



CIW BRIDGE PLUG

9-5/8"

Manual No:
DL-850-9625-588

Revision: **A**

Revision Date:
08/16/2013

Authored by: J.Anderson

Approved by: J.McArthur

A) DESCRIPTION

The D&L CIW Bridge Plug is designed to have excellent running characteristics and secure sets. The CIW Bridge Plug can be set on different types of wireline pressure setting tools as well as with D&L Hydraulic Setting Tools. The CIW Bridge Plug is designed for rapid drill-out while maintaining sufficient strength during the set. The CIW Bridge Plug is designed for high differential pressures and up to 300° F temperatures with standard nitrile element and o-ring. Different elastomers are available for higher temperatures.

The short, compact, interlocked construction assures the user that 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.

The following service tools are used for setting and servicing the CIW Bridge Plugs:

- Wireline Adapter Kit
- Hydraulic Setting Tool

NOTE₁: Uses 9-5/8" Wireline Adapter Kit (WLAK) (P/N 85595). Refer to technical manual *DL-855-9625-592* for WLAK technical information. Sold separately.

NOTE₂: This bridge plug requires a greater than 30 second burn on the wireline setting tool to ensure a proper set.

B) SPECIFICATION GUIDE

| CASING | | RECOMMENDED HOLE SIZE (INCHES) | TOOL OD (INCHES) | PART NUMBER |
|---------------|-----------------|--------------------------------|------------------|-------------|
| SIZE (INCHES) | WEIGHT (LBS/FT) | | | |
| 9-5/8" | 29.3 – 61.1# | 8.375 – 9.063 | 8.125 | 85095 |

| |
|------------------------------------|
| DIFFERENTIAL PRESSURE (MAX) |
| 6,000 PSI |

C) SETTING TECHNIQUES

The CIW Bridge Plug is set with a wireline or hydraulic setting tool such as a Model #20 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.

D) REMOVAL TECHNIQUES

D-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.

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



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D) REMOVAL TECHNIQUES (cont'd)

D-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.

D-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.

NOTE₃: 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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E) MANUFACTURER'S RECOMMENDATIONS

- E-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.
- E-2) Always follow recommendations of the Wireline Setting Tool manufacturer as to proper cleaning, redressing and operational procedures.
- E-3) Always run a gauge ring and junk basket prior to running CIW Bridge Plug.
- E-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.
- E-5) Do not allow the weight of the setting tool to rest on the CIW Bridge Plug after make up.
- E-6) A bit and scraper should always be run prior to entering wellbore. The well should be circulated clean.
- E-7) Visually check slips for cracks before lowering CIW Bridge Plug into Blowout Preventers/Wellhead.
- E-8) Hand guide Wireline Setting Tool and CIW Bridge Plug through Blowout Preventers/Wellhead.
- E-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.
- E-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.
- E-11) Always set the CIW Bridge Plug in casing that has 100% cement bond.
- E-12) Never set a CIW Bridge Plug in a casing collar or where a packer has previously been set or milling has occurred.
- E-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.
- E-14) Only set CIW Bridge Plug in static well conditions. Do not set in well that has fluid or gas movement.
- E-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.
- E-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.
- E-17) Tubular weight should never be placed on plug.
- E-18) After setting CIW Bridge Plug, the setting tool should not be dropped on plug. Gently ease tool to plug.
- E-19) Never hit plug with Dump Bailer.
- E-20) Go very slow when going through fluid level.
- E-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.



