



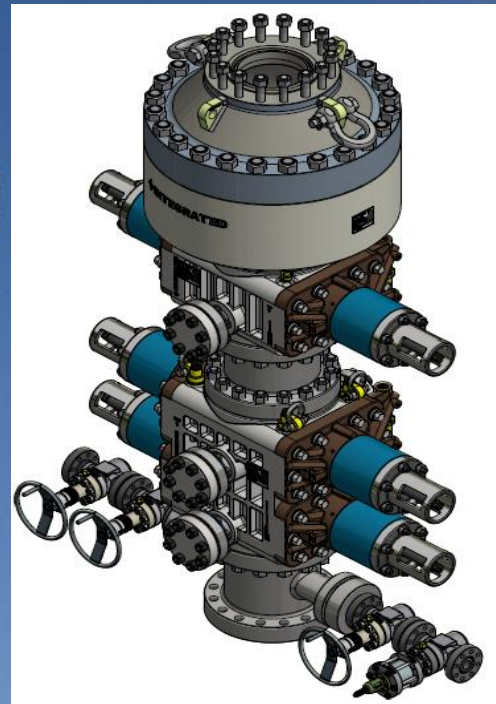
INTEGRATED[®]

OEM RAM IWS[™] BOP CATALOG

INTEGRATED[®]

is an established OEM manufacturer of API Monogrammed Pressure Control Equipment and Spare Parts that meets or exceeds industry Requirements. All products are designed, engineered, manufactured, and validated as per latest edition of API 6A, 16A, 20E & ASME Standards & Specifications.

The INTEGRATED[®] IWS[™] Ram BOP is an industry proven design that is tough, reliable and easy to service in the field. The BOP is hydraulically operated and can be manually locked by turning handwheels. The IWS[™] Ram BOP are designed for drilling and workover service. A large range of Blind, Pipe Rams and Multi Ram are offered.



INTEGRATED[®] is an API licensed Original Equipment Manufacturer (OEM) of Pressure and Flow Control Equipment for the Global Drilling, Workover, Snubbing, Rental and Production sectors of the Oil and Gas Industry

INTEGRATED[®] holds the following Manufacturing Licenses & Certifications:

API 6A | API 16A | API 16AR | API 16C | API 20E (BSL 1,2 & 3) | ASME U | CE | CRN | NATIONAL BOARD | API Q1 (10th Edition) | ISO-9001-2015

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INTEGRATED® ORIGINAL EQUIPMENT MANUFACTURE (OEM) API Monogrammed Equipment & Product - Licenses and Certifications

API 6A-0851 | API 16A-0197 | API 16AR-0015 | API 16C-0564 | API 20E-0087 | ASME U-59670 | CE (European) | CRN (Canadian) | API Q1-4952 (10th Edition) | ISO 9001:2015-RQ91/4505

API 6A	API 6A	API 16A	API 16A	API 16C	API 20E	ASME U	API 16AR	API Q1 / ISO
PRESSURE CONTROL VALVES	PRESSURE MANIFOLDS WELLHEAD COMPONENTS	BLOWOUT PREVENTERS (RAM BOPS)	BLOWOUT PREVENTERS (ANNULAR BOPS)	WELL CONTROL CHOKES & BUFFER TANKS	EQUIPMENT BOLTING (BSL)	PULSATION DAMPENERS (PD)	REMANUFACTURING (Recertification)	EQUIPMENT & ELASTOMERS
IFCTM (Slab Gate Valve) 2-1/16" to 4-1/16"	Choke & Kill Manifolds	IUTM Ram Forged BOP Single Double Shear & Non-Shear 7-1/16" to 21-1/4"	ISATM Spherical Annular Forged BOP Studded Top x Flanged Bottom 7-1/16" to 21-1/4"	Well Control Chokes Positive Choke Adjustable Choke	Ram & Annular BOP Bolting (BSL 1, 2 & 3)	IDPDTM Drilling Pulsation Damper 10 & 20 GALLON Up to 7,500 psi	Ram & Annular BOP Repair and/or Remanufacture All Major Brands	Certified Quality Management System (QMS)
IFLSTM (Slab Gate Valve) 2-1/16" to 7-1/16"	Standpipe & Managed Pressure Drilling Manifolds	IWSTM Ram Forged BOP Single Double 7-1/16" to 13-5/8"	IKTSM Annular Forged BOP Studded Top x Flanged Bottom 7-1/16" to 13-5/8" & 29" - MSP	Well Control Choke Actuators	Valve Bolting	IPDPTM Production Pulsation Damper 1 to 20 GALLON 285 to 6,180 psi	Choke & Kill Manifolds	Corporate ERP Manufacturing System (JDE)
AceFlowTM (Expanding Gate Valve) 2-1/16" to 4-1/16"	Cement Manifolds	IESTM Ram Forged BOP Single Double Triple 7-1/16" to 9"	ISATM & IKTSM Annular Spare Parts	Choke & Kill Manifold Buffer Chambers (tanks)	Pulsation Damper Bolting	Pulsation Damper Diaphragm & Kits	API Valves FC & FLS Styles	Global System to connect all Manufacturing, Distribution & Services
Surface Safety Valves (SSV) (PSL 2 & 3)	Kill Wing Valve Manifold	IWPTSM Ram Forged BOP Single Double 9"	ISATM & IKTSM Packing Elements Natural (NBR) Nitrile (NBR)		Customized Bolting	IDPDTM Drilling NBR HNBR FKM	Pulsation Dampeners Drilling & Production Only Major Brands	QMS for Pressure Control Elastomer Manufacturing as per API 16A
Ball Valves	Hydraulic Fail-Safe Surface Safety Valve Skid Manifold	IUTM Ram Blocks & Assemblies CSO, Pipe, VBR, IFlex™ & SBR	ISATM & IKTSM Seal Kits			IPDPTM Production NBR HNBR FKM		
Plug Valves	Chokes	I70TM (IWSTM) Ram Blocks Full Assemblies CSO, Pipe & Multi Ram				Emco Style PD45 PD55 PD55A NBR HNBR FKM		
Minor & Major Repair Kits	Tubing & Casing Spools	IESTM Ram Blocks Full Assemblies CSO, Pipe & IFlex™				PD Parts Stabilizers, Gaskets & Kits		
Ball Valves	Tubing & Casing Hangers	IWPTSM Ram Blocks Full Assemblies CSO & Pipe						
	Adapter Spools	Ram Blocks - Forgings						
	Spacer Spools	IUTM , IWSTM , IESTM & IWPTSM Ram Spare Parts						
	Cross-Over Connectors	Ram Elastomers						
	Tree Caps	Front Packers, Top Seals, VBR, IFlex™, SBR, Door Seal & Seal Kits						
	Flanges							
	Blind, Companion & Test PE Seals							

INTEGRATED's API Certified – Licensed OEM plants provide state-of-the-art manufacturing of our Engineered-Designed Pressure Control Equipment and Elastomeric Products.

