Shop Manual

VENBM67002

PW180-11

MACHINE MODEL	SERIAL NUMBER
PW180-11	H75051 AND UP

- This shop manual may contain attachments and optional equipment that are not available in your area. Please consult your local Komatsu distributor for those items you may require.
- Materials and specifications are subject to change without notice.
- PW180-11 mount the SAA6D107E-3 engine.
- For details of the engine, see the 107 Series Engine Shop Manual.

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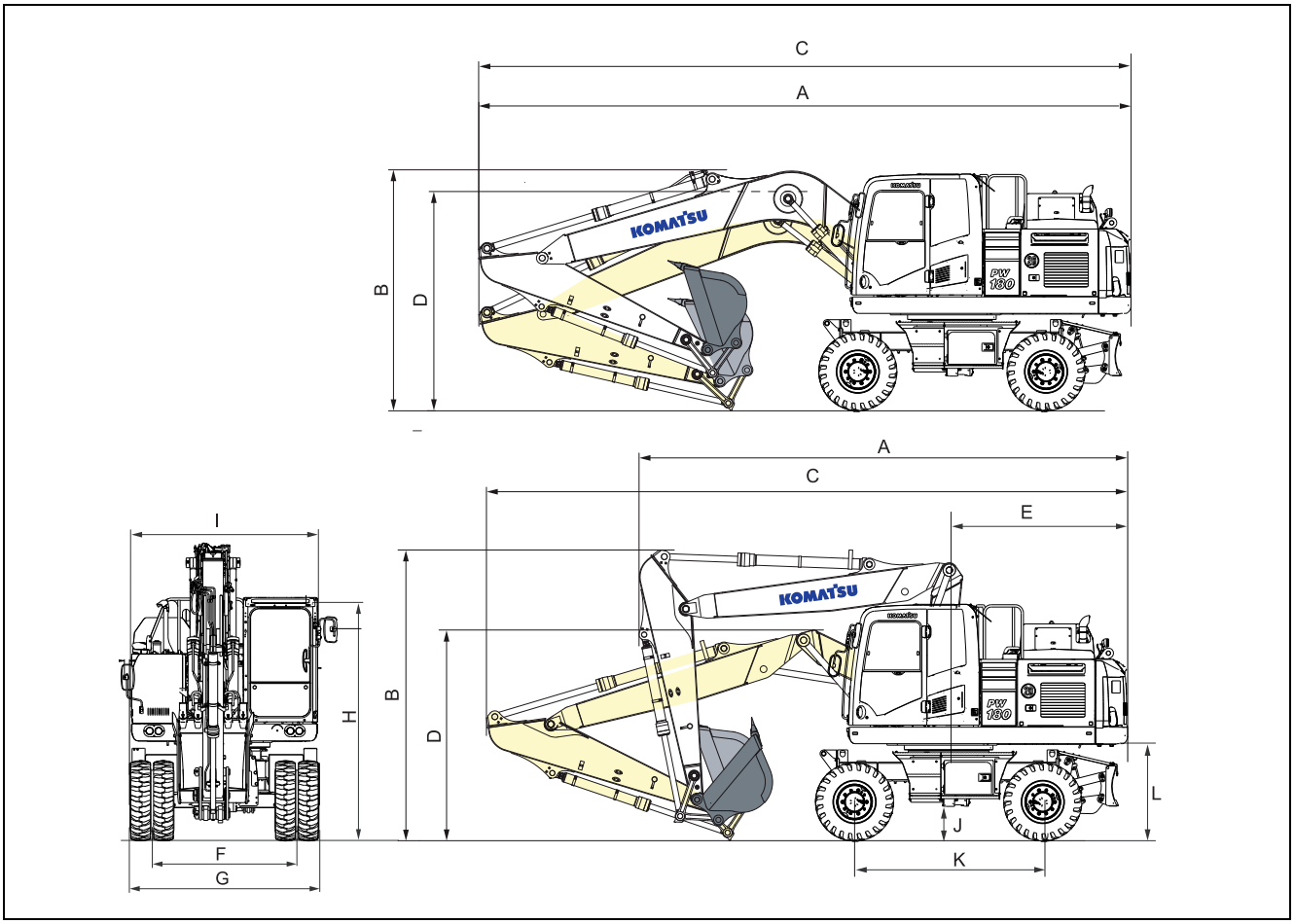
KOMATSU

Specification dimension drawings

Dimensions



	Description	2.5 m axle	2.75 m axle
A	Overall length (Driving position)	See next page	
B	Overall height (Driving position)		
C	Overall length (Transport position)		
D	Overall height (Transport position)		
E	Radius of upper structure	2500 mm	
	Radius of tail structure	2475 mm	
F	Front and rear track	1944 mm	2114 mm
G	Overall width	2550 mm	2750 mm
H	Overall height of cabin	3263 mm	
I	Overall width of upper structure	2490 mm	
J	Ground clearance	457 mm	
K	Wheel base	2600 mm	
L	Height bottom edge counterweight	1310 mm	

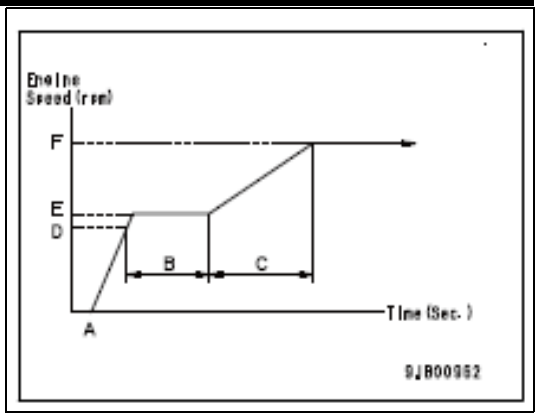
A. From AdBlue/DEF mixing tube B: To exhaust pipe
1. SCR body
2. SCR temperature sensor
3. SCR outlet NOx sensor
4 SCR outlet temperature sensor
5: Temperature sensor controller
6 Ammonia sensor
7 Hanger plate
8 water baffle
B. To exhaust pipe
9. Sensor table
10. AdBlue/DEF injector
11 Sensor table band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

- SCR assembly consists of rectifier tube (10) equalizing the distribution of flow speed by leading exhaust gas, upstream SCR catalyst (11), downstream SCR catalyst, ammonia oxidation catalyst (integrated type) (12), and water dam (13) which prevents rain water from entering into downstream SCR catalyst and ammonia oxidation catalyst (integrated type) (12) while exhausting gas.
- Ammonia oxidation catalyst (a part of 12) oxidizes ammonia to water and nitrogen with ammonia oxidation catalyst (a part of 12) to prevent ammonia which is supplied to SCR assembly from being released out be- cause SCR catalyst (a part of 12, 11) cannot completely consume it.
- SCR assembly has SCR temperature sensor (2), SCR outlet temperature sensor (5), and SCR outlet NOx sensor (3) (1 piece each). These sensors monitor the function of SCR catalyst. These sensors are used for various troubleshooting.
- Rectifying tube (10) equalizes the distribution of exhaust gas flow speed.
- SCR catalyst (a part of 12, 11) uses the ceramic honeycomb
- The catalyzer holding mat (9) is made of a specific fiber and protects the ceramic catalyst against vibrations by the engine and the machine body. It also protects the outer periphery of SCR assembly against a heat transfer of the ceramics during operation.
- Water dam (13) is located at the upstream side of the outlet and prevents rainwater from entering into downstream SCR catalyst unit and ammonia oxidation catalyst (integrated type) (12).
- Water baffle (4) is located at the downstream side of the outlet and prevents rainwater at outlet from splashing over the detection part of NOx sensor.

Function of turbocharger protection system

This function limits the engine speed to prevent seizure of the turbocharger when the engine speed is increased suddenly just after the engine is started.

Operating condition	Operation
Engine oil pressure: Below 50 kPa {0.51 kgf/cm^2}	Protection of turbocharger (see following figure)

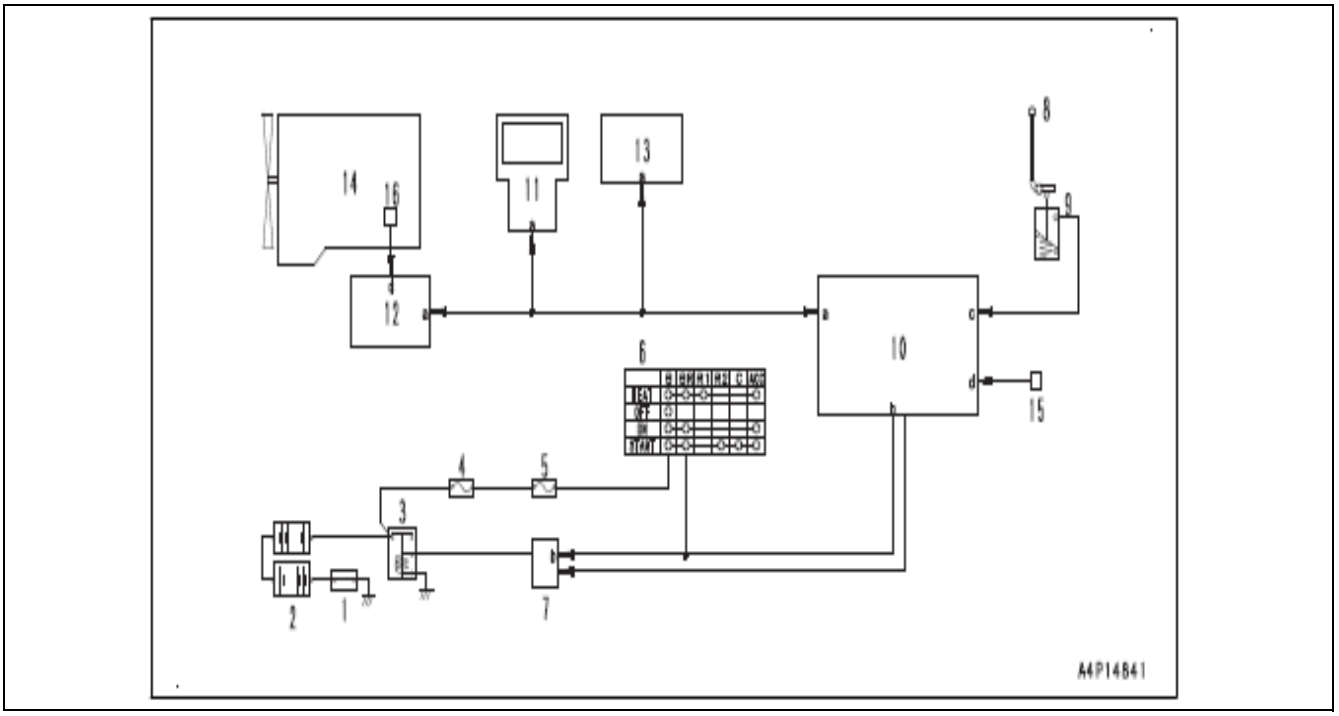


A. Starting of engine
B. Turbocharger protection time (approximately 0 to 20 seconds)
C. Modulation time (approximately 1 second)
D. 500 rpm
E. Approximately 1050 rpm
F. 1650 rpm (*1)

(*1). Working mode: P mode
Fuel control dial: High idle (MAX) position
Travel lever: Fine control

Automatic idle stop system

Automatic idle stop system diagram



A. CAN signal
B. BR signal
C. Lock lever signal
D. Various sensor signals

Types of regeneration functions

Regeneration means to purify (oxidize) the soot accumulated on the soot collecting filter (KCSF) in KDPF or maintain the urea SCR system normal.

Passive regeneration

When the exhaust temperature of the engine is relatively high, the oxidation power of soot in the exhaust gas components is increased by the catalysis of KDOC to oxidize (burn) the soot accumulated in KCSF naturally.

Active regeneration (engine exhaust temperature rise control + fuel dosing)

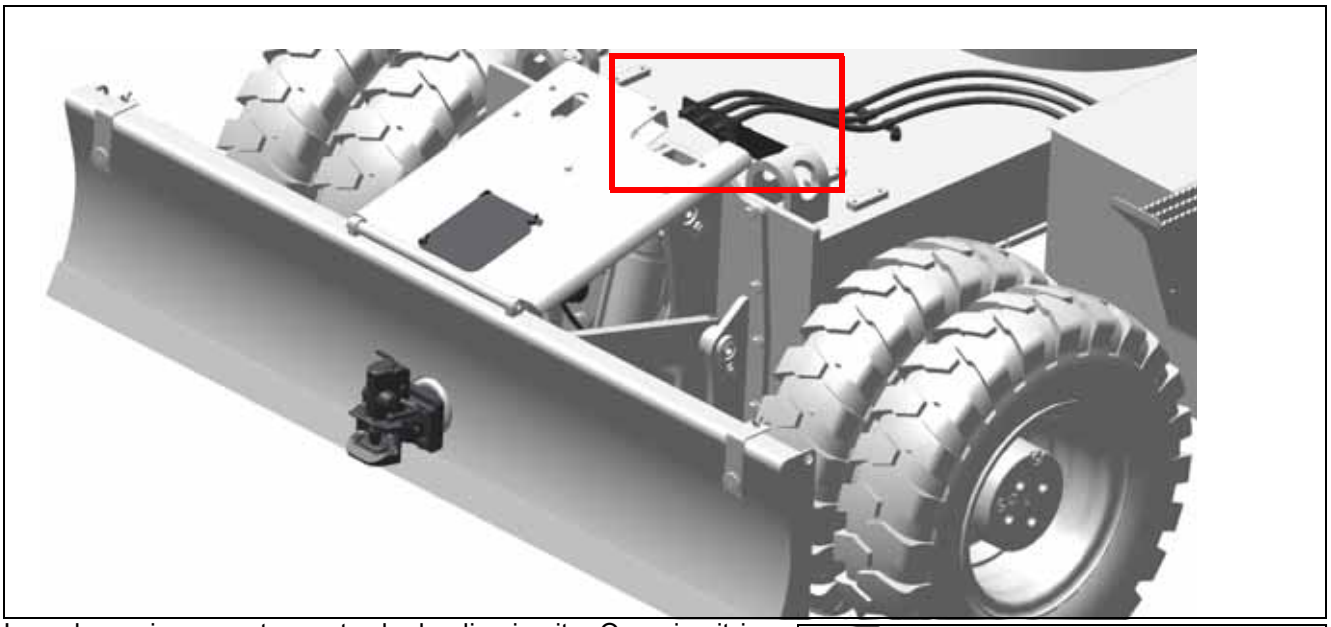
- Automatic regeneration
    - When soot is accumulated more than a certain level or the urea SCR system makes a request to maintain itself normal, the engine enters the exhaust temperature rise control mode (*1) and performs fuel dosing (*2) and starts regeneration automatically.
      The automatic regeneration is also performed by the direction from the engine controller at a set time after the previous regeneration, regardless of soot accumulation in KCSF.
      *1: Control to increase the engine exhaust temperature by controlling the fuel injection timing or VGT.
      *2: Fuel injection performed to accelerate regeneration by increasing the exhaust temperature.
- Manual stationary regeneration
    - When the exhaust temperature does not reach a certain level, depending on the operating condition of the machine, or when the operator disables regeneration, the automatic regeneration is not performed and accumulated soot in KCSF increases. Also, when the automatic regeneration is performed upon receiving a request from the urea SCR system, the exhaust temperature may not reach a certain level, depending on the operating condition of the machine. In these cases, a request for the manual stationary regeneration request is displayed on the machine monitor, and the operator must perform regeneration by the operation on the machine monitor screen.
      In addition, when the engine controller is replaced or ash in KCSF is washed, a serviceman performs regeneration by the operation on the machine monitor screen (“active regeneration for service”).

NOTICE

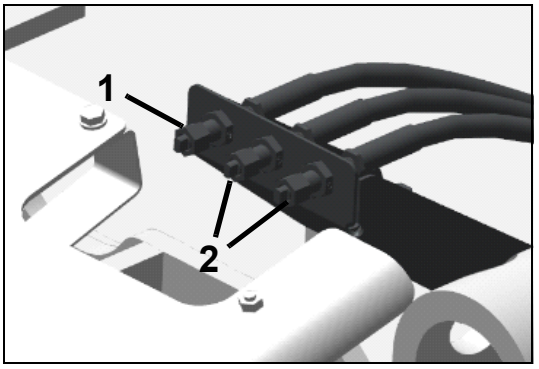
- **For the procedure to start and stop the regeneration of KDPF, see the Operation and Maintenance Manual for each machine.**
- **Always use ultra low-sulfur diesel fuel. If any fuel other than the specified one is used, it can cause a failure in KDPF.**

Second auxiliary circuit control system

It is an additional circuit in the undercarriage.



In undercarriage are two extra hydraulic circuits. One circuit is single-acting (1) an one is double-acting (2).



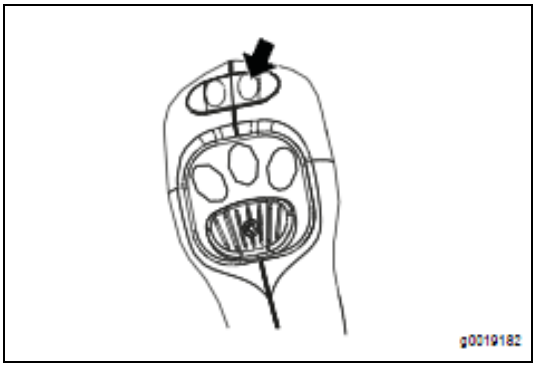
Technical data

:

	single-acting circuit	double-acting circuit
max. pressure {bar}	150	30
max. volume flow {L/min}	30	30

Operation:

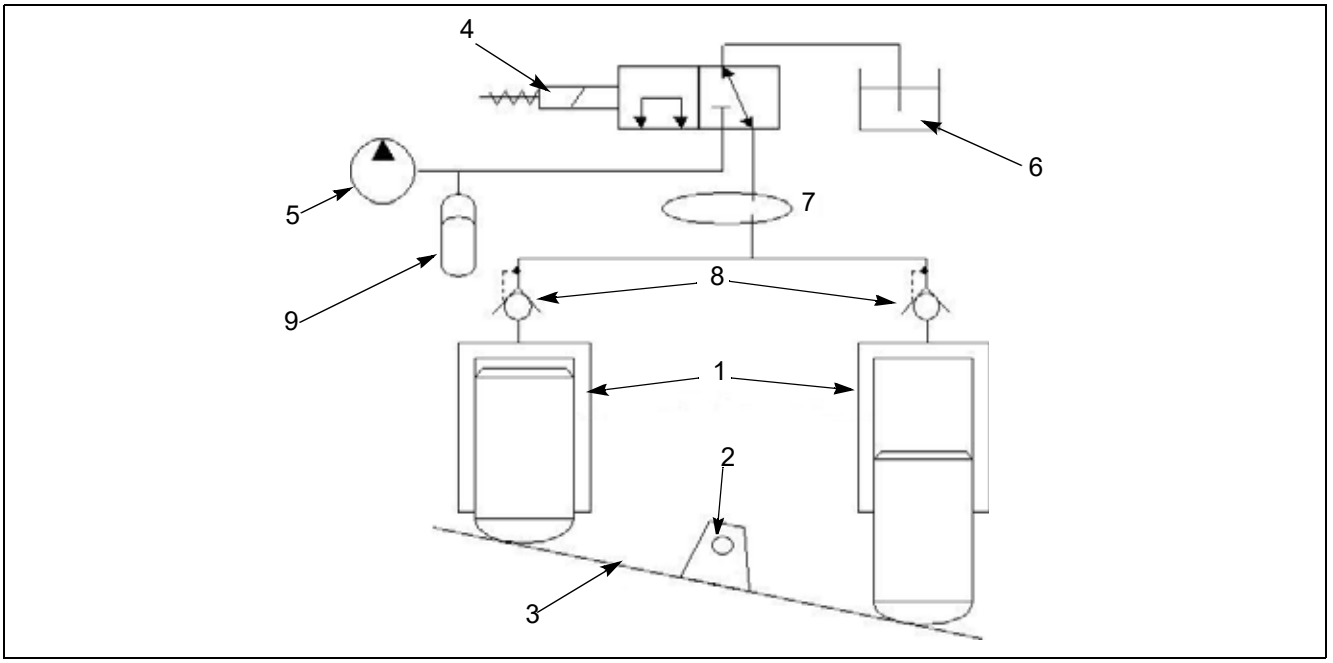
1. Press the button on the right joystick to activate the circuit.
2. Keep pressing the button to keep the circuit activated.



Circuit

Purpose

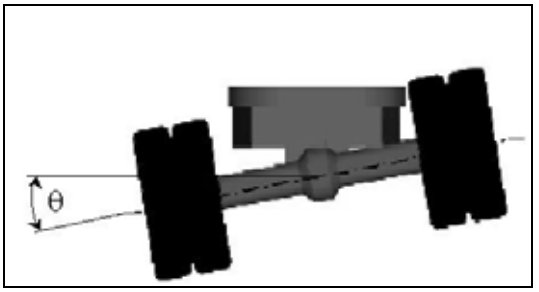
The undercarriage of wheeled hydraulic excavators has one of the two driven axles oscillating mounted. This makes it possible to fully utilize the excavators rimpull in rough terrain - all of the wheels being constantly in contract with the ground. A suspension cylinder is fitted on each side of the undercarriage to block the axle during digging or lifting work.
Blocking the axle increases the excavators stability.
The oscillating axle (3) is mounted on axle mount pin (2) in the middle of the excavator. The two cylinders (1) which are full of hydraulic oil are connected through pipelines to the suspension lock solenoid valve (4).
When the excavator is being moved on the jobsite, the suspension lock solenoid valve should be engernised so that the hydraulic oil in the cylinder can be returned to tank as the axle is oscillating up and down. Before commencing excavating operations, the oscillation lock solenoid valve should be de-energised to pressurise the oil in the cylinders. This will lock the axle in the position it is in.



1. Cylinder
2. Axle mount pin
3. Oscillating axle
4. Oscillation lock solenoid valve
5. PPC pressure reducing valve
6. Hydraulic tank
7. Swivel joint
8. PPC operated check valve
9. Accumulator

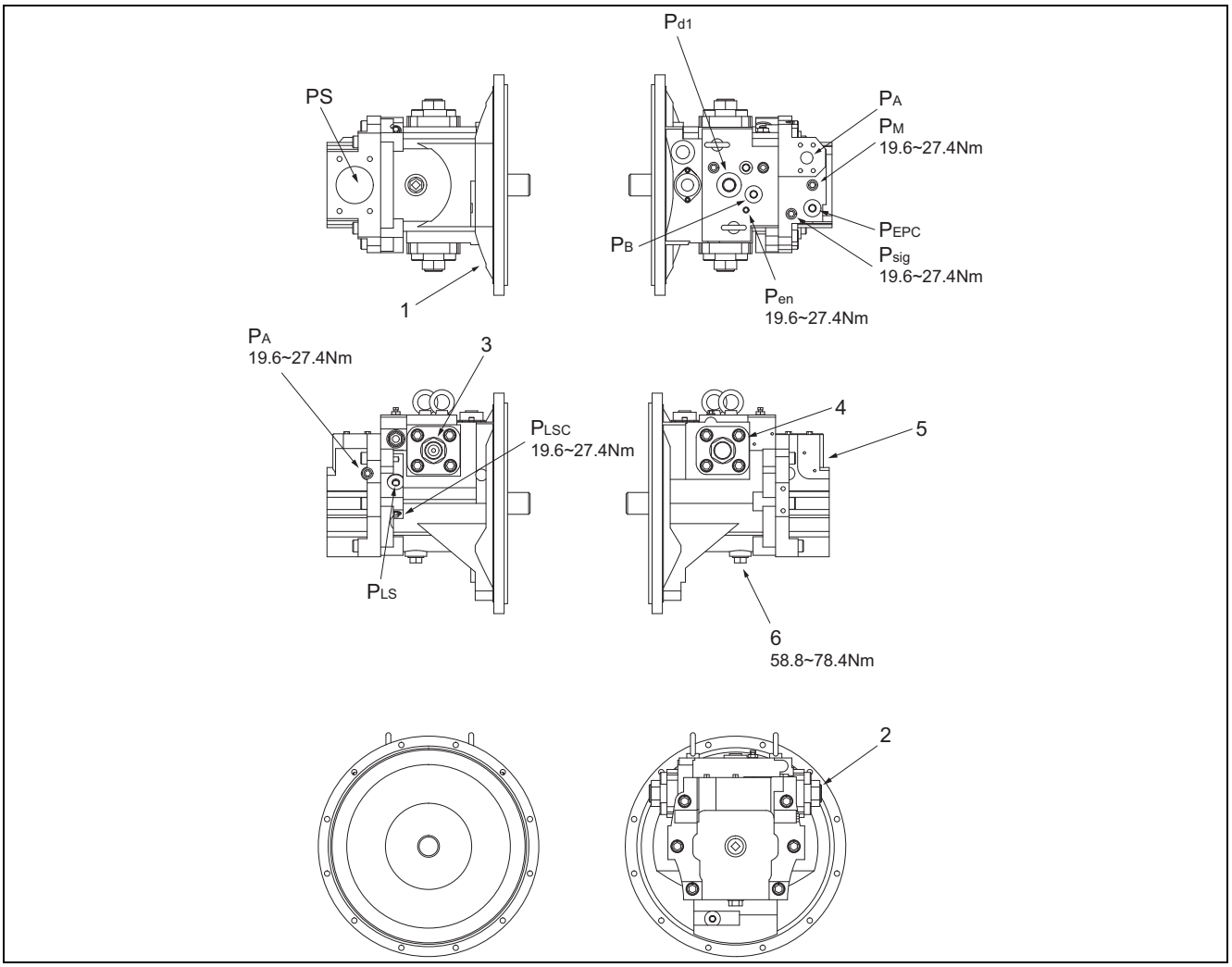
Axle oscillation

Axle oscillation: 10°
Minimum turning radius: 6.8m.



Hydraulic pump

HPV125 (140)

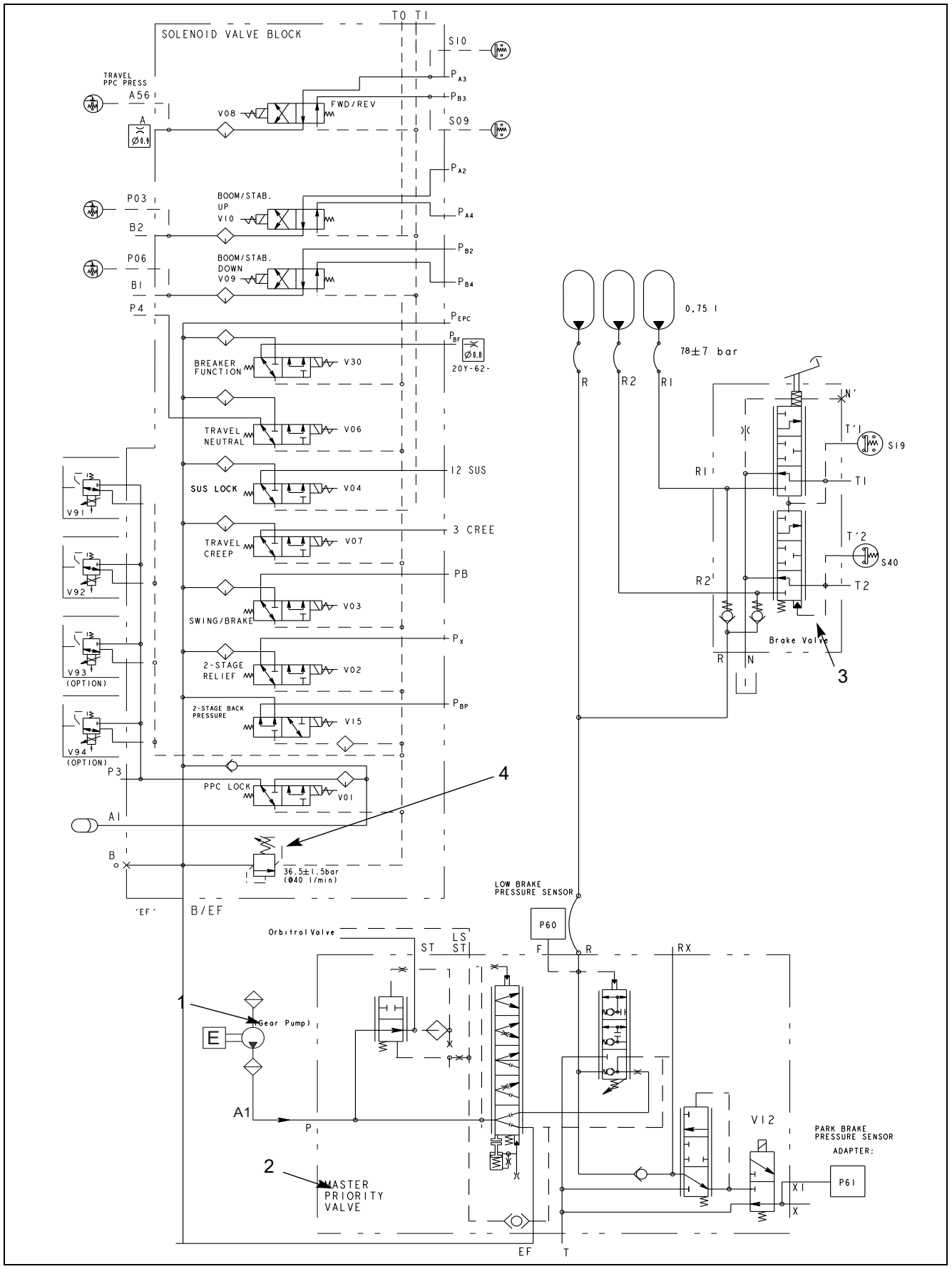


1.	Main pump	P_A:	Pump delivery port	P_{LS}:	Load pressure input port
2.	LS valve	P_A:	Pump delivery pressure detection port	P_{LSC}:	Load pressure detection port
3.	PC valve	PB:	Pump pressure input port	P_S:	Pump suction port
4.	LS-EPC valve	Pd1:	Case drain port	P_M :	PC set selector pressure detection port
5.	PC-EPC valve	Pen:	Pump control pressure detection port	P_{EPC}:	EPC basic pressure input port
6.	Drain plug	Pd2:	Drain port	P_{SIG}:	LS set change pressure checking port

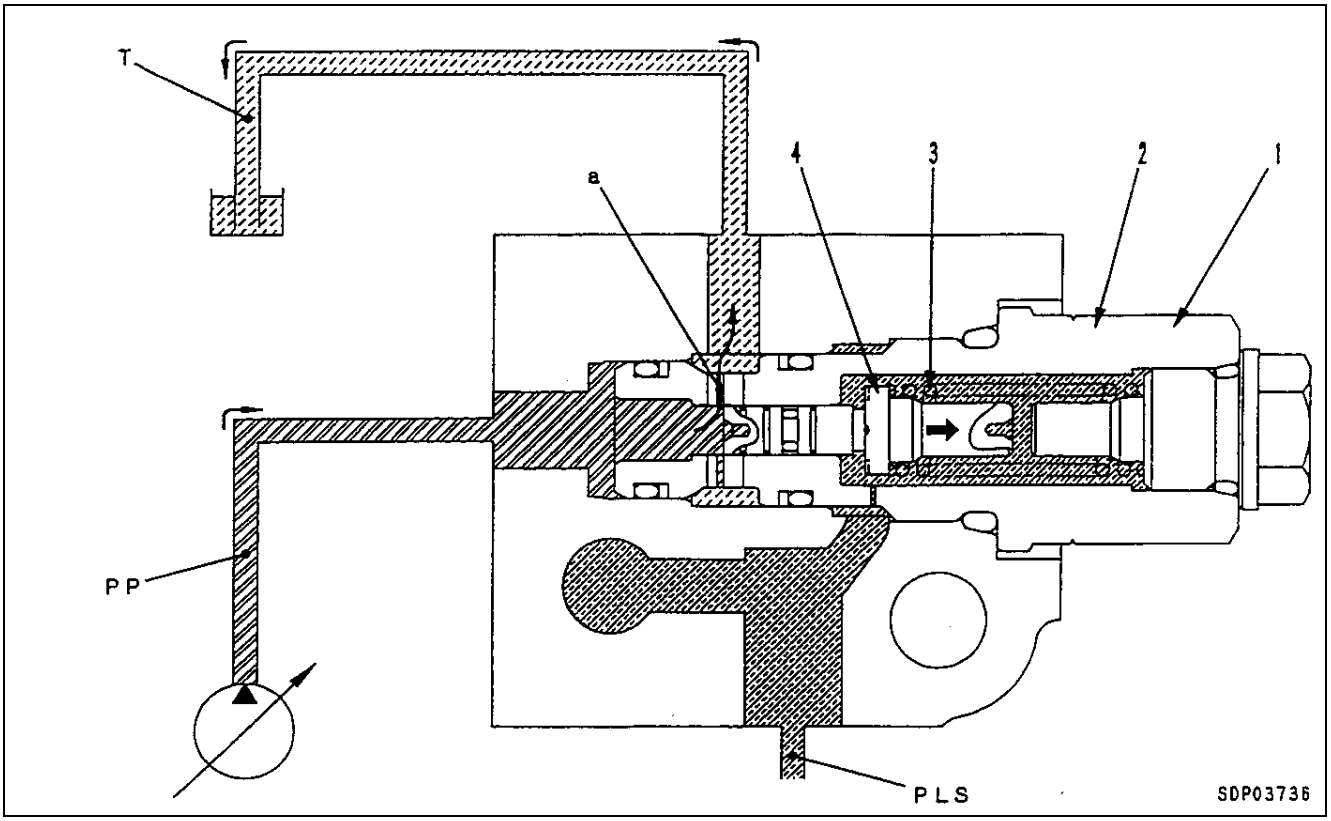
Outline

- This pump consists of a variable capacity swash plate piston pumps, PC valve, LS valve, and EPC valve.

Pilot pressure control (PPC) system



2. During fine control of the valve, when the demand flow for the actuator is within the amount discharged by the minimum swash plate angle of the pump, pump discharge pressure **PP** is set to LS pressure **PLS** + 3.38 MPa {34.5 kgf/cm²}.
   When the differential pressure between the pump discharge pressure **PP** and LS pressure **PLS** reaches the load of spring (3) (3.38 MPa {34.5 kgf/cm²}), the unload valve opens, so LS differential pressure PLS becomes 3.38 MPa {34.5 kgf/cm²}.



