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Title: 2013-2015 N13 Required Torque Wrench to Complete Connecting Rod Bolt Torque Procedure

Applies To: 2013-2015 N13 APR Liner Upgrade

Change Log

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

03/07/2019- Added notes and listed out torque procedure.
11/13/2018- Responded to feedback via email, republished article.
05/14/2018- Changed format, added links to APR and connecting rod IK articles.
02/8/2018 - Added Spanish translation and updated French translation
01/30/2018- Add updates to torque wrench download, notes, and WPL 18-002G information

Description

In some instances an N13 can experience a catastrophic engine failure due to improperly torqued connecting rod bolts after upgrading to an APR liner.

Symptom(s)

Low oil pressure / Misfire faults / Excessive lower-end noise / Broken & stretched connecting rod bolt(s) / Spun connecting rod bearing (s) / Ventilated engine block.

Required Tool(s)

Each service department has been issued (1) 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)

Digital Torque Wrench Tester Set-Up

Tool Instruction: 4328553 Digital Torque Tester Kit

Torque Wrench Set-Up

Tool Instruction: 4328552 CTECH3FR250A Digital Torque Wrench Set-Up

For proper torque wrench operation ensure the following:

- Clear previous torque wrench data
- Check and set the correct date and time
- Check and set the correct preset values:
- **(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)**
- **(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)**
- **(PSET 3) Target Angle: 90 degrees, Minimum Angle: 90 degrees, Maximum Angle: 91 degrees**
-

NOTE:

- **Prior to torquing a connecting rod bolt validate torque wrench operation and calibration with the Snap-On Digital Torque Wrench Tester**

NOTE:

- **Whichever occurs first (1) year, 5,000 cycles or CAL NEEDED message the torque wrench will require a calibration check by an authorized Snap-On repair facility refer to TL2900164**

- **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**

Installation & Repair Step(s)

Review the following IK articles:

IK1201157 N13 2013-14 Oil Consumption

IK1201260 N13 2015 Oil Consumption

IK1201384 Partially Blocked or Blocked Connecting Rod Oil Passage N13

NOTE:

- **Connecting rod bolts are torque to yield one time use discard after removal**
- **Engine damage will occur if one or multiple connecting rod cap(s) are installed backwards**
- **Do not use an impact to tighten the connecting rod bolts**
- **Do not use any universal adapters and swivels during torque procedure**
- **Remove the oil pick up tube assembly for access**

1. Review the N13 **Engine Service Manual** prior to disassembly and assembly.

2. Review **General Inspection Procedure** listed within the N13 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 (12) 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.

6. Install the connecting rod cap making sure the cap is centered and installed correctly aligning marks with upper portion of the connecting rod.

NOTE:

- **Complete connecting rod torque sequence prior to rotating the crankshaft.**

7. Complete installation and torque sequence by hand threading both bolts into the connecting rod alternating back and forth while seating the cap. Start with cylinder #1 and complete in pairs (1/6), (2/5) and (3/4). Torque connecting rod bolts in three steps starting with preset: **(PSET1) 22 ft-lbs (30 Nm), arrow up, (PSET2) 77 ft-lbs (105 Nm), arrow up, (PSET3) 90 degrees.**

8.Continue to downloading torque wrench data.

NOTE:

- **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.**

Downloading File and Reviewing Torque Wrench Data

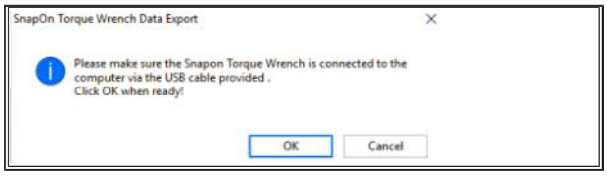
IK2700065 EZ-Tech Download Center

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

Desktop Icon

2. Follow prompts after clicking on the icon.

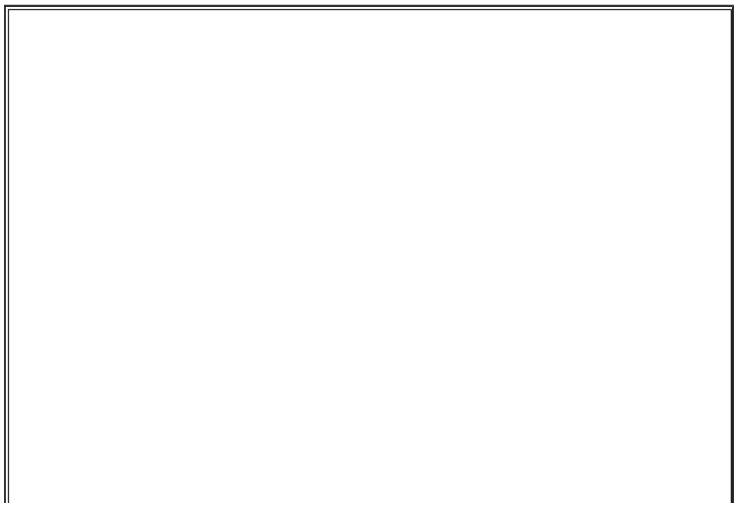
3. Click “OK” after connecting the torque wrench to an EZ-Tech computer using the supplied USB cord.

