SEN06506-07

Shop Manual

ENGINE

114E -6 SERIES

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EXPLANATION OF TERMS FOR MAINTENANCE STANDARD

The maintenance standard section shows the judgment criteria whether the equipment or parts should be replaced or can be reused when the machine is disassembled for the maintenance. The following terms are the descriptions of the judgment criteria.

Standard dimension and tolerance

- The finished dimension of a part is slightly different from one to another actually.
- A standard dimension of a finished part is set, and an allowable difference from that dimension is set for the part.
- The dimension set as the standard is called the standard dimension and the allowable range of difference from this standard dimension is called "tolerance".
- An indication example of a standard dimension and tolerance is shown in the following table.
  (The standard dimension is entered on the left side and the tolerance is entered with a positive or negative symbol on the right side)

Example:

Standard dimension	Tolerance
120	-0.022 -0.126

- The tolerance may be indicated in the text and a table as "standard dimension (upper limit of tolerance/ lower limit of tolerance)."
  Example) 120 (-0.022/ -0.126)
- Usually, the dimension of a hole and the dimension of the shaft to be inserted into that hole are indicated by the same standard dimension and different tolerances of the hole and shaft. The tightness of fit is determined by the tolerance.
- A dimension indication example of a shaft and hole is shown in the following table.
  (The standard dimension is entered on the left side and the tolerance of the shaft is entered with a positive or negative symbol at the center and that of the hole on the right side)

Standard dimension	Tolerance	
	Shaft	Hole
60	-0.030 -0.076	+0.046 0

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Status		Elapsed time (*1)	Machine monitor					Engine deration (*5)
			Message of SCR Information	AdBlue/DEF system caution lamp (Action level)	Tone of audible alert	Failure code for abnormality (*2),(*3)	Failure code for Inducement strategy status (*4)	
4	Severe Inducement (Inducement 2)	Until repairing	4: Engine power is under heavy deration.	Red  APP14413 Red L04 APP14413	Continuously	CA3571 CB3571	AS00R4 (Inducement 2 (SCR Device Abnormality))	Torque: over 50% and RPM: over 40%

*1: Elapsed time of each stage describes an accumulated time advancing to the next stage after starting "Warning" stage. Final Inducement is not cleared till abnormality is repaired.

*2: These failure codes are displayed on "Current Abnormality" in the operator mode, or "Abnormality Record" in the service mode. The failure code shown here is an example of failure code which is displayed on the machine monitor when an abnormality occurs. For the failure codes, see TROUBLESHOOTING, "TROUBLESHOOTING POINTS FOR UREA SCR SYSTEM".

*3: The failure code which starts with CB may be displayed for the machine equipped with aftertreatment devices branching off to 2 lines.

*4: These failure codes are displayed on "Current Abnormality" in the operator mode, or "Abnormality Record" in the service mode.

*5: These percentages show a torque reduction ratio from the full torque curve, and a speed reduction ratio from the rated speed.

*6: Construction equipment with crawler

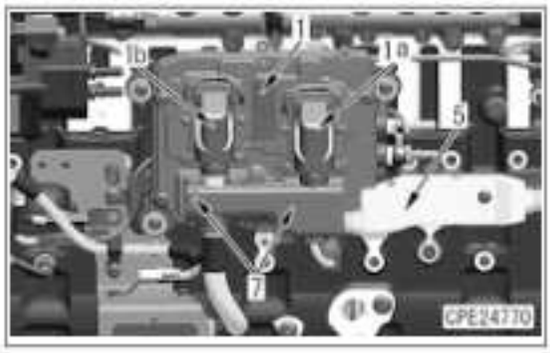
*7: Construction equipment with wheel

INDUCEMENT STRATEGY WHEN ABNORMALITY IS FOUND IN THE KDPF SYSTEM BY THE UREA SCR SYSTEM DEVICES (FOR EUROPEAN UNION)

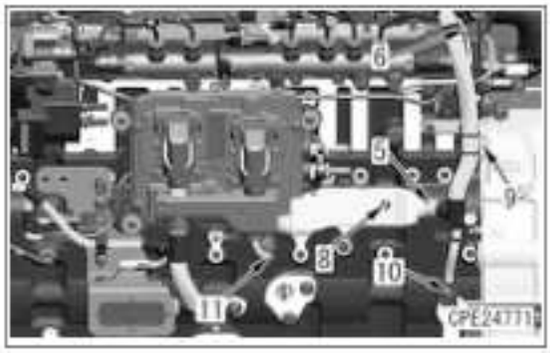
- The Inducement strategy is different if Inducement is triggered by abnormalities in KDPF. Although the total steps are the same and 4, warning indications are different and engine power deration (Over 25% torque reduction) starts from that of "Warning ".
- The table shows warning indications and engine power derations by each Inducement strategy status.