Operation

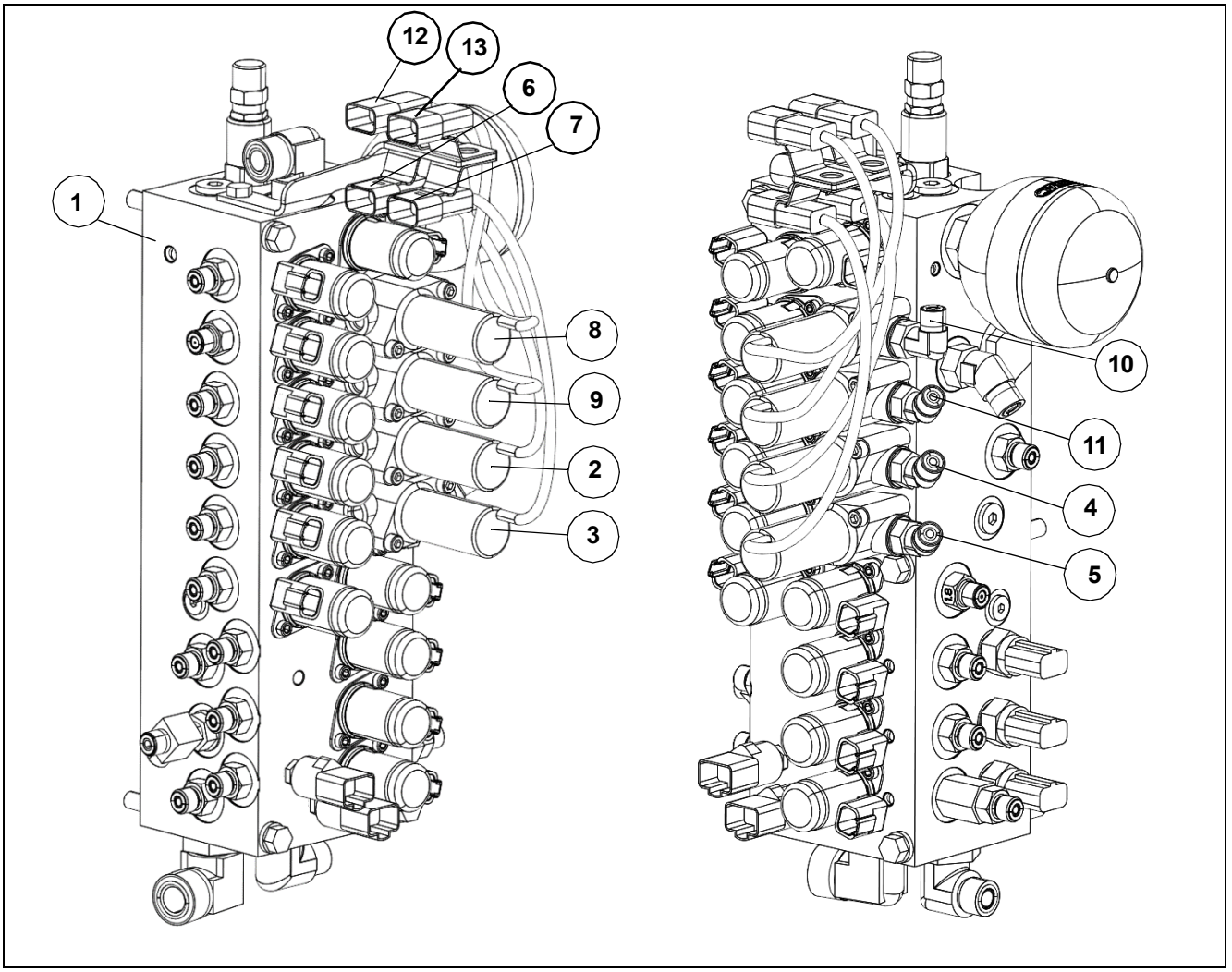
Fine control of control valve

- When fine control is carried out on the control valve, LS pressure **PLS** is generated and acts on the right end of the spool (4).
- When this happens, the area of the opening of the control valve spool is small, so there is a big difference between LS pressure **PLS** and pump discharge pressure **PP**.
- When the differential pressure between pump discharge pressure **PP** and LS pressure **PLS** reaches the load of the spring (3) (3.38 MPa {34.5 kgf/cm²}), spool (4) is moved to the right in the direction of the arrow, and pump circuit **PP** and tank circuit **T** are connected.
- In other words, pump discharge pressure PP is set to a pressure equal to the spring force (3.38 MPa {34.5 kgf/cm²}) + LS pressure PLS, and LS differential pressure PLS becomes 3.38 MPa {34.5 kgf/cm²}.

1. Unload valve
2. Sleeve
3. Spring
4. Spool

PP: Pump circuit (pressure)
PLS: LS circuit (pressure)
T: Tank circuit (pressure)

ATT EPC valve assembly



1. PPC valve block
2. 1ATT EPC valve
3. 1ATT EPC valve
4. To Main Valve port PAS
5. To Main Valve port PB8
6. 1ATT EPC Valve Connector CN-V92
7. 1ATT EPC Valve Connector CN-V91
8. 2ATT EPC valve
9. 2ATT EPC valve
10. To Main Valve port PA9
11. To Main Valve port PB9
12. 2ATT EPC Valve Connector CN-V94
13. 2ATT EPC Valve Connector V93

Unit: mm

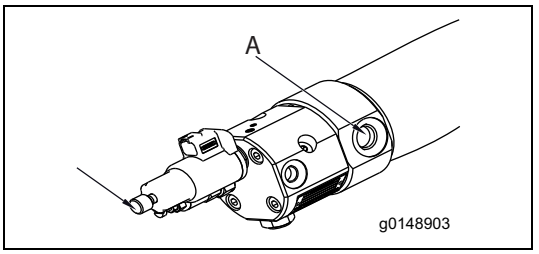
No.	Check item		Criteria					Remedy
		Cylinder	Standard size	Tolerance		Standard clearance	Repair limit	
				Shaft	Hole			
1	Clearance between piston rod and bushing	2 piece boom	85	-0.036 -0.090	+0.222 +0.047	0.083 ~ 0.312	0.445	Replace bushing
		Arm	85	-0.036 -0.090	+0.222 +0.047	0.083 ~ 0.312	0.445	
		Bucket	70	-0.030 -0.076	+0.259 +0.063	0.093 ~ 0.335	0.445	
		Adjust	100	-0.036 -0.090	+0.257 +0.047	0.083 ~ 0.347	0.445	
		1 Piece boom	85	-0.036 -0.090	+0.222 +0.047	0.083 ~ 0.312	0.445	
2	Clearance between piston rod support pin and bushing	2 piece boom	80	-0.030 -0.060	+0.211 +0.124	0.154 ~ 0.271	1.0	Replace pin or bushing
		Arm	80	-0.030 -0.076	+0.211 +0.124	0.154 ~ 0.287	1.0	
		Bucket	70	-0.030 -0.076	+0.198 +0.124	0.154 ~ 0.274	1.0	
		Adjust	90	-0.036 -0.090	+0.457 +0.370	0.406 ~ 0.547	1.0	
		1 Piece boom	80	-0.030 -0.060	+0.211 +0.124	0.154 ~ 0.271	1.0	
3	Clearance between cylinder bottom support pin and bushing	2 piece boom	70	-0.030 -0.060	+0.190 +0.070	0.100 ~ 0.250	1.0	
		Arm	80	-0.030 -0.076	+0.211 +0.124	0.154 ~ 0.287	1.0	
		Bucket	70	-0.030 -0.060	+0.198 +0.124	0.154 ~ 0.258	1.0	
		Adjust	90	-0.036 -0.090	+0.457 +0.370	0.406 ~ 0.547	1.0	
		1 Piece boom-	70	-0.030 -0.060	+0.190 +0.070	0.100 ~ 0.250	1.0	

ECSS Valve

WARNING!
Risk of injury!
The accumulator is charged with high-pressure nitrogen gas. If the accumulator is handled mistakenly, it may cause an explosion. It is dangerous and may cause serious personal injury or death. Always observe the following.
- In order to depressurize the accumulator on the oil side, you must screw in the knurled screw on the 3/2 valve clockwise.
- The main control valve (transfer point F in the diagram) must also be open to the tank so that the pressure above can be reduced.

Manual valve release

A Hydraulic connection



Function

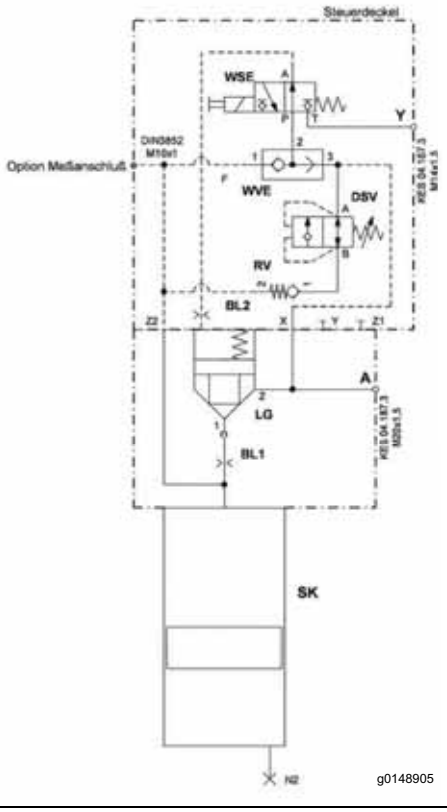
1. In operation:

   Unscrew the screw to the left until stop.

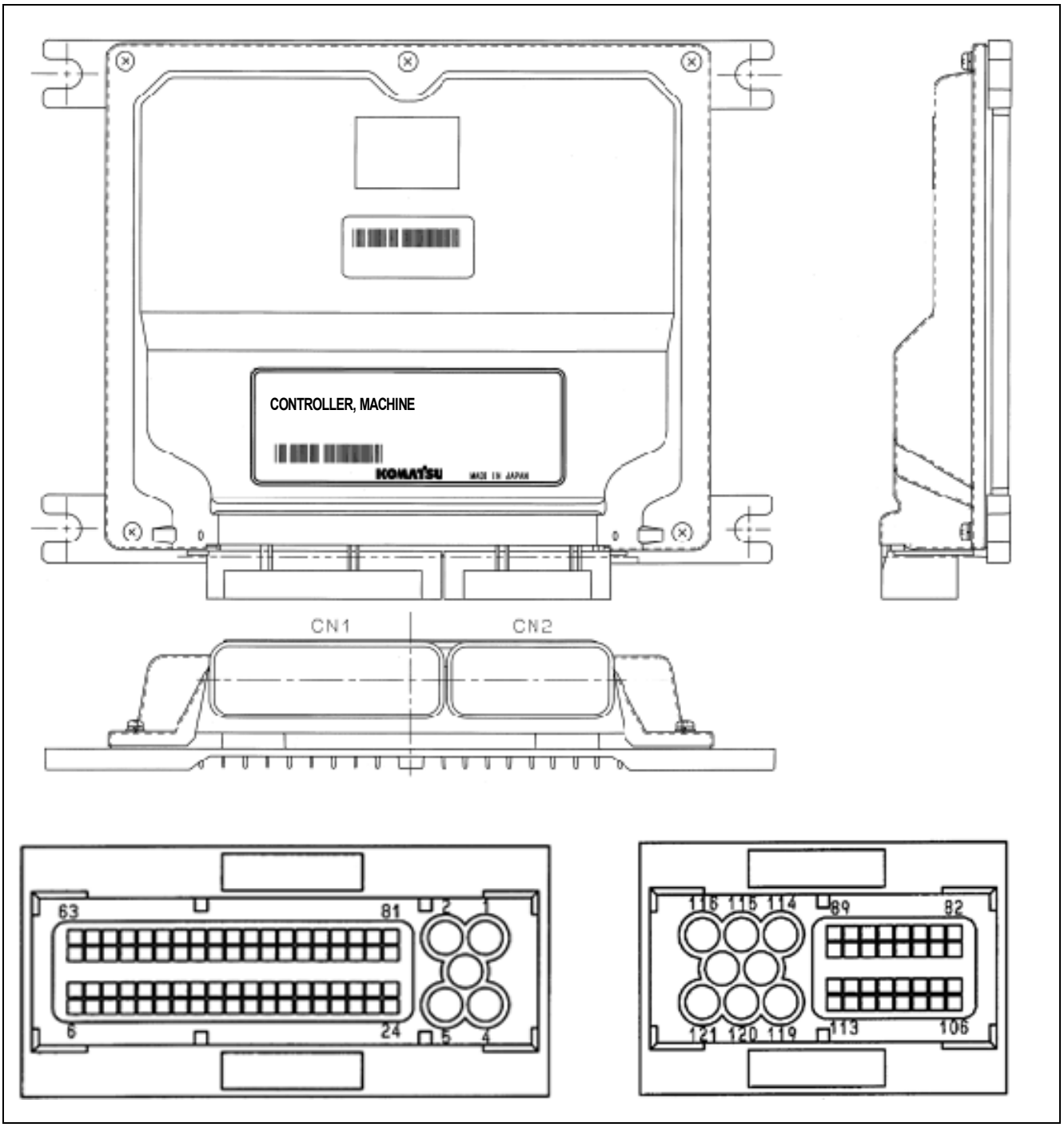
2. Emergency hand function:

   Turn the screw clockwise until it reaches the stop.

Diagram detail of ECSS Valve



Machine controller



7.1 Pump control function during travel

- If the machine travels in a work mode other than mode P, the work mode and the engine speed remain unchanged and the pump absorption torque is increased.
    - For details, see ENGINE/PUMP COMPOSITE CONTROL FUNCTION.

7.2 Travel speed change function

- Manual change with travel speed button on the monitor panel.

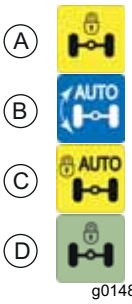
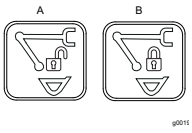
Travel speed switch	CREEP	LO	HI	AUTO (LO~HI)
Motor capacity	Max.	Min~Max	Min~Max	Min~Max
Travel speed (km/h)	2.5	0 ~8.5	0 - 35 0 - 20	0 - 35 0 - 20 (German spec.)

- If the travel speed switch is changed between CREEP, LO, and HI, the governor/pump controller controls the pump capacity and motor capacity at each gear speed (as shown in the table below) to change the travel speed. (See engine speed table, right).

	Max. Engine speed	
	P max.	P normal
Travel	2,200 rpm	2,600 rpm
P Mode	1,850 rpm	
E Mode	1,850 rpm	
L Mode	1,685 rpm	
B Mode	2,000 rpm	

- Automatic change by engine speed
- The travel speed changes to Hi level automatically if the travel speed has been Hi.
- Automatic change by pump discharge pressure
- While the machine is traveling with the travel speed switch at Hi, if the load is increased because of an upslope ground, etc. and the travel pressure keeps above 35 MPa {357 kgf/cm²} for 0.5 seconds, the travel motor capacity is changed automatically and the travel speed is lowered (to the LO level) (The travel speed switch is kept at Hi, however).
- While the machine is travelling at LO, if the load is reduced on a flat or downslope ground, etc. and the travel pressure keeps below 23 MPa {234 kgf/cm²} for 0.5 seconds, the travel motor capacity is changed automatically and the travel speed is set to Hi again.
- Controller does not change the travel mode in travel HI/LO switch unless a mode continues for more than 0.5 seconds.
- From CREEP to other mode, or from other mode to CREEP, travel mode should be changed immediately.
- Default mode should be the last mode when starter switch was turned off.
- Maximum speed 2320 rpm.

Max. Engine speed	
Travel	2,200 rpm
P Mode	1,850 rpm
E Mode	1,850 rpm
L Mode	1,685 rpm
B Mode	2,000 rpm

Symbol	Item displayed	Description	Remarks
 RKA56110	Blade/outriggers	Blue background: attachment selected. Green background: attachment operating.	Indicates which attachment is selected
 g0018700	Auxiliary circuit 1/ auxiliary circuit 2	Blue background: auxiliary circuit selected. Green background: auxiliary circuit operating.	Indicates which attachment is selected
	Street mode	Red background:	• when street mode is switched on but not activated • when the upper structure is not in straight position • when the axle is in lock modus
	Auto greasing	Yellow background: while the auto greasing system is working	
	ECSS	Blue background: ECSS switched ON but not active. Yellow background: ECSS switched ON and active.	Indicates when ECSS switch is turned ON.
 g0148820	Axle lock	A: Always locked (yellow) B: AUTO free (blue) C: AUTO locked (yellow) D: Quick locked (green)	Indicates axle lock status.
	Quick coupler	Red background (A): the quick coupler system is ready to unlock by the lever button.	The alarm buzzer sounds permanently.
		Green background (B): quick coupler is correctly locked	Only with Lehnhoff safety quick coupler
	Floating	Blue background: when boom floating is selected. Yellow background: when boom floating is activated.	
	Bucket or 2ATT	Yellow background: when bucket or 2. attachment (2ATT) is activated (only by activated option)	
	PPC pressure	Blue background: when PPC pressure reduction is selected. Yellow background: when PPC pressure reduction is activated.	
	Travel direction	F: Forward (white) N: Neutral (green) R: Reverse (yellow)	Indicates travel direction status.

Overload warning device

Outline

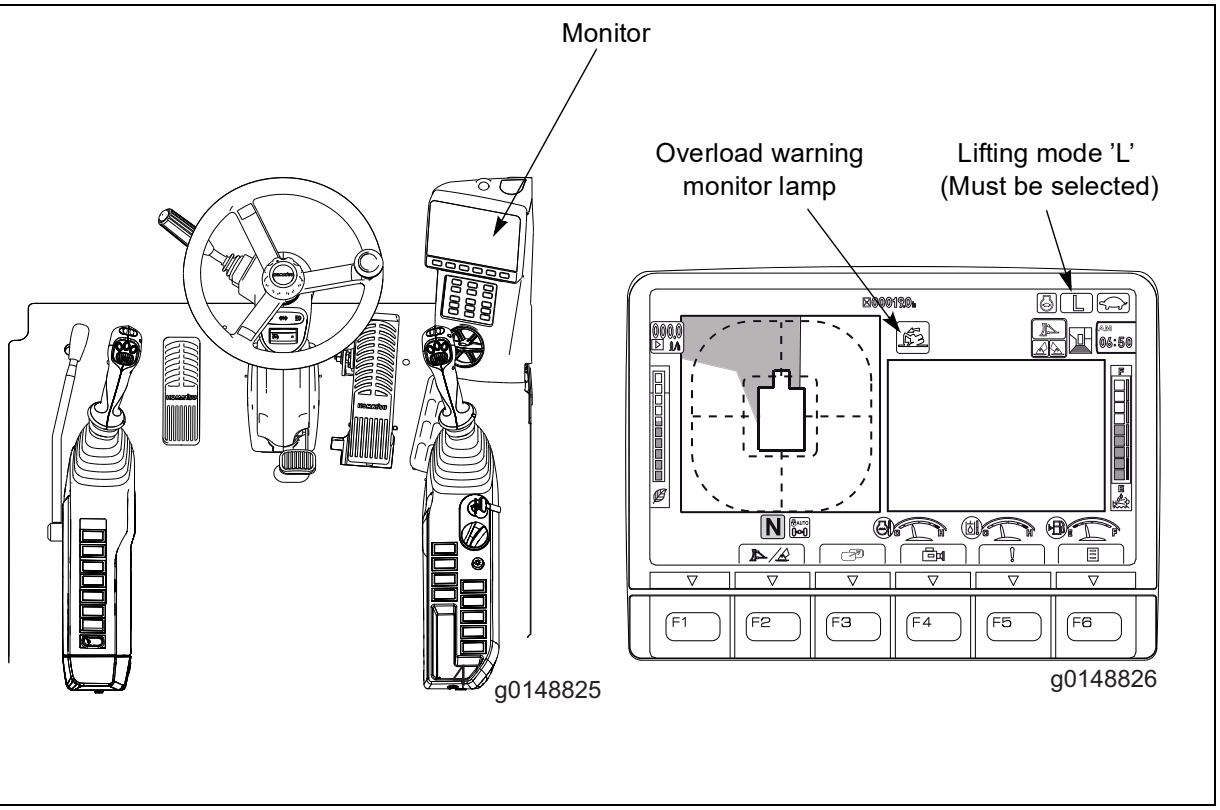
Function

- This device is installed to warn the operator when the machine lifts an excessive weight.

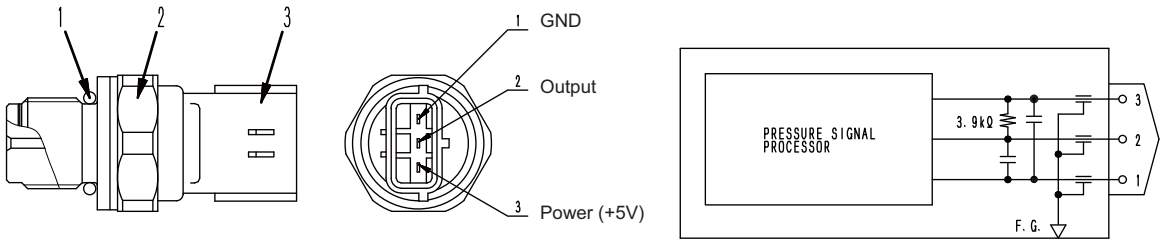
Structure

- When an excessive weight is lifted, the oil pressure increases at the bottom side of the boom cylinders. When this happens, a pressure switch is activated which lights the monitor lamp to warn the operator. When the monitor lamp lights, immediately lower the weight to the ground or bring the arm closer in the operator to prevent the machine from tipping over.

NOTE
The overload caution system can only be activated when the lifting mode (L) is activated on the monitor panel.



Park brake pressure sensor (CN-P61)



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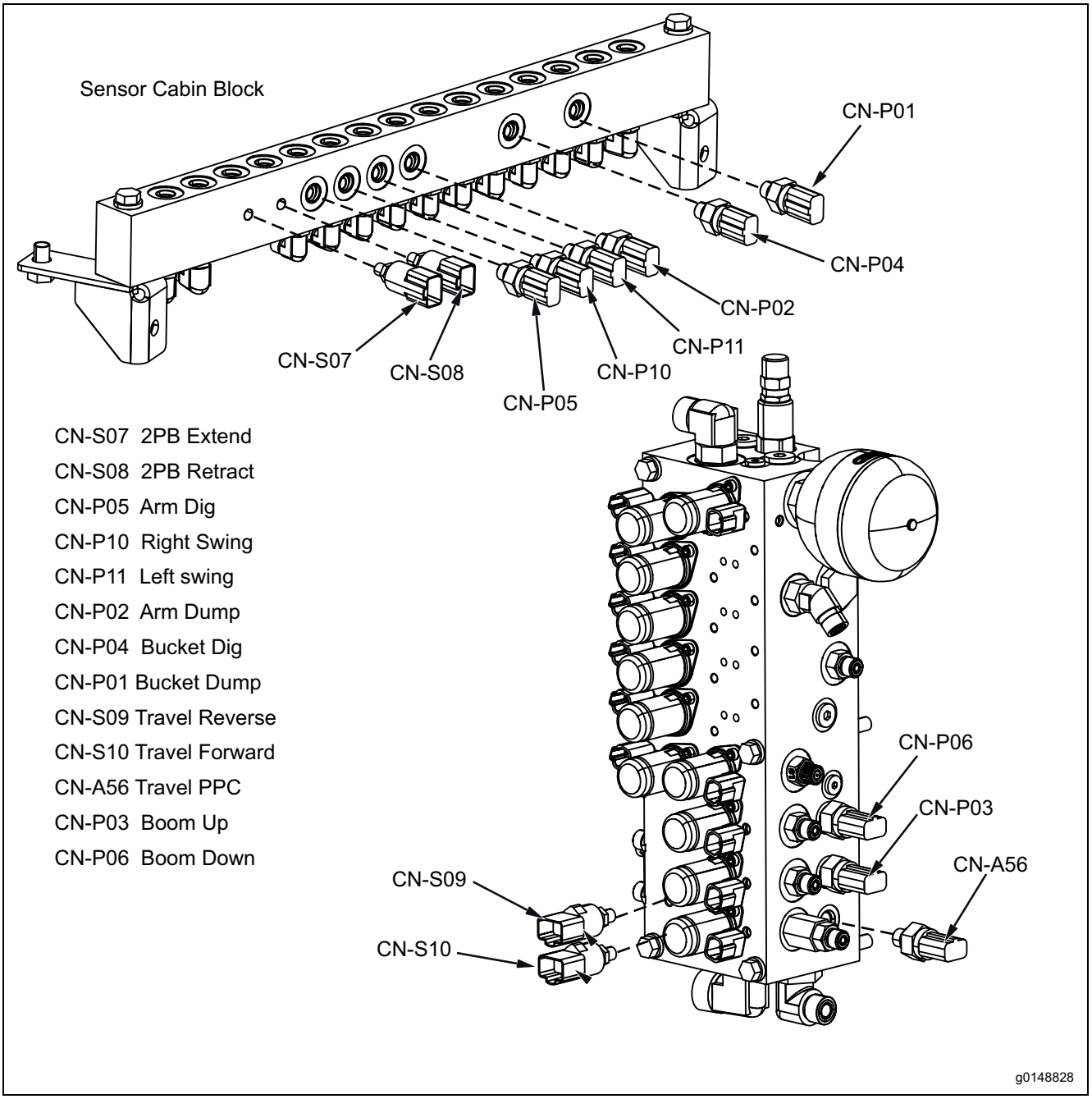
PPC pressure sensors



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Standard value table for chassis related parts

Engine speed

Machine model			PW180-11	
Engine			SAA6D107E-3	
Item	Measurement condition	Unit	Standard value for new machine	Repair limit
Engine speed at 2- pump relief	• Engine coolant temperature: 60 to 100 °C • Hydraulic oil temperature: 45 to 55 °C • Fuel control dial: MAX (High idle) position • Working mode: P (Power Mode) • Swing lock switch: ON • Arm IN relief	rpm	1700±100	1700±100
Engine speed at 2- pump relief + One-touch power maximizing is ON	• Engine coolant temperature: 60 to 100 °C • Hydraulic oil temperature: 45 to 55 °C • Fuel control dial: MAX (High idle) position • Working mode: P (Power Mode) • Arm IN relief + One-touch power maximizing ON	rpm	1950±100	1950±100
Speed when auto-decelera- tion is operated	• Engine coolant temperature: 60 to 100 °C • Fuel control dial: MAX (High idle) position • Auto-deceleration switch: ON • Each control lever and control pedal: NEUTRAL	rpm	1050±100	1050±100

SCR

Machine model			PW180-11	
Engine			SAA6D107E-3	
Item	Measurement condition	Unit	Standard value for new machine	Repair limit
AdBlue/DEF Pump Pres- sure Up Test	AdBlue/DEF Pump Pressure Up Test within approximately 200 seconds after starting the test	kPa	Min. 800	Min. 800
AdBlue/DEF Injection Quan- tity Test	AdBlue/DEF Injection Quantity Test Injection amount after the test	mℓ	100 (+7/-26)	100 (+7/-26)
AdBlue/DEF Line Heater Relay 1 Test	AdBlue/DEF Line Heater Relay 1 Test within approximate- ly 900 seconds after starting the test	V	24.5±1.5	24.5±1.5
AdBlue/DEF Line Heater Relay 2 Test	AdBlue/DEF Line Heater Relay 2 Test within approximate- ly 900 seconds after starting the test	V	24.5±1.5	24.5±1.5
AdBlue/DEF Pump Heater Relay Test	AdBlue/DEF Pump Heater Relay Test within approximate- ly 900 seconds after starting the test		V	24.5±1.5
AdBlue/DEF Tank heater valve test	AdBlue/DEF Tank Heater Valve Test within approximately 900 seconds after starting the test		V	24.5±1.5
SCR Denitra- tion Efficiency Test	SCR Denitration Efficiency Test monitor dis- play after the test	AdBlue/ DEF Injection Test	?	1 (Normal)
		SCR Effi- ciency Test Result		1 (Normal)

Test engine oil pressure

Testing tools for 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 in a stable posture, set the lock lever to LOCK position, and stop the engine.

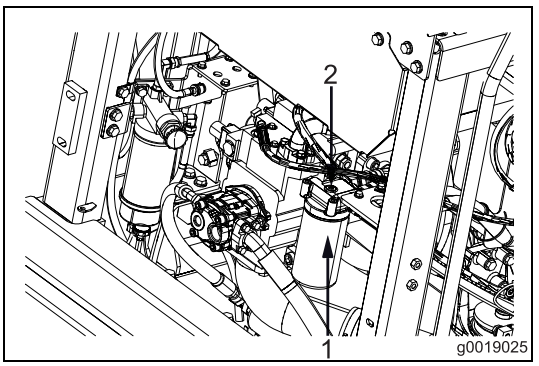
Test this item under the following conditions.

Engine coolant temperature: 60 to 100 °C

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

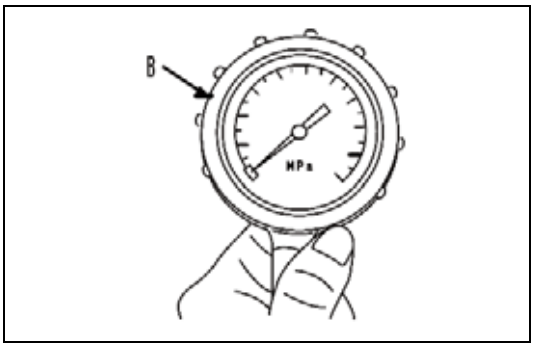
Method for testing engine oil pressure

1. Open the cover on the right side of the machine.
2. Remove the engine oil pressure pickup plug (1) on the upper part of engine oil filter.



3. Install the nipple A1 of hydraulic tester A, and connect them to gauge B.
4. Start the engine, and turn off the auto-decelerator switch.
5. Test the engine oil pressure with fuel control dial at MIN (Low idle) position and MAX (High idle) position.

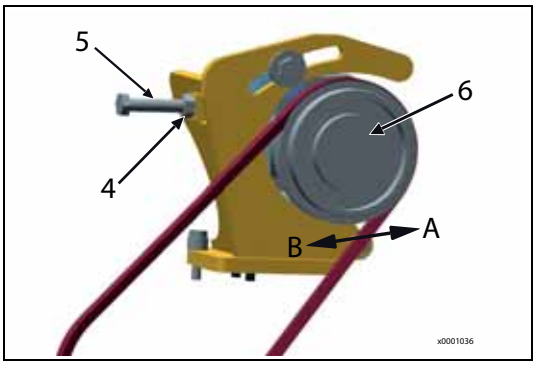
   For standard values, see STANDARD VALUE TABLE, “STANDARD VALUE TABLE FOR ENGINE”.



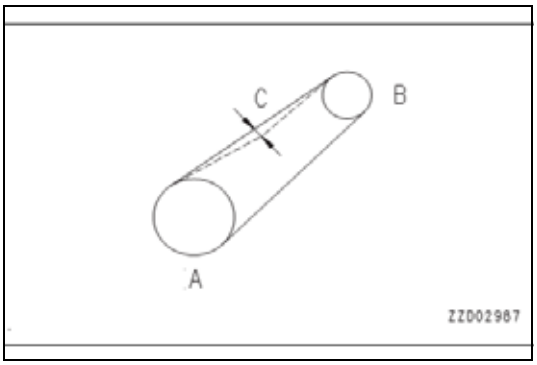
After finishing the test, remove the testing tools and restore the machine.

4. Loosen nut (4).
   Nut (4) is provided to prevent loosening of jack bolt (5).

5. Tighten jack bolt (5).
   Compressor (6) moves in direction (A), and the compressor belt is tensed.



6. Press the centre between drive pulley (A) and compressor pulley (B) with a finger (approximately 60 N {6.1 kgf}).
   If deflection (C) is 6 to 9 mm {0.24 to 0.35 in}, the belt tension is normal.
   If the deflection is out of the standard, adjust it to the standard value by repeating steps 4 and 6.



7. When the belt tension becomes appropriate, tighten bolts (3) (2 pieces) and fix it.

   Tightening torque:
   59 to 74 Nm{ 6.0 to 7.5 kgfm,43.4 to 54.2 lbft}

8. After tightening nut (4) until it touches the boss, then tighten it further in direction (B) to prevent it from loosening.

   Tightening torque:
   108 to 132 Nm {11.0 to 13.5 kgfm,79.6 to 97.6 lbft}

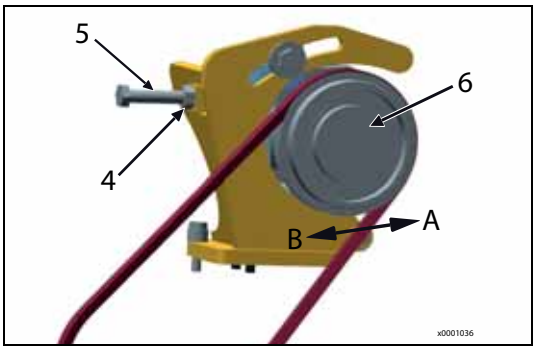
9. After fixing, check again that the belt tension is proper.
   Adjust it again if the tension is not within the proper range.

10. Check each pulley for damage, wear of the V-groove, and the wear of the V-belt. In particular, be sure to check that the V-belt is not touching the bottom of the V-groove.

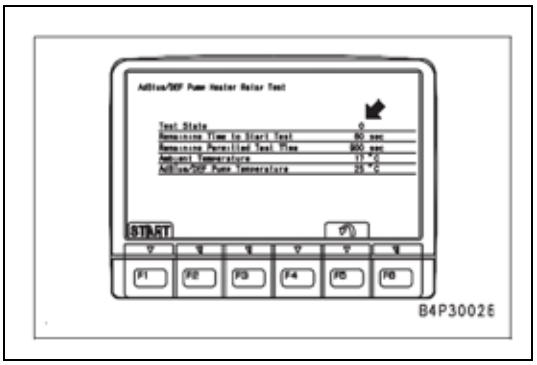
11. Replace the belt with a new one if the belt is stretched and has no allowance for adjustment, or has slipping sound or squeak because of cuts or cracks of the belt.

    NOTICE

    - When the new V-belt is installed, readjust it after operating for 1 hour.
    - When replacing the V-belt, be careful not to damage the electric wiring of the cooling fan.



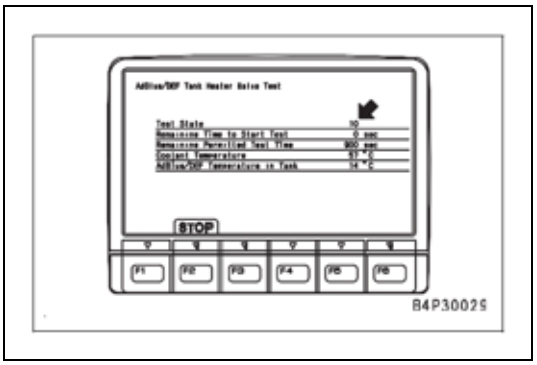
8. Check that “0” of “Test State” is flashing.



REMARK

Flashing of “0” indicates “Waiting for the start (default)”, and test can be performed. Display other than “0” appears, follow instructions according to “Parameter list of test state”.

9. Press F1 to start “AdBlue/DEF Pump Heater Relay Test”.
   F1: Starts “AdBlue/DEF Pump Heater Relay Test”.
   F2: Stops “AdBlue/DEF Pump Heater Relay Test”. (When “STOP” is displayed.)
   F5: Returns the screen to “SCR Service Test” screen.



