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Coding Information

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Title: Snap-On Torque Wrench Requirement for all Big Bore Engine Connecting Rod Bolt(s)

Applies To: A26 / MF13 / N13 / APR / Connecting Rod

Change Log

Please refer to the change log text box below for recent changes to this article:

08/30/2021 - Updated step 9 installation procedure.
 08/17/2021- Updated article reviewing steps with Excel.
 08/05/2019- Updated article reflecting changes to all big bore engines, warranty dates, links to shop & SRT manual.
 07/15/2019- Added connecting rod bolt socket part number.
 03/07/2019- Added notes and listed out torque procedure.

Description

This article has been published to ensure proper operation of the Snap-On torque wrench for all big bore engine repairs related to connecting rod torque. (A26 / N13A / N13B / MF 11 / 13)

Symptom(s)

The Snap-On Torque Wrench is required for all repairs related to all connecting rod replacement or engine overhauls.

Required Tool(s)

Each service department was issued a Snap-On Torque Wrench and Digital Torque Wrench Checker

Tool Description	Tool Number and Specifications
Snap-On Torque Wrench	CTECH3R250A (12.5-250 ft-lb) (16.9-339.0 Nm)
Snap-On (3/4")Torque Wrench Checker	6004-F-DDT (60-600 ft-lb) (81.3-813.6 Nm)
Socket, External Torx (E18)	ZTSE4835

Service Information

Review the following IK articles and Engine Manuals:

[A26 Engine Service Manual](#)

[2010 MF13 Engine Service Manual](#)

[2013 N13 Engine Service Manual](#)

[2015 N13 Engine Service Manual](#)

Digital Torque Wrench Tester Set-Up

[Tool Instruction: 4328553 Digital Torque Tester Kit](#)

Torque Wrench Set-Up

NOTE:

- Torque wrench data is required for all big bore engine repairs [WPL2800136](#).
- Prior to torquing a connecting rod bolt validate torque wrench operation and calibration with the Snap-On Digital Torque Wrench Tester.
- Average battery life is approximately 80 hours. If the batteries have been removed or replaced exceeding 20 minutes the wrench will default back to the original factory settings.
- Which ever occurs first the Snap-On torque wrench will require a calibration check at 5,000 cycles or (1) year by a certified Snap-On repair center.

[Tool Instruction: 4328552 CTECH3FR250A Digital Torque Wrench Set-Up](#)

For proper torque wrench operation ensure the following:

1. Clear previous torque wrench data.
2. Check and set the correct date and time.
3. Check and set the correct present values.
4. (PSET 1) Target Torque: 22.0 ft/lb (30 Nm), Minimum Torque: 22.0 ft/lb (30 Nm), Maximum Torque: 23.0 ft/lb (31.1 Nm), batch (2).
5. (PSET 2) Target Torque: 77.0 ft/lb (105 Nm), Minimum Torque: 77.0 ft/lb (104.3 Nm), Maximum Torque: 78 ft/lb (105.7 Nm), batch (2).
6. (PSET 3) Target Angle: 90 degrees, Minimum Angle: 90 degrees, Maximum Angle: 91 degrees, batch (2).

Installation & Repair Step(s)

NOTE:

- Connecting rod bolts are [torque to yield one time use](#).
- Engine damage will occur if one or multiple connecting rod cap(s) are mismatched or installed backwards.
- Do not use an impact to tighten connecting rod bolts.
- Do not use any universal adapters and swivels during torque procedure.
- Remove the oil pick up tube assembly for access.
- Complete connecting rod torque sequence prior to rotating the crankshaft.

CAUTION:

If a connecting rod bolt is over torqued, both bolts have to be replaced and the cap has to be recentered. Premature failure will occur due to uneven clamp load across the connecting rod cap if one bolt was replaced.

1. Review the appropriate engine service manual prior to disassembly and assembly.
2. Review [general inspection procedure](#) listed within the engine service manual prior to installation of engine components.
3. Clean all foreign material from the crankshaft journals and connecting rod assemblies.

- Install one upper and lower connecting rod bearing, lubricate each with clean engine oil or Lubriplate #105.
- A total of 2 new connecting rod bolts are required to complete connecting rod installation. Lubricate each bolt with clean engine oil first (3-4 threads) and flange, **do not submerge the whole bolt in oil, excessive engine oil can cause a connecting rod bolt to hydro-lock during installation.**
- Ensure fractured surface is clean. Install the connecting rod cap making sure the cap is centered and installed correctly aligning marks with upper portion of the connecting rod.



