

## 03-317 Modifications to pistons

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### Piston pin bearings Engines 601, 602 and 603

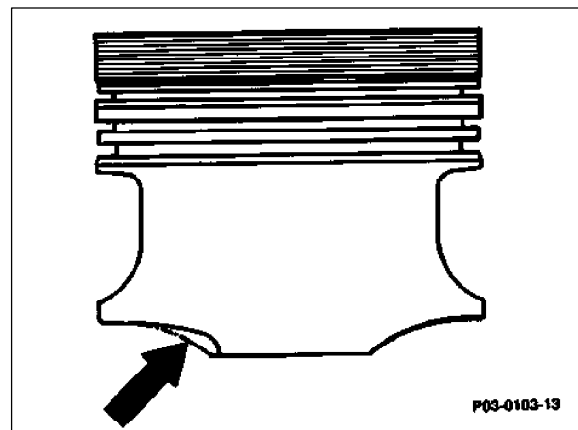
Since 08/85 piston pin bore provided with angular oil pockets (previously flat oil pockets) for improved lubrication.

### Engines 601.91, 602.91, 603.91

The piston skirt has been provided with a larger recess (arrow) for better clearance on engines with oil injection nozzles or exhaust gas recirculation.

Standardization with engine 601.91 B .

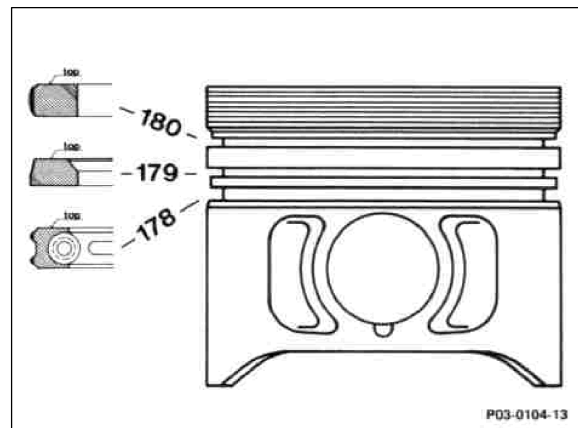
Piston code: 15.



P03-0103-13

Each piston is equipped with two compression rings and one oil scraper ring. The first piston ring groove is provided with a Niresit ring carrier.

- 178 Bevelled ring with expander, 3 mm thick, running surface chrome-plated
- 179 Taper face ring with inside bevel, 2 mm thick, running surface chrome-plated
- 180 Rectangular ring, 2 mm thick, running surface chrome-plated



P03-0104-13

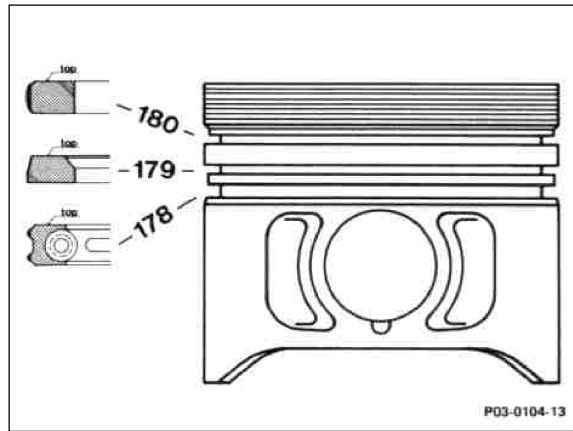
**Engines 601.91, 602.91, 601.91 as of 09/89**

The height of the ring groove for the rectangular ring (180) has been increased from 2.0 to 2.5 mm.

Piston code 16 (Mahle co.)

Piston code 17 (Alcan co.)

- 178 Bevelled ring with expander, 3 mm thick, running surface chrome-plated
- 179 Taper face ring with inside bevel, 2 mm thick, running surface chrome-plated
- 180 Rectangular ring, 2.5 mm thick, running surface chrome-plated



P03-0104-13

These pistons can also be installed in engines with cylinder sleeves.

**Engines 601.91, 602.91 and 603.91**

In 03/88 temporary installation of pistons from Alcan, piston code 12, KS, piston code 14

**Engines 602.961, 603.96/97 as of 12/87 (turbo)****Piston pins**

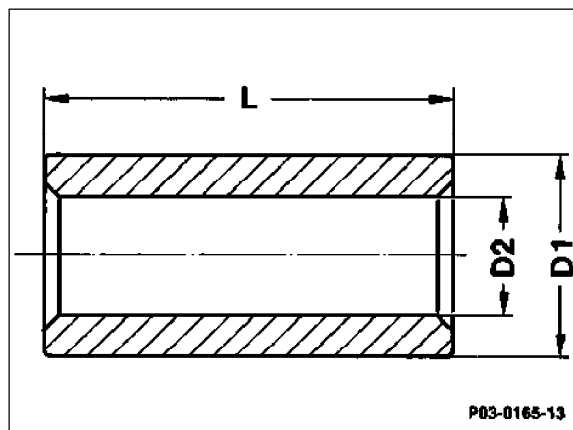
The size of the piston pin has been increased to reduce the surface pressure.

