

Shop Manual

BULLDOZER

D61EXi-24
D61PXi-24

SERIAL NUMBERS D61EXi-40001 and up
 D61PXi-40001

KOMATSU

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SAFETY NOTICE FOR OPERATION

- Appropriate servicing and repair are extremely important to ensure safe operation of the machine. The shop manuals describe the effective and safe servicing and repair methods recommended by Komatsu. Some of the servicing and repair methods require the use of special tools designed by Komatsu for special purposes.
- The symbol mark  is indicated for such matters that require special precautions. The work indicated with this warning mark  should be performed according to the instructions with special attention. Should a hazardous situation occurs or be anticipated during such work, be sure to keep safe first and take every necessary measures.

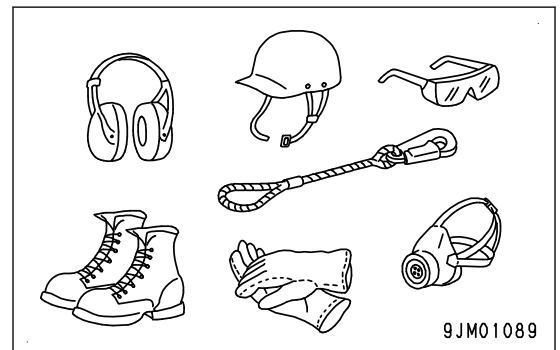
Safety matters

- Well organized work place
- Correct work clothes
- Observance of work standard
- Enforcement of hand signals
- Prohibition against unlicensed persons operating and handling the machine
- Safety check before starting work
- Wear of dust glasses (for cleaning or grinding work)
- Wear of welding goggles and protectors (for welding work)
- Being in good physical condition, and good preparation
- Always be alert and careful.

General precautions

 **If the machine is handled incorrectly, it is dangerous. Read and understand what is described in the operation and maintenance manual before operation. Read and understand what is described in this manual before operation.**

- Read and understand the meaning of all the safety labels stuck to the machine before performing any greasing or repairs. For the locations of the safety labels and detailed explanation of precautions, see Operation and Maintenance Manual.
- Tools and removed parts in the workshop should be well organized. Always keep the tools and parts in their correct places. Always keep the work area clean and make sure that there is no dust, dirt, oil, or water on the floor. Smoke only in the designated areas. Never smoke while working.
- Keep all tools in good condition, learn the correct way to use them, and use the proper ones. Check the tools, machine, forklift truck, service car, etc. thoroughly before starting the work.
- Always wear safety shoes and helmet when performing any operation. Do not wear loose clothes, or clothes with buttons missing.



DISCONNECT AND CONNECT PUSH-PULL TYPE COUPLER

REMARK

- Loosen the oil filler cap of the hydraulic tank slowly to release the remaining pressure in the hydraulic tank.
- Provide an oil container to receive oil since some hydraulic oil flows out when the hose is disconnected even after the remaining pressure is released from the hydraulic tank.

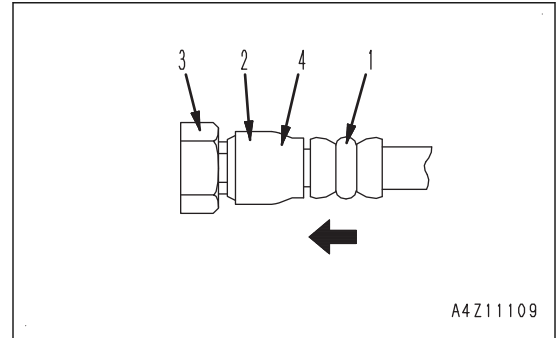
METHOD FOR DISCONNECTING AND CONNECTING TYPE 1 PUSH-PULL TYPE COUPLER

Disconnection

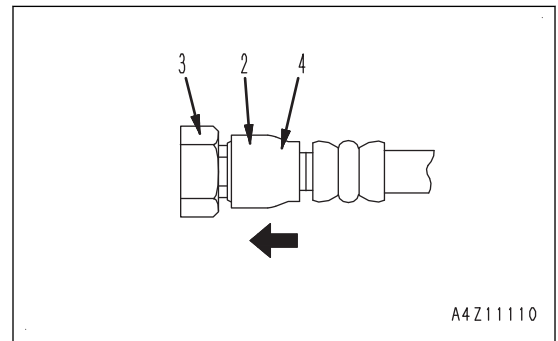
1. Hold adapter (1), and push hose joint (2) into mating adapter (3).

REMARK

- Push it in approximately 3.5 mm.
- Do not hold rubber cap portion (4).



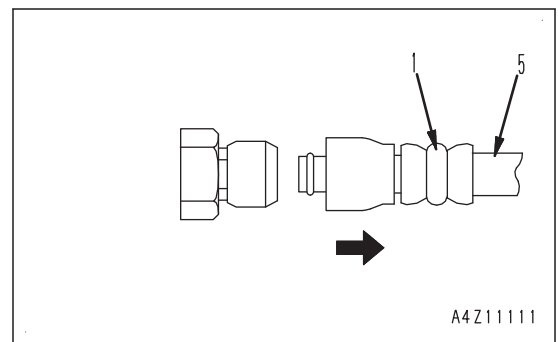
2. While having adapter (3) inserted into hose side joint (2), insert rubber cap (4) to adapter (3) side until it clicks.



3. Hold hose adapter (1) or hose (5), and pull it out.

REMARK

Provide an oil container to receive a quantity of hydraulic oil which may flow out.

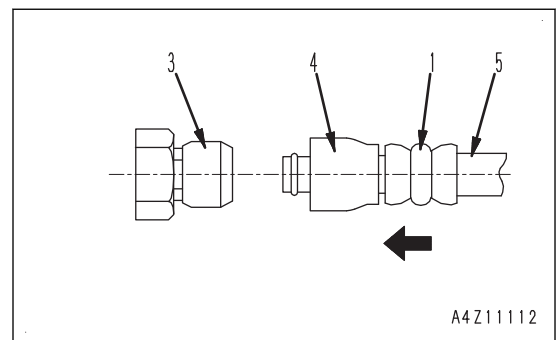


Connection

1. Hold hose adapter (1) or hose (5), and insert it in mating adapter (3), aligning the axis.

REMARK

Do not hold rubber cap portion (4).



1 mm = 0.03937 in

| | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|----|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 60 | 2.362 | 2.402 | 2.441 | 2.480 | 2.520 | 2.559 | 2.598 | 2.638 | 2.677 | 2.717 |
| 70 | 2.756 | 2.795 | 2.835 | 2.847 | 2.913 | 2.953 | 2.992 | 3.032 | 3.071 | 3.110 |
| 80 | 3.150 | 3.189 | 3.228 | 3.268 | 3.307 | 3.346 | 3.386 | 3.425 | 3.465 | 3.504 |
| 90 | 3.543 | 3.583 | 3.622 | 3.661 | 3.701 | 3.740 | 3.780 | 3.819 | 3.858 | 3.898 |

kg to lb

1 kg = 2.2046 lb

| | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|----|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0 | 0 | 2.20 | 4.41 | 6.61 | 8.82 | 11.02 | 13.23 | 15.43 | 17.64 | 19.84 |
| 10 | 22.05 | 24.25 | 26.46 | 28.66 | 30.86 | 33.07 | 35.27 | 37.48 | 39.68 | 41.89 |
| 20 | 44.09 | 46.30 | 48.50 | 50.71 | 51.91 | 55.12 | 57.32 | 59.53 | 61.73 | 63.93 |
| 30 | 66.14 | 68.34 | 70.55 | 72.75 | 74.96 | 77.16 | 79.37 | 81.57 | 83.78 | 85.98 |
| 40 | 88.18 | 90.39 | 92.59 | 94.80 | 97.00 | 99.21 | 101.41 | 103.62 | 105.82 | 108.03 |
| 50 | 110.23 | 112.44 | 114.64 | 116.85 | 119.05 | 121.25 | 123.46 | 125.66 | 127.87 | 130.07 |
| 60 | 132.28 | 134.48 | 136.69 | 138.89 | 141.10 | 143.30 | 145.51 | 147.71 | 149.91 | 152.12 |
| 70 | 154.32 | 156.53 | 158.73 | 160.94 | 163.14 | 165.35 | 167.55 | 169.76 | 171.96 | 174.17 |
| 80 | 176.37 | 178.57 | 180.78 | 182.98 | 185.19 | 187.39 | 189.60 | 191.80 | 194.01 | 196.21 |
| 90 | 198.42 | 200.62 | 202.83 | 205.03 | 207.24 | 209.44 | 211.64 | 213.85 | 216.05 | 218.26 |

ℓ to U.S.Gal

1 ℓ = 0.2642 U.S.Gal

| | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|----|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0 | 0 | 0.264 | 0.528 | 0.793 | 1.057 | 1.321 | 1.585 | 1.849 | 2.113 | 2.378 |
| 10 | 2.642 | 2.906 | 3.170 | 3.434 | 3.698 | 3.963 | 4.227 | 4.491 | 4.755 | 5.019 |
| 20 | 5.283 | 5.548 | 5.812 | 6.076 | 6.340 | 6.604 | 6.869 | 7.133 | 7.397 | 7.661 |
| 30 | 7.925 | 8.189 | 8.454 | 8.718 | 8.982 | 9.246 | 9.510 | 9.774 | 10.039 | 10.303 |
| 40 | 10.567 | 10.831 | 11.095 | 11.359 | 11.624 | 11.888 | 12.152 | 12.416 | 12.680 | 12.944 |
| 50 | 13.209 | 13.473 | 13.737 | 14.001 | 14.265 | 14.529 | 14.795 | 15.058 | 15.322 | 15.586 |
| 60 | 15.850 | 16.115 | 16.379 | 16.643 | 16.907 | 17.171 | 17.435 | 17.700 | 17.964 | 18.228 |
| 70 | 18.492 | 18.756 | 19.020 | 19.285 | 19.549 | 19.813 | 20.077 | 20.341 | 20.605 | 20.870 |
| 80 | 21.134 | 21.398 | 21.662 | 21.926 | 22.190 | 22.455 | 22.719 | 22.983 | 23.247 | 23.511 |
| 90 | 23.775 | 24.040 | 24.304 | 24.568 | 24.832 | 25.096 | 25.361 | 25.625 | 25.889 | 26.153 |

ℓ to U.K.Gal

1 ℓ = 0.21997 U.K.Gal









| | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|----|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0 | 0 | 0.220 | 0.440 | 0.660 | 0.880 | 1.100 | 1.320 | 1.540 | 1.760 | 1.980 |
| 10 | 2.200 | 2.420 | 2.640 | 2.860 | 3.080 | 3.300 | 3.520 | 3.740 | 3.950 | 4.179 |
| 20 | 4.399 | 4.619 | 4.839 | 5.059 | 5.279 | 5.499 | 5.719 | 5.939 | 6.159 | 6.379 |

Unit: kg

| Item | D61PXI-24 |
|---|-----------|
| PLUS type single grouser shoe (860 mm) | 1830 |
| Swamp shoe (860 mm) | 1560 |
| Hydraulic tank assembly (including washer tank, AdBlue/DEF tank, battery, and a part of piping) | 498 |
| Power angle power tilt dozer assembly (including center ball, pitch link, and pin) | 2260 |
| • Blade | 1158 |
| Dozer frame assembly (including piping and trunnion) | 1030 |
| • Stroke sensing tilt cylinder assembly | 63.8 |
| • Stroke sensing angle cylinder assembly | 67.9 |
| Lift cylinder assembly | 45 |
| • Stroke and reset sensing lift cylinder assembly | 50.7 |
| ROPS cab and floor assembly (including air conditioner) | 1100 |
| • Operator's seat | |
| Mechanical suspension seat (Low back) | 52 |
| Air suspension seat (Low back) | 49 |
| Rear mask assembly | 80 |
| Engine hood assembly (including door, pre-cleaner, and air cleaner) | 349 |

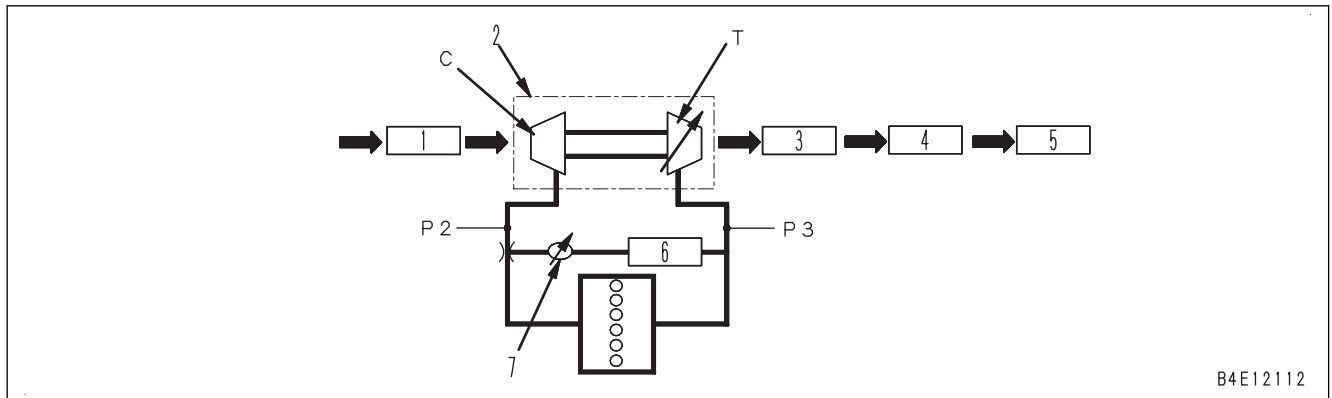
INDUCEMENT STRATEGY WHEN ABNORMALITY IS FOUND IN THE EGR SYSTEM BY THE UREA SCR SYSTEM DEVICES (FOR EUROPEAN UNION)

- The Inducement strategy is different if Inducement is triggered by abnormalities in EGR. It has 4 levels totally which is the same as that, but it has different display on the machine monitor, and engine power deration (torque lowering ratio is 25% or more) and alarm starts from "Warning".
- The table shows warning indications and engine power derations by each Inducement strategy status.

| Status | Elapsed time (*1) | Machine monitor | | | | | Engine deration (*5) |
|--|-------------------|---|---|---|--|---|----------------------|
| | | Message of SCR Information | Caution lamp (Action level) | Tone of audible alert | Failure code for abnormality (*2),(*3) | Failure code for Inducement strategy status (*4) | |
| 1 Warning | 5 hours | 1: Please inspect and maintain SCR system. | Red  APP14416 Red  APP14414 | Long intermittently | CA2271 CB2271 | No indication | Torque: over 25% |
| 2 Continuous Warning (Warning 2) | 10 hours | 2: Without treatment, engine power will be derated. | Red  APP14416 Yellow  APP14417 Red  APP14414 | Triplet (*6) Short intermittently (*7) | CA2271 CB2271 | AS00R2 (Warning 2 (SCR Device Abnormality)) | Torque: over 25% |
| 3 Low-Level Inducement (Inducement 1) | 20 hours | 3: Engine power is under deration. | Red  APP14416 Red  APP14415 Red  APP14414 | Long intermittently | CA2271 CB2271 | AS00R3 (Inducement 1 (SCR Device Abnormality)) | Torque: over 25% |

- | | |
|-----------------------|----------------------|
| 1: Blower housing | 7: Nozzle ring |
| 2: VGT speed sensor | 8: Push rod |
| 3: Hydraulic actuator | 9: Shaft |
| 4: Turbine housing | 10: Blower impeller |
| 5: Plate | 11: Turbine impeller |
| 6: Vane | 12: Piston |

FUNCTION OF VGT



- | | |
|-------------------------------|---------------------|
| C: Blower impeller | T: Turbine impeller |
| 1: Air cleaner | 5: SCR assembly(*1) |
| 2: VGT | 6: EGR cooler |
| 3: KDPF | 7: EGR valve |
| 4: AdBlue/DEF mixing tube(*1) | |

*1: This may not be installed on some machine models and specifications.

- The exhaust gas regulations are applied to the exhaust gas from the engine running at low speed, as well as at high speed. To meet this, the EGR ratio is improved. (EGR ratio = Ratio of amount of EGR to amount of fresh suction air)
- To attain high EGR ratio, turbine inlet pressure (P3) must be set higher than boost pressure (P2) ($P3 > P2$). For this reason, the variable turbocharger (VGT) is employed, in which the exhaust gas pressure acting on turbine impeller (T) is adjustable. Also, since the boost pressure increases more quickly, generation of particulate caused by lack of oxygen during low-speed operation (rotation) is reduced.
- The shaft joined to turbine impeller (T) drives blower impeller (C) and sends much air to the cylinder for combustion. If VGT (2) sends more air, the fuel injection rate can be increased, thus the engine output is increased. In addition, the air cooled by aftercooler becomes dense, that is, more oxygen is supplied, thus the fuel injection rate can be increased and the engine output is increased.

NOTICE

Adequate amount of clean high quality oil is required to maintain VGT performance. Be sure to use Komatsu genuine high quality oil. Follow the procedures in the Operation and Maintenance Manual when replacing oil or oil filter.

REMARK

It sounds like air is leaking from VGT or a boost pipe, but it is not abnormal.

OPERATION OF VGT

REMARK

Six cylinder engine is shown in this item.

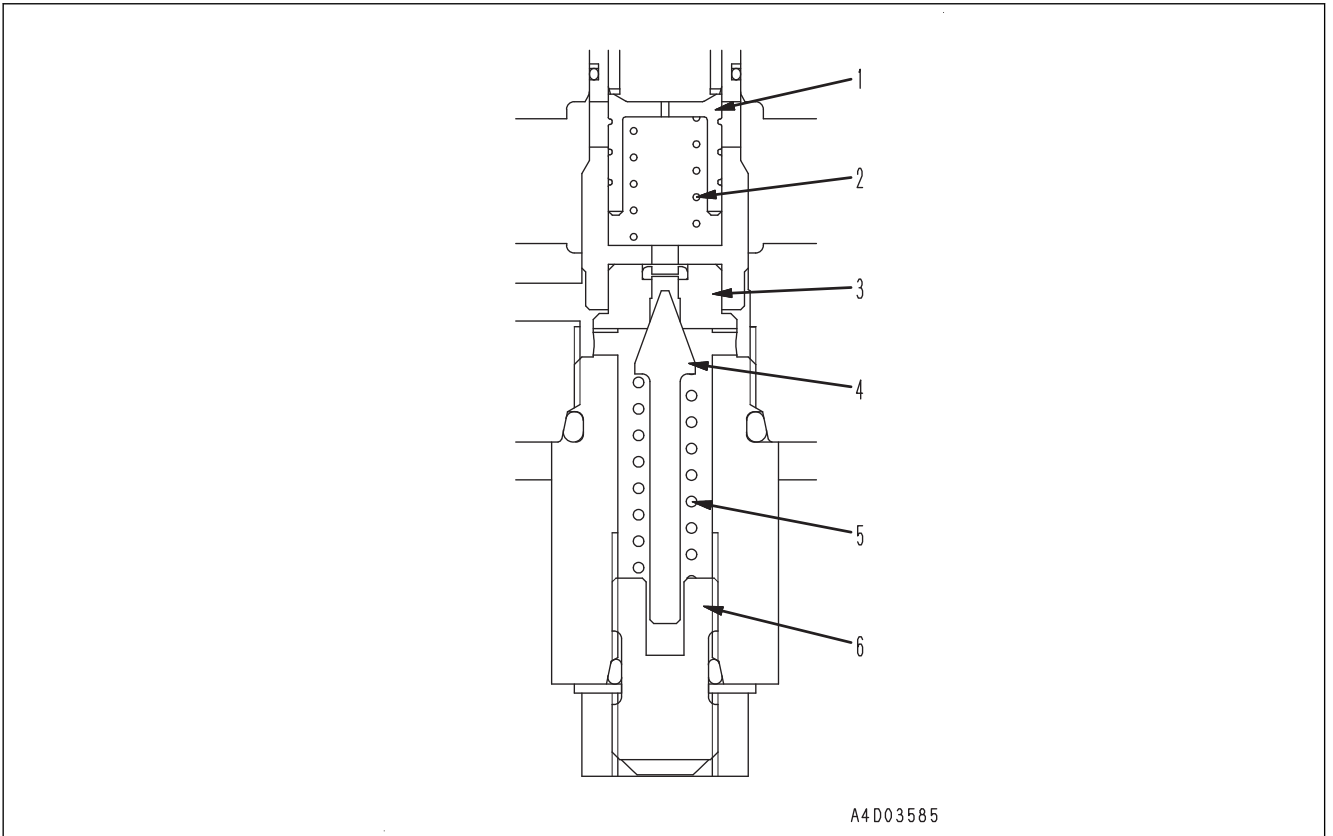
HST CHARGE SAFETY VALVE

HST

Abbreviation for Hydro Static Transmission

STRUCTURE OF HST CHARGE SAFETY VALVE

Structural view



1: Valve

2: Spring

3: Valve seat

4: Poppet

5: Spring

6: Adjustment screw

SPECIFICATIONS OF HST CHARGE SAFETY VALVE

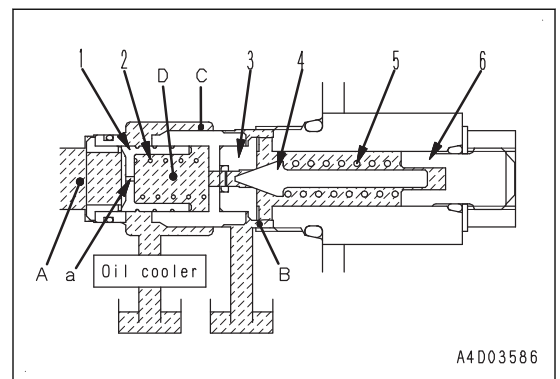
Cracking pressure: 2.7 MPa {28 kg/cm²}

FUNCTION OF HST CHARGE SAFETY VALVE

HST charge safety valve keeps the oil pressure in HST charge circuit to the set pressure.

OPERATION OF HST CHARGE SAFETY VALVE

1. Port (A) is connected to the charge circuit, and port (B) is connected to the drain circuit, and port (C) is connected to the tank drain circuit through the hydraulic oil cooler. The hydraulic oil fills chamber (D) through orifice (a) of valve (1). Poppet (4) is in contact with valve seat (3).



| Pin No. | Signal name | Input/output signal |
|---------|---|--------------------------|
| 21 | Datalink4 (+) (sensor controller) | Communication |
| 22 | Datalink4 (+) (KOMNET/c) | Communication |
| 23 | (*1) | - |
| 24 | (*1) | - |
| 25 | Power supply (+24 V, continuous) | Power supply |
| 26 | Power supply (+24 V, continuous) | Power supply |
| 27 | Power supply (+24 V, continuous) | Power supply |
| 28 | Power supply (+24 V, continuous) | Power supply |
| 29 | (*1) | - |
| 30 | (*1) | - |
| 31 | (*1) | - |
| 32 | GND | Ground/Shield/ Return |
| 33 | GND | Ground/Shield/ Return |
| 34 | (*1) | - |
| 35 | (*1) | - |
| 36 | (*1) | - |
| 37 | (*1) | - |
| 38 | AdBlue/DEF line heater Diag1 | Input |
| 39 | AdBlue/DEF line heater Diag2 | Input |
| 40 | (*1) | - |
| 41 | KDPF differential pressure sensor | Input |
| 42 | KDPF outlet pressure sensor | Input |
| 43 | (*1): Machine equipped with fuel control dial Idle validation switch 2: Machine with accelerator pedal | - |
| 44 | (*1): Machine equipped with fuel control dial Idle validation switch 1: Machine with accelerator pedal | - |
| 45 | Datalink4 (-) (Sensor controller) | Communication |
| 46 | Datalink4 (-) (KOMNET/c) | Communication |
| 47 | (*1) | - |
| 48 | System operating lamp | Output |
| 49 | Power GND | Ground/Shield/ Return |
| 50 | Power GND | Ground/Shield/ Return |
| 51 | Power GND | Ground/Shield/ Return |
| 52 | Power GND | Ground/Shield/ Return |

7: Suction safety valve

8. Pressure compensation valve (*2)

Lift valve

9. Pressure compensation valve (*1)

10: Spool

11: Suction valve (LOWER)

12. Pressure compensation valve (*2)

*1: Flow control valve

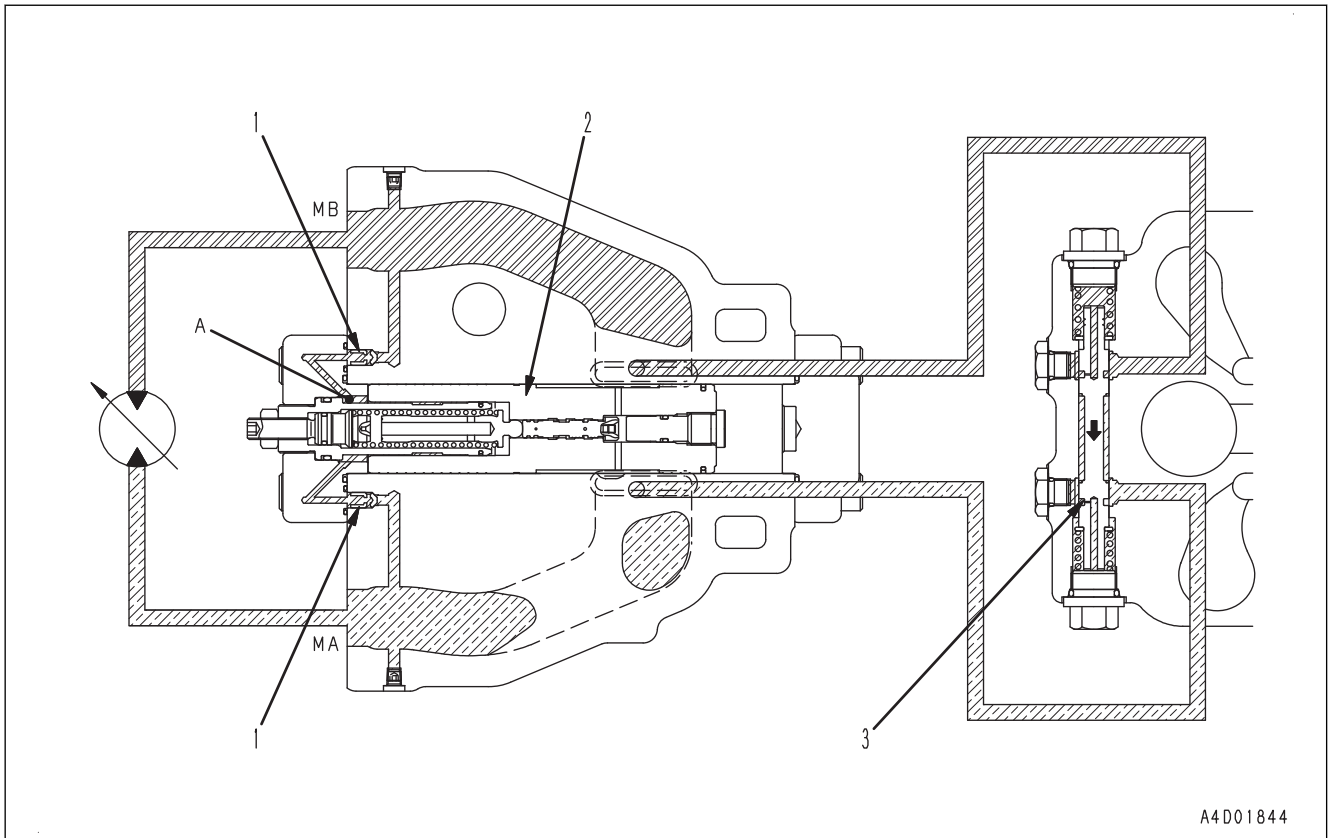
*2: Pressure reducing valve

- When the machine travels forward straight, if R.H. HST motor speed is higher than L.H. HST motor speed, this reduces the control signal of R.H. forward HST pump EPC valve and controls it so that the machine constantly travels straight.

Conditions for canceling straight travel correction control function

- When the joystick (steering, directional and gear shift lever) is operated to “turn LEFT” or “turn RIGHT”.
- When the travel direction operation of the joystick (steering, directional and gear shift lever) is in “NEUTRAL”.
- When each pedal or the fuel control dial is operated and the speed signal of HST motor speed sensor is 0.15 km/h or less.
- When HST motor speed sensor is judged failed because of an open circuit, etc.

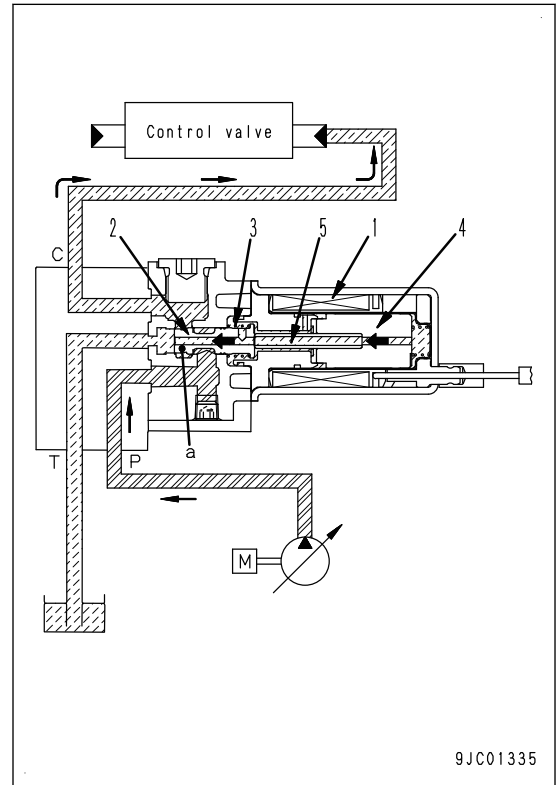
Straight travel is secured in all conditions other than the above.



1. When $(MA) < (MB)$, low pressure selector spool (3) moves down, (MA) is selected as the lower side, and sent to the charge relief valve.

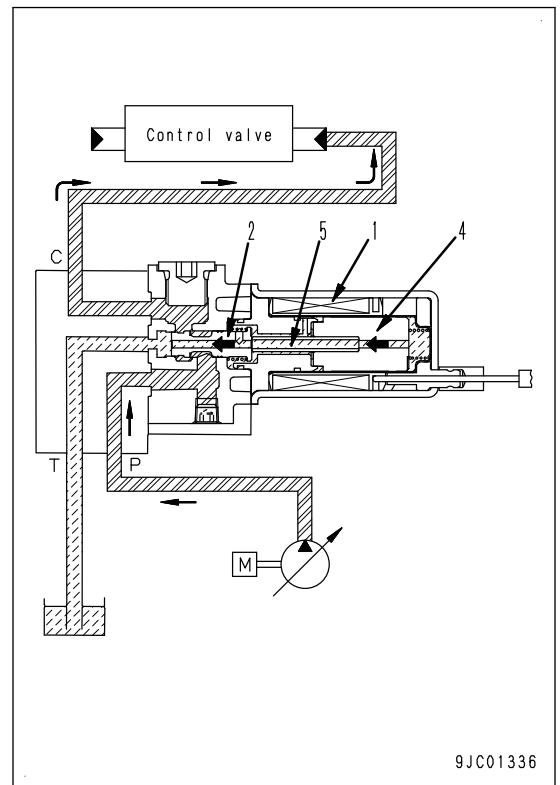
Operation when signal current is minute (coil is energized)

1. When minute signal current flows into coil (1), coil (1) is energized to generate thrust for plunger (4) to the right.
2. Push-pin (5) pushes spool (2) to the left, and the pressurized oil from port (P) flows into port (C).
3. The pressure at port (C) increases and the total of the force applied to surface (a) of spool (2) and the force of spring (3) becomes larger than thrust of plunger (4).
4. Spool (2) is pushed to the right and port (P) and port (C) are disconnected, and port (C) and port (T) are connected.
5. Spool (2) moves up and down so that the thrust of plunger (4) is balanced with the total of the pressure in port (C) and load of spring (3).
6. The circuit pressure between EPC valve and control valve is controlled in proportion to the signal current.



Operation when signal current is maximum (coil is energized)

1. When the signal current flows into coil (1), coil (1) is energized.
2. Since the signal current is maximum at this time, the thrust of plunger (4) also becomes maximum.
3. Spool (2) is pushed to the left by push-pin (5).
4. The maximum rate of the pressurized oil flows from port (P) to port (C), and the circuit pressure between EPC valve and control valve becomes maximum.
5. Port (T) closes and no pressurized oil flows into the hydraulic tank.



