

Manual No: DL-725-6625-240

Revision: N

Revision Date: 10/19/2022

Authored by: S. White

Approved by: B. Oligschlaeger

### 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 and 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.

CAUTION1: When running this tool with a packer, make sure the J-slots in the plug, running/ retrieving tool, and packer are all compatible.

### B) RELATED TOOLS (sold separately)

B-1) 6-5/8 X 2-7/8" Spring Loaded Retrieving Tool (P/N 57765) - refer to technical manual DL-577-6625-239.

### **C) SPECIFICATION GUIDE**

	CASING				
SIZE (INCHES)	WEIGHT (LBS/FT)	RECOMMENDED HOLE SIZE (INCHES)	TOOL OD (INCHES)	THREAD CONNECTION PIN DOWN	PART NUMBER
6-5/8	24.0 - 32.0	5.675 – 5.921	5.500	2-3/8 EUE	72565RR 72565RRH <sup>1</sup> 72565RRV <sup>2</sup>

Elastomer Trim Options: <sup>1</sup>HSN, <sup>2</sup>Viton

NOTE<sub>1</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	80,000 LBS <sup>†</sup>	80,000 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 www.dloiltools.com



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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

GHT		Gl	ENERAL THREAD CO	NNECTION TORQUE RECOM	IMENDATIONS
ľ		STUB ACME /	INTERNAL TAPI	ERED TUBING THREADS	PREMIUM THREADS
	ACME THREADS	UP TO 2-3/8"	GREATER THAN 2-3/8"		
ľ		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**

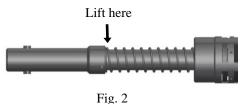
- CAUTION<sub>3</sub>: Do not run the tool without properly tightening connections. Running the tool with loose connections may damage the tool and cause malfunction.
- CAUTION<sub>4</sub>: Lift the AS Retrievable Bridge Plug by placing the sling or chain just below the pulling head. <u>DO NOT</u> lift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

#### E-1) TENSION SET

Run to setting depth while latched to its spring loaded retrieving tool. Pick up, rotate 1/4 turn to the right at the plug, and lower tubing to set lower slips. Pull tension to pack-off elements, slack off, and then pick up again to assure plug setting (14,000 lbs minimum). After setting plug, slack off tubing weight, hold left-hand torque and pick up to free tubing from plug.

#### **E-2) COMPRESSION SET**

Run to setting depth while latched to its spring-loaded retrieving tool. Pick up, rotate 1/4 turn to the right at the plug, and lower tubing to set lower slips. Slack off sufficient weight to pack-off elements, then pick up to firmly set upper slips and slack off again (14,000 lbs minimum). After setting plug, slack off tubing weight, hold left-hand torque and pick up the free tubing from plug.



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### F) RELEASING PROCEDURES

Lower tubing until the retrieving tool automatically latches to the AS 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 plug may now be removed or re-located.

#### F-1) EMERGENCY RELEASE

If the plug will not release conventionally, slack off re-set, then pick straight up to shear J-pins and release the plug (standard J-pins will shear at 40,000 lbs each – refer to Parts List for J-pins with other shear values) Once the J-pins are sheared, the tool cannot be moved down hole.

**NOTE**<sub>3</sub>: 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. After removal, close inspection of the parts is necessary to identify any parts which require replacement.

### **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 or other 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.

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

### H) ELASTOMER TRIM TEMPERATURE GUIDE

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



# **AS RETRIEVABLE BRIDGE PLUG** RIGHT-HAND SET / RIGHT-HAND RELEASE

6-5/8" W/ 2-3/8" EUE (PIN DOWN)

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### I) RECOMMENDED TOOLS

### I-1) 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

• ALIGNING PUNCH

- SNAP RING SPREADER PLIERS
- SCREWDRIVER SET, FLAT-TIPPED
   SOCKET SETS
- SOCKET SETS
  - 3/8-INCH DRIVE
    1/2-INCH DRIVE
- I/2-INCH L
   HAMMERS
  - SLEDGE
  - SLEDGE - BALL PEEN
  - DEAD BLOW