Engines 602.961/982, 603.96:

- D1 =28 mm
- D2 =13.5 mm, engine 602.98=14.5 mm
- L =70 mm

Engines 601.91, 602.91, 603.91:

- D1 =26 mm
- D2 =14 mm
- L =55 mm

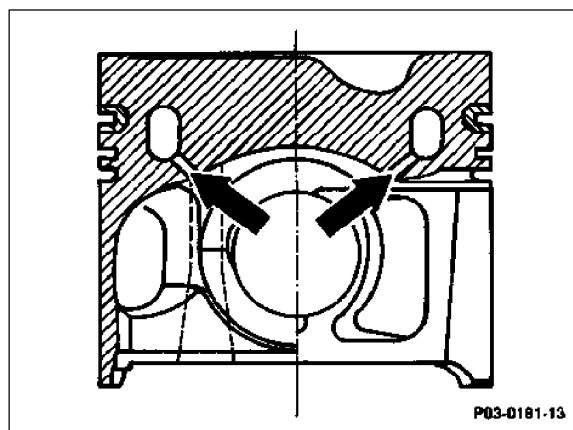


P03-0165-13

**Engines 602.961, 603.96****Pistons with annular gallery**

Due to the higher thermal load the pistons are cooled with oil via an annular gallery in the piston crown. Moreover the piston pins are supplied with oil injected through the two bores (2.0 mm dia., arrows), ending in the annular gallery.

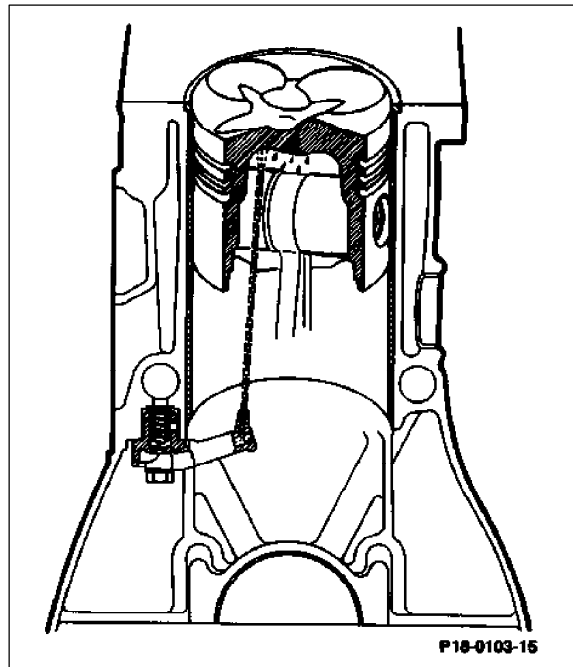
The required oil is supplied via injection nozzles located in the crankcase on the right side.



P03-0181-13

**Engine 603.970/971 up to 03/95**

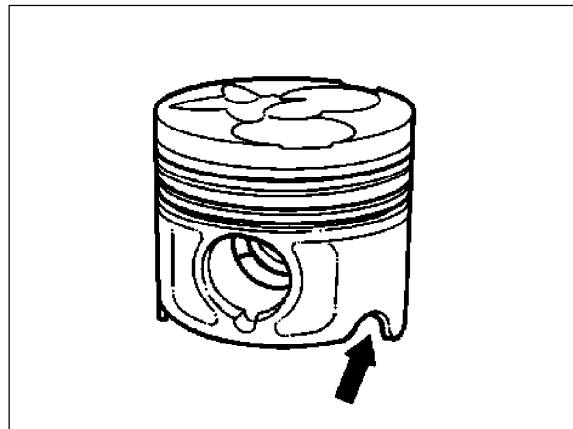
The annular gallery is not fitted in these engines. Oil is supplied only to the piston crown.



P18-0103-15

A recess is located on the piston skirt (arrow) for the oil injection nozzle.

The precombustion chamber recess in the piston crown has a diameter of 18 mm (normally aspirated engine = 17 mm).



