



# ***PRODUCT CATALOGUE***



**BOTIL OIL TOOLS INDIA PRIVATE LIMITED**  
***Engineering Excellence Powered by Experience***

**1. BRIDGE PLUGS - CEMENT RETAINERS & ACCESSORIES ..... 1 - 9**

MODEL "K-1" CEMENT RETAINER  
MODEL "N-1" BRIDGE PLUG  
MODEL "KL" CONTROL UNIT  
MODEL "B" SNAP LATCH STINGER SUB  
MODEL "K-1" SNAP LATCH SETTING TOOL  
MODEL "HN-1" BRIDGE PLUG  
MODEL "N-2" BRIDGE PLUG & ADAPTER KITS  
MODEL "BFCP" COMPOSITE FRAC PLUG  
WIRELINE SET RETRIEVABLE BRIDGE PLUG  
MODEL "BCP-1" PLUG PLUCKER  
MODEL "BCJ" PACKER MILLING TOOL  
MODEL "BCB" PACKER MILLING TOOL  
MODEL "BCC" MILLING TOOL  
MODEL "BCK" MILLING TOOL

**2. PRIMARY CEMENTING ..... 10 - 20**

CEMENT FLOAT SHOE & COLLAR WITH POPPET VALVE  
CEMENT FLOAT SHOE & COLLAR WITH BALL VALVE  
CEMENT DOWN- JET SWIRL GUIDE SHOE  
MODEL "G" DIFFERENTIAL FILL- UP DOWN- JET SWIRL SHOE & COLLAR  
CEMENT FLOAT COLLAR WITH ANTI- ROTATIONAL PLUGS  
ANTI- ROTATIONAL CEMENTING PLUGS  
CEMENTING PLUGS  
MODEL "B" DUPLEX CEMENT FLOAT SHOE & COLLAR  
MODEL "B" STAB- IN FLOAT SHOE & COLLAR  
AUTO FILL CEMENT FLOAT SHOE & COLLAR  
BUTT- WELD CEMENT FLOAT COLLAR  
CEMENT BASKET  
MODEL "J" STAGE CEMENTING COLLAR  
HYDRAULIC OPENING STAGE CEMENTING COLLAR  
MODEL "JB" THREE STAGE CEMENTING COLLAR  
MODEL "G" STAGE CEMENTING COLLAR  
MODEL "BD" SINGLE AND DOUBLE PLUG TYPE CONVENTIONAL CEMENTING HEAD

**3. LINER HANGER SYSTEMS ..... 21 - 52**

MODEL "BPDR" POCKET SLIP HYDRAULIC ROTATING & "BPDN" NON- ROTATING LINER HANGER  
MODEL "BT" & "BS" HYDRAULIC LINER HANGER WITH DOUBLE SLIPS  
MODEL "BHP" HYDRAULIC NON-ROTATING LINER HANGER WITH TRIPLE CONE  
MODEL "BMDC" MECHANICAL LINER HANGER WITH DOUBLE CONE & DOUBLE SLIPS  
MODEL "BMDN" MECHANICAL SET NON- ROTATING LINER HANGER  
MODEL "BMDR" MECHANICAL ROTATING LINER HANGER  
SIMPLEX LINER HANGER  
MODEL "OFF-BOTTOM" SETTING TOOL  
LATCH-DOWN LINER WIPER PLUG  
MODEL "BHFWS" LINER TOP PACKER  
MODEL "BDLP" LINER TOP PACKER  
MODEL "BMLTP" LINER TOP TIE-BACK PACKER FOR LINER HANGER  
MODEL "BTSN" TIEBACK SEAL ASSEMBLY  
MODEL "BHDA" HOLD DOWN SUB ASSEMBLY  
LINER SWIVEL SUB  
MODEL "BS" HYDRAULIC & "BL" MECHANICAL LANDING COLLAR  
DOWN JET SWIRL SHOE W/ DOUBLE POPPET VALVE & ALUMINIUM SPADE NOSE  
DOWN JET SWIRL SHOE W/ DOUBLE POPPET VALVE  
JET SWIRL REAMER SHOE WITH POPPET VALVE  
DOWN JET SWIRL FLOAT SHOE W/ DOUBLE POPPET VALVE & ECCENTRIC ALUMINIUM GUIDE NOSE  
HANDLING NIPPLE  
TIE-BACK RECEPTACLE  
MODEL "BFN" LINER HANGER SETTING TOOL  
MODEL "BE" RUNNING TOOL  
MODEL "BMST" & "BRST" LINER HANGER SETTING TOOL  
MODEL "BHR" HYDRAULIC RELEASE SETTING TOOL  
MODEL "BA" TOP SET RUNNING TOOL  
MODEL "BPST" PACKER SETTING TOOL  
MODEL "BAFN" SETTING TOOL  
MODEL "BLWP" LINER WIPER PLUG  
MODEL "BRL" LINER WIPER PLUG  
MODEL "BSSR" SUB SURFACE RELEASED CEMENTING PLUGS  
FOUR PLUG SYSTEMS FOR STAGE CEMENTING  
MODEL "BF" LINER HANGER JUNK SCREEN  
MODEL "BG" SETTING COLLAR  
TOP SET COUPLING  
MODEL "BR" RETRIEVABLE PACK-OFF BUSHING  
MODEL "B" & "BF" SETTING COLLAR WITH OPTIONAL TBR  
MODEL "BD" SETTING COLLAR WITH INTEGRAL PACK-OFF BUSHING  
MODEL "BER" SLICK JOINT USED WITH RETRIEVABLE PACK OFF BUSHING (RPOB)  
MODEL "BPM" POLISH AND DRESS MILL  
MODEL "BTDS" TOP DRIVE CEMENTING HEAD

**4. PACKER SYSTEMS ..... 53 - 109****SEAL BORE PACKERS SYSTEM - PERMANENT**

MODEL "BD" RETAINER PRODUCTION PACKER  
MODEL "BF-1" PRODUCTION PACKER  
MODEL "B-FA-1" RETAINER PRODUCTION PACKER  
MODEL "B-FB-3" HIGH PRESSURE RETAINER PRODUCTION PACKER  
WIRE LINE ADAPTER KIT  
MODEL "BH" HYDRAULIC SETTING TOOL FOR MODEL "BD" PERMANENT PACKER AND RETRIEVABLE HYDRAULIC SEAL BORE PACKER  
MODEL "BSB-3" HYDRO-SET RETAINER PRODUCTION PACKER  
MODEL "BSAB-3" HYDRO-SET RETAINER PRODUCTION PACKER  
MODEL "SABL-3" HYDRO-SET RETAINER PRODUCTION PACKER  
MODEL "BK-22" ANCHOR TUBING SEAL NIPPLE  
AUTO ORIENTING BOTTOM SUB WITH HALF MULE SHOE  
DOWN HOLE SEALING SYSTEMS PACKER TO TUBING - SEAL SYSTEM SELECTION  
MODEL "BG" LOCATOR TUBING SEAL ASSEMBLY  
MODEL "BG" LOCATOR TUBING SEAL ASSEMBLY WITH SPACER TUBE  
MODEL "BE" ANCHOR TUBING SEAL ASSEMBLY  
MODEL "DR" LOCATOR TYPE PACKER PLUG  
MODEL "DR" LATCHING TYPE PACKER PLUG  
TYPICAL HOOK-UP WITH MILLOUT EXTENSION AND SEAL BORE EXTENSION  
TYPICAL HOOK-UP WITH SEAL BORE EXTENSION  
TYPICAL HOOKUP WITH MILLOUT EXTENSION AND FLOW CONTROL ACCESSORIES

**MISCELLANEOUS COMPLETION PRODUCTS**

MODEL "BIM" EXPANSION JOINT  
MODEL "BE" EXPANSION JOINT  
SEAL BORE EXTENSION  
PERFORATED SPACER TUBE  
WIRELINE ENTRY GUIDE  
MODEL "E" FULL OPENING NON- PERFORATED PRODUCTION TUBE  
FLOW COUPLING

**SEAL BORE PACKERS SYSTEM - RETRIEVABLE**

MODEL "BRSB" RETRIEVABLE HYDRAULIC SEAL BORE PACKER  
MODEL "BH-1" HYDRAULIC SETTING TOOL WITH ADAPTER KIT FOR MODEL "BRSB" PACKER  
MODEL "BR" RETRIEVING TOOL  
MODEL "BC-2RAH" PACKER ALL SIZES  
MODEL "BH" RETRIEVING TOOL  
MODEL "PBR" HYDRAULIC SET RETRIEVABLE SEAL BORE PACKER  
MODEL "BC" RETRIEVING TOOL  
MODEL "BP" RETRIEVING TOOL  
MODEL "PBR" PACKER BORE RECEPTACLE





**PRODUCTION AND TEST PACKERS - RETRIEVABLE**

- MODEL "BR-3" DOUBLE-GRIP RETRIEVABLE CASING PACKER
- MODEL "B-AD-1" TENSION PACKERS
- MODEL "BA-S" TUBING ANCHOR CATCHER
- MODEL "BG" RETRIEVABLE CASING PACKER
- MODEL "BAR-1" SNAP-SET COMPRESSION PACKER
- MODEL "BTCN" MECHANICAL SET PACKER
- MODEL "BA-2" LOCK-SET RETRIEVABLE CASING PACKER
- MODEL "BFL" AND "BFR" ON-OFF SEALING CONNECTORS
- MODEL "BHHP" SINGLE STRING, DOUBLE GRIP HYDRAULIC PACKER
- MODEL "BFH" HYDROSTATIC SINGLE STRING PACKER
- MODEL "BFHL" HYDROSTATIC SINGLE STRING PACKER
- MODEL "BHRL" HYDRAULIC RETRIEVABLE PACKER
- MODEL "B" HYDRO-TRIP PRESSURE SUB
- MODEL "BHBL" HYDRAULIC SET LARGE BORE RETRIEVABLE PACKER
- MODEL "BRHD" RETRIEVABLE HYDRAULIC DUAL PACKER
- MODEL "BHLP" HYDRAULIC RETRIEVABLE PACKER
- MODEL "BRSP" RETRIEVABLE SQUEEZE PACKER
- MODEL "BGCT" GRAVEL PACK SYSTEM
- MODEL "BESP" ELECTRIC SUBMERSIBLE PUMP PACKER
- BALL CATCHER SUB
- AUTO FILL PUMP OUT PLUG
- WIRELINE ENTRY GUIDE WITH SHEAR-OUT BALL SEAT
- MODEL "NON ROTATIONAL" SHEAR OUT SAFETY JOINT
- MODEL "B" SHEAR-OUT SAFETY JOINT

**RETRIEVABLE CEMENTER**

- MODEL "BC-1" FULL-BORE RETRIEVABLE CEMENTER
- MODEL "BEA" RETRIEVAMATIC SERVICE PACKER

**5. CASING CLEAN UP TOOLS .....110 - 111**

- MODEL "BC" CASING SCRAPER
- MODEL "B" JUNK BASKET
- JUNK SUB

**6. FLOW CONTROL EQUIPMENT .....112 - 129**

MODEL "BF" SEATING NIPPLE

MODEL "BR" SEATING NIPPLE

MODEL "BFSG-21", "BFWG-21" &amp; "BRZG-21" BY-PASS BLANKING PLUGS WITH REMOVABLE MANDREL

MODEL "BFB-2" &amp; "BRB-2" EQUALIZING CHECK VALVE

MODEL "B-RZB" DOWNHOLE INSTRUMENT HANGER

MODEL "JDC" &amp; "JUC" PULLING TOOL

MODEL "BSB" &amp; "BRB" PULLING TOOL

MODEL "BC-1" RUNNING TOOL

MODEL "A" GUIDE

MODEL "A" SHANK

MODEL "N-1" SHANK

MODEL "N-1" PROBE

MODEL "A", "B" &amp; "C" PRONG

MODEL "A" &amp; "B" PROBE

MODEL "BX", "BXN", "BR" &amp; "BRN" NON-PORTED SEATING NIPPLE

MODEL "BRT" NON-PORTED SEATING NIPPLE

MODEL "BX", "BXN", "BR", &amp; "BRN", LOCK MANDREL

MODEL "BPR" PLUG

EQUALIZING CHECK VALVE

MODEL "R" VALVE CAP

MODEL "BR" RUNNING TOOL

MODEL "GS" RUNNING AND PULLING TOOL

MODEL 'X' &amp; 'R' RUNNING &amp; PULLING PRONG

MODEL "BL" SLIDING SLEEVE

SEPARATION SLEEVES FOR MODEL "BL" SLIDING SLEEVE

MODEL "BD-2" SHIFTING TOOL

NON-ELASTOMERIC SLIDING SLEEVE

"BX" &amp; "BR" SEPARATION SLEEVES FOR NON-ELASTOMERIC SLIDING SLEEVE

MODEL "B" SHIFTING TOOL

**7. GAS LIFT EQUIPMENT .....130 - 146**

SIDE POCKET MANDREL (STANDARD)  
SIDE POCKET MANDREL (ML SERIES)  
SIDE POCKET MANDREL (SPECIAL CLEARANCE ROUND BODY)  
SIDE POCKET MANDREL (SPECIAL CLEARANCE ROUND BODY WITHOUT ORIENTING SLEEVE)  
SIDE POCKET MANDREL (CHAMBER LIFT)  
WIRELINE RETRIEVABLE GAS LIFT VALVES (IPO)  
WIRELINE RETRIEVABLE ORIFICE VALVES  
WIRELINE RETRIEVABLE DUMMY VALVES (NON-EQUALIZING)  
WIRELINE RETRIEVABLE CHEMICAL INJECTION VALVES  
WIRELINE RETRIEVABLE DUMP/KILL VALVES  
ACCESSORIES: LATCHES FOR WIRELINE RETRIEVABLE VALVES  
ACCESSORIES: RUNNING TOOLS FOR WIRELINE RETRIEVABLE VALVES  
ACCESSORIES: KICK-OVER TOOLS FOR WIRELINE RETRIEVABLE VALVES  
ACCESSORIES: PULLING TOOLS FOR WIRELINE RETRIEVABLE VALVES  
WIRELINE ACCESSORIES: ROPE SOCKET  
WIRELINE ACCESSORIES: WIRELINE JAR (MECHANICAL JAR)  
WIRELINE ACCESSORIES: WEIGHT BAR (SINKER BAR)  
MODEL 'B' CONVENTIONAL GAS LIFT MANDRELS (TUBING RETRIEVABLE VALVE MANDRELS)  
MODEL 'C' CONVENTIONAL GAS LIFT MANDRELS (TUBING RETRIEVABLE VALVE MANDRELS)  
CONVENTIONAL GAS LIFT VALVE -IPO (TUBING RETRIEVABLE VALVE)  
REVERSE FLOW CHECK VALVE  
TUBING RETRIEVABLE ORIFICE VALVES



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**BRIDGE PLUGS – CEMENT  
RETAINERS & ACCESSORIES**

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**Model “K-1” Cement Retainer  
(Mechanical Set)**

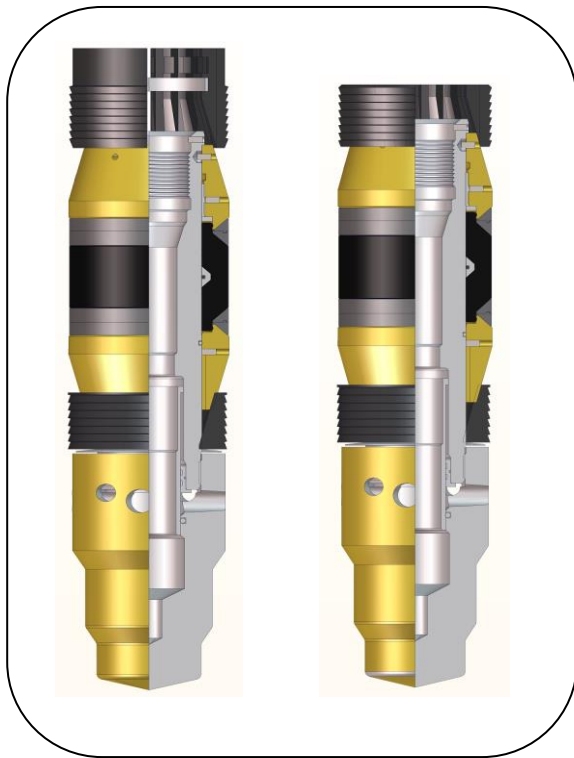
**Product No.: BI 400-21**

**(Wireline Set)**

**Product No.: BI 400-23**

This drillable Cement Retainer continues to be the best tool available for single-interval squeeze, batch, or block squeeze cementing.

The Model K-1 Cement Retainer is constructed of components subject to stringent material specifications and quality control procedures. It provides the optimum strength and drillability combination. The model K-1 Cement Retainer’s two way valve is controlled from the surface: no springs to cock or stick. Just pick up to close; set down to open. Maximum clearance for fast running plus improved drillability and pressure ratings make it the right choice.



Model K – 1  
Mechanical Set  
Cement Retainer  
Product No.: BI 400-21

Model K - 1  
Wireline Set  
Cement Retainer  
Product No.: BI 400-23

**Performance features:**

**Tubing or electric line set:** Can be set by mechanical methods on tubing or drill pipe, or run and set on electric line. Faster, safer run-in. Run - in speed is up to the operator. Locked construction design and larger clearance make this possible.

**Tests tubing:** Tubing can be tested before squeezing by picking up to close the valve and applying pressure.

**Holds final squeeze pressure:** The automatic closing of the valve when picking up, or removal of stinger, ensures holding the squeeze under final pressure as cement is circulated out

**Isolates squeeze from hydrostatic pressure:** Keeping hydrostatic pressure off the zone just squeezed is important, especially for cementing low-fluid-level wells in batch-squeeze operations. This unique valve guarantees an effective seal.

**Fast drill out:** New material specifications developed especially for the K-1 Cement Retainers result in faster drill out.

**PRESSURE RATING (Above & Below)**

1AA-5AA	10,000 psi
6AA	8,000 psi
6BB	5,000 psi
7AA	5,000 psi
8AA	4,000 psi
8BB	3,000 psi
9AA	3,000 psi

Note: Temperature Rating upto 400° F

**NOTE:**

The temperature rating is governed by the hardness of Elastomer (Packing Element)

- For continuous temperature rating of 400°F use 90 hard Packing Element
- For temperature rating up to 300°F use standard 70 hard Packing Element
- Packing element in premium grades of elastomer for severe environments are also provided on request.

**Model "N-1" Bridge Plug**

**Product No.: BI 401-22 (Mechanical Set)**

**Product No.: BI 401-20 (Wire Line set)**

The Model N-1 runs and sets on Wireline or Tubing/Drill Pipe. It also incorporates the seal element lock to allow faster, safer run-in. Its materials are also subject to the same stringent specifications and quality control procedures as the Model K-1 Cement Retainer, providing improved drillability and higher pressure ratings.



Model N-1  
Mechanical Set  
Bridge Plug  
Product No.: BI 401-22

Model N-1  
Wireline Set  
Bridge Plug  
Product No.: BI 401-20

**Model "KL" Control Unit**

**Product No.: BI 430-61**

**Model "B" Snap Latch Stinger Sub**

**Product No.: BI 400-92**

**Model "K-1" Snap Latch Setting Tool**

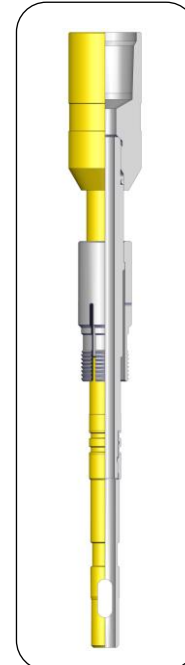
**Product No.: BI 400-69**

The Model B Snap Latch Stinger Sub is used with Model K-1 Wireline Set Cement Retainers. It features a snap-in, snap-out-type latch that provides a surface indication of the stinger being landed in the cement retainer (giving assurance that the sleeve valve is open) or the Stinger Sub being removed from the Cement Retainer (and the sleeve valve closed).

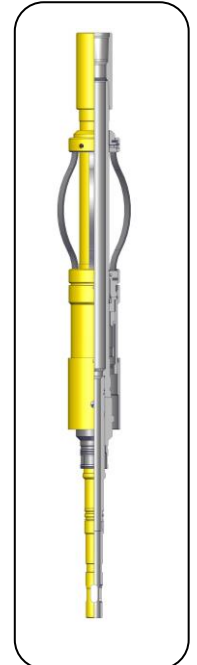
A Model KL Control Unit is made up above the Stinger Sub and provides a centring device for entering the retainer bore.



Model KL  
Control Unit  
Product No.:  
BI 430-61



Model B  
Snap Latch  
Stinger Sub  
Product  
No.:



Model K-1  
Snap Latch  
Setting Tool  
Product No.:  
BI 400-69

CEMENT RETAINERS AND BRIDGE PLUGS						
Casing		Size	Bore (Inch.)	Maximum O.D. (Inch.)	Range of Casing I.D. for Running	
O.D. (Inch.)	Weight (Lbs.) T & C				Minimum (Inch.)	Maximum (Inch.)
4-1/2	9.5-16.6	1AA	1.345	3.593	3.826	4.090
5	11.5-18	1BB		3.937	4.154	4.560
5-1/2	13-23	2AA		4.312	4.580	5.044
6	14-26	2BB	2.000	4.937	5.140	5.552
6	10.5-12	3AA		5.375	5.595	6.135
6-5/8	17-34					
7	32-38					
7	17-35	3BB		5.687	6.004	6.538
7-5/8	20-39	4AA		6.312	6.560	7.125
8-5/8	24-49	5AA		7.125	7.511	8.097
9-5/8	32.3-58.4	6AA		8.125	8.435	9.063
10-3/4	60.7-81	6BB		9.000	9.250	9.660
10-3/4	32.75-60.7	7AA		9.437	9.660	10.192
11-3/4	38-60	8AA		10.437	10.772	11.150
13-3/8	77-102	8BB		11.562	11.633	12.464
13-3/8	48-72	9AA	12.000	12.175	12.715	

SETTING TOOLS								
Cement Retainer & Bridge Plug Size	"K-1" Setting Tool (Product No.: BI 400-69)	Wireline Setting Tools						
		Release Stud Size (Inch.)	WLAK For Bridge Plug Prod. No. BI 438-24 For Cement Retainer (Product No.: BI 438-19)	"E-4" W.L.P.S.A. (Product No.: BI 437-02)	Stinger Sub (Product No.: BI 400-92)	"KL" Control Unit (Product No.: BI 430-61)		
						Tool	Drag Spring	
1AA 1BB	1AA-1BB	7/8	1AA	10	1AA-2BB	43	10	
2AA	2AA		1BB-2AA	20		3AA-9AA	45	20
2BB	2BB		2BB				30	
3AA	3AA	1	3AA-3BB		20		3AA-9AA	47
3BB	3BB		4AA	49		30		
4AA	4AA		5AA	51		40		
5AA	5AA		6AA	53		50		
6AA	6AA		6BB					
6BB	6BB		7AA					
7AA	7AA		8AA	55		50		
8AA	8AA		8BB					
8BB	8BB		9AA					
9AA	9AA							

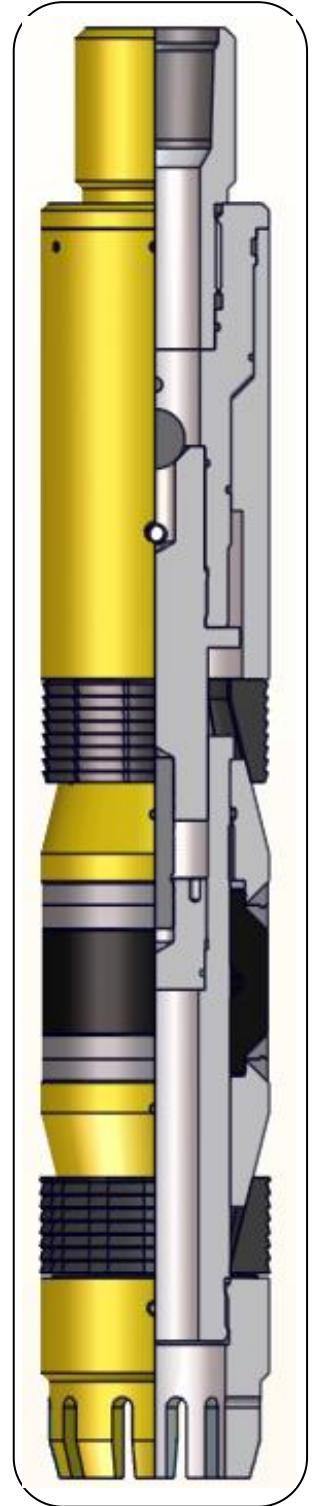
## Model "HN-1" Bridge Plug

Product No.: BI 401-23 (Hydraulically Actuated and Mechanically Set)

The BOTIL HN-1 Bridge Plug is hydraulically actuated and mechanically set. Compact tool can withstand high pressure and is designed for easy drill out. It can be used in zone isolation for squeeze cementing, fracturing, plug and abandonment either temporary or permanent.

Specification Guide Model "HN-1" BRIDGE PLUG  
(Product No.: BI 401-23)

Casing		Setting Range		Plug Max. OD (Inch.)	Shear Force (lbs.)	Top Connection	Ball OD (Inch.)	Pressure Differential (psi)
OD (Inch.)	Weight (ppf) T & C	Min. ID (Inch.)	Max. OD (Inch.)					
4-1/2	9.5-15.1	3.826	4.090	3.593	33,000	2-3/8 EUE	1-1/2	10,000
5	11.5-20.8	4.154	4.560	3.937	33,000	2-3/8 EUE	1-1/2	10,000
5-1/2	13.0-23.0	4.580	5.044	4.312	33,000	2-3/8 EUE	1-1/2	10,000
7	17.0-35.0	6.004	6.538	5.687	55,000	2-7/8 EUE	1-3/4	10,000
7-5/8	20.0-39.0	6.625	7.125	6.312	55,000	2-7/8 EUE	1-3/4	10,000
9-5/8	29.3-58.4	8.435	9.063	8.125	55,000	2-7/8 EUE 3-1/2 IF	2	8,000
13-3/8	48.0-80.7	12.175	12.715	11.880	55,000	2-7/8 EUE 4-1/2 IF	2 2 11/64	3,000



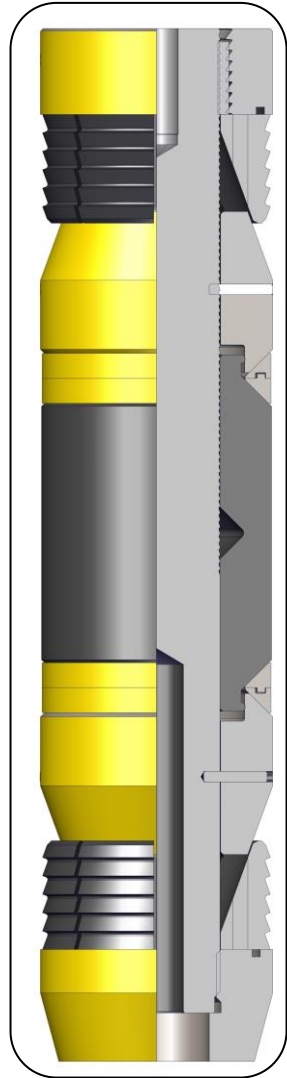
Model HN-1  
Bridge Plug  
Product No.: BI 401-23



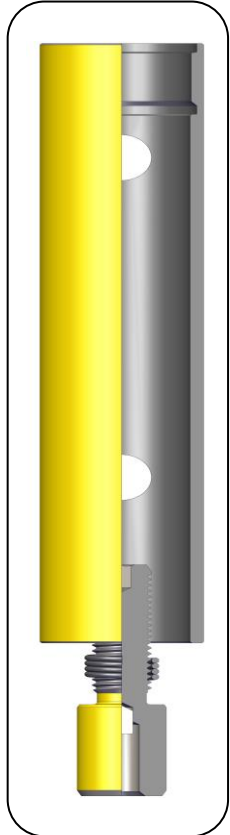
**Model "N-2" Bridge Plug & ADAPTER KITS**  
**Product No.: BI 401-25, 438-25**

These bridge plugs, designed for use in tubing- less completions, incorporate the same solid ring slips and a swab proof packing element system with positive anti-extrusion back-up rings as used in the conventional bridge plugs.

The bridge plug is made-up to the appropriate size and model Wireline pressure setting assembly and wire line adapter kit (refer to Specification Guide) and run to setting depth. When the pressure setting assembly is actuated the tension mandrel in the adapter kit moves upward, pulling the body of the bridge plug up with the respect to the setting sleeve, thereby setting and packing-off the bridge plug. Continued upward movement then shears the Release Stud, leaving the wireline pressure setting assembly and adapter kit free to be retrieved from the well.



Model N-2  
 Bridge Plug  
 Product No.: BI 401-25



Adapter Kit  
 Product No.: BI 438-25

Specification Guide BRIDGE PLUG (Product No.: BI 401-25)						
Casing		Bridge Plugs			Adapter Kit Product No. & Size	Wireline Pressure Setting Assembly
OD (Inch.)	Weight (Lbs.) T & C	Size (Inch.)	Max. OD (Inch.)	Model		
3-1/2	5.75-10.3	35	2.765	N-2	35-40	Size 10
4	14.8-19.0					
4-1/2	26.5					
4	5.6-14	40	3.14			
4-1/2	17.7-24.6					

## MODEL "BFCP" COMPOSITE FRAC PLUG

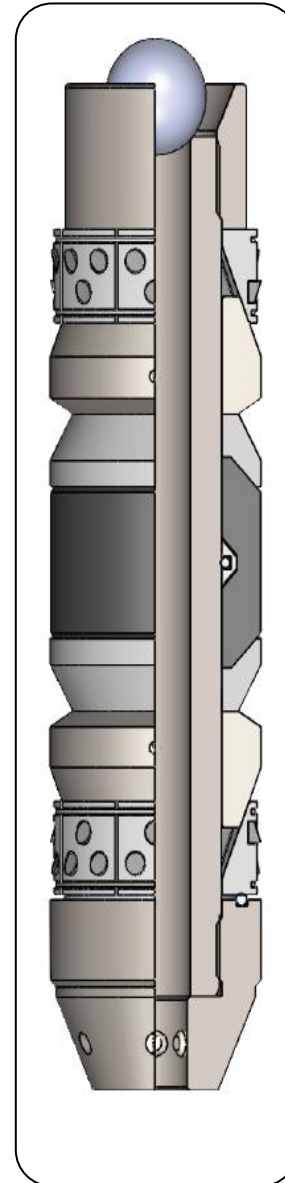
**Product No.: BI 401-26**

The BOTIL Composite Frac Plug is designed to be used for temporary zone isolation during stage Frac operation in horizontal and vertical wells. The composites used in construction allows for short drill time and ease of operation.

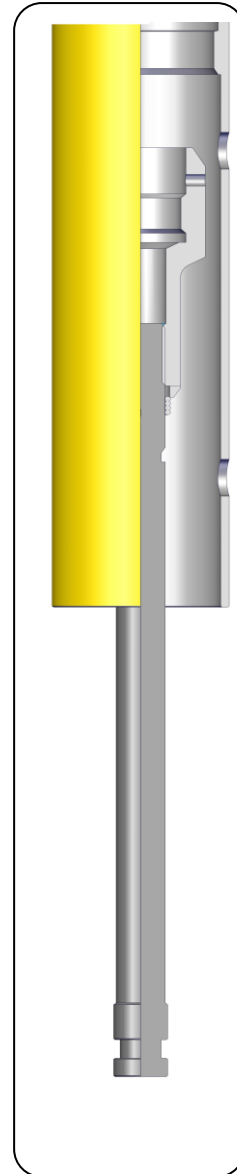
The compact composite plug consists of a large bore body and a ball which is dropped after the plug body is set to complete the plug. Pressure from below is not contained. The ball can subsequently be flowed out and/or the plug body drilled up, knocked to bottom, or remains for production through its large bore.

The composite Frac Plug can operate in temperatures up to 275° F and hold pressure from above up to 8000 psi.

Specification Guide MODEL "BFCP" COMPOSITE FRAC PLUG (Product No.: BI 401-25)					
Casing		Overall Length (Inch.)	Setting Range		Tool O.D. (Inch.)
Size (Inch.)	Weight (Lbs.) T & C		Min I.D. (Inch.)	Max I.D. (Inch.)	
4 1/2"	9.5-16.6	17.00"	3.826	4.090	3.594
5 1/2"	13-23	17.00"	4.580	5.044	4.24



Model BFCP  
Composite Frac Plug  
Product No.: BI 438-25



Adapter Kit

## WIRE-LINE SET RETRIEVABLE BRIDGE PLUG

**Product No.: BI 577-32**

The BOTIL Wireline Set Retrieable Bridge Plug is a medium performance retrievable bridge plug that combines the advantages of tubing or sand-line retrievability with the advantages of fast, accurate wireline setting. The Bridge Plug is set on wireline by using The Wireline Adapter Kit attached to Pressure Setting Assembly.

Model "BWR" Wire Line Set Retrieable Bridge Plug can alternately be lowered on Tubing and set by application of pressure. This is done by attaching the Bridge Plug to the Wireline Adapter Kit which, in turn is attached to the BOTIL Size 20 Model "BH" Hydraulic Setting Tool.

The Wireline Set Retrieable Bridge Plug can be used for operations such as zone isolation, formation fracturing or acidizing, and surface equipment repair where wireline setting is desirable. This provides a distinct advantage in situations where the plug must be run and retrieved under pressure, as it may be run in and out of the well using a lubricator eliminating the necessity of snubbing tubing or killing the well.

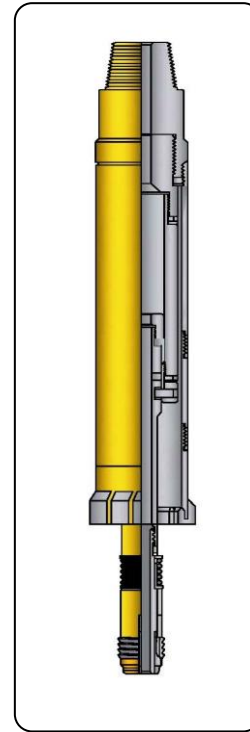


Wireline Set Retrieable  
Bridge Plug  
Product No.: BI 577-32

Specification Guide									
Casing		Packer Size	Gage Ring OD (Inch.)	Packing Element O.D (Inch.)	Packing Element Spacer OD (Inch.)	Slip Range			
						Preferred		Absolute	
O.D (Inch.)	Weight (Lbs.) T & C					Min (Inch.)	Max (Inch.)	Min (Inch.)	Max (Inch.)
5-1/2"	26	43C	4.250	4.156	4.250	4.408	4.560	4.062	4.582
	20-23	45A2	4.500	4.375	4.500	4.625	4.778	4.437	5.221
	15.5-20	45A4	4.641			4.778	4.950		
	13-15.5	45B	4.781	4.688	4.781	4.950	5.190		
7"	32-35	47A4	5.812	5.500	5.656	5.930	6.135	5.562	6.665
	26-29	47B2	5.968	5.750	5.938	6.136	6.276	6.200	7.303
	23-26	47B4	6.078			6.276	6.366		
	17-20	47C2	6.266	6.125	6.266	6.456	6.578		
9-5/8"	47-53.5	51A2	8.218	7.938	8.218	8.343	8.681	8.125	9.283
	40-47	51A4	8.437			8.681	8.835		
	29.3-36	51B	8.593	8.375	8.593	8.836	9.063		

**Model "BCP-1" Plug Plucker**  
**Product No.: BI 747-12**

For milling over permanent Bridge Plugs and/or Cement Retainers and retrieving the milled-out portion from the wellbore. With this tool, Bridge Plugs and Retainers never have to be pushed down hole, allowing high performance Bridge Plugs or Cement Retainers to be safely set above a liner. This Milling Tool will easily mill up even the largest Retainer or Plug, in most cases in one round trip.



Model BCP-1  
 Plug Plucker  
 Product No.: BI 747-12

<b>Specification Guide for MODEL "BCP-1" PLUG PLUCKER</b> ( Product No.: BI 747-12)										
Casing		Bridge Plug or Retainer Size	Plug Plucker						Shoe Comm. No.	Size
O.D (Inch.)	Weight (Lbs.) T & C		Shoe Size (Inch.)	Shoe O.D.		Shoe I.D.				
				Max. (Inch.)	Min. (Inch.)	Max. (Inch.)	Min. (Inch.)			
4-1/2	9.5-16.6	1AA	22	3.618	3.603	2.625	2.531	BI 07-52269-00	1AA	
5	11.5-18	1BB	24	3.859	3.828	2.625	2.531	BI 07-52270-00	1BB	
5-1/2	13.23	2AA	42	4.515	4.484	3.500	3.437	BI 07-50971-00	2AA	
6	14-26	2BB	46	4.890	4.859	3.500	3.437	BI 07-51805-00	2BB	
6-5/8	17-34	3AA	82	5.546	5.531	4.187	4.125	BI 07-52276-00	3AA	
7	32-38		82	5.765	5.734	4.500	4.250	BI 07-50973-00	3BB	
7	17-35	3BB								
7-5/8	20-39	4AA	88	6.300	6.281	4.500	4.250	BI 07-52277-00	4AA	
8-5/8	24-49	5AA	126	7.328	7.296	5.375	5.250	BI 07-52290-00	5AA	
9-5/8	32.3-58.4	6AA	194	8.328	8.295	6.281	6.250	BI 07-52289-00	6AA	
10-3/4	60.7-81	6BB	212	9.031	8.984	7.625	7.500	BI 07-52279-00	6BB	
10-3/4	32.75-60.7	7AA	214	9.468	9.406	7.625	7.500	BI 07-52280-00	7AA	
11-3/4	38-60	8AA	220	10.406	10.343	8.468	8.406	BI 07-52281-00	8AA	
13-3/8	77-102	8BB	230	11.531	11.468	9.843	9.781	BI 07-52282-00	8BB	
13-3/8	48-72	9AA	240	12.156	12.093	9.843	9.781	BI 07-52283-00	9AA	



Through the use of Milling Tools, Packers can be quickly and safely milled over and retrieve retainer production Packer and/or retrieved from the well.

Because only a very small portion of the Plug, Retainer, or Packer ever needs to be milled out, and the Milling Shoes have been specifically designed to remove only the necessary sections, mill-out time is reduced to the minimum.

Cementing and treating work previously limited by the capabilities of Retrievable Plugs or Packers can be done with high- performance drillable tools, since they can be safely removed following treatment.

**Model "BCJ" Packer Milling Tool**  
**Product No.: BI 747-06**

The Model BCJ Packer Milling Tool is used to mill over Permanent Packers and to retrieve the milled-out Packers from well.

**Model "BCB" Packer Milling Tool**  
**Product No.: BI 747-02**

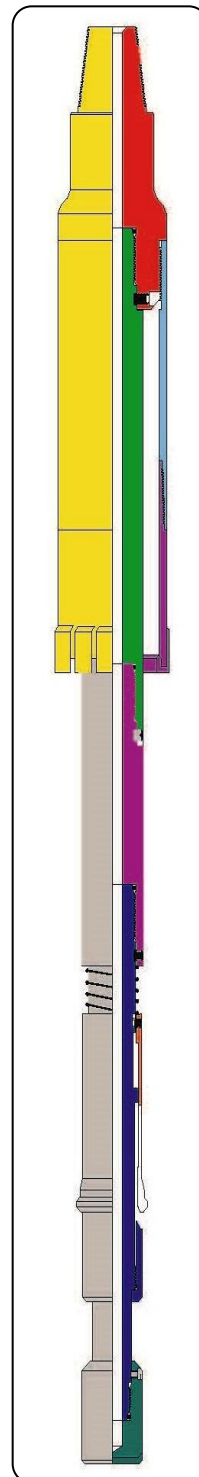
The Model BCB Packer Milling Tool is used to mill over Permanent Packers and to push to bottom of hole. BCB Packer Milling Tool can be converted from BCJ Milling Tool by removing Catch Sleeve, Spring and J-Pin.

**Model "BCC" Milling Tool**  
**Product No.: BI 747-03**

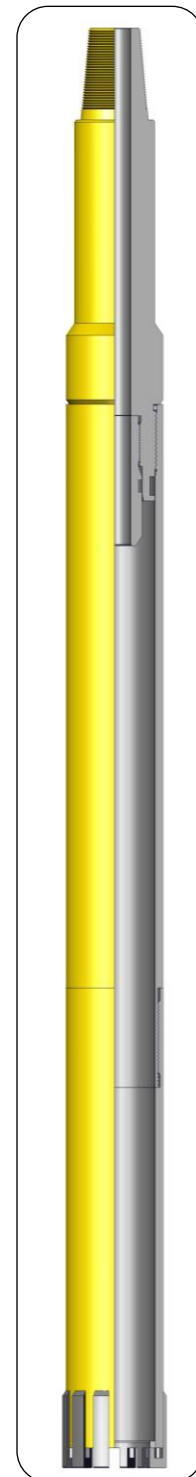
The Model BCC Milling Tool is used to mill out Permanent Bridge Plugs or Cement Retainers and to push to bottom of hole, or to mill over retrievable-type Packers when conditions exist that render normal retrieving methods impossible.

**Model "BCK" Milling Tool**  
**Product No.: BI 747-08**

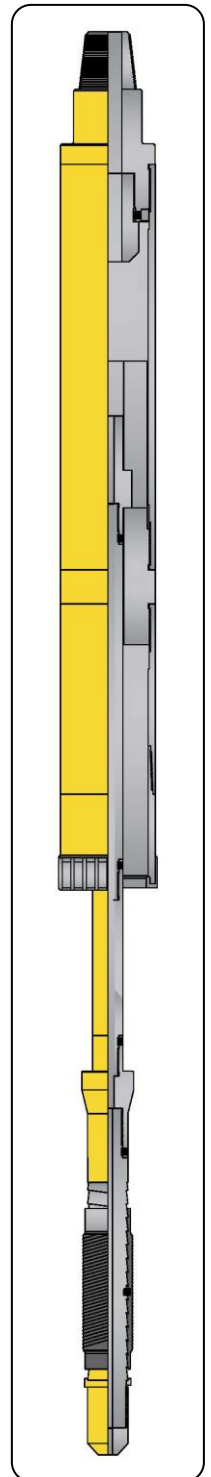
The Model BCK Milling Tool is used to mill over and retrieve Retainer Production Packers with Seal Bore Extensions, Pup Joints, Landing Nipples, and the like, where the Model BCJ Packer Milling Tool is not applicable. The BCK mill includes a spear that is used to latch into and retrieve the body of the Packer after the outside portion of the Packer has been milled up.



Model BCJ  
Packer Milling  
Tool  
Product No.:  
BI 747-06



Model BCC  
Packer Milling  
Tool  
Product No.:  
BI 747-03



Model BCK  
Packer Milling  
Tool  
Product No.:  
BI 747-08



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# PRIMARY CEMENTING

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## CEMENT FLOAT SHOE WITH POPPET VALVE

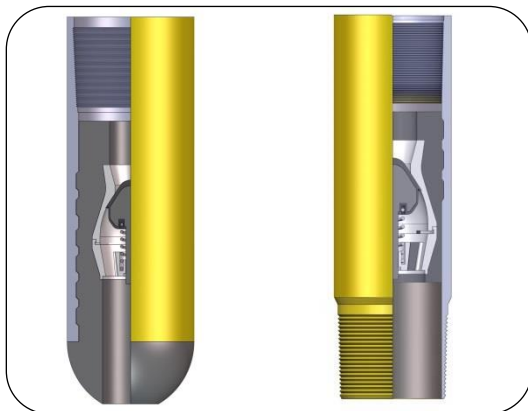
Product No.: BI 100-05

## CEMENT FLOAT COLLAR WITH POPPET VALVE

Product No.: BI 101-05

Cement Poppet-type Float equipment offers dependable performance for all classes oil and gas wells. The valves prevent cement backflow, provide casing buoyancy during run in, and act as internal BOP's during the process of running and cementing the casing.

Float equipment is manufactured to match customer casing specification. All Poppet type cement Float Shoe & Collars are PDC drillable.



Cement Float Shoe with Poppet Valve  
Product No.: BI 100-05

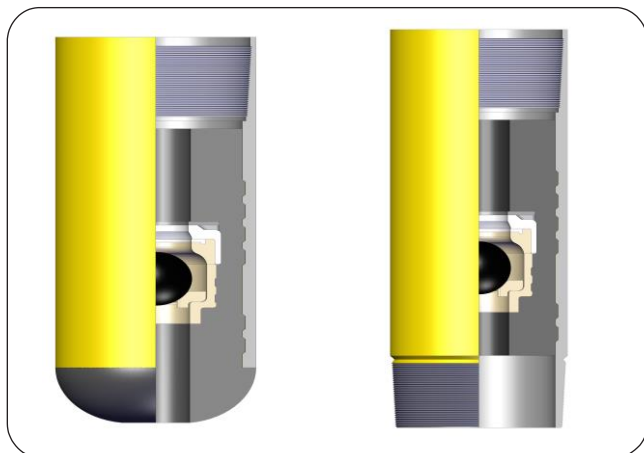
Cement Float Collar with Poppet Valve  
Product No.: BI 101-05

## CEMENT FLOAT COLLAR WITH BALL VALVE

Product No.: BI 101-01

## CEMENT FLOAT SHOE WITH BALL VALVE

Product No.: BI 100-01



Cement Float Shoe  
Product No.: BI 100-01

Cement Float Collar  
Product No.: BI 101-01

Cement ball-type Float Equipment offers dependable performance for all classes of oil and gas wells. The valves prevent cement back-flow, provide casing buoyancy during run- in, and act as internal BOPs during the process of running and cementing the casing.

Float equipment is manufactured to match customer casing specifications. All ball type Cement Float Shoes and Float Collars are PDC drillable.

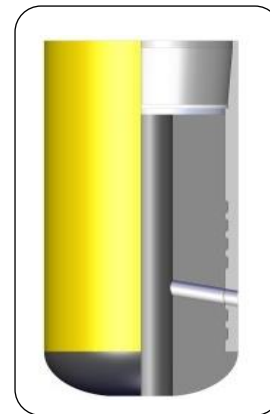
### Benefits / Features:

- Fast drill-out
- No metal parts-will not damage PDC bits
- Free-floating ball abrades evenly.
- Operator controlled buoyancy-regulated by filling casing at surface
- No springs
- Cost effective

## CEMENT DOWN-JET SWIRL GUIDE SHOE

Product No.: BI 102-40

This Shoe is used to provide turbulent flow at the shoe and where obstructions are expected while running in, the Down- Jet Swirl ports allow operator to "wash" casing down.



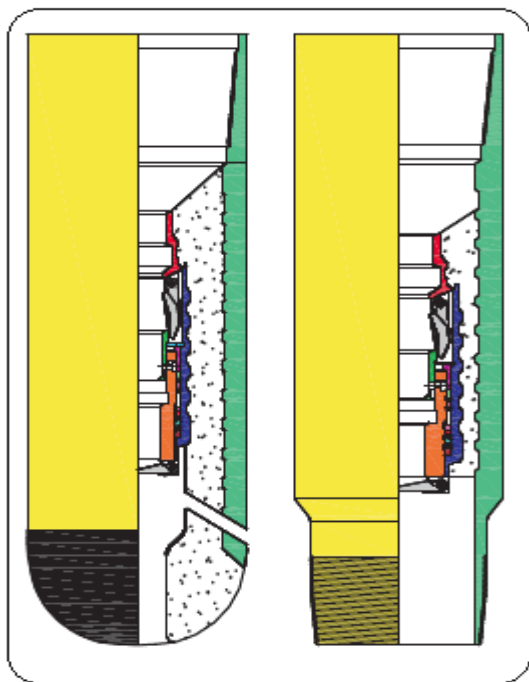
Cement Down Jet Swirl Guide Shoe  
Product No.: BI 102-40

## MODEL "G" DIFFERENTIAL FILL-UP DOWN-JET SWIRL SHOE

Product No.: BI 108-44

## MODEL "G" CIRCULATING DIFFERENTIAL FILL-UP COLLAR

Product No.: BI 109-11



Model "G"  
Differential Fill-Up  
Down-Jet Swirl Shoe  
Product No.: BI 108-44

Model "G"  
Circulating Differential  
Fill-Up Collar  
Product No.: BI 109-11

Differential Fill-up Float Equipment allows 90 % casing fill-up during run-in, reducing surge pressures caused by the piston effect of running casing in restricted IDs. Use of Differential Collar with Shoe provides additional buoyancy by allowing only 81 per cent casing fill-up further enhancing draw works efficiency.

Circulation can be established at any time while running in. Dropping a ball converts the Differential Valve to a regular Back- Pressure Valve. When Collar and Shoe are run together, dropping one ball converts both units.

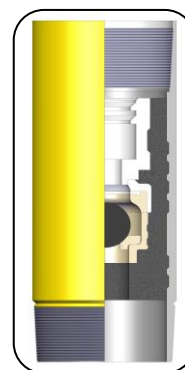
## CEMENT FLOAT COLLAR WITH ANTI-ROTATIONAL PLUGS

Product No.: BI 101-02

Cement/ball type float equipment offers dependable performance for all classes of oil and gas wells. The valves prevent cement back-flow and provide casing buoyancy during run in.

Float Collar is Non-Rotational type pressure and Cementing Plug activated. Plugs feature the latch-down type anti-rotational feature which is compatible with the Float Collar and eliminates rotation during drilling.

Float Equipment is manufactured to match customer casing specification. All ball type Cement Float Collars are PDC drillable.

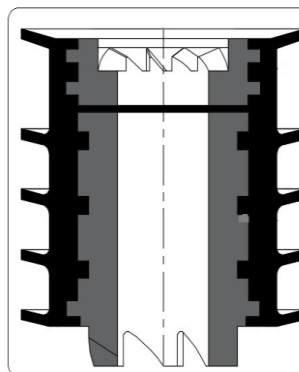


Cement Float Collar with Anti-Rotational Plug  
Product No.: BI 101-02

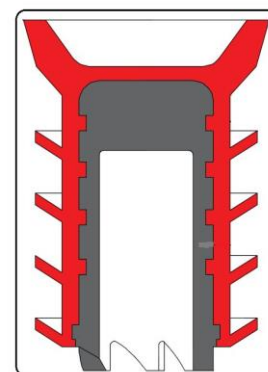
## ANTI-ROTATIONAL CEMENTING PLUGS

Product No.: BI 177-20 & BI 177-21

The Non-Rotating Top & Bottom Cementing Plugs significantly reduce the drill out time, thereby resulting in cost saving. The Bottom Plug separates the cement from drill mud, and features a rubber diaphragm which is opened once the Plug has landed and latched into the Anti-Rotational Float Collar. The Top Plug, used as a follow Plug to displace cement, latches into the upper end of the Bottom Plug. After latching, these provide the anti-rotational feature to eliminate rotation during drilling and save drill out time.



Top Plug  
Product No.: BI 177-20



Bottom Plug  
Product No.: BI 177-21

The body consists of insert of Nylon with additives, moulded with elastomer. No metal parts are used; therefore the Plugs are completely PDC drillable.

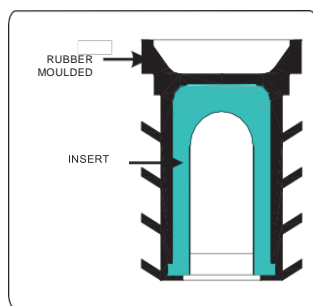
The plugs are available in various elastomers including HNBR for high temperature applications.

## CEMENTING PLUGS

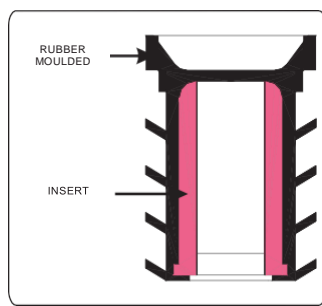
**Product No.: BI 177-18 & BI 177-19**

The Top & Bottom Plug are constructed of material selected to reduce the drill out time, there-by resulting in cost saving. The Bottom Plug separates the cement from the drill mud and features a rubber diaphragm which is opened once the plug has landed on the Cement Float Collar. The Top Plug is used as a follow plug to displace cement and land on the upper end of the Bottom Plug.

The body consists of insert of nylon with additives, moulded with elastomer. No metal parts are used; therefore the Plugs are PDC drillable.



Top Cement Plug  
Product No.: BI 177-18



Bottom Cementing Plug  
Product No.: BI 177-19

## MODEL "B" DUPLEX CEMENT FLOAT SHOE

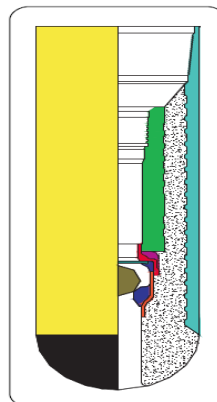
**Product No.: BI 250-03**

## MODEL "B" DUPLEX CEMENT FLOAT COLLAR

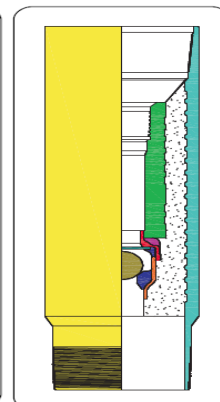
**Product No.: BI 251-02**

Duplex Shoes and Collars sizes 7 5/8" to 30" are furnished with heavy duty duplex connection. These heavy duty connection have 4" O.D. left hand threads and 3 1/4" I.D. seal bores, and are capable of carrying 100,000 lbs. with a minimum safety factor 2. Special accessory products are available for use with this large Duplex Equipment.

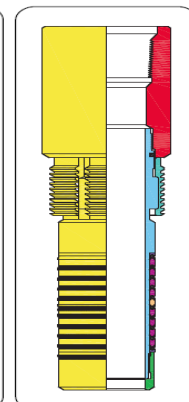
The Model "BE" Tubing Seal Nipple Product No. BI 443-13 has field proven Chevron Seals for positive sealing of the nipple in the seal bore.



Duplex Cement  
Float Shoe  
Product No.:  
BI 250-03



Duplex Cement  
Float Collar  
Product No.:  
BI 250-02



Model "BE" Duplex  
Tubing Seal Nipple  
Product No.:  
BI 443-13

The Model "BE" Tubing Seal Nipple features an expandable left hand latch mechanism, allow the nipple to be "stabbed" into the duplex connection, and when up-strain is applied the latch is expanded to provide full engagement in duplex assembly. The nipple is released by rotating to the right unscrewing the latch mechanism of the duplex connection.

## MODEL "B" STAB-IN FLOAT SHOE

**Product No.: BI 255-05**

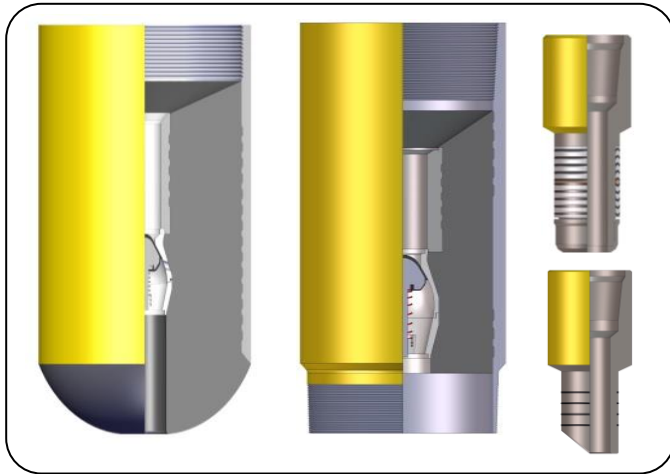
## MODEL "B" STAB-IN FLOAT COLLAR

**Product No.: BI 254-04**

Stab-In cementing is an improved method for cementing large diameter casing. Conventional methods require excessive amounts of cement to ensure cement circulation to surface because of open hole volume, losses to the formation, or mud displacement efficiency that cannot be determined with sufficient accuracy. In addition, large plugs must be used to separate the cement from the mud and have to be drilled out, along with any cement in the casing.

With stab-in cementing, the Drill Pipe is stabbed directly into the Float Shoe or Collar and cement is pumped through the drill pipe until returns reach surface. Cement is then displaced to the bottom of the Drill Pipe — a wiper dart can be used. The drill pipe is then picked up, circulated, and pulled out of the hole.

Stab-in Float Shoe and Collars are available in both versions: with Poppet or Ball Valve and with either Phenolic (PDC drillable) or Aluminium housing.



Model "B" Stab-In Float Shoe  
Product No.: BI 255-05

Model "B" Stab-In Float Collar  
Product No.: BI 254-04

Model "B" Stab-In Seal Sub  
Product No.: BI 250-85

### Advantages:

- Improve displacement accuracy — cement mixing and pumping continues until cement returns reach surface.
- Get better cement quality — the reduced cement/mud interface area and high velocity of flow in the Drill Pipe minimize cement contamination while the short pumping time eliminates the need for cement retarders.
- Reduce cement volume — conventional displacement requires calculation of excess cement factor, whereas with stab-in methods excess cement need be no greater than the volume of the drill pipe. No large plugs are needed.
- Reduce net rig time — circulating, pumping, and drill-out times are minimized.
- Protect casing — cementing pressures are confined to the drill pipe as in a squeeze job.

### AUTO FILL CEMENT FLOAT SHOE

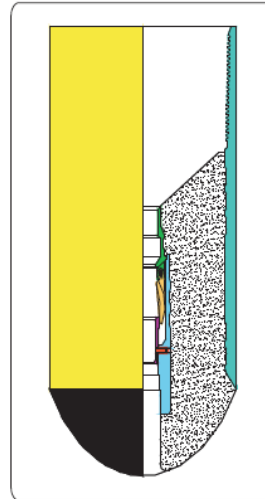
Product No.: BI 100-45

### AUTO FILL CEMENT FLOAT COLLAR

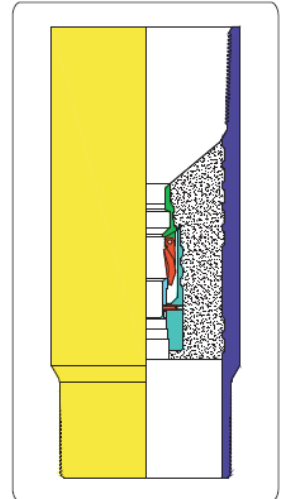
Product No.: BI 101-03

The Auto Fill Cement Float Shoe or Collar permits the casing to fill automatically while being run into the hole. The valve is in the open position while running in allowing maximum filling of the casing as it is lowered into the well bore.

This is especially effective on liner jobs and sensitive hole conditions.