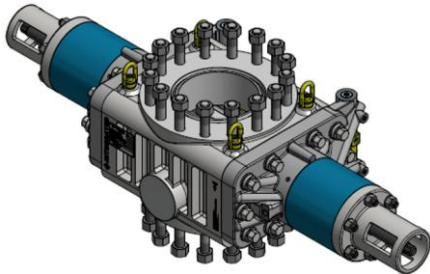


**INTEGRATED's
Oracle - JD
Edwards
Enterprise
Resource Planning
(ERP) system
integrates our
global
manufacturing,
distribution
facilities and
service centers**

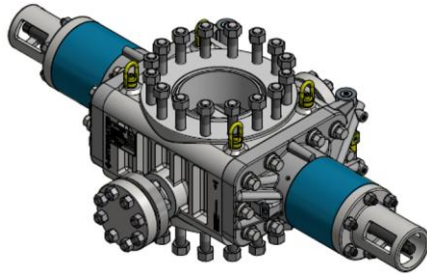


INTEGRATED® OEM API 16A MONOGRAMMED TYPE IWS™ RAM BLOWOUT PREVENTER

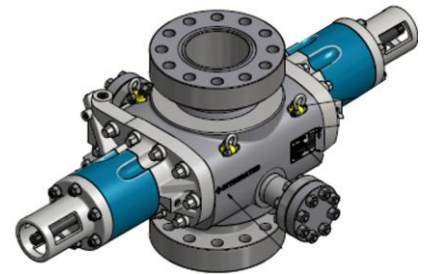
The INTEGRATED® Model **IWS™** Ram Type Blowout Preventer (BOP) is used to contain wellbore pressure for onshore and inland water drilling and workover service. The **IWS™** Ram BOP provides a rugged, reliable operations that is proven to be easy to maintain with a long history of field proven reliability. Integrated BOPs are manufactured in accordance with API 16A and 6A specifications.



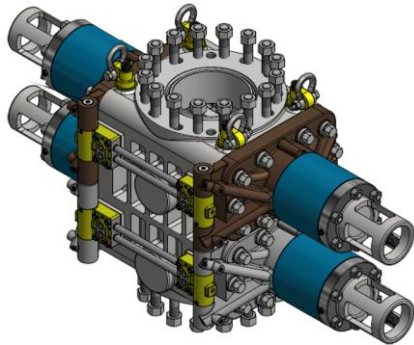
11" & 13-5/8" SR Ram **IWS™** BOP



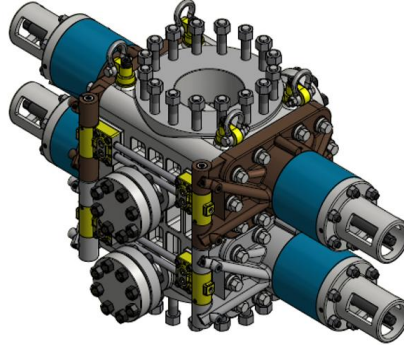
11" & 13-5/8" SR Ram **IWS™** BOP



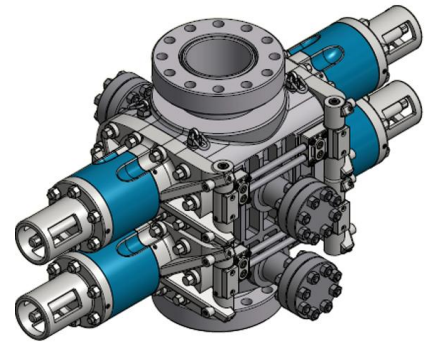
11" & 13-5/8" SR Ram **IWS™** BOP



11" & 13-5/8" DR Ram **IWS™** BOP



11" & 13-5/8" DR Ram **IWS™** BOP



11" & 13-5/8" DR Ram **IWS™** BOP

PRODUCT SPECIFICATIONS

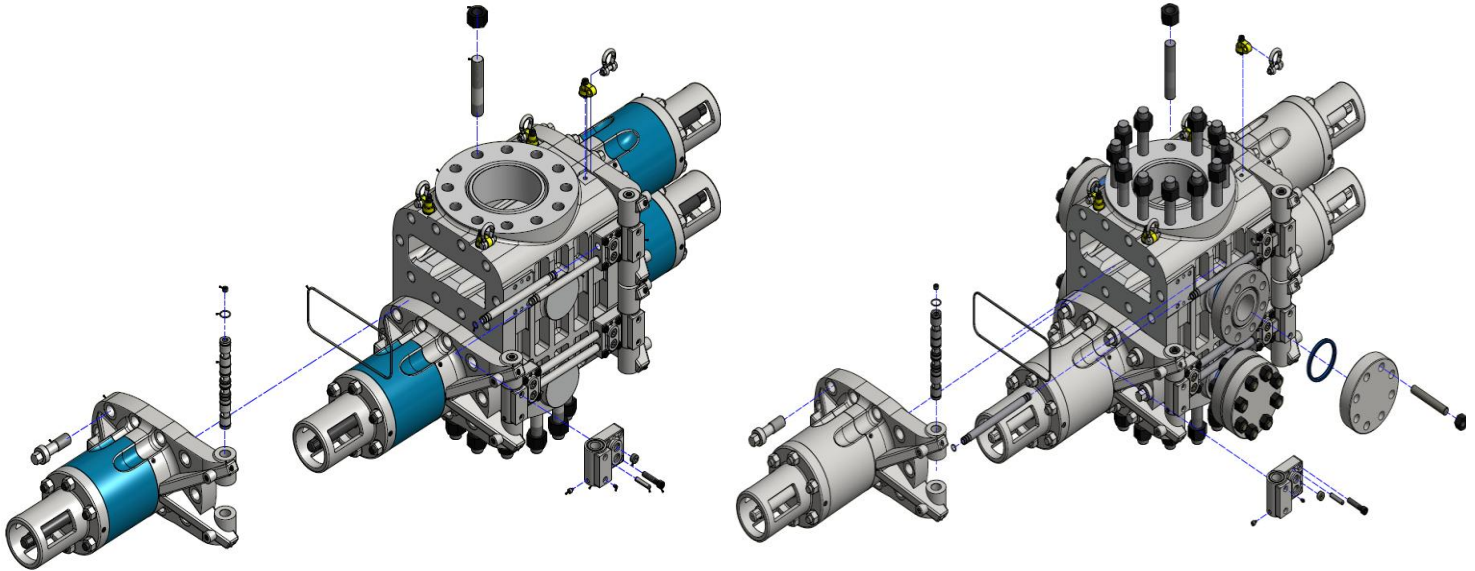
- Designed and manufactured ISO 13533 (API 16A) for Drill-through equipment
- API 16A 4th Edition Monogrammed
- Designed as standard to ISO 15156-1 (NACE MR-0175) for use in hydrogen sulfide environments (H2S)
- Material: A487D, 75k
- Temperature Class: T-20/250 | Non-Metallic Temperature Rating: BGB
- Quality Level: PR1
- Xylan coated internals for operational performance and corrosion control
- Manual Ram locking device
- The hydraulic fluid wetted dynamic sealing surfaces are either hard chrome plated or hard faced, assuring maximum performance
- Ring Grooves are standard carbon steel. Other options are SS316 or 625 Inconel.
- Top and Bottom Connections:
 - Studded x Studded | Studded x Flanged | Flanged x Studded | Flanged x Flanged
- Outlets: The IWS™ BOPs is manufactured with no outlets. Outlets are installed through a qualified Integrated process. We offer weld neck flanged outlets in the following sizes: 2-1/16" – 5k, 3-1/8" – 5k and 4-1/16" – 5k.

