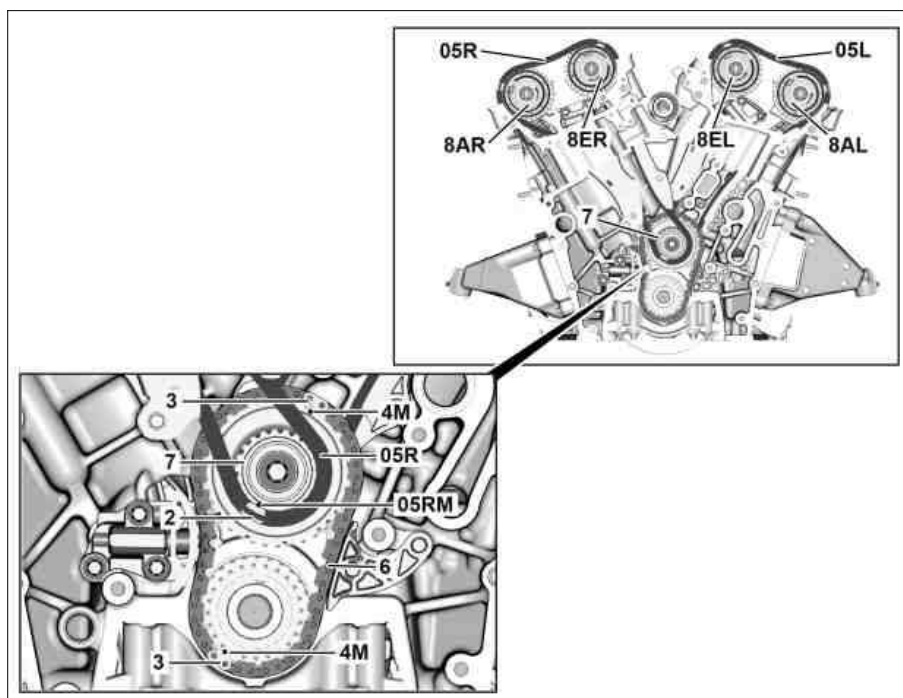
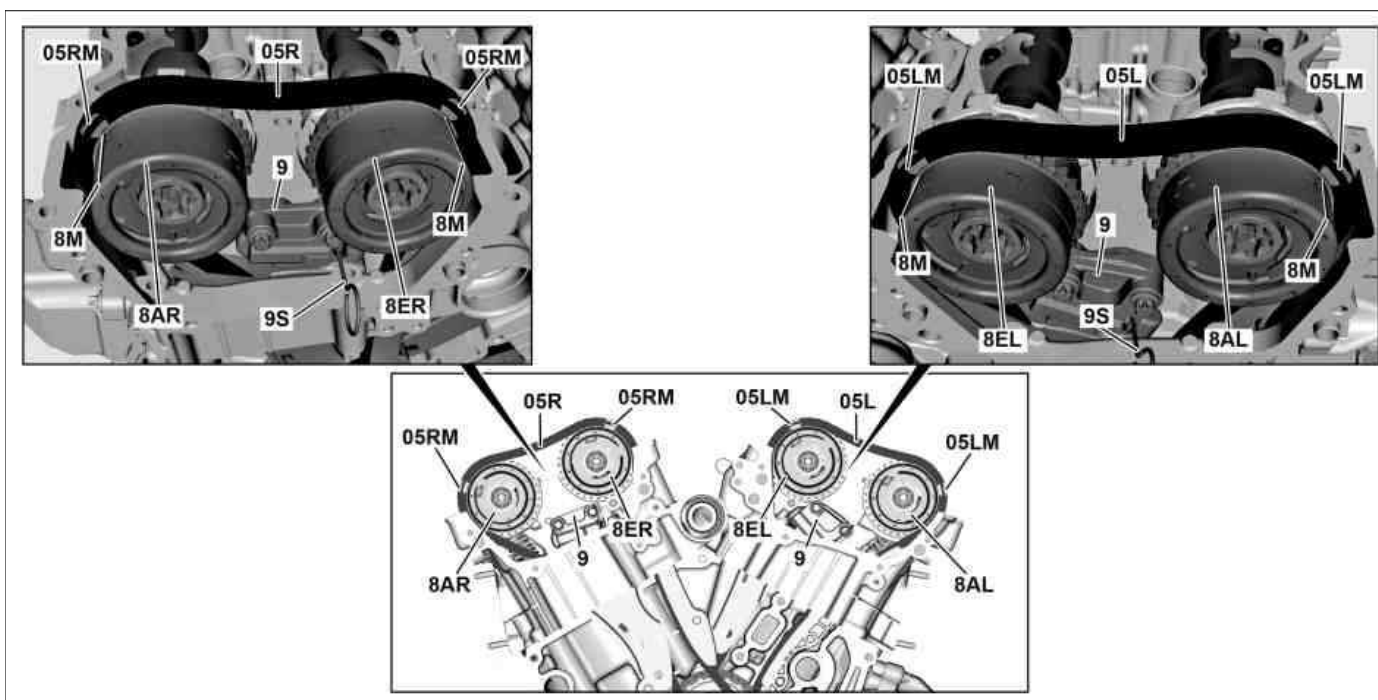


