



HYDRATRIEVE PACKER, HSN, CARBIDE 7-5/8" X 4-1/2"

Manual No:
DL-915-7625-1687

Revision: **A**

Revision Date:
06/29/2023

Authored by: *J.Anderson*

Approved by: *K.Plunkett*

A) DESCRIPTION

The Hydratrieve Packer is a hydraulic set, mechanically held, single string production packer. Because no tubing manipulation is required to set this packer, the wellhead can be installed and flanged up before setting.

This packer is available with a variety of tubing connections. The packer features a sequential upper slip release system designed to release each slip individually to reduce the pull required to release it. The angles on the upper slips and upper slip body result in the slips releasing smoothly from the casing.

B) SPECIFICATION GUIDE

CASING			TOOL		THREAD CONNECTION BOX UP / PIN DOWN	PART NUMBER
SIZE (INCHES)	WEIGHT (LBS/FT)	RECOMMENDED HOLE SIZE (INCHES)	GAGE OD (INCHES)	ID (INCHES)		
7-5/8	24.0 – 29.7	6.875 - 7.025	6.672	3.875	4-1/2 LTC	91575BHC

DIFFERENTIAL PRESSURE (MAX)	TENSILE LOAD FROM SURFACE (MAX)	TENSILE LOAD THRU TOOL (MAX)	TEMPERATURE RANGE	TEMPERATURE CYCLE RANGE
7,000 PSI	90,000 LBS	121,000 LBS*	70 - 300°F	230°F

* Using all 18 releasing shear screws

SETTING			
SETTING AREA (IN ²)	SHEAR VALUE (PSI/SCREW)	INITIATION PRESSURE (PSI)	RECOMMENDED SETTING PRESSURE (PSI)
7.38	321	2,580	3,400

RELEASING
Shear release is adjustable from 40,000 to 90,000 lbs (5,000 lbs/screw). Minimum of 8 shear screws required.

C) PRE-INSTALLATION INSPECTION PROCEDURES

CAUTION: D&L ships tool connections made-up **HAND TIGHT**—labeled with hand-tight tape on the tool (Fig. 1)—unless stated otherwise. Tighten/torque all connections properly before operating tool.



Fig. 1

GENERAL THREAD CONNECTION TORQUE RECOMMENDATIONS			
STUB ACME / ACME THREADS	INTERNAL TAPERED TUBING THREADS		PREMIUM THREADS
	UP TO 2-3/8"	GREATER THAN 2-3/8"	
600 – 800 FT-LBS	600 – 800 FT-LBS	800 – 1,200 FT-LBS	Consult thread manufacturer's recommendations.

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



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C) PRE-INSTALLATION INSPECTION PROCEDURES (cont'd)

GENERAL SCREW TORQUE RECOMMENDATIONS									
SCREW SIZE (INCHES)	#6	#8	#10	1/4	5/16	3/8	7/16	1/2	5/8 and larger
TORQUE RANGE (INCH-POUNDS)	5 – 8	10 – 15	18 – 25	25 – 40	50 – 80	90 – 135	160 – 210	250 – 330	450 - 650

Before first use, D&L recommends disassembly and inspection of the tool unless stated otherwise. Ensure parts have not been damaged during shipping. Replace damaged parts with D&L replacement parts. Contact D&L sales for replacement part information.

Re-assemble the tool after inspection. Install parts in the correct order and orientation. Properly tighten connections.

Before re-using the tool, D&L recommends disassembly and inspection of the tool. Clean parts and ensure parts are in good working condition. Replace worn or damaged parts with D&L replacement parts.

When redressing the tool, D&L recommends replacement of all seals, elements, o-rings, shear screws, etc. Contact D&L sales for redress kit and/or other replacement part information.

D) OPERATION

CAUTION: Do not run the tool without properly tightening connections. Running the tool with loose connections may damage the tool and cause malfunction.

When tubing pressure is applied to the packer, the inlet port allows pressure differential to be present in the lower body. The pressure differential forces the piston to separate from the lock ring housing/lower body and shears the setting shear screws. The lower body is forced down and shears the lower slip body shear screws to set the lower slips. The upper cone is forced up with the piston to shears the upper slip body shear screw and set the upper slips. With the slips set, the pressure on the piston shears the shear screws in the upper cone to set the elements.

