



SIB 11 02 20

2022-09-22

## ENGINE REPLACEMENT AND ENGINE REPAIRS

This Service Information Bulletin (Revision 4) replaces SI B11 02 20 **dated June 2021**.

### What's New (Specific text highlighted):

- Diagnostic steps changed
- Bleeding procedure steps changed
- Claim Information changed

## MODEL

## INFORMATION

New and remanufactured 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 new or remanufactured 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.

Furthermore, 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 following components, you must perform a short oil pump and oil supply circuit priming procedure. Refer to the appropriate section below.

- Engine bearings
- VANOS gears
- Camshafts
- Bed plate resealing
- Engine oil pump
- Engine oil filter housing
- Cylinder head
- Engine oil cooler
- Anything that interrupts the engine oil supply circuit of the engine

### **Reusing or transferring components from the old engine to the new engine:**

Always inspect and clean prior, as needed, when reusing or transferring components.

If required, use a borescope to look inside the components. Contaminated engine parts (metal particles, fuel, water, antifreeze, etc.) can lead to subsequent engine or component failure and will not be covered by Warranty.

If the engine is hydrolocked due to water ingestion, clean the entire intake track by removing all of the induction system components from the vehicle and ensuring no water is present before starting the

replacement engine.

If the engine is hydrolocked due to a leaking injector, clean the entire intake track by removing all of the induction system components from the vehicle and ensuring no fuel is present before starting the replacement engine. Replace the affected injector.

If the engine failure includes damage to the pistons and valves, for example, a hole in the piston or a broken valve then inspect and clean the intake track and the exhaust system by removing and reinstalling all of the components for inspection before starting the replacement engine.

If the lubrication circuit is contaminated with metal fragments, then the oil cooler and the oil cooler lines need to be replaced. Cleaning these components will not be effective.

If necessary, always use a borescope to inspect all of parts if the component cannot be inspected visually, for example, an induction pipe with multiple direction changes and blind spots.

If repairing the engine always account for all the broken parts, timing chain guides, fasteners, rings etc., using a borescope in the oil drain plug hole or if necessary, the oil pan may need to be removed if all of the parts are not accounted for.

### **All vehicles using two turbos and vacuum-operated wastegates:**

When disassembling the vacuum supply system, always ensure the hoses and components are marked or labeled so that reassembly is performed correctly. Always refer to the applicable repair instruction to ensure the vacuum hoses are connected to the correct bank turbocharger wastegate actuator or EPDW.

If the hoses are not connected correctly subsequent internal engine piston and combustion chamber damage can occur. Engine or component failure related to incorrectly connected vacuum hoses will not be covered by Warranty.

## **PROCEDURE**

### **Vehicles equipped with the following engine families:**

**N20, N26, N55, N63, N63T, N63R, N63B, N63M, S55, S63, S63T, S63M, B36, B38, B46, B48, B58, S58, S68, M57, N47 and M57**

### **Engine Replacement and Engine Repairs which include the following:**

- Engine removal and installation
- Engine replacement
- VANOS gears
- Timing chain tensioner
- Bed plate resealing
- Engine oil pump
- Engine oil filter housing
- Engine oil cooler
- Any engine repair that interrupts the engine oil supply circuit of the engine

1. Proceed to the “Start-up of the oil circuit” with the ISTA test plan using the following path:

Connect a battery charger to the vehicle.

Select – “Service functions”

Select – “Powertrain”

Select – “Engine electronics MEVD”

Select – “Start-up of the oil circuit”

Follow the test plan steps. Thoroughly read the test plan directions to avoid repeating work.  
Connect a battery charger to the vehicle.  
Select – “Service functions”  
Select – “Powertrain”  
Select – “Engine electronics MEVD”  
Select – “Start-up of the oil circuit”

Follow the test plan steps. Thoroughly read the test plan directions to avoid repeating work.

### **Important information for F39, F44 and F48 vehicles:**

If the test plan states to access the DME only remove the electrical connectors from the ignition coils and the fuel injectors. Do not remove any electrical connectors from the DME. When the test plan is complete reconnect all electrical connectors. Verify proper engine operation.

### **Cylinder Head Replacement or Valvetrain Repairs:**

This procedure is used when the cylinder head is removed and installed or replaced. This also applies to valvetrain repairs where the valvetrain is disassembled from the cylinder head. This would include-

- Camshafts
- Eccentric shafts
- Intermediate levers
- Roller drag levers
- Valve springs
- Valves

The following procedure applies to all engines equipped with an electronic engine oil level sensor, with or without an engine oil dipstick.

