



AS II PACKER, RIGHT-HAND MANUAL 6-5/8" X 2-7/8"

Manual No:
DL-611-6625-1599

Revision: **A**

Revision Date:
07/12/2022

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)		
6-5/8	17.0 – 24.0	5.921 - 6.135	5.750	2.50	2-7/8 EUE	61167RM 61167RMH ¹ 61167RMV ² 61167RMC ³ 61167RMHC ⁴ 61167RMVC ⁵
	24.0 – 32.0	5.675 – 5.921	5.500	2.50	2-7/8 EUE	61165RM 61165RMH ¹ 61165RMV ² 61165RMC ³ 61165RMHC ⁴ 61165RMVC ⁵

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

DIFFERENTIAL PRESSURE (MAX)	TENSILE LOAD THRU TOOL (MAX)
7,000 PSI	121,000 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

CAUTION₂: 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 14,000 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. Rotate to the left a 1/4 turn at the packer and set down to return the J-pin to the running position in the J-slot. 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
6-5/8	2.375	6.834 (DOWN)	3.979 (DOWN)
	2.875	4.772 (DOWN)	5.533 (DOWN)
	3.500	1.643 (DOWN)	7.884 (DOWN)

Example: Consider a 6-5/8" X 2-7/8" ASI-II Packer set on 2.875" 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 6-5/8" X 2-7/8" ASI-II Packer run on 2.875" 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 4.772 in². Multiplying the differential pressure (3,000 psi) by the pressure affected area (4.772 in²) results in a force of 14,316 lbs. The piston effect on the packer mandrel is a downward force of 14,316 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) Unscrew and remove J-pin bottom sub (23) from inner mandrel (2).

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

J-1.2) Compress drag blocks (22) using drag block body assembly tool (T1). Rotate drag block retainer (21) as needed to unscrew and remove set screws (33) from drag block body (18).

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

J-1.3.1) Remove retaining ring (29) from J-body (20).

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

J-1.5) Release and remove drag blocks (22) and drag block springs (3).

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 rubber mandrel (11) from valve body (31). 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 (31) from central body (10).

J-1.10.1) Remove o-ring (34) from valve body (31).

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

J-1.12) Unscrew and remove seal (24) from valve piston (32).

J-1.13) Unscrew and remove valve piston (32) from valve piston cap (27).

J-1.13.1) Remove o-ring (36) from valve piston (32).

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 (26) from spring cage (5).

CAUTION₄: Compression spring has tension against upper slip body 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 upper slip body assembly and disassemble:

J-2.4.1) Remove wedges. Remove releasing slip (7), upper slips (8), and upper slip springs (25 or 37) from upper slip body (6).

J-2.4.2) Unscrew and remove spring cage (5) from upper slip body (6).

J-2.4.3) Remove spring retaining ring (30) from upper slip body (6).

J-2.5) Remove upper cone (9), compensating piston (28), and valve piston cap (27) from inner mandrel (2).

J-2.5.1) Remove o-rings (35, 36) from compensating piston (28).

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



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K) ASSEMBLY

NOTE4: 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 (35, 36) in grooves in compensating piston (6).

K-1.2) Install valve piston cap (27) and compensating piston (28) onto inner mandrel (2).

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

K-1.3) Install upper cone (9) onto inner mandrel (2).

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

K-1.4) Assemble upper slip body assembly and install:

K-1.4.1) Install spring retaining ring (30) into upper slip body (6).

K-1.4.2) Screw spring cage (5) into upper slip body (6).

K-1.4.3) Install releasing slip (7), upper slips (8), and upper slip springs (25 or 37) into spring cage (5).

K-1.4.4) Wedge slips outward (if needed). Install upper slip body assembly onto inner mandrel (2).

K-1.5) Install compression spring (4) into upper slip body (6).

K-1.6) Screw top sub (1) onto inner mandrel (2).

K-1.7) Screw spring cage cap (26) into spring cage (5). Remove wedges.

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 (36) in groove in valve piston (32).

K-2.2) Screw valve piston (32) onto valve piston cap (27).

K-2.3) Screw seal (24) onto valve piston (32).

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 (34) in groove in valve body (31).

