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Kleemann M113 Camshafts Installation Manual

Rev 280213

Installation Manual Kleemann M113 Camshafts

This instruction manual provides a step by step process for installing the Kleemann Camshafts. It is recommended that you read the instruction manual completely before starting the installation of the Kleemann Camshafts gain an overview of the entire process. If questions arise during the installation, you are welcome to contact us directly. We are ready to provide answers and assistance. It is essential for all involved that the installation is done correctly, the car performs flawlessly and the customer is satisfied.

This manual is shown on a W203 C55 AMG. This procedure may vary slightly from chassis to chassis.
These instructions are intended as a guide only- they are in no way a substitute for professional installation.
Kleemann USA and Kleemann A/S are not responsible for failure to follow these instructions, or any damage resulting from improper installation.
The Kleemann warranty is only valid when installation is performed by an authorized Kleemann agent.

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Pre-installation

Before beginning the procedure, please make sure you have the following tools.

Mercedes-Benz Factory Camshaft Tools:

1. A112.589.01.32-Left Side Cam Locating Tool
2. A112.589.00.32-Right Side Cam Locating Tool
3. A112.589.01.03-E18 Wrench
4. A210.589.01.16-Ratchet Adapter

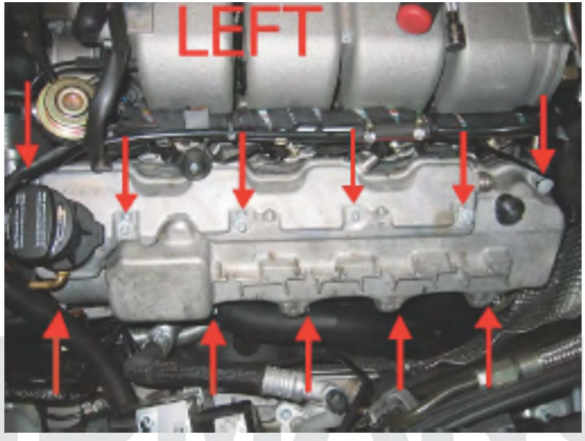
These tools are available for special order Directly from your dealership and are required for proper installation of the Kleemann Cams.

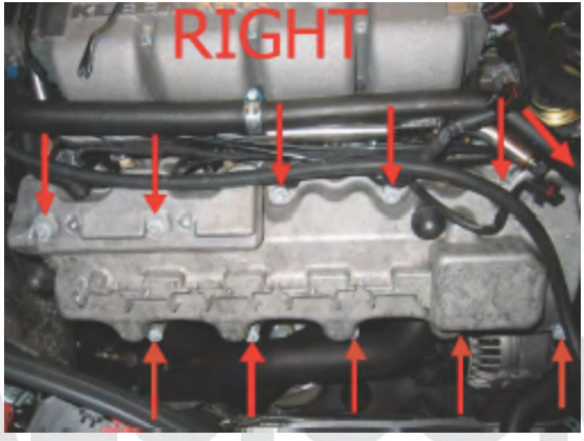
1. Begin by cleaning engine bay, paying close attention to the areas around each valve cover and disconnect the negative battery cable.