7. Install both bolts into the connecting rod by hand. Complete torque sequence in cylinder pairs (1/6), (2/5) and (3/4). **Do not alternate between connecting rods during this process. (PSET1) 22 ft-lbs (30 Nm), arrow up, (PSET2) 77 ft-lbs (105 Nm), arrow up, (PSET3) 90 degrees.**
Note: Recommend starting with cylinder #1 complete all (6) steps prior to moving to another connecting rod.

- Repeat Steps 4-7 for the remaining cylinders
- Its required to review torque wrench data (36 steps) prior to installation of the oil pan assembly to ensure proper torque values.
- Continue to downloading torque wrench data.

Viewing Torque Wrench Data

Torque wrench data can be viewed by downloading the .CSV file to a computer with an Excel based program or by viewing recorded data on the wrench.

(Correct amount of steps (36) recorded during procedure)

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	DATE/TIME	TARGET TC	MIN TORC	MAX TORC	PEAK TORC	TARGET AN	MIN ANGL	MAX ANGL	PEAK ANGL	TORQUE U	TORQUE S	ANGLE STA	MODE	COUNT
2	8/1/2021 12:06	22	22	23	22.5	0	0	0	0	0 FT-LB	OK	OK		1
3	8/1/2021 12:06	22	22	23	22.3	0	0	0	0	0 FT-LB	OK	OK		2
4	8/1/2021 12:06	77	77	78	77.4	0	0	0	0	0 FT-LB	OK	OK		1
5	8/1/2021 12:06	77	77	78	77.5	0	0	0	0	0 FT-LB	OK	OK		2
6	8/1/2021 12:06	0	0	275	145.7	90	90	91	90	90 FT-LB	OK	OK		1
7	8/1/2021 12:07	0	0	275	142.2	90	90	91	91	90 FT-LB	OK	OK		2
8	8/1/2021 12:07	22	22	23	25.5	0	0	0	0	0 FT-LB	OK	OK		1
9	8/1/2021 12:07	22	22	23	22.1	0	0	0	0	0 FT-LB	OK	OK		2
10	8/1/2021 12:08	77	77	78	77	0	0	0	0	0 FT-LB	OK	OK		1
11	8/1/2021 12:08	77	77	78	77.5	0	0	0	0	0 FT-LB	OK	OK		2
12	8/1/2021 12:08	0	0	275	133.4	90	90	91	90	90 FT-LB	OK	OK		1
13	8/1/2021 12:08	0	0	275	140.2	90	90	91	90	90 FT-LB	OK	OK		2
14	8/1/2021 12:09	22	22	23	25.5	0	0	0	0	0 FT-LB	OK	OK		1
15	8/1/2021 12:09	22	22	23	22.1	0	0	0	0	0 FT-LB	OK	OK		2
16	8/1/2021 12:10	77	77	78	77.9	0	0	0	0	0 FT-LB	OK	OK		1
17	8/1/2021 12:10	77	77	78	77.5	0	0	0	0	0 FT-LB	OK	OK		2
18	8/1/2021 12:11	0	0	275	133.5	90	90	91	90	90 FT-LB	OK	OK		1
19	8/1/2021 12:11	0	0	275	137.1	90	90	91	90	90 FT-LB	OK	OK		2
20	8/1/2021 12:12	22	22	23	25.5	0	0	0	0	0 FT-LB	OK	OK		1
21	8/1/2021 12:13	22	22	23	22.1	0	0	0	0	0 FT-LB	OK	OK		2
22	8/1/2021 12:14	77	77	78	77.8	0	0	0	0	0 FT-LB	OK	OK		1
23	8/1/2021 12:14	77	77	78	77.5	0	0	0	0	0 FT-LB	OK	OK		2
24	8/1/2021 12:15	0	0	275	134.1	90	90	91	90	90 FT-LB	OK	OK		1
25	8/1/2021 12:15	0	0	275	136.5	90	90	91	90	90 FT-LB	OK	OK		2
26	8/1/2021 12:18	22	22	23	25.5	0	0	0	0	0 FT-LB	OK	OK		1
27	8/1/2021 12:18	22	22	23	22.1	0	0	0	0	0 FT-LB	OK	OK		2
28	8/1/2021 12:20	77	77	78	77.2	0	0	0	0	0 FT-LB	OK	OK		1
29	8/1/2021 12:22	77	77	78	77.5	0	0	0	0	0 FT-LB	OK	OK		2
30	8/1/2021 12:25	0	0	275	133.9	90	90	91	90	90 FT-LB	OK	OK		1
31	8/1/2021 12:26	0	0	275	136.1	90	90	91	90	90 FT-LB	OK	OK		2
32	8/1/2021 12:27	22	22	23	25.5	0	0	0	0	0 FT-LB	OK	OK		1
33	8/1/2021 12:29	22	22	23	22.1	0	0	0	0	0 FT-LB	OK	OK		2
34	8/1/2021 12:30	77	77	78	77.1	0	0	0	0	0 FT-LB	OK	OK		1
35	8/1/2021 12:31	77	77	78	77.5	0	0	0	0	0 FT-LB	OK	OK		2
36	8/1/2021 12:35	0	0	275	134.7	90	90	91	90	90 FT-LB	OK	OK		1
37	8/1/2021 12:40	0	0	275	136.1	90	90	91	90	90 FT-LB	OK	OK		2

