



DLH HT PACKER

5-1/2" X 2-3/8"

Manual No:
DL-935-5500-1140

Revision: **B**

Revision Date:
09/16/2022

Authored by: J.Anderson

Approved by: N.Banker

A) DESCRIPTION

The DLH Packer is a hydraulic-set single-string retrievable packer and may be used in virtually any production application. Tubing pump pressure is used to set the packer and the setting force is locked into the packer by a body lock ring. A large internal by-pass reduces swabbing when running and retrieving. The by-pass closes when the packer is set, and opens during the releasing process to allow pressure equalization. Shear screws are used to control the packer release.

The DLH HT Packer is designed for differential pressures up to 10,000 psi (unless otherwise noted). The high pressure version may be utilized in completions where high pressure treating operations are performed and the tool is left in the well for production.

B) RELATED TOOLS

B-1) 2-3/8" Pump-Out Plug (P/N varies)—refer to technical manual *DL-597-0000-431*.

C) SPECIFICATION GUIDE

CASING			TOOL		THREAD CONNECTION BOX UP / PIN DOWN	PART NUMBER
SIZE (INCHES)	WEIGHT (LBS/FT)	RECOMMENDED HOLE SIZE (INCHES)	OD (INCHES)	NOMINAL ID (INCHES)		
5-1/2	23.0 – 26.0	4.548 – 4.670	4.406	2.00	2-3/8 EUE	93554HT 93554HTH ¹ 93554HTV ² 93554HTC ³ 93554HTHC ⁴ 93554HTVC ⁵

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

DIFFERENTIAL PRESSURE (MAX)	TENSILE LOAD THRU TOOL (MAX)
10,000 PSI	75,000 LBS

D) 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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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.

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.

E) SETTING PROCEDURES

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

E-1) RUNNING SEQUENCE

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. Transmission of make-up torque through the packer should be avoided.

Run the packer to the desired setting depth at the recommended speed and taking precautions listed above. While running in the hole, the packer body is rigidly connected to the packer mandrel and external forces caused by debris or tight spots are transmitted directly to the tubing. These forces load the mandrel through the chamber and body locks. Unless the string sequence is initiated by tubing pressure, the packer will not set.

Typically the tubing 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 to the recommended pressure for the given size of packer and hold for 5 minutes. If the well completion allows, apply annulus pressure to test the packer.

CAUTION₃: If the packer is used in a multi-zone completion above a permanent packer and locator type seal, care should be taken to ensure that no set down weight can be exerted on the locator as this will act on the shear system and try to unset the packer.



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E) SETTING PROCEDURES (cont'd)

E-2) SETTING SEQUENCE

Internal tubing pressure enters the setting chamber through the setting port and acts upward on the setting sleeve and downwards on the setting chamber/lower cone. When the applied load acting on these pistons exceeds the value of the setting initiation shear screws, they will shear and allow the setting process to proceed.

The setting sleeve pushes up through the setting shear screws between the rubber mandrel and setting sleeve closing the valve and setting the upper slips. The setting chamber/lower cone pushes down setting the lower slips.

Further pressuring shears the setting shear screws and packs off the packer elements. All this setting force is mechanically locked in place by the packer lock ring as it slides over the threads on the setting sleeve.

NOTE: No mandrel movement occurs during the setting sequence. However, some residual tension will remain in the tubing due to the tubing elongation caused by piston effects. This should be taken into consideration when deciding on field shear-out adjustments.

F) RELEASING PROCEDURES

The packer is released by tension on the tubing string which triggers the following sequence of events:

- The upper and lower shear screws shear as the tension exceeds the shear value. The mandrel begins to move up relative to the packer body. The by-pass valve opens and movement upward raises the upper slip support thereby releasing the upper slips. Continued upward movement lifts the packer body, relaxing the packer elements and pulling the bottom cone upwards releasing the lower slips.
- The final stage of un-setting occurs when the lower section (lower slip body and lower slips) reach the bottom sub. They are then latched down by a split ring snapping into a groove in the inner mandrel, thus allowing the tool to move freely up or down.
- After unsetting, wait 10 minutes to allow the rubber to relax and then pull out of the hole. The valve will be open allowing fluid to by-pass the rubber through the passage under the rubber mandrel.
- The shear release value is adjustable by adding or removing shear screws from the shear housing, or by using steel screws. The upper brass shear screws (P/N DL66469) are rated to 3,000 lbs/screw, the lower brass shear screws (P/N DL41252) are rated to 6,000 lbs/screw.
- Two (2 qty) upper shear screws should always be used in the upper slip support.
- The recommended shear screw arrangement:
 - o Total shear value = 54,000 lbs
 - Upper shear screws = Two (2 qty) for 6,000 lbs shear
 - Lower shear screws = Eight (8 qty) for 48,000 lbs shear

G) 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.



