

AIRMAN

PC

INSTRUCTION MANUAL

ENGINE COMPRESSOR

PDS400S-6E1

PDS400SC-6E1

PDSF375DP-6E1

PDSF375DPC-6E1

PDSG310DP-6E1

Please be sure to read this manual
before using this machine.

HOKUETSU INDUSTRIES CO., LTD.

Preface / Table of Contents

Thank you for having selected our "AIRMAN" product.

- ◆ Keep this manual at hand to refer to it always when necessary.
- ◆ When this manual is missing or damaged, order it from our office nearby or distributor.
Make sure that the manual is included with the machine when it is handed over to another user.
- ◆ The contents of this manual sometimes may be different from this machine because it has been improved. When you have anything unclear or you want to advise us, contact our office nearby or distributor.
- ◆ For details of handling, maintenance and safety of the engine, see the Engine Operation Manual.

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Safety

This section explains safety cautions for safety work for operation, inspection, maintenance, installation, movement and transportation. Read these safety requirements carefully and fully understand the contents before starting the machine.

For your better understanding of the precautions in this manual and on this machine, safety precautions are classified into "DANGER", "WARNING" and "CAUTION" message with a warning symbol  marked, according to the degree of hazards.

When one of these messages is found, please take preventative safety measures and carry out "SAFETY OPERATION AND PROPER MAINTENANCE OF THE MACHINE".

 DANGER	DANGER indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.
 WARNING	WARNING indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
 CAUTION	CAUTION indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.
IMPORTANT	IMPORTANT indicates important caution messages for the performance or durability of the machine, which has no concern to injury or accident of or to a human body.

This manual does not describe all safety items. We, therefore, advise you to pay special attention to all items (even though they may not be described in the manual) for your safety.

PROPOSITION 65 WARNING

 **WARNING**

Breathing engine exhaust exposes you to chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.

- Always start and operate the engine in a well-ventilated area.
- If in an enclosed area, vent the exhaust system.
- Do not modify or tamper with the exhaust system.
- Do not idle the engine except as necessary

For more information, go to www.P65warnings.ca.gov/diesel

Safety

- ◆ Please tell us a MODEL /SER.No. on the plate of the machine when you make an inquiry.
A plate stamped with the model and serial number is attached to side of the machine.

PORTABLE COMPRESSOR	
MODEL	<input type="text"/>
SER. NO.	<input type="text"/>
NORMAL OPERATING PRESSURE	<input type="text"/> MPa
NET DRY MASS	<input type="text"/> kg
OPERATING MASS	<input type="text"/> kg
HOKUETSU INDUSTRIES CO., LTD.	
MADE IN JAPAN 39103 10811	

A130375

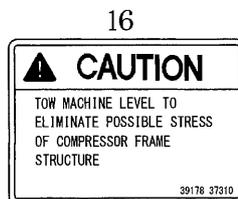
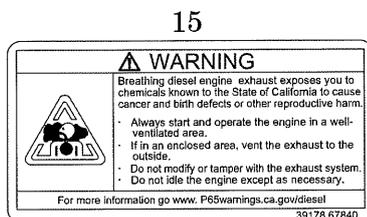
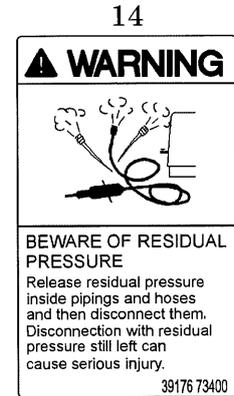
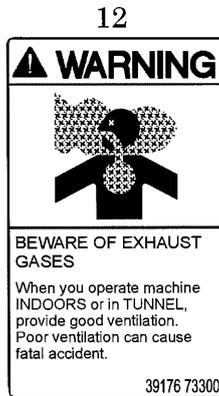
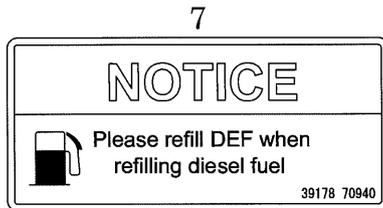
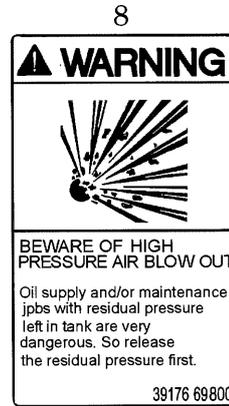
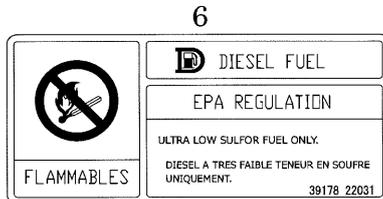
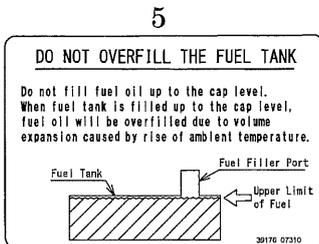
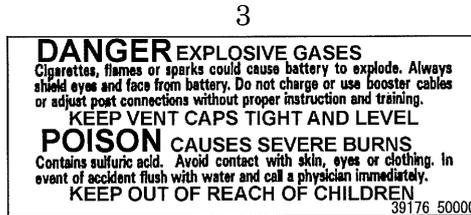
Each illustrated figure (Fig.) has a number (for instance, A130375) at the right bottom. This number is not a part number, but it is used only for our reference number.

Safety

[Safety Warning Labels]

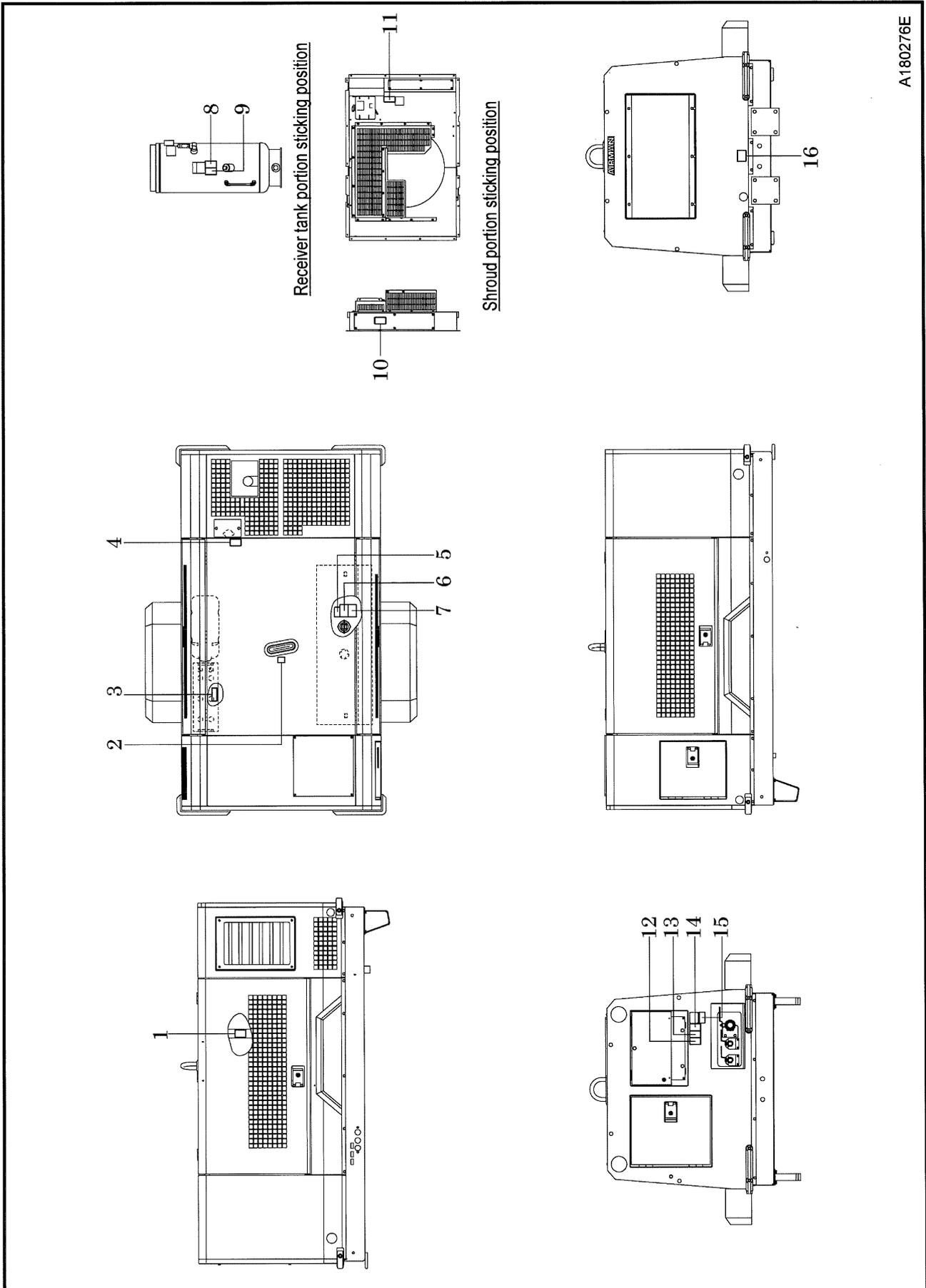
Following labels are attached to the machine.

When they are found damaged or peeled off, order them from our office nearby or distributor and attach them again.

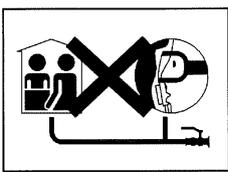
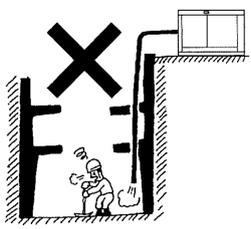
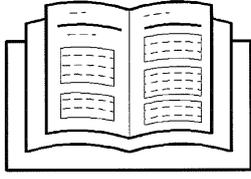
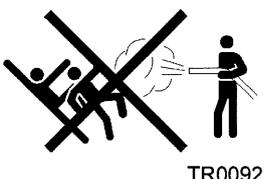
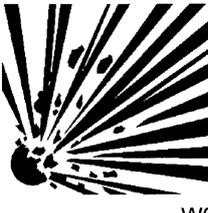


Safety

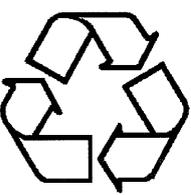
- The pasting position of safety warning labels is as follows.



Safety

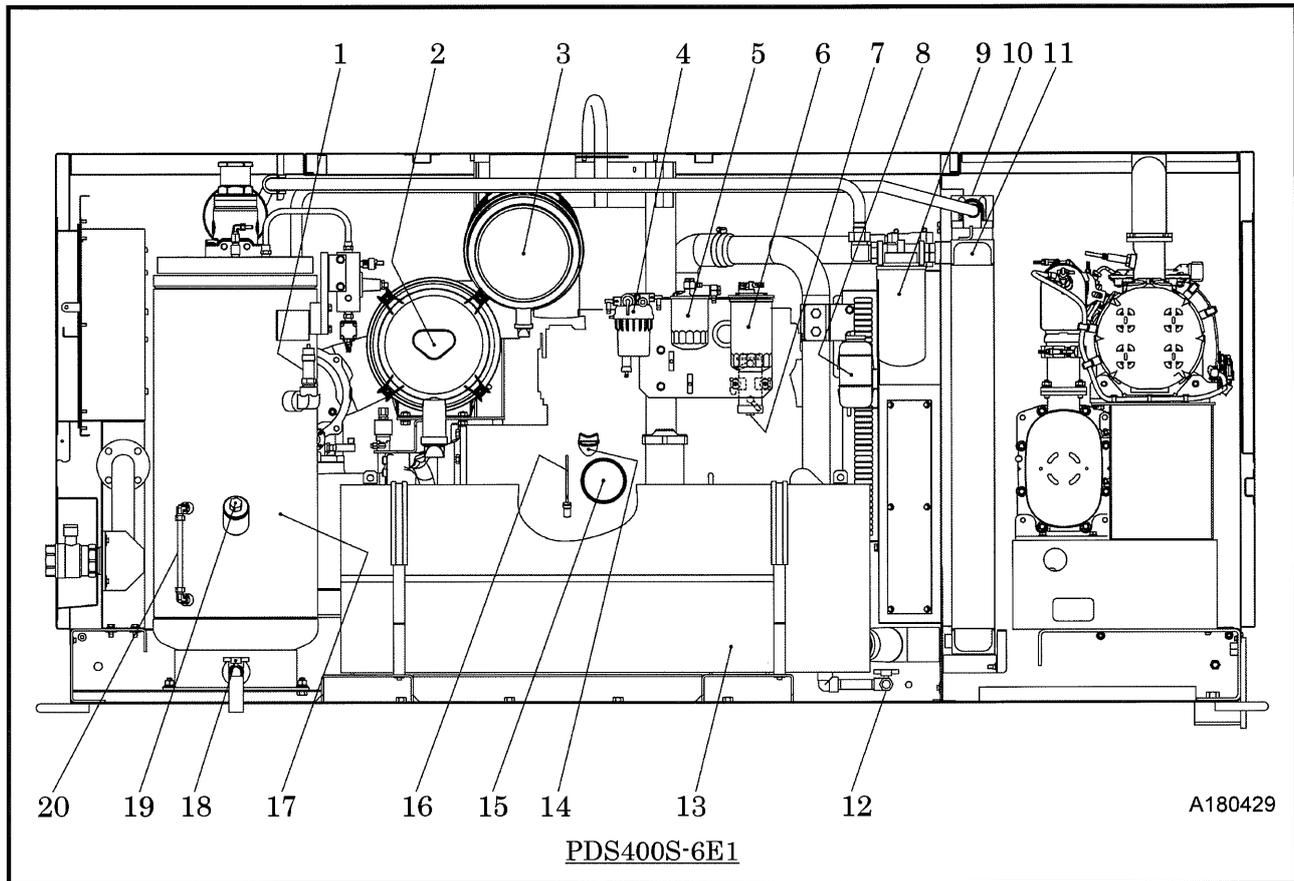
<p style="text-align: center;">DANGER</p> 	 <p style="text-align: center;">TR0201-1</p>	<ul style="list-style-type: none"> ● Compressed air from this machine contains poisonous materials. Absorption of the compressed air can cause serious injury. Never provide this compressed air for human respiration. ● This machine is not designed to be used for working chambers pressurized by compressed air such as respiratory air provided to persons working inside wells and tunnels such as pneumatic engineering method and pneumatic caisson method. Should this machine stop operation due to trouble, it can cause death and serious injury to the working persons. Refrain from using the compressed air for such pneumatic engineering method or pneumatic caisson method.
	 <p style="text-align: center;">A080001</p>	
<p style="text-align: center;">WARNING</p> 	 <p style="text-align: center;">TR0086</p>	<ul style="list-style-type: none"> ● Read each instruction plate which is displayed in the manual or on the machine carefully, understand its content and follow the indications thereof. ● Do not modify the machine without prior approval. The safety may be compromised, functions may be deteriorated, or the machine life may be shortened. ● Never use the machine for the purpose of compression of gases other than air, or as a vacuum pump. Otherwise, serious accidents may occur.
	 <p style="text-align: center;">TR0092</p>	<ul style="list-style-type: none"> ● Never blow compressed air directly at people. Scattered impurities, dust, or foreign objects in the compressed air may cause skin and eyes to be seriously injured. ● As compressed air contains toxic gas etc., compressed air should not be used to be blown or sprayed against food etc.
	 <p style="text-align: center;">TR0304</p>	<ul style="list-style-type: none"> ● Keep hands off from the rotating portion or belts while running. It could cause serious injuries if hands should be caught in.
	 <p style="text-align: center;">W011</p>	<ul style="list-style-type: none"> ● As part of pre-start safety checks, always confirm that there is no residual pressure in the tank by carefully opening the service valve, even if the pressure gauge on the screen indicates 0PSI. ● Note residual pressure in the separator receiver tank could force both extremely hot compressed air and oil to jet out and you may be scalded or seriously injured.

Safety

WARNING 	 M003	<ul style="list-style-type: none">● When cleaning dust accumulated in such devices as the air-filter, by blowing compressed air, wear safety glasses, etc. to protect your eyes.
CAUTION 	 H990432	<ul style="list-style-type: none">● Be sure to stop the engine, and let the coolant water sufficiently cool down before draining it.● If the drain valve is opened before the coolant water is cooled enough, hot water could jet out, and it could cause scalding.
	 W004-1	<ul style="list-style-type: none">● Be sure to perform the periodic checks of compressor oil and oil separator.● Neglecting checks could cause overheat of the oil, resulting in a fire.
	 A100285	<ul style="list-style-type: none">● Waste liquid from the machine contains harmful material. Do not discharge it onto the ground or into the river, lake or sea. Such material will contaminate the environment.● Be sure to use a container to hold the waste liquid from the machine.● Be sure to follow the designated regulations when disposing of oil, fuel, coolant (antifreeze), filter, battery or other harmful materials.
<ul style="list-style-type: none">● The engine of this machine and electrical parts many electronic devices have been installed. If you perform welding work, remove the connector of the electronic control equipment. Application of excessive current to electronic controls can cause equipment malfunction.		

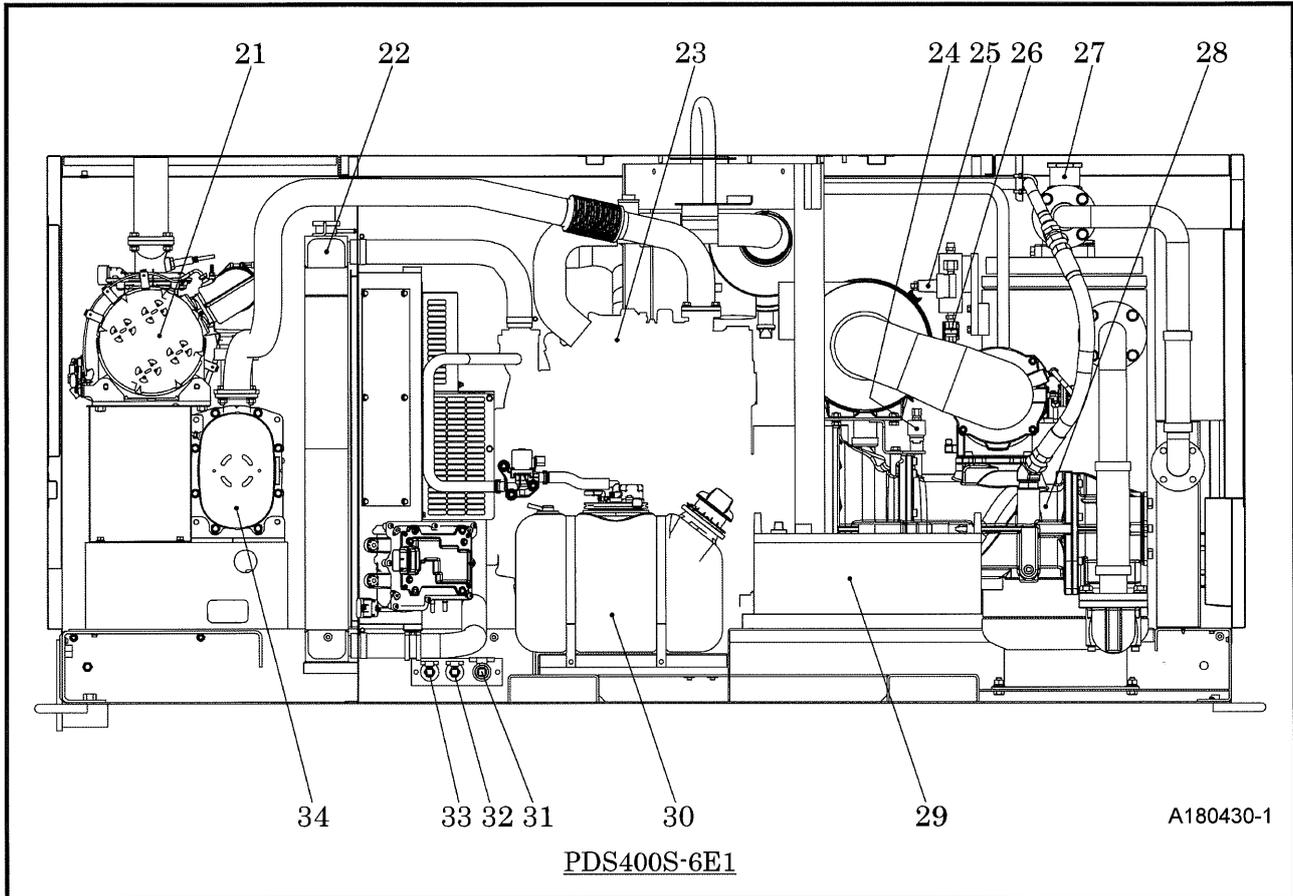
1.Part Names

1.1 Internal Components and Part Names



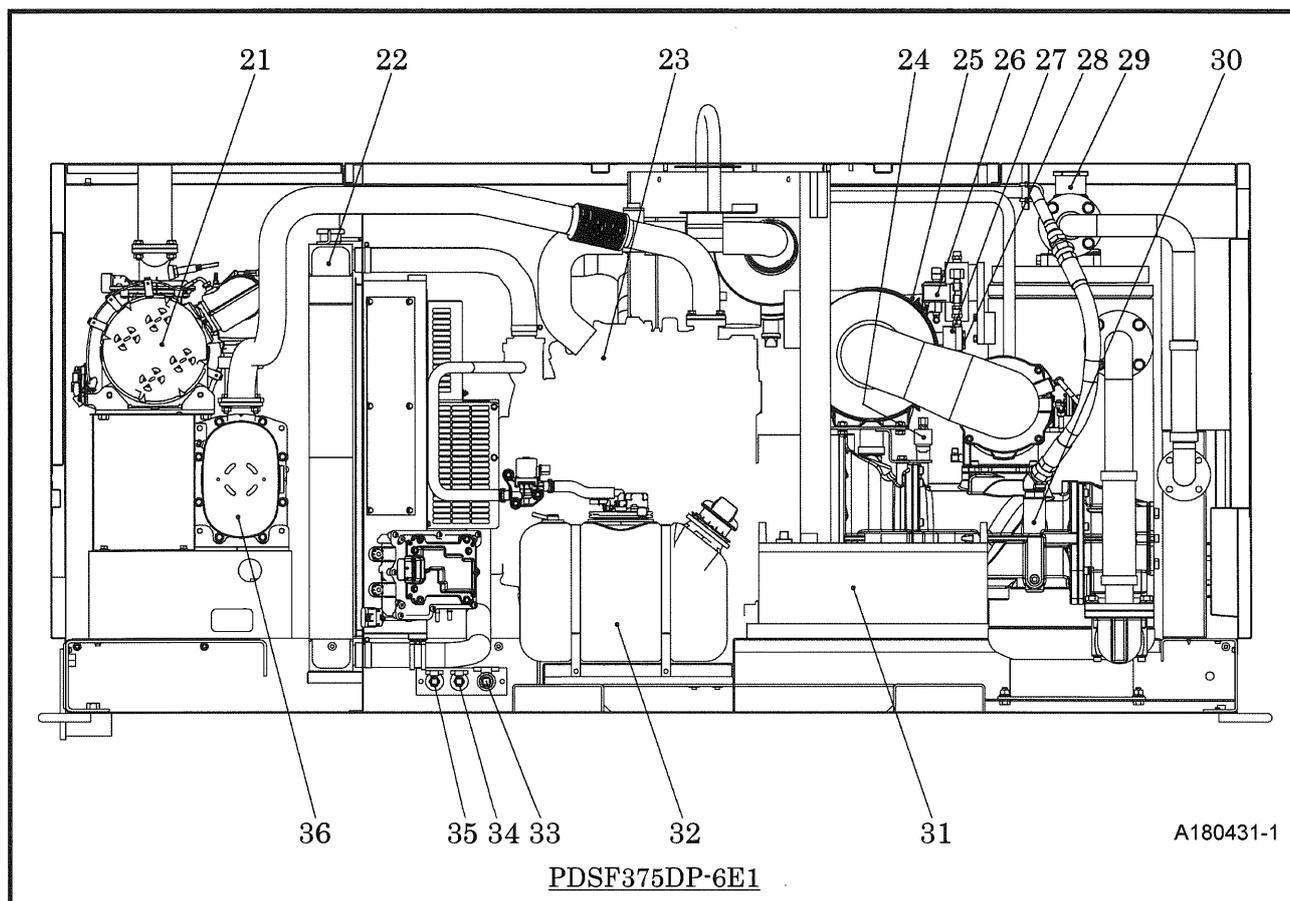
No.	Description	Function
1	Safety valve	For releasing compressed air to the atmosphere when the pressure rises higher than the rated pressure in the system.
2	Air filter (For compressor air-end)	Filtering device for filtering dust floating in intake air.
3	Air filter (For engine)	Filtering device for filtering dust floating in intake air.
4	Sedimenter	For separating coolant from fuel in the system.
5	Fuel pre-filter	For removing dust and water mixed in fuel.
6	Fuel filter	For filtering foreign matter and dust mixed in fuel.
7	Fuel air-bleeding electromagnetic pump	For automatically bleeding air from fuel pipes in the system.
8	Reserve tank	For checking coolant level and supplying it.
9	Compressor oil filter	For filtering compressor oil in the system.
10	By-pass valve	For keeping compressor oil at optimum temperature in the system.
11	Oil cooler	For cooling compressor oil in the system.
12	Fuel tank drain valve	For draining condensates from fuel tank.
13	Fuel tank	For storing fuel.
14	Engine oil filler port	For supplying and replenishing engine oil to engine.
15	Engine oil filter	For filtering engine oil in the system.
16	Engine oil level gauge	For checking engine oil level.
17	Separator receiver tank	For separating air and oil from compressed air in the system.
18	Separator receiver tank drain valve	For draining condensed water from separator receiver tank.
19	Compressor oil filler port	For supplying or adding compressor oil.
20	Compressor oil level gauge	For checking compressor oil level.

1.Part Names



No.	Description	Function
21	SCR (Selective Catalytic Reduction)	Selective reduction-type catalyst that uses DEF as a reducing agent.
22	Radiator	For cooling the coolant for engine in the system.
23	Engine	For driving the compressor air-end in the system.
24	Solenoid valve for unloader spring chamber	For reducing loads during start-up.
25	Pressure regulator	For controlling full load and unload operation.
26	Solenoid valve for starting unload	For reducing load at start-up.
27	Pressure control valve	For keeping the pressure in receiver tank constantly higher than a certain level in the system.
28	Compressor air-end	For compressing air in the system.
29	Battery	For electrically starting engine.
30	DEF tank	Container for DEF
31	Engine oil drain valve	For draining engine oil.
32	Oil cooler drain valve	For draining compressor oil from oil cooler and oil line.
33	Radiator drain valve	For draining engine coolant.
34	DPF (Diesel Particulate Filter)	Apparatus for removing harmful components contained in the exhaust gas.

1.Part Names

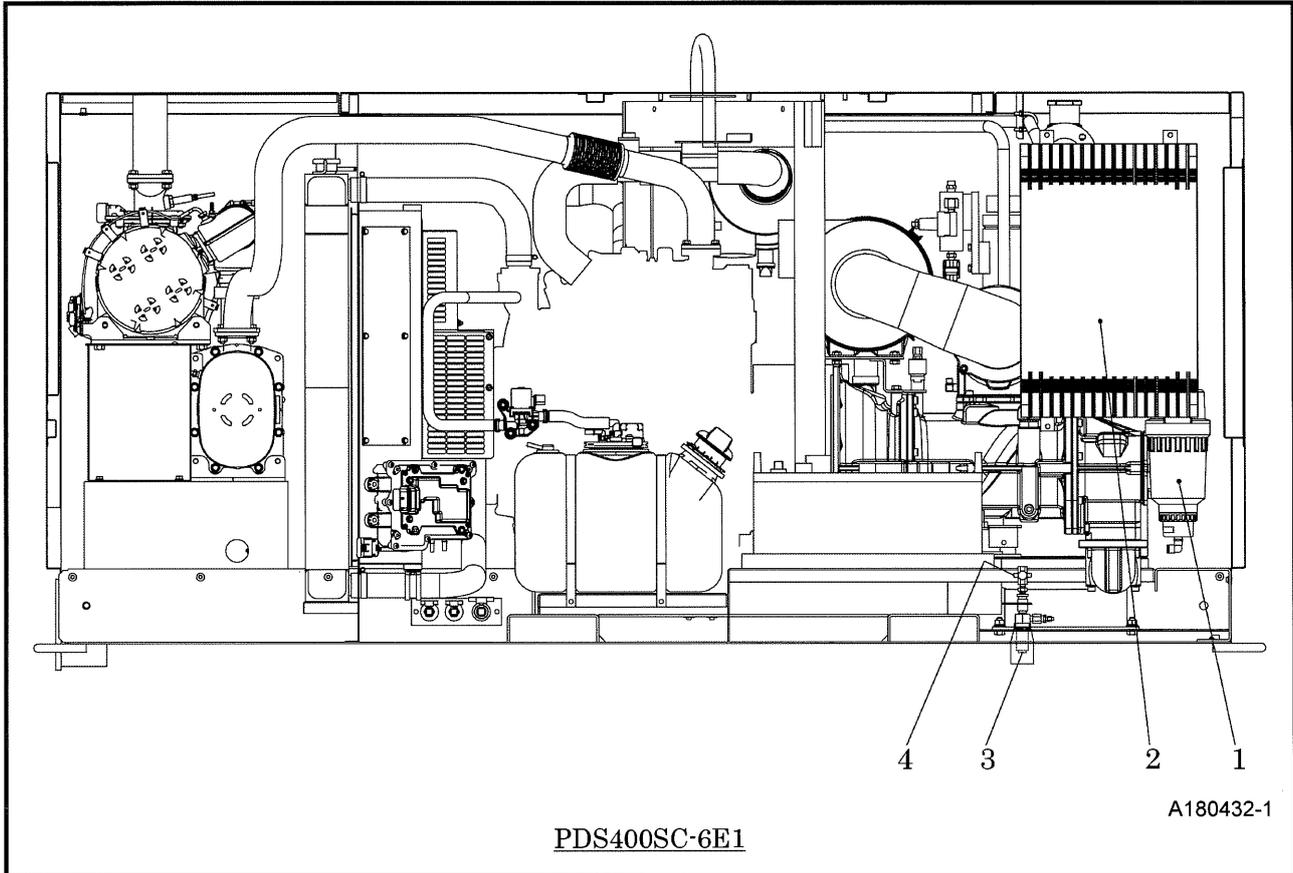


No.	Description	Function
21	SCR (Selective Catalytic Reduction)	Selective reduction-type catalyst that uses DEF as a reducing agent.
22	Radiator	For cooling the coolant for engine in the system.
23	Engine	For driving the compressor air-end in the system.
24	Solenoid valve for unloader spring chamber	For reducing loads during start-up.
25	High pressure regulator	Pressure regulator used to control air pressure during high pressure operation.
26	Pressure switching solenoid valve	Equipment for switching the operating pressure between low pressure and high pressure.
27	Low pressure regulator	Pressure regulator used to control air pressure during low pressure operation.
28	Solenoid valve for starting unload	For reducing load at start-up.
29	Pressure control valve	For keeping the pressure in receiver tank constantly higher than a certain level in the system.
30	Compressor air-end	For compressing air in the system.
31	Battery	For electrically starting engine.
32	DEF tank	Container for DEF
33	Engine oil drain valve	For draining engine oil.
34	Oil cooler drain valve	For draining compressor oil from oil cooler and oil line.
35	Radiator drain valve	For draining engine coolant.
36	DPF (Diesel Particulate Filter)	Apparatus for removing harmful components contained in the exhaust gas.

