

DB Bridge Plug

Bridge Plugs & Retainers

The WELLFIRST Premium Cast Iron Bridge Plug designed to run on electric line. Rated between 2000 - 10000-psi differential, and 300°F from above and below.

Features

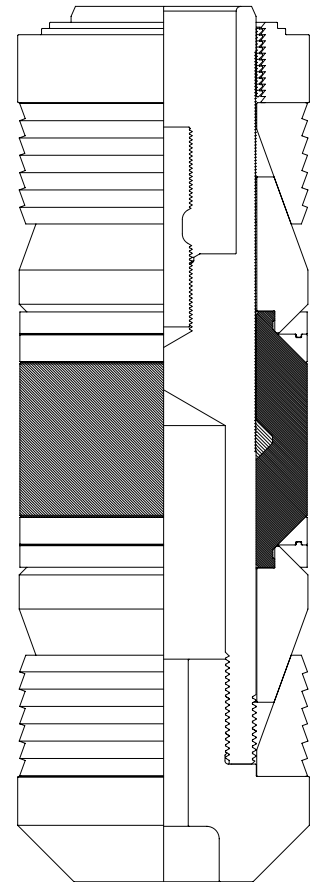
- **Field Proven Design**
- **Constructed of drillable materials**
- **Top set with shear stud**
- **Standard packing element rated at 300°F**
- **One piece slips**

Benefits

- **Rated to 2,000 psi to 10,000 psi differential from above and below at 300°F,**
- **Runs on existing electric line setting tools**
- **Sets in P-110 casing**
- **High temperature packing elements available upon request**
- **No tension mandrel required**
- **Retaining rings to assist in preventing element extrusion**

Applications

- **Well abandonment**
- **Temporary and permanent zonal isolation**
- **Squeeze Cementing**
- **Fracturing**



SPECIFICATION GUIDE

CASING				PLUG				
SIZE (IN./mm)	WEIGHT (LB/FT - kg/m)	MIN. I.D. (IN./mm)	MAX. I.D. (IN./mm)	PRESSUE RATING (PSI/bar)	O.D. (IN./mm)	SET FORCE (LB-kg)	FOR BAKER STYLE SETTING	FOR GO SETTING TOOL
2-3/8 60,33	4.0 - 5.8 5,95 - 8,63	1.780 45,21	2.074 52,68	10,000 689,48	1.750 44,45	*9,000	00175237 (238DB10-B)	00175387 (238DB10-G)
2-7/8 73,03	6.4 - 6.5 9,52 - 9,67	2.340 59,44	2.525 64,14	10,000 689,48	2.220 56,39	*9,000	00172073 (278DB10-B)	00172092 (278DB10-G)
3-1/2 88,90	5.75 - 10.3 8,56 - 15,33	2.867 72,82	3.258 82,75	10,000 689,48	2.750 69,85	*9,000	00172186 (350DB10-B)	00172216 (350DB10-G)
4 101,60	5.6 - 14.0 8,33 - 20,83	3.340 84,84	3.732 94,79	10,000 689,48	3.140 79,76	20,000	00172153 (400DB10-B)	00146056 (400DB10-G)
4-1/2 114,30	9.5 - 15.1 14,14 - 22,47	3.826 97,18	4.090 103,89	10,000 689,48	3.562 90,47	33,000	00175013 (450DB10-B)	00175198 (450DB10-G)
5 127,00	11.5 - 20.8 17,11 - 30,95	4.156 105,56	4.560 115,82	10,000 689,48	3.937 100,00	33,000	00172546 (500DB10-B)	00172583 (500DB10-G)
5-1/2 139,70	13.0 - 23.0 19,34 - 34,22	4.670 118,62	5.044 128,12	10,000 689,48	4.312 109,52	33,000	00174656 (550DB10-B)	00174808 (550DB10-G)
5-3/4 146,05	14.0 - 25.2 20,83 - 37,50	4.890 124,21	5.290 134,37	10,000 689,48	4.700 119,38	33,000	00230063 (575DB10-B)	N/A
6-5/8 168,28	17.0 - 32.0 25,30 - 47,62	5.675 144,15	6.135 155,83	10,000 689,48	5.375 136,53	50,000	00173190 (658DB10-B)	N/A
7 177,80	17.0 - 35.0 25,30 - 52,08	6.004 152,50	6.538 166,07	10,000 689,48	5.687 144,45	50,000	00173135 (700DB10-B)	00173132 (700DB10-G)
7 177,80	17.0 - 29.0 25,30 - 43,15	6.184 157,07	6.538 166,07	10,000 689,48	5.900 149,86	50,000	00741114 (700DB10LW-B)	N/A
7-5/8 193,68	20.0 - 39.0 29,76 - 58,03	6.625 168,28	7.125 180,98	10,000 689,48	6.312 160,32	50,000	00173586 (758DB10-B)	00173362 (758DB10-G)
8-5/8 219,08	24.0 - 49.0 35,71 - 72,91	7.511 190,78	8.097 205,66	10,000 689,48	7.144 181,46	50,000	00173358 (858DB10-B)	00173368 (858DB10-G)

