Group:	Service Manual Update
Bulletin No.:	SB-14-028
Issue Date:	12/2/2014

SERVICE INFORMATION BULLETIN

CORRECTION OF WORKSHOP MANUAL FOR 2011- 2015 MY
(REVISION OF TROUBLESHOOTING PROCEDURE FOR THE DTC P207F)

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

CONTENTS:
Troubleshooting information and Inspection procedure of the DTC/P207F were revised.

RELEVANT MANUAL:

MODEL	MANUAL No.	CHAPTER	PAGE No.
USA 2011MY	S1-UNAE07B DIA	FUEL CONTROL (J08E)	DN02–193
USA 2012MY	S7-UNAE08A	FUEL CONTROL (J08E)	DN02–558
USA 2012MY	S7-UNAE08B	FUEL CONTROL (J08E)	DN02–548
USA 2013MY	S7-UNAE09A	FUEL CONTROL (J08E)	DN02–584

MODEL	MANUAL No.	CHAPTER	PAGE No.
USA 2014MY	S7-UNAE10 A	ENGINE CONTROL SYSTEM (J08E)	From 4–947 to 4–952
USA 2014MY	S7-UNAE10 C	ENGINE CONTROL SYSTEM (J08E)	From 4–933 to 4–938
USA 2015MY	S7-UNAE11 A	ENGINE CONTROL SYSTEM (J08E)	From 4–741 to 4–749

Vendor Ref.:	SB-A-17-026

INSPECTION PROCEDURE FOR 2013 and 2014 MODEL YEARS: P207F

ENGINE CONTROL SYSTEM (J08E)

INSPECTION PROCEDURE: P207F

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.

- 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 Check the DTC detected (Engine ECU) [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 [Engine] and check if P200C (DPF over temperature) has been detected.

Has DTC P200C been detected?

ENGINE CONTROL SYSTEM (J08E)

YES	NO
Replace the DPR filter, DOC, and SCR catalyst. NOTICE As the proper functioning of the DOC and SCR catalyst decreases with abnormally high exhaust gas temperatures, it is doubtful whether deterioration of the cleaning effect can be detected as DEF deterioration. Replace the DOC and SCR catalyst in addition to the DPR filter when P200C (DPF over temperature) has been detected.	Go to step 3.

3	Inspect the DPR filter outlet exhaust gas temperature [HINO DX II]

1. Use [DPR outlet maximum exhaust gas temperature] from [DX Report] to read the history of the maximum exhaust gas temperature at the DPR outlet.
   HINO DX II selection items:[Past work information] / (VIN of the relevant vehicle) / [Open] / [Print] / [Vehicle data] / [Print]

Have a temperature of over 700 °C {1,292 °F} been detected?

YES	NO
Check the condition of the DPR filter and the tailpipe, and then check the SCR catalyst inlet area if signs of soot leakage is found. See reference A on the last page of this procedure.	Go to step 4.

4	Detection confirmation for a DTC indicating abnormal NOx sensor characteristics

1. Select [Engine] and [DCU] on the HINO DX II screen and check for detection of a DTC indicating abnormal NOx sensor characteristics.
   DTC related to abnormal NOx sensor characteristic:
   P2201, P2204, P2209, P2212, P2214, P2222

Has a DTC related to abnormal NOx sensor characteristic been detected?

YES	NO
Go to diagnosis procedure of a related DTC.	Go to step 5.

5	Detection confirmation for a DTC related to DEF injector malfunction

1. Select [DCU] on the HINO DX II screen and check for detection of a DTC related to a DEF injector defect.

ENGINE CONTROL SYSTEM (J08E)

DEF injector malfunction related DTCs:
P202E, P2047, P2048, P2049, P20F4

Has a DTC related to DEF injector malfunction been detected?

YES	NO
Go to diagnosis procedure of a related DTC.	Go to step 6.

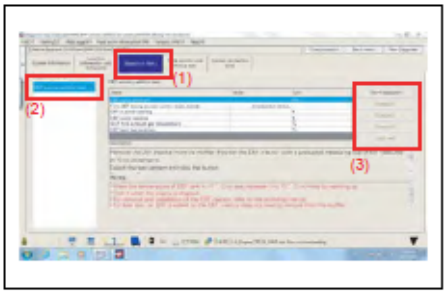
6 Detection confirmation for a DTC related to the exhaust gas temperature sensor (SCR inlet)

1. Select [DCU] on the HINO DX II screen and check for detection of a DTC related to the exhaust gas temperature sensor (SCR inlet).
   Exhaust gas temperature sensor (SCR inlet) related DTCs:
   P2481, P2482, P2483

Has a DTC related to the exhaust gas temperature sensor (SCR inlet) been detected?

YES	NO
Go to diagnosis procedure of a related DTC.	Go to step 7.

7 Inspect the DEF injector [HINO DX II]



SAPH15FD10300713

Use the activation test function of the HINO DX II to perform a DEF injection test, and then check for clogging of the DEF injector.

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 decreases.)

1. Set the starter switch to the "LOCK" position.
2. Remove the DEF injector from the muffler.
3. Set the starter switch to the "ON" position.
4. Select [DCU] on the screen of HINO DX II .
5. Select [Inspection Menu] on HINO DX II menu and check the operation of the DEF injector.
   <Inspection procedure>
   (1) Select [Inspection Menu].
   (2) Select [DEF solution addition test].
   (3) Perform addition test as instructed on the HINO DX II screen. (Perform all three patterns)

NOTICE
Carrying out the DEF injection test while DEF is frozen may damage the DEF pump. Make sure the DEF is not frozen when performing the injection test.

