Running Procedure for Hercules® SL Connection

Procedure No: FT-RP-018

Rev: 00

Approvals

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Revision Control

REV	Description of Changes	Date Issued
00	Approved for release	11/11/2025

1. General Running Procedure

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

1.2 Hercules® SL requires Slip Type Elevators to run.

1.3 Handling Plugs and Stabbing Guide are required for running.

1.4 Fermata® strongly recommends the use of a Fermata® certified and trained thread rep service company during all Fermata® Connections casing runs. If a Fermata® certified/trained thread rep service is not used, the operator is responsible for approving and ensuring that all connection make-ups meet Fermata® make-up criteria.

2. Thread Compound Application

2.1 Fermata® recommends the use of BOL 72733 or API Modified applied on the pin threads of Hercules® SL.

2.2 Ensure the thread compound is properly mixed prior to using. The thread compound shall be in good condition, within the compound shelf life, free of debris or contaminants and not separated.

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

2.4 Using a measuring device, apply the amount of thread compound specified in Table 1 to the pin threads. Adjust the thread compound amount by up to 2mL as needed to achieve comparable application to that in Figure 1.

2.5 Under certain circumstances the compound application may be altered, only if approved by Fermata® Engineering.

Table 1: Thread Compound Amounts

OD (inches)	Volume (mL)
5”	4
5-1/2”	4.5
7	6
7-5/8”	6.5
8-5/8”	7.5
9-5/8”	8.5

2.6 The use of a fine bristle mustache or 1” paint brush is recommended to best control the application of thread compound. The brush should be free of debris and water. Water that is on the brush, connection, or in the running compound container must be completely removed before use or application of the compound. Apply a light coat of thread compound to the field end pin threads, ensuring that the thread form is visible and the compound does not fully cover the threads (Figure 1).

2.7 When applying thread compound, ensure the mill end pin is made up to the center of the coupling to prevent a low or high shoulder torque. This may be done by verifying the knurl or triangle stamp box face position see Figure 9 and 12.

2.8 Under certain circumstances thread compound application may be altered only if approved by Fermata® Engineering.

Figure 1: Proper Thread Compound Application Example

Figure 2: Do NOT Apply Thread Compound to the Hercules® SL Box Threads

2.9 Ensure not to overapply thread compound. When using a measuring spoon to measure the thread compound amount, level the spoon by scraping the top of the spoon with 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.

2.10 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 maintains light and full coverage of the threads. The following figures (Figures 3 & 4) are 2 unacceptable graphs due to excessive compound.

Figure 3: Yielding

Figure 4: Dope Squeeze

3. Compatibility

3.1 Hercules® SL pins have limited compatibility with differing weights within the same O.D. Careful consideration of the performance properties of the weakest connection must be made by the operator.

4. Connection Make-up

4.1 The Field Service Technician must ensure that he has the correct and latest data sheets.

4.2 The Field Service Technician will apply all thread compound per Fermata® recommendations prior to starting the casing run. If any joints are not able to have thread compound applied on the pipe rack due to the arrangement of the pipe, the Field Service Technician will apply the thread compound as pipe is brought to the rig floor, or as the ends are accessible on the pipe rack during the run.

4.3 The Field Service Technician must remain on the tower or rig floor to accept all make-up graphs and notify the rig crew if he leaves the rig floor to apply thread compound to any pipe on the pipe rack.

4.4 During the running of the casing, the Field Service Technician is responsible for approving all make-up graphs and verifying the torque shoulder. If the movement of cables, slips, or binding of elevators is observed, all efforts must be made to fix the issue and shall be noted in the comments of the make-up graph and the field service report.

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

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

4.7 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 thread locking compound. A torque shoulder must be visible for proper make-up.

4.8 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.

4.9 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).

4.10 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).

4.11 Repeat 4.9 to 4.10.

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

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

4.14 Spin in the connection in high gear at a Revolutions per Minute (RPM) at or below that listed in Table 3.

4.15 Switch to low gear prior to shouldering and keep the RPM’s at or below that listed in Table 3

4.16 The following (Table 3) 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”	30 RPMs	15 RPMs
7” to 7-5/8”	20 RMPs	10 RPMs
9-5/8” and greater	15 RPMs	7 RPMs

4.17 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.

4.18 The shoulder torque is the point in which the pin noses make contact. This is indicated by a dramatic spike in the torque-turn graph and shall be clearly visible at a minimum of 5% of make-up torque and at a maximum of 90% of make-up torque as shown in Figures 5 & 6. If the shoulder torque is outside of these specifications, break out and inspect the pin and coupling.

