



DLH PACKER

9-5/8" X 4-1/2" (12.75#) CS HYDRIL

Manual No:
DL-935-9625-1243

Revision: **B**

Revision Date:
11/04/2022

Authored by: J.Anderson

Approved by: J.Johnson

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 standard DLH Packer is designed for differential pressures up to 7,500 psi.

B) RELATED TOOLS (sold separately)

B-1) 4-1/2" 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)	GAGE OD (INCHES)	ID (INCHES)		
9-5/8	43.5 – 53.5	8.535 – 8.755	8.250	4.00	4-1/2 (12.75#) CS HYDRIL	93595-XGJKA 93595H-XGJKA ¹ 93595V-XGJKA ² 93595C-XGJKA ³ 93595HC-XGJKA ⁴ 93595VC-XGJKA ⁵

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

DIFFERENTIAL PRESSURE (MAX)	TENSILE LOAD THRU TOOL (MAX)
7,500 PSI	190,000 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.

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

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)

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-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 pins 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 pins 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.

NOTE₁: 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 work 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 32045910) are rated to 5,000 lbs/screw, the lower brass shear screws (P/N DL60442) are rated to 6,000 lbs/screw.

NOTE₂: An alternate lower shear screw made of steel is available and is rated to 10,000 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 = 58,000 lbs
 - Upper shear screws = Two (2 qty) for 10,000 lbs shear
 - Lower shear screws (brass) = Eight (8 qty) for 48,000 lbs shear

G) SETTING AREA GUIDE

VALVE ID (INCHES)	BALANCE AREA UNPLUGGED		SHEAR VALUE (PSI/SCREW)	SETTING AREA (IN ²)	SETTING INITIATION (PSI)	RECOMMENDED SETTING (PSI)
	ABOVE (IN ²)	BELOW (IN ²)				
4.750	4.760 (DOWN)	17.391 (UP)	238	23.071	955	2,500



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H) 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.

I) ELASTOMER TRIM OPTIONS

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
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
- STRAP WRENCH
- 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

NOTE3: Ensure vise is capable of handling weight of tool.

NOTE4: Support tool during disassembly and assembly with jack stands as necessary.

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

K-1.1) From lower end of tool, unscrew and remove bottom sub (28) from inner mandrel (2).

NOTE5: Place back-up wrench on inner mandrel above bottom sub while wrenching on bottom sub.

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

K-1.3) Remove lower slip body assembly and disassemble:

K-1.3.1) Unscrew and remove socket cap screws (31) from lower slip body (18).

K-1.3.2) Wedge lower slips (17) outward (if needed). Remove lower slip support (32) from lower slip body (18).

K-1.3.3) Remove wedges (if needed). Remove lower slips (17) and lower slip springs (25) from lower slip body (18).

K-1.3.4) Remove internal ring (38) from lower slip body (18).



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K) DISASSEMBLY (cont'd)

- K-1.4) Unscrew setting chamber (30) from lower cone (16). Move setting chamber assembly up out of way temporarily.
- K-1.5) Unscrew and remove shear screws (35) from setting piston (19).
- K-1.6) Remove lower cone (16) from setting piston (19) and inner mandrel (2).
 - K-1.6.1) Remove o-rings (41, 44) from lower cone (16).
- K-1.7) Unscrew setting chamber cap (22) from setting chamber (30).
- K-1.8) Unscrew and remove shear screw (45) from setting chamber (30).
- K-1.9) Unscrew and remove setting chamber (30) from lock ring (3).
- K-1.10) Remove stop ring (27) from inner mandrel (2).
- K-1.11) Unscrew and remove shear screws (36) from upper end of setting sleeve (21).
- K-1.12) Unscrew and remove setting piston (19) from setting sleeve (21).
 - K-1.12.1) Remove o-rings (41, 44) from setting piston (19).
- K-1.13) Unscrew and remove setting sleeve (21) from rubber retainer (15).
 - K-1.13.1) Remove setting chamber cap (22) from setting sleeve (21).
 - K-1.13.2) Unscrew and remove lock ring (3) from setting sleeve (21) (**NOTE**: Internal threads are left-hand threads).
- K-1.14) Unscrew rubber mandrel (11) from center coupling (10).
- K-1.15) Remove rubber mandrel assembly and disassemble:
 - K-1.15.1) Remove elements (13, 14), rubber spacers (12), and rubber retainer (15) from rubber mandrel (11).
- K-1.16) Unscrew and remove gage ring (29) from center coupling (10).
- K-1.17) Unscrew and remove center coupling (10) from by-pass housing (20).
 - K-1.17.1) Remove o-rings (40, 43) and bonded seal (24) from center coupling (10).
 - K-1.17.1.1) Remove o-ring (39) from bonded seal (24).
- K-1.18) Unscrew and remove by-pass housing (20) from upper cone (9).
- K-1.19) Unscrew and remove set screws (23) from valve piston (5).
- K-1.20) Unscrew and remove valve piston (5) from inner mandrel (2).
 - K-1.20.1) Remove o-ring (44) from valve piston (5).
- K-2) Unclamp and remove top sub (1) from vise and clamp inner mandrel (2) in vise.
 - CAUTION:** Do NOT wrench or clamp on seal surface.
 - K-2.1) From upper end of tool, unscrew and remove shear screws (37) from upper slip support (33).
 - K-2.2) Unscrew and remove top sub (1) from inner mandrel (2).
 - K-2.3) Remove upper slip body assembly and disassemble:
 - K-2.3.1) Wedge releasing slip (7) and upper slips (8) outward (if needed). Unscrew and remove upper slip support (33) from upper slip body (6).
 - K-2.3.2) Remove wedges (if needed). Remove releasing slip (7), upper slips (8), and upper slip springs (26) from upper slip body (6).
 - K-2.4) Remove upper cone (9) from inner mandrel (2).
 - K-2.5) Remove balance piston (4) from inner mandrel (2).
 - K-2.5.1) Remove o-rings (42, 44) from balance piston (4).
- K-3) Unclamp and remove inner mandrel (2) from vise.