#### I-2) SPECIAL TOOLS

ITEM	QTY	DESCRIPTION	PART NUMBER
T1	1	DRAG BLOCK ASSEMBLY TOOL	AT070110

### J) DISASSEMBLY

- J-1) Clamp center coupling (10) in vise.
  - **NOTE<sub>2</sub>**: If needed, align hole in upper cone (9) with slot in sealing mandrel (27) and insert punch (or other tool) to prevent tool components from rotating during disassembly.
  - J-1.1) Unscrew and remove set screws (35) from lower end of body extension (28).
  - J-1.2) Unscrew and separate body extension (28) from J-pin body (23) (**NOTE**<sub>4</sub>: Left-hand threads). **NOTE**<sub>5</sub>: Drag block body assembly must be free to rotate.
  - J-1.3) Remove J-pins (15) from J-pin body (23).
  - J-1.4) Remove J-pin body (23) from J-slot mandrel (20).
  - J-1.5) Compress drag blocks (22) with drag block body assembly tool (T1). Unscrew and remove set screws (41) from drag block body (18). Rotate drag block retainer (21) as needed.
  - J-1.6) Unscrew and remove body extension (28) from drag block body (18) (NOTE4: Left-hand threads).
    - J-1.6.1) Remove retaining ring (31) from body extension (28).
  - J-1.7) Remove drag block retainer (21) from drag block body (18).
  - J-1.8) Release drag blocks (22). Remove drag blocks (22) and drag block springs (3) from drag block body (18).
  - J-1.9) Unscrew and remove rubber mandrel cap (19) from lower slip sleeve (32).

NOTE<sub>6</sub>: Set screws (36) in lower slip sleeve prevent it from unscrewing from rubber mandrel (11).

- J-1.10) Wedge lower slips (17) outward (if needed). Remove drag block body assembly and disassemble:
  - J-1.10.1) 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 (36) from lower slip sleeve (32).
- J-1.12) Unscrew and remove lower slip sleeve (32) from rubber mandrel (11).
- J-1.13) Unscrew and remove set screws (36) from J-slot mandrel (20).
- J-1.14) Unscrew and remove J-slot mandrel (20) from sealing mandrel (27).
- J-1.15) Unscrew rubber mandrel (11) from center coupling (10). Remove rubber mandrel assembly and disassemble: J-1.15.1) Remove elements (13, 14), rubber spacers (12), and lower cone (16) from rubber mandrel (11).
- J-1.16) Unscrew and remove gage ring (29) from center coupling (10).



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### J) DISASSEMBLY (cont'd)

- J-1.17) Moving to upper end of tool, unscrew and remove set screws (35) from pulling head (1).
- J-1.18) Unscrew and remove pulling head (1) from upper mandrel (2).

CAUTION<sub>5</sub>: Compression spring (4) is compressed with spring tension against pulling head (1).

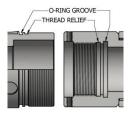
- J-1.18.1) Unscrew and remove spring retaining ring (34) from pulling head (1).
- J-1.19) Remove compression spring (4) from upper mandrel (2).
- J-1.20) Wedge slips outward (if needed). Remove upper slip body assembly and disassemble:
  - J-1.20.1) Remove wedges (if needed). Remove releasing slip (7), upper slips (8) and upper slip springs (26) from upper slip body (6).
  - J-1.20.2) Unscrew and remove upper slip support (33) from upper slip body (6).
- J-1.21) Unscrew and remove set screws (36) from upper mandrel (2). Move support sleeve (35) as necessary to access set screws (36).
- J-1.22) Unscrew and remove upper mandrel (2) from sealing mandrel (27).
- J-1.23) Remove plug (5) from sealing mandrel (27).
  - J-1.23.1) Remove o-ring (40) from plug (5).
- J-1.24) Unscrew and remove set screws (36) from upper cone (9).
- J-1.25) Unscrew and remove upper cone (9) from center coupling (10).
  - J-1.25.1) Remove seal retaining ring (30) from upper cone (9).
- J-1.26) Remove sealing mandrel (27) from center coupling (10).
- J-2) Unclamp and remove center coupling (10) from vise.
  - J-2.1) Remove bonded seals (24) and internal ring (37) from center coupling (10).
    - J-2.1.1) Remove o-rings (38) from bonded seals (24).
  - J-2.2) Remove o-ring (39) from center coupling (10).
- **NOTE**7: To redress tool assembly, follow disassembly instructions. It is recommended by D&L Oil Tools to replace all bonded seals, elements, o-rings, shear screws, etc. when redressing tool.

