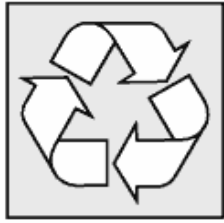


**Warning!**

Danger of scalding!

Only carry out work on the cooling system after the engine has cooled down!

*Recycling*

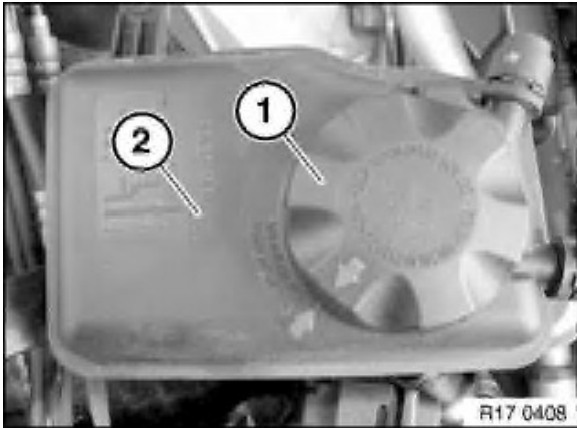
Catch and dispose of drained coolant in a suitable container.

Observe country-specific waste-disposal regulations.

Risk of slipping due to coolant on the floor.

*Necessary preliminary tasks:*

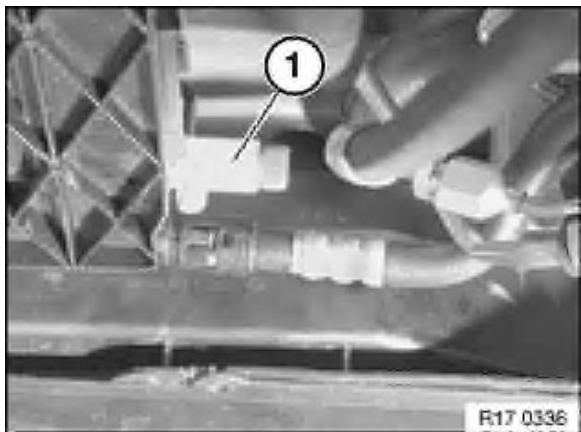
- Remove radiator cover
- Remove engine underbody protection
- Remove reinforcement plate
- Follow instructions for working on cooling system.

**Draining coolant:**

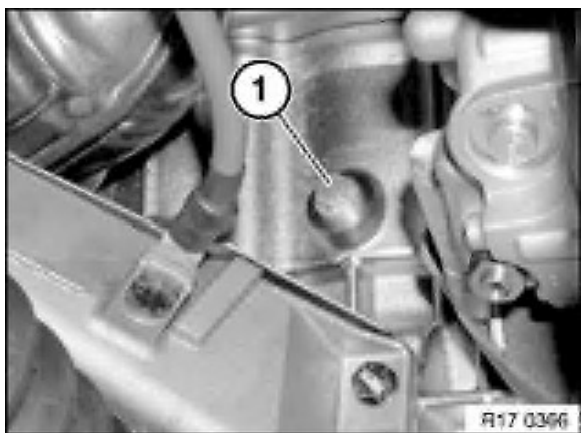
Open cap (1) on coolant expansion tank (2).

Installation:

Observe arrow marks on cap and expansion tank.



If fitted, release drain plug (1) on radiator at bottom. On coolant radiators which do not have a drain plug, remove coolant hose. Drain, catch and dispose off coolant.



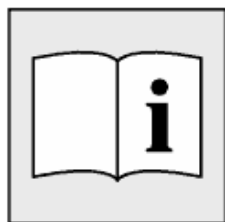
Illustrations show E85:

Open drain plug (1) on engine block. Drain, catch and dispose off coolant.

Installation:

Replace sealing ring.

Tightening torque 11 11 5AZ .



Adding coolant:

Use only recommended coolant.

Vent cooling system.

