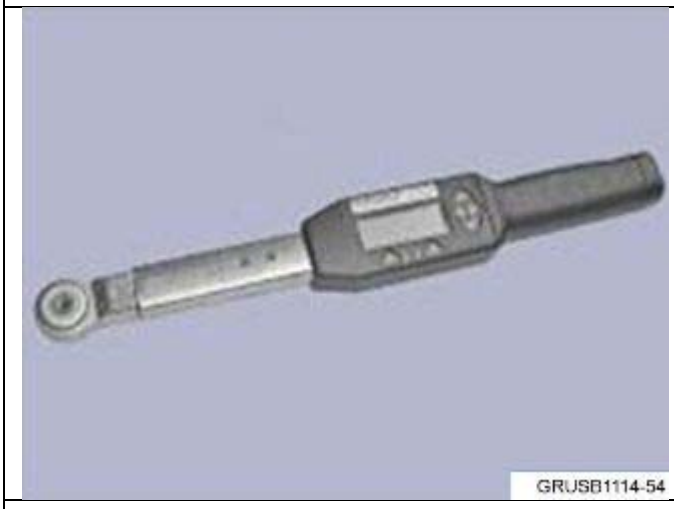
Attachment to B11 08 14 Recall Campaign 14V- 176: N55 Engine – Replace VANOS Gear Bolts

