



DLESP PACKER

5-1/2" X 2-3/8" X (4) 1/4"

Manual No:
DL-908-5500-568

Revision: **A**

Revision Date:
11/06/2023

Authored by: *J.Anderson*

Approved by: *E.Visaez*

A) DESCRIPTION

The DLESP Packer is a hydraulic set, mechanically held dual string production packer normally run above a single string hydraulic set or wireline set seal bore packer. Because no tubing manipulation is required to set this packer, the well head can be installed and flanged up before setting.

This packer is available with short string or long string setting capabilities and a variety of tubing connections. This packer is also adaptable for electrical submersible pump applications. This packer features a sequential upper slip release system designed to release each slip 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.

B) SPECIFICATION GUIDE

CASING		
SIZE (INCHES)	WEIGHT (LBS/FT)	RECOMMENDED HOLE SIZE (INCHES)
5-1/2	14.0 – 20.0	4.778 – 5.012

TOOL			PART NUMBER
OD (INCHES)	LONG STRING ID (INCHES)	FEED THRU HOLE ID (INCHES)	
4.625	1.94	0.37	94855-BAB-4 94855H-BAB-4 ¹ 94855V-BAB-4 ² 94855C-BAB-4 ³ 94855HC-BAB-4 ⁴ 94855VC-BAB-4 ⁵

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

THREAD CONNECTION BOX UP / PIN DOWN		DIFFERENTIAL PRESSURE (MAX)	TENSILE LOAD THRU TOOL (MAX)
LONG STRING	FEED THRU HOLES		
2-3/8 EUE	1/4 NPT	5,000 PSI	28,500 LBS*

*Using all six (6 qty) releasing shear screws

SETTING				
SETTING AREA (SQ INCHES)	SHEAR VALUE (PSI/SCREW)	INITIATION PRESSURE (PSI)	MINIMUM SETTING PRESSURE (PSI)	RECOMMENDED SETTING PRESSURE (PSI)
8.63	139	1,113	2,550	3,825

RELEASING
Shear release is adjustable from 15,000 to 30,000 lbs (5,000 lbs increments). Minimum of 3 shear screws required.

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

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.

NOTE₁: Do not tighten the long string mandrel (2) into the flat top (1) with more than 400 ft-lbs torque.

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

CAUTION₂: Do not run the tool without properly tightening connections. Running the tool with loose connections may damage the tool and cause malfunction.

CAUTION₆: The DLESP Packer is not intended for use in tandem with other DLESP packers.

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 cylinder, 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.



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D) OPERATION (cont'd)

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 long string below the packer and apply a minimum of 2,550 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.

D-2) RELEASING PROCEDURES

The packer is released by a straight pick up on the long string.

The standard mandrel can carry a maximum of 58,500 lbs below the packer. If the force required to shear the releasing shear screws plus the weight hung below the tool exceeds 58,500 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) ELASTOMER TRIM TEMPERATURE GUIDE

TEMPERATURE RANGE (F°)			
TEMPERATURE RANGE (F°)	DUROMETER		
	END	MIDDLE	END
40° - 125°	60	60	60
125° - 300°	80	70	80
300° +	Contact D&L Sales		

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



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G) 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

H) DISASSEMBLY

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

H-1.1) From upper end of tool, unscrew and remove top sub (10) from handling pup (20).

H-1.1.1) Remove o-rings (31) from top sub (10).

H-1.2) Unscrew and remove handling pup (20) from flat top (1).

H-1.3) Moving to lower end of tool, unscrew and remove bottom sub (23) from long string mandrel (2).

H-1.3.1) Remove o-rings (30) from bottom sub (23).

H-1.4) Unscrew and remove changeovers (4) from lower slip body cap (19).

H-1.5) Unscrew and remove shear screws (5) from shear sleeve (21).

H-1.6) Unscrew and remove shear sleeve (21) from lower slip body cap (19).

H-1.7) Unscrew and remove cap screws (24) from lower cone (16).

H-1.8) Unscrew and remove shear screws (4) from lower slip body (18).

H-1.9) Wedge lower slips (17) outwards. Remove lower slip body assembly and disassemble:

H-1.9.1) Remove wedges (if needed). Remove lower slips (17) from lower slip body (18).