SPECIFICATION GUIDE

CASING				PLUG				
SIZE (IN./mm)	WEIGHT (LB/FT-kg/m)	MIN. I.D. (IN./mm)	MAX. I.D. (IN./mm)	PRESSURE RATING (PSI/bar)	O.D. (IN./mm)	SET FORCE (LB-kg)	FOR BAKER STYLE SETTING TOOL	FOR GO SETTING TOOL
9-5/8 244,48	29.3 - 58.4 43,60 - 86,90	8.435 214,25	9.063 230,20	8,000 551,58	8.125 206,38	50,000 22679	00174321 958DB8-B	00174017 958DB8-G
10-3/4 273,05	32.7 - 60.7 48,66 - 90,32	9.660 245,36	10.192 258,88	5,000 344,74	9.440 239,78	50,000 22679	00175375 1075DB5-B	N/A
11.750 298,45	38.0 - 60.0 56,54 - 89,28	10.772 273,61	11.150 283,21	4,000 275,79	10.437 265,10	50,000 22679	00175647 1175DB4-B	N/A
11.750 298,45	60.0 - 83.0 89,28 - 123,50	10.368 263,35	10.772 273,61	4,000 275,79	9.937 252,40	50,000 22679	00761311 1176DB4-B	N/A
13.375 339,73	48.0 - 83.5 71,42 - 124,25	12.125 309,25	12.715 322,96	3,000 206,84	11.880 301,75	50,000 22679	00175239 1338DB3-B	N/A
16.0 406,40	65.0 - 118.0 96,72 - 175,58	14.570 370,08	15.250 387,35	2,000 137,90	14.125 358,78	50,000 22679	00291149 1600DB2-B	N/A
20.0 508,00	94.0 - 133.0 139,87 - 197,90	18.730 475,74	19.124 485,75	2,000 137,90	18.375 466,73	50,000 22679	00175203 2000DB2-B	N/A

HMI Bridge Plug

The WELLFIRST HM-I bridge plug is designed to set with a combination of hydraulic pressure and mechanical pull. The HM-I bridge plug requires a setting tool.

Features

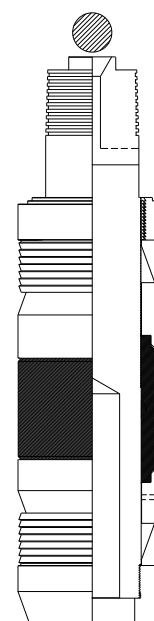
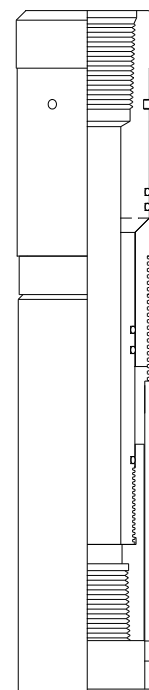
- **Field Proven Design**
- **Constructed of drillable materials**
- **Right hand rotation releases setting tool from plug**
- **Standard packing element rated at 300°F**
- **One piece slips**

Benefits

- **One setting tool sets plugs for 4 1/2 in. through 5 1/2 in. casing by changing setting sleeves.**
- **Set with a combination of hydraulic pressure and mechanical pull**
- **Excellent for use in deviated applications**
- **Available in high pressure and low pressure on most sizes**

Applications

- **Well abandonment**
- **Temporary and permanent zonal isolation**
- **Squeeze Cementing**
- **Fracturing**
- **Deviated wellbores**



SPECIFICATION GUIDE

CASING		RECOMMENDED CASING RANGE		MAXIMUM O.D. OF TOOL (IN./mm)	SURFACE PRESSURE (PSI)	TENSION FORCE REQUIRED		PRESSURE RATING (PSI/bar)	PRODUCT NUMBER
SIZE (IN./mm)	WEIGHT (LB/FT.-kg/m)	MIN. (IN./mm)	MAX. (IN./mm)			MIN. (LB.)	MAX. (LB.)		
6-5/8 168,28	17.0 - 32.0 25,30 - 47,62	5.595 142,11	6.135 155,83	5.375 136,53	1,500	45,000	50,000	10,000	00140270
8-5/8 219,08	24.0 - 49.0 35,71 - 72,91	7.310 185,67	8.097 205,66	7.125 180,98	1,500	45,000	50,000	10,000	00174253
9-5/8 244,48	29.3 - 58.4 43,60 - 86,90	8.435 214,25	9.063 230,20	8.175 207,65	1,500	45,000	50,000	8,000	00174023
10-3/4 273,05	32.7 - 60.7 48,66 - 90,32	9.660 245,36	10,192 258,88	9.437 239,70	1,400	45,000	50,000	5,000	00752938
11-3/4 298,45	38.0 - 60.0 56,54 - 89,28	10.772 273,61	11.150 283,21	10.437 265,10	1,400	45,000	50,000	4,000	00752939
13-3/8 339,73	48.0 - 84.5 71,42 - 125,74	12.175 309,25	12.175 309,25	11.880 301,75	1,400	45,000	50,000	3,000	00752941

NOTE: A Drag Spring Centralizer should be run with the plug in a vertical hole. A minimum of two should be used in a deviated or directional well.

HM2 Bridge Plug

The WELLFIRST HM-2 Permanent Cast Iron Bridge Plug is designed especially for use in high-pressure situations. The HM -2 bridge plug is designed to set with a combination of hydraulic pressure and mechanical pull and is designed with built in setting tool for greater efficiency.