NOTICE

- **“Test State” does not change to “10” and test does not start even if F1 is pressed, turn starting switch to OFF position once, and repeat the testing procedure from step 5.**
- **If you turn starting switch to OFF position by mistake during test, do not turn starting switch to ON position immediately. Check that system operating lamp is off, and turn starting switch to ON position again after engine controller shuts down.**
- **If KOMNET communication error remains less than 1 second, engine controller is unable to detect it, and the test may be continued while the machine monitor does not continue the test(standard screen). In that case, once the starting switch is turned to OFF position, system operating lamp goes out, and the engine controller shuts down to reset the test.**

REMARK

- Display of “Test State” changes to flashing of “10”, and display of “Remaining Time to Start Test” is counted down from “60” to “0 sec”.
- When the display of “Test State” is “11” to “41”, follow “Parameter list of test state”.
- When the display of “Remaining Time to Start Test” becomes “0 sec”, voltage will be outputted.
- The relay operates for 900 seconds at maximum, and the remaining operable time is displayed as “Remaining Permitted Test Time”. However, it stops operation automatically if the temperature of the pump reaches the upper limit to protect pump heater. It re-starts operation automatically when the temperature of the pump drops, and then turns ON and OFF repeatedly.
- Perform measuring when energization ON/OFF is not repeated to measure the stable voltage.
- When energization connection is repeatedly turned ON/OFF, press F2 and stop the test until pump temperature drops.
- When the sum of Remaining time to start test + Heater operating time exceeds 15 minutes after F1 is pressed, the test stops automatically.
- This check can be also performed by the following method; When AdBlue/DEF pump temperature is below 45°C, per-

Inspection and adjustment of pump LS differential pressure

- Pump LS control circuit oil pressure inspection and adjustment tools

Mark		Part No.	Part Name	No. Off
K	1	799-101-5002	Hydraulic Tester	2
		790-261-1203	Digital Type Hydraulic Tester	2
	2	799-101-5220	Grease Fitting (10 x 1.25 mm)	2
		07002-11023	O-ring	2
	3	799-401-1340	Differential Pressure Gauge	2

Measurement

- Measure pump LS control circuit oil pressure after confirming that the work equipment, swing and travel circuit oil pressure as well as control circuit original pressure are normal.

Lower the work equipment to the ground and stop the engine. After the engine is stopped, (but with the ignition switch in the ON position and safety lever still ENGAGED), operated the control levers several times to release the remaining pressure in the hydraulic system. Then loosen the oil filler cap to release any pressure in the hydraulic tank.

1. Measurement of LS differential pressure

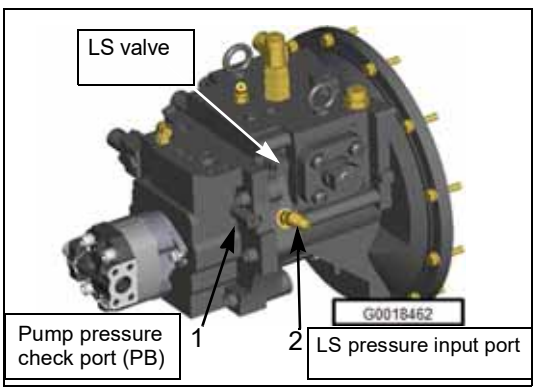
- LS differential pressure can be obtained by measuring pump delivery pressure and LS pressure (actuator loaded pressure) at the same time and computing the difference of both pressures.

a. Remove oil pressure measurement plugs (1) and (2).

- Plug (1): For measuring the pump delivery pressure
- Plug (2): For measuring the pump LS pressure

b. Fit tool **K2** to each port (1 and 2) connect each tool to oil pressure gauge of hydraulic tester **K1** or differential pressure gauge **K3**.

- When using a differential pressure gauge:
  Connect pump delivery pressure to the high pressure side and LS pressure to the low pressure side.
  A differential pressure gauge requires DC 12V power. Connect it with one battery.



c. Safety valve circuit

- Normally, air in the safety valve circuit is bled by swinging the machine in step 1. If abnormal sound comes out from around the safety valve during swinging operation, however, bleed air from the safety valve circuit according to the following procedure.

I. Loosen fittings (3) and start the engine.

II. Run the engine at low idle. After clear oil oozes out, tighten the fitting.

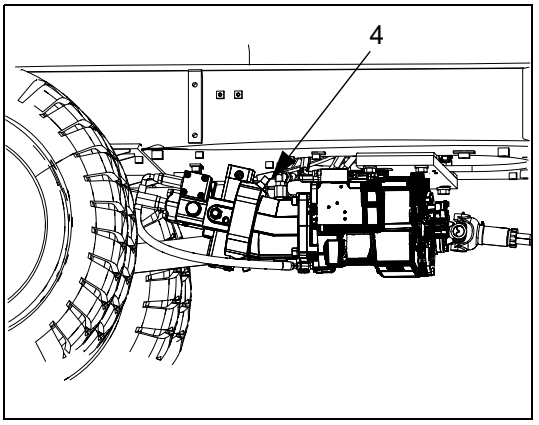
Plug:
9.8 - 12.74Nm {1.0 - 1.3kgfm}

5. Bleeding air from travel motor

a. Loosen motor drain hose fitting (4)

b. Run engine at low idle and repeat forward and reverse operations 4 or 5 times. After clear oil flows out, retighten the fitting.

- Limit the operation to the travel to a degree where the machine just starts to move.



6. Checking oil level and starting work

a. Run the engine, retract the arm cylinder and bucket cylinder to the stroke ends, lower the work equipment to the ground and stop the engine.

b. Check the oil level by the sight gauge at the back of the hydraulic tank.

- If the oil level is between lines H and L, it is normal.
- If the oil level is below line L, add new oil.

Pre-defined Monitoring (25/35) Fan clutch

No	ID	Item	Unit (SI)	Applicable component
1	01002	Engine Speed	r/min	ENG
2	10010	Fan Speed Command	r/min	PUMP
3	10007	Fan Speed	r/min	PUMP
4	10019	Fan Speed Deviation	r/min	PUMP
5	04107	Coolant Temperature	°C	ENG
6	04401	Hydraulic Oil Temperature	°C	PUMP

Pre-defined Monitoring (26/35) Engine status

No	ID	Item	Unit (SI)	Applicable component
1	01002	Engine Speed	r/min	ENG
2	18600	Inject Fuelling Command	mg/st	ENG
3	19200	Exhaust Gas Flow Rate	kL/h	ENG
4	47300	KDOC 1 Inlet Temperature	°C	ENG
5	19300	SCR Temperature	°C	ENG
6	19302	SCR Outlet Temperature	°C	ENG

Pre-defined Monitoring (27/35) AdBlue/ DEF Injector

No	ID	Item	Unit (SI)	Applicable component
1	47200	KDPF 1 Outlet Temperature	°C	ENG
2	19304	DEF Pump State	-	ENG
3	19120	DEF Injection Quantity	ml/sec	ENG
4	19205	SCR NH3 Concentration Corrected	ppm	ENG
5	19202	Turbo Outlet Nox Corrected	ppm	ENG
6	19209	SCR Outlet Nox Corrected	ppm	ENG

Pre-defined Monitoring (28/35) AdBlue/ DEF Pump

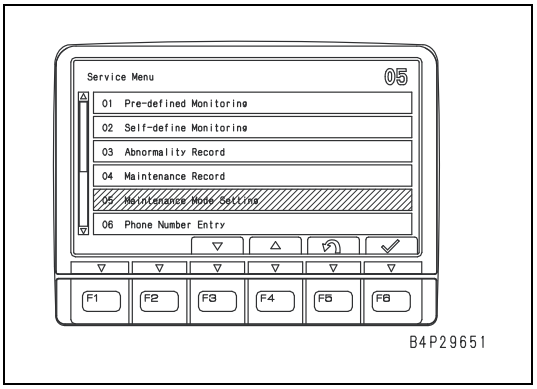
No	ID	Item	Unit (SI)	Applicable component
1	19120	DEF Injection Quantity	ml/sec	ENG
2	19108	DEF Pump Pressure	kPa	ENG
3	19109	DEF Pump Press Sensor Volt	V	ENG
4	19304	DEF Pump State	-	ENG
5	19136	DEF Pump Temperature	°C	ENG
6	19114	DEF Reverting Valve Cmd	-	ENG

Method for operating maintenance mode setting

- To enable or disable the function of maintenance items.
- To change the replacement interval setting of maintenance items (by item).
- To initialize all of the replacement interval setting of maintenance items.

1. Select “Maintenance Mode Setting” on the “Service Menu” screen.

   REMARK
   For the selection method, see “Operating method of service mode” in “SERVICE MODE”.



2. On the “Maintenance Mode Setting” screen, select the an item with the function switches or numeral input switches.

   F1: Moves to the next page

   F2: Returns to the previous page

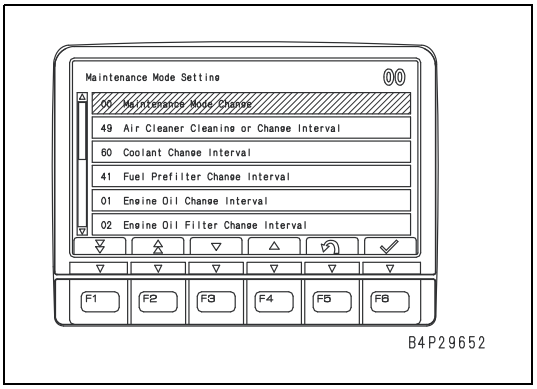
   F3: Moves the selected item down by one item

   F4: Moves the selected item up by one item

   F5: Returns to the “Service Menu” screen

   F6: Enters the selected item

   REMARK
   Input a code (2-digit) with the numeral input switches to directly select the item.



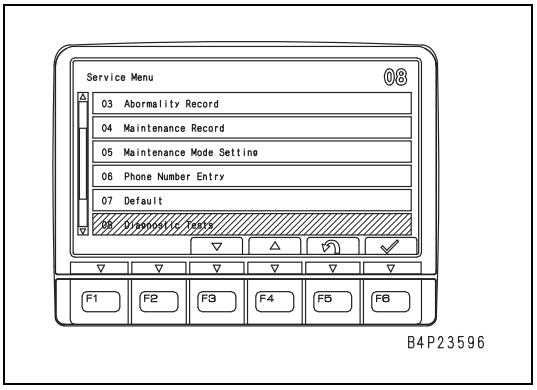
Method for operating testing menu (regeneration for service)

Use the testing menu to check the machine or to reset the settings of machine monitor.

The “Active Regeneration for Service” function is used to regenerate the aftertreatment devices for purification (oxidation).

1. Select “Diagnostic Tests” from the “Service Menu” screen.

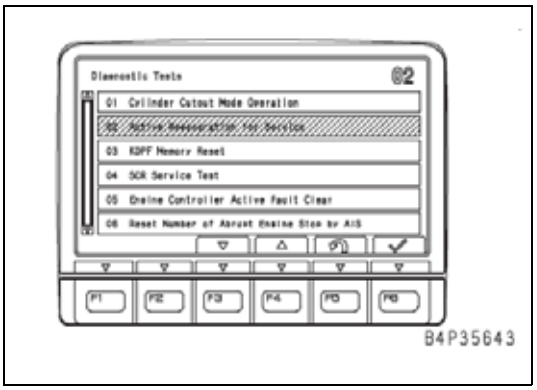
   REMARK
   For the selection method, see “Operating method of service mode” in “SERVICE MODE”.



2. On the “Diagnostic Tests” screen, select “Active Regeneration for Service” with function switches or numeral input switches.

   REMARK

   - For the selection method, see “Operating method of service mode” in “SERVICE MODE”.
   - When the manual stationary regeneration has been performed or stopped while the aftertreatment devices regeneration has also been performed, “Active Regeneration for Service” cannot be selected.

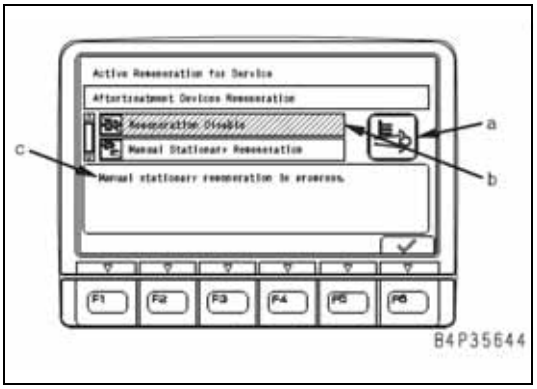


3. When the “Active Regeneration for Service” screen is displayed, the following information is displayed corresponding to regeneration process. Set up the aftertreatment devices regeneration according to the given messages.

   a: Regenerating aftertreatment devices

   b: Selectable items

   c: Message



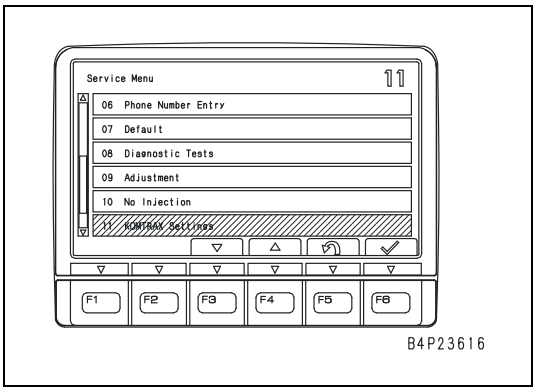
Machine side inspection for KOMTRAX Communication opening

- KOMTRAX Communication Inspection must be done to check whether normal communication is available from the terminal when the KOMTRAX terminal is replaced or started up.
- By performing this inspection, KOMTRAX starts communication.
- GPS and data communication are checked during the KOMTRAX Communication Inspection. Accordingly, it is preferable to place the machine under the open sky where radio wave from the satellite is not blocked. The opening inspection may not be completed when the machine is placed indoor where radio wave from the satellite is blocked.

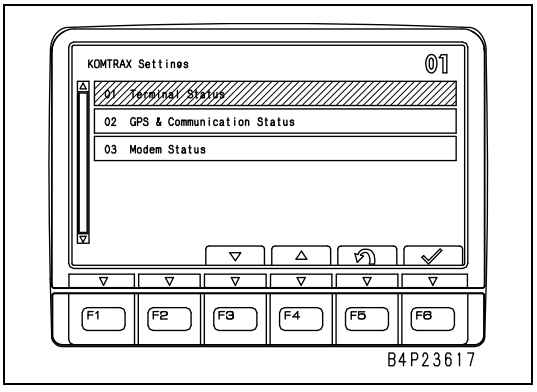
1. Check the machine for KOMTRAX Communication Inspection

   Observe the following when checking if KOMTRAX Communication Inspection is required or not.

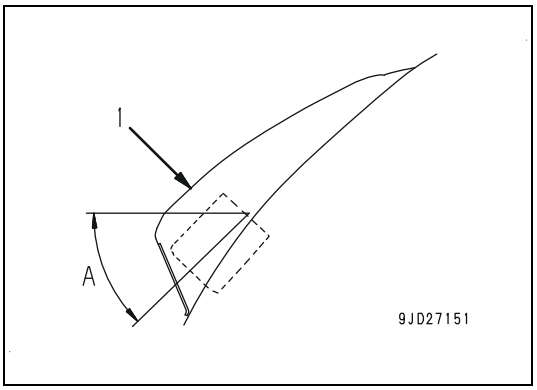
   1) On “Service Menu” screen, select “KOMTRAX Settings” with function switches or numeral input switches.



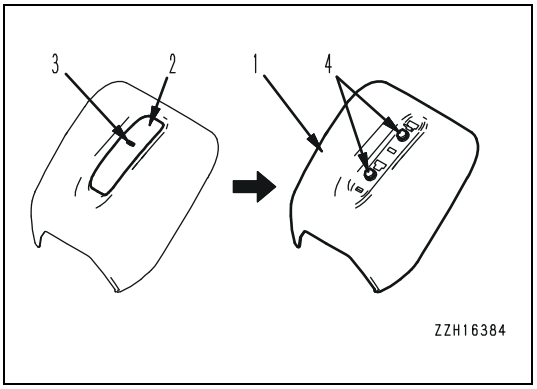
   2) On “KOMTRAX Settings” screen, select “Terminal Status” with the function switches or numeral input switches.

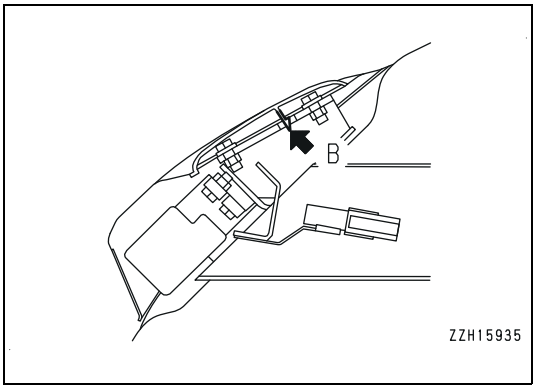


If the image on the monitor is not aligned correctly, adjust the mounting angle (A) of the rearview camera in the following procedure.
Angle (A) can be adjusted within the range from 44° to 46°.



1. Insert a flat-head screwdriver or the like into the hole (3) of cover (2) and push the inside tooth (B) to remove the cover.
2. Remove the bolts (4) (2 places).

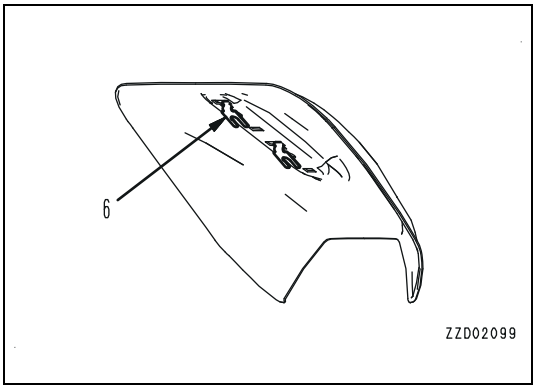


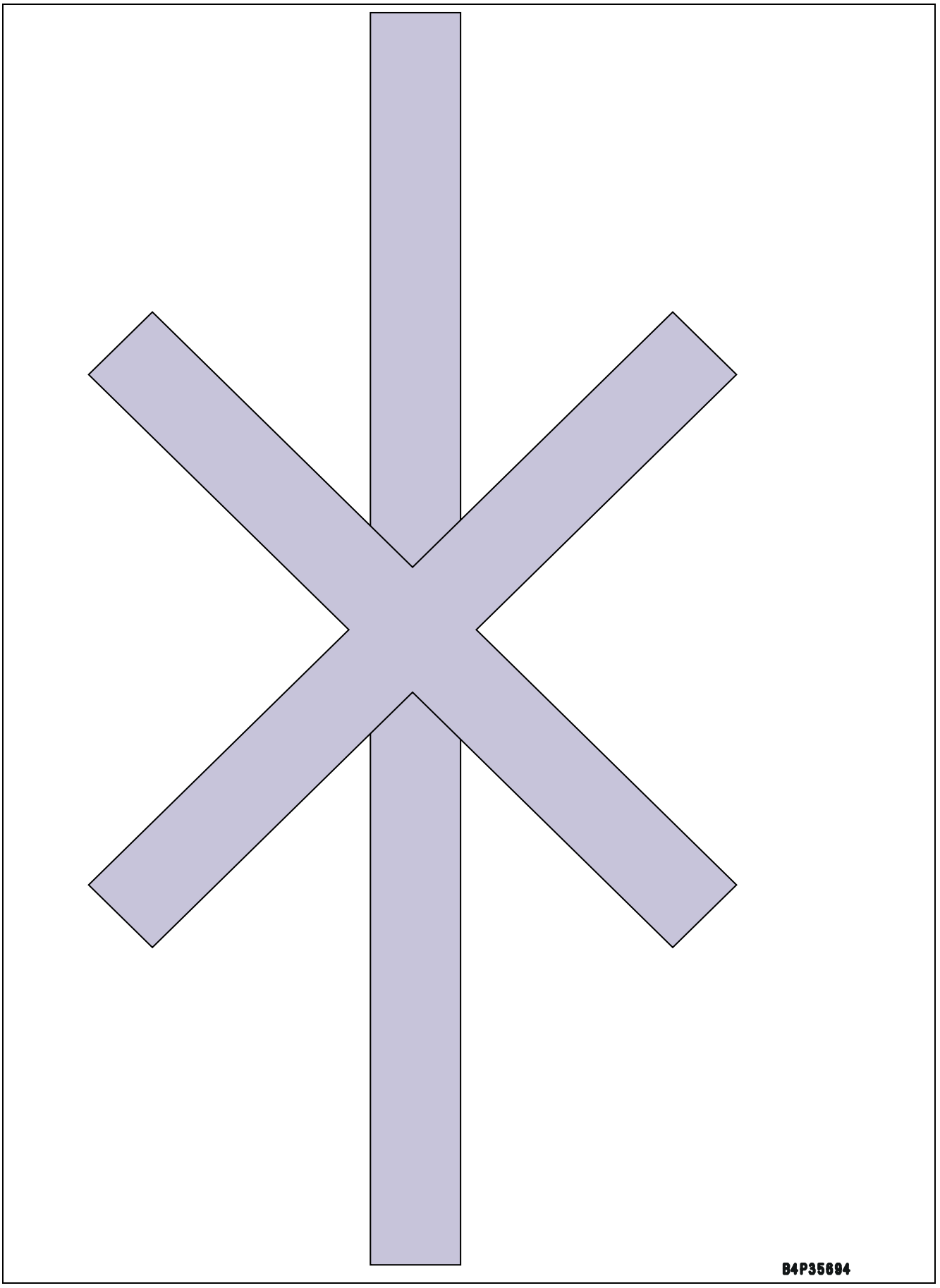


3. Remove the cover (1).

REMARK

- Shim (6) may be inserted in the cover mounting bolts to adjust the clearance in the rim of the cover. When removing the cover (1), record the positions and quantities of the shims. When installing the cover, insert the shims according to the record.
- Take care of shim (6), since it comes off together with over (1).

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Electrical equipment

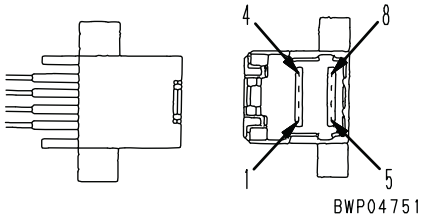
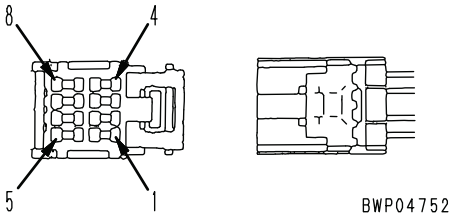
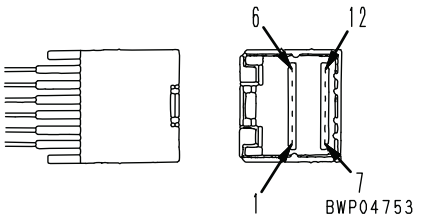
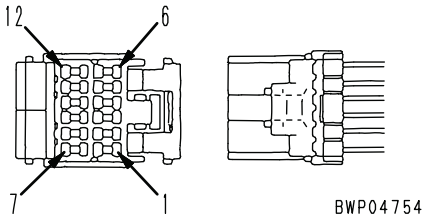
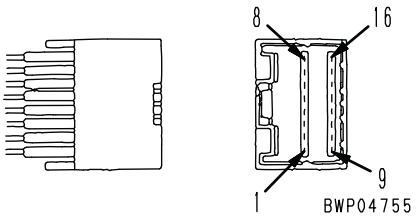
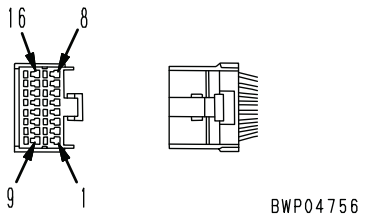
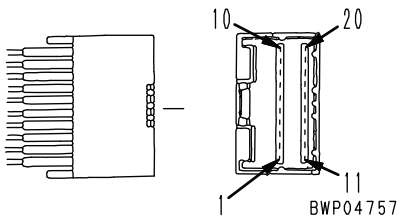
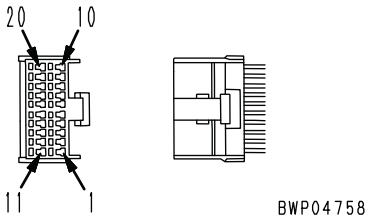
No.	Item	Criteria	Remedy
1	Check of battery terminal for looseness and corrosion	-	Retighten or replace
2	Check of alternator terminal for looseness and corrosion	-	Retighten or replace
3	Check of starting motor terminal for looseness and corrosion	-	Retighten or replace
4	Check of battery voltage (with engine stopped)	20 to 30 V	Charge or replacement
5	Check of battery electrolyte level	Between H and L	Refill or replacement
6	Check of wiring harness for discoloration, burnt areas and cover peeling	-	Replacement or repair
7	Check for coming off of wiring harness clamp and sagging of wiring harness	-	Repair
8	Check of grounding	-	Repair
9	Check for loose connector and damaged lock	-	Replacement or repair
10	Check of connector pin for corrosion, bends and AdBlue/ DEFormation	-	Replacement or repair
11	Check of connector for water and foreign material	-	Drying, cleaning or replacement
12	Check of wiring harness for open or short circuit	-	Replacement or repair
13	Check of fuse for blowing out and corrosion	-	Replacement
14	Check of alternator voltage (when engine speed is medium or higher)	27.5 to 29.5 V after few minutes operation	Replacement
15	Check of battery relay operation sound (when starting switch is turned to ON or OFF position)	-	Replacement
16	Check and cleaning of camera	-	Cleaning or repair

Exterior

No.	Item	Criteria	Remedy
1	Check of wheel nuts	-	Retighten or replace
2	Check of tyres and wheel rims condition	-	Replace
3	Check handrails and steps	-	Repair
4	Check mirrors	-	Clean or repair

Interior

No.	Item	Criteria	Remedy
1	Check gauges and monitors	-	Clean or replace
2	Check seat belt	-	Replace
3	Check brake pedal	-	Clean

No. of pins	AMP040 type connector		
	Male (female housing)	Female (male housing)	Testing connection use special tool Part No.
8			799-601-7180 (T-adapter)
	—	Housing part No. : 79A-222-3430 (Q'ty:5)	
12			799-601-7190 (T-adapter)
	—	Housing part No. : 79A-222-3440 (Q'ty:5)	
16			799-601-7210 (T-adapter)
	—	Housing part No. : 79A-222-3450 (Q'ty:5)	
20			799-601-7220 (T-adapter)
	—	Housing part No. : 79A-222-3460 (Q'ty:5)	

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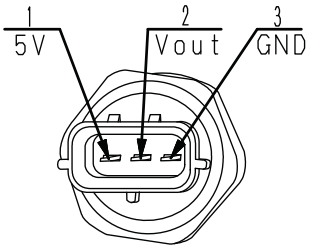
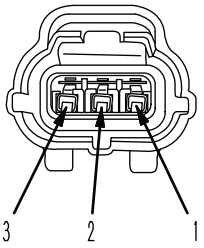
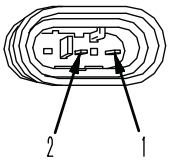
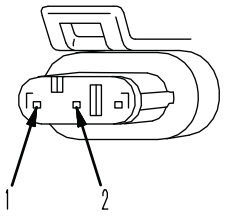
AMP connelor for engine

No. of pins	Common rail (fuel) pressure sensor (95, 125, 140 engine)		
	Sensor side (plue)	Harness side (receptacle)	Testing connection use special tool Part No.
3			799-601-9420 (T-adapter) (kit:799-601 -4101) (kit:799-601 -4201)
	—	—	

No. of pins	Turbocharger speed sensor (107, 114 engine)		
	Sensor side (plue)	Harness side (receptacle)	
3			799-601-4660 (Socket) (kit:799-A65 -4600)
	☆ Without pin (3)	☆ Without pin (3)	

B4W21625

In case of KDOC cleaning or change

- When breakage or damage is found in check.
  1. When damage or crack is found in KDOC, change KDOC.
  2. From “Service menu” of machine monitor, display “Diagnostic Tests” screen, and perform reset of “KDOC Change” from “KDPF Memory Reset” screen.
- When Defective Regeneration [CA1691] is displayed
  1. Stop the machine and check that failure code [CA1691] is displayed on the machine monitor. ([CA2637] may be displayed at the same time.)
  2. Check exhaust gas color of the engine.
  3. Stop the engine, wait for the piping around the engine to be cooled down, and remove KDOC, and then check it for damage or crack.
  4. When crack or damage is found in KDOC
     I. Replace KDOC.
     II. From “Service menu” of machine monitor, display “Diagnostic Tests” screen, and perform reset of “KDOC Change” from “KDPF Memory Reset” screen.
  5. When crack or damage is not found in KDOC
     I. Clean KDOC and install it again.
     II. From “Service menu” of machine monitor, display “Diagnostic Tests” screen, and perform reset of “KDOC Change” from “KDPF Memory Reset” screen.
     III. Perform “Active Regeneration for Service” twice. (The fuel is injected during regeneration.)

     REMARK

     When “Active Regeneration for Service” is performed continuously, stop the engine once.
     Engine controller stops after starting switch is turned to OFF position and AdBlue/DEF is retracted (for up to 6 minutes). So when you restart engine, wait for the system operating lamp to go out after starting switch is turned OFF, and then turn the starting switch to ON position.
     IV. If “[CA2637]: KDOC Face Plugging” is displayed after performing “Active Regeneration for Service”, KDOC efficiency is decreased, so replace KDOC.

Failure code [879GKX] – Refrigerant abnormality

Action level	Failure code	Failure	Refrigerant Pressure Input Signal Out of Range (Machine monitor system)
L01	**879GKX**		
Detail of failure	Air conditioner controller detected that dual pressure switch is OFF (abnormal).		
Action of controller	• Air conditioner controller transmits abnormality information of refrigerant pressure to machine monitor by CAN communication. • Air conditioner controller turns OFF compressor clutch relay since refrigerant pressure is abnormal. (Air conditioner compressor stops)		
Problem on machine	Air conditioner does not function (in cooling mode).		
Related information	• Check if this failure code is displayed on electrical system failure record screen in service mode of machine monitor. • For each connector, see 80 APPENDIX, “Installation locations of air conditioner parts and arrangement of connectors”. • Since air conditioner controller connector ACECU has no T-adapter and has small pins, perform troubleshooting by using intermediate connector (although intermediate connector has no T-adapter either, it has large pins). • When replacing air conditioner harness between air conditioner controller connector ACECU and intermediate connector, replace air conditioner unit. • T-adapter is not provided for connectors of dual pressure switch. • 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 refrigerant (dual) pressure switch	See 80 APPENDIX, “TEST (DUSL) PRESSURE SWITCH FOR REFRIGERANT”. ⚠ **Before replacing dual pressure switch, collect refrigerant. See 80 APPENDIX, “PRECAUTIONS FOR REFRIGERANT”.**		
2	Open circuit in wiring harness (wire breakage or defective contact of connector)	1. Turn starting switch to OFF position. 2. Disconnect connectors AC01 and P17.		
		Resistance	Between P17 (female) (1) and AC01 (female) (6)	Max. 1 Ω
			Between P17 (female) (2) and ground	Max. 1 Ω
3	Defective air conditioner controller	If failure code is still displayed after above checks, air conditioner controller is defective. (In case of an internal defect, troubleshooting is impossible as an assembly Replace whole assembly.)		
4	Defective air conditioner unit	If failure code is still displayed after above checks, air conditioner unit may be defective. (In case of an internal defect, troubleshooting is impossible as an assembly Replace whole assembly.)		

Failure code [AS10NR] – AdBlue/DEF injector high temperature warning

Action level	Failure code	Failure	AdBlue/DEF Injector High Temperature Warning (Engine controller system)
—	**AS10NR**		
Detail of failure	The temperature of the AdBlue/DEF injector may become so high that it is damaged, so the output is limited.		
Action of controller	• Changes to output limitation		
Phenomenon on machine	• Engine power deration		
Related information	• This may occur if a heavy load operation is performed for a long time during AdBlue/DEF thawing. • This may occur if a heavy load operation is performed for a long time when an error related to SCR system occurs. • If the engine coolant temperature is high, the cooling capability of the AdBlue/DEF injector is degraded and a warning may appear. • If the ambient temperature sensor and engine room temperature sensor shows different values (values much lower than the actual temperature), unnecessary thawing control is applied and a warning may appear. • This failure code is a warning for equipment protection and does not indicate any failures. • Both failure code and output limitation are cleared by turning OFF and ON the starting switch.		

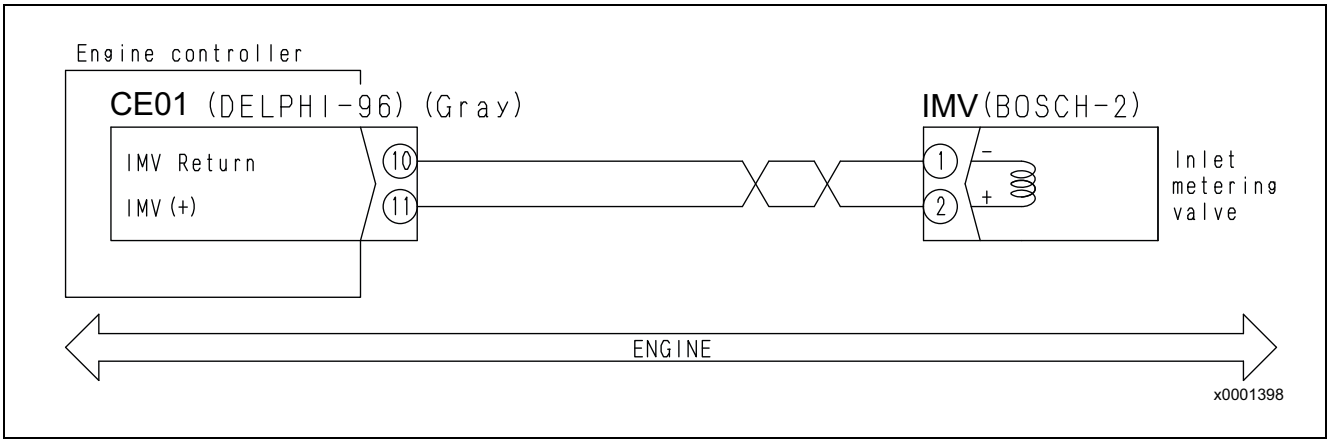
No.	Cause	Procedure, measuring location, criteria and remarks
1	Occurrence of an error related to SCR components (error that stops AdBlue/DEF injection)	Confirm if an error that stops AdBlue/DEF injection is displayed. If displayed, perform a cancellation process.
2	Rising coolant temperature (degraded radiator capability)	Check the radiator condition if the radiator shutter prevents the coolant from working properly, or the radiator is clogged. Correct so that the radiator cooling capability works sufficiently.
3	Defective ambient temperature sensor	Turn the starting switch to ON position.
		If the temperature sensed by ambient temperature sensor is significantly low com- pared to the actual temperature, the ambient temperature sensor is defective.
4	Defective engine room temperature sensor	1. Turn starting switch to ON position. 2. Open the pump side cover and wait for 5 minutes.
		If the temperature sensed by engine room temperature sensor is significantly low compared to the actual temperature, the engine room temperature sensor is defective.
5	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.)

