



**RECOMMENDED
PRACTICE
SEAL-LOCK HT**

Approved	Initials	Date
Prepared by	RBI	09/09/19
Engineer	SJH	10/16/19
GM QA	GJR	09/18/19
Revision	008	10/17/19

SUBJECT: FIELD RUNNING AND HANDLING PROCEDURES

1.0 SCOPE

- 1.1 This document sets forth Hunting's recommended practice for the field running and handling procedures that should be used in conjunction with the **SEAL-LOCK HT** product line.

2.0 REFERENCES

- 2.1 The following documents were used for reference in the preparation of this document:
- 2.1.1 API RP 5C1
 - 2.1.2 API BUL. 5A2

3.0 EQUIPMENT

- 3.1 The following list of equipment should be on location when **SEAL-LOCK HT** is run:
- 3.1.1 Ample supply of fresh, unopened thread compound.

NOTE: Hunting has standardized the use of SealLube™ on the mill end Coupling make-up as follows:

Seal Lube LTF 4444 for any size larger than 3 1/2"

Seal Lube HTM 1001 for 3 1/2" and smaller

For other applications, accessories and field end, please refer to Hunting's website to verify the current Recommended Thread Compounds approved by Hunting – Per Connection List.

To access the list, visit www.hunting-intl.com, click on "Connection Technology" and look for the link: "Recommended Thread Compounds approved by Hunting".

- 3.1.3 Hunting's field service kit.
- 3.1.4 Appropriate sales data sheet.
- 3.1.5 **VISUAL THREAD INSPECTION**, Ancillary Specification.
- 3.1.6 **STEEL IMPERFECTIONS**, Ancillary Specification.
- 3.1.7 **OPTIONAL** - Torque turn monitoring equipment.
- 3.1.8 **OPTIONAL** - Molybdenum disulfide spray.
- 3.1.9 **OPTIONAL** - WD-40.
- 3.1.10 **OPTIONAL** - Internal tool guides.

4.0 FIELD RUNNING AND HANDLING PROCEDURES

- 4.1 Precaution
- 4.1.1 Tubulars should not be stacked higher than five tiers at the rig. (API RP 5C1).
 - 4.1.2 Layers should be separated by wooden dunnage so that no weight rests on the connections. (API RP 5C1)
 - 4.1.3 Thread protectors should always remain in place when moving or handling tubulars.
 - 4.1.4 If a mixed string is to be run, ensure proper identification to accommodate sequence of running.
 - 4.1.5 Do not use a welding torch to remove thread protectors. A thread protector removal tool is available from Hunting should weather, handling or other conditions make protector removal a difficult or time-consuming procedure.
 - 4.1.6 Avoid rough handling. Do not unload pipe by dropping.



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- 4.1.7 Do not handle more than three joints unless the pipe is packaged or bundled.
- 4.1.8 Never use hooks on the ends of pipe. Handle with nylon slings only.

4.2 Preparation

- 4.2.1 By visual inspection, ensure that all necessary running equipment and accessories (subs, crossovers, nipples, gas lift mandrels, lifting/handling plugs, hangers, pup joints, internal tool guides, etc.) are available and in good condition. Document condition in tally book.

NOTE: Following a thorough review of running/accessory equipment, discuss running procedures with Drilling Supervisor.

- 4.2.2 Slip type elevators of proper size, in good repair and with the setting plate adjusted properly, should be used.

NOTE: Hunting does not recommend the use of bottleneck or shoulder type elevators.

- 4.2.3 Ensure that slips are of the correct size to accommodate the size, weight and length of the tube.
- 4.2.4 Ensure that the safety clamp is the correct size and in serviceable condition.

NOTE: The safety clamp should be used above the table slips for the first 20 lengths.

- 4.2.5 Check for traveling block alignment and rotary hole alignment.
- 4.2.6 Ensure that an ample supply of thread compound is available. Only fresh, previously unopened containers of compound shall be used. Stir thoroughly.

NOTE: See Section 3.1.1 for recommended thread compounds.

- 4.2.7 A stabbing board or a yoke may be required to offer stability for ease of make-up.
- 4.2.8 Ensure that the power tong snub line is at 90° and level with the tong.

NOTE: Ensure that an accurate torque monitoring device (Martin-Decker torque gauge) is available, the load cell is for use in the required torque range, and the load cell has been calibrated within the past six (6) months.

