

ENGINES 112 in MODEL 129, 163, 202, 208, 210, 211.061 /065 /261 /265 /080 /280 /082 /282, 220, 230.467

ENGINES 113 in MODEL 129, 163, 202, 208, 210, 211.070 /270 /083 /283, 215, 220

ENGINES 113.962 in MODEL 463.206 /240 /241 /247 /248 /249 /254

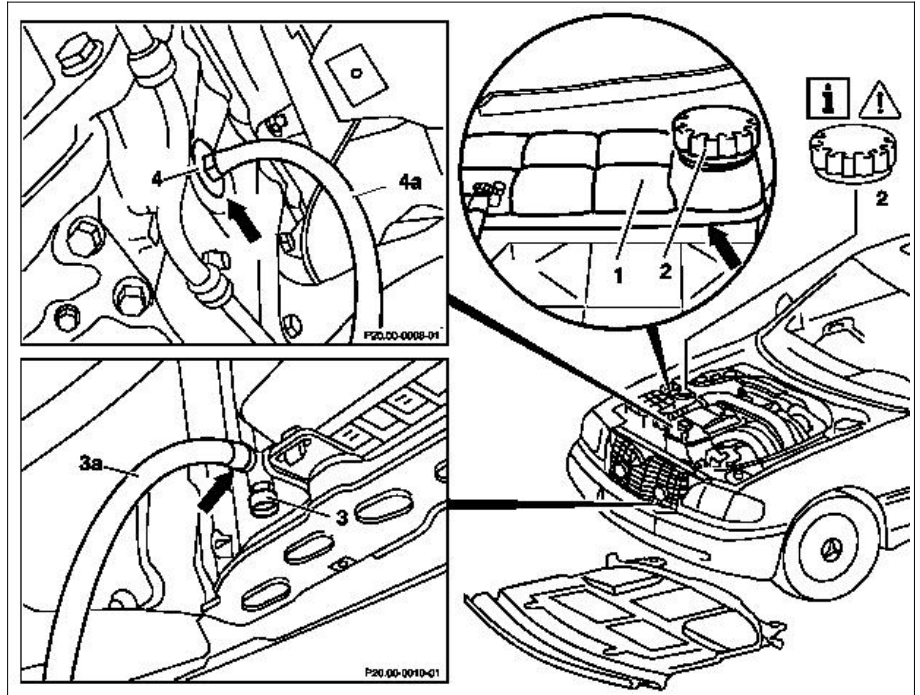
ENGINES 112.945 in MODEL 463.209 /232 /233 /244 /245 /250

ENGINES 137 in MODEL 215, 220

ENGINES 113.982 in MODEL 463.241 /243 /246

Illustrated on model 202

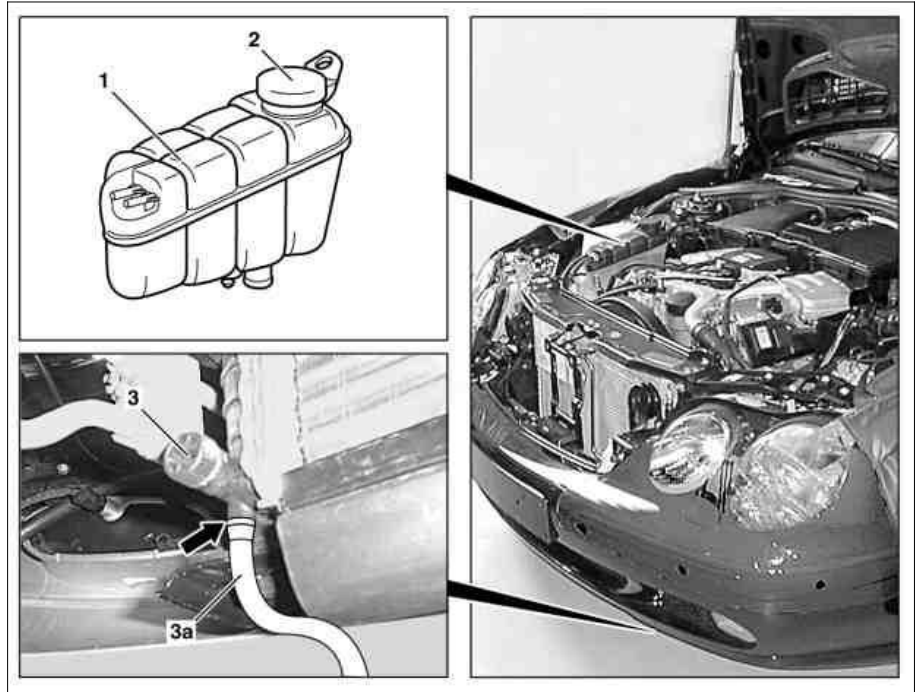
- 1 Coolant compensation tank
- 2 Cooling system cap
- 3 Drain plug on radiator
- 3a Drain hose
- 4 Drain plug for crankcase
- 4a Drain hose