ENGINE CONTROL SYSTEM (J08E)

Is operation normal?	
YES	NO
Go to step 9.	Go to step 8.

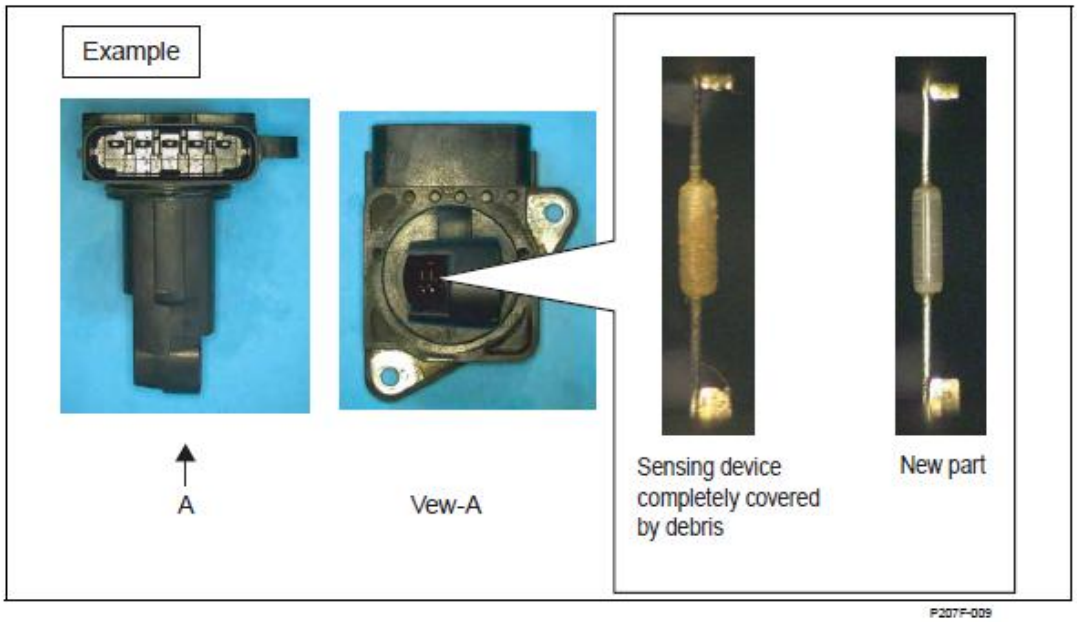
8	Inspect the DEF piping for clogging [Hino-DX II]

1. Disconnect the DEF piping from the injector, and then perform a DEF injection test to check for clogging of the piping. (Same test with step 7.)

Was any failure found?	
YES	NO
Repair the faulty part. Clear passed DTC and check if the DTC is detected again after test drive.	Replace the DEF injector

9	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 10.	Go to step 11.

10	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 .

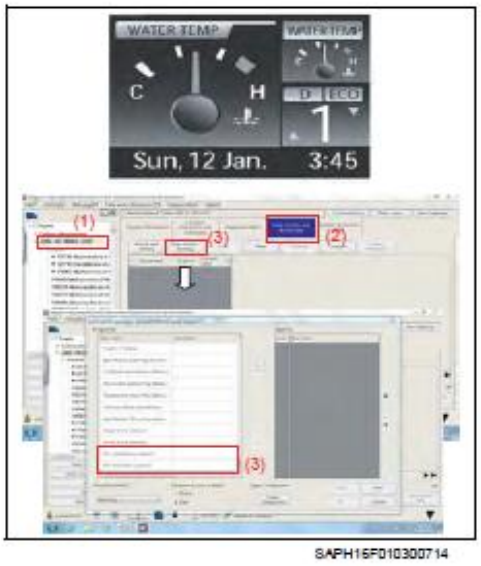
1. Set the starter switch to the lock position and connect HINO DX II to the vehicle.
2. Reconnect the sensor to the vehicle.
3. Set the starter switch to ON position and select [Engine] on HINO DX II menu.
4. Select [Amount of intake air flow inspection] from [Inspection Menu] on HINO DX II .
5. Perform [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 11.	Install the new air flow sensor.

ENGINE CONTROL SYSTEM (J08E)

11	Inspect the NOx sensor [HINO DX II]



SAPH15F010300714

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

1. 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.

2. Confirm that the output waveform of NOx sensor is being read out, by using Data Monitor function of the HINO DX II .
<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)] and [NOx level (after catalyst)] on [Data monitor Setting] screen, and start data monitor.

3. 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.

4. 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 NOx sensor that does not operate properly.	Go to step 12.

ENGINE CONTROL SYSTEM (J08E)

12	Inspect the SCR catalyst, and intermediate pipes between SCR catalyst and mixing chamber

1. Remove the SCR catalyst and confirm that there is no soot leakage, breakage, deformation, or other abnormality.
2. Check that there are no chunks of DEF crystals in the intermediate pipes between the mixing chamber and the SCR catalyst.

Was any failure found?

YES

1. Replace the SCR catalyst.
2. Clean or replace the pipe.

NO

Confirm that there are no indications that fuel was filled into the DEF tank by mistake.