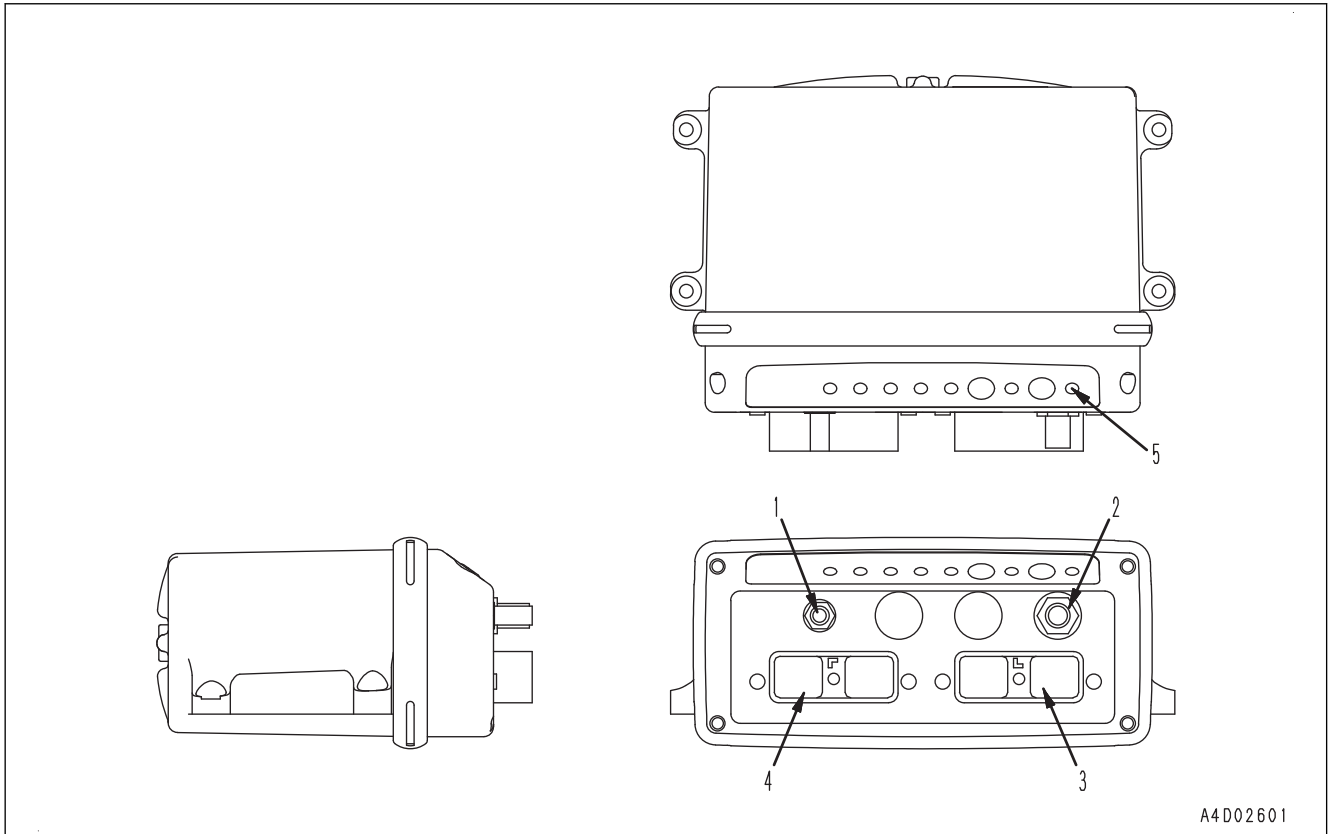
GNSS RECEIVER

GNSS

Abbreviation for Global Navigation Satellite System

STRUCTURE OF GNSS RECEIVER

General view



1: Radio antenna connection port

2: GNSS antenna connection port

3: Machine wiring harness connection port
(DRC26-40P(A))

4: Machine wiring harness connection port
(DRC26-40P(B))

5: GNSS satellite capture display LED

FUNCTION OF GNSS RECEIVER

- This terminal receives the GNSS positioning data from GNSS satellite through GNSS antenna, and processes it.
- This terminal receives the corrected GNSS positioning data from base station through a radio set, and processes it.
- This terminal receives the information from network signals or input signals inside the machine, and processes it.
- This terminal detects the information of coordinates necessary for automatic control, and outputs it.
- This terminal displays the number of captured GNSS satellites on GNSS satellite capture display LED (4) by color and number of times of flashing.
Number of times of green flashing: Number of captured GPS
Number of times of orange flashing: Number of captured GLONASS

ABBREVIATION LIST

- This list of abbreviations includes the abbreviations used in the text of the shop manual for parts, components, and functions whose meaning is not immediately clear. The spelling is given in full with an outline of the meaning.
- Abbreviations that are used in general society may not be included.
- Special abbreviations which appear infrequently are noted in the text.
- This list of abbreviations consists of two parts. The first part is a list of the abbreviations used in the text of the manual, and the second part is a list of the abbreviations used in the circuit diagrams.

List of abbreviations used in the text

| Abbreviation | Actual word spelled out | Purpose of use (major applicable machine (*1), or component/system) | Explanation |
|--------------|--|---|--|
| ABS | Antilock Brake System | Travel and brake (HD, HM) | This is a function that releases the brake when the tires skid (tires are not rotated). This function applies the brake again when the tires rotate. |
| AISS | Automatic Idling Setting System | Engine | This is a function that automatically sets the idle speed. |
| AJSS | Advanced Joystick Steering System | Steering (WA) | This is a function that performs the steering operations with a lever instead of using a steering wheel. This function performs gear shifting and changing forward and reverse direction. |
| ARAC | Automatic Retarder Accelerator Control | Travel and brake (HD, HM) | This is a function that automatically operates the retarder with a constant braking force when letting go of the accelerator pedal on the downhill. |
| ARSC | Automatic Retarder Speed Control | Travel and brake (HD, HM) | This is a function that automatically operates the retarder to ensure that the machine speed does not accelerate above the speed set by the operator when letting go of the accelerator pedal on the downhill. |
| ASR | Automatic Spin Regulator | Travel and brake (HD, HM) | This is a function that drives both wheels automatically using the optimum braking force when the tire on one side spins on the soft ground surfaces. |
| ATT | Attachment | Work equipment | A function or component that can be added to the standard specification. |
| BCV | Brake cooling oil control valve | BRAKE (HD) | This is a valve that bypasses a part of the brake cooling oil to reduce the load applied to the hydraulic pump when the retarder is not being used. |
| CAN | Controller Area Network | Communication and electronic control | This is one of communication standards that are used in the network on the machine. |
| CDR | Crankcase Depression Regulator | Engine | This is a regulator valve that is installed to KCCV ventilator. It is written as CDR valve and is not used independently. |
| CLSS | Closed-center Load Sensing System | Hydraulic system | This is a system that can actuate multiple actuators simultaneously regardless of the load (provides better combined operation than OLSS). |

| Machine model | | | D61EXI-24 | |
|--|--|------------------|--------------------------------|--------------|
| Engine | | | SAA6D107E-3 | |
| Item | Measurement condition | Unit | Standard value for new machine | Repair limit |
| Accuracy of stroke sensor for angle cylinder | Work equipment: During left angle stroke end operation | Before resetting | 0 ± 3 | 0 ± 3 |
| | | After resetting | 0 | 0 |
| | Work equipment: During right angle stroke end operation | Before resetting | 452 ± 3 | 452 ± 3 |
| | | After resetting | 452 | 452 |
| Accuracy of reset sensor for lift cylinder | <ul style="list-style-type: none"> Work equipment: Perform blade raise stroke end operation Lift cylinder stroke: Before resetting | mm | 0 ± 3 | 0 ± 3 |

| Abbreviation | Actual word spelled out |
|--------------|-------------------------|
| S/T | Steering |
| STRG | |
| SIG | Signal |
| SOL | Solenoid |
| STD | Standard |
| OPT | Option |
| OP | |
| PRESS | Pressure |
| SPEC | Specification |
| SW | Switch |
| TEMP | Temperature |
| T/C | Torque Converter |
| T/M | Transmission |

TEST ENGINE OIL PRESSURE

Tools for testing engine oil pressure

| Symbol | Part No. | Part name | Q'ty | Remarks |
|--------|--------------|--------------|------------------|-----------------------|
| A | - | 799-101-5002 | Hydraulic tester | 1 |
| | 1 | 799-101-5160 | Nipple | 1 Size: R1/8 |
| B | 799-401-2320 | Gauge | 1 | Pressure range: 1 MPa |

⚠ Place the machine on a level ground, lower the work equipment to the ground, stop the engine, and set the parking brake lever and work equipment lock lever to LOCK position.

Check this item under the following conditions.

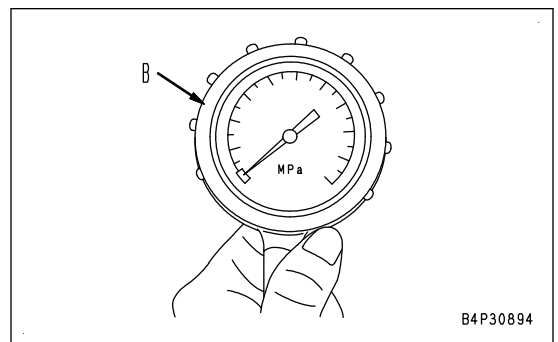
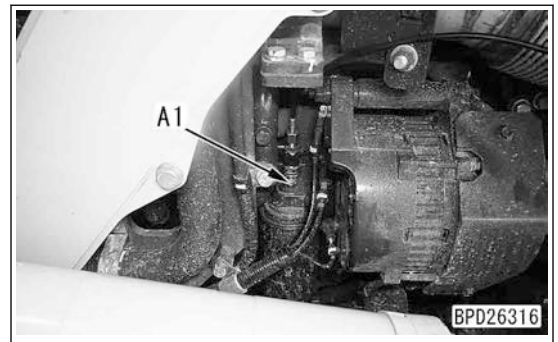
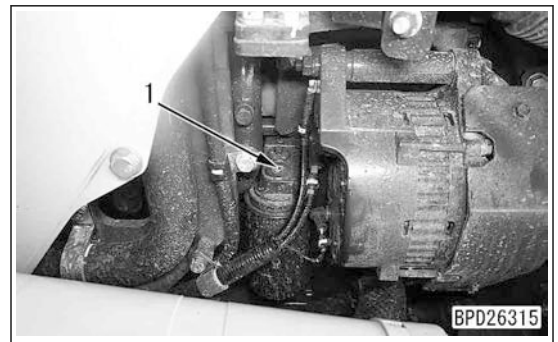
Engine coolant temperature: 30 to 100 °C

For testing of engine oil pressure to perform troubleshooting or others, refer to this section.

METHOD FOR TESTING ENGINE OIL PRESSURE

1. Remove the R.H. engine side cover
2. Remove engine oil pressure pickup plug (1).
3. Install the nipple A1 of hydraulic tester A, and connect gauge B.
4. Start the engine and measure the engine oil pressure with fuel control dial at MIN (Low idle) position and MAX (High idle) position.

For standard values, see STANDARD VALUE TABLE, "STANDARD VALUE TABLE FOR ENGINE".



After finishing the test, remove the testing tools and restore the machine.

Parameter list of test state

| Test State | Contents | Details | Required action |
|------------|--|---|--|
| 0 | Wait for the start (default) | Regeneration disable state of aftertreatment devices by machine monitor | Press the start test switch to start the test. |
| 1 | AdBlue/DEF pump pressure is being increased. | Being changed to "Test State" "10" | Wait until "Test State" changes to "10". |
| 10 | Being tested | It is on the following state depending on the contents. <ul style="list-style-type: none"> • Being pressure-fed by AdBlue/DEF pump • AdBlue/DEF is being injected. • The operation of energization cycle at a fixed time after specific time passes. • SCR Denitration Efficiency Test is being performed. • "Ash in Soot Accumulation Correction" is being performed. | <ul style="list-style-type: none"> • Check the items to be performed during the test. • For "SCR Denitration Efficiency Test" or "Ash in Soot Accumulation Correction" test, wait for the test to finish. |
| 5 | Pressure drop of AdBlue/DEF pump is detected (failure code [CA3574] is displayed) | Pressure drops (only when AdBlue/DEF pump is pressure-fed) while the display of "Test State" is "10". | Perform the troubleshooting for the failure code [CA3574]. For details, see "TROUBLESHOOTING". |
| 20 | Test has been finished. | <ul style="list-style-type: none"> • AdBlue/DEF is being purged. • Heater energizing has been completed. | <ul style="list-style-type: none"> • When "Turn the key to OFF position." appears, turn the starting switch to OFF position and shut down the engine controller. (*1) • If "STOP" is displayed, press the corresponding switch to return the test to initial state. <p>Other than the above, the state automatically returns to initial state.</p> |
| 11 | Purging (energizing temporarily stops) or test cannot be performed. | <ul style="list-style-type: none"> • AdBlue/DEF is being purged. • A particular error message is being displayed. | <ul style="list-style-type: none"> • Turn the starting switch to OFF position, and perform the test again after shutting down the engine controller. • If a specific error message is displayed, see "TROUBLESHOOTING" and perform troubleshooting for the failure code. |
| 12 | AdBlue/DEF tank or AdBlue/DEF pump is at high temperature (energizing temporarily stops) | AdBlue/DEF tank temperature exceeds 70 °C or AdBlue/DEF pump temperature exceeds upper limit. | Wait for AdBlue/DEF tank temperature or AdBlue/DEF pump temperature to be lowered. After the display of "Test State" changes to "10", the test restarts automatically. |
| 14 | SCR temperature is out of specified range | SCR temperature is above 450 °C or below 250 °C (temperature range is set by each test level) | "SCR Denitration Efficiency Test" wait for a few minutes. Test will start automatically after "Test State" changes to "10". |

F5: Returns the screen to “SCR Service Test” screen

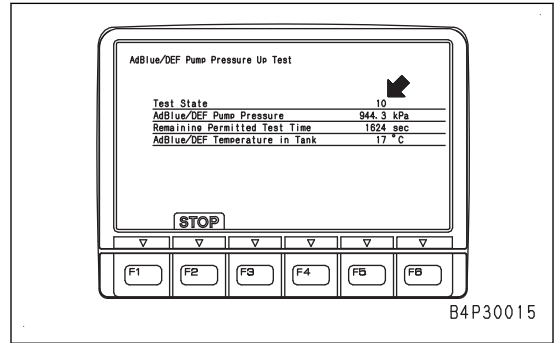
REMARK

AdBlue/DEF pump operates.

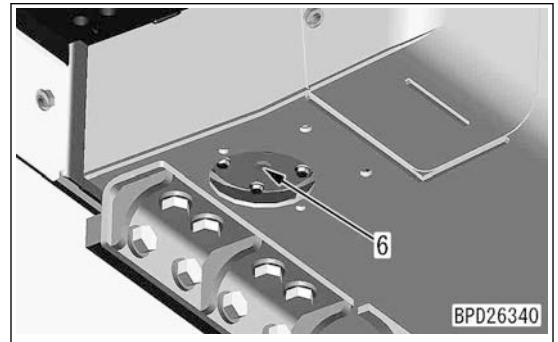
- 7) When the value of “AdBlue/DEF Pump Pressure” exceeds “800 kPa”, press F2.

REMARK

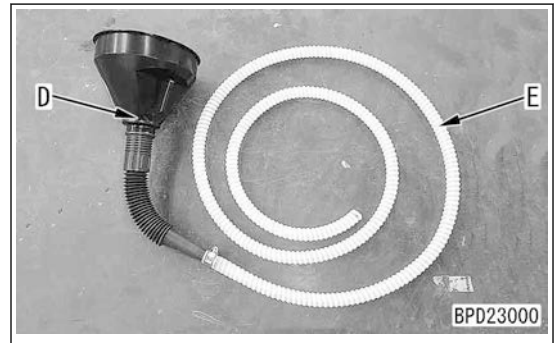
- When the value of “AdBlue/DEF Pump Pressure” exceeds “800 kPa”, the display of “Test State” changes to flashing of “10”.
- At this point, 1st “AdBlue/DEF Pump Pressure Up Test” is completed. Perform 3 times in total.



- 8) Repeat above steps 5 to 7 for 2 times.
- 9) Close valve B1 of remote breather hose B securely.
- 10) Place oil container A under AdBlue/DEF tank drain plug (6). Place polyethylene container F on the side of machine on AdBlue/DEF tank drain plug (6) side.



- 11) Connect hose E to funnel D, and put the end of hose E in polyethylene container F.

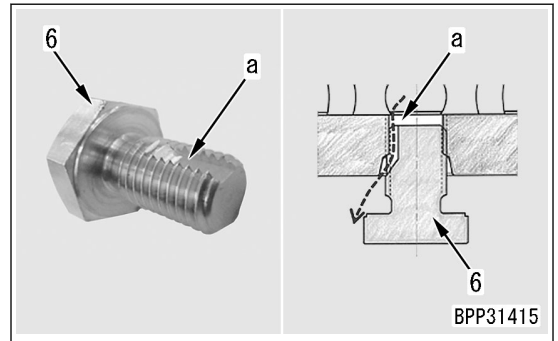


- 12) Loosen drain plug (6) by 6 turns and drain AdBlue/DEF into oil container A.

REMARK

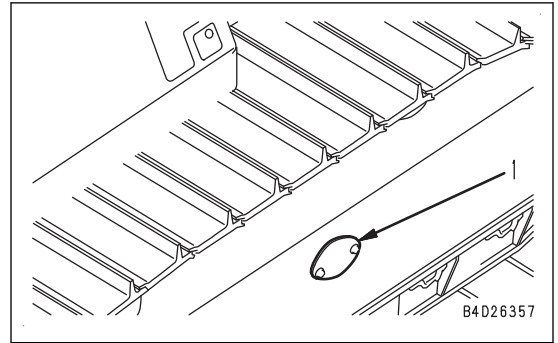
There is a slit (a) at threaded portion of drain plug (6) so that AdBlue/DEF is not drained too much and splashed.

- 13) Draining amount decreases in approximately 2 minutes, remove drain plug (6).
- 14) After removing the drain plug, remote breather starts breathing in approximately 10 seconds. Set funnel D when breathing stops.



- 15) Fix funnel D by holding it between wooden blocks C.
- 16) Fully open valve B1 of remote breather hose B.
- 17) When polyethylene container F is almost filled up with AdBlue, close valve B1 of remote breather hose B securely.
- 18) Draining amount decreases in approximately 15 seconds, change polyethylene container F.
- 19) Repeat steps 16) to 18). When AdBlue/DEF tank becomes empty, install drain plug securely.

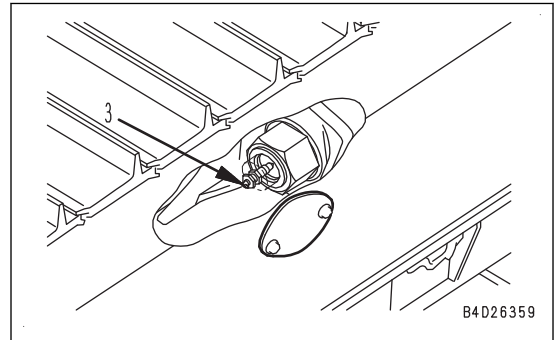
1. Remove cover (1).



2. Pump in grease through grease fitting (3).

REMARK

Slowly drive forward and then backward if the track tension is abnormal.



After the adjustment, check that the track tension is proper.

| Code | Item | | Reference |
|------|--------------------------|--|---|
| 03 | Abnormality Record | Mechanical Sys Abnormality Record | METHOD FOR CONFIRMING ABNORMALITY RECORD (MECHANICAL SYSTEMS) |
| | | Electrical Sys Abnormality Record | METHOD FOR CONFIRMING ABNORMALITY RECORD (ELECTRICAL SYSTEMS) |
| 04 | Maintenance Record | | METHOD FOR CONFIRMING MAINTENANCE RECORD |
| 05 | Maintenance Mode Setting | | METHOD FOR OPERATING MAINTENANCE MODE SETTING |
| 06 | Phone Number Entry | | METHOD FOR OPERATING PHONE NUMBER ENTRY SETTING |
| 07 | Default | Key-on mode | METHOD FOR SETTING WITH DEFAULT SETTING MENU (KEY-ON MODE) |
| | | Unit | METHOD FOR SETTING WITH DEFAULT SETTING MENU (UNIT) |
| | | Camera | METHOD FOR SETTING WITH DEFAULT SETTING MENU (CAMERA) |
| | | Float Buzzer Setting | METHOD FOR SETTING WITH DEFAULT SETTING MENU (FLOAT BUZZER) |
| | | Auto Idle Stop Timer Setting | METHOD FOR SETTING WITH DEFAULT SETTING MENU (AUTO IDLE STOP TIMER FIXING) |
| 08 | Diagnostic Tests | Cylinder Cutout Mode Operation | METHOD FOR OPERATING TESTING MENU (CYLINDER CUT-OUT OPERATION) |
| | | Active Regeneration for Service | METHOD FOR OPERATING TESTING MENU (REGENERATION FOR SERVICE) |
| | | KDPF Memory Reset | METHOD FOR OPERATING TESTING MENU (KDPF MEMORY RESET) |
| | | SCR Service Test | METHOD FOR OPERATING TESTING MENU (SCR SERVICE TEST) |
| | | Engine Controller Active Fault Clear | METHOD FOR OPERATING TESTING MENU (ENGINE CONTROLLER ACTIVE FAULT CLEAR) |
| | | Ash in Soot Accumulation Correction | METHOD FOR OPERATING TESTING MENU (ASH IN SOOT ACCUMULATION CORRECTION) |
| | | Reset Number of Abrupt Engine Stop by AIS | METHOD FOR OPERATING TESTING MENU (RESET NUMBER OF ABRUPT ENGINE STOP BY AIS) |
| | | Engine Stop at AdBlue/DEF Inj Overheat Count Reset | METHOD FOR OPERATING TESTING MENU (ENGINE STOP AdBlue/DEF INJ OVERHEAT COUNT RESET) |
| 09 | Adjustment | | VARIOUS SETTINGS OF MACHINE |
| 10 | No-Injection Cranking | | METHOD FOR PERFORMING NO-INJECTION CRANKING |
| 11 | KOMTRAX Setting | Terminal Status | METHOD FOR CONFIRMING KOMTRAX SETTINGS (TERMINAL STATUS) |
| | | GPS & Communication State | METHOD FOR CONFIRMING KOMTRAX SETTINGS (GPS AND COMMUNICATION STATUS) |
| | | Modem Information | METHOD FOR CONFIRMING KOMTRAX SETTINGS (MODEM STATUS) |
| 12 | Service Message | | METHOD FOR DISPLAYING SERVICE MESSAGE |

DEFAULT MENU

METHOD FOR SETTING WITH DEFAULT SETTING MENU (KEY-ON MODE)

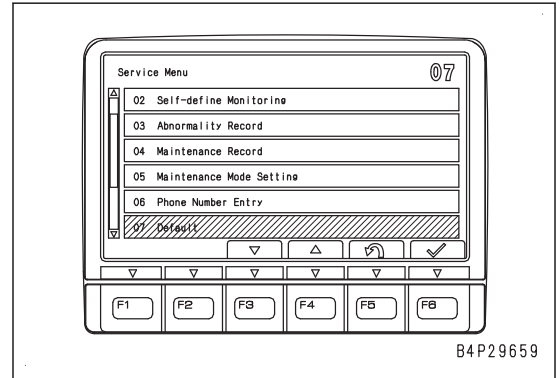
Default menu is used to check or change default values of the machine monitor and machine.

Key-on Mode is used to set the operating mode to be selected automatically when the starting switch is turned to ON position.

1. Select "Default" on "Service Menu" screen.

REMARK

For selecting method, see "Operating method of service mode" in "SERVICE MODE".



2. On the "Default" screen, select "Key-on Mode" with the function switches or numeral input switches.

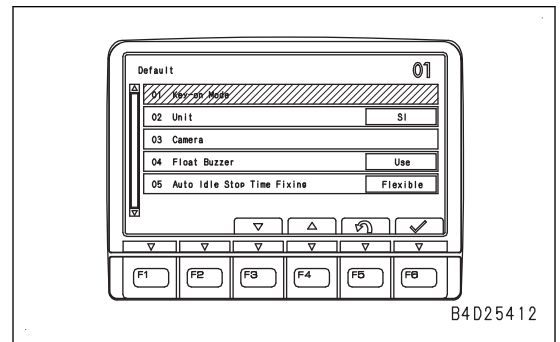
REMARK

- Method of selecting is similar to "Service Menu" screen.
- The following operating modes can be set by this function.

"Operating mode": "Power"/"Economy"

"Load graph": "ON/OFF"

"Blade Fine Control": "ON"/OFF



3. On the "Key-on Mode" screen, select the mode to be set with the function switches.

"Mode at Previous Key-off": Uses the last mode in previous operation when starting switch is turned ON

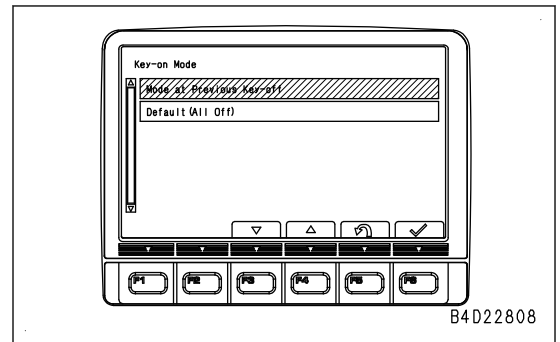
"Default (All Off)": Default mode settings (Operating mode P: P, other items: OFF) are displayed when starting switch is turned to ON position.

F3: Moves the selection downward

F4: Moves the selection upward

F5: Cancels the selection and returns the screen to "Default" screen.

F6: Enters the selection and returns the screen to "Default" screen.



REMARK

Default value at shipment is "Mode at Previous Key-off".

METHOD FOR SETTING WITH DEFAULT SETTING MENU (UNIT)

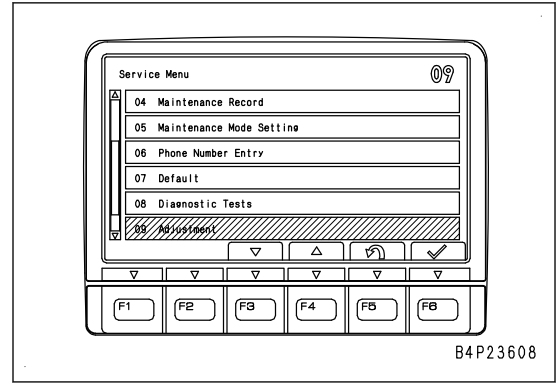
Default menu is used to check or change default values of the machine monitor and machine.

The unit selecting function is used to select units of data displayed for monitoring, etc.

1. Select "Adjustment" on "Service Menu" screen.

REMARK

For selecting method, see "Operating method of service mode" in "SERVICE MODE".

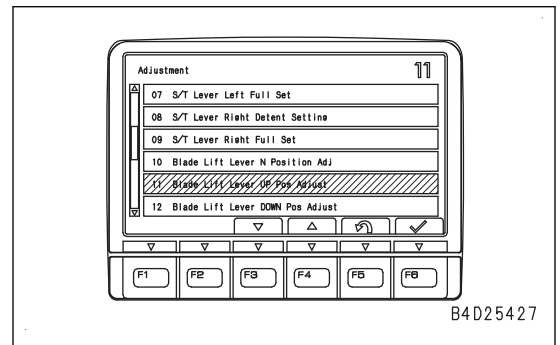


B4P23608

2. On "Adjustment" menu screen, select "Blade Lift Lever UP Pos Adjust" with function switches or numeral input switches.

REMARK

- For details of adjustment items, see "ADJUSTMENT ITEMS TABLE".
- For selecting method, see "Operating method of service mode" in "SERVICE MODE".



B4D25427

3. On "Adjustment" screen, perform "Blade Lift Lever UP Pos Adjust" with the function switches.

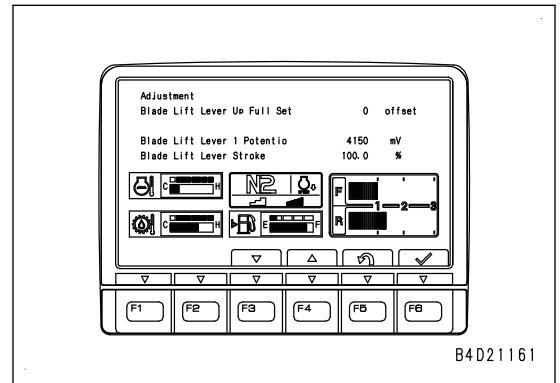
F3: Not used

F4: Not used

F5: Returns to adjustment item selection screen

F6: Saves the compensation value.

- 1) Operate the blade control lever in the lifting direction to the RAISE stroke end (blade lift lever ratio = 100 %), and keep the blade in the same position.
- 2) Press F6, and check that warning buzzer sounds.



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REMARK

- This adjustment does not change the displayed values other than the compensation value.
- In this adjustment, the saved adjustment values are effective even when the starting switch is turned to OFF position after the adjustment is completed.
- "Blade Lift Lever UP Pos Adjust" does not adjust the sensitivity of the blade control lever.
- To adjust the sensitivity of the blade control lever in the lifting direction, see "Adjustment IDs: 8020 to 8023".
- Even if F3 or F4 is pressed, switches do not work.

METHOD FOR ADJUSTING WITH ADJUSTMENT MENU (BLADE LIFT LEVER DOWN POS ADJUST)

"Blade Lift Lever DOWN Pos Adjust" makes the HST controller recognize and save the voltage of the lift potentiometer of blade control lever at maximum LOWER stroke position (blade lift lever ratio = -100 %).

This adjustment must be performed when the HST controller or blade control lever was replaced.

⚠ If the values are large, the machine may move unexpectedly. Accordingly, change the value little by little, while checking the actual movement of the machine.

REMARK

- After the adjustment value (c) and (d) are changed, the changed value becomes effective until the starting switch is turned to OFF position.
 - The value does not change even after this adjustment is finished. When the value needs to be changed to the previous one, turn the starting switch to OFF position, then change the setting.
- 5) Travel the machine at the lowest speed (minimum speed) in the variable shift mode. Check that travel speed (b) is in the range of 0.6 to 1.0 km/h.

NOTICE

- **If the travel speed is too fast, decrease the currents on both right and left sides.**
- **If the travel speed is too slow, increase the currents on both right and left sides.**

REMARK

When the direction (left or right) needs to be changed before confirming the changed current value, press F5, then display this adjustment code again.

- 6) Press F6 to enter the change.

REMARK

- When F6 is pressed, the alarm buzzer sounds.
- Without performing a confirming operation at last, the change becomes ineffective when the starting switch is turned to OFF position.
- This adjustment does not adjust the starting acceleration performance but it adjusts the strength (level) of momentary shocks when the machine starts and stops.

METHOD FOR PERFORMING WITH ADJUSTMENT ID: 3434 (STRAIGHT TRAVEL ADJUSTMENT OFF MODE)

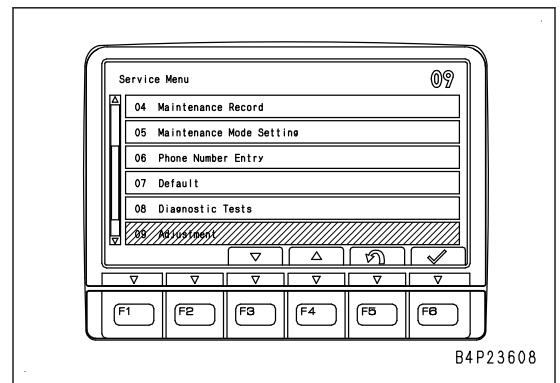
“Straight Travel Correction Mode” can set the straight travel correction mode to ON or OFF.

Perform this testing and adjusting, troubleshooting, etc., as necessary.

1. Select “Adjustment” on “Service Menu” screen.

REMARK

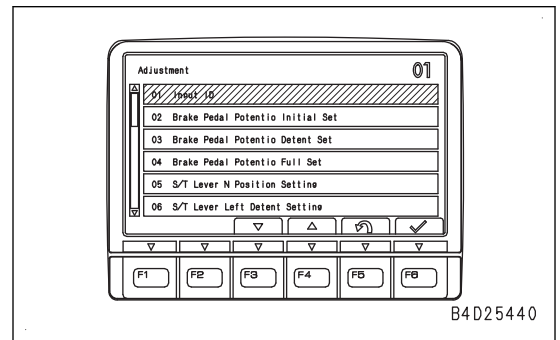
For selecting method, see “Operating method of service mode” in “SERVICE MODE”.



2. On “Adjustment”, select “Input ID” to be set.

REMARK

For selecting method, see “Operating method of service mode” in “SERVICE MODE”.



- Display of message (with message return function)

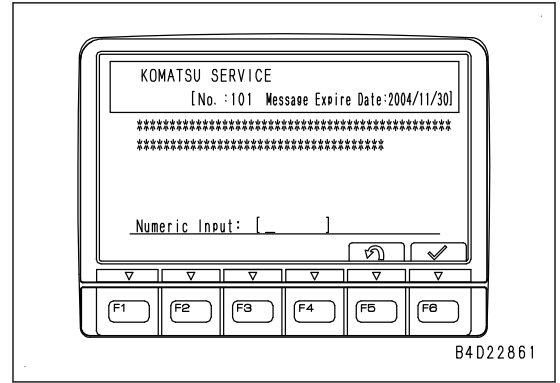
If a message provides the Numeric Input line under the text, input a proper number by using the numeral input switches and enter it by using the function switch, and the information is returned to the KOMTRAX base station.

F5: Returns the screen to "KOMTRAX Settings" screen

F6: Enters and sends the input value.

REMARK

- This message is different from that sent to the operator in the operator mode.
- Since this message is special for the technician, the message monitor is not displayed as it is displayed in the operator mode.



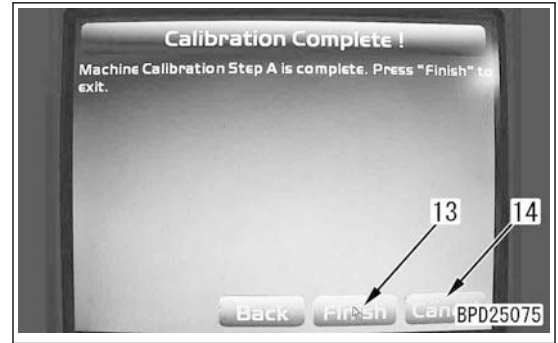
11. When the “Calibration Complete !” screen is displayed, press “Finish” (13).

“Back”: Returns the screen to the previous screen

“Finish” (13): Moves the screen to the main screen

“Cancel” (14): Cancels “Machine Cal Step A”, and returns the screen to the main screen

This is to calculate compensation value of lift cylinder length when the blade is in contact with the ground during automatic control and save it to the ICT sensor controller.