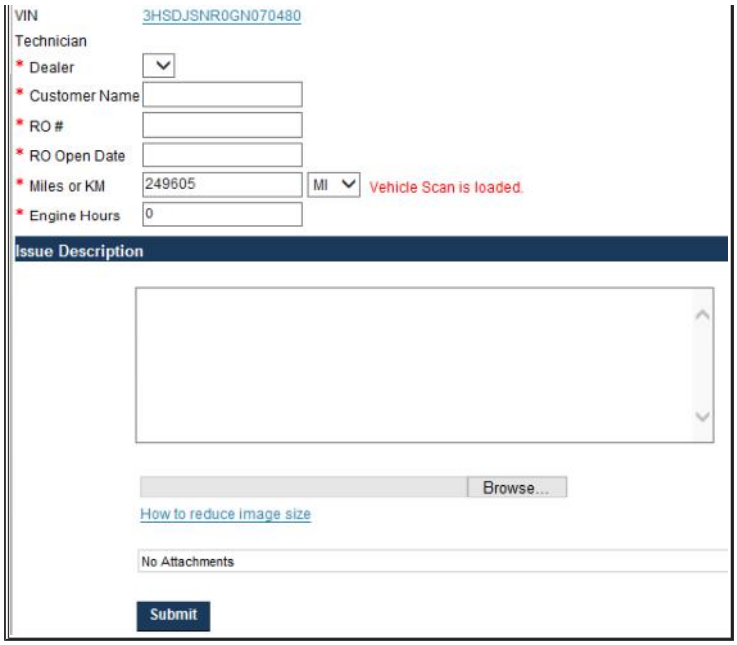


4. Download the "zipped" file to the desktop.

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

6. 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.





7. The torque wrench iApprove case file is set to **Auto Closure.** **Heavy Duty Tech Service does NOT review any file**. **It's highly recommened to review data prior to completing engine assembly.**
Please keep in mind we want to be as close as we can to the published torque specification.

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

8. Viewing torque wrench data can be accomplished by:

Step 1: Transferring wrench data via use of the USB cable to a computer that is equipped with Microsoft Excel (36 steps).

	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	3/13/2018 8:39	100	100	104	107.8	0	0	0	0	FT-LB	HIGH	OK		1
3	3/13/2018 8:40	100	100	104	100.8	0	0	0	0	FT-LB	OK	OK		2
4	3/13/2018 8:55	22	22	22.9	22	0	0	0	0	FT-LB	OK	OK		2
5	3/13/2018 8:55	22	22	22.9	22.1	0	0	0	0	FT-LB	OK	OK		1
6	3/13/2018 8:56	77	77	78	77.4	0	0	0	0	FT-LB	OK	OK		2
7	3/13/2018 8:56	77	77	78	77.2	0	0	0	0	FT-LB	OK	OK		1
8	3/13/2018 8:56	0	0	275	133.3	90	90	91	90	FT-LB	OK	OK		2
9	3/13/2018 8:57	0	0	275	131.3	90	90	91	90	FT-LB	OK	OK		1
10	3/13/2018 8:57	22	22	22.9	22	0	0	0	0	FT-LB	OK	OK		2
11	3/13/2018 8:57	22	22	22.9	22.1	0	0	0	0	FT-LB	OK	OK		1
12	3/13/2018 8:58	77	77	78	77.3	0	0	0	0	FT-LB	OK	OK		2
13	3/13/2018 8:58	77	77	78	77.4	0	0	0	0	FT-LB	OK	OK		1
14	3/13/2018 8:58	0	0	275	120.2	90	90	91	90	FT-LB	OK	OK		2
15	3/13/2018 8:59	0	0	275	129.1	90	90	91	90	FT-LB	OK	OK		1

Step 2: Viewing data on the torque wrench by holding the **ENTER** button for 3 seconds, scrolling the menu and highlighting **SHOW DATA** (36 steps).

Warranty Information

WPL 18-002G- Required Use of New Torque Wrench

All repair orders dated February 5, 2018 or later will require digital torque wrench data to be uploaded into the iApprove case file system for all N13 APR repairs.

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**

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.

Standard Repair Time(s):

Refer to the SRT Manual for Repair Times

Hide Details

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