SI B11 21 14
Engine

December 2014
Technical Service

PERFORM THE PROCEDURE OUTLINED IN THIS SERVICE INFORMATION ON ALL AFFECTED VEHICLES BEFORE CUSTOMER DELIVERY OR THE NEXT TIME THEY ARE IN THE SHOP FOR MAINTENANCE OR REPAIRS.

BMW centers must ensure recalls are completed after having been notified by BMW of North America, LLC (BMWNA) that a safety-related defect or noncompliance exists in any motor vehicle or item of replacement equipment in the center's possession at the time of notification. In BMW NA's case, this notification would typically be made by the issuance of a recall notification in the form of a Service Information bulletin (SIB) or transmission of a Dealer Communication System (DCS) recall message.

Under the National Traffic and Motor Vehicle Safety Act of 1966, as amended, if a recall campaign is announced by BMW NA, centers must ensure that all recalls on new vehicles and new items of replacement equipment are completed BEFORE delivery to the consumer. This means that centers may not legally deliver new motor vehicles or new items of replacement equipment to consumers with an open recall.

The Safety Act also prohibits centers from selling or leasing the motor vehicle or item of replacement equipment, unless and until the open recall has been completed BEFORE delivery. This also pertains to vehicles in the Certified Pre-Owned program, and to items of replacement equipment.

Finally, BMW centers should not sell or use parts that have been recalled by BMW NA. Please follow the specific instructions provided by BMW NA on the return or disposition of the parts.

SUBJECT

Recall Campaign 14V-627: N20 and N26 Engine - Check Intake Camshaft

MODEL

E84 (X1)

E89 (Z4)

F10 (5 Series Sedan)

F22 (2 Series Coupe)

F30 (3 Series Sedan)

F31 (3 Series Sports Wagon)

F32 (4 Series Coupe)

F34 (3 Series Gran Turismo)

F25 (X3)

SITUATION

A defect in the intake camshaft can reduce engine oil lubrication to the engine vacuum pump, which may result in the pump’s failure. Failure of the engine vacuum pump can lead to subsequent loss of power-assisted braking.

AFFECTED VEHICLES

This Recall Campaign involves certain E84, E89, F10, F22, F30, F31, F32, F34 and F25 vehicles with the N20

and N26 engines produced from May 2012 to August 2013.

First check if a Recall Campaign label with a code number **666** is already attached to the B-pillar.

If a code number **666** has been punched out, the Campaign has already been performed and no further action is necessary.

Vehicles which require this Recall Campaign to be completed will show it as “Open” when checked either in the "Service Menu" of DCSnet (Dealer Communication System) or with the Key Reader.

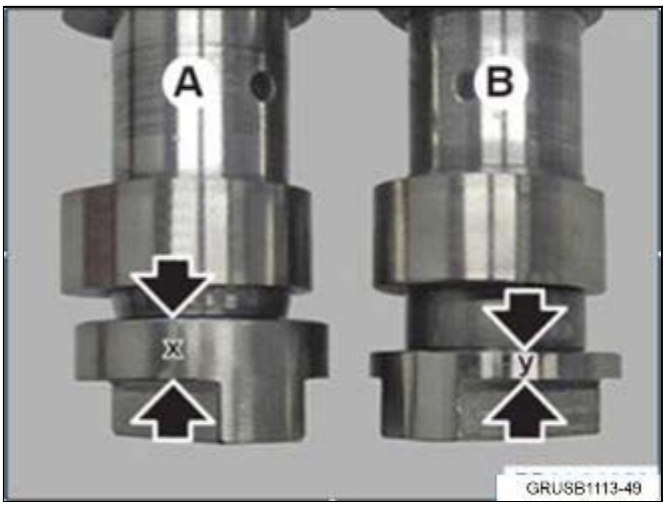
CORRECTION

Inspect the intake camshaft and check the depth of the intake camshaft internal sealing cover to determine the condition of the camshaft. The results of the visual inspection and the depth measurement will determine whether the spring steel sleeve can be installed inside the camshaft or the camshaft is replaced.

PROCEDURE

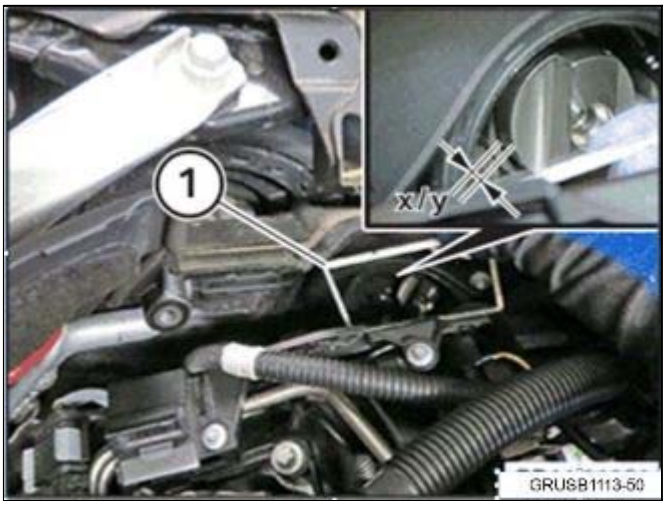
Note: Please follow the repair procedure outlined below; it contains modified instructions that optimize the repair procedure. This modified procedure is reflected in the labor operation time allowances.

1. To determine the type of camshaft that is installed, the vacuum pump must first be removed. Refer to Repair Instruction 11 66 000, “Remove and refit/replace vacuum pump (N20/N26).” Do not remove the cylinder head cover.



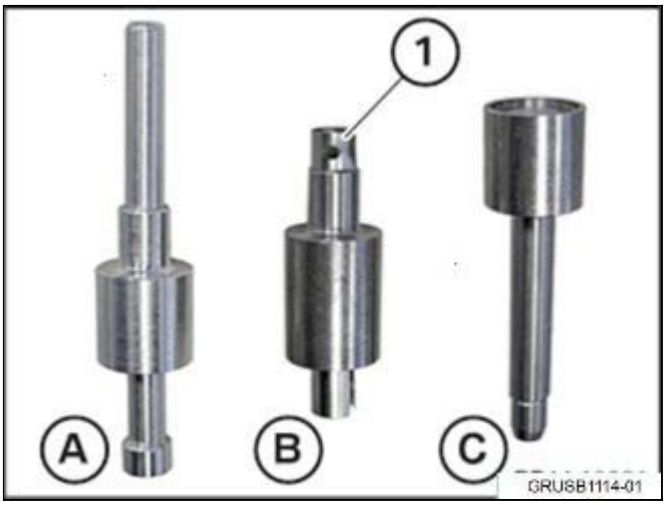
2. The width of the camshaft material near the vacuum pump drive lug must be identified. In the example, the thickness of the material is highlighted between the arrows.

