



SERVICE MANUAL

ENGINE COMPRESSOR

PDS400S-6B5

PDS400SC-6B5

PDSF330DP-6B5

PDSF330DPC-6B5

→ **FAC-113P (KUBOTA)**

→ **FAC-113PC (KUBOTA)**

Preface

This service manual explains about the cautions for maintenance jobs and is to serve a guide for the electric system, and troubleshooting for service personnel.

In the fundamental matters and other things already mentioned in the “Instruction Manual” and the “Parts Catalogue” are omitted to avoid duplication. Therefore, for the operation and handling of this unit, we request you to refer to the “Instruction Manual” and “Caution Plates”, and further for the structure and components of the unit, please refer to the “Parts Catalogue” separately to be supplied with the unit.

If you should find any description which does not coincide with the “Instruction Manual” and “Parts Catalog”, we request you to make sure to start the job after clarifying it.

Service personnel is required to safely take quick and proper countermeasures as well as to use correct technology of maintenance in case of field services and periodical maintenance. It is important that service personnel should have proper and sufficient knowledge about the structure and function of the unit and should be well familiar with such technique mentioned in them.

Regarding the part numbers mentioned in this manual, we request you to refer to the Parts catalogue separately supplied together with the unit, because the parts numbers in this manual are sometimes changed.

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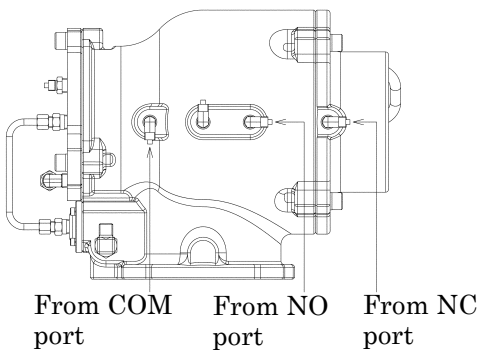
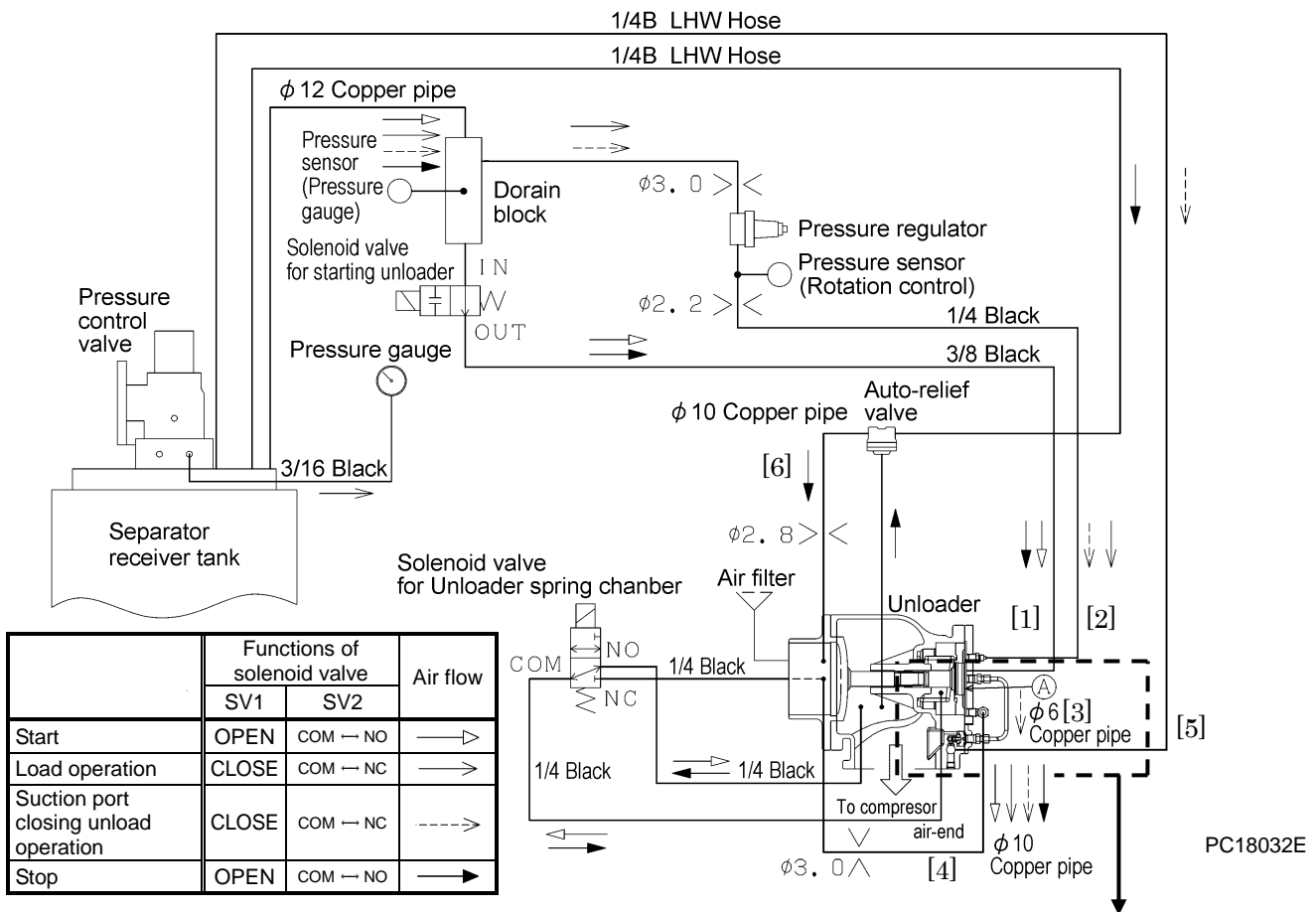
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※ For the details of specifications, operation and installation, see Instruction Manual.

1. Outline

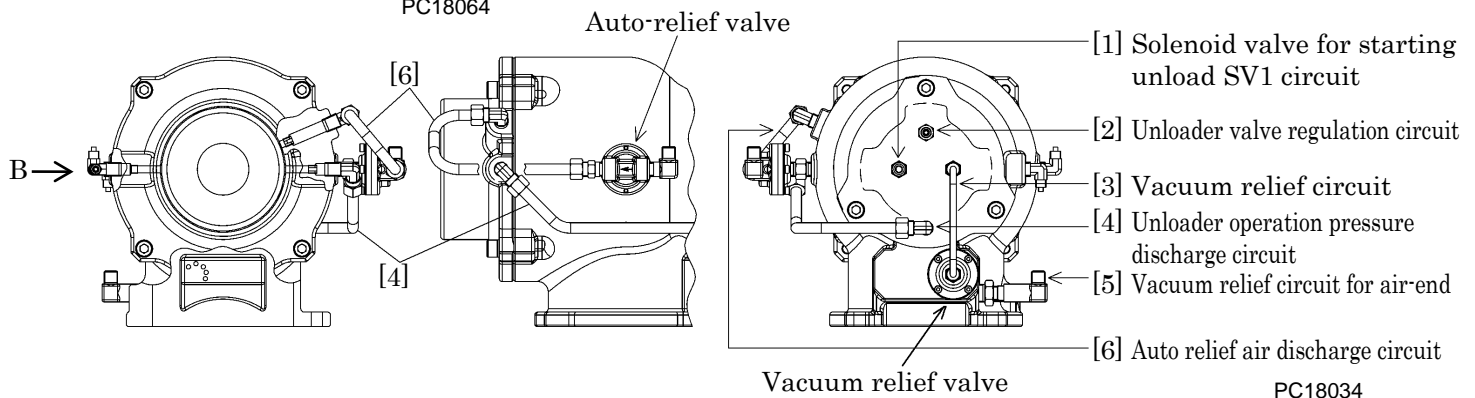
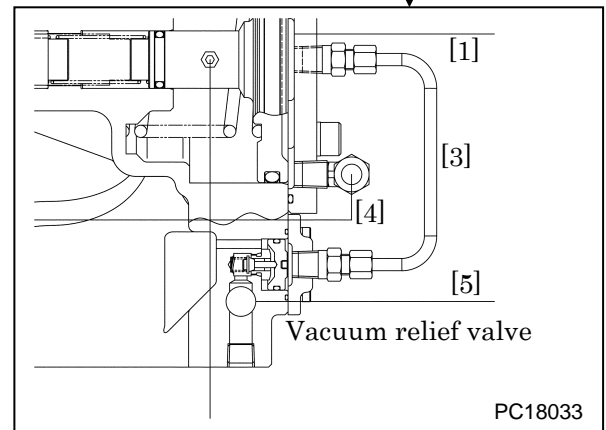
1.1 Capacity control

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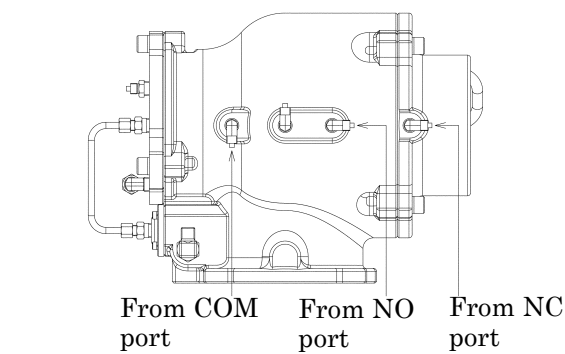
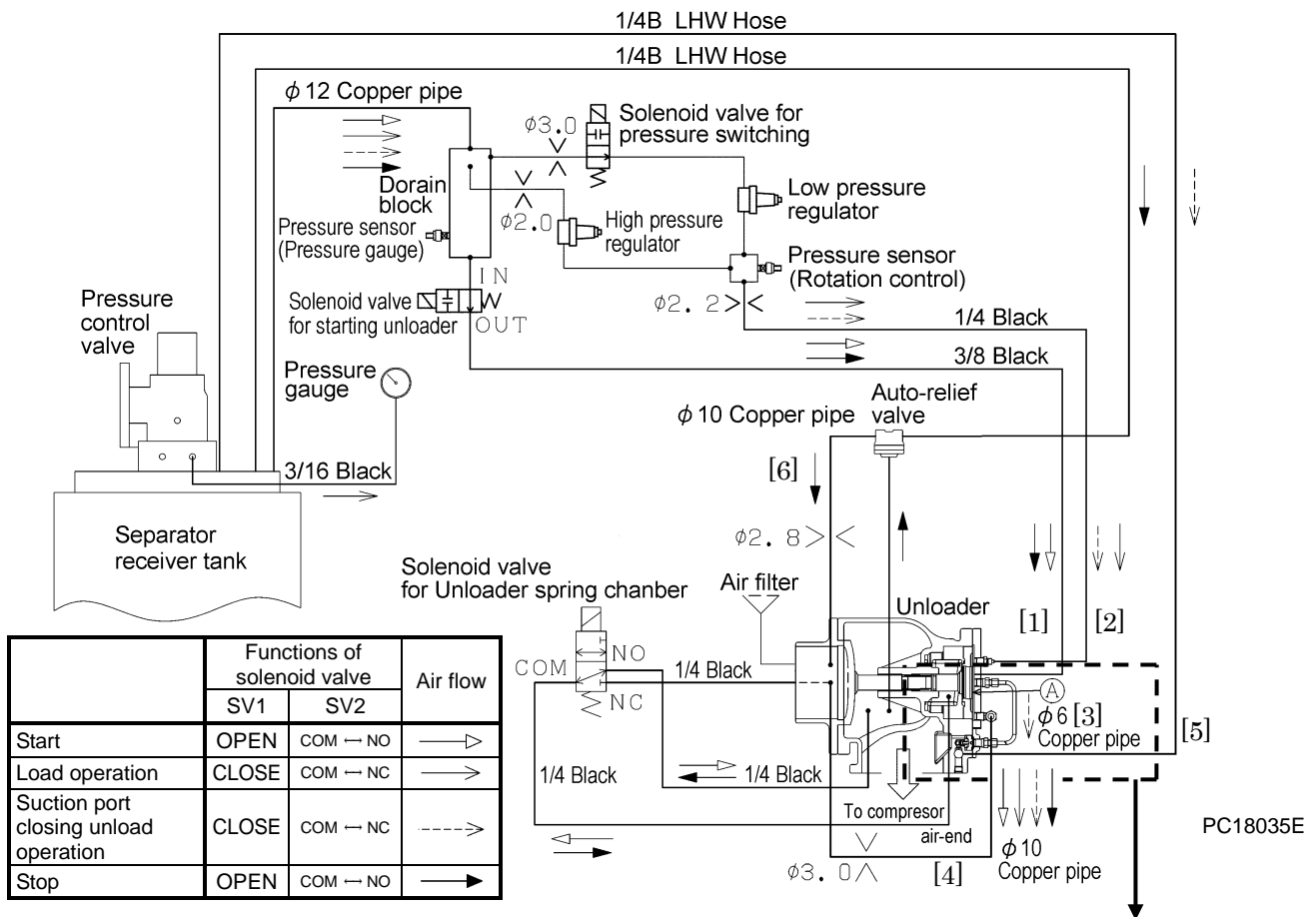
Arrow mark B (Details for Solenoid valve SV2 connection)

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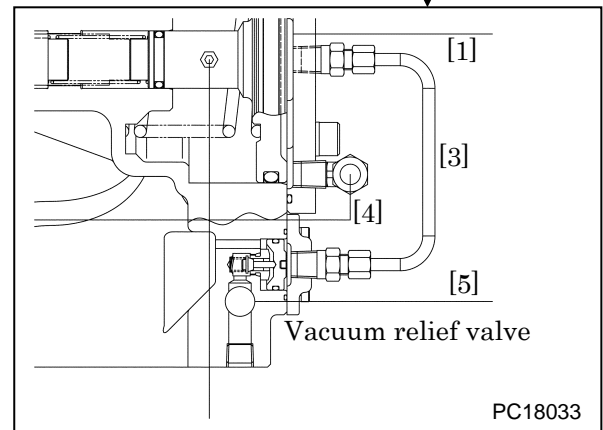
1. Outline

PDSF330DP(DPC)-6B5

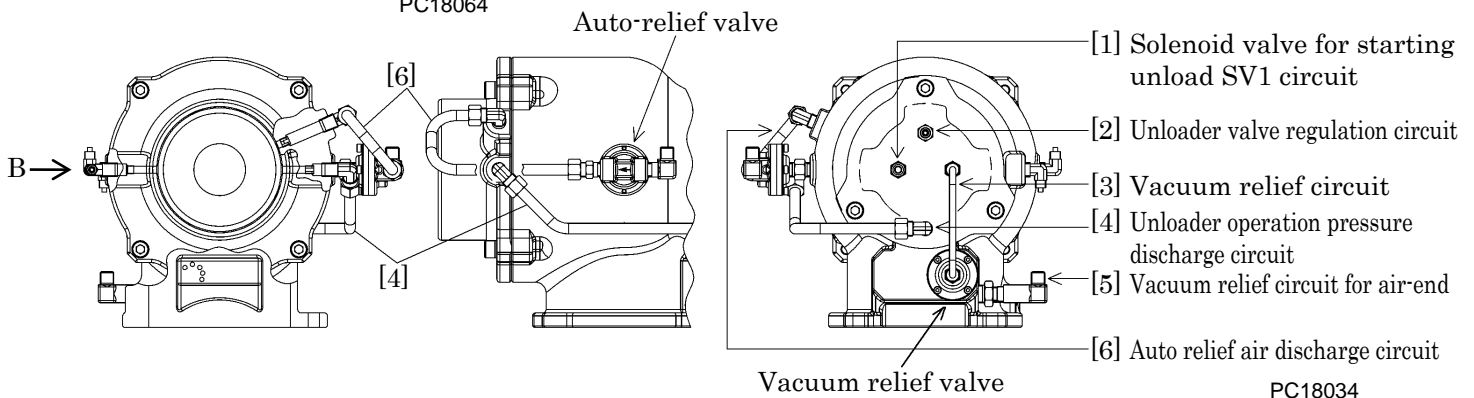


Arrow mark B (Details for Solenoid valve SV2 connection)

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1. Outline

Step	Response									
Start	<p>As solenoid valve for starting unload SV1 is set to OPEN position, compressed air will flow into unloader chamber (A), then unloader valve will be completely closed. Further, as COM-NC for the solenoid valve SV2 is connecting, the spring chamber becomes negative pressure, and unloader valve fully closes at lower pressure. Thus starting unloader operation is performed.</p> <ul style="list-style-type: none">●Solenoid valve SV1/SV2 will operates for 30 seconds when discharge air temperature is 60°C or more. When discharge air temperature is less than 60°C, it operates for 30 – 120 seconds.●Engine rotation speed will be fixed to unload rotation speed. <p>Rotation speed</p> <table><tr><th>Model</th><th>Unload rotation speed</th></tr><tr><td>PDS400S(SC) – 6B5</td><td>1,300min⁻¹</td></tr><tr><td>PDSF330DP(DPC) – 6B5</td><td>1,400min⁻¹</td></tr></table>	Model	Unload rotation speed	PDS400S(SC) – 6B5	1,300min ⁻¹	PDSF330DP(DPC) – 6B5	1,400min ⁻¹			
Model	Unload rotation speed									
PDS400S(SC) – 6B5	1,300min ⁻¹									
PDSF330DP(DPC) – 6B5	1,400min ⁻¹									
Load operation	<p>SV1 “CLOSE” and SV2 “COM-NC” are communicated. Air flow amount from ※ pressure regulator to chamber (A) will be increased/decreased according to discharge air pressure increase/decrease. Thus unloader valve will be OPEN/CLOSE and air amount will be regulated steplessly from 0 to 100 %.</p> <p>※Switching to high/low pressure regulator by operation of solenoid valve for pressure switching SVP. (PDSF330DP(DPC)-6B5 only)</p> <p>Regulator setting pressure</p> <table><tr><th>Model</th><th>High pressure setting pressure</th><th>Low pressure setting pressure</th></tr><tr><td>PDS400S(SC)-6B5</td><td>-</td><td>0.7MPa</td></tr><tr><td>PDSF330DP(DPC)-6B5</td><td>1.03MPa</td><td>0.7MPa</td></tr></table>	Model	High pressure setting pressure	Low pressure setting pressure	PDS400S(SC)-6B5	-	0.7MPa	PDSF330DP(DPC)-6B5	1.03MPa	0.7MPa
Model	High pressure setting pressure	Low pressure setting pressure								
PDS400S(SC)-6B5	-	0.7MPa								
PDSF330DP(DPC)-6B5	1.03MPa	0.7MPa								
Suction port closing unload operation	<p>When air consumption is decreased and exceeding the rated pressure, pressure regulator will operate and unloader valve will be closed gradually. Pressure sensor on pressure regulator secondary side detects the pressure simultaneously. Then engine controller (ECU) will be commanded to lower engine rotation speed. At the unload condition, the inside of air end becomes high vacuum and it causes vacuum noise. In order to prevent this noise, it opens vacuum relief valve to prevent the compressor air end from becoming vacuum.</p>									
Stop	<p>Auto relief valve operates when detecting the pressure of air-end inner side. Then compressed air in separator receiver tank will be discharged from unloader primary side through auto relief valve. And SV1 will be OPEN. Compressed air will be discharged to air from unloader primary side through unloader chamber (A).</p>									

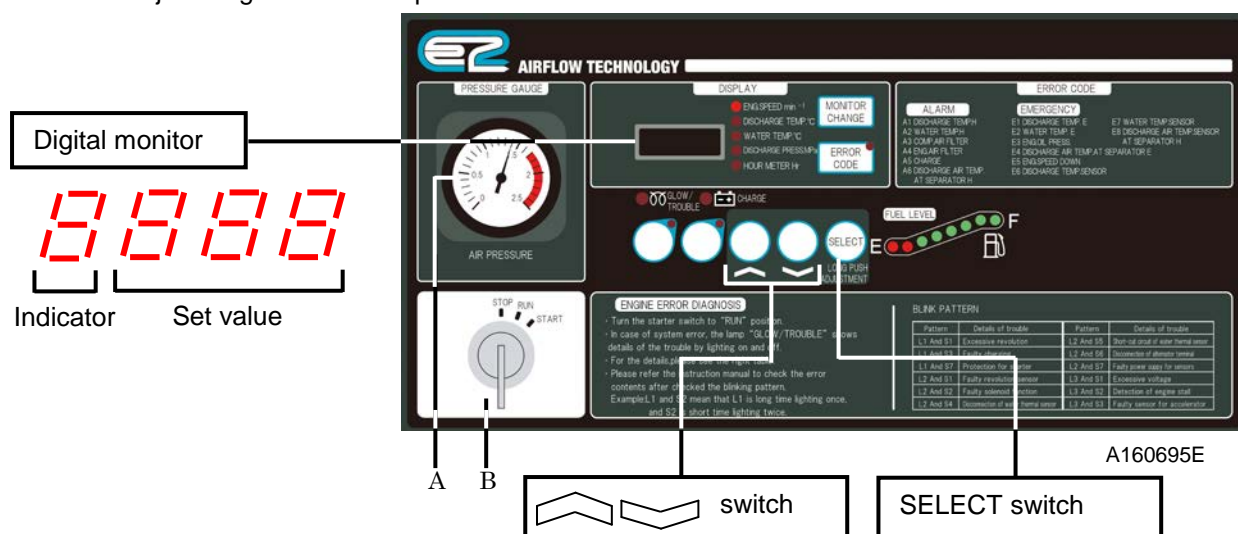
1.2 Function/Adjustment

1. Starting unloader operation

Discharge air temperature	Required time for starting unloader operation
Lower than 60°C	120sec or till the temperature rises higher than 60°C.
Higher than 60°C	30 seconds

1. Outline

2. How to adjust engine rotation speed



<Procedures>

1. Check if discharge pressure meter [A] indicates 0MPa.
2. Set starter switch [B] to RUN position.
3. Push SELECT switch long (for 3 or more seconds).
4. Digital monitor indicates H (full load rotation speed correction value).
5. Push switch to change set value.
6. Push SELECT switch.
7. Digital monitor indicates L (unload rotation speed correction value).
8. Push switch to change set value.
9. Push SELECT switch again to complete setting.

※SELECT switch does not need manipulation as it is used only for adjusting engine rotation speed when trial run at factory or engine dismantling/maintenance. Manipulate it only when engine rotation speed needs adjustment.

PDS400S(SC)-6B5

No.	Item	Indicator	Set value ※		Normal rotation speed (min ⁻¹)
			Default setting	Setting range	
1	Full load rotation speed correction	H	45	0~100	2,600±50
2	Unload rotation speed correction	L	40	0~100	1,300 ⁺⁵⁰ ₀

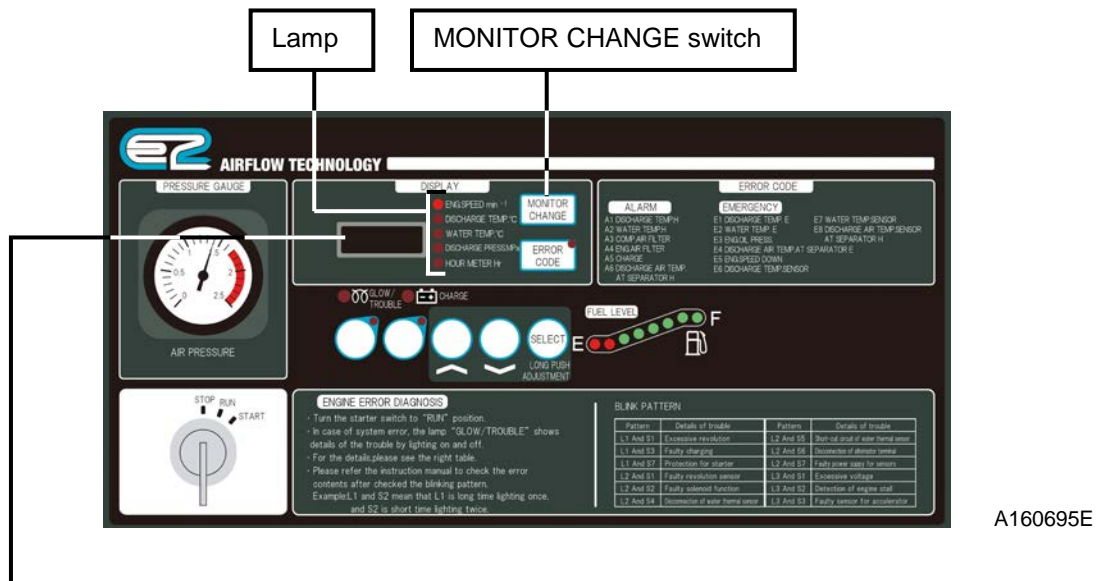
PDSF330DP(DPC)-6B5

No.	Item	Indicator	Set value ※		Normal rotation speed (min ⁻¹)
			Default setting	Setting range	
1	Full load rotation speed correction	H	45	0~100	2,400±50
2	Unload rotation speed correction	L	40	0~100	1,400 ⁺⁵⁰ ₀

※For each set value 1 changed in this way, rotation speed will be changed for about 3 min⁻¹.

1. Outline

3. Function indicated

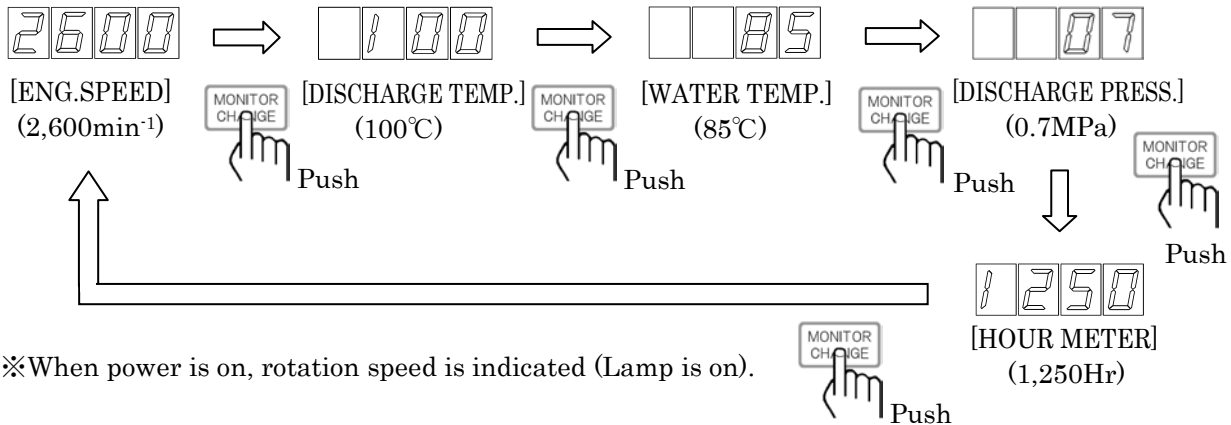


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Digital monitor

For each time you push MONITOR CHANGE switch, indication switches as below order when in rated operation.

※In case that discharge air temperature is below 0°C, “---L” is indicated on screen.

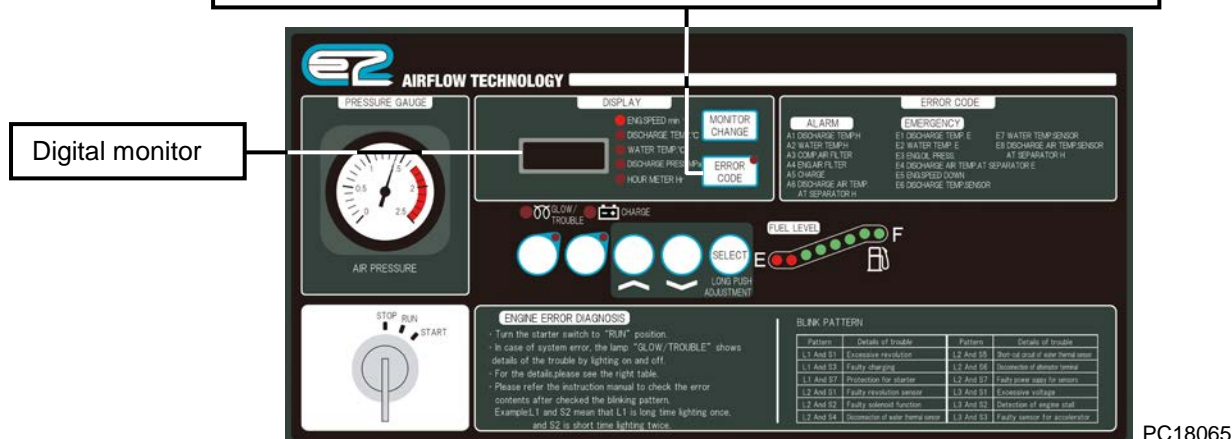
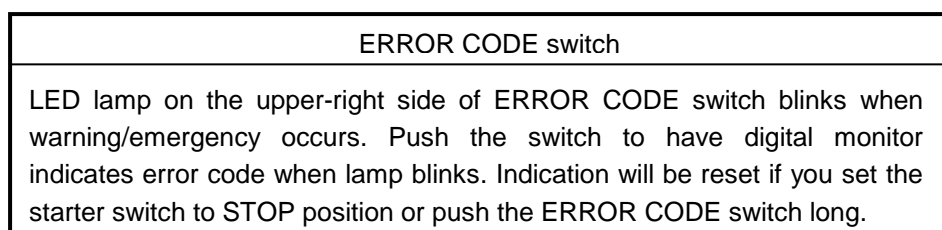


※When power is on, rotation speed is indicated (Lamp is on).