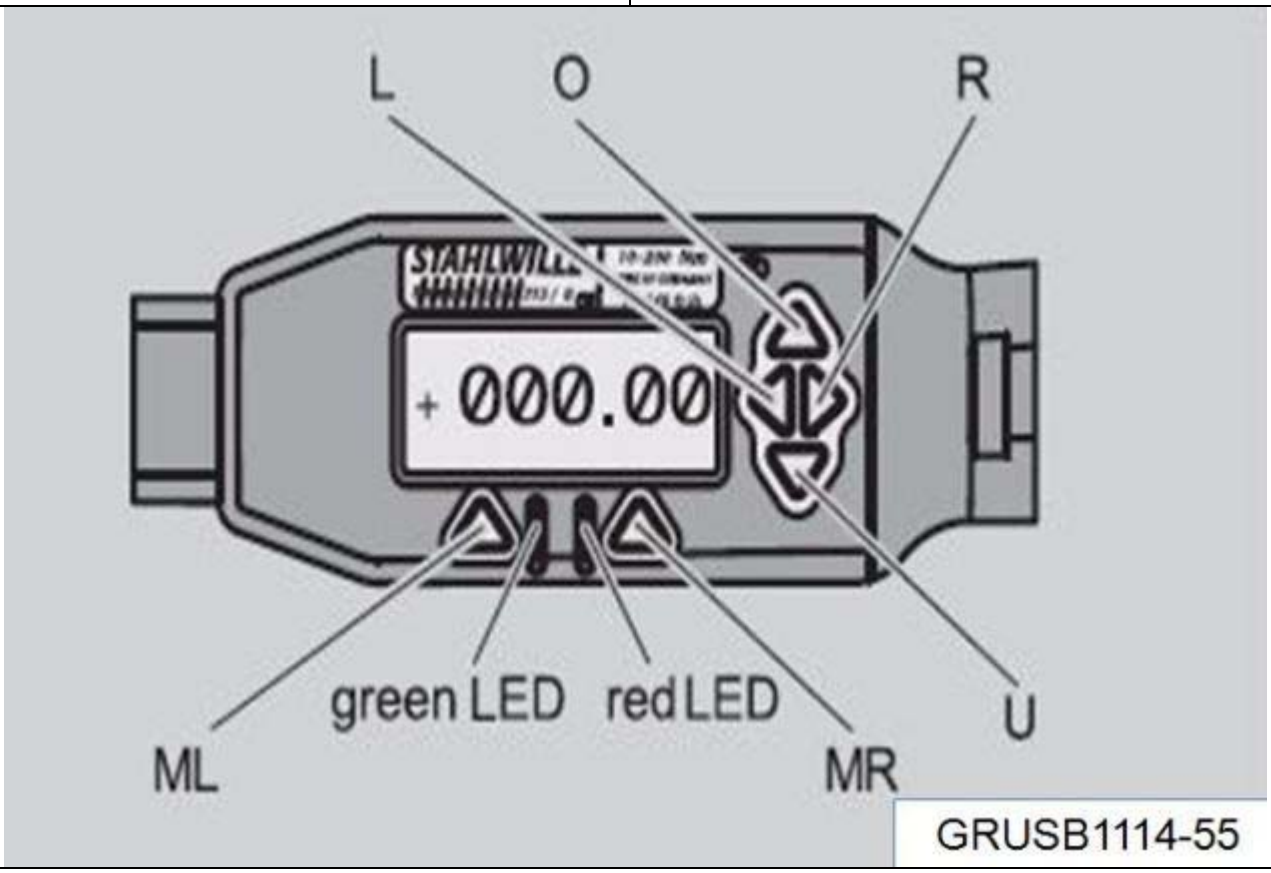
REPAIR PROCEDURE

There is no "prior repair" part inspection procedure required. When this Recall shows open, perform the appropriate Recall repair procedure described in this document.

Note: Please follow the repair procedure outlined below; it contains modified instructions that apply to vehicles that may or may not have a broken or loose bolt. The ISTA/D repair instructions apply only to the VANOS gear replacement. This modified procedure is reflected in the labor operation time allowances.

Required special tools:	
	Socket for Torque Wrench P/N 83 30 2 333 891 Distributed via Automatic Tool Shipment. Refer to SI B04 08 14.
	Torque Wrench P/N 81 64 0 418 185 Distributed via Automatic Tool Shipment. Refer to SI B04 08 14.

Torque Wrench Set Up:	



Initial setup of torque wrench must be completed when using the tool for the first time.

Push any of the green buttons to turn on.

Press the “ML” button to select language. Scroll up and down with the “O” and “U” buttons to select English.

Press the “MR” button to select.

Press the “ML” button to enter the menu. Select “OK” and scroll using the “O” and “U” buttons to select “presets.” Select the “MR” button to select “modify.”
Scroll down using the “U” button to “shutdown time.” Select the “MR” button to select “modify.” Increase the time by using the “O” button. Press repeatedly until “9” is displayed. Select the “MR” button to “save” the setting. This setting will now automatically turn off the tool after 9 minutes of inactivity, and it will be saved for the next usage.

Select “return” twice with the “ML” button to go back to the main screen.
Select “menu” with the “ML” button.

Select “OK” with the “MR” button.

Scroll with the “O” and “U” buttons to “presets” and select “modify” with the “MR” button.

Scroll with the “O” and “U” buttons to “unit” and select “modify” with the “MR” button.

Scroll with the “O” and “U” buttons to “Nm” and select “OK” with the “MR” button.

Scroll with the “O” and “U” buttons to “adaptor length” and select “modify” with the “MR” button.

Scroll with the “O” and “U” buttons and the “L and R” buttons to enter the digits. Enter 17.50 mm and select “OK” with the “MR” button. This setting identifies the length of the tool, i.e., ratchet head or crow’s foot wrench end.

Select “return” twice with the “ML” button to go back to the main screen.

If the batteries are replaced, the initial setup will need to be performed again.

Selecting and Entering Rotation Angle Mode:

Press the “L” and “R” buttons at the same time. The “preload” screen should now be displayed. Preload is the initial torque setting.

Scroll with the “O” and “U” buttons and the “L and R” buttons to enter the digits. Enter 6.00 (6 Nm initial torque) and select “OK” with the “MR” button. The angle torque screen will be displayed automatically when this is complete.

Scroll with the “O” and “U” buttons and the “L and R” buttons to enter the digits. Enter 60.00 (60 degree angle torque) and select “OK” with the “MR” button. The screen will now state it is the “direct” mode.

Press the “tare” to zero the measurement. The torque wrench is now ready for use.