Camshaft A: X = approximately 8 mm
Camshaft B: Y = approximately 4 mm



3. Using a mirror (1), the camshaft can be seen through the vacuum pump opening.

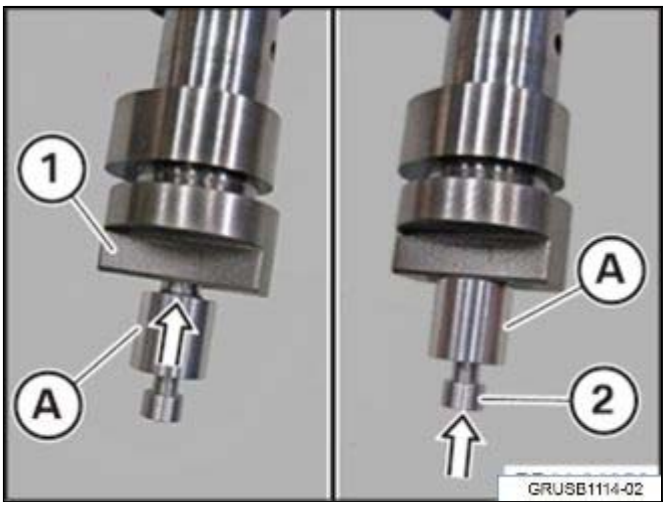
If camshaft A is identified using the previous illustration, proceed to step 4.
Camshaft A: X = approximately 8 mm
If camshaft B is identified using the previous illustration, the engine and vehicle can be reassembled. No further repairs are required.
Camshaft B: Y = approximately 4 mm



4. Checking the depth of the intake camshaft internal sealing cover:

Intake camshaft repair kit P/N 11 31 8 632 503 overview
The repair kit will consist of the special tools and repair part needed to check the intake camshaft and install the solution described in these instructions.
Check tool:
Test sleeve with test pin (A)
Press-in tools:
Centering cylinder (B) and spring steel sleeve (1)
Press tool (C)

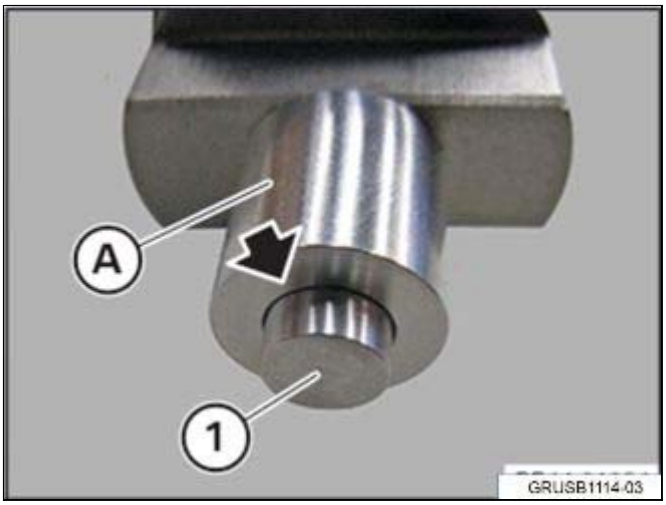
Note: The following steps are described with the inlet camshaft removed for increased clarity. Do not remove the inlet camshaft to determine measurement. Remove the vacuum pump to access the intake camshaft. Refer to Repair Instruction 11 66 000, "Remove and refit/replace vacuum pump (N20/N26)." Do not remove the cylinder head cover.



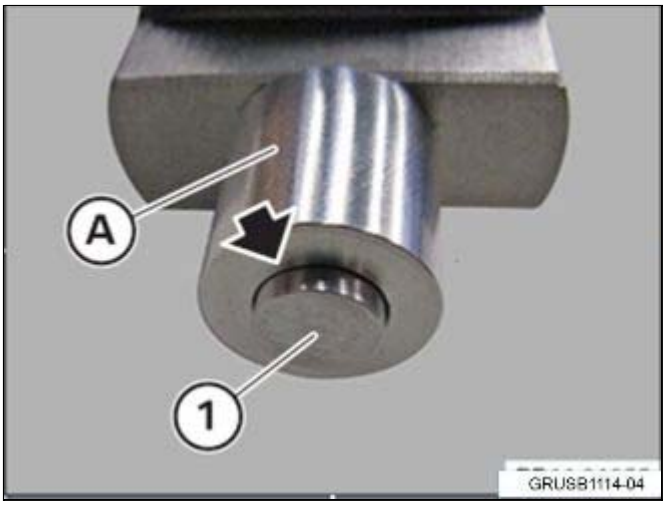
5. Insert the test sleeve (A) into the intake camshaft vacuum pump drive flange (1).

Push the test pin (2) in the direction of the arrow until it stops. Determine the position of the test pin (2).

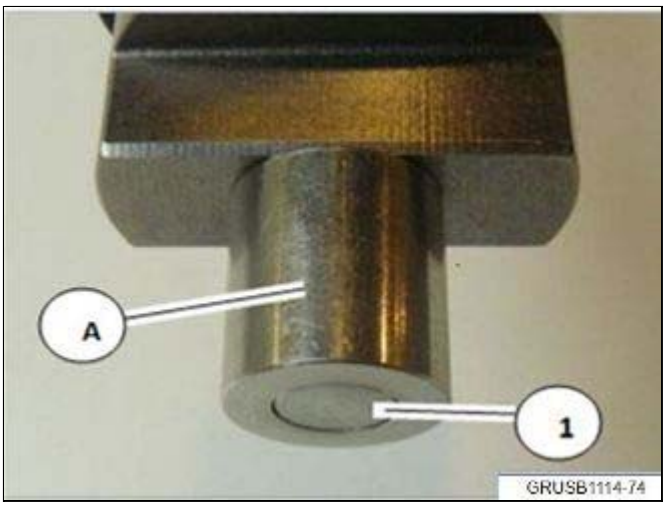
6. If the test pin (1) protrudes significantly in relation to the test sleeve (A) as seen in the illustration, the intake camshaft internal sealing cover has already moved out of position and may have restricted lubrication to the vacuum pump. **Remove the test pin and replace the intake camshaft and vacuum pump.** See the intake camshaft replacement section for proper repair instructions.



Note: Compare the illustrations in procedure steps 4 and 5 to be sure the protrusion of the test pin is properly identified.



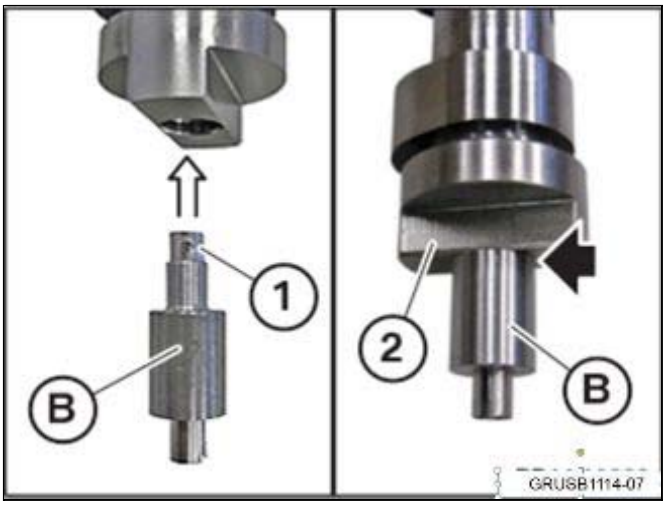
7. If the test pin (1) only protrudes approximately 1 mm in relation to the test sleeve (A) as seen in the illustration, the intake camshaft internal sealing cover has already moved out of position and may have restricted lubrication to the vacuum pump. **Remove the test pin and replace the intake camshaft and vacuum pump.** See the intake camshaft replacement section for proper repair instructions.



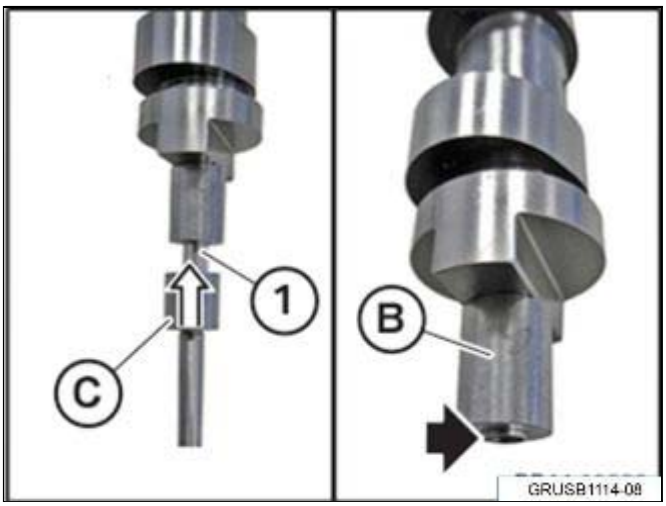
8. If the test pin (1) does not protrude and is flush with the test sleeve (A), the internal sealing cover of the intake camshaft has not moved out of position. Remove the test sleeve and test pin and retrofit the spring steel sleeve in step 9.

