



**SEAL-LOCK APEX  
ANCILLARY**

SECTION	V	
Prepared	RBI	04/13/18
Engineer	SJH	04/16/18
QA Mgr	GJR	04/14/18
Revision	006	04/16/18

**SUBJECT: COUPLING MAKE-UP PROCEDURE - SEAL-LOCK APEX**

**1.0 SCOPE**

1.1 This document sets forth the procedure for the mill end make-up or bucking of **SEAL-LOCK APEX** casing connectors.

**2.0 DEFINITION**

2.1 Make-up shall be defined as the power tight application of a coupling or box connector to a pin connector.

**3.0 EQUIPMENT**

- 3.1 The following list of equipment is required in the making-up or the bucking-on of couplings to pin connectors.
  - 3.1.1 Appropriate size, grade, type box connector, or coupling to match the pipe and pin connector.
  - 3.1.2 An adequate supply of clean, uncontaminated thread compound.

**NOTE: Hunting recommends Best-O-Life PTC, Best-O-Life 4010NM, OCR 325, OCR 167ML50 for CRA material, LTF 4444, HTM 1001, Clear Glide, Jet Lube Seal Guard, and Topco II as the tested and approved thread compounds for Hunting premium, metal-to-metal sealing products.**

**NOTE: Hunting does not recommend API modified thread compound for Hunting proprietary connection. However, when an API modified thread compound is specified by the end user, Hunting has standardized on Best-O-Life 72732/72733 as the API modified thread lubricant used for connection qualification testing. Using another thread lubricant may substantially change the recommended torque range listed on the sales data sheet.**

**WARNING: Hunting "DOES NOT" recommend any thread lubricant with large particles such as Best-O-Life 2000 on its metal-to-metal sealing connections. It has been proven to compromise connection integrity on Hunting's metal-to-metal sealing connections.**

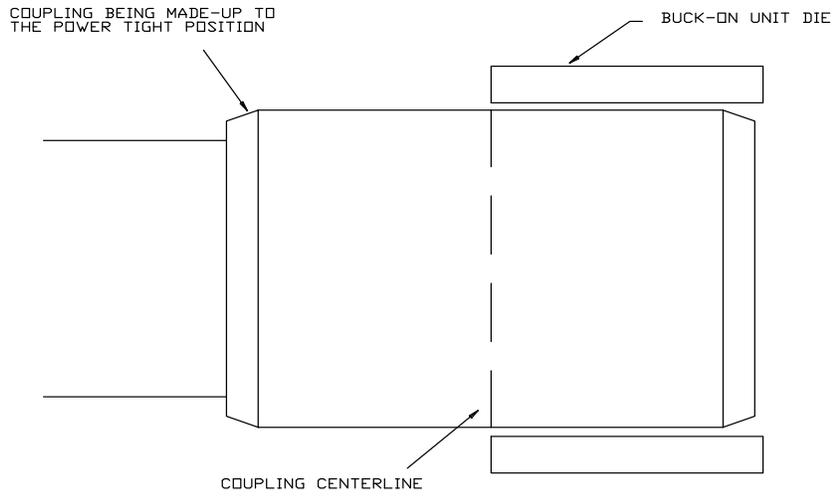
- 3.1.3 Thread lubricant application brushes (Model 58235 moustache brush recommended).
- 3.1.4 Molybdenum disulfide spray or equivalent. (Molykote)
- 3.1.5 Power tongs capable of producing the required torque at 3 - 8 RPM.

**NOTE: The power and back-up tongs shall have sufficient dies, evenly spaced around the coupling and pipe circumferences, where an even gripping pressure is applied, both axially and circumferentially, to prevent distortion to the connection.**

