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Author	Omar Perdomo
Approved By:	Carl Gay

ALPHA MODEL B Cement Retainer

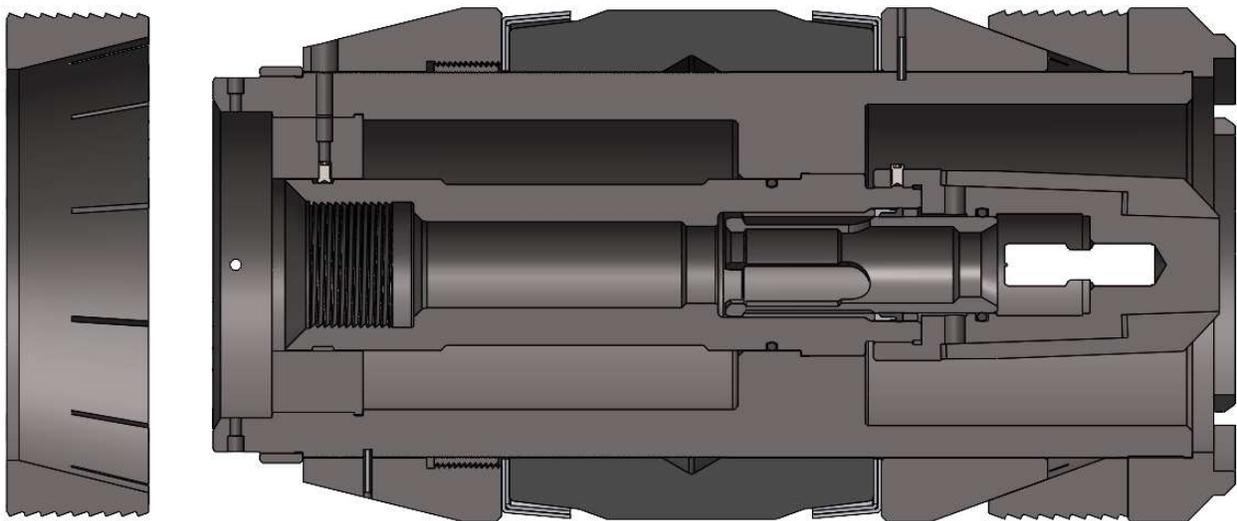
Introducing the Model “B” Cement Retainer: a premium solution for squeeze cementing operations, is one of the most trusted in the industry. Controlled effortlessly from the surface, the sleeve valve operation is as simple as picking up to close and setting down to open.

This retainer is set on the tubing string or drill pipe using a mechanical setting tool or wireline pressure setting tools ensuring efficient installation. Prior to the squeeze operation, the tubing can be tested for integrity, enhancing operational confidence. Upon release, the valve automatically closes, maintaining pressure containment. For the wireline configuration after its installation, a tubing seal nipple is added, allowing for a pre-squeeze testing of the tubing string. Upon removal of the nipple, the valve automatically closes, ensuring optimal pressure containment.

Engineered to withstand high pressure and temperatures, the Model B Sleeve Valve Cement Retainer guarantees reliability and performance in any application.

Features:

- Mechanical set. (Part Number: 005-XXXX-000)
- Wireline set. (Part Number: 005-XXXX-002)
- Drillable Cast Iron construction.
- One-piece grips.
- Sets in any grade casing including P-110.
- Form fitting metal back-ups prevent rubber extrusion.
- Permanent service.
- Ratcheting lock ring holds setting force.
- Can be upgraded to 400°F temperature rating upon request for sizes up to 7.125
- Available sizes for setting range from 3.826 to 18.73 in.



1200 Model B Cement Retainer Wireline Set illustration.

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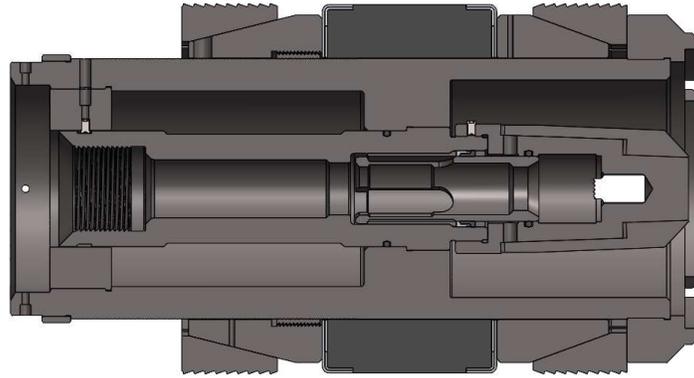
MODEL B CEMENT RETAINER SIZE CHART