9. Installing the spring steel sleeve

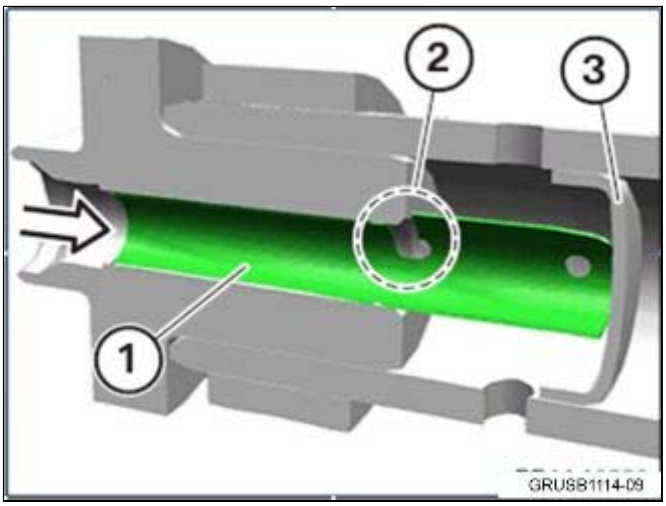
Note: The holes in the spring steel sleeve (1) must be at the front pointing towards the intake camshaft vacuum



pump drive flange.
Insert the sleeve (B) into the inlet camshaft (2) as illustrated. Make sure the sleeve makes contact with the camshaft; see the arrow.



10. Using the press-in tool (C), press the spring steel sleeve (1) in the direction of the arrow through the pre-tensioning sleeve (B) until the spring steel sleeve almost comes flush to the end of the pre-tensioning sleeve (B).

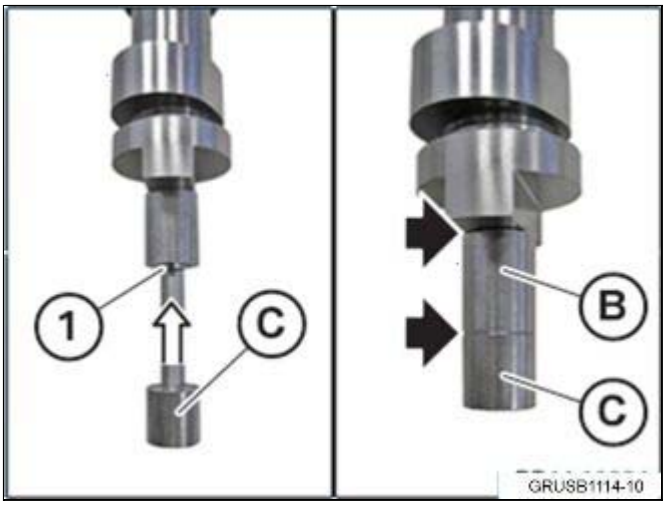


11. This illustration is a cutaway of the intake camshaft, special tools and spring steel sleeve.

The spring steel sleeve (1) must lock in place inside the intake camshaft (2). This prevents the internal sealing cover of the intake camshaft from moving out of position (3).

12. Press the spring steel sleeve (1) fully into the camshaft in the direction of the arrow.

The pre-tensioning sleeve (B) and the press-in tool (C) must be seated to ensure the spring steel sleeve locks

	into place inside the intake camshaft (see arrows). Remove the pre-tensioning sleeve (B) and the press-in tool together. Reinstall the vacuum pump and reassemble the vehicle.

CAMSHAFT REPLACEMENT

Special tool required:

11 7 110 (Intermediate Lever Tool)

To replace the camshaft, the following preliminary work must be performed:

To remove the DME control unit, proceed as recommended in Repair Instruction 12 14 550, “Replace control unit (DME)” (N20, N26).

To remove the cylinder head cover, proceed as recommended in Repair Instruction 11 12 000, “Remove and refit/seal cylinder head cover” (N20, N26).

To check the valve timing, proceed as recommended in Repair Instruction 11 31 005, “Check camshaft valve timing” (N20, N26).

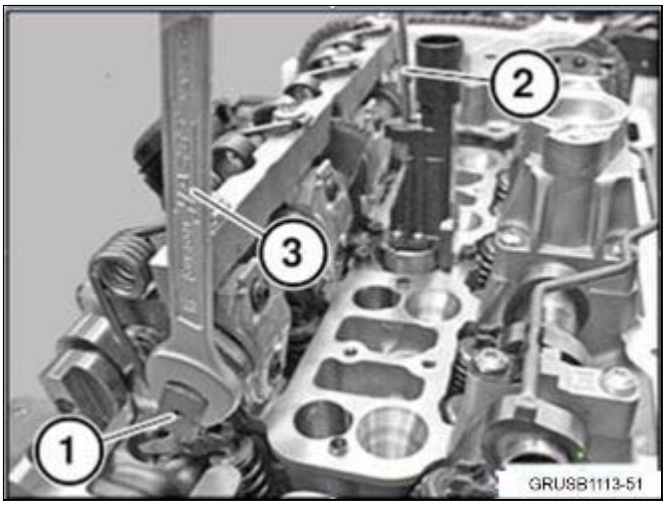
To remove the intake adjustment unit, proceed as recommended in Repair Instruction 11 36 046, “Remove and refit/replace intake and exhaust adjustment unit” (N20, N26).

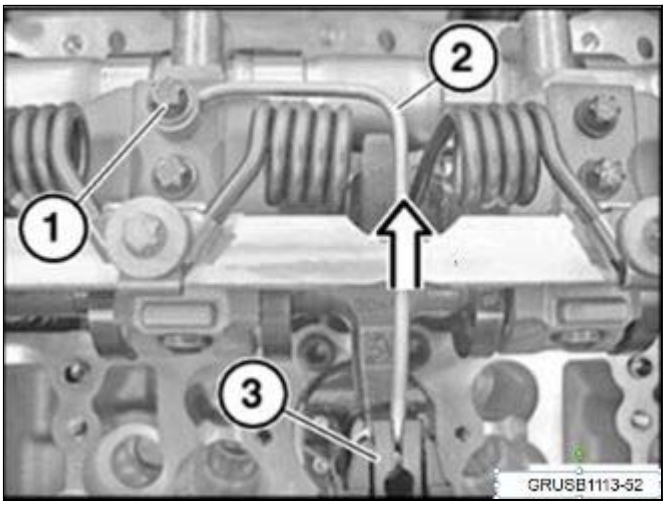
Removal of the intake camshaft:

To show the operation more clearly in this procedure, the injector ducts have been removed.

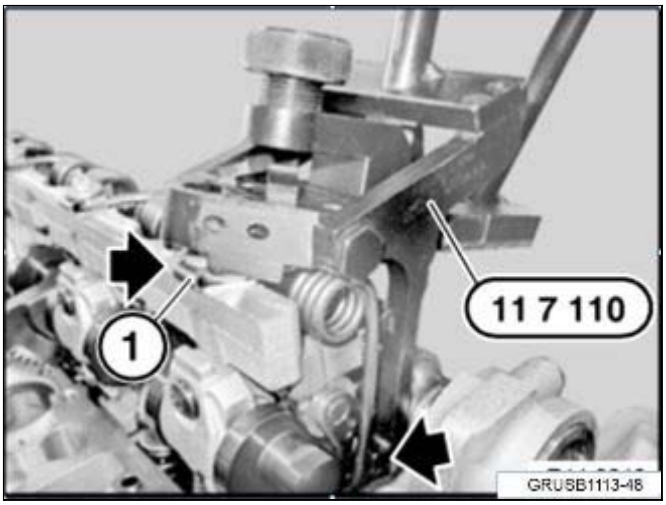
When carrying out this procedure on the engine, the injector ducts and injectors must not be removed.