Any relative motion between the piston and the lower body is held in place by the lock ring that ratchets 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.

D-1) SETTING PROCEDURES

Running speed is critical, especially in heavy or viscous fluid where excess speed can result in swabbing off the packing element or in creating pressure waves which could lead to creating a preset condition. As a guide it is recommended that running speed should not be more than 30 seconds per joint (range II or 30 feet). **Do not exceed this speed**, particularly when running the packer in the heaviest weight casing for the range for which the packer is dressed.

A run in the well with a junk basket and suitable sized gauge ring or a bit and scraper is strongly recommended prior to running. The location of any tight spots should be noted and the running speed for the packer through these spots should be reduced.

Being a hydraulically set packer, it can be subject to preset conditions by pressure waves through the fluid. A slow steady running speed should be used and sudden stops and starts, such as when setting or pulling slips, should be avoided. Make up the packer to the tubing string in the desired position and to the required torque.

Allow at least 30 minutes for the packer to equalize thermally before setting. Temporarily plug the tubing below the packer and apply a minimum of 3,500 psi differential in the tubing at the packer and hold it for 30 minutes. The packer should now be fully set and can be pressure tested if desired.



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D) OPERATION (cont'd)

D-2) RELEASING PROCEDURES

The packer is released by a straight pick up on the mandrel. The shear release value is adjustable from 40,000 lbs to 90,000 lbs (5,000 lbs/screw).

NOTE1: A minimum of eight (8 qty) shear screws must be used or the packer may release prematurely.

A maximum of 121,000 lbs can be hung below the packer. If the combined force from the releasing shear screws plus the weight below the tool exceeds 211,000 lbs, a telescoping union should be run directly below the packer.

E) STORAGE RECOMMENDATIONS

When preparing the tool for storage, follow the Pre-Installation Inspection Procedures. Re-assemble the tool with connections hand-tight only and in running position if applicable. Elements should be in a relaxed state—free from tension, compression, and other stresses that could cause deformation.

Store the tool, if possible, in an enclosed, temperature and humidity controlled environment. Avoid excessively high temperatures over long periods of time. Shield elastomeric parts from ultraviolet light sources. Keep tool dry and protected from condensation. Do not store in contact with or near volatile or corrosive chemicals. Do not store near ozone generating equipment or operations such as welding.

F) RECOMMENDED HAND TOOLS

- VISE
- GLOVES
- ALLEN WRENCHES
- TAPE MEASURE
- O-RING PICK
- BAR
 - 1/2-INCH
 - 3/4-INCH
- PAINT BRUSH, 2-INCH
- PIPE WRENCH, 3-FT (2 EA)
- "CHEATER" PIPE, 4-FT LONG
- ADJUSTABLE WRENCH, 12-INCH
- CORDLESS DRILL, 18V
- SNAP RING SPREADER PLIERS
- ALIGNING PUNCH
- BOLTS, 1/4-20 X 1-1/4" LONG (4EA)
- SCREWDRIVER SET, FLAT-TIPPED
- SOCKET SETS
 - 3/8-INCH DRIVE
 - 1/2-INCH DRIVE
- HAMMERS
 - SLEDGE
 - BALL PEEN
 - DEAD BLOW

G) DISASSEMBLY

G-1) Clamp top sub (1) in vise.

G-1.1) From lower end of tool, unscrew and remove shear screws (20, 21) and cap screws (17) from lower slip body (13).

G-1.2) Wedge lower slips (12) outwards. Remove lower slip body assembly and disassemble:

G-1.2.1) Remove wedges (if needed). Remove lower slips (12) from lower slip body (13).

G-1.2.2) Unscrew button head screws (19) from lower slips (12) and remove slip springs (15).

G-1.3) Remove pick up ring (14) from inner mandrel (2).

G-1.4) Unscrew and remove set screws (18) from lock ring housing (9).

G-1.5) Unscrew lower body (11) from lock ring housing (9) and remove from inner mandrel (2).

G-1.6) Remove o-ring and backup rings (25, 26) from lower body (11).

