ADL-1 Tension-Set Packer

Compact & economical retrievable tension-set packer for large bore wells

Applications

- Formation fracturing in shallow or low-fluid level wells where set-down weight is not available
- Waterflooding operations

Features & Benefits

- Short And Compact - Increases the efficiency of handling, shipping, and storing of the tool
- Rocker-Type Slip Design - Eliminates the need for extra drag blocks, slip tie links, and guide grooves, allowing for shorter overall length but ones permanently free from stuck or cocked slips.
- Easy To Operate - A simple and reliable J-Slot mechanism, actuated from the surface by tubing rotation, makes the packer easy to set and release.
- Packing Element System - For temperatures up to 250º F, the standard 80 D (durometer) element can be used with sizes 41 through 51, and for applications above 250º F, a 90 D element is available. The Size 53 and 55 tools use a 70 D element, rated to 225º F. Standard and alternate elements are also available for higher temperatures.
- Full-Bore - Larger than tubing drift diameter. Any instruments capable of passing thru the tubing can be run thru the packer. Full ID also assists in preventing screen-out and subsequent plugging of the tubing during fracturing.
- Redress Kits available, extending tool life
- Alternate Body with Larger ID - Body with 1.978 in. ID (Size 43 only) is available for use in areas where a pump is run, or where customer desires to swab below the tool.

Description

The **Evolution ADL-1 Tension Packer** (also known as the STP-1 Packer) provides a compact, economical retrievable packer for use where a set-down type packer is impractical due to pressure requirements. Although designed primarily for waterflooding, this packer can also be used for such pressuring operations as formation fracturing in shallow or low-fluid-level wells.

Along with the ADL-1, Evolution also offers the AD-1, a regular bore version of the tool.

This document is uncontrolled when printed.
© 2014 Evolution Oil Tools Inc. All rights reserved.

Operation

To Set Packer

Run the packer to desired setting depth, making the last movement down before attempting actual set. Rotate the tubing to the left one-quarter turn at the tool, and pick-up on the tubing string to obtain pack-off. Refer to chart below for upstrain required to set the various size packers.

Required Upstrain on Tubing String To Set Tension Packers

Size Tool	Upstrain (lbs)
41	2,000
43 & 45	5,000
47	7,500
49-55	15,000

To Release Packer

Lower the tubing string at least one (1) foot more than is necessary to remove the applied tension (this will move the J-Pin to the top of the J-Slot) and rotate to the right sufficiently to obtain one-quarter turn at the packer.

Emergency Release

For use under extreme conditions, two safety release methods are available.

1. The ADL-1 Packer has an emergency Shear Ring installed on the Body, below the Guide. Application of from 25,000 to 50,000 lbs. tension (dependent on strength of Shear Ring) will shear the Shear Ring, permitting the Cone, Packing Element and Guide to drop against the Bottom Sub where they will remain as the Packer is retrieved from the well.

2. If it is not desirable or practical to pull 50,000 lbs. through the tubing, apply approximately 10,000 lbs. strain and rotate the tubing 20 or more turns to the right. This unscrews the left-hand safety thread between the Top Sub and the Body and allows removal of the tubing string and the Top Sub. To remove the remaining portion of the Packer, install a set of Jars made up above an overshot, socket or spear (or the Top Sub), engage the Packer Body and actuate the Jars to free the Packer Body from the casing.

Redress Kits (including such items as packing elements, seal rings, etc.) are available.

Specifications

Casing		Packer		Preferred Range of Casing ID's		Guide Ring OD	Packing Element OD	Minimum Collapsed Diameter of Slips	Maximum Casing ID Slip Travel	Thread Spec. (Box x Pin)	Item Number
O.D.	Weight Lbs / ft	Size	Bore	Min.	Max						
5-1/2	39-46.3	45B x 2.90	2.900	4.876	5.044	4.750	4.688	4.749	5.059	3-1/2 EUE	605-43
6	23-26	45C x 2.90		5.140	5.240	5.000	4.938	5.064	5.296		605-12
	18-20	45D x 2.90		5.241	5.424	5.218		5.216	5.448		605-45
7	23-29	47B x 4.12	4.120	6.136	6.366	5.968	5.781	5.968	6.417	4-1/2 LTC Box x 4-1/2 STC Pin	605-47
	17-20	47C2 x 4.12		6.367	6.538	6.266	6.125	6.284	6.657		605-47
8-5/8	24-32	49A4 x 4.00	4.000	7.921	8.097	7.600	7.125	7.798	8.250	4-1/2 LTC	605-52

* Plain end: 12.24-14.98 lbs/ ft.