	Important: Secure the eccentric shaft (1) with an open-ended wrench (3) (risk of backlash). Using a 4-mm Allen key (2) and an open-ended wrench (3), slowly turn the eccentric shaft (1) to minimum lift via the actuator motor.

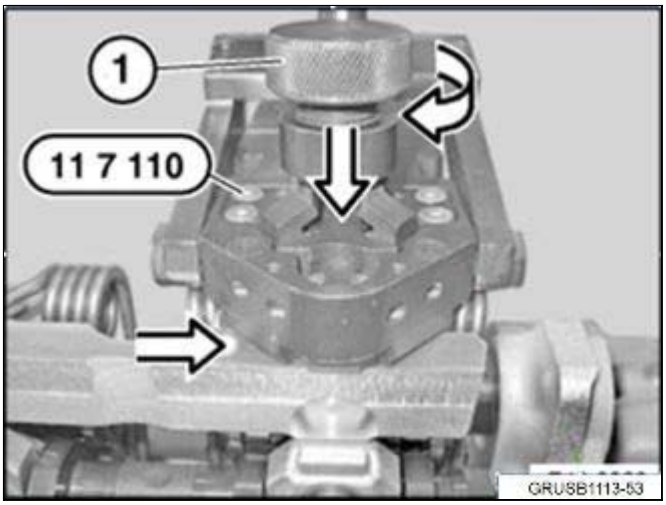




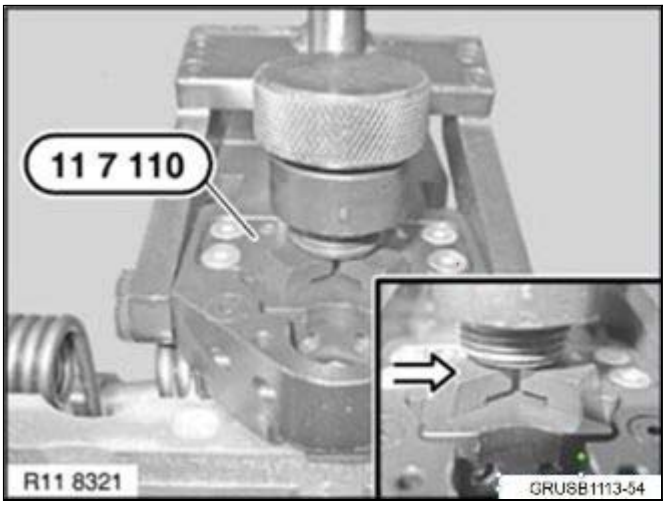
Undo the screw (1) on the oil spray nozzle.
Tightening torque **11 37 4AZ** (oil spray nozzle on the bracket 10 Nm)
Remove the oil spray nozzle (2) from the bracket on the actuator drive (3) in the direction of the arrow.



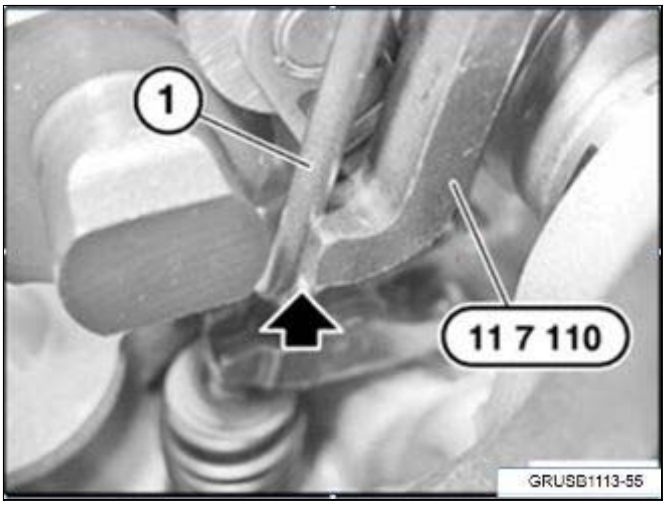
Position special tool 11 7 110 on the return spring (1) (see the arrows).
Warning:
Risk of injury if used incorrectly
Important:
Incorrect handling increases risk of damage!



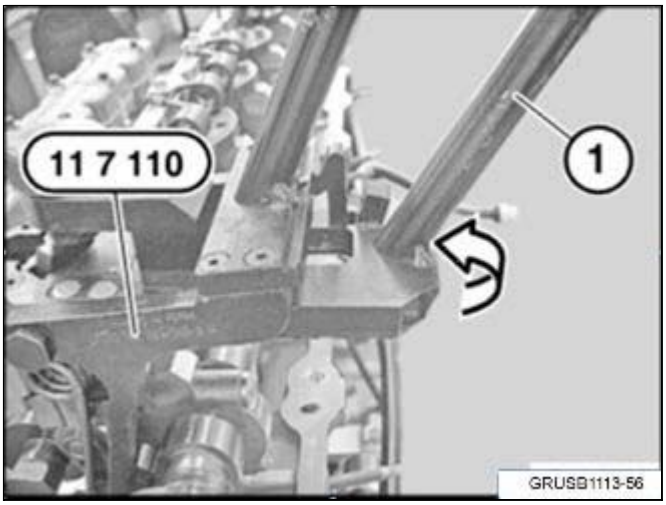
Lay special tool 11 7 110 flat on the cylinder head.
Turn the knurled screw (1) in the direction of the arrow until both of the clamping levers have clamped the return spring in the bracket.



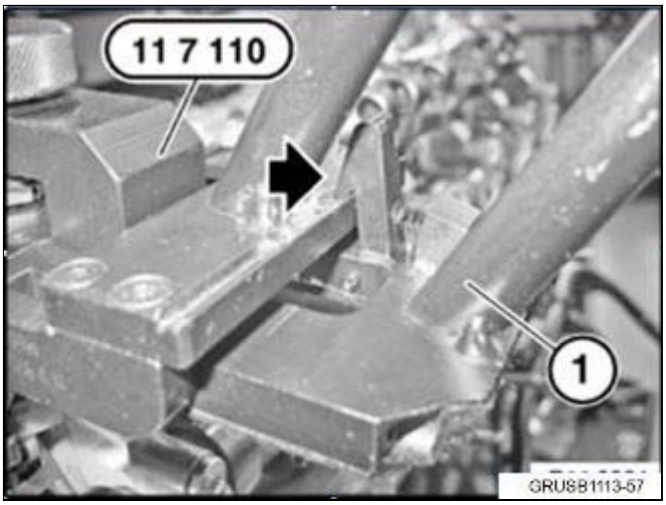
The return spring is correctly preloaded when both of the clamping levers are parallel to the bracket.



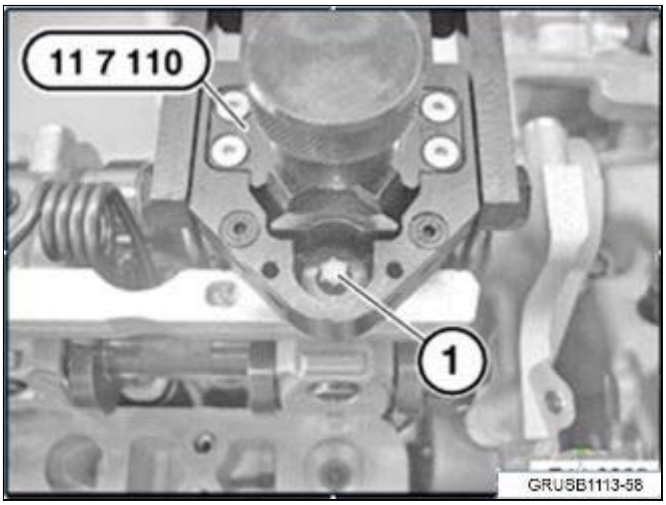
Important:
Incorrect handling increases risk of damage!
Both of the return springs (1) (left and right) must be positioned in the side guide of special tool 11 7 110.



Preload the return spring with the lever (1) on special tool **11 7 110** in the direction of the arrow.

