AIRMAN

PC

INSTRUCTION MANUAL

ENGINE COMPRESSOR

PDSF750DP-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 your nearest dealer.
  Make sure that the manual is included with the machine when it is handed over to another user.
- ◆ The contents of this manual may differ from the machine because of design changes. If anything is unclear, please contact your nearest dealer for clarification.
- ◆ For details of handling, maintenance and safety of the engine, see the Engine Operation Manual.

— Table of Contents —

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 preventive measures for safety to carry out "SAFETY OPERATION AND PROPER MAINTENANCE OF THE MACHINE".

⚠ DANGER	DANGER indicates an imminently hazardous situation which, if not avoided by any user, will result in death or serious injury. This signal word is to be limited to the most extreme situations.
⚠ WARNING	WARNING indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury to a user.
⚠ 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

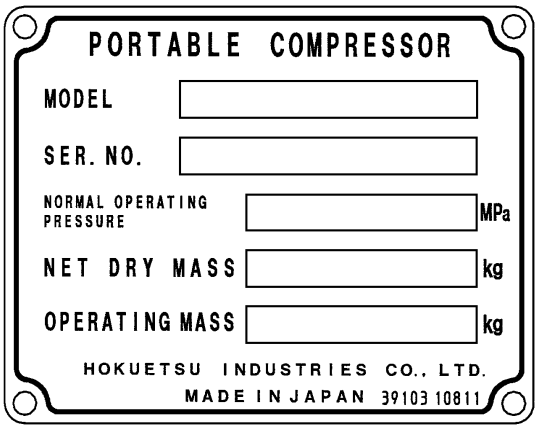
⚠ WARNING

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

◆ 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.



A130375

※ Each illustrated figure (Fig.) has a number (for instance, A130375) at the right bottom. This number is not a part number, it is an internal reference number.

[Safety Warning Labels]

Following labels are attached to the machine.
When they are found damaged or peeled off, order them from your nearest dealer and attach them again.

1

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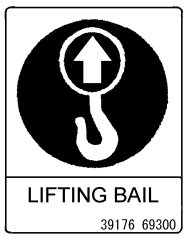

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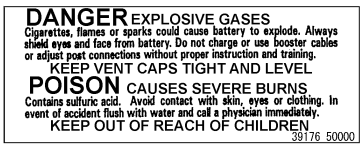

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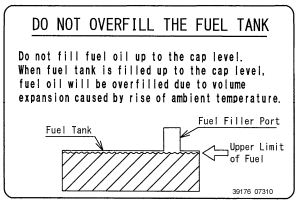

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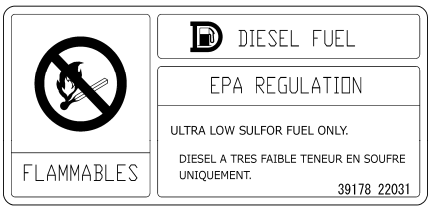

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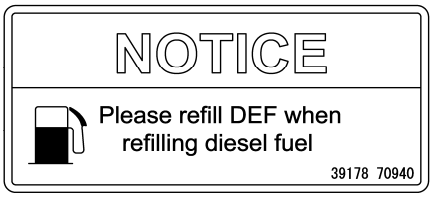

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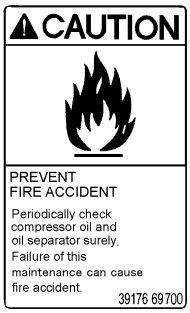

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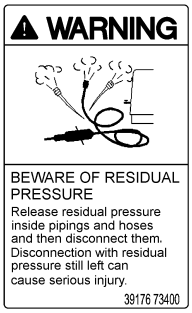

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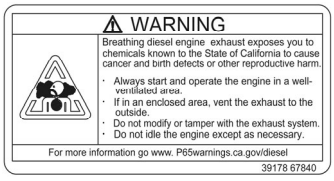

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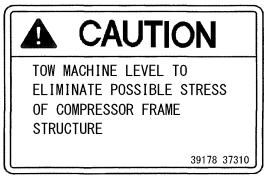

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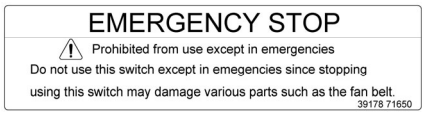
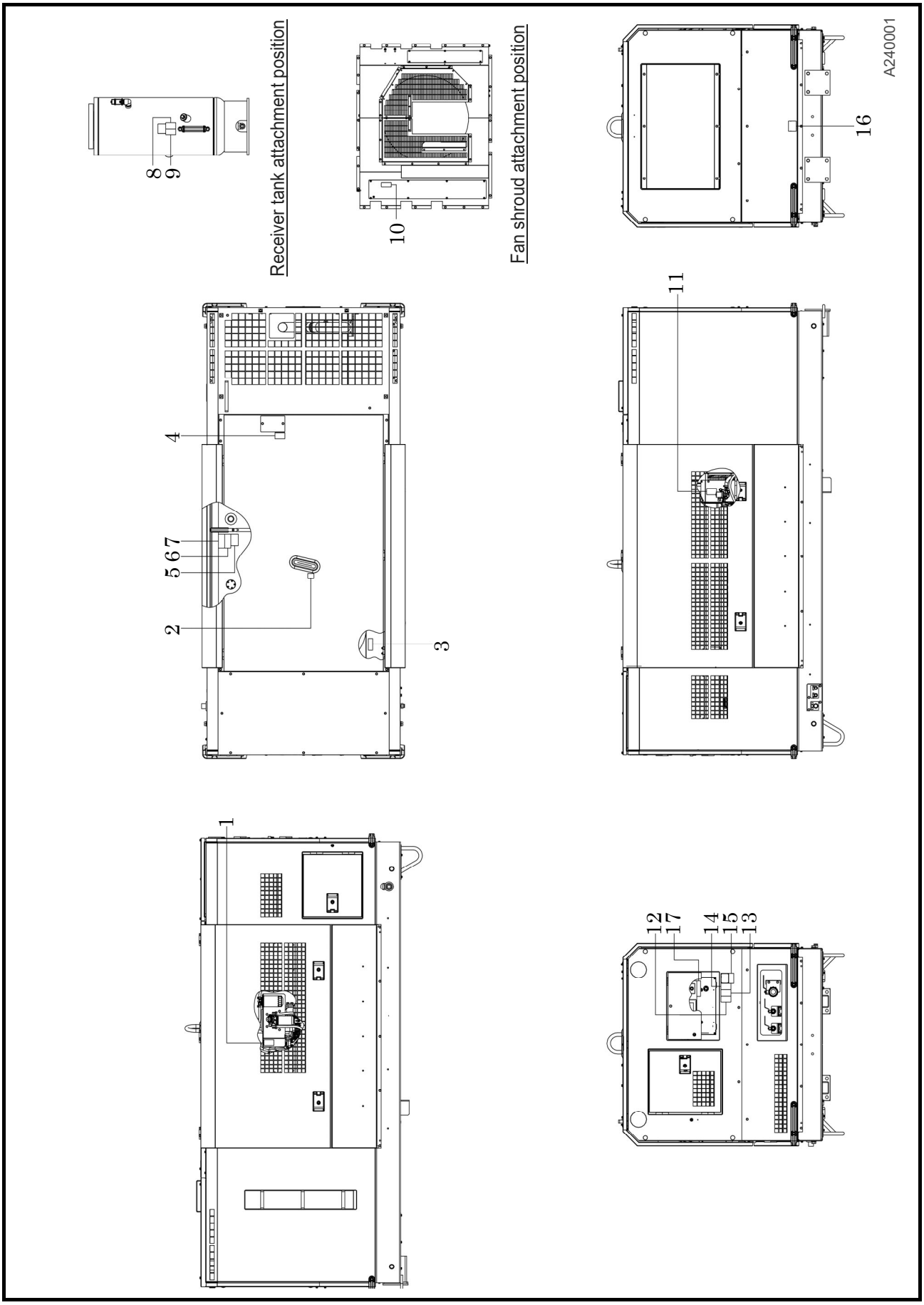
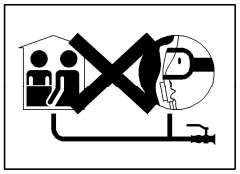


Safety

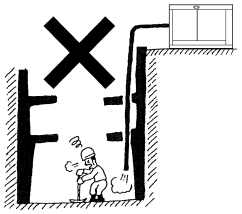
- The pasting position of safety warning labels is as follows.



DANGER



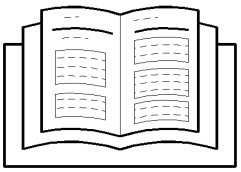
TR0201-1



A080001

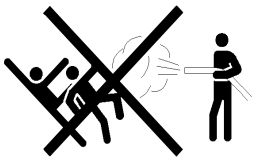
- Compressed air from this machine contains poisonous materials. Absorption of the compressed air can cause serious injury. Never provide this compressed air for human respiration.
- This machine is not designed to be used for working chambers pressurized by compressed air such as respiratory air provided 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.

WARNING



TR0086

- 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 as a compressor of gases other than air or as a vacuum pump, etc. Otherwise, serious accidents may occur.

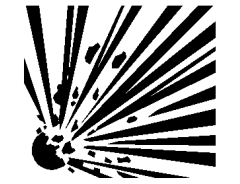


TR0092

- 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.

TR0304

- Keep hands away from the rotating machinery or belts during operation. It could cause serious injuries if hands should be caught in.



W010

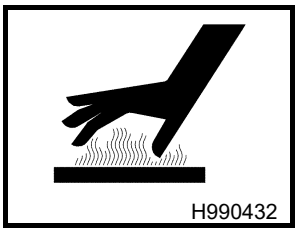
- When you refill the separator receiver tank with compressor oil, stop the engine, and make sure that the pressure gauge indicates 0psi and there is no residual pressure in it, and then gradually loosen the oil filler cap for refilling oil.
- Note residual pressure in the separator receiver tank could force both extremely hot compressed air and oil to jet out and you may be scalded or seriously injured.

⚠ WARNING

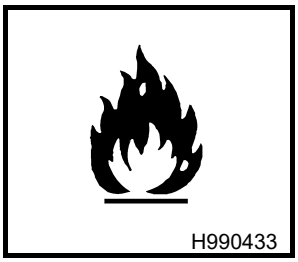

M003

- When cleaning dust accumulated in such devices as the air-filter, by blowing compressed air, wear safety glasses, etc. to protect your eyes.

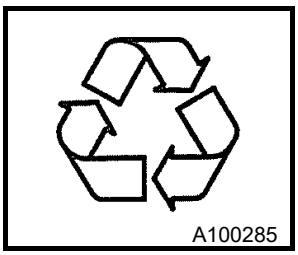
⚠ CAUTION


H990432

- 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 cool enough, hot scalding water could jet out, causing burns.


H990433

- Be sure to perform the periodic checks of compressor oil and oil separator element.
- Neglecting checks could cause overheat of the oil, resulting in a fire.

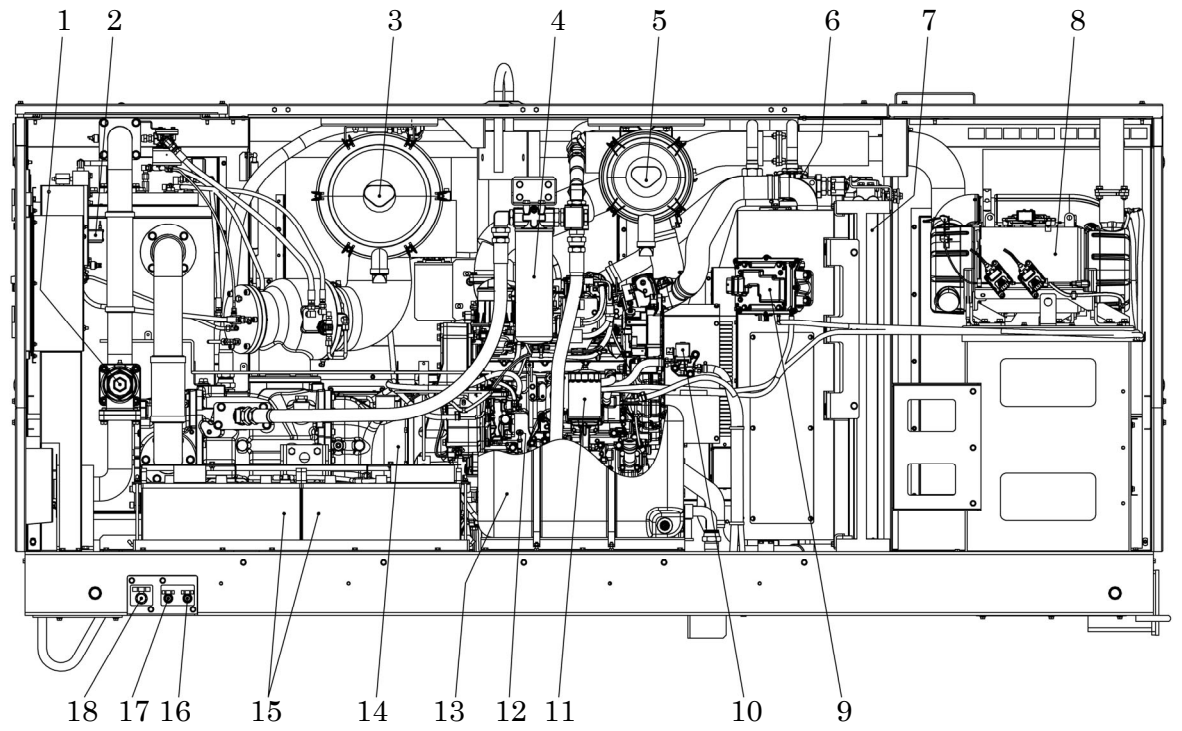

A100285

- 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.

- The engine of this machine and electrical parts many electronic devices have been installed.
  If you perform welding work on this machine, first remove the connector of the electronic control equipment (specifically the ECM). Application of excessive current to electronic controls can cause equipment malfunction.

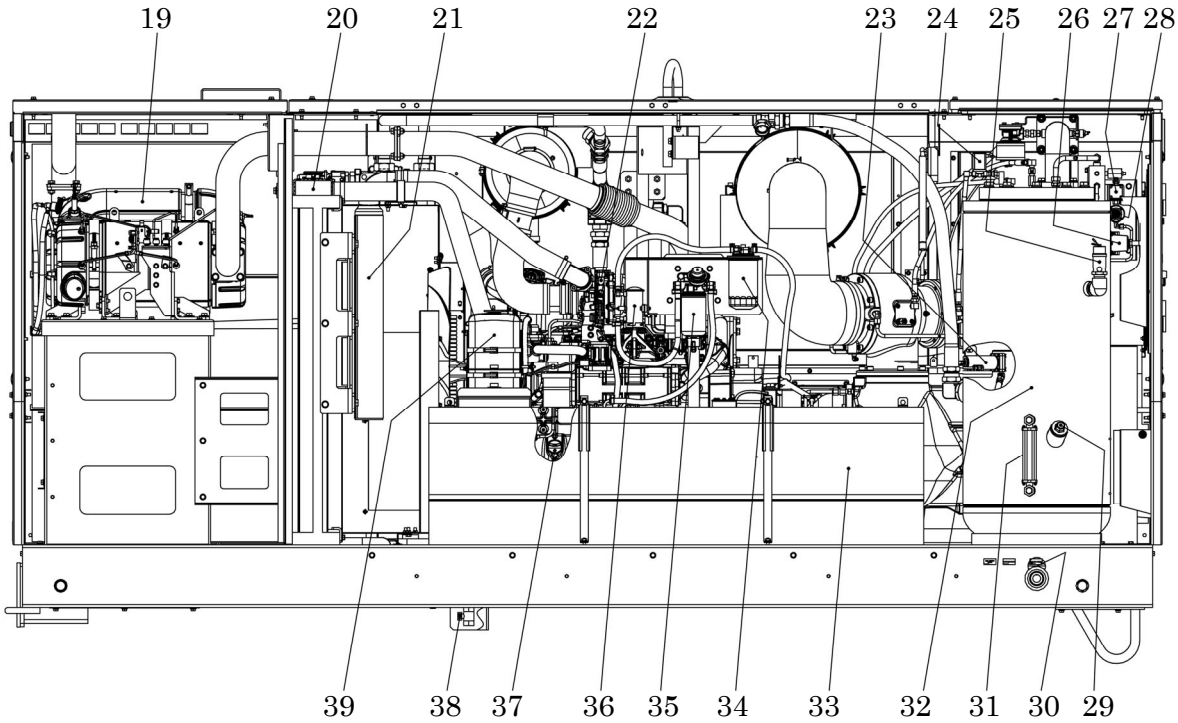
1.Part Names

1.1 Internal Components and Part Names



No.	Description	Function
1	Pressure control valve	For keeping the pressure in receiver tank constantly higher than a certain level in the system.
2	Solenoid valve for starting unload	For regulating operation when starting the machine.
3	Air filter (For compressor air-end)	Filtering device for filtering dust floating in intake air.
4	Compressor oil filter	For filtering compressor oil in the system.
5	Air filter (For engine)	Filtering device for filtering dust floating in intake air.
6	By-pass valve	For keeping compressor oil at proper temperature.
7	Oil cooler	For cooling compressor oil in the system.
8	SCR (Selective Catalytic Reduction)	Selective reduction-type catalyst that uses DEF as a reducing agent.
9	DEF pump	Pump unit to send DEF (Diesel Exhaust Fluid)
10	Coolant valve	Valve that passes cooling water to warm the urea piping in cold weather
11	Engine oil filter	Device that filters engine oil.
12	Engine oil level gauge	For checking quantity and impurity of engine oil.
13	DEF tank	Container for DEF
14	Compressor air-end	For compressing air in the system.
15	Battery	Power source to start the engine.
16	Oil cooler drain valve	For draining compressor oil from oil cooler and oil line.
17	Radiator drain valve	For draining engine coolant.
18	Engine oil drain valve	For draining engine oil.

1.Part Names



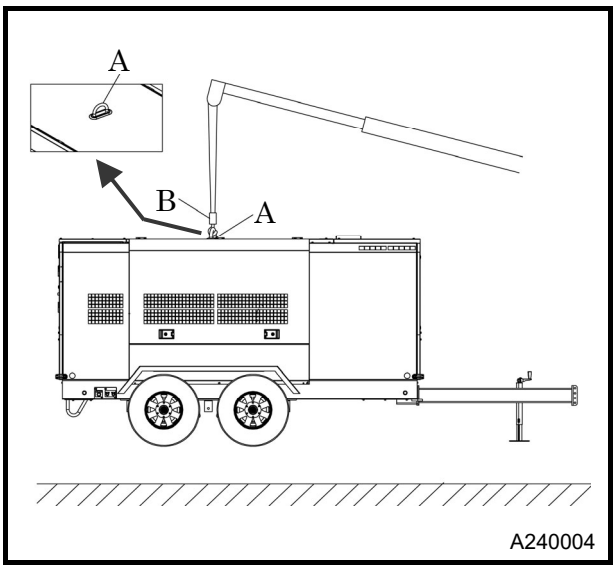
No.	Description	Function
19	DPF (Diesel Particulate Filter)	Apparatus for removing harmful components contained in the exhaust gas.
20	Radiator	Device that cools the engine coolant.
21	Inter cooler	For cooling the air compressed by engine supercharger in the system.
22	Engine	For driving the compressor air-end in the system.
23	Regulator for starting unloader	For opening and closing unloader butterfly type valve.
24	Solenoid valve for purge control	For releasing compressed air in the separator receiver tank during purge control operation.
25	Safety valve	For releasing compressed air to the atmosphere when the pressure rises above the specified level
26	High pressure regulator	Pressure regulator used to control air pressure during high pressure operation.
27	Solenoid valve for pressure switching	Equipment for switching the operating pressure between low pressure and high pressure.
28	Low pressure regulator	Pressure regulator used to control air pressure during low pressure operation.
29	Compressor oil filler port	For supplying or adding compressor oil.
30	Separator receiver tank drain valve	For draining condensed water from separator receiver tank.
31	Compressor oil level gauge	For checking quantity and impurity of compressor oil.
32	Separator receiver tank	For separating air and oil from compressed air in the system.
33	Fuel tank	Vessel for storing fuel.
34	Fuel-filter	For filtering foreign matter and dust mixed in fuel.
35	Fuel pre-filter	For filtering larger dust, water, etc., from fuel.
36	Air bleeding electromagnetic pump	Device that automatically bleeds air from the fuel lines.
37	Engine oil filler port	Port for supplying / replenishing engine oil.
38	Fuel tank drain valve	For draining condensates from fuel tank.
39	Reserve tank	Tank for verifying & replenishing coolant

2.Installation

2.1 Transportation

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

2.1.1 Lifting up

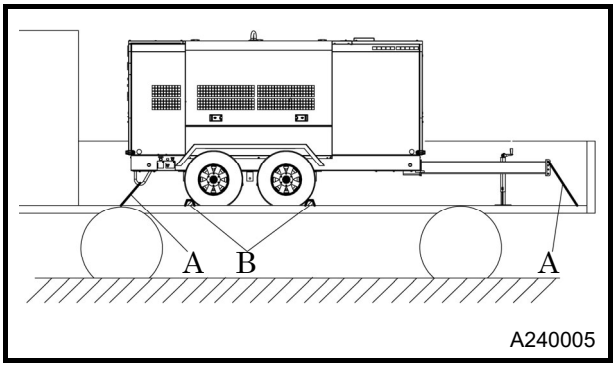


<Procedure>

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.

- 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.
- Cranes should only be operated by qualified personnel.

2.1.2 Mounting the machine on the truck bed



- Be sure to fasten the machine with the ropes [A] as shown in the figure, and securely fix the machine on the truck bed.
- Be sure to put one set of chocks [B] to the wheels.

WARNING **Transportation**

- 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.

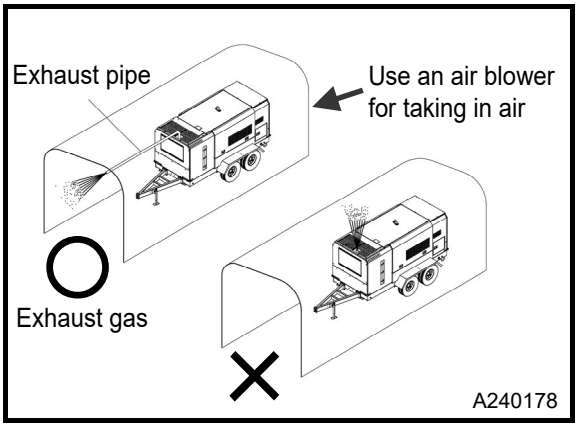
2.2 Installation conditions

- Make sure to use the machine in the operating environment described below, if you use it in any environment other than the following, it may lead to a serious failure.
- **Ambient temperature ---------- 5°F～+104°F (-15℃～+40℃)**
- **Humidity ---------- Less than 80%**
- **Altitude ---------- Lower than 4,921ft above sea level**
- **Allowable inclination angle ------- 15-degree angle or less**
  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 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.