Part Number	OD (in)	Setting Range Min (in)	Setting Range Max (in)	Setting Tool	Max Pressure (psi)
005-3593-000	3.593	3.826	4.090	MST 3593	10,000
005-3593-002	3.593	3.826	4.090	#10	10,000
005-3937-000	3.937	4.184	4.560	MST 3.593	10,000
005-3937-002	3.937	4.184	4.560	#20	10,000
005-4312-000	4.312	4.670	5.012	MST 4312	10,000
005-4312-002	4.312	4.670	5.012	#20	10,000
005-4750-000	4.750	5.132	5.424	MST 4750	10,000
005-4750-002	4.750	5.132	5.424	#20	10,000
005-5375-000	5.375	5.625	6.094	MST 5687	10,000
005-5375-002	5.375	5.625	6.094	#20	10,000
005-5687-000	5.687	6.004	6.560	MST 5687	10,000
005-5687-002	5.687	6.004	6.560	#20	10,000
005-6312-000	6.312	6.625	7.025	MST 6312	10,000
005-6312-002	6.312	6.625	7.025	#20	10,000
005-7125-000	7.125	7.511	8.097	MST 7125	8,000
005-7125-002	7.125	7.511	8.097	#20	8,000
005-8125-000	8.125	8.535	9.001	MST 8125	8,000
005-8125-002	8.125	8.535	9.001	#20	8,000
005-8690-000	8.690	9.000	9.342	MST 8690	5,000
005-9000-000	9.000	9.282	9.660	MST 9000	5,000
005-9000-002	9.000	9.282	9.660	#20	5,000
005-9437-000	9.437	9.660	10.192	MST 9437	5,000
005-9437-002	9.437	9.660	10.192	#20	5,000
005-9500-000	9.500	9.850	10.369	MST 9437	5,000
005-9500-002	9.500	9.850	10.369	#20	5,000
005-9937-000	9.937	10.192	10.772	MST 9937	5,000
005-9937-002	9.937	10.192	10.772	#20	5,000
005-1156-002	11.56	11.907	12.275	#20	3,000
005-1200-000	12.00	12.347	12.715	MST 1200	3,000
005-1200-002	12.00	12.347	12.715	#20	3,000
005-1425-000	14.25	14.688	15.250	MST 1425	2,000
005-1425-002	14.25	14.688	15.250	#20	2,000
005-1725-000	17.25	17.655	18.730	MST 1725	2,000
005-1725-002	17.25	17.655	18.730	#20	2,000

HOW THE MODEL B CEMENT RETAINER WORKS

The Model B Cement Retainer is run into wellbore on wireline or tubing to the desired depth. The setting mechanism is triggered, causing the cone to push slips outward to grip the wellbore wall and compress the sealing element to form a tight seal. Once the slips are fully anchored and the packing element is compressed, the lock ring will secure the retainer in place. The B model cement retainer is equipped with a slide valve that enables the squeezing operation to be initiated or halted at any time. After the cementing process is complete, the valve can be closed, making the retainer to function as a plug. This action retains the squeeze pressure on the cement beneath the retainer and isolates the newly cemented area from the hydrostatic pressures exerted above the cement retainer.

