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)		
5-3/4	17.6 – 19.4	5.083 – 5.146	4.875	2.38	2-7/8 EUE	61158YHT 61158YHTH[1] 61158YHTV[2]

Elastomer Trim Options: [1]HSN, [2]Viton

NOTE$_1$: Tools listed are right-hand set / straight pick-up release.

DIFFERENTIAL PRESSURE (MAX)	TENSILE LOAD THRU TOOL (MAX)
10,000 PSI	110,000 LBS

C) PRE-INSTALLATION INSPECTION PROCEDURES

CAUTION$_1$: 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.

Before first use, D&L recommends disassembly and inspection of the tools 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.

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 part information.

D) SETTING PROCEDURES

CAUTION$_2$: 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 weight of 12,000 lbs at the packer is required to pack off the elements.

E) RELEASING PROCEDURES

Pick up on the work string to open the unloader, allowing a minimum of 5 minutes for the tubing and casing pressure to equalize. Continue upward movement of the work string to un-set the slips, relax the packing elements, and re-jay 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) ELASTOMER TRIM TEMPERATURE GUIDE

NITRILE (STD)			
TEMPERATURE RANGE (F°)	**DUROMETER**		
	END	**MIDDLE**	**END**
70° - 125°	80	70	80
125° - 250°	90	70	90
150° - 250°	90	80	90
250° +	Contact D&L Sales		

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

H) RECOMMENDED TOOLS

H-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
- 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

H-2) SPECIAL TOOLS

ITEM	QTY	DESCRIPTION	PART NUMBER
T1	1	DRAG BLOCK ASSEMBLY TOOL	AT055110

I) DISASSEMBLY

NOTE$_4$: For added leverage, insert a rod through rubber retainer (15) and rubber mandrel (11) as needed.

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

I-1.1) Unscrew and remove J-pin bottom sub (23) from inner mandrel (2).

NOTE$_2$: Drag block body (18) must be free to rotate.

I-1.2) Compress drag blocks (22) with drag block assembly tool (T1).

I-1.3) Unscrew and remove set screws (30) from J-body (20).

I-1.4) Unscrew and remove J-body (20) from drag block body (18) (**NOTE$_3$**: Left-hand threads).

I-1.5) Remove drag block retainer (31) from drag block body (18).

I-1.6) Release drag blocks (22). Remove drag blocks (22) and drag block springs (3) from drag block body (18).

I-1.7) Unscrew and remove rubber mandrel cap (19) from rubber mandrel (11).

I-1.8) Wedge lower slips (17) outwards (if needed). Remove drag block body assembly and disassemble:

I-1.8.1) Remove wedges (if needed). Remove lower slips (17) and lower slip springs (25) from drag block body (18).

I-1.9) Unscrew and remove lower cone (16) from rubber retainer (15).

I-1.10) Unscrew rubber mandrel (11) from valve body (21).

I-1.11) Remove rubber mandrel assembly and disassemble:

I-1.11.1) Remove elements (13, 14), rubber spacers (12), and rubber retainer (15) from rubber mandrel (37).

I-1.12) Unscrew and remove valve body (21) from central body (10).

I-1.12.1) Remove o-ring (32) from valve body (21).

I-1.13) Unscrew and remove central body (10) from upper cone (9).

I-1.14) Unscrew and remove seal (24) from valve piston (29).

I-1.14.1) Remove o-ring (34) from seal (24).

I-1.15) Unscrew and remove valve piston (29) from valve piston cap (28).

CAUTION$_4$: Do NOT wrench on seal surface.

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

CAUTION$_4$: Do NOT wrench or clamp on seal surface.

I) DISASSEMBLY (cont'd)

I-2.1) Unscrew and remove spring cage cap (27) from spring cage (5).

CAUTION$_3$: Compression spring (4) is compressed with spring tension against spring cage assembly (5).

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

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

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

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

I-2.5) Remove upper cone (9) from inner mandrel (2).

