FSCURTIS®

INSTRUCTION MANUAL

PORTABLE
SCREW COMPRESSOR

FAC-113P
FAC-113PC

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

Preface / Table of Contents

Thank you for having selected our "FSCURTIS" product.

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

— Table of Contents —

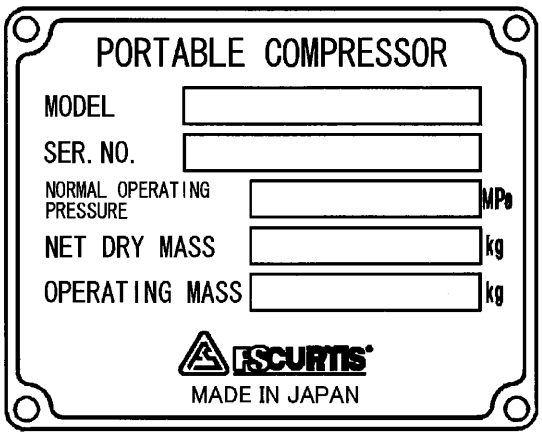
Safety

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

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

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



A090188

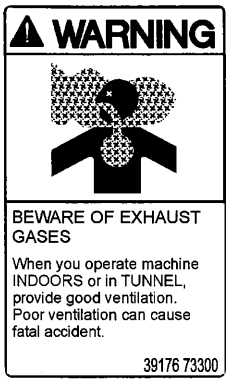
Each illustrated figure (Fig.) has a number (for instance, A090188) at the right bottom. This number is not a part number, but it is used only for our reference number.

[Safety Warning Labels]

Following labels are attached to the machine.
Keep them clean at all times. If they are damaged or missing, immediately place an order with your nearest dealer for replacement. Part numbers are indicated on the lower right corner of the label. Adhere a new one to the original location.

1

2



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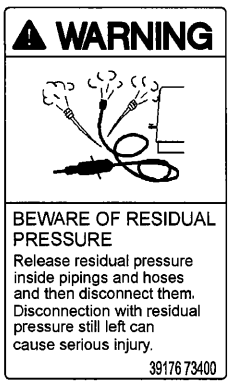

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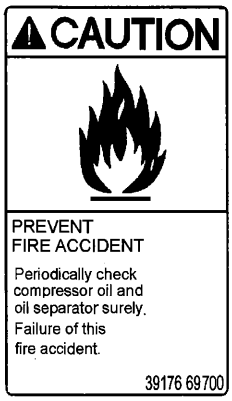

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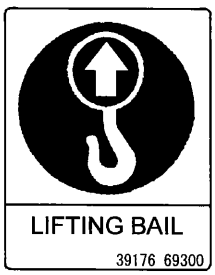

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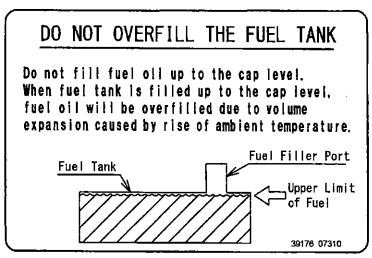
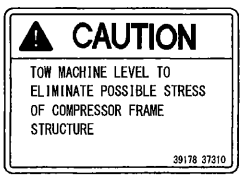
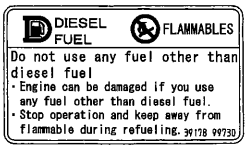


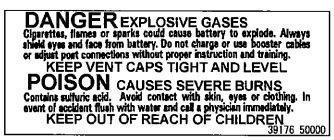
12



13

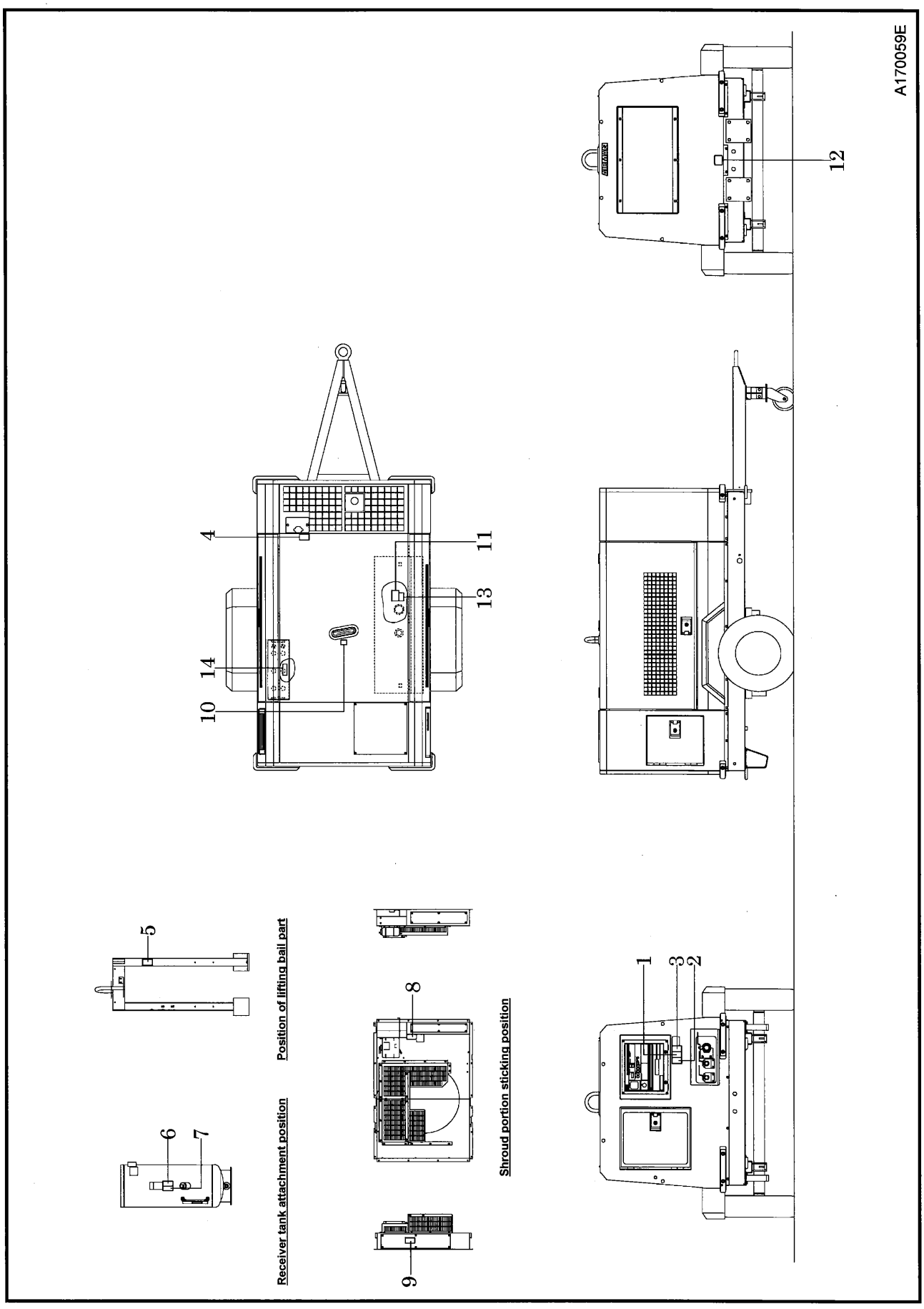


14

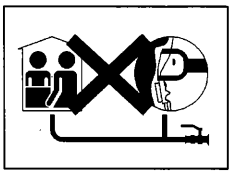


Safety

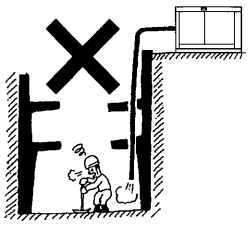
● The pasting position of safe warning label is as follows.



DANGER



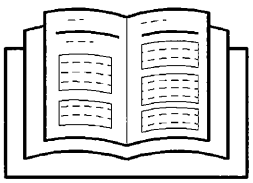
TR0201-1



A080001

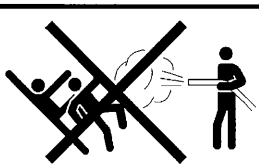
- Compressed air by this machine contains poisonous materials. Absorption of the compressed air can cause serious injury. Never provide this compressed air for human respiration.
- This machine is not designed to be used for working chambers pressurized by compressed air such as respiratory air provided 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 for the purpose of compression of gases other than air, or as a vacuum pump. Otherwise, serious accidents may occur.

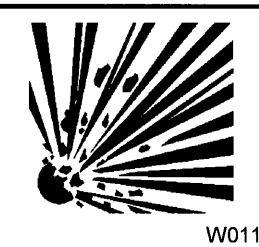


TR0092

- 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

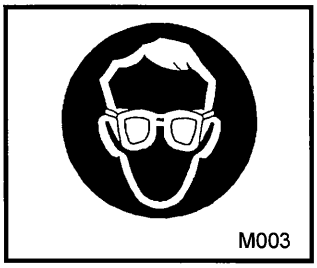
- Keep hands off from the rotating portion or belts while running. It could cause serious injuries if hands should be caught in.



W011

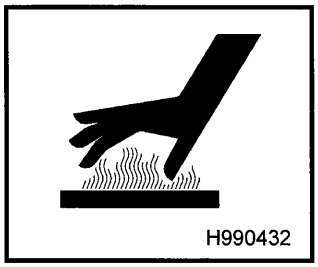
- When you refill the separator receiver tank with compressor oil, stop the engine, and make sure that the pressure gauge indicates 0MPa and there is no residual pressure in it, and then gradually loosen the oil filler cap for refilling oil.
- Note residual pressure in the separator receiver tank could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

WARNING

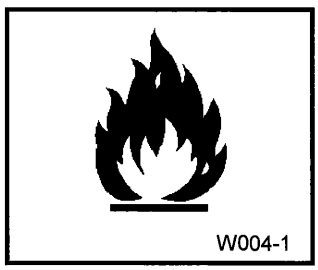


- When cleaning dust accumulated in such devices as the air-filter, by blowing compressed air, wear safety glasses, etc. to protect your eyes.

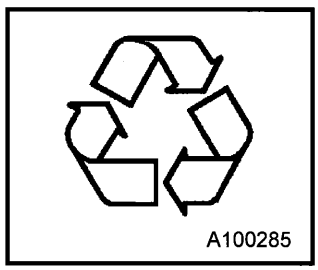
CAUTION



- Be sure to stop the engine, and let the coolant water sufficiently cool down before draining it.
- If the drain valve is opened before the coolant water is cooled enough, hot water could jet out, and it could cause scalding.



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



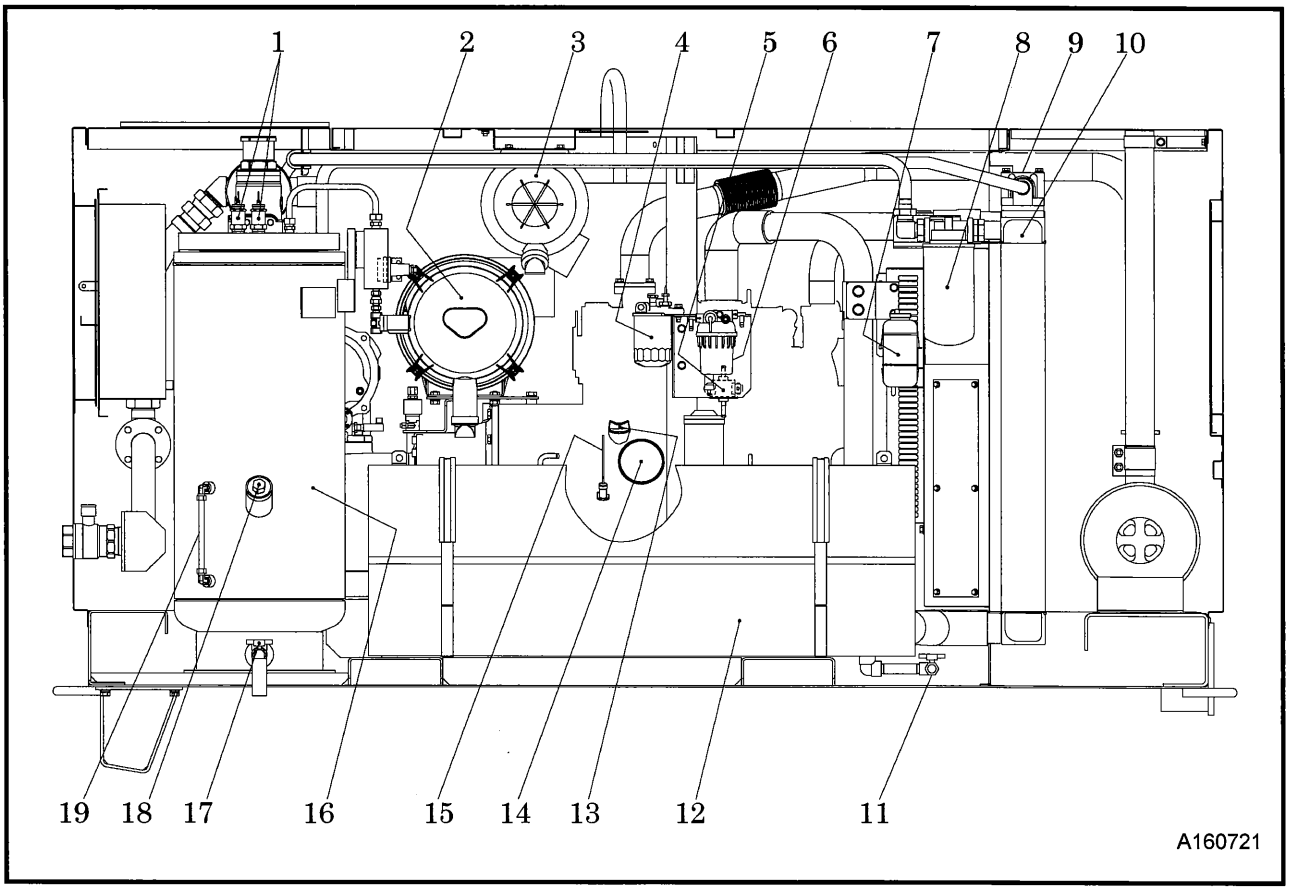
- Waste liquid from the machine contains harmful material. Do not discharge it onto the ground or into the river, lake or sea. Such material will contaminate the environment.
- Be sure to use a container to hold the waste liquid from the machine.
- Be sure to follow the designated regulations when disposing 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 do this please go airborne welding work, remove the connector of the electronic control equipment.
  Can cause equipment to malfunction due to electronic control of excessive current is applied.

MEMO

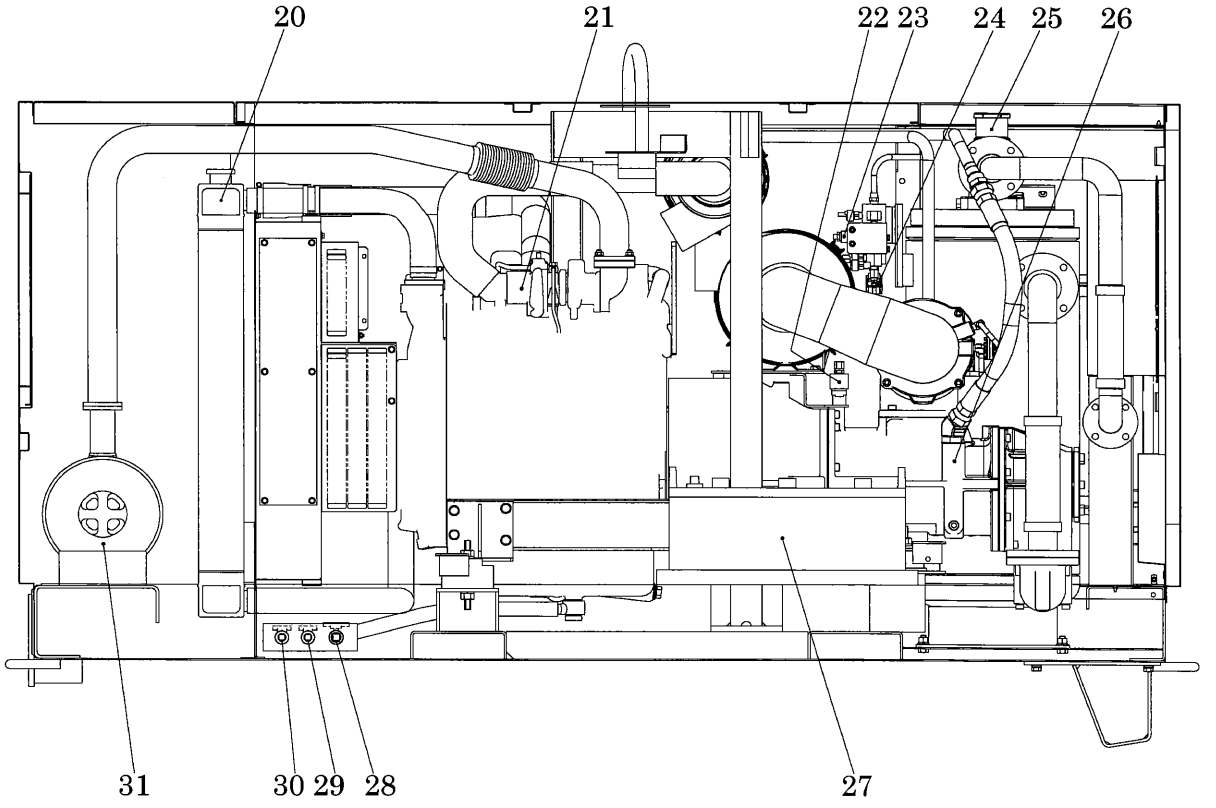
1.Part Names

1.1 Internal Components and Part Names



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

1.Part Names

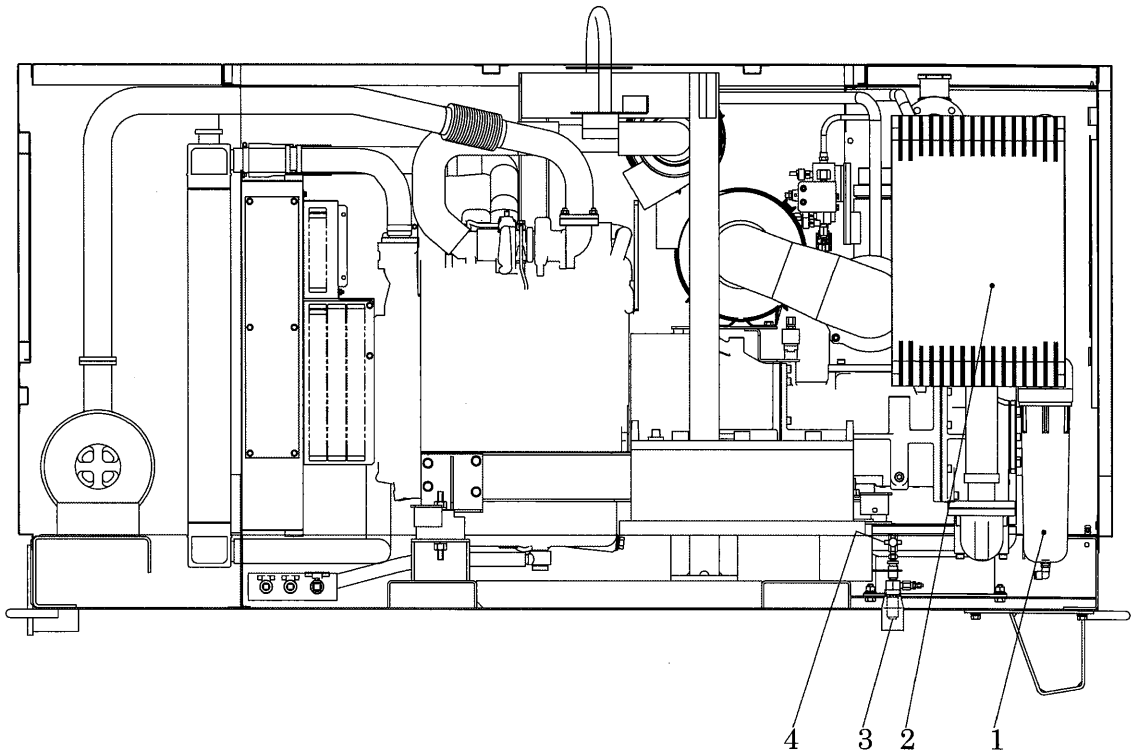


No.	Description	Function
20	Radiator	For cooling the coolant for engine in the system.
21	Engine	For driving the compressor in the system.
22	Solenoid valve for unloader spring chamber	For reducing load at start-up.
23	Pressure regulator	For controlling full load and unload operation.
24	Solenoid valve for starting unloader	For reducing load at start-up.
25	Pressure control valve	For keeping the pressure in receiver tank constantly higher than a certain level in the system.
26	Compressor air-end	For compressing air in the system.
27	Battery	For electrically starting engine.
28	Engine oil drain valve	For draining engine oil.
29	Oil cooler drain valve	For draining compressor oil from oil cooler and oil line.
30	Radiator drain valve	For draining engine coolant.
31	Exhaust muffler	For silencing the noise caused before discharging the air.

