



SI B01 21 18
Warranties

December 2018
Technical Service

UPDATE ! N63 ENGINE: OIL CONSUMPTION CLASS ACTION SETTLEMENT DIAGNOSIS AND REPAIR PROCEDURES (VERSION 7.0)

New information provided by this revision is preceded by this symbol **UPDATE !**.

This Service Information bulletin supersedes SI B01 21 18 **dated December 2018**

What's New:

- Subject Title updated
- Diagnostic and repair procedure updated
- Warranty labor operations updated to match the diagnostic and repair procedure
- Consequential Repairs statement has been added
- The OC and BS Warranty Information attachments were update
- New OC and BS FRU allowance attachment has been added

INFORMATION

This Service Information bulletin applies to:

- **UPDATE !** Class vehicles in operation on the road (Applicable N63 engine model vehicles); by
- Class members (Class Vehicle owners on the date this settlement became effective),

And it provides diagnostic/repairs instructions, as well as, Warranty Information for performed remedies.

Also, please familiarize yourself with other important Service Bulletins pertaining to the N63 Class Action Settlement:

- SI [B01 29 18](#) - N63 Engine Vehicles: Class Action Settlement For Engine Oil Consumption/Battery Drain / OVERVIEW
- SI [B01 22 18](#) - N63 Engine Class Action Settlement: BATTERY SERVICE BENEFIT
- SI [B01 23 18](#) - N63 Engine Oil Consumption/Battery Drain Class Action Law Suit Settlement: FUTURE ENGINE OIL SERVICE BENEFIT
- SI [B01 28 18](#) - N63 Engine Repairs: RENTAL CARS for OUT of SERVICE VEHICLES

SITUATION

UPDATE ! While engine oil consumption may create a customer inconvenience, in the short term, it should not cause any drivability problems that would prevent normal day-to-day operational use of the vehicle.

Some Class Vehicles will “pass” the oil consumption test (No repair necessary) even though a “Low Oil Level” indicator/message” displayed between required engine oil services

It is important that the engine oil level stays and is maintained above the minimum (“Low Oil Level” indicator/message is not displaying).

Refer to the Procedure section for information on diagnosing the oil consumption issue.

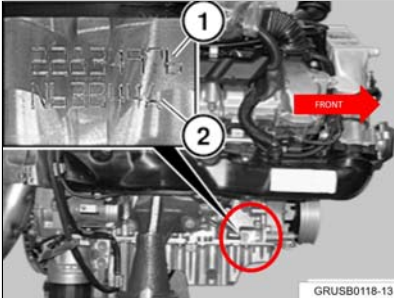
PROCEDURE

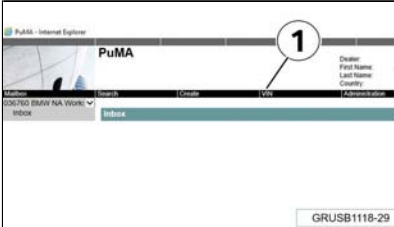
UPDATE !

Engine serial number verification (Included in the engine diagnosis labor operations):

Verify the proper engine serial number is installed in the vehicle before starting any diagnosis or repairs.

NOTE: Only vehicles equipped with the original engines (engine serial number matching the serial number in PuMA), or with BMW Replacement Engine (purchased from BMW PDCs, and replaced under Warranty, or customer pay) are eligible to participate in this Class Action Settlement.

 GRUSB0118-13	Engine serial number is located at the lower front right corner of the engine block. Engine serial number (1) Engine type Number (2)
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 GRUSB1118-29	Compare the engine serial number to PuMA. Select “VIN” (1)
 GRUSB1118-30	Enter the VIN (1) Select “Display” Engine serial number is shown (2)

If they do not match then create a PuMA TeileClearing Hotline case with the numbers that are shown on the engine block and wait for a response before proceeding with repairs.

All engine serial numbers will be verified at the Warranty Part Return Center.

IMPORTANT NOTE:

Only a Shop Forman is authorized to approve the final results of N63 Class Action diagnosis and repair.

The complete “N63 Oil Consumption Checklist”, or “N63 Smoke” Checklist”, along with the relevant photographs have to be submitted via a PuMA TeileClearing Hotline case titled “N63 Class_Action”.



IMPORTANT NOTE:

Do not attach pictures which are not relevant, vague, not clear, and which are not providing a clear evidence/source of an observed major leak. A TC case with an excessive number of poor quality pictures requires more time to process, resulting in a delayed response.

Please specify in the case details the picture description. Renaming the picture is not necessary

For example:

Front engine cover = X1234.jpg

Turbo inspection = X5678.jpg

The PuMA TeileClearing “N63 Class Action” process has started on November 1st, 2018. Weekend and holiday submissions are required, and they must wait for a response on the following business day before starting any repairs. The AutoStamp submission process has been deactivated as of 11/01/2018.



It is the Shop Foreman's responsibility to provide a complete and accurate diagnosis documentation, as described below. Including follow-up/updates to the original PuMA TeileClearing case prior to performing any additional related work that is found needed during the repair process.

IMPORTANT NOTE:

The parts stock of the N63 Replacement engine will remain extremely limited until January 2019. In case, an engine replacement is required as a result of the Class Action Diagnosis, please advise the customer that such a repair will be performed at a future date, when N63 engines are available. The vehicle's mileage for Customer's Contribution will be taken from the date of final, 5-step diagnosis.

Refer to the section that applies to the vehicle situation.

IMPORTANT: Do not drain and measure the engine oil. Follow the applicable instructions to use the electronic oil level measurement.



When the customer's complaint is “smoke from the exhaust system”, proceed to Section 1, Step 1 below. If the customer complains only about frequent engine oil top-offs, go to Step 2.

Section 1 – Visually diagnose the vehicle for smoke from the exhaust tail pipes:

Do not drain and measure the engine oil. Follow the applicable instructions to use the electronic oil level measurement:

1. Start the vehicle and allow it to reach to reach operating temperature, approximately 15 minutes or less. Quickly push-and-release the accelerator pedal from idle position to between 2,000 and 3,000 RPM, then immediately allow the engine to return to idle and observe the exhaust tail pipes for smoke. If the vehicle is smoking then refer to the following two attachments. If the vehicle is not smoking then proceed to step 2.

- N63 Smoke Instructions
- N63 Smoke Checklist

Note: Document all results in the “B01_21_18_N63 Smoke Checklist” simultaneously while following the instructions.

IMPORTANT: Take a picture of a smoke emitted from the exhaust pipes during this test, and attach it to a PuMA TeileClearing Hotline case.

2. If the vehicles does not exhibit any smoke from the tailpipes then an oil consumption test will need to be started using the following attachment.

- N63 Oil Consumption Instructions (only perform steps 1 and 2 in this document until the vehicle returns for the measurement described in section 2)

Section 2 – The vehicle has returned for the oil consumption measurement:

Measure the oil consumption. Refer to the following attachments.

- N63 OC Instructions (Resume the procedure at step 3 in this document)
- N63 Oil Consumption Checklist

Note: Document all results in the “N63 Oil Consumption Checklist” simultaneously while following the instructions.

Section 3 – Documenting the results of the visual inspection, failed oil consumption test and or vehicle inspection steps.

1. The “N63 Oil Consumption Checklist”, or “N63 Smoke Checklist” must be completed and photographed (both pages side by side in one photo).
2. Capture photos of the failed or leaking components.
3. Document the inspection/test results in a PuMA TeileClearing Hotline case, submit the case and wait for a response before continuing with repairs.

If the vehicle is not smoking or the vehicle passes the oil consumption test or the vehicle does not require any repairs then do not enter a PuMA TeileClearing Hotline case.

Calculating Oil Consumption by Milliliters

If the customer has driven much further than recommended then the result of the test plan and the miles driven can be determined using a calculator. The calculation below will determine the exact oil consumption level of the engine.

Calculation:

Milliliters of oil consumed ÷ miles driven = X.XXX milliliters (ml) per mile driven

The oil consumption specification of this calculation is 1.333 milliliters (ml) per mile driven.

For example, 1000ml ÷ 750 miles = **1.333 ml per mile**, this is the 1 liter per 750 miles specification.

If the result of the calculation is 1.333 per mile and greater then you have to continue with the diagnosis and address the customer complaint.

If the result of the calculation is less than or equal to 1.332 then the customers complaint **does not exceed** the allowable engine oil consumption specification. Take no further action.

Example:

900ml consumed ÷ 750 miles driven = 1.2 ml per mile – Take no further action and release the vehicle.

Engine Repairs and Replacements:

Replacement engine assemblies are **NOT pre-filled** with engine oil.

After replacing an engine with a new or remanufactured engine assembly, the engine oil level must be verified as outlined in the procedure below first, before starting the engine for the first time.

If the replacement engine is started to determine electronically if the engine is filled with the appropriate amount of engine oil, damage to the replacement engine can occur immediately.

The engine may have some residual engine oil from assembly, but this is **not enough** engine oil to properly lubricate the engine to measure the engine oil level electronically when it is started for the first time.

Further, the electronic engine oil measurement is only operational when the engine is running at its full operating temperature. Checking the engine oil without the engine running at operating temperature will lead to an incorrect or incomplete measurement.

After replacing the engine or making engine repairs that require the replacement or removal of the engine bearings, VANOS gears, camshafts, bed plate resealing, engine oil pump, engine oil filter housing, cylinder head, engine oil cooler or anything that interrupts the engine oil supply circuit of the engine requires a short oil pump and oil supply circuit priming procedure.

UPDATE I Refer to SI B11 09 15 for the detailed bleeding procedure (the time to perform this procedure is included in the applicable special repair labor operations that are provided in the attachments to this Service Information bulletin).

UPDATE I After engine repairs or replacement, pay attention to a proper installation of all engine ground connections. Mark the various ground connections with a small parts tag or colored tape.

In particular, follow the recommendations from SI B12 24 14 (N63: Proper Ignition Harness Installation and Ground Connections) for the ignition harness grounding. Any consequential damage to DME, alternator, or QLT sensor resulted from a loose ground (causing BSD communication faults), is not covered under N63 Class Settlement

PARTS INFORMATION

Based on the results from the inspections and testing select the appropriate parts to repair the vehicle.

Engine replacement only if the vehicle is found smoking or the measured oil consumption is too high and failing any one of the 5 point checks.

IMPORTANT NOTE:

The parts stock of the N63 Replacement engine will remain extremely limited until January 2019. In case, an engine replacement is required as a result of the Class Action Diagnosis, please advise the customer that such a repair will be performed at a future date, when N63 engines are available. The vehicle's mileage for Customer's Contribution will be taken from the date of final, 5-step diagnosis.

Part Number	Description	Quantity
Refer to ETK using the vin number of the vehicle	Remanufactured engine	1

Valve seal and engine oil separator replacement only if the vehicle is found smoking or the measured oil consumption is too high and all 5 point checks are found to be good.

Part Number	Description	Quantity

11 34 0 054 492	Valve seal repair kit	2
11 15 8 636 540	Oil separators, set (kit with bolts)	1
11 12 7 566 281	Timing chain tensioner cover gasket	2
11 12 7 566 288	Cylinder head cover profile gasket (cylinders 1-4)	1
11 12 7 566 289	Cylinder head cover profile gasket (cylinders 5-8)	1
11 12 8 636 401	High-pressure pump profile gasket	2
11 36 7 564 346	VANOS central screws	4
11 42 7 583 220	Engine oil filter	1
13 53 7 584 315	Injector gasket ring seal	8
13 53 7 564 751	Injector decoupling element	8

Also, if found defective (cracked, leaking), the following crankcase ventilation hoses need to be replaced:

Part Number	Description	Quantity
11 15 7 575 640	Vent pipe	1
11 15 7 575 641	Vent pipe	1
11 15 7 646 086	Connecting line	1
11 15 7 646 087	Connecting line	1

Also, if found leaking, turbocharger oil return cover and gaskets.

Part Number	Description	Quantity
11 65 7 577 016	Oil return cover	1
11 42 8 624 158	Gasket, asbestos free	2

Turbo replacement only if found leaking.

Part Number	Description	Quantity
11 65 7 646 092	Turbocharger	2

Rear cover and rear crankshaft seal replacement only if found leaking.

Part Number	Description	Quantity
11 14 2 446 298	Updated, end cover, rear kit	1
Refer to ETK	Cap with rear seal (rear crankshaft seal)	1



Refer to the ETK and the applicable repair instructions for one-time use fasteners and/or component information regarding additional, in-conjunction parts/kits or replacement screws, gaskets, seals and clamps

that need to be installed and claimed.

All repairs (as needed):

Bulk Materials - Sublet

Part Number	Description	Quantity
83 21 2 365 946	5W30 BMW Engine Oil 1 liter	Up to 9.6 liters
		(E72, F04 8.5)
82 14 1 467 704	Antifreeze	See Sublet
		(1 Gallon)
83 29 0 429 576	Hydraulic fluid CHF 11 S (F01, F02, F04, F07)	See Sublet
		(up to 1)

1 Gallon Antifreeze = 2 Gallons at a 50/50 mixture solution.

WARRANTY INFORMATION

The engine diagnosis and repair procedures outlined in this bulletin are covered under the terms of this Class Action Settlement (as noted below) for first 10 years or 120,000 miles, whichever occurs first, as determined by the original in-service date.

However, in no event less than 1 year or 12,000 miles from the Effective Day of the settlement date (repair dates up to and including 10/11/2019, coverage is 11 years or 132,000 miles, whichever occurs first).

Engine diagnosis:

A. Up to three (3) engine oil consumption (two-part setup/test) diagnosis procedures may be eligible to be performed or upon verification of blue smoke from the exhaust pipes is reimbursement is at 100%.