NOTICE

To input a new value or correct a value after the “Calibration Complete !” screen is displayed, be sure to press “Cancel” (14) to return the screen to the main screen, turn off the power supply of the control box and turn the starting switch of the machine to OFF position, and then perform again.

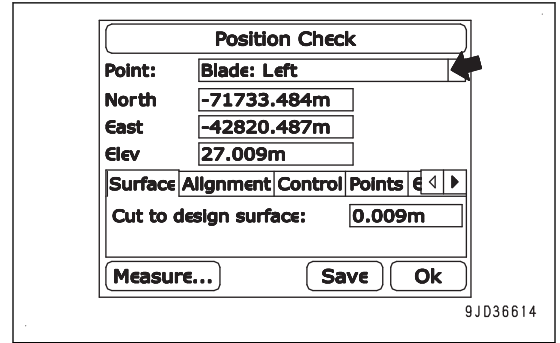
REMARK

When inputting a new value or correcting an input value after the “Calibration Complete !” screen is displayed, turn off the control box and turn the starting switch of the machine to OFF position once. Otherwise, calibration is not performed accurately.

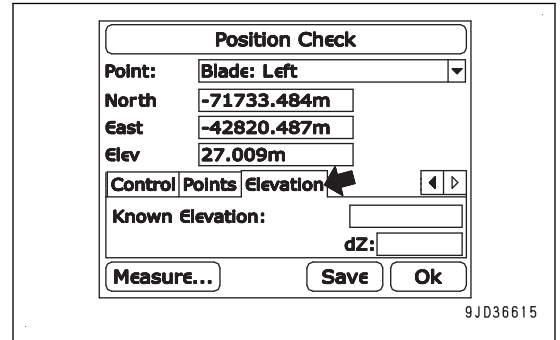
12. When the main screen is displayed, turn off the power supply of the control box.
13. Turn the starting switch of the machine to OFF position. Check that the machine monitor goes out, and then turn the starting switch to ON position.
- The compensation value is reflected in the coordinate calculation of blade edge.
14. Turn on the power supply of the control box.

13. Select the position of blade matched with the control point on the "Position check" screen.

- When matched with the left blade edge: "Blade: Left"
- When matched with the right blade edge: "Blade: Right"

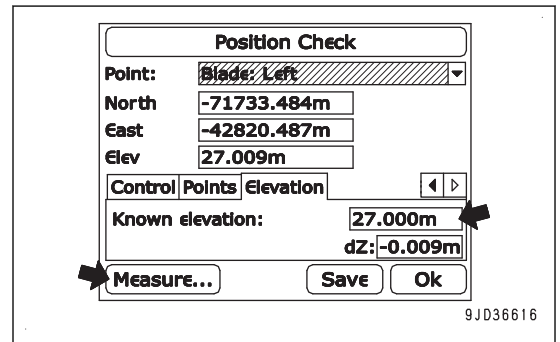


14. Press "Elevation" tab and select.

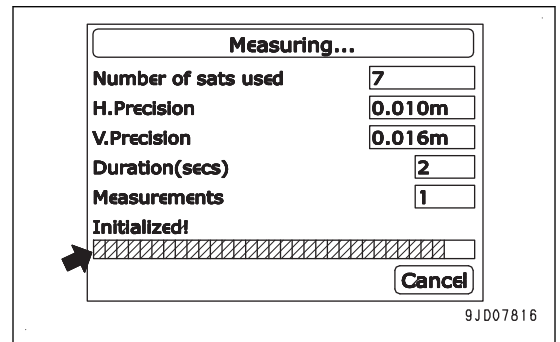


15. "Known elevation:" and input the elevation of the base point.

16. Press "Measure..."



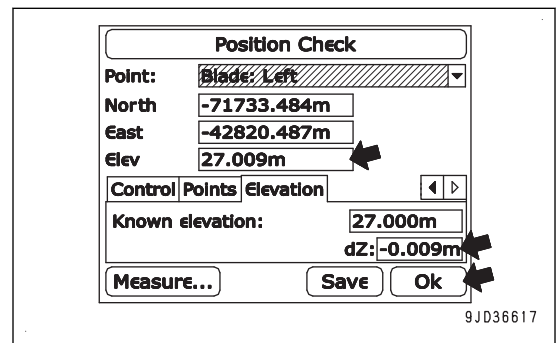
- The figure on the right is displayed. When the bar at the bottom of the screen reaches the right end, screen returns to "Position check" screen.



- The altitude that the machine recognizes is displayed in "Elev". The difference between above altitude and the altitude of the base point that is inputted in "Known elevation:" is displayed in "dZ".

17. Check the difference between the altitude that the machine recognizes and the altitude of the base point, and press "Ok".

The screen returns to the main window.



Cooling fan

| Machine model | | | D61PXI-24 | | | Good | No good |
|---------------------------------------|--|-------------------------------|--------------------------------|------------------------------|----------------|------|---------|
| Engine | | | SAA6D107E-3 | | | | |
| Item | Measurement condition | Unit | Standard value for new machine | Repair limit | Measured value | | |
| Cooling fan speed (Max. speed) (*1) | <ul style="list-style-type: none"> HST oil temperature (hydraulic oil temperature): 50 to 60 °C Operating Mode: P (Power mode) Fuel control dial: MAX (High idle) position Fan normal rotation Fan 100 % speed mode | rpm | 1600 to 1700 | 1500 to 1800 | | | |
| Cooling fan circuit oil pressure (*1) | <ul style="list-style-type: none"> HST oil temperature (hydraulic oil temperature): 50 to 60 °C Operating Mode: P (Power mode) Fuel control dial: MAX (High idle) position Fan normal rotation Fan 100 % speed mode | MPa { kg/cm ² } | 15.7 to 18.7 {160 to 190} | 14.7 to 19.7 {150 to 200} | | | |

*1: Item that can be checked in monitoring function of machine monitor

Hydraulic oil pump pressure

| Machine model | | | D61PXI-24 | | | Good | No good |
|--|---|-------------------------------|--------------------------------|-------------------------|----------------|------|---------|
| Engine | | | SAA6D107E-3 | | | | |
| Item | Measurement condition | Unit | Standard value for new machine | Repair limit | Measured value | | |
| Work equipment pump relief pressure (*1) | <ul style="list-style-type: none"> HST oil temperature (hydraulic oil temperature): 40 to 60 °C Fuel control dial: MAX (High idle) position During work equipment relief | MPa { kg/cm ² } | 26.4 to 28.4 {270 to 290} | Min. 24.5 {Min. 250} | | | |

*1: Item that can be checked in monitoring function of machine monitor

TROUBLESHOOTING POINTS FOR UREA SCR SYSTEM

The followings are troubleshooting related cautions and changes for the newly installed Urea SCR system for the Tier4 Final specification.

Engine controller shut down

- When the starting switch is turned to the OFF position, the engine controller starts the shutdown processing. After the shutdown processing is completed, the action of turning off the engine controller's power is referred to as "Engine controller shut down".
- On machines with the Urea SCR system, the engine controller's shutdown process now includes purging of AdBlue/DEF from devices or hoses to the tank. This increases average shutdown time from 2 minutes in former models to maximum 7 minutes in Tier4 Final Specification models. (Described as 2 to 6 minutes in the description of "Troubleshooting by failure code").
- If the starting switch is turned OFF and ON before the engine controller is shut down, the information in the engine controller which should be updated will not be updated, and the troubleshooting of the device may not function properly. If this happens, it becomes necessary to shut down the engine controller. Completion of engine controller shut down can be confirmed when the system operating lamp goes out.

Loaded Diagnostics Operation To Confirm Failure Correction and Loaded Diagnostics Operation To Clear Failure Code in the troubleshooting procedure

⚠ Since the aftertreatment devices and their temperature sensor, pressure sensor, NOx sensor, ammonia sensor, AdBlue/DEF injector, etc. are heated to a high temperature after "Loaded Diagnostics Operation To Confirm Failure Correction" or "Loaded Diagnostics Operation To Clear Failure Code", take care not to get burned. Perform troubleshooting or repair after letting the devices cool down.

NOTICE

The operations for "Operation for judging the repair result" and "Machine operation for clearing the failure code" to apply a load to the engine are special operations to be performed only in a procedure for troubleshooting.

Perform stall operation, etc. to implement normal check according to the procedure described in TESTING AND ADJUSTING.

NOTICE

Check the fuel and AdBlue/DEF level before the operation for "Operation for judging the repair result" or "Machine operation for clearing the failure code".

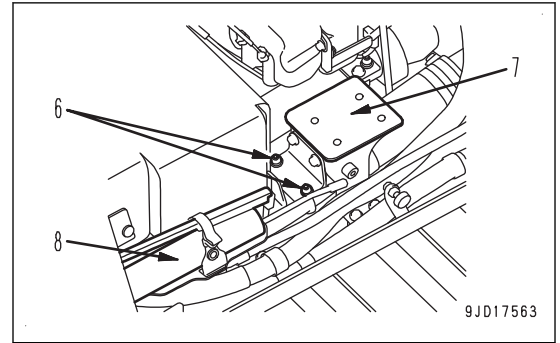
For checking the fuel and AdBlue/DEF level, see TESTING AND ADJUSTING, "SET AND OPERATE MACHINE MONITOR", "SERVICE MODE", "METHOD FOR OPERATING TESTING MENU (SCR SERVICE TEST)".

1. Tips

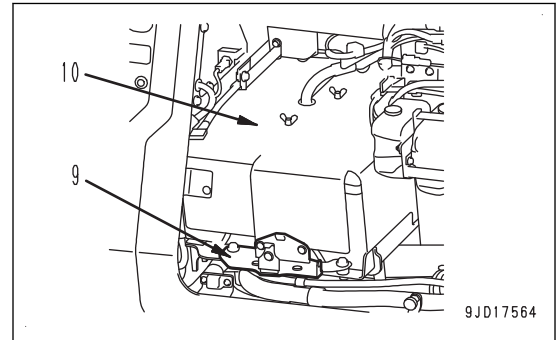
- The engine controller monitors the operation of engine related components (including aftertreatment devices), and displays a failure code on the monitor when an abnormality is detected, and clears the failure code after the failure is corrected. The monitored items include: sensors, actuators, electric wiring, catalyzer, etc.
- The engine controller clears the failure code when it performs troubleshooting and the failure is corrected. However, the failure code may be cleared when the engine controller is shut down even if the failure still exists. It may be necessary to apply load to the engine to activate the troubleshooting. Open circuits and short circuits can be diagnosed by turning the starting switch to ON position after completing the repair. The engine controller determines if the failure, and displays a failure code on the monitor when an abnormality is detected.
- However, the engine controller may not activate troubleshooting of the aftertreatment devices or other functions if the exhaust gas temperature or flow rate is below the specified value. "Loaded Diagnostics Operation To Confirm Failure Correction" or "Loaded Diagnostics Operation To Clear Failure Code" should always be performed after the repair. These operations mean to run the engine, and rev up or load the engine to meet the conditions for activating troubleshooting.

2. Loaded Diagnostics Operation To Confirm Failure Correction

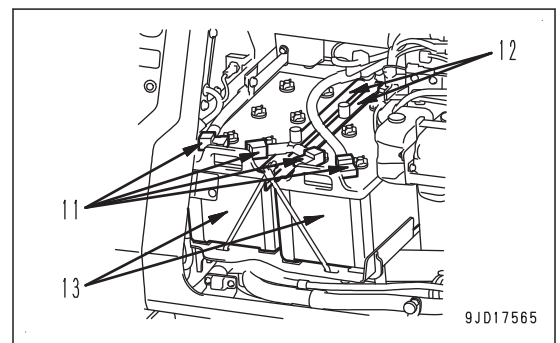
15. Remove U-bolt (6).
16. Remove step mounting bracket (7).
17. Remove grease pump (8).



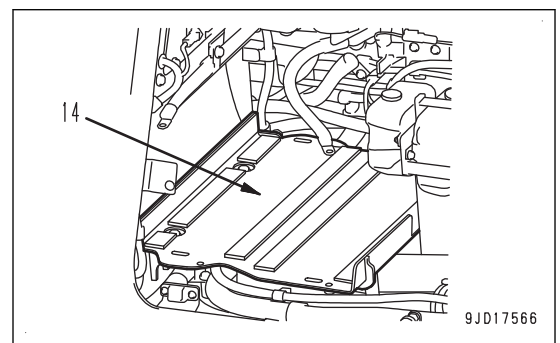
18. Remove grease pump bracket (9).
19. Remove battery cover (10).



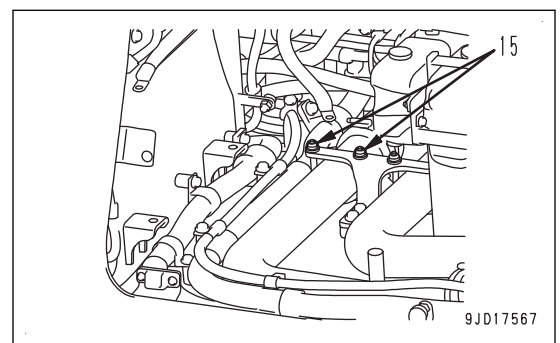
20. Remove battery terminal (11) (4 places).
21. Remove battery fixing hardware (12) (4 places).
22. Remove batteries (13) (2 pieces).



23. Remove battery tray (14).

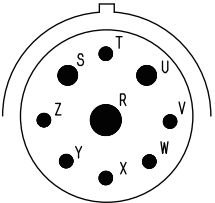
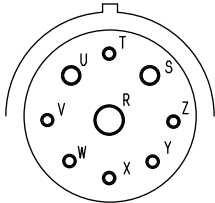
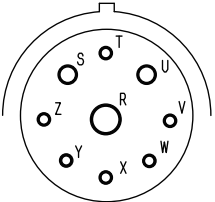
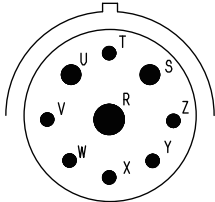
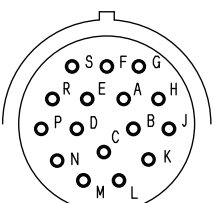
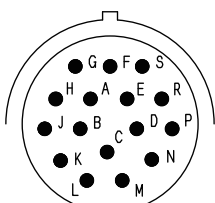


24. Remove U-bolt (15).



| Connector No. | Connector type | Number of pins | Location | Address |
|-----------------|----------------|----------------|--|---------|
| D4 | DT | 2 | Diode | D-8 |
| D20 | DT | 2 | Diode | F-1 |
| DAC | DT | 2 | Diode | E-1 |
| DSM | TYCO | 12 | AdBlue/DEF pump temperature sensor | H-3 |
| DSM1 | DT | 12 | Intermediate connector | J-8 |
| DT12 | DT | 12 | KOM-NET service connector | O-1 |
| ECM J1 | DELPHI | 96 | Engine controller | AI-3 |
| ECM J2 | DELPHI | 96 | Engine controller | D-1 |
| EG4 | DT | 12 | Intermediate connector | L-2 |
| EG5 | DT | 12 | Intermediate connector | L-3 |
| EG6 | DT | 8 | Intermediate connector | L-2 |
| EG7 | DT | 6 | Intermediate connector | K-3 |
| EL | DT | 8 | Joystick (steering, directional, and gear shift lever) | V-3 |
| F | Terminal | 1 | Fuse | - |
| F01 | - | 20 | Fuse box | T-1 |
| F21 | - | 6 | Fuse box | T-1 |
| F22 | - | 6 | Fuse box | T-1 |
| FAC | DT | 2 | Fan EPC solenoid | K-8 |
| FAR | DT | 2 | Fan reverse solenoid | J-8 |
| FG | DTHD(#8) | 1 | Intermediate connector | E-9 |
| FLSW | SWP | 6 | Headlamp switch | V-3 |
| FM1 | DT | 12 | Intermediate connector | G-9 |
| FP | DT | 3 | Fuel control dial | U-7 |
| FRS | DT | 2 | Fan speed sensor | J-8 |
| FUEL RAIL PRESS | BOSCH | 3 | Common rail pressure sensor | AJ-6 |
| FUSE | - | - | Fuse box | AA-9 |
| GND0 | Terminal | 1 | Ground | I-9 |
| GND1 | Terminal | 1 | Ground | AA-9 |
| GND3 | Terminal | 1 | Ground | AD-6 |
| GND4 | Terminal | 1 | Ground | AD-4 |
| GND5 | Terminal | 1 | Ground | AC-2 |
| GND6 | Terminal | 1 | Ground | AB-2 |
| GND7 | Terminal | 1 | Ground | Y-4 |
| GND8 | Terminal | 1 | Ground | AD-3 |
| GND21 | Terminal | 1 | Ground (engine body) | C-1 |
| GPARA | DE-9 | 9 | Intermediate connector | AS-7 |
| GPSB1 | DRC26-40A | 40 | GPS controller | AS-7 |

[The pin No. is also marked on the connector (electric wire insertion end)]

| Type (shell size code) | HD30 Series connector | | Testing connection use special tool Part No. |
|------------------------|--|---|--|
| | Body (plug) | Body (receptacle) | |
| | Pin (male terminal) | Socket (female terminal) | |
| 24-9 (5) |  <p style="text-align: right;">BWP05017</p> |  <p style="text-align: right;">BWP05018</p> | 799-601-9250 (T-adapter) |
| | Part No. :08191-51201, 08191-51202 | Part No. :08191-54101, 08191-54102 | |
| | Socket (female terminal) | Pin (male terminal) | |
| 24-16 (6) |  <p style="text-align: right;">BWP05021</p> |  <p style="text-align: right;">BWP05022</p> | 799-601-9260 (T-adapter) |
| | Part No. :08191-61201, 08191-62202, 08191-61205, 08191-62206 | Part No. :08191-64101, 08191-64102, 08191-64105, 08191-64106 | |
| | Socket (female terminal) | Pin (male terminal) | |
| 24-16 (6) |  <p style="text-align: right;">BWP05023</p> |  <p style="text-align: right;">BWP05024</p> | 799-601-9260 (T-adapter) |
| | Part No. :08191-62201, 08191-62202, 08191-62205, 08191-62206 | Part No. :08191-63101, 08191-63102, 08191-63105, 08191-63106 | |

B4D18407

Fuse box FUSE

| Type of power supply | Power supply to fuse | Fuse No. | Fuse capacity | Destination of power |
|-------------------------|----------------------------|----------|---------------|----------------------------|
| Continuous power supply | Fuse box F01 (19) (120 A) | 1 | 10 A | Radio |
| Switched power supply | Fuse box F01 (7, 8) (30 A) | 2 | 20 A | Additional working lamp |
| | | 3 | 20 A | Lighter, 12 V socket |
| | | 4 | 10 A | Radio, lamp |
| | | 5 | 10 A | Front wiper, rear wiper |
| | | 6 | 10 A | Right and left door wipers |

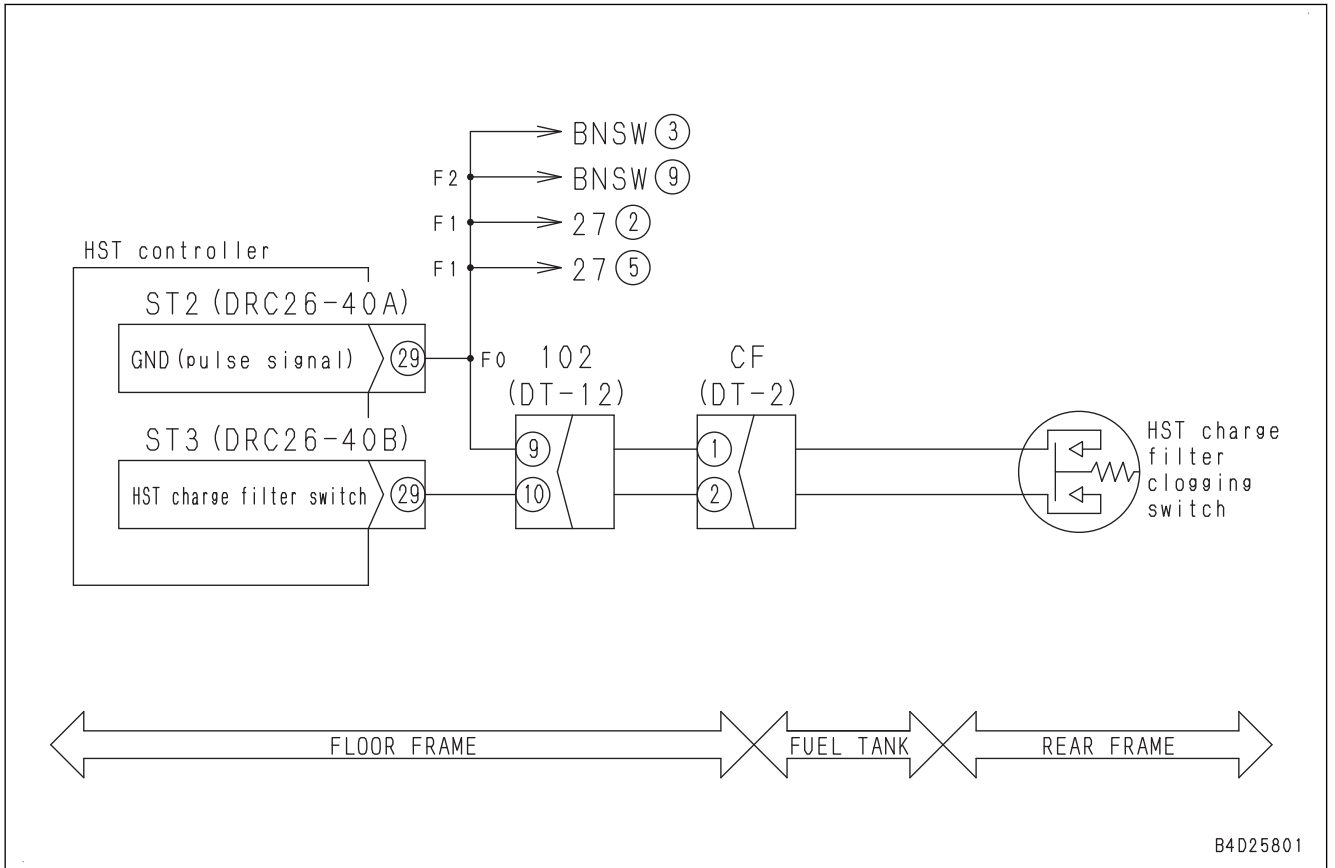
Connection table of fusible link**Fusible link 106 (engine compartment)**

| Type of power supply | Power supply to fusible link | Terminal No. | Fuse capacity | Destination of power |
|-----------------------|------------------------------|--------------|---------------|----------------------|
| Switched power supply | Battery relay T8 terminal | 3 | 120 A | Alternator |
| | Battery relay T8 terminal | 4 | 120 A | Intake air heater |

Fusible link 107 (battery room)

| Type of power supply | Power supply to fusible link | Terminal No. | Fuse capacity | Destination of power |
|-------------------------|------------------------------|--------------|---------------|---|
| Continuous power supply | Battery relay T7 terminal | 3 | 120 A | Fuse boxes F01 (9, 10, 15 to 19), F21, F22 (1 to 4) |
| Switched power supply | Battery relay T8 terminal | 4 | 120 A | Fuse box F01 (1 to 8, 11, 12) |

Circuit diagram related to HST oil filter clogging



FAILURE CODE [B@CRNS]

| | | | |
|-----------------------|--|---------|---|
| Action level | Failure code | Failure | Hydrostatic Transmission Oil Overheat (Machine monitor system) |
| L02 | B@CRNS | | |
| Detail of failure | While engine is running, HST oil temperature caution is generated. | | |
| Action of controller | <ul style="list-style-type: none"> Displays the HST oil temperature monitor in red on machine monitor. If cause of failure is eliminated, machine becomes normal by itself. | | |
| Phenomenon on machine | If machine is used as it is, the HST hydraulic component or work equipment hydraulic component may be damaged. | | |
| Related information | <ul style="list-style-type: none"> HST oil temperature from HST oil temperature sensor and HST oil temperature sensor voltage can be checked with monitoring function. (Code: 04401), (Code: 04402) After completion of repair, check that the failure code is cleared by the following procedure. Procedure: Start the engine. <p>REMARK HST oil temperature and hydraulic oil temperature are detected by same sensor, so they have same meaning.</p> | | |

| No. | Cause | Procedure, measuring location, criteria and remarks |
|-----|--|--|
| 1 | Overheat of HST oil (when system is normal) | Since a phenomenon leading to HST oil overheat may have occurred in the past or occurs currently, check cause of overheat and condition of machine damage, then repair machine. |
| 2 | Defective HST oil temperature gauge system | If no failure is found by check on cause 1, HST (hydraulic) oil temperature gauge system may be defective. Perform troubleshooting for failure codes [DGS1KA] and [DGS1KX] or "Hydraulic oil temperature gauge does not indicate correct temperature" in E mode. |

FAILURE CODE [CA239]

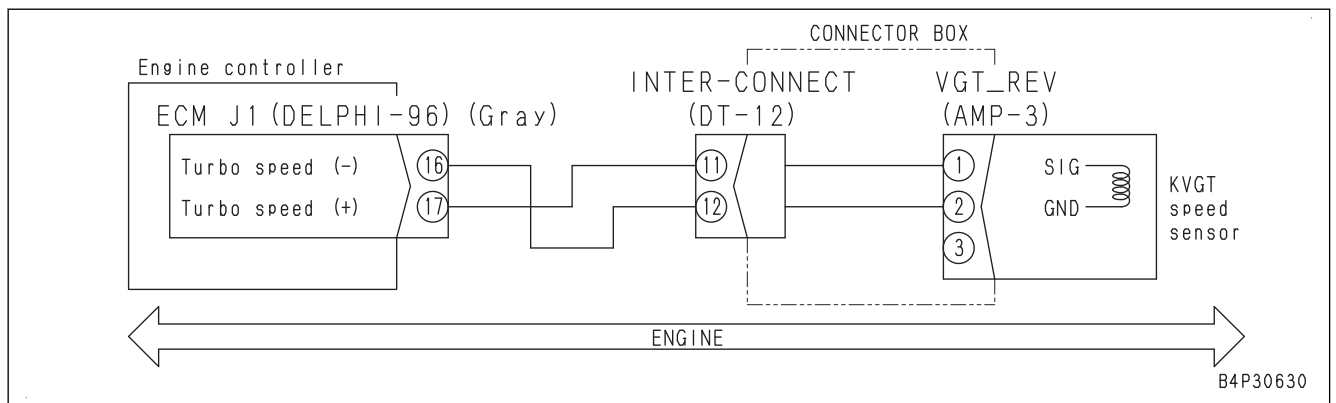
| | | | |
|-----------------------|--|---------|--|
| Action level | Failure code | Failure | NE Speed Sensor Supply Voltage High Error (Engine controller system) |
| L01 | CA239 | | |
| Details of failure | High voltage occurs in power supply (5 V) circuit of Ne speed sensor. | | |
| Action of controller | Controls by Bkup speed sensor signal. | | |
| Phenomenon on machine | <ul style="list-style-type: none"> Running engine stops (when Bkup (G) speed sensor is also defective). Stopped engine cannot be started (when Bkup (G) speed sensor is also defective). | | |
| Related information | After repairing, check if the failure code is cleared by the following procedure. Procedure: Turn starting switch to ON position. | | |

| No. | Cause | Procedure, measuring location, criteria and remarks | | |
|-----|------------------------------------|--|-------------------------------------|----------------|
| 1 | Defective wiring harness connector | 1. See descriptions of wiring harness and connectors in "Electrical equipment" in "CHECKS BEFORE TROUBLESHOOTING" of "RELATED INFORMATION ON TROUBLESHOOTING", and check it. 2. Start the engine. | | |
| | | If this failure code is cleared, wiring harness connector is defective. | | |
| 2 | Defective NE speed sensor | 1. Turn starting switch to OFF position. 2. Disconnect connector CRANK SENSOR. 3. Turn starting switch to ON position. | | |
| | | If this code is not displayed, disconnected sensor or engine wiring harness is defective. | | |
| 3 | Defective wiring harness | 1. Turn starting switch to OFF position. 2. Disconnect connector ECM J1. 3. Turn starting switch to ON position. | | |
| | | If this failure code is cleared, wiring harness is defective. REMARK Many of other failure codes are displayed at the same time. This is because of connector being disconnected. So ignore other codes than this failure code [CA239]. | | |
| 4 | Defective engine controller | 1. Turn starting switch to OFF position. 2. Disconnect connector ECM J1, and connect T-adapter to male side. 3. Turn starting switch ON with engine wiring harness disconnected. | | |
| | | Voltage | Between ECM J1 (male) (79) and (55) | 4.75 to 5.25 V |
| | | If no failure is found by above checks, engine controller is defective. (Since this is an internal defect, troubleshooting cannot be performed.) | | |

| No. | Cause | Procedure, measuring location, criteria and remarks | | |
|-----|--|---|--|---------------|
| 5 | Open circuit in wiring harness (wire breakage or defective contact of connector) | 1. Starting switch: OFF 2. Disconnect connectors ECM J1 and P55, and connect T-adaptor to either female side. | | |
| | | Resistance | If failure code is still displayed after above checks on cause 4, this check is not required. Between ECM J1 (female) (80) and P55 (female) (2) | Max. 10 Ω |
| | | | If failure code is still displayed after above checks on cause 4, this check is not required. Between ECM J1 (female) (56) and P55 (female) (3) | Max. 10 Ω |
| | | | Between ECM J1 (female) (32) and P55 (female) (1) | Max. 10 Ω |
| 6 | Ground fault in wiring harness (contact with ground circuit) | 1. Starting switch: OFF 2. Disconnect connectors ECM J1 and P55, and connect T-adaptor to either female side. | | |
| | | Resistance | Between ground and ECM J1 (female) (32) or P55 (female) (1) | Min. 100 kΩ |
| 7 | Short circuit in wiring harness | 1. Starting switch: OFF 2. Disconnect connectors ECM J1 and P55, and connect T-adaptor to female side of ECM J1. Check by using multimeter in continuity mode. | | |
| | | Continuity | Between ECM J1 (female) (32) and each pin other than (32) pin. | No continuity |
| 8 | Hot short circuit in wiring harness | 1. Perform preparation when starting switch is in OFF position. 2. Disconnect connector P55 and connect T-adaptor to female side. 3. Turn starting switch to ON position. | | |
| | | Voltage | Between P55 (female) (1) and (3) | Max. 1 V |
| 9 | Defective engine controller | If no failure is found by above checks, engine controller is defective. (Since this is an internal defect, troubleshooting cannot be performed.) | | |

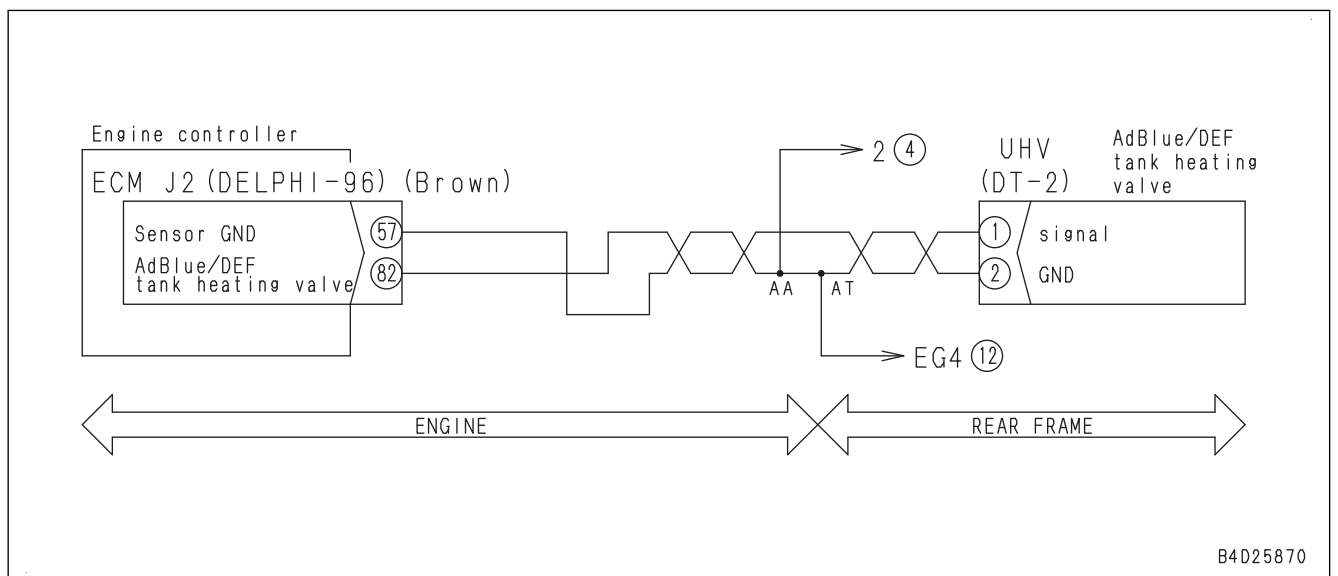
| No. | Cause | Procedure, measuring location, criteria and remarks | | |
|-----|--|--|---|-------------|
| 6 | Ground fault in wiring harness (contact with ground circuit) | 1. Turn starting switch to OFF position. 2. Disconnect connectors ECM J1 and VGT REV., and connect T-adaptor to either female side. | | |
| | | Resistance | Between ground and ECM J1 (female) (17) or VGT REV. (female) (1) | Min. 100 kΩ |
| | | Resistance | Between ground and ECM J1 (female) (16) or VGT REV. (female) (2) | Min. 100 kΩ |
| 7 | Short circuit in wiring harness | 1. Turn starting switch to OFF position. 2. Disconnect connectors ECM J1 and VGT REV., and connect T-adaptor to either female side. | | |
| | | Resistance | Between ECM J1 (female) (17) and (16), or between VGT REV. (female) (1) and (2) | Min. 100 kΩ |
| 8 | Hot short circuit in wiring harness | 1. Turn starting switch to OFF position. 2. Disconnect connector ECM J1, and connect T-adaptor to female side. 3. Turn starting switch to ON position. | | |
| | | Voltage | Between ECM J1 (female) (17) and ground | Max. 1 V |
| 9 | Defective sensor installation or defective parts for speed detection | Defective VGT speed sensor (looseness) or defective parts for speed detection (VGT internal parts) (including deformation by heat) may be suspected. Check it. | | |
| 10 | Defective engine controller | If no failure is found by above checks, engine controller is defective. (Since this is an internal defect, troubleshooting cannot be performed.) | | |