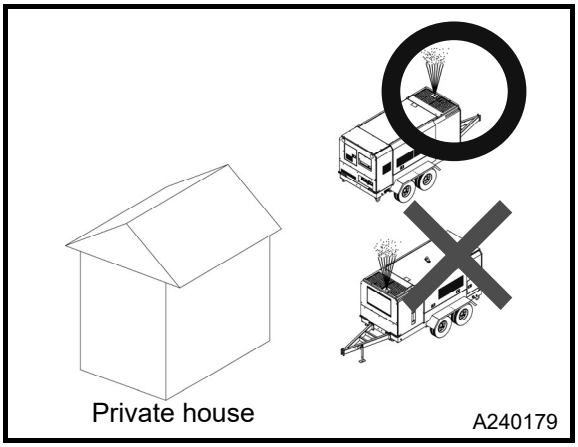
⚠ WARNING **Exhaust gas precautions**


PC002

- Exhaust gas can cause death or serious injury upon inhalation.
  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.



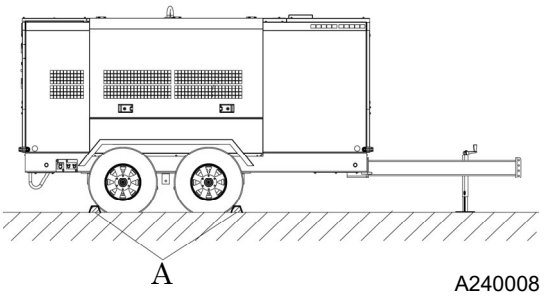
- When installing the machine in a tunnel or the like, ensure a supply of fresh air and provide adequate ventilation.
- Be sure to place the exhaust pipe in an outdoor location, so that no exhaust gas will be leaked from any pipe seam.



- 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

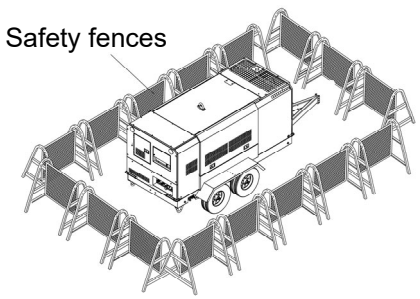
WARNING Installation notes



A240008

- Place the wheel chocks [A] against the wheels to prevent the machine from moving abruptly.

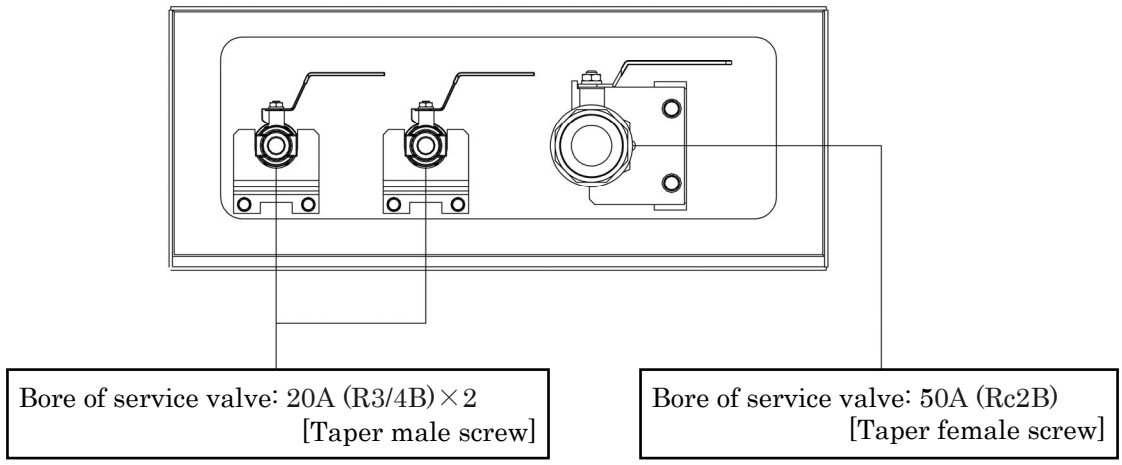
CAUTION Placing safety fence in position



A240009

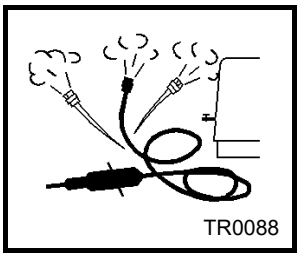
- Be sure to place the safety fence around the machine in order to prevent other people than those involved in construction work from entering the construction site or from accessing the machine.

2.2.1 Service valve

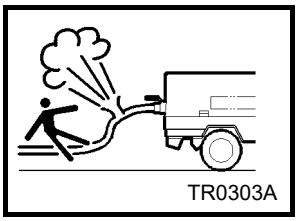


A240010

WARNING **Cautions of hose attachment and removal**



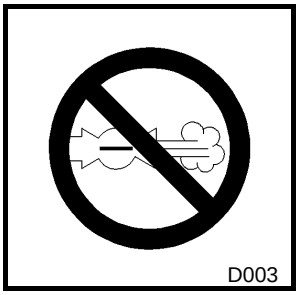
TR0088



TR0303A

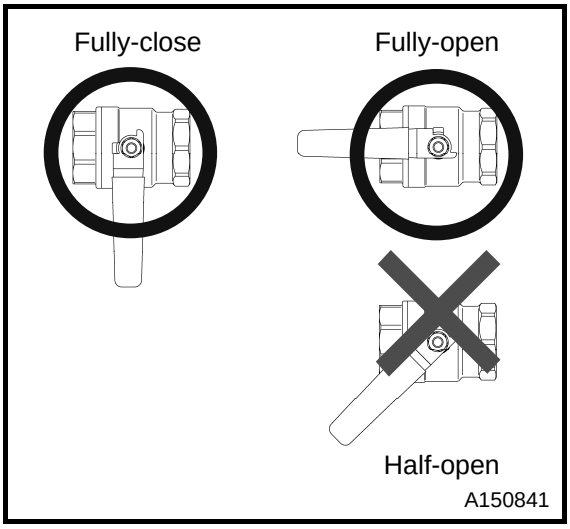
- Piping or the hose from this machine service valve should use what can be borne enough for the safety valve set pressure of this machine.
- Please connect piping or a hose to this machine service valve firmly before operation and during operation. If the connection part is loosening, there is a possibility of piping or a hose separating and getting seriously injured.
- Please remove after closing a service valve and extracting pressure remained, in case piping or a hose is removed. If pressure remained should remain, a near thing blows away or there is a possibility of a hose whipping, causing a phenomenon and getting seriously injured.
- In order to use it safely, please read the handling of the work tools often used.

CAUTION Operation with service valve opened is prohibited


D003

- Do not operate the machine with service valves 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.

CAUTION Cautions of service valve

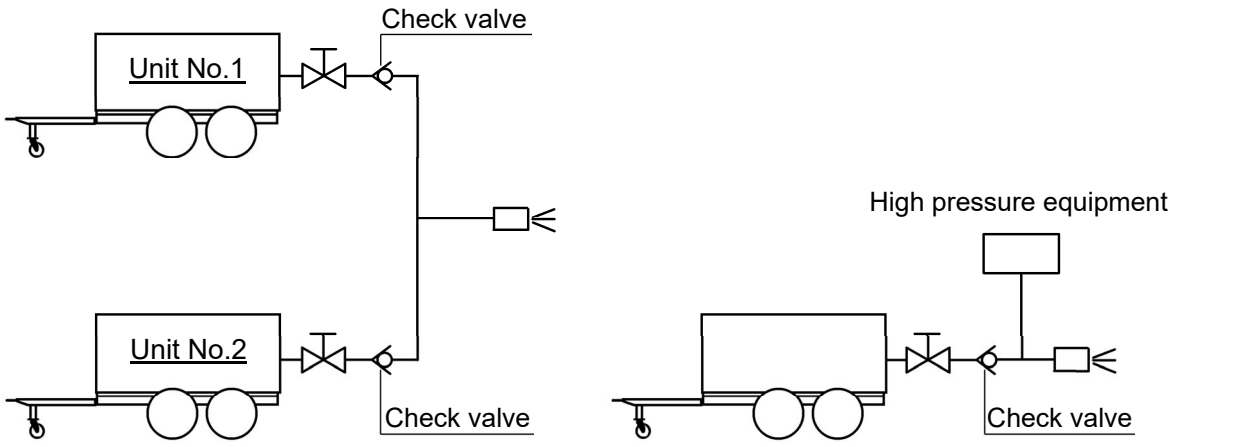


- Half-open of service valve could cause cracks of valve seat and air leaks. Be sure to use as full-close or full-open, not to use as half-open.

2.2.2 Parallel operation

CAUTION

- In case of parallel operation with the plural compressor units or operation to connect other compressor, be sure to install a check valve after the service valve and connect the piping.
  (Use the spec. of check valve which meet the rated pressure of safety valve well.)
  Further, two machines should be adjusted to be operated at the same discharge pressure and then piping work must be done.
- If piping work is performed without a check valve fitted, the fluidity in the pipe may have possibility to be sent back into the machine during operation or when it stops. So much care should be paid as it can result in damaging the compressor air-end.



Parallel operation

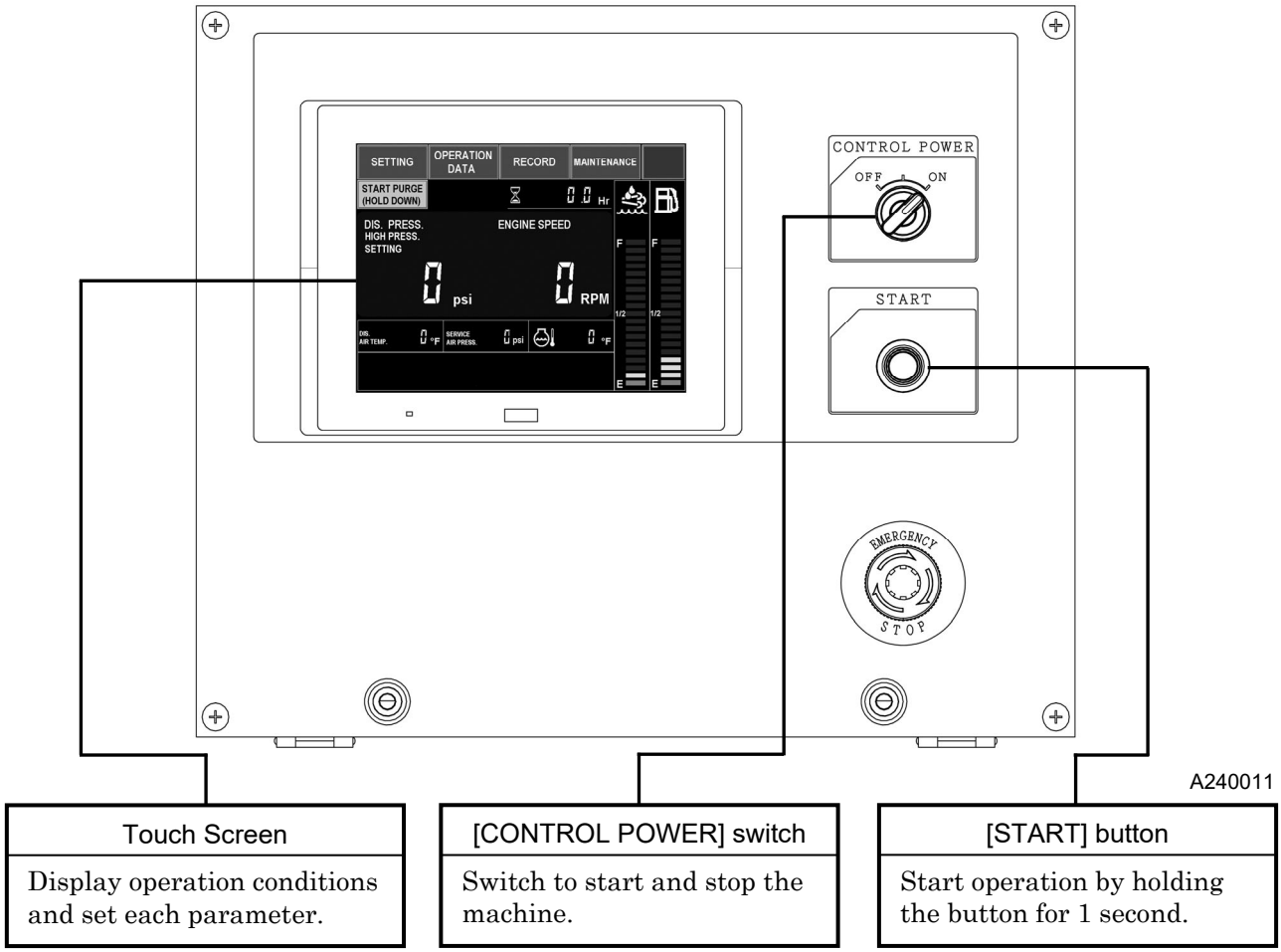
Operation for connection with a high pressure equipment

A100331

3.Operation

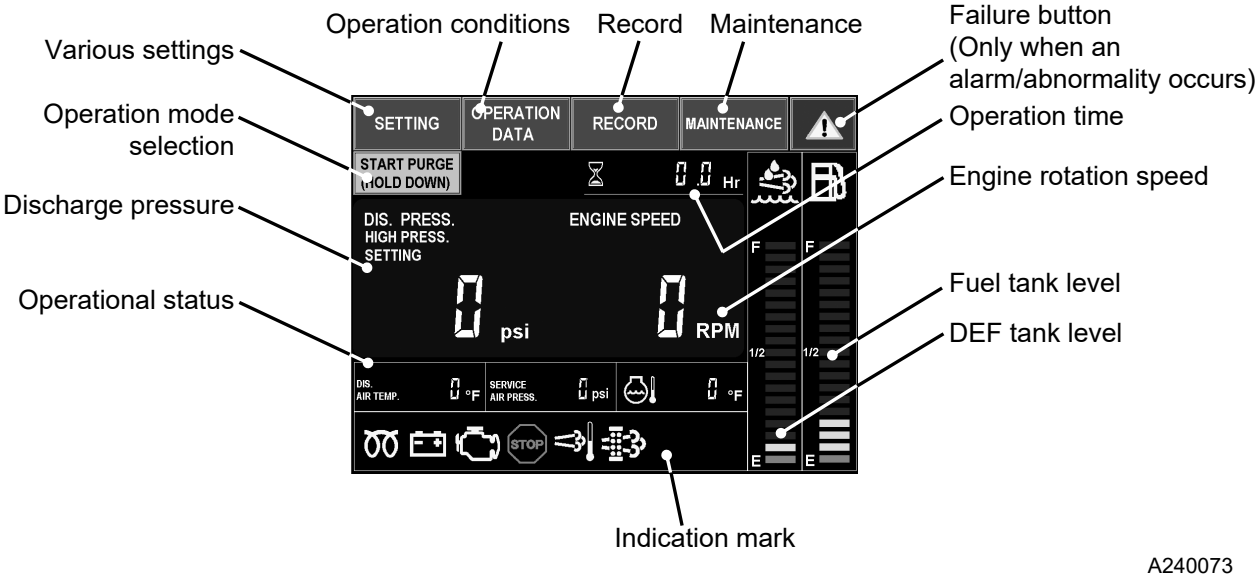
3.1 Instrument Panel

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



Touch Screen	[CONTROL POWER] switch	[START] button
Display operation conditions and set each parameter.	Switch to start and stop the machine.	Start operation by holding the button for 1 second.

3.1.1 Home screen



3.2 Lubricating oil / Coolant / Fuel / DEF

3.2.1 Engine oil

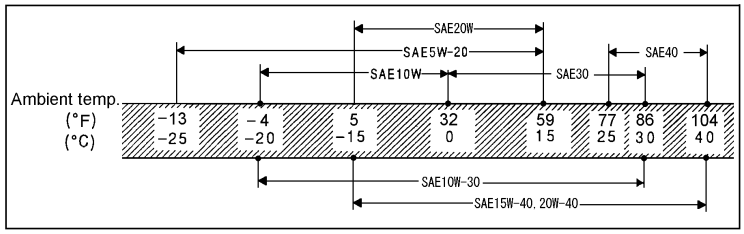
Use engine oil recommended by us. (Using engine oil with poor quality may shorten the life of the engine)

Classification	API service classification CJ-4 class or higher
Viscosity	SAE10W-30 (as ex-factory)

IMPORTANT

- Viscosity of engine oil greatly affects startability, performance, oil consumption of the engine, as well as wear of the moving parts choose appropriate oil based upon the table below according to the outside air temperature.

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

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

Maker	Brand
SHELL	SHELL CORENA S4R (VG32)
MOBIL	MOBIL RARUS SHC 1024 (VG32)

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 your nearest dealer.
- **Follow the designated regulations to dispose of compressor oil.**

3.2.3 Coolant

Use coolant that is a mixture of LLC (antifreeze) and soft water of good quality such as tap water.

IMPORTANT

- If you use water mixed with soil, sand, or dust, or soft water such as well water (ground water), water will easily accumulate in the coolant channels of the engine and radiator, leading to an increase in the coolant temperature.
- Freezing the coolant can damage the engine and radiator. Adjust the LLC (antifreeze) mixing ratio within the range of 30-60% depending on the outside temperature. If the mixing ratio exceeds 60%, the antifreeze effect will decrease. At the time of factory shipment, coolant with a mixing ratio of 55% is filled.

Mixing ratio of LLC (antifreeze) (reference)

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

- Use LLC (antifreeze) which conforms to one of such standards : SAE J814, SAE J1034 and ASTEM D3306.
- **Follow the designated regulations to dispose of LLC (antifreeze).**

3.2.4 Fuel

⚠ CAUTION

- Diesel fuel is required to meet the following characteristics:
  - Free from even fine dust particulate
  - Appropriate viscosity grade
  - It must have high cetane number. (greater than 45)
  - It must have high fluidity even at low temperature.
  - Carbon residue content in fuel must be a little.

IMPORTANT

- Do not use such diesel fuel having higher sulfur content above 0.0015%(15 ppm)
- Use ultra-low sulfur diesel fuel only for diesel engine.
- Use such diesel fuel which conforms to either EN590 or ASTM D975 standard.
- Do not use kerosene. And never use fuel mixed with kerosene.
- **Follow the designated regulations to dispose of fuel.**

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.

⚠ 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.

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.
- **Follow the designated regulations to dispose of DEF.**

3.3 Check before starting machine

Be sure to check the machine before operation. When any abnormality is found, be sure to repair it before restarting the machine. Be sure to make daily checks before operation. If the machine is operated without prior check and without noticing its abnormality, such operation could cause seizure of components or may even cause fire.

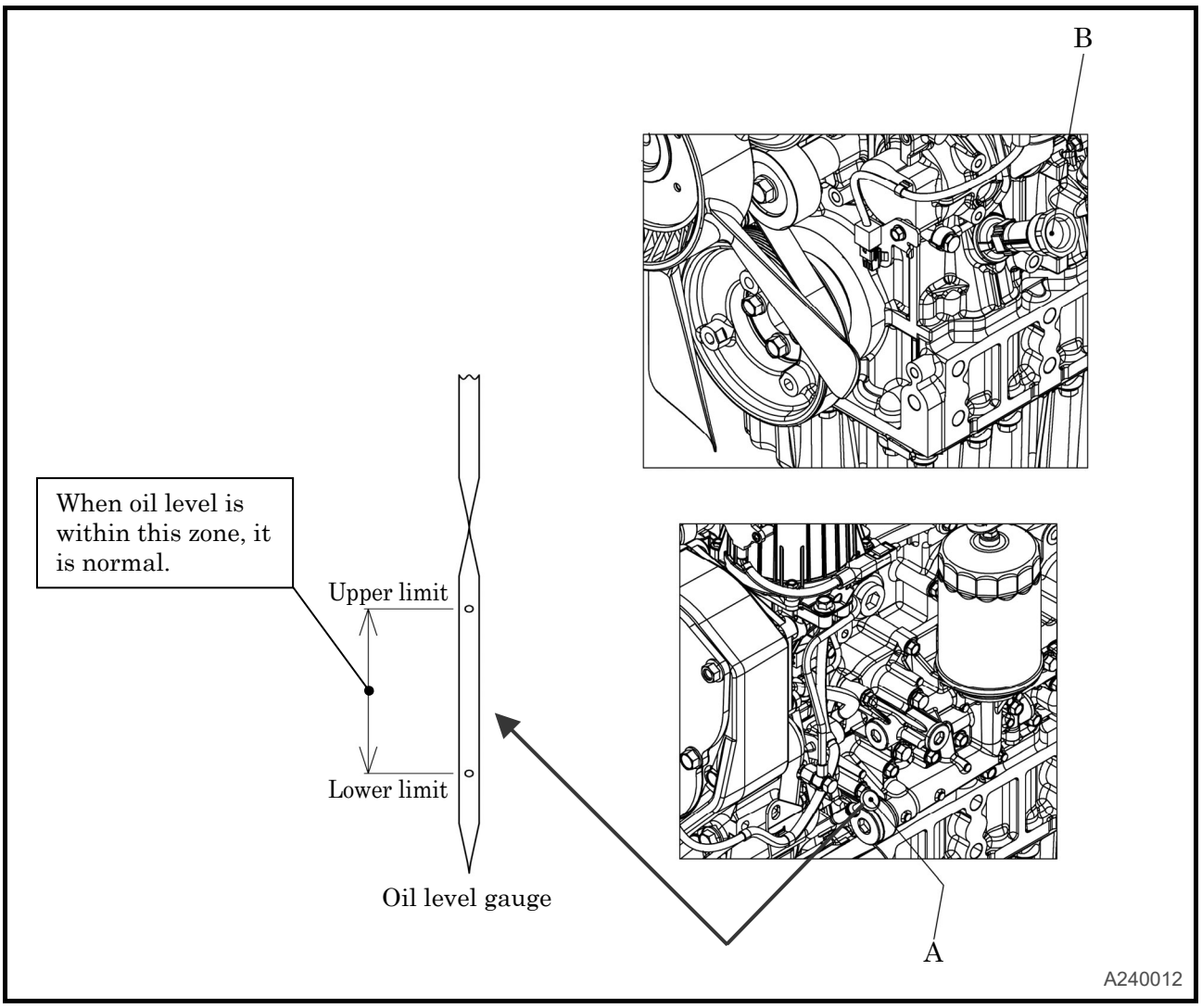
3.3.1 Check engine oil level

Place the machine on level ground when checking the oil level. If you check engine oil level after starting operation, be sure to check it after 10 minutes or more have elapsed since stopping the engine.

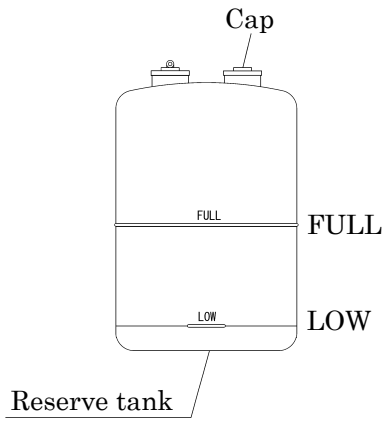
<Procedures>

1. Pull out the oil level gauge [A], 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 upper limit and lower limit, it is normal.
3. When the oil level is below its lower limit, add engine oil from oil filler port [B].

- 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)**
- Excessive engine oil supply could cause engine output degradation. Therefore, never fill more than the upper limit.



