

Engine 157, 276, 278, 642 in model 292

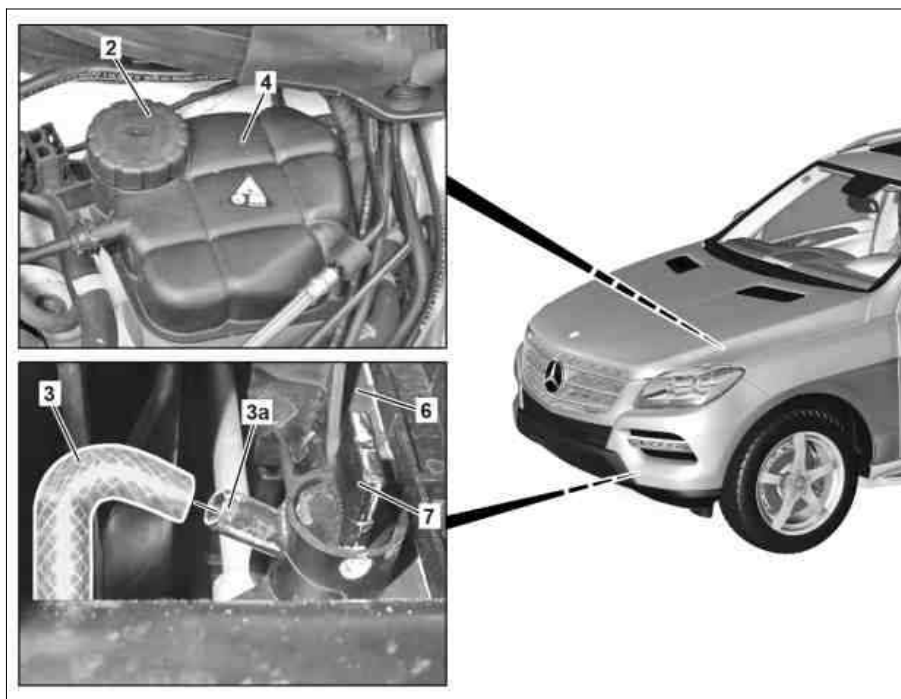
Engine 157, 276, 278, 642, 651 in model 166

Modification notes

15.04.2016	Work procedure completely revised.		
------------	------------------------------------	--	--

Shown on model 166 with engine 278

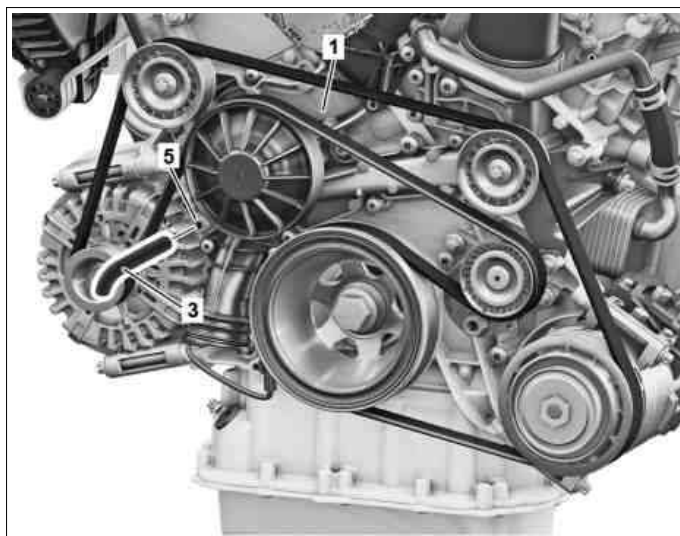
- 2 Cap
- 3 Drain hose
- 3a Fitting
- 4 Coolant expansion reservoir
- 6 Radiator
- 7 Drain valve