CIRCUIT DIAGRAM (TURBO SPEED SENSOR)



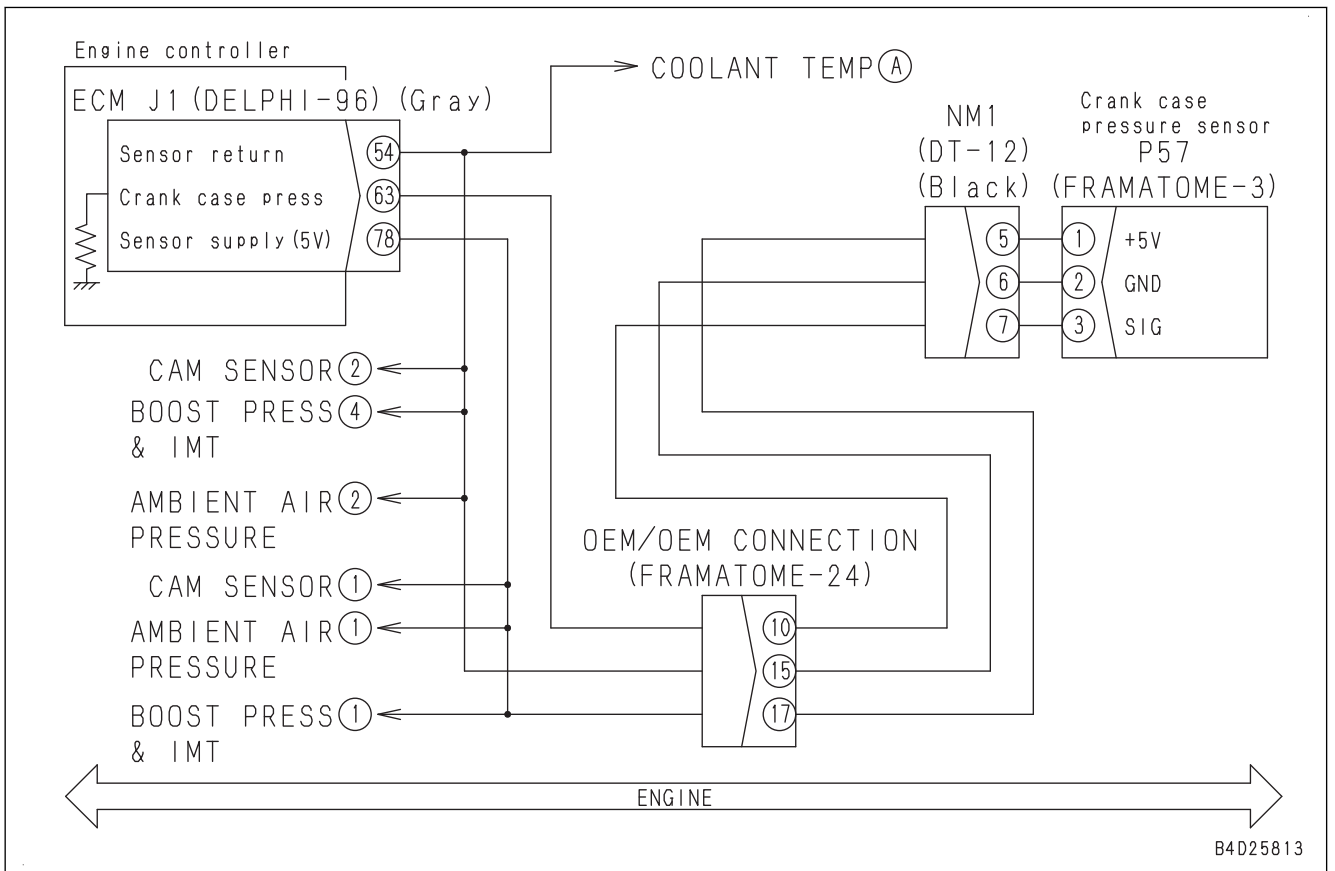
| No. | Cause | Procedure, measuring location, criteria and remarks | | |
|-----|-------------------------------------|--|---|--------------------------|
| 5 | Short circuit in wiring harness | 1. Turn starting switch to OFF position. 2. Disconnect connectors ECM J2 and UHV, and connect T-adapter to female side of ECM J2. REMARK Measure it with continuity range of multimeter. | | |
| | | Continuity | Between ECM J2 (female) (82) and each pin other than pin (82) | No continuity (no sound) |
| 6 | Hot short circuit in wiring harness | 1. Turn starting switch to OFF position. 2. Disconnect connector UHV, and connect T-adapter to female side. 3. Turn starting switch to ON position (with the valve disconnected). | | |
| | | Voltage | Between UHV (female) (1) and (2) | Max. 4.5 V |
| 7 | Defective engine controller | If no failure is found by above checks, engine controller is defective. (Since this is an internal defect, troubleshooting cannot be performed.) | | |

Circuit diagram related to AdBlue/DEF tank heating valve



B4D25870

Circuit diagram related to crankcase pressure sensor



FAILURE CODE [CA2249]

| Action level | Failure code | Failure | Common Rail Pressure Low Error 2 (Engine controller system) |
|-----------------------|--|---|---|
| L03 | CA2249 | | |
| Details of failure | No-pressure error is detected in supply pump. (Pressure lower than specified pressure continues for a long time: Level 2.) | | |
| Action of controller | Restricts engine output for operation. | | |
| Phenomenon on machine | Engine power deration | | |
| Related information | <ul style="list-style-type: none"> • Signal voltage from common rail pressure sensor can be checked by monitoring function. (Code: 36401 (V)) • Common rail pressure in common rail pressure sensor can be checked by monitoring function. (Code: 36400 (MPa)) • After repairing, check if the failure code is cleared by the following procedure. Procedure: Start engine. | | |
| No. | Cause | Procedure, measuring location, criteria and remarks | |
| 1 | Supply pump pressure low error | Perform troubleshooting for failure code [CA559]. | |

FAILURE CODE [CA2556]

| | | | |
|-----------------------|---|---------|---|
| Action level | Failure code | Failure | Intake Air Heater Relay Short Circuit Error (Engine controller system) |
| L01 | CA2556 | | |
| Detail of failure | Short circuit is detected in intake air heater relay drive circuit (primary circuit). | | |
| Action of controller | None in particular | | |
| Phenomenon on machine | Intake air heater does not work in auto preheating mode (resulting in degraded startability and emission of white smoke at low temperatures). | | |
| Related information | <ul style="list-style-type: none"> Temperature sensed by charge temperature sensor (boost temperature sensor) can be checked with monitoring function. (Code: 18500 (°C)) Troubleshooting of this failure code covers circuits from engine controller to primary (coil) circuit of pre-heater relay. This failure code is detected only when the relay is ON. Troubleshoot with charge temperature at -3 °C and below. For troubleshooting of secondary circuit of heater relay and pre-heater relay, see E-mode. After repairing, check if the failure code is cleared by the following procedure. Procedure: Turn starting switch to ON position (charge (boost) temperature: Max. -3 °C | | |

| No. | Cause | Procedure, measuring location, criteria and remarks | | |
|--|------------------------------------|---|---|---------------|
| 1 | Defective wiring harness connector | <ol style="list-style-type: none"> See descriptions of wiring harness and connectors in “c. METHOD FOR CHECKING ELECTRIC EQUIPMENT” in “CHECKS BEFORE TROUBLESHOOTING” of “RELATED INFORMATION ON TROUBLESHOOTING”, and check it. Turn starting switch to ON position. (charge (boost) temperature: Max. -3 °C) | | |
| | | If this failure code is cleared, wiring harness connector is defective. | | |
| 2 | Defective preheating relay PHR | <ol style="list-style-type: none"> Turn the starting switch to OFF position. Disconnect relay RHR, and connect T-adaptor to male side. | | |
| | | Resistance | Between RHR (male) (1) and (2) | 200 to 400 Ω |
| | | <ol style="list-style-type: none"> Turn the starting switch to OFF position. Replace relay RHR with another relay. Turn the starting switch to ON position. | | |
| If this failure code is cleared, original preheating relay RHR is defective. | | | | |
| 3 | Ground fault in wiring harness | <ol style="list-style-type: none"> Turn the starting switch to OFF position. Disconnect connector ECM J2 and relay RHR, and connect T-adaptor to either female side. | | |
| | | Resistance | Between ground and ECM J2 (female) (75) or RHR (female) (1) | Min. 100 kΩ |
| 4 | Short circuit in wiring harness | <ol style="list-style-type: none"> Turn the starting switch to OFF position. Disconnect connector ECM J2 and relay RHR, and connect T-adaptor to female side of ECM J2. | | |
| | | Continuity | Between ECM J2 (female) (75) and each pin other than pin (75) | No continuity |

| No. | Cause | Procedure, measuring location, criteria and remarks |
|-----|---|---|
| 1 | Defective SCR temperature sensor (internal open or short circuit to ground) | If failure code [CA3142] or [CA3143] is displayed, perform troubleshooting for [CA3142] or [CA3143]. |
| 2 | Defective KDPF system (Abnormal exhaust gas temperature to SCR) | <ol style="list-style-type: none"> 1. If failure code [CA3251] is displayed, perform troubleshooting for [CA3251]. 2. If failure code [CA3253], [CA3254], or [CA3311] is displayed, perform troubleshooting for [CA3253], [CA3254], or [CA3311]. 3. If failure code [CA3255], [CA3256], or [CA3312] is displayed, perform troubleshooting for [CA3255], [CA3256], or [CA3312]. |
| 3 | Defective SCR temperature sensor (installation error) | See "DISASSEMBLY AND ASSEMBLY", "REMOVE AND INSTALL SCR ASSEMBLY" and fix installation error, if any. |
| 4 | Improper AdBlue/DEF quality | <ol style="list-style-type: none"> 1. Turn starting switch to ON position. 2. If failure code [CA4277] is displayed or failure code [CA4277] is logged on the abnormality record screen, perform troubleshooting these first. 3. Check the "AdBlue/DEF concentration" on the troubleshooting assistance screen (normal value: 29 to 36 %). 4. If a failure is found by above checks, it may be contaminated. Replace the AdBlue/DEF in the tank. 5. Replace the AdBlue/DEF injector. 6. Perform "Loaded Diagnostics Operation To Confirm Failure Correction". |
| 5 | Defective SCR temperature sensor (internal defect) | <ol style="list-style-type: none"> 1. If the failure code persists after the above checks, replace the SCR temperature sensor. 2. Perform "Loaded Diagnostics Operation To Confirm Failure Correction". |
| | | If the failure code is cleared, the SCR temperature sensor may be defective. |
| 6 | Defective engine controller | If no failure is found by above checks, engine controller is defective. (Since this is an internal defect, troubleshooting cannot be performed.) |

Loaded Diagnostics Operation to Confirm Failure Correction

Check if the repair has been completed with the following procedure:

(Make sure this failure code is not displayed after this procedure.)

REMARK

If this failure code is displayed during "Loaded Diagnostics Operation To Confirm Failure Correction", return to troubleshooting.

1. Clear this failure code by "Engine Controller Inducement Fault Clear".
2. Turn the starting switch to OFF position, and shut down the engine controller.
3. Turn the starting switch to ON position, and start the engine.
4. Run the engine at low idle speed for approximately 1 minute.
5. After warm-up operation, set fuel control dial to MAX position, and the working mode to P.
6. Run the engine at high idle speed for 15 minutes.
7. If this failure code is not displayed, repair is completed.

| No. | Cause | Procedure, measuring location, criteria and remarks |
|-----|---|---|
| 3 | Mechanical failure of AdBlue/DEF tank heating valve | <p>See "TESTING AND ADJUSTING", "SERVICE MODE" of "SETTING AND OPERATION MACHINE MONITOR", "METHOD FOR SETTING WITH TESTING MENU (SCR SERVICE TEST)" to perform an "AdBlue/DEF TANK HEATER RELAY TEST" and check if the AdBlue/DEF tank heater valve is driven normally.</p> <p>Confirm that the AdBlue/DEF tank heating valve operates in response to 19102 "AdBlue/DEF Tank HtrValve Command" (switches between 0 and 1).</p> <ol style="list-style-type: none"> 1. Remove the coolant hose from the outlet side of the AdBlue/DEF tank heating valve, and plug the removed hose. 2. Start the engine. 3. Perform an "AdBlue/DEF TANK HEATER RELAY TEST" to drive the AdBlue/DEF tank heating valve. 4. Make sure that coolant flows out in response to valve open and close commands. <p>REMARK</p> <p>If coolant flows out in response to valve operation, the AdBlue/DEF tank heating valve is normal.</p> <p>If coolant does not flow out:</p> <p>Increase the temperature of the inlet side coolant hose to make sure that the coolant flows out.</p> <ol style="list-style-type: none"> 1. If coolant flows out from the inlet side coolant hose, replace the AdBlue/DEF tank heating valve. 2. If coolant does not flow out from the inlet side coolant hose, clogging of the coolant circuit is suspected. |
| 4 | Failure of engine coolant circuit | <ul style="list-style-type: none"> • Check if the engine coolant circuit in the engine or AdBlue/DEF tank is leaking or clogged. • Also check whether amount of engine coolant is appropriate. If there are some problems, repair the relevant portions. |
| 5 | Defective AdBlue/DEF tank temperature sensor | Perform "Loaded Diagnostics Operation To Confirm Failure Correction". If the AdBlue/DEF tank temperature does not rise correctly, replace the AdBlue/DEF tank sensor. |
| 6 | Defective engine controller | If no failure is found by above checks, engine controller is defective. (Since this is an internal defect, troubleshooting cannot be performed.) |

Loaded Diagnostics Operation To Confirm Failure Correction

Check if the repair has been completed with the following procedure:

1. Turn the starting switch to OFF position, and shut down the engine controller.
2. Start the engine and confirm 19115 "AdBlue/DEF tank temperature" on the Pre-defined Monitoring screen.
3. Conduct warm-up operation and raise the 4107 "engine coolant temperature" to 20 °C or more.
 - 1) When the 19115 "AdBlue/DEF tank temperature" is less than 1 °C

If the 4107 "engine coolant temperature" becomes 0 °C or more, the 19102 "AdBlue/DEF Tank HtrValve Command" is issued (0 to 1).

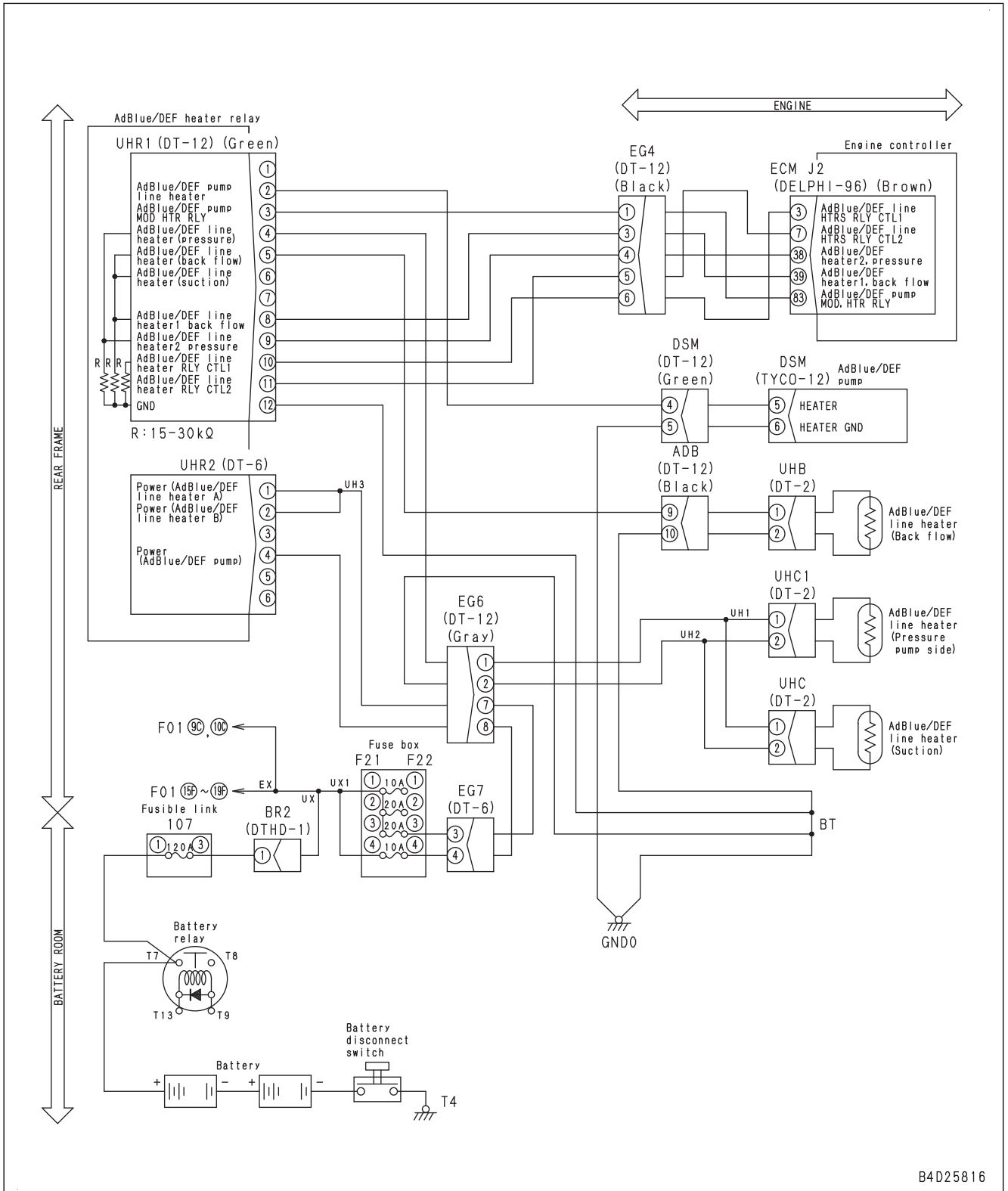
Confirmation will be completed if the AdBlue/DEF tank temperature becomes 4 °C or more within an hour after the AdBlue/DEF tank heating valve open and close command is issued.
 - 2) When the 19115 "AdBlue/DEF tank temperature" is 1 °C or more

Conduct warm-up operation and raise the 4107 "engine coolant temperature" to ambient temperature + 20 °C or more.
 - 3) See "TESTING AND ADJUSTING", "Service mode" and "Inspection menu (SCR Service Test)" in "SETTING AND OPERATION OF MACHINE MONITOR" to perform "AdBlue/DEF tank heater relay test".

FAILURE CODE [CA3319]

| | | | |
|-----------------------|--|---|---|
| Action level | Failure code | Failure | KDPF Outlet Temperature Sensor High Error (Engine controller system) |
| L03 | CA3319 | | |
| Detail of failure | Open circuit, hot short circuit, or sensor circuit error in KDPF outlet temperature sensor measuring section or probe (+) | | |
| Action of controller | <ul style="list-style-type: none"> Substitute the KDOC outlet temperature for the KDPF outlet temperature and run the engine (if the KDOC outlet temperature sensor also has an error, use the default value of the KDPF outlet temperature (250 °C)). Engine power deration AdBlue/DEF injection stops. EGR valve closed. Regeneration control stops. Fuel dosing stops. Advances to Inducement strategy. | | |
| Phenomenon on machine | <ul style="list-style-type: none"> NOx emission increases because AdBlue/DEF injection is disabled. Defective forcible regeneration control. KDPF Soot Accumulation High. Engine output is reduced based on inducement strategy. | | |
| Related information | <p>⚠ Be careful not to get burned as the temperature of KDPF and KDOC rises up over 500 °C.</p> <ul style="list-style-type: none"> The KDOC inlet temperature sensor, the KDOC outlet temperature sensor, and the KDPF outlet temperature sensor are integrated into one sensor controller which provides CAN communication with the engine controller. Open circuit, hot short circuit, or sensor circuit error in KDPF outlet temperature sensor measuring section or probe (+) is sent to the engine controller via CAN communication, and this failure code is displayed. For details of access to the KDOC inlet temperature sensor, the KDOC outlet temperature sensor, and the KDPF outlet temperature sensor, see “Chapter 50 DISASSEMBLY AND ASSEMBLY”, “REMOVE AND INSTALL KDPF ASSEMBLY” and “DISASSEMBLE AND ASSEMBLE KDPF ASSEMBLY”. After repairing, check if the failure code is cleared by the following procedure. Procedure: Turn starting switch to ON position. Engine power deration is canceled by turning starting switch to OFF position after this failure code is cleared (note that the engine power deration is not canceled only by the failure code is cleared). | | |
| No. | Cause | Procedure, measuring location, criteria and remarks | |
| 1 | Defective KDPF outlet temperature sensor system | Perform troubleshooting for failure code [CA3321]. | |

Circuit diagram related to AdBlue/DEF line heater



B4D25816

FAILURE CODE [CA3583]

| | | | |
|-----------------------|---|--|---|
| Action level | Failure code | Failure | SCR Outlet NOx Sensor Heater Warming up Error (Engine controller system) |
| L01 | CA3583 | | |
| Detail of failure | There is an abnormality in the heater part of the SCR outlet NOx sensor. (It is not heated or the temperature cannot be kept) | | |
| Action of controller | <ul style="list-style-type: none"> • Drive at the default NOx emission value (0 ppm) • Advances to Inducement strategy. (EU Specification) | | |
| Phenomenon on machine | <ul style="list-style-type: none"> • NOx emission may increase or ammonia may be exhausted because AdBlue/DEF injection works inappropriately. • Engine power deration according to inducement strategy. (EU Specification) | | |
| Related information | <p>⚠ The KDPF, sensor fitting piping, and sensor probe become hot (Min. 500 °C). Be careful not to get burned.</p> <p>⚠ The SCR assembly, sensor fitting piping, and sensor probe become hot (Min. 400 °C). Be careful not to get burned.</p> <p>⚠ Be careful not to get burned by the sensor probe as it is heated by itself even if the ambient temperature is not high.</p> <ul style="list-style-type: none"> • The SCR outlet NOx sensor operates when 19302 SCR outlet temperature is 150 °C or more (19210 SCR outlet NOx sensor measurement state is "1"). • The SCR outlet NOx sensor is a smart sensor which performs CAN communication with the engine controller together with the other sensors. • The SCR outlet NOx sensor does not operate when SCR outlet temperature is 150 °C or lower, and correct value is not displayed. • The Pre-defined Monitoring screen uses the engine operation state diagnosis, SCR catalyst, NOx sensor, and ammonia sensor diagnosis. • Engine operation state diagnosis <ul style="list-style-type: none"> 01002 Engine speed 19200 Exhaust gas flow rate 47300 KDOC Inlet Temperature 19300 SCR Temperature 19302 SCR Outlet Temperature • SCR catalyst, NOx sensor, ammonia sensor diagnosis. <ul style="list-style-type: none"> 19203 Turbo Outlet NOx Sensor State 19210 SCR Outlet NOx Sensor State 19202 Turbo Outlet Concentration Corrected 19209 SCR Outlet NOx Corrected 19205 Ammonia Concentration Corrected 19120 AdBlue/DEF Injection Quantity <p>NOTICE</p> <p>For this failure code, after investigating the cause of the problem and completing the repair, perform "Loaded Diagnostics Operation To Confirm Failure Correction" to make sure the failure code is cleared. (This failure code is not cleared by only turning ON the starting switch.)</p> | | |
| No. | Cause | Procedure, measuring location, criteria and remarks | |
| 1 | Defective CAN communication system | If failure code [CA2771] is displayed, perform troubleshooting for [CA2771] first. | |

REMARK

- If this failure code is cleared, repair is completed.
- In case it is not cleared, return to troubleshooting.

| No. | Cause | Procedure, measuring location, criteria and remarks |
|-----|-------------------------------------|--|
| 3 | Defective ammonia sensor controller | <ol style="list-style-type: none"> 1. Turn starting switch to OFF position. 2. If this failure code is displayed in above diagnosis, replace an ammonia sensor controller. 3. Perform "Loaded Diagnostics Operation To Confirm Failure Correction". |
| | | If the failure code is cleared, the original ammonia sensor controller may be defective. |
| 4 | Defective engine controller | If no failure is found by above checks, engine controller is defective. (Since this is an internal defect, troubleshooting cannot be performed.) |

Loaded Diagnostics Operation to Confirm Failure Correction

Check if the repair has been completed with the following procedure:

(Make sure this failure code is not displayed after this procedure.)

Clear this failure code by "Engine Controller Inducement Fault Clear" before step 1. (EU Specification)

1. Turn the starting switch to OFF position, and shut down the engine controller.
2. Turn the starting switch to ON position, and start the engine.
3. Run the engine at high idle speed to raise the exhaust temperature. (Keep the engine speed so that monitoring code 19300 "SCR temperature" is 150 °C or higher.)
4. Check if this failure code is not displayed after 1 minute.

REMARK

- If this failure code is not displayed, repair is completed.
- In case it is displayed, return to troubleshooting.

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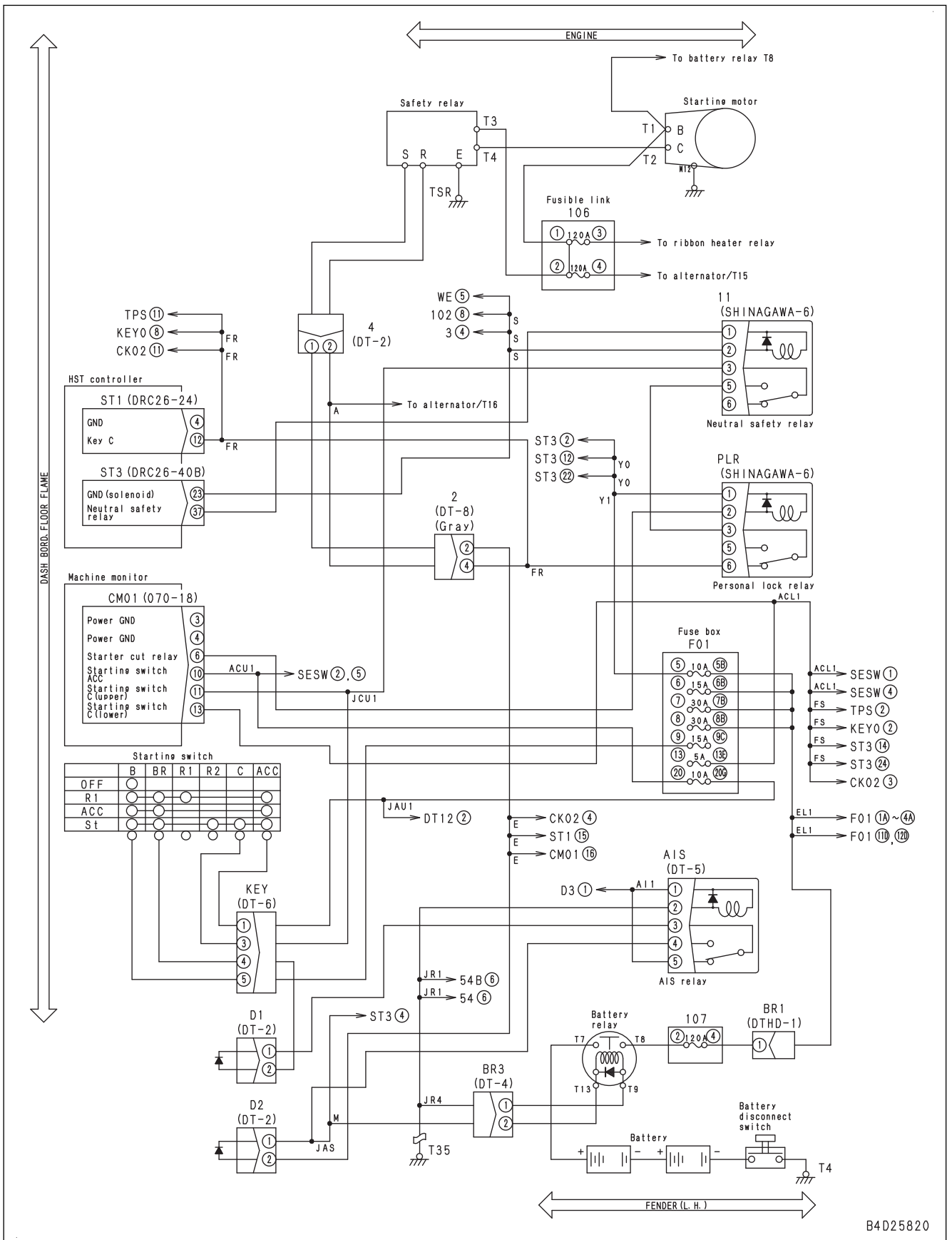
FAILURE CODE [CA4165]

| | | | |
|-----------------------|---|---------|--|
| Action level | Failure code | Failure | SCR Temperature Sensor ECU Voltage Low Error (Engine controller system) |
| L01 | CA4165 | | |
| Detail of failure | Low voltage error is detected in power supply voltage of SCR temperature sensor controller. | | |
| Action of controller | <ul style="list-style-type: none"> The SCR temperature and SCR outlet temperature are the latest normal value for operation. Advances to Inducement strategy. AdBlue/DEF injection stops | | |
| Phenomenon on machine | <ul style="list-style-type: none"> Defective detection of SCR temperature and SCR outlet temperature. NOx emission increases because AdBlue/DEF injection is disabled. Engine power deration according to inducement strategy. | | |
| Related information | <p>⚠ The SCR assembly, sensor fitting piping, and sensor probe become hot (Min. 400 °C). Be careful not to get burned.</p> <ul style="list-style-type: none"> The SCR temperature sensor and SCR outlet temperature sensor are integrated into one sensor controller which provides CAN communication with the engine controller. For the replacement procedure of the SCR temperature sensor, see "DISASSEMBLY AND ASSEMBLY", "REMOVE AND INSTALL SCR TEMPERATURE SENSOR". After repairing, check if the failure code is cleared by the following procedure. Procedure: Turn starting switch to ON position. | | |

| No. | Cause | Procedure, measuring location, criteria and remarks | | | | | | |
|---------|--|--|--|---------|----------------------------------|------------|----------------------------------|------------|
| 1 | Defective wiring harness connector | <ol style="list-style-type: none"> See descriptions of wiring harness and connectors in "Electrical equipment" in "CHECKS BEFORE TROUBLESHOOTING" of "RELATED INFORMATION ON TROUBLESHOOTING", and check it. Turn starting switch to ON position. <p>If this failure code is cleared, wiring harness connector is defective.</p> | | | | | | |
| 2 | Low battery voltage | <ol style="list-style-type: none"> Check that system operating lamp is not illuminated, and then turn the battery disconnect switch to OFF position. Turn starting switch to OFF position. Disconnect connector SSR, and connect T-adapter to female side. Turn the battery disconnect switch to ON position. Turn starting switch to ON position. <table border="1"> <tr> <td rowspan="2">Voltage</td> <td>Between SSR (female) (1) and (4)</td> <td>22 to 30 V</td> </tr> <tr> <td>Between SSR (female) (3) and (4)</td> <td>22 to 30 V</td> </tr> </table> | | Voltage | Between SSR (female) (1) and (4) | 22 to 30 V | Between SSR (female) (3) and (4) | 22 to 30 V |
| Voltage | Between SSR (female) (1) and (4) | 22 to 30 V | | | | | | |
| | Between SSR (female) (3) and (4) | 22 to 30 V | | | | | | |
| 3 | Defective SCR temperature sensor (internal defect) | <ol style="list-style-type: none"> Turn starting switch to OFF position. Replace SCR temperature sensor. Turn starting switch to ON position. <p>If this failure code is cleared, the original SCR temperature sensor is defective. (In case of an internal defect, troubleshooting is impossible as an assembly. Replace whole assembly.)</p> | | | | | | |
| 4 | Defective engine controller | If no failure is found by above checks, engine controller is defective. (Since this is an internal defect, troubleshooting cannot be performed.) | | | | | | |

| No. | Cause | Procedure, measuring location, criteria and remarks |
|-----|-----------------------------------|---|
| 3 | Defective AdBlue/DEF heater relay | <ol style="list-style-type: none"> 1. Turn the starting switch to OFF position. 2. Check that system operating lamp is not lit, and turn the battery disconnect switch to OFF position. 3. Disconnect connector UHR1 and UHR2 and replace AdBlue/DEF heater relay. 4. Turn the battery disconnect switch to ON position. 5. Start the engine in low temperature (ambient temperature of 5 °C or below) or see "service modes" of "SET AND OPERATE MACHINE MONITOR", and "METHOD FOR OPERATING TESTING MENU (SCR SERVICE TEST)" to perform "AdBlue/DEF Line Heater Relay 2 Test". |
| | | If this failure code is no longer displayed, AdBlue/DEF heater relay is defective. |
| 4 | Defective engine controller | If no failure is found by above checks, engine controller is defective. (Since this is an internal defect, troubleshooting cannot be performed.) |