1.Part Names

[After cooler type]

Only the special devices additionally or optionally attached to the standard unit are shown in the following figure. For the details of the other standard devices, refer to page 1-1,1-2.



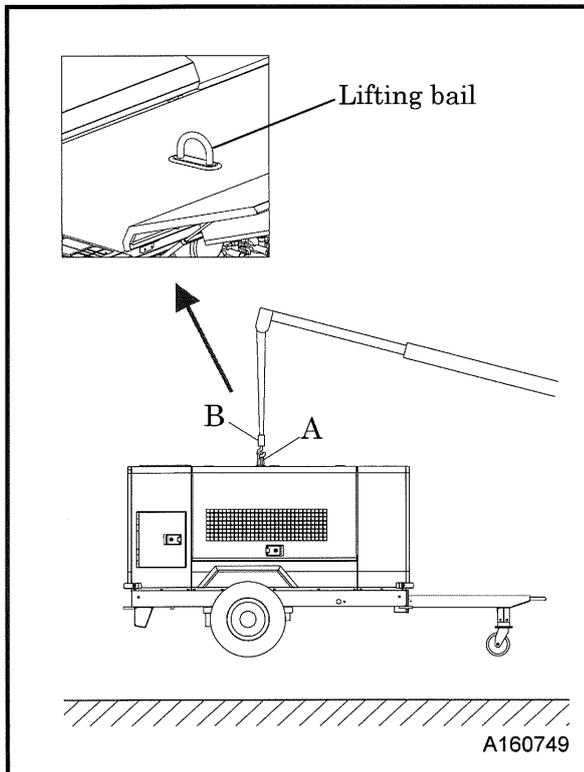
No.	Description	Function
1	Drain separator	For separating water from compressed air cooled through after cooler.
2	After cooler	For cooling compressed air.
3	Drain port of air pipe	For draining condensate from drain separator.
4	Drain warming valve	For preventing freezing of water separated through drain separator when exhausting it.

2. Installation

2.1 Transportation

When loading and unloading the machine, be sure to use the lifting bail provided on the center of the machine top.

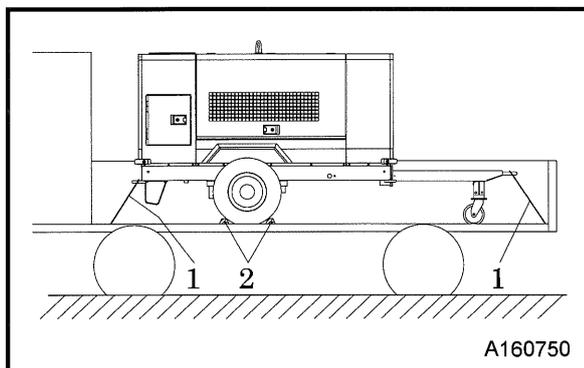
2.1.1 Lifting up



<Procedure>

1. Before lifting the machine up, make sure to check the lifting bail [A] for any crack or loosened bolts.
2. Connect the hook [B] of the crane or shackle with lifting bail eye fitted at the top center of the machine, and make sure that there is no person standing around the machine. Then perform the hoisting operation.
3. Select a truck or a crane with a capacity sufficient for the size and weight of the machine by referring to the values shown in Chapter 7 "Specifications" of the manual.
4. Any crane operations must be performed by a qualified crane operator.

2.1.2 Mounting the machine on the truck bed



- Be sure to fasten the machine with ropes [1] as shown in the figure right, and securely fix it on the truck bed.
- Be sure to put one set of chocks [2] to the wheels. Pull the parking brake lever it firmly after the machine is loaded on the truck bed.

Transportation

WARNING

- Never get under the machine which is lifted up, because it is very dangerous.
- Never lift the machine which is still in operation, or it could cause critical damage to each component or lead to serious accident.

2. Installation

2.2 Towing the Machine

Caution for towing the machine

CAUTION



- Before towing the machine, make sure to check and confirm that the following points have no problem.
- Tire air pressure is proper.
- Tire fixing nuts are not loose.
- Tires are not worn nor damaged.
- Make sure that the end of the drawbar is so surely and firmly connected to the coupler of the towing vehicle that the disconnection may not occur while the machine is being towed.
- Make sure if there is no deform or damage on the drawing vehicle and the drawbar of the machine.
- Be sure to keep your hand or finger away from any part of the coupling device when coupling or uncoupling a drawing device to a draw bar.
- Be sure to drive the drawing vehicle safely, avoiding dangerous place or ground, if any.
- If you do not follow the above instructions, it could cause serious injury or big damage.

2. Installation

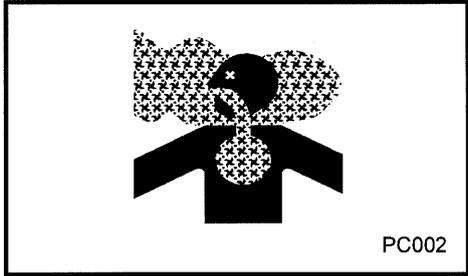
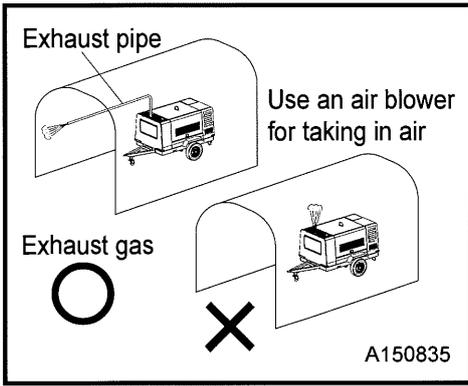
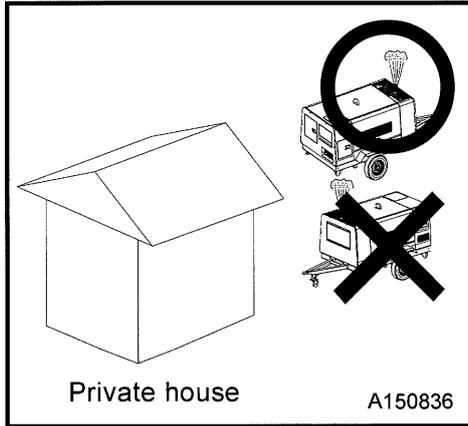
2.3 Installation conditions

The machine has to be parked horizontally on a level place.

- The machine has to be parked right-angled on a slope.
- The machine has to be parked on a slope within an angle of 15°
- The machine should be operated in following conditions:
 - **Ambient temperature**----- -5°F to 104°F (-15°C to +40°C)
 - **Humidity**----- Less than 80%
 - **Altitude**----- Lower than 4,921ft above sea level

※If you use the machine not in the conditions stated above, it may causes serious breakdown.

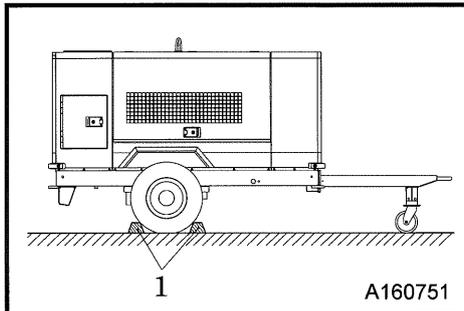
- The machine has to be installed in the environment where fresh air is always available, temperature is low and ambient air is dry as much as possible.
- If more than two machines are placed parallel in operation, keep enough distance so that exhaust air from one machine does not affect the other one.
- Also, a machine has to be installed in the environment where fresh air is always available.
- Keep enough space around the machine for inspection and maintenance access.

 WARNING		<ul style="list-style-type: none"> ● Exhaust gas from the engine is poisonous. It could cause death or serious injury if inhaled. Avoid using the machine in an insufficiently ventilated building or tunnel. ● Do not position the exhaust gas outlet in direction of a person or a house.
		<ul style="list-style-type: none"> ● When installing the machine in a tunnel or the like, ensure a supply of fresh air and provide adequate ventilation. ● Be sure to place the exhaust pipe in an outdoor location, so that no exhaust gas will be leaked from any pipe seam.
		<ul style="list-style-type: none"> ● Do not position the exhaust gas outlet in the direction of a house. ● Because the exhaust gas from the engine is poisonous, avoid positioning it in the direction of passers-by.

2. Installation

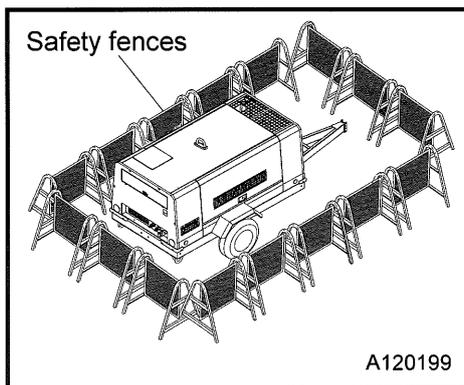
Installation notes

WARNING



- Be sure to stop the wheels on both wheels [1] on the tire.

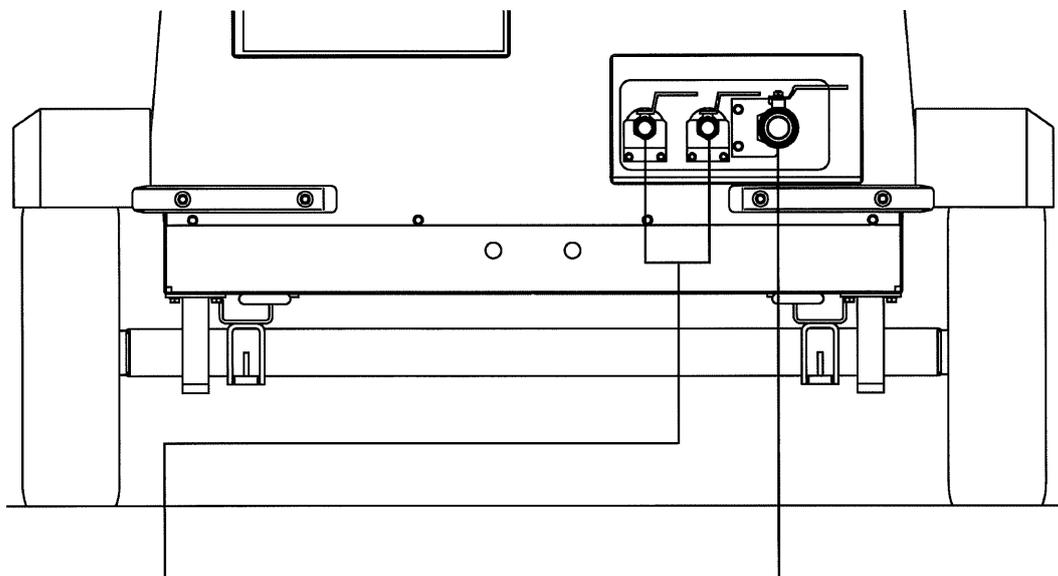
CAUTION



Placing safety fence in position

- Be sure to place the safety fence around the machine in order to prevent other people than those involved in construction work from entering the construction site or from accessing the machine

2.3.1 Service valve



Bore of service valve: 20A(R3/4B) × 2
[Taper male screw]

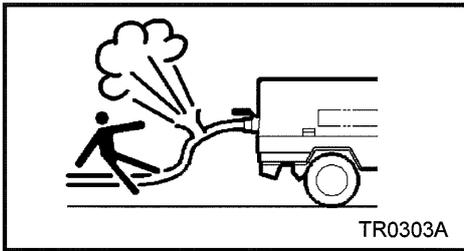
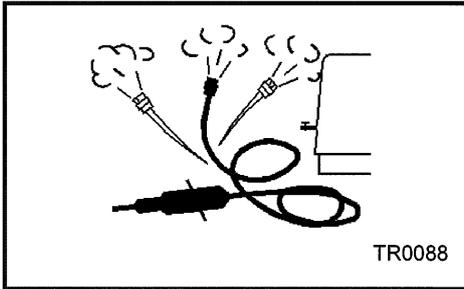
Bore of service valve: 50A(Rc2B) × 1
[Taper female screw]

A160694

2.Installation

Cautions of hose attachment and removal

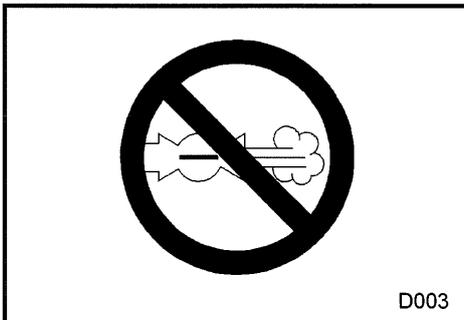
WARNING



- Piping or the hose from this machine service valve should use what can be borne enough for the discharge pressure of this machine.
- Please connect piping or a hose to this machine service valve firmly before operation and during operation. If the connection is loose, there is a possibility of piping or a hose separating and getting seriously injured.
- Please remove after closing the service valve and relieving remaining pressure. If pressure remains, there is a possibility of the hose whipping, causing damage and possibly injury.
- In order to use it safely, please read the handling of the work tools often used.

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

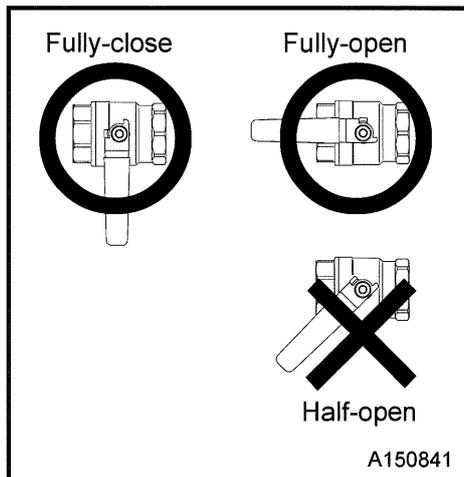
CAUTION



- 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.
- When the machine has to be unavoidably temporarily operated with its port open, be sure to mount a silencer to reduce noise and wear protective materials such as earplugs to prevent damage to hearing.

Cautions of service valve

CAUTION

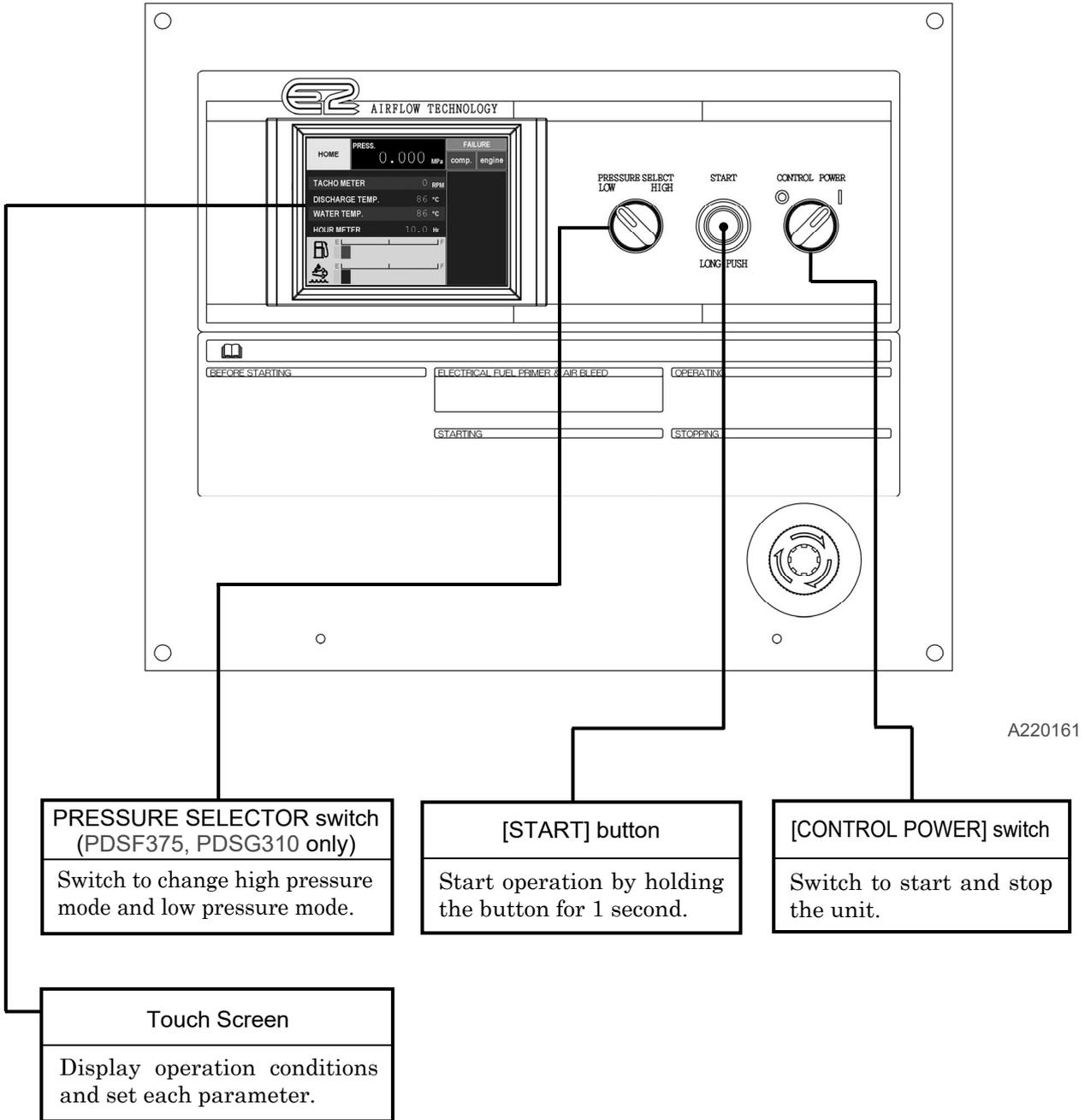


- Half-open of service valve could cause cracks of valve seat and air leaks. Be sure to use as full-close or full-open, not to use as half-open.

3.Operation

3.1 Instrument Panel

Each display of the operation panel is illustrated as follows.
Read and fully understand the explanations and be sure to operate safely:



3. Operation

3.2 Lubricating oil · Coolant · Fuel · DEF

3.2.1 Engine oil

Use engine oil recommended by us.

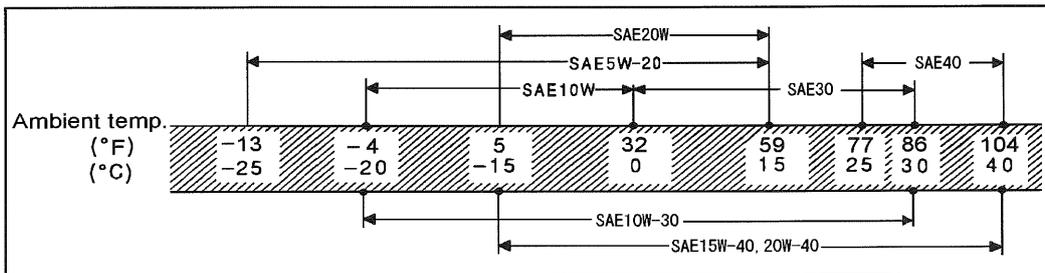
Be sure to use CJ class or higher engine oil or superior class. (Using engine oil with poor quality may shorten the life of the engine).

Classification	API service classification CJ-4 class or higher
Viscosity	SAE10W-30

IMPORTANT

- Viscosity of engine oil greatly affects startability, performance, oil consumption of the engine, as well as wear of the moving parts.

Ambient temperature range and oil viscosity (SAE)



A180160E

- When two or more different brands of oil are mixed, its performance can be deteriorated. Do not mix oils.
- Follow the designated regulations to dispose of engine oil.

3.2.2 Compressor oil

Be sure to use recommended oil listed below.

Even continuous oil replenishment cannot improve its deteriorated condition. Be sure to change the oil completely at every scheduled interval.

Maker	Brand	Model
MOBIL	MOBIL RARUS SHC 1024	PDS400, PDSF375
	MOBIL RARUS SHC 1025	PDSG310
SHELL	SHELL CORENA S4R (VG32)	PDS400, PDSF375
	SHELL CORENA S4R (VG46)	PDSG310

IMPORTANT

- Mixture of different brands compressor oil could cause an increase of viscosity and make compressor oil sticky. In the worst case, it could cause sticking trouble of compressor air-end "Compressor air-end will not turn". Also repairing of such air-end needs expensive cost. Therefore, be sure to avoid mixing different brands oil. In case compressor oil brand in use has to be unavoidably changed, it is absolutely necessary to completely clean up the interior of compressor air-end. In such a case, contact "AIRMAN" dealer or us directly.
- Follow the designated regulations to dispose of compressor oil.

3.Operation

3.2.3 Coolant

Coolant freezing could cause cracks of cylinder and radiator. Be sure to always use mixture of LLC (antifreezing solution) and soft water like good quality tap water.

IMPORTANT	<ul style="list-style-type: none"> ● When water with dirt, sand, and/or dust contained, or hard water such as well water (ground water) is used, this will cause deposits inside radiator or on cylinder head, and will cause engine overheat due to poor flow of coolant. ● Adjust mixing ratio of LLC (Antifreeze) with water according to the temperature. (When the machine is delivered from factory, it is filled with LLC (Antifreeze) of density 55%) Use LLC (Antifreeze) within the range of its mixing ratio between 30 and 60%. (If LLC (Antifreeze) in the water exceeds more than 60%, it may decrease its antifreezing effect.) <p style="text-align: center;"><u>Mixing ratio of LLC (antifreeze) (reference)</u></p> <table border="1" style="margin-left: auto; margin-right: auto; border-collapse: collapse;"> <tr> <td style="padding: 2px;">Outside temperature (°F)</td> <td style="padding: 2px;">5</td> <td style="padding: 2px;">-4</td> <td style="padding: 2px;">-13</td> <td style="padding: 2px;">-22</td> <td style="padding: 2px;">-31</td> <td style="padding: 2px;">-40</td> <td style="padding: 2px;">-49</td> </tr> <tr> <td style="padding: 2px;">Outside temperature (°C)</td> <td style="padding: 2px;">-15</td> <td style="padding: 2px;">-20</td> <td style="padding: 2px;">-25</td> <td style="padding: 2px;">-30</td> <td style="padding: 2px;">-35</td> <td style="padding: 2px;">-40</td> <td style="padding: 2px;">-45</td> </tr> <tr> <td style="padding: 2px;">Mixing ratio (%)</td> <td style="padding: 2px;">30</td> <td style="padding: 2px;">35</td> <td style="padding: 2px;">40</td> <td style="padding: 2px;">45</td> <td style="padding: 2px;">50</td> <td style="padding: 2px;">55</td> <td style="padding: 2px;">60</td> </tr> </table> <ul style="list-style-type: none"> ● Use coolant that conforms to SAE J814/SAE J1034/ASTEM D3306. ● Follow the designated regulations to dispose of LLC (Antifreeze). 	Outside temperature (°F)	5	-4	-13	-22	-31	-40	-49	Outside temperature (°C)	-15	-20	-25	-30	-35	-40	-45	Mixing ratio (%)	30	35	40	45	50	55	60
Outside temperature (°F)	5	-4	-13	-22	-31	-40	-49																		
Outside temperature (°C)	-15	-20	-25	-30	-35	-40	-45																		
Mixing ratio (%)	30	35	40	45	50	55	60																		

3.2.4 Fuel

IMPORTANT	<ul style="list-style-type: none"> ● Never use fuel with sulfur content greater 0.0015%(15ppm) ● Use only ultra-low sulfur fuel. ● Use such diesel fuel which conforms to either standard EN590 or ASTM D975. ● Use only clean diesel fuel. Never mix fuel with kerosene or other additives. ● Dispose of fuel in accordance with all applicable regulations.
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CAUTION	<ul style="list-style-type: none"> ● Diesel fuel is required to meet the following conditions. <ul style="list-style-type: none"> ● Free from even minute dust particles. ● High optimum viscosity. ● High cetane number.(45 or more) ● High fluidity even at low temperature. ● Low carbon residue content.
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3. Operation

3.2.5 DEF

DEF (AdBlue or equivalent) is transparent, colorless, and non-hazardous. In some circumstances, DEF will put off odor, but this is normal and not indicative of any problems.

IMPORTANT

- Only use DEF which conforms to API standards.
- Store DEF in a sealed container away from direct sunlight to prevent water evaporation.
- The usable period of DEF depends on temperature. For details, reference the engine manual.
- If a substantial quantity of DEF is not within specification, contact the DEF supplier for assistance with disposal. Do not dump substantial quantities of DEF onto the ground or send DEF to wastewater treatment facilities.

CAUTION

- Avoid contact with eyes. In case of contact, immediately flush eyes with large amounts of water for a minimum of 15 minutes.
- Do not ingest DEF. In the event that DEF is ingested, contact a physician immediately.
- Avoid prolonged contact with skin. In case of accidental contact, wash skin immediately with soap and water.
- Reference the Materials Safety Data Sheet (MSDS) for additional information.

3.Operation

3.3 Check before starting unit

Be sure to check the unit before operation.

When any abnormality is found, be sure to repair it before restarting the unit.

Be sure to make daily checks before operation. If the unit is operated without prior check and without noticing its abnormality, such operation could cause seizure of components or may even cause fire.

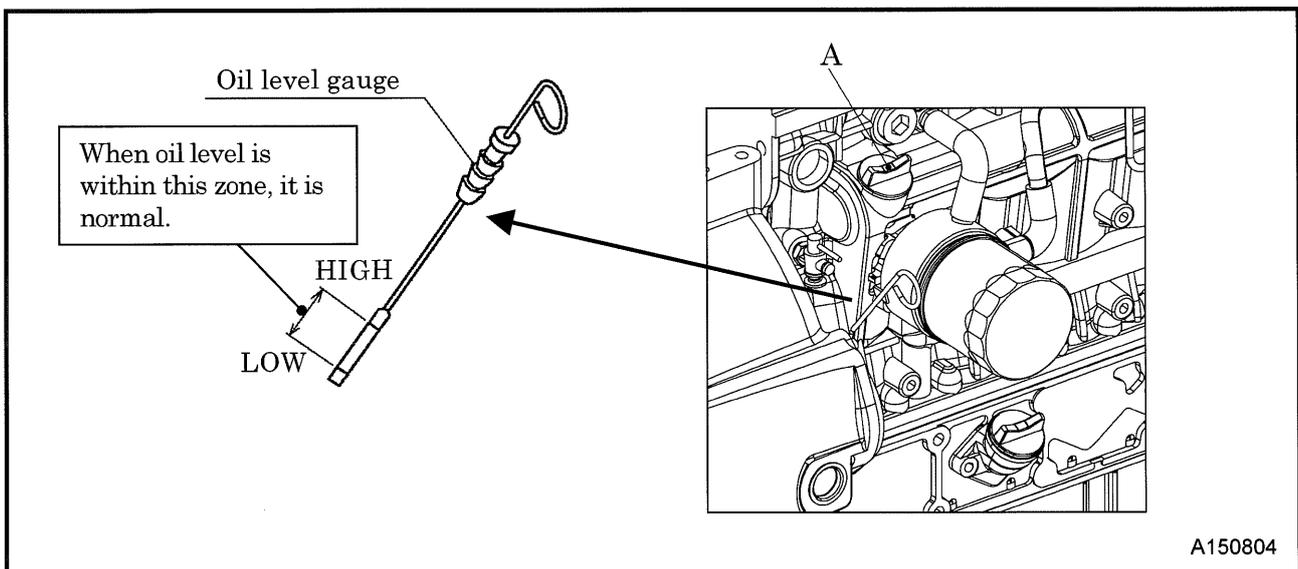
3.3.1 Check engine oil level

Unit should be on level before checking oil level.

When you check oil level after you have once started operation, wait 10 to 20 minutes after stopping engine, before checking the oil level.