Engine 157, 278 in model 216, 221

- 05L Left secondary chain
- 05R Right secondary chain
- 3 Primary chain markings
- 4M Punch marks
- 6 Primary chain drive timing chain
- 7 Intermediate gear
- 8AR Right exhaust camshaft adjuster
- 8EL Left intake camshaft adjuster



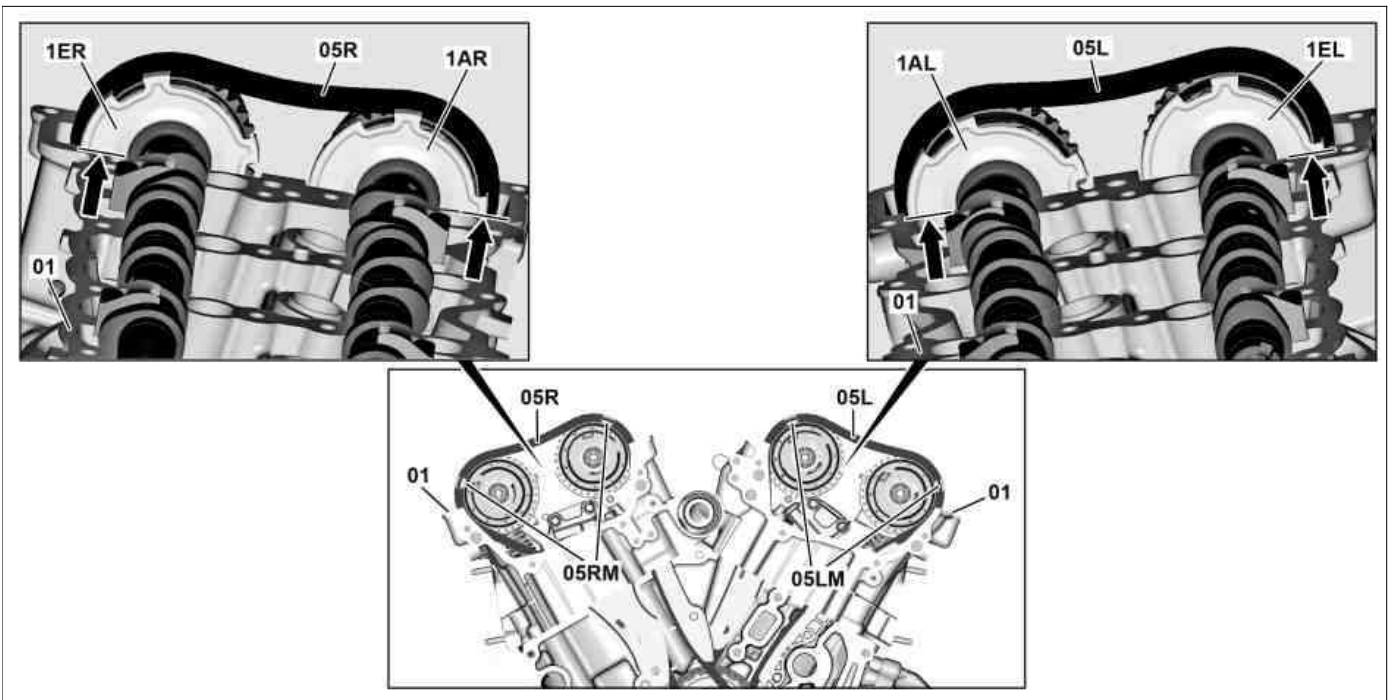
P05.10-2473-06



P05.10-2474-09

- 05L Left secondary chain
- 05R Right secondary chain















- 8AR Right exhaust camshaft adjuster
- 8EL Left intake camshaft adjuster




P05.10-2475-09

- | | | | | | |
|-----|--------------------------------|-----|---|-----|--|
| 01 | Cylinder head contact surfaces | 1AL | Segmented disc for left exhaust camshaft | 1ER | Segmented disc for right intake camshaft |
| 05L | Left secondary chain | 1AR | Segmented disc for right exhaust camshaft | | |
| 05R | Right secondary chain | 1EL | Segmented disc for left intake camshaft | | |