1. Outline

1.3 Warning/Emergency and checking main controller

1. Error code list

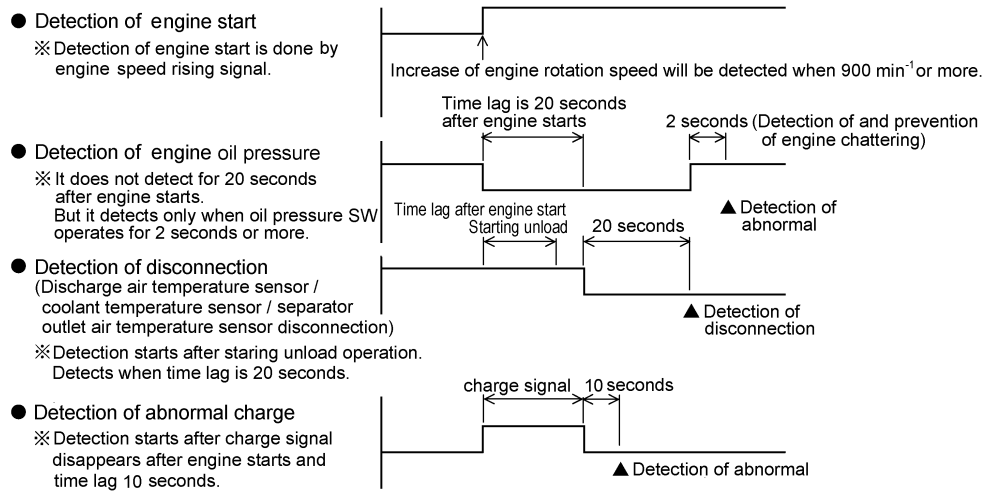


Item		Error code	Sensor		Actuation	Detecting timing	Time lag
Warning	Discharge air temp. H	A-1	Thermistor	—	115℃ or more, but less than 120℃	Always	120sec
	Engine water temp. H	A-2	Thermistor	—	100℃ or more, but less than 105℃	Always	120sec
	Comp. air filter	A-3	Negative pressure sw.	A contact	Differential pressure 6.2kPa or more	Always	10sec
	Eng. air filter	A-4	Negative pressure sw.	A contact	Differential pressure 6.2kPa or more	Always	10sec
	Charge	A-5	—	—	Belt loosened and/or cut Faulty generation of alternator	After starting engine	10sec
	Separator discharge air temp. H	A-6	Thermistor	—	115℃ or more, but less than 120℃	Always	1sec
Emergency	Discharge air temp. E	E-1	Thermistor	—	120℃ or more	Always	1sec
	Water temp. E	E-2	Thermistor	—	105℃ or more	Always	1sec
	Eng. oil press.	E-3	Pressure switch	B contact	Oil pressure is lower than 98kPa	20 seconds after engine starts	2sec
	Separator discharge air temp. E	E-4	Thermistor	—	120℃ or more	Always	1sec
	Engine speed down	E-5	—	—	Operation in range of 400~1,100min ⁻¹ , or lowered to 1,100min ⁻¹ or less after engine start.	Always	30 seconds elapsed in following range, or 5 seconds when lowered to 1,100min ⁻¹
	Discharge air temp. sensor	E-6	Thermistor	—	Disconnected	After starting unload operation	20sec
	Engine water temp. sensor	E-7	Thermistor	—	Disconnected	After starting unload operation	20sec
	Separator discharge air temp. sensor	E-8	Thermistor	—	Disconnected	After starting unload operation	20sec

- Warning : Compressor continues to run.
- Emergency : Compressor stops.

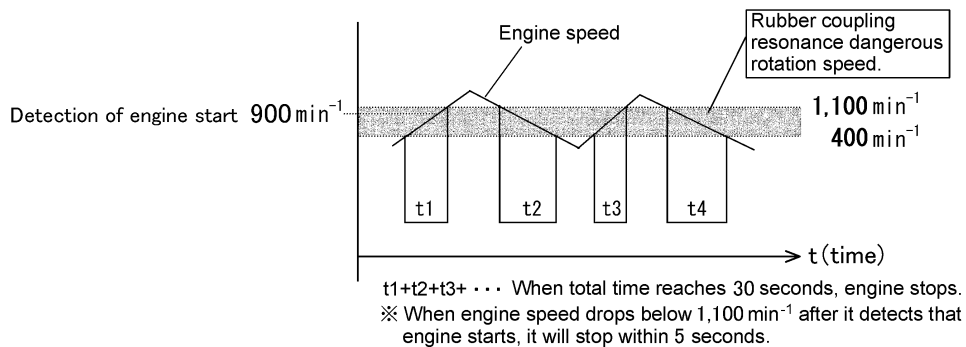
1. Outline

2. Detection timing of engine start, engine oil pressure error, discharge air temperature sensor/coolant temperature sensor/seperator outlet air temperature sensor disconnection and charging failure.



PC18036E-1

3. Engine speed drop



PC18012E-1

4. Abnormality reset

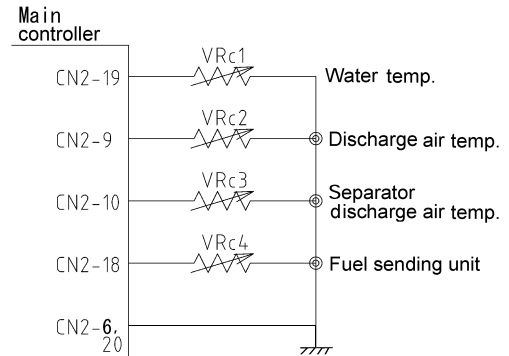
Set starter switch OFF or push ERROR CODE switch long.

1. Outline

5. Inspection

Perform the detection and inspection of engine water temperature, discharge air temperature, separator discharge air temperature and fuel sending unit by controller in the following steps.

- (1) Connect resistance to controller as shown right.
Or use multi-speed variable resistance
(resistance value: 1.0k Ω) for VRc1 to VRc4.



PC18037E

- (2) Gradually lower resistance values of VRc1 VRc2 and VRc3 and measure them when they reach abnormal values. Then check and confirm that they are within the following ranges.

Item	Indicator	Set temperature(°C)	Resistance(Ω)
Water temperature	Warning	100	733 \pm 15
	Emergency	105	640 \pm 15
• Discharge air temperature • Separator discharge air temperature	Warning	115	492 \pm 15
	Emergency	120	433 \pm 15

Sending unit

Float position	Resistance (Ω)
F	3 \pm 2
1/2	32.5
E	110 \pm 7

1. Outline

6. Pressure sensor / Main controller Output – revolution speed list (for reference only)

The voltage values in the following table are different a little from actual ones during operation.

PDS400S(SC)-6B5

Pressure sensor		Main controller Voltage signal (DCV)	Engine RPM (min ⁻¹)
Regulator secondary pressure (MPa)	Output voltage (DCV)		
0.2	1.3	1.4	1,300
0.0	0.5	3.8	2,600

PDSF330DP(DPC)-6B5

Pressure sensor		Main controller Voltage signal (DCV)	Engine RPM (min ⁻¹)
Regulator secondary pressure (MPa)	Output voltage (DCV)		
0.2	1.3	1.5	1,400
}	}	3.6 (High pressure operation)	2,400
		3.8 (Low pressure operation)	2,600
0.0	0.5	3.9 (Air boosting operation)	2,700

2. Maintenance

2.1 Cautions for Overhauling

2.1.1 Precautions before starting work

(1) Work to be performed

It is very important to always plan in advance what facilities, tools, instruments, materials, oil, etc. you will need to use; the exact locations and methods of performing inspection, adjustment, or disassembly; and the key points of any repair work to be performed.

(2) Care not to spill oil

Use a pan to collect used compressor oil, engine oil when changing the oil or attaching or detaching an oil line. If a large volume of oil is expected to flow out, make sure to drain any accumulated oil from the reserve tank, engine oil pan in advance.

[Follow the designated regulations to dispose of compressor oil and engine oil.]

(3) Care when detaching parts

When disassembling a complicated part, put a matching mark to indicate the position of detached parts for future reference. Make sure that the grounding cable (—terminal) is detached from the battery terminals before starting repair work.

(4) Use genuine parts

Make sure to use genuine parts when changing parts. Otherwise, it degrades performance and it shortens machine life.

(5) Tools to be prepared

- | | |
|--|---|
| 1. Measuring instruments
(e. g. tester, insulation resistance gauge etc.) | 9. Grease |
| 2. Tools | ● Lithium based all-purpose grease
: For O-ring spray
[CALTEX MULTIFAK EP1] |
| 3. Torque wrenches | ● Chassis grease |
| 4. Jigs and specialized tools | 10. Diesel oil |
| 5. Sealing tape (GAFLON seal tape) | 11. Compressor oil |
| 6. Liquid gasket (THREEBOND 1212) | 12. Cleaning cloths |
| 7. Lubricant (NICHIMOLY LAP spray or equivalent) | 13. Literatures (such as manuals etc.) |
| 8. Molybdenum sulfide (Paste spray type) | |

2.1.2 Disassembly and reassembly

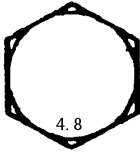

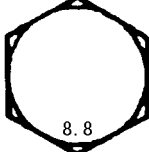
1. Before removing nylon tubes, hydraulic/fuel hoses, it is necessary to clean the inside of machine to prevent from entrance of dirt and foreign matters.
2. Perform disassembly work in a dust-free location whenever possible.
3. When disassembling parts, wash their outer surfaces and place them on a clean sheet of paper or cloth, taking care not to contaminate or damage them.
4. Wash disassembled parts with diesel oil (cleaning solvent) after checking for contamination or discoloration. However, do not wash rubber parts with diesel oil.
5. Be careful not to damage disassembled parts, they are precision built.
6. Replace consumable parts such as oil seal, O-ring, filter & oil with new one if needed.
7. Apply “CALTEX MULTIFAK EP1” to O-ring surface. Never coat the sliding portion of oil seal with grease because it loses sealing effect by stopping screw groove with grease.
8. When reassembling parts, place each part in the order of assembly and take care that no parts are missing or misassembled.
9. When reassembling an assembled part (set part), be sure to replace it as an assembly.
10. Contamination or rusting may occur due to dust or humidity if parts are left in disassembled or partly disassembled condition for a long time. Therefore, be careful to prevent dust or rust from affecting parts if you have to leave the repair incomplete for a long period of time.
11. Check tightening torque and clearance when assembling parts.
12. Check the direction of rotation, speed, and oil leakage after assembly.
13. Before starting the machine after disassembly, run it at low idle to check for unusual noises, etc. to prevent engine or generator damage.

2. Maintenance

2.2 Tightening Torque

2.2.1 General bolts and nuts tightening torque

Fasten all the bolts and nuts with the specified tightening torque when assembling.

<div> <div>Kind</div> <div>Strength and sorting</div> <div>Width of across flat Tightening torque</div> <div>Bolt diameter (mm)</div> </div>	Low or Middle carbon steel bolt (SS400B etc...)		High tensile strength bolt (SCM435 etc...)		
	4.6—6.8 (4T—6T)		8.8—12.9 (7T—12T)		
	 Hexagon bolts		 Socket bolts	 Hexagon bolts	
	Hexagon bolts Width of across flat (mm)	Tightening torque N·m (kgf·cm)	Socket bolts Width of across flat (mm)	Hexagon bolts Width of across flat (mm)	Tightening torque N·m (kgf·cm)
6	10	5.0 (51)	5	10	10.0 (100)
8	13	12.0 (124)	6	13	25.0 (245)
10	17	25.0 (245)	8	17	49.0 (485)
12	19	43.0 (425)	10	19	85.0 (845)
14	22	68.0 (675)	12	22	135.0 (1,350)
16	24	106.0 (1,055)	14	24	210.0 (2,100)
18	27	145.0 (1,450)	14	27	290.0 (2,900)
20	30	205.0 (2,050)	17	30	410.0 (4,100)
22	32	280.0 (2,800)	17	32	560.0 (5,600)
24	36	345.0 (3,450)	19	36	710.0 (7,100)
Applied sections	For general sections such as bonnet and frame.		Compressor air-end, receiver tank and other designation part.		

IMPORTANT

- The above torque values in the table shall be applicable for the bolts and nuts used for machine.
- Generally, the abovementioned tightening torques should be followed, but in some points different torque is specified. So use the tightening torque without fail.
(See following pages.)
- Make sure to remove rust and dust before tightening.

2. Maintenance

2.2.2 Structure of compressor air-end

【Standard clearance when assembling compressor air-end】

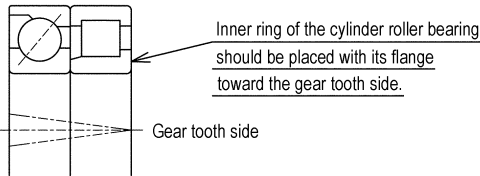
Standrd clearance when assembling compressor air-end (mm)	
Clearance of discharge portion A	0. 0 7~0. 1 1
Clearance of suction portion B	0. 1 9~0. 6 3
Clearance of circumference CM	0. 0 6~0. 0 9
Clearance of circumference CF	0. 0 6~0. 0 9

Note : Discharge clearance A should be measured with geared portion of rotor place downward against discharge port.

【Tightening torque】

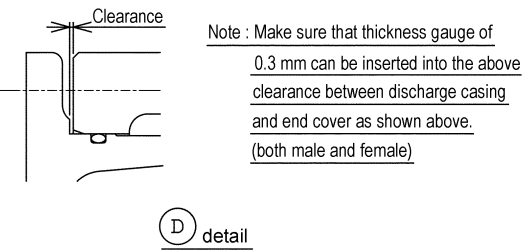
Tightening torque (N・m)	
E	2 5
※3 F	4 9
G	4 9
※3 H	6 4

【Assembly of bearing at discharge side】

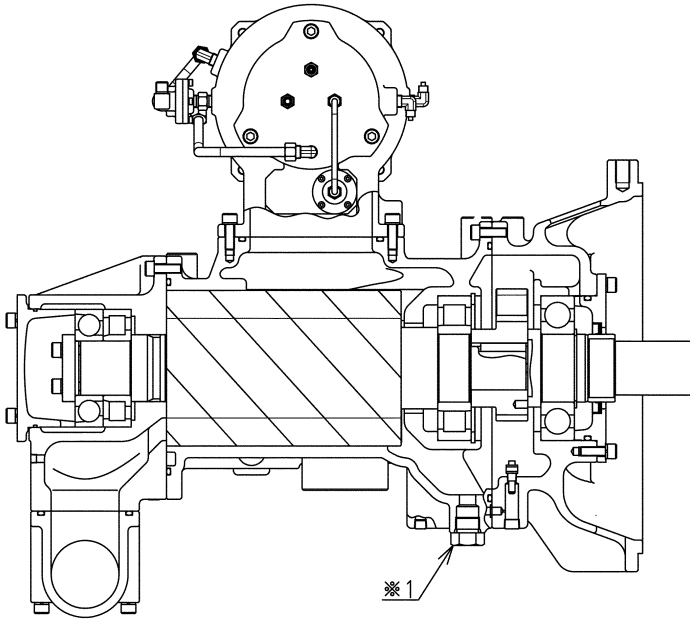
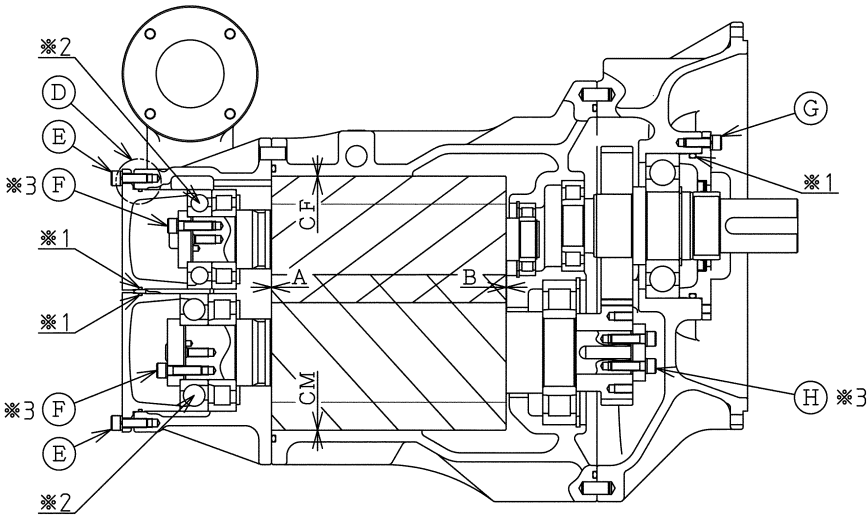


When assembling bearings at discharge side of male and female screw rotor, install bearings in the same directions of the marks shown above.

【Clearance between discharge casing and end cover】

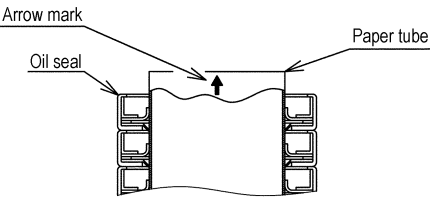


【Sectional view】



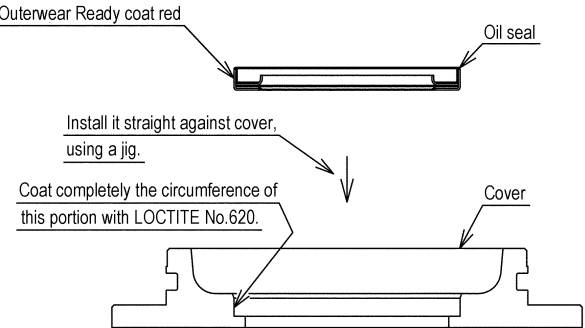
- Note : 1. When assembling check and make sure that no foreign matters such as dust, burrs and chips exist.
2. O-ring ※1 : This O-ring should be installed, slightly coated with lithium base grease after checking and making sure that no dust is sticking on it.
3. As the inner clearance of the roller bearing marked ※2 is an incompatible clearance, be sure to replace the inner and outer bearings as a set.
4. When setting ※3 parts, be sure to degrease both male and female screw part completely.
Apply LOCTITE No.243 to screw part when setting the parts.
5. When assembling, be sure to check if any backlash is on speed increasing gear.
(Design value : 0.05 - 0.20 mm on P.C.D.)
6. After assembling, be sure to inject compressor oil 5L before first operation.

【Detail of assembling oil seal and collar】



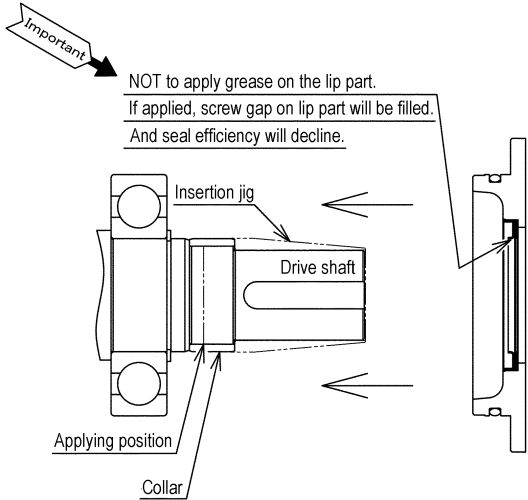
When removing the paper tube from the product, be sure to move the product according to the direction which the arrow mark on the paper tube shows.

How to remove oil seal



Unpack oil seal set and use it just before pressing oil seal set.

Oil seal assembling details



1. Before setting collar to drive shaft, be sure to degrease the collar inner perimeter and the drive shaft.
2. Apply LOCTITE No.620 thinly to the drive shaft full perimeter of the collar mating near end side. Then set the collar. After setting it, be sure to wipe out the sealing agent which protrudes from the end side cleanly.
3. Install oil seal to rotor shaft, using insert jig the external circumference of which is completely coated with compressor oil and preventing the oil seal from inclining against the shaft.

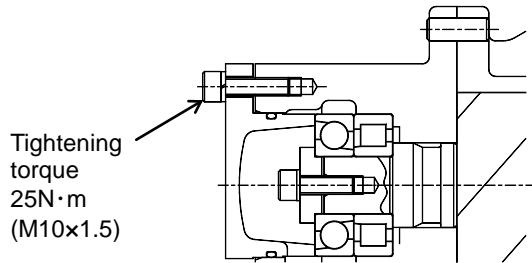
Oil seal and collar assembling details

2. Maintenance

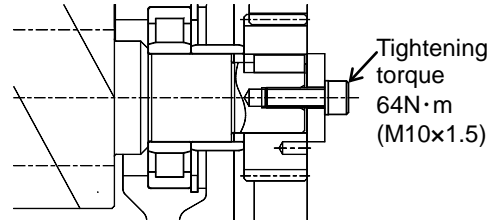
2.2.3 Tightening torque of such important quality parts as bolts and nuts

1 Air-end

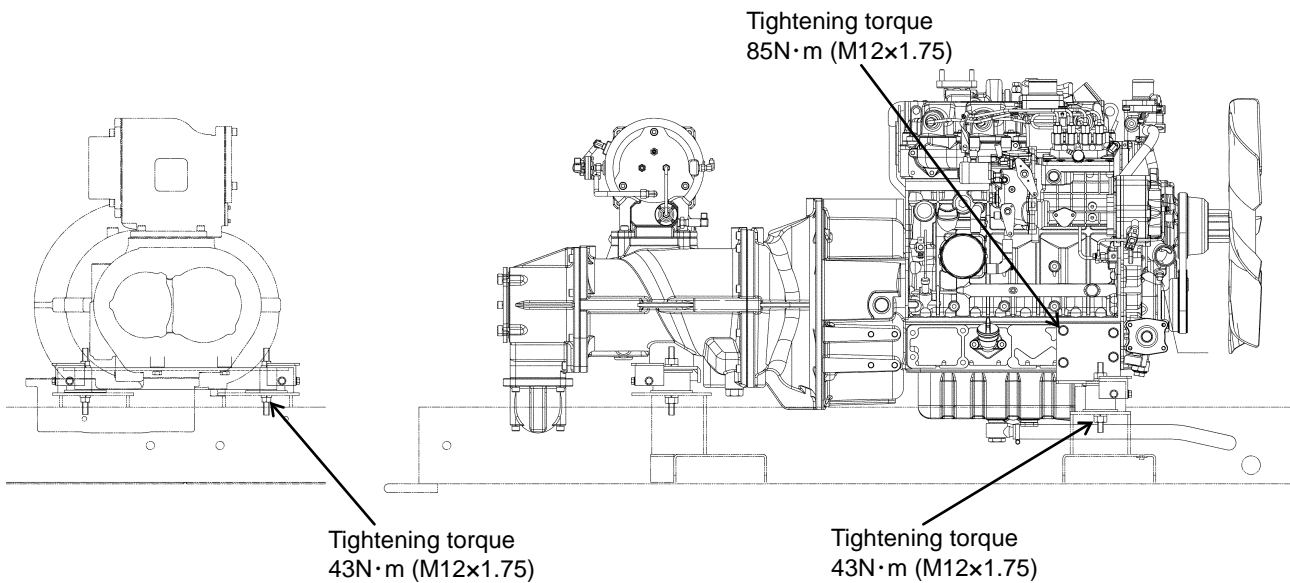
<End cover>



<Plate holding pinion gear>



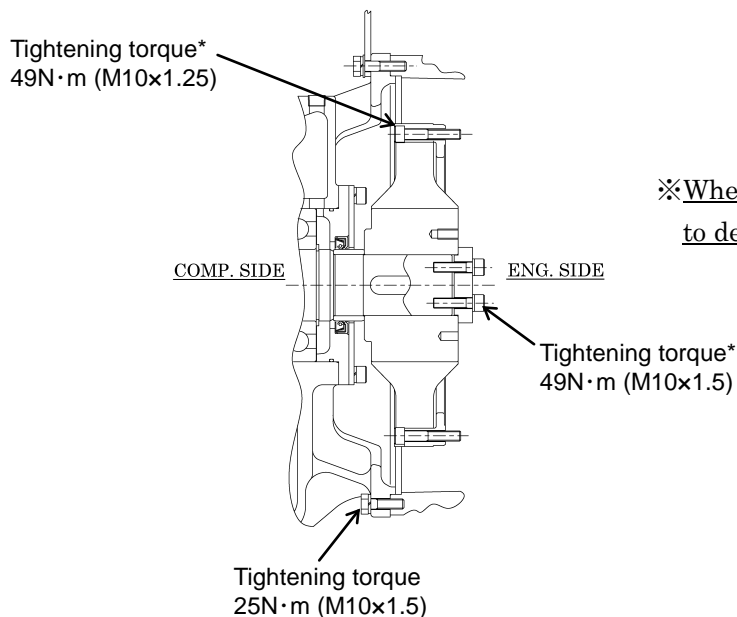
2 Mounting



PC18038

2. Maintenance

3 Coupling portion between air-end and engine



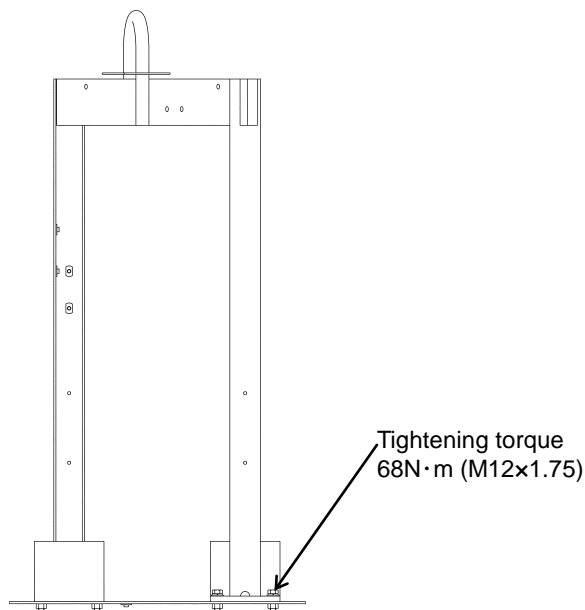
※When tighten the * marked bolts, be sure to degrease female screw part completely.

PC12076E

How to re-use adhesive coated bolts: * marked bolts

1. Coating which is stuck to the threaded portion of the removed bolts should be removed by using a wire brush or the like. And tapped holes should be cleaned.
2. They should be degreased and dried completely by using air blow.
3. Threaded portion of the bolts should be coated with LOCTITE 242 or 243 (middle grade strength screw lock agent) or the equivalent and retightened.
4. When it is replaced by new one, screw lock agent is not required, but female threaded portions should be degreased completely.

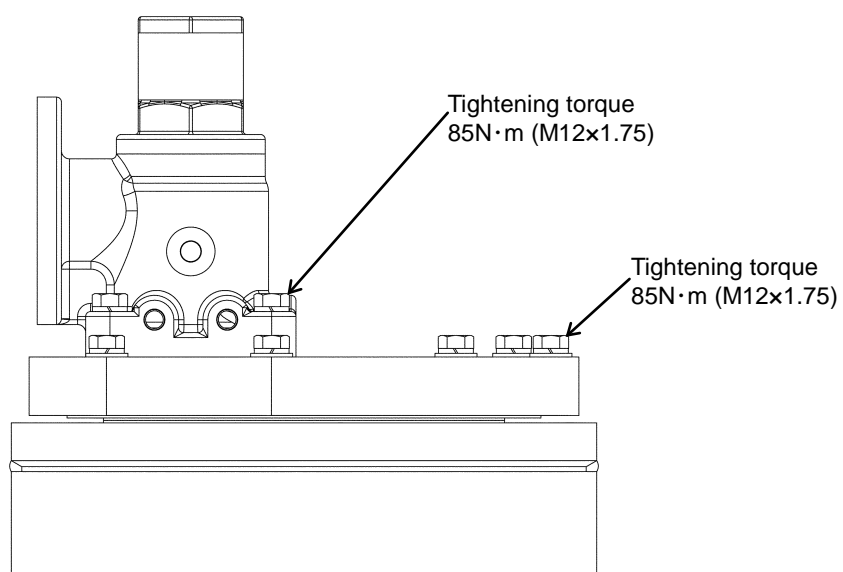
4 Lifting portion



PC18039

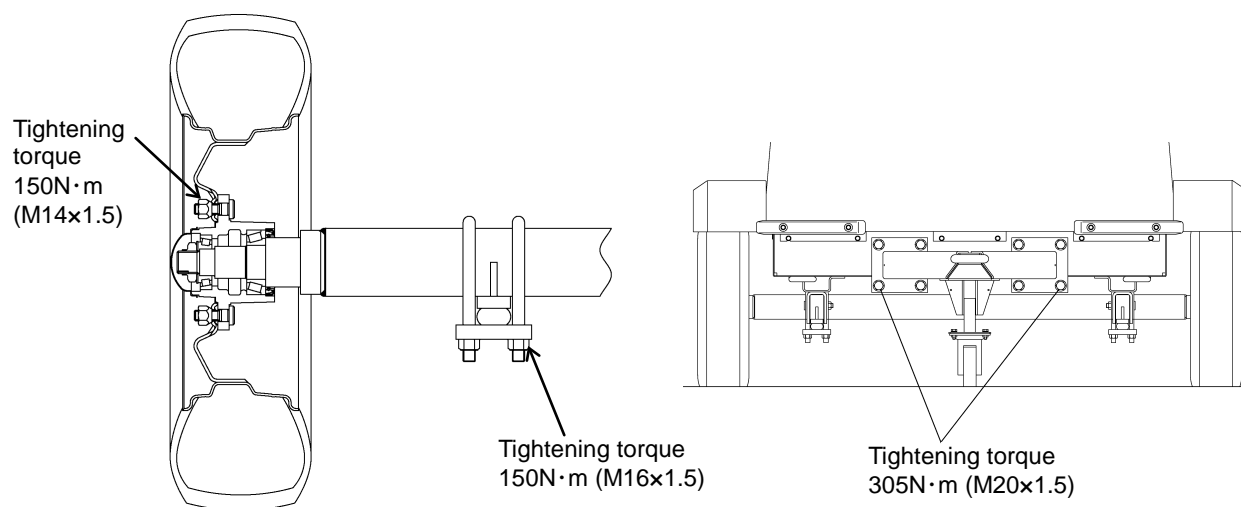
2. Maintenance

5 Pressure vessel and pipes



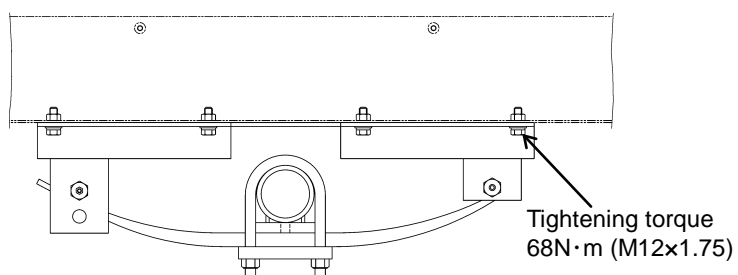
PC18040

6 Undercarriage



A170115

A150829



PC16015

2. Maintenance

2.3 Periodic Inspection List

(Unit:Hour)

Maintenance		Daily	250	300	500	1,000	2,000	3,000	6,000	12,000
Compressor	Check compressor oil level.	○								
	Drain separator receiver tank.	○								
	Check for looseness in pipe connecting part, and wear and tear of pipe.	○								
	Check oil, water, fuel and air leak.	○								
	Check functions of all instruments and devices.	○								
	Performance check of safety valve	○								
	Check and clean clogging air filter element.		○							
	Change compressor oil.			○ First time	○					
	Change compressor oil filter.			○ First time	○					
	Change air filter element				○					
	Clean strainer in the scavenging orifice.				○					
	Clean outside of the oil cooler.					○				
	Clean outside of the after cooler. (After cooler type)					○				
	Check and clean drain outlet port of after cooler (After-cooler type)					※1○				
	Change oil separator.						●			
	Change nylon tubes.						☆●			
	Change rubber hoses.						☆●			
	Change O-ring of the unloader.							★●		
	Check and change the unloader bushing.					※2○		★●		
	Change pressure regulator							★●		
	Check consumable parts of auto-relief valve.							★●		
	Check consumable parts of vacuum-relief valve.							★●		
	Performance check of pressure control valve								●	
	Check and change O-ring and piston of pressure control valve.								★●	
	Change rubber coupling.									●
	Change oil seal/bearing.									●
	Change solenoid valve.									●

Such items marked ○ shall be carried out by customers. ●marked items should be conducted by mechanic.

Regarding the item marked ※1:When water is found mixed in the discharged air, perform cleaning work even before the specified interval comes.

※2.Carry out a performance check of the unloader. Should any operation failure occur, the O-ring or bushing of the unloader may have been worn. If so, replace it with a new one.