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H) SETTING AREA GUIDE

VALVE ID (INCHES)	BALANCE AREA UNPLUGGED		SHEAR VALUE (PSI/SCREW)	SETTING AREA (SQ INCHES)	SETTING INITIATION (PSI)	RECOMMENDED SETTING (PSI)
	ABOVE (SQ INCHES)	BELOW (SQ INCHES)				
3.250	1.227	4.271	198	6.063	792	2,721

I) ELASTOMER TRIM TEMPERATURE GUIDE

NITRILE (STD)			
TEMPERATURE RANGE (F°)	DUROMETER		
	END	MIDDLE	END
40° - 125°	80	70	80
125° - 250°	90	70	90
150° - 250°	90	80	90
250° +	Contact D&L Sales		

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

J) 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

K) DISASSEMBLY

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

K-1.1) Unscrew and remove bottom sub (28) from inner mandrel (2).

NOTE: Back-up on inner mandrel with wrench above bottom sub (28) as needed.

K-1.2) Unscrew and remove shear screws (34) from lower slip body (18).

K-1.3) Wedge lower slips (17) outward (if needed). Remove lower slip body assembly and disassemble:

K-1.3.1) Remove wedges (if needed). Remove lower slips (17) from lower slip body (18).

K-1.3.2) Unscrew and remove button head screws (31) from slips (17) and remove slip springs (25).

K-1.3.3) Remove internal ring (23) from lower slip body (18).

K-1.4) Unscrew setting chamber (30) from lower cone (16). Move setting chamber assembly up and out-of-way temporarily to access shear screws (37).

K-1.5) Unscrew and remove shear screws (37) from lower end of setting sleeve (21).

K-1.6) Remove lower cone (16) from setting sleeve (21) and inner mandrel (2).

K-1.6.1) Remove o-ring (41) and o-ring and backup rings (42, 46) from lower cone (16).

K-1.7) Screw and remove set screws (35) from setting chamber (30).

K-1.8) Unscrew setting chamber cap (22) from setting chamber (30) to be removed later.

K-1.9) Unscrew and remove shear screw (19) from setting chamber (30).



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K) DISASSEMBLY (cont'd)

K-1.10) Unscrew and remove setting chamber (30) from lock ring (3).

K-1.11) Remove snap ring (27) from inner mandrel (2).

K-1.12) Unscrew and remove shear screws (19) from upper end of setting sleeve (21).

K-1.13) Unscrew and remove setting sleeve (21) from rubber retainer (15).

K-1.14) Remove setting sleeve assembly and disassemble.

K-1.14.1) Remove setting chamber cap (22) from setting sleeve (21).

K-1.14.2) Unscrew and/or slide lock ring (3) from setting sleeve (21) (**NOTE4:** Left-hand threads).

NOTEs: Using snap ring spreader pliers, the lock ring (3) may be spread slightly to be removed from setting sleeve (21).

K-1.14.3) Remove o-rings and backup rings (41, 45 & 42, 46) from setting sleeve (21).

K-1.15) Unscrew rubber mandrel (11) from center coupling (10).

K-1.16) Remove rubber mandrel assembly and disassemble:

K-1.16.1) Remove gage ring (29), elements (13, 14), rubber spacers (12) and rubber retainer (15) from rubber mandrel (11).

K-1.17) Unscrew and remove center coupling (10) from by-pass housing (20).

K-1.17.1) Remove o-rings (39, 41) from center coupling (10).

K-1.18) Unscrew and remove by-pass housing (20) from upper cone (9).

K-1.18.1) Remove bonded seal (24) and o-ring (43) from by-pass housing (20).

K-1.18.1.1) Remove o-ring (38) from bonded seal (24).

K-1.19) Unscrew and remove set screws (36) from valve piston (5).

K-1.20) Unscrew and remove valve piston (5) from inner mandrel (2).

K-1.20.1) Remove o-ring and backup rings (40, 44) from valve piston (5).

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

NOTEs: Do **NOT** wrench or clamp on seal surface.