<Procedure>

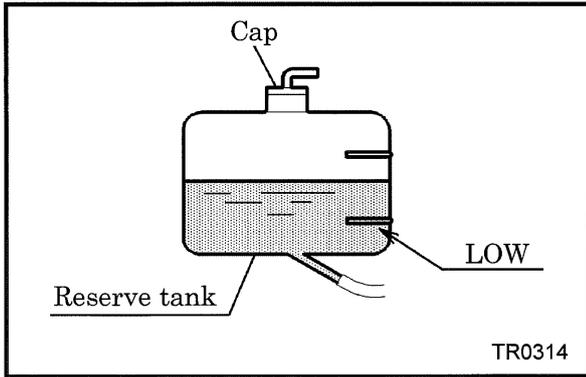
1. Pull out the oil level gauge and wipe it with a clean cloth.
 2. Then, re-insert the oil level gauge fully and pull it out again. If the oil level gauge shows the oil level between LOW and HIGH, it is normal.
 3. When the oil level is below its LOW, add engine oil from oil filler port [A].
- While checking oil level, check also for contamination. If the oil is found dirty, contaminated or should it be changed according to the periodic inspection list, change the oil. (See 5.5.1)
 - To cause of the engine output reduction when oil level is too high, do not put oil in more than the upper limit.



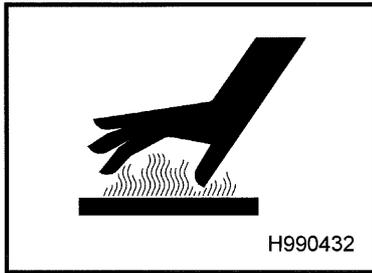
A150804

3.Operation

3.3.2 Check coolant level



- Check the coolant level in the reserve tank. If it is lower than the limit, open the cap and replenish the coolant. (Level must be kept above LOW mark.)
- If it is lower than the limit or empty, open the cap and check the coolant, then replenish the coolant to radiator and reserve tank. (See 5.5.18)



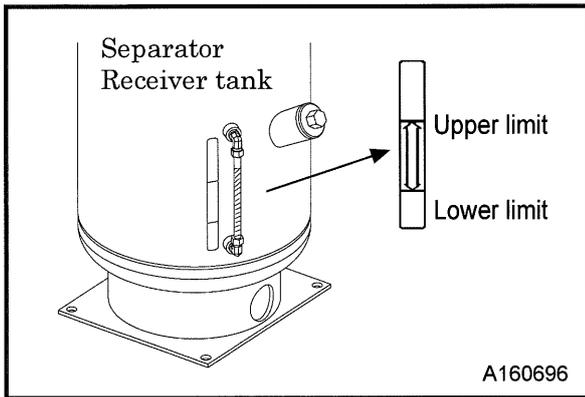
- When removing radiator cap, unfasten it to decrease internal pressure while unlocking first step. After checking internal pressure decreased, unfasten the radiator cap more until second step unlocked. If you fail to conduct these processes, it might causes blowing radiator cap by internal pressure or gushing hot scalding vapor.



- Do not operate the machine while being lack enough the coolant amount. An air bubble is involved and leads to damage of a radiator.

3.Operation

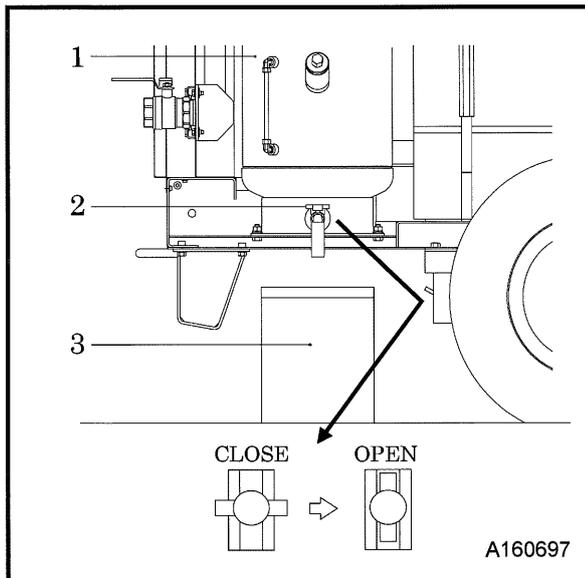
3.3.3 Check compressor oil level



- Place the machine on level ground when checking the oil level.
- After checking and confirming that the residual pressure in separator receiver tank is 0PSI, replenish the tank with compressor oil so that the oil level is kept higher than the Lower limit of level gauge plate. Be sure to check the surface of compressor oil is in the range between upper limit and lower limit when machine operating. (See 5.5.6)
- ※ Supply of excessive oil can cause deterioration of oil separation performance and the like.

		<ul style="list-style-type: none"> ● When you fill the separator receiver tank with compressor oil, stop the engine, and make sure that the pressure gauge indicates 0PSI and there is no residual pressure in it, and then gradually loosen the oil filler cap for refilling oil. ● Should any residual pressure be left in the separator receiver tank, hot compressed air and hot compressor oil jetting out could cause burning or serious injury to persons nearby.
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3.3.4 Drain separator receiver tank



- Gradually opening the drain valve [2] fitted under the separator receiver tank [1] as shown in the fig, drain the condensate.
- Be careful not to fully open the drain valve. Otherwise, much oil may be lost.
- After draining the oil completely, close the drain valve firmly.
- Drain the condensate in container [3], and then dispose of condensate according to the designated regulations.
- Touch the fluid and check its viscosity to determine whether it is condensate or compressor oil, and when it is difficult to distinguish between the two.

		<ul style="list-style-type: none"> ● After stopping the engine, confirm that the pressure gauge indicates 0PSI and there is no residual pressure in it, then open the drain valve gradually to drain the compressor oil. ● Note residual pressure in the receiver tank could force both extremely hot compressed air and oil to jet out and you may be scalded or seriously injured.
--	--	--

3. Operation

3.3.5 Check fuel

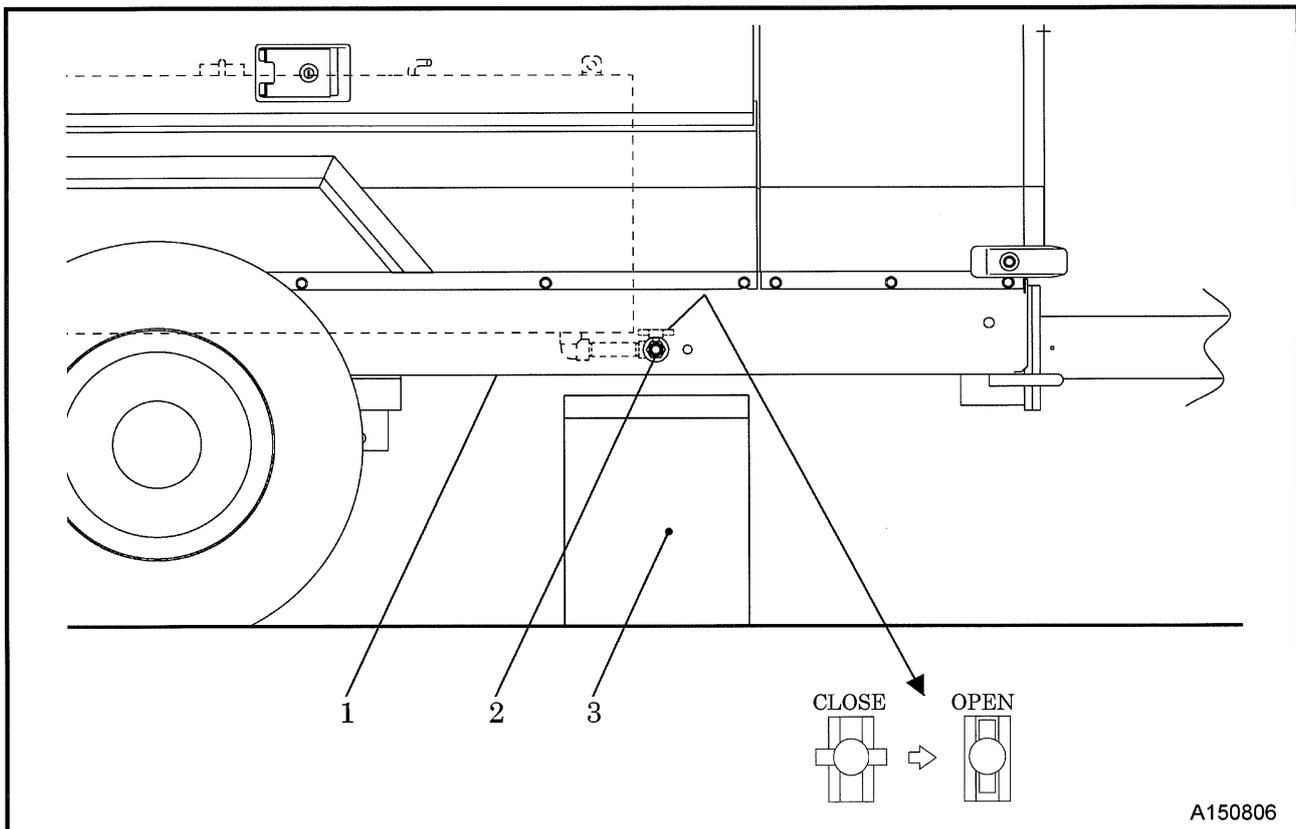
Before starting operation, make sure to check the level of residual fuel so that fuel shortage during operation can be avoided. Drain condensate accumulated at the bottom of fuel tank whenever necessary.

- Refilling fuel tank should be done in an outdoor well-ventilated place.
- **Never let oil reach the filler pipe of the filler port. Otherwise, high temperature may cause fuel to expand and spill out. Also, fuel may spill out due to vibrations during movement or carriage.**

CAUTION 	 D004	<ul style="list-style-type: none">● Do not, under any circumstance, bring lit cigarettes and/or matches to the fuel.● The fuel is extremely flammable and dangerous. Be careful of fire because it is very likely to catch fire.● Refuel only after stopping the engine, and never leave open fuel can near the machine. Do not spill. It could cause a fire. When it is spilt, wipe it up completely.● Never use alcohol-base cleaning fluid. If it sticks to such parts made of plastic, it causes degradation of liquid surface visibility, and in worst case, it leads to crack and fuel leak due to crack caused.
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3.3.6 Drain fuel tank

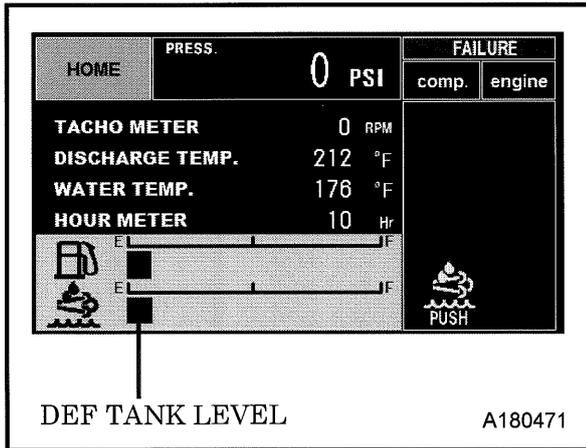
Open drain valve [2] under fuel tank [1] and discharge drain. After drain is discharged completely, make sure to close drain valve [2]. Drain should be discharged to container [3] and disposed according to regulations.



A150806

3.Operation

3.3.7 Check DEF Level



- If DEF tank level is below 15%, an icon will be displayed as shown below. If the icon is pressed, a more detail explanation of the DEF issue will be displayed on the warning screen.
 - If DEF tank level is below 5%, the engine may stall when opening service valve due to output restrictions. If DEF tank level is at 0%, the ENGINE STOP indicator will be displayed and the engine will shut down. Refill DEF to restore.
- ※ **When refilling diesel fuel, refill DEF as well.**

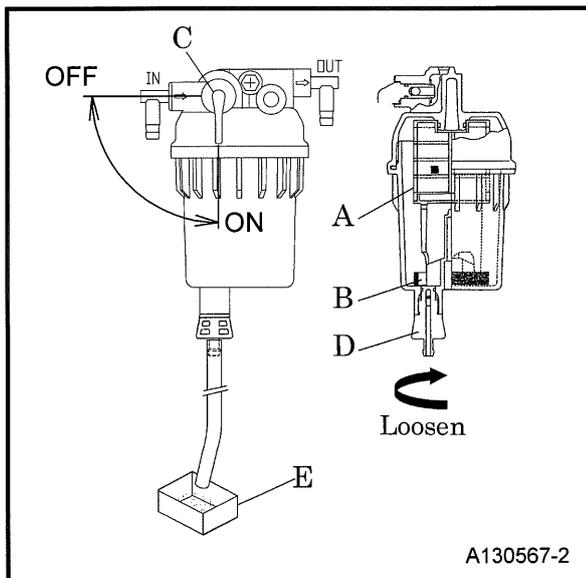
DEF Tank level display

State Description	DEF Level	Over 15%	Below 15%	5%	0%
Indicator	Icon (DEF Level)	-	 PUSH	 PUSH	 PUSH
	Engine Stop	-	-	-	

3.Operation

3.3.8 Check sedimenter for condensate

When red float [B] under element [A] in fuel filter is raised up to upper level, drain water.



<Procedure>

1. Turn fuel selector valve [C] to “OFF” position.
 2. Loosen the drain valve [D] and drain out condensed water inside.
 3. Make sure to tighten the drain valve [D] securely, after draining the condensate.
- Drain the condensate in container [E] and then dispose of condensate according to the designated regulations.

CAUTION



- When checking, do not use alcoholic parts cleaner for cleaning. If it sticks to plastic parts, which might causes cracks and less visual recognition for fuel level. In worst case, which might causes cracks and fuel leaks.

3.3.9 Check wiring of each part

Check each wiring for any loose connection, damage to insulating sheathed portion, disconnection, and short-circuit.

3.3.10 Check piping of each part

Check each piping for any loose connection and also check each hose and pipe for any tear and leaks.

3.3.11 Check in the machine

Periodically check the inside of the machine for dust and flammables.

CAUTION



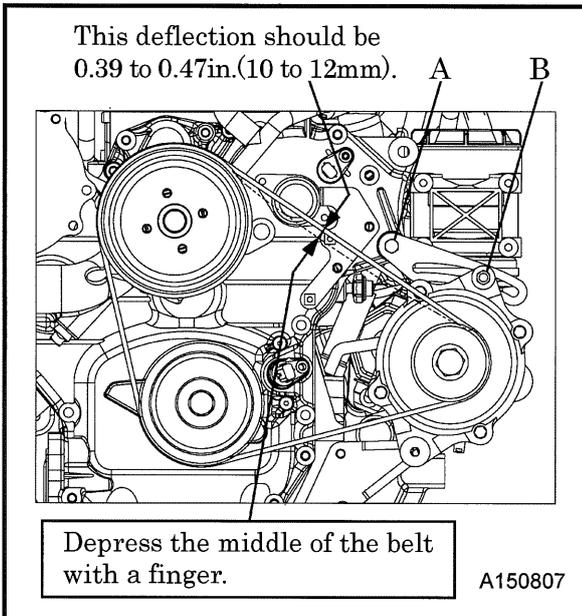
- Be sure to wear protector such as helmet, protective glasses, earplug, safety shoes, gloves and dust protective mask for safety operation conforming with details of work.
- Temperature of muffler and exhaust valve will become high. Be sure to remove combustibles such woodchip, dead leaf, waste paper nearby it.
- Just in case for fire, be sure to set fire extinguisher nearby machine.
- It is helpful to keep emergency contact numbers for urgent visit clinic, ambulance and firehouse.

3.Operation

3.3.12 Check belt tension

Follow the procedure below to adjust tension of belt.

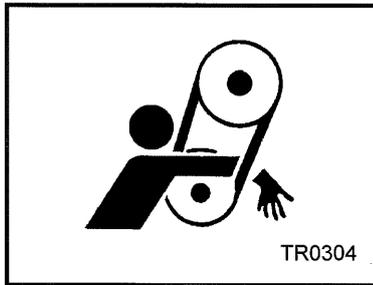
Adjust the tension by gradually loosening the fastening bolt [A] or nut [B] of the alternator.



<Procedure>

1. Visually check if there are any cracks or tears in the belt.
2. Once loosen and adjust the alternator lock bolt or lock nut, so as to belt deflection should be 0.39 to 0.47in.(10 to 12mm) when you depress the middle of the belt with your finger with a force of 98N·m (10kgf·m). After adjusting, be sure to tighten lock bolt or lock nut firmly.
3. Be careful not to leave any grease or LLC on a belt while changing it. If any such material is left, wipe it off completely.

WARNING



- Be sure to stop the engine and remove the starter key whenever the tension of the belt is to be adjusted.
- Remove the negative (-) side cable from the battery.
- If the machine is running, it might catch the operator's hand into the belts, and this could cause a serious injury.
- Be sure to stop the engine and remove the starter key whenever the tension of the belt is to be adjusted.
- If the machine is running, it might catch the operator's hand into the belts, and this could cause a serious injury.

IMPORTANT

- Too tight belt tension could damage shaft and shorten bearing life. Too loose belt tension may result in damaging belt earlier and machine components due to overheat.

3.3.13 Opening and closing doors

Pull the handle forward to open the door. Be sure to close the door tightly so that its latch is firmly caught.

WARNING



- Keep the door closed and locked while running the unit.
- When the door has to be opened, be careful not to touch portions that are rotating or very hot.

3.Operation

3.4 Operating Procedure

For proper cooling and airflow, make sure that all enclosure doors are closed before starting.

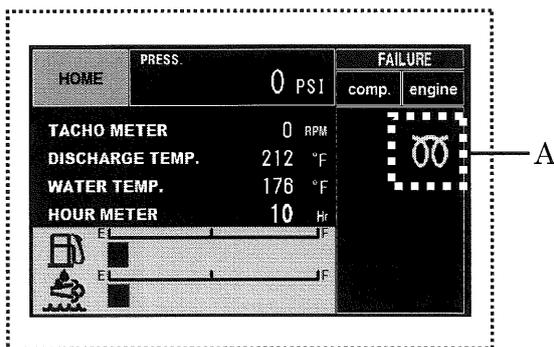
3.4.1 Procedure to start the unit

Start-up procedure.

During the warm-up operation, examine the different parts of the equipment for any looseness, leakage of water, oil, fuel, and other irregularities. Also, make sure that diagnosis lamp is off.

<Procedure>

1. Close fully service valve.
2. Set the "CONTROL POWER" switch to  from .
3. Make sure that the pressure reading [PRESS.] on the home screen indicates [0] PSI.



4. Once the glow lamp [A] is extinguished, press the [START] button for 1 second or longer to start the engine.

The starter switch will stop itself automatically after 15 seconds. Wait at least one minute for any subsequent starting operation; otherwise, the starter motor may overheat and become damaged. (See 3.4.8)

- See the table below for starting unloader operation. It varies according engine speed.

	PDS400S,SC-6E1	PDSF375DP,DPC-6E1	PDSG310DP-6E1		
Usage pressure	100PSI	150PSI	100PSI	200PSI	150PSI
Engine speed	About 1,450rpm				

- The time of starting unloader operation changes according to the discharge air temperature as mentioned in the following table.

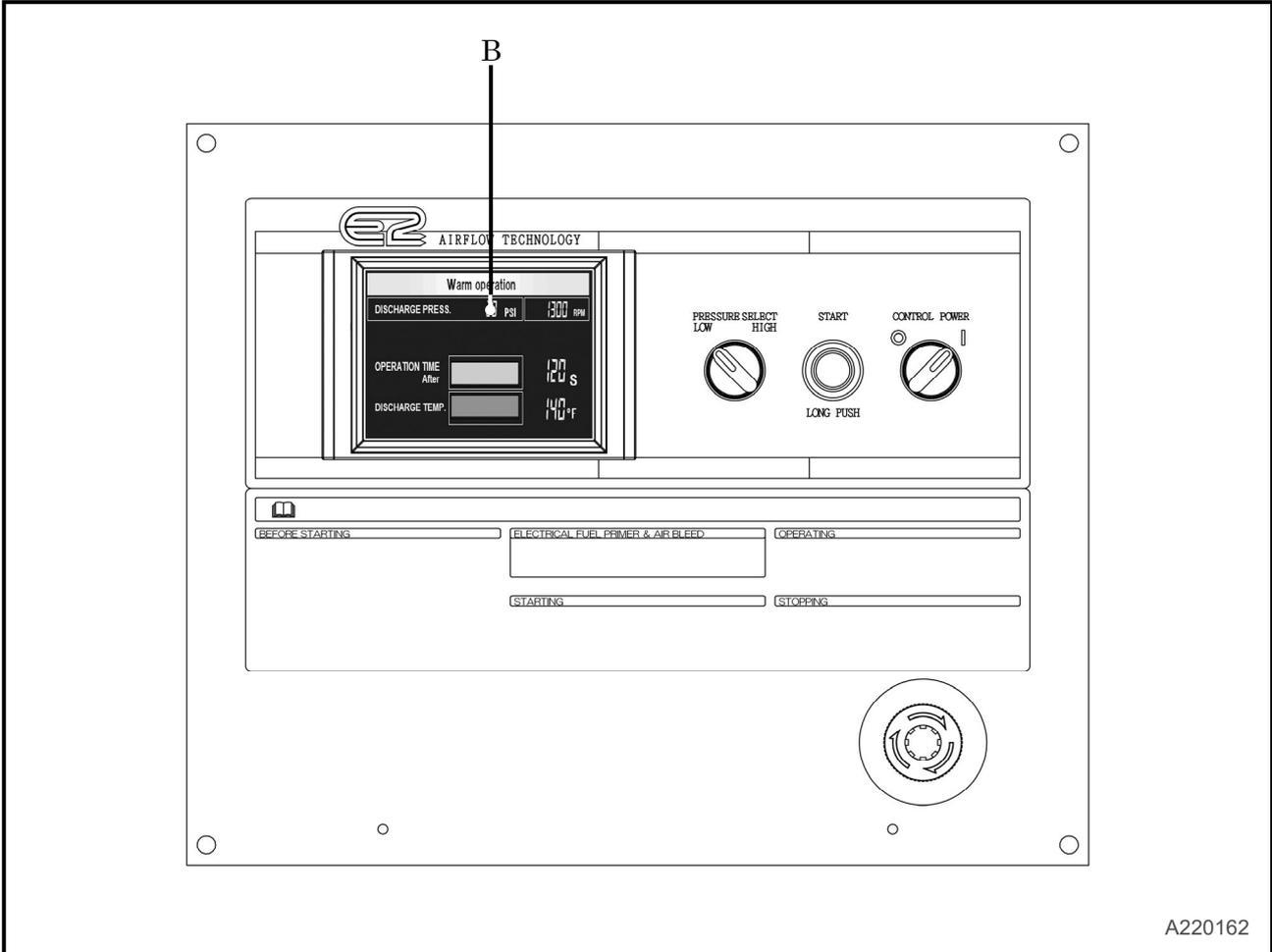
Discharge air temperature	Required time for starting unloader operation
Lower than 140°F(60°C)	It exceeds 120 seconds or 30 seconds or certain seconds until discharge air temperature becomes 140°F(60°C) or more degrees which comes first.
Higher than 140°F(60°C)	30 seconds

- During the unloader operation, the engine speed changes depending on the discharge air temperatures as shown below.

Discharge air temperature	Engine speed
Lower than 60°C	1,450min ⁻¹
Higher than 60°C	1,300min ⁻¹

3.Operation

- Once the engine has started up, leave it running to warm-up for 5 minutes.
The discharge air pressure gauge [B] in this condition ranges from PDS400: 43 to 130PSI / PDSF375: 43 to 174PSI / PDSG310: 43 to 230PSI.
- After finishing warming up operation, open the service valve provided at the outlet of compressed air and start service job.



CAUTION



- 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.
- When the machine has to be unavoidably temporarily operated with its port open, be sure to mount a silencer to reduce noise and wear protective materials such as earplugs to prevent damage to hearing.

IMPORTANT

- Be sure to let unit warm-up after starting for smooth operation of the engine and the compressor. Do not operate the engine at full load immediately after it starts up. This will shorten the equipment life.

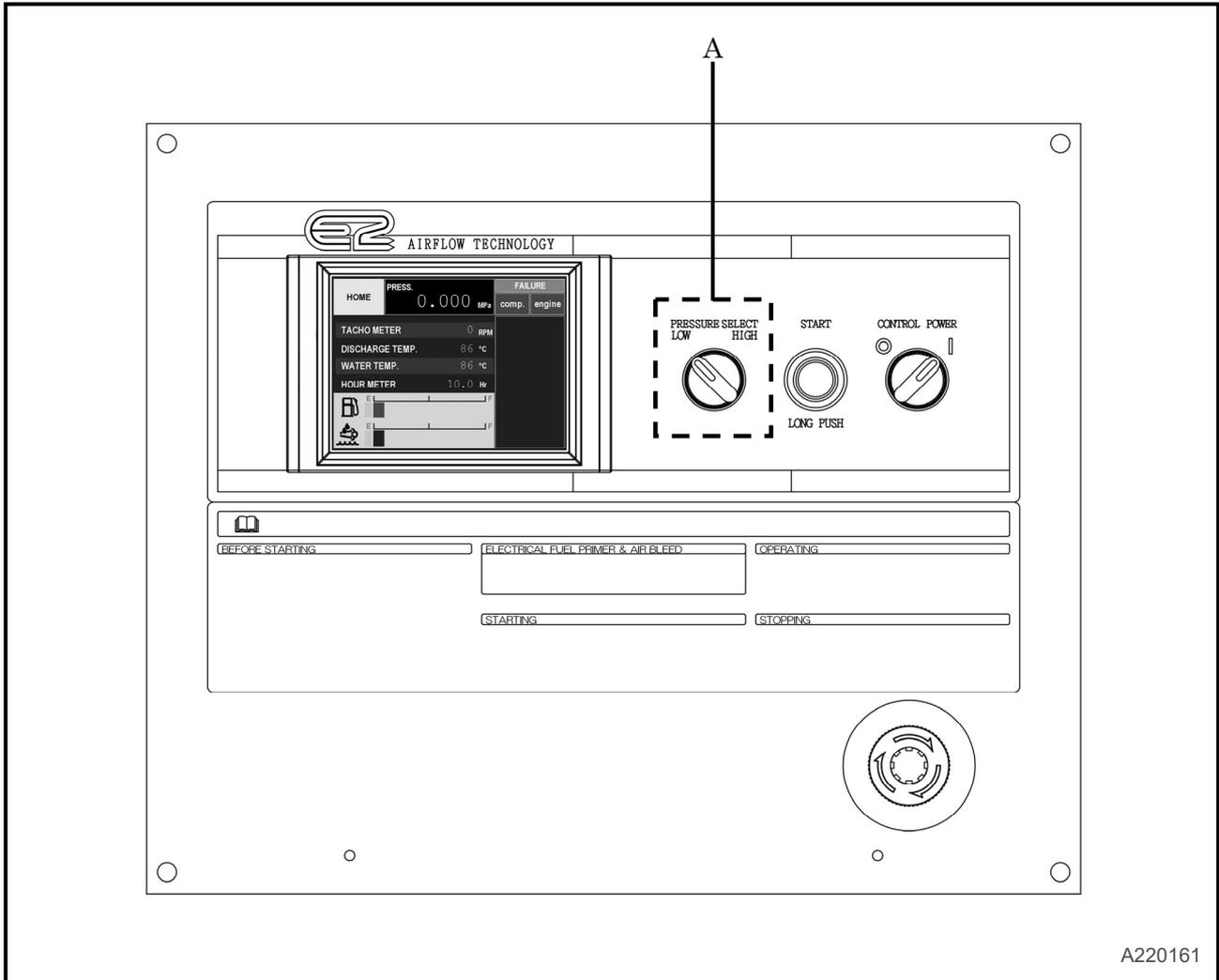
3.Operation

3.4.2 How to select operating pressure

[PDSF375DP, DPC-6E1 / PDSG310DP-6E1]

- Set the PRESSURE SELECT switch [A] to the [LOW] position for PDSF375: 100PSI / PDSG310: 150PSI and the [HIGH] position for PDSF375: 150PSI / PDSG310: 200PSI.

※You can alternate the usage pressure during operation.

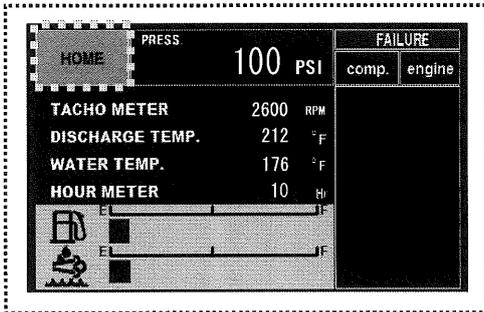


3.Operation

3.4.3 Method of activating air boosting

[PDSF375DP, DPC-6E1 / PDSG310DP-6E1]

<MAIN SCREEN>



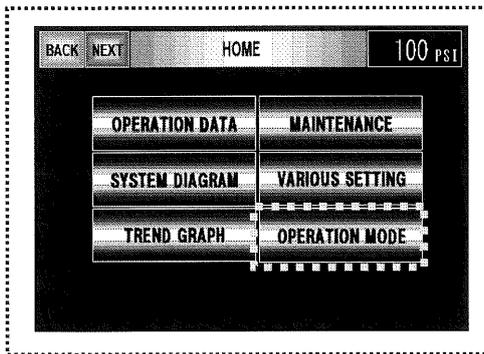
<Procedure>

- Press "HOME" on "MAIN" screen.
- Select "OPERATION MODE"
- Set "AIR-BOOSTING MODE" to "ON" to activate.

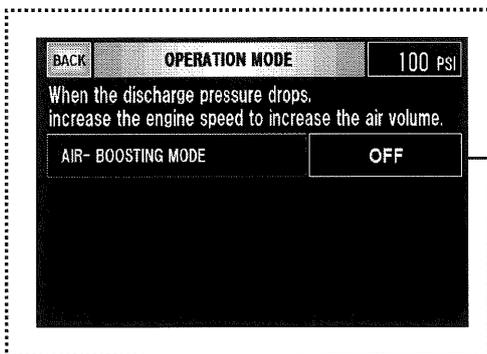
"AIR-BOOSTING MODE" is now active.

When the "AIR-BOOSTING MODE" is activated, the engine speed will be increase to increase air delivery when pressure is low.