H-1.9.1.1) Unscrew and remove button head cap screws (22) from lower slips (17) and remove slip springs (15).

H-1.9.2) Unscrew and remove lower slip body (18) from lower slip body cap (19).

H-1.9.3) Remove o-rings (28) from lower slip body cap (19).

H-1.10) Remove pick-up ring (26) from long string mandrel (2).

H-1.11) Remove setting mandrel assembly and disassemble:

H-1.11.1) Unscrew and remove lower cone (16) from setting chamber (25).

H-1.11.1.1) Remove o-rings (28, 31, 32) from lower cone (16).

H-1.11.2) Unscrew and remove lock ring (7) from lower end of setting mandrel (11).

H-1.11.3) Unscrew and remove shear screws (4) from setting chamber (25).

H-1.11.4) Remove setting mandrel (11) from setting chamber (25).

H-1.11.4.1) Remove o-rings (28, 31) from setting mandrel (11).

H-1.11.4.2) Remove o-rings (33) from setting chamber (25).

H-1.12) Remove elements (13, 14) and rubber spacers (12) from long string mandrel (2) and feed through mandrels (3).

H-1.13) Unscrew and remove cap screws (24) from upper cone (9).

H-1.14) Unscrew and remove shear screws (4) from upper slip body (6).

H-1.15) Wedge upper slips (8) outwards (if needed). Remove upper cone (9) from upper slip body (6).

H-1.15.1) Remove o-rings (28, 31) from upper cone (9).



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H) DISASSEMBLY (cont'd)

H-1.16) Unscrew upper slip body (6) from flat top (1). Remove upper slip body assembly from mandrel and feed-through and disassemble:

H-1.16.1) Remove wedges (if needed). Remove upper slips (8) from upper slip body (6).

H-1.16.1.1) Unscrew and remove button head cap screws (22) from upper slips (8) and remove slip springs (15).

H-1.17) Unscrew and remove long string mandrel (2) and feed through mandrels (3) from flat top (1).

CAUTION₃: Do NOT wrench or clamp on seal surfaces.

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

H-2.1) Remove o-rings (29, 31) from flat top (1).

I) 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).

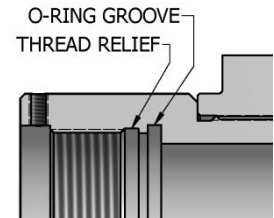


Fig. 2

I-1) Install o-rings (29, 31) in o-ring grooves in flat top (1).

I-2) Clamp flat top (1) in vise

I-2.1) Screw handling pup (20) into flat top (1).

CAUTION₅: Do NOT rip or tear o-rings while installing.

I-2.2) Install o-rings (31) in o-ring grooves in top sub (10).

I-2.3) Screw top sub (10) onto handling pup (20).

CAUTION₅: Do NOT rip or tear o-rings while installing.

I-2.4) Screw feed through mandrels (3) and long string mandrel (2) into flat top (1).

CAUTION₃: Do NOT wrench or clamp on seal surfaces.

CAUTION₅: Do NOT rip or tear o-rings while installing.

I-2.5) Assemble upper slip body assembly and install:

I-2.5.1) Place slip springs (15) onto upper slips (8) and screw button head cap screws (22) into upper slips (8) to secure slip springs (15).

NOTE₃: Install two (2ea) springs per slip (Fig. 3).

I-2.5.2) Install upper slip assemblies into upper slip body (6). Wedge slips outwards.

I-2.5.3) Install upper slip body assembly onto long string mandrel (2) and feed through mandrels (3). Screw upper slip body (6) onto flat top (1). Remove wedges from slips.

CAUTION₅: Do NOT rip or tear o-rings while installing.

I-2.6) Install o-rings (28, 31) in o-ring grooves in upper cone (9).

I-2.7) Install upper cone (9) onto inner mandrel (2) and feed through mandrels (3) and into upper slip body (6). Align threaded holes in upper cone (9) with slots in upper slip body (6).

I-2.8) Screw cap screws (24) into upper cone (9).

I-2.9) Screw shear screws (4) into upper slip body (6). Tighten until shear screws (4) contact upper cone (9). Back shear screws (4) out 1/4 turn.

I-2.10) Install elements (13, 14) and rubber spacers (12) onto feed through mandrels (3) and long string mandrel (2).