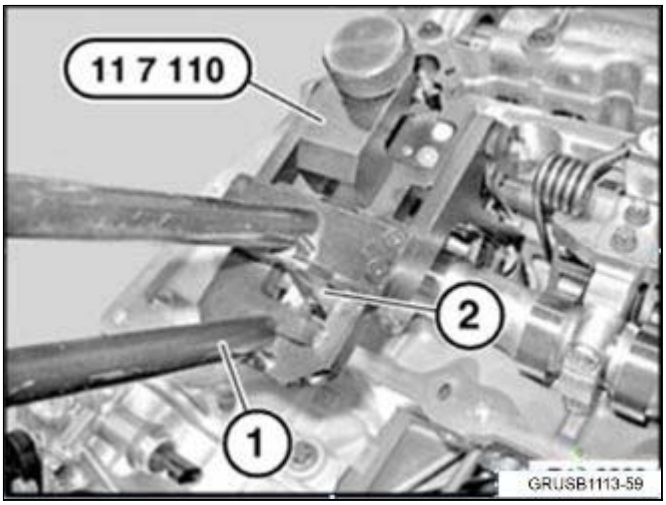


Lock special tool 11 7 110 by locking the hook on the lever (1); see the arrow.
Important:
The intermediate lever retainer spring torx screws can only be released with special tool 11 7 110.

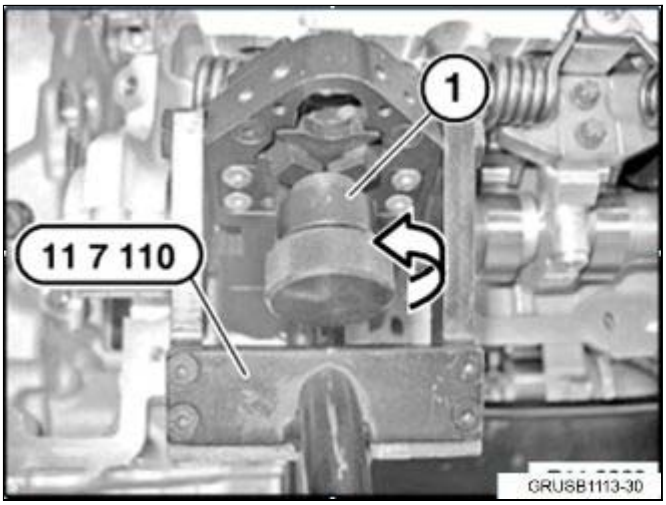


Remove the intermediate lever retainer spring torx screw (1).

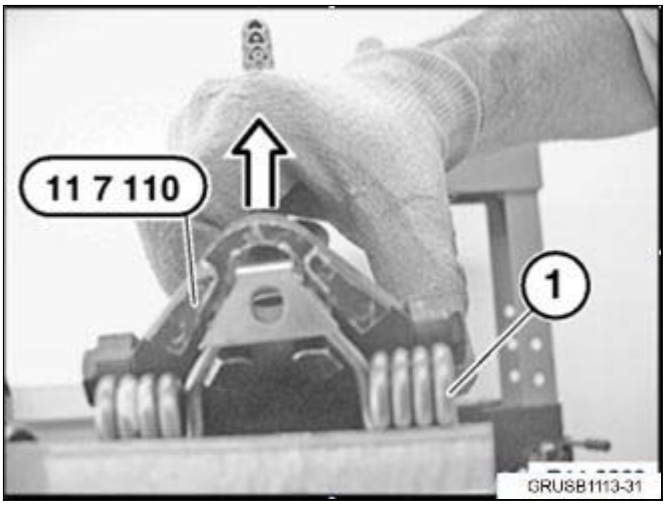
Warning:
Risk of injury if the tool is used



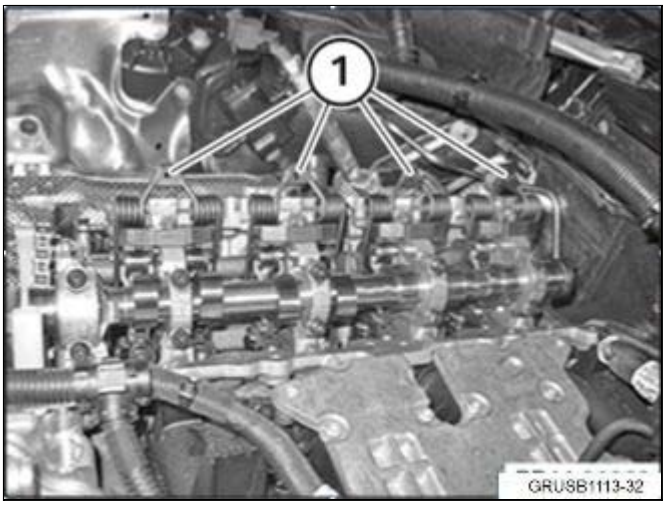
incorrectly
Lever (1) is under spring preload when it is in use.
Important:
Incorrect handling increases risk of damage!
Secure the lever (1).
Release the locking hook (2) and slowly allow the lever (1) to release the retainer spring.



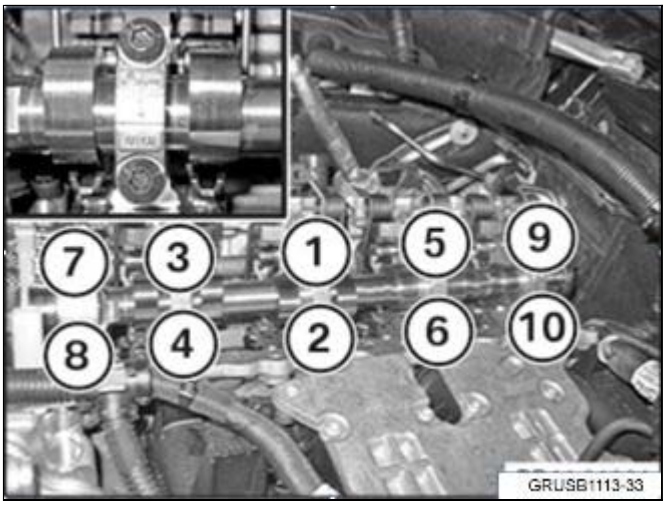
Turn the knurled screw (1) on special tool 11 7 110 in the direction of the arrow.



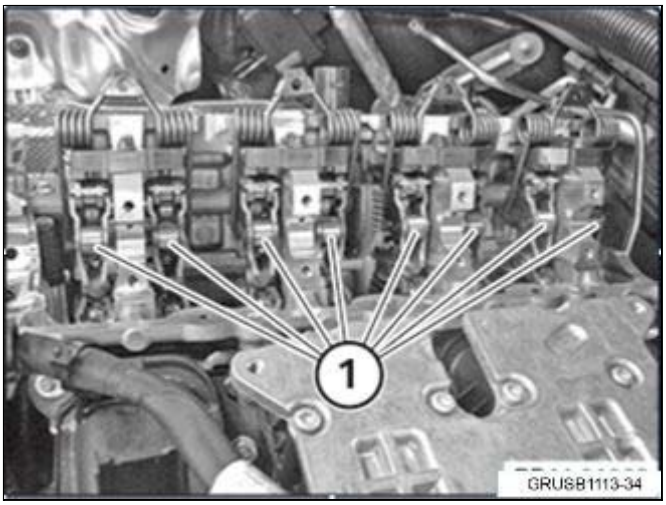
Release special tool 11 7 110 from the retainer spring (1) in the direction of the arrow.



