

RIGHT HAND SET / RIGHT HAND RELEASE 4" W/ 1.900" EUE (PIN DOWN) Manual No: **DL-724-4000-843** 

Revision: D

Revision Date:

05/31/2023

Authored by: J.Anderson

Approved by: K.Riggs

#### A) DESCRIPTION

The AS Retrievable Bridge Plug is a high pressure plug for multiple zone and selective single zone operations such as acidizing, fracturing, cementing and testing. It features a large internal by-pass to reduce swabbing when running and retrieving. The by-pass closes during the setting of the plug and opens prior to releasing the upper slips to equalize pressure when unsetting. The by-pass is located directly below the upper slips to help wash debris when the by-pass is open.

This tool can be set in tension or compression. It can be set shallow in unsupported casing to contain pressure while working on wellhead equipment. It can be set in tension making it ideal for setting shallow to test wellhead equipment and also deep, high-pressure wells.

The ASW Retrievable Bridge Plug is a version of the AS Retrievable Bridge Plug that allows the plug to be set on wireline or with a hydraulic setting tool, and retrieved with tubing. It cannot be reset in the wellbore once it is unset, but it can be pulled, re-dressed and run again. A Wireline Adapter Kit is required for this version.

CAUTION<sub>1</sub>: When running this tool with a packer, make sure the J-slots in the plug, running/ retrieving tool, and packer are all compatible

**NOTE**<sub>1</sub>: 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 off of the packer <u>before</u> fully setting the packer.

#### B) RELATED TOOLS (sold separately)

B-1) 4" Wireline Adapter Kit (WLAK) (P/N 72340)—refer to Technical Manual DL-723-4000-844.

B-2) 4" X 1.900" Spring Loaded Retrieving Tool (P/N 57740)—refer to Technical Manual DL-577-4000-350.

#### C) SPECIFICATION GUIDE

C	ASING	RECOMMENDED	GAGE OD	THREAD CONNECTION	PART
SIZE (INCHES)	<b>WEIGHT</b> (LBS/FT)	HOLE SIZE (INCHES)	(INCHES)	PIN DOWN	NUMBER
4	9.5 - 11.0	3.476 - 3.548	3.250	1.900 EUE	72440RR 72440RRH <sup>1</sup> 72440RRV <sup>2</sup>

Elastomer Trim Options: 1HSN, 2Viton

NOTE<sub>2</sub>: Tool listed is right-hand set / right-hand release. Additional J-slot designs are available.

DIFFERENTIAL	HANGING WEIGHT	TENSILE LOAD	TORQUE
PRESSURE	ON SET TOOL	THRU TOOL	THRU TOOL
(MAX)	(MAX)	(MAX)	(MAX)
10,000 PSI	27,500 LBS <sup><math>\dagger</math></sup>	27,500 LBS	300 FT-LBS

<sup>†</sup>Casing must be cemented for this load rating.

D & L OIL TOOLS P.O. BOX 52220 TULSA, OK 74152 PHONE: (800) 441-3504 <u>www.dloiltools.com</u>



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### D) PRE-INSTALLATION INSPECTION PROCEDURES

CAUTION<sub>2</sub>: 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

IGHT	Gl	ENERAL THREAD CO	NNECTION TORQUE RECOM	MENDATIONS	
	STUB ACME /	INTERNAL TAPH	ERED TUBING THREADS	PREMIUM THREADS	
	ACME THREADS	UP TO 2-3/8"	GREATER THAN 2-3/8"		
V	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

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.

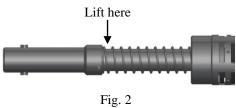
Before re-using the tool, D&L recommends disassembly and inspection of the tool. Clean parts and ensure parts are in good working condition. Replace worn or damaged parts with D&L replacement parts.

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**

- CAUTION<sub>3</sub>: Do not run the tool without properly tightening connections. Running the tool with loose connections may damage the tool and cause malfunction.
- **CAUTION**<sub>4</sub>: Lift the AS Retrievable Bridge Plug by placing the sling or chain just below the pulling head. <u>**DO NOT**</u> lift the bridge plug by the upper slip body assembly (Fig. 2).

