



AS II PACKER, RH AUTO

5" X 2-3/8"

Manual No:
DL-611-5000-1227

Revision: **C**

Revision Date:
08/29/2023

Authored by: J.Anderson

Approved by: D.Hushbeck

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	11.5 – 18.0	4.276 – 4.560	4.125	1.94	2-3/8 EUE	61150RS 61150RSH ¹ 61150RSV ² 61150RSC ³ 61150RSHC ⁴ 61150RSVC ⁵
	18.0 – 20.8	4.156 – 4.276	4.000	1.94	2-3/8 EUE	61152RS 61152RSH ¹ 61152RSV ² 61152RSC ³ 61152RSHC ⁴ 61152RSVC 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.



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C) 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.

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 right-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 10,000 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	1.900	1.457 (DOWN)	0.133 (DOWN)
	2.375	1.457 (DOWN)	1.223 (DOWN)

Example: Consider a 5" X 2-3/8" 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" X 2-3/8" ASI-II 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 1.457 in². Multiplying the differential pressure (3,000 PSI) by the pressure affected area (1.457 in²) results in a force of 4,371 lbs. The piston effect on the packer mandrel is a downward force of 4,371 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: The 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) Release and remove drag blocks (22) and drag block springs (3) from drag block body (18).

J-1.5) 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-1.6) Wedge lower slips (17) outwards (if needed). Remove drag block body assembly and disassemble:

J-1.6.1) Remove wedges. Remove lower slips (17) and lower slip springs (25) from drag block body (18).

J-1.7) Unscrew and remove lower cone (16) from rubber retainer (15).

J-1.8) Unscrew and remove rubber mandrel (11) from valve body (6).

J-1.9) Remove rubber mandrel assembly from inner mandrel (2) and disassemble:

J-1.9.1) Remove elements (13, 14), rubber spacers (12), and rubber retainer (15) from rubber mandrel (11).

J-1.10) Unscrew and remove valve body (6) from central body (10).

J-1.10.1) Remove o-ring (32) from valve body (6).

J-1.11) Unscrew and remove central body (10) from upper cone (9).

J-1.12) Unscrew and remove seal (24) from valve piston (29).

J-1.13) Unscrew and remove valve piston (29) from valve piston cap (28).

J-1.13.1) 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 cap (27) from spring cage (5).

CAUTION₄: Compression spring has tension against spring cage assembly.

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

J-2.3) Remove compression spring (4) from spring cage (5).

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

J-2.4.1) Remove wedges. Remove releasing slip (7), upper slips (8), and upper slip springs (26) from spring cage (5).

J-2.4.2) Remove spring retaining ring (21) from spring cage (5).

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) and compensating piston (30) 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 (Fig. 3).

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 spring cage assembly and install:

K-1.6.1) Install spring retaining ring (21) into spring cage (5).

K-1.6.2) Install releasing slip (7), upper slips (8), and upper slip springs (26) into spring cage (5). Wedge slips outward.

NOTE₄: Install one (1 ea) spring per slip.

K-1.6.3) Install spring cage assembly onto inner mandrel (2). Release slips.

K-1.7) Install compression spring (4) into spring cage (5).

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

K-1.9) Screw spring cage cap (27) into spring cage (5).

CAUTION₄: Compression spring has tension against spring cage 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).

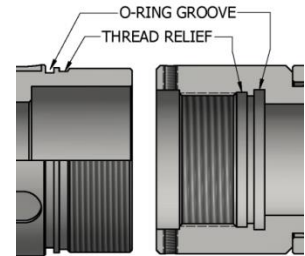


Fig. 2

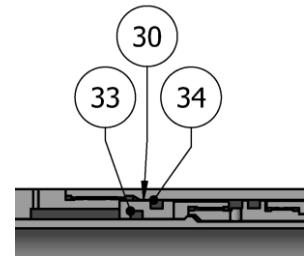


Fig. 3



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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 one (1 ea) spring 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 three (3 ea) springs per slip.

K-2.12) Screw J-body (20) onto drag block body (18) (**NOTE₂:** Left-hand threads).

K-2.13) Screw set screws (31) into drag block body (18).

K-2.14) Remove drag block assembly tool (T1).

K-2.15) 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 61150RS	P/N 61152RS
1	1	TOP SUB	DLMS80	60145610	
2	1	INNER MANDREL	DLMS80	61045210	
3	12	DRAW BLOCK SPRING	-	9100900	
4	1	COMPRESSION SPRING	DLMSRSP	61045920	
5	1	SPRING CAGE	DLMS60	61050325	
6	1	VALVE BODY	DLMS80	61150350	61152350
7	1	RELEASING SLIP	DLMS110	60050125	
8	2	UPPER SLIP	DLMS35	60050115	
9	1	UPPER CONE	DLMS110	61045411	
10	1	CENTRAL BODY	DLMS80	61045370	
11	1	RUBBER MANDREL	DLMS80	61045220	
12	2	RUBBER SPACER	DLMS35	60250840	60252840
13	1	ELEMENT	70 DURO NITRILE	60250511	60252511
14	2	ELEMENT	90 DURO NITRILE	60250513	60252513
15	1	RUBBER RETAINER	DLMS60	60250850	60252850
16	1	LOWER CONE	DLMS60	60045420	
17	4	LOWER SLIP	DLMS35	60050135	



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L) PARTS LIST (cont'd)

