



AS II PACKER, LH AUTO

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

Manual No:
DL-611-5500-1464

Revision: **B**

Revision Date:
03/29/2023

Authored by: J.Anderson

Approved by: E.Visaez

A) DESCRIPTION

The AS-II Packer is a large-opening, compression-set packer with mechanical slip hold-downs. This packer withstands high pressure from above or below by using a 3-element packing system, and upper and lower mechanical slips. A J-slot and a drag block mechanism are incorporated for easy setting. This packer has a built-in unloader which circulates across the mechanical hold-down slips to improve retrievability. The unloader has a pressure compensating piston to keep it closed when pressure is greater below the set packer.

The AS-II Packer is available in the standard J-slot arrangement - right-hand auto set with straight pick-up release. Other J-slot arrangements are available: right-hand manual set, left-hand auto set, and left-hand manual set. All J-slot arrangements are straight pick-up release.

B) SPECIFICATION GUIDE

CASING			TOOL		THREAD CONNECTION BOX UP / PIN DOWN	PART NUMBER
SIZE (INCHES)	WEIGHT (LBS/FT)	RECOMMENDED HOLE SIZE (INCHES)	GAGE OD (INCHES)	NOMINAL ID (INCHES)		
5-1/2	14.0 – 20.0	4.778 – 5.012	4.625	2.00	2-3/8 EUE	61155LS 61150LSH ¹ 61150LSV ² 61155LSC ³ 61150LSHC ⁴ 61150LSVC ⁵

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

DIFFERENTIAL PRESSURE (MAX)	TENSILE LOAD THRU TOOL (MAX)
7,000 PSI	60,000 LBS

C) 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



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C) 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.

D) SETTING PROCEDURES

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

Run to setting depth. The unloader remains open while running in. Pick up the work string and rotate 1/4 left-hand turn at the packer. Slack off weight and set down on the packer to set the slips, close the unloader and compress the packing elements. A minimum of 11,000 lbs at the packer is required to pack off the elements.

E) RELEASING PROCEDURES

Pick up on the work string to open the unloader. Allow time for the tubing and casing pressure to equalize. Continue to pick up on the work string to unset the top slips, relax the elements, and re-jays the packer. The tool may now be moved and reset, or pulled from the well.

F) 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.

G) PRESSURE AFFECTED AREA GUIDE

When set downhole, the packer mandrel is subjected to a force created by differential pressure above or below the packer that acts on the pressure affected area (i.e., the piston effect). Depending on the tubing size and weight and the seal area of the packer the force created by differential pressure acts upwards or downwards on the packer mandrel. An upward force, designated as a negative (-) value, acts to push the packer mandrel up hole and must be accounted for to ensure that the packer remains set. A downward force, designated as a positive value, acts to push the packer mandrel down hole and must be accounted for when releasing the packer. Other factors (e.g., tubing movement due to temperature change) must be considered separately to determine all the forces acting on the packer.



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G) PRESSURE AFFECTED AREA GUIDE (cont'd)

PACKER SIZE (INCHES)	TUBING SIZE (INCHES)	PRESSURE AFFECTED AREA (SQ. INCHES)	
		ABOVE	BELOW
5-1/2	1.900	4.409 (DOWN)	2.012 (DOWN)
	2.375	2.814 (DOWN)	3.102 (DOWN)

Example: Consider a 5-1/2" ASI-II Packer set on 2.375" tubing with a differential pressure of 3,000 psi in the annulus around the tubing above the packer. What is the force acting on the seal area of the mandrel?

To calculate the force (lbs) acting on the seal area of the mandrel, refer to the Pressure Affected Area Guide for a 5-1/2" packer run on 2.375" tubing. In this example, the differential pressure from above the packer acts on the seal area of the packer mandrel across a pressure affected area of 2.814 in². Multiplying the differential pressure (3,000 psi) by the pressure affected area (2.814 in²) results in a force of 8,442 lbs. The piston effect on the packer mandrel is a downward force of 8,442 lbs.

H) 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
NITRILE	40° - 250°F
HSN (HNBR)	70° - 300°F
VITON	100° - 350°F

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
- 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

I-2) OPTIONAL SPECIAL TOOLS

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



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J) DISASSEMBLY

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

J-1.1) From lower end of tool, unscrew and remove J-pin bottom sub (23) from inner mandrel (2).

