RECOMMENDED PRACTICE SEAL-LOCK HT-S TIMED

Approved	Initials	Date
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Revision	015	

SUBJECT: FIELD RUNNING AND HANDLING

1.0 SCOPE

1.1 This document sets forth Hunting's recommended practice for the general field running and handling procedures that should be used when making-up with the **SEAL-LOCK HT-S TIMED** product line.

WARNING: **Hunting Energy Services SEAL-LOCK HT-S TIMED connection requires specific make-up procedures. A qualified Hunting Energy Services Representative must be present when running the SEAL-LOCK HT-S TIMED connection. If a qualified Hunting Energy Services Representative is not present, Hunting Energy Services may choose to not accept responsibility for connection damage or performance.**

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. 5A3

3.0 EQUIPMENT

3.1 The following list of equipment should be on location when the connection is run:

3.1.1 Ample supply of fresh, unopened thread compound.

NOTE 1: Hunting recommends the use of SealLube ™ on the mill end for 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 including accessories, and field end make up, please refer to Hunting's website to verify the current Recommended Thread Compounds approved by Hunting.

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

3.1.2 Thread lubricant applicators #58235 moustache brush recommended.

NOTE 2: Hunting does not recommend bottlebrushes that are commonly used for thread lubricant application, as the amount of lubricant cannot be adequately controlled.

3.1.3 Hunting's field service kit – pit gage and caliper (four (4) month calibration.

3.1.4 Appropriate Connection Data Sheet (CDS).

3.1.5 **VISUAL THREAD INSPECTION**, Ancillary Specification.

3.1.6 **STEEL IMPERFECTIONS**, Ancillary Specification.

3.1.7 **MANDATORY** - Torque turn monitoring equipment.

3.1.8 Approved molybdenum disulfide spray.

4.0 FIELD RUNNING AND HANDLING PROCEDURES

4.1 Handling

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.

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 Ensure that all necessary running equipment and accessories (subs, crossovers, nipples, gas lift mandrels, lifting/handling plugs, hangers, pup joints, etc.) are available and in good condition. Document condition in tally book.

NOTE 3: Following a thorough review of running/accessory equipment, discuss running procedures with Drilling Supervisor.

4.2.2 It is the responsibility of the operator and/or the user of the connections to define safe and sustainable lifting and pulling operations. Hunting recommends slip type elevators as they suit all connection types. However, for regular OD coupled connections a collar, shoulder, or side door type elevator is permissible. The maximum bearing load of the coupling face shall be requested from Hunting Connection Technology for the specific product. The maximum coupling face bearing load provided is a calculated engineering value based on connection dimensions and design combined with minimum material properties. It shall be the responsibility of the operator and the user of the connection to define the appropriate safety factors considering the elevator design, dimensions, and condition for safe operations that do not jeopardize or damage the integrity of the connection.

NOTE 4: Hunting does not recommend the use of bottleneck or drill pipe elevators.

4.2.3 Ensure that the slips are 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 5: The safety clamp should be used above the table slips per the clamp manufacturer's rated load limit.

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 6: See Section 3.1.1 for recommended thread compounds.

4.2.7 A stabbing board or a yoke should be used 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.

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 7: 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 8: Ensure that there are no bristles left on the threads from cleaning.

4.3.4 If applicable, 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 shoulder 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.**

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

4.3.7 If any joint shows obvious ovality, it should not be run.

4.4 Running

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

NOTE 9: While moving tubing, do not lift with a hook that may/will contact the box/coupling thread, shoulder, 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 Single joint elevators or pick-up line with or without single joint elevators may be used to lift the joint up in the derrick.

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.

NOTE 10: Hunting connections are not interchangeable with any other connections in the industry. The use of an internal tool guide 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.

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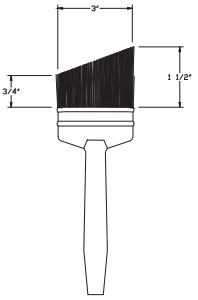
4.4.5 As each length is suspended vertically, remove the thread protectors and clean both pin and box connectors to be made-up. Remove any thread compound, solvent or moisture remaining on the connection after removing the protector.

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

4.4.7 After the connection is clean and dry, apply a ***light***, even coating of the recommended thread compound to the pin and coupling connectors.

Do Not Use
Bottle Brush

Preferred Moustache Brush #58235



Alternate Acceptable
Modified Paint Brush

NOTE 11: A *light*, even coating of thread compound is defined as all thread surfaces, root and crest, and pin face/torque shoulder covered with an even coat of thread compound. However, the thread form should remain clearly visible.

NOTE 12: The amount of thread compound applied will affect the make-up curve. For consistently high shoulder torques, molybdenum disulfide can be applied to both pin and box connectors prior to the application of the thread compound.