2. Remove the following: Air box, Coil packs, Electric cooling fan, drive belt

3. Disconnect the fuel line from the fuel rail, and disconnect any breather tubes from the valve cover.

4. Remove both Alternator bolts and move the alternator back (as show in photo)

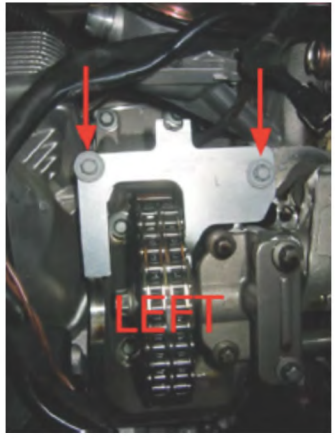


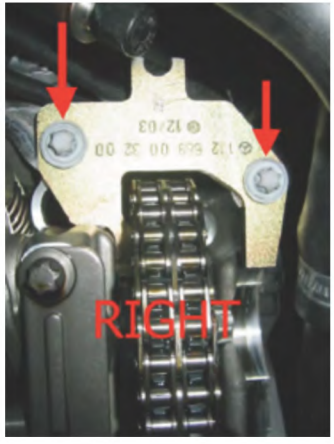


5. Remove the left and right side valve covers (above)

6. Set the engine at 40 degrees AFTER TDC (Shown Below). It is imperative that the key wayon the left and right camshafts are facing towards the "V" of the engine. Always rotate the engine in the clockwise direction only!!!!

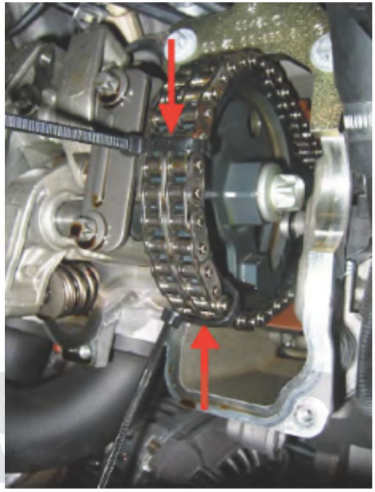
7. Remove the camshaft sensor from the right cylinder head (shown above).





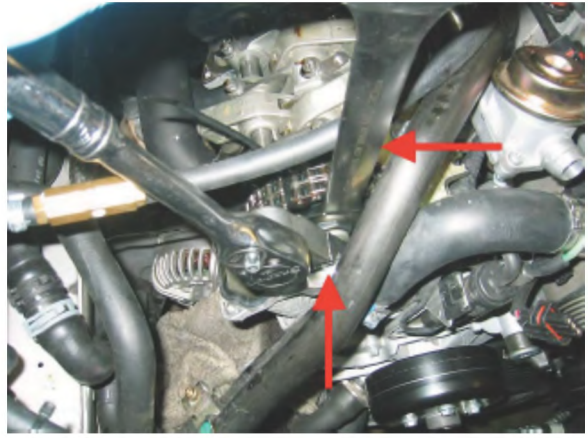
8. Insert the factory MBZ camshaft locating tools (as shown above).
You can use 4 short bolts from the valve cover to hold the locating tools in place.
Make sure the finger on the tools can easily be inserted into the keyway on the camshaft.
If not, the engine is not set to 40 degrees ATDC- Reset the engine to 40 ATDC and repeat until the tool "falls" into place easily. Tighten the bolts (red arrows) to 8 NM of torque.

9. Secure the timing chain to the cam gear (left and right) with zip ties as shown below.
This will prevent the timing chain from skipping teeth on the cam gears.



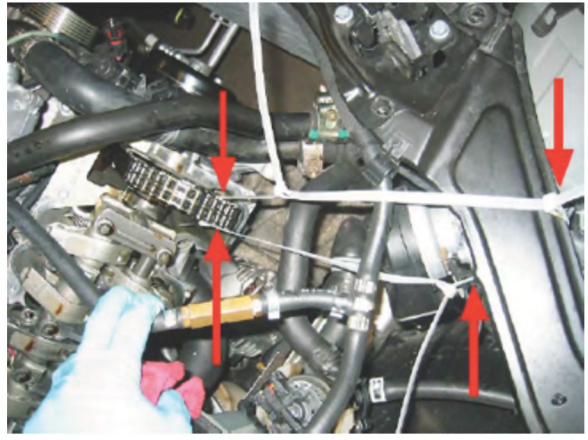
10. Remove the chain tensioner as show to the right.
The tensioner is located on the front cover, behind the alternator.