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L) ASSEMBLY

NOTE₃: Ensure vise is capable of handling weight of tool.

NOTE₄: Support tool during disassembly and assembly with jack stands as necessary.

NOTE₇: Clean and inspect all parts. Replace all worn and damaged parts. Install parts in proper order, and orientation and tighten/torque all connections properly.

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

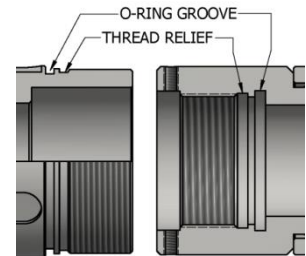


Fig. 2

L-1) Install o-ring (44) in o-ring groove in valve piston (5).



Fig. 3

L-2) From lower end of inner mandrel (2), install valve piston onto inner mandrel (2). Screw valve piston (5) onto inner mandrel (2) (Fig 3).

CAUTION₄: Do **NOT** wrench or clamp on seal surface.

L-3) Screw set screws (23) into valve piston (5).

L-4) Install o-rings (42, 44) in o-ring grooves on balance piston (4).

L-5) From upper end of inner mandrel (2), install balance piston (4) onto upper end of inner mandrel (2).

NOTE₈: Stand inner mandrel (2) on end if needed.



Fig 4

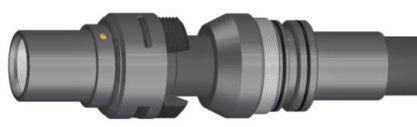


Fig 5



Fig 6

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

CAUTION₆: Do not rip or tear o-ring during installation.

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

L-7.1) Install upper slip springs (26), releasing slip (7), and upper slips (8) into upper slip body (6). Wedge slips outwards.

NOTE₉: Install two springs (2 ea) per slip.

L-7.2) Screw upper slip support (33) into upper slip body (6). Remove wedges.

L-7.3) Install upper slip body assembly onto inner mandrel (2).

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

CAUTION₆: Do not rip or tear o-ring during installation.

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

L-10) Screw shear screws (37) into upper slip support (33). Screw shear screws (37) into upper slip support (33). Tighten until shear screws (37) contact top sub (1). Back shear screws (37) out 1/4 turn.

L-11) Screw by-pass housing (20) onto upper cone (9) (Fig. 6).

CAUTION₆: Do not rip or tear o-rings during installation.



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L) ASSEMBLY (cont'd)

L-12) Install o-rings (40, 43) in o-ring grooves in center coupling (10).

L-13) Install o-ring (39) in o-ring groove in bonded seal (24).

L-14) Install bonded seal (24) in center coupling (10).

CAUTION₆: Do not rip or tear o-ring during installation.

L-15) Install center coupling (10) onto mandrel (2) and screw into by-pass housing (20).

CAUTION₆: Do not rip or tear o-ring during installation.

L-16) Screw gage ring (29) onto center coupling (10).

L-17) Assemble rubber mandrel assembly and install:

L-17.1) Install rubber retainer (15), elements (13, 14), and rubber spacers (12) onto rubber mandrel (11) – if needed, stand rubber mandrel (11) on end with outer threads facing up.

