

# Model B Mechanical Setting Tool

## For “B” Sleeve Valve Cement Retainers

The Model B Mechanical Setting Tool is designed to run and set Alpha’s Model B Sleeve Valve Cement Retainer. Easy to operate and low maintenance are evident in the design. The tool incorporates both a stinger seal and built-in snap latch allowing the tool to be latched into the retainer with set down weight and released with up-strain or right-hand rotation. This tool can be run time after time by simply moving the drive housing (slip nut on smaller sizes) into place and installing new shear screws. Disassembly is not required between runs on the same location, but is recommended upon returning to the shop. Tool sizes are available from 4 1/2 to 13 3/8 casing. Fewer moving parts and ease of operation make this tool a good addition to your line. The Model B-1 Mechanical Set Bridge Plug can be run with this tool as well by removing items 23 through 27 and replacing item 1 with item 30.

### INSTALLATION OF RETAINER OR BRIDGE PLUG ON THE MODEL B MECHANICAL SETTING TOOL

1. Place the top cone of the retainer or bridge plug in the vise and tighten
2. Apply grease to the stinger section of the setting tool.
3. Stab the stinger section of the setting tool into the retainer or plug using a quick motion. If necessary place a block of wood across the end of setting tool and strike with a sledge hammer. The stinger needs to go in until the latch threads snap into the retainer threads.
4. Place a pipe wrench on the drive housing (slip nut on smaller sizes) and turn to the left screwing the latch farther into the retainer. Stop when the holes in the latch align with the holes in the body of retainer.
5. Install torque screws furnished with the retainer.
6. Align the holes in the drive housing (slip nut in smaller sizes) with the groove in the lower mandrel.
7. Install shear screws in setting tool.
8. Place the mechanical slips over the slip nut. With the drag housing butted against the stop ring, rotate the slip retaining sleeve down over the mechanical slips. Tighten the set screw in slip retaining sleeve.

### RUNNING INSTRUCTIONS

1. The tool should be run at a moderate speed avoiding sudden stops.
2. Avoid right-hand rotation transmitted to the setting tool. As a precaution, after every 10 stands the tubing or drill pipe can be rotated to the left by hand until torque is felt.
3. At desired setting depth, rotate tubing to the right a minimum of seven turns, releasing the slips onto the cone.
4. Pull into the tubing in one continuous pull. See chart below to view the recommended tension. It is important to calculate this tension through tubing stretch. Do not rely on weight indicators.
5. After desired pull is reached, lock down the break on rig to allow setting force to reach retainer. Hold the tension approximately five minutes, then slack off pipe and set approximately five to ten thousand pounds weight down insuring retainer or plug is securely set.

Retainer Size	Minimum Tension	Maximum Tension
3.593-4.312	22,000 lbs.	30,000 lbs.
5.375-6.312	30,000 lbs.	45,000 lbs.
7.125-12.00	35,000 lbs.	48,000 lbs.

### TEST OPTIONS

1. The tubing or drill pipe can be pressure tested by simply pulling up five thousand pounds at the tool and applying pump pressure to the tubing.
2. The retainer can now be tested for seal-off by applying pressure down the annulus or by slacking off five thousand pounds weight on retainer and applying pump pressure down the tubing and pumping into formation
  - These tests are performed before the setting tool is released from the retainer
  - If seal-off has not been accomplished, up-strain on the tubing can again be applied and the tools can be retested until seal-off is accomplished

### RELEASING RETAINER

1. Hold an up-strain of approximately one thousand pounds on the tubing.
2. Apply torque to the right until torque screws are sheared. Each screw requires 200 - 400 foot-pounds.
3. Continue right-hand rotation for ten turns or until latch is felt releasing
  - After releasing from retainer, the setting tool can be relatched into the retainer with three to five thousand pounds set-down weight. This stabilizes at two thousand five hundred pounds with repetition.
  - The valve will open when the stinger is fully engaged into the retainer and will close with a 2 inch upstroke at the tool. The stinger will remain sealed in the bore as long as snap-out force is not exceeded.