The ASW Bridge Plug is attached to a wireline setting tool (Size #10 Baker E-4 Wireline Setting Assembly or similar) via a wireline adapter kit. when attaching the inner adapter to the bridge plug, six (6 qty) shear screws should be used to ensure proper setting.



Once the setting tool and bridge plug are run to setting depth, the setting tool is activated. The plug will set and the adapter kit will shear loose.

**NOTE**<sub>1</sub>: 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 off of the packer <u>before</u> fully setting the packer.

When set with a hydraulic setting tool, the ASW Bridge Plug is also attached with an adapter kit to the setting tool. Pressure, or pressure and tension, are used to set the plug and shear loose.

**NOTE3**: Most of the component parts are manufactured from heat treated alloy steel. Therefore, extended exposure to corrosives can be detrimental to the metallurgy. Care in cleaning the tool soon after removal from the well can help extend the life of component parts. Close inspection of the parts is necessary, after removal, to identify any parts which require replacement.



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### F) RELEASING PROCEDURES

Lower work string until the retrieving tool automatically latches to the ASW Retrievable Bridge Plug. Sand may be washed from the upper slip by circulating through the upper portion of the plug. Slack off weight, hold right-hand torque pick up to open the by-pass valve, and wait until differential pressure has equalized. Continue upward movement to release upper slips, relax packing elements and re-latch. The ASW Retrievable Bridge Plug may now be removed or relocated.

#### F-1) EMERGENCY RELEASE

If the plug will not release conventionally, slack off re-set, then pick straight up to shear J-pins (16,000# each) and release the plug Once the J-pins are sheared, the tool cannot be moved down hole.

### 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.

### H) ELASTOMER TRIM TEMPERATURE GUIDE

NITRILE (STD)				
TEMPERATURE	DUROMETER			
<b>RANGE</b> $(F^{\circ})$	END	MIDDLE	END	
40° - 125°	80	70	80	
125° - 250°	90	70	90	
150° - 250°	90	80	90	
250° +	Contact D&L Sales			

### **I) 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

- RUBBER<br/>TYPETEMPERATURE<br/>RANGE (F°)NITRILE40° 250°FHSN (HNBR)70° 300°FVITON100° 350°F
  - SCREWDRIVER SET, FLAT-TIPPED
  - SOCKET SETS
  - 3/8-INCH DRIVE
  - 1/2-INCH DRIVE
  - HAMMERS
  - SLEDGE
  - BALL PEEN
  - DEAD BLOW



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### J) DISASSEMBLY

- J-1) Clamp center coupling (10) in vise.
  - J-1.1) Unscrew and remove crossover (21) from J-slot mandrel (20).
  - J-1.2) Unscrew and remove set screws (32) from body extension (28).
  - J-1.3) Unscrew and remove shear screws (22) from body extension (28).
  - J-1.4) Unscrew body extension (28) from J-pin body (23) (NOTE4: Left-hand threads). Move body extension (28) and drag block body assembly up and out of way temporarily.
    NOTE5: Drag block body assembly must be free to rotate.
  - J-1.5) Remove J-pins (15) from J-pin body (23).
  - J-1.6) Remove J-pin body (23) from J-slot mandrel (20).
  - J-1.7) Unscrew and remove set screws (36) from body extension (28).
  - J-1.8) Unscrew and remove body extension (28) from drag block body (18) (NOTE4: Left-hand threads).
  - J-1.9) Unscrew and remove rubber mandrel cap (19) from rubber mandrel (11).
  - J-1.10) Remove drag block body assembly and disassemble:
    - J-1.10.1) Remove drag block retainer (29) from drag block body (18).
    - J-1.10.2) Wedge lower slips (17) outwards (if needed). Unscrew and remove cap screws (35) from lower slip support (30).
    - J-1.10.3) Remove lower slip support (30) from drag block body (18).
    - J-1.10.4) Remove wedges (if needed). Remove lower slips (17) and lower slip springs (25) from drag block body (18).
  - J-1.11) Unscrew and remove set screws (3) from J-slot mandrel (20).
  - J-1.12) Unscrew and remove J-slot mandrel (20) from sealing mandrel (27).
  - J-1.13) Unscrew rubber mandrel (11) from center coupling (10).
  - J-1.14) Remove rubber mandrel assembly and disassemble:

J-1.14.1) Remove elements (13, 14), rubber spacers (12), and lower cone (16) from rubber mandrel (11).