Based on the results of the engine diagnosis, when applicable:

B. Eligible **“engine repairs”** are reimbursed at 100%.

C. Eligible **“complete engine assembly replacements”** (including supplemental/in conjunction repairs) are reimbursed according to the customer contribution percentage matrix.

Engine Assembly Replacement - Customer Contribution Percentage Matrix (Item C)			
		Customer's	

Odometer Miles*		Contribution	BMW's Contribution
Up to	50,000	0% (None)	100%
50,001	60,000	5%	95%
60,001	70,000	15%	85%
70,001	80,000	30%	70%
80,001	90,000	45%	55%
90,001	100,000	60%	40%
100,001	110,000	75%	25%
110,001	120,000	90%	10%
120,001	And higher	100%	0% (None)

Applying the Contribution Matrix*

When an eligible vehicle returns to a BMW authorized center for an oil consumption issue and the vehicle's engine either:

- Fails the oil consumption measure test (part two); or there is
- Visible blue smoke from the exhaust pipes; **and** the
- Vehicle's engine fails the one of the other required inspections (5 point checks); then

Use the vehicle's "odometer miles" when the **above occurred** to determine the customer's contribution. This documented odometer mileage is to be also used when the **qualifying engine replacement** is delayed due to awaiting parts from BMW.

Please ensure to document this information on the repair order and in the claim comments.

BMW Certified Pre-owned (CPO) Vehicles

Qualifying N63 engine "replacements" are covered under the terms of the applicable CPO coverage.



Consequential Repairs

When additional work and/or parts are required as a "direct result" of performing an eligible repair that is outlined in this Service Information bulletin, claim these items under the applicable defect code, including prior TeileClearing (TC) approval (when required) together with the corresponding labor operations listed in the AIR/KSD2.

Please explain the reason for this consequential repair work (the why and what) on the repair order and in the claim comments section.



Overlapping Labor Procedure – Other Repairs

If invoicing the KSD2/AIR flat rate labor operation codes for other repair work results in overlapping labor, for those flat rate labor operations that are affected, you are able to:

- Replace the stated KSD2 "FRU allowance" with a "reduced FRU value" to eliminate the overlapping labor.

For help in identifying the overlapping labor, please refer to the AIR FRU Plausibility Check (Overlapping Labor

Tool) that is located in the AIR Client.

Eligible other repair work being claimed under a different defect code will require separate punch times.

On the repair order and in the claim comment section, please identify and itemize those labor operations being claimed with a “reduced FRU value.”



Attachments for Defect Codes, Labor Operation information and FRU allowances for Repair Invoicing for Claim Submission

For oil consumption diagnosis and repair-related defect codes and labor operations, see the attachment:

- B01 21 18 N63 Oil Consumption (OC) Wty Info 12_18_18; or

For visible blue smoke diagnosis and repair-related defect codes and labor operations, see the attachment:

- B01 21 18 N63 Blue Smoke (BS) Wty Info 12_18_18; and

For the corresponding oil consumption/blue smoke diagnosis and repair-related labor operation FRU allowances, see the attachment:

- B01 21 18 N63 OC_BS Labor Operation FRU Allowances 12_18_18.

Pease use this “FRU Allowance Attachment” only until this information becomes available in AIR/KSD2.

Posted: Friday, December 21, 2018

ATTACHMENTS

View PDF attachment [B01 21 18 N63 Oil Consumption Instructions 12 04 18.](#)

View PDF attachment [B01 21 18 N63 Smoke Instructions 12 04 18.](#)

View PDF attachment [B01 21 18 N63 Blue Smoke Checklist 12 05 18.](#)

View PDF attachment [B01 21 18 N63 Oil Consumption Checklist 12 03 18.](#)

View PDF attachment [B01 21 18 N63 Oil Consumption \(OC\) Wty Info 12 18 18.](#)

View PDF attachment [B01 21 18 N63 Blue Smoke \(BS\) Wty Info 12 18 18.](#)

View PDF attachment [B01 21 18 N63 OC_BS Labor Operation FRU Allowances 12 18 18.](#)

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SI B01 21 18: Engine has Visible (Blue) Smoke from the Exhaust Tailpipes

Labor Operation:	Labor Allowance:	Description:
00 66 287	Refer to AIR/KSD2	Visual inspection for the exhaust tailpipes for blue smoke (includes running engine to operating temperature) (Main work)
Or		
00 66 995	Refer to AIR/KSD2	Visual inspection for the exhaust tailpipes for blue smoke (includes running engine to operating temperature) (Plus work)

And:

Labor Operation:	Labor Allowance:	Description:
00 66 997	Refer to AIR/KSD2	Remove and install clean air pipes, underbody paneling/visual inspection of the: • exhaust turbochargers and both turbochargers/oil return lines and return line cover; and the • front cover, upper oil pan; and the • engine backside (Transmission) for oil leakage; and • borescope inspect the engine valley as necessary
Or:		
00 66 998	Refer to AIR/KSD2	Remove and install clean air pipes, underbody paneling/ visual inspection of the: • exhaust turbochargers and both turbochargers/oil return lines and return line cover; and the • front cover, upper oil pan; and the • engine backside (Transmission) for oil leakage; • perform the timing chain test plan; and • borescope inspect the engine valley as necessary
Or:		
00 66 999	Refer to AIR/KSD2	Remove and install clean air pipes, underbody paneling/ visual inspection of: • exhaust turbocharger both turbochargers/oil return lines and return line cover; • front cover, upper oil pan; • engine backside (Transmission) for oil leakage; • perform the timing chain test plan; and • cylinder compression test; and • borescope inspect the engine valley as necessary
And:		
00 58 677	1 FRU	TeileClearing, lump-sum fee (B01 01 07)

SI B01 21 18: Engine has Visible (Blue) Smoke from the Exhaust Tailpipes

Engine Fails One of the Inspections/Test Procedures - Engine Replacement is Necessary

The owner “**approves**” the repair, however, the qualifying N63 engine replacement repair **is pending** due to **awaiting parts** to become available from BMW, then claim the applicable diagnosis labor operations above and submit using the Defect Code below.

Defect Code:	1100901700	E7x F0x F1x N63 Measured engine oil consumption excessive, diagnosis, engine replacement pending
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Or:

If the vehicle owner “**rejects**” a N63 engine replacement procedure that qualifies, then claim the applicable diagnosis labor operations above and submit using the Defect Code below.

Defect Code:	1100901800	E7x F0x F1x N63 Engine diagnosis, engine replacement rejected by customer
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Or:

The qualifying engine replacement procedure **can be performed** during the current workshop visit, then claim and submit for the applicable diagnosis above and the N63 engine replacement using the Defect Code below that applies

Defect Code:	1100901100	E7x F0x F1x N63 Additional diagnosis leads to engine replacement
Or:		
Defect Code:	1100901200	E7x F0x F1x N63 Additional diagnosis leads to engine and turbocharger replacement
Labor Operation:	Labor Allowance:	Description:
00 67 500	Refer to AIR/KSD2	Replace the engine (includes remove and install the old turbochargers or replace both turbochargers)

Or, if the vehicles **does not fail** one of the above inspections/test procedures, then:

SI B01 21 18: Engine has Visible (Blue) Smoke from the Exhaust Tailpipes

Blue Smoke/Engine Does Not Fail One of the Inspections/Test Procedures - Engine Replacement is Not Necessary

Labor Operation:	Labor Allowance:	Description:
00 66 287	Refer to AIR/KSD2	Visual inspection for the exhaust tailpipes for blue smoke (includes running engine to operating temperature) (Main work)
Or		
00 66 995	Refer to AIR/KSD2	Visual inspection for the exhaust tailpipes for blue smoke (includes running engine to operating temperature) (Plus work)
And:		
00 66 999	Refer to AIR/KSD2	Remove and install clean air pipes, underbody paneling/ visual inspection of: • exhaust turbocharger both turbochargers/oil return lines and return line cover; • front cover, upper oil pan; • engine backside (Transmission) for oil leakage; • perform the timing chain test plan; and • cylinder compression test; and • borescope inspect the engine valley as necessary
And:		
00 58 677	1 FRU	TeileClearing, lump-sum fee (B01 01 07)

And, with the applicable labor above together with the engine repair performed:

Defect Code:	1100900900	E7x F0x F1x N63 Additional diagnosis leads to engine repairs (valve seals, cylinder head cover oil separators)
Labor Operation:	Labor Allowance:	Description:
00 67 501	Refer to AIR/KSD2	Perform additional diagnosis, replace the: • valve stem seals; and the • cylinder head covers oil separators

Or, with turbocharger-related repairs

Defect Code:	1100901000	E7x F0x F1x N63 Additional diagnosis leads to engine repairs (valve seals, cylinder head cover oil separators, turbochargers)
Labor Operation:	Labor Allowance:	Description:
00 67 502	Refer to AIR/KSD2	Perform additional diagnosis, replace the: • valve stem seals; • cylinder head cover oil separators; and • replace both turbochargers and/or the oil return line seals and return line cover

Or:

SI B01 21 18: Engine has Visible (Blue) Smoke from the Exhaust Tailpipes

Defect Code:	1100902200	E7x F0x F1x N63 Additional diagnosis, replace valve seals, cylinder head covers, turbos, repair oil leaks
Labor Operation:	Labor Allowance:	Description:
00 67 688	Refer to AIR/KSD2	Perform additional diagnosis, replace the • valve stem seals; • cylinder head cover oil separators; • rear crankshaft and rear engine cover seals; • lower oil pan gasket; and • replace both turbochargers; and/or the oil return line seals and return line cover
Or:		
00 67 689	Refer to AIR/KSD2	Perform additional diagnosis, replace the • valve stem seals; • cylinder head cover oil separators; • rear crankshaft and rear engine cover seals; and • replace both turbochargers; and/or the oil return line seals and return line cover
Or:		
00 67 690	Refer to AIR/KSD2	Perform additional diagnosis, replace the • valve stem seals; • cylinder head cover oil separators; and the • lower oil pan gasket; and • replace both turbochargers; and/or the oil return line seals and return line cover

Or, **without** turbocharger-related repairs

Defect Code:	1100902100	E7x F0x F1x N63 Additional diagnosis, replace valve seals, cylinder. head covers, repair leaks
Labor Operation:	Labor Allowance:	Description:
00 67 691	Refer to AIR/KSD2	Perform additional diagnosis, replace the • valve stem seals; and the • cylinder head cover oil separators; and the • rear crankshaft and rear engine cover seals; • lower oil pan gasket
Or:		
00 67 692	Refer to AIR/KSD2	Perform additional diagnosis, replace the • valve stem seals; and the • cylinder head cover oil separators; and the • rear crankshaft and rear engine cover seals
Or:		
00 67 693	Refer to AIR/KSD2	Perform additional diagnosis, replace the • valve stem seals; and the • cylinder head cover oil separators; and the • lower oil pan gasket

SI B01 21 18: Engine has Visible (Blue) Smoke from the Exhaust Tailpipes

And, applicable:

Sublet – Materials

Sublet Code 4	See sublet reimbursement calculation below	Reimbursement for used quantities of required operating fluids, including engine oil only when it is not claimed under the BMW Maintenance Program (applicable BMW part numbers). Please do not use these part numbers for claim submission.
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Sublet calculation:

Reimbursement for used quantities of required operating fluids (applicable BMW part numbers) at dealer net plus handling.

Enter the material cost in sublet and itemize the amount in the claim comment section.

N63 Engine	Series	E70	E71	E72	F01	F01	F01	F01	F02	F02	F02	F02	F04	F04	F07	F07	F10	F10	F10	F12	F12	F12	F13	F13	F13
	Model Code	ZN83	FG83	FH03	KA73	KA83	KC53	KC63	KB73	KB83	KC73	KC83	KX63	KX83	SN43	SP43	FR03	FR93	FU03	LZ33	LZ43	LZ63	LX33	LX43	LX63
Labor Operations	Type	Flat Rate Unit (FRU) Allowances Engine Oil Consumption (OC) Setup (Part One)																							
00 66 283 OC	Main	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
00 66 979 OC	Plus	10	10	10	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
		OC Measure (Part Two - First Time)																							
00 66 284 OC	Main	9	9	9	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
00 66 983 OC	Plus	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
		OC Measure (Part Two - Second Time)																							
00 66 285 OC	Main	9	9	9	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
00 66 985 OC	Plus	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
		OC Measure (Part Two - Third Time)																							
00 66 286 OC	Main	9	9	9	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
00 66 987 OC	Plus	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
		Engine Diagnosis (Use the one that applies)																							
00 66 989	Assoc.	37	37	60	30	30	30	30	30	30	30	30	30	30	30	30	31	31	31	30	30	30	30	30	30
00 66 990	Assoc.	41	41	64	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34
00 66 991	Assoc.	49	49	72	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42
		Engine Replacements (Use the one that applies); or																							
00 66 992	Assoc.	273	281	313	277	239	280	286	280	239	283	286	265	265	243	290	233	224	285	229	242	287	226	238	276
00 66 993	Assoc.	242	242	269	243	254	246	254	243	254	246	254	255	255	255	255	249	249	255	248	248	250	248	248	248
		Engine Repairs (Use the one that applies)																							
00 66 994	Assoc.	303	303	319	306	306	303	306	306	303	306	306	307	307	307	307	299	299	299	299	299	301	299	299	299
00 67 682	Assoc.	374	385	401	380	393	376	377	380	376	377	380	406	406	380	384	362	368	373	372	370	377	369	367	371
00 67 683	Assoc.	374	385	401	380	393	376	377	380	376	377	380	406	406	380	384	362	368	373	372	370	377	369	367	371
00 67 684	Assoc.	310	310	326	310	313	313	313	310	313	313	313	313	313	313	313	306	306	306	306	306	307	306	306	306
00 67 685	Assoc.	315	326	355	331	324	319	322	331	324	319	322	357	357	336	328	311	318	332	332	324	322	316	319	324
00 67 686	Assoc.	311	319	349	315	324	316	318	324	313	316	318	351	351	329	322	305	311	325	318	313	325	315	310	317
00 67 687	Assoc.	251	251	278	252	264	255	268	252	264	255	268	269	269	265	268	259	259	269	261	261	266	259	259	262