3.3.2 Check coolant level



- Verify the coolant level in the reserve tank is above "LOW".
- If the coolant level is lower than "LOW", remove the cap and supply coolant up to the center between "LOW" and "FULL". If too much coolant is poured into the reserve tank, it may overflow during operation.
- If there is no coolant in the reserve tank, remove the radiator cap and add coolant directly through the radiator fill port. **(See 5.5.17)**

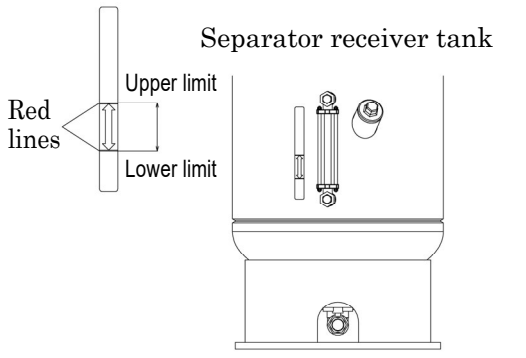
⚠ CAUTION

- When removing the radiator cap, lightly turn it and release the internal pressure without completely opening it once the first stage lock is released. After confirming that the internal pressure has been released, turn it while pushing in until the second stage lock is released. If this procedure is neglected, its inner pressure can blow off the radiator cap, and steam jetting out of the radiator may cause scalding burns.

IMPORTANT

- If the engine is operated with insufficient cooling water, the engine may be damaged.

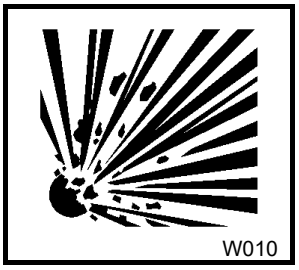
3.3.3 Check compressor oil level



- The machine should be on level before checking compressor oil level.
- The oil level of this machine will vary depending on whether it is in operation or not. When it is not in operation, make sure that the compressor oil level is above the upper limit line as shown in red on the level gauge plate. Replenish the oil if short. **(See 5.5.6)**

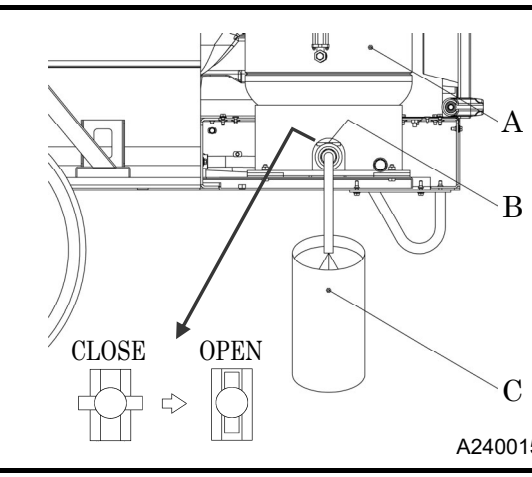
※ Supply of excessive oil can cause deterioration of oil separation performance and the like.

⚠ WARNING



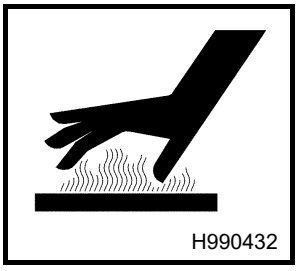
- When you refill the separator receiver tank with compressor oil, stop the engine, and make sure that the pressure gauge indicates 0psi and there is no residual pressure in it, and then gradually loosen the oil filler cap for refilling oil.
- Note residual pressure in the receiver tank could force both extremely hot compressed air and oil to jet out and you may be scalded or seriously injured.

3.3.4 Drain separator receiver tank



- Gradually opening the drain valve [B] fitted under the separator receiver tank [A] as shown in the fig, drain the condensate.
- When all the condensate is drained away and the compressor oil starts to come out, close the drain valve.
- Drain the condensate in container [C], and then dispose of condensate according to the designated regulations.
- When the fluid is difficult to distinguish by appearance, use a gloved hand and check its viscosity via touch to determine whether it is condensate or compressor oil.

⚠ WARNING



- 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.
- 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.
- A long-time operation with condensate accumulated could cause rust in the interior of compressor air-end, resulting in serious trouble.

3.3.5 Check fuel

Before starting operation, turn the CONTROL POWER switch on the operation panel from "OFF" to "ON". 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.

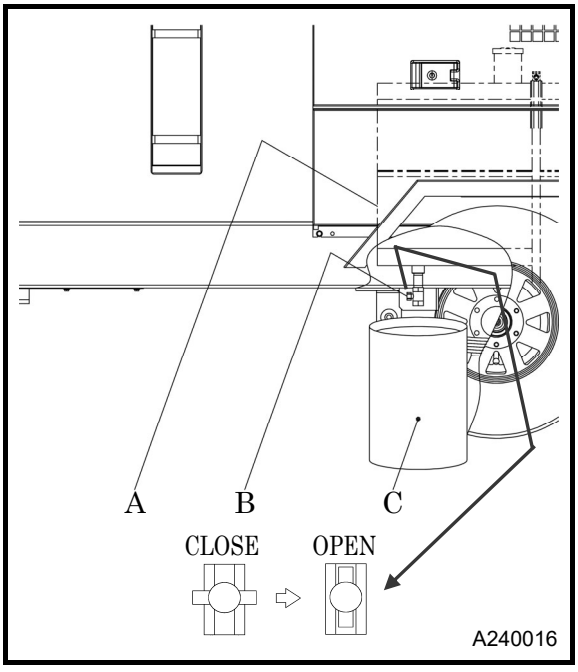
- Refilling fuel tank should be done in an outdoor well-ventilated place.
- **Never let oil reach the filler pipe of the filler port. Otherwise, high temperature may cause fuel to expand and spill out. Also, fuel may spill out due to vibrations during movement or carriage.**

⚠ CAUTION


D004

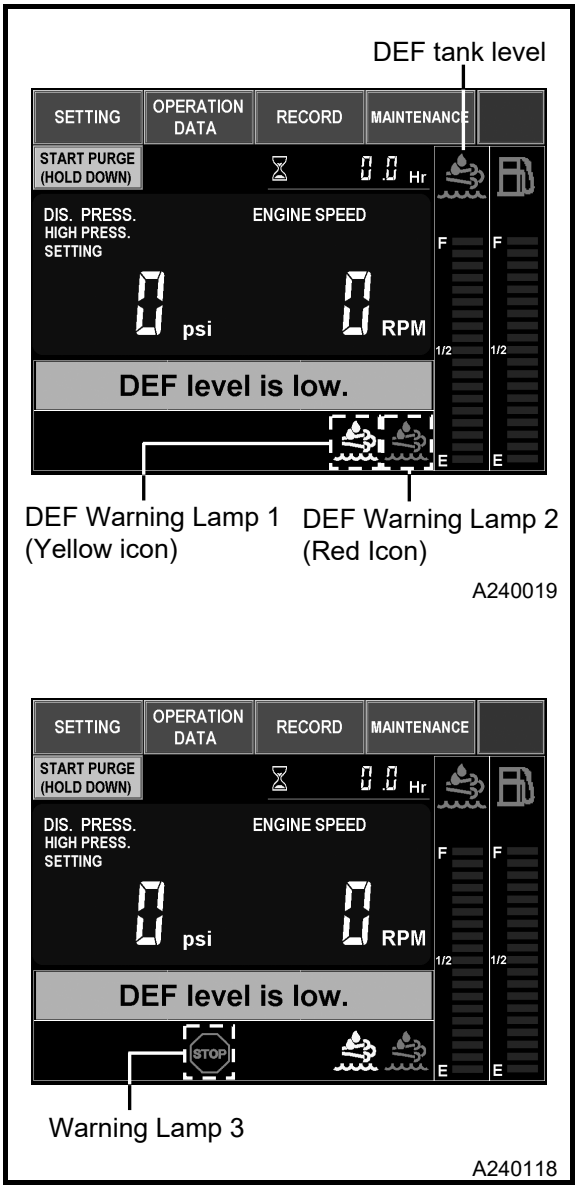
- Do not, under any circumstance, bring lit cigarettes and/or matches near fuel.
- The fuel is extremely flammable and dangerous. Be aware of fire sources that can easily ignite the fuel.
- Refuel only after stopping the engine, and never leave open fuel cans near the machine. Do not spill. It is a fire hazard. When spills occur, wipe up thoroughly.
- 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.

3.3.6 Drain fuel tank



- Gradually open the drain valve [B] of the fuel tank [A], drain the condensate from the tank.
- When all the condensate is drained away and the fuel starts to come out, firmly shut the drain valve [B].
- Drain the condensate in container [C], and then dispose of condensate according to the designated regulations.

3.3.7 Check DEF Level



- When there is less than 15% of DEF in the tank, the DEF Warning Lamp 1 will light up on the Home screen.
- When there is less than 5% of DEF in the tank, the DEF Warning Lamp 1 will start to blink; if the machine continues to operate, Engine Derate Level 1 is applied to the engine output.
- If the machine continues to operate while Engine Derate Level 1 is active, the DEF Warning Lamp 2 will also start to blink. If the machine runs for five minutes in this state, Warning Light 3 will light up on the Home screen, activating Engine Derate Level 2 on the engine.
- When Engine Derate Level 2 is active, the engine may stall if you open the service valve because this mode significantly restricts the engine output. To restore the operation, refill the DEF.

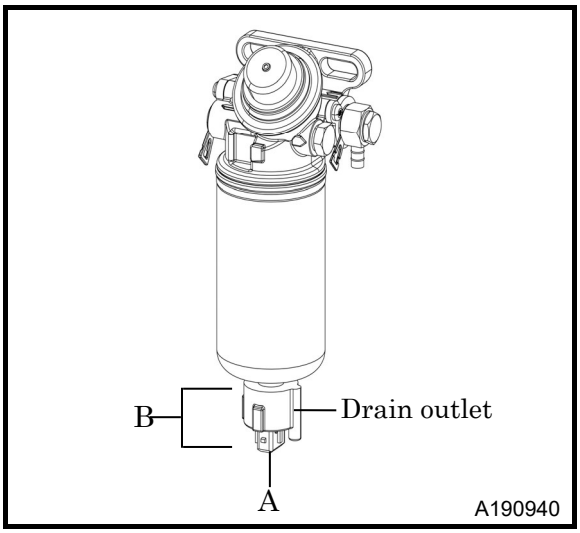
※**When refilling diesel fuel, refill DEF as well.**

[Engine Derate Levels]

- Level 1: Up to 50% of the maximum torque and 60% of the rated rotation speed
- Level 2: As slow as idling without torque

3.3.8 Check fuel pre-filter drain

Drain water whenever it accumulates in the fuel pre-filter. An alarm will be displayed on the touch screen of the operation panel when excess water builds up inside the pre-filter.



<Procedure>

1. Remove the wiring connector connected to [A].
2. Connect a drain hose to the drain outlet.
3. Prepare a container and loosen the drain plug [B] to begin draining.

- Fuel will be mixed in with the water, so take care not to spill.

4. When the water has been drained completely, retighten the drain plug [B] to stop.
5. Finally, reconnect the wiring connector removed from [A].

- Drain the condensate in container and then dispose of condensate according to the designated regulations.

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 Periodical Inspection of Machine Insides

Periodically check the inside of the machine for dusts (rubbishes) and flammables.

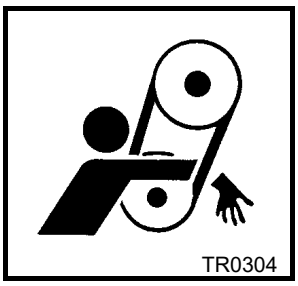
⚠ CAUTION

- 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.
- When any flammables such as chips of wood, dead leaves (dry leaves) and waste paper are left near heated exhaust muffler and heated exhaust pipe, all of them should be eliminated.
- Keep a fire extinguisher on hand near the machine in case of fire hazards.
- It is helpful to keep emergency contact numbers for urgent visit clinic, ambulance and firehouse.

3.3.12 Check belt

- Visually check if there are any cracks or tears in the belt.
- 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


TR0304

- When inspecting the belt, be sure to stop the machine, and then lock the door on the front of the instrument panel, remove the key before carrying out the work.
- Remove the negative (–) side cable from the battery.
- If the machine is not stopped, the operator's hand may be caught in the belt and cause serious injury.
- If inspecting or maintaining the area near the cooling fan, always stop the machine before going forward.
- Otherwise, personnel could become caught by the fan and thus could be seriously injured.

3.3.13 Opening and closing doors

To open the door, pull the handle toward you to release the latch. Be sure to close the door tightly so that its latch is firmly caught.

WARNING


PK0028

- Keep the door closed and locked while running the machine.
- When the door has to be opened, be careful not to touch portions that are rotating or very hot. Scalding burns or serious injury may result.

3.4 Operating Procedure

Make sure the door is closed securely.

3.4.1 Procedure of starting and stopping the machine

Follow the steps below to start up.

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 the error code lamp on the instrument panel is off.

<Procedures>

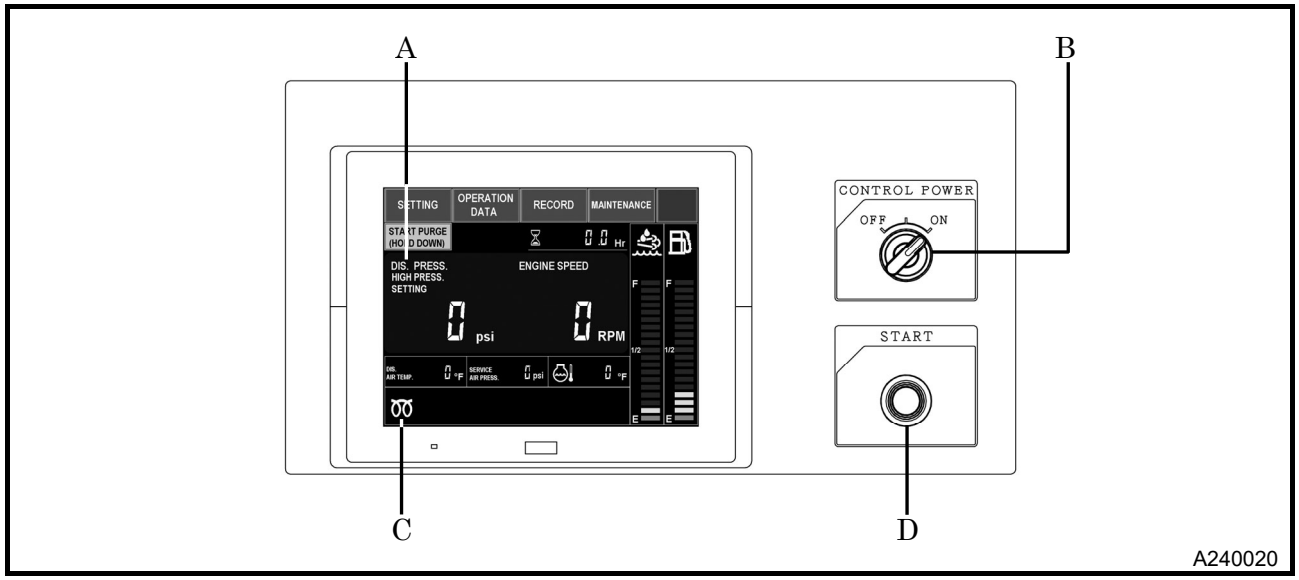
1. Ascertain that the service valve is fully closed.
2. Turn the CONTROL POWER switch [B] to "ON"
3. Ascertain that the discharge pressure display [A] on the home screen indicates 0psi.
4. Immediately after the GLOW lamp [C] goes off, press and hold down the START button [D] for one second or more to start the engine.
   The startup operation will stop automatically if it takes more than 30 seconds. If the machine fails to start after one attempt, wait for at least 1 minute before attempting to start it again. It could cause overheating to the starter motor and it could damage it. **(See 3.4.4)**
5. Once the engine has started up, leave it running to warm-up for 5 minutes.

● After the engine starts up, the starting unloader operation will automatically be performed. 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℃)	It exceeds 120 seconds or 30 seconds or certain seconds until discharge air temperature becomes 140°F (60℃) or more degrees which comes first.
Higher than 140°F (60℃)	30 seconds

During the starting unloader operation, compressed air will not be discharged.

6. After finishing warming up operation, open the service valve and start the work.



3.Operation

⚠ CAUTION

- Do not operate the machine with service valves 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.

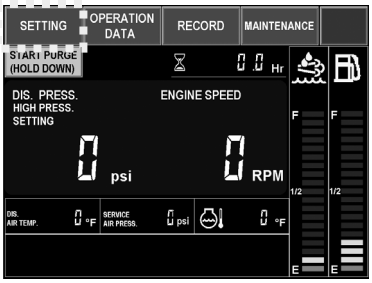
IMPORTANT

- Be sure to let machine warm-up after starting for smooth operation of the engine and the compressor air-end.
- Do not carry out on-load operations immediately after turning the machine on, as this could result in a shorter machine life.

3.4.2 How to select operating pressure

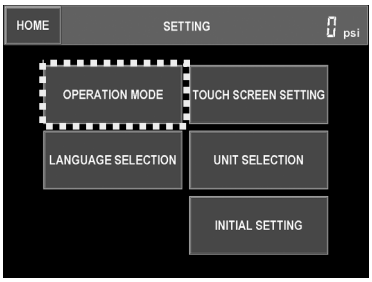
This machine allows you to change its operating pressure. The operating pressure can only be switched when the engine is stopped. (Operating pressure cannot be changed during operation.)

<HOME>



A240017

<SETTING>



A240021

<OPERATION MODE-1>

A240022

<Procedure>

1. Press SETTING on HOME screen.
2. Select OPERATION MODE on SETTING screen.
3. OPERATION MODE screen-1 is displayed.
4. Select the operating pressure (low pressure or high pressure).

- When LOW PRESS. SETTING is selected
  : Discharge pressure 100psi
  When HIGH PRESS. SETTING is selected
  : Discharge pressure 150psi

IMPORTANT

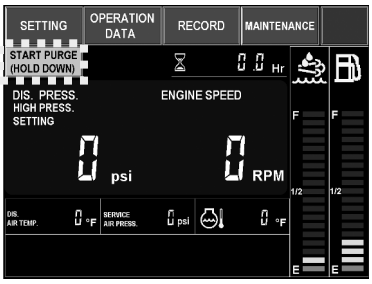
- When switching pressure, confirm the pressure specification of the load side equipment and use the equipment that meets the supply pressure.

3.4.3 Operation mode

Purge mode

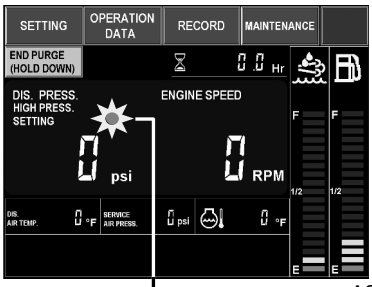
This device has both manual purge and auto-purge operation modes to reduce fuel consumption during no-load operations. Select the most suitable mode for your operating conditions.

<HOME>



A240017

<SETTING>



A240024

Purge indicator light

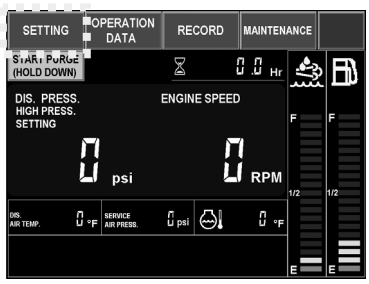
<Procedure>

1. Press and hold START PURGE (HOLD DOWN) on the HOME screen.
2. The purge indicator lights up on the HOME screen.
3. To stop the purge mode, press and hold END PURGE (HOLD DOWN) one more time to release the purge control and the purge indicator light will go out.

3.Operation

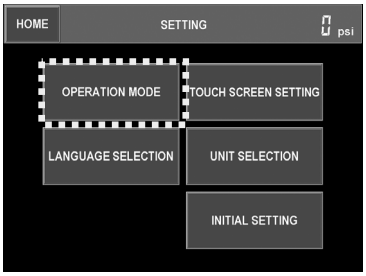
Selecting an Operation Mode

<HOME>



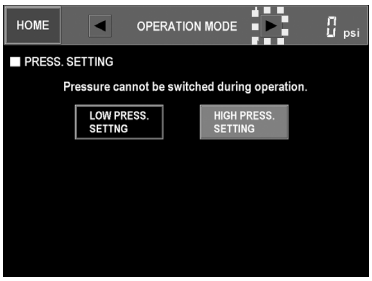
A240017

<SETTING>



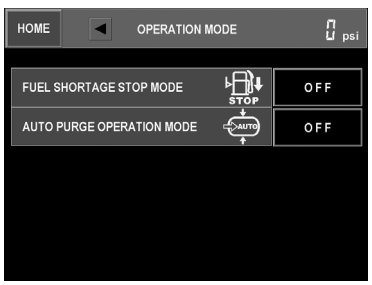
A240021

<OPERATION MODE-1>



A240022

<OPERATION MODE-2>



A240023

<Procedure>

1. Press the SETTING on the HOME screen.
2. Press the OPERATION MODE on the SETTING screen.
3. OPERATION MODE screen-1 is displayed.
4. Press the ▶ to switch to OPERATION MODE screen-2.
5. You can ON / OFF fuel shortage stop mode, and auto purge operation mode.

Purge operation behavior

Mode selection	Status of purge operation and auto purge lamp
● Purge operation After the engine rotation speed has reached the unload rotation speed, the pressure in the separator receiver tank will drop to reduce the power of the compressor itself.	 ON
● Auto-purge operation If the unload operation continues for a given setup time (initial setup: 60 seconds), the electromagnetic valve will start to operate, reducing the pressure in the separator receiver tank and reducing the power of the compressor itself.	 Flashing (in Auto-purge operation)
Next, the amount of consumed air will increase. When the service pressure has gone below the purge operation release pressure, the electromagnetic valve will close, thereby returning the machine to normal operation.	 OFF (in normal operation)

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

If the engine did not start even when you performed Steps 1 through 4 of Section 3.4.1, return the CONTROL POWER switch to the "OFF" position and wait 1 minutes or more. Then, perform the engine-starting operation again. If the repeated procedure does not allow the engine to run, the following causes are suspected. Therefore, check the following:

- No fuel
- Lack of air bleeding in fuel line. **(See 3.4.9)**
- Fuel filter clogging.
- Battery discharge (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 the machine in cold weather, change engine oil, fuel and LLC (antifreeze) according to the ambient temperature.

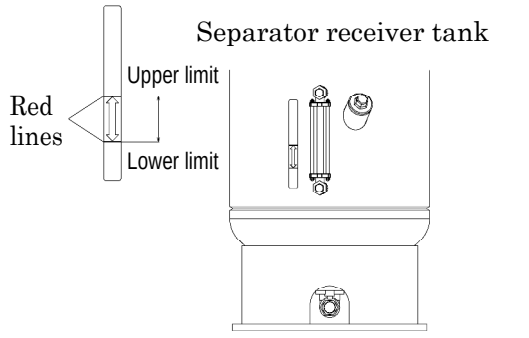
3.4.6 Inspection during operation

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

Item		Discharge pressure		Engine rotation speed		Indication mark	
							
Pressure setting value		High pressure :150psi	Low pressure :100psi	High pressure :150psi	Low pressure :100psi	—	—
Before startup (CONTROL POWER switch set to "ON" position		—		—		Not indicated ※1	Indicated
Starting unloaded operation		15 to 29psi		1,300 to 1,400RPM		Not indicated	Not indicated
In operation	No load (Unload)	150 to 174psi	100 to 131psi	1,300RPM	1,100RPM ※2 (1,300RPM)	Not indicated	Not indicated
	Full load	58 to 150psi	58 to 100psi	1,900RPM	2,200RPM	Not indicated	Not indicated

※1: The indication mark will disappear after 0 and 20 seconds. (Depending on outside temperature.)
※2: When discharge air temperature is less than 140°F (60°C).