K-2.1) Unscrew and remove shear screws (32) from upper slip support (33).

K-2.2) Unscrew and remove top sub (1) from inner mandrel (2).

K-2.3) Unscrew and remove upper slip support (33) from upper slip body (6).

K-2.4) Wedge releasing slip (7) and upper slips (8) outward (if needed). Remove upper slip body assembly and disassemble:

K-2.4.1) Remove wedges (if needed). Remove releasing slip (7), upper slips (8) from upper slip body (6).

K-2.4.2) Unscrew and remove button head cap screws (31) from slips and remove slip springs (25).

K-2.5) Remove upper cone (9) from inner mandrel (2).

K-2.6) Remove balance piston (4) from inner mandrel (2).

K-2.6.1) Remove o-rings and backup rings (42, 46 & 43, 47) from balance piston (4).

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



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L) ASSEMBLY

NOTE₆: Clean and inspect all parts. Replace all worn and damaged parts. Install parts in proper order and orientation. Tighten/torque all connections properly.

CAUTION₅: To ensure tool operates properly, install o-rings in o-ring grooves **NOT** thread reliefs (Fig. 2).

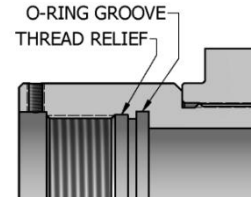


Fig. 2

L-1) Install o-ring and backup rings (40, 44) in o-ring groove in valve piston (5).

L-2) From lower end of inner mandrel (2), slide valve piston (5) onto inner mandrel (2). Screw valve piston (5) onto inner mandrel (2).

L-3) Screw set screws (36) into valve piston (5).

L-4) Install o-rings and backup rings (42, 46 & 43, 47) in o-ring grooves in balance piston (4).

L-5) From upper end of inner mandrel (2), slide balance piston (4) onto inner mandrel (2) until it contacts/stops at the first shoulder.

NOTE₇: Stand inner mandrel (2) on end if needed.

L-6) Install upper cone (9) onto inner mandrel (2). Use upper cone (9) to tap balance piston (4) down into position against valve piston (5).

CAUTION₄: Do not rip or tear o-ring during installation.

L-7) Assemble upper slip body assembly and install:

L-7.1) Screw upper slip support (33) into upper slip body (6).

L-7.2) Install slip springs (25) onto slips (7, 8) and secure with button head cap screws (31)

L-7.3) Install releasing slip (7) and upper slips (8) into upper slip body (6). Wedge slips (7,8) outwards.

L-7.4) Install upper slip body assembly onto inner mandrel (2). Remove wedges.

L-8) Screw top sub (1) onto inner mandrel (2).

L-9) Slide upper slip body assembly onto top sub (1). Align threaded holes in upper slip support (33) with shear screw groove in top sub (1).

L-10) Screw shear screws (32) into upper slip support (33). Tighten until screws (32) contact top sub (1). Back off 1/4 turn.

L-11) Assemble by-pass housing assembly:

L-11.1) Install o-ring (43) in o-ring groove in by-pass housing (20).

L-11.2) Install o-ring (38) in o-ring groove in bonded seal (24).

L-11.3) Install bonded seal (24) in by-pass housing (20).

CAUTION₄: Do not rip or tear o-ring during installation.

L-11.4) Install o-rings (39, 41) in o-ring grooves in center coupling (10).

L-11.5) Screw center coupling (10) into by-pass housing (20). Hand-tighten until center coupling (10) contacts by-pass housing (20).

CAUTION₄: Do not rip or tear o-ring during installation.

L-12) Assemble rubber mandrel assembly:

L-12.1) Stand rubber mandrel (11) on end with threads facing upwards. Install rubber retainer (15), elements (14, 13), rubber spacers (12) and gage ring (29) onto rubber mandrel (11).

NOTE₁₁: Do not damage threads - use plastic or rubber hammer as needed.

L-13) Assemble rubber mandrel assembly into by-pass housing assembly:

L-13.1) Clamp by-pass housing assembly in vise - clamp on by-pass housing (20).



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L) ASSEMBLY (cont'd)

L-13.2) Screw rubber mandrel (11) (of rubber mandrel assembly) into center coupling (10) (of by-pass housing assembly). Hand-tighten until body of rubber mandrel (11) contacts o-ring (39).

CAUTION₄: Do not rip or tear o-ring during installation.