The items or parts marked ☆ should be replaced every two years even if they are not in disorder within their periodical maintenance interval because their materials will change or become degraded over the course of as time passes. Also for the same reason, the parts marked ★ should be replaced every three years.

◎ The indicated replacement periods are rough estimates. Depending on the usage conditions or environment, inspection/maintenance should be conducted earlier.

2. Maintenance

(Unit:Hour)

Maintenance		Daily	50	250	500	1,000	2,000	3,000	6,000
Engine	Check engine oil level.	○							
	Check coolant level.	○							
	Check fuel.	○							
	Drain fuel tank.	○							
	Check sedimenter for condensate.	○							
	Check looseness in pipe connectors, terminals and tear in wiring.	○							
	Check belt tension.	○							
	Change engine oil.		○ First time		○				
	Change engine oil filter.		○ First time		○				
	Check battery electrolyte.			○					
	Check and clean clogging of air filter element.			○					
	Check specific gravity of battery electrolyte				○				
	Change air filter element.				○				
	Change fuel filter.				○				
	Change sedimenter element.				○				
	Clean inside of radiator.				●				
	Clean outside of the radiator.					○			
	Change of breather filter element					○			
	Change coolant						☆○		
	Clean inside of fuel tank.						●		
	Change fuel hose.						☆●		
	Change radiator hoses.							☆●	
	Change wiring harness.								●

The items or parts marked ☆ should be replaced every 2 years even if they are not in disorder within their periodical maintenance interval because their materials will change or become degraded as time passes.

◎ The indicated replacement periods are rough estimates. Depending on the usage conditions or environment, inspection/maintenance should be conducted earlier.

(Unit:Hour)

Maintenance		Daily	250	300	500	1,000	2,000	3,000	6,000
Undercarriage	Supply grease to trailer hub bearing.					●			
	Supply grease to leaf spring pin.					●			
	Check and confirm that the fixing nuts for the tires are properly tightened.	○							
	Check and confirm that the nuts with which tires are fixed are properly tightened.			○ Every 3 months					
	Check and confirm that the fixing bolts for the drawbar are properly tightened			○ Every 3 months					

2. Maintenance

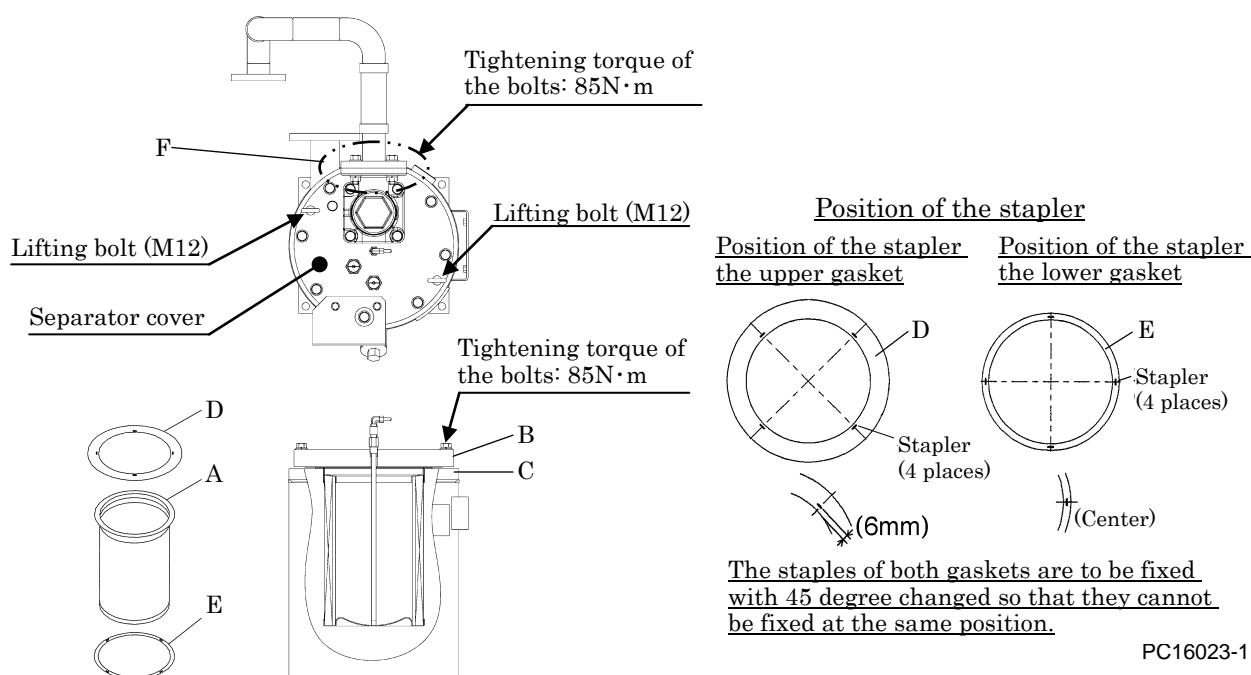
2.4 Inspection/Maintenance

2.4.1 Change Oil Separator

- When consumption of the oil is still unusual even after cleaning strainer in the scavenging orifice, change the oil separator with a new one.
- When replacing oil separator, be sure to replace gasket too.
- Separator is made of electrostatic material for static protection. And gasket is conductively treated by stapler. So be sure to use our genuine parts.

<Procedure>

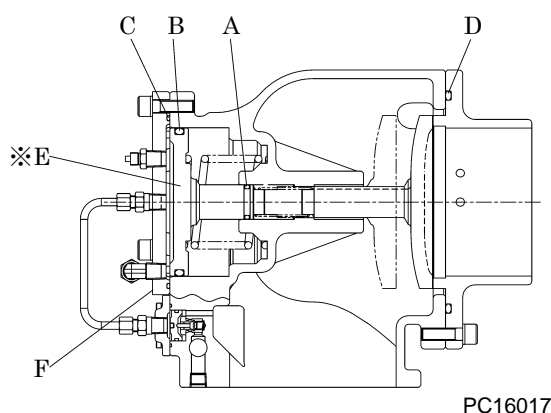
1. To remove oil separator [A], be sure to remove joint bolts (M6, 4 pieces) of separator removing cleaning window which is on upper part of separator cover.
2. Remove receiver tank bracket, piping, copper pipe, nylon tube and separator outlet air temperature sensor wiring which is on upper part of separator cover [B].
3. Remove the fixing bolts (M12, 4 pieces) provided at [F] flange of separator outlet.
4. Remove the fixing bolts (M12, 8 pieces) of separator cover [B].
5. Screw two lifting eyebolts (M12) for the 2 threaded holes provided on the separator cover [B].
6. Pass a rope through the eyes of the lifting bolts and lift the separator cover [B] up by a crane etc. Mark the separator cover [B] and separator receiver tank [C] for reassembling them before removing it.
7. Clean and degrease the connecting portion between separator cover [B] and separator receiver tank [C] and check and confirm that there are no damages nor abnormalities.
8. Replace oil separator [A], gasket [D], [E] and O-ring of [F] flange with new one. Put O-ring with applying grease thinly.
9. Tighten the fixing bolts of separator cover [B] according to the specified torque.
(Tighten the bolts diagonally and after tightening all the bolts, ultimately tighten them again in full circumference.)
10. Tighten the fixing bolts of [F] flange according to the specified torque.
11. Connect re-assemble the pipes which were removed from the top of separator cover [B].



2. Maintenance

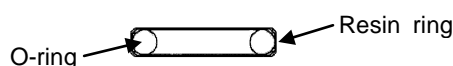
2.4.2 O-ring replacement of the unloader and vacuum relief valve

(1) Change O-ring of Unloader



<Note of the O-ring replacement>

- Apply a thin coat of grease on the O-rings when replacing the O-rings [A] and [B].
※Remove Piston [E] because it will stick out by spring if you remove cover [F].
- Although O-rings [A] and [B] are of the type where a resin ring is layered on top of an O-ring (commonly referred to as a Teflon ring), as the resin is easily stretched and likely to catch on the bushing which could lead to deformation, please attach these by following the steps outlined below.



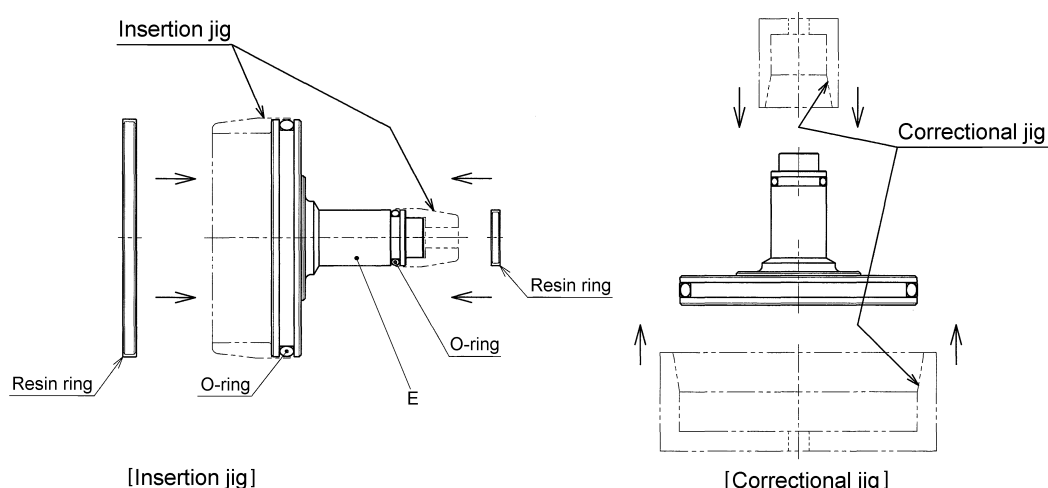
SC15215

<O-ring [A] and [B] mounting procedures>

- Put it with using following insertion jig or correctional jig.
- Refrain from wearing gloves when performing this task. (To prevent dust/fiber adhesion)

<Procedure>

1. Apply grease on the O-ring and attach this to the O-ring groove on the shaft of the piston [E].
2. Apply grease thinly to inner perimeter of resin ring and outer perimeter of insertion jig. Then put insertion jig. Put resin ring to upper side of the O-ring which is put by procedure 1.
3. Apply a thin coat of grease to the inner perimeter of the correctional jig and insert this into the piston [E] to correct the resin ring.
Gradually insert the resin ring while correcting it to prevent it from catching on the correctional jig.
4. After insertion, remove correctional jig and check if resin ring covers O-ring closely. In case deformed, correct it again.



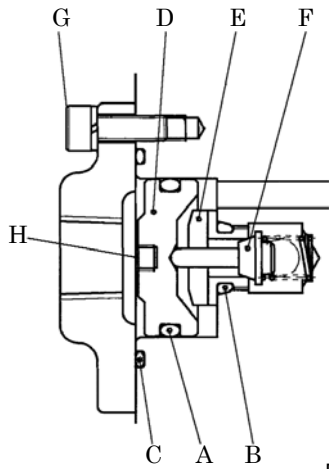
PC16018E-1

[Insertion and correctional jig]

	O-ring [A]	O-ring [B]
Insertion jig	00817 00196	00817 00198
Correctional jig	00817 00197	00817 00199

2. Maintenance

(2) O-ring replacement of the vacuum relief valve (Built in unloader)





PC18062

< Note of the O-ring replacement >

- Apply a thin coat of grease on the O-rings when replacing the O-rings [A] and [B].
- Extract piston [D] by screwing in a bolt [G] in to portion [H] (M4×0.7 internal threads).
- When reassembling needle valve [F], set it perpendicularly and securely tighten valve seat [E]

[Cover fixing bolt [G]]

-  : 3 mm
-  : 2.9 N·m(29kgf·cm)

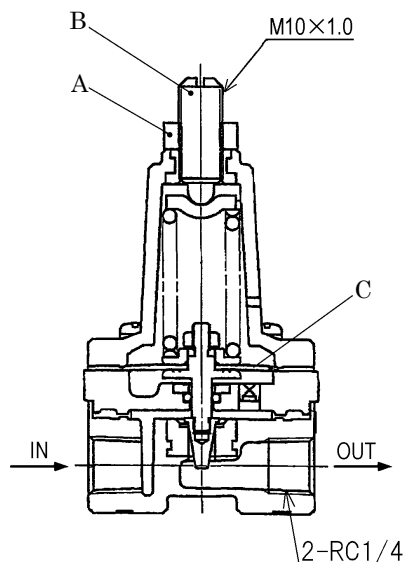
IMPORTANT

- When reassembling, apply sufficient grease to O-ring sliding surface.
Use CALTEX MULTIFAK EP1 grease or equivalent. Grease of poor quality will deteriorate the material.

2. Maintenance

2.4.3 How to Adjust Pressure regulator

The regulator is already adjusted prior to delivery ex. works. Never change the setting of the regulator by turning adjusting screw and nut recklessly.



PC16016-1

<How to adjust regulator>

1. Loosen lock nut [A] of pressure regulator.
2. After engine starts and starting unload operation completed, be sure to turn adjusting screw [B] of pressure regulator with service valve closed in order to have discharge pressure meter indicates rated pressure +0.1MPa.

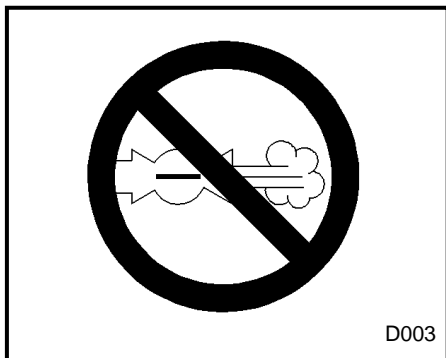
Clockwise: pressure increasing

Counterclockwise: pressure decreasing

3. After adjusting, tighten lock nut [A].
4. When it is impossible to adjust it, it could be due to the damage of diaphragm [C]. So replace the regulator and try it again.

Operation with discharge port (compressed air supply port) opened is prohibited

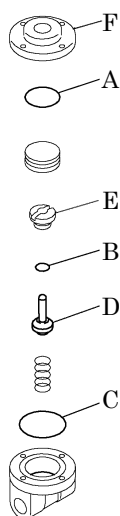
CAUTION



- When adjusting pressure regulator system, install a silencer to the air delivery port and wear earplugs for protection of hearing damage.
- Do not operate the machine with service valves and relief valve open unless air hoses and/or pipes are connected.
High-pressurized air blows out and its air pressure could cause injury to the people nearby.

2. Maintenance



2.4.4 Change O-ring of Auto-relief Valve



< Note of the O-ring replacement >

- Disassemble and clean the component, and check O-ring [A] , [B] and [C]. Then, replace O-ring [A] , [B] and [C], if hardened.
- Apply grease thinly to O-ring [A] and [B] when assembling. Tighten valve sheet [E] firmly with keeping valve [D] in vertical position when assembling.

[Cover [F] fixing bolt]

 : 3 mm
 : 2.9 N·m(29kgf·cm)

PC16092

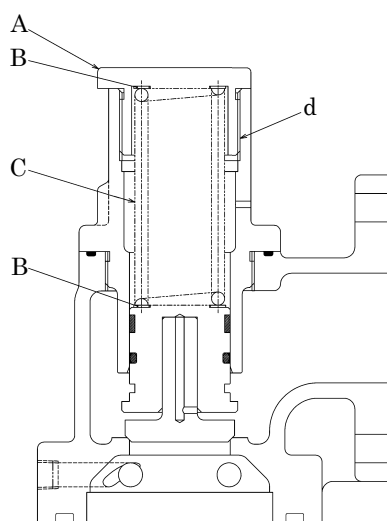
IMPORTANT

- When reassembling, apply thinly grease to O-ring and sliding surface.
 Use CALTEX MULTIFAK EP1 grease or equivalent. Grease of poor quality will deteriorate the material.

2.4.5 Maintenance and Adjustment of Pressure Control Valve

<Procedure of maintenance>


In case that the discharge air pressure becomes lower than 0.35MPa, it is necessary to adjust the pressure of the pressure control valve according to the following procedures. As it is possible that the O-ring has deteriorated or hardened, replace the O-ring even if the replacement cycle has not yet been reached.



PC13058-3

<Procedure>

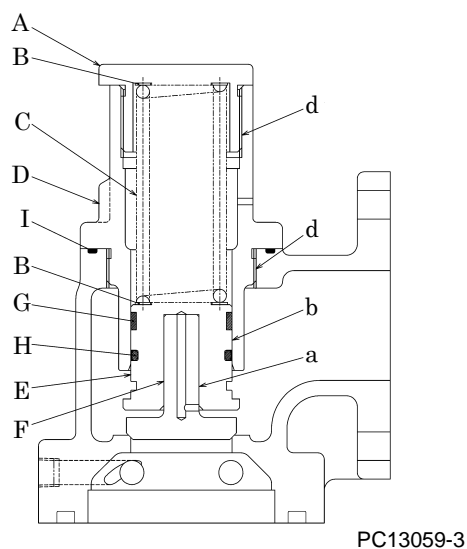
1. After checking and confirming that compressed air is completely emptied, remove the pressure control valve cover [A](opposite side 65mm), and remove spring seat [B]. Then change the spring [C].
2. After installing the spring seat [B], assemble the cover [A] (opposite side 65mm).
3. After having assembled, operate to check and confirm that the set pressure is $0.4 \pm 0.10 / -0.05$ MPa.
 Before assembling, coat the threaded portion (d portion) of spring seat [B] and of cover [A] with lithium based all-purpose grease for prevention of falling of spring seat and for prevention of thread galling.

 : 65 mm

2. Maintenance

<Inspection procedures of piston, valve, ring and O-ring>

When the pressure is low even after the spring is replaced, disassemble and inspect it, in the following procedures.



<Procedure>

1. After checking and confirming that compressed air is completely emptied, remove the cover [A] and then remove the spring [C].
2. After removing the cover [A] (opposite side 65mm), and piston [E] and valve [F], check the ring [G] and O-ring [H] for any hardness and any damages. Check abnormality such as wear/tear on the sliding portion of piston [E] and valve [F]. If there is, replace it.
3. Coat the sliding surface (a portion) of valve [F] with compressor oil.
4. Coat the sliding surface (b portion) of piston [E] with grease.
5. Prevent the threaded portion (d portion) from galling by coating the threaded portion with grease.
6. Coat ring [G] and O-ring [H] with grease.
7. Coat both sides of spring seat [B] with grease so that it cannot fall when assembling.
8. Re-assemble the pressure control valve in reverse order to disassembly.
9. After having assembled, operate to check and confirm that the set pressure is $0.4+0.10/-0.05\text{MPa}$.



- When disassembling the pressure control valve, remove the cover [D] after removing the cover [A] first without fail. If the cover [D] should be removed with the cover [A] fitted, the cover [D] will jet out by the tensile strength of the inside spring, and it could cause a serious accident.

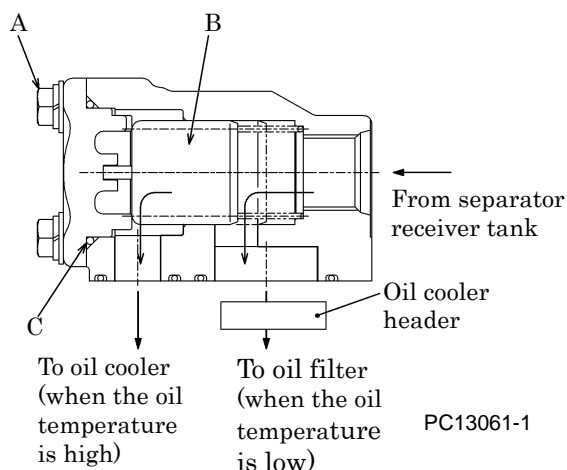


- When reassembling, apply thinly grease to O-ring and sliding surface.
Use CALTEX MULTIFAK EP1 grease or equivalent. Grease of poor quality will deteriorate the material.

2. Maintenance

2.4.6 Change of Pellet assembly of By-pass Valve

By-pass valve fitted on this unit is of full bore type. In normal operation, there is no need to replace inner pellet ASS'Y regularly. If there is a trouble such as compressor oil temperature increasing, bypass valve pellet ASS'Y may be in abnormality. In such case, replace it according to following procedures.



<Procedure>

1. First stop the unit and make sure that there is no residual pressure left in the separator receiver tank.
2. After checking and confirming that the temperature of compressor oil has become amply low, open drain valves on separator receiver tank and oil cooler to empty compressor oil completely.
3. After compressor oil discharged completely, remove cover with removing bolt [A]. Then remove pellet ASS'Y [B].
4. Replace the pellet assembly [B] and O-ring [C] by new ones.
※Install O-ring [C] coated thinly with compressor oil.
5. Supply compressor oil through the filler port provided on the receiver tank.
6. Start operation and check the function of by-pass valve.
(It functions well when delivery air temperature will not rise abnormally.)

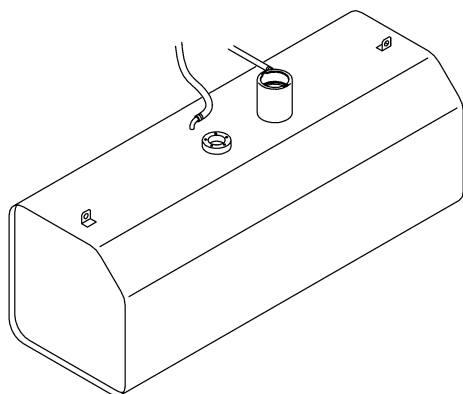
Model	Actuating	※By-pass valve fully
PDS400S(SC)-6B5	82 ± 3°C	89 ± 2°C
PDSF330DP(DPC)-6B5	88 ± 3°C	94 ± 2°C

※Temperature at which the by-pass circuit is fully closed.

2. Maintenance

2.4.7 Clean inside of Fuel Tank

Condensate is caused and accumulated at the bottom of fuel tank, owing to churning of dust or dirt mixed when fuel oil is fed and water drop caused while fuel oil tank is used for a long time. When any condensate is found afloat and fuel filter gets clogged too fast, fuel oil tank should be cleaned after condensate is removed from fuel oil tank even before the specified cleaning interval time.



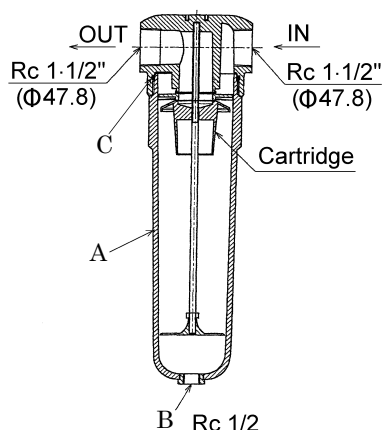
PC16022-1

<Procedure>

1. Open drain valve to remove fuel oil from fuel tank.
2. Remove the fender on the right side to open the door of the bonnet.
3. Remove fuel pipes and wires connected to fuel tank.
4. Remove belt holding fuel tank and remove tank.
5. Insert cleansing nozzle through fuel filler port or drain port for cleaning tank.
6. After cleaning job is finished, install fuel tank from which water or the like should be completely removed.

2.4.8 Clean Drain Separator (Aftercooler type only)

Due to accumulation of dust, dirt and sludge etc., the outlet of condensate could be clogged so that condensate cannot be drained. And in case that the service air is mixed with water, clean the drain separator.



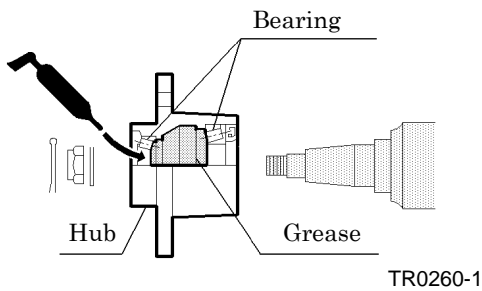
PC13063-1

<Procedure>

1. Remove the ball [A] by turning it.
2. Check the outlet [B] whether it is clogged and clean it.
3. As it is possible that the O-ring [C] has deteriorated or hardened, replace the O-ring.
4. After finishing clean, assemble it in reverse procedure.

2. Maintenance

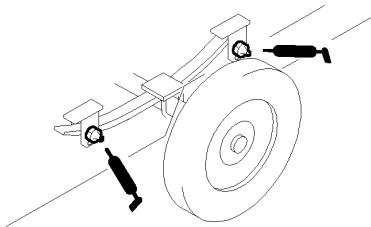
2.4.9 Supply Grease to Trailer Hub Bearing



Apply grease to trailer hub bearing with using a tool such as grease gun.

Grease: Chassis grease

2.4.10 Supply Grease to Leaf Spring Pin



Apply grease to grease nipple on the lower part of the machine with using a tool such as grease gun.

Grease: Chassis grease

3. Electric System

3.1 Electronic Control System of Engine

3.1.1 Electronic governor

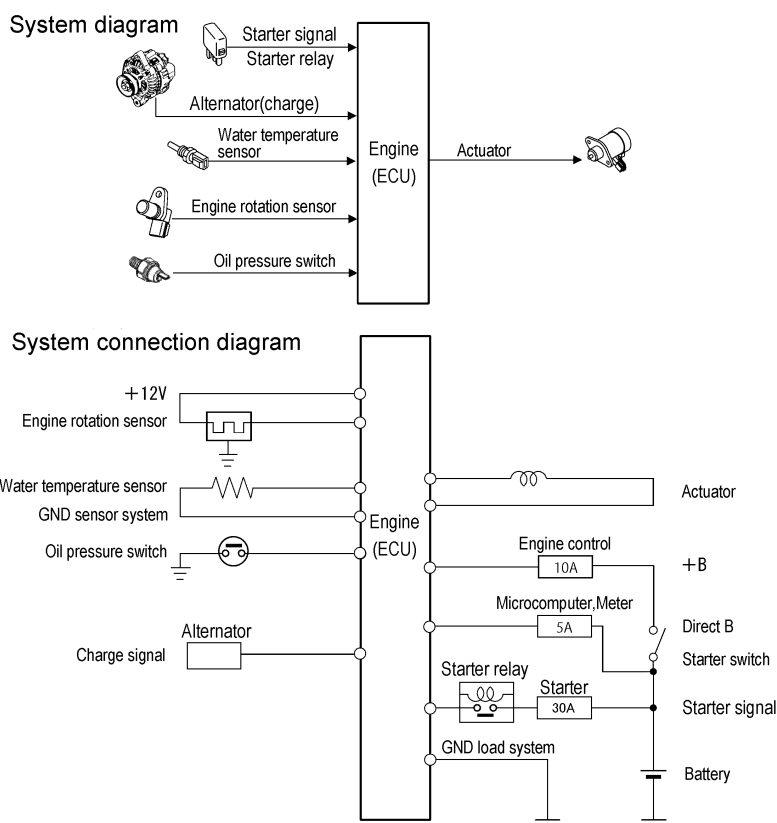
[Outline]

[Quoted from Kubota work shop manual]

Electronic governor is the mechanism which controls the control rack working of injection pump electronically by actuator. Then it controls fuel injection quantity to be always adequate.

Conventional mechanical governor has a feature that its governor spring tension varies according to the centrifugal force which affects governor weight and is to be varied by engine rotation. That tension variation operates the fork lever, then operates the control rack of injection pump, and adjusts fuel injection quantity. Thus each response such as of governor spring has its limit. So there is some delay on the response for engine rotation variation such as in overload.

Electronic governor detects engine status by the electric signal of each sensor. So it can respond for engine rotation variation quickly. Thus it can regulate fuel injection quantity always to be adequate even though engine rotation varies by working contents. And it can operate in wide rotation range and wide load range steadily. Also controls graphite which is generated by excessive fuel on rapid acceleration.



PC18063E

3. Electric System

- Engine Controller (ECU)

This unit regulates the fuel injection always to be adequate. This detects engine status by the signal from each sensor. And it operates actuator to optimize fuel injection for each situation.

- Rotation Sensor

The sensor which detects engine rotation speed is installed at the circumference of injection pump gear on gear case. Pulse signal is generated by passing injection pump gear tooth on sensor part. The sensor detects rotation speed by that signal.

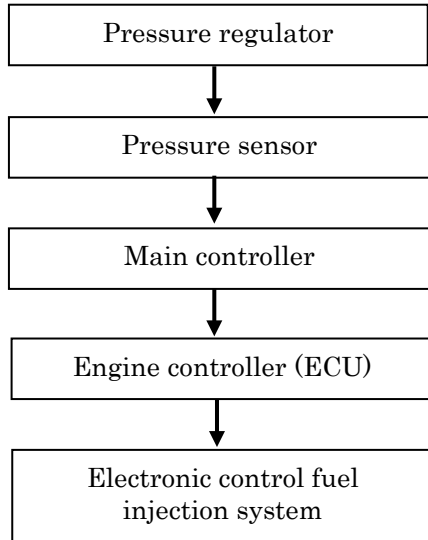
- Actuator

The actuator adjusts fuel injection quantity. It is installed at injection pump. It regulates (In duty ratio regulation) the internal solenoid valve time by the input signal to the engine controller (ECU) such as engine rotation speed, throttle position, water temperature and engine oil pressure. According to above, the rod will be moved. This movement will be connected to the injection pump control rack. Then fuel injection amount will be adjusted.

3. Electric System

3.1.2 Acceleration control

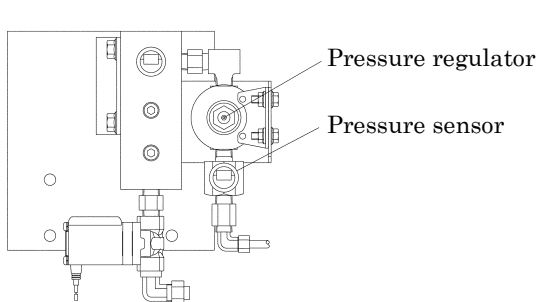
Main controller receives electric signal outputted from pressure sensor, and it controls electronic fuel injection system by outputting to engine controller (ECU).



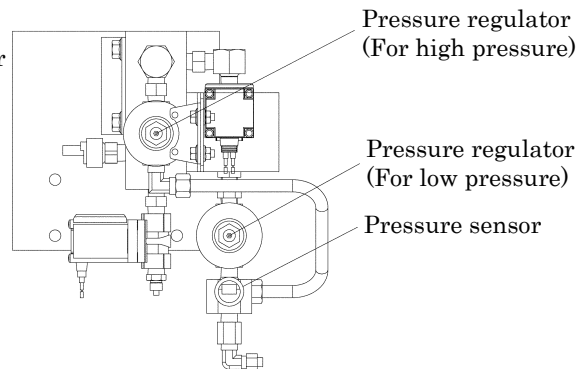
The pressures at 2nd stage is converted into voltage and outputted.

The input voltage (pressure signal) is converted into voltage again, and it is output to engine controller (ECU)

The input signal is converted into control signal. Then it is output to electronic control fuel injection system.