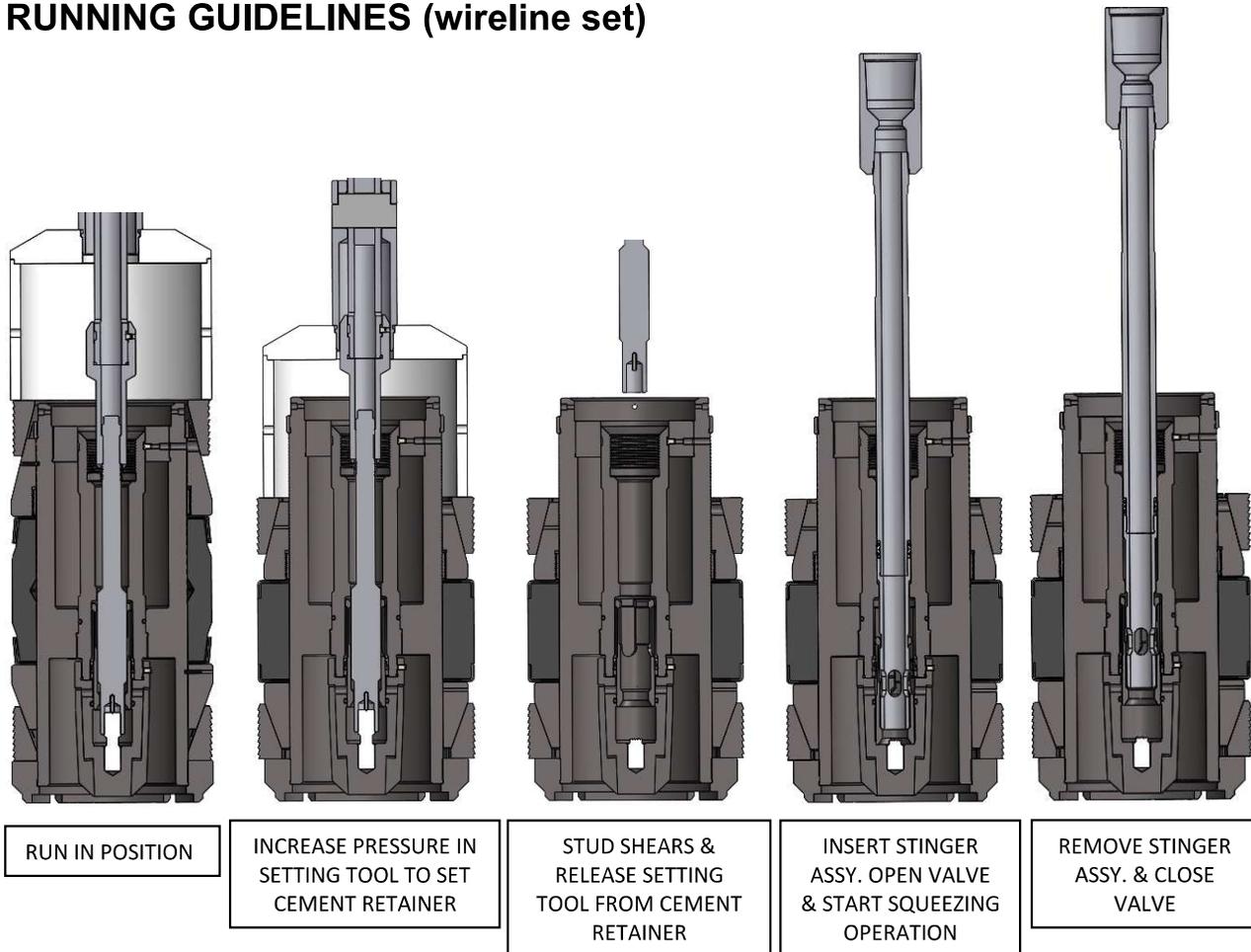
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1200 B model Cement Retainer (wireline set) in Set Position illustration.

Once the B model Cement Retainer is securely installed and on setting depth, initiate the set via wireline (or hydraulic) setting tool to fracture the stud or rotate to fracture the shear screws (mechanical set) and detach the setting tool from the Retainer.

RUNNING GUIDELINES (wireline set)



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GUIDELINES FOR RUNNING B MODEL CEMENT RETAINER (wireline set)

1. Use casing scraper before running any equipment in the well to remove scale and other materials from the casing wall. Any tool that is expected to grip the casing wall has to first reach the casing wall. Follow scraper with gage ring and junk basket.
2. Always follow cleaning, redressing and operational procedures on the setting tool. Make certain oil levels in pressure setting tool are correct for the well environment involved. Take into consideration the heat expansion of the oil in your manufacturers guidelines that should be supplied with your pressure setting tool.
3. Use the correct cement retainer for the temperature, pressure, casing size, casing weight and environment.