PRODUCT FEATURES AND BENEFITS

- Easy field maintenance. Doors that simplify ram changes.
- Door Seals with special backing to prevent extrusion and pinching.
- The IWS™ BOP is offer as a Single (SR) or Double (DR) cavity configuration.
- Large assortment of **I70™** ram sizes available; CSO, Pipe: 2-3/8" through 9-5/8" and Multi Rams – 2-7/8" to 5" and 4-1/2" to 7". Specific **I70™** Multi Ram Sizes are available per BOP size (see ram block section per BOP size).
- The component parts of a Model **IWS™** blowout preventer are suitable for use as replacement parts for most LWS style ram type blowout preventers
- All maintenance can be done with standard tools
- Lifting swivels are designed to meet or exceed safety loads for this style BOP

INTEGRATED® OEM API 16A MONOGRAMMED TYPE IWS™ RAM BLOWOUT PREVENTER

IWS™ BOP EXPLODED VIEW (No Outlets and Outlets)



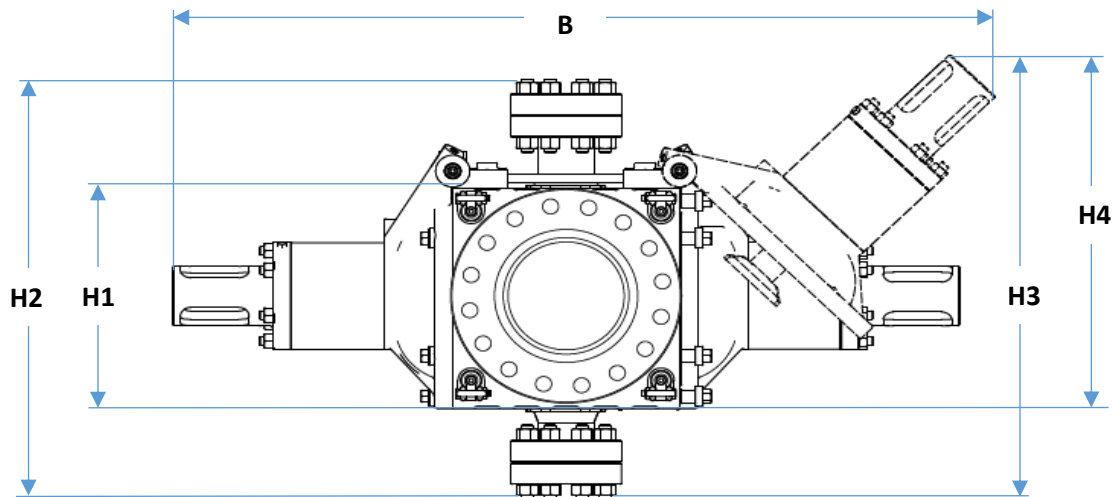
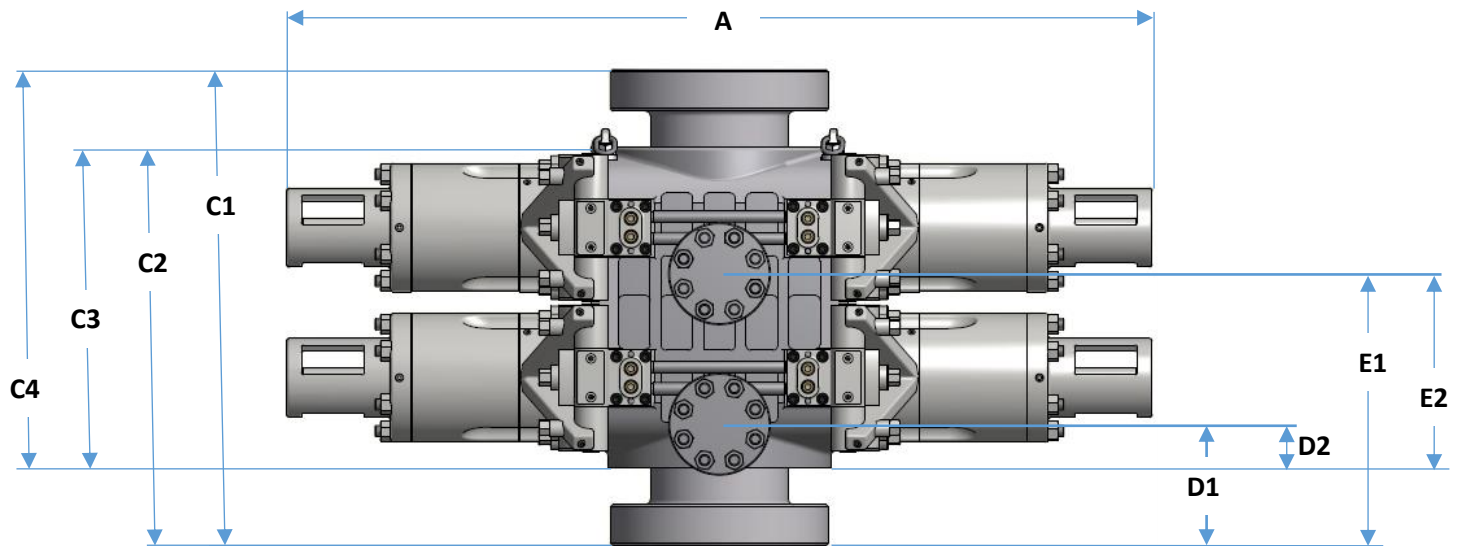
IWS™ BOP GENERAL DIMENSIONS AND WEIGHTS

