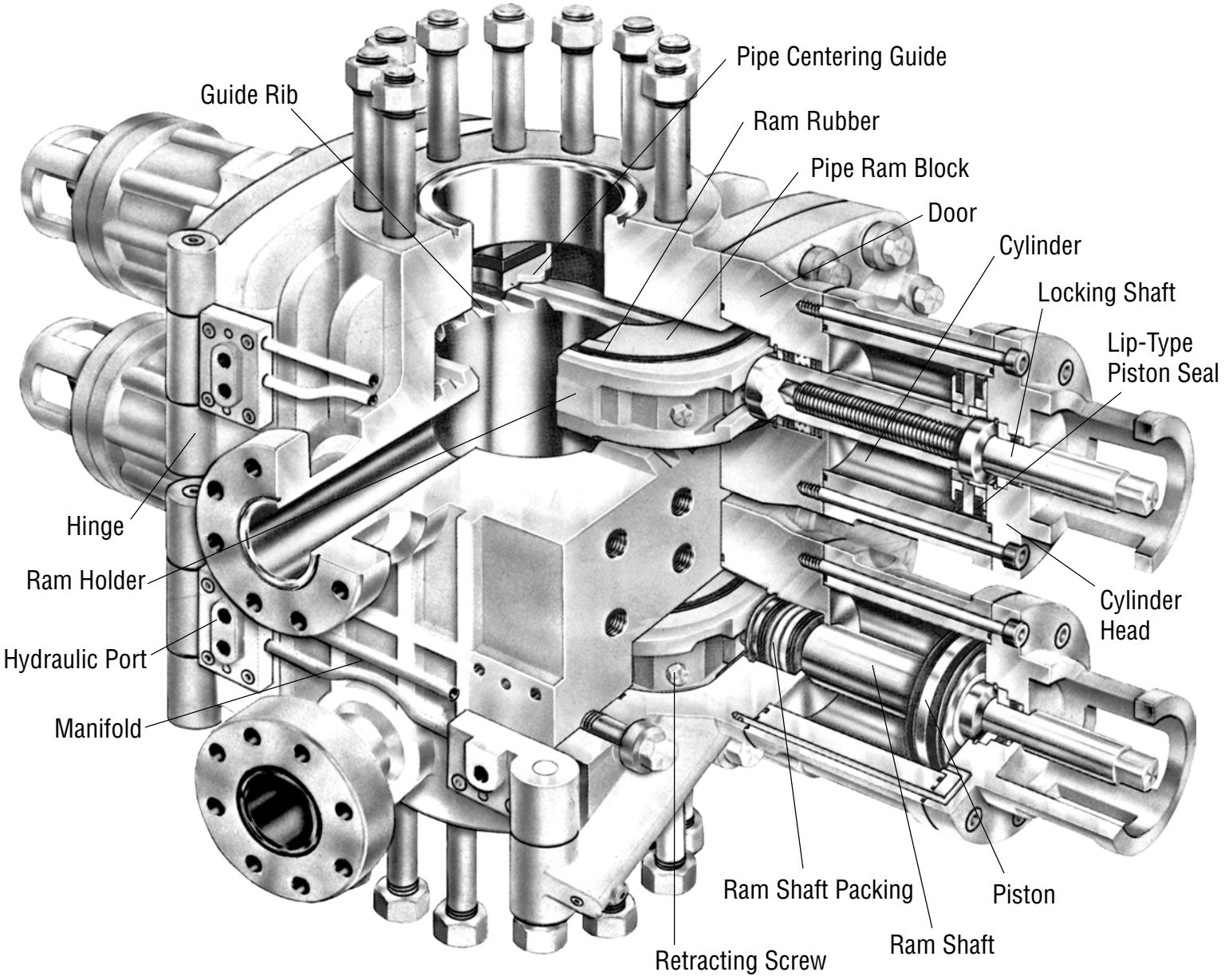
# Control Flow
# DRH & The Trojan Catalog

# Fast, Effective Blowout Protection

## MODEL DRH - DUAL RAM HYDRAULIC BOP



# DRH Features

CONTROL FLOW INC.

**A positive seal every time.** Control Flow's DRH (Dual Ram Hydraulic) or SRH (Single Ram Hydraulic) models let you shut in a well in seconds from a control panel located at the driller's station or any other place you choose. There's no waiting for rig hands to get to the cellar and manually close the rams. The trouble-free, efficient design of these 5,000-psi-working-pressure BOPs has been field-proven in many years of rugged service.

**Double protection.** Install pipe rams in one compartment of a DRH and blind rams in the other and you can shut in the well whether there's pipe in the hole or not. Each set of rams operates independently of the other.

**Automatic pipe string alignment.** As rams close, guides on the ram blocks automatically center the pipe string in the wellbore, even if the string is hanging off center.

**Positive pressure control.** One-piece ram rubbers seal across the wellbore and against the top of the ram cavity. Retracting screws allow ram blocks to move slightly in their holders to ensure positive alignment as sealing contact occurs.

**Extrusion plates channel rubber flow toward sealing surfaces as rams meet.** Each rubber is secured to its ram block by two retaining screws, which fit into trunnion nuts extending through the extrusion plates molded into the rubber. This keeps the rubber in proper sealing position, even under extreme pressure.

**Well pressure assists sealing.** When rams are closed, pressure in the wellbore pushes them upward and inward, squeezing the ram rubbers more tightly against the sealing surfaces.

**Any standard 1,500-psi accumulator will operate your Control Flow BOP.** Rams can also be opened and closed with a hand pump, if necessary.

**Rams can be locked in their closed position** by manually turning each locking shaft clockwise until it shoulders against the cylinder head.

**Rig crew can close rams manually** with the locking shafts if hydraulic pressure should fail. Closed rams can be opened only by hydraulic pressure.

**Locking shafts can't corrode or freeze up** because the exposed portions of their threads are constantly immersed in hydraulic fluid.

**Each ram and its operating mechanism is completely self-contained.** Ram, ram shaft, piston and cylinder are all mounted on a hinged door, which can be swung open after the cap screws are removed.