Check cooling system for leaks.

Illustrations show M54:

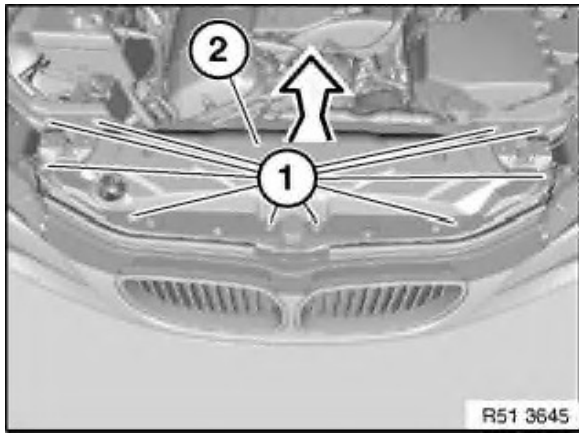
Important!

Do not place front panel center section (2) on jump start terminals.

Do not kink Bowden cables for engine hood locking.

Release screws (1).

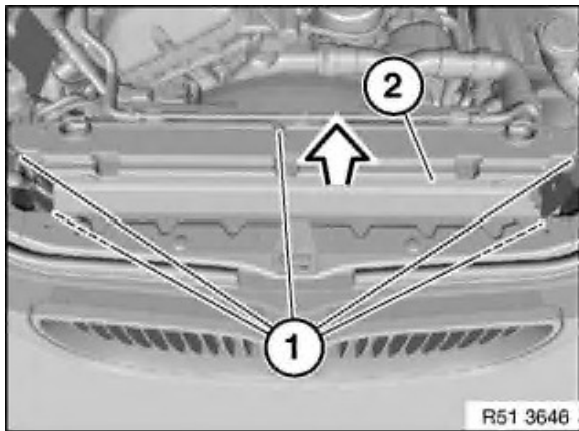
Remove front panel center section (2) in direction of arrow and place to one side.

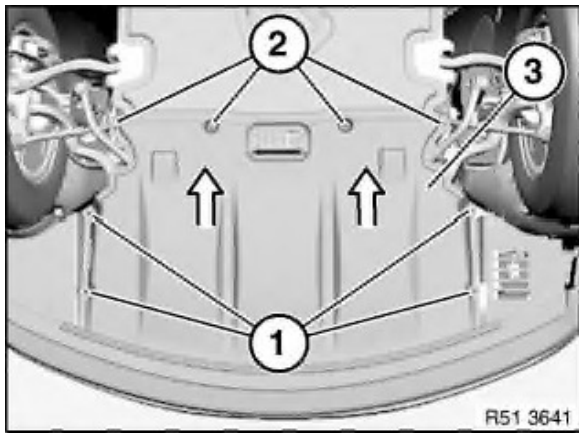


Illustrations show M54:

Release screws (1).

Remove radiator cover (2) in direction of arrow.