SINGLE AND DOUBLE RAM IWS™ BLOWOUT PREVENTER DIMENSIONS & WEIGHTS

The information below applies to Integrated Model **IWS™** Ram Type Blowout Preventers. Dimensions shown in the following chart are in inches and are approximate

A	- Length Doors Closed
B	- Length Doors Open
C1	- Height Flanged Top x Flanged Bottom Connections
C2	- Height Studded Top x Flanged Bottom Connections
C3	- Height Studded Top x Studded Bottom Connections
C4	- Height Flanged Top x Studded Bottom Connections
D1	- Height Flanged Bottom to Centerline of Lower Outlet
D2	- Height Studded Bottom to Centerline of Lower Outlet
E1	- Height Flanged Bottom to Centerline of Upper Outlet
E2	- Height Studded Bottom to Centerline of Upper Outlet
H1	- Width of BOP Body (No Outlets)
H2	- Width Flanged x Flanged Outlets
H3	- Width Flanged Outlets with Door Open at 45°
H4	- Width No Outlets with Door Open at 45°

**INTEGRATED® OEM API 16A MONOGRAMMED
TYPE IWS™ RAM BLOWOUT PREVENTER**



Size (in.)	Pressure Rating (psi)	Piston Size (in.)	A (in.)	B (in.)	C1 (in.)	C2 (in.)	C3 (in.)	C4 (in.)	D1 (in.)	D2 (in.)	E1 (in.)	E2 (in.)	H1 (in.)	H2 (in.)	H3 (in.)	H4 (in.)	Weight (lbs)	
																	NO	O
11" Single	3000	6.5	74.6	73.7	27.5	21.0	14.5	21.0	9.9	3.4	NA	NA	23.1	42.7	45.4	36.5	2177	2415
11" Double	3000	6.5	74.6	73.7	42.5	36.0	29.5	36.0	10.9	4.4	24.9	18.4	23.1	42.8	45.5	36.5	4195	4671
11" Single	5000	8.5	89.2	87.3	38.5	29.0	19.5	29.0	16.0	6.5	NA	NA	25.8	50.7	54.7	42.1	4409	4665
11" Double	5000	8.5	89.2	87.3	52.0	42.5	33.0	42.5	14.0	4.5	29.5	20.0	25.8	50.5	54.6	42.1	7732	8246
13-5/8" Single	5000	8.5	92.7	91.8	36.5	28.0	19.5	28.0	14.1	5.6	NA	NA	29.0	49.6	44.8	55.0	4972	5285
13-5/8" Double	5000	8.5	92.7	91.8	53.0	44.5	36.0	44.5	13.8	5.3	30.6	22.1	29.0	49.6	44.8	55.1	9308	9865

STANDARD FLANGED OUTLET SIZE: 11" – 3k & 11" – 5k is 3-1/8" 5k | 13-5/8" – 5k is 4-1/16" 5k

ABBREVIATIONS: "NO" – No Outlets | "O" – Outlets

**INTEGRATED® OEM API 16A MONOGRAMMED
TYPE IWS™ RAM BLOWOUT PREVENTER**

IWS™ BOP CONFIGURATION OPTIONS

11" – 3k SINGLE RAM IWS™ BOP

IWS™ BOP Part Number	Top Connection	Bottom Connection	Outlet Connection	No. of Outlets	Outlet Size
70-01110320300	Studded	Studded	None	None	None
70-1103-00059	Studded	Flanged	None	None	None
70-1103-00060	Flanged	Studded	None	None	None
70-1103-00061	Flanged	Flanged	None	None	None
70-1103-00062	Studded	Studded	Flanged	2	2-1/16"
70-1103-00063	Studded	Flanged	Flanged	2	2-1/16"
70-1103-00064	Flanged	Studded	Flanged	2	2-1/16"
70-1103-00065	Flanged	Flanged	Flanged	2	2-1/16"
70-01110320100	Studded	Studded	Flanged	2	3-1/8"
70-1103-00066	Studded	Flanged	Flanged	2	3-1/8"
70-1103-00067	Flanged	Studded	Flanged	2	3-1/8"
70-1103-00068	Flanged	Flanged	Flanged	2	3-1/8"
70-1103-00069	Studded	Studded	Flanged	2	4-1/16"
70-1103-00070	Studded	Flanged	Flanged	2	4-1/16"
70-1103-00071	Flanged	Studded	Flanged	2	4-1/16"
70-1103-00072	Flanged	Flanged	Flanged	2	4-1/16"

11" – 3k DOUBLE RAM IWS™ BOP

IWS™ BOP Part Number	Top Connection	Bottom Connection	Outlet Connection	No. of Outlets	Outlet Size
70-02110320300	Studded	Studded	None	None	None
70-1103-00073	Studded	Flanged	None	None	None
70-1103-00074	Flanged	Studded	None	None	None
70-1103-00075	Flanged	Flanged	None	None	None
70-02110320100	Studded	Studded	Flanged	4	2-1/16"
70-1103-00076	Studded	Flanged	Flanged	4	2-1/16"
70-1103-00077	Flanged	Studded	Flanged	4	2-1/16"
70-1103-00078	Flanged	Flanged	Flanged	4	2-1/16"
70-1103-00079	Studded	Studded	Flanged	4	3-1/8"
70-1103-00080	Studded	Flanged	Flanged	4	3-1/8"
70-1103-00081	Flanged	Studded	Flanged	4	3-1/8"
70-02110320100	Flanged	Flanged	Flanged	4	3-1/8"
70-1103-00082	Studded	Studded	Flanged	4	4-1/16"
70-1103-00083	Studded	Flanged	Flanged	4	4-1/16"
70-1103-00084	Flanged	Studded	Flanged	4	4-1/16"
70-1103-00085	Flanged	Flanged	Flanged	4	4-1/16"

