



**PI 2073**

For technical personnel only!

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# PRODUCT INFORMATION

## CONTROL VALVES AND CENTRAL MAGNETS FOR CAMSHAFT ADJUSTMENT

FOR ALMOST 110 MILLION VEHICLES



HIGH-GRADE OE QUALITY

MODERN PRODUCTION PROCESSES

MOTORSERVICE QUALITY STANDARDS

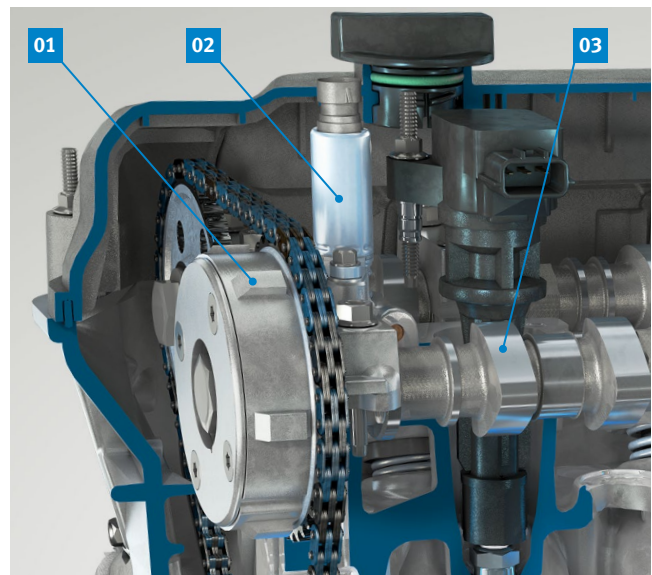
Camshaft adjustment is an established method of emission control. Depending on the engine speed, control valves (02) guide the flow of oil through different oil channels to the relevant chambers in the hydraulic camshaft adjuster (01).

As a result, the camshaft (03) is turned relative to the camshaft gear and the valve timing, i.e. the opening and closing points of the intake and exhaust valves, is changed.

The effects of this include:

- Improved operating behaviour under part load and full load
- Reduced fuel consumption
- Internal exhaust gas recirculation
- Dethrottling of the engine
- Reduced pollutant emissions

You will find a list of the products currently available for delivery on the following pages. The range is continually being expanded.





## RANGE OF CONTROL VALVES AND CENTRAL MAGNETS

| Manufacturer | Potential <sup>1)</sup><br>[million] | Pierburg no. | Example / Vehicles |                                                                                                |
|--------------|--------------------------------------|--------------|--------------------|------------------------------------------------------------------------------------------------|
| BMW          | 8.3                                  | 7.06117.36.0 | Alpina             | B6, B7                                                                                         |
|              |                                      |              | BMW                | 1, 2, 3, 4, 5, 6, 7 Series, X1, X3, X4, X5, X6                                                 |
|              |                                      |              | Rolls-Royce        | Cullinan, Dawn, Ghost, Phantom, Wraith                                                         |
|              |                                      | 7.06117.00.0 |                    |                                                                                                |
|              |                                      | 7.06117.01.0 |                    |                                                                                                |
|              |                                      | 7.06117.02.0 |                    |                                                                                                |
|              |                                      | 7.06117.10.0 |                    |                                                                                                |
|              |                                      | 7.06117.58.0 |                    |                                                                                                |
| FCA          | 7.2                                  | 7.06117.38.0 | Alfa Romeo         | Giulietta, Mito, Spider, 159, 4C                                                               |
|              |                                      |              | Fiat               | Doblo, Fiorino, Idea, Linea, Palio, Panda, Punto, Qubo, Sienna, 500                            |
|              |                                      |              | Ford               | Ka                                                                                             |
|              |                                      |              | Lancia             | Delta, Musa, Ypsilon                                                                           |
|              |                                      | 7.06117.35.0 |                    |                                                                                                |
| Ford         | 19                                   | 7.06117.31.0 | Ford               | B Max, C Max, Fiesta, Focus, Galaxy, Ka, Kuga, Mondeo, S Max, Tourneo Connect, Transit Connect |
|              |                                      | 7.06117.12.0 |                    |                                                                                                |
|              |                                      | 7.06117.32.0 |                    |                                                                                                |
|              |                                      | 7.06117.33.0 |                    |                                                                                                |
|              |                                      | 7.06117.52.0 |                    |                                                                                                |
|              |                                      | 7.06117.53.0 |                    |                                                                                                |
|              |                                      | 7.06117.55.0 |                    |                                                                                                |
| GM           | 30.5                                 | 7.06117.06.0 | Buick              | La Crosse, Regal, Verano                                                                       |
|              |                                      |              | Chevrolet          | Captiva, Cobalt, Equinox, HHR, Malibu                                                          |
|              |                                      |              | GMC                | Terrain                                                                                        |
|              |                                      |              | Opel               | Antara, Astra, GT, Insignia                                                                    |
|              |                                      |              | Pontiac            | G5, G6, Pursuit, Solstice                                                                      |
|              |                                      |              | Saab               | 9-3, 9-5                                                                                       |
|              |                                      |              | Saturn             | Aura, Ion, Sky, Vue                                                                            |
|              |                                      |              | Vauxhall           | Antara, Astra, Insignia                                                                        |
|              |                                      | 7.06117.03.0 |                    |                                                                                                |
|              |                                      | 7.06117.04.0 |                    |                                                                                                |
|              |                                      | 7.06117.05.0 |                    |                                                                                                |
|              |                                      | 7.06117.07.0 |                    |                                                                                                |
|              |                                      | 7.06117.08.0 |                    |                                                                                                |
|              |                                      | 7.06117.56.0 |                    |                                                                                                |
|              |                                      | 7.06117.57.0 |                    |                                                                                                |