P20.00-0215-06

Shown on model 215 with engine 137

- 1 Coolant compensation tank
- 2 Cooling system cap
- 3 Drain plug on radiator
- 3a Drain hose


















P20.00-2045-06

Modification notes

12.10.04	Pour in coolant using the vacuum method added	Step 16	
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<b>Danger!</b>	<b>Drain</b> <b>Risk of death</b> caused by vehicle slipping or toppling off of the lifting platform.	Align vehicle between columns of vehicle lift and position four support plates at vehicle lift support points specified by vehicle manufacturer.	AS00.00-Z-0010-01A
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 <b>Danger!</b>	<b>Risk of injury</b> to skin and eyes caused by scalding from contact with hot coolant spray. <b>Risk of poisoning</b> if coolant is swallowed	Do not open cooling system unless coolant temperature is below 90°C. Open cap slowly and release the pressure. Do not pour coolant into beverage containers. Wear protective gloves, protective clothing and safety glasses.	AS20.00-Z-0001-01A
	Notes on coolant		AH20.00-N-2080-01A
1	Open engine hood		
2	Detach ground line from battery	Only when draining coolant at crankcase, right  Do not connect quiescent current retention unit. Model 129, 163, 202, 208, 210 Model 211.0 Model 211.2 Model 215, 220 Model 230 Model 463 without special protection Model 463.241 with special protection, code 979 Model 463.248 with special protection, code 979	AR54.10-P-0003A AR54.10-P-0003T AR54.10-P-0003TA <b>AR54.10-P-0003I</b> AR54.10-P-0003R AR54.10-P-0003G AR54.10-P-0003PV AR54.10-P-0003PM
3	Open cooling system cap (2) at coolant expansion reservoir (1)	 Pay attention to different versions. Cooling system cap (2) with notch: Carefully turn cooling system cap (2) to first detent, release pressure, then remove cooling system cap (2). 1-stage and 2-stage cooling system cap (2): turn cooling system cap (2) 1/2 revolution counterclockwise, release pressure, then remove cooling system cap (2).	
4	Raise vehicle		
5.1	Remove lower engine compartment paneling	Model 129, 202, 208, 210 Model 163 with engine 112 Model 163 with engine 113 Model 211 Model 215, 220 Model 230	AR61.20-P-1105AB AR61.20-P-1105GH AR61.20-P-1105T <b>AR61.20-P-1105M</b> AR61.20-P-1105R
5.2	Remove underdrive guard	Model 463	
6	Remove air deflector shield	Model 163 with engine 113.942	
	<b>Drain coolant from radiator</b>		
7	Push siphon hose (3a) onto radiator drain plug (3)	Model 129, 202, 208, 210, 211, 215, 220, 230, 463	
8	Open radiator drain plug (3) and drain coolant	Model 129, 202, 208, 210, 211, 215, 220, 230, 463  Catch coolant in a suitable vessel.	
9	Tighten radiator drain plug (3) and detach drain hose (3a) from radiator drain plug (3)	Model 129, 202, 208, 210, 211, 215, 220, 230, 463	
10	Detach lower coolant hose from radiator or coolant pump and drain coolant	Model 163  Catch coolant in a suitable vessel.	
11	Attach lower coolant hose to radiator or coolant pump	Model 163  <b>Installation:</b> Replace hose clamp. 	*BA20.20-P-1004-01A
	<b>Drain coolant at crankcase</b>		
12	Push siphon hose (4a) onto crankcase drain plug (4)	Model 129, 202, 208, 210, 211, 215, 220, 230, 463	
13	Open crankcase drain plug (4) and drain coolant	Model 129, 202, 208, 210, 211, 215, 220, 230, 463  Catch coolant in a suitable vessel.	
14	Tighten crankcase drain plug (4) and detach drain hose (4a) from crankcase drain plug (4)	Model 129, 202, 208, 210, 211, 215, 220, 230, 463  	*BA01.40-P-1003-01C *BA20.00-P-1001-02B
15	Lower vehicle		
	<b>Filling</b>		
16	Pour in coolant and bleed cooling system	 Reuse clean coolant.  	AR20.00-P-1142-04A *210589009100 *285589002100
	Coolant specifications	Sheet 310.1	BB00.40-P-0310-01A