<HOME SCREEN-1/2>



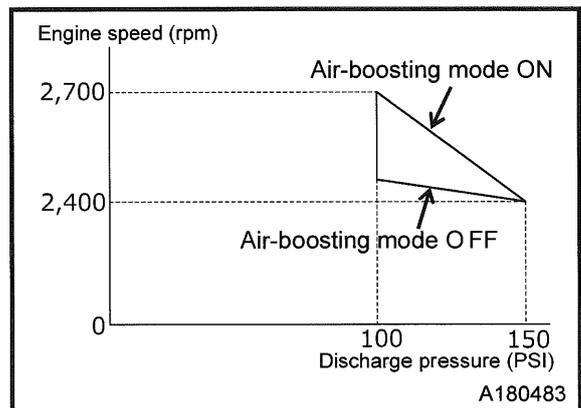
<OPERATION MODE>



When set to "ON", air-boosting mode will be active.

[About AIR-BOOSTING MODE]

When using air-boosting mode, air delivery will be increased by higher engine speed when the pressure is low. The air-boosting mode is on when the unit is shipped from factory.



A180483

3.Operation

3.4.4 Operating procedures when engine fails to start up on first attempt

If the engine fails to start after following steps 1 through 4, set the CONTROL POWER switch to the  position and wait 1 minute before attempting the steps again.

If the repeated procedure does not allow the engine to run, the following causes are suspected.

Therefore, check the following items.

- No fuel
- Lack of air bleeding in fuel line (See 3.4.8)
- Clogging of fuel filter
- Discharge of battery (Low cranking speed)

CAUTION



- If you do starting manipulation successively, the starter will not stop fully and it causes damages to pinion ring gear and breakdown of the starter.

3.4.5 Operation in cold weather

- Use engine oil of a viscosity that meets the ambient temperature according to 3.2.1.
- Use LLC (antifreeze). Use correct amount to provide freeze protection, according to the ambient temperature according to 3.2.3.
- Battery should always be kept fully charged.

CAUTION



- When operating in cold weather be sure to change engine oil and coolant according to outside temperature.

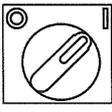
3.Operation

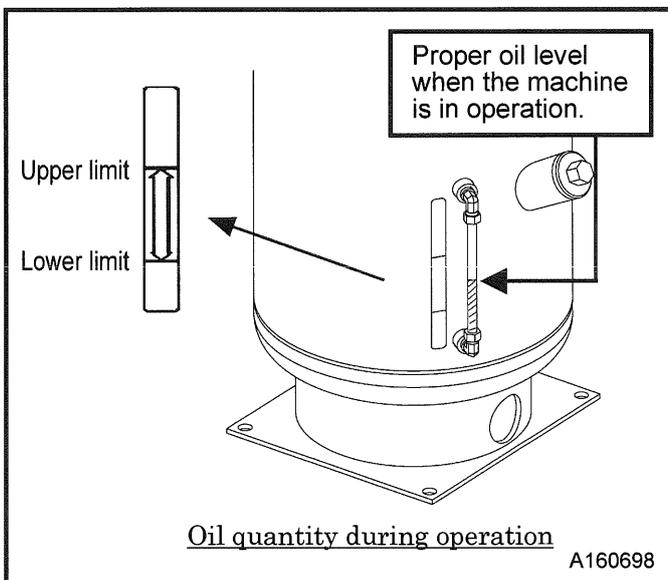
3.4.6 Displays during operation

Be sure to check at times to see if screen indicates or each component of the unit are properly working, or if there is any air-leak, oil-leak, water-leak or fuel-leak etc.

During normal operation, each indication of instruments is shown in the table below. Refer to the table for daily checks.

- The above table gives standard values. They may vary slightly depending on the operating conditions and other factors.

		Discharge pressure					Protection device	Indicator	
		PDS400S,SC -6E1	PDSF375DP,DPC -6E1	PDSG310DP -6E1		GLOW		CHARGE	
Starting unloaded operation		About 15 to 29PSI					Monitor		
Usage pressure		100PSI	150PSI	100PSI	200PSI	150PSI		-	ON
In operation	No load (Unload)	100 to 131PSI	150 to 174PSI	100 to 131PSI	200 to 230PSI	150 to 174PSI			
	Full load	58 to 100PSI	58 to 150PSI	58 to 100PSI	58 to 200PSI	58 to 150PSI	In operation OFF		



- When the machine is in operation under load, check to see that the compressor's oil level falls within the range between the lower limit and upper limit of the level gauge if the level is found to be insufficient, replenish the oil.
- ✳ Keep the operation log to record constant inspection of each component, so that trouble of the machine can be easily discovered and preventive measures can be taken.

	 PK0028	<ul style="list-style-type: none"> ● Do not open the valves below listed when operating. ● Separator receiver tank drain valve ● Coolant drain valve ● Engine oil drain valve ● Oil cooler drain valve ● Fuel tank drain valve
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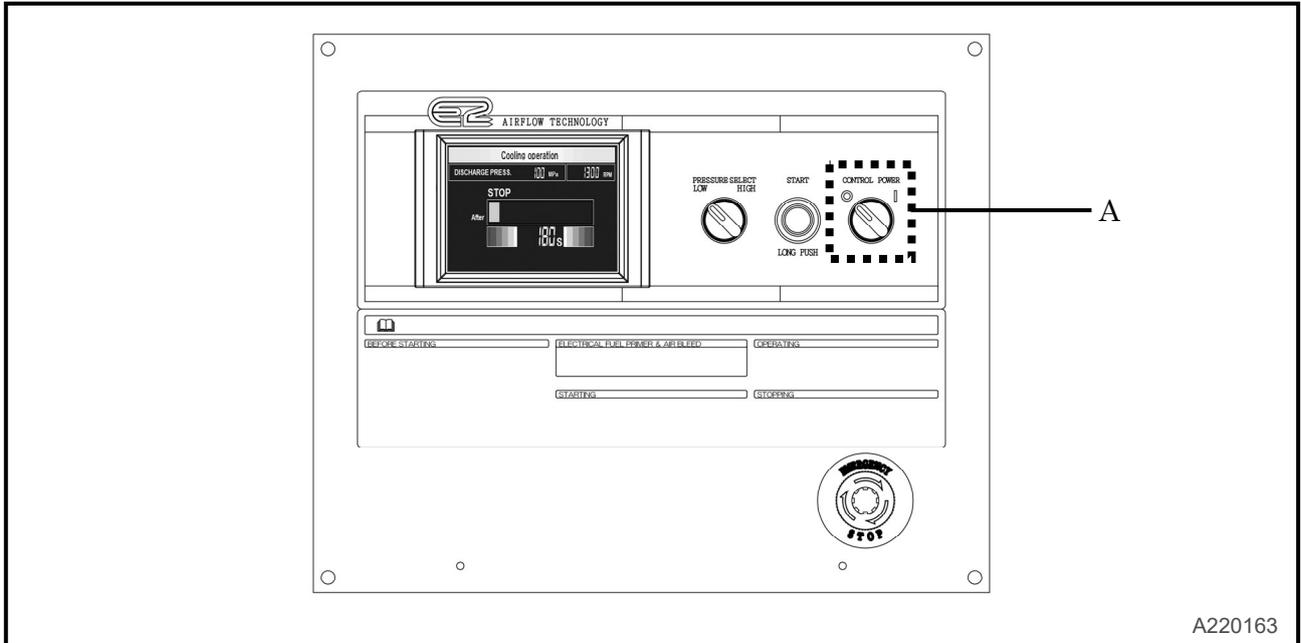
	<ul style="list-style-type: none"> ● Make sure that discharge pressure always reads at least 58PSI during operation. ● If you keep operating with less than 58PSI, it will causes less separation of lubricating oil at oil separator, or baking caused by overheat of compressor body.
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3.Operation

3.4.7 Stopping

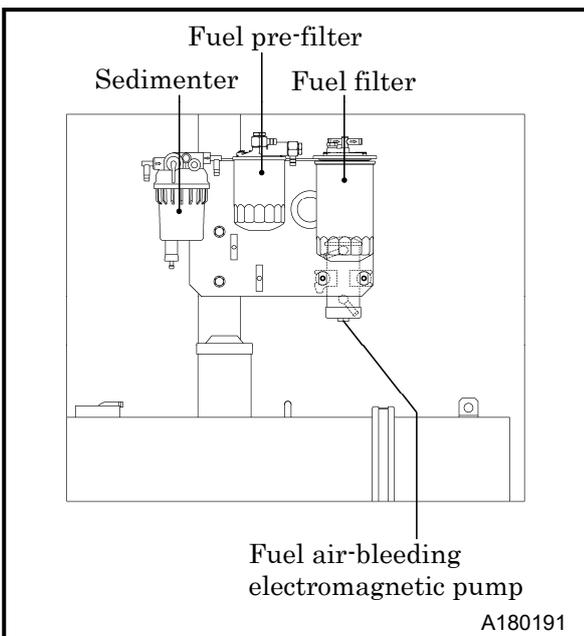
<Procedure>

1. Close fully service valve.
2. Set the CONTROL POWER switch [A] to  position.
3. The engine will stop automatically after a 180 second cool down.
4. After stopping the engine, close and lock the front panel. Store the key in a safe place.



3.4.8 Air bleeding in fuel line

Should the machine stop due to fuel shortage, perform air bleeding according to the following steps.



<Procedure>

1. Refill the fuel tank.
2. When CONTROL POWER switch is turned to  position, electromagnet pump starts to automatically bleed air in fuel line.
3. Air bleeding is completed about one minute.

3.Operation

3.5 Operation of after cooler type

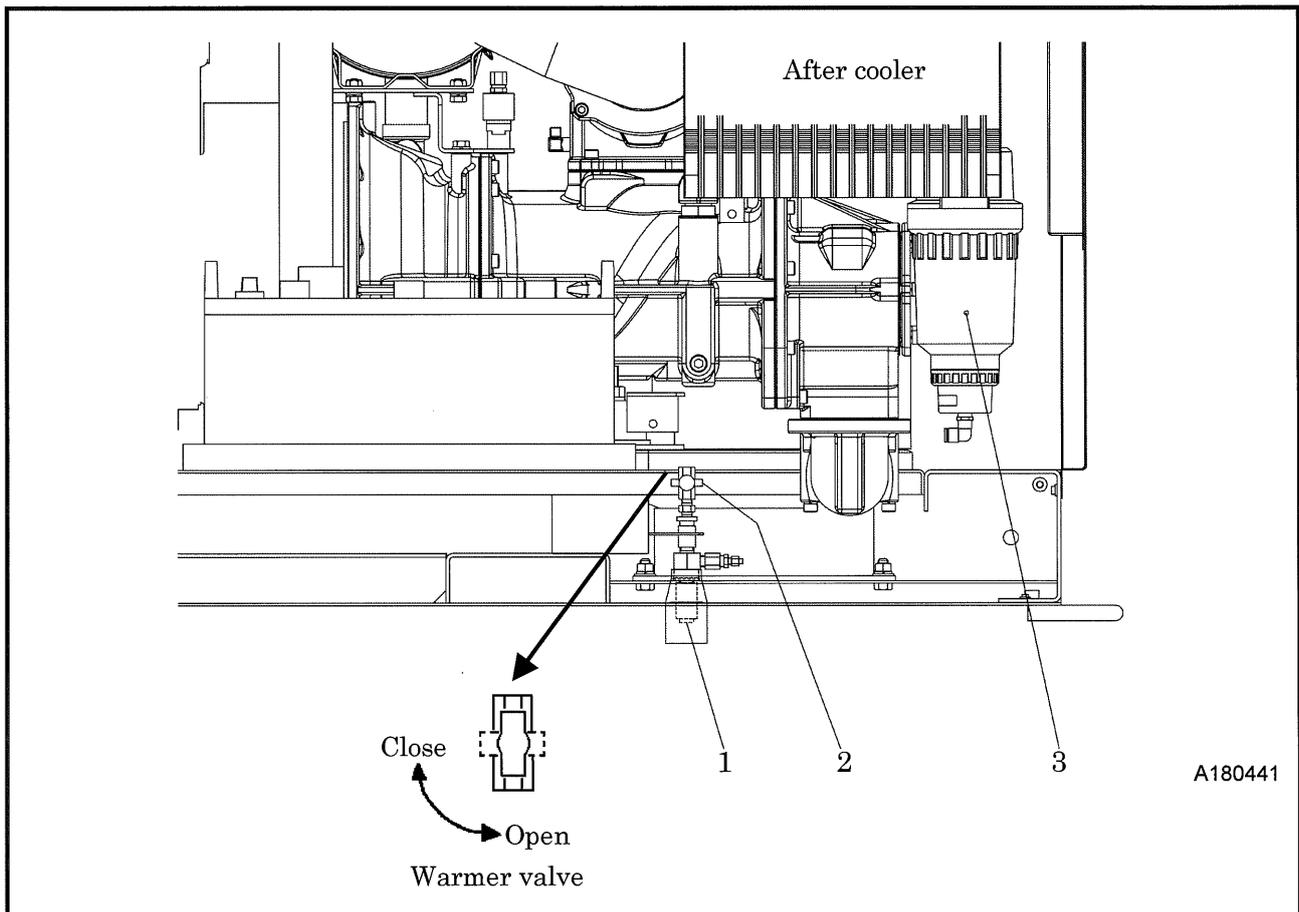
3.5.1 Draining after cooler

The condensed water drained from after-cooler contains a little bit of oil. So take care how to dispose of it.

[In case that any condensate is found in discharged air]

- Be sure to check air discharge from after cooler drain outlet when operating. If drain is found in discharged air, clean silencer [1] at outlet. If it is dirty, replace it.

When cleaning and replacing it, contact our office nearby or distributor because technical knowledge is required.



3.5.2 Drain warmer valve

The valve [2] is installed for drain antifreezing when discharging water separated at drain separator [3]. Be sure to use the valve with opened if ambient temperature is 41°F (5°C) or less.

If there is no risk of freezing, use the valve [2] with closed.

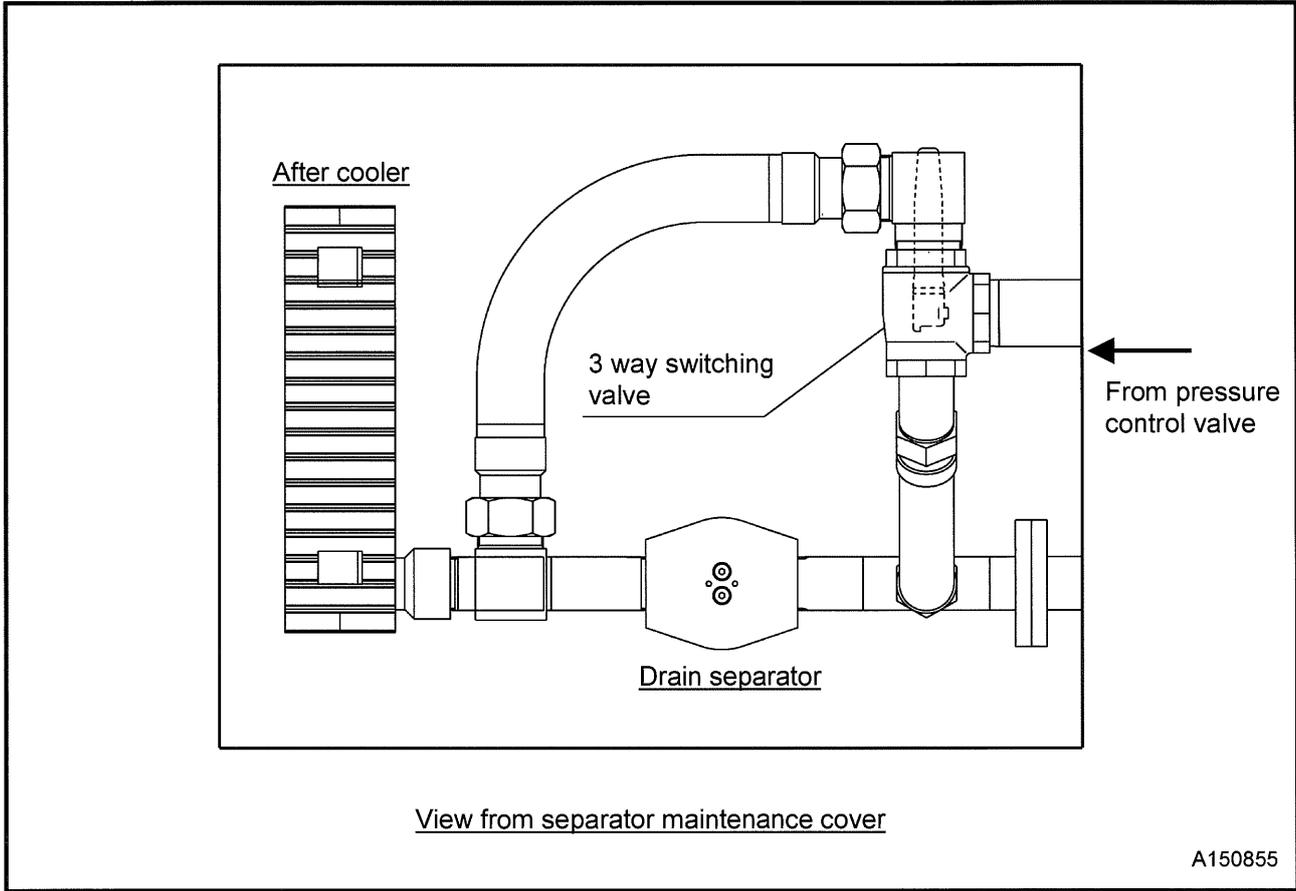
3.5.3 To prevent freezing

- If cease the operation and storage the machine under use environment in winter season, be sure to open the service valve 2 to 3 times in order to remove water droplet in air piping such as after-cooler before stoppage of engine.

3.Operation

3.5.4 Selection of service air

Switch the 3-way switching valve and you can use low or normal temperature air to meet your use.

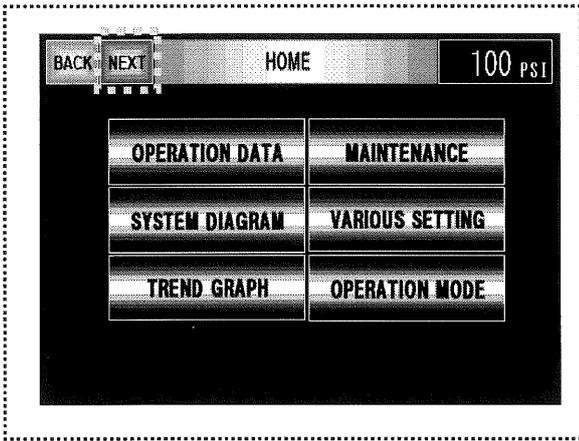


Service air Operation	Low temperature air	Normal temperature air
3 way switching valve	<p>To after cooler</p>	<p>To service valve</p>

3.Operation

3.6 SETTING screen

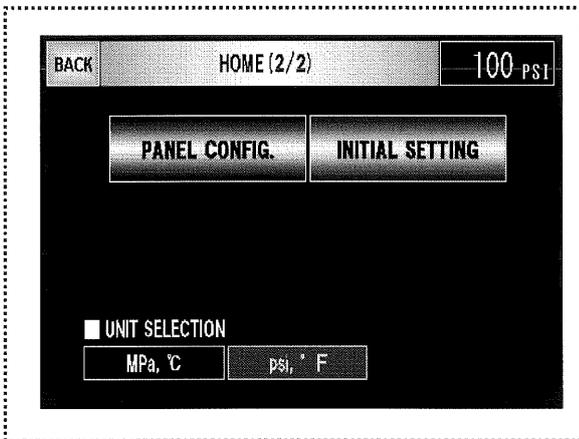
<HOME SCREEN-1/2>



- Operating condition, running parameters, and various other settings and be can be read and changed here.
- Select “NEXT” on “HOME” screen-1/2 to show “HOME” screen-2/2.



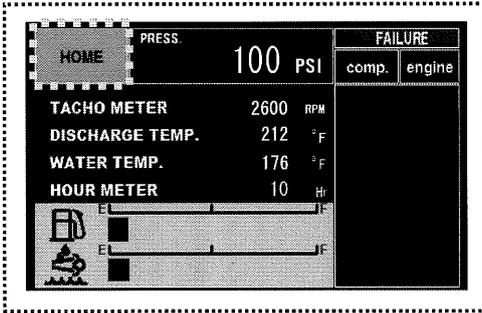
<HOME SCREEN-2/2>



3.Operation

3.6.1 OPERATION DATA

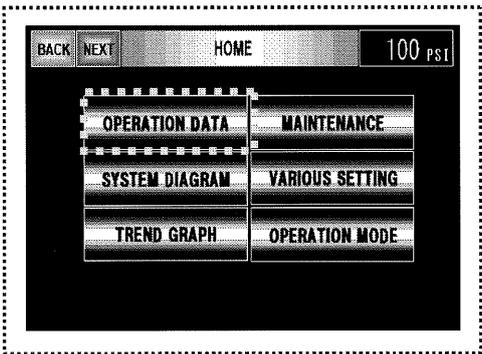
<MAIN SCREEN>



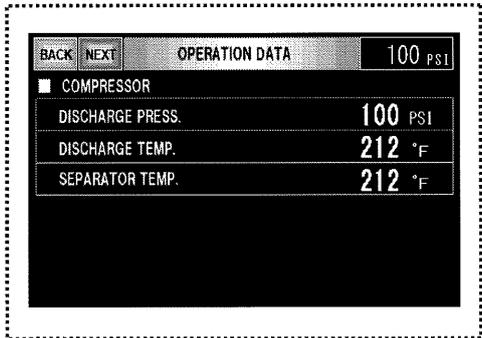
<Procedure>

1. Press "HOME" on "MAIN" screen.
2. Select "OPERATION DATA".
3. Current operating parameters are displayed.

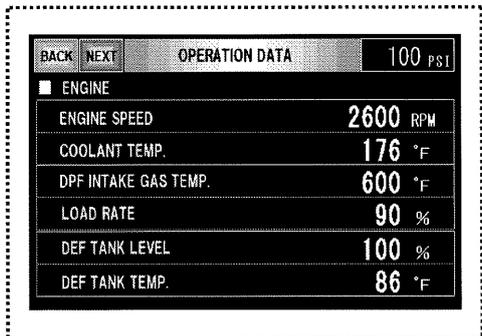
<HOME SCREEN-1/2>



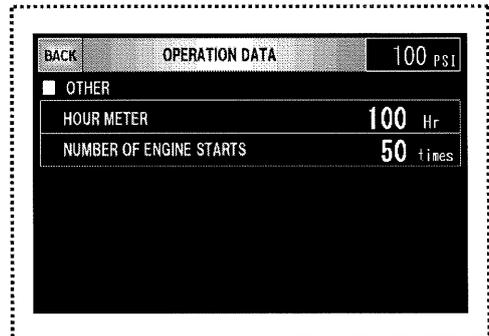
<OPERATION DATA-1/3>



<OPERATION DATA-2/3>



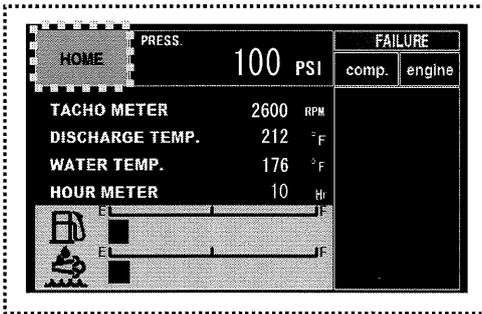
<OPERATION DATA-3/3>



3. Operation

3.6.2 SYSTEM DIAGRAM

<MAIN SCREEN>

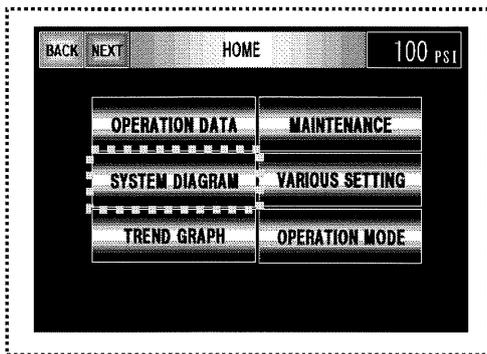


<Procedure>

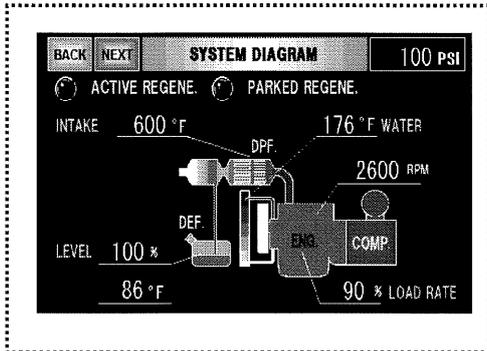
1. Press "HOME" on "MAIN" screen.
2. Select "SYSTEM DIAGRAM"
3. Current operating parameters are displayed.



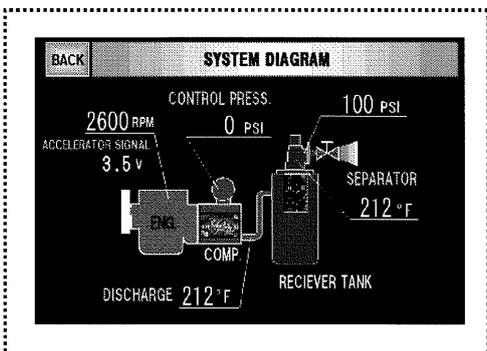
<HOME SCREEN-1/2>



<SYSTEM DIAGRAM-1/2> (For ENGINE)



<SYSTEM DIAGRAM-2/2> (For COMPRESSOR)



3.Operation

3.6.3 Timing and temp. adjustment

Depending on the weather and circumstances, you can change the timings for start-up and cooldown of the unit here, as well as initial discharge temperature.

<MAIN SCREEN>

HOME	PRESS	100 PSI	FAILURE	
			comp.	engine
TACHO METER	2600	RPM		
DISCHARGE TEMP.	212	°F		
WATER TEMP.	176	°F		
HOUR METER	10	Hr		

<Procedure>

1. Press "HOME" on "MAIN" screen.
 2. Select "VARIOUS SETTING".
 3. "VARIOUS SETTING" screen is displayed.
- Touch any of the settings and a numerical keypad will be displayed. Input the values required within range.

<HOME SCREEN-1/2>

BACK	NEXT	HOME	100 PSI
OPERATION DATA		MAINTENANCE	
SYSTEM DIAGRAM		VARIOUS SETTING	
TREND GRAPH		OPERATION MODE	

<VARIOUS SETTING>

BACK	VARIOUS SETTING	100 PSI
COOLING OPERATION TIME (60.0 ~ 600.0)	180	SEC
STARTING OPERATION TIME (30.0 ~ 300.0)	120	SEC
STARTING OPERATION DIS. TEMP.	140	°F

<SETTING>

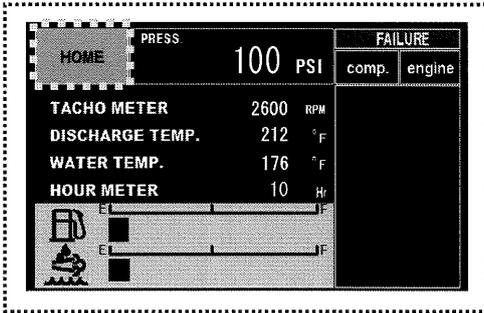
- COOLING OPERATION TIME 180sec
- STARTING OPERATION TIME 120sec
- STARTING OPERATION DIS.TEMP. 140°F

3.Operation

3.6.4 MAINTENANCE

The Maintenance alarm schedule for major items can be set at the user's discretion.

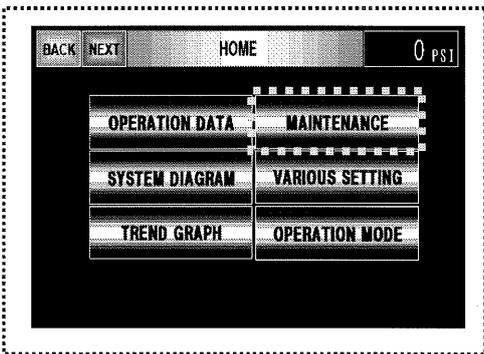
<MAIN SCREEN>



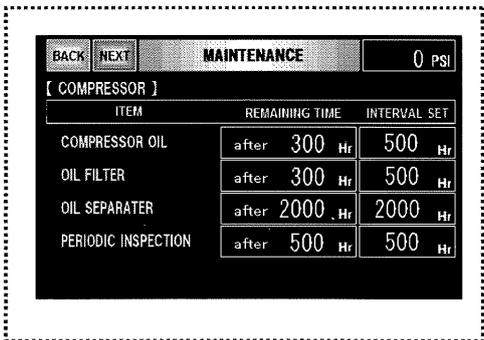
<Procedure>

1. Select "MAINTENANCE".
 2. "MAINTENANCE" screen is displayed.
 3. Press "NEXT" to show engine items.
 4. Touching any value will display a number pad.
 5. Touching any value will display a number pad.
- No maintenance alarm will be displayed if the scheduled time is set to [0].