N63 Engine	Series	E70	E71	E72	F01	F01	F01	F01	F02	F02	F02	F02	F04	F04	F07	F07	F10	F10	F10	F12	F12	F12	F13	F13	F13
	Model Code	ZN83	FG83	FH03	KA73	KA83	KC53	KC63	KB73	KB83	KC73	KC83	KX63	KX83	SN43	SP43	FR03	FR93	FU03	LZ33	LZ43	LZ63	LX33	LX43	LX63
Labor Operations	Type	Flat Rate Unit (FRU) Allowances Blue Smoke from the Tailpipes (BS)																							
00 66 287 BS	Main	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
00 66 005 BS	Plus	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
		Diagnosis (Use the one that applies)																							
00 66 997	Assoc.	37	37	60	30	30	30	30	30	30	30	30	30	30	30	30	31	31	31	30	30	30	30	30	30
00 66 998	Assoc.	45	45	67	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38
00 66 999	Assoc.	52	52	75	45	45	45	45	45	45	45	45	45	45	45	45	46	46	46	45	45	45	45	45	46
		Engine Diagnosis (Use the one that applies)																							
00 66 997	Assoc.	37	37	60	30	30	30	30	30	30	30	30	30	30	30	30	31	31	31	30	30	30	30	30	30
00 66 998	Assoc.	45	45	67	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38
00 66 999	Assoc.	52	52	75	45	45	45	45	45	45	45	45	45	45	45	45	46	46	46	45	45	45	45	45	46
		Engine Replacements (Use the one that applies); or																							
00 67 500	Assoc.	273	281	313	277	239	280	286	280	239	283	286	265	265	243	290	233	224	285	229	242	287	226	238	276
00 67 501	Assoc.	242	242	269	243	254	246	254	243	254	246	254	255	255	255	255	249	249	255	248	248	250	248	248	248
		Engine Repairs (Use the one that applies)																							
00 67 502	Assoc.	285	285	299	292	292	293	293	284	290	290	293	301	301	291	291	286	286	291	285	285	285	285	285	285
00 67 688	Assoc.	374	385	401	377	376	393	380	377	376	380	380	406	406	380	384	368	362	373	370	372	377	367	369	371
00 67 689	Assoc.	368	378	396	370	370	373	373	370	370	387	373	399	399	373	378	361	355	366	363	366	370	360	363	365
00 67 690	Assoc.	310	310	326	310	313	313	313	310	313	313	313	313	313	313	313	306	306	306	306	306	307	306	306	306
00 67 691	Assoc.	315	326	355	319	324	322	331	319	324	322	331	357	357	328	336	318	311	332	322	324	332	316	319	324
00 67 692	Assoc.	311	319	349	315	318	316	324	313	318	316	324	351	351	322	329	311	305	325	313	318	325	310	315	317
00 67 693	Assoc.	251	251	278	252	264	255	268	252	264	255	268	269	269	265	268	259	259	269	261	261	266	259	259	262

N63 ENGINE BLUE SMOKE CHECKLIST

Date:		Record the results of the vehicle's engine inspection and measurements below. Use this checklist for "blue smoke" complaints only.
Dealer Number:	VIN (7)	
RO number	Engine Serial Number	

Concern is "blue smoke" for tailpipes.	Visual inspection for the exhaust tailpipes for blue smoke	Labor operations	00 66 287 (995)
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1. Is there blue smoke emitting from the tailpipes (Running engine to operating temperature) as described in B01 21 18? YES or No (No further repair)

Five Point Check and Results: Only provide the answers to the applicable questions in steps 2 through 9, unless otherwise directed.

2. Is the front engine cover leaking?	YES or NO
3. Is the upper engine oil pan leaking?	YES or NO
4. Is the engine oil leaking from the lower bell housing area?	YES or NO
5. Only if 2 or 3 or 4 are answered with "YES". Use the bore scope (10). Is the oil return cover or oil return line gaskets leaking oil? Provide photo in the case using the borescope regardless if it is found wet or dry.	YES or NO If YES , do not replace the engine for oil leakage and proceed to step 6.
6. Are the turbochargers leaking engine oil?	YES or NO
7. Did the vehicle fail the timing chain test plan?	YES or NO
8. Was a cylinder compression test performed?	YES or NO
Note: The cylinder compression test should be performed after the engine has reached operating temperature. When performing this test, count the rotations of the engine crankshaft and apply the same rotations to each additional cylinder of the compression test. The industry standard is four (4) rotations per cylinder.	
9. Test Plan Compression Test Results: Did the cylinders exceed the specification	YES or NO

When comparing the values of all cylinders, the compression results should not vary by more than 2.5 bar or 36.25 PSI. If the difference is greater than 2.5 bar or 36.25 PSI, then the complete engine will need to be replaced.

If the test plan was not used, then document the compression test results by cylinder in the table below

1.	2.	3.	4.
5.	6.	7.	8.

Vehicles that pass the tests and/or do not require any engine repairs do not need a PuMA TeileClearing authorization.

N63 ENGINE BLUE SMOKE CHECKLIST

	The diagnosis scenarios are listed below, check the one that best describes the diagnosis result.	Recommended Repair Procedures	Labor Op Main (Plus) Code	Defect Code
	Vehicle fails engine oil consumption measure test/inspections		Plus (see above):	
	Engine oil leakage (2 and/or 3) found	Replace the engine		1100901100
	Engine oil leakage (2 and/or 3) and turbochargers found leaking oil (6)	Replace the engine and turbochargers	00 66 997 & 00 67 500	1100901200
	Only the timing chain test fails (7)	Replace engine		1100901100
	Timing chain test fails (7), and turbochargers (5) are leaking oil.	Replace engine and turbochargers	00 66 998 & 00 67 500	1100901200
	Only the cylinder compression test fails (8)	Replace engine		1100901100
	Cylinder compression test (8) fails and turbochargers (5) are leaking oil	Replace engine and turbochargers	00 66 999 & 00 67 500	1100901200
	Replacement engine is not available, claim applicable diagnosis labor operations with this defect code		See B01 21 18 and above	1100901700
	Customer rejects replacement engine, claim applicable diagnosis labor operations with this defect code		See B01 21 18 and above	1100901800
	Steps 2, 3, 7 and 9 – OK, engine replacement is not necessary: performed additional diagnosis and found:			
	All other items ok	(A) Replace the valve stem seals and cylinder head covers oil separators	00 66 999 & 00 67 501	1100900900
	Turbos and/or lines (6) leaking	With (A), replace both turbochargers and/or the oil return line seals/return line cover seals	00 66 999 & 00 67 502	1100901000
	Rear oil leak (4), found valley dry (10) and the lower oil pan and turbos and/or lines (6) leaking	With (A), replace rear crankshaft and rear engine cover seals; lower oil pan gasket; replace both turbochargers; and/or the oil return line seals/return line cover seals	00 66 999 & 00 67 688	1100902200
	Found Step (10) ok, found rear oil leak (4), and turbos and/or lines (6) leaking	With (A) replace; rear crankshaft and rear engine cover seals; replace both turbochargers; and/or the oil return line seals/return line cover seals	00 66 999 & 00 67 689	
	Found Step (4 and 10) ok, found the lower oil pan and turbos and/or lines (6) leaking	With (A) replace the lower oil pan gasket; replace both turbochargers; and/or the oil return line seals/return line cover seals	00 66 999 & 00 67 690	
	Rear oil leak (4), found valley dry (10) and a lower oil pan leak	With (A). replace the rear crankshaft and rear engine cover seals and lower oil pan gasket	00 66 999 & 00 67 691	1100902100
	Found Step (10) ok, found rear oil leak (4)	With (A) replace the rear crankshaft and rear engine cover seals	00 66 999 & 00 67 692	
	Found Step (4 and 10) ok, found lower oil pan leak	With (A) replace the lower oil pan gasket	00 66 999 & 00 67 683	

Retain copy of this checklist in the vehicle file. Provide copy to your booker/warranty admin for claim processing. Take a photo of these two pages (side by side) with pictures, submit for authorization to PuMA TeileClearing Hotline case - wait for a response. Weekend and holiday submissions must wait for a response on the following business day before starting any repairs.

N63 ENGINE OIL CONSUMPTION CHECKLIST

Date:		Record the results of the vehicle's engine inspection and measurements below. Use this checklist for "oil consumption" complaints only.
Dealer Number:	VIN (7)	
RO number	Engine Serial Number	

	Concern is "oil consumption."	Perform Consumption Test	Labor Operations:	00 66 284 (983); or 00 66 285 (985); or 00 66 286 (987)
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1. Was an engine oil consumption test started and measured (Completed)? YES or No (No further repair) If yes, what was the level of engine oil consumption? _____ Did the vehicle fail the oil consumption test? YES or NO (If yes, proceed to the five point check)
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Five Point Check and Results: Only provide the answers to the applicable questions in steps 2 through 9, unless otherwise directed.

2. Is the front engine cover leaking?	YES or NO
3. Is the upper engine oil pan leaking?	YES or NO
4. Is the engine oil leaking from the lower bell housing area?	YES or NO
5. Only if 2, 3 and/or 4 are answered with "YES," then use the borescope: Is the oil return cover and/or oil return line gaskets leaking (10) oil? Provide photo in the case using the borescope regardless if it is found wet or dry.	YES or NO If YES, do not replace the engine for oil leakage, proceed to step 6.
6. Are the turbochargers leaking engine oil?	YES or NO
7. Did the vehicle fail the timing chain test plan?	YES or NO
8. Was a cylinder compression test performed?	YES or NO

Note: The cylinder compression test should be performed after the engine has reached operating temperature. When performing this test, count the rotations of the engine crankshaft and apply the same rotations to each additional cylinder of the compression test. The industry standard is four (4) rotations per cylinder.

9. Test Plan Compression Test Results: Did the cylinders exceed the specification	YES or NO
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When comparing the values of all cylinders, the compression results should not vary by more than 2.5 bar or 36.25 PSI. If the difference is greater than 2.5 bar or 36.25 PSI, then the complete engine will need to be replaced.

If the test plan was not used, then document the compression test results by cylinder in the table below

1.	2.	3.	4.
5.	6.	7.	8.

N63 ENGINE OIL CONSUMPTION CHECKLIST

	The diagnosis scenarios are listed below, check the one that best describes the diagnosis result.	Recommended Repair Procedures	Labor Op Main (Plus) Code	Defect Code
	Vehicle fails engine oil consumption measure test/inspections		Plus (see above):	
	Engine oil leakage (2 and/or 3) found	Replace the engine		1100900700
	Engine oil leakage (2 and/or 3) and turbochargers found leaking oil (6)	Replace the engine and turbochargers	00 66 989 & 00 66 992	1100900800
	Only the timing chain test fails (7)	Replace engine		1100900700
	Timing chain test fails (7), and turbochargers (5) are leaking oil	Replace engine and turbochargers	00 66 990 & 00 66 992	1100900800
	Only the cylinder compression test fails (8).	Replace engine		1100900700
	Cylinder compression test (8) fails and turbochargers (5) are leaking oil	Replace engine and turbochargers	00 66 991 & 00 66 992	1100900800
	Replacement engine is not available, claim applicable diagnosis labor operations with this defect code		See B01 21 18 and above	1100901600
	Customer rejects replacement engine, claim applicable diagnosis labor operations with this defect code		See B01 21 18 and above	1100901800
	Steps 2, 3, 7 and 9 – OK, engine replacement is not necessary: performed additional diagnosis and found:			
	All other items ok	(A) Replace the valve stem seals and cylinder head covers oil separators	00 66 991 & 00 66 993	1100900500
	Turbos and/or lines (6) leaking	With (A), replace both turbochargers and/or the oil return line seals/return line cover seals	00 66 991 & 00 66 994	1100900600
	Rear oil leak (4), found valley dry (10) and the lower oil pan and turbos and/or lines (6) leaking	With (A), replace rear crankshaft and rear engine cover seals; lower oil pan gasket; replace both turbochargers; and/or the oil return line seals/return line cover seals	00 66 991 & 00 67 682	1100902000
	Found Step (10) ok, found rear oil leak (4), and turbos and/or lines (6) leaking	With (A) replace; rear crankshaft and rear engine cover seals; replace both turbochargers; and/or the oil return line seals/return line cover seals	00 66 991 & 00 67 683	
	Found Step (4 and 10) ok, found the lower oil pan and turbos and/or lines (6) leaking	With (A) replace the lower oil pan gasket; replace both turbochargers; and/or the oil return line seals/return line cover seals	00 66 991 & 00 67 684	
	Rear oil leak (4), found valley dry (10) and a lower oil pan leak	With (A). replace the rear crankshaft and rear engine cover seals and lower oil pan gasket	00 66 991 & 00 67 685	1100901900
	Found Step (10) ok, found rear oil leak (4)	With (A) replace the rear crankshaft and rear engine cover seals	00 66 991 & 00 67 686	
	Found Step (4 and 10) ok, found lower oil pan leak	With (A) replace the lower oil pan gasket	00 66 991 & 00 67 687	

Retain copy of this checklist in the vehicle file. Provide copy to your booker/warranty admin for claim processing. Take a photo of these two pages (side by side) with pictures, submit for authorization to PuMA TeileClearing Hotline case - wait for a response. Weekend and holiday submissions must wait for a response on the following business day before starting any repairs.