| | | | |
|-----------|--|---|--|
| ⚠ Caution | Risk of injury to skin and eyes due to handling of engine oil. Risk of poisoning caused by swallowing engine oil | Wear protective gloves, protective clothing and safety glasses. Do not fill engine oil into beverage containers. | AS18.00-Z-0001-01A |
| ⚠ Caution | Risk of injury caused by scraping or cutting body parts on sharp vehicle parts | Always wear protective gloves when working on or near sharp and non-deburred vehicle parts. Deburr repair panels. | AS00.00-Z-0017-01A |
| ⚠ Warning | Risk of injury. Moving parts can pinch, crush or, in extreme cases even sever extremities. | No parts of the body or limbs should be within the operating area of mechanical components when moving components. | AS00.00-Z-0009-01A |
| ⚠ Warning | Risk of injury. Skin or eye injuries may result when handling hot or glowing objects. | Wear protective gloves, protective clothing and safety glasses, if necessary. | AS00.00-Z-0002-01A |
| | Notes on avoiding damage through contamination and foreign objects | | AH00.00-P-5000-01A |
| 🔧 🛠 | Remove/install | | |
| 1 | Remove cylinder head covers | Left cylinder head cover Engine 157, 278 in model 216, 221 Right cylinder head cover Engine 157, 278 in model 216, 221 i Installation: Before installing the cylinder head covers, check the engine timing and correct if necessary. | AR01.20-P-5013MMB AR01.20-P-5012MMB |
| 2 | Remove timing case cover | i Installation: Before installing the timing case cover, check the engine timing and correct if necessary. | AR01.40-P-8000MMB |
| 3.1 | Remove camshafts | For missing color codings on the segmented discs (1AL, 1AR, 1EL, 1ER). | AR05.20-P-6992MM |
| 3.2 | Remove right exhaust camshaft adjuster (8AR) and left intake camshaft adjuster (8EL) | For existing color codings on the segmented discs (1AL, 1AR, 1EL, 1ER). | AR05.20-P-7201MMB |

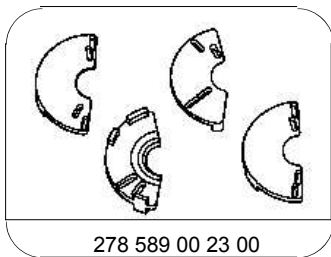
| | | | |
|--|--|--|--|
| 4 | Mark segmented discs (1AL, 1AR, 1EL, 1ER) of the camshaft for the cylinder head contact surfaces (01) in color (arrows) | For missing color codings on the segmented discs (1AL, 1AR, 1EL, 1ER).  Template | AR05.20-P-6292-04MM *278589002300 |
| 5 | Remove oil pump | | AR18.10-P-6020MM |
| 6 | Remove chain tensioner for primary chain drive timing chain (6) |  Installation: Replace chain tensioner for primary chain drive timing chain (6).  Screw/bolt, chain tensioner to cylinder crankcase/cylinder head | *BA05.10-P-1001-01R |
| 7.1 | Remove both cylinder heads | When replacing primary chain drive timing chain (6), left secondary chain (05L) and right secondary chain (05R) with slide and tensioning rails. Left cylinder head Engine 157, 278 in model 216, 221 Right cylinder head Engine 157, 278 in model 216, 221 | AR01.30-P-5770MMB AR01.30-P-5780MMB |
| 7.2 | Disconnect left secondary chain (05L) and right secondary chain (05R) | When replacing the left secondary chain (05L) and right secondary chain (05R) without slide and tensioning rails. Engine 278 in model 216, 221  With timing chain stretch, replace the left secondary chain (05L), the right secondary chain (05R) and the primary chain drive timing chain (6). | AR05.10-P-7601MM |
| 8 | Remove right secondary chain (05R) from intermediate gear (7) | | |
| 9 | Remove screw/bolt for intermediate gear (7) on cylinder crankcase |  Installation: Replace screw/bolt.  Screw/bolt, journal for intermediate gear to cylinder crankcase | *BA05.10-P-1004-01R |
| 10 | Remove the intermediate gear (7) together with the crankshaft gear, primary chain drive timing chain (6) and left secondary chain (05L) |  Installation: Mount the primary chain drive timing chain (6) in such a way that the primary chain markings, (3) and the punch marks (4M) on the intermediate gear (7) and crankshaft gear match. Engine damage will occur otherwise.  Installation: Install the intermediate gear (7) together with the primary chain drive timing chain (6) and left secondary chain (05L).  A new primary chain drive timing chain (6), the left secondary chain (05L) and right secondary chain (05R) are optionally delivered with color codings or copper links.  Installation: Replace intermediate gear (7) with journals. | |
| 11 | Install in the reverse order | | |
|  | Check | | |
| 12 | Check basic position of camshafts |  Before installing the cylinder head covers and timing case cover, check the engine timing and correct if necessary. | AR05.20-P-6010MM |
|  Warning | Risk of burn injuries , suffocation and poisoning when working on the exhaust system and the components connected to it. Risk of suffocation and risk of poisoning caused by inhalation of gaseous and solid components of the exhaust. Risk of poisoning caused by skin contact with solid components of the exhaust. | Wear protective clothing and safety glasses. Use the extraction system. Move people out of the hazard area. | AS49.00-Z-0001-01A |
|  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 |
| 13 | Carry out an engine test run, checking the engine for proper operation and leaktightness | | |

 Timing chain, chain tensioner

| Number | Designation | | Engine 157 | Engine 278 |
|--------------------|---|----|------------|------------|
| BA05.10-P-1001-01R | Screw/bolt, chain tensioner to cylinder crankcase/cylinder head | Nm | 9 | 9 |

Nm Timing chain, chain tensioner

| Number | Designation | | | Engine 157 | Engine 278 |
|--------------------|---|-----|----|------------|------------|
| BA05.10-P-1004-01R | Screw/bolt, journal for intermediate gear to cylinder crankcase | M10 | Nm | 55 | 55 |



Template