### K) ASSEMBLY

- **NOTE8:** 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>6</sub>: To ensure tool operates properly, install o-rings in o-ring grooves <u>NOT</u> thread reliefs (Fig. 3).
- K-1) Install o-ring (39) in groove in center coupling (10).
- K-2) Install o-rings (38) in grooves in bonded seals (24).
- K-3) Install bonded seals (24) and internal ring (37) in center coupling (10).

CAUTION7: Do not rip or tear o-rings during installation.

- K-4) Clamp center coupling (10) in vise.
  - K-4.1) Install seal retaining ring (30) in upper cone (9).
  - K-4.2) Screw upper cone (9) onto center coupling (10).
  - K-4.3) Screw set screws (36) into upper cone (9).





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### K) ASSEMBLY (cont'd)

- K-4.4) Install sealing mandrel (27) through bonded seals into center coupling (10). **CAUTION8:** Do not damage bonded seals during installation.
- K-4.5) Install o-ring (40) in groove in plug (5).
- K-4.6) Install plug (5) into end of sealing mandrel (27).

CAUTION<sub>7</sub>: Do not rip or tear o-ring during installation.

- K-4.7) Screw upper mandrel (2) onto sealing mandrel (27).
  - **NOTE**<sub>2</sub>: If needed align hole in upper cone (9) with slot in sealing mandrel (27) and insert punch (or other tool) to prevent tool components from rotating during assembly.
- K-4.8) Screw set screws (36) into upper mandrel (2).
- K-4.9) Assemble upper slip body assembly and install:

K-4.9.1) Screw upper slip support (33) onto upper slip body (6).

- K-4.9.2) Install releasing slip (7), upper slips (8) and upper slip springs (26) into upper slip body (6). **NOTE**9: Install two (2ea) springs per slip (Fig. 4).
- K-4.9.3) Wedge slips outward. Install upper slip body assembly onto upper mandrel (2). Remove wedges.
- K-4.10) Install compression spring (4) onto upper mandrel (2).
- K-4.11) Screw spring retaining ring (34) onto pulling head (1).
- K-4.12) Screw pulling head (1) onto upper mandrel (2).

CAUTION<sub>5</sub>: Compression spring (4) will be compressed with spring tension against pulling head (1).

- K-4.13) Screw set screws (35) into pulling head (1).
- K-4.14) Moving to lower end of tool, screw gage ring (29) onto center coupling (10).
- K-4.15) Assemble rubber mandrel assembly and install:
  - K-4.15.1) Install elements (13, 14), rubber spacers (12) and lower cone (16) onto rubber mandrel (11).
  - K-4.15.2) Install rubber mandrel assembly onto sealing mandrel (27).
- K-4.16) Screw rubber mandrel (11) into center coupling (10).

CAUTION<sub>7</sub>: Do not rip or tear o-ring during installation.

- K-4.17) Screw J-slot mandrel (20) onto sealing mandrel (27).
- K-4.18) Screw set screws (36) into J-slot mandrel (20).
- K-4.19) Screw lower slip sleeve (32) onto rubber mandrel (11).
- K-4.20) Screw set screws (36) into lower slip sleeve (32).
- K-4.21) Assemble drag block body assembly and install:
  - K-4.21.1) Install lower slips (17) and lower slip springs (25) into drag block body (18). Wedge slips outwards. **NOTE**<sub>10</sub>: Install two (2 ea) springs per slip (Fig. 5).
  - K-4.21.2) Install drag block body assembly onto lower slip sleeve (32). Remove wedges.
- K-4.22) Screw rubber mandrel cap (19) onto lower slip sleeve (32).







Fig. 4



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Fig. 6

### K) ASSEMBLY (cont'd)

K-4.23) Install drag blocks (22) and drag block springs (3) into drag block body (18). Compress drag blocks (22) with drag block body assembly tool (T1).

