Running Procedure for King Cobra® Connection

Procedure No: FT-RP-007

Rev: 02

Approvals

Documented By	Israel Martinez (Fermata ® Technologies) & Daniel Ruiz (Oilfield Services & Technologies)	11/13/2024
Reviewed By	Angela Hill	11/13/2024
Approved By	Ryan Broussard	11/13/2024

Revision Control

Rev	Description of Changes	Date Issued
00	Issued for use	10/28/2020
01	RPMs, Thread compound requirement	02/26/2021
02	Revised to include knurling verification, add Constrictor® Thread Sealant	11/13/2024

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1. General Running Procedure

1.1 Refer to General Running Procedure No. FT-RP-000 latest revision.

2. Thread Compound Application

2.1 Fermata® recommends the use of Fermata® Constrictor® Advanced Thread Sealant for all sizes on the pin connection.

Figure 1: Fermata® Constrictor® Advanced Thread Sealant

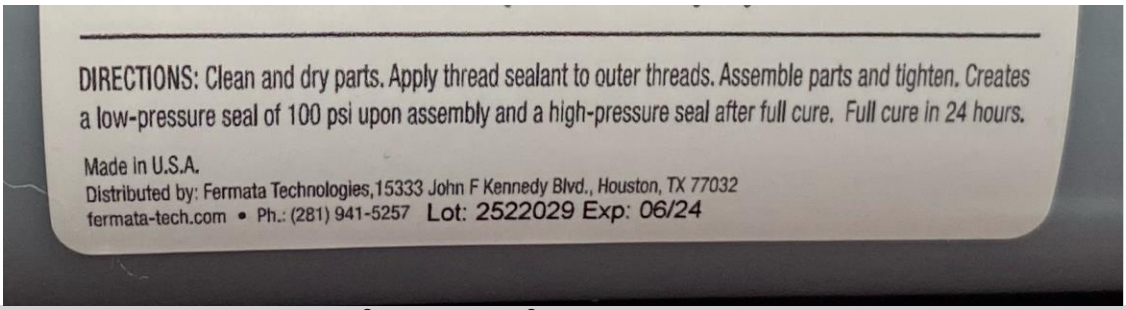

Figure 2: Example of Fermata® Constrictor® Advanced Thread Sealant Label Expiration Date

2.2 The amount of applied thread compound will depend on the size and weight configuration of the connection.

2.3 Using a measuring device, apply the amount of thread compound or sealant specified in Table 1 to the pin threads only. Adjust the sealant amount as needed to achieve comparable application to that in Figure 3. DO NOT apply thread compound or sealant on the box connection. Under certain circumstances dope application may be altered only if approved by Fermata® engineering.

Table 1: Constrictor® Advanced Thread Sealant Amount

OD (inches)	Volume (mL)
3-1/2”	1.25
4”	2.5
4-1/2”	3
5”	3.5
5-1/2”	5
7	5
7-5/8”	6.25
8-5/8”	6.25
9-5/8”	7.5

2.4 The use of a fine bristle mustache or 1” paint brush is recommended to best control the application of thread sealant. The brush should be clean and free of any water. Water that is on the brush or connection must be completely removed before the application of sealant.

Figure 3: Example of Proper & Acceptable Thread Compound Application of the Pin Connection

2.5 Ensure to not overapply thread compound. When using a measuring spoon, level the spoon by scraping the top with a flat edge if the volume increment is equivalent to the spoon (example: if 5mL is specified in the running procedure and a 5mL spoon is used for measuring, level the spoon). Use the applicator brush to clean out the spoon and spread the compound evenly across all threads. Do not apply any compound past the base of the make-up indicator.

2.6 Excessive thread compound can cause dope squeeze and/or yielding on a connection. If dope squeeze or yielding is observed, reduce the amount of thread compound. It is recommended to start with a reduction of 30%. Ensure that the connection still maintains light, full coverage. The following figures (Figures 4 & 5) are 2 unacceptable graphs due to excessive compound.

Figure 4: Example of Dope Squeeze **Figure 5: Example of Yielding**

3 Compatibility

3.1 King Cobra® does **NOT** have compatibility with different weights within the same OD.

4. Make-up

4.1 Fermata® recommends setting the scale (X axis) of the make-up graph to 5-8 turns to obtain a proper make-up profile.

4.2 An encoder should be used and not a proximity switch for counting rotations. Generally, proximity switches do not provide adequate pulses per revolution.

4.3 Fermata® recommends targeting the optimum make-up torque listed on the current connection data sheet. Any make-up torque between the minimum and maximum make-up torque is acceptable, but the optimum make-up torque is ideal for most conditions and common equipment. Add 10% to all specified make-up torque values when using a thread locking compound.