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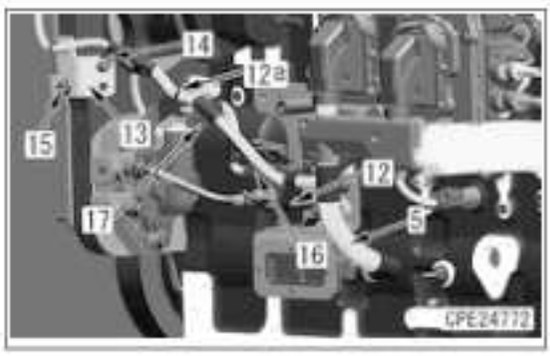
260. Install wiring harness (5) to engine controller (1) with hexagonal socket head bolts (7) and (4 mm).
   Mounting bolt:
   9±1 Nm {0.92±0.1 kgm}
261. Install connectors J1 (1a) and J2 (1b) to engine controller (1).



262. Fix wiring harness (5) with bolt (8).
   Mounting bolt (8):
   24±4 Nm {2.45±0.41 kgm}
263. Install wiring harness (5) to brackets (9).
264. Install clamp (6).
265. Install NE (crankshaft) speed sensor connector (10).
266. Install engine oil pressure switch connector (11).

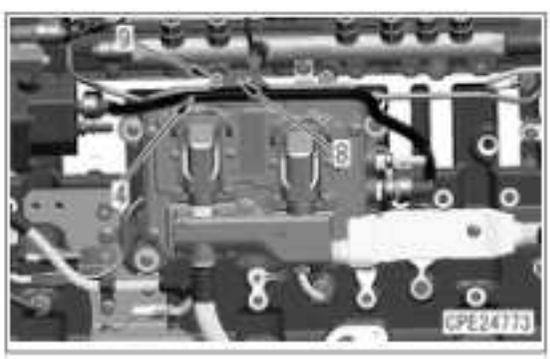


267. Install clamp (12) that is fixing wiring harness (5).
   Mounting bolt:
   24±4 Nm {2.45±0.41 kgm}
268. Install clip (12a) that is fixing wiring harness (5).
269. Install clamp (14) that is fixing wiring harness (5) together with bracket (13).
   Mounting bolt (clamp (14)):
   24±4 Nm {2.45±0.41 kgm}
   Mounting bolt (bracket (15)):
   43±6 Nm {4.38±0.61 kgm}
270. Install fuel lift pump connector (16).
271. Install Bkup (cam) speed sensor connector (17).

