Group:	Service Manual Update
Bulletin No.:	SB-14-029
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SERVICE INFORMATION BULLETIN

CORRECTION OF WORKSHOP MANUAL FOR 2011 - 2015 MY
(REVISION OF TROUBLESHOOTING PROCEDURE FOR THE DTC P2201 & P2214)

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 MODELS:
2011 - 2015 MY (HINO 238, 258, 268, 338)

CONTENTS:
Troubleshooting information and inspection procedures for the DTC P2201 and P2214 were revised.

RELEVANT MANUALS:

MODEL	MANUAL No.	CHAPTER	PAGE No.
USA 2011MY	S1-UNAE07B DIA	FUEL CONTROL (DEF SCR)	From DN02–48 to DN02–51 From DN02–57 to DN02–61
USA 2012MY	S7-UNAE08A,B	FUEL CONTROL (DEF SCR)	From DN02–124 to DN02–127 From DN02–140 to DN02–144
USA 2013MY	S7-UNAE09A	FUEL CONTROL (DEF SCR)	From DN02–130 to DN02–133 From DN02–146 to DN02–150
USA 2014MY	S7-UNAE10 A	DEF SCR SYSTEM (DCU), ENGINE CONTROL SYSTEM (J08E)	From 5–288 to 5–295 From 4–1075 to 4–1081

MODEL	MANUAL No.	CHAPTER	PAGE No.
USA 2014MY	S7-UNAE10 C	DEF SCR SYSTEM (DCU), ENGINE CONTROL SYSTEM (J08E)	From 5–283 to 5–290 From 4–1060 to 4–1066
USA 2015MY	S7-UNAE11 A	DEF SCR SYSTEM (DCU), ENGINE CONTROL SYSTEM (J08E)	From 5–241 to 5–247 From 4–888 to 4–895

Vendor Ref.:	SB-A-17-025

SERVICE INFORMATION BULLETIN

INSPECTION PROCEDURE FOR 2013 - 2015 MODEL YEAR: P2201

DEF SCR SYSTEM (DCU)

INSPECTION PROCEDURE: P2201

1 **Check the DTC detected [HINO DX II]**

1. Set the starter switch to the "LOCK" position.
2. Connect the vehicle to HINO DX II .
3. Set the starter switch to the "ON" position.
4. Select [DCU] and check if any DTC other than P2201 (for example P2202, P2209, U029D) has been detected.

Has a DTC other than P2201 been detected?

YES → **Go to diagnosis procedure of a related DTC.**

NO → **Go to step 2.**

2 **Inspect the NOx sensor 1 (SCR upstream) [HINO DX II]**

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Confirm the output waveform of NOx sensor by using Data monitor function of the HINO DX II .

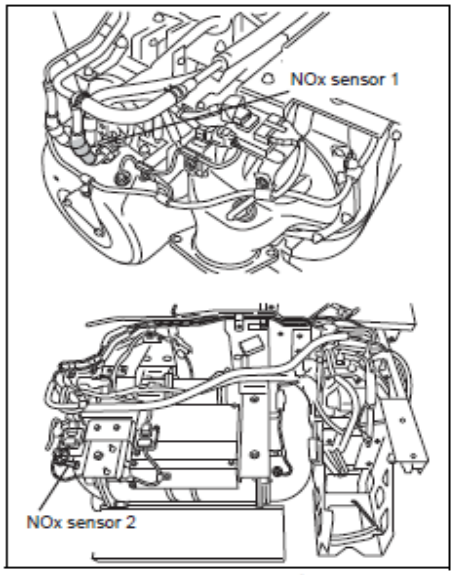
1. Set the starter switch to the "ON" position.
2. Select [DCU] on the screen of HINO DX II .
3. Delete the past DTC detected in the DCU.
4. Start the engine. Begin warm-up operation while turning on the exhaust brake. Wait until the indicator on coolant temperature gauge goes up to the middle, as shown in the left picture.
5. Confirm that the output waveform of NOx sensor is being read out, by using HINO DX II Data monitoring function.
   <Inspection procedure>
   (1) Select [Engine] on the screen of HINO DX II .
   (2) Select [Data monitor Setting and Active test Setting].
   (3) Select the [NOx level (before catalyst)] on [Data monitor Setting] screen, and start data monitor.
6. If the level of NOx sensor is being read out, wait for three minutes, then turn off the exhaust brake while continued idling.
   If the level of NOx sensor is not being read out, keep the exhaust brake turned on until the level of NOx sensor begins to be read out, wait for three minutes, then turn off the exhaust brake while continued idling.
7. Check the level of NOx sensor five minutes after having the exhaust brake turned off.

NOTICE
Refer to the Failure Judgment Manual for NOx sensor.

Was any failure found?

YES	NO
Replace the NOx sensor1 (SCR upstream)	Go to step 3.

3 Inspect the NOx sensor 1 (SCR upstream) [HINO DX II]



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1. Set the starter switch to the "LOCK" position.
2. Remove the NOx sensor 1 (SCR upstream) and NOx sensor 2 (SCR downstream) assemblies (with controller).

⚠ WARNING
Never touch the DPR, heat insulator, exhaust pipe or muffler while these parts are still hot to avoid serious burns or injury.

3. Install NOx sensors 1 and 2 in the vehicle, in their opposite location.

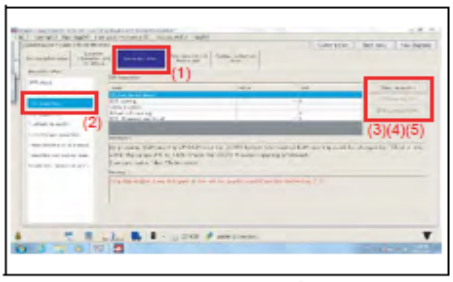
NOTICE
Do not separate the controller and sensor, but remove them as a set.

4. Set the starter switch to the "ON" position.
5. Perform DPR manual forced regeneration by using HINO DX II . HINO DX II selection items: [Engine]/[Inspection Menu]/[DPR check]/[Manual forced regeneration]
6. Keep the engine running for 10 minutes after regeneration has been completed. Then select "DCU" on the HINO DX II screen and confirm that P2201 is not detected.

Was DTC P2201 detected?

YES	NO
Go to step 4	Replace the NOx sensor 1 (SCR upstream). Clear passed DTC and check if the DTC is detected again after test drive.

4 Check the response delay of the EGR valve [HINO DX II]



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1. Select [Engine] on the screen of HINO DX II .
2. Check the time lag (following characteristics) of the target EGR valve opening and actual EGR valve opening by following procedure.

⚠ CAUTION
- **Perform the inspection while the engine is stopped to avoid engine damages.**

<Inspection procedure>
(1) Select [Inspection Menu].
(2) Select [EGR inspection].
(3) Click [Start inspection].
(4) Click [EGR opening UP]:

- Check each step from 0 % – 90 % of the time lag (following characteristics) of the target EGR valve opening and actual EGR valve opening.
  (5) Click [EGR opening DOWN]:
- Check each step from 90 % – 0 % of the time lag (following characteristics) of the target EGR valve opening and actual EGR valve opening.