P20.00-2429-06

Engine 276

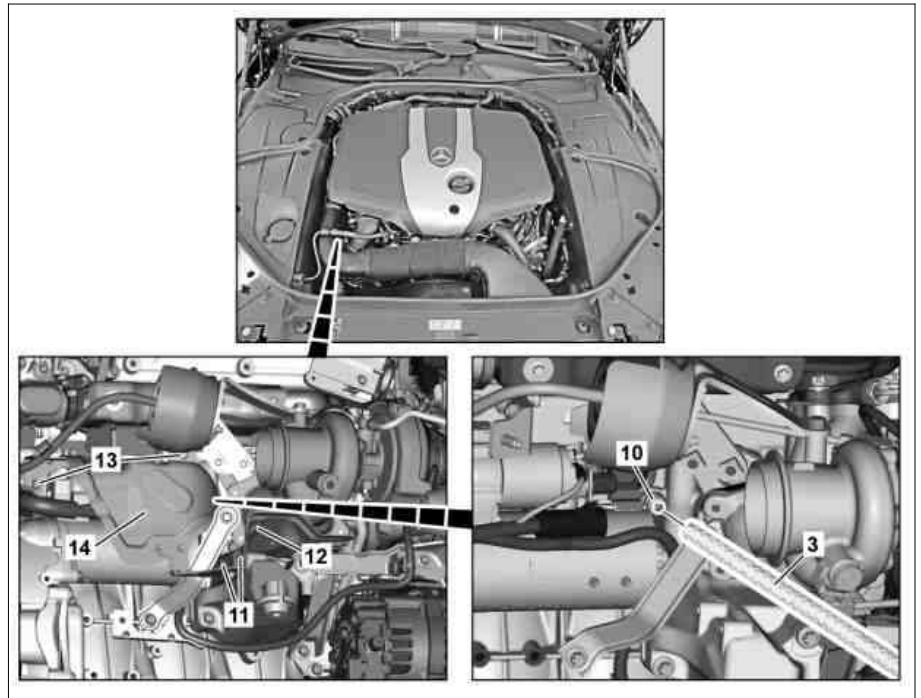
- 1 Coolant pump
- 3 Drain hose
- 5 Coolant pump drain screw





P20.00-2406-11

Shown on model 222 with engine 651

- 3 Drain hose
- 10 Crankcase drain screw
- 11 Bolts
- 12 Heat shield
- 13 Bolts
- 14 Heat shield



P20.00-2514-06

<p> Warning</p>	<p>Risk of injury to skin and eyes suffering scalding from contact with hot coolant spray. Risk of poisoning from swallowing coolant.</p>	<p>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.</p>	<p>AS20.00-Z-0001-01A</p>
	<p>Notes on coolant</p>		<p>AH20.00-N-2080-01A</p>
	<p>Notes on coolant level</p>		<p>AH20.00-P-1142-01CW</p>
	<p>Drain off</p>		
<p>1</p>	<p>Unscrew cap (2) on coolant expansion reservoir (4)</p>		
<p>2</p>	<p>Remove front and center underfloor paneling</p>		<p>AR61.30-P-1001GQ</p>
<p>3</p>	<p>Push drain hose (3) onto left fitting (3a) on radiator (6)</p>		
<p>4</p>	<p>Open drain valve (7) at radiator (6) and drain coolant</p>	<p> Observe regulations to dispose of coolant.</p>	
<p>5</p>	<p>Unfasten drain screw from coolant line to ATL and drain off coolant</p>	<p>Engine 157, 278 in model 166, 292</p>	
<p>6</p>	<p>Unfasten coolant pump drain screw (5) at coolant pump (1)</p>	<p>Engine 276 in model 166, 292</p>	
<p>7</p>	<p>Push drain hose (3) onto coolant pump drain screw (5)</p>	<p>Engine 276 in model 166, 292</p>	
<p>8</p>	<p>Open coolant pump drain screw (5) at coolant pump (1) and drain off coolant</p>	<p>Engine 276 in model 166, 292</p>	
<p>9</p>	<p>Remove catalytic converter DPF unit</p>	<p>Engine 651 in model 166</p>	<p>AR49.10-P-5501GQ</p>
<p>10</p>	<p>Unscrew screws (11) and remove heat shield (12)</p>	<p>Engine 651 in model 166</p>	
<p>11</p>	<p>Unscrew screws (13) and remove heat shield (14)</p>	<p>Engine 651 in model 166</p>	
<p>12</p>	<p>Unfasten crankcase drain screw (10)</p>	<p>Engine 651 in model 166</p>	
<p>13</p>	<p>Push drain hose (3) onto crankcase drain screw (10)</p>	<p>Engine 651 in model 166</p>	
<p>14</p>	<p>Open crankcase drain screw (10) and drain off coolant</p>	<p>Engine 651 in model 166</p>	
	<p>Pour in</p>		
<p>15</p>	<p>Close jiggle valve (7) on cooler (6) and detach drain hose (3) from fitting (3a)</p>		
<p>16</p>	<p>Fasten drain screw from coolant line to ATL</p>	<p>Engine 157, 278 in model 166, 292  Drain screw to coolant line</p>	<p>*BA09.40-P-1010-01R</p>
<p>17</p>	<p>Push drain hose (3) onto coolant pump drain screw (5)</p>	<p>Engine 276 in model 166, 292</p>	
<p>18</p>	<p>Tighten coolant pump drain screw (5) at coolant pump (1)</p>	<p>Engine 276 in model 166, 292  Drain screw on coolant pump</p>	<p>*BA20.10-P-1008-01AA</p>

