



# CIW BRIDGE PLUG 4-1/2"

Manual No:  
**DL-850-4500-613**

Revision: **C**

Revision Date:  
**04/27/2023**

Authored by: J.Anderson

Approved by: K.Plunkett

## A) DESCRIPTION

The CIW Bridge Plug is designed to have excellent running characteristics and secure sets. This plug can be set on different types of Wireline Pressure Setting Tools as well as with Hydraulic Setting Tools. This plug is designed for rapid drill-out while maintaining sufficient strength during the set. It is designed for high differential pressures and temperatures up to 250°F with standard Nitrile element and O-ring. Different elastomers are available for higher temperatures.

The short, compact, interlocked construction assures the CIW Bridge Plug will provide faster, safer run-in, dependable set and pack-off, and hold pressure that is safe for the casing weight and grade. The interlock construction and compact size requires minimal material removal during drill out.

**NOTE<sub>1</sub>:** This tool requires at least a 30 second burn on the wireline setting tool to ensure a proper set. A burn time less than 30 seconds may shear the setting tool from the tool before fully setting the tool.

## B) RELATED TOOLS (sold separately)

B-1) 4-1/2" Wireline Adapter Kit (WLAK) (P/N 85545)—refer to technical manual *DL-855-4500-614*.

## C) SPECIFICATION GUIDE

CASING			TOOL OD (INCHES)	PART NUMBER
SIZE (INCHES)	WEIGHT (LBS/FT)	RECOMMENDED HOLE SIZE (INCHES)		
4-1/2	9.5 – 15.1	3.826 – 4.090	3.613	85045 85045H <sup>1</sup> 85045V <sup>2</sup>

Elastomer Trim Options: <sup>1</sup>HSN, <sup>2</sup>Viton

<b>DIFFERENTIAL PRESSURE (MAX)</b>
10,000 PSI

## D) PRE-INSTALLATION INSPECTION PROCEDURES

Before use, D&L recommends inspection of the tool. Ensure parts have not been damaged during shipping. Replace damaged with D&L replacement parts. Contact D&L sales for replacement part information.

## E) STORAGE RECOMMENDATIONS

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.

D & L OIL TOOLS  
P.O. BOX 52220 TULSA, OK 74152  
PHONE: (800) 441-3504 [www.dloiltools.com](http://www.dloiltools.com)



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## F) SETTING TECHNIQUES

The CIW Bridge Plug is set with a wireline or hydraulic setting tool such as a Model #10 Baker E-4 Wireline Setting Tool. A wireline adapter kit (WLAK) is needed to run the plug. The plug is run to depth and set by activating the setting tool.

## G) REMOVAL TECHNIQUES

### G-1) GENERAL

Drilling is the preferred method of removing CIW Bridge Plugs since drilling can usually be accomplished in less than 10% of the time it takes to millout the same tool. The high removal time for the milling technique is explained by the mechanics of the two methods. Drilling causes a chiseling effect, and milling has a shaving effect of the target. Further, milling yields more debris of the type that causes penetration stoppage. Drilling with a short tooth, medium hard formation rock bit is usually the best combination for CIW Bridge Plug removal.

### G-2) SUGGESTED MILLING TECHNIQUE

If equipment availability or other considerations dictate that the CIW Bridge Plug be milled, the recommended combination is a junk type mill tool rotated at 60-150 RPM with 5,000-8,000 lbs on the mill.

Use a mud viscosity of 60 CPS and a minimum annular velocity of 120 Ft/min to assure cutting removal. When ready to begin milling operations, start rotating the mill above the target and lower it slowly onto the target. Do not apply weight in excess of recommended amount. Excessive weight can tear out chunks of the CIW Bridge Plug and make a bailer trip necessary to remove the chunks to allow further penetration. Maintain a constant milling rate by adding weight as the tool is milled away.

### G-3) SUGGESTED DRILLING TECHNIQUE

Though the best drilling technique will vary with available equipment, a typical combination of a short tooth, medium hard formation rock bit (ADC Codes 2-1, 2-2, 2-3, 2-4, and 3-1), 75 to 120 RPM rotary speed and such drill collars as necessary for weight and bit stabilization will provide desirable results. To drill the CIW Bridge Plug:

- Apply 5,000-7,000 lbs. until top end of the mandrel is drilled (4 to 5 inches)
- Increase weight to 2,500-3,000 lbs. per inch of bit diameter to drill out remainder  
**Example:** Use 12,000-14,500 lbs for a 4-3/4" OD bit
- Drill collars should be used as required for weight and bit stabilization
- A rotary speed of 75-125 RPM is recommended
- A Junk Basket should be used
- The mud viscosity and gel strength should be sufficient to remove and support the cuttings. A minimum annular velocity of 120 Ft/min is recommended

When normal circulation is to be used, place a junk basket above the bit. If reverse circulation is planned, the casing scraper or other equipment in the tubing string should have an inside fluid passage as large as the passage through the bit so cuttings will not bridge.