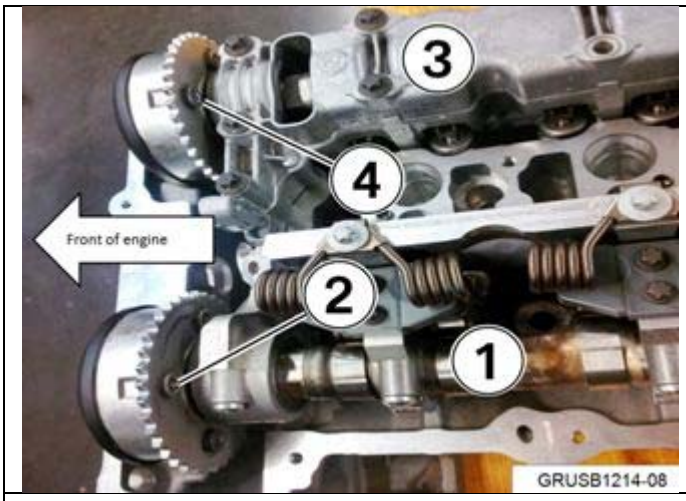
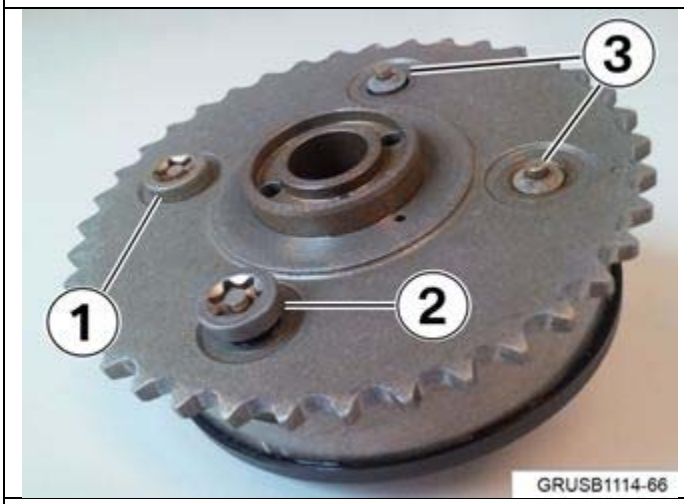
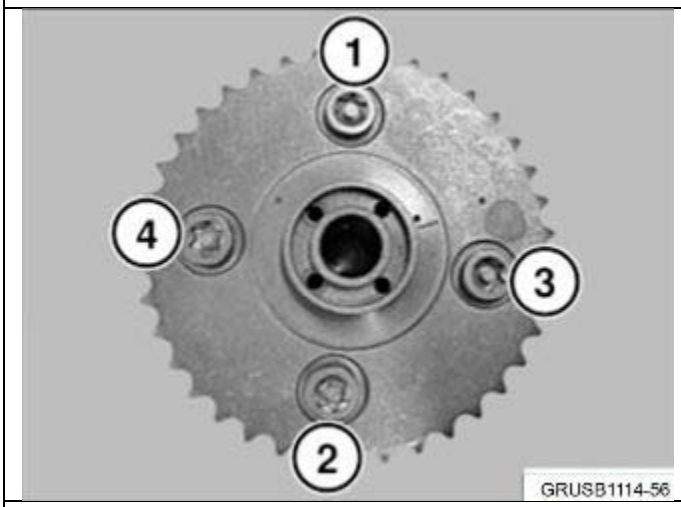
These values will stay stored as long as the tool is powered up. If the tool turns off after 9 minutes of inactivity, the initial torque and angle torque will be erased and will not be available for the next usage. The values will need to be reentered if the torque wrench turns off.

Alternative removal and installation tools can be sourced locally via SNAP-ON Tools ™.

