

**Warning!****Danger of scalding!**

Carry out all tasks only when wearing oil-resistant, heat-resistant protective gloves incl. underarm protection, face guard and protective apron.

**Important!**

Perform engine oil changes only when engine is at normal operating temperature ($>70^{\circ}$ engine oil temperature).

An exact oil level reading can only be obtained from an engine oil temperature $\geq 70^{\circ}$.

Engine oil temperature can be read off in the instrument cluster.

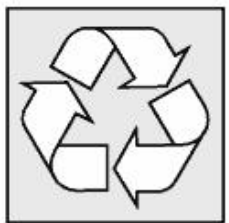
It is essential to adhere to the exact filling capacities specified.

The possibility of **engine damage** cannot be excluded if the engine is overfilled with engine oil

Checking and drip-off times must be observed without fail.

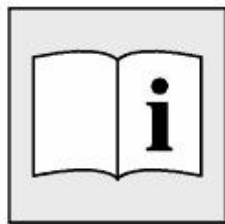
Note:

The S85 engine is equipped with an engine oil sump (oil pan) with separate oil chambers. During an oil change, the oil is drained solely from the main oil sump (rear chamber). The oil from the front chamber is pumped permanently into the main oil sump by a separate oil pump. For this purpose, the engine must be run at idle for at least 1 minute immediately prior to an oil change.

*Recycling:*

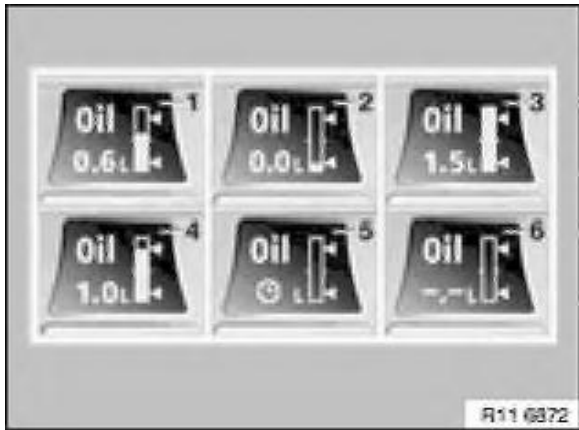
Catch and dispose of engine oil with suitable equipment.

Note national regulations.



Necessary preliminary tasks:

- M5: Release service flaps.
- M6: Detach underbody protection.



Engine with one drain plug (up to 3/07).

Explanation of instrument displays:

1. Oil level is OK.
2. Oil level at minimum.
3. Oil level too high (overfilled ≥ 0.5 litres).
4. Oil level at maximum.
5. Rapid measurement running: oil level is being determined.
6. A reading cannot be taken at present (engine oil temperature ≥ 70 °).



Run engine at idle speed.

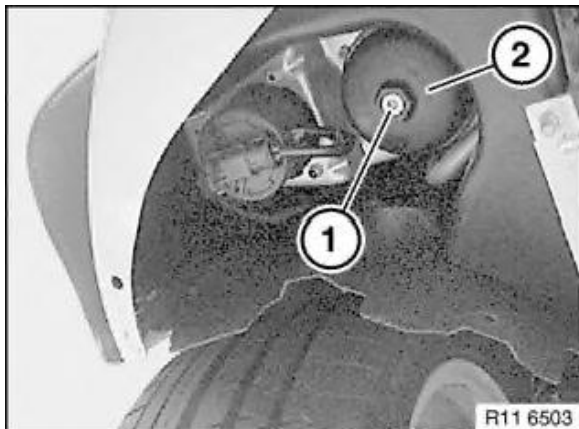
Keep pressing on-board computer button on direction indicator lever until oil level reading can be read off in instrument display.

Press on-board computer button for longer than 3 seconds to reset the display value.

Run engine at idle until the oil level is determined again (engine oil temperature of ≥ 70 °C).

The required oil temperature for an engine oil change is thus achieved.

Measurement range from minimum (3) to maximum (2) = 1 litre.