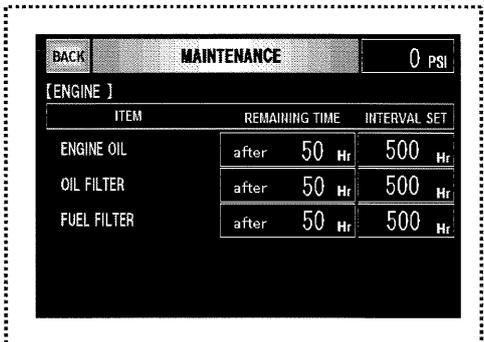
<HOME SCREEN-1/2>



<MAINTENANCE-1/2> [COMPRESSOR]



<MAINTENANCE-2/2> [ENGINE]



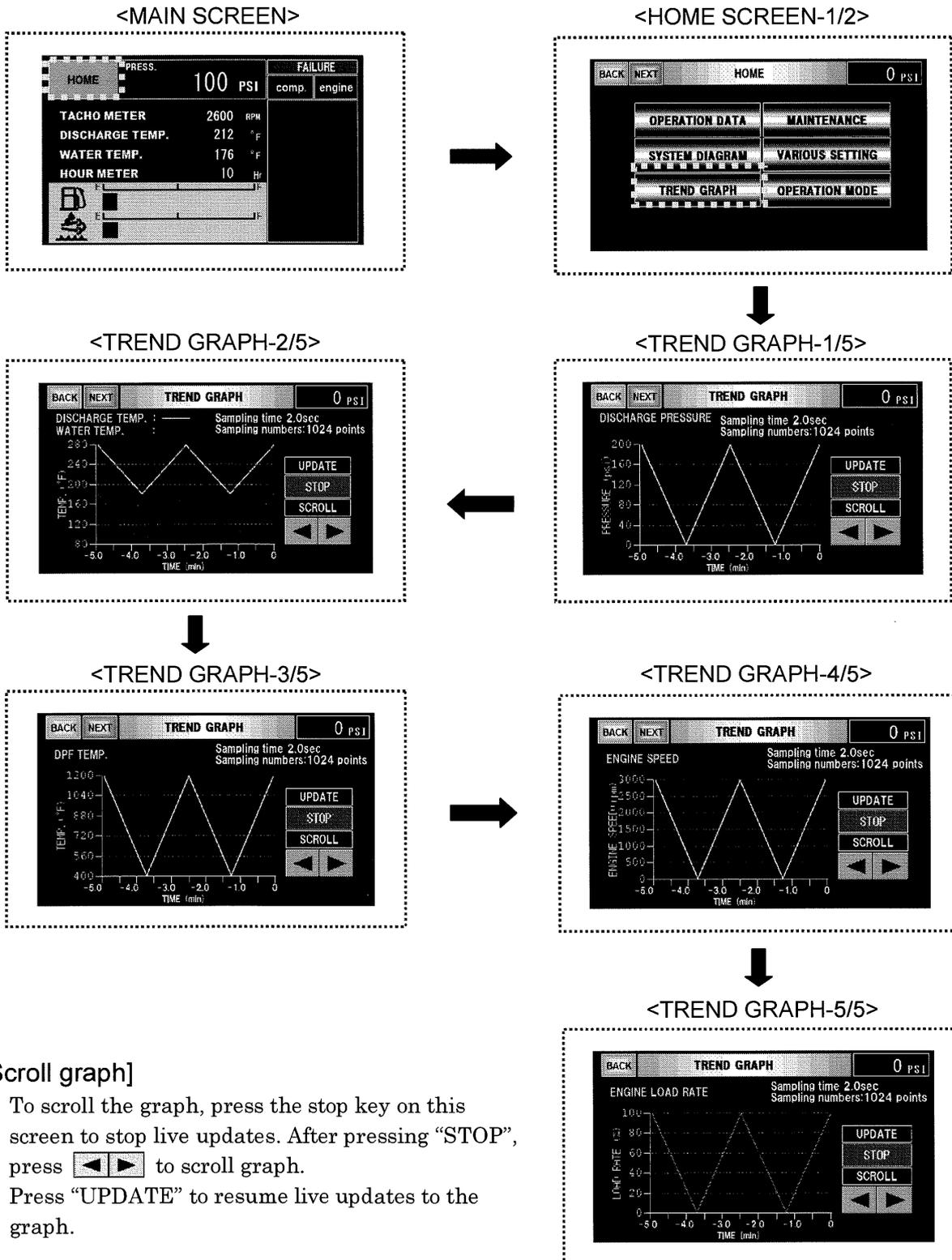
3.Operation

3.6.5 Log

The operating log for the unit can be read on this screen.

[Trend graph]

- Select "TREND GRAPH" on "HOME" screen-1/2 to show "TREND GRAPH" screen-1/5.
(Sampling interval is every 2 seconds, log time is up to 40 minutes.)
- Press "NEXT" to show graphs of each items.



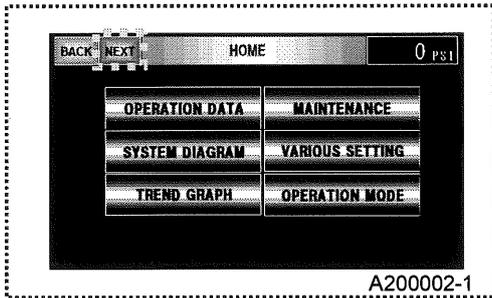
[Scroll graph]

- To scroll the graph, press the stop key on this screen to stop live updates. After pressing "STOP", press to scroll graph.
- Press "UPDATE" to resume live updates to the graph.

3. Operation

3.6.6 PANEL CONFIG.

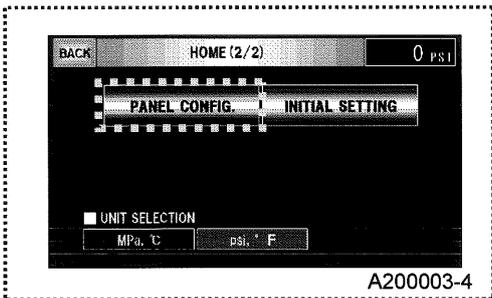
<HOME SCREEN-1/2>



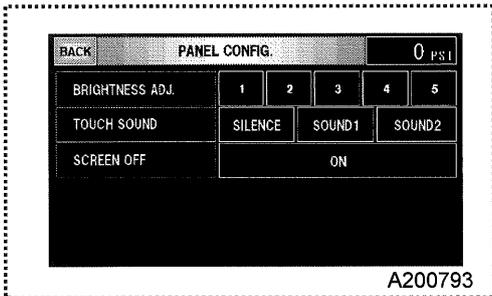
<Procedure>

1. Select "NEXT" on "HOME" screen-1/2 to show "HOME" screen-2/2.
2. Select "PANEL CONFIG."
3. "PANEL CONFIG." screen is displayed, and you can adjust the brightness, select the touch sound, and set whether to turn off the screen.

<HOME SCREEN-2/2>



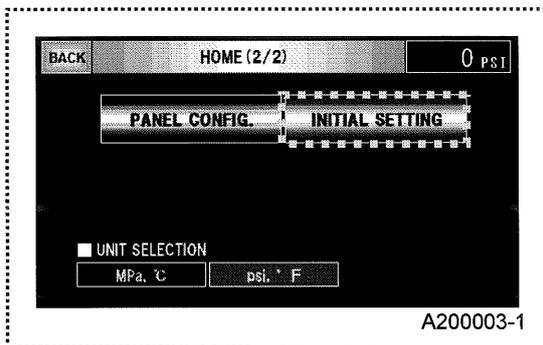
<PANEL CONFIG.>



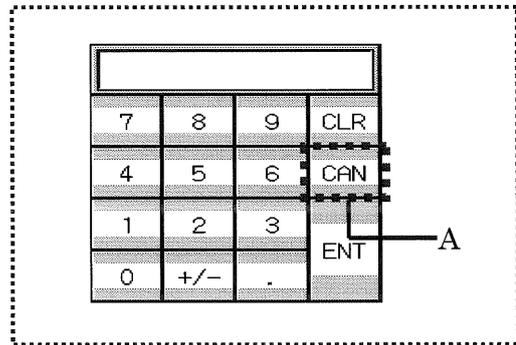
3.6.7 INITIAL SETTING

- The "INITIAL SETTING" section on the "HOME" screen-2/2 is to restore the unit to factory settings. It is not required during normal operation. If pressed by mistake, a password input may appear to confirm you wish to reset the machine. To exit this screen, press the "CAN" button [A] to cancel.

<HOME SCREEN-2/2>



<PASSWORD INPUT SCREEN>



3. Operation

3.7 DPF regeneration

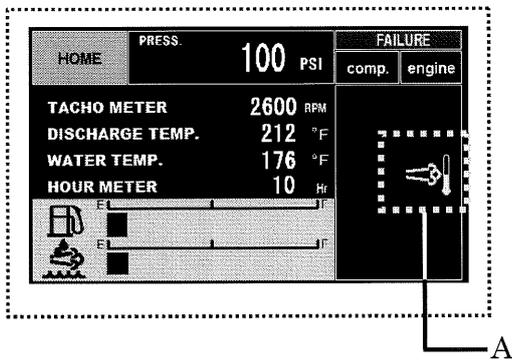
- The engine will make a revving sound when starting and stopping the regeneration process. This is normal and is from the adjustment of the air intake throttle and EGR on the engine.
- Exhaust gas may smell different from regular diesel during regeneration, which is normal.

 <p>WARNING</p>	<ul style="list-style-type: none">● During regeneration, the exhaust gases reach temperatures hot enough to cause burns to people, or ignite and melt other materials. During regeneration the area above and immediately surrounding the engine should be free of any possibly flammable objects.
---	--

3.7.1 Natural regeneration

- When the engine is operated under high loads, exhaust gas temperature is hot enough to burn off soot accumulated in the DPF without entering a regeneration state.

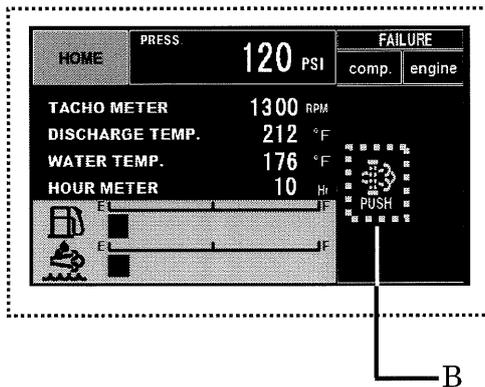
3.7.2 Automatic regeneration



- Exhaust temperatures are increased periodically to perform automatic regeneration to avoid soot accumulation in the DPF.
- The unit can still be operated normally during this type of regeneration.
- A high exhaust system temperature indicator [A] will be displayed onscreen when the exhaust gas temperature is above 842°F (450°C).
- If the engine regeneration intervals are consistently shorter than 5 hours, change the engine oil. Contact a service center if this condition continues after changing the oil.

3.Operation

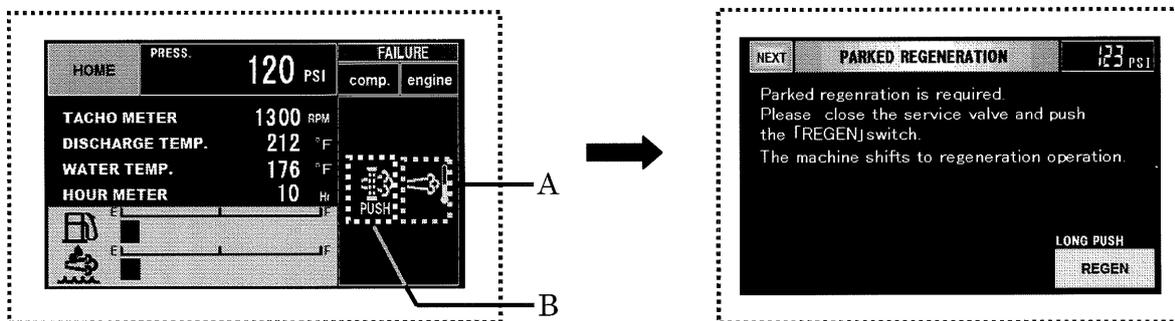
3.7.3 Manual regeneration



- The exhaust temperature may not reach temperatures hot enough to burn soot during operation in cold weather or under low loads. If the unit is operated under low load or in cold weather for an extended time, a DPF indicator [B] will be displayed. Immediately take action and being a Manual Regeneration by following steps below.

<Procedure>

1. Stop any ongoing work and close the service valve.
2. Select "SYSTEM DIAGRAM" on the "HOME" screen-1/2 and make sure that the water temperature is above 158°F (70°C)
- If the water temperature is below 158°F (70°C), let the unit warm up until the water temperature will be above 158°F (70°C).
3. Press DPF indicator [B] on the "MAIN" screen.
4. "PARKED REGENERATION" screen will be displayed.



5. Hold the "REGEN" button to start manual regeneration. High Exhaust System Temperature (HEST) indicator [A] will be ON.
- ※ It is normal for engine speed to vary while performing a manual regeneration.
- Regeneration will take anywhere from 15 to 30 minutes.
 - If the exhaust temperature is higher during regeneration, the High Exhaust System Temperature (HEST) indicator [A] will be ON.
 - The DPF indicator [B] will be cleared once the manual regeneration is completed.
 - When finished, the unit will return to an unloaded state and be ready for normal operation.



- Do not stop the engine during the manual regeneration.
- Only begin manual regeneration after the engine is warmed up. If the water temp is not enough high enough the unit will cancel the manual regeneration, as it may only further clog the DPF if performed cold.

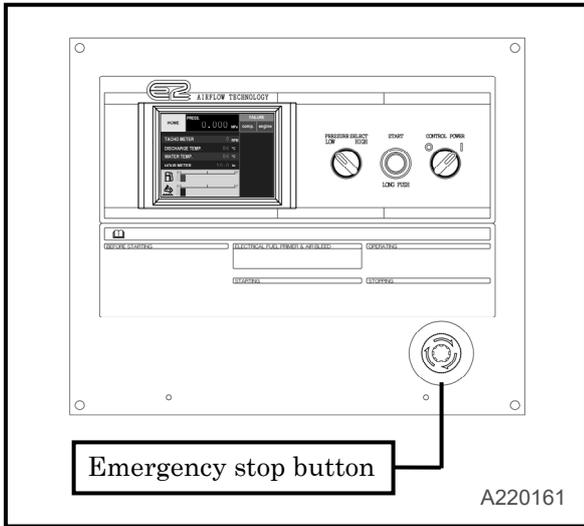


- If the DPF indicator is ON, take immediate action to perform the manual regeneration. Failure to do so could result in damage to the DPF or fire in the exhaust system.

3.Operation

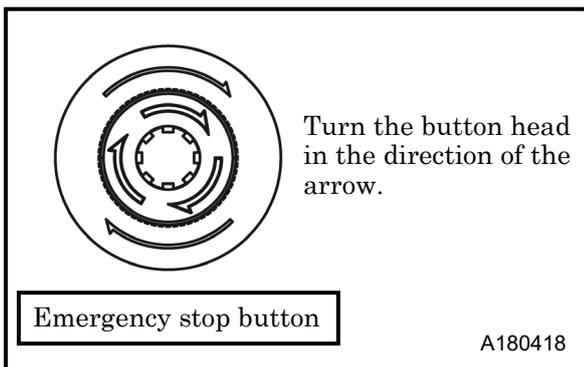
3.8 Emergency Stop

3.8.1 Emergency stopping procedures



- If it is necessary to stop the machine for emergency, press the Emergency Stop button which set up under part of the operation panel. When doing shut down by emergency stop button, the machine will be stopped immediately.

3.8.2 Reset the emergency stop button



- After emergency stopping, be sure to carry out an investigation of the cause you made stop and the countermeasure, release emergency stop button after making sure the safety was confirmed. To reset the button, turn the button head in the direction of the arrow.

※If it is not reset, the machine cannot restart to operate.

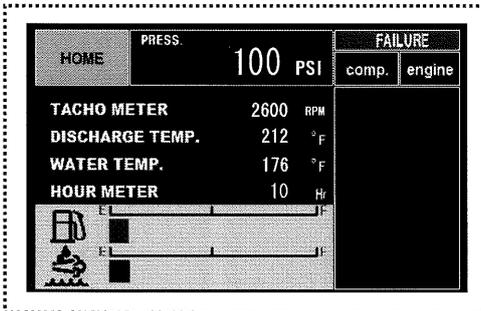
4 Failure cause and measures

4.1 Warning / Emergency display

4.1.1 Warning / Emergency

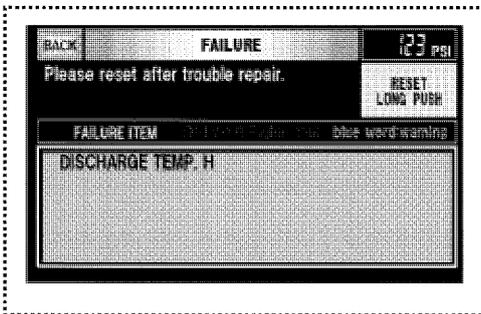
Alarm display.

<MAIN SCREEN>



- When an alert or fault occurs, an indicator will blink.
Touch the icon for more details.

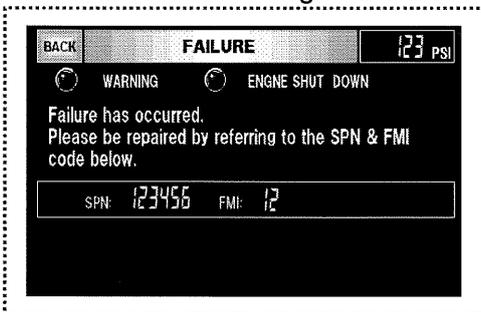
<FAILURE comp.>



[COMP. button blinking]

- Press “comp.” to display more detail on the error.
(Refer to 4-2 and 4-3.)
- After clearing the cause of the error, press and hold the “RESET” button to clear the alert.

<FAILURE engine>



[ENGINE button blinking]

- Press “engine” to display diagnostic code(s).
If necessary, contact the nearest dealer for diagnosis and repair.

4 Failure cause and measures

4.1.2 Indicator lamp and Warning / Emergency display

[Indicator lamp] Turn the CONTROL POWER switch to  position. Then the lamp goes on.

Item	Contents	Measures	Monitor
Glow	When the unit is switched on, the preheat indicator will be displayed briefly during preheating.	—	
Charge	The battery indicator will be displayed when it is not being charged.	Check wiring. Check alternator.	

[Warning display] This displays such trouble of less importance when it occurs during operation, but the unit continues operating. When any abnormality happens, a trouble button flickers. In this time when trouble button is pressed, a failure code will be displayed.

Display	Contents	Measures
DISCHARGE TEMP.H	Displayed when the air temperature at the outlet of the air-end reaches PDS400,PDSF375: 239°F (115°C) / PDSG310: 257°F (125°C).	See 4.2 “Troubleshooting”
ENGINE WATER TEMP.H	Displayed when coolant temperature reaches 212°F (100°C).	
COMP.AIR FILTER CLOGGING	Displayed when air filter gets clogged and suction resistance increases. [Actuating resistance is more than 0.9PSI.]	Clean/Change
ENGINE AIR FILTER CLOGGING		
ENGINE CHARGE DEFECT	Belt loosened and/or cut Faulty generation of alternator	Check/Change
SEPARATOR TEMP.H	Displayed when the air temperature at the outlet of the separator reaches PDS400,PDSF375: 239°F (115°C) / PDSG310: 257°F (125°C).	See 4.2 “Troubleshooting”

4 Failure cause and measures

[Emergency display] When any trouble takes place during operation, this displays and it stops as an emergency stop.

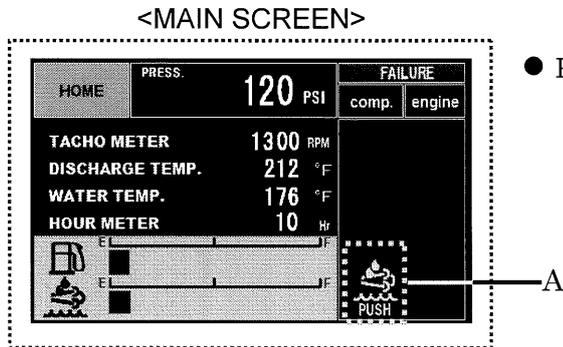
When any abnormality happens, a trouble button flickers. In this time when trouble button is pressed, a failure code will be displayed.

Display	Contents	Measures
DISCHARGE TEMP.HH	Displayed when the air temperature at the outlet of the air-end reaches PDS400,PDSF375: 248°F (120°C) / PDSG310: 266°F (130°C).	See 4.2 "Troubleshooting"
ENGINE WATER TEMP.HH	Displayed when coolant temperature reaches 221°F (105°C).	
ENGINE OIL PRESSURE DOWN	Displayed when engine oil pressure drops. [The function pressure: 14PSI.]	
SEPARATOR TEMP.HH	Displayed when the air temperature at the outlet of the separator reaches PDS400,PDSF375: 248°F (120°C) / PDSG310: 266°F (130°C).	
ENGINE SPEED DOWN	Displayed when engine revolution speed is slow down. [Operation speed: less than PDS400,PDSF375: 1,000min ⁻¹ / PDSG310: 1,150min ⁻¹]	
DISCHARGE TEMP.SENSOR	Displayed when the air temperature sensor at the outlet port of compressor air end is disconnected.	
SEPARATOR TEMP.SENSOR DISCONNECTION	Displayed when the separator outlet air temperature sensor is disconnected.	

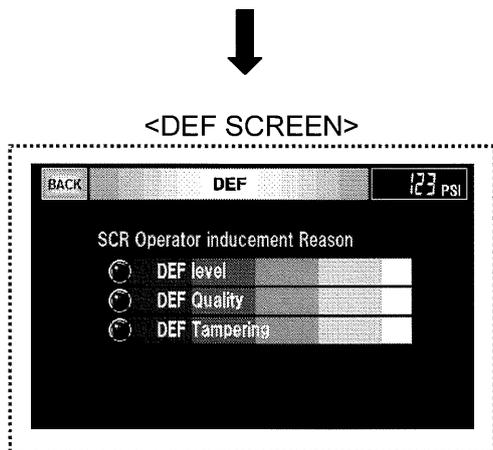
4 Failure cause and measures

4.1.3 SCR inducement

If SCR system error occurs, SCR malfunction indicator [A] will blink. Check for the cause of the error and take appropriate action. If no action taken, after 3 hours 15 minutes the engine will begin derating and become unable to keep running.



- Press the indicator [A] to see cause of the failure.



- When DEF Level blinks, refill DEF and confirm the lamp is inactive.
- When DEF Quality blinks, replace DEF.
- When the DEF Tampering indicator blinks, check the DEF injection system and sensors.



- Stop the engine immediately when the indicators above blink, and contact the nearest service center.

4 Failure cause and measures

4.2 Troubleshooting

If any trouble occurs during operation, do not leave it. Investigate the cause and take appropriate measures.

Read the manual carefully and fully understand what to do in case of trouble.

- The better you understand the construction and function of the machine, the faster you can find a problem and solution.
- This chapter describes the symptom, cause and countermeasures of important troubles in detail:

4.2.1 Compressor

Symptom	Cause	Countermeasures
Low starter revolution speed.	(1)Faulty battery. (2)Failure of battery charging (3)Failure of alternator (4)Failure of starter] Check battery → Charge Change Change
The starter rotates normally but the engine does not start.	(1)Fuel filter clogging. (2)Clogging of fuel pre-filter (3)No fuel (4)Air entry into fuel line system (5)Nozzle clogging	Disassemble, clean, and change Disassemble, clean, and change Fuel replenishment Bleed the air Disassemble/Clean
The discharge air pressure will not rise.	(1)Pressure regulator insufficient adjustment. (2)Trouble of solenoid valve for starting unloader	Re-adjust (Fasten) Change
The engine does not reach the rated revolution speed.	(1)Faulty engine controller (2)Clogging of the unloader orifice (3)Trouble of emergency controller (4)Engine trouble. (5)Fuel filter clogging	Call your nearest dealer Disassemble/Clean Call your nearest dealer Call your nearest dealer Disassemble/Change
If the discharge pressure will not increase to the specified one, RPM will drop.	(1)Pressure regulator insufficient adjustment. (2)Trouble of pressure regulator (3)Clogging of the unloader orifice.	Re-adjust (Fasten) Change Disassemble/Check
Engine does not reach minimum revolution at unload.	(1)Faulty engine controller (2)Trouble of emergency controller	Call your nearest dealer Call your nearest dealer
Safety valve relieves at unload.	(1)Pressure regulator insufficient adjustment. (2)Unloader valve damaged/Faulty seat (3)Faulty safety valve	Re-adjust (loosen) Call your nearest dealer Change
Oil mixes in air. (poor oil separation)	(1)Scavenging orifice strainer clogging (2)Excessive oil in separator receiver tank (3)Low discharge pressure (4)Oil separator deteriorated	Disassemble/Clean Drain to its proper level Disassemble and check of pressure control valve Check/Change
Water found mixed in air. (Condensate separation malfunctioned.) For after-cooler type only	(1)Clogging of silencer at after cooler drain outlet (2)Inside of piping between drain separator and silencer clogged with dust	Disassemble/Clean/Change Disassemble/Clean

4 Failure cause and measures

Symptom	Cause	Countermeasures
Insufficient free air delivery.	(1)Air filter element clogging (2)Unloader valve cannot fully open (3)Engine does not reach rated speed	Clean or change of element Call your nearest dealer Call your nearest dealer
It is indicated that engine oil pressure is abnormal, and engine stops.	(1)Engine oil shortage (2)Engine oil filter clogging (3)Faulty oil pressure sensor (4)Loose wiring, connectors and disconnection.	Replenish oil Change Change Check/Fasten
High water temp. warning/shutdown	(1)Radiator clogging (2)Faulty thermostat (3)Faulty coolant temperature sensor (4)Low coolant level (5)Belt slippage (6)Loose wiring, connectors and disconnection.	Clean Change Change Replenish Re-adjust tension Check/Fasten
Discharge air temp. sensor or separator temp. sensor are disconnected, cause the engine to shutdown	(1)Coolant temperature sensor is disconnected. (2)Separator outlet air temperature sensor is disconnected.	Repair/Change Repair/Change
High separator temp shutdown.	(1)Oil cooler clogging (2)Oil filter clogging (3)The discharge air temperature sensor is defective (4)Loosened or disconnected wiring or connector (5)Belt slippage (6)Shortage of compressor oil (7)Malfunction of by-pass valve (8)discharge air temperature sensor is disconnected (9)Separator clogging (Separator outlet air temperature alarm. Displayed only during irregular conditions.)	Clean Change Disassemble/Check Check/Fasten Re-adjust tension Replenish oil Check/Change Repair/Change Change
It is indicated that engine speed down is abnormal, and engine stops.	(1)Malfunction controller. (2)Loose wiring connectors and disconnection (3)Shortage of feeding fuel caused due to fuel filter and feed pump strainer clogging. (4)Air mixed in fuel line system (5)Output reduction due to clogged engine air filter	Change Check/Retighten Replace filter and/or clean the strainer Bleed the air Clean and/or replace air filter

- Contact our office nearby or distributor if you find it difficult to repair by yourselves.
- Refer to the engine operation manual for trouble concerning the engine.

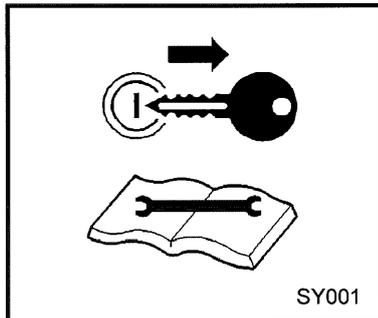
5.Periodic inspection/Maintenance

5.1 Important Items at Periodic Inspection and Maintenance or after Maintenance

The following table shows the inspection and maintenance intervals under normal operation conditions. When used or operated under hard environmental conditions, it is impossible to warrant the unit even if the above conditions are performed according to the intervals listed in the above table.

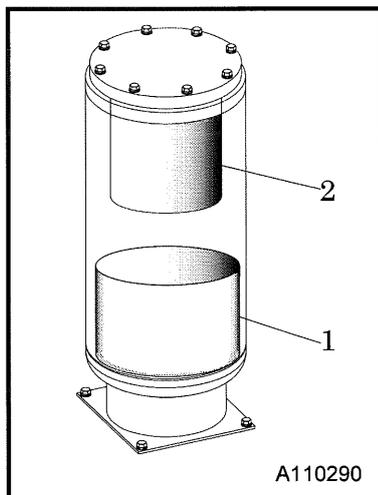
- Please wear protection implements, such as a helmet, protection glasses, earplugs, safety shoes, a glove, and a protection-against-dust mask, according to the contents of work for safety.
- Do not touch hot portions of the machine while inspecting the machine when running. Such parts as engine, exhaust manifold, exhaust pipe, muffler, radiator, oil cooler, air-end, pipe, separator receiver tank, and discharging pipe are especially hot, so never touch those parts, because it could cause serious burns.

Hang a "Now Checking and under Maintenance" tag



- Remove the starter key from the starter switch before starting inspection, and hang up a "Now Checking and under Maintenance" tag where it can be easily seen. The checker must keep the key during checking and maintenance.
- Remove the negative (-) side cable from the battery. If the above procedure is neglected, and another person starts operating the machine during check or maintenance, it could cause serious injury.

Prevention of oil separator from catching fire



- Be sure to perform following periodic inspection and maintenance:
 1. Check and change compressor oil quantity
 2. Change oil separator

5.Periodic inspection/Maintenance

Directions: Prohibition of any other jobs or works than directed herein

IMPORTANT

- Be sure to use recommended fuel, DEP, oil, grease, and antifreeze.
- Do not disassemble or adjust engine, compressor air-end or part(s) for which inspection or maintenance is not referred to in this manual.
- Use genuine parts for replacement.
- Any breakdown, caused by using unapproved parts or by wrong handling, will be out of the scope of "WARRANTY".
- Keep the electrical components away from water or steam.
- Waste from machines contains harmful material. Do not dispose of such harmful fluids to the ground, rivers, lakes or ponds, and sea. It contaminates the environment.
- When draining waste fluid from machines, use leak proof containers to hold such fluids from machine.
- Be sure to follow the designated regulations when disposing of oil, fuel, coolant, filters, battery and other harmful things.

5.2 Inspection on Separator Receiver Tank

Periodic inspection of separator receiver tank

IMPORTANT

- Be sure to carry out the following cleaning and inspection of the separator receiver tank at least once every year.
<Place to check>
 - (1) Any damage found on the tank.
 - (2) Any excessive wear found in the fastening bolts on the cover.
 - (3) Any damage found to pipes and valves etc.