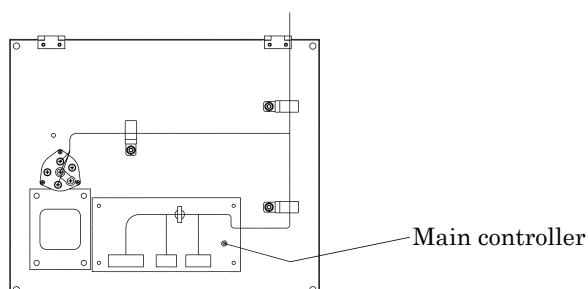
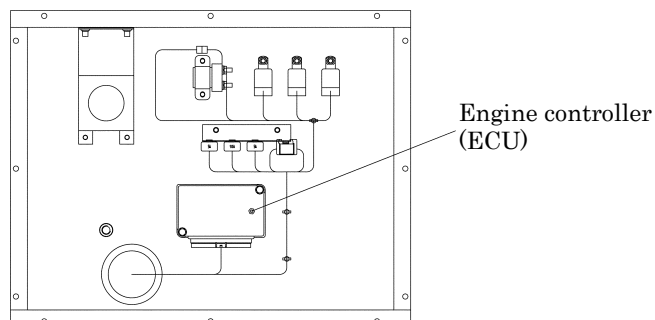


PDS400S(SC)-6B



PDSF330DP(DPC)-6B

PC18049



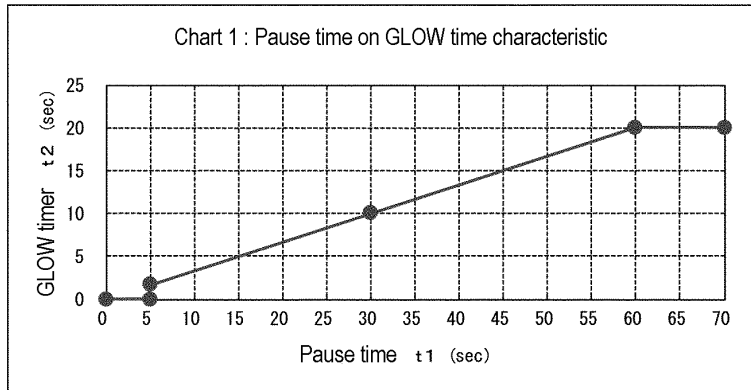
PC18048

3. Electric System

3.1.3 Preheating control

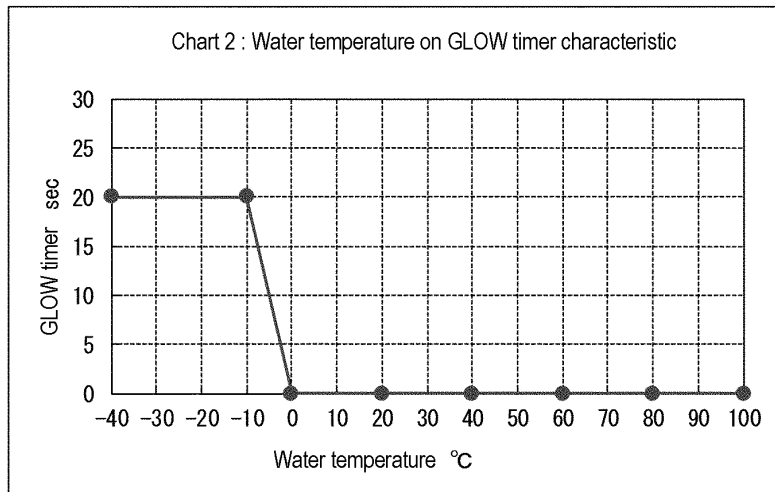
< Controller function >

- 1) When set starter switch from STOP position to RUN position, air heater is ON during the time t2 as following chart 1 (MAX : 20 seconds)
When setting the starter switch from RUN position to STOP position, then again to RUN position, the GLOW timer t2 differs from Pasuse time t1.
- 2) GLOW time is corrected in proportion to water temperature as following chart 2.
※ GLOW is to be conducted in the range of charadcteristics as shown on chart
- 3) Air heater is ON during starter is conducted. (MAX : 12 seconds)
- 4) Lamp lights up when air heater is ON. Lights out when air heater is OFF.



Pause time on GLOW timer characteristic MAP

Pause time t1	sec	0	4.99	5	30	60	70
GLOW timer t2	sec	0	0	1.7	10	20	20

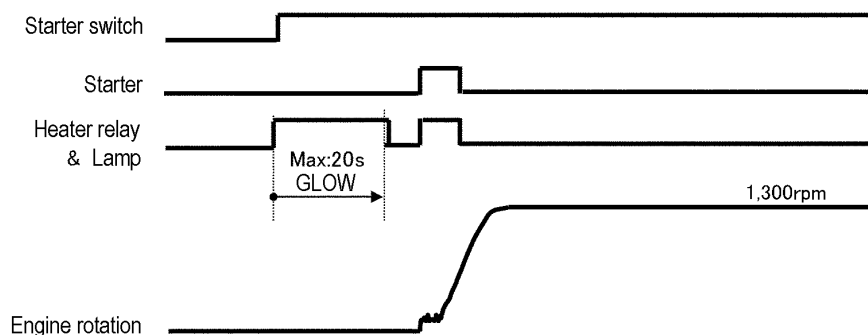


Water temperature on GLOW timer characteristic MAP

Water temperature	°C	-40	-10	0	20	40	60	80	100
GLOW timer	sec	20	20	0	0	0	0	0	0

< Operation example >

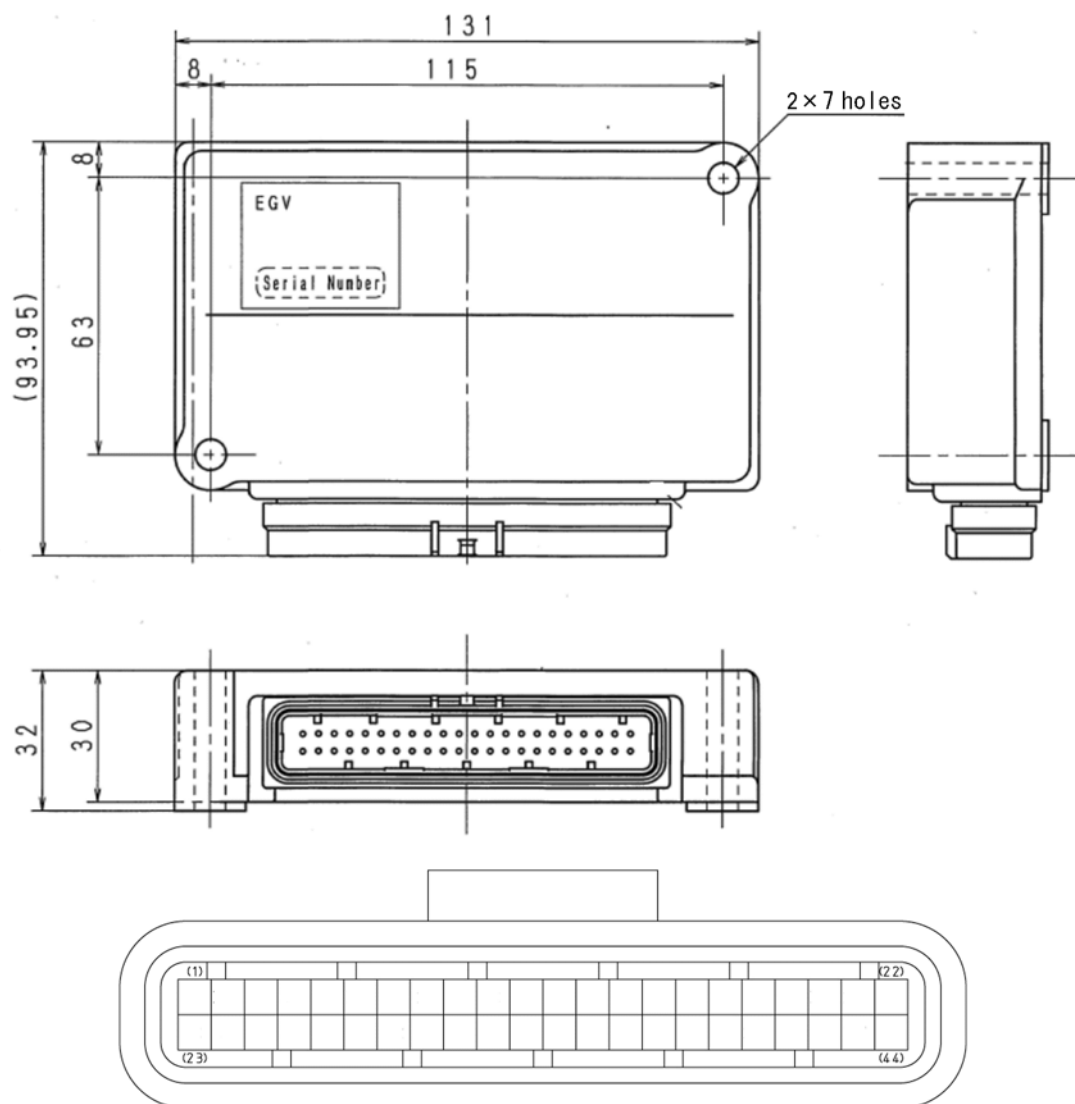
Normal operation when engine starts at -20°C



3. Electric System

3.2 Engine Controller (ECU)

Part number: 44390 05200



Terminal arrangement of connector (CN4)

PC18051E

3. Electric System

1. List of functions

(1) Connector CN1

Pin No.	Line color	Connection	Function
CN4-1	—	NIL	
CN4-2	G/O	Rotation sensor SIG terminal	ECU uses it for engine rotation speed calculation signal.
CN4-3	—	NIL	
CN4-4	—	NIL	
CN4-5	—	NIL	
CN4-6	R/B	Water temperature sensor	Detect the water temperature.
CN4-7	—	NIL	
CN4-8	Y	Main controller CN2-11 terminal Alternator L terminal	Detect generation signal from alternator
CN4-9	—	NIL	
CN4-10	—	NIL	
CN4-11	—	NIL	
CN4-12	—	NIL	
CN4-13	L	Main controller CN2-12 terminal	No electricity when normal operation. When preheating manipulation, ECU internal contact will be ON. Then main controller has power source and glow lamp will be ON.
CN4-14	—	NIL	
CN4-15	—	NIL	
CN4-16	—	NIL	
CN4-17	—	NIL	
CN4-18	—	NIL	
CN4-19	B	GND of ECU	Grounding
CN4-20	B	Rotation sensor GND terminal	Rotation sensor earth
CN4-21	R/L	Starter switch C terminal	Start signal input terminal. When start signal is input to CN4-21 terminal, internal connection between CN4-40 and grounding terminal turns ON, and starter relay functions.
CN4-22	R/G	Starter switch B terminal (Through 5A fuse)	Power supply
CN4-23	—	NIL	
CN4-24	—	NIL	
CN4-25	—	NIL	

3. Electric System

Pin No.	Line color	Connection	Function
CN4-26	—	NIL	
CN4-27	—	NIL	
CN4-28	W	Main controller CN3-8 terminal	Input voltage signal from main controller (FULL road: 3.8V, UN road: 1.4V)
CN4-29	R	Main controller CN3-7 terminal	Supply power source to main controller
CN4-30	—	NIL	
CN4-31	B	Main controller CN3-3 terminal	Grounding
CN4-32	—	NIL	
CN4-33	—	NIL	
CN4-34	—	NIL	
CN4-35	G/L	Main controller CN1-5 terminal	No electricity when normal operation. When main controller internal contact (Ry4) is ON because of discharge air temperature increase, coolant temperature increase, engine rotation speed decrease, engine oil pressure decrease, etc., it supplies electricity and makes engine emergency stop.
CN4-36	L/B	Actuator - terminal	Grounding
CN4-37	B	GND of ECU	Grounding
CN4-38	—	NIL	
CN4-39	L/G	Heater drive relay CN12-1 terminal	Heater drive relay operation terminal When preheating, it turns CN4-39 terminal and power source internal contact ON. Then preheating will be started.
CN4-40	L/R	Starter relay CN11-3 terminal	Starter relay excitation terminal When signal is input to CN4-21 terminal, ECU internal switch between CN4-40 terminal and earth terminal will be connected. Thus starter relay operates and starter signal will be input to starter C terminal.
CN4-41	L/R	Actuator + terminal	Actuator rod moves in proportion to weld time by ECU. This movement and injection pump control rack will have linkage for each other. Then fuel injection will be adjusted.
CN4-42	B/R	Starter switch BR terminal (Through 5A fuse)	Heater switch When starter switch is ON, CN4-39 terminal will be ON.
CN4-43	G/B	Rotation VCC terminal	Rotation sensor power source
CN4-44	R/W	Starter switch ACC terminal (Through 10A fuse) Fuel pump	ECU power source

3. Electric System

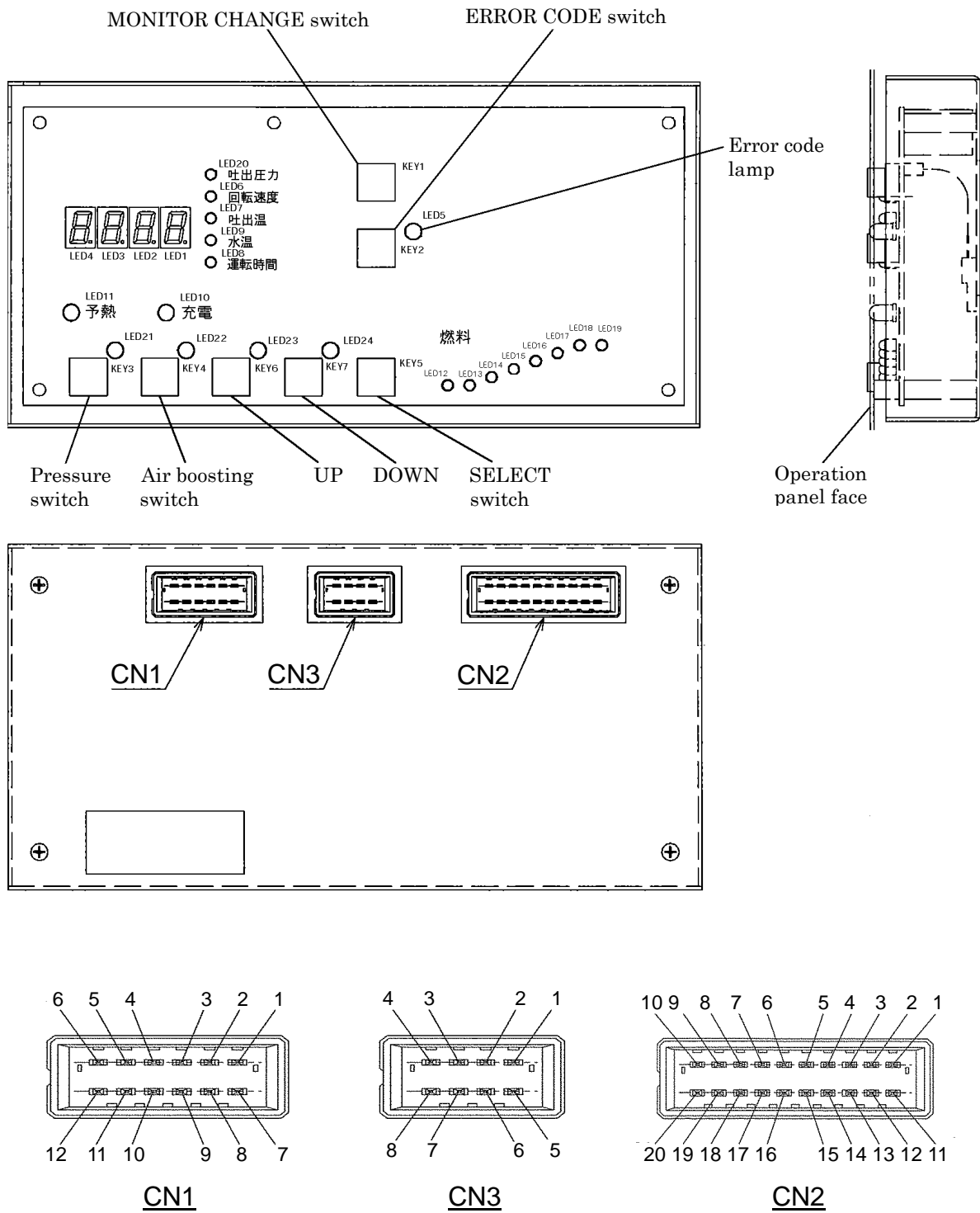
3.3 Main controller

PDS400S(SC)-6B5

Part number: 46870 72300

PDSF330DP(DPC)-6B5

Part number: 46870 74100

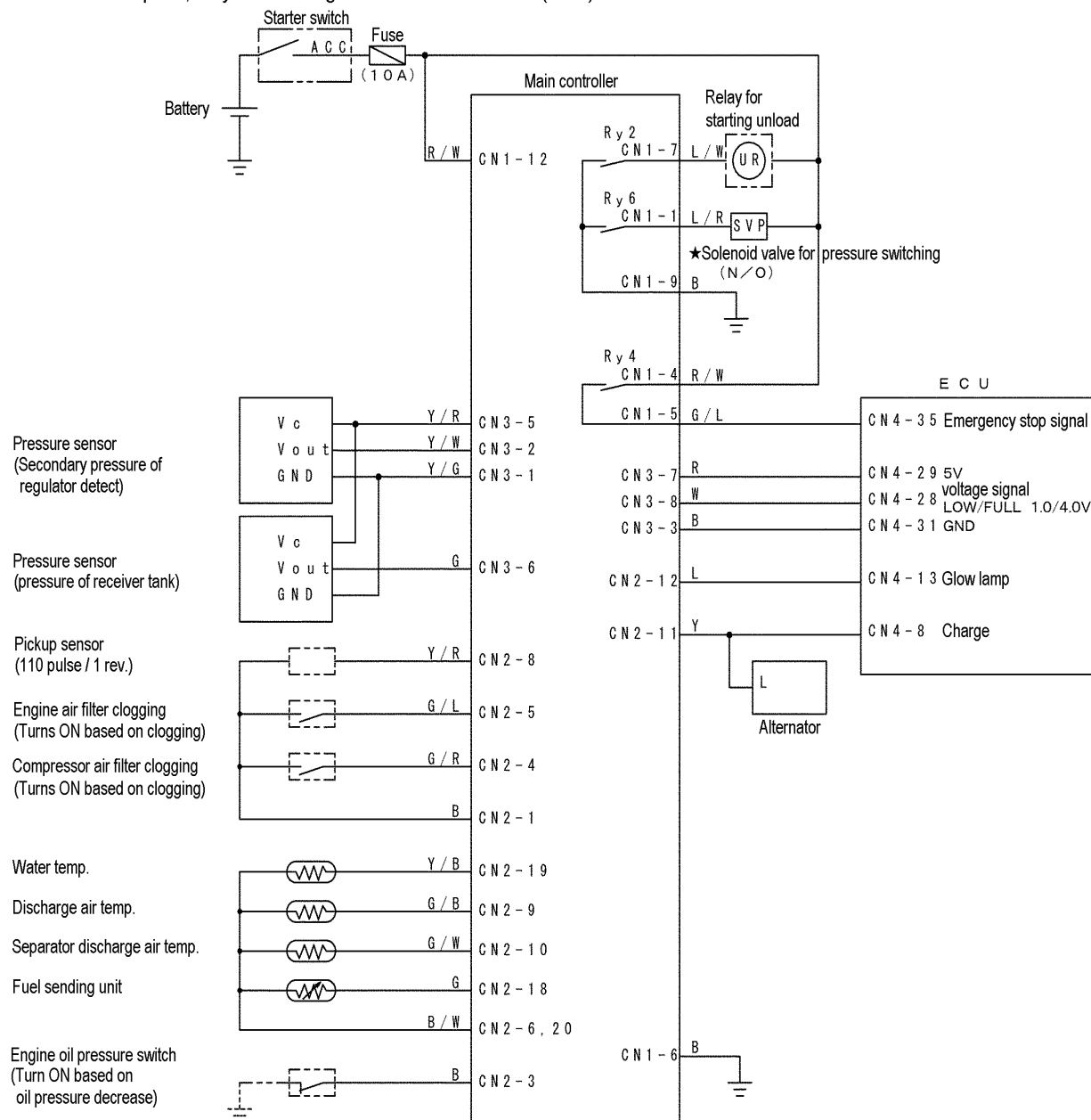


PC18015E

3. Electric System

1. Exterior connection drawing

For ★ marked point, only have wiring for model PDSF330DP(DPC)-6B5.



PC18043E

2. Functions of each output relay

Mark	Name	Function
Ry2	Relay for starting unloader • Solenoid valve for starting unloader (SV1) • Solenoid valve for unloader spring chamber (SV2)	OFF when starting Discharge air temperature: Lower than 60°C... ON either 120 seconds elapse or discharge air temperature is 60°C or more which comes first. Discharge air temperature: Higher than 60°C... It becomes ON 30 seconds later.
Ry4	Abnormality output relay	OFF during normal operation, ON emergency stop
Ry6	Solenoid valve for pressure switching (SVP)	Relay ON: 1.03 MPa, Relay OFF: 0.7 MPa Setting change by pressure switch manipulation on manipulation panel

3. Electric System

3. List of functions

(1) Connector CN1

Pin No.	Line color	Connection	Function
CN1-1	L/R	Solenoid valve for pressure switching (SVP)	Switch discharge pressure (0.7 MPa • 1.03 MPa) Main controller internal contact (RY6) ON:1.03 MPa , OFF:0.7MPa
CN1-2	—	NIL	
CN1-3	—	NIL	
CN1-4	R/W	Starter switch ACC terminal (Through 10A fuse)	Power source voltage application by starter switch ON
CN1-5	G/L	Engine controller (ECU) CN4-35 terminal	No power exists during usual operation. It is connected to the emergency stop circuit of engine controller (ECU). When main controller internal contact (Ry4) is ON because of discharge air temperature increase, coolant temperature increase, engine rotation speed decrease, engine oil pressure decrease, etc., it supplies electricity from CN1-4 terminal to engine controller (ECU) CN4-35. Then makes engine emergency stop.
CN1-6	B	Grounding	
CN1-7	L/W	Relay for starting unload	When main controller internal contact (Ry-2) is ON, relay for starting unload coil have electricity and solenoid valve for starting unload is CLOSE. Then stop the starting unload operation.
CN1-8	—	NIL	
CN1-9	B	Grounding	
CN1-10	—	NIL	
CN1-11	—	NIL	
CN1-12	R/W	Starter switch ACC terminal (Through 10A fuse)	Power supply

3. Electric System

(2) Connector CN2

Pin No.	Line color	Connection	Function
CN2-1	B	Engine air filter Compressor air filter Pickup sensor	Grounding
CN2-2	—	NIL	
CN2-3	G/R	Oil pressure switch	No power exists during usual operation. ON when engine oil pressure drops to emergency stop setting pressure. Then have electricity by connecting earth.
CN2-4	G/R	Compressor air filter	When compressor air filter clogging, connect earth.
CN2-5	G/L	Engine air filter	When engine air filter clogging, connect earth.
CN2-6	B/W	Water temperature sensor Discharge air temperature sensor Separator air temperature sensor Sending unit	Grounding
CN2-7	—	NIL	
CN2-8	Y/R	Pickup sensor	Detect the pick up sensor signal (110 pulse / 1 rev.)
CN2-9	G/B	Discharge air temperature sensor	Detect the discharge air temperature.
CN2-10	G/W	Separator air temperature sensor	Detect the separator air temperature.
CN2-11	Y	Alternator L terminal	Detect the generation signal form alternator
CN2-12	L	Engine controller (ECU) CN4-13 terminal	Detect the preheating signal from ECU
CN2-13	—	NIL	
CN2-14	—	NIL	
CN2-15	—	NIL	
CN2-16	—	NIL	
CN2-17	—	NIL	
CN2-18	G	Sending unit	Detect the fuel level.
CN2-19	Y/B	Water temperature sensor	Detect the water temperature.
CN2-20	B/W	Water temperature sensor Discharge air temperature sensor Separator air temperature sensor Sending unit	Grounding

3. Electric System

(3) Connector CN3

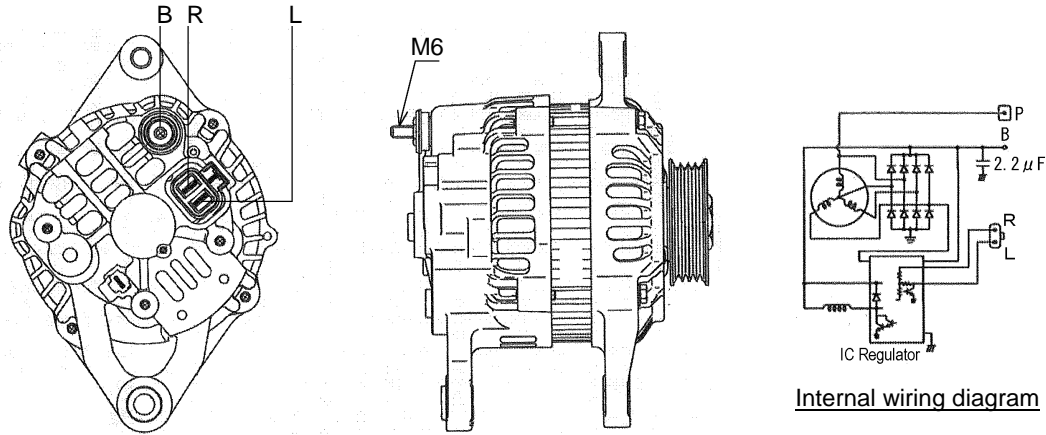
Pin No.	Line color	Connection	Function
CN3-1	Y/G	Pressure sensor GND terminal	Grounding
CN3-2	Y/W	Pressure sensor Vout terminal	Detection of regulator secondary pressure.
CN3-3	B	Engine controller (ECU) CN4-31 terminal	Grounding
CN3-4	—	NIL	
CN3-5	Y/R	Pressure sensor Vcc terminal	Pressure sensor power source
CN3-6	G	Pressure sensor Vout terminal	Detect the signal of receiver tank pressure sensor
CN3-7	R	Engine controller (ECU) CN4-29 terminal	Power supply (ECU supplies reference voltage)
CN3-8	W	Engine controller (ECU) CN4-28 terminal	Input the voltage signal which regulates engine rotation speed (FULL road: 3.8V, UN road: 1.4V)

3. Electric System

3.4 Electrical Pars

3.4.1 Alternator

KUBOTA part number: 1G377-64011



Nominal capacity	DC12V-80A
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PC18052E

(1) List of functions

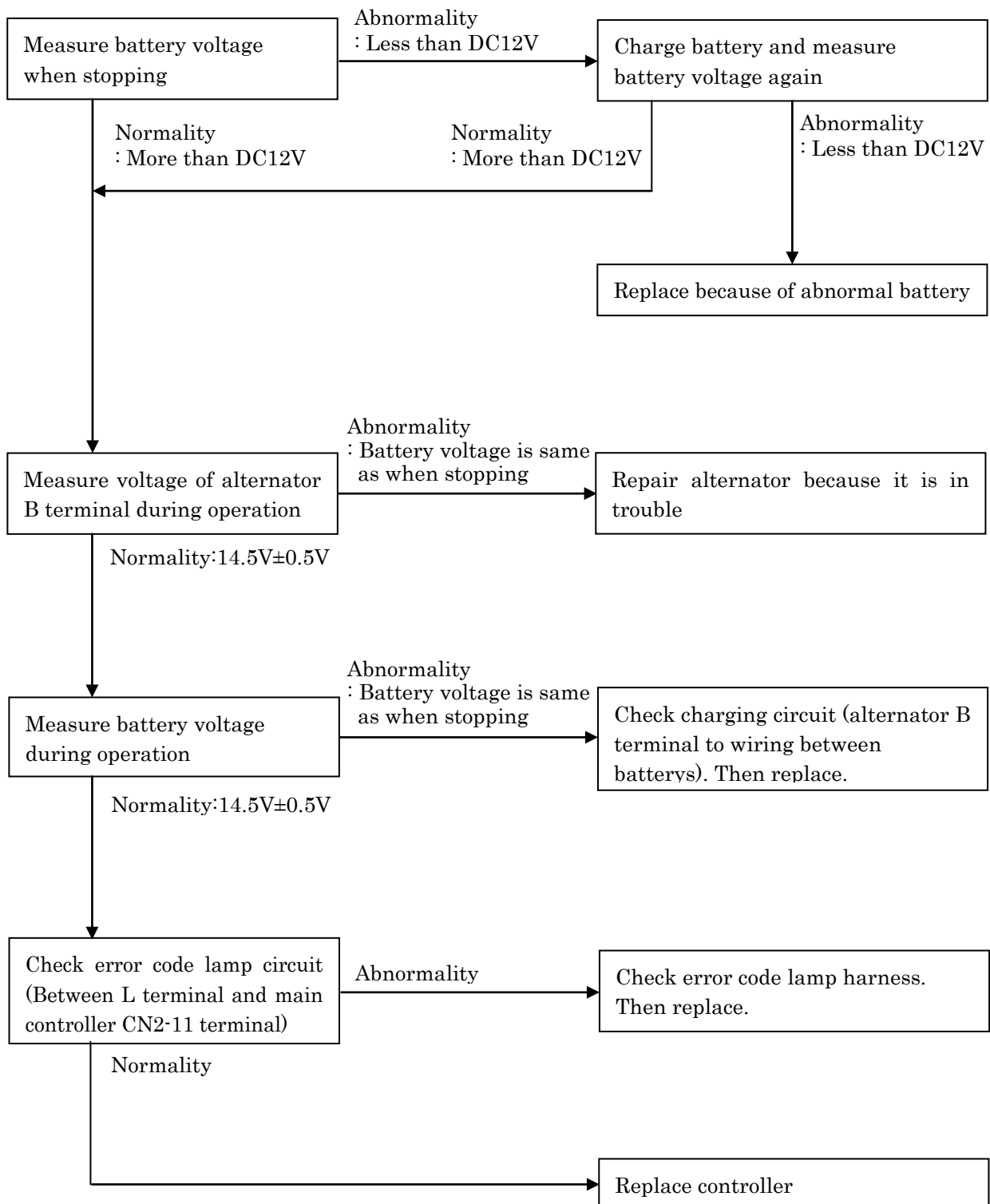
Terminal No.	Connection	Function
B	Battery + terminal (Through 80A fuse)	Power for charging voltage.
R	Starter switch ACC terminal (Through 10A fuse)	Detect voltage of ACC terminal and adjust the current flowing to rotor coil
L	Main controller CN2-11 terminal	Turn lamp ON when abnormal charge for battery
	Engine controller CN4-8 terminal	If engine start completed and alternator L terminal have no voltage (0V) for 1 second or more, it stops engine after 10 seconds or more elapse after starting operation. (See page 1-7: Detect of abnormal charge)

(2) How to check

Checking method by voltage measurement	Normal value
Measure the battery terminal voltage at full load operation.	DC14.5±0.5V

3. Electric System

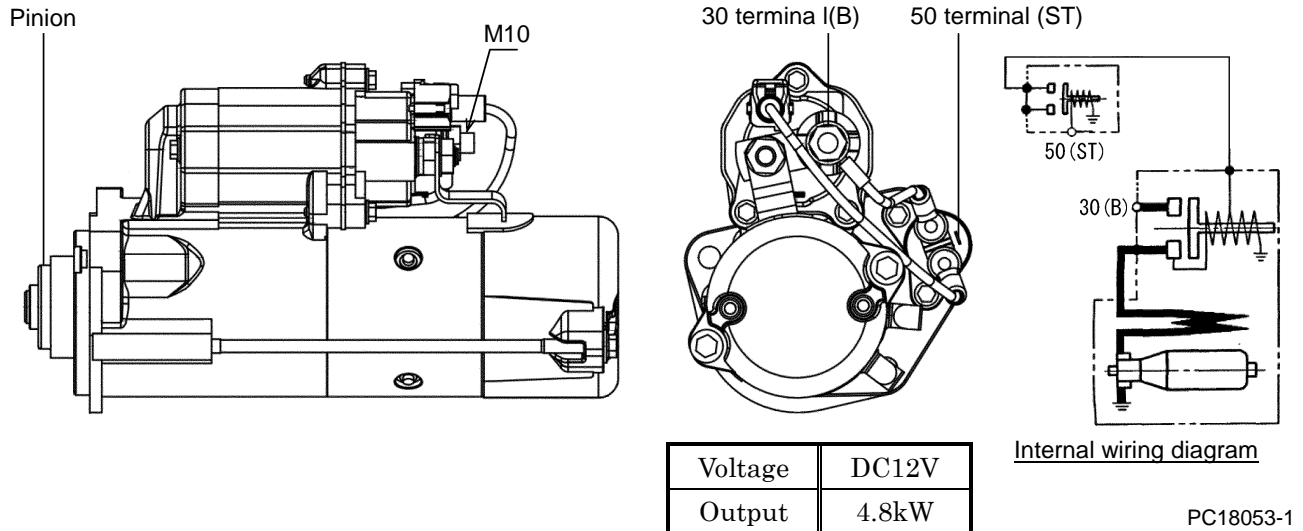
(3) Checking procedures when abnormal charge error code lamp blinks. (Error code A-5)



3. Electric System

3.4.2 Starter

KUBOTA part number: 1E456-63011



(1) List of functions

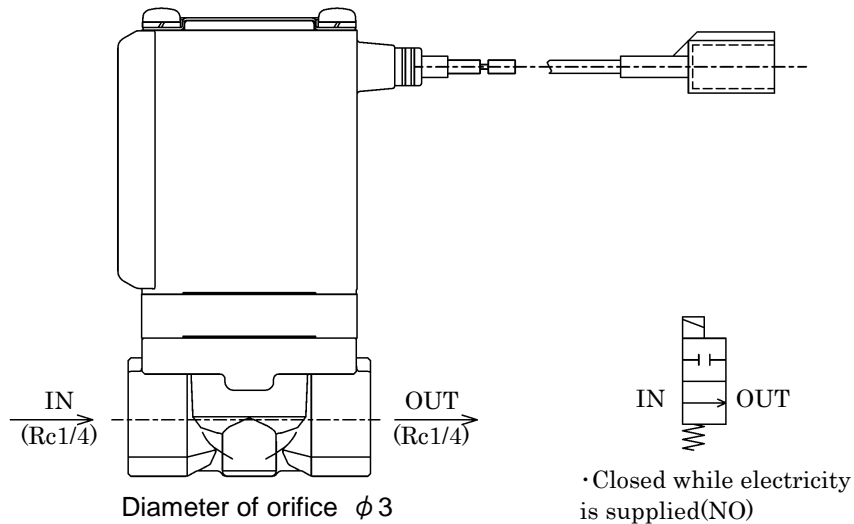
Terminal No.	Connection	Function
B	Battery + terminal	For supplying power to starter which enables starter pinion to turn.
ST	Starter relay CN11-2 terminal	For supplying power to make starter pinion to spring out and also a little power to make pinion turn for smooth engagement between pinion gear and ring gear when they are in contact.