- When the machine is in operation under load, check to see that the compressor's oil level falls within the range between the red lines on 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.

⚠ CAUTION

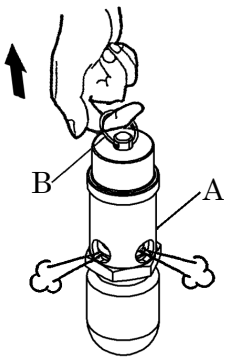
- Do not open the valves below listed when operating.
- Separator receiver tank condensate drain valve
- Radiator drain valve
- Engine oil condensate drain valve
- Oil cooler condensate drain valve
- Fuel tank condensate drain valve

IMPORTANT

- Minimum discharge air pressure is 58psi during operation.
- Continuing equipment operation at a lower pressure than the above pressure may cause overheating, since it affects the separation of compressor oil inside the oil separator and reduces the compressor oil flow to the compressor air-end, resulting in temperature rise. **(See 5.5.34)**

3.4.7 Checking the operation of the safety valve

Before using the machine, be sure to check the operation of the safety valve [A].



A240025

- Pull the test ring [B] to perform checks during the unload operation of the machine. It is performing normally when the compressed air jets out with slight force.

- Set Pressure

Safety valve set pressure	195psi

⚠ WARNING

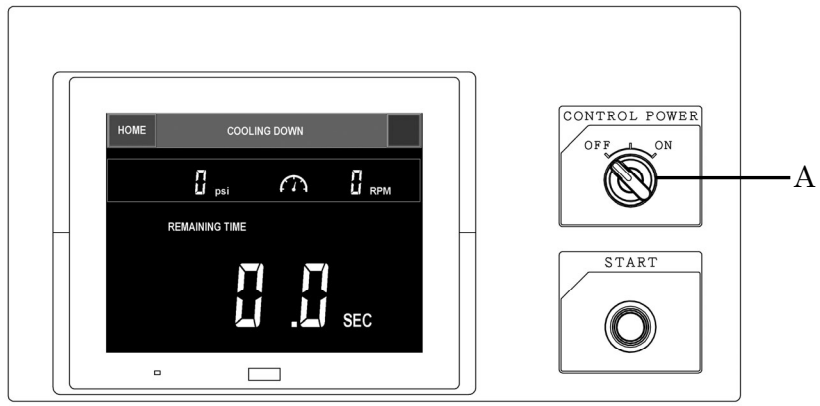
- Do not put your face or hand close to the outlet of the safety valve.
  Doing so is dangerous because high-pressure compressed air will be ejected.

3.4.8 Procedure to stop the machine

<Procedure>

1. Close the service valve completely.
2. Turn the CONTROL POWER switch [A] to the "OFF" position.
3. After 180 seconds of cooling operations, the engine will automatically stop.
4. After the engine stops, close the door located on the front of the instrument panel and then lock the door with the key. Remove the key and keep it in a safe place.

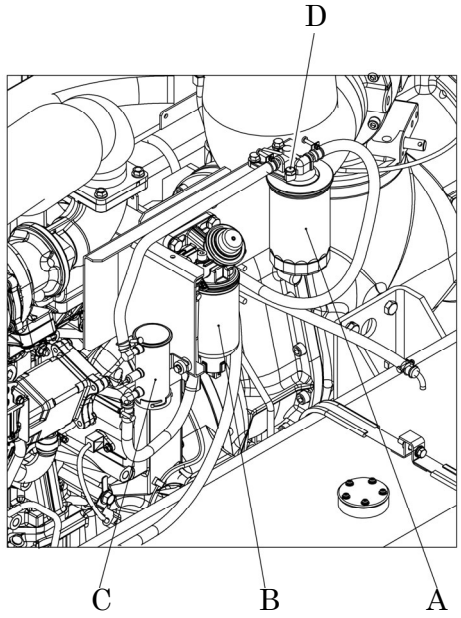
※ After the engine stops, the SCR system will run for a few minutes. Do not disconnect the battery until the SCR System has stopped to avoid any potential failure or malfunction.



A240026

3.4.9 Air bleeding in fuel line

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

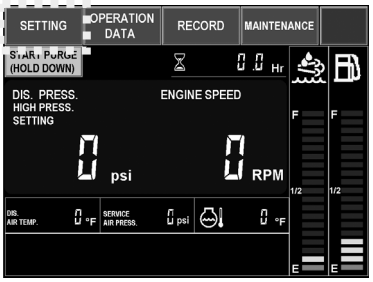


<Procedure>

1. Fuel filter [A] and fuel pre-filter [B] should be filled up with fuel and set up.
2. Loosen the air bleeding plug [D] sufficiently on the fuel filter [A].
3. Turn the CONTROL POWER switch to the “ON” position, so the electromagnetic pump [C] will begin to operate. Check that air bubbles and fuel are coming out from where the air bleed plug [D] was loosened.
4. Air bleeding is completed about 1 minute.
5. Once the air bleeding is completed, tighten the air bleeding plug [D].
   Air bleeding plug tightening torque: 7.8N･m (5.9 to 9.8N･m)
6. Set the CONTROL POWER switch to the “OFF” position, and then wipe spilled fuel.

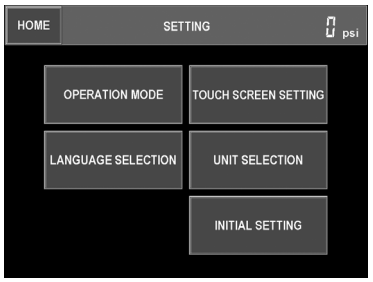
3.5 SETTING screen

<HOME>



A240017

<SETTING>



A240021

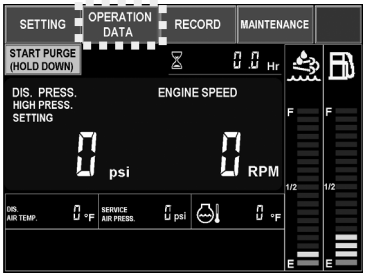
- Operating condition, running parameters, and various other settings and be can be read and changed here.
- Press the SETTING on HOME screen to display the SETTING screen.

3.5.1 OPERATION DATA

<Procedure>

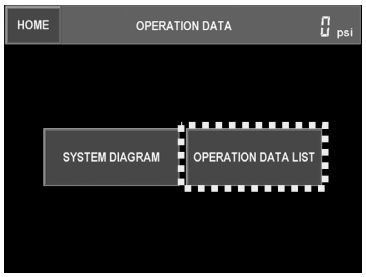
1. Press the OPERATION DATA on HOME screen.
2. Press the OPERATION DATA LIST on OPERATION DATA screen.
3. OPERATION DATA LIST COMPRESSOR screen will appear, and you can easily see how the machine is running.
4. Each time the ▶ button is pressed, the screen will change in the order as shown below.

<HOME>



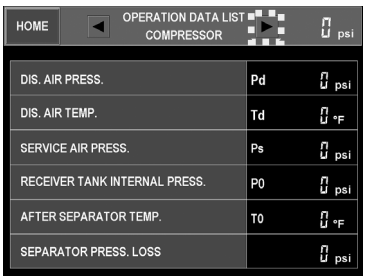
A240017

<OPERATION DATA>



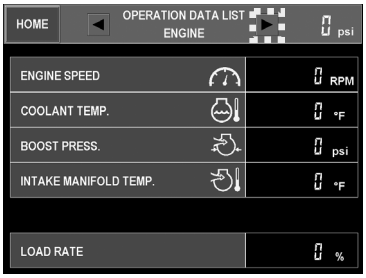
A240086E

<OPERATION DATA LIST-COMPRESSOR>



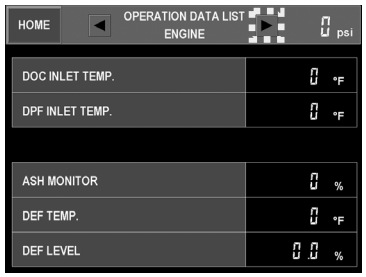
A240087

<OPERATION DATA LIST-ENGINE-1>



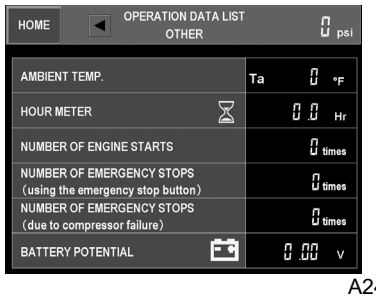
A240088

<OPERATION DATA LIST-ENGINE-2>



A240089

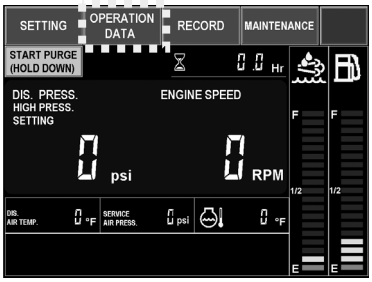
<OPERATION DATA LIST-OTHER>



A240090

3.5.2 SYSTEM DIAGRAM

<HOME>

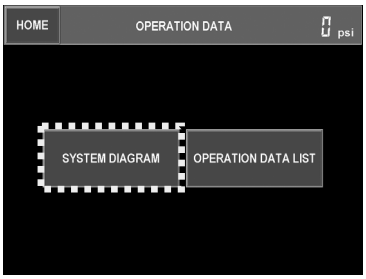


A240017

<Procedure>

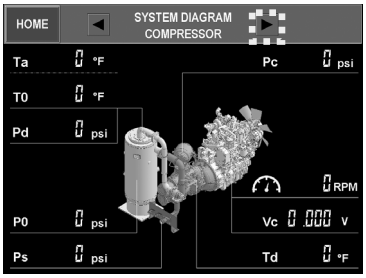
1. Press the OPERATION DATA on HOME screen.
2. Press the SYSTEM DAIGRAM on OPERATION DATA screen.
3. The screen displays how the compressor is operating.
4. Press ▶ to see how the engine is running.
5. Press ▶ once again to see how DPF and SCR are operating.

<OPERATION DATA>



A240086E

<SYSTEM DIAGRAM-COMPRESSOR>

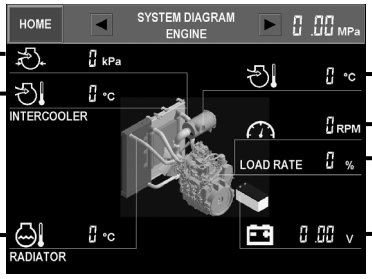


A240028

<SYSTEM DIAGRAM-ENGINE-1>

Engine intake temp.
Engine speed
Engine load factor
Battery voltage

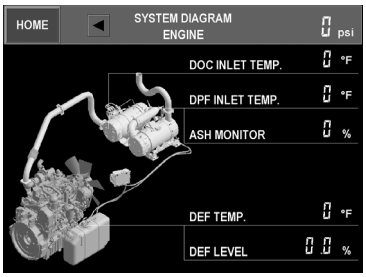
Boost pressure
Intake manifold temperature
Coolant temperature



A240029

Ta: Outside temperature
T0: Discharge air temp. at separator receiver tank
Pd: Discharge air pressure
P0: Pressure within the separator receiver tank
Ps: Service pressure
Pc: Secondary pressure of the pressure regulator
Vc: Voltage signal (Accelerator)
Td: Discharge air temp.

<SYSTEM DIAGRAM-ENGINE-2>

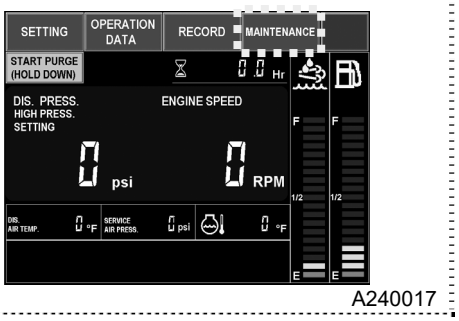


A240030

3.5.3 MAINTENANCE

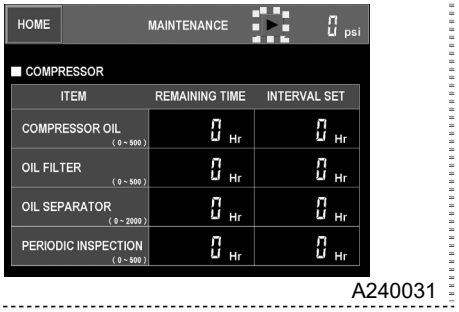
The maintenance intervals for major maintenance items can be set at the user's discretion.

<HOME>



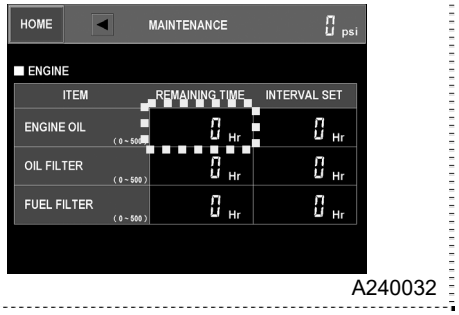
A240017

<MAINTENANCE-1>



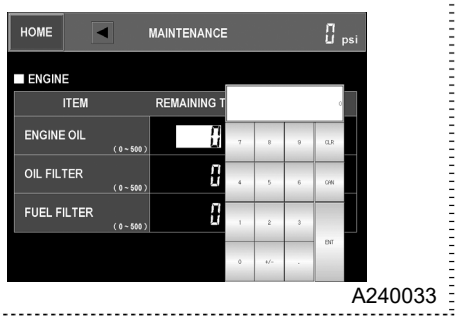
A240031

<MAINTENANCE-2>



A240032

<MAINTENANCE-2>



A240033

<Procedure>

1. Press the MAINTENANCE on HOME screen.
2. MAINTENANCE screen-1 is displayed.
3. Press the ▶ to switch to MAINTENANCE screen-2.

- Press the REMAINING TIME to display the numeric keypad. Set the desired times.
- For maintenance intervals, refer to “Periodic Inspection List” and set them, as necessary.
- No maintenance alarm will be displayed if the maintenance interval is set to [0].

3.5.4 Record

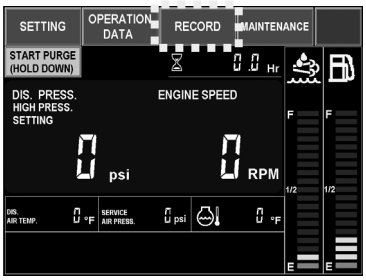
The records of various operations can be displayed.

[TREND GRAPH]

<Procedure>

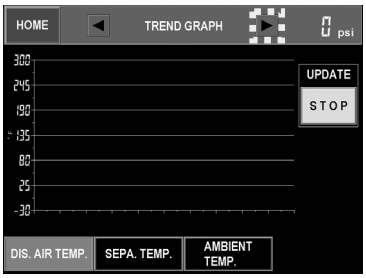
1. Press the RECORD on HOME screen.
2. Press the TREND GRAPH on RECORD screen to display the TREND GRAPH screen-1.
   (Sampling interval: Two seconds, recording time: 60 minutes.)
3. Press the ▶ in TREND GRAPH screen-1 to switch to TREND GRAPH screen-2 and 3 in series.

<HOME>



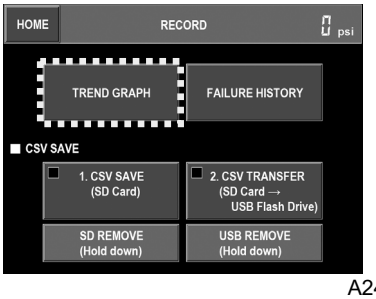
A240017

<TREND GRAPH-2>



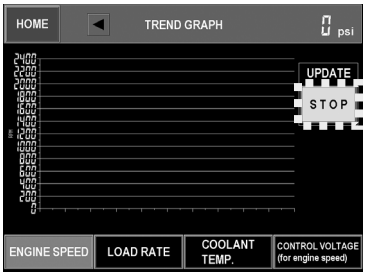
A240036

<RECORD>



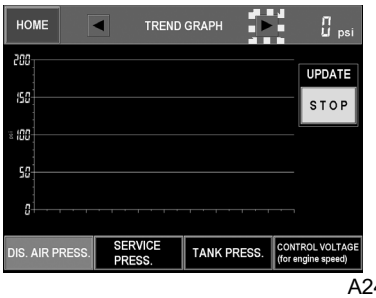
A240034

<TREND GRAPH-3>



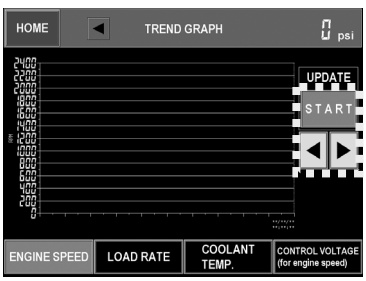
A240037

<TREND GRAPH-1>



A240035

<TREND GRAPH-3>



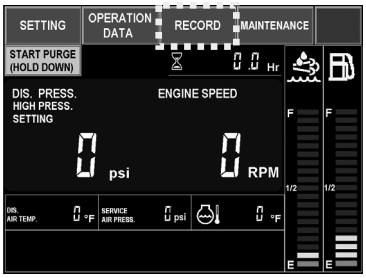
A240038

[Graph scrolling]

4. Press the STOP to display the scroll buttons ◀▶. Press the scroll buttons to scroll the graph.
   You can check the previous operational conditions.
5. Press the START button to start updating the graph.

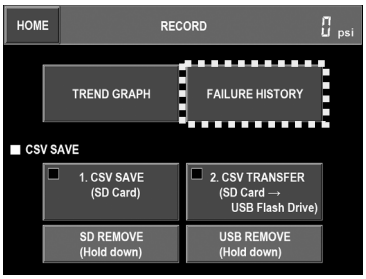
[Failure history]

<HOME>



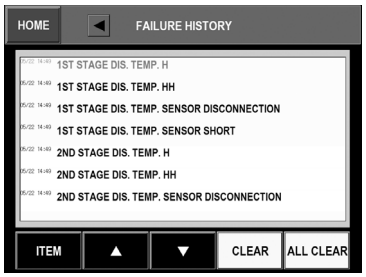
A240017

<RECORD>



A240034

<FAILURE HISTORY>



A240041

<Procedure>

1. Press the RECORD on HOME screen.
2. Press the FAILURE HISTORY on RECORD screen to display the failure history screen.
3. From this screen, you can see the details of abnormal conditions that occurred and any alarms that were previously issued and solved.

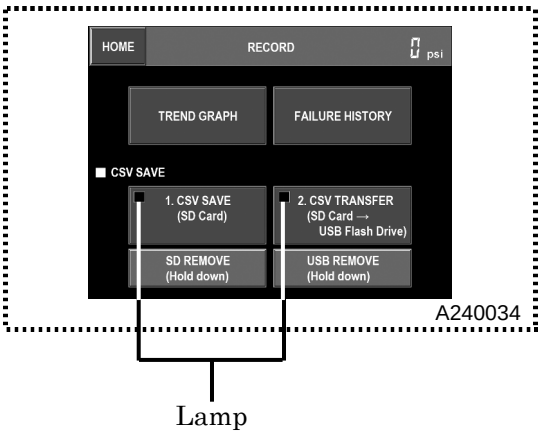
● By pressing and holding CLEAR or ALL CLEAR, you can delete the history.

CLEAR: Clears the selected item only (Press ITEM and then select an item using ▲ · ▼.)

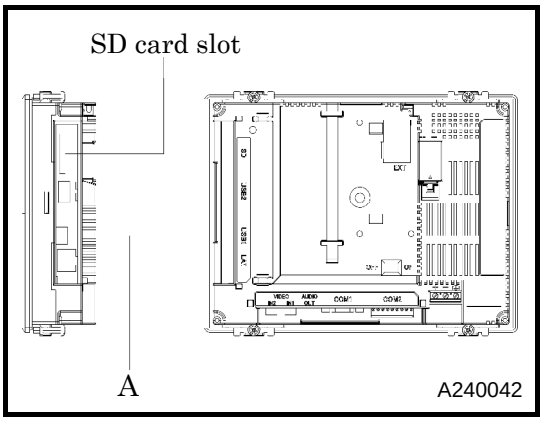
ALL CLEAR: Clears all the displayed items

[CSV data saving]

<RECORD>



- The operation record (sampling interval: 2 seconds) and the failure history can be saved onto an SD card as CSV data to transfer to a USB memory.
- Follow the procedure on page 3-25 to switch to the RECORD screen.
- On the RECORD screen, before saving the data, make sure that the 1.CSV SAVE lamp lights up.



<Procedure>

1. If an SD card is inserted in the touch screen. The 1.CSV SAVE lamp will light up.
2. Touch 1.CSV SAVE to save the CSV data to the SD card. The button will change to SAVING while the data is being saved, and then it will returns to 1. CSV SAVE when the saving is completed.
3. Open the operation panel and insert a USB memory (USB2.0, TYPE-A) into the USB port [A] on the reverse side of the touch screen. The 2.CSV TRANSFER lamp will light up.
4. Touch 2.CSV TRANSFER to transfer the saved CSV data from the SD card to the USB memory. The button will change to TRANSFERRING during the transfer, and then it will return to 2.CSV TRANSFER when the data transfer is completed.

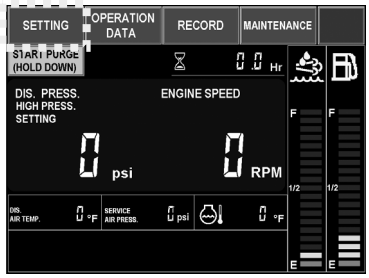
- CSV data cannot be saved directly to USB memory; save the data to the SD card and then to the USB memory.

5. Press and hold USB REMOVE, and then make sure that the 2.CSV TRANSFER lamp is turned off. Next, remove the USB memory. (Removing the USB memory will hide USB REMOVE and inserting it again will restore the indication.)

- Pressing and holding SD REMOVE will turn off the 1. CSV SAVE lamp, allowing you to remove the SD card safely. (Removing the SD card will hide SD REMOVE and inserting it again will restore the indication.)

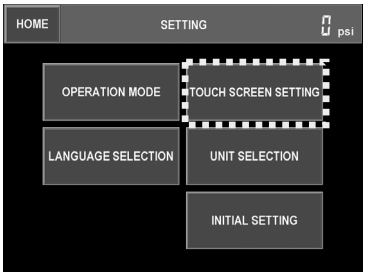
3.5.5 Touch screen adjustments

<HOME>



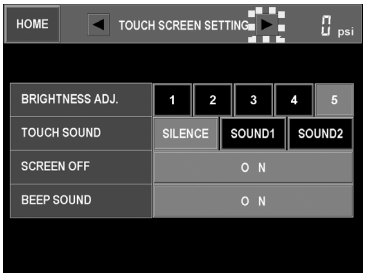
A240017

<SETTING>



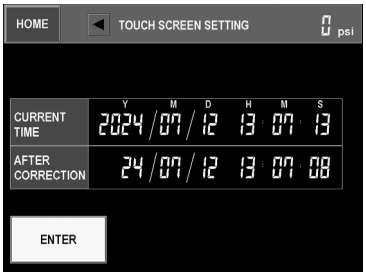
A240021

<TOUCH SCREEN SETTING-1>



A240039

<TOUCH SCREEN SETTING-2>



A240040

<Procedure>

1. Press the SETTING on HOME screen.
2. SETTING screen is displayed.
3. Press the TOUCH SCREEN SETTING on SETTING screen to change the TOUCH SCREEN SETTING screen-1. Here, you can adjust the brightness, select the touch sound, and set whether to turn off the screen and whether to sound a failure warning.

