ENGINE

Engine timing - 230 Chassis

GENERAL INFORMATION

GENERAL NOTES ON TIMING, MARKINGS - AH05.10-P-1000-01A

Engine 112, 113

Shown on engine 112

1 Copper plates
2 Groove in the crankshaft
3 Marking on balance shaft sprocket engine 112
3 Marking on the guide wheel for engine 113
4 Scribe mark on right-hand camshaft sprocket
5 Scribe mark on left-hand camshaft sprocket
6 Grooves in the camshaft

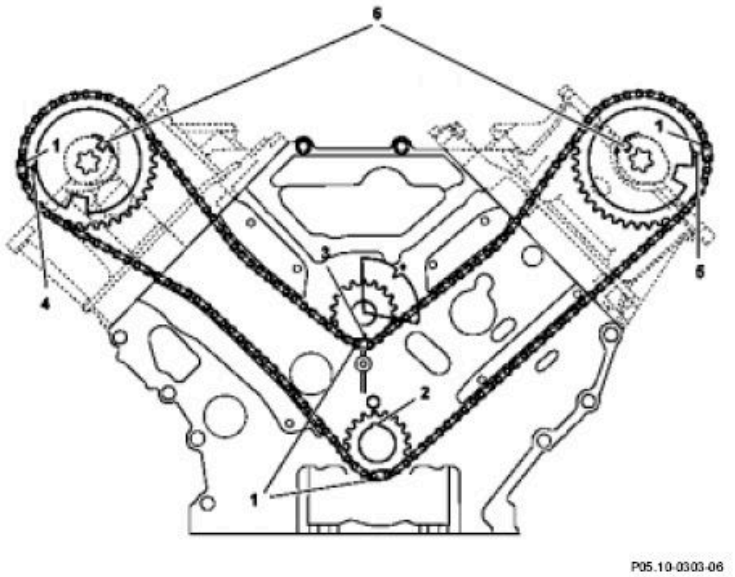


Fig. 1: Identifying Timing, Markings - Shown On Engine 112
Courtesy of MERCEDES-BENZ USA

GF The four copper plates for the timing chain facilitate assembly when putting on timing chain. Every copper plate (1) must coincide with one of the markings.

GF Due to unequal length of timing chain paths, the engine must be cranked up to 14 times until the copper plates are matched again with the markings.

CAMSHAFT CODE NUMBER AND ASSIGNMENT - AH05.20-N-0100-01A

Engine 111, 112, 113

Inspection data of camshaft code numbers

Number	Designation		Engine 111.948	Engine 111.978
BE05.20-N-1001-01A	Camshaft code numbers	Intake	16	16
		Exhaust	24	17

BE05.20-N-1002-01A	Camshaft code numbers repair camshaft	Intake	19	19
		Exhaust	25	20

Inspection data for camshaft code numbers

Number	Designation	Engines 113.940// 941/942943	Engine 113.944	Engine 113.960 with code 479	Engine 113.960 without Code 479
BE05.20-P-1001-01G	Left camshaft code number	04/28/34/52	41	32	06/10/29/36/54
BE05.20-P-1002-01G	Right camshaft code number	05/30/35/53	40	33	07/11/31/37/55

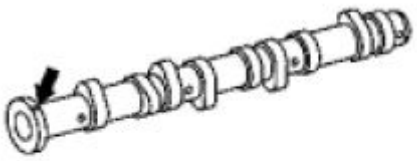
Inspection data for camshaft code numbers

Number	Designation	Engines 113.961/962/963	Engines 113.980/981/984	Engine 113.987/988/989/990/991
BE05.20-P-1001-01G	Left camshaft code number	06/10/29/36/54	39	61
BE05.20-P-1002-01G	Right camshaft code number	07/11/31/37/55	38	60

Engine 112, 113

GF The camshaft code number is located at the flange for the camshaft sprockets (arrow).

Shown on camshaft for engine 112.