Circuit diagram related to neutral safety relay



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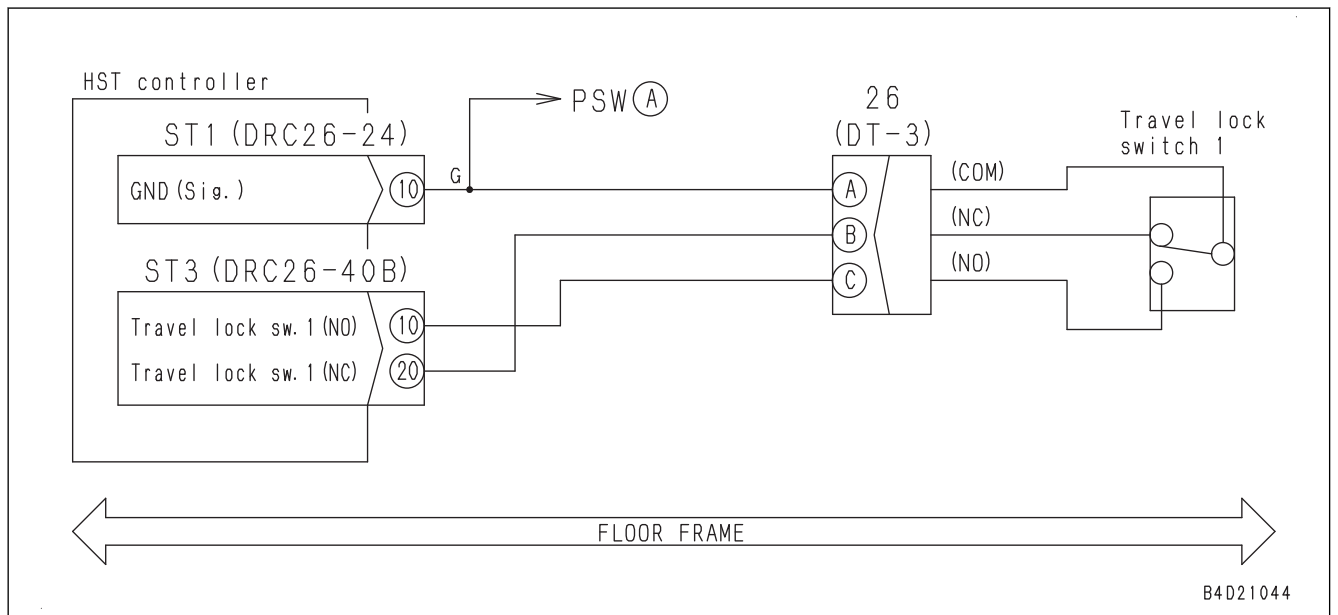
FAILURE CODE [DAJ0MC]

| Action level | Failure code | Failure | Hydrostatic Transmission Controller Error (HST controller system) |
|-----------------------|--|---|--|
| - | DAJ0MC | | |
| Detail of failure | A runtime error generated by the OS | | |
| Action of controller | Resets the CPU, restarts the system, and sends a failure code after restarting. | | |
| Phenomenon on machine | <ul style="list-style-type: none"> • Since HST pump and motor stop, machine cannot travel. • Parking brake is set to LOCK. • An output to the work equipment stops (but when the work equipment lever is returned to NEUTRAL position, work equipment can be operated). | | |
| Related information | After completion of repair, check that the failure code is cleared by the following procedure. Procedure: Turn the starting switch to ON position. | | |
| No. | Cause | Procedure, measuring location, criteria and remarks | |
| 1 | Defective HST controller | Since this is an internal defect, troubleshooting cannot be performed. (If there is no visible failure, controller may be used as it is.) | |

| No. | Cause | Procedure, measuring location, criteria and remarks | | |
|-----|--|---|---|------------|
| 6 | Ground fault in wiring harness (contact with ground circuit) | If there is no failure in check on cause 4, this check is not required. 1. Turn the starting switch to OFF position. 2. Turn the battery disconnect switch to OFF position. 3. If fuse F01-18 is blown out, replace it. 4. Remove fuse 107-1. 5. Disconnect connectors IB3 and GPSB1, and connect T-adaptor to female side of IB3. | | |
| | | Resistance | Between IB3 (female) (1) and each of (21) and (31) | Max. 1 Ω |
| | | | Between IB3 (female) (11) and each of (32) and (33) | Max. 1 Ω |
| 7 | Defective ICT sensor controller | If no failure is found by preceding checks, ICT sensor controller is defective. (Since this is an internal defect, troubleshooting cannot be performed). 1. Turn the starting switch to OFF position. 2. Turn the battery disconnect switch to OFF position. 3. Insert T-adaptor into connector IB3. 4. Turn the battery disconnect switch to ON position. 5. Turn the starting switch to ON position. | | |
| | | Voltage | Between IB3 (1) and each of (21) and (31) | 20 to 30 V |
| | | | Between IB3 (11) and each of (32) and (33) | 20 to 30 V |

| No. | Cause | Procedure, measuring location, criteria and remarks | | |
|--|--------------------------|--|-------------|-----------|
| 4 | Defective HST controller | If no failure is found by preceding checks, HST controller is defective. | | |
| | | Reference | | |
| | | 1. Turn the starting switch to OFF position. | | |
| | | 2. Insert T-adapter into connector ST1 and ST3. | | |
| | | 3. Turn the starting switch to ON position. | | |
| 4. Operate parking brake lever to perform troubleshooting. | | | | |
| REMARK | | Voltage of approximately 9 V is applied to ST3 pin (20) and pin (10) through resistor in HST controller. | | |
| Voltage | | Between ST3 (20) and ST1 (10) | Lever: LOCK | 7 to 11 V |
| | | | Lever: FREE | Max. 1 V |
| | | Between ST3 (10) and ST1 (10) | Lever: LOCK | Max. 1 V |
| | | | Lever: FREE | 7 to 11 V |

Circuit diagram related to parking brake lever switch and solenoid valve



| No. | Cause | Procedure, measuring location, criteria and remarks | | |
|-----|--|---|---|--------------|
| 3 | Open circuit in wiring harness (wire breakage or defective contact of connector) | 1. Turn the starting switch to OFF position. 2. Disconnect connectors ST1 and BS, and connect T-adapter to each female side. | | |
| | | Resistance | If power supply voltage in check on cause 1 is normal, this check is not required. Between ST1 (female) (21) and BS (female) (1) | Max. 1 Ω |
| | | | Between ST1 (female) (8) and BS (female) (2) | Max. 1 Ω |
| 4 | Ground fault in wiring harness (contact with ground circuit) | If no failure is found by check on cause 2, this check is not required. 1. Turn the starting switch to OFF position. 2. Disconnect connectors ST1 and BS, and connect T-adapter to either female side. | | |
| | | Resistance | Between ST1 (female) (8) and (21), or between BS (female) (1) and (2) | Min. 1 MΩ |
| | | | Between ST1 (female) (8) and ground, or between BS (female) (2) and ground | Min. 1 MΩ |
| 5 | Defective HST controller | If no failure is found by preceding checks, HST controller is defective. Reference 1. Turn the starting switch to OFF position. 2. Insert T-adapter into connector ST1. 3. Turn the starting switch to ON position. | | |
| | | Voltage | Between ST1 (8) and (21) | 0.5 to 4.5 V |

FAILURE CODE [DFA7L8]

| Action level | Failure code | Failure | Blade Tilt Lever Potentiometer 1 or 2 Signal Abnormality (HST controller system) |
|-----------------------|--|---|---|
| L01 | DFA7L8 | | |
| Detail of failure | In blade tilt lever potentiometer 1 and 2 systems, total of both signal voltages is 4.41 V and below or 5.59 V and above. | | |
| Action of controller | Continues control with signal of normal one of blade tilt lever potentiometer 1 and 2 systems. | | |
| Phenomenon on machine | None | | |
| Related information | <ul style="list-style-type: none"> Signal state of blade tilt lever potentiometer can be checked with monitoring function. (Code: 73500), (Code: 73501) After completion of repair, check that the failure code is cleared by the following procedure. Procedure: Turn the starting switch to ON position, and operate the blade control lever (tilt direction). | | |
| No. | Cause | Procedure, measuring location, criteria and remarks | |
| 1 | Defective blade tilt lever potentiometer | Perform troubleshooting for failure codes [DFA8KA], [DFA8KB], [DFA9KA], and [DFA9KB]. | |

FAILURE CODE [DHH7KB]

| | | | |
|-----------------------|--|---------|--|
| Action level | Failure code | Failure | Left Forward Hydrostatic Transmission Circuit Pressure Sensor Hot Short Circuit (HST controller system) |
| L03 | DHH7KB | | |
| Detail of failure | Signal voltage from left HST pump pressure sensor is 4.7 V and above. | | |
| Action of controller | <ul style="list-style-type: none"> Displays HST system state monitor on machine monitor. Controls with pressure signal just before the failure occurs until the machine stops. Once machine stops, controller recognizes the pump pressure as 3.0 MPa {30 kg/cm²} and controls. Even if cause of failure is eliminated, machine does not become normal until starting switch is turned to OFF position. | | |
| Phenomenon on machine | <ul style="list-style-type: none"> After machine stops, engine speed is restricted to medium (half) speed. Deviation control does not operate normally. Engine stopping and stalling of HST (the travel speed decreases) will easily occur when load is heavy. Electronic cut-off does not operate. | | |
| Related information | <ul style="list-style-type: none"> If 5 V circuit (3) and ground circuit (1) of pressure sensor are connected inversely, pressure sensor will break. Accordingly, take extreme care when checking. Input pressure and voltage from left HST pump pressure sensor can be checked with monitoring function. (Code: 52503), (Code: 52502) After completion of repair, check that the failure code is cleared by the following procedure. Procedure: Turn the starting switch to ON position or start the engine. | | |

| No. | Cause | Procedure, measuring location, criteria and remarks | | | | |
|---------|--|--|--|----------|---------|----------------------------------|
| 1 | Defective 5 V sensor power supply system | If failure code [DAJ5KK] is also displayed, perform troubleshooting for it first. | | | | |
| | | <ol style="list-style-type: none"> Turn the starting switch to OFF position. Disconnect connector LPF, and connect T-adaptor to female side. Turn the starting switch to ON position. | | | | |
| | | <p>REMARK</p> <p>If power supply voltage is abnormal, go to check on cause 3 and after.</p> <table border="1"> <tr> <td>Voltage</td> <td>Between LPF (female) (3) and (1)</td> <td>Power supply</td> <td>4.5 to 5.5 V</td> </tr> </table> | | | Voltage | Between LPF (female) (3) and (1) |
| Voltage | Between LPF (female) (3) and (1) | Power supply | 4.5 to 5.5 V | | | |
| 2 | Defective left forward HST pressure sensor (internal defect) or ground fault | <ol style="list-style-type: none"> Turn the starting switch to OFF position. Disconnect connector LPF. Turn the starting switch to ON position. | | | | |
| | | If failure code [DHH7KB] is cleared and [DHH7KA] indicating open circuit is displayed, left forward HST pressure sensor is defective (if failure code [DHH7KB] remains, wiring harness or HST controller is defective). | | | | |
| 3 | Hot short circuit in wiring harness | <ol style="list-style-type: none"> Turn the starting switch to OFF position. Disconnect connector LPF, and connect T-adaptor to female side. Turn the starting switch to ON position. | | | | |
| | | Voltage | Between LPF (female) (2) and (1) or ground | Max. 1 V | | |

FAILURE CODE [DK40KA]

| | | | |
|-----------------------|---|---------|---|
| Action level | Failure code | Failure | Brake Pedal Potentiometer Open Circuit (HST controller system) |
| L03 | DK40KA | | |
| Detail of failure | Signal voltage of brake pedal potentiometer is 0.3 V and below. | | |
| Action of controller | <ul style="list-style-type: none"> Keeps the input until the machine stops. Recognizes that the pedal is not depressed after the machine stops. | | |
| Phenomenon on machine | <ul style="list-style-type: none"> At the first depressing stage (deceleration), the state is that the pedal is not depressed. At the second stage (brake), you can control the brake. Even if you release the pedal, the machine stays stopped. | | |
| Related information | <ul style="list-style-type: none"> Signal voltage of brake pedal potentiometer can be checked with monitoring function. (Code: 50400) After completion of repair, check that the failure code is cleared by the following procedure. Procedure: Turn the starting switch to ON position, and operate decelerator/brake pedal. | | |

| No. | Cause | Procedure, measuring location, criteria and remarks | | | |
|-----|---|---|-----------------------------------|--------------|---------------|
| 1 | Defective 5 V sensor power supply system | If failure code [DAJ5KK] is also displayed, perform troubleshooting for it first. | | | |
| | | <ol style="list-style-type: none"> Turn the starting switch to OFF position. Disconnect connector BP1, and connect T-adapter to female side. Turn the starting switch to ON position. | | | |
| | | REMARK | | | |
| | | If power supply voltage is abnormal, go to check on cause 3 and after. | | | |
| | Voltage | Between BP1 (female) (C) and (B) | Power supply | 4.5 to 5.5 V | |
| 2 | Defective decelerator/brake pedal potentiometer (internal open circuit or ground fault) | <ol style="list-style-type: none"> Turn the starting switch to OFF position. Disconnect connector BP1, and connect T-adapter to male side. Depress decelerator/brake pedal to perform troubleshooting. | | | |
| | | Resistance | Between BP1 (male) (C) and (B) | | Approx. 2 kΩ |
| | | | Between BP1 (male) (A) and (C) | | 0.2 to 1.8 kΩ |
| | | | Between BP1 (male) (A) and (B) | | 0.2 to 1.8 kΩ |
| | | | Between BP1 (male) (A) and ground | | Min. 1 MΩ |

FAILURE CODE [DKS3KA]

| | | | |
|-----------------------|--|---------|---|
| Action level | Failure code | Failure | Blade Lift Cylinder Stroke Reset Sensor Open Circuit And Ground Fault (ICT Sensor Controller System) |
| L01 | DKS3KA | | |
| Detail of failure | Input voltage from stroke reset sensor for blade lift cylinder is Max. 0.3 V. | | |
| Action of controller | Prohibits automatic control of blade. | | |
| Phenomenon on machine | <ul style="list-style-type: none"> Automatic control of blade is turned OFF. Automatic control of blade does not turn ON even when auto/manual switch is pressed. | | |
| Related information | <ul style="list-style-type: none"> After completion of repair, check if the failure code is cleared by the following procedure. Procedure: Turn the starting switch to ON position. “Cylinder stroke reading abnormal” is displayed in “Slope control key” of control box Device name of “Blade lift cylinder stroke sensor” is displayed on the machine monitor with failure code. It is described as “Stroke and reset sensor for blade lift cylinder” in the table of troubleshooting and other chapter. | | |

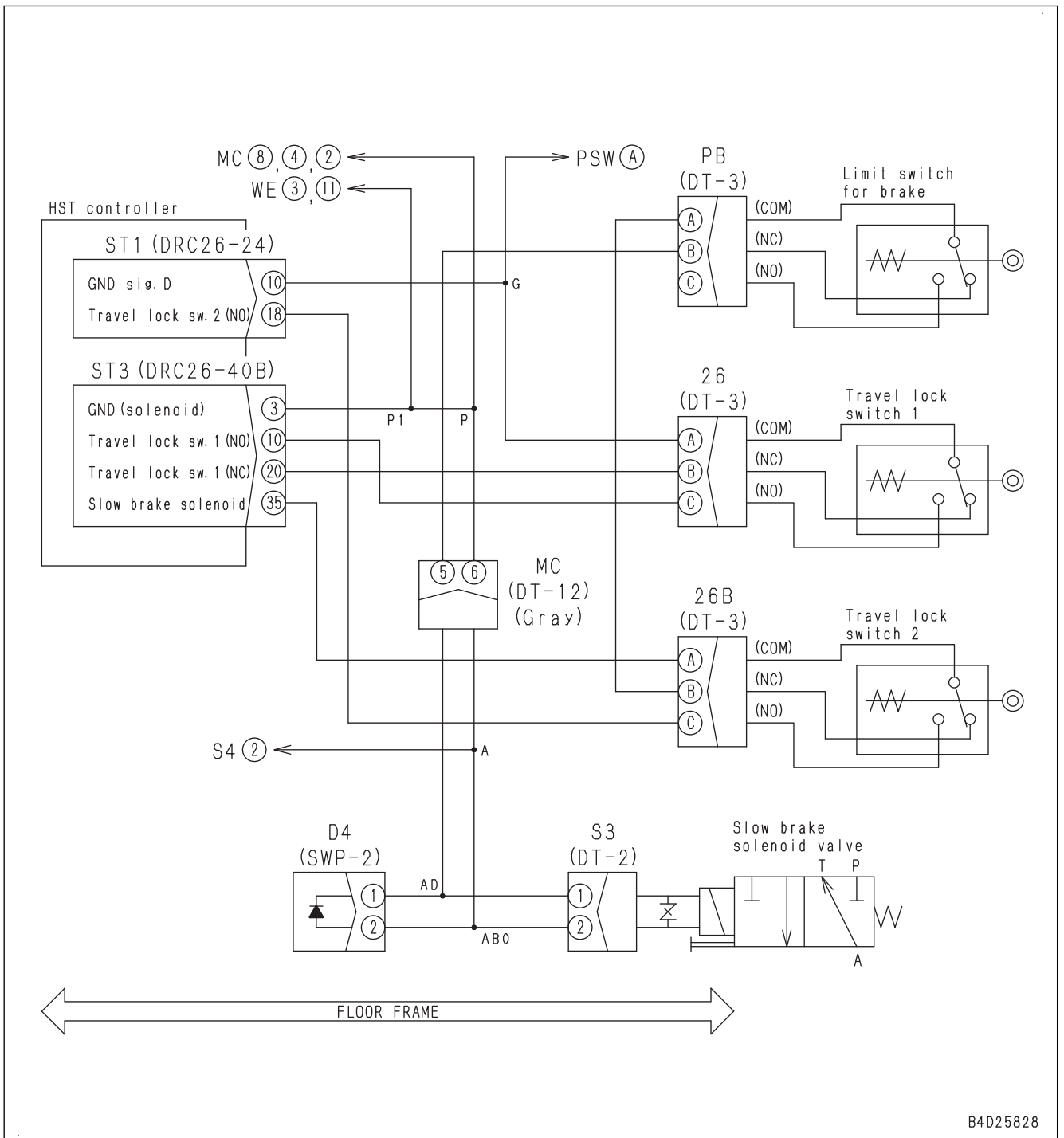
| No. | Cause | Procedure, measuring location, criteria and remarks | | | |
|-----|---|---|---|--------------|--------------|
| 1 | Defective 5 V sensor power supply system | If failure code [DBR5KK] is also displayed, perform troubleshooting for it first. <ol style="list-style-type: none"> Turn the starting switch to OFF position. Disconnect connector CY11, and connect T-adapter to female side. Turn the starting switch to ON position. <p>REMARK</p> If power supply voltage is abnormal, go to check on cause 3 and after. | | | |
| | | Voltage | Between CY11 (female) (3) and (4) | Power supply | 4.5 to 5.5 V |
| 2 | Defective stroke reset sensor for blade lift cylinder (internal open circuit) or ground fault in wiring harness | <ol style="list-style-type: none"> Turn the starting switch to OFF position. Insert T-adapter into connector CY11. Turn the starting switch to ON position. <p>REMARK</p> If power supply voltage is normal and this voltage is abnormal (0.3 V and below), it cannot be determined whether ground fault or defective sensor is the cause. In this case, go to check on cause 4. If no failure is found by check on cause 4, stroke and reset sensor for blade lift cylinder is defective. | | | |
| | | Voltage | Between CY11 (4) and (5) | | 0.3 to 4.7 V |
| 3 | Open circuit in wiring harness (wire breakage or defective contact) | <ol style="list-style-type: none"> Turn the starting switch to OFF position. Disconnect connectors IB1 and CY11, and connect T-adapter to each female side. | | | |
| | | Resistance | If power supply voltage in check on cause 1 is normal, this check is not required. Between IB1 (female) (22) and CY11 (female) (3) | | Max. 1 Ω |
| | | | If power supply voltage in check on cause 1 is normal, this check is not required. Between IB1 (female) (4) and CY11 (female) (4) | | Max. 1 Ω |
| | | | Between IB1 (female) (13) and CY11 (female) (5) | | Max. 1 Ω |

FAILURE CODE [DLM1KB]

| | | | |
|-----------------------|---|---------|---|
| Action level | Failure code | Failure | Left Hydrostatic Transmission Motor Speed Sensor Ground Fault (HST controller system) |
| - | DLM1KB | | |
| Detail of failure | Even if the travel command is issued, no signal is input from the left HST motor speed sensor. | | |
| Action of controller | <ul style="list-style-type: none"> Stops deviation control. Even if cause of failure is eliminated, machine does not become normal until starting switch is turned to OFF position. | | |
| Phenomenon on machine | Machine deviates. | | |
| Related information | <ul style="list-style-type: none"> Input speed and voltage from left HST motor speed sensor can be checked with monitoring function. (Code: 40003), (Code: 40964) After completion of repair, check that the failure code is cleared by the following procedure. Procedure: Start the engine, and operate the joystick (steering, directional and gear shift lever) (forward). If error is not reproduced, sensor is normal. Air bleeding after reassembling or modification is defective. Or, replacement is not required since error may be detected incorrectly due to moving off at low temperature. | | |

| No. | Cause | Procedure, measuring location, criteria and remarks | | | | | | |
|---------|--|---|---|--|---------------|---|--------------|---------------|
| 1 | Defective 5 V sensor power supply system | If failure code [DAJ5KK] is also displayed, perform troubleshooting for it first. | | | | | | |
| | | <ol style="list-style-type: none"> Turn the starting switch to OFF position. Disconnect connector LRS2, and connect T-adapter to female side. Turn the starting switch to ON position. <p>REMARK If power supply voltage is abnormal, go to check on cause 3 and after.</p> <table border="1"> <tr> <td>Voltage</td> <td>Between LRS2 (female) (A) and (B)</td> <td>Power supply</td> <td>4.5 to 5.5 V</td> </tr> </table> | | | Voltage | Between LRS2 (female) (A) and (B) | Power supply | 4.5 to 5.5 V |
| Voltage | Between LRS2 (female) (A) and (B) | Power supply | 4.5 to 5.5 V | | | | | |
| 2 | Open circuit or short circuit in wiring harness | <ol style="list-style-type: none"> Turn the starting switch to OFF position. Disconnect connector ST2, and connect T-adapter to female side. <p>REMARK If resistance value is 1 MΩ and above, wiring harness has an open circuit. If resistance value is 1 Ω and below, wiring harness has a short circuit.</p> <table border="1"> <tr> <td>Resistance</td> <td>Between ST2 (female) (20) and (1)</td> <td></td> <td>Approx. 620 Ω</td> </tr> </table> | | | Resistance | Between ST2 (female) (20) and (1) | | Approx. 620 Ω |
| | | Resistance | Between ST2 (female) (20) and (1) | | Approx. 620 Ω | | | |
| 3 | Ground fault in wiring harness (contact with ground circuit) | <ol style="list-style-type: none"> Turn the starting switch to OFF position. Disconnect connectors ST2 and LRS2, and connect T-adapter to either female side. <table border="1"> <tr> <td>Resistance</td> <td>Between ground and ST2 (female) (20) or LRS2 (female) (C)</td> <td></td> <td>Min. 1 MΩ</td> </tr> </table> | | | Resistance | Between ground and ST2 (female) (20) or LRS2 (female) (C) | | Min. 1 MΩ |
| | | Resistance | Between ground and ST2 (female) (20) or LRS2 (female) (C) | | Min. 1 MΩ | | | |
| 4 | Defective L.H. HST motor speed sensor (internal defect) | If no failure is found by preceding checks, left HST motor speed sensor is defective. | | | | | | |
| 5 | Defective HST controller | If no failure is found by preceding checks, HST controller is defective. (Since this is an internal defect, troubleshooting cannot be performed.) | | | | | | |

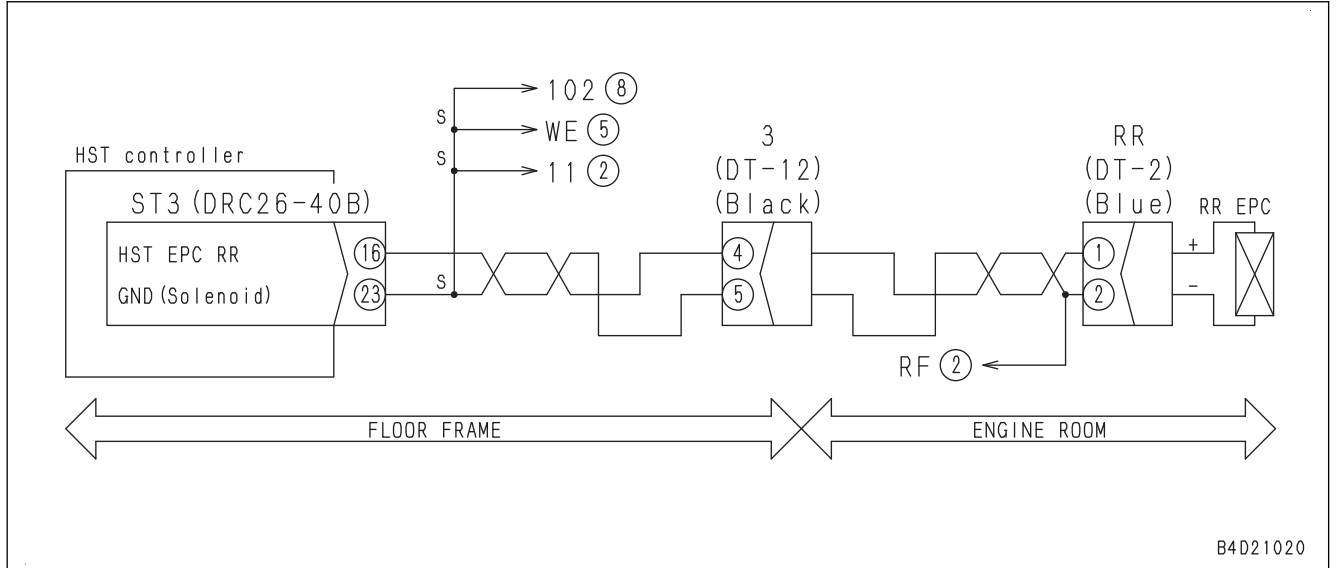
Circuit diagram related to slow brake solenoid



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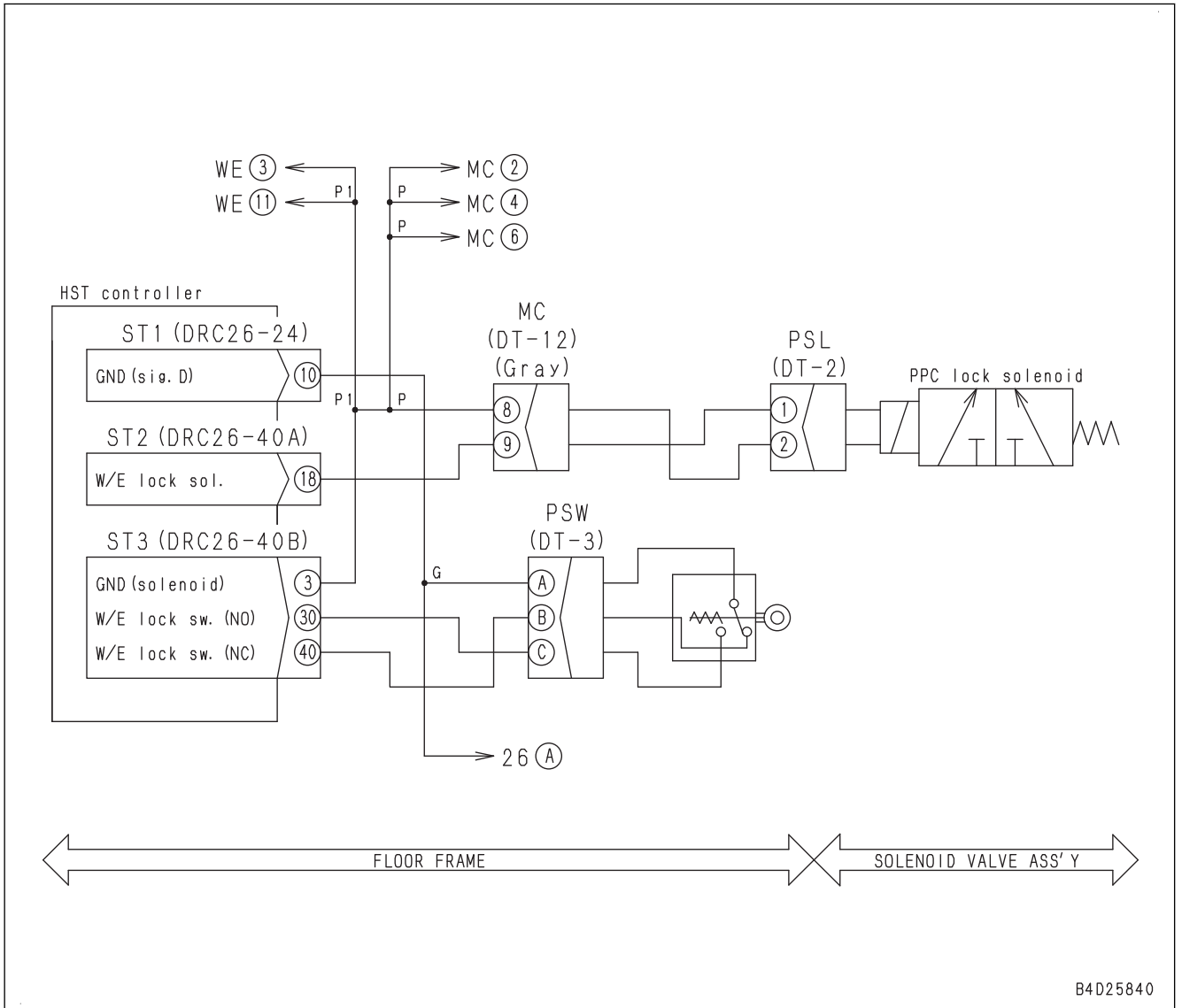
| No. | Cause | Procedure, measuring location, criteria and remarks |
|-----|--------------------------|---|
| 5 | Defective HST controller | If no failure is found by preceding checks, HST controller is defective. (Since this is an internal defect, troubleshooting cannot be performed.) |

Circuit diagram related to right reverse HST pump EPC



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Circuit diagram related to work equipment lock lever solenoid



| No. | Cause | Procedure, measuring location, criteria and remarks | | | | |
|---|---|--|---|--------------------|-----------------|--|
| 20 | Defective starting motor safety relay (internal defect) | 1. Turn the starting switch to OFF position. 2. Insert T-adapter into connector 4. 3. Turn the starting switch to START position, and perform troubleshooting. | | | | |
| | | Voltage | Between starting motor B terminal (T1) and ground | Power supply | 20 to 30 V | |
| | | | Between 4 (1) and ground | Input for starting | 20 to 30 V | |
| | | | Between 4 (2) and ground | Input for charging | Max. 1 V | |
| If power supply and input for starting are normal but starting motor does not rotate, starting motor safety relay is defective. | | | | | | |
| 21 | Defective diode D1 or D2 (internal open circuit or short circuit) | 1. Turn the starting switch to OFF position. 2. Disconnect connectors D1 and D2, and connect T-adapter to each male side. | | | | |
| | | REMARK Measure it with diode range of multimeter. | | | | |
| | | Continuity | Between D1 (male) (1) (+) and (2) (-) | | No continuity | |
| | | | Between D1 (male) (2) (+) and (1) (-) | | Continuity | |
| | | | Between D2 (male) (1) (+) and (2) (-) | | No continuity | |
| Between D2 (male) (2) (+) and (1) (-) | | | Continuity | | | |
| 22 | Open circuit in battery relay harness | 1. Turn the starting switch to OFF position. 2. Disconnect connectors D1, AIS, and KEY, and connect T-adapter to each female side. | | | | |
| | | Resistance | Between KEY (female) (4) and D1 (female) (2) | | Max. 1 Ω | |
| | | | Between D1 (female) (1) and AIS (female) (3) | | Max. 1 Ω | |
| | | | Between AIS (female) (4) and T13 terminal | | Max. 1 Ω | |
| | | 1. Turn the starting switch to OFF position. 2. Turn the starting switch to ON position. | | | | |
| | | REMARK Check how far the 24 V comes and locate open circuit place. | | | | |
| | | Voltage | Between T7 terminal and T9 terminal | | 20 to 30 V | |
| | | | Between T13 terminal and T9 terminal | | 20 to 30 V | |
| Between T8 terminal and T9 terminal | | | 20 to 30 V | | | |
| Between T9 terminal and ground | | | Max. 1 V | | | |