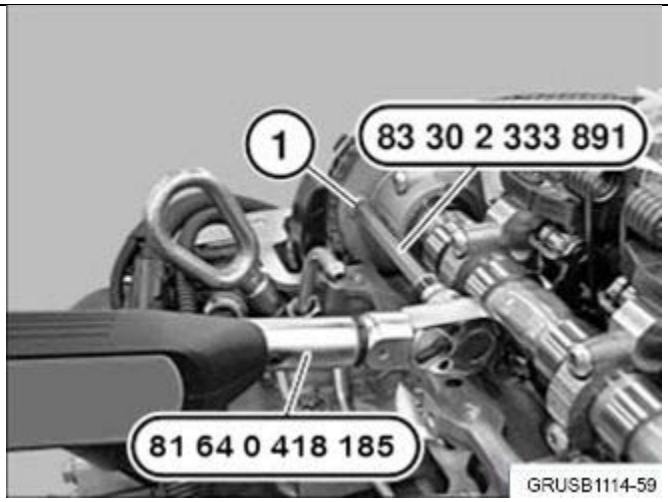
Torque Wrench, Electronic, TechAngle®

P/N ATECH1FR240B

 GRUSB1114-64	T45 TORX Socket (Long) P/N BLPTL3845TP
 GRUSB1114-65	Adaptor, 1/4" Internal drive x 3/8" External drive P/N TA3 (1/4” to 3/8”)
Preliminary Work:	
1. Remove the cylinder head cover per Repair Instruction 11 12 000, “Removing and installing or sealing cylinder head cover.”	
2. Remove the fan and fan cowl per Repair Instruction 17 11 035, “Removing and installing/replacing fan cowl with electric fan.”	
IMPORTANT: Do not reuse aluminum bolts. Once the aluminum bolts are removed, they must be replaced with new bolts.	

	Overview of components: Intake camshaft (1) Intake VANOS gear assembly bolts (2) Exhaust camshaft (3) Exhaust VANOS gear assembly bolts (4)
	3. Evaluation of bolt: If any of the bolts were loose or broken during this procedure, the VANOS assembly will need to be replaced. Refer to step 14. VANOS bolt is tight (1) VANOS bolt is loose (2) VANOS bolt heads have sheared off (3) Note: VANOS gear assembly removed from engine for clarity. Do not remove VANOS Gear Assembly
Intake VANOS Adjustment Unit:	
	4. Replace and torque the aluminum bolts (1-4) one at a time. Note: 1-4 is not a sequence; they can be replaced in any sequence. **IMPORTANT: Never loosen more than one VANOS assembly bolt (1-4) at a time to avoid losing the sealing and alignment of gear assembly.**

	5. Turn the engine by hand, using a suitable tool on the crankshaft central bolt to align one of the bolts (1), as shown in the illustration. Remove the bolt (1) using the required special tool (2).
	6. Clean the threads on the VANOS assembly using compressed air to remove the excessive oil. **Always wear safety glasses.**



7. IMPORTANT: The bolts require initial torque and angle torque. Observe the procedures in this step and the next step very carefully!

Install one new P/N 11 36 8 602 263 aluminum VANOS bolt and apply the initial torque, using the required special tools to the specification below.

Initial torque: 6 Nm

Turn the torque wrench very slowly and do not over-torque the bolt. The handle of the torque wrench will vibrate and the green LED will briefly blink when the 6 Nm have been reached.

Angle torque: 60°

The torque wrench will automatically switch to angle torque and show zero degrees. Begin turning the torque wrench. The red and green LEDs will blink on the tool, warning the technician that the desired value is approaching. When 60 degrees has been reached, the handle will vibrate and the green LED will illuminate. The screen may or may not record the angle torque. Do not be alarmed if the screen freezes and captures a value that is a few degrees lower than the desired value.

Do not rotate the torque wrench any further after the handle vibrates and both LEDs illuminate.

8. While performing the angle torque, the digital screen on the torque wrench will display the current Nm meter value. This value should be between **8 Nm-14 Nm.**

If the displayed value is not within the specification, the bolt will need to be removed and replaced with a new bolt again. Repeat as necessary.