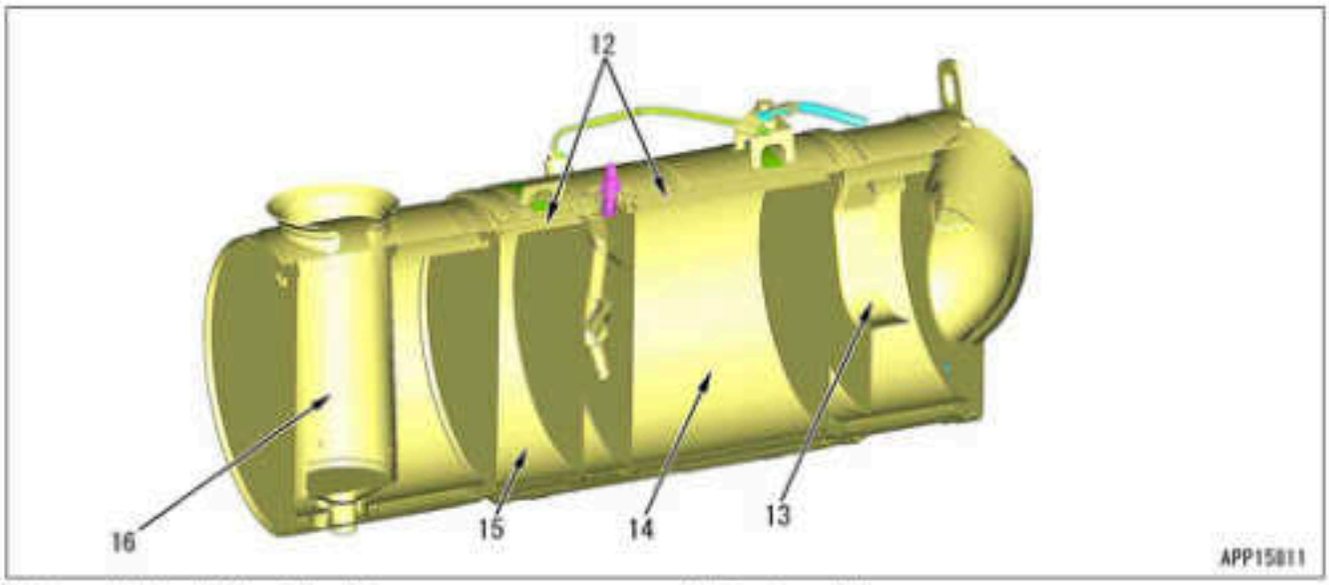


Fuel filter, hose

272. Install bracket (8) with bolt (9).
   Mounting bolt:
   43±6 Nm {4.38±0.61 kgm}



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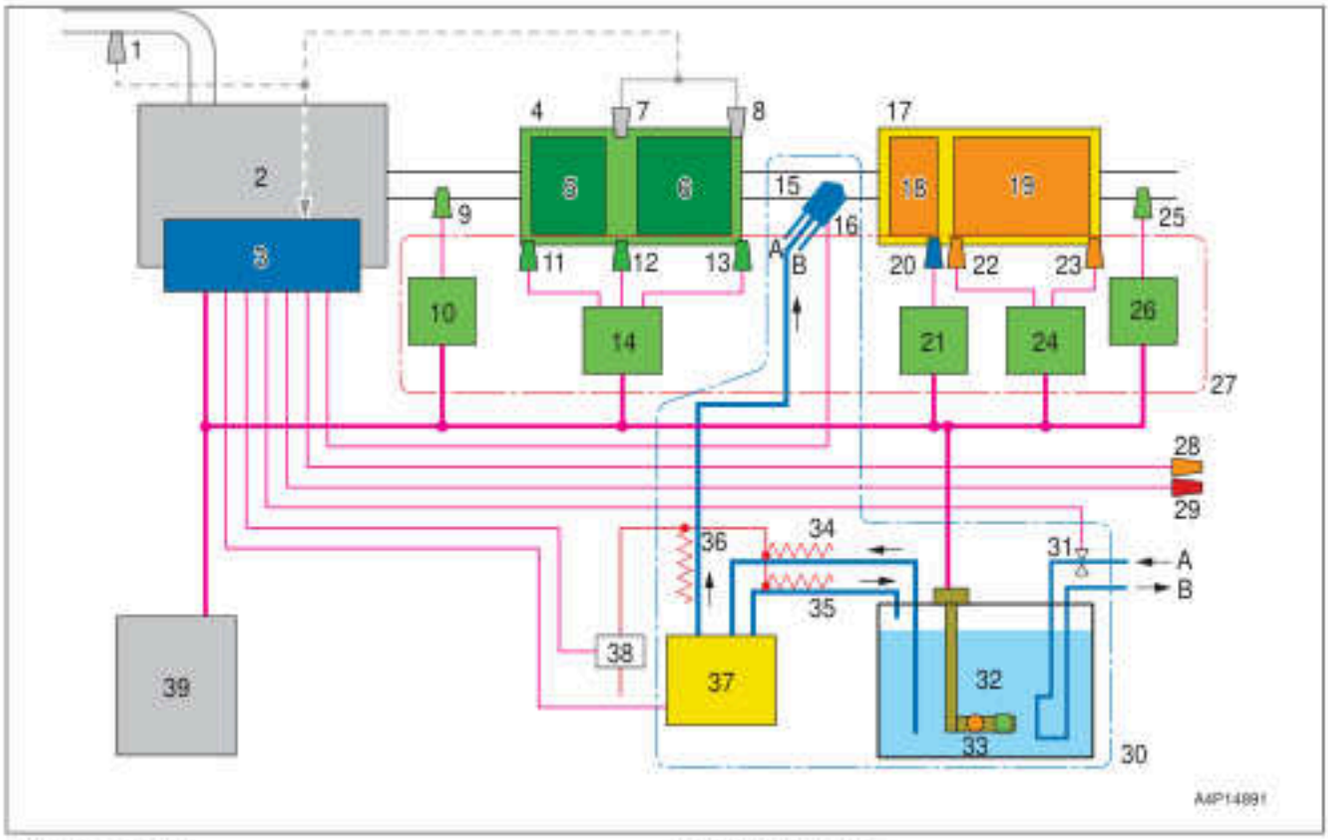