NOTICE

If fuel has been filled into the DEF tank by mistake, the DEF level tube and the DEF pump filter will be discolored, or deposits will have become attached.

See reference B on the last page of this procedure.

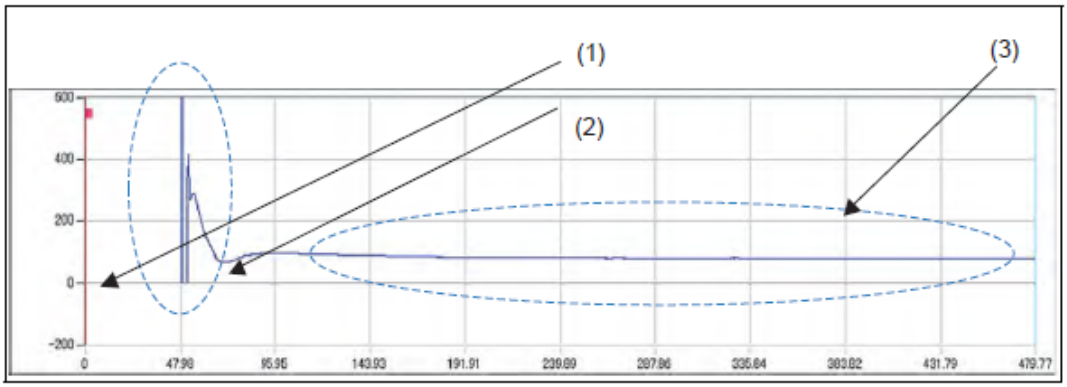
REMARK: If no trouble causes are found with this diagnosis procedure, it can be suspected that the respective DTC was issued because of a temporary fault condition caused by the freezing of the DEF.

ENGINE CONTROL SYSTEM (J08E)

Manual for the Verification of the Condition of NOx Sensor

Verify the condition of NOx sensor based on the waveforms illustrated below when checking the level of NOx sensor using DX.

Quality Product Example



SAPH16F0103007 15

Judgmental Standard
The data of the level of NOx sensor is below "1" and becomes stable in 5 minutes after the initiation of NOx transmission.

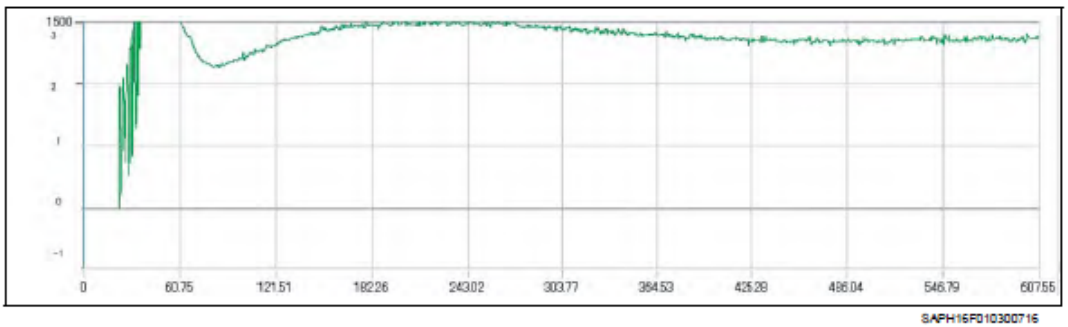
Characteristics

1. The level of NOx sensor stays around "0" until the indicator on the water temperature meter on the vehicle goes up to the middle, as its data is not being transmitted.
2. It is not a problem if the meter shows a high level of NOx sensor for an instant moment when the data of the level of NOx sensor begins to be transmitted.
3. The data of the level of NOx sensor becomes stable at below "1" in about 5 minutes after the initiation of NOx transmission. (Make sure to set the exhaust brake to "OFF")

Failed Product Examples

The level of NOx sensor staying at a elevated level.
The condition in which the level of NOx sensor stays above "1" for longer than 5 minutes after the initiation of NOx transmission is called "elevated NOx level" and NOx sensors with this condition is considered as defective.

<Elevated NOx Level CASE1>

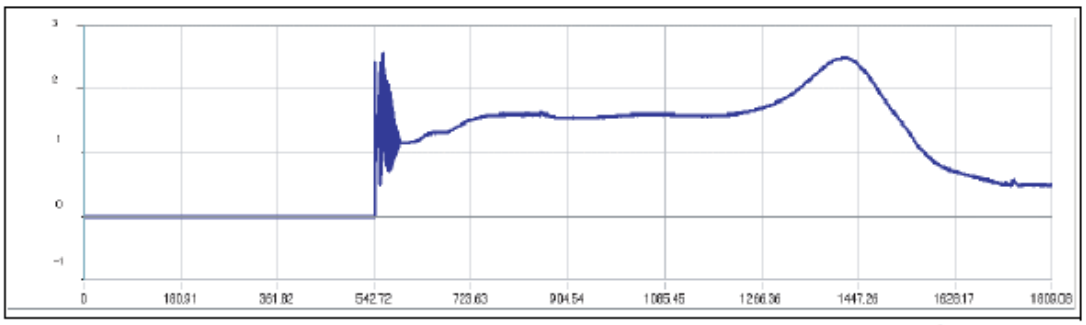


SAPH16F0103007 16

Considered defective as the level of NOx sensor is above "1"

ENGINE CONTROL SYSTEM (J08E)