Features

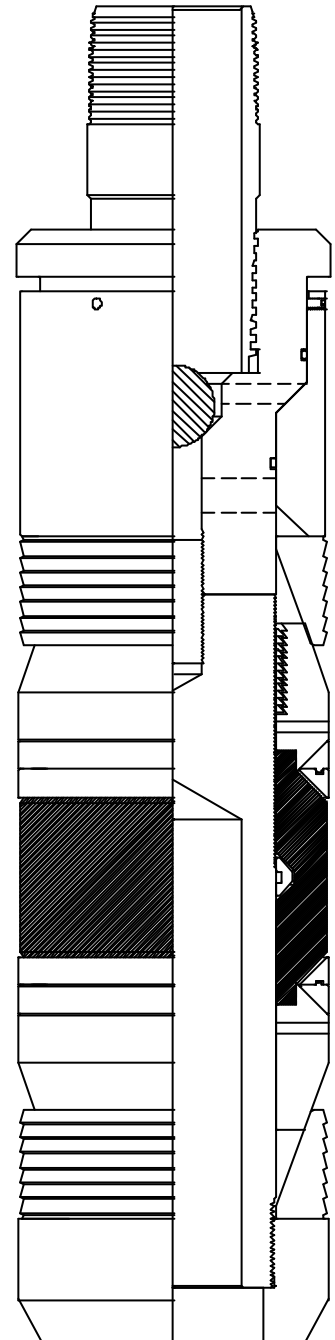
- **Field Proven Design**
- **Constructed of drillable materials**
- **Right hand rotation releases setting tool from plug**
- **Standard packing element rated at 300°F**
- **One piece slips**

Benefits

- **Built-in setting tool**
- **Set with a combination of hydraulic pressure and mechanical pull**
- **Excellent for use in deviated applications**
- **Thermal version available**

Applications

- **Well abandonment**
- **Temporary and permanent zonal isolation**
- **Fracturing**
- **Deviated wellbores**



SPECIFICATION GUIDE

CASING		RECOMMENDED CASING RANGE		MAXIMUM O.D. OF TOOL (IN./mm)	SURFACE PRESSURE (PSI)	TENSION FORCE REQUIRED		PRODUCT NUMBER
SIZE (IN./mm)	WEIGHT (LB/FT.-kg/m)	MIN. (IN./mm)	MAX. (IN./mm)			MIN. (LB.)	MAX. (LB.)	
3-1/2 88,90	5.75 - 10.3 8,56 - 15,33	2.867 72,82	3.258 82,75	2.750 69,85	1,400	10,000	13,000	00172169
4 101,60	5.6 - 14.0 8,33 - 20,83	3.340 84,84	3.732 94,79	3.190 81,03	1,400	17,000	20,000	00172160
4-1/2 114,30	9.5 - 15.1 14,14 - 22,47	3.826 97,18	4.090 103,89	3.562 90,47	1,400	28,000	30,000	00174792
5 127,00	11.5 - 20.8 17,11 - 30,95	4.154 105,51	4.560 115,82	3.937 100,00	1,400	28,000	30,000	00172649
5-1/2 139,70	13.0 - 23.0 19,34 - 34,22	4.580 116,33	5.044 128,12	4.312 109,52	1,400	28,000	30,000	00175115
5-3/4 146,05	14.0 - 25.2 20,83 - 37,50	4.890 124,20	5.290 134,37	4.699 119,35	1,400	30,000	33,000	00752936
6-5/8 168,28	17.0 - 32.0 25,30 - 47,62	5.595 142,11	6.135 155,83	5.375 136,53	1,400	45,000	50,000	00173192
7 177,80	17.0 - 35.0 25,30 - 52,08	6.000 152,40	6.538 166,07	5.687 144,45	1,400	45,000	50,000	00173315
7-5/8 193,68	20.0 - 39.0 29,76 - 58,03	6.625 168,28	7.125 180,98	6.312 160,32	1,400	45,000	50,000	00173357
8-5/8 219,08	24.0 - 49.0 35,71 - 72,91	7.310 185,67	8.097 205,66	7.125 180,98	1,400	45,000	50,000	00173956
9-5/8 244,48	29.3 - 58.4 43,60 - 86,90	8.435 214,25	9.063 230,20	8.175 207,65	1,400	45,000	50,000	00174028
10-3/4 273,05	32.7 - 60.7 48,66 - 90,32	9.660 245,36	10,192 258,88	9.437 239,70	1,400	45,000	50,000	00755765
11-3/4 298,45	38.0 - 60.0 56,54 - 89,28	10.772 273,61	11.150 283,21	10.437 265,10	1,400	45,000	50,000	00729432
13-3/8 339,73	48.0 - 84.5 71,42 - 125,74	12.175 309,25	12.175 309,25	11.880 301,75	1,400	45,000	50,000	00234019

NOTE: A Drag Spring Centralizer should be run with the plug in a vertical hole. A minimum of two should be used in a deviated or directional well.

SIZE (IN./mm)	PRESSURE RATING (PSI/bar)
3-1/2 - 8-5/8 41,42 - 219,08	10,000 689,48
9-5/8 244,48	8,000 551,58

The WRS Bridge Plug is a wireline set, retrievable bridge plug used for zone isolation, surface equipment repair, or any other application in which a reliable retrievable bridge plug is required.

The WRS Bridge Plug is commonly run on wireline using an E4 pressure setting tool (or equivalent). However, it may be set on conventional or coiled tubing using a hydraulic setting tool. The plug may be retrieved on conventional or coiled tubing using the WRN Retrieving Tool.