Auto Fill Cement Float Shoe  
Product No.: BI 100-45



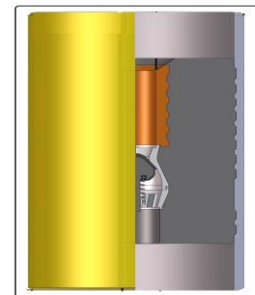
Auto Fill Cement Float Collar  
Product No.: BI 101-03

The circulation may be established at any time during or after casing is run. The flapper type back pressure valve does not become operative until the drop ball is dropped or pumped down. From this point on like Differential Fill-up Shoe or Collar, this model Auto Fill Cement Float Shoe or Collar acts as conventional Floating Equipment. All Auto fill Cement Float Shoes and Collar are PDC drillable. When run in tandem, a single ball may be used to activate both the Float Collar & Shoe.

### BUTT-WELD CEMENT FLOAT COLLAR

Product No.: BI 255-14

Cement Poppet-type Float equipment offers dependable performance for all classes' oil and gas wells. The valves prevent cement backflow, provide casing buoyancy during run in, and act as internal BOPs during the process of running and cementing the casing.



Butt-Weld Cement Float Collar  
Product No.: BI 101-06



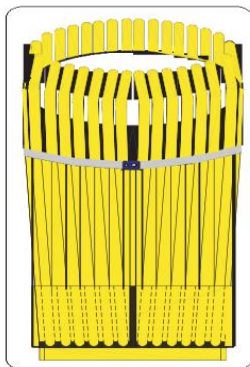
Float equipment is manufactured to match customer casing specification. All ball type cement float collars are PDC drillable.

Butt-Weld Casing Collar O.D. matches with the casing O.D. and upper end is only bevelled, not recessed for directly welding to the Casing pipe.

### CEMENT BASKET

**Product No.: BI 231-03**

The Cementing Basket is designed to run on the casing string or liner to support a cement column to prevent contamination of a lower zone or to keep hydrostatic head of a column from breaking down a weak formation.



Cement Basket  
Product No.: BI 231-03

The Basket consists of flexible steel springs that support overlapping rubber liners. The Basket is placed on the casing with movement limited by pipe couplings or by welding the ring of the basket directly to the casing. Stop rings may also be used to selectively space the Baskets between Collars without welding.

### MODEL "J" STAGE CEMENTING COLLAR

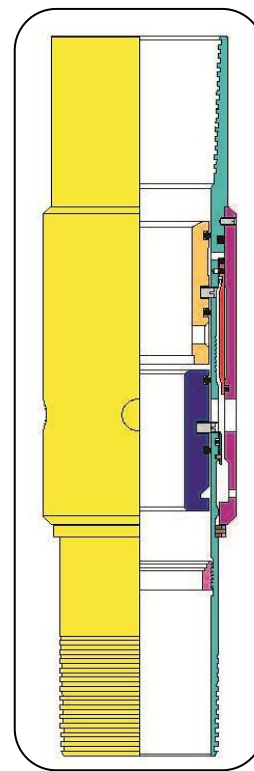
**Product No.: BI 200-03**

The Model "J" Stage Cementing Collar is used to cement casing in two or more stages and allows operators greater flexibility in controlling flow rheology, cement chemistry, and down hole hydrostatic pressures. Typically, the Model "J" Stage Collar is used where a single stage cement job would result in breakdown of a weak formation causing cement losses and /or contamination of the producing zone.

### Operation:

The operation of the Stage Collar requires only the Plugs that come with the Collar and the manipulation of casing pressure. A rubber seal-off plate is also provided to place in the top Float Collar only when the plug bumping surface is flat. The nose of the Model "D" Flexible Wiper Plug is tapered to guide it through the stage collar and needs a bevelled surface on which to seat and seal.

The Model "J" Stage Collar covers casing sizes 4½ in. through 9-5/8 in. Threads and materials specifications vary to meet operators casing program.



Model "J" Stage Cementing  
Collar  
Product No.: BI 200-03

### Features:

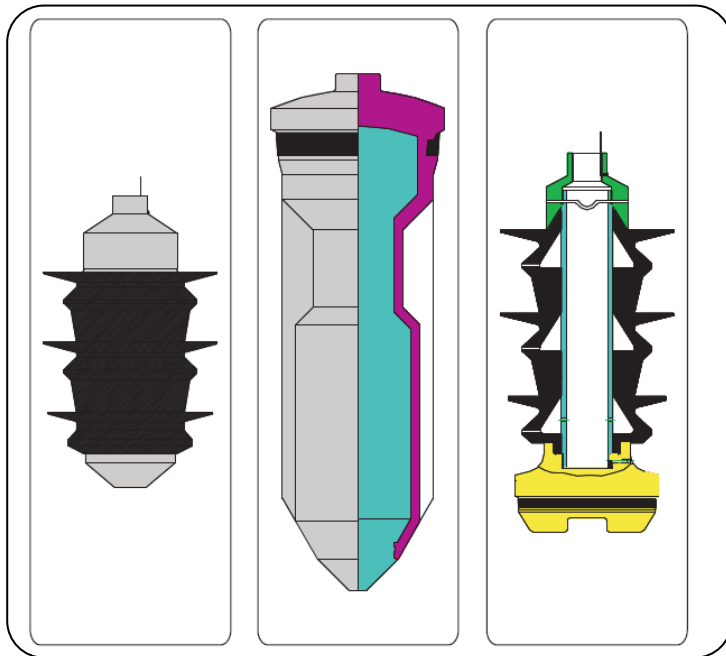
- Strong one-piece body construction.
- Protected closing sleeve.
- Inner sleeves locked against rotation.
- Full, smooth bore after drill out.



**Benefits:**

- No internal threaded or welded pieces to leak or fail
- Nothing to snag Packers or Running Tools run subsequently.
- Easily drilled out-sleeves and plugs are rubber and aluminium.
- Simple hydraulic operation.
- Shut-off sleeve cannot be accidentally reopened.

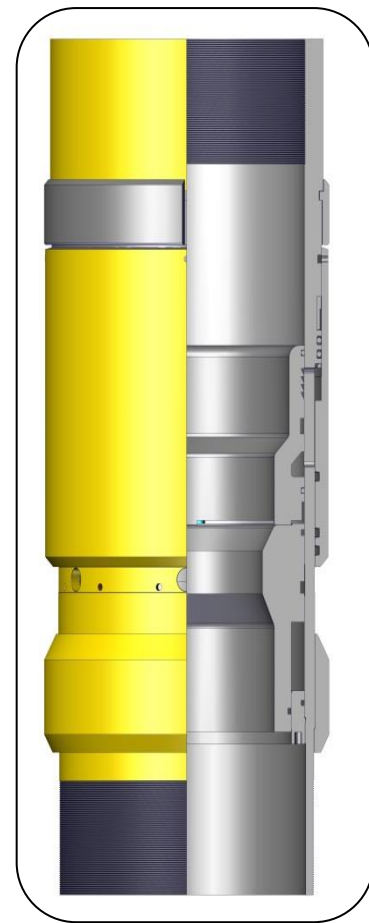
This hydraulic stage-cementing collar can be run with Liner Hanger in conjunction with one or several inflatable packers and used to isolate and selectively cement certain casing intervals. Slotted or pre- drilled liner can be run below a inflatable packers/ hydraulic stage collar assembly, allowing cement to be pumped above the packer and isolated from highly sensitive producing zones.



Model "D"  
Flexible Plug  
Indicating Type

Model "J"  
Cementing Trip  
Plug

Model "J"  
Shut-Off Plug



Hydraulic Opening  
Stage Cementing Collar  
Product No.: BI 200-94

**HYDRAULIC OPENING STAGE CEMENTING COLLAR**

Product No.: BI 200-94

**Description & Application:**

This stage collar features an opening sleeve with area difference on opposite end that allows it to be manipulated hydraulically. The hydraulic opening feature makes the use of this tool very practical in horizontal wells.

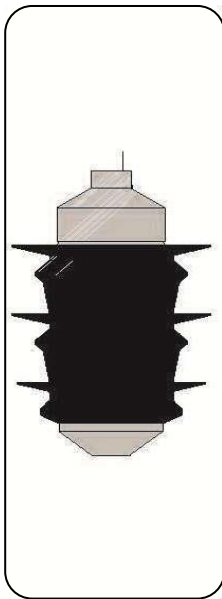
The elimination of the need to use a mechanical opening device has several other merits. Casing run in highly deviated wells can now be two- stage cemented without having to use continuous displacement type plugs.

## Features:

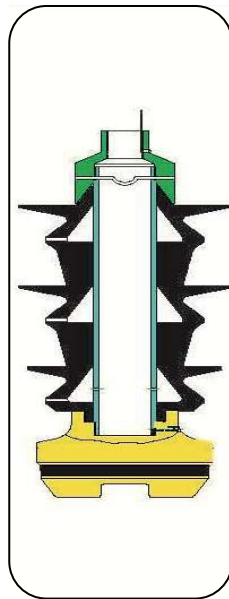
- Field adjustable shear screws, allowing the opening pressure to be adjusted at the well site to ensure that all inflatable packers or other hydraulic tools present in casing string will be triggered in the correct juncture.
- Effective differential area on the opening sleeve that generates a high opening force while requiring only optimal pressure to do so.
- The ability to open immediately upon the completion of first-stage cement displacement.

## MODEL "JB" THREE STAGE CEMENTING COLLAR Product No.: BI 200-04

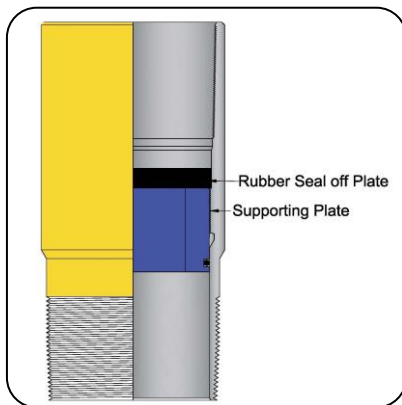
Three Stage Cementing is used to place a long column of cement about a weak zone. The "JB" Stage Collar is located a short distance about the weak zone. The First Stage is cemented by pumping cement up to the "JB" Collar. The "JB" Collar is then opened using the Trip Plug and then the Second and Third Stages are cemented.



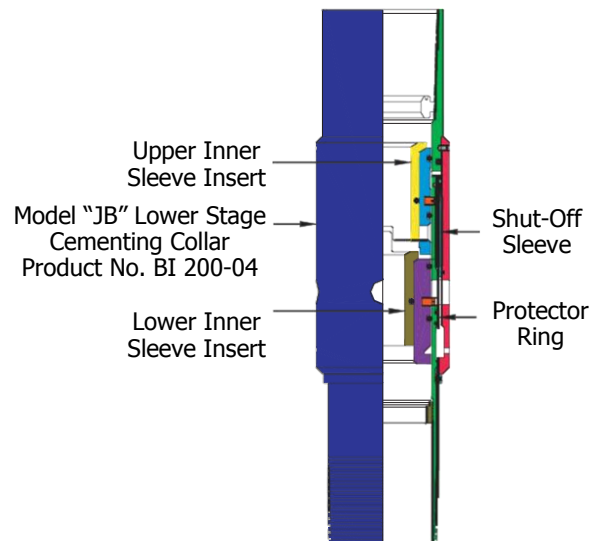
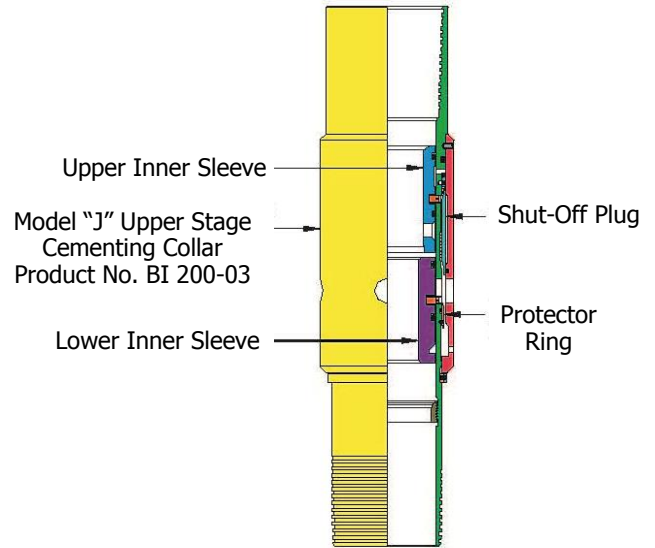
Model "D"  
Flexible Plug  
Indicating Type

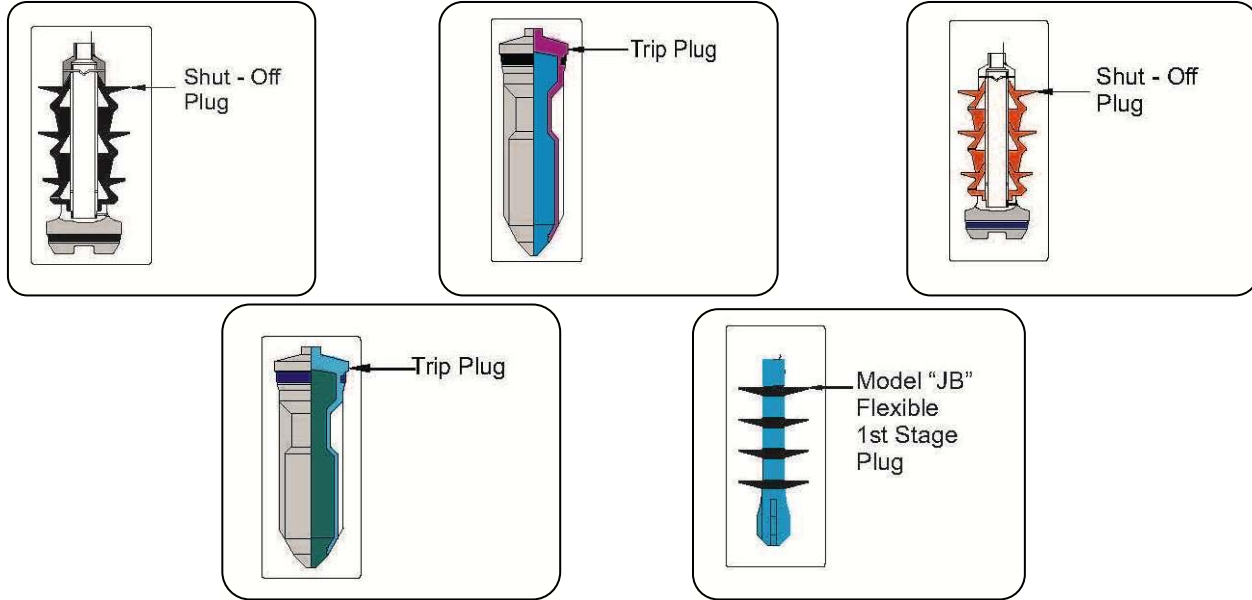


Model "J"  
Shut-Off Plug



Baffle Collar





**Specification Guide**  
**MODELS "J" & "JB" STAGE CEMENTING COLLARS**  
 (Product No.: BI 200-03 & BI 200-04)

Casing OD	Weight (lbs.) Threaded & Coupled	Size Stage Collar	Tensile Strength (lbs.)	Drilled- Out ID (Inch.)	Max. OD Of Tool (Inch.)	Model "J" Only				Model D Indicating Plug Nose OD (Inch.)
						Min ID Lower Inner Sleeve (Inch.)	Max OD of Trip Plug (Inch.)	Min ID Upper Inner Sleeve (Inch.)	Max OD Shut-Off Plug Nose (Inch.)	
5-1/2	13.0 14.0 15.5	5-1/2" 13-15.5 J-55	164,000	4.919	6.625	3.620	3.781	3.870	4.281	2.906
	17.0 20.0	5-1/2" 17-20# N-80 & 17 P-110	277,000	4.812						
	20.0 23.0	5-1/2" 20-23# P-110	462,000	4.710						
7	17.0 20.0 23.0	7" 17-23# N-80	264,000	6.415	8.281	4.495	4.687	4.935	5.656	
	26.0 29.0	7" 2 6-29# N-80	457,000	6.200						
	26.0 29.0 32.0 35.0 38.0	7" 32-38# N-80 & 26-29# P-110	622,000	6.200						
	32.0 35.0 38.0	7" 32-38# P-110	918,000	6.020						
9-5/8	29.3 32.3 36.0 40.0	9-5/8" 29.3-40# J-55	422,000	8.906	11.141	6.495	6.687	6.870	7.656	
	40.0 43.5 47.0	9-5/8" 40-47# N-80 & 43.5# P-110	701,000	8.730						
	47.0 53.5	9-5/8" 47-53.5# P-110	1,170,000	8.580						

Other Sizes on Request

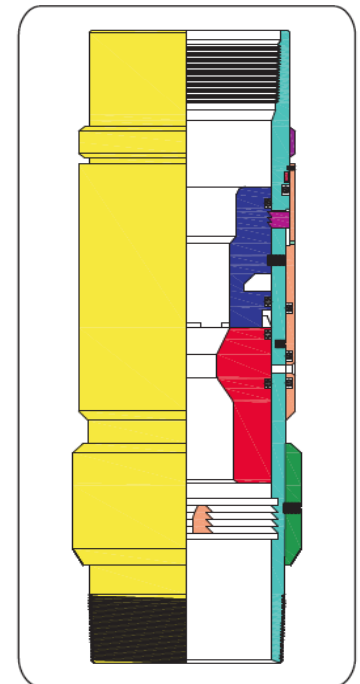
Specification Guide PLUGS FOR MODEL "J" & "JB" STAGE CEMENTING COLLARS				
Part name		Sizes and Commodity		
		5-1/2	7	9-5/8
Rubber Seal-off plate		BI 01-36715-00	BI 01-36718-00	BI 07-06222-00
Model D flexible cementing plug, indicating type		BI 01-41894-02	BI 01-41694-02	BI 01-50037-02
Model J trip plug - J2, J3		BI 01-52765-02	BI 02-19259-02	BI 02-19257-02
Model J shut-off plug - J2, J4		BI 01-59329-01	BI 01-82817-02	BI 01-46628-02
Model JB shut-off plug	Plug OD	3-1/2	4-1/4	6-1/4
Model JB-2	Comm. No.			BI 01-46648-01
Model JB-3	Comm. No.			
Model JB-4	Comm. No.	BI 01-58972-01	BI 01-58973-01	
Model JB continuous cementing trip plug	Plug OD	3-3/16	3-3/4	5-7/8
Model JB-2	Comm. No.		BI 01-46656-00	BI 01-46657-00
Model JB-3	Comm. No.	BI 01-52771-01		
Model JB gravity-type trip plug	Plug OD	3-3/4	5-5/8	
Model JB-2	Comm. No.		BI 02-19262-01	
Model JB-3	Comm. No.	BI 01-47281-01		
Model JB flexible cementing plug, bypassing type		BI 01-42723-01	BI 01-42725-18	BI 01-48240-82
Model JB flexible cementing plug, indicating type		BI 01-42842-50	BI 01-42844-38	BI 01-42847-03

## MODEL "G" STAGE CEMENTING COLLAR

Product No.: BI 200-02

The Model "G" Stage Cementing Collar covers sizes larger than 9-5/8 inch.

It offers operators all of the benefits of the Model "J" Stage Collar (sizes 9-5/8 in. and smaller), and also features an outer closing sleeve which cannot be accidentally reopened. Non-API threads require the use of special casing sub.



Model "G" Stage  
Cementing Collar  
Product No.: BI 200-02

Specification Guide PLUGS FOR MODEL "G" & GB STAGE CEMENTING COLLARS				
Type of Plug	Collar Model	Plugs used with Model "G" Stage Collar for regular two-stage cementing	Plugs used with Model "G" & "GB" Stage Collar for regular three-stage cementing	Size & Commodity Number
				13-3/8
Model "D" Flexible Cementing Plug Indicating Type	G	1		BI 100253-00
	GB		1	BI 01-67932-02
Model "D" Flexible Cementing Plug Bypassing Type	G			BI 02-00096-02
	GB		1	BI 01-67935-02
Trip Plug	G	1	1	BI 100260-00
	GB		1	BI 01-67930-01
Shut-off Plug	G	1	1	BI 100252-00
	GB		1	BI 01-67933-02
Continuous Cementing Trip Plug	G			BI 02-00094-02
	GB			BI 01-67937-01

Specification Guide MODELS "G" & "GB" STAGE CEMENTING COLLARS SPECIFICATION GUIDE											
Casing to be Run				Stage Collar Specifications							
OD	Weight range	Grade	Thread	Tensile Strength (lbs.)	Drilled Out ID	Max Collar OD	Model "G"				
							Min ID Lower Inner Sleeve	Max OD Trip Plug	Min ID Upper Inner Sleeve	Max OD Shut-Off Plug Nose	Model D Indicating Plug Nose OD
13-3/8	48-61	H-40, J-55	8 RD Short	491000	12.687	15.06	8.00	8.625	9.234	11.375	7.00
			Buttress	661,000							
	48-61	N-80	8 RD Short	659,000							
			Buttress	961,000							
	48-61	S-95, P-110	8 RD Short	887,000	12.343	15.094	8.00	8.625	9.234	11.375	7.00
			Buttress	1,332,000							
	68-77	H-40, J-55	8 RD Short	786,000	12.090	15.094	8.00	8.625	9.234	11.375	7.00
			Buttress	928,000							
	68-77	N-80	8 RD Short	1,054,000	12.090	15.094	8.00	8.625	9.234	11.375	7.00
			Buttress	1,350,000							
68-77	S-95, P-110	8 RD Short	1,420,000	12.090	15.094	8.00	8.625	9.234	11.375	7.00	
		Buttress	1,856,000								
80.7-86	C-95, S-95	8 RD Short	1,548,000	12.090	15.094	8.00	8.625	9.234	11.375	7.00	
		Buttress	1,938,000								

Other sizes on request

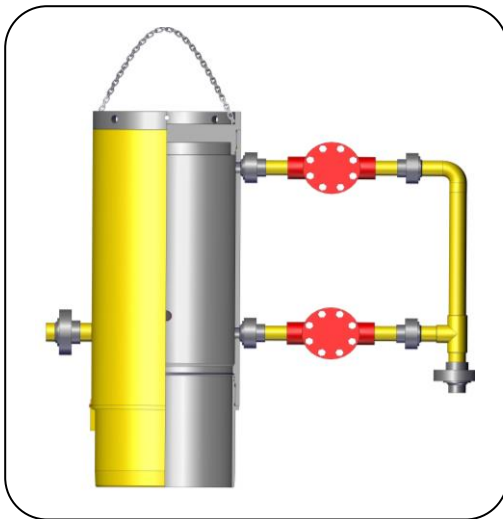
## MODEL "BD" SINGLE AND DOUBLE PLUG TYPE CONVENTIONAL CEMENTING HEAD

Product No.: BI 200-91 & BI 200-92

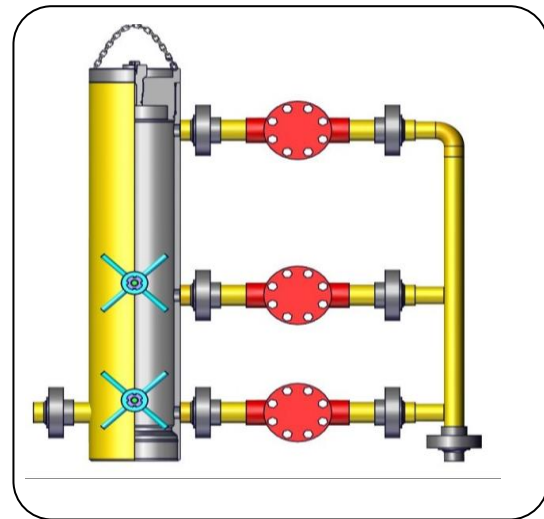
The Model "BD" Conventional Cementing Head is used with Stage Collars to drop flexible Cementing Plugs and Shut off Plugs and with Cement Float Collar, to drop Conventional Top & Bottom Cementing Plug. The Cement Heads are available in either single or double plug configurations.

### Features:

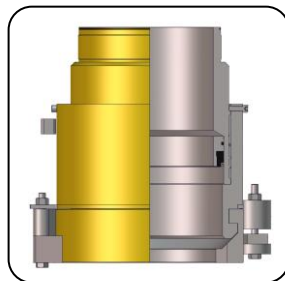
- The Cementing Head is manufactured utilizing API grade steels with connections for API 8 Rd. BTC and premium threads. Cementing Heads are available for working pressure from 3,000 psi to 10,000 psi. The Cementing Heads are hydraulically tested prior to shipment.
- The design of Cementing Head incorporates such features as quick release retainer bar, gland seals for positive sealing of indicating wires, and fully detachable cementing manifold.
- The Cementing Head Manifold is supplied with Plug Valves and other fittings rated to same or higher working pressure than the Cementing Heads.
- These can be provided with two alternate versions of Quick Change Couplings for ease of attachment to or release from, the uppermost coupling on the casing.



Model "BD" Single Plug  
Cementing Head  
BI-200-91



Model "BD" Double Plug  
Cementing Head  
BI 200-92



Quick Latch  
Coupling



Quick Change  
Coupling



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**LINER HANGER  
SYSTEMS**

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### MODEL "BPDR" POCKET SLIP HYDRAULIC ROTATING & "BPDN" NON- ROTATING LINER HANGER

Product No.: BI 261-2U & BI 261-5U

#### Description & Application:

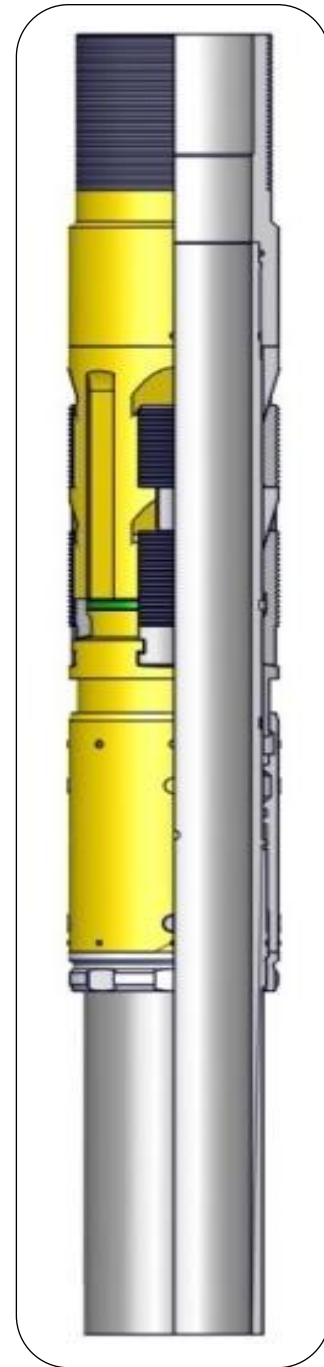
The BOTIL Model "BPDR" Pocket Slip Hydraulic set Rotating Liner Hangers can be used to rotate the liner string while running in and during cementing operations insuring a more complete cement bond. Specially designed Recessed type/ Protected type slip deliver excellent hanging capacity and protected Slip design eliminates the risk of premature setting. The design is primarily based on the hydraulic setting of slip segments which distribute the liner weight evenly on the entire length of the slips, which is guided in the pocket of the cone. The Hanger provides large by-pass area in the set position.

The "BPDN" Pocket Slip is a Non-Rotating version of Model "BPDR" Liner Hanger, with same features and advantages.

The Hydraulic liner hanger may be set before or after cementing by applying pressure to running-in string.

#### Features:

- Mandrel is manufactured from mechanical casing grade equivalent to that of liner.
- Provided with heavy duty thrust tapered roller bearing for rotation with higher hanging capacity.
- Recessed type / protected slip design protects the slips from any damage during running-in.
- Slips are manufactured to Rockwell "C" scale hardness of 57-64 for use in the highest grade casing strings.



Model "BPDR"  
Hydraulic Liner  
Hanger  
Product No.: 261-2U

Specification Guide						
Sizes	7" x 4-1/2"	7" x 5"	7-5/8" x 5"	7-5/8" x 5-1/2"	9-5/8" x 7"	13-3/8" x 9-5/8"
Cone O.D (Inch.)	6.093 (20- 23#)	6.093 (20- 23#)	6.500 (26.4- 33.7#)	6.500 (26.4- 33.7#)	8.250 (36- 53.5#)	12.068 (68#)
	6.000 (23- 26#)	6.000 (23- 26#)				
	5.906 (26- 29#)	5.906 (26- 29#)	6.406 (33.7- 39#)	6.375 (33.7- 39#)	8.150 (53.5- 58.5#)	
Body Collapse (psi)	14400	9950	14985	6980	7030	3500
Body Burst (psi)	12800	8975	13300	7500	7500	5600
Cylinder Collapse (psi)	3550	3550	5110	5110	4100	7500
Cylinder Burst (psi)	5300	5300	6200	6200	4800	9700
Flow Area Unset (in <sup>2</sup> )	3.615	3.615	2.260	2.260	6.715	12.669
Flow Area set (in <sup>2</sup> )	3.182	3.182	1.260	1.260	7.250	7.280
Piston Area (in <sup>2</sup> )	3.182	3.182	4.510	4.510	7.250	14.153
Hanging Capacity (Lbs.)	183,000	183,000	280,000	280,000	300,400	420,000
Bearing capacity ( Static) (Lbs.)	203,900	203,900	270,000	270,000	450,000	885,872
Bearing capacity ( dynamic) (Lbs.)	101,950	101,950	135,000	135,000	225,000	187,844
Setting Pressure (psi)	1840	1840	2250	2250	1940	1870
Differential Pressure rating (psi)	7500-10000	5000-7500	7500-10000	5000	5000	5000
Differential pressure across Pack-off bushing (psi)	5000					

## MODEL "BT" & "BS" HYDRAULIC LINER HANGER WITH DOUBLE SLIPS

Product No.: BI 261-1U & BI-261-0U

### Description & Application:

Model "BT" & "BS" Hangers are used to hang a Liner in the well without rotating the work string to set the Hanger. The Hydraulic Liner Hanger is recommended for applications such as setting new Liner through existing liners or on floating rigs. Hydraulic Liner Hangers may be set prior to or after cementing. The Hanger provides large by-pass area in the set position during cementing operations.

All BOTIL Hangers are solid body construction and have rugged slips, individually tested and certified to assure their biting and hanging capacity even in the highest strength casing.

The Model "BS" Liner Hanger is used where Liner is run without the Compression Set Packer. The "BS" Liner Hanger has Stub Acme Thread on Top to connect the TBR.

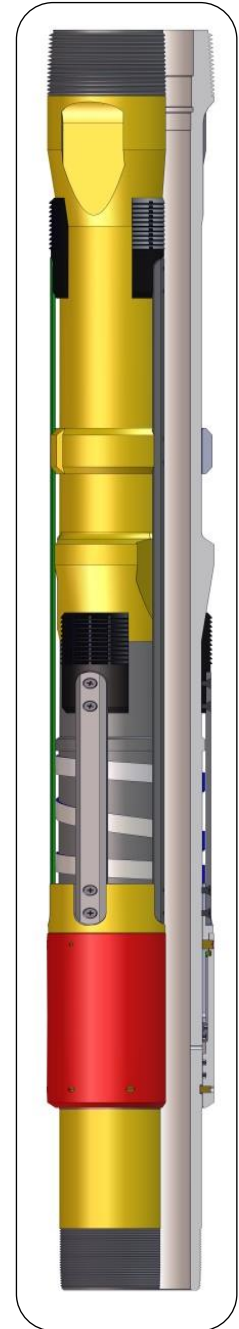
The Model "BT" Hanger, meant for use with Model "BHFWS" and "BDLP" Compression Packer is provided with internal casing threads for Top Packer.

### Features:

- Mandrel is manufactured from mechanical casing grade equivalent to that of liner.
- Single piece body construction with equivalent mechanical strength to liner.
- Return spring allows easy release after set.
- Slips are manufactured to Rockwell "C" scale hardness of 57-64 for use in the highest grade casing strings.



Model "BT"  
Hydraulic Liner Hanger  
With Double Slips  
Product No.: BI 261-1U



Model "BS"  
Hydraulic Liner Hanger  
With Double Slips  
Product No.: BI 261-0U

### Specification Guide

Sizes	7" x 4-1/2"	7" x 5"	7-5/8" x 5"	7-5/8" x 5-1/2"	9-5/8" x 7"
Cone O.D (Inch.)	6.093 (20- 23#)	6.093 (20- 23#)	6.500 (26.4- 33.7#)	6.500 (26.4- 33.7#)	8.400 (36- 43.5#)
	6.000 (23- 26#)	6.000 (23- 26#)			8.250 (43.5- 53.5#)
	5.875 (26- 29#)	5.875 (26- 29#)	6.375 (33.7- 39#)	6.375 (33.7- 39#)	8.187 (53.5- 58.5#)
Body Collapse (psi)	14400	9950	14985	6980	7030
Body Burst (psi)	12800	8975	13300	7500	7500
Cylinder Collapse (psi)	3550	3550	5110	5110	2690
Cylinder Burst (psi)	5300	5300	6200	6200	4800
Flow Area Unset (in <sup>2</sup> )	6.090	6.090	5.072	5.072	12.644
Flow Area set (in <sup>2</sup> )	4.320	4.320	3.130	3.130	9.356
Piston Area (in <sup>2</sup> )	3.182	3.182	4.51sq.in	4.51	7.25
Hanging Capacity (Lbs.)	1,83,000	1,83,000	2,80,000	2,80,000	3,00,400
Setting Pressure (psi)	1840	1840	2250	2250	1875
Differential Pressure rating (psi)	7500-10000	5000-7500	7500-10000	5000	5000
Differential pressure across Pack-off bushing (psi)	5000				

Sizes	9-5/8" x 7-5/8"	13-3/8" x 9-5/8"	13-3/8" x 11-3/4"	20" x 16"
Cone O.D (Inch.)	8.400 (36- 43.5#)	11.890 (68- 72#)	12.068 (68- 72#)	18.00 (106- 133#)
	8.250 (43.5- 53.5#)			
	8.250 (53.5- 58.5#)			
Body Collapse (psi)	8810	3810	1590	3080
Body Burst (psi)	9180	6330	4050	5720
Cylinder Collapse (psi)	435	6167	194	2510
Cylinder Burst (psi)	3580	9070	2790	6467
Flow Area Unset (in <sup>2</sup> )	11.543	8.125	8.125	43.20
Flow Area set (in <sup>2</sup> )	8.456	2.872	2.827	32.45
Piston Area (in <sup>2</sup> )	5.960	6.756	6.915	20.11
Hanging Capacity (Lbs.)	300,400	420,000	210,000	287,000
Setting Pressure (psi)	1200	1870	1400	1000
Differential Pressure rating (psi)	5000-7500	5000	3000	3000
Differential pressure across Pack-off bushing (psi)	5000		3000	

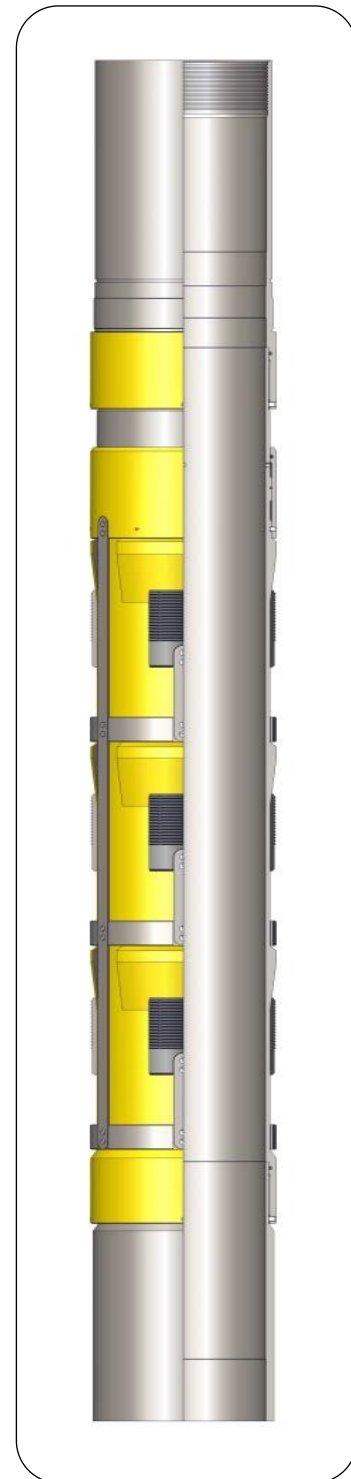
**MODEL "BHP" HYDRAULIC NON-ROTATING LINER HANGER WITH TRIPLE CONE**  
**Product No.: BI 292-03**

**Description:**

"BHP" Hydraulic Liner Hanger is used to hang a liner in well without rotating the work string to set the hanger. The Hanger provides full bypass in the set position during cementing operations.

**Features:**

- Single piece design allows higher hanging capacity.
- Triple cone design allows high hanging capacity.
- Body has equivalent mechanical properties to the liner to be hung.
- Hardened slips of 57-64 Rc make it suitable to use in any grade of casing.
- Slips are sufficiently protected to make it suitable for narrow annular clearance.
- Available with API and premium connections.
- Large bypass flow area
- Provided with integral setting collar to connect the Running Tool.
- Available with optional Drillable or Retrievable Pack-Off Bushing.



Model "BHP"  
 Hydraulic Non-Rotating  
 Liner Hanger  
 With Triple Cone  
 Product No.: BI 292-03

Specification Guide for 13-3/8" (68- 72#) x 11-3/4" (60#) MODEL "BHP" LINER HANGER WITH TRIPLE CONE	
<b>Cone O.D (Inch.)</b>	12.130
<b>Body Tensile (Lbs.)</b>	638000
<b>Cylinder Collapse (psi)</b>	3000
<b>Cylinder Burst (psi)</b>	3000
<b>Flow Area Unset (in<sup>2</sup>)</b>	8.13 (72#) 9.63 (68#)
<b>Flow Area Set (in<sup>2</sup>)</b>	4.98 (72#) 5.27 (68#)
<b>Piston Area (in<sup>2</sup>)</b>	4.374
<b>Hanging Capacity (Lbs.)</b>	450,000
<b>Setting Pressure (Lbs.)</b>	1650
<b>Differential Pressure Rating (psi)</b>	5000
<b>Differential Pressure across Pack-off Bushing (psi)</b>	5000

### MODEL "BMDC" MECHANICAL LINER HANGER WITH DOUBLE CONE & DOUBLE SLIPS

Product No.: BI 292-08

#### Description & Application:

Model "BMDC" Mechanical Set Liner Hanger is a versatile and economical Tool. The design is based on an enclosed jay within a one piece sleeve with friction springs. The Hanger is mechanically set by manipulating the running-in string.

The jay slot holds the slips in place below the taper cone while running in the well. When setting depth is reached the Hanger is picked up couple feet and rotated (either right hand or left hand depending upon application).

As the Hanger is lowered, the slips will be held stationary by the friction springs and the taper cone contacts the slips and forces them outward into the casing. The simple jay mechanism allows the operator to set and release the Hanger multiple times if necessary.

#### Features:

- Mandrel is manufactured from mechanical casing grade equivalent to that of liner.
- High strength Friction Springs manufactured from spring steel material
- Slips are manufactured to Rockwell "C" scale hardness of 57-64 for use in the highest grade casing strings.



Model "BMDC"  
Mechanical Liner Hanger  
With Double Cone  
& Double Slips  
Product No.: BI 292-08

Specification Guide					
Sizes	7" x 4-1/2"	7" x 5"	7" x 5-1/2"	7-5/8" x 5"	7-5/8" x 5-1/2"
<b>Cone O.D (Inch.)</b>	6.093 (20- 23#)	6.093 (20- 23#)	6.000 (23- 29#)	6.500 (26.4- 33.7#)	6.500 (26.4- 33.7#)
	6.000 (23- 26#)	6.000 (23- 26#)		6.406 (33.7- 39#)	6.375 (33.7- 39#)
	5.906 (26- 29#)	5.906 (26- 29#)			
<b>Body Collapse (psi)</b>	14400	9950	8830	14985	6980
<b>Body Burst (psi)</b>	12800	8975	8990	13300	7500
<b>Flow Area Unset (in<sup>2</sup>)</b>	6.090	6.090	6.090	5.072	5.072
<b>Flow Area set (in<sup>2</sup>)</b>	4.320	4.320	4.320	3.130	3.130
<b>Hanging Capacity (Lbs.)</b>	183,000	183,000	183,000	280,000	280,000
<b>Slack-off weight for hanger setting (Lbs.)</b>	10000				
<b>Differential pressure across Pack-off bushing (psi)</b>	5000				

Sizes	8-5/8" x 5-1/2"	9-5/8" x 7"	9-5/8" x 7-5/8"	13-3/8" x 9-5/8"
<b>Cone O.D (Inch.)</b>	7.500 (32- 40#)	8.400 (36- 43.5#)	8.400 (36- 43.5#)	12.068 (68- 72#)
		8.250 (43.5- 53.5#)	8.250 (43.5- 53.5#)	
		8.150 (53.5- 58.5#)	8.150 (53.5- 58.5#)	
<b>Body Collapse (psi)</b>	7600	7030	8810	3810
<b>Body Burst (psi)</b>	10640	7500	9180	6330
<b>Flow Area Unset (in<sup>2</sup>)</b>	7.057	12.644	11.543	8.125
<b>Flow Area set (in<sup>2</sup>)</b>	5.095	9.356	8.456	2.872
<b>Hanging Capacity (Lbs.)</b>	300,000	3,00,400	300,400	420,000
<b>Slack-off weight for hanger setting (Lbs.)</b>	15000			
<b>Differential pressure across Pack-off bushing (psi)</b>	5000			



### MODEL "BMDN" MECHANICAL SET NON-ROTATING LINER HANGER

Product No.: BI 292-12

#### Description & Application:

Model "BMDN" Mechanical Non Rotating (Recessed Slips design) Liner Hanger is a very efficient and economical Tool. The hanger features recessed/protected hardness controlled slips to avoid the risk of premature setting.

The hanger is set mechanically by un-jaying of Double Jay from each other. The bow friction springs hold the J-cage stationary during setting of the hanger. After setting depth is reached the work string is picked up one foot and rotated right or left hand by 1/4 turn to Un-Jay and applying slack-off weight sets the hanger by forcing the cone under the slips. The simple double jay mechanism allows the operator to set and release the Hanger multiple times if necessary.

#### Features:

- Mandrel is manufactured from mechanical casing grade equivalent to that of liner.
- High strength Friction Springs manufactured from spring steel material.
- Recessed type / protected slip design protects the slips from any damage during running in Slips are manufactured to Rockwell "C" scale hardness of 57-64 for use in the highest grade casing strings.



Model "BMDN"  
Mechanical  
Liner Hanger  
Product No.: BI 292-12

Specification Guide					
Sizes	7" x 4-1/2"	7" x 5"	7" x 5-1/2"	7-5/8" x 5"	7-5/8" x 5-1/2"
<b>Cone O.D (Inch.)</b>	6.093 (20- 23#)	6.093 (20- 23#)	6.000 (23- 29#)	6.500 (26.4- 33.7#)	6.500 (26.4- 33.7#)
	6.000 (23- 26#)	6.000 (23- 26#)		6.406 (33.7- 39#)	6.375 (33.7- 39#)
	5.906 (26- 29#)	5.906 (26- 29#)			
<b>Body Collapse (psi)</b>	14400	9950	8830	14985	6980
<b>Body Burst (psi)</b>	12800	8975	8990	13300	7500
<b>Flow Area Unset (in<sup>2</sup>)</b>	6.090	6.090	6.090	5.072	5.072
<b>Flow Area set (in<sup>2</sup>)</b>	4.320	4.320	4.320	3.130	3.130
<b>Hanging Capacity (Lbs.)</b>	183,000	183,000	183,000	280,000	280,000
<b>Slack-off weight for hanger setting (Lbs.)</b>	10000				
<b>Differential pressure across Pack-off bushing (psi)</b>	5000				

Sizes	8-5/8" x 5-1/2"	9 5/8 x 7	9 5/8 x 7 5/8	13 3/8 x 9 5/8
<b>Cone O.D (Inch.)</b>	7.500 (32- 40#)	8.400 (36- 43.5#)	8.400 (36- 43.5#)	12.068 (68- 72#)
		8.250 (43.5- 53.5#)	8.250 (43.5- 53.5#)	
		8.150 (53.5- 58.5#)	8.150 (53.5- 58.5#)	
<b>Body Collapse (psi)</b>	7600	7030	8810	3810
<b>Body Burst (psi)</b>	10640	7500	9180	6330
<b>Flow Area Unset (in<sup>2</sup>)</b>	7.057	12.644	11.543	8.125
<b>Flow Area set (in<sup>2</sup>)</b>	5.095	9.356	8.456	2.872
<b>Hanging Capacity (Lbs.)</b>	300,000	3,00,400	300,400	420,000
<b>Slack-off weight for hanger setting (Lbs.)</b>	15000			
<b>Differential pressure across Pack-off bushing (psi)</b>	5000			

**MODEL "BMDR" MECHANICAL ROTATING LINER HANGER****Product No.: BI 281-41****Description & Application:**

Model "BMDR" Mechanical Set Rotating Liner Hanger is a very efficient and economical Tool. Liner Hanger initially hangs the liner in tension and then provides a means to rotate the liner during cementing operations ensuring a more complete cement bond.

The hanger features recessed / protected hardness controlled slips to avoid the risk of premature setting.

The hanger is set mechanically by un-jaying of Double Jay from each other. The bow friction springs hold the J-cage stationary during setting of the hanger. After setting depth is reached the work string is picked up one foot and rotated right or left hand by 1/4 turn to Un-Jay and applying slack-off weight sets the hanger by forcing the cone under the slips. The simple double jay mechanism allows the operator to set and release the Hanger multiple times if necessary.

The simple jay mechanism allows the operator to set and release the hanger multiple times if necessary. It provides full bypass in the set position during cementing operations.

**Features:**

- Mandrel is manufactured from mechanical casing grade equivalent to that of the Liner.
- High strength Friction Springs manufactured from spring steel material
- Recessed type / protected slip design protects the slips from any damage during running in Slips are manufactured to Rockwell "C" scale hardness of 57-64 for use in the highest grade casing strings.
- Incorporated with high compressive strength thermo plastic bearing which is very efficient and economical and well suited for rotating moderate liner loads with normal torque during cementing operation.



Model "BMDR"  
Mechanical Rotating  
Liner Hanger  
Product No.: BI 281-41

Specification Guide						
Sizes	7" x 4-1/2"	7" x 5"	7-5/8" x 5"	7-5/8" x 5-1/2"	9-5/8" x 7"	13-3/8" x 9 5/8"
Cone O.D (Inch.)	6.093 (20- 23#)	6.093 (20- 23#)	6.500 (26.4- 33.7#)	6.500 (26.4- 33.7#)	8.250 (36- 53.5#)	12.068 (68#)
	6.000 (23- 26#)	6.000 (23- 26#)				
	5.906 (26- 29#)	5.906 (26- 29#)	6.406 (33.7- 39#)	6.375 (33.7- 39#)	8.150 (53.5- 58.5#)	
Body Collapse (psi)	14400	9950	14985	6980	7030	3500
Body Burst (psi)	12800	8975	13300	7500	7500	5600
Cylinder Collapse (psi)	3550	3550	5110	5110	4100	7500
Cylinder Burst (psi)	5300	5300	6200	6200	4800	9700
Flow Area Unset (in <sup>2</sup> )	3.615	3.615	2.260	2.260	6.715	12.669
Flow Area set (in <sup>2</sup> )	3.182	3.182	1.260	1.260	7.250	7.280
Piston Area (in <sup>2</sup> )	3.182	3.182	4.510	4.510	7.250	14.153
Hanging Capacity (Lbs.)	183,000	183,000	280,000	280,000	300,400	420,000
Bearing capacity ( Static) (Lbs.)	203,900	203,900	270,000	270,000	450,000	885,872
Bearing capacity ( dynamic) (Lbs.)	101,950	101,950	135,000	135,000	225,000	187,844
Setting Pressure (psi)	1840	1840	2250	2250	1940	1870
Differential Pressure rating (psi)	7500-10000	5000-7500	7500-10000	5000	5000	5000
Differential pressure across Pack-off bushing (psi)	5000					

## SIMPLEX LINER HANGER

### MODEL "A" SINGLE SLIP

Product No.: BI 261-01

### MODEL "A" DOUBLE SLIP

Product No.: BI 261-02

#### Description & Application:

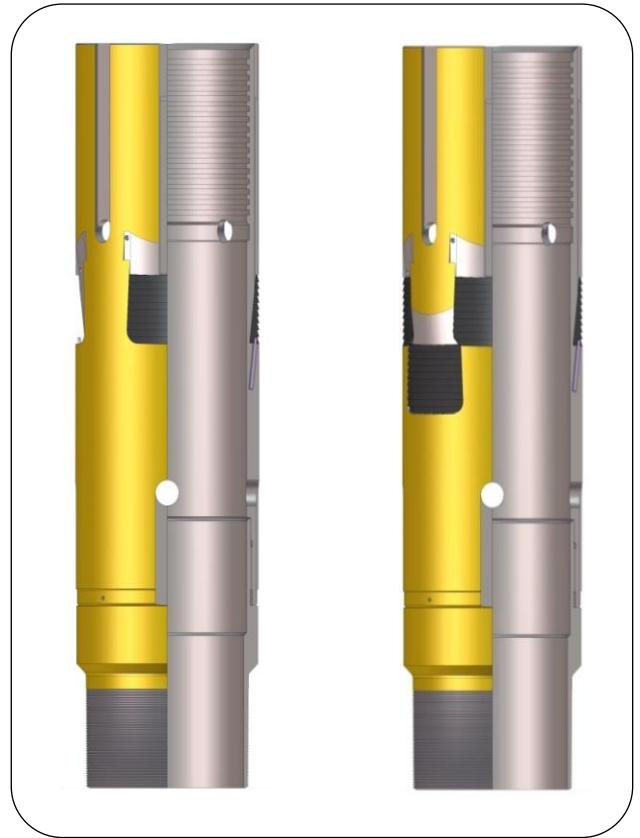
Simplex Liner Hanger is a simple, rugged tool that has proven its dependability in the field. This is the forerunner of present hydraulic liner hanger designs and still widely used, including for applications where it is desired only to hang a liner with bottom without cementing.

#### Features:

**Compact Size:** The Simplex Liner Hanger is less than three feet long. The short length reduces the risk of sticking the Hanger in directionally drilled high angle holes.

**One Piece Body:** Simplex Liner Hangers have a unitary, one piece body with few parts. All parts are fully contained. There are no drag units or exposed parts to hang up even in high angle holes. The Simplex Liner Hanger runs in fast without dragging and sets easily and securely.

**Slip Hanging Capacity:** All slip teeth maintain 100% contact with the casing and carry their share of the load. The full contact slips are fitted to obtain total surface contact with the casing, and full contact and support from the Hanger body. For a better bite in the hardest casing, the slips are case carburized and serrated to prevent accumulation of scale, rust, or other debris between the rows of teeth.



Model "A"  
Single Slip  
Product No.: BI 261-01

Model "A"  
Double Slip  
Product No.: BI 261-02

CASING				LINER HANGER						
O.D. (Inch.)	WEIGHT (ppf) T & C	I.D. RANGE IN WHICH LINER HANGER CAN BE RUN		MODEL	COMM. NO.	MAX. O.D. (Inch.)	MIN. I.D. (Inch.)	O.D. BOX THREAD DOWN (Inch.)	MAX. SIZE T.B.R. WHICH CAN BE RUN	
		MIN. (Inch.)	MAX. (Inch.)						LINER SIZE (Inch.)	SEAL BORE (Inch.)
5-1/8	20- 23	4.545	4.852	A	BI 261-01-3300	4.479	3.438	4	3-1/2	3.375
	14- 17	4.767	5.074	A	BI 261-01-3200	4.704			3-1/2	3.375
7	38	5.795	6.022	A	BI 261-01-4706	5.754	4.969	5-1/2	5	4.896
				AW/D.S.	BI 261-02-4706					
	35- 38	5.795	6.102	A	BI 261-01-4900	5.747	4.406	5	4-1/2	4.315
	35	5.879	6.102	A	BI 261-01-4705	5.811	4.969	5-1/2	5	4.896
				AW/D.S.	BI 261-02-4705					
	32	5.969	6.187	A	BI 261-01-4704	5.906	4.969	5-1/2	5	4.896
				AW/D.S.	BI 261-02-4704					
	29- 32	5.969	6.273	A	BI 261-01-4800	5.906	4.406	5	4-1/2	4.315
				AW/D.S.	BI 261-02-4800					
	26- 29	6.059	6.361	A	BI 261-01-4703	5.996	4.969	5-1/2	5	4.896
				AW/D.S.	BI 261-02-4703					
	20- 26	6.151	6.532	A	BI 261-01-4700	6.088	4.406	5	4-1/2	4.315
				AW/D.S.	BI 261-02-4700					
	17- 23	6.241	6.610	A	BI 261-01-4702	6.178	4.969	5-1/2	5	4.896
				AW/D.S.	BI 261-02-4702					
	9-5/8	53.5	8.379	8.656	A	BI 261-01-630E	8.316	7.531	8 S.A	7-5/8
AW/D.S.					BI 261-02-630E					
47- 53.5		8.379	8.795	A	BI 261-01-6400	8.300	6.937	7-5/8	7	6.844
				AW/D.S.	BI 261-02-6400					
47		8.525	8.795	A	BI 261-01-630D	8.462	7.531	8 S.A	7-5/8	7.500
				AW/D.S.	BI 261-02-630D					
40- 47		8.525	8.942	A	BI 261-01-6300	8.446	6.937	7-5/8	7	6.844
				AW/D.S.	BI 261-02-6300					
43.5		8.599	8.865	A	BI 261-01-630C	8.536	7.531	8 S.A	7-5/8	7.500
				AW/D.S.	BI 261-02-630C					
36- 40		8.679	9.024	A	BI 261-01-630B	8.615	7.531	8 S.A	7-5/8	7.500
				AW/D.S.	BI 261-02-630B					
29.3- 40		8.679	9.159	A	BI 261-01-6200	8.600	6.937	7-5/8	7	6.844
				AW/D.S.	BI 261-02-6200					
29.3- 36		8.765	9.159	A	BI 261-01-630A	8.702	7.531	8 S.A	7-5/8	7.500
				AW/D.S.	BI 261-02-630A					
13-3/8	48-72	12.191	12.843	A	BI 261-01-7600	12.098	9.953	10-3/4	9-5/8	9.562
				A	BI 261-02-7600					

### MODEL "OFF-BOTTOM" SETTING TOOL

Product No.: BI 484-71

Model "OFF-BOTTOM" Setting Tool Assembly is designed to be used as Mechanical Running Tool when it is desired to set the Simplex Liner Hanger mechanically without the liner weight resting on bottom.



Model "OFF-BOTTOM"  
Setting Tool  
Product No.: BI 484-  
71

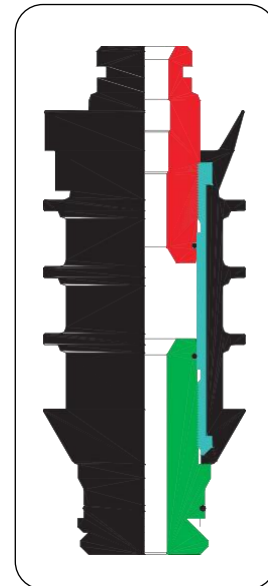
### LATCH-DOWN LINER WIPER PLUG

Product No.: BI 269-02

The use of a Latch-Down Liner Wiper Plug provides four principal benefits:

1. It prevents cement contamination by separating displacement fluids from cement.
2. It wipes the liner ID clean.
3. The Latch-Down Liner Wiper Plug prevents cement reentry into the Liner by latching and sealing into the Landing Collar and thus provides a backup seal for the Floating Equipment.
4. After latching into the Landing Collar, the Latch-Down Liner Wiper Plug cannot move up the hole later when the well is producing.

The Latch-Down Liner Wiper Plug is attached to the Shear Pin Adapter (or Shear Screw Adapter) as the last item in the Mechanical or Hydraulic Setting String. The Latch-Down Liner Wiper Plug follows the cement down the liner effectively cleaning cement from the liner ID. The Latch-Down feature enables the tool to land and positively lock into the Landing Collar.



Latch Down  
Liner Wiper Plug  
Product No.: BI 269-02



### MODEL "BHFWS" LINER TOP PACKER

Product No.: BI 281-41

Model "BHFWS" Compression Set Liner Top Packers isolate annulus from the top of cement and prevent gas migration and protect sensitive zones from well hydrostatics after cementing. The Single Packing Element with Metal Back-up design prevents swabbing of Packing Element which allows high circulation rates and higher pressure ratings. This packer is equipped with hold down slips, which makes it suitable for use in horizontal wells also.

#### Features:

- Hold down slips prevents upward movement after setting.
- One piece packing element with extrusion back up ring allows high circulation rate design provides high tensile strength.
- Can be provided with anti-premature
- Setting mechanism.

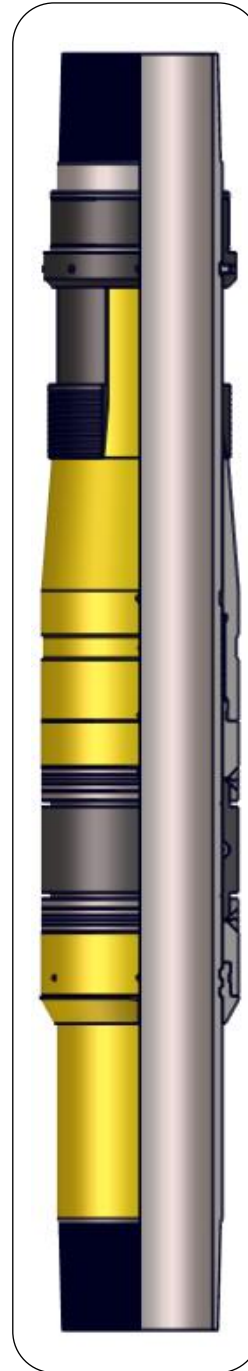
### MODEL "BDLP" LINER TOP PACKER

Product No.: BI 281-43

Model "BDLP" Compression Set Liner Top Packer has double body lock ring arrangement for locking slips and packing element, individually after setting.

This Packer top has a clutch profile to engage running torque fingers and locking groove for collet of the Hydraulic Release Running Tool. It also has a profile for Retrievable Pack off Bushing.

The Packer features a Mechanical Locking Key that prevents premature setting of the packer during running.



