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| Group: | Service Manual Update |
| Bulletin No.: | SB-15-021 |
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# SERVICE INFORMATION BULLETIN

**Subject: CORRECTION OF WORKSHOP MANUAL FOR 2015MY- 2016MY**
**(REVISION OF TROUBLESHOOTING PROCEDURE FOR THE DTC P20BD, P20B9 and P20C1)**

The following is to inform you of the above caption. This service data should be attached to the relevant pages of the workshop manuals for maintenance and to use for servicing.

**RELEVANT MODEL:**
Hino 155, 155h, 195, 195h, 238, 258, 268, 338, 358

**CONTENTS:**
Correction of troubleshooting information and inspection procedure of the DTC P20BD, P20B9 and P20C1 were revised.

**RELEVANT MANUALS:**

| Model Year | MANUAL No. | CHAPTER | DTC CODE |
|---|---|---|---|
| 2015 | S7-LXJE05A | Engine/Troubleshooting | P20BD, P20B9 and P20C1 |
| 2016 | S7-LXJE08A | Engine/Troubleshooting | P20BD, P20B9 and P20C1 |
| 2015 | S7-UNAE11A | DEF SCR System (DCU) | P20BD, P20B9 and P20C1 |
| 2016 | S7-UNAE12A | DEF SCR System (DCU) | P20BD, P20B9 and P20C1 |



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|---|---|
| Vendor Ref.: | SB-A-17-029 |

DEF SCR SYSTEM (DCU)

## DTC: P20BD, P20B9 and P20C1

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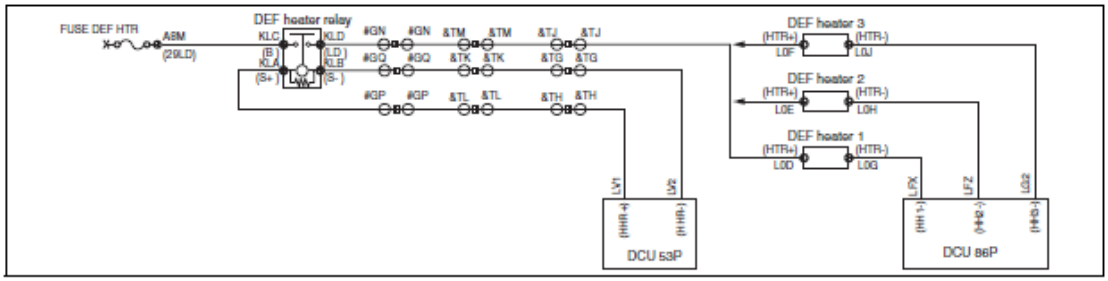
**DTC: P20BD DEF heater 1 failure (Open load / low)**
**DTC: P20B9 DEF heater 2 failure (Open load / low)**
**DTC: P20C1 DEF heater 3 failure (Open load / low)**
INFORMATION



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1. **Technical description**
   - Electrify the DEF heater to prevent the freezing of DEF pipings.
   - DCU detects harness disconnection or short-circuit based on the DEF heater circuit voltage.

   **<Description of malfunction>**
   - Malfunction of DEF heater is detected.

2. **DTC set condition**
   (1) DTC detection condition
   - Starter switch ON.
   - When the DEF defrosting control is disabled (DCU detects the ambient temperature > -5 °C {23 °F})

   (2) Judgement criteria
   Voltage difference of DEF heater 1 drive FET (DCU internal element) is less than 2 V. (P20BD)
   Voltage difference of DEF heater 2 drive FET (DCU internal element) is less than 2 V. (P20B9)
   Voltage difference of DEF heater 3 drive FET (DCU internal element) is less than 2 V. (P20C1)

3. **Reset condition**
   - After having restored to the normal conditions.

4. **Indication, warning or system control regulation when the DTC is set.**
   - MIL: ON
   - SCR malfunction light: Blink
   - "SCR malfunction" appears on the multi-information.
   - If malfunction does not improve within 500 miles: engine output is restricted.
   - If malfunction does not improve within 2,000 miles: vehicle speed is restricted.

5. **Symptoms on the vehicle when the DTC is set**

   **<Symptoms on the vehicle due to backup control (fail safe function)>**
   - Engine output is insufficient (when malfunction does not improve within 500 miles).
   - Vehicle does not speed up (when malfunction does not improve within 2,000 miles).

   **<Symptoms on the vehicle due to malfunction>**
   - Deterioration of the function to prevent the freezing of DEF pipings.

**6. Pre-inspection work**

- Check if the battery voltage is in the normal range.