Features

- **Safe releasing** — when releasing, the **WRN Retrieving Tool** automatically opens the bypass to allow pressure to equalize before the plug is released.
- **Short, compact design** allows setting in applications where the setting area is restricted, such as between perforated intervals.
- **When using a special adapter**, recorders may be run below the plug. The system allows recorders to be run inside a tube below the plug to prevent damage to the recorders while running or retrieving.
- **The WRS may be lubricated** into wells under pressure on wireline or on coiled tubing.



WRS Retrievable Bridge Plug							
Casing						WRS O.D.	
O.D.		Weight		Range			
in	mm	lb/ft	kg/m	in	mm	in	mm
4-1/2	114.3	9.5 - 13.5	14.1 - 20.1	4.090 - 3.920	103.9 - 99.6	3.750	95.25
5	127.0	11.5 - 13	17.1 - 19.3	4.560 - 4.494	115.8 - 114.1	4.220	107.19
		15 - 18	22.3 - 26.7	4.408 - 4.276	111.9 - 108.6	4.100	104.14
5-1/2	139.7	13 - 17	19.3 - 25.3	5.044 - 4.892	128.2 - 124.2	4.620	117.35
		17 - 23	25.3 - 34.2	4.892 - 4.670	124.2 - 118.6	4.500	114.30
7	177.8	17 - 20	25.3 - 29.8	6.538 - 6.456	166.1 - 164.0	6.250	158.75
		23 - 26	34.2 - 38.7	6.366 - 6.276	161.7 - 159.4	6.050	153.67
		26 - 32	38.7 - 47.6	6.276 - 6.094	159.4 - 154.8	5.875	149.22
8-5/8	219.1	20 - 28	24.8 - 41.7	8.017 - 8.191	203.6 - 208.1	7.531	197.6
		32 - 40	47.6 - 59.5	7.725 - 7.921	196.2 - 201.2	7.312	191.3
		44 - 49	65.5 - 72.9	7.511 - 7.625	190.8 - 193.7	7.281	185.7
9-5/8	244.5	29.3 - 36	43.6 - 53.6	8.921 - 9.063	226.6 - 230.2	8.593	218.3
		40 - 47	59.5 - 69.9	8.681 - 8.835	220.5 - 224.4	8.437	214.3
		47 - 53.5	69.9 - 79.6	8.535 - 8.681	216.8 - 220.5	8.218	208.7
10-3/4	273.0	45.5 - 51	67.7 - 75.9	9.950 - 9.850	252.7 - 250.1	9.500	241.3
		32.75 - 40.5	48.7 - 60.3	10.192 - 10.050	258.8 - 255.2	9.700	246.4

*Other sizes and weight ranges available upon request.
Contact your Wellfirst sales representative for details*

WRS Retrievable Bridge Plug



Maximum Temperature at Time of Setting - Degrees C (Nitril Elements)							
Element Durometer	114mm	127mm	138mm	177mm	193mm	219mm	244mm
60 / 60				100	100	100	100
70 / 70	100	100	120	140	140	140	140
80 / 80	150	150	150	155	155	170	170
90 / 90	175	175	175	175	175		

Minimum Temperature at Time of Setting - Degrees C (Nitril Elements)							
Element Durometer	114mm	127mm	138mm	177mm	193mm	219mm	244mm
60 / 60				20	20	20	20
70 / 70	20	20	20	35	35	50	50
80 / 80	45	45	45	60	60	80	80
90 / 90	65	65	65	75	75		

Note: Temperature range relates to the temperature of the element at time of setting, **not** the bottom hole temperature.

Nitril Elements							
Durometer	114mm	127mm	138mm	177mm	193mm	219mm	244mm
Above	68,000	68,000	68,000	62,000	62,000	51,000	51,000
Below	48,000	48,000	48,000	45,000	45,000	35,000	35,000

Average Element to Casing Contact Area			
Casing Weight - lbs/ft	26 to 36	40 to 47	47 to 53
Contact Area - in ²	120.54	92.4	100.8





The WRN Retrieving Tool is used to retrieve the WRS Retrievable Bridge Plugs well as the Endless Tubing Safety Shear Sub.

Features

- The WRN Retrieving Tool features a unique soft grapple system that allows the overshot to engage the plug with minimal force and makes coiled tubing retrieval easier and more reliable than with competing products.
- The WRN Retrieving Tool is designed to allow sand or other debris to be efficiently and reliably circulated off the WRS before latching on.

WRN Retrieving Tool					
WRS Size		WRN Maximum O.D.		WRN Connection	
in	mm	in	mm	in	mm
4-1/2	114.3	3.75	95.3	2-3/8 EUE	60.3 EUE
5	127.0	3.75	95.3		
5-1/2	139.7	4.380	111.3	2-7/8 EUE	73.0 EUE
7	177.8	5.000	127.0		
8-5/8	219.1	7.300	185.4		
9-5/8	244.5	8.335	211.7		
10-3/4	273.0	9.500	241.3		