Failure code [CA153] – Charge air temperature sensor high error

Action level	Failure code	Failure	Charge Air Temperature Sensor High Error (Engine controller system)
L03	**CA153**		
Details of failure	High voltage occurs in signal circuit of charge (boost) temperature sensor.		
Action of controller	• Sets charge temperature (boost temperature) to fixed value (70 °C) for operation. • EGR valve closed. • Engine power deration • Regeneration control stops.		
Phenomenon on machine	• Engine start ability becomes poor in low temperature. • Engine power deration		
Related information	• Signal voltage from charge temperature sensor (boost temperature sensor) can be checked by monitoring function. (Code: 18501 (V)) • Temperature sensed by charge temperature sensor (boost temperature sensor) can be checked with monitoring function. (Code: 18500 (°C)) • After repairing, check if the failure code is cleared by the following procedure. Procedure: Turn starting switch to ON position. • Because female connector alone is provided in “Socket” for troubleshooting for this sensor, socket cannot be connected to female connector on wiring harness side of sensor and check for wire breakage cannot be performed (T-adapter is not provided). • This failure code is displayed when temperature sensor connector is disconnected. • Engine power deration is cancelled by turning starting switch to OFF position after this failure code is cleared (note the engine power deration is not cancelled right after the failure code is cleared).		

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. Turn starting switch to ON position.			
		If this failure code is cleared, wiring harness connector is defective.			
2	Defective charge temperature sensor	1. Turn the starting switch to OFF position. 2. Disconnect the connector BPT, and connect the socket to male side **REMARK** Regard the charge temperature sensor as normal if its resistance is 80 Ω to 48 kΩ.			
		Resistance	Between BPT (male) (3) and (4) Charge thermal characteristics	-40 °C	41 to 48 kΩ
				-20 °C	14 to 16 kΩ
				0 °C	5.4 to 6.1 kΩ
				30 °C	1.6 to 1.8 kΩ
				60 °C	500 to 600 Ω
				90 °C	230 to 250 Ω
				130 °C	80 to 90 Ω
3	Open or short circuit in wiring harness	1. Turn the starting switch to OFF position. 2. Disconnect the connector CE01, and connect the T-adapter to female side.			
		Resistance	**REMARK** Use charge temperature sensor resistance characteristics table for check on cause 2 as resistance value between CE01 (female) (62) and (54).		80 Ω to 48 kΩ

Circuit diagram related to IMV/PCV1



Failure code [CA429] – Water in fuel sensor low error

Action level	Failure code	Failure	Water in Fuel Sensor Low Error (Engine Controller System)
L01	**CA429**		
Detail of failure	Low voltage is detected in signal circuit of water-in-fuel sensor installed to fuel prefilter.		
Action of controller	None in particular		
Phenomenon on machine	Water separator monitor is not displayed properly		
Related information	• Connectors of electrical parts around engine may be defective due to heat and vibration. See descriptions of wiring harness and connectors in “Electrical equipment” in “CHECKS BEFORE TROUBLESHOOTING” of “RELATED INFORMATION ON TROUBLESHOOTING”, and check it. • State (ON/OFF) of water-in-fuel sensor signal can be checked with monitoring function. (Code: 18800 State of WIF 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 fuel prefilter water sensor	1. Turn the starting switch to OFF position. 2. Disconnect connector P47 and connect T-adapter to female side. **REMARK** If water is accumulated in the fuel prefilter, remove the water accumulated.		
		Resistance	Between P47 (female) (2) and (1)	10 to 100 kΩ
			Between P47 (female) (2) and ground	Min. 100 kΩ
2	Short circuit or ground fault in wiring harness	1. Turn starting switch to OFF position. 2. Disconnect connector CE02 and connect T-adapter to female side of connector.		
		Resistance	Between CE02 (female) (13) and (32) (water-in-fuel sensor resistance)	10 to 100 kΩ
			Between CE02 (female) (13) and ground	Min. 1 Ω
3	Short circuit in wiring harness	1. Starting switch: OFF 2. Disconnect connectors CE02 and P47, and connect T-adapter to female side of CE02.		
		Continuity	Between CE02 (female) (13) and each pin other than pin (13)	No continuity (no sound)
4	Ground fault in wiring harness	**REMARK** If no failure is found in cause 2, this troubleshooting is not required. 1. Turn the starting switch to OFF position. 2. Disconnect connectors CE02 and P47, and connect T-adapter to either female side of CE02 or male side of P47		
		Resistance	Between ground and either CE02 (female) (13) or P47 (male) (2)	Min. 100 kΩ

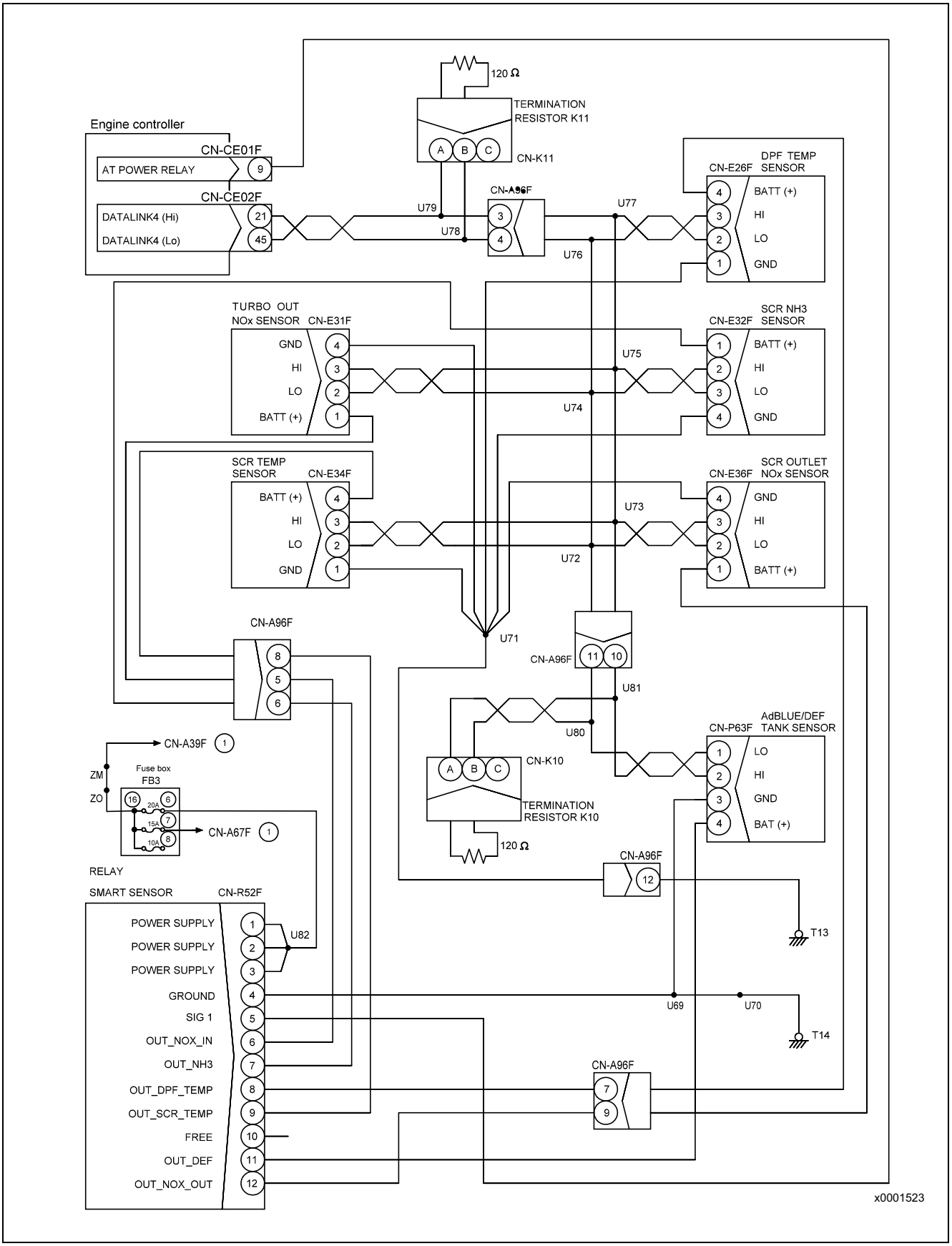
Blank for technical reason

Failure code [CA1682] – AdBlue/DEF pump priming error

Action level	Failure code	Failure	AdBlue/DEF pump priming error (Engine controller system)
L01	**CA1682**		
Detail of failure	The pressure cannot be raised for preparation of AdBlue/DEF injection due to damage, clogging, etc. of the AdBlue/DEF pump or hose.		
Action of controller	• AdBlue/DEF pump stop • Advances to Inducement strategy.		
Phenomenon on machine	• NOx emission increases because AdBlue/DEF injection is disabled. • Engine output is reduced based on Inducement strategy.		
Related information	• The engine controller does not display this failure code during thawing control of the AdBlue/DEF supply system (AdBlue/DEF injection is disabled, which disables judgment). • Make sure that the value of the following 4 states are other than 1 (thawing) 3 minutes after the engine is started. (It is not possible to troubleshoot this failure until thawing control is completed.) • The state of each heater is 1: Thawing, 2: Warming, or 0: OFF. Enter the following numbers directly and confirm the values on the monitoring code screen. 19305 AdBlue/DEF Tank Heating State 19306 AdBlue/DEF suction and purge line heater state 19307 AdBlue/DEF pressure line heater state 19308 AdBlue/DEF pump heater state • This failure code is cleared on the AdBlue/DEF pump “Pre-defined Monitoring” screen if the AdBlue/DEF pump pressure rises to around 900 kPa. • The associated values can be confirmed on the following screen. (The values can also be confirmed on the monitoring code screen by entering the numbers directly.) • The “Pre-defined Monitoring” screen. (The following numbers are the monitoring codes) AdBlue/DEF pump diagnosis 19304 AdBlue/DEF pump state 19108 AdBlue/DEF Pump Pressure 19136 AdBlue/DEF Pump Temperature 19109 AdBlue/DEF Pump Pressure Sensor Voltage 19120 AdBlue/DEF Injection Quantity **NOTICE** **This failure code requires “Loaded Diagnostics Operation To Clear Failure Code”. After investigating the cause of the problem and completing the repair, perform “Loaded Diagnostics Operation To Clear Failure Code” to make sure the failure code is cleared. (This failure code is not cleared by only turning ON the starting switch again.)**		

No.	Cause	Procedure, measuring location, criteria and remarks
1	Defective AdBlue/DEF pump system	If failure code [CA3558] or [CA3559] or [CA3571] or [CA3572] is displayed on the abnormality record screen, perform troubleshooting these first.
2	Open circuit or short circuit in AdBlue/DEF line heater 1	If failure code [CA3713] or [CA5115] is displayed on the abnormality record screen, perform troubleshooting these first.
3	Defective AdBlue/DEF pump temperature sensor system	If failure code [CA2976] is also displayed, perform checks on causes 2 and after in troubleshooting for this failure code.
4	Defective AdBlue/DEF level sensor system	If failure code [CA1669] or [CA3868] or [CA4732] or [CA4739] or [CA4769] is displayed, perform troubleshooting these first.
5	Low AdBlue/DEF level	If failure code [CA1673] or [CA3497] or [CA3498] or [CA3547] is displayed, trouble- shoot for those codes first. If the level is low, replenish AdBlue/DEF until it can be seen in the sight gauge, and then “Loaded Diagnostics Operation To Clear Failure Code”.
6	Damaged AdBlue/DEF hose, AdBlue/DEF leakage at connection	If crystallized AdBlue/DEF is adhered to the surrounding of hose, tank, pump, or engine compartment, it shows AdBlue/DEF may be leaking. Refer to “TESTING AND ADJUSTING”, “SETTING AND OPERATION OF MACHINE MONITOR”, “METHOD FOR SETTING WITH TESTING MENU (SCR SERVICE TEST)” to perform AdBlue/DEF Pump Pressure Up Test and find the location of the AdBlue/DEF leak. Replace parts as necessary.

Circuit diagram related to sensor power supply relay circuit



<table>
<tr><th>No.</th><th>Cause</th><th>Procedure, measuring location, criteria and remarks</th></tr>
<tr><td>3</td><td>Defective KDPF (KCSF) (abnormal accumulation of soot)</td><td>If the actual accumulation of soot is less than the indicated value on the machine monitor:

1. Perform checks on causes 4 to 7.
2. Turn the starting switch to ON and perform “KDPF Cleaning” reset (see “PRECAUTIONS FOR KDPF (KCSF, KDOC) CLEANING AND CHANGE”).
Make sure that failure code [CA1922] changed to [CA1921].
If failure code [CA1922] persists, check the operation procedure for “KDPF Memory Reset” Reset, then perform “KDPF Cleaning” Reset again.(see “PRECAUTIONS FOR KDPF (KCSF, KDOC) CLEANING AND CHANGE”)

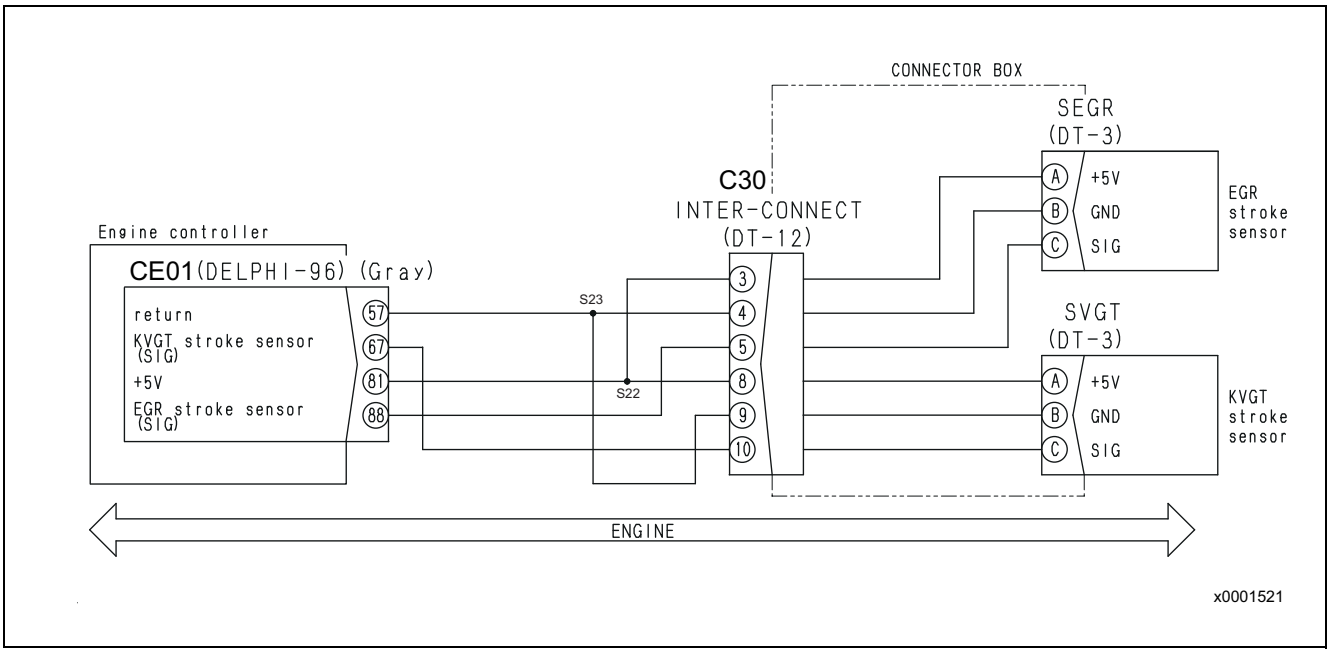
NOTICE
Do not perform “KDOC Change” (resetting KDOC Change) if KCSF or KDOC is not changed.
3. Start the engine.
4. Secure the safety of the machine.
5. Perform “manual stationary regeneration” in user mode.
When the manual stationary regeneration is finished correctly, the repair is completed.
If failure code [CA1922] is displayed again within 1 hour after starting the manual stationary regeneration, perform steps 2 and 3 again.
If the regeneration is not completed after 3 hours, perform troubleshooting for [CA2639].
Check that the failure code is cleared after manual stationary regeneration is complete.
If failure code [CA1922], [CA1921] or [CA2639] is displayed after manual stationary regeneration is complete, perform checks on cause 8.</td></tr>
<tr><td>4</td><td>Defective KDOC inlet temperature sensor</td><td>If failure code [CA3313], [CA3314] or [CA3315] is displayed, perform troubleshooting for [CA3313], [CA3314] or [CA3315].</td></tr>
<tr><td>5</td><td>Defective KDOC outlet temperature sensor</td><td>If failure code [CA3316], [CA3317] or [CA3318] is displayed, perform troubleshooting for [CA3316], [CA3317] or [CA3318].</td></tr>
<tr><td>6</td><td>Defective KDPF outlet temperature sensor</td><td>If failure code [CA3319], [CA3321] or [CA3322] is displayed, perform troubleshooting for [CA3319], [CA3321] or [CA3322].</td></tr>
<tr><td>7</td><td>Defective KDPF differential pressure sensor (including the sensor tube)</td><td>1. Turn starting switch to ON position.
2. Monitor the differential pressure by using KDPF differential pressure sensor on Self-define Monitoring screen of the machine monitor.
<table><tr><td>Code</td><td>47100 (kPa)</td><td>0±3 kPa</td></tr></table>NOTICE
Perform the following when differential pressure is not within the above range:

1. Remove KDPF differential pressure sensor tube.
2. Clean and unclog the KDPF differential pressure sensor tube.
Perform this when the KDPF differential pressure sensor tube is not clogged.
3. Check “Short circuit in wiring harness” for failure code [CA1881] or [CA1879] (change the KDPF differential pressure sensor if no short circuit is found).</td></tr>
<tr><td>8</td><td>Defective exhaust gas color</td><td>• If failure code [CA1921], or [CA2639] is displayed after manual stationary regeneration is complete, perform the following:
• See “TEST EXHAUST GAS COLOR” section in “Chapter 30 TESTING AND ADJUSTING” for checking the exhaust gas color.
• Perform regeneration disable on the machine monitor to check the exhaust gas color.

1. Suddenly accelerate the engine from low idle to high idle two times, and then keep the engine running at high idle speed for 5 seconds.
If an excess black smoke is seen at high idle speed during acceleration, perform “KDPF GETS CLOGGED IN A SHORT TIME” of S mode.
Even excessive black smoke is exhausted during engine acceleration, if it is not at engine high idle, it is not defective.
2. To finish the exhaust gas color check, cancel the regeneration disable.
3. Make sure that the failure code is cleared.</td></tr>
</table>

6	Open circuit in wiring harness (wire breakage of GND line or defective contact of connector)	1. Turn starting switch to OFF position. 2. Disconnect connectors C30 and CE01, and connect T- adapters to each female side.		
		Resistance	If power supply voltage in check on cause 2 is normal, this check is not required. Between CE01 (female) (81) and C30 (female) (8)	Max. 10 Ω
			If power supply voltage in check on cause 2 is normal, this check is not required. Between CE01 (female) (57) and C30 (female) (9)	Max. 10 Ω
			Between CE01 (female) (67) and C30 (female) (10) (sensor output)	Max. 10 Ω
7	Ground fault in wiring harness (contact with ground circuit)	1. Turn starting switch to OFF position. 2. Disconnect connectors CE01 and SVGT, and connect T-adapter to either female side.		
		Resistance	Between CE01 (female) (67) and ground, or between C30 (female) (10) and ground	Min. 100 kΩ
8	Short circuit in wiring harness	1. Turn starting switch to OFF position. 2. Disconnect connectors CE01 and C30, and connect T- adapter to either female side.		
		Resistance	Between CE01 (female) (67) and (57), or between C30 (female) (10) and (9)	Min. 100 kΩ
9	Defective VGT position sensor	If no failure is found in causes 1 through 8 but found in cause 9, the sensor is defective. 1. Turn starting switch to OFF position. 2. Insert T-adapter into connector CE01 or SVGT. 3. Turn starting switch to ON position.		
		Voltage	Between CE01 (67) and (57), or between SVGT (C) and (B)	1.0 to 4.0 V
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 (VGT position sensor)



Failure code [CA3133] – KDPF outlet pressure sensor high error

Action level	Failure code	Failure	KDPF outlet pressure sensor high error (Engine controller system)
L03	**CA3133**		
Detail of failure	High voltage is generated in signal circuit of KDPF outlet pressure sensor.		
Action of controller	Drives KDPF outlet pressure sensor at estimated value (gauge pressure). (Operates at 0 kPa (gauge pressure) if other failure code is displayed at the same time).		
Phenomenon on machine	None		
Related information	**⚠ KDPF is heated to 500 °C or higher. Be careful not to get burn injury.** • KDPF differential pressure sensor and KDPF outlet pressure sensor are provided as a unit. • If failure code [CA1695] is not displayed but failure code [CA1879] is on screen, ground line probably has open circuit (defective contact of connector). • Signal voltage from KDPF outlet pressure sensor can be checked with monitoring function. (Code: 47001 (V)) • Differential pressure detected by KDPF outlet pressure sensor can be checked with monitoring function. (Code: 47000 (kPa)) • After completion of repair, check that the failure code is cleared by the following operation. Procedure: Turn the 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. Turn starting switch to ON position.		
		If this failure code is cleared, wiring harness connector is defective.		
2	Defective sensor power supply system	If failure code [CA1695] or [CA1696] is displayed, perform troubleshooting for [CA1695] or [CA1696] first.		
		1. Turn starting switch to OFF position. 2. Disconnect connector E25, and connect T-adapter to female side. 3. Turn starting switch to ON position.		
		Voltage	Between E25 (female) (4) and (1)	4.75 to 5.25 V
3	Defective KDPF outlet pressure sensor	1. Turn starting switch to OFF position. 2. Disconnect connector E25. 3. Turn starting switch to ON position.		
		If this failure code is changed to [CA3134], the KDPF outlet pressure sensor is defective. NOTICE • If this failure code is displayed, the wiring harness or engine controller is defective. • Ignore other failure codes displayed.		
4	Open circuit in wiring harness (wire breakage of GND line or defective contact of connector)	If failure code is still displayed after above checks on cause 2, this check is not required. 1. Starting switch: OFF 2. Disconnect connectors CE02 and E25, and connect T-adapters to each female side.		
		Resistance	Between CE02 (female) (32) and E25 (female) (1)	Max. 10 Ω
5	Short circuit in wiring harness	1. Starting switch: OFF 2. Disconnect connectors CE02 and E25, and connect T-adapter to female side of CE02.		
		Continuity	Between CE02 (female) (42) and each pin other than pin (42)	No continuity (no sound is heard)

4	Improper AdBlue/DEF quality	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 engine controller	If no failure is found by above checks, engine controller is defective. (Since this is an internal defect, troubleshooting cannot be performed.)
6	Defective SCR temperature sensor (internal defect)	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.

Loaded diagnostics operation to confirm failure correction

REMARK

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

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. Turn the starting switch to the ON position, and check the failure code is cleared. If this failure code is displayed, return to troubleshooting.
3. Start the engine.
4. Run the engine at low idle speed for 10 minutes.
5. Run the engine at high idle speed for 10 minutes.
6. If this failure code is cleared, repair is completed.

Failure code [CA3256] – KDPF outlet temperature high error 1

Action level	Failure code	Failure	KDPF Outlet Temperature High Error 1 (Engine controller system)
L01	**CA3256**		
Details of failure	The SCR outlet temperature has been in a high temperature state		
Action of controller	None in particular		
Phenomenon on machine	None in particular		
Related information	**⚠ Since KDPF and KDOC are heated to 500 °C or above, be careful not to get burned.** • Temperature in KDOC inlet temperature sensor can be checked by monitoring function. (Code: 47300 (°C)) • Temperature in KDOC outlet temperature sensor can be checked by monitoring function. (Code: 47400 (°C)) • Temperature in KDPF outlet temperature sensor can be checked by monitoring function. (Code: 47200 (°C)) • KDOC inlet temperature, KDOC outlet temperature, and KDPF outlet temperature when at low idle speed (KDPF regeneration is not executed) are approximately 100 to 250 °C, and difference between these temperatures is approximately 10 °C. (KDOC inlet temperature > KDOC outlet temperature > KDPF outlet temperature) • If the engine runs with poor combustion, (poor fuel spray due to troubles in the fuel injectors is one of the examples of root causes but not limited to it), large amount of unburnt fuel slips out with the exhaust gas and will be trapped in the aftertreatment system. The trapped unburnt fuel can start burning in the aftertreatment system once the exhaust gas becomes hot and it can keep burning. 1. Combustion is impaired causing high exhaust temperature. 2. Cylinders other than disabled cylinder may increase their fuel injection in order to compensate for torque drop, causing high exhaust temperature. • As to procedure for accessing KDPF temperature sensor, see “DISASSEMBLY AND ASSEMBLY”, “REMOVE AND INSTALL KDPF ASSEMBLY” and “DISASSEMBLE AND ASSEMBLE KDPF ASSEMBLY”. • After turning starting switch to OFF position, engine controller performs AdBlue/DEF purging (for Max. 6 minutes) and then stops. To restart engine, wait until system operating lamp goes off after turning starting switch to OFF position, and then turn starting switch to ON position. **NOTICE** • **This failure code requires “Loaded Diagnostics Operation To Clear Failure Code”. After investigating the cause of the problem and completing the repair, perform “Loaded Diagnostics Operation To Clear Failure Code” to make sure the failure code is cleared.** • **This failure code is cleared by performing operations indicated in “TESTING AND ADJUSTING”, “SETTING AND OPERATION OF MACHINE MONITOR”, “SERVICE MODE”, “METHOD FOR SETTING WITH TESTING MENU (ENGINE CONTROLLER ACTIVE FAULT CLEAR)”.**		

No.	Cause	Procedure, measuring location, criteria and remarks
1	Defective KDPF outlet temperature sensor	If failure code [CA3319], [CA3321] or [CA3322] is displayed, perform troubleshooting for [CA3319], [CA3321] or [CA3322].
2	Defective intake air system	Check intake air system hoses, clamps, and tubes for damage and loosening. Repair as necessary.
3	Defective injector	Perform cylinder cutout mode operation to identify disabled cylinder (see “TESTING AND ADJUSTING”, “HANDLING CYLINDER CUTOUT MODE OPERATION”).
4	Oil leakage to turbo- charger exhaust connector	1. Remove turbocharger exhaust connector. 2. Check inside of turbocharger exhaust connector for adhesion of oil and fuel. **NOTICE** • **If oil or fuel is found, visually check for oil leaks from EGR valve and turbocharger. Repair abnormality, if any.** • **Wipe off oil or fuel sticking to piping.**
5	Oil leakage into exhaust connector or duct to KDPF	Check the exhaust system between the turbocharger and KDPF to check for oil or fuel flow into KDPF. • Wipe stained oil or fuel off clean, if any. • If there is a trace of oil or fuel flowing into KDPF, check for KDPF and clean or replace it as necessary.

Failure code [CA3498] – AdBlue/DEF level low error 2

Action level	Failure code	Failure	AdBlue/DEF Level Low Error 2 (Engine controller system)
-	**CA3498**		
Detail of failure	The AdBlue/DEF tank level lowered. (The tank capacity becomes 5 % or less)		
Action of controller	None in particular		
Phenomenon on machine	None in particular		
Related information	• The failure codes of AdBlue/DEF level low are as follows: When AdBlue/DEF level is 10 % or less [CA3497] When AdBlue/DEF level is 5 % or less [CA3498] When AdBlue/DEF level is 2.5 % or less [CA1673] When AdBlue/DEF level is 0.0 % or less [CA3547] • CA1673 is displayed and engine output is limited significantly if usage is continued without refilling AdBlue/DEF and the AdBlue/DEF level becomes 2.5 % or less. • 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	Low AdBlue/DEF level	1. Turn starting switch to OFF position. 2. Check the sight gauge to confirm that there is sufficient amount of AdBlue/DEF in the AdBlue/DEF tank. 3. Refill AdBlue/DEF if the level is low. 4. Turn starting switch to ON position.
		If this failure code is cleared, AdBlue/DEF has been insufficient.
2	Defective AdBlue/DEF tank sensor	1. Check the sensor connector for contamination and damage. 2. Turn starting switch to OFF position. 3. Replace the AdBlue/DEF tank sensor. 4. Turn starting switch to ON position.
		If this failure code is cleared, any internal parts in the original AdBlue/DEF tank sensor is defective. (In case of an internal defect, troubleshooting is impossible as an assembly. Replace whole assembly.)
3	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.)

Failure code [CA3571] – AdBlue/DEF pump pressure sensor high error

Action level	Failure code	Failure	AdBlue/DEF pump pressure sensor high error (Engine controller system)
L01	**CA3571**		
Detail of failure	High voltage error is detected in signal circuit of AdBlue/DEF pump pressure sensor.		
Action of controller	Operates at fixed value (1300 kPa) of AdBlue/DEF pump pressure. AdBlue/DEF pump stop AdBlue/DEF purging stops Advances to Inducement strategy.		
Phenomenon on machine	• NOx emission increases because AdBlue/DEF injection is disabled due to AdBlue/DEF pump stop. • Because AdBlue/DEF purge is impossible, AdBlue/DEF in AdBlue/DEF line may be frozen at low temperature. • Engine power deration according to inducement strategy.		
Related information	• AdBlue/DEF pump pressure sensor is built in AdBlue/DEF pump. • If AdBlue/DEF pump pressure sensor is defective, replace AdBlue/DEF pump. • After completion of repair, check that the failure code is cleared by the following operation. Procedure: Turn the 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 the failure code “RELATED INFORMATION ON TROUBLESHOOTING”, and check it. 2. Turn starting switch to ON position.		
		If this failure code is cleared, wiring harness connector is defective.		
2	Defective power supply system of AdBlue/DEF pump pressure sensor	If failure code [CA1695] or [CA1696] is also displayed, perform troubleshooting these first.		
3	Defective AdBlue/DEF pressure sensor	1. Turn starting switch to OFF position. 2. Disconnect connector MB02. 3. Turn starting switch to ON position.		
		If the displayed failure code changes from [CA3571] to [CA3572], the AdBlue/DEF pump pressure sensor is defective.		
4	Open circuit in wiring harness (wire breakage or defective contact of connector)	1. Turn starting switch to OFF position. 2. Disconnect connectors CE02 and MB02 and connect T-adapters to each female side. Open circuit in GND line		
		Resistance	Between CE02 (female) (32) and MB02 (female) (4)	Max. 10 Ω
5	Short circuit in wiring harness	1. Turn starting switch to OFF position. 2. Disconnect connectors CE02 and MB02, and connect T-adapter to female side of CE02.		
		Resistance	Between CE02 (female) (16) and (8)	Min. 100 kΩ
6	Hot short circuit in wiring harness	1. Turn starting switch to OFF position. 2. Disconnect connector MB02, and connect T-adapter to female side or insert T-adapter to connector CE02. 3. Turn starting switch to ON position.		
		Voltage	Between MB02 (female) (3) and (4), or between CE02 (16) and (32)	Max. 1 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.)		