5.Periodic inspection/Maintenance

5.3 Periodic Inspection List

(Unit:Hour)

Maintenance	Daily	250	300	500	1,000	2,000	3,000	6,000	12,000	Page
Compressor	Check compressor oil level.	○								3-7
	Drain separator receiver tank.	○								3-7
	Check for looseness in pipe connecting part, and wear and tear of pipe.	○								3-10
	Check oil, water, fuel and air leak.	○								3-17
	Check functions of all instruments and devices.	○								3-17
	Check and clean clogging of air filter element.		○							5-9
	Change compressor oil.			○ First time	○					5-10
	Change compressor oil filter element			○ First time	○					5-11
	Change air filter element				○					5-11
	Clean strainer in the scavenging orifice.				○					5-12
	Clean outside of the oil cooler.					○				5-14
	Clean outside of the after cooler. (After cooler type)					○				5-15
	Check and clean drain outlet port of after cooler. (After cooler type)					※1 ○				5-15
	Change oil separator.						●			5-17
	Change nylon tubes.						☆●			5-18
	Change rubber hoses.						☆●			5-18
	Change O-ring of unloader.							★●		5-19
	Check and change the unloader bushing.					※2 ○		★●		5-19
	Change pressure regulator							★●		5-19
	Check consumable parts of auto-relief valve.							★●		5-19
	Check consumable parts of vacuum-relief valve.							★●		5-19
	Performance check of pressure control valve								●	5-20
	Check and change O-ring and piston of pressure control valve.								★●	5-20
	Change rubber coupling.							● Every 3 years		5-21
	Change oil seal/bearing.								●	5-21
	Change solenoid valve.								●	5-21
Change touchscreen battery							● Every 4 years		5-21	

Such items marked ○ shall be carried out by customers. For the items marked ●, contact our office nearby or distributor because technical knowledge is required.

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

Regarding the item marked ※2,check the function of the unloader. In case the unloader malfunctions, change O-ring or bushing of unloader. This is because either of both parts may be worn out.

※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. Also for the same reason, the parts marked ★ should be replaced every 3 years.

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

※The above intervals of inspection and maintenance are respectively based on 1,000 hours of use per year.

5.Periodic inspection/Maintenance

◎Refer to engine operation manual for inspection and maintenance of an engine.
For the details, contact our office nearby or distributor.

(Unit:Hour)

Maintenance		Daily	50	250	500	1,000	2,000	3,000	6,000	Page	
Engine related	Check engine oil level.	○								3-5	
	Check coolant level.	○								3-6	
	Check fuel	○								3-8	
	Drain fuel tank.	○								3-8	
	Check DEF level.	○								3-9	
	Check sedimenter for condensate.	○								3-10	
	Check looseness in pipe connectors, terminals and tear in wiring.	○								3-10	
	Check belt tension.	○								3-11	
	Change engine oil.		○ First time			○					5-6
	Change engine oil filter element.		○ First time			○					5-7
	Check battery electrolyte.				○						5-7
	Check and clean clogging of air filter element.				○						5-9
	Check specific gravity of battery electrolyte					○					5-7
	Change air filter element.					○					5-11
	Change of fuel filter element.					○					5-12
	Change of fuel pre-filter element.					○					5-12
	Clean of element in sedimenter					○					5-13
	Check for crack and leak on the exhaust flexible pipe					○					5-14
	Clean inside of radiator.					●					5-13
	Clean outside of the radiator.						○				5-14
	Change coolant						☆○				5-16
	Clean inside of fuel tank.							●			5-18
Change fuel hose.							☆●			5-18	
Change radiator hoses.								☆●		5-19	
Change wiring harness.									●	5-19	

※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. Also for the same reason, the parts marked ★ should be replaced every 3 years.

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

※The above intervals of inspection and maintenance are respectively based on 1,000 hours of use per year.

Maintenance		1,500	3,000	Page	Remarks
Engine body	Change of breather filter element	○		5-15	
	Change DEF pump filter		●	5-18	See engine manual for more details.
	Check DEF hoses		●	5-19	See engine manual for more details.

5.Periodic inspection/Maintenance

5.4 Periodic Replacement of Parts

Part number changes upon modification.

For replacement of parts, make sure whether the part number is correct or applicable.

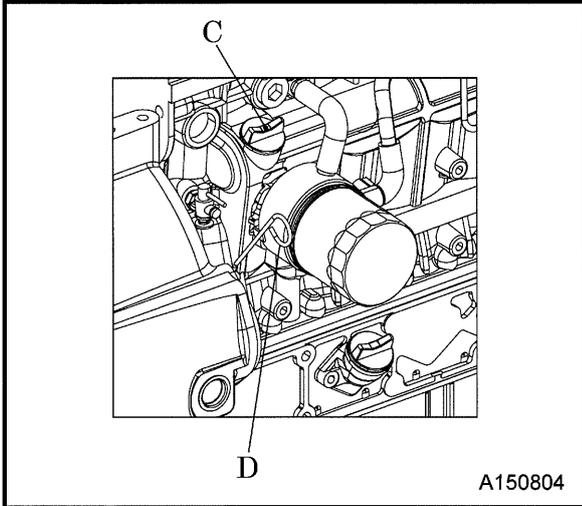
Part Name		Part Number			Quantity
		PDS400S,SC -6E1	PDSF375DP,DPC -6E1	PDSG310DP -6E1	
Engine oil filter element		KUBOTA 1C020-32434	←	←	1
Air filter element for compressor air-end	Element [C]	32143 12500	←	←	1
Air filter element for engine side	Element [D]	32143 12800	←	←	1
Compressor oil filter element		37438 05601	←	37438 10100	1
Fuel filter element		KUBOTA 1K947-43172	←	←	1
Fuel pre-filter element	Element	KUBOTA 16631-43560	←	←	1
	O-ring	KUBOTA 16541-43330	←	←	1
Element in sedimenter	Element [E]	KUBOTA RD451-51940	←	←	1
	O-ring [F] (For element)	KUBOTA 04817-00160	←	←	1
	O-ring [G] (For body)	KUBOTA RD451-51930	←	←	1
Solenoid valve for starting unload		46811 30000	←	46811 32400	1
Solenoid valve for pressure switching		-	46811 31700	←	1
Solenoid valve for unloader spring chamber		46811 31800	←	←	1
Oil separator	Separator [A]	34220 16501	←	←	1
	Gasket [B]	34235 06000	←	←	1
	Gasket [C]	34235 06100	←	←	1
Pressure control valve	O-ring [A]	03402 15080	←	←	1
	O-ring [B]	21441 03700	←	←	1
	Teflon ring [C]	22505 03300	←	←	1
	Piston [D]	35303 10500	←	←	1
High pressure regulator		36400 24100	←	36400 12300	1
Low pressure regulator		-	36400 24100	←	1
Belt		KUBOTA 1K861-9701-0	←	←	1
Breather filter element (With O-ring)		KUBOTA 1J508-05812	←	←	1
Filter assy		KUBOTA 1J508-1966-0	←	←	1

5.Periodic inspection/Maintenance

5.5 Maintenance Items

5.5.1 Change engine oil

At 50 hours for the first change and at every 500 hours thereafter

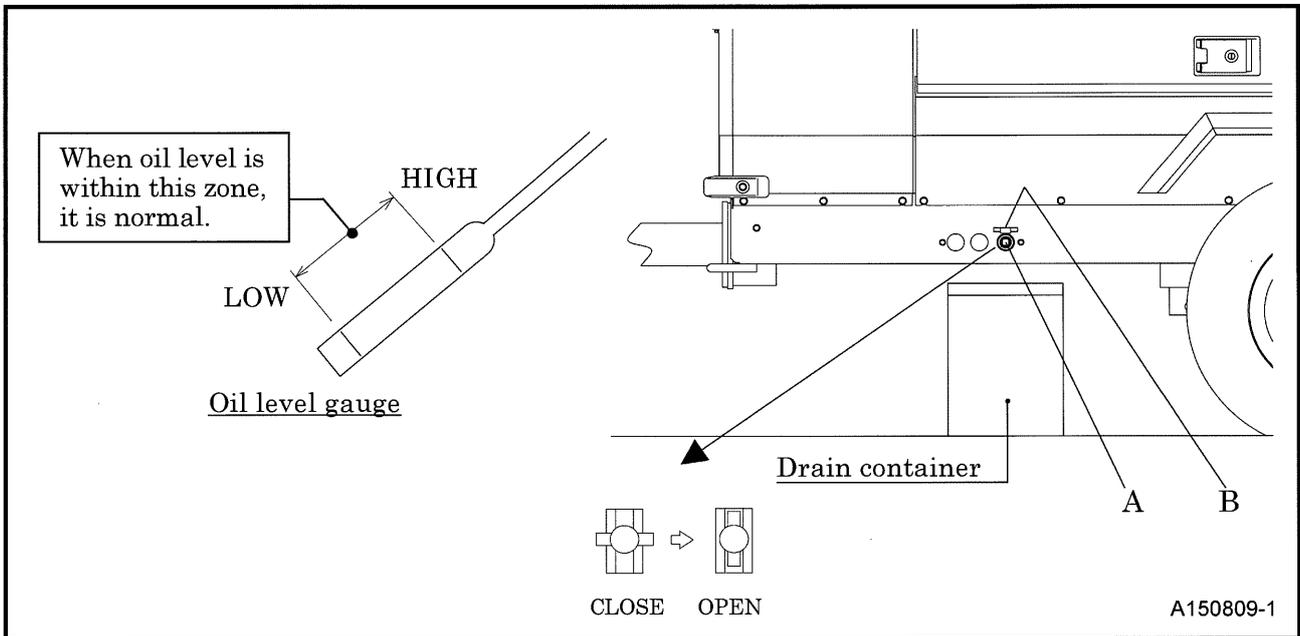


<Procedure>

1. Remove the drain plug [A], open a drain valve [B], and discharge engine oil drain.
2. After drainage of used engine oil has been completed, close drain plug [A] and drain valve [B], and supply new engine oil through the oil filler port [C] which is used as oil level gauge also.

[Quantity of oil : approx. 3.4gal.(13L)]

3. After supplying oil, pull out the oil level gauge [D] and wipe it out.
4. Then, re-insert the oil level gauge [D] fully and pull it out again. If the dipstick shows the oil level between LOW and HIGH, it is normal.
5. As you finish refilling, make sure to close filler port [C] and to firmly reinsert oil level gauge [D].



Caution in filling or discharging engine oil

CAUTION

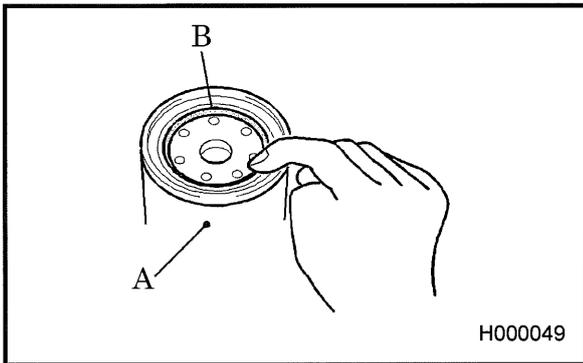


- After stopping the engine, wait for 10 to 20 minutes until the engine oil cools off. Then check the level of the engine oil, or refill or drain the oil.
- Engine oil is very hot and highly pressurized during or just after the operation. Hot oil could blow out of the tank and can cause scalding.
- Never supply more engine oil than the proper level. Too much oil could cause white smoke out of the exhaust, and it can cause damage and accident to engine.

5.Periodic inspection/Maintenance

5.5.2 Change engine oil filter element

At 50 hours for the first change and at every 500 hours thereafter



<Procedure>

1. Remove the oil filter element [A], using a filter wrench.
2. Screw in the new oil filter element [A] with the gasket [B] coated slightly with oil.
(For part number, See 5.4)
3. After the packing touches the sealing face, tighten another 1 times with a filter wrench.
4. After installing the oil filter element, check it for any leak during operation.

5.5.3 Check battery electrolyte and specific gravity of battery electrolyte

Battery electrolyte: every 250 hours

Specific gravity of battery electrolyte: every 500 hours

If there seems to be a problem in starting an engine due to a flat battery, carry out the checks by following the procedures below:

● Ordinary type battery:

Check battery electrolyte level and if the level is not within the specified level, add distilled water.

Measure specific gravity of battery electrolyte, and if it shows below 1.24, recharge the battery immediately.

Refer to 5.5.4 for method of specific gravity measurement and recharging the battery.

● Enclosed type battery:

Check the indicator on top surface of the battery.

If the indicator shows that charge is needed, recharge the battery immediately.

If specific gravity of battery electrolyte does not rise in spite of replenishing distilled water or charging battery, be sure to replace battery with new one quickly.

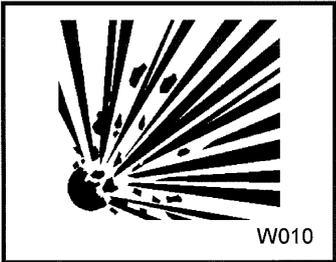
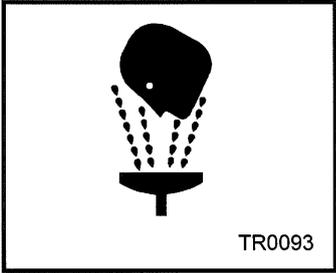
5.Periodic inspection/Maintenance

5.5.4 Maintenance of Battery

Battery may generate hydrogen gas and may explode.

Therefore, recharging should be done at a well-ventilated place.

- Do not check the battery by short-circuiting the positive and negative terminals with a metallic piece.
- Never operate the machine nor charge the batteries with the battery liquid level being kept lower than the lower level. Continuing operation at this lower level will cause deterioration of such parts as pole plates etc., and also it may cause explosion as well as reduction of battery life. Add distilled water so that the liquid level may reach the middle level between the "UPPER LEVEL" and "LOWER LEVEL" without any delay.
- Wear protective gloves and safety glasses when handling a battery.
 - When such battery electrolyte contacts your clothes or skin, wash it away with large amount of water immediately.
 - If the battery electrolyte gets into your eyes, wash it away immediately with plenty of water and see a doctor at once, because it is feared that eyesight might be lost.

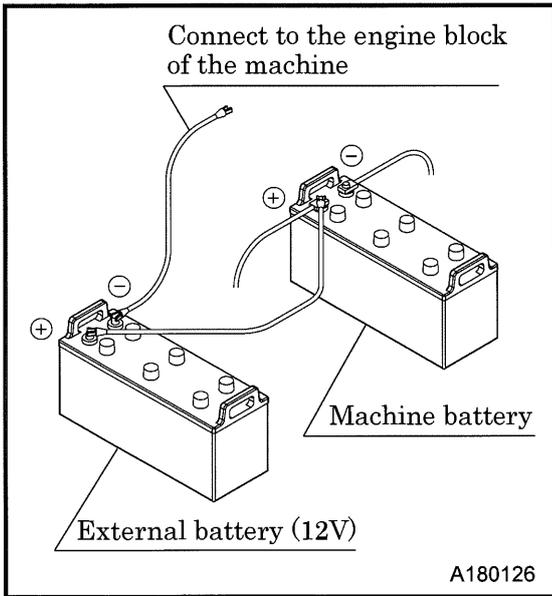
 WARNING	 D004	<h3>Handling battery</h3> <ul style="list-style-type: none">● Keep flames away from battery.● Do not spark near the battery nor light a match, nor bring lit cigarette and match close to the battery.● Do not charge the frozen battery. Otherwise it may explode. If the battery is frozen, warm it up until the battery temperature becomes 61°F to 86°F (16°C to 30°C).● Battery electrolyte is dilute sulfuric acid. In case of mishandling, it could cause skin burning.● Dispose of battery, observing local regulations.
	 W010	
	 TR0093	

[Charge battery]

- Use the battery charger after make sure to confirm whether it's fulfill a condition with the battery you charge.
- Disconnect the cable between battery and the machine, and charge the battery with a 12V battery charger. Do not charge two batteries at the same time.
- Be sure not to connect (+) and (-) terminals backwards.

5.Periodic inspection/Maintenance

[How to use booster cable]



<Procedure for using a booster cable>

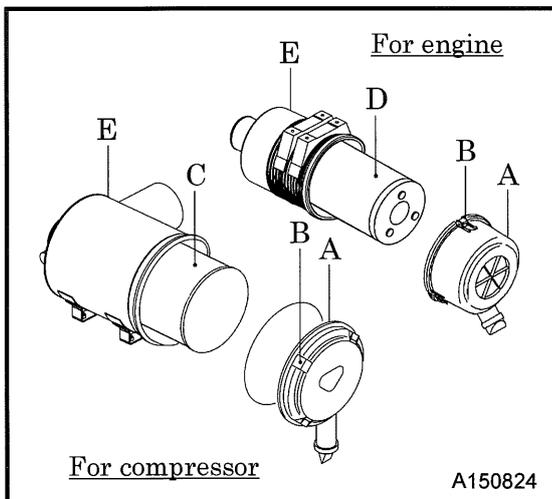
1. Stop the engine.
2. Connect one end of the (+) booster cable to the (+) terminal of the machine battery.
3. Connect the other end of the (+) booster cable to the (+) terminal of the external battery.
4. Connect one end of the (-) booster cable to the (-) terminal of the external battery.
5. Connect the other end of the (-) booster cable to the engine block of the machine.
6. Start up the engine.
7. Disconnect the booster cable by following the procedure back in the reverse order.

CAUTION

- When a booster cable has to be used or when cables are connected again after an battery is replaced, be careful not to connect (+) and (-) terminals backwards. Such wrong-connection will cause spark and damage to each component.

5.5.5 Check and clean clogging of air filter element

Every 250 hours



<Procedure>

1. Loosen the cap fix latch [B] at cap [A], then remove cap and clean inside.
 2. Remove the element [C] & [D], and clean it.
 3. When putting the cap after cleaning, push it into case [E] with your hand and fasten it after checking the hook of cap fix latch is set to case.
- If the element is found heavily dusty, replace it with a new one. **(For part number, See 5.4)**

IMPORTANT

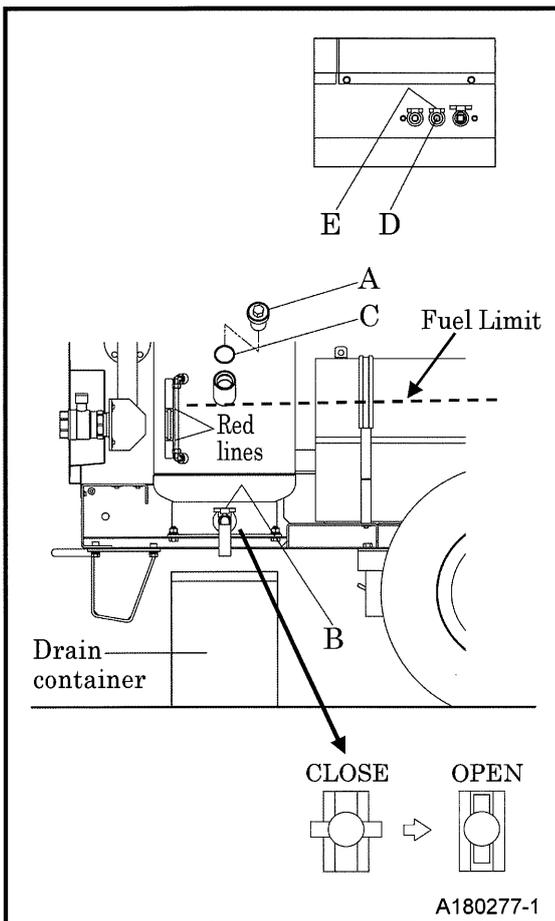
- When an element that is clogged or has holes or cracks is used, dust or foreign material will get in the engine. This causes accelerated wear in each sliding part of the engine. Be sure to make daily check and cleaning so that the life of the engine will not be shortened.

5.Periodic inspection/Maintenance

5.5.6 Change compressor oil

At 300 hours for the first change and at every 500 hours thereafter

- For prevention of fire caused due to deteriorated oil separator, in principle change of compressor oil is to be performed in accordance with the schedule mentioned in the regular maintenance table. However, it is heavily influenced by operation conditions and environmental conditions. If it has been found more dirty and corrupted, it should be changed.
- If machine is continuously operated in such bad conditions, it could damage bearings and degraded oil sticks oil separator to cause accumulated oxidation heat of reaction to lead oil separator fire. For this reason, regular maintenance work should be done surely and perfectly.
- Conduct changing compressor oil after checking machine stoppage for about 2-3 minutes and dropping pressure of separator receiver tank to zero.



<Procedures>

1. After the machine has stopped and pressure inside the separator receiver tank has been completely released as much time passed, remove the oil filler cap [A] and open the drain valve [B] to drain the residual oil. Further, open the drain valve [E] after removing oil cooler drain plug [D] and drain the oil accumulated in the cooler.
2. After draining compressor oil, surely retighten drain valve [B] and [E].
3. Fill the tank with new compressor oil up to the height indicated by the dotted line (Fuel Limit). Then, close filler cap [A]. Inspect O-ring [C] of filler cap [A]. and replace it with a new one if any hardening or damage is found.
4. After starting operation, check and confirm that oil level is within red lines of oil level gauge.
5. Repeat the process 1 to 4 if oil level is out of red lines range.

Quantity of oil between the red lines	Approx.1.3gal.(5L)
Quantity of change oil	Approx.10.6gal.(40L)

IMPORTANT

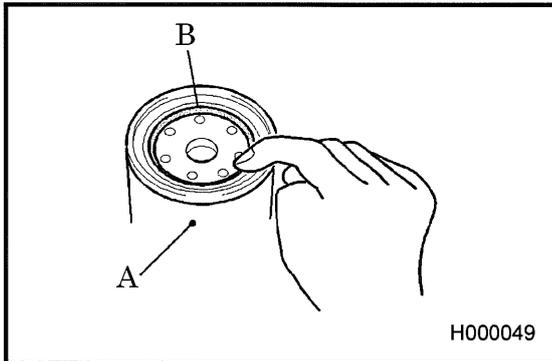
- Mixture of different brands compressor oil could cause an increase of viscosity and make compressor oil sticky. In the worst case, it could cause sticking trouble of compressor air-end "Compressor air-end will not turn". Also repairing of such air-end needs expensive cost. Therefore, be sure to avoid mixing different brands oil. In case compressor oil brand in use has to be unavoidably changed, it is absolutely necessary to completely clean up the interior of compressor air-end. In such a case, contact "AIRMAN" dealer or us directly.
- Follow the designated regulations to dispose of compressor oil.

5.Periodic inspection/Maintenance

5.5.7 Change compressor oil filter element

At 300 hours for the first change and every 500 hours thereafter

Be sure to use genuine filter element.



<Procedure>

1. Remove the oil filter element [A], using a filter wrench.
2. Screw in the new oil filter element [A] with the packing [B] coated slightly with oil.
(For part number, See 5.4)
3. After the packing touches the sealing face, tighten another 1/2 to 3/4 turn with a filter wrench.
4. After installing the oil filter element, check it for any leak during operation.

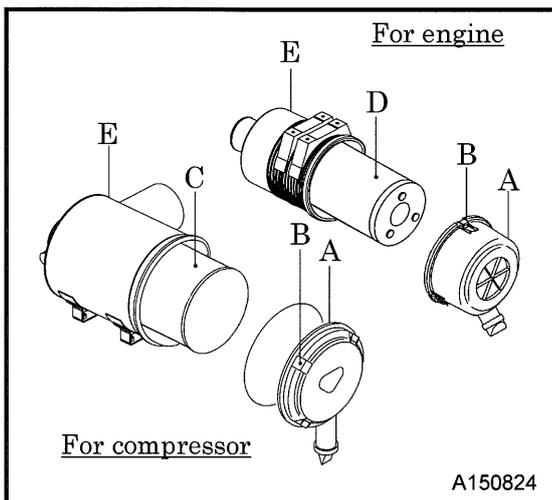
IMPORTANT

- Poor quality oil filter elements do not trap dust sufficiently and will cause damage to the bearings in a short period. Be sure to use genuine parts.

5.5.8 Change air filter element

Every 500 hours

Be sure to use genuine air filter element.



<Procedure>

1. Loosen the cap fix latch [B] at cap [A], then remove cap and clean inside.
 2. Remove element [C] & [D] and replace it with new one.
(For part number, See 5.4)
 3. When putting cap after replacing, push it into case [E] with your hand and fasten it after checking the hook of cap fix latch is set to case.
- When used or operated under bad conditions, it is better to remove all the elements, check them, clean them and replace them earlier before the intervals listed in maintenance table, if they are found difficult to be repaired.

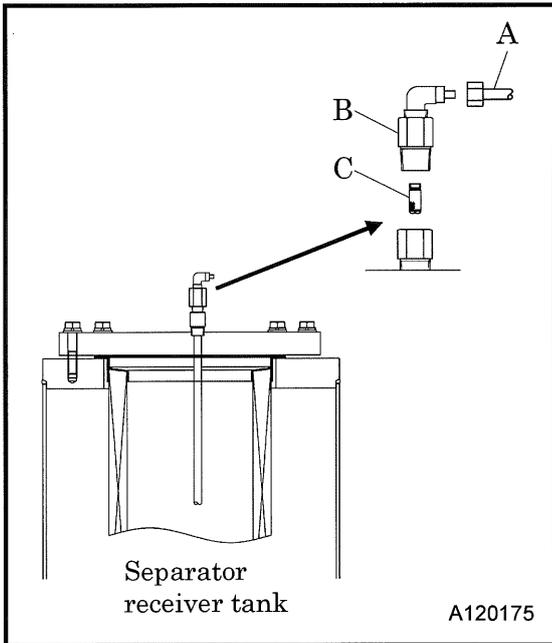
IMPORTANT

- Air filter is an important part which is crucial to machine's performance and life. Be sure to use genuine parts.

5.Periodic inspection/Maintenance

5.5.9 Clean strainer in the scavenging orifice

Every 500 hours

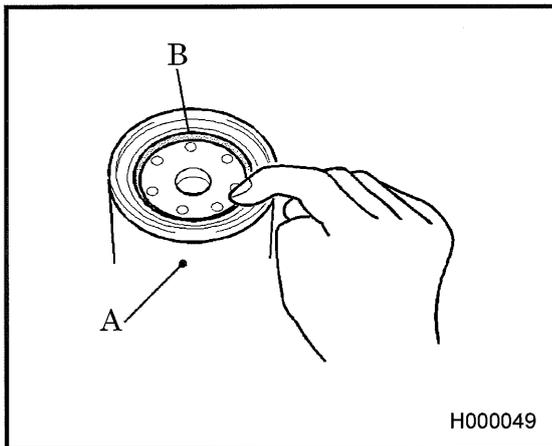


<Procedure>

1. Remove the pipe [A], using a spanner.
2. First remove the bushing [B].
3. Then remove the strainer [C]
4. Wash the removed strainer in diesel oil and blow out "dust" by air blowing.
5. After finishing the cleaning, install the strainer again in the reverse procedure.

5.5.10 Change of fuel filter and fuel pre-filter element

Every 500 hours



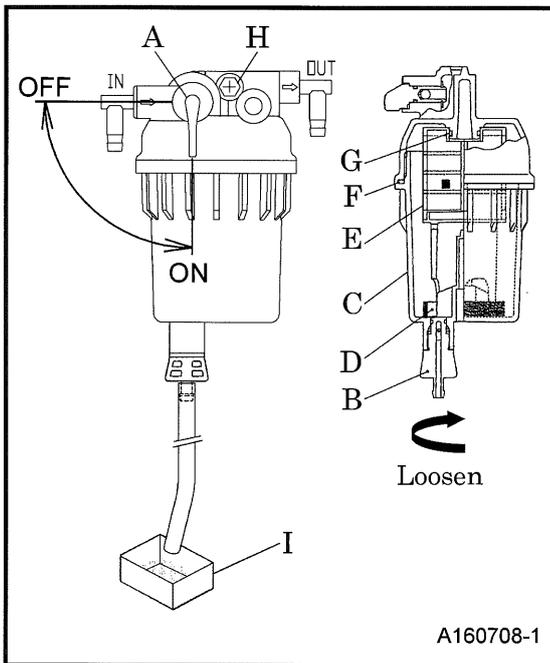
<Procedure>

1. Remove the filter element [A], using a filter wrench.
 2. Spread a thin film of oil on a packing [B] of a new filter and screw it in.
(For part number, See 5.4)
 3. After the packing touches the sealing face, tighten it by turning 2/3 times using a filter wrench.
 4. Bleed the air from the fuel. **(See 3.4.8)**
 5. After installing a fuel filter element in position, be sure to check for oil leakage during operation.
- For details of replacement, refer to the engine operation manual.

5.Periodic inspection/Maintenance

5.5.11 Clean of element in sedimenter

Every 500 hours



<Procedure>

1. Turn fuel selector valve [A] to [OFF] position.
 2. Loosen the drain valve [B] and drain out condensed water inside.
 3. Turn the cup [C] to the left and remove it.
Be careful to remove the cup [C], because it is filled with fuel. Wipe out split fuel completely.
 4. Remove float [D] inside cup [C].
 5. Washing element [E] and the cup [C] inside with new fuel.
 6. Replace element [E] and O-ring [F], [G] if they are found broken or damaged. **(For part number, See 5.4)**
 7. After finishing clean, assemble it in reverse procedure.
- If air remains in the fuel line, set the CONTROL POWER switch to  position and release the air by loosening bolt [H].
 - Drain the condensate in container [I], and then dispose of condensate according to the designated regulations.

