Print Form

TnA™ 144 Torque and Angle Fastening System

Submittal Package

TO:

PROJECT:

SPECIFIED ITEM:

Product for Submittal/Substitution Requested:

Submitted By:

Name:

Company:

Address:

Phone: Fax: email: Date:

For use by Architect and/or Engineer:

( ) Approved ( ) Approved as Noted ( ) Not Approved

Note or Remarks (Briefly explain approved as noted/not approved in this section)

By: Signature: Date:

Copyright 2014 LeJeune Bolt Company I All Rights Reserved

TnA™ 144 Torque and Angle Fastening System

Product Description

The TnA™ 144 Torque and Angle Fastening System is a structural bolting system that includes a single grade structural bolt that can be used in F1852 (A325) and *F2280 (A490) design applications and a two function installation tool that provides accurate and repeatable snug tight and final tension.

Fastener and Tool Specifications

The TnA™ bolt is a round head, fixed spline structural bolt installed using calibrated torque for snug tight and angle (Turn-of-the-Nut) for final installation. TnA™ bolts are sold as matched assemblies to ensure accurate and repeatable installation. The bolt is installed from a single side using the TA Series Torque/Angle Wrench. A reversing tool is available for easy removal of bolt assemblies.

Bolt Properties		TnA		F1852 (A325)		A325	
Tensile Strength (min), psi		144,000		120,000		120,000	
Proof Load, psi		101,000		85,000		85,000	
Hardness, Hrc		31-35		25-34		25-34	
Dimensions, ASME		B18.2.6		B18.2.6		B18.2.6	
Type		1,3		1,3		1,3	
Diameters		3/4" - 1”		1/2" – 1 1/8"		1/2” – 1 1/2”	
Material	Type 1	Carbon, Carbon Boron, Alloy		Carbon, Carbon Boron, Alloy		Carbon, Carbon Boron, Alloy	
	Type 3	Weathering		Weathering		Weathering	
Finishes		Plain, MG B695 Class 55		Plain, MG B695 Class 55		Plain, MG B695 Class 55, HDG	
Marking		Type 1	Type 3	Type 1	Type 3	Type 1	Type 3
TnA™ Bolt Assembly							
Spline Drive		Fixed		Twist Off		None	
Nut Properties							
ASTM		A563		A563		A563	
Grade		DH		DH		DH	
Type		1,3		1,3		1,3	
Proof Load, psi		Non-Coated	Coated	Non-Coated	Coated	Non-Coated	Coated
		175,000	175,000	175,000	150,000	175,000	150,000
Diameters		3/4"- 1”		1/2" – 1 1/8”		1/2” – 1 1/2”	
Finishes		Plain, MG B695 Class 55		Plain, MG B695 Class 55		Plain, MG B695 Class 55, HDG	
Washer Properties							
ASTM		F436		F436		F436	
Type		1,3		1,3		1,3	
Diameters		3/4" - 1”		1/2" – 1 1/8”		1/2" – 1 1/2”	
Finishes		Plain, MG B695 Class 55		Plain, MG B695 Class 55		Plain, MG B695 Class 55, HDG	

Tool Properties

	Model TA-6144	Model TA-7144	Model TA-8144
Voltage	115 VAC	115 VAC	115 VAC
Frequency	50-60 Hz	50-60 Hz	50-60 Hz
Max Torque	390 lbf	700 lbf	890 lbf
Snug Torque	250 lbf	375 lbf	550 lbf
Controllable Angle	90° – 240°	90° – 240°	90° – 240°
No Load Speed	22 rpm	15 rpm	9 rpm
Diameter Installed	3/4"	7/8”	1”

TA Series Installation Tool

*Consult LeJeune Bolt Company for further information when F2280 (A490) design criteria is required

Copyright 2014 LeJeune Bolt Company I All Rights Reserved

TnA™ 144 Torque and Angle Fastening System

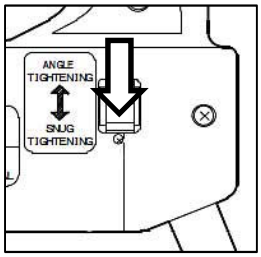
Installation Procedure

Installation Instructions for TnA™ bolts.

Step 1. Install Bolts - Matched TnA™ bolt assemblies should be installed into the connection to finger tight.

Step 2. Setting the Tool for Snug Tightening – Set the diameter appropriate TA Series Torque/Angle wrench to the Snug Tightening setting.

Illustration 1.
Push switch down for Snug



Step 3. Snug Tight Installation – Beginning from the TnA™ bolt installed in the most rigid point of the connection, place the TA tool firmly over the nut and spline end ensuring full engagement. Pull and hold the trigger. The tool will shut off when reaching the calibrated torque value. Confirm that the plates have come into firm contact. If a significant gap in the plates was witnessed prior to installation or if a gap remains, a second snugging pass should be performed. TnA™ Bolts that have lost tension due to joint compression during the initial snugging operation will be brought up to the calibrated torque value and the TA tool will shut off. For those TnA™ bolts that are at the calibrated snug value during secondary snugging operations, the tool will shut off prior to any additional turn. *The joint should be compacted and the TnA™ bolts uniformly snugged.*
note: If your connection design only requires snug tight, stop now and move on to the next connection. If your connection design requires pre-tensioned or slip critical joints, proceed to step 4.