1) Vehicle fleet or number of vehicles covered

All content including pictures and diagrams is subject to change. For assignment and replacement, refer to the current catalogues or systems based on TecAlliance.

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| Manufacturer   | Potential <sup>1)</sup><br>[million] | Pierburg no. | Example /Vehicles |                                                                                                          |
|----------------|--------------------------------------|--------------|-------------------|----------------------------------------------------------------------------------------------------------|
| Mercedes-Benz  | 4.6                                  | 7.06117.60.0 | Mercedes-Benz     | C, E, G, R, S Class, CL, CLK, CLS, GL, GLK, ML, SL, SLK, Sprinter, Viano, Vito                           |
|                |                                      | 7.06117.20.0 |                   |                                                                                                          |
|                |                                      | 7.06117.21.0 |                   |                                                                                                          |
|                |                                      | 7.06117.24.0 |                   |                                                                                                          |
| Nissan-Renault | 2.8                                  | 7.06117.39.0 | Renault           | Clio, Fluence, Scenic, Laguna, Megane, Modus, Twingo, Wind                                               |
|                |                                      | 7.06117.14.0 |                   |                                                                                                          |
|                |                                      | 7.06117.15.0 |                   |                                                                                                          |
| PSA            | 6.9                                  | 7.06117.45.0 | Citroën           | Berlingo, C-Elysee, C3, C3 Aircross, C3 Picasso, C4, C4 Cactus, C4 Picasso, C5, C5 Aircross, Spacetourer |
|                |                                      |              | DS                | DS3, DS4, DS5, DS7                                                                                       |
|                |                                      |              | Opel              | Crossland X, Grandland X                                                                                 |
|                |                                      |              | Peugeot           | Partner, RCZ, 207, 208, 2008, 301, 308, 3008, 508, 5008                                                  |
|                |                                      |              | Vauxhall          | Crossland X, Grandland X                                                                                 |
|                |                                      | 7.06117.34.0 |                   |                                                                                                          |
| Subaru         | 3.7                                  | 7.06117.59.0 | Scion             | FR-S                                                                                                     |
|                |                                      |              | Subaru            | BRZ, Forester, Impreza, Legacy, Levorg, Outback, WRX                                                     |
|                |                                      |              | Toyota            | GT86                                                                                                     |
|                |                                      | 7.06117.41.0 |                   |                                                                                                          |
| VAG            | 24.6                                 | 7.06117.47.0 | Audi              | A3, A4, A5, A6, A7, A8, Q3, Q5, Q7, TT                                                                   |
|                |                                      |              | Porsche           | Cayenne                                                                                                  |
|                |                                      |              | Volkswagen        | Touareg                                                                                                  |
|                |                                      | 7.06117.26.0 |                   |                                                                                                          |
|                |                                      | 7.06117.37.0 |                   |                                                                                                          |
|                |                                      | 7.06117.42.0 |                   |                                                                                                          |
|                |                                      | 7.06117.43.0 |                   |                                                                                                          |
|                |                                      | 7.06117.44.0 |                   |                                                                                                          |
|                |                                      | 7.06117.46.0 |                   |                                                                                                          |
|                |                                      | 7.06117.48.0 |                   |                                                                                                          |
|                |                                      | 7.06117.54.0 |                   |                                                                                                          |
| Volvo          | 0.7                                  | 7.06117.18.0 | Land Rover        | Freelander                                                                                               |
|                |                                      |              | Volvo             | S60, S80, V60, V70, XC60, XC70, XC90                                                                     |
|                |                                      | 7.06117.16.0 |                   |                                                                                                          |
|                |                                      | 7.06117.17.0 |                   |                                                                                                          |
| Σ 108.3        |                                      | 46 articles  |                   |                                                                                                          |