P03-2226-13

**Engine 603.970/971 as of 09/95**

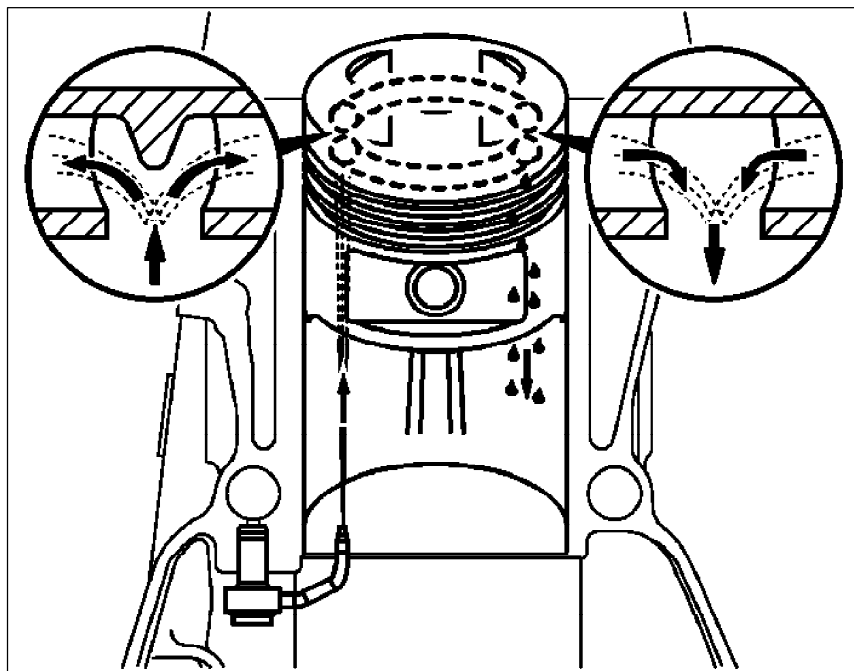
Pistons with semi-cooling gallery for cooling pistons and modified piston rings.



This piston must be installed **only as a set** as it is 5 g heavier than its predecessor.

**Piston code: 18**

Piston with semi-cooling gallery



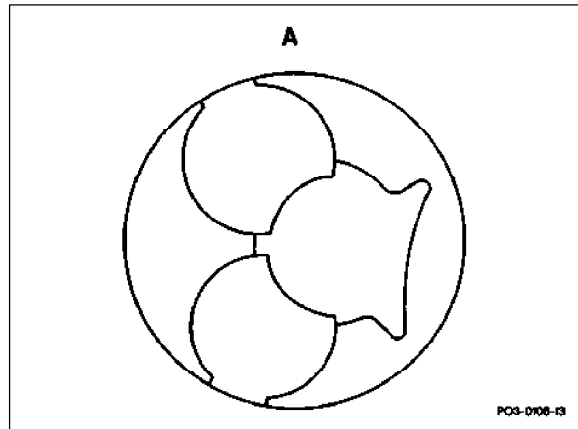
P03.00-0216-35

**Piston crown**

On engines 602.96 and 603.97 from the start of production and on engine 603.96 starting 08/88 moose horn recess pistons are installed (previously star recessed pistons).

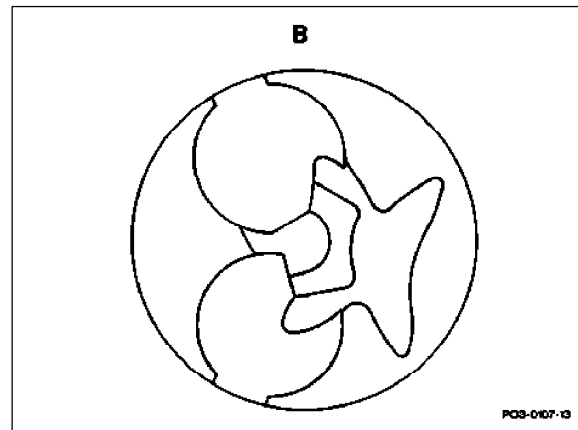
The piston crown is coated with aluminum oxide on both piston versions.