**ASSEMBLY INSTRUCTIONS**

(note: grease all threaded connections and o-ring surfaces)

1. Slide the Upper Mandrel (item 2) through the Drag Housing (item 4), entering at the end of drag housing with external threads.
2. Screw the Top Coupling (item 1) onto the Upper Mandrel (item 2). Place the Top Coupling in the vise and tighten with wrench placed in the groove on the Upper Mandrel.
3. Slide on the Stop Ring (item 11). Screw on the Lock Nut (item 14). Install the Set Screw (item 13).
4. Screw the Drag Housing (item 4) toward the Stop Ring (item 11). Turn the Stop Ring with the Drag Housing until maximum butting surface is obtained. Make certain it will not jam by backing off the Drag Housing one round. If holes in the Stop Ring and the Upper Mandrel are not aligned at this point, turn the Stop Ring to the right until alignment is obtained. Install the Set Screws (item 12).
5. *for 7" and Larger Sizes only*  
Slide the Upper Drag Bushing (item 3) over the Drag Housing (item 4) to the far end and insert the Set Screws (item 31). Repeat with the Lower Drag Bushing (item 6).
6. Screw the Adjuster Sleeve (item 8) onto the Drag Housing (item 4) as far as it can go. Start the Set Screw (item 9) and tighten.
7. Screw the Slip Retaining Sleeve (item 18) onto the Adjuster Sleeve (item 8) as far as it can go. Start the Set Screw (item 10), but do not tighten.
8. *for 4 1/2 and 5 1/2 Sizes only*  
Place the O-Ring (item 15) on outside of the Crossover (item 28). Place another O-Ring (item 29) on inside of the Crossover. Slide the Slip Nut (item 19) over the Lower Mandrel (item 22) and screw the Lower Mandrel into Crossover. Screw the Crossover into the Upper Mandrel and tighten.  
*For 7" and Larger Sizes only*  
Screw the Slip Nut (item 19) onto the Drive Housing (item 16). Slide the Drive Housing over the Lower Mandrel (item 22). Install the O-Ring (item 15) on the Lower Mandrel and then screw the Lower Mandrel into the Upper Mandrel and tighten.
9. Screw the Latch (item 21) into the Slip Nut or Drive Housing, depending on size, and install Set Screws (item 20).
10. Place the O-Ring (item 23) in the Seal Sub (item 24) and screw onto the Lower Mandrel.
11. Place the O-Ring (item 26) in the Molded Seal (item 25) and slide onto Seal Sub.
12. Screw the Shifter Sub (item 27) onto Seal Sub and tighten. Pipe wrench placement for shifter sub is just above groove.
13. Shear Screws (item 17) are installed after the setting tool is stabbed into retainer or plug.
14. Slide the Drag Spring (item 5) under the cover on the Upper Drag Bushing (item 3) and then align holes in the Drag Spring and the Lower Drag Bushing (item 6). Install Screws (item 7).

**DIMENSIONAL DATA**

Callout	3.593/ 3.937	4.312	5.375/ 5.687	6.312	7.125	8.125	9.000	9.437	10.437	12.00
A	3.062		3.672							
B	2.250									
C	2.375									
D	3.500		5.000		5.875	7.218	7.812	8.656	9.593	11.156
E	6.250	6.959	8.374		9.260	10.600	11.194	12.038	12.960	14.535
F	1.500									
G	3.375		4.875		5.750	7.093	7.687	8.531	9.468	11.031
H	3.125		4.375							
J	3.745	4.312	5.375	6.312	7.125	8.125	9.000	9.437	10.437	12.000
K	2.750		4.125	4.593	5.593	6.593	7.593		10.093	
L	2.000		2.900							
M	1.320		1.990							
N	1.250		1.875							
P	1.320		1.990							
Q	1.320		1.990							
R	1.250		1.875							
S	1.062		1.562							
T	1.218		1.750							
W	1.156		1.687							
X	.750		1.250							
Y	45.031		47.640							
Z	58.250		61.062							