NOTE₁: Drag block body assembly must be free to rotate.

J-1.2) Compress drag blocks (22) with drag block assembly tool (T1). Unscrew and remove set screws (31) from J-body (20).

J-1.3) Unscrew and remove J-body (20) from drag block body (18) (**NOTE₂:** Left-hand threads).

J-1.4) Remove drag block retainer (21) from drag block body (18).

J-1.5) Release drag block assembly tool (T1) and remove drag blocks (22) and drag block springs (3) from drag block body (18).

J-1.6) Unscrew and remove rubber mandrel cap (19) from rubber mandrel (11).

NOTE₃: For added leverage, insert a rod thru rubber retainer (15) and rubber mandrel (11) as needed.

J-1.7) Wedge lower slips (17) outwards (if needed). Remove drag block body assembly and disassemble:

J-1.7.1) Remove wedges. Remove lower slips (17) and lower slip springs (25) from drag block body (18).

J-1.8) Unscrew and remove lower cone (16) from rubber retainer (15).

J-1.9) Unscrew and remove rubber mandrel (11) from valve body (6).

J-1.10) Remove rubber mandrel assembly from inner mandrel (2) and disassemble:

J-1.10.1) Remove elements (13, 14), rubber spacers (12), and rubber retainer (15) from rubber mandrel (11).

J-1.11) Unscrew and remove valve body (6) from central body (10).

J-1.11.1) Remove o-ring (32) from valve body (6).

J-1.12) Unscrew and remove central body (10) from upper cone (9).

J-1.13) Unscrew and remove seal (24) from valve piston (29).

J-1.14) Unscrew and remove valve piston (29) from valve piston cap (28).

J-1.14.1) Remove o-ring (34) from valve piston (29).

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

CAUTION₃: Do NOT wrench or clamp on seal surface.

J-2.1) Unscrew and remove spring cage (5) from upper slip body (27).

CAUTION₄: Compression spring has tension against slip body assembly.

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

J-2.3) Remove compression spring (4) from inner mandrel (2).

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

J-2.4.1) Remove wedges. Remove releasing slip (7), upper slips (8), and upper slip springs (26) from upper slip body (27).

J-2.5) Remove upper cone (9), compensating piston (30), and valve piston cap (28) from inner mandrel (2).

J-2.5.1) Remove o-ring (33) from upper cone (9).

J-2.5.2) Remove o-rings (33, 34) from compensating piston (30).

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



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K) ASSEMBLY

NOTE₆: 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 (Fig. 2).

K-1) Clamp lower end of inner mandrel (2) in vise.

CAUTION₃: Do **NOT** wrench or clamp on seal surface.

K-1.1) Install o-rings (33, 34) in o-ring grooves in compensating piston (6).

K-1.2) Install valve piston cap (28) onto inner mandrel (2).

K-1.3) Install compensating piston (30) onto inner mandrel (2). Install compensating piston (30) in the correction orientation to ensure tool works properly.

CAUTION₆: Do **NOT** rip or tear o-ring while installing.

K-1.4) Install o-ring (33) in groove in upper cone (9).

K-1.5) Install upper cone (9) onto inner mandrel (2).

CAUTION₆: Do **NOT** rip or tear o-ring while installing.

K-1.6) Assemble upper slip body assembly and install:

K-1.6.1) Install releasing slip (7), upper slips (8), and upper slip springs (26) into spring cage (5). Wedge slips outward.

NOTE₄: Install two (2 ea) springs per slip.

K-1.6.2) Install upper slip body assembly onto inner mandrel (2). Release slips.

K-1.7) Install compression spring (4) onto inner mandrel (2).

K-1.8) Screw top sub (1) onto inner mandrel (2).

K-1.9) Screw spring cage (5) into upper slip body (27).

CAUTION₄: Compression spring has tension against slip body assembly.

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

K-2.1) Install o-ring (34) in o-ring groove in valve piston (29).

K-2.2) Install valve piston (29) onto inner mandrel (2) and screw into valve piston cap (28).