Warning!

Danger of scalding!

Open oil drain plug (1) on oil filter housing.

Tightening torque: 11 42 2AZ .

Installation:

Replace sealing ring.

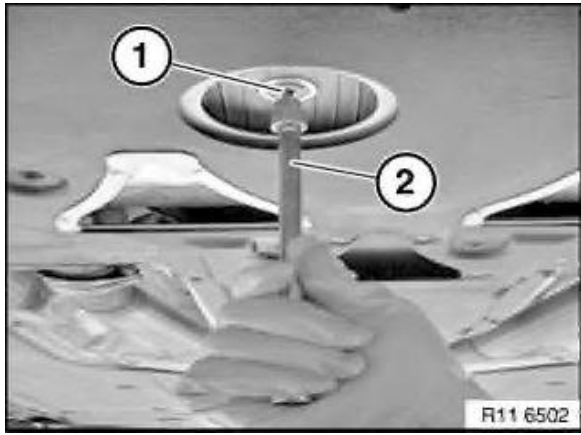
Release oil filter housing (2).

Tightening torque: 11 42 1AZ .

Installation:

Replace all sealing rings.

Replace filter element.



Warning!

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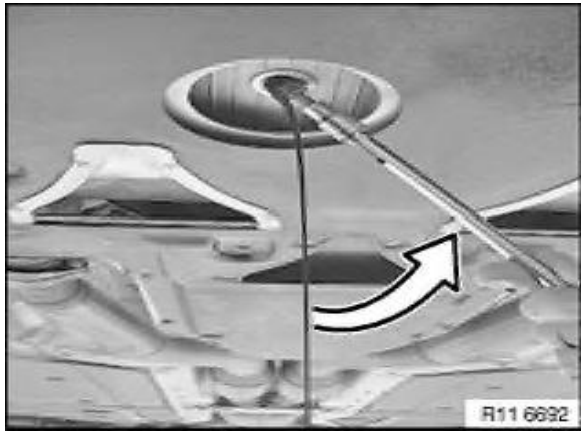
Carry out all tasks only when wearing oil-resistant, heat-resistant protective gloves incl. underarm protection, face guard and protective apron.

Open screw plug (1) with socket and a long extension (2).

Installation:

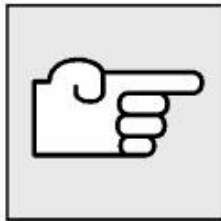
Replace sealing ring.

Tightening torque: 11 13 1AZ .



Tilt long extension (1) with socket and screw plug in direction of arrow.

Catch and dispose of engine oil with suitable equipment.



Pour in engine oil.

Important!

To prevent the possibility of overfilling, fill the engine initially with **8 litres** of engine oil.

Park vehicle on a horizontal surface.

Start engine and run at idle until an engine oil temperature $\geq 70^\circ$ is reached.

Press on-board computer button for longer than 3 seconds.

Determine the oil level again.



Measurement range from minimum to maximum = 1 litre.

1. Oil level (+0.6 l)
2. Range for maximum
3. Range for minimum

The oil fill quantity is 0.6 l above the permissible minimum.

Top-up quantity to be calculated:

1 litre - 0.6 litre (display) = 0.4 litre top-up quantity.

Important!

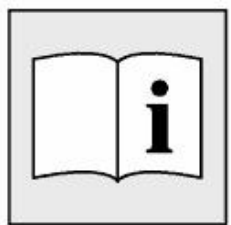
A replenishment quantity of **less than 0.5 litre** is not displayed in the instrument cluster: i.e. interrogating the oil level again produces the value (+0.6 l) again.

Allow engine at normal operating temperature to run at idle for 1 minute.



- **Pre-delivery inspection / engine replacement**

Carry out distance travelled reset **only** with the BMW diagnosis system.