**Swing-open doors simplify ram changing.** Rams can even be changed with pipe in the hole, if necessary. Bottom doors swing out from under the upper cylinders on DRH models, allowing a hoisting line to be attached directly to the rams, which slide on and off their shafts horizontally.

**Hydraulic passages are built into the hinges,** so doors can be opened without draining fluid or breaking hydraulic connections. Since the hydraulic circuits are unbroken, rams can be extended and retracted while the doors are open to facilitate ram changing and testing.

**Hydraulic control lines connect to ports in the hinge brackets** at whichever end of the BOP is the most convenient for the hookup. Fluid flows to the opposite end through manifolds on the outside of the body. Pipe plugs seal the unused ports.

**Simple, trouble-free design.** There's just a single piston, made from stainless steel and manganese bronze, for each ram. This piston is completely enclosed and protected by the cylinder. Control Flow's piston seals are the large lip-type made for use on moving parts — not O-rings.

**Ram shaft packing protects operating mechanism** from wellbore pressure and contamination by wellbore fluid.

**Self-draining ram compartments.** The bottom of each ram compartment slopes toward the wellbore to drain away mud and sand that could interfere with free movement of the rams.

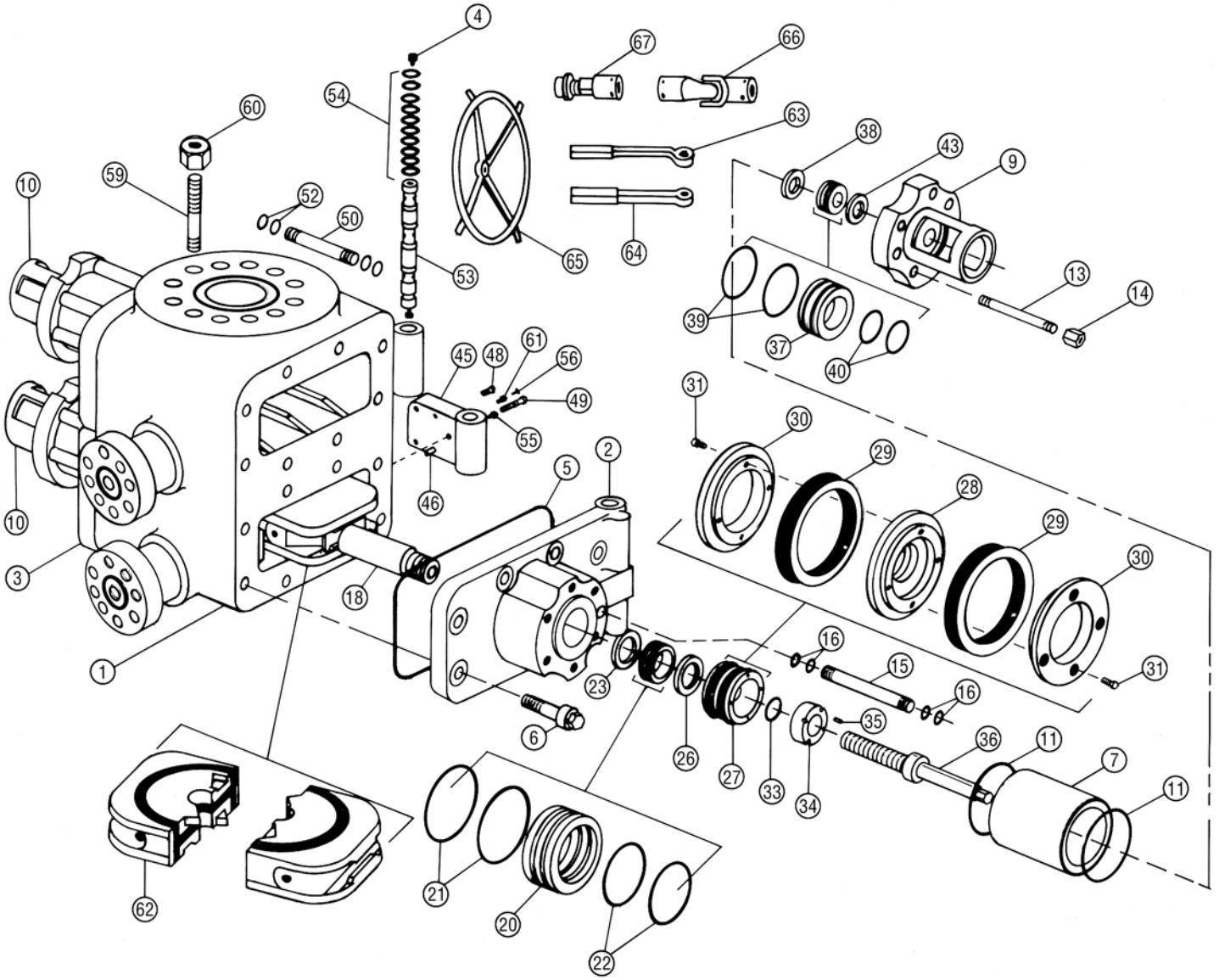
**Free-floating rams prolong rubber life.** When rams are open, they rest on narrow guide ribs and touch no other part of the ram cavity. Ram rubbers have no contact with the top of the cavity until the rams are nearly closed, which greatly reduces rubber wear.

**Interchangeable ram blocks.** Ram blocks for various sizes of drill pipe, tubing and casing, and for complete shut-off of the wellbore, can be interchanged in the same ram holder.

**High-strength alloy steel** is used for ram blocks, ram holders, cylinder heads, doors and the deep-ribbed body. Ram shafts are stainless steel.

**Dual ram model's double body configuration saves installation space.** Two ram compartments in one unitized body offers a lower overall height than two single preventers installed one above the other.