G-1.7) Unscrew and remove shear screws (21, 22) from lock ring housing (9).

G-1.8) Unscrew lock ring housing (9) from lock ring (10) and remove from piston (8).

G-1.9) With snap ring spreader pliers, spread lock ring (10) slightly to remove from piston (8).

G-1.10) Unscrew and remove shear screws (21) from upper cone (6).



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G) DISASSEMBLY (cont'd)

G-1.11) Remove piston assembly from inner mandrel (2) and disassemble:

G-1.11.1) Remove element (7) from piston (8).

G-1.11.2) Remove o-rings and backup rings (25, 26 & 27, 28) from piston (8).

G-1.12) Unscrew and remove shear screws (21) from upper slip body (3).

G-1.13) Unscrew and remove cap screws (17) from upper cone (6).

G-1.14) Remove upper cone (6) from inner mandrel (2).

G-1.14.1) Remove o-ring and backup rings (27, 28) from upper cone (6).

G-2) Unclamp and remove top sub (1) from vise. Clamp lower end of inner mandrel (2) in vise.

CAUTION₃: Do NOT wrench or clamp on seal surfaces.

G-2.1) Unscrew and remove shear screws (20) from upper slip body (3).

G-2.2) Move upper slip body (3) down inner mandrel (2) to access set screws (16).

G-2.3) Unscrew and remove set screws (16) from top sub (1).

G-2.3.1) Remove o-ring and backup rings (23, 24) from top sub (1).

G-2.4) Wedge upper slips outwards. Remove upper slip body assembly from inner mandrel (2) and disassemble:

G-2.4.1) Remove upper and releasing slips (4, 5) from upper slip body (3).

G-2.4.2) Unscrew button head screws (19) from slips (4, 5) and remove slip springs (15).

G-3) Unclamp inner mandrel (2) and remove from vise.

H) ASSEMBLY

NOTE₂: Clean and inspect all parts. Replace all worn and damaged parts. Install parts in proper order, and orientation and tighten/torque all connections properly.

CAUTION₄: To ensure tool operates properly, install o-rings in o-ring grooves **NOT** thread reliefs (Fig. 2).

H-1) Clamp lower end of inner mandrel (2) in vise.

CAUTION₃: Do NOT wrench or clamp on seal surfaces.

H-1.1) Assemble upper slip body assembly and install:

H-1.1.1) Install slip springs (15) onto slips (4, 5). Align holes in springs (15) with threaded holes in slips (4, 5). Screw button head screws (19) into slips (4, 5).

NOTE₃: Install two (2 ea) springs per slip.

H-1.1.2) Install slips (4, 5) into windows in upper slip body (3). Wedge slips outwards.

H-1.1.3) Install upper slip body (8) onto top sub (1).

H-1.2) Install o-ring and backup rings (23, 24) in o-ring groove in top sub (1).

H-1.3) Screw top sub (1) onto inner mandrel (2).

CAUTION₅: Do NOT rip or tear o-rings and/or back-up rings while installing.

H-1.4) Screw set screws (16) into top sub (1).

H-1.5) Ensure slips are below shoulder and upset on upper end of inner mandrel (2). Remove wedges and pull slips back over upset of inner mandrel (2).

H-1.6) Screw upper slip body (3) onto top sub (1). Align threaded holes in slip body (3) with shear groove in top sub (1).

H-1.7) Screw shear screws (20) into slip body (3). Tighten shear screws (20) to contact top sub (1) and back off 1/4 turn.

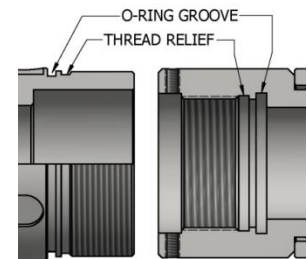


Fig. 2



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H) ASSEMBLY (cont'd)

H-2) Unclamp and remove inner mandrel (2) from vise. Clamp top sub (1) in vise.

H-2.1) Install o-ring and backup rings (27, 28) in o-ring groove in upper cone (6).

H-2.2) Install upper cone (6) onto inner mandrel (2). Align threaded holes in upper cone (6) with slots in upper slip body (3).