3. Electric System

3.4.3 Solenoid Valve

(1) Solenoid Valve for Starting Unload:SV1

Part number: 46811 30000

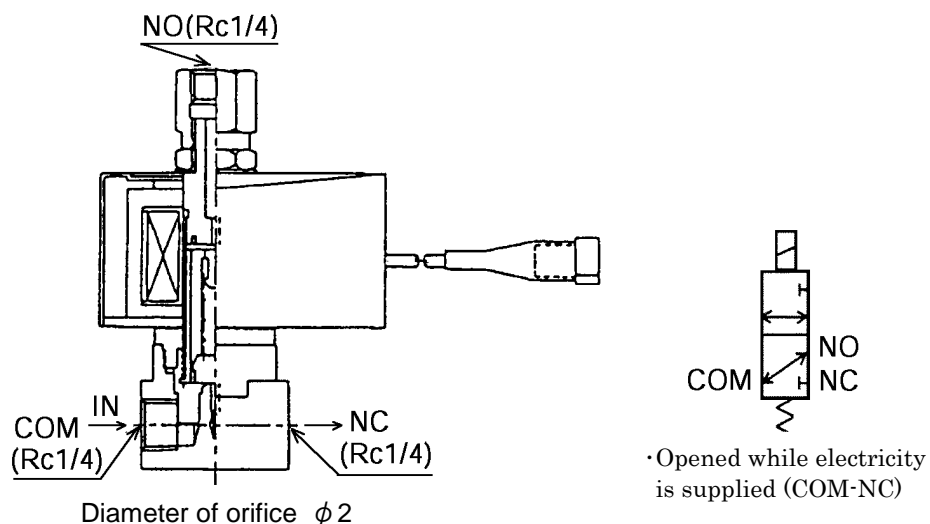


PC14027

Rated voltage	DC12V
Function	Power is not supplied. It is ON (NO)

(2) Solenoid Valve for Unloader Spring Chamber:SV2

Part number: 46811 31800



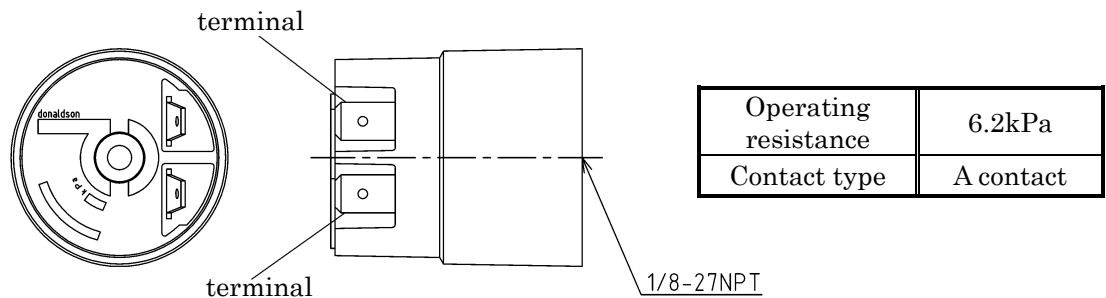
PC16046

Rated voltage	DC12V
Function	Power is supplied. It is ON (COM-NC)

3. Electric System

3.4.4 Air Filter Indicator (Engine / Air-end common)

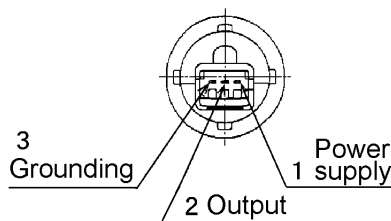
Part number: 32148 03000



SC10016-2

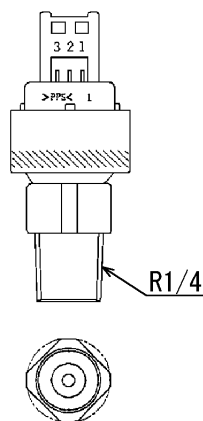
3.4.5 Pressure Sensor (Pressure of receiver tank · Secondary pressure of regulator detect)

Part number: 44328 20600



Trouble diagnosis of pressure sensor itself

Check and confirm that output voltage between [2] – [3] is $0.5 \pm 0.1V$ when DC5V is applied between [1] – [3] terminals at an atmospheric pressure.



PC08035E-2

Pressure and output voltage(for reference only)

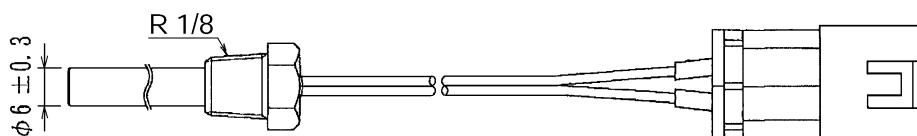
Electric wire	Signal
[1]VCC	Power supply (DC5V)
[2]VOUT	Output
	Pressure 0MPa (0kgf/cm ²) DC0.5V
	Pressure 0.1MPa (1kgf/cm ²) DC0.9V
	Pressure 0.6MPa (6kgf/cm ²) DC2.9V
	Pressure 0.69MPa (7kgf/cm ²) DC3.3V
	Pressure 0.98MPa (10kgf/cm ²) DC4.5V
[3]GND	Grounding

3. Electric System

3.4.6 Discharge Air Temperature·Separator Air Temperature· Engine Coolant Temperature Sensor (Thermister)

Part number: 44364 08200

※Use when temperature display and emergency stop



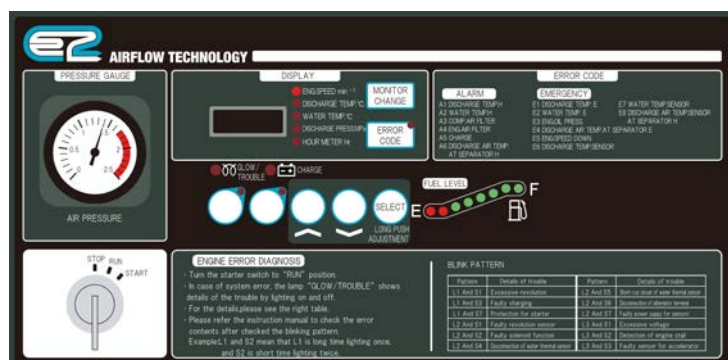
SC14066

《Note》 Take care not to tighten excessively. Less than 2N·m [20kgf·cm]

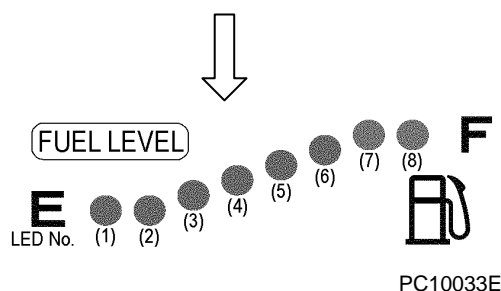
Characteristic of temperature·resistance

Temperature (°C)	Resistance value (Ω)	Permissible value (%)	Temperature (°C)	Resistance value (Ω)	Permissible value (%)
20	11,620	±10	80	1,310	± 6
35	6,270	± 9	95	840	± 5
50	3,560	± 8	110	560	± 4
65	2,120	± 7	115	490	± 4

3.4.7 Fuel Meter (Display)



A160695E



Relation between indicator lamp (LED) and residual fuel level

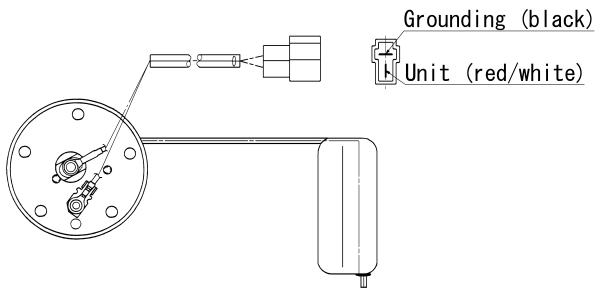
Indicator lamp		Remaining fuel (L)	Remark
Full		175.0	F
LED No.8	ON (Green)	146.0	
LED No.7	ON (Green)	127.0	
LED No.6	ON (Green)	104.0	
LED No.5	ON (Green)	84.0	1/2
LED No.4	ON (Green)	66.0	
LED No.3	ON (Green)	47.0	
LED No.2	ON (Red)	31.0	
LED No.1	Blinking (Red)	18.0	E

※Value when fuel is supplied (E – F)

3. Electric System

3.4.8 Sending Unit

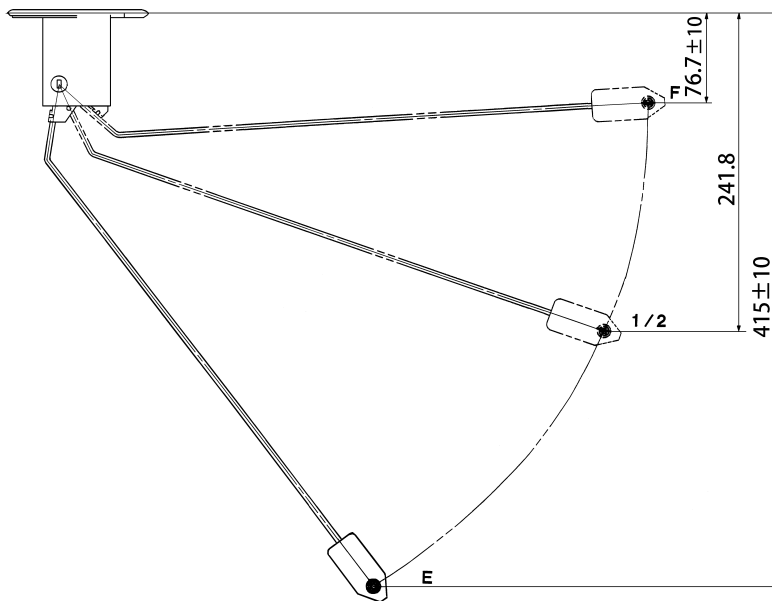
Part number: 36159 04500



Float position	Resistance value (Ω)
F	3.0 ± 2.0
1/2	32.5
E	110.0 ± 7.0

(See clause 3.4.7 for remaining oil quantity)

Unit : mm

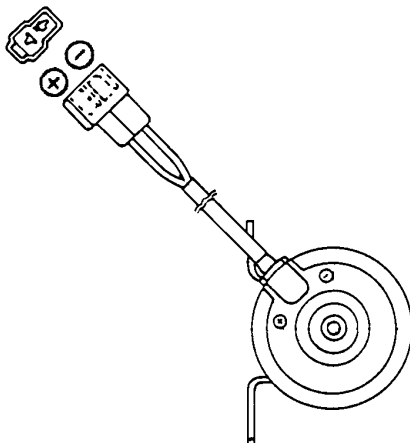


PC16034E

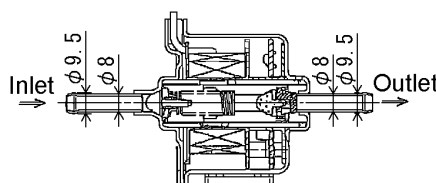
3.4.9 Fuel air-bleeding electromagnetic pump (without filter type)

Part number : 43650 02400

KUBOTA part number: R1401-51352



Rated voltage	DC12V
Operating current	1.5A(MAX)
Delivery capacity	More than 400cc/min



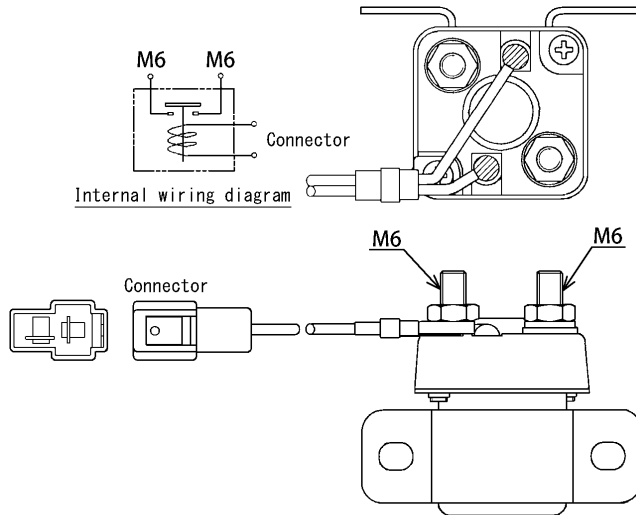
SG13038E-2

3. Electric System

3.4.10 Heater relay HR1

Part number : 44346 16200

KUBOTA part number: 3N300-75211



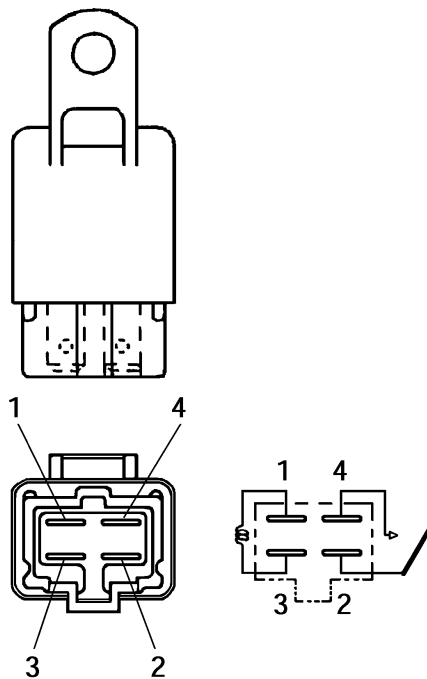
Rated voltage	DC12V
Rated load	100A Resistance load (Less tha 3 minutes, at 20°C)

PC18058E

3.4.11 Heater drive relay • Starter Relay • Relay for starting unloader HR2 • SR • UR

Part number : 44346 15300

KUBOTA part number: 68881-53542



Rated voltage	DC12V
Rated load	20A Motor load Halogen load
Coil resistance	80Ω±10%

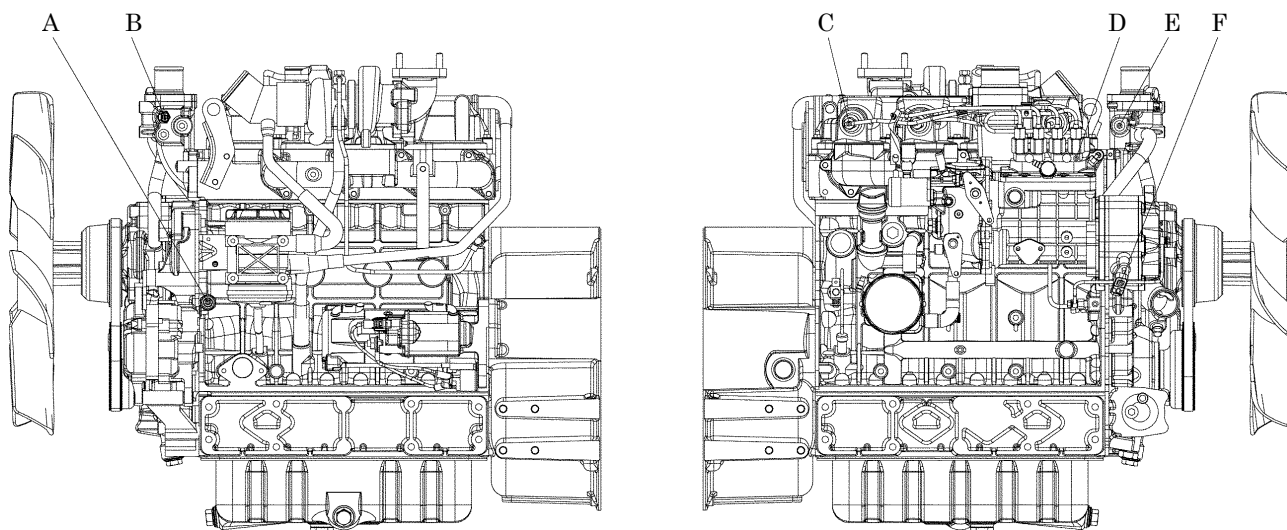
SG13033-1

3. Electric System

3.5 Engine Component

3.5.1 Engine component location diagram

【Quoted from Kubota work shop manual】

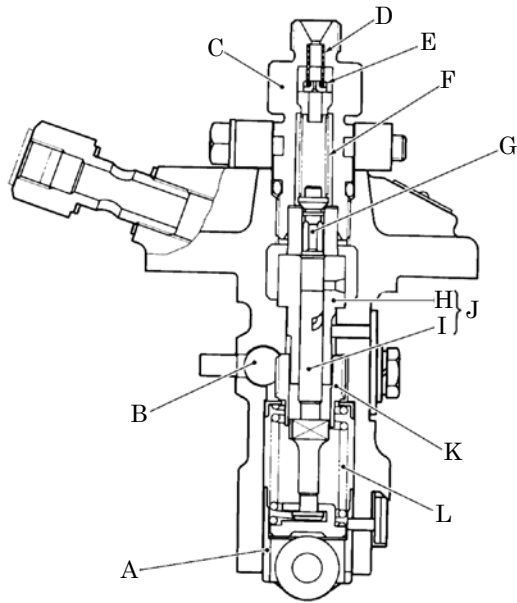


PC18057

- | | |
|--|---|
| A. Oil Pressure Switch (for emergency stops) | D. Injection pump |
| B. Water temperature sensor (For ECU regulation) | E. Water temperature sensor (For meter) |
| C. E-CDIS injection nozzle | F. Engine Rotation sensor |

3. Electric System

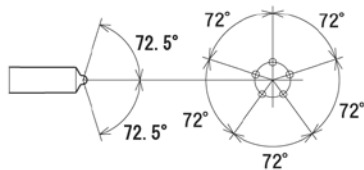
3.5.2 Injection pump D



PC18047

Injection pump equips PFR-M pump which is small, light and reliable. Its structure is as following figure. It consists of plunger [I], tappet [A], control rack [B], delivery valve [G], etc. Damping valve [E] is installed at the inside of delivery valve holder [C]. This provides stable injection without irregular injection, cavitation, secondary injection, etc. from idling status to highest rotation status.

3.5.3 E-CDIS injection nozzle C



PC18055

Injection nozzle equips 2-spring nozzle which is effective for nitric oxide/ particulate matter deduction. 2-spring nozzle enhances stability when low/middle speed and deducts noises.

Its structure is as following figure. Two nozzle springs and two push rods are used. There is a space (pre-lift) between first push rod and second push rod. This space enables fuel two-stage injection. Nozzle operation is as follows.

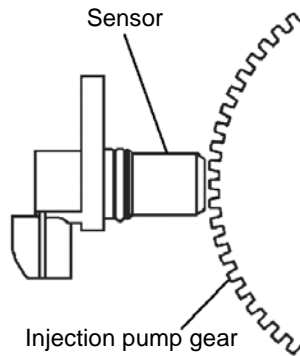
1. When inner nozzle fuel pressure increases and the pressure reaches at the open valve pressure for first spring, needle valve is lifted according to the pre-lift. Then fuel injection (throttle injection) starts.
2. When inner nozzle fuel pressure increases more and the pressure exceeds the resultant force of first spring and second spring, needle valve is lifted more and opens fully. Then main injection starts.

- A. Nozzle holder body
- B. First open valve pressure adjusting sim
- C. First spring
- D. Pressure pin
- E. Spring sheet
- F. Second open valve pressure adjusting sim

- G. Second spring
- H. Pre-lift adjusting spring sheet
- I. Chip packing
- J. Max lift adjusting washer
- K. Retaining nut
- L. Nozzle

3. Electric System

3.5.4 Engine Rotation sensor F

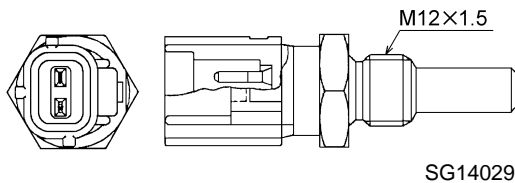


PC18056

The sensor detects engine rotation speed. It is installed at the around of injection pump gear on gear case. Pulse signal is generated by passing injection pump gear tooth on sensor part. The signal helps detecting rotation speed.

3.5.5 Water temperature sensor (For ECU regulation) B

KUBOTA part number:5H601-41941



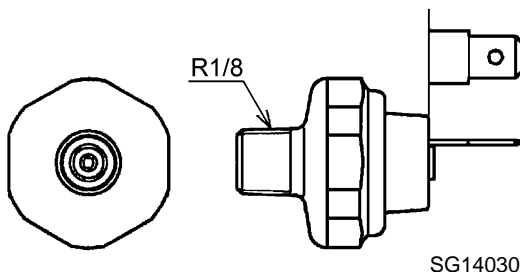
(1) Characteristic of temperature · resistance

Temperature (°C)	Resistance value (Ω)
-30	(25.4)
-20	15.04 ^{+1.29} _{-1.20}
20	2.45 ^{+0.14} _{-0.13}
100	(0.1836)
120	(0.1108)

() marked: reference value

3.5.6 Oil Pressure Switch (for emergency stops) A

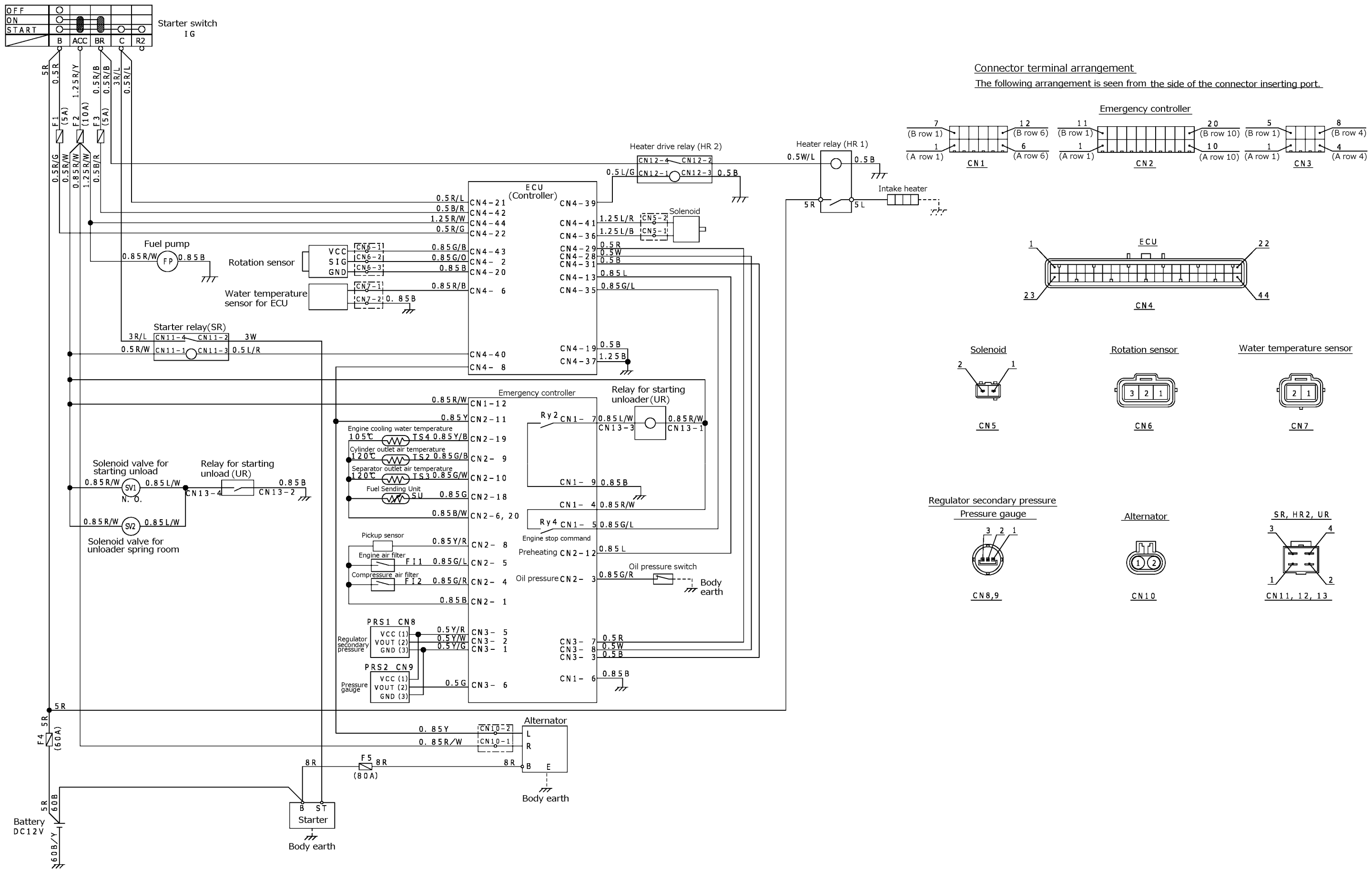
KUBOTA part number:17189-39013



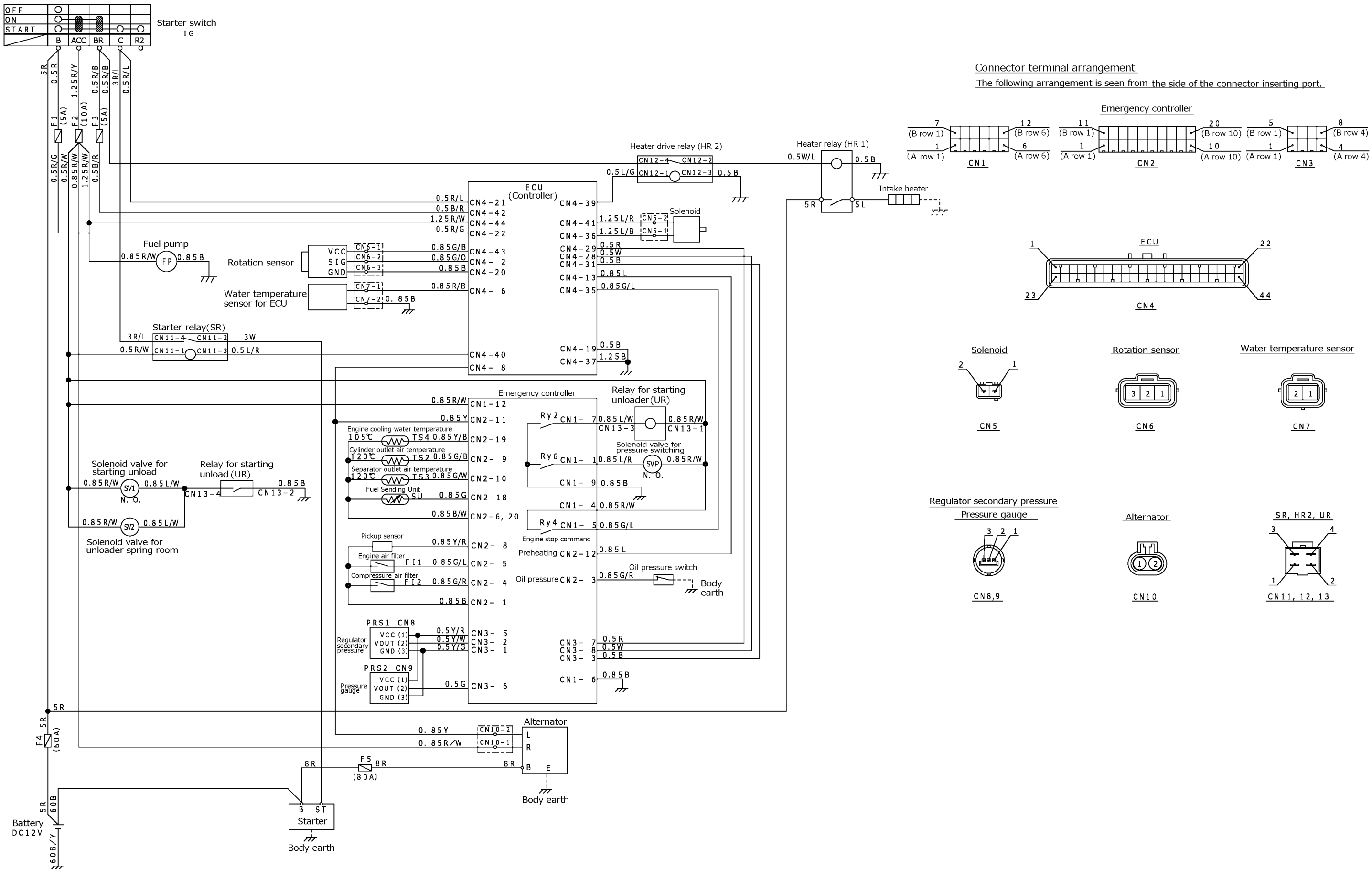
Setting pressure	ON when 98kPa or less
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3.6 Engine Wiring Diagram

PDS400S(SC)-6B5



PDSF330DP(DPC)-6B5



4. Troubleshooting

4.1 Repairing Procedures

When performing failure diagnosis, pay special attention to the followings, observing general cautions.