NOTE: When running with a CRT (Casing Running Tool) no dump valve shall be used and a 5 to 8 second torque shall be applied.

NOTE: When running with a CRT (Casing Running Tool) Hunting recommends the use of a compensator.

NOTE: If CRT is to be used during the running phase, Hunting strongly recommends the use of the Hunting internal tool guides.



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4.3 Cleaning and Thread Inspection
All tubular connections shall be thoroughly cleaned and dried at the rig prior to running or inspection.

- 4.3.1 Immediately before running, remove protectors from both the field end and the coupling. Clean each connection and protector thoroughly.
- 4.3.2 All compounds that have been applied to the connections and protectors are to be wiped off or washed off using solvent and a non-metallic bristle brush. Wipe out or blow out the solvent from the connection or protector after washing.

NOTE: Care must be taken to ensure that the cleaning process does not cause environmental pollution.

- 4.3.3 Check and clean the inside of the tubulars to eliminate any foreign material that may fall into the box while stabbing. If compressed air is available, air blast from box to pin.

NOTE: Ensure that there are no bristles left on the threads from cleaning.

- 4.3.4 Drift the pipe and accessory equipment with a clean, properly sized mandrel. Drift shall be performed box to pin, being careful not to damage the pin face or threads when placing the mandrel in the joint.
- 4.3.5 Inspect the threaded connections using Hunting's Ancillary Specifications titled **VISUAL THREAD INSPECTION** and **STEEL IMPERFECTIONS**.

NOTE: Repair as required by VISUAL THREAD INSPECTION and/or STEEL IMPERFECTION ANCILLARY SPECIFICATIONS.

- 4.3.6 If any joint shows obvious ovality, it should not be run.
- 4.3.7 Never leave the threads exposed for longer than two hours without corrosion protection. If the connection is cleaned more than two hours but less than twelve hours before the joint is run, a light oil should be used to prevent corrosion. If it will be more than twelve hours until a joint is to be run, reapply thread compound and clean thread protectors.

4.4 Running

- 4.4.1 Handling plugs or thread protectors must be in place whenever tubulars are moved.

NOTE: While moving tubing, do not lift with a hook that may/will contact the box/coupling thread or seal or the pin face.

- 4.4.2 Joints should be moved to the V-Door via a pick-up machine. If a pick-up machine is unavailable, joints should be moved to the V-door by slings or a pick-up line attached to the box end.
- 4.4.3 Elevators or pick-up line with or without pick-up line elevators may be used to lift the joint up in the derrick.



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4.4.4 If CRT (casing running tool) is to be used, remove the thread protector and replace it with a Hunting internal tool guide / handling plug.

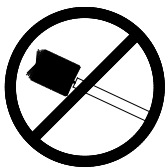
NOTE: Hunting connections are not interchangeable with any other connections in the industry. The use of an internal tool guide / handling plug different than the ones designed by Hunting Energy Services for specific connections or applications may result in property damage, injury, or death. Hunting will not be held accountable nor accept any liability if the proper equipment is not utilized for its intended purpose.

4.4.5 As each length is suspended vertically, remove the thread protectors and clean both pin and box connectors to be made-up. Remove any thread compound, solvent or moisture remaining on the connection after removing the protector.

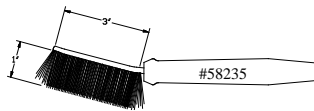
4.4.6 Visually inspect to assure no damage to either connector has occurred.

4.4.7 OPTIONAL - after the connection is clean and dry, apply a light to moderate, even coating of molybdenum disulfide spray to the pin and coupling connector.

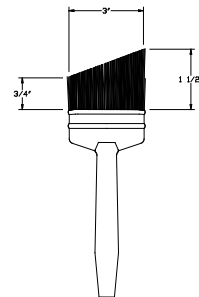
4.4.8 After the connection is clean and dry, apply a *light*, even coating of the thread compound to the pin and coupling connectors. Assure that the thread compound has been thoroughly and adequately stirred and is of uniform consistency.



Do Not Use
Bottle Brush



Preferred Moustache Brush #58235



Alternate Acceptable
Modified Paint Brush

NOTE: A *light*, 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 coat of thread compound. However, the thread form should remain clearly visible.