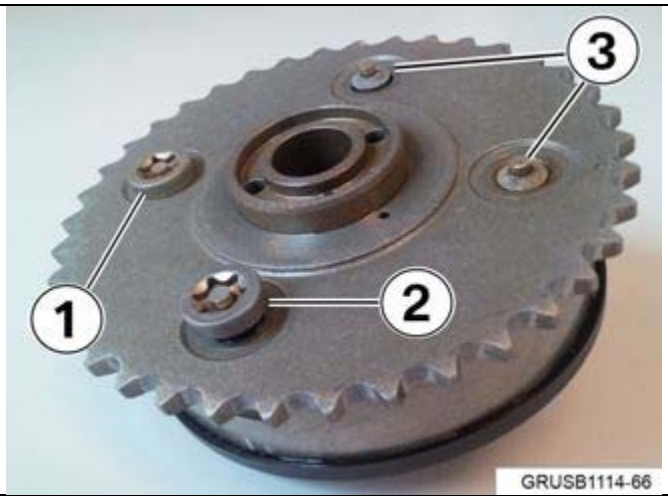
To reset the torque wrench and clear the screen to Nm again, just press the “MR” button to continue replacing additional bolts.

9. If any of the bolts were loose or broken during this procedure, the VANOS assembly will need to be replaced. Refer to step 16.

   If no bolts were found loose, repeat steps 4-8 for the remaining 3 bolts on the VANOS gear assembly. It is good practice to mark each bolt head with a felt marker as it is replaced, so one is not mistaken and removed again.

   When all of the intake VANOS assembly bolts have been replaced successfully, proceed to step 10.

Exhaust VANOS Adjustment Unit:



10. Evaluation of bolt:

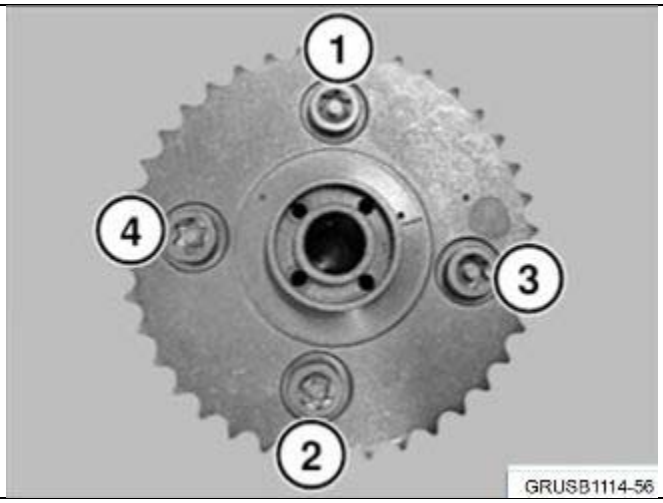
    If any of the bolts were loose or broken during this procedure, the VANOS assembly will need to be replaced. Refer to step 16.

    VANOS bolt is tight (1)

    VANOS bolt is loose (2)

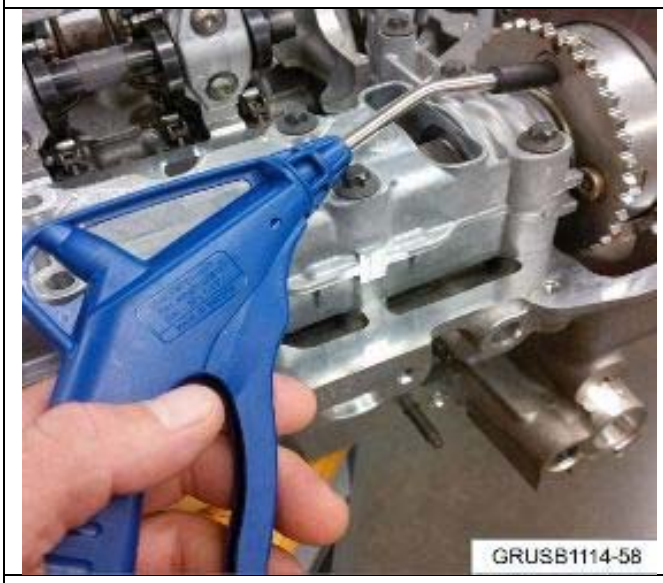
    VANOS bolt heads have sheared off (3)