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

I-2.6) Remove compensating piston (6) from inner mandrel (2).

I-2.6.1) Remove o-rings (32, 34) from compensating piston (6).

I-2.7) Remove valve piston cap (28) from inner mandrel (2).

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

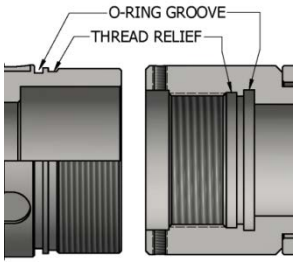


Fig. 2

J) ASSEMBLY

NOTE$_5$: 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$_5$: To ensure tool operates properly, install o-rings in o-ring grooves **NOT** thread reliefs (Fig. 2).

J-1) Clamp inner mandrel (2) in vise.

CAUTION$_4$: Do NOT wrench or clamp on seal surface.

J-1.1) From upper end of tool, install valve piston cap (28) onto inner mandrel (2).

J-1.2) Install o-rings (32) in inner o-ring grooves and o-rings (34) in outer o-ring grooves of compensating piston (6).

J-1.3) Install compensating piston (6) onto inner mandrel (2).

CAUTION$_6$: Do not rip or tear o-rings during installation.

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

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

CAUTION$_6$: Do not rip or tear o-ring during installation.

J-1.6) Assemble spring cage assembly and install:

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

NOTE$_6$: Uses two (2ea) springs per slip (Fig. 3).

J-1.6.2) Install spring cage (5) onto inner mandrel (2). Remove wedges.

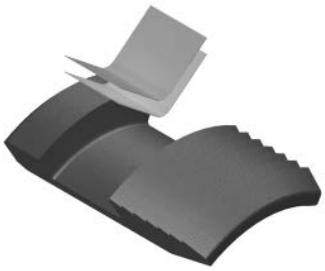


Fig. 3

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

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

J-1.9) Compress compression spring (4) by forcing spring cage upwards. Screw spring cage cap (27) into spring cage (5).

CAUTION$_3$: Compression spring (4) is compressed with spring tension against spring cage (5).

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

J) ASSEMBLY (cont'd)

J-2.1) Screw valve piston (29) into valve piston cap (28).

CAUTION$_4$: Do NOT wrench on seal surface.

J-2.2) Install o-ring (34) in o-ring groove in seal (24).

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

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

CAUTION$_6$: Do not rip or tear o-rings during installation.

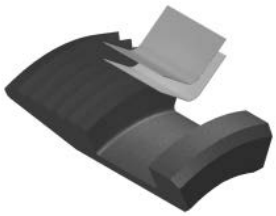


Fig. 4

J-2.5) Install o-ring (32) in o-ring groove in valve body (21).

J-2.6) Screw valve body (21) into central body (10).

J-2.7) Assemble rubber mandrel assembly and install:

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

J-2.7.2) Install rubber mandrel assembly onto inner mandrel (2).

J-2.7.3) Screw rubber mandrel (11) into valve body (21).

CAUTION$_6$: Do not rip or tear o-ring during installation.

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

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

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

NOTE$_6$: Uses two (2ea) springs per slip (Fig. 4).

J-2.9.2) Install drag block body (18) onto rubber mandrel (11). Remove wedges.

Fig. 5

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

J-2.11) 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$_7$: Uses four (4ea) springs per drag block (Fig. 5).

J-2.12) Install drag block retainer (31) onto drag block body (18) capturing ends of drag blocks (22).

J-2.13) Screw J-body (20) onto drag block body (18) (**NOTE$_3$**: Left-hand threads).

J-2.14) Screw set screws (30) into J-body (20). Release drag blocks (22).

J-2.15) Screw J-pin bottom sub (23) onto inner mandrel (2).

NOTE$_2$: Drag block body (18) must be free to rotate.