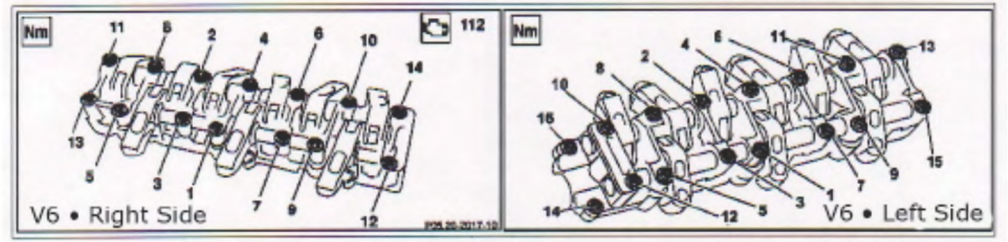
11. Remove the camshaft bolts (left and right) using the special E18 wrench Use a 27mm open end wrench to hold the cam gear while removing the cam bolt (picture).



Do not use the camshaft locating tool to hold the camshaft stationary while removing the cam bolt!!!

12. To ensure the timing chain does not skip, tie the cam gear to the front clip of the vehicle with releasable zip ties (show below). Make sure there is no slack in the timing chain when tying the gear to the front clip;
- read: adjust the zip ties rightly.





13. Remove the camshaft bearing bridge.

VERY IMPORTANT!

Loosen the camshaft bearing bridge bolts in stages, in the reverse order of the tightening sequence below. On the left side, start with 20, moving to 19, 18, 17 etc. The right side starts at 18, moving to 17, 16, etc. to loosen. It is not necessary to remove the bolts from the bearing bridge completely - loosen the bolts and leave them in their original position.

14. Remove the camshaft bearing bridge and set aside.

15. Remove the MBZ camshaft locating tools.

16. Remove the left and right side camshafts. Keep in mind, these are hollow camshafts, so oil will be present inside the camshaft, which will quickly leak out as soon as you remove the camshaft.

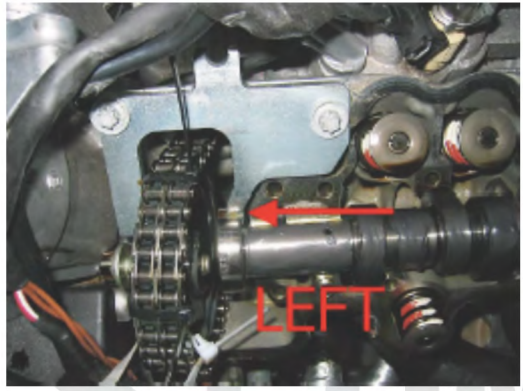
17. Remove the Kleemann Camshafts from their packaging.

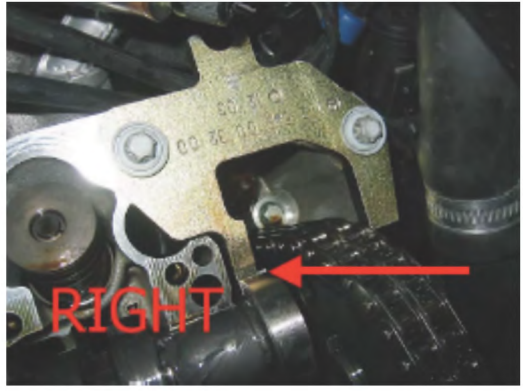
VERY IMPORTANT!