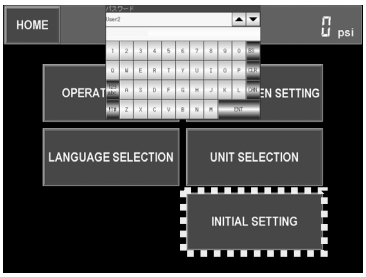
- If the failure warning sound is ON, a warning will be sounded when a failure occurs. (If it is OFF, no warning will be sounded).

4. Press the ▶ to switch to TOUCH SCREEN SETTING screen-2. Here, you can set the time.

- To change the time, touch the numeric time indicated to the right of AFTER CORRECTION to display the numeric keypad. Enter the numeric time and then press ENT. After setting the time, press the ENTER on TOUCH SCREEN SETTING screen.

3.5.6 INITIAL SETTING

<HOME>



A240043

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

3.6 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.

⚠ WARNING

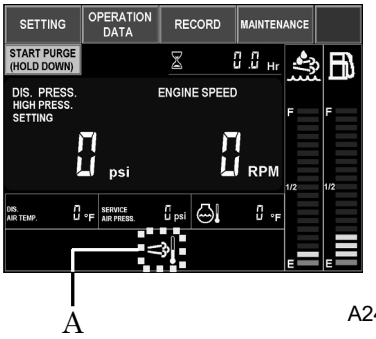
- During regeneration, the exhaust gases reach temperatures hot enough to cause burns to people, or ignite and melt other materials. During regeneration the area above and immediately surrounding the engine should be free of any possibly flammable objects.

3.6.1 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.

3.6.2 Automatic regeneration

<HOME>

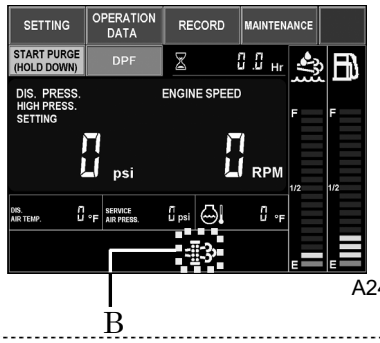


A240044

- Exhaust temperatures are increased periodically to perform automatic regeneration to avoid soot accumulation in the DPF.
- The machine 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℃).
- 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.

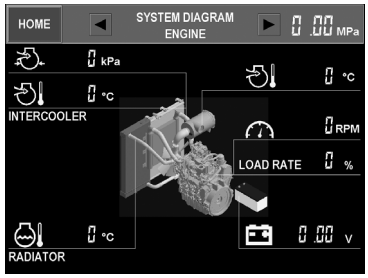
3.6.3 Manual regeneration

<HOME>



- The exhaust temperature may not reach temperatures hot enough to burn soot during operation in cold weather or under low loads. If the machine 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.

<SYSTEM DIAGRAM-2>



<Procedure>

1. Stop any ongoing work and close the service valve.
2. Select SYSTEM DIAGRAM screen-2 from OPERATION DATA on the HOME screen and make sure that the water temperature is above 122°F (50℃).

- If the water temperature is below 122°F (50℃), let the machine warm up until the water temperature will be above 122°F (50℃).

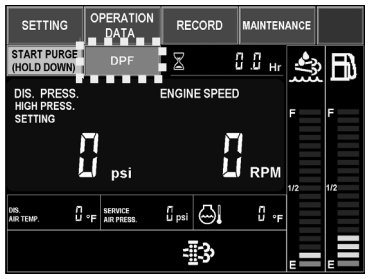
3. Return to the HOME screen and press the DPF.
4. PARKED REGENERATION screen will be displayed.
5. Press and hold the START to switch to manual regeneration.

- While the machine is in the manual regeneration mode, the indicators of Preparing..., Regenerating..., and completed will blink in this order, respectively, to display what it is doing.

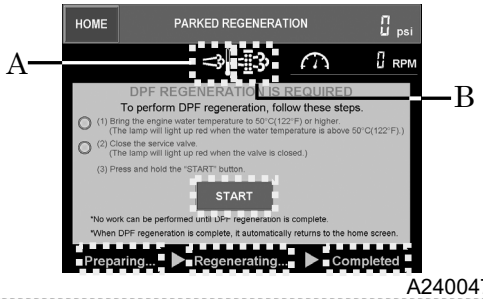
※ It is normal for engine speed to vary while performing a manual regeneration.

- 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. Beware of hot exhaust gas.
- The DPF indicator [B] will be cleared once the manual regeneration is completed.
- When finished, the machine will return to an unloaded state and be ready for normal operation.
- When regeneration is completed, the screen will automatically return to the HOME screen.

<SETTING>



<PARKED REGENERATION>



⚠ CAUTION

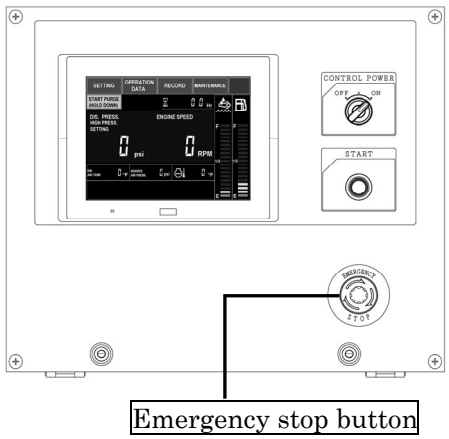
- Do not stop the engine during the manual regeneration.
- Warm up in advance before pressing the START button. If the water temperature is not high enough, the engine will not start regeneration when you press the START button.

IMPORTANT

- Take the specific steps to perform manual regeneration when the DPF Regeneration Light lights up. Operation without manual regeneration in advance may result in excess soot deposits, which could burn abnormally and cause damage to the DPF or cause a fire.

3.7 Emergency Stop

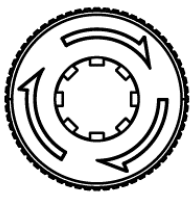
3.7.1 Emergency stopping procedures



A240011

- If it is necessary to stop the machine for emergency, press the Emergency Stop button which is located below the operation panel. When doing shut down by emergency stop button, the machine will be stopped immediately.
- After stopping, immediately return the CONTROL POWER switch to the "OFF" position. Also, do not look inside the machine and take inspection right after stopping.
- Stopping the machine with this button can damage various parts such as the DEF System; only use it in an emergency.

3.7.2 Cancellation of emergency stop button



Turn the button head in the direction of the arrow.

Emergency stop button

A190949

- After emergency stopping, be sure to carry out an investigation of the problem which caused you to use the emergency stop and take appropriate countermeasures. 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 operation.

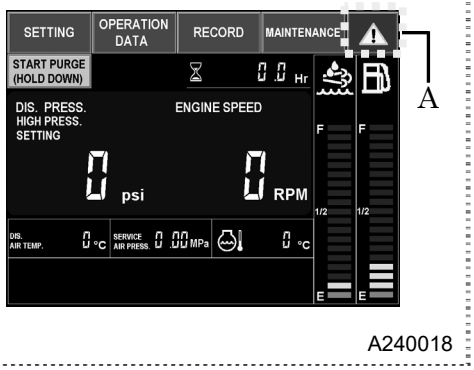
4 Failure cause and measures

4.1 Warning / Emergency display

4.1.1 Warning / Emergency conditions

When an alarm or abnormality occurs, the failure button [A] will appear on the main screen and flash.

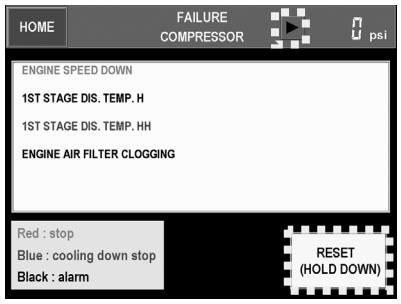
<HOME>



A240018

- When a warning or emergency, press the blinking failure button [A] on the HOME screen.

<FAILURE COMPRESSOR>

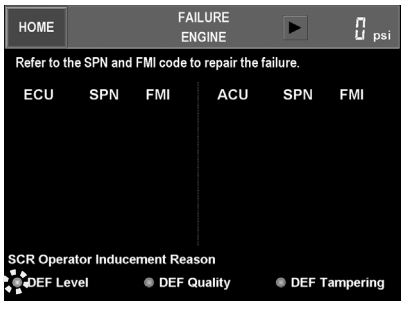


A240048

[Details of a failure in the compressor]

- Press the failure button [A] to show the warning or emergency indication described on page 4-2 or 4-3.
- After clearing the cause of the error, press and hold the RESET button.

<FAILURE ENGINE>



A240180

[Details of a failure in the engine]

- ▶ blinks on the FAILURE COMPRESSOR screen in case of a failure in the engine. Press ▶.
- Pressing ▶ opens the FAILURE ENGINE screen. Please contact your nearest dealer. **(See 4.1.5)**
- Press the ▶ again to return to the FAILURE COMPRESSOR screen.

[In case of a failure of the SCR system]

In case of a failure of the SCR system, the DEF Level, the DEF Quality, or the DEF Tampering indicator will light up at the bottom of the FAILURE ENGINE screen, indicating what is wrong. Check the cause of the failure and take proper measures. **(See 4.1.6)**

4.1.2 Indication mark and Warning / Emergency display

[Indication mark]

Item	Contents	Measures	Indication mark
Glow	Press CONTROL POWER switch "ON" and the lamp goes on and after preheating is finished, the lamp will be off.	—	
Charge	Lamp goes on when alternator is not charging.	Check wiring Check alternator	

4.1.3 Warning Display

This displays such trouble of less importance when it occurs during operation, but the unit continues operating. When warnings are displayed, immediately take relevant countermeasures to resume normal operations.

Item	Contents	Measures
DISCHARGE TEMP. H	Displayed when the discharge air temperature at the outlet of the compressor air-end reaches 239°F (115℃).	See 4.2 "Troubleshooting"
ENGINE WATER TEMP.ALARM	Displayed when engine coolant temperature reaches 221°F (105℃).	
COMP. AIR FILTER CLOGGING	Displayed when the 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	See 4.2 "Troubleshooting"
SEPARATOR TEMP. H	Displayed when the discharge air temperature at the outlet of the separator reaches 239°F (115℃).	
OUTSIDE TEMP. RISE	Displayed when the outside temperature reaches 113°F (45℃).	
SEPARATOR PRESSURE LOSS	Displayed when the pressure difference between the separator inlet and the outlet reaches 16psi.	
AMBIENT TEMP. SENSOR DISCONNECTION OR SHORT	Displayed when the outside temperature sensor is disconnected or short-circuited.	Check/Change
MAINTENANCE PARTS NEED CHECK	Displayed when it is time to clean or replace maintenance parts or to conduct an annual inspection. The maintenance intervals are specified in 3.5.3.	Maintenance based on the list of regular inspection items

4.1.4 Emergency display

If any failure is detected during operation, an emergency alert will appear, and the machine will stop. Take the necessary countermeasures and restart the machine.

Item	Contents	Measures
※DISCHARGE TEMP. HH	Displayed when the discharge air temperature at the outlet of the compressor air-end reaches 248°F (120℃).	See 4.2 "Troubleshooting"
※ENGINE WATER TEMP. RISE	Displayed when engine coolant temperature reaches 230°F (110℃).	
☆ENGINE OIL PRESSURE DOWN	Displayed when the engine oil pressure drops. [The function pressure: 7psi.]	
☆SEPARATOR TEMP. HH	Displayed when the discharge air temperature at the outlet of the separator reaches 248°F (120℃).	
☆ENGINE SPEED DOWN	Displayed when the engine rotation speed drops during operation.	
※DISCHARGE TEMP. SENSOR DISCONNECTION OR SHORT	Displayed when the discharge air temperature sensor at the outlet of the compressor air-end is disconnected or short-circuited.	
※SEPARATOR TEMP. SENSOR DISCONNECTION OR SHORT	Displayed when the discharge air temperature sensor at the outlet of the separator is disconnected or short-circuited.	
※TANK INTERNAL PRESS. RISE	Displayed when the internal pressure of the separator receiver tank reaches 195psi.	
※FUEL SHORTAGE	Displayed when fuel is in short supply.	
☆COUPLING PROTECTION	Displayed when the engine keeps the rotation speed low during startup.	
☆START-UP CONGESTION	Displayed when the engine does not start up after running the cell motor for 30 seconds.	

※. **Stops after cooling operation**
☆. **Immediately stops**

4 Failure cause and measures

4.1.5 Engine trouble

[List of diagnostic codes]

The table below shows a list of failure codes.
The details of the failure codes and the countermeasures require professional knowledge. For the details, contact your nearest dealer.

SPN	FMI	Details	Condition of machine
1077	2	Abnormal of ECU	Engine does not start. Engine stops during operation.
102	3	Abnormal of boost pressure sensor output voltage high	Output drops.
91	3	Abnormal of throttle voltage high	Low idling is fixed.
104	3	Abnormal of oil pressure sensor output voltage high	Engine burns or No signal of engine hydraulic detection.
110	3	Abnormal of water temp. sensor output voltage high	Cold start performance is not good.
110	0	Engine overheat	Output drops.
102	3	Abnormal of boost temp. sensor output voltage high	Drop of output or Black smoke when speed up
108	3	Abnormal of atmospheric temp. sensor output voltage high	Drop of output or Black smoke when speed up. Discharge temp. increases at high altitude. Output drops.
190	0	Engine over speed	Engine revolution changes dramatically.
651	3	Abnormal of breaking or short circuit of injector system	Output drops.
3509	3	Abnormal of power voltage high of engine control sensor supply power 1 (+5V･CN-J1 Connector Pin No.33)	Engine performance is not good.
168	3	Abnormal of power voltage high	Engine revolution unstable
100	1	Drop of engine oil pressure	Output and revolution drops.
157	3	Abnormal of common rail pressure sensor output voltage high	Engine performance is not good.
157	0	Abnormal of common rail pressure 1 (First stage)	Engine performance is not good.
97	31	Abnormal amount of deposits in the fuel pre-filter	Output drops. Engine stops during operation.

4.1.6 SCR inducement

Item	Contents	Measures
DEF Level	Lights up when 15% or less of DEF is left	Replenish DEF
DEF Quality	Lights up when DEF quality degrades	Replace DEF
DEF Tampering	Lights up during a DEF injection fault or a system failure (e.g., sensor disconnected)	Call your nearest dealer

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 measures of important troubles in detail:

Symptom	Cause	Measures
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 Change
The starter rotates normally but the engine does not start.	(1) Clogging of fuel filter (2) Clogging of fuel pre-filter (3) No fuel (4) Air entry into fuel line system (5) Nozzle clogging	Disassemble/Clean/Change Disassemble/Clean/Change Replenish fuel Bleed the air Disassemble/Clean
The discharge air pressure will not rise.	(1) Pressure regulator insufficient adjustment (2) Trouble of the solenoid valve for starting unloader (3) Faulty regulator for starting unloader	Re-adjust (Fasten) Change Call your nearest dealer
The engine does not reach the rated revolution speed.	(1) Faulty engine controller (2) Trouble of emergency controller (3) Clogging of the unloader orifice (4) Trouble of engine (5) Clogging of fuel filter (6) Clogging of fuel pre-filter (7) Water is accumulated in fuel pre-filter (8) Clogging of the air filter element (9) Trouble of the solenoid valve for starting unloader	Call your nearest dealer Call your nearest dealer Disassemble/Clean Call your nearest dealer Disassemble/Change Disassemble/Change Drain water Clean or change of element 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) Clogging of the scavenging orifice strainer (2) Excessive oil in separator receiver tank (3) Low discharge pressure (4) Oil separator element deteriorated	Disassemble/Clean Drain to its proper level Disassemble and check of unloader/pressure control valve Check/Change
Insufficient free air delivery.	(1) Clogging of the air filter element (2) Unloader valve cannot fully open (3) Engine does not reach rated speed	Clean or change of element Call your nearest dealer (See page 4-5)

4 Failure cause and measures

Symptom	Cause	Measures
Charge error	(1) Belt snapped (2) Belt slippage (3) Loose wiring, connectors and disconnection around the alternator (4) Trouble of the alternator	Change Change Check/Fasten Call your nearest dealer
Error code of engine hydraulic abnormal indicates and engine stops.	(1) Engine oil shortage (2) Engine oil filter clogging (3) Faulty oil pressure sensor (4) Loose wiring, connectors and disconnection	Replenish engine oil Change Change Check/Fasten
Warning of coolant temperature or abnormal error code indicates. (Engine stops when abnormal error code indicates.)	(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 Change Check/Fasten
Warning of discharge air temperature or separator discharge air temperature or abnormal error code indicates. (Engine stops when abnormal error code indicates.)	(1) Oil cooler clogging (2) Oil filter clogging (3) Faulty discharged air temperature sensor (4) Loosened or disconnected wiring or connector (5) Belt slippage (6) Shortage of compressor oil (7) Operation error of by-pass valve. (8) Discharge air temperature sensor is disconnected (9) Separator element clogging (Separator discharge air temperature warning / emergency display only)	Clean Change Disassemble/Check Check/Fasten Change Replenish compressor oil Check/Change Repair/Change Change
Coupling protection, starting failure, or drop of engine RPM is displayed, and engine stops.	(1) Loose wiring, connectors and disconnection (2) Shortage of feeding fuel caused due to fuel filter and feed pump strainer clogging (3) Air mixed in fuel line system (4) Output reduction due to clogged engine air filter	Check/Fasten Change filter/Clean strainer Bleed air Clean or change of air filter
Discharge air temperature sensor disconnection, water temperature sensor disconnection, or separator outlet air temperature sensor disconnection is displayed, and engine stops.	(1) Each sensor's wiring/connector loosen/come off (2) Each sensor has error (3) Each sensor disconnects	Check/Fasten Disassemble/Check Repair/Change
High outside temperature warning is displayed.	(1) High outside temperature (2) Insufficient ventilation at the temperature sensor (3) Exhaust from other equipment	Improve ventilation Improve ventilation Install shield to prevent exhaust from other equipment

4 Failure cause and measures

Symptom	Cause	Measures
Warning for increasing separator pressure loss is displayed.	(1) Separator clogging (2) Compressor oil deteriorated	Change Change
Increased internal pressure of the separator receiver tank is displayed and the engine stops.	(1) Pressure regulator insufficient adjustment (2) Unloader valve damaged/Faulty seat (3) Faulty controller	Re-adjust (loosen) Call your nearest dealer Call your nearest dealer
Low remaining amount of fuel is displayed and the engine does not start up.	(1) No fuel (2) Sending unit failure	Replenish Check/Repair

- Contact your nearest dealer if you find it difficult to repair by yourselves.
- Refer to the engine operation manual for trouble concerning the engine.

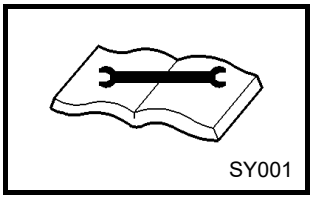
5. Periodic Inspection/Maintenance

5.1 Important Items at Periodic Inspection and Maintenance or after Maintenance

This manual shows the inspection and maintenance intervals under normal operating conditions, not the warranty period. When using under severe environmental conditions or operating conditions, shorten the maintenance interval.

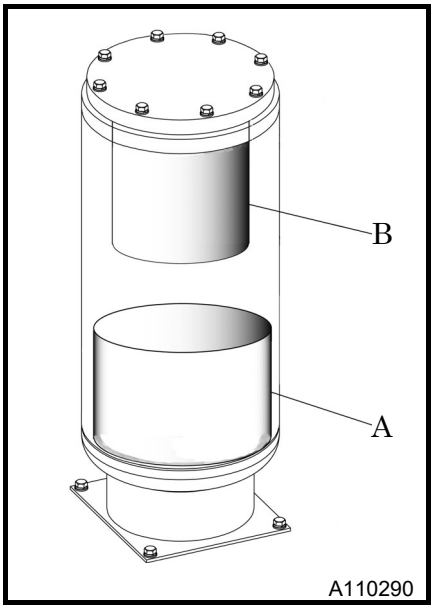
- Please wear protection implements, such as a helmet, protection glasses, earplugs, safety shoes, a glove, and a protection-against-dust mask, according to the contents of work for safety.
- Take care not to touch hot portions of the machine while inspecting during operation. Such parts as engine, exhaust manifold, exhaust pipe, muffler, radiator, oil cooler, air-end, pipe, separator receiver tank, and discharging pipe are especially hot, so never touch these parts, it will cause burning.

⚠ WARNING **Hang an "Under Maintenance" tag**


SY001

- Before starting inspection, make sure to turn the CONTROL POWER switch to "OFF", and then lock the door on the front of the instrument panel, remove the key, 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.

⚠ CAUTION **Prevention of oil separator from catching fire**



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- Be sure to perform following periodic inspection and maintenance:
  A. Check and change compressor oil quantity
  B. Change oil separator element

5. Periodic Inspection/Maintenance

IMPORTANT **Important points for work not mentioned or instructed in this manual**

- Be sure to use recommended fuel, DEF, oil, grease, and LLC (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.
- We recommend to use genuine parts.
- Damage caused by improper operation is not covered by the warranty.
- Keep the electrical components (including electrical components attached to the engine) away from water or steam.
- Place a container or a pan underneath the oil port to catch waste liquid so that such liquid does not spill on the floor or inside the machine.
- 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.
- Be sure to follow the designated regulations when disposing of oil, fuel, LLC (antifreeze), filters, battery and other harmful things.

5.2 Inspection on Separator Receiver Tank

IMPORTANT **Periodic inspection of separator receiver tank**

- 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 Items	Daily	Every 250	Every 300	Every 500	Every 1,000	Every 2,000	Every 3,000	Every 6,000	Every 12,000	Ref. 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	○									3-18
	Check the operation of the touch screen and each device	○									3-18
	Checking the operation of the safety valve	○									3-19
	Check and clean clogging of air filter element		○								5-10
	Change compressor oil			※1○	○						5-11
	Change compressor oil filter cartridge			※1○	○						5-12
	Change air filter element				○						5-12
	Clean strainer in the scavenging orifice				○						5-13
	Clean strainer in the oil seal drain scavenging orifice				○						5-13
	Clean exterior of the oil cooler					○					5-15
	Change oil separator element						☆●				5-18
	Change nylon tubes						☆●				5-19
	Change rubber hoses						☆●				5-19
	Change O-ring of unloader							★●			5-20
	Check and change the unloader bushing					※2○		★●			5-20
	Change the unloader regulator							★●			5-20
	Change high pressure regulator diaphragm / low pressure regulator							★●			5-20
	Check consumable parts of auto-relief valve.							★●			5-20
	Check consumable parts of vacuum-relief valve.							★●			5-20
	Performance check of pressure control valve								●		5-21
	Check O-ring and piston of pressure control valve								★●		5-21
	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

Items marked with a ○ are to be performed by the customer. For the following items or clauses marked with a ●, contact your nearest dealer because they require expert technical knowledge to perform.