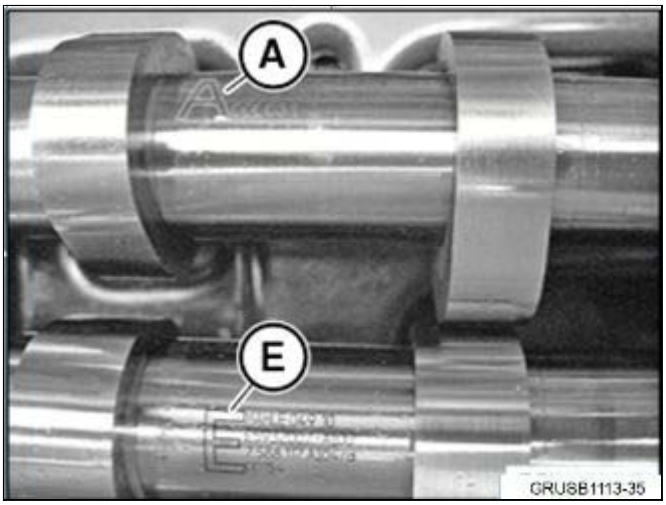
Retainer springs (1) remain on the engine.



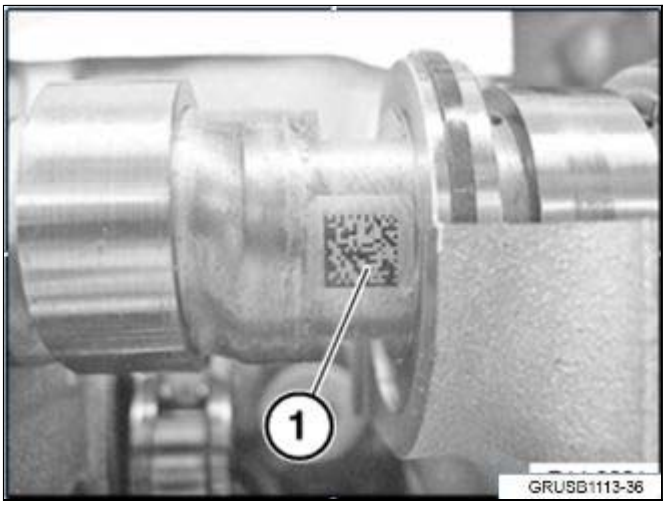
All bearing caps are marked with numbers from 1 to 4.
The front bearing cap is thrust-bearing and not marked.
Loosen and remove the bolts on all bearing caps (1 to 10).
Store all of the bearing caps in numeric order.



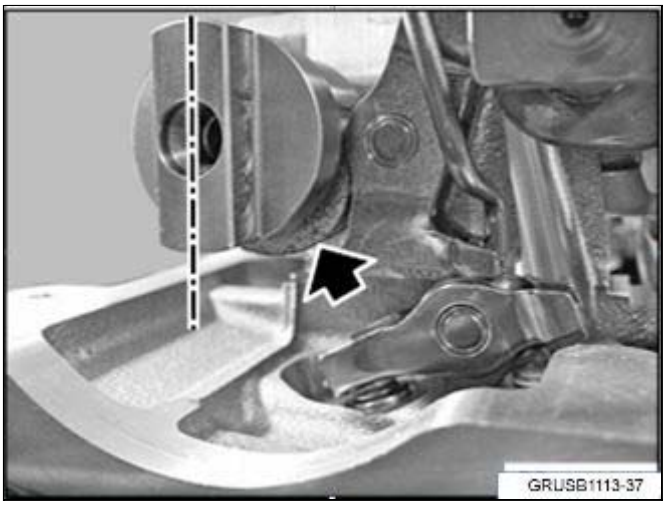
Important:
Do **not** remove the intermediate levers (1).
Interchanging the intermediate levers (1) may cause engine speed fluctuations during idling.
Remove the intake camshaft.



Installation of the intake camshaft:
Important:
The markings on the intake and exhaust camshafts are different. Interchanging the intake and exhaust camshafts will cause engine damage.
A = Exhaust camshaft
E = Intake camshaft

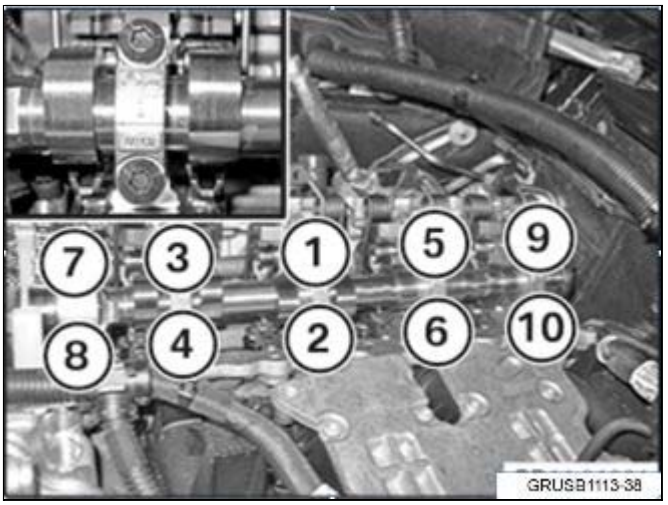


Place the intake camshaft in the position so that the date code (1) is pointing upwards.

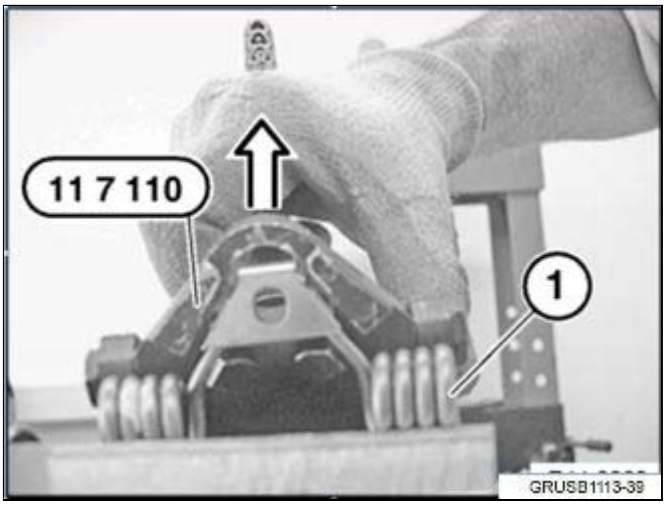


Position the intake camshaft so that the cylinder #4 camshaft lobes are pointing diagonally downwards in relation to the vacuum pump lug. See the dotted line and arrow.

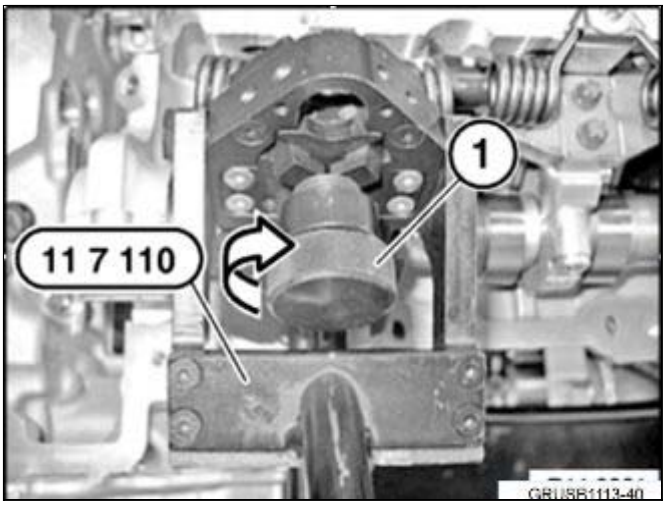
All bearing caps are marked with



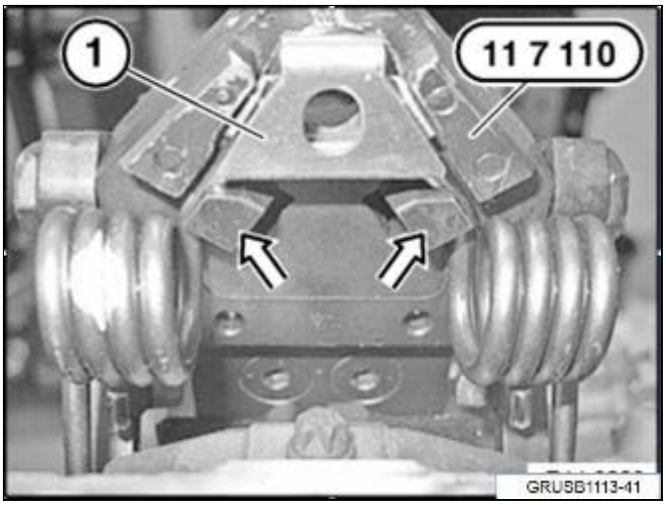
numbers from 1 to 4.
The front bearing cap is thrust-bearing and not marked.
Insert and torque the bolts on the bearing caps starting with (10) and ending with (1).
Tightening torque 11 31 3AZ - intake camshaft bearing cap to cylinder head 10 Nm