1. Do not drain and measure the engine oil. Follow the applicable instructions to use the electronic oil level measurement.**Do not reprogram the vehicle.**

The engine oil must be measured using the electronic measurement test plan called "Motor Oil Quantity" found in ISTA/D 4.14.XX or higher.

Test Plan Path:

Select "Vehicle management"
Select "Powertrain"
Select "Engine electronics, quality control valve (MSV)"
Select "Engine oil"
Select "ABL Motor oil quantity"
Select "Display"

Follow the onscreen prompts. The test plan will measure the engine oil in 100 ml increments.

Top the engine oil accordingly and perform the test plan a second time (after topping) to ensure the proper full engine oil level is reached.

The vehicle must be driven by the customer roughly 750 to 1,000 miles or until the next low engine oil message appears (whichever comes first). After the customer returns the engine oil must be measured again using the electronic measurement test plan called "Motor Oil Quantity" found in ISTA/D 4.14.XX or higher (see test plan path above).

If the oil consumption is not greater than 1 liter per 750 miles then top the engine oil and return the vehicle to the customer.

OR

If the engine oil consumption is greater than 1 liter per 750 miles then proceed to step 2.

For additional information on oil consumption refer to B11 03 13.

2. Inspect or measure the following 5 items in order. Note the inspection results on the attached "B01_21_18_N63_Oil_Consumption_Checklist."

- Engine front cover
- Engine upper oil pan
- Lower bell housing
- Perform the timing chain test plan
- Perform a compression test.

All components or measurements that are found to be outside the specification need to be documented with pictures and submitted for authorization via a PuMA TeileClearing Hotline case at the end of this procedure.

Vehicles that require an oil consumption test, have passed the oil consumption test or do not require any repairs do not need authorization.

IMPORTANT!

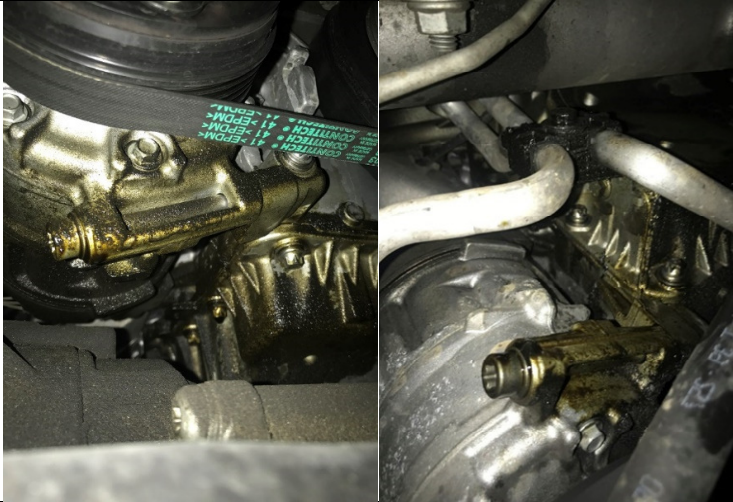
If the engine is leaking engine oil, the oil leak must be an active major engine oil leak, not seepage or wetness.

GENERAL NOTES REGARDING ENGINE OIL LEAKS:

“Oil Leaks” are being defined as clearly visible oil presence (like oil drops) at the engine components (e.g. area of oil pan, front cover, etc.), and in their vicinity. Also, a large visible oil stains (or oil accumulation) on the underbody panels are indication of oil leaks, causing a substantial oil capacity loss.

The black (dirt stained) “wetness” marks on the engine components, **DO NOT** qualify as oil leaks.

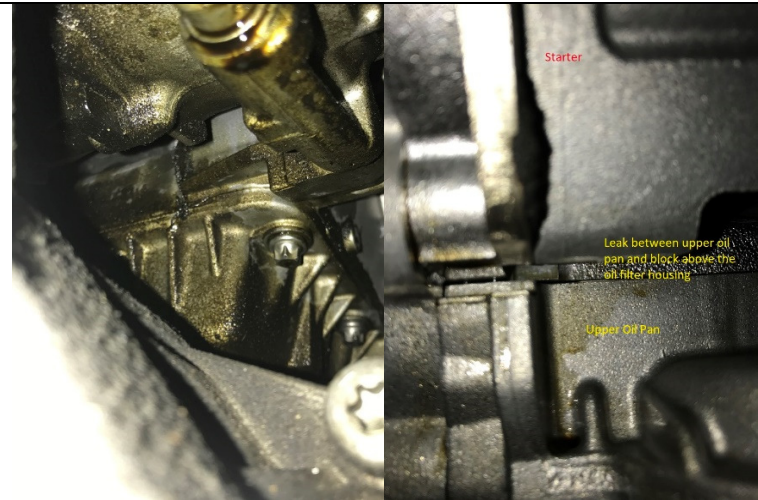
3. Inspect the front engine cover for engine oil leakage.

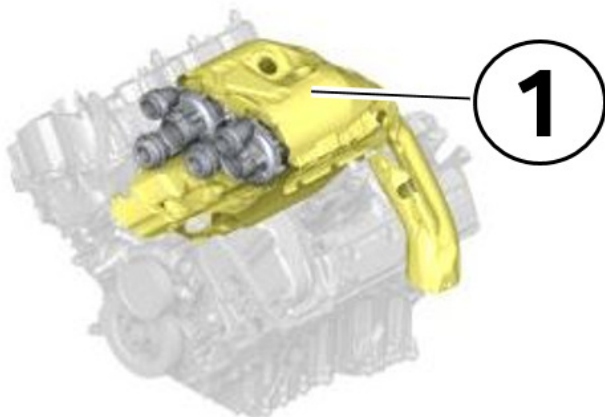
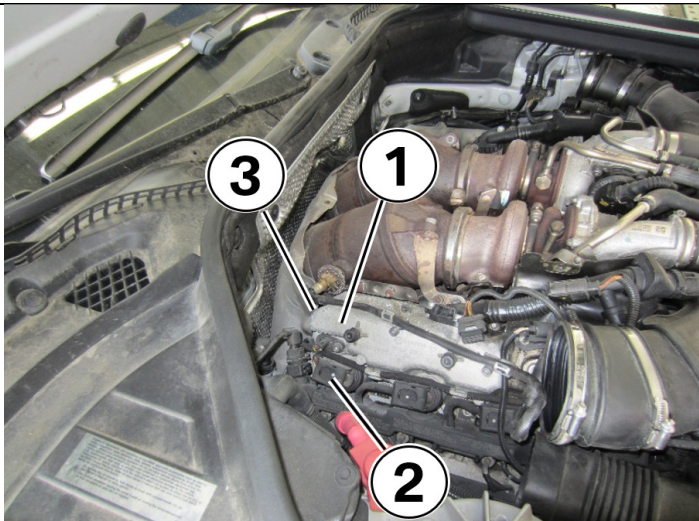
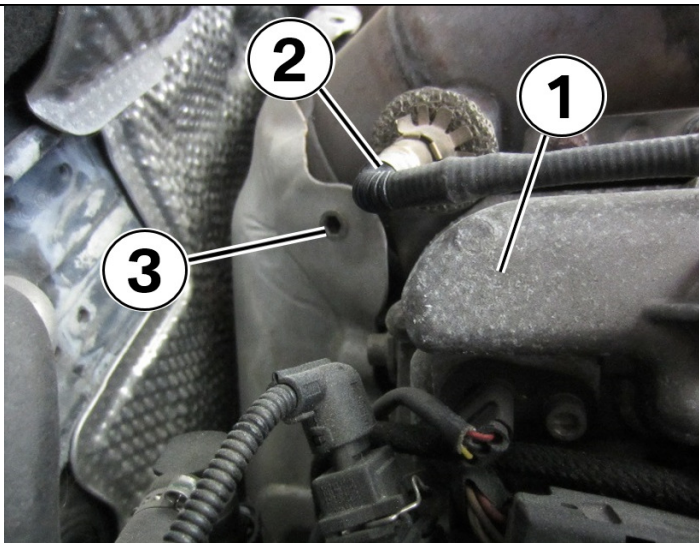


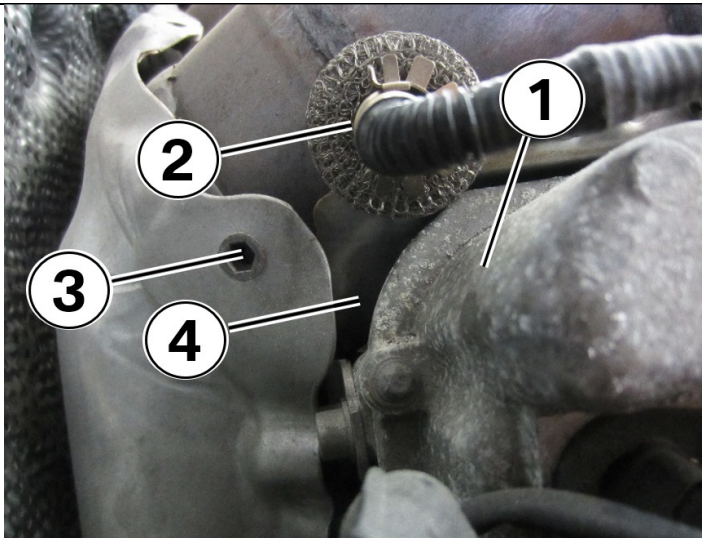
If the front timing cover is not leaking. Go to step 4.

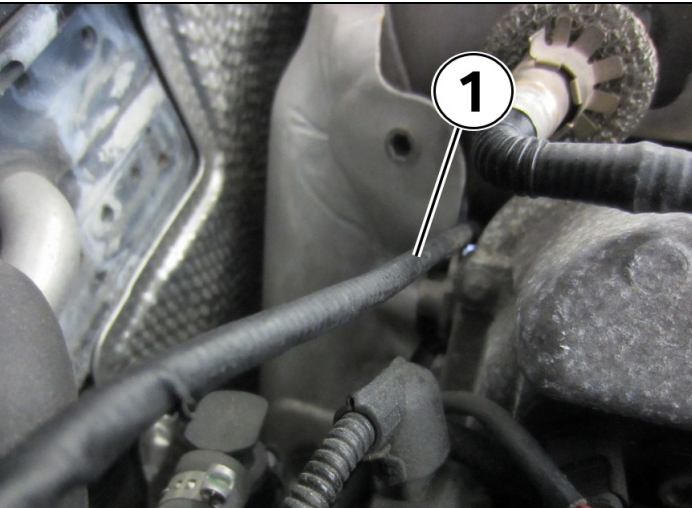
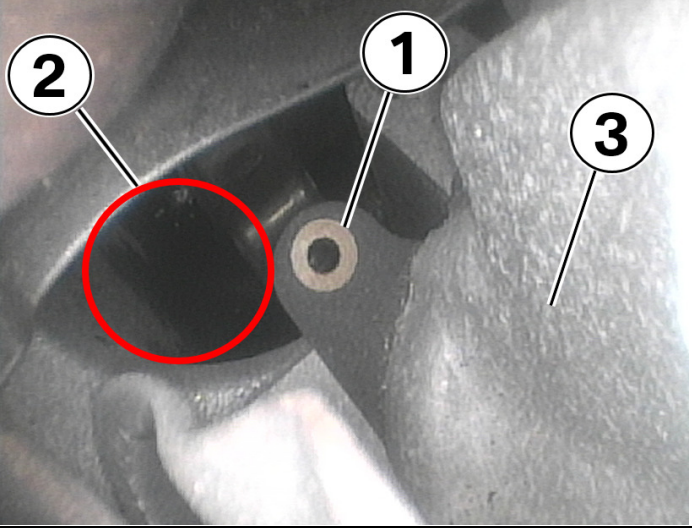
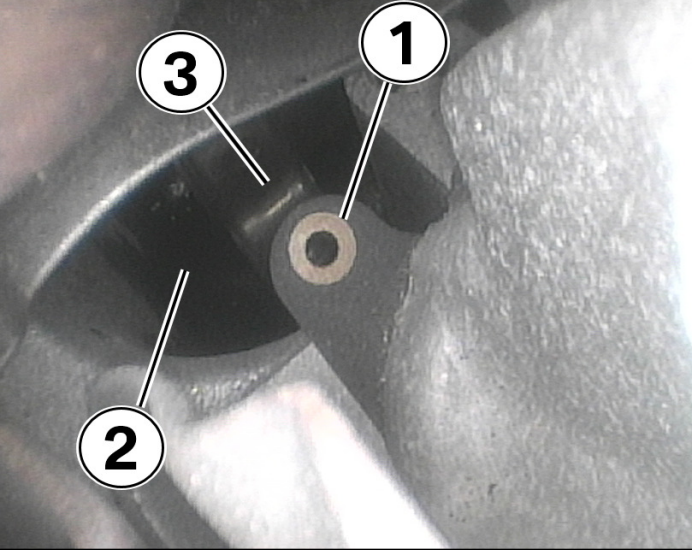
If the front timing cover is leaking. Go to step 6.