Variations in bit speed and bit weight should be made to help break up debris to re-establish penetration should it cease while drilling.

Penetration may be stopped by "bit tracking" which is usually caused by insufficient weight on the bit. Bit tracking occurs when bit teeth travel in the same indentation of "track" made previously by another tooth. Successive tooth impact to the same location will sometimes deepen the track until indentations equal bit tooth length, reducing the impact of teeth to the point that they will not penetrate. Drilling penetration may be re-established by raising the bit off of the tool and then lowering the bit while maintaining rotation and making rapid bit contact with extra weight.

**NOTE:** Drilling times are directly related to tool size, bit stability, drilling weight, pump rate, bit RPM, type of bit, drilling fluid, etc. The same considerations should be used when drilling CIW Bridge Plugs as would be used when drilling medium hard formations.



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### H) MANUFACTURER'S RECOMMENDATIONS

- H-1) Use CIW Bridge Plug that conforms to well conditions, such as but not limited to casing size and weight, temperature, pressure and fluid/gas composition.
- H-2) Always follow recommendations of the Wireline Setting Tool manufacturer as to proper cleaning, redressing and operational procedures.
- H-3) Always run a gauge ring and junk basket prior to running CIW Bridge Plug.
- H-4) Do not over tighten CIW Bridge Plug onto setting tool. This action could cause the upper slip to crack. "Snug" the CIW Bridge Plug onto tool by hand. Never use a wrench.
- H-5) Do not allow the weight of the setting tool to rest on the CIW Bridge Plug after make up.
- H-6) A bit and scraper should always be run prior to entering wellbore. The well should be circulated clean.
- H-7) Visually check slips for cracks before lowering CIW Bridge Plug into Blowout Preventers/Wellhead.
- H-8) Hand guide Wireline Setting Tool and CIW Bridge Plug through Blowout Preventers/Wellhead.
- H-9) Run CIW Bridge Plug slowly into well. A good running speed is 100 Ft/minute. Run considerably slower when entering a liner or going through damaged casing. Well conditions may require a slower speed.
- H-10) Should the tool misfire at setting depth or the CIW Bridge Plug is pulled from the hole for any reason do not retrieve at a speed greater than the running speed going in the hole.
- H-11) Always set the CIW Bridge Plug in casing that has 100% cement bond.
- H-12) Never set a CIW Bridge Plug in a casing collar or where a packer has previously been set or milling has occurred.
- H-13) When CIW Bridge Plug is being set under pressure and is in lubricator, equalize pressure slowly from well into lubricator. If during the process the tool slams into the top of the lubricator the jarring action could crack or break the slips. The tool should be removed and the CIW Bridge Plug inspected if this occurs.
- H-14) Only set CIW Bridge Plug in static well conditions. Do not set in well that has fluid or gas movement.
- H-15) A minimum of ten (10) feet of uncontaminated cement should be placed on top of CIW Bridge Plug after setting. Lab test should be run on the cement to determine "Set" time for the well conditions. The cement and plug should be pressure tested prior to further well work.
- H-16) The plug must be a minimum of fifty (50) feet from the bottom shot when perforating or "Shooting" off casing. A string shot is included in this category.
- H-17) Tubular weight should never be placed on plug.
- H-18) After setting CIW Bridge Plug, the setting tool should not be dropped on plug. Gently ease tool to plug.
- H-19) Never hit plug with Dump Bailer.
- H-20) Go very slow when going through fluid level.
- H-21) **Always** use a slow burn charge in wireline setting tool. The burn time for setting CIW Bridge Plugs must be greater than 30 seconds.

### I) ELASTOMER TRIM TEMPERATURE GUIDE

RUBBER TYPE	TEMPERATURE RANGE
NITRILE	40° - 250°F
HSN (HNBR)	70° - 300°F
VITON	100° - 350°F



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### J) PARTS LIST

ITEM	QTY	DESCRIPTION	MATERIAL	P/N 85045
1	1	TOP SUB	DLMCIG2	85045610
2	1	INNER MANDREL	DLMCIG2	85045210
3	2	FEMALE EXPANSION RING	DLMDB65	84045815
4	2	MALE EXPANSION RING	DLMDB65	84045810
5	2	LOWER CONE	DLMCIG2	84045420
6	2	SLIP	DLMCIG2	84045135
7	1	LOCK RING	DLMS60	84055011
8	1	ELEMENT	80 DURO NITRILE	84045512
9	1	BOTTOM SUB	CLASS 40 CAST IRON	85045620
10	1	SHEAR STUD (35,000#)	12L14	85045900
11	1	KEY 3/16 X 3/16 X 1	DLMSKSL	KS018X018X100
12	7	ROLL PIN 3/16 X 1/2	STEEL	RP018050
13	1	TORSION SPRING	CHROME VANADIUM	39110920