K-2.6) Screw valve body (31) into central body (10).

K-2.7) Assemble rubber mandrel assy and install:

K-2.7.1) Slide 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 (31).

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

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

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).

K-2.9.2) Wedge slips outward (if needed). Slide drag block body assembly onto rubber mandrel (11).

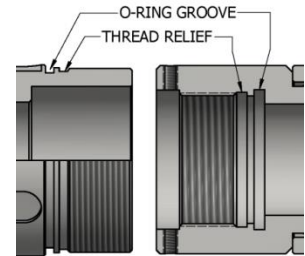


Fig. 2



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K) ASSEMBLY (cont'd)

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) using drag block body assembly tool (T1).

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

NOTE₅: Align holes in drag block retainer (21) to access threaded holes in drag block body (18).

K-2.13) Install retaining ring (29) onto J-body (20).

K-2.14) Screw J-body (20) onto drag block body (18) (**NOTE₂:** Left-hand threads).

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

K-2.15) Screw set screws (33) into drag block body (18).

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 61167RM	P/N 61165RM
1	1	TOP SUB	DLMS80	60070610	
2	1	INNER MANDREL	DLMS80	61067210	61070210
3	24	DRAG BLOCK SPRING		9101900	
4	1	COMPRESSION SPRING	DLMCRSP	61070920	
5	1	SPRING CAGE	DLMS60	61070310	
6	1	UPPER SLIP BODY	DLMS110	61167320HT	60065320
7	1	RELEASING SLIP	DLMS110	60070125	60065125
8	2	UPPER SLIP	DLMS35	60070115	60065115
9	1	UPPER CONE	DLMS80	61067410	61065410
10	1	CENTRAL BODY	DLMS110	61065370	
11	1	RUBBER MANDREL	DLMS80 / DLMS60	61067220	61065220
12	2	RUBBER SPACER	DLMS60	60267840	60265840
13	1	ELEMENT	70 DURO NITRILE	60267511	60265511
14	2	ELEMENT	90 DURO NITRILE	60267513	60265513
15	1	RUBBER RETAINER	DLMS35	61167850	60365850
16	1	LOWER CONE	DLMS80	61167420	60065420
17	4	LOWER SLIP	DLMS35	60070135	60065135
18	1	DRAG BLOCK BODY	DLMS80	60067335	60065335
19	1	RUBBER MANDREL CAP	DLMS60	60070230	
20	1	J-BODY	DLMS60	61070342	
21	1	DRAG BLOCK RETAINER	DLMS60	60067910	60065910
22	4	600 DRAG BLOCK	DLMSDB8	9060900	



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L) PARTS LIST (cont'd)

ITEM	QTY	DESCRIPTION	MATERIAL	P/N 61167RM	P/N 61165RM
23	1	BOTTOM SUB	DLMS80	61070630	
24	1	SEAL	90 DURO NITRILE	61170520	
25	-	LOWER SLIP SPRING	-	7170901 10 QTY	8 QTY
26	1	SPRING CAGE CAP	DLMS35	61167810	60065810
27	1	VALVE PISTON CAP	DLMS80	61070720	
28	1	COMPENSATING PISTON	DLMS60	61070710	
29	1	RETAINING RING	DLMS60	60070911	60065911
30	1	SPRING RETAINING RING	DLMS60	60070820	
31	1	VALVE BODY	DLMS80	61167350	61165350
32	1	VALVE PISTON	DLMS60	61170730	
33	3	5/16-18 UNC X 7/16 SOCKET SET SCREW	STEEL	SSS031C043	
34	1	242 O-RING	90 DURO NITRILE	90242	
35	1	338 O-RING	90 DURO NITRILE	90338	
36	2	350 O-RING	90 DURO NITRILE	90350	
37	6	UPPER SLIP SPRING		-	7170902

REDRESS KIT (RDK)		61167050	61165050
ASSEMBLED WEIGHT		271 LBS	255 LBS

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 61167RMH	P/N 61165RMH
13	1	ELEMENT	70 DURO HSN	60267511H	60265511H
14	2	ELEMENT	90 DURO HSN	60267513H	60265513H
24	1	SEAL	90 DURO HSN	61170520H	
34	1	242 O-RING	90 DURO HSN	90242H	
35	1	338 O-RING	90 DURO HSN	90338H	
36	2	350 O-RING	90 DURO HSN	90350H	