Model "BHFWS"  
Liner Top Packer  
Product No.: BI 281-41



Model "BDLP"  
Liner Top Packer  
Product No.: 281-43

<b>Specification Guide "BHFWS" LINER TOP PACKER</b>				
<b>Sizes</b>	7" x 4-1/2"	7" x 5"	7-5/8" x 5-1/2"	9-5/8" x 7"
<b>O.D (Inch.)</b>	6.093 (20- 23#)	6.093 (20- 23#)	6.500 (26.4- 33.7#)	8.400 (36- 43.5#)
	6.000 (23- 26#)	6.000 (23- 26#)		8.250 (43.5- 53.5#)
	5.906 (26- 29#)	5.906 (26- 29#)	6.406 (33.7- 39#)	8.150 (53.5- 58.5#)
<b>Collapse Pressure (psi)</b>	13465	7875	5079	4050
<b>Burst Pressure (psi)</b>	11,860	7900	6450	5900
<b>Working Pressure (psi)</b>	10000	7500-10000	5000-7500	5000-7500
<b>Flow Area across packer (in<sup>2</sup>)</b>	2.926	2.926	2.260	2.260
<b>Set Down Weight (Lbs.)</b>	35000	35000	40000	45000

<b>Sizes</b>	9-5/8" x 7-5/8"	13-3/8" x 9-5/8"	13-3/8" x 11-3/4"	20" x 16"
<b>O.D (Inch.)</b>	8.400 (36- 43.5#)	11.843 (68- 72#)	12.068 (68- 72#)	18.375 (106- 133#)
	8.250 (43.5- 53.5#)			
	8.150 (53.5- 58.5#)			
<b>Collapse Pressure (psi)</b>	6100	3800	2590	3080
<b>Burst Pressure (psi)</b>	7000	5700	5075	5720
<b>Working Pressure (psi)</b>	5000-7500	5000	5000	5000
<b>Flow Area across packer (in<sup>2</sup>)</b>	6.745	9.575	5.350	10.345
<b>Set Down Weight (Lbs.)</b>	45000	45000	45000	45000

Specification Guide "BDLP" LINER TOP PACKER						
Sizes	7" x 4-1/2"	7" x 5"	7 5/8"x 5-1/2"	9 5/8" x 7"	9 5/8" x 7 5/8"	13 3/8" x 9 5/8"
<b>O.D (Inch.)</b>	6.093 (20- 23#)	6.093 (20- 23#)	6.500 (26.4- 33.7#)	8.400 (36- 43.5#)	8.400 (36- 43.5#)	11.843 (68- 72#)
	6.000 (23- 26#)	6.000 (23- 26#)		8.250 (43.5- 53.5#)	8.250 (43.5- 53.5#)	
	5.906 (26- 29#)	5.906 (26- 29#)	6.406 (33.7- 39#)	8.150 (53.5- 58.5#)	8.150 (53.5- 58.5#)	
<b>Collapse Pressure (psi)</b>	14000	10400	11100	11300	12040	6500
<b>Burst Pressure (psi)</b>	14200	10100	10500	10700	11380	7900
<b>Working Pressure (psi)</b>	10000	7500-10000	7500-10000	7500-10000	7500-10000	7500-10000
<b>Flow Area across packer (in<sup>2</sup>)</b>	3.825	3.825	2.260	7.845	6.745	9.575
<b>Set Down Weight (Lbs.)</b>	35000	35000	40000	45000	45000	45000

**MODEL "BMLTP" LINER TOP TIE-BACK PACKER  
FOR LINER HANGER  
Product No.: BI 281-13**

**Description & Application:**

Model "BMLTP" is used as Liner Top isolation Packer in case of annulus leakage. This packer is used to tie back casing to the surface when existing casing leaks or get damaged.

The seals on the mandrel of packer seals inside the Polished Bore Receptacle of an existing liner. The Packing elements of the packer pack-off inside the host casing when set down weight is applied.

They are available with standard or premium seals of various material compositions depending on well conditions.

"BMLTP" Liner Top Packer with Tie Back Seal Mandrel comes with special features such as mule shoe bottom, locator sub and circulation ports.



Model "BMLTP"  
Liner Top  
Tie-Back Packer  
Product No.: BI 281-13

Specification Guide							
"BMLTP" LINER TOP TIE-BACK PACKER FOR LINER HANGER							
Size	7" x 4-1/2"	7" x 5"	7-5/8" x 5-1/2"	9-5/8" x 7"	9-5/8" x 7-5/8"	13-3/8" x 9-5/8"	
<b>Max. O.D (Inch.)</b>	6.093 (20- 23#)	6.093 (20- 23#)	6.500 (26.4- 33.7#)	8.400 (36- 43.5#)	8.400 (36- 43.5#)	11.875 (68- 72#)	
	6.000 (23- 26#)	6.000 (23- 26#)		8.250 (43.5- 53.5#)	8.250 (43.5- 53.5#)		
	5.875 (26- 29#)	5.875 (26- 29#)	6.406 (33.7- 39#)	8.150 (53.5- 58.5#)	8.150 (53.5- 58.5#)		
<b>Seal O.D (Inch.)</b>	5.266		5.766	7.391	7.516	7.766	10.391
<b>Burst Pressure (psi)</b>	12400	7150	8050	6500		6150	3800
<b>Collapse Pressure (psi)</b>	14000	6380	8200	5200	7000	5780	
<b>Differential Pressure (psi)</b>	10000	7500-10000	5000-7500	5000-7500	5000	7500	
<b>Setting Force (Lbs.)</b>	35000	35000	40000	45000	45000	45000	

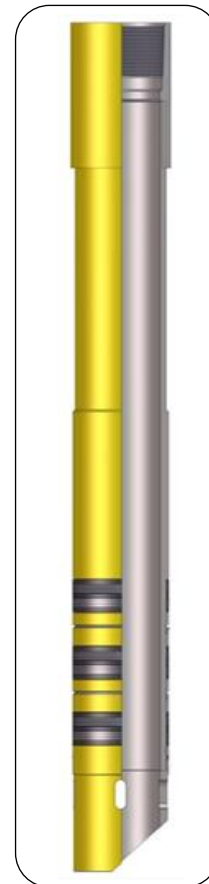
**MODEL "BTSN" TIEBACK SEAL ASSEMBLY**  
**Product No.: BI 272-0U**

**Description & Application:**

Model "BTSN" Tie Back Seal Mandrel is used to tie back to surface or some point above the Liner by sealing into the polished bore receptacle of an existing Liner. The Seal Mandrel seals inside the Tie Back Receptacle and provides a pressure competent connection which can be retrievable or cemented in place.

They are available with standard or premium seals of various material compositions depending on well conditions.

Seal mandrels come with standard features such as mule shoe bottom, locator sub and circulation ports.



Model "BTSN"  
Tie-Back Seal Assembly  
Product No.: BI 272-0U

Specification Guide "BTSN" TIE-BACK SEAL ASSEMBLY							
Sizes	7" x 4-1/2"	7" x 5"	7-5/8" x 5-1/2"	9-5/8" x 7"		9-5/8" x 7-5/8"	13-3/8" x 9-5/8"
Seal O.D (Inch.)	5.266		5.766	7.391	7.516	7.766	10.391
Burst Pressure (psi)	10100	6400	7100	7350		6500	5800
Collapse Pressure (psi)	11650	5000	6300	6780		5200	3800
Differential Pressure (psi)	10000	7500- 10000	5000-7500	5000- 7500		5000	7500

**MODEL "BHDA" HOLD DOWN SUB ASSEMBLY**  
Product No.: - BI 261-7U

**Description & Application:**

Model "BHDA" Hold-Down Sub is used for "light" weight liners and in applications where a positive indication of the setting tool release is required. It is configured to function simultaneously with the Liner Hanger and acts as an anchor against forces that could potentially unset the liner hanger. The BHDA can be easily added to existing liner-hanger systems.

It is designed to be run in situations where any upward force caused by buoyancy and frictional forces can unset the liner hanger.

**Features:**

- Positively locks in setting forces.
- Allows liner rotation once set.
- Rigid design for drill-down applications.
- Makes up directly onto the liner-hanger thread.
- Can be used as an anchor point to give a positive indication that the setting tool has released.
- Can be unset by a predetermined over-pull.
- Counteracts buoyancy forces during cementation and frictional forces when "stroking" the running string.



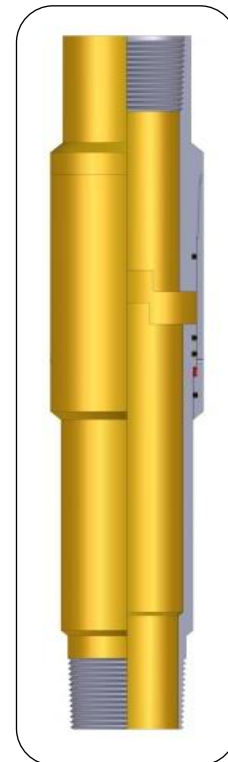
Model "BHDA"  
Hold Down Sub Assembly  
Product No.: BI 261-7U

Specification Guide "BHDA" HOLD DOWN SUB-ASSEMBLY					
Liner Size (Inch.)	Liner Weight (ppf)	Casing Size (Inch.)	Casing Weight (ppf)	Tool O.D. (Inch.)	Tool I.D. (Inch.)
4.500	12.6	7.000	29-32	5.72	3.86
5.000	15	7.000	23-32	6.03	4.31
5.000	18	7.000	23-32	6.03	4.17
5.000	18	7.000	29-32	5.84	4.17
7.000	23-26	9.625	43.5-53.5	8.36	6.25
7.000	26-32	9.625	43.5-53.5	8.36	6.07
7.000	29-32	9.625	40-43.5	8.56	6.07
7.625	29.7	9.625	53.5	8.48	6.80

**LINER SWIVEL SUB**  
Product No.: BI 267-02

**Description & Application:**

Liner Swivel Sub is normally used when running mechanical set liners in highly deviated wells in which rotating to set the liner may be a problem. The swivel allows rotation of the hanger without having to rotate the total Liner. A clutch system in the swivel (feature may be deleted if required) allows easy release of running nut from the Liner, if the Liner has to be set on bottom.



Liner Swivel Sub  
Product No.: BI 267-02

DIMENSION	5" OR 4-1/2"	5-1/2"	7"
<b>O.D</b>	5.875	6.375	8.250
<b>I.D</b>	4.500	5.000	6-1/2

## MODEL "BS" HYDRAULIC LANDING COLLAR

Product No.: BI 274-0U

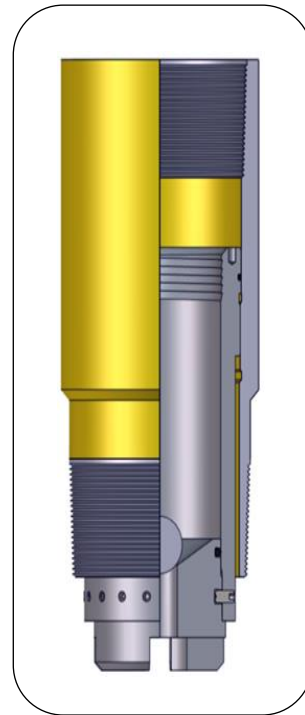
### Description & Application:

Model "BS" Hydraulic Landing Collar is used with hydraulic set Liner Hangers to build pressure in the work string for setting of the Hanger hydraulically. The Liner Landing Collar has a latch profile for locking of the Liner Wiper Plug. The latch profile provides anti-rotational lock to the Liner Wiper Plug which enables fast drill-out.

The ball seat in the Hydraulic Landing Collar is shear pinned to the latch bushing. When a ball lands on the seat, pressure rises to set the hanger hydraulically. Additional pressure is then applied to shear the ball seat to establish circulation through the Landing Collar. The ball seat has a slotted bottom which enables circulation through the shoe without any restriction after landing on the shoe.

### Features:

- Used as a plugging device below the Liner Hanger
- Anti-rotational profile locks the LWP into the HLC providing a positive seal in both directions.
- The anti-rotational profile locks the LWP rotationally to prevent rotation of the plug during drill out.
- Pressure ratings can be adjusted as per the requirement by removing or adding easily accessible shear screws.



Model "BS"  
Hydraulic Liner  
Landing Collar  
Product No.: BI 274-  
0U

Specification Guide "BS" HYDRAULIC LANDING COLLAR									
Sizes	4"	4-1/2"	5"	5-1/2"	7"	7-5/8"	9-5/8"	11-3/4"	16"
Max O.D (Inch.)	5	5	5.562	5.880	7.875	8.500	10.625	12.750	17.00
Ball Seat I.D (Inch.)	3/4	1.093	1.093	1.093	1.375	1.375	1.375	1.375	1.375
Effective Pressure Area (in <sup>2</sup> )	4.677	6.20	7.068	7.068	16.98	16.98	16.98	16.98	16.98
Ball O.D (Inch.)	1.250	1.250	1.250	1.250	1.750	1.750	1.750	1.750	1.750
Burst Pressure (psi)	9170	9020	10140	10450	8160	9100	6830	6900	5720
Collapse Pressure (psi)	8800	8540	10490	11160	7030	8820	4750	4880	3080
Shear Pressure (psi)	3000 (6)	3120 (8)	3060 (9)	3060 (9)	2940 (14)	2940 (14)	2100 (10)	2100 (10)	2100 (10)

## MODEL "BL" MECHANICAL LANDING COLLAR

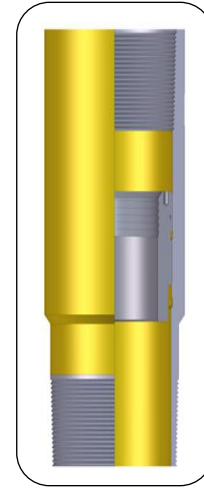
Product No.: BI 274-05

### Description & Application:

Model "BL" Mechanical Landing Collar is used with mechanical set liner hangers to land the liner wiper plug and drill pipe wiper plug after cementing. The landing collar has a latch profile for locking of the liner wiper plug. The latch profile provides an anti-rotational lock to the liner wiper plug which enables fast drill-out.

### Features:

- Used as a landing device for the plugs
- All internal parts are easily PDC drillable.
- The anti-rotational profile locks the LWP rotationally to prevent rotation of the Plug during drill out.



Model "BL"  
Mechanical Liner  
Landing Collar  
Product No.: BI 274-05

Specification Guide "BL" MECHANICAL LANDING COLLAR						
SIZES	4-1/2"	5"	5-1/2"	7"	7-5/8"	9-5/8"
Max O.D (Inch.)	5	5.562	5.880	7.656	8.500	10.625
Min I.D (Inch.)	2.812	3.000	3.000	4.650	4.650	4.650
Burst Pressure (psi)	9020	10140	10450	8160	9100	6830
Collapse Pressure (psi)	8540	10490	11160	7030	8820	4750

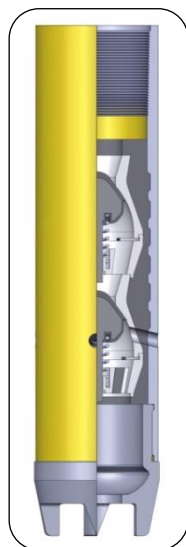
## DOWN JET SWIRL SHOE W/ DOUBLE POPPET VALVE & ALUMINIUM SPADE NOSE

Product No.: BI 100-61

### Description & Application:

Poppet Valve Jet Swirl Float Shoes with Aluminum spade nose are designed to guide the liner to the bottom and provide the primary valves for the displacement of cement. Nose provides direction to the Shoe during running in and provides support to the string during cementing while the shoe is landed at the bottom of hole.

The nose is available in different materials as per customer requirement with different geometry and the direction of jets.



Down Jet Swirl Shoe  
With Double Poppet Valve  
& Aluminium Spade Nose  
Product No.: BI 100-61

### Features:

- Valve made from Phenolic material.
- Spring loaded Plunger valve.
- Large flow area.
- High strength concrete.
- Optional upward or downward facing jets.
- Valve is validated to III C category as per API-RP-10 F



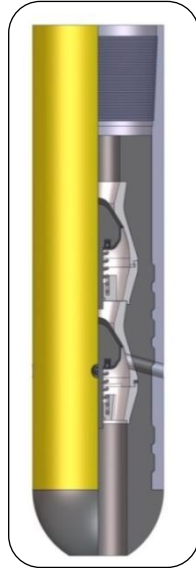
## DOWN JET SWIRL SHOE W/ DOUBLE POPPET VALVE

Product no.: BI 100-43

### Description & Application:

Poppet Valve Jet Swirl Float shoes are designed to guide the liner to the bottom and provide the primary valves for the displacement of cement.

The Float Shoes are equipped with two spring loaded valves and down jet swirl port that provide optimum assurance that the cement volume pumped around the liner remains in place.



Down Jet Swirl Shoe  
With Double Poppet Valve  
Product No.: BI 100-43

### Features:

- Valve made from Phenolic material.
- Spring loaded Plunger valve.
- Large flow area.
- High strength concrete.
- Optional upward or downward facing jets.
- Valve is validated to III C category as per API-RP-10 F

## JET SWIRL REAMER SHOE WITH POPPET VALVE

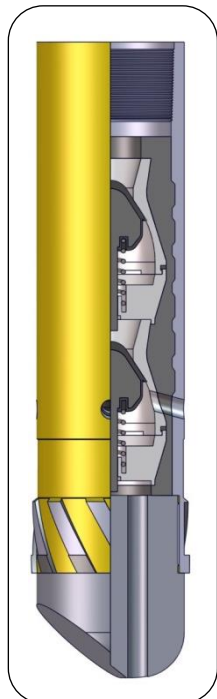
Product no.: BI 100-78

### Description & Application:

Jet Swirl Reamer Shoes are designed to use with rotating liner hanger for drill down against tight spots.

All Shoes are equipped with spring loaded valve and down jet swirl port that provide optimum assurance that the cement volume pumped around the liner remains in place.

The aluminum guide nose guides liner to bottom. The tungsten carbide composite layer provides cutting edges which allows easy drill down while running in.



Jet Swirl Reamer Shoe  
With Poppet Valve  
Product No.: BI 100-78

### Features:

- Valve made from Phenolic material.
- Spring loaded Plunger valve.
- Large flow area.
- High strength concrete.
- Optional upward or downward facing jets.
- Valve is validated to IIIC category as per API-RP-

## DOWN JET SWIRL FLOAT SHOE W/ DOUBLE POPPET VALVE & ECCENTRIC ALUMINIUM GUIDE NOSE

Product no.: BI 100-91

### Description & Application:

Poppet Valve Jet Swirl Float Shoes with Eccentric Aluminum Guide nose are designed to guide the liner to the bottom and provide the primary valves for the displacement of cement. The aluminum nose provides direction to the Shoe during running in and provides support to the string during cementing while the shoe is landed at the bottom of hole.

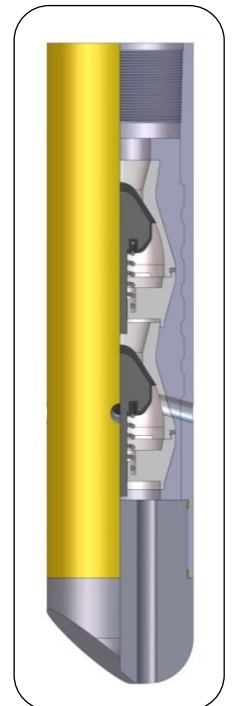
The nose is available in different materials as per customer requirement with different geometry and the direction of jets.

### Features:

- Phenolic material spring loaded valve.
- Large flow area.
- Steel shell made of coupling stock.
- High strength concrete.
- Aluminum, concrete and composite noses available in range of styles.
- Optional upward or downward facing jets.
- Valve is validated to III C category as per API-RP-10 F

### Benefits:

- Most suitable for horizontal wells.

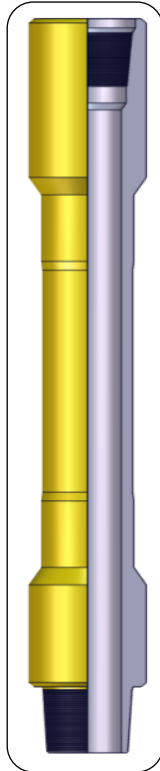


Down Jet Swirl Float Shoe  
With Double Poppet Valve  
& Aluminium Guide Nose  
Product No.: BI 100-91

**HANDLING NIPPLE**  
Product No.: BI 271-01

**Description:**

Handling Nipple provides an interface between the Liner Hanger assembly and the Drill Pipe. The Handling Nipple is provided in the same grade of material as that of the Drill Pipe.



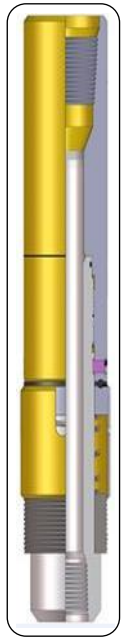
Handling Nipple  
Product No.: BI 271-01

**MODEL "BFN" LINER HANGER SETTING TOOL**  
Product No.: BI 265-0U

**Description:**

Model "BFN" Liner Setting Tool is used to run Liner Hangers, Compression Set packers or Tie Back Packers into the well. Setting Tool is released mechanically by giving right Hand rotation to the drill string after running, setting and cementing.

The tool has provision in the bottom to connect slick joint for cementing.

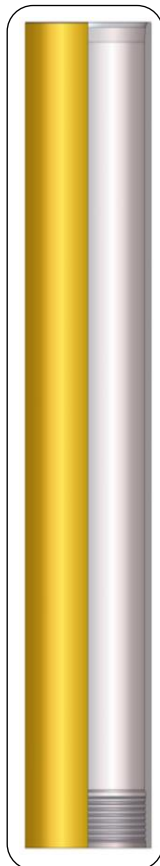


Model "BFN"  
Liner Hanger  
Setting Tool  
Product No.: BI 265-0U

**TIE-BACK RECEPTACLE**  
Product No.: BI 271-01

The Tie-Back Receptacle provides a high integrity honed seal bore above and below a Liner Hanger which permits landing, sealing, and extending additional Liner to a point further up the hole, or to the surface.

A Tie Back Seal Assembly seals in the Receptacle ID to hold pressure in both directions.

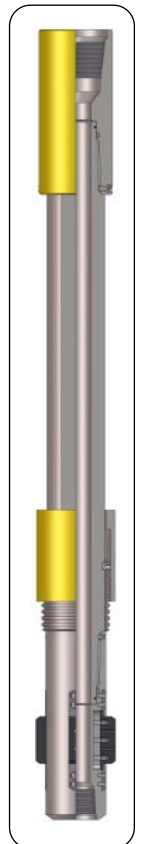


Tie-Back  
Receptacle  
Product No.: BI 271-01

**MODEL "BE" RUNNING TOOL**  
Product No.: BI 266-09

Model "BE" Running Tool is used to run Rotating Liner Hangers. The Running Tool is provided with spring loaded dogs. The dogs engage with splines of setting collar to provide rotation to the liner hanger during running in and after setting of slips. The tool Kelly has 2 feet stroke, which allows rotation in tension or compression. The tool has provision in the bottom to connect the slick joint for cementing.

Model "BE" Running tool is also used to run and set Mechanical Set Liner Hangers. The tool is released mechanically by giving right hand rotation to the drill string.



Model "BE"  
Running Tool  
Product No.: BI 266-09

## MODEL "BMST" & "BRST" LINER HANGER SETTING TOOL

Product No.: BI 266-0U, BI 266-2U

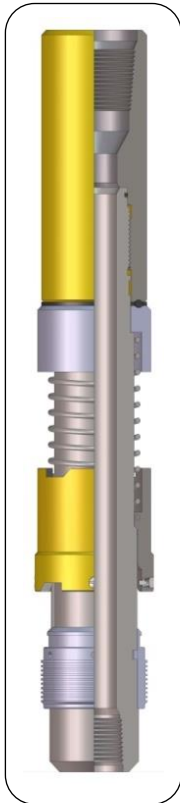
### Description:

Model "BMST" or "BRST" Setting Tool is used to run and set the liner hanger. The tool is designed to accommodate the high rotational torque required for rotating and setting long, heavy liners.

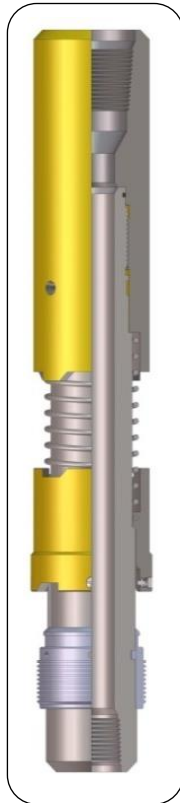
The "BMST" is used with Non-Rotating Liner Hangers. The Model "BRST" is designed to be used with rotating liner hangers and allows liner rotation during running in and cementation.

### Features:

- Tool incorporated with ball bearing for easy release.
- Spring loaded clutch system.
- Non Re-engaged feature, to prevent nut re-engagement due to residual torque.
- Field adjustable shear value for the setting nut



Model "BMST"  
Liner Hanger  
Setting Tool  
Product No.: BI 266-0U



Model "BRST"  
Liner Hanger  
Setting Tool  
Product No.: BI 266-2U

## MODEL "BHR" HYDRAULIC RELEASE SETTING TOOL

Product No.: BI 266-05

### Description:

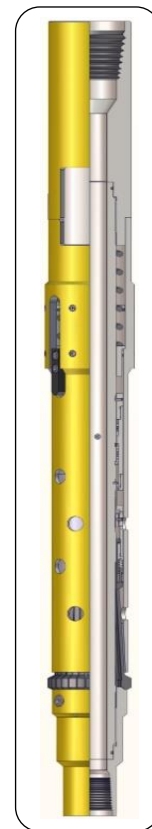
Model "BHR" Hydraulic Running Tool is used to run and set the liner hanger.

The Hydraulic Release Setting Tool connects to the Model BPSR Liner Setting Sleeve profile provides a means to carry a liner down hole, set a liner hanger and release from the liner prior to or, if desired, after cementing.

The primary releasing mechanism is hydraulic with an emergency mechanical back-up release system. This tool carries the weight of the liner on a fully supported collet assembly with no threads that could back off and drop the liner while running in the hole. High torque ratings of the Hydraulic release Running Tool system allow aggressive rotation if required to work a liner to bottom.

### Features:

- Emergency Back Up release system.
- High torque rating.



Model "BHR"  
Hydraulic Release  
Setting Tool  
Product No.: BI 266-05

## MODEL "BA" TOP SET RUNNING TOOL

Product No.: BI 281-2U

### Description:

Model "BA" is a Liner Top Packer Setting Tool used in conjunction with the Liner Setting Tool. It is used when running Liner equipment with Liner top packer.

After Setting of Liner Hanger the Setting Tool is released from the Liner Hanger setting sleeve and the drill string is pulled up, which allow the Setting Dogs of BA Top Set Running Tools to come out in expanded position & further set down weight can be transferred mechanically to the Liner Top Packer through TBR to set & pack-off the Liner top packer.



Model "BA"  
Top-Set  
Running Tool  
Product No.: BI 281-2U

## MODEL "BPST" PACKER SETTING TOOL

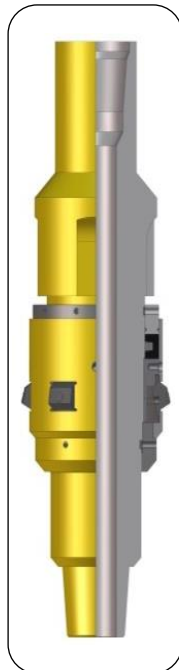
Product No.: BI 266-3U

### Description:

Model "BPST" Packer Setting Tool is designed to apply set down weight to mechanically set the Liner Top Packer. It is equipped with spring loaded Dogs that are used to transfer the set down weight from the drill-string to the TBR which transfer it to the Liner Top Packer.

The bearing assembly in the tool allows the drill pipe to be rotated while slacking off weight to the Liner Top Packer.

The Dogs remain stationary during rotation thereby preventing damage to the honed I.D of the Tie Back Receptacle.



Model "BPST"  
Packer Setting Tool  
Product No.: BI 266-3U

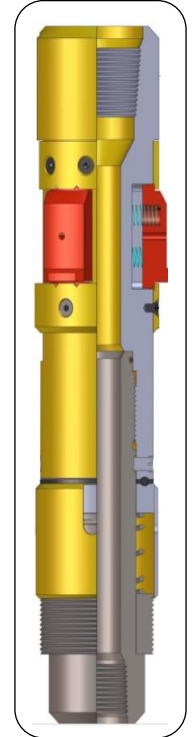
## MODEL "BAFN" SETTING TOOL

Product No.: BI 281-OU

### Description:

Model "BAFN" is a combination of Model "BA" Top Set Packer Running Tool & Model 'BFN' Running Tool.

The Model "BAFN" Running cum packer Setting Tool is provided with slots on the body for circulation purposes. After the completion of cementing the tool is released by right hand rotation & packer activation can be done by transferring the set down weight from the drill-string to the TBR which transfers it to the Liner Top Packer.



Model "BAFN"  
Setting Tool  
Product No.: BI 281-OU

## LINER AND DRILL PIPE WIPER PLUGS

Liner Wiper Plug in conjunction with the Drill Pipe Wiper Plug is designed to separate the cement from the displacing fluid in the liner.

### LATCH-DOWN DRILL WIPER PLUG

Product No.: BI 270-02

Latch-Down Drill Pipe Plug is dropped from Plug Dropping Cementing Head to follow the cement down the Drill Pipe. The Latch-Down Drill Pipe Wiper Plug effectively cleans cement from the ID of the Drill Pipe and Liner Running Tools. The Latch-Down feature enables the Drill Pipe Wiper Plug to land and positively lock into the Liner Wiper Plug.

The Latch-Down Liner Wiper Plug is used to separate displacing fluid from cement in liner cementing operations. During cement displacement the Latch-Down Drill Pipe Wiper Plug lands on, latches in, and releases the Latch-Down Liner Wiper Plug from the tail pipe of the Running Tool Assembly.

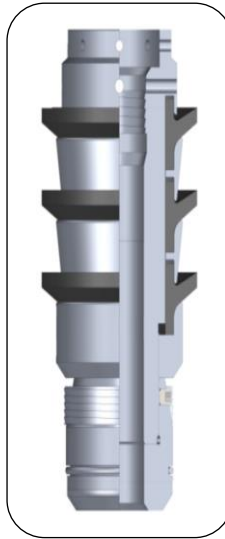


Latch Down  
Drill Wiper Plug  
Product No.:  
BI 270-02

**MODEL "BLWP" LINER WIPER PLUG**  
**Product No.: BI 269-0U**

**Description:**

Model "BLWP" Liner Wiper Plug is designed to receive the Drill Wiper Plug and clean the Liner casing after cementing. When latched into the Landing Collar its nose seal ring provides an additional back pressure safety check and the anti-rotation lock ring allows for fast drill out. The "BLWP" is constructed of material easily drilled out after cementing.



Model "BLWP"  
 Liner Wiper Plug  
 Product No.:  
 BI 269-0U

**MODEL "BRL" LINER WIPER PLUG**  
**Product No.: BI 269-OY**

**Description:**

Model "BRL" liner wiper plug is designed with ball seat is to enable the operator to position a ball seat near the liner top, in the tailpipe directly below the slick joint or pack-off assembly. This eliminates the need for a ball-seat-type landing collar. This is beneficial in areas where the conventional ball seat landing collar would be positioned at or near horizontal creating a possible seating problem with the ball and the seat.

With the ball seat in the liner-wiper plug positioned near the liner top, this will increase the possibility of the ball seating properly. Another important benefit of the ball seat being at the liner top is that reduces the sometimes-harmful pressure surge on the formation when the Ball seat assembly shears out. The BRL liner wiper plugs land and locked inside landing collar. The nose seal ring provides additional back pressure check. The anti-lock mechanism allows fast drill-out. The fins are made of SBR rubber and built with PDC drillable material.



Model "BRL"  
 Liner Wiper Plug  
 Product No.:  
 BI 269-OY

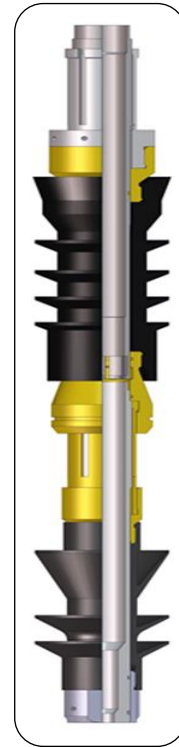
**MODEL "BSSR" SUB SURFACE RELEASE CEMENTING PLUGS**  
**Product No.: BI 25X-0U**

**Description:**

Model "BSSR" Sub-Surface Release Cementing Plug system is used in cementing of liners. The plug set is made up in the bottom of Liner Hanger assembly on stinger. The liner assembly is lowered on drill pipe. When the tool and string have landed, the well can be circulated before cementing operations. This Plug is used for Stage Cementing of Collar.

**Features:**

- Prevents contamination of Cement and Mud
- Can be used to run liner on floater and fixed Offshore Rigs



Model "BSSR"  
 Sub-Surface Released  
 Cementing Plugs  
 Product No.: BI 25X-0U



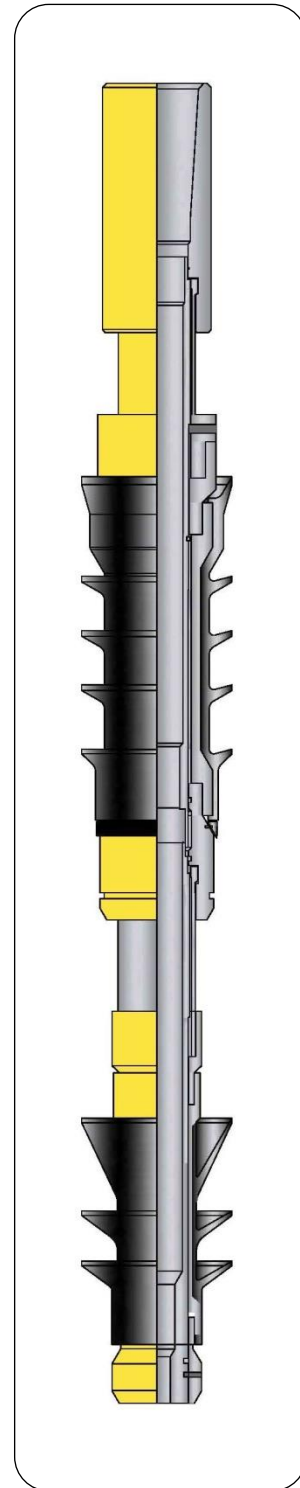
## FOUR PLUG SYSTEMS FOR STAGE CEMENTING

### Description:

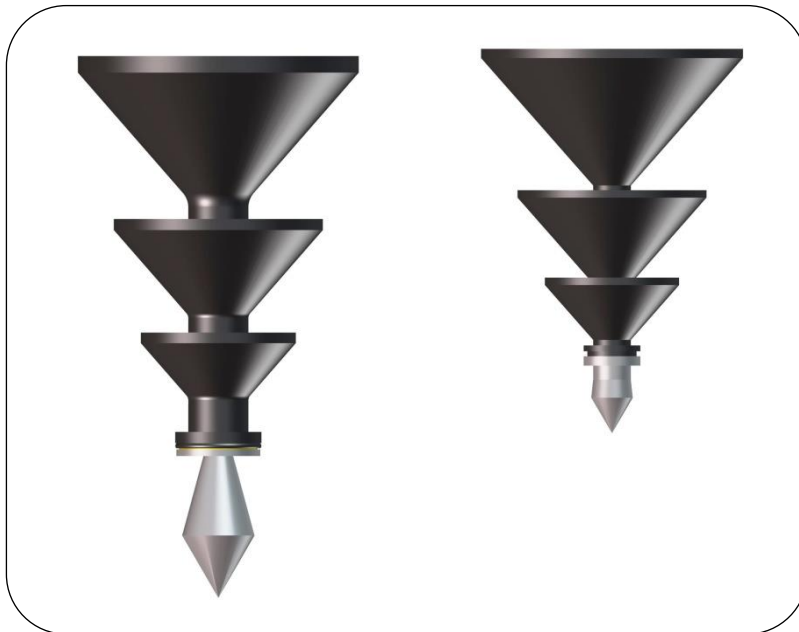
Two Stage Wiper Plug Systems is a very effective means of wiping in two stages with liner hanger and ECP Packer. The Top Liner Wiper Plug is a Flexible Type Rubber Plug, which is assembled with the Top Liner Wiper Plug with the help of shear pins. The Plugs have Non-Rotational features, which allow easy PDC drilling after cementing.

The Bottom Liner Wiper Plug releases from the Top Liner Wiper Plug by bumping of lower releasing dart and it travels through the Hydraulic Stage Cementing Collar without any effect and seats into the BFC Landing Collar. The pressure rises against the Bottom Liner Wiper Plug and activates the ECP Packer and then opens the port of the stage tool.

The Upper Dart bump onto the Top Liner Wiper Plug and release the Top Liner Wiper Plug, seats in the closing seat of the Hydraulic Stage Cementing Collar. It closes the ports by shearing the shear pin and shifting the closing sleeve after the Second Stage Cementing Job.



Model "BLWP"  
Top and Bottom  
Liner Wiper Plug



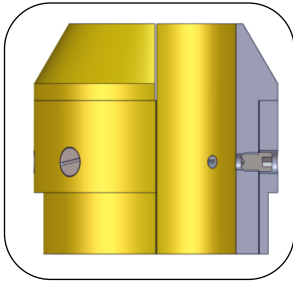
Model "BDWP"  
Upper and Lower release Units

## MODEL "BF" LINER HANGER JUNK SCREEN

Product No.: BI 25X-0U

### Description:

Model "BF" Liner Hanger Junk Screen should be run as part of the Setting Tool assembly to prevent debris from damaging the polished bore Tie Back Receptacle. It will also prevent debris from setting on top of the Setting Tool and ease retrieval.



Model "BF"  
Liner Hanger Junk Screen  
Product No.: BI 25X-0U

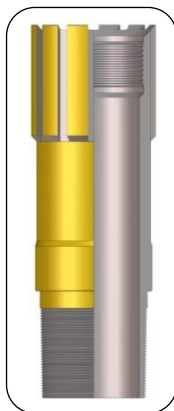
## MODEL "BG" SETTING COLLAR

Product No.: BI 26X-1U

### Description:

Model "BG" Setting Collar is a basic releasing Collar used to carry the Liner into the well. The right-hand releasing thread ensures easy release of the Setting Tool.

Its fluted top guide assures centering of the Liner in the hole and its shape provides an internal guide for smooth running of tools into the Liner.

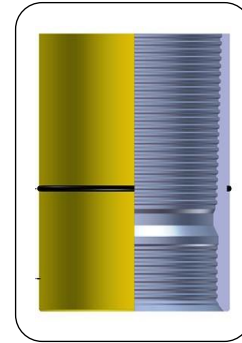


Model "BG"  
Setting Collar  
Product No.: BI 26X-1U

## TOP SET COUPLING

Product No.: BI 281-1U

Top Set Coupling is used above the Compression Liner Packer and proves heavy duty Box-Up threads to enable the Liner Hanger Setting Tool to be connected, through the Packer and Liner Hanger, in turn to the Liner.



Top Set Coupling  
Product No.: BI 281-1U

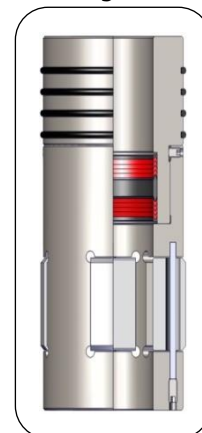
## MODEL "BR" RETRIEVABLE PACK-OFF BUSHING

Product No.: BI 282-03

Model "BR" RPOB is used to eliminate the drilling time required for drillable pack off bushing and also provide smooth ID after retrieval. RPOB is dressed with V-rings of high performance rubber in the I.D and O-Rings at the O.D. The V-ring seal unit is suitable to seal off the O.D of the polished Slick Joint. It is run with a Slick Joint provided with lifting sub to retrieve the Pack-off Bushing.

### Features:

- Locking dog provides positive lock.
- Available for all liner sizes to seal inside the I.D.
- Collapsible lock allows easy retrieving.
- Suitable to run with swab cup assembly for setting hangers hydraulically when slotted liners are to be hung.

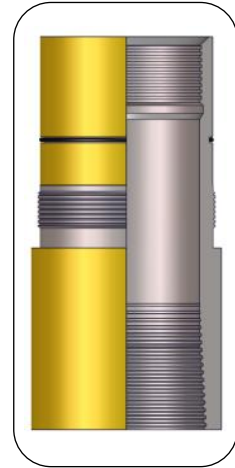


Model "BR"  
Retrieval Pack-Off Bushing  
Product No.: BI 282-03

**MODEL "B" & "BF" SETTING COLLAR WITH OPTIONAL TBR**  
**Product No.: BI 295-19 & BI 261-BF**

**Description:**

Model "B" & "BF" Setting Collar is typically run above the Model "BMLTP" Tie-Back Packer for the purpose of Setting Tie-Back Packer with help of Model "BE" Setting Tool. It also serves as a tool entry guide after completion. The Model "B" Setting Collar can be provided with honed Tie-Back Receptacle for Tie- Back Seal Nipple to run through it at the time of production.

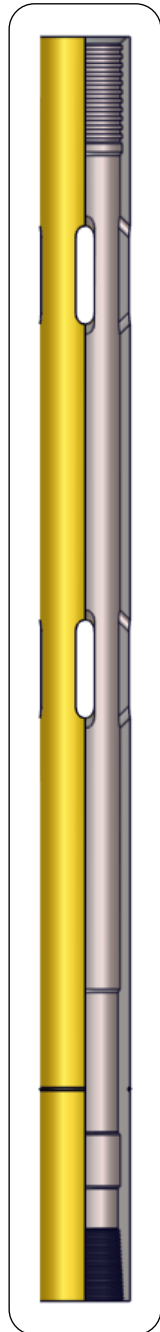


**MODEL "BD" SETTING COLLAR WITH INTEGRAL PACK-OFF BUSHING**  
**Product No.: BI 295-17**

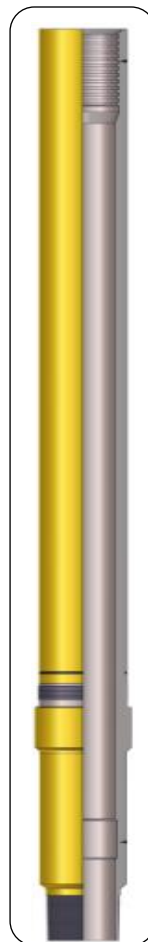
**Description:**

Model "BD" Setting Collar offers a left hand thread allowing easy right hand release of Setting Tool, outer thread for Tie-Back Receptacle and pin thread for Liner Hanger. Model "BD" Setting Collar is fitted with pack-off bushing for sealing with Slick joint O.D. The pack-off bushing is made up of aluminium material which is P.D.C. drillable.

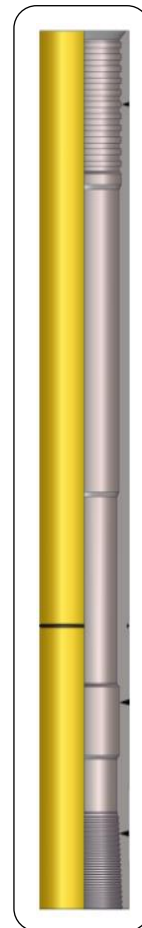
**Note: Different types of Setting Collars and Setting Sleeve are available as per configuration of Liner hanger System**



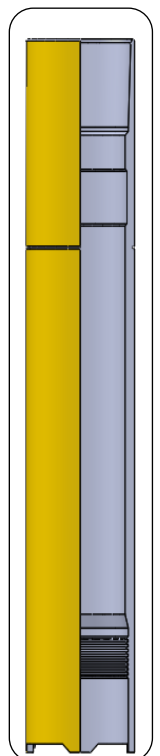
Model "BD"  
 Setting Collar  
 With Integral  
 Pack-Off Bushing  
 Product No.:  
 BI 295-17



Model "BRL"  
 Setting Collar  
 Product No.:  
 BI 261-12



Model "BR"  
 Setting Collar  
 Product No.:  
 BI 261-07



Setting Collar  
 For "BMST"  
 Product No.:  
 BI 266-0U

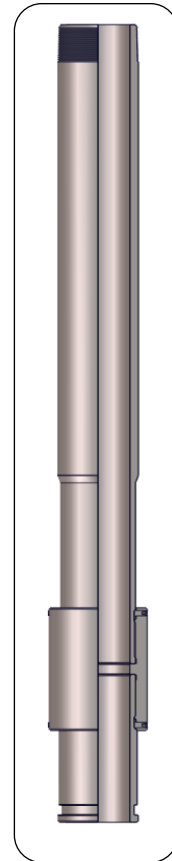


**MODEL "BER" SLICK JOINT USED WITH RETRIEVABLE PACK OFF BUSHING (RPOB)**  
**Product No.: BI 283-01**

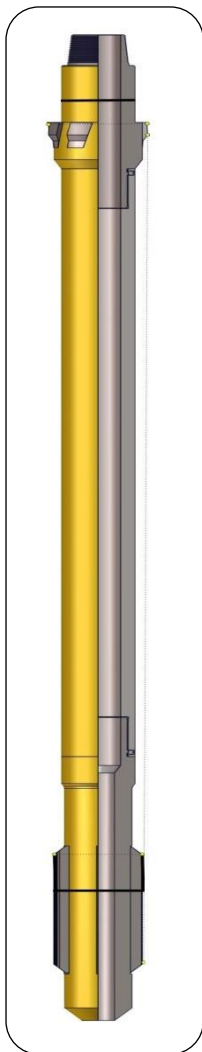
**Description:**

Model "BER" Slick Joint is used in combination with the retrievable Pack off Bushing (RPOB). This combination is used to provide a seal between the liner and setting tool during cementing operations. The Slick Joint stinger is stabbed into the bushing inner V-Ring Seal Pack-Off Assembly and the bushing OD is sealed and located in the RPOB profile within the setting collar or Liner Top Packer to provide a high integrity seal. This method significantly reduces the upward hydraulic force on the drill pipe during cementing when compared to the casing packer cup method to provide this seal. This is especially beneficial when cementing larger diameter liners, and /or cementing at relatively shallow depths where this upward force might exceed the drill pipe string weight and pump the running string up the hole, possibly losing the seal between the liner and setting tool. After the cement job, The Slick Joint and RPOB are pulled out of the liner top with no drill out required.

**Note: Different types of Slick Joints are available as per the configuration of Liner hanger System**



Model "BER"  
 Slick Joint with RPOB  
 Product No.: BI 283-01



Model "BPM"  
 Polish and Drill Mill  
 Product No.: BI 275-03

**MODEL "BPM" POLISH AND DRESS MILL**  
**Product No.: BI 275-03**

**Description:**

Model "BPM" Polish & Dress mill assembly is used to clean cement from the I.D and dress top of the Polished Bore Receptacle in single trip. This is to prevent seal damage and allows good sealing of seal stem run in thereafter. The blades have a deposited layer of tungsten carbide which improves cutting efficiency. It is run on drill pipe.

**Features:**

- Tungsten Carbide coated blades for smooth cleaning.
- Single trip operation
- Reduces rig time.
- All parts are made of AISI 4140 HT or 4145 HT high tensile material for heavy duty.

## MODEL "BTDS" TOP DRIVE CEMENTING HEAD

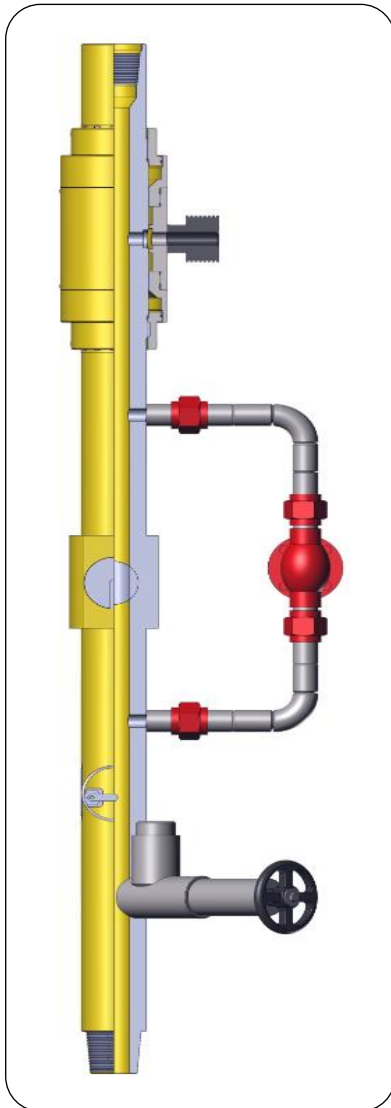
Product No.: BI 278-34

### Description:

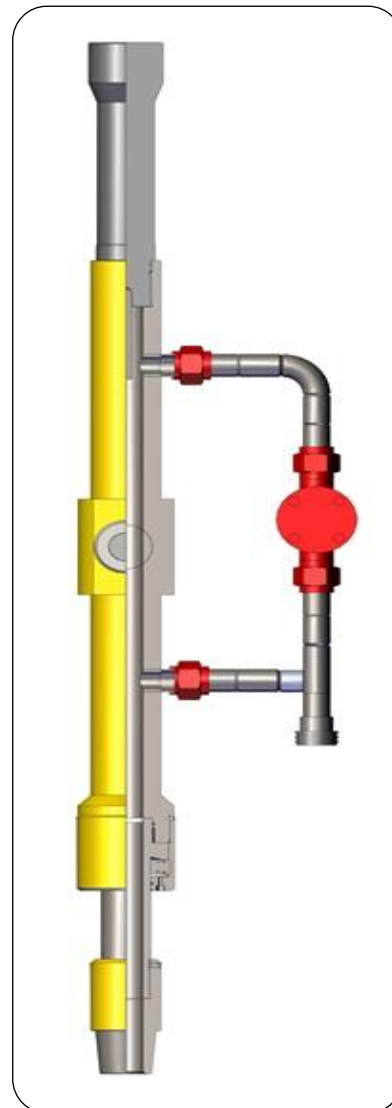
Model "BTDS" Top Drive Cementing Head (BTDS) suspends drill pipe weight from the rig elevators while retaining the plug so that it can be released after cementing has been completed. The BTDS also connects the cementing lines to the running string during liner operations, and includes a heavy-duty swivel for easy string manipulation with the cementing lines in place. This swivel mechanism and drill pipe plug retainer are built in below the elevators for unobstructed operation. A ball drop assembly is integral with the plug dropping manifold for use with hydraulic-set liner systems.

### Features and Benefits:

- Maximum strength and toughness from quenched and tempered alloy steel construction.
- Displacement fluid and cement are diverted below or above the plug through an external manifold.
- Manifold rated to 10,000 PSI working Pressure.
- Cementing flag sub for visual indication of drill pipe wiper plug release is integral with the Plug Dropping Manifold.
- Heavy duty swivel permits easy manipulation of the string without having to break out the cementing lines.



"BTDS" Cementing Head  
Product No.: BI 278-34



Conventional Cementing Head  
Product No.: BI 278-31



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# PACKER SYSTEMS

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### MODEL "BD" RETAINER PRODUCTION PACKER

Product No.: BI 415-13

Model "BD" Retainer Production Packers are the most widely used, most versatile, high performance Permanent Production Packers available. They are frequently used as a permanent squeeze or testing Packer or as a permanent or temporary Bridge Plug.

Model "BD" Packers and their guides can also be ordered separately by those interested in maximum inventory flexibility.

#### Packer Setting:

Electric Line  
Wire Line Adapter Kit  
Tubing

#### Packer Accessories:

Tubing Seal Assemblies  
Perforated Spacer Tubes

#### Features / Benefits:

- Proven reliability
- Slim-line design
- Solid construction that makes possible a significant savings in rig time by providing a 50% faster run-in without fear of impact damage or premature setting.
- Two opposed sets of full-circle, full strength slips.
- A packing element that resists swab-off but packs-off securely when the Packer is set.
- Unique inter locked expandable metal back-up rings that contact the casing creating positive Packing Element extrusion barrier.

### MODEL "BF-1" PRODUCTION PACKER

Product No.: BI 413-06

Model "BF-1" Retainer Production Packer is large bore version of Model "BD" Retainer Production Packer. They combine the features of the "BD" with the largest bore through any drillable Packer.

#### Packer Setting:

Electric Line  
Tubing

#### Packer Accessories:

Tubing Seal Assemblies  
Seal Bore Extensions  
Mill-out Extensions  
Packer Plugs  
Expansion Joints

#### Features / Benefits:

- Solid, slim-line construction and a packing element system that resists swab-off. This provides a faster run-in time without fear of impact damage or premature setting, yet packs-off securely and permanently when the Packer is set.
- Two opposed sets of full-circle; full strength slips assure that the Packer will stay where it is set.
- Unique interlocked, expandable metal back-up rings contact the casing and create a positive barrier to Packing Element extrusion.
- The largest possible opening through a drillable Packer.



Model "BD"  
Retainer Production  
Packer with Blank Guide  
Product No.: BI 415-13



Model "BF-1"  
Retainer Production  
Packer with Blank Guide  
Product No.: BI 413-06

Specification Guide MODEL "BD" RETAINER PRODUCTION PACKER								
Casing				Packer			Seal Assembly	
O.D. (Inch.)	Weight (ppf) T & C	I.D. Range in which Packer may be run		Size	O.D. (Inch.)	Diameter of Sealing Bore (Inch.)	Size	Min Bore Thru Seals (Inch.)
		Min. (Inch.)	Max (Inch.)					
5	15- 21	4.125	4.436	BI 32-26	3.968	2.688	BI 40/80-26	1.968
				BI 32-25			BI 41/81-26	1.750
				BI 32-19			BI 20-25	1.875
	11.5- 13	4.437	4.670	BI 34-26	4.250	2.688	BI 21-19	1.312
				BI 34-25			BI 20/40-19	.984
				BI 34-19			BI 40/80-26	1.968
5-1/2	23- 26	4.625	4.811	BI 42-26	4.328	2.688	BI 41/81-26	1.750
				BI 42-19			BI 21-19	1.312
	20- 23	4.812	5.044	BI 44-26	4.500	2.688	BI 20/40-19	.984
				BI 44-19			BI 40/80-26	1.968
	13- 17	5.540	5.921	BI 81-32	5.350	3.250	BI 41/81-26	1.750
				BI 82-32 BI 82-26			BI 60/80-32	2.406
7	38- 49.5	5.675	6.135	BI 84-32 BI 84-26	5.687	2.688	BI 61/81-32	1.990
							BI 60/80-32	1.968
	32- 44	6.049	6.366	BI 86-32	5.875	3.250	BI 41/81-26	1.750
							BI 60/80-32	2.406
	23- 32	6.184	6.456	BI 88-32	6.187	2.688	BI 61/81-32	1.990
							BI 60/80-32	2.406
20- 29	6.456	6.765	BI 88-26	6.187	2.688	BI 40/80-26	1.968	
						BI 41/81-26	1.750	
9-5/8	32.3- 53.5	8.438	9.001	BI 194-47	8.125	4.750	BI 60/80-32	2.406
				BI 194-40			BI 192-47	3.875
				BI 194-32			BI 190-47	3.000
				BI 194-32			BI 191-47	2.500
				BI 194-32			BI 80-40	2.985
				BI 194-32			BI 60/80-32	2.406
BI 194-32	BI 61/81-32	1.990						



## SEAL BORE PACKERS SYSTEM - PERMANENT

### Specification Guide MODEL "BF-1" RETAINER PRODUCTION PACKER

Casing		Packer (B)		Seal Assembly (C)				
OD (Inch.)	Weight (A) (ppf)	ID Range in which Packer may be run		Size	OD (Inch.)	Seal Bore(D) (Inch.)	Size	Min Bore (E) Thru Seals (Inch.)
		Min (Inch.)	Max (Inch.)					
5	24.2- 26.7	3.781	4.000	BI 22-23	3.593	2.390	BI 20-23	1.703
	21.4- 24.2	4.000	4.126	BI 24-23	3.781		BI 21-23	1.807
5-1/2	20- 23.8	4.625	4.811	BI 43-30	4.437	3.000	BI 42/62-30	2.375
	14- 17	4.812	5.012	BI 45-30	4.562		OR	
	13- 14	4.976	5.126	BI 47-30	4.750		BI 40/60-30	1.970
7	32- 38	5.875	6.094	BI 83-40	5.687	4.000	BI 80-40	2.985
	26- 32	6.094	6.276	BI 85-40	5.875			
	20- 23	6.276	6.456	BI 87-40	6.000			
	17- 20	6.456	6.765	BI 89-40	6.250			
9-5/8	40- 58.4	8.435	8.835	BI 192-60	8.218	6.000	BI 190-60	4.750
	36- 47	8.681	8.921	BI 194-60	8.438			

(A) Includes some drill pipe and line pipe weights.

(B) "BF-1" Packers do not contain a flapper valve.

(C) Tubing seal assemblies, tubing seal and spacer nipples

(D) The maximum OD (including tolerance) of any part run through a Production Packer should be at least 1/16" 1.59 mm smaller than the minimum bore through the Packer body. This may occasionally require that the coupling ODs be turned down

(E) ID listed is for commonly used "BG-22" or "BE-22" Seal Assemblies.

### MODEL "B-FA-1" RETAINER PRODUCTION PACKER

Product No.: BI 413-07

#### Description:

The Model "B-FA-1", Retainer Production Packers are offered to further improve the present line of drillable-type Production Packers. They combine the best features of both Model "BD" and "B-F" Retainer Production Packers to provide the following operational advantages:

1. Largest possible opening through a Drillable Packer.
2. May be set on wire line using the simpler Model "B" Wire Line Adapter Kit, Product No.: BI 438-09, or on tubing.
3. Accepts standard accessories such as Seal Nipples Expendable Plugs and Packer Milling Tools.
4. Permits extensions or tailpipe to be attached below the Packer when assembled with threaded guides are designated Models "B-FB-1" and "B-FAB-1" Product Nos.: BI 413-08 and BI 413-09 respectively.
5. Tailpipe load transmitted directly into the Body.
6. Having the large I.D at the Upper bore for receiving the Anchor Tubing Seal Nipple



Model "B-FA-1"  
Retainer Production Packer  
Product No.: BI 413-07

### MODEL "B-FB-3" HIGH PRESSURE RETAINER PRODUCTION PACKER

Product No.: BI 414-08

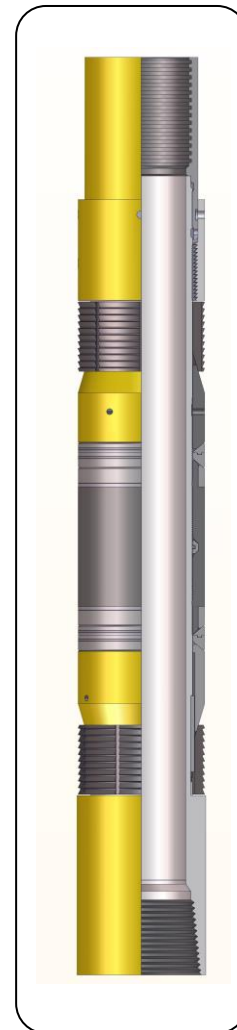
#### Description:

The Model "BFB-3" are designed for HPHT wells, which are suitable for 15000 psi and 450 Def. F with high tensile Inconel alloy body and 90 Hard Kalrez Elastomer. The material of packer is conforming to NACE MR 01-75 requirements for sour and highly corrosive environment.

The packers are run with Model "B" Wireline Adapter Kit, Product No. BI 438-09 in conjunction with Size Baker E-4 WLPSA or BOTIL SIZE# 20 Hydraulic Setting Tool.