**E-19 MODIFYING SETTING ON CUSTOMIZE SCREEN DOES NOT CHANGE
SETTING OF MACHINE**

| Failure | Modifying setting on customize screen does not change setting of machine. | |
|---------------------|---|--|
| Related information | | |
| No. | Cause | Procedure, measuring location, criteria and remarks |
| 1 | Defective machine monitor | Machine monitor may be defective. (Because this is an internal defect, troubleshooting cannot be performed.) |
| 2 | Defective engine controller or defective HST controller | Engine controller or HST controller may be defective. (Since this is an internal defect, troubleshooting cannot be performed.) |

| No. | Cause | Procedure, measuring location, criteria and remarks | | |
|-----|--|---|---|------------|
| 5 | Defective L.H. and R.H. door wiper intermittent unit (internal open circuit) | 1. Turn the starting switch to OFF position. 2. Disconnect connector CB27. | | |
| | | Resistance | Between CB27 (male) (2) and (8) | Max. 1 Ω |
| | | | Between CB27 (male) (2) and (6) | Min. 1 MΩ |
| | | | Between CB27 (male) (3) and (1) | 1 to 50 MΩ |
| | | Between CB27 (male) (4) and (1) | 1 to 50 MΩ | |
| 6 | Defective left door wiper switch | 1. Turn the starting switch to OFF position. 2. Disconnect connector CB15, and connect T-adapter to male side. 3. Turn left door wiper switch to ON and OFF positions, and perform troubleshooting. | | |
| | | Resistance | Between CB15 (male) (2) and (3) | OFF |
| | ON | | | Max. 1 Ω |
| 7 | Open circuit in wiring harness of intermittent switch power supply | 1. Turn the starting switch to OFF position. 2. Disconnect connector CB11, and connect T-adapter to female side. 3. Remove fuse No.6 in fuse box FUSE (in cab). | | |
| | | Resistance | Between CB11 (female) (4), (5) and FUSE-6 | Max. 1 Ω |
| 8 | Open circuit in wiring harness for continuous operation of wiper intermittent unit | 1. Turn the starting switch to OFF position. 2. Disconnect connectors CB11 and CB15, and connect T-adapter to each female side. REMARK • There are many diodes in internal circuit. Pay attention to tester polarity. • If multimeter does not indicate "OFF" as resistance, it is considered that wiring harness has no open circuit. | | |
| | | Resistance | Between CB11 (female) (3) (+) and CB15 (female) (3) (-) | 1 to 50 MΩ |
| 9 | Open circuit in wiring harness for intermittent operation of wiper intermittent unit | 1. Turn the starting switch to OFF position. 2. Disconnect connectors CB11 and CB15, and connect T-adapter to each female side. REMARK • There are many diodes in internal circuit. Pay attention to tester polarity. • If multimeter does not indicate "OFF" as resistance, it is considered that wiring harness has no open circuit. | | |
| | | Resistance | Between CB11 (female) (6) (+) and CB15 (female) (3) (-) | 1 to 50 MΩ |
| 10 | Open circuit in wiring harness for power supply of wiper intermittent unit | 1. Turn the starting switch to OFF position. 2. Insert T-adapter into connector CB24. 3. Turn the starting switch to ON position. 4. Turn on the L.H. wiper switch. 5. Turn off the intermittent switch. | | |
| | | Voltage | Between CB24 (3) and ground | 20 to 30 V |

E-46 CONTROL BOX DISPLAYS THE MESSAGE [Cylinder Stroke Reading Abnormal]

| | |
|---------------------|--|
| Failure | Control box displays "Cylinder Stroke Reading Abnormal". |
| Related information | <ul style="list-style-type: none"> • Perform troubleshooting outdoors or at a place open to the sky to acquire a sufficient number of satellites. • Before performing troubleshooting, check that "MACHINE SETTING" is performed correctly as specified in the "Machine Setting" section of the Operation and Maintenance Manual. • Perform troubleshooting for following related failure codes displayed on machine monitor. [DKS1KA] Blade Lift Cyl Stroke Sensor A Phase Open and Ground Fault [DKS1KB] Blade Lift Cyl Stroke Sensor A Phase Hot Short [DKS2KA] Blade Lift Cyl Stroke Sensor B Phase Open and Ground Fault [DKS2KB] Blade Lift Cyl Stroke Sensor B Phase Hot Short [DKS0L8] Blade Lift Cyl Stroke Sensor Mismatch Error [DKS5KA] Blade Tilt Cyl Stroke Sensor A Phase Open and Ground Fault [DKS5KB] Blade Tilt Cyl Stroke Sensor A Phase Hot Short [DKS6KA] Blade Tilt Cyl Stroke Sensor B Phase Open and Ground Fault [DKS6KB] Blade Tilt Cyl Stroke Sensor B Phase Hot Short [DKS4L8] Blade Tilt Cyl Stroke Sensor Mismatch Error [DKSDKA] Angle Left Cyl Stroke Sensor A Phase Open and Ground Fault [DKSDKB] Angle Left Cyl Stroke Sensor A Phase Hot Short [DKSEKA] Angle Left Cyl Stroke Sensor B Phase Open and Ground Fault [DKSEKB] Angle Left Cyl Stroke Sensor B Phase Hot Short [DKSCL8] Angle Left Cyl Stroke Sensor Mismatch Error [DKS3KA] Blade Lift Cyl Stroke Reset Sensor Open and Ground Fault [DKS3KB] Blade Lift Cyl Stroke Reset Sensor Hot Short [DBR5KK] ICT Con 5V Sensor 0 Power Out of Normal Range <p>NOTICE Message display location "Cylinder Stroke Reading Abnormal" (red): Slope Control Key</p> |

| No. | Cause | Procedure, measuring location, criteria and remarks |
|-----|--------------------------|--|
| 1 | Defective sensor circuit | Perform troubleshooting for preceding failure codes. |

E-74 BLADE TILT ANGLE DOES NOT COINCIDE WITH DESIGN SURFACE

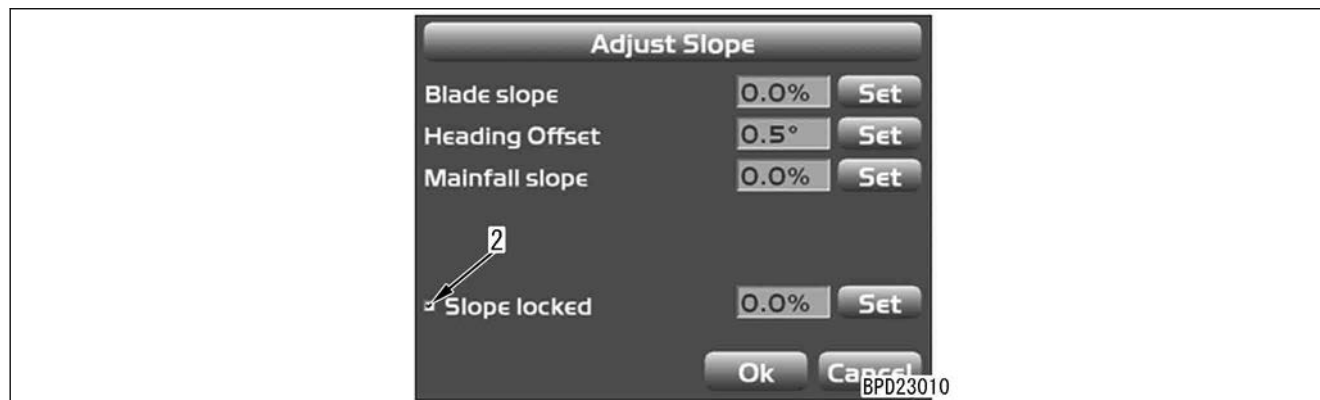
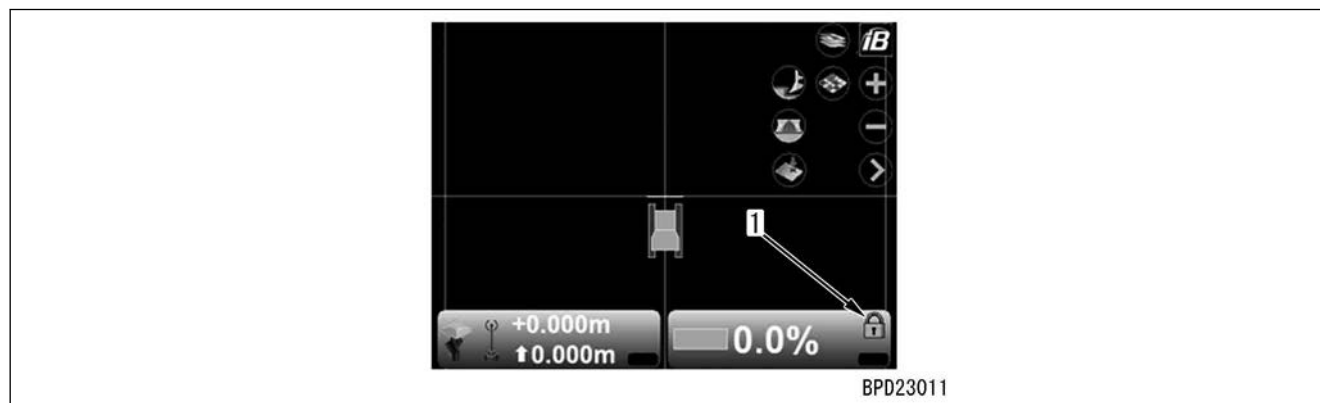
| | |
|---------------------|--|
| Failure | Blade tilt angle does not match with design surface during blade automatic control. |
| Related information | <ul style="list-style-type: none"> Perform troubleshooting outdoors or at a place open to the sky to acquire a sufficient number of satellites. Before performing troubleshooting, check that a request of cylinder stroke end resetting is not displayed on the control box screen. |

| No. | Cause | Procedure, measuring location, criteria and remarks |
|-----|---|--|
| 1 | "Slope locked" is enabled | <ol style="list-style-type: none"> Set the work equipment lock lever to LOCK position. Blade is fixed at a certain tilting angle by "Slope locked" function. When key icon (1) is displayed next to "Slope Control Key" on the control box screen, "Slope locked" is activated. Press "Slope Control Key" and clear check (2) of "Slope locked" at bottom of "Adjust Slope" screen, and then "Slope locked" is canceled. |
| 2 | Setting of blade control to be "Automatic best-fit" (whole blade) | <ol style="list-style-type: none"> On the control box screen, press "iB Logo Key" → "Control..." → "Blade control...", and then dialog screen of "Blade control..." is displayed. If check mark (3) is displayed next to "Automatic best-fit (whole blade)", blade tilting angle will not match with design surface when blade (4) position is lapped over a corner of design surface (5). |

When slope locked is enabled

When key icon (1) is displayed next to "Slope Control Key" on the control box screen, "Slope locked" is activated.

Press "Slope Control Key" and clear check (2) of "Slope locked" at bottom of "Adjust Slope" screen, and then "Slope locked" is canceled.



H-10 UNUSUAL NOISE IS HEARD FROM AROUND HST PUMP OR MOTOR

| | |
|---------------------|--|
| Failure | Unusual noise is heard from around HST pump or motor |
| Related information | <ul style="list-style-type: none"> • Check that the oil level in hydraulic tank is correct. • If any failure code is displayed, perform troubleshooting for that failure code first. ([6091NX]) • Charge circuit pressure (brake pressure) can be checked with monitoring mode as well. (Monitoring code: 91902 "Brake Pressure") |

| No. | Cause | Procedure, measuring location, criteria and remarks | | | |
|-----|--|--|---|-----------------------|---|
| 1 | Use of wrong oil | Collect the oil and analyze it to check if the wrong oil is used. (Check if the oil is recommended grade and brand.) | | | |
| 2 | Clogging of charge pump suction strainer | Check strainer for clogging. | | | |
| 3 | Air sucked in suction circuit | Check suction pipe of charge pump for looseness and crack, etc. | | | |
| 4 | Loosened piping between HST pump and HST motor | Check piping for looseness and crack, etc. | | | |
| 5 | Clogged charge filter | Check if charge filter is clogged. Clogging state of charge filter can be checked with monitoring function. (Monitoring code: 40912 "HST Oil Filter Clogging Sensor") | | | |
| 6 | Defective adjustment or malfunction of oil cooler bypass valve (charge safety valve) | Be ready with engine stopped, set the machine monitor to "Control Brake Release Mode" by adjustment menu with engine at high idle, and then perform troubleshooting. | | | |
| | | HST charge circuit pressure | Joystick (steering, directional and gear shift lever) | When it is in neutral | 3.23 ± 0.29 MPa {33 ± 3 kg/cm ² } |
| | | If oil pressure cannot be adjusted to normal level, charge safety valve of oil cooler bypass valve may be defective. Check spring for deterioration and valve for sticking. | | | |
| 7 | Defective adjustment or malfunction of L.H. HST motor (charge relief valve) | Be ready with engine stopped, set the machine monitor to Code 91902: "Brake Pressure" by monitoring function with engine at high idle, and then perform troubleshooting by traveling. | | | |
| | | HST charge circuit pressure | Joystick (steering, directional and gear shift lever) | In FORWARD or REVERSE | 3.04 ± 0.49 MPa {31 ± 5 kg/cm ² } |
| | | If oil pressure cannot be adjusted to normal level, charge relief valve of L.H. HST motor may malfunction or has internal defect. Check spring for deterioration and valve seat for defect. | | | |

S-8 ENGINE LACKS POWER

| | |
|---------------------|--|
| Failure | Engine lacks power. |
| Related information | If any failure code is displayed, perform troubleshooting for that code first. |

| No. | Cause | Point to check, remarks | Remedy |
|-----|--|--|--|
| 1 | Fuel level is low. | If fuel tank is checked, it is empty. | Refueling |
| 2 | Clogging fuel tank cap air bleeding hole | Fuel tank cap air bleeding hole is clogged. | Flush air breather hole in fuel tank cap surrounding area. |
| 3 | Clogged fuel filter element | Check used hours of fuel filter element. If it is used over specified time, fuel filter element may be clogged. | Fuel filter element replacement |
| 4 | Foreign materials are mixed into fuel. | If drain fuel from fuel tank, rust or water comes out. | Fuel replacement |
| 5 | Air mixed in fuel piping system | When performing bleeding air from the fuel system, air comes out. (For details, see Testing and adjusting, "Bleeding air from fuel system"). | <ul style="list-style-type: none"> Perform air bleeding operation Correct or replace fuel piping |
| 6 | Leakage from fuel piping system | Fuel leaks from fuel piping. (For details, see Testing and adjusting, "Test fuel circuit for leakage"). | Correct or replace fuel piping related parts |
| 7 | Fuel leakage at Injector and inlet connector | Return rate from injector is high. (See TESTING AND ADJUSTING, "METHOD FOR TESTING FUEL DISCHARGE, RETURN AND LEAKAGE") | Tighten or replace inlet connector |
| 8 | Defective supply pump | See Testing and adjusting, "Testing fuel discharge rate, return rate, and leakage" | Supply pump and pressure limiter replacement |
| 9 | Clogged air cleaner element | Air cleaner dust indicator is at caution level. | Air cleaner element check and cleaning |
| 10 | Defective air cleaner | Check air cleaner and rectifying wire net for deformation. | Air cleaner repair or replacement |
| 11 | Defective air intake hose (air cleaner to VGT inlet) | Visually check for damages of air intake hose. | Air intake hose replacement |
| 12 | Defective air intake manifold | Check for internal damages of air intake manifold. | Air intake manifold replacement |
| 13 | Defective boost piping and connection (between VGT outlet and intake manifold) | Air comes out of boost piping. | Boost piping repair or replacement |
| 14 | Defective installation of charge pressure sensor | Air leakage through mounting portion of charge pressure sensor | Repair installation of charge pressure sensor |
| 15 | Defective exhaust pipe (between exhaust manifold and KDPF inlet) | Check exhaust pipes for damage and exhaust gas leakage (Check heat insulation cover and soot on heat insulation plate) | Exhaust piping replacement |
| 16 | Gas leakage from EGR piping | Gas leaking from EGR piping. | Replace EGR piping |

ABBREVIATION LIST

- This list of abbreviations includes the abbreviations used in the text of the shop manual for parts, components, and functions whose meaning is not immediately clear. The spelling is given in full with an outline of the meaning.
- Abbreviations that are used in general society may not be included.
- Special abbreviations which appear infrequently are noted in the text.
- This list of abbreviations consists of two parts. The first part is a list of the abbreviations used in the text of the manual, and the second part is a list of the abbreviations used in the circuit diagrams.

List of abbreviations used in the text

| Abbreviation | Actual word spelled out | Purpose of use (major applicable machine (*1), or component/system) | Explanation |
|--------------|--|---|--|
| ABS | Antilock Brake System | Travel and brake (HD, HM) | This is a function that releases the brake when the tires skid (tires are not rotated). This function applies the brake again when the tires rotate. |
| AISS | Automatic Idling Setting System | Engine | This is a function that automatically sets the idle speed. |
| AJSS | Advanced Joystick Steering System | Steering (WA) | This is a function that performs the steering operations with a lever instead of using a steering wheel. This function performs gear shifting and changing forward and reverse direction. |
| ARAC | Automatic Retarder Accelerator Control | Travel and brake (HD, HM) | This is a function that automatically operates the retarder with a constant braking force when letting go of the accelerator pedal on the downhill. |
| ARSC | Automatic Retarder Speed Control | Travel and brake (HD, HM) | This is a function that automatically operates the retarder to ensure that the machine speed does not accelerate above the speed set by the operator when letting go of the accelerator pedal on the downhill. |
| ASR | Automatic Spin Regulator | Travel and brake (HD, HM) | This is a function that drives both wheels automatically using the optimum braking force when the tire on one side spins on the soft ground surfaces. |
| ATT | Attachment | Work equipment | A function or component that can be added to the standard specification. |
| BCV | Brake cooling oil control valve | BRAKE (HD) | This is a valve that bypasses a part of the brake cooling oil to reduce the load applied to the hydraulic pump when the retarder is not being used. |
| CAN | Controller Area Network | Communication and electronic control | This is one of communication standards that are used in the network on the machine. |
| CDR | Crankcase Depression Regulator | Engine | This is a regulator valve that is installed to KCCV ventilator. It is written as CDR valve and is not used independently. |
| CLSS | Closed-center Load Sensing System | Hydraulic system | This is a system that can actuate multiple actuators simultaneously regardless of the load (provides better combined operation than OLSS). |

| Symbol | Part No. | Part name | Necessity | Q'ty | New/Redesign | Sketch | Remarks |
|--------|------------------------|---------------------|-----------|------|--------------|--------|--|
| H | 1 | 790-720-1000 | Expander | ■ | 1 | | Assembly of piston assembly |
| | 2 | 796-720-1670 | Ring | ■ | 1 | | |
| | 3 | 07281-01279 | Clamp | ■ | 1 | | |
| J | Commercially available | Digital angle gauge | ■ | 1 | | | For measurement of sensor mounting angle |

Tools for removal and installation of stroke sensing blade angle cylinder assembly

| Symbol | Part No. | Part name | Necessity | Q'ty | New/Redesign | Sketch | Remarks |
|--------|------------------------|------------------------------|-----------|------|--------------|--------|---|
| A | Commercially available | Lifting tool (webbing sling) | ■ | 1 | | | Removal and installation of blade angle cylinder assembly |

Disassembly and assembly of stroke sensing blade angle cylinder assembly

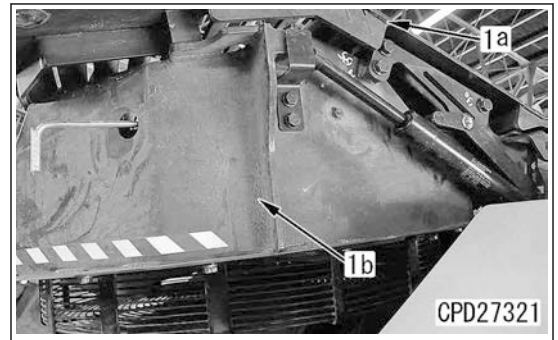
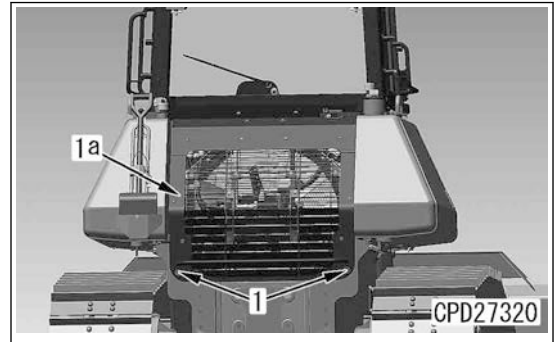
| Symbol | Part No. | Part name | Necessity | Q'ty | New/Redesign | Sketch | Remarks |
|--------|------------------------|-----------------|-----------|------|--------------|--------|--|
| A | 790-502-1003 | Repair stand | ■ | 1 | | | Disassembly and assembly of stroke sensing blade angle cylinder assembly |
| | 790-101-1102 | Pump assembly | ■ | 1 | | | Disassembly and assembly of stroke sensing blade angle cylinder assembly |
| B | 790-330-1100 | Wrench assembly | ■ | 1 | | | Removal and installation of head assembly |
| C | Commercially available | Rubber hammer | ● | 1 | | | Removal of stroke sensor assembly |
| D | Commercially available | Spatula | ● | 1 | | | Removal of stroke sensor assembly |
| E | 790-102-1330 | Socket | ■ | 1 | | | Removal and installation of nut |
| F | 790-201-1500 | Push tool kit | ■ | 1 | | | Press-fit of dust seal |
| | 790-201-1610 | • Plate | | 1 | | | |
| | 790-101-5021 | • Grip | | 1 | | | |
| | 01010-50816 | • Bolt | | 1 | | | |
| G | 790-201-1702 | Push tool kit | ■ | 1 | | | Press-fit of bushing |
| | 790-201-1791 | • Push tool | | 1 | | | |
| | 790-101-5021 | • Grip | | 1 | | | |
| | 01010-50816 | • Bolt | | 1 | | | |

Fuel supply valve

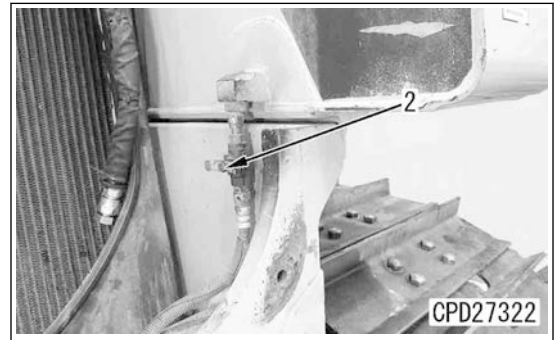
2. Remove the bolts (1) (2 pieces), open the cooling fan drive assembly (1b) upward together with the cooling fan guard (1a).

REMARK

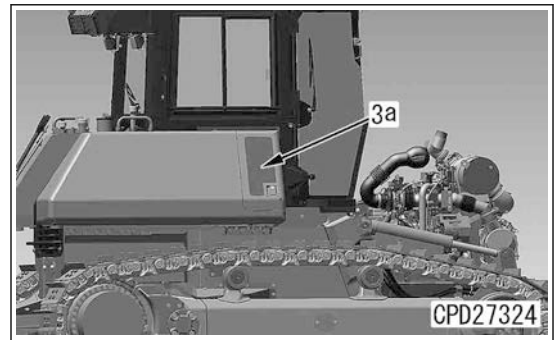
Be sure to check that the lock is engaged.



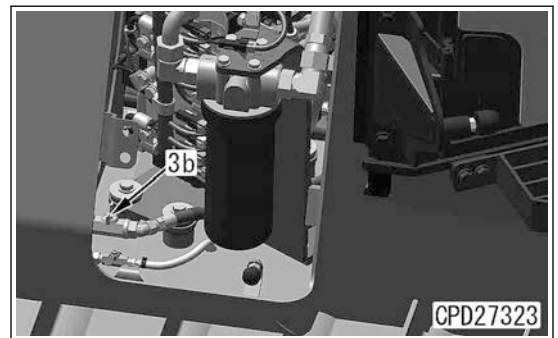
3. Close the fuel supply valve (2).



4. Open the cover (3a) on the right side of the machine.



5. Close the fuel supply valve (3b).



Injector assembly

- When replacing the injector assembly (96) with a new one, be sure to replace the inlet connector (94) with a new one as well.

REMARK


Check that the injector sleeve (104) is free from scratches, or dusts, etc.

- Install O-ring (106) and the gasket (107) to the injector (105).

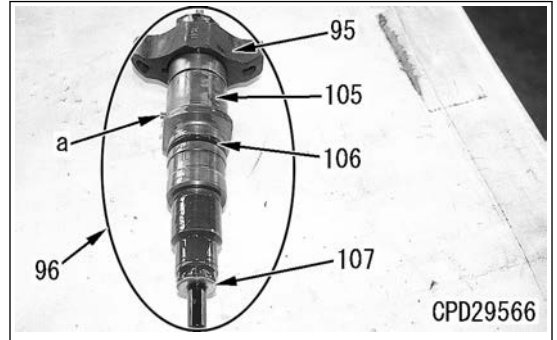
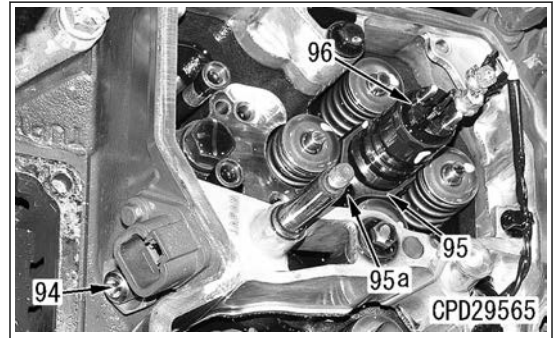
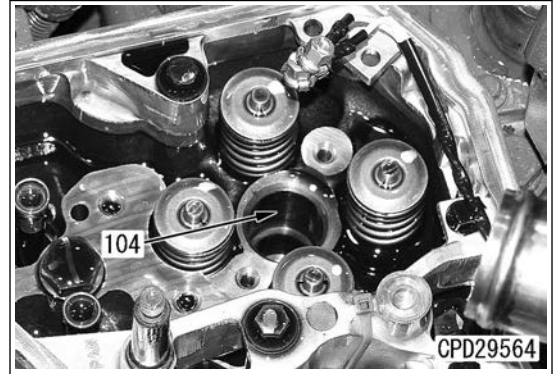
REMARK

Replace O-ring (106) and the gasket (107) with the new ones.

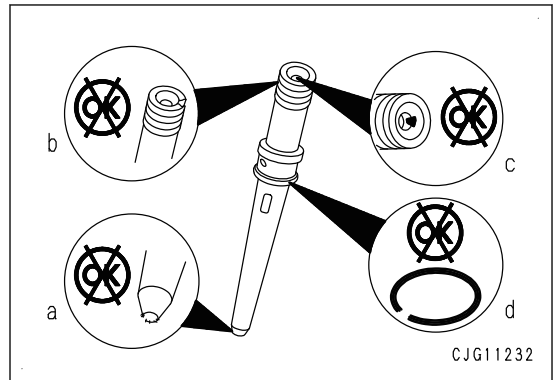
- Apply engine oil to O-ring (106) of the injector (105) and the cylinder head side.

 O-ring (106) and inner surface of the injector sleeve (104):
Engine oil (EO15W-40)

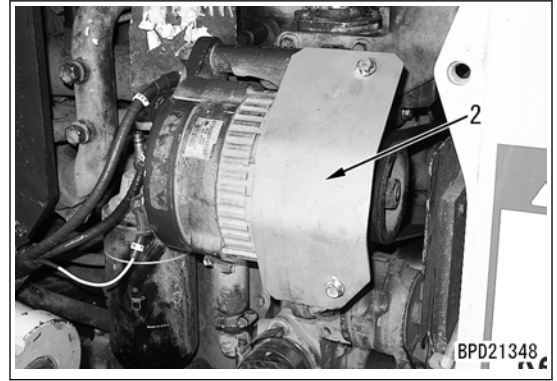
- While aligning convex and concave shapes of (a) part, install the holder (95) to the injector (105).
- Direct the fuel inlet hole of the injector assembly (96) toward the air intake manifold, and install it to the cylinder head.
- Tighten the holder mounting bolt (95a) by 3 to 4 turns.
- Check the inlet connector on the following points. If any abnormality is found, replace it.



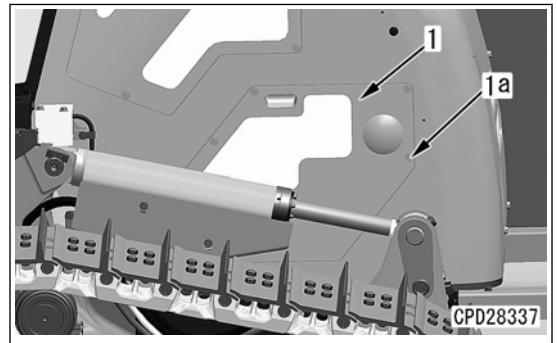
- When burrs or wear are found on front end part (a) or rear end part (b) of the inlet connector
- When foreign materials are attached to the edge filter at rear end part (c) of the inlet connector
- When cracks or deterioration are found on the O-ring of the inlet connector upper part (d)



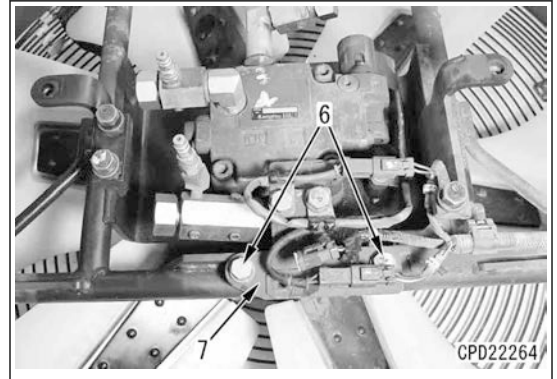
5. Install the cover (2).



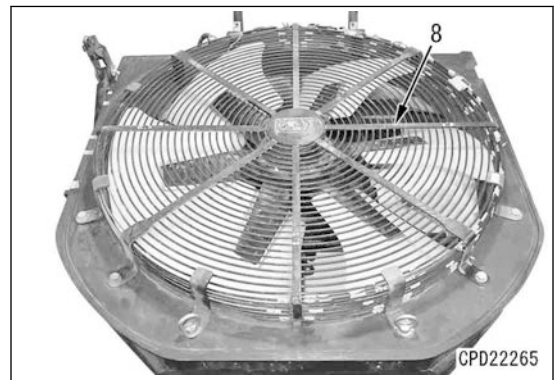
6. Install the cover (1) on the right side of the machine with bolts (1a) (4 pieces).



6. Remove the bolts (6) (2 pieces), and remove the bracket (7).
7. Invert the cooling fan drive assembly.

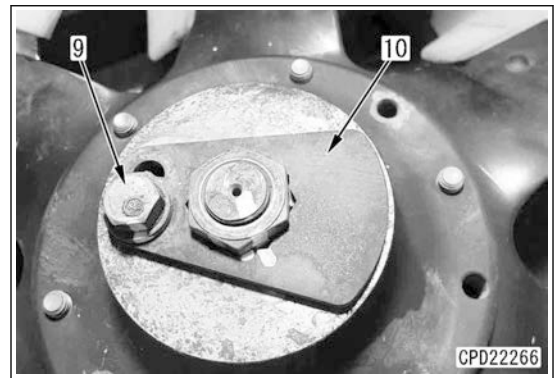


8. Remove cooling fan net (8).



Fan

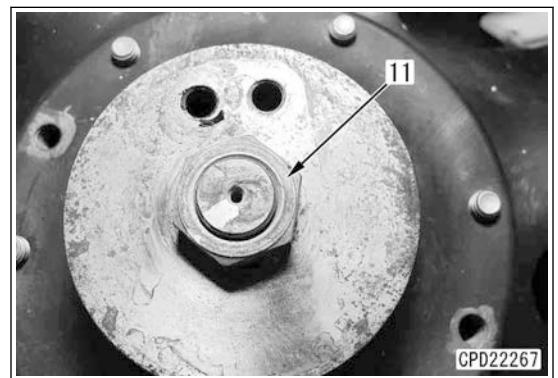
9. Remove the bolt (9), and remove the lock plate (10).



10. Loosen nut (11).

REMARK

Turn the nut (11) by 2 or 3 threads to prevent the cooling fan from flying out.



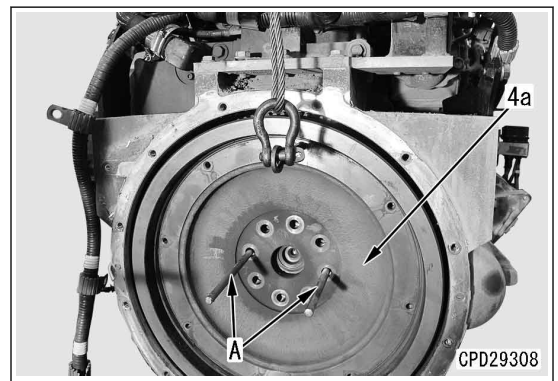
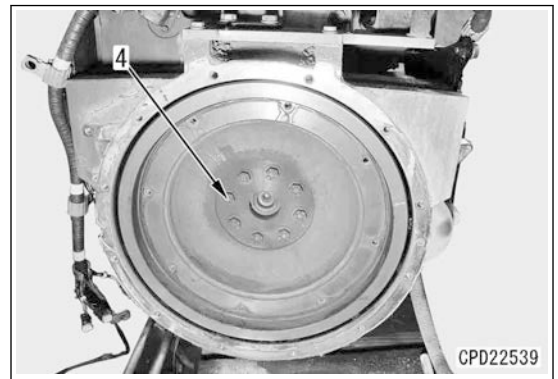
Flywheel assembly

4. Sling the flywheel assembly (4a), and hold it.
5. Remove the bolts (4) (8 pieces), and set the guide bolts (A) (2 pieces) to the bolt holes.
6. Pull out the flywheel assembly (4a) by using the guide bolts (A) (2 pieces).
7. Sling the flywheel assembly (4a), and remove it.