The items or parts marked ※1 show that they should be replaced primarily.
The items or parts 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 your nearest dealer.**

(Unit: Hour)

	Maintenance Items	Daily	50 (First time)	Every 250	Every 500	Every 1,000	Every 2,000	Every 3,000	Every 6,000	Ref. Page
Engine	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 fuel pre-filter drain	○								3-10
	Check looseness in pipe connectors, terminals and tear in wiring.	○								3-10
	Check belt	○								3-11
	Change engine oil		○		○					5-6
	Change engine oil filter cartridge		○		○					5-8
	Check battery electrolyte			○						5-8
	Check and clean clogging of air filter element			○						5-10
	Check specific gravity of battery electrolyte				○					5-8
	Change air filter element				○					5-12
	Change fuel filter cartridge				○					5-13
	Change fuel pre-filter cartridge				○					5-14
	Check for leak on the exhaust flexible pipe				○					5-14
	Check and maintenance of belt					●				5-15
	Clean exterior of the radiator and inter cooler					○				5-15
	Clean interior of radiator					●				5-15
	Change coolant					☆○				5-16
	Clean inside of fuel tank						●			5-17
	Change inter cooler hose						☆●			5-19
	Change fuel hose						☆●			5-19
	Change radiator hoses							☆●		5-20
	Change wiring harness								●	5-20

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

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

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

(Unit: Hour)

	Maintenance Items	Every 1,500	Every 3,000	Ref. Page	Remarks
Engine body	Check DEF hose	●		5-17	See engine manual for more details.
	Change filter in the DEF pump		●	5-19	See engine manual for more details.

5. Periodic Inspection/Maintenance

5.4 Replacement Parts Schedule

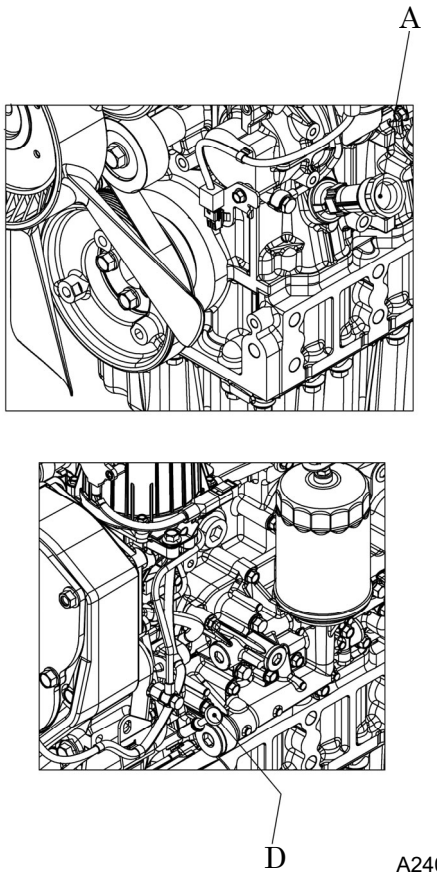
Part numbers change upon modification. For replacement of parts, contact your nearest dealer to verify the part number is correct or applicable.

Part Name		Part Number	Quantity
Engine oil filter cartridge		37438 10500 KUBOTA 1J600-3243X	1
Air filter element for compressor air-end	Outer element [C]	32143 16000	1
	Inner element [E]	32143 15901	1
Air filter element for engine side	Element [D]	32143 15400	1
Compressor oil filter cartridge		37438 09600	1
Fuel filter cartridge		43543 03200 KUBOTA 1K947-4317X	1
Fuel pre-filter cartridge		43543 03100 KUBOTA 1E786-4306X	1
Solenoid valve for starting unload		46811 29500	1
Solenoid valve for pressure switching		46811 32600	1
Solenoid valve for purge control		46811 32600	1
Compressor oil filler cap O-ring		03402 25040	1
Oil separator	Element [A]	34200 03101	1
	Gasket [B]	34235 08000	2
Pressure control valve	O-ring [A]	03402 15090	1
	O-ring [B]	21411 05000	1
	Teflon ring [C]	22505 03200	1
	Piston [D]	35303 09300	1
High pressure regulator diaphragm		36437 02101	1
Low pressure regulator ASSY		36400 19000	1
unloader regulator ASSY		36400 23402	1
Belt		KUBOTA 1J602-9701X	1
DEF pump filter ASSY		KUBOTA 1J508-1963X	1
DEF tank filter		KUBOTA 1J508-1998X	1

5.5 Maintenance Items

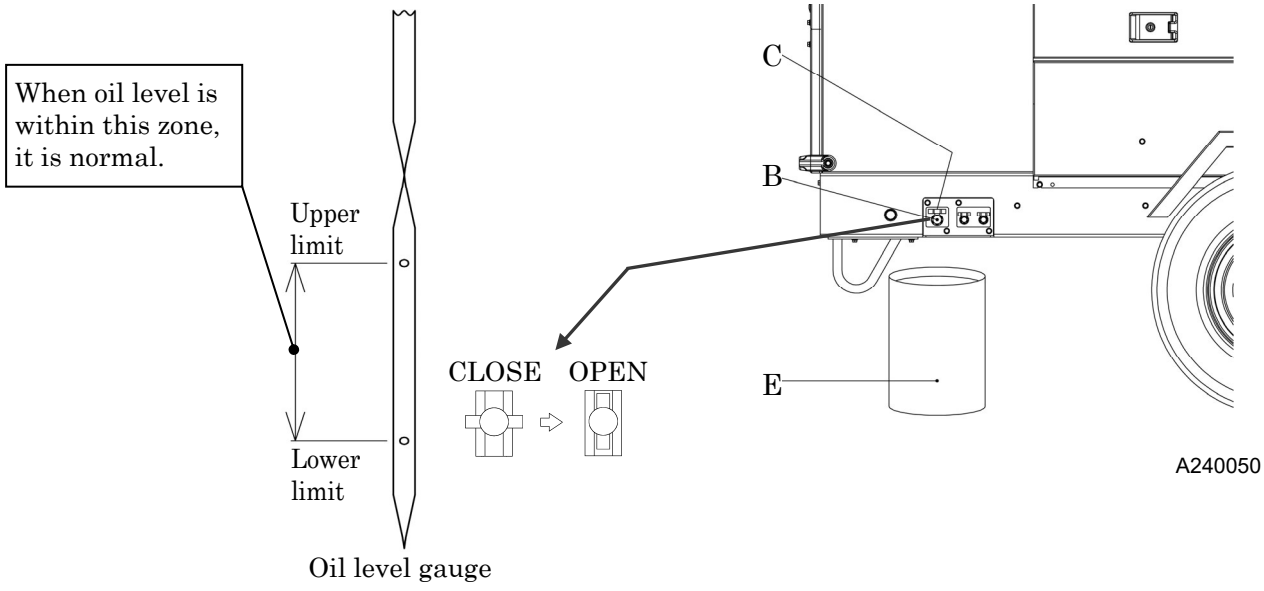
5.5.1 Change engine oil

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



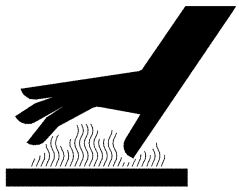
<Procedures>

1. Remove the cap of engine oil filler port [A] and also remove the drain plug [B] on the outside of the machine, and then open the drain valve [C] to drain the oil into the drain container [E].
2. When the oil is drained, close the drain valve [C], reinsert the drain plug [B] and pour in engine oil in from the engine oil filler port [A].
   [Oil capacity : Approx. 3.43gal.(13L)]
3. After refilling oil, tighten the cap of engine oil filler port [A] properly. Then, remove oil level gauge [D] and wipe it by cloth once.
4. Then, re-insert the oil level gauge [D] fully and pull it out again. If the oil level gauge shows the oil level between upper limit and lower limit, it is normal.
5. After finishing the oil supply, tighten the oil level gauge [D] firmly.



5. Periodic Inspection/Maintenance

CAUTION **Caution in filling or discharging engine oil**



H990432

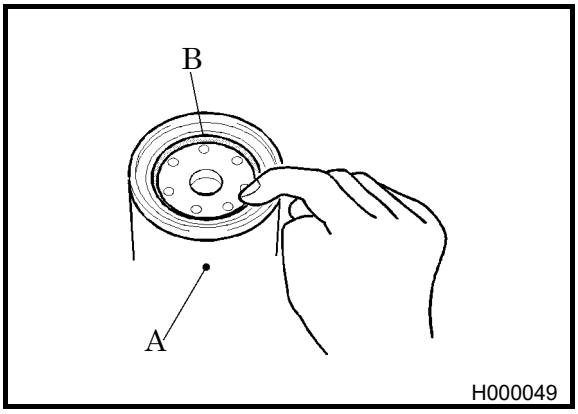
- After stopping the engine, wait of 10 minutes or more until the engine oil cools off. Then check the level of the engine oil, or refill or drain the oil.
- Engine oil is very hot and highly pressurized during and just after operating. Hot oil may spray out and cause injury.
- Never overfill the engine oil above the proper level. Too much oil can cause white smoke out of the exhaust, and it can damage and harm the engine.

IMPORTANT

- Follow the designated regulations to dispose of engine oil.

5.5.2 Change engine oil filter cartridge

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



<Procedures>

1. Remove the oil filter cartridge [A], using a filter wrench.
2. Screw in the new oil filter cartridge [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 times with a filter wrench.
4. After installing the oil filter cartridge, 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 is an engine starting issue due to battery discharge, follow the procedure below:

- Ordinary type battery:
  Check the amount of battery fluid and if it is not within specification, add distilled water.
  Measure specific gravity of battery electrolyte, and if it shows below 1.24, recharge the battery immediately. **(See 5.5.4)**

- Enclosed type battery:
  Check the indicator on top 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.

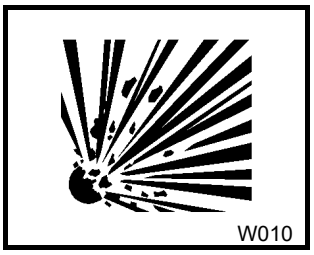
5.5.4 Maintenance of Battery

Battery may generate hydrogen gas and can explode. Therefore, recharging should be done in a well-ventilated place.

- Do not check the battery by short-circuiting the positive and negative terminals with a piece of metal.
- 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 the 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 Handling the Battery


D004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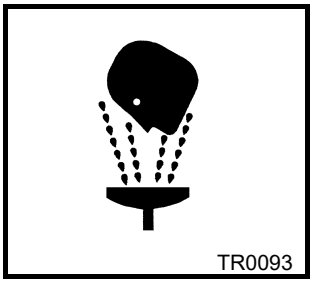
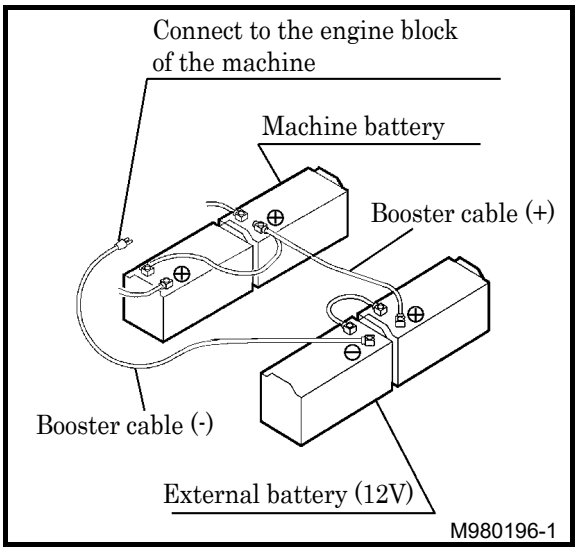

TR0093

- Keep flames away from battery.
- Keep sparks, matches, cigarettes, and other fire sources away from 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), and then recharge.
- Battery electrolyte is dilute sulfuric acid. In case of mishandling, it could cause skin burning.
- Dispose of battery observing local regulations.

[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 2 batteries at the same time.
- Be sure not to connect (+) and (–) terminals backwards.

[How to use booster cable]



<Procedure for using a booster cable>

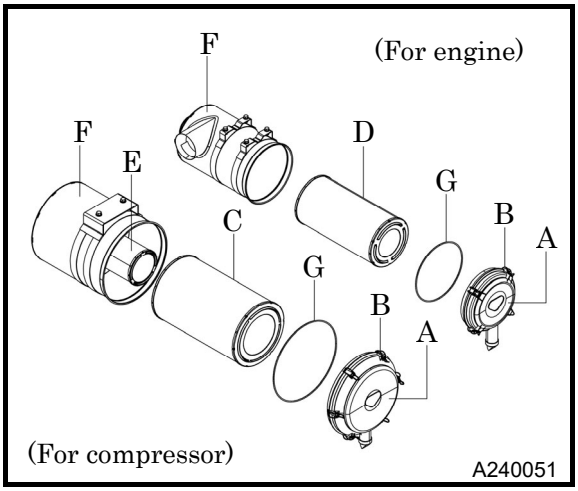
1. Stop the engine.
2. Connect one end of the (+) booster cable to the (+) terminal of the machine battery.
3. Connect the other end of the (+) booster cable to the (+) terminal of the external battery.
4. Connect one end of the (–) booster cable to the (–) terminal of the external battery.
5. Connect 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 Do not reverse the cable connection

- 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

When the air filter clogging warning indicator is on or every 250 hours



<Procedures>

1. Loosen the cap fix latch [B] at cap [A], then remove cap and clean inside.
2. Remove the outer element [C] and element [D] only, and clean it. Do not remove inner element [E].
- Inner element cannot re-use with cleaning.
3. When installing the cap [A] after it is cleaned, hold the case [F] securely by hand so that O-ring [G] may not protrude from it, and retighten it after checking and confirming that the latch hook for fixing the cap is engaged to the case.
- If the element is found heavily dusty, replace it with a new one. **(For part number, See 5.4)**

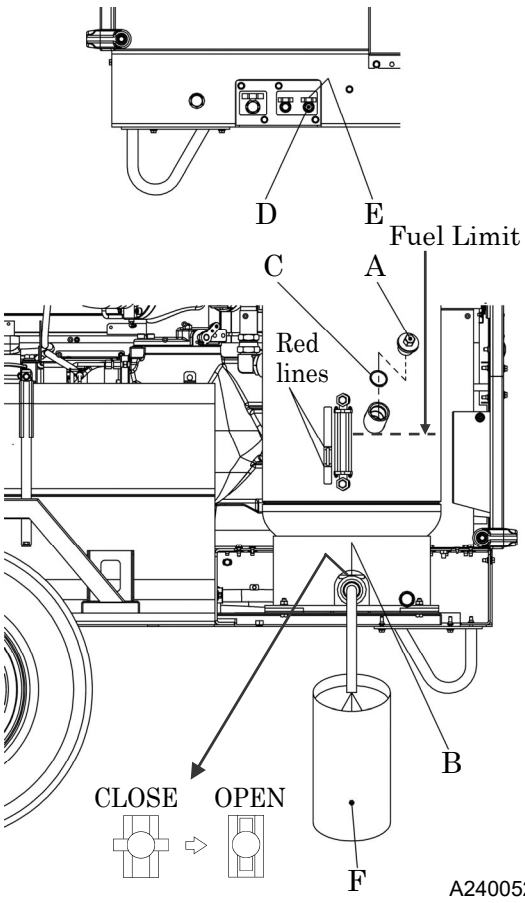
IMPORTANT

- 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.

5.5.6 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, slowly remove the oil filler cap [A] and gradually open the drain valve [B] to drain the oil into the drain container [F].
2. Remove the drain plug [D] of the oil cooler and open the drain valve [E] to drain the compressor oil accumulated in the cooler.
3. After draining compressor oil, close the drain valve [B] and [E], attach the drain plugs [D].
4. 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.
   (For part number, See 5.4)
5. After starting operation, check and confirm that oil level is within red lines of oil revel gauge.
6. Repeat the process 4. to 5. if oil level is out of red lines range.

Quantity of oil between the red lines	Approx. 2.11 gal. (8L)
Quantity of change oil	Approx. 17.44 gal. (66L)

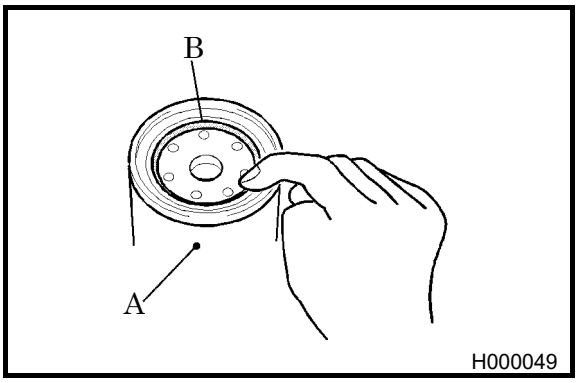
IMPORTANT

- 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 your nearest dealer.
- Follow the designated regulations to dispose of compressor oil.

5.5.7 Change compressor oil filter cartridge

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

We recommend to use genuine oil filter cartridges.



<Procedures>

1. Remove the oil filter cartridge [A], using a filter wrench.
2. Screw in the new oil filter cartridge [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 cartridge, check it for any leak during operation.

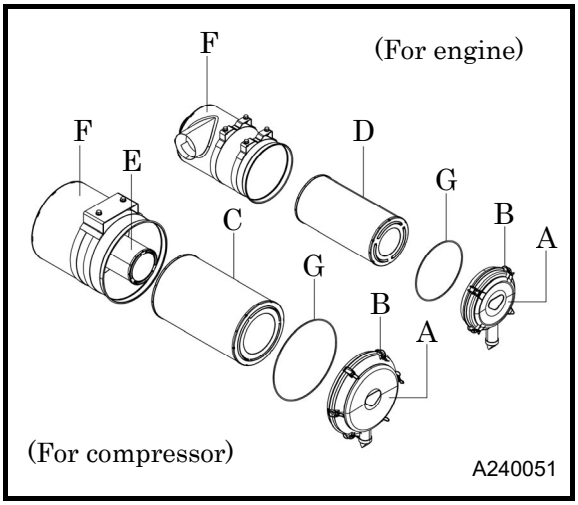
IMPORTANT

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

5.5.8 Change air filter element

Every 500 hours

We recommend to use genuine air filter element.



<Procedures>

1. Loosen the cap fix latch [B] at cap [A], then remove cap and clean inside.
2. Remove outer element [C] and element [D], and replace it with new one. In general, replace the inner element [E] at the time when the outer element is cleaned for the 2 time (approximate guide). When removing the inner element, take care that dust and dirt do not enter the secondary side.
   (For part number, See 5.4)
3. When installing the cap [A] after it is changed, hold the case [F] securely by hand so that O-ring [G] may not protrude from it, and retighten it after checking and confirming that the latch hook for fixing the cap is engaged to the case.

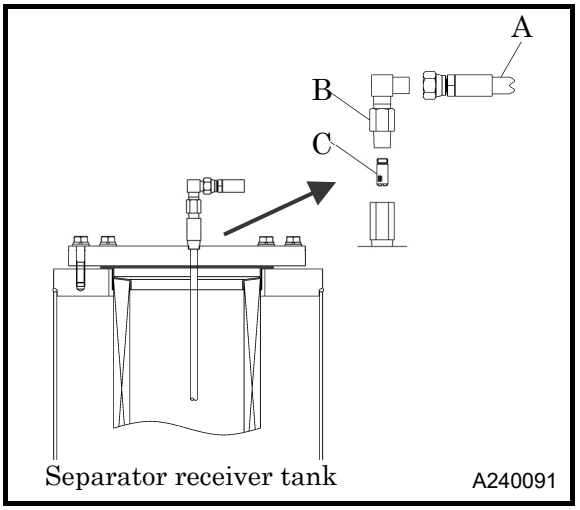
- When used or operated under bad conditions, it is better to remove all the elements, check them, clean them and replace them earlier before the intervals listed in maintenance table, if they are found difficult to be repaired.

IMPORTANT

- The air filter is an important part which is crucial to your machine's performance and life. We recommend to use genuine parts.

5.5.9 Clean strainer in the scavenging orifice

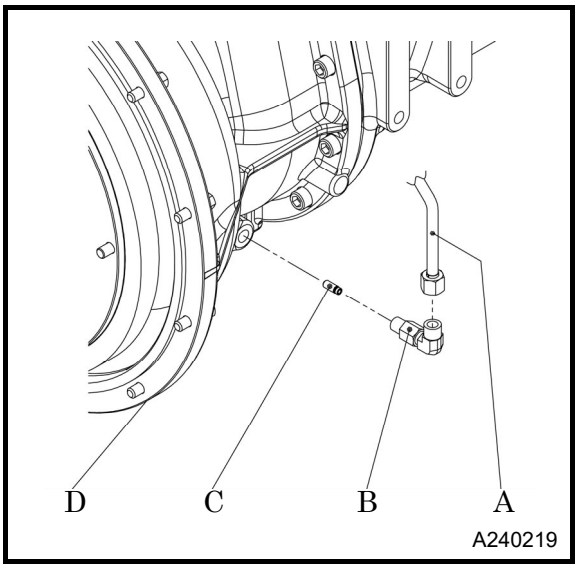
Every 500 hours



<Procedures>
1. Remove the rubber hose [A].
2. Remove the bushing [B] from the separator receiver tank.
3. Remove the strainer [C] screwed into the bushing.
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 Clean strainer in the oil seal drain scavenging orifice

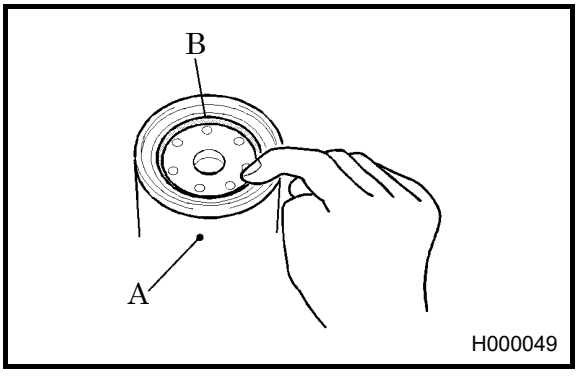
Every 500 hours



<Procedures>
1. Remove the pipe [A].
2. Remove the bushing [B] from the compressor air-end [D].
3. Remove the strainer [C] screwed into the bushing [B].
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.

5.5.11 Change fuel filter cartridge

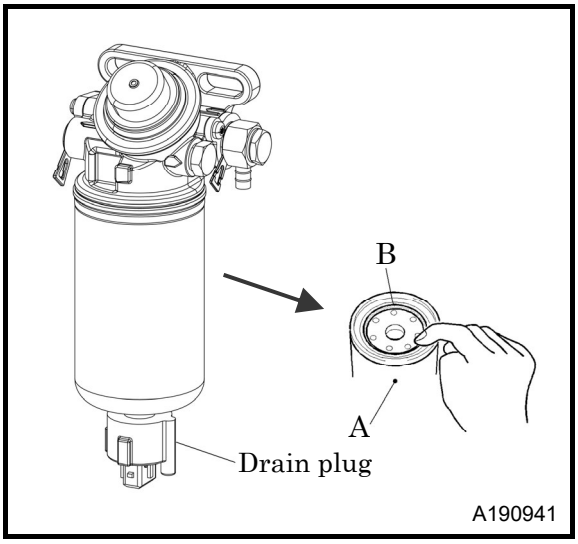
Every 500 hours



<Procedures>
1. Remove the fuel filter cartridge [A], using a filter wrench.
2. Screw in the new fuel filter cartridge [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 2/3 turn with a filter wrench.
4. Bleed the air from the fuel. **(See 3.4.9)**
5. After installing the fuel filter cartridge, check it for any leak during operation.