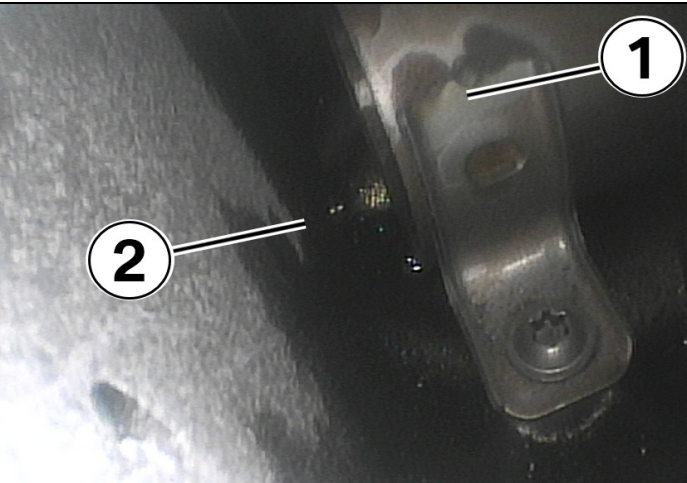
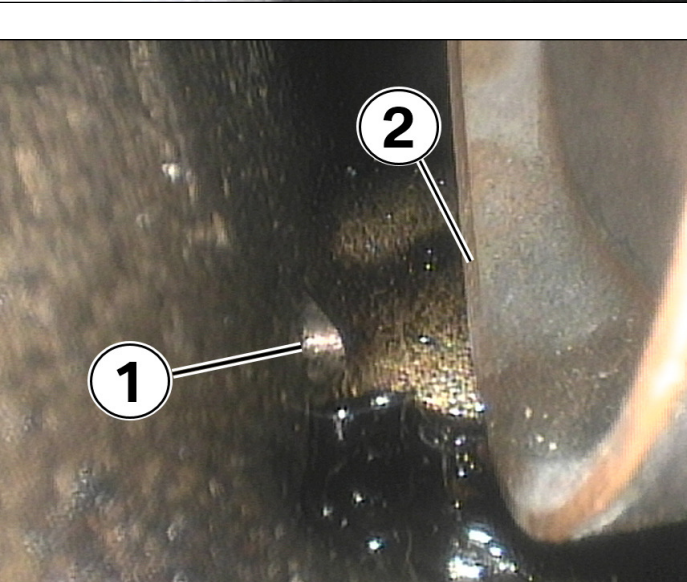
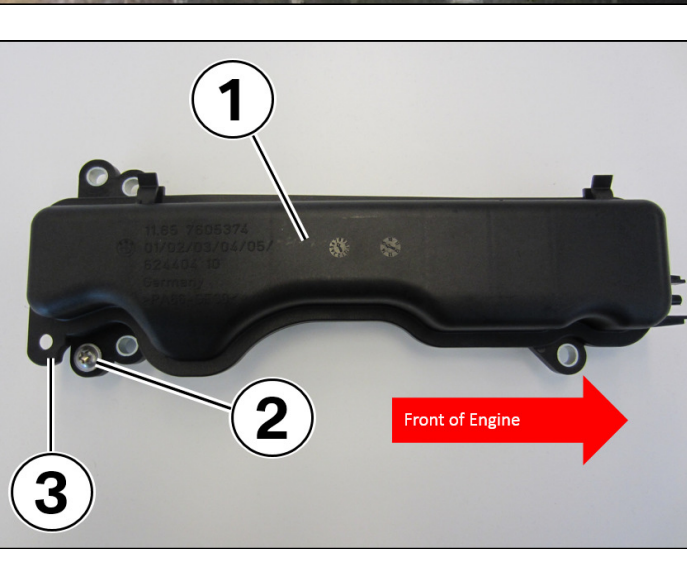
4. Inspect the upper engine oil pan for engine oil leakage.

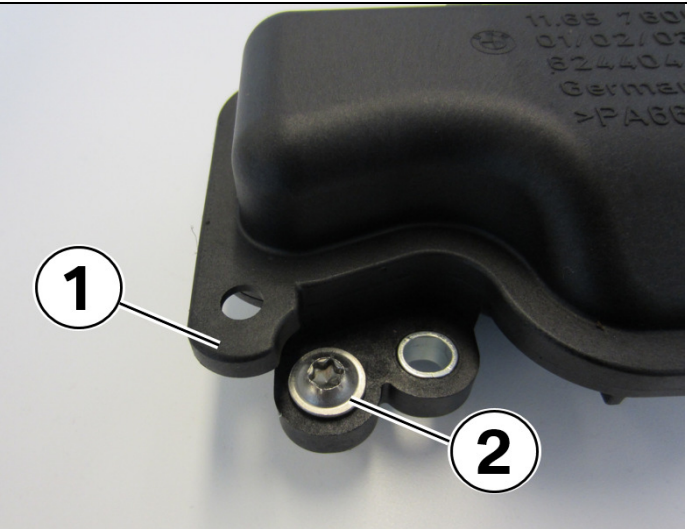
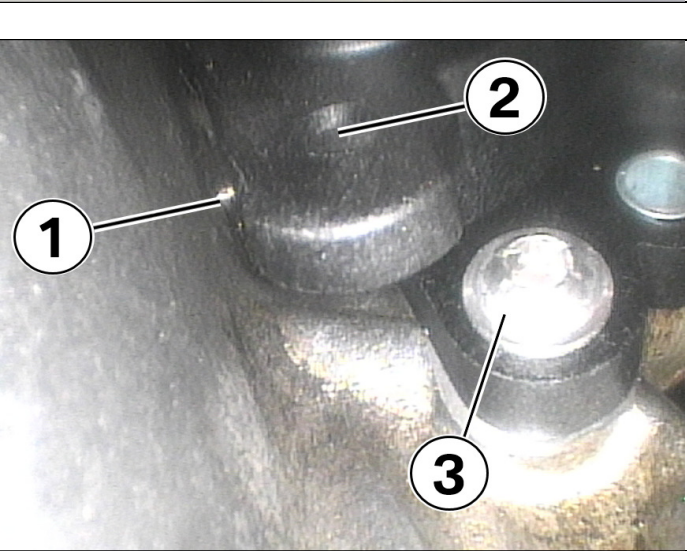
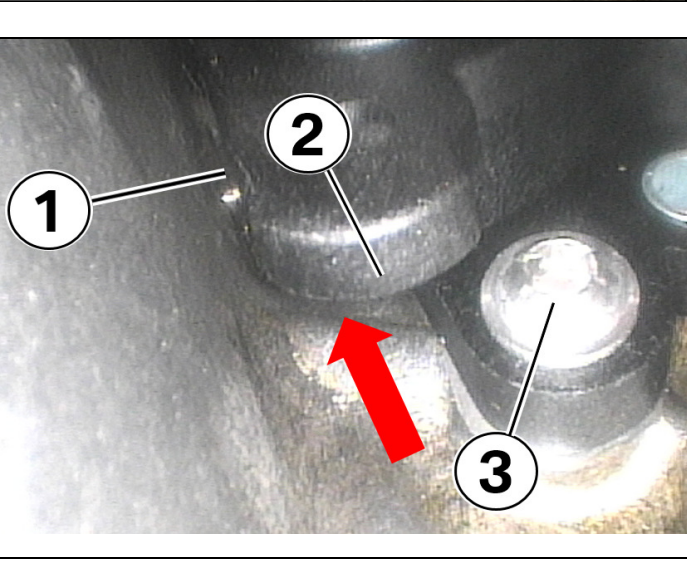
	If the upper engine oil pan is not leaking. Go to step 5. If the upper engine oil pan is leaking. Go to step 6.
5. Inspect the lower bell housing for engine oil leakage	
	The lower bell housing is not leaking. Go to step 7. The lower bell housing is leaking. Go to step 6.
6. Turbocharger oil line diagnosis.	

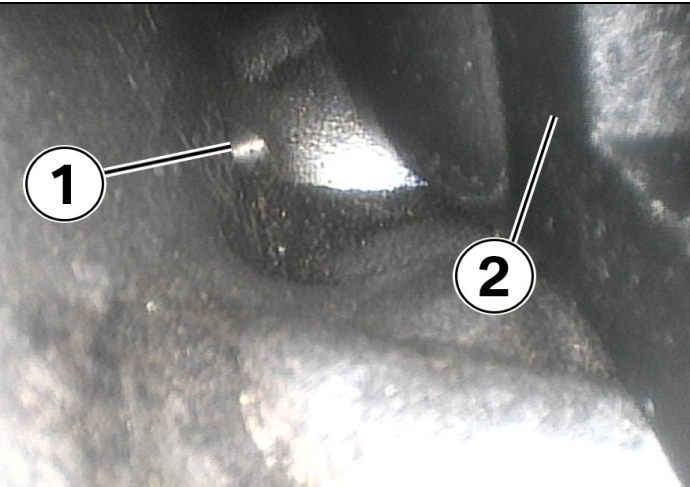
	Remove the heat shield (1) to diagnose the engine oil leak. Refer to Repair Instruction 11 65 180 Removing and installing/replacing heat shield at top.
	The illustration shows an overview of the components found on cylinder bank 1. Cylinder head cover (1) Cylinder # 4 (2) Inspection location (3)
	The illustration shows an overview of the components frond on cylinder bank 1. Cylinder head cover (1) Bank 1 post O2 sensor (2) Heat shield mounting hole (3)

 The image shows a Snap-on video scope with a red and black body and a black fiber optic cable. The scope has a screen displaying a live feed from the camera. The cable is coiled and has a connector at the end.	Preparing for the inspection: Bore scope specifications: The recommended diameter of the fiber optic cable (imager) should not be greater than 5.5 mm. The 8 mm fiber optic cable (imager) will work but it is very tight and damage may occur to the larger cable and imager. The recommended borescope and imager can be found at www.centersolutions.com or refer to SI B04 19 15 for more information about the BMW Equipment Program. Equipment Program Part Numbers: 107 - BK5000 - SNAP ON Video Scope 107- BK8000 – 5.5 mm Dual View Side Imager
 The image shows a close-up of an engine component, likely a cylinder head cover, with four numbered callouts: 1 points to the cylinder head cover, 2 points to the bank 1 post O2 sensor, 3 points to the heat shield mounting hole, and 4 points to the location where the bore scope should be inserted.	The illustration shows an overview of the components frond on cylinder bank 1. Cylinder head cover (1) Bank 1 post O2 sensor (2) Heat shield mounting hole (3) Insert bore scope here (4) on an angle downward.

	Approach angle of the bore scope (1) is approximately 45 degrees.
	After inserting the bore scope you must locate the cylinder head gasket tab. (1). The tab is approximately 135 mm straight down from original entry point. Cylinder head gasket tab (1) Gap in heat shields (2) Cylinder head (3)
	Feed the bore scope past the left side (1) of the cylinder head gasket tab (2) towards the vacuum reservoir (3).

	Continue to push the bore scope towards the vacuum reservoir (1). The engine valley drain hole is location is just to the left of the vacuum reservoir (2). Metal vacuum reservoir shown in photo. As the bore scope approaches the drain hole it will become more apparent.
	Inspect the surrounding area of the engine valley drain hole (1). Engine valley drain hole (1) Metal vacuum reservoir (2) shown. This is a clean picture. No oil can be seen in the oil drain hole (1). The dark material at the bottom of the photo is dust and dirt. This material appears to be reflective but it is dry
	It is possible that a black plastic vacuum reservoir (1) is installed. This illustration provides an overview of the entire component and specific points of the component. Reservoir (1) Reservoir mounting screw (2) Plastic vacuum reservoir tab (3)

	Plastic vacuum reservoir tab (1) Mounting screw (2)
	Diagnosis in the vehicle: It may be more difficult to position the bore scope but it will only take a few minutes more to make the diagnosis. Engine valley drain hole (1) Plastic vacuum reservoir tab (2) Reservoir mounting screw (3)
	Continue to push bore scope down ward towards the plastic vacuum reservoir tab (2). The bore scope needs to be moved towards the direction of the red arrow and under the tab (2) to have the best viewing angle of the engine valley drain hole (1). Engine valley drain hole (1) Plastic vacuum reservoir tab (2) Reservoir mounting screw (3)

	Once the bore scope has gone under the plastic reservoir tab then the engine valley drain hole (1) and surrounding area can be clearly inspected. The dark material at the bottom of the photo is dust and dirt. This material appears to be reflective but it is dry. Engine valley drain hole (1) Plastic vacuum reservoir (2)
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If engine oil is found in the valley area, then the root cause of the engine oil leak resides in the components on top of the engine i.e. turbocharger oil line cover, turbo charger, etc. Further basic diagnosis will be needed to find the root cause this engine oil leak. Do not remove the transmission from the vehicle. Go to Step 7.

If NO engine oil residue is found at the engine valley drain hole, but an original visual inspection indicated leak in the bell housing area, the root cause of the engine leak resides in the rear main seal and rear engine cover. Do not remove transmission from the vehicle. Go to step 7.

If NO engine oil residue is found at the engine valley drain hole, then the root cause of the engine oil leak will be related to the original visual inspection of front cover, or oil pan. Go to step 12.

Using the borescope, provide a picture of the engine valley drain hole regardless if oil is present or not.

7. Perform the timing chain test plan.

All Models: Timing Chains Test Plan path:

1. Select "Vehicle management"
2. Select "Troubleshooting"
3. Select "Function structure"
4. Select "Powertrain"
5. Select "Engine electronics, quality control valve (MSV)"
6. Select "Valve gear"
7. Select "Start search"
8. From the list of available test plans, select "VANOS solenoid valve, exhaust" or "Exhaust Camshaft Sensor"

9. Select "Continue"
10. Select "VANOS Solenoid Valve"
11. Select "Display"
12. Select "Continue test module" and "Next"
13. Select "Timing chain test" and follow the steps to complete the test plan.
14. If the test plan asks "Solenoid valves ok?" Select "Yes".
15. Follow the test plan steps to check the timing chain.
16. Test plan will conclude with the statement "Timing chain is OK" or "Timing chain is not OK".