<Elevated NOx Level CASE2>

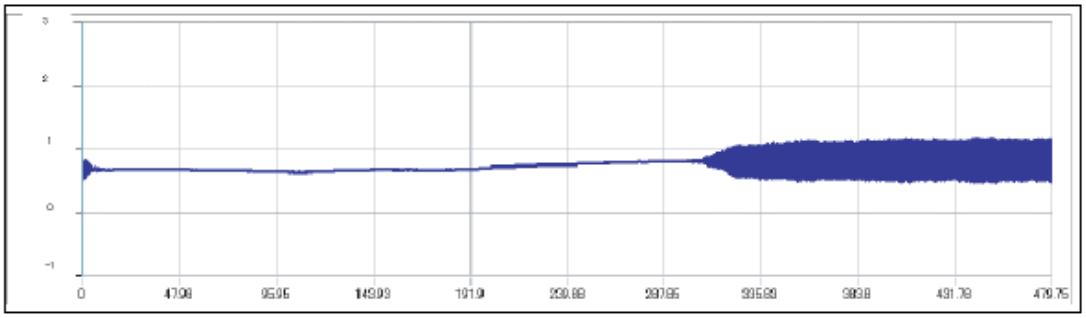


SAPH16F010300717

Considered defective as the level of NOx sensor mostly stays above "1" for longer than 5 minutes after the initiation of NOx transmission, although it goes down to below "1" at the end of the graph.

Oscillation
The condition in which the level of NOx sensor is unstable is called "Oscillation" and considered as defective.

<Oscillation CASE1>

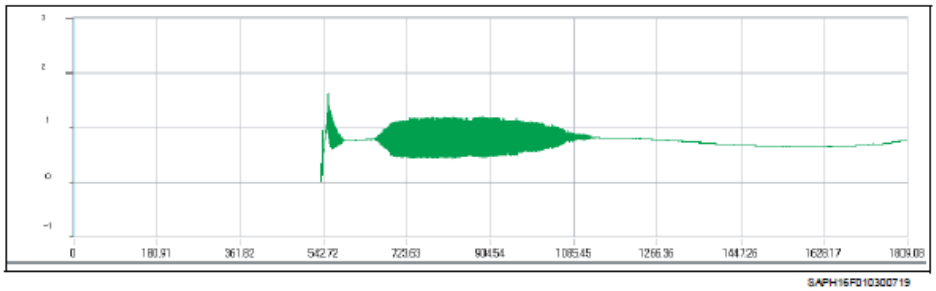


SAPH16F010300718

Considered defective as the level of NOx sensor is not stable all the way through, although it stays below "1".

ENGINE CONTROL SYSTEM (J08E)

<Oscillation CASE2>



SAPH16F010300719

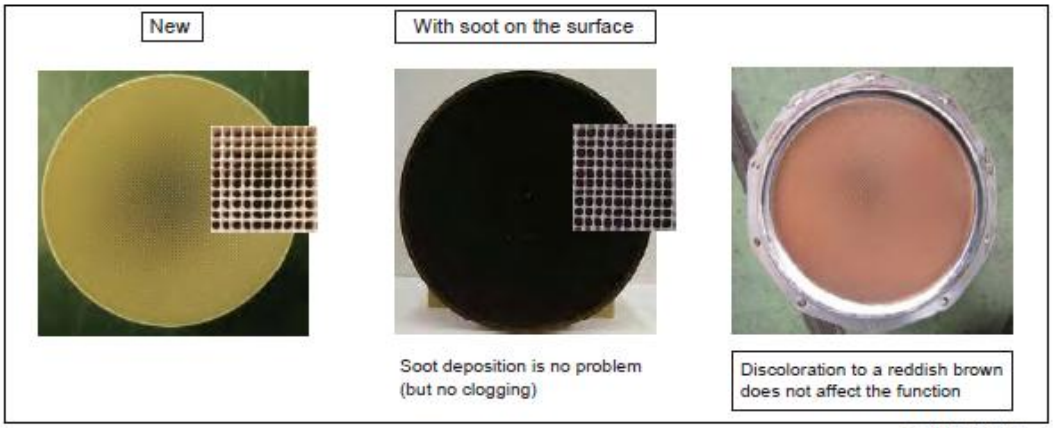
Considered defective as the level of NOx sensor is not stable all the way through, although it stays below level "1".

ENGINE CONTROL SYSTEM (J08E)

Reference A

NOTICE

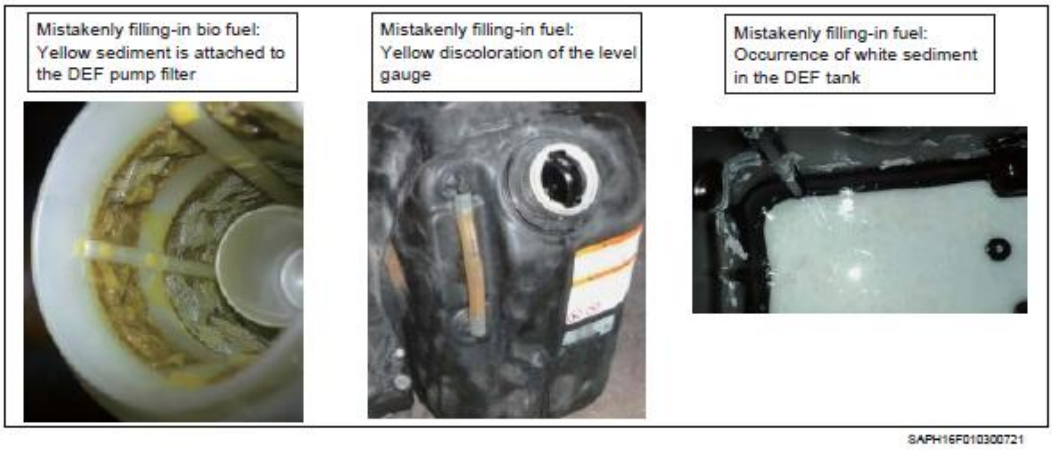
In case of deformation, breakage, or clogging of the SCR catalyst, replace the catalyst. However, if there is only soot adhering to it, or the color has changed to a reddish brown, there is no problem in regard to the function; in this case, a replacement is not required.