The packers are available with threaded bottom guide to connect Seal Bore extension or mill out extension.

For assembly and disassembly instructions and setting procedure on the Wire line Pressure Setting Assembly.



Model "B-FB-3"  
Production Packer  
Product No.: BI 414-08



## SEAL BORE PACKERS SYSTEM - PERMANENT

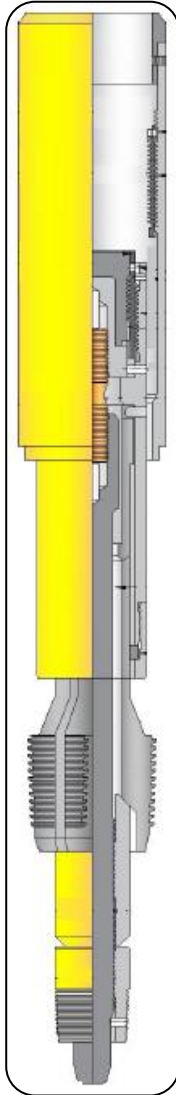
Specification Guide MODEL "B-FB-3" HIGH PRESSURE RETAINER PRODUCTION PACKER										
Casing		Packer		Range of Casing ID In which Packer May Be Run		Max. Tool OD (Inch.)	Elastomer	Pressure Ratings (psi)		Temp. (° F)
OD (Inch.)	Weight (ppf) T & C	Model	Size	Min. (Inch.)	Max. (Inch.)			Unplugged	Plugged	
5	18	BFB-3	32-25	4.125	4.436	3.968	Kalrez	15000	12500	450
7	35		83-40 Sp.	5.892	6.123	5.770				

Specification Guide MODEL "B-F-1", "B-FA", "B-FA-1" PACKER											
Casing		Packer		Range of Casing ID In which Packer may be Run		Maximum Tool OD (Inch.)	Minimum Bore Thru		Diameter Sealing Bore For Seal Nipple (Inch.)	Accessory Size	
OD (Inch.)	Weight (ppf) T & C	Model	Size	Min (Inch.)	Max. (Inch.)		Seal Nipple (Inch.)	Packer (Inch.)			
4	12.6-14	B-FA	13B-FA-25	This size Packer available only as a Model "B-FA", refer to unit filed under this tap							
	9.5-11.6		15B-FA-25								
4-1/2	11.6-16.6*	B-F-1	22-23	3.781	4.000	3.593	1.730	2.390	2.390	20-23	
		B-FA	22B-FA-30	This size Packer available only as a Model "B-FA", refer to unit filed under this tap							
	9.5-11.6	B-FA	22B-FA-30	This size Packer available only as a Model "B-FA", refer to unit filed under this tap							
		B-F-1	24-23	4.000	4.124	3.718	1.730	2.390	2.390	20-23	
						1.807				21.23	
5	15-21	B-FA-1	32B-FA-30	4.125	4.436	3.968	2.390	2.500	3.000	20BFA-30	
5-1/2	20-23	B-FA	43BFA-36	This size Packer available only as a Model "B-FA", refer to unit filed under this tap							
		B-F-1	43-30	4.625	4.811	4.437	2.000	3.000	3.000	40-30d	
							2.375				42-30e
5-1/2	14-17	B-FA-1	45BFA-36	4.812	5.012	4.562	3.000	3.000	3.625	40BFA-36f	
		B-F-1	45-30				2.000			40-30d	
							2.375		3.000	42-30e	
5-1/2	13-14	B-FA-1	47BFA-36	4.976	5.124	4.750	3.000	3.000	3.625	40BFA-36f	
		B-F-1	47-30				2.000			40-30d	
							2.375		3.000	42-30e	
6-5/8	20-24	B-FA-1	83BFA-47h	5.875	6.094	5.687	4.031	4.000	4.750	80BFA-47g	
7	32-38	B-F-1	83-40				3.000			4.000	
6-5/8	17	B-FA-1	85BFA-47	6.095	6.276	5.875	4.031	4.000	4.750	80BFA-47g	
7	26-29	B-F-1	85-40				3.000			4.000	
7	20-23	B-FA-1	87BFA-47	6.277	6.456	6.000	4.031	4.000	4.750	80BFA-47g	
		B-F-1	87-40				3.000			4.000	
7	17	B-FA-1	89BFA-52	6.456	6.765	6.250	4.421	4.400	5.250	80BFA-52	
7-5/8	33.7-39	B-F-1	89-44				3.500			4.400	
7	17	B-F-1	89-40				3.000	4.000	4.000	80-40	
7-5/8	24-33.7	B-F-1	91-40	6.706	7.025	6.500	3.000	4.400	4.000	80-40	
		B-FA-1	91BFA-52				4.421			5.250	80BFA-52
		B-F-1	91-44				3.500			4400	80-44
9-5/8	40-53.5	B-F-1	192-60	8.438	8.835	8.218	4.875	6.000	6.000	192-60	
	36-47	B-F-1	194-60	8.525	8.921	8.438				6.031	194-60
		B-FA-1	194BFA-75j							7.500	190FA-75



## WIRE LINE ADAPTER KIT

Product No.: BI 438-09



Wire Line Adapter Kit  
Product No.: BI 438-09

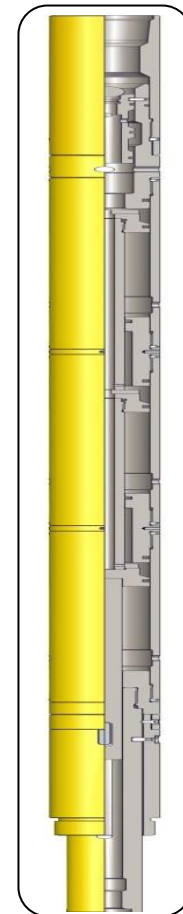
## MODEL "BH" HYDRAULIC SETTING TOOL FOR MODEL "BD" PERMANENT PACKER AND RETRIEVABLE HYDRAULIC SEAL BORE PACKER

Product No.:- BI 414-71

### Description:

The model "BH" Hydraulic Setting Tool is used to set MODEL BD Permanent Packer and Model "BRSB" Retrievable Hydraulic Seal Bore Packer.

The Packer is run in the model "B" Wire Line Adapter Kit, attached to the model "BH" Hydraulic setting tool on the drill pipe and lower to setting depth. The tubing fills automatically as it is run in, through a ported top sub in the setting assembly. The ports also permit circulation at any time. A 1 7/16" Brass Ball is pumped down to seat in the hydraulic setting tool. Approximately 1500 psi is applied to set the packer slips. Following which the pressure is released and / or tension applied to shear the release stud of the Wire line Adapter Kit. The Hydraulic Setting Tool along with wire line adapter kit can then be retrieved leaving the packer set in hole.



Model "BH"  
Hydraulic Setting Tool  
Product No.: BI 414-71



## SEAL BORE PACKERS SYSTEM - PERMANENT

### Specification Guide MODEL "B" WIRE LINE ADAPTER KIT FOR MODELS "B-F-1", "B-FA-1", "B-FB-1" AND "B-FAB-1" RETAINER PRODUCTION PACKERS

ITEM NO.	Part Name	No. Reqd.	22-23,24-23 F/Use with #10 WLPSA	22-23,24-23 F/Use with #10 WLPSA	32B-FA-30	43-30 45-30 47-30	45-36 47-36	83-40 85-40 87-40	83B-FA-47
1	Adapter Sleeve	1	BI 02-05720-00		BI 02-05755	BI 02-05683-00	BI 02-05686-00	BI 02-05606-00	BI 02-05608-00
2	Hex. Soc. Set. Screw	Ref.+	---			BI WW-G51B-0B0 (5/16-18x5/16)		BI WW-G51B-0S0 (5/16-18 x 3/4)	
3	Adapter Sleeve Bushing	1	---			BI 01-53812-00		BI 01-53820-00	
4	Hex. Soc. Set. Screw	Ref.+	BI WW-G518-080 (1/4-20 x 1/4)			BI WW-G60B-080 (10-32 x 1/4)		BI WW-G51B-0D0 (5/16-18 x 3/8)	
5	Adjusting Nut	1	BI 02-05716-00	BI 02-05717-00	BI 01-37230-00	BI 01-38022-00		BI 01-36819-00	
6	Hex. Soc. Set. Screw	Ref.+	BI WW-G51B-0B0 (5/16-18 x 5/16)						
7	Adapter Bushing	1	BI 01-45430-00	BI 01-25394-00					
8	Stud Bushing	1	BI 01-41352-00			BI 01-25393-00			
9	Hex. Soc. Set. Screw	Ref.+	BI WW-G60B-0H0 (5/16-18 x 1/2)						
10	Release Stud	1	BI 01-35672-00			BI 01-34152-00			
11	Body	1	BI 01-31752-00						
12	Mandrel	1	BI 01-37205-00			BI 01-25386-00			
13	Split Ring Ret.	1	BI 01-32624-00						
14	Split Ring Seg.	2 Seg	BI 01-32623-00						
15	Release Sleeve	1	BI 01-33000-00		BI 01-32625-00	BI 01-39582-00	BI 01-25389-00	BI 01-35834-00	BI 01-73660-00
16	Mandrel Guide	1	BI 01-73704-00	BI 01-32291-00					
17	Lock Bushing	1	BI 01-43457-00	BI 01-25387-00					
18	Hex. Soc. Set. Screw	Ref.+	BIWW-G60B-060 (10-32x3/16)		BI WW-G51B-0D0 (5/16-18 x 3/8)			BI WW-G51B-080 (5/16-18 x 1/4)	
19	Gage Ring	1	BI 01-24723-00		BI 01-32628-00	BI 01-39905-00	BI 01-25396-00	BI 01-37905-00	BI 01-44437-00
20	Tension Mandrel Lock Spring	1	BI 01-35707-00	---					

+ Item furnished with respective parts.  
 Δ Or BI 01-25394-00 and BI 01-47293-00



## SEAL BORE PACKERS SYSTEM - PERMANENT

Specification Guide									
MODEL "B" WIRE LINE ADAPTER KIT FOR MODELS "B-F-1", "B-FA-1", "B-FB-1" AND "B-FAB-1" RETAINER PRODUCTION PACKERS									
ITEM NO.	Part Name	No. Reqd.	85B-FA-47 87B-FA-47	89-40 91-40	89-44 91-44	89B-FA-52 91B-FA-52	192-60	194-60	194B-FA-75
1	Adapter Sleeve	1	BI 02-0561200	BI 02-05619-00	BI 02-05619-00	BI 02-05616-00	BI 02-08302-00	BI 01-86900-00	BI 01-85674-00
2	Hex. Soc. Set. Screw	Ref. +	BI WW-G51B-0S0 (5/16-18 x 3/4)						
3	Adapter Sleeve Bushing	1	BI 01-53820-00						
4	Hex. Soc. Set. Screw	Ref. +	BI WW-G51B-0D0 (5/16-18 x 3/8)						
5	Adjusting Nut	1	BI 01-36819-00						
6	Hex. Soc. Set. Screw	Ref. +	BI WW-G51B-0B0 (5/16-18 x 5/16)						
7	Adapter Bushing	1	BI 01-25394-00						
8	Stud Bushing	1	BI 01-25393-00						
9	Hex. Soc. Set. Screw	Ref. +	BI WW-G60B-0H0 (5/16-18 x 1/2)						
10	Release Stud	1	BI 01-34152-00						
11	Body	1	BI 01-31752-00						
12	Mandrel	1	BI 01-25386-00						
13	Split Ring Ret.	1	BI 01-32624-00						
14	Split Ring Seg.	2 Seg	BI 01-32623-00						
15	Release Sleeve	1	BI 01-73660-00	BI 01-35834-00	BI 01-44586-00	BI 01-86351-00	BI 01-44561-00	BI 01-85673-00	
16	Mandrel Guide	1	BI 01-32291-00						
17	Lock Bushing	1	BI 01-25387-00						
18	Hex. Soc. Set. Screw	Ref. +	BI WW-G51B-080 (5/16-18 x 1/4)						
19	Gage Ring	1	BI 01-44437-00	BI 01-37905-00	BI 01-44895-00	BI 01-86352-00	BI 01-44585-00	BI 01-85913-00	
20	Tension Mandrel Lock Spring	1	-----						

+ Item furnished with respective parts.  
 Δ Or BI 01-25394-00 and BI 01-47293-00

**MODEL "BSB-3" HYDRO-SET RETAINER PRODUCTION PACKER**  
**Product No.: BI 409-06**

Model "BSB-3" Retainer Production Packer is the hydraulically set version of the Model "BDB" Packer.

**Features / Benefits:**

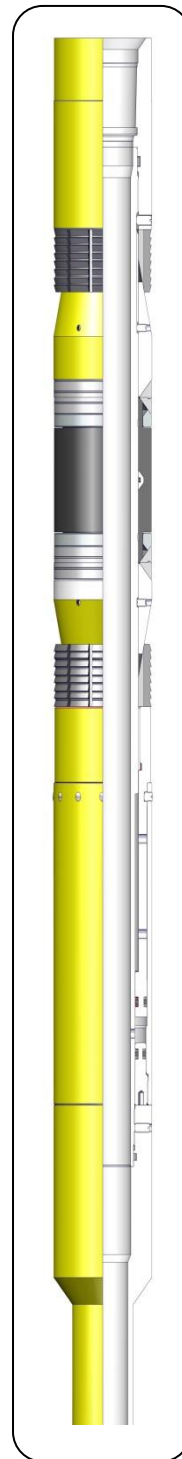
- Solid, slim-line construction and a packing element system that resists swab-off. This provides fast run-in time without fear of impact damage or premature setting, yet packs-off securely and permanently when the Packer is set.
- Two opposed sets of full-circle; full strength slips assure that the Packer will stay where it is set.
- Unique interlocked, expandable metal back-up rings contact the casing and create a positive barrier to packing element extrusion.
- Safety of flanged-up completions.
- Setting requires no rotation or reciprocation, thereby eliminating the problems of spacing out, landing, etc.
- All O-Rings supported by back-up rings to improve long term seal integrity.
- All "BSB-3" Packers are designed to withstand pressure differentials up to 10,000 psi.
- "B" Guide furnished standard allowing attaching of a Millout Extension or other component below the Packer. A blank bottom guide or guide for Seal Bore Extension can be furnished if required.
- All alloy materials within the Packer are suitable f/H2S service.
- The shear release seal assembly on which the Packer is run serves as a Seal Nipple after the Packer is set.

**Packer Setting:**

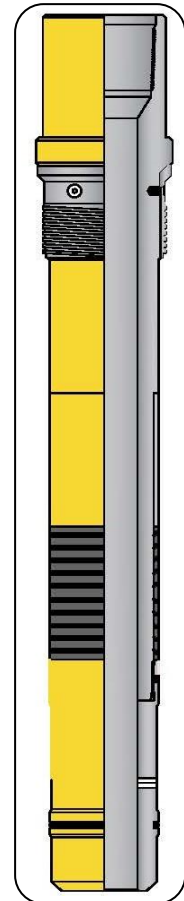
The Model "BD" Shear Release Seal Assembly or the Model "BD" Shear Release Snap Out Seal Assembly is used to set the Model "BSB-3" Packer with tubing pressure. A pump-out ball seat near the bottom of the tubing provides a means of applying setting pressure. After the Packer is set and the ball and seat are pumped out the Model "D" Seal Assembly functions as a Tubing Seal Assembly. If some time later the Shear Release Seal Assembly is removed from the Packer, standard locator seal assemblies can then be used. The setting nut is left in the Packer threads. A Shear Release Snap Out Seal Assembly, however, leaves the packer threads clear so that either Anchor or Locator Type Seal Assemblies can be used after it is removed.

Alternatively the Packer may be RIH attached below an Anchor Tubing Seal Nipple and set by pressurizing against a pump-out Ball Seat. The well may then be produced through the same tubing to which the ATSN is attached.

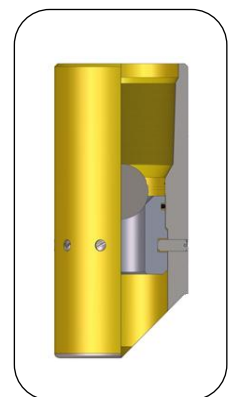
Pressure required to set and pack-off: 2500 psi tubing pressure will fully pack-off all sizes of the "BSB-3" Packer.



Model "BSB-3"  
Hydro-Set Retainer  
Production Packer  
Product No.: BI 414-08



Model "BD"  
Shear Release  
Assembly



Ball Seat Sub  
Assembly

Selection Guide SEAL ASSEMBLY PRODUCT NUMBER		
This product numbers include a ball seat sub-assembly	10 Seals	20 Seals
Model "BD" Shear Release Seal Assembly	BI 409-82	BI 409-83
Model "BD" Shear Release Snap Out Seal Assembly	BI 409-84	BI 409-85

Specification Guide MODEL "BSB-3" Packer										
Casing			Packer				Standard Seal Assembly		Model "D" Shear Release Seal Assembly	
OD (Inch.)	Weight (ppf)	I.D. range in which Packer may be run		Size	OD (Inch.)	Seal Bore (Inch.)	Size	Min Bore Thru Seals (Inch.)	Size	Min Bore Thru Ball Sub (Inch.)
		Min. (Inch.)	Max. (Inch.)							
5	15-21	4.125	4.436	BI 32-19	3.968	1.968	21-19	1.312	BI 30-19	1.005 25.53
							20-19	0.984		
5-1/2	13-17	4.812	5.044	BI 44-25	4.500	2.500	20-25	1.875	BI 40-25	1.875 47.63
6-5/8	17-32	5.675	6.135	BI 82-32	5.468	3.250	80-32	2.406	BI 80-32	2.375
	17-20	6.049	6.456	BI 84-32	5.687					
7	32-38	5.675	6.135	BI 82-32	5.468	3.250	OR		OR	
	20-32	6.049	6.456	BI 84-32	5.687		81-32	1.990	BI 81-32	1.938
	17-20	6.456	6.765	BI 88-32	6.187					
8-5/8	24-36	7.812	8.150	BI 128-40	7.500	4.00	80/ 120-40	3.000	120-40	2.932 74.47
9-5/8	32.3-58.4	8.435	9.001	BI 194-47	8.125	4.750	190-47	3.000	BI 190-47	2.932
							191-47	2.500	OR	
							192-47	3.875	BI 191-47	2.375

**MODEL "BSAB-3" HYDRO-SET RETAINER PRODUCTION PACKER**  
**Product No.: BI 409-07**

Model "BSAB-3" Retainer Production Packers are the hydraulically set versions of Model "BDAB" and "BFAB" Packers.

**MODEL "SABL-3" HYDRO-SET RETAINER PRODUCTION PACKER**  
**Product No.: BI 409-06**

The "SABL-3" (Large Bore) Packer is similar in design to the "SAB" Packer and "SAB-3" Packer. They have Low Pressure Rating because of increased bore size.

**Features/Benefits:**

- Solid, slim-line construction and a Packing Element system that resists swab-off. This provides fast run-in time without fear of impact damage or premature setting, yet packs-off securely and permanently when the Packer is set.
- Two opposed sets of full-circle, full strength slips assure that the Packer will stay where it is set.
- Unique interlocked, expandable metal back-up rings contact the casing and create a positive barrier to packing element extrusion.
- Safety to flanged-up completions permits displacing tubing before setting Packer.
- Setting requires no rotation or reciprocation, thereby eliminating the problems of spacing out, landing, etc.
- All O-Rings are supported by back-up rings to improve long-term seal integrity.
- All "BSAB-3" Packers are designed to withstand pressure differentials up to 10,000 psi.
- "B" Guide furnished as standard equipment allowing attachment of a Millout Extension, seal bore extension or other component, below the Packer.
- One piece alloy steel body which meets NACE standard MR0175-88 for H2S service

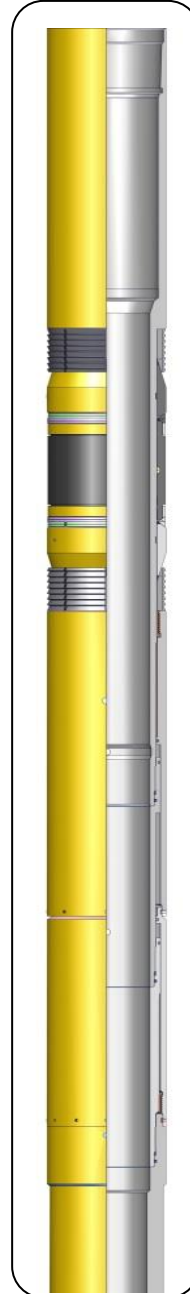
**Packer Setting:**

Using a Model "BK-22" Anchor Seal Tubing Nipple, The Packer is made up to the Tubing String and run to depth. Tubing pressure is applied against a tubing plugging device installed as close to the bottom of the Tubing String as possible. The following plugging devices are suggested.

- Shear- out Ball Seal Sub Product No.: BI 799-27

- Model "BE" Hydro-Trip Pressure Sub Product No.: BI 799-28
- A Wireline Blanking Plug seated in a Nipple.

Setting pressure is held for ten minutes to set Packer and then the plugging device is either pumped out or



Model "SABL-3"  
Hydro-Set Retainer  
Production Packer  
Product No.: BI 409-06



Model "BSAB-3"  
Hydro-Set Retainer  
Production Packer  
Product No.: BI 409-07

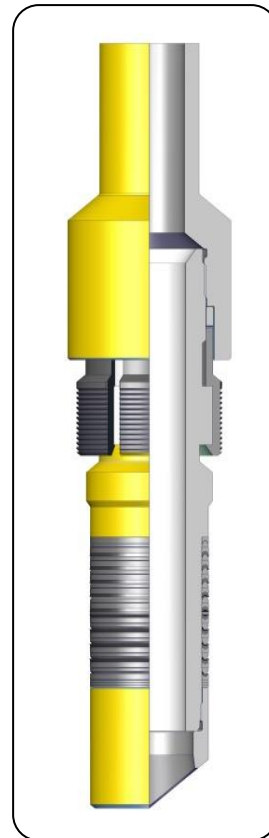
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Specification Guide MODEL "BSAB-3", "BSABL-3" PACKER											
Casing				Packer		Packer Sealing Bore					
O.D. (Inch.)	Weight (ppf)	I.D. Range in Which Packer May Be Run		Size	O.D. (Inch.)	Upper			Lower		
		Min (Inch.)	Max (Inch.)			Seal Bore (Inch.)	Seal Assembly Size	Min Bore Thru Seals (Inch.)	Seal Bore (Inch.)	Seal Assembly Size	Min Bore Thru Seals (Inch.)
5	15- 21	4.125	4.436	32BSAB30 x 19	3.968	3.000	20FA30	2.390	1.968	20-19	1.000
										21-19	1.312
5-1/2	13- 17	4.812	5.044	44BSAB30 x 25	4.500	3.250	40DA32	2.500	2.500	20-25	1.875
6-5/8	17- 32	5.675	6.135	82BSAB40 x 32	5.468	4.000	80DA40	3.250	3.250	80-32	2.406
	17- 20	6.049	6.456	84BSAB40 x 32	5.687						
7	32- 44	5.675	6.135	82BSAB40 x 32	5.468						
	20- 32	6.049	6.456	84BSAB40 x 32	5.687						
	17- 20	6.456	6.765	88BSAB40 x 32	6.187						
8-5/8	24- 36	7.812	8.150	128BSAB47 x 40	7.500	4.750	81FA47	3.875	4.000	80/120-40	3.000
9-5/8	32.3- 58.4	8.435	9.001	194BSAB60 x 47	8.125	6.000	190DA60	4.875	4.750	191-47	2.500
				194BSAB60 x 48						190-47	3.000
				192-47						3.875	
								4.875	—	—	
10-3/4	32.75- 55.5	9.660	9.760	214BSABL	9.437	7.500	190FA75	6.031	6.000	190-60	4.875

**MODEL "BK-22" ANCHOR TUBING SEAL NIPPLE**  
Product No.: BI 443-38

Used for sealing in the upper bore of Model "BDA", "BFA", "BSAB-3" Packers. Supplied with one Seal Stack and blank or half Mule Shoe Bottom Sub which will not accommodate tail pipe of production tubes. The Seal Stack can be provided suiting to the specific well conditions. The "BK-22" Anchor features metal-to-metal internal connections for hostile environments. The Top connection can be specified as requested.

Specification Guide LOCATOR/ANCHOR TUBING SEAL ASSEMBLIES & NIPPLES			
Seal Assembly/Nipple		Seal Stack	
Model	Description	Nitrile Chevron	V-Ryte
BG-22	LTSA w/2 SU	BI 442-34	BI 453-01
BG-22	LTSA w/6 SU f/SBE	BI 442-80	BI 453-10
BE-22	ATSA w/2 SU	BI 443-44	BI 454-01



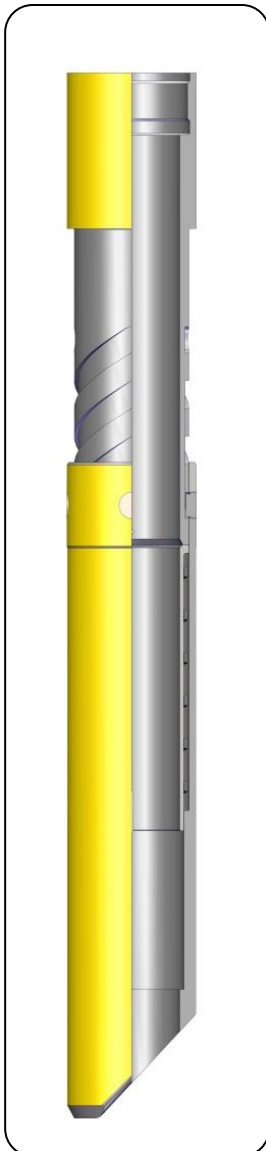
Model "BK-22"  
Anchor Tubing  
Seal Nipple  
Product No.: BI 443-38

### AUTO ORIENTING BOTTOM SUB WITH HALF MULE SHOE

Product No.: BI 442-A0

The bottom sub of L.T.S.A is provided with double-start helical groove and two Guide Pins. Half Mule Shoe as shown in the accompanying illustration.

The double-start helix provides for uniform self-orienting action of the Half Mule Shoe to permit easy entry in the Packer bore.



Auto Orienting Bottom  
Sub With Half  
Mule Shoe  
Product No.: BI 442-A0

### DOWN HOLE SEALING SYSTEMS PACKER TO TUBING - SEAL SYSTEM SELECTION

A variety of sealing accessories are available for use with Retainer Production Packers. Each is designed to meet the specific requirements of certain completion techniques. To select the proper Packer-to-Tubing Seal System for any well completion, careful consideration must be given to present and future well conditions. Factors which must be considered are:

- Seal movement
- Maximum pressure differential
- Maximum and minimum temperatures
- Well Fluids & (H<sub>2</sub>S, CO<sub>2</sub> or other corrosives and inhibitors)

These environmental considerations will determine the best combination of Packer Seal Accessory type (locator, anchor or other), accessory material (metals), and seal stack (elastomers) for use in each case.

### SEAL STACKS

**Standard Seal Stack:** Made up of Nitrile Chevron Seals and steel spacer rings. Should not be allowed to leave seal bore in service.

**V-RYTE Seal Stack:** Made up of Viton Chevron Seals with Teflon and Ryton back-up rings, Ryton front-up rings and steel separators. Should not be allowed to leave seal bore in service. This Seal Stack is used for hostile well environment with H<sub>2</sub>S & Co<sub>2</sub> at high temperatures.



Standard Seal Stack



## MODEL "BG" LOCATOR TUBING SEAL ASSEMBLY

Basic assembly includes two seal stacks. Any number of seal units can be added for increased length. Production tubes, tail pipe or other accessories with OD's compatible with Packer bore can be attached to the bottom of this seal assembly.

The Locator Tubing Seal Assembly is the simplest Packer Seal system. It is run in the well on the production tubing string until its no-go shoulder "locates" on the top of the Packer. This positions one or two Seal Stacks in the Packer's bore and establishes a seal between the Packer and the Tubing. The number of Seal Stacks in the Packers is determined by the type of Packer being used. Packers with enlarged upper or alternate seal bores use Seal Nipples with one Seal Stack. Packers which do not have alternate seal bores will accept seal assemblies with two or more Seal Stacks.

When a Locator Tubing Seal Assembly is landed on a Packer the Tubing is normally set in compression to compensate for any contraction of the tubing during treating operations. It is not always possible or desirable to slack off sufficient weight, particularly in deep deviated wells, to compensate for contraction. In such a case, additional length must be added to the Packer's seal bore using seal bore extensions and to the Locator Tubing Seal Assembly using a combination of Spacer Tubes along and additional seal units.



Model "BG"  
Locator Tubing Seal  
Assembly

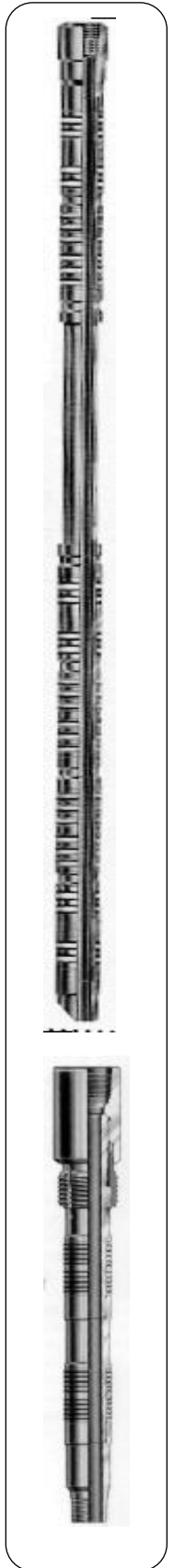
## MODEL "BG" LOCATOR TUBING SEAL ASSEMBLY WITH SPACER TUBE

This extended Model "BG" Locator Tubing Seal Assembly is furnished with 6 Seal Stacks. Designed for installations requiring tubing movement, this seal assembly should only be used with Packers with Seal Bore Extensions or with Retrievable Packer Bore Receptacles. Like all Locator Tubing Seal Assemblies, it should be landed with sufficient set-down weight to prevent seal movement. When used in a properly designed system, this seal assembly will give long service life even if movement occurs.

## MODEL "BE" ANCHOR TUBING SEAL ASSEMBLY

Basic assembly includes two Seal Stacks designed for use in Model "BD" Packers. Production Tubes, Tail-Pipe or other accessories with ODs compatible with Packer bore can be attached to the bottom of this seal assembly.

An Anchor Tubing Seal Assembly can be used as an alternative to set-down weight to prevent seal movement or when it is desirable to land the Tubing in tension. The Anchor Tubing Seal Assembly or Anchor Tubing Seal Nipple is run on the production tubing string. Set-down weight will cause the anchor's threaded latch to engage the corresponding threads in the top of the Packer. Once engaged, the Anchor and Tubing are securely locked in place. Any Tubing contraction will cause a tensile load to be applied to the Tubing String. Care must be taken to ensure tensile forces developed will not part the Tubing whenever an anchor is used. To release the Anchor it must be rotated to the right 10 to 12 turns at the Packer.



## MODEL "DR" LOCATOR TYPE PACKER PLUG

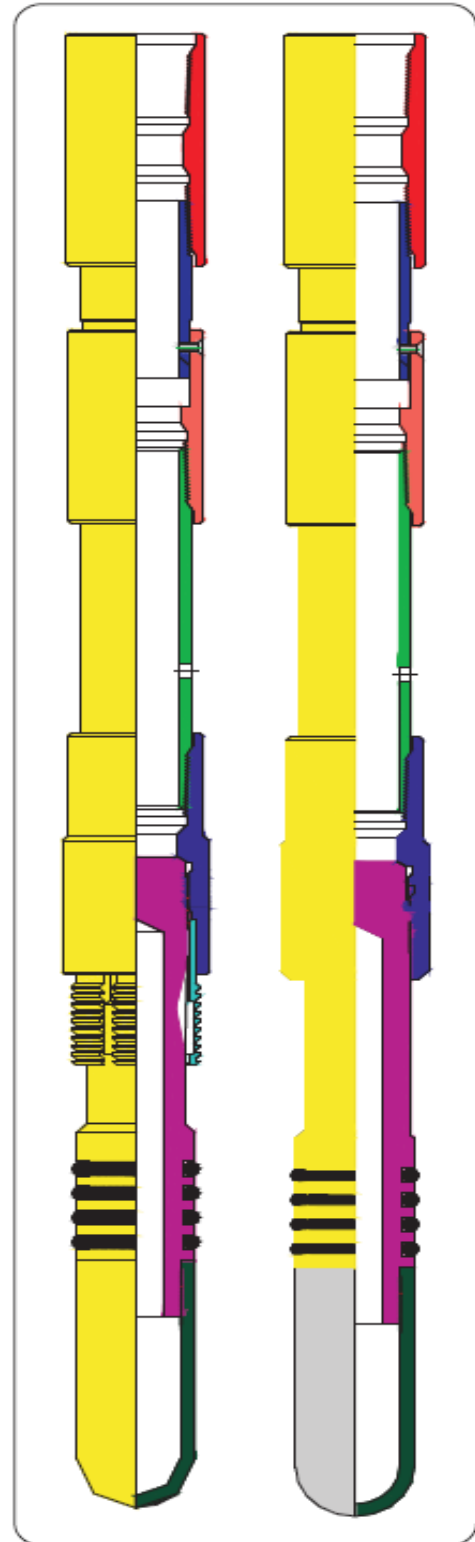
Product No.: BI 665-01

The Model "DR" Locator Type Packer Plug is used to convert a Model "BD", "BF-1" Retainer Production Packer that has been previously set, into a temporary Bridge Plug. It permits the performance of pressuring operation above the Packer without affecting the zones below. It is attached with Shear Screws to a Shear Sub which is made up on the bottom of the Work String or a Retrievable Squeeze Tool. Set-down weight shears the screws and leaves the plug in the Packer. It is retrieved with a conventional overshot.

## MODEL "DR" LATCHING TYPE PACKER PLUG

Product No.: BI 665-03

The Model "DR" Latching Type Packer Plug is used for the same purpose and in the same way as the locator type but will hold pressure in both directions. It is run in the same way but is retrieved by holding a slight up-strain and turning to the right 15 turns after engaging with a conventional overshot.



Model "DR"  
Locator Type  
Packer Plug  
Product No.:  
BI 665-01

Model "DR"  
Latching Type  
Packer Plug  
Product No.:  
BI 665-03

**Specification Guide  
MODEL "DR" PACKER PLUGS  
PRODUCT NOS.: BI 665-01, BI 665-03**

Packer		Packer Plug Size	
Model	Series	Locator Product No.: BI 665-01	Latching Product No.: BI 665-03
BF-1	20-23	BI 20-23	BI 20-23
BD	30-25	BI 20-25	BI 20-25
BD, BF-1	40-30	BI 60-30	BI 60-30
	60-30		
BD	80-26	BI 80-26	BI 80-26
BD	80-32	BI 80-32	BI 80-32
BF-1	80-40	BI 80-40	BI 80-40
BD	190-40	BI 80-40	BI 80-40
BD	190-47	BI 190-47	BI 212-47
			BI 190-47
BF-1	190-60	BI 190-60	BI 190-60

## TYPICAL HOOK-UP WITH MILLOUT EXTENSION AND SEAL BORE EXTENSION

## TYPICAL HOOK-UP WITH SEAL BORE EXTENSION

### ANY SEAL BORE PACKER

Permanent Packers are generally available for threading extensions below the Packer and are designed with the model letter "B" added to the Packer Model, as "BDB", "BFB", etc.

#### "B" GUIDE

"B" Guides are threaded bottom subs for Seal Bore Packers, and can be ordered separately or as an integral part of the Packer, i.e. "BDB" etc. They are available as box thread down to accommodate Millout Extensions or Seal Bore Extensions or, as pin thread down to Crossover to other tail-pipe. Standard Millout Extensions utilize API tapered thread connections. Other threads are available on request. Seal Bore Extension connections utilize a straight thread and need not be specified.

#### MILLOUT EXTENSION

Product No.: BI 499-41

For Packers that will eventually be milled out using the Model "CJ" Packer Milling Tool, the Millout Extension is used to provide the length and inside diameter necessary to accommodate the Mandrel and Catch Sleeve of a standard Model "CJ" Tool. Millout Extensions are not required when using the Model "CK" Packer Milling Tool.

#### CONNECTOR SUB-MILLOUT EXTENSION TO-SEAL BORE EXTENSION

#### SEAL BORE EXTENSION WITH BLANK BOTTOM

Product No.: BI 499-40

#### "B" GUIDE

#### SEAL BORE EXTENSION

Product No.: BI 499-40

A Seal Bore Extension is used to provide additional sealing bore when a long seal assembly is run to accommodate Tubing movement. The Seal Bore Extension has the same ID as the Packer. Packers with continuous seal bores are milled out and retrieved with the Model "CK" Packer Milling Tool.

#### CONCENTRIC COUPLING

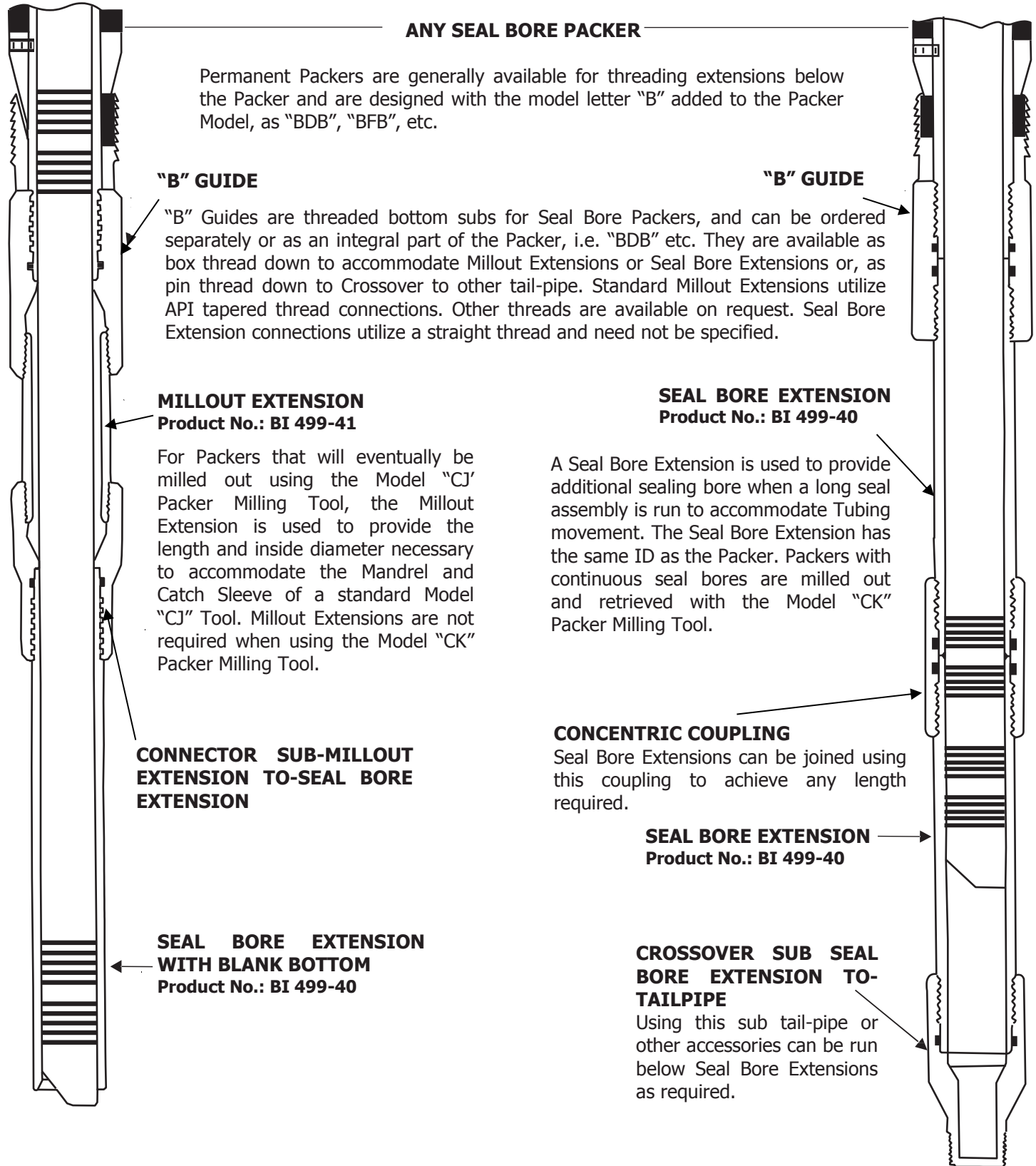
Seal Bore Extensions can be joined using this coupling to achieve any length required.

#### SEAL BORE EXTENSION

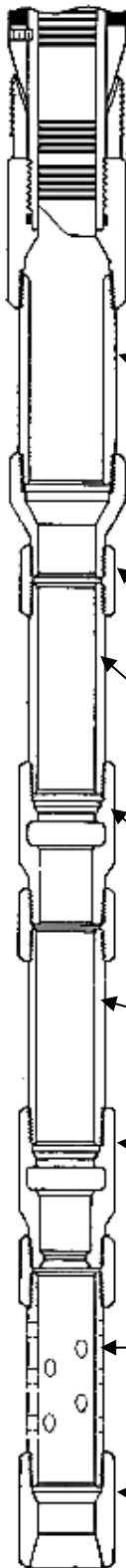
Product No.: BI 499-40

#### CROSSOVER SUB SEAL BORE EXTENSION TO-TAILPIPE

Using this sub tail-pipe or other accessories can be run below Seal Bore Extensions as required.



## TYPICAL HOOKUP WITH MILLOUT EXTENSION AND FLOW CONTROL ACCESSORIES



**ANY SEAL BORE PACKER**

Permanent Packers are generally available for threading extensions below the Packer and designated with the model letter "B" added to the Packer model, as "BDB" etc.

**"B" GUIDE FOR MILLOUT EXTENSION**

The "B" versions of these Packers are the same basic Packers as the regular versions as far as construction, running and setting, holding characteristics, etc., are concerned. The only difference is the Lower Guide, which in the "B" version is threaded to accept the various extensions.

**MILLOUT EXTENSION**

**Product No.: BI 499-41**

For Packers that will eventually be milled out using the Model "CJ" Packer Milling Tool, the Millout Extension is used to provide the length and inside diameter necessary to accommodate the Mandrel and catch sleeve of a standard Milling Tool. Millout Extensions are not required when using the Model "CK" Packer Milling Tool.

**CROSSOVER SUB—MILLOUT EXTENSION TO TAILPIPE**

**Product No.: BI 266-69 or BI 469-10**

**TUBING COUPLING**

**Product No.: BI 457-60**

**SPACER TUBE**

**Product No.: BI 457-40**

**MODEL "F" SEATING NIPPLE**

**Product No.: BI 801-50**

**SPACER TUBE**

**Product No.: BI 457-40**

**MODEL "R" SEATING NIPPLE**

**Product No.: BI 801-55**

**PERFORATED SPACER TUBE**

**Product No.: BI 457-43**

**WIRELINE ENTRY GUIDE**

**Product No.: BI 469-21**

### MODEL "BIM" EXPANSION JOINT

Product No.: BI 995-59

#### Description:

Model BIM Expansion Joint is designed for use above Packers in well completions to compensate for Tubing movement during treating and injecting operations and where rotation through the tool is required. The design allows torque to be applied through the tool at any position.

#### Features:

- Rotationally locked at all times for transmitting torque when required.
- Multi-spline design for high torque load.
- Maximized tension carrying capability.
- ID compatible with tubing ID.
- Tool can be pinned at one foot spacing from closed to fully stroked position.
- Shear value can be adjusted by varying the number of shear screws.

- **Torsional Rating:**

Torsional rating are 7,500 ft-lb for Standard Service at 110,000 psi material yield and 5,500 ft-lb for sour Service at 80,000 psi material yield. Other torque rating can be provided on request.

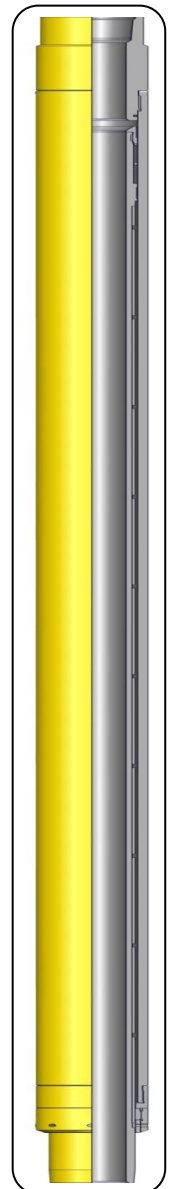
- **Pressure Rating:**

Pressure rating can be provided upto 10,000 PSI depending on the service type and material selection.

- Different Seal Stack configurations, such as standard Nitrile Chevron, Bonded Nitrile, V-Ryte (Viton-Ryton-Teflon), A-Ryte (Aflas-Ryton-Teflon) etc. are available to suit a variety of temperatures and well fluid combinations.
- Tensile Rating is compatible with Tubing.
- 'BIM' Expansion Joint can be made upto 20 ft. length.

Dimensional Data MODEL "BIM" EXPANSION JOINT				
DIM	Sizes			
	2-3/8" x 6ft	2-3/8" x 10ft	2-7/8" x 6ft	2-7/8" x 10ft
OD/HOU (Inch.)	3.688		4.360	
ID/HOU (Inch.)	3.000		3.359	
ID/MAN (Inch.)	1.995		2.441	
L/HOS (Inch.)	86.125	134.125	86.125	134.125
L/MAN (Inch.)	91.250	139.250	91.250	139.250
L/TOL (Inch.)	101.312	149.312	101.312	149.312
*BOX THD	2-3/8" 8Rd. EUE Box Thd. or as ordered		2-7/8" 8Rd. EUE Box Thd. or as ordered	
*PIN THD	2-3/8" 8Rd. EUE Pin Thd. or as ordered		2-7/8" 8Rd. EUE Pin Thd. or as ordered	
Stroke	6 ft.	10 ft.	6 ft.	10 ft.

DIM	SIZES				
	3-1/2" x 6ft	3-1/2" x 10ft	4-1/2" x 6ft	4-1/2" x 10ft	5-1/2" x 20ft
OD/HOU (Inch.)	5.250		6.406		7.280
ID/HOU (Inch.)	4.000		5.250		6.094
ID/MAN (Inch.)	2.992		3.989		4.778
L/HOS (Inch.)	86.125	134.125	86.125	134.125	255.810
L/MAN (Inch.)	91.500	139.500	92.281	140.281	263.281
L/TOL (Inch.)	101.562	149.562	102.343	150.343	275.562
*BOX THD	3-1/2" 8Rd.EUE Box Thd. or as ordered		4-1/2" 8Rd.EUE Box Thd. or as ordered		as ordered
*PIN THD	3-1/2" 8Rd.EUE Pin Thd. or as ordered		4-1/2" 8Rd.EUE Pin Thd. or as ordered		as ordered
Stroke	6 ft.	10 ft.	6 ft.	10 ft.	20 ft.



Model "BIM"  
Expansion Joint  
Product No.: BI 995-59

## MODEL "BE" EXPANSION JOINT

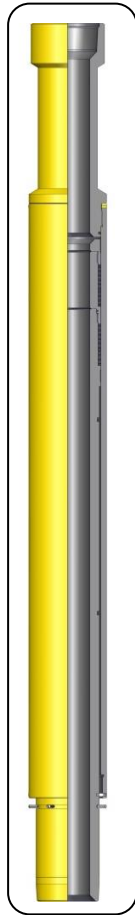
Product No.: BI 441-45

### Description:

The Model "BE" Expansion Joint is designed for use above packer in well completions to compensate for tubing movement during treating and injection operations.

### Features & Limitations:

- Rotational lock in fully extended position to transmit torque when required.
- Extra-long seal area to provide adequate sealing in case of side load.
- Upto 20 feet travel as per requirement.
- Utilizes Elastomeric Seals to suits well condition which can be easily field replaced.



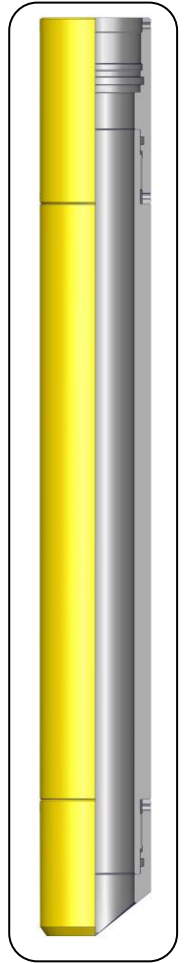
Model "BE"  
Expansion Joint  
Product No.: BI 441-45

## SEAL BORE EXTENSION

Product No.: BI 499-40

### Description & Application:

Seal Bore Extension can be run below a "BDB" and "BFB-1" Retainer Production Packer. Seal Bore Extension is run to provide additional sealing bore when a long Seal Bore Assembly is run to accommodate considerable tubing movement. The Seal Bore Extension has the same ID as the corresponding Packer seal bore it is run with, thus all seals of a long Seal Assembly seal off in the Seal Bore Extension. If the top set of seal normally sealing in the Packer bore should get damaged, the Seal Bore Extension still provide a sealing surface for the lower seal.



Seal Bore Extension  
Product No.: BI 499-40

Dimensional Data MODEL "BE" EXPANSION JOINT	
Dim.	Size (Inch.)
Top Sub OD	5.500
Top Sub ID	3.885
Housing OD	3.875
Housing Length	288
Total Length	304
Pin Thd.	4-1/2", 12.6 VAM
Stroke Length	UPTO 20 FT

Note: Sizes for reference only, Other sizes available.

Dimensional Data SEAL BORE EXTENSION			
Dim.	Size 40-26	Size 80-32	Size 194-40
OD (Inch.)	3.625	4.250	5.125
Seal Bore ID (Inch.)	2.668	3.250	4.000
Length (Inch.)	120	120	120
Guide OD (Inch.)	4.328	5.468	7.125
Coupling OD (Inch.)	4.500	5.468	8.125
Thd.	3.406, 8 STUB ACME	4.094, 8 NAT'L	4.906, 8N
Guide THD.	2 7/8" E.U.8 RD. PIN	PIN THD. AS ORDRED	

Note: Length is indicative. Can be furnished in any length to suit customer need.



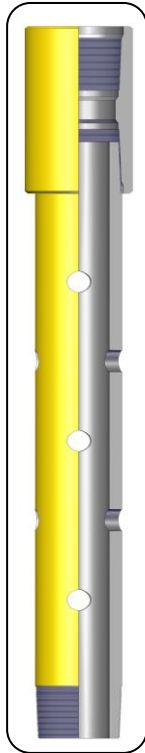
## PERFORATED SPACER TUBE

Product No.: BI 457-43

### Description:

The Perforated Spacer Tube is used at the end of a Tubing String to provide an alternate flow path in cases where Wireline measuring devices are used.

The Perforated Spacer Tube is made of J-55 or equivalent material and its assembly consists of a perforated Nipple with Standard Tubing Thread, a Crossover Coupling up, and a Crossover Sub down. Available in tubing size 1.660" through 4-1/2" and casing sizes 4-1/2" through 7-5/8". The standard length of all Perforated Spacer Tubes is six feet with the exception of Tubing size 1.660. (This size will have a standard length of five feet.) Specify box thread up and pin thread down when ordering.



Perforated Spacer Tube  
Product No.: BI 457-43

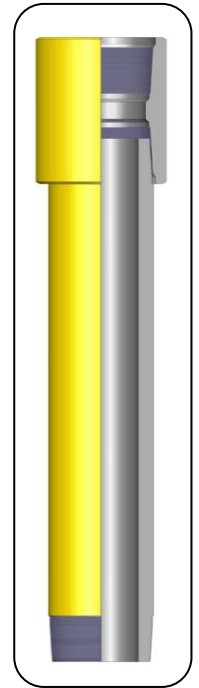
## MODEL "E" FULL OPENING NON-PERFORATED PRODUCTION TUBE

Product No.: BI 457-04

### Description:

The Type "E" Full Opening Non-Perforated Production Tube is made-up at the bottom of the seal assembly. Its basic purpose is to act as a stinger (or extension) to keep the Packer Flapper Valve open when producing or when working below the packer.

This assembly consists of the production tube (with Mule Shoe Guide) and a coupling. Available in tubing sizes 1.660 through 4". Standard length is 5 feet. Other lengths are available on special order. Coupling ODs are turned to clear packer bores. Specify thread when ordering.



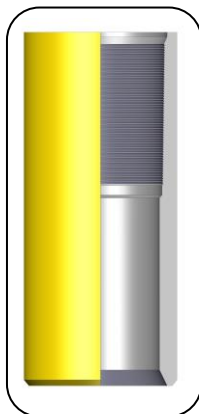
TYPE "E"  
Non-Perforated Spacer  
Tube  
Product No.: BI 457-04

## WIRELINE ENTRY GUIDE

Product No.: BI 469-21

### Description:

The Wireline Entry Guide is designed to be run on the bottom of the Tubing String. It will aid Wireline tools that have passed out the bottom of the tubing to re-entry without hanging up. Specify tubing size and thread.



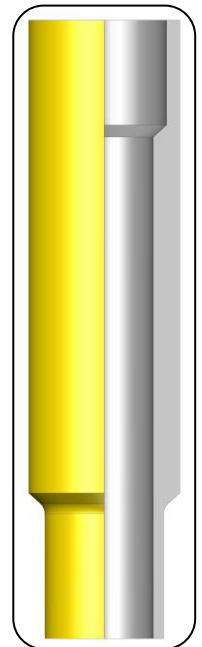
Wireline Entry  
Guide Tube  
Product No.: BI 469-21

## FLOW COUPLING

Product No.: BI 819-20, BI 819-25, BI 819-26 & BI 819-27

### Description & Application:

The Flow Coupling is a thick-walled section of Tubing that minimises the resultant effects of internal erosion that can occur in a Tubing String in a flowing well. Changes in the diametral cross-section of a flow stream cause turbulence which accentuates the erosive effects of abrasive particles carried in the flow stream and can also cause erosion by cavitation effects. Flow Couplings are commonly installed immediately downstream and upstream of major turbulence inducing locations in a Tubing column. The Flow Coupling OD and ID are sized to be compatible with the particular Tubing size weight with which they are intended to be utilised, and are provided with this appropriate tubing thread connections.



Flow Coupling  
Product No.: BI 819-20

### MODEL "BRSB" RETRIEVABLE HYDRAULIC SEAL BORE PACKER

Product No.: BI 646-88

#### Description:

Model "BRSB" Retrievable Hydraulic Seal Bore Packer is a Retrievable Packer, Hydraulically set by pressure in the Tubing. It is run with BH Hydraulic Setting Tool and the retrieving is done independently from the Tubing, using a Retrieving Tool manipulated on a work string. This packer is ideally suited for highly deviated well both onshore and offshore.

#### Applications:

Model "BRSB" Retrievable Hydraulic Seal Bore Packer can be used in oil production wells or in water or gas injection wells. It is also called "ERD" Packer.

#### Advantages:

Run and set with the Production Tubing.

**Hydraulic setting** eliminates the requirements for spacing out and opening and closing with the help of Sliding Sleeves for the displacement of fluids.

**Effects on the tubing** (compression and tension) are transmitted to slips- there is no shear ring which limits these stresses.

**Retrieval Independent** of the Tubing using a Retrieving Tool. It can be left at the bottom of the well with a By-pass Blanking Plug in a Nipple to isolate the formation.

**Opposed slips** (without hold down) positioned

Available for standard H2S (or CO2) Service, NACE MR 01-75.



Model "BRSB"  
Retrieval Hydraulic  
Seal Bore Packer  
Product No.: BI 646-88

#### Running:

- Check that the outside diameter corresponds to the weight of the tubing.
- Lubricate the polished bore
- Install the test pins in the corresponding holes, hold them in place with an elastic band or adhesive strip,
- Pressurize the assembly and make sure that there are no air pockets.
- Remove test plugs and test pins.
- Lower the Packer slowly to the required position. Be careful when entering Liners.
- Install and land Tubing Hanger.
- Test the Tubing by running a Standing Valve in a Nipple above the Packer.
- Install the well head.
- Displace the mud with a "completion" fluid in the annulus by introducing a lighter fluid such as diesel or gas oil into the tubing.
- Run the Standing Valve into the Seating Nipple under the Packer. Remain attached to the Standing Valve
- Apply a pressure to set the Packer - this Should be done without stopping pumping.

#### Setting Procedure:

- Pressure is applied on the bottom of the piston contained by O - ring which shear the Shear Screws.
- The packings are then packed off.
- The Shear Pins are sheared allowing the upper slips to come in contact with casing, followed by the Shear Pins shearing and allowing the lower slips to come in contact with the casing as well.
- The pack-off is mechanically held in position by the body lock ring.

#### Retrieving Procedure:

- Run the Retrieving Tool on the work string or the Tubing
- Put set down weight on the Packer and turn to the right to engage the collet of the Retrieving Tool under the Supporting Sleeve of the Packer.
- Once the screws have sheared the Support Sleeve move upwards freeing the support beneath the fingers of the collet. The collet flexes and detaches itself from the thread linking it to the base of the housing. By upward movement of the body of the Packer, the compression of the Packing Element is released and the Slips get retracted. The Setting Sleeve is supported by the Ring which rests on the top of the piston above the O-ring.



Specification Guide MODEL "BRSB" RETRIEVABLE HYDRAULIC SEAL BORE PACKER						
Casing		Tubing	"BRSB" Packer			
O.D. (Inch.)	Weight (ppf) T & C	O.D. (Inch.)	Seal Bore (Inch.)	Outside Diameter (Inch.)	Thread Down (Inch.)	Typical I.D. Thru Seals* (Inch.)
5-1/2	17-20	2.688	2.690	4.552	As Ordered	
7	23-29	3-1/2	4.000	5.955	4-1/2	2.992
	32-35	4-1/2	4.000	5.80	As Ordered	2.992
9-5/8	40-47	3-1/2	4.000	8.425	4-1/2	2.992
		4-1/2	4.875		5-1/2	3.958

\*I.D. will vary with tubing weight

## MODEL "BH-1" HYDRAULIC SETTING TOOL WITH ADAPTER KIT FOR MODEL "BRSB" PACKER

Product No.: BI 800-02

### Description:

The Model BH-1 Hydraulic Setting Tool is a single chamber, tubing pressure actuated setting tool used in gravel pack operations in conjunction with the Gravel Pack Crossover Tool or Hydro-Set Adapter Kit to run and set Drillable Type Production Packers on tubing.