**Choice of studded or flanged connections** lets you match your DRH or SRH to the other components of your BOP stack. (Studded connections shown.)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# Parts List - DRH BOPs

CONTROL FLOW INC.

| Item No. | Description | Qty. | Part No. | | |
|---|---|---|---|---|---|
| | Working Pressure 5,000 psi | | | | |
| | Bore | | 7 1/16" | 11" | 13 5/8" |
| 1 | Body | 1 | - | - | - |
| 2 | Door, Right Hand | 2 | 133002 | 134807 | 134607 |
| 3 | Door, Left Hand | 2 | 133003 | 134808 | 134608 |
| 4 | Pipe Plug | 24 | - | 065001 | 065001 |
| | | 32 | 065001 | - | - |
| 5 | O-Ring, Door | 4 | 030030 | 030008 | 134014 |
| 6 | Cap Screw, Door | 32 | 133012 | - | - |
| | | 40 | - | 134806 | 134606 |
| 7 | Cylinder | 4 | 133004 | 134005 | 134005 |
| 8 | Cylinder Head | 4 | - | 134006 | 134006 |
| 9 | Cylinder Head, Right Hand | 2 | 133005 | - | - |
| 10 | Cylinder Head, Left Hand | 2 | 133006 | - | - |
| 11 | O-Ring, Cylinder and Cylinder Head | 8 | 030141 | 030007 | 030007 |
| 12 | Cap Screw, Cylinder and Cylinder Head | 24 | - | - | - |
| 13 | Stud, Cylinder and Cylinder Head | 24 | 215283 | 134418 | 134418 |
| 14 | Nut, Cylinder and Cylinder Head | 24 | 020101 | 020103 | 020103 |
| 15 | Manifold, Cylinder | 4 | 133007 | - | - |
| 16 | O-Ring, Cylinder Manifold | 16 | 030056 | - | - |
| 17 | O-Ring, Cylinder Manifold Port | 8 | - | 030058 | 030058 |
| 18 | Ram Shaft | 4 | 133008 | 193601 | 193601 |
| 19 | Packing, Ram Shaft | 32 | - | 030003 | 030003 |
| 20 | Packing Adaptor, Ram Shaft | 4 | 132415 | 115025 | 192011 |
| 21 | O-Ring, Packing Adaptor — Outer | 8 | 030077 | 030006 | 030006 |
| 22 | O-Ring, Packing Adaptor — Inner | 8 | 030000 | 030005 | 030005 |
| 23 | Retainer, Packing Adaptor | 4 | 040952 | - | 041017 |
| 24 | Ring, Packing Back-Up | 4 | - | 115026 | 015026 |
| 25 | Retainer, Packing Back-Up Ring | 4 | - | 041017 | 041017 |
| 26 | Scraper Ring, Ram Shaft | 4 | 040395 | - | - |
| 27 | Piston Assembly | 4 | 132413 | 192006 | 192006 |
| 28 | Body | 4 | 132420 | 192007 | 192007 |
| 29 | Rubber | 8 | 132422 | 115021 | 115021 |
| 30 | Retainer, Rubber | 8 | 132421 | 115020 | 115020 |
| 31 | Cap Screw, Rubber Retainter | 32 | 132423 | 010657 | 010657 |
| 32 | Lock Washer, Retainer Cap Screw | 32 | - | 025032 | 025032 |
| 33 | O-Ring | 4 | 030071 | 030000 | 030000 |
| 34 | Lock Nut, Piston | 4 | 132414 | 192103 | 192103 |

| Item No. | Description | Qty. | Part No. | | |
|---|---|---|---|---|---|
| | Working Pressure 5,000 psi | | | | |
| | Bore | | 7 1/16" | 11" | 13 5/8" |
| 35 | Set Screw | 4 | 010015 | - | - |
| | | 8 | - | 010000 | 010000 |
| 36 | Locking Shaft | 4 | 141218 | 193703 | 193703 |
| 37 | Thrust Bushing, Locking Shaft | 4 | 130014 | 134008 | 134008 |
| 38 | Retainer, Thrust Bushing | 4 | 040146 | 040001 | 040001 |
| 39 | O-Ring, Thrust Bushing — Outer | 8 | 030011 | - | - |
| 40 | O-Ring, Thrust Bushing — Inner | 8 | 030065 | - | - |
| 41 | Packing, Locking Shaft | 12 | - | 030210 | 030210 |
| 42 | End Ring, Locking Shaft Packing | 4 | - | 030211 | 030211 |
| 43 | Scraper Ring, Locking Shaft | 4 | 040384 | 040002 | 040002 |
| 44 | Carrier, Scraper Ring | 4 | - | 134009 | 134009 |
| 45 | Hinge Bracket | 4 | 132411 | 134810 | 134010 |
| 46 | Dowel Pin | 8 | 050080 | 050096 | 050096 |
| 47 | Cap Screw, Hinge Bracket | 16 | - | 010726 | 010727 |
| 48 | Cap Screw, Hinge Bracket — Short | 16 | 010691 | - | - |
| 49 | Cap Screw, Hinge Bracket — Long | 4 | 010622 | - | - |
| 50 | Manifold, Hinge | 2 | - | 134812-1 | - |
| | — Straight | 4 | 132427 | - | 134609 |
| 51 | Manifold, Hinge — Curved | 2 | - | 134812-2 | - |
| 52 | O-Ring, Hinge Manifold | 16 | 030054 | 030056 | 030056 |
| 53 | Hinge Pin | 4 | 133010 | 134811 | 134001 |
| 54 | O-Ring, Hinge Pin | 40 | 030061 | 030064 | 030065 |
| 55 | Retainer, Hinge Pin | 4 | 132424 | 132424 | 132424 |
| 56 | Pipe Plug | 8 | 066326 | 066326 | 066326 |
| 57 | Pipe Plug | 4 | - | 065009 | - |
| 58 | Grease Fitting | 8 | 050267 | - | - |
| 59 | Stud, Body | 24 | 011017 | 011026 | - |
| | | 32 | - | - | 010422 |
| 60 | Nut, Body Stud | 24 | 020011 | 020014 | - |
| | | 32 | - | - | 020012 |
| 61 | Bushing | 8 | 065145 | 065145 | 065145 |
| 62 | Ram Assembly | 4 | *See Ram Parts List* | | |
| 63 | Wrench, Door | 1 | 050363 | 050828 | 050459 |
| 64 | Wrench, Cylinder and Cylinder Head | 1 | 050561 | 050370 | 050370 |
| 65 | Handwheel | 4 | 131107 | 115050 | 115050 |
| 66 | U-Joint | 4 | 202011 | 202007 | 202007 |
| 67 | Stem Assembly | 4 | 202402 | 202402 | 202402 |

CONTROL FLOW INC.