Features

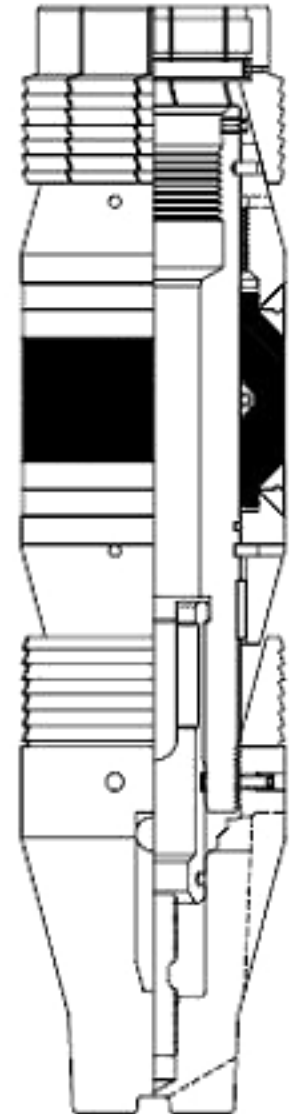
- Cast Iron drillable design
- Simple, surface-controlled valve automatically closes when stinger is removed.
- Converts between mechanical and wireline set by changing top slips.
- Components rotationally locked for easy drillout.
- Temperature rating to 400F

Benefits

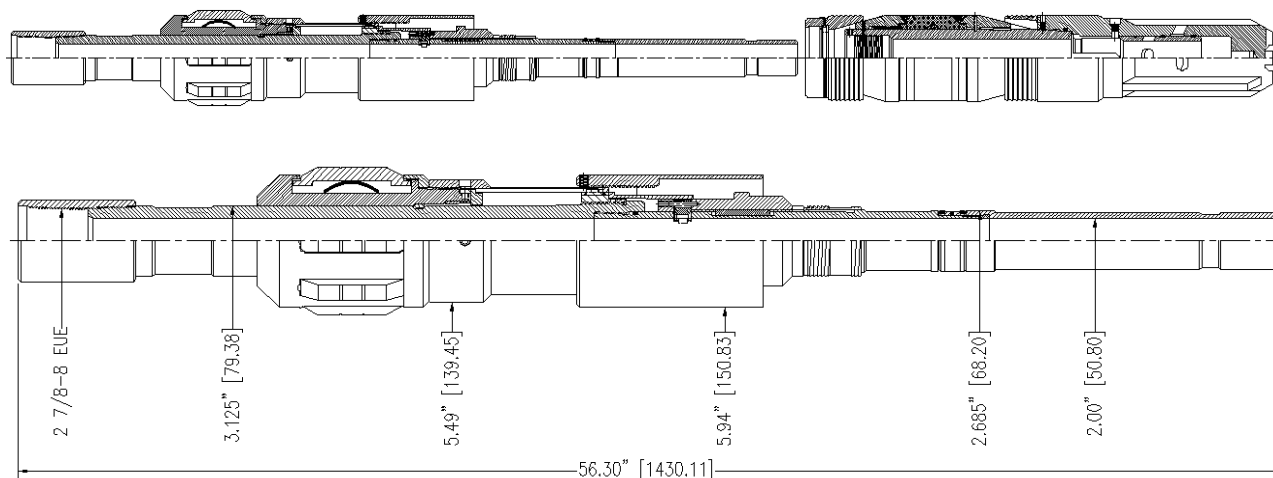
- Allows pressure testing before squeeze
- Valve protects sensitive zones in low-fluid wells
- Fast drill out time saves rig time

Operating Instructions

The setting tool is designed for use in varied hole conditions and employs several features to prevent premature setting of the retainer or bridge plug or damage to the tool. It is suggested that the tool be run at a moderate speed while avoiding sudden stops. Note: While running in, care must be taken to prevent right-hand rotation from being transmitted to the setting tool. Under no circumstance must there be allowed more than four turns of the tubing to the right while running in. As a precaution, after every 10 to 15 stands, at least one or more left hand turns should be placed in the work string to assure the control nut is “bumped up”. When the desired setting depth has been reached, the tools should be picked up two (2) feet above the desired setting point. This movement is necessary to provide the required tool stroke to release the upper slips and allow the Control Nut to move freely. Rotate the work string to the right sufficiently to transmit 10 turns to the tool. This right-hand rotation will thread the Control Nut off its matching thread on the Mechanical Setting Tool mandrel and release the Control Sleeve from the running in position. Lower the tools back down to the desired setting depth. The Drag Blocks will support the Control Sleeve and Setting Sleeve. The downward motion will push the upper slips from under the Setting Sleeve. The upper slip segments are then forced out against the casing by the leaf springs attached to the inside of each slip segment. When the upper slips are released, the Retaining Sleeve is pulled from over the Dog allowing it to move out and release the Control Latch from the Stinger Sub Body.



CASING				TOOL
O.D. (IN./mm)	WEIGHT (LB/FT.-kg/m)	MIN. I.D. (IN./mm)	MAX. O.D. (IN./mm)	MAX. O.D. (IN./mm)
4-1/2 114,30	9.5 - 15.1 14,14 - 22,47	3.826 97,18	4.090 103,89	3.593 96,26
5 127,00	11.5 - 18.0 17,11 - 26,78	4.276 108,61	4.560 115,82	3.937 100,00
5-1/2 139,70	13.0 - 23.0 19,34 - 34,22	4.670 118,62	5.118 129,00	4.312 109,52
5-3/4 146,05	14.0 - 25.2 20,83 - 37,50	4.890 124,21	5.290 134,37	4.700 119,38
6-5/8 168,28	17.0 - 34.5 25,30 - 51,34	5.575 144,61	6.135 155,83	5.375 136,53
7 177,80	17.0 - 35.0 25,30 - 52,08	6.004 152,50	6.538 166,07	5.688 144,48
7-5/8 193,68	20.0 - 39.0 29,76 - 58,03	6.625 168,28	7.125 180,98	6.312 160,32
8-5/8 224,48	24.0 - 49.0 35,71 - 72,90	7.511 190,77	8.097 205,66	7.125 180,98
9-5/8 224,48	29.3 - 61.1 43,60 - 90,92	8.375 212,73	9.063 230,22	8.125 206,38