4.1.1 Safety caution

- (1) Removing such cap and/or plug for receiver tank, fuel tanks and pipes where pressure is loaded, stop the machine and relieve all the interior pressure. Install measuring instruments connected firmly.
- (2) When doing the job with co-worker(s) together, make sure to give signal to the other person(s) and do not allow other persons to come near to the job site.
- (3) Take care not to touch hot portions and not to be involved in turning portions.

4.1.2 Caution during failure diagnosis

- (1) Do not make haste to disassemble the unit

If the unit is disassembled urgently.

1. You may disassemble the other portions which are not related with the trouble.
2. The cause of trouble may be missing.

The unnecessary reparations require more spare parts and man-hours, and reparation costs will increase more. What is worse, you will lose reliance or trust from clients, operators and users.

Therefore, it is absolutely necessary to investigate the trouble more carefully in advance and to follow the required procedures for failure diagnosis.

- (2) Ask the clients about the trouble in details

In order to prevent misunderstanding and incorrect judgment about the trouble, it is necessary to ask users or operators about the following questions.

1. Is there any other disorder than the trouble he has informed?
2. Anything abnormal occurred before this trouble?
3. Did this trouble happen unexpectedly? Or the unit had been operated in bad conditions before?
4. When and how did this trouble occur?
5. Had he repaired the unit before this trouble occurred?
6. Did he not experience similar trouble before?

- (3) Inspection items before starting diagnosis

Sometimes such trouble may be caused owing to routine mishandling of the unit. Before starting failure diagnosis, check the following items.

1. The engine runs short of engine oil or its oil is not dirty?
2. Check each wire connection for any disconnection.
3. Check the other portions for any damage.

- (4) Confirmation of trouble

Discuss with user(s) and/or operator(s) sufficiently about the trouble. As a result, judge whether their judgment is based on the numerical comparison or sentimental basis. Make him (them) understand well the reparation or correction you have finished.

Then check and confirm by yourself the cause of the trouble.

Note) Never proceed any investigation or measurement which may cause further greater damage.

4. Troubleshooting

(5) Procedures of diagnosis

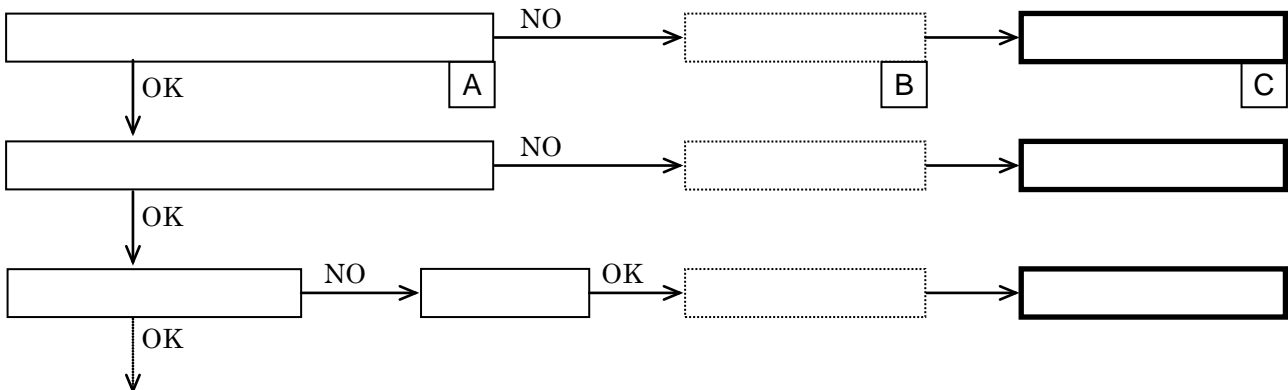
When you become well experienced, you can find out the cause easily during the process of confirmation (4). But easy understanding could cause unexpected failure. So check and judge it according to the following procedures.

1. Check the easiest thing or portion first.
2. Investigate the most possible cause.
3. Check the other things connected to the trouble.
4. Check for the possibility of any other troubles.
5. Start proper and careful investigation on this trouble.

(6) Prevention of repeated occurrence of similar trouble

Even if you have repaired the trouble, unless you get rid of the fundamental cause of the trouble, it will repeatedly occur. Therefore, perform full investigation of the trouble, and it is absolutely necessary to remove the basis of the trouble.

4.1.3 How to use the failure diagnosis



1. In the troubleshooting column something abnormal is mentioned in lined parenthesis.

2. In the troubleshooting column the cause of the said trouble is mentioned in dotted parenthesis.

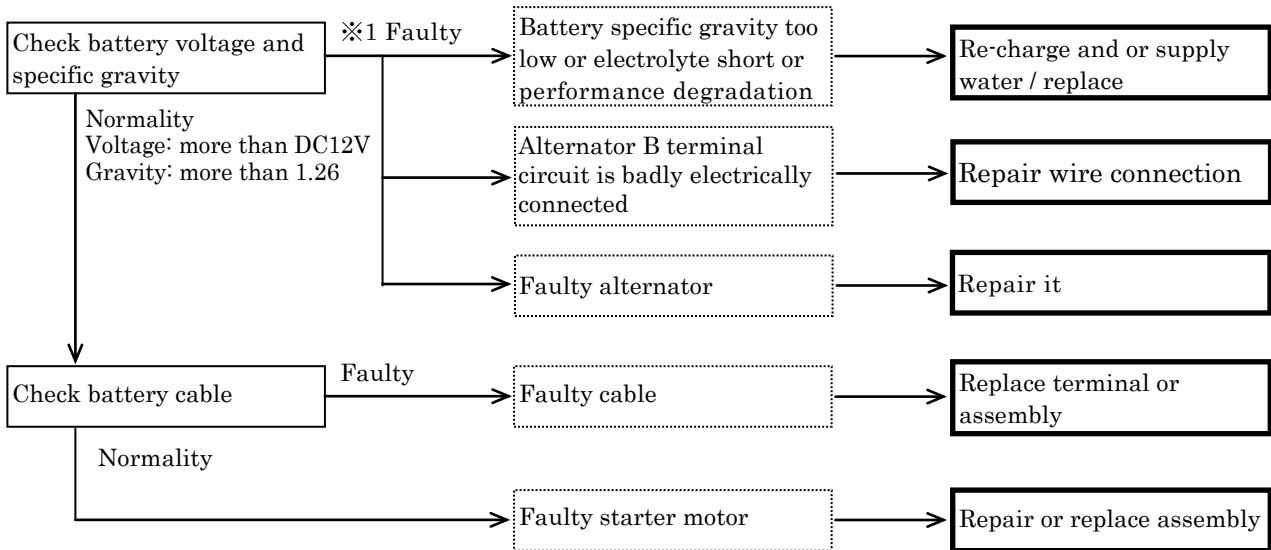
3. In the troubleshooting column the countermeasures or treatment are mentioned in the double lined parenthesis.

4. A under each column means the index of explanation.
For details, see 4.5 “Explanation of Trouble Diagnosis”.

4. Troubleshooting

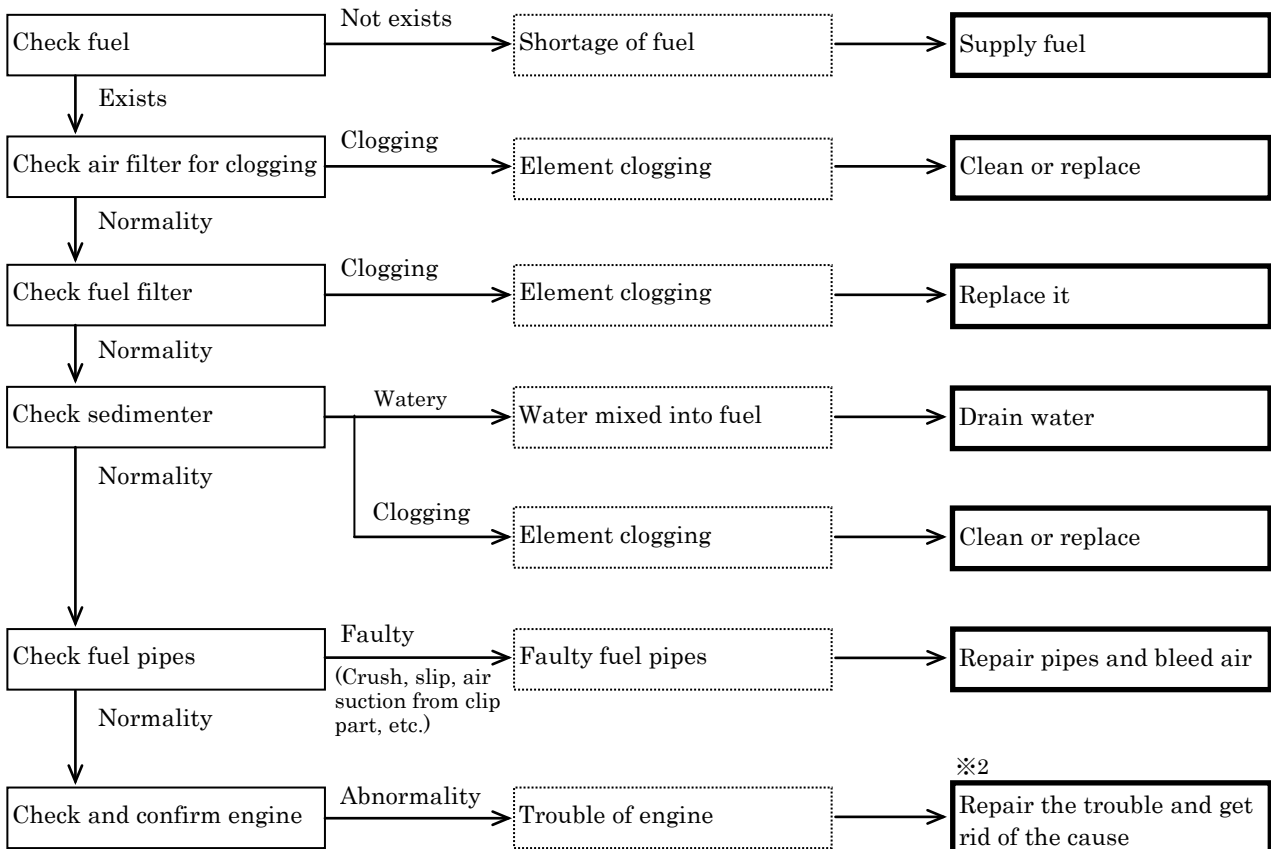
4.2 Failures of Compressor and Engine

4.2.1 At start-up, starter rotates slowly



※1 : When starter switch is placed at the “START” position, the battery is not normal if B terminal voltage decreases by 10V.

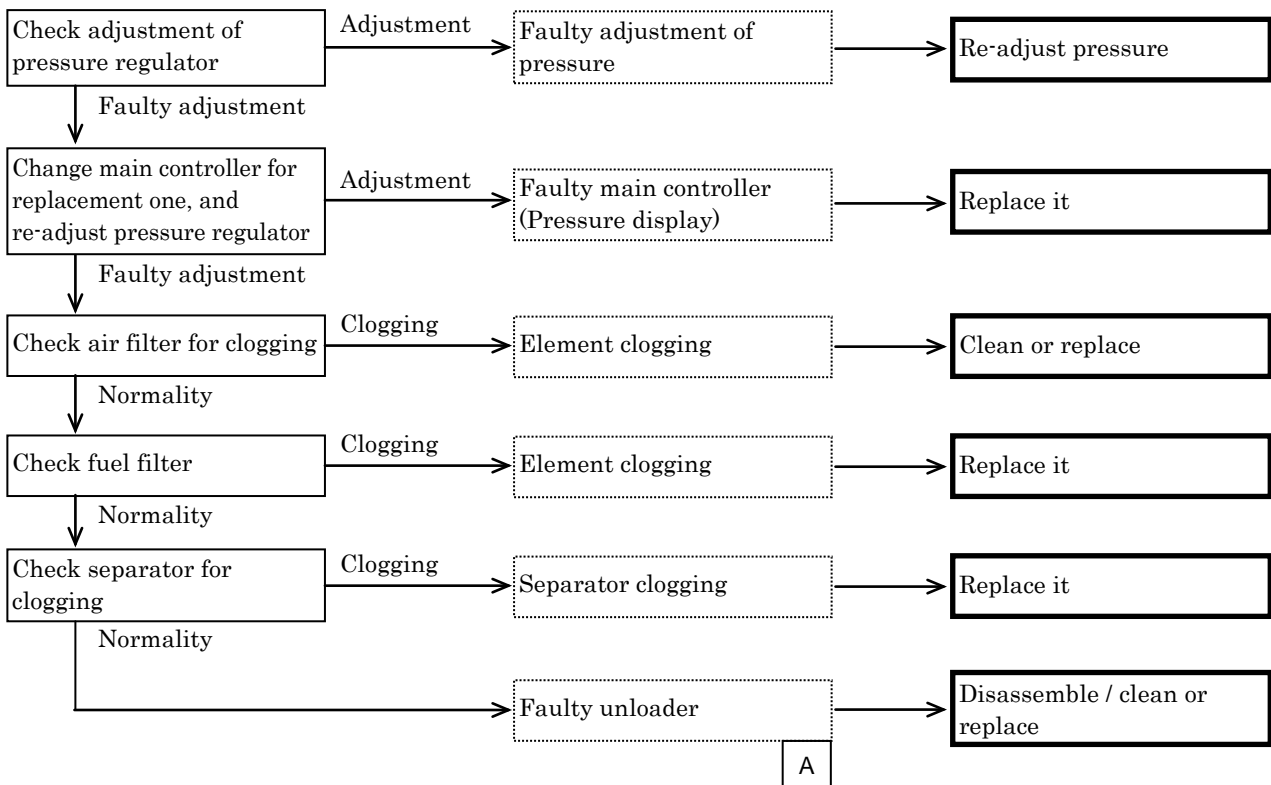
4.2.2 Starter turns, but engine will not start



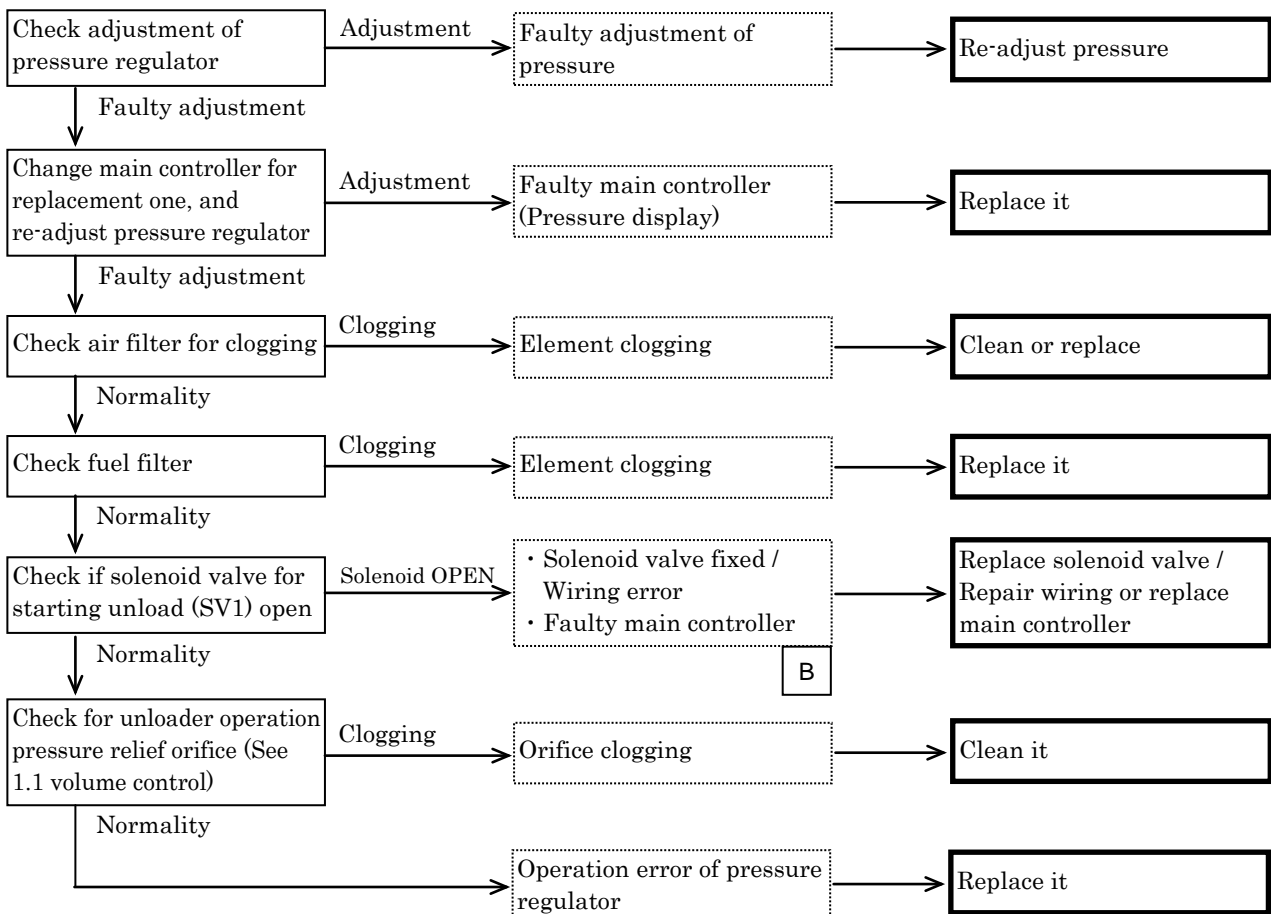
※2 For the detailed countermeasures, refer to [Workshop manual] published by engine manufacturer.

4. Troubleshooting

4.2.3 Engine will not turn to meet rated pressure

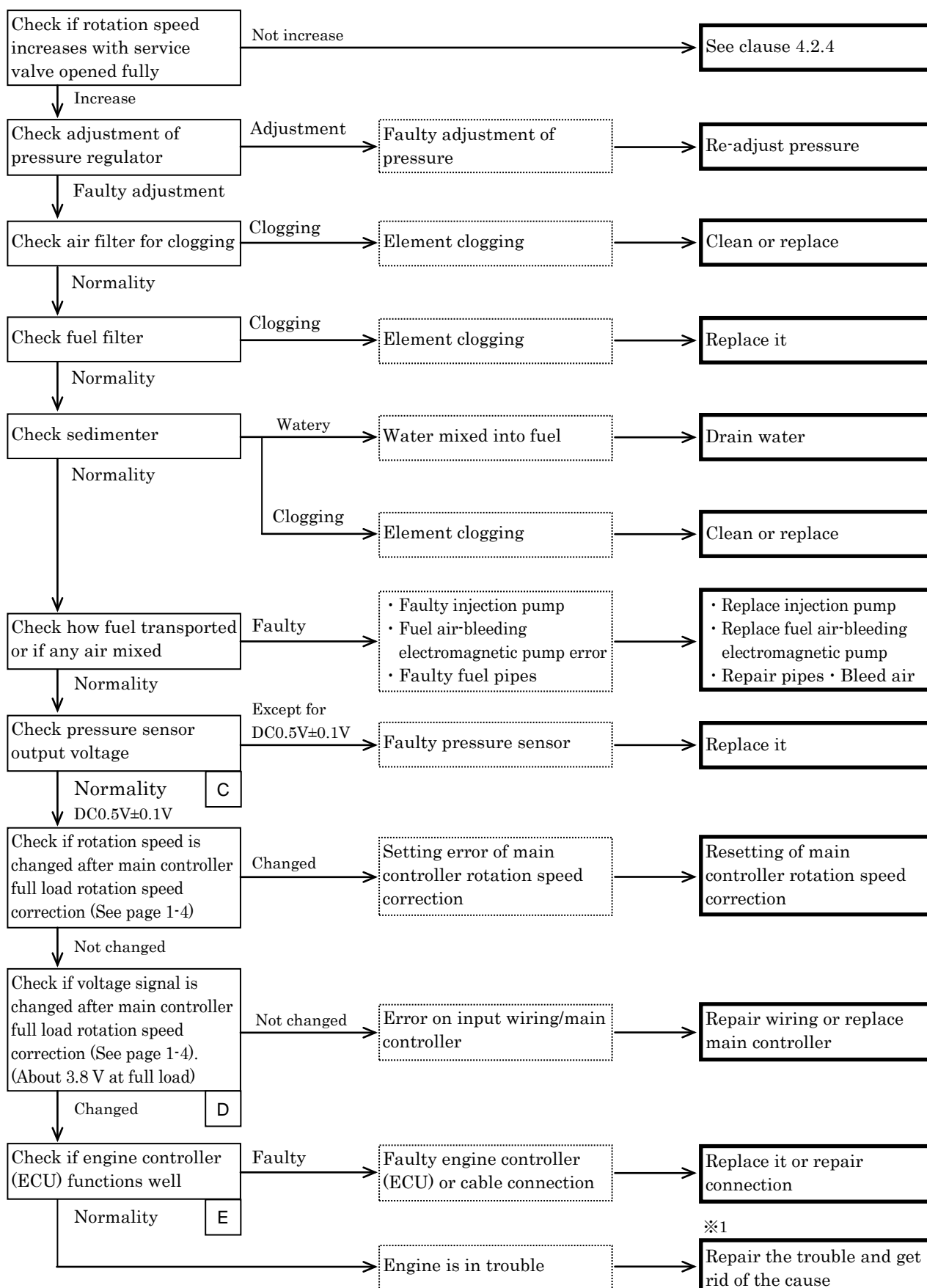


4.2.4 Engine revolutions will drop before rises up to rated pressure



4. Troubleshooting

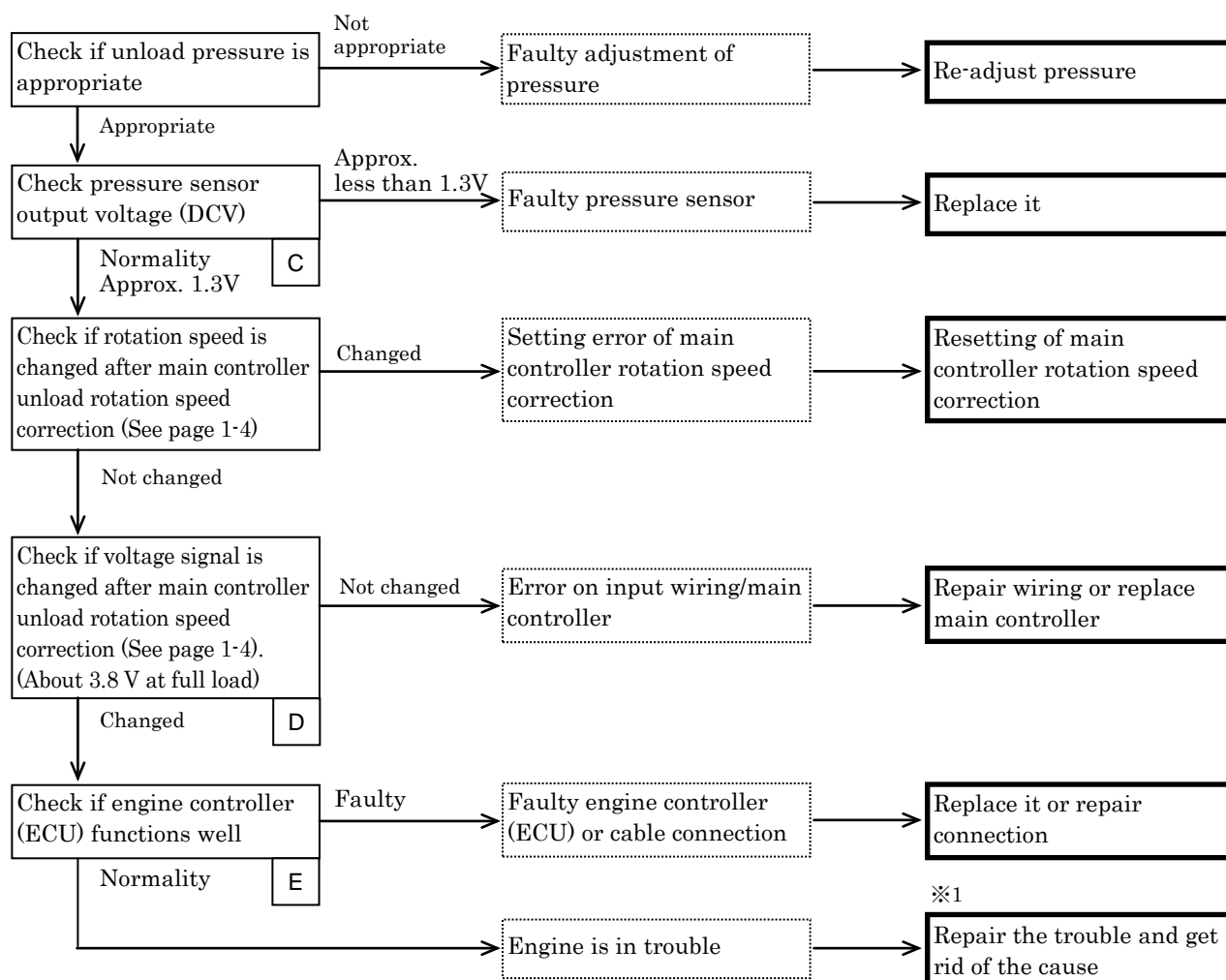
4.2.5 Engine will not turn to meet rated revolutions



※1 For the detailed countermeasures, refer to [Workshop manual] published by engine manufacturer.

4. Troubleshooting

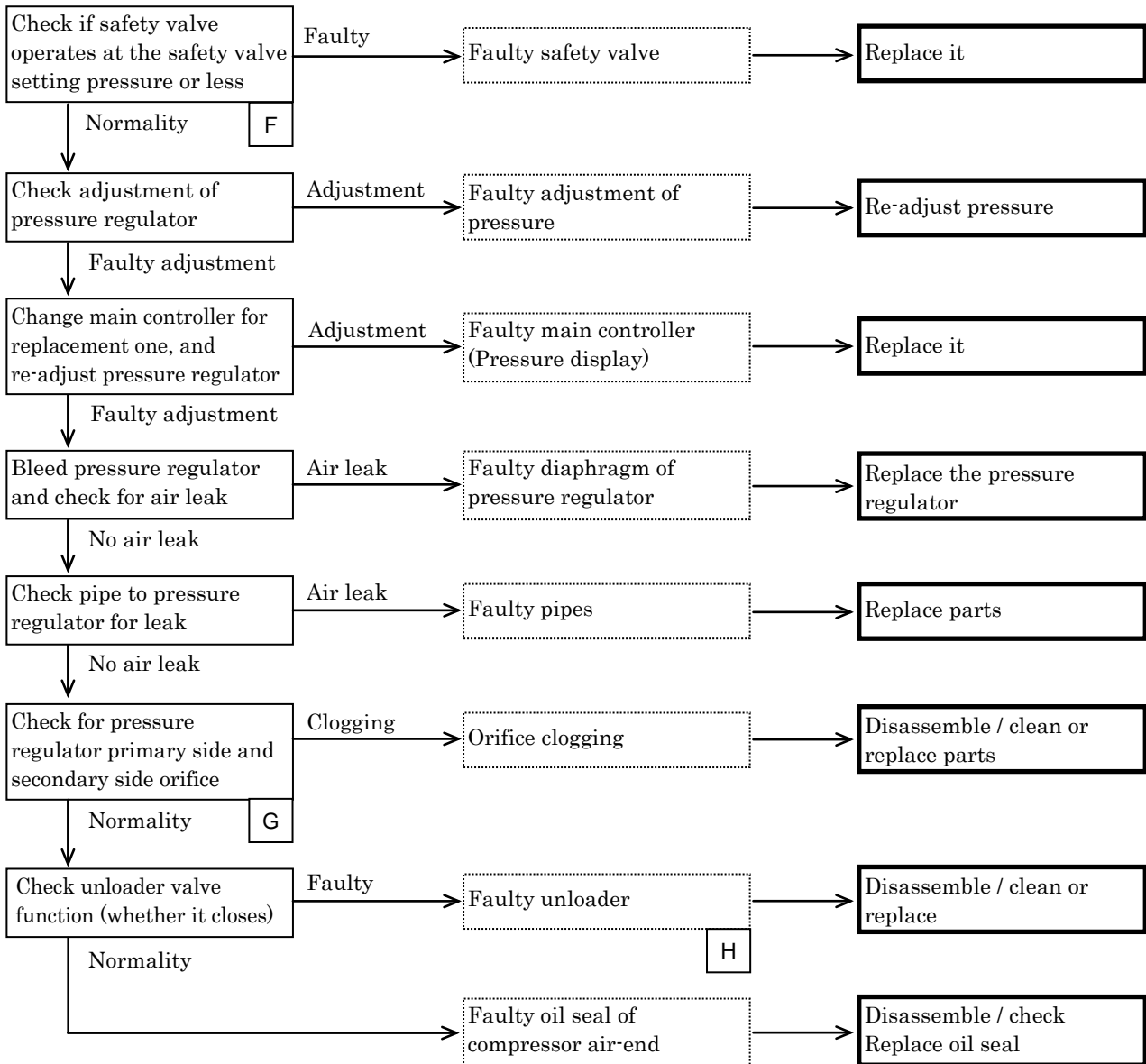
4.2.6 Minimum speed not available even upon no-load operation



※1 For the detailed countermeasures, refer to [Workshop manual] published by engine manufacturer.