<table>
<tr><th>No.</th><th>Cause</th><th colspan="3">Procedure, measuring location, criteria and remarks</th></tr>
<tr><td rowspan="6">4</td><td rowspan="6">Open circuit in wiring harness (wire breakage or defective contact of connector) (broken power line)</td><td colspan="3">• Power line
1. Turn starting switch to OFF position.
2. Disconnect connector E36, and connect T-adapter to female side.
3. Turn starting switch to ON position.
If no failure is found by this check, perform checks on causes 8 and after.</td></tr>
<tr><td>Voltage</td><td>Between E36 (female) (1) and (4)</td><td>Min. 22 V</td></tr>
<tr><td colspan="3">If no failure is found by above results, this check is not required.
1. Turn starting switch to OFF position.
2. Disconnect connectors R52 and E36 and connect T-adapters to each fe- male side.</td></tr>
<tr><td rowspan="2">Resistance</td><td>Between R52 (female) (12) and E36 (female) (1)</td><td>Max. 10 Ω</td></tr>
<tr><td>Between E36 (female) (4) and ground</td><td>Max. 10 Ω</td></tr>
<tr><td rowspan="2">5</td><td rowspan="2">Improper battery voltage</td><td colspan="3">1. Perform troubleshooting with starting switch at OFF position and when starting engine.</td></tr>
<tr><td>Voltage</td><td>Between battery (+) and (-).</td><td>20 to 30 V</td></tr>
<tr><td rowspan="2">6</td><td rowspan="2">Defective alternator</td><td colspan="3">1. Turn starting switch to OFF position.
2. Start engine. (Engine speed: Medium or higher)</td></tr>
<tr><td>Voltage</td><td>alternator terminal R and ground</td><td>26 to 30.5 V</td></tr>
<tr><td rowspan="2">7</td><td rowspan="2">Defective sensor power supply relay</td><td colspan="3">1. Turn starting switch to OFF position.
2. Check that system operating lamp does not light up, and then turn the bat- tery disconnect switch OFF.
3. Disconnect connector R52, and replace sensor power supply relay.
4. Turn the battery disconnect switch ON.
5. Perform “Loaded Diagnostics Operation To Confirm Failure Correction”.</td></tr>
<tr><td colspan="3">If this failure code is cleared, the original sensor power supply relay is defective.</td></tr>
<tr><td rowspan="2">8</td><td rowspan="2">Defective SCR outlet NOx sensor</td><td colspan="3">If no failure is found by preceding checks, the SCR outlet NOx sensor is defective.
1. Turn starting switch to OFF position.
2. Replace the SCR outlet NOx sensor.
3. Turn starting switch to ON position.
4. Perform “Loaded Diagnostics Operation To Confirm Failure Correction”.</td></tr>
<tr><td colspan="3">If this failure code is cleared, the original sensor is defective. (In case of an internal defect, trouble- shooting is impossible as an assembly. Replace whole assembly.)</td></tr>
<tr><td>9</td><td>Defective engine controller</td><td colspan="3">If no failure is found by above checks, engine controller is defective. (Since this is an internal defect, troubleshooting cannot be performed.)</td></tr>
</table>

Failure code [CA3867] – AdBlue/DEF low concentration error 1

Action level	Failure code	Failure	AdBlue/DEF Low Concentration Error 1 (Engine controller system)
—	**CA3867**		
Detail of failure	AdBlue/DEF low concentration (25 % or below) is detected.		
Action of controller	None in particular		
Phenomenon on machine	AdBlue/DEF is consumed largely		
Related information	No error is displayed on the machine monitor. A surface in AdBlue/DEF fluctuates more in work on slopes or travel on uneven ground, possibly disabling to detect the correct level or concentration. If AdBlue/DEF level monitor is illuminated in red or a warning on the concentration is displayed, move to a flat place as soon as possible and refill AdBlue/DEF. If this phenomenon persists, refill AdBlue/DEF extra in AdBlue/DEF tank. • If AdBlue/DEF tank temperature is 0 °C or below, the engine controller does not trouble- shoot this failure code (“Loaded Diagnostics Operation To Clear Failure Code” does not clear this failure code). • Make sure that AdBlue/DEF tank temperature is 0 °C or above on the “Pre-defined Monitoring” screen before troubleshooting this failure code. • When AdBlue/DEF level is 0 %, the engine controller does not troubleshoot this failure code (“Loaded Diagnostics Operation To Clear Failure Code” does not clear this failure code). • Make sure that AdBlue/DEF tank temperature is 20 % or above on the “Pre-defined Monitoring” screen before troubleshooting this failure code. • For draining and cleaning procedures of AdBlue/DEF tank, see Testing and adjusting, “CLEAN AdBlue/DEF TANK”. • For the replacement procedure of AdBlue/DEF/level sensor, see Disassembly and assembly, “Disassembly and assembly of AdBlue/DEF/level sensor”. • On the “Pre-defined Monitoring” screen troubleshooting for AdBlue/DEF level and AdBlue/DEF quality sensors are used. • Troubleshooting for AdBlue/DEF level and AdBlue/DEF quality sensors 19100 AdBlue/DEF Concentration 19110 AdBlue/DEF Level 19111 AdBlue/DEF Level Corrected 19115 AdBlue/DEF Temperature in Tank 19400 Ambient Temperature 19305 AdBlue/DEF Tank Heating State **NOTICE** **This failure code requires “Loaded Diagnostics Operation To Clear Failure Code”. After investigating the cause of the problem and completing the repair, perform “Loaded Di- agnostics Operation To Clear Failure Code” to make sure the failure code is cleared.**		

No.	Cause	Procedure, measuring location, criteria and remarks
1	Defective AdBlue/DEF tank sensor system	1. If failure code [CA1669] or [CA1677] or [CA1678] or [CA1686] or [CA1714] or [CA1715] or [CA3868] or [CA4277] or [CA4731] or [CA4732] or [CA4739] or [CA4768] or [CA4769] is displayed, perform troubleshooting these first. 2. If troubleshooting has been performed, carry out “Loaded Diagnostics Operation To Clear Failure Code” topics.
2	Low AdBlue/DEF concentration (entrained water, etc.)	1. Check that the “AdBlue/DEF concentration” displayed on the Pre-defined Monitoring screen is in the normal range (29 to 36 %). 2. If the “AdBlue/DEF concentration” is normal, perform “Loaded Diagnostics Operation To Clear Failure Code”. 3. If the “AdBlue/DEF concentration” falls outside of this range, use a portable concentration meter to recheck the concentration. If the concentration still falls outside of the range of 31.5 to 33.5 %, drain all of the AdBlue/DEF from the tank and refill with fresh AdBlue/DEF. 4. If the “AdBlue/DEF concentration” is in 29 to 36 % after the work finished, perform “Loaded Diagnostics Operation To Clear Failure Code”. 5. If the portable concentration meter reading is in the range of 31.5 to 33.5 %, proceed to the next troubleshooting.

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.

Failure code [CA4163] – KDOC and KDPF temperature sensor ECU over temperature error

Action level	Failure code	Failure	KDOC and KDPF Temperature Sensor ECU Over Temperature Error (Engine controller system)
L01	**CA4163**		
Detail of failure	KDOC/KDPF temperature sensor controller temperature high error		
Action of controller	None in particular		
Phenomenon on machine	• Defective forcible regeneration control • All of the KDOC inlet temperature, KDOC outlet temperature, and KDPF outlet temperature cannot be detected.		
Related information	⚠ **Be careful not to get burned as the temperature of KDPF and KDOC rises up over 500 °C.** • 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. • For replacement of the KDPF temperature sensor, see Disassembly and assembly, “Disassembly and assembly of KDPF assembly”. **NOTICE** **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 that the failure code is cleared. (Repair completion cannot be judged without raising the exhaust temperature even if this failure code is cleared by turning ON the starting switch)**		

No.	Cause	Procedure, measuring location, criteria and remarks
1	Exhaust gas leakage (high environmental temperature)	Check if the temperature sensor controller environmental temperature is extraordinary high (150 °C or above).
2	Defective KDPF temperature sensor	1. Turn starting switch to OFF position. 2. Replace KDPF temperature sensor. 3. Turn starting switch to ON position.
		If this failure code is cleared, the original sensor is defective. (In case of an internal defect, troubleshooting is impossible as an assembly. Replace whole assembly.)
3	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	Contaminated AdBlue/DEF	1. Drain more than 1 ℓ of AdBlue/DEF to check that it is not contaminated with foreign material, etc. 2. If the drained AdBlue/DEF is contaminated, drain all of the AdBlue/DEF and refill with fresh AdBlue/DEF. 3. If it is heavily contaminated with sand, dirt, etc., clean the AdBlue/DEF tank. 4. If the “AdBlue/DEF concentration” is in 29 to 36 % after the work finished, perform “Loaded Diagnostics Operation To Clear Failure Code”. 5. If the “AdBlue/DEF concentration” is out of the normal range, proceed to the next troubleshooting.
4	Foreign matter adhered to the sensing part of the AdBlue/DEF tank sensor	REMARK • If new AdBlue/DEF has not been refilled at the cause 3, and if it would take some time to remove the sensor, drain all of AdBlue/DEF, and refill with fresh AdBlue/DEF, and check the output of the sensor. • For the removal procedure of the AdBlue/DEF tank sensor, see “DISASSEMBLY AND ASSEMBLY”, “REMOVE AND INSTALL AdBlue/DEF TANK SENSOR FLANGE ASSEMBLY”. 1. Remove the AdBlue/DEF level sensor to gain access to the “AdBlue/DEF concentration” sensing part (end of sensor). 2. Wipe the “AdBlue/DEF concentration” sensing part with a dry, clean cloth. Install the AdBlue/DEF level sensor. 3. If the “AdBlue/DEF concentration” displayed on the Pre-defined Monitoring screen falls in the range of 29 to 36 %, perform “Loaded Diagnostics Operation To Clear Failure Code” topics to complete the repair. 4. If the “AdBlue/DEF concentration” falls outside of this range, proceed to the next troubleshooting.
5	Defective AdBlue/DEF tank sensor (internal defect)	1. Replace the AdBlue/DEF tank sensor. 2. If the “AdBlue/DEF concentration” displayed on the Pre-defined Monitoring screen falls in the range of 29 to 36%, perform “Loaded Diagnostics Operation To Clear Failure Code” topics to complete the repair. 3. If the “AdBlue/DEF concentration” falls outside of this range, proceed to the next troubleshooting.
6	Defective engine controller	1. Replace the engine controller. 2. Perform “Loaded Diagnostics Operation To Clear Failure Code”. 3. If this failure code is displayed, perform troubleshooting again.

Loaded diagnostics operation to clear failure code

Check if the repair has been completed with the following procedure: (Make sure this failure code is cleared after this procedure.)

1. Turn the starting switch to OFF position, and shut down the engine controller.
2. Turn the starting switch to ON position.
3. Wait for 30 minutes. (It is not necessary to start the engine.)
4. If this failure code is cleared, repair is completed.

Failure code [CA5115] – AdBlue/DEF line heater 1 voltage low error

Action level	Failure code	Failure	AdBlue/DEF Line Heater 1 Voltage Low Error (Engine controller system)
L01	**CA5115**		
Detail of failure	A low voltage error occurs in AdBlue/DEF line heater 1 (low-temperature pressure, intake and return side) signal circuit.		
Action of controller	None in particular		
Phenomenon on machine	• AdBlue/DEF line stops thawing. • NOx emission increases because AdBlue/DEF injection is disabled at low temperature.		
Related information	• AdBlue/DEF line heater 1 is driven at AdBlue/DEF supply system thawing/thermal insulation or “AdBlue/DEF line heater relay 1 test”. • AdBlue/DEF line heater 1 is driven by AdBlue/DEF line heater relay 1 inside AdBlue/DEF heater relay. • This failure code is detected only when the AdBlue/DEF line heater 1 is turned ON. • After repairing, check if the failure code is cleared by the following procedure. Procedure: Start the engine in low temperature (ambient temperature of 5 °C or below) or see “service modes” of “setting and operating machine monitor”, and “explanation of operating method of testing menu (SCR service test)” to perform “AdBlue/DEF line heater relay 1 test”.		

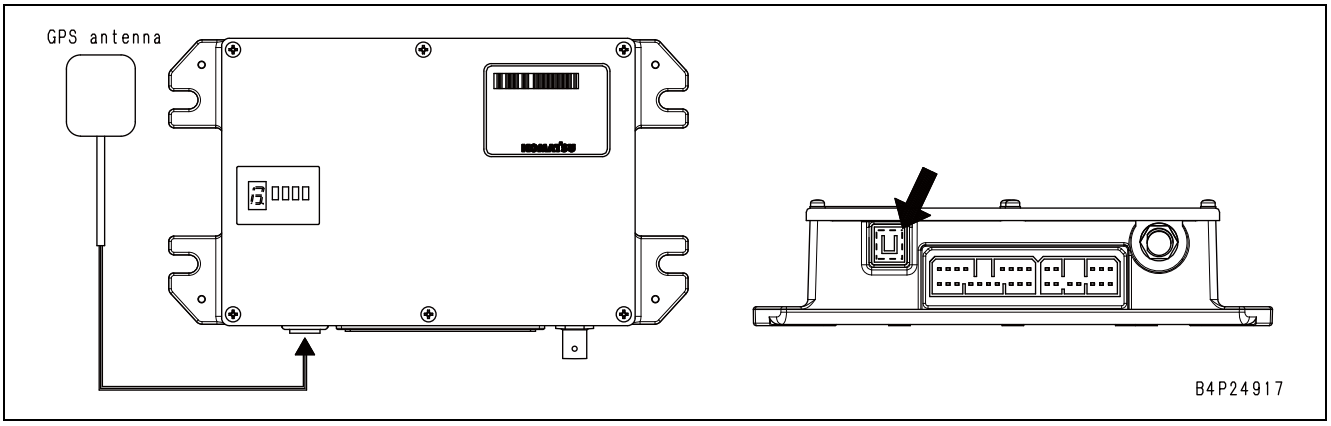
No.	Cause	Procedure, measuring location, criteria and remarks		
1	Defective wiring harness connector	1. See descriptions of wiring harness and connectors in “Electrical equipment” in “CHECKS BEFORE TROUBLESHOOTING” of “RELATED INFORMATION ON TROUBLESHOOTING”, and check it. 2. Perform the “AdBlue/DEF Line Heater Relay 1 Test” by staring the engine in low ambient temperature (5 °C or below), or by referring “SERVICE MODE” of setting and operating machine monitor, “METHOD FOR OPERATING TESTING MENU (SCR SERVICE TEST)”.		
		If this failure code is cleared, wiring harness connector is defective.		
2	Defective AdBlue/DEF line heater	1. Turn starting switch to OFF position. 2. Disconnect connectors MB04 and MB06A, and connect T-adapters to each male side.		
		Resistance	Between MB04 (male) (1) and (2)	5 to 40 Ω
			Between MB06A (male) (1) and (2)	5 to 40 Ω
3	Short circuit in wiring harness	1. Starting switch: OFF 2. Disconnect connectors CE02 and R53A, and connect T-adapter to female side of CE02.		
		Continuity	Between CE02 (female) (39) and each pin other than pin (39)	No continuity
4	Open circuit or short circuit in wiring harness (line heater relay input side)	1. Starting switch: OFF 2. Disconnect connector CE02, and connect T-adapter to female side. **REMARK** Internal resistance is possessed by above-mentioned heater relay.		
		Resistance	Between CE02 (female) (39) and ground	10 to 30 kΩ
5	Ground fault in wiring harness (contact with ground circuit)	1. Starting switch: OFF 2. Disconnect connectors CE02, R53A, MB04, and MB06A, and connect T-adapter to either female side.		
		Resistance	Between ground and CE02 (female) (39) or R53A (female) (8)	Min. 100 kΩ
			Between R53A (female) (5) and ground, or between MB06A (female) (1) and ground	Min. 100 kΩ
			Between R53A (female) (6) and ground, or between MB04 (female) (1) and ground	Min. 100 kΩ

Failure code [D862KA] – GPS antenna open circuit

Action level	Failure code	Failure	GPS Antenna Open Circuit (KOMTRAX system)
-	**D862KA**		
Details of failure	Open circuit occurs in GPS antenna circuit.		
Action of machine monitor	• None in particular • If cause of failure disappears, machine becomes normal by itself.		
Phenomenon on machine	GPS positioning system does not work.		
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 GPS antenna or antenna cable	GPS antenna may be defective, or antenna cable may have open or short circuit, or poor contact at terminal area (GPS).

Configuration diagram of GPS system

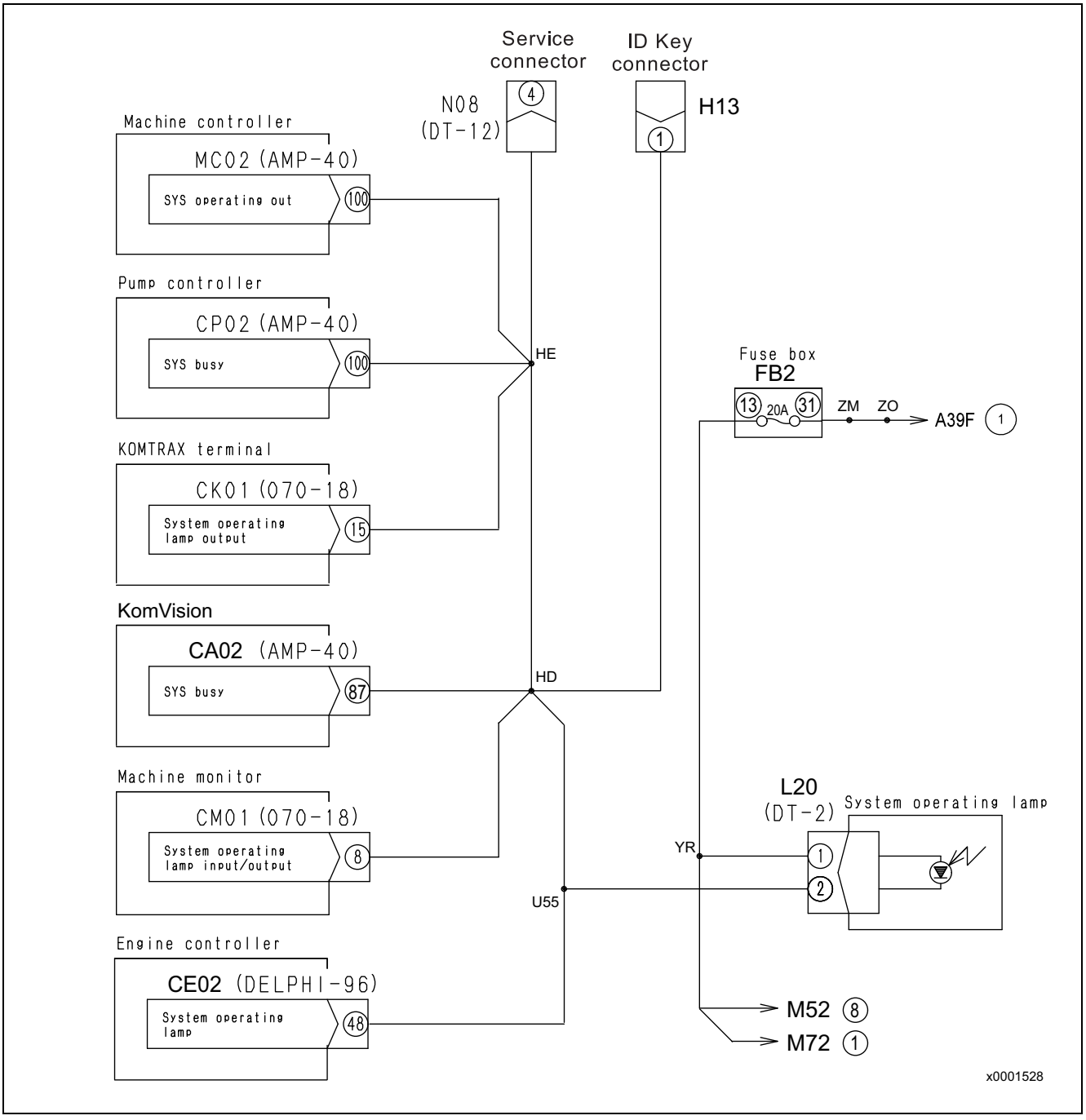


Failure code [DA2QKR] – Controller area network 2 defective communication

Action level	Failure code	Failure	Controller Area Network 2 Defective Communication (Pump Controller) (Machine monitor system)
L03	**DA2QKR**		
Detail of failure	Machine monitor does not recognize pump controller through CAN communication 2 line (KOMNET/c).		
Action of controller	Retains information at time of occurrence of failure.		
Phenomenon on machine	Information to be obtained from pump controller is not displayed and special functions that need information do not work. Or update of received data is stopped (such as failure codes and monitoring codes sent from the pump controller).		
Related information	• Start of CAN communication is recognized by each controller when ACC signal of starting switch is received. • 4 different failure codes, [DA2QKR], [DB2QKR], [D8AQKR], and [DAZQKR] are used for defective CAN communication by CAN2, which are detected by machine monitor. When all of these 4 failure codes are displayed, ground fault, short circuit or hot short in wiring harness (CAN communication circuit) can be suspected. **REMARK** • Also display [DBPQKR] for the KomVision specifications. • If air conditioner is controlled, wiring harness (CAN communication line) does not have ground fault, short circuit, or hot short circuit. • This may occur even when power is not supplied to pump controller. • Since each controller and machine monitor are connected directly to battery, they are supplied with power even after starting switch is turned to OFF position. • Since signal of active CAN communication line is pulse voltage, it cannot be measured by using multimeter. • 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 pump controller power supply circuit	1. Turn the starting switch to OFF position. 2. Check that system operating lamp is not lit, and then turn the battery disconnect switch to OFF position. 3. Disconnect the connector CP01 and connect the T-adapter to female side. 4. Turn the battery disconnect switch to ON position. 5. Turn the starting switch to ON position. **REMARK** If there is no failure, troubleshooting for No. 2 is not required.		
		Voltage	Between CP01 (female) (1) and (2)	20 to 30 V
			Between CP01 (female) (4) and (5)	20 to 30 V
2	Open circuit in wiring harness	1. Turn the starting switch to OFF position. 2. Check that system operating lamp is not lit, and then turn the battery disconnect switch to OFF position. 3. Remove the fuse No.17 in fuse box FB1. 4. Disconnect the connector CP01, and connect the T-adapter to female side.		
		Resistance	Between CP01 (female) (1) and FB1-17	Max. 1 Ω
			Between CP01 (female) (4) and FB1-17	Max. 1 Ω
			Between CP01 (female) (2) and ground	Max. 1 Ω
			Between CP01 (female) (5) and ground	Max. 1 Ω

Circuit diagram related to system operating lamp

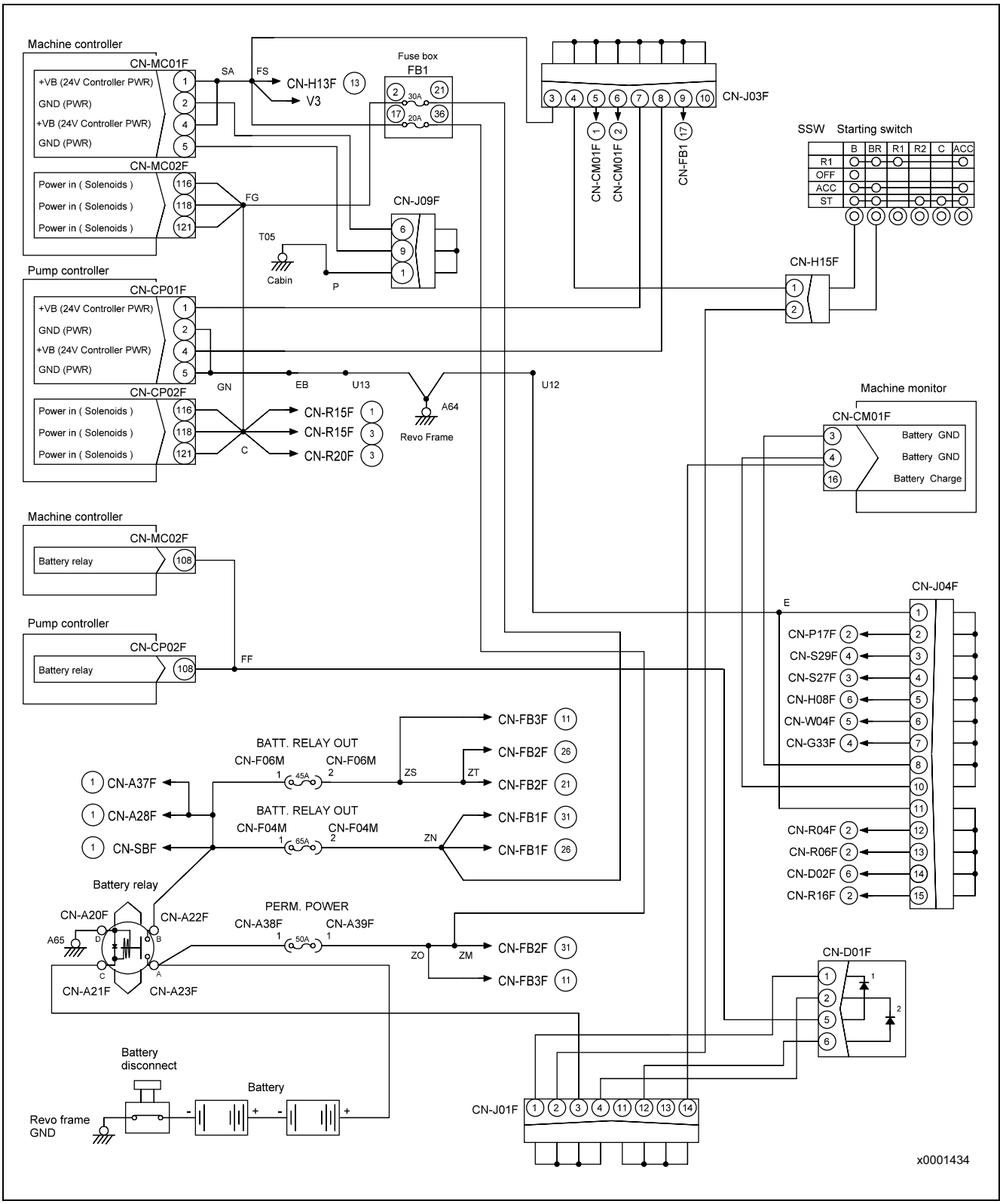


Failure code [DBP5KB] – Camera power supply short circuit

Action level	Failure code	Failure	Camera Power Supply Short Circuit (KomVision controller system)
L03	**DBP5KB**		
Detail of failure	Output power supply voltage (rating: 8 V) from KomVision controller to camera is 3.85 V and below.		
Action of controller	• Stops output power supply voltage to camera. • Even if cause of failure disappears, machine does not become normal until starting switch is turned to OFF position.		
Phenomenon on machine	Display area of the camera and the single camera images are displayed in black.		
Related information	After repair is completed, check if the failure code is cleared by the following procedure. Procedure: Turn the starting switch to ON position.		

<table>
<tr><th>No.</th><th>Cause</th><th colspan="3">Procedure, measuring location, criteria and remarks</th></tr>
<tr><td rowspan="6">1</td><td rowspan="6">Ground fault in wiring harness</td><td colspan="3">1. Identify the camera displayed in black.
2. Turn the starting switch to OFF position.
3. Disconnect the connectors CA01, A42, A45, A46, A77, and A78, and connect the T-adapter to each female side.
4. Perform troubleshooting for the camera displayed in black.</td></tr>
<tr><td rowspan="5">Resistance</td><td>Between ground and either CM04 (female) (1) or A42 (female) (1)
Rear camera</td><td>Min. 1 MΩ</td></tr>
<tr><td>Between ground and either CA01 (female) (6) or A45 (female) (1)
Rear camera</td><td>Min. 1 MΩ</td></tr>
<tr><td>Between ground and either CA01 (female) (25) or A46 (female) (1)
R.H. camera</td><td>Min. 1 MΩ</td></tr>
<tr><td>Between ground and either CA01 (female) (44) or A77 (female) (1)
Front RH camera</td><td>Min. 1 MΩ</td></tr>
<tr><td>Between ground and either CA01 (female) (63) or A78 (female) (1)
L.H. camera</td><td>Min. 1 MΩ</td></tr>
<tr><td rowspan="2">2</td><td rowspan="2">Defective camera</td><td colspan="3">1. Turn the starting switch to OFF position.
2. Replace the camera which does not display the captured image.
3. Turn the starting switch to ON position.</td></tr>
<tr><td colspan="3">If failure code is not displayed, camera has internal defect.</td></tr>
<tr><td>3</td><td>Defective KomVision controller</td><td colspan="3">If no failure is found by above checks, KomVision controller is defective. (Since this is an internal defect, troubleshooting cannot be performed).</td></tr>
</table>

7	Defective machine monitor	If no failure is found by above checks, machine monitor is defective. (Since this is an internal defect, troubleshooting cannot be performed.)



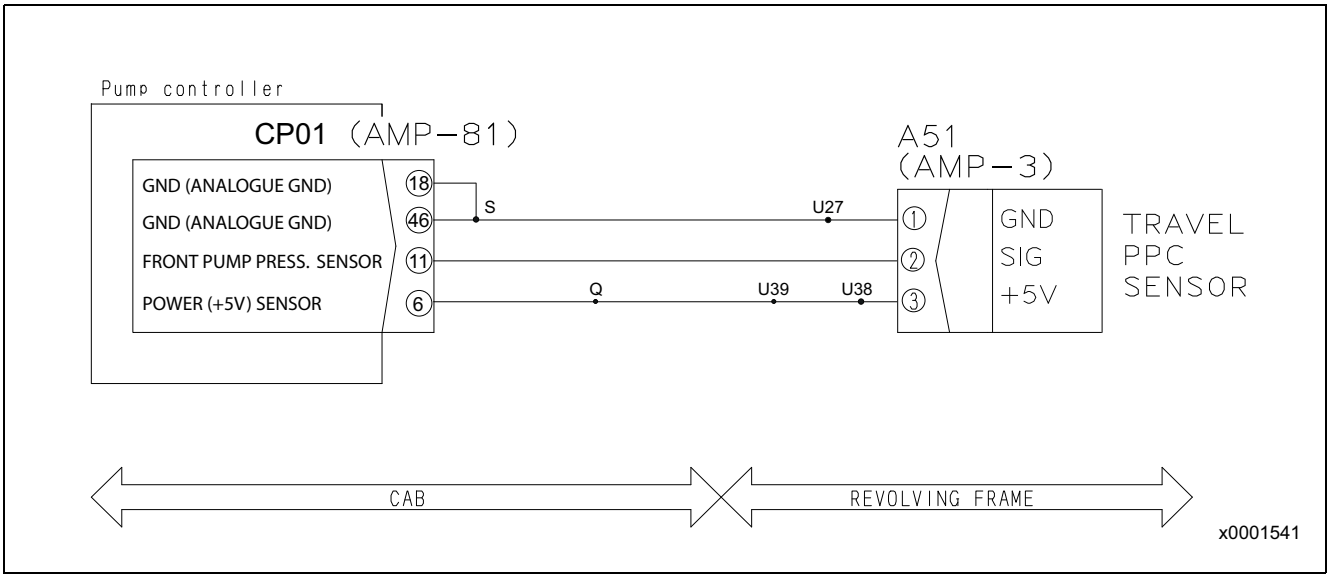
Failure code [DDWMKZ] – FBR attachment SW abnormality

Action level	Failure code	Failure	FBR Attachment SW Abnormality (machine controller system)
—	**DDWMKZ**		
Detail of failure	F, B, R switches are all OFF or more than one is ON)		
Action of controller			
Problem on machine	FBR switch does not operate.		
Related information	• After completion of repair, check that the failure code is cleared by the following operation. Procedure: Turn the starting switch to ON position.		

No.	Cause	Procedure, measuring location, criteria and remarks		
1	Defective travel F/B/R switch	1. Turn starting switch to OFF position. 2. Disconnect connector G74 and connect T-adapter male side.		
		FBR switch in position F		Resistance value
		• Between G74 (1) and G74 (2)		Less than 1 Ω
		• Between G74 (1) and G74 (3)		Above 1 MΩ
		• Between G74 (1) and G74 (4)		Above 1 MΩ
		FBR switch in position B		Resistance value
		• Between G74 (1) and G74 (2)		Above 1 MΩ
		• Between G74 (1) and G74 (3)		Less than 1 Ω
		• Between G74 (1) and G74 (4)		Above 1 MΩ
		FBR switch in position R		Resistance value
		• Between G74 (1) and G74 (2)		Above 1 MΩ
		• Between G74 (1) and G74 (3)		Above 1 MΩ
		• Between G74 (1) and G74 (4)		Less than 1 Ω
2	Disconnection of wiring harness	1. Turn starting switch OFF position. 2. Disconnect G74 and MC01 and connect T-adapter to female side. 3. Hold OFF during troubleshooting		
		Resistance	G74 (1) and ground	Below 1 Ω
			Between S29 (8) and FB2 (1)	
			Between G74 (2) and MC01 (39)	
			Between G74 (3) and MC01 (20)	
			Between G74 (4) and MC01 (76)	

No.	Cause	Procedure, measuring location, criteria and remarks		
3	Open circuit in wiring harness (Wire breakage or defective contact of connector)	1. Turn starting switch to OFF position. 2. Disconnect connectors CP01 and A51, and connect T-adapters to each female side.		
		Resistance	**REMARK** If power supply voltage in check on cause 1 is normal, this check is not required. Between CP01 (female) (18) and A51 (female) (1)	Max. 1 Ω
			Between CP01 (female) (11) and A51 (female) (2)	Max. 1 Ω
			REMARK If power supply voltage in check on cause 1 is normal, this check is not required. Between CP01 (female) (6) and A51 (female) (3)	Max. 1 Ω
4	Ground fault in wiring harness (Contact with ground circuit)	1. Turn starting switch to OFF position. 2. Disconnect connectors CP01 and A51, and connect T-adapter to either female side.		
		Resistance	Between ground and CP01 (female) (11) or A51 (female) (2)	Min. 1 MΩ
5	Hot short circuit in wiring harness (Contact with 5 V circuit and 24 V circuit)	1. Turn starting switch to OFF position. 2. Disconnect connector A51. 3. Connect T-adapter to female side of connector A51. 4. Turn starting switch to ON position.		
		Voltage	Between A51 (female) (2) and ground	Max. 1 V
6	Defective pump controller	If no failure is found by preceding checks, pump controller is defective. (In case of an internal defect, troubleshooting is impossible as an assembly. Replace whole assembly).		

Circuit diagram related to front pump pressure sensor

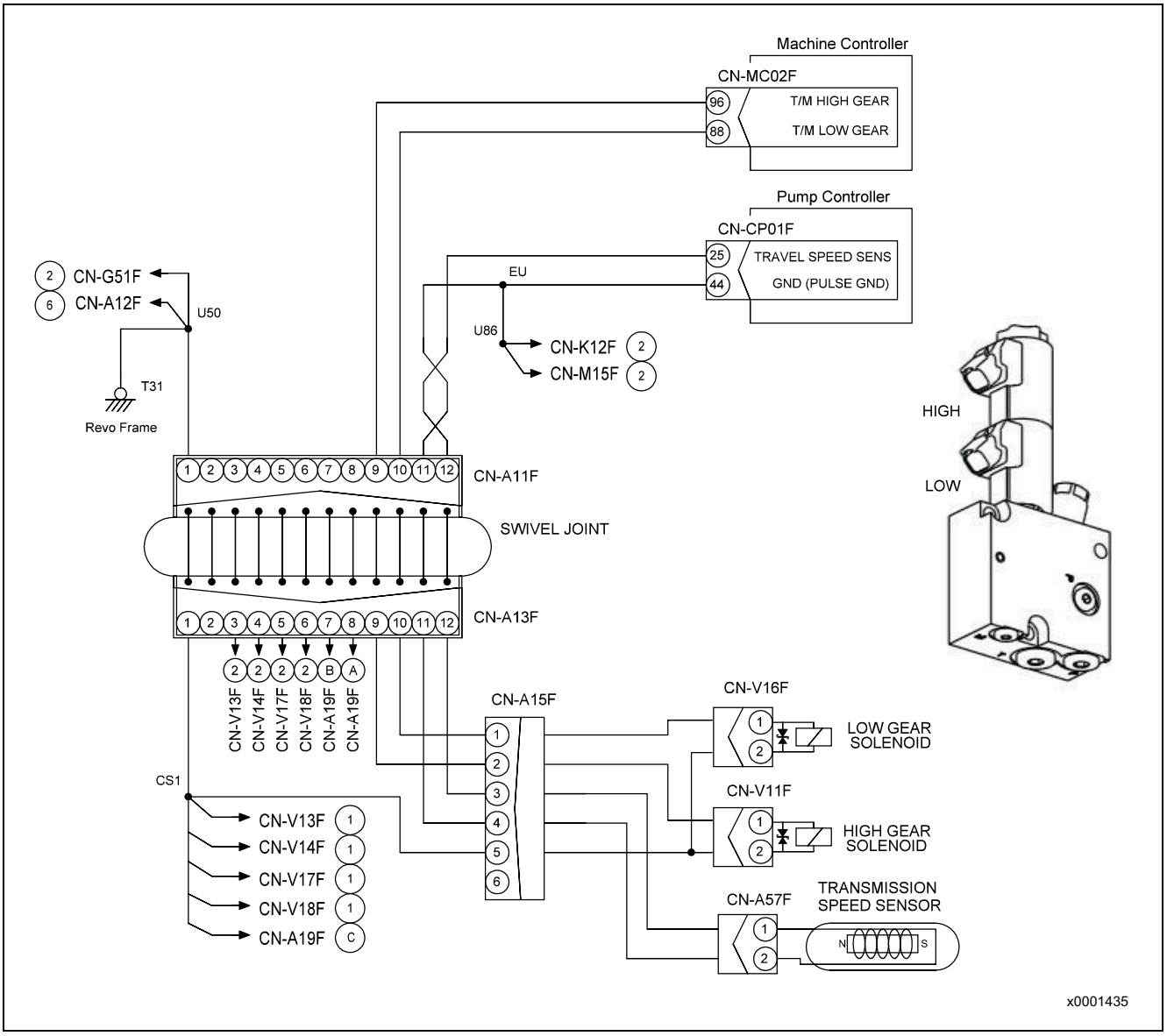


Failure code [DHUCKA] – Parking brake press sensor open circuit

Action level	Failure code	Failure	Parking brake press sensor open circuit (Machine controller system)
L03	**DHUCKA**		
Detail of failure	Input voltage on MC01 (49) is under 0.3[V]		
Action of controller	Assume that parking brake pressure is 0 Mpa. If cause of failure disappear, machine becomes normal itself.		
Problem on machine	• Indicator brake accumulator on monitor always becomes ON. • Cannot control travel N solenoid correctly. • Travel is stopped. • Travel can operate with emergency travel switch ON.		
Related information	★ If 5 V circuit (3) and ground circuit (1) of pressure sensor are connected inversely, pressure sensor will be broken. Accordingly, take extreme care when checking. • As T-adapter for machine controller connector is “socket-type box”, operating voltage cannot be measured at machine controller connector. • Parking brake pressure can be checked with monitoring function. (Code: 91939 Parking Brake pressure) • Method of reproducing failure code: turn starting switch to ON position or start engine.		