1.Part Names

[After cooler type]

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



FAC-113PC

A160723

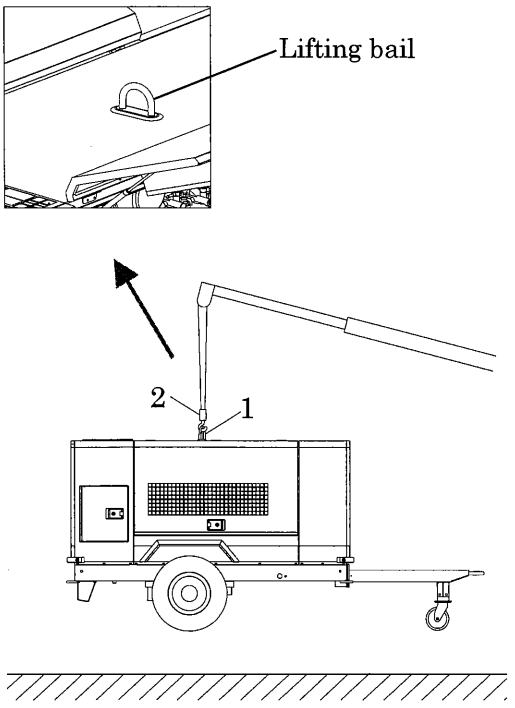
No.	Description	Function
1	Drain separator	For separating water from compressed air cooled through after cooler.
2	After cooler	For cooling compressed air.
3	Drain port of air pipe	For draining condensate from drain separator.
4	Drain warming valve	For preventing freezing of water separated through drain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

2.Installation

2.1 Transportation

When loading and unloading the machine, be sure to use the lifting bail "1" provided on the center of the machine top.

2.1.1 Lifting up



<Procedure>

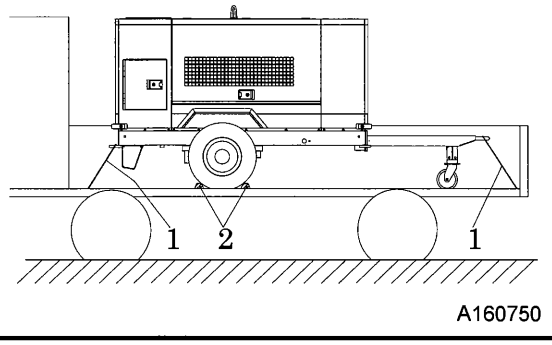
① Before lifting the machine up, make sure to check the lifting bail "1" for any crack or loosened bolts.

② Connect the hook "2" of the crane or shackle with lifting bail "1" eye fitted at the top center of the machine, and make sure that there is no person standing around the machine. Then perform the hoisting operation.

③ Select a truck or a crane with a capacity sufficient for the weight and size of the machine by referring to the values shown in Chapter 8 "Specifications" of the manual.

④ Any crane operations must be performed by a qualified crane operator.

2.1.2 Mounting the machine on the truck bed



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

Transportation

WARNING

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

2.Installation

2.2 Towing the Machine

Before towing the machine, check the following conditions and make sure that there is no problem to start towing it.

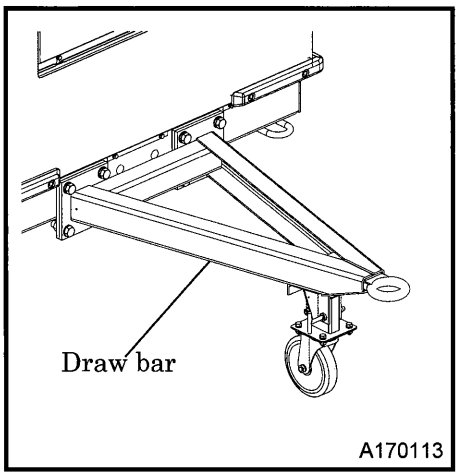
- Ensure that there is nothing wrong with the air pressure in the tires. **(See 5.5.31)**
- As certain that any of the nuts used to mount the tires in place are not loosened. **(See 5.5.31)**
- As certain that any of the bolts used to mount the draw bar in place are not loosened. **(See 5.5.32)**

⚠ WARNING

- When towing machine, make sure there is no person or obstacle at both front and rear sides and under the machine.
- Towing speed should be within 20 km/h.

⚠ CAUTION

Caution for towing the machine



- Before towing the machine, check the following conditions and make sure that there is no problem to start towing it.
- Make sure that the end of the drawbar is so surely and firmly connected to the coupler of the towing vehicle that disconnection will not occur while the machine is being towed.
- Make sure that the end of the drawbar is so surely and firmly connected to the coupler of the towing vehicle that the disconnection may not occur while the machine is being towed.
- Be sure to keep your hand or finger away from any part of the coupling device when coupling or uncoupling a drawing device to a drawbar.
- Be sure to keep your hand or finger away from any part of the coupling device when coupling or uncoupling a drawing device to a drawbar.
- If you do not follow the above instructions, it could cause injury or property damage.

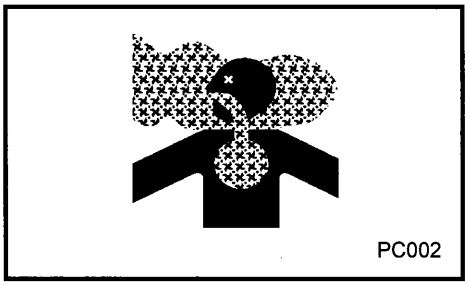
2.Installation

2.3 Installation conditions

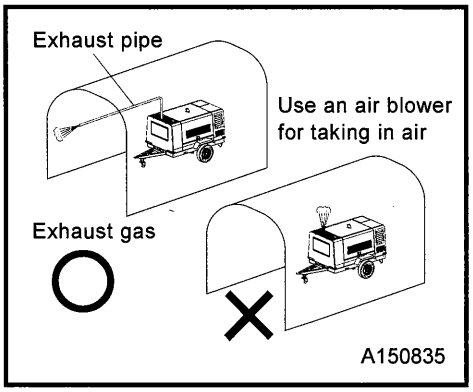
The machine has to be parked horizontally on a level place.

- The machine has to be parked right-angled on a slope.
- The machine has to be parked on a slope within an angle of 15°
- The machine should be operated in following conditions:
- **Ambient temperature---------- -15℃to+40℃**
- **Humidity---------- Lesss than 80%**
- **Altitude---------- Lower than1,500m above sea level**
- 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

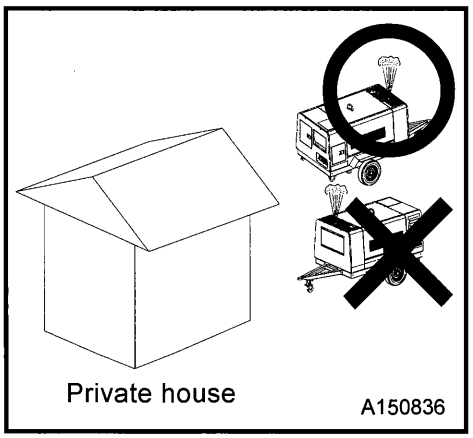

PC002

- Exhaust gas from the engine is poisonous. It could cause death or serious injury if inhaled. Avoid using the machine in an insufficiently ventilated building or tunnel.
- Do not position the exhaust gas outlet in direction of a person or a house.



A150835

- 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.



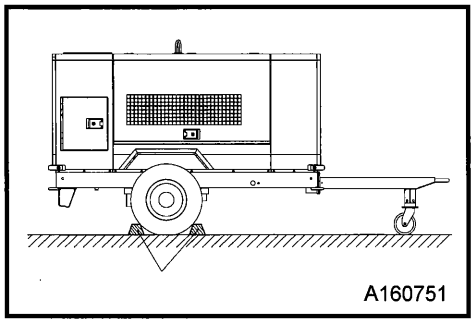
A150836

- Do not position the exhaust gas outlet in the direction of a house.
- Because the exhaust gas from the engine is poisonous, avoid positioning it in the direction of passers-by.

2.Installation

Installation notes

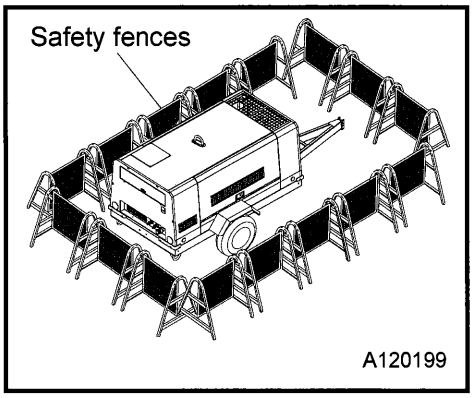
WARNING



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

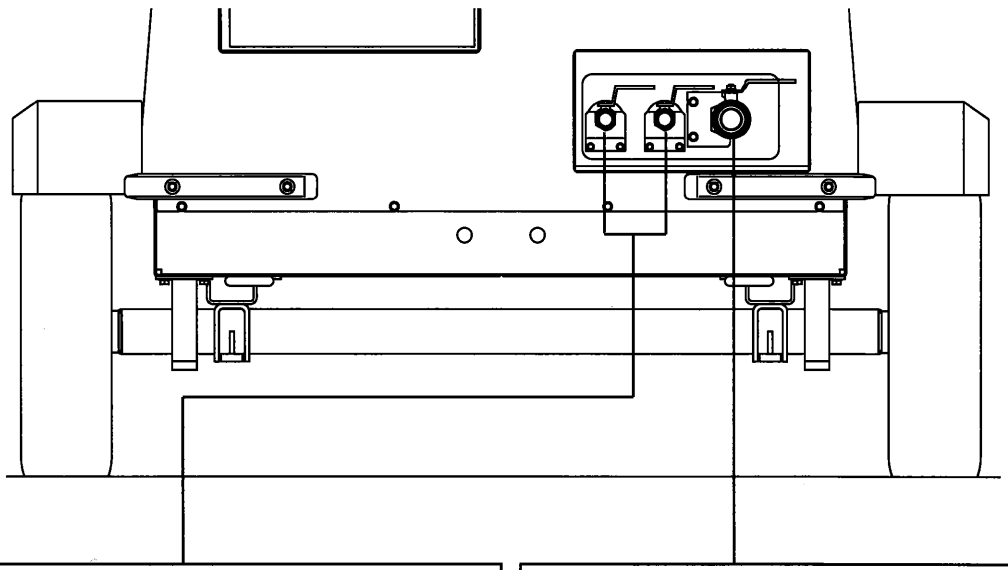
Placing safety fence in position

CAUTION



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

2.3.1 Service valve



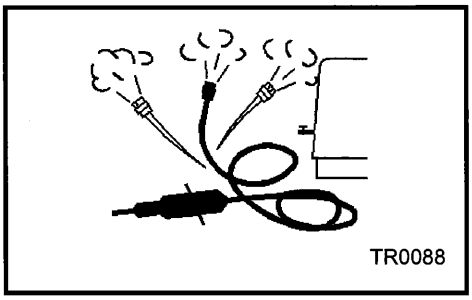
Bore of service valve: 20A (R3/4B) × 2 pieces [Taper male screw]	Bore of service valve: 50A(Rc2B) × 1 piece [Taper female screw]

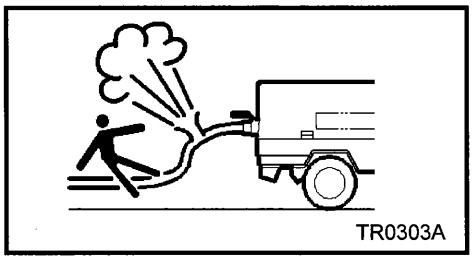
A160694

2.Installation

Cautions of hose attachment and removal

⚠ WARNING

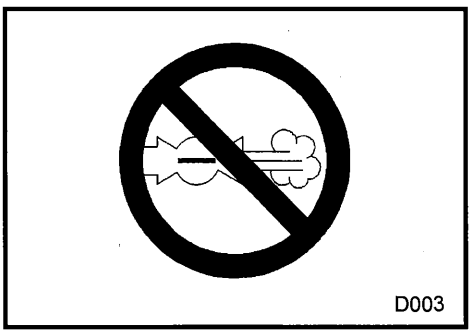

TR0088


TR0303A

- Piping or the hose from this machine service valve should use what can be borne enough for the discharge pressure of this machine.
- Please connect piping or a hose to this machine service valve firmly before operation and during operation. If the connection 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.

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

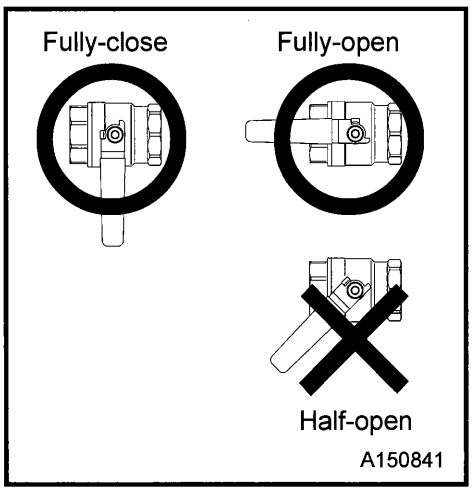
⚠ CAUTION


D003

- Do not operate the machine with service valves and relief valve open unless air hoses and/or pipes are connected.
  High-pressurized air blows out and its air pressure could cause injury to the people nearby.
- When the machine has to be unavoidably temporarily operated with its port open, be sure to mount a silencer to reduce noise and wear protective materials such as earplugs to prevent damage to hearing.

Cautions of service valve

⚠ CAUTION



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

3.Operation

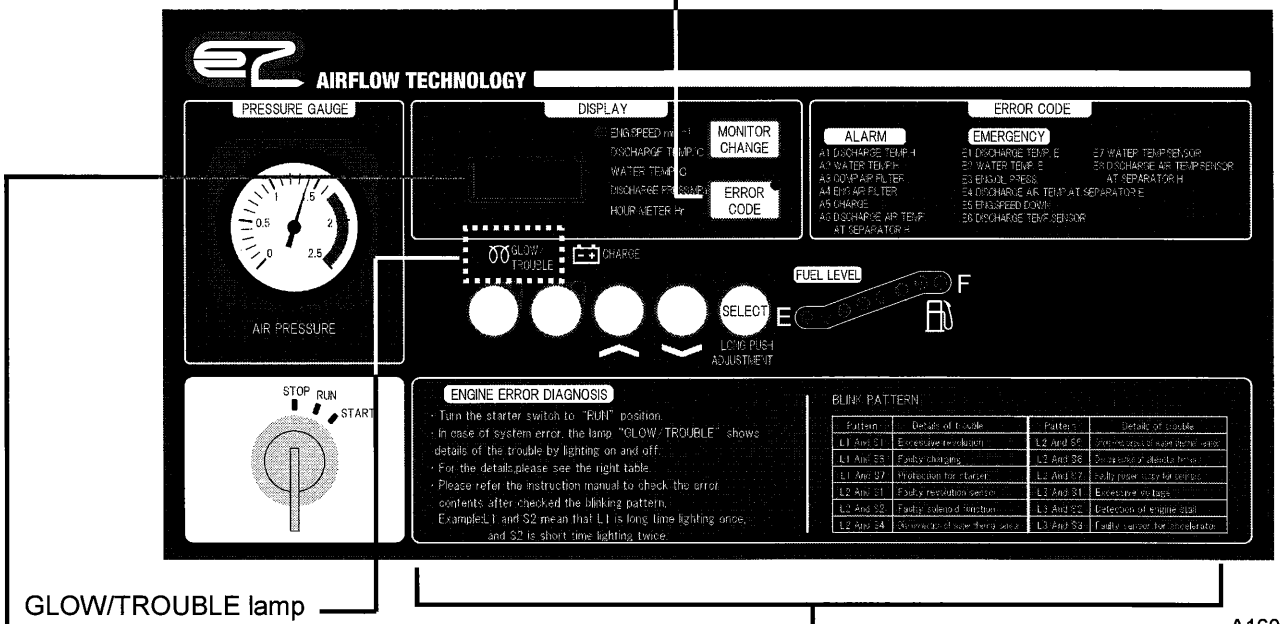
3.1 Instrument Panel

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

Error code switch

When this switch is pushed on while lamp is blinking, it shows error code. When starter switch is placed to "STOP", displayed screen is reset.

※For error code, see 4.1.