Figure 5: Example of a Proper Make-up Graph & Shoulder Torque

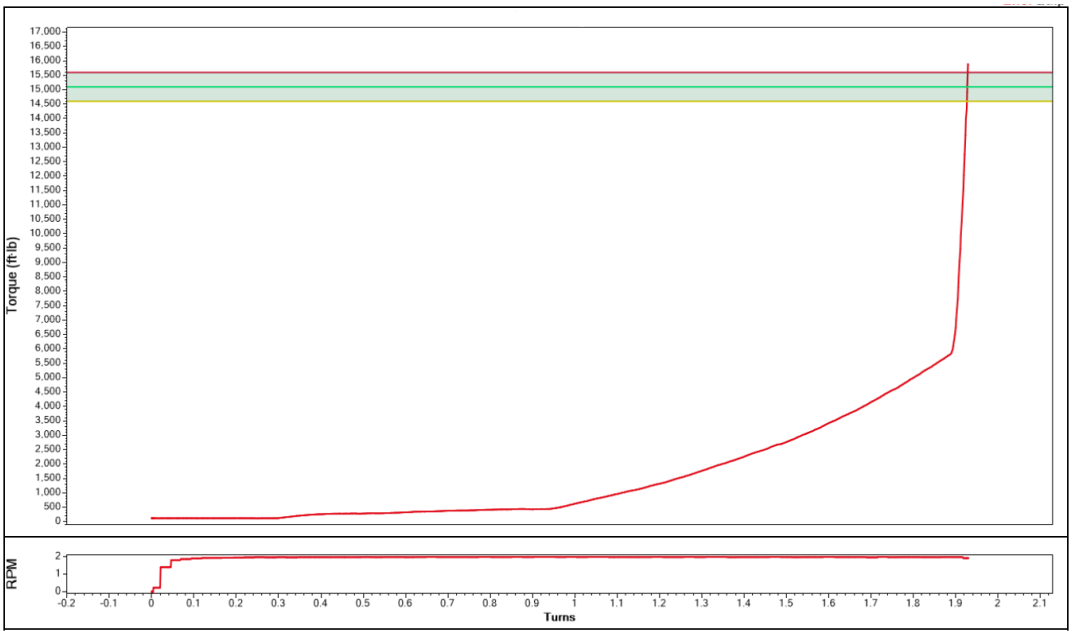


Figure 6: Example of an Acceptable/Proper Hercules® SL Connection Make-Up

4.19 Figures 7 and 8 are examples of unacceptable graphs where too much thread compound was applied.

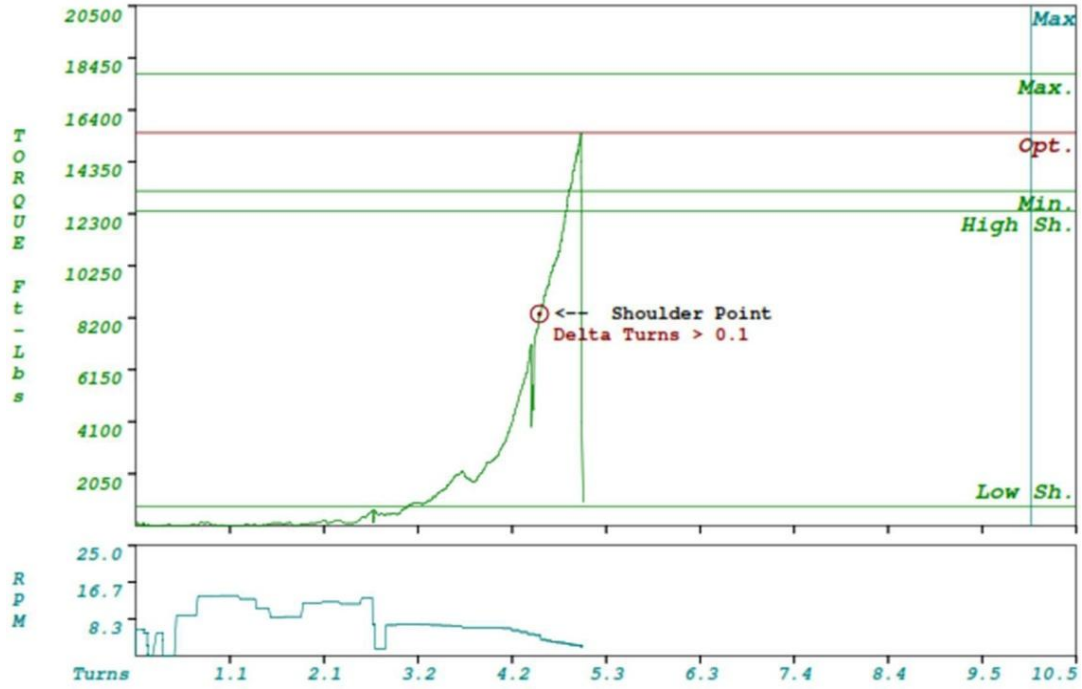


Figure 7: Unacceptable Make-Up Graph

