	PERMAPAK SEAL BORE PACKER 5" X 2.688"	Manual No: DL-672-5000-516
		Revision: C
		Revision Date: 02/13/2024
<i>Authored by: B.Mathis</i>		<i>Approved by: D.Hushbeck</i>

A) DESCRIPTION

The Permapak Seal Bore Packer can be used for single or multiple zone completions. It is designed for wells where high pressure/temperatures and corrosive fluids are present and it is available in a variety of elastomers and seal bore materials to meet a wide range of hostile downhole environments. This packer is recommended for injection stimulation and testing or can become a temporary bridge plug when used with our knock-out or pump-out bottom assembly (refer to Permapak Packer Tubing and Accessories product sheet). The Permapak Seal Bore Packer comes with a complete line of tubing seal accessories and elastomers.

NOTE₁: Permapak setting equipment, bottoms, and accessories are sold separately.

NOTE₂: This packer requires at least a 30 second burn on the wireline setting tool to ensure a proper set. A burn time less than 30 seconds may shear the setting tool from the packer before fully setting the packer.

B) RELATED TOOLS (sold separately)

B-1) 4-1/2" Wireline Adapter Kit (WLAK) (PN 97245)—refer to technical manual *DL-972-4500-571*.

B-2) Model "H" #20 Hydraulic Setting Tool (PN 39120-3)—refer to technical manual *DL-391-20-377*.

B-3) 2.688" Seal bore accessories—refer to technical manual *DL-581-2688-780*.

C) SPECIFICATION GUIDE

CASING			TOOL OD (INCHES)	THROUGH SEALS (INCHES)	SEAL BORE (INCHES)	PART NUMBER
SIZE (INCHES)	WEIGHT (LBS/FT)	RECOMMENDED HOLE SIZE (INCHES)				
5	15.0 – 21.4	4.126 – 4.408	3.968	2.688	1.938	67250 67250H ¹ 67250V ² 67250C ³ 67250HC ⁴ 67250VC ⁵

Tool Options: ¹HSN, ²Viton, ³Nitrile, Carbide, ⁴HSN, Carbide, ⁵Viton, Carbide

DIFFERENTIAL PRESSURE (MAX)	TENSILE RATING (MAX)
10,000 PSI	69,500 LBS

D) PRE-INSTALLATION INSPECTION PROCEDURES

CAUTION₁: 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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D) 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.

E) OPERATION PROCEDURES

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

E-1) ON A WIRELINE

In setting the Permapak, the setting forces are transferred from the gun to the packer through the setting adapter kit. The lock ring housing is backed up while the top connection (and thus the inner mandrel) is pulled up. This movement causes the shear pins in the lock ring housing and the cones to shear and the slips to separate and set. Further stroke expands the back-up rings against the casing, packs off the element, and shears the adapter kit free of the packer.

The rubber pack-off is maintained by the slips and the inner mandrel movement is checked by the lock ring. When the packer is milled, there are two rotational locks; the lock ring and the key in the lower cone.

F) 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. Elastomers should be in a relaxed state—free from tension, compression or other 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.

G) ELASTOMER TRIM TEMPERATURE GUIDE

RUBBER TYPE	TEMPERATURE RANGE
NITRILE	40° - 250°F
HSN (HNBR)	70° - 300°F
VITON	100° - 350°F



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H) 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

I) DISASSEMBLY

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

I-1.1) Remove slip (5) from inner mandrel (2).

I-1.2) Unscrew and remove shear screws (15) from lower cone (7).

I-1.3) Remove lower cone (7) from inner mandrel (2).

I-1.4) Remove key (14) from inner mandrel (2).

I-1.5) Remove female expansion rings (9), male expansion rings (9), rubber retainers (10), and element (11) from inner mandrel (2).

I-1.6) Unscrew and remove shear screws (15) from upper cone (6).

I-1.7) Remove upper cone (6) from inner mandrel (2).

I-1.8) Remove slip (5) from inner mandrel (2).