# Ram Parts List

## 7 1/16", 5,000 psi DRH & SRH BOPs

| Pipe O.D. | Part Number | | | | |
|---|---|---|---|---|---|
| | Ram Assembly[a] | Ram Block Sub-Assembly[b] | Ram Block | Ram Rubber |
| C.S.O. | 135783 | 135940 | 135842 | 135857 |
| 1.315" | 135787 | 135941 | 135788 | 135789 |
| 1.660" | 135791 | 135942 | 135788 | 135793 |
| 1.900" | 135795 | 135943 | 135788 | 135797 |
| 2 1/16" | 136073 | 142643 | 136075 | 136076 |
| 2 3/8" | 135799 | 135944 | 135863 | 135858 |
| 2 7/8" | 135803 | 135945 | 135863 | 135859 |
| 3 1/2" | 135807 | 135946 | 135808 | 135860 |
| 4" | 135811 | 135947 | 135840 | 135861 |
| 4 1/2" | 135815 | 135948 | 135840 | 135862 |

[a] Includes ram holder (135847), ram block sub-assembly, 2 ram block retracting screws (135848) and centering plug (010706).

[b] Includes ram block, ram rubber and 2 ram rubber retaining screws (135545).

## 11", 5,000 psi DRH & SRH BOPs

| Pipe O.D. | Part Number | | | |
|---|---|---|---|---|
| | Ram Assembly[a] | Ram Block Sub-Assembly[b] | Ram Block | Ram Rubber |
| C.S.O. | 215269 | 215227 | 215231 | 215275 |
| 1.315" | 215270 | 215228 | 215232 | 215276 |
| 1.660" | 215271 | 215229 | 215233 | 215277 |
| 1.900" | 215272 | 215230 | 215234 | 215278 |
| 2 3/8" | 215273 | 215211 | 215235 | 215279 |
| 2 7/8" | 215274 | 215212 | 215236 | 215280 |
| 3 1/2" | 215244 | 215213 | 215237 | 215281 |
| 4" | 215112 | 215114 | 215116 | 215118 |
| 4 1/2" | 215245 | 215214 | 215238 | 215220 |
| 5" | 215113 | 215115 | 215117 | 215119 |
| 5 1/2" | 215246 | 215215 | 215239 | 215221 |
| 6 7/8" | 215247 | 215216 | 215240 | 215222 |
| 7" | 215248 | 215217 | 215241 | 215223 |
| 7 5/8" | 215249 | 215218 | 215242 | 215224 |
| 8 5/8" | 215226 | 215219 | 215243 | 215225 |

[a] Includes ram holder (135875), ram block sub-assembly and 2 ram block retracting screws (135575).

[b] Includes ram block, ram rubber and 2 ram rubber retaining screws (135546).

## 13 5/8", 5,000 psi DRH & SRH BOPs

| Pipe O.D. | Part Number | | | |
|---|---|---|---|---|
| | Ram Assembly[a] | Ram Block Sub-Assembly[b] | Ram Block | Ram Rubber |
| C.S.O. | 215122 | 215140 | 215158 | 215176 |
| 1.315" | 215123 | 215141 | 215159 | 215177 |
| 1.660" | 215124 | 215142 | 215160 | 215178 |
| 1.900" | 215125 | 215143 | 215161 | 215179 |
| 2 1/16" | 215126 | 215144 | 215162 | 215180 |
| 2 3/8" | 215127 | 215145 | 215163 | 215181 |
| 2 7/8" | 215128 | 215146 | 215164 | 215182 |
| 3 1/2" | 215129 | 215147 | 215165 | 215183 |
| 4" | 215130 | 215148 | 215166 | 215190 |
| 4 1/2" | 215131 | 215149 | 215167 | 215191 |
| 5" | 215132 | 215150 | 215168 | 215192 |
| 5 1/2" | 215133 | 215151 | 215169 | 215193 |
| 6 5/8" | 215134 | 215152 | 215170 | 215194 |
| 7" | 215135 | 215153 | 215171 | 215195 |
| 7 5/8" | 215136 | 215154 | 215172 | 215196 |
| 8 5/8" | 215137 | 215155 | 215173 | 215197 |
| 9 5/8" | 215138 | 215156 | 215174 | 215198 |
| 10 3/4" | 215139 | 215157 | 215175 | 215199 |

[a] Includes ram holder (135551), ram block sub-assembly and 2 ram block retracting screws (135575).

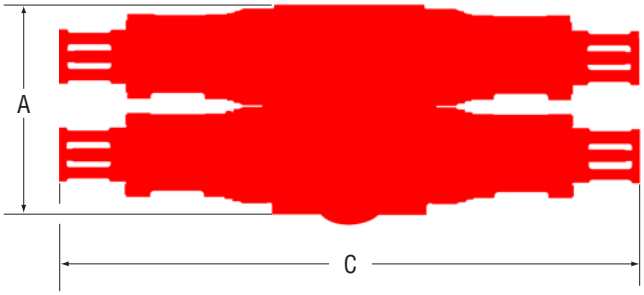
[b] Includes ram block, ram rubber and 2 ram rubber retaining screws (135546).