If the test plan results indicate the timing chains are not stretched ("OK"), then go to step 8.

Or

If the test plan results indicate the timing chains are stretched ("not OK"), then go to step 12.

8. Perform the compression test.

Test Plan Path:

1. Select "Vehicle management"
2. Select "Service functions"
3. Select "Powertrain"
4. Select "Engine Electronics quality control (MSV)"
5. Select "Compression test"
6. The compression test plan and the compression test repair instructions will be shown on the screen.
Review the compression test repair instruction to become more familiar with the tools and the procedure before starting the compression test plan.
7. Select "ABL Compression test"
8. Follow the test plan steps to complete the compression tests.

For reference the compression test procedure instructions can also be found in Repair Instruction 11 00 039 "Checking compression of all cylinders"

The compression test should be performed after the engine has reached operating temperature. When performing the test count the rotations of the engine crankshaft and apply the same rotations to each cylinder compression test. The industry standard is 4 rotations per cylinder.

When comparing the values of all cylinders the compression results should not vary by more than 2.5 bar or 36.25 psi. If the difference is greater than 2.5 bar or 36.25 psi then proceed to step 11.

The test plan will record the measurements but you will have to determine if they are within specification or not.

If the BMW special tools are not available at the dealer then a manual gauge procedure can be substituted, record all values in the oil consumption checklist. Use the limit values listed above to determine if the values are within specification.

If the engine passes the compression test then proceed to step 9.

9. Inspect the turbochargers for engine oil leakage.	
	The turbocharger is OK. No engine oil can be seen around the turbocharger impeller.
	The turbocharger is OK. No engine oil can be seen around the turbocharger impeller.
	The turbocharger is not OK. The turbocharger impeller seals are leaking engine oil.



The turbocharger is not OK.

The turbocharger impeller seals are leaking engine oil.

If the turbocharger inspection is "OK", then go to step 10.

Or

If the turbocharger inspection is "NOT OK", then replace the turbochargers in conjunction with the recommendations in step 10. Go to step 10.



10. Replace the intake and exhaust valve seals using the N63 Valve Seal Replacement Tool Kit P/N 83 30 2 408 268 as per SI B11 08 15 or Repair Instruction 11 34 570 "Replace all valve stem seals using special tool 83 30 2 408 268 (N63)".

Refer to SI [B04 15 15](#) for additional ordering information.

NOTE:

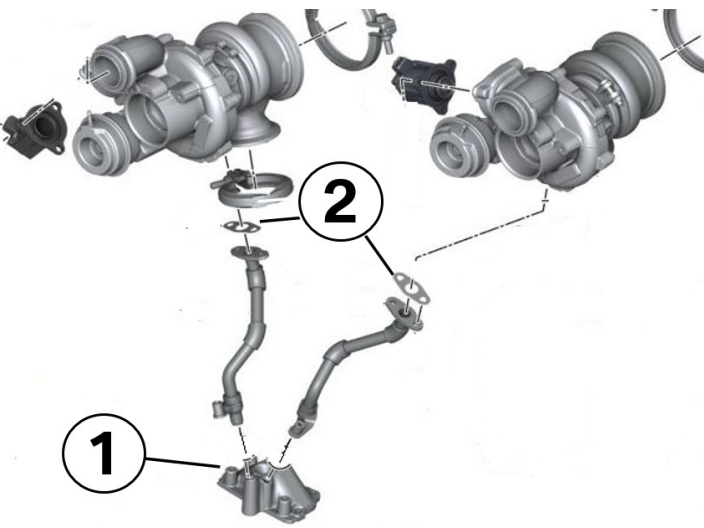
Prior to proceeding with VANOS units removal, and after removing the valve covers, make sure that the timing chain guides are intact (not broken).

Specifically, turn the engine manually 2-3 times over, while listening for any unusual noises coming from the timing chains area.

Using boroscope, run the probe down the chains on both banks, to inspect for possible guides breakage/cracks.

If any chains guides damage is found, supplement your PuMA TC case with additional information and pictures, and wait for response before proceeding further.

Replace the cylinder head cover oil separators as per Repair Instruction 11 15 140 "Replace oil separator"

	If the turbocharger inspection is “not OK” then replace the turbochargers. Refer to repair instruction 11 65 025 “Removing and installing exhaust turbocharger, cylinders 1-4” and Repair Instruction 11 65 030 “Removing and installing exhaust turbocharger, cylinders 5-8” Do not replace the turbo chargers if they are not leaking. If engine oil is found under the turbos using a borescope then the oil return line cover (1) or the oil return line gaskets (2) are leaking engine oil. (1) The oil return cover comes with all 3 O-rings. Use P/N 11 42 7 935 572. (2) Gasket asbestos free. Use P/N 11 42 8 624 158. If the bell housing area shows a major oil leak, but engine valley area is dry (no oil puddle present), then also replace the rear main oil seal (find the correct PN in the ETK), with the rear engine cover (PN 11 14 2 446 298). Follow repair instructions found in SI B11 09 16.
11. Complete the “B01_21_18_N63_Oil_Consumption_Checklist” All components or measurements that are found to be outside the specification need to be documented with pictures and submitted for authorization via a PuMA TeileClearing Hotline case and wait for a response. Weekend and holiday submissions must wait for a response on the following business day before starting any repairs. Vehicles that require an oil consumption test, have passed the oil consumption test or do not require any repairs do not need authorization.	
12. Only continue if one of the 5 inspections above have failed in steps 3 – 8 and there is no engine oil found under the turbo chargers using the borescope. Inspect the turbochargers for engine oil leakage.	

	The turbocharger is OK. No engine oil can be seen around the turbocharger impeller.
	The turbocharger is OK. No engine oil can be seen around the turbocharger impeller.
	The turbocharger is not OK. The turbocharger impeller seals are leaking engine oil.



The turbocharger is not OK.

The turbocharger impeller seals are leaking engine oil.

If the turbocharger inspection is "OK", then go to step 13.

Or,

If the turbocharger inspection is "NOT OK", then replace the turbochargers in conjunction with the recommendations in step 12. Go to step 13.

13. Replace the engine.

If the turbocharger inspection is "not OK" then replace the turbochargers. Refer to repair instruction 11 65 025 "Removing and installing exhaust turbocharger, cylinders 1-4" and Repair Instruction 11 65 030 "Removing and installing exhaust turbocharger, cylinders 5-8"

Do not replace the turbo chargers if they are not leaking.

Complete the "B01_21_18_N63_Oil_Consumption_Checklist"

All components or measurements that are found to be outside the specification need to be documented with pictures and submitted for authorization via a PuMA TeileClearing Hotline case and wait for a response. Weekend and holiday submissions must wait for a response on the following business day before starting any repairs.

Vehicles that require an oil consumption test, have passed the oil consumption test or do not require any repairs do not need authorization.

Engine Repairs and Replacements:

Replacement engine assemblies are **NOT pre-filled** with engine oil.

After replacing an engine with a new or remanufactured engine assembly, the engine oil level must be verified as outlined in the procedure below first, before starting the engine for the first time.

If the replacement engine is started to determine electronically if the engine is filled with the appropriate amount of engine oil, damage to the replacement engine can occur immediately.

The engine may have some residual engine oil from assembly, but this is **not enough** engine oil to properly lubricate the engine to measure the engine oil level electronically when it is started for the first time.

Further, the electronic engine oil measurement is only operational when the engine is running at its full operating temperature. Checking the engine oil without the engine running at operating temperature will lead to an incorrect or incomplete measurement.

After replacing the engine or making engine repairs that require the replacement or removal of the engine bearings, VANOS gears, camshafts, bed plate resealing, engine oil pump, engine oil filter housing, cylinder head, engine oil cooler or anything that interrupts the engine oil supply circuit of the engine requires a short oil pump and oil supply circuit priming procedure.

Refer to SI B11 09 15 for the detailed bleeding procedure.

After engine repair or replacement, pay attention to a proper installation of all engine ground connections.

In particular, follow the recommendations from SI B12 24 14 (N63: Proper Ignition Harness Installation and Ground Connections) for the ignition harness grounding. Any consequential damage to DME, alternator, or QLT sensor resulted from a loose ground (causing BSD communication faults), is not covered under N63 Class Settlement.

1. Start the vehicle and allow it to reach operating temperature, approximately 15 minutes or less.



2. Quickly push-and-release the accelerator pedal from idle position to between 2,000 and 3,000 RPM, then immediately allow the engine to return to idle and observe the exhaust tail pipes for smoke.

If smoke is present continue to step 3.

If smoke is **NOT** present then refer to the "N63 Oil Consumption Instructions" attached to SI B01 21 18.

IMPORTANT!

- **If the vehicle is smoking from the exhaust then a clear picture of the smoke must be submitted with the PuMA TeileClearing Hotline case.**

3. Inspect or measure the following 5 items in order. Note the inspection results on the attached "N63 Smoke Checklist."

- Engine front cover
- Engine upper oil pan
- Lower bell housing/cylinder heads valley area
- Perform the timing chain test plan
- Perform a compression test

IMPORTANT!

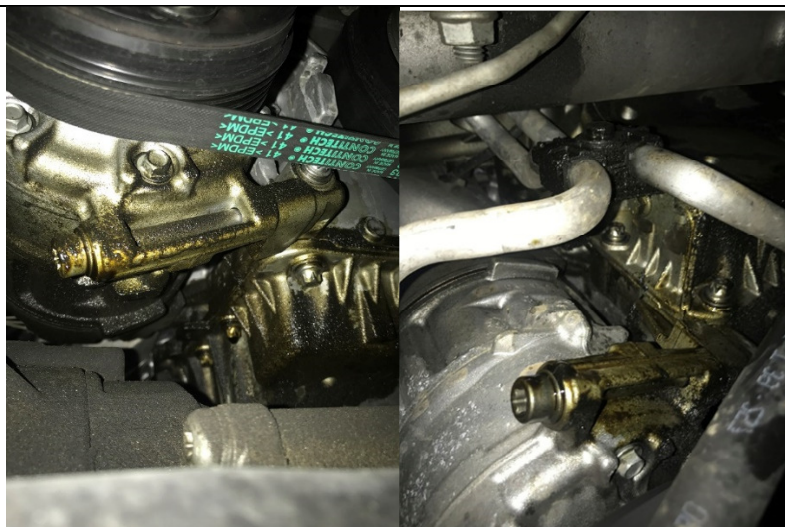
- **If the engine is leaking engine oil, the oil leak must be an active major engine oil leak, not seepage or wetness.**

All components or measurements that are found to be outside the specification need to be documented with pictures and submitted for authorization via a PuMA TeileClearing Hotline case at the end of this procedure.

Vehicles that are not smoking or do not require any repairs do not need authorization.

“Oil Leaks” are being defined as clearly visible oil presence (like oil drops) at the engine components (e.g. area of oil pan, front cover, etc.), and in their vicinity. Also, large visible oil stains (or oil accumulation) on the underbody panels are indication of oil leaks, causing a substantial oil capacity loss.

4. Inspect the front engine cover for engine oil leakage.



Front cover is leaking. Go to step 7.

Two close-up photographs of the engine oil filter housing area. The left photo shows the internal components, including the oil filter housing and the upper oil pan. The right photo shows the starter motor and the upper oil pan.

The upper engine oil pan is leaking.
Go to step 7.

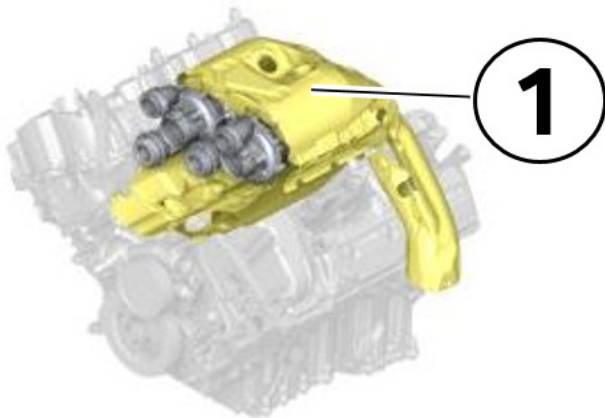
6. Inspect the lower bell housing for engine oil leakage



The lower bell housing is **not** leaking. Go to step 8.

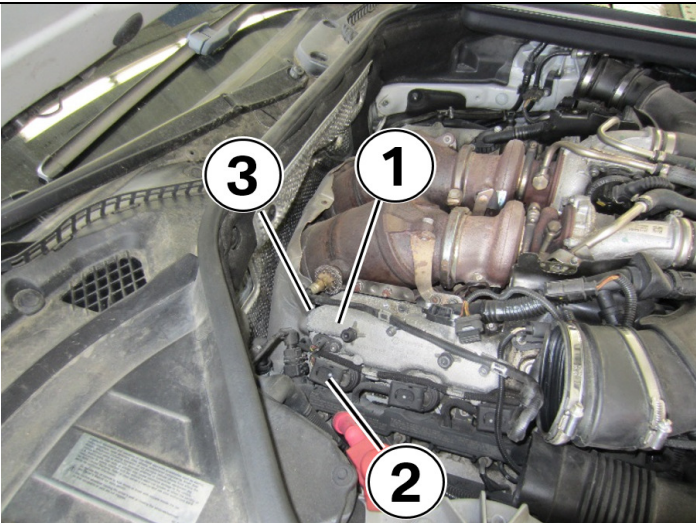
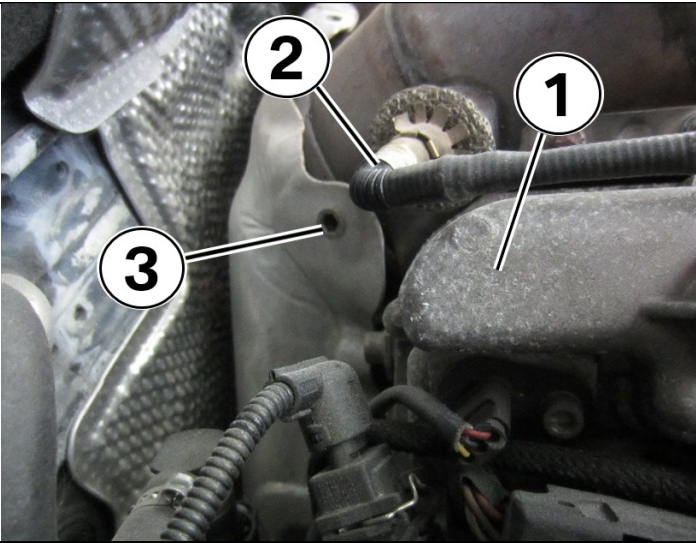
The lower bell housing is leaking. Go to step 7.