  	Anticorrosion/antifreeze agents (Sheet 325.0)	Sheet 325.0 Engine 112, 113 Engine 137 Engine 112, 113, 137 Model 163 with engine 112, 113	<b>BB00.40-P-0325-00A</b> <b>*BF20.00-P-1001-02K</b> <b>*BF20.00-P-1001-02M</b> <b>AH20.00-P-1142-01V</b> AH20.00-P-1142-01GH
	Notes on coolant level		
	Notes on coolant level		
17	Inspect cooling system for leaks		<b>AR20.00-P-1010HA</b>
18	Install air baffle plate	Model 163 with engine 113.942	
19.1	Install underride guard	Model 463	
19.2	Install lower engine compartment paneling	Model 129, 202, 208, 210 Model 163 with engine 112 Model 163 with engine 113 Model 211 Model 215, 220 Model 230	AR61.20-P-1105AB AR61.20-P-1105GH AR61.20-P-1105T <b>AR61.20-P-1105M</b> AR61.20-P-1105R
20	Lower vehicle		
21	Connect ground cable to battery	Only when coolant has been drained at crankcase on the right Model 129, 163, 202, 208, 210 Model 211.0 Model 211.2 Model 215, 220 Model 230 Model 463 without special protection Model 463.241 with special protection, code 979 Model 463.248 with special protection, code 979	AR54.10-P-0003A AR54.10-P-0003T AR54.10-P-0003TA <b>AR54.10-P-0003I</b> AR54.10-P-0003R AR54.10-P-0003G AR54.10-P-0003PM AR54.10-P-0003PV
22	Perform basic programming	Only if ground line for battery has been disconnected Model 129 Model 163 Model 202, 208 Model 210 Model 211 Model 215, 220 Model 230 Model 463 except 463.206/ 209/ 232/ 233/ 240/ 241 Model 463.206/ 209/ 232/ 233/ 240/ 241	AR00.19-P-0200A AR00.19-P-0200GH AR00.19-P-0200C AR00.19-P-0200D AR00.19-P-0200T <b>AR00.19-P-0200M</b> AR00.19-P-0200R AR00.19-P-0200P
23	Read out and erase the fault memory using Star Diagnosis	Only if the ground line of the battery has been disconnected	
24	Close engine hood		

**Crankcase, timing case cover, end cover**

Number	Designation	Engine
		<b>113.940/941/            942/943/944/            948/960/961/            962/963/964/            965/966/967/            968/969/971/            980/981/982/            984/986/992/            995</b>
BA01.40-P-1003-01C	Outlet connection on crankcase	Nm 12

**Crankcase, timing case cover, end cover**

Number	Designation	Engine
		<b>137</b>

BA01.40-P-1003-01C	Outlet connection on crankcase	Nm	12
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### Engine cooling, general

Number	Designation	Engine
		112, 113.940/941/ 942/943/944/ 945/946/948/ 960/961/963/ 964/965/966/ 967/968/971/ 980/981/984/ 986/987/988/ 990/991/992/ 995
BA20.00-P-1001-02B	Coolant drain plug on crankcase	Nm 12

### Radiator, coolant hoses

Number	Designation	Engine
		112.942/ 970, 113.942/ 965/981
BA20.20-P-1004-01A	Hose clamp	Nm 3

### Cooling system

Number	Designation	Engine 112.910/920 in model 202, 112.940 in model 208	Engine 112.911/921/941 in model 210	Engine 112.922/944/972 in model 220		
BF20.00-P-1001-02K	Cooling system	Total filling capacity	Liters	≈9.5	≈10.0	≈10.5
		Capacity of anticorrosion/antifreeze agent down to -37°C	Liters	≈4.75	≈5.0	≈5.0
		Filling capacity of anticorrosion/antifreeze down to -45°C	Liters	≈5.25	≈5.5	≈5.5
		Specifications for Operating Fluids	Sheet	BB00.40-P-0310-01A	BB00.40-P-0310-01A	BB00.40-P-0310-01A
			Sheet	BB00.40-P-0325-00A	BB00.40-P-0325-00A	BB00.40-P-0325-00A

### Cooling system

Number	Designation	Engine 112.923/943 in model 129	Engine 112.942 in model 163, 113.940/980 in model 210, 113.943/984 in model 208, 113.944 in model 202	Engine 112.945 in model 463.209/ 232/233/244/ 245/250		
BF20.00-P-1001-02K	Cooling system	Total filling capacity	Liters	≈11.75	≈11.0	≈11.5
		Capacity of anticorrosion/ antifreeze agent down to -37°C	Liters	≈6.0	≈5.5	≈5.8
		Filling capacity of anticorrosion/ antifreeze down to -45°C	Liters	≈6.5	≈6.0	≈6.4
		Specifications for Operating Fluids	Sheet	BB00.40-P-0310-01A	BB00.40-P-0310-01A	BB00.40-P-0310-01A
			Sheet	BB00.40-P-0325-00A	BB00.40-P-0325-00A	BB00.40-P-0325-00A

