



**RECOMMENDED
PRACTICE
TWO-STEP
(TSHP, TSHD
TSHP-SR, TSHD-SR)**

Approved	Initials	Date
Prepared by	RBI	09/19/18
Engineer	SJH	10/10/18
GM QA	GJR	09/28/18
Revision	009	10/11/18

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 **TSHP and TSHD** carbon and chrome tubing product lines.

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 **TWO-STEP** tubing is run:
- 3.1.1 Ample supply of fresh, unopened thread compound.

NOTE: For thread compounds, 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".

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.

- 3.1.2 Thread lubricant applicators #58235 moustache brush.

NOTE: Hunting does not recommend the bottlebrush commonly used for thread lubricant application as the amount of lubricant cannot be adequately controlled.

- 3.1.3 Hunting's field service kit.
- 3.1.4 Appropriate sales data sheet. See above notes.
- 3.1.5 **VISUAL THREAD INSPECTION**, Ancillary Specification.
- 3.1.6 **STEEL IMPERFECTIONS**, Ancillary Specification.
- 3.1.7 Molybdenum disulfide spray.
- 3.1.8 **OPTIONAL** - WD-40.
- 3.1.9 **OPTIONAL** - Torque monitoring equipment.
- 3.1.10 Appropriate size and weight handling plug.
- 3.1.11 Appropriate size stabbing guide.
- 3.1.12 Dillion gage or equivalent.
- 3.1.13 Seal ring installation tool.
- 3.1.14 SR products "dead blow", non sparking.
- 3.1.15 Extra seal rings – SR products



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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.
- 4.1.7 Do not handle more than three joints unless the pipe is packaged or bundled.
- 4.1.8 Handle pipe with hooks with liftable protectors in place.

NOTE: Extreme care must be taken to ensure that liftable protectors are in place, and hooks are securely fastened, to ensure safety while lifting pipe.

NOTE: For CRA material, pipe racks should be coated with a non metallic material.

NOTE: The following precautions should be observed when handling casing and tubing:

- a. Before loading or unloading make sure that the thread protectors are tightly in place. Do not unload pipe by dropping. Avoid rough handling which might damage the threads or ding or dent the body of the pipe. Damaged threads may leak or part. Dents and out-of-roundness may reduce the collapse resistance of the pipe.
- b. Special handling may be required for sour service and CRA material. Impact against adjacent pipe or other objects may cause a local increase in the hardness of the pipe to the extent that they become susceptible to sulfide stress cracking. The owner of pipe that requires special handling requirement should notify his service providers of the applicable special handling requirements and to which pipe the special requirements are applicable.
- c. When unloading by hand, use rope slings to control the pipe. When rolling down skids, roll pipe parallel to the stack and do not allow pipe to gather momentum or to strike the ends, because even with thread protectors in place there is danger of damaging the threads.
- d. When using a crane, the use of spreader-bar with a choker-sling(s) at each end is the recommended method of handling long pipe. Each choker-sling shall be double wrapped.
- e. When rolling pipe on the rack, keep pipe parallel and do not allow pipe to gather momentum or to strike the ends.

4.2 Preparation

- 4.2.1 Ensure that all necessary running equipment is available and in good condition.



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

NOTE: Accessories should be inspected and origin of manufacture should be determined. It is recommended that Two-Step connections from other manufacturers NOT be mixed with a HUNTING TSHP and TSHD strings.

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 Check for traveling block alignment and rotary hole alignment.

4.2.5 Ensure that an ample supply of thread compound is available. Only fresh, previously unopened containers of compound shall be used. Stir thoroughly.

NOTE: Hunting recommends the use of non directional inserts for CRA material in elevators and slips.

NOTE: See Section 3.1.1 for recommended thread compounds.

4.2.6 A stabbing board or a yoke may be required to offer stability for ease of make-up.

4.2.7 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 four (4) months.

NOTE: Hunting recommends the use of a Dillion gage to assist in establishing the torque dump on the tong unit.

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 and box ends. Clean each connection and pin protectors thoroughly. Pre-install handling plugs in the first joints to be run and reinstall pin and box protectors (dry). If no handling plugs are to be used, reinstall pin and box protectors (dry).

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.



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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 box shoulder, seal, or threads when placing the mandrel in the joint.

NOTE: Drift should be made of chrome, nylon or a non-metallic material for CRA material.

4.3.5 Inspect the threaded connections using Hunting's **VISUAL THREAD INSPECTION** guide lines and **ANCILLARY SPECIFICATIONS**.

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

4.3.6 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 and/or thread protectors must be in place whenever tubulars are moved.

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 may be used to lift the joint up in the derrick.

NOTE: Do not remove handling plug from box until mud fill-up line is removed.

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: 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 Clean and re-inspect each connection as it hangs in the derrick. Remove any thread compound, drilling mud, solvent, or moisture remaining on the connection after removing the protector and/or handling plug.

4.4.6 After the connection is clean and dry, apply a light to moderate, even coating of molybdenum disulfide spray to the pin and box connector.



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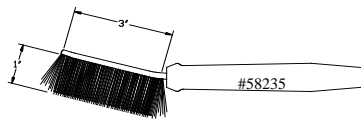
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- 4.4.7 After the connection is clean and dry, apply a very light, even coat of the thread compound to the box connector. Apply a very light even coat of the thread compound to the 14° and 30° seal surfaces only on the pin connectors.