Step 4. Setting the Tool for Angle Tightening – Set the diameter appropriate TA Series Torque/Angle wrench to the Angle Tightening setting. Then set the Angle Setting Dial to the degree of angle specified in table 1 (A small screw driver works best. We include one with every tool just in case you don't have something that small on hand).

Illustration 2.
Push switch up for Angle

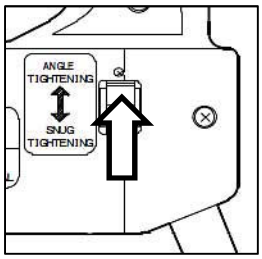
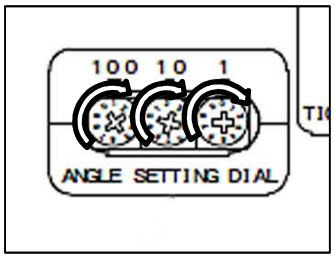


Illustration 3.
Set each dial to the corresponding value (i.e. 90 degrees = '0' on the 100 dial, '9' on the 10 dial, and '0' on the 1 dial



Step 5. Match Mark the Bolts – It's not a requirement to match mark TnA™ bolts since the tools measures the degree of nut turn relative to the bolt. If you or your inspector would like the assurance of visual inspection, then go ahead and match mark the plate on the nut side, the nut, and the bolt spline on the same line. Place a second mark on the plate only at 90° from your starting position where you can easily see the finished turn.

Copyright 2014 LeJeune Bolt Company I All Rights Reserved

Step 6. Angle Installation – Using the same installation pattern you used in your snugging operation, place the TA tool firmly over the nut and spline end of the TnA™ bolt ensuring full engagement. Pull and hold the trigger until the tool shuts off by reaching the selected degree of angle. The relative degree of angle between the nut and bolt should be at least that value shown in table 1. We recommend setting the tool +10° beyond the minimum required angle just to be sure you reach the minimum. An extra 10° won't over tighten the bolt. *Your TnA™ Bolts are now uniformly installed above the designated minimum tension requirement.*

Table 1.

	TA-6144	TA-7144	TA-8144
Snug Tightening (ft/lbs.)	200	325	500
Angle Tightening (≤ 8d)	90	90	90

Pre-Installation Verification – Torque & Angle

Pre-Installation Verification Instructions for TnA™ Bolts Using TA-Series Torque/Angle Wrenches

Tension Calibrator

A tension calibrator shall be used where bolts are to be installed in pretensioned and slip-critical joints to:

1) Confirm the suitability of the complete fastener assembly, and;
2) Confirm the procedure and proper use by the bolting crew.

Calibration of the Tension Calibrator shall be confirmed through calibration at least annually by Skidmore-Wilhelm or another NIST accredited agency. Calibration date shall be clearly identifiable on the Tension Calibrator and c calibration documents shall be readily available at the location and time of testing.

Required Testing

A representative sample of no fewer than three complete TnA™ fastener assemblies of each unique *set* to be used in the work shall be checked at the site of installation in a tension calibrator to verify that the Torque & Angle Method develops a pretension that is equal to or greater than the specified value in Table 1.

If the actual snug or pretension developed in any of the TnA™ fastener assemblies is less than that specified in Table 1, the cause(s) shall be determined and resolved before the fastener assemblies are used in the work.

Copyright 2014 LeJeune Bolt Company I All Rights Reserved

Procedure

Step 1. Install the sample in the tension calibrator using the appropriate plate, bushing, and spacer set for the individual diameter and length of bolt. The bolt head shall not be captured. The washer shall be installed against the plate or spacer. The nut shall be installed against the washer to at least flush with the first full thread of the bolt at finger tight. At no time shall additional washers or make shift spacers be used in the test.

Step 2. Install the sample to snug tight using the TA Series tool in Snug Tightening mode. The fastener assembly shall meet the minimum required snug tight tension found in Table 1 for snug tight, pretensioned, and slip-critical connections.

Step 3. From the snug tight condition, install the sample to final tension using the TA Series tool in Angle Tightening mode. The fastener assembly shall meet the minimum required final tension found in Table 1. The installer shall also witness that the tool has turned at least the minimum specified angle. This can be identified by marking the nut, bolt, and plate on the same line and placing a second mark on the plate at the specified minimum angle for the sample set.

Step 4. Repeat for each additional sample.

Each sample should be at or above minimum installation value designated in RCSC 2009 Table 7.1. TnA™ bolts can be installed using either criterion. Test criteria will be determined by design criteria used (A325 or A490) if using TnA™ as an approved substitute.

Table 1.

Nominal Bolt Diameter		Minimum Bolt Pretension for Pre-Installation Verification, kips	
		ASTM A325 and TnA™ 144	ASTM A490 and TnA™ 144
3/4"	Snug		
	Pretension		
7/8”	Snug		
	Pretension		
1”	Snug		
	Pretension		

Copyright 2014 LeJeune Bolt Company I All Rights Reserved