Reference B

NOTICE

Examples for mistakenly filling fuel into the DEF tank



INSPECTION PROCEDURE FOR 2015 MODEL YEAR: P207F

ENGINE CONTROL SYSTEM (J08E)

INSPECTION PROCEDURE: P207F

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 Check the DTC detected (Engine ECU) [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 [Engine] and check if P200C (DPF over temperature) has been detected.

Has DTC P200C been detected?

YES	NO
Replace the DPR filter, DOC, and SCR catalyst. NOTICE As the proper functioning of the DOC and SCR catalyst decreases with abnormally high exhaust gas temperatures, it is doubtful whether deterioration of the cleaning effect can be detected as DEF deterioration. Replace the DOC and SCR catalyst in addition to the DPR filter when P200C (DPF over temperature) has been detected.	Go to step 3.

3	Inspect the DPR filter outlet exhaust gas temperature [HINO DX II]

1. Use [DPR outlet maximum exhaust gas temperature] from [DX Report] to read the history of the maximum exhaust gas temperature at the DPR outlet.
HINO DX II selection items:[Past work information] / (VIN of the relevant vehicle) / [Open] / [Print] / [Vehicle data] / [Print]

Have a temperature of over 700 °C {1,292 °F} been detected?

YES	NO
Check the condition of the DPR filter and the tailpipe, and then check the SCR catalyst inlet area if signs of soot leakage is found. See reference A on the last page of this procedure.	Go to step 4.

4	Detection confirmation for a DTC indicating abnormal NOx sensor characteristics

1. Select [Engine] and [DCU] on the HINO DX II screen and check for detection of a DTC indicating abnormal NOx sensor characteristics.
DTC related to abnormal NOx sensor characteristic:
P2201, P2204, P2209, P2212, P2214, P2222

Has a DTC related to abnormal NOx sensor characteristic been detected?

YES	NO
Go to diagnosis procedure of a related DTC.	Go to step 5.

5	Detection confirmation for a DTC related to DEF injector malfunction

1. Select [DCU] on the HINO DX II screen and check for detection of a DTC related to a DEF injector defect.

ENGINE CONTROL SYSTEM (J08E)

DEF injector malfunction related DTCs:
P202E, P2047, P2048, P2049, P20F4

Has a DTC related to DEF injector malfunction been detected?

YES	NO
Go to diagnosis procedure of a related DTC.	Go to step 6.

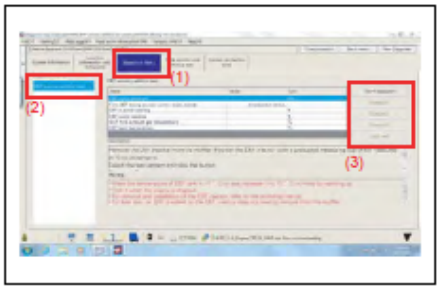
6 Detection confirmation for a DTC related to the exhaust gas temperature sensor (SCR inlet)

1. Select [DCU] on the HINO DX II screen and check for detection of a DTC related to the exhaust gas temperature sensor (SCR inlet).
Exhaust gas temperature sensor (SCR inlet) related DTCs:
P2481, P2482, P2483

Has a DTC related to the exhaust gas temperature sensor (SCR inlet) been detected?

YES	NO
Go to diagnosis procedure of a related DTC.	Go to step 7.

7 Inspect the DEF injector [HINO DX II]



SAPH16F010300713

Use the activation test function of the HINO DX II to perform a DEF injection test, and then check for clogging of the DEF injector.

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 decreases.)

1. Set the starter switch to the "LOCK" position.
2. Remove the DEF injector from the muffler.
3. Set the starter switch to the "ON" position.
4. Select [DCU] on the screen of HINO DX II .
5. Select [Inspection Menu] on HINO DX II menu and check the operation of the DEF injector.
<Inspection procedure>
(1) Select [Inspection Menu].
(2) Select [DEF solution addition test].
(3) Perform addition test as instructed on the HINO DX II screen.
(Perform all three patterns)

NOTICE
Carrying out the DEF injection test while DEF is frozen may damage the DEF pump. Make sure the DEF is not frozen when performing the injection test.

ENGINE CONTROL SYSTEM (J08E)

Is operation normal?	
YES	NO
Go to step 9.	Go to step 8.