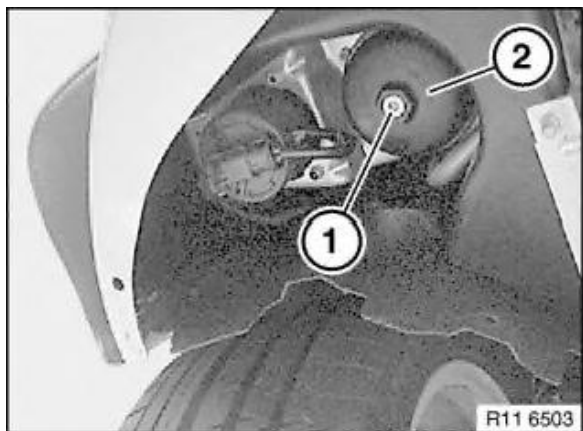


- **Engine oil service!**

Distance travelled RESET can be carried out with the BMW diagnosis system or with the instrument cluster.

An exact measurement of the engine oil fill quantity can be read out via the BMW diagnosis system in the DME in the test module **(Oil condition measurement)**

Top up engine oil.



- **Overfilling of engine oil**

Start engine and run at idle (engine oil temperature $\geq 70^\circ$).

Run engine at idle speed.

Keep pressing on-board computer button on direction indicator lever until oil level reading can be read off in instrument display.

Press on-board computer button for longer than 3 seconds to reset the display value.

Run engine at idle until the oil level is determined again (engine oil temperature of greater than 70°C).

The required oil temperature for an engine oil change is thus achieved.>

Note:

An overfill value of up to 0.5 litre can be displayed in the instrument cluster.

Further overfilling of more than 0.5 litre can be read out via the BMW diagnosis system.

The BMW diagnosis system can display overfilling of up to 3.5 litres.

If overfilling is suspected, we recommend that the oil filling be corrected with the BMW diagnosis system.

Select following steps on BMW diagnosis system:

- Complete vehicle

- Drive
- Engine electronics
- Oil supply
- Oil condition sensor

Switch off engine and detach underbody protection.

Open oil drain plug (1) on oil filter housing.

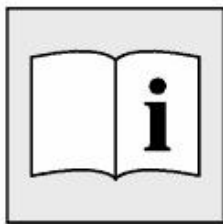
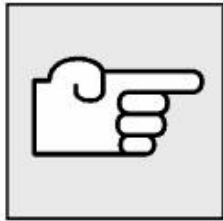
Tightening torque: 11 42 2AZ .

Note:

Drain quantity in air cleaner housing **approx. 0.4 litre** .

Perform this work step several times if necessary.

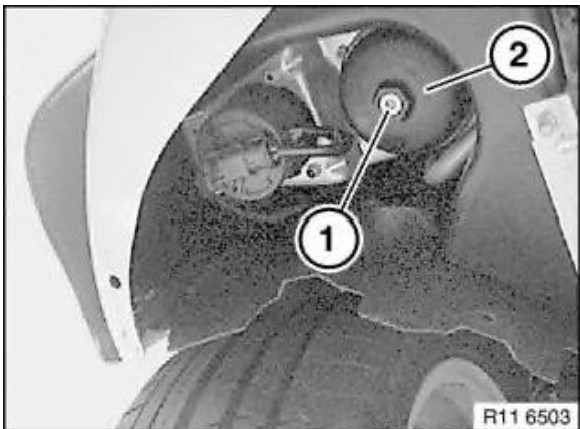
Add final details to vehicle.



Engine with two drain plugs (from 3/07).

It is no longer necessary to read out the oil fill level.

Perform engine oil changes only when engine is at normal operating temperature (>70 ° engine oil temperature).



Warning!

Danger of scalding!

Open oil drain plug (1) on oil filter housing.

Tightening torque: 11 42 2AZ .

Installation:

Replace sealing ring.