HINT

- **In EGR openings from 0 % – 90 %, 1 step corresponds to a 10 % change.**

Standard values
The response delay should be less than 5 seconds.

Do the measurements meet the standard value?

YES	NO
Go to step 5.	Replace the EGR valve. Clear passed DTC and check if the DTC is detected again after test drive.

5	Inspect the EGR valve [HINO DX II]

1. Set the starter switch to the "LOCK" position.
2. Remove the EGR valve.
3. Set the starter switch to ON position and select [Engine] on the screen of HINO DX II .
4. Perform [EGR inspection] in the same way as step 4.
   Confirm the tracking properties of the EGR valve and make sure it closes tightly.

Are tracking and tightness normal?

YES	NO
Go to step 6.	Replace the EGR valve. Clear passed DTC and check if the DTC is detected again after test drive.

6	Inspect the EGR cooler

1. Check the condition of the tube coming out of the outlet side of the EGR cooler.
2. Check if the EGR cooler tube is clogged.

DEF SCR SYSTEM (DCU)

Is the tube clogged?

YES	NO
Wash or replace the EGR cooler.	Go to step 7

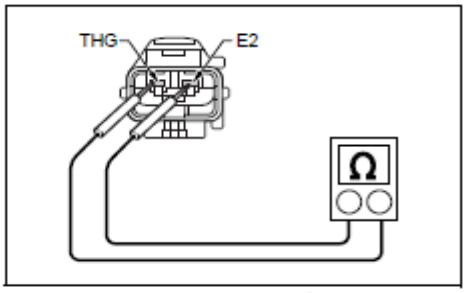
7 Inspect the intake air temperature sensor (intake manifold)

1. Check the installation of the intake air temperature sensor (intake manifold).
2. Make sure there is no dirt or damage to the intake air temperature sensor (intake manifold).

Was any failure found?

YES	NO
Clean the intake air temperature sensor (intake manifold) and install it properly. If damaged, replace the sensor. Clear passed DTC and check if the DTC is detected again after test drive.	Go to step 8.

8 Inspect the intake air temperature sensor (intake manifold) unit



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1. Set the starter switch to the "LOCK" position.
2. Disconnect the intake air temperature sensor (intake manifold) connector.
3. Measure the resistance between the terminals of the sensor using the electrical tester.

Measurement conditions	Tester connections	Standard values
Starter switch: LOCK	Intake air temperature sensor (intake manifold) THG – E2	20 °C: 7.336 – 5.794 kΩ 50 °C: 2.435 – 1.994 kΩ

Do the measurements meet the standard value?

YES	NO
Go to step 9.	Replace the intake air temperature sensor (intake manifold). Clear passed DTC and check if the DTC is detected again after test drive.

9	Inspect the boost pressure sensor

1. Check the installation of the boost pressure sensor.
2. Make sure there is no dirt or damage to the boost pressure sensor.

Was any failure found?

YES	NO
If dirt, clogging or damage was found in sensing unit, replace the boost pressure sensor. Clear passed DTC and check if the DTC is detected again after test drive.	Go to step 10.

10	Check the boost pressure sensor output signal [HINO DX II]

1. Start the engine.
2. Select [Engine] from screen of HINO DX II .
3. Select [Actual boost pressure] from the [Data monitor Setting] menu.
4. Race the engine from idle to NMR and verify that the boost pressure output signal varies.

Standard values
There is no abnormal change in the sensor output signal. (The pressure sensor signal response changes according to the engine speed)

Was there no abnormal change in the sensor output signal?

YES	NO
Go to step 11.	Replace the boost pressure sensor. Clear passed DTC and check if the DTC is detected again after test drive.

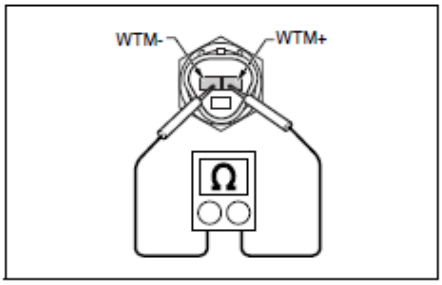
11	Inspect the engine coolant temperature sensor

1. Check the installation of the engine coolant temperature sensor.
2. Make sure there is no dirt or damage to the engine coolant temperature sensor.

Was any failure found?

YES	NO
Clean the engine coolant temperature sensor and install it properly. If damaged, replace the engine coolant temperature sensor. Clear passed DTC and check if the DTC is detected again after test drive.	Go to step 12.

12	Inspect the engine coolant temperature sensor unit



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1. Set the starter switch to the "LOCK" position.
2. Disconnect the engine coolant temperature sensor.
3. Use the electrical tester to measure the resistance between the terminals of the engine coolant temperature sensor.

Measurement conditions	Tester connections	Standard values
Starter switch: LOCK	Engine coolant temperature sensor WTM+ – WTM-	20 °C: 2.59 – 2.32 kΩ 80 °C: 0.326 – 0.310 kΩ

Do the measurements meet the standard value?

YES	NO
Go to step 13.	Replace the engine coolant temperature sensor. Clear passed DTC and check if the DTC is detected again after test drive.

13	Inspect the air flow sensor connector

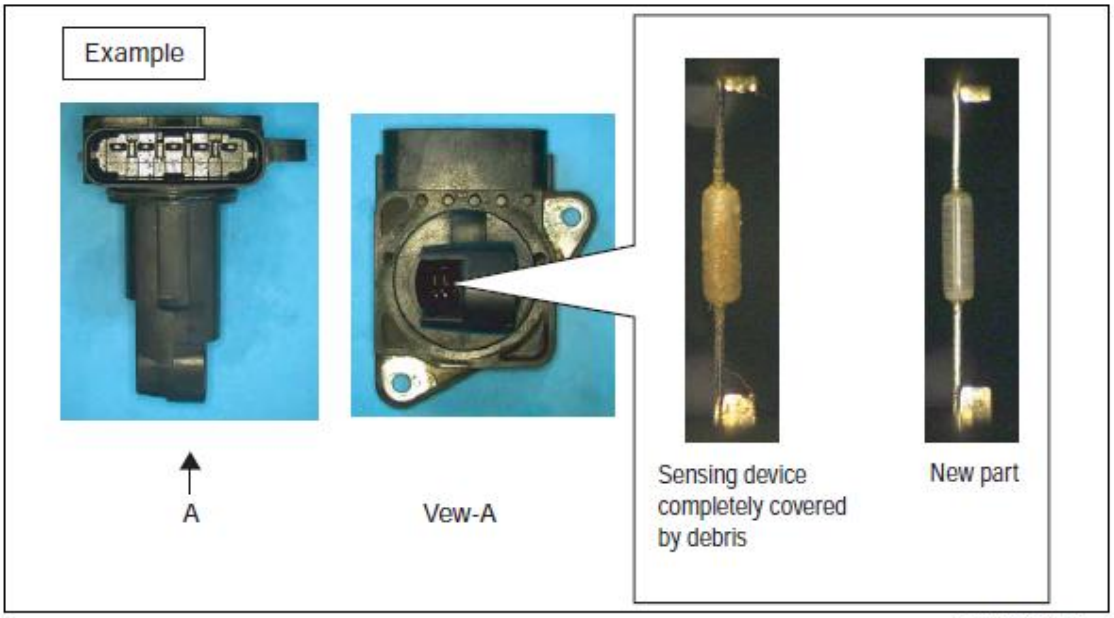
1. Check the connection of the air flow sensor (Looseness and poor contact).

