

Quality Assurance Procedure QAP 5925
Method of test for

**Rotational Capacity Test of Bolt Fastener Assemblies With Lengths 2 - 3/4 Inches
and Longer**

1. SCOPE

1.1 The purpose of this procedure is to assure the bolted fastener assemblies are capable of achieving the minimum required tension without exhibiting torsional nor stripping failure. This test is applicable to friction connections specified in Section 509 of the Standard Specifications. This procedure is specific to 7/8 inch diameter bolts.

1.2 This test is performed on two fasteners from each Rotational Capacity Lot number.

1.3 The tension indicating device should have been calibrated within the last six months, or if the unit has been dropped.

1.4 The torque wrench shall be calibrated within the last six months, whenever the unit has been dropped, or if the unit was used to loosen a fastener.

2. REFERENCE

2.1 FHWA-SA-91-031, High Strength Bolts for Bridges

3. APPARATUS

3.1 Skidmore - Wilhelm 3.2 Marker 3.3 Torque Wrench 3.4 Spud Wrench 3.5 Breakaway Wrench

4. PROCEDURE

4.1 Measure the thread projection from the outside of the nut such that three to five threads are within the grip (distance between the bearing faces of the nut and the bolt head).

4.2. Install the bolt into the Skidmore-Wilhelm such that identical projection is achieved. This may be accomplished using washers or spacers. In any case, the lot washer must be used and be adjacent to the nut. Note the number of threads sticking out at the start of the test.

4.3 Snug tighten the assembly to 4-7 kips inclusive.

4.4 Match mark a corner of the nut to a mark made on the face of the Skidmore.

4.5 Measure and mark a vertical stripe: 240 degrees (four corners on the nut clockwise) if the length of the fastener is 3 & 1/2 inches, or less in length; 360 degrees if the fastener is more than 3 & 1/2 inches, but less than 7 inches in length.

4.6 Tension the assembly until the rotation marked in the previous step is reached. Record the tension.

4.7 Read the torque value at this point. (Torque is measured by reading the wrench after you feel it just start moving the nut in the clockwise direction.

4.8 Loosen the assembly using a breakaway wrench. (Not the calibrated torque wrench). Remove the assembly from the Skidmore. Hand thread the nut onto the bolt. The nut must thread at least to the point at which the test was started in step 4.2.

5. ACCEPTANCE CRITERIA

5.1 The tension measured in step 4.6 shall be equal to or greater than 45,000 lbs.

5.2 The Maximum Torque Value measured in 4.7 (using the Skidmore) shall be as follows:

Maximum Torque = 0.25 PD

Where:

Torque = Measured in foot-pounds

P = Measured bolt tension in pounds

D = Nominal diameter in feet

5.3 The fastener shall not strip (in step 4.8).

5.4 A failure of any assembly to meet the criteria specified in 5.1 - 5.3, shall constitute failure of the respective Rotational Capacity Lot.