K-2.3) Screw seal (24) onto valve piston (29).

CAUTION₇: Do **NOT** rip or tear rubber seal while installing.

K-2.4) Screw central body (10) onto upper cone (9).

CAUTION₆: Do **NOT** rip or tear o-ring while installing.

K-2.5) Install o-ring (32) in o-ring groove in valve body (6).

K-2.6) Screw valve body (6) into central body (10).

K-2.7) Assemble rubber mandrel assembly and install:

K-2.7.1) Install rubber retainer (15), elements (13, 14), and rubber spacers (12) onto rubber mandrel (11).

K-2.7.2) Install rubber mandrel assembly onto inner mandrel (2). Screw rubber mandrel (11) into valve body (6).

CAUTION₆: Do **NOT** rip or tear o-ring while installing.

K-2.8) Screw lower cone (16) into rubber retainer (15).

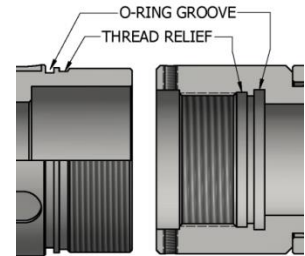


Fig. 2



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K) ASSEMBLY (cont'd)

K-2.9) Assemble and install drag block body assembly:

K-2.9.1) Install lower slips (17) and lower slip springs (25) into drag block body (18). Wedge slips outwards.

NOTE₄: Install two (2 ea) springs per slip.

K-2.9.2) Install drag block body assembly onto rubber mandrel (11). Release wedges.

K-2.10) Screw rubber mandrel cap (19) onto rubber mandrel (11).

NOTE₃: For added leverage, insert a rod thru rubber retainer (15) and rubber mandrel (11) as needed.

K-2.11) Install drag blocks (22) and drag block springs (3) in drag block body (18). Compress drag blocks (22) with drag block assembly tool (T1).

NOTE₅: Install five (5 ea) springs per slip.

K-2.12) Install drag block retainer (21) onto drag block body (18) capturing lower ends of drag blocks (22).

K-2.13) Screw J-body (20) onto drag block body (18) (**NOTE₂:** Left-hand threads).

K-2.14) Screw set screws (31) into drag block body (18).

K-2.15) Remove drag block assembly tool (T1).

K-2.16) Screw J-pin bottom sub (23) onto inner mandrel (2).

NOTE₁: The drag block body assembly must be free to rotate.

K-3) Unclamp top sub (1) from vise and remove assembled tool.

L) PARTS LIST

ITEM	QTY	DESCRIPTION	MATERIAL	P/N 61155LS
1	1	TOP SUB	DLMS60	60055610
2	1	INNER MANDREL	L-80	61055210
3	20	DRAG BLOCK SPRING	-	9100900
4	1	COMPRESSION SPRING	DLMCRSP	61055920
5	1	SPRING CAGE	DLMS60	61055310
6	1	VALVE BODY	DLMS80	61155350
7	1	RELEASING SLIP	DLMS110	60055125
8	2	UPPER SLIP	DLMS35	60055115
9	1	UPPER CONE	DLMS60	61055410
10	1	CENTRAL BODY	DLMS110	61055370
11	1	RUBBER MANDREL	DLMS60	61055220
12	2	RUBBER SPACER	DLMS60	60255840
13	1	ELEMENT	70 DURO NITRILE	60255511
14	2	ELEMENT	90 DURO NITRILE	60255513
15	1	RUBBER RETAINER	DLMS60	61155850
16	1	LOWER CONE	DLMS60	60055420
17	4	LOWER SLIP	DLMS60	60055135



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L) PARTS LIST (cont'd)