(Missing & repeated torque wrench data)

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	DATE/TIME	TARGET TOR	MIN TORC	MAX TORC	PEAK TORC	TARGET AN	MIN ANGL	MAX ANGL	PEAK ANGL	TORQUE U	TORQUE S	ANGLE STA	MODE COUNT	
2	8/1/2021 12:06	22	22	23	22.5	0	0	0	0	FT-LB	OK	OK	1	Cylinder #1
3	8/1/2021 12:06	22	22	23	22.3	0	0	0	0	FT-LB	OK	OK	2	
4	8/1/2021 12:06	77	77	78	77.4	0	0	0	0	FT-LB	OK	OK	1	
5	8/1/2021 12:06	77	77	78	77.5	0	0	0	0	FT-LB	OK	OK	2	
6	8/1/2021 12:07	0	0	275	142.2	90	90	91	91	FT-LB	OK	OK	1	Missing (2nd) 90 degrees
7	8/1/2021 12:07	22	22	23	25.5	0	0	0	0	FT-LB	OK	OK	1	Cylinder #6
8	8/1/2021 12:07	22	22	23	22.1	0	0	0	0	FT-LB	OK	OK	2	
9	8/1/2021 12:08	22	22	23	22.1	0	0	0	0	FT-LB	OK	OK	1	Repeat 22 ft-lbs
10	8/1/2021 12:08	77	77	78	77.5	0	0	0	0	FT-LB	OK	OK	2	Missing (2nd) 77 ft-lbs
11	8/1/2021 12:08	0	0	275	133.4	90	90	91	90	FT-LB	OK	OK	1	
12	8/1/2021 12:08	0	0	275	140.2	90	90	91	90	FT-LB	OK	OK	2	
13	8/1/2021 12:09	22	22	23	25.5	0	0	0	0	FT-LB	OK	OK	1	Cylinder #2
14	8/1/2021 12:09	77	77	78	77.5	0	0	0	0	FT-LB	OK	OK	2	
15	8/1/2021 12:10	77	77	78	77.9	0	0	0	0	FT-LB	OK	OK	1	
16	8/1/2021 12:10	77	77	78	77.5	0	0	0	0	FT-LB	OK	OK	2	Repeat 77 ft-lbs
17	8/1/2021 12:11	0	0	275	133.5	90	90	91	90	FT-LB	OK	OK	1	
18	8/1/2021 12:11	0	0	275	137.1	90	90	91	90	FT-LB	OK	OK	2	
19	8/1/2021 12:12	22	22	23	25.5	0	0	0	0	FT-LB	OK	OK	1	Cylinder #5
20	8/1/2021 12:13	22	22	23	22.1	0	0	0	0	FT-LB	OK	OK	2	
21	8/1/2021 12:14	77	77	78	85	0	0	0	0	FT-LB	HIGH	OK	1	Over-torque 77 ft-lbs
22	8/1/2021 12:14	77	77	78	77.5	0	0	0	0	FT-LB	OK	OK	2	
23	8/1/2021 12:15	0	0	275	134.1	90	90	91	90	FT-LB	OK	OK	1	
24	8/1/2021 12:15	0	0	275	136.5	90	90	91	90	FT-LB	OK	OK	2	
25	8/1/2021 12:18	22	22	23	25.5	0	0	0	0	FT-LB	OK	OK	1	Cylinder #3
26	8/1/2021 12:18	22	22	23	22.1	0	0	0	0	FT-LB	OK	OK	2	
27	8/1/2021 12:20	77	77	78	77.2	0	0	0	0	FT-LB	OK	OK	1	
28	8/1/2021 12:22	77	77	78	77.5	0	0	0	0	FT-LB	OK	OK	2	
29	8/1/2021 12:25	0	0	275	133.9	90	90	91	90	FT-LB	OK	OK	1	
30	8/1/2021 12:26	0	0	275	136.1	90	90	91	100	FT-LB	HIGH	OK	2	Over-torque 90 degrees
31	8/1/2021 12:27	22	22	23	25.5	0	0	0	0	FT-LB	OK	OK	1	Cylinder #4
32	8/1/2021 12:29	22	22	23	22.1	0	0	0	0	FT-LB	OK	OK	2	
33	8/1/2021 12:30	77	77	78	77.1	0	0	0	0	FT-LB	OK	OK	1	
34	8/1/2021 12:31	77	77	78	77.5	0	0	0	0	FT-LB	OK	OK	2	
35	8/1/2021 12:35	0	0	275	134.7	90	90	91	90	FT-LB	OK	OK	1	Missing (2nd) 90 degrees
36														
37														