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

K) PARTS LIST

ITEM	QTY	DESCRIPTION	MATERIAL	P/N 61158YHT
1	1	TOP SUB	P-110	60070610HT
2	1	INNER MANDREL	P-110	61056210HT
3	16	DRAG BLOCK SPRING	INCONEL	9100900
4	1	COMPRESSION SPRING	CHROME VANADIUM	61056920
5	1	SPRING CAGE	1026	61058Y325
6	1	COMPENSATING PISTON	DLMS60	61056710
7	1	RELEASING SLIP	P-110	60058125
8	2	UPPER SLIP	1026	60058115
9	1	UPPER CONE	P-110	61056410HT
10	1	CENTRAL BODY	P-110	61055370
11	1	RUBBER MANDREL	P-110	61056220HT
12	2	RUBBER SPACER	DLMS35	60258Y840
13	1	ELEMENT	80 DURO NITRILE	60258Y512
14	2	ELEMENT	90 DURO NITRILE	60258Y513
15	1	RUBBER RETAINER	1026	61058Y850
16	1	LOWER CONE	DLMS110	60056420HT
17	4	LOWER SLIP	1026	60058135
18	1	DRAG BLOCK BODY	DLMS60	60056335
19	1	RUBBER MANDREL CAP	DLMS60	60056230
20	1	J-BODY	1026	61056340
21	1	VALVE BODY	L-80	61158Y350
22	4	DRAG BLOCK	DLMS65	9056900
23	1	J-PIN BOTTOM SUB	P-110	61056630
24	1	SEAL	90 DURO NITRILE	61156520
25	8	LOWER SLIP SPRING	ELGILOY	7155901
26	6	UPPER SLIP SPRING	ELGILOY	7155902
27	1	SPRING CAGE CAP	1026	60058Y810

K) PARTS LIST (cont'd)

ITEM	QTY	DESCRIPTION	MATERIAL	P/N 61158YHT
28	1	VALVE PISTON CAP	DLMS60	61056720
29	1	VALVE PISTON	DLMS80	61156730
30	3	SET SCREW 5/16-18 UNC X 3/8	STEEL	SSS031C037
31	1	DRAG BLOCK RETAINER	1026	60058Y910
32	3	235 O-RING	90 DURO NITRILE	90235
33	1	338 O-RING	90 DURO NITRILE	90338
34	3	342 O-RING	90 DURO NITRILE	90342

REDRESS KIT (RDK)		61158Y050HT
ASSEMBLED WEIGHT		172 LBS

K-1) ELASTOMER TRIM OPTIONS

NOTE$_8$: For temperature range, refer to Elastomer Trim Temperature Guide.

K-1.1) HSN

ITEM	QTY	DESCRIPTION	MATERIAL	P/N 61158YHTH
13	1	ELEMENT	80 DURO HSN	602575512H
14	2	ELEMENT	90 DURO HSN	602575513H
24	1	SEAL	90 DURO HSN	61156520H
32	3	235 O-RING	90 DURO HSN	90235H
33	1	338 O-RING	90 DURO HSN	90338H
34	3	342 O-RING	90 DURO HSN	90342H