* Packer shown for this weight is recommended and should be run where possible; however, the other size packer listed for this same weight may be run under certain circumstances, such as unusual hole conditions or running mixed string.

Strain Requirements When Annulus Pressure Is Greater Than Tubing Pressure

Since Tension Packers have only one set of Slips which serve only to keep the Packer from moving up the hole, special consideration must be given those operating conditions in which the annulus pressure will be greater than tubing pressure.

In this situation, the Packer tends to pump down the hole with the result that it may come unpacked, or under extreme conditions, the Shear Sub or Ring on the bottom of the Packer may be pumped off. Within reasonable limits, however, the annulus pressure may be greater than tubing pressure provided the downward force on the Packer resulting from the pressure differential of the annulus over the tubing (which is acting on the annular area between tubing OD and casing ID) is compensated for by holding sufficient strain on the tubing. Column 2 of the table below lists the MAXIMUM pressure differential (annulus pressure greater than tubing pressure) that may be safely held for the sizes shown. In order to hold the pressure differentials shown, a tubing strain of 40,000 lbs is required. The values in the table are based on the strength of the packer and the smallest tubing OD that may be used.

© 2014 Evolution Oil Tools Inc. All rights reserved.

CAUTION — DO NOT exceed either the maximum pressure differential indicated in the table below or the 40,000 lbs strain requirement, as either excess might result in shearing the Shear Ring.

Packer Size	Maximum Pressure Differential In Favor Of Annulus* (PSI)	Maximum Area In Annulus (in2)				
		Tubing OD				
		2-3/8	2-7/8	3-1/2	4	4-1/2
41A	6000	5.68				
41B	4400	8.10				
43A	3800	9.25	7.20			
43B	3200	10.80	8.75			
43C	3000	11.90	9.85			
45A	2300	14.95	12.90			
45B	2000	17.20	15.15			
45C	1800	19.20	17.10			
45D	1700	20.40	18.35			
45	1500	22.65	20.60			
45 x 2.90 A,B	2500	-	13.65	10.50		
45 x 2.90 D	2100	-	16.60	13.50		
47A	1200	26.40	24.35			
47B	1100	29.05	27.00			
47C	1000	33.70	31.65			
47D	800	38.50	36.45			
47 x 4.12 B,C	1400			23.90	21.00	17.60
49 x 4.00 A4	650	-	-	-	38.90	35.60
49A2	600		40.30	37.20	34.30	30.90
49A4	575		42.80	39.70	36.80	33.40
49B	525		46.20	43.10	40.20	36.80
51A2	475		52.70	49.60	46.70	43.30
51A4	450		54.80	51.70	48.80	45.40
51B	400		58.00	54.90	52.00	48.60
53A	325		75.00	71.90	68.90	65.60
53B	250		92.10	89.00	86.00	82.70
55A	0		112.3	109.1	106.2	103.0
55B	0		120.4	117.3	114.4	111.0

NOTE—In those cases where a shear ring with a shear value less than 40,000 lbs is used, this MAXIMUM strain will be decreased accordingly. Due to the very large annular areas (tubing OD to casing ID) involved in the Size 55 Packer, it must not be used when annulus pressure will be greater than tubing pressure.

WARNING

DO NOT exceed tubing joint strength which may sometimes be below the strain required to hold this maximum pressure differential. The tubing grade and operating depth must always be taken into consideration.

NOTE— When the pressure differential between the tubing and the annulus (in favor of the annulus) is less than shown in the table, the strain required to hold the differential may be calculated as follows:

1. Check to see that the desired annular pressure does not exceed the tubing pressure by more than the maximum listed in the table;
2. Select the Maximum Annular Area for the appropriate size Packer and tubing;
3. Multiply this area by the differential pressure to be applied to the annulus;
4. Add the following weights to obtain the necessary strain.