This procedure is used when the high-pressure fuel system pressure is already depleted from complete engine replacement.

1. If the engine oil was drained, torque the engine oil drain plug (with new seal ring per the applicable repair instruction), ensure the proper type and amount of engine oil is used when refilling the engine.

2. If you are unsure, remove the oil filter housing cover and verify the oil filter is present. Reinstall the oil filter housing cover and torque it to the proper specification noted in the applicable repair instruction.

3. Manually rotate the engine 2 revolutions in the **clockwise** direction with the appropriate wrench or a ratchet with socket (crankshaft pulley). **Never rotate the engine counterclockwise.**

4. Proceed to the “Start-up of the oil circuit” with the ISTA test plan using the following path:

Connect a BMW Group-approved battery charger to the vehicle. Refer to **SI [B04 23 10](#)**.

- Select – “Service functions”
- Select – “Powertrain”
- Select – “Engine electronics MEVD”
- Select – “Start-up of the oil circuit”

5. Follow the test plan steps. Thoroughly read the test plan directions to avoid repeating work.

**Important information for F39, F44 and F48 vehicles:**

If the test plan states to access the DME, only remove the electrical connectors from the ignition coils and the fuel injectors. Do not remove any electrical connectors from the DME. When the test plan is complete reconnect all electrical connectors. Verify proper engine operation.

**Manual procedure for all engine family variants that do not support the ISTA Test Plan described above.**

**Engine Replacement:**

The following procedure applies to all engines equipped with an electronic engine oil level sensor, with or without an engine oil dipstick.

This procedure is used when the high-pressure fuel system pressure is already depleted from complete engine replacement.

1. After installation of the replacement engine and before starting the engine for the first time, remove the engine oil drain plug. Drain any residual engine oil from the crankcase.
2. Reinstall and torque the engine oil drain plug (with a new seal ring) per the applicable repair instruction.
3. Remove the oil filter housing cover and verify the oil filter is present. Reinstall the oil filter housing cover and torque it to the proper specification noted in the applicable repair instruction.
4. Fill the engine with the proper type and amount of engine oil, as specified in the applicable repair instruction.
5. Manually rotate the engine 2 revolutions in the **clockwise** direction with the appropriate wrench or a ratchet with socket. **Never rotate the engine counterclockwise.**
6. Connect a BMW Group-approved battery charger to the vehicle.
7. Remove the electrical connectors from the ignition coils and the fuel injectors.

8. Crank the engine for 10 seconds.
9. After 10 seconds have elapsed, stop the starter, and allow the starter to cool for 20 seconds.
10. Repeat steps 8 and 9 two additional times.
11. Reconnect all electrical connectors. Verify proper engine operation.
12. After the engine has reached operating temperature, check the engine oil electronically or with the dipstick, and top up the engine oil as needed.

### **Cylinder Head Replacement or Valvetrain Repairs:**

This procedure is used when the cylinder head is removed and installed or replaced. This also applies to valvetrain repairs where the valvetrain is disassembled from the cylinder head. This would include-

- Camshafts
- Eccentric shafts
- Intermediate levers
- Roller drag levers
- Valve springs
- Valves

The following procedure applies to all engines equipped with an electronic engine oil level sensor, with or without an engine oil dipstick.

This procedure is used when the high-pressure fuel system pressure is already depleted from complete engine replacement.

6. If the engine oil was drained, torque the engine oil drain plug (with new seal ring per the applicable repair instruction), ensure the proper type and amount of engine oil is used when refilling the engine.

7. If you are unsure, remove the oil filter housing cover and verify the oil filter is present. Reinstall the oil filter housing cover and torque it to the proper specification noted in the applicable repair instruction.

8. Manually rotate the engine 2 revolutions in the **clockwise** direction with the appropriate wrench or a ratchet with socket. **Never rotate the engine counterclockwise.**

9. Connect a BMW Group-approved battery charger to the vehicle.
10. Remove the electrical connectors from the ignition coils and the fuel injectors.
11. Crank the engine for 10 seconds.
12. After 10 seconds have elapsed, stop the starter, and allow the starter to cool for 20 seconds.
13. Repeat steps 6 and 7 two additional times.
14. Reconnect all electrical connectors. Verify proper engine operation.
15. After the engine has reached operating temperature, check the engine oil electronically or with the dipstick, and top up the engine oil as needed.

### **Engine Repairs:**

This procedure is used when the engine oil supply circuit is interrupted during a repair. This applies to-

- VANOS gears
- Timing chain tensioner
- Bed plate resealing
- Engine oil pump
- Engine oil filter housing
- Engine oil cooler
- Any engine repair that interrupts the engine oil supply circuit of the engine

This procedure is used when the high-pressure fuel system pressure may not be depleted after minor engine repairs. The fuel injection system needs to be disabled by removing the fuel injector electrical connectors.