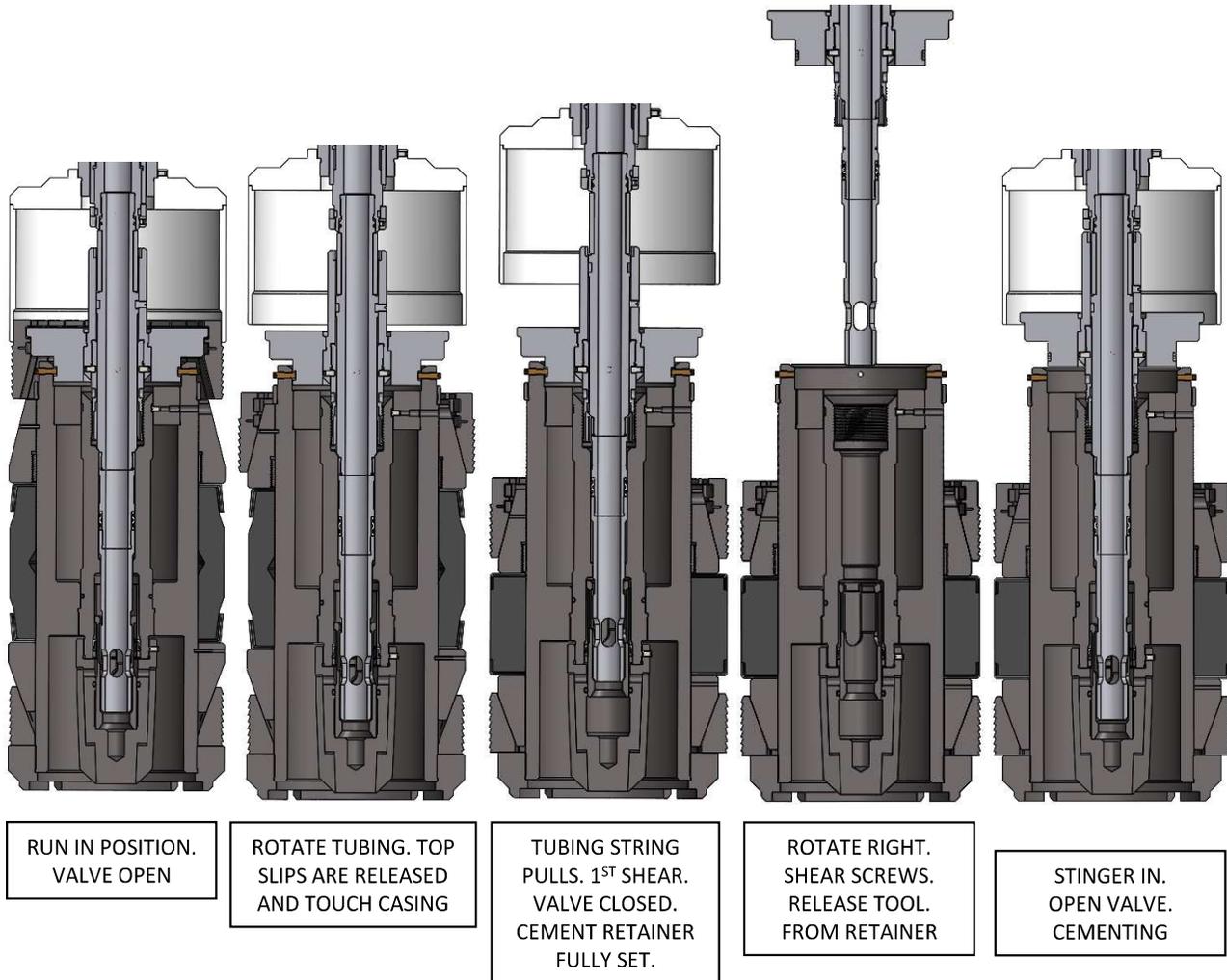
SLEEVE VALVE CEMENT RETAINER	PRESSURE	TEMPERATURE (depends on elastomer choice)
3.593-6.312 MODEL B	10,000 psi	250°F - 400°F
7.125-8.125 MODEL B	8,000 psi	250°F - 400°F
9.000-9.937 MODEL B	5,000 psi	250°F - 400°F
11.562-12.000 MODEL B	3,000 psi	250°F - 400°F
14.250-17.250 MODEL B	2,000 psi	200 °F

4. Casing should have 100% cement bond before running plug/retainer in the well.
5. Do not overtighten cement retainer onto setting tool. This action causes the slips to crack which leads to premature setting. Snug tight is sufficient for a cement retainer. The lock spring or nut, depending on make of setting tool, must accompany the tension mandrel to prevent plug/retainer from backing off.
6. Do not allow the setting tool weight to rest on the cement retainer after making up. This can cause the slips to crack.
7. Help guide the setting tool and cement retainer through lubricators, wellhead and blowout preventer. When running under pressure raise tools to the top of lubricator before equalizing the pressure into lubricator.
8. Running speed should not exceed 300 feet per minute to avoid fluid displacement cutting on elastomer. Should setting tool misfire, retrieve equipment no faster than it went in. Slow down for liners and other restrictions.
9. Never set retainer in casing collar or where milling has occurred.
10. Always set retainers in static well conditions (no fluid or gas movement).
11. Shock to the retainers can result in failure. Warn service companies of the retainer depth to avoid high impact collisions. Never use a cement retainer for a reference point (tagging) before cement job is completed.
12. Pressure setting tool failure can result from several causes (ex: out of date power charge or bad O-ring). In the event that a pressure setting tool does not shear off of the cement retainer and you have to pull out of the rope socket, the shear stud will still part in a normal manner when the setting tool is fished out. This happens most commonly because the power charge did not put up sufficient pressure to shear the stud in the retainer. The Alpha studs are made to shear correctly and are held to high standards of accuracy. When the fishing tool goes in to retrieve the setting tool, you can watch the accuracy of the shear stud when it shears, assuming that the weight indicator is not out of calibration.
13. When perforating, cement retainer should be protected with a minimum of ten feet of cement dumped directly on top of the retainer. Cement should be given sufficient time to harden before perforating. Perforating should not be done closer than fifty feet of bridge plug.
14. Perforating should not be done closer than fifty feet of cement retainer without putting a minimum of 10 ft. of hard cement on top of retainer.
15. Make seal nipple up on a 4 ft. tubing sub (if available); if not, use stop collar to prevent centralizer from moving up the full length of tubing joint. Centralizer should not be more than 10 ft. from top of

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seal nipple. Go in hole at normal speed. Be sure and strap the tubing and keep accurate measurements. When the seal nipple assembly has been lowered to approximately 200 ft. above cement retainer, slow down and ease tubing in the hole, being careful not to run into cement retainer. After top of cement retainer has been tagged with seal nipple assembly, lower seal nipple into retainer until 10,000 lbs. down force has been applied. To test tubing, raise tubing until all tubing weight is picked up and a slight pull-on tubing is encountered. Pressure can be applied to tubing for tubing test. After test is completed release pressure.