GLOW/TROUBLE lamp

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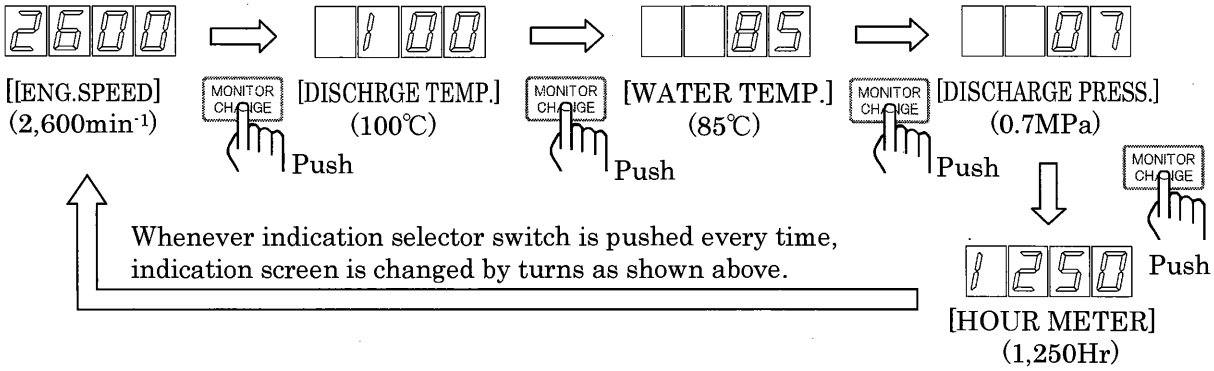
Engine error diagnosis

In case of system error, the lamp "GLOW/TROUBLE" shows details of the trouble by lighting on and off.

Digital monitor

When power is supplied, revolution speed (lamp lighting) is indicated.



Whenever indication selector switch is pushed every time, indication screen is changed by turns as shown above.

※In case that discharge air temperature is below 0℃, "---L" is indicated on screen.

3.Operation

3.2 Lubricating oil · Coolant · Fuel

3.2.1 Engine oil

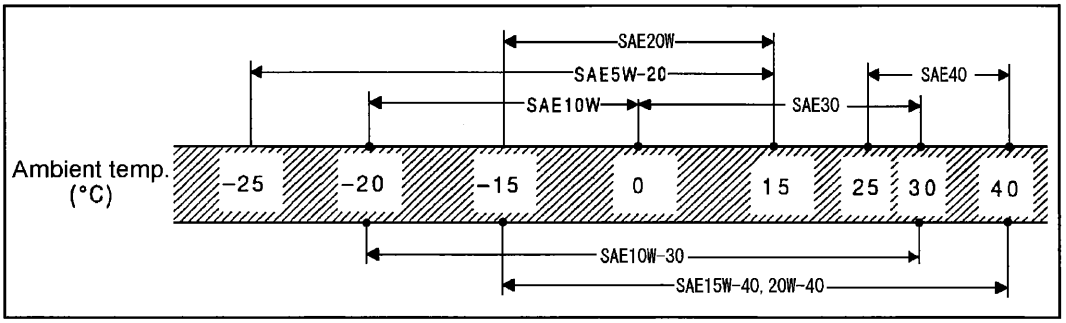
Use engine oil recommended by us.
Be sure to use CF class or higher engine oil or superior class. (Using engine oil with poor quality may shorten the life of the engine).

Classification	API service classification CF class or higher
Viscosity	SAE10W-30

IMPORTANT

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

Ambient temperature range and oil viscosity (SAE)



A100293E

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

3.2.2 Compressor oil

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

Maker and Brand of Recommended Oil

Maker	Brand
SHELL	SHELL CORENA S3R (VG32)
JX NIPPON OIL & ENERGY CORPORATION	FAIRCOL RA32

IMPORTANT

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

3.2.3 Coolant

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

IMPORTANT

- When water with dirt, sand, and/or dust contained, or hard water such as well water (ground water) is used, this will cause deposits inside radiator or on cylinder head, and will cause engine overheat due to poor flow of coolant.
- Adjust mixing ratio of LLC (Antifreeze) with water according to the temperature. **(When the machine is delivered from factory, it is filled with the oil of density 35%.) Use LLC (Antifreeze) within the range of its mixing ratio between 30 and 60%. (If LLC (Antifreeze) in the water exceeds more than 60%, it may decrease its antifreezing effect.)**

Mixing ratio of LLC (antifreeze) (reference)

Outside temperature (℃)	-15	-20	-25	-30	-35	-40	-45
Mixing ratio (%)	30	35	40	45	50	55	60

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

3.2.4 Fuel

- As for fuel, use diesel fuel oil (having higher than 45 cetane number).
- Use of diesel fuel oil having lower than 45 cetane number will cause inferior function to engine and, what is worse, it will cause serious accident to the engine.

IMPORTANT

- You will be punished if you use mixture of light oil and heavy oil/coal oil or fuel other than light oil in region there is regulation for illegal light oil.
- **Follow the designated regulations to dispose of fuel.**

3.Operation

3.3 Check before starting unit

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

3.3.1 Check engine oil level

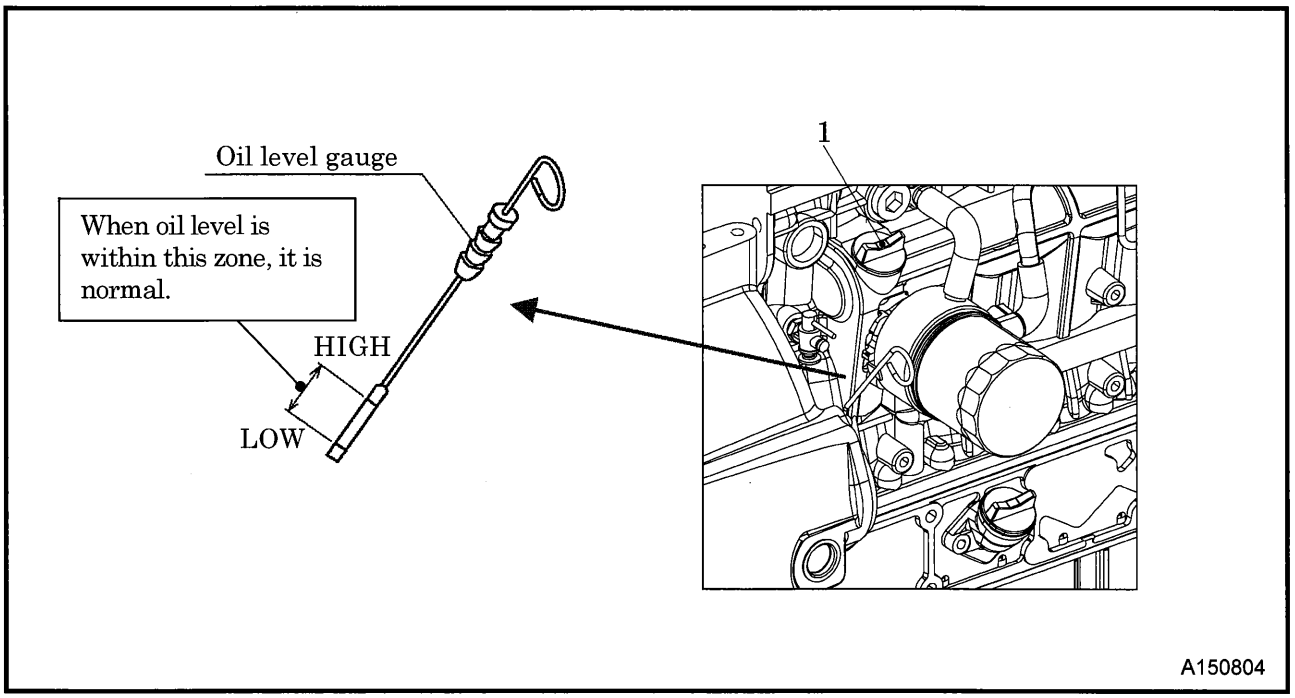
Unit should be on level before checking oil level.
When you check oil level after you have once started operation, wait 10 to 20 minutes after stopping engine, before checking the oil level.

<Procedure>
① Pull out the oil level gauge"1"and wipe it with a clean cloth.
② Then, re-insert the oil level gauge"1"fully and pull it out again. If the oil level gauge"1" shows the oil level between LOW and HIGH, it is normal.
③ When the oil level is below its LOW, add engine oil from oil filler port"2".

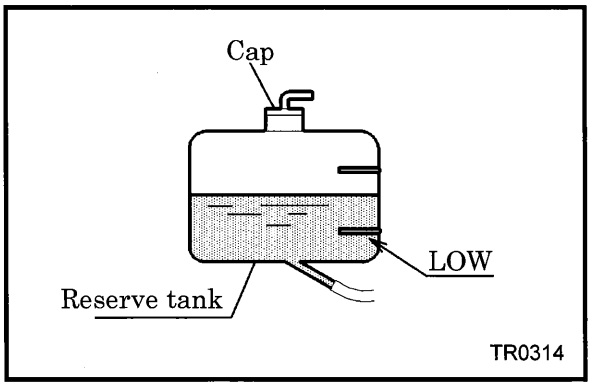
- While checking oil level, check also for contamination. If the oil is found dirty, contaminated or should it be changed according to the periodic inspection list, change the oil.

(See 5.5.1)

- To cause of the engine output reduction when oil level is too high, do not put oil in more than the upper limit.



3.3.2 Check coolant level

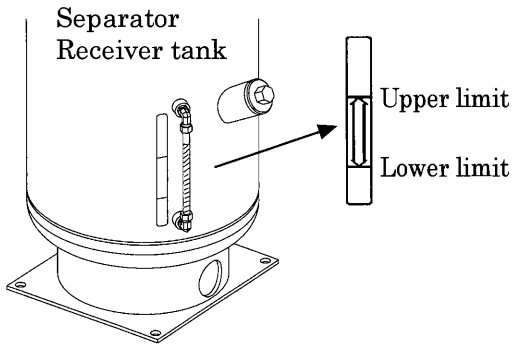


- Check the coolant level in the reserve tank. If it is lower than the limit, open the cap and replenish the coolant. (Level must be kept above LOW mark.)
- When there is a little water or no water in the reserve tank, remove the radiator cap and make sure to check the water level. Then supply coolant to the radiator and also the reserve tank if necessary. **(See 5.5.19)**

IMPORTANT

- Do not continue operation at low coolant level. Air bubble is mixed into radiator, and it causes damage to the radiator.

3.3.3 Check compressor oil level

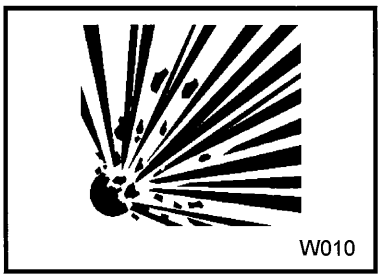


- Place the machine on level ground when checking the oil level.
- After checking and confirming that the residual pressure in separator receiver tank is0MPa replenish the tank with compressor oil so that the oil level is kept higher than the Lower limit of level gauge plate. Be sure to check the surface of compressor oil is in the range between upper limit and lower limit when machine operating.

(See 5.5.6)

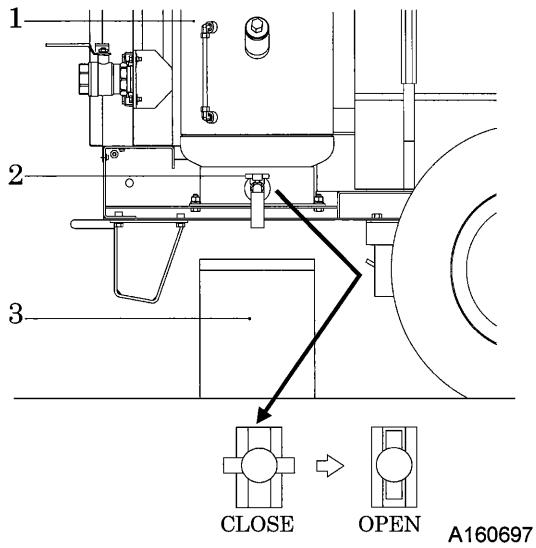
※ Supply of excessive oil can cause deterioration of oil separation performance and the like. Never supply oil at a higher level than the "proper level" of oil level gauge when the machine is on standstill.

⚠ WARNING



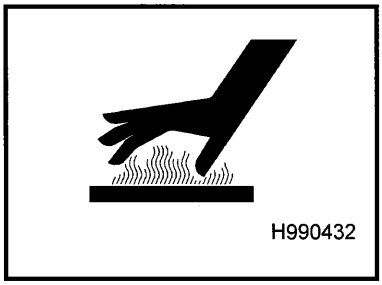
- When you fill the separator receiver tank with compressor oil stop the engine and make sure that the pressure gauge indicates 0MPa and there is no residual pressure in it, and then gradually loosen the oil filler cap for refilling oil.
- Should any residual pressure be left in the separator receiver tank, hot compressed air and hot compressor oil jetting out could cause burning or serious injury to persons nearby.

3.3.4 Drain separator receiver tank



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

⚠ WARNING



- After stopping the engine, confirm that the pressure gauge indicates 0MPa and there is no residual pressure in it, then open the drain valve gradually to drain the compressor oil.
- Note residual pressure in the receiver tank could force both extremely hot compressed air and oil to jet out and you may be scalded or seriously injured.

3.3.5 Check fuel

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

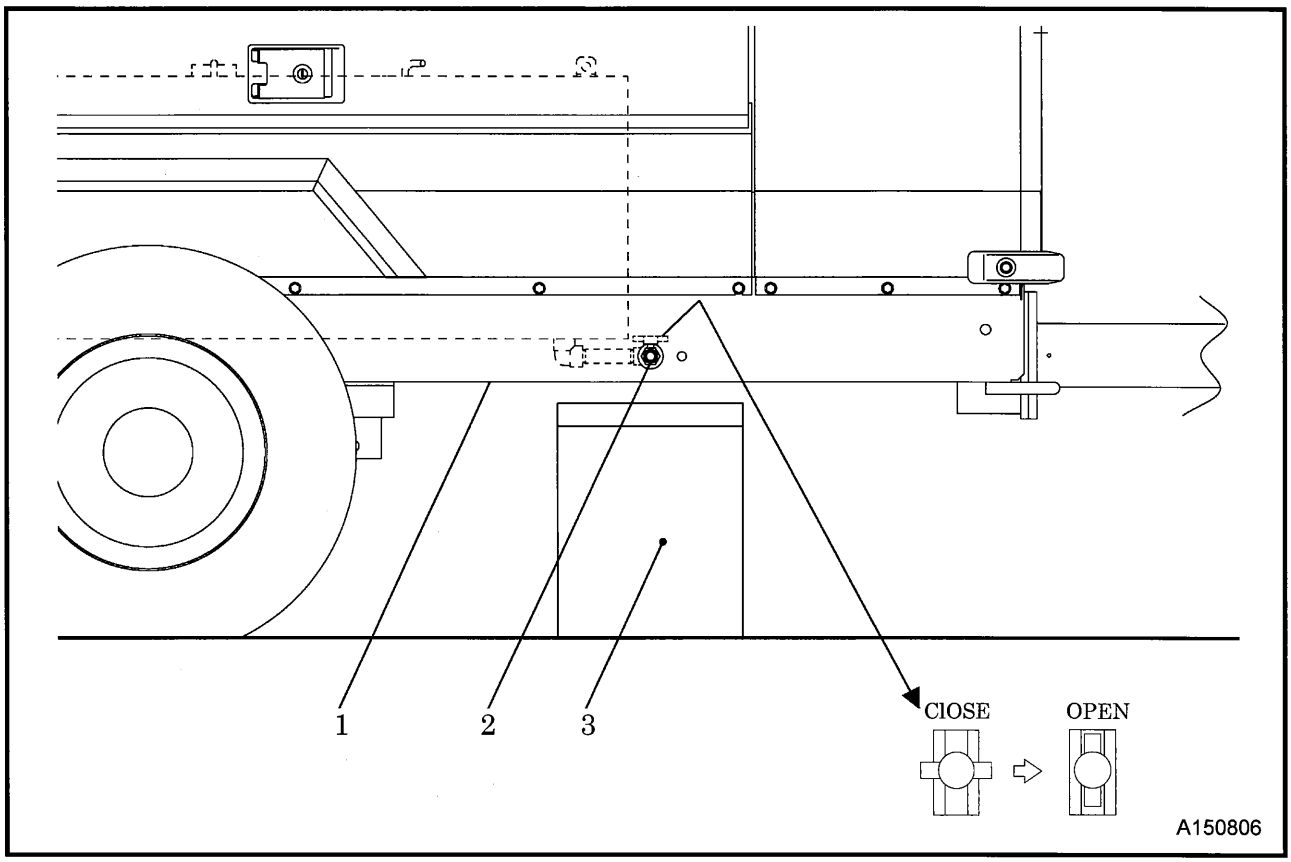
- **Refilling fuel tank should be done in an outdoor well-ventilated place.**
- **Do not fill fuel up to the filler level. When fuel tank is filled up to the filler level, fuel will be overfilled due to volume expansion caused by rise of ambient temperature. Further, fuel will be possibly spilled from fuel tank due to vibration caused during movement and/or transportation of the machine.**

CAUTION

- Do not, under any circumstance, bring lit cigarettes and/or matches to the fuel.
- The fuel is extremely flammable and dangerous. Be careful of fire because it is very likely to catch fire.
- Refuel only after stopping the engine, and never leave open fuel can near the machine. Do not spill. It could cause a fire. When it is spilt, wipe it up completely.
- Never use alcohol-base cleaning fluid. If it sticks to such parts made of plastic, it causes degradation of liquid surface visibility, and in worst case, it leads to crack and fuel leak due to crack caused.

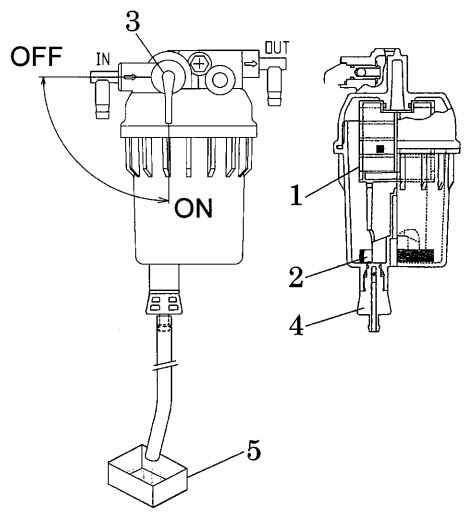
3.3.6 Drain fuel tank

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



3.3.7 Check sedimenter for condensate

When red float "2" under element "1" in fuel filter is raised up to upper level, drain water.



<Procedure>

① Turn fuel selector valve "3" to "OFF"position.

② Loosen the drain valve"4"and drain out condensed water inside.

③ Make sure to tighten the drain valve "4" securely, after draining the condensate.

- Drain the condensate in container "5" and then dispose of condensate according to the designated regulations.