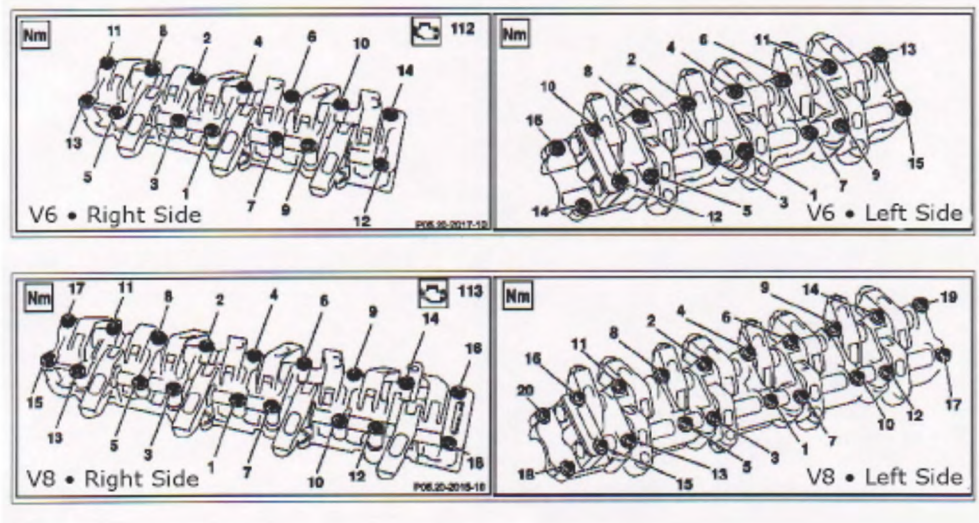
Use assembly lubricant prior to installing the Kleemann Camshafts into to cylinder heads. (Show on photo).

18. Install the Kleemann Camshafts as show below. Make sure each camshaft is installed on the proper side of the car. Take great care to avoid damaging the Kleemann Camshafts and the bearing surfaces inside the cylinder head. Make sure the camshaft keyways face towards the “V” of the engine.

19. Re-install the MBZ Camshaft locating tools (shown below)







20. Re-install the camshaft bearing bridge (left and right). The diagram below shows the proper torque sequence.

Torque specs are as follows.

M7X45 1st stage: 15 NM
M7X84 1st stage: 10 NM 2nd stage: +90 degrees

NOTE: Use upper most diagram for M112 V6 engines and lower diagram for M113 V8 engines.

21. Re-install the camshaft sprockets left and right. Use the following torque spec.:

IMPORTANT!
MAKE SURE THE KEYWAY ON THE CAMSHAFT IS ALIGNED PROPERLY WITH THE KEY ON THE CAMSHAFT SPROCKET!! IT IS IMPORTANT THAT THE CAM SPROCKET IS FULLY SEATED AGAINST THE CAMSHAFT BEFORE APPLYING TORQUE!!

Camshaft Sprocket Bolt: 1st. stage: 50NM 2nd Stage: + 90 degrees

NOTE: When using the MBZ special E18 wrench with socket adapter, keep in mind you are increasing the length of your torque wrench, which in turn increases the amount of torque you have set for your torque wrench. When using the special tool, reduce the setting on
your torque wrench to 44 NM. DO NOT use the camshaft locating tool to hold the camshaft stationary while you torque the cam bolt, or you will damage the camshaft and the special tool. After torquing is complete, remove the camshaft locating tools.

22. Re-install the timing chain tensioner as show to the right.

Chain Tensioner Torque: 80 NM

23. Before removing the zip ties from the camshaft sprocket, double check all your work. Once you have confirmed everything is torqued to spec, and the camshafts are installed properly, remove the zip ties from the camshaft sprockets.

24. Before installing the valve covers, rotate the engine two full turns, listening carefully for any signs of valve clearance problems. If the engine becomes "stuck" at any point in the rotation, re-check all your work. Once you have rotated the engine twice, reset it to
40 degrees AFTER TDC. Re-install the MBZ camshaft locating tools and make sure they can be installed easily, without needing to turn the engine.
Both tools should be installed at the same time. This procedure ensures the camshaft timing is correct. If you find any problems, re-check all your work.

25. Re-install the valve covers. Make sure the valve cover gasket is properly installed.
Valve Cover Torque: 10mm

26. Re-install the alternator, coil packs, electric cooling fan, drive belt, cam sensor and air box.

27. Once you have all parts re-installed correctly, verify proper oil level, then start the car. If you hear any strange noises (metal against metal, knocking, etc.), immediately turn the car off and re-check all your work. You will notice once warm, the car will have a slightly "lumpy" idle- this is normal due to the lift and duration of the Kleemann Camshafts.