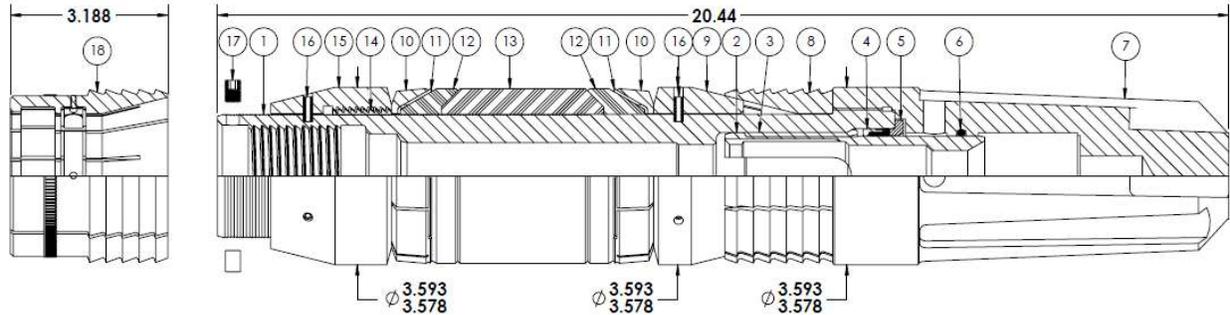
RUNNING GUIDELINES (mechanical set)



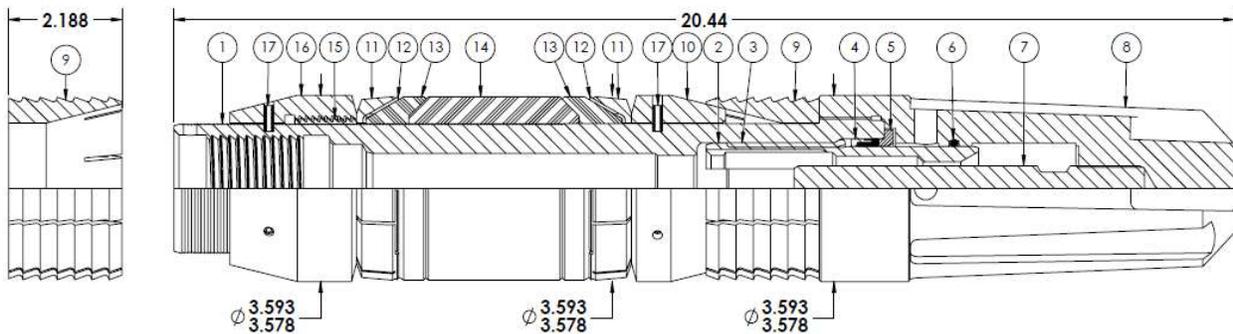
Refer to the operation procedure section of the mechanical setting tool tech unit for detailed guidelines.

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MODEL B CEMENT RETAINER PLUG PARTS LIST