#### Cooling system

Number	Designation	Engine 112.913/917/ 949/954 in Model 211	Engine 113.967/969 in model 211		
BF20.00-P-1001-02K	Cooling system	Total filling capacity	Liters	≈9.5	≈10.75
		Capacity of anticorrosion/ antifreeze agent down to -37°C	Liters	≈4.75	≈5.25
		Filling capacity of anticorrosion/ antifreeze down to -45°C	Liters	≈5.25	≈6.0
		Specifications for Operating Fluids	Sheet	BB00.40-P-0310-01A	BB00.40-P-0310-01A
			Sheet	BB00.40-P-0325-00A	BB00.40-P-0325-00A

#### Cooling system

Number	Designation	Engine 113.941/960 in model 220	Engine 113.961 in model 129	Engine 113.962 in Model 463.206/ 240/241 /247/248 249/254		
BF20.00-P-1001-02K	Cooling system	Total filling capacity	Liters	≈11.5	≈12.75	≈12
		Capacity of anticorrosion/ antifreeze agent down to -37°C	Liters	≈5.75	≈6.25	≈6
		Filling capacity of anticorrosion/ antifreeze down to -45°C	Liters	≈6.25	≈7.0	≈6.6

	Specifications for Operating Fluids	Sheet	BB00.40-P-0310-01A	BB00.40-P-0310-01A	BB00.40-P-0310-01A
		Sheet	BB00.40-P-0325-00A	BB00.40-P-0325-00A	BB00.40-P-0325-00A

 Cooling system

Number	Designation	Engine 112.973 in model 230.467	Engine 113.960/986 in model 215	Engine 113.991 in model 215	
BF20.00-P-1001-02K	Cooling system	Total filling capacity Liters	≈10.8	≈11.5	≈14.5
		Capacity of anticorrosion/antifreeze agent down to -37°C Liters	≈5.4	≈5.75	≈7.3
		Filling capacity of anticorrosion/antifreeze down to -45°C Liters	≈6	≈6.25	≈8
	Specifications for Operating Fluids	Sheet	BB00.40-P-0310-01A	BB00.40-P-0310-01A	BB00.40-P-0310-01A
		Sheet	BB00.40-P-0310-01A	BB00.40-P-0325-00A	BB00.40-P-0325-00A


 Cooling system

Number	Designation	Engine 112.970 113.965 in Model 163	Engine 113.942/981 in model 163	Engine 113.982 in model 463.241/243/246	
BF20.00-P-1001-02K	Cooling system	Total filling capacity Liters	≈12.0	≈11.5	≈11.9
		Capacity of anticorrosion/antifreeze agent down to -37°C Liters	≈6.0	≈5.75	≈5.95
		Filling capacity of anticorrosion/antifreeze down to -45°C Liters	≈6.75	≈6.25	≈6.55
	Specifications for Operating Fluids	Sheet	BB00.40-P-0310-01A	BB00.40-P-0310-01A	BB00.40-P-0310-01A
		Sheet	BB00.40-P-0325-00A	BB00.40-P-0325-00A	BB00.40-P-0325-00A

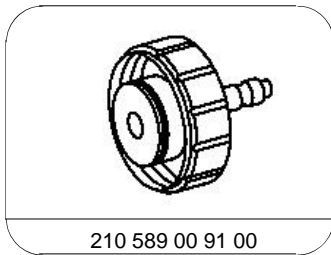
 Cooling system

Number	Designation	Engine 112.975 in model 220	Engine 113.948/966 in model 220	Engine 113.986/991 in Model 220	
BF20.00-P-1001-02K	Cooling system	Total filling capacity Liters	≈10.4	≈11.6	≈13.5
		Capacity of anticorrosion/antifreeze agent down to -37°C Liters	≈5.2	≈5.8	≈6.8
		Filling capacity of anticorrosion/antifreeze down to -45°C Liters	≈5.7	≈6.4	≈7.4

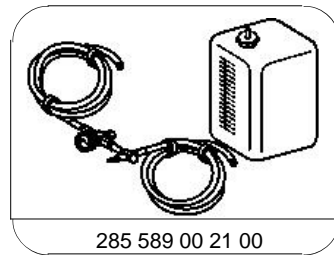
	Specifications for Operating Fluids	Sheet	BB00.40-P-0310-01A	BB00.40-P-0310-01A	BB00.40-P-0310-01A
		Sheet	BB00.40-P-0310-01A	BB00.40-P-0325-00A	BB00.40-P-0325-00A

 **Cooling system**

Number	Designation	Engine 137.970
BF20.00-P-1001-02M	Cooling system	
	Total filling capacity	Liters ≈12
	Filling capacity of anticorrosion/antifreeze down to -37°C	Liters ≈6
	Filling capacity of anticorrosion/antifreeze down to -45°C	Liters ≈6.6
	Specifications for Operating Fluids	Sheet BB00.40-P-0310-01A
		Sheet BB00.40-P-0325-00A



Test cap



Vacuum-type cooling system filler