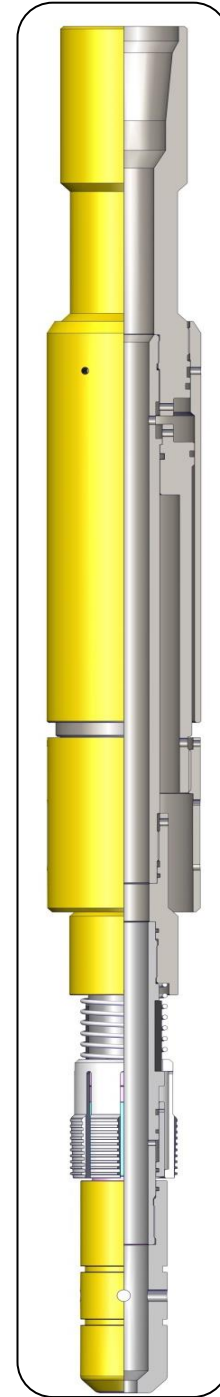
### Features:

- Short and Compact- Increases the efficiency of handling, shipping, and storing as well as operations on the rig.
- Simple Construction- Constructed of a minimum number of working parts, making it economical to maintain.

### Operation:

The Model "BH-1" Hydraulic Setting Tool, with the appropriate Setting Sleeve, Adapter Sleeve, is made up above the Gravel Pack Crossover Tool or Hydro-Set Adapter Kit. This unit is stabbed into the gravel pack assembly and run in place into the well. See 5.0 of this technical literature for proper adjustment of the Setting Tool.

Pump ball to seat and set the Packer.



Model "BH-1"  
Hydraulic Setting Tool  
Product No.: BI 800-02

## MODEL "BR" RETRIEVING TOOL

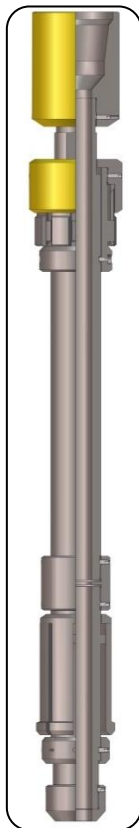
Product No.: BI 646-71

### Description:

The model "BR" Retrieving Tool is used for retrieving MODEL "BRSB" Retrievable Hydraulic Seal Bore Packer.

The latch of the Retrieving Tool is engaged in the Top Box Thread of the Seal Bore Packer, which is a left hand sq. thread. Put Set down weight 3000-5000 Lbs. on the Packer and turn to the right to engage the collet of the Retrieving Tool under the supporting sleeve of the Packer.

**PULL!** In principle the Packer should release with a pull of 5-10 tons. Once the screws have sheared the support sleeve moves upwards freeing the support beneath the finger of the collet the latter can then flex and detach itself from the thread linking it to the base of the Housing. On upward movement of the body of the packer the compression of the packing element are Released and the slips retracted. The Setting Sleeve is supported by the Ring, which rests on the top of the Piston above the O-ring.



Model "BR"  
Retrieving Tool  
Product No.: BI 646-71

## MODEL "BC-2RAH" PACKER ALL SIZES

Product No.: BI 509-07

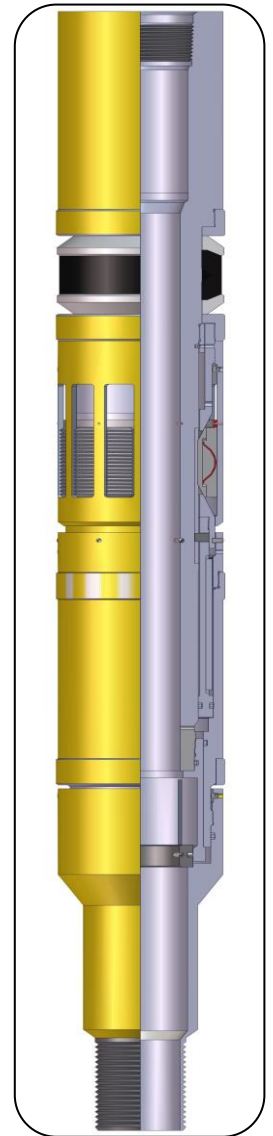
### Description:

The BOTIL BC-2RAH packer is a fully retrievable, high performance retainer production packer. Although originally designed for premium gravel pack applications, they may also be used as standard completion packers in high pressure and/or high temperature wells where premium retrievable retainer production packers are required.

The Model BC-2RAH Packer is fully compatible with standard BOTIL sealing accessories including retrievable and/or expandable plugs.

### Features/Benefits:

- One trip installation.
- No tubing manipulation required. The setting mechanism is actuated hydraulically with pump pressure alone at any depth. The tubing can be displaced and the packer set after the well is flanged up.
- Single, self-energizing cup-forming packing element for repeated low and high differential reversals. Nitrile packing elements are standard.
- Bi-directional, case hardened slips are suitable for all grades of casing. The slips are protected by the slip cage during run-in.
- Packers may be run in tandem with BOTIL model KC-22 Anchor Tubing Seal Nipple.
- A left hand thread is provided in the body head of the packer. This accepts standard packer accessories and also provides a means of positioning the retrieving tool.
- The releasing mechanism for the packer is not affected by differential pressure or tail pipe weight.
- Short overall length facilitating easy running/retrieving through doglegs and tight spots.



Model "BC-2RAH"  
Retrievable Packer  
Product No.: BI 509-07

### Specification Guide MODEL "BC-2RAH" PACKER

Size	Casing Size (Inch.)	Weight (ppf)	Preferred Range of Casing ID's		Gauge Ring O.D (Inch.)	Lower Bore (Inch.)	Upper Bore (Inch.)	Min. Bore Thru Seal (Inch.)	Seal Assembly Size	Retrieving Tool Size
			Min. (Inch.)	Max. (Inch.)						
84A4 – 40 x 32	7	29- 35	5.879	6.189	5.812	3.250	4.000	3.250	80DA40	80- 40x32
84A4 – 47 x 38					5.820	3.875	4.750	3.875 OR 4.000	81FA- 47 OR 82FA- 47	80- 47x38
84B – 47 x 38		6.000								
194A2 – 47 x 38	9-5/8	47- 53.5	8.379	8.681	8.319	4.000	4.750	3.875	192- 47	190- 47x38
194A2 – 47 x 40						4.750		6.000	4.750	190- 60
194A2 – 60 x 47							4.750		6.000	4.750
194A4 – 60 X47		40- 47	8.525	8.835	8.465	4.000	4.750	3.875	192- 47	190- 47X40
194B – 47 X 40		43.5- 53.5	8.535	8.755	8.375	4.000	4.750	3.875	192- 47	190- 47X40
194B – 60 X 47		43.5- 58.4	8.435	8.755	8.275	4.750	6.000	4.750	190- 60	190- 60X47

### MODEL "BH" RETRIEVING TOOL

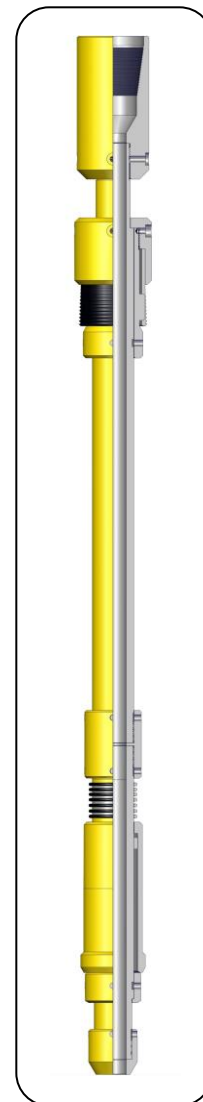
Product No.: BI 646-73

#### Description & Application:

The BOTIL model "BH" Retrieving Tool is used to retrieve BOTIL MODEL "BC-2RAH" Retrievable Hydraulic Seal Bore Packer by applying straight pick-up load.

The Latch of the Retrieving Tool is engaged in the Top Box thread of the seal bore packer, which is a left hand sq. thread.

The spring loaded Collet provides easy engagement of Collet to Support the Ring of Packer. Emergency release feature is provided for emergency retrieval of Drill string along with Retrieving Tool in case of Packer stuck up.



Model "BH"  
Retrieving Tool  
Product No.: BI 646-73

### MODEL "PBR" HYDRAULIC SET RETRIEVABLE SEAL BORE PACKER

Product No.: BI 509-08

#### Description:

Model "PBR" packer is a fully retrievable, high performance retainer production packer. Although originally designed for premium gravel pack applications, it may also be used as standard completion packer in high pressure and/or high temperature wells where premium retrievable retainer production packer is required.

Model "PBR" Packer is fully compatible with standard BOTIL sealing accessories including retrievable and/or expandable plugs.

Model "PBR" has the advantage over Model "BC-2RAH" Packer since it has benefit of a Shear Ring provided in the Body of the Packer enabling the Packer to be retrieved by straight pull using a Retrieving Tool of short length.

#### Features/Benefits:

- One trip installation.
- No tubing manipulation required. The setting mechanism is actuated hydraulically with pump pressure alone at any depth, and The tubing can be displaced and the packer set after the well is flanged up.
- Single, self-energizing cup-forming packing element for repeated low and high differential reversals. Nitrile packing elements are standard.
- Bi-directional, case hardened slips are suitable for all grades of casing. The slips are protected by the slip cage during run-in.
- Tubing may be run with Locator Tubing Seal Assembly pinned in PBR (Packer Bore Receptacle). PBR will be connected to Packer through Anchor Tubing Seal Nipple.
- Packers may be run with BOTIL model KC-22 Anchor Tubing Seal Nipple above the Packer.
- A left hand thread is provided in the body head of the packer. This accepts standard packer accessories and also provides a means of positioning the retrieving tool.
- Packer is design for Straight Pull retrievable applications.
- Short overall length facilitating easy running/retrieving through doglegs and tight spots.
- Short length of Retrieving Tool required to retrieve the Packer.

### MODEL "BC" RETRIEVING TOOL

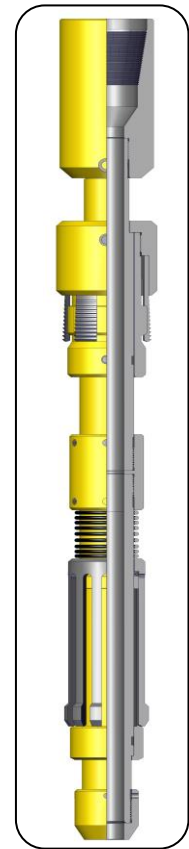
Product No.: BI 609-08

#### Description & Application:

To retrieve PBR Packer on drill pipe or Tubing connects BOTIL Model "BC" Retrieving Tool with drill pipe. Model "BC" Retrieving Tool has Left Hand Square Thread on Latch which easily snaps into PBR Packer Left Hand Square Threads. By applying straight pull up Shear Ring of "PBR" Packer shears and Body moves up. Upward movement of Packer Body causes the packing element and slip system to retract and the Packer comes into the retrieving position.



Model "PBR"  
Retrievable Packer  
Product No.: BI 509-08



Model "BC"  
Retrieving Tool  
Product No.: BI 609-08

### Specification Guide MODEL "PBR" PACKER

Size	Casing Size (Inch.)	Weight Range ( PPF)	Preferred Range of Casing ID's		Gauge Ring O.D (Inch.)	Lower Bore (Inch.)	Upper Bore (Inch.)	Min. Bore Thru Seal (Inch.)	Seal Assembly Size	Retrieving Tool Size				
			Min. (Inch.)	Max. (Inch.)										
84A4-40 x 32	7	29-35	5.879	6.189	5.812	3.250	4.000	3.250	80DA40	80- 40x32				
84A4-47 x 38					5.820						4.750	3.875 OR 4.000	81FA-47 OR 82FA-47	80- 47x38
84B-47 x 38		23-29	6.184	6.366	6.000		3.875	4.000	3.250	80DA40				
84B-40 x 32											9 5/8	47-53.5	8.379	8.681
194A2-47 x 40	4.750	6.000	4.750	192-60	190-47x40									
194A2-60 x 47					40-47	8.525	8.835	8.465	3.250	4.000				
194A4-60 X 47	43.5-53.5	8.535	8.755	8.375										
194B-40 x 32					9 5/8	43.5-53.5	8.535	8.755	8.375	4.780 (4.750 drift)		6.000	4.780 (4.750 drift)	192-60
194B-47 X 40	9 5/8	47 - 58.4	8.435	8.681										
194B-60 x 47														
194B2-60 x 47														

### MODEL "BP" RETRIEVING TOOL

Product No.: BI 610-01

#### Description & Application:

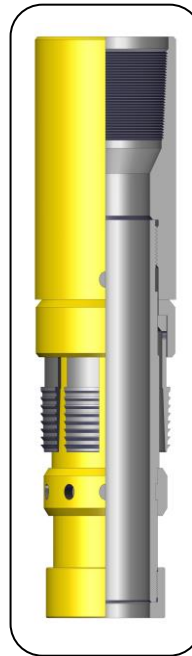
Model "BP" Retrieving Tool is used to retrieve PBR (Packer Bore Receptacle) with Anchor Tubing Seal Nipple or used to retrieve PBR (Packer Bore Receptacle), Anchor Tubing Seal Nipple and PBR Packer in one Trip.

### MODEL "PBR" PACKER BORE RECEPTACLE

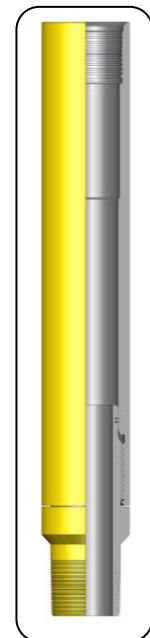
Product No.: BI 510-01

#### Description & Application:

BOTIL Retrievable Packer Bore Receptacle (PBR), may be used where extreme tubing movement is anticipated because of temperature and pressure changes during treatment or production. The PBR is designed to be run above and anchored into the LEFT HAND square threads of Retainer Production Packer or Liner Hanger.



Model "BP"  
Retrieving Tool  
Product No.: BI 610-01



Model "PBR"  
Packer Bore Receptacle  
Product No.: BI 510-01



## MODEL "BR-3" DOUBLE-GRIP RETRIEVABLE CASING PACKER

Product No.: BI 642-01

The "BR-3 Double-Grip" is a truly versatile set-down type Packer. Proven by its world-wide use, it performs reliably in production, stimulation and testing operations.

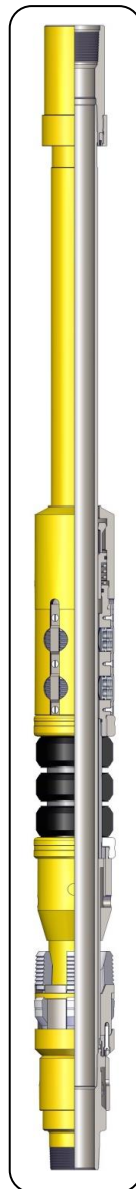
### Features / Benefits:

- Hydraulic button-type holds down located below the by-pass valve.
- Unique, built-in, "differential lock" helps keep the by-pass valve closed.
- Effective by-pass design speeds equalization and resists swab-off.
- Field-proven, three-element packing system and rocker-type slips.

**To Set the Packer:** The "BR-3" is set by picking up, rotating to the right and then slacking off on the tubing. Set-down weight closes and seals the by-pass valve, sets the slips and packs-off the Packing Elements.

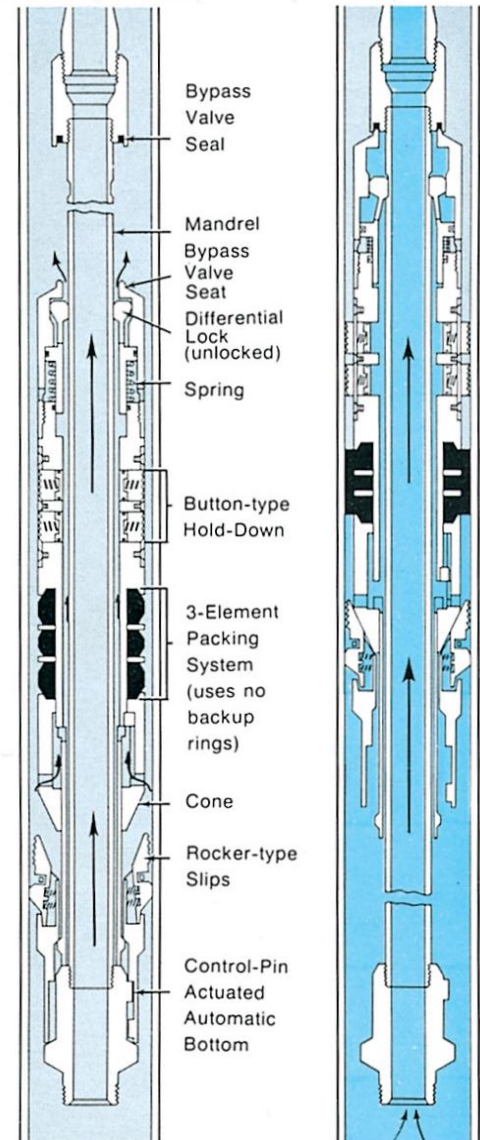
**To Release the Packer:** Picking up the tubing releases the Packer (no rotation required). When the tubing is raised, the by-pass valve opens to permit circulation through and around the Packer.

When the tubing string is raised the full length of the Packer, the J-pins (on the bottom sub) are oriented for automatic re-engagement. By then lowering the tubing slightly, the J-pin engages the J-slot thus assuring complete release and preventing accidental resetting while retrieving the Packer.



Model "BR-3"  
Double Grip Packer  
Product No.: BI 642-01

## MODEL "BR-3" Double-Grip Packer Operation



Running In

Producing



## PRODUCTION AND TEST PACKERS - RETRIEVABLE

Specification Guide MODEL "BR-3" Double-Grip & Single-Grip Casing Packer Product No. BI 642-01, BI 641-01								
Casing				Packer				
O. D. (Inch.)	Weight (ppf) (A)	ID Range in which Packer may be run		Size (B)	Nominal ID (Inch.)	Gage & Guide Ring OD (Inch.)	Thread specification (B) Box Up & Pin Down (Inch.)	
		Min (Inch.)	Max (Inch.)					
4-1/2	9.5- 13.5	3.910	4.090	BI43A	1.89	3.771	2-3/8 OD EU 8 RD	
5	15- 18	4.250	4,408	BI43B		4.125		
	11.5- 15 26	4.408	4,560	BI43C		4.250		
5-1/2	20- 23	4.625	4.777	BI 45A2	1.96	4.500	2-7/8 OD EU8RD	
				BI 45A2 X 2-3/8	2.38			
	15.5- 20 14- 20	4.778	4.950	BI45A4	1.96	4.641		2-3/8 OD EU 8 RD
	17- 20	4.778	4.892	BI 45A4 X 2-3/8	2.38	2-7/8 OD EU 8 RD		
5-3/4	13- 15.5	4.950	5.190	BI 45B	1.96	4.781	2-3/8 OD EU 8 RD	
		4.893	5.044	BI 45B X 2-3/8	2.38		2-7/8 OD EU 8 RD	
	22.5	4.950	5.190	BI 45B	1.96		2-3/8 OD EU 8 RD	
		4.893	5.044	BI 45B X 2-3/8	2.38		2-7/8 OD EU 8 RD	
6-5/8	34	5.5 61	5.609	BI 45E2	1.96	5.405	2-3/8 OD EU 8 RD	
	28- 32	5.6 10	5.791	BI 45E4		5.484		
		5.600		BI 46A2	2.41	5.475	2-7/8 OD EU 8 RD	
	24- 28	5.791	5.921	BI 45EF	1.96	5.484	2-3/8 OD EU 8 RD	
				BI 46A4	2.41	5.588	2-7/8 OD EU 8 RD	
	24	5.830	5.937	BI 47A2		5.656		
17- 20	5.938	6.135	BI 47A4	5.812				
7	38	5.791	5.921	BI 46A4	2.41	5.588	2-7/8 OD EU 8 RD	
		5.830	5.937	BI 47A2		5.656		
	32- 35	5.922	6.135	BI 46B BI 47A4		5.781		
		5.938			5.812	3-1/2 OD EU 8 RD		
		5.989			6.094	-	5.812	3-1/2 OD EU 8 RD
	26- 29	6.136	6.276	BI 47B2	2.41	5,968	2-7/8 OD EU 8 RD	
	20- 26	6.276	6.456	BI 47B4	2.41	6.078	2-7/8 OD EU 8 RD	
BI 47C2				2.41	6.266	2-7/8 OD EU 8 RD		
7-5/8	33.7- 39	6.579	6.797	BI 47C4	2.41	6.453	2-7/8 OD EU 8 RD	
		6.765	7.025	BI 47C4 X 3	3.00		3-1/2 OD EU 8 RD	
	24- 29.7	6.788	7.025	BI 47D2	2.41	6.672	2-7/8 OD EU 8 RD	
		6.766		BI 47D2 X 3	3.00	3-1/2 OD EU 8 RD		
	20- 24	7.025	7.125	BI 47D4	2.41	6.812	2-7/8 OD EU 8 RD	
8-5/8	44- 49	7.511	7.687	BI 47D4 X 3	3.00	7.312	3-1/2 OD EU 8 RD	
				BI 49A2	3.00		7.531	3-1/2 OD EU 8 RD
	32- 40	7.688	7.921	BI 49A4		7.781		
20- 28	7.922	8.191	BI 49B2	8.218				
9-5/8	47- 53.5	8.343	8.681	BI 51A2	3.96	8.437	3-1/2 OD EU 8 RD	
	40- 47	8.681	8.835	BI 51A4		8.593		
	29.3- 36	8.836	9.063					

(A) When selecting a Packer for a casing weight common to two weight ranges (same OD, choose the Packer size shown for the lighter of the two weight ranges.

Example: For 7" 20 lbs./ft. Casing use Packer size 47C2. Under certain circumstances the other Packer size may be run, such as when running in mixed Casing Strings.

(B)Threads shown below are "standard" for the respective Packer sizes. Other threads are available on request. Please specify threads when ordering.

Repair Kits, including such items as packing elements, seal rings, etc. are available for redressing Retrievable Packers.

## MODEL "B-AD-1" TENSION PACKERS

Product No.: BI 739-08

### Description:

The Model "B-AD-1" Tension Packer is compact, economical Retrievable Packer. Primarily used in water flood applications, this Packer can also be used for production and/or treating operations. It is used where a set down Packer is impractical. Because the Model "B-AD-1" is tension set, it is ideally suited for shallow wells where set down weight is not available.

### Feature/Benefits:

- Utilizes BOTIL's rugged rocker type slips.
- Bore through the Packer mandrel is large than drift.
- Simple, low-cost Packer for fluid injection.
- Three release methods ensure retrievability.
- Uses proven one-piece packing element.

### To Set Packer:

Run Packer to desired setting depth, making the last movement downward. Rotate the tubing to the left one quarter turn at the tool. Then, pick up and pack-off.

**Multiple** Packing Element system

**Large Flow Path ID** -2.375 I.D. for 5½"

**Straight Up-strain release**

### To Retrieve Packer:

Lower the tubing at least one foot (0.31m) more than is needed to remove applied tension so that the J-pin will move fully to the top of the J-slot. Rotate the tubing to the right one-quarter turn at the Packer so slips will now be in the running position. Packer can be moved to a new position and reset or it can be retrieved.

An optional J-slot, which provides for auto-release of the Packer by lowering of the Tubing String, is provided on special request.

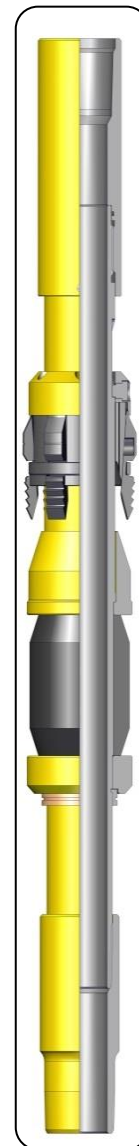
### To Shear Release Packer:

As an alternate release method, the Tension Packer has shear rings designed to part at tension varying from 13,000-100,000 lbs. (5,89 to 45,35 t). The Cone Packing Element and Guide drop down are carried out of hole by the Bottom Sub.

### To Release in Emergency:

Left-hand square threads on the Top Sub of the Packer allow the Tubing to be retrieved when the Packer will not otherwise release.

Required Up strain TO SET PACKER		
Packer Size	Up strain	
	Lbs.	Kg.
41	2,000	907
43 & 45	5,000	2268
47	7,500	3402
49-55	15,000	6804



Model "B-AD-1"  
Tension Packer  
Product No.: BI 739-08





## PRODUCTION AND TEST PACKERS - RETRIEVABLE

### Specification Guide MODEL "B-AD-1" Tension Packer

Casing		Packer						
O.D. (Inch.)	Weight (ppf)	I.D. Range in which Packer May Be Run		Size	Nom. I.D. (Inch.)	Guide Ring O.D. (Inch.)	Thread Specification Box Up & Pin Down (Inch.)	
		Min (Inch.)	Max (Inch.)					
5-1/2	20-23	4.625	4.778	45 A2	1.97	4.500	2-3/8 O.D. EU.8.RD.	
	15.5-20	4.778	4.950	45 A4		4.641		
	13-15.5							
5-3/4	22.5	4.950	5.190	45 B		4.781		
6	26					5.062		
	20-23	5.191	5.390	45 C		5.156		
	15-18	5.391	5.560	45 D		5.406		
6-5/8	34	5.561	5.595	45 E2		5.484		
	28-32	5.596	5.791	45 E4		5.656		2-7/8 O.D. EU.8.RD.
	24	5.830	5.921	47 A2		5.812		
	17-20	5.922	6.135	47 A4	5.656			
7	38	5.830	5.921	47 A2	5.812			
	32-35	5.922	6.135	47 A4	5.968			
	26-29	6.136	6.276	47 B2	6.078			
	20-26	6.276	6.456	47 B4	6.266			
	17-20	6.456	6.538	47 C2	6.453			
7-5/8	33.7-39	6.539	6.765	47 C4	6.672			
	24-29.7	6.766	7.025	47 D2	6.812			
	20-24	7.025	7.125	47 D4				
9-5/8	47-53.5	8.300	8.681	51 A2	4.00	8.218	4-1/2 O.D.8.RD. LG CSG	
	40-47	8.681	8.835	51 A4		8.437		
	29.3-36	8.836	8.681	51 B		8.593		

### MODEL "BA-S" TUBING ANCHOR CATCHER

**Product No.: BI 698-0B**

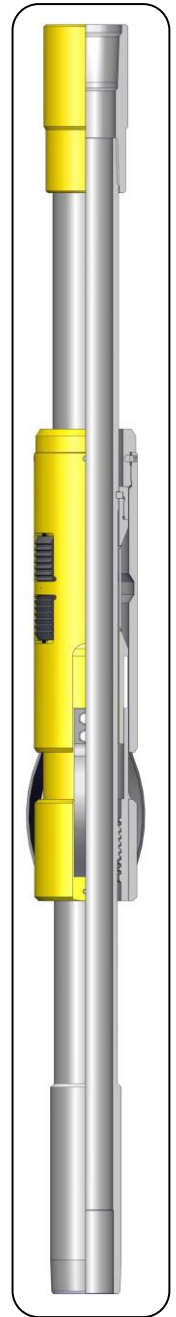
The Model "BA-S" Tubing Anchor performs two important functions: 1) anchors the tubing string, and 2) catches the tubing if it should part. Unlike most anchor catchers, which are set as tubing anchors and rely upon movement of the parted tubing string to set them as catchers, the BOTIL Tubing Anchor Catcher is simultaneously set in anchoring and catching position at all times.

When set with proper tension (to overcome both breathing and buckling), the BOTIL Anchor Catcher effectively cuts operating costs by reducing excessive rod, tubing and casing wear and the number of resulting pulling jobs. Elimination of breathing and buckling also increases production by lengthening the effective stroke of the pump, thereby increasing volumetric efficiency.

#### Features / Benefits:

- No Free Fall if Tubing Parts – The distinguishing feature that sets the BOTIL tubing Anchor Tubing Catcher apart from the other types of anchor catchers is that it catches tubing without permitting any movement since the tool is set in only one position for both anchoring and catching. If the tubing should part, the load is simply transferred through the Slips from the lower cone to Upper Cone with no resulting movement.
- Tool does not "Beat itself to Death" – if the tubing is not properly pre strained when a conventional anchor catcher (with travel between anchoring and catching positions) is set in the well, the conventional tool can literally "beat itself to death" as it slams back and forth between anchoring and catching positions, the result of tubing between anchoring and catching positions, the result of tubing breathing with each cycle of the pump. Since the BOTIL Tubing Anchor-Catch is always set both to anchor tubing in tension and to catch it if it should part, such impact loading is not possible even if pre straining is not correct. There is no possibility of travel between anchoring and catching positions.
- Tubing "breathing" actually cannot occur with the BOTIL Tubing Anchor Catcher.
- Positive Catching regardless of Well Conditions – Since the BOTIL Tubing Anchor Catcher does not transfer from one position to another if the tubing parts, catching the tubing does not depend upon movement of parts that could become stuck with shale deposits or sand. Thus, it is assured that the tubing will caught regardless of length of time the tool has been in the well.

- Slips Held Securely In Place – The slips in the BOTIL Tubing Anchor Catcher are forged with a flange on each side. The flanges fit under the Housing making it impossible for the slips to work loose from the tool. This is in direct contrast to other types of anchor catchers that rely on pins and springs which could break under high corrosive conditions.
- Dependable Drag Springs – The stainless steel Drag Springs of the BOTIL Tubing Anchor Catcher are specially designed with a low-stress value to minimize the possibility of breakage under corrosive conditions. As a safety precaution, however, the springs are attached to the top rather than to the bottom of the tool, so that if they should break they will be pulled rather than pushed when the Anchor Catcher is retrieved from the well. In this manner, the broken spring ends cannot catch on the joints and impede the retrieving operation.
- Simple Operation and Positive Release – The BOTIL Tubing Anchor Catch is set by right-hand rotation and released by straight pull shear release. The Right-hand rotation moves both Upper and Lower Cones under the single set of slips, forcing the Slips out against the casing to set the tool.
- The hold of the slips on the casing provides sufficient drag to permit the tool to be released independent of the Drag Springs.
- Straight Pull Shear Release –BOTIL Tubing Anchor-Catcher provides straight pull release in the form of a selective Shear Pin Arrangement that permits the operator to predetermine the shear value of the tool.



Model "BA-S"  
Tubing Anchor Catcher  
Product No. BI 698-0B

Specification Guide					
MODEL "BA-S" TUBING ANCHOR CATCHER					
Casing		Tubing Anchor Catcher			
O.D. (Inch.)	Weight (ppf)	Tool Size	Tool O.D. (Inch.)	Tool I.D. (Inch.)	Standard Box x Pin
5-1/2	13-23	45A	4.500	2.375	2 7/8" EU 8RD
6	18-23	45B	4.812	2.375	2 7/8" EU 8RD
6-5/8	17-32	47A	5.500	2.438	2 7/8" EU 8RD
7	17-38	47A	5.500	2.438	2 7/8" EU 8RD
				3.000	3 1/2" EU 8RD
9-5/8	32.3-47	51	8.000	3.000	2 7/8" OR 3 1/2" EU 8RD

**MODEL "BG" RETRIEVABLE CASING PACKER**  
**Product No.: BI 420-03**

The Model "BG" Retrievable Casing Packer is a compact, economical set-down Packer that can be used by itself for production applications or, with a companion unloaded and hold-down, it can be used for well stimulation, testing and other pressuring operations and then left in the well as a Production Packer.

**Feature:**

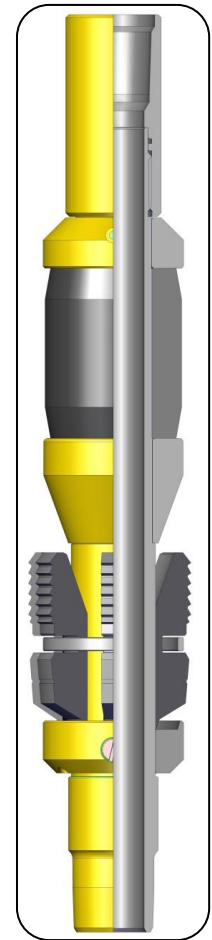
- Rugged rocker-type slips and one piece Packing Element
- Full-opening bore through the Packer.
- Economical to buy and maintain
- Easy to set and release
- Safety Joint for emergency disconnection
- Can be run upside down as a Tension Packer (without the emergency release feature)
- System functions above 250°F (120°C) with an alternate Packing Element system
- Short and compact for ease of storage, shipping and handling.

SET DOWN WEIGHTS	
Packer Size	Minimum Set Down Weight Required
43	6,000 lbs.
45 47 x 3.300	
46 & 47	10,000 lbs.
49 thru 55	15,000 lbs.

**To Set the Packer:** Run the Packer to a position about one foot below the setting depth, and then pick up to the setting point. Rotate the tubing to the right ¼ turn at the tool. Apply set down weight to set and pack-off the tool.

**To Release The Packer:** Simply pick up the Tubing to release. If the Packer is to be moved down-hole and reset, rotate the Tubing to the left ¼ turn at the tool after release.

To remove the Tubing String from the Packer, rotate the tubing string (under slight tension) at least seven turns to the right. The left-hand thread that connects the Top Sub to the body will unscrew, permitting the removal of the Tubing String and the Top Sub from the well.



Model "BG"  
 Retrievable Casing Packer  
 Product No.: BI 420-03

Specification Guide MODEL "BG" RETRIEVABLE CASING PACKER										
Casing		Packer Size	Preferred Range of Casing I.D.'s		Cone & Guide Ring O.D (Inch.)	Packing Element O.D. (Inch.)	Absolute Limits of Slop Travel		Thread Specs.	
O.D. (Inch.)	Weight (ppf) T & C		Min. (Inch.)	Max. (Inch.)			Min (Inch.)	Max (Inch.)	Box up	Pin Down
0	9.5-13.5	BI43A	3.910	4.090	3.771	3.718	3.709	4.091	2-3/8 OD EU 8RD	2-3/8 OD EU 8RD
5	15-18	BI43.B	4.250	4.408	4.125	3.938	4.103	4.409		
5	11.5-15*	BI43C	4.408	4.560	4.250	4.156	4.255	4.561		
5-1/2	26									
5-1/2	20-23	BI45A2	4.625	4.778	4.500	4.375	4.543	4.966		
5-1/2	15.5-20*	BI45A4	4.778	4.950	4.641					
5-1/2	13-15.5*	BI45B	4.950	5.190	4.781	4.687	4.825	5.248		
5-3/4	22.5									
6	26									
6	20 - 23	BI45C	5.191	5.390	5.062	4.938	5.059	5.482		
6	15-18	BI45D	5.391	5.560	5.156		5.197	5.620		
6-5/8	34	BI45E2	5.561	5.595	5.406	5.250	5.449	5.872		
6-5/8	28 - 32	BI45E4	5.596	5.791	5.484					
6-5/8	17-20	BI47B2	6.049	6.276	5.812	5.656	5.911	6.400	3-1/2 OD EU 8RD	3-1/2 OD EU 8RD
7	26 - 29	BIX3.00								
7	20 -26	BI47B4	6.276	6.456	6.078	5.781	6.193	6.680		
6-5/8	28 -32	BI46A2	5.600	5.791	5.475	5.375	5.473	6.013		
6-5/8	24-28	BI46A4	5.792	5.921	5.588					
7	38									
6-5/8	17-20	BI46B	5.922	6.135	5.781	5.500	5.707	6.247		
7	32-25									
6-5/8	24	BI7A2	5.830	5.921	5.656	5.500	5.653	6.262	2-7/8 OD EU 8RD	2-7/8 OD EU 8RD
7	38									
6-5/8	17-20	BI47A4	5.922	6.135	5.812					
7	32-35									
7	26-29	BI47B2	6.136	6.276	5.968	5.781	5.919	6.528		
7	20-26 *	BI47B4	6.276	6.456	6.078					
7	17-20 *	BI47C2	6.456	6.538	6.266	6.125	6.357	6.966		
7-5/8	33.7-39	BI47C4	6.539	6.765	6.453					
7-5/8	24-29.7	BI47D2	6.766	7.025	6.672	6.500	6.607	7.216		
7-5/8	20-24 *	BI47D4	7.025	7.125	6.812					
8-5/8	40-49	BI49A2	7.511	7.725	7.312	6.938	7.300	8.059	3-1/2 OD EU 8RD	3-1/2 OD EU 8RD
8-5/8	32-40 *	BI49A4	7.725	7.921	7.531					
8-5/8	20-28	BI49B	7.922	8.191	7.781					
9-5/8	47-53.5	BI51A2	8.300	8.681	8.218	7.938	8.051	8.934		
9-5/8	40 -47 *	BI51A4	8.681	8.835	8.437					
9-5/8	29.3-36	BI51B	8.836	9.062	8.593	8.312	8.548	9.244	4-1/2 OD 8 RD Long Csg.	4-1/2 OD 8 RD Short Csg.
10-3/4	32.7-55.5	BI53A	9.625	10.192	9.500	9.250	9.548	10.192		
11-3/4	38 - 60	BI53B	10.605	11.200	10.500	10.000	10.503	11.263		
12-3/4	43-53	BI55A	11.750	12.300	11.625	10.875	11.675	12.435		
13-3/8	48-72	BI55B	12.300	12.715	12.000	11.687	12.173	12.745		

\* Packer shown for this weight is recommended and should be run where possible. However, the other size Packer listed for this same casing weight may be run under certain circumstances, such as running mixed strings or unusual hole conditions.

### MODEL "BAR-1" SNAP-SET COMPRESSION PACKER

Product No.: BI 635-31, BI-636-31

The Model "BAR-1" Snap set Compression Packer, "BAR-1" is Retrievable Set Down Packer featuring a bypass area through the Packer and an integral unloaded. It is used as the upper Packer in a single string two-Packer installation for zone isolation, injection, or productions. The "BMR-1" Packer (without slips) is used above either Retainer Production Packers or Retrievable Packers.

#### Features:

- Reliable Multiple Packing Element system that has been proven on the Model "BR-3" Retrievable Casing Packer.
- Simple Operation-No tubing rotation is required. Application of approximately 7000 lbs. set down (against a lower Packer) will set and pack-off the packer. A straight up-stain releases the Packer.
- Simple collet type Snap-latch prevents the Packer from setting before landing the seal assembly (or setting a lower Retrievable Packer). The lower portion of the tool is rotationally locked in order to deliver torque in either direction, through the Packer.
- Versatile - the two models available can fulfil a variety of requirements. The "BAR-1" Compression Packer (without slips) are more economical than the "BMR-1" Packers and may be used where differentials from and above are not severe.



Model "BAR-1"  
Snap Set  
Compression Packer  
Product No.: BI 635-31

#### To Set Packer above a Seal Bore Packer: ("BAR-1" Only)

- Run and set a Retainer Production Packer.
- Make up the Snap Set Packer in Tubing at a desired location and run the Tubing String into the well until the Locator Sub of the Tubing Seal Assembly lands in the Retainer Production Packer.
- Apply set-down weight to set and pack-off the Packer.
- Make up both Packers on the Tubing String and run them into the well.
- Rotate the Tubing as required to prepare the lower Packer for setting, and apply set-down weight to set and pack-off both the Packers.

#### To Release The Packer:

To release the Packer simply pick up on the tubing string. If the weight of the Tubing String below the Packer is less than 1,500 lbs., the snap latch will not "recock", and any attempt to lower the tool back down the hole during retrieving may not be successful. The unloaded will not be locked open. However, if the weight of the Tubing below the Packer is greater than 1,500 lbs., the snap-latch will "recock" to the running-in position. The Packer can then be raised or lowered during the retrieving operation.

Specification Guide MODEL "BAR-1" SNAP-SET COMPRESSION PACKER										
Casing				Packer						
O.D. (Inch.)	Weight (ppf) T & C	Preferred Range of Casing I.D'S		Size	Packing Element O.D. (Inch.)	Packing Element Spacer O.D. (Inch.)	Gauge & Guide Ring O.D. (Inch.)	"BAR-1" W/ Hold-Down Product No. BI636-31 Absolute Limits of Bottom Travel		Thread specification Box Up x Pin down (Inch.)
		Min. (Inch.)	Max. (Inch.)					Min (Inch.)	Max (Inch.)	
4-1/2	9.5-13.5	3.910	4.090	BI43A	3.625	3.771	3.771	3.755	4.105	2-3/8 O.D. EU.RD
5	15-18	4.250	4.408	BI43B	3.938	4.125	4.125	4.095	4.443	2-3/8 O.D. EU. RD
5-1/2	11.5-15 2 6	4.408	4.560	BI43C	4.156	4.250	4.250	4.251	4.599	2-3/8 O.D.
	20-23	4.625	4.777	BI45A2	4.375	4.500	4.500	4.514	4.950	2-3/8 O.D. EU. 8RD
				BI45A2x2-3/8						2-7/8 O.D. EU.8RD
	15.5-20 14-20	4.778	4.950	BI45A4	4.375	4.500	4.641	4.514	4.950	2-3/8 O.D. EU. 8RD
				BI45A4x2-3/8						2-7/8 O.D. EU. 8RD
	13-15.5	4.950	5.190	BI45B	4.688	4.781	4.781	4.764	5.196	2-3/8 O.D. EU. 8RD
BI45Bx2-3/8				2-3/8 O.D. EU.8RD						
5-3/4	22.5	4.950	5.190	BI45B	4.688	4.781	4.781	4.764	5.196	2-7/8 O.D. EU. 8RD
6	26	4.893	5.044	BI45Bx2-3/8						2-3/8 O.D. EU. 8RD
6	20-23	5.191	5.390	BI45C	4.938	5.062	5.062	4.968	5.631	2-7/8 O.D. EU. 8RD
6	15-18	5.391	5.560	BI45 D	4.938	5.156	5.156			
6-5/8	34	5.561	5.609	BI45E2	5.250	5.46	5.406	5.122	5.791	
	28-32	5.610	5.791	BI45E4			5.484			
		24		5.830	5.937	BI47A2	5.500	5.656	5.656	5.548
17-20	5.938	6.135	BI47A4	5.812						
7	38	5.830	5.937	BI47A2	5.500	5.656	5.656	5.548	6.139	2-7/8 O.D.EU.8RD
	32-35	5.938	6.135	BI74A4			5.812			
	26-29	6.136	6.276	BI47B2	5.750	5.968	5.968	5.858	6.456	
	20-26*	6.276	6.456	BI47B4			6.078			
	17-20*	6.456	6.578	BI47C2	6.125	6.266	6.266	6.259	7.397	
7-5/8	33.7-39	6.579	6.797	BI47C4			6.453			
	24-29.7	6.798	7.025	BI47D2			6.500			6.672
20-24	7.025	7.125	BI47D4	6.812						

\* Packer shown for this weight is recommended and should be run where possible, however, the other size Packer listed for this same casing weight may be run under certain circumstances, such as running mixed strings or unusual hole condition.

## MODEL "BTCN" MECHANICAL SET PACKER

Product No.: BI 643-02

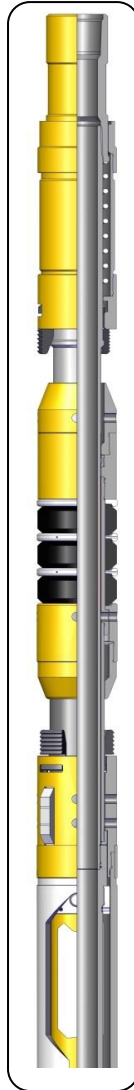
### Description & Application:

Model "BTCN" Retrievable Production Packer meets several zone isolation, production, and injection requirements. Full opening design gives unrestricted flow and allows

Wireline tools to pass. Mechanical lock-setting action holds substantial pressure from above or below without tubing weight or tension. No hydraulic anchor is required to prevent packer movement, even with differential pressures.

Packer's ability to absorb tubing expansion or contraction forces makes the "BTCN" right for both pumping and injection wells. The large internal bypass reduces swabbing effect when running-in or retrieving. When packer is set, by pass is automatically sealed.

The "BTCN" also features an upper slip releasing system that reduces the strain required to release the slips by dislocating a key non-directional slip first which automatically releases the other slips. This mechanical feature replaces the hold down system found in other tools making it independent of pressure variations.



Model "BTCN"  
Mechanical Set Packer  
Product No.: BI 643-02

### Feature & Benefits:

- Tension set for shallow applications.
- Three assemblies are available; small bore, large bore and high pressure.
- Can leave the tubing in a tension, compression or neutral condition.
- Holds pressure from above or below.
- Right hand set, right hand release.
- Jay setting and releasing mechanism.
- Internal by-pass

Internal pressure unloaded seal is located below the upper slips; this allows debris to be flushed away from hold down slips before releasing.

Specification Guide							
MODEL "BTCN" MECHANICAL SET PACKER							
Casing		Casing ID Range		Max O.D. Of Tool (Inch.)	Packer Bore (Inch.)	Thread Connection Box Up / Pin Down	Packer Size
Size (Inch.)	Weight (ppf) T & C	Min (Inch.)	Max (Inch.)				
5 1/2	20-23	4.629	4.852	4.500	2.000	2 3/8 EU 8 RD	450-200
	14-17	4.851	5.075	4.625			462-200
	15.5-17	4.851	5.016		2.375	462-237	
	20-23	4.629	4.852	4.500		450-237	
7	29-35	5.952	6.237	5.812	2.500	2 7/8 EU 8 RD	581-250
	26-32	6.042	6.342	5.875			587-250
	17-26	6.224	6.611	6.000			600-250
	26-32	6.042	6.361	5.875	3.000	3 1/2 EU 8 RD	587-300
	17-26	6.224	6.611	6.000			600-300
9 5/8	43.5-53.5	8.463	8.866	8.250	4.000	4 1/2 EU 8 RD	825-400
	32.3-43.5	8.683	9.101	8.500			850-400



**MODEL "BA-2" LOCK-SET RETRIEVABLE CASING PACKER****Product No.: BI 646-12****Features:**

Lock Set Packer is a retrievable packer with no-movement performance that is ideal for many production, injection and zone isolation operations.

**Hold From Above and Below:**

The Lock Set Packer is mechanically locked for no movement after it is set and packed off. It will hold pressure from above and below without requiring set down weight, tubing tension or the use of hydraulic holds downs to maintain its pack off.

In Pumping wells, the Lock-Set may be used to isolate bad casing and, by applying tension, it can also serve as a Tubing Anchor. By contrast, in water-flood wells, where seasonal temperature changes in injection water can create problems for conventional Packers, Lock-Set permits the Tubing to be installed in neutral. This eliminates the possibility of unpacking the Packer due to elongation of the Tubing, and the possibility of parted strings due to contraction.

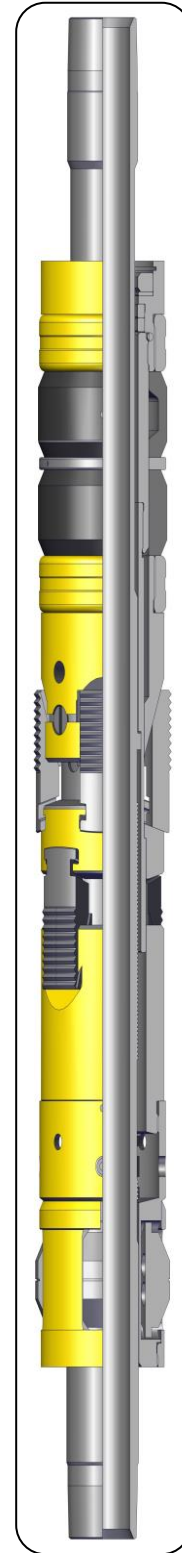
**Safe, Right-Hand Rotation:**

The Lock-Set Packer features a remarkable design that permits right hand control of both setting and releasing, and also locks in compression of the packing element.

The Packer incorporates a releasable Lock ring that provides a no-return, ratchet take up for holding compression of Packing Elements after pack-off. This ratchet lock can release only by right-hand rotation of the mandrel.

The Lock-Set ratchet action is accomplished with left and right multiple threads on the Mandrel, in conjunction with the segmented releasable lock ring. The lock ring contains two segments with matching left hand threads and two segments with matching right hand thread. Depending on the thread involved the arrangement permits ratchet movement of the Mandrel relative to the lock ring, in one direction only. Movement in the opposite direction is possible only by rotating to the right.

The Lock-Set threads have ratchet take ups of 1/8 in. since the success of the pack-off is largely determined by the fineness of the take up, this small increment is important to assure a perfect pack-off.



Model "BA-2"  
Lock-Set Retrievable  
Casing Packer  
Product No.: BI 783-16



Specification Guide																		
MODEL "BA-2" LOCK-SET RETRIEVABLE CASING PACKER																		
Casing		Packer Size	Preferred Range of Casing ID's		Gage Ring OD (Inch.)	Packer ID (Inch.)	Packing Element O D (Inch.)	Packing Element Spacer OD (Inch.)	Absolute Limits of Slip Travel		Drag Block Min. Comp. Height (Inch.)	Thread Spec. Box Up & Pin down						
O.D. (Inch.)	Weight (ppf) T & C		O.D. (Inch.)	Weight (ppf) T & C					Min. (Inch.)	Max. (Inch.)								
4-1/2	11.6-13.5	BI43A2	3.910	4.000	3.771	-	3.625	3.771	3.687	4.207	3.750	2-3/8 OD EU 8 Rd & 2-3/8 OD NU 10 RD						
	9.5-10.5	BI43A4	4.001	4.090					3.938	4.125	4.062		4.582	4.125				
5	15 - 18	BI43B	4.250	4.408	4.125	-	3.938	4.125	4.062	4.582	4.125		2-3/8 OD EU 8 Rd					
	11.5 - 15	BI 43C	4.408	4.560										4.250	4.156	4.250		
5-1/2	26	BI45A2	4.625	4.778	4.500	-	4.375	4.500	4.437	5.221	4.500			2-3/8 OD EU 8 RD				
	20 - 23		BI45A4	4.778							4.950				4.641	4.688	4.781	4.688
	13 - 15.5		BI45B	4.950							5.190				4.781	4.938	5.062	5.000
26	BI45C	5.191		5.390	5.062	5.156	5.437	6.221	5.468									
6	20 - 23	BI45D	5.391	5.560	5.156	-	4.938	5.062	5.000	5.784	5.000				2-7/8 OD EU 8 RD			
	15 - 18	BI45E	5.561	5.609							5.406					5.250	5.406	5.562
6-5/8	34	BI45F	5.610	5.921	5.484	-	5.250	5.406	5.437	6.221	5.468	2-7/8 OD EU 8 RD						
	24 - 32		BI45G	5.922							6.135					5.781	5.500	5.656
7	24	BI47A2	5.830	5.937	5.656	-	5.500	5.656	5.562	6.665	5.936		2-7/8 OD EU 8 RD					
	38		BI47A4	5.938							6.135					5.812	5.750	5.968
6-5/8	17 - 20	BI47B2	6.136	6.276	5.968	-	6.125	6.266	6.200	7.303	6.375			4 OD NU 8 RD				
	32 - 35		BI47B4	6.276							6.366					6.078	6.500	6.672
7	26 - 29	BI47C2	6.456	6.578	6.266	-	6.125	6.266	6.200	7.303	6.375					4 OD NU 8 RD		
	23 - 26		BI47C4	6.579							6.797						6.453	7.000
7-5/8	1 - 20	BI47D2	6.798	7.025	6.672	-	6.500	6.672	7.250	8.276	7.750				4 OD NU 8 RD			
	33.7 - 39		BI47D4	7.025							7.125						6.812	7.500
8-5/8	44 - 49	BI49A2	7.511	7.687	7.312	-	7.000	7.312	7.250	8.276	7.250	4 OD NU 8 RD						
	32 - 40	BI49A4	7.688	7.921							7.531						7.938	8.218
9-5/8	20 - 28	BI49B	7.922	8.191	7.781	-	7.500	7.781	7.250	8.276	7.750		4 OD NU 8 RD					
	47- 53 .5	BI51A2	8.343	8.681							8.218						8.375	8.593
9-5/8	40 - 47	BI51A4	8.681	8.835	8.437	-	7.938	8.218	8.125	9.283	8.125			4 OD NU 8 RD				
	29.3 - 36	BI51B	8.836	9.063							8.593						8.375	8.593

NOTE: Repair Kits (including such items as packing elements, seal rings, etc.) are available for redressing Retrievable Packers.

## MODEL "BFL" AND "BFR" ON-OFF SEALING CONNECTORS

**Product No.: BI 683-15 and BI 683-14**

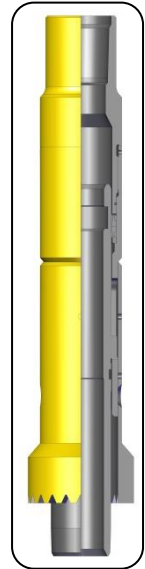
The Models "BFL" and "BFR" On-Off Sealing Connectors are Tubing Seal Receptacles which accommodate isolation of a lower zone by means of a Wireline Blanking Plug and disconnection of the Tubing from the Packer by right or left hand J-slot release.

Although designed for use with the Lock-Set Retrievable Casing Packer, Model "BFL" can be used with any Packer that will stay set without applied tubing tension or weight.

When used with an Anchor Seal Assembly to land in a Retainer Production Packer, an Extension Sub must be used to put the Washover Shoe above the top of the Packer.

### Features/Benefits:

- Moulded seals allow multiple disconnects and reconnects, as well as washing over, without seal damage.
- Right-hand or left-hand release j-slot.
- J-slot can be shear pinned for safety.
- Can be dressed to shear down or up.
- Receptacle design permits wash over down to top of Packer.



Model BFL  
On-Off Sealing Connector  
Product No.: BI 683-15

Specification Guide ON-OFF SEALING CONNECTOR								
Casing O.D. (Inch.)	Tubing O.D. (Inch.)	Size (Wash over Shoe OD x Tubing Thread x BFC Profile Bore)	Wash over Shoe OD (Inch.)	Max BFC Profile Bore (Inch.)	Pressure Rating		Standard Thread Specs (Box Up & Pin Down) (Inch.)	
					Internal	External		
					psi	psi		
4-1/2	2-3/8 & smaller	3-3/4 x 2-3/8 x*	3.75	1.875	6000 424	8,000 656	2-3/8 OD EU 8RD	
5								
5-1/2	2.33	4-1/2 x 2-3/8 x*	4.50	2.312				2-7/8 OD EU 8RD
6								
6-5/8	2-7/8 & smaller	4-1/2 x 2-7/8 x*	5.50	2.812			2-3/8 OD EU 8RD	
7 or 7-5/8	2-3/8#	5-1/2 x 2-3/8 x*						
	2-7/8 & smaller	5-1/2 x 2-7/8 x*						
8-5/8	2-7/8 & smaller	6-1/2 x 2-7/8 x*	6.50	2.312			2-7/8 OD EU 8RD	
		7-1/4 x 2-7/8 x*	7.25					
	3-1/2 & smaller	7-1/2 x 3-1/2 x*	6.50	2.812	3-1/2 OD EU 8RD			
		7-1/4 x 3-1/2 x*	7.25					

\* Specify BFC Profile Bore based on "Max. BFC Profile Bore" data column.  
# When using 2-3/8 in. (60.3mm) tubing with a Size 47 Lock-Set Packer, and the On-Off Tool is to be coupled directly to the Packer body, a size 5-1/2 x 2-7/8 x (2.31 or smaller) must be used.

**MODEL "BHHP" SINGLE STRING, DOUBLE GRIP HYDRAULIC PACKER**

**Product No.: BI 783-20**

Model "BHHP" is a high-pressure, double-grip, retrievable hydraulic-set production packer. It is released by the straight pull of the tubing string and upper-slip releasing system has a feature that reduces the strain required to release the slips. Dislocating a key non-directional slip first triggers an automatic release of the other slips.

The production packer is recommended for use in well completions where the packer will be set after the well has been flanged up, as well as in deviated holes, gas-lift installations, and other completions where a mechanical-set packer is not suitable. The Packer is ideal for stacked installations because the built-in zone-activated pressure-balance system offsets pressure differentials across the packer.

