



HYDROSET II PACKER

w/FLAT TOP
5-1/2" X 1.900" X 1.900"

Manual No:
DL-905-5500-269

Revision: **A**

Revision Date:
02/03/2010

Written by: *B. Mathis*

Approved by: *F. Johnson*

A) DESCRIPTION

The D&L Hydroset II is a hydraulic set, mechanically held dual string production packer, normally run above a single string hydraulic set or wireline set seal bore packer. The short length of the Hydroset II makes it ideally suited for deviated wells or doglegs. Since there is no tubing manipulation required to set the packer, the well head can be installed and flanged up before setting the packer. The Hydroset II is available with short or long string setting capabilities and a variety of tubing connections. The packer is also adaptable for submersible pump applications. The Hydroset II has a sequential upper slip releasing system that is designed so that each slip is released individually to reduce the pull required to release the packer. The angles on the upper slips and upper slip body result in the slips releasing smoothly from the casing. This packer is pressure rated to 5,000 PSI.

B) SPECIFICATION GUIDE

CASING		RECOMMENDED HOLE SIZE	TOOL OD (INCHES)	THREAD CONNECTION BOX UP / PIN DOWN		PART NUMBER
SIZE (INCHES)	WEIGHT (LBS/FT)			LONG STRING	SHORT STRING	
5-1/2	14 – 20#	4.778 – 5.012	4.625	1.900 EU	1.900 NU / 1.660 EU	90555-BAA-BBA

C) OPERATION

When tubing pressure is applied to the packer, the inlet port allows pressure differential to be present in the setting chamber. This differential forces the setting mandrel to separate from the setting chamber, shearing the setting shear screws. The setting cylinder is forced down, which shears the lower slip body shear screws and sets the lower slips. The setting mandrel is forced up, which shears the upper slip body shear screws, and sets the upper slips and packs off the elements. Any relative motion between the setting cylinder and the setting mandrel is held in place by the locking nut, which will ratchet in only one direction. With a pressure differential from above, the force is transferred through the outer components of the packer and is supported by the lower slips. With the pressure differential from below, the force transfers through the outer components of the packer and is supported by the upper slips.

C-1) SETTING PROCEDURES

Run the packer in the well slowly (*60 Ft. stand in 30 seconds is recommended*). If both strings are run simultaneously, allow at least 30 minutes for the packer to equalize thermally before setting. Run the secondary string, if it was not run with the primary string, and latch into the packer seal bore. Temporarily plug the long string below the packer and apply a minimum of 1,500 PSI differential in the tubing at the packer and hold it for 10 minutes. (**CAUTION: Do NOT exceed 5,000 PSI**). The packer should now be fully set and can be pressure tested if desired.

C-2) RELEASING PROCEDURES

The Hydroset II packer is released by a straight pick up on the long string. The shear release value is adjustable from 5,000 lbs to 30,000 lbs (in 5,000 lb increments - see illustration).

D & L OIL TOOLS
P.O. BOX 52220 TULSA, OK 74152
PHONE: (800) 441-3504



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D) DISASSEMBLY

D-1) Clamp flat top (1) in vise.

D-1.1) Unscrew and remove pup joint (20) from flat top (1).

D-1.1.1) Unscrew and remove crossover coupling (4) from pup joint (20).

D-1.2) Unscrew and remove pup joint (21) from lower slip body cap (19).

D-1.2.1) Unscrew and remove crossover (2) from pup joint (21)

D-1.3) Unscrew and remove crossover (5) from long string mandrel (10).

D-1.4) Unscrew and remove shear screws (27) from shear pin retainer (24).

D-1.5) Unscrew and remove shear pin retainer (24) from lower slip body cap (19).

D-1.6) Unscrew and remove socket cap (torque) screws (29) and shear screws (26) from lower slip body (18).

D-1.7) Slide lower slip body assembly off of lower cone (16), long string mandrel (10) and short string mandrel (23) and disassemble:

D-1.7.1) Unscrew and remove lower slip body cap (19) from lower slip body (18).

D-1.7.2) Unscrew and remove alignment mandrel (3) from lower slip body cap (19).

D-1.7.2.1) Remove o-ring (30) from lower slip body cap (19).

D-1.7.3) Remove lower slips (17) from lower slip body (18).

D-1.7.3.1) Unscrew and remove button head screws (28), and remove slip springs (25).

D-1.8) Remove pick up ring (11) from long string mandrel (10)

D-1.9) Unscrew and remove long string mandrel (10) from flat top (1). Pull long string mandrel (10) out through lower cone (16).

NOTE: Do NOT wrench or clamp on seal surface.

D-1.10) Remove setting mandrel assembly from short string mandrel (23) and disassemble:

D-1.10.1) Unscrew and remove lower cone (16) from setting cylinder (15).

D-1.10.1.1) Remove o-rings (30, 31, 32) from lower cone (16).

D-1.10.2) Unscrew and remove shear screws (26) from setting cylinder (15).