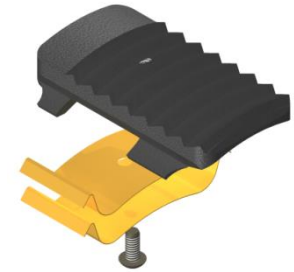


Fig. 3



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I) ASSEMBLY (cont'd)

I-2.11) Assemble setting mandrel assembly and install:

I-2.11.1) Install o-rings (28, 31) in o-ring grooves in setting mandrel (11).

I-2.11.2) Install o-rings (33) in o-ring grooves in setting chamber (25).

I-2.11.3) Gently tap setting mandrel (11) into setting chamber (25). Align threaded holes in setting chamber (25) with groove in setting mandrel (11).

CAUTIONs: Do NOT rip or tear o-rings while installing.

I-2.11.4) Screw shear screws (4) into setting chamber (25). Tighten until shear screws (4) contact setting mandrel (11). Back shear screws (4) out 1/4 turn.

I-2.11.5) Install lock ring (7) into bottom end of setting chamber (25) and screw onto setting mandrel (11). Keep lock ring (7) in smooth part of setting chamber (25) to avoid premature setting.

NOTE4: Spread lock ring (7) to hold a gap of 3/4" to 1" before installing.

I-2.11.6) Install o-rings (28, 31, 32) in o-ring grooves in lower cone (16).

I-2.11.7) CAREFULLY screw lower cone (16) into setting chamber (25) until they shoulder.

CAUTIONs: Do NOT rip or tear o-rings while installing.

I-2.11.8) Back up on setting chamber (25) with a wrench while backing off lower cone (16) to align holes for long string mandrel (2) and feed through mandrels (3).

I-2.11.9) Install setting mandrel assembly onto long string mandrel (2) and feed through mandrels (3).

CAUTIONs: Do NOT rip or tear o-rings while installing.

I-2.12) Install pick-up ring (26) in groove in long string mandrel (2).

I-2.13) Assemble lower slip body assembly and install:

I-2.13.1) Install o-rings (28) in o-ring grooves in lower slip body cap (19).

I-2.13.2) Screw lower slip body (18) onto lower slip body cap (19).

I-2.13.3) Place slip springs (15) onto lower slips (17) and screw button head cap screws (22) into lower slips (17) to secure slip springs (15).

NOTE3: Install two (2ea) springs per slip (Fig. 4).

I-2.13.4) Install lower slip assemblies onto lower slip body (18). Wedge slips outwards.

I-2.13.5) Install lower slip body assembly onto long string mandrel (2) and feed through mandrels (3) and onto lower cone (16).

NOTEs: Back off lower slip body cap (19) as needed to align long string mandrel (2) and feed through mandrels (3).

CAUTIONs: Do NOT rip or tear o-rings while installing.

I-2.14) Align threaded holes in lower cone (16) with slots in lower slip body (18). Screw cap screws (24) into lower cone (16).

I-2.15) Screw shear screws (4) into lower slip body (18). Tighten until shear screws (4) contact lower cone (16). Back shear screws (4) out 1/4 turn. Remove wedges.

I-2.16) Screw shear sleeve (21) into lower slip body cap (19). Align threaded holes in shear sleeve (21) with shear screw groove in mandrel (2).

I-2.17) Screw shear screws (5) into shear sleeve (21). Tighten until shear screws (5) contact long string mandrel (2). Back shear screws (5) out 1/4 turn.

NOTE6: Install a minimum of three (3 qty) shear screws (5). Install additional shear screws (5) as needed to achieve desired shear value.



Fig. 4



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I) ASSEMBLY (cont'd)

I-2.18) Screw changeovers (27) into lower slip body cap (19).

I-2.19) Install o-rings (30) in bottom sub o-ring grooves.

I-2.20) Screw bottom sub (23) onto long string mandrel (2).

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

I-3) Unclamp flat top (1) from vise and remove assembled tool.

NOTE: If pressure testing of the packer is desired, refer to technical manual *DL-945-5500-1192*. Pressure testing of the packer is not mandatory.