CAUTION

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

3.3.8 Check wiring of each part

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

3.3.9 Check piping of each part

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

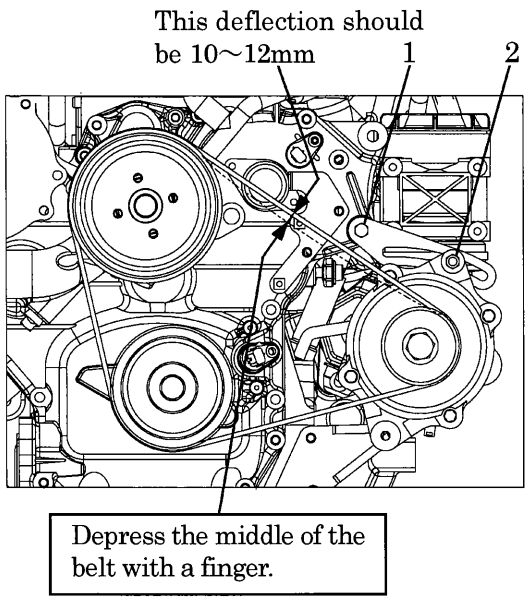
3.3.10 Check in the machine

CAUTION

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

3.3.11 Check belt tension

Follow the procedure below to adjust tension of belt.
Adjust the tension by gradually loosening the fastening bolt "1" or nut "2" of the alternator.



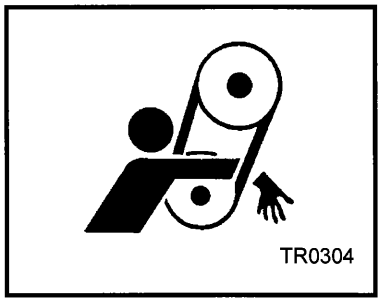
<Procedure>

① Visually check if there are any cracks or tears in the belt.

② Once loosen and adjust the alternator lock bolt or lock nut, so as to belt deflection should be 10-12mm when you depress the middle of the belt with your finger with a force of about 98N・m(10kgf・m). After adjusting, be sure to tighten lock bolt or lock nut firmly.

③ Be careful not to leave any grease or LLC on a belt while changing it. If any such material is left, wipe it off completely.

WARNING



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

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

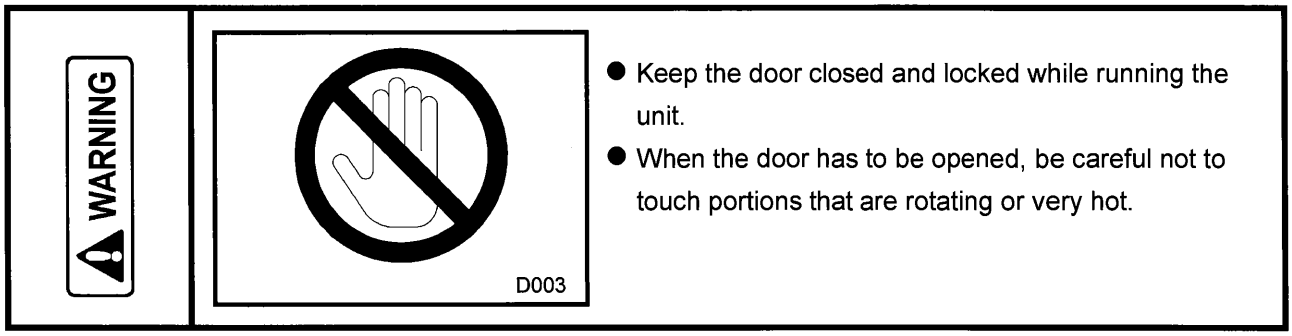
IMPORTANT

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

3.Operation

3.4 Operation

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



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

3.4.1 Procedure to start the unit

When warming up operation, be sure to check if there is no loosening in each part of machine or any leaks of water, oil, fuel and air. Also check putting out of the lamp "GLOW/TROUBLE".

<Procedure>

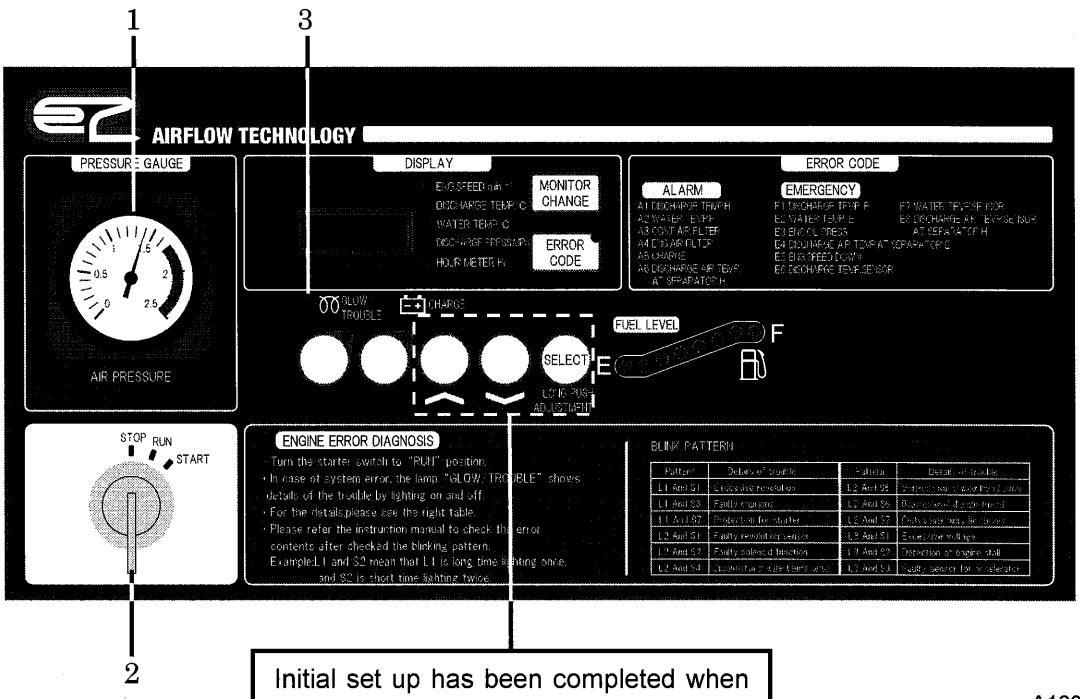
① Make sure that the pressure gauge "1" indicates 0MPa.
② Close fully service valve.
③ Turn the starter switch "2" to "RUN" position, and the glow lamp "3" goes on.
④ As soon as the glow lamp "2" has gone out, turn the starter switch "1" fully clockwise to start up the engine.
Starting manipulation of starter switch should be done within 30 seconds. And be sure to take 1 or more minutes for next starting operation. If you don't, starter motor might be over heated and broken.

- See the table below for required time for starting unloader operation. It varies according to discharge air temperature.

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

⑤ Once the engine has started up, leave it running to warm-up for 5 minutes.
The discharge air pressure gauge"1"in this condition ranges from 0.3 to 0.9MPa.
⑥ After finishing warming up operation, open the service valve provided at the outlet of compressed air and start service job.

3.Operation



Initial set up has been completed when shipped out from our factory. You do not need to do any adjustment.

A160695E-1

IMPORTANT

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

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

When the engine fails to start even after performing the startup procedures ①to ④, do not keep the starter running, but set the starter switch back to the "STOP" position and wait approximately 60 seconds. Then, repeat the startup procedure once again.
If the repeated procedure does not allow the engine to run, the following causes are suspected. Therefore, check the following items.

- No fuel
- Lack of air bleeding in fuel line **(See 3.4.7)**
- Clogging of fuel filter
- Discharge of battery (Low cranking speed)

CAUTION	● Do not operate the starter more than 30 or more seconds at one operation. ● 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.

3.4.3 How to start the machine at low temperature

Use SAE10W-30 (CF class or higher) for the engine oil.
Use LLC (antifreeze). Use correct amount to provide freeze protection, according to the ambient temperature.
Battery should always be kept fully charged.

<Procedure>
① Close fully service valve.
② Do normal starting manipulation and start the engine.

CAUTION	● Should change a different types of engine oil, compressor oil, LLC, or fuel when operating a machine in cold weather.

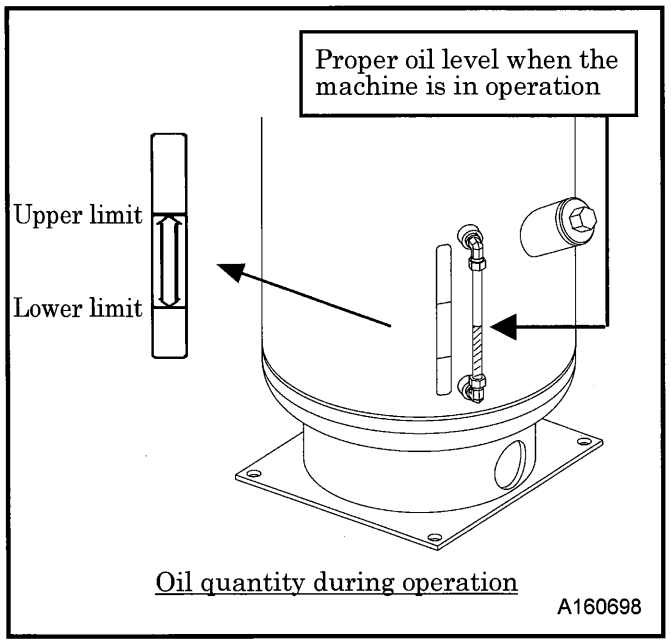
3.4.4 Gauge indication while operating

Be sure to check at times to see if gauges or each component of the unit are properly working, or if there is any air-leak, oil-leak, water-leak or fuel-leak etc.
During normal operation, each indication of instruments is shown in the table below. Refer to the table for daily checks.

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

		Discharge pressure gauge
Starting unloaded operation		About 0.1 to 0.2 MPa
In operation	No load (Unload)	0.7 to 0.9MPa
	Full load	0.4 to 0.7MPa

Protection device		Indicator lamp	
		GLOW/TROUBLE	CHARGE
Monitor			
Before startup	Starter switch set to "RUN" position	● OFF	☼ ON
In operation		● OFF	



- When the machine is in operation under load check to see that the compressor's oil level falls within the range between the lower limit and upper limit of the level gauge if the level is found to be insufficient, replenish the oil.

※ Keep the operation log to record constant inspection of each component, so that trouble of the machine can be easily discovered and preventive measures can be taken.

⚠ CAUTION

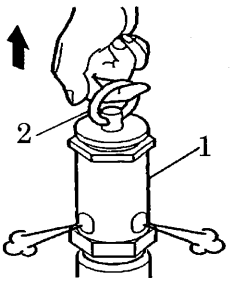
- Do not open the valves below listed when operating.
- Separator receiver tank drain valve
- Coolant drain valve
- Engine oil drain valve
- Oil cooler drain valve
- Fuel tank drain valve

IMPORTANT

- Discharge pressure level must be kept 0.4 or more MPa when operating.
- If you keep operating with less than 0.4MPa, it will causes less separation of lubricating oil at oil separator, or baking caused by overheat of compressor body.

3.4.5 Performance check of safety valve

Be sure to check the safety valve"1"performance once a day.
Pressure setting for safety valve is 1.0MPa.



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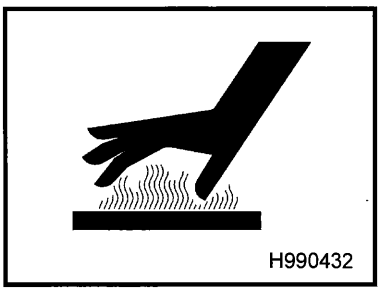
- Close the service valve completely and pull the test ring"2"of the safety valve"1"to check the performance. It is performing normally when the compressed air jets out with slight force at a discharge pressure between 0.7 to 0.9MPa Wear safety glasses.

WARNING

- Keep face or hand away from the discharging outlet of safety valve.
  It is very dangerous because high-pressure compressed air jets out.

CAUTION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- Never work nearby hot portions of the machine while it is running.
- Do not touch hot portions of the machine while inspecting the machine when running.
- Such parts as engine, exhaust manifold, exhaust pipe, muffler, radiator, oil cooler, air-end, supply of pipe, separator receiver tank, and discharging pipe are especially hot, so never touch those parts, because it could cause serious burns.
- Compressor oil, coolant water, and engine oil are also very hot and dangerous to touch.
  Avoid checking or refilling them while the machine is running.

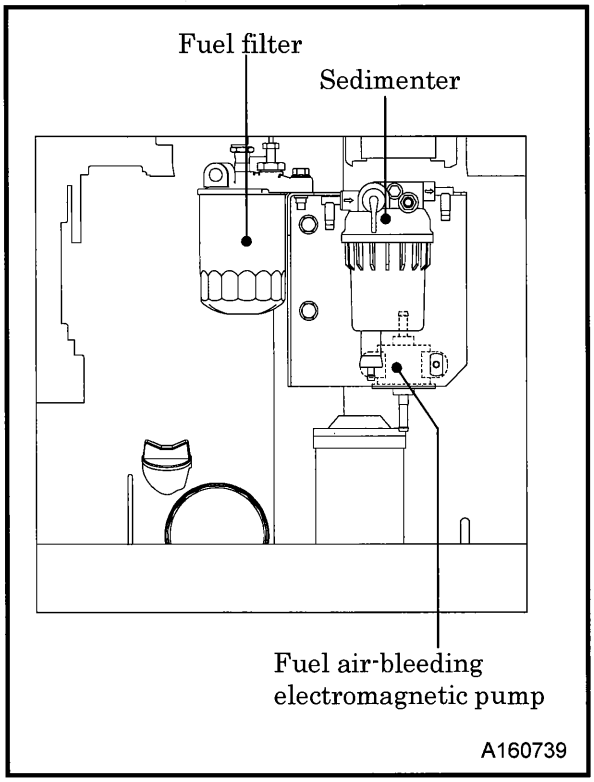
3.4.6 Stopping

<Procedure>
① Close the service valve completely and operate the machine about 5 minutes until it cools down.
② Turn the starter switch to "STOP" position to stop the engine.
③ Remove the key from the compressor every time when you stop the engine. Keep the key and be careful not to lose it.

- Unless all the service valves are fully closed upon stopping operation, the compressed air will be sent in reverse direction in the hoses (pipes) connected to air tools and relieved to atmosphere continuously through the auto-relief valve. Further, when re-starting operation next time, compressed air will be jetted out through air valves.

3.4.7 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 and sedimenter should be filled up with fuel and set up.

② When starter switch is turned to "RUN" position electromagnet pump starts to automatically bleed air in fuel line.

③ Air bleeding is completed about one minute.

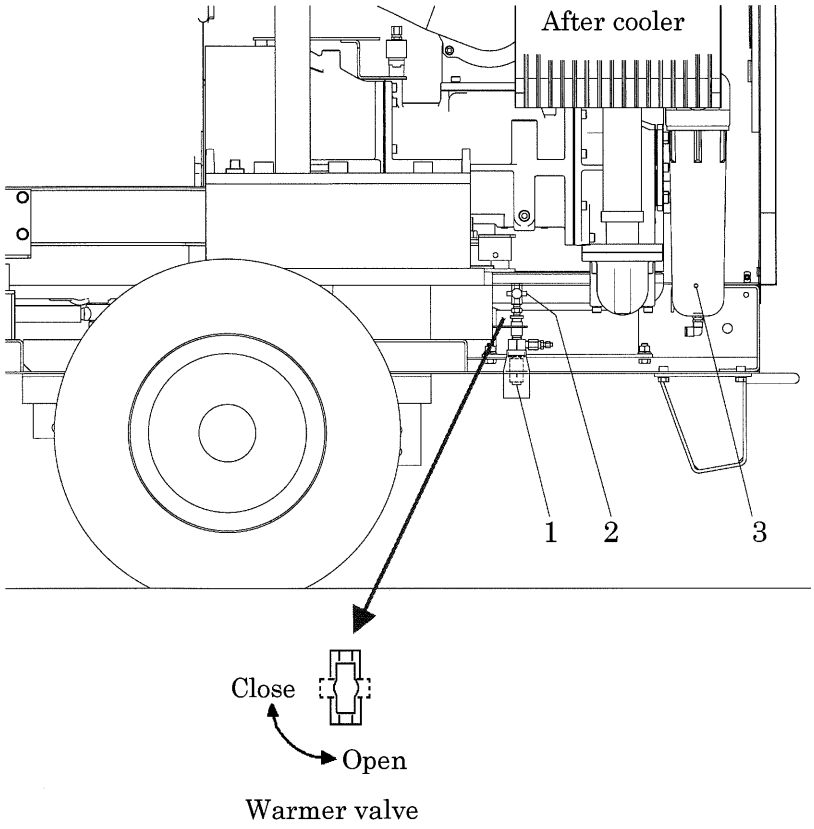
3.5 Operation of after cooler type

3.5.1 Draining after cooler

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

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

- Be sure to check air discharge from after cooler drain outlet when operating. If drain is found in discharged air, clean silencer "1" at outlet. If it is dirty, replace it.
  When cleaning and replacing it, contact our office nearby or distributor because technical knowledge is required.



3.5.2 Drain warmer valve

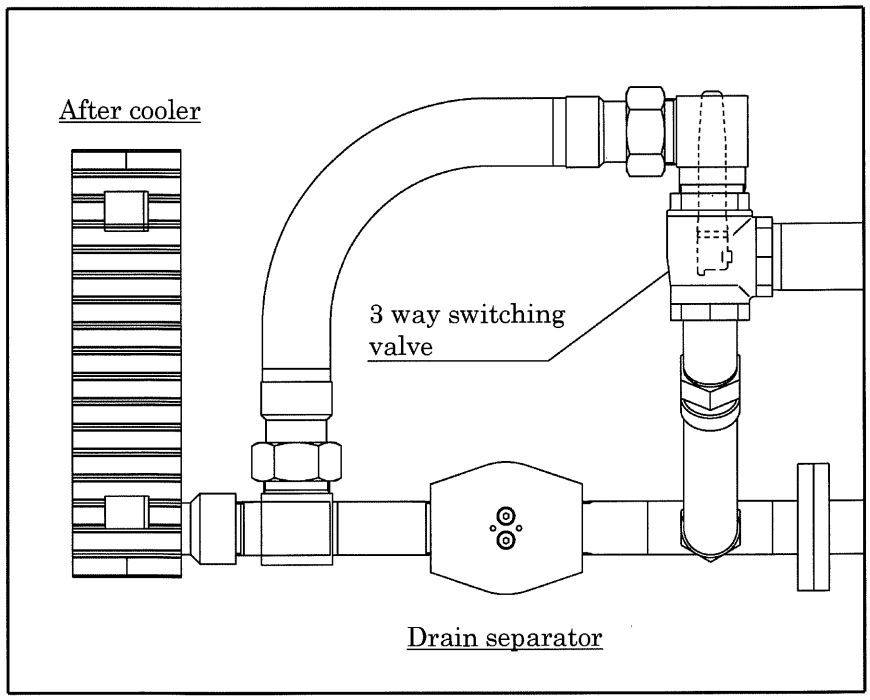
The valve "2" is installed for drain antifreezing when discharging water separated at drain separator "3". Be sure to use the valve with opened if ambient temperature is 5 or less degree.
If there is no risk of freezing, use the valve "2" with closed.