41	43 & 45	47	49, 53 & 55
2,000 lbs	5,000 lbs	7,500 lbs	15,000 lbs

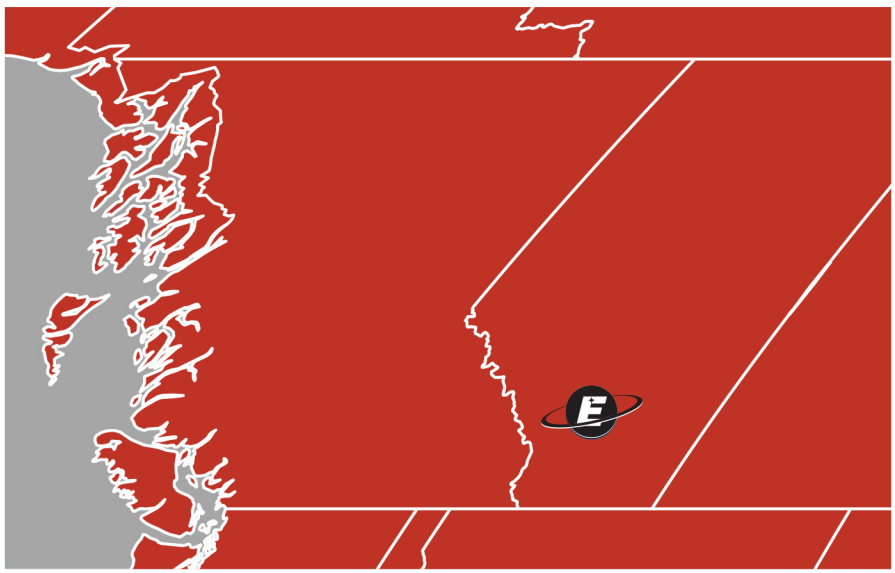
Example

Size 45D Model AD-1 Tension Packer set at 5,000 ft on 2-7/8" OD EU J-55 tubing. Annulus pressure will be 1,300 psi greater than tubing pressure.

1. Checking the table, note that the 1,300 psi by which the annulus pressure exceeds the tubing pressure is within the 1,700 psi maximum listed for Size 45D Packer.
2. Opposite Size 45D Packer, and below 2-7/8" OD tubing, note that the Maximum Area in the Annulus is 18.35 in2.
3. The force acting to unpack the Packer due to the pressure differential can be computed as follows:
4. 18.35 in2 X 1,300 psi = 23,855 lbs To arrive at the total amount of upstrain:

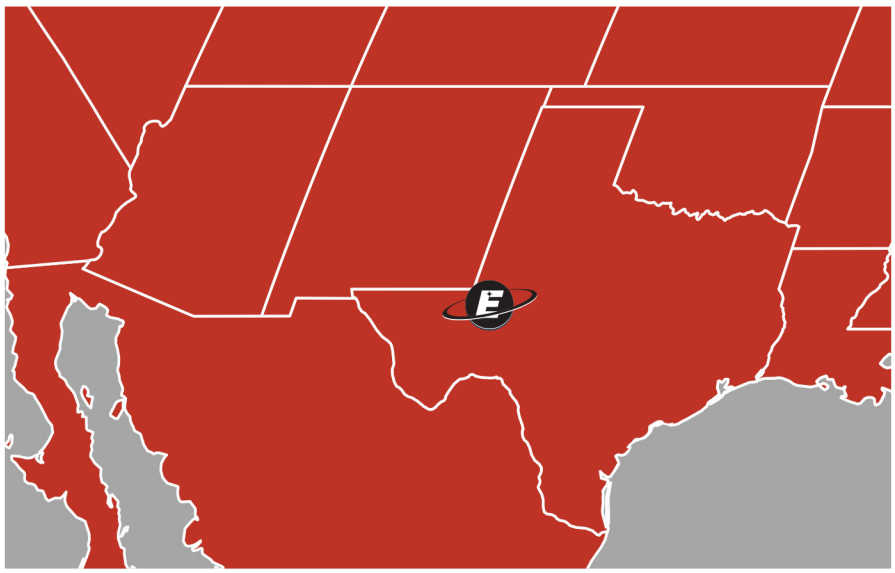
23,855 lbs
+5.000 lbs (for Size 45 Packer)
28,855 lbs minimum strain required to hold 1,300 psi greater pressure in the annulus than in the tubing.

This document is uncontrolled when printed.
© 2014 Evolution Oil Tools Inc. All rights reserved.
www.eotools.com Toll Free: 1-800-265-TOOL



Canada

#3, 1820 - 30th Ave, NE
Calgary, Alberta T2E 7M5
Main: 403-243-1442
Fax: 403-258-2614



United States of America

3400 Kermit Hwy
Odessa, Texas 79764
Main: 432-337-7900
Cell: 432-248-9411

1-800-265-TOOL (8665)

sales@eotools.com