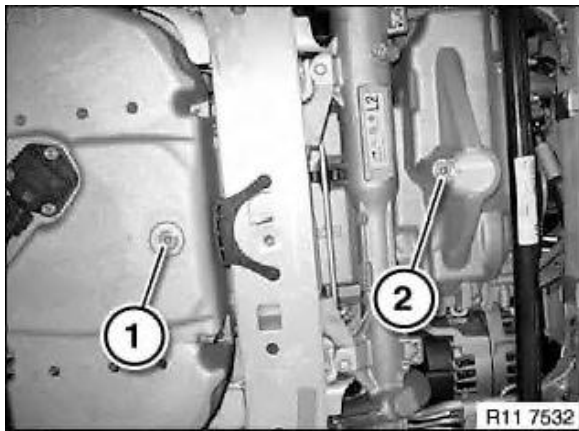
Release oil filter housing (2).

Tightening torque: 11 42 1AZ .

Installation:

Replace all sealing rings.

Replace filter element.



Release screw (1).

Installation:

Replace sealing ring.

Tightening torque: 11 13 1AZ .

Release screw (2).

Installation:

Replace sealing ring.

Tightening torque: 11 13 1AZ .

Warning!

Danger of scalding!

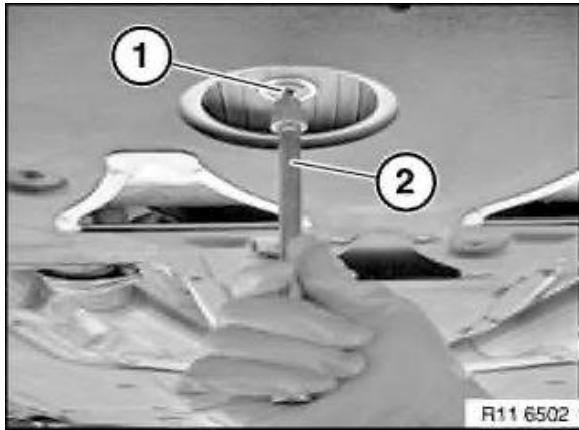
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Open screw plug (1) with socket and a long extension (2).

Installation:

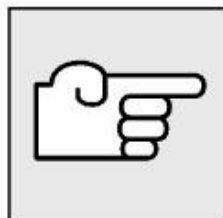
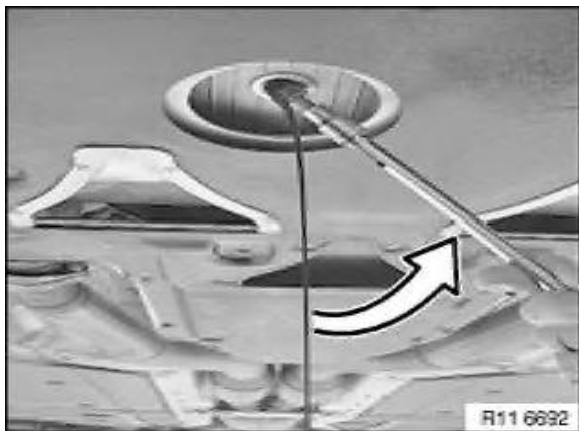
Replace sealing ring.

Tightening torque: 11 13 1AZ .



Tilt long extension (1) with socket and screw plug in direction of arrow.

Catch and dispose of engine oil with suitable equipment.



Pour in engine oil.

Park vehicle on a horizontal surface.

Start engine and run at idle until an engine oil temperature $\geq 70^\circ$ is reached.

Press on-board computer button for longer than 3 seconds.

Determine oil level.

11 42 Oil Filter and Pipes

	Type	Thread	Tightening specification	Measure
1AZ Oil filter cap to oil filter housing	S85	wrench size 24 mm		25 Nm
2AZ Oil drain plug in oil filter cap	S85	M6		10 Nm
3AZ Line to oil filter housing	S85	M8	Replace nut	18 Nm

11 13 Oil Pan

	Type	Thread	Tightening specification	Measure
1AZ Oil drain plug	S85	M12x1.5	Replace sealing ring	25 Nm

11 40 Oil Supply S85 From 3/07 two drain plugs

Oil grades and consumption: refer to BMW Service Operating Fluids		
Oil change volume without oil filter	ltr.	8.85
Oil change volume with oil filter	ltr.	9.85

11 40 Oil Supply S85 Up to 3/07 one drain plug

Oil grades and consumption: refer to BMW Service Operating Fluids		
Oil change volume without oil filter	ltr.	8.30
Oil change volume with oil filter	ltr.	9.30

9.0 SAE 10W-60 engine oils for S54, S62/E39 (up to 02/2000), S65, S85

These engine oils are specified for: Please refer to Enclosure 3.