**7. After-inspection work**

- Clear all past DTCs.
  (Also clear DTC P204F (DEF SCR system failure) of the engine ECU side.)
- Using HINO DX II , set DEF heater ON for 10 seconds and after this set to OFF.
- Check if no DTC is stored after test drive.

**8. Estimated failure factors**

- Harness disconnection or short-circuit of GND
- DEF heater (1, 2 or 3) malfunction
- DEF heater relay malfunction
- FUSE DEF HTR malfunction
- Harness short-circuit
- DCU malfunction

## INSPECTION PROCEDURE: P20BD, P20B9 and P20C1

| 1 | Inspect the fuse |
|---|---|

1. Check the fuse (FUSE DEF HTR) for fusing or improper fit.

**Was any failure found?**

| YES | NO |
|---|---|
| Connect the fuse properly or replace. Perform "After-inspection work" of INFORMATION section. | Go to step 2. |

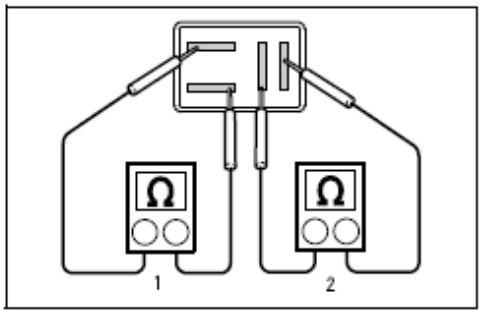
| 2 | Inspect the DEF heater relay |
|---|---|

1. Check the connection of the DEF heater relay (inside cab) (Looseness or poor contact).

**Was any failure found?**

| YES | NO |
|---|---|
| Connect securely, repair if needed. Perform "After-inspection work" of INFORMATION section. | Go to step 3. |

| 3 | Inspect the DEF heater relay unit |
|---|---|



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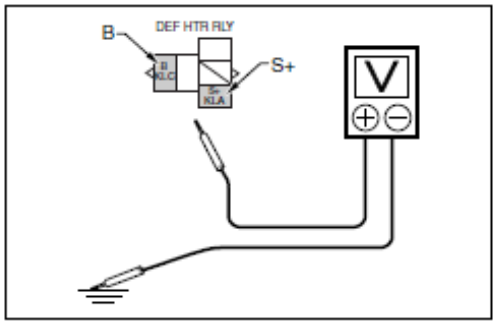
1. Set the starter switch to the "LOCK" position.
2. Disconnect the DEF heater relay.
3. Use the electrical tester to measure the resistance between the terminals of the DEF heater relay.

| Tester connections | Standard values |
|---|---|
| DEF heater relay terminals | 1 in the figure: 320 Ω<br>2 in the figure: ∞ Ω |

**Do the measurements meet the standard value?**

| YES | NO |
|---|---|
| Go to step 4. | Replace the DEF heater relay. Perform "After-inspection work" of INFORMATION section. |

| 4 | Inspect the DEF heater relay power supply circuit |
|---|---|



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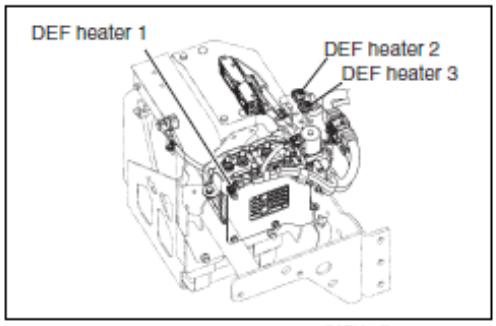
1. Set the starter switch to the "ON" position.
2. Use the electrical tester to measure the voltage between each terminal in the DEF heater relay vehicle-side connector (inside the cab) and ground.

| Measurement conditions | Tester connections | Standard values |
|---|---|---|
| Starter switch: ON<br>Disconnect DEF heater relay | DEF heater relay vehicle-side connector<br>B – Ground<br>S+ – Ground | 10 V or more |