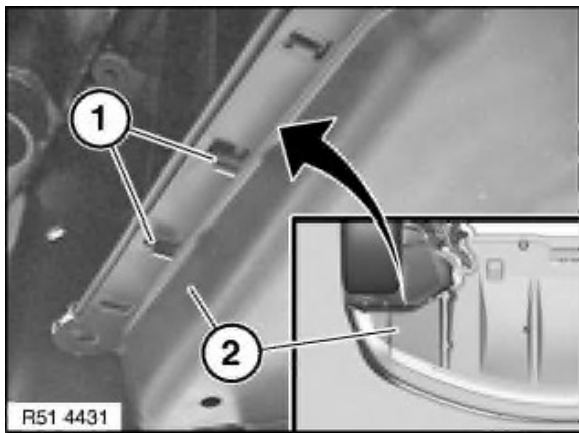
**All except M5:**

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

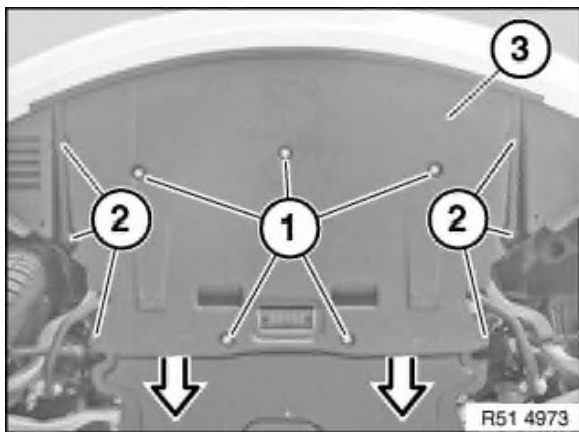
Installation:

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:**

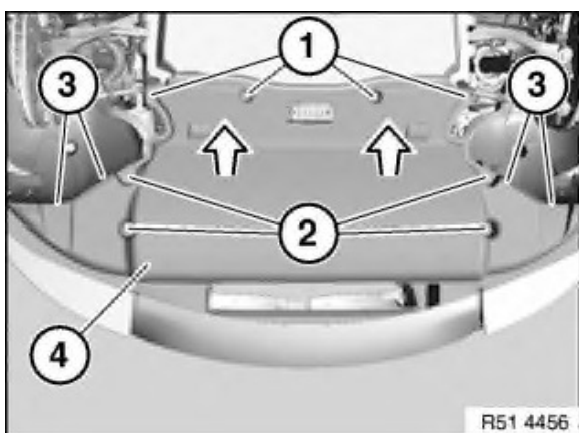
Release screws (1 and 2).

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.

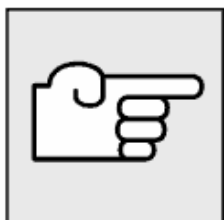
Installation:

Ensure that seals are correctly seated.

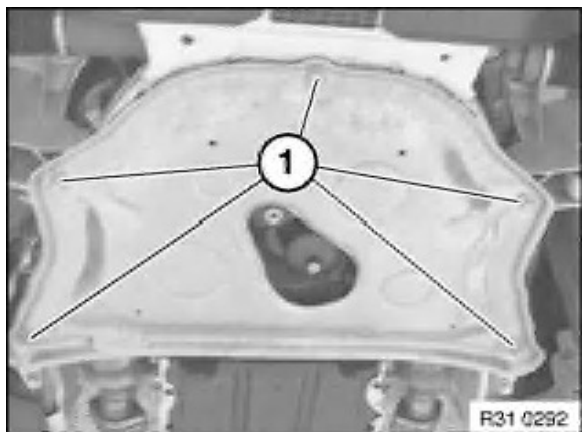
Center underside protection (4) and tighten down screws (1, 2 and 3).

**Important!**

Observe safety instructions for raising the vehicle
Driving without reinforcement plate is not permitted!

*Necessary preliminary tasks:*

- Remove underbody protective plate

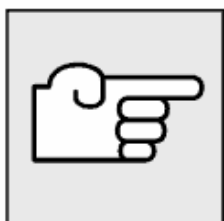


Release screws (1) and remove reinforcement plate.

Installation:

Replace screws and insertion nuts.

Tightening torque 31 10 9AZ .

**Replacement:**

If applicable, remove heat shield.

**Warning!**

Danger of scalding! Work on the cooling system should only be carried out when the engine has cooled down.

**Important!**

Wear protective gloves and goggles.

**Important!****Lifetime coolant filling:**

Never reuse used coolant.

When replacing and removing components which rely on the corrosion protection effect of the coolant, it is essential to change the coolant. The cooling system must therefore be drained and refilled.

In the case of other removal work involving the draining of partial quantities of coolant, replace these quantities which have been drained with new coolant.

**Important!**

Open cooling system only when it has cooled down.

Opening the cooling system while hot can result in air entering the system.