1. If the engine oil was drained, torque the engine oil drain plug (with new seal ring per the applicable repair instruction), ensure the proper type and amount of engine oil is used when refilling the engine.
2. If you are unsure, remove the oil filter housing cover and verify the oil filter is present. Reinstall the oil filter housing cover and torque it to the proper specification noted in the applicable repair instruction.

3. Connect a BMW Group-approved battery charger to the vehicle.
4. Remove the electrical connectors from the ignition coils and the fuel injectors.
5. Crank the engine for 10 seconds.
6. After 10 seconds have elapsed, stop the starter, and allow the starter to cool for 20 seconds.
7. Repeat steps 5 and 6 two additional times.
8. Reconnect all electrical connectors, reassemble the vehicle and verify proper engine operation.
9. After the engine has reached operating temperature, check the engine oil electronically or with the dipstick, and top up the engine oil as needed.

### **Replaced Components Requiring a 1,200 Mile Fluid Replacement Service**

Certain BMW vehicles have specific components that require a “running-in” fluid replacement service after the first 1,200 miles of vehicle operation. Refer to SI B00 06 10 for more information.

### **Cooling Systems**

Always ensure the replacement engine is filled with the proper coolant and quantity before starting the engine. Refer to the applicable repair instructions.

### **CLAIM INFORMATION**

Claimable in conjunction with an applicable repair that is covered under the terms of a BMW Limited Warranty or BMW program coverage that applies and is active.

### **Performing the “Start-up of the oil circuit” with the ISTA test plan.**

<b>Defect Code:</b>	<b>Refer to AIR</b>	<b>Claim with the defect code that applies to the engine replacement or component repair that required this necessary work procedure to be performed</b>
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Refer to AIR for the corresponding flat rate unit (FRU) allowance

<b>Labor Operation</b>	<b>Description (Associated work)</b>	<b>Labor Allowance</b>
11 00 896	Engine oil priming procedure (Performing any of the repair procedures listed above that includes the engine oil pump and oil supply circuit priming procedure after engine	Refer to AIR

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	replacement, cylinder head replacement or other applicable engine repairs)	
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And if necessary for:

### All models with the S55 engine

Labor Operation	Description (Associated work)	Labor Allowance
12 14 550	Removing and installing the DME	Refer to AIR

### Manual procedure for all engine family variants that do not support the ISTA Test Plan.

<b>Defect Code:</b>	<b>Refer to AIR</b>	<b>Claim with the defect code that applies to the engine replacement or component repair that required this necessary work procedure to be performed</b>
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Labor Operation	Description (Associated work)	Labor Allowance
11 99 000	Work time for the engine oil priming procedure (See below) (Performing any of the repair procedures listed above that includes the engine oil pump and oil supply circuit priming procedure after engine replacement, cylinder head replacement or other applicable engine repairs)	6 FRU

### Work Time Labor Operation Code 11 99 000

At the AIR start screen, use the Search for vehicle with vehicle identification number option (enter a minimum of the last 7 digits of the VIN).

In the AIR application, select Flat Rate Units from the top menu bar, enter **flat rate labor operation code 1100896 (without spaces)** in the search field, hit enter or the search icon to confirm that labor operation 11 00 896 applies and is available and then obtain the corresponding FRU allowance information.

If flat rate labor operation **11 00 896 is not found**, submit, and claim for job/repair work time labor operation 11 99 000 for the FRU allowance as described above instead.

If other required work was also performed under labor operation 11 99 000, claim labor operation 11 99 000 one time only for all the job/repair WT FRU that was needed and itemize the total FRU amount claimed on the repair order and in claim comment section.

Based on which one applies to your center, please refer to **SI B01 01 20 or B01 07 20** for the applicable procedure for documenting, claiming, and explaining, on the RO and in the claim comments, your diagnosis work time (WT), job/repair work time (WT), and the vehicle repairs your center performed, unless otherwise required by State law.

### **FEEDBACK REGARDING THIS BULLETIN**

Technical Feedback	To submit feedback for the technical topics of this bulletin: Submit your feedback in the rating box at the top of this bulletin
Warranty Feedback	To submit feedback for the CLAIMS section of this bulletin: Submit an IDS ticket to the Warranty Department, or use the chat available in the Warranty Documentation Portal
Parts Feedback	To submit feedback for the PARTS section of this bulletin: Submit an IDS ticket to the Parts Department