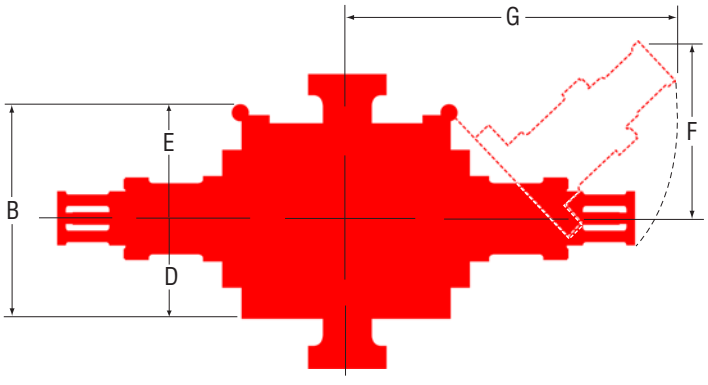
## Specifications

| Vertical Bore Size (inches) | Maximum Service Pressure Rating (psi) | Test Pressure (psi) | Maximum Ram Size (inches) |
|---|---|---|---|
| 7 1/16 | 5,000 | 10,000 | 4 1/2 |
| 11 | 5,000 | 10,000 | 8 5/8 |
| 13 5/8 | 5,000 | 10,000 | 10 3/4 |

## Dimensions (inches)

| | A | | B | C | D | E | F | G |
|---|---|---|---|---|---|---|---|---|
| | Height | | | | | | | |
| Vertical Bore Size | Studded End Connections | Flanged End Connections | Width | Length | Center to Front | Center to Rear | Door Open to Change Rams | Door Open to Change Rams |
| 7 1/16 | 26 3/4 | 30 1/2 | 21 1/2 | 58 | 9 5/16 | 12 1/8 | 21 | 34 |
| 11 | 33 | 50 1/2 | 28 3/4 | 89 1/4 | 12 3/4 | 16 | 32 | 46 |
| 13 5/8 | 36 | 49 5/8 | 33 5/8 | 92 3/4 | 14 3/4 | 18 7/8 | 41 | 54 |



# "TROJAN" Blowout Preventers

CONTROL FLOW INC.

**Control Flow's "TROJAN" ram type blowout preventer is a field proven workhorse. You'll find it pulling its weight on many major oil company wells and is one of the most easily maintained and reliable BOPs ever built.**

**SPECIAL FEATURES:**

**Body** is produced from high quality static-cast, sand molded casting using a process called "Argon Oxygen Refining" which allows cleaner metal, with low residual oxygen, nitrogen, and hydrogen.

**Ram Cavity** bottoms are steeply sloped to prevent accumulation of sand or drilling fluids.

**Single or Double Body** configurations are available with 2,000 psi or 3,000 psi or combination of both studded top and bottom connections.

**Well Pressure Seals** are located in a cartridge between the body and pressure bonnet for ease of installation or replacement. This assures positive alignment between the body and bonnet assembly.

**Ram Assembly** combines toughness and a generous supply of self-feeding packing.

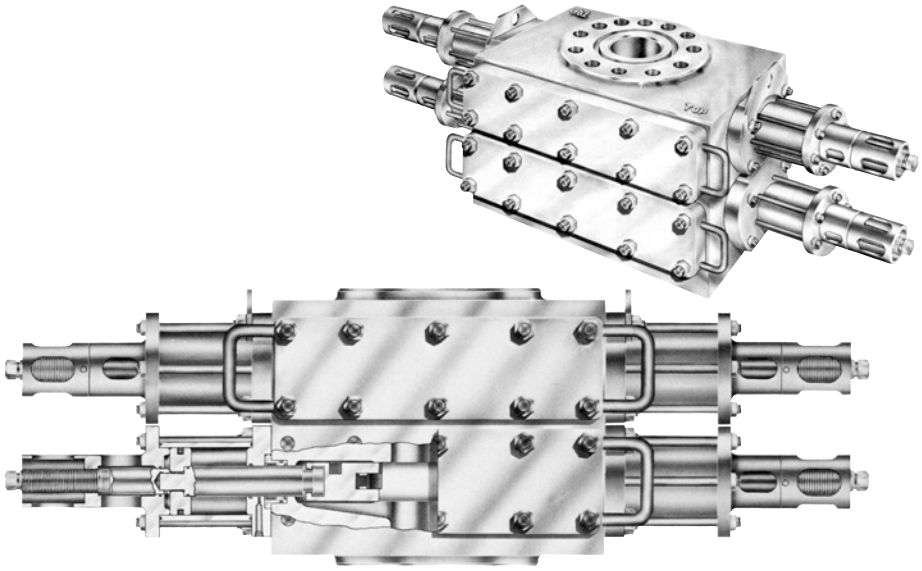
**Ram Blocks** can be changed with pipe in the hole.

All "TROJAN" BOP assemblies are trimmed for internal $H_2S$ service. This feature is standard at no extra cost.

# HYDRAULIC

| Dimensions & Weights | | |
|---|---|---|
| Weight | Single | 1,300 lbs. |
| | Double | 2,300 lbs |
| Overall Height, Less Studs | Single | 13 1/8" |
| | Double | 22 1/4" |
| Overall Length | | 63" |
| Overall Width, Less Handwheel | | 21 3/4" |
| Opening Through Preventer | | 7 1/16" |
| Working Pressure | | 3,000 psi |
| Test Pressure | | 6,000 psi |
| Handwheel Diameter | | 14" |
| Ring Joint Gasket API Number | | R-45 |

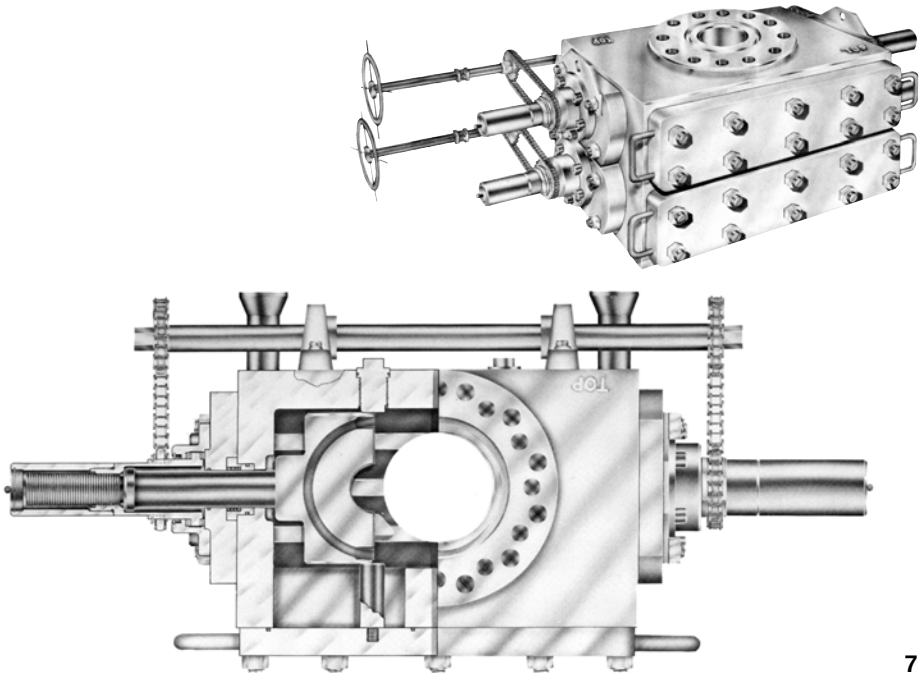
Packers and ram assemblies interchange with other preventers of this design.