Latch Style Cement Retainer Stringer

The Latch Style Cement Retainer Stringer is used to operate the valve system in the wireline set Cement Retainer. The snap latch is run on the bottom of the tubing and automatically locates in the retainer bore. The snap-latch seal unit seals in the cement retainer bore and the collet system engages the latch thread at the top of the retainer bore. The collet on the snap latch requires 5,000 to 10,000 lbs. (2,200 to 4,500 daN) force to snap out of the retainer bore. The exact amount of force will depend on the size of the retainer and the amount of time the collet is engaged and disengaged. The snap latch allows for sufficient movement to open and close the valve while maintaining a seal in the cement retainer bore. The tubing is simply picked up to close the valve and set down to open the valve.

If it is not possible to remove the snap latch from the bore with a straight pull, then the collet maybe disengaged with right-hand rotation.

Latch Style Cement Retainer Stringer			
Casing O.D.		Connection	
in	mm	in	mm
4-1/2	114.3	2-3/8 EUE	60.30
5	127.0		
5-1/2	139.7	2-7/8 EUE	73.00
6-5/8	168.3		
7	177.8		
7-5/8	193.7		
8-5/8	219.1		
9-5/8	244.5		



Mechanical Cement Retainer Setting Tool

The Mechanical Cement Retainer Setting Tool is used to run, set, and operate a cement retainer (with mechanical slips) using tubing or drill pipe.

Setting Procedure

The retainer and Mechanical Cement Retainer Setting Tool are run to depth using tubing or drill pipe. At depth, the top slips of the retainer are set with right-hand rotation. Setting is then completed with tubing tension. At this point the tubing may be pressure tested. Right-hand rotation is used to disengage the setting tool from the retainer. Once disengaged, the Mechanical Cement Retainer Setting Tool operates as a Snap Latch Seal Assembly to operate the valve system in the retainer.



Mechanical Cement Retainer Setting Tool		
Casing O.D.	Thread Connection	Connection
in	mm	in
mm	mm	daN
4-1/2	2-3/8 EUE	20,000
114.3		
5	60.30	8,900
127.0		
5-1/2		
139.7	2-7/8 EUE	30,000
6-5/8		
168.3		
7		
177.8		
7-5/8	73.0	13,350
193.7		
8-5/8		
219.1		
9-5/8		
244.5		

Features

- Large flow area for fluid dumping as in a disposal, or large cement squeeze where large amount of media is needed.
- The bypass ports are aligned for maximum fluid movement with minimum turbulence.
- When the valve is open, the seals are protected from fluid erosion.
- The valve sleeve is pressure balanced to prevent sudden opening from creep.

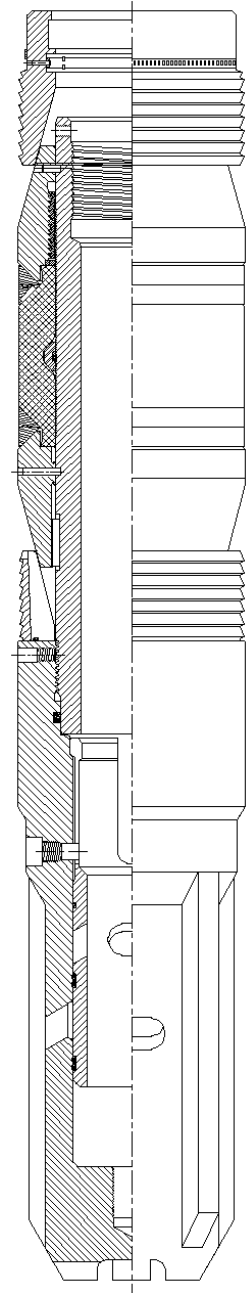
Operating Instructions

The setting tool is designed for use in varied hole conditions and employs several features to prevent premature setting of the retainer or bridge plug or damage to the tool. It is suggested that the tool be run at a moderate speed while avoiding sudden stops. Note: While running in, care must be taken to prevent right-hand rotation from being transmitted to the setting tool. Under no circumstance must there be allowed more than four turns of the tubing to the right while running in. As a precaution, after every 10 to 15 stands, at least one or more left hand turns should be placed in the work string to assure the control nut is “bumped up”. When the desired setting depth has been reached, the tools should be picked up two (2) feet above the desired setting point. This movement is necessary to provide the required tool stroke to release the upper slips and allow the Control Nut to move freely. Rotate the work string to the right sufficiently to transmit 10 turns to the tool. This right-hand rotation will thread the Control Nut off its matching thread on the Mechanical Setting Tool mandrel and release the Control Sleeve from the running in position. Lower the tools back down to the desired setting depth. The Drag Blocks will support the Control Sleeve and Setting Sleeve. The downward motion will push the upper slips from under the Setting Sleeve. The upper slip segments are then forced out against the casing by the leaf springs attached to the inside of each slip segment. When the upper slips are released, the Retaining Sleeve is pulled from over the Dog allowing it to move out and release the Control Latch from the Stinger Sub Body. Refer to the following chart and pull tension over pipe weight at the tool to set the slips and affect packoff.