**Features:**

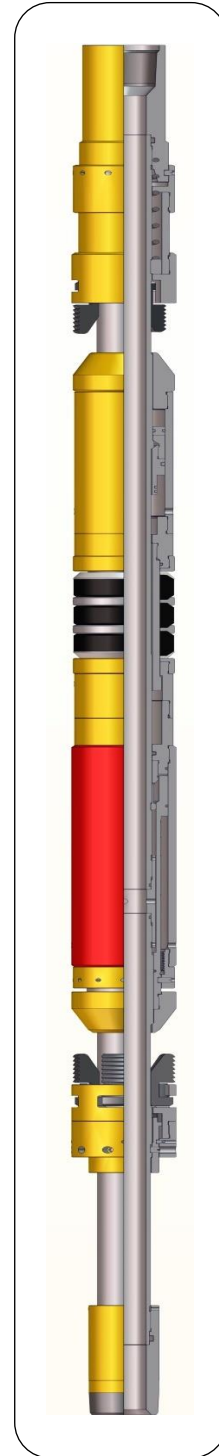
- Non-Directional upper-releasing slip system
- Tension force to release packer easily adjusted before running
- All components locked to prevent pre-set
- Release shear pins not affected by differential pressures
- Tension force to release the packer is easily adjusted in the field

**Benefits:**

- Straight pull release
- Balance system offsets pressure reversals
- Mechanical upper slips
- Can be converted to selective set

**Applications:**

- Offshore oil and gas completions
- Highly deviated wells and doglegs
- Stacked-packer completions
- Coiled-tubing completions



Model "BHHP"  
Hydraulic Retrievable  
Packer  
Product No.: BI 783-20

Specification Guide						
MODEL "BHHP" HYDRAULIC RETRIEVABLE PACKER						
CASING				PACKER		
OD (Inch)	Weight (ppf) T & C	Minimum ID (Inch)	Maximum ID (Inch)	Gage Ring OD (Inch)	ID (Inch)	Tubing Size (Inch)
4-1/2"	9.5-13.5	3.920	4.090	3.750	2.000	2-3/8"
5"	15-18	4.276	4.408	4.125	2.000	2-3/8"
	11.5-15	4.408	4.560	4.250	2.000	2-3/8"
5-1/2"	20-23	4.670	4.778	4.500	2.000	2-3/8"
	13-20	4.778	5.044	4.625	2.000	2-3/8"
	9-13	5.044	5.240	4.875	2.000	2-3/8"
	20-23	4.670	4.778	4.500	2.375	2-7/8"
	15.5-20	4.778	4.950	4.641	2.375	2-7/8"
	13-15.5	4.892	5.044	4.781	2.375	2-7/8"
6"	23-26	5.132	5.240	4.875	2.000	2-3/8"
6-5/8"	24-32	5.675	5.921	5.500	2.500	2-7/8"
	17-24	5.921	6.135	5.875	3.000	3-1/2"
	20-24	5.921	6.049	5.750	2.500	2-7/8"
7"	26-35	6.004	6.276	5.875	2.500	2-7/8"
	17-29	6.184	6.538	6.000	2.500	2-7/8"
	26-35	6.004	6.276	5.875	3.000	3-1/2"
	17-29	6.184	6.538	6.000	3.000	3-1/2"
7 5/8"	29.7-39	6.625	6.875	6.453	3.000	3-1/2"
	20-33.7	6.765	7.125	6.625	3.000	3-1/2"
8 5/8"	28-40	7.725	8.017	7.531	3.000	3-1/2"
9 5/8"	40-53.5	8.535	8.835	8.250	3.000	3-1/2"
	29.3-43.5	8.755	9.063	8.500	3.000	3-1/2"
	40-53.5	8.535	8.835	8.250	4.000	4-1/2"
10 3/4"	60.7-71.1	9.450	9.660	9.190	3.000	3-1/2"
	60.7-71.1	9.450	9.660	9.190	4.875	5-1/2"
13 3/8"	48-68	12.415	12.715	12.200	4.930	5-1/2"
	20-33.7	6.765	7.125	6.625	3.000	3-1/2"

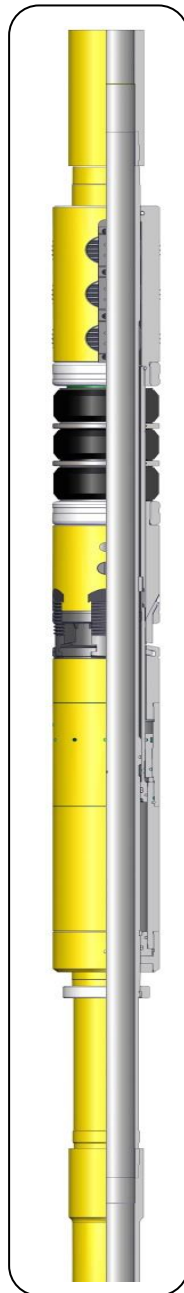
**MODEL "BFH" HYDROSTATIC SINGLE STRING PACKER**

**Product No.: BI 781-08**

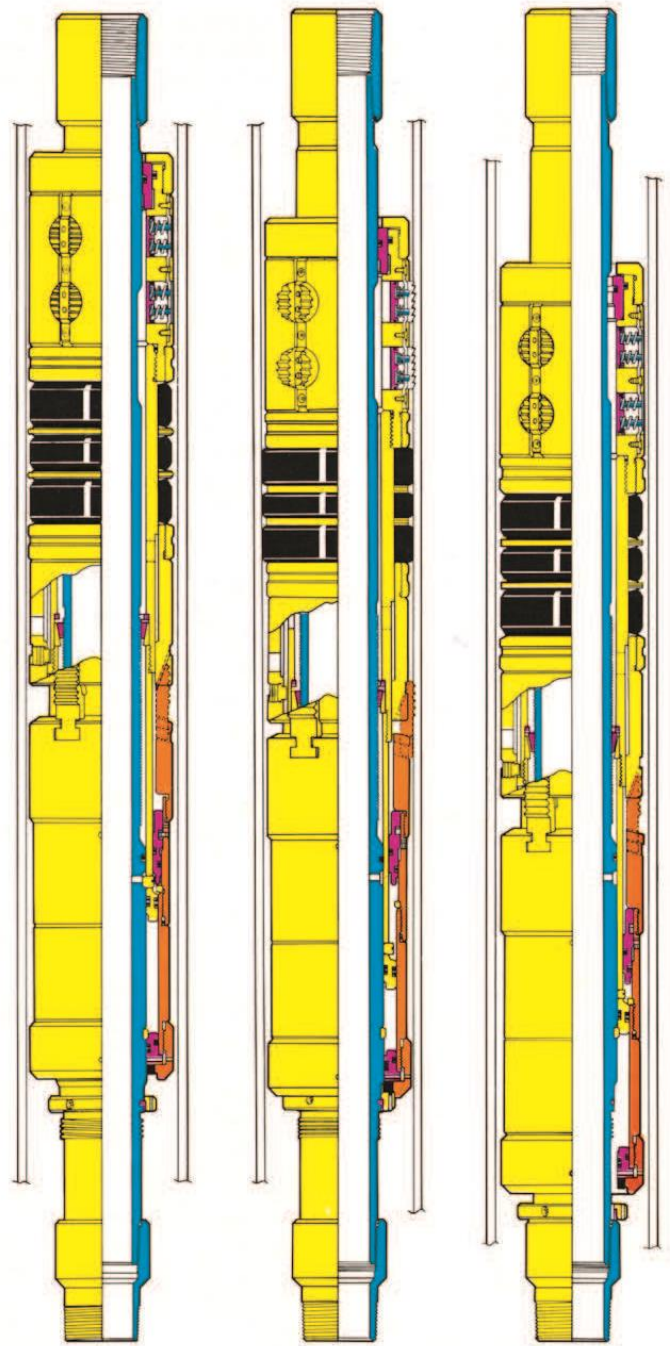
The "BFH" can be run in single-packer installations, as the lower packer in multiple - string hook - ups using hydrostatic or hydraulic duals, or in tandem in single string selective zone or multiple-zone production wells. In addition to applications where displacing and setting after the well is flanged up are desirable, the hydrostatic single is ideal for deviated or crooked holes where conditions are not suitable for mechanically set packers.

**Features/Benefits:**

- Flanged up completion. No tubing manipulation required.
- Hydrostatic/hydraulic setting.
- Pack-off mechanically locked in.
- Standard hydraulic hold downs.
- Simple up-strain shear-release or optional rotational-release.
- Multiple packing element system.



Model BFH  
Hydrostatic Single String  
Packer  
Product No.: BI 781-08



Running Position      Set Position      Retrieving Position

Model "BFH" Hydrostatic  
Single String Packer Operation

**Operation:** The Model "BFH" Hydrostatic Packer is actuated by pressuring the Tubing, and this is generally done in one of three ways:

1. Dropping a ball to seat in a Hydro-Trip Pressure Sub or shear out Ball Seat Sub (Prod. No. BI 799-27 or BI 469-21) located below the Packer.
2. Use of a Differential Displacing Valve provided operations will not require pressuring the tubing before the displacing valve is to be opened.
3. Landing a BFC Blanking Plug in a BFC Seating Nipple or Sliding Sleeve below the Packer. In most cases, the Plug can be run, the Packer set, and the Plug retrieved all in one trip. Where more than one Model "BFH" Packer is to be run, only one of these plugging devices needs to be used below the lower most Packer. This arrangement will result in simultaneous setting of all the "BFH" Packers when the tubing is pressured. If simultaneous setting is not desirable, shear values can be altered so the Packers will set in sequence, the bottom first and the top last.

**To Set Packer Where Hydrostatic Pressure Is Greater Than 1,500 PSI**

Run the Packer to setting depth, flange up the well and displace the tubing. Using one of the methods mentioned above, Plug the Tubing and increase Tubing pressure to approximately 1,000 psi over annulus pressure at the Packer. The shear screws will shear, exposing the setting mechanism to the hydrostatic pressure in the well. This pressure completely sets and packs-off the Packer.

<b>SHEAR RING AVAILABILITY GUIDE</b>				
<b>Packer Size</b>	<b>Shear Rating Lbs. x1,000</b>			
	<b>20</b>	<b>30</b>	<b>40</b>	<b>50</b>
43	x	x	x	x
45	x	x	x	x
47	x	x	x	x
49	x	x	x	x
51	x	x	x	x

**MODEL "BFHL" HYDROSTATIC SINGLE STRING PACKER**

**Product No.: BI 781-20**

The Model "BFHL" Hydrostatic Packer is a large bore version of the "BFH" Packer. Features, advantages, and operational procedures are basically the same as those described for the "BFH".

The Body Lock Ring mechanically locks in the set so that a drop in hydrostatic pressure can have no effect on the Packer. After the Packer is set, the tubing is opened by pressuring to force the tripping ball through the Pressure Sub or Displacing Valve or by retrieving the BFC Plug.

**To Set Packer Where Hydrostatic Pressure is Less Than 1,500 PSI**

The Packer is dressed with additional shear screws to increase the actuating pressure to 2,000 psi; and the Hydro-Trip Pressure Sub or Shear-out Ball Seat Sub is dressed to require 3,500 psi differential to blow the ball through after the packer is set.

**Using a Differential Displacing Valve**

This valve offers distinct advantages where it is desirable to displace the tubing after the well is flanged up and the tubing sealed off in a Packer below the "BFH". The valve is opened and the tubing displaced, then one ball is dropped to set the Packer and close the valve.

**To Release the Packer**

The standard Model "BFH" Packer is equipped with a 30,000 lbs. Shear Ring for a straight up-strain release. Other values of Shear Rings available are shown in the table below.

An alternate rotational-release is available on special order, which permits the Packer to be released by taking an up-strain and rotating to the right. The rotational release has 50,000 lbs. 40,000 lbs. on Size 43 straight up-strain shear-out safety release.

As an option, to make provision for adjustment of the shear value, Shear Screws can be provided instead of shear ring.

Specification Guide MODEL "BFH" HYDROSTATIC SINGLE STRING PACKER							
Casing				Packer			
O.D. (Inch.)	Weight (ppf) T & C (A)	ID Range in which Packer may be run		Size	Nom ID (Inch.)	Gage Ring OD (Inch.)	Standard Thread specification (B) Box Up & Pin Down (Inch.)
		Min. (Inch.)	Max. (Inch.)				
4-1/2	9.5-13.5	3.910	4.090	BI 43A	1.98	3.771	2-3/8 OD EU 8 RD
5	15-18	4.250	4.408	BI 43B		4.125	
	11.5-15	4.408	4.560	BI 43C		4.250	
5-1/2	26			4.625		4.778	
	20-23	4.778	4.950	BI 45A4		4.641	
	14-20	4.950	5.190	BI 45B		4.781	
	15.5-20			BI 45B		4.781	
7	38	5.830	5.937	BI 47A2	2.42 or 2.00	5.656	2-7/8 OD EU 8 RD or 2-3/8 OD EU 8 RD
	32-35	5.938	6.135	BI 47A4		5.812	
	26-29	6.136	6.276	BI 47B2		5.968	
	20-26	6.276	6.456	BI 47B4		6.078	
	17-20	6.456	6.578	BI 47C2		6.266	
9-5/8	47-53.5	8.343	8.681	BI 51A2	3.0 or 2.44 or 2.00	8.218	3-1/2 O.D. EU 8 RD or 2-7/8OD EU 8 RD or 2-3/8OD EU 8 RD
	40-47	8.681	8.835	BI 51A4		8.218	
	29.3-36	8.836	9.063	BI 51B		8.593	

(A) When selecting a Packer for a Casing weight common to two weights ranges (same OD), choose the Packer size shown for the lighter of the two weight ranges.

(B) Threads shown below are "standards" for the respective Packer Mandrel sizes. Other threads are available on request. Please specify threads when ordering.

Repair kits, including such items as packing elements, seal rings, etc., are available for redressing BOTIL Retrievable Packers.

Specification Guide MODEL "BFHL" HYDROSTATIC SINGLE STRING PACKER							
Casing		ID Range in which Packer may be run		Size	Nom ID (Inch.)	Gage & Guide Ring O.D. (Inch.)	Thread Specification
O.D. (Inch.)	Weight (ppf) T & C (A)	Min. (Inch.)	Max. (Inch.)				
6-5/8	24	5.830	5.921	BI 47 A2	3.00 76.20	5.656	3-1/2 O.D. EU. 8 RD.
7	38			BI 47 A2		5.656	
6-5/8	20	5.989	6.094	BI 47 A4		5.812	
7	32-35			BI 47 A4		5.812	
6-5/8	17	6.135	6.276	BI 47 B2		5.968	
7	26-29			BI 47 B2		5.968	
7	20-26	6.276	6.456	BI 47 B4		6.078	
7	17-20	6.456	6.578	BI 47 C2		6.266	
7-5/8	33.7-39	6.579	6.765	BI 47 C4		6.453	
7-5/8	24-29.7	6.766	7.025	BI 47 D2		6.672	
7-5/8	20-24	7.025	7.125	BI 47 D4		6.812	
9-5/8	47-53	8.343	8.681	BI 51 A2		3.958 100.53	
	40-47	8.681	8.835	BI 51 A4	8.437		
	29.3-36	8.836	9.063	BI 51 B	8.593		



## MODEL "BHRL" HYDRAULIC RETRIEVABLE PACKER

**Product No.:** BI 646-90

### Description:

Model "BHRL" is a hydraulically set, straight-pull, shear release retrievable packer. It is used in vertical and deviated wellbore or in application in which single or multiple packers are set after the wellhead has been installed. A modular shell and body design for low to medium pressure differentials allows configuration as a single-string production packer. Its compact, modular design makes the BHRL an economical choice for production applications.

The BHRL is installed with the completion tubing and is set by applying pressure to the tubing. Retrieval of the BHRL is accomplished with a straight upward pull on the tubing. Once the tension on the tubing string exceeds the shear value of the release pins, the slips disengage the casing, and the element relaxes. Set at the factory to a standard value, the packer-shear release mechanism can be adjusted in the field just before installation.



Model "BHRL"  
Hydraulic Retrievable  
Packer  
Product No.: BI 646-90

### Features:

- No Tubing Manipulation required while setting of the Packer. The Packer can be set after the well is flanged up and the tubing is displaced.
- Opposed Double grip slips (Bi-Directional) prevent movement of the Packer in either direction due to pressure differentials.
- Large Flow Path ID.
- Straight pull shear release.
- Adjustable shear release.
- Field proven sealing element
- Minimized end effect on shear-release screws.
- Slips located below the Packing Elements.
- Double Piston design prevents tubing movement while setting.
- Double Lock ring sustain Pack-off and Slip grip mechanically after setting.

### Benefits:

- Simplified operations reduce rig costs.
- Eliminates tubing movement during installation.
- Prevents debris build up above slips.
- Facilitates circulating out debris before retrieval.
- Positive casing grip secures packer.

### Applications:

- Single string completion
- Zonal Isolation
- Vertical, deviated or horizontal well bores.

Specification Guide MODEL "BHRL" HYDRAULIC RETRIEVABLE PACKER					
Casing Size (Inch.)	Weight (ppf)	Max O.D (Inch.)	Packer I.D** (Inch.)	Differential Pressure Rating(Psi)	Min. tubing Setting Pressure(psi)
7	23-26	6.090	2.426,2.992	7,000	3500
7	26-29	6.000	2.426,2.992	7,000	
7	29-32	5.910	2.426,2.992	7,000	
7	32-35	5.850	2.426,2.992	7,000	
7-5/8	24-29.7	6.690	2.992	7,000	3000
7-5/8	33.7-39	6.440	2.992	7,000	
9-5/8	40-47	8.463	2.992,3.910,4.733	7,000	3000
9-5/8	47-53.5	8.354	2.929,3.910,4.733	7,000	

\*\* I.D may vary depending on End connection selected.



## MODEL "B" HYDRO-TRIP PRESSURE SUB

Product No.: BI 799-32

The BOTIL Model "B" Hydro – Trip Pressure Sub is installed in the tubing string below a hydraulic packer to blank tubing for pressurizing the string for activation of the packer hydraulically.

A ball is circulated through the packer to a seat in the hydro-Trip Pressure Sub and sufficient tubing pressure is applied to activate the setting mechanism in the packer. After the packer is set, pressure is increased to a predetermined shear value to blow-out the ball seat. The Ball Seat shifts down in the expanding groove, allowing the Ball to drop in the sump.

The Hydro-Trip Pressure Sub is dressed with Shear Pins of value 2500 psi to 5000 psi and which are field adjustable.

The model "B" Hydro-Trip Pressure Sub is available from size 2-3/8" to 5-1/2".



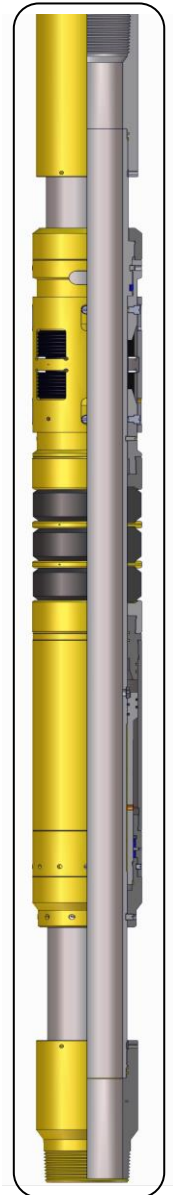
Model "B"  
Hydro-Trip Pressure Sub  
Product No.: BI 799-32

## MODEL "BHBL" HYDRAULIC SET LARGE BORE RETRIEVABLE PACKER

Product No.: BI 783-18

Model "BHBL" is a hydraulically set, straight-pull, shear-release retrievable packer. It is used in vertical and deviated wellbore or in application in which single or multiple packers are set after the wellhead has been installed. Its compact design makes the BHBL an economical choice for production applications.

The BHBL is installed with the completion tubing and is set by applying pressure to the tubing. Retrieval of the BHBL is accomplished with a straight upward pull on the tubing. Once the tension on the tubing string exceeds the shear value of the release pins, the slips disengage the casing, and the element relaxes. Set at the factory to a standard value, the packer-shear release mechanism can be adjusted in the field just before installation.



Model "BHBL"  
Hydraulic Set  
Large Bore  
Retrievable Packer  
Product No.: BI 783-18

### Features:

- No Tubing Manipulation required while setting of the Packer. The Packer can be set after the well is flanged up and the tubing is displaced.
- Opposed case carburized Double grip slips (Bi-Directional) prevent movement of the Packer in either direction due to pressure differentials.
- Large Flow Path ID.
- Straight pull shear release.
- Adjustable shear release.
- Field proven sealing element

Specification Guide MODEL "B" HYDRO-TRIP PRESSURE SUB			
Sub-Basic Size (Inch.)		3-1/2	5-1/2
Ball Size (Inch.)		2-3/4	4-1/2
Ball Seat I.D. Before Shifting (Inch.)		2.320	4.250
Ball Seat I.D. After shifting (Inch.)		2.910	4.670
Thread Connection Selections**		3-1/2	5-1/2
Shear* Value per screw	Brass ±5%	500 psi	500 psi
Maximum Shear out Value	Brass ±5%	2500 psi to 5,000 psi	5,000 psi

\* When using steel shear screw a Kirksite ball must be used to shift the seat.  
\*\*All thread connections can be furnished as per customer requirement.

**Benefits:**

- Simplified operations reduce rig costs.
- Eliminates tubing movement during installation.
- Positive casing grip secures packer.

**Applications:**

- Single string completion
- Zonal Isolation.
- Vertical, deviated or horizontal well bores.

Specification Guide					
MODEL "BHBL" HYDRAULIC SET LARGE BORE RETRIEVABLE PACKER					
Casing Size (Inch.)	Casing Weight (Inch.)	Packer Max. O.D. (Inch.)	**Packer Min. I.D. (Inch.)	Trigger Pressure (Psi)	Max. Setting Pressure (Psi)
7	20-26	6.09	3.87	1200	3000
	23-29	6.00	3.87		3000
	26-32	5.93	3.87		3000
9-5/8	40-47	8.46	4.72		2500

\*\*I.D may vary depending on End connection selected.

**MODEL "BRHD" RETRIEVABLE HYDRAULIC DUAL PACKER**

Product No.: BI 783-16

**Description:**

Model "BRHD" Retrieval Hydraulic Dual Packer with flat top and by-pass is one out of group of Packers for offshore annulus safety systems. The "BRHD" Dual Packer pack-off features a single by-pass passage and a control line passage which is used for setting the Packer. It is a versatile Packer which provides improved capabilities in the well.

**Applications:**

Model "BRHD" Dual Packer is meant specifically to be run with Valve. This System has full drift flow passages which are required for chemical injection and gas lift operations.

**Features:**

Hydraulic/ Hydrostatic Set Model "BRHD" Dual Packer is hydraulically set by control line pressure using a Wireline Retrieval Setting Dummy. Model "BRHD" Dual Packer uses existing hydrostatic pressure in the well to reduce pressure applied to the control line to set the Packer.

**Testing:** The control line passage within the Model "BRHD" Dual Packer can be tested before running or setting the Packer. Also, both Tubing Strings can be tested once the Packer is in the well without setting the Packer.



Model "BRHD" Hydraulic Dual Packer  
Product No.: BI 783-16

**Ease of Make-Up:** Both strings are free to rotate for easy tubing string make-up without the use of Swivel Subs and allow the unlatching production equipment below.

**Floating Joint:** The floating string is free to reciprocate (24"). This feature facilitates spacing out to the Dual Tubing and Annular Safety System above the Packer. Also, one Tubing String is not required to support the load of both strings when running the completion.

**Non-Rotational Release:** Model "BRHD" Dual Packer is retrieved by straight pull on the fixed string. The force required to release the Packer can be set prior to running by retaining, or reducing the area of the shear plate without dismantling the Packer. Non-rotational release eliminates problems with the control line and is an advantage in greater well depths or in the case of well deviation.

**5000 PSI Rating:** The "BRHD" Dual Packer is rated for 5000 psi differential from above or below and is designed for H2S service. All tubing wetted parts meet NACE MR-01-75 standards.

**Large Slip Area:** A large Slip contact area prevents the casing from being damaged when the Packer is set. The opposing Slips hold the Packer in both directions without the use of troublesome Hold down Buttons.

**Three Packing Elements:** The "BRHD" Dual Packer has a three element packing system consisting of hard rubber outer elements for anti-extrusion and a soft rubber centre elements for sealing. When the Packer is set, the pack-off force is mechanically locked into the Packing Elements.

**Safety Lock:** The "BRHD" Dual Packer is mechanically locked while running down hole to prevent premature setting.

## Operation:

**Production Test:** Before running, check the control line passage by unscrewing the release sub-assembly from the Packer and replacing it with the "RHD" Test Plug. Test the control line to 5000 psi; hold the pressure for 5 minutes and check for pressure drop. If the test is successful, grease seals of Release Sub Assembly with down hole seal lubricant, unscrew "BRHD" Test Plug and replace with release Sub Assembly.

**Running and Setting:** The exterior parts of the "BRHD" Dual Packer are mechanically locked to the fixed string, thus eliminating the possibility of premature setting while running down hole.

Both fixed and floating tubing strings can be tested without mechanical lock and setting the packer.

Check the shear plate for the proper Release Value and the outside diameter of the Packer. The Packer is ready to run down hole. After hanging the Tubing and installing the Wellhead, well fluids can be replaced by the completion fluid (in the annulus) and a light fluid (gas oil) in the tubing. The displacement rate should not exceed 2bbl per min. to keep the Packing Elements from sealing during circulation.

**Setting by Control Line:** The "BRHD" Dual Packer is set by pressuring the control line to 1400 psi which hydraulically releases the premature setting lock and allows the Packer to start setting. Further pressuring and maximum applied pressure = 10000 psi cause the Slips to grip firmly in the casing, expanding the Packing Elements to exert sufficient pack-off force to ensure an effective seal, and allowing the lock ring to mechanically lock the Packing Elements and Slips in place.

**Retrieving:** The "BRHD" Dual Packer is retrieved by a straight pull on the fixed string. The sequence of releasing the Packing and Slips is as follows: Pulling the fixed string shears the Shear Plate and allows the fixed string to move up. The fixed string shoulders on the retaining plate and further movement up shears it's Shear Screws and releases the collets from the Pack-off Mandrels. The fixed string is then pulled further up and releases the Packings and Slips from the casing I.D. The Packer is then free and can be retrieved.

## MODEL "BHLP" HYDRAULIC RETRIEVABLE PACKER Product No.: BI 782-08

### Description & Application:

The Model "BHLP" Retrievable Packer is a hydraulic set, large bore Double Grip Packer used for production, zone isolation, multiple string completions, commingling hook ups and for stimulation.

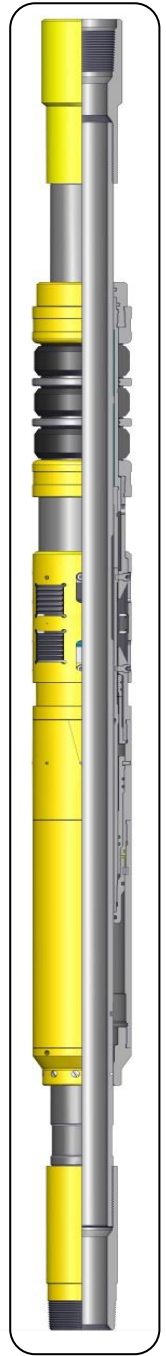
The Setting starts on application of pump pressure to the Tubing, the "BHLP" sets and packs-off due to the force applied by tubing pressures. The design of the setting mechanism ensures sustained pack-off force throughout the life of the Packer. Opposed Double Grip Slips prevent movement of the Packer in either direction due to pressure differentials, while allowing landing of the tubing in tension, compression, or neutral.

The standard model BHLP Packer is equipped with shear screws for a straight pick-up release. The Packer is suitable for maximum 5,000 psi differential pressure.

### Features:

**No Tubing Manipulation required:** The setting mechanism of this Packer is activated with pump pressure. The Packer can be set after the well is flanged up and the Tubing is displaced.

**Setting Mechanism:** The design of the setting mechanism ensures sustained pack-off force throughout life of the Packer. The tool does not depend on trapped hydraulic pressure, but mechanically locks initial setting forces into the packing elements. Setting activation pressure can be adjusted by dressing up with required number of shear screws.



Model "BHLP"  
Hydraulic  
Retrievable Packer  
Product No.: BI 782-08

**Opposed** Double Grip Slips prevent movement of the Packer in either direction due to pressure differentials.

**Unloaded valve** provided for equalising the pressure to nullify the swabbing of the Packing Element.

**Multiple** Packing Element system

**Large Flow Path ID** -2.375 I.D. for 5½"

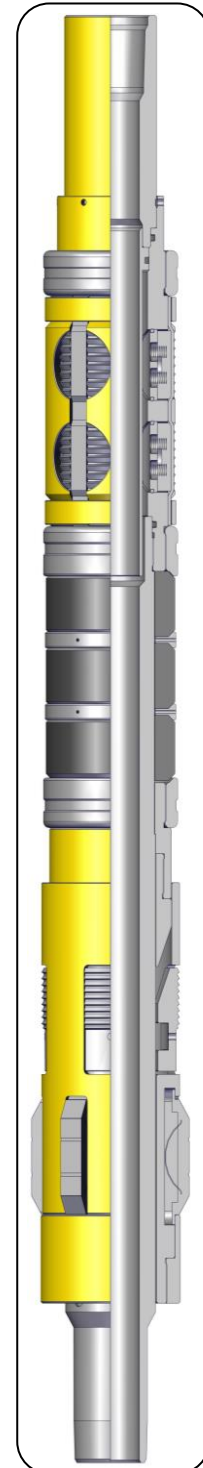
**Straight Up-strain release**

Specification Guide MODEL "BHLP" HYDRAULIC RETRIEVABLE PACKER								
Casing				Size	Nom. I.D. (Inch.)	Gauge Ring O.D. (Inch.)	Packing Element O.D (Inch.)	Standard Thread Specification Box X Pin
O.D. (Inch.)	Weight (ppf)	I.D. Range in which Packer may Run						
		Min. (Inch.)	Max. (Inch.)					
5-1/2"	20-23	4.625	4.778	BI 45A2	2.375	4.500	4.375	2 7/8 O.D. EU. 8RD.
	17-20	4.778	4.950	BI45A4	2.375	4.641	4.375	
	13-15.5	4.950	5.190	BI45B	2.375	4.781	4.687	

**MODEL "BRSP" RETRIEVABLE SQUEEZE PACKER**  
Product No.: BI 800-07

**Description:**

The BOTIL Retrievable Squeeze Packer is designed to perform all the tasks required of a retrievable stimulation and work over packer, and withstand high pressures from above or below. It can be used in all types of squeeze cementing, fracturing, and acidizing, with subsequent testing. The hydraulically actuated hold down slips and mechanical lower slips are carbide tipped for long, dependable service. The packing element system is the proven three-section type, but heavier and more reliable than systems on packers with an integral bypass. This packer is run with a separate, positive locking unloaded, eliminating the possibility of pumping open, as on many equalizing valves.



Model "BRSP"  
Retrievable Squeeze  
Packer  
Product No.: BI 800-07

Specification Guide MODEL "BRSP" RETRIEVABLE SQUEEZE PACKER							
Size (Inch.)	Casing Weight (ppf)	Gage Ring O.D. (Inch.)	Packing Element O.D. (Inch.)	Packer Bore (Inch.)	Connections (box up/pin down)		
4-1/2	9.5-13.5	3.750	3.62	1.94	2-3/8"EU8Rd		
5	15-18	4.125	3.94				
	11.5-15	4.250	4.12				
5-1/2	17-23	4.500	4.38			2.38	2-7/8"EU8Rd
	14-17	4.641	4.50				
	13-15.5	4.781	4.69				
	17-23	4.500	4.38				
	14-17	4.641	4.50				
	13-15.5	4.781	4.69				
6-5/8	20-24	5.687	5.56	2.42	2-7/8"EU8Rd		
7	29-38		5.56				
	23-29	6.000	5.75				
	17-23	6.188	6.12				
7-5/8	43-47					6.12	
	33-39	6.453					
	24-30	6.672	6.50				
8-5/8	40-49	7.312	7.00	3.00	3-1/2"		
	28-36	7.625					
9-5/8	43-53	8.250	7.94	4.00	4-1/2"EU8Rd		
	32-43	8.500	8.38				

**MODEL "BGCT" GRAVEL PACK SYSTEM**

**Product No.: BI 800-03**

BOTIL Gravel Pack System has complete operational flexibility for gravel packing. It is capable of multiple circulation modes, reverse circulation, and squeeze modes with the ability to use each mode whenever desired, as many times as desired. It uses only work string reciprocation for mode changes. These have extremely high reliability. The system is designed to work with high pressure integrity in a sand laden environment.

The perforated Gravel Pack Extension is an economical device that adapts the Packer for use in a gravel pack system.

The Gravel Pack Extension with Sliding Sleeve provides a gravel packing port that can be closed after completion of the gravel pack and opened again whenever necessary.

Features a positive tool position indicating system which allows gravel placement with set down weight on the tool.

**MODEL "BESP" ELECTRIC SUBMERSIBLE PUMP PACKER**

**Product No.: BI 783-19**

BOTIL ESP Packer is designed to facilitate the use of an Electric Submersible Pump. The Packer can be provided with threaded connections to accept a pack-off power cable feed thru system with cable pigtails, or a drop-through penetrator. Additional operational ports allow venting of annular pressure, fluid injection thru the packer or instrument wire port by pass.

It is hydraulic set and straight pull release. There is no relative movement between tubing and cable.



Model "BGCT"  
Gravel Pack System  
Product No.: BI 800-03



Model "BESP"  
Electric Submersible Pump  
Packer  
Product No.: BI 783-19



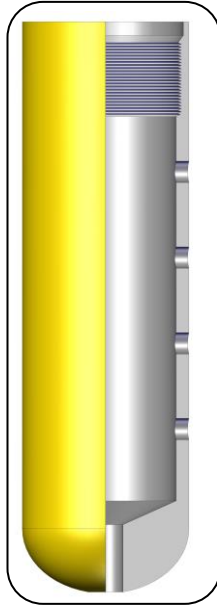
**BALL CATCHER SUB**  
Product No.: BI 409-77

**Description:**

The Ball catcher sub provides a means of catching the ball and sheared out ball seat from a landing collar. It incorporates a perforated baffle plate to catch the ball and ball seat yet allows fluid passage without restriction.

**Features/Benefits:**

- Large bypass area-the Baffle Plate in the catcher sub is made with multiple sets of large diameter holes. These holes are sized to catch the ball and seat, but allow fluid to pass through the tool without plugging.
- Internal parts rotationally locked.

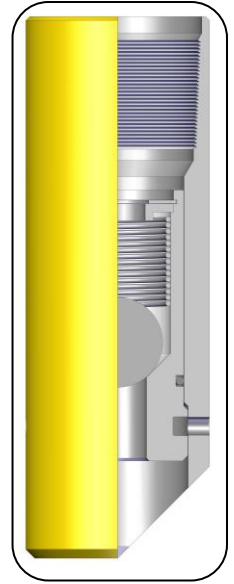


Ball Cather Sub  
Product No.: BI 409-77

**AUTO FILL PUMP OUT PLUG**  
Product No.: BI 799-29

**Description:**

The Model Auto-fill Pump Out Plug is used as a tubing Plug device against which pressure can be applied in order to set Hydraulic Set Packers. The Pump out Ball Seat Sub is made up in the tail pipe below the Packer to be set. In this model with the ball seating down, the Pump out Plug acts as a reverse check valve preventing flow down the string, while allowing the string to fill from below. Without need to drop a ball to seat, the tubing can be pressured up. Once the Packer is set, tubing pressure is increased to values shown in the chart below to shear the screws holding the ball seat sub. The ball seat and the ball with spring etc. are blown out of the sub to the bottom of the well. Any tubing run below the ball seat sub should have sufficient I.D. clearance to permit passage of the ball, ball seat, spring etc.



Auto Fill Pump Out Plug  
Product No.: BI 799-29

Pressure Values SHEAR BALL SEAT										
Size Sub (Inch.)	Pressure Required ( $\pm 400$ PSI)									
	Number of Screws									
	2	3	4	5	6	7	8	10	12	16
2-3/8	1,500	2,250	3,000	3,750	4,500	-	-	-	-	-
2-7/8	1,500	2,250	3,000	3,750	4,500	-	-	-	-	-
3-1/2	1,000	1,500	2,000	2,500	3,000	3,500	-	-	-	-
4-1/2	900	1,300	1,700	2,100	2,500	2,900	3,300	-	-	-
5-1/2	-	-	1,400	1,750	2,100	2,450	2,800	3,500	4,200	5,600
6-5/8	-	-	-	-	1,000	1,250	1,500	2,500	2,500	-

The number of screws installed in the Pump out Plug must be compatible with the pressure required to set Packer.



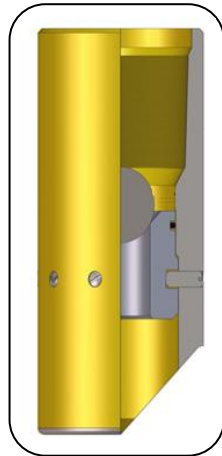
**SHEAR-OUT BALL SEAT SUB**

Product No.: BI 799-27

**WIRELINE ENTRY GUIDE WITH SHEAR-OUT BALL SEAT**

Product No.: BI 469-21

The Shear-Out Ball Seat Sub and the Wireline Entry Guide with Shear-Out Ball Seat are installed on the bottom end of the Tubing to allow the Tubing String to be pressured. When the differential pressure at the tool reaches a predetermined value the ball and seat are pumped out of the tool. After the Ball Seat has been pumped out, these subs allow unrestricted access from the Tubing into the casing below the Tubing String.



Wireline Entry Guide With Shear -Out Ball Seat  
Product No.: BI 469-21

These products are available in a variety of configurations. The tool illustrated here offers both a re-entry guide to simplify Wireline operations (Prod. No. BI 469-21 only) as well as a optional conical guide to facilitate easy entry when running the tubing through the top of a Liner or into a Seal Bore Packer. Other options include a solid Pump-Out Plug and expendable Check Valves. The Shear- Out Ball Sub (Prod. No. BI 799-27) can also be furnished in a box x pin configuration for those applications where it is necessary to run additional Tubing or completion equipment below the Shear-Out Ball Seat Sub.

**Caution:** Since each of these tools expend a Ball and Ball Seat during their operation, it is necessary to ensure those parts will safely pass through all equipment which is located below them.

**MODEL "NON ROTATIONAL" SHEAR OUT SAFETY JOINT**

Product No.: BI 441-32

**Description & Application:**

The BOTIL Non Rotational Shear-Out Safety Joint is used between packers in dual and triple completions and in selective completions using Hydrostatic Single-String Packers. It is also used when rotational releasing is not desired. When run above the upper packer in a single-string completion, however, the shear value should be adjusted to compensate for any hydraulic conditions that exist when the string is landed, or that are created by well treating operations. This Model has Torque transmission feature.

**MODEL "B" SHEAR-OUT SAFETY JOINT**

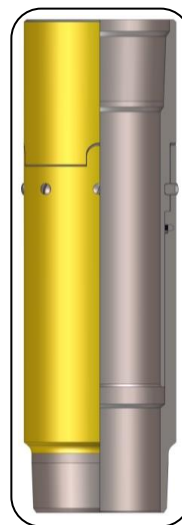
Product No.: BI 441-31

The Model "B" Shear-Out Safety Joint is designed for use between a Packer and a Sand Screen to provide a means of releasing and retrieving the production string, should the screen become sanded in. It may also be used in any application where an up-strain type of releasing device can be used.

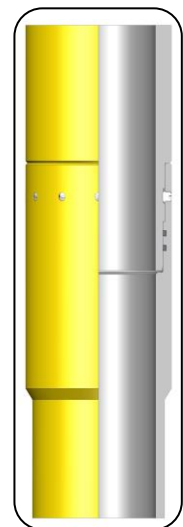
The Shear-Out Safety Joint can be run with from 2 to 16 Brass Shear Screws, each valued at 2,500 lb. (1,13t), allowing the shear value of the tool to be varied from 5,000 to 40,000 lb. The tool is shipped with all 16 Brass Shear Screws in place. Remove the necessary number of shear screws required to obtain the desired releasing pull; i.e., if a releasing pull of 15,000 lb. is desired remove all but six (6 x 2,500 = 15,000) screws. The remaining screws should be as evenly spaced as possible.

Specification Guide MODEL "B" SHEAR-OUT SAFETY JOINT			
Size (Inch.)	Nom OD (Inch.)	Nom ID (Inch.)	Standard Thread* Specification (Box Up & Pin Down) (Inch.)
3-1/2	3.88	3.06	3-1/2 NU 10 RD
4	4.34	3.43	4 NU 8 RD

\*Threads shown are "standard" for the respective sizes. Other threads are available on request



Model "Non Rotational" Shear-Out Safety Joint  
Product No. BI 441-32

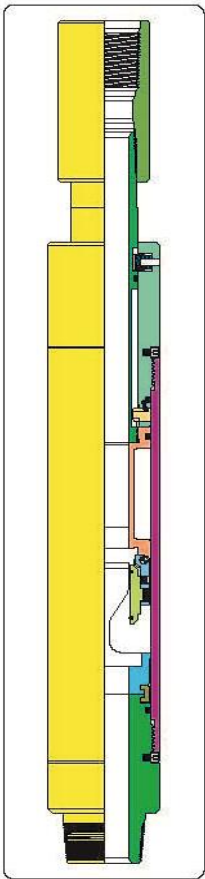


Model "B" Shear-Out Safety Joint  
Product No.: BI 441-31

## MODEL "BC-1" FULL-BORE RETRIEVABLE CEMENTER

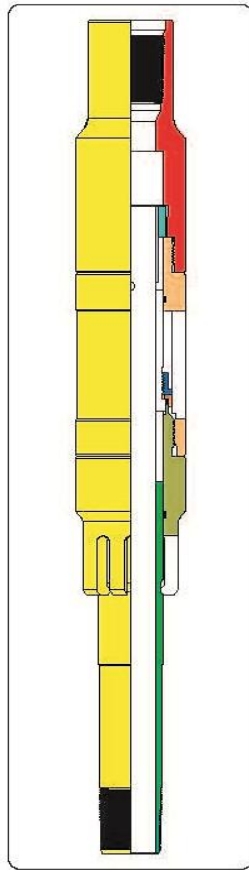
Product No.: BI 410-01

This is a squeeze Packer with a full bore, used for pressurising operations such as casing testing, formation fracturing, squeeze cementing and high-pressure acidizing with subsequent testing. It is particularly useful when set-down weight is limited. It is run with the Model BR Up-strain Unloading Sub (Product No.: BI 675-05) to allow equalisation of Tubing and annulus pressure. The running-in string may be tested with the Model BN Full Bore Tubing Tester (Product No.: BI 672-01).



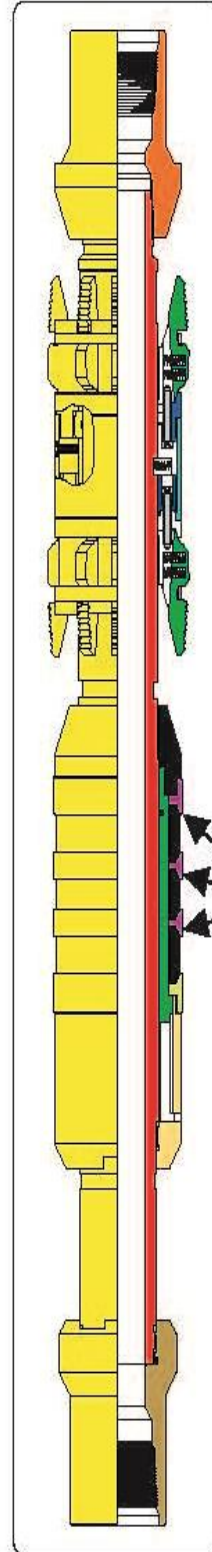
Model "BN"  
Full-Bore Tubing  
Tester

Product No.: BI 672-01



Model "BR"  
Up-strain Unloading  
Sub

Product No.: BI 675-05



Packing Elements allow circulation when upper slips are set and pack off when Tubing is raised & up-strain applied.

Model "BC-1"  
Full-Bore Retrievable  
Cementer  
Product No.: BI410-01

Specification Guide MODEL "BC-1" FULL-BORE RETRIEVABLE CEMENTER																	
Casing		Cementer Size	Gauge & Guide Ring O. D. (Inch.)	Slip Range				Packing Element O. D. (Inch.)	Packing Element Spacer O.D. (Inch.)	Threads Box Up & Box Down	Minimum Bore Through Cementer (Inch.)						
				Preferred		Absolute											
				Min (Inch.)	Max (Inch.)	Min (Inch.)	Max (Inch.)										
O.D. (Inch.)	Weight (ppf) T & C																
5-1/2	20-23	BI 45A	4.500	4.625	4.953	4.610	4.953	4.375	4.500	2-3/8 O.D. E.U. 8 RD.	1.968						
	15.5-17		4.641														
	13-15	BI 45B	4.781	4.954	5.190	4.950	5.190					4.688	4.781				
5-3/4	19.5-22.5			BI 45C	5.062	5.191	5.390	5.160	5.424			4.938	5.062				
	14																
6	20-23	BI 45D	5.156	5.391	5.560	5.248	5.560	5.250	5.406			2-7/8 O.D. E.U. 8 RD.	2.375				
			17-18											5.812			
		14-16	5.312														
6-5/8	34	BI 45E	5.406	5.561	5.791	5.561	5.791	5.250	5.406					2-7/8 O.D. E.U. 8 RD.	2.375		
			28-32													5.484	
		24-29	BI 45F	5.588	5.761	5.921	5.695									6.118	
6-5/8	24-26.5	BI 47A	5.656	5.830	6.100	5.830	6.184	5.500	5.656							2-7/8 O.D. E.U. 8 RD.	2.375
7	38-40		5.812														
6-5/8	20-22									5.968							
7	32-35																
6-5/8	17	BI 47B	5.968	6.101	6.530	6.094	6.538	5.750	5.968	2-7/8 O.D. E.U. 8 RD.	2.375						
7	28-30		6.078														
	23-26	6.210															
	20-23		6.281														
	17	BI47BC		6.281	6.531	6.700	6.531	6.875	6.125			6.281					
9-5/8	53.5	BI 51A	8.218	8.375	8.781	8.250	8.813	7.938	8.218			2.468					
	43.5-47		8.437														
	40	BI 51B	8.593	8.718	9.125	8.688	9.125	8.375	8.593								
	29.3-36		8.750														

## MODEL "BEA" RETRIEVAMATIC SERVICE PACKER

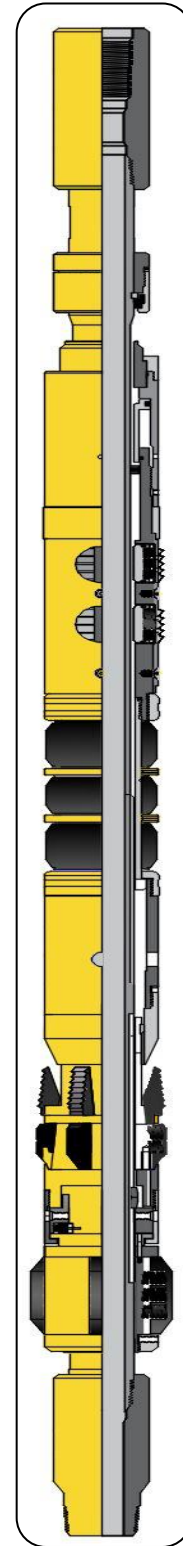
Product No.: BI 410-02

### Description & Application:

The BOTIL Model "BEA" Retrievmatic Service Packer is a retrievable stimulation and work over packer. Model "BEA" Retrievmatic is used in all types of squeeze cementing, casing testing, formation fracturing and high-pressure acidizing with subsequent testing. It is a full-opening, set – down packer with piston-type hold down buttons, actuated by pressure from below and a three-section packing element system.

### Features / Benefits:

- Large bypass area permits circulation around and through the tool while running in; straight pickup equalizes pressure across hold- down buttons instantly.
- Proven face seal unloaded controls the bypass, eliminating the need for mechanical locks and rotation.
- Bypass running completely through the packer isolates buttons from tubing pressure surges, reducing chance of dulling.
- Hold-down buttons maintain pack-off during high-pressure operations from below.
- Proven packing element system.
- Rocker slips set with only  $\frac{3}{4}$  turn, straight pickup to retrieve.



Model "BEA"  
Retrievmatic  
Service Packer  
Product No.: BI 783-19

Specification Guide MODEL "BEA" RETRIEVAMATIC SERVICE PACKER																	
Casing		Packer Size	Gage and Guide Ring OD (Inch.)	Packing Element OD (Inch.)	Packing Element Spacer OD (Inch.)	Slips and Buttons Range											
O.D. (Inch.)	Weight (ppf) T & C					Preferred		Absolute									
						Min. (Inch.)	Max. (Inch.)	Min. (Inch.)	Max. (Inch.)								
4-1/2	9.5-13.5	43A	3.771	3.625	3.734	3.910	4.090	3.820	4.090								
5	15-18	43B	4.125	3.937	3.937	4.250	4.408	4.126	4.409								
	11.5-15	43C	4.250	4.156	4.125	4.408	4.560	4.274	4.561								
5-1/2	26					44	4.406	4.312	4.375	4.625	4.778	4.484	4.778				
	20-23	45A2	4.500	4.375	4.500	4.778	4.950	4.950									
	15.5-20	45A4	4.641			4.781	4.687	4.781	4.950	5.190	4.764	5.190					
	13-15.5	45B	4.781	4.687	4.781								4.950	5.190	4.764	5.190	
	22.5																45C
6	26	45D	5.156	4.937	5.062	5.391	5.560	5.136	5.560								
	20-23	47A2	5.656			5.500	5.656	5.830	5.937	5.597	6.135						
6-5/8	34			45E2	5.406							5.250	5.406	5.561	5.609	5.386	5.791
	28-32			45E4	5.484									5.610	5.791		
	24-29			45F	5.625							5.609	5.761	5.921	5.632	5.941	
7	38	47A2	5.656	5.500	5.656	5.830	5.937	5.597	6.135								
6-5/8	17-20	47A4	5.812							5.750	5.968	5.938	6.135	5.861	6.538		
7	32-35			47B2	5.968	5.750	5.968	6.136	6.276			6.297	6.884				
	26-29	47B4	6.078	6.276	6.456												
	20-26	47C2	6.266	6.125	6.250	6.456	6.578										
7-5/8	33.7-39	47C4	6.453	6.500	6.671	6.579	6.797	6.545	7.132								
	24-29.7	47D2	6.672			6.798	7.025										
	20-24	47D4	6.812			7.025	7.125										
8-5/8	44-49	49A2	7.312	7.000	7.312	7.511	7.687	7.423	8.060								
	32-40	49A4	7.531			7.688	7.921										
	20-28	49B	7.781	7.500	7.781	7.922	8.191	7.919	8.255								
9-5/8	47-53.5	51A2	8.218	7.937	8.218	8.343	8.681	8.117	8.934								
	40-47	51A4	8.437			8.681	8.835										
	29.3-36	51B	8.593	8.375	8.593	8.836	9.063	8.539	9.063								
10-3/4	65.7-81	53A2	9.000	8.875	9.000	9.094	9.560	9.000	9.903								
	55.5-60.7	53A4	9.375			9.250	9.375	9.504	9.760	9.392	10.020						
	45.5-51	53A6	9.625	9.850	9.950												
	32.75-40.5	53B		10.050	10.192	9.642	10.270										
11-3/4	65-80.5	54A	10.125	10.000	10.125	10.406	10.682	10.250	10.711								
	38-60	54B	10.250			10.187	10.772	11.150	10.612	11.313							
13-3/8	77-102	55A	11.625	11.625	11.625	11.733	12.275	11.633	12.464								
	48-72	55B	12.125			11.812	12.191	12.715	12.133	12.800							



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**CASING CLEAN  
UP TOOLS**

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### MODEL "BC" CASING SCRAPER

**Product No.: BI 620-03**

#### Description:

Casing Scraper is used to remove mud or cement sheath, imbedded bullets, perforation burrs, rust, mill scale, paraffin and similar substances from the inside walls of the casing.

The importance of keeping this vital "working surface" clean and smooth is because all subsequent operations in the well are affected in one way or another by the condition of the casing ID. An imbedded bullet or sharp burr can damage a swab cup or packing element; less-than-full calculated inside diameter can be responsible for premature set of close-tolerance tools; and hardened rotary mud or a thin cement sheath left after drilling out following a cement job may prevent the slips of a pack-off tool from engaging the wall of the casing.

#### Features/Advantages:

**Rugged Construction:** The body of the Scraper is machined from solid bar stock, and blade blocks are of case hardened steel for absolute maximum ruggedness and strength.

**Rotating or Reciprocal Action:** The Casing Scraper operates successfully either when rotated or reciprocated vertically on Drill Pipe or Tubing. It can also be run on cable-tool drilling line with jars and sinkers when ordered with a cable-tool joint pin up.

**Cannot "Screw" Down During Rotation:** The angle and direction of shear of the scraping edges of the blades are such that the Scraper cannot "Screw" down past burrs as it rotates.

#### Operation:

For removal of cement sheath, the Scraper should be installed between the drill bit and the drill collar so that both the drilling-out and the sheath removal can be accomplished at the same time. It is good practice to maintain circulation while these operations are being conducted. The Scraper should be run completely through the perforated section without rotation, then pull back up and make a rotary run through the section. Casing Scrapers can be operated without rotary equipment by simply running completely through again. If the perforation density is relatively high, it is a good policy to rotate the tubing a quarter of a turn with tongs.

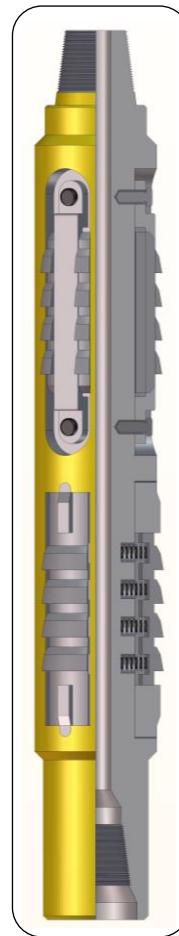
A Junk Basket is some time run above the Casing Scraper. If the mud pumps do not have the capacity to maintain the necessary circulation, the Basket may be mounted below the Scraper.

### MODEL "B" JUNK BASKET

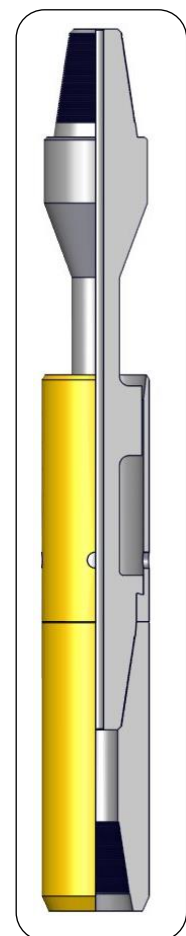
**Product No.: BI 428-02**

#### Description:

The Model "B" Junk Basket aids in the removal of cuttings from the hole when drilling or milling drillable or non-drillable materials. The basket is positioned just above the bit or Milling Tool in the Drilling String. It consists of a Drill Collar, a Cylinder and a Drill Collar Sub. This forms a basket for trapping the metal cutting. The effectiveness of the unit lies in the reduction of circulation fluid velocity upon reaching the upper portion of the Cylinder, which allows metal cutting to drop into the basket. A Junk Basket is sometimes run above the Casing Scraper.



Model "BC"  
Casing Scraper  
Product No.: BI 620-03



Model "B"  
Junk Basket  
Product No.: BI 428-02



Specification Guide MODEL "BC" CASING SCRAPERS							
O.D (Inch.)	Weight (ppf) T & C	Scraper size (Inch.)	Blade Block size	Range of Casing I.D. in which Scraper may be run		Thd. Specs.* Pin Up x Box Down	Circulating Hole I.D. (Inch.)
				Min. (Inch.)	Max. (Inch.)		
5-1/2	15.5-23	12	12-A	4.545	4.950	2-7/8 API Reg. TJ	1-1/8
5-1/2	13-14	12	12-B	4.887	5.240	2-7/8 API Reg. TJ	1-1/8
7	35-38	14	14-A	5.550	6.065	3-1/2 API Reg. TJ	1-1/4
7	17-32	14	14-B	5.969	6.538	3-1/2 API Reg. TJ	1-1/4
9-5/8	43.5-53.5	16	16-AB-1	8.379	8.755	4-1/2 API Reg. TJ	2
9-5/8	29.3-47	16	16-B	8.525	9.063	4-1/2 API Reg. TJ	2

\*Threads shown are standard, others can be furnished on special order only

## JUNK SUB

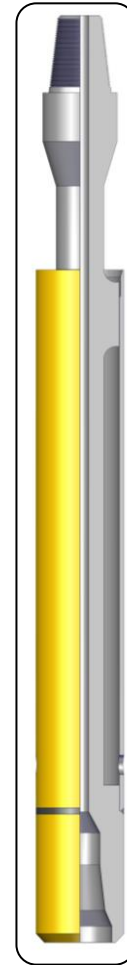
Product No.: BI 428-03

### Description & Application:

Junk Sub, which is normally run just above the drill bit, has a cup for catching object too heavy to be completely circulated out of the hole. This is particularly advantageous in junk milling operations.

By running a Junk Sub above a Scraper, operators can get quicker, cleaner scraping jobs.

Junk Sub is constructed from high quality steel, and features a rib guide which prevents the cup from becoming crushed and helps guide the tool through tight places upon withdrawal from the hole.



Junk Sub  
Product No.: BI 428-03

Specification Guide JUNK SUB										
MODEL SIZE	4 TO 5-5/8	4-5/8 TO 4-7/8	5-1/8 TO 5-7/8	6 TO 6-3/8	6-1/2 TO 7-1/2	7-1/2 TO 8-1/2	8-5/8 TO 9-5/8	9-5/8 TO 11-5/8	11-1/2 TO 13	14-3/4 TO 17-1/2
STD TOP CONNECTION A.P.I.REG. TOOL JOINT OIN	2-3/8	2-7/8	3-1/2	3-1/2	3-1/2	4-1/4	4-1/4	6-5/8	5-6/8	7-5/8
O.D.OF BODY (TOP CONNECTION)	3-1/8	3-3/4	4-1/4	4-1/4	4-1/4	5-1/2	5-1/2	7-3/4	7-3/4	8-7/8
O.D.OF BODY (UNDER CUP)	2	2-5/8	3 1/8	3-1/4	3 1/4	4-1/2	4-1/2	5-3/4	5-3/4	7-5/8
O.D.OF BODY (UNDER CUP)	3-11/16	4	4-1/2	5	5-1/2	6-5/8	7	8-5/8	9 5/8	12-7/8
I.D.OF CUP	3-5/16	3-5/8	-	4-9/16	4-7/8	5-15/16	6-9/32	7-15/16	8-17/32	11-5/8
DIAMETER OF BORE	3/4	1-1/4	1-1/2	1-1/2	1-1/2	2-1/4	2-1/4	3-1/2	3-1/2	4
LENGTH OF CUP	10	10	10	10	10	10	10	10	10	10
TOTAL LENGTH	29	29-1/2	30-1/2	30-1/2	30-1/2	31-1/2	31-1/2	33	33	36
LENGTH OF CUP	20	20	20	20	20	20	20	20	20	20
TOTAL LENGTH	43-1/2	44	45	45	45	46	46	48	48	50
LENGTH OF CUP	30	30	30	30	30	30	30	30	30	30
TOTAL LENGTH	53-1/2	54	55	55	55	56	56	58	58	60



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**FLOW CONTROL  
EQUIPMENT**

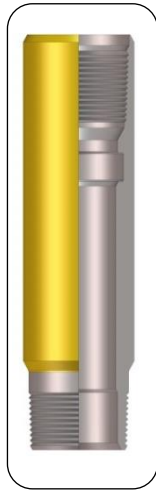
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## MODEL "BF" SEATING NIPPLE

Product No.: BI 801-50

Model "BF" Seating Nipple is a Top No-Go or Selective Seating Nipple that provides for the location of various wire-line flow control devices in the production string. Its location should be carefully considered in the completion planning stages to allow maximum versatility in the positioning of various flow control accessories.

Model "BF" Seating Nipples are manufactured as per ANSI/NACE MR0175/ISO 15156 2009.



Model "BF" Seating Nipple  
Product No.: BI 801-50

### Applications:

Model "BF" Seating Nipples are used for the following operations:

- To land Blanking Plugs to shut in well or to test the Production Tubing.
- To land Velocity Type Safety Valves.
- To land equalizing Check Valves, Circulation Blanking Plugs & land chokes.
- 

### Features:

- Honed internal sealing bores for maximum sealing performance.
- Locking Groove / No-Go Shoulder combination above seal bore.
- Accepts Selective or Top No-Go locks.
- Any number of Model "BF" Nipples with the same seal bore can be run in the tubing when Selective Locks are required.

Specification Guide "BF" SEATING NIPPLE		
Tubing OD (Inch.)	Nipple	
	Seal Bore (Inch.)	Min OD (Inch.)
2-1/16	1.562	Coupling O.D.
	1.625	
2-3/8	1.781	
	1.812	
	1.875	
2-7/8	2.062	
2-7/8	2.250	
	2.312	
3-1/2	2.562	
	2.750	
	2.812	
4	3.125	
	3.250	
	3.312	
4-1/2	3.688	
	3.750	
	3.812	

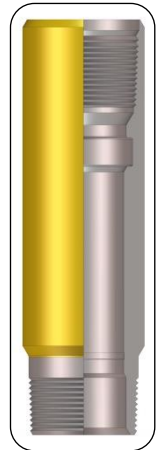
Smaller O.D's can be supplied on Request.

## MODEL "BR" SEATING NIPPLE

Product No.: BI 801-55

The Model "BR" Seating Nipple is a Bottom No-Go Seating Nipple that provides for the location of various wire-line flow control devices in the production string. The location and number of Model "BR" Seating Nipples should be carefully considered in the completion planning stages.