CAUTION: Do NOT rip or tear o-rings and/or back-up rings while installing.

H-2.3) Screw cap screws (17) into upper cone (6).

H-2.4) Align threaded holes in upper slip body (3) with counterbores in upper cone (6). Screw shear screws (21) into upper slip body (3). Tighten shear screws (21) to contact upper cone (6) and back off 1/4 turn.

H-2.5) Install piston assembly and install:

H-2.5.1) Install o-rings and backup rings (25, 26 & 27, 28) in o-ring grooves in piston (8).

H-2.5.2) Install element (7) onto piston (8).

H-2.5.3) Install piston (8) onto inner mandrel (2). Align counterbores in piston (8) with threaded holes in upper cone (6).

CAUTION: Do NOT rip or tear o-rings and/or back-up rings while installing.

H-2.5.4) Screw shear screws (21) into upper cone (6). Tighten shear screws (21) to contact piston (8) and back off 1/4 turn.

H-2.6) With snap ring spreader pliers, spread lock ring (10) to install onto piston (8).

NOTE4: Threads on lock ring (10) must be in installed in correct direction for tool to work properly (Fig. 3).

H-2.7) Install lock ring housing (9) onto piston (8) and carefully screw onto lock ring (10) to ensure lock ring (10) doesn't prematurely engage ratchet threads on piston (8).

H-2.8) Align threaded hole in middle of lock ring housing (9) with gap in lock ring (10). Screw shear screw (22) into lock ring housing (9). Tighten screw (22) to contact piston (8) and back off 1/4 turn.

H-2.9) Align thread holes in upper end of lock ring housing (9) with shear groove in piston (8). Screw shear screws (21) into lock ring housing (9). Tighten screws (21) to contact piston (8) and back off 1/4 turn.

H-2.10) Install o-ring and back-up rings (25, 26) in o-ring groove in lower body (11).

H-2.11) Install lower body (11) onto inner mandrel (2) and piston (2). Screw lower body (11) into lock ring housing (9).

CAUTION: Do NOT rip or tear o-rings and/or back-up rings while installing.

H-2.12) Screw set screws (18) into lock ring housing (9)

H-2.13) Install pick up ring (14) in pick up ring groove in lower end inner mandrel (2).

H-2.14) Assemble lower slip body assembly and install:

H-2.14.1) Install slip springs (15) in place in lower slips (12). Align holes in springs (15) with threaded holes in slips (12). Screw button head screws (19) into slips (12).

NOTE3: Install two (2 ea) springs per slip.

H-2.14.2) Install lower slips (12) into windows in lower slip body (13). Wedge slips outwards.

H-2.14.3) Install lower slip body assembly onto inner mandrel (2) and onto lower body (11).

H-2.15) Align slots in lower slip body (13) with threaded holes in lower body (11). Screw cap screws (17) into lower body (11). Remove wedges slips.

H-2.16) Align threaded holes lower slip body (13) with counterbores in lower body (11). Screw shear screws (21) into lower slip body (13). Tighten until screws (21) contact lower body (11). Back off 1/4 turn.

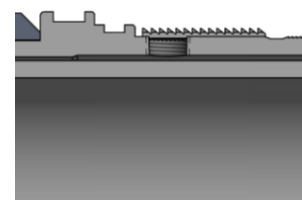


Fig. 3



**HYDRATRIEVE PACKER, HSN,
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H) ASSEMBLY (cont'd)

H-2.17) Align threaded holes in lower slip body (13) with counterbores in inner mandrel (2). Screw shear screws (20) into lower slip body (13). Tighten screws (20) to contact inner mandrel and back off 1/4 turn.

NOTE: Install a minimum of eight (8 qty) shear screws (20). Install additional shear screws (20) as needed to achieve desired shear value.

H-3) Unclamp top sub (1) from vise and remove assembled tool.