**Do the measurements meet the standard value?**

| YES | NO |
|---|---|
| Go to step 5. | Repair or replace the DEF heater relay power supply circuit.<br>Perform "After-inspection work" of INFORMATION section. |

| 5 | Inspect the DEF heater (1, 2 or 3) connector |
|---|---|



SAPH16F020400181

1. Check the connection of the DEF heater (1, 2 or 3) connector (Looseness and poor contact).

**Was any failure found?**

| YES | NO |
|---|---|
| Connect securely, repair if needed.<br>Perform "After-inspection work" of INFORMATION section. | Go to step 6. |

| 6 | Inspect the DEF heater (1, 2 or 3) pipe |
|---|---|

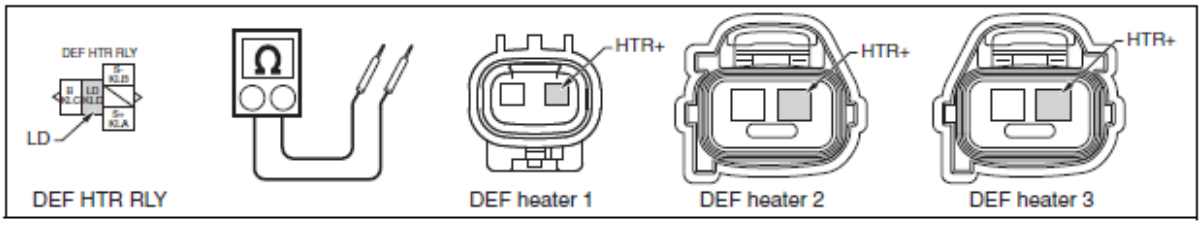
1. Check for cracks (leakage of DEF, etc) in the DEF heater (1, 2 or 3) pipe.

**Was any failure found?**

| YES | NO |
|---|---|
| **Replace the DEF heater pipe. Perform "After-inspection work" of INFORMATION section.** | **Go to step 7.** |

| 7 | Inspect the DEF heater (1, 2 or 3) power supply circuit (1) |
|---|---|

1. Set the starter switch to the "LOCK" position.
2. Disconnect the DEF heater relay.
3. Disconnect the DEF heater (1, 2 or 3) connector.
4. Use the electrical tester to measure the continuity between the terminals of the DEF heater relay vehicle-side connector (inside the cab) and the DEF heater (1, 2 or 3) vehicle-side connector.

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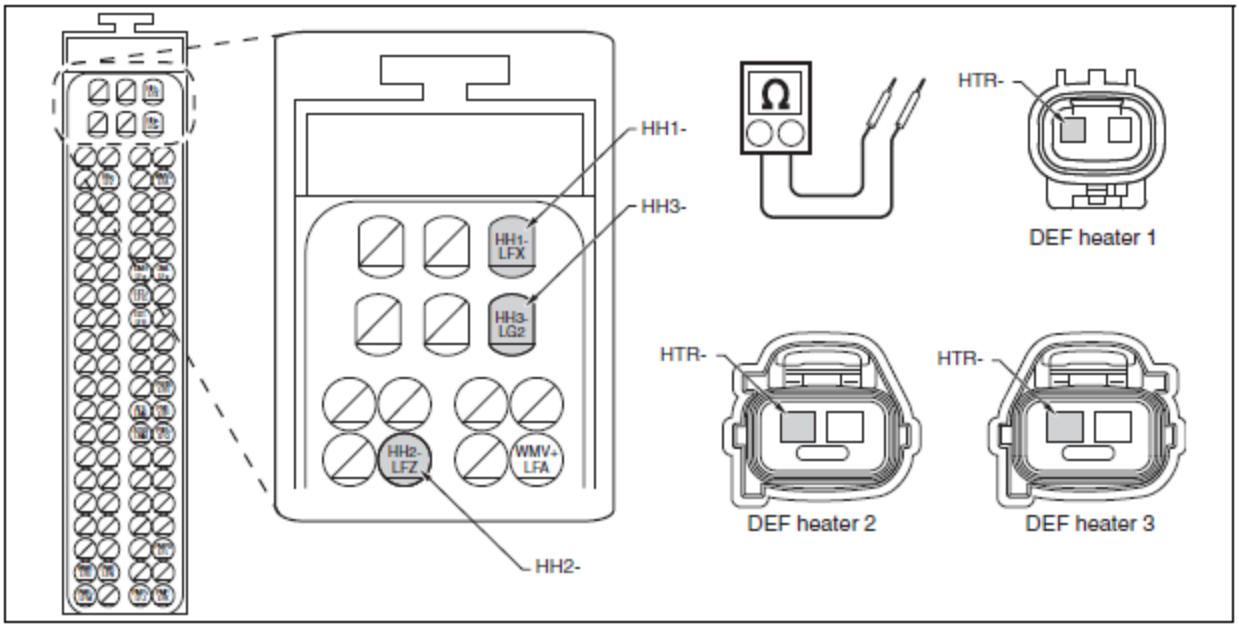
| Measurement conditions | Tester connections | Standard values |
|---|---|---|
| Starter switch: LOCK<br>Disconnect the DEF heater relay<br>Disconnect the DEF heater connector | DEF heater relay vehicle-side connector – DEF heater (1, 2 or 3) vehicle-side connector<br>LD – HTR+ | Continue |