ITM	QTY	DESCRIPTION	MATERIAL	P/N 61150RS	P/N 61152RS
18	1	DRAG BLOCK BODY	DLMS60	60050335	
19	1	RUBBER MANDREL CAP	DLMS110	61345230	
20	1	J-BODY	DLMS60	61045340	
21	1	SPRING RETAINING RING	DLMS60	60045820	
22	4	DRAG BLOCK	DLMSDB8	9057900	
23	1	BOTTOM SUB	DLMS110	61045630	
24	1	BONDED SEAL	90 DURO NITRILE	61145520	
25	4	LOWER SLIP SPRING	-	7145901	
26	3	UPPER SLIP SPRING	-	7145902	
27	1	SPRING CAGE CAP	DLMS60	60045810	
28	1	VALVE PISTON CAP	DLMS60	61145720	
29	1	VALVE PISTON	DLMS110	61145730	
30	1	COMPENSATING PISTON	DLMS60	61045710	
31	4	SOCKET SET SCREW 1/4-20 UNC X 3/8	STEEL	SSS025C037	
32	1	231 O-RING	90 DURO NITRILE	90231	
33	2	332 O-RING	90 DURO NITRILE	90332	
34	2	336 O-RING	90 DURO NITRILE	90336	

REDRESS KIT (RDK)		61150050	61152050
ASSEMBLED WEIGHT		110 LBS	110 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 61150RSH	P/N 61152RSH
13	1	ELEMENT	70 DURO HSN	60250511H	60252511H
14	2	ELEMENT	90 DURO HSN	60250513H	60252513H
24	1	BONDED SEAL	90 DURO HSN	61145520H	
32	1	231 O-RING	90 DURO HSN	90231H	
33	2	332 O-RING	90 DURO HSN	90332H	
34	2	336 O-RING	90 DURO HSN	90336H	

REDRESS KIT (RDK)		61150050H	61152050H
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L-1.2) VITON

ITEM	QTY	DESCRIPTION	MATERIAL	P/N 61150RSV	P/N 61152RSV
13	1	ELEMENT	70 DURO VITON	60250511V	60252511V
14	2	ELEMENT	90 DURO VITON	60250513V	60252513V
24	1	BONDED SEAL	90 DURO VITON	61145520V	
32	1	231 O-RING	90 DURO VITON	90231V	
33	2	332 O-RING	90 DURO VITON	90332V	
34	2	336 O-RING	90 DURO VITON	90336V	

REDRESS KIT (RDK)		61150050V	61152050V
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L-2) CARBIDE OPTIONS

ITEM	QTY	DESCRIPTION	MATERIAL	P/N 61150RSC	P/N 61152RSC
8	2	CARBIDE UPPER SLIP	DLMS110	60050115C	
17	4	CARBIDE LOWER SLIP	DLMS110	60050135C	
22	4	CARBIDE DRAG BLOCK	DLMSDB4	9057900C	



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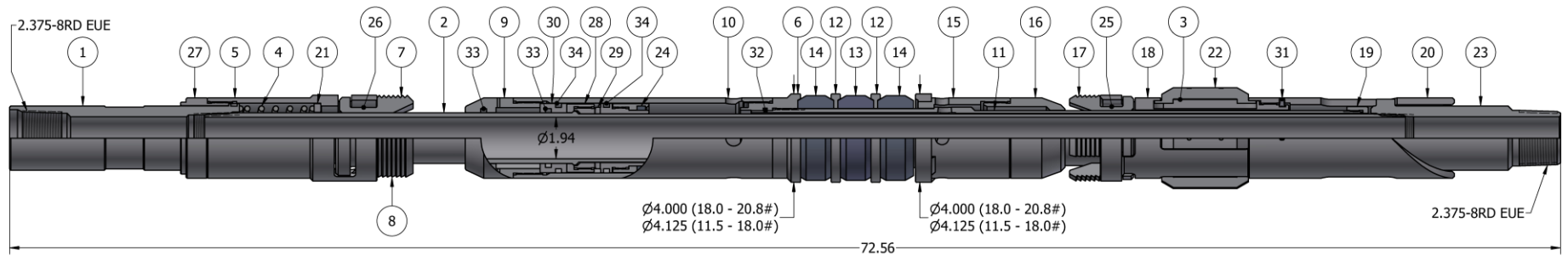
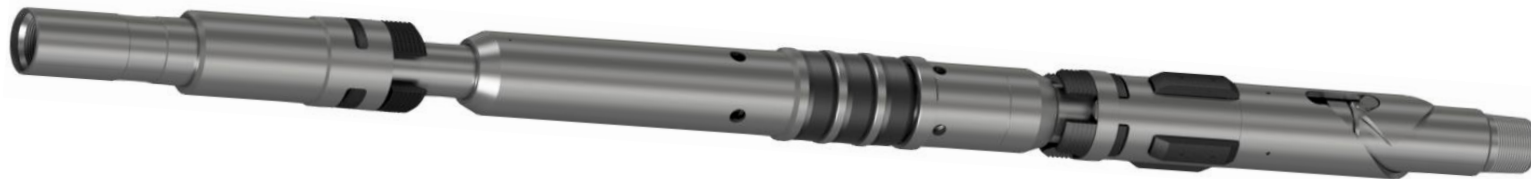
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M) TECHNICAL ILLUSTRATION



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N) REVISION HISTORY

DATE	REVISION	DESCRIPTION OF CHANGES	REVISED BY	APPROVED BY
08/29/2023	C	Added Carbide options	J.Anderson	E.Visaez
05/15/2023	B	Revised weight range 18.0-20.8# for P/N 61152RS was 18.0-21.4#	J.Anderson	E.Visaez
04/16/2019	A	Created new manual	-	-