Was any failure found?

YES	NO
Connect securely, repair if needed. Clear passed DTC and check if the DTC is detected again after test drive.	Go to step 14.

14	Inspect the air flow sensor

1. Check the installation of the air flow sensor.
2. Make sure there is no dirt or damage to the air flow sensor.



Was any failure found?

YES	NO
Go to step 15.	Go to step 16.

15	Inspect air flow sensor [HINO DX II]

Prepare the new air flow sensor, and compare the air flow sensor characteristics between the sensor on the vehicle and new sensor by using HINO DX II .

1. Set the starter switch to the lock position and connect HINO DX II to the vehicle.

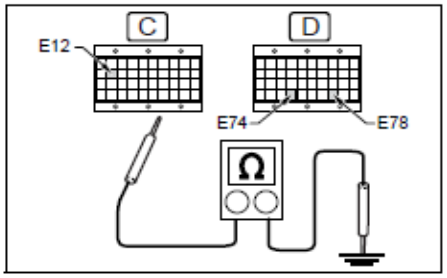
2. Reconnect the sensor to the vehicle.
3. Set the starter switch to ON position and select [Engine] on HINO DX II menu.
4. Select [Amount of intake air flow inspection] from [Inspection Menu] on HINO DX II .
5. Perform [Amount of intake air flow inspection] as instructed on the HINO DX II screen.
6. Perform the same inspection with the new sensor, and compare the characteristics between old and new.

Standard values
Performance error: less than 10 %

Do the measurements meet the standard value?

YES	NO
Go to step 16.	Install the new air flow sensor.

16 Inspect for short-circuits in wire harness of air flow sensor



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1. Set the starter switch to the "LOCK" position.
2. Disconnect the air flow sensor connector.
3. Connect the signal check harness to the engine ECU vehicle-side harness. (Do not connect harness to the ECU.)
4. Use the electrical tester to measure the resistance between the engine ECU (signal check harness) terminals and ground.

HINT
Measure while shaking the harness.

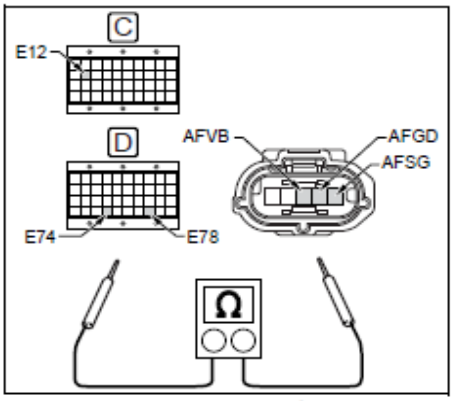
Measurement conditions	Tester connections	Standard values
Starter switch: LOCK	Engine ECU (signal check harness) AFVB(E12) – Ground AFSI(E74) – Ground AGD6(E78) – Ground	∞ Ω

Do the measurements meet the standard value?

YES	NO
Go to step 17.	Repair or replace the harness.

DEF SCR SYSTEM (DCU)

17	Inspect for disconnection in wire harness of air flow sensor



1. Use the electrical tester to measure the resistance between the engine ECU (signal check harness) terminal and the air flow sensor vehicle-side connector terminal.

HINT
Measure while shaking the harness.

Measurement conditions	Tester connections	Standard values
Starter switch: LOCK	Engine ECU (signal check harness) – air flow sensor vehicle side connector AFVB(E12) – AFVB AFSI(E74) – AFSG AGD6(E78) – AFGD	1 Ω or less

Do the measurements meet the standard value?

YES

Go to step 18.
Go to step 19 if the air flow sensor was replaced at step 15.

NO

Repair or replace the harness.
Clear passed DTC and check if the DTC is detected again after test drive.

18	Inspect the air flow sensor [HINO DX II]

Prepare the new air flow sensor, and compare the air flow sensor characteristics between the sensor on the vehicle and new sensor by using HINO DX II .

1. Set the starter switch to the "LOCK" position and connect HINO DX II to the vehicle.
2. Set the starter switch to "ON" position and select [Engine] on HINO DX II menu.
3. Select [Amount of intake air flow inspection] from [Inspection Menu] on HINO DX II menu.
4. Perform [Amount of intake air flow inspection] as instructed on the HINO DX II screen.
5. Perform the same check with the new sensor, and compare the characteristics between old and new.

Standard values
Performance error: less than 10 %

Do the measurements meet the standard value?

DEF SCR SYSTEM (DCU)

YES	NO
Go to step 19.	Replace the air flow sensor. After replacement, Go to step 19.

19	Inspect the NOx sensor 1 (SCR upstream) [HINO DX II]

1. Replace NOx sensor 1 (SCR upstream) with a new sensor.
2. Set the starter switch to the "ON" position.
3. Perform DPR manual forced regeneration by using HINO DX II . HINO DX II selection items: [Engine]/[Inspection Menu]/[DPR check]/[Manual forced regeneration]
4. Wait 10 minutes after regeneration has been completed. Then Select "DCU" on the HINO DX II screen and read the detected DTC from "Trouble Information".

Has DTC P2201 been detected?

YES	NO
Replace the DCU. Clear passed DTC and check if the DTC is detected again after test drive.	NOx sensor 1 failure. (Install the new NOx sensor 1.) Clear passed DTC and check if the DTC is detected again after test drive.

INSPECTION PROCEDURE FOR 2013 AND 2014 MODEL YEAR: P2214

ENGINE CONTROL SYSTEM (J08E)

INSPECTION PROCEDURE: P2214

1 Inspect the DEF

1. Check the DEF concentration.

Reference value
31.8 – 33.2 % (DEF value(Brand new))

Are the measurements excessively different?

YES

If the DEF concentration is excessively different from the reference value, replace the DEF. Leave the starter switch to the "ON" position, drain the DEF through the tank drain, and then refill the tank with at least 5 liters {1.3 gallons} of DEF.
Afterward, drive the vehicle and confirm that the problem does not recur under driving conditions. Clear passed DTC and check if the DTC is detected again after test drive.

NOTICE

- When changing the DEF, place (leave) the starter switch to the "ON" position.
- When changing the DEF, be sure to use the API-certified DEF and replenish the DEF tank with DEF up to the "F" level of the level gauge on the tank.

NO

Go to step 2.

2 Inspect the exhaust gas leakage

1. Check the exhaust gas flow downstream of the turbocharger and confirm that there is no leakage of exhaust gas.

Was any failure found?