3.5.3 To prevent freezing

- In case the machine operates in winter season and before the machine storage, be sure to open service valve 2 to 3 times in order to remove accumulated water drop in air piping for after-cooler etc.

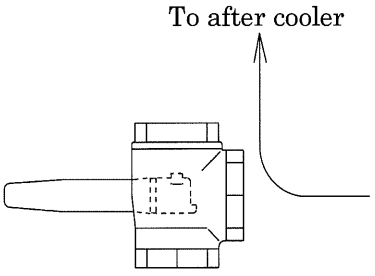
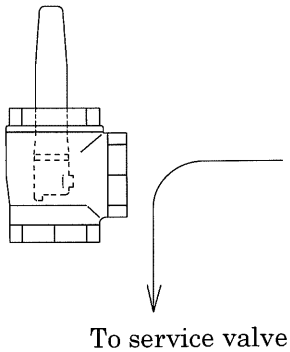
3.5.4 Selection of service air

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



View from separator maintenance cover

A150855

Service air / Operation	Low temperature air	Normal temperature air
3 way switching valve		

4 Failure cause and measures

4.1 Indicator lamp and Warning / Emergency display

[Indicator lamp] Turn the starter switch to "RUN" position. Then the lamp goes on.

Item	Contents	Measures	Monitor
Glow/Emergency	Press starter switch "RUN" 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.	

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

Item	Failure code	Contents	Measures
DISCHARGE TEMP.H	A-1	Lamp flickers when the air temperature at the outlet of the air-end reaches 115℃.	See 4.2 "Troubleshooting"
WATER TEMP.H	A-2	Lamp flickers when coolant temperature reaches 100℃.	
COMP. AIR FILTER	A-3	Lamp flickers when air filter gets clogged and suction resistance increases. [Actuating resistance is more than 6.2kPa.]	Clean or Replace
ENG. AIR FILTER	A-4		
CHARGE	A-5	Belt loosened and/or cut Faulty generation of alternator	Check/Change
DISCHARGE AIR TEMPERATURE AT SEPARATOR OUTLET H	A-6	When the air temperature at the outlet of the separator reaches115℃, lamp comes on.	See 4.2 "Troubleshooting"

4 Failure cause and measures

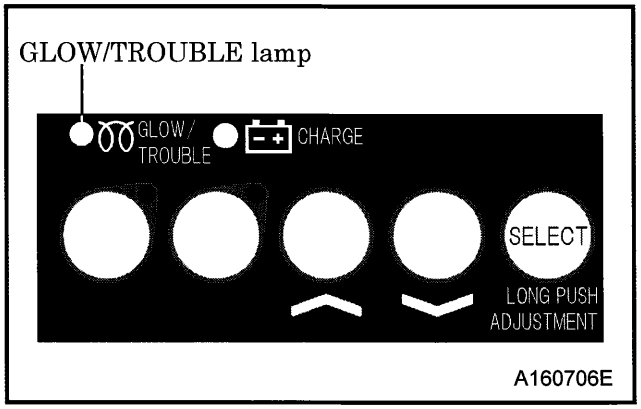
[Emergency display] When any trouble takes place during operation, this displays and it stops as an emergency stop.
When any abnormality happens, a trouble code lamp flickers. In this time when trouble code switch is pressed, a failure code will be displayed.

Item	Failure code	Contents	Measures
DISCHARGE AIR TEMP. E	E-1	When the air temperature at the outlet of the air-end reaches120℃,lamp comes on.	See 4.2 "Troubleshooting"
WATER TEMP. E	E-2	When coolant temperature reaches 105℃,lamp comes on.	
ENGINE OIL PRESS	E-3	The lamp comes on when engine oil pressure drops. [The function pressure: 98kPa.]	
DISCHARGE AIR TEMPERATURE AT SEPARATOR OUTLET E	E-4	When the air temperature at the outlet of the separator reaches120℃,lamp comes on.	
ENG. SPEED DOWN	E-5	The lamp comes on when engine revolution speed is slow down. [Operation speed: less than 900min^{-1}]	
DISCHARGE AIR TEMP. SENSOR DISCONNECTION	E-6	The lamp comes on when the air temperature sensor at the outlet port of compressor air end is disconnected.	
COOLANT TEMP. SENSOR DISCONNECTION	E-7	The lamp comes on when the engine coolant temperature sensor is disconnected.	
SEPARATOR OUTLET TEMP. SENSOR DISCONNECTION	E-8	The lamp comes on when the separator outlet air temperature sensor is disconnected.	

4 Failure cause and measures

4.1.1 Engine emergency stop

- When the machine detects any trouble listed on below table, its engine will stop and GLOW/TROUBLE lamp will flicks. You can find which trouble occurs by its flickering pattern.



Trouble	Detective way and contents	Flickering pattern	Note
Engine over-rotation	Number of revolution exceeds 115% (3,162min^{-1}) which is maximum number of revolution in operation range.	L1 and S1	Engine stops immediately
Drop of engine oil pressure	After engine starts, oil pressure switch turns "ON" for 1 or more seconds.	L1 and S2	Engine stops after 10 or more seconds later than started.
Battery charging faulty	After engine starts, alternator "L" terminal keeps no voltage status (0V) for more than 1 or more seconds.	L1 and S3	Engine stops after 10 or more seconds later than started.
Water temperature emergency	After engine starts, water temperature switch turns "ON" for 1 or more seconds.	L1 and S4	Engine stops after 10 or more seconds later than started.
	Coolant temperature exceeds 110℃ for 1 or more seconds.	L1 and S6	
Emergency stop	Emergency stop switch (ECU pin No. 35) turns "ON" for 0.1 or more seconds.	L1 and S5	Engine stops immediately
Malfunction of RPM sensor	After engine starts, alternator "L" terminal has voltage although number of revolution is 0min^{-1}	L2 and S1	Engine stops after 10 or more seconds later than started.
Trouble of solenoid	Detect by solenoid driver IC or current value.	L2 and S2	Engine stops immediately
Trouble of coolant temperature sensor	Detect open circuit (-40 or less ℃)	L2 and S4	Engine stops after 10 or more seconds later than started.
	Detect short circuit (140 or more ℃)	L2 and S5	
Trouble of alternator L terminal	After key is "ON" (engine does not start), alternator "L" terminal has voltage although number of revolution is 0min^{-1}	L2 and S6	Engine stops after 10 or more seconds later than started.
Excessive voltage	Power source voltage exceeds 18V or more.	L3 and S1	Engine stops immediately
Trouble of power source for sensor	Detect short circuit at power source (analog 5V drops to 4 or less V)	L2 and S7	Engine stops after 10 or more seconds later than started.
Protection of starter	Starter keeps "ON" for 12 or more seconds.	L1 and S7	
Detection of engine stoppage	After engine starts, number of revolution is 0 and no oil pressure.	L3 and S2	
Trouble of accelerator sensor	Detect open circuit (0.244 or less V) Detect short circuit (4.432 or more V)	L3 and S3	Engine stops after 10 or more seconds later than started.

※When engine is brought to emergency stop, some of the above flashing patterns is indicated.
L and S mean Long time and short time alternatively. Also the numbers of each L and S mean repeated time of flickering lamp.

4 Failure cause and measures

4.2 Troubleshooting

If any trouble occurs during operation, do not leave it. Investigate the cause and take appropriate measures.
Read the manual carefully and fully understand what to do in case of trouble.

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

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

4 Failure cause and measures

Symptom	Cause	Countermeasures
Water found mixed in air. (Condensate separation malfunctioned.) For after-cooler type only	(1)Clogging of silencer at after cooler drain outlet (2)Inside of piping between drain separator and silencer clogged with dust	Disassemble/Clean/Change Disassemble/Clean
Insufficient free air delivery.	(1)Air filter element clogging (2)Unloader valve cannot fully open (3)Engine does not reach rated speed	Clean or change of element Call your nearest dealer Call your nearest dealer
It is indicated that engine oil pressure is abnormal, and engine stops.	(1)Engine oil shortage (2)Engine oil filter clogging (3)Faulty oil pressure sensor (4)Loose wiring connectors and disconnection.	Replenish oil Change Change Check/Fasten
Alarm of coolant temperature	(1)Radiator clogging (2)Faulty thermostat (3)Faulty coolant temp. sensor (4)Low coolant level (5)Belt slippage (6)Loose wiring, connectors and disconnection.	Clean Change Change Replenish Re-adjust tension Check/Fasten
It is indicated that discharge air temperature sensor is disconnection, and engine stops.	(1)Coolant temp. sensor is disconnected.	Repair/Change
Alarm of discharge air temperature or separator outlet air temperature	(1)Oil cooler clogging (2)Oil filter clogging (3)The discharge air temperature sensor is defective (4)Loosened or disconnected wiring or connector (5)Belt slippage (6)Shortage of compressor oil (7)Malfunction of by-pass valve (8)discharge air temperature sensor is disconnected (9)Separator clogging (In case separator outlet air temperature alarm)	Clean Change Disassemble/Check Check/Fasten Re-adjust tension Replenish oil Check/Change Repair/Change Change
It is indicated that engine speed down is abnormal, and engine stops.	(1)Malfunction controller. (2)Loose wiring connectors and disconnection (3)Shortage of feeding fuel caused due to fuel filter and feed pump strainer clogging. (4)Air mixed in fuel line system (5)Output reduction due to clogged engine air filter	Change Check/Retighten Replace filter and/or clean the strainer Bleed the air Clean and/or replace air filter

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

5.Periodic inspection/Maintenance

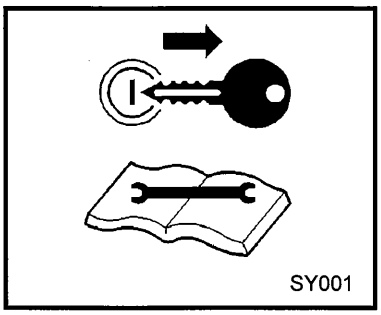
5.1 Important Items at Periodic Inspection and Maintenance or after Maintenance

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

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

Hang a "Now Checking and under Maintenance" tag

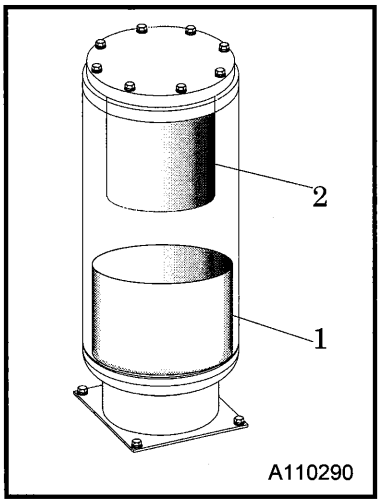
⚠ WARNING



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

Prevention of oil separator from catching fire

⚠ CAUTION



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

5.Periodic inspection/Maintenance

IMPORTANT

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

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

5.2 Inspection on Separator Receiver Tank

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	Daily	250	300	500	1,000	2,000	3,000	6,000	12,000	Page
Compressor	Check compressor oil level.	○									3-6
	Drain separator receiver tank.	○									3-6
	Check for looseness in pipe connecting part, and wear and tear of pipe.	○									3-8
	Check oil, water, fuel and air leak.	○									3-13
	Check functions of all instruments and devices.	○									3-13
	Conduct the performance check of the safety valve.	○									3-14
	Check and clean a clogging air filter element.		○								5-9
	Change compressor oil.			※1○	○						5-10
	Change compressor oil filter.			※1○	○						5-11
	Change air filter element				○						5-11
	Clean strainer in the scavenging orifice.				○						5-12
	Clean outside of the oil cooler.					○					5-14
	Clean outside of the after cooler. (After cooler type)					○					5-14
	Check and clean of the silencer fitted at the drain port of after cooler. (After cooler type)					※2○					5-14
	Change oil separator.						●				5-17
	Change nylon tubes.						☆●				5-18
	Change rubber hoses.						☆●				5-18
	Change the O-ring of the unloader.							★●			5-19
	Check and change the unloader bushing.					※3○		★●			5-19
	Change pressure regulator							★●			5-19
	Check consumable parts of the auto-relief valve.							★●			5-20
	Change consumable parts of the vacuum-relief valve.							★●			5-20
	Performance check of pressure control valve								●		5-20
	Check and change O-ring and piston of pressure control valve.								★●		5-21
	Change rubber coupling.									●	5-21
	Change oil seal/bearing.									●	5-21
	Change solenoid valve.									●	5-21

Such items marked ○ shall be carried out by customers.

For the items marked ●, contact our office nearby or distributor because technical knowledge is required.

The items or parts marked ※1. Such items or parts should be replaced primarily.

Regarding the item marked ※2:When water is found mixed in the discharged air, perform cleaning work even before the specified interval comes.

The items or parts marked ※3. Carry out a performance check of the unloader.should any operation failure occur, the o-ring or bushing of the unloader may have been worn. If so, replace it with a new one.

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

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

5.Periodic inspection/Maintenance

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

(Unit:Hour)

	Maintenance	Daily	50	250	500	1,000	2,000	3.000	6,000	Page
Engine	Check engine oil level.	○								3-4
	Check coolant level.	○								3-5
	Check fuel	○								3-7
	Drain fuel tank.	○								3-7
	Check sedimenter for condensate.	○								3-8
	Check looseness in pipe connectors, terminals and tear in wiring.	○								3-8
	Check belt tension.	○								3-9
	Change engine oil.		※○		○					5-6
	Change engine oil filter.		※○		○					5-7
	Check battery electrolyte.			○						5-7
	Check and clean clogging of air filter element.			○						5-9
	Check specific gravity of battery electrolyte				○					5-7
	Change air filter element.				○					5-11
	Change fuel filter				○					5-12
	Clean of element in sedimenter				○					5-13
	Clean inside of radiator.				●					5-13
	Clean outside of radiator.					○				5-14
	Change of breather filter element					○				5-15
	Change coolant						☆○			5-16
	Clean inside of fuel tank.						●			5-18
	Change fuel hose.						☆●			5-18
	Change radiator hoses.							☆●		5-19
	Change wiring harness.								●	5-19

※First replace timing

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.

(Unit:Hour)

	Maintenance	Daily	250	300	500	1,000	2,000	3,000	6,000	Page
Undercarriage	Supply grease to trailer hub bearing.					●				5-15
	Supply grease to leaf spring pin.					●				5-15
	Check and confirm that the fixing nuts for the tires are properly tightened.	○								
	Check and confirm that the nuts with which tires are fixed are properly tightened.			○ Every 3 months						5-19
	Check and confirm that the fixing bolts for the drawbar are properly tightened			○ Every 3 months						5-20

5.Periodic inspection/Maintenance

5.4 Periodic Replacement of Parts

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

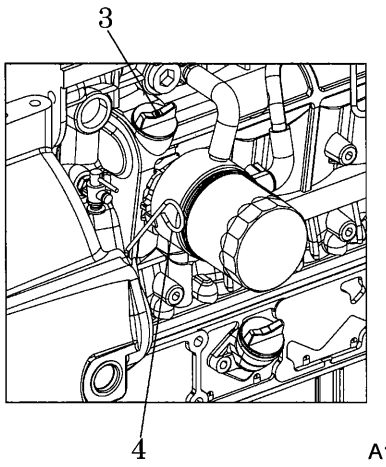
Part Name		Part Number	Quantity
Engine oil filter		KUBOTA 1C020-32434	1
Air filter element for compressor air-end	Outer element "4"	32143 12500	1
	Inner element "3"	32143 12400	1
Air filter element for engine side	Outer element "6"	32143 12700	1
	Inner element "5"	32143 12600	1
Compressor oil filter		37438 05601	1
Fuel filter		KUBOTA 1G518-43011	1
Element in sedimenter	Element"5"	KUBOTA RD451-51940	1
	O-ring"6" (For element)	KUBOTA 04817-00160	1
	O-ring"7" (For body)	KUBOTA RD451-51930	1
Solenoid valve for starting unloader		46811 30000	1
Solenoid valve for unloader spring chamber		46811 31800	1
Oil separator	Separator"1"	34200 03500	1
	Gasket"2"	34235 06000	1
	Gasket"3"	34235 06100	1
Pressure control valve	O-ring "1"	03402 15080	1
	O-ring "2"	21441 03700	1
	Teflon ring "3"	22505 03300	1
	Piston "4"	35303 10500	1
Pressure regulator		36400 24100	1
Belt		KUBOTA 1K922-97011	1
Breather filter element(With O-ring)		KUBOTA 1J419-0581-0	1

5.Periodic inspection/Maintenance

5.5 Maintenance Items

5.5.1 Change engine oil

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



<Procedure>

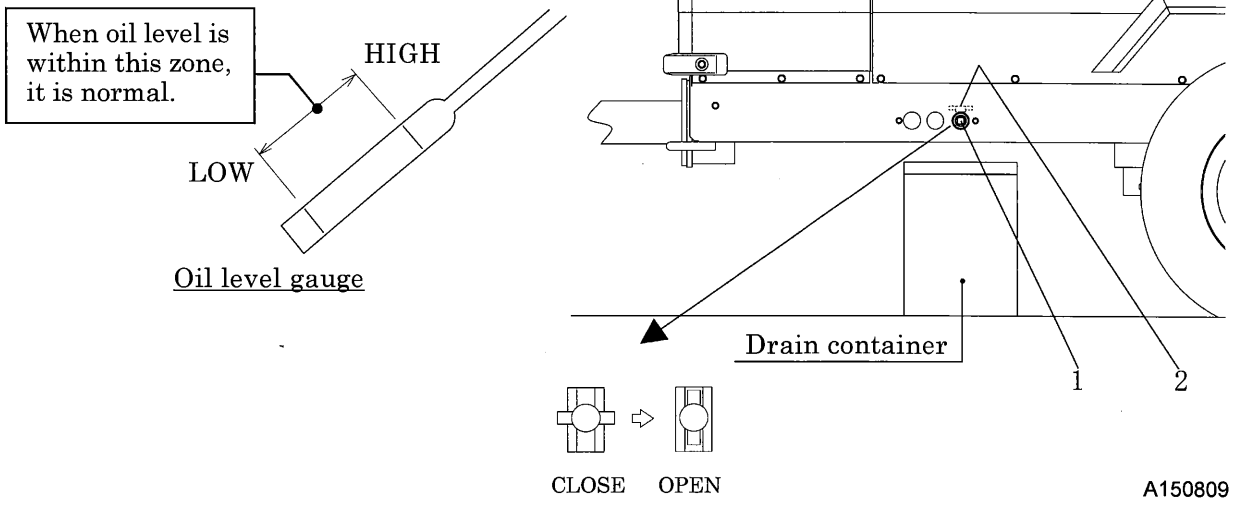
① Remove the drain plug "1" attached outside the plane, open a drain valve "2" inside the plane, and discharge engine oil drain.

② After drainage of used engine oil has been completed, close drain plug "1" and drain valve "2", and supply new engine oil through the oil filler port "3" which is used as oil level gauge also.

