



# HYDRAULIC OPEN HOLE PACKER 7" X 4-1/2"

Manual No:  
**DL-335-7000-483**

Revision: **C**

Revision Date:  
**02/10/2023**

Authored by: *B.Mathis*

Approved by: *B.Oligschlaeger*

## A) DESCRIPTION

The Hydraulic Open Hole Packer is a hydraulic set, single string packer suitable for use in open hole applications. Tubing pressure is used to set the packer and the setting force is locked into the packer by a body lock ring. This packer features a double backup element system capable of holding high pressures in open hole or large ID cased holes. A large ID is maintained through the packer for increased flow potential. It is ideal for use as a tandem isolation packer between ports in a multi-stage hydraulic fracturing completion.

**NOTE1:** The Hydraulic Open Hole Packer is not designed to be released.

## B) SPECIFICATION GUIDE

OPEN HOLE SIZE (INCHES)	RECOMMENDED SETTING RANGE (INCHES)	TOOL OD (INCHES)	TOOL ID (INCHES)	THREAD CONNECTION BOX UP / PIN DOWN	PART NUMBER
7	5.875 - 6.600	5.750	3.92	4-1/2 LTC	33570-1
	5.875 - 6.600	5.750	3.92	4-1/2 BUTTRESS	33570-1-XBLA

DIFFERENTIAL PRESSURE (MAX)	TEMPERATURE RATING (MAX)
10,000 PSI	250°F

## 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.

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.



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## D) RUNNING SEQUENCE

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

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. 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 pre-set conditions by pressure waves through the fluid. A slow steady running speed should be used. Sudden stops and starts should be avoided.

Make up the packer to the tubing string in the desired position and to the required torque.

Run the packer to the desired setting depth at the recommended speed and taking precautions listed above.

- Typically the tubing/casing will be landed prior to setting.
- Establish a plug in the tubing below the packer using a drop ball, wireline plug or other device.
- Apply pressure to the tubing/casing to the recommended pressure for the given size of packer. Hold for 20 minutes.

## E) SETTING AREA GUIDE

PACKER SIZE (INCHES)	SHEAR VALUE (PSI/SCREW)	SETTING AREA (SQ INCHES)	MINIMUM SETTING PRESSURE (PSI)	RECOMMENDED SETTING PRESSURE (PSI)
7	338	5.022	2,800	3,500

## 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
- 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) Unscrew and remove bottom sub (7) from mandrel (2).

G-1.2) Remove element backups (12) and elements (10, 11) from mandrel (2)

G-1.3) Unscrew and remove and remove set screws (9) from lock ring housing (6).

G-1.4) Unscrew and remove and remove lock ring housing (6) from lock ring (8).

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

**CAUTION:** Do NOT mar or damage seal surface.

G-2.1) Unscrew and remove top sub (1) from mandrel (2).

G-2.2) Unscrew and remove shear screws (3) from shear cap (4).

G-2.3) Remove shear cap (4) from mandrel (2).

G-2.3.1) Remove o-ring (13) from shear cap (4).

G-2.4) Remove setting piston (5) from mandrel (2).



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## G) DISASSEMBLY (cont'd)

G-2.4.1) Remove o-rings (13, 14) from setting piston (5).

G-2.5) Unscrew and remove lock ring (8) from mandrel (2) (**NOTE**<sub>3</sub>: Inner threads are left-hand threads).

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

## H) ASSEMBLY

**NOTE**<sub>2</sub>: Clean and inspect all parts. Replace all worn and damaged parts. Install parts in proper order & orientation.

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

**CAUTION**<sub>3</sub>: Do NOT mar or damage seal surface.

H-1.1) Screw setting piston (5) into lock ring housing (6).

H-1.2) Install lock ring (8) onto mandrel (2). Thread partially onto threads on mandrel (2) (**NOTE**<sub>3</sub>: Inner threads are left-hand threads).

**NOTE**<sub>4</sub>: Lock ring (8) MUST be installed in proper direction (Fig. 1).

H-1.2.1) Install o-rings (13, 14) in setting piston (5).

H-1.3) Install settings piston (5) onto mandrel (2).

H-1.4) Install o-ring (13) in groove in shear cap (4).

H-1.5) Screw shear cap (4) onto inner mandrel (2).

H-1.6) Screw shear screws (3) into shear cap (4). Make contact and back out 1/4 turn.

H-1.7) Screw top sub (1) onto mandrel (2).