4.4.9 A stabbing guide is recommended to limit damage during the stabbing process.

4.4.10 Stab the pin connector into the box connector carefully to avoid damage to the connectors; request assistance from the man on the stabbing board.

4.4.11 If the connection is mis-stabbed, pick up the joint, clean the pin and the box and reinspect for damage. Repair if necessary.



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4.5 Make-up

4.5.1 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 encoder should be utilized when available. An enhanced computer display should be part of the torque-turn monitoring equipment and 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 **six (6) months**, traceable to the appropriate national standard.

4.5.2 Back-up tongs should be placed below the coupling. Use back-up tongs for the first 10 joints or until sufficient weight is generated in the slips to prevent the entire string from rotating.

NOTE: Power and backup tong dies shall be clean and not worn down and shall not leave marks exceeding 0.015" in depth. Excessive marks or sharp-bottomed marks must be removed. Removal may be by filing only; grinding is prohibited.

4.5.3 Position the power tongs approximately 7" above the coupling.

NOTE: Do not allow the stabber to rock the tube during make-up.

NOTE: Activate dies according to manufacturer's recommendation.

4.5.4. Make up the connection power-tight using a make-up speed between 8 and 14 rpm. In any case the make up speed should not exceed 14 rpm. Make-up speed should not vary excessively and should be continuous with no gear changing after the snub line becomes tight. Make up in high gear is allowed from stabbing to hand-tight but should be continuous and not exceed 30 RPM.

TARGET MAKE-UP RPM

2 1/16"	-	3 1/2"	14 RPM
4 1/2"	-	5 1/2"	12 RPM
6 5/8"	-	7"	10 RPM

NOTE: If shoulder torques are high or low, adjust the thread compound application to give good make up torque curves. For high torque, apply more compound. For very high torque, apply Molybdenum disulfide to both pin and box connectors prior to the application of the thread compound.



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NOTE: Hunting running specifications state that the connection must shoulder prior to reaching maximum assembly torque.

NOTE: The normal shoulder window is based on dimensional tolerances only. Other factors affecting shoulder torque are texture of phosphate coating, type of thread lubricant, make-up speeds, temperature, etc.

NOTE: The mill make-up should not move appreciably during field make-up. However, a small amount of rotation or less than 1/4 turn is acceptable.

NOTE: If a casing running tool is used and the connection is being made up with the TOP Drive, insure that the torque registered at the floor is consistent with the torque being applied at the Top Drive.

NOTE: If CRT is used for make-up no dump valve shall be used and a 5 - 8 second torque hold shall be applied.

- 4.5.5 If the optional torque/turn monitoring equipment is used a make-up torque/turn graph should be generated for every connection.
- 4.5.6 Pipe should be vertical and spin freely during make-up. Elevators should not interfere with this process.
- 4.5.7 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 4.5.4 **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.
- 4.5.8 In the event CRT is used at the rig site, the following procedure should be used to extract the tooling once make-up is complete:
 - a) Disengage in accordance with CRT manufacturer's procedure.
 - b) Slowly extract tools from pipe.
 - c) Remove the internal tool guide.
 - d) Inspect thread to insure there is no damage.

- 4.6 Pulling
 - 4.6.1 Preparation



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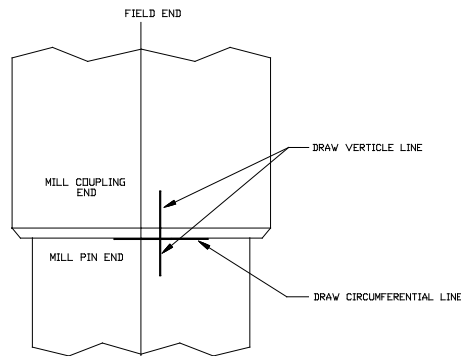
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- a) Slip type elevators are required.
- b) Use an alignment yoke and weight compensator when pulling casing.
- c) Use power tongs with acceptable torque read-out and back-up tongs.
- d) A wooden platform must be used for standing back tubulars. (Refer to API 5C1)
- e) Clean thread protectors should be available prior to laying down or standing back. As each connection is broken out, protectors shall be installed on each pin.