Model "BR" Seating Nipples are manufactured as per ANSI/NACE MR0175/ISO 15156 2009.



Model "BR" Seating Nipple  
Product No.: BI 801-55

### Applications:

Model "BR" Seating Nipples are used for the following operations:

- To land Blanking Plugs to shut in well or to test the Production Tubing.
- To land Velocity Type Safety Valves.
- To land equalizing Check Valves, Circulation Blanking Plugs & land chokes.
- To prevent loss of wire-line work string in some cases.
- To land chokes.
- To land instrument hangers with geophysical devices

### Features:

- Honed internal sealing bores for maximum sealing performance.
- Locking Groove/ Bottom No-Go shoulder combination accepts Bottom No-Go Locks.

Specification Guide "BR" SEATING NIPPLE			
Tubing OD (Inch.)	Seal Bore (Inch.)	No-Go ID (Inch.)	Min. OD (Inch.)
2-1/16	1.562	1.510	Coupling O.D.
2-3/8	1.781	1.728	
	1.812	1.760	
2-7/8	1.875	1.822	
	2.062	1.978	
	2.125	2.035	
2-7/8	2.250	2.197	
	2.312	2.259	
	2.562	2.442	
3-1/2	2.750	2.697	
	2.812	2.759	
4	3.125	3.072	
	3.312	3.242	
4-1/2	3.688	3.625	
	3.750	3.700	
	3.812	3.75	

Smaller O.D's can be supplied on Request.

**MODEL "BFSG-21", "BFWG-21" & "BRZG-21"  
BY-PASS BLANKING PLUGS WITH REMOVABLE  
MANDREL**

**Product No.: BI 806-87, BI 806-88, BI 806-89**

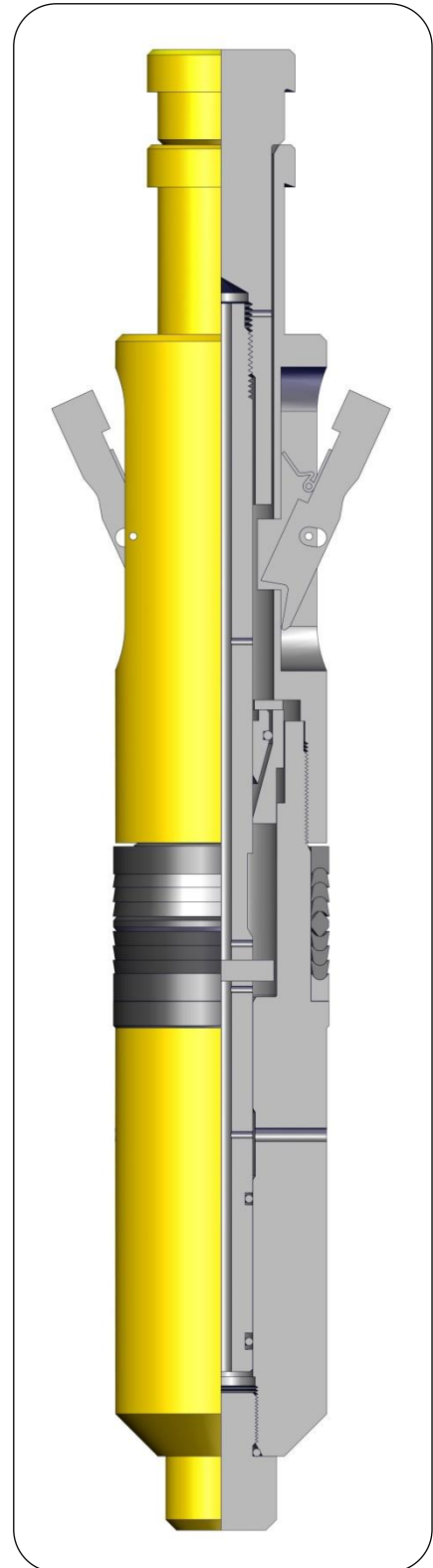
Models "BFSG", "BFWG" and "BRZG" Bypass Blanking Plugs with Removable Mandrel are positive blank-off devices designed to seal off pressure from above and below.

The Models "BFSG" and "BFWG" Blanking Plugs are equipped for Top No-Go landing in Model "F" Non-Ported Seating Nipples and upper bore of Model "L" Sliding Sleeves.

The Model "BRZG" Blanking Plug is equipped for Bottom No-Go landing in Model "R" Non-Ported Seating Nipples. The plugs are compatible with normal wire line equipment and procedures.

During running-in the Removable Mandrel is held in the by-pass position by the Running Tool, to allow fluid by-pass when landing in the Seating Nipple. When the Plug is locked into the desired Seating Nipple, the Removable Mandrel is shifted and locked to close the By-pass Ports.

To equalize, a standard Wire line Pulling Tool latches on to and retrieves the Removable Mandrel. After the pressures have been equalized through the By-pass Ports, the plug may be retrieved with a standard Pulling Tool.



Model "BFWG"  
By-Pass Blanking Plug  
Product No.: BI 806-88

Specification Guide MODEL "BFWG-21" & "BRZG-21" BY-PASS BLANKING PLUG						
Tubing OD (Inch.)	Seal Bore (Inch.)	Size (Inch.)	Max OD (Inch.)	To Run	To Pull	
				"BC-1" Running Tool Product No.: BI 811-06	Removable Mandrel Pulling Tool	Plug "B" Probe Product No.: BI 812-07
2-1/16	1.562	1.56	1.615	1.900	JUC or JDC	1.900
2-3/8	1.781	1.78	1.865	2-3/8	JUC or JDC	2-3/8
	1.812	1.81				
	1.875	1.87				
2-7/8	2.250	2.25	2.302	2-7/8	JUC or JDC	2-7/8
	2.312	2.31				

Specification Guide MODEL "BFSG-21" BY-PASS BLANKING PLUG							
Tubing OD (Inch.)	Seal Bore (Inch.)	Size (Inch.)	Locating Ring OD (Inch.)	To Run		To Pull	
				"BC-1" Running Tool Product No.: BI 811-06	"BG" Running Tool Product No.: BI 811-08	Removable Mandrel	Plug
						Pulling Tool	"AC" Probe Product No.: BI 812-08
2-1/16	1.562	1.56	1.593	1.900		JUC or JDC	1.900
	1.625	1.62	1.656				
2-3/8	1.781	1.78	1.807	2-3/8		JUC or JDC	2-3/8
	1.812	1.81	1.843				
	1.875	1.87	1.906				
2-7/8	2.250	2.25	2.281	2-7/8		JUC or JDC	2-7/8
	2.312	2.31	2.343				
3-1/2	2.750	2.75	2.781	3-1/2		JUC or JDC	3-1/2
	2.810	2.81	2.843				
4-1/2	3.688	3.68	3.717	4-1/2		JUC or JDC	4-1/2
	3.812	3.81	3.835				

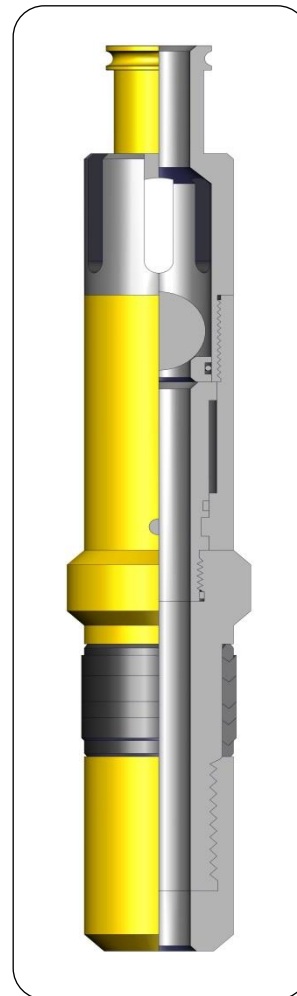
**MODEL "BFB-2" EQUALIZING CHECK VALVE**  
Product No.: BI 809-35 (Top No-Go)

**MODEL "BRB-2" EQUALIZING CHECK VALVE**  
Product No.: BI 809-36 (Bottom No-Go)

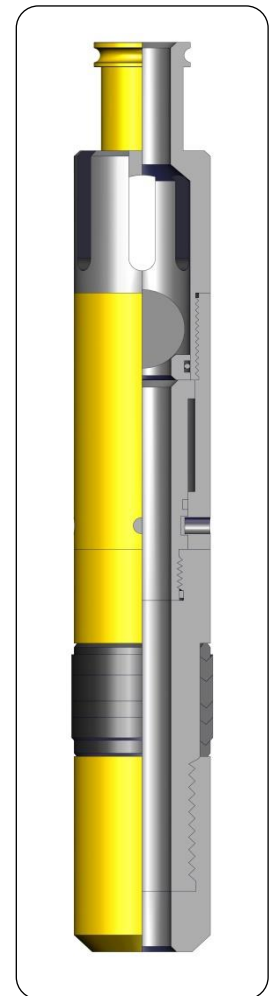
Equalizing Check Valves, sometimes called "Standing Valves", prevent downward flow while allowing upward flow. These wire-line retrievable check valves are run and landed in Seating Nipples or in Sliding Sleeves.

**Features:**

- Provide simple means for testing tubing and setting hydraulically actuated equipment.
- Run and retrieved with standard wire-line equipment or run in place with the tubing.
- Integral equalizing feature for quick and easy retrieval of Equalizing Check Valve.



Model "BFB-2"  
Equalizing Check Valve  
Product No.: BI 809-35  
(Top No-Go)



Model "BRB-2"  
Equalizing Check Valve  
Product No.: BI 809-36  
(Bottom No-Go)

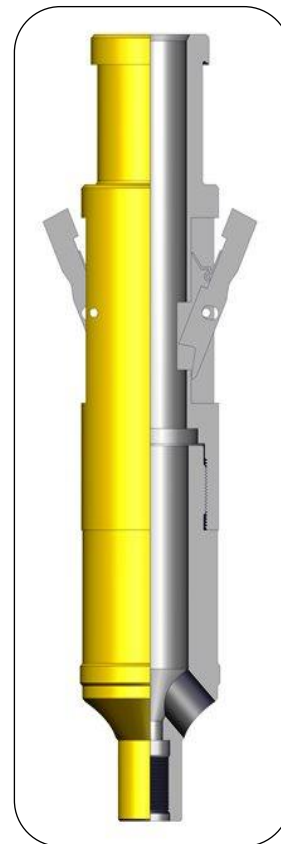
Specification Guide							
Tubing O.D. (Inch.)	Seal Bore (Inch.)	Size (Inch.)		Max O.D. (Inch.)		To Run	To Pull
		"BFB-2"	"BRB-2"	"BFB-2"	"BRB-2"	"BC-1" Running Tool Product No.: BI 811-06	Pulling Tool
2-1/16	1.562	1.56		1.615	1.552	1.900	JUC or JDC
	1.625	1.62		1.672	-		
2-3/8	1.781	1.78		1.803	1.771	2-3/8	JUC or JDC
	1.812	1.81		1.865	1.802		
	1.875	1.87		1.905	1.865		
2-7/8	2.062	2.06		2.115	2.052	2-7/8	JUC or JDC
	2.250	2.25		2.302	2.240		
	2.312	2.31		2.364	2.302		
3-1/2	2.562	2.56		2.625	2.552	3-1/2	JUC or JDC
	2.750	2.75		2.802	2.740		
4	2.812	2.81		2.865	-	3-1/2	JUC or JDC
	3.125	3.12		3.175	3.115		
	3.312	3.31		3.406	3.302		
4-1/2	3.688	3.68		3.740	3.678	4-1/2	JUC or JDC
	3.750	3.75		3.802	3.740		
	3.812	3.81		3.875	3.802		

**MODEL "B-RZB" DOWNHOLE INSTRUMENT HANGER**  
**Product No.: BI 803-25**

The Model "B-RZB" Downhole Instrument Hanger is used to land and lock geophysical instruments in "BR" type profiles to allow recording of reservoir data.

**Features:**

- It allows the well's Safety System to remain in full Operation during the survey.
- It allows removal of wire-line from a corrosive environment to prevent damage of wire-line.
- Several wells may be surveyed with one wire-line unit.
- Model "BC-1" Running Tool is used to run.
- Model "B" Probe is used to release.
- Model "JDC" Pulling Tool is used to pull.



Model "B-RZB"  
 Downhole Instrument Hanger  
 Product No.: BI 803-25

Specification Guide		
Size (Inch.)	NO-GO	Bottom Thread
1.780	1.771	0.750" OD 16UNF
1.810	1.802	
1.870	1.865	
2.250	2.240	
2.310	2.302	
2.750	2.740	
2.813	2.802	

## MODEL "JDC" PULLING TOOL

Product No.: BI 811-90

## MODEL "JUC" PULLING TOOL

Product No.: BI 811-91

The model "JDC" or "JUC" Pulling Tool is a wire-line service tool designed to remove retrievable sub-surface devices with outside fishing necks from a well. The Model "JDC" or "JUC" Pulling Tool is available with different core length which permits the tool to retrieve subsurface devices with fishing neck of different lengths of reach.

### Features:

The Model "JUC" Pulling Tool utilizes the "U" Sub which is made up to the core of the tool. The dogs which are mounted on the skirt are inserted into the vertical openings in the skirt. The dogs are spring loaded and have pawls located in the windows of the skirt. The "JUC" Pulling Tool can be released, in the event that the sub-surface device cannot be pulled, by continued upward jarring.



Model "JDC"  
Pulling Tool  
Product No.: BI 811-90

Specification Guide "JDC" PULLING TOOL								
Nominal Size	1-1/4"	1-3/8"	1-1/2"	1-5/8"	2"	2-1/2"	3"	4"
Max. O.D. (Inch.)	1.291	1.375	1.422	1.625	1.859	2.250	2.796	3.750
Fishing Neck O.D (Inch.)	1.187	1.187	1.187	1.187	1.375	1.375	1.750	2.313
Thread Connection	15/16 10UN	15/16 10UN	15/16 10UN	15/16 10UN	15/16 10UN	15/16 10UN	15/16 10UN	15/16 10UN
Overall Length (Inch.)	13.00	12.94	13.00	13.00	14.50	14.77	14.94	19.06
Reach	1.937	1.875	1.094	1.094	1.437	1.313	1.437	2.313

Specification Guide "JUC" PULLING TOOL						
Nominal Size	1-1/2"	1-5/8"	2"	2-1/2"	3"	4"
Max. O.D. (Inch.)	1.422	1.422	1.859	2.250	2.796	3.750
Fishing Neck O.D (Inch.)	1.187	1.187	1.375	1.375	1.750	2.313
Top Thread Connection	15/16 10UN	15/16 10UN	15/16 10UN	15/16 10UN	15/16 10UN	15/16 10UN
Overall Length (Inch.)	13.00	13.00	14.50	14.77	14.94	19.06
Reach	1.094	1.094	1.437	1.313	1.437	2.313
Bottom Thread Connection	1/2 13UNC	1/2 13UNC	1/2 13UNC	1/2 13UNC	5/8 11UN	1-1/4 12UN



## MODEL "BSB" PULLING TOOL

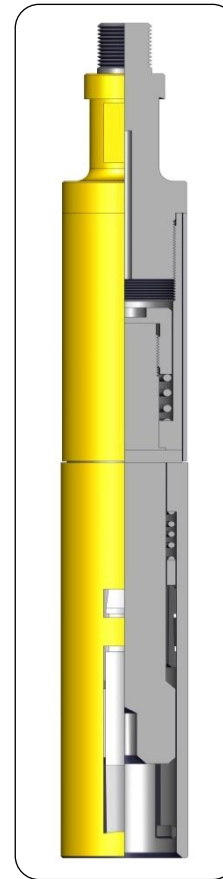
Product No.: BI 811-45

The "BSB" Pulling Tool is a basic wire-line device which establishes the connection between a Wire-line Tool and a subsurface device that is to be retrieved from its operating location in a well. The Pulling Tool is designed to engage an external type fishing neck and release by downward jarring.

## MODEL "BRB" PULLING TOOL

Product No.: BI 811-46

The "BRB" Pulling Tool is a basic wire-line device which establishes the connection between a Wire-line Tool and a subsurface device that is to be retrieved from its operating location in a well. The Pulling Tool is designed to engage an external type fishing neck and release by upward jarring. The tool is offered in sizes according to the customer's choice.



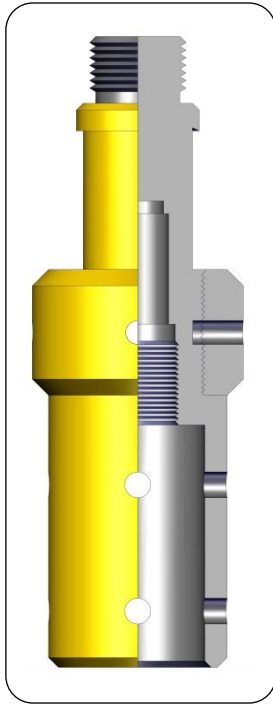
Model "BSB"  
Pulling Tool  
Product No.: BI 811-45

Specification Guide "BSB" PULLING TOOL					
Nominal Size	1-1/2"	2"	2-1/2"	3"	4"
Max. O.D. (Inch.)	1.422	1.766	2.188	2.844	3.670
Fishing Neck O.D (Inch.)	1.187	1.375	1.375	2.312	2.312
Top Thread Connection	15/16 10UN	15/16 10UN	15/16 10UN	15/16 10UN	15/16 10UN
Overall Length (Inch.)	11.87	15.89	16.36	17.50	18.00
Reach	1.297	1.219	1.281	1.500	1.500
Bottom Thread Connection	3/8 16UNC	1/2 13UNC	1/2 13UNC	5/8 11UN	1-1/4 12UN

Specification Guide "BRB" PULLING TOOL					
Nominal Size	1-1/2"	2"	2-1/2"	3"	4"
Max. O.D. (Inch.)	1.430	1.770	2.180	2.840	3.670
Fishing Neck O.D (Inch.)	1.187	1.375	1.375	2.312	2.312
Top Thread Connection	15/16 10UN	15/16 10UN	15/16 10UN	15/16 10UN	15/16 10UN
Overall Length (Inch.)	12.65	16.42	16.35	16.07	17.90
Reach	1.265	1.219	1.203	1.265	1.490
Bottom Thread Connection	3/8 16UNC	1/2 13UNC	1/2 13UNC	5/8 11UN	1-1/4 12UN

**MODEL "BC-1" RUNNING TOOL**  
**Product No.: BI 811-06**

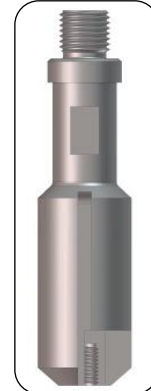
The Model 'BC-1' Running Tool runs Flow Control devices that have external fishing neck locks. A thread protector, which is the same OD as the tool body, makes possible selective setting. A Seal Bore Locating Ring provides Top No-Go setting. A box-down connection accepts the 'A' or 'N-1' Shank.



Model "BC-1"  
 Running Tool  
 Product No.: BI 811-06

**MODEL "A" GUIDE**  
**Product No.: BI 811-71**

The Model "A" Guide is basically a Prong carrier. It centers and limits the Prong penetration during equalizing operations.

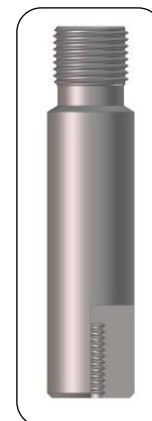


Model "A"  
 Guide  
 Product No.:  
 BI 811-71

**MODEL "A" SHANK**  
**Product No.: BI 811-80**

The Model "A" Shank is used with the "BC-1" Running Tool to run "S", "W" and "Z" locks (retracted) during running and it can also be used as a Prong carrier when Prongs are required during running operations.

"A" prong is widely used in running and pulling operations. "B" Prong runs "R" type Blanking Plugs. "C" Prong equalizes "R" Blanking Plugs.



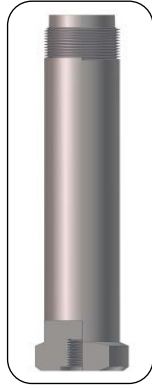
Model "A"  
 Shank  
 Product No.:  
 BI 811-80

**Specification Guide**

Accessory Size (Inch.)	Running Tool Size (Inch.)	Locating Ring OD (Inch.)
1.43	1.900 To 2-1/16	1.468
1.50		1.520
1.56		1.593
1.62		1.656
1.78	2-3/8	1.807
1.81		1.843
1.87		1.906
2.25	2-7/8	2.281
2.31		2.343
2.75	3-1/2	2.781
2.81		2.843
3.68	4-1/2	3.802
3.81		-

**MODEL "N-1" SHANK**  
**Product No.: BI 811-85**

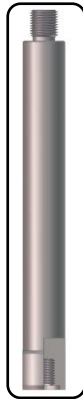
The Model "N-1" Shank is used in conjunction with the Model "BC-1" Running Tool to run and land Flow Control Equipment having "G" or "R" locks.



Model "N-1"  
Shank  
Product No.:  
BI 811-85

**MODEL "N-1" PROBE**  
**Product No.: BI 812-13**

The Model "N-1" is used to retrieve "G" and "R" locks.



Model "N-1"  
Probe  
Product No.:  
BI 812-13

**MODEL "A" PRONG**  
**Product No.: BI 811-70**

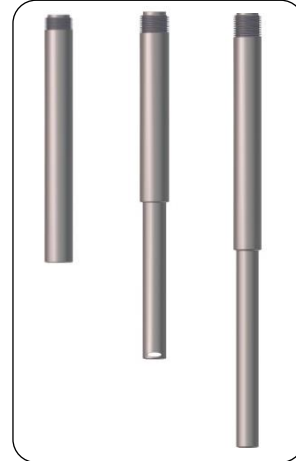
The Model "A" Prong is made up on the Model "A" Shank connected to a BOTIL Model "C-1" Running Tool or the plunger extension of a Model "E" Selective Running Tool to hold the circulating device of the BOTIL Flow Control Accessory open.

**MODEL "B" PRONG**  
**Product No.: BI 811-72**

The Model "B" Prong is used with BOTIL Running Tools only when running Flow Control Accessories that contain Type "R" Bypass Blanking Plug Sub-assemblies and also hold the Bypass Valve open while running. The Model "B" differs from the Model "A" in that it has a specific length of turned-down OD on the bottom end for passing through the Bypass Valve, plus a drill hole located near the bottom for pinning to the Valve.

**MODEL "C" PRONG**  
**Product No.: BI 811-73**

The Model "C" Prong differs from the Model "B" in that it is longer and does not contain a drilled hole. The Model "C" is run below the Model "A" Guide to actuate the equalizing device and allow the Accessory to be retrieved.

**MODEL "A" PROBE**  
**Product No.: BI 812-06**

The Model "A" is used to retrieve "S" locks.

**MODEL "B" PROBE**  
**Product No.: BI 812-07**

The Model "B" is used to retrieve "W" and "Z" locks.



## MODEL "BX", "BXN", "BR" & "BRN" NON-PORTED SEATING NIPPLE

**Product No.: BI 801-01, BI 801-02, BI 801-03 & BI 801-04**

Model "BX" Non-Ported Seating Nipple is a Top no-go downhole tubing Nipple used to locate, seal, and retain "BX" Locks.

Model "BXN" Non-Ported Seating Nipple is a bottom no-go downhole tubing Nipple used to locate, seal, and retain "BXN" Locks.

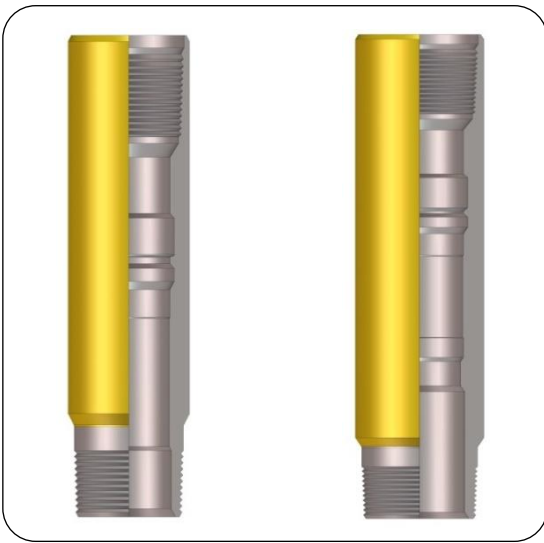
Model "BR" Non-Ported Seating Nipple is a Top no-go downhole tubing Nipple used to locate, seal, and retain "BR" Locks.

Model "BRN" Non-Ported Seating Nipple is a bottom no-go downhole tubing Nipple used to locate, seal, and retain "BRN" Locks. X and XN Landing Nipple are designed for use with standard tubing weights.

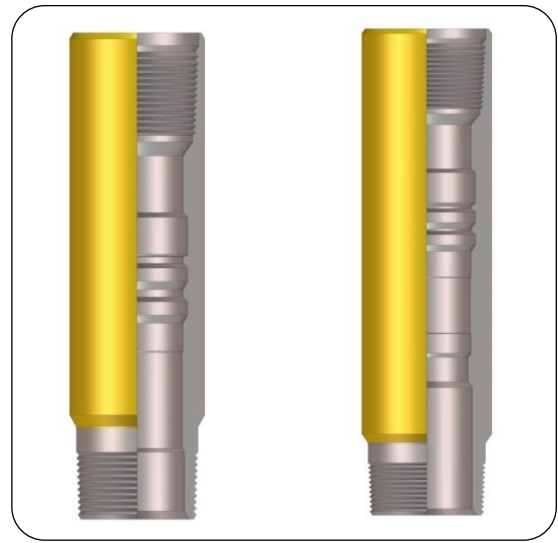
R and RN Landing Nipple are designed for use with heavy weight tubing. (The N designate no-go nipple).

### Features:

- Large bore for minimum restriction.
- Universal Nipple with one internal profile.



Model "BX" & "BXN"  
Seating Nipple  
Product No.: BI 801-01 & BI 801-02



Model "BR" & "BRN"  
Seating Nipple  
Product No.: BI 801-03 & BI 801-04

Specification Guide OTIS TYPE "X" AND "XN" LANDING NIPPLES AND LOCK MANDRELS							
Tubing				For Standard Tubing Weights			Lock Mandrel ID (Inch.)
				"X" Profile	"XN" Profile		
Size (Inch.)	Weight (ppf)	ID (Inch.)	Draft (Inch.)	Packing Bore (Inch.)	Packing Bore (Inch.)	No- Go ID (Inch.)	
1.660	2.3	1.380	1.286	1.250	1.250	1.135	0.62
	2.4						
1.900	2.4	1.660	1.516	1.500	1.500	1.448	0.75
	2.76	1.610					
	2.9						
2.063	3.25	1.751	1.657	1.625	1.625	1.536	0.75
2-3/8	4.6	1.995	1.901	1.875	1.875	1.791	1.00
	4.7						
2-7/8	6.4	2.441	2.347	2.313	2.313	2.205	1.38
	6.5						
3-1/2	9.3	2.992	2.867	2.813	2.813	2.666	1.75
	10.2	2.922	2.797	2.750	2.750	2.635	
4	11	3.476	3.351	3.313	3.313	3.135	2.12
4-1/2	12.75	3.958	3.833	3.813	3.813	3.725	2.62
5	13	4.494	4.369	4.313	4.313	3.987	2.62
5-1/2	17	4.892	4.767	4.562	4.562	4.455	3.12

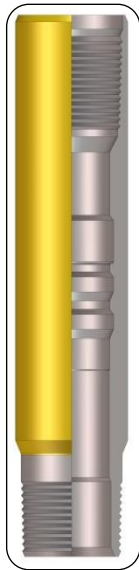
Specification Guide OTIS TYPE "R" AND "RN" LANDING NIPPLES AND LOCK MANDRELS							
Tubing				For Standard Tubing Weights			Lock Mandrel ID (Inch.)
				"R" Profile	"RN" Profile		
Size (Inch.)	Packing Bore (Inch.)	Packing Bore (Inch.)	Packing Bore (Inch.)	Packing Bore (Inch.)	Packing Bore (Inch.)	No- Go ID (Inch.)	
1.900	3.64	1.500	1.406	1.375	1.375	1.250	0.62
2 3/8	5.30	1.939	1.845	1.781	1.781	1.640	0.88
	5.95	1.867	1.773	1.710	1.710	1.560	0.75
	6.20	1.853	1.759				
	7.70	1.703	1.609	1.500	1.500	1.345	0.62
2 7/8	7.90	2.323	2.229	2.188	2.188	2.010	1.12
	8.70	2.259	2.165	2.125	2.125	1.937	0.88
	8.90	2.243	2.149				
	9.50	2.195	2.101	2.000	2.000	1.881	0.88
	10.40	2.151	2.057				
	11.00	2.065	1.971	1.875	1.875	1.716	0.88
	11.65	1.995	1.901				
3 1/2	12.95	2.750	2.625	2.562	2.562	2.329	1.38
	15.80	2.548	2.423	2.313	2.313	2.131	1.12
	16.70	2.480	2.355				
	17.05	2.440	2.315	2.188	2.188	2.010	1.12
4	11.60	3.428	3.303	3.250	3.250	3.088	1.94
	13.40	3.340	3.215	3.125	3.125	2.907	1.94
4 1/2	12.80	3.958	3.833	3.813	3.813	3.725	2.12
	13.50	3.920	3.795	3.688	3.688	3.456	2.38
	15.50	3.826	3.701				
	16.90	3.754	3.629	3.437	3.437	3.260	1.94
	19.20	3.640	3.515				
5	15.00	4.408	4.283	4.125	4.125	3.912	2.75
	18.00	4.276	4.151	4.000	4.000	3.748	2.38
5 1/2	17.00	4.892	4.767	4.562	4.562	4.445	2.85
	20.00	4.778	4.653				
	23.00	4.670	4.545	4.313	4.313	3.987	2.62
6	15.00	5.524	5.399	5.250	5.250	5.018	3.50
	18.00	5.424	5.299				
6 5/8	24.00	5.921	5.795	5.625	5.625	5.500	3.50
	28.00	5.791	5.666				
7	17.00	6.538	6.431	5.963	5.963	5.770	3.75
	20.00	6.456	6.331				
	23.00	6.366	6.241				
	26.00	6.276	6.151				
	29.00	6.184	6.059				
	32.00	6.094	5.969				
8 5/8	36.00	7.825	7.700	7.050	7.050	6.925	3.75
				7.250	7.250	7.125	
				7.450	7.450	7.325	

**MODEL "BRT" NON-PORTED SEATING NIPPLE**  
**Product No.: BI 801-05**

BOTIL "BRT" NO-GO Landing Nipple system provides a means of running a series of positive location landing nipples in tubing string with minimum restriction. BOTIL "BRT" NO-GO Landing Nipples are designed to accept BOTIL "BRT" Lock Mandrels with a rated working pressure of 10,000 psi differential and greater from above and below.

The BOTIL "BRT" Lock Mandrels locates on top of the Nipple's polished bore, therefore, there are no secondary restrictions normally associated with bottom no-go profiles.

This feature makes BOTIL "BRT" systems well suited for high pressure, high volume, and large bore completions. BOTIL "BRT" Lock Mandrels in any given size range are designed to use the same running and pulling tool.



Model "BRT"  
 Seating Nipple  
 Product No.: BI 801-05

Specification Guide "BRT" Landing Nipples and Lock Mandrels			
Tubing (Inch.)	Nipple Profile	Lock Mandrel	
	Seal Bore Min. I.D (Inch.)	ID (Inch.)	OD (Inch.)
2-3/8	1.500	0.75	1.580
	1.625		1.685
	1.781		1.841
	1.875		1.935
	2.000		2.080
	2.125		2.185
2-7/8	2.000	1.12	2.060
	2.125		2.185
	2.188		2.248
	2.313		2.373
	2.482		2.542
3-1/2	2.562	1.50	2.622
	2.650		2.710
	2.750		2.810
	2.810		2.860
	2.875		2.935
4 to 4-1/2	3.000	1.75	3.060
	3.125		3.210
	3.250	1.94	3.335
	3.313		3.395
4-1/2 to 5	3.437	1.94	3.520
	3.562		3.650
	3.688		3.770
	3.750		3.807
	3.813		3.895
	4.000		4.090
5-1/2	4.125	2.75	4.207
	4.188		4.270
	4.250		4.332
	4.313		4.395
	4.437		4.520
	4.500		4.550
	4.562		4.650
	4.688	4.760	
	4.688	3.12	4.760
	4.750		4.825
4.813	4.890		
7	5.250	3.68	5.334
	5.500		5.585
	5.625		5.710
	5.750		5.840
	5.813		5.890
	5.875		5.940
	5.983		6.025
	6.125		6.180
	6.250		6.330

**MODEL "BX", "BXN", "BR", & "BRN", LOCK MANDREL**

**Product No.: BI 804-04**

The "BXN" & "BRN" Locking Mandrel is the "NO-GO" version of the usually selective locks.

The keys have an angled shoulder instead of the square shoulder of the selective locks. A "NO-GO" shoulder of an equalizing sub or a crossover sub made up the bottom of the lock must make contact with a bore restriction in the "NO-GO" nipple in order to lock this mandrel.

**MODEL "BPR" PLUG**

**Product No.: BI 806-95**

Model "BPR" Plug is a positive plug used in conjunction with the Type "BR" Landing Nipple. This Plug might be used to test tubing or to plug tubing to perform repairs or replacement of surface equipment.

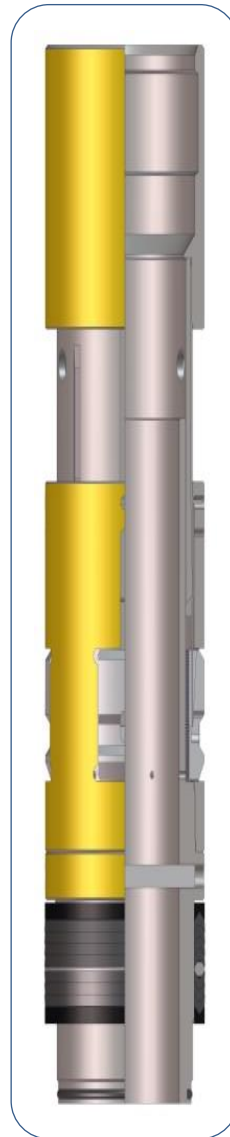
Equalization is achieved by pulling the equalizing prong from the plug assembly.

**EQUALIZING CHECK VALVE**

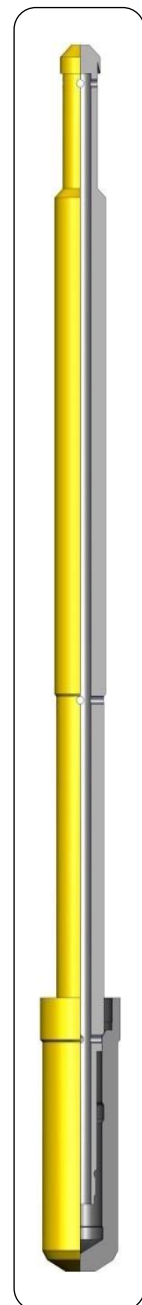
**Product No.: BI 809-38**

BOTIL one trip Equalizing Check Valves, they are sometimes called "Standing Valves" because they prevent fluid flow in one direction (downward) while allowing full fluid in the opposite direction (upward). This type has a built-in method of allowing equalizing before pulling.

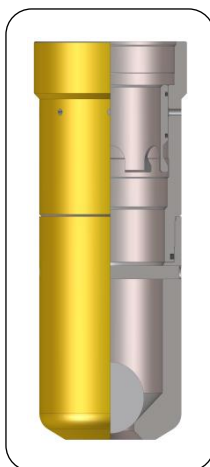
BOTIL one trip Equalizing check valve consist of a standing valve cap in conjunction with Equalizing sub assembly & Lock Mandrel.



Model "BX"  
Lock Mandrel  
Product No.: BI 804-04



Model "BPR"  
Plug  
Product No.: BI 806-95



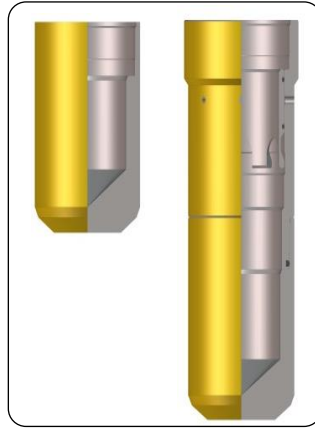
Equalizing  
Check Valve  
Product No.:  
BI 809-38



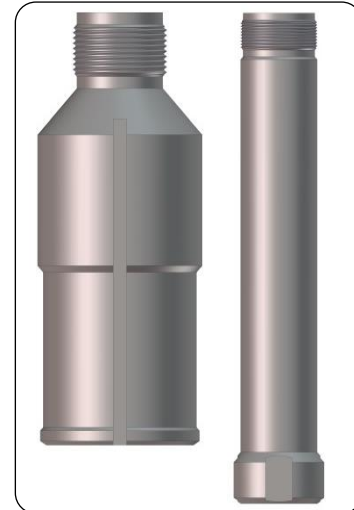
**MODEL "R" VALVE CAP**

**Product No.: BI 806-92**

The Model 'R' Valve cap conjugation with Model 'RN' Lock Mandrel and Model "BR" Equalizing Sub Assembly makes a Positive Plug to hold pressure from above and below, in a "BRN" Landing Nipple. This plug might be used to test tubing or to plug tubing to perform repairs or replacement of surface equipment. Equalization is achieved by shifting an equalizing valve into the open position before the mandrel is unlocked.



Model "R"  
Valve Cap  
Product No.: BI 806-92



Model "X" & "R"  
Running & Pulling Prong  
Product No.:  
BI 811-74 & BI 811-75

**MODEL "BR" RUNNING TOOL**

**Product No.: BI 811-08**

The "BX" and "BR" Running Tools are used to run, locate, and set Type "BX", "BXN", "BR", and "BRN" Locks and subsurface safety equipment.

**MODEL "GS" RUNNING AND PULLING TOOL**

**Product No.: BI 811-90**

The "GS" Running/Pulling Tool is a basic wire line device which connects a wire line tool string to a wire line retrievable flow control device that is to be run into or retrieved from a well. The "GS" Running/Pulling Tool is designed to engage an internal type fishing neck. The tool is offered in a wide range of sizes. The tools are supplied for standard or H2S service.

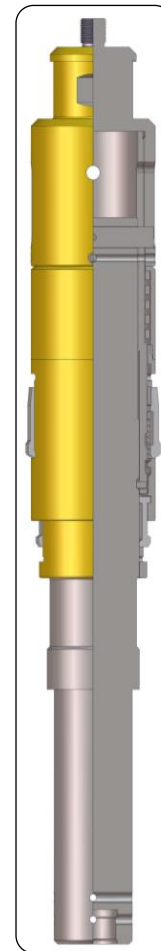
**MODEL 'X' & 'R' RUNNING & PULLING PRONG**

**Product No.: BI 811-74 & 811-75**

Model "X" Running Prong is used with Model "BX" and "BR" Running Tool. The thread connection is compatible with the box end of Core in the Running Tool. It is used to run the locks of locking devices in the retracted position to facilitate running of locking devices in the well bore until the locking devices not reach the desire depth.

Model "X" Pulling Prong is used with Model "GS" Pulling Tool. The thread connection is compatible with the box end of Core in the Pulling Tool. It is used to retract locks of locking devices to facilitate pulling of devices.

Running and Equalizing Prongs are commonly screwed into running and pulling tools to perform functions necessary in manipulating subsurface devices.



Model "BR"  
Running Tool  
Product No.: BI 811-08

## MODEL "BL" SLIDING SLEEVE

**Product No.: BI 810-04**

The Model 'BL' Sliding Sleeve is a downhole flow control device mounted in the Production Tubing. It effectively controls flow between the tubing and casing annulus, by means of an internal sleeve that is opened or closed by standard wire-line methods.

### Applications:

Sliding Sleeves may be used to establish Tubing to annulus communication for following operations:

- Displacing the Tubing or annulus fluid after X-mas tree installation.
- For testing, treating and production of individual zones in a multi- zone selective well.
- For producing more than one zone through a single Tubing String. For killing a well by circulation.
- For Gas Lift.
- For landing a Blanking Plug in Nipple profile to shut in well or when testing Tubing.
- For landing comingling chokes in nipple profile.
- For circulating Inhibitors for corrosion control.



Model "BL"  
Sliding Sleeve  
Product No.:  
BI 810-04

### Features:

- Simple, Positive Control - With a Model 'BL' Sliding Sleeve, establishing or closing off tubing-to-casing annulus communication is simple, dependable and quick. This type of product makes it possible to close the ports without leaving any obstruction in the Tubing once the shifting operation is completed.
- Protected Closing Sleeve - The closing sleeve is recessed so that there is no danger of opening or closing the sleeve by mistake while running Wire-line Tools through or while seating a Flow Control device in the Sliding Sleeve.
- Run in Tandem - Any number of Model "L" Sliding Sleeves may be run in tandem and still accept Wire-line Flow Control devices. Selective-type locks will pass through as many of the Sleeves as the operator chooses and seat in any sleeve he selects.
- Additional Seating Nipple - The Upper Sub of the Model 'BL' Sleeve has a Model "BF" Seating Nipple profile to land selective or Top No-Go Locking Flow Control devices.
- The lower seal sub has a honed bore that in combination with the upper seating nipple can be utilized to land Separation Sleeves, Chokes or Blanking Plugs.

Specification Guide			
Tubing O.D (Inch.)	Seal Bore (Inch.)	Size (Inch.)	Min O.D. (Inch.)
2-1/16	1.562	1.56	2.500
	1.625	1.62	
2-3/8	1.781	1.78	2.910
	1.812	1.81	
	1.875	1.87	
2-7/8	2.250	2.25	3.410
	2.312	2.31	
3-1/2	2.750	2.75	4.500
	2.812	2.81	
4	3.125	3.12	5.000
	3.250	3.25	
	3.312	3.31	
4-1/2	3.688	3.68	5.500
	3.750	3.75	
	3.812	3.81	
5	4.000	4.00	6.050
	4.125	4.12	
	4.312	4.31	
5-1/2	4.562	4.56	6.050
6-5/8	5.500	5.50	7.390
7			7.656
7-5/8			8.500

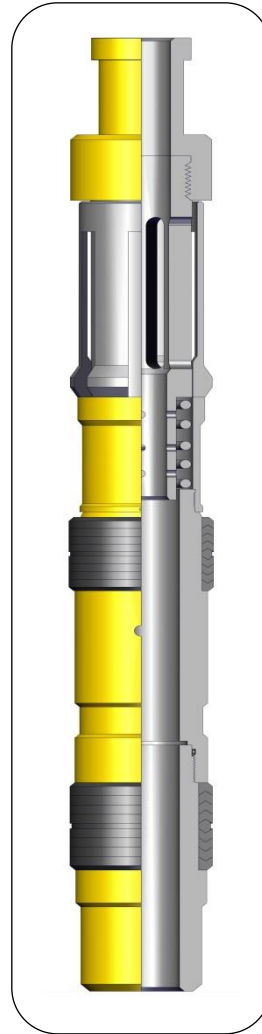
**SEPARATION SLEEVES FOR MODEL "BL" SLIDING SLEEVE**

"BLSE" Product No.: BI 805-41 (Selective)

"BLGE" Product No.: BI 805-50 (Top No-Go)

Separation Sleeve used in the Model 'BL' Sliding Sleeve is designed to SHUT off Tubing to annulus flow through the Sliding Sleeve should the Sliding Sleeve become inoperative. "Straight through Flow" through the Separation Sleeve is accomplished by a chevron packing system that will seal off in the upper and lower seal bores, isolating the ports of the Sliding Sleeve.

The Separation Sleeve is also designed with an internal equalizing plug to equalize pressure before retrieving.



Model "BLGE"  
Separation Sleeve  
Product No.: BI 805-50

Specification Guide "BLSE" SEPARATION SLEEVE									
Tubing OD (Inch.)	Seal Bore (Inch.)	Size (Inch.)	Max OD (Inch.)	To Run			To Equalize		To Pull
				"BC-1" Running Tool Product No.: BI 811-06	"N-1" Shank Product No.: BI 811-85	"A" Guide Product No.: BI 811-71	"A" Prong Product No.: BI 811-70	Pulling Tool	"N-1" Probe Product No.: BI 812-13
2-1/16	1.562	1.56	1.615	1.900	2-1/16	2-1/16	7/16 x 28	JUC	2-1/16
2-3/8	1.781	1.78	1.865	2-3/8	2-3/8	2-3/8	1/2 x 30	JUC or JDC	2-3/8
	1.812	1.81							
	1.875	1.87	1.928						
2-7/8	2.250	2.25	2.302	2-7/8	2-7/8	2-7/8	1/2 x 30	JUC or JDC	2-7/8
	2.312	2.31	2.365						

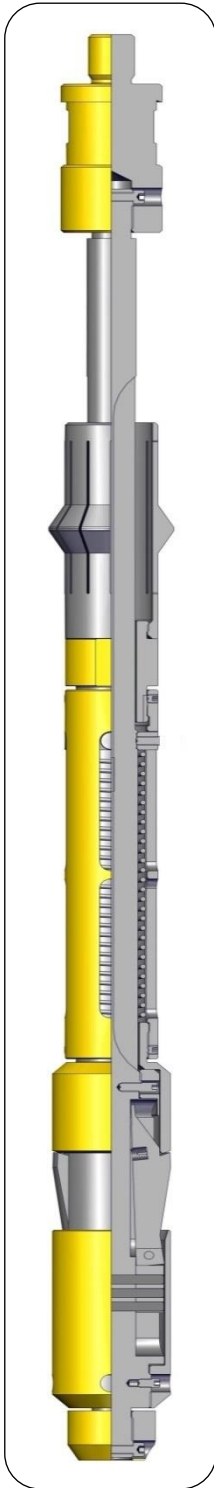
Specification Guide "BLGE" SEPARATION SLEEVE										
Tubing OD (Inch.)	Seal Bore (Inch.)	Size (Inch.)	To Run				To Equalize		To Pull	
			NO-GO				"A" Guide Product No.: BI 811-71	"A" Prong Product No.: BI 811-70	Pulling Tool	"A" Probe Product No.: BI 812-06
			Locating Ring OD (Inch.)	"BC-1" Running Tool Product No.: BI 811-06	"A" Shank Product No.: BI 811-80	"E" Selective Running Tool Product No.: BI 811-17				
2-1/16	1.562	1.56	1.593	1.900"	2-1/16" x 4-3/4"	1.900"	2-1/16"	7/16 x 28"	JUC or JDC	1.900"
	1.625	1.62	1.656							
2-3/8	1.781	1.78	1.807	2-3/8"	2-3/8 x 5"	2-3/8"	2-3/8"	1/2" x 27-1/2"	JUC or JDC	2-3/8"
	1.812	1.81	1.84							
	1.875	1.87	1.906							
2-7/8	2.250	2.25	2.281	2-7/8"	2-7/8" x 4-11/16"	2-7/8"	2-7/8"	5/8" x 28-9/16"	JUC or JDC	2-7/8"
	2.312	2.31	2.343							
3-1/2	2.750	2.75	2.781	3-1/2"	3-1/2" x 5-5/16"	3-1/2"	3-1/2"	5/8" x 35"	JUC or JDC	3-1/2"
	2.812	2.81	2.843							
4-1/2	3.688	3.68	3.802	4-1/2"	4-1/2" x 7"	4-1/2"	4-1/2"		JUC or JDC	4-1/2"
	3.812	3.81	3.843							

## MODEL "BD-2" SHIFTING TOOL Product No.: BI 810-72

The Model "BD-2" Shifting Tool is a wire-line operated tool used to open and close the Model "BL" Sliding Sleeve. Any number of sleeves, of the same size, in a single Tubing String can be shifted in any combination or in any sequence.

### Features:

- The Automatic Locating Collet: on the tool positively notifies the operator when the desired sleeve is reached. Running through two consecutive seal bores located two feet apart, indicates a sleeve. Running through only one seal bore indicates a Landing Nipple.
- Proof of Sleeve Shift: After completing of a shift, an attempt to repeat the operation will give a surface indication that the shift was performed.
- Safety Release: If the sleeve is opened in the presence of a differential pressure in favor of the annulus, the release mechanism is held inoperative by flow until the pressures equalize.
- Emergency Release: The Shifting Tool has a shear pin release mechanism below the shifting Dogs for emergency release.
- Deliberate Release: Even after the Shifting Tool is seated in a sleeve, it can be released without shifting the sleeve.
- Open/Close Sequence: Upward jarring opens the sleeve. This allows the use of Hydraulic or Mechanical Jars. Run in the inverted position, the tool will close the sleeve with downward jarring. At least 6 feet, without restrictions, should be provided below the sleeve.



Model "BD-2"  
Shifting Tool  
Product No.:  
BI 810-72

## NON-ELASTOMERIC SLIDING SLEEVE Product No.: BI 810-81

The BOTIL Non-Elastomeric Sliding Sleeve is available in XD/RD/BRT type. It is a full-opening device with an inner sleeve that can be opened or closed using standard slick line methods. This sleeve enables communication between the tubing/casing annulus. An Otis Type X, R, and BOTIL BRT nipple profile is featured in the top sub and a polished pack-off area below is an integral part of the assembly.

The Sliding Sleeve is available in two shifting versions: down-to-close and up-to-open or up-to-close and down to open. It is available for standard and heavy weight tubing and high temperature service. The ports flow area corresponds to tubing area.

### Features:

- Otis type X, R, and BOTIL BRT nipple profiles are available on request.
- Durable Non-Elastomeric seals.
- Polished pack-off area
- Circulation/production area equals the tubing area
- Opens up and down
- Packing does not move when the sleeve is shifted.
- Three-position collet lock
- Repeatedly opened against 5,000 psi differential pressure.



Non-Elastomeric  
Sliding Sleeve  
Product No.: BI 810-81

Specification Guide		
Tubing Size (Inch.)	Seal Bore (Inch.)	Max. O.D (Inch.)
2-3/8	1.750	3.062
	1.875	
2-7/8	2.250	3.668
	2.312	
3-1/2	2.750	4.500
	2.813	
4	3.250	5.250
	3.313	
4-1/2	3.688	5.500
	3.750	
	3.813	
5-1/2	4.313	6.500
	4.462	

**"BX" & "BR" SEPARATION SLEEVES FOR NON-ELASTOMERIC SLIDING SLEEVE**  
**Product No.: BI 805-49**

Separation Sleeve used in the Non-Elastomeric Sliding Sleeve, is designed to SHUT off Tubing to annulus flow through the Sliding Sleeve should the Sliding Sleeve become inoperative. "Straight through Flow" through the Separation Sleeve is accomplished by a chevron packing system that will seal off in the upper and lower seal bores, isolating the ports of the Sliding Sleeve.

The Separation Sleeve is also designed with an internal equalizing plug to equalize pressure before retrieving.

**Features:**

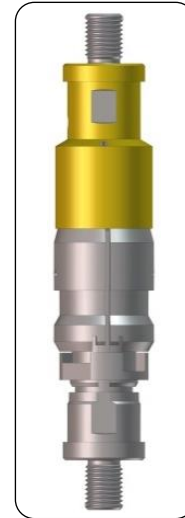
- Pressure can be equalized by the equalizing valve while running in and pulling out.
- "BX" & "BR" Running Tool is used with running prong to run.
- "GS" Pulling Tool is used with pulling prong to pull.
- Available in all seal bore sizes.



Model "BX"  
 Separation Sleeve  
 Product No.:  
 BI 805-49

**MODEL "B" SHIFTING TOOL**  
**Product No.: BI 811-19**

The Model "B" Shifting Tool is a wire line operated tool used to position the closing Sleeve or Sliding Side Doors to the open position or the closed position of the Model "Non-Elastomeric" Sliding Sleeve.



Model "B"  
 Shifting Tool  
 Product No.: BI 811-19

Specification guide MODEL "B" SHIFTING TOOL						
Sliding Side Door ID	Fish Neck Size	OD of Expanded Keys	OD of Retracted Keys	Threads	Overall length	
1.500	1.187	1.690	1.490	15/16 10UN	12.440	
1.625		1.890	1.620		12.750	
1.710		-	1.690		-	
1.781	1.375	2.070	1.750		12.500	
1.875		2.110	1.840		13.300	
2.125		2.350	1.970			
2.313	1.750	2.590	2.160		1-1/16 10UN	13.940
2.562		3.000	2.530			
2.750	2.313	2.900	2.730			14.190
2.813		3.010	2.720			
3.688	3.125	4.130	3.660	15.750		
3.813		4.090	3.120	13.880		



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**GAS LIFT EQUIPMENT**

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### The Gas Lift Equipment- An overview

As oil production continues, oil wells get deeper and have reduced reservoir pressure which requires external assistance to take the fluid to surface. To meet these demands, BOTIL offers complete range of Gas lift equipment including Conventional Gas Lift Mandrels, Side Pocket Mandrels and Flow-control devices like Gas Lift Valves, Dummy Valves, Chemical injection Valves, Orifice Valves etc.

BOTIL Wireline Valves (FCDs) of each design, type and size are validated and tested in accordance with ISO 17078-2/API Spec 19G2 as well as Customer specification. These Valves are offered in customer specified materials.

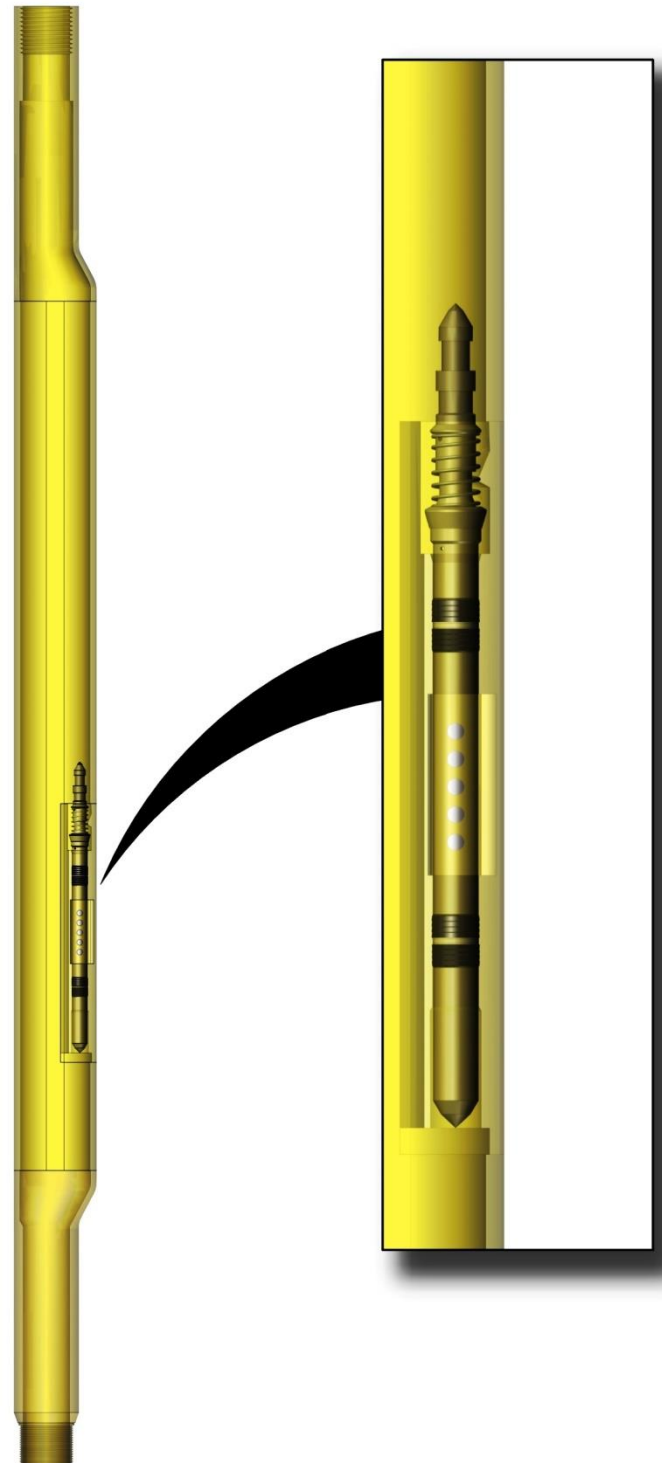
To accommodate these flow-control devices, BOTIL offers Side Pocket Mandrels, specially designed, Manufactured, Validated and tested as per ISO 17078-1/API Specification 19G1 as well as customer specification.

BOTIL SPM range includes operating accessories viz. Latches, Kick-over tool, Running and Pulling tool manufactured and tested as per ISO 17078-3/API Specification 19G3.

The integral Latch and Gas Lift Valve are installed in the Side-pocket Mandrel using standard slick line method with Running tool and Kick-over tool. The Latch secures the Flow-control device inside Pocket seal bore of Side-pocket Mandrel until human intervention takes place.

The Pulling tool is used with Kick-over tool to retrieve flow-control devices from a Side-pocket Mandrel. This releases the locking mechanism of the Latch and retrieves Flow-control devices attached to it.

Other Gas lift equipment such as Conventional Gas lift mandrels, Conventional Valves (tubing retrievable) etc. are also offered to meet the industry requirements



## SIDE POCKET MANDREL (STANDARD)

**BI 820-02**

BOTIL model 'B1M' & 'B2M' Side Pocket Mandrels allow use of standard Wireline tools for installation and retrieval of different types of flow control devices.

### MATERIALS:

Generally low alloy steel AISI 4130 is used. For corrosive application, 410 Stainless Steel, 13Cr is used. Other materials may be used as per NACE MR-01-75 /ISO 15156 (all Parts)/ customer's requirement.

### FORGINGS:

Pockets & Tool discriminators are closed die forged and are integral part of the Pocket. Swages are forged from seamless mechanical tubing or it can be machined from solid bar stock. Forgings are made by using a precision closed die process. All forged parts are visually and dimensionally inspected by Quality Control before machining. After Heat treatment, additional testing i.e. Grain Flow, Micro Examination, Hardness Testing, Dye Penetrant Testing Magnetic Particle Testing & Ultrasonic Testing are also carried out.

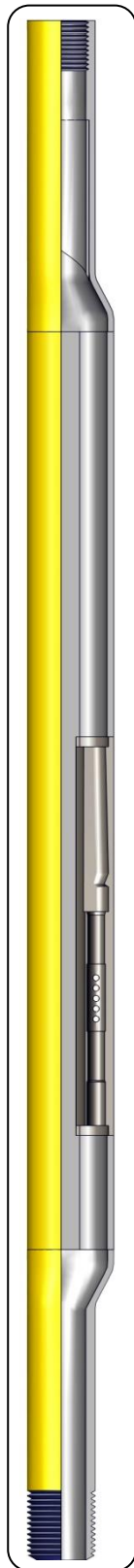
### MACHINING:

Pockets are machined using Deep Hole Drilling & boring process that provides accurate polished bore diameters, alignment and better surface finish for packing seals. The Orienting Sleeve and Swages are machined with precision accuracy. Threads are machined as per design specification. All components are dimensionally inspected before welding and assembly as per BOTIL procedure.