CAUTION₇: Do not damage threads - use plastic or rubber hammer as needed.

L-17.2) Install rubber mandrel assembly onto inner mandrel (2). Screw rubber mandrel assembly into center coupling.

CAUTION₆: Do not rip or tear o-rings during installation.

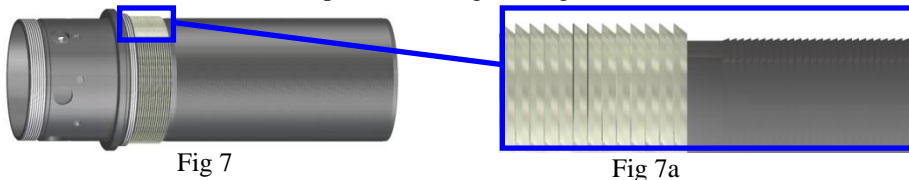


Fig 7

Fig 7a

L-18) Assemble setting chamber assembly and install:

L-18.1) Stand setting chamber (21) on end with upper end facing upwards. Install lock ring (3) and setting chamber cap (22) onto setting sleeve (21) (Fig 7 and Fig 7a).

NOTE₁₀: Lock ring I.D. threads MUST NOT ENGAGE with threads on setting sleeve (21).

NOTE₁₁: Threads on lock ring are directional and must be installed in correct direction for tool to operate properly (Fig. 7a).

L-18.2) Install o-rings (41, 44) in o-ring grooves in setting piston (19).

L-18.3) Screw setting sleeve (21) onto setting piston (19).

L-18.4) Install setting sleeve (21) onto setting piston (19) onto inner mandrel (2). Screw setting sleeve (21) into rubber retainer (15).

L-18.5) Align threaded holes in setting sleeve (21) with counterbores in rubber mandrel (11). Screw shear screws (36) into setting sleeve (21). Tighten until shear screws (36) contact rubber mandrel (11). Back shear screws (36) out 1/4 turn.

L-18.6) Install setting chamber (30) over setting sleeve (21). Screw setting chamber (30) onto lock ring (3) until upper end of lock ring (3) is flush with top of threads in setting chamber (30). Align threaded hole in setting chamber (30) with gap in lock ring (3).

NOTE₁₀: Lock ring I.D. threads MUST NOT ENGAGE with threads on setting sleeve (21).

CAUTION₆: Do not rip or tear o-ring during installation.

L-18.7) Screw shear screw (45) into setting chamber (30). Tighten until screw (45) contacts setting sleeve (21). Back off 1/4 turn.

L-18.8) Screw setting chamber cap (22) into setting chamber (30).

L-18.9) Install snap ring (27) in ring groove in inner mandrel (2).

L-18.10) Install o-rings (41, 44) in o-ring grooves in lower cone (16).



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L) ASSEMBLY (cont'd)

L-18.11) Install lower cone (16) onto inner mandrel (2). Using hammer and soft block (brass or wood), tap lower cone (16) onto inner mandrel (2). Align threaded holes in setting piston (19) with holes in lower cone (16).

CAUTION₆: Do not rip or tear o-ring during installation.



Fig. 8



Fig. 9

L-18.12) Screw shear screws (35) into setting piston (19). Tighten until shear screws (35) contact inner mandrel (2). Back shear screws (35) out 1/4 turn (Fig 8).

L-18.13) Slowly slide setting chamber assembly down. Screw setting chamber (30) onto lower cone (16) (Fig. 9).

NOTE₁₀: Lock ring I.D. threads **MUST NOT ENGAGE** with threads on setting sleeve (21).

CAUTION₆: Do not rip or tear o-ring during installation.

L-18.14) Assemble lower slip body assembly and install:

L-18.14.1) Install lower slip springs (25) and lower slips (17) into lower slip body (18). Wedge lower slips (17) outward.

NOTE₉: Install two springs (2 qty) per slip.

L-18.14.2) Install lower slip support (32) into lower slip body (18). Remove wedges from slips.

L-18.14.3) Align threaded holes in lower slip body (18) with holes in lower slip support (32). Screw socket cap screws (31) into lower slip body (18).

L-18.14.4) Install internal ring (38) in groove in lower slip body (18).

L-18.14.5) Install lower slip body assembly onto inner mandrel (2). Align threaded holes in lower slip body (18) with counterbores in inner mandrel (2).

L-18.15) Screw shear screws (34) into lower slip body (18). Tighten until shear screws (34) contact inner mandrel (2). Back shear screws (34) out 1/4 turn.