# MECHANICAL

| Dimensions & Weights | | |
|---|---|---|
| Weight | Single | 1,272 lbs. |
| | Double | 2,335 lbs |
| Overall Height, Less Studs | Single | 13 1/8" |
| | Double | 22 1/4" |
| Overall Length | | 63" |
| Overall Width, Less Handwheel | | 21 3/4" |
| Opening Through Preventer | | 7 1/16" |
| Working Pressure | | 3,000 psi |
| Test Pressure | | 6,000 psi |
| Handwheel Diameter | | 48" |
| Ring Joint Gasket API Number | | R-45 |

Packers and ram assemblies interchange with other preventers of this design.

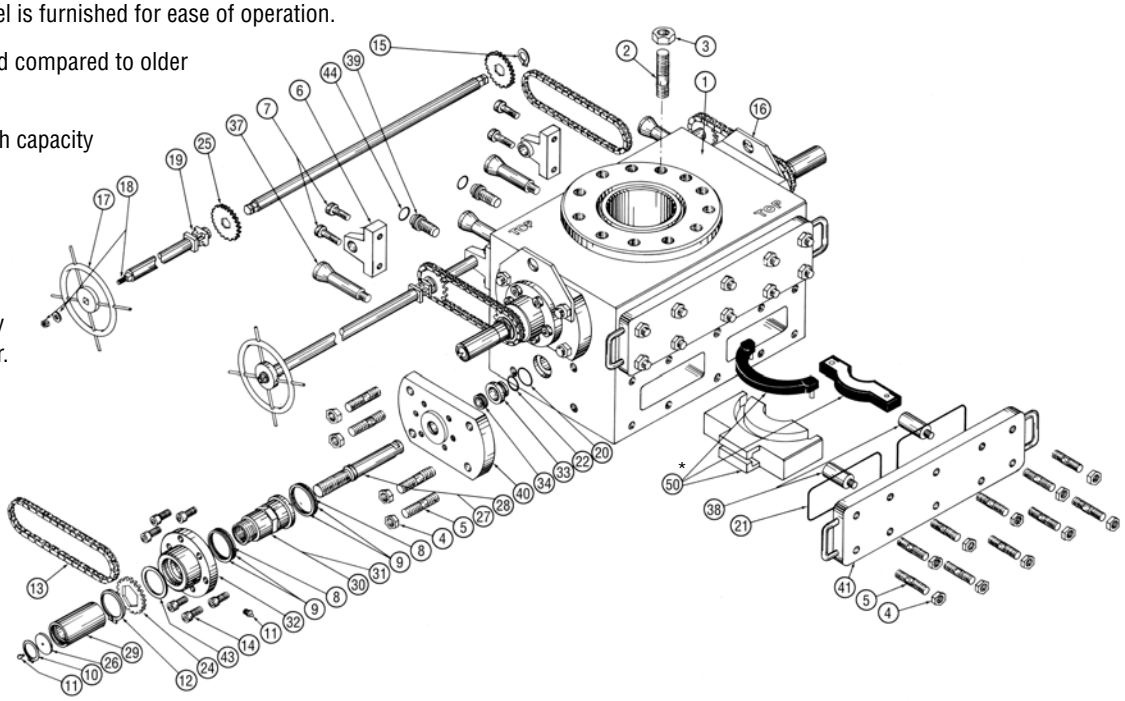


CONTROL FLOW INC.

# "TROJAN" Mechanical Blowout Preventer

## Features:

- One man can open or close the "TROJAN."
- A large 45" diameter handwheel is furnished for ease of operation.
- Timing problems are minimized compared to older designed B.O.P.'s.
- Thrust loads are carried by high capacity needle bearings.
- Grease fittings on the bonnet assembly allow the bearings to be lubricated.
- Sprocket protector on the body protects sprocket and drive bar.
- Lifting plates are provided for ease of handling.
- All maintenance can be done with standard tools. No special tools are required.
- Barrier ring between stem nut and bonnet eliminates side loading during opening and closing of the rams.



| Item | Description | Qty. | Part No. |
|---|---|---|---|
| 1 | Body | 1 | |
| 2 | 1 ⅛" x 5 ½" T.E. Stud B-7 | 24 | 011010 |
| 3 | 1 ⅛" Hex Nut, Gr. 2H | 24 | 020003-62 |
| 4 | 1" Hex Nut, Gr. 2H | 36 | 020001-62 |
| 5 | 1" x 4 ¼" T.E. Stud Gr. B-7 | 24 | 0064 |
| 6 | Pillow Block | 4 | 0066 |
| 7 | ½" x 2" Hex Head Cap Screw | 8 | 010609 |
| 8 | Bearing NTA-6074 | 8 | 0069 |
| 9 | Bearing Race TRC-6074 | 16 | 0070 |
| 10 | Snap Ring N-500-262 | 4 | 0072 |
| 11 | ¼" Grease Fitting | 8 | 0073 |
| 12 | Snap Ring N-5100-375 | 4 | 0074 |
| 13 | Chain | 4 | 0075-A |
| 14 | ¾" x 1 ½" Socket Head Cap Screw | 24 | 0076 |
| 15 | Snap Ring N-5100-125 | 4 | 0077 |
| 16 | Lifting Plate | 2 | 0082 |
| 17 | Handwheel, 36" | 2 | 0084 |
| 18 | Handwheel Bar | 2 | 0087 |
| 19 | Universal Joint | 2 | 0089 |
| 20 | O-Ring, 2-339 | 4 | 0182 |
| 21 | O-Ring, 2-442 | 4 | 0188 |
| 22 | Wiper, Type D-2250 | 4 | 0253 |