This can cause overheating with permanent damage to the engine.



Important!

When working on the oil, coolant or fuel circuit, protect the alternator against contamination.

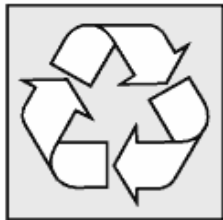
Cover alternator with suitable materials.

Failure to comply with this procedure may result in an alternator malfunction.



Important!

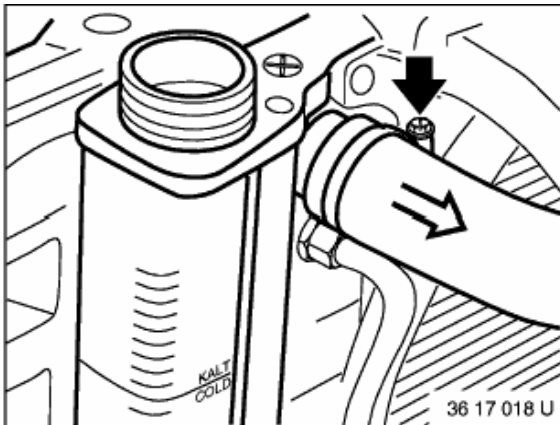
Do not fill coolant expansion tank over MAX level as overfilling will cause the coolant to overflow. This may give rise to traces of residual coolant on the expansion tank or in the engine compartment and wrongly suggest possible leakages.



Recycling

Catch and dispose of drained coolant.

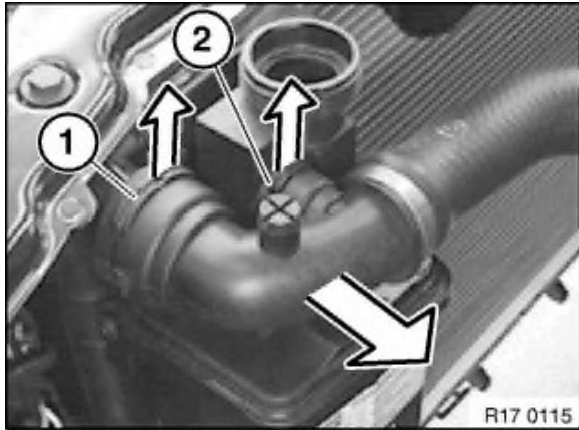
Observe country-specific waste-disposal regulations.



Note:

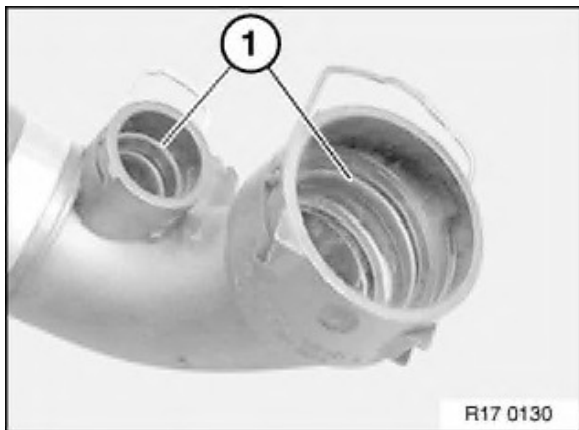
Tightening torque, hose clamps 17 00 1AZ .

Instructions for disassembly/assembly of coolant hose fast-release couplings



Disassembly of fast-release coupling

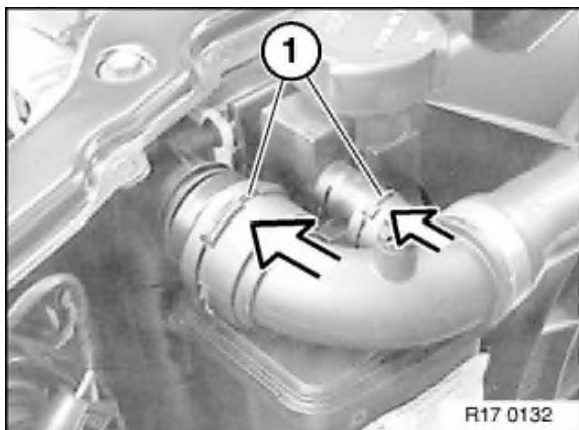
Withdraw lock (1/2), disconnect hose.