3.593 B CEMENT RETAINER MECHANICAL SET ILLUSTRATION (005-3593-000)



3.593 B CEMENT RETAINER WIRELINE SET ILLUSTRATION (005-3593-002)

3.593 MECHANICAL SET BOM

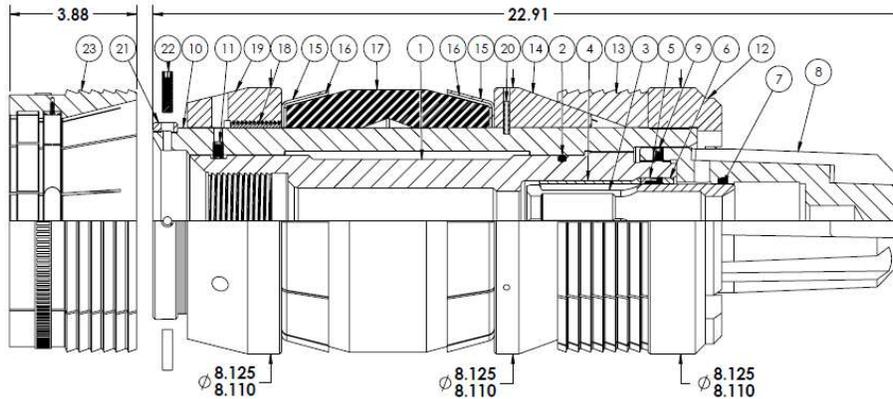
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	005-3593-006	BODY	1
2	005-3593-021	VALVE BODY	1
3	005-3593-026	COLLET SLEEVE	1
4	003-3500-025	MOLDED SEAL	1
5	003-3500-020	SEAL RETAINER	1
6	000-223N-090	223 O-RING	1
7	005-3593-007FC	VALVE SHOE	1
8	005-3593-011	SLIP	1
9	005-3593-009	BOTTOM CONE	1
10	005-3593-024	OUTER METAL BACK-UP	2
11	005-3593-023	INNER METAL BACK-UP	2
12	005-3593-036	END PACKING ELEMENT	2
13	005-3593-037	CENTER PACKING ELEMENT	1
14	005-3593-013	LOCK RING	1
15	005-3593-008	TOP CONE	1
16	RP0187X500	ROLL PIN	6
17	005-3593-019	TORQUE SCREW	2
18	005-3593-010	MECHANICAL TOP SLIP	1

3.593 WIRELINE SET BOM

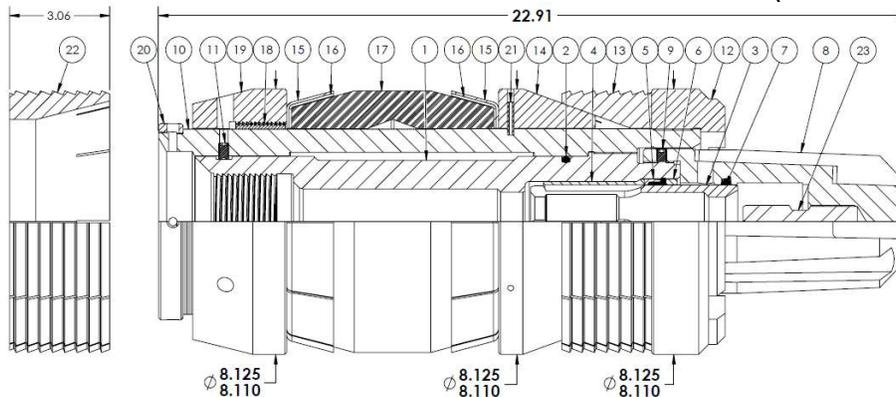
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	005-3593-006	BODY	1
2	005-3593-021	VALVE BODY	1
3	005-3593-026	COLLET SLEEVE	1
4	003-3500-025	MOLDED SEAL	1
5	003-3500-020	SEAL RETAINER	1
6	000-223N-090	223 O-RING	1
7	005-3593-014	SHEAR STUD	1
8	005-3593-007FC	VALVE SHOE	1
9	005-3593-011	SLIP	2
10	005-3593-009	BOTTOM CONE	1
11	005-3593-024	OUTER METAL BACK-UP	2
12	005-3593-023	INNER METAL BACK-UP	2
13	005-3593-036	END PACKING ELEMENT	2
14	005-3593-037	CENTER PACKING ELEMENT	1
15	005-3593-013	LOCK RING	1
16	005-3593-008	TOP CONE	1
17	RP0187X500	ROLL PIN	6

Models with a size of 8.125 and larger are equipped with both inner and outer body components. Example provided on next page.

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8.125 B CEMENT RETAINER MECHANICAL SET ILLUSTRATION (005-8125-000)



8.125 B CEMENT RETAINER WIRELINE SET ILLUSTRATION (005-8125-002)

8.125 MECHANICAL SET BOM

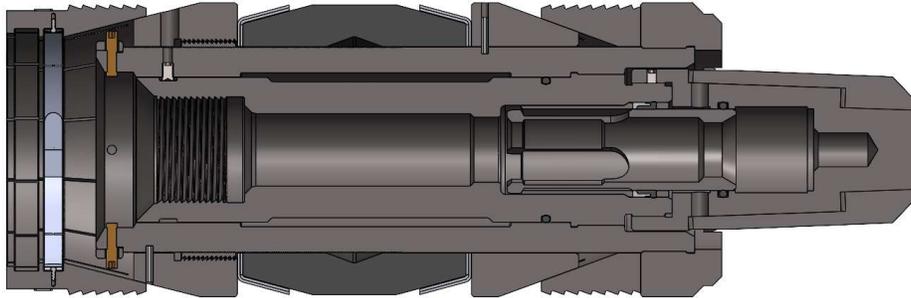
ITEM	PART NUMBER	PART NAME	QTY.
1	005-8125-004	INNER BODY	1
2	000-342N-090	342 O-RING	1
3	005-5687-021	VALVE BODY	1
4	005-5687-026	COLLET SLEEVE	1
5	003-5610-025	MOLDED SEAL	1
6	005-5687-020	SEAL RETAINER	1
7	000-331-N090	331 O-RING	1
8	005-8125-007FC	VALVE SHOE	1
9	FAS-313S18X375	5/16-18 X .375 SET SCREW	1
10	005-8125-006	OUTER BODY	1
11	313S18X500	5/16-18 X .500 SET SCREW.	3
12	005-8125-005	BOTTOM SHOE	1
13	005-8125-016	BOTTOM SLIP	1
14	005-8125-009	BOTTOM CONE	1
15	005-8125-024	OUTER PETAL BACK-UP	2
16	005-8125-023	INNER PETAL BACK-UP	2
17	005-8125-034	PACKING ELEMENT	1
18	000-8710-013	LOCK RING	1
19	005-8125-008	TOP CONE	1
20	RP0187X100	ROLL PIN	6
21	005-8125-027	STOP RING	1
22	005-8125-019	TORQUE SCREW	2
23	005-8125-010	TOP SLIP	1