Tension Requirements		
Tool Size	Min. Tension	Max. Tension
7"	45,000 lb.	50,000 lb.

It is recommended that the maximum tension shown above be pulled when possible. However, to assure sufficient packoff and slip breakage, the minimum tension shown must be pulled. Set down weight equal to the calculated weight required to prevent the slide valve from closing during pumping operations. Do not apply tension after setting weight on retainer other than that required to release setting tool or close valve. Pull a slight strain on work string and pressure the work string to insure that the slide valve is closed.

Contd...



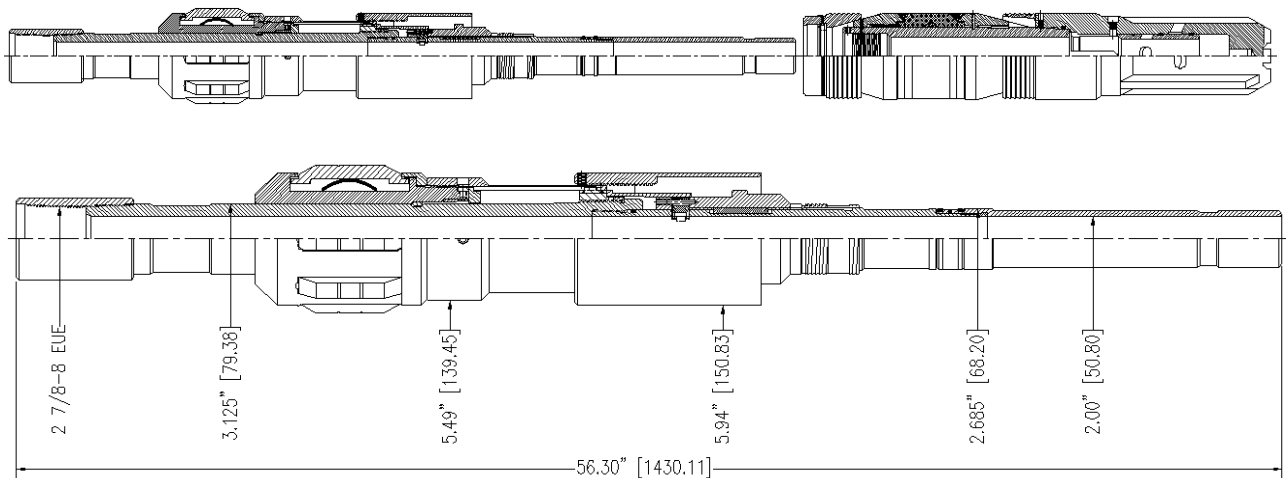
Operating Instructions, continued

SPECIAL NOTE: In wells where paraffin or suspended solids in the well fluids are present, the Dog on the Control Latch may not fully release from the Stinger Sub Body. This is indicated when the Cement Retainer sets properly, as in steps 1 through 5, but the slide valve will not close so that the work string can be pressure tested. In this event the work string should be alternately picked up and slacked off. This movement will assist the Dog to move outward on the inclined edges of the locking groove in the Stinger Sub Body, thus freeing the Sub Body for the required two (2) inches of vertical movement.

The Mechanical Setting tool is released from the Cement Retainer by pulling 500-1000 lbs. tension at the tool and then rotating the work string 10 turns to the right at the tool. This will shear the rotational lock screw and unscrew the Control Latch from the Cement Retainer.

After Releasing from a Cement Retainer

The Mechanical Setting Tool can be reattached to the Cement Retainer by setting down 3,000 to 5,000 lbs. of work string weight and snapped out again by pulling 8,000 to 10,000 lbs. tension at the Cement Retainer. The Stinger Seal will remain in the Cement Retainer until the snap-out retaining force is exceeded. Each time the Mechanical Setting Tool is snapped in and snapped out, the snap-in and snap-out value is reduced until they stabilize at about 2,500 pounds snap-in and 5,000 pounds snap-out. Two (2) inches of upward movement at the Cement Retainer will close the slide valve; two (2) inches of downward movement at the Cement Retainer will open the slide valve.



Hydraulic Forces Acting on High Flow Cement Retainer

Force created by applied pressure to the casing and tubing act upon the stinger sub and tubing during cementing and pressure testing operations. These forces are variable and are affected by the area of the cement retainer seal bore, casing and tubing pressure changes at the Cement Retainer, tubing size and weight and fluid weight. An increase in casing pressure at the cement retainer tends to lift tubing which can cause the slide valve to close. The force generated by a casing pressure increase is calculated by multiplying the casing pressure increase by outside area of the tubing minus the seal bore area of the tool.

A pressure increase in the tubing exerts a lifting force at the top of the string which will reduce the effective hook load. A pressure increase in the tubing at the Cement Retainer will tend to hold the stinger sub in the tool and keep the slide valve open. The net of these two forces is upward and is equal to the increase in tubing pressure multiplied by the area of seal bore in cement retainer. When this force is equal to the tubing weight, any additional pressure will lift the tubing and allow the slide valve to close. Therefore, the minimum setting depth will depend on applied pressure changed in the tubing and casing acting to lift the available tubing weight.

The amounts of tubing and annulus pressure that can be applied are limited for any size and length of tubing. When total of the forces is equal to the weight of the tubing in fluid, an increase in either tubing or casing pressure will raise the tubing and close the slide valve.