I-1.9) Unscrew and remove shear screws (13) from lock ring housing (3).

I-1.10) Unscrew and remove set screws (12) from top sub (1).

I-1.11) Unscrew and remove inner mandrel (2) from top sub (1).

CAUTION₃: Do NOT wrench or clamp on seal surface.

I-1.11.1) Unscrew lock ring housing (3) from lock ring (4) and remove from inner mandrel (2).

I-1.11.2) Unscrew and/or slide lock ring (4) and remove from inner mandrel (2) (**NOTE₃:** Left-hand threads).

NOTE₄: Using snap ring spreader pliers, lock ring may be spread slightly to be removed from mandrel.

I-2) Unclamp top sub (1) and remove from vise.

J) ASSEMBLY

NOTE₅: Clean and inspect all parts. Replace all worn and damaged parts. Install parts in proper order, and orientation and tighten/torque all connections properly.

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

J-1.1) Screw and/or slide lock ring (4) onto the upper end of OD threads on inner mandrel (2) (**NOTE₃:** Left-hand threads).

NOTE₆: Threads on lock ring (4) are directional and must be installed in correct direction for tool to work properly (Fig. 2).

J-1.2) Screw lock ring housing (3) onto lock ring (4). Align gap in lock ring (4) with threaded hole in lock ring housing (3).

J-1.3) Screw shear screw (13) into lock ring housing (3). Tighten until shear screw contacts inner mandrel (2). Back out 1/4 turn.

J-1.4) Align thread holes in upper end of lock ring housing (3) with counterbores in inner mandrel (2).

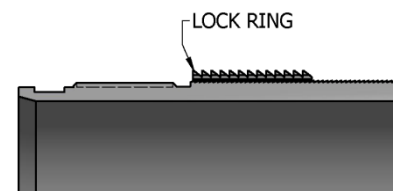


Fig. 2



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J) ASSEMBLY (cont'd)

- J-1.5) Screw shear screws (13) into lock ring housing (3). Tighten until shear screws contact inner mandrel (2). Back out 1/4 turn.
- J-1.6) Screw inner mandrel (2) into top sub (1).
CAUTION₃: Do NOT wrench or clamp on seal surface.
- J-1.7) Screw set screws (12) into top sub (1).
- J-1.8) Install slip (5) onto inner mandrel (2).
- J-1.9) Install upper cone (6) onto inner mandrel (2). Align threaded holes in upper cone (6) with counterbores in inner mandrel (2).
- J-1.10) Screw shear screws (13) into upper cone (6). Tighten until shear screws contact inner mandrel (2). Back out 1/4 turn.
- J-1.11) Install female expansion rings (9), male expansion rings (9), rubber retainers (10), and element (11) onto inner mandrel (2).
- J-1.12) Set key (14) in place on flat on inner mandrel (2).
- J-1.13) Align slot in ID of lower cone (7) with key (14). Install lower cone (7) onto inner mandrel (2) and key (14). Align threaded holes in lower cone (7) with counterbores in inner mandrel (2).
- J-1.14) Screw shear screws (13) into upper cone (6). Tighten until shear screws contact inner mandrel (2). Back out 1/4 turn.
- J-1.15) Install slip (5) onto inner mandrel (2).
- J-2) Unclamp top sub (1) from vise and remove tool assembly.



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K) PARTS LIST

ITEM	QTY	DESCRIPTION	MATERIAL	P/N 67250
1	1	TOP SUB	DLMS110	67245001
2	1	INNER MANDREL	DLMS125	67245210
3	1	LOCK RING HOUSING	DLMS80	67250012-L-80
4	1	LOCK RING	DLMS41X80	67245011
5	2	SLIP	DLMCIG2	67250110
6	1	UPPER CONE	DLMCIG2	67250014
7	1	LOWER CONE	DLMCIG2	67250023
8	2	FEMALE EXPANSION RING	DLM660BRZ	67250013
9	2	MALE EXPANSION RING	DLM660BRZ	67250020
10	2	RUBBER RETAINER	DLMCIG2	67250015
11	1	ELEMENT	80 DURO NITRILE	67250512
12	3	3/8-16 UNC X 5/16 SOCKET SET SCREW	STEEL	SSS037C031
13	7	SHEAR SCREW (750#) #10-32 UNF X 3/8	DLM360BRS	BSSSLT1032F037
14	1	KEY	DLMSKS	KS012X012X062
15	4	SHEAR SCREW (1200#) 1/4-20 UNC X 3/8	DLM360BRS	BSSSLT025C037
16	6	5/16 X 5/8 DRIV-LOK PIN (4800#)	4140	DLP031062*