L-18.16) Screw bottom sub (28) onto inner mandrel (2).

CAUTION₆: Do not rip or tear o-ring during installation.

L-19) Unclamp top sub (1) from vise and remove assembled tool.

NOTE₁₂: If pressure testing of the packer is desired, refer to technical manual *DL-937-9625-1197*. Pressure testing of the packer is not mandatory.



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M) PARTS LIST

ITEM	QTY	DESCRIPTION	MATERIAL	P/N 93595-XGJKA
1	1	TOP SUB	DLMS80	93595610-XGJKA
2	1	INNER MANDREL	DLMS80	93595210
3	1	LOCK RING	DLMS80	93595005
4	1	BALANCE PISTON	DLMS35	93595918
5	1	VALVE PISTON	DLMS80	93595960
6	1	UPPER SLIP BODY	DLMS110 / DLMS80	60395320
7	1	RELEASING SLIP	DLMS110	60095125
8	2	UPPER SLIP	DLMS35	60095115
9	1	UPPER CONE	DLMS80	93595410
10	1	CENTER COUPLING	DLMS80	93595230
11	1	RUBBER MANDREL	DLMS80	93595220
12	2	RUBBER SPACER	DLMS35	60295840S
13	1	ELEMENT	70 DURO NITRILE	60295511S
14	2	ELEMENT	90 DURO NITRILE	60295513S
15	1	RUBBER RETAINER	DLMS35	93595850
16	1	LOWER CONE	DLMS80	93595420
17	4	LOWER SLIP	DLMS35	60095135
18	1	LOWER SLIP BODY	DLMS80	93595325
19	1	SETTING PISTON	DLMS80	93595751
20	1	BY-PASS HOUSING	DLMS80	93595311
21	1	SETTING SLEEVE	DLMS80	93595752
22	1	SETTING CHAMBER CAP	DLMS60	93595315
23	2	SOCKET SET SCREW 1/4-20 UNC X 3/8	STEEL	SSS025C037
24	1	BONDED SEAL	DLMS60 / 90 DURO NITRILE	93595520
25	8	LOWER SLIP SPRING	-	7170901
26	6	UPPER SLIP SPRING	-	7170902
27	1	STOP RING	DLMS80	93595980
28	1	BOTTOM SUB	DLMS80	93595630-XGJKA
29	1	GAGE RING	DLMS60	93595830
30	1	SETTING CHAMBER	DLMS80	93595312
31	2	SOCKET CAP SCREW 1/2-13 UNC X 1"	STEEL	SCS050C100
32	1	LOWER SLIP SUPPORT	DLMS35	93595912
33	1	UPPER SLIP SUPPORT	DLMS80	93595810
34	8	SHEAR SCREW	DLM360BRS	DL60442
35	4	SLOTTED SHEAR SCREW (5500#) 1/2-13 UNC X 1"	DLM360BRS	BSSSLT050C100
36	8	SLOTTED SHEAR SCREW (5500#) 1/2-13 UNC X 1/2	DLM360BRS	BSSSLT050C050



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M) PARTS LIST (cont'd)

ITEM	QTY	DESCRIPTION	MATERIAL	P/N 93595-XGJKA
37	2	SHEAR SCREW	DLM360BRS	32045910
38	1	SMALLEY MEDIUM HEAVY DUTY INTERNAL RING	DLMSC	WHT-525
39	1	162 O-RING	90 DURO NITRILE	90162
40	1	259 O-RING	90 DURO NITRILE	90259
41	2	350 O-RING	90 DURO NITRILE	90350
42	1	351 O-RING	90 DURO NITRILE	90351
43	1	356 O-RING	90 DURO NITRILE	90356
44	4	364 O-RING	90 DURO NITRILE	90364
45	1	1/4-20 UNC X 1/2 SLOTTED SHEAR SCREW (1200#)	DLM360BRS	BSSSLT025C050

REDRESS KIT (RDK)		93595050
ASSEMBLED WEIGHT		647 LBS

M-1) ELASTOMER TRIM OPTIONS

NOTE₁₃: For temperature range, refer to Elastomer Trim Temperature Guide.