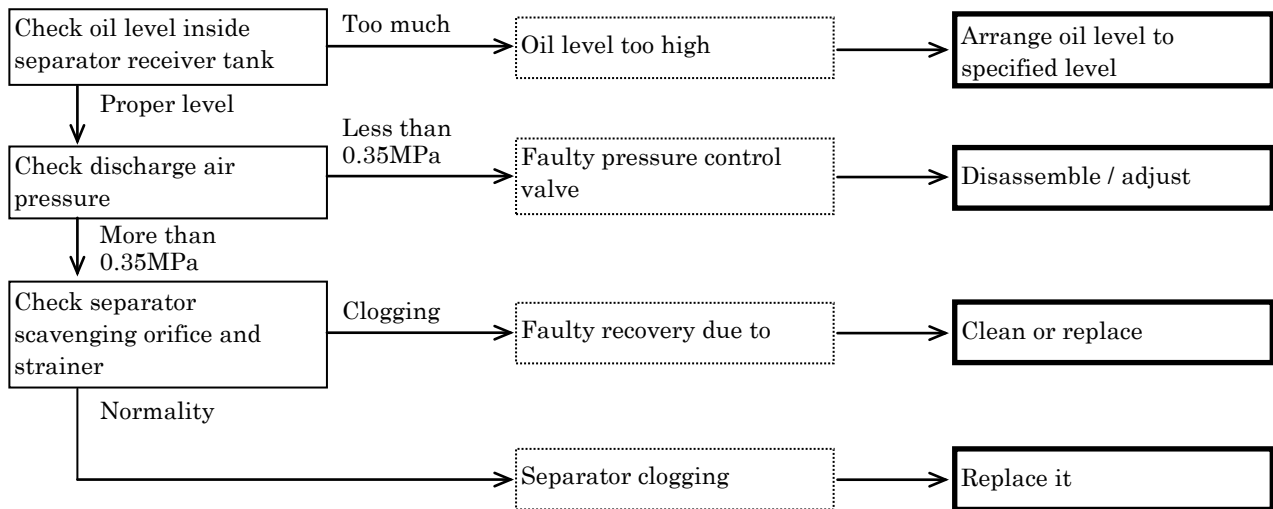
4. Troubleshooting

4.2.7 Safety valve bursts out during unloaded operation

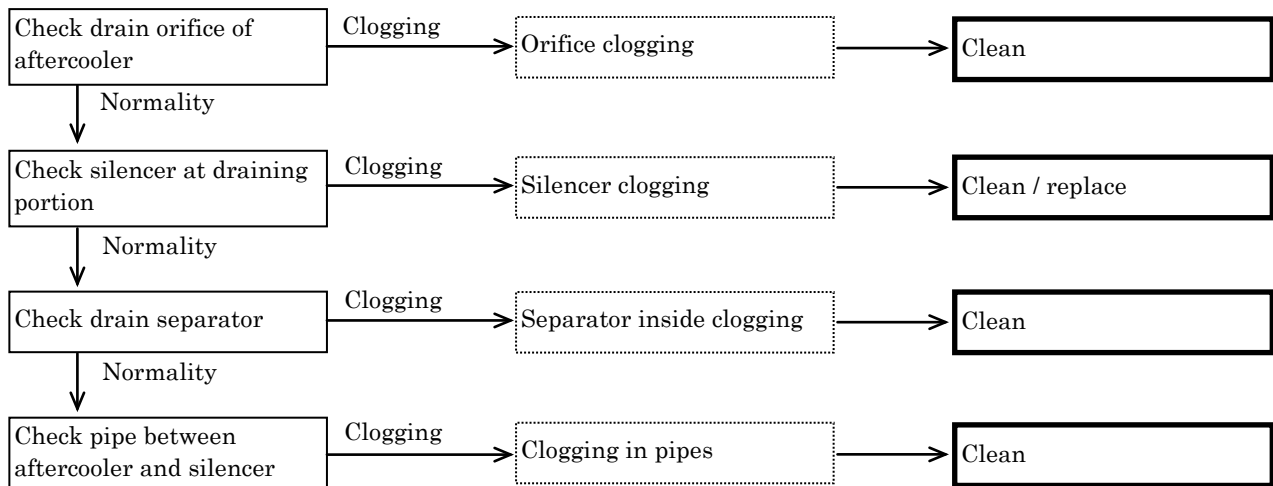


4. Troubleshooting

4.2.8 Oil mixed found in delivery air

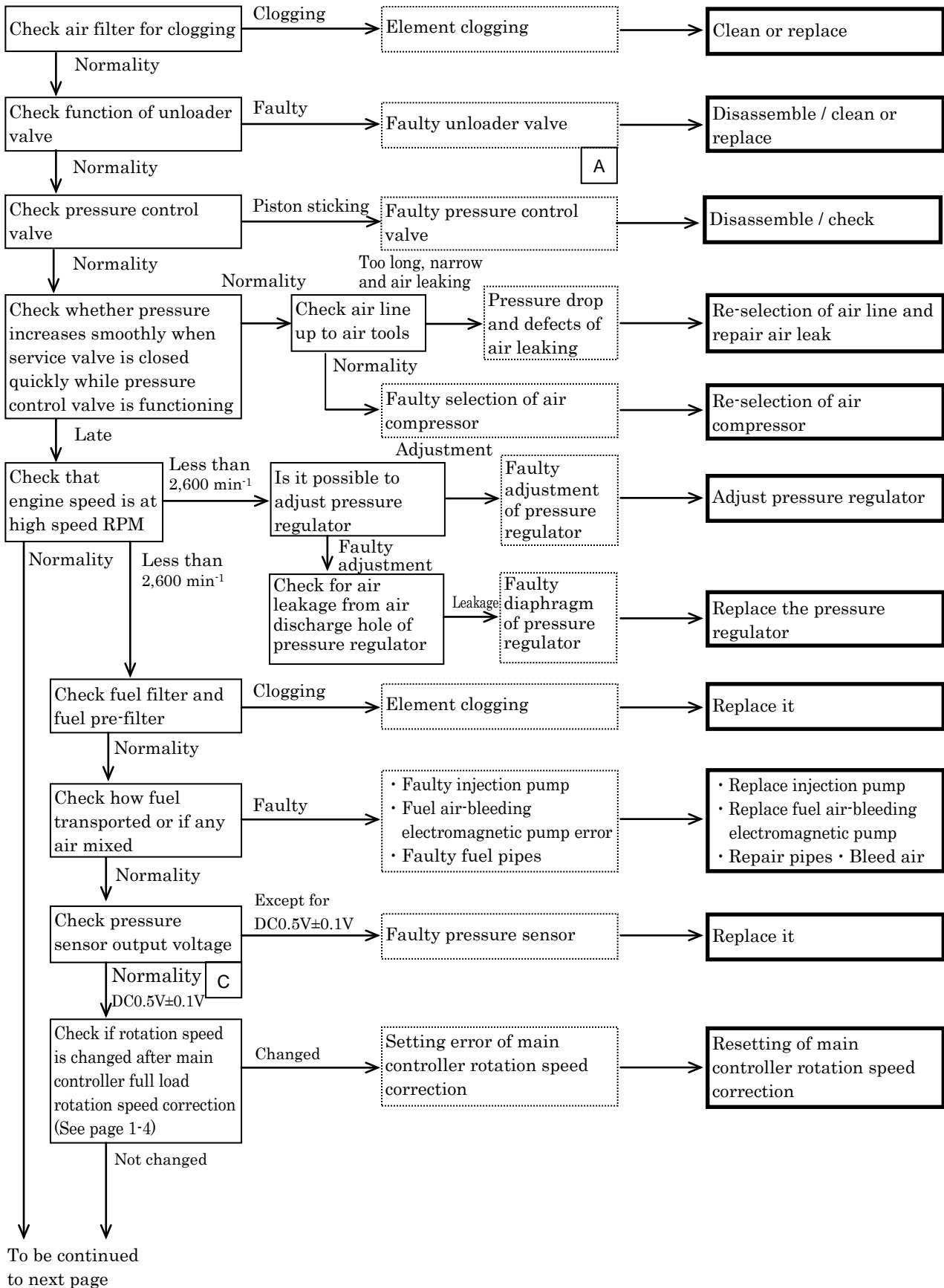


4.2.9 Water found mixed in discharge air (Aftercooler type)



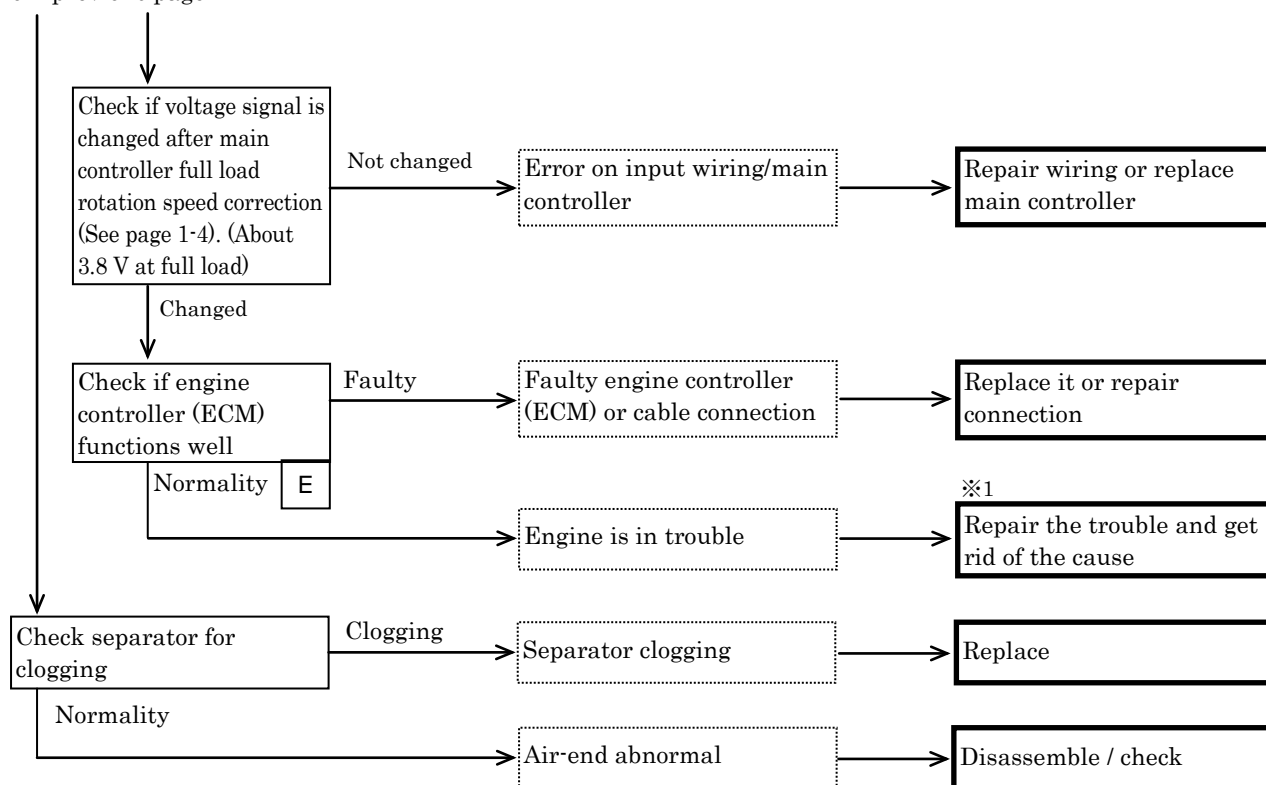
4. Troubleshooting

4.2.10 Discharge air is insufficient



4. Troubleshooting

From previous page

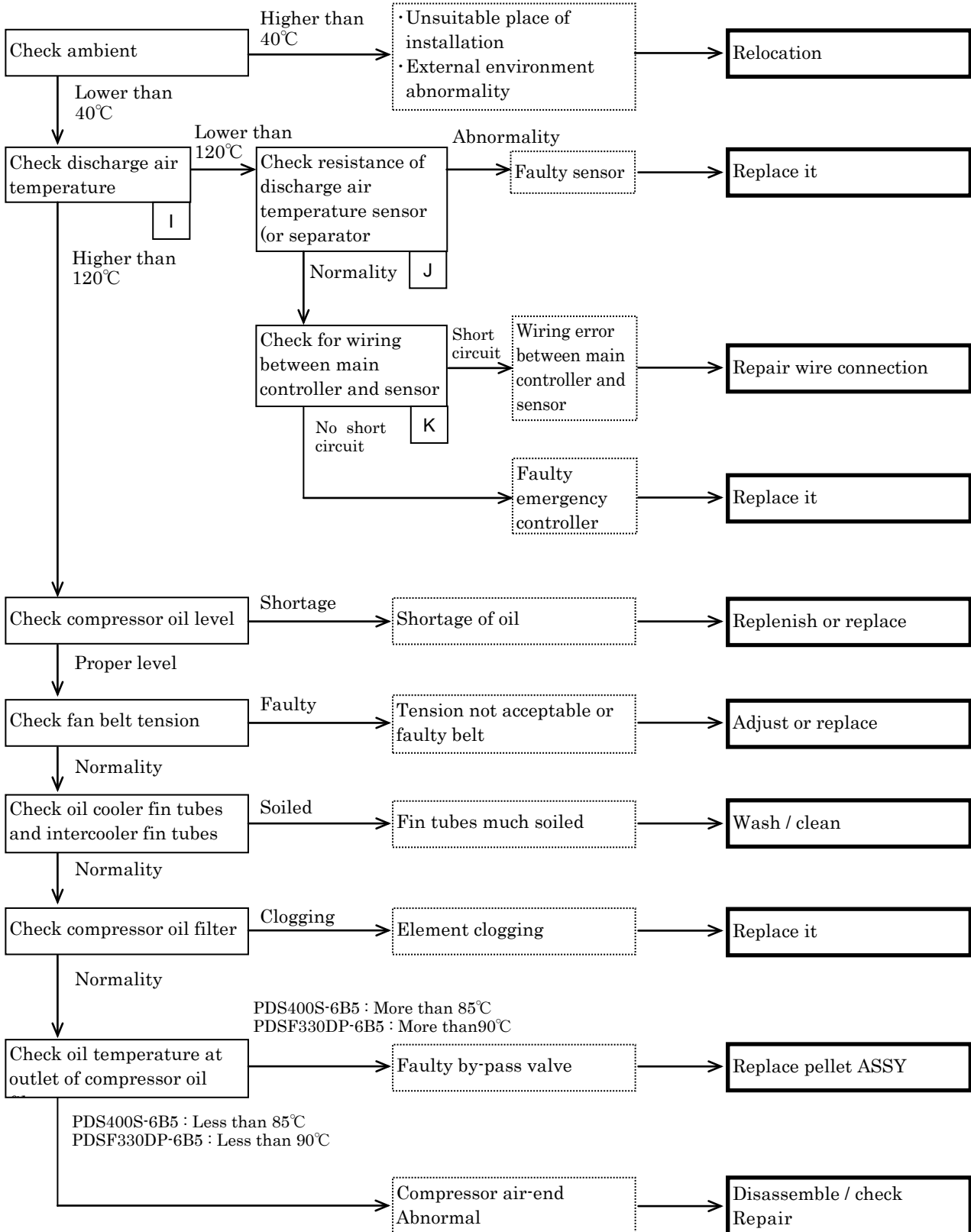


※1 For the detailed countermeasures, refer to [Workshop manual] published by engine manufacturer.

4. Troubleshooting

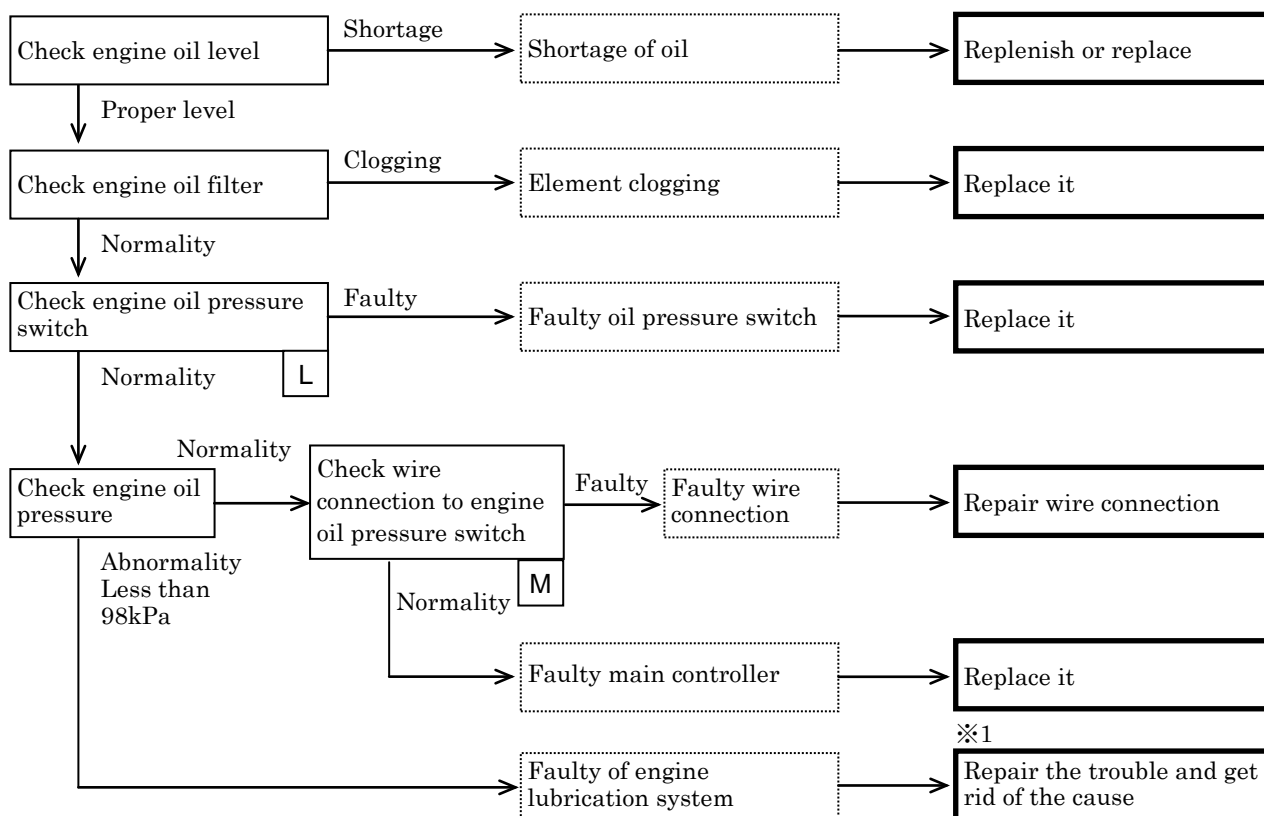
4.3 Operation of Emergency Switch

4.3.1 It displays Discharge air temperature rise error code [E-1] (or Separator discharge air temperature rise error code [E-4]) and it stops engine



4. Troubleshooting

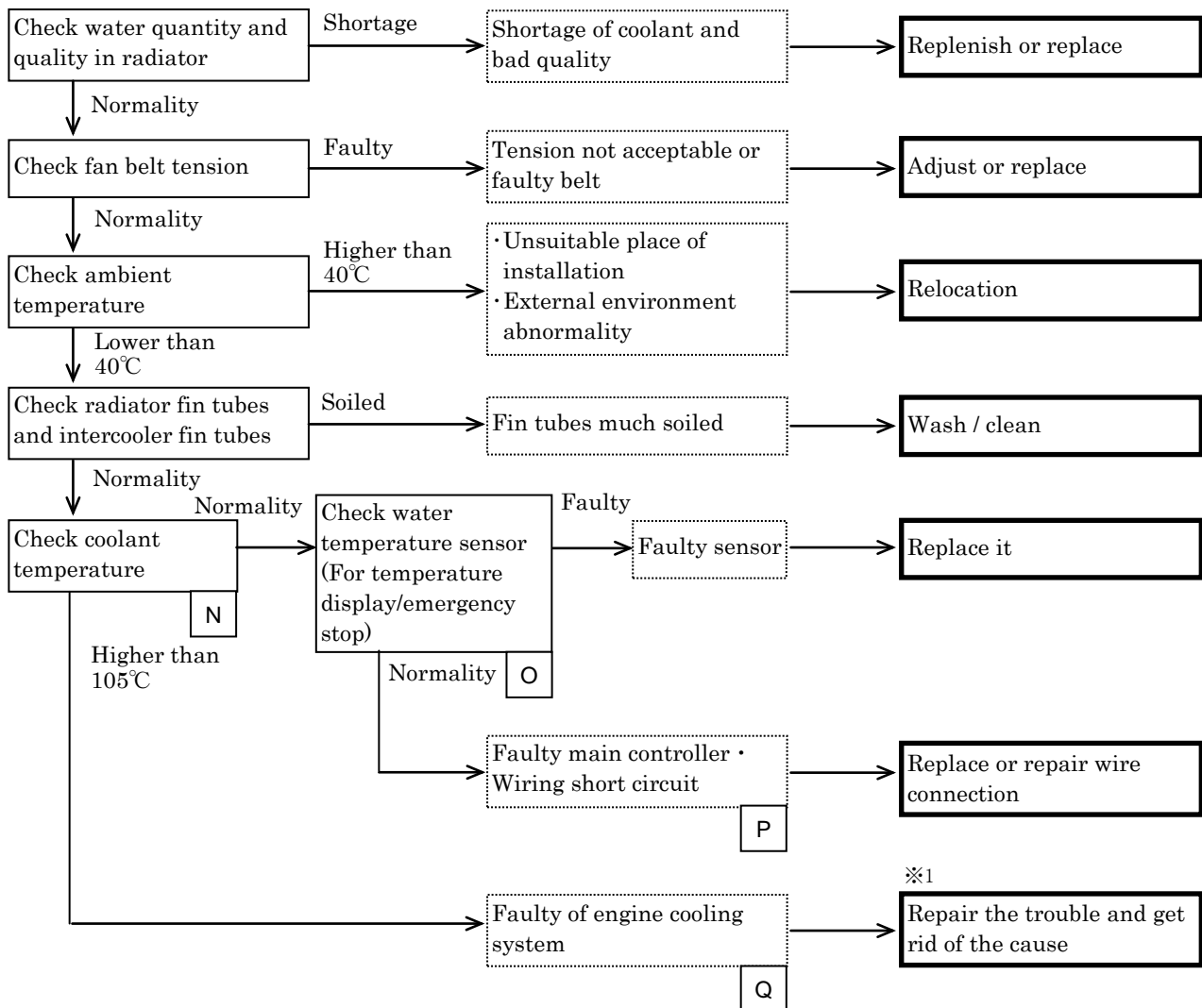
4.3.2 It displays Engine oil pressure error code [E-3] and it stops engine



※1 For the detailed countermeasures, refer to [Workshop manual] published by engine manufacturer.

4. Troubleshooting

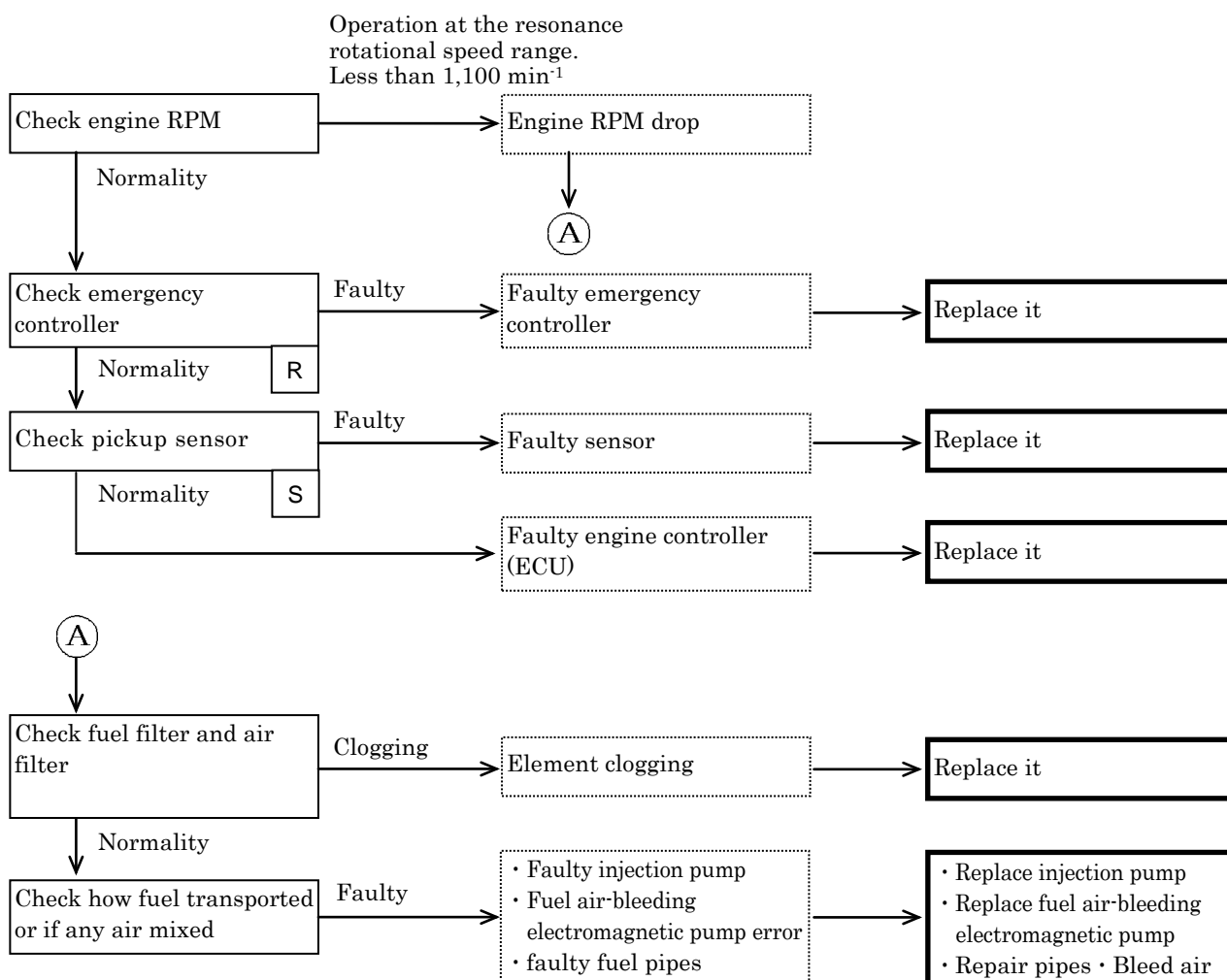
4.3.3 It displays Engine water temperature rise error code “E-2” and it stops engine



※1 For the detailed countermeasures, refer to [Workshop manual] published by engine manufacturer.

4. Troubleshooting

4.3.4 It displays Engine speed down error code “E-5” and it stops engine

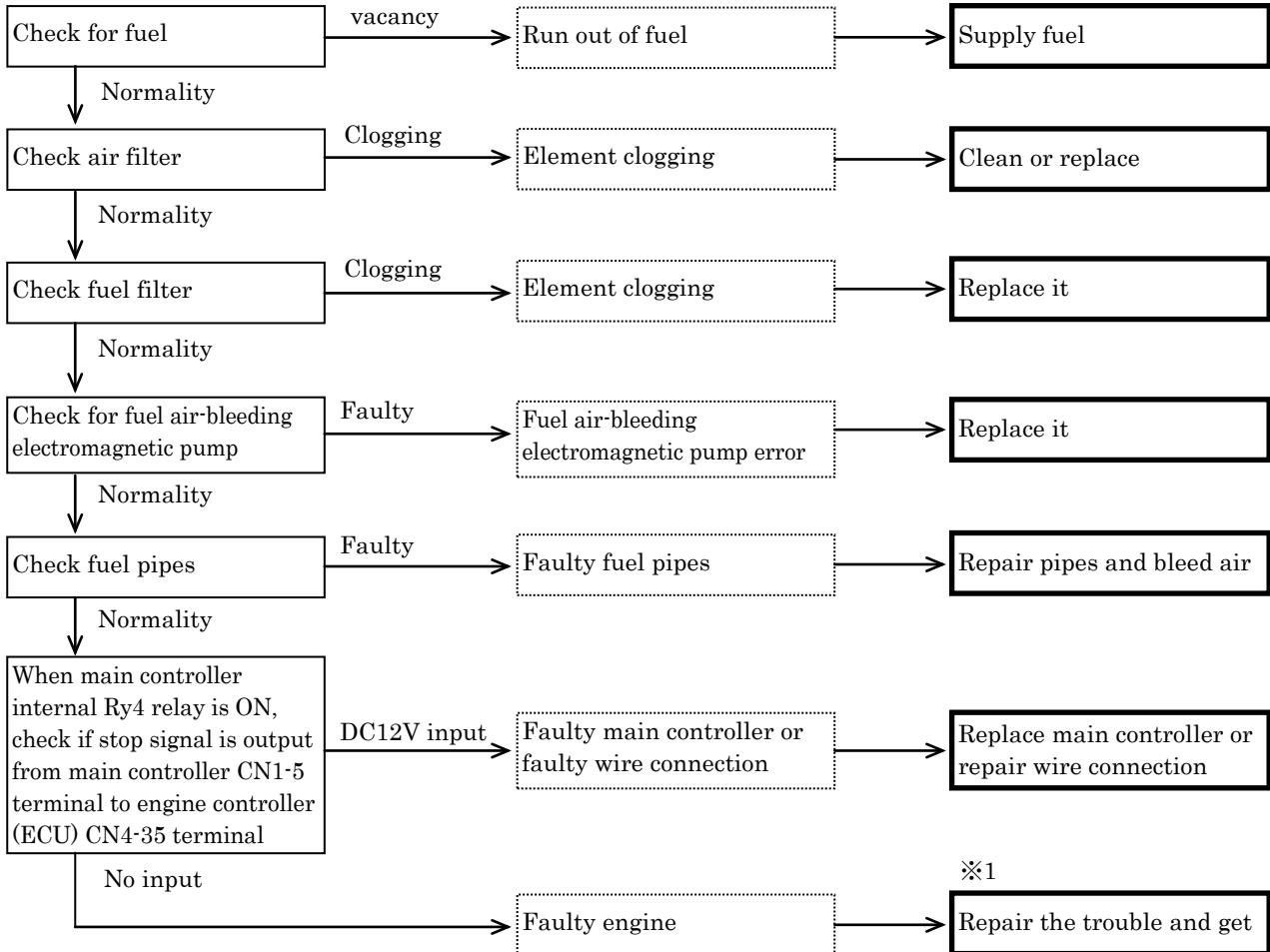


4. Troubleshooting

4.4 Others

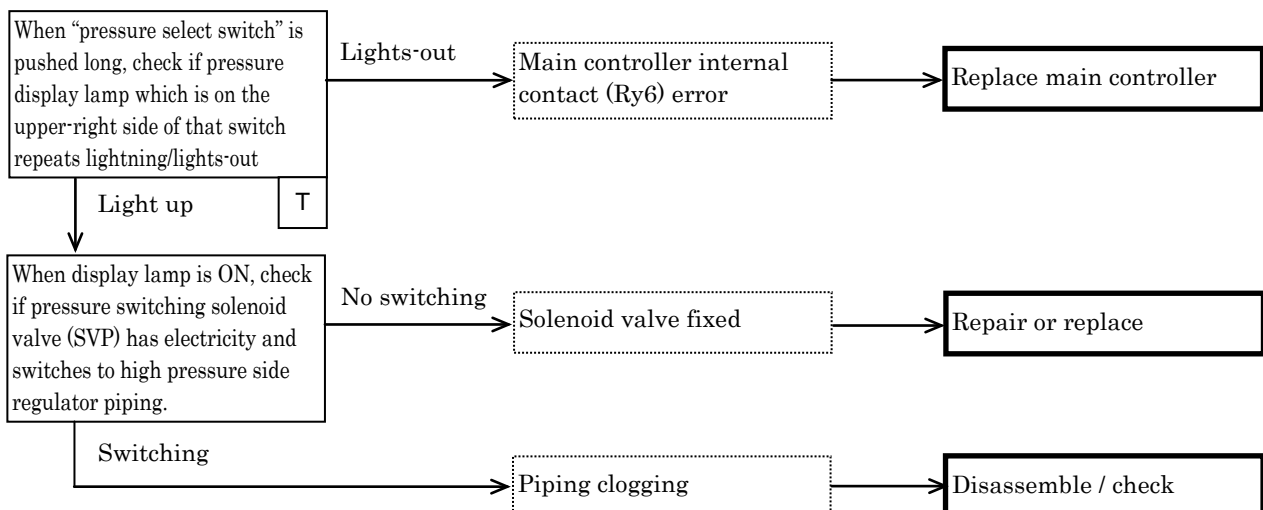
4.4.1 Error code is not shown, engine will stop

(Starter switch is not set in contact, and blown fuse trouble is exempted)



※1 For the detailed countermeasures, refer to [Workshop manual] published by engine manufacturer.