### WELDING & HEAT TREATMENT:

Welding is done as per ASME Section IX and BOTIL welding process to ensure full penetration of weld joints during welding of Swages and Pocket with Round pipe. After welding, grinding operations are carried out to remove external weld deposits and to match mandrels outside profile.

All mandrels are heat treated, quenched & tempered to required hardness as per well



environmental service class specified by customer/end user.

### ASSEMBLED MANDREL:

After welding and post-weld heat treatment each mandrel is tested as per ISO 17078-1 /API Specs 19G1 for hardness, internal and external drift and rated pressure etc. Additionally, non-destructive testing (Magnetic particle/ Radiography) can be done if requested by customer.

ENGINEERING DATA							
Tubing Size (inch)	Valve OD (inch)	Mandrel		SPM Configuration			
		Type	Shape	Length	Major OD	Minor OD	ID
2 3/8	1.0	B1M	OVAL	83	4.25	2.92	2.000
2 3/8	1.5	B2M	OVAL	102	4.75	4.00	2.000
2 7/8	1.0	B1M	OVAL	85	4.75	4.00	2.441
2 7/8	1.5	B2M	OVAL	103	5.50	4.59	2.441
3 1/2	1.0	B1M	OVAL	85	5.31	4.12	2.992
3 1/2	1.5	B2M	OVAL	104	6.06	5.00	2.992
4.0	1.0	B1M	OVAL	86	5.85	5.00	3.476
4.0	1.5	B2M	OVAL	107	6.63	5.55	3.476
4 1/2	1.0	B1M	OVAL	90	5.86	5.00	3.897
4 1/2	1.0	B1M	OVAL	86	6.45	5.50	3.958
4 1/2	1.5	B2M	OVAL	107	7.03	5.625	3.958
5.0	1.5	B2M	OVAL	116	7.94	6.80	4.408
5 1/2	1.0	B1M	OVAL	87	7.94	6.80	4.778
5 1/2	1.5	B2M	OVAL	115	7.44	6.05	4.000

PRESSURE RATING					
Tubing Size (inch)	Valve OD (inch)	STD Service		Sour Service	
		Internal	External	Internal	External
2 3/8	1.0	8000	7000	6000	5500
2 3/8	1.5	7500	6500	6000	5000
2 7/8	1.0	8000	7000	6000	5500
2 7/8	1.5	7500	6500	6000	5000
3 1/2	1.0	8000	6500	6000	5000
3 1/2	1.5	8000	6500	7000	5500
4.0	1.0	8000	6500	7000	5500
4.0	1.5	8000	6500	7000	5500
4 1/2	1.0	7500	6000	6000	5000
4 1/2	1.0	7500	6000	6000	5000
4 1/2	1.5	7500	6000	6000	5000
5.0	1.5	8500	7000	6500	5500
5 1/2	1.0	7500	6000	6000	5000
5 1/2	1.5	7500	6000	6000	5000

## SIDE POCKET MANDREL (ML SERIES)

**BI 820-02**

**BOTIL** model 'B1ML' & 'B2ML' Side Pocket Mandrels allow use of standard wireline tools for installation and retrieval of different types of flow control devices.

### MATERIALS:

Generally low alloy steel AISI 4130 is used. For corrosive application, 410 Stainless Steel, 13Cr is used. Other materials may be used as per NACE MR-01-75 /ISO 15156 (all Parts)/ customer's requirement.

### FORGINGS:

Swages are forged from seamless mechanical tubing or machined from solid bar stock for low volume. Forgings are made by using a precision upsetting process. All parts are visually and dimensionally inspected before machining. After forging, heat-treatment and other additional testing i.e. Grain flow, micro examination, hardness testing, Penetrant testing, Ultrasonic testing are also carried out.

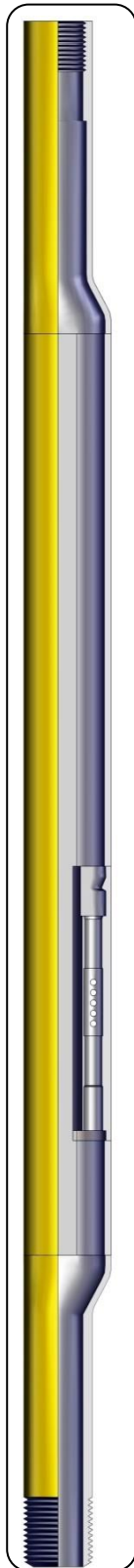
### MACHINING:

Pockets are made from solid bar without tool discriminators and machined using Deep Hole Drilling & boring process that provides accurate polished bore diameters, alignment and required surface finish to suit packing seals. The swages are machined with precision accuracy and threads are machined as per customer requirements/ design specification. All components are dimensionally inspected before welding and assembly as per BOTIL procedure.

### WELDING & HEAT TREATMENT:

Welding is done as per ASME Section IX and BOTIL welding process to ensure full penetration of weld joints during welding of Swages and Pocket with Oval pipe. After welding, grinding operations are carried out to remove external weld deposits and to match mandrels outside profile.

All mandrels are heat treated, quenched & tempered to required hardness as per well



environmental service class specified by customer/end user.

### ASSEMBLED MANDREL:

After welding and post-weld heat treatment each mandrel is tested as per ISO 17078-1/API Specs 19G1 for hardness, internal and external drift and rated pressure etc. Additionally, non-destructive testing (Magnetic particle/ Radiography) can be done if requested by customer.

### ENGINEERING DATA

Tubing Size (inch)	Valve OD (inch)	Mandrel		SPM Configuration			
		Type	Shape	Length	Major OD	Minor OD	ID
2 3/8	1.0	B1ML	OVAL	83	4.25	2.92	2.000
2 3/8	1.5	B2ML	OVAL	102	4.75	4.00	2.000
2 7/8	1.0	B1ML	OVAL	85	4.75	4.00	2.441
2 7/8	1.5	B2ML	OVAL	103	5.50	4.59	2.441
3 1/2	1.0	B1ML	OVAL	85	5.31	4.12	2.992
3 1/2	1.5	B2ML	OVAL	104	6.06	5.00	2.992
4.0	1.0	B1ML	OVAL	86	5.85	5.00	3.476
4.0	1.5	B2ML	OVAL	107	6.63	5.55	3.476
4 1/2	1.0	B1ML	OVAL	90	5.86	5.00	3.897
4 1/2	1.0	B1ML	OVAL	86	6.45	5.50	3.958
4 1/2	1.5	B2ML	OVAL	107	7.03	5.625	3.958
5.0	1.5	B2ML	OVAL	116	7.94	6.80	4.408
5 1/2	1.0	B1ML	OVAL	87	7.94	6.80	4.778
5 1/2	1.5	B2ML	OVAL	115	7.44	6.05	4.000

### PRESSURE RATING

Tubing Size (inch)	Valve OD (inch)	STD Service		Sour Service	
		Internal	External	Internal	External
2 3/8	1.0	8000	7000	6000	5500
2 3/8	1.5	7500	6500	6000	5000
2 7/8	1.0	8000	7000	6000	5500
2 7/8	1.5	7500	6500	6000	5000
3 1/2	1.0	8000	6500	6000	5000
3 1/2	1.5	8000	6500	7000	5500
4.0	1.0	8000	6500	7000	5500
4.0	1.5	8000	6500	7000	5500
4 1/2	1.0	7500	6000	6000	5000
4 1/2	1.0	7500	6000	6000	5000
4 1/2	1.5	7500	6000	6000	5000
5.0	1.5	8500	7000	6500	5500
5 1/2	1.0	7500	6000	6000	5000
5 1/2	1.5	7500	6000	6000	5000

**SIDE POCKET MANDREL  
(SPECIAL CLEARANCE ROUND BODY)  
BI 820-07**

**BOTIL** model 'B1MR-U' special clearance round body Side Pocket Mandrels allow use of Wireline tools for installation and retrieval of different types of flow- control devices in smaller-diameter casing, where standard-diameter mandrels may not be practical.

**MATERIALS:**

Generally low alloy steel AISI 4130 is used. For corrosive application, 410 Stainless Steel, 13Cr is used. Other materials may be used as per NACE MR-01-75 /ISO 15156 (all Parts)/ customer's requirement.

**FORGINGS:**

Swages are forged from seamless mechanical tubing or machined from solid bar stock for low volume. Forgings are made by using a precision upsetting process. All parts are visually and dimensionally inspected before machining. After forging, heat-treatment and other additional testing i.e. Grain flow, micro examination, hardness testing, Penetrant testing, Ultrasonic testing are also carried out.

**MACHINING:**

Pockets with integral tool discriminators are machined from solid bar using Deep Hole Drilling & boring process that provides accurate polished bore diameters, alignment and required surface finish to suit packing seals. The Orienting sleeve and Swages are machined with precision accuracy and threads are machined as per customer requirements / design specification. All components are dimensionally inspected before welding and assembly as per BOTIL procedure.

**WELDING & HEAT TREATMENT:**

Welding is done as per ASME Section IX and BOTIL welding process to ensure full penetration of weld joints during welding of Swages, Orienting Sleeve and Pocket with Round pipe. After welding, grinding operations are carried out to remove

external weld deposits and to match mandrels outside profile.

All mandrels are heat treated, quenched & tempered to required hardness as per well environmental service class specified by customer/end user.

**ASSEMBLED MANDREL:**

After welding and post-weld heat treatment each mandrel is tested as per ISO 17078-1/API Specs 19G1 for hardness, internal and external drift and rated pressure etc. Additionally, non-destructive testing (Magnetic particle/ Radiography) can be done if requested by customer.

**SIDE POCKET MANDREL  
(SPECIAL CLEARANCE ROUND BODY  
WITHOUT ORIENTING SLEEVE)  
BI 820-29**

**BOTIL** model 'B1MLR' & 'B2MLR' Side Pocket Mandrels are similar to above model B1MR-U' SPM but does not have Orienting Sleeve and tool discriminators for Pocket.



**ENGINEERING DATA- MODEL B1MR-U & B1MLR**

Tubing Size (inch)	Valve OD (inch)	Mandrel		Dimensions (inch)		
		Type	Shape	Length	OD	I.D.
2 3/8	1.0	B1MR-U B1MLR	ROUND	85	3.9	1.995

**PRESSURE RATING**

Tubing Size (inch)	Valve OD (inch)	STD Service		Sour Service	
		Internal	External	Internal	External
2 3/8	1.0	6000	3600	5000	3300

## SIDE POCKET MANDREL (CHAMBER LIFT)

**BI 820-27**

**BOTIL** model 'B1ME' & 'B2ME' Chamber Lift Side Pocket Mandrels allow use of standard wireline tools for installation and retrieval of different types of flow control devices.

### MATERIALS:

Generally low alloy steel AISI 4130 is used. For corrosive application, 410 Stainless Steel, 13Cr is used. Other materials may be used as per NACE MR-01-75 /ISO 15156 (all Parts)/ customer's requirement.

### FORGINGS:

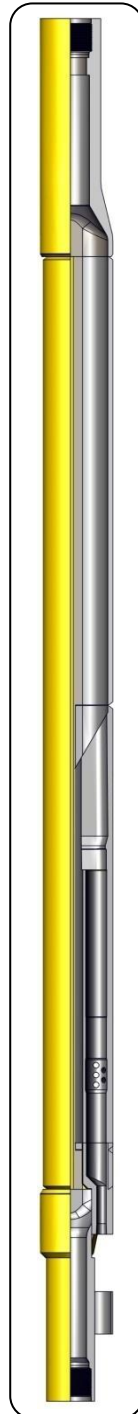
Pockets & Tool guard discriminators are closed die forged and are integral part of the Pocket. Swages are forged from seamless mechanical tubing or it can be machined from solid bar stock. Forgings are made by using a precision closed die process. All forged parts are visually and dimensionally inspected by Quality Control before machining. After Heat treatment, additional testing i.e. Grain Flow, Micro Examination, Hardness Testing, Dye Penetrant Testing Magnetic Particle Testing & Ultrasonic testing are also carried out.

### MACHINING:

Pockets are machined using Deep Hole Drilling & boring process that provides accurate polished bore diameters, alignment and better surface finish for packing seals. The swages are machined with precision accuracy. Threads are machined as per design specification. The exhaust port is welded with Pocket outlet. All components are dimensionally inspected before welding and assembly as per BOTIL procedure.

### WELDING & HEAT TREATMENT:

Welding is done as per ASME Section IX and BOTIL welding process to ensure full penetration of weld joints during welding of Swages, Orienting Sleeve and Pocket with Oval pipe. After welding, grinding operations are carried out to remove



external weld deposits and to match mandrels outside profile.

All mandrels are heat treated, quenched & tempered to required hardness as per well environmental service class specified by customer/end user.

### ASSEMBLED MANDREL:

After welding and post-weld heat treatment each mandrel is tested as per ISO 17078-1/API Specs 19G1 for hardness, internal and external drift and rated pressure etc. Additionally, non-destructive testing (Magnetic particle/ Radiography) can be done if requested by customer.

For CRA alloys copper plating followed by glass-bead peening on box threads are done to prevent threads galling. For low-alloy medium carbon steels phosphate coating are done. Other specific coating/plating requirements can be done if specified by the user/purchaser and agreed by BOTIL.

ENGINEERING DATA							
Tubing Size (inch)	Valve OD (inch)	Mandrel		SPM Configuration			
		Type	Shape	Length	Major OD	Minor OD	ID
2 7/8	1.0	B1ME	OVAL	85	4.75	4.00	2.441
2 7/8	1.5	B2ME	OVAL	103	5.50	4.59	2.441
3 1/2	1.0	B1ME	OVAL	85	5.31	4.12	2.992
3 1/2	1.5	B2ME	OVAL	104	6.06	5.00	2.992

PRESSURE RATING					
Tubing Size (inch)	Valve OD (inch)	STD Service		Sour Service	
		Internal	External	Internal	External
2 7/8	1.0	8000	7000	6000	5500
2 7/8	1.5	7500	6500	6000	5000
3 1/2	1.0	8000	6500	6000	5000
3 1/2	1.5	8000	6500	7000	5500



## WIRELINER RETRIEVABLE GAS LIFT VALVES (IPO)

**BI 01-40-1000 ('GR-40' GAS LIFT VALVES)**

**BI 01-20-1000 ('GR-20' GAS LIFT VALVES)**

### DESCRIPTION

BOTIL GR Series valve utilizes nitrogen charged bellow configuration designed for either continuous or intermittent flow applications. They are especially suitable for use as unloading and operating valves in areas where high gas lift pressures are available. Since the charge pressure above the bellows is affected by temperature, it is important that the operating temperatures at the valve be known. These valves are available in Wireline installations.

### ADVANTAGES

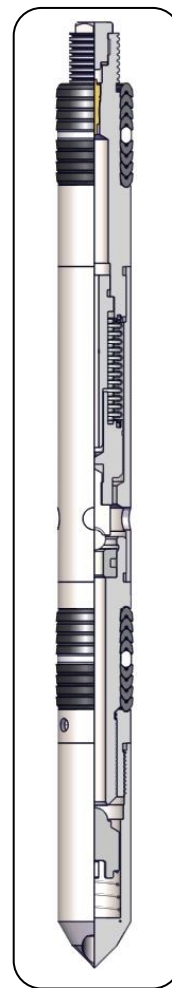
Vibration protected 3-ply Monel bellow are designed to withstand hydrostatic pressure up to 5000 psi. Nitrogen dome charge, acting on the O.D. of the bellow, permits bellows to expand uniformly without stacking, thus prolonging bellow's life. The multiple port size availability, make this valve series appropriate for a wide range of operating conditions. Reversible seat are available in several different materials.

### OPERATING PRINCIPLE

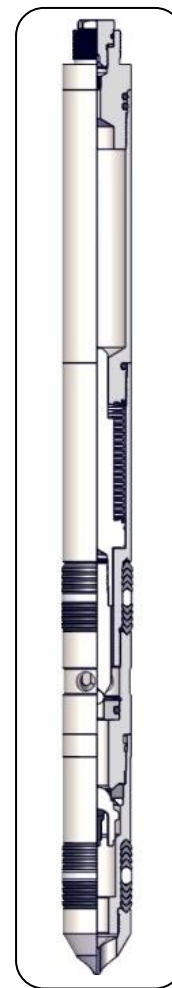
The nitrogen charged dome applies pressure to the external area of the bellows provides the downward force, holding the valve on its seat. This dome pressure is preset at the reference temperature and corrected to operating temperature. The opening forces on the valve are the casing pressure acting on the internal area of the bellows (less the area of the seat) and the tubing pressure acting on the seat area. When the combined Casing & Tubing pressures are sufficient, the valve opens. Once the valve is open, it remains open until the casing pressure is reduced to predetermined closing pressure.

The spread (the difference between opening & closing casing pressure) is

controlled by the tubing sensitivity of the valve. The larger the seat port area, the more tubing sensitive the valve is.



GR-40  
Gas Lift Valve



GR-20  
Gas Lift Valve



Gas Lift Valve  
with Latch

### ENGINEERING DATA

BOTIL Valve Model	Valve OD (inch)	Packing OD (inch)		SPM Compatibility	Port size Range (inch)
		Upper	Lower		
GR-40	1.0	1 1/32	1 1/32	B1M, B1MR, TMP	1/8 – 5/16
GR-20	1.5	1 9/16	1 1/2	B2M, B2MR, TP	1/8 – 1/2

### TOOLING COMPATIBILITY

BOTIL Valve Model	Valve OD (inch)	Latch	Kick-over tool	Running tool	Pulling tool
GR-40	1.0	GBK-2	BK-5	JK/BC-1	1 1/4 JDC/MP
GR-20	1.5	GRK	BM1	RK-1/BC-1	1 5/8 JDS/PTG

## WIRELINE RETRIEVABLE ORIFICE VALVES BI 820-06

### DESCRIPTION

BOTIL 'GRO' series, single-point injection Orifice valves are designed for circulating operations and provide means for communication between the tubing and the annulus at the operating valve depth. All of these valves contain integral reverse flow check valves which prevent reverse flow communication back through the valves.

These valves are available in 1in [25.4 mm] OD 'GRO-40' & 1-1/2-in [38.1 mm] OD 'GRO-20' in either stainless steel or nickel alloys for corrosion resistance in wells with high concentrations of H<sub>2</sub>S or CO<sub>2</sub>. Packing and elastomeric materials for the valves are available for various service classes to suit individual well conditions.

### ADVANTAGES

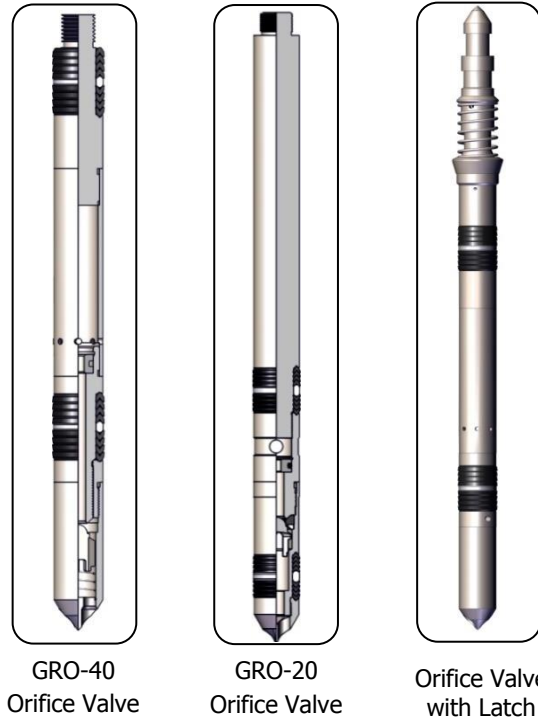
- No need to pull the entire tubing for maintenance or exchange.
- Positive sealing feature of Integral reverse flow check valve prevents intrusion of production fluids into annulus.
- Replaceable square edged orifice in Tungsten Carbide material
- Flow capacity determined by orifice sizing
- May be coated, if necessary, to meet the most demanding applications.
- Compatible with other manufacturers Side-pocket Mandrels e.g. TMP/TP.

### APPLICATIONS

The Wireline retrievable Orifice valves are used to establish communication between the tubing and annulus during circulating, gas or fluid injection operations. They are utilized in single point injection continuous flow completions. These valves have no closing function and are commonly used to control stable injection at the operating valve depth.

### OPERATING PRINCIPLE

Injection fluid or gas enters through the entry ports and through an orifice. Injection pressure moves the back check valve off seat allowing gas or fluids to enter into the tubing. Reverse flow pushes the check valve on seat to prevent flow into the casing. The port sizes designs are suitable for a wide range of operating conditions.



ENGINEERING DATA					
BOTIL Valve Model	Valve OD (inch)	Packing OD (inch)		SPM Compatibility	Port size Range (inch)
		Upper	Lower		
GRO-40	1.0	1 1/32	1 1/32	B1M, B1MR, TMP	1/8 – 5/16
GRO-20	1.5	1 9/16	1 1/2	B2M, B2MR, TP	1/8 – 1/2

TOOLING COMPATIBILITY					
BOTIL Valve Model	Valve OD (inch)	Latch	Kick-over tool	Running tool	Pulling tool
GRO-40	1.0	GBK-2	BK-5	JK/BC-1	1 1/4 JDC/MP
GRO-20	1.5	GRK	BM1	RK-1/BC-1	1 5/8 JDS/PTG



## WIRELINE RETRIEVABLE DUMMY VALVES (NON-EQUALIZING)

**BI 04-01-1000 ('E' DUMMY VALVES)**  
**BI 04-01-1000 ('RD' DUMMY VALVES)**

suitable for a wide range of operating conditions.

### DESCRIPTION

The Wireline Retrievable Dummy Valve is an isolation tool designed to seal off the Side-pocket Mandrel preventing communication between the Casing & Tubing. The Dummy Valve with appropriate Latch is installed in Pocket seal bore of Side-pocket Mandrel either at the surface, before the tubing string is run into the well or into a completed tubing string by Wireline operation.

It is retrieved only after equalizing the casing and tubing pressures at valve depth prior to installation of Flow-control device.

### ADVANTAGES

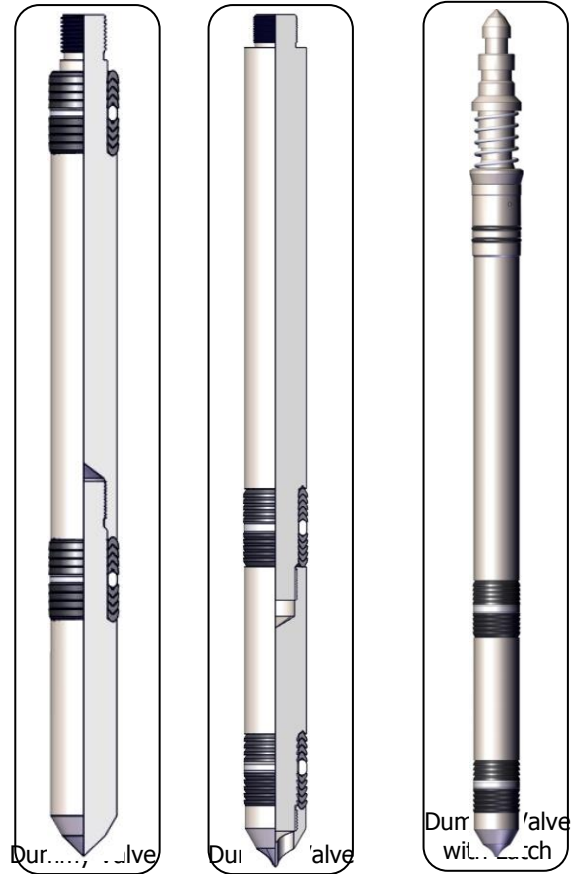
- Isolate Tubing and Casing flow during single alternative production.
- Isolate Tubing & Casing flow for test purpose during multi-point waterflood or gas injection.
- Allow pressure to be applied to the tubing by blanking-off Side-pocket Mandrel inside the well.

### APPLICATIONS

The Wireline retrievable Orifice valves are used to establish communication between the tubing and annulus during circulating, gas or fluid injection operations. They are utilized in single point injection continuous flow completions. These valves have no closing function and are commonly used to control stable injection at the operating valve depth.

### OPERATING PRINCIPLE

Injection fluid or gas enters through the entry ports and through an orifice. Injection pressure moves the back check valve off seat allowing gas or fluids to enter into the tubing. Reverse flow pushes the check valve on seat to prevent flow into the casing. The port sizes designs are



ENGINEERING DATA				
BOTIL Valve Model	Valve OD (inch)	Packing OD (inch)		SPM Compatibility
		Upper	Lower	
E	1.0	1 1/32	1 1/32	B1M, B1MR, TMP
RD	1.5	1 9/16	1 1/2	B2M, B2MR, TP

TOOLING COMPATIBILITY					
BOTIL Valve Model	Valve OD (inch)	Latch	Kick-over tool	Running tool	Pulling tool
E	1.0	GBK-2	BK-5	JK/BC-1	1 1/4 JDC/MP
RD	1.5	GRK	BM1	RK-1/BC-1	1 5/8 JDS/PTG

## WIRELINE RETRIEVABLE CHEMICAL INJECTION VALVES BI 820-09

### DESCRIPTION

BOTIL Chemical injection valves for Side-pocket Mandrels are designed to control chemicals injected into the production fluid at the valve depth. The valves are designed with an Inconel Spring which provides the closing force of the valve. Reverse flow checks are included as an integral part of these valves.

These valves are available in 1 inch [25.4 mm] OD 'BCLK-2' & 1-1/2 inch [38.1 mm] OD 'BCLK-3' in either stainless steel or nickel alloys for corrosion resistance in wells with high concentrations of H<sub>2</sub>S or CO<sub>2</sub>. Packing and elastomeric materials for the valves are available for various service classes to suit individual well conditions.

### ADVANTAGES

- No need to pull the entire tubing for maintenance or exchange.
- The spring allows mechanical setting at test rack opening pressure for the required operating differential pressure.
- Positive sealing feature of Integral reverse flow check valve prevents intrusion of production fluids into annulus.
- Replaceable square edged orifice in Tungsten Carbide material.

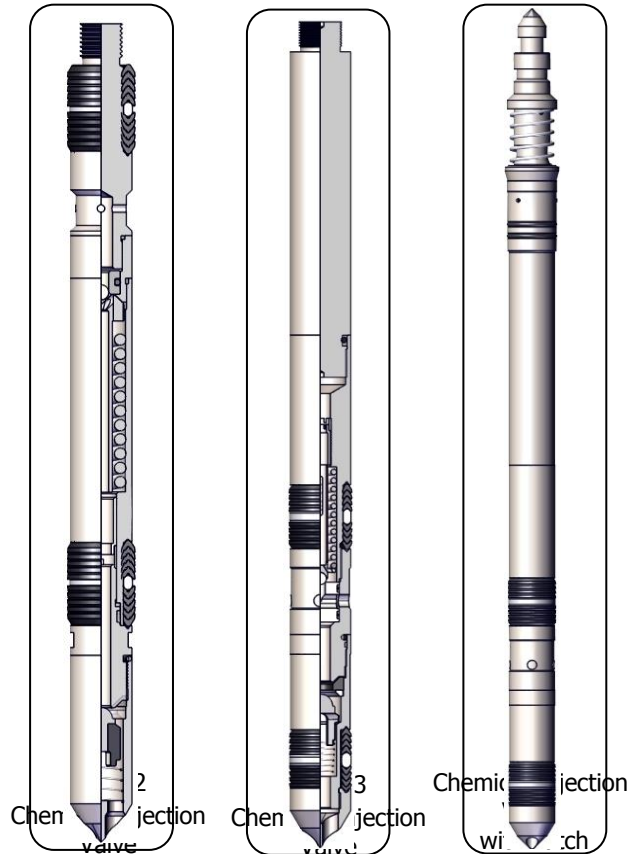
### APPLICATIONS

The Wireline retrievable Chemical injection valves are used to control the amount of chemicals or fluids injected into the tubing at the valve depth. The injected chemicals or fluid controls corrosion in wells, treats paraffin, salt and or hydrate formation.

### OPERATING PRINCIPLE

Injected chemicals enter the valves from the annulus in an open injection system. Chemicals also may enter the valve from a separate injection line as in a closed injection system. The hydraulic pressure of

the injected chemicals compresses the Spring & lift the Stem Tip of the Seat & open the valve. Chemicals then flow through the valve into the production conduit.



ENGINEERING DATA					
BOTIL Valve Model	Valve OD (inch)	Packing OD (inch)		SPM Compatibility	Port Size
		Upper	Lower		
BCLK-2	1.0	1 1/32	1 1/32	B1M, B1MR, TMP	1/8, 3/16
BCLK-3	1.5	1 9/16	1 1/2	B2M, B2MR, TP	1/8, 3/16

TOOLING COMPATIBILITY					
BOTIL Valve Model	Valve OD (inch)	Latch	Kick-over tool	Running tool	Pulling tool
BCLK-2	1.0	GBK-2	BK-5	JK/BC-1	1 1/4 JDC/MP
BCLK-3	1.5	GRK	BM1	RK-1/BC-1	1 5/8 JDS/PTG

## WIRELINE RETRIEVABLE DUMP/KILL VALVES BI 820-20

### DESCRIPTION

BOTIL Wireline retrievable Dump/Kill Valve provides a means of communication between the casing annulus and tubing when the casing annulus pressure is increased above the tubing pressure. Initially it functions as dummy valve using a movable piston to block off the circulating port in the valve and the Side-Pocket Mandrel. The Piston is held in closed position with the help of shear screws. After the valve opens, it restricts the flow to a desired rate but cannot be closed again.

These valves are available in 1 inch [25.4 mm] OD 'BEDK' in either stainless steel or nickel alloys for corrosion resistance in wells with high concentrations of H<sub>2</sub>S or CO<sub>2</sub>. Packing and elastomeric materials for the valves are available for various service classes to suit individual well conditions.

### ADVANTAGES

- No need to pull the entire tubing for maintenance or exchange.
- Wireline operation is not required to activate valve into open position.
- Calibrated opening pressure (between 1000 to 5000 psi shear differentials).
- No reverse-flow check to allow a high injection rate to kill the well
- May be coated, if necessary, to meet the most demanding applications.
- Compatible with other manufacturers Side-pocket Mandrels e.g. CAMCO, TMP/TP etc.

### APPLICATIONS

The Wireline retrievable Dump/kill Valves are used to establish communication between the tubing and casing annulus when the casing annulus pressure is increased. Initially these valves function as dummy valves valve using a movable

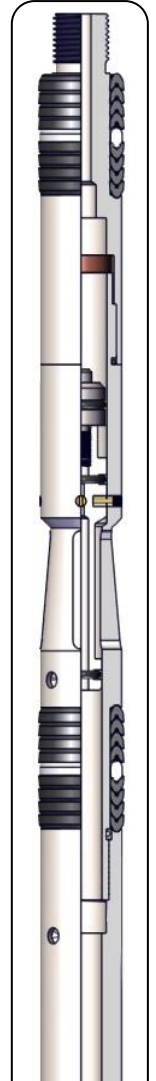
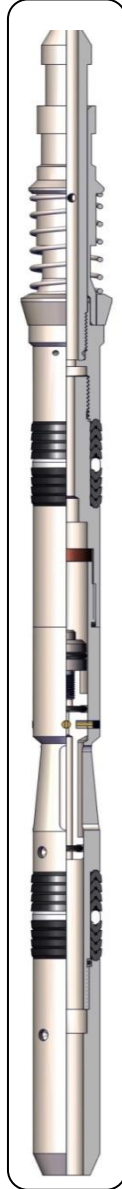
piston to block off the circulating port in the valve and the Side-Pocket.

### OPERATING PRINCIPLE

Prior to running, a GBEK-2 latch is assembled on to the top of the BEDK Dump/kill valve. The assembly can then be installed into a Side-pocket mandrel on the surface before running the tubing string into the well or by using standard wireline tools and methods if the tubing string has already been installed in the well.

When the valve has been installed in the mandrel's pocket, the tubing is isolated from the casing annulus by the packing sets.

In operation, injection gas that is injected into the casing annulus enters through the communication ports in the Side-pocket Mandrel. This gas then enters through valve ports that are located between packing sets. The hydraulic pressure of the injected fluids shears the Shear Screw and moves the Piston downward causing the valve to open. The injection gas then flow downward past the valve nose and out into the tubing.



BEDK  
Dump/Kill Valve

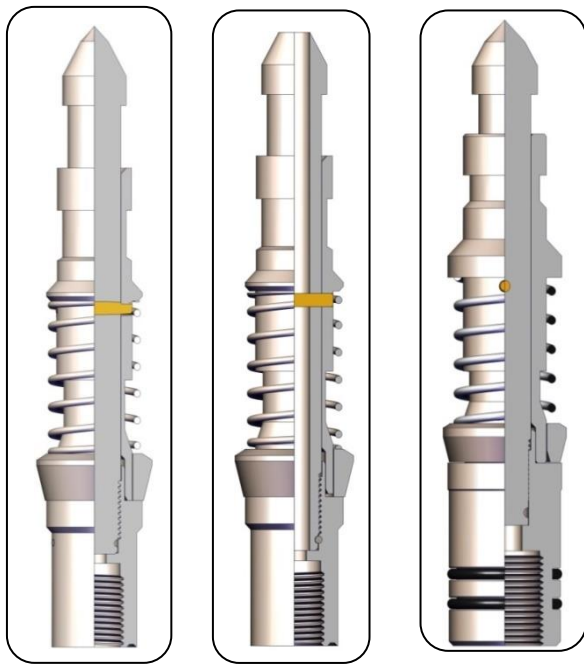
ENGINEERING DATA					
BOTIL Valve Model	Valve OD (inch)	Packing OD (inch)		SPM Compatibility	Port Size
		Upper	Lower		
BEDK	1.0	1 1/32	1 1/32	B1M, B1MR, TMP	1/8, 3/16

TOOLING COMPATIBILITY					
BOTIL Valve Model	Valve OD (inch)	Latch	Kick-over tool	Running tool	Pulling tool
BEDK	1.0	GBEK-2	BK-5	JK/BC-1	1 1/4 JDC/MP

**ACCESSORIES: LATCHES  
FOR WIRELINE RETRIEVABLE VALVES**

**DESCRIPTION**

BOTIL Wireline retrievable Latches are designed for installation in G-type pocket profile Side Pocket Mandrels. They utilize a locking ring which is held in position by spring forces. As the Latch enters the Pocket latch profile, the locking ring moves up and into the recessed area of the latch. When the latch seats, the ring is positioned in the locking recess of the Pocket. To retrieve the Latch, a pin is sheared by upward force allowing the locking ring mandrel to move up and out of the way. The ring is then freed to disengage from the locking recess as the valve and Latch is retrieved.



GBK-2 Latch  
BI 10-01-1000

GBEK-2 Latch  
BI 10-01-1000

GRK Latch  
BI 10-25-1000

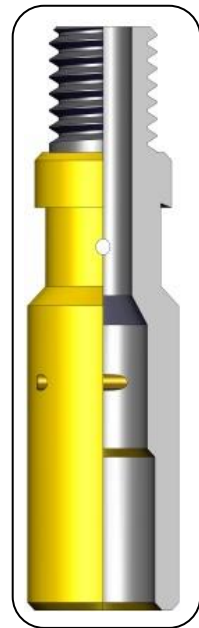
**ACCESSORIES: RUNNING TOOLS  
FOR WIRELINE RETRIEVABLE VALVES  
BI 820-04 ('JK' RUNNING TOOLS)  
BI 820-05 ('RK-1' RUNNING TOOLS)**

**DESCRIPTION**

The Running tool is used to secure Valves and Latch assembly into pocket of Side-pocket Mandrels by wireline running operation. The tool is simple in design, consisting of one part. The inside is machined with two different inside diameters allowing the running tool to shoulder on the side pocket mandrel latch being run. The upper portion of the body has a set of 1/8" shear pin holes on the outer circumference to permit pinning the running tool to the side pocket latch. The running tool is run in conjunction with the appropriate kick over tool.

**OPERATION**

1. Pin valve onto running tool and attached to tool string.
2. Lower tool string into well bore to desired depth.
3. Trip the Kick-over tool, set down into side pocket mandrel and jar down to set valve as well as shear the pin in the running tool.
4. Remove tool string from well bore.



Running Tool

**TOOLING COMPATIBILITY**

BOTIL Latch Model	Valve OD (inch)	Kick-over tool	Running tool	Pulling tool	SPM Compatibility
GBK-2	1.0	BK-5	JK/BC-1	1 ¼ JDC/MP	B1M, B1MR, TMP
GBEK-2	1.0	BK-5	JK/BC-1	1 ¼ JDC/MP	B1M, B1MR, TMP
GRK	1.5	BM1	RK-1/BC-1	1 5/8 JDS/PTG	B2M, B2MR, TP

**ENGINEERING DATA-RUNNING TOOL**

BOTIL Running Tool Model	Nom. Size (inch)	Max. OD. (inch)	Fishing Neck size (inch)	Thread
JK	1.00	1.33	1.187	15/16-10 UN
RK-1	1.50	1.43	1.187	15/16-10 UN

**ACCESSORIES: KICK-OVER TOOLS  
FOR WIRELINE RETRIEVABLE VALVES  
BI 820-01**

**DESCRIPTION**

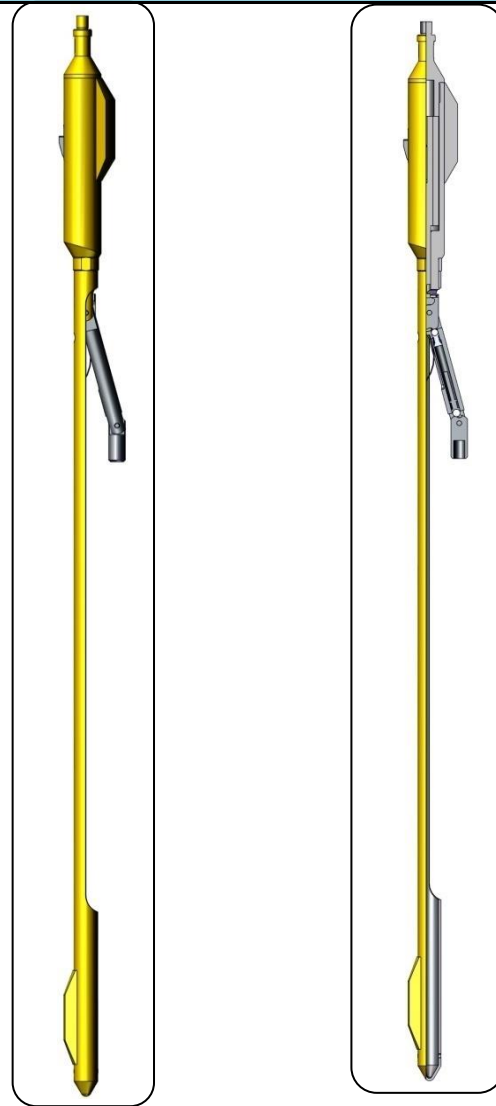
The Kick-over tool (KOT) is used to install and retrieve valve and latch assembly into/from the Side pocket mandrels.

**ADVANTAGES**

The KOT features removable pads to allow the Kick-over tool to operate in two sizes of tubing such as 2-3/8" and 2-7/8" or 3-1/2" and 4-1/2" respectively.

**OPERATING PRINCIPLE**

The Kick-over tool is lowered into the well by standard wireline techniques until the tool is below the selected mandrel. As the tool string is raised, the locator finger of the Kick-over tool contacts the top of the slot in the orienting sleeve in the mandrel, and the kick spring pivots the lower section of the Kick-over tool, the pulling or running tool and the valve into the Kick-over position. The orienting sleeve in the mandrel provides positive installation and retrieval of the flow control device by the Kick-over tool. Once the flow control device is installed or retrieved, and the wireline operator raises the Kick-over tool the latch spring is compressed thus permitting the Kick-over tool to pass through all mandrels above the one in which the wireline operation was performed.



Kick over Tool

TOOLING COMPATIBILITY				
Kick-over Tool Model	Valve OD (inch)	Running tool	Pulling tool	SPM Compatibility
BK-5	1.0	JK/BC-1	1 ¼ JDC/MP	B1M, B1MR, TMP
BK-5	1.0	JK/BC-1	1 ¼ JDC/MP	B1M, B1MR, TMP
BM1	1.5	RK-1/BC-1	1 5/8 JDS/PTG	B2M, B2MR, TP

ENGINEERING DATA- BK-5 KICK OVER TOOL				
Configuration	BK-5 Kick-over tool size			
	2"	2-1/2"	3"	4-1/2"
Fishing Neck OD	1.375	1.375	1.375	1.375
Max OD	1.75	2.063	2.5	3.5
Length	72.844	72.844	70.031	70.562
Top Pin Thread	15/16-10	15/16-10	15/16-10	15/16-10

ENGINEERING DATA- B1M KICK OVER TOOL				
Configuration	B1M Kick-over tool size			
	2-1/2"	3"	4-1/2"	5-1/2"
Fishing Neck OD	1.375	1.375	1.375	2.31
Max OD	2.218	2.734	3.71	4.25
Length	81.75	81.875	82	78.125
Top Pin Thread	15/16-10	15/16-10	15/16-10	1 9/16-10

**ACCESSORIES: PULLING TOOLS  
FOR WIRELINE RETRIEVABLE VALVES**

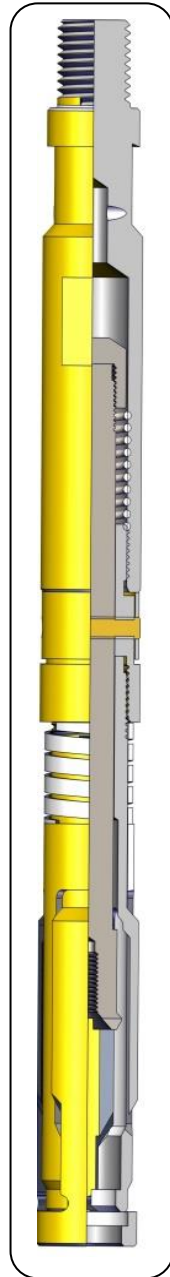
**BI 811-90 ('JDC' PULLING TOOLS)  
BI 811-97 ('JDS' PULLING TOOLS)**

**DESCRIPTION**

The Pulling tool is a wireline service tool designed to remove retrievable subsurface devices with external fishing necks from well. This tool has collet-type dogs with large latching area. It is also available with different length cores which make the reach of the tool adaptable to retrieve subsurface devices with fishing necks of different lengths.

The Pulling tool utilizes the top sub which is made up to the skirt of the tool. The dogs, which are mounted on the skirt, are inserted into the vertical openings in the skirt. The JD series Pulling Tool can be released, if necessary from the retrievable device by downward jarring.

In the Pulling tool nomenclature, the second letter is used to designate the direction of shear release. The "JDC/JDS" is a "jar down" release tool. The third letter designates core length with a "C" being a "long" core and an "S" core being a "short" core.

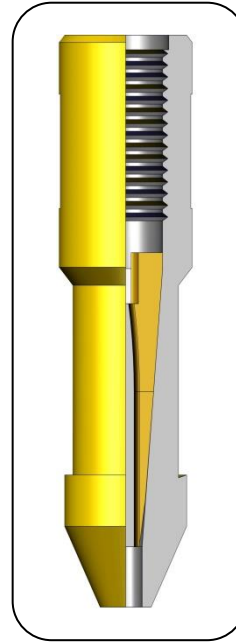


Pulling Tool

**WIRELINE ACCESSORIES: ROPE SOCKET**

**BI 820-17**

BOTIL Wireline Socket (Wedge type Rope Socket) is designed to connect wireline to the tool string. It utilizes a brass or soft alloy wedge to keep the wireline attached within the rope socket.



Rope Socket

<b>ENGINEERING DATA- ROPE SOCKET</b>				
<b>Tool nominal size</b>	<b>Max OD (inch)</b>	<b>Fishing Neck OD (inch)</b>	<b>Thread Size and type</b>	<b>Wire Size (inch)</b>
1-1/8	1.125	0.875	5/8-11 UNC	0.066-0.092
1-1/2	1.500	1.375	15-16-10 UN	0.092-0.108
1-1/2	1.500	1.375	1-1/16-10 UN	0.092-0.108
1-7/8	1.875	1.750	15/16-10 UN	0.092-0.108

<b>ENGINEERING DATA- PULLING TOOLS</b>				
<b>Tool Size</b>	1 1/4"	1 3/8"	1 1/2"	1 1/2"
<b>Model</b>	JDC	JDC	JDC	JDS
<b>Fishing Neck OD</b>	0.875"	1.000"	1.187"	1.187"
<b>Reach</b>	1.937"	1.875"	1.093"	1.843"
<b>Max OD</b>	1.281"	1.375"	1.422"	1.422"
<b>Top Pin Thread</b>	15/16-10	15/16-10	15/16-10	15/16-10

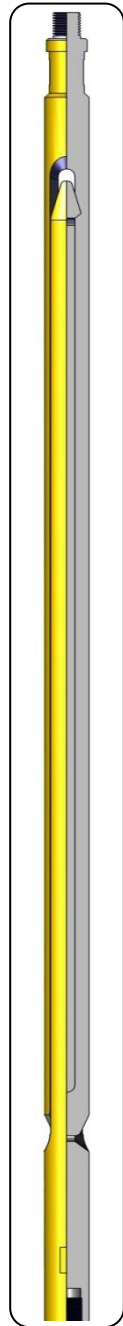


**WIRELINER ACCESSORIES: WIRELINE JAR (MECHANICAL JAR)  
BI 820-18**

BOTIL Wireline Jar designed to act like a sliding hammer, which utilizes the impact load transferred by Stem Bar attached above to it. Upward and downward impacts (jarring actions) are achieved by controlling the direction and speed of the wireline at surface provided with pin connections and fishing necks at one end and box connections at the lower ends.

The impact load by jarring action will depend on the speed of movement, stem weight, the jar's stroke length, tubing size and deviation, fluid viscosity and well pressure.

These jars are composed of two pieces linked together rather like long chain links which are free to be extended or collapsed (stroke).



Mechanical Jar

ENGINEERING DATA- MECHANICAL JAR				
Tool nominal size	Max OD (inch)	Fishing Neck OD (inch)	Top and Bottom Thread	Stroke Length (inch)
1-1/8	1.250	1-3/16"	15-16-10 UN	20
1-1/2	1.500	1- 3/8"	15-16-10 UN	20
1-1/2	1.500	1- 3/8"	15-16-10 UN	20

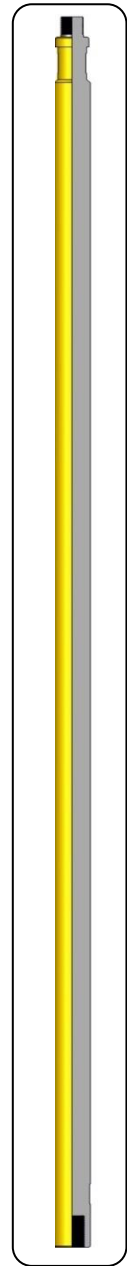
**WIRELINER ACCESSORIES: WEIGHT BAR (SINKER BAR)  
BI 820-19**

BOTIL Wireline Stem / Weight Bar or Sinker Bars are designed to overcome forces created by Well pressure and to deliver necessary impact load during Setting or Pulling of Flow-control devices inside the tubing.

The impact load by jarring action will depend on the speed of movement, stem weight, the jar's stroke length, tubing size and deviation, fluid viscosity and well pressure.

BOTIL Wireline Stem / Weight Bar (Sinker Bar) provided with pin connections and fishing necks at one end and box connections at the lower ends.

Special lead filled stems are available whenever more weight per foot is required. These are available in 2 ft, 3 ft and 5 ft in length.



Weight Bar

ENGINEERING DATA- STEM / WEIGHT BAR		
Tool nominal size	Fishing Neck OD (inch)	Top and Bottom Thread
1-1/4	1-3/16"	15-16-10 UN
1-1/2	1- 3/8"	15-16-10 UN



## MODEL 'B' CONVENTIONAL GAS LIFT MANDRELS (TUBING RETRIEVABLE VALVE MANDRELS)

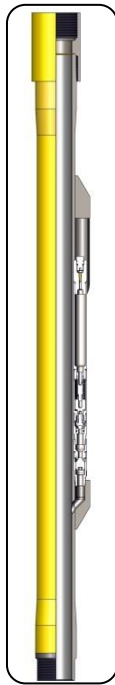
**BI 06-115-601**

The Model 'B' Mandrels are designed to accept the 1" conventional G-40 pressure operated gas lift valve and G-40 tubing flow check Valve. The Mandrels are manufactured with side guards to protect the valve when running or pulling the tubing string.

These mandrels are available in various tubing grades such as J-55, N-80, L-80, P-110 & other grades of material as per customer requirement.



Model 'B'  
Conventional Mandrel



Conventional Mandrel with  
Conventional Valve and RFCV

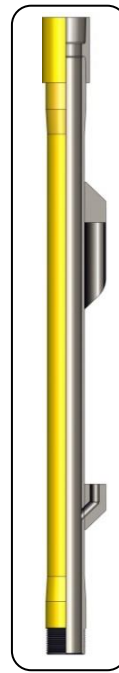
ENGINEERING DATA MODEL 'B' GAS LIFT MANDREL					
Tubing size	Maximum OD (inch)	Minimum ID (inch)	Length (inch)	Pressure (psi)	
				Internal	External
2-3/8	3.781	1.995	48	8000	6000
2-7/8	4.396	2.441	48	8000	6000
2-7/8	4.396	2.259	48	8000	6000
3-1/2	5.062	2.992	48	8000	6000

## MODEL 'C' CONVENTIONAL GAS LIFT MANDRELS (TUBING RETRIEVABLE VALVE MANDRELS)

**BI 06-535-501**

The Model 'C' Mandrels are designed to accept the 1-1/2" conventional G-20 pressure operated gas lift valve and G-20 tubing flow check Valve. The Mandrels are manufactured with side guards to protect the valve when running or pulling the tubing string.

These mandrels are available in various tubing grades such as J-55, N-80, L-80, P-110 & other grades of material as per customer requirement.



Model 'C'  
Conventional Mandrel



Conventional Mandrel with  
Conventional Valve and RFCV

ENGINEERING DATA MODEL 'C' GAS LIFT MANDREL					
Tubing size	Maximum OD (inch)	Minimum ID (inch)	Length (inch)	Pressure (psi)	
				Internal	External
2-3/8	4.375	1.995	48	8000	6000
2-7/8	4.929	2.441	48	8000	6000
2-7/8	4.929	2.259	48	8000	6000
3-1/2	5.655	2.992	48	8000	6000
4-1/2	6.875	3.958	48	8000	6000

## CONVENTIONAL GAS LIFT VALVE -IPO (TUBING RETRIEVABLE VALVE)

**BI 02-40-1000 ('G-40' GLV)**

**BI 02-20-1000 ('G-20' GLV)**

### DESCRIPTION

BOTIL G-Series conventional gas Lift valves are Nitrogen charged gas lift valves which can be used as an intermittent valve or a continuous flow valve. This valve is installed with a reverse check valve on the conventional tubing retrievable gas lift mandrel. Dome pressure is set in a shop at a reference temperature and corrected to an operating depth temperature. The nitrogen charge inside the bellows provides a downward force tending to hold the valve on its seat.

BOTIL gas lift valves has 1/2"-14 NPT Pin connection to suit Reverse flow check Valves and these are available in various port sizes as required.

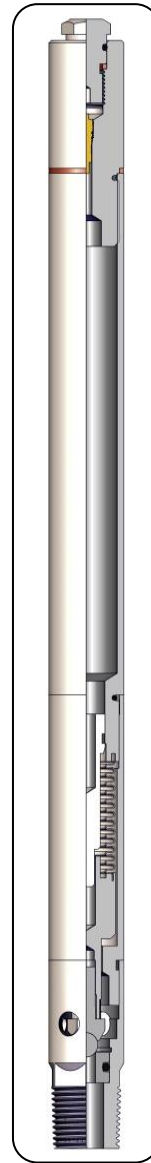
### ADVANTAGES

Vibration protected 3-ply Monel bellow are designed to withstand hydrostatic pressure up to 5000 psi. Nitrogen dome charge, acting on the O.D. of the bellows, permits bellows to expand uniformly without stacking, thus prolonging bellows' life. The multiple port size availability, make this valve series appropriate for a wide range of operating conditions.

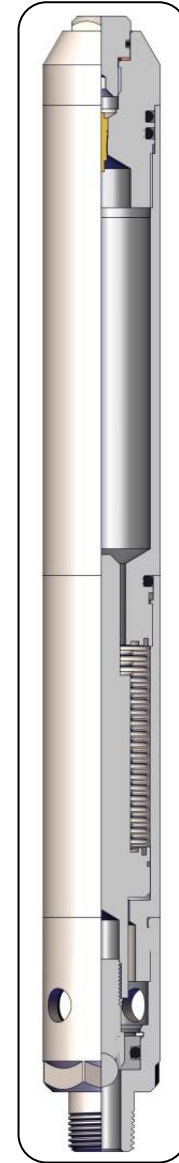
### OPERATING PRINCIPLE

The nitrogen charged dome applies pressure to the external area of the bellows provides the downward force, holding the valve on its seat. This dome pressure is preset at the reference temperature and corrected to operating temperature. The opening forces on the valve are the casing pressure acting on the internal area of the bellows (less the area of the seat) and the tubing pressure acting on the seat area. When the combined Casing & Tubing pressures are sufficient, the valve opens. Once the valve is open, it remains open until the casing pressure is reduced to predetermined closing pressure.

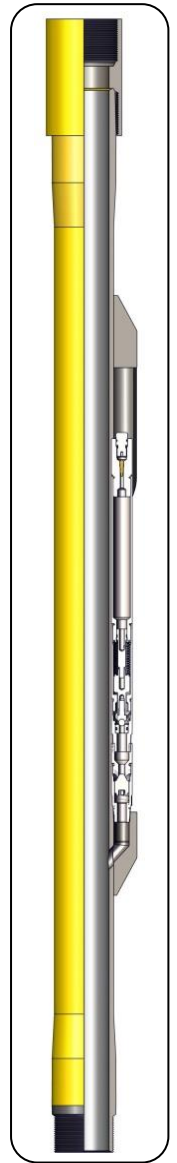
The spread (the difference between opening & closing casing pressure) is controlled by the tubing sensitivity of the valve. The larger the seat port area, the more tubing sensitive the valve is.



Model 'G-40'  
Conventional Gas  
Lift Valve



Model 'G-20'  
Conventional Gas  
Lift Valve



Conventional Mandrel  
with Conventional Valve  
and RFCV

### ENGINEERING DATA

BOTIL Valve Model	Valve OD (inch)	Gas Lift Mandrel Compatibility	Port size Range (inch)	Check Valve
G-40	1.0	(B Series) JR Mandrel	1/8 – 5/16	G-40, GCF-40
G-20	1.5	(C Series) SR Mandrel	1/8 – 1/2	G-20, GCF-20

**REVERSE FLOW CHECK VALVE**

**BI 02-90-1000 ('G-40' RFCV)**  
**BI 02-70-1000 ('G-20' RFCV)**

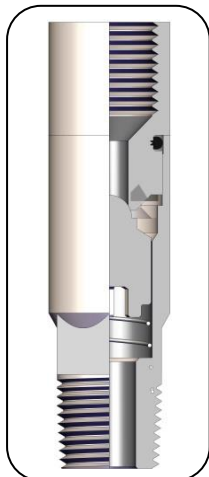
**DESCRIPTION**

BOTIL G-Series Reverse flow check valves (RFCV) are used with conventional gas Lift valves and Mandrels. The RFCV assembly utilizes the same metal to metal seal as well as metal dart to soft Hy-car pad seal as does the retrievable valve checks. The check is a velocity type check requiring flow pressure to force the dart on seat but is also available in a normally closed variation with a spring attachment.

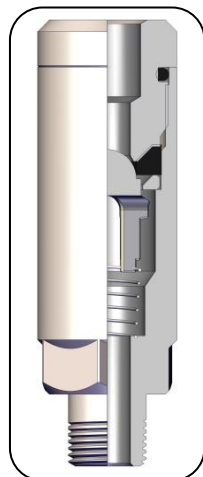
BOTIL Reverse flow check valves (RFCV) have 1/2"-14 NPT internal and external threaded connections to suit conventional Gas lift Valves and Mandrels respectively.

**ADVANTAGES**

The RFCV protect the casing from backflow, allowing the tubing to be pressurizing in various procedures, and prevent any comingling of fluids in dual installation for a wide range of operating conditions.



Model 'G-40'  
RFCV



Model 'G-20'  
RFCV

ENGINEERING DATA - RFCV				
BOTIL RFCV Model	Valve OD (inch)	Gas Lift Mandrel Compatibility	Port size (inch)	BOTIL Valve Model
G-40	1.0	(B Series) JR Mandrel	5/16	G-40
G-20	1.5	(C Series) SR Mandrel	9/16	G-20

**TUBING RETRIEVABLE ORIFICE VALVES**

**BI 820-12**

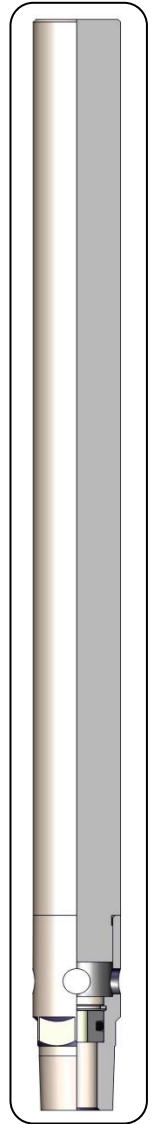
**DESCRIPTION**

BOTIL G-Series tubing retrievable Orifice Valves are designed for circulating operations and provide means for communication between the tubing and the tubing/casing annulus. These Valves are used with Conventional Gas Lift Mandrels and Reverse flow check valves (RFCV).

These valves have 1/2"-14 NPT external threaded connections to assemble with RFCV.

**ADVANTAGES**

- Flow capacity determined by orifice sizing.
- Various orifice materials (Monel, Tungsten Carbide) available to meet application requirements.
- Orifice Valves are suitable for 1200 PSI & above Surface Injection Pressure.
- Temperature rating of 275° F (Standard Service).
- Valves are Casing pressure operated valve in open position, with 1/2" NPT bottom connection.
- The Floating Seat is replaceable.
- An integral choke controls the flow of gas through the normally opened valve and into the production conduit.



Orifice Valve

ENGINEERING DATA – ORIFICE VALVE				
BOTIL Valve Model	Valve OD (inch)	Gas Lift Mandrel Compatibility	Port size Range (inch)	RFCV Model
GO-40	1.0	(B Series) JR Mandrel	1/8 – 5/16	G-40, GCF-40
GO-20	1.5	(C Series) SR Mandrel	1/8 – 1/2	G-20, GCF-20