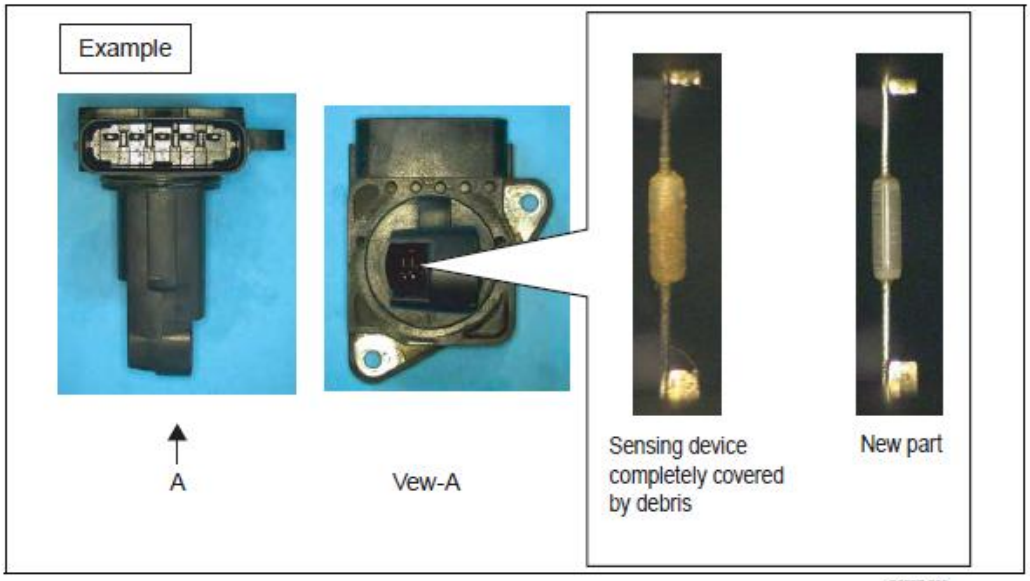
8	Inspect the DEF piping for clogging [Hino-DX II]

1. Disconnect the DEF piping from the injector, and then perform a DEF injection test to check for clogging of the piping. (Same test with step 7.)

Was any failure found?	
YES	NO
Repair the faulty part. Clear passed DTC and check if the DTC is detected again after test drive.	Replace the DEF injector

9	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 10.	Go to step 11.

10	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 .

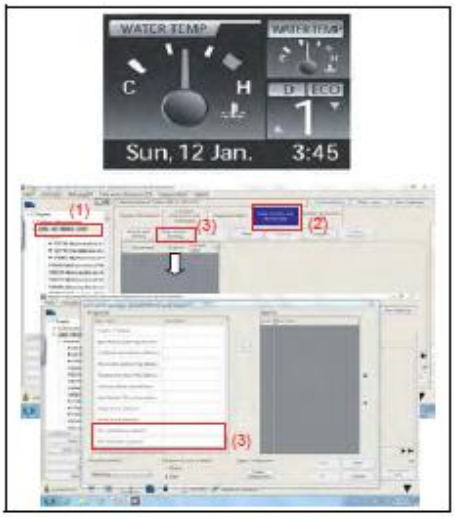
1. Set the starter switch to the lock position and connect HINO DX II to the vehicle.
2. Reconnect the sensor to the vehicle.
3. Set the starter switch to ON position and select [Engine] on HINO DX II menu.
4. Select [Amount of intake air flow inspection] from [Inspection Menu] on HINO DX II .
5. Perform [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 11.	Install the new air flow sensor.

ENGINE CONTROL SYSTEM (J08E)

11	Inspect the NOx sensor [HINO DX II]



SAPH16F010300714

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

1. 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.

2. Confirm that the output waveform of NOx sensor is being read out, by using Data Monitor function of the HINO DX II .
<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)] and [NOx level (after catalyst)] on [Data monitor Setting] screen, and start data monitor.

3. 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.

4. 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 NOx sensor that does not operate properly.	Go to step 12.

ENGINE CONTROL SYSTEM (J08E)

12	Inspect the SCR catalyst, and intermediate pipes between SCR catalyst and mixing chamber

1. Remove the SCR catalyst and confirm that there is no soot leakage, breakage, deformation, or other abnormality.
2. Check that there are no chunks of DEF crystals in the intermediate pipes between the mixing chamber and the SCR catalyst.

Was any failure found?

YES

1. Replace the SCR catalyst.
2. Clean or replace the pipe.

NO

Confirm that there are no indications that fuel was filled into the DEF tank by mistake.

NOTICE

If fuel has been filled into the DEF tank by mistake, the DEF level tube and the DEF pump filter will be discolored, or deposits will have become attached.
See reference B on the last page of this procedure.

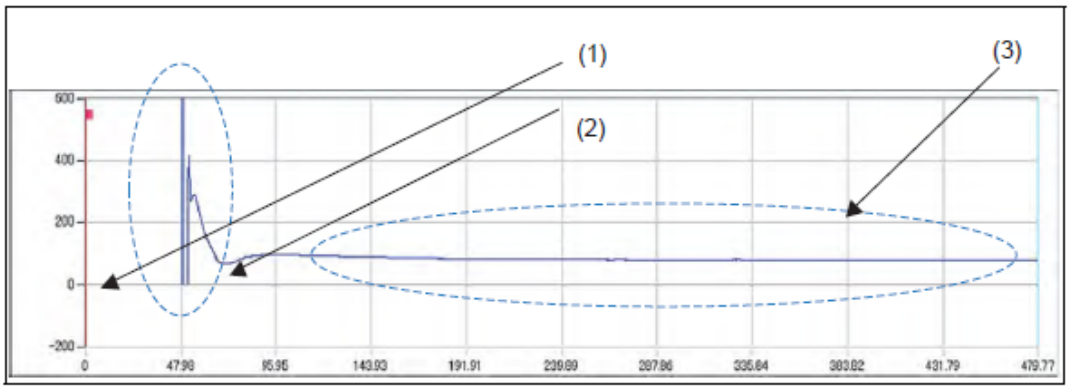
REMARK: If no trouble causes are found with this diagnosis procedure, it can be suspected that the respective DTC was issued because of a temporary fault condition caused by the freezing of the DEF.