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F) ELEMENT SELECTION GUIDE

| RUBBER TYPE | TEMPERATURE RANGE |
|-------------|-------------------|
| NITRILE | 70° - 300°F |
| HSN (HNBR) | 70° - 325°F |
| VITON | 100° - 350°F |

G) PARTS LIST

| ITEM | QTY | DESCRIPTION | MATERIAL | P/N 85095 (29.3 – 61.1#) |
|------|-----|----------------------------|--------------------|-----------------------------|
| 1 | 1 | TOP SUB | CLASS 40 CAST IRON | 85095610 |
| 2 | 1 | INNER MANDREL | G-2 CAST IRON | 85095210 |
| 3 | 2 | FEMALE EXPANSION RING | DURA BAR 65-45-12 | 84095815 |
| 4 | 2 | MALE EXPANSION RING | DURA BAR 65-45-12 | 84095810 |
| 5 | 2 | LOWER CONE | GRAY IRON | 84095420 |
| 6 | 2 | SLIP RING | GRAY IRON | 84095135 |
| 7 | 1 | LOCK RING | L-80 | 85095011 |
| 8 | 1 | ELEMENT | 80 DURO NITRILE | 84095512 |
| 9 | 1 | BOTTOM SUB | CLASS 40 CAST IRON | 85095620 |
| 10 | 1 | SHEAR STUD (60,000#) | 12L14 | 85085900 |
| 11 | 1 | KEY 3/16 X 3/16 X 1 | HEAT TREATED STEEL | KS018X018X100 |
| 12 | 9 | ROLL PIN 3/16 X 1 | STEEL | RP018100 |
| 13 | 1 | MANDREL PLUG | G-2 CAST IRON | 85095215 |
| 14 | 4 | SET SCREW 1/4-20 UNC X 1/2 | STEEL | SSS025C050 |
| 15 | 1 | 342-90 O-RING | NITRILE | 90342 |

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| ASSEMBLED WEIGHT | 193 LBS |
|------------------|---------|



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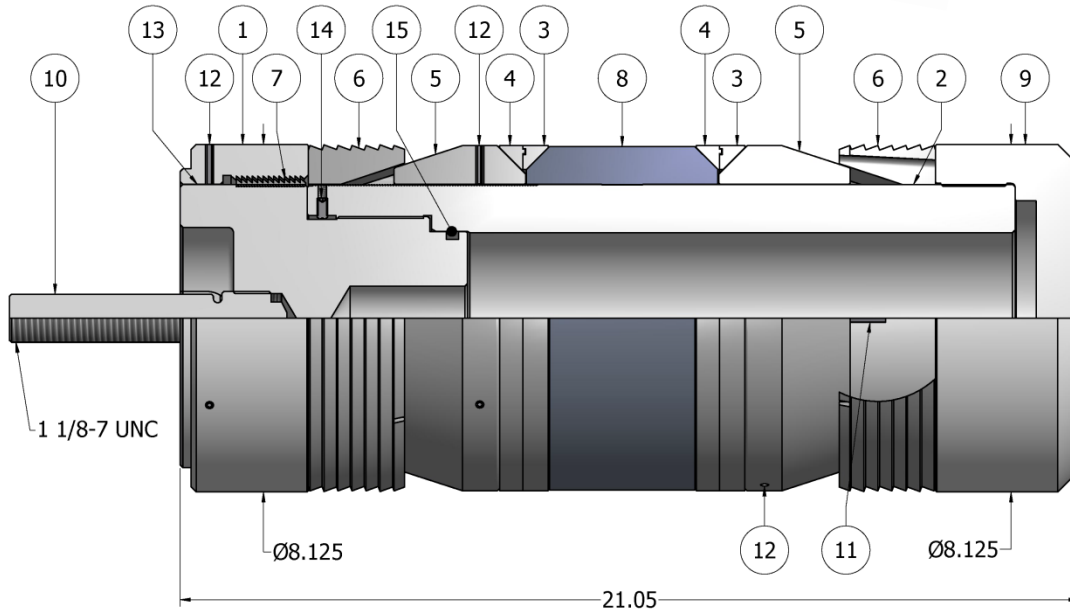
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H) TECHNICAL ILLUSTRATION



I) REVISION HISTORY

| DATE | REVISION | DESCRIPTION OF CHANGES | REVISED BY | APPROVED BY |
|----------|----------|------------------------|------------|-------------|
| 08/16/13 | A | Created new manual. | - | - |