8.125 WIRELINE SET BOM

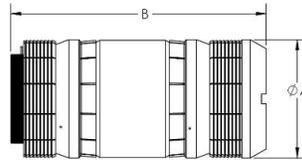
ITEM	PART NUMBER	PART NAME	QTY.
1	005-8125-004	INNER BODY	1
2	000-342N-090	342 O-RING	1
3	005-5687-021	VALVE BODY	1
4	005-5687-026	COLLET SLEEVE	1
5	003-5610-025	MOLDED SEAL	1
6	005-5687-020	SEAL RETAINER	1
7	000-331-N090	331 O-RING	1
8	005-8125-007FC	VALVE SHOE	1
9	FAS-313S18X375	5/16-18 X .375 SET SCREW	1
10	005-8125-006	OUTER BODY	1
11	313S18X500	5/16-18 X .500 SET SCREW.	3
12	005-8125-005	BOTTOM SHOE	1
13	005-8125-016	BOTTOM SLIP	1
14	005-8125-009	BOTTOM CONE	1
15	005-8125-024	OUTER PETAL BACK-UP	2
16	005-8125-023	INNER PETAL BACK-UP	2
17	005-8125-034	PACKING ELEMENT	1
18	000-8710-013	LOCK RING	1
19	005-8125-008	TOP CONE	1
20	005-8125-027	STOP RING	1
21	RP0187X100	ROLL PIN	6
22	005-8125-011	SLIP	1
23	005-5687-014	RELEASE STUD	1

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18. For mechanical set B Cement Retainer include torque screws (item 22) and mechanical Top Slip (item 23) instead of Wireline Top Slip. Shear Stud is not part of the mechanical set B Cement Retainer.



MODEL B CEMENT RETAINER DIMENSIONAL DATA



Part Number	Dim. "A"	Dim. "B"	Setting Sleeve	Shear Stud Value (lbs.)
005-3593-000	3.593	20.44	N/A	N/A
005-3593-002	3.593	20.44	005-3593-200	30,000 - 35,000
005-3937-000	3.937	20.44	N/A	N/A
005-3937-002	3.937	20.44	005-3937-200	30,000 - 35,000
005-4312-000	4.312	20.44	N/A	N/A
005-4312-002	4.312	20.44	005-3937-200	30,000 - 35,000
005-4750-000	4.750	20.44	N/A	N/A
005-4750-002	4.750	20.44	005-4750-200	30,000 - 35,000
005-5375-000	5.375	22.10	N/A	N/A
005-5375-002	5.375	22.10	005-5687-200	50,000 - 55,000
005-5687-000	5.687	22.10	N/A	N/A
005-5687-002	5.687	22.10	005-5687-200	50,000 - 55,000
005-6312-000	6.312	22.19	N/A	N/A
005-6312-002	6.312	22.19	005-6312-200	50,000 - 55,000
005-7125-000	7.125	22.19	N/A	N/A
005-7125-002	7.125	22.19	005-7125-200	50,000 - 55,000
005-8125-000	8.125	22.91	N/A	N/A
005-8125-002	8.125	22.91	005-8125-200	50,000 - 55,000
005-9000-000	9.000	22.91	N/A	N/A
005-9000-002	9.000	22.91	005-9000-200	50,000 - 55,000
005-9437-000	9.437	23.44	N/A	N/A
005-9437-002	9.437	23.44	005-9437-200	50,000 - 55,000
005-9500-000	9.500	23.44	N/A	N/A
005-9500-002	9.500	23.44	005-9437-200	50,000 - 55,000
005-9937-000	9.937	23.44	N/A	N/A
005-9937-002	9.937	23.44	005-9937-200	50,000 - 55,000
005-1156-002	11.56	24.03	005-1156-200	50,000 - 55,000
005-1200-000	12.00	23.84	N/A	N/A
005-1200-002	12.00	23.84	005-1200-200	50,000 - 55,000
005-1425-000	14.25	25.50	N/A	N/A
005-1425-002	14.25	25.50	000-1425-200	50,000 - 55,000
005-1725-000	17.25	24.07	N/A	N/A
005-1725-002	17.25	24.07	000-1725-200	50,000 - 55,000