1) Vehicle fleet or number of vehicles covered

**NOTE**

The camshaft adjustment assembly groups may be different for the intake and outlet sides. The corresponding control valves must not be mixed up. Observe the exact assignment.

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## BACKGROUND INFORMATION

Control valves for camshaft adjustment are 4/3 way valves. They control the oil flow to working chambers A or B in the camshaft adjuster.

The central magnets are electromagnetic actuators and are a separate component.

The actual valve body is part of the camshaft adjustment.

The camshaft adjuster is located on the end of the intake / outlet camshaft.

The rotor (04) with the oil channels to chambers A / B is permanently connected to the camshaft.

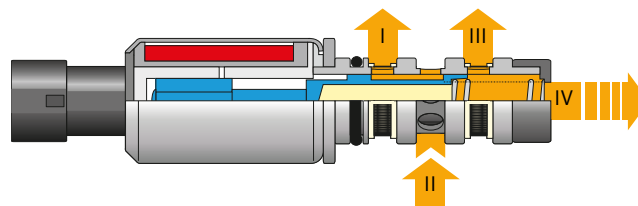
The stator (03) is connected to a ring gear, over which the timing chain runs.

The pressure in chambers A / B enables the rotor – and therefore the camshaft – to be adjusted so it is “early” or “late” relative to the stator.

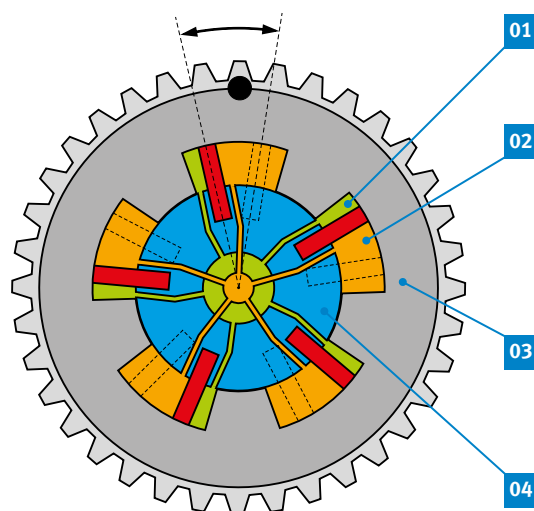
This results in different lengths of time in which the intake and exhaust valve are simultaneously open.

This “internal exhaust gas recirculation” has an influence on the power and pollutant emissions of the engine.

- When idling, minimal valve overlapping reduces the engine speed while optimising even running.
- For part load operation, the valve overlapping is set to achieve minimal emissions and low fuel consumption.
- At full load, the closing time of the intake valves is used to increase the torque and thus increase power.

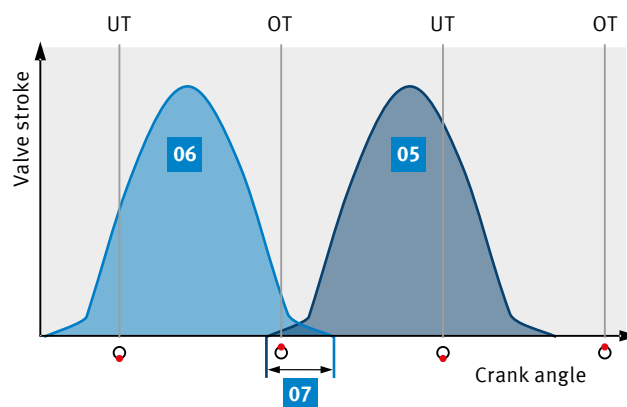


Ring grooves I – III and return side IV on control valve



Camshaft adjuster (schematic)

- 01 Chamber A
- 02 Chamber B
- 03 Stator
- 04 Rotor with oil channels to chambers A / B



- Valve overlapping
- 05 Intake valve stroke
- 06 Exhaust valve stroke
- 07 Valve overlapping