NOTE<sub>11</sub>: Install six (6 ea) springs per drag block (Fig. 6).

- K-4.24) Install drag block retainer (21) onto drag block body (18) capturing ends of drag blocks (22).
- K-4.25) Install retaining ring (31) onto body extension (28).
- K-4.26) Screw body extension (28) into drag block body (18) (**NOTE**<sub>4</sub>: Left-hand threads). Move drag block retainer (21) as necessary to access threaded holes in drag block body (18).
- K-4.27) Screw set screws (41) into drag block body (18). Release drag blocks (22).
- K-4.28) Install J-pin body (23) onto J-slot mandrel (20).



- K-4.29) Align holes in J-pin body (23) with lower tension shoulder of J-slot mandrel (20). Install J-pins (15) into J-pin body (23) (Fig. 7).
- K-4.30) Slide drag block body assembly down and screw body extension (28) onto J-pin body (23) (NOTE4: Left-hand threads).

**NOTE**<sub>5</sub>: Drag block body assembly must be free to rotate.

- K-4.31) Screw set screws (35) into body extension (28).
- K-5) Unclamp center coupling (10) from vise and remove assembled tool.

### L) PARTS LIST

ITEM	QTY	DESCRIPTION	MATERIAL	P/N 72565RR
1	1	PULLING HEAD	DLMS110	72570710
2	1	UPPER MANDREL	DLMS110	72570212
3	36	DRAG BLOCK SPRING	-	9101900
4	1	COMPRESSION SPRING	DLMCRSP	72570920
5	1	PLUG	DLMS110	72570216
6	1	UPPER SLIP CAGE	DLMS110	72465320
7	2	RELEASING SLIP	DLMS110	72565126
8	2	CARBIDE UPPER SLIP	DLMS110	72565116C
9	1	UPPER CONE	DLMS110	72465410
10	1	CENTER COUPLING	DLMS110	72566621
11	1	RUBBER MANDREL	DLMS110	72570220
12	2	RUBBER SPACER	DLMS35	72565851



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### L) PARTS LIST (cont'd)

ITEM	QTY	DESCRIPTION	MATERIAL	P/N 72565RR
13	1	ELEMENT	70 DURO NITRILE	72065511
14	2	ELEMENT	90 DURO NITRILE	72065513
				72570870-25 (25,000#)
1.5	2	J-PIN		72570870-30 (30,000#)
15	2	NOTE <sub>12</sub> : Shear value is stamped on J-pin.	DLMS110	72570870-35 (35,000#)
				72570870-40 (STD 40,000#)
16	1	LOWER CONE	DLMS110	72565420
17	4	CARBIDE LOWER SLIP	DLMS110	60065135C
18	1	DRAG BLOCK BODY	DLMS110	61365335
19	1	RUBBER MANDREL CAP	DLMS60	60070230
20	1	J-SLOT MANDREL	DLMS110	72570230
21	1	DRAG BLOCK RETAINER	DLMS60	60065910
22	6	600 CARBIDE DRAG BLOCK	DLMSDB4	9060900C
23	1	J-PIN BODY	DLMS110	72570875
24	2	BONDED SEAL	90 DURO NITRILE	60045520
25	8	LOWER SLIP SPRING	-	7170901
26	6	UPPER SLIP SPRING	-	7170902
27	1	SEALING MANDREL	DLMS110	72570214
28	1	BODY EXTENSION	DLMS110	72570370
29	1	GAGE RING	DLMS60	72565830
30	1	RETAINING RING	DLMS110	72570225
31	1	RETAINING RING	DLMS60	60065911
32	1	LOWER SLIP SLEEVE	DLMS110	72570912
33	1	UPPER SLIP PICKUP	DLMS110	72465346
34	1	SPRING RETAINING RING	DLMS110	72570820
35	9	3/8-16 UNC X 1/2 SOCKET SET SCREW	STEEL	SSS037C050
36	12	3/8-16 UNC X 3/8 SOCKET SET SCREW	STEEL	SSS037C037
37	1	SMALLEY HEAVY DUTY INTERNAL RING	DLMSC	WHM-275
38	2	1450-RING	90 DURO NITRILE	90145
39	1	234O-RING	90 DURO NITRILE	90234
40	1	322 O-RING	90 DURO NITRILE	90322
41	3	5/16-18 UNC X 3/8 SOCKET SET SCREW	STEEL	SSS031C037