11" – 5k SINGLE RAM IWS™ BOP

IWS™ BOP Part Number	Top Connection	Bottom Connection	Outlet Connection	No. of Outlets	Outlet Size
70-01110520300	Studded	Studded	None	None	None
70-1105-00091	Studded	Flanged	None	None	None
70-1105-00092	Flanged	Studded	None	None	None
70-1105-00093	Flanged	Flanged	None	None	None
70-1105-00094	Studded	Studded	Flanged	2	2-1/16"
70-1105-00095	Studded	Flanged	Flanged	2	2-1/16"
70-1105-00096	Flanged	Studded	Flanged	2	2-1/16"
70-1105-00097	Flanged	Flanged	Flanged	2	2-1/16"
70-01110520100	Studded	Studded	Flanged	2	3-1/8"
70-1105-00098	Studded	Flanged	Flanged	2	3-1/8"
70-1105-00099	Flanged	Studded	Flanged	2	3-1/8"
70-1105-00100	Flanged	Flanged	Flanged	2	3-1/8"
70-1105-00101	Studded	Studded	Flanged	2	4-1/16"
70-1105-00102	Studded	Flanged	Flanged	2	4-1/16"
70-1105-00103	Flanged	Studded	Flanged	2	4-1/16"
70-1105-00104	Flanged	Flanged	Flanged	2	4-1/16"

11" – 5k DOUBLE RAM IWS™ BOP

IWS™ BOP Part Number	Top Connection	Bottom Connection	Outlet Connection	No. of Outlets	Outlet Size
70-1105-00104	Studded	Studded	None	None	None
70-1105-00105	Studded	Flanged	None	None	None
70-1105-00106	Flanged	Studded	None	None	None
70-1105-00107	Flanged	Flanged	None	None	None
70-1105-00108	Studded	Studded	Flanged	4	2-1/16"
70-1105-00109	Studded	Flanged	Flanged	4	2-1/16"
70-1105-00110	Flanged	Studded	Flanged	4	2-1/16"
70-1105-00111	Flanged	Flanged	Flanged	4	2-1/16"
70-02110520100	Studded	Studded	Flanged	4	3-1/8"
70-1105-00112	Studded	Flanged	Flanged	4	3-1/8"
70-1105-00113	Flanged	Studded	Flanged	4	3-1/8"
70-1105-00114	Flanged	Flanged	Flanged	4	3-1/8"
70-1105-00115	Studded	Studded	Flanged	4	4-1/16"
70-1105-00116	Studded	Flanged	Flanged	4	4-1/16"
70-1105-00117	Flanged	Studded	Flanged	4	4-1/16"
70-1105-00118	Flanged	Flanged	Flanged	4	4-1/16"

13-5/8" – 5k SINGLE RAM IWS™ BOP

IWS™ BOP Part Number	Top Connection	Bottom Connection	Outlet Connection	No. of Outlets	Outlet Size
70-91130520300	Studded	Studded	None	None	None
70-1305-00123	Studded	Flanged	None	None	None
70-1305-00124	Flanged	Studded	None	None	None
70-1305-00125	Flanged	Flanged	None	None	None
70-1305-00126	Studded	Studded	Flanged	2	2-1/16"
70-1305-00127	Studded	Flanged	Flanged	2	2-1/16"
70-1305-00128	Flanged	Studded	Flanged	2	2-1/16"
70-1305-00129	Flanged	Flanged	Flanged	2	2-1/16"
70-1305-00130	Studded	Studded	Flanged	2	3-1/8"
70-1305-00131	Studded	Flanged	Flanged	2	3-1/8"
70-1305-00132	Flanged	Studded	Flanged	2	3-1/8"
70-1305-00133	Flanged	Flanged	Flanged	2	3-1/8"
70-1305-00082	Studded	Studded	Flanged	2	4-1/16"
70-1305-00134	Studded	Flanged	Flanged	2	4-1/16"
70-1305-00135	Flanged	Studded	Flanged	2	4-1/16"
70-1305-00136	Flanged	Flanged	Flanged	2	4-1/16"

13-5/8" – 5k DOUBLE RAM IWS™ BOP

IWS™ BOP Part Number	Top Connection	Bottom Connection	Outlet Connection	No. of Outlets	Outlet Size
70-92130520300	Studded	Studded	None	None	None
70-1305-00137	Studded	Flanged	None	None	None
70-1305-00138	Flanged	Studded	None	None	None
70-1305-00139	Flanged	Flanged	None	None	None
70-1305-00140	Studded	Studded	Flanged	4	2-1/16"
70-1305-00141	Studded	Flanged	Flanged	4	2-1/16"
70-1305-00142	Flanged	Studded	Flanged	4	2-1/16"
70-1305-00143	Flanged	Flanged	Flanged	4	2-1/16"
70-1305-00144	Studded	Studded	Flanged	4	3-1/8"
70-1305-00145	Studded	Flanged	Flanged	4	3-1/8"
70-1305-00146	Flanged	Studded	Flanged	4	3-1/8"
70-1305-00147	Flanged	Flanged	Flanged	4	3-1/8"
70-1305-00148	Studded	Studded	Flanged	4	4-1/16"
70-1305-00149	Studded	Flanged	Flanged	4	4-1/16"
70-1305-00150	Flanged	Studded	Flanged	4	4-1/16"
70-1305-00151	Flanged	Flanged	Flanged	4	4-1/16"

INTEGRATED® OEM API 16A MONOGRAMMED
TYPE IWS™ RAM BLOWOUT PREVENTER

IWS™ PRODUCT OPERATING DATA AND FLUID REQUIREMENT

All Integrated Model IWS™ ram type blowout preventers are supplied with labeled “OPEN” and “CLOSED” ports located on the body of the blowout preventers. The connections to the hydraulic operating system of the blowout preventer are 1” NPT.

Bore Size	Working Pressure (psi)	Piston Size (in.)	Opening Ratio	Closing Ratio	Gallons to Open	Gallons to Close
11”	3,000	6.5	1.16	5.45	1.45	1.74
11”	5,000	8.5	2.09	5.57	2.62	2.98
13-5/8”	5,000	8.5	2.09	5.57	3.00	3.20

Hydraulic Fluid: Hydraulic fluid under pressure drives the pistons, which open and close the rams. Hydraulic fluid should have the following characteristics:

- Non-freezing in cold climates
- Lubricity to reduce wear
- Chemical compatibility with the elastomer seals
- Corrosion inhibitors for metal surfaces

Recommended Hydraulic Fluid: The recommended hydraulic fluid is listed in order of preference:

- Hydraulic oil with viscosity between 200 and 300 SSU at 100°F (38°C). In the IWS™ closed hydraulic system, there is no waste of oil and fluid costs are negligible.
- Where pollution due to accidental spillage of hydraulic fluid is a problem, use water-soluble oil or premix control fluid.
- To prevent freezing at lower temperatures, ethylene glycol without any additives is recommended. Do not use commercial antifreeze mixes.