19	Push drain hose (3) onto crankcase drain screw (10)	Engine 651 in model 166	
20	Tighten down crankcase drain screw (10)	Engine 651 in model 166 Coolant drain plug on crankcase	*BA20.00-P-1001-02A
21	Install heat shield (14)	Engine 651 in model 166 Heat shield on starter	*BA15.30-P-1004-01P
22	Install heat shield (12)	Engine 651 in model 166 Bolt, heat shield to engine support	*BA22.10-P-1003-02A
23	Install catalytic converter DPF unit	Engine 651 in model 166	AR49.10-P-5501GQ
24	Pour in coolant and bleed cooling system	Re-use clean coolant. Engine 157 in model 166 Engine 157 in model 292Cooling system Engine 651 in model 166Cooling system Engine 276 in model 166 except code ME05 (HYBRID DRIVE 80KW VARIANT (INCLUDING PLUGIN)) Engine 276 in model 166 with code ME05 (HYBRID DRIVE 80KW VARIANT (INCLUDING PLUGIN)) Engine 276 in model 292Cooling system Engine 278 in model 166 Engine 278 in model 292Cooling system Engine 642 in model 166 Engine 642 in model 292Cooling system Electric vacuum pump NTKL Adaption Test cap Cooler vacuum filling device	AR20.00-P-1142-04A *BF20.00-P-1001-02FA *BF20.00-P-1001-02AA *BF20.00-P-1001-02BA *BF20.00-P-1001-02EA *BF20.00-P-1001-02W *285589022100 *285589012100 *210589009100 *285589002100
	Check		
25	Check cooling system for leak tightness		AR20.00-P-1010GQ
Warning	Risk of accident from vehicle starting off by itself when engine running. Risk of injury (bruises and burns) resulting from working on the engine while it is being started or when it is running.	Secure vehicle to prevent it from starting off by itself. Wear closed and snug-fitting work clothes. Do not touch hot or rotating parts.	AS00.00-Z-0005-01A
26	Carry out engine test run and check the cooling system for proper operation and leaktightness		

Turbocharger

Number	Designation		Engine 157	Engine 278
BA09.40-P-1010-01R	Drain screw to coolant line	Stage 1	Nm	6
		Stage 2	∠°	90

Starter

Number	Designation		Engine 651
BA15.30-P-1004-01P	Heat shield on starter	Nm	9

Engine cooling, general

Number	Designation		Engine 651
BA20.00-P-1001-02A	Coolant drain plug on crankcase	Nm	12

Coolant pump, coolant thermostat

Number	Designation		Engine 276
BA20.10-P-1008-01AA	Drain screw on coolant pump	Stage 1	Nm
		Stage 2	∠°

 Engine support (engine side)

Number	Designation		Engine 651
BA22.10-P-1003-02A	Bolt, heat shield to engine support	Nm	9

 Cooling system

Number	Designation				Engine 651 in model 166
BF20.00-P-1001-02AA	Cooling system	Workshop replacement amount	Main circuit	Liter	≈ 10,0
			Low temperature circuit	Liter	-
		Antifreeze/water	Down to -37°C	%	50/50
			-38°C and below	%	55/45
			Specifications for Operating Fluids, sheet		BB00.40-P-0310-01 A
		Specifications for Operating Fluids, sheet		BB00.40-P-0325-00 A	
		Specifications for Operating Fluids, sheet		BB00.40-P-0326-00 A	