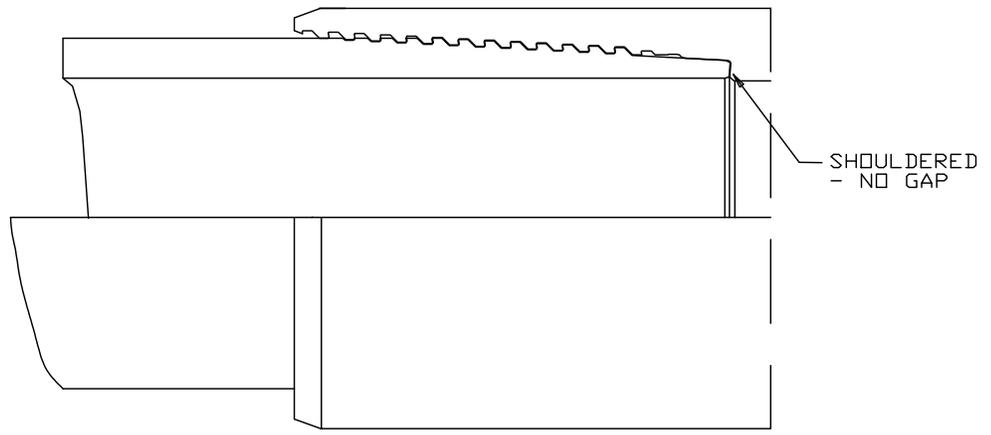
- 3.1.6 Latest Hunting sales drawing with specified torque values for the appropriate size, weight and grade of **SEAL-LOCK APEX**.
- 3.1.7 0.005" Feeler Gage.
- 3.1.8 **OPTIONAL** - Torque turn monitoring system.

**4.0 CERTIFICATION**

4.1 The torque unit shall be calibrated for accuracy every four (4) months.



**BUCK-ON UNIT DIE POSITION**



**MAKE-UP INSPECTION OF SEAL-LOCK APEX**



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**5.0 MAKE-UP PROCEDURE**

- 5.1 Thoroughly clean and visually inspect both sides of the connection to be made-up.
  - 5.1.1 Ensure that the pin thread start and full form threads are free from tears and burrs.
  - 5.1.2 Ensure that the coupling or box connector is free from burrs or tears on the starting threads and throughout the full form thread length.
  - 5.1.3 Both connectors shall be free of any debris such as chips, shavings, dirt or other foreign particles that could create galling or damage to the connection during make-up.
- 5.2 Cover both pin and coupling connectors that are to be mated during mill make-up with a thin, even spray coating of molybdenum disulfide spray.
- 5.3 Apply a light-to-moderate, even coating of the recommended thread lubricant to cover the full box/coupling threaded surface.

**NOTE: See Section 3.1 for recommended thread compounds.**

- 5.4 Apply a light coating of the recommended thread lubricant to the thread and seal areas on the pin connector and the coupling connector, seal area and torque shoulder areas.

**NOTE: A light to moderate, even coating of thread compound is defined as all thread surfaces, root and crest, seal surfaces and pin face/torque shoulder covered with an even coating of thread compound. However, the thread form should remain clearly visible.**

**NOTE: Adjust the amount of lubricant applied to the pin and coupling connectors to cause a gradual increase in torque throughout the make-up. An indicator of connection overlube is during the last one-half of a turn to final make-up position there is no gradual increase of torque even though the pin is continuing to advance into the coupling.**

- 5.5 Apply the box or coupling to the pin end by hand to the hand-tight position.
- 5.6 Position the connection in the power tongs.
- 5.7 Apply the specified torque to the connection at 3 - 14 RPM. Make-up speed should not exceed 14 rpm. Make-up speed should not vary excessively during make-up and should be continuous with no gear changing.

**TARGET MAKE-UP RPM**

2 3/8"	-	14 RPM
2 7/8"	-	13 RPM
3 1/2"	-	12 RPM
4 1/2"	-	12 RPM
5"	-	12 RPM
5 1/2"	-	12 RPM
6 5/8"	-	10 RPM
7"	-	10 RPM
7 5/8"	-	8 RPM