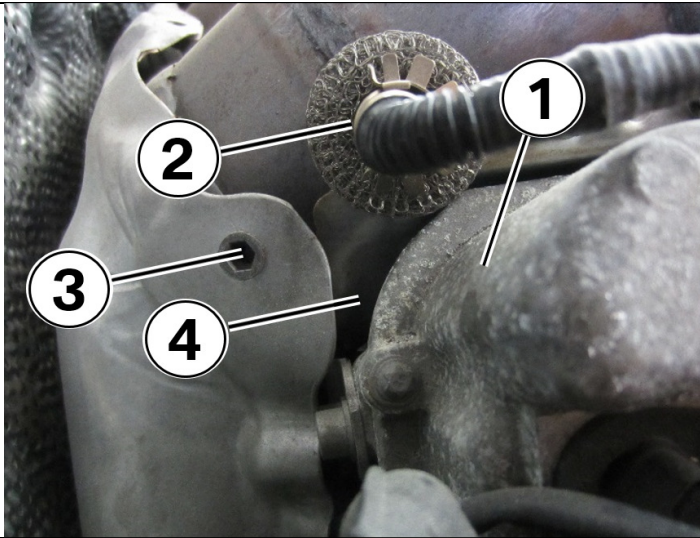
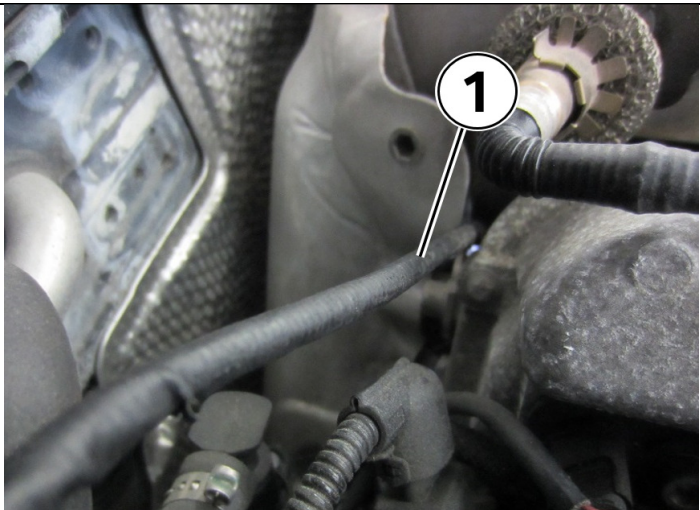
7. Turbocharger oil line diagnosis.

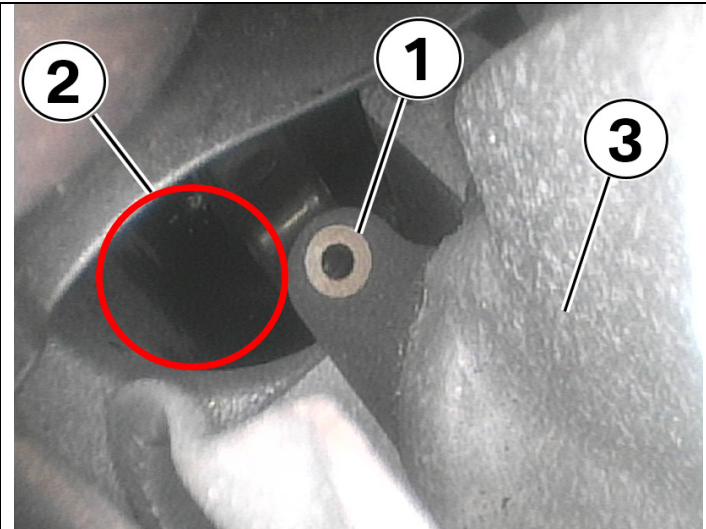
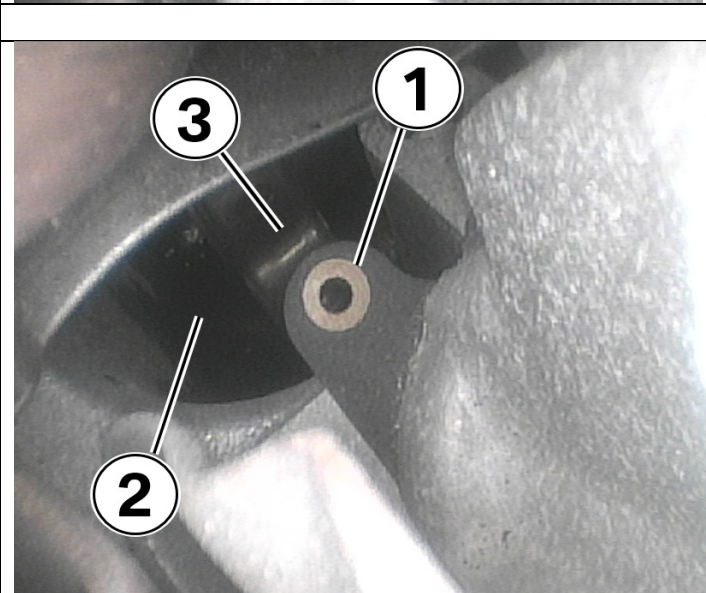
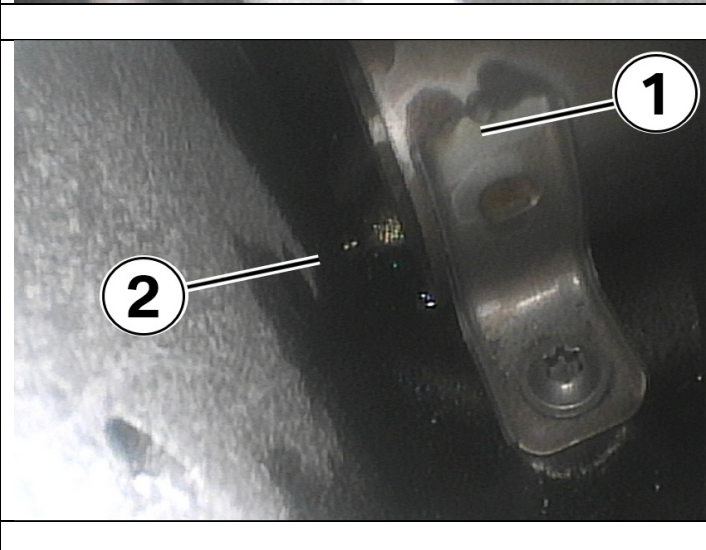


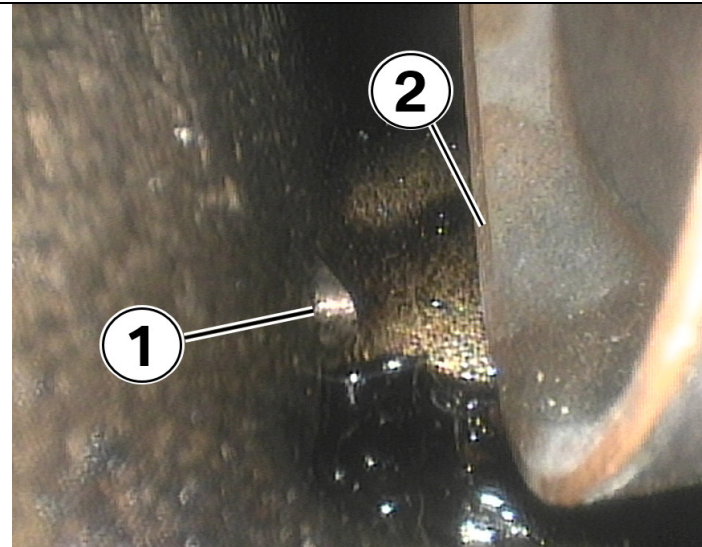
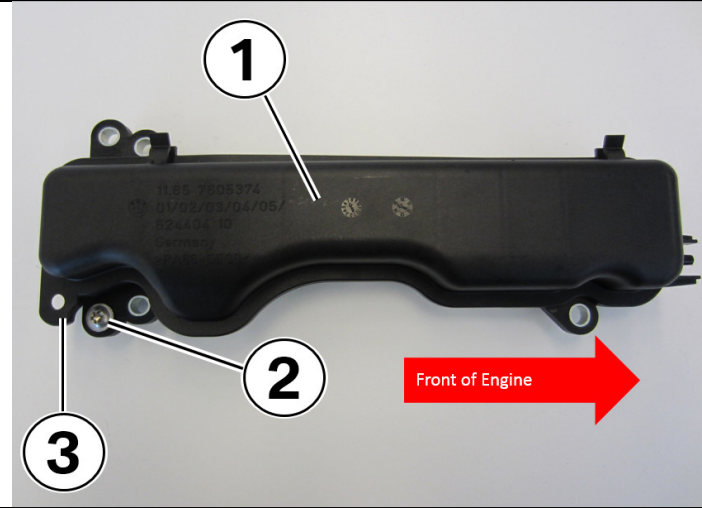
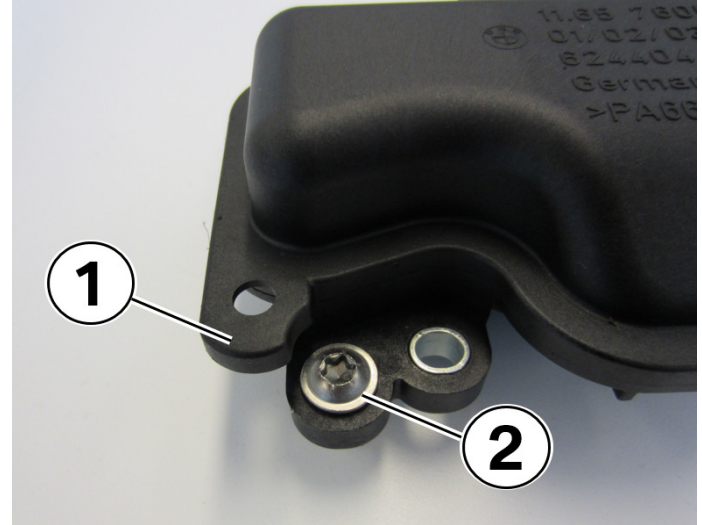
Remove the heat shield (1) to diagnose the engine oil leak.

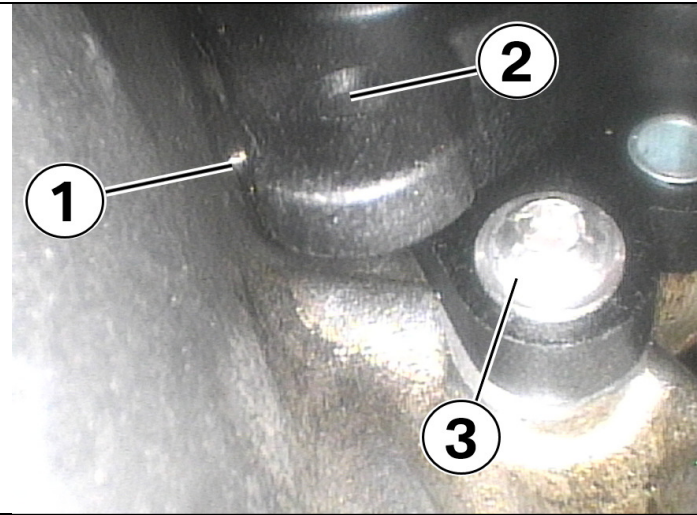
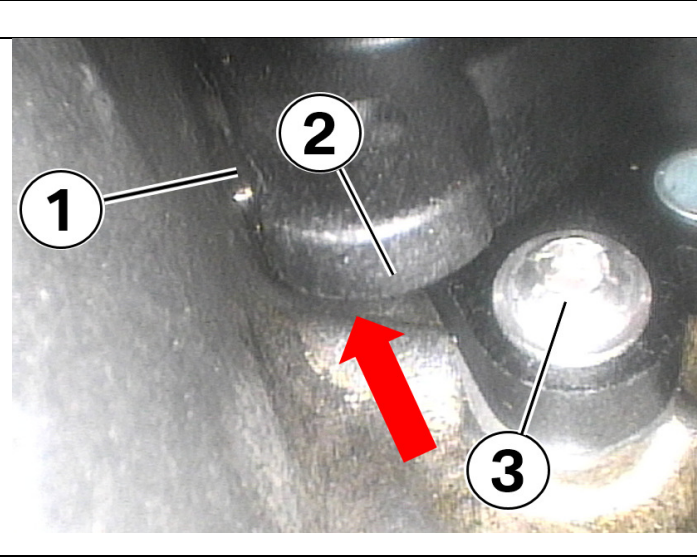
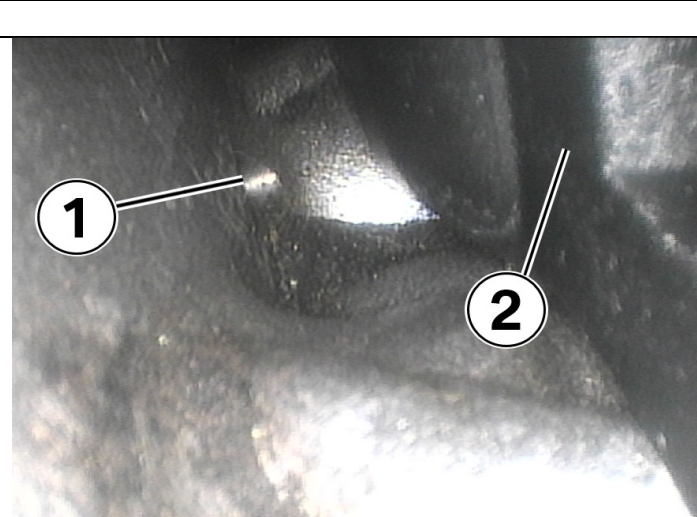
Refer to Repair Instruction 11 65 180 Removing and installing/replacing heat shield at top.