P05.20-0304-01

Fig. 2: Locating Camshaft Code Number - Shown On Camshaft For Engine 112
Courtesy of MERCEDES-BENZ USA

SLACKENING AND TIGHTENING INSTRUCTIONS FOR THE CAMSHAFT BEARING CAPS - AH05.20-P-0300-01A

Engine 275

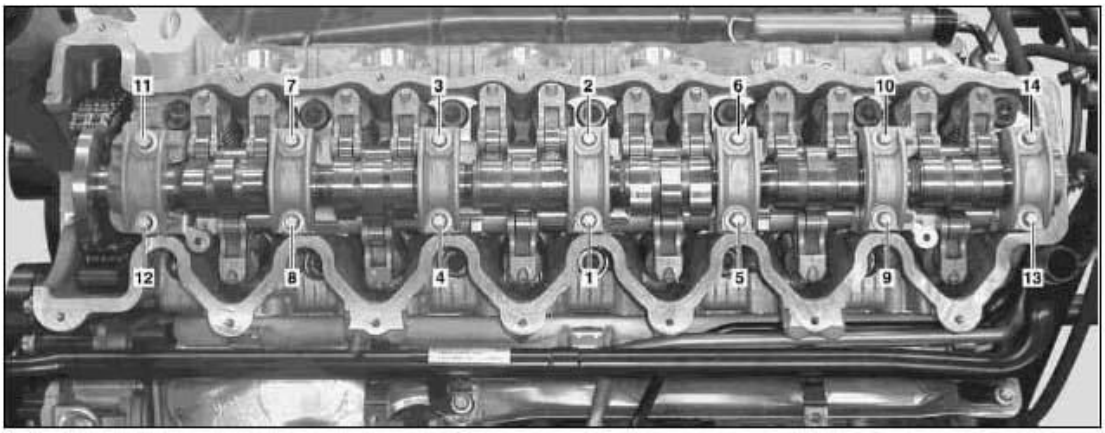


Fig. 3: Identifying Camshaft Bearing Caps Bolts Tightening Sequence - Left Cylinder Head
Courtesy of MERCEDES-BENZ USA

Tightening instructions for left cylinder head

1. Tighten screws according to the specified sequence.

   GF At the same time the bearing caps must not tilt.

Slackening instructions for left cylinder head

GF The slackening of the screws is performed in the reverse order.

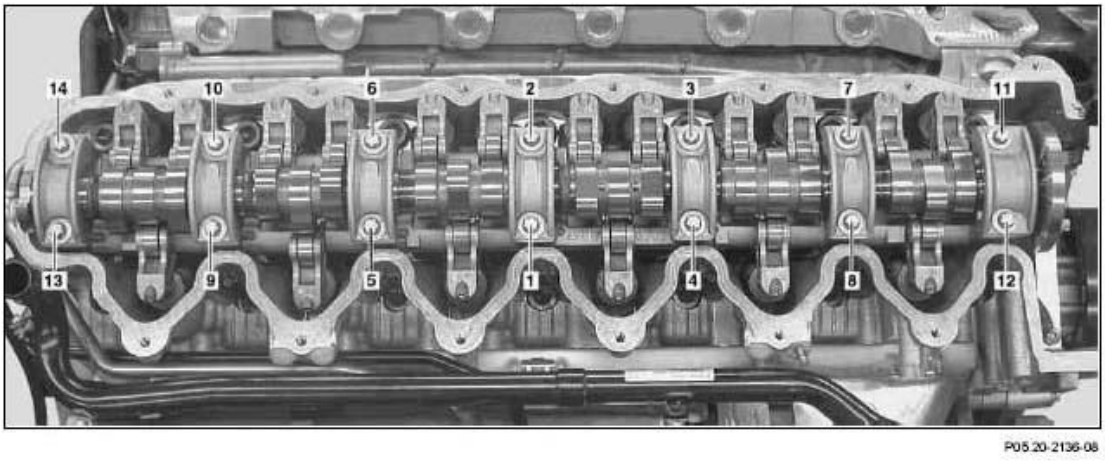


Fig. 4: Identifying Camshaft Bearing Caps Bolts Tightening Sequence - Right Cylinder Head
Courtesy of MERCEDES-BENZ USA

Tightening instructions for right cylinder head

1. Tighten screws according to the specified sequence.

GF At the same time the bearing caps must not tilt.

Slackening instructions for right cylinder head

GF The slackening of the screws is performed in the reverse order.

NOTES ON INSTALLING CAMSHAFT BEARING BRIDGE - AH05.20-P-2000-01AV

Engines 112, 113 except 113.960, 113.960 except cylinder shutoff codes 479, 113.962/982/993, 112.951/976

i Pay attention to the following notes before installing the camshaft bearing bridges:

- Lubricate the camshaft bearings.
- Due to tolerance reasons, the camshafts must not be replaced individually.
- If the camshaft bearing bridge is damaged, replace the cylinder head complete with the camshaft bearing bridge.
- It not permitted to reuse the bolts M7X84; these must always be replaced.
- Pay attention to tightening torque, slackening diagram and tightening diagram of the bolts M7x84.