| Item | Description | Qty. | Part No. |
|---|---|---|---|
| 24 | Sprocket for Bearing Housing | 4 | 3102 |
| 25 | Sprocket for Drive Shaft | 4 | 3103 |
| 26 | Grease Plate | 4 | 3104 |
| 27 | Ram Shaft, Left Hand | 2 | 3105 |
| 28 | Ram Shaft, Right Hand | 2 | 3106 |
| 29 | Thread Protector | 4 | 3107 |
| 30 | Stem Bearing Housing/ Right Hand | 2 | 3108 |
| 31 | Stem Bearing Housing/ Left Hand | 2 | 3109 |
| 32 | Bearing Housing | 4 | 3110 |
| 33 | Packing Gland | 4 | 3111 |
| 34 | Packing Assembly | 4 | 3114 |
| 36 | Drive Shaft | 2 | 3115 |
| 37 | Sprocket Protector | 4 | 3116 |
| 38 | Ram Guide Pin | 4 | 3117 |
| 39 | Alignment Plug | 4 | 3118 |
| 40 | End Cover | 4 | 3119 |
| 41 | Pressure Plate | 2 | 3122 |
| 42 | Ram Tool | 1 | 3134 |
| 43 | Barrier Ring | 4 | 3137 |
| 44 | O-Ring 2-226 | 4 | 0211 |

Parts interchange with other preventers of this design.
*#50 - See Page 10 for Ram Block Assembly.

# "TROJAN" Hydraulic Blowout Preventer

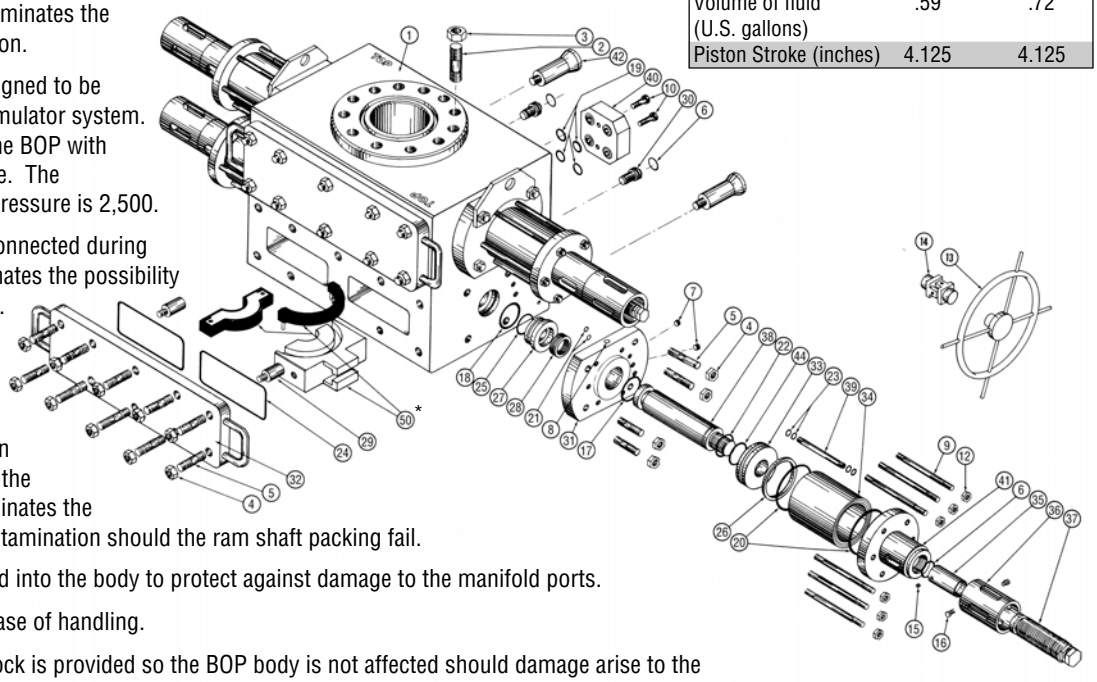
CONTROL FLOW INC.

## Features:

- Hydraulic fluid passages are ported through the body, eliminating the need for external piping.
- Ram position can be positively determined visually. Slots are provided in both the cylinder head and the M.O.R. protective cover.
- The bi-directional piston seal eliminates the possibility of improper installation.
- The Hydraulic "TROJAN" is designed to be operated with any oil field accumulator system. Less than 1,000 psi will close the BOP with full working pressure in the bore. The maximum hydraulic operating pressure is 2,500.
- The hydraulic lines are not disconnected during ram change. This feature eliminates the possibility of hydraulic fluid contamination.
- All maintenance can be done with standard tools. No special tools are required.
- A weep hole is provided between wellbore ram shaft packing and the hydraulic seal. This feature eliminates the possibility of hydraulic fluid contamination should the ram shaft packing fail.
- Manifold protectors are threaded into the body to protect against damage to the manifold ports.
- Lifting plates are provided for ease of handling.
- A bolt-on hydraulic manifold block is provided so the BOP body is not affected should damage arise to the threaded connections for the accumulator units' operating lines.
- The hydraulic "TROJAN" can be converted to the mechanical version.