9.1 SAE 10W-60 oils available from the parts sales department:

Trade name	BMW part number	Container size
Castrol TWS Motorsport	83 12 0 029 683	1 litre
Castrol TWS Motorsport	83 12 0 029 684	60 litres

9.2 Names of approved SAE 10W-60 oils:

Trade name	Viscosity	Manufacturer/Supplier
Castrol TWS Motorsport ¹⁾	SAE 10W-60	Castrol Limited
Castrol Edge	SAE 10W-60	Castrol Limited

1) Note:

The trade name of the Castrol oil has been changed:

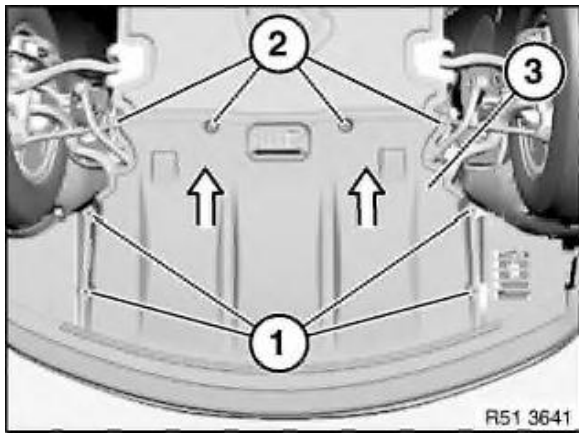
old: "Castrol Formula RS Racing Syntec SAE 10W-60"

new: "Castrol TWS Motorsport SAE 10W-60"

Castrol will continue to market an engine oil under the previous trade name which has not been approved by BMW!

BMW recommends Castrol.

Status 08/2007

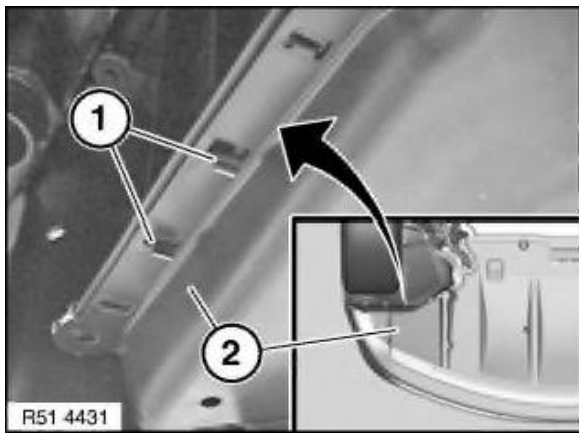
**All except M5:**

Release screws (1 and 2) and pull out underbody protection (3) from under bumper trim.

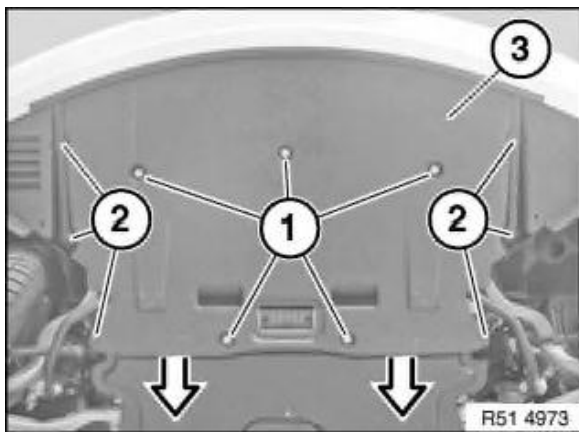
Installation:

Ensure that seals are correctly seated.

