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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:

07/12/2023 - Provide allowable torque limits, revised specifications
12/06/2022 - Updated caution statement for bolt replacement
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.

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 / MF11 / 13)**

Symptom(s)

The Snap-On Torque Wrench is required for all repairs related to 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

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.

NOTE:

For the steps that follow, please make certain anytime the connecting rod bolts are loosened, that the connecting rod cap remain properly seated to the connecting rod. Failure to do so will result in rapid catastrophic engine damage.

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).**
   - If results are above 25 ft/lb, loosen both of the rod bolts and retorque within the proper range
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).**
   - If torque results are above 80 ft/lb, replace both of the rod bolts and start at step 1
6. **(PSET 3) Target Angle: 90 degrees, Minimum Angle: 90 degrees, Maximum Angle: 91 degrees, batch (2).**
   - If torque results are 93 degrees or higher, replace both of the rod bolts and start at step 1
   - Verify the final torque value is within a minimum of 95 ft/lb to a maximum of 150 ft/lb. If any are out of range, replace both of the rod bolts and start at step 1. Typically the final torque values for all 6 rods will be fairly consistant if done correctly
   - Maximum torque variance on a single rod is 20 ft/lb. If that value is exceeded, replace both of the rod bolts and start at step 1

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 at 93 degrees or greater, both bolts must be replaced and the connecting rod cap has to be recentered. Premature engine failure will occur if only one connecting rod bolt is replaced.

1. Review the appropiate 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.

4. Install one upper and lower connecting rod bearing, lubricate each with clean engine oil or Lubriplate #105.

5. A total of 2 new connecting rod bolts are required to complete connecting rod installation. Lubricate each of the bolt threads with 3 drops of clean engine oil (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.**

6. 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.

8. Repeat Steps 4-7 for the remaining cylinders

9. Its required to review torque wrench data (36 steps) prior to installation of the oil pan assembly to ensure proper torque values.

10. 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 TOR(	TARGET AN	MIN ANGL	MAX ANGL	PEAK ANGI	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	
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	Cylinder
5	8/1/2021 12:06	77	77	78	77.5	0	0	0	0	FT-LB	OK	OK	2	#1
6	8/1/2021 12:06	0	0	275	145.7	90	90	91	90	FT-LB	OK	OK	1	
7	8/1/2021 12:07	0	0	275	142.2	90	90	91	91	FT-LB	OK	OK	2	
8	8/1/2021 12:07	22	22	23	25.5	0	0	0	0	FT-LB	OK	OK	1	
9	8/1/2021 12:07	22	22	23	22.1	0	0	0	0	FT-LB	OK	OK	2	
10	8/1/2021 12:08	77	77	78	77	0	0	0	0	FT-LB	OK	OK	1	Cylinder
11	8/1/2021 12:08	77	77	78	77.5	0	0	0	0	FT-LB	OK	OK	2	#6
12	8/1/2021 12:08	0	0	275	133.4	90	90	91	90	FT-LB	OK	OK	1	
13	8/1/2021 12:08	0	0	275	140.2	90	90	91	90	FT-LB	OK	OK	2	
14	8/1/2021 12:09	22	22	23	25.5	0	0	0	0	FT-LB	OK	OK	1	
15	8/1/2021 12:09	22	22	23	22.1	0	0	0	0	FT-LB	OK	OK	2	
16	8/1/2021 12:10	77	77	78	77.9	0	0	0	0	FT-LB	OK	OK	1	Cylinder
17	8/1/2021 12:10	77	77	78	77.5	0	0	0	0	FT-LB	OK	OK	2	#2
18	8/1/2021 12:11	0	0	275	133.5	90	90	91	90	FT-LB	OK	OK	1	
19	8/1/2021 12:11	0	0	275	137.1	90	90	91	90	FT-LB	OK	OK	2	
20	8/1/2021 12:12	22	22	23	25.5	0	0	0	0	FT-LB	OK	OK	1	
21	8/1/2021 12:13	22	22	23	22.1	0	0	0	0	FT-LB	OK	OK	2	
22	8/1/2021 12:14	77	77	78	77.8	0	0	0	0	FT-LB	OK	OK	1	Cylinder
23	8/1/2021 12:14	77	77	78	77.5	0	0	0	0	FT-LB	OK	OK	2	#5
24	8/1/2021 12:15	0	0	275	134.1	90	90	91	90	FT-LB	OK	OK	1	
25	8/1/2021 12:15	0	0	275	136.5	90	90	91	90	FT-LB	OK	OK	2	
26	8/1/2021 12:18	22	22	23	25.5	0	0	0	0	FT-LB	OK	OK	1	
27	8/1/2021 12:18	22	22	23	22.1	0	0	0	0	FT-LB	OK	OK	2	
28	8/1/2021 12:20	77	77	78	77.2	0	0	0	0	FT-LB	OK	OK	1	Cylinder
29	8/1/2021 12:22	77	77	78	77.5	0	0	0	0	FT-LB	OK	OK	2	#3
30	8/1/2021 12:25	0	0	275	133.9	90	90	91	90	FT-LB	OK	OK	1	
31	8/1/2021 12:26	0	0	275	136.1	90	90	91	90	FT-LB	OK	OK	2	
32	8/1/2021 12:27	22	22	23	25.5	0	0	0	0	FT-LB	OK	OK	1	
33	8/1/2021 12:29	22	22	23	22.1	0	0	0	0	FT-LB	OK	OK	2	
34	8/1/2021 12:30	77	77	78	77.1	0	0	0	0	FT-LB	OK	OK	1	Cylinder
35	8/1/2021 12:31	77	77	78	77.5	0	0	0	0	FT-LB	OK	OK	2	#4
36	8/1/2021 12:35	0	0	275	134.7	90	90	91	90	FT-LB	OK	OK	1	
37	8/1/2021 12:40	0	0	275	136.1	90	90	91	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 TC	MIN TORC	MAX TORC	PEAK TORC	TARGET AN	MIN ANGL	MAX ANGL	PEAK ANG	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