Parts List								
Item	Qty.	Description	3.593-3.937	4.312	5.375-5.687	6.312	7.125	8.125
		Assy. Complete - "B" Mechanical Setting Tool	017-3593-000	017-4312-000	017-5687-000	017-6312-000	017-7125-000	017-8125-000
1	1	Top Coupling	016-3500-015		016-5610-015			
2	1	Upper Mandrel	016-3500-016					
3	1	Upper Drag Bushing	Not Required		016-5610-019	016-6960-019	016-7710-019	
4	1	Drag Housing	017-3593-017					
5	*	Drag Spring	016-3500-021 (3)	016-4240-021 (3)		016-4240-021 (6)		
6	1	Lower Drag Bushing	Not Required		016-5610-023	016-6960-023	016-7710-023	
7	*	Button Head Cap Screw	5/16 - 18 x 5/16 (6)		5/16 - 18 x 1/2 (6)	5/16 - 18 x 1/2 (12)		
8	1	Adjuster Sleeve	Not Required		017-5687-022			
9	1	Socket Head Set Screw	Not Required		5/16 - 18 x 3/8			
10	1	Socket Head Set Screw	5/16 - 18 x 3/16	5/16 - 18 x 3/8	5/16 - 18 x 5/8			
11	1	Stop Ring	016-3500-025					
12	4	Socket Head Set Screw	5/16 - 18 x 3/8					
13	1	Socket Head Set Screw	5/16 - 18 x 3/8					
14	1	Lock Nut	016-3500-026					
15	1	O-Ring	100-2224-090N					
16	1	Drive Housing	Not Required		017-5687-037			
17	3	Shear Screw	016-3500-040					
18	1	Slip Retaining Sleeve	017-3593-024	017-4312-024	017-5687-024	017-6312-024	017-7125-024	017-8125-024
19	1	Slip Nut	017-3593-029		017-5687-029	017-6312-029	017-7125-029	016-8125-029
20	4	Socket Head Set Screw	5/16 - 18 x 3/8		5/16 - 18 x 3/8			
21	1	Latch	017-3593-031					
22	1	Lower Mandrel	017-3593-028					
23	1	O-Ring	100-2023-090N		100-2130-090N			
24	1	Seal Sub	017-3593-032		017-5687-032			
25	1	Molded Seal	016-3500-033		016-5610-033			
26	1	O-Ring	100-2024-090N		100-2130-090N			
27	1	Shifter Sub	017-3593-034		017-5687-034			
28 **	1	Cross-Over	016-3500-035		Not Required			
29 **	1	O-Ring	100-2122-090N		Not Required			
30 **	1	Ported Coupling (Option) ***	016-3500-014		016-5610-014			
31 **	*	Cap Screws for Drag Bushings	Not Required		1/2 - 20 x 1"		1/2 - 20 x 1 3/8	Not Required
31 **	*	Set Screws for Drag Bushings	Not Required		Not Required		Not Required	1/2 - 20 x 1 1/2

\* - Quantity for this item is noted beside the part number.      \*\* - Not shown in illustration.      \*\*\* - Used for tubing filling when running mechanical set bridge plugs. It replaces item 1.

Parts List (Continued)								
Item	Qty.	Description	9.000	9.437	10.437	12.00		
		Assy. Complete - "B" Mechanical Setting Tool	017-9000-000	017-9437-000	017-1043-000	017-1200-000		
1	1	Top Coupling	016-5610-015					
2	1	Upper Mandrel	016-3500-016					
3	1	Upper Drag Bushing	016-8710-019	016-9500-019	016-9500-020	016-1200-019		
4	1	Drag Housing	017-3593-017					
5	*	Drag Spring	016-4240-021 (6)					
6	1	Lower Drag Bushing	016-8710-023	016-9500-023	016-9500-022	016-1200-023		
7	*	Button Head Cap Screw	5/16 - 18 x 1/2 (12)					
8	1	Adjuster Sleeve	017-5687-022					
9	1	Socket Head Set Screw	5/16 - 18 x 3/8					
10	1	Socket Head Set Screw	5/16 - 18 x 5/8					
11	1	Stop Ring	016-3500-025					
12	4	Socket Head Set Screw	5/16 - 18 x 3/8					
13	1	Socket Head Set Screw	5/16 - 18 x 3/8					
14	1	Lock Nut	016-3500-026					
15	1	O-Ring	100-2224-090N					
16	1	Drive Housing	017-5687-037					
17	3	Shear Screw	016-3500-040					
18	1	Slip Retaining Sleeve	017-9000-024	017-9437-024	017-1043-024	017-1200-024		
19	1	Slip Nut	017-9000-029	016-9437-029	017-1043-029	017-1200-029		
20	4	Socket Head Set Screw	5/16 - 18 x 5/8					
21	1	Latch	017-5687-031					
22	1	Lower Mandrel	017-5687-028					
23	1	O-Ring	100-2130-090N					
24	1	Seal Sub	017-5687-032					
25	1	Molded Seal	016-5610-033					
26	1	O-Ring	100-2130-090N					
27	1	Shifter Sub	017-5687-034					
28 **	1	Cross-Over	Not Required					
29 **	1	O-Ring	Not Required					
30 **	1	Ported Coupling (Option) ***	016-5610-014					
31 **	*	Cap Screws for Drag Bushings	1/2 - 20 x 1 7/8	1/2 - 20 x 2 1/4	1/2 - 20 x 2 3/4	1/2 - 20 x 3 1/2		

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