L-13.3) Tighten rubber mandrel (11) (of rubber mandrel assembly) by wrenching on rubber mandrel (11) to tighten connections in sub-assembly.

L-14) Assemble setting chamber assembly:

L-14.1) Install o-rings and backup rings (41, 45 & 42, 46) in o-ring grooves in setting sleeve (21).

L-14.2) Stand setting sleeve (21) on end with upper end facing upwards.

L-14.3) Install setting chamber (30) over setting sleeve (21).

CAUTION₄: Do not rip or tear o-ring(s) during installation.

L-14.4) Install lock ring (3) onto setting sleeve (21) until outer threads contact threads in setting chamber (30). Rotate setting chamber (30) to thread lock ring (3) into setting chamber leaving enough room for setting chamber cap (22) to be installed.

NOTE₉: ID threads **MUST NOT** engage with threads on setting sleeve (21).

NOTE₁₀: Threads on lock ring (3) are directional - it **MUST** be installed in correct direction for tool to work properly.

L-14.5) Align gap in lock ring (3) with threaded hole in setting chamber (30). Screw shear screw (19) into setting chamber (30). Tighten until screw contacts setting sleeve (21). Back off 1/4 turn.

L-14.6) Screw setting chamber cap (22) into setting chamber (30).

L-14.7) Screw set screws (35) into setting chamber (30).

L-15) Assemble setting chamber assembly onto rubber mandrel assembly:

L-15.1) During the sub-assembly process, the rubber retainer (15) and element (13) might get in a slight bind. Using a plastic or rubber hammer, tap upwards on rubber retainer (15) to unbind them enough to thread onto setting chamber assembly.

NOTE₁₁: Do not damage threads - use plastic or rubber hammer as needed.

L-15.2) Install setting chamber assembly onto rubber mandrel (11). Screw rubber retainer (15) onto setting sleeve (21).

L-15.3) Unclamp and remove assembly from vise and set aside temporarily.

L-16) Clamp top sub (1) and mandrel assembly in vise.

L-16.1) While gripping in the element area, slide pre-assembled assemblies (by-pass housing assembly, rubber mandrel assembly, and setting chamber assembly) onto upper cone (9) of mandrel assembly.

NOTE₁₂: **DO NOT** grip on the setting chamber assembly as this may cause the lock ring (3) to prematurely lock in place.

L-16.2) Tap setting chamber assembly upwards to rubber retainer (15).

NOTE₁₁: Do not damage threads. Use plastic or rubber hammer as needed.

L-17) Install snap ring (27) in groove in inner mandrel (2).

L-18) Moving to upper end of tool, screw upper cone (9) into by-pass housing (20).

NOTE₁₃: For added leverage, insert a rod or punch tool into holes in by-pass housing (20) as needed.

L-19) Install o-ring (41) and o-ring and backup rings (42, 46) in o-ring grooves in lower cone (16).

L-20) From lower end of tool, install lower cone (16) onto inner mandrel (2). Tap lower cone (16) into place. Align holes in lower cone (16) with threaded holes in setting sleeve (21).

CAUTION₄: Do not rip or tear o-ring during installation.



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L) ASSEMBLY (cont'd)

- L-21) Screw shear screws (37) into setting sleeve (21). Tighten until screws (37) are just flush or slightly below OD of setting sleeve (21).
- L-22) Assemble lower slip body assembly and install:
 - L-22.1) Install internal ring (23) in groove in lower slip body (18).
 - L-22.2) Install slip springs (25) into lower slips (17) and secure with button head cap screws (31).
 - L-22.3) Install slips (17) into lower slip body (18). Wedge lower slips (17) outwards.
 - L-22.4) Install lower slip body assembly onto inner mandrel (2). Remove wedges.
 - L-22.5) Align threaded holes in lower slip body (18) with counterbores in inner mandrel (2). Screw shear screws (34) into lower slip body (18). Tighten until shear screws (34) contact inner mandrel (2). Back out 1/4 turn.
- L-23) Screw bottom sub (28) onto inner mandrel (2).
- L-24) Slide setting chamber assembly down. Tap setting chamber assembly downwards onto lower cone (16). Screw setting chamber (30) onto lower cone (16).

CAUTION₄: Do not rip or tear o-ring(s) during installation.
- L-25) Wrench on setting chamber (30) to tighten. Might have to put downward pressure to get threads started. Back up on lower cone (16) with wrench as needed.
- L-26) Align threaded holes in setting sleeve (21) with holes in rubber mandrel (11). Might have to tap setting chamber assembly downwards using hammer and brass block to align holes.