Elastomer Compatibility Guideline Table:

Elastomer Type	Nitrile (NBR)	Hydrogenated Nitrile (HNBR / HSN)	Viton / Fluoroelastomer (FKM)	Aflas (TFE/P)
Low Temp Resistance, °F	-4	-4	5	100
Maximum Heat Resistance, °F	250	300	350	400
H ₂ S	Very Poor (<0.5%)	Poor (<1%)	Fair (<2%)	Very Good (<20%)
CO ₂	Poor (<1%)	Fair (<2%)	Very Good (Unrestricted)	Very Good (Unrestricted)
Amine Inhibitors	Very Poor (Not Recommended)	Very Poor (Not Recommended)	Very Poor (Not Recommended)	Very Good (Unrestricted)
Zn & Ca Bromides	Very Poor (Not Recommended)	Very Poor (Not Recommended)	Very Good (Unrestricted)	Good
Xylene	Very Poor (Not Recommended)	Very Poor (Not Recommended)	Fair	Very Poor (Not Recommended)
HCl & HF Acid	Very Poor (Not Recommended)	Very Poor (Not Recommended)	Fair	Good
Toluene	Very Poor (Not Recommended)	Poor	Fair	Very Poor (Not Recommended)
Sulfuric Acid	Very Poor (Not Recommended)	Poor	Good	Good
Steam	Very Poor (Not Recommended)	Poor	Poor	Poor
Crude Oil	Very Good (Unrestricted)	Very Good (Unrestricted)	Very Good (Unrestricted)	Very Good (Unrestricted)
Methane	Very Good (Unrestricted)	Very Good (Unrestricted)	Very Good (Unrestricted)	Very Good (Unrestricted)
KCl & Salt Water	Very Good (Unrestricted)	Very Good (Unrestricted)	Very Good (Unrestricted)	Very Good (Unrestricted)

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Recommended Drillout/Millout of Cast Iron Bridge Plugs or Cement Retainers

General

Preferred method is drilling with medium steel tooth tri-cone bit as it is usually faster than mill- out time for same bridge plug or cement retainer. Drilling results in a chiseling effect, where milling is more of a grinding or shaving effect of the targeted tool. Milling out also results in more debris that can hinder penetration as well as circulation to clear the targeted tool face. History has shown that utilizing a short to medium tooth hard formation rock bit to yield the best results.

Suggested Drilling Techniques

While best methods vary based on equipment, depth of objective, or other factors, Alpha Oil Tools suggests rock bit as suggested above with a rotary speed 75-120 RPM. Use drill collars as required to maintain necessary weight and bit stabilization.

To drill the bridge plug or cement retainer:

1. Apply 5000-7000 pounds until the top end of the retainer/plug mandrel is drilled (4-5 inches).
2. Increase weight to 2000-3000 pounds per inch of bit diameter to complete the drill out. For example, apply 9500 up to 14,250 pounds when using a 4.75-inch bit.

When circulating normally, place a junk basket above the bit. If using reverse circulation, any casing scraper or other equipment above the bit should have an inside fluid passage at least as large as that through the bit so as to allow any/all cuttings to be circulated clear. Utilize varying RPM's and weight on bit to optimize drill out, especially if getting indications that penetration by the bit has slowed or stopped. Loss of penetration may occur by "bit tracking" usually caused by too little weight on the bit. Besides changing weight and RPM's, bit tracking can be overcome by picking up the bit above the retainer, then re-engaging the objective while maintaining same RPM's as before.

Drilling times are directly related to tool size, bit stability, bit type, weight/RPM's on bit, wellbore fluids, and pump rate/pressure. High viscosity fluids combined with high pump rates may result in sufficient hydraulic force and cause the bit to lift off the objective.

Suggested Milling Technique

If conditions mandate milling be used as the preferred removal method, it is recommended to use a concave junk mill, 60-150 RPM maintaining 5000-8000 pounds on the mill. Use a mud viscosity 60 cps with a minimum annular velocity of 120 ft/min for cuttings removal.

When ready to begin milling, start the mill above the target then slowly lower to the objective. Do not apply excess weight since this can cause "chunking" which will not allow cuttings removal and then slow the millout. If chunking does occur, it will be necessary for a bailer or junk basket to remove chunked debris before milling can resume. A constant milling rate will require added weight as milling progresses.