4.4 Before the first connection make-up, set the dump valve to the optimum torque and test on the pipe body to ensure proper tong engagement and that the pipe integrity is not compromised.

4.5 Make-up the first connection to the optimum torque, draw a line across the pin and box, and re-apply the optimum torque (double bump).

4.6 If movement past 0.5” is observed, reapply optimum torque +20% (This may exceed maximum make-up torque, but is acceptable, provided no yielding is observed and the tongs are not compromising the pipe body).

4.7 Repeat 4.5 to 4.6.

4.8 Movement is an indication of excess thread compound. If observed, review the amount of thread compound applied and reduce the amount.

4.9 Continue making up the string to the higher torque value, if necessary.

4.10 Initial spin-in of the connection at Revolutions Per Minute (RPM) at or below that listed in Table 2 should be applied until torque builds.

4.11 Move to the final RPM, point at which torque accumulates prior to the Constrictor® lock point (see Figure 5) and keep the RPM at or below that listed in Table 2.

4.12 RPM may occasionally be adjusted based on makeup profile if approved by Fermata® Field Service Management or Engineering.

4.13 The following (Table 2) is the recommended maximum make-up RPM.

Table 2

Pipe Diameter	High Gear not to exceed	Low Gear not to exceed
4-1/2” to 5-1/2”	20 RPMs	5 RPMs
7” to 7-5/8”	15 RPMs	5 RPMs
9-5/8” and greater	10 RPMs	3 RPMs

4.14 Verify the make-up result against the torque-turn graph to ensure that there were no abnormal make-up scenarios that could affect the make-up and performance of the connection.

4.15 The Constrictor® Lock Point is the point on the graph where the torque-turn slope begins to change from curved to linear. It is required to be between 5% and 80% of makeup torque. See Figure 5.