REDRESS KIT (RDK)		61167050H	61165050H
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L) PARTS LIST (cont'd)

L-1.2) VITON

ITEM	QTY	DESCRIPTION	MATERIAL	P/N 61167RMV	P/N 61165RMV
13	1	ELEMENT	70 DURO VITON	60267511V	60265511V
14	2	ELEMENT	90 DURO VITON	60267513V	60265513V
24	1	SEAL	90 DURO VITON	61170520V	
34	1	242 O-RING	90 DURO VITON	90242V	
35	1	338 O-RING	90 DURO VITON	90338V	
36	2	350 O-RING	90 DURO VITON	90350V	

REDRESS KIT (RDK)		61167050V	61165050V
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L-2) CARBIDE OPTIONS

ITEM	QTY	DESCRIPTION	MATERIAL	P/N 61167RMC	P/N 61165RMC
8	2	CARBIDE UPPER SLIP	DLMS110	60070115C	60065115C
17	4	CARBIDE LOWER SLIP	DLMS110	60070135C	60065135C
22	4	600 DRAG BLOCK	DLMSDB4	9060900C	



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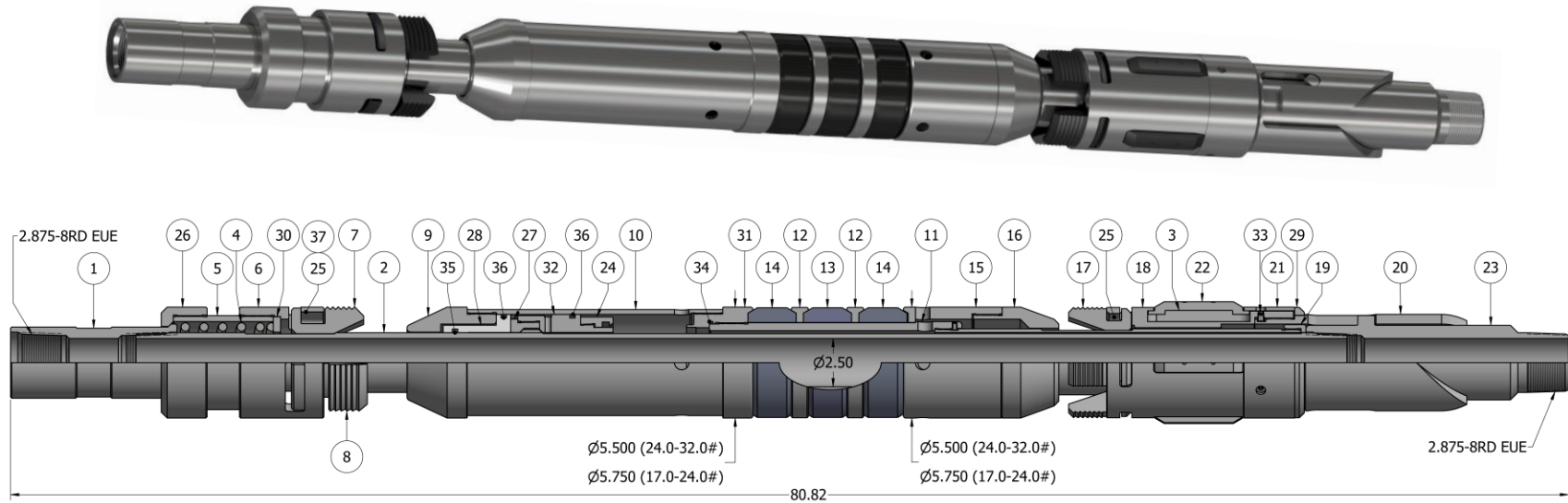
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M) TECHNICAL ILLUSTRATION



N) REVISION HISTORY

DATE	REVISION	DESCRIPTION OF CHANGES	REVISED BY	APPROVED BY
07/12/2022	A	Created manual	-	-