5.5.12 Clean inside of radiator

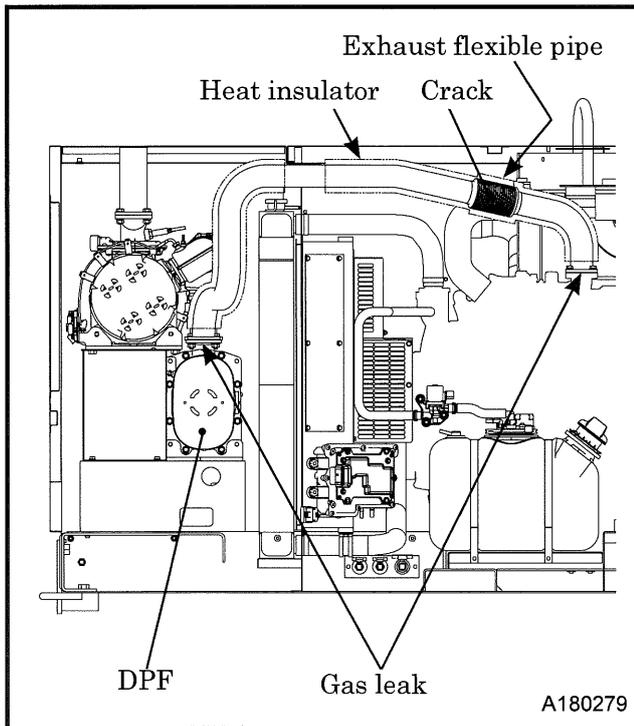
Every 500 hours

- When the inside of a radiator and water conduits of an engine are dirty with scale and rust, its cooling efficiency will be deteriorated. Clean the interiors of such components periodically.
- When cleaning it, contact directly us or distributor because it requires expert technical knowledge.

5.Periodic inspection/Maintenance

5.5.13 Check for cracks and leaks on the exhaust pipe

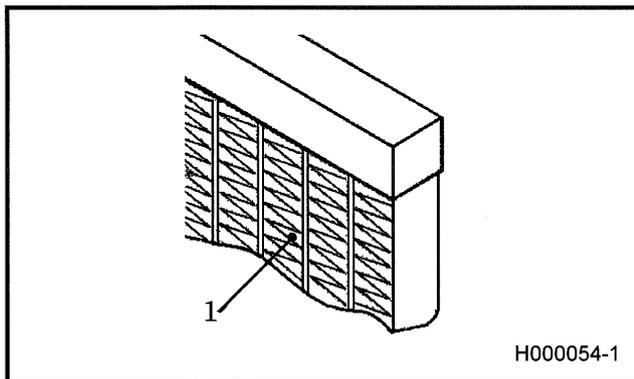
Every 500 hours



- Inspect the flexible pipes in the exhaust system for cracks or leaks etc.
- Remove any insulating material wrapped around pipes when performing inspection.
- If any leak is found, take care to avoid getting burned by exhaust gas.
- After finishing inspection, rewrap the insulation and tighten with with a clamp or belt.

5.5.14 Clean outside of the radiator · oil cooler

Every 1,000 hours



- When the fin tubes diaphragm [1], of a radiator, and an oil cooler are clogged with dust or other foreign materials, the heat exchange efficiency drops and this will raise coolant temperature and discharge air temperature. These tubes and fins should be cleaned depending on the state of clogged tubes diaphragm, even before maintenance schedule.
- Do not use a high pressure washer to protect fin tubes from being damaged.

5.Periodic inspection/Maintenance

5.5.15 Clean outside of the after cooler (After-cooler type)

Every 1,000 hours

- When the fin tubes of the after-cooler get clogged with dust and dirt, it can cause deterioration of the effectiveness of the heat exchanger to be lowered so that cold air cannot be produced. In order to prevent such trouble, clean them, depending the clogging conditions of the fin tubes, even before the scheduled periodic cleaning time.
- Do not use a high pressure washer, in order to protect the fin tubes from being damaged.

5.5.16 Check and clean drain outlet port of after cooler (After-cooler type)

Every 1,000 hours

See 3.5.1 for after cooler drain.

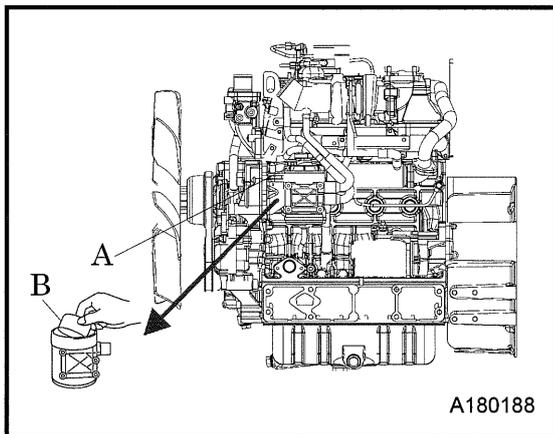
Cleaning it completely and keeping it cleaned

IMPORTANT

- When any water is found mixed in compressed air, silencer and air pipe could be clogged.
Periodically carry out inspection and cleaning of it.

5.5.17 Change of breather filter element

Every 1,500 hours



<Procedure>

1. Remove cap [A] of breather filter, and take out element [B] from inside.
2. Install brand new element [B] and firmly install the cap [A]. **(For part number, See 5.4)**

5.Periodic inspection/Maintenance

5.5.18 Change coolant

1,000 hours or every 2 years

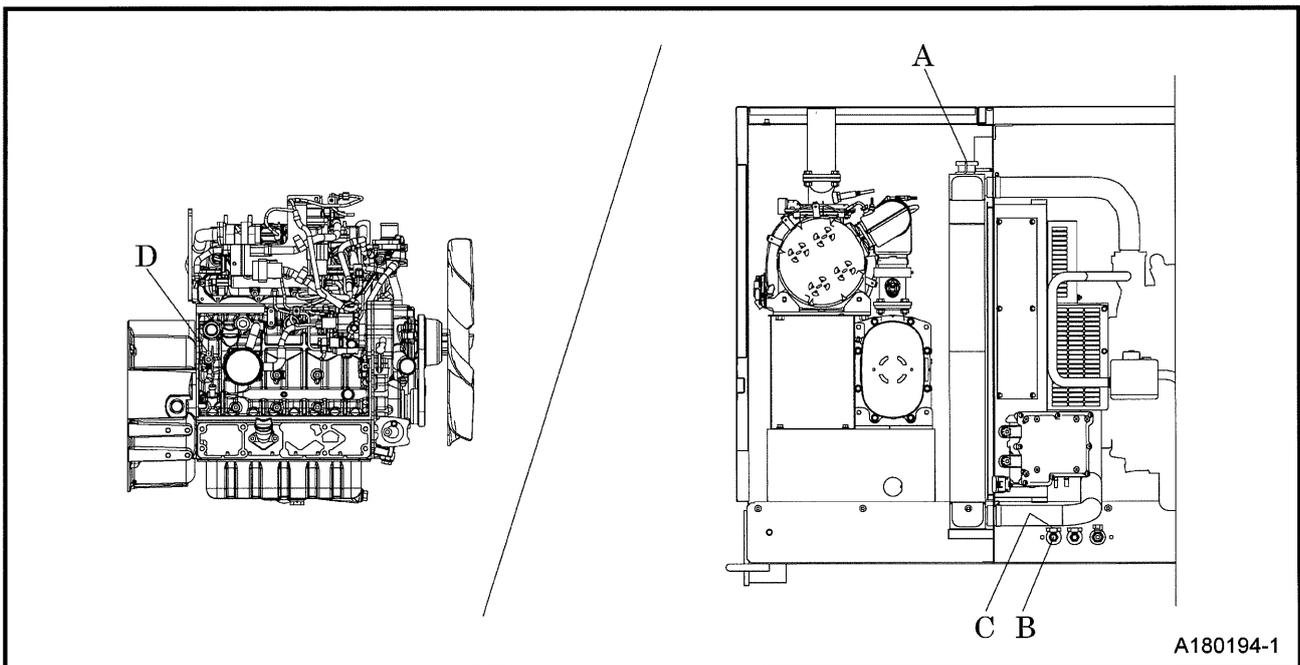
Be sure to stop the machine and loosen the radiator cap slowly after the coolant water is sufficiently cooled and the inner pressure is released, then take the cap off.

<Procedure>

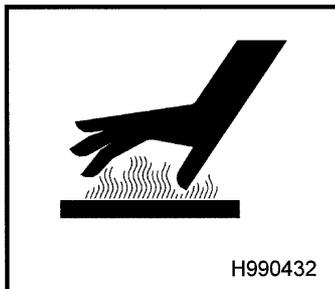
1. Remove radiator cap [A]. Then remove the drain plug [B] and open the valve [C] slowly.
2. Loosen the drain plug [D] provided on engine body to drain.
3. Drain coolant of reserve tank.
4. After draining, fasten drain valve [C] and fasten drain plug [D] of engine body, then replenish coolant from inlet (Be sure to replenish coolant to reserve tank).

[Quantity of water : approx. 4.1gal. (15.4L)]

5. After changing the coolant, operate the machine for 5 minutes at the unloaded condition and stop it. Then check the coolant level again, and replenish if it is short.



CAUTION



- When removing radiator cap, unfasten it to decrease internal pressure while unlocking first step. After checking internal pressure decreased, unfasten the radiator cap more until second step unlocked. If you fail to conduct these processes, it might causes blowing radiator cap by internal pressure or gushing hot scalding vapor.
- LLC (Antifreeze) is a toxic material.
- If it should be swallowed by mistake, it is necessary to see a doctor immediately instead of being sent out enforcedly.
- When a person gets LLC (Antifreeze) in his eyes, wash the eyes with clean running water and make him see a doctor immediately.
- When LLC (Antifreeze) is stored, put it in a container with an indication saying "LLC (Antifreeze) inside" and seal it up, then Keep it in a place away from children.
- Beware of flames.

5.Periodic inspection/Maintenance

5.5.19 Change oil separator

Every 2,000 hours

Even before the periodic interval time of replacement, replace the oil separator element whenever the oil consumption increases and also oil is found mixed in the discharge air. When replacing oil separator, contact directly us or distributor because it requires expert technical knowledge.

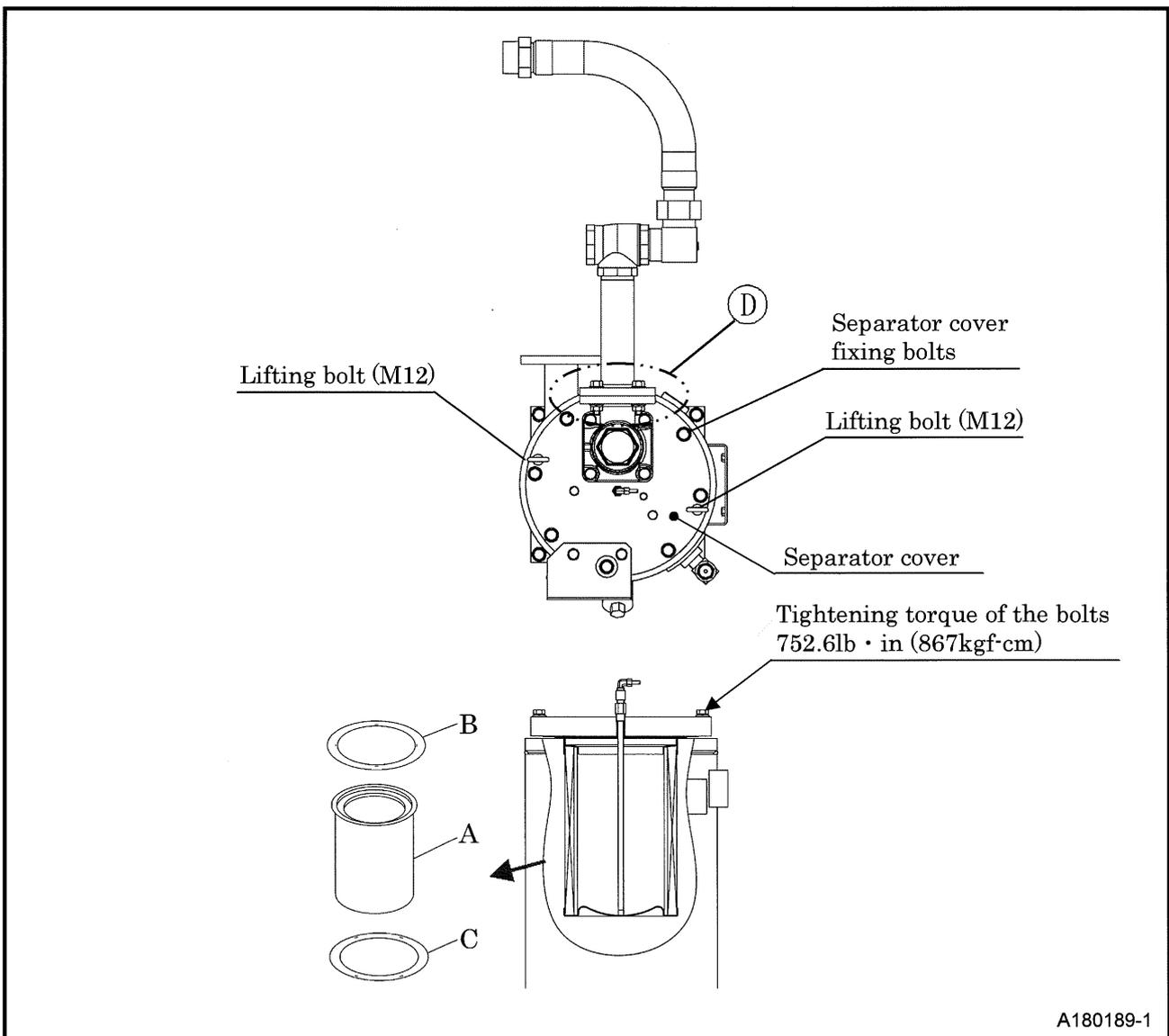
- When replacing oil separator [A], make sure to replace gasket [B]·[C] at the same time.

(For part number, See 5.4)

- The oil separator [A] is made from electrically conducting material in order to be anti-static. Also gaskets [B]·[C] is treated for conduction by using staplers. Make sure to use our genuine parts for replacement.

<Procedure>

1. In order to pull out the separator, remove the bolts (4 pieces) fixing the top cover on the separator cover.
2. Remove nylon tubes and copper pipes connected to the pipes and parts fitted on the separator cover, using a spanner.
3. At first remove the union joint (D) between separator outlet and air outlet.
4. Remove the fixing bolts (8 pcs.) of separator cover, using an impact wrench etc.
5. Screw two lifting eyebolts (M12) for the 2 threaded holes provided on the separator cover.
6. Hook rope to lifting bolts, and remove separator cover while lifting with crane. Then pull out the separator.



5.Periodic inspection/Maintenance

5.5.20 Clean inside of fuel tank

Every 2,000 hours

When cleaning inside of fuel tank it, contact our office nearby or distributor because technical knowledge is required.

5.5.21 Change nylon tubes

2,000 hours or every 2 years

Replace nylon tubes used for the oil and air piping's. When replacing it, contact our office nearby or distributor because technical knowledge is required.

5.5.22 Change fuel hose

2,000 hours or every 2 years

In case various rubber hoses for fuel system and engine lubrication system are hardened or deteriorated, replace them even before the specified replacement time.

When replacing hoses, contact directly us or distributor because it requires expert technical knowledge.

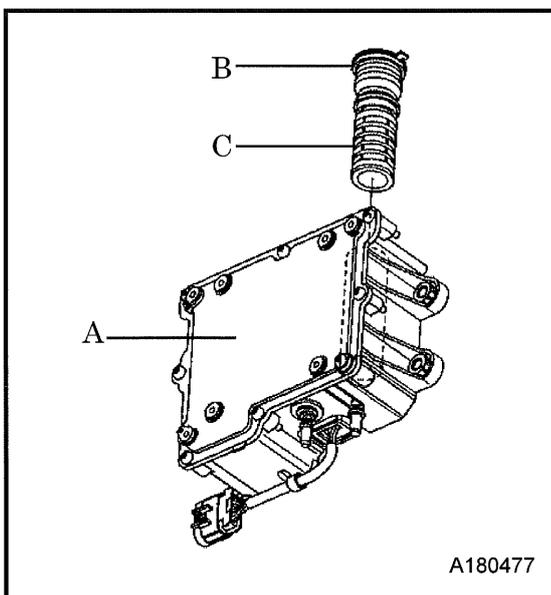
5.5.23 Change rubber hose

2,000 hours or every 2 years

Check hoses used for oil piping for any crack or tear, and replace when an abnormality is found. When replacing hoses, contact directly us or distributor because it requires expert technical knowledge.

5.5.24 Change DEF pump filter

Every 3,000 hours



<Procedure>

1. Set the CONTROL POWER switch to  position.
Wait at least 2 minutes to ensure the supply module [A] has fully stopped.
2. Place an oil pan under the supply module, loosen the cover [B] and pull it out together with the filter [C].
3. Install new filter [C].
(For part number, See 5.4)
4. Install cover [B] and tighten.

IMPORTANT

- The DEF filter acts as an important step in filtering small particulate matter from the system. To ensure the long life of the unit, it is important to use genuine replacement parts.

5.Periodic inspection/Maintenance

5.5.25 Check DEF hoses

Every 3,000 hours

Inspect hoses for cracks or DEF leaks. Check for any loose connections.

5.5.26 Change radiator hoses

3,000 hours or every 2 years

When any crack or wear is found on the hoses, change it even before the scheduled time.

When replacing it, contact directly us or distributor because it requires expert technical knowledge.

5.5.27 Change O-ring of unloader

3,000 hours or every 3 years

When replacing it, contact directly us or distributor because it requires expert technical knowledge.

5.5.28 Check and change the unloader bushing

3,000 hours or every 3 years

Replace unloader when malfunction occurred even if before normal replace timing.

When replacing it, contact directly us or distributor because it requires expert technical knowledge.

5.5.29 Change pressure regulator

3,000 hours or every 3 years

When replacing it, contact directly us or distributor because it requires expert technical knowledge.

(For part number, See 5.4)

5.5.30 Check consumable parts of auto-relief valve and vacuum relief valve

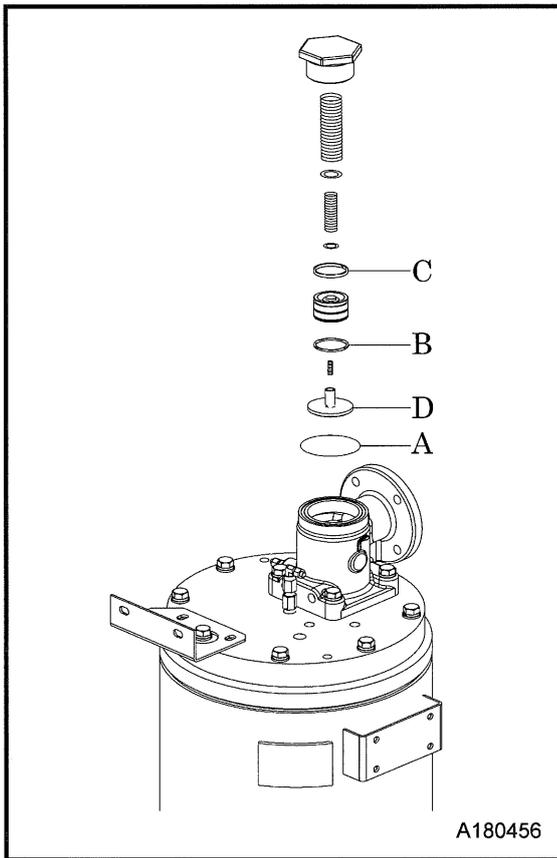
3,000 hours or every 3 years

When replacing it, contact directly us or distributor because it requires expert technical knowledge.

5.Periodic inspection/Maintenance

5.5.31 Performance check of pressure control valve

Every 6,000 hours



<Procedure>

1. Make sure that the pressure gauge indicates 51 to 73 PSI when opening the service valve during operation.
 2. When the pressure is lower than 51PSI, replace spring with a new one. **(For part number, See 5.4)**
 3. When the indicator shows excessively higher pressure, you will find that the piston does not move smoothly due to foreign material and rust stuck inside valve. In such a case, disassemble the component for checking and cleaning.
- When replacing it, contact directly us or distributor because it requires expert technical knowledge.

IMPORTANT

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

5.5.32 Change wiring harness

Every 6,000 hours

When replacing it, contact directly us or distributor because it requires expert technical knowledge.

5.5.33 Check and change O-ring and piston of pressure control valve

6,000 hours or every 3 years

After disassembling and cleaning pressure control valve, check O ring [A], [B] and teflon ring [C], piston [D].When the rubber of these parts is found hardened, or damaged, replace them.

(For part number, see 5.4)

When replacing it, contact directly us or distributor because it requires expert technical knowledge.

5.Periodic inspection/Maintenance

5.5.34 Change rubber coupling

Every 3 years

When replacing it, contact directly us or distributor because it requires expert technical knowledge.

5.5.35 Change oil seal/bearing

Every 12,000 hours

When replacing it, contact directly us or distributor because it requires expert technical knowledge.

5.5.36 Change solenoid valve

Every 12,000 hours

When replacing it, contact directly us or distributor because it requires expert technical knowledge.

5.5.37 Change touchscreen battery

Every 4 years

When replacing it, contact directly us or distributor because it requires expert technical knowledge.

6. Storage and Disposal

6.1 Preparation for Long-term Storage

When the machine is left unused or not operated longer than half a year (6 months), store it at the dry place where no dust exists after the following treatments have been done to it.

- Put the machine in a temporary cabin if it is stored outside. Avoid leaving the machine outside with a sheet cover directly on the paint for a long time, or this will cause rust to the machine.
- Perform the following treatments at least once every three months.

<Procedure>

1. Drain existing lubricant from the engine oil pan. Pour new lubricant in the engine to clean its inside. After running it for a while, drain it again.
2. Completely charge the battery and disconnect grounding wires. Remove the battery from the machine, if possible, and store it in a dry place. (Charge the battery at least once every month.)
3. Drain coolant and fuel from the machine.
4. Seal the engine, air-intake port and other openings like the muffler with a vinyl sheet, packing tape, etc., to prevent moisture and dust from entering the machine.
5. Be sure to repair any breakdowns and maintain the machine so that it will be ready for the next operation.

6.2 Disposal of Product

- When disposing of this machine, first drain the cooling water and oils. If you require any additional instruction or advice, please contact our office or distributor.

7.Specifications

7.1 Specifications

Model		PDS400S-6E1	PDS400SC-6E1 (After-cooler type)	
COMPRESSOR	Type	Single-stage oil cooled, screw type compressor		
	Free air delivery	cfm (m ³ /min)	400(11.3)	
	Working pressure	psi(MPa)	100(0.69)	
	Engine speed(full load)	min ⁻¹	2,600	
	Engine speed(unload)	min ⁻¹	1,300	
	Lubricating system	Forced Lubrication by compressed pressure		
	Driving system	Direct driving with rubber coupling		
	Receiver tank capacity	cu in.(L)	4,699(77)	
	Lubricating oil capacity	gal.(L)	10.6(40)	
ENGINE	Model	KUBOTA V3800TIEF4B-COHE-1		
	Type	4 Cycle, water cooled, direct injection, Turbocharged, EGR,DPF,SCR		
	Cylinder quantity- Cylinder diameter × Cylinder stroke	in(mm)	4-3.94in×4.72in(4-100mm×120mm)	
	Total displacement	cu in.(L)	230(3.769)	
	Rated output (GROSS)	kW/min ⁻¹	86.4 / 2,600	
	Rated output (NET)		77.9 / 2,600	
	Lubricating oil capacity	gal.(L)	3.4(13)	
	Coolant capacity (including radiator)	gal.(L)	4.1(15.6)	
	Battery	Equivalent to 130F51×1 (12 V)		
	Fuel tank capacity	gal.(L)	47.0(178)	
	DEF tank capacity	gal.(L)	5.3(20)	
DIMENSION · MASS	Overall length (only for bonnet)	in(mm)	103.5(2,630)	
	Overall width	in(mm)	57.3(1,455)	
	Overall height	in(mm)	47.6(1,210)	
	Net dry mass	lb(kg)	3,737(1,695)	3,803(1,725)
	Operating mass	lb(kg)	4,233(1,920)	4,299(1,950)

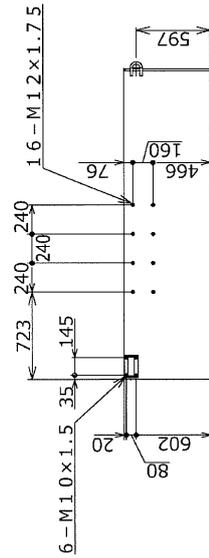
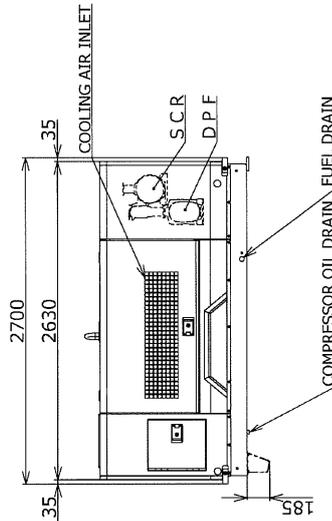
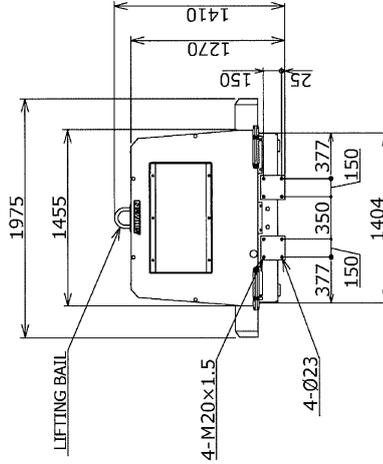
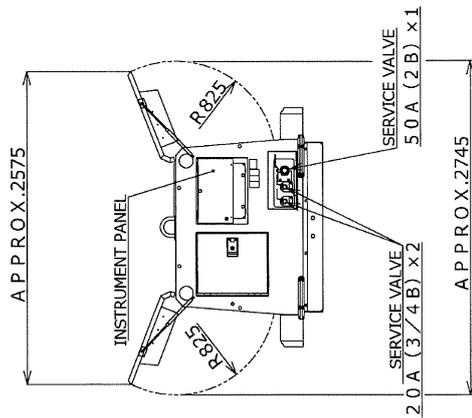
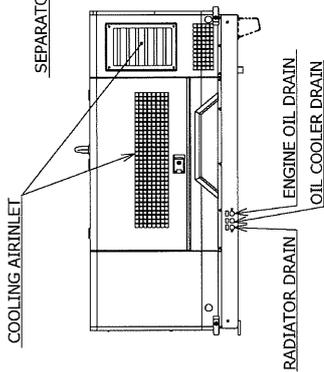
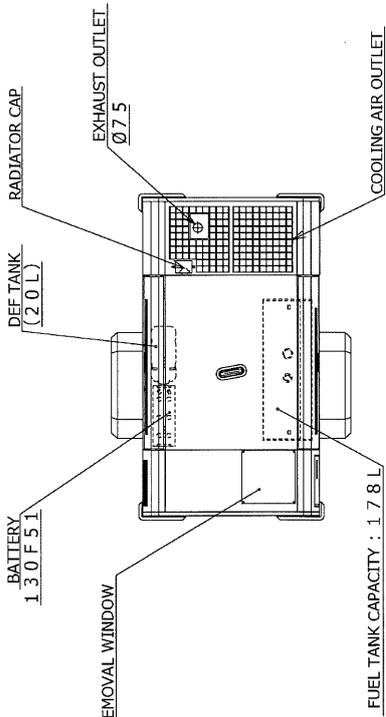
7. Specifications

Model		PDSF375DP-6E1	PDSF375DPC-6E1 (After-cooler type)	PDSG310DP-6E1	
COMPRESSOR	Type	Single-stage oil cooled, screw type compressor			
	Free air delivery	cfm (m ³ /min)	330/375 (9.3)/(10.6)	270/310 (7.6)/(8.7)	
	Working pressure	psi(MPa)	150/100 (1.03)/(0.69)	200/150 (1.4)/(1.03)	
	Engine speed(full load)	min ⁻¹	2,400/2,700		
	Engine speed(unload)	min ⁻¹	1,300		
	Lubricating system		Forced Lubrication by compressed pressure		
	Driving system		Direct driving with rubber coupling		
	Receiver tank capacity	cu in.(L)	4,699(77)		
	Lubricating oil capacity	gal.(L)	10.6(40)		
ENGINE	Model	KUBOTA V3800TIEF4B-COHE-1			
	Type	4 Cycle, water cooled, direct injection, Turbocharged, EGR,DPF,SCR			
	Cylinder quantity- Cylinder diameter × Cylinder stroke	in(mm)	4-3.94in×4.72in(4-100mm×120mm)		
	Total displacement	cu in.(L)	230(3.769)		
	Rated output (GROSS)	kW/min ⁻¹	86.4 / 2,600		
	Rated output (NET)		77.9 / 2,600		
	Lubricating oil capacity	gal.(L)	3.4(13)		
	Coolant capacity (including radiator)	gal.(L)	4.1(15.6)		
	Battery		Equivalent to 130F51×1 (12 V)		
	Fuel tank capacity	gal.(L)	47.0(178)		
	DEF tank capacity	gal.(L)	5.3(20)		
DIMENSION · MASS	Overall length (only for bonnet)	in(mm)	103.5(2,630)		
	Overall width	in(mm)	57.3(1,455)		
	Overall height	in(mm)	47.6(1,210)		
	Net dry mass	lb(kg)	3,737(1,695)	3,803(1,725)	3,781(1,715)
	Operating mass	lb(kg)	4,233(1,920)	4,299(1,950)	4,277(1,940)