J) PARTS LIST

ITEM	QTY	DESCRIPTION	MATERIAL	P/N 94855-BAB-4
1	1	FLAT TOP	DLMS80	94855618B4
2	1	LONG STRING MANDREL	DLMS110	94520200-SA55
3	4	FEED THROUGH MANDREL	DLMS60	90425210-55
4	16	1/4-20 UNC X 1/4 SLOTTED SHEAR SCREW (1200#)	DLM360BRS	BSSSLT025C025
5	6	SHEAR SCREW (5000#)	DLM464BRS	65050902
6	1	UPPER SLIP BODY	DLMS80	90455320
7	1	LOCK RING	DLMS41X80	90555720
8	4	UPPER SLIP	DLMS35	90855115-4
9	1	UPPER CONE	DLMS80	94855410B4
10	1	TOP SUB	DLMS80	90420610
11	1	SETTING MANDREL	DLMS80	94855751B4
12	2	RUBBER SPACER	DLMS80	90855840-4
13	1	ELEMENT	70 DURO NITRILE	90855511-4
14	2	ELEMENT	80 DURO NITRILE	90855512-4
15	16	SLIP SPRING	-	32045950
16	1	LOWER CONE	DLMS80	94855420B4
17	4	LOWER SLIP	DLMS35	90855135-4
18	1	LOWER SLIP BODY	DLMS80	90455315
19	1	LOWER SLIP BODY CAP	DLMS80	94855335B4
20	1	HANDLING PUP	DLMS110	90420223-C
21	1	SHEAR SLEEVE	DLMS60	94555741
22	8	BUTTON HEAD CAP SCREW	-	BHSC832C025
23	1	LONG STRING BOTTOM SUB	DLMS80	90420631
24	4	5/16-18 UNC X 3/8 SOCKET CAP SCREW	STEEL	SCS031C037
25	1	SETTING CHAMBER	DLMS110	90455755
26	1	PICK UP RING	DLMS80	94520915
27	4	CHANGEOVER	DLMS60	CH-50NPT-25NPT
28	24	113 O-RING	90 DURO NITRILE	90113
29	4	115 O-RING	90 DURO NITRILE	90115



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J) PARTS LIST (cont'd)

ITEM	QTY	DESCRIPTION	MATERIAL	P/N 94855-BAB-4
30	2	141 O-RING	90 DURO NITRILE	90141
31	11	142 O-RING	90 DURO NITRILE	90142
32	2	155 O-RING	90 DURO NITRILE	90155
33	2	156 O-RING	90 DURO NITRILE	90156

REDRESS KIT (RDK)	94855-B4-050
ASSEMBLED WEIGHT	161 LBS

J-1) ELASTOMER TRIM OPTIONS

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

J-1.1) HSN

ITEM	QTY	DESCRIPTION	MATERIAL	P/N 94855H-BAB-4
13	1	ELEMENT	70 DURO HSN	90855511H-4
14	2	ELEMENT	80 DURO HSN	90855512H-4
28	24	113 O-RING	90 DURO HSN	90113H
29	4	115 O-RING	90 DURO HSN	90115H
30	2	141 O-RING	90 DURO HSN	90141H
31	11	142 O-RING	90 DURO HSN	90142H
32	2	155 O-RING	90 DURO HSN	90155H
33	2	156 O-RING	90 DURO HSN	90156H

REDRESS KIT (RDK)	94855-B4-050H
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J-1.2) VITON

ITEM	QTY	DESCRIPTION	MATERIAL	P/N 94855V-BAB-4
13	1	ELEMENT	70 DURO VITON	90855511V-4
14	2	ELEMENT	80 DURO VITON	90855512V-4
28	24	113 O-RING	90 DURO VITON	90113V
29	4	115 O-RING	90 DURO VITON	90115V
30	2	141 O-RING	90 DURO VITON	90141V
31	11	142 O-RING	90 DURO VITON	90142V
32	2	155 O-RING	90 DURO VITON	90155V
33	2	156 O-RING	90 DURO VITON	90156V

REDRESS KIT (RDK)	94855-B4-050V
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J-2) CARBIDE OPTION

ITEM	QTY	DESCRIPTION	MATERIAL	P/N 94855C-BAB-4
8	4	CARBIDE UPPER SLIP	DLMS110	90855115C-4
17	4	CARBIDE LOWER SLIP	DLMS110	90855135C-4