**Do the measurements meet the standard value?**

| YES | NO |
|---|---|
| **Go to step 8.** | **Repair or replace the harness. Perform "After-inspection work" of INFORMATION section.** |

| 8 | Inspect the DEF heater (1, 2 or 3) power supply circuit (2) |
|---|---|

1. Disconnect the DCU 86P connector.
2. Use the electrical tester to measure the continuity between the terminals of the DEF heater (1, 2 or 3) vehicle-side connector and the terminals of the DCU 86P vehicle-side connector.

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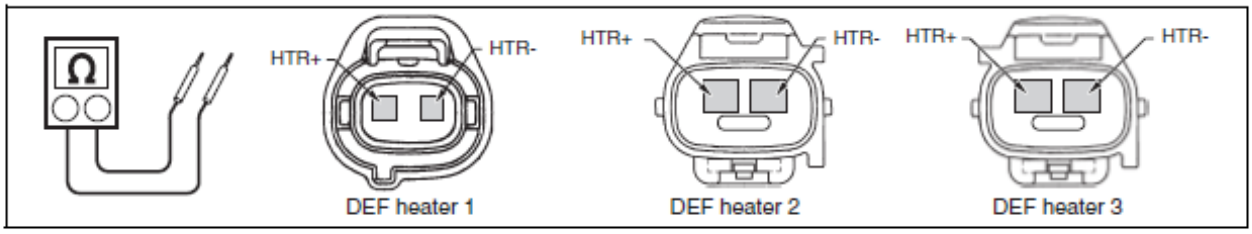
| Measurement conditions | Tester connections | Standard values |
|---|---|---|
| Starter switch: LOCK<br>Disconnect the DEF heater connector<br>Disconnect the DCU 86P connector | DEF heater (1, 2 or 3) connector – DCU 86P vehicle-side connector<br>HTR- – HH1-<br>HTR- – HH2-<br>HTR- – HH3- | Continue |

**Do the measurements meet the standard value?**

| YES | NO |
|---|---|
| Go to step 9. | Repair or replace the harness.<br>Perform "After-inspection work" of INFORMATION section. |

| 9 | Inspect the DEF heater (1, 2 or 3) unit |
|---|---|

1. Use the electrical tester to measure the continuity between the terminals of the DEF heater (1, 2 or 3).




| Measurement conditions | Tester connections | Standard values |
|---|---|---|
| Starter switch: LOCK<br>Disconnect the DEF heater connector | DEF heater (1, 2 or 3)<br>HTR+ – HTR- | Continue |

**Do the measurements meet the standard value?**

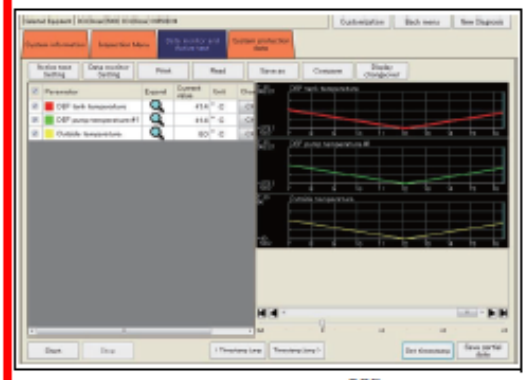
**YES**

**Replace the DCU.**
**Go to step 10.**

**NO**

**Replace the DEF heater (1, 2 or 3).**
**Perform "After-inspection work" of INFORMATION section.**

| 10 | Check the DTC detected (DCU) [HINO DX II ] |
|---|---|



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1. Start the engine and keep the engine idling for about 10 minutes at room temperature (Around 20 °C {68 °F}).
2. Set the starter switch to the "LOCK" position.
3. Set the starter switch to the "ON" position.
4. Select [DCU].
5. Set up data monitor [DEF tank temperature], [DEF pump temperature #1] and [Outside temperature].
6. Go to next [7], if every temperature values are exceeding -5 °C {23 °F}. Go back to [1], if either temperature value is not exceeding -5 °C {23 °F}.
7. Set the starter switch to the "LOCK" position for 30 second.
8. Set the starter switch to the "ON" position.

**Has DTC P20BD, P20B9 and P20C1 been detected?**

**YES**

**Replace the DCU.**
**Perform "After-inspection work" of INFORMATION section.**

**NO**

**Procedure completed.**
**Perform "After-inspection work" of INFORMATION section.**