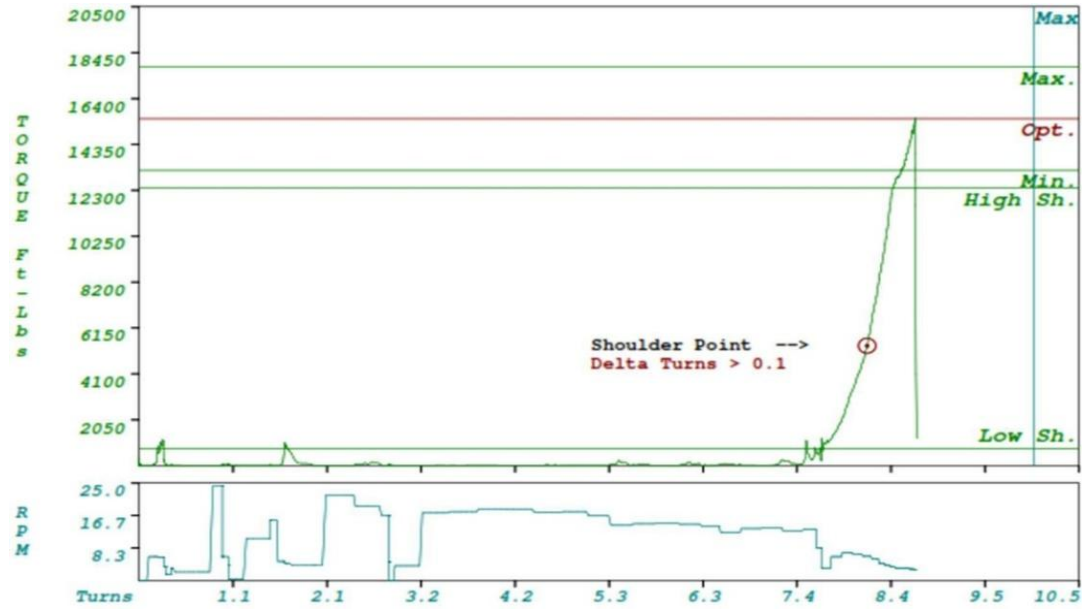


Figure 8: Unacceptable Make-Up Graph

4.20 Verification of proper Hercules® SL connection make-up can be made by checking that the box face falls within ±.063” of the knurl marking base on the pin/pipe body (Figures 9 & 10), or that the base of the triangle is aligned within ±.063” of the box face (Figure 12).