### Hydraulic System Operational Data

| | TO OPEN | TO CLOSE |
|---|---|---|
| Maximum operating pressure (psi) | 1,500 | 1,500 |
| Ratio | | 4.2:1 |
| Volume of fluid (U.S. gallons) | .59 | .72 |
| Piston Stroke (inches) | 4.125 | 4.125 |



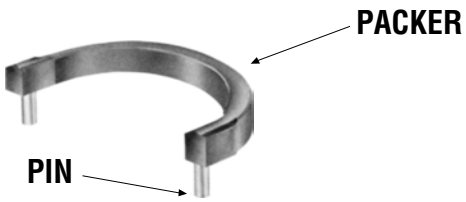
| Item | Description | Qty. | Part No. |
|---|---|---|---|
| 1 | Body | 1 | |
| 2 | 1 ⅛" x 5 ¼" T.E. Stud Gr. B-7 | 24 | 011010 |
| 3 | 1 ⅛" Hex Nut, Gr. 2H | 24 | 020003-62 |
| 4 | 1" Hex Nut, Gr. 2H | 36 | 020001-62 |
| 5 | 1" x 4 ¼" T.E. Stud Gr. B-7 | 24 | 0064 |
| 6 | O-Ring 2-226 | 8 | 0211 |
| 7 | ¼" NPT Pipe Plug | 12 | 0078 |
| 8 | ¼" NPT Weep Plug | 4 | 0079 |
| 9 | ¾" x 9 ¾" lg. T.E. Stud A193 B-7 | 24 | 0080 |
| 10 | ½" x 3" lg. Socket Head Cap Screw | 4 | 0081 |
| 11 | Lifting Plate | 2 | 0082 |
| 12 | ¾" Nut, Gr. 2H | 24 | 0083 |
| 13 | Handwheel 14" | 4 | 0085 |
| 14 | Universal Joint | 4 | 0089 |
| 15 | ¼" x ¼" S.H. Set Screw/S.S. | 4 | 0095 |
| 16 | ⅜" x ¾" Grade 8 Bolt | 12 | 0096 |
| 17 | O-Ring, 2-228 | 12 | 0181 |
| 18 | O-Ring, 2-339 | 4 | 0182 |
| 19 | O-Ring, 2-017 | 4 | 0183 |
| 20 | O-Ring, 2-161 | 8 | 0184 |
| 21 | O-Ring, 2-116 | 8 | 0185 |
| 22 | O-Ring, 2-328 | 4 | 0186 |

| Item | Description | Qty. | Part No. |
|---|---|---|---|
| 23 | O-Ring, 2-210 | 8 | 0187 |
| 24 | O-Ring, 2-442 | 4 | 0188 |
| 25 | Wiper, Type D-2250 | 4 | 0253 |
| 26 | Crown Seal, CP-350 | 4 | 0254 |
| 27 | Packing Gland | 4 | 3111 |
| 28 | Packing Assembly | 4 | 3114 |
| 29 | Ram Guide Pin | 4 | 3117 |
| 30 | Alignment Plug | 4 | 3118 |
| 31 | End Cover | 4 | 3119 |
| 32 | Pressure Plate | 2 | 3122 |
| 33 | Piston | 4 | 3123 |
| 34 | Cylinder | 4 | 3124 |
| 35 | Balance Stem | 4 | 3125 |
| 36 | Protector, M.O.R. | 4 | 3126 |
| 37 | Locking Shaft | 4 | 3127 |
| 38 | Ram Shaft | 4 | 3128 |
| 39 | Manifold Tube | 4 | 3129 |
| 40 | Manifold Block | 2 | 3130 |
| 41 | Bonnett | 4 | 3131 |
| 42 | Manifold Protector | 2 | 3132 |
| 43 | Ram Tool | 1 | 3134 |
| 44 | Brass Spacer Ring | 4 | 3136 |

Parts interchange with other preventers of this design.
*#50 - See Page 10 for Ram Block Assembly.

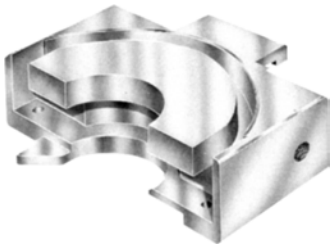
CONTROL FLOW INC.

# Type "EH" Ram Block Assembly



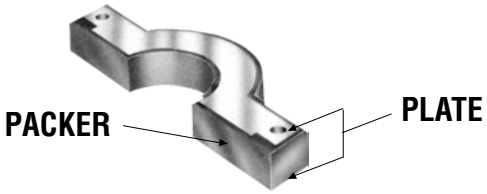

The Type EH ram allows for quick and easy packer replacement. No special tools are required

The packers are bonded to anti-extrusion plates or pins which confine the large reserve of feedback rubber.



**Control Flow also manufactures replacement parts for:**

**Shaffer**
"Type A"
"Type B"
"Type E"
"LWS" & "LWP" hydraulic BOPs
"Type 45" mechanical BOP
"Type 50" rotating preventer
Complete array of ring seals and seal kits for all Shaffer spherical preventers




**Cameron** Complete line of BOP parts

**Single Offset Rams**

| | | RIGHT HAND | | LEFT HAND | | INNER PACKER | |
|---|---|---|---|---|---|---|---|
| Pipe O.D. | Centers (Inches) | Assembly Number | Block Part Number | Assembly Number | Block Part Number | Right Hand Part Number | Left Hand Part Number |
| 1.315 | 2 25/32 | 3206 | 3071 | 3200 | 3281 | 3060 | 3060 |
| 1.660 | 2 25/32 | 3207 | 3072 | 3201 | 3282 | 3061 | 3061 |
| 1.900 | 2 25/32 | 3208 | 3073 | 3202 | 3083 | 3062 | 3062 |
| 2 1/16 | 2 25/32 | 3209 | 3074 | 3203 | 3084 | 3063 | 3063 |
| 2 3/8 | 3 35/64 | 3210 | 3075 | 3204 | 3085 | 3064 | 3064 |
| 2 7/8 | 3 35/64 | 3211 | 3076 | 3205 | 3086 | 3065 | 3065 |

Outer packer 3023

**"EH" Ram Assemblies**

| Pipe O.D | Block | Inner Packer |
|---|---|---|
| C.S.O. | 3045 | 3000 |
| 1.315 | 3046 | 3001 |
| 1.660 | 3047 | 3002 |
| 1.900 | 3048 | 3003 |
| 2 1/16 | 3049 | 3004 |
| 2 3/16 | 3050 | 3005 |
| 2 3/8 | 3051 | 3006 |
| 2 3/4 | 3052 | 3007 |
| 2 7/8 | 3053 | 3008 |
| 3 1/2 | 3054 | 3009 |
| 4 | 3077 | 3066 |
| 4 1/2 | 3078 | 3067 |
| 5 | 3079 | 3068 |
| 5 1/2 | 4080 | 3069 |