4.6.2 Breaking Out

- a) Use power tongs with torque adjustment adequate for break out without damaging pipe. When coming out of hole, the back-up tong should be placed on the coupling (below centerline) to assure that the pipe joint breaks out at the top of the coupling. Pipe wrenches or chain tongs shall not be used as back-ups.

NOTE: Prior to break-out, using an ink paint marker, draw a vertical line from the mill make-up side of the coupling onto the mill end tube body. Also draw a line circumferential on the tube body, either side of the vertical line even with the coupling face. If the mill make-up moves over 1/4 turn during break-out, use these marks to reestablish the mill make-up position.



- b) Break out the connection at a speed less than 10 rpm in a vertically aligned position.
- c) After breaking loose, rotate by hand with the aid of a strap wrench. The connection will be disengaged and ready for separation in approximately 6 turns from the power tight position.

NOTE: Do not spin after the connection has “popped.” This can and will cause thread damage and/or galling. The proper method of thread disengagement is to rotate the field pin 1/4 to 1/2 a turn after the connection has popped.

- d) If excessive torque is noted, rotation should be stopped until cause is determined.



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- e) Great care should be exercised to disengage all of the threads before lifting the tubing field end out of the coupling. Do not jump out of the coupling. If this occurs, inspect the thread flank seal for damage.
- 4.6.3 Standing Back
 - a) Tubulars should be set on a firm wooden platform when stood back in the derrick.
 - b) Protect threads from dirt or damage when the tubulars are out of the hole. Thread protectors should be installed on the pin members when standing back and may be required in the coupling when conditions warrant.
- 4.6.4 Re-Running
 - a) Clean connection members fully and inspect for damage.
 - b) Field repair any small protrusion on threads.
 - c) Re-run as per 4.4 and 4.5.
- 4.6.5 Laying Down
 - a) Clean protectors shall be placed on the tubulars before they are laid down.
 - b) If tubulars are stored or re-used, remove the protectors after laying down, clean and inspect connections. Coat all exposed threads with water displacing oil (WD-40) followed by Kendex or other acceptable storage compound and install clean thread protectors.

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

- 5.1 Using steam, soap and hot water, or safety solvent, remove all thread storage or running compound from both pin and box connectors.
- 5.2 Ensure that the thread and sealing surfaces are clean, dry, and free of oil, grease, or residues.
- 5.3 On thread sealing connections, apply the Hunting recommended thread compound on the first three (3) thread of the pin and last three (3) threads of the box (area of the perfect threads engagement).
- 5.4 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.
- 5.5 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.
- 5.6 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.



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6.0 RUNNING PROCEDURE FOR LIFTING ACCESSORIES MADE UP WRENCH TIGHT

- 6.1 Thoroughly clean and visually inspect both sides of the connection to be made-up.
- 6.2 Ensure that the pin thread start and full form threads are free from tears and burrs.
- 6.3 Ensure that the box connector is free from burrs or tears on the starting threads and throughout the full form thread length.
- 6.4 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.
- 6.5 Apply make-up lines to both pin and box connectors in accordance with Ancillary Specification **“Make-up Position Using Barrettes, SEAL-LOCK HT”**.
- 6.6 Apply the appropriate thread compound to the pin and box connection in accordance with Section 4.4.8.
- 6.7 With a suitable back-up on the pipe, apply with a wrench the following minimum make-up torque.

<u>SIZE</u>	<u>M/U TORQUE (FT-LB)</u>	<u>SIZE</u>	<u>M/U TORQUE (FT-LB)</u>
2 1/16"	250	4 1/2"	350
2 3/8"	250	5"	500
2 7/8"	250	5 1/2"	500
3 1/2"	250	6 5/8"	600
4"	350	7"	600

- 6.8 Check to ensure that the distance between the make-up lines is equal to or less than the following:

<u>SIZE</u>	<u>TURNS</u>	<u>SIZE</u>	<u>TURNS</u>
2 1/16"	.50	4 1/2"	.75
2 3/8"	.50	5"	.75
2 7/8"	.50	5 1/2"	.75
3 1/2"	.75	6 5/8"	1.00
4"	.75	7"	1.00

- 6.9 If the distance between the two make-up marks is greater than the values listed above, apply additional torque until the number of turns between the two lines is equal to or less than the turns listed above.
- 6.10 If this distance cannot be achieved, break the lifting sub loose, lay it down and contact a Hunting Representative.