ITEM	QTY	DESCRIPTION	MATERIAL	P/N 61155LS
18	1	DRAG BLOCK BODY	DLMS35	60055335
19	1	RUBBER MANDREL CAP	DLMS60	60055230
20	1	J-BODY	DLMS60	61055341
21	1	DRAG BLOCK RETAINER	DLMS60	60055910
22	4	DRAG BLOCK	DLMSDB8	9055900
23	1	BOTTOM SUB	DLMS110	61055630
24	1	SEAL	DLMS60 / 90 DURO NITRILE	61155520
25	8	LOWER SLIP SPRING	-	7155901
26	6	UPPER SLIP SPRING	-	7155902
27	1	UPPER SLIP BODY	DLMS60	60055320
28	1	VALVE PISTON CAP	DLMS60	61155720
29	1	VALVE PISTON	DLMS80	61155730
30	1	COMPENSATING PISTON	DLMS60	61055710
31	4	5/16-18 UNC X 1/2 SOCKET SET SCREW	STEEL	SSS031C050
32	1	234 O-RING	90 DURO NITRILE	90234
33	2	334 O-RING	90 DURO NITRILE	90334
34	2	342 O-RING	90 DURO NITRILE	90342

REDRESS KIT (RDK)		61155050
ASSEMBLED WEIGHT		166 LBS



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L) PARTS LIST (cont'd)

L-1) ELASTOMER TRIM OPTIONS

NOTE7: For temperature range, refer to Elastomer Trim Temperature Guide.

L-1.1) HSN

ITEM	QTY	DESCRIPTION	MATERIAL	P/N 61155LSH
13	1	ELEMENT	70 DURO HSN	60255511H
14	2	ELEMENT	90 DURO HSN	60255513H
24	1	BONDED SEAL	DLMS60 / 90 DURO HSN	61155520H
32	1	234 O-RING	90 DURO HSN	90234H
33	2	334 O-RING	90 DURO HSN	90334H
34	2	342 O-RING	90 DURO HSN	90342H

REDRESS KIT (RDK)		61155050H
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L-1.2) VITON

ITEM	QTY	DESCRIPTION	MATERIAL	P/N 61155LSV
13	1	ELEMENT	70 DURO VITON	60255511V
14	2	ELEMENT	90 DURO VITON	60255513V
24	1	BONDED SEAL	DLMS60 / 90 DURO VITON	61155520V
32	1	234 O-RING	90 DURO VITON	90234V
33	2	334 O-RING	90 DURO VITON	90334V
34	2	342 O-RING	90 DURO VITON	90342V

REDRESS KIT (RDK)		61155050V
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L-2) CARBIDE OPTION

ITEM	QTY	DESCRIPTION	MATERIAL	P/N 61155LSC
8	2	CARBIDE UPPER SLIP	DLMS110	60055115C
17	4	CARBIDE LOWER SLIP	DLMS110	60055135C
22	4	CARBIDE DRAG BLOCK	DLMSDB4	9055900C



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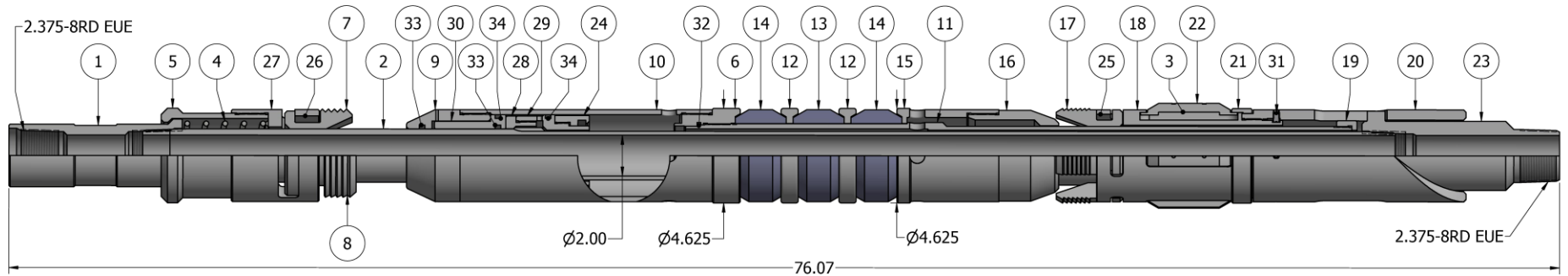
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Approved by: *E.Visaez*

M) TECHNICAL ILLUSTRATION



N) REVISION HISTORY

DATE	REVISION	DESCRIPTION OF CHANGES	REVISED BY	APPROVED BY
03/29/2023	B	Revised 61055341 was 61055340	J.Anderson	K.Plunkett
05/14/2021	A	Created manual	-	-