Installation:

Check O-rings (1).

Do not coat O-rings (1) with antiseize agent.



Assembly of fast-release coupling

Press in lock (1) before installing fast-release coupling.

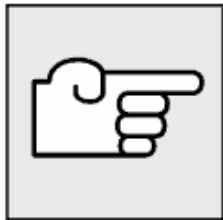
Push on hose.

Fast-release coupling must clearly snap audibly into place.

**Warning!**

Danger of scalding!

Open sealing cap only after engine has cooled down.



No vent screws on radiator or on thermostat housing.

Cooling system is vented while it is filled and during subsequent idle operation.

Note:

Before filling, turn on ignition. Set blower to low level. Seat heating controller to maximum temperature. This ensures that the heater valves are fully opened and the auxiliary water pump starts up.

Important: The auxiliary water pump must deliver coolant in order to ensure fully venting!

Installation:

Use only recommended coolant.

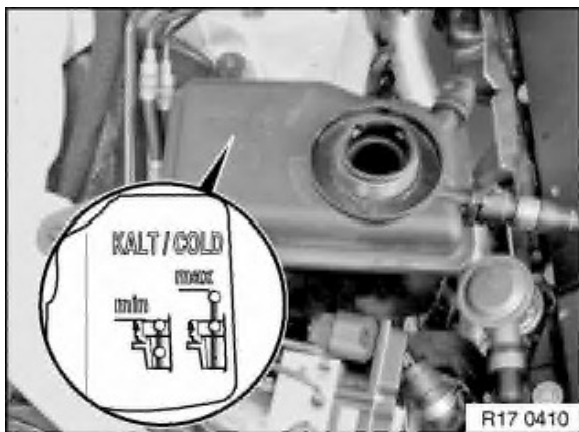
Check cooling system for leaks.

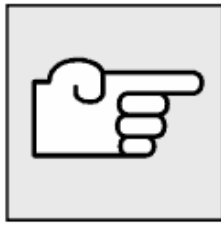
Perform filling operation slowly.

Pour coolant into coolant expansion tank up to MAX mark.

Start engine and run at idle speed for approx. one minute (cap open). Then adjust coolant level to MAX.

Close cap and run engine up to operating temperature until main thermostat opens. Check cooling circuit and drain plug for leaks.





Important!

The engine must be cooled down before the coolant level is checked. Coolant temperature must not exceed 30°C. If ambient temperature is above 30°C, allow engine to cool down to ambient temperature at least.

Check coolant level and adjust to MAX.

Note:

Do not fill coolant expansion tank over MAX level as overfilling will cause the coolant to overflow.

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

31 10 Front Axle Suspension

	Type	Thread	Tightening specification	Measure
1AZ Front axle carrier to engine carrier	E30, E31, E32, E34	M10 8.8	Replace screws (E30 AWD insert with Loctite)	42 Nm
	E30, E31, E32, E34	M10 9.8	Replace screws	47 Nm
	E36	M12 12.9	Replace screws	105 Nm
	E36, E46	M12 10.9	Replace screws	110 Nm
	E38, E39	M12 8.8	Replace screws	77 Nm
	E52	M12 front 10.9 middle 8.8 rear 8.8	Replace screws	75 Nm
	E53, E60 / REAR END, E61 / REAR END, E63, E64, E65, E66, E67, E85, E86	M12 10.9	Observe repair instruction.	100 Nm
	E60 / Four Wheel Drive, E61 / Four Wheel Drive	M12 10.9	Observe repair instruction. Replace screws Jointing torque Torque angle	100 Nm 90 °
2AZ Front end of front axle carrier to body	E34 / Four Wheel Drive	M10 8.8		47 Nm
	E83	M12 10.9		113 Nm
3AZ Front axle subframe rear / middle to body	E34 / Four Wheel Drive	(collar screw)		59 Nm
	E83	M10 10.9		50 Nm
	E83	M12 10.9		100 Nm

