Continental
The Future in Motion



Diesel Common Rail Injectors

Continental CR injectors

Test and Repair Manual



V1 08.2021

3 General information

Common Rail Diesel injectors are connected to the rail and deliver the necessary amount of fuel into the combustion chamber for all engine-operating conditions. The amount injected per stroke consists of a pre-injection, a main-injection and a post-injection amount. This three phases injection leads to a quieter combustion operation.

Piezo actuators allow extremely short response times, enabling precise, accurate and repeatable control of the injected quantity.

The engine control unit (ECU) controls the operation of the injectors. Through the energy recovery facility with Piezo injectors, a substantially smaller triggering force is required in comparison to previous systems.

Continental EU3/4 CR injectors



DW10TD
DV4
DW10B
DW10U
Lion V6
Lion V6 Upgrade
Lion V8
Ford Lynx
K9K EU4
MWM IESA

Continental EU5 CR injectors



VW EA189
Ford Puma
Ford I PSA DV6C
Renault K9K EU5
Renault K9KGen6
MWM Sprint
Ford Ranger
JMC 2.0
Renault M9T

Continental EU6 CR injectors



Ford Panther
Hyundai 1.6

3.1 CR Diesel injectors – types

3.1.1 EU3 / EU4 / EU5 CR injectors design

The mechanical design of EU3, EU4 and EU5 CR injectors is similar across all three. The only one which differs is the DW10TD CR injector. This type is equiped with a very long nozzle-retaining nut, which not only fixes the nozzle but also the functional parts. Therefore, the replacement of the nozzle is not possible.

Although the mechanical design is very close the electrical design of EU3, EU4 CR injectors compared to the EU5 types is very different. EU3 and EU4 CR injectors are voltage controlled; EU 5 CR injectors are energy controlled.

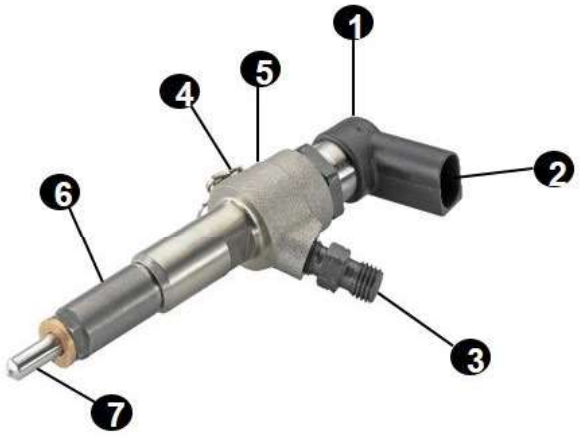
The homologated CR injector test benches for Continental EU3 and EU4 CR injectors are equipped with a dedicated power stage that controls the CR injectors according to the specification.

Continental EU5 CR injectors must not be controlled using this or any other non-authorized power stage, as applying power outside the specification will lead to an uncontrolled reaction of the piezo actuator. This will have a negative impact on the adjustment of the CR injector, leading to incorrect measurements and could even cause the CR injectors nozzle to stay open.

To avoid any malfunction or damage EU5 CR injectors must only be tested on homologated test equipment!

Important note:

- Never replace the piezo actuator on any Continental CR injector as the basic adjustment is based on the position of the Actuator in relation to the internal hydraulic components.
- Once loosened it is not possible to re-adjust the CR injector within specification using aftermarket equipment.
- The same applies to the nozzle of EU5 CR injectors. Replacing the nozzle will result in a change of the injection quantity.
- Aftermarket test benches are not precise enough to measure all relevant values, it is not possible to re-assign the correct code, which is required for the engine management control unit (ECU) to control the CR injectors operation according to the specification.
- Although the engine seems to operate correctly, the exhaust emissions will not be within tolerance.



1 Piezo-actuator
2 Electrical connection
3 High pressure connection
4 Fuel return
5 Injector head
6 Nozzle retaining nut
7 Injector nozzle

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3.1.2 EU6 CR injector design

With the EU6 CR injector Continental has introduced a significant design change. Mechanically as well as electrically. The piezo actuator has moved from the injector head to the injector body and the electrical control has changed.

Currently no test procedures are available to test EU6 CR injectors.

Testing the EU6 CR injector on non homologated test equipment will lead to the same problems as described in chapter 3.1.1.

Important note:
Never open the nozzle-retaining nut as the torque and position of the nut has a major impact on the adjustment of the CR injector. As described for the EU3, EU4 and EU5 CR injectors this will lead to malfunction.



1 Piezo-actuator
2 Electrical connection
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4 Fuel return
5 Nozzle retaining nut
6 Injector nozzle

3.2 Detailed information

CR injectors play an essential role in the correct functionality of the diesel engine.

Correct functionlity of the CR injectors is essential for the smooth engine operation and to ensure the exhaust emission specifications are met under all operating conditions.

It is important to test and repair these components following the guidelines provided in this manual.

3.2.1 Repair depth

Because of the special design of the Continental CR injectors and compared to serial line equipment limited accuracy of aftermarket diesel test benches test and repair is restricted to certain operations.

- Test on homologated test benches only
- Replacement of the high pressure connector
- Replacement of nozzle and nozzle retaining nut

For details please see the table below (3.2.1) and check the Continental Extranet for updates regularly!

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