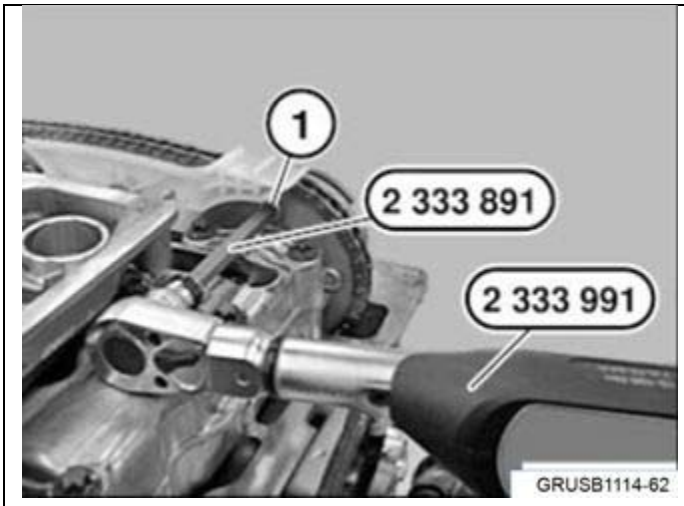
    Note: VANOS gear assembly removed from engine for clarity. Do not remove VANOS Gear Assembly



11. Replace and torque the aluminum bolts (1-4) one at a time.

    IMPORTANT: Never loosen more than one VANOS assembly bolt (1-4) at a time to avoid losing the sealing and alignment of gear assembly.

	12. Turn the engine by hand using a suitable wrench on the crankshaft central bolt to align the bolt (1) as shown in the illustration. Remove the bolt (1) using the required special tool. Note: The tool will be on a slight angle when loosening.
	13. Clean the threads on the VANOS assembly using compressed air to remove the excessive oil. **Always wear safety glasses.**



14. **IMPORTANT: The bolts require initial torque and angle torque. Observe the procedures in this step and the next step very carefully!**

    Install one new P/N 11 36 8 602 263 aluminum VANOS bolt and apply the initial torque, using the required special tools to the specification below.

    Initial torque: 6 Nm

    Turn the torque wrench very slowly and do not over-torque the bolt. The handle of the torque wrench will vibrate and the green led will briefly blink when the 6 Nm have been reached.

    Angle torque: 60°

    The torque wrench will automatically switch to angle torque and show zero degrees. Begin turning the torque wrench. The red and green LEDs will blink on the tool, warning the technician that the desired value is approaching. When 60 degrees has been reached, the handle will vibrate and the green LED will illuminate. The screen may or may not record the angle torque. Do not be alarmed if the screen freezes and captures a value that is a few degrees lower than the desired value.

    Do not rotate the torque wrench any further after the handle vibrates and both of the LEDs illuminate.
    Note: The tool will be on a slight angle when tightening.

15. While performing the angle torque, the digital screen on the torque wrench will display the current Nm meter value. This value should be between **8 Nm-14 Nm**.

    If the displayed value is not within the specification, the bolt will need to be removed and replaced with a new bolt again. Repeat as necessary.

    To reset the torque wrench and clear the screen to Nm again, just press the “MR” button to continue replacing additional bolts.

16. If any of the bolts were found loose or broken during this procedure, the affected VANOS assembly will need to be replaced. Refer to step 17. If no bolts were found loose, repeat steps 10-15 for the remaining 3 bolts on the applicable VANOS gear assembly. It is good practice to mark each bolt head with a felt marker as it is replaced, so one is not mistaken and removed again. Refer to step 18 when complete.
17. If any of the VANOS bolts were found loose or broken, that VANOS unit will need to be replaced. Refer to Repair Instruction 11 36 046, “Removing and installing or replacing intake and exhaust camshaft adjusters.”
18. Reassemble the vehicle per the applicable repair instructions.
Refer to SI B11 08 14 for the Parts and Warranty information.