D-1.10.3) Rotate setting mandrel (22) to remove it from locking ring (7) and out of setting cylinder (15).

D-1.10.3.1) Remove o-rings (34, 35) from setting mandrel (22).

D-1.10.4) Unscrew and remove locking ring (7) from setting cylinder (15).

D-1.10.4.1) Remove o-ring (33) from setting cylinder (15).

D-1.11) Remove elements (13, 14) and rubber spacers (12) from short string mandrel (23).

D-1.12) Unscrew and remove short string mandrel (23) from flat top (1).

NOTE: Do NOT wrench or clamp on seal surface.

D-1.13) Unscrew and remove upper slip body assembly from flat top (1) and disassemble:

D-1.13.1) Unscrew and remove shear screws (26) and socket cap (torque) screws (29) from upper slip body (6).

D-1.13.2) Slide upper cone (9) out of upper slip body (6).

D-1.13.2.1) Remove o-rings (34, 35) from upper cone (9).

D-1.13.3) Remove upper slips (8) from upper slip body (6).

D-1.13.3.1) Unscrew and remove button head screws (28) and remove slip springs (25).

D-2) Unclamp and remove flat top (1) from vise.



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E) ASSEMBLY

NOTE: Clean and inspect all parts. Replace all worn and damaged parts. Install parts in proper order & orientation.

E-1) Clamp flat top (1) in vise.

E-1.1) Assemble upper slip body assembly:

E-1.1.1) Set slip springs (25) in place on upper slips (8) and screw in button head screws (28).

E-1.1.2) Install upper slips (8) into upper slip body (6).

E-1.1.3) Install o-rings (34, 35) into grooves in upper cone (9).

E-1.1.4) Then slide upper cone (9) into upper slip body (6) far enough to hold slips in place.

E-1.1.5) Screw shear screws (26) and socket cap (torque) screws (29) to secure upper cone (9) to upper slip body (6).

E-1.1.6) Screw upper slip body (6) and assembly onto flat top (1).

E-1.2) Screw short string mandrel (23) into flat top (1).

NOTE: Do NOT wrench or clamp on seal surface.

E-1.3) Slide elements (13, 14) and rubber spacers (12) onto short string mandrel (23).

E-1.4) Assemble setting mandrel assembly:

E-1.4.1) Install o-rings (34, 35) into grooves in setting mandrel (22).

E-1.4.2) Install o-ring (33) into groove in setting cylinder (15).

E-1.4.3) With setting mandrel (22) on bench with thread facing up, CAREFULLY slide setting cylinder (15) onto setting mandrel (22).

E-1.4.4) With holes aligned, screw a shear screw (26) through setting cylinder (15) and into setting mandrel (22).

NOTE: Install one shear screw to hold parts together temporarily.

E-1.4.5) Insert locking ring (7) into setting cylinder (15) and screw it onto setting mandrel (22) until locking ring (7) is flush with lower end of setting mandrel (22).

E-1.4.6) Install o-rings (30, 31, 32) into grooves in lower cone (16).

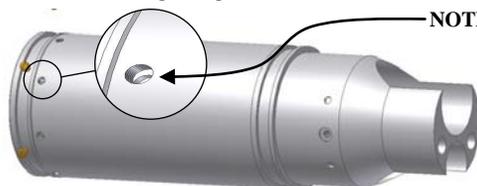
E-1.4.7) CAREFULLY start the lower cone (16) into the setting cylinder (15).

CAUTION: Do NOT rip or tear the o-rings on the threads while installing into the setting chamber.

E-1.4.8) Screw lower cone (16) into setting cylinder (15) until they shoulder.

E-1.4.9) Remove shear screw (27) from setting cylinder (15).

E-1.4.10) Rotate setting cylinder (15) and lower cone (16) in unison about setting mandrel (22) until holes for long and short strings align.

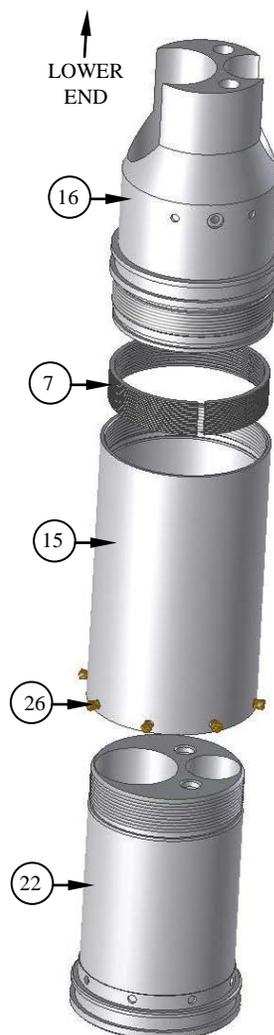


NOTE: Holes MUST be aligned before installing shear screws (27).

NOTE: O-rings not shown.