- J-1.15) Moving to upper end of tool, unscrew and remove set screws (32) from pulling head (1).
- J-1.16) Unscrew and remove pulling head (1) from upper mandrel (2). CAUTION<sub>5</sub>: Compression spring (4) is compressed with spring tension against upper slip body assembly.
- J-1.17) Remove compression spring (4) from upper mandrel (2).
- J-1.18) Unscrew and remove shear screws (22) from upper slip support (31).
- J-1.19) Remove upper slip body assembly and disassemble:
  - J-1.19.1) Wedge releasing slip (7) and upper slips (8) outward (if needed). Unscrew and remove upper slip support (31) from upper slip body (6).
  - J-1.19.2) Remove wedges (if needed). Remove releasing slip (7), upper slips (8) and upper slip springs (26) from upper slip body (6).
- J-1.20) Unscrew and remove set screws (33) from upper mandrel (2). Move upper mandrel (2) upwards as necessary to access set screws.
- J-1.21) Unscrew and remove upper mandrel (2) from sealing mandrel (27).

CAUTION6: Do NOT wrench or clamp on seal surface.

- J-1.22) Remove plug (5) from sealing mandrel (27).
  - J-1.22.1) Remove o-ring (37) from plug (5).
- J-1.23) Unscrew and remove set screws (34) from center coupling (10).



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## J) DISASSEMBLY (cont'd)

- J-1.24) Unscrew and remove upper cone (9) from center coupling (10).
  - J-1.24.1) Remove upper bonded seal (24) and o-rings (38, 39) from upper cone (9).
- J-1.25) Remove sealing mandrel (27) from center coupling (10).
- J-2) Unclamp and remove center coupling (10) from vise.
- J-3) Remove lower bonded seal (24) and o-rings (38) from center coupling (10).

## K) ASSEMBLY

- **NOTE<sub>6</sub>:** Clean and inspect all parts. Replace all worn and damaged parts. Install parts in proper order, and orientation and tighten/torque all connections properly.
- **CAUTION**<sub>7</sub>: To ensure tool operates properly, install o-rings in o-ring grooves <u>NOT</u> thread reliefs (Fig. 3).
- K-1) Install o-rings (38) in o-ring grooves in center coupling (10).
- K-2) Install lower bonded seal (24) in center coupling (10).

CAUTION<sub>8</sub>: Do not rip or tear o-ring during installation.

- K-3) Clamp center coupling (10) in vise.
  - K-3.1) Install o-rings (38, 39) in o-ring grooves in upper cone (9).
  - K-3.2) Install upper bonded seal (24) in upper cone (9). CAUTION<sub>8</sub>: Do not rip or tear o-ring during installation.
  - K-3.3) Screw upper cone (9) into center coupling (10). CAUTION<sub>8</sub>: Do not rip or tear o-ring during installation.
  - K-3.4) Screw set screws (32) into center coupling (31).
  - K-3.5) Assemble mandrel assembly and install:
    - K-3.5.1) Install o-ring (37) in o-ring groove in plug (5).
    - K-3.5.2) Install plug (5) into sealing mandrel (27).
      - CAUTION<sub>8</sub>: Do not rip or tear o-ring during installation.
    - K-3.5.3) Screw upper mandrel (2) onto sealing mandrel (27).

CAUTION6: Do NOT wrench or clamp on seal surface.

- K-3.5.4) Screw set screws (33) into upper mandrel (2).
- K-3.5.5) Install mandrel assembly into center coupling (10).

CAUTION9: Do not damage seals during installation.

K-3.6) Assemble upper slip body assembly and install:

K-3.6.1) Install upper slip springs (26), releasing slips (7), and upper slips (8) into upper slip body (6). Wedge slips outwards.