Retainer Specifications						
Casing		Retainer OD	Setting Range		Seal Bore	Mechanical Setting Equipment
OD	Wt (T&C)	17-20	Min	Max		Part Number
7"	17-23#	6.0	6.366	6.538	2.688	062-0600-105

However the cementing pressure may be increased if the casing pressure is decreased and vice versa. The snap latch feature of the stinger sub has no effect on either opening or closing the side valve. The stinger sub will remain in the cement retainer as long as the snap-out force is not exceeded. If excess tension is pulled on tubing while pressure testing the snap-out force may be overcome and stinger sub will be pumped out.

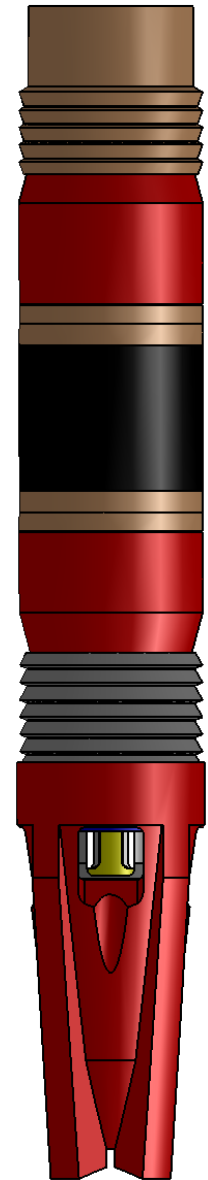
BD Cement Retainer

The Ball Drop Cement Retainer, is a proven design, that can be used during surface casing gas migration cement squeezes. A ball drop selective cementing application directs cement flow through the tight formation, ensuring 360° cementing coverage of the annulus. The internal valve is a pressure balanced valve when closed, and acts as a standard Cement Retainer. It is opened or closed with pipe manipulation, to allow, or isolate flow in high differential pressure scenarios.

Features

- Fully pressure testable prior to remedial operations
- Valve automatically opens and closes with removal of the stinger
- Easily drilled due to rotationally locked components
- Can be converted between mechanical or wireline set
- Able to reliably pass through a $\varnothing 15.9\text{mm}$ or $\varnothing 22.2\text{mm}$ ball

Available Sizes					
Casing Size	Weight Range	O.D.	Ball Size	Pressure Rating	Temp Rating
(mm)	(kg/m)	(mm)	(mm)	MPa	°C
114.3	14.1 - 22.5	91.3	15.9	68.9	up to 204
139.7	19.3 - 34.2	109.5	15.9	68.9	up to 204
177.8	25.3 - 34.2	152.4	22.2	68.9	up to 135





The Mill-EZ Composite Bridge Plug is a slim design bridge plug. The Mill-EZ's low metallic content allows for the plug to be quickly and easily milled and circulated back to surface. The bottom is designed for milling of several plugs in the same wellbore. This can be accomplished with conventional milling with a rig or coiled tubing.

Features

- Can be set on wireline, coiled tubing, or production tubing
- Utilizes conventional setting tools
- Multiple plugs in a single wellbore
- Mill or drill multiple plugs in a single run
- Can be milled or drilled with coiled tubing
- Utilizes conventional milling or drilling tools
- Extremely fast milling or drilling operation
- High differential pressure rating
- Wash-thru bottom to aid in milling multiple plugs
- Custom O.D. available upon request

Mill-EZ Composite Bridge Plug							
Casing		Bridge Plug O.D.	Bridge Plug Set Length	Low Temp	Low Temp	High Temp	Recommended Setting Tool
O.D. in	Weight			Low psi	High psi	High psi	
				Grey	Yellow	Blue	
2.375	4.7	1.750	11.0	250 ⁷ /10K	250 ⁷ /10K	350 ⁷ /10K	GO
2.875	6.5	2.200	11.0	250 ⁷ /10K	250 ⁷ /10K	350 ⁷ /10K	Baker #5 or GO
2-7/8 HW	7.9	2.150	11.0	250 ⁷ /10K	250 ⁷ /10K	350 ⁷ /10K	Baker #5 or GO
3-1/2	9.30 - 10.20	2.725	11.0	250 ⁷ /10K	250 ⁷ /10K	350 ⁷ /10K	Baker #5 or GO
3-1/2 HW	12.95	2.500	11.0	250 ⁷ /10K	250 ⁷ /10K	350 ⁷ /10K	Baker #5 or GO
4	9.50 - 11.0	3.188	16.0	250 ⁷ /10K	250 ⁷ /10K	350 ⁷ /10K	Baker #10 or GO
4-1/2	9.50 - 11.0	3.600	16.0	250 ⁷ /10K	250 ⁷ /10K	350 ⁷ /10K	Baker #10 or GO
5	11.5 - 20	3.920	16.0	250 ⁷ /10K	250 ⁷ /10K	350 ⁷ /10K	Baker #10 or GO
5-1/2	15.5 - 23	4.400	16.0	250 ⁷ /10K	250 ⁷ /10K	350 ⁷ /10K	Baker #20 or GO
7	20 - 35	5.750	18.0	250 ⁷ /10K	250 ⁷ /10K	350 ⁷ /10K	Baker #20 or GO
7-5/8	24 - 33.7	6.400	18.0			350 ⁷ /10K	Baker #20 or GO
8-5/8	36 - 49	7.250	22.0		250 ⁷ /10K		Baker #20 or GO
9-5/8	32.3 - 53.5	8.375	22.0		250 ⁷ /10K		Baker #20 or GO