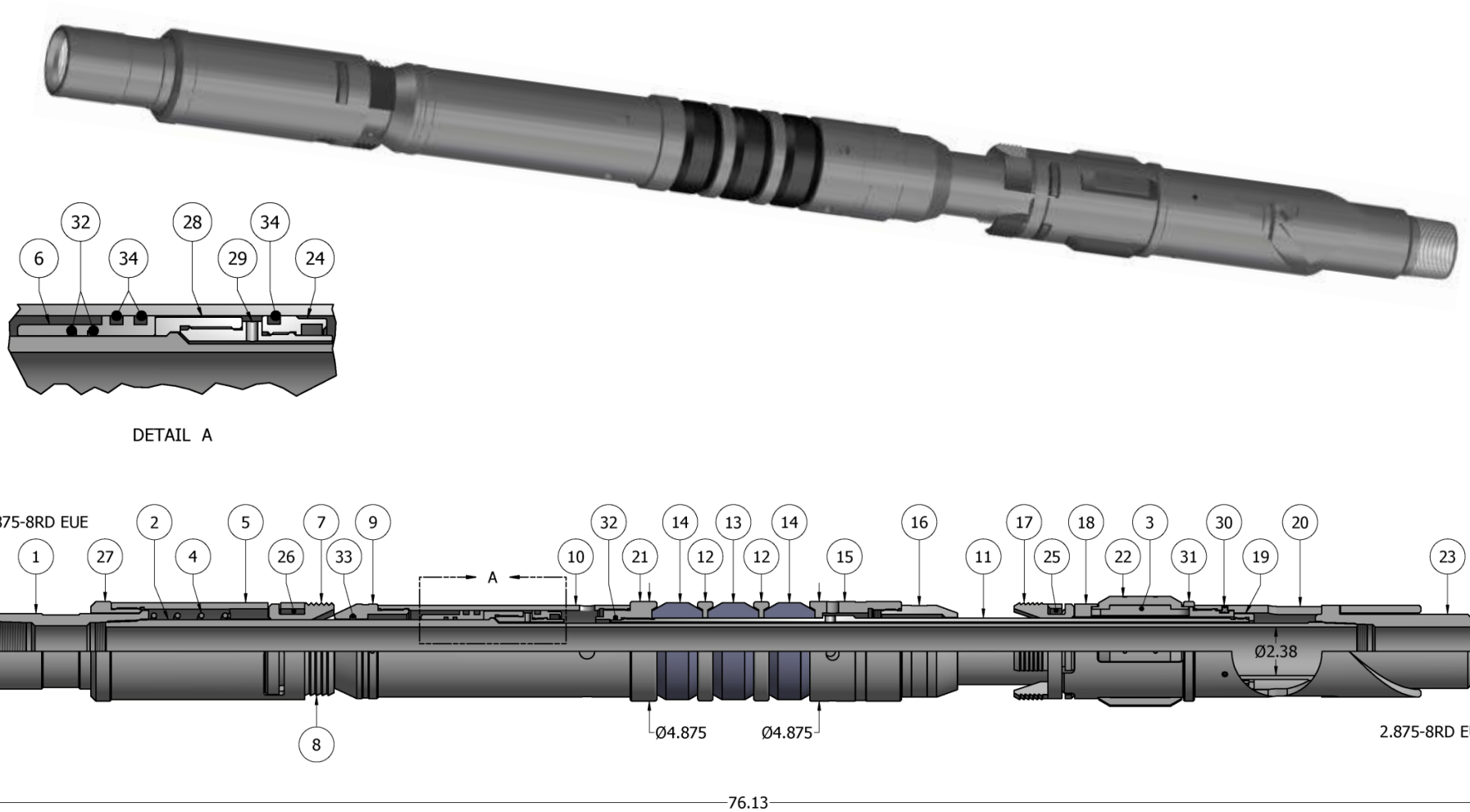
REDRESS KIT (RDK)		61158Y050HTH

K-1.2) VITON

ITEM	QTY	DESCRIPTION	MATERIAL	P/N 61158YHTV
13	1	ELEMENT	80 DURO VITON	602575512V
14	2	ELEMENT	90 DURO VITON	602575513V
24	1	SEAL	90 DURO VITON	61156520V
32	3	235 O-RING	90 DURO VITON	90235V
33	1	338 O-RING	90 DURO VITON	90338V
34	3	342 O-RING	90 DURO VITON	90342V

REDRESS KIT (RDK)		61158Y050HTV

L) TECHNICAL ILLUSTRATION



M) REVISION HISTORY

DATE	REVISION	DESCRIPTION OF CHANGES	REVISED BY	APPROVED BY
12/08/2015	B	Added HSN and Viton options, Pre-Installation Inspection Procedures, Storage Recommendations; Revised Elastomer Trim Temperature Guide was Element Selection Guide, Parts List	J.Anderson	J.McArthur
08/22/13	A	Created new manual	-	-