Emergency Fluid Recommendations: In an emergency where hydraulic fluid is lost and the BOP must be operated, the fluids listed below can be substituted.

1. When using hydraulic oil:
 - Add motor oil (SAE 10W is recommended, but heavier oils can be used)
 - Add water if motor oil is not available, but after the emergency, the hydraulic system must be flushed and refilled with hydraulic oil.
2. When using a water-soluble mixture or premix fluid, add more water. After the emergency, replace the fluid in the system with the proper mixture.

Caution: Do not use diesel fuel or kerosene as these fluids will cause the rubber goods to swell and deteriorate. Do not use drilling mud as the grit in this fluid will cause the pistons and cylinders to wear and gall rapidly.



**INTEGRATED® OEM API 16A MONOGRAMMED
TYPE IWS™ RAM BLOWOUT PREVENTER**

IWS™ RAM BOP SEAL KIT PART NUMBERS & INDIVIDUAL PART DESCRIPTION

**11" – 3k, RAM IWS™ BOP SEAL KIT
Master Kit Part Number: 82-880001**

Part Description	Part Number	Qty
Door Seal	70-02110320514	2
Piston Seal Rubber	70-02110320511	3
Piston O-Ring	70-02110320517	2
Hinge Pin O-Ring	70-02110320521	20
Hinge Pin Retainer	70-02110320246	4
Cylinder Head O-Ring	70-02110320519	4
Hinge Manifold O-Ring	70-02110320523	8
Cylinder Manifold Port O-Ring	70-02110320522	4
Graphite Plastic Packing	17-080-000	3
Adapter O-Ring (Outer)	70-02110320515	4
Adapter O-Ring (Inner)	70-02110320516	4
Scraper / Wiper Ring	70-02110320525	2
Packing Adapter	70-02110320242	2
Retainer Ring	70-02110320512	2
Bushing O-Ring (Outer)	70-02110320520	4
Bushing O-Ring (Inner)	70-02110320518	4
Scraper / Wiper Ring	70-02110320524	2
Thrust Bushing / Locking Adp	70-02110320244	2
Retainer Ring	70-02110320513	2

**11" – 5k, RAM IWS™ BOP SEAL KIT
Master Kit Part Number: 82-881100-SG**

Part Description	Part Number	Qty
Cylinder Manifold Port O-Ring	70-02110320522	4
Hinge Manifold O-Ring	70-02110520523	8
Graphite Plastic Packing	82-194-000	2
Door Seal	70-02110520514	2
Cylinder Head O-Ring	70-02110520519	4
Hinge Pin O-Ring	70-02110520523	8
Hinge Pin Retainer	70-02110320246	2
Piston O-Ring	70-02110320516	2
Piston Seal Rubber	70-02110520511	4
Wiper Ring	70-02110520530	2
Packing Lip Seal	70-02110520531	4
Retainer Ring	70-02110520512	2
Wiper Ring Holder	70-02110520529	2
Packing End Ring Seal	70-02110520528	2
Packing Adapter	70-02110520242	2
Retainer Ring	70-02110520513	2
Thrust Bushing	70-02110520526	2
Packing Seal	70-02110520527	2
Wiper Ring Holder	70-02110520532	2
Wiper Ring	70-02110520524	2

**13-5/8" – 5k, RAM IWS™ BOP SEAL KIT
Master Kit Part Number: 82-80011**

Part Description	Part Number	Qty
Cylinder Manifold Port O-Ring	70-02110320522	4
Hinge Manifold O-Ring	70-02110520523	8
Graphite Plastic Packing	82-194-000	2
Door Seal	70-92130520514	2
Cylinder Head O-Ring	70-02110520519	4
Hinge Pin O-Ring	31-000096	20
Hinge Pin Retainer	70-02110320246	2
Piston O-Ring	70-02110320516	2
Piston Seal Rubber	70-02110520511	4
Wiper Ring	70-02110520530	2
Packing Lip Seal	70-02110520531	4
Retainer Ring	70-02110520512	2
Wiper Ring Holder	70-02110520529	2
Packing End Ring Seal	70-02110520528	2
Packing Adapter	70-02110520242	2
Retainer Ring	70-02110520513	2
Thrust Bushing	70-02110520526	2
Packing Seal	70-02110520527	2
Wiper Ring Holder	70-02110520532	2
Wiper Ring	70-02110520524	2

**EMERGENCY PARTS KIT
11" – 3K RAM IWS™ BOP**

Part Description	Part Number	Weight (lbs)	Qty
Door Screw	26-016-063	2.6	40
Ram Shaft	70-02110320136	18.8	4
Locking Shaft	70-02110320166	11.5	4

**EMERGENCY PARTS KIT
11" – 5K RAM IWS™ BOP**

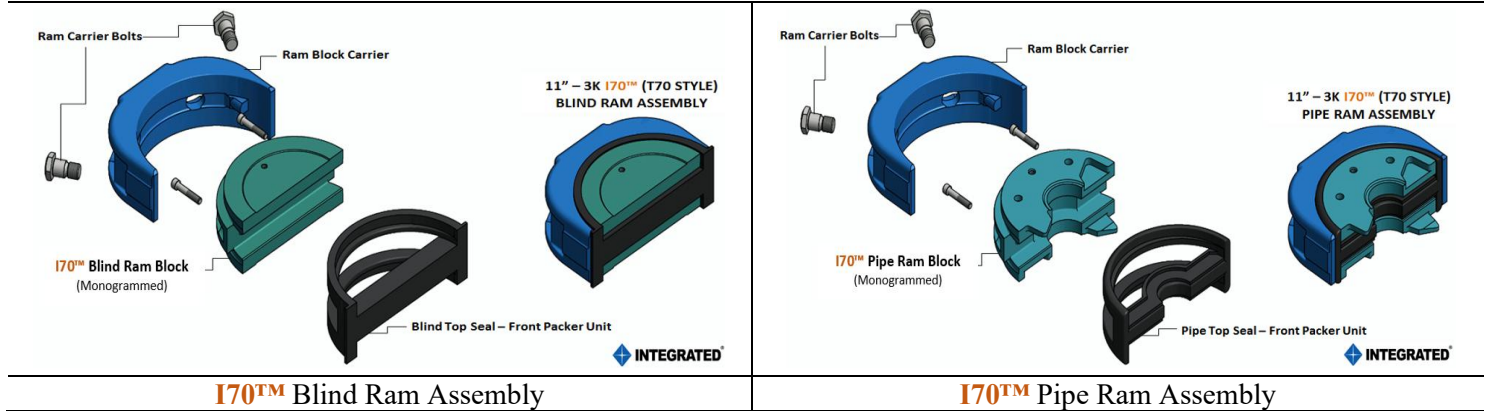
Part Description	Part Number	Weight (lbs)	Qty
Door Screw	26-016-077	5.4	40
Ram Shaft	70-02110520136	31.5	4
Locking Shaft	70-02110520166	21.5	4