No.	Cause	Procedure, measuring location, criteria and remarks			
1	Defective 5V sensor power supply 1 system	If failure code [DCS5KP] is also displayed, perform troubleshooting for it first.			
		1. Turn starting switch to OFF position. 2. Disconnect connector P61and connect T-adapters to female side. 3. Turn starting switch to ON position. ★ If power supply voltage is abnormal, proceed to check on cause 3.			
		Voltage	Between P61 (female) (3) and (1)	Power supply	4.5 to 5.5 V
2	Defective Parking Brake pressure sensor (internal defect)	1. Turn starting switch to OFF position. 2. Insert T-adapters into connector P60. 3. Turn starting switch to ON position.			
		Voltage	Between P61 (2) and (1)	Sensor output	0.5 to 4.5 V
		★ If power supply voltage is normal and sensor output voltage is abnormal, it is difficult to judge whether cause of failure is defective sensor, ground fault or hot short circuit in wiring harness. Check as below. 1. Turn starting switch to OFF position. 2. Replace connector P61 with connector of other PPC pressure sensor. 3. Turn starting switch to ON position and display "Abnormality Record" screen of electrical system on machine monitor. 4. If E mark is not displayed again for this failure code, Parking Brake pressure sensor is defective. ★ After finishing test, restore connectors.			
3	Open circuit in wiring harness (wire breakage or defective contact of connector)	1. Turn starting switch to OFF position. 2. Disconnect connector MC01 and P61, and connect T-adapters to each female side.			
		Resistance	★ If power supply voltage measured in check on cause 1 is nor-		Max. 1 Ω
			Between MC01 (female) (29) and P61 (female) (2)		Max. 1 Ω
			★ If power supply voltage measured in check on cause 1 is nor-		Max. 1 Ω
4	Ground fault in wiring harness (contact with GND circuit)	1. Turn starting switch to OFF position.			
		Resistance	Between ground and MC01 (female) (29) or P61 (female) (2)		Min. 1 MΩ
5	Defective machine controller	If no failure is found by above checks, machine controller is defective. (Since this is an internal			

Circuit diagram related to transmission speed sensor

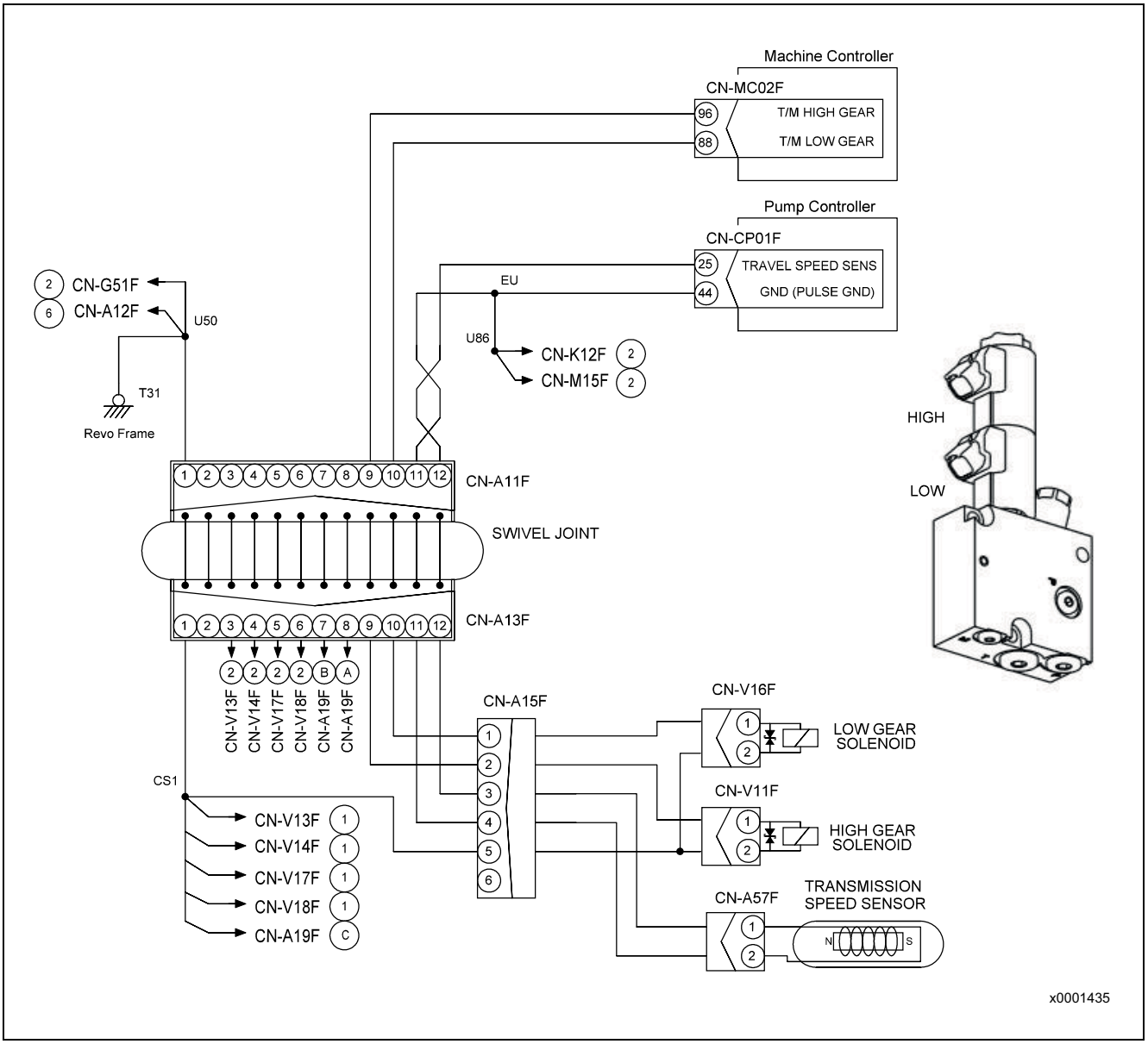


Failure code [DW44KY] – Travel F/R solenoid hot short circuit

Action level	Failure code	Failure	Travel F/R sol hot short circuit
L04	DW44KY		
Detail of failure	Terminal voltage on MC02 (111) > 2.6[V] when this output is OFF		
Action of controller	• Travel N solenoid is set to OFF. • If cause of failure disappear, machine becomes normal by itself.		
Problem on machine	Vehicle cannot travel.		
Related information	• Controller's command (ON/OFF) to travel F/R solenoid can be checked with monitoring function. (As long as controller's command to solenoid is "OFF", sensor status displayed on monitoring screen is "OFF" even if solenoid is energized due to hot short circuit) (Code: 02331 solenoid valve 2, Machine controller) • Method of reproducing failure code: Turn starting switch to ON position.		

No.	Cause	Procedure, measuring location, criteria, and remarks		
1	Hot short circuit in wiring harness	1. Turn starting switch to OFF position. 2. Disconnect connector V08 and connect T-adapter to female side. 3. Turn starting switch to ON position.		
		Voltage	Between V08 (female) (1) and ground	Max 4.5 V
2	Machine controller is defective.	If no failure is found by preceding checks, machine controller is defective. (Since this is an internal defect, troubleshooting cannot be performed.)		

Circuit diagram related to High gear solenoid

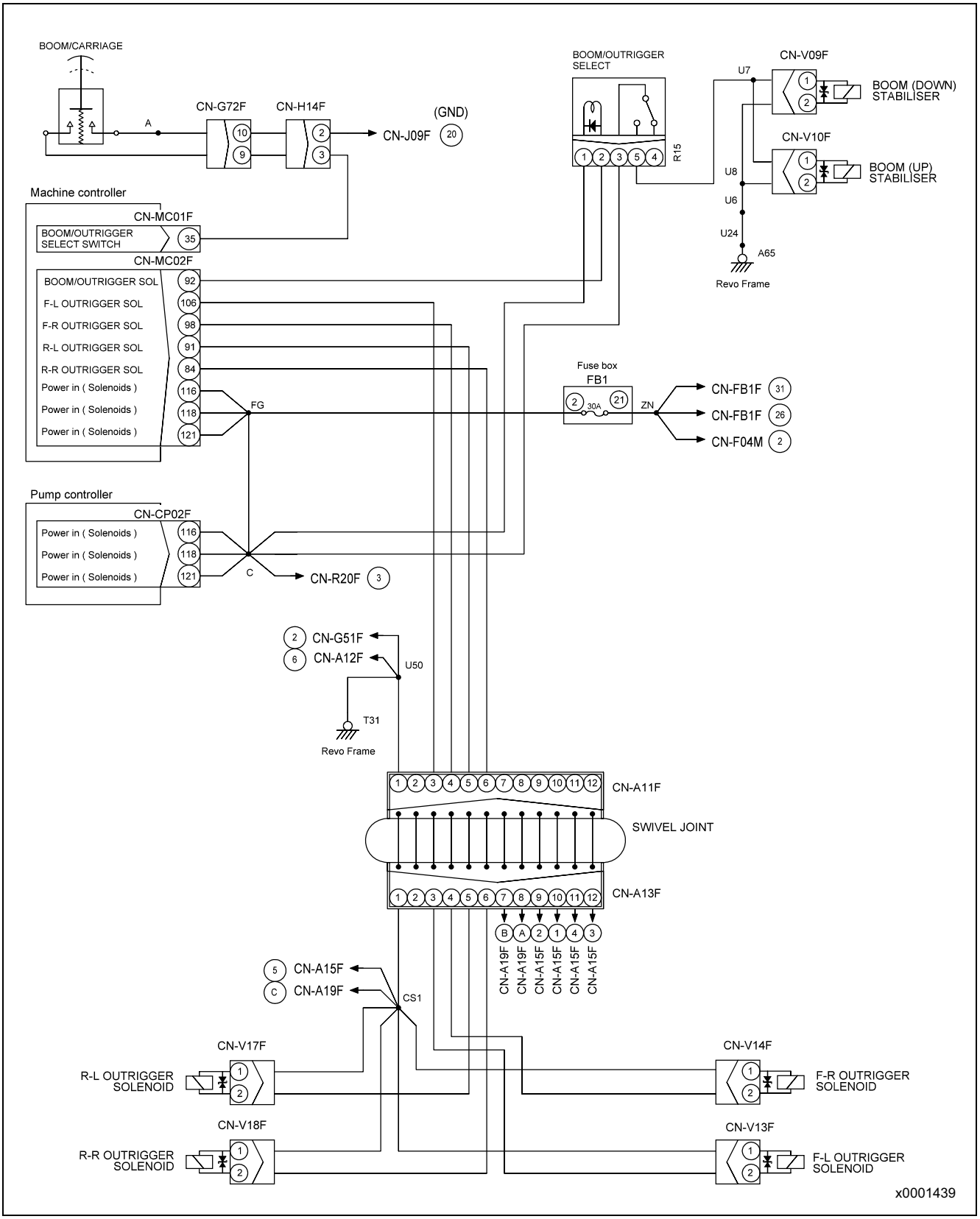


Failure code [DWB1KB] – Outrigger selection sol relay short circuit

Action level	Failure code	Failure	Hot Short circuit in outrigger/boom operation relay (or relay internal short circuit) (Machine controller system)
L03	**DWB1KB**		
Detail of failure	Controller output voltage to relay is over 5.7 V when machine controller drive relay.		
Action of controller	• Stops driving outrigger/boom relay. • Even if cause of failure disappears, machine does not become normal until starting switch is turned to OFF position.		
Problem on machine	Outrigger/boom will not move.		
Related information	• Controller's command (ON/OFF) to outrigger/boom can be checked with monitoring function. (As long as controller's command to solenoid is "ON", sensor status displayed on monitoring screen is "ON" even if solenoid is energized due to hot short circuit) (Code: 02331 solenoid valve 2, Machine controller) • Method of reproducing failure code: Turn starting switch to ON position with output ON.		

No.	Cause	Procedure, measuring location, criteria, and remarks		
1	Defective outrigger/boom relay (Internal short circuit)	1. Turn starting switch to OFF position. 2. Disconnect connector R15 and connect T-adapter to male side.		
		Resistance	Between R15 (male) (1) and (2)	300 to 850 Ω
2	Hot short circuit in wiring harness	1. Turn starting switch to OFF position. 2. Disconnect connector R15 and connect T-adapter to female side. 3. Turn starting switch to ON position.		
		Voltage	Between R15 (female) (2) and ground	Max 4.5 V
3	Machine controller is defective.	If no failure is found by preceding checks, machine controller is defective. (Since this is an internal defect, troubleshooting cannot be performed.)		

Circuit diagram related to 4th outrigger solenoid

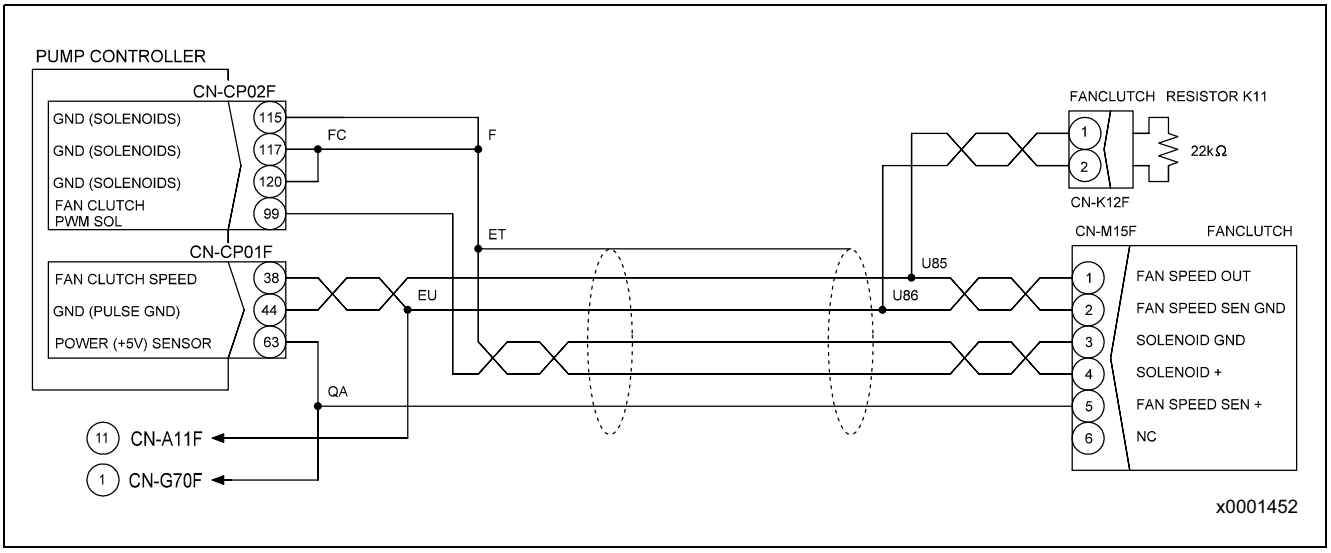


Failure code [DWMAKB] – Two piece boom suspension sol short circuit

Action level	Failure code	Failure	Short connection in 2-piece boom suspension solenoid (ECSS solenoid relay) (Pump controller system)
L03	**DWMAKB**		
Detail of failure	Controller detects short circuit of 2-piece boom suspension solenoid		
Action of controller	• None in particular (since no current flows, solenoid is not energized). • When the failure cause disappears of itself, the machine operation returns to normal.		
Problem on machine	• It is not possible to activates the boom suspension		
Related information	• After repair is completed, check if 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 2-boom suspension solenoid (Internal short circuit or ground fault)	1. Turn starting switch to OFF position. 2. Disconnect connectors V61, V65, V66 and connect T-adapter to male side.		
		Resistance	Between V61 (male) (1) and (2)	20 to 40 Ω
			Between V61 (male) and ground.	Min. 1 Ω
			Between V65 (male) (1) and (2)	20 to 40 Ω
			Between V65 (male) and ground.	Min. 1 Ω
			Between V66 (male) (1) and (2)	20 to 40 Ω
			Between V66 (male) and ground.	Min. 1 Ω
2	Short circuit or ground fault in wiring harness	1. Turn starting switch to OFF position. 2. Disconnect connector CP01 (55) and (94) and connect T-adapter to female side.		
		Resistance	Between CP01 (female) (94) and ground	200 to 600 Ω
			Between CP01 (female) (55) and GND (ECSS switch switched)	20 to 40 Ω
3	Ground fault in wiring harness (Contact with ground circuit)	1. Turn starting switch to OFF position. 2. Disconnect connectors V61, V65and V66. 3. Remove fuse (4) from FB3.		
		Resistance	Between R42 (female) (5) and each of pins V61 (female) (1), V65 (female) (1) and V66 (female) (1).	Max. 1Ω
			Between ground and each of pins V61 (female) (2), V65 (female) (2) and V66 (female) (2).	Max. 1Ω
			Between FB3 (4) and ground	Min. 1MΩ
4	Pump controller is defective	If no failure is found by above checks, pump controller is defective. (Since this is an internal defect, troubleshooting cannot be performed.)		

Circuit diagram related to fan clutch



Failure code [DXE9KB] – Attachment flow regulating EPC 4 solenoid short circuit

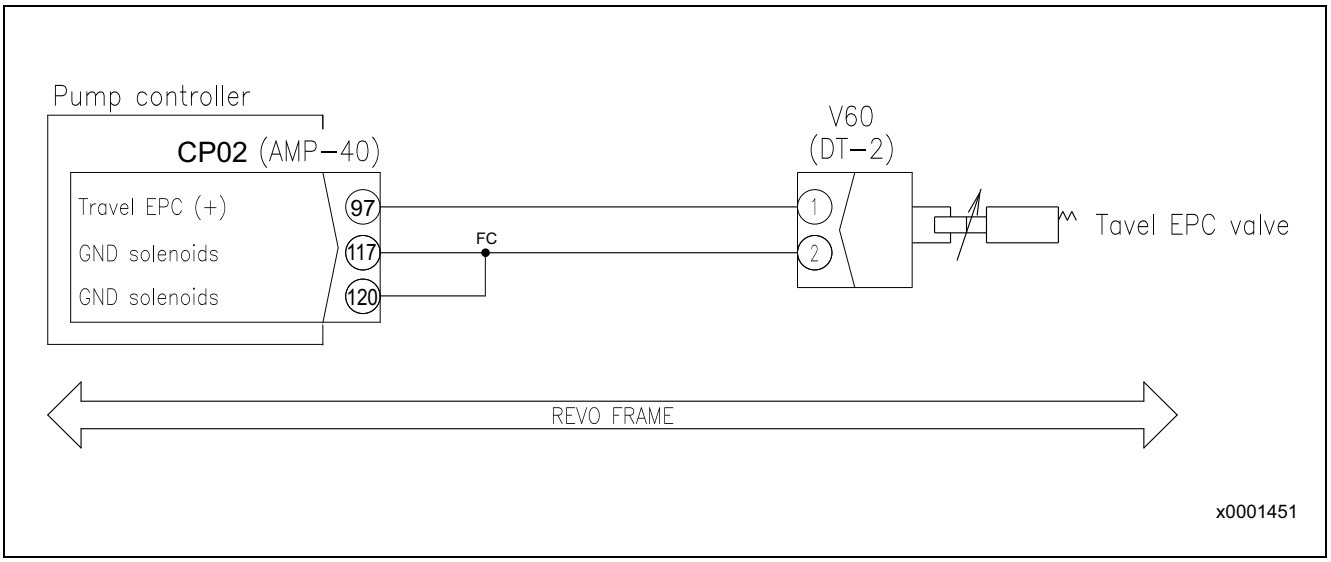
Action level	Failure code	Failure	Attachment Flow Regulating EPC 4 Solenoid Short Circuit (Pump controller system)
-	**DXE7KB**		
Detail of failure	Abnormal current flows when pump controller drives attachment flow rate (service current) EPC4 solenoid, so pump controller determines that short circuit exists in attachment flow rate adjustment (service current) EPC4 solenoid circuit.		
Action of controller	• Stops driving attachment flow rate adjustment EPC1, EPC2, EPC3, and EPC4 solenoids. • Even if cause of failure disappears, machine does not become normal until starting switch is turned to OFF position.		
Phenomenon on machine	Attachment does not move.		
Related information	• Drive current of attachment flow rate adjustment EPC4 solenoid can be checked with monitoring function (code: 01702). • After repairing, check if the failure code is cleared by the following procedure. Procedure: Turn the starting switch to ON position and set machine in attachment mode (ATT).		

No.	Cause	Procedure, measuring location, criteria and remarks		
1	Defective attachment flow rate adjustment EPC 4 (internal short circuit or ground fault)	1. Turn starting switch to OFF position. 2. Disconnect connector V94, and connect T-adapter to male side.		
		Resistance	Between V94 (male) (1) and (2)	7 to 12 Ω
			Between V94 (male) (1) and ground	Min. 1 MΩ
2	Ground fault in wiring harness (contact with ground circuit)	1. Turn starting switch to OFF position. 2. Disconnect connectors CP02 and V94, and connect T-adapters to each female side.		
		Resistance	Between ground and CP02 (female) (110) or V94 (female) (1)	Min. 1 MΩ
3	Defective pump controller	If no failure is found by preceding checks, pump controller is defective. (In case of an internal defect, troubleshooting is impossible as an assembly. Replace whole assembly).		

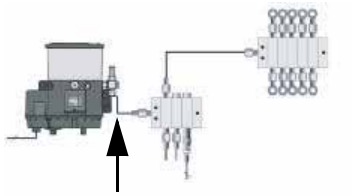
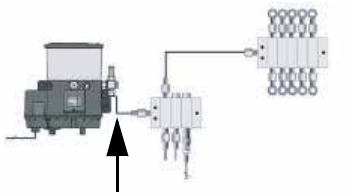
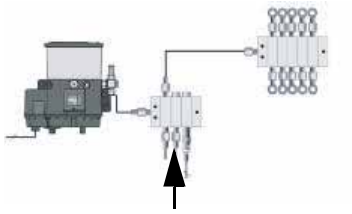
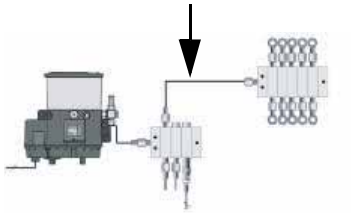
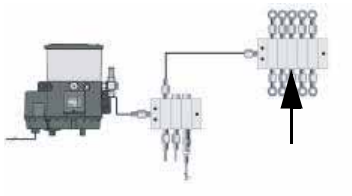
Failure code [DXK3KB] – Travel pedal throttle EPC solenoid short circuit

Action level	Failure code	Failure	Travel pedal throttle EPC solenoid short circuit (Pump controller system)
L03	**DXK3KB**		
Detail of failure	No current flows to the travel EPC solenoid circuit when power is supplied to the circuit.		
Action of controller	Power supply to the travel EPC valve is switched OFF.		
Problem on machine	Machine will not travel (no pressure P between travel EPC valve and main control valve).		
Related information	After repair is completed, check if 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	Travel pedal throttle EPC solenoid defective (Internal Short circuit or grounding fault)	Turn the engine starting switch OFF for the preparations, and hold it in the OFF position during the troubleshooting.		
		V60 (male)	Resistance value	
		Between (1) and (2)	9 - 11 Ω at 20°C	
		Between (1) and ground	Above 1 MΩ	
2	Grounding fault of wiring harness (Contact with grounding circuit)	Turn the engine starting switch OFF for the preparations, and hold it in the OFF position during the troubleshooting.		
		Between wiring harness from CP02 (female) (97) and V60 (female) (1)	Resistance value	Above 1MΩ
3	Pump controller defective	Turn the engine starting switch ON for the preparations, and hold it in the ON position during the troubleshooting.		
		C02	Voltage	
		Between (97) and ground	20 - 30 V	



Troubleshooting – grease system faults

Complain	Possible cause	Repair method
No pressure built up in the main line (Fault code FCS, no grease at the main relief valve, the grease pump is in good condition). 	Main grease line defective. (grease leakage)	Replace main line. Use genuine Komatsu spare parts!
	Air has entered main grease line.	Bleed air from main line. ● Remove main line from main feeder block. ● Activate the intermediate grease cycle until the grease is free from air bubbles.
Main relief valve opens too early (grease is released through the relief drilling. Fault code FCS, system pressure below 300 bar).	Defective main relief valve.	Replace main relief valve.
Grease system blocked: Main relief valve is set to open (grease is released through the relief drilling), fault code FCS		Troubleshoot the system in steps from the pump forward to the farthest grease point for defects and malfunction.
	Blocked main line.	● Remove main line at the main feeder valve inlet port. ● Activate the intermediate grease cycle. ● In case of no grease flow: Maine line blocked -> Replace main line
	Blocked main feeder valve.	● Remove sub lines from the main feeder valve outlet ports. ● Activate the intermediate grease cycle. ● In case of no grease flow: Main feeder blocked -> Replace main feeder
In case main line and main feeder valve are free, then possibly the sub lines are blocked. To find the blocked sub line, connect each sub line separately to the main feeder valve and start the intermediate grease cycle. Grease is drained from the related open feeder valve outlet ports. If this in not the case, then the currently connected sub line is blocked.		
	Blocked sub line	● Release sub line at the sub feeder inlet port. ● Activate the intermediate grease cycle. ● In case of no grease flow: Sub line blocked -> Replace sub line
	Blocked sub feeder valve	● Release grease lines from the feeder valve outlet ports. ● Activate the intermediate grease cycle. ● In case of no grease flow: Sub feeder blocked -> Replace sub feeder

S-17 Coolant temperature rises too high (overheating)

Failure	Coolant temperature rises too high (overheating)
Related information	If any failure code is displayed, perform troubleshooting for that code first.

No.	Cause	Point to check, remarks	Remedy
1	Clogged radiator core	Check for clogging of radiator core and crushing of fin.	Cleaning of radiator core
2	Malfunction of thermostat	Thermostat does not open at cracking temperature. **REMARK** Cracking temperature of thermostat: 79.4 ± 83.3 °C (Full open temperature: 95 °C)	Thermostat replacement
3	Defective coolant temperature gauge	The error is detected in coolant temperature gauge system, but measured coolant temperature in radiator is normal.	Coolant temperature sensor, monitor or wiring harness replacement
4	Increase of fuel injection amount	Fuel injection amount is excessive.	Perform troubleshooting of “FUEL CONSUMPTION IS EXCESSIVE” in S mode, and take corrective action.
5	Low coolant level	Check coolant level for decrease.	Refilling with coolant
6	Coolant leakage	Check coolant piping for coolant leakage.	Coolant piping replacement
7	Broken water pump	Visually check water pump (check of water leakage through shaft seal, breakage of impeller, breakage of shaft)	Water pump replacement
8	Overheat due to increase in EGR ratio (EGR amount against fresh air intake amount) caused by defective mass air flow and temperature sensor	Check for defective mass air flow and temperature sensor.	Mass air flow and temperature sensor replacement
9	Overheat caused by increase of EGR ratio (quantity of EGR to fresh intake air) caused by deformation of air cleaner	Check air cleaner and rectifying wire net for deformation.	Air cleaner repair or replacement
10	Defective cylinder head or head gasket	Check if there are many bubbles in radiator and if coolant blows back.	Perform troubleshooting of “OIL IS IN COOLANT” in S mode, and take corrective action.
11	Defective piston ring	• Remove plug of bore for measuring the exhaust gas color in front of KDPF, and check color of the exhaust gas coming out of the bore. (Reference: See TESTING AND ADJUSTING “TEST EXHAUST GAS COLOR”) • Measure compression pressure (See standard value table). (Reference: See “TESTING AND ADJUSTING”, “Testing compression pressure”.) • Check piston ring and piston ring groove.	Piston ring and piston replacement

TIGHTENING TORQUES FOR SCREWS (in Nm) ACC. TO ZF STANDARD 148

Friction coefficient: μ tot.= 0.12 for plugs and nuts without rework, as well as phosphated nuts. Tighten manually!

Take tightening torques from the following chart, unless otherwise specified:

Metric ISO standard thread DIN 13, page 13

Dimension	8.8		10.9		12.9
M4	2.8		4.1		4.8
M5	5.5		8.1		9.5
M6	9.5		14		16.5
M7	15		23		28
M8	23		34		40
M10	46		68		79
M12	79		115		135
M14	125		185		215
M16	195		280		330
M18	280		390		460
M20	390		560		650
M22	530		750		880
M24	670		960		1100
M27	1000		1400		1650
M30	1350		1900		2250
M33	1850		2600		3000
M36	2350		3300		3900
M39	3000		4300		5100

Metric ISO fine thread DIN 13, page 13

Dimension	8.8		10.9		12.9
M 8 x 1	24		36		43
M 9 x 1	36		53		62
M 10 x 1	52		76		89
M 10 x 1,25	49		72		84
M 12 x 1,25	87		125		150
M 12 x 1,5	83		120		145
M 14 x 1,5	135		200		235
M 16 x 1,5	205		300		360
M 18 x 1,5	310		440		520
M 18 x 2	290		420		490
M 20 x 1,5	430		620		720
M 22 x 1,5	580		820		960
M 24 x 1,5	760		1100		1250
M 24 x 2	730		1050		1200
M 27 x 1,5	1100		1600		1850
M 27 x 2	1050		1500		1800
M 30 x 1,5	1550		2200		2550
M 30 x 2	1500		2100		2500
M33 x 1,5	2050		2900		3400
M 33 x 2	2000		2800		3300
M 36 x 1,5	2700		3800		4450
M 36 x 3	2500		3500		4100
M 39 x 1,5	3450		4900		5700
M 39 x 3	3200		4600		5300

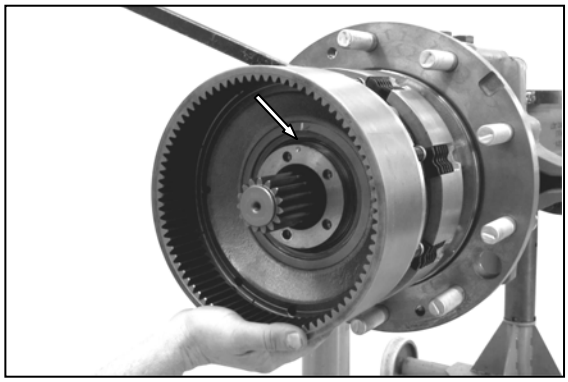


Figure 9

Press off ring gear together with piston from joint housing.

(S) Assembly lever 5870 345 036

☞ **Pay attention to releasing O-ring (arrow)!**

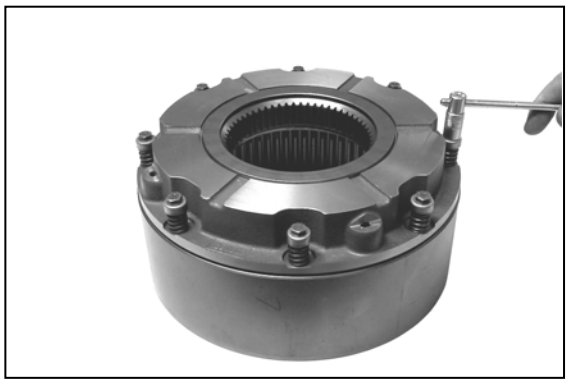


Figure 10

Loosen hexagon screws and remove releasing spring sleeves and compression springs.

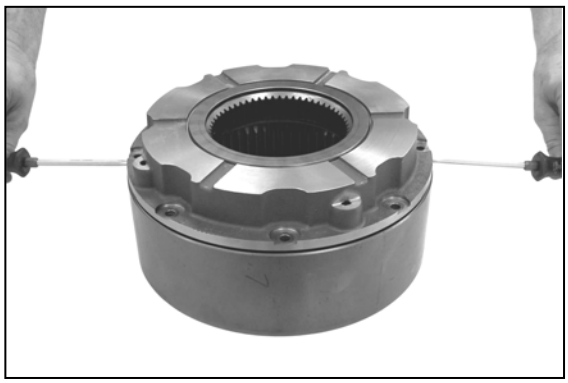


Figure 11

Press off piston from ring gear.

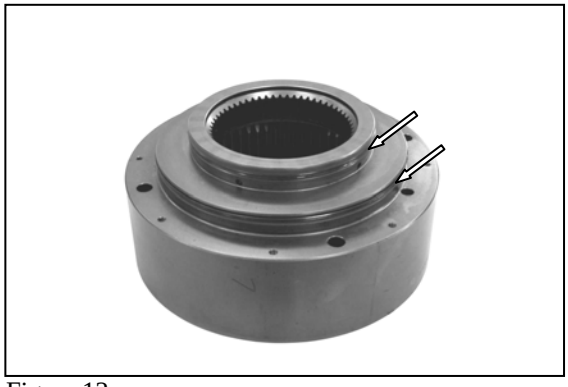


Figure 12

Remove sealing elements from the annular grooves (see arrows) of the ring gear.

CALCULATION EXAMPLE „A“:

Dimension II	116.00 mm
Dimension III	+ 36.50 mm
Result dim. X	= 152.50 mm

CALCULATION EXAMPLE „B“:

Dimension I	154.05 mm
Dimension X	- 152.50 mm
Difference = shim	**s = 1.55 mm**

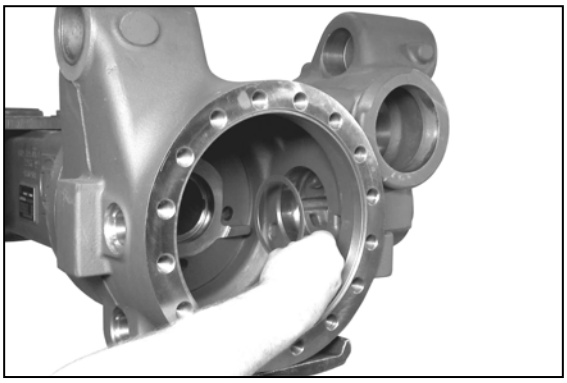


Figure 4

Insert the determined shim (e.g. s = 1.55 mm) into the inner bearing hole.