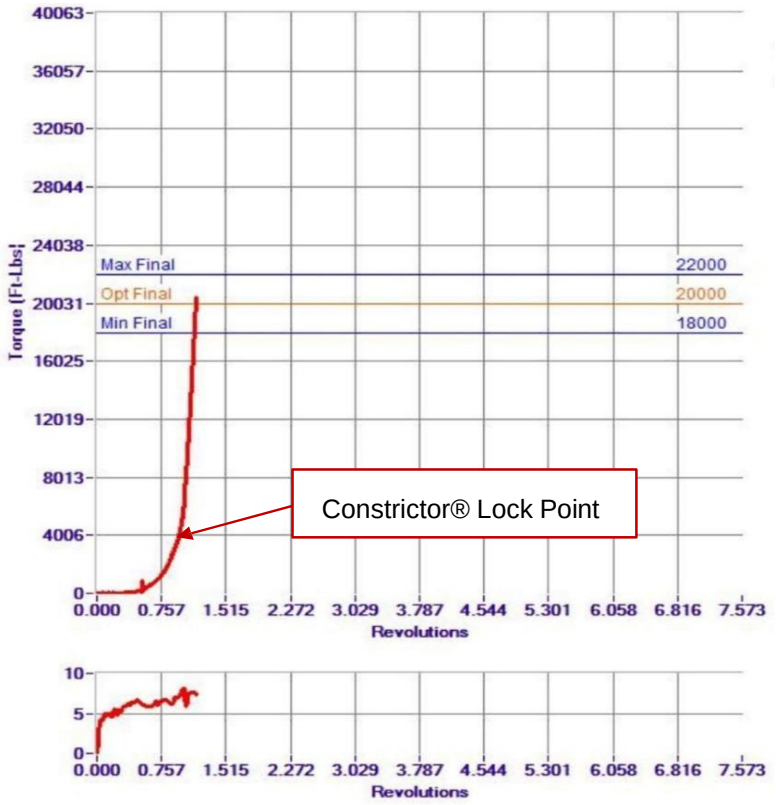

Figure 6: Example of a Proper Make-up Graph

4.16 Figures 6 and 7 are examples of unacceptable make-up graphs where too much thread compound was applied.

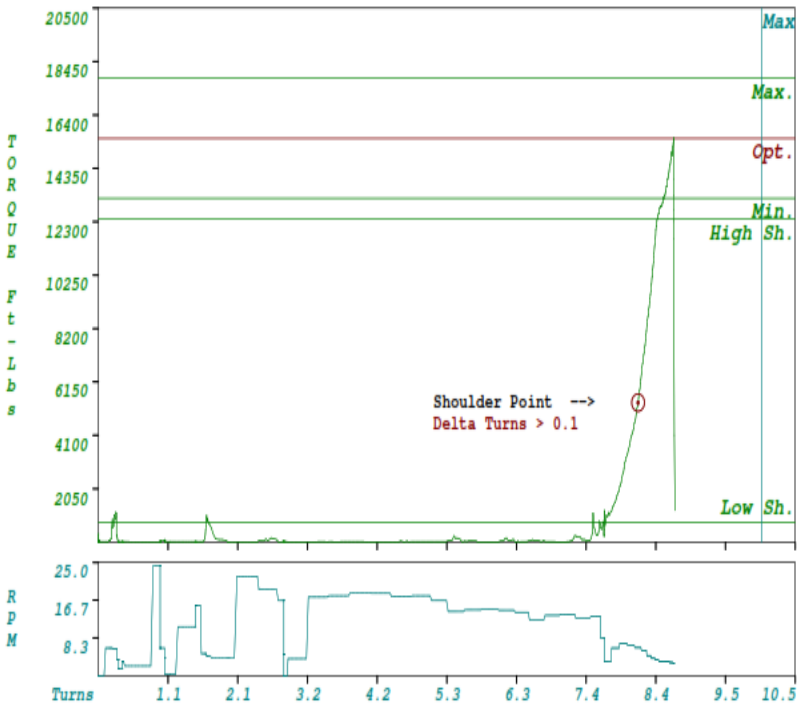

Figure 7: Unacceptable Make-Up Graph Example 1

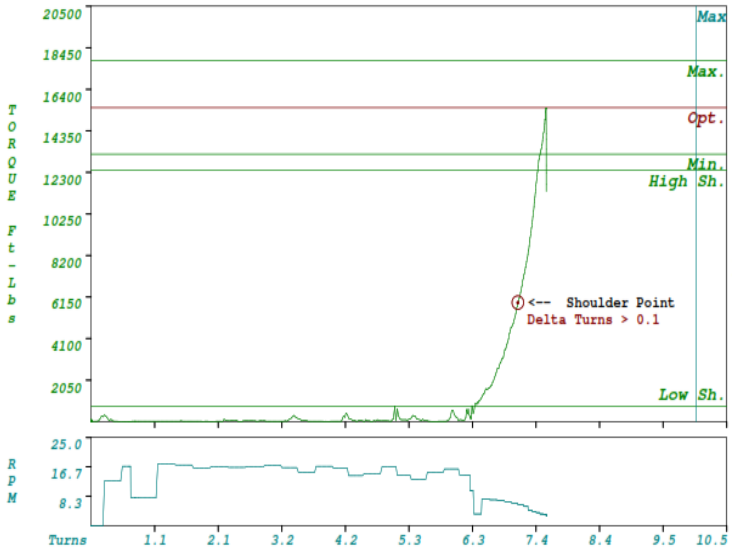

Figure 8: Unacceptable Make-Up Graph Example 2

4.17 Verification of King Cobra® connection make-up can be made by checking the triangle stamp or knurling.

- For connections with a triangle stamp, the base of the triangle shall be aligned within ± .125” of the box face. A 1” wide X 24” long white paint stripe is applied to the field end pin to aid in location the triangle stamp location.

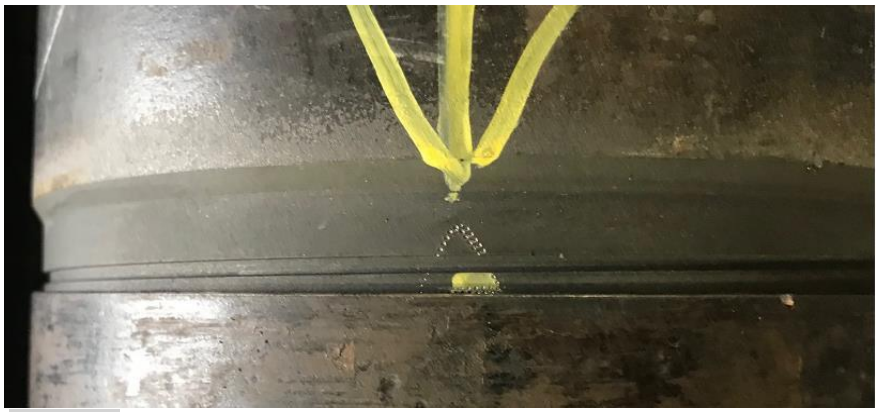

Figure 9: Example of Proper Triangle Stamp Position After Make-Up

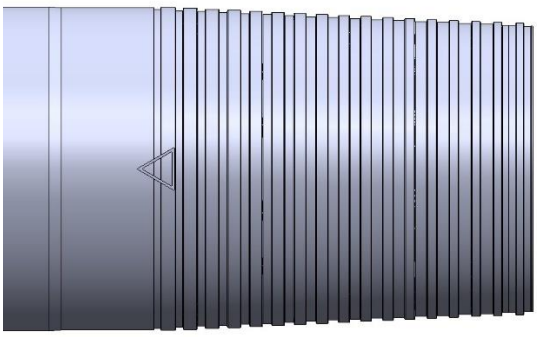

Figure 9: Triangle Stamp Applied to Pin

Figure 10: Triangle Stamp After Make-Up

- For connections with knurling, the box face shall be anywhere in the knurl area.

