	PERMAPAK PACKER **DUAL BORE without UPPER BORE** 10-3/4" X 8.000" X 7.000"	Manual No: **DL-673-10750-1592** Revision: **A** Revision Date: **06/24/2022**
Authored by: J.Anderson		*Approved by: J.Johnson*

A) DESCRIPTION

The Dual Bore Permapak Packer is a highly versatile packer which has a large upper sealbore to allow for a large bore through the packer. This packer may be set on wireline or hydraulically and can be used for single or multiple zone completions. This packer is designed for wells where high flow rates, high pressure, high temperatures and corrosive fluids are present. This packer 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 production, injection, stimulation and testing or can become a temporary plug when used with the Knock-Out or Pump-Out Bottom Assembly.

The Dual Bore Permapak Packer comes with a complete line of accessories and elastomers. Contact D&L sales for more information.

B) RELATED TOOLS (sold separately)

B-1) Wireline Adapter Kit (WLAK) for 10-3/4" X 8.000" X 7.000" Dual Bore Permapak (P/N varies)—refer to applicable technical manual.

B-2) 8.000" Seal bore accessories—contact D&L Sales for more information.

B-3) 7.000" Seal bore accessories—contact D&L Sales for more information.

B-4) Upper bore for 10-3/4" X 8.000" X 7.000" Dual Bore Permapak (P/N 67310X610).

C) SPECIFICATION GUIDE

CASING			TOOL MAX OD (INCHES)	THROUGH SEALS (INCHES)	SEAL BORE (INCHES)	PART NUMBER
SIZE (INCHES)	WEIGHT (LBS/FT)	RECOMMENDED HOLE SIZE (INCHES)				
10-3/4	40.5 – 55.5	9.670 – 10.050	9.469	6.84	8.000 / 7.000	67310X-1 67310XH-1[1] 67310XV-1[2]

Elastomer Trim Options: [1]HSN, [2]Viton

DIFFERENTIAL PRESSURE (MAX)	TENSILE LOAD THRU TOOL (MAX)
5,000 PSI	350,000 LBS

D) PRE-INSTALLATION INSPECTION PROCEDURES

CAUTION$_1$: 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

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 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.

E) OPERATION PROCEDURES

CAUTION$_2$: 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 WIRELINE

In setting the Permapak, the setting forces are transferred from the gun to the packer through the wireline adapter kit (WLAK). 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 WLAK 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. 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.

G) ELASTOMER TRIM TEMPERATURE GUIDE

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

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

NOTE$_1$: Ensure vise is capable of handling weight of tool.

NOTE$_2$: Support tool during disassembly and assembly with jack stands as necessary.

I-1) Clamp inner mandrel (2) in vise.

I-1.1) From lower end of tool, remove lower slip ring (5) from inner mandrel (2).

I-1.2) Unscrew and remove shear screws (1) from lower cone (11).

I-1.3) Remove lower cone (11) from inner mandrel (2).

I-1.4) Remove keys (12) from inner mandrel (2)

I-1.5) Remove female and male expansion rings (7, 8), rubber retainers (9), and element (10) from inner mandrel (2).

I-1.6) Unscrew and remove shear screws (1) from upper cone (6).

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

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

I-1.9) Unscrew and remove shear screw (13) from lock ring housing (4).

I-1.10) Remove lock ring housing (4) from lower end of inner mandrel (2).

I-1.10.1) Unscrew and remove lock ring (3) from lock ring housing (4).

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

J) ASSEMBLY

NOTE$_1$: Ensure vise is capable of handling weight of tool.

NOTE$_2$: Support tool during disassembly and assembly with jack stands as necessary.

NOTE$_3$: 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 inner mandrel (2) in vise.

J-1.1) Install lock ring housing (4) onto inner mandrel (2).

J-1.2) Install lock ring (3) onto inner mandrel (2) and screw lock ring (3) into lock ring housing (4). Align gap in lock ring (3) with threaded hole in lock ring housing (4).

NOTE$_4$: Inner and outer threads on lock ring (3) are directional – lock ring (3) MUST be in installed in correct direction for tool to work properly.

NOTE$_5$: Using snap ring spreader pliers, lock ring (3) may be spread slightly to be installed onto inner mandrel (2).

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

J-1.4) Install upper slip ring (5) onto inner mandrel (2).

J) ASSEMBLY (cont'd)

J-1.5) Install upper cone (6) onto inner mandrel (2). Align threaded holes in upper cone (6) with counterbores in inner mandrel (2).

J-1.6) Screw shear screws (1) into upper cone (6). Tighten until shear screws (1) contacts inner mandrel (2). Back shear screws (1) out a 1/4 turn.

J-1.7) Install male and female expansion rings (7, 8), rubber retainers (9) and element (10) onto inner mandrel (2).

J-1.8) Set keys (12) in place on flat key surface of inner mandrel (2). Hold keys in place as necessary while installing lower cone (11).

J-1.9) Install lower cone (11) onto inner mandrel (2). Align key slots in lower cone (11) with keys (12) and slide over keys (12). Align threaded holes in lower cone (11) with counterbores in inner mandrel (2).

J-1.10) Screw shear screws (1) into lower cone (11). Tighten until shear screws (1) contacts inner mandrel (2). Back shear screws (1) out a 1/4 turn.

J-1.11) Install lower slip ring (5) onto inner mandrel (2).

J-2) Unclamp inner mandrel (2) from vise and remove assembled tool.