**EMERGENCY PARTS KIT
13-5/8" – 5K RAM IWS™ BOP**

Part Description	Part Number	Weight (lbs)	Qty
Door Screw	26-016-085	6.7	40
Ram Shaft	70-02110520136	31.5	4
Locking Shaft	70-02110520166	21.5	4

**INTEGRATED® OEM API 16A MONOGRAMMED
TYPE IWS™ RAM BLOWOUT PREVENTER**

I70™ RAM ASSEMBLIES (For IWS™ Style BOP): 11" – 3k



I70™ – CSO & PIPE RAMS

I70™ Ram Size	I70™ Complete Assembly Part Number	Sub-Components Part Numbers			
		Ram Block API 16A Monogrammed (require 2 pieces)	Carrier (require 2 pieces)	Carrier Bolt (require 4 pieces)	Front Packer-Top Seal Unit Material: NBR (require 2 pieces)
CSO (blind)	70-1103006	70-1103006	70-1103005	26-012-203	70-401-711
2-3/8"	70-1103104-6	70-1103004-6	70-1103005	26-012-203	70-401-711-1
2-7/8"	70-1103104-7	70-1103004-7	70-1103005	26-012-203	70-401-711-2
3-1/2"	70-1103104-1	70-1103004-1	70-1103005	26-012-203	70-401-711-4
4"	70-1103104-2	70-1103004-2	70-1103005	26-012-203	70-401-711-5
4-1/2"	70-1103104-3	70-1103004-3	70-1103005	26-012-203	70-401-711-6
5"	70-1103104-4	70-1103004-4	70-1103005	26-012-203	70-401-711-7
5-1/2"	70-1103104-5	70-1103004-5	70-1103005	26-012-203	70-401-711-8
6-5/8"	70-1103104-14	70-1103004-14	70-1103005	26-012-203	70-401-711-9
7"	70-1103104-15	70-1103004-15	70-1103005	26-012-203	70-401-711-10
7-5/8"	70-1103104-16	70-1103004-16	70-1103005	26-012-203	70-401-711-11

No Multi Rams are offered in the 11" – 3k, Ram IWS™ BOP Model

IWS™ REPAIR SEAL KITS: 11" – 3k

Description	Size	Pressure	Seal Kit Part Number	Weight Per Kit
11" – 3k, IWS™ Hydraulic Ram Complete Seal Kit	11"	3k	82-880001	20 lbs (9.07 kg)
11" – 3k, IWS™ Ram BOP Door Seal	11"	3k	70-02110320514	-

Note: Each Integrated carded seal kit rebuilds one cavity (2 doors)

**INTEGRATED® OEM API 16A MONOGRAMMED
TYPE IWS™ RAM BLOWOUT PREVENTER**

170™ RAM ASSEMBLIES (For IWS™ Style BOP): 11" – 5k



170™ – CSO & PIPE RAMS

170™ Ram Size	170™ Complete Assembly Part Number	Sub-Components Part Numbers			
		Ram Block API 16A Monogrammed (require 2 pieces)	Carrier (require 2 pieces)	Carrier Bolt (require 4 pieces)	Front Packer-Top Seal Unit Material: NBR (require 2 pieces)
CSO (blind)	70-1105006	70-1105005	26-012-203	70-401-701	70-1105006
2-3/8"	70-1105004-3	70-1105005	26-012-203	70-401-701-1	70-1105004-3
2-7/8"	70-1105004-4	70-1105005	26-012-203	70-401-701-2	70-1105004-4
3-1/2"	70-1105004-6	70-1105005	26-012-203	70-401-701-4	70-1105004-6
4"	70-1105004-8	70-1105005	26-012-203	70-401-701-5	70-1105004-8
4-1/2"	70-1105004-7	70-1105005	26-012-203	70-401-701-6	70-1105004-7
5"	70-1105004-9	70-1105005	26-012-203	70-401-701-7	70-1105004-9
5-1/2"	70-1105004-13	70-1105005	26-012-203	70-401-701-8	70-1105004-13
6-5/8"	70-1105004-14	70-1105005	26-012-203	70-401-701-9	70-1105004-14
7"	70-1105004-15	70-1105005	26-012-203	70-401-701-10	70-1105004-15
7-5/8"	70-1105004-16	70-1105005	26-012-203	70-401-701-11	70-1105004-16
8-5/8"	70-1105004-17	70-1105005	26-012-203	70-401-701-12	70-1105004-17

170™ – MULTI RAM

170™ Ram Size	170™ Complete Assembly Part Number	Sub-Components to the Assembly		
		Multi Ram Block API 16A Monogrammed (require 2 pieces)	Multi Ram Front Packer Material: NBR (require 2 pieces)	Multi Ram Top Seal Material: NBR (require 2 pieces)
Multi Ram 2-7/8" to 5"	70-401-702-VK	70-401-701-V2	70-401-701-V	70-401-701-V1

IWS™ REPAIR SEAL KITS: 11" – 5k

Description	Size	Pressure	Seal Kit Part Number	Weight Per Kit
11" – 5k, IWS™ Hydraulic Ram Complete Seal Kit	11"	5k	82-881100-SG	20 lbs (9.07 kg)
11" – 5k, IWS™ Ram BOP Door Seal	11"	5k	70-02110520514	-

Note: Each Integrated carded seal kit rebuilds one cavity (2 doors)