Center underbody protection (3) and tighten down screws (1) and (2).

**Replacement:**

If necessary, remove catches (1) on cover (2).

**Version with rough road package:**

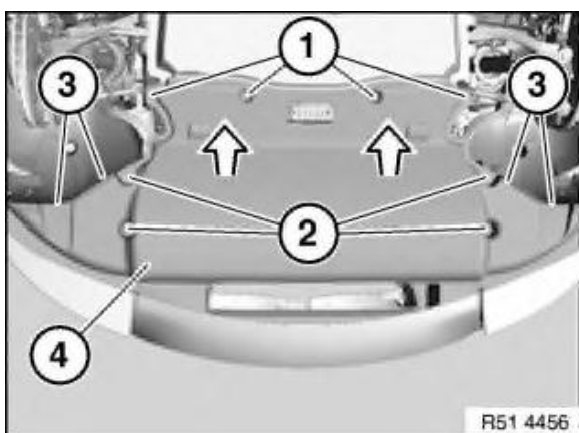
Release screws (1 and 2).

Feed out underbody protection (3) towards rear.

Installation:

Replace screws (1).

Tightening torque 51 71 20AZ .

**M5 only:**

Release screws (1 and 2).

Release screws (3) at side from wheel arch trim.

Pull underbody protection (4) forward under bumper trim.

Installation:

Ensure that seals are correctly seated.

Center underside protection (4) and tighten down screws (1, 2 and 3).

51 71 Seals and Loose Body Parts

	Type	Thread	Tightening specification	Measure
1AZ Front spoiler to bumper	E36 / M3			3 Nm
2AZ Rear spoiler	E34 / Touring, E36 / Z3 Coupé / M Coupé	M6		6 Nm
	E36 / M3	M6		7 Nm
	E53			3 Nm
	E83	M6		10 Nm
	E61			8 Nm
3AZ Reinforcement plate to front axle support/engine carrier	E46 / without AWD, E85, E86		Replace screws	
			Jointing torque	59 Nm
			Torque angle	90 °
4AZ Tension strut in engine compartment	E85, E86		Nut	41 Nm
			Replace screw	56 Nm
			Torque angle	105 ±15 °
E83	M8		19 Nm	
5AZ Reinforcing plate/ tension strut to rear axle	E46 / Convertible, E85, E86	M10	Replace screws	
			Jointing torque	59 Nm
			Torque angle	90 °
6AZ Stiffening plate to body	E85, E86	M8		21 Nm
7AZ Tension strut to rear axle	E46 / Convertible	M8		24 Nm
	E85, E86		Replace nut	24 Nm
8AZ Cross-member, A-pillar, to mounting	E52	M8		19 Nm
9AZ Cross-member, A-pillar, middle	E52	M8		10 Nm
10AZ Strut to cardan tunnel	E52	M8		19 Nm

11AZ Cross-member, A-pillar, bottom, to mounting	E52	M6		11 Nm
12AZ Support tube to support, steering column upper section	E65, E66, E67	M8		21 Nm
13AZ Support tube to body	E85 / E86	M8		20 Nm
14AZ Heater to support tube	E85, E86			4 Nm
15AZ Support tube to body	E60, E61, E63, E64, E83	M8		21 Nm
16AZ Take-up, cover, sill to body	E83	M8		5 Nm
17AZ Cover, partition, to body, front	E61			2.5 Nm
18AZ Retaining strip, sill trim, to side panel	E61			5 Nm
19AZ Multifunction pan to body	E60 / M5			3 Nm
	E86			12 Nm
20AZ Underride protection to retaining bar	E60, E61	M8	Replace screws	8 Nm
21AZ Retaining bar for underride protection to frame side member	E60, E61	M8	Replace screws	8 Nm
22AZ Protective mat/protective cover to body	E60 / Security	M6	Screw	10 Nm