SERVICE MANUAL

New Common Rail System for HINO E13C Type Engine

OPERATION

February, 2004

DENSO CORPORATION
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1. Outline

1-1. Product Application

A. Application

<table>
<thead>
<tr>
<th>Manufacturer</th>
<th>Engine Model</th>
<th>Destination</th>
</tr>
</thead>
<tbody>
<tr>
<td>HINO</td>
<td>E13C</td>
<td>General countries</td>
</tr>
</tbody>
</table>

B. System Components Parts Number

<table>
<thead>
<tr>
<th>Parts Name</th>
<th>DENSO Parts Number</th>
<th>Manufacturer Parts Number</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply pump</td>
<td>094000-0421</td>
<td>22730-1231A</td>
<td>HP0 type</td>
</tr>
<tr>
<td>Injector</td>
<td>095000-5223</td>
<td>23910-1242A</td>
<td>With QR code</td>
</tr>
<tr>
<td>Rail</td>
<td>095440-0460</td>
<td>22760-1150A</td>
<td></td>
</tr>
<tr>
<td>Engine ECU</td>
<td>102758-3001</td>
<td>89560-6530A</td>
<td>With EDU inside</td>
</tr>
<tr>
<td>Accelerator position sensor</td>
<td>198300-8160</td>
<td>89441-6950A</td>
<td></td>
</tr>
<tr>
<td>Crankshaft position sensor</td>
<td>029600-0570</td>
<td>89411-1280A</td>
<td></td>
</tr>
<tr>
<td>Cylinder recognition sensor</td>
<td>949979-1300</td>
<td>—</td>
<td>Included in the supply pump</td>
</tr>
<tr>
<td>Fuel temperature sensor</td>
<td>179730-0090</td>
<td>22790-1010A</td>
<td></td>
</tr>
<tr>
<td>Coolant temperature sensor</td>
<td>071560-0110</td>
<td>83420-1250A</td>
<td></td>
</tr>
<tr>
<td>Intake air temperature sensor</td>
<td>072800-0350</td>
<td>89441-6230A</td>
<td></td>
</tr>
<tr>
<td>Intake air pressure sensor</td>
<td>079800-5890</td>
<td>89390-1080A</td>
<td></td>
</tr>
</tbody>
</table>

1-2. Outline

- This Service Manual describes the new common rail system installed on the E13C engine of large Hino trucks. The biggest difference compared with conventional common rail systems is that it uses an injector with a QR code. The basic construction and operation of the system is about the same as for systems installed on the P11C engine, so this Service Manual will only give a general outline of the E13C system and describe its unique features. For details on the common rail system, refer to Service Bulletin ECD 01-08 "New Common Rail System (ECD-U2) for HINO" published in December 2001, and Service Manual "Common Rail System for HINO J05D/J08E Type Engine" published in October 2003.
2. Outline of The Main New Features

2-1. Common Rail Specifications and Engine Features

<table>
<thead>
<tr>
<th>Common Rail Specifications</th>
<th>E13C</th>
<th>K13C (Current Model)</th>
</tr>
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<tbody>
<tr>
<td>Main Features</td>
<td>HP-0 + G2</td>
<td>HP-0 + X1</td>
</tr>
<tr>
<td>Pressure</td>
<td>160 MPa</td>
<td>120 MPa</td>
</tr>
<tr>
<td>Type</td>
<td>L6, TI, 4 valves</td>
<td>L6, TI, 4 valves</td>
</tr>
<tr>
<td>Engine Features</td>
<td>Displacement</td>
<td>13 L</td>
</tr>
<tr>
<td>Variation</td>
<td>5 Output Settings</td>
<td>Low Output</td>
</tr>
<tr>
<td>Torque</td>
<td>1764-2156 N•m/900 rpm</td>
<td>1520 N•m/1100 rpm</td>
</tr>
<tr>
<td>Vehicle</td>
<td>Cargo and Dump Trucks, Tractors</td>
<td>Cargo and Dump Trucks, Tractors</td>
</tr>
</tbody>
</table>
2-2. System Construction

< NOTE >
• For details on sensors such as the NE sensor and G sensor (sub-NE sensor), refer to Page 3,4 in Service Bulletin 01-08.
## Revision History

<table>
<thead>
<tr>
<th>Date</th>
<th>Revision Contents</th>
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| 2007. 09 | • SCV: Explanation of compact SCV added to "Suction Control Valve (SCV)". (Operation: Refer to page 1-30.)  
         | • "Repair" section added. |
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1. GENERAL DESCRIPTION

1.1 Changes In Environment Surrounding The Diesel Engine

Throughout the world, there is a desperate need to improve vehicle fuel economy for the purposes of preventing global warming and reducing exhaust gas emissions that affect human health. Diesel engine vehicles are highly acclaimed in Europe, due to the good fuel economy that diesel fuel offers. On the other hand, the "nitrogen oxides (NOx)" and "particulate matter (PM)" contained in the exhaust gas must be greatly reduced to meet exhaust gas regulations, and technology is being actively developed for the sake of improved fuel economy and reduced exhaust gases.

(1) Demands on Diesel Vehicles

- Reduce exhaust gases (NOx, PM, carbon monoxide (CO), hydrocarbon (HC) and smoke).
- Improve fuel economy.
- Reduce noise.
- Improve power output and driving performance.

(2) Transition of Exhaust Gas Regulations (Example of Large Vehicle Diesel Regulations)

The EURO IV regulations take effect in Europe from 2005, and the 2004 MY regulations take effect in North America from 2004. Furthermore, the EURO V regulations will take effect in Europe from 2008, and the 2007 MY regulations will take effect in North America from 2007. Through these measures, PM and NOx emissions are being reduced in stages.