4AZ	Front axle carrier with reinforcement to engine carrier	E31			47 Nm
5AZ	Cruciform reinforcement to door sill	E31			42 Nm
6AZ	Reinforcement to bracket Bracket to body	E31			42 Nm
7AZ	Reinforcement (sleeve) to body	E31			127 Nm
8AZ	Front end reinforcement on front axle carrier/engine carrier	E46		Replace screws; first tighten down rear screws Jointing torque Torque angle	59 Nm 90+30 °
9AZ	Reinforcement plate to front axle support/engine carrier	E53		Replace screws & nuts Jointing torque Torque angle	56 Nm 90 °
		E60 / REAR END, E61 / REAR END, E63, E64, E65, E66, E67		Replace screws & insertion nuts Jointing torque Torque angle	56 Nm 56 Nm 90 °
		E60 / Four Wheel Drive, E61 / Four Wheel Drive		Replace screws Jointing torque Torque angle	56 Nm 90 °
		E83	M10	Replace screws	74 Nm
10AZ	Adapter to body	E46 / Four Wheel Drive		Replace screws	59 Nm
11AZ	Front axle support to adapter	E46 / Four Wheel Drive		Replace screws	110 Nm
12AZ	Heat shield to front axle carrier	E60, E61, E63, E64, E65, E66, E67			8 Nm

13AZ Mounting bracket to front axle carrier / engine carrier	E60 / Four Wheel Drive, E61 / Four Wheel Drive	M8 x 26		19 Nm
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17 00 Coolant

	Type	Thread	Tightening specification	Measure
1AZ Hose clamps to coolant hoses 32 ... 48 mm dia.	All			2.5 Nm
2AZ Bleed screw (WAF 8) to thermostat housing	All, without E46			8 Nm
Plastic bleed screws to coolant lines	E46			2 -0.5/+1 Nm
3AZ Level switch (WAF 30) to coolant expansion tank	All			3 Nm
4AZ Bleed screw to water valve or auxiliary water pump	E90 / E91			3.5 Nm

11 11 Engine block

	Type	Thread	Tightening specification	Measure
3AZ Taper screw mount on main bearing				
Screws and spacer bolts	M60 / M62 / M70 / S70 / M73 / S62	M8	Replace screws Jointing torque Torque angle	20 Nm 45 °
	N62 / N62TU / N73	M8		34 Nm
Threaded support sleeves	M70 / M60 / M62 / S70 / M73 / S62			10 Nm
	N62 / N62TU / N73			6 Nm
4AZ Struts/bracing shell	M67	M10.9		66 Nm
		M10		43 Nm
		M8		22 Nm
5AZ Drain plug for coolant in engine block		M14 x 1.5		25 Nm
6AZ Main oil gallery seal plugs		M16 x 1.5		34 Nm
		M18x1.5		40 Nm
	N62 / N62TU / N73	M18x1.5	Insert screw with Loctite	25 Nm
	N40 / N42 / N45 / N46	M16x1.5		36 Nm
Main oil gallery, rear (seal plugs with control valve)	M62 / S62	M18x1		10 Nm
7AZ Oil spray nozzle on engine block		M6		10 Nm
Oil spray nozzle screwed into bearing seat (coat thread with Loctite 243)	M73	M8x1		5 Nm
Oil spray nozzle to engine block (banjo bolt)		M8x1		12 Nm

8AZ Pressure holding valve to crankcase (1bar)	S54 / B32			20 Nm
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