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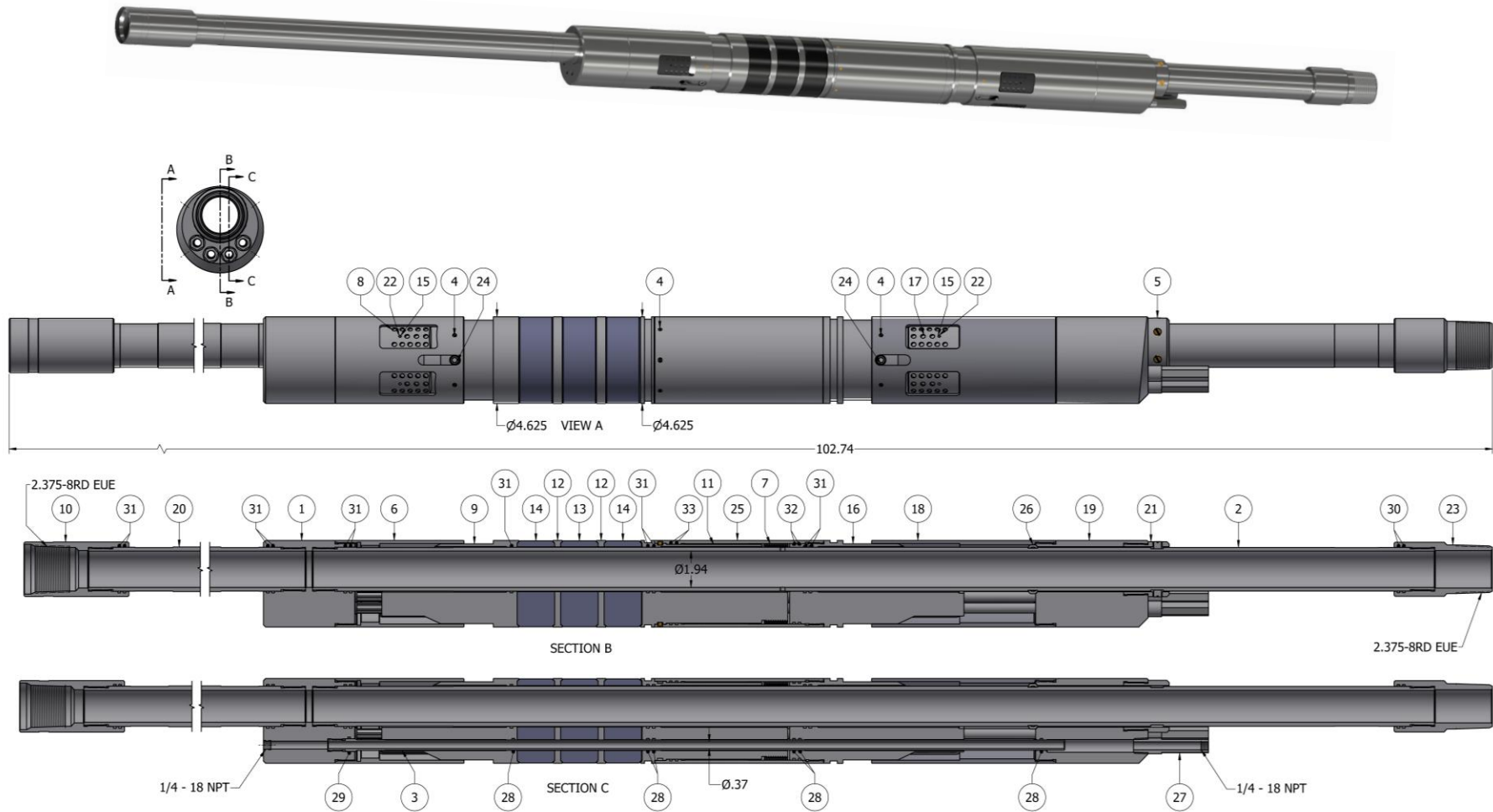
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K) TECHNICAL ILLUSTRATION



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L) REVISION HISTORY

DATE	REVISION	DESCRIPTION OF CHANGES	REVISED BY	APPROVED BY
11/06/2023	A	Created manual	-	-