Viewing torque wrench data can be completed by holding the **ENTER** button for 3 seconds, scrolling down in the menu and highlight **SHOW DATA**. Scrolling through (36 steps).



Downloading Torque Wrench File

[IK2700065 EZ-Tech Download Center](#)

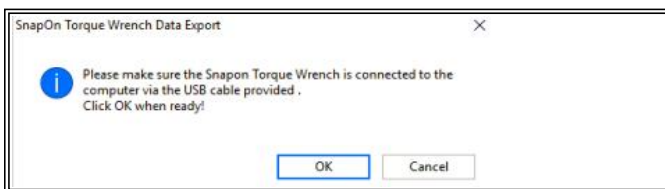
1. Prior to downloading any torque wrench data install the necessary software

Desktop Icon



2. Follow prompts after clicking on the icon.

3. Click "OK" after connecting the torque wrench to an EZ-Tech computer using the supplied USB cord.



4. Download the "zipped" file to the desktop.

Torque Wrench Troubleshooting/Information Maintenance & Service

Clean the wrench with a damp cloth.

DO NOT use solvents such as thinners, brake cleaner, carburetor cleaners.

DO NOT immerse the entire wrench into anything.

Display: persistent **TORQUE ZERO ERROR** at power on, the wrench is damaged and must be returned for repair.

Display: **ANGLE ERROR** in angle mode, fastener rotation speed has exceeded capacity of wrench.

Display: **TORQUE UCAL** wrench needs to be calibrated.

Display: **MEMORY ERROR** clear data memory.

Warranty Information

[WPL 18-002G- Required Use of New Torque Wrench](#)

September 1, 2019 all Big Bore Engines will require digital torque wrench data to be uploaded into the iApprove case file system.

Potential Warranty Chargebacks:

Click type torque wrench was used during connecting rod torque sequence.

Incorrect or manipulated files.

Hand written files.

Download is missing torque wrench data.

Missed or incorrect steps.

For APR Warranty: Torque data must be uploaded

1. Access the service portal chassis/VIN number and click on iApprove.

N13 Connecting Rod Torque Upload	N13 Connecting Rod Torque Upload	Launch Pr
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2. Attach the "zip file" to the iApprove from the desktop by clicking browse. Add comments to the description section if there were any added steps to the torque procedure.

VIN [3HSDJSNR0GN070480](#)

Technician

* Dealer

* Customer Name

* RO #

* RO Open Date

* Miles or KM Vehicle Scan is loaded.

* Engine Hours

Issue Description

[How to reduce image size](#)

No Attachments

3. The torque wrench iApprove case file is set to **Auto Closure**.

NOTE:
Do NOT manipulate torque wrench data or change any information Acceptable saved files will be saved as .csv Unacceptable saved files .txt, .pdf, .xlsx

Standard Repair Time(s):

Refer to the [SRT Manual](#) for Repair Times.

 Hide Details

Feedback Information

Viewed: 6487

Helpful: 63

Not Helpful: 7

No Feedback Found