K) PARTS LIST

ITEM	QTY	DESCRIPTION	MATERIAL	P/N 67310X-1
1	8	1/4-20 UNC X 7/16 SLOTTED SHEAR SCREW (1200#)	DLM360BRS	BSSSLT025C043
2	1	INNER MANDREL	DLMS110	67310X210
3	1	LOCK RING	DLMS80	67210X005
4	1	LOCK RING HOUSING	DLMS80	67310X012
5	2	SLIP	DLMCIG2	67210X110
6	1	UPPER CONE	DLMCIG2	67210X014
7	2	MALE EXPANSION RING	DLM660BRZ	67210X020
8	2	FEMALE EXPANSION RING	DLM660BRZ	67210X013
9	2	RUBBER RETAINER	DLMCIG2	67210X015
10	1	ELEMENT	80 DURO NITRILE	67210X512
11	1	LOWER CONE	DLMCIG2	67210X024
12	2	KEY	DLMSKS	KS018X018X100
13	7	#10-32 UNF X 3/8 SLOTTED SHEAR SCREW (750#)	DLM360BRS	BSSSLT1032F037†
14	3	1/4-20 UNC X 1/4 SOCKET SET SCREW	STEEL	SSS025C025†
15	3	261 O-RING	90 DURO NITRILE	90261†
16	8	5/16 X 1 DRIV-LOK PIN (4800#)	4140	DLP031100*

ASSEMBLED WEIGHT		161 LBS

†Screws and o-rings not shown.
*Refer to WLAK tech manual for placement.

K) PARTS LIST (cont'd)

K-1) ELASTOMER TRIM OPTIONS

NOTE$_2$: For temperature range, refer to Elastomer Trim Temperature Guide.

K-1.1) HSN

ITEM	QTY	DESCRIPTION	MATERIAL	P/N 67310XH-1
10	1	ELEMENT	80 DURO HSN	67210X512H
15	3	261 O-RING	90 DURO HSN	90261H†

K-1.2) VITON

ITEM	QTY	DESCRIPTION	MATERIAL	P/N 67310XV-1
10	1	ELEMENT	80 DURO VITON	67210X512V
15	3	261 O-RING	90 DURO VITON	90261V†

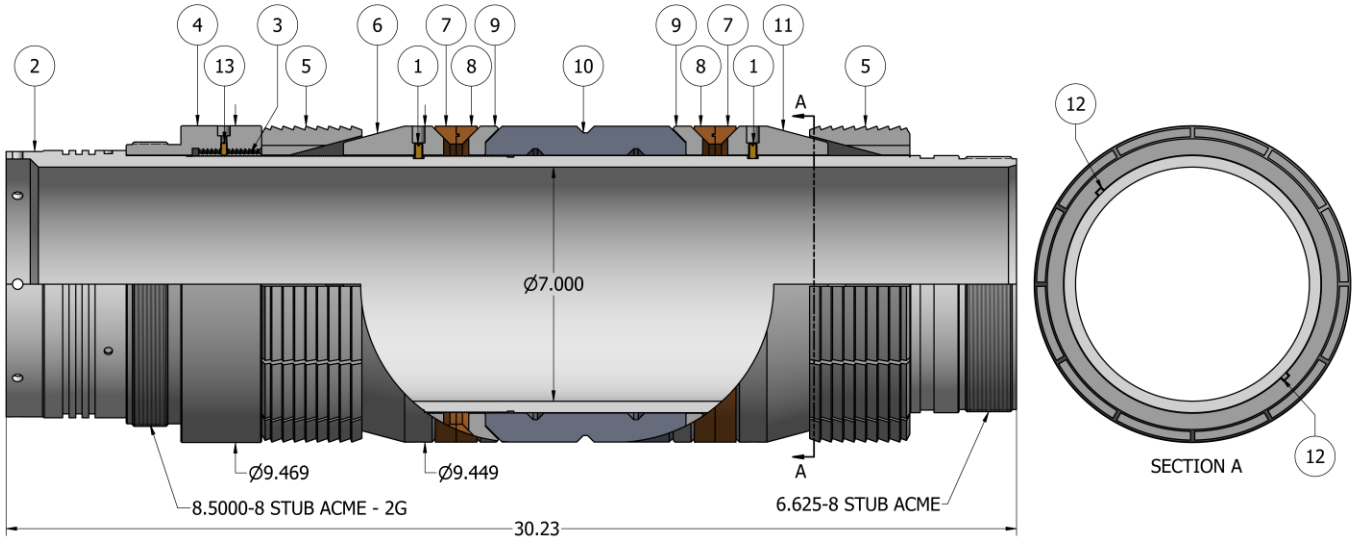
L) ACCESSORIES - BOTTOM SUBS

NOTE$_6$: Standard bottom subs are listed. Other tubing sizes/configurations and threads are available. All sold separately.

DESCRIPTION	MATERIAL	THREAD CONNECTION	PART NUMBER
PLAIN BOTTOM	DLMS35	-	67210X018
CONCENTRIC BOTTOM	DLMS35	6.6250-8 STUB ACME	67210X610
BOX TUBING BOTTOM	DLMS80	-	67210X620‡
PIN TUBING BOTTOM	DLMS80	-	67210X630‡

‡Part number varies depending on thread specification.

M) TECHNICAL ILLUSTRATION



N) REVISION HISTORY

DATE	REVISION	DESCRIPTION OF CHANGES	REVISED BY	APPROVED BY
06/24/2022	A	Created manual	-	-