		ASSEMBLED WEIGHT		27 LBS
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* Refer to WLAK manual for placement.

K-1) ELASTOMER TRIM OPTIONS

NOTE: For temperature range, refer to Elastomer Trim Temperature Guide.

K-1.1) HSN

ITEM	QTY	DESCRIPTION	MATERIAL	P/N 67250H
11	1	ELEMENT	80 DURO HSN	67250512H

K-1.2) VITON

ITEM	QTY	DESCRIPTION	MATERIAL	P/N 67250V
11	1	ELEMENT	80 DURO VITON	67250512V

K-2) CARBIDE OPTIONS

ITEM	QTY	DESCRIPTION	MATERIAL	P/N 67250C
5	2	CARBIDE SLIP	DLMCIG2	67250110C



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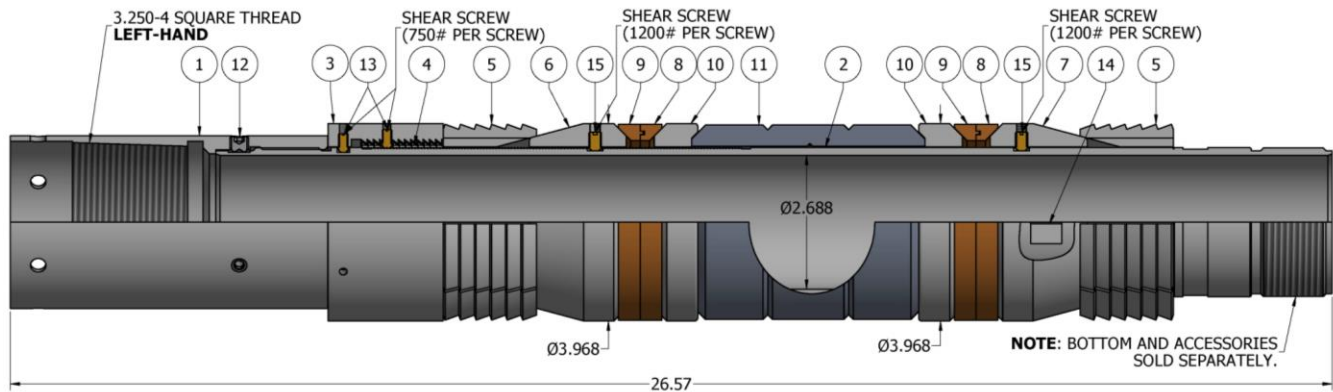
L) ACCESSORIES - BOTTOM SUBS

NOTE7: Standard bottom subs are listed. Other tubing sizes/configurations and threads are available. Sold separately.

NOTE8: O-rings and set screws required for installation of bottom subs. Sold separately.

DESCRIPTION	MATERIAL	THREAD CONNECTION	PART NUMBER
PLAIN BOTTOM	DLMS60	-	67245018
CONCENTRIC BOTTOM	L-80	3.1250-8 STUB ACME	67245610
BOX TUBING BOTTOM	DLMS80	2.375-8RD EUE BOX	67245620
PIN TUBING BOTTOM	L-80	2.375-8RD EUE PIN	67245630

M) TECHNICAL ILLUSTRATION



N) REVISION HISTORY

DATE	REVISION	DESCRIPTION OF CHANGES	REVISED BY	APPROVED BY
02/13/2024	C	Revised entire manual	J.Anderson	J.Johnson