Flywheel assembly (4a):

35 kg



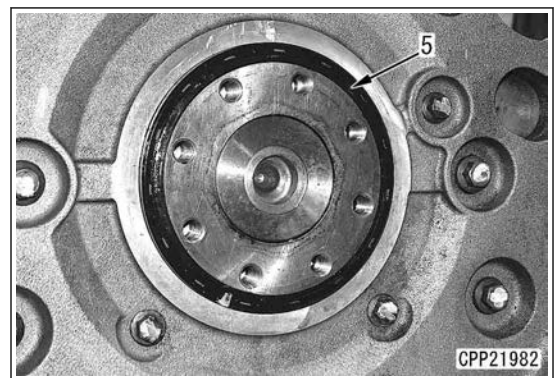
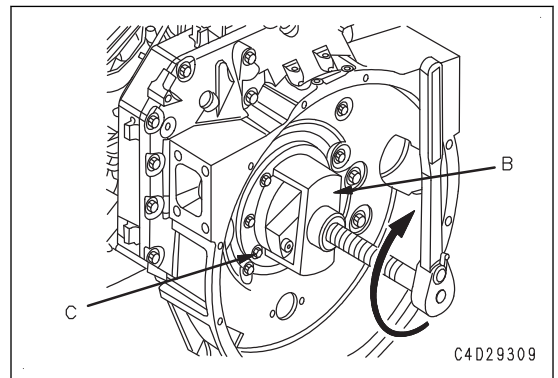
Engine rear oil seal

8. Install the seal puller (B) to the crankshaft.

REMARK

Take care not to scratch the oil seal contact surfaces of the crankshaft.

9. Screw in the tapping screw (C) to the seal carrier part of engine rear oil seal (5).
10. Turn the handle clockwise, and remove the rear oil seal (5).



7. Remove the plug (for 3/8 inch of hose diameter) (E), the plug (for 5/16 inch of hose diameter) (H), and the cap kit (F) for AdBlue/DEF pump.

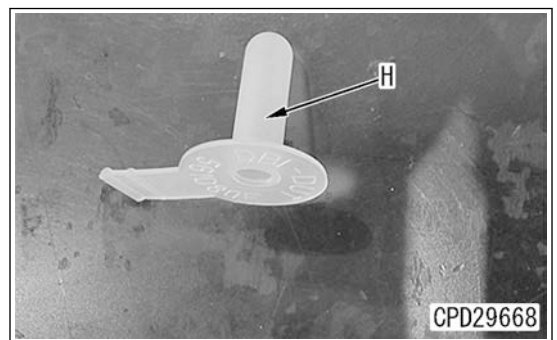
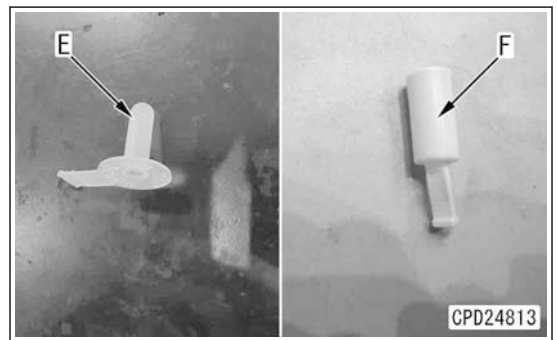
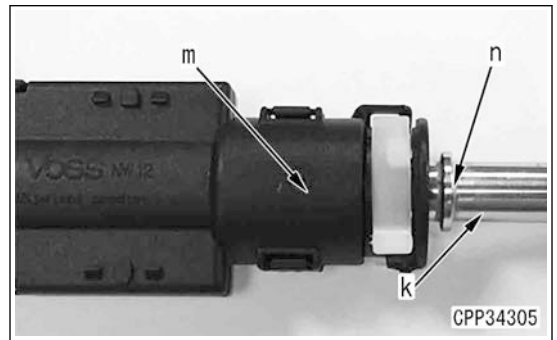
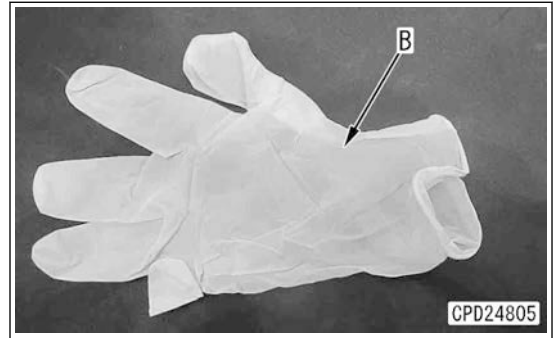
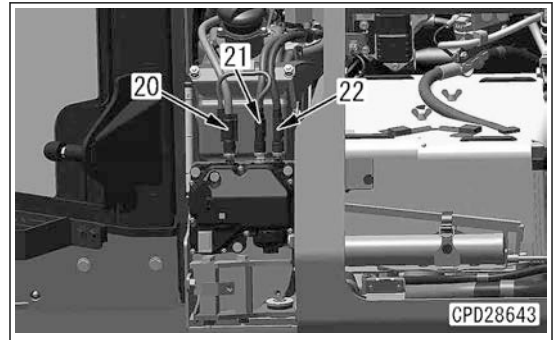
NOTICE

When handling AdBlue/DEF, be sure to use the vinyl gloves (B).

REMARK

- Clean the connecting portions of AdBlue/DEF hoses and the pin of AdBlue/DEF injector thoroughly, and check that there are no dust and damage on them.
- Insert the connector (m) of AdBlue/DEF hose into the pin (k) on the injector side until click sound is heard to install it. (Connect AdBlue/DEF hose on the opposite side to the joint side.)
- When it is inserted so that the convex part (n) of the pin (k) passes the convex part inside of the clip, it can be locked by the clip.

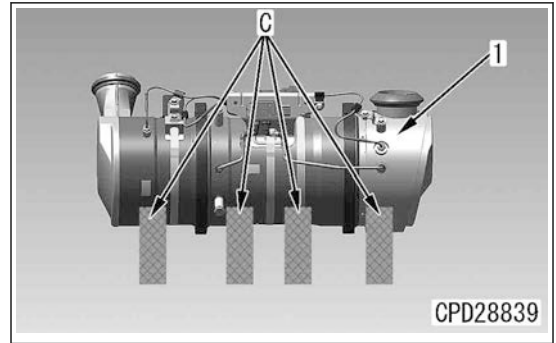
8. Connect AdBlue/DEF hoses (20), (21), and (22).



- Securely fix KDPF assembly (1) by using the blocks (C) (4 places).

REMARK

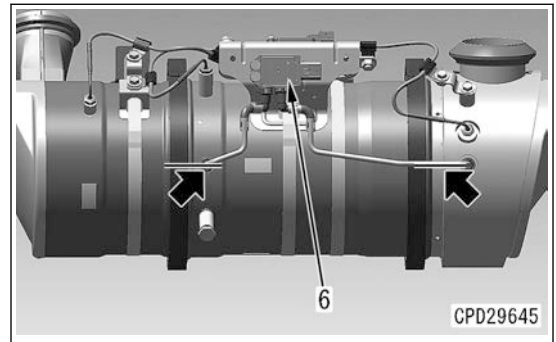
- Place the blocks (C) at positions where they do not touch the pipes and installed bands.
- Place cloths on the supporting portions of blocks (C) to prevent KDPF assembly (1) from being damaged.



- Put matchmarks to align outlet and inlet angle when assembling.

NOTICE

- Put matchmarks on V-clamp and the bodies on the inlet and outlet sides, while aligning with the installing position of the pipe for differential pressure sensor (6).
- These marks are required to facilitate the angle adjustment of KDPF inlet and outlet flanges securely when assembling.



Temperature sensor

- Disconnect the connectors (2a), (3a), and (4a) of KDOC inlet temperature sensor (2), KDOC outlet temperature sensor (3), and KDPF outlet temperature sensor (4) from the sensor table (5).

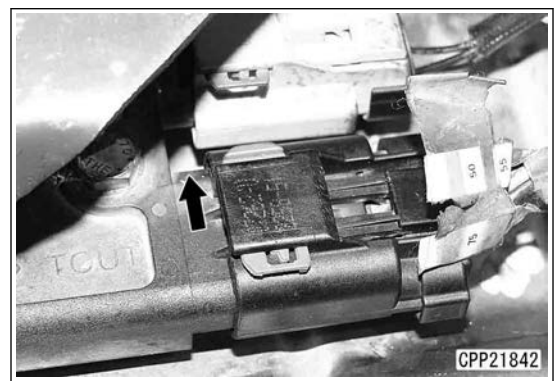
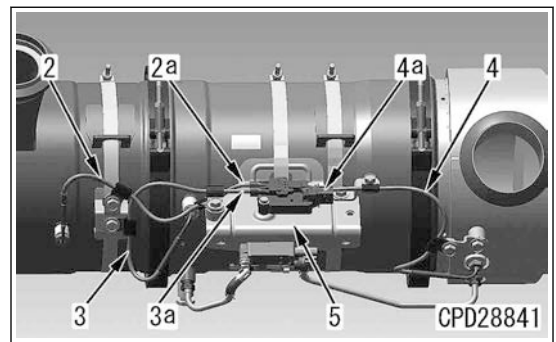
REMARK

Remove all the clamps attached to KDOC inlet temperature sensor (2), KDOC outlet temperature sensor (3), and KDPF outlet temperature sensor (4).

REMARK

Disconnect the connector according to the following procedure.

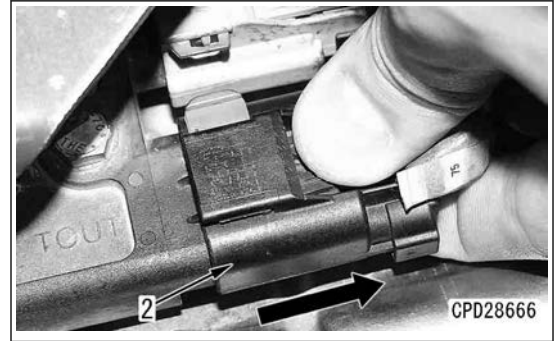
- Slide the connector lever in the direction of the arrow to unlock it.



3. While pressing the knob of connector P57 (2), pull out the connector in the direction of the arrow.

REMARK

Connector P57 (2): Crankcase pressure sensor



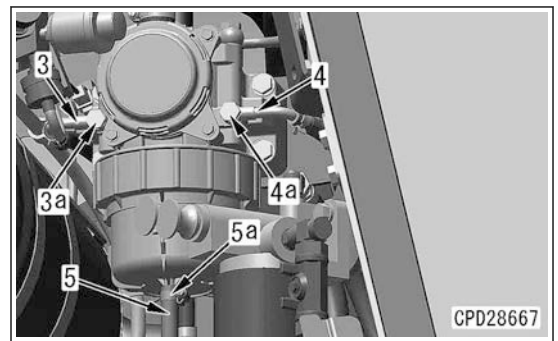
Hose

4. Remove the joint bolts (3a) and (4a), and disconnect the coolant hoses (3) and (4).

REMARK

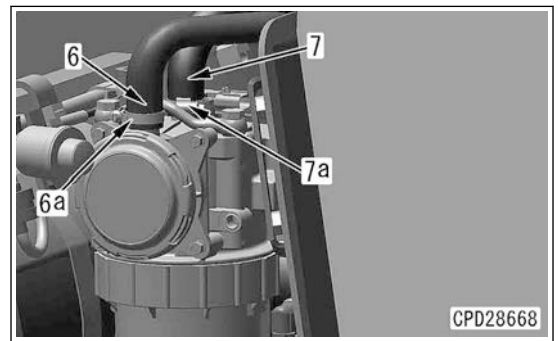
Prepare oil container under the piping.

5. Loosen the clamp (5a), and disconnect the oil drain hose (5).



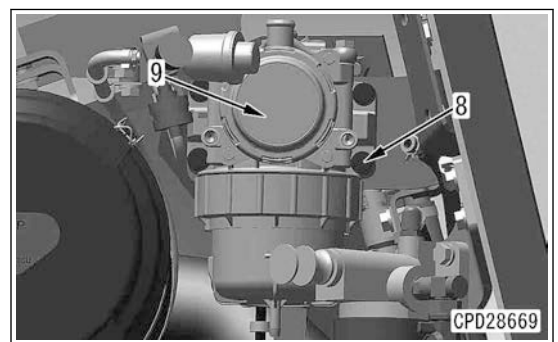
6. Loosen the clamp (6a), and disconnect the blowby gas outlet hose (6).

7. Loosen the clamp (7a), and disconnect the blowby gas inlet hose (7).

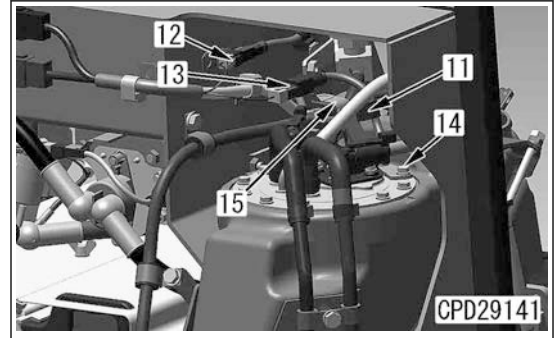


KCCV assembly

8. Remove the bolts (8) (4 pieces), and remove KCCV assembly (9).



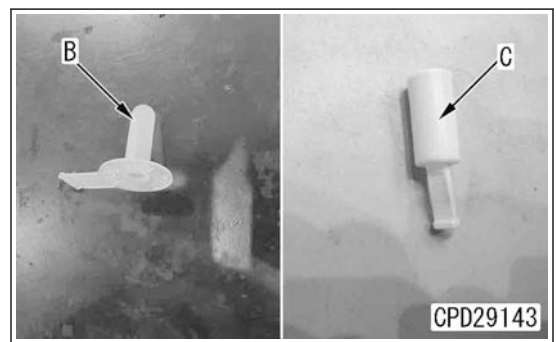
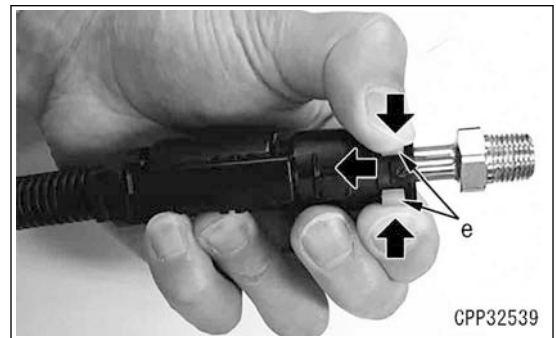
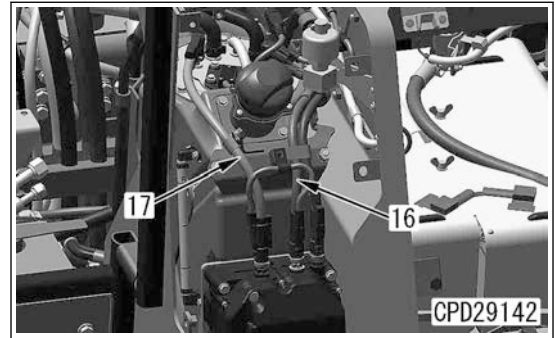
8. Remove the clip (11), and disconnect the connectors (12) and (13).
9. Remove the bolts (14) (2 pieces), and remove the bracket (15).



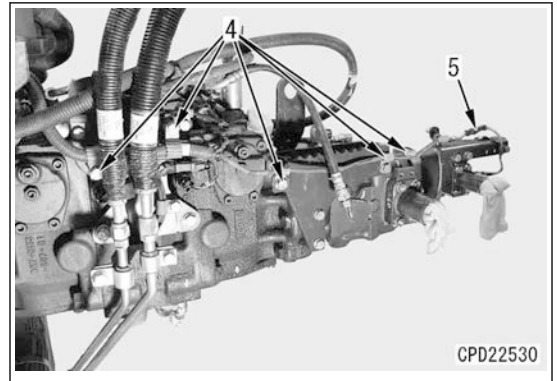
10. Remove AdBlue/DEF hoses (16) and (17).

NOTICE

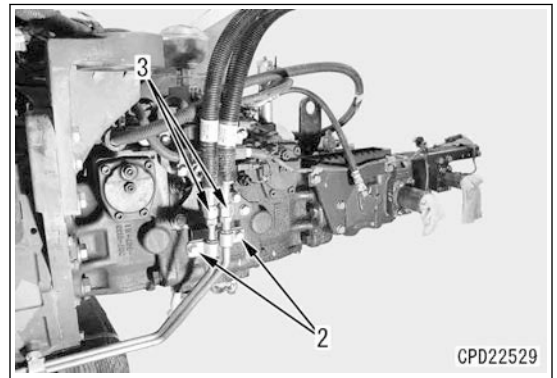
- Before removing AdBlue/DEF hoses, wash the connecting portions with clean tap water to remove the sticking materials.
- Pinch protruding portions (e) of the clip with your fingers, and the lock is unlocked. While they are kept pinched, pull out AdBlue/DEF hose in the opposite direction to that of the AdBlue/DEF tank side.
- After disconnecting AdBlue/DEF hose, install the plug (for 3/8 inch of hose diameter) (B) on the hose side, and install the cap kit (C) for AdBlue/DEF pump on the nipple side to prevent leakage.
- Cover the connecting portion with a clean plastic sheet, etc. to prevent entering of dusts or sticking of AdBlue/DEF.



3. Install the clamps (4) (5 pieces) and (4a) (2 pieces).



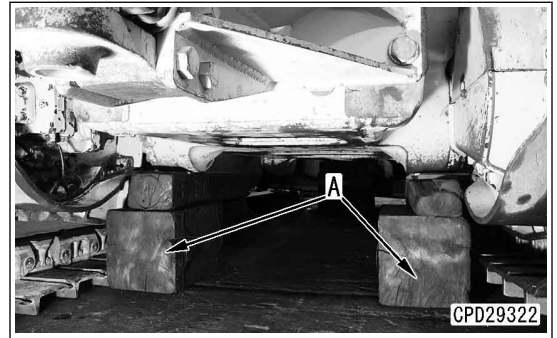
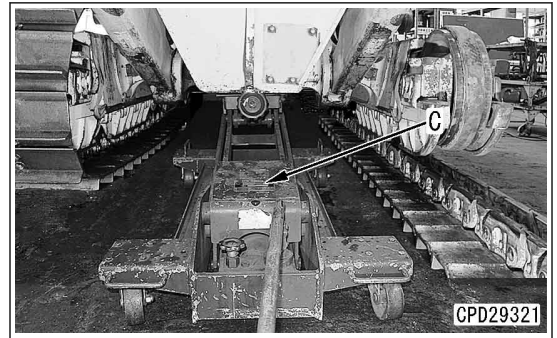
4. Connect the tubes (3) (2 pieces) to HST pump, and install the clamps (2) (2 pieces).



Engine and HST pump assembly

5. Install the engine and HST pump assembly. For details, see "REMOVE AND INSTALL ENGINE AND HST PUMP ASSEMBLY".

16. Lift up the machine by using the jack (C) from the front and rear of the frame, and remove the front and rear blocks (A).



Track shoe assembly

17. Install the track shoe assembly. For details, see “SEPARATION AND CONNECTION OF TRACK ASSEMBLY”.

Refilling hydraulic tank with oil

18. Refill the hydraulic tank with Komatsu genuine oil to the specified level through the oil filler port. Start the engine to circulate the oil through the piping, and check the oil level again.

Air bleeding

19. Bleed air from HST circuit. For details, see TESTING AND ADJUSTING, “BLEED AIR FROM HYDRAULIC CIRCUIT”.

REMOVE AND INSTALL CARRIER ROLLER ASSEMBLY

Tools for removal and installation of carrier roller assembly

| Symbol | Part No. | Part name | Necessity | Q'ty | New/Redesign | Sketch | Remarks |
|--------|------------------------|----------------|-----------|------|--------------|--------|---|
| A | Commercially available | Hydraulic jack | • | 2 | | | Removal and installation of carrier roller assembly |

⚠ Place the machine on a level ground, and lower the work equipment to the ground in a stable posture.

⚠ Set the work equipment lock lever to LOCK position.

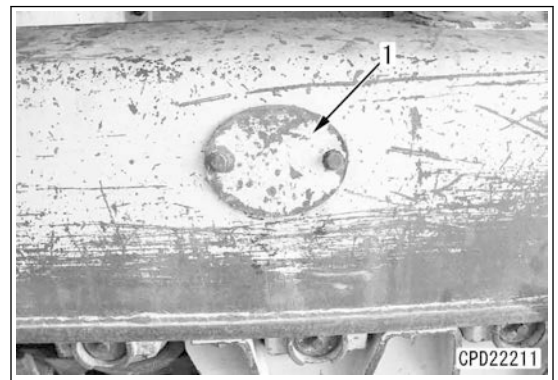
⚠ Turn the starting switch to OFF position to stop the engine.

⚠ Turn the battery disconnect switch to OFF position, and remove the key. (For details, see TESTING AND ADJUSTING, "HANDLE BATTERY DISCONNECT SWITCH".)

METHOD FOR REMOVING CARRIER ROLLER ASSEMBLY

Track shoe assembly

1. Remove the plate (1).



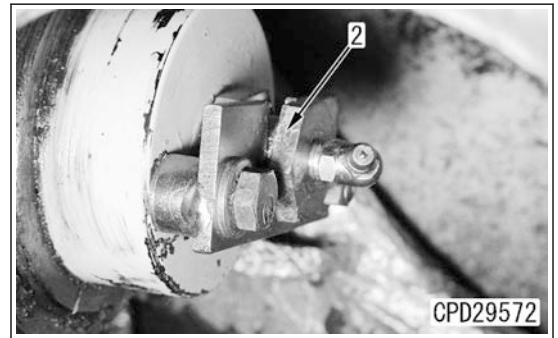
2. Loosen the lubricator (2), and decrease the track tension.

NOTICE

Do not loosen the lubricator (2) by more than 1 turn.

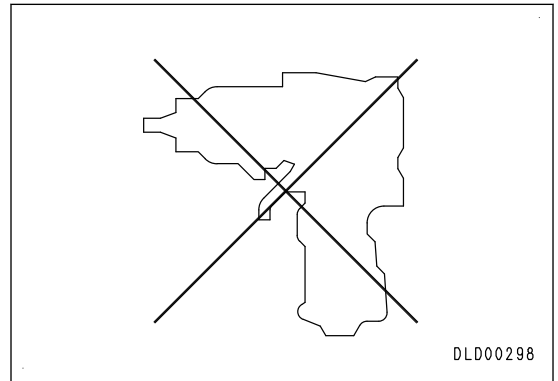
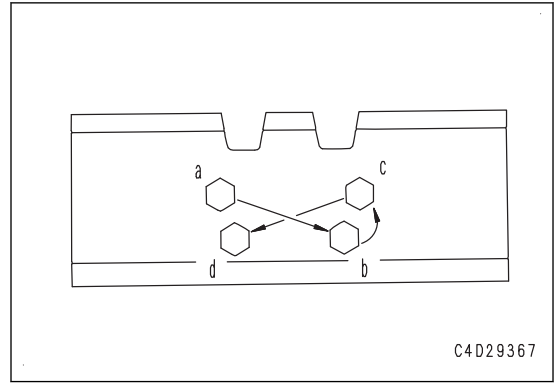
REMARK

If the tension of the track shoe assembly is not decreased even by loosening the lubricator (2), move the machine backward and forward.



REMARK

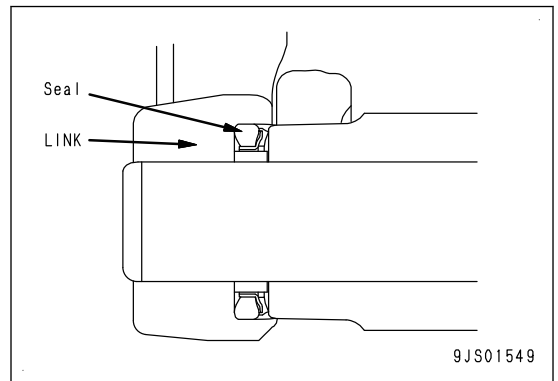
- Tighten the shoe bolts in the order of (a) to (d) shown in the figure.
- Do not use an impact wrench for installing the master link.



Rebuilding the link assembly for grease lubricated track

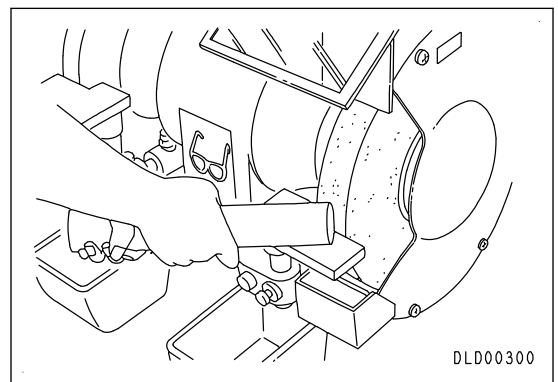
Preparation

1. Do not remove the seal (F5 type seal) to be reused from the link, and do not clean it.



2. Smoothly chamfer the end surface corner by using a grinder when reusing the pin.

⚠ Be sure to wear the protective eyeglasses always when using the grinder.

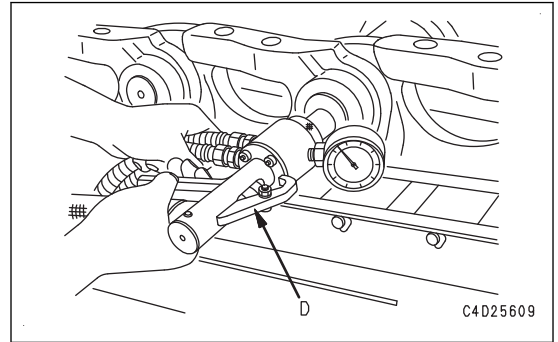


Sealing oil

30. Refill with oil (GO80W90) through the small plug hole of the pin by using the lubricator (D).

REMARK

- If the oil refilling pressure is raised excessively, it negatively affects the seal.
- Considering the thermal expansion of oil, be careful not to refill with oil excessively.

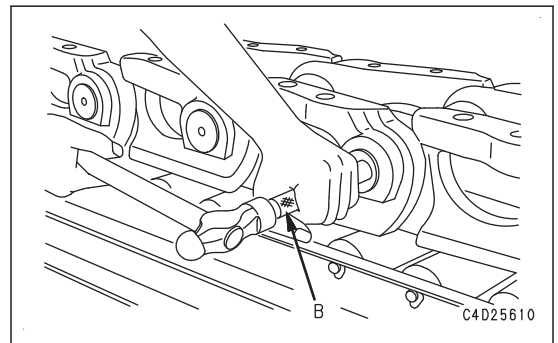


31. Drive in the smaller plug quickly up to the following specified position by using the plug push tool (B).

REMARK

Apply oil (GO80W90) to the outer periphery of the small plug.

Driving-in depth from end surface: 2.5 ± 1 mm

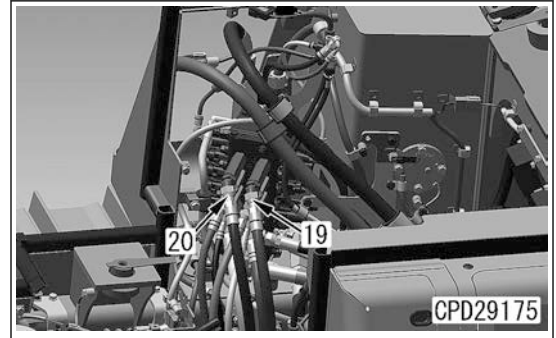


12. Disconnect the hoses (19) and (20).

REMARK

Plug the disconnected hoses and fitting to prevent oil from flowing out.

- Hose (19): Ripper bottom
- Hose (20): Ripper top

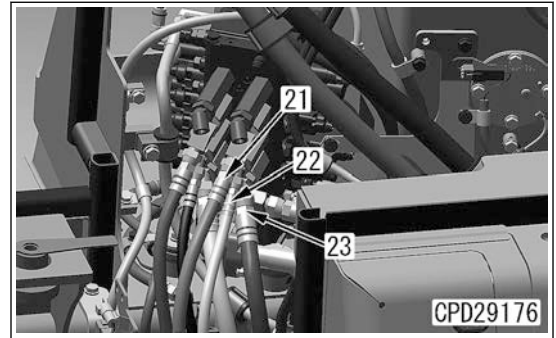


13. Disconnect the hoses (21), (22) and (23).

REMARK

Plug the disconnected hose and fitting to prevent oil from flowing out.

- Hose (21): Angle right
- Hose (22): Tilt right
- Hose (23): Ripper top

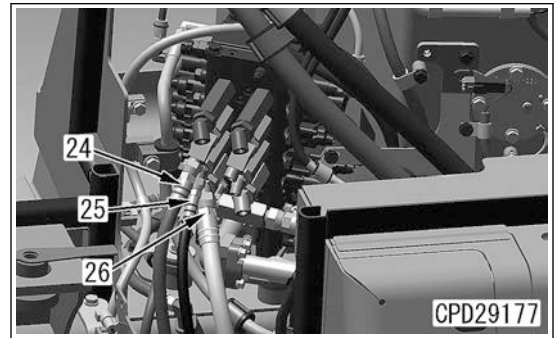


14. Disconnect the hoses (24), (25) and (26).

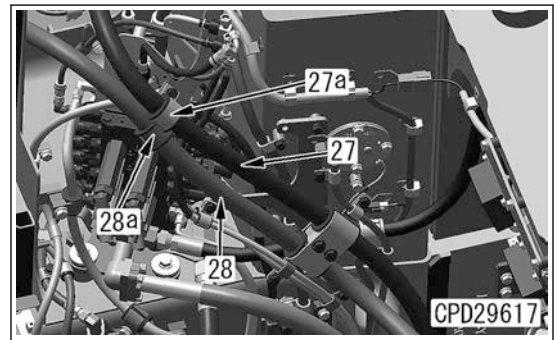
REMARK

Plug the disconnected hose and fitting to prevent oil from flowing out.

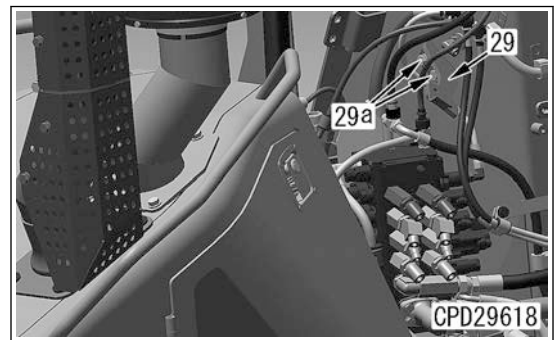
- Hose (24): Angle left
- Hose (25): Tilt left
- Hose (26): Ripper bottom



15. Remove the clamps (27a) and (28a).
 16. Move the hoses (27) and (28) so that they do not hinder the work.

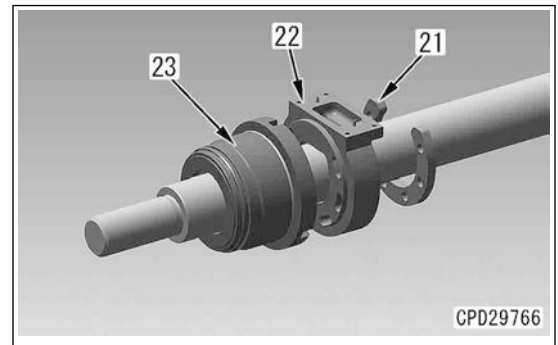


17. Remove the bolts (29a) (2 pieces), and remove the bracket (29).

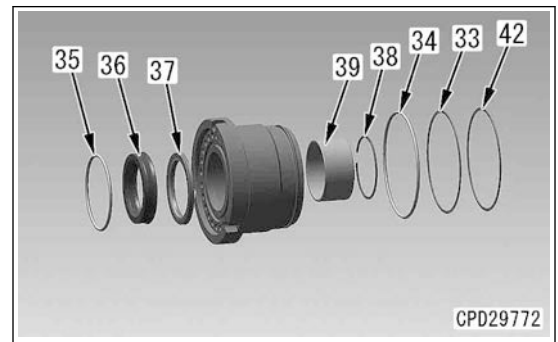


Cylinder head assembly

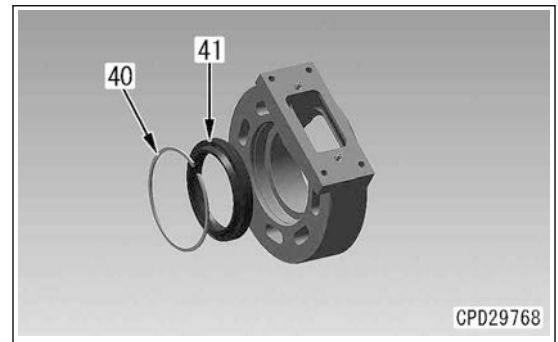
15. Remove the cylinder head assembly (23).
16. Remove the housing assembly (22).
17. Remove the plate (21).

**Disassembly of cylinder head assembly**

18. Remove O-rings (35), (34), (42), and the backup ring (33).
19. Remove the rod packing (36).
20. Remove the buffer ring (37).
21. Remove the snap ring (38), and remove the bushing (39).

**Disassembly of housing assembly**

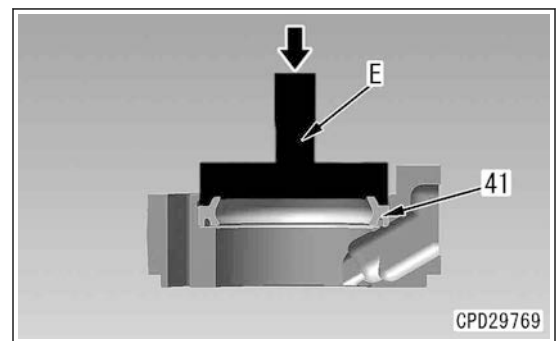
22. Remove the snap ring (40).
23. Remove the dust seal (41).

**METHOD FOR ASSEMBLING STROKE SENSING BLADE LIFT CYLINDER ASSEMBLY****REMARK**

Apply engine oil to the sliding surfaces of each part (for details, see "TABLE OF FUEL, COOLANT, AND LUBRICANTS"), and be careful not to damage the rod packings, the dust seals, and O-rings when assembling.