A: From AdBlue/DEF mixing tube
1: SCR body
2: SCR temperature sensor
3: SCR outlet NOx sensor
4: SCR outlet temperature sensor
5: Temperature sensor controller
6: Ammonia sensor
7: Hanger plate
8: water baffle
9: Water drain port
B: To exhaust pipe
10: Sensor table
11: Sensor table band
12: Catalyzer hold mat
13: Water dam
14: Downstream SCR catalyst and ammonia oxidation catalyst (integrated type)
15: Upstream SCR catalyst
16: Rectifier tube

- SCR assembly consists of rectifier tube (16) equalizing the distribution of flow speed by leading exhaust gas, upstream SCR catalyst (15), downstream SCR catalyst, ammonia oxidation catalyst (14), and water dam which prevents rain water from entering into downstream SCR catalyst and ammonia oxidation catalyst (14) while exhausting gas.
- Ammonia oxidation catalyst (a part of 14) oxidizes ammonia to water and nitrogen with ammonia oxidation catalyst (a part of 14) to prevent ammonia which is supplied to SCR assembly from being released out because SCR catalyst (a part of 14, 15)cannot completely consume it.
- Each 1 piece of SCR temperature sensor (2), SCR outlet temperature sensor (4), ammonia sensor (6), and SCR outlet NOx sensor (3) are installed. These sensors are usable for various troubleshooting, such as they are used to control the feedback of denitration efficiency or they monitor that SCR catalyst properly functions or not.
- Rectifying tube (16) equalizes the distribution of exhaust gas flow speed.
- SCR catalyst (15, a part of 14) uses the ceramic honeycomb.
- The catalyzer holding mat (12) is made of a specific fiber and protects the ceramic catalyst against vibrations by the engine and the machine body. It also protects the outer periphery of SCR assembly against a heat transfer of the ceramics during operation.
- Water dam (13) is located at the upstream side of the outlet and prevents rainwater from entering into downstream SCR catalyst unit and ammonia oxidation catalyst (14).
- Water baffle (8) is located at the downstream side of the outlet and prevents rainwater at outlet from splashing over the detection part of NOx sensor.

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UREA SCR SYSTEM DIAGRAM



A: Coolant inlet
B: Coolant outlet
1: Mass air flow and temperature sensor
2: Engine
3: Engine controller
4: KDPF assembly
5: KDOC unit
6: KCSF unit
7: KDPF differential pressure sensor
8: KDPF outlet pressure sensor
9: Turbocharger outlet NOx sensor
10: Turbocharger outlet NOx sensor controller
11: KDOC inlet temperature sensor
12: KDOC outlet temperature sensor
13: KDPF outlet temperature sensor
14: KDPF temperature sensor controller
15: AdBlue/DEF mixing tube
16: AdBlue/DEF injector
17: SCR assembly
18: Upstream SCR catalyst
19: Downstream SCR catalyst and ammonia oxidation catalyst (integrated type)
20: Ammonia sensor
21: KDPF temperature sensor controller
22: SCR temperature sensor
23: SCR outlet temperature sensor
24: SCR temperature sensor controller
25: SCR outlet NOx sensor
26: SCR outlet NOx sensor controller
27: Smart sensor
28: Ambient temperature sensor
29: Engine room temperature sensor (*1)
30: AdBlue/DEF system
31: AdBlue/DEF tank heating valve
32: AdBlue/DEF tank
33: AdBlue/DEF tank sensor
34: AdBlue/DEF suction line
35: AdBlue/DEF return line
36: AdBlue/DEF pressure line
37: AdBlue/DEF pump
38: AdBlue/DEF line heater relay
39: Machine monitor
*1: There are some machine models which are not equipped with it.

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