[Quantity of oil : approx. 13L]

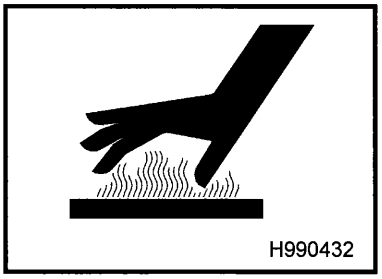
③ After supplying oil, pull out the oil level gauge"5"and wipe it out.

④ Then, re-insert the oil level gauge fully and pull it out again. If the dipstick shows the oil level between LOW and HIGH, it is normal.



Caution in filling or discharging engine oil

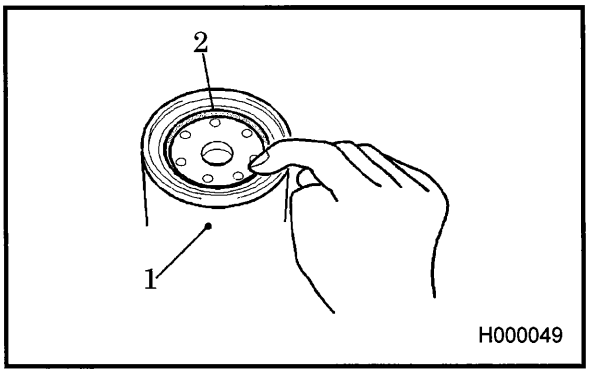
CAUTION



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

5.5.2 Change engine oil filter

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



<Procedure>

① Remove the oil filter"1", using a filter wrench.

② Screw in the new oil filter with the packing"2"coated slightly with oil.

(For part number,See 5.4)

③ After the packing touches the sealing face, tighten another 1 times by hand.

④ After installing the oil filter, check it for any leak during operation.

5.5.3 Check battery electrolyte and specific gravity of battery electrolyte

Battery electrolyte : every 250 hours

Specific gravity of battery electrolyte : every 500 hours

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

●Ordinary type battery:

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

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

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

●Enclosed type battery:

Check the indicator on top surface of the battery.

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

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

5.5.4 Maintenance of Battery

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

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

Handling battery

WARNING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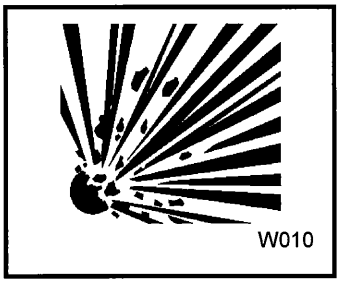
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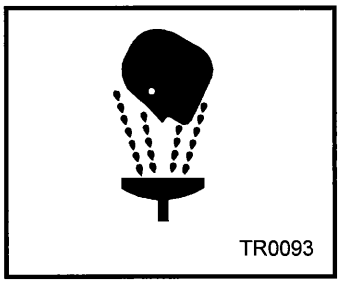

TR0093

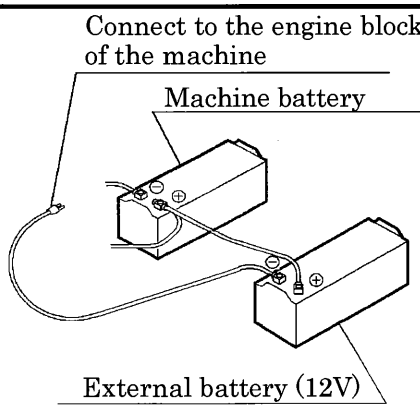
- Keep flames away from battery.
- Do not spark near the battery nor light a match, nor bring lit cigarette and match close to the battery.
- Do not charge the frozen battery. Otherwise it may explode. If the battery is frozen, warm it up until the battery temperature becomes 16°C to 30°C.
- Battery electrolyte is dilute sulfuric acid. In case of mishandling, it could cause skin burning.
- Dispose of battery, observing local regulations.

[Charge battery]

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

5.Periodic inspection/Maintenance

[How to use booster cable]



<Procedure for using a booster cable>
① Stop the engine.
② Connect one end of the (+) cable to the (+) terminal of the machine battery.
③ Connect the other end of the (+) cable to the (+) terminal of the external battery.
④ Connect one end of the (–) cable to the (–) terminal of the external battery.
⑤ Connect the other end of the (–) 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.

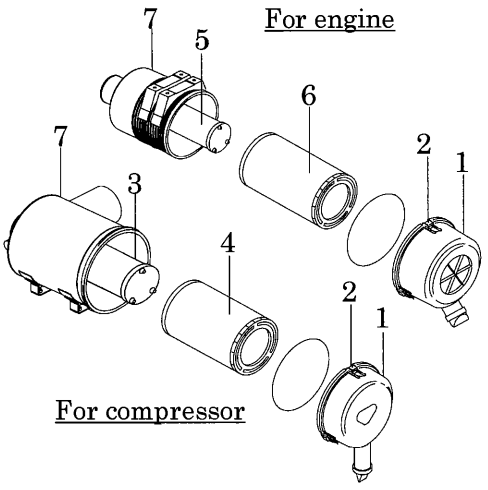
CAUTION

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

Every 250 hours



<Procedure>
① Loosen the cap fix latch"2"at cap "1", then remove cap and clean inside.
② Only remove outer casing element "4" & "6" and do cleaning. Do not remove inner casing element "3" & "5".
③ Replace inner casing element "3" & "5" at the same time with outer casing element "4" & "6". About the fourth cleaning time of outer casing element "4" & "6" is the standard for replacing element.
④ Inner casing element can't be re-used with cleaning. In case removing inner casing element "3" & "5", be sure to prevent coming of dust into load side.
⑤ When putting cap after cleaning, push it into case "7" with your hand and fasten it after checking the hook of cap fix latch is set to case.

- If the element is found heavily dusty, replace it with a new one. **(For part number, See 5.4)**

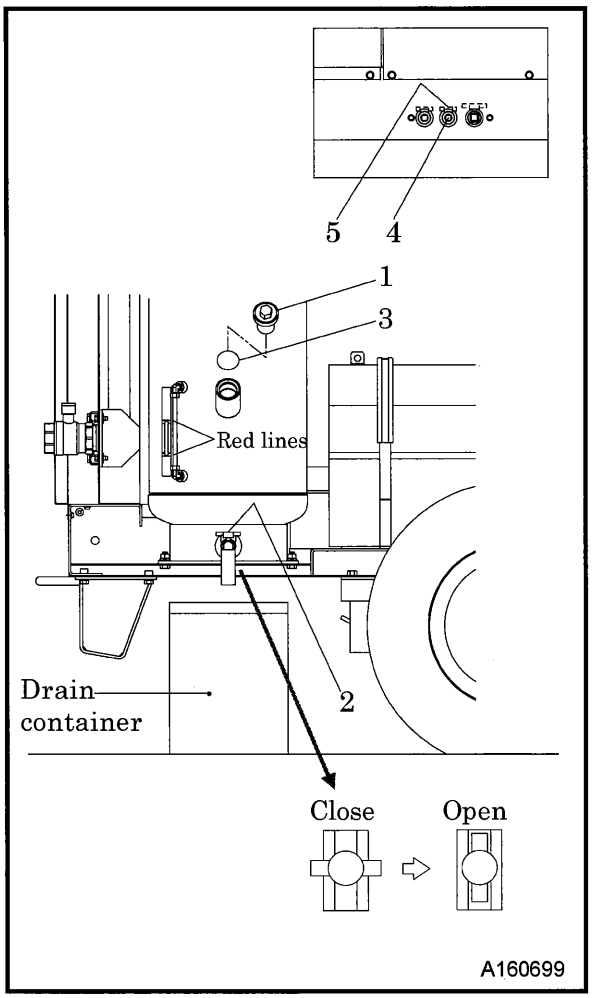
IMPORTANT

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

5.5.6 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 checking machine stoppage for about 2-3 minutes and dropping pressure of separator receiver tank to zero, remove oil inlet cap "1" and unfasten drain valve "2", then drain the compressor oil. Remove oil cooler drain plug "4" and unfasten drain valve "5", then drain the oil inside of cooler.

② After draining compressor oil, surely retighten drain valve "2" and "5".

③ After filling fresh oil up to the upper level of level gauge, close the oil filler cap. Check the O-ring "3" of oil filler cap for damage or hardening. If there is any damage, replace it with a new one.

④ After starting operation, check and confirm that oil level is within red lines of oil revel gauge.

⑤ Repeat the process ① to ④ if oil level is out of red lines range.

Quantity of oil between the red lines	Approx.5L
Quantity of change oil	Approx.40L

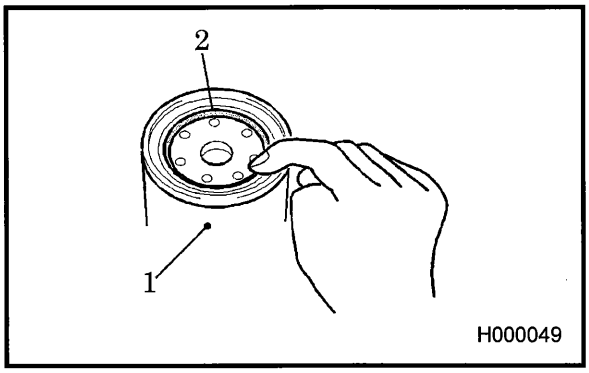
IMPORTANT

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

5.5.7 Change compressor oil filter

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

Be sure to use genuine oil filter.



<Procedure>

① Remove the cartridge"1", using a filter wrench.

② Screw in the new oil filter with the packing"2"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, check it for any leak during operation.

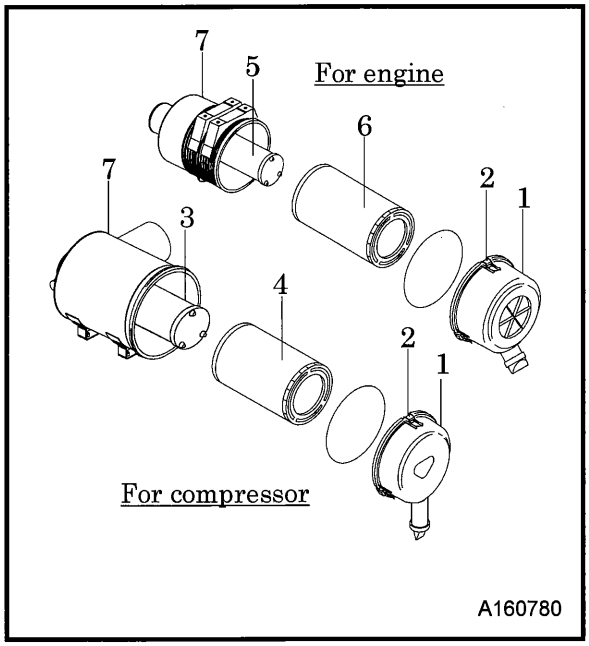
IMPORTANT

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

5.5.8 Change air filter element

Every 500 hours

Be sure to use genuine air filter element.



<Procedure>

① After removing the cap"1"by loosening its fixing latch"2", clean its interior properly.

② Remove element "3","4","5" & "6" and replace it with new one. Replace inner casing element at the same time with replacing outer casing element at about the fourth cleaning time. In case removing inner casing element, be sure to prevent coming of dust into load side. **(For part number, See 5.4)**

③ When putting cap after replacing, push it into case "7" with your hand and fasten it after checking the hook of cap fix latch is set to case.

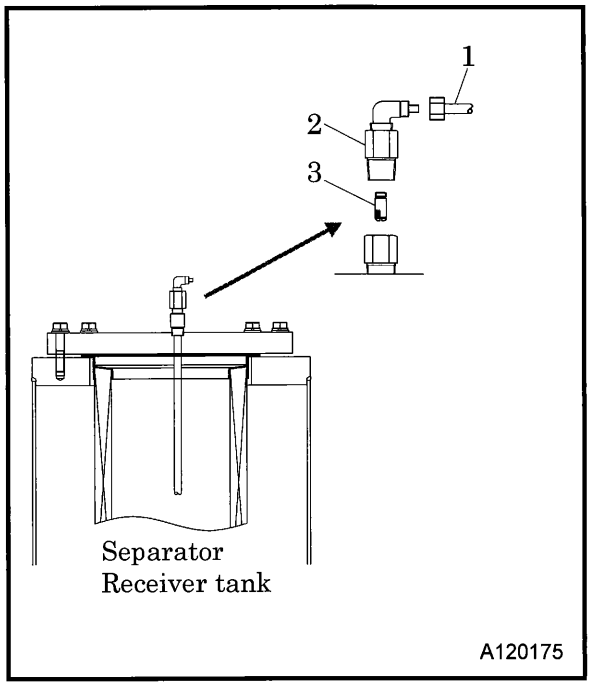
- When used or operated under bad conditions, it is better to remove all the elements, check them, clean them and replace them earlier before the intervals listed in maintenance table, if they are found difficult to be repaired.

IMPORTANT

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

5.5.9 Clean strainer in the scavenging orifice

Every 500 hours

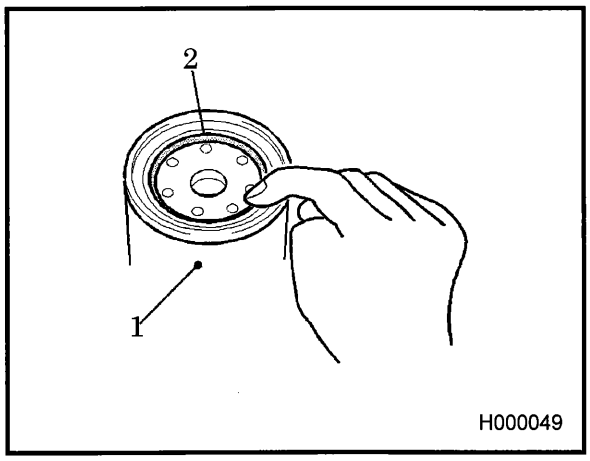


<Procedure>

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

5.5.10 Change fuel filter

Every 500 hours



<Procedure>

① Remove the cartridge"1", using a filter wrench.
② Spread a thin film of oil on a packing"2"of a new filter and screw it in.

(For part number, See 5.4)

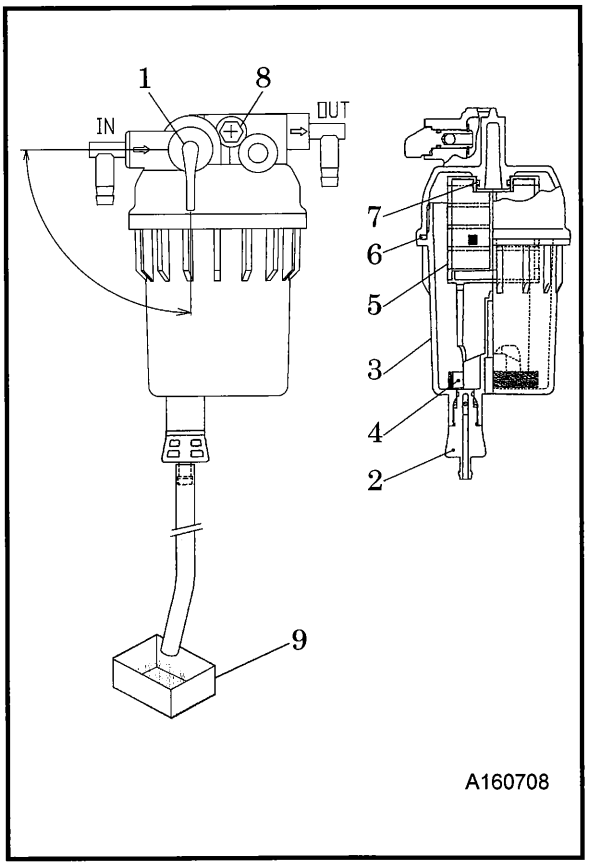
③ After the packing "2" touches the sealing face, tighten it by turning 2/3 times using a filter wrench.
④ Bleed the air from the fuel. **(See 3.4.7)**
⑤ After installing a fuel filter in position, be sure to check for oil leakage during operation.

- For details of replacement, refer to the engine operation manual.

5.Periodic inspection/Maintenance

5.5.11 Clean of element in sedimenter

Every 500 hours



<Procedure>

① Turn fuel selector valve "1" to "OFF" position.

② Loosen the drain valve "2" and drain out condensed water inside.

③ Turn the cup "3" to the left and remove it. Be careful to remove the cup, because it is filled with fuel. Wipe out split fuel completely.

④ Remove float "4" inside cup.

⑤ Washing element "5" and the cup "3" inside with new fuel.

⑥ Replace element "5" and O-ring "6" , "7" if they are found broken or damaged.

(For part number, See 5.4)

⑦ After finishing clean, assemble it in reverse procedure.

- If air is found still in fuel pipe, place starter switch to "RUN" position and loosen air bleeding bolt "8" to bleed air. After finishing air bleeding, tighten the air bleeding bolt "8" .
- Drain the condensate in container "9" ,and then dispose of condensate according to the designated regulations.

5.5.12 Clean inside of radiator

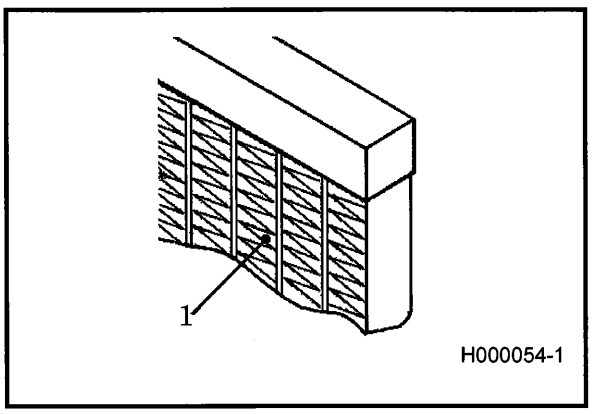
Every 500 hours

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

5.Periodic inspection/Maintenance

5.5.13 Clean outside of the radiator · oil cooler

Every 1,000 hours



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

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

Every 1,000 hours

- When the fin tubes "1" of the after-cooler get clogged with dust and dirt, it can cause deterioration of the effectiveness of the heat exchanger to be lowered so that cold air cannot be produced. In order to prevent such trouble, clean them, depending the clogging conditions of the fin tubes, even before the scheduled periodic cleaning time.
- Do not use a high pressure washer, in order to protect the fin tubes from being damaged.

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

Every 1,000 hours

See 3.5.1 for after cooler drain.