M-1.1) HSN

ITEM	QTY	DESCRIPTION	MATERIAL	P/N 93595H-XGJKA
13	1	ELEMENT	70 DURO HSN	60295511SH
14	2	ELEMENT	90 DURO HSN	60295513SH
24	1	BONDED SEAL	DLMS60 / 90 DURO HSN	93595520H
39	1	162 O-RING	90 DURO HSN	90162H
40	1	259 O-RING	90 DURO HSN	90259H
41	2	350 O-RING	90 DURO HSN	90350H
42	1	351 O-RING	90 DURO HSN	90351H
43	1	356 O-RING	90 DURO HSN	90356H
44	4	364 O-RING	90 DURO HSN	90364H

REDRESS KIT (RDK)		93595050H
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DLH PACKER

9-5/8" X 4-1/2" (12.75#) CS HYDRIL

Manual No:
DL-935-9625-1243

Revision: **B**

Revision Date:
11/04/2022

Authored by: J.Anderson

Approved by: J.Johnson

M) PARTS LIST (cont'd)

M-1.2) VITON

ITEM	QTY	DESCRIPTION	MATERIAL	P/N 93595V-XGJKA
13	1	ELEMENT	70 DURO VITON	60295511SV
14	2	ELEMENT	90 DURO VITON	60295513SV
24	1	BONDED SEAL	DLMS60 / 90 DURO VITON	93595520V
39	1	162 O-RING	90 DURO VITON	90162V
40	1	259 O-RING	90 DURO VITON	90259V
41	2	350 O-RING	90 DURO VITON	90350V
42	1	351 O-RING	90 DURO VITON	90351V
43	1	356 O-RING	90 DURO VITON	90356V
44	4	364 O-RING	90 DURO VITON	90364V

REDRESS KIT (RDK)	93595050V
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M-2) CARBIDE OPTIONS

ITEM	QTY	DESCRIPTION	MATERIAL	P/N 93595C-XGJKA
8	2	CARBIDE UPPER SLIP	DLMS110	60095115C
17	4	CARBIDE LOWER SLIP	DLMS110	60095135C



DLH PACKER

9-5/8" X 4-1/2" (12.75#) CS HYDRIL

Manual No:
DL-935-9625-1243

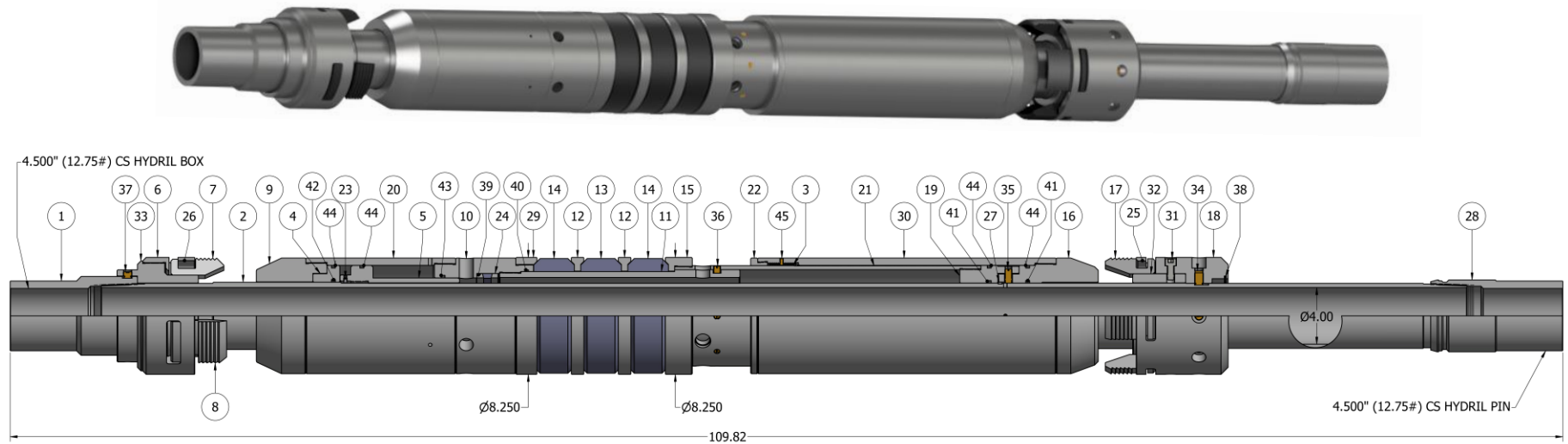
Revision: **B**

Revision Date:
11/04/2022

Authored by: J.Anderson

Approved by: J.Johnson

N) TECHNICAL ILLUSTRATION



O) REVISION HISTORY

DATE	REVISION	DESCRIPTION OF CHANGES	REVISED BY	APPROVED BY
11/04/2022	B	Revised setting initiation pressure; Added carbide options, P/N BSSSLT025C050	J.Anderson	K.Plunkett
06/20/2019	A	Created new manual	-	-