YES

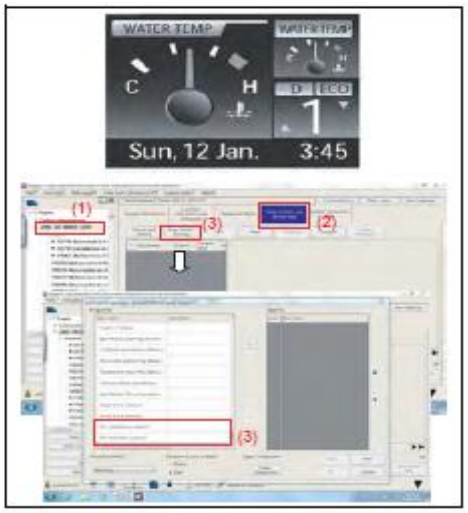
Repair or replace the area where the leak is.

NO

Go to step 3.

ENGINE CONTROL SYSTEM (J08E)

3	Inspect the NOx sensor 2 (SCR downstream) [HINO DX II]



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Confirm the output waveform of NOx sensor by using Data Monitor function HINO DX II .

1. Delete past DTCs detected.
2. Start the engine. Begin warm-up operation while turning on the exhaust brake. Wait until the indicator on coolant temperature gauge goes up to the middle, as shown in the left picture.
3. Confirm that the output waveform of NOx sensor is being read out, by using HINO DX II Data monitoring function.
   <Inspection procedure>
   (1) Select [Engine] on the screen of HINO DX II .
   (2) Select [Data monitor Setting and Active test Setting].
   (3) Select the [NOx level (after catalyst)] on [Data monitor Setting] screen, and start data monitor.
4. If the level of NOx sensor is being read out, wait for three minutes, then turn off the exhaust brake while continued idling.
   If the level of NOx sensor is not being read out, keep the exhaust brake turned on until the level of NOx sensor begins to be read out, wait for three minutes, then turn off the exhaust brake while continued idling.
5. Check the level of NOx sensor five minutes after having the exhaust brake turned off.

NOTICE
Refer to the Failure Judgment Manual for NOx sensor.

Was any failure found?

YES	NO
Replace the NOx sensor 2 (SCR downstream)	Go to step 4.

4	Inspect the exhaust gas temperature sensor (DOC outlet) connector

1. Check the connection of the exhaust gas temperature sensor (DOC outlet) connector. (Looseness and poor contact)

Was any failure found?

YES	NO
Connect securely, repair if needed. Clear passed DTC and check if the DTC is detected again after test drive.	Go to step 5.

ENGINE CONTROL SYSTEM (J08E)

5 Inspect the exhaust gas temperature sensor (DOC outlet)

1. Check the installation of the exhaust gas temperature sensor (DOC outlet).
2. Make sure there is no dirt or damage to the exhaust gas temperature sensor (DOC Outlet).

Was any failure found?

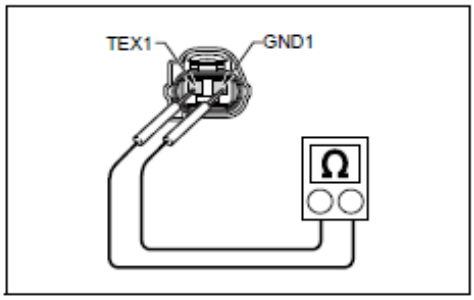
YES

Clean the exhaust gas temperature sensor (DOC Outlet) and install it properly.
If damage was found, replace the sensor.
Clear passed DTC and check if the DTC is detected again after test drive.

NO

Go to step 6.

6 Inspect the exhaust gas temperature sensor (DOC outlet) unit



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1. Set the starter switch to the "LOCK" position.
2. Disconnect the exhaust gas temperature sensor (DOC outlet) connector.
3. Use the electrical tester to measure the resistance between the terminals of the exhaust gas temperature sensor (DOC outlet).

Measurement conditions	Tester connections	Standard values
Starter switch: LOCK	Exhaust gas temperature sensor (DOC outlet) TEX1 – GND1	20 °C: 13.7 – 29.8 kΩ 50 °C: 7.13 – 13.7 kΩ 80 °C: 4.1 – 7.13 kΩ

Do the measurements meet the standard value?

YES

Go to step 7.

NO

Replace the exhaust gas temperature sensor (DOC outlet).
Clear passed DTC and check if the DTC is detected again after test drive.

ENGINE CONTROL SYSTEM (J08E)

7	Inspect the ambient air temperature sensor connector

1. Check the connection of the ambient air temperature sensor connector. (Looseness and poor contact)

Was any failure found?

YES	NO
Connect securely, repair if needed. Clear passed DTC and check if the DTC is detected again after test drive.	Go to step 8.

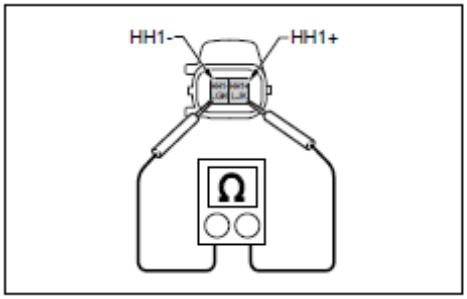
8	Inspect the ambient air temperature sensor

1. Check the installation of the ambient air temperature sensor.
2. Make sure there is no dirt or damage to the ambient air temperature sensor.

Was any failure found?

YES	NO
Clean the ambient air temperature sensor and install it properly. Clear passed DTC and check if the DTC is detected again after test drive.	Go to step 9.

9	Inspect the ambient air temperature sensor unit



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1. Set the starter switch to the "LOCK" position.
2. Disconnect the ambient air temperature sensor connector.
3. Use the electrical tester to measure the resistance between the terminals of the ambient air temperature sensor.

Measurement conditions	Tester connections	Standard values
Starter switch: LOCK	Ambient air temperature sensor HH1+ – HH1-	25 °C {77 °F}: 1.7 kΩ

Do the measurements meet the standard value?

YES

Go to step 10.

NO

Replace the ambient air temperature sensor. Clear passed DTC and check if the DTC is detected again after test drive.

10	Inspect the exhaust gas temperature sensor (SCR inlet) connector

1. Check the connection of the exhaust gas temperature sensor (SCR inlet) connector. (Looseness and poor contact)

Was any failure found?

YES

Connect securely, repair if needed. Clear passed DTC and check if the DTC is detected again after test drive.

NO

Go to step 11.

11	Inspect the exhaust gas temperature sensor (SCR inlet)

1. Check the installation of the exhaust gas temperature sensor (SCR inlet).
2. Make sure there is no dirt or damage to the exhaust gas temperature sensor (SCR inlet).

Was any failure found?

YES

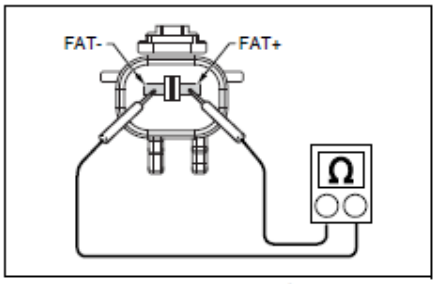
Clean the exhaust gas temperature sensor (SCR inlet) and install it properly. If damage was found, replace the sensor. Clear passed DTC and check if the DTC is detected again after test drive.

NO

Go to step 12.

ENGINE CONTROL SYSTEM (J08E)

12 **Inspect the exhaust gas temperature sensor (SCR inlet) unit**



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1. Set the starter switch to the "LOCK" position.
2. Disconnect the exhaust gas temperature sensor (SCR inlet) connector.
3. Use the electrical tester to measure the resistance between the terminals of the exhaust gas temperature sensor (SCR inlet).