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**TARGET MAKE-UP RPM**

7 3/4"	-	7 RPM
8 5/8"	-	7 RPM
9 5/8"	-	6 RPM
10 3/4"	-	5 RPM
11 3/4"	-	5 RPM
13 3/8"	-	4 RPM
13 5/8"	-	4 RPM

**5.8 OPTIONAL Make-up Torque/Turn Monitoring**

- 5.8.1 Optional Torque-Turn Equipment - A torque-turn /time or torque/turn monitoring system may be utilized. Monitoring equipment should be capable of resolving torque to 1/100th of a turn increments as a minimum but equipment capable of resolving torque to 1/1000th of a turn should be utilized when available. An enhanced computer display should be part of the torque-turn monitoring equipment and should be utilized to monitor make-up. The monitoring equipment should be capable of dumping during the make-up by either the computer technician or when maximum parameters are reached. As the torque enters the acceptable window, the technician should be able to depress a function key to manually terminate the make-up. The system should be capable of automatic dumping as input parameters are met. The load cells used with the torque monitoring equipment should be calibrated every four (4) months, traceable to the appropriate national standard.
- 5.8.2 If the optional torque/turn monitoring equipment is used, a make-up torque/turn graph should be generated for every connection.
- 5.8.3 In the event torque/turn or torque turn/time equipment is used at the rig site, the following procedure should be used to set acceptance criteria:
  - a) Prior to the job, the operating company representative should review the Hunting sales data sheet for this connection. Shoulder torque acceptance limits should be in the range shown on Hunting's optimum torque/turn graph.
  - b) Those connections falling outside the acceptable shoulder torque values should be broken out and checked for damage. If no damage is found, the connection may be made up again. Adjust doping procedures as suggested in Section 5.4 **NOTE** to achieve higher or lower shouldering torque as necessary.
  - c) A torque curve showing a small wave shall be acceptable. However, the connection with a wave in the torque curve exceeding the shouldering torque shall be broken out and visually inspected. If no damage is found, the connection may be made up again.
  - d) Final torque in excess of the maximum acceptable final torque or less than the minimum acceptable final torque should be broken out and visually inspected. If no damage is found, the connection may be made up again.

**NOTE: If an appreciable amount of thread lubricant is being pushed to the tube ID and/or the tube OD during make-up, too much thread lubricant is being applied to the connection.**

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**NOTE:** The normal published torque window is based on dimensional tolerance and friction factors. Other factors affecting torque are texture of phosphate coating, type of thread lubricant, make-up speeds, temperature, etc. For size 7" and above, the important feature of SEAL-LOCK APEX is for the connection to achieve a shoulder with minimum of 1,000 ft/lbs (delta) torque prior to reaching 80% of the published minimum yield torque value stated on the appropriate connection data sheet. All other sizes below 7" refer to sales data sheet. In severe service applications, such as very low temperature situations, the recommended torque range may be increased upon approval, contact Hunting's Q.A. Department.

**6.0 MAKE-UP ACCEPTANCE AND REJECTION**

- 6.1 For an acceptable make-up, torque requirements must be met.
  - 6.1.1 The torque applied to the connection must meet the minimum published torque. The maximum torque may be exceeded on thick wall accessories.
- 6.2 Thoroughly clean the thread lubricant from the connection ID and inspect to ensure that the connection has shouldered by using the optional torque turn unit or by measuring the make-up by passing the 0.005" feeler gage between the pin face and the torque shoulder. If the feeler gage goes into the gap, the connection is not properly made up.
- 6.3 Visually and by actual hand contact inspect the pin ID at the coupling torque shoulder to ensure that no deformation to the pin ID or torque shoulder has occurred. Reject any connection so damaged.
  - 6.3.1 Following buck-up, the ovality or out-of-roundness shall be within the specified manufacturing tolerances for the product when measured on the open end of the coupling.
- 6.4 End drift the made-up connection in accordance with Hunting's "**Full Length Drift/End Drift Inspection Procedure**" (Generic).

**7.0 REWORK**

- 7.1 If the connection does not shoulder or make-up to the proper position, remove the coupling, clean and visually examine both pin and box for damage. If no damage is found remake up as directed in Section 5.0 and inspect as directed in Section 6.0 of this document. The amount of the thread lubricant may be altered and a higher make-up torque (up to maximum recommended torque) may be used.
- 7.2 Connections which will not meet the criteria of Section 6.0 should be set aside and a Hunting representative contacted.

**8.0 RUNNING PROCEDURE FOR ACCESSORIES MADE UP USING THREAD LOCKING COMPOUND / LUBRICANT**

- 8.1 Using steam, soap and hot water, or safety solvent, remove all thread storage or running compound from both pin and box connectors.
- 8.2 Ensure that the thread and sealing surfaces are clean, dry, and free of oil, grease, or residues.
- 8.3 On metal-to-metal seal connections, apply the Hunting recommended thread compound to the seal area on both elements (pin and box connectors).

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- 8.4 Just prior to make up, the thread locking lubricant shall only be applied on the pin threads (not on the box), on the area that has not been covered by the approved thread compound.
- 8.5 When making up accessories like float equipment, hangers, thick wall accessories, and others, shoulder torques might be higher than normal due to relationship of the friction factors of the thread locking lubricant in comparison with the API Modified thread compounds and the wall thickness.
- 8.6 The make up torque of the accessories should be aimed to the maximum recommended torque. Therefore, if necessary, the published torque may be exceeded but in any case shall not exceed 80% of the published minimum yield torque.