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

4.4.9 Stab the pin connector into the box connector carefully to avoid damaging the connectors.

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

4.5 Make-up

4.5.1 Mandatory Torque-Turn Equipment.
A torque/turn monitoring system shall be utilized. Monitoring equipment should be capable of resolving torque to 1/100th of a turn increments. A computer display should be part of the torque-turn monitoring equipment and utilized to monitor make up. 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 on the coupling below the connection being made-up. Use back-up tongs until sufficient weight is generated in the slips to prevent the entire string from rotating.

NOTE 13: 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 3" above the coupling.

NOTE 14: Do not allow the stabber to rock the tube during make-up.

4.5.4 Make up the connection according to the directions given by the Hunting Energy Services Field Service Representative. Begin make-up of the connection with the power tongs in low gear not exceeding 20 RPM. From hand tight position to power-tight shall not exceed 5 RPM.

NOTE 14: SEAL-LOCK HT-S TIMED is a connection made up manually on both the mill and field ends. Timing marks have been applied to both the field pin end as well as the open end of the coupling. Manually rotate the field pin end into the open end of the coupling until reaching position. This is defined as both pin and open-end coupling timing marks being in circumferential alignment after the connection has shouldered. Once in position, manually release the torque from the tong by letting go of the torque lever without the aid/use of the dump valve. See illustration below.

NOTE 15: Make-up torques are for reference only. Alignment of marks determine proper make-up. A circumferential line at the make-up loss length may be added to the pin to aid in recognition of reaching the timed position.

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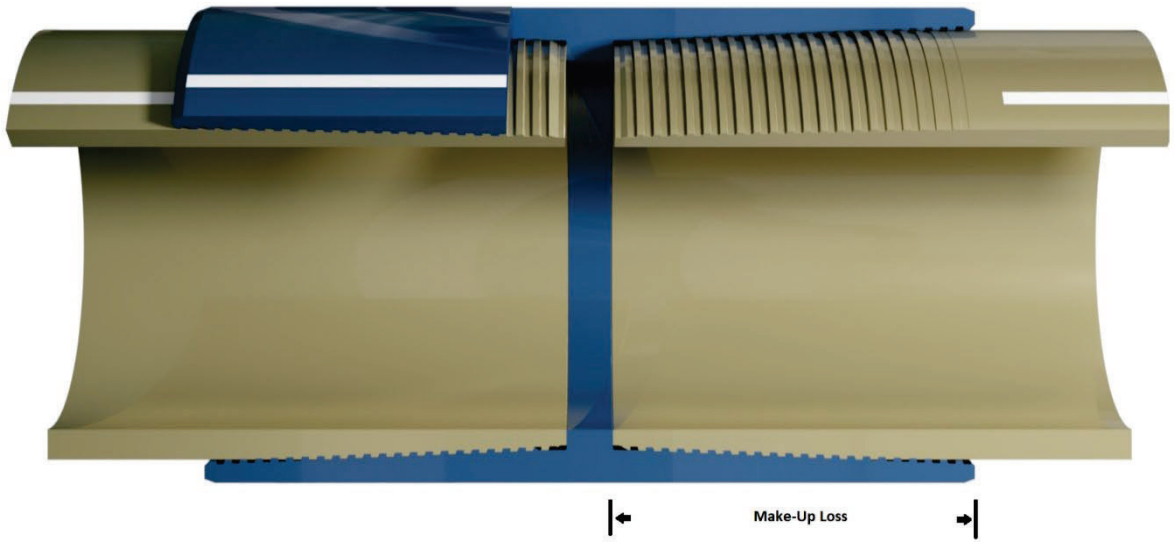
EXAMPLE: SEAL-LOCK HT-S-TIMED



NOTE 16: The mill make-up shall not move from established made-up position.

4.5.5 A make-up torque/turn graph shall 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 Prior to the job, the operating company representative should review the Hunting CDS with the Hunting Energy Services Representative.

NOTE 17: SEAL-LOCK HT-S TIMED is a connection that is manually made up to position.

4.6 Make-up Acceptance and Rejection

4.6.1 To achieve an acceptable make-up, the following requirements shall be met:

a) The "Timed" alignment make-up marks shall be the main criteria for achieving proper make-up.

b) For connection sizes smaller than 4-1/2", the final torque-turn graph shall exhibit a clear and distinct shoulder prior to reaching the timing marks.

c) For connection sizes 4-1/2" and greater, The connection should achieve a shoulder with a minimum of 500 ft-lb of shoulder delta torque prior to reaching the timing marks.

d) For all connection sizes, the torque-turn graph shall not indicate non-linear (yielding) behavior after shouldering.

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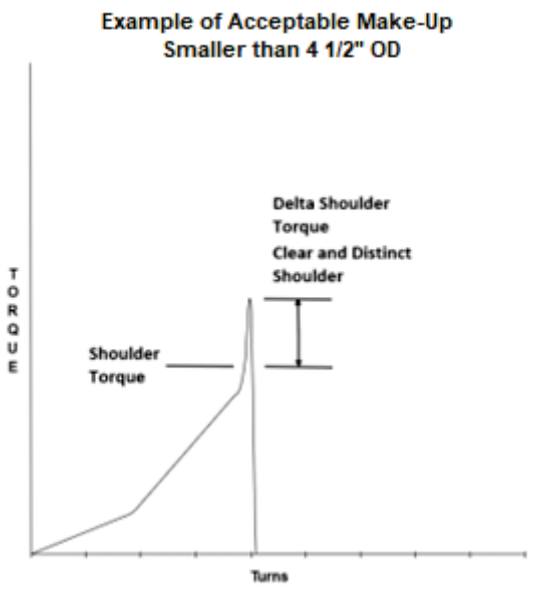
NOTE 18: Delta Torque is defined as the amount of torque applied to the connection shoulder (pin face to box shoulder) once the pin face reaches the integral shoulder within the box connection.

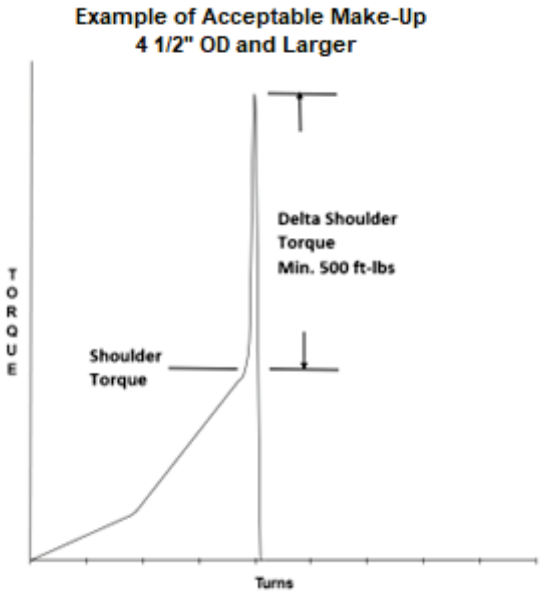
NOTE 19: The "Dump Torque" of the torque-turn unit shall be set at the torque value published in the CDS.

4.6.2 The torque – turn graph shall be analyzed to ensure that the connection will perform as designed. The illustrations below show examples of an acceptable make-up and an unacceptable make-up that yielded the connection during the make-up process:

4.6.3 The dump valve shall not be activated until the connection has shouldered and the alignment marks have achieved position. The dump valve of the tong should not have any function in the connection make-up process.

4.6.4 If the Dump Torque is exceeded and the timing marks are not in position, the connection shall not be used. If a decision cannot be made, or if there are some questions or concerns about the make-up, please contact Hunting Energy Services at ++1 (281) 442 7382, ask to speak with a Field Service Representative.





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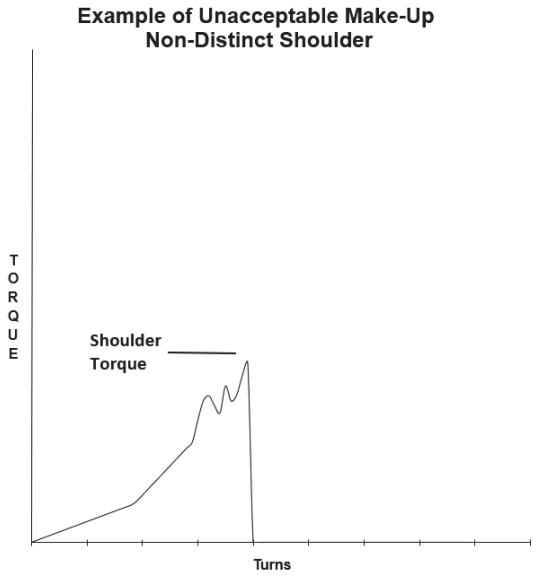

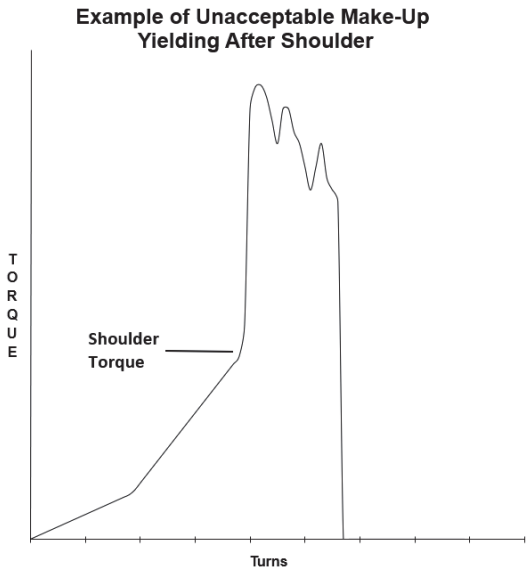

4.7 Pulling

4.7.1 Preparation

a) Proper elevators are required as mentioned in section 4.2.2.
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.

4.7.2 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 connection breaks out at the top of the coupling. Pipe wrenches or chain tongs shall not be used as back-ups.
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 20: 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.

e) Great care should be exercised to disengage all 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.

4.7.3 Standing Back

a) Tubulars should be set on a firm wooden platform when standing 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.

4.7.4 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.

4.7.5 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) threads 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.