**INTEGRATED® OEM API 16A MONOGRAMMED
TYPE IWS™ RAM BLOWOUT PREVENTER**

170™ RAM ASSEMBLIES (For IWS™ Style BOP): 13-5/8" – 5k



170™ – CSO & PIPE RAMS					
170™ Ram Size	170™ Complete Assembly Part Number	Sub-Components Part Numbers			
		Ram Block API 16A Monogrammed (require 2 pieces)	Carrier (require 2 pieces)	Carrier Bolt (require 4 pieces)	Front Packer-Top Seal Unit Material: NBR (require 2 pieces)
CSO (blind)	70-1305101	70-1305001	70-1305005	26-012-135	70-401-801
2-3/8"	70-135101-1	70-1305001-1	70-1305005	26-012-135	70-401-801-1
2-7/8"	70-135101-2	70-1305001-2	70-1305005	26-012-135	70-401-801-2
3-1/2"	70-135101-3	70-1305001-3	70-1305005	26-012-135	70-401-801-3
4"	70-135101-4	70-1305001-4	70-1305005	26-012-135	70-401-801-4
4-1/2"	70-135101-5	70-1305001-5	70-1305005	26-012-135	70-401-801-5
5"	70-135101-6	70-1305001-6	70-1305005	26-012-135	70-401-801-6
5-1/2"	70-135101-7	70-1305001-7	70-1305005	26-012-135	70-401-801-7
6-5/8"	70-135101-8	70-1305001-8	70-1305005	26-012-135	70-401-801-8
7"	70-135101-9	70-1305001-9	70-1305005	26-012-135	70-401-801-9
7-5/8"	70-135101-10	70-1305001-10	70-1305005	26-012-135	70-401-801-10
8-5/8"	70-135101-11	70-1305001-11	70-1305005	26-012-135	70-401-801-11
9-5/8"	70-135101-12	70-1305001-12	70-1305005	26-012-135	70-401-801-12

170™ – MULTI RAM				
170™ Ram Size	170™ Complete Assembly Part Number	Sub-Components Part Numbers		
		Multi Ram Block API 16A Monogrammed (require 2 pieces)	Multi Ram Front Packer Material: NBR (require 2 pieces)	Multi Ram Top Seal Material: NBR (require 2 pieces)
Multi Ram 2-7/8" to 5"	70-135101-VK1	70-135101-V03	70-135101-V02	70-135101-V01
Multi Ram 4-1/2" to 7"	70-135101-VK2	70-135101-V06	70-135101-V05	70-135101-V04

IWS™ REPAIR SEAL KITS: 13-5/8" – 5k

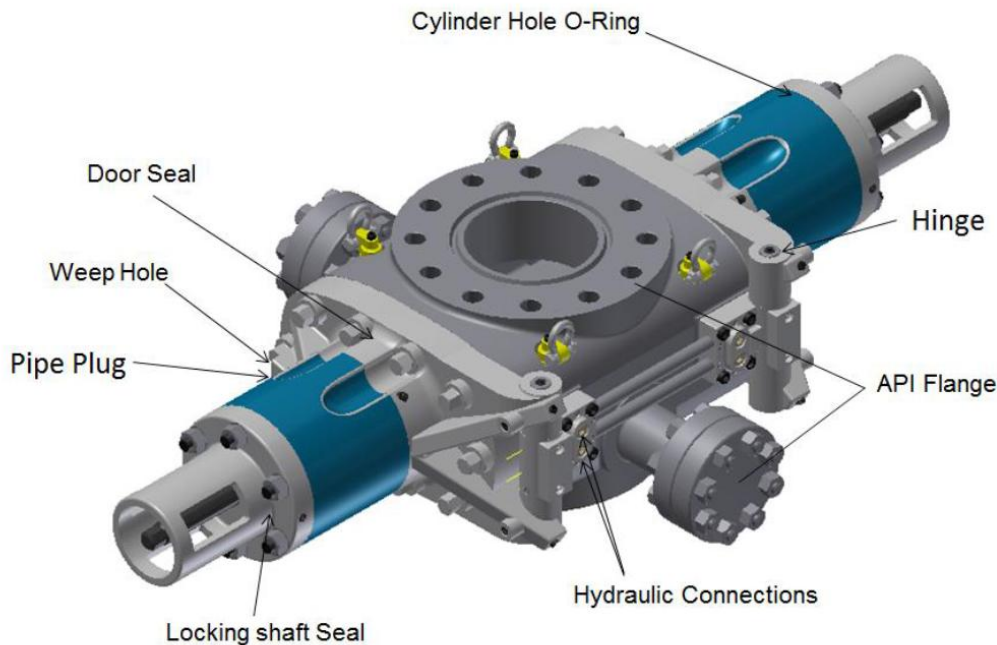
Description	Size	Pressure	Seal Kit Part Number	Weight Per Kit
13-5/8" – 5k, IWS™ Hydraulic Ram Complete Seal Kit	13-5/8"	5k	82-80011	20 lbs (9.07 kg)
13-5/8" – 5k, IWS™ Ram BOP Door Seal	13-5/8"	5k	70-02110520514	-

Note: Each Integrated carded seal kit rebuilds one cavity (2 doors)

**INTEGRATED® OEM API 16A MONOGRAMMED
TYPE IWS™ RAM BLOWOUT PREVENTER**

IWS™ MAINTENANCE SCHEDULE

INTERVAL	AT	BY	SUMMARY
Daily	Rig	Rig Personnel	Operate all rams. Look for external hydraulic leaks (see “Daily Maintenance” in Operations and Maintenance manual).
Monthly	Rig	Rig Personnel	Do not open doors. Run a field wellbore pressure test. Look for external hydraulic leaks (see “Monthly Preventive Maintenance” in Operations and Maintenance manual).
Three Months	Rig	Rig Personnel	Open doors and inspect visually. Run a field wellbore pressure test and an internal hydraulic pressure test. Operate manual locks (see the “Three-Month Preventive Maintenance” in Operations and Maintenance manual).
Yearly	Rig	Integrated or ARLF	Open doors. Measure rams and ram cavity. Do field repairs as needed. Run a field wellbore pressure test and an internal hydraulic pressure test. Operate manual locks (see the “Yearly Preventive Maintenance” in Operations and Maintenance manual).
Three Years	Service Repair Facility	Integrated or ARLF	Completely disassemble. Repair or replace all parts as required. Replace all seals. Run a field wellbore pressure test and an internal hydraulic pressure test. Operate manual locks (see the “Three-Year Maintenance” in Operations and Maintenance manual).





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