Assembly of housing assembly

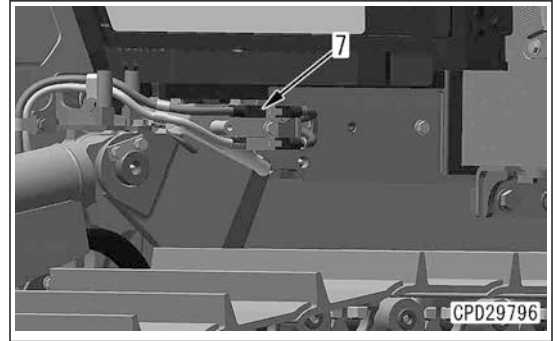
1. Press fit the dust seal (41) by using the push tool (E).



8. Connect the connector CY11 (7).

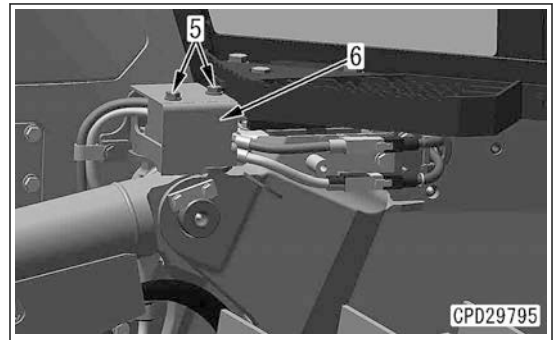
NOTICE

Check that the connector is free from dusts, and then connect it.

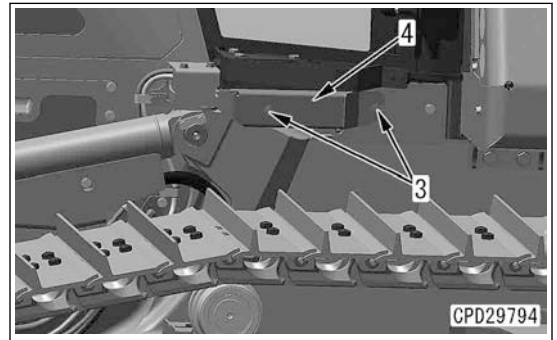


Cover

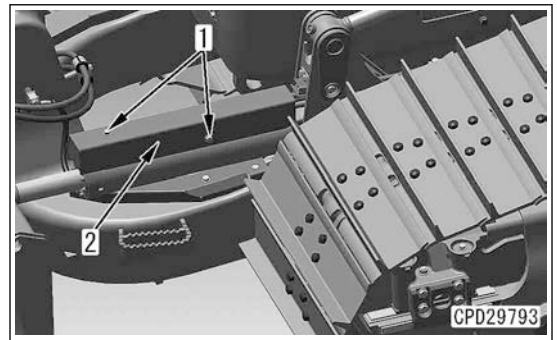
9. Install the cover (6) with the bolts (5) (2 pieces).



10. Install the cover (4) with the bolts (3) (2 pieces).



11. Install the cover (2) with the bolts (1) (2 pieces).

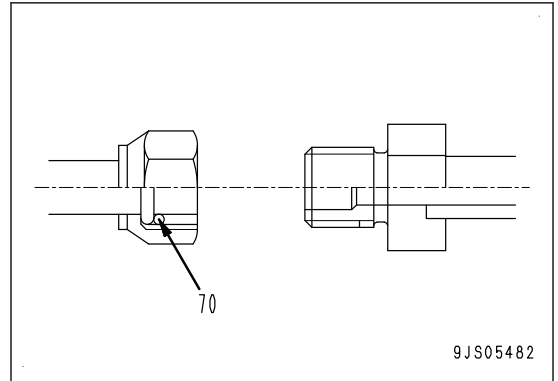


Greasing

12. After completion of installation, securely grease the removed and installed mounting pins.

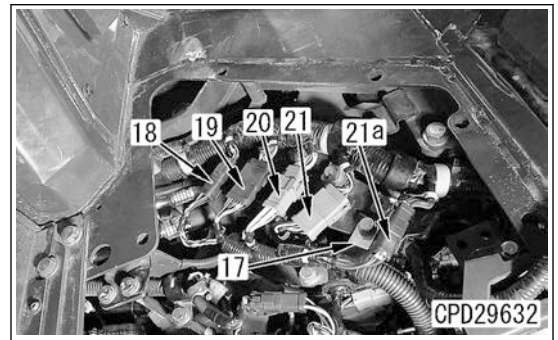
- When installing the air conditioner hoses, check that O-rings (70) are fitted to each of the fittings.
- Check that O-rings (70) are not damaged or deteriorated.
- When connecting the refrigerant pipes, apply compressor oil for new refrigerant (R134a) (SANDEN: SP-20 PAG oil) to O-rings (70).

31. Install the bracket (22) with the bolts (22a) (2 pieces).



32. Connect the following connectors, and install the clamp (17).

- Connector EG7 (21a)
- Connector 104 (21)
- Connector 2 (20)
- Connector 3 (19)
- Connector 5 (18)

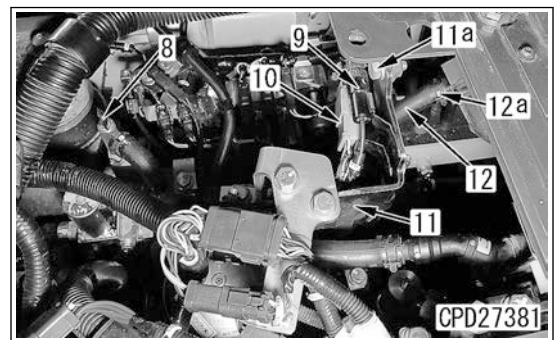
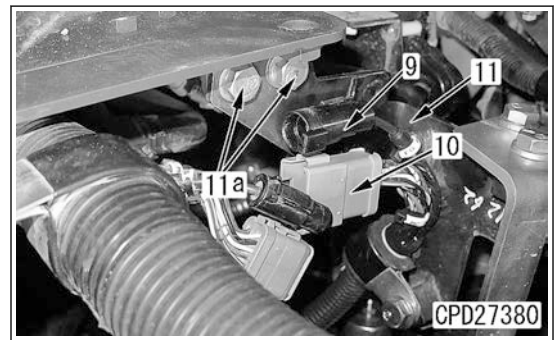


33. Connect the heater inlet hose (12), and install the clamp (12a).

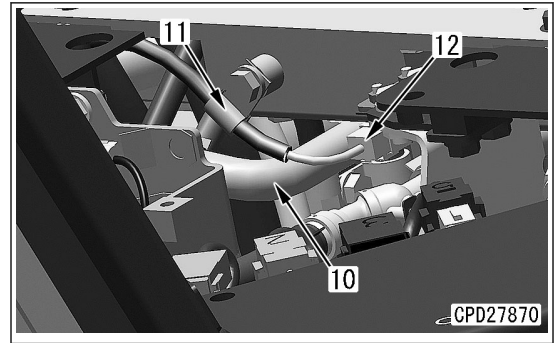
34. Install the bracket (11) with the bolts (11a) (2 pieces).

35. Connect the connectors MC (10) and FG (9).

36. Open the valve (8) of the heater inlet.




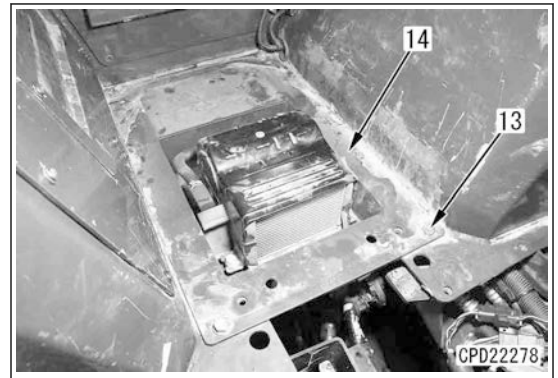
10. Disconnect the heater inlet hose (10).
11. Remove the clamp (11), and disconnect the connector 92 (12).



Foot heater assembly

12. Remove the bolts (13) (4 pieces), and remove the foot heater assembly (14).


 Foot heater assembly (14):
25 kg

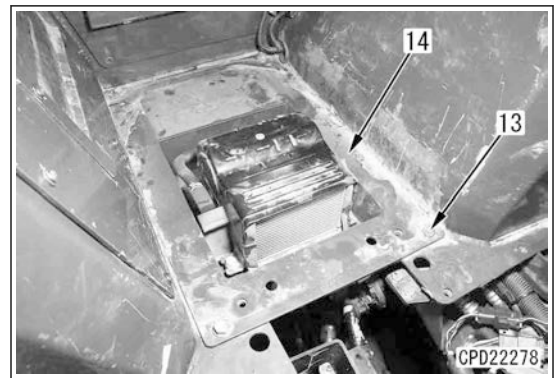


METHOD FOR INSTALLING FOOT HEATER ASSEMBLY

Foot heater assembly

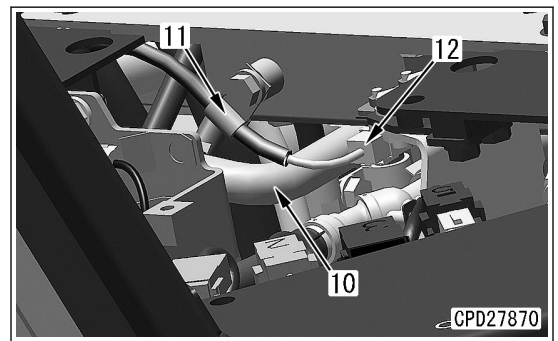
1. Install the foot heater assembly (14) with the bolts (13) (4 pieces).

 Foot heater assembly (14):
25 kg



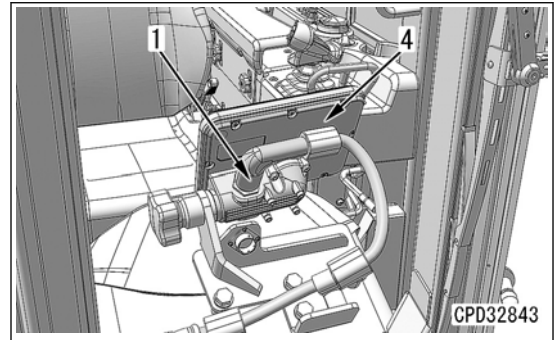
Hose, connector

2. Connect the connector 92 (12), and install it with the clamp (11).
3. Connect the heater inlet hose (10).

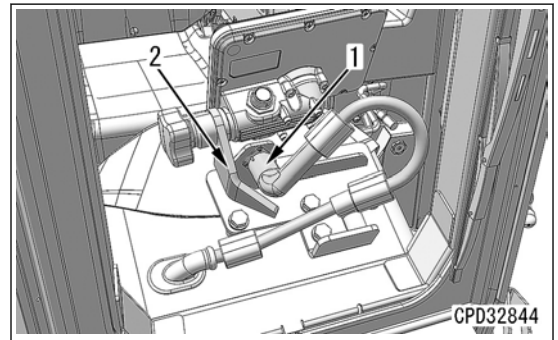


METHOD FOR REMOVING CONTROL BOX (FOR NEW CONTROL BOX)**Wiring harness connector**

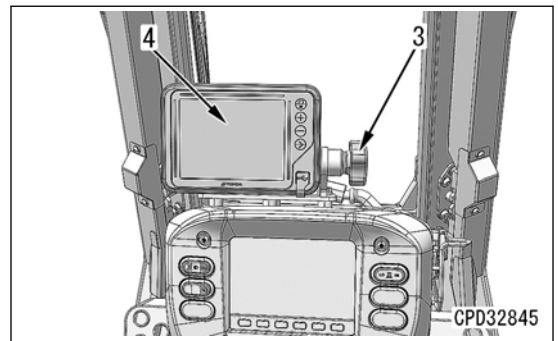
1. Disconnect the harness connector MONI (1) from the control box (4).



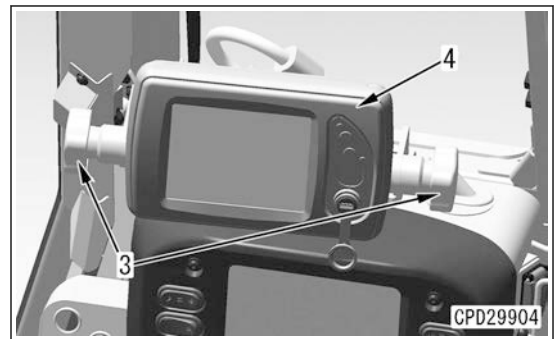
2. Connect the disconnected wiring harness connector MONI (1) to the monitor bracket (2) to prevent dusts, etc. from sticking inside of the connector.

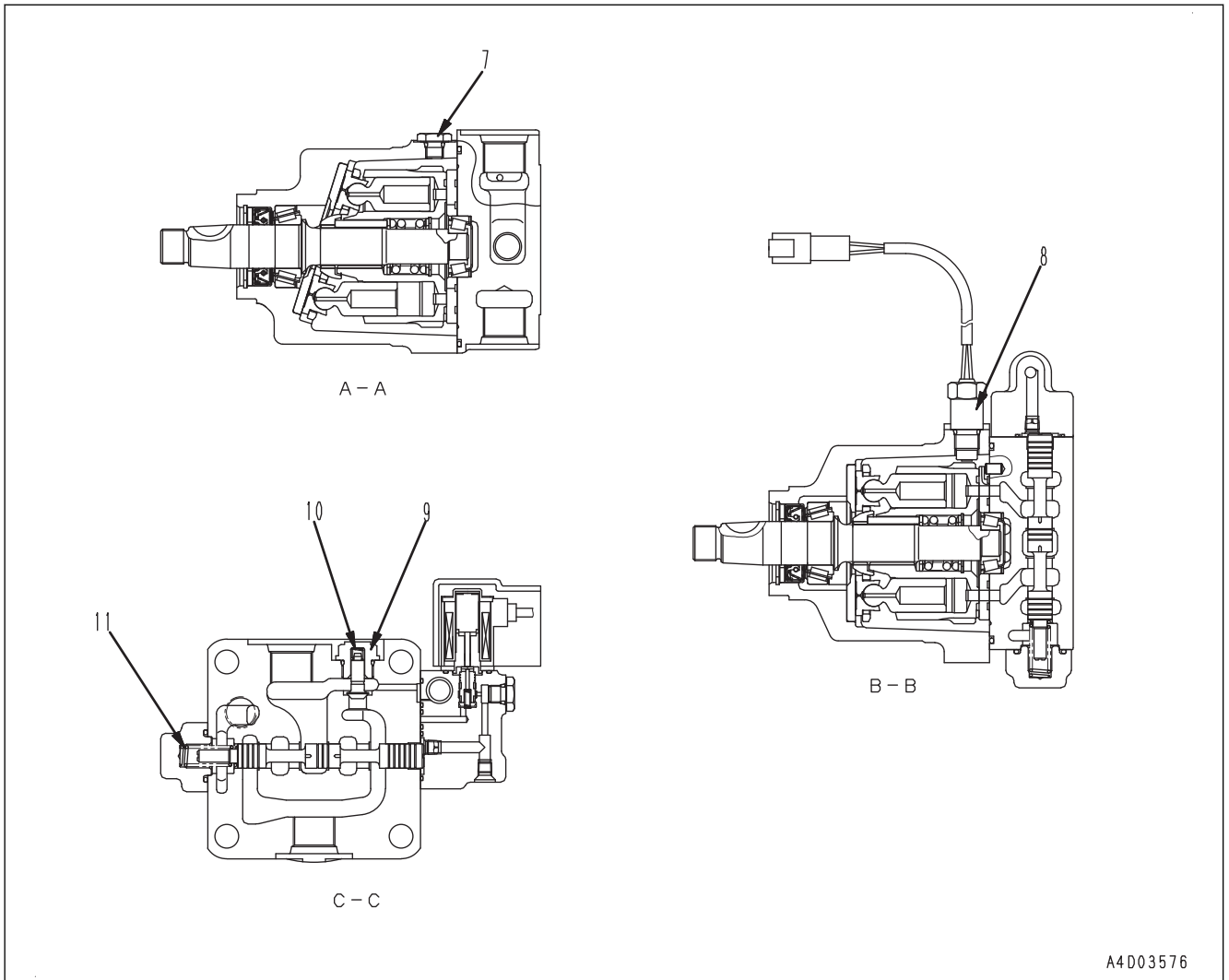
**Control box**

3. Loosen the knob (3), and remove the control box (4).

**METHOD FOR INSTALLING CONTROL BOX (FOR OLD CONTROL BOX)****Control box**

1. Install the control box (4) with the knobs (3) (2 places).



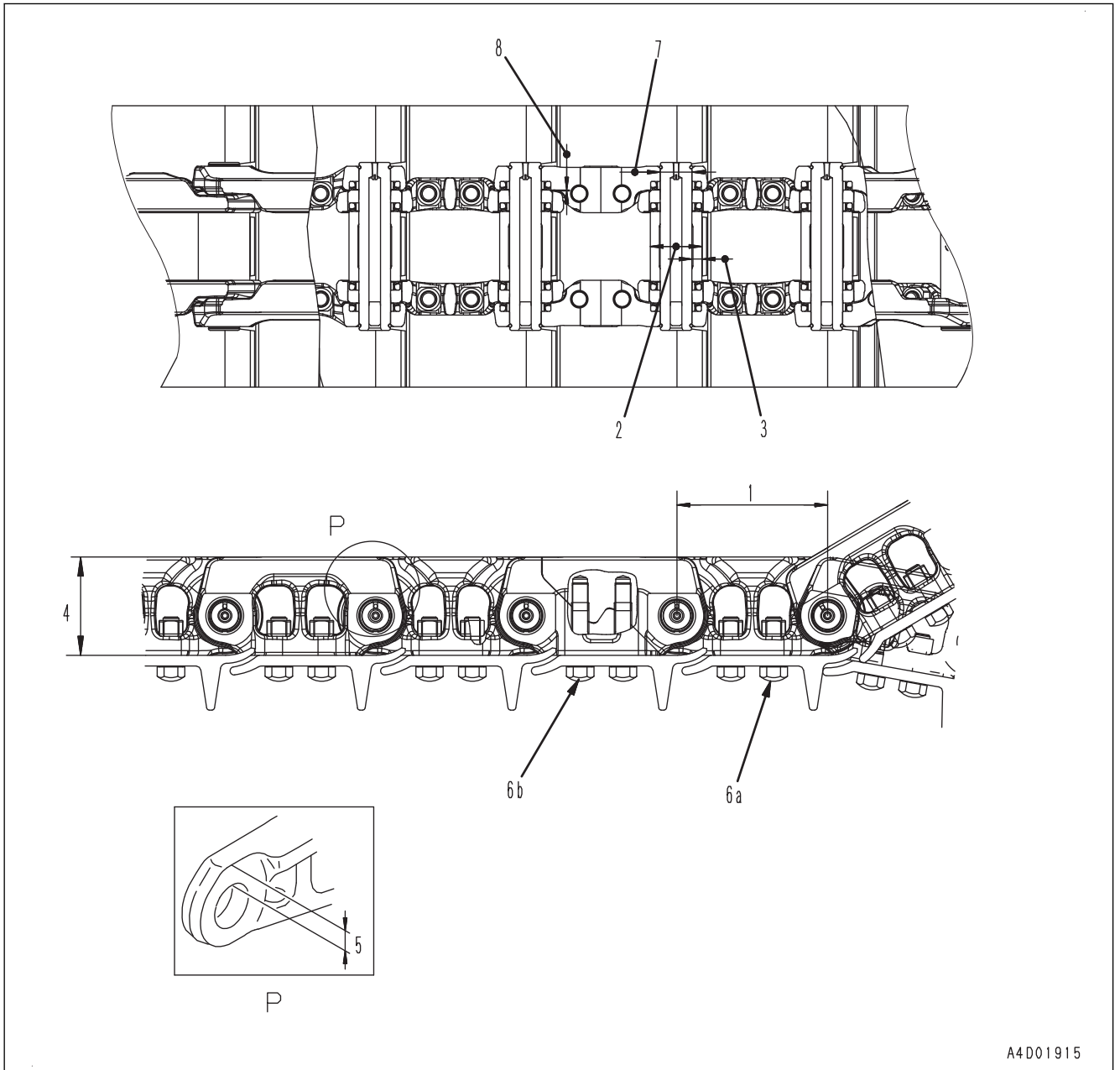


A4D03576

Unit: mm

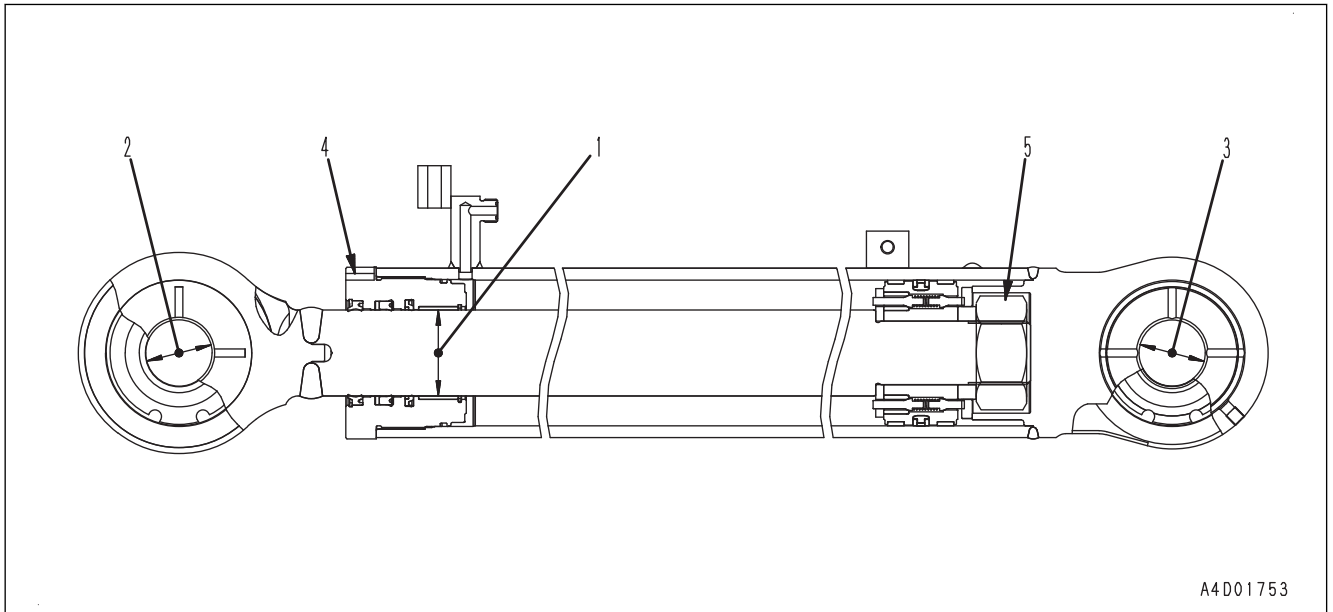
| No. | Item | Judgment criteria | | | | | Remedy |
|-----|---------------------------|----------------------------------|------------------|--------------------------|--------------|--------------------------|--|
| 7 | Tightening torque of bolt | 9.8 to 12.7 Nm {1.0 to 1.3 kgm} | | | | | Retighten |
| 8 | Tightening torque of bolt | 20 to 25 Nm {2.0 to 2.5 kgm} | | | | | |
| 9 | Tightening torque of bolt | 44.1 to 63.7 Nm {4.5 to 6.5 kgm} | | | | | |
| 10 | Check valve spring | Standard dimension | | | Repair limit | | Replace (Replace if damaged or deformed as well) |
| | | Free height x outside diameter | Installed height | Load at installed height | Free height | Load at installed height | |
| | | 13.0 x 6.5 | 7.1 | 3.33 N {0.34 kg} | - | 2.66 N {0.27 kg} | |
| 11 | Spool return spring | 44.84 x 12 | 33 | 58.8 N {6 kg} | - | 47.1 N {4.8 kg} | |

MAINTENANCE STANDARD OF PLUS TYPE TRACK SHOE



Portion P shows the link in which the bushing is press-fitted.

MAINTENANCE STANDARD OF BLADE ANGLE CYLINDER



A4D01753

Unit: mm

| No. | Item | Judgment criteria | | | | Remedy | |
|-------|---|--|------------------|------------------|--------------------|-----------|---------------------|
| | | Standard dimension | Tolerance | | Standard clearance | | Allowable clearance |
| Shaft | Hole | | | | | | |
| 1 | Clearance between piston rod and bushing | 65 | -0.030 -0.076 | +0.250 +0.055 | 0.085 to 0.326 | 0.626 | Replace the bushing |
| 2 | Clearance between piston rod support shaft and bushing | 50 | -0.025 -0.064 | +0.039 0 | 0.025 to 0.103 | 0.5 | |
| 3 | Clearance between cylinder bottom support shaft and bushing | 50 | -0.025 -0.064 | +0.039 0 | 0.025 to 0.103 | 0.5 | |
| 4 | Tightening torque of cylinder head | 932±93.0 Nm {95±9.5 kgm} | | | | Retighten | |
| 5 | Tightening torque of cylinder piston fixing nut | 4120±412 Nm {420±42.0 kgm} (Width across flats: 75 mm) | | | | | |

- When refrigerant gas (2) sealed in the diaphragm chamber (hatched portion) receives the temperature change from thermoprobe (1a-2), its pressure varies, and accordingly force (F_g) to press needle valve (1a) varies.
- The position of needle valve (1a) is determined by the balance between the rightward reaction force of spring (1b) and force (F_g) of refrigerant gas (2) to push needle valve (1a) to the left through diaphragm (1a-1).
- The position of needle valve (1a) determines the flow rate of the refrigerant from the receiver drier to evaporator (3).

When evaporator (3) outlet temperature is high

- The pressure of refrigerant gas (2) in the diaphragm chamber (hatched portion) increases and the volume increases.
- Force (F_g) of refrigerant gas (2) to push needle valve (1a) increases, and needle valve (1a) moves to the left.
- Needle valve (1a) opens wider to increase the refrigerant flow rate to evaporator (3), and the cooling performance increases. (State (A) in the above figure)

When evaporator (3) outlet temperature is low

- The pressure of refrigerant gas (2) in the diaphragm chamber (hatched portion) decreases, and accordingly the volume decreases.
- Force (F_g) of refrigerant gas (2) to push needle valve (1a) decreases, and needle valve (1a) moves to the right.
- Needle valve (1a) opens smaller to decrease the refrigerant flow rate to evaporator (3), and the cooling capacity decreases. (State (B) in the above figure)

FUNCTION OF DUAL PRESSURE SWITCH

The dual pressure switch is installed to the air conditioner hose near the air conditioner unit.

LA or lower: Abnormally low pressure

HA or higher: Abnormally high pressure

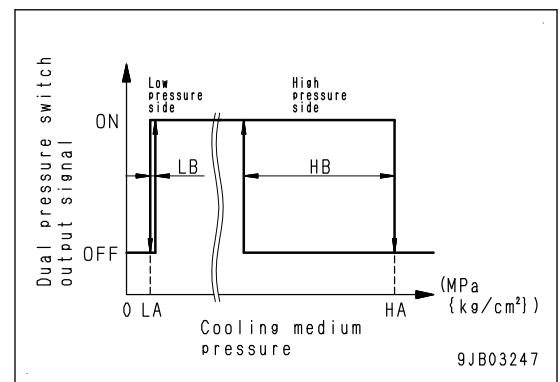
LA: 0.14 to 0.23 MPa {1.4 to 2.3 kg/cm²}

LB: 0.16 to 0.25 MPa {1.6 to 2.5 kg/cm²}

HA: 2.62 to 2.89 MPa {26.2 to 28.9 kg/cm²}

HB: 1.38 to 2.07 MPa {13.8 to 20.7 kg/cm²}

- The dual pressure switch turns "OFF" when it detects abnormally low pressure or abnormally high pressure in the refrigerant circulation circuit.
- When the dual pressure switch turns "OFF", the compressor clutch relay turns "OFF". Thus, the electromagnetic clutch of compressor is disengaged and air conditioner components are protected.



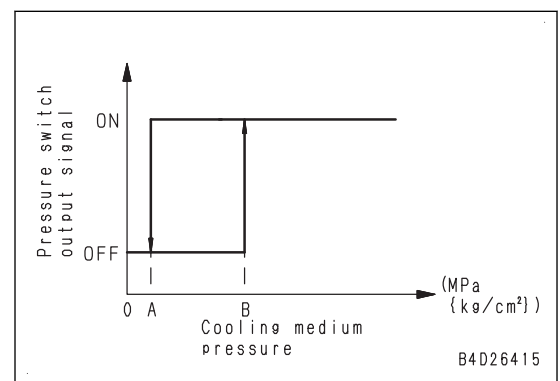
FUNCTION OF PRESSURE SWITCH

The pressure switch is installed to the air conditioner hose near the air conditioner unit.

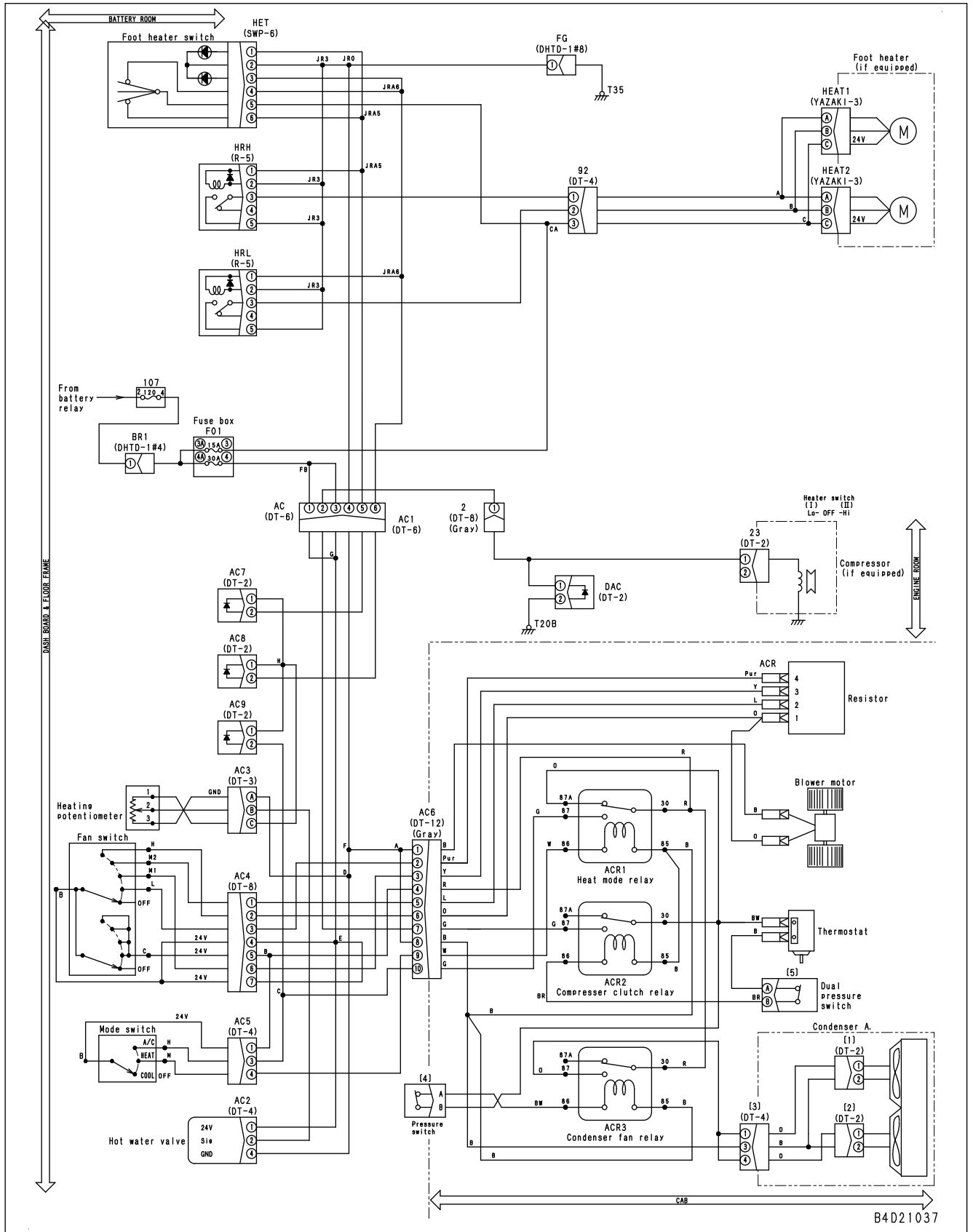
OFF pressure (A): 1.24 to 1.38 MPa {12.4 to 13.8 kg/cm²}

ON pressure (B): 1.65 to 1.79 MPa {16.5 to 17.9 kg/cm²}

- The pressure switch turns "OFF" when it detects abnormally low refrigerant pressure in the refrigerant circulation circuit.
- When the pressure switch turns "OFF", the condenser fan relay turns "OFF" and the condenser fan does not operate.



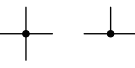
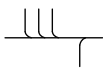
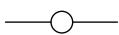









Circuit diagram related to compressor and refrigerant system



ELECTRICAL CIRCUIT DIAGRAM

SYMBOLS USED IN ELECTRICAL CIRCUIT DIAGRAM

| Symbol | Content |
|---|---|
|  9JC01473 | Wire |
|  9JC01512 | Wire (junction disconnected) |
|  9JC01477 | Wire (junction connected) |
|  9JC01513 | Combined wire |
|  9JC01514 | Terminal |
|  9JC01515 | Grounding by chassis ground |
|  9JC01516 | Grounding by terminal |
|  9JC01517 | Contact, switch |
|  9JC01518 | Push button switch (N.O. type) N.O.: Normally Open |
|  9JC01519 | Push button switch (N.C. type) N.C.: Normally Closed |
|  9JC01520 | Push button switch (N.O. type) N.O.: Normally Open |
|  9JC01521 | Push button switch (N.O. type) N.C.: Normally Closed |

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