NOTE₁₄: Align large hole in setting sleeve (21) with large hole in rubber mandrel (11).
- L-27) Screw shear screws (19) into upper end of setting sleeve (21). Tighten until shear screws (19) contact rubber mandrel (11). Back out 1/4 turn.

NOTE₁₅: Shear screws (19) **MUST** be below the OD surface of the setting sleeve (21). Adjust shear screws (19) as required.
- L-28) Unclamp top sub (1) from vise and remove assembled tool.

NOTE₁₆: If pressure testing of the packer is desired, refer to technical manual *DL-937-5500-1177*. Pressure testing of the packer is not mandatory.

M) PARTS LIST

ITEM	QTY	DESCRIPTION	MATERIAL	P/N 93554HT
1	1	TOP SUB	DLMS110	93545610-C
2	1	INNER MANDREL	DLMS110	93554211HT
3	1	LOCK RING	DLMS41X80	93554011HT
4	1	BALANCE PISTON	DLMS110	93554919HT
5	1	VALVE PISTON	DLMS110	93554961HT
6	1	UPPER SLIP BODY	DLMS110	93554321HT
7	1	RELEASING SLIP	DLMS110	93554125HT
8	2	UPPER SLIP	DLMS35	93554115HT
9	1	UPPER CONE	DLMS110	93554411HT
10	1	CENTER COUPLING	DLMS110	93554230HT
11	1	RUBBER MANDREL	DLMS110	93554220HT
12	2	RUBBER SPACER	DLMS60	60251840



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M) PARTS LIST (cont'd)

ITEM	QTY	DESCRIPTION	MATERIAL	P/N 93554HT
13	1	ELEMENT	80 DURO NITRILE	60251512
14	2	ELEMENT	90 DURO NITRILE	60251513
15	1	RUBBER RETAINER	DLMS80	93554850
16	1	LOWER CONE	DLMS110	93554421HT
17	4	LOWER SLIP	DLMS335	93554135HT
18	1	LOWER SLIP BODY	DLMS110	93554325HT
19	11	1/4-20 UNC X 1/4 SLOTTED SHEAR SCREW (1900#)	DLM360BRS	BSSSLT025C025
20	1	BY-PASS HOUSING	DLMS125	93554312HT
21	1	SETTING SLEEVE	DLMS110	93554751HT
22	1	SETTING CHAMBER CAP	DLMS60	93554315
23	1	SMALLEY MEDIUM DUTY INTERNAL RING	DLMSC	WH-300
24	1	SEAL	90 DURO NITRILE	60070520
25	8	LOWER SLIP SPRING		7155901
26	15	UPPER SLIP SPRING		32045950
27	1	SNAP RING	DLMS110	93554980
28	1	BOTTOM SUB	DLMS110	93545630-C
29	1	GAGE RING	DLMS80	93554830
30	1	SETTING CHAMBER	DLMS110	93554316HT
31	7	#8-32 UNC X 3/16 BUTTON HEAD SOCKET CAP SCREW	STEEL	BHSC832C018
32	2	3000# SHEAR SCREW	DLM360BRS	DL66469
33	1	UPPER SLIP SUPPORT	DLMS110	93554810HT
34	8	SHEAR SCREW	DLM360BRS	DL41252
35	2	1/4-20 UNC X 1/4 SOCKET SET SCREW	STEEL	SSS025C025
36	4	1/4-20 UNC X 5/16 SOCKET SET SCREW	STEEL	SSS025C031
37	6	1/4-20 UNC X 1/2 SLOTTED SHEAR SCREW (1900#)	DLM360BRS	BSSSLT025C050
38	1	153 O-RING	90 DURO NITRILE	90153
39	1	235 O-RING	90 DURO NITRILE	90235
40	1	237 O-RING	90 DURO NITRILE	90237
41	3	239 O-RING	90 DURO NITRILE	90239
42	3	335 O-RING	90 DURO NITRILE	90335
43	2	339 O-RING	90 DURO NITRILE	90339
44	2	237 BACK UP RING	PEEK	06500237
45	2	239 BACK UP RING	PEEK	06500239
46	6	335 BACK UP RING	PEEK	06500335



DLH HT PACKER

5-1/2" X 2-3/8"

Manual No:
DL-935-5500-1140

Revision: **B**

Revision Date:
09/16/2022

Authored by: J.Anderson

Approved by: N.Banker

M) PARTS LIST (cont'd)

ITEM	QTY	DESCRIPTION	MATERIAL	P/N 93554HT
47	2	339 BACK UP RING	PEEK	06500339

REDRESS KIT (RDK)		93554HT050
ASSEMBLED WEIGHT		168 LBS

M-1) ELASTOMER TRIM OPTIONS

NOTE₂: For temperature range, refer to Elastomer Trim Temperature Guide.