NOTE7: Install one (1 ea) spring per slip (Fig. 4).

- K-3.6.2) Screw upper slip support (31) into upper slip body (6). Remove wedges.
- K-3.6.3) Install upper slip body assembly onto upper mandrel (2). Align threaded holes in upper slip body (6) with pocket holes in upper mandrel (2).
- K-3.7) Screw shear screws (22) into upper slip body (6). Tighten until shear screws (22) make contact with upper mandrel (2). Back shear screws (22) out 1/4 turn.
- K-3.8) Install compression spring (4) onto upper mandrel (2).

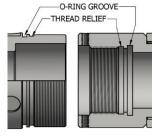
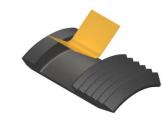


Fig. 3





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#### **K) ASSEMBLY** (cont'd)

K-3.9) Screw pulling head (1) onto upper mandrel (2).

CAUTION<sub>5</sub>: Compression spring (4) is compressed with spring tension against upper slip body assembly.

- K-3.10) Screw set screws (32) into pulling head (1).
- K-3.11) Moving to lower end of tool, screw J-slot mandrel (20) onto sealing mandrel (27).
- K-3.12) Screw set screws (3) into J-slot mandrel (20).
- K-3.13) Assemble rubber mandrel assembly and install:
  - K-3.13.1) Install lower cone (16), elements (13, 14), and rubber spacers (12) onto rubber mandrel (11).
  - K-3.13.2) Install rubber mandrel assembly onto J-slot mandrel (20) and sealing mandrel (27). Screw rubber mandrel (11) into center coupling (10).

CAUTION<sub>8</sub>: Do not rip or tear o-ring during installation.

- K-3.14) Assemble drag block body assembly and install:
  - K-3.14.1) Install lower slips (17) and lower slip springs (25) into drag block body (18). Wedge slips outward.

NOTE7: Install one (1 ea) spring per slip (Fig. 5).

- K-3.14.2) Install lower slip support into drag block body (18). Align holes in lower slip support with threaded holes in drag block body.
- K-3.14.3) Screw cap screws (35) into drag block body (18). Remove wedges.
- K-3.14.4) Install drag block retainer (29) onto drag block body (18).
- K-3.14.5) Install drag block body assembly onto rubber mandrel (11).
- K-3.15) Screw rubber mandrel cap (19) onto rubber mandrel (11).
- K-3.16) Install body extension (28) onto J-slot mandrel (20) and screw onto drag block body (18) (NOTE4: Left-hand threads).
- K-3.17) Screw set screws (36) into body extension (28).
- K-3.18) Push body extension (28) and drag block body assembly up and out of way temporarily.
- K-3.19) Install J-pin body (23) onto J-slot mandrel (20).
- K-3.20) Align holes in J-pin body (23) with lower landing in slot in J-slot mandrel (20). Install J-pins (15) into J-pin body (23) (Fig. 6).
- K-3.21) Slide drag block body assembly and body extension (35) down to J-pin body (23). Screw body extension (28) onto J-pin body (23) (NOTE<sub>4</sub>: Left-hand threads).

NOTEs: Drag block body assembly must be free to rotate.

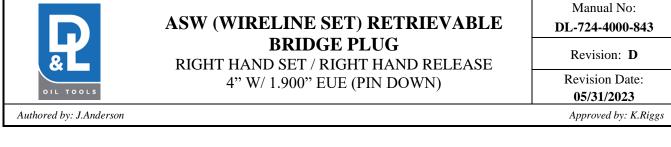
- K-3.22) Screw set screws (34) into body extension (28).
- K-3.23) Screw crossover (21) onto J-slot mandrel (20).



Fig. 6



Fig. 5



### K) ASSEMBLY (cont'd)

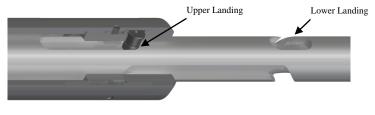


Fig. 7

K-3.24) Rotate and move J-slot mandrel (20) downwards to move J-pins (15) to upper landing in slot on J-slot mandrel (20) (Fig. 7).