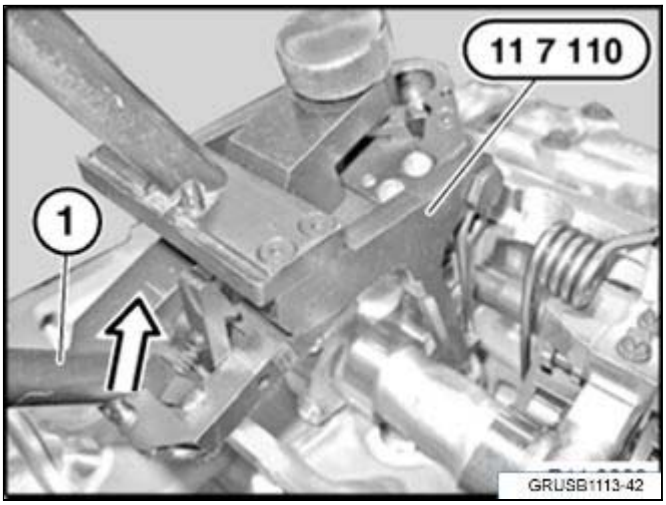
Position special tool **11 7 110** on the retainer spring.



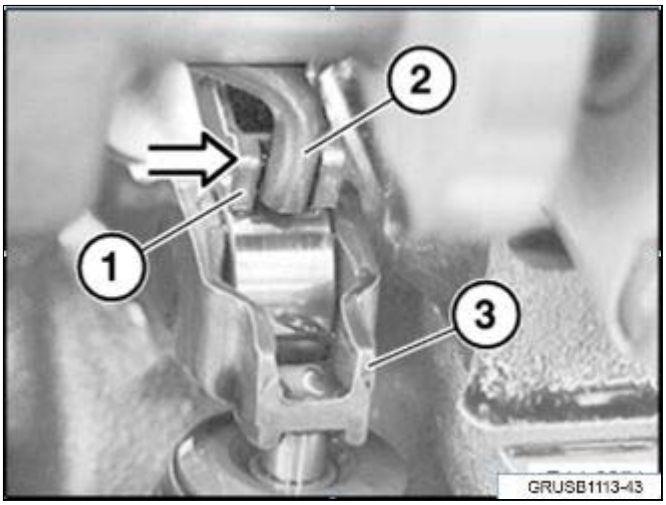
Clamp the retainer spring by turning the knurled screw (1) in the direction of the arrow.



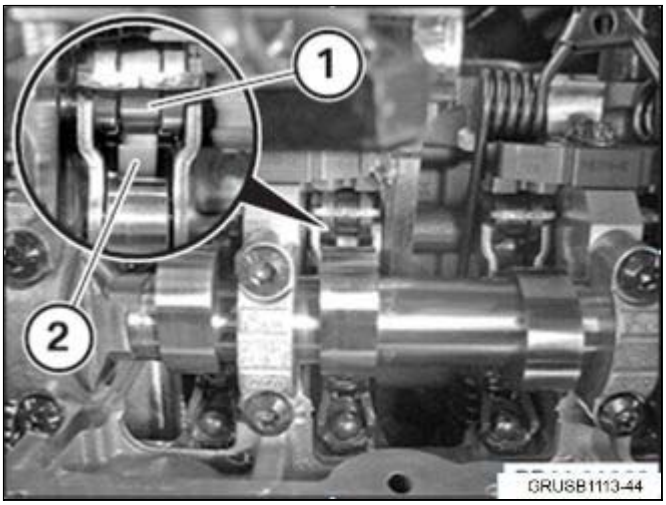
The retainer spring (1) is in the correct position when the locking hooks (see the arrows) enclose the retainer spring.



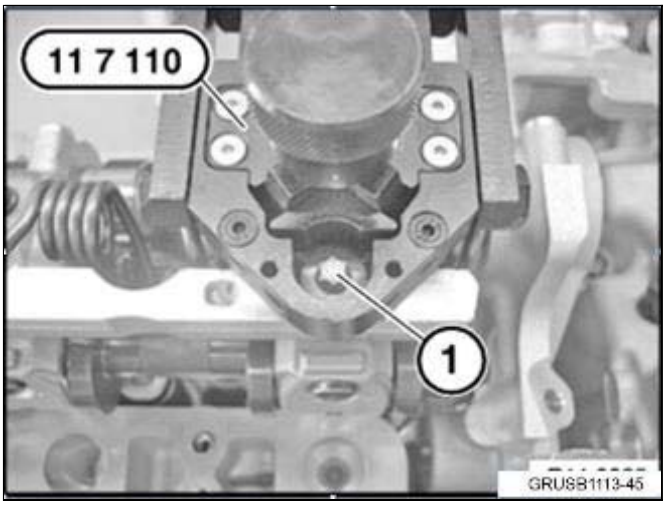
Warning:
Risk of injury if used incorrectly
Important:
Incorrect handling increases risk of damage!
Check the retainer spring on the intermediate lever for the correct installation position.
Move special tool 11 7 110 as far as it will travel in the direction of the arrow.



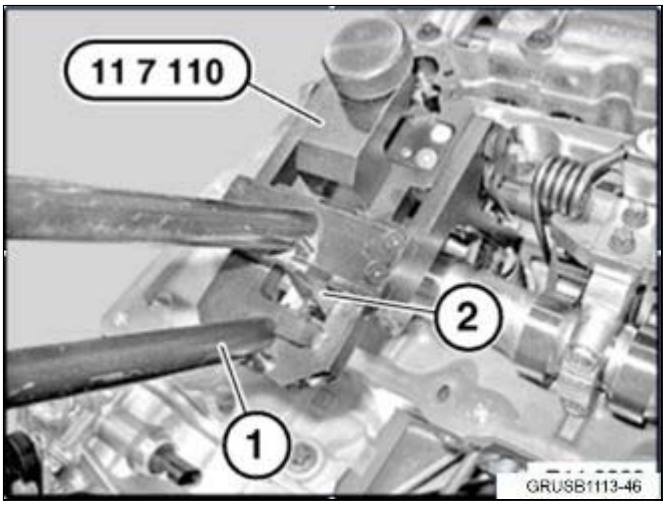
Install the return spring (2) into the intermediate lever bracket (1) (see the arrow).
Check the roller drag lever (3) for the correct installation position.



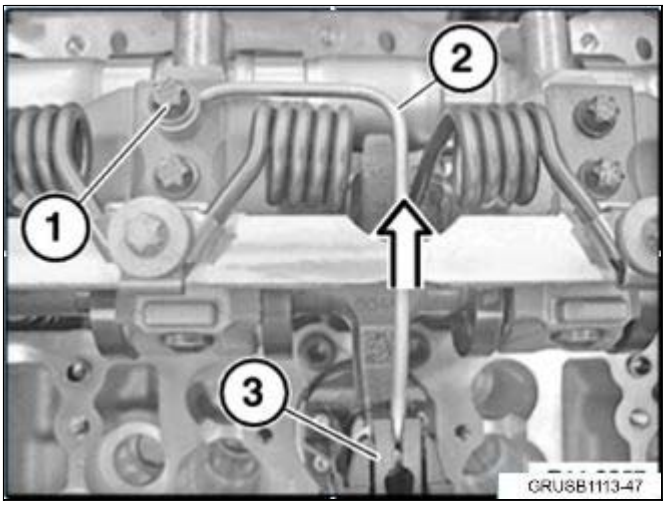
Important:
Check that the intermediate lever (1) is correctly installed on the eccentric shaft (2).