M-1.1) HSN

ITEM	QTY	DESCRIPTION	MATERIAL	P/N 93554HTH
13	1	ELEMENT	80 DURO HSN	60251512H
14	2	ELEMENT	90 DURO HSN	60251513H
24	1	SEAL	90 DURO HSN	60070520H
39	1	235 O-RING	90 DURO HSN	90235H
40	1	237 O-RING	90 DURO HSN	90237H
41	3	239 O-RING	90 DURO HSN	90239H
42	3	335 O-RING	90 DURO HSN	90335H
43	2	339 O-RING	90 DURO HSN	90339H

REDRESS KIT (RDK)		93554HT050H
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M-1.2) VITON

ITEM	QTY	DESCRIPTION	MATERIAL	P/N 93554HTV
13	1	ELEMENT	80 DURO VITON	60251512V
14	2	ELEMENT	90 DURO VITON	60251513V
24	1	SEAL	90 DURO VITON	60070520V
39	1	235 O-RING	90 DURO VITON	90235V
40	1	237 O-RING	90 DURO VITON	90237V
41	3	239 O-RING	90 DURO VITON	90239V
42	3	335 O-RING	90 DURO VITON	90335V
43	2	339 O-RING	90 DURO VITON	90339V

REDRESS KIT (RDK)		93554HT050V
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M-2) CARBIDE OPTION

ITEM	QTY	DESCRIPTION	MATERIAL	P/N 93554HTC
8	2	CARBIDE UPPER SLIP	DLMS110	93554115HTC
17	4	CARBIDE LOWER SLIP	DLMS110	93554135HTC



DLH HT PACKER

5-1/2" X 2-3/8"

Manual No:
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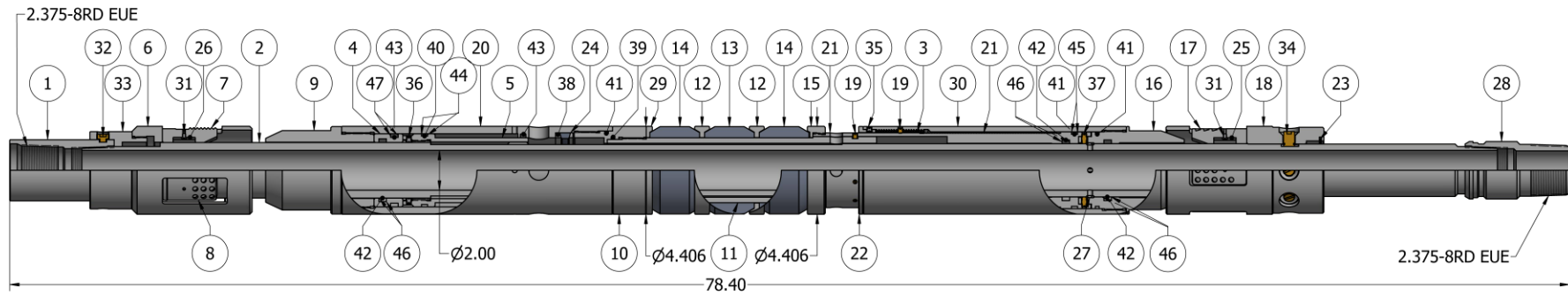
Revision: **B**


Revision Date:
09/16/2022

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Approved by: N.Banker

N) TECHNICAL ILLUSTRATION



	DLH HT PACKER 5-1/2" X 2-3/8"	Manual No: DL-935-5500-1140
		Revision: B
		Revision Date: 09/16/2022
<i>Authored by: J.Anderson</i>		<i>Approved by: N.Banker</i>

O) REVISION HISTORY

DATE	REVISION	DESCRIPTION OF CHANGES	REVISED BY	APPROVED BY
09/16/2022	B	Redesign of tool; added non-carbide options	J.Anderson	E.Visaez
05/14/2018	A	Created manual	-	-