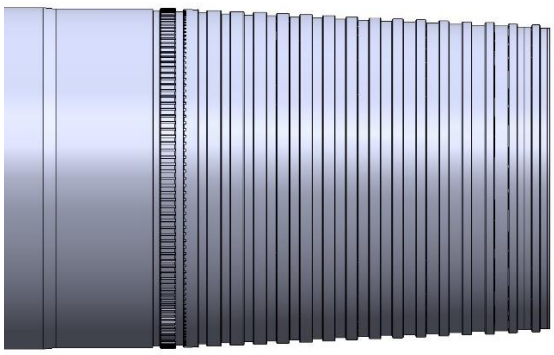

Figure 11: Knurling Applied to Pin

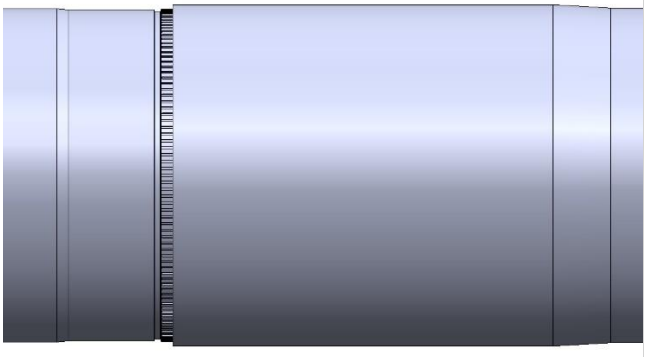

Figure 12: Knurling Area After Make-Up

5. Downhole Rotation

5.1 The maximum operating torque listed on the latest revision of the connection data sheet is the maximum torque allowed for downhole rotation, unless reviewed and approved by Fermata® Engineering. The speed should not exceed 40 RPM.

5.2 RPM's and operating torque may be evaluated and adjusted on a case-by-case basis, if approved by Fermata® Engineering.

5.3 Take care to gradually increase or decrease rotation speed and torque to prevent potential dynamic loading scenarios.

6. Break out and Inspection of Connection

6.1 Verify back-up tongs are equipped with the appropriately sized dies prior to break-out of the connection.

6.2 Place the back-up tongs on the pipe body below the swaged area of the box.

6.3 Break-out the connection in low gear to ensure adequate torque capability.

6.4 Keep break-out speed low to prevent galling (preferably 5 RPM or less)

6.5 Break-out slowly until the pin "jumps", indicating disengagement.

6.6 Use a stabbing guide prior to disengagement to prevent damage to the connection.

6.7 Alignment is equally important during break-out as during make-up. Verify alignment prior to break-out of the connection.

6.8 If it is necessary to re-run the connection, make sure to fully break-out the connection, remove all thread compound and debris, inspect the connection for damage (galling/gouging), and follow the make-up procedure outlined in Section 4.

6.9 When necessary to lay down the string, the connection must be stored and covered with an approved storage compound and covered with the proper sized thread protectors. Ensure that the thread protectors are clean and free of grime, debris and foreign contaminants.

6.10 Properly mark the joints in accordance with the rig repair / rejection report (Figure 9) and notify your immediate supervisor if joints were laid down.

7. Marking Instructions

7.1 All used, rejected, repairable, and or prime pipe left on rig locations will be identified into a classification based on the below chart and must be submitted to Field Service Management as soon as possible via email.

Summary of Pipe left on Rig Location

Customer: _____ **Rig:** _____ **Well Name:** _____

String 1	String 2	
		Prime Joints, conduct VTI leave insructions to apply storage compound prior to having thread protectors placed back on. (Joints that never left the pipe rack)
		Rig Returns, identified by **1 White band** near mill end & **1 Yellow band** at repairable end / area. (Joints that were made up never went below the rig floor, broken out, laid down, and passed VTI.)
		Used Pipe, identified by a **1 Orange band** 6 inches each side of the defect, damage, or made up end and near the mill end. (Joints failed VTI or went below rig floor.)
		Rejected Pipe, identified by a **1 Red band** 6 inches each side of the defect, damage, or made up end and near the mill end. (Joints rejected with signs of galling, pitting, or other damage.)

Figure 12: Pipe Classification Summary Example