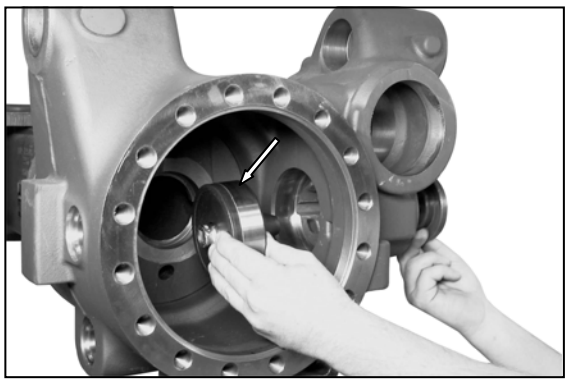


Figure 5

Undercool bearing outer ring (see arrow) and bring into contact position in the bearing hole by using the assembly fixture (S).

(S) Assembly fixture	5870 345 049
(S) Pressure ring	5870 345 056

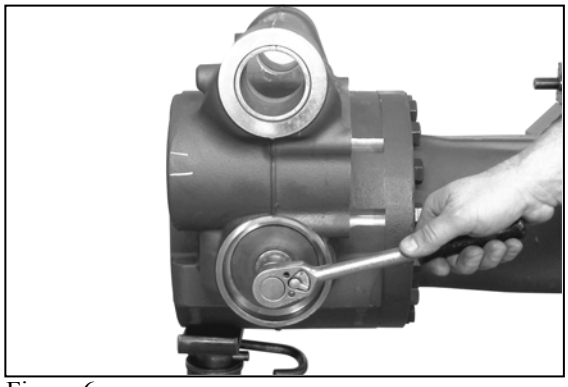


Figure 6

Undercool outer bearing outer ring and insert into bearing hole until contact is obtained.

(S) Assembly fixture	5870 345 049
(S) Pressure ring	5870 345 056

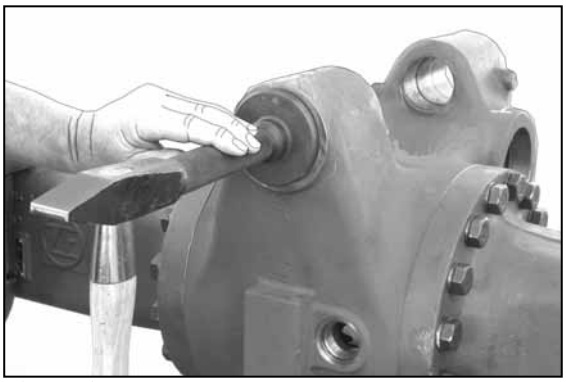


Figure 57

7.7 Reassembly pivot bearing

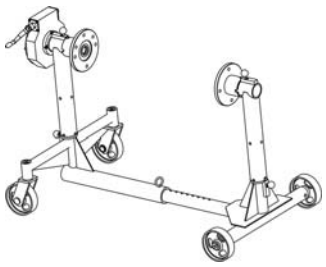
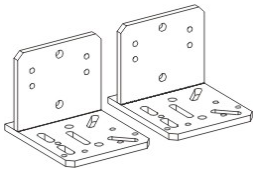
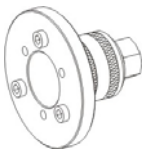
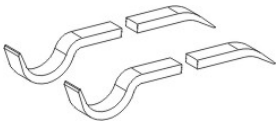
Super-cool bushings and insert into the heated pivot bearing hole until contact is obtained.

☞ **Observe installation position for bushing version with slot, insert bushings with slot in 12 ^{00} o'clock position**!

⚠ **Prior to putting the axle into operation, fill in oil in accordance with the Lubrication and Maintenance Instructions (5871 564 902)!**

SPECIAL TOOLS FOR DISASSEMBLY AND REASSEMBLY

MT-E 3050 / 3060 / 3070 II
4472 047 200 / 4472 048 200 – 202 / 4472 049 201

Cons. No.	Figure	Designation Order no.	Qty.	Chapter/ Figure
1		**Assembly truck** assy with tilting device **5870 350 000**	1	1/1
2		**Supporting bracket** **5870 350 106**	1	1/1
3		**Socket wrench** **5870 656 097**	1	1/8 6/12 6/25
4		**Assembly lever** **5870 345 036**	1	1/10
5		**Adjusting device** **5870 400 001**	2	1/15

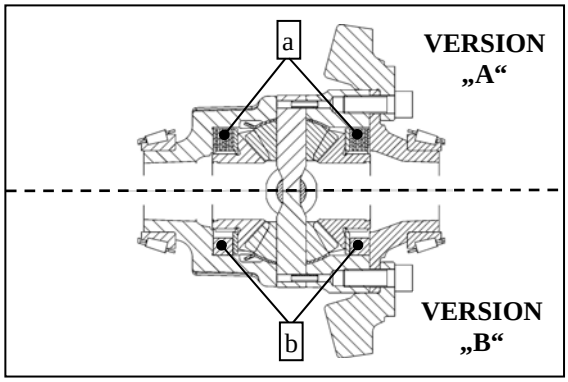


Figure 1

3. Disassembly differential

3.1 DZ-500 and D-500

VERSION "A" = DZ-500:
DZ-500 = limited slip differential
(e.g. with 45 % locking value)
a = Disk package (outer disks, s = optional)

VERSION "B" = D-500:
D-500 = Standard differential
(without disks / no locking value)
b = Constant spacers


Figure 2

Pull both tapered roller bearings from differential carrier.

(S) Grab sleeve	5873 011 019
(S) Basic tool	5873 001 000
(S) Pressure piece	5870 100 009

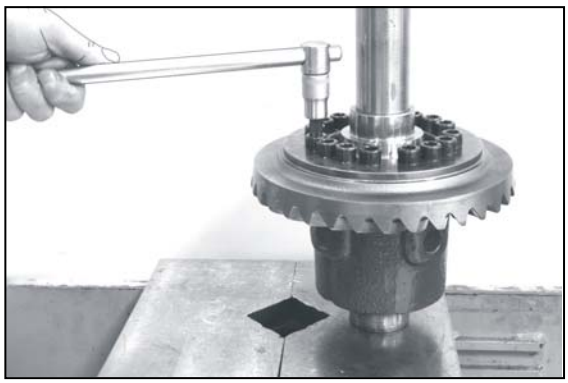


Figure 3

Use press to fix differential and loosen threaded joint crown wheel / differential carrier.

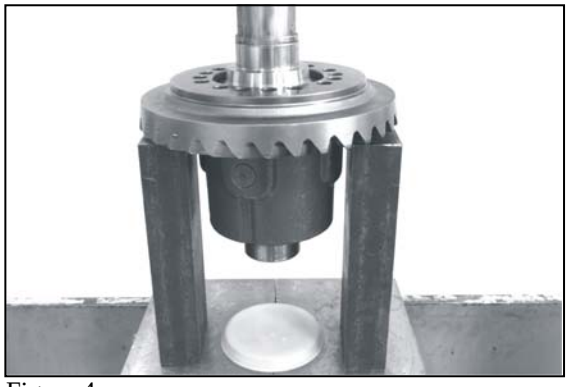


Figure 4

Press crown wheel from differential.

Figure 35

Place determined shim (e.g. thickness = 1.00 mm) and bearing outer ring into the hole of the axle housing on the crown wheel side (part II).

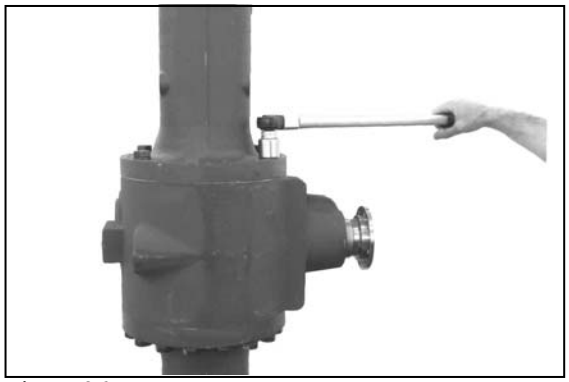


Figure 36

Use lifting tackle to mount the axle housing (crown wheel side, part II) and preliminarily fix it with hexagon screws.

Tightening torque (M18/12.9) . . . . . M_A = 440 Nm

☞ **Preliminarily fix axle housing without O-ring!**

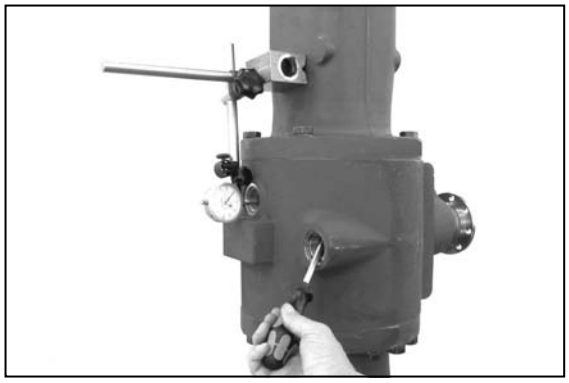


Figure 37

<u>Check of backlash 0.06 … 0.36 mm and contact pattern of the bevel gear set</u>

Place dial indicator at a right-angle position to a tooth flank of the crown wheel (in the area of the outer diameter) through the oil filler hole and check backlash.

☞ **In case of a deviation from the required backlash use suitable adjusting shims for correction!**

1. **Insufficient backlash – install thicker shim (Figure 30).**
   Select an accordingly thinner shim for the determination of the bearing preload (Figure 35).

2. **Excessive backlash – install thinner shim- (Figure 30).**
   Select an accordingly thicker shim for determination of the bearing preload (Figure 35).

SPECIAL TOOLS FOR DISASSEMBLY AND REASSEMBLY

2 HL-250/270/290/ 4143 020 095/106

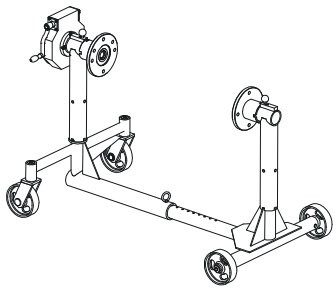
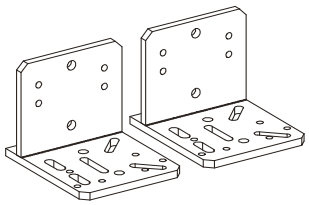
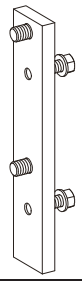
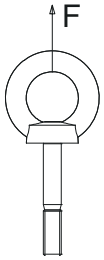
Cons. No.	Figure	Designation Order No.	Qty	Chapter/Fig
1		**Assembly truck assy** with tilting device **5870 350 000**	1	1/1 2/1
2		**Supporting bracket** **5870 350 106**	1	1/1
3		**Lifting strap** **5870 281 026**	1	1/2 10/1
4		**Fixture** **5870 350 079**	1	2/1
5		**Eye bolt assortment** **5870 204 002**	1	2/17

Figure 31

Unsnap retaining ring.

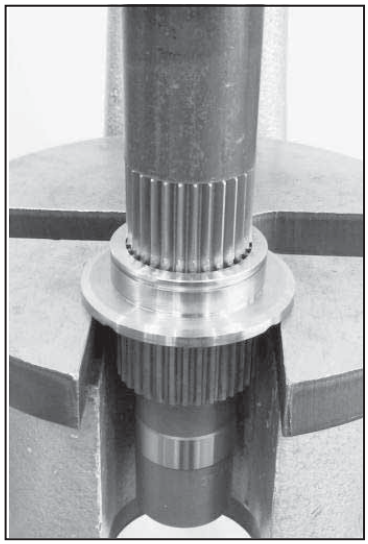


Figure 32

Press centering disk from input shaft.

☞ **In case of extreme press fit – heat centering disk!**

Figure 33

Unsnap retaining ring and remove ball bearing.

(S) Clamping pliers 5870 900 021

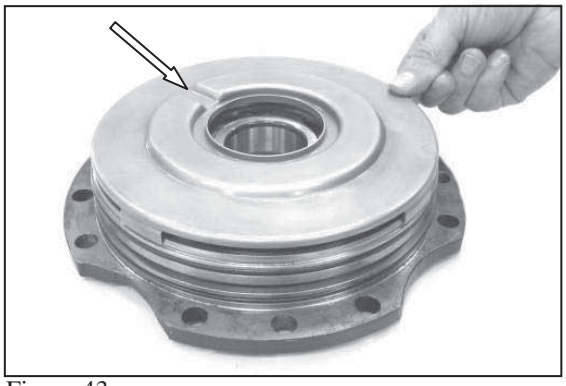


Figure 43

Insert oil screen sheet onto bearing cover

☞ **Observe installation position - place locating tab (see arrow) into recess of bearing cover (radial fixing)!**

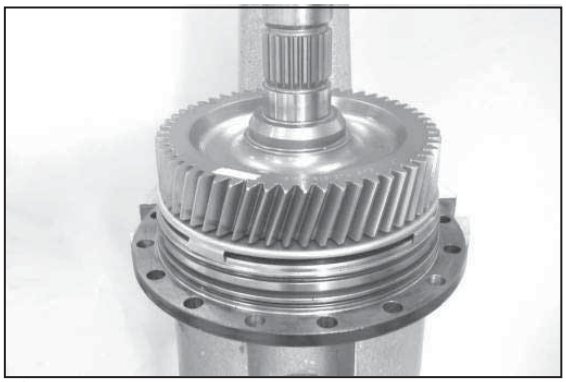


Figure 44

Press output gear into ball bearing/bearing cover.

☞ **Support ball bearing onto bearing inner ring!**

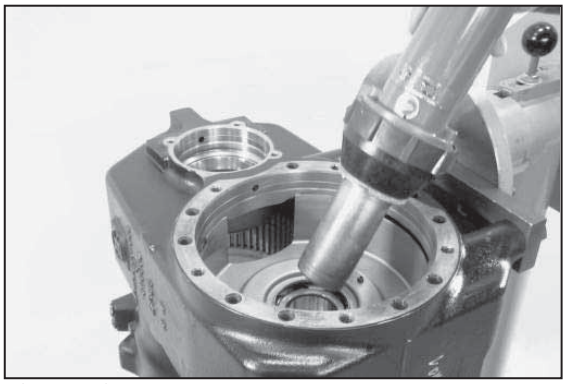


Figure 45

Heat bearing inner ring of ball bearing.

Attach two adjusting screws and mount preassembled bearing cover/output gear until contact is obtained.

(S) Adjusting screws (M12) 5870 204 021

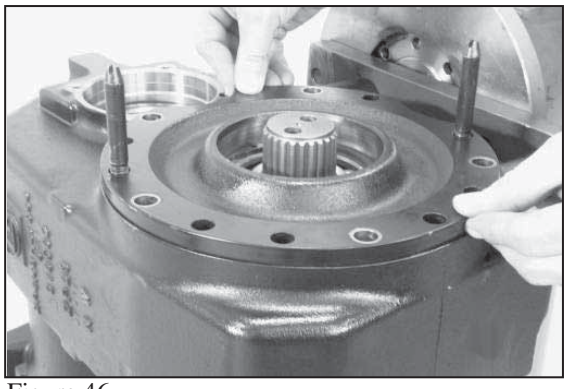
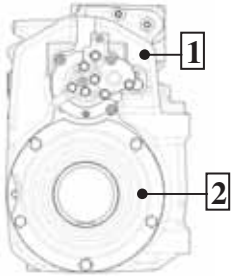


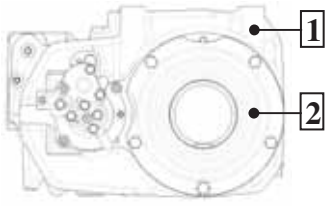
Figure 46

☞ **Observe installation position of bearing cover (2) in transmission (1) – Transmission installation „VERTICAL“ or „HORIZONTAL“ - see detailed sketches below:**

„VERTICAL“



„HORIZONTAL“



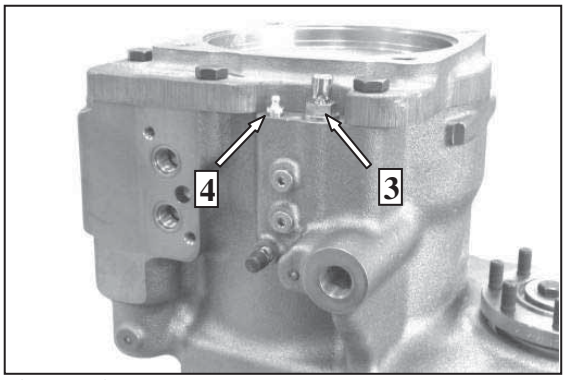


Figure 75

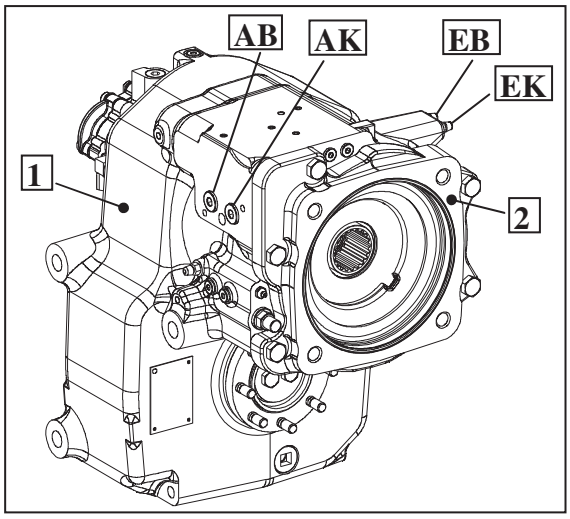


Figure 76

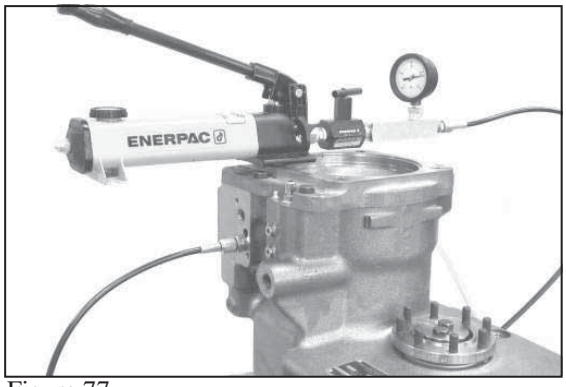


Figure 77

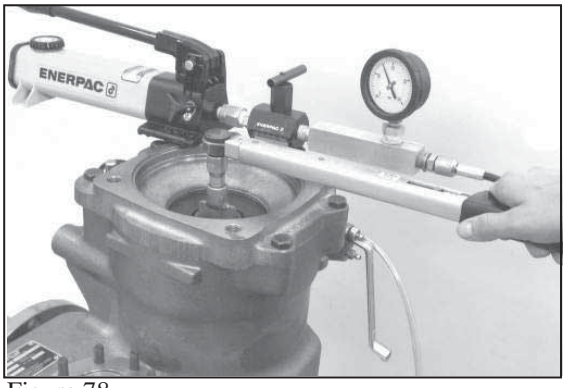


Figure 78

Remove screw plug and compressed air connection piece (see Fig. no. 73).

Install breather (3) with new O-ring and lubrication nipple (4).

Tightening torques:

Lubrication nipple (M 10x1)	M_A = 15 Nm
Breather (M 18x1.5)	M_A = 22 Nm

5.4.2 Check multi-disk brake and multi-disk clutch for leak tightness as well as closing pressure

Legend to sketch no. 75:
1 = Transmission housing
2 = Input housing

AB = Pressure oil connection – multi-disk brake
AK = Pressure oil connection – multi-disk clutch

EB = Breather valve – multi-disk brake
EK = Breather valve – multi-disk clutch

☞ Illustration shows version transmission installation position **„Vertical“.**

☞ For version Transmission installation position **„Horizontal“,** connections and positions of breather valves/lubrication nipple etc. according to illustration in sketch no. 72 must be considered!

Multi-disk brake

Connect HP pump (“AB“ – see sketch no. 76 and sketch no. 72) and
build up pressure of p = 30 … max. 35 bar.
- Bleed pressure chamber several times.

Close shut-off valve.
During a test duration of 3 minutes no measurable pressure drop is allowed!

(S) HP pump 5870 287 007

Test medium:
According to ZF List of Lubricants TE-ML 07

Closing pressure test (Cup spring preloading force):
When measuring closing pressure, valve block may not be attached to transmission due to by-pass function between brake and clutch.
Connection „AK“ (see sketch no. 76 and sketch no. 72) open (not closed and tank connection).

Reduce pressure slowly, when pressure range 12 ... 9 bar (closing pressure) is reached, input shaft must be locked at a tightening torque of 35 Nm!

(S) Spline mandrel 5870 510 039

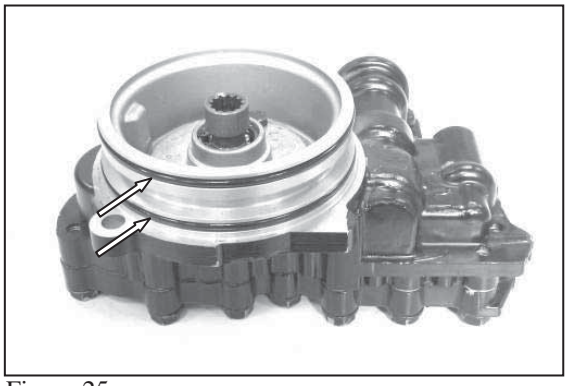


Figure 25

Oil both O-rings (arrows) and put them into annular groove of housing.

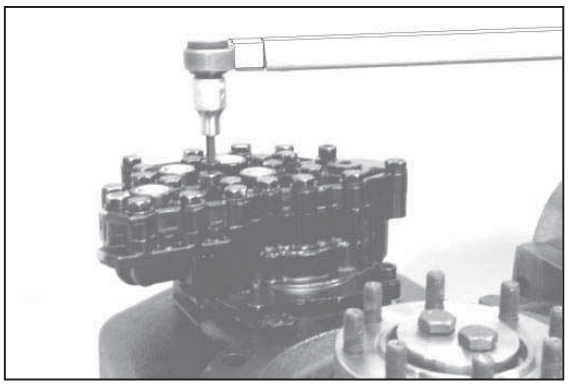


Figure 26

Insert cpl. shift interlock and fix with cylindrical screws with disks.

Tightening torque (M8/10.9) M_A = 23 Nm

☞ **Pay attention to different screw length!**

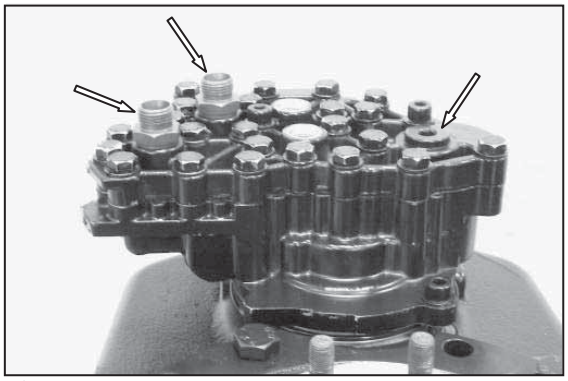


Figure 27

Install both screw-in sleeves and screw plug (see arrow) with O-rings.

Tightening torque:
Screw-in sleeve (M 16 x 1.5) M_A = 30 Nm
Screw plug (M 18 x 1.5) M_A = 35 Nm

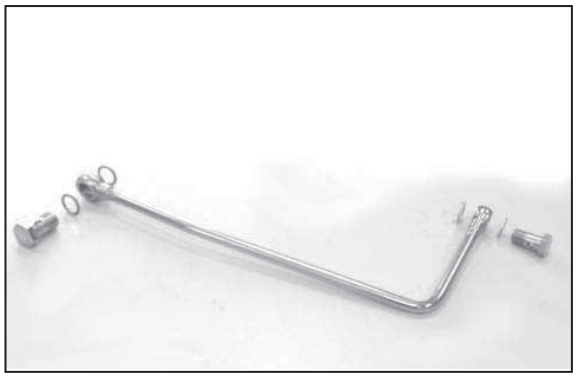
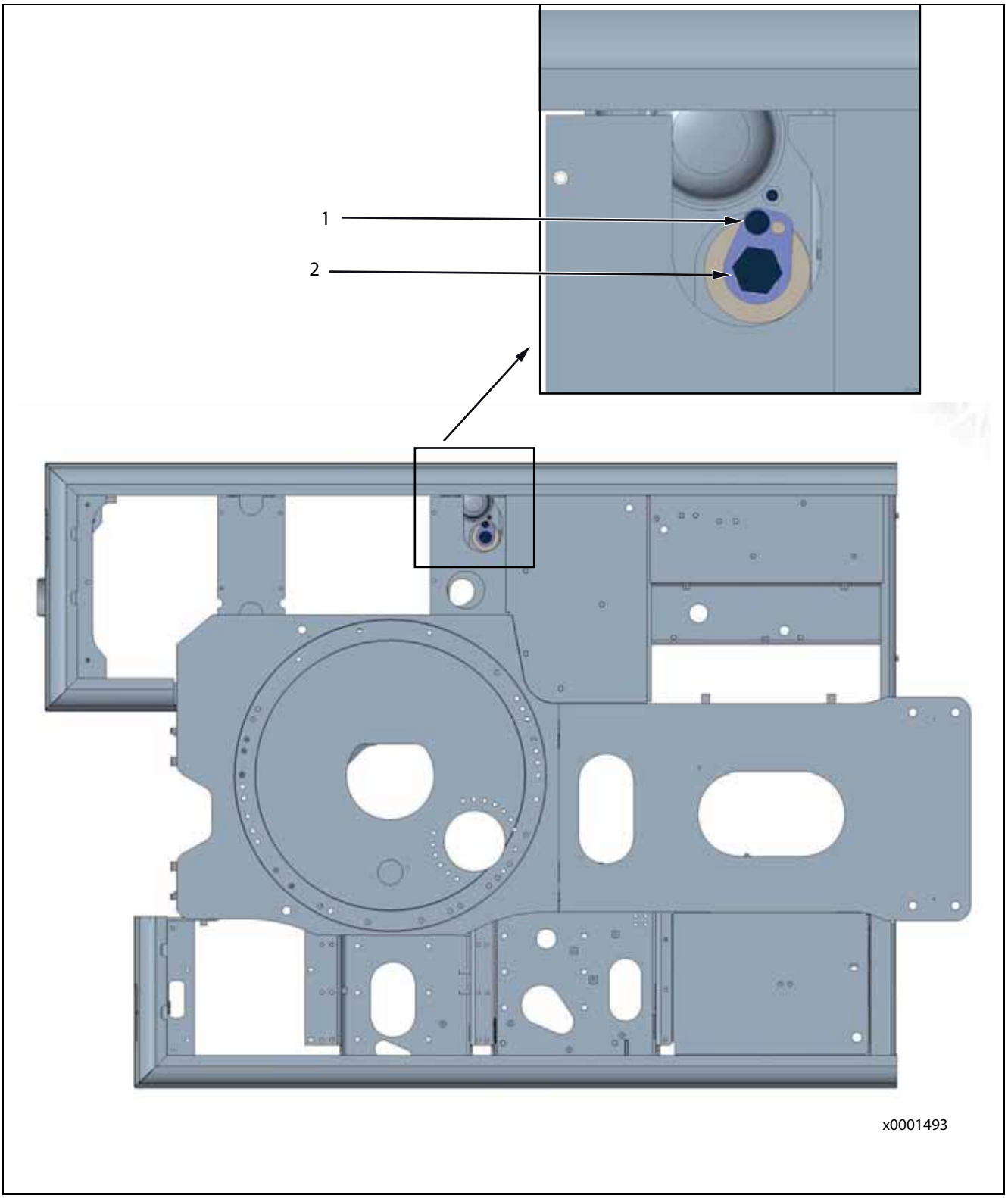


Figure 28

Legend to Figure no. 28:

1 = Oil tube
2 = Hollow screw (M 16 x 1.5)
3 = Seal ring
4 = Hollow screw (M 14 x 1.5)
5 = Seal ring


1
2
x0001493

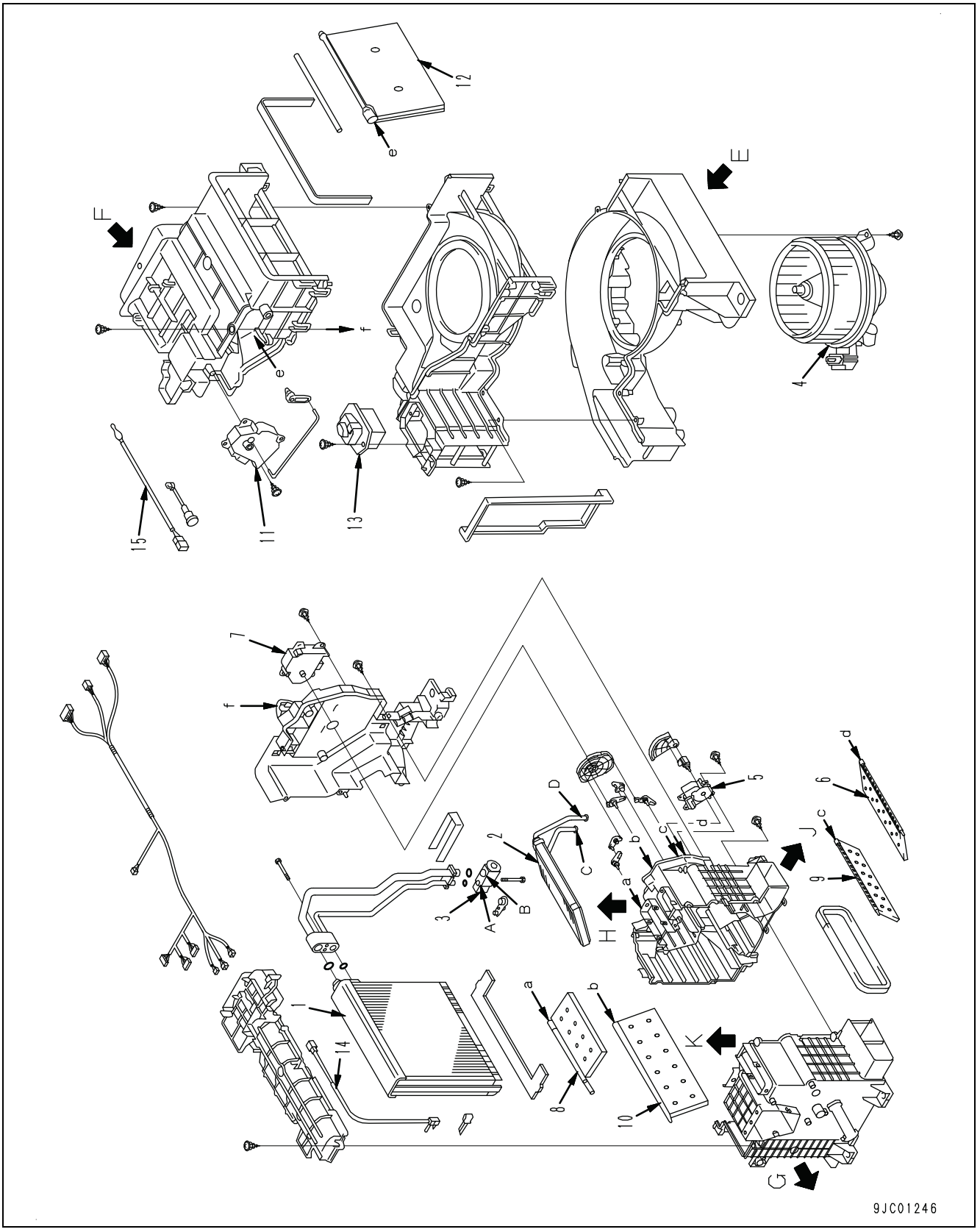
Unit: mm

No.	Check item	Criteria					Remedy
		Standard size	Tolerance		Standard clearance	Clearance limit	
			Shaft	Hole			
1	Clearance between connecting pin and bushing of revolving frame and boom	80	-0.030 -0.060	+0.215 +0.180	0.210 ~ 0.275	1.0	Replace
2	Clearance between connecting pin and bushing of boom and arm	80	-0.030 -0.104	+0.213 +0.164	0.194 ~ 0.317	1.0	
3	Clearance between connecting pin and bushing of arm and link	70	-0.030 -0.076	+0.158 +0.078	0.108 ~ 0.234	1.0	
4	Clearance between connecting pin and bushing of arm and bucket	70	-0.030 -0.076	+0.135 +0.074	0.104 ~ 0.211	1.0	
5	Clearance between connecting pin and bushing of link and bucket	70	-0.030 -0.076	+0.157 +0.078	0.108 ~ 0.233	1.0	
6	Clearance between connecting pin and bushing of link and link	70	-0.030 -0.076	+0.265 +0.215	0.245 ~ 0.341	1.0	

Component parts of air conditioner system

Air conditioner unit

Configuration diagram of air conditioner unit



Air conditioner unit and connectors layout

2: Power transistor connector [2]

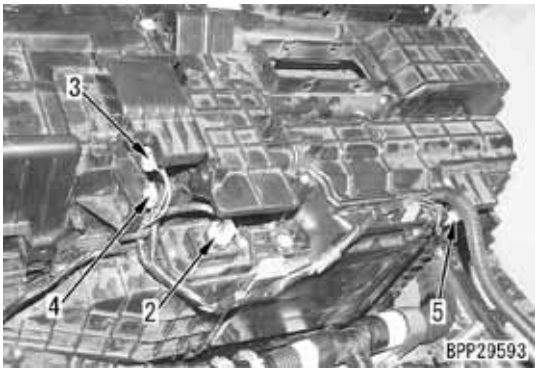
3: FRESH/RECIRC air changeover servomotor connector [5]

4: Inside air temperature sensor connector [6]

5: Evaporator temperature sensor (frost sensor) connector [7]

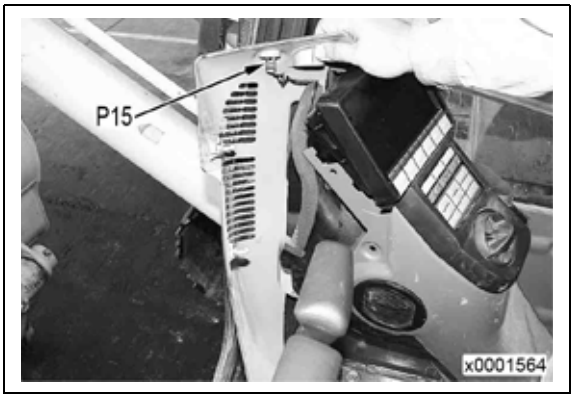
REMARK

- The connectors cannot be disconnected while mounted on the machine, except connector 2 at the rear side of the air conditioner unit.
- [2], [5], [6], and [7] are unlabeled connectors.