7.Specifications

PDS400S-6E1
 PDSF375DP-6E1
 PDSG310DP-6E1

Unit : mm

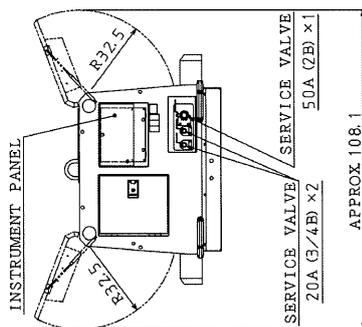
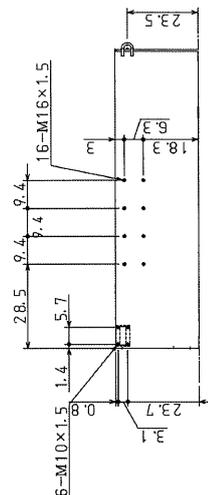
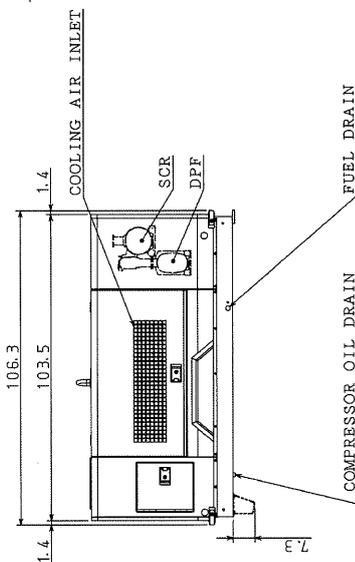
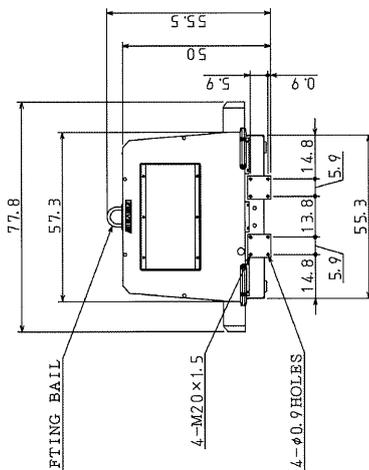
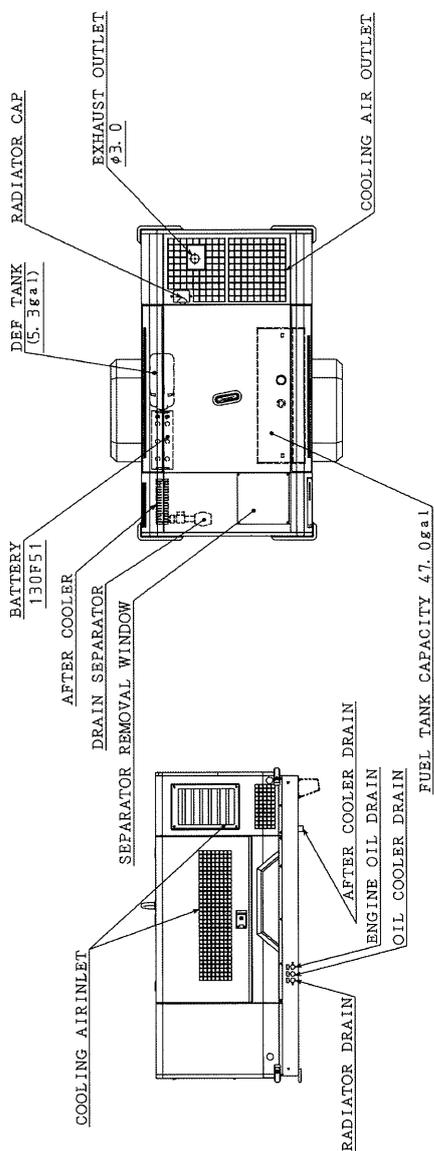


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7.Specifications

PDS400SC-6E1 (After-cooler type)
 PDSF375DPC-6E1 (After-cooler type)

Unit : in

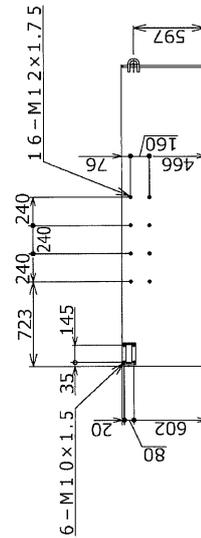
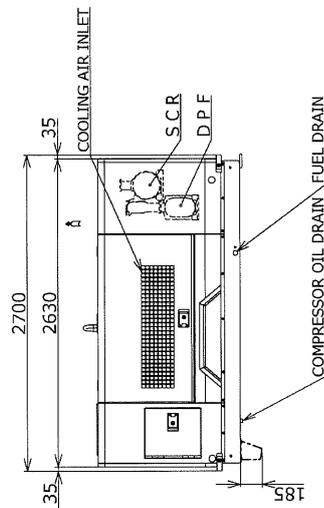
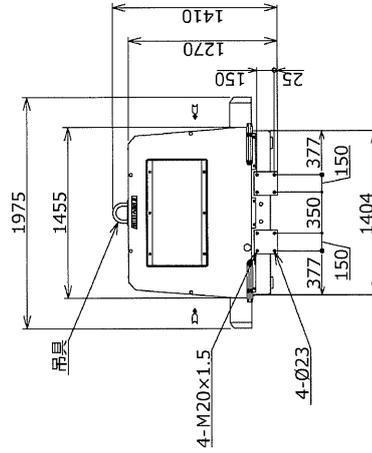
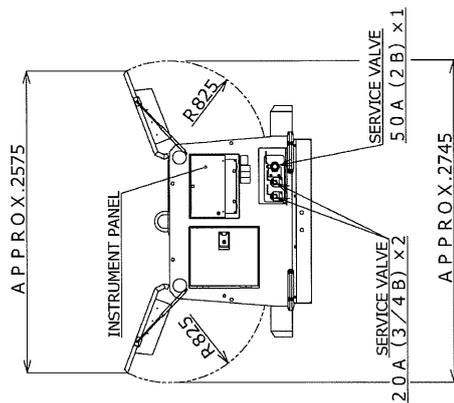
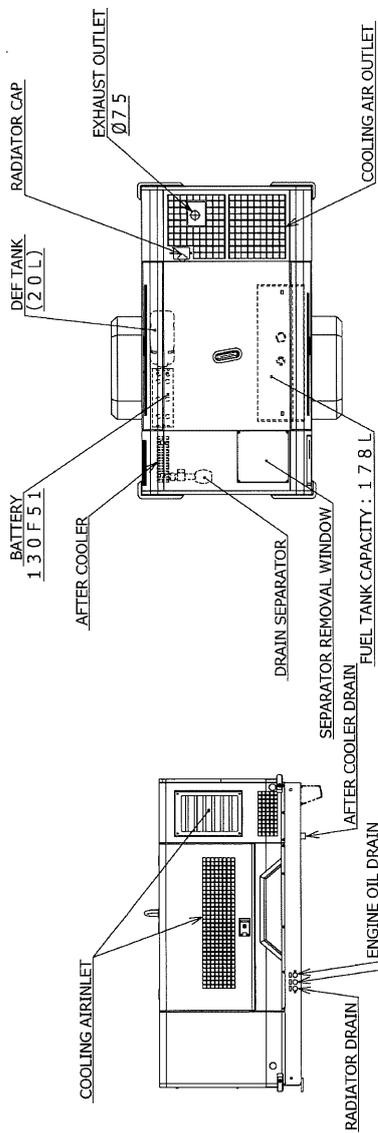


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7.Specifications

PDS400SC-6E1 (After-cooler type)
 PDSF375DPC-6E1 (After-cooler type)

Unit : mm

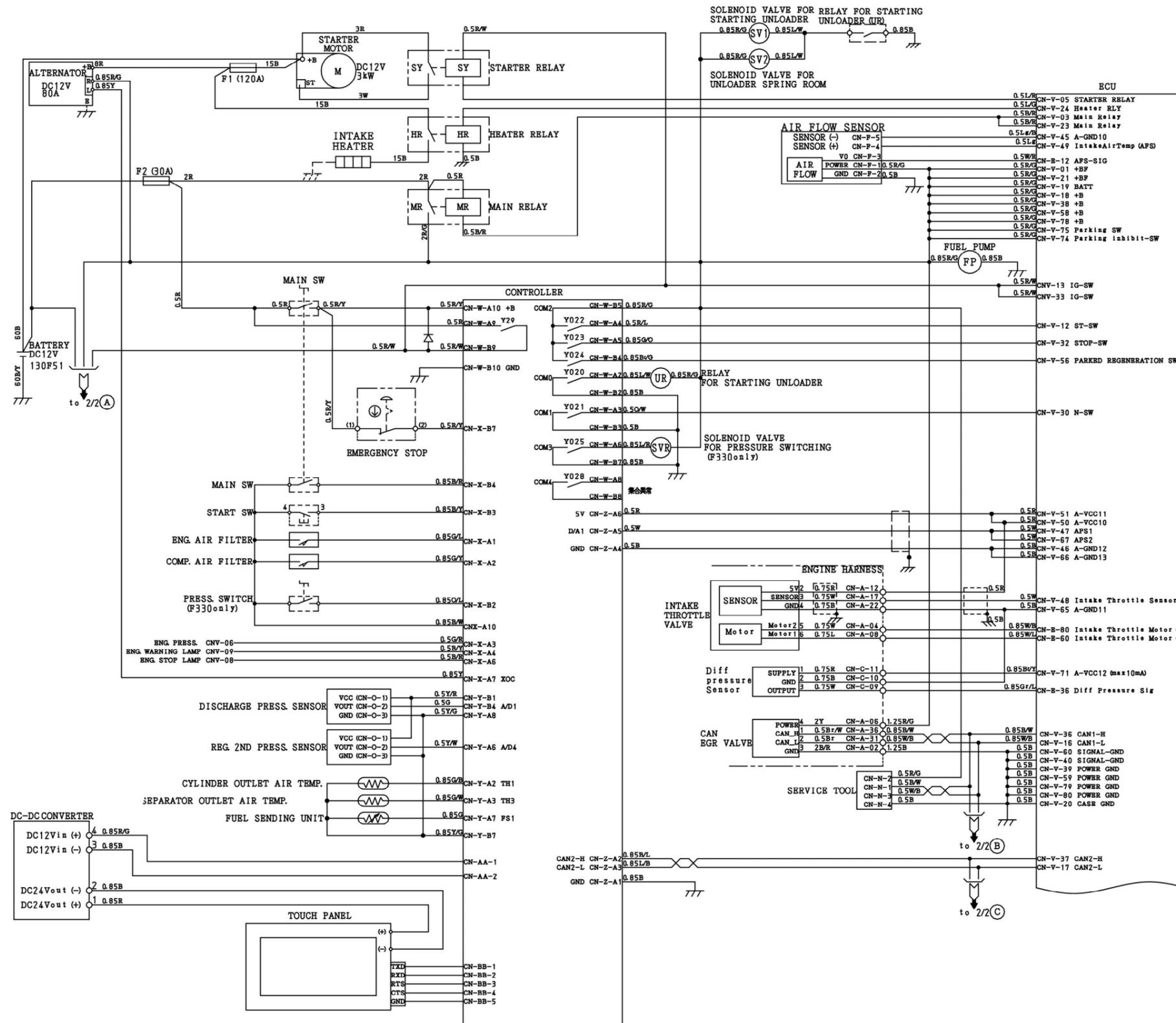


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7.Specifications

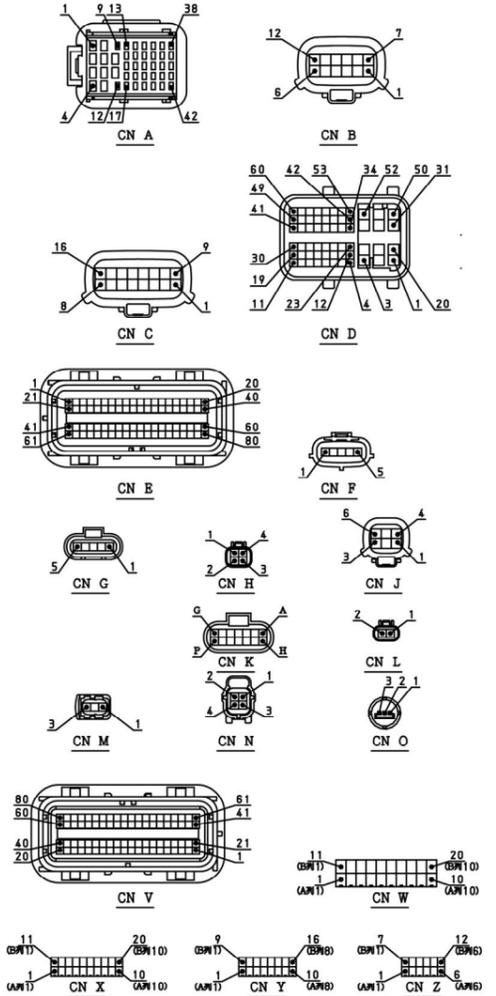
7.3 Wiring Diagram

PDS400S, SC-6E1 / PDSF375DP,DPC-6E1 / PDSG310DP-6E1

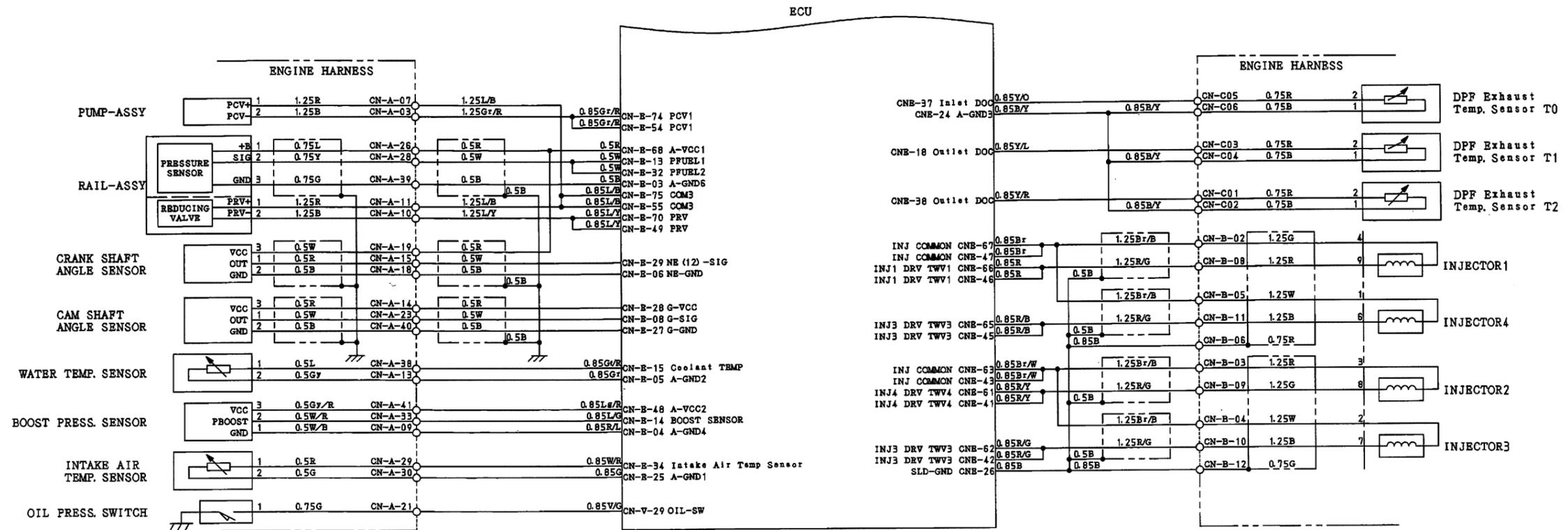


Connector terminal arrangement

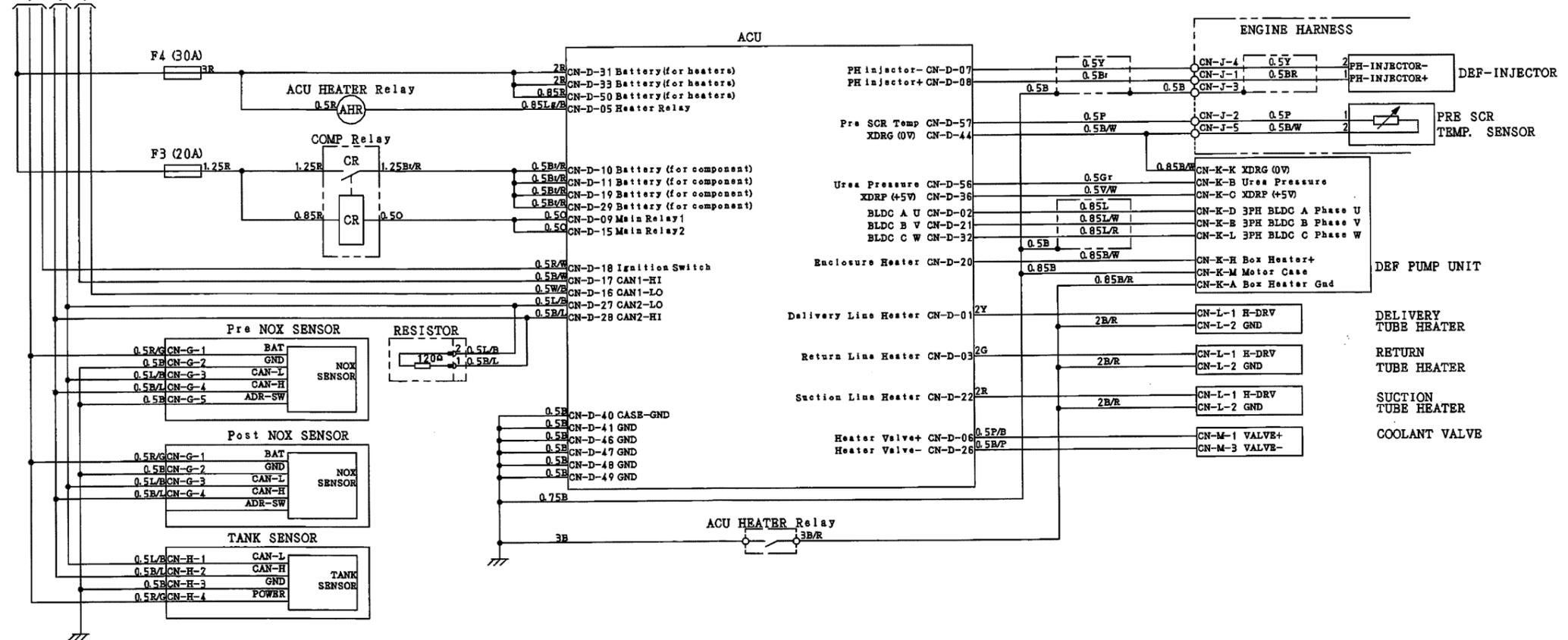
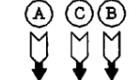
The following arrangement is seen from the side of the connector inserting port.



7. Specifications

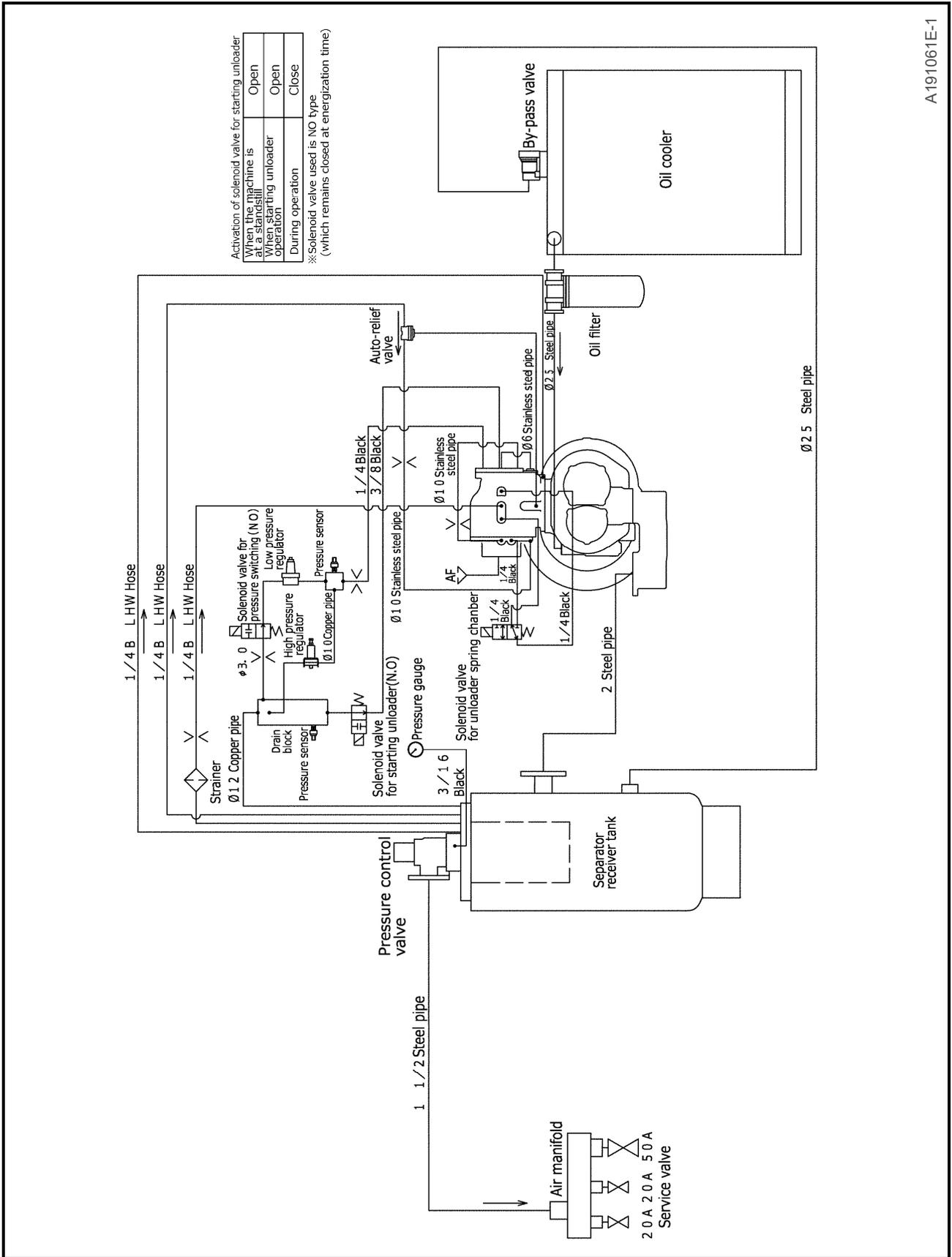


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7.Specifications

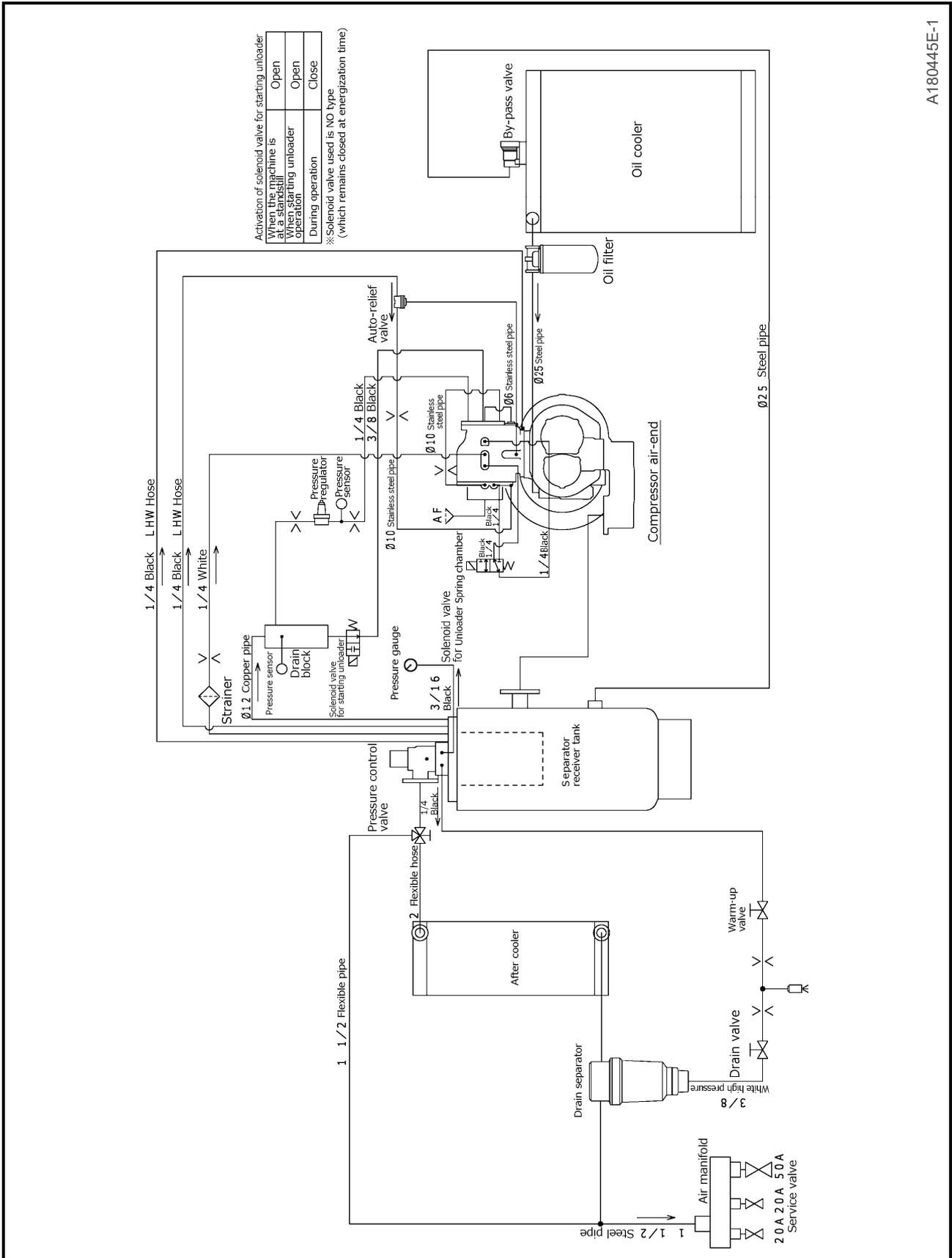
PDSG310DP-6E1



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7. Specifications

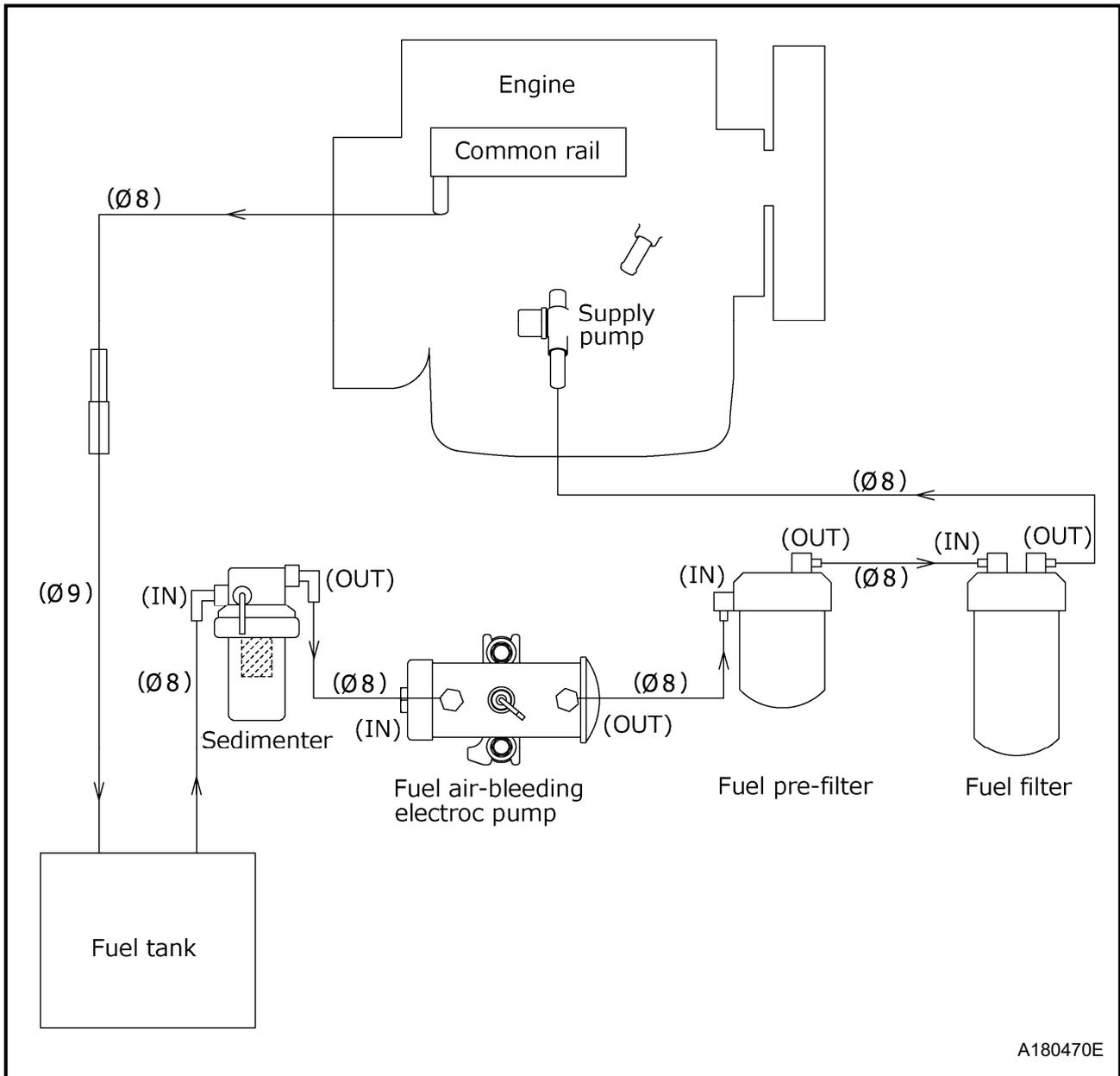
PDS400SC-6E1 (After-cooler type)



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7. Specifications

7.4.2 Fuel Piping



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