4.21 Knurl band acceptable coverage/visibility is 50% - 100% of pipe circumference.

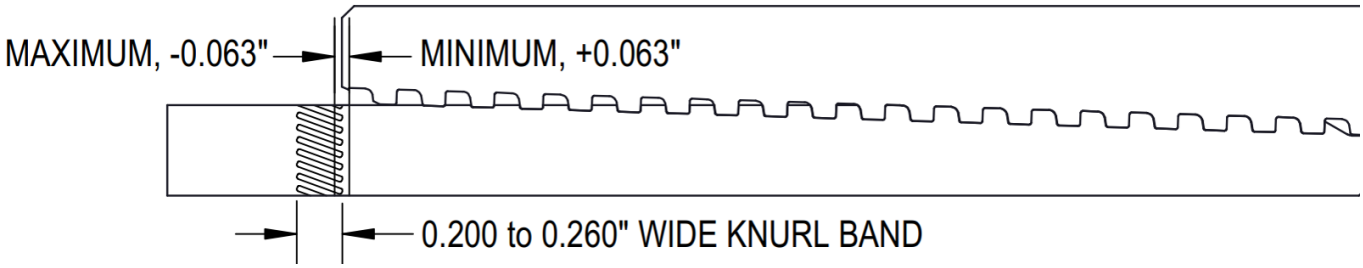


Figure 9: Knurl Band Make-Up Tolerance Criteria for Hercules® SL

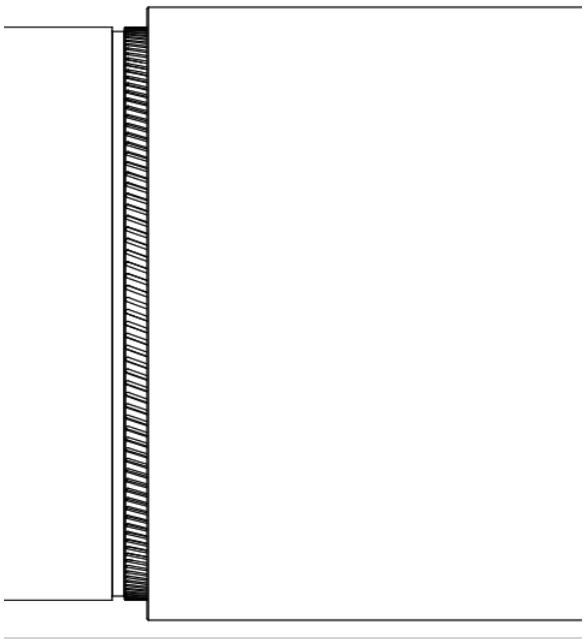


Figure 10: Knurling Area After Box/Pin Make-Up

4.22 For connections with a triangle stamp, a 1” wide X 4” long white paint stripe is applied to the mill and 1” wide X 24” long field end to aid in locating the triangle stamp (Figure 11).