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I) PARTS LIST

ITEM	QTY	DESCRIPTION	MATERIAL	PART NUMBER
1	1	TOP SUB	DLMS41X80	91576610
2	1	INNER MANDREL	DLMS41X80	91576210
3	1	UPPER SLIP BODY	DLMS110	91578320
4	3	CARBIDE UPPER SLIP	DLMS110	91578115C
5	2	RELEASING SLIP	DLMS110	91578125
6	1	UPPER CONE	DLMS110	91578410
7	1	ECNER ELEMENT ARRAY	80 DURO HSN	OEM78BH
8	1	PISTON	DLMS110	91578620
9	1	LOCK RING HOUSING	DLMS110	91577012
10	1	LOCK RING	DLMS110	91577011
11	1	LOWER BODY	DLMS125	91577420
12	5	CARBIDE LOWER SLIP	DLMS110	91578135C
13	1	LOWER SLIP BODY	DLMS110	91578325
14	1	PICK UP RING	DLMS110	94550915
15	20	SLIP SPRING	DLMINC750	32055950
16	4	3/8-16 UNC X 3/8 SOCKET SET SCREW	STEEL	SSS037C037
17	10	5/16-18 UNC X 5/16 SOCKET CAP SCREW	STEEL	SCS031C031
18	3	#10-24 UNC X 3/16 SOCKET SET SCREW	STEEL	SSS1024C018
19	10	#10-24 UNC X 1/4 BUTTON HEAD SOCKET CAP SCREW	STEEL	BHSC1024C025
20	18	SHEAR SCREW (5000#)	DLM360BRS	32045910
21	24	SHEAR SCREW (2375#)	DLM360BRS	60100990
22	1	#10-32 UNF X 3/8 SLOTTED SHEAR SCREW (750#)	DLM360BRS	BSSSLT1032F037
23	1	249 O-RING	90 DURO HSN	90249H
24	2	249 PARBAK BACKUP RING	PEEK	06500249
25	3	250 O-RING	90 DURO HSN	90250H
26	6	250 PARBAK BACKUP RING	PEEK	06500250
27	2	357 O-RING	90 DURO HSN	90357H
28	4	357 PARBAK BACKUP RING	PEEK	06500357
		REDRESS KIT (RDK)		91575050BH
		ASSEMBLED WEIGHT		314 LBS



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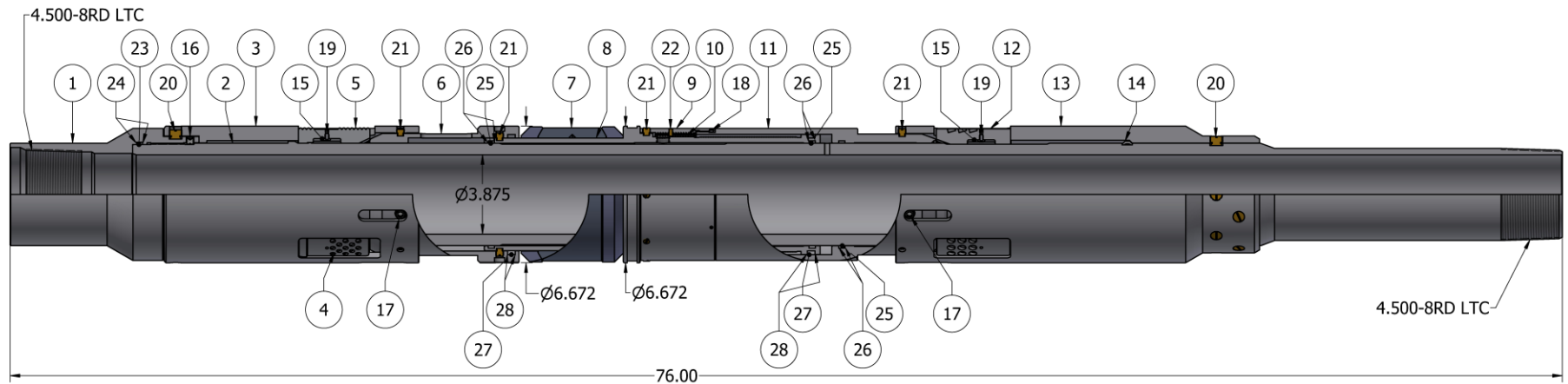
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J) TECHNICAL ILLUSTRATION



K) REVISION HISTORY

DATE	REVISION	DESCRIPTION OF CHANGES	REVISED BY	APPROVED BY
06/29/2023	A	Created new manual	-	-