Measurement conditions	Tester connections	Standard values
Starter switch: LOCK	Exhaust gas temperature sensor(SCR inlet) FAT+ – FAT-	20 °C {68 °F}: 220 Ω

Do the measurements meet the standard value?

YES	NO
Go to step 13.	Replace the exhaust gas temperature sensor (SCR inlet). Clear passed DTC and check if the DTC is detected again after test drive.

13 **Inspect the air flow sensor connector**

1. Check the connection of the air flow sensor (Looseness and poor contact).

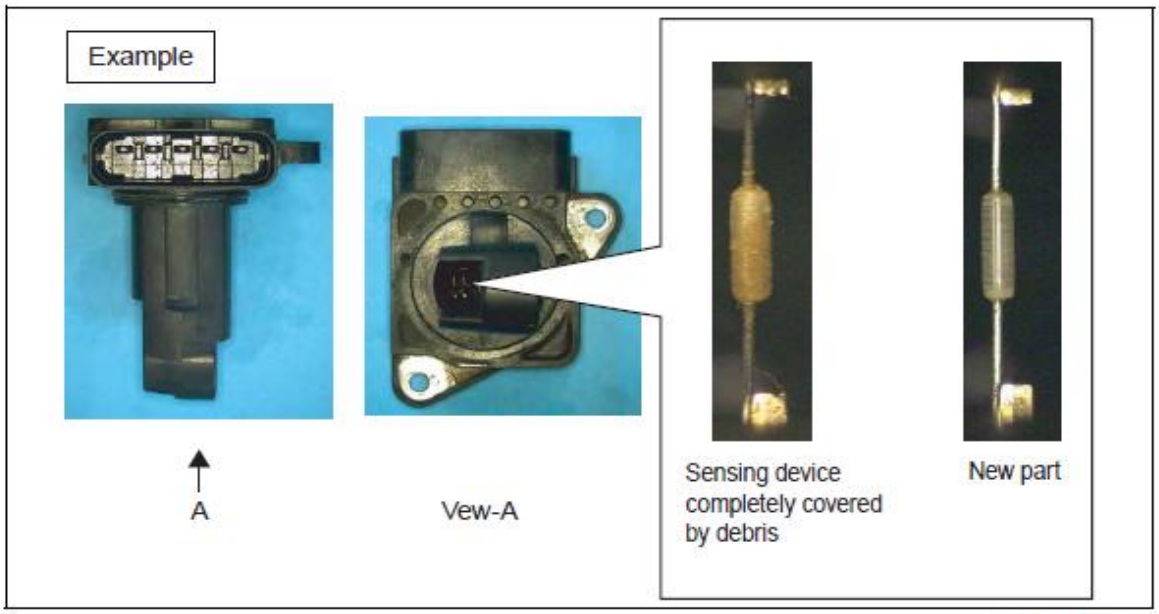
Was any failure found?

YES	NO
Connect securely, repair if needed. Clear passed DTC and check if the DTC is detected again after test drive.	Go to step 14.

14 **Inspect the air flow sensor**

1. Check the installation of the air flow sensor.
2. Make sure there is no dirt or damage to the air flow sensor.

ENGINE CONTROL SYSTEM (J08E)



Was any failure found?	
YES	NO
Go to step 15.	Go to step 16.

15	Inspect air flow sensor [HINO DX II]

Prepare the new air flow sensor, and compare the air flow sensor characteristics between the sensor on the vehicle and new sensor by using HINO DX II .

1. Set the starter switch to the lock position and connect HINO DX II to the vehicle.
2. Reconnect the sensor to the vehicle.
3. Set the starter switch to ON position and select [Engine] on HINO DX II menu.
4. Select [Amount of intake air flow inspection] from [Inspection Menu] on HINO DX II .
5. Perform [Amount of intake air flow inspection] as instructed on the HINO DX II screen.
6. Perform the same inspection with the new sensor, and compare the characteristics between old and new.

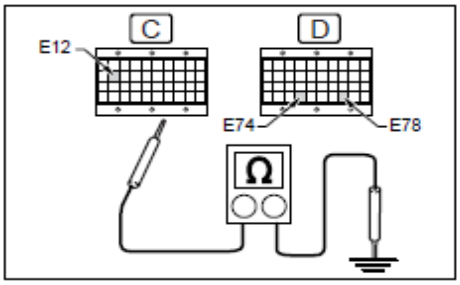
ENGINE CONTROL SYSTEM (J08E)

Standard values
Performance error: less than 10 %

Do the measurements meet the standard value?

YES	NO
Go to step 16.	Install the new air flow sensor.

16 Inspect for short-circuits in wire harness of air flow sensor



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1. Set the starter switch to the "LOCK" position.
2. Disconnect the air flow sensor connector.
3. Connect the signal check harness to the engine ECU vehicle-side harness. (Do not connect harness to the ECU.)
4. Use the electrical tester to measure the resistance between the engine ECU (signal check harness) terminals and ground.

HINT
Measure while shaking the harness.

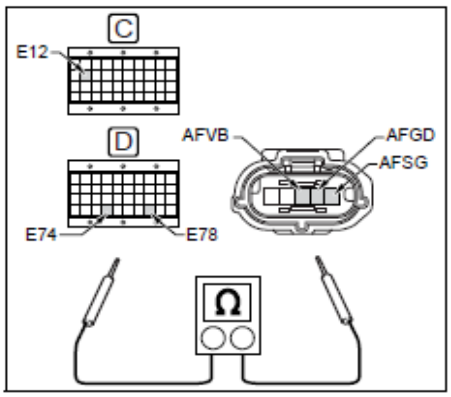
Measurement conditions	Tester connections	Standard values
Starter switch: LOCK	Engine ECU (signal check harness) AFVB(E12) – Ground AFSI(E74) – Ground AGD6(E78) – Ground	∞ Ω

Do the measurements meet the standard value?

YES	NO
Go to step 17.	Repair or replace the harness.

ENGINE CONTROL SYSTEM (J08E)

17	Inspect for disconnection in wire harness of air flow sensor



1. Use the electrical tester to measure the resistance between the engine ECU (signal check harness) terminal and the air flow sensor vehicle-side connector terminal.

HINT
Measure while shaking the harness.

Measurement conditions	Tester connections	Standard values
Starter switch: LOCK	Engine ECU (signal check harness) – air flow sensor vehicle side connector AFVB(E12) – AFVB AFSI(E74) – AFSG AGD6(E78) – AFGD	1 Ω or less

Do the measurements meet the standard value?

YES

Go to step 18.
Go to step 19 if the air flow sensor was replaced at step 15.

NO

Repair or replace the harness.
Clear passed DTC and check if the DTC is detected again after test drive.

18	Inspect the air flow sensor [HINO DX II]

Prepare the new air flow sensor, and compare the air flow sensor characteristics between the sensor on the vehicle and new sensor by using HINO DX II .

1. Set the starter switch to the "LOCK" position and connect HINO DX II to the vehicle.
2. Set the starter switch to "ON" position and select [Engine] on HINO DX II menu.
3. Select [Amount of intake air flow inspection] from [Inspection Menu] on HINO DX II menu.
4. Perform [Amount of intake air flow inspection] as instructed on the HINO DX II screen.
5. Perform the same inspection with the new sensor, and compare the characteristics between old and new.

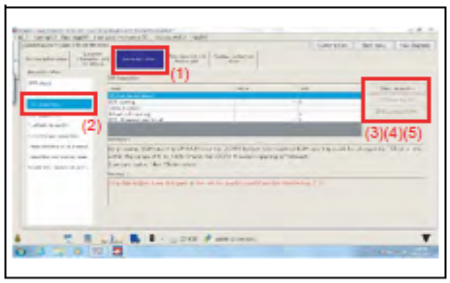
Standard values
Performance error: less than 10%

Do the measurements meet the standard value?

ENGINE CONTROL SYSTEM (J08E)

YES	NO
Go to step 19.	Replace the air flow sensor. After replacement, Go to step 19.

19	Inspect the DEF injector [HINO DX II]



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NOTICE
Prepare a beaker or similar, plus a larger measuring vessel for measuring the DEF to be injected, before perform this inspection. (If the vessel is small, there is dispersion at the time of injection from the injector, and the measuring quantity deecreases.)

1. Set the starter switch to the "LOCK" position.
2. Remove the DEF injector from muffler.
3. Connect the vehicle to HINO DX II .
4. Set the starter switch to the "ON" position.
5. Select [DCU].
6. Select [Inspection Menu] and check the DEF injector actuation.
   <Inspection procedure>
   (1) Select [Inspection Menu].
   (2) Select [DEF solution addition test].
   (3) Perform additional tests as instructed on the HINO DX II screen. (Perform test patterns 1 – 3 and check the injection amount and spray condition.)

Is operation normal?	
YES	NO
Go to step 20.	Replace the DEF injector. (After replacing the DEF injector, execute a DPR forced regeneration.) Clear passed DTC and check if the DTC is detected again after test drive.

ENGINE CONTROL SYSTEM (J08E)

20	Inspect the NOx sensor 2 (SCR downstream) [HINO DX II]

1. Enter a soot amount value of 2.2 using the DX Customization function.
   HINO DX II selection items: Customization_DPR deposit quantity
2. After DPR auto regeneration has been completed (the soot bar display reads zero), drive the vehicle for about 5 minutes at a constant vehicle speed or engine revolution.

HINT
To stabilize the exhaust gas flow rate, drive at a steady speed of about 45 – 50 mph.

3. Select [Engine] and check if P2214 has been detected.

Has DTC P2214 been detected?

YES	NO
Replace the engine ECU. (After replacing the engine ECU, execute a DPR forced regeneration.) Clear passed DTC and check if the DTC is detected again after test drive.	Procedure completed. Clear passed DTC and check if the DTC is detected again after test drive.

INSPECTION PROCEDURE FOR 2015 MODEL YEAR: P2214

ENGINE CONTROL SYSTEM (J08E)

INSPECTION PROCEDURE: P2214

1	Inspect the DEF

1. Check the DEF concentration.

Reference value
31.8 – 33.2 % (DEF value(Brand new))

Are the measurements excessively different?

YES

If the DEF concentration is excessively different from the reference value, replace the DEF. Leave the starter switch to the "ON" position, drain the DEF through the tank drain, and then refill the tank with at least 5 liters {1.3 gallons} of DEF.
Afterward, drive the vehicle and confirm that the problem does not recur under driving conditions. Clear passed DTC and check if the DTC is detected again after test drive.

NOTICE
When changing the DEF, place (leave) the starter switch to the "ON" position.

NO

Go to step 2.

2	Inspect the exhaust gas leakage

1. Check the exhaust gas flow downstream of the turbocharger and confirm that there is no leakage of exhaust gas.

Was any failure found?

YES

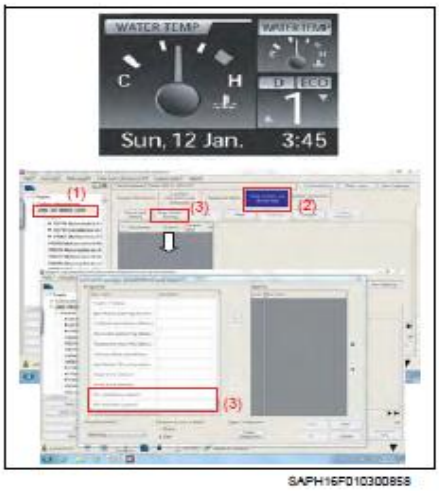
Repair or replace the area where the leak is.

NO

Go to step 3.

ENGINE CONTROL SYSTEM (J08E)

3	Inspect the NOx sensor 2 (SCR downstream) [HINO DX II]



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Confirm the output waveform of NOx sensor by using Data Monitor function HINO DX II .

1. Delete past DTCs detected.
2. Start the engine. Begin warm-up operation while turning on the exhaust brake. Wait until the indicator on coolant temperature gauge goes up to the middle, as shown in the left picture.
3. Confirm that the output waveform of NOx sensor is being read out, by using HINO DX II Data monitoring function.
   <Inspection procedure>
   (1) Select [Engine] on the screen of HINO DX II .
   (2) Select [Data monitor Setting and Active test Setting].
   (3) Select the [NOx level (after catalyst)] on [Data monitor Setting] screen, and start data monitor.
4. If the level of NOx sensor is being read out, wait for three minutes, then turn off the exhaust brake while continued idling.
   If the level of NOx sensor is not being read out, keep the exhaust brake turned on until the level of NOx sensor begins to be read out, wait for three minutes, then turn off the exhaust brake while continued idling.
5. Check the level of NOx sensor five minutes after having the exhaust brake turned off.

NOTICE
Refer to the Failure Judgment Manual for NOx sensor.

Was any failure found?

YES	NO
Replace the NOx sensor 2 (SCR downstream)	Go to step 4.

4	Inspect the exhaust gas temperature sensor (DOC outlet) connector

1. Check the connection of the exhaust gas temperature sensor (DOC outlet) connector. (Looseness and poor contact)

Was any failure found?

YES	NO
Connect securely, repair if needed. Clear passed DTC and check if the DTC is detected again after test drive.	Go to step 5.

ENGINE CONTROL SYSTEM (J08E)

5 **Inspect the exhaust gas temperature sensor (DOC outlet)**

1. Check the installation of the exhaust gas temperature sensor (DOC outlet).
2. Make sure there is no dirt or damage to the exhaust gas temperature sensor (DOC Outlet).

Was any failure found?

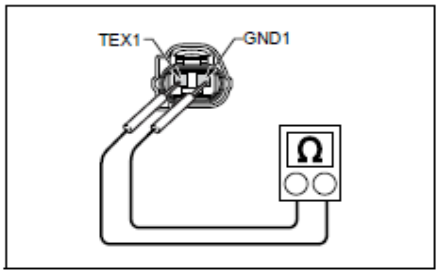
YES

Clean the exhaust gas temperature sensor (DOC Outlet) and install it properly.
If damage was found, replace the sensor.
Clear passed DTC and check if the DTC is detected again after test drive.

NO

Go to step 6.

6 **Inspect the exhaust gas temperature sensor (DOC outlet) unit**



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1. Set the starter switch to the "LOCK" position.
2. Disconnect the exhaust gas temperature sensor (DOC outlet) connector.
3. Use the electrical tester to measure the resistance between the terminals of the exhaust gas temperature sensor (DOC outlet).

Measurement conditions	Tester connections	Standard values
Starter switch: LOCK	Exhaust gas temperature sensor (DOC outlet) TEX1 – GND1	20 °C: 13.7 – 29.8 kΩ 50 °C: 7.13 – 13.7 kΩ 80 °C: 4.1 – 7.13 kΩ

Do the measurements meet the standard value?

YES

Go to step 7.

NO

Replace the exhaust gas temperature sensor (DOC outlet).
Clear passed DTC and check if the DTC is detected again after test drive.

ENGINE CONTROL SYSTEM (J08E)

7 **Inspect the ambient air temperature sensor connector**

1. Check the connection of the ambient air temperature sensor connector. (Looseness and poor contact)

Was any failure found?

YES	NO
Connect securely, repair if needed. Clear passed DTC and check if the DTC is detected again after test drive.	Go to step 8.

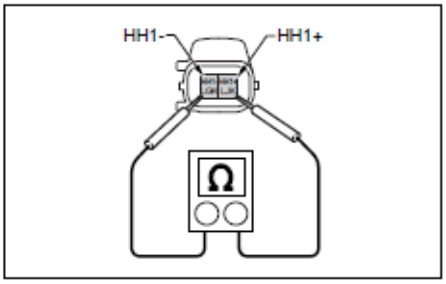
8 **Inspect the ambient air temperature sensor**

1. Check the installation of the ambient air temperature sensor.
2. Make sure there is no dirt or damage to the ambient air temperature sensor.

Was any failure found?

YES	NO
Clean the ambient air temperature sensor and install it properly. Clear passed DTC and check if the DTC is detected again after test drive.	Go to step 9.

9 **Inspect the ambient air temperature sensor unit**



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1. Set the starter switch to the "LOCK" position.
2. Disconnect the ambient air temperature sensor connector.
3. Use the electrical tester to measure the resistance between the terminals of the ambient air temperature sensor.

Measurement conditions	Tester connections	Standard values
Starter switch: LOCK	Ambient air temperature sensor HH1+ – HH1-	25 °C {77 °F}: 1.7 kΩ

Do the measurements meet the standard value?

ENGINE CONTROL SYSTEM (J08E)

YES	NO
Go to step 10.	Replace the ambient air temperature sensor. Clear passed DTC and check if the DTC is detected again after test drive.

10	Inspect the exhaust gas temperature sensor (SCR inlet) connector

1. Check the connection of the exhaust gas temperature sensor (SCR inlet) connector. (Looseness and poor contact)

Was any failure found?

YES	NO
Connect securely, repair if needed. Clear passed DTC and check if the DTC is detected again after test drive.	Go to step 11.

11	Inspect the exhaust gas temperature sensor (SCR inlet)

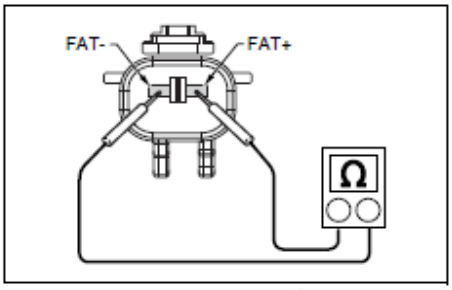
1. Check the installation of the exhaust gas temperature sensor (SCR inlet).
2. Make sure there is no dirt or damage to the exhaust gas temperature sensor (SCR inlet).

Was any failure found?

YES	NO
Clean the exhaust gas temperature sensor (SCR inlet) and install it properly. If damage was found, replace the sensor. Clear passed DTC and check if the DTC is detected again after test drive.	Go to step 12.

ENGINE CONTROL SYSTEM (J08E)

12 **Inspect the exhaust gas temperature sensor (SCR inlet) unit**



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1. Set the starter switch to the "LOCK" position.
2. Disconnect the exhaust gas temperature sensor (SCR inlet) connector.
3. Use the electrical tester to measure the resistance between the terminals of the exhaust gas temperature sensor (SCR inlet).

Measurement conditions	Tester connections	Standard values
Starter switch: LOCK	Exhaust gas temperature sensor(SCR inlet) FAT+ – FAT-	20 °C (68 °F): 220 Ω

Do the measurements meet the standard value?

YES

Go to step 13.

NO

Replace the exhaust gas temperature sensor (SCR inlet).
Clear passed DTC and check if the DTC is detected again after test drive.

13 **Inspect the air flow sensor connector**

1. Check the connection of the air flow sensor (Looseness and poor contact).

Was any failure found?

YES

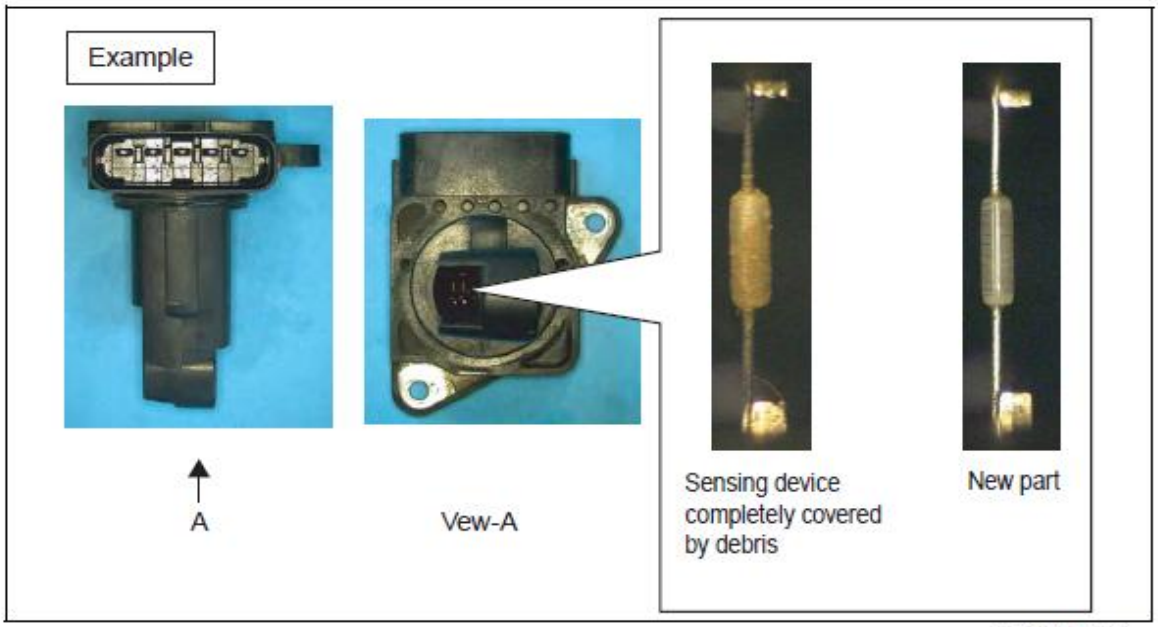
Connect securely, repair if needed.
Clear passed DTC and check if the DTC is detected again after test drive.

NO

Go to step 14.

14 **Inspect the air flow sensor**

1. Check the installation of the air flow sensor.
2. Make sure there is no dirt or damage to the air flow sensor.



Was any failure found?	
YES	NO
Go to step 15.	Go to step 16.

15	Inspect air flow sensor [HINO DX II]

Prepare the new air flow sensor, and compare the air flow sensor characteristics between the sensor on the vehicle and new sensor by using HINO DX II .

1. Set the starter switch to the lock position and connect HINO DX II to the vehicle.
2. Reconnect the sensor to the vehicle.
3. Set the starter switch to ON position and select [Engine] on HINO DX II menu.
4. Select [Amount of intake air flow inspection] from [Inspection Menu] on HINO DX II .
5. Perform [Amount of intake air flow inspection] as instructed on the HINO DX II screen.
6. Perform the same inspection with the new sensor, and compare the characteristics between old and new.

ENGINE CONTROL SYSTEM (J08E)

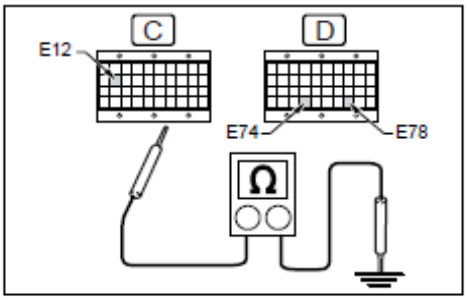
Standard values
Performance error: less than 10 %

Do the measurements meet the standard value?

YES → **Go to step 16.**

NO → **Install the new air flow sensor.**

16 Inspect for short-circuits in wire harness of air flow sensor



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1. Set the starter switch to the "LOCK" position.
2. Disconnect the air flow sensor connector.
3. Connect the signal check harness to the engine ECU vehicle-side harness. (Do not connect harness to the ECU.)
4. Use the electrical tester to measure the resistance between the engine ECU (signal check harness) terminals and ground.

HINT
Measure while shaking the harness.

Measurement conditions	Tester connections	Standard values
Starter switch: LOCK	Engine ECU (signal check harness) AFVB(E12) – Ground AFSI(E74) – Ground AGD6(E78) – Ground	∞ Ω

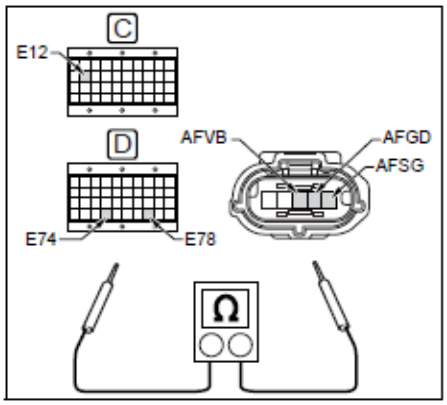
Do the measurements meet the standard value?

YES → **Go to step 17.**

NO → **Repair or replace the harness.**

ENGINE CONTROL SYSTEM (J08E)

17 **Inspect for disconnection in wire harness of air flow sensor**



1. Use the electrical tester to measure the resistance between the engine ECU (signal check harness) terminal and the air flow sensor vehicle-side connector terminal.

HINT
Measure while shaking the harness.

Measurement conditions	Tester connections	Standard values
Starter switch: LOCK	Engine ECU (signal check harness) – air flow sensor vehicle side connector AFVB(E12) – AFVB AFSI(E74) – AFSG AGD6(E78) – AFGD	1 Ω or less

Do the measurements meet the standard value?

YES

Go to step 18.
Go to step 19 if the air flow sensor was replaced at step 15.

NO

Repair or replace the harness.
Clear passed DTC and check if the DTC is detected again after test drive.

18 **Inspect the air flow sensor [HINO DX II]**

Prepare the new air flow sensor, and compare the air flow sensor characteristics between the sensor on the vehicle and new sensor by using HINO DX II .

1. Set the starter switch to the "LOCK" position and connect HINO DX II to the vehicle.
2. Set the starter switch to "ON" position and select [Engine] on HINO DX II menu.
3. Select [Amount of intake air flow inspection] from [Inspection Menu] on HINO DX II menu.
4. Perform [Amount of intake air flow inspection] as instructed on the HINO DX II screen.
5. Perform the same inspection with the new sensor, and compare the characteristics between old and new.

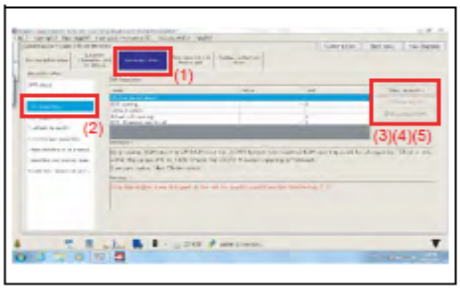
Standard values
Performance error: less than 10%

Do the measurements meet the standard value?

ENGINE CONTROL SYSTEM (J08E)

YES	NO
Go to step 19.	Replace the air flow sensor. After replacement, Go to step 19.

19	Inspect the DEF injector [HINO DX II]



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NOTICE
Prepare a beaker or similar, plus a larger measuring vessel for measuring the DEF to be injected, before perform this inspection. (If the vessel is small, there is dispersion at the time of injection from the injector, and the measuring quantity deecreases.)

1. Set the starter switch to the "LOCK" position.
2. Remove the DEF injector from muffler.
3. Connect the vehicle to HINO DX II .
4. Set the starter switch to the "ON" position.
5. Select [DCU].
6. Select [Inspection Menu] and check the DEF injector actuation.
   <Inspection procedure>
   (1) Select [Inspection Menu].
   (2) Select [DEF solution addition test].
   (3) Perform additional tests as instructed on the HINO DX II screen. (Perform test patterns 1 – 3 and check the injection amount and spray condition.)

Is operation normal?	
YES	NO
Go to step 20.	Replace the DEF injector. (After replacing the DEF injector, execute a DPR forced regeneration.) Clear passed DTC and check if the DTC is detected again after test drive.

ENGINE CONTROL SYSTEM (J08E)

20	Inspect the NOx sensor 2 (SCR downstream) [HINO DX II]

1. Enter a soot amount value of 2.2 using the DX Customization function.
   HINO DX II selection items: Customization_DPR deposit quantity

2. After DPR auto regeneration has been completed (the soot bar display reads zero), drive the vehicle for about 5 minutes at a constant vehicle speed or engine revolution.

HINT
To stabilize the exhaust gas flow rate, drive at a steady speed of about 45 – 50 mph.

3. Select [Engine] and check if P2214 has been detected.

Has DTC P2214 been detected?

YES

Replace the engine ECU. (After replacing the engine ECU, execute a DPR forced regeneration.)
Clear passed DTC and check if the DTC is detected again after test drive.

NO

Procedure completed.
Clear passed DTC and check if the DTC is detected again after test drive.