4.4.2 No switching on pressure setting (Only PDSF330DP(DPC)-6B5)

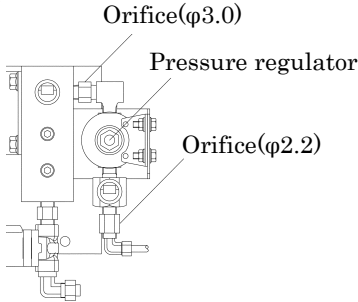


4. Troubleshooting

4.5 Explanation of Trouble Diagnosis

No.	Item	Cause	Remedy
A	Faulty unloader	Unloader valve cannot be open.	Remove unloader valve from air-end, and disassemble it for clean and replace O-ring.
B	Solenoid valve for starting unload operation	If solenoid valve for starting unload is OPEN during load operation, engine rotation regulation pressure sensor detects pressure. And engine rotation speed is decreased. 1. Solenoid valve for starting unload fixed 2. DC12V output from main controller CN1-7 terminal to relay for starting unload	Check if above 1 and 2 can be observed
C	Check pressure sensor output voltage	Engine speed is controlled by the proper speed finally outputted to electro-control fuel injection system in the following flows after pressure sensor detects second stage pressure of regulator. Therefore, when abnormality is found in rotational speed, it is necessary that pressure sensor, main controller, engine controller (ECU) and related wires should be checked and confirmed whether they are disconnected and/or short-circuited. <div style="border: 1px dashed black; padding: 5px; margin: 10px auto; width: fit-content;"> Pressure sensor ↓ Output voltage <div style="border: 1px dashed black; padding: 5px; margin: 5px auto; width: fit-content;">Main controller</div> ↓ Voltage signal <div style="border: 1px dashed black; padding: 5px; margin: 5px auto; width: fit-content;">Engine controller (ECU)</div> ↓ (Control signal) <div style="border: 1px dashed black; padding: 5px; margin: 5px auto; width: fit-content;">Electronic control fuel injection system</div> </div>	Check output voltage (DCV) referring to [3.3 Main Controller] and [3.4.5 Pressure Sensor].
D	Check main controller voltage signal		
E	Check if engine controller (ECU) functions well		
F	Check and confirm that safety valve functions at lower pressure than set pressure	Check and locate pressure maladjustment or defective safety valve. Setting pressure of safety valve : PDS400S(SC)-6B5 1.0MPa PDSF330DP(DPC)-6B5 1.35MPa	In case of malfunction of safety valve, safety valve assembly should be replaced.

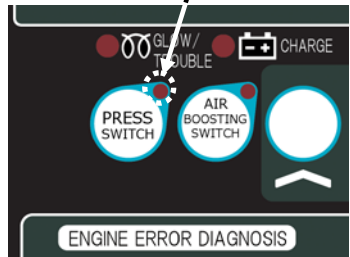
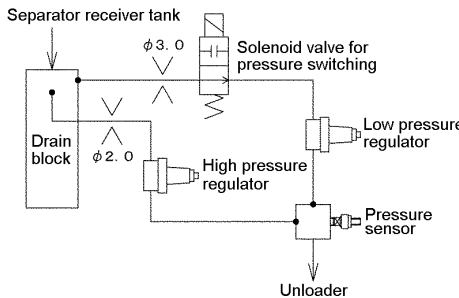
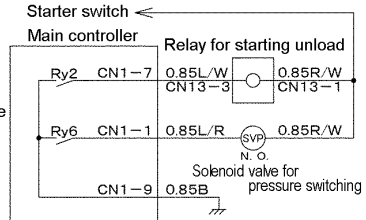
4. Troubleshooting

G	Check pressure regulator primary side and secondary side orifice	<p>If clogging is observed in orifice, it affects unloader valve open/close operation</p>  <p>Orifice(φ3.0)</p> <p>Pressure regulator</p> <p>Orifice(φ2.2)</p> <p>PC18044</p>	Clean orifice with disassembling
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4. Troubleshooting

No.	Item	Cause	Remedy
H	Faulty unloader	Faulty seat of unloader valve or faulty function of unloader piston.	Remove unloader assembly from compressor air-end, and disassemble it for inspection and replace O-ring.
I	Check discharge air temperature	Check whether actual rise of discharge air temperature stops engine or any failure of electrical circuit stops engine.	
J	Check resistance of discharge air temperature / separator air temperature sensor	For temperature and resistance characteristics of discharge air temperature and separator discharge air temperature sensor, See page 3.4.6.	Even disconnection of sensor or its short-circuit causes engine to stop.
K	Check of electric conductance between main controller CN2-9 terminal and ground (or between CN2-10 terminal and ground)	In case that no electrical conductance exists, engine will stop with controller disconnection detecting function 20 seconds after engine starts. In case of short-circuit, engine will be brought to emergency stop.	Repair disconnection and short-circuit.
L	Check engine oil pressure switch	<ul style="list-style-type: none"> • If oil pressure decreased, oil pressure switch contact is ON. And signal is transferred from engine controller (ECU) to main controller • Check the cause of emergency stop whether engine oil pressure is under setting pressure (98kPa) or not. 	Detecting timing for oil pressure decrease: After starting operation, error detecting circuit will operate after 20 seconds elapse from alternator generation signal input. Time lag: Operates after 2 seconds elapse from error detection during operation.
M	Check wiring	Check if oil pressure switch wiring has no short-circuit	Repair short-circuit
N	Check coolant temperature	Find out whether actually engine stops owing to rise of coolant temperature or owing to defect of electric circuit. Two water temperature sensors are installed for temperature display/emergency stop and for ECU control.	See clause 3.4.6 for temperature display/emergency stop sensor. See clause 3.5.5 for ECU control sensor.
O	Check coolant temperature sensor (for temperature display/emergency stop)	Detect resistance (thermistor) when water temperature changes.	<ul style="list-style-type: none"> • See clause 3.4.6 • Even disconnection of sensor or its short-circuit causes engine to stop.
P	Check and confirm that DC voltage exists between emergency controller CN1-5 terminal and ground	In the case there is electricity (DC12V) between main controller CN1-5 terminal and earth terminal although water temperature is under emergency stop temperature (105°C), main controller might have malfunction.	Replace main controller.
Q	Faulty of engine cooling system	When any trouble is not found in thermostat, coolant pump can be in disorder.	For the temperature at which thermostat valve opens, refer to 5.2.

4. Troubleshooting

No.	Item	Cause	Remedy
R	Check main controller	When engine operates with rubber coupling resonance dangerous rotation speed, the rotation speed is input by voltage signal from pick up sensor to main controller CN2-8 terminal. Then main controller internal contact (Ry4) is CLOSE and the engine makes emergency stop. In the case there is electricity (DC12V) between main controller CN1-5 terminal and earth terminal although engine is in normal operation and there are error code 「E-5」 and emergency stop, main controller might have malfunction.	Rubber coupling resonance dangerous rotation speed: In the case total 30 seconds operation with engine rotation speed is 400 – 1,100min ⁻¹ and 5 seconds operation with engine rotation speed is 1,100min ⁻¹ or less, makes emergency stop for rubber coupling protection. Replace main controller.
S	Check pick up sensor	Engine rotation speed is calculated by the sensor installed at the near side of gear case crankshaft gear tooth which detects flywheel ring gear pulse (110 pulse/1 rev).	Pick up sensor calculates engine rotation speed.
T	When “pressure select switch” is pushed long, check if pressure display lamp which is on the upper-right side of that switch repeats lightning/lights-out	When display lamp of pressure select switch on operation panel is lighting, main controller internal contact (Ry6) is ON. And pressure select solenoid valve (SVP) is CLOSE with electricity, then switches to high pressure side (1.03MPa). In the case pressure select solenoid valve (SVP) is CLOSE without electricity, solenoid valve might have malfunction (Fixing).	Display lamp of pressure select switch Switches as follows Lightning : High pressure 1.03MPa Lights-out: Low pressure 0.7MPa Pressure display lamp  PC18059
		Piping diagram  Wiring diagram  PC18060E	

5. References

5.1 Set Value

Item	unit	Set value	
		PDS400S(SC)-6B5	PDSF330DP(DPC)-6B5
●Set pressure			
Pressure control valve	MPa	0.40 $\begin{smallmatrix} +0.10 \\ -0.05 \end{smallmatrix}$	0.40 $\begin{smallmatrix} +0.10 \\ -0.05 \end{smallmatrix}$
Set pressure of safety valve	MPa	1.0	1.35
Unload starting pressure	MPa	0.7	1.03/0.7
●Engine RPM			
Rated RPM	min ⁻¹	2,600	2,400/2,700
RPM at no load	min ⁻¹	1,300	1,400
●Indications of gauges or instruments during operation			
Discharge pressure gauge (at full load)	MPa	0.4 - 0.7	0.4 - 1.03 / 0.4 - 0.7
Discharge pressure gauge (at no load)	MPa	0.7 - 0.9	1.03 - 1.20 / 0.7 - 0.9
Discharge air temperature	°C	50 - 120	50 - 120
Engine water temperature	°C	40 - 105	40 - 105

5.2 Values of Various Adjustments of Engine

Item		unit	PDS400S(SC)-6B5,PDSF330DP(DPC)-6B5	
Engine model			KUBOTA V3800DI-TIE2B-COHE1	
Tightening torque of head bolts		N・m	98.1 - 107.9	
Valve clearance	Air intake	mm	0.23 - 0.27 (in cold season)	
	Discharge	mm	0.23 - 0.27 (in cold season)	
Firing order			1-3-4-2	
Injection timing (BTDC)		°	Electronic control unit	
Nozzle injection pressure			-	
Compression	Standard	MPa	3.27 - 3.47 (Rotation speed 200 - 300 min ⁻¹)	
	Working limit	MPa	Limited value	2.56
			Each cylinder limit value	Within 10%
Thermostat	Temperature for start of release	°C	74.5 - 78.5	
	Full open temperature	°C	90	
	Valve lift	mm	8	

※ For the detailed countermeasures, refer to [Workshop manual] published by engine manufacturer.

5. References

5.3 Consumable Parts and Electrical Appliances

Item	Parts No.	
	PDS400S(SC)-6B5	PDSF330DP(DPC)-6B5
●Element / Filter / Belt		
Air filter ASS'Y (For compressor)	32100 39700	←
Air filter element (outer element)	32143 12500	←
Air filter element (inner element)	32143 12400	←
Air filter ASS'Y (For engine)	32100 41001	←
Air filter element (outer element)	32143 12700	←
Air filter element (inner element)	32143 12600	←
Oil separator	34220 16501	←
Gasket for oil separator	34235 06000 34235 06100	← ←
Compressor oil filter ASS'Y	37400 13700	←
Oil filter cartridge	37438 05601	←
Drain separator ASS'Y (Aftercooler type)	34200 03201	←
O-ring (Aftercooler type)	38911 01300	←
Oil filter cartridge	KUBOTA:1C020-32434	←
Fuel filter	43540 08400 (KUBOTA:1G518-43011)	←
Sedimenter	43550 03400 (KUBOTA:RD451-51361)	←
Element	KUBOTA:RD451-51930	←
O-ring	KUBOTA:04817-00160	←
Breather filter element(With O-ring)	KUBOTA:1J419-0581-0	←
O-ring of filler cap	03402 25040	←
Belt	KUBOTA:1K922-97011	←
●Air control		
Pressure regulator (For high pressure)	—	36400 24100
Pressure regulator (For low pressure)	36400 24100	←
Auto-relief valve / Vacuum relief valve	(built-in unloader)	←
O-ring	21221 02100×2	←
O-ring	03402 25021×2	←
O-ring	03402 25008×2	←
Pressure control valve ASS'Y	35300 18200	←
O-ring	03402 15080	←
O-ring	21441 03700	←
Ring	22505 03300	←
Spring	35304 03000	←
Piston	35303 10500	←
O-ring	03402 25100	←

5. References

Item	Parts No.	
	PDS400S(SC)-6B5	PDSF330DP(DPC)-6B5
Unloader ASS'Y	22100 48500	←
O-ring	21441 05300	←
O-ring	21441 05400	←
O-ring	03402 15135	←
O-ring	03402 15170	←
O-ring	03402 15150	←
●Oil line		
By-pass valve ASS'Y	37200 11502	37200 12400
Pellet	37231 02100	37231 04500
O-ring	03402 25045	←
O-ring	03402 15025	←
O-ring	03402 15045	←
●Instruments on panel		
Starter switch	44322 07200	←
Pressure air gauge	36141 15503	36141 18800
●Electrical appliances		
Main controller	46870 72301	46870 74101
Engine controller (ECU)	44390 05600 (KUBOTA:1K922-60601)	←
Heater drive relay (HR2)	44346 15300 (KUBOTA:68881-53542)	←
Starter relay (SR)	44346 15300 (KUBOTA:68881-53542)	←
Relay for starting unloader (UR)	44346 15300 (KUBOTA:68881-53542)	←
Heater relay (HR1)	44346 16200 (KUBOTA:56713-42931)	←
Fuel air-bleeding electromagnetic pump	43650 02400 (KUBOTA:R1401-51352)	←
Solenoid valve for starting unloader (SV1)	46811 30000	←
Solenoid valve for unloader spring chamber (SV2)	46811 31800	←
Solenoid valve for pressure switching (SVP)	—	46811 31700
Pressure sensor (Secondary pressure of regulator detect)	44328 20600	←
Pressure sensor(Pressure gauge)	44328 20600	44328 20700
Water temperature sensor	44364 08200	←
Discharge air temperature sensor	44364 08200	←
Separator discharge air temperature sensor	44364 08200	←

5. References

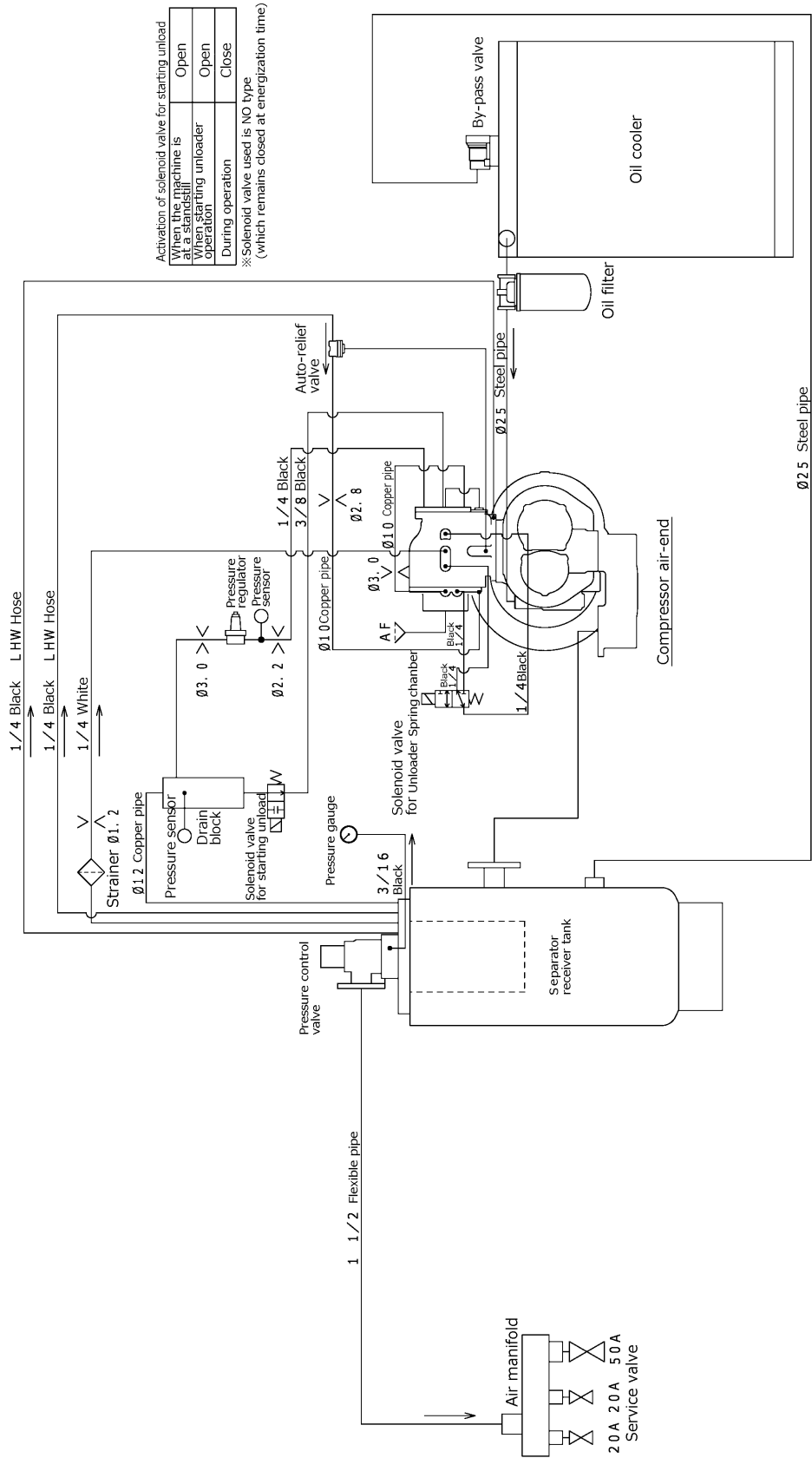
Item	Parts No.	
	PDS400S(SC)-6B5	PDSF330DP(DPC)-6B5
Oil pressure switch	KUBOTA:17189-39013	←
Engine coolant temperature sensor (ECU)	KUBOTA:5H601-41941	←
Sending unit	36159 04500	←
Air filter indicator	32148 03000×2	←
Fuse 5A	46934 05000×2	←
Fuse 10A	46934 03200×1	←
Fuse 60A	44470 02300×1	←
Fuse 80A	44470 03000×1	←

5. References

5.4 Piping Diagram

5.4.1 Air compressor piping

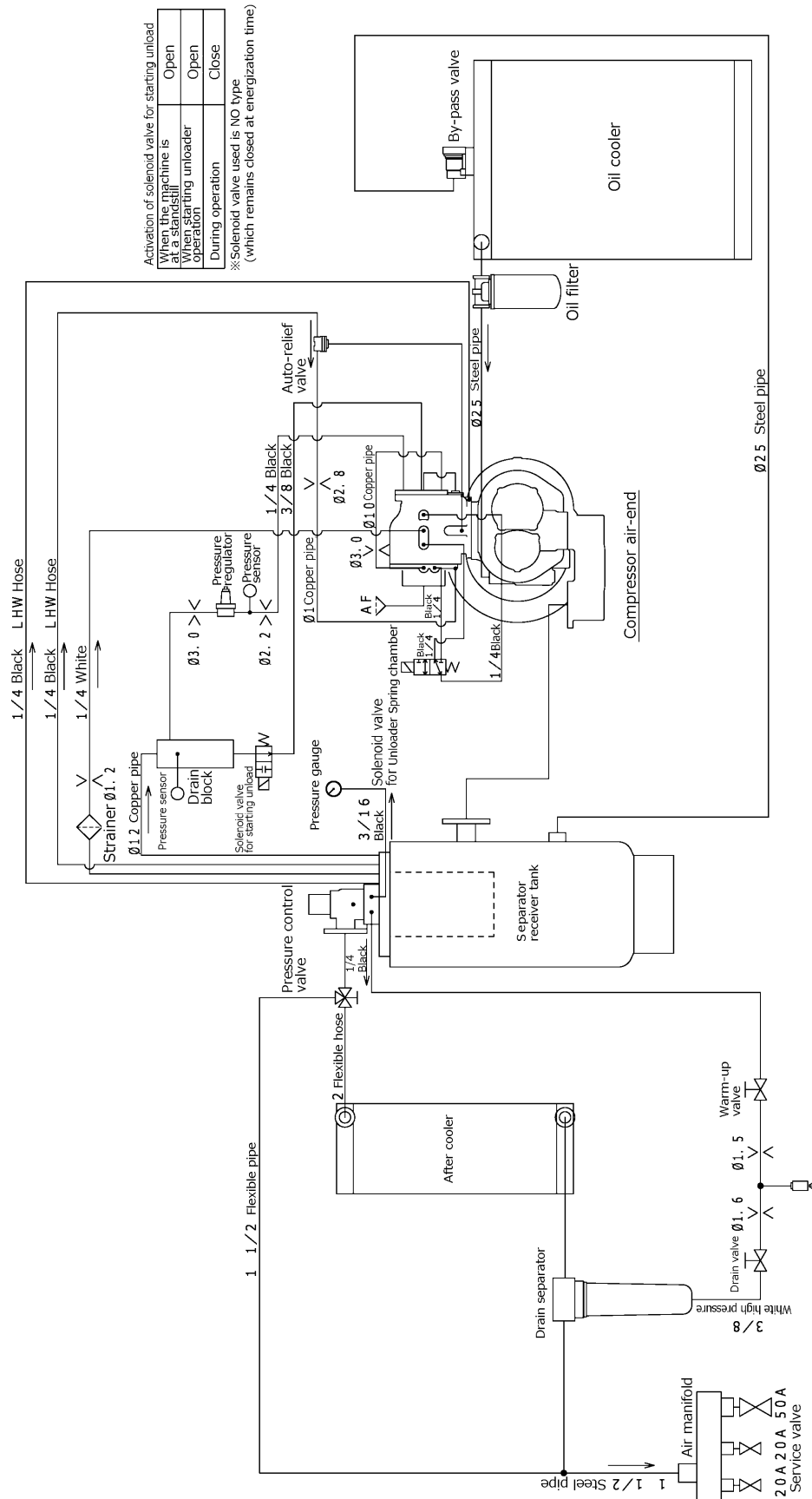
PDS400S-6B5



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5. References

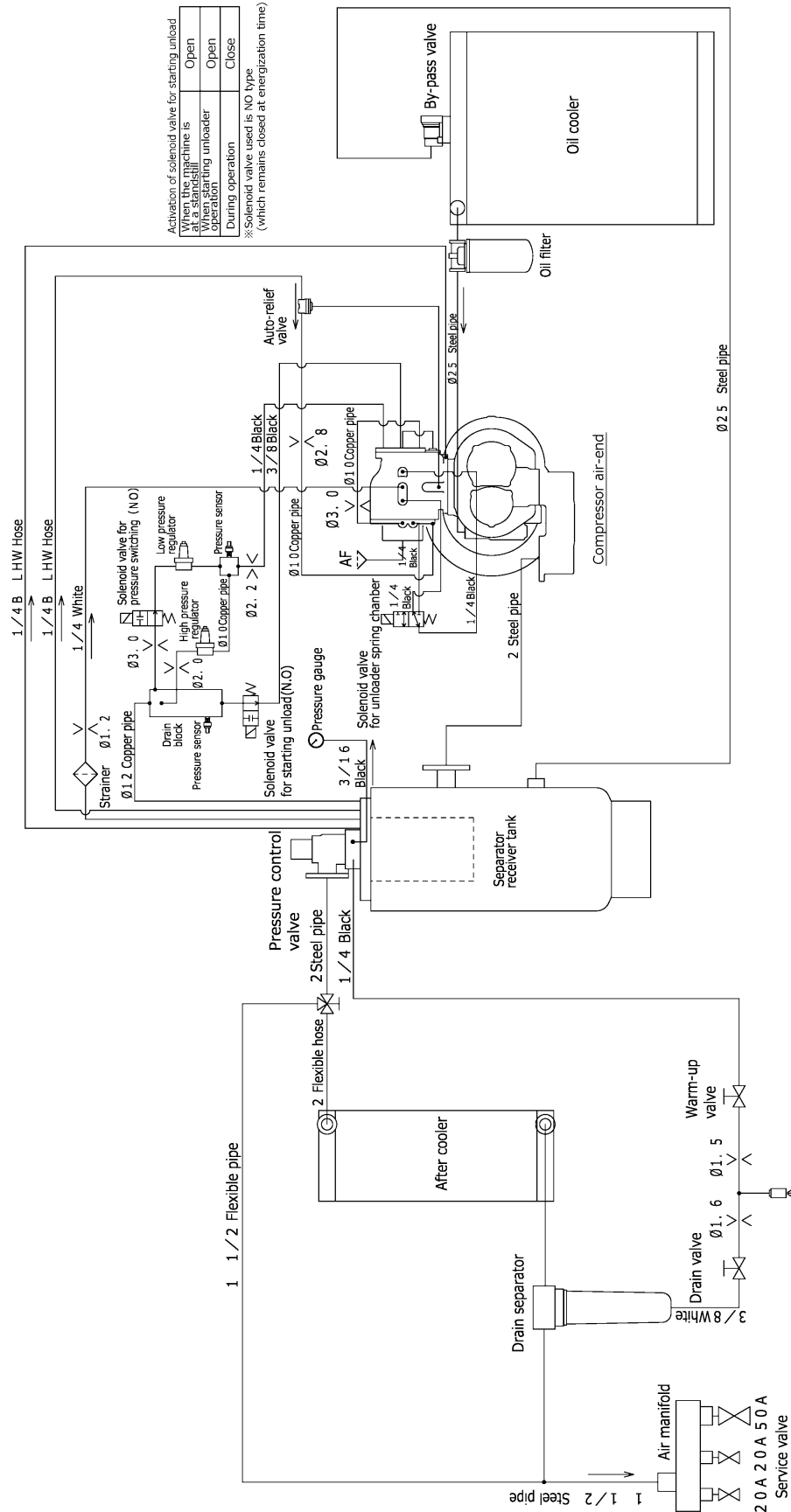
PDS400SC-6B5 (Aftercooler type)



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5. References

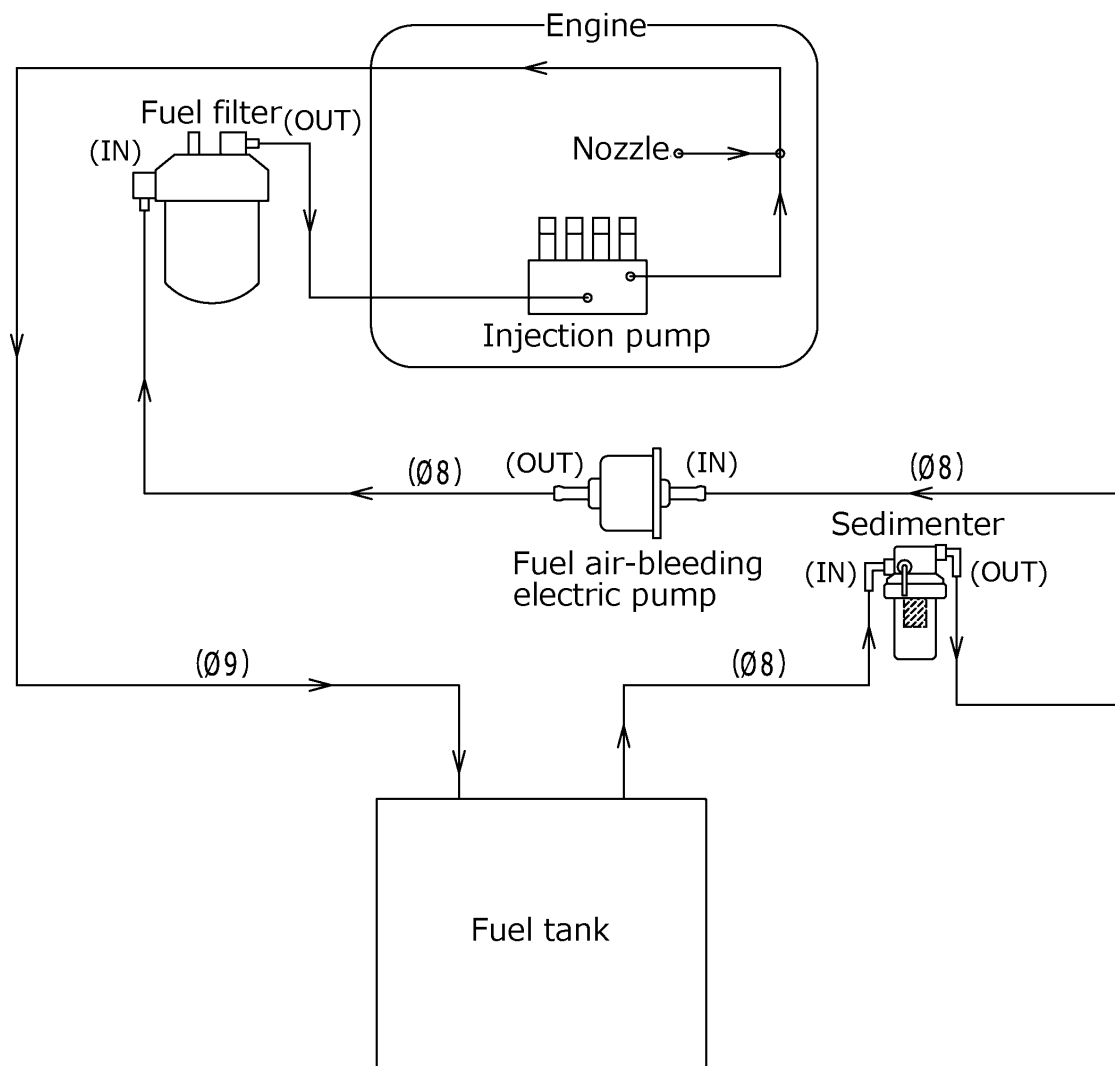
PDSF330DPC-6B5 (Aftercooler type)



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5. References

5.4.2 Fuel Piping



A170055E

This text book contains the most recent information available at the time of printing, and the contents of the list are based on information in effect at that time and are subject to change without notice.

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