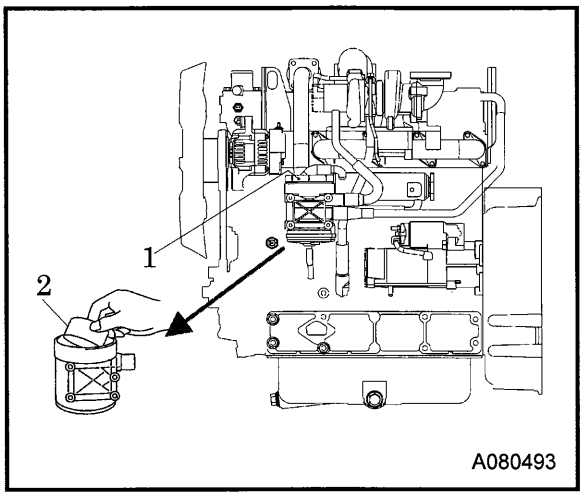
IMPORTANT

Cleaning it completely and keeping it cleaned

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

5.5.16 Change of breather filter element

Every 1,000 hours



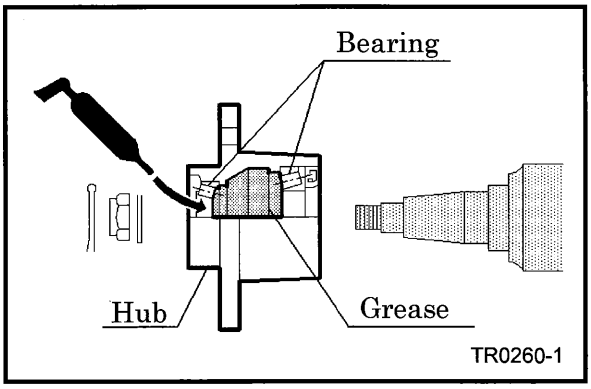
<Procedure>

① Remove cap"1"of breather filter, and take out element"2"from inside.

② Install brand new element"2"and firmly install the cap"1". **(For part number, See 5.4)**

5.5.17 Supply grease to trailer hub bearing

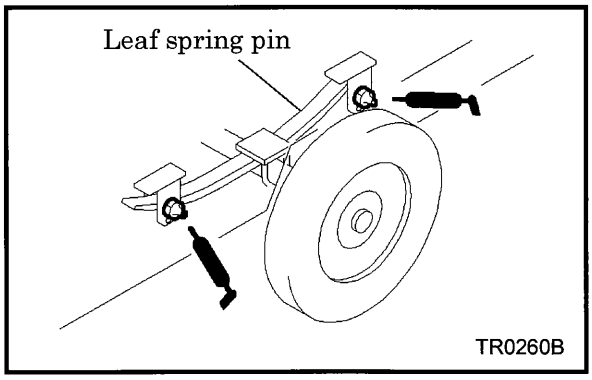
1,000 hours or every 1 year



- When replenishing grease to the trailer hub bearing, contact our office nearby or distributor.
  Grease: Chassis grease

5.5.18 Supply grease to leaf spring pin

1,000 hours or every 1 year



- When replenishing grease to the leaf spring pin, contact our office nearby or distributor.
  Grease: Chassis grease

5.5.19 Change coolant

2,000 hours or every 2 years

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

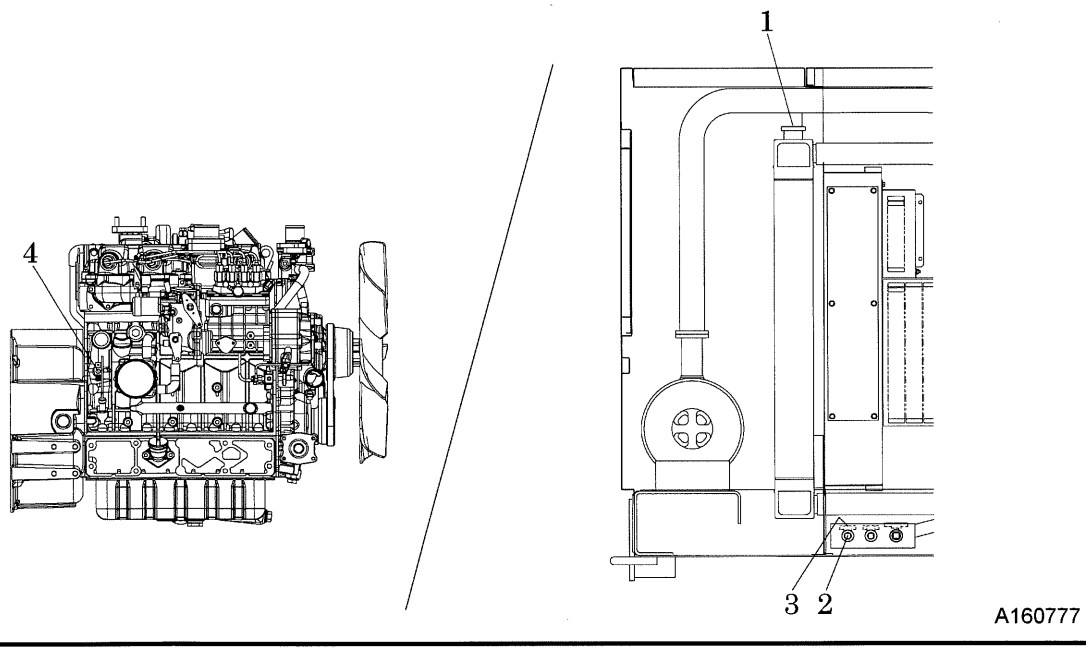
<Procedure>

① To drain coolant, remove cap "1" of radiator top and open the drain plug "2" to drain it.
② Loosen the drain plug "4" provided on engine to drain engine.
③ Drain coolant of reserve tank.
④ After draining, fasten drain valve "3" and fasten drain plug "4" of engine body, then replenish coolant from inlet (Be sure to replenish coolant to reserve tank).

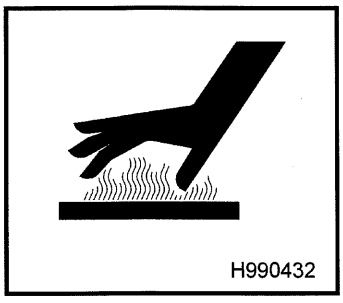
[Quantity of water : approx. 14L]

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

- For the details of replacement, refer to engine operation manual.



CAUTION



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

5.5.20 Change oil separator

Every 2,000 hours

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

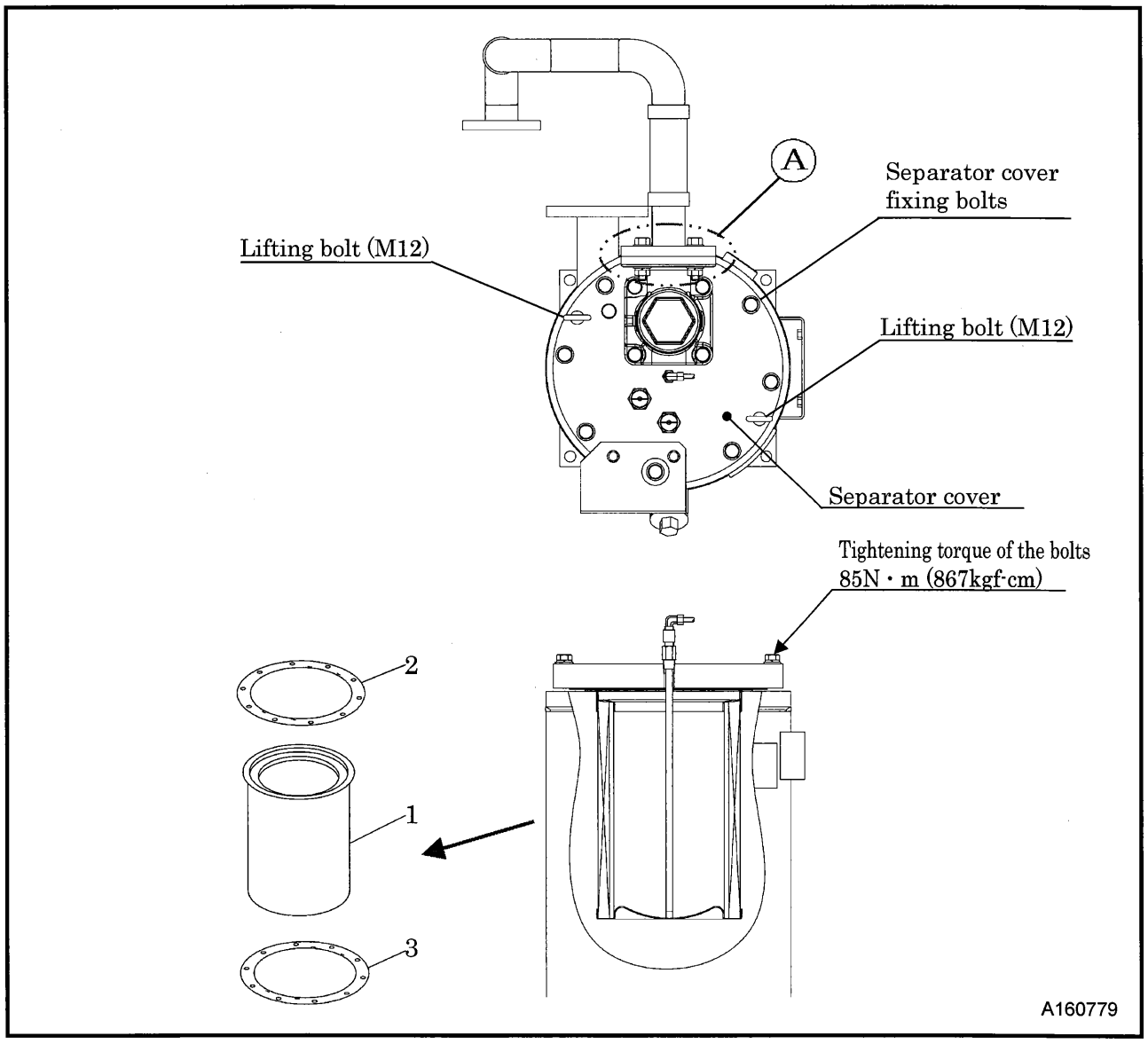
- When replacing oil separator, make sure to replace gasket "2" · "3"at the same time.

(For part number, See 5.4)

- The oil separator "1" is made from electrically conducting material in order to be anti-static. Also gaskets "2"·"3" is treated for conduction by using staplers. Make sure to use our genuine parts for replacement.

<Procedures>

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



5.5.21 Clean inside of fuel tank

Every 2,000 hours

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

5.5.22 Change nylon tubes

2,000 hours or every 2 years

Replace nylon tubes used for the oil and air pipings. When replacing it contact our office nearby or distributor 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 hoses, contact directly us or distributor because it requires expert technical knowledge.

5.5.24 Check rubber hose

2,000 hours or every 2 years

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

5.5.25 Change radiator hoses

3,000 hours or every 2 years

When any crack or wear is found on the hoses, change it even before the scheduled time.
When replacing it, contact directly us or distributor because it requires expert technical knowledge.

5.5.26 Change O-ring of unloader

3,000 hours or every 3 years

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

5.5.27 Check and change the unloader bushing

3,000 hours or every 3 years

Replace unloader when malfunction occurred even if before normal replace timing.
When replacing it, contact directly us or distributor because it requires expert technical knowledge.

5.5.28 Change pressure regulator

3,000 hours or every 3 years

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

(For part number, See 5.4)

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

3,000 hours or every 3 years

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

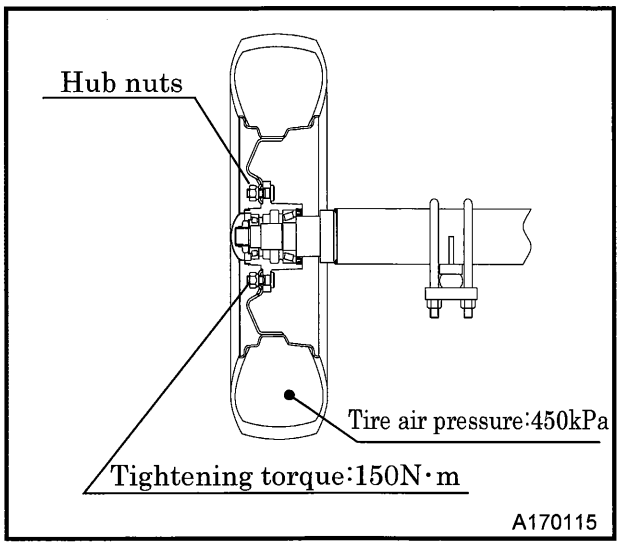
5.5.30 Change wiring harness

Every 6,000 hours

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

5.5.31 Check and confirm that the nuts with which tires are fixed are properly tightened

Every 3 months

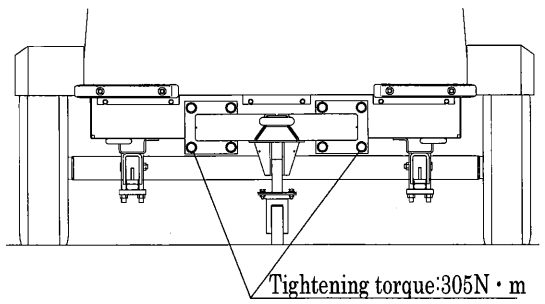


- Check and confirm once every three months that hub nuts with which tires are fixed are not loosened. (12points)
- If it is found that specified tightening torque of clamped bolts drops to a lesser value, retighten them to correct specified value.
  (Tightening torque : 150N·m)

5.Periodic inspection/Maintenance

5.5.32 Check and confirm that the fixing bolts for the drawbar are properly tightened

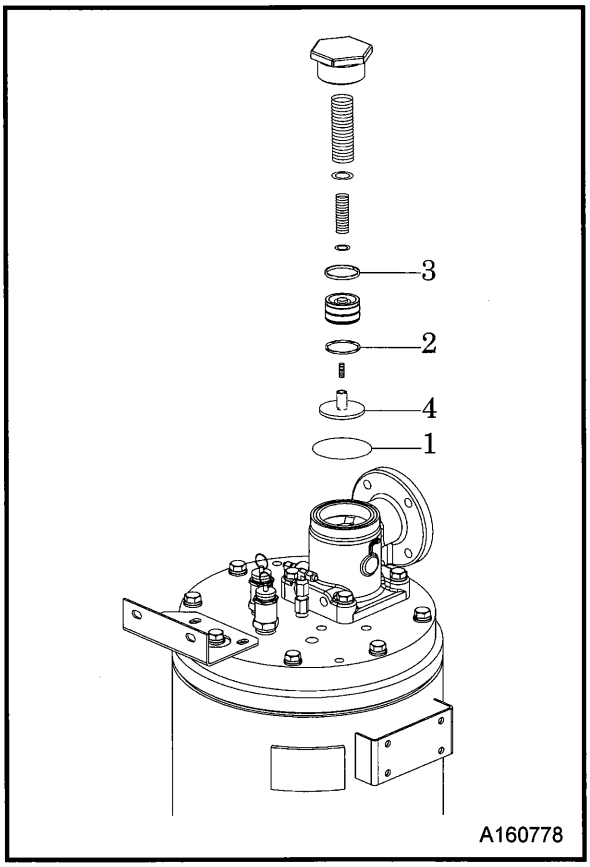
Every 3 months



- Check and confirm once every three months that the bolts with which drawbar is fixed are not loosened. (8 points)
- If it is found that specified tightening torque of clamped bolts drops to a lesser value, retighten them to correct specified value.

5.5.33 Performance check of pressure control valve

Every 6,000 hours



<Procedure>

① When closing stop valve and fully opening service valve while the machine is running, make sure that the discharge pressure gauge shows the figure between 0.35 to 0.50MPa.

② When the pressure is lower than 0.35MPa, replace spring "3" with a new one.

(For part number, See 5.4)

③ When the indicator shows excessively higher pressure, you will find that the piston does not move smoothly due to foreign material and rust stuck inside valve. In such a case, disassemble the component for checking and cleaning.

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

IMPORTANT

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

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

6,000 hours or every 3 years

After disassembling and cleaning pressure control valve, check O ring "1" , "2" and teflon ring "3" , piston "4" .When the rubber of these parts is found hardened, or damaged, replace them.

(For part number, see 5.4)

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

5.5.35 Change rubber coupling

Every 12,000 hours

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

5.5.36 Change oil seal/bearing.

Every 12,000 hours

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

5.5.37 Change solenoid valve.

Every 12,000 hours

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

6. Storage of the Machine and Disposal of Product

6.1 Preparation for Long-term Storage

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

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

<Procedure>

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

6.2 Disposal of Product

- In case of disposal of this machine, at first drain the cooling water and oils.
  When you have anything unclear or you want to advise us, contact our office nearby or distributor.