Shown on engine 112

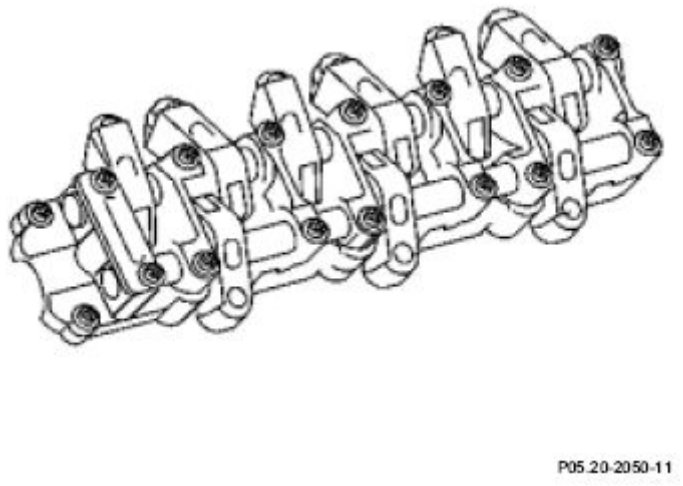


Fig. 5: Identifying Camshaft Bearings Bridge Bolts
Courtesy of MERCEDES-BENZ USA

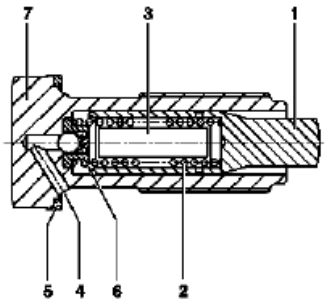
BASIC KNOWLEDGE

DESIGN OF CHAIN TENSIONER - GF05.10-P-7801-01A

Engines 112, 113

Shown on engine 112

1 Thrust pin
2 Compression spring
3 Filler pin
4 Feed oil gallery
5 Seal
6 Valve assembly
7 Housing



P05.10-0286-02

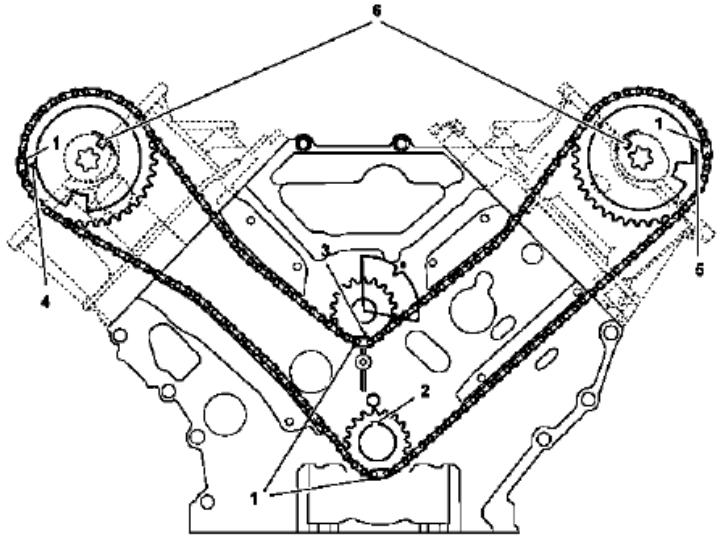
Fig. 6: Identifying Design Of Chain Tensioner - Engines 112, 113
Courtesy of MERCEDES-BENZ USA

TIMING CHAIN DRIVE, GENERAL - GF05.10-P-9611-01C

Engine 112, 113

Shown on engine 112

1 Copper-plated lug
2 Groove in crankshaft
3 Marking at balancing shaft sprocket engine 112
3 Marking at guide sprocket engine 113
4 Marking at right camshaft sprocket
5 Marking at left camshaft sprocket
6 Groove in camshaft



P05.10-0303-06

Fig. 7: Identifying Timing, Markings - Shown On Engine 112
Courtesy of MERCEDES-BENZ USA

Engine timing

The basic setting is 40° after TDC.

At 40° after TDC the grooves (6) in the left and right camshafts point in the direction of the inner V and are