REDRESS KIT (RDK)	72565050
ASSEMBLED WEIGHT	303 LBS



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### L) PARTS LIST (cont'd)

### L-1) ELASTOMER TRIM OPTIONS

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

L-1.1) HSN

ITEM	QTY	DESCRIPTION	MATERIAL	P/N 72565RRH
13	1	ELEMENT	70 DURO HSN	72065511H
14	2	ELEMENT	90 DURO HSN	72065513H
24	2	BONDED SEAL	90 DURO HSN	60045520H
38	2	1450-RING	90 DURO HSN	90145H
39	1	2340-RING	90 DURO HSN	90234H
40	1	322 O-RING	90 DURO HSN	90322H

REDRESS KIT (RDK)		72565050H
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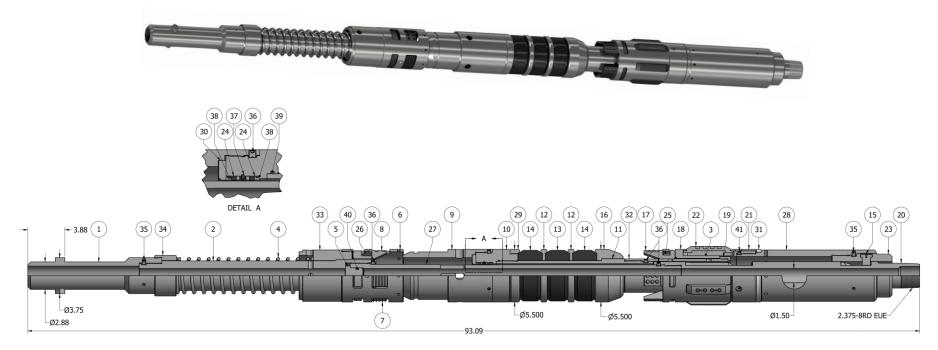
#### L-1.2) VITON

	,						
ITEM	QTY	DESCRIPTION	MATERIAL	P/N 72565RRV			
13	1	ELEMENT	70 DURO VITON	72065511V			
14	2	ELEMENT	90 DURO VITON	72065513V			
24	2	BONDED SEAL	90 DURO VITON	60045520V			
38	2	145O-RING	90 DURO VITON	90145			
39	1	2340-RING	90 DURO VITON	90234			
40	1	322 O-RING	90 DURO VITON	90322			

REDRESS KIT (RDK)	72565050V



### M) TECHNICAL ILLUSTRATION





### **N) REVISION HISTORY**

DATE	REVISION	DESCRIPTION OF CHANGES	<b>REVISED BY</b>	APPROVED BY
10/19/2022	Ν	Added SSS031C037 qty 3, SSS037C037 qty 12 was 15	J.Anderson	E.Visaez
08/30/2022	М	Revised disassembly, assembly, parts list and illustration for tool redesign	J.Anderson	E.Visaez
08/29/2017		Revised max. tensile load and hanging weight was 113,500 lbs, Elastomer Trim Temperature Guide nitrile temp. rating was 70-250°	J.Anderson	K.Riggs
12/15/2015		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 $70°$ - $325°F$		B.Oligschlaeger
10/22/2015	J	Added max. torque thru tool, max. hanging weight on set tool, max. tensile load thru tool	J.Anderson	K.Riggs
04/11/14		Revised max differential pressure was 7,000 PSI; Added Related Tools, Pre-Installation Inspection Procedures, caution for tightening connections, Storage Procedures.	S. McEntire	K. Riggs
02/24/14	G	Revised P/N 72470211 & 72570218 material was 4130-4140, P/N 72565115C, 72566411, 72566348 & 72565400 material was 4140 26-36Rc, P/N 72566355, 72566621 & 72565420 material was 4140 HT, Assembled weight was 292lbs; Added HSN and Viton options (P/N 72565RRH, 72565RRV), max. differential pressure, caution for lifting plug, Element Selection Guide, Recommended Tools, Options Parts List, Revision History		K. Riggs