Important:
Pay attention to the bolt thread on the cylinder head.
Important:
Incorrect handling increases risk of damage!
Torque the bolt (1).
Tightening torque 11 37 2AZ (torsion spring/return spring on cylinder head) to 10 Nm



Warning:
Risk of injury if used incorrectly
Lever (1) is under spring preload when it is in use.
Important:
Incorrect handling increases risk of damage!
Secure the lever (1). Press back the locking hook (2) and the return spring can now be detensioned
Check again that the intermediate lever and return spring are correctly installed. Remove special tool 11 7 110.

	Install the oil spray nozzle (2) into the actuator drive (3). Tighten the bolt (1) to 10 Nm and then loosen by 90°. To position the oil spray nozzle (2) exactly, clip it in upwards until it is heard locking into place. Tightening torque 11 37 4AZ - Oil spray nozzle on bracket 10 Nm (1)

Continue with the following repair procedures to complete the repairs.

To install the intake adjustment unit, proceed as recommended in Repair Instruction 11 36 046, “Remove and refit/replace intake and exhaust adjustment unit” (N20, N26).

To adjust the valve timing, proceed as recommended in Repair Instruction 11 31 505, “Adjust camshaft valve timing” (N20, N26).

To fit the cylinder head cover, proceed as recommended in Repair Instruction 11 12 000, “Remove and refit/seal cylinder head cover” (N20, N26).

To install the DME control unit, proceed as recommended in Repair Instruction 12 14 550, “Replace control unit (DME)” (N20, N26) (no injector adjustment necessary).

PARTS INFORMATION

Parts List A:

The parts list below is only for vehicles that receive the intake camshaft repair kit. Refer to ETK and the repair instructions for onetime use fastener and component information regarding additional screws, gaskets and seals.

Part Number	Description	Quantity
11 31 8 632 503	Intake camshaft repair kit	1

Parts List B:

The parts list below is only for vehicles that qualify for intake camshaft and vacuum pump replacement per procedure steps 1-4. Read important vacuum pump identification notes below.

Refer to ETK and the repair instructions for onetime use fastener and component information regarding additional screws, gaskets and seals, with the exception of the three items described below.

- Reuse the strut brace bolts unless otherwise noted below.
- Both of the high-pressure pump screws, P/N 07 12 9 905 597, are to be reused.

Part Number	Description	Quantity
11 31 7 616 469	Intake camshaft	1
11 66 7 622 380	Vacuum pump **(See identification instructions)**	1
11 66 7 640 279	Vacuum pump **(See identification instructions)**	1
11 12 7 507 217	Shaft seal ring	1
11 12 7 588 418	Cylinder head cover gasket set	1
11 31 7 631 972	Chain tensioner seal ring	1
13 53 7 585 426	High-pressure line	1
07 14 7 029 829	Bolts for strut brace (F10 only)	4

VACUUM PUMP IDENTIFICATION

Some of the early production N26 engines were fitted with a vacuum pump that incorporated an additional vacuum supply port. The early vehicle may also have a vacuum-actuated exhaust flap before the switch to an electrically actuated exhaust flap.

If the original vacuum pump has a small hose connected to the additional vacuum port, the vehicle requires the P/N 11 66 7 640 279 vacuum pump. If the vacuum pump does not have a hose connected and the vacuum port has a small cap installed, the P/N 11 66 7 622 380 vacuum pump should be installed. If the vacuum pump does not have a vacuum port, the P/N 11 66 7 622 380 vacuum pump should be installed.

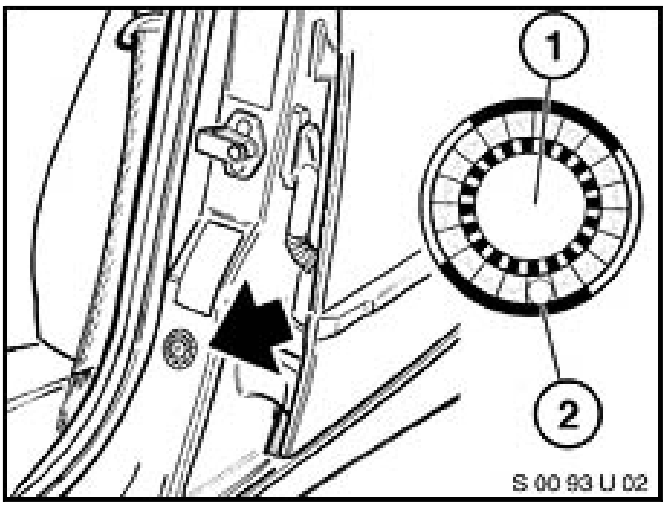
N20 engines that have a vacuum-operated turbocharger waste gate or a vacuum-operated exhaust flap require a vacuum pump with the additional vacuum port. If the original vacuum pump fitted has a small hose connected to the additional vacuum port, the vehicle requires P/N 11 66 7 640 279.

See the illustration below identifying the additional vacuum port location, if applicable.

	P/N 11 66 7 622 380 **Without** the additional vacuum port: see the arrow. **Application:** Vehicles **without** the vacuum-actuated

	turbocharger waste gate Vehicles **with** the electrically actuated exhaust flap Note: The vacuum pump has one large vacuum port.
	P/N 11 66 7 640 279 **With** the additional vacuum port; see the arrow. **Application:** Vehicles **with** the vacuum-actuated turbocharger waste gate Vehicles **with** the vacuum-actuated exhaust flap Note: The vacuum pump has one large vacuum port.

LABEL INSTRUCTIONS

	This Recall Campaign has been assigned code number **666**. After the vehicle has been checked and/or corrected, obtain a label (SD 92-431) and: A. Emboss your BMW center warranty number in the middle of the label (1); B. Punch out code number **666** (2), printed on the label; and C. Affix the label to the B-pillar as shown.

If the vehicle already has a label from a previous Service Action/Recall Campaign, affix the new label next to the old one. Do not affix one label on top of another one, because a number from an underlying label could appear in the punched-out hole of the new label.

WARRANTY INFORMATION

The repair described in this bulletin is covered under warranty regardless of time or mileage.

Reimbursement for this Recall will be via normal claim entry utilizing the following information:

Defect Code:	**00 11 48 03 00**

Before vehicle delivery to the customer (including center vehicles that are in-service)

Labor Operation:	**Labor Allowance:**	**Description:**
00 62 785	4 FRU (F10)	Identifying the type of camshaft; no repair is necessary
	5 FRU (E89)	
	11 FRU (F22, F30, F31, F32, F34)	
	14 FRU (F25)	
	15 FRU (E84)	
or		
00 62 821	7 FRU (F10)	Check intake camshaft and install the spring steel sleeve
	8 FRU (E89)	
	14 FRU (F22, F30, F31, F32, F34)	
	16 FRU (F25)	
	18 FRU (E84)	
or		
00 62 822	57 FRU (F10, E89)	Check intake camshaft; replace the intake camshaft and vacuum pump
	58 FRU (F10 xDrive)	
	69 FRU (F22, F30, F32)	
	71 FRU (F31, F34)	
	73 FRU (F30 xDrive, F32 xDrive)	
	74 FRU F34 sDrive)	
	75 FRU (F31 xDrive,	
	81 FRU (F25, E84 sDrive)	
	84 FRU (E84 xDrive)	

Labor operation codes 00 62 785, 00 62 821 and 00 62 822 are Plus labor operations.