CAUTIONs: Compression spring (4) is compressed with spring tension against upper slip body assembly.

- K-3.25) Align threaded holes in body extension (28) with groove in rubber mandrel cap (19). Screw shear screws (22) into body extension (35). Tighten until shear screws (22) make contact with rubber mandrel cap (19). Back shear screws (22) out 1/4 turn.
- K-4) Unclamp center coupling (10) from vise and remove assembled tool.

### L) PARTS LIST

ITEM	QTY	DESCRIPTION	MATERIAL	P/N 72440RR
1	1	PULLING HEAD	DLMS110	72435710
2	1	UPPER MANDREL	DLMS110	72440211
3	3	SET SCREW 1/4-20 UNC X 1/4	STEEL	SSS025C025
4	1	COMPRESSION SPRING	CHROME VANADIUM	72535920
5	1	PLUG	DLMS110	72535216
6	1	UPPER SLIP BODY	DLMS110	72540320
7	1	RELEASING SLIP	DLMS110	60040125
8	2	UPPER SLIP W/ CARBIDE	DLMS110	60040115C
9	1	UPPER CONE	DLMS110	72540410
10	1	CENTER COUPLING	DLMS80	72540620
11	1	RUBBER MANDREL	DLMS110	72535220
12	2	RUBBER SPACER	DLMS35	72540840
13	1	ELEMENT	70 DURO NITRILE	72040511
14	2	ELEMENT	90 DURO NITRILE	72040513
15	2	J-PIN	DLMS110	72535870
16	1	LOWER CONE	DLMS110	72540420
17	4	LOWER SLIP W/CARBIDE	DLMS110	60040135C
18	1	DRAG BLOCK BODY	DLMS110	72540335

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## L) PARTS LIST (cont'd)

ITEM	QTY	DESCRIPTION	MATERIAL	P/N 72440RR
19	1	RUBBER MANDREL CAP	DLMS60	60130230
20	1	J-SLOT MANDREL	DLMS110	72540230
21	1	CROSSOVER	DLMS80	CH1050E1900E-B
22	10	SHEAR SCREW (2375#)	DLM360BRS	60100990*
23	1	J-PIN BODY	DLMS110	72535875
24	2	BONDED SEAL	90 DURO NITRILE	60325520M
25	4	LOWER SLIP SPRING	-	7145900
26	3	UPPER SLIP SPRING	-	7045900
27	1	SEALING MANDREL	DLMS110	725740215
28	1	BODY EXTENSION	DLMS110	72440370
29	1	DRAG BLOCK RETAINER	DLMS60	72540910
30	1	LOWER SLIP SUPPORT	DLMS60	72540912
31	1	UPPER SLIP SUPPORT	DLMS110	72440325
32	3	SET SCREW 5/16-18 UNC X 5/16	STEEL	SSS031C031
33	3	SET SCREW 5/16-18 UNC X 7/16	STEEL	SSS031C043
34	5	SET SCREW 5/16-18 UNC X 3/8	STEEL	SSS031C037
35	2	CAP SCREW 1/4-20 UNC X 3/8	STEEL	SCS025C037
36	4	SET SCREW #10-24 UNC X 3/16	STEEL	SSS1024C018
37	1	203 O-RING	90 DURO NITRILE	90203
38	3	223 O-RING	90 DURO NITRILE	90223
39	1	227 O-RING	90 DURO NITRILE	90227

\*Refer to WLAK Technical Manual for placement of shear screws (6 qty) that pin bridge plug to WLAK.

REDRESS KIT (RDK)	72440050
ASSEMBLED WEIGHT	76 LBS



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# L) PARTS LIST (cont'd)