5.5.12 Change fuel pre-filter cartridge

Every 500 hours



<Procedures>

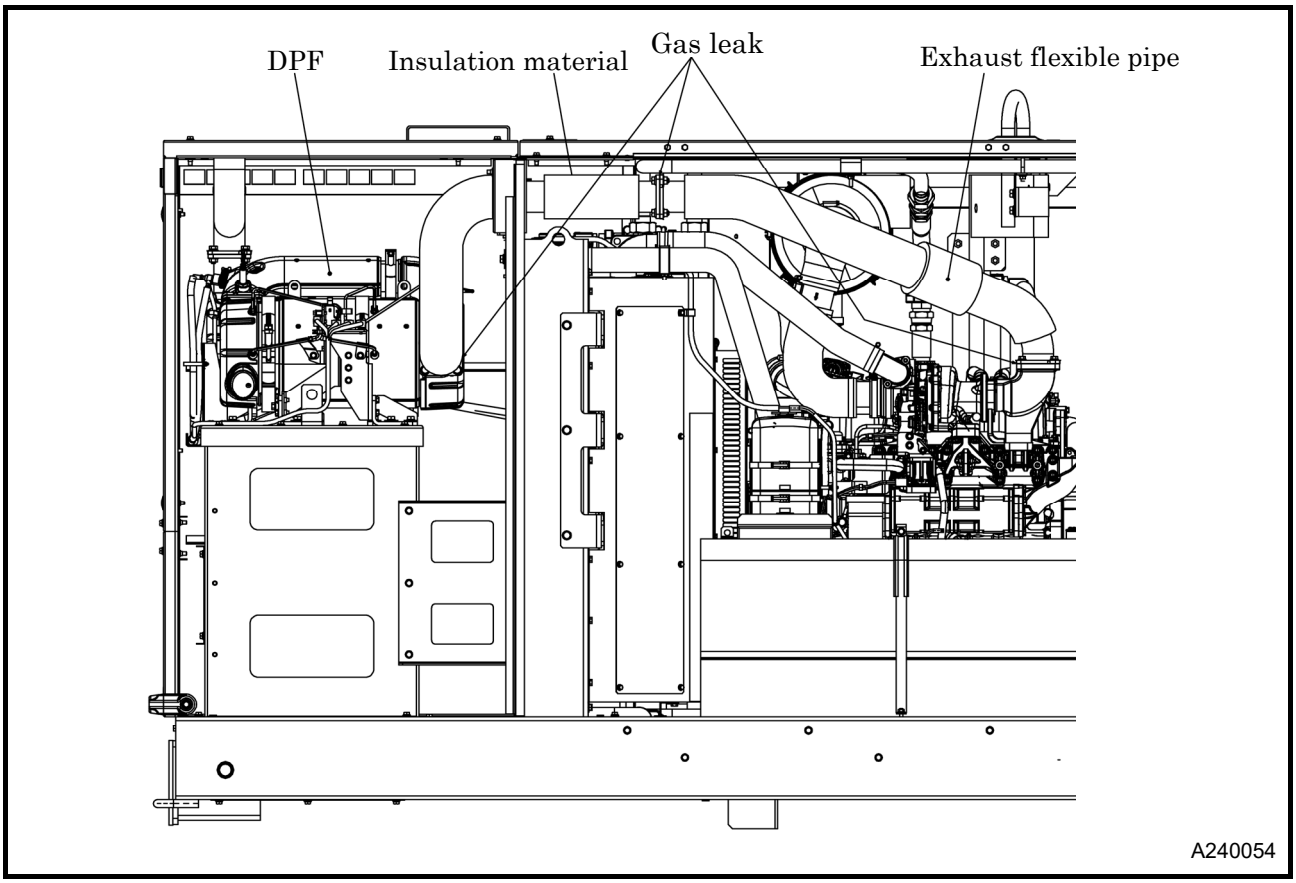
1. Remove the drain plug.
2. Prepare a container and completely drain the filter. **(See 3.3.6)**
3. Use the filter wrench to remove the filter cartridge [A].
4. Screw in the new filter cartridge with the packing [B] coated slightly with oil. **(For part number, See 5.4)**
5. After the packing touches the sealing face, tighten with a filter wrench.
6. Attach the removed drain plug to the newly installed filter cartridge [A].
7. Bleed the air from the fuel. **(See 3.4.9)**
8. After installing a fuel filter cartridge in position, be sure to check for oil leakage during operation.

- Drain the condensate in container, and then dispose of condensate according to the designated regulations.

5.5.13 Check for leak on the exhaust flexible pipe

Every 500 hours

- Check for any exhaust gas leakage on the connection flange section between the engine exhaust outlet and the DPF.
- If any leak is found, avoid getting burned by the exhausted gas.



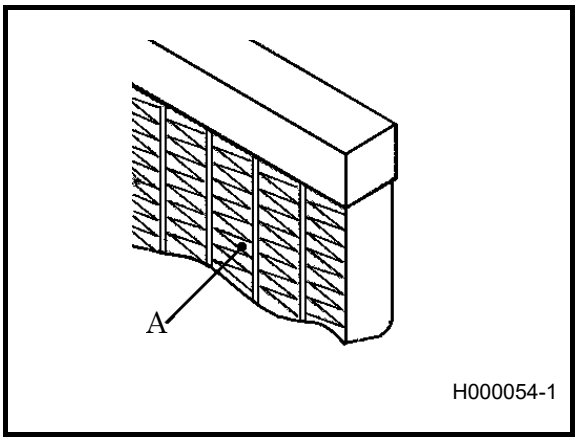
5.5.14 Check and maintenance of belt

Every 1,000 hours

- Belt check and maintenance, contact your nearest dealer because technical knowledge is required.

5.5.15 Clean exterior of the radiator / oil cooler and inter cooler

Every 1,000 hours



- When the fin tubes diaphragm [A], of the radiator, oil cooler and inter 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.
- Take steam cleaning with removing cooler when there is a lot of dirt.

5.5.16 Clean interior of radiator

Every 1,000 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 your nearest dealer because technical knowledge is required.

5.5.17 Change coolant

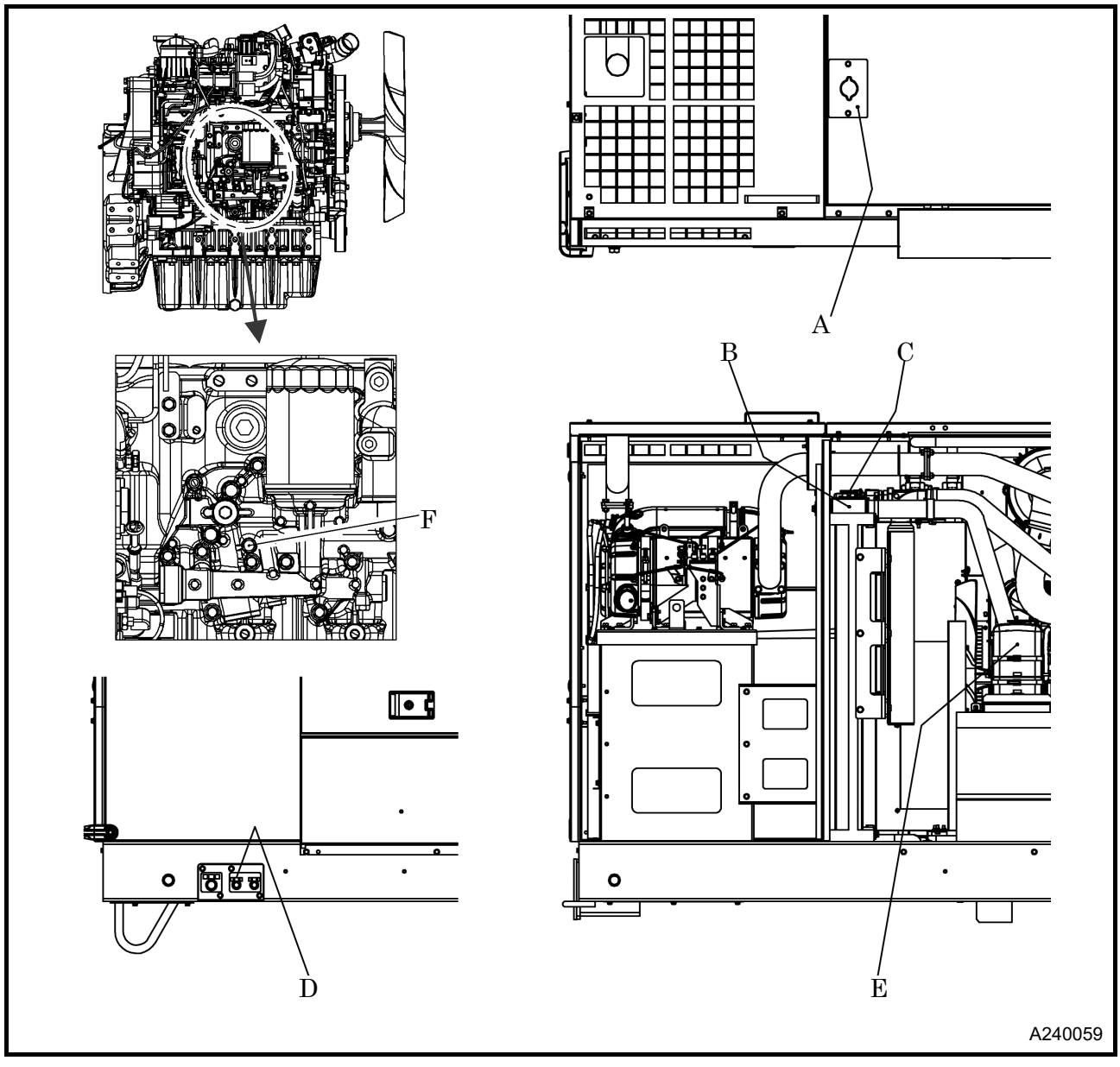
1,000 hours or every 2 years

Be sure to stop the engine and let the coolant water sufficiently cool down before changing it.

<Procedures>

1. Remove the inlet cover [A], and the radiator cap [C] on the top of the radiator [B]. Next, open the drain valve [D] to drain the coolant.
2. Loosen the drain plug [F] on the engine cylinder block to discharge the coolant.
3. Drain the coolant in the reserve tank [E].
4. After the drainage of the coolant is completed, close drain valve [D] and tighten drain plug [F] of engine body, then replenish coolant so that it reaches the opening of the radiator inlet. Do not forget to pour in cooling water up to the "FULL" level of the reserve tank [E].
5. After refilling coolant, securely attach the radiator cap [C] and the reserve tank [E] cap and operate the machine for about 5 minutes with no load.
6. Stop the machine, wait until the coolant has cooled down, and then check the coolant level.
7. If the coolant level is too low, replenish the coolant.

● Refer to section 3.3.2 for reserve tank capacity details.



CAUTION **Caution when changing coolant**

- When removing the radiator cap, lightly turn it and release the internal pressure without completely opening it once the first stage lock is released. After confirming that the internal pressure has been released, turn it while pushing in until the second stage lock is released. If this procedure is neglected, its inner pressure can blow off the radiator cap, and steam jetting out of the radiator may cause scalding burns.
- LLC (antifreeze) is a toxic.
- In case of accidental ingestion, do not force vomiting and seek medical attention immediately.
- In case of contact with eyes, rinse with plenty of water and seek medical attention.
- When storing LLC (antifreeze), label it as LLC (antifreeze), seal it, and keep it out of reach of children.
- Beware of flames.

IMPORTANT

- Follow the designated regulations to dispose of LLC (antifreeze).

5.5.18 Check DEF hose

Every 1,500 hours

Visually check the hose for cracks or DEF leaks. Also, check for loose fastening bolts and nuts.

5.5.19 Clean inside of fuel tank

Every 2,000 hours

When cleaning inside of fuel tank it, contact your nearest dealer because technical knowledge is required.

5.5.20 Change oil separator element

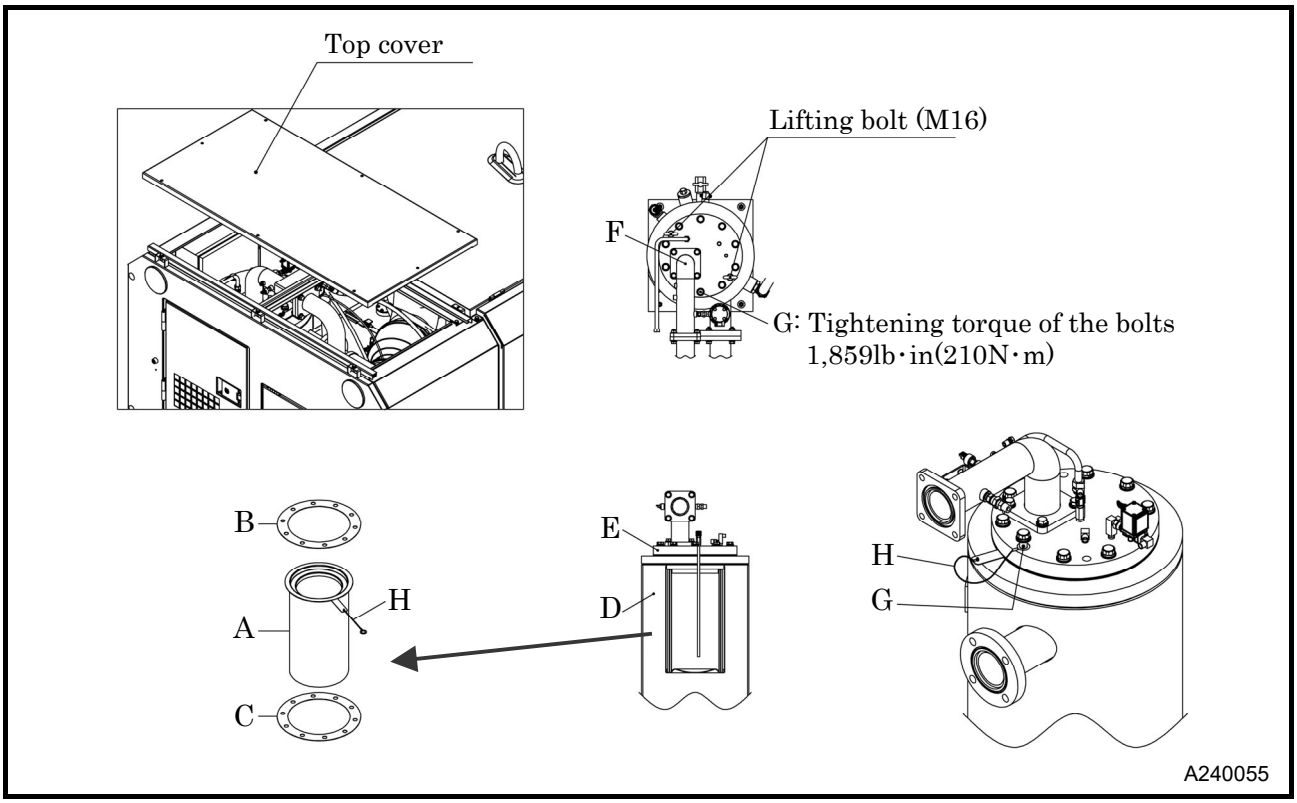
2,000 hours or every 2 years

When replacing oil separator, contact your nearest dealer because technical knowledge is required.

- Be sure to replace the gaskets [B] and [C] together with the oil separator element [A]. **(For part number, See 5.4)**
- The oil separator element [A] is made from electrically conducting material in order to be anti-static. Also gaskets [B]･[C] is treated for conduction by using staplers. When replacing it, we recommend to use genuine parts.

<Procedures>

1. Remove the to top cover above the separator reciever tank [D] on the top of the machine to open the top.
2. Remove the piping part [F], rubber hose, and copper pipe secured to the separator cover [E].
3. Remove the fixing bolt [G] on the separator cover, and then remove the separator cover [E] by lifting it.
4. Pull out the oil separator element [A] from the separator receiver tank [D] by lifting it. Then, install the new oil separator element [A] and gaskets [B] and [C] in the specified locations on the separator receiver tank [D].
5. Place the separator cover [E] in the specified location, and then tighten the fixing bolt [G] of the separator cover to with the specified torque. The oil separator element [A] has a ground wire [H] to avoid being charged. Make sure to fasten the terminal of the ground wire [H] with the fixing bolt [G] on the separator cover.
6. Install the piping part [F], rubber hose, and copper pipe onto the separator cover [E].
7. Finally, attach the top cover to the top of the machine.



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 your nearest dealer because technical knowledge is required.

5.5.22 Change inter cooler hose

2,000 hours or every 2 years

In case intercooler hose is hardened or deteriorated, replace them even before the specified replacement time.
When replacing it, contact your nearest dealer because technical knowledge is required.

5.5.23 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 it, contact your nearest dealer because technical knowledge is required.

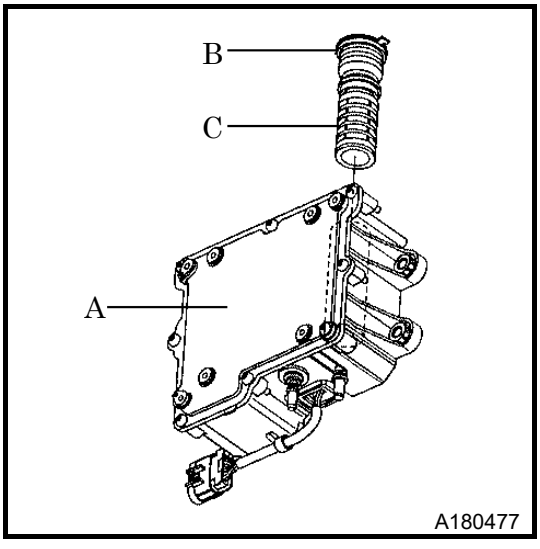
5.5.24 Change rubber hoses

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 it, contact your nearest dealer because technical knowledge is required.

5.5.25 Change filter in the DEF pump

Every 3,000 hours



<Procedures>
1. Set the CONTROL POWER switch to "OFF" 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 assy [C].
3. Install new filter assy [C]. **(For part number, See 5.4)**
4. Finally, tighten the cover [B]

IMPORTANT

- The DEF filter acts as an important step in filtering small particulate matter from the system. When replacing it, we recommend to use genuine parts.

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 your nearest dealer because technical knowledge is required.

5.5.27 Change O-ring of unloader

3,000 hours or every 3 years

When replacing it, contact your nearest dealer because technical knowledge is required.

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 your nearest dealer because technical knowledge is required.

5.5.29 Change the unloader regulator

3,000 hours or every 3 years

When replacing it, contact your nearest dealer because technical knowledge is required.

5.5.30 Change high pressure regulator diaphragm / low pressure regulator

3,000 hours or every 3 years

When replacing it, contact your nearest dealer because technical knowledge is required.
(For part number, See 5.4)

5.5.31 Check consumable parts of auto-relief valve

3,000 hours or every 3 years

When replacing it, contact your nearest dealer because technical knowledge is required.

5.5.32 Check consumable parts of vacuum-relief valve

3,000 hours or every 3 years

When replacing it, contact your nearest dealer because technical knowledge is required.

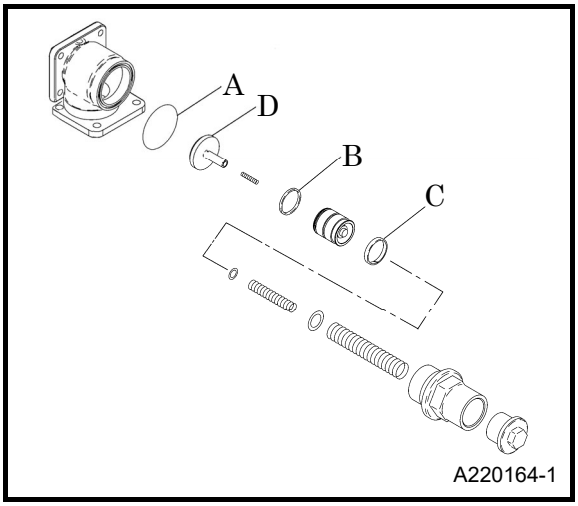
5.5.33 Change wiring harness

Every 6,000 hours

When replacing it, contact your nearest dealer because technical knowledge is required.

5.5.34 Performance check of pressure control valve

Every 6,000 hours



<Procedures>

1. When the service valve is fully opened during operation, confirm that the pressure on the touch screen indicates 58psi.
2. When the pressure is lower than 58psi, 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 your nearest dealer because technical knowledge is required.

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.

5.5.35 Check 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], teflon ring [C], and 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 your nearest dealer because technical knowledge is required.

5.5.36 Change rubber coupling

Every 3 years

When replacing it, contact your nearest dealer because technical knowledge is required.

5.5.37 Change oil seal / bearing

Every 12,000 hours

When replacing it, contact your nearest dealer because technical knowledge is required.

5.5.38 Change solenoid valve

Every 12,000 hours

When replacing it, contact your nearest dealer because technical knowledge is required.

5.5.39 Change touchscreen battery

Every 4 years

When replacing it, contact your nearest dealer because technical knowledge is required.

6. Storage and Disposal

6.1 Preparation for Long-term Storage

When storing for more than half a year without using the machine, perform the following measures and store it in a dry place with little dust.

- Put the machine in a temporary cabin if it is stored outside. Avoid leaving the machine outside with a sheet directly on the paint for a long period of time, as this may cause rusting.
- Perform the following measures at least once every three months.

<Procedures>

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. If possible, remove the battery from the machine 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 information, contact your nearest dealer.