7.Specifications

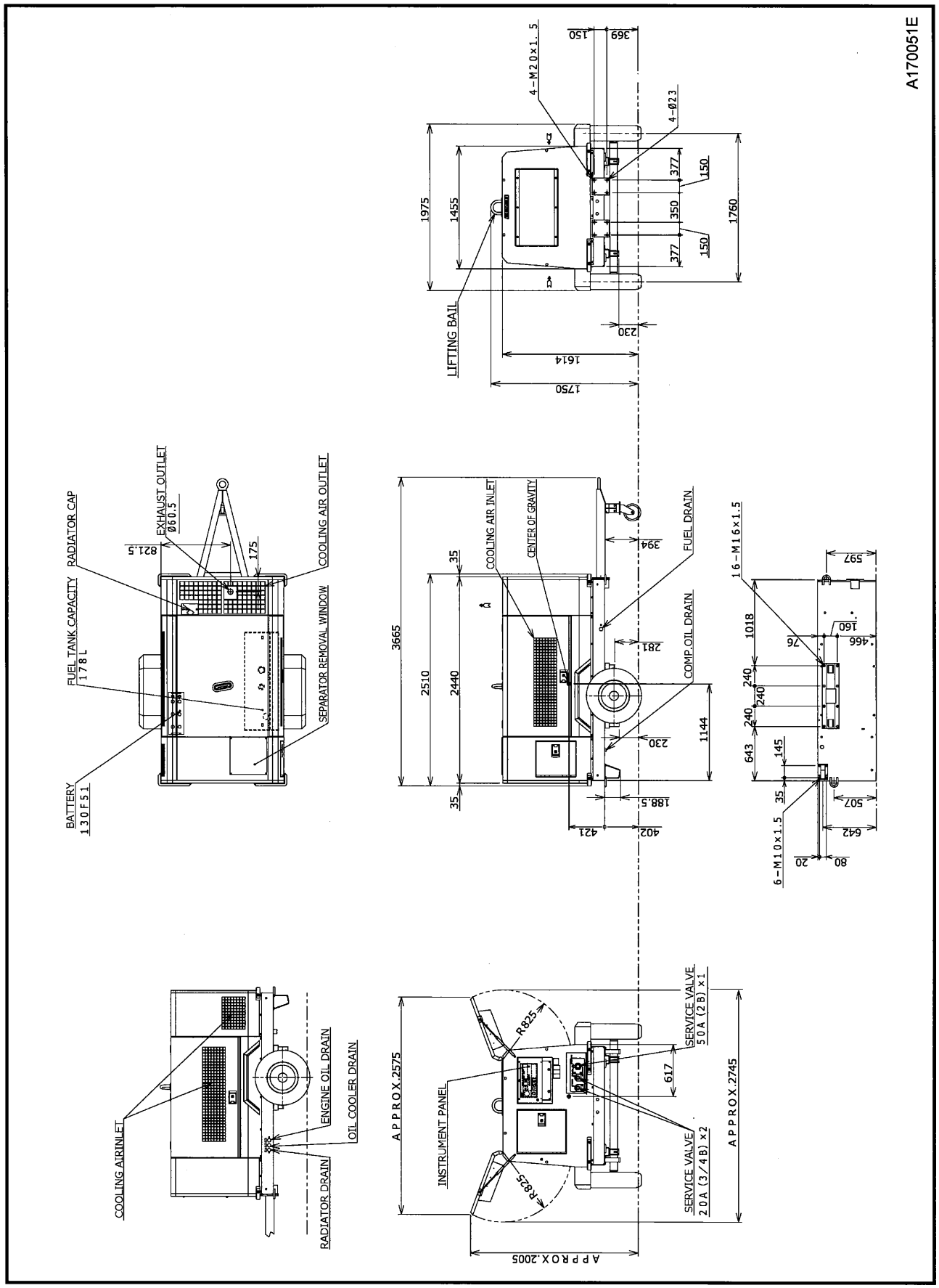
7.1 Specifications

Model			FAC-113P	FAC-113PC (After-cooler type)
COMPRESSOR	Type		Single-stage oil cooled, screw type compressor	
	Free air delivery	m^3/min	11.3	
	Working pressure	MPa	0.7	
	Lubricating system		Forced Lubrication by compressed pressure	
	Driving system		Direct driving with rubber coupling	
	Receiver tank capacity	m^3	0.077	
	Lubricating oil capacity	L	40	
ENGINE	Model		KUBOTA V3800DI-TIE2B-COHE1	
	Type		4 cycle water-cooled, direct injection, turbo-charged with charge air cooler	
	Cylinder quantity-Cylinder diameter × Cylinder stroke	mm	4-100mm×120mm	
	Total displacement	L	3.769	
	Rated output	kW/min^{-1}	75.2 / 2,600	
	Lubricating oil capacity	L	13	
	Coolant capacity (including radiator)	L	15.6	
	Battery		Equivalent to 130F51×1 (12 V)	
	Fuel tank capacity	L	178	
DIMENSION・MASS	Overall length (only for bonnet)	mm	2,440	
	Overall length (including drawbar)	mm	3,665	
	Overall width	mm	1,975	
	Overall height	mm	1,750	
	Net dry mass (with trailer)	kg	1,740	1,780
	Operating mass (with trailer)	kg	1,940	1,980
	Net dry mass (without trailer)	kg	—	1,610
	Operating mass (without trailer)	kg	—	1,810

7.Specifications

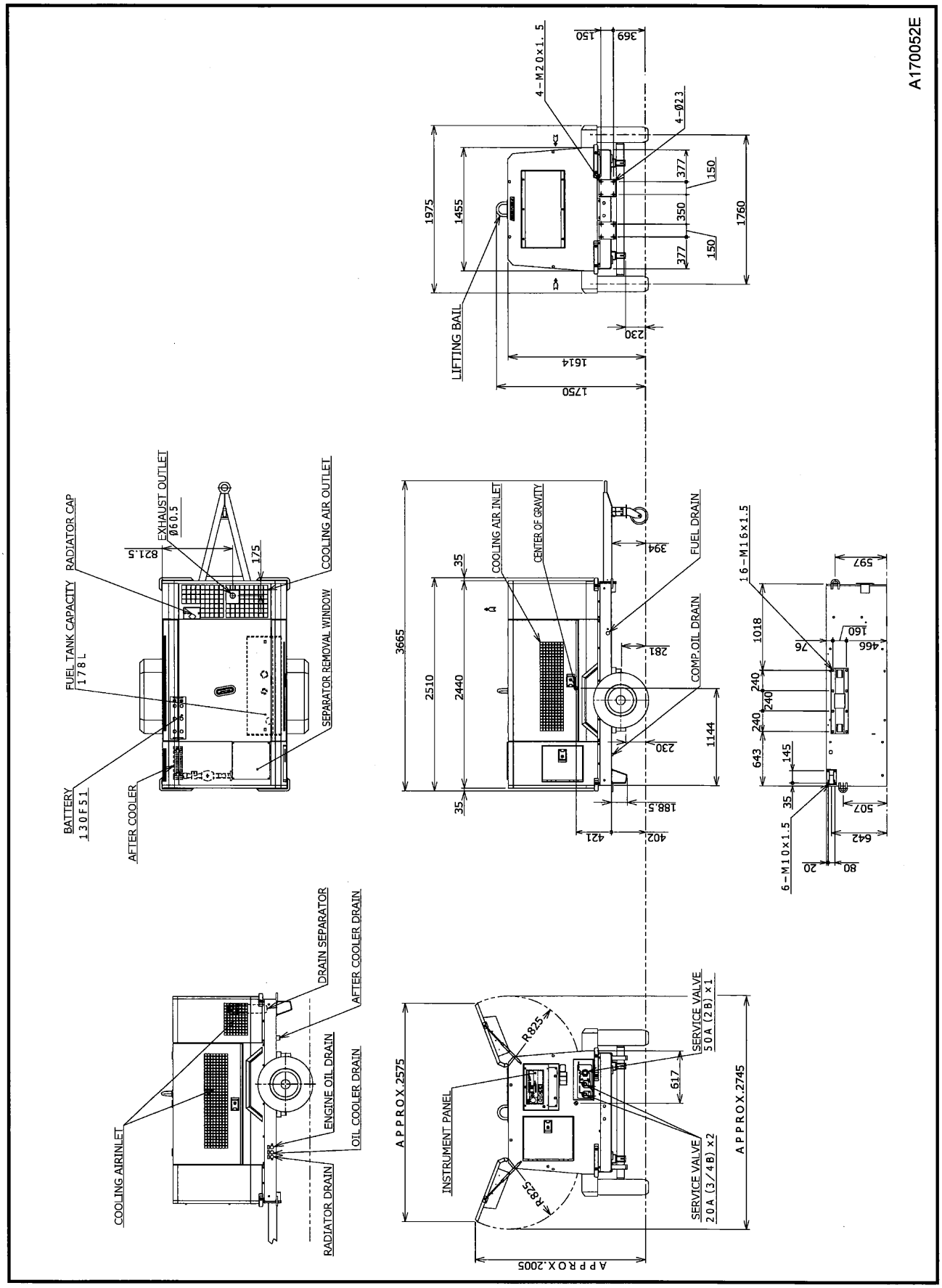
7.2 Outline drawing

FAC-113P



7.Specifications

FAC-113PC (After-cooler type)



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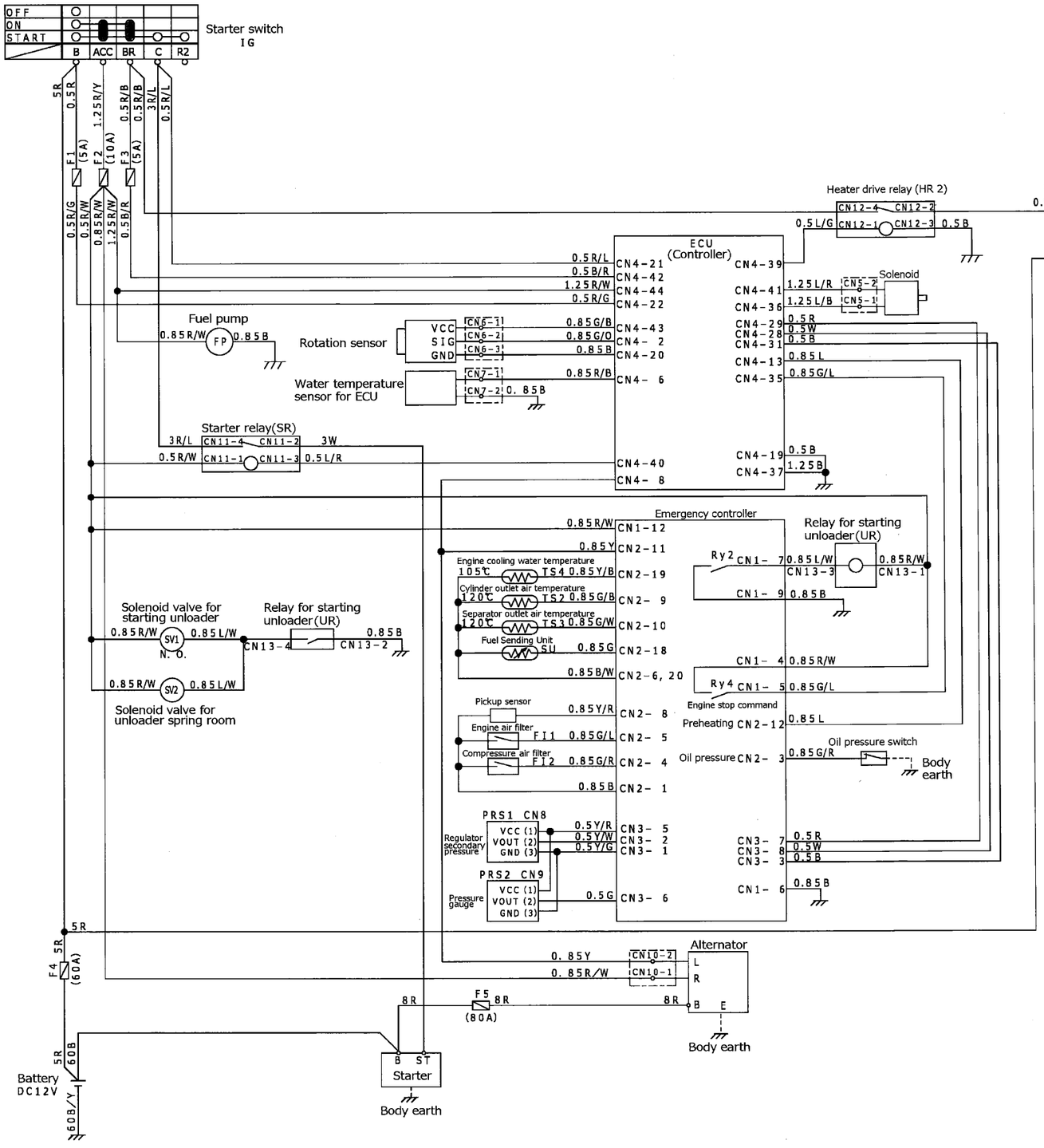
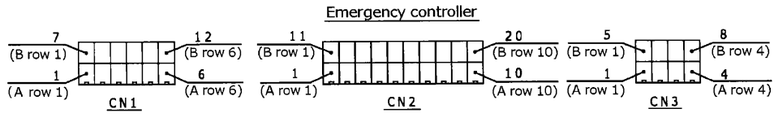
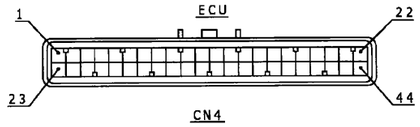
7.3 Wiring Diagram



Connector terminal arrangement

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





Solenoid

CN5

Rotation sensor

CN6

Water temperature sensor

CN7

Regulator secondary pressure

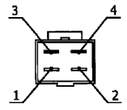
Pressure gauge

CN8,9

Alternator

CN10

SR, HR2, UR



CN11, 12, 13

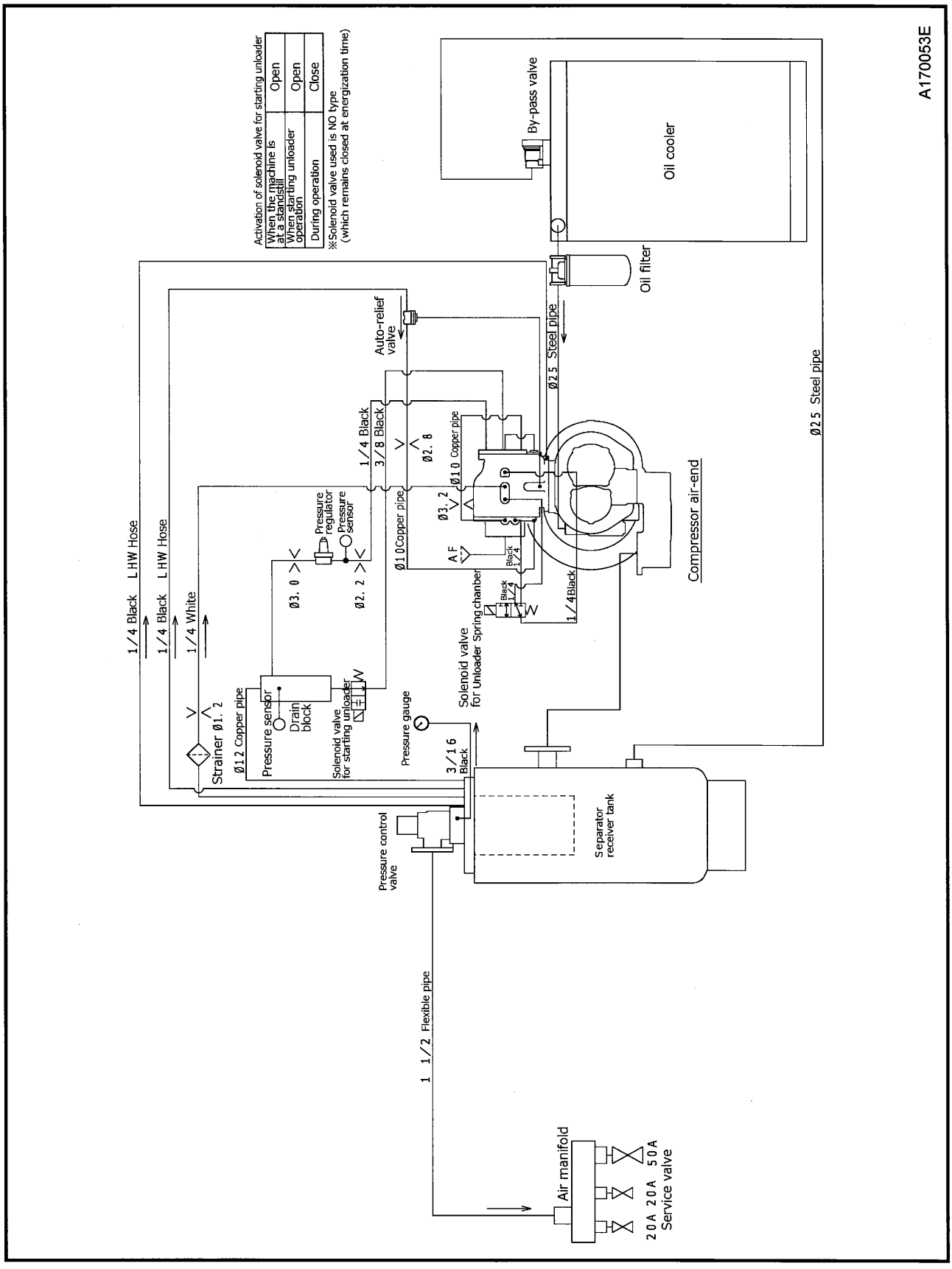
A170050E

7.Specifications

7.4 Piping Diagram

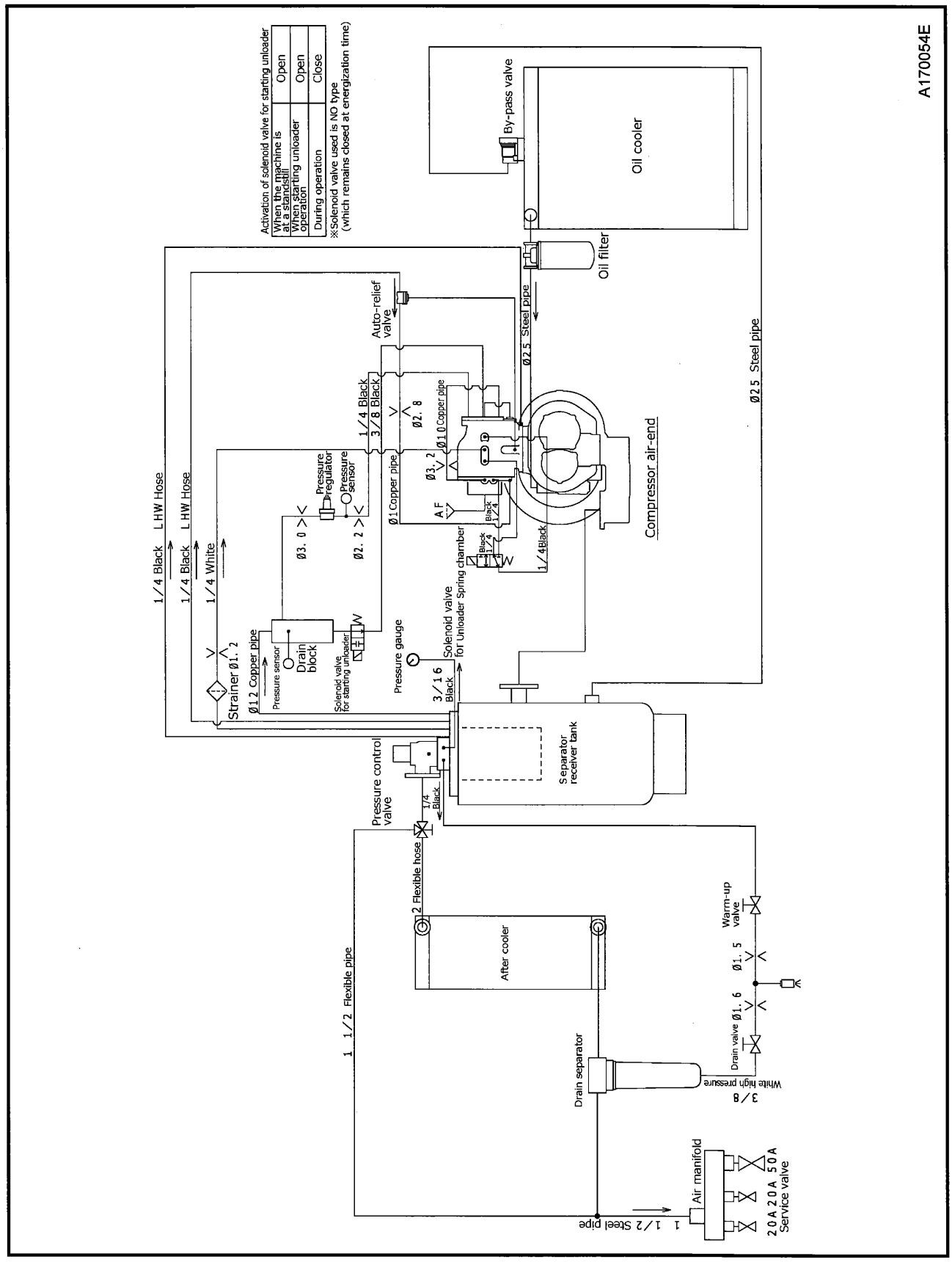
7.4.1 Compression air · Compressor oil

FAC-113P