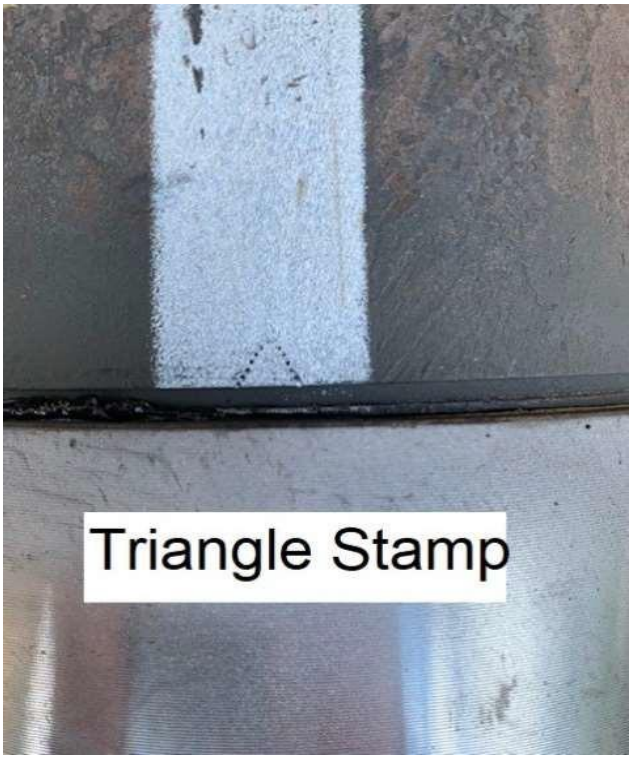


Figure 11: Example of Proper Triangle Stamp Position After Make-Up

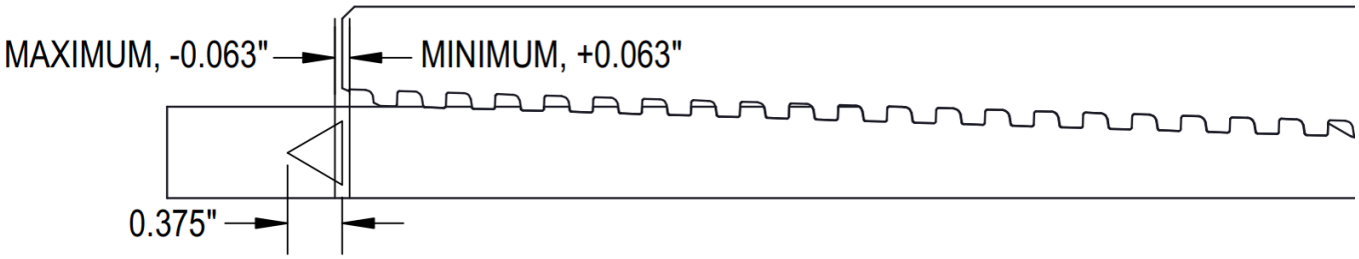


Figure 12: Triangle Stamp Make-Up Tolerance Criteria Hercules® SL

Figure 13: Triangle Stamp Applied to Pin

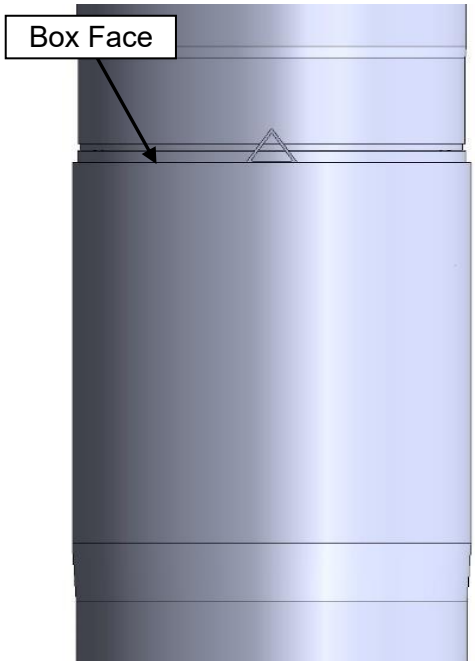


Figure 14: Triangle Stamp Location After Make-Up

5. Downhole Rotation

5.1 The maximum operating torque listed on the current connection data sheet is the maximum torque for downhole rotation unless reviewed and approved by engineering. Speed should not exceed 40 RPM. RPM's and operating torque can be evaluated and adjusted on a case-by-case basis if approved by Fermata® Engineering.

5.2 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.

6.2 Place the back-up tongs on the lower half of the coupling and not on the pipe body for threaded & coupled connections to ensure breaking out the field end pin.

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.

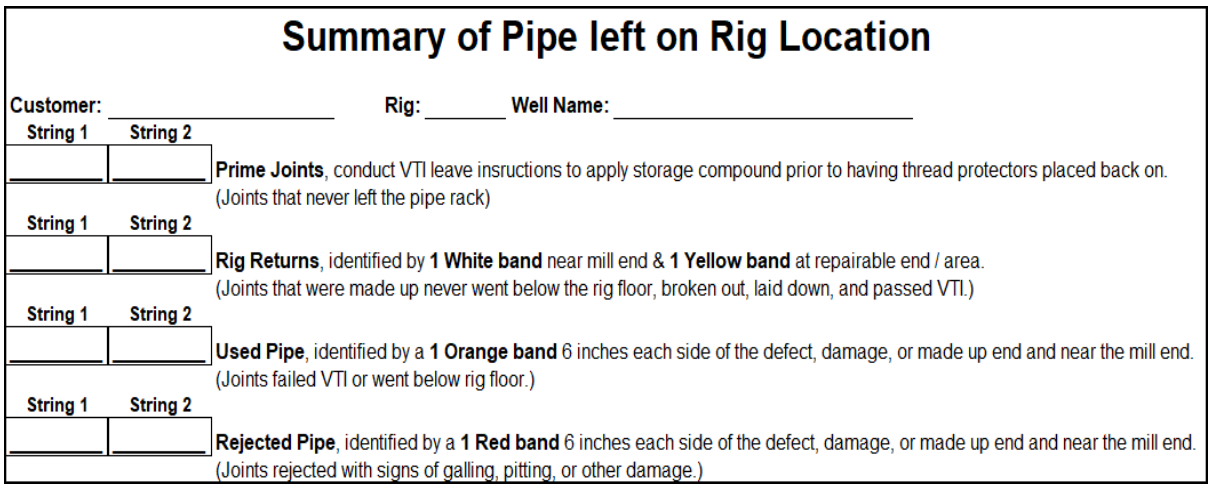
6.7 Alignment is equally important during the connection break-out as during make-up. Verify alignment prior to break-out of the connection.

6.8 If re-running, fully break out the connection, remove all thread compound and debris, inspect, and follow the make-up procedure. If laying down, apply storage compound and thread protectors free of grime and debris.

6.9 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.

6.10 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.

6.11 All used, rejected, and/or repairable pipe left at the rig location must be identified, tagged and categorized based on the chart shown in Figure 15, 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 15: Pipe Classification Summary