7. Specifications

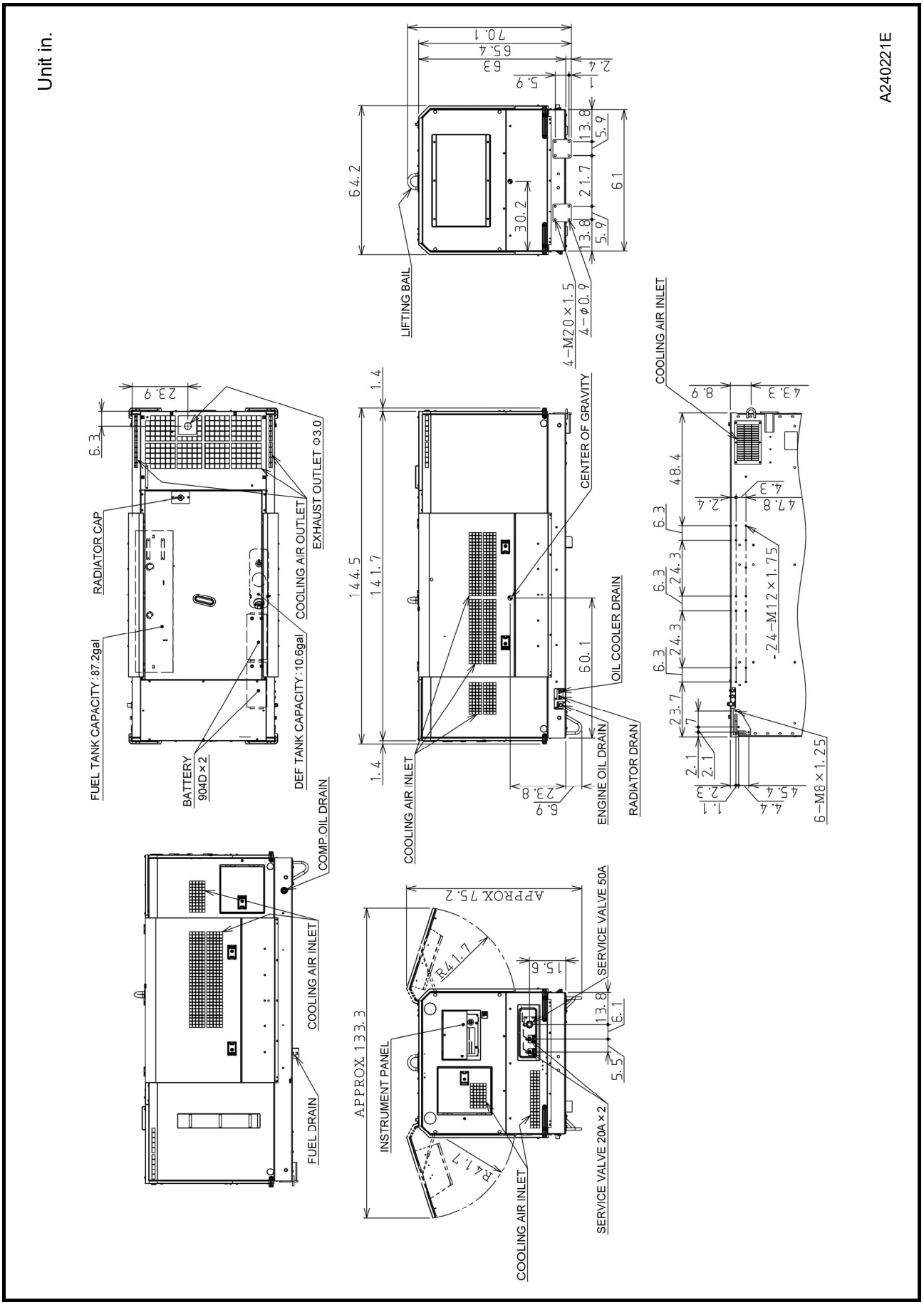
7.1 Specifications

Description			PDSF750DP-6E1
COMPRESSOR	Type		Single-stage oil cooled, screw type compressor
	Free air delivery	cfm (m^3/min)	750/630 (21.2/17.9)
	Working pressure	psi	100/150
	Safety valve setting pressure	psi	195
	ENG.SPEED (full load)	RPM	2,200/1,900
	ENG.SPEED (unload)	RPM	1,100/1,300
	Lubricating system		Forced Lubrication by compressed pressure
	Driving system		Direct driving with rubber coupling
	Separator receiver tank capacity	cu in. (L)	9,947 (163)
	Lubricating oil capacity	gal. (L)	17.44 (66)
ENGINE	Model		KUBOTA V5009-TIE5B-COHE-1
	Type		4 Cycle, water cooled, direct injection, Turbocharged, EGR
	Aftertreatment		DPF+SCR
	Cylinder quantity - Cylinder diameter × Cylinder stroke	in. (mm)	4-4.33in.×5.2in. (4-110mm×132mm)
	Total displacement	cu in. (L)	306.2 (5.017)
	Rated output (GROSS)	HP(kW)/RPM	210.9(157.3)/2,200
	Rated output (NET)		195.1(145.5)/2,200
	Lubricating oil capacity	gal. (L)	5.02 (19)
	Coolant capacity (including radiator)	gal. (L)	7.79 (29.5)
	Battery		904D×2
	Fuel tank capacity	gal. (L)	87.2 (330)
	DEF tank capacity	gal. (L)	10.6 (40)
※ DIMENSION・MASS	Overall length only for bonnet	in. (mm)	141.7 (3,600)
	Overall width	in. (mm)	64.2 (1,630)
	Overall height	in. (mm)	63.0 (1,600)
	Net dry mass	lb. (kg)	6,812 (3,090)
	Operating mass	lb. (kg)	7,694 (3,490)

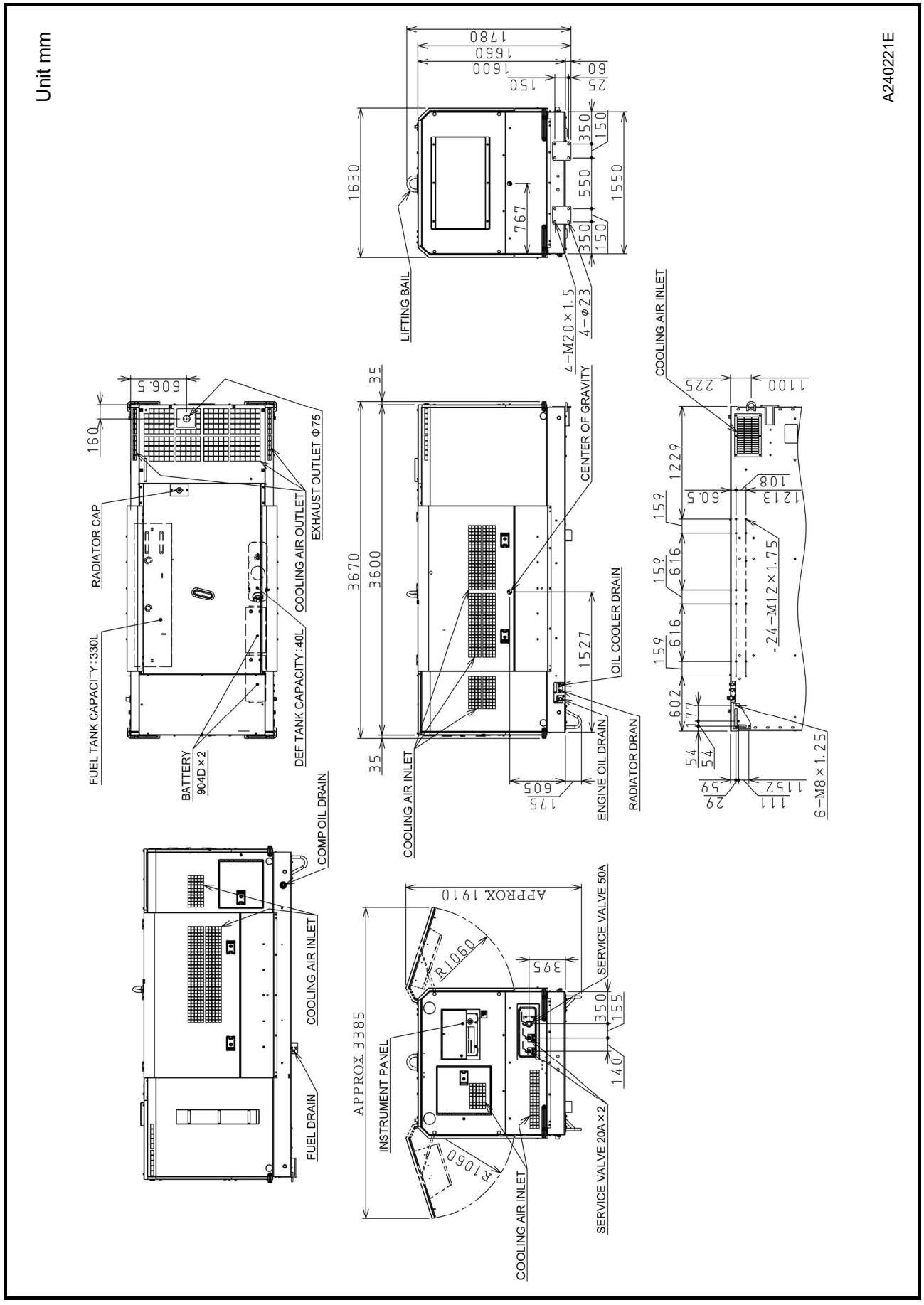
※: Without trailer

7. Specifications

7.2 Exterior drawing



7. Specifications



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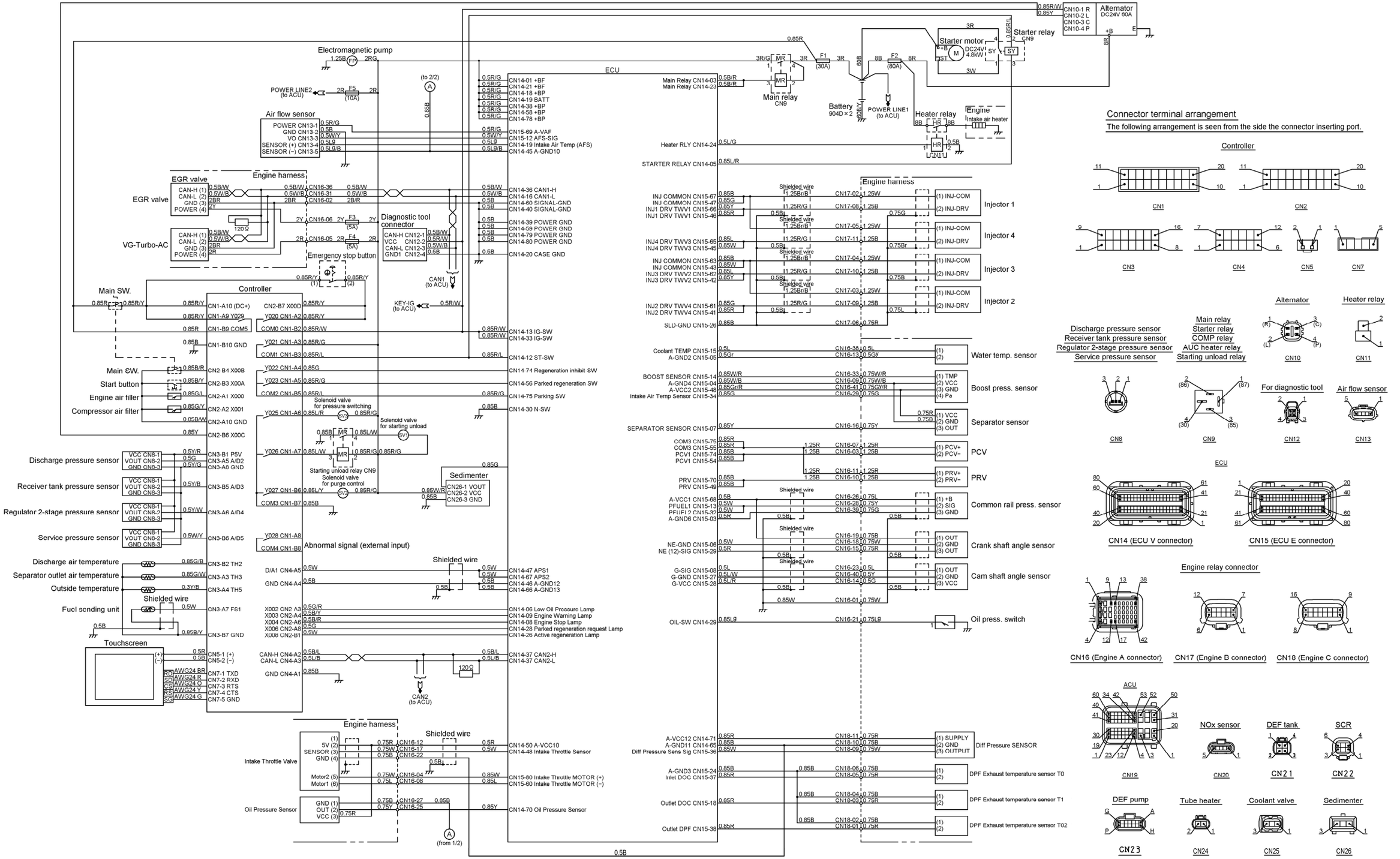
7.3 Wiring Diagram



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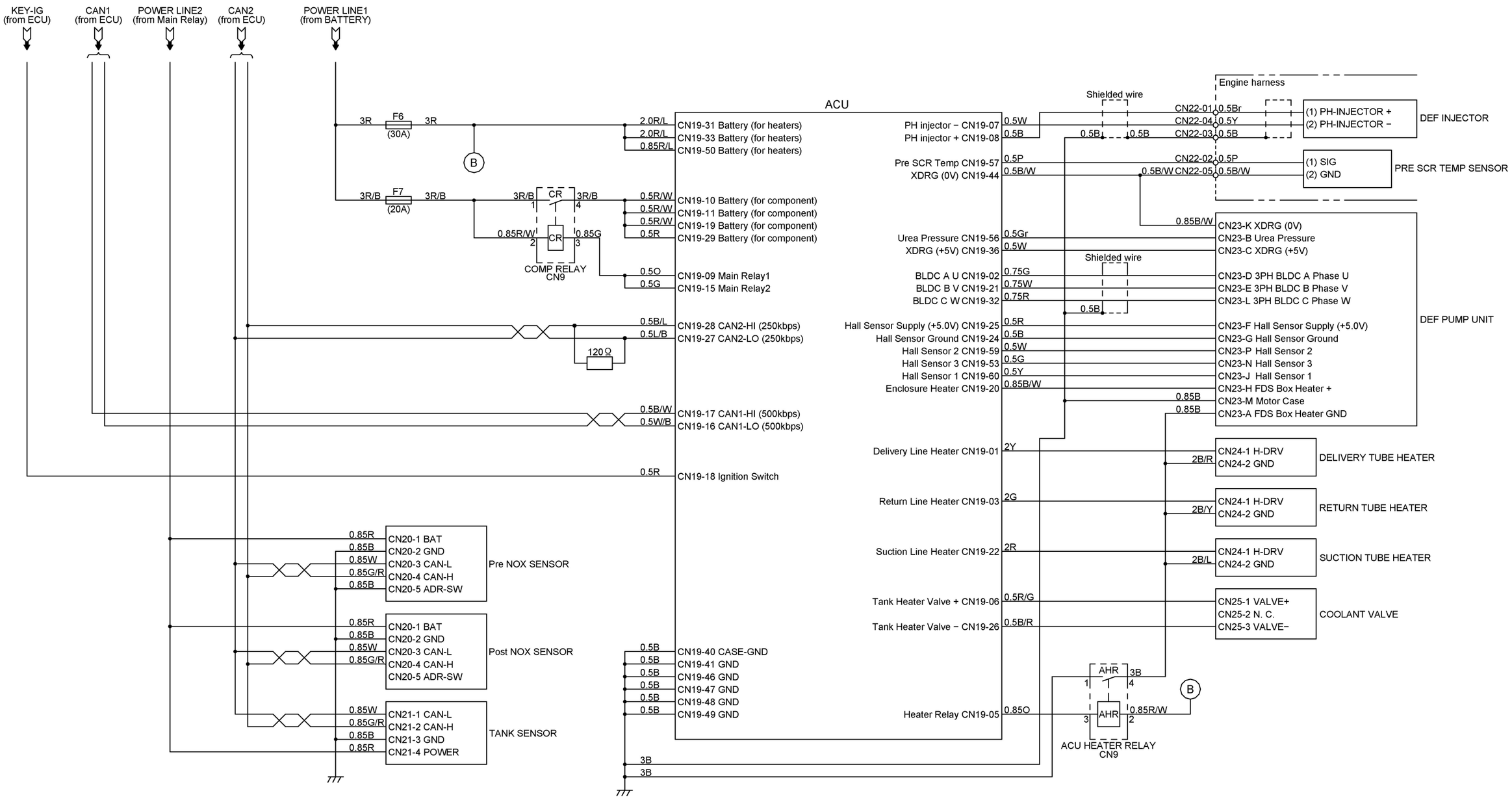
7. Specifications



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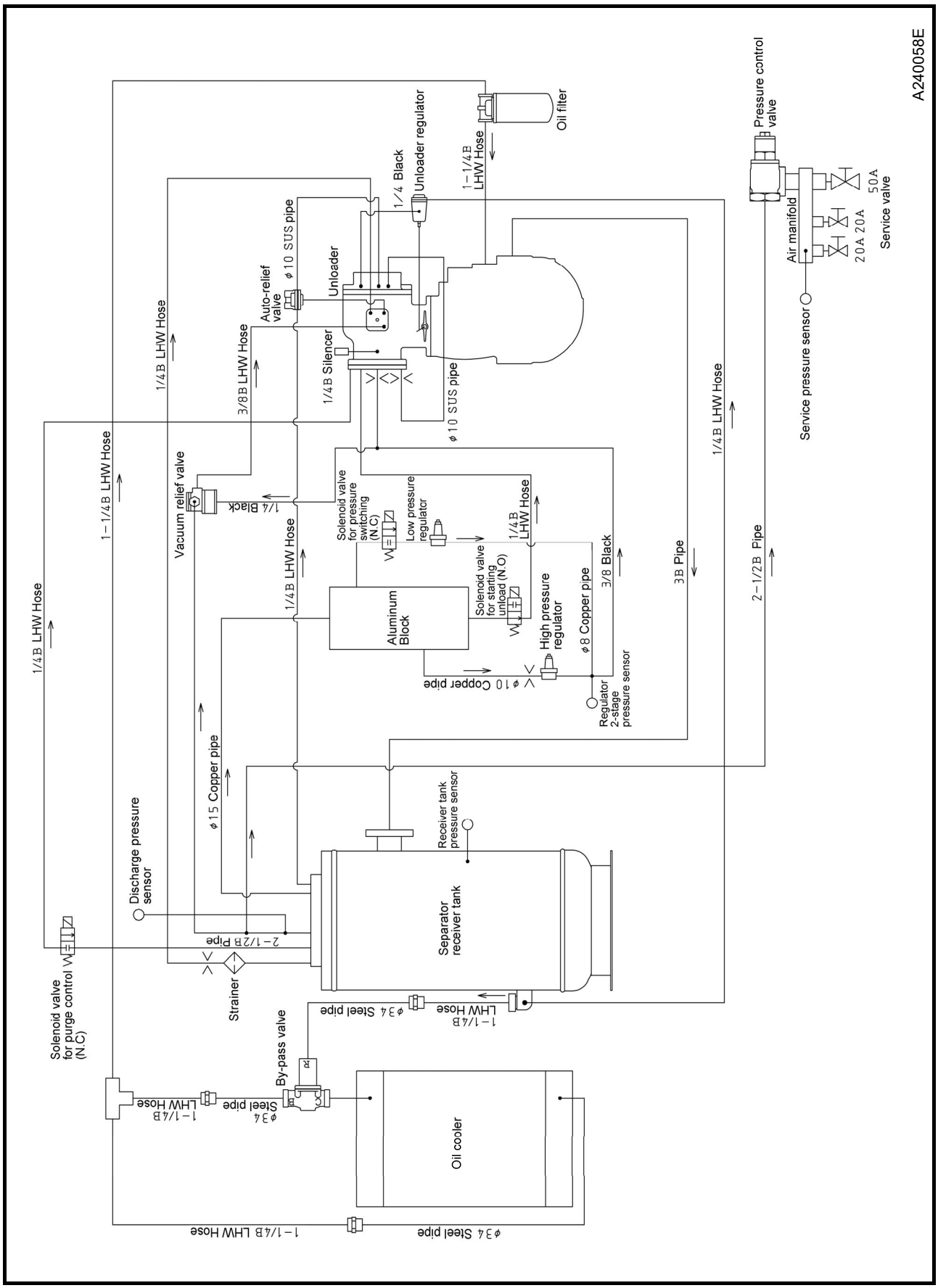
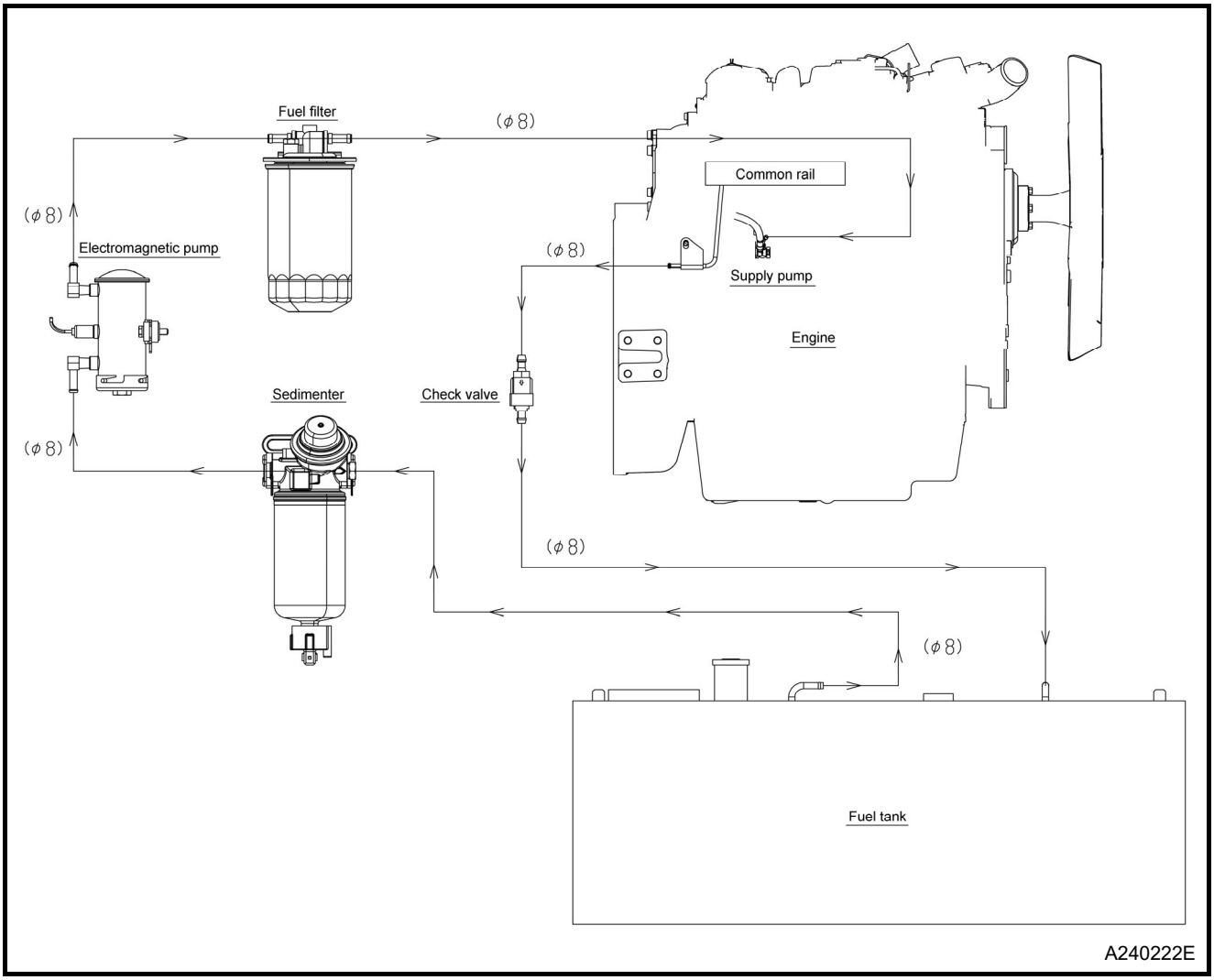
7. Specifications

7.4 Piping Diagram

7.4.1 Compression air・Compressor oil



7.4.2 Fuel Piping



OPERATION LOG

OPERATION DATE	OPERATION TIME		TOTAL OPERATION HOURS (h)	DISCHARGE AIR PRESS. [psi]	AMBIENT TEMP.(°F)	DISCHARGE AIR TEMP. (°F)	COOLANT TEMP.(°F)	RATED RPM (rpm,min^{-1})	ENG.OIL REPLACEMENT HOUR (h)	COMP.OIL SUPPLY(L)	REMARKS (INSPECTION/PART CHANGE HISTORY ETC.)
	START TIME	STOP TIME									
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