 Cooling system

Number	Designation				Engine 276 in model 166 except code ME05 (HYBRID DRIVE 80KW VARIANT (INCLUDING PLUGIN))	Engine 276 in model 166 with code ME05 (HYBRID DRIVE 80KW VARIANT (INCLUDING PLUGIN))
BF20.00-P-1001-02BA	Cooling system	Workshop replacement amount	Main circuit	l	≈ 10,5	≈ 9,7
			Low-temperature circuit	l	≈ 1,9	≈ 6,0
		Antifreeze/water	Up to -37°C	%	50/50	50/50
			As of -38 °C	%	55/45	55/45
			Specifications for Operating Fluids, sheet		BB00.40-P-0310-01A	BB00.40-P-0310-01 A
		Specifications for Operating Fluids, sheet		BB00.40-P-0325-00A	BB00.40-P-0325-00 A	
		Specifications for Operating Fluids, sheet		BB00.40-P-0326-00A	BB00.40-P-0326-00 A	

 Cooling system

Number	Designation				Engine 276 in model 292
BF20.00-P-1001-02BA	Cooling system	Workshop replacement amount	Main circuit	l	≈ 10,5
			Low-temperature circuit	l	≈ 1,9
		Antifreeze/water	Up to -37°C	%	50/50
			As of -38 °C	%	55/45
			Specifications for Operating Fluids, sheet		BB00.40-P-0310-01 A
		Specifications for Operating Fluids, sheet		BB00.40-P-0325-00 A	
		Specifications for Operating Fluids, sheet		BB00.40-P-0326-00 A	

 Cooling system

Number	Designation				Engine 278 in model 166	Engine 278 in model 292
BF20.00-P-1001-02EA	Cooling system	Workshop replacement quantity	Main circuit	Liter	≈ 11,4	≈ 11,4

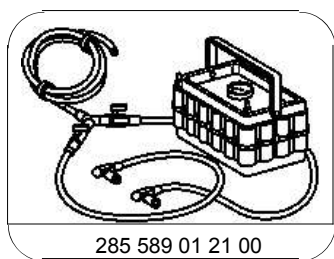
		Low temperature circuit	Liter	≈ 2,5	≈ 2,5
	Antifreeze/water	Up to -37 °C	%	50/50	50/50
		As of -38 °C	%	55/45	55/45
		Sheet		BB00.40-P-0310-01A	BB00.40-P-0310-01A
		Sheet		BB00.40-P-0325-00A	BB00.40-P-0325-00A
		Sheet		BB00.40-P-0326-00A	BB00.40-P-0326-00A

 Cooling system

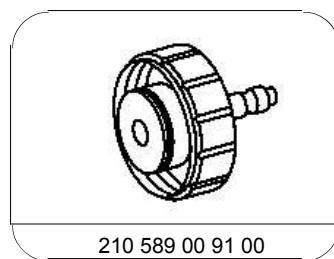
Number	Designation			Engine 157 in model 166	Engine 157 in model 292	
BF20.00-P-1001-02FA	Cooling system	Workshop change quantity	Main circuit	Liter	≈ 8	≈ 8
			Low-temperature circuit	Liter	≈ 2	≈ 2
		Antifreeze/water	Up to -37 °C	%	50/50	50/50
			As of -38 °C	%	55/45	55/45
			Sheet		BB00.40-P-0310-01A	BB00.40-P-0310-01A
			Sheet		BB00.40-P-0325-00A	BB00.40-P-0325-00A
			Sheet		BB00.40-P-0326-00A	BB00.40-P-0326-00A

 Cooling system

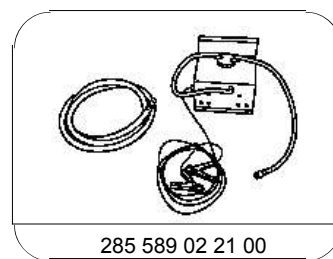
Number	Designation			Engine 642 in model 166	Engine 642 in model 292	
BF20.00-P-1001-02W	Cooling system	Workshop replacement amount	Main circuit	l	≈ 11,5	≈ 11,5
			Low-temperature circuit	l	-	-
		Antifreeze/water	Down to -37 °C	%	50/50	50/50
			-38 °C and below	%	55/45	55/45
			Sheet		BB00.40-P-0310-01A	BB00.40-P-0310-01A
			Sheet		BB00.40-P-0325-00A	BB00.40-P-0325-06A
			Sheet		BB00.40-P-0326-00A	BB00.40-P-0326-06A



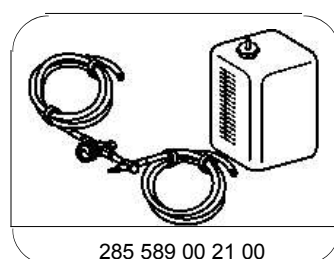
NTKL Adaption



Test cap



Electric vacuum pump



Cooler vacuum filling device