 This photograph shows the engine compartment of a vehicle. Callout 1 points to the cylinder head cover, callout 2 points to cylinder #4, and callout 3 points to the inspection location on the left side of the engine bay.	The illustration shows an overview of the components found on cylinder bank 1. Cylinder head cover (1) Cylinder # 4 (2) Inspection location (3)
 This close-up photograph shows the area around the cylinder head cover. Callout 1 points to the cylinder head cover, callout 2 points to the Bank 1 post O2 sensor, and callout 3 points to a heat shield mounting hole.	The illustration shows an overview of the components frond on cylinder bank 1. Cylinder head cover (1) Bank 1 post O2 sensor (2) Heat shield mounting hole (3)
 A Snap-on bore scope imager is shown, consisting of a red and black handheld unit with a screen displaying a live video feed of the engine's interior. A long, flexible black cable is attached to the unit.	Preparing for the inspection: Bore scope specifications: The recommended diameter of the fiber optic cable (imager) should not be greater than 5.5 mm. The 8 mm fiber optic cable (imager) will work but it is very tight and damage may occur to the larger cable and imager. The recommended borescope and imager can be found at www.centersolutions.com or refer to SI B04 19 15 for more information about the BMW Equipment Program. Equipment Program Part Numbers:

	107 - BK5000 - SNAP ON Video Scope 107- BK8000 – 5.5 mm Dual View Side Imager
	The illustration shows an overview of the components frond on cylinder bank 1. Cylinder head cover (1) Bank 1 post O2 sensor (2) Heat shield mounting hole (3) Insert bore scope here (4) on an angle downward.
	Approach angle of the bore scope (1) is approximately 45 degrees.

	After inserting the bore scope you must locate the cylinder head gasket tab. (1). The tab is approximately 135 mm straight down from original entry point. Cylinder head gasket tab (1) Gap in heat shields (2) Cylinder head (3)
	Feed the bore scope past the left side (1) of the cylinder head gasket tab (2) towards the vacuum reservoir (3).
	Continue to push the bore scope towards the vacuum reservoir (1). The engine valley drain hole location is just to the left of the vacuum reservoir (2). Metal vacuum reservoir shown in photo. As the bore scope approaches the drain hole it will become more apparent.

	Inspect the surrounding area of the engine valley drain hole (1). Engine valley drain hole (1) Metal vacuum reservoir (2) shown. This is a clean picture. No oil can be seen in the oil drain hole (1). The dark material at the bottom of the photo is dust and dirt. This material appears to be reflective but it is dry
	It is possible that a black plastic vacuum reservoir (1) is installed. This illustration provides an overview of the entire component and specific points of the component. Reservoir (1) Reservoir mounting screw (2) Plastic vacuum reservoir tab (3)
	Plastic vacuum reservoir tab (1) Mounting screw (2)

	Diagnosis in the vehicle: It may be more difficult to position the bore scope but it will only take a few minutes more to make the diagnosis. Engine valley drain hole (1) Plastic vacuum reservoir tab (2) Reservoir mounting screw (3)
	Continue to push bore scope down ward towards the plastic vacuum reservoir tab (2). The bore scope needs to be moved towards the direction of the red arrow and under the tab (2) to have the best viewing angle of the engine valley drain hole (1). Engine valley drain hole (1) Plastic vacuum reservoir tab (2) Reservoir mounting screw (3)
	Once the bore scope has gone under the plastic reservoir tab then the engine valley drain hole (1) and surrounding area can be clearly inspected. The dark material at the bottom of the photo is dust and dirt. This material appears to be reflective but it is dry. Engine valley drain hole (1) Plastic vacuum reservoir (2)

If engine oil is found in the valley area, then the root cause of the engine oil leak resides in the components on top of the engine i.e. turbocharger oil lines cover, turbo charger, etc. Further basic diagnosis will be needed to find the root cause this engine oil leak. Do not remove the transmission from the vehicle. Go to Step 8.

If NO engine oil residue is found at the engine valley drain hole, but an original visual inspection indicated leak in the bell housing area, the root cause of the engine leak resides in the rear main seal and rear engine cover. Do not remove transmission from the vehicle. Go to step 8.

If NO engine oil residue is found at the engine valley drain hole, then the root cause of the engine oil leak will be related to the original visual inspection of front cover, or oil pan. Go to step 12.

Using the borescope, provide a picture of the engine valley drain hole regardless if oil is present or not.

8. Perform the timing chain test plan.

All Models: Timing Chains Test Plan path:

1. Select "Vehicle management"
2. Select "Troubleshooting"
3. Select "Function structure"
4. Select "Powertrain"
5. Select "Engine electronics, quality control valve (MSV)"
6. Select "Valve gear"
7. Select "Start Search"
8. From the list of available test plans, select "VANOS solenoid valve, exhaust" or "Exhaust Camshaft Sensor"
9. Select "Continue"
10. Select "VANOS Solenoid Valve"
11. Select "Display"
12. Select "Continue test module" and "Next"
13. Select "Timing chain test" and follow the steps to complete the test plan.
14. If the test plan asks "Solenoid valves ok?" Select "Yes".
15. Follow the test plan steps to check the timing chain.
16. Test plan will conclude with the statement "Timing chain is OK" or "Timing chain is not OK".

If the test plan results indicate the timing chains are not stretched ("OK"), then go to step 9.

Or

If the test plan results indicate the timing chains are stretched ("not OK"), then go to step 14.

9. Perform the compression test.

Test Plan path:

1. Select "Vehicle management"
2. Select "Service functions"
3. Select "Powertrain"
4. Select "Engine Electronics quality control (MSV)"
5. Select "Compression test"
6. The compression test plan and the compression test repair instructions will be shown on the screen. Review the compression test repair instruction to become more familiar with the tools and the procedure before starting the compression test plan.
7. Select "ABL Compression test"
8. Follow the test plan steps to complete the compression tests.

For reference the compression test procedure instructions can also be found in Repair Instruction 11 00 039 "Checking compression of all cylinders"

For the compression test procedure instructions refer to Repair Instruction 11 00 039 "Checking compression of all cylinders"

The compression test should be performed after the engine has reached operating temperature. When performing the test count the rotations of the engine crankshaft and apply the same rotations to each cylinder compression test. The industry standard is 4 rotations per cylinder.

When comparing the values of all cylinders the compression results should not vary by more than 2.5 bar or 36.25 psi. If the difference is greater than 2.5 bar or 36.25 psi then proceed to step 14.

The test plan will record the measurements but you will have to determine if they are within specification or not.

If the BMW special tools are not available at the dealer then a manual gauge procedure can be substituted, record all values in the oil consumption checklist. Use the limit values listed above to determine if the values are within specification.

If the engine passes the compression test then proceed to step 10.

10. Inspect the turbochargers for engine oil leakage.



The turbocharger is OK.

No engine oil can be seen around the turbocharger impeller.



The turbocharger is OK.

No engine oil can be seen around the turbocharger impeller.



The turbocharger is not OK.

The turbocharger impeller seals are leaking engine oil.



The turbocharger is not OK.

The turbocharger impeller seals are leaking engine oil.

If the turbocharger inspection is "OK", then go to step 11.

Or

If the turbocharger inspection is "NOT OK", then replace the turbochargers in conjunction with the recommendations in step 11. Go to step 11.



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11. Replace the intake and exhaust valve seals using the N63 Valve Seal Replacement Tool Kit P/N 83 30 2 408 268 as per SI B11 08 15 or Repair Instruction 11 34 570 "Replace all valve stem seals using special tool 83 30 2 408 268 (N63)".

Refer to SI [B04 15 15](#) for additional ordering information.

NOTE:

Prior to proceeding with VANOS units removal, and after removing the valve covers, make sure that the timing chain guides are intact (not broken). Specifically, turn the engine manually 2-3 times over, while listening for any unusual noises coming from the timing chains area.

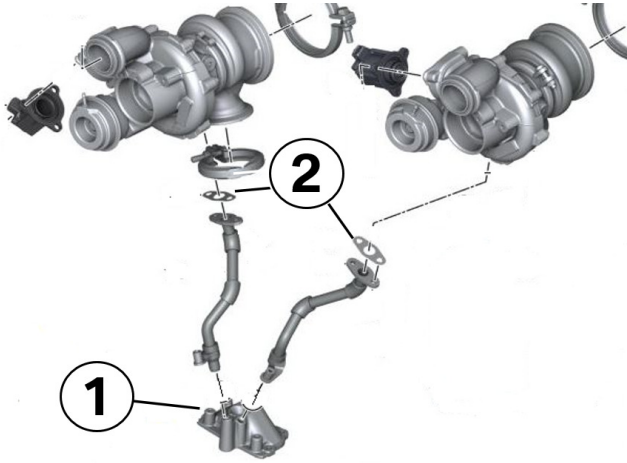
Using boroscope, run the probe down the chains on both banks, to inspect for possible guides breakage/cracks.

If any chains guides damage is found, supplement your PuMA TC case with additional information and pictures, and wait for response before proceeding further.

Replace the cylinder head cover oil separators as per Repair Instruction 11 15 140 " Replace oil separator"

If the turbocharger inspection is "not OK" then replace the turbochargers. Refer to repair instruction 11 65 025 "Removing and installing exhaust turbocharger, cylinders 1-4" and Repair Instruction 11 65 030 "Removing and installing exhaust turbocharger, cylinders 5-8"

Do not replace the turbo chargers if they are not leaking.



If engine oil is found under the turbos using a borescope then the oil return line cover (1) or the oil return line gaskets (2) are leaking engine oil.

(1) The oil return cover comes with all 3 O-rings. Use P/N 11 42 7 935 572.

Gasket asbestos free. Use P/N 11 42 8 624 158.

If the bell housing area shows a major oil leak, but engine valley area is dry (no oil puddle present), then also replace the rear main oil seal (find the correct PN in the ETK), with the rear engine cover (PN 11 14 2 446 298). Follow repair instructions from SI B11 09 16.

12. Complete the "B01_21_18_N63_Smoke_Checklist".

All components or measurements that are found to be outside the specification need to be documented with pictures and submitted for authorization via a PuMA TeileClearing Hotline case and wait for a response. Weekend and holiday submissions must wait for a response on the following business day before starting any repairs.

Vehicles that are not smoking or do not require any repairs do not need authorization.

13. Only continue if one of the 5 inspections above have failed in steps 3 – 8 and there is no engine oil found under the turbo chargers using the borescope.

Inspect the turbochargers for engine oil leakage.



The turbocharger is OK.

No engine oil can be seen around the turbocharger impeller.



The turbocharger is OK.

No engine oil can be seen around the turbocharger impeller.



The turbocharger is not OK.

The turbocharger impeller seals are leaking engine oil.



The turbocharger is not OK.

The turbocharger impeller seals are leaking engine oil.

If the turbocharger inspection is "OK", then go to step 14.

Or

If the turbocharger inspection is "NOT OK", then replace the turbochargers in conjunction with the recommendations in step 14. Go to step 14.

14. Replace the engine.

If the turbocharger inspection is "not OK" then replace the turbochargers. Refer to repair instruction 11 65 025 "Removing and installing exhaust turbocharger, cylinders 1-4" and Repair Instruction 11 65 030 "Removing and installing exhaust turbocharger, cylinders 5-8"

Do not replace the turbo chargers if they are not leaking.

Complete the "B01_21_18_N63_Smoke_Checklist"

All components or measurements that are found to be outside the specification need to be documented with pictures and submitted for authorization via a PuMA TeileClearing Hotline case and wait for a response. Weekend and holiday submissions must wait for a response on the following business day before starting any repairs.

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Engine Repairs and Replacements:

Replacement engine assemblies are **NOT pre-filled** with engine oil.

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If the replacement engine is started to determine electronically if the engine is filled with the appropriate amount of engine oil, damage to the replacement engine can occur immediately.

The engine may have some residual engine oil from assembly, but this is **not enough** engine oil to properly lubricate the engine to measure the engine oil level electronically when it is started for the first time.

Further, the electronic engine oil measurement is only operational when the engine is running at its full operating temperature. Checking the engine oil without the engine running at operating temperature will lead to an incorrect or incomplete measurement. After replacing the engine or making engine repairs that require the replacement or removal of the engine bearings, VANOS gears, camshafts, bed plate resealing, engine oil pump, engine oil filter housing, cylinder head, engine oil cooler or anything that interrupts the engine oil supply circuit of the engine requires a short oil pump and oil supply circuit priming procedure.

Refer to SI B11 09 15 for the detailed bleeding procedure.

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