## L-1) ELASTOMER TRIM OPTIONS

**NOTE8**: For temperature range, refer to Elastomer Trim Temperature Guide.

L-1.1) HSN

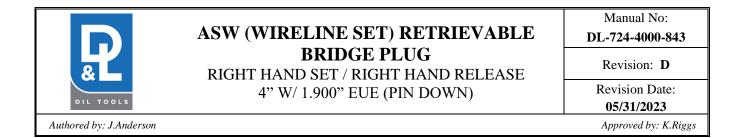
ITEM	QTY	DESCRIPTION	MATERIAL	P/N 72440RRH
13	1	ELEMENT	70 DURO HSN	72040511H
14	2	ELEMENT	90 DURO HSN	72040513H
24	2	BONDED SEAL	1026/90 DURO HSN	60325520MH
37	1	203 O-RING	90 DURO HSN	90203H
38	3	223 O-RING	90 DURO HSN	90223H
39	1	227 O-RING	90 DURO HSN	90227H

REDRESS KIT (RDK)	72440050H	

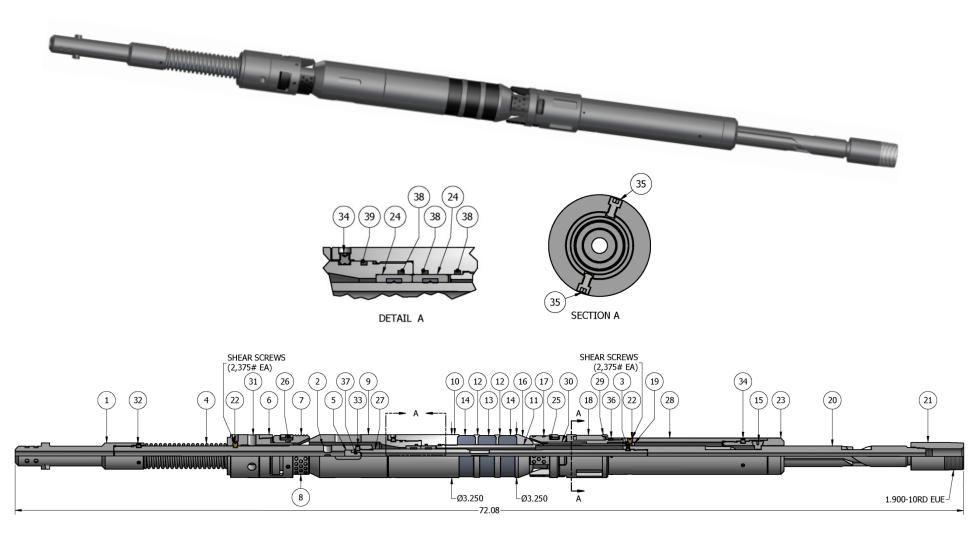
#### L-1.2) VITON

ITEM	QTY	DESCRIPTION	MATERIAL	P/N 72440RRV
13	1	ELEMENT	70 DURO VITON	72040511V
14	2	ELEMENT	90 DURO VITON	72040513V
24	2	BONDED SEAL	1026/90 DURO VITON	60325520MV
37	1	203 O-RING	90 DURO VITON	90203V
38	3	223 O-RING	90 DURO VITON	90223V
39	1	227 O-RING	90 DURO VITON	90227V

REDRESS KIT (RDK)	72440050V



#### M) TECHNICAL ILLUSTRATION



OIL TOOLS	ASW (WIRELINE SET) RETRIEVABLE BRIDGE PLUG RIGHT HAND SET / RIGHT HAND RELEASE 4" W/ 1.900" EUE (PIN DOWN)	Manual No:	
		DL-724-4000-843	
		Revision: <b>D</b>	
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## N) REVISION HISTORY

	DATE	REVISION	DESCRIPTION OF CHANGES	<b>REVISED BY</b>	APPROVED BY
	05/31/2023	D	Revised elastomer trim temp. ratings, 72540215 was 72535215, 72540230 was 72535230	J.Anderson	E.Visaez
	12/14/2015	С	Revised Elastomer Durometer Temperatures – Nitrile (90/80/90 Duro) was 250° - 300°F, Nitrile (Contact D&L Sales) was 300°F +, Rubber Type Temperature Ranges – Nitrile was 70° - 300°F, HSN was 70° - 325°F	J.Anderson	B.Oligschlaeger
	11/03/2015	В	Added max. torque thru tool, max. hanging weight on set tool, max. tensile load thru tool	J.Anderson	K.Riggs
	04/15/15	А	Created new manual	-	-