A. Moose horn piston



P03-0106-13

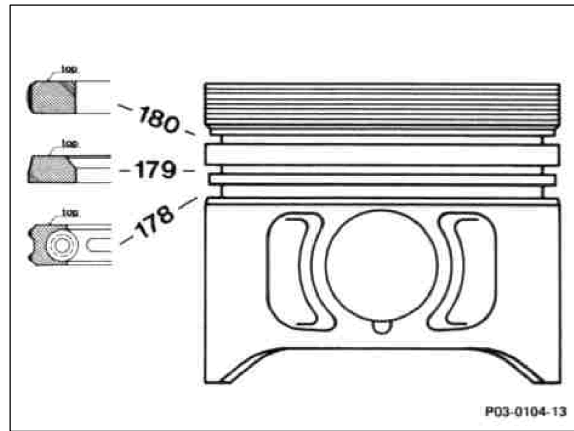
B. Star recessed piston



P03-0107-13

These pistons each have two compression rings and one oil scraper ring. The piston skirt is graphitized.  
 Piston codes:           00 Engine 602.96  
                               13 Engine 603.96

- 178   bevelled ring with expander, 3 mm thick, running surface chrome-plated
- 179   Taper face ring with inside bevel, 2 mm thick
- 180   Rectangular ring with inside bevel, 2.5 mm thick, running surface molybdenum-coated



P03-0104-13

P03-0104-13

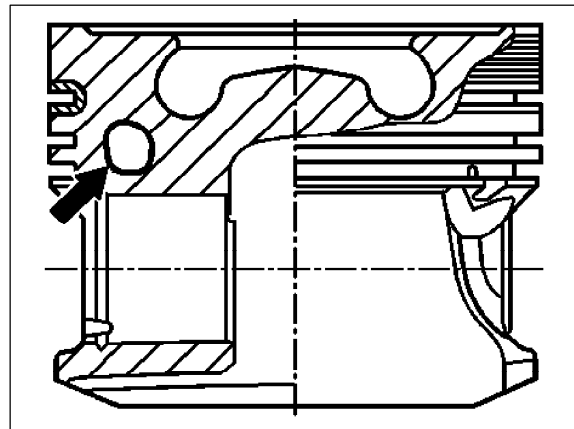
**Motoren 601.91, 602.91, 603.91 ab 01/91**

Bei diesen Motoren werden Kolben mit graphitiertem Kolbenschaft eingebaut.  
 Kennzahl 22.

**Engine 602.982**

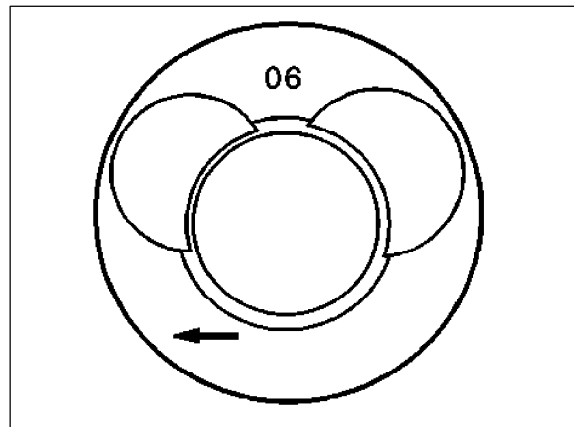
Piston with  $\omega$  bowl and annular gallery for cooling piston (arrow). Piston stem graphited.  
 Piston code: 06

Piston cross section



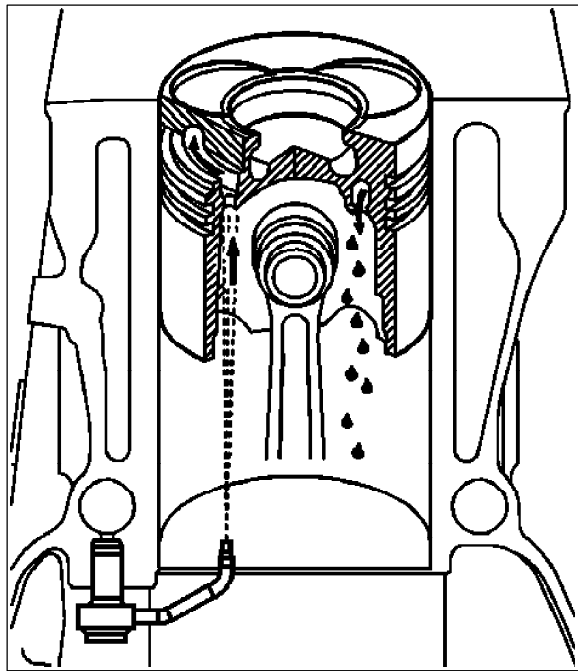
P03.00-0217-13

Piston crown, arrow points in direction of travel  
 Piston code: 06



P03.00-0218-13

Oil spray nozzle for cooling piston made of sheet steel, interference-fitted in crankcase. The oil is distributed along an annular gallery drilling and flows back into the sump. As the oil flows through the annular gallery, it absorbs heat and thus cools the piston crown.  
Opening pressure: 1.5 bar



P18.00-0224-15