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

H-2.1) Screw lock ring housing onto lock ring (8).

H-2.2) Align gap in lock ring (8) with threaded holes in lock ring housing (6). Screw set screws (9) into lock ring housing (6).

**CAUTION**<sub>4</sub>: DO NOT tighten socket set screws (9) down onto threads on mandrel (2).

H-2.3) Install elements (10, 11) and element backups (12) onto mandrel (2).

H-2.4) Screw bottom sub (7) onto mandrel (2).

H-3) Unclamp and remove assembly from vise.

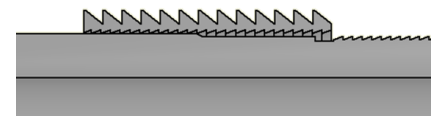


Fig. 1



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## I) PARTS LIST

ITEM	QTY	DESCRIPTION	MATERIAL	P/N 33570-1	P/N 33570-1-XBLA
1	1	TOP SUB	DLMS110 / DLMS60	33570610-CBCA	33570610
2	1	MANDREL	DLMS110	33570211	
3	8	SHEAR SCREW 1/4-20 UNC X 5/16 (1700#)	DLMSLS	SSSSLT025C031	
4	1	SHEAR CAP	DLMS110	33570741	
5	1	SETTING PISTON	DLMS110	33570750	
6	1	LOCK RING HOUSING	DLMS110	33570012	
7	1	BOTTOM SUB	DLMS110	33570630-CBCA	33570630
8	1	LOCK RING	DLMS80	67070011	
9	2	SET SCREW #10-32 UNF X 1/2	STEEL	SSS1032F050	
10	1	ELEMENT	80 DURO NITRILE	33070512	
11	2	ELEMENT	90 DURO NITRILE	33070515	
12	2	ELEMENT BACK UP	90 DURO NITRILE/MESH	33070850	
13	2	350 O-RING	90 DURO NITRILE	90350	
14	1	351 O-RING	90 DURO NITRILE	90351	
		REDRESS KIT (RDK)		33570050	
		ASSEMBLED WEIGHT		136 LBS	132 LBS



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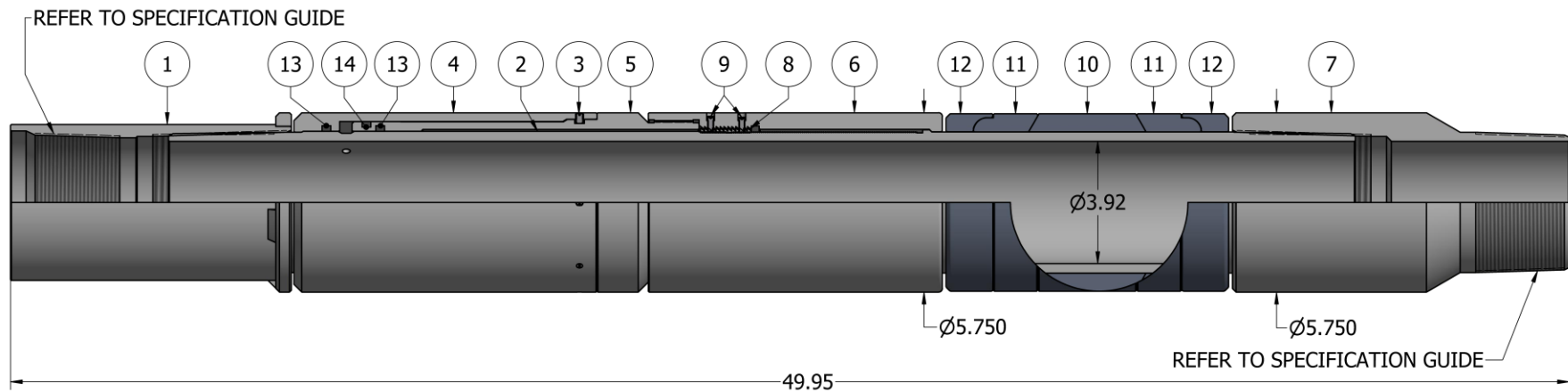
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### J) TECHNICAL ILLUSTRATION



### K) REVISION HISTORY

DATE	REVISION	DESCRIPTION OF CHANGES	REVISED BY	APPROVED BY
02/10/2023	C	Revised differential pressure, hold time during setting; added setting area guide	J.Anderson	K.Plunkett