E-1.4.11) Align set screw holes in setting cylinder (15) with setting mandrel (22). Looking from lower end of lower cone (16), rotate setting cylinder (15) and lower cone (16) clockwise until shear screw holes align with pockets in setting mandrel (22).

NOTE: This should NOT take more than 1/8 (45°) rotation.





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E) ASSEMBLY (cont'd)

E-1.4.12) Screw shear screws (26) into setting cylinder (15). Tighten and back out 1/4 turn.

E-1.4.13) While backing up on setting cylinder (15) with a wrench, back off lower cone (16) just enough to allow holes for short & long strings (10, 23) to align again.

E-1.4.14) Slide the setting piston assembly onto the short string mandrel (23).

CAUTION: Do NOT rip or tear the o-rings on the threads while installing.

E-1.5) Screw long string mandrel (10) into flat top (1).

E-1.6) Install pick up ring (11) into groove in long string mandrel (10).

E-1.7) Assemble lower slip body assembly:

E-1.7.1) Set slip springs (25) in place on lower slips (17) and screw in button head screws (28).

E-1.7.2) Install lower slips (17) into lower slip body (18).

E-1.7.3) Install o-ring (30) into groove in lower slip body cap (19).

E-1.7.4) Screw alignment mandrel (3) into lower slip body cap (19).

E-1.7.5) Screw lower slip body (18) onto lower slip body cap (19).

E-1.7.6) Slide lower slip body assembly onto lower cone (16). Screw shear screws (26) and socket cap (torque) screws (29). Tighten shear screws and back off 1/4 turn.

NOTE: Back off lower slip body cap (19) as needed to align short and long string mandrels.

E-1.8) Screw shear pin retainer (24) into lower slip body cap (19) until shouldered. Back off shear pin retainer (24) as needed to align threaded holes with pocket holes in long string mandrel (10).



E-1.9) Screw shear screws (27) into shear pin retainer (24). Tighten and back out 1/4 turn.

NOTE: Install quantity of shear screws (28) needed to achieve desired shear value.

E-1.10) Screw crossover (5) onto long string mandrel (10).

E-1.11) Screw pup joint (21) into lower slip body cap (19).

E-1.11.1) Screw crossover (2) onto pup joint (21).

E-1.12) Screw pup joint (20) into flat top (1).

E-1.12.1) Screw coupling (4) onto pup joint (20).

E-2) Unclamp flat top (1) from vise and remove tool assembly.



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F) PARTS LIST

ITEM	QTY	DESCRIPTION	MATERIAL	P/N 90555-BAA-BBA (14 - 20#)
1	1	FLAT TOP	L-80	90555611
2	1	CROSSOVER	L-80	CH-BBBA-BAA
3	1	ALIGNMENT MANDREL	1018	90555215
4	1	CROSSOVER COUPLING	1018	CP1900E1900N
5	1	CROSSOVER - SPECIAL CLEARANCE	1018	CH1900N1900E-SC
6	1	UPPER SLIP BODY	L-80	90555320
7	1	RATCHET RING	1018	90555720
8	4	UPPER SLIP	CARBURIZED STEEL	90555115
9	1	UPPER CONE	L-80	90555410
10	1	LONG STRING MANDREL	P-110	90555210
11	1	PICK UP RING	1018-1020	90555760
12	2	RUBBER SPACER	1018	90555840
13	1	ELEMENT	70 DURO NITRILE	90555511
14	2	ELEMENT	80 DURO NITRILE	90555512
15	1	SETTING CYLINDER	L-80	90555755
16	1	LOWER CONE	P-110	90555420
17	4	LOWER SLIP	1018	90555131
18	1	LOWER SLIP BODY	L-80	90555316
19	1	LOWER SLIP BODY CAP	1018	90555335
20	1	PUP JOINT - 36"	L-80	PJ1900N-36
21	1	PUP JOINT - 24"	L-80	PJ1660N-24
22	1	SETTING MANDREL	L-80	90555850
23	1	SHORT STRING MANDREL	L-80	90555211
24	1	SHEAR SLEEVE	1018	90555740
25	8	SLIP SPRING		72455950
26	16	SHEAR SCREW	BRASS	90555990
27	6	SHEAR SCREW (5000#) 1/2-13 W/ .418 DOG POINT	BRASS	65050902



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ITEM	QTY	DESCRIPTION	MATERIAL	P/N 90555-BAA-BBA (14 - 20#)
28	8	BUTTON HEAD CAP SCREW		BHSC08C037
29	4	SOCKET CAP SCREW 5/16-18 UNC X 7/16	STEEL	SCS031C044
30	2	130-90 O-RING		90130
31	1	134-90 O-RING		90134
32	1	155-90 O-RING		90155
33	1	156-90 O-RING		90156
34	2	223-90 O-RING		90223
35	2	225-90 O-RING		90225

ASSEMBLED WEIGHT		148 LBS
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G) TECHNICAL ILLUSTRATION