Sunlight sensor connectors layout

P15: Sunlight sensor connector

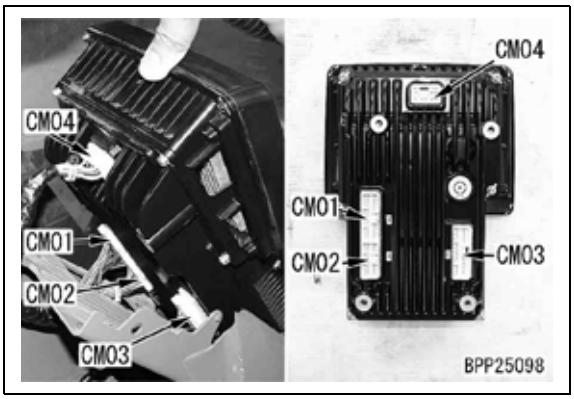


Machine monitor connectors layout

CM01 to CM04: Machine monitor connectors

REMARK

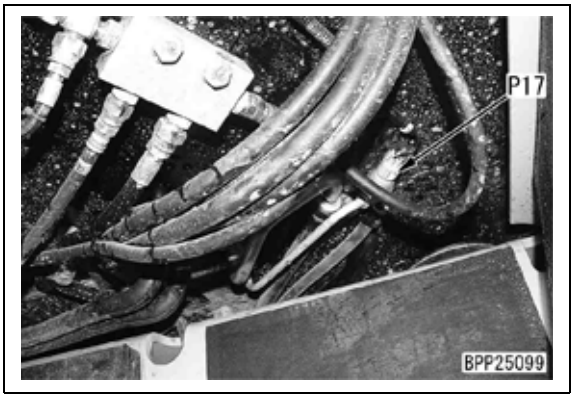
- Connector CM03: (Unused)
- Connector CM04: (For connecting camera)



Dual pressure switch connectors layout

When disconnecting the dual pressure switch connector, swing the upper structure 90 ° and remove the cab undercover.

P17: Dual pressure switch connectors



Failure code [879CKA] Ventilating sensor open circuit

Action level	Failure code	Failure	Ventilating sensor Open Circuit (Machine monitor system)
-	**879CKA**		
Details of failure	Air conditioner controller detects open circuit in evaporator temperature (frost) sensor.		
Action of controller	• Air conditioner controller transmits open circuit information of evaporator temperature (frost) sensor to machine monitor by CAN communication. • Stops air conditioner.		
Phenomenon on machine	Air conditioner does not operate because of open circuit in evaporator temperature (frost) sensor.		
Related information	• After repairing, check if the failure code is cleared by the following procedure. Procedure: Turn starting switch to ON position. • Check if this failure code is displayed on electrical system failure record screen in service mode of machine monitor. • Since connector of air conditioner evaporator temperature (frost) sensor cannot be checked when it is mounted on machine, troubleshooting cannot be performed.		

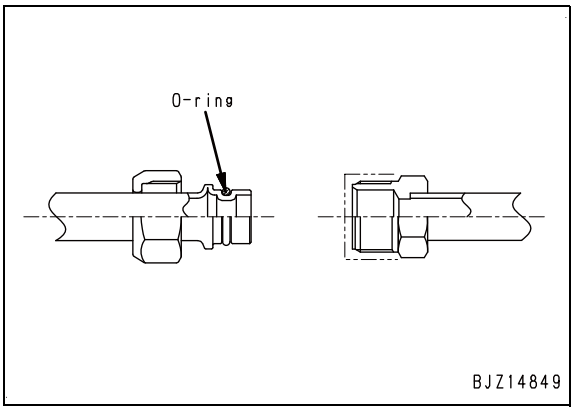
No.	Cause	Procedure, measuring location, criteria and remarks
1	Defective air conditioner controller	Air conditioner controller may be defective. (In case of an internal defect, troubleshooting is impossible as an assembly. Replace whole assembly.)
2	Defective air conditioner unit	Air conditioner unit may be defective. (In case of an internal defect, troubleshooting is impossible as an assembly. Replace whole assembly.)

Precautions for connection

- When connecting the piping, apply compressor oil (NDOIL8) for R134a to its O-rings. (See item 4 of “Handling of compressor oil”)
  Do not apply oil to the threaded part of a bolt, nut or union, however.

  REMARK

  An O-ring is fitted to every joint of the air conditioner piping.
- Once an O-ring is used, it is deformed and deteriorated. Accordingly, do not reuse it. When removing it, use a soft tool (such as a toothpick) so that the piping will not be damaged.



- When connecting a pipe, push it into the end and fully finger- tighten the bolt or nut.
- Be sure to use 2 wrenches to tighten each nut. Use one wrench to fix one nut and the other wrench (torque wrench) to tighten the other nut to the specified torque.

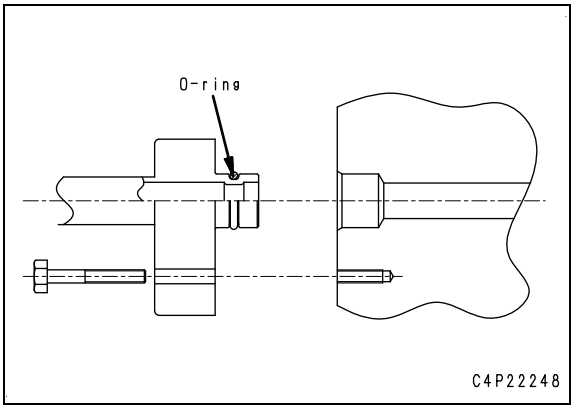
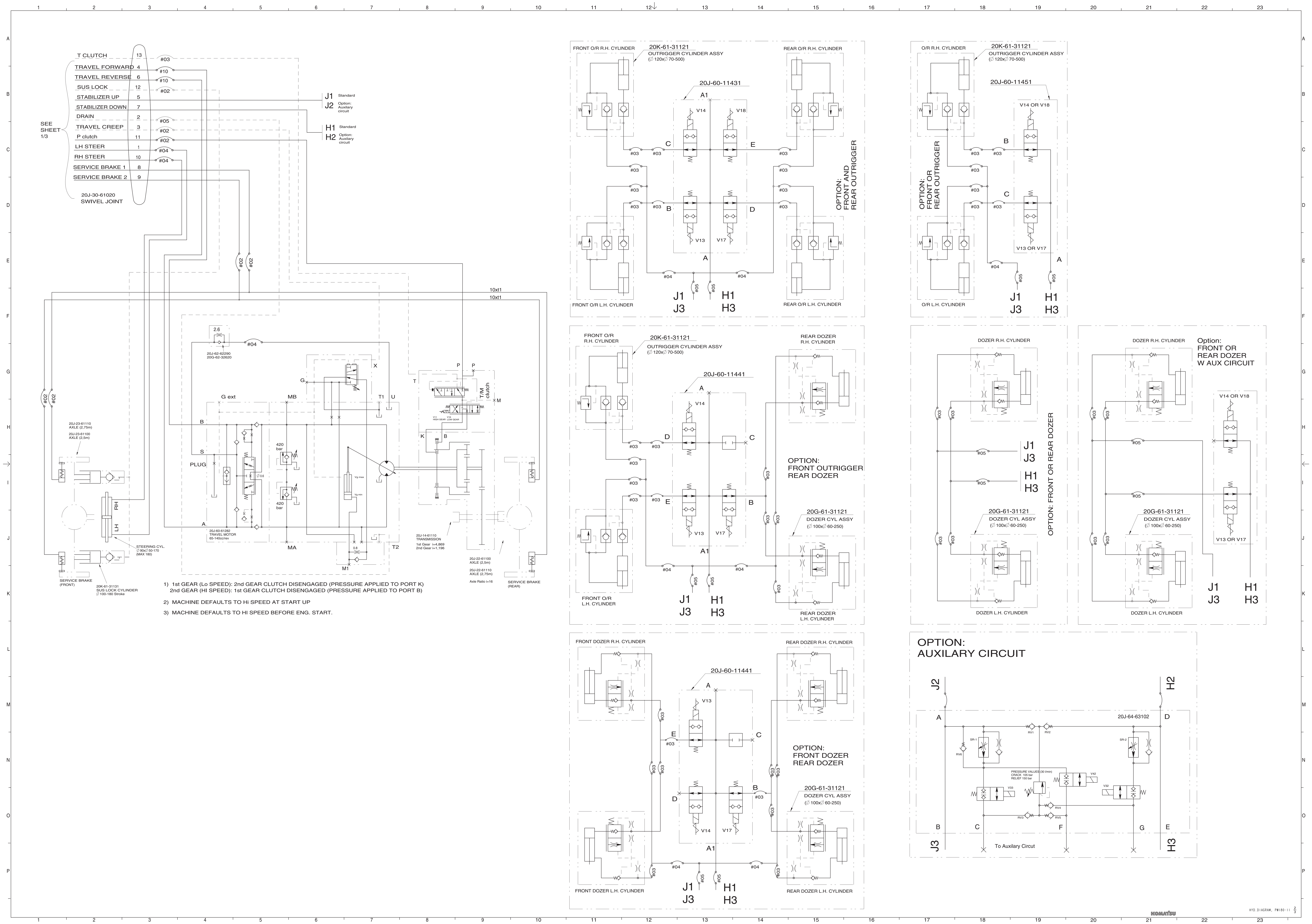


Table of tightening torque for refrigerant pipe joint.

Thread size	Tightening torque
M6x1.0	Air conditioner unit, compressor: 8 to 12 Nm {0.8 to 1.2 kgm}

- **Cut-Off Valve Sinking Output Open Circuit**
  - The driving pin for the cut off valve has reported an open circuit (measured current below 50,0 mA while turned on) for more than 200ms.
  - The pin is C2p09 (Title is incorrectly referring to "Sinking", and the Service Tool also incorrectly references the "Sinking" output C2p10).
- Investigate and correct:
  - Check for open circuit of the wiring, or short circuit to Battery+.
    - Correct wiring.
  - Check for open circuit in the valve spool.
    - Replace the valve.
- **Cut-Off Valve Sinking Output Status**
  - The sinking pin for the cut off valve has reported, for more than 200ms, either:
    - Overload
    - Configuration Error
    - Safety Circuit Failure (controller internal)
    - Internal voltage out-of-range (controller internal)
  - The pin is C2p10.
- Investigate and correct:
  - Check for continuity to Battery+ in the wiring.
    - Correct wiring.
  - Check for short circuit in the valve spool.
    - Replace the valve.
  - Is the application version displayed in the Service Tool the latest released version?
    - Update the application software to the latest version.
  - Does another joystick controller show the same error?
    - If not; replace the joystick controller.
- **Cut-Off Valve Current Feedback Mismatch**
  - Mismatch between Cut-Off valve current command and feedback current.
    - Compared in a +/- 100mA window, for 200ms.
    - Compared for C2p09 and C2p10, in parallel.
- Investigate and correct:
  - Check for short circuits to Battery+/GND or open circuit in the wiring.
    - Correct wiring.
  - Check for open/short circuit of valve spool.
    - Replace Cut Off valve.

Hydraulic circuit diagram (2/3)

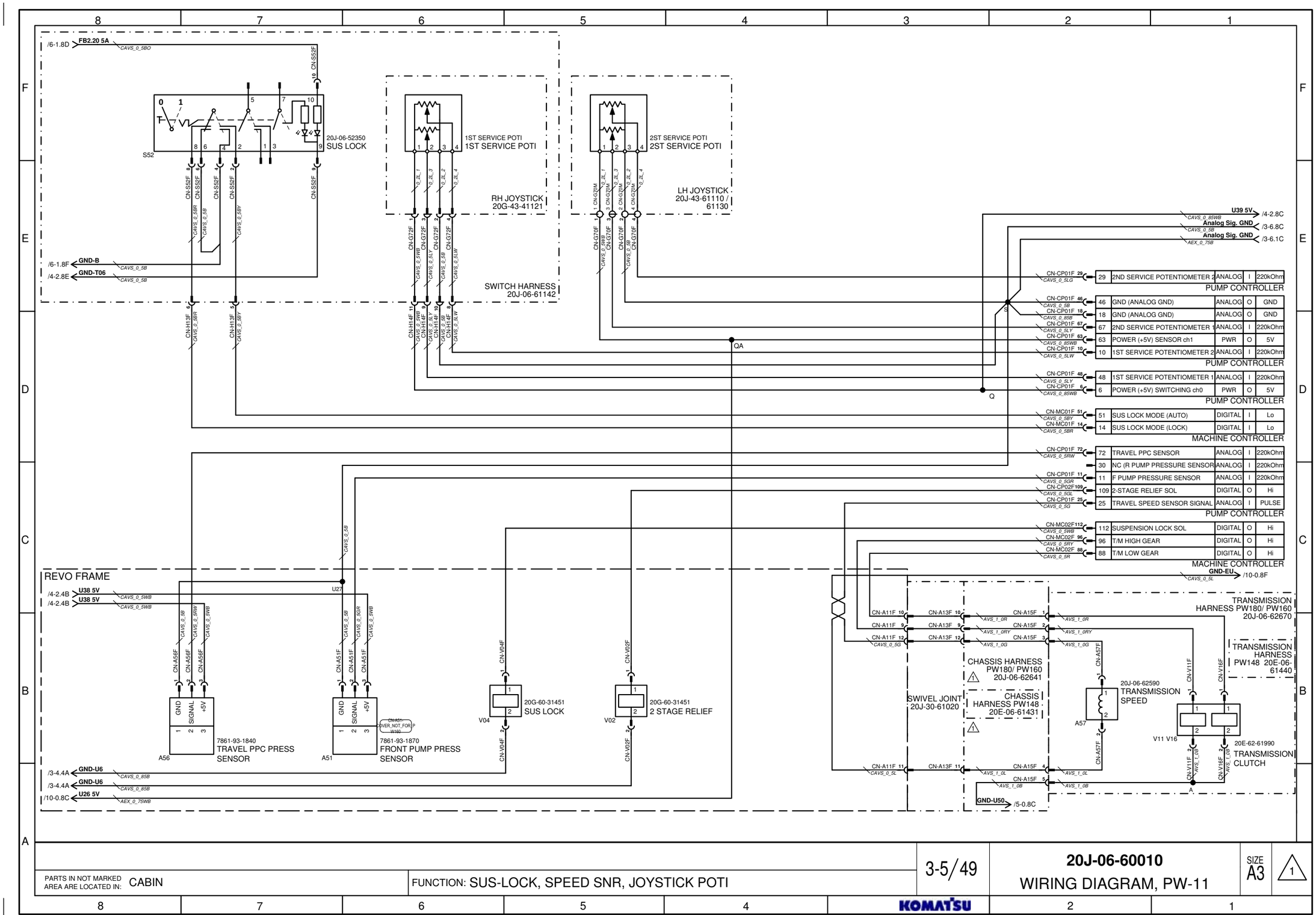


1) 1st GEAR (Lo SPEED): 2nd GEAR CLUTCH DISENGAGED (PRESSURE APPLIED TO PORT K)
2nd GEAR (HI SPEED): 1st GEAR CLUTCH DISENGAGED (PRESSURE APPLIED TO PORT B)

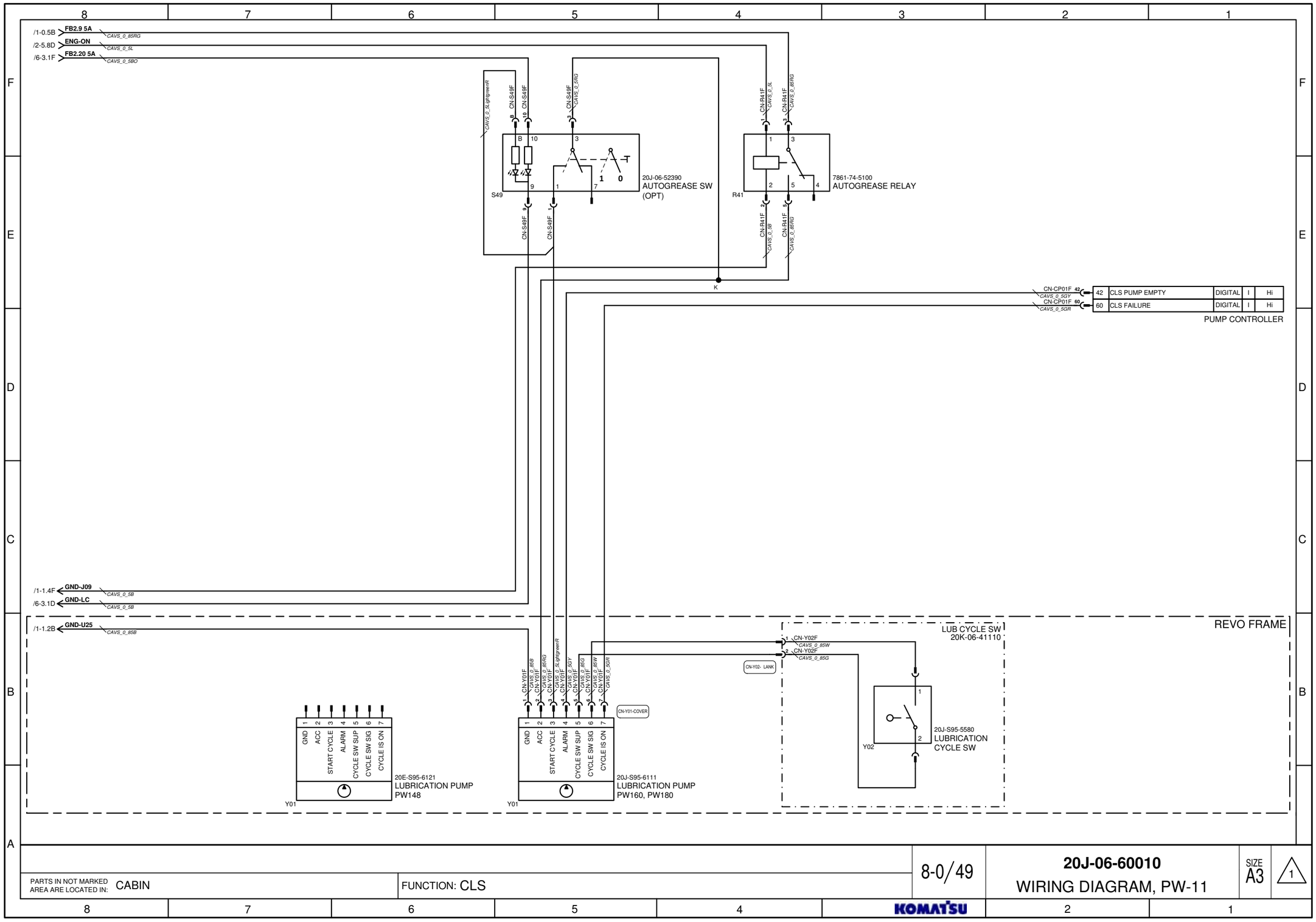
2) MACHINE DEFAULTS TO Hi SPEED AT START UP

3) MACHINE DEFAULTS TO HI SPEED BEFORE ENG. START.

3-5 SUS-LOCK, SPEEDSNR, JOYSTICK POTI



PARTS IN NOT MARKED AREA ARE LOCATED IN: CABIN	FUNCTION: SUS-LOCK, SPEED SNR, JOYSTICK POTI	3-5/49	**20J-06-60010** WIRING DIAGRAM, PW-11	SIZE A3


/1-0.5B FB2.9 5A CAVS_0_85RG
/2-5.8D ENG-ON CAVS_0_5L
/6-3.1F FB2.20 5A CAVS_0_5BO
CAVS_0_5LgHtgreenR
CN-S49F 8
CN-S49F 10
CN-S49F 3 CAVS_0_5RG
B 10
3
9
1
7
1 0
S49
20J-06-52390
AUTOGREASE SW
(OPT)
CN-R41F 1 CAVS_0_5L
CN-R41F 3 CAVS_0_85RG
1
3
2
5
4
R41
7861-74-5100
AUTOGREASE RELAY
CN-S49F 9
CN-S49F 1
CN-R41F 2 CAVS_0_5B
CN-R41F 5 CAVS_0_85RG
K
CN-CP01F 42 CAVS_0_5GY
CN-CP01F 60 CAVS_0_5GR
42 CLS PUMP EMPTY DIGITAL I Hi
60 CLS FAILURE DIGITAL I Hi
PUMP CONTROLLER
/1-1.4F GND-J09 CAVS_0_5B
/6-3.1D GND-LC CAVS_0_5B
/1-1.2B GND-U25 CAVS_0_85B
REVO FRAME
CN-Y01F 1 CAVS_0_85B
CN-Y01F 2 CAVS_0_85RG
CN-Y01F 3 CAVS_0_5LgHtgreenR
CN-Y01F 4 CAVS_0_5GY
CN-Y01F 5 CAVS_0_85G
CN-Y01F 6 CAVS_0_85W
CN-Y01F 7 CAVS_0_5GR
CN-Y01-COVER
GND
ACC
START CYCLE
ALARM
CYCLE SW SUP
CYCLE SW SIG
CYCLE IS ON
Y01
20E-S95-6121
LUBRICATION PUMP
PW148
20J-S95-6111
LUBRICATION PUMP
PW160, PW180
CN-Y02F 1 CAVS_0_85W
CN-Y02F 2 CAVS_0_85G
CN-Y02- LANK
LUB CYCLE SW
20K-06-41110
Y02
20J-S95-5580
LUBRICATION
CYCLE SW
PARTS IN NOT MARKED AREA ARE LOCATED IN: CABIN
FUNCTION: CLS
8-0/49
20J-06-60010
WIRING DIAGRAM, PW-11
SIZE A3
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KOMATSU

Pin Location List

NO.	CONNECTOR NAME	PIN NO			▲ PART OF	DRAWN ON PAGE
811	CN-A98F	1	CABIN	FLOOR	MAIN HARNESS PW180 20J-06-62632 CN-A98F	20J-06-60010 6-7.4C
812	CN-A98F	2	CABIN	FLOOR	MAIN HARNESS PW180 20J-06-62632 CN-A98F	20J-06-60010 6-7.4C
813	CN-A98F	3	CABIN	FLOOR	MAIN HARNESS PW180 20J-06-62632 CN-A98F	
814	CN-A98F	4	CABIN	FLOOR	MAIN HARNESS PW180 20J-06-62632 CN-A98F	20J-06-60010 6-7.4C
815	CN-A98F	5	CABIN	FLOOR	MAIN HARNESS PW180 20J-06-62632 CN-A98F	20J-06-60010 6-7.4C
816	CN-A98F	6	CABIN	FLOOR	MAIN HARNESS PW180 20J-06-62632 CN-A98F	20J-06-60010 6-7.3C
817	CN-A98F	7	CABIN	FLOOR	MAIN HARNESS PW180 20J-06-62632 CN-A98F	20J-06-60010 6-7.3C
818	CN-A98F	8	CABIN	FLOOR	MAIN HARNESS PW180 20J-06-62632 CN-A98F	
819	CN-A98F	9	CABIN	FLOOR	MAIN HARNESS PW180 20J-06-62632 CN-A98F	20J-06-60010 6-7.3C
820	CN-A98F	10	CABIN	FLOOR	MAIN HARNESS PW180 20J-06-62632 CN-A98F	20J-06-60010 6-7.3C
821	CN-A98F	11	CABIN	FLOOR	MAIN HARNESS PW180 20J-06-62632 CN-A98F	
822	CN-A98F	12	CABIN	FLOOR	MAIN HARNESS PW180 20J-06-62632 CN-A98F	
823	CN-AC01F	1	CABIN	FLOOR	MAIN HARNESS PW180 20J-06-62632 CN-AC01F	20J-06-60010 7-0.7C
824	CN-AC01F	2	CABIN	FLOOR	MAIN HARNESS PW180 20J-06-62632 CN-AC01F	20J-06-60010 7-0.7C
825	CN-AC01F	3	CABIN	FLOOR	MAIN HARNESS PW180 20J-06-62632 CN-AC01F	
826	CN-AC01F	4	CABIN	FLOOR	MAIN HARNESS PW180 20J-06-62632 CN-AC01F	20J-06-60010 7-0.7C
827	CN-AC01F	5	CABIN	FLOOR	MAIN HARNESS PW180 20J-06-62632 CN-AC01F	
828	CN-AC01F	6	CABIN	FLOOR	MAIN HARNESS PW180 20J-06-62632 CN-AC01F	20J-06-60010 7-0.6C
829	CN-AC01F	7	CABIN	FLOOR	MAIN HARNESS PW180 20J-06-62632 CN-AC01F	20J-06-60010 7-0.6C
830	CN-AC01F	8	CABIN	FLOOR	MAIN HARNESS PW180 20J-06-62632 CN-AC01F	20J-06-60010 7-0.6C
831	CN-AC01F	9	CABIN	FLOOR	MAIN HARNESS PW180 20J-06-62632 CN-AC01F	20J-06-60010 7-0.6C
832	CN-AC01F	10	CABIN	FLOOR	MAIN HARNESS PW180 20J-06-62632 CN-AC01F	20J-06-60010 7-0.6C
833	CN-AC02F	1	CABIN	FLOOR	MAIN HARNESS PW180 20J-06-62632 CN-AC02F	20J-06-60010 7-0.6C
834	CN-AC02F	2	CABIN	FLOOR	MAIN HARNESS PW180 20J-06-62632 CN-AC02F	20J-06-60010 7-0.6C
835	CN-AC02F	3	CABIN	FLOOR	MAIN HARNESS PW180 20J-06-62632 CN-AC02F	20J-06-60010 7-0.6C
836	CN-AC02F	4	CABIN	FLOOR	MAIN HARNESS PW180 20J-06-62632 CN-AC02F	20J-06-60010 7-0.6C
837	CN-C09M	1	CABIN	FLOOR	MAIN HARNESS PW180 20J-06-62632 CN-C09M	20J-06-60010 1-2.5D
838	CN-C09M	2	CABIN	FLOOR	MAIN HARNESS PW180 20J-06-62632 CN-C09M	20J-06-60010 1-2.5D
839	CN-C09M	3	CABIN	FLOOR	MAIN HARNESS PW180 20J-06-62632 CN-C09M	20J-06-60010 1-2.5D
840	CN-C09M	4	CABIN	FLOOR	MAIN HARNESS PW180 20J-06-62632 CN-C09M	20J-06-60010 1-2.5D
841	CN-C09M	5	CABIN	FLOOR	MAIN HARNESS PW180 20J-06-62632 CN-C09M	20J-06-60010 1-2.5D
842	CN-C09M	6	CABIN	FLOOR	MAIN HARNESS PW180 20J-06-62632 CN-C09M	20J-06-60010 1-2.5D
843	CN-C09M	7	CABIN	FLOOR	MAIN HARNESS PW180 20J-06-62632 CN-C09M	20J-06-60010 1-2.5D
844	CN-C09M	8	CABIN	FLOOR	MAIN HARNESS PW180 20J-06-62632 CN-C09M	20J-06-60010 1-2.5D
845	CN-CA01F	1	CABIN	FLOOR	MAIN HARNESS PW180 20J-06-62632 CN-CA01F	
846	CN-CA01F	2	CABIN	FLOOR	MAIN HARNESS PW180 20J-06-62632 CN-CA01F	
847	CN-CA01F	3	CABIN	FLOOR	MAIN HARNESS PW180 20J-06-62632 CN-CA01F	
848	CN-CA01F	4	CABIN	FLOOR	MAIN HARNESS PW180 20J-06-62632 CN-CA01F	
849	CN-CA01F	5	CABIN	FLOOR	MAIN HARNESS PW180 20J-06-62632 CN-CA01F	
850	CN-CA01F	6	CABIN	FLOOR	MAIN HARNESS PW180 20J-06-62632 CN-CA01F	20J-06-60010 6-7.2F
851	CN-CA01F	7	CABIN	FLOOR	MAIN HARNESS PW180 20J-06-62632 CN-CA01F	
852	CN-CA01F	8	CABIN	FLOOR	MAIN HARNESS PW180 20J-06-62632 CN-CA01F	
853	CN-CA01F	9	CABIN	FLOOR	MAIN HARNESS PW180 20J-06-62632 CN-CA01F	
854	CN-CA01F	10	CABIN	FLOOR	MAIN HARNESS PW180 20J-06-62632 CN-CA01F	
855	CN-CA01F	11	CABIN	FLOOR	MAIN HARNESS PW180 20J-06-62632 CN-CA01F	
856	CN-CA01F	12	CABIN	FLOOR	MAIN HARNESS PW180 20J-06-62632 CN-CA01F	
857	CN-CA01F	13	CABIN	FLOOR	MAIN HARNESS PW180 20J-06-62632 CN-CA01F	
858	CN-CA01F	14	CABIN	FLOOR	MAIN HARNESS PW180 20J-06-62632 CN-CA01F	
859	CN-CA01F	15	CABIN	FLOOR	MAIN HARNESS PW180 20J-06-62632 CN-CA01F	
860	CN-CA01F	16	CABIN	FLOOR	MAIN HARNESS PW180 20J-06-62632 CN-CA01F	20J-06-60010 6-7.2E
861	CN-CA01F	17	CABIN	FLOOR	MAIN HARNESS PW180 20J-06-62632 CN-CA01F	20J-06-60010 6-7.2E
862	CN-CA01F	18	CABIN	FLOOR	MAIN HARNESS PW180 20J-06-62632 CN-CA01F	20J-06-60010 6-7.2E
863	CN-CA01F	19	CABIN	FLOOR	MAIN HARNESS PW180 20J-06-62632 CN-CA01F	20J-06-60010 6-7.2F
864	CN-CA01F	20	CABIN	FLOOR	MAIN HARNESS PW180 20J-06-62632 CN-CA01F	
865	CN-CA01F	21	CABIN	FLOOR	MAIN HARNESS PW180 20J-06-62632 CN-CA01F	20J-06-60010 6-7.2E
866	CN-CA01F	22	CABIN	FLOOR	MAIN HARNESS PW180 20J-06-62632 CN-CA01F	20J-06-60010 6-7.2E
867	CN-CA01F	23	CABIN	FLOOR	MAIN HARNESS PW180 20J-06-62632 CN-CA01F	20J-06-60010 6-7.2F
868	CN-CA01F	24	CABIN	FLOOR	MAIN HARNESS PW180 20J-06-62632 CN-CA01F	20J-06-60010 6-7.2F
869	CN-CA01F	25	CABIN	FLOOR	MAIN HARNESS PW180 20J-06-62632 CN-CA01F	20J-06-60010 6-7.2F
870	CN-CA01F	26	CABIN	FLOOR	MAIN HARNESS PW180 20J-06-62632 CN-CA01F	
871	CN-CA01F	27	CABIN	FLOOR	MAIN HARNESS PW180 20J-06-62632 CN-CA01F	
872	CN-CA01F	28	CABIN	FLOOR	MAIN HARNESS PW180 20J-06-62632 CN-CA01F	
873	CN-CA01F	29	CABIN	FLOOR	MAIN HARNESS PW180 20J-06-62632 CN-CA01F	
874	CN-CA01F	30	CABIN	FLOOR	MAIN HARNESS PW180 20J-06-62632 CN-CA01F	
875	CN-CA01F	31	CABIN	FLOOR	MAIN HARNESS PW180 20J-06-62632 CN-CA01F	
876	CN-CA01F	32	CABIN	FLOOR	MAIN HARNESS PW180 20J-06-62632 CN-CA01F	
877	CN-CA01F	33	CABIN	FLOOR	MAIN HARNESS PW180 20J-06-62632 CN-CA01F	
878	CN-CA01F	34	CABIN	FLOOR	MAIN HARNESS PW180 20J-06-62632 CN-CA01F	
879	CN-CA01F	35	CABIN	FLOOR	MAIN HARNESS PW180 20J-06-62632 CN-CA01F	
880	CN-CA01F	36	CABIN	FLOOR	MAIN HARNESS PW180 20J-06-62632 CN-CA01F	
881	CN-CA01F	37	CABIN	FLOOR	MAIN HARNESS PW180 20J-06-62632 CN-CA01F	
882	CN-CA01F	38	CABIN	FLOOR	MAIN HARNESS PW180 20J-06-62632 CN-CA01F	
883	CN-CA01F	39	CABIN	FLOOR	MAIN HARNESS PW180 20J-06-62632 CN-CA01F	
884	CN-CA01F	40	CABIN	FLOOR	MAIN HARNESS PW180 20J-06-62632 CN-CA01F	20J-06-60010 6-7.2E
885	CN-CA01F	41	CABIN	FLOOR	MAIN HARNESS PW180 20J-06-62632 CN-CA01F	20J-06-60010 6-7.2E
886	CN-CA01F	42	CABIN	FLOOR	MAIN HARNESS PW180 20J-06-62632 CN-CA01F	20J-06-60010 6-7.2E
887	CN-CA01F	43	CABIN	FLOOR	MAIN HARNESS PW180 20J-06-62632 CN-CA01F	20J-06-60010 6-7.2F
888	CN-CA01F	44	CABIN	FLOOR	MAIN HARNESS PW180 20J-06-62632 CN-CA01F	20J-06-60010 6-7.2E
889	CN-CA01F	45	CABIN	FLOOR	MAIN HARNESS PW180 20J-06-62632 CN-CA01F	
890	CN-CA01F	46	CABIN	FLOOR	MAIN HARNESS PW180 20J-06-62632 CN-CA01F	
891	CN-CA01F	47	CABIN	FLOOR	MAIN HARNESS PW180 20J-06-62632 CN-CA01F	
892	CN-CA01F	48	CABIN	FLOOR	MAIN HARNESS PW180 20J-06-62632 CN-CA01F	
893	CN-CA01F	49	CABIN	FLOOR	MAIN HARNESS PW180 20J-06-62632 CN-CA01F	
894	CN-CA01F	50	CABIN	FLOOR	MAIN HARNESS PW180 20J-06-62632 CN-CA01F	
895	CN-CA01F	51	CABIN	FLOOR	MAIN HARNESS PW180 20J-06-62632 CN-CA01F	
896	CN-CA01F	52	CABIN	FLOOR	MAIN HARNESS PW180 20J-06-62632 CN-CA01F	
897	CN-CA01F	53	CABIN	FLOOR	MAIN HARNESS PW180 20J-06-62632 CN-CA01F	
898	CN-CA01F	54	CABIN	FLOOR	MAIN HARNESS PW180 20J-06-62632 CN-CA01F	
899	CN-CA01F	55	CABIN	FLOOR	MAIN HARNESS PW180 20J-06-62632 CN-CA01F	
900	CN-CA01F	56	CABIN	FLOOR	MAIN HARNESS PW180 20J-06-62632 CN-CA01F	

PARTS IN NOT MARKED AREA ARE LOCATED IN:

FUNCTION: PIN LOCATION LIST

KOMATSU

20J-06-60010

WIRING DIAGRAM, PW-11

SIZE A3

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