ASSEMBLED WEIGHT	32 LBS
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#### J-1) ELASTOMER TRIM OPTIONS

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

##### J-1.1) HSN

ITEM	QTY	DESCRIPTION	MATERIAL	P/N 85045H
8	1	ELEMENT	80 DURO HSN	84045512H

##### J-1.2) VITON

ITEM	QTY	DESCRIPTION	MATERIAL	P/N 85045V
8	1	ELEMENT	80 DURO VITON	84045512V



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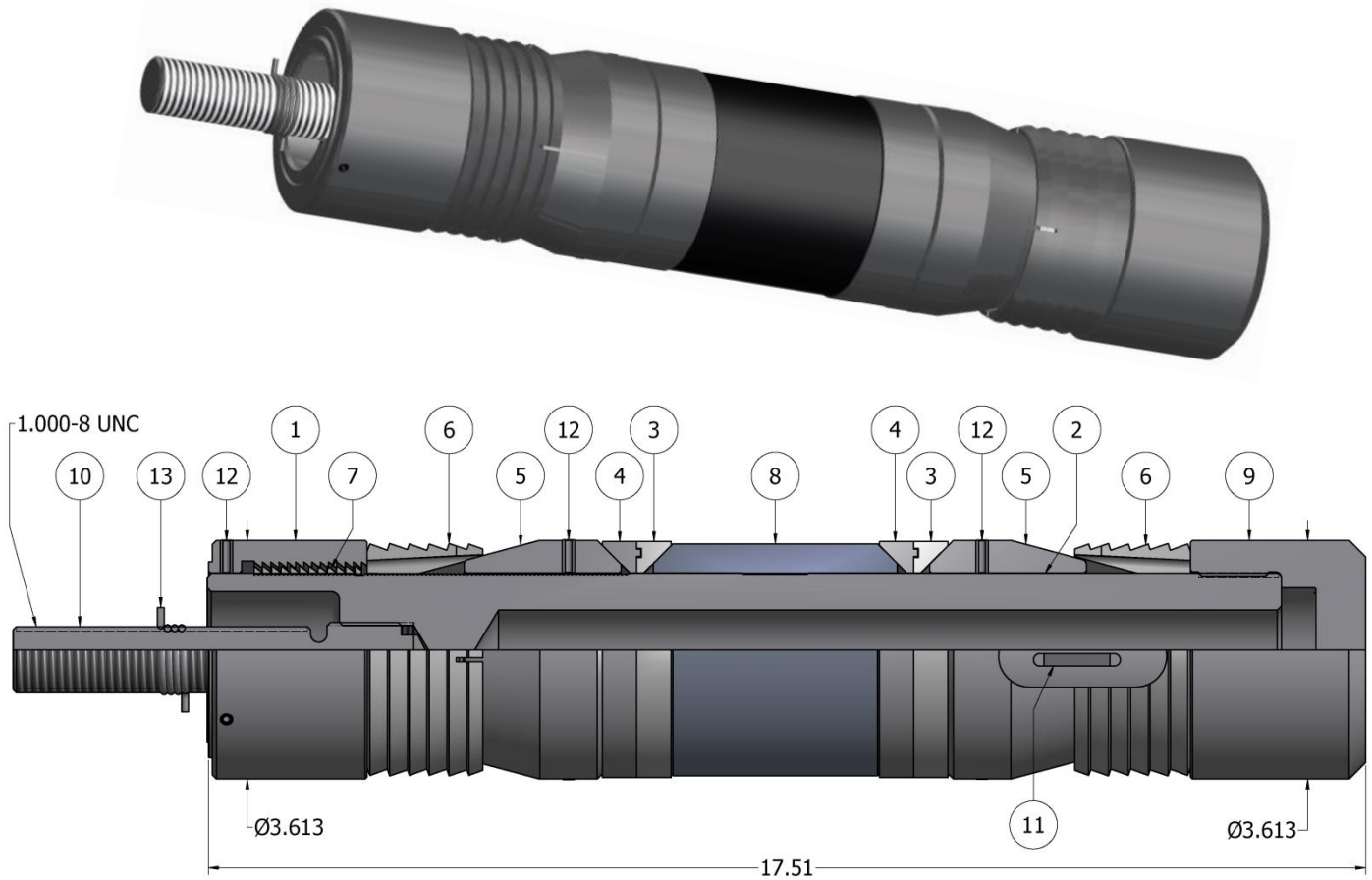
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## K) TECHNICAL ILLUSTRATION



## L) REVISION HISTORY

DATE	REVISION	DESCRIPTION OF CHANGES	REVISED BY	APPROVED BY
04/27/2023	C	Added HSN and Viton; revised trim temp. ratings	J.Anderson	E.Visaez
03/07/14	B	Revised tool part number in Specification Guide	J.Anderson	K.Riggs
10/09/13	A	Created new manual.	-	-