ENGINE CONTROL SYSTEM (J08E)

Manual for the Verification of the Condition of NOx Sensor

Verify the condition of NOx sensor based on the waveforms illustrated below when checking the level of NOx sensor using DX.

Quality Product Example



SAPH15FD10300715

Judgmental Standard
The data of the level of NOx sensor is below "1" and becomes stable in 5 minutes after the initiation of NOx transmission.

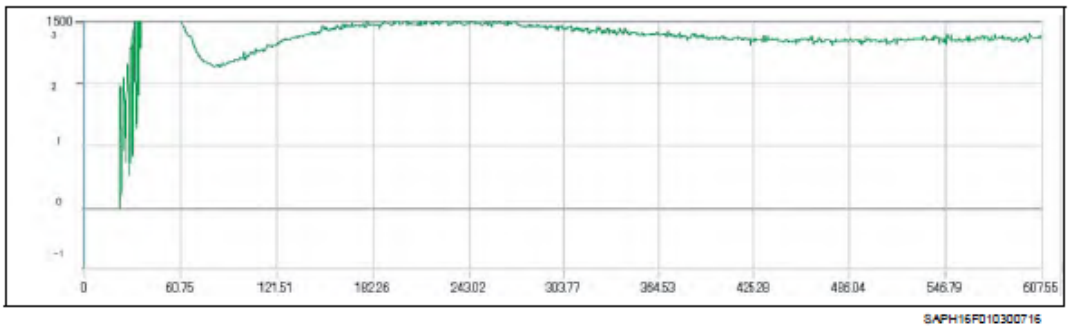
Characteristics

1. The level of NOx sensor stays around "0" until the indicator on the water temperature meter on the vehicle goes up to the middle, as its data is not being transmitted.
2. It is not a problem if the meter shows a high level of NOx sensor for an instant moment when the data of the level of NOx sensor begins to be transmitted.
3. The data of the level of NOx sensor becomes stable at below "1" in about 5 minutes after the initiation of NOx transmission. (Make sure to set the exhaust brake to "OFF")

Failed Product Examples

The level of NOx sensor staying at a elevated level.
The condition in which the level of NOx sensor stays above "1" for longer than 5 minutes after the initiation of NOx transmission is called "elevated NOx level" and NOx sensors with this condition is considered as defective.

<Elevated NOx Level CASE1>

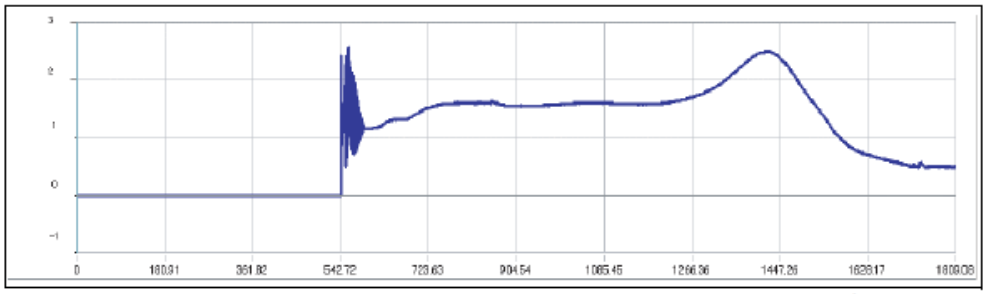


SAPH15FD10300716

Considered defective as the level of NOx sensor is above "1"

ENGINE CONTROL SYSTEM (J08E)

<Elevated NOx Level CASE2>

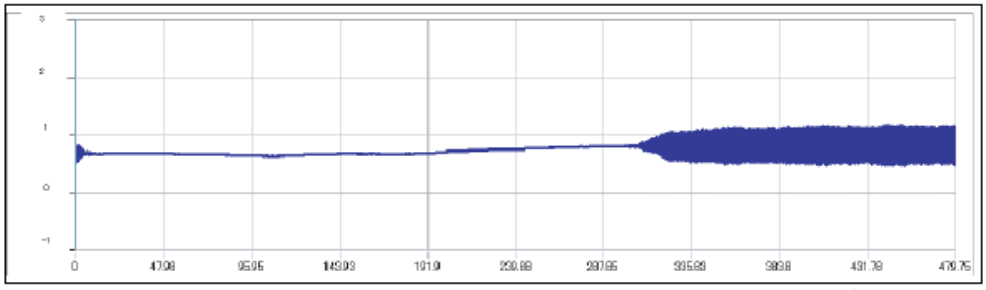


SAPH16F010300717

Considered defective as the level of NOx sensor mostly stays above "1" for longer than 5 minutes after the initiation of NOx transmission, although it goes down to below "1" at the end of the graph.