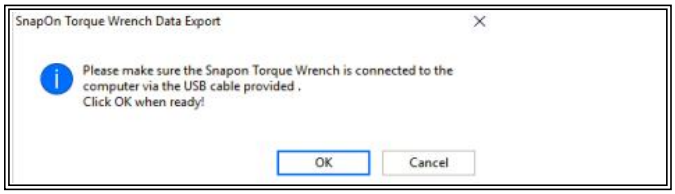
[IK2700065 EZ-Tech Download Center]

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.

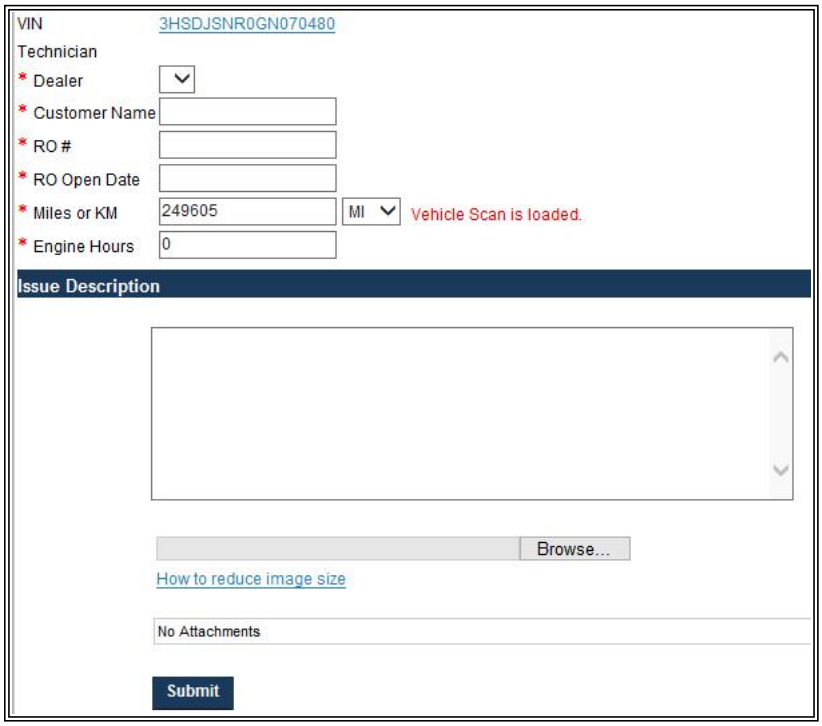
Download is missing torque wrench data.

Missed or incorrect steps.

For APR Warranty: Torque data must be uploaded

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

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.



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

NOTE:
Do NOT maniplulate 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:	11937
Helpful:	70
Not Helpful:	8

No Feedback Found