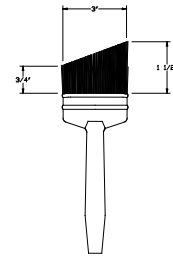
CAUTION: To much thread lubricant can cause connection damage and or seal ring damage on make-up. The problem is heightened with a high make-up speed.



Do Not Use
Bottle Brush



Preferred Moustache Brush #58235



Alternate Acceptable
Modified Paint Brush

NOTE: A very light, even coating of thread compound is defined as all thread surfaces, root and crest, and seal surfaces covered with an even coat of thread compound that has very little build-up of the thread compound. The 14° and 30° seals and thread form should remain clearly visible.

- 4.4.8 Use an alignment yoke to assist make-up.
4.4.9 Place the stabbing guide onto the box connector.
4.4.10 Stab the pin connector into the box connector.
4.4.11 If the connection is mis-stabbed, pick up the joint, clean the pin and the box and reinspect.
- 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 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 months, traceable to the appropriate national standard.

NOTE: Set the reference torque to 000 (zero).



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4.5.2 Back-up tongs should be placed below the box connection. 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: TWO-STEP is a free running connection. Interference prior to the torque shoulder (30°Seal) is minimal. Caution should be exercised in controlling the speed of the pin when shouldering into the box. Example: The typical shoulder torque for 3 1/2 TSHP is approximately 250 ft./lbs.

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 pin connector.

NOTE: For CRA material the connection shall be started by hand and/or with a strap wrench.

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

4.5.4 Make up the connection power-tight with the tong in low gear using a make-up speed between 5 and 10 rpm. In any case the make up speed should not exceed 12 rpm. Make-up speed should not vary excessively and should be continuous with no gear changing.

**TARGET MAKE-UP RPM
(CARBON MATERIAL)**

2 1/16"	-	10 RPM
2 3/8"	-	9 RPM
2 7/8"	-	8 RPM
3 1/2"	-	7 RPM
4"	-	6 RPM
4 1/2"	-	5 RPM

**TARGET MAKE-UP RMP
(CRA MATERIAL)**

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

NOTE: On CRA materials, do not exceed 8 RPM.

CAUTION: Over speed during make-up can cause damage to the connection and/or the Teflon seal rings on TSHP-SR connections.

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 Lower the elevators over the pipe after make-up is complete, not during make-up.

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.



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- b) 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: Hunting recommends visually inspecting pin and box external mated shoulders for bellling or deformation due to over torque.

4.6 Pulling

4.6.1 Preparation

- a) Slip type elevators are required.
- b) Install lifting/handling plug in box.
- c) Use an alignment yoke and weight compensator when pulling tubing and casing.
- d) Use power tongs with acceptable torque read-out and back-up tongs.
- e) A wooden platform must be used for standing back tubing. (Refer to API 5C1)
- f) 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.

NOTE: Safety clamps and handling plugs must be used during pulling.

NOTE: Hunting does not recommend standing back CRA material.

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 pipe body below the transition area of the upset. Pipe wrenches or chain tongs shall not be used as back-ups.
- b) Break out the connection at a speed less than 10 rpm.
- c) After breaking loose continue to rotate at 10 RPM or less until the connection drops down one thread. The connection will be disengaged and ready for separation in 4 to 6 turns from the power tight position.

NOTE: Do not spin after the connection has “dropped.” This can and will cause thread damage and/or galling.

NOTE: For CRA material break out initial torque and back out with a strap wrench.

- d) If excessive torque is noted, rotation should be stopped until cause is determined.
- e) Great care should be exercised to disengage all of the threads before lifting the tubing out of the box. Do not jump out of the box. If this occurs, inspect the pin face and flank seal for damage. Remove the power tongs and slowly pick up the joint.

4.6.3 Standing Back (Tubing)

- a) Tubulars should be set on a firm wooden platform when stood back in the derrick.



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- 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 box when conditions warrant.

4.6.4 Re-Running

- a) Clean connection members fully and inspect for damage.
- b) 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.

4.7 Seal Ring (Optional)

- 4.7.1 The seal ring is inserted into a machined groove in the box designed to provide continuity of the corrosion resistance on coated pipe.

NOTE: Visually inspect the box end to assure that a seal ring has been installed or has been installed properly. In the event that a seal ring has not been installed, follow the following procedure:

- a. Visually inspect the box seal ring groove for dents, dings, burrs, or debris that may affect the seal ring installation.
- b. Place one (1) seal ring on the seal ring installation tool.
- c. Insert the installation tool with the attached seal ring into the box end. The seal ring should contact the circumference of the 14° seal going into the seal ring groove.
- d. While firmly holding the installation tool in place, strike the top of the installation tool, pressing the seal ring into place.
- e. Visually inspect the seal ring to assure proper installation. The Teflon seal should seat firmly into the groove without looping or protrusions of the seal ring into the box I.D.

NOTE: The seal ring installation tool is a dual-purpose tool, it is self-centering to the box I.D. Assure that the appropriate size tool is utilized for the connection being run. Installation tools are size specific.

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 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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- 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.