Oscillation
The condition in which the level of NOx sensor is unstable is called "Oscillation" and considered as defective.

<Oscillation CASE1>

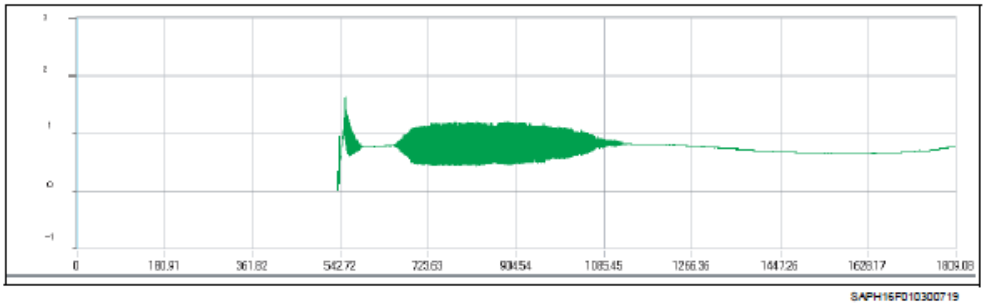


SAPH16F010300718

Considered defective as the level of NOx sensor is not stable all the way through, although it stays below "1".

ENGINE CONTROL SYSTEM (J08E)

<Oscillation CASE2>



SAPH16F010300719

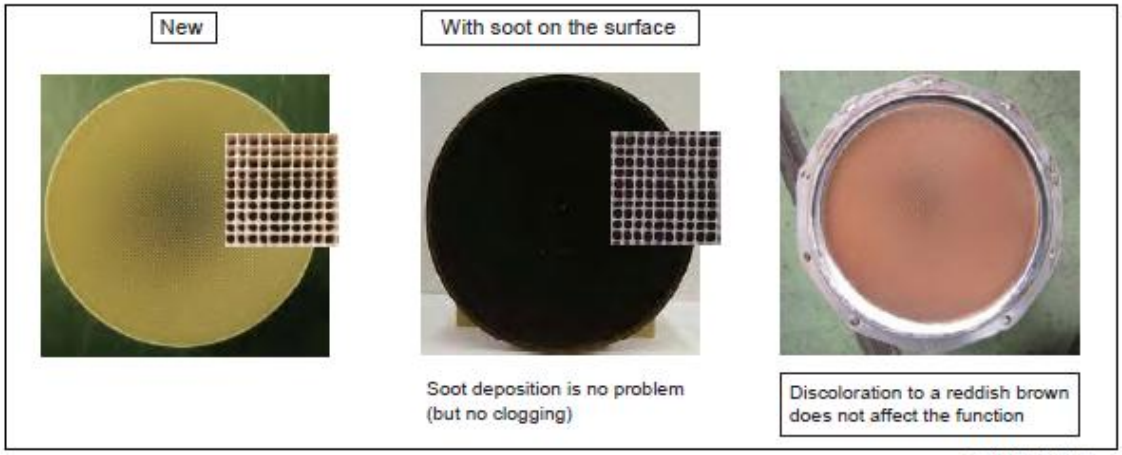
Considered defective as the level of NOx sensor is not stable all the way through, although it stays below level "1".

ENGINE CONTROL SYSTEM (J08E)

Reference A

NOTICE

In case of deformation, breakage, or clogging of the SCR catalyst, replace the catalyst. However, if there is only soot adhering to it, or the color has changed to a reddish brown, there is no problem in regard to the function; in this case, a replacement is not required.

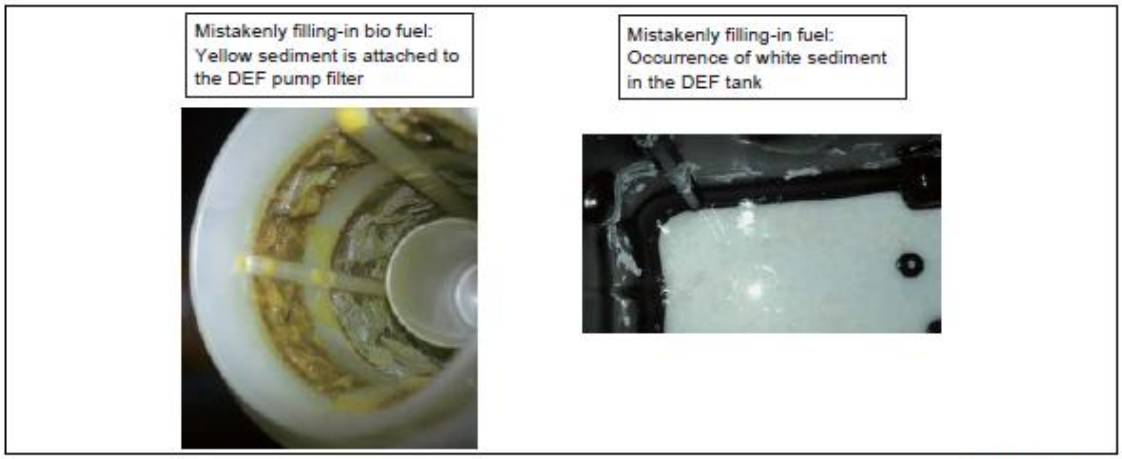


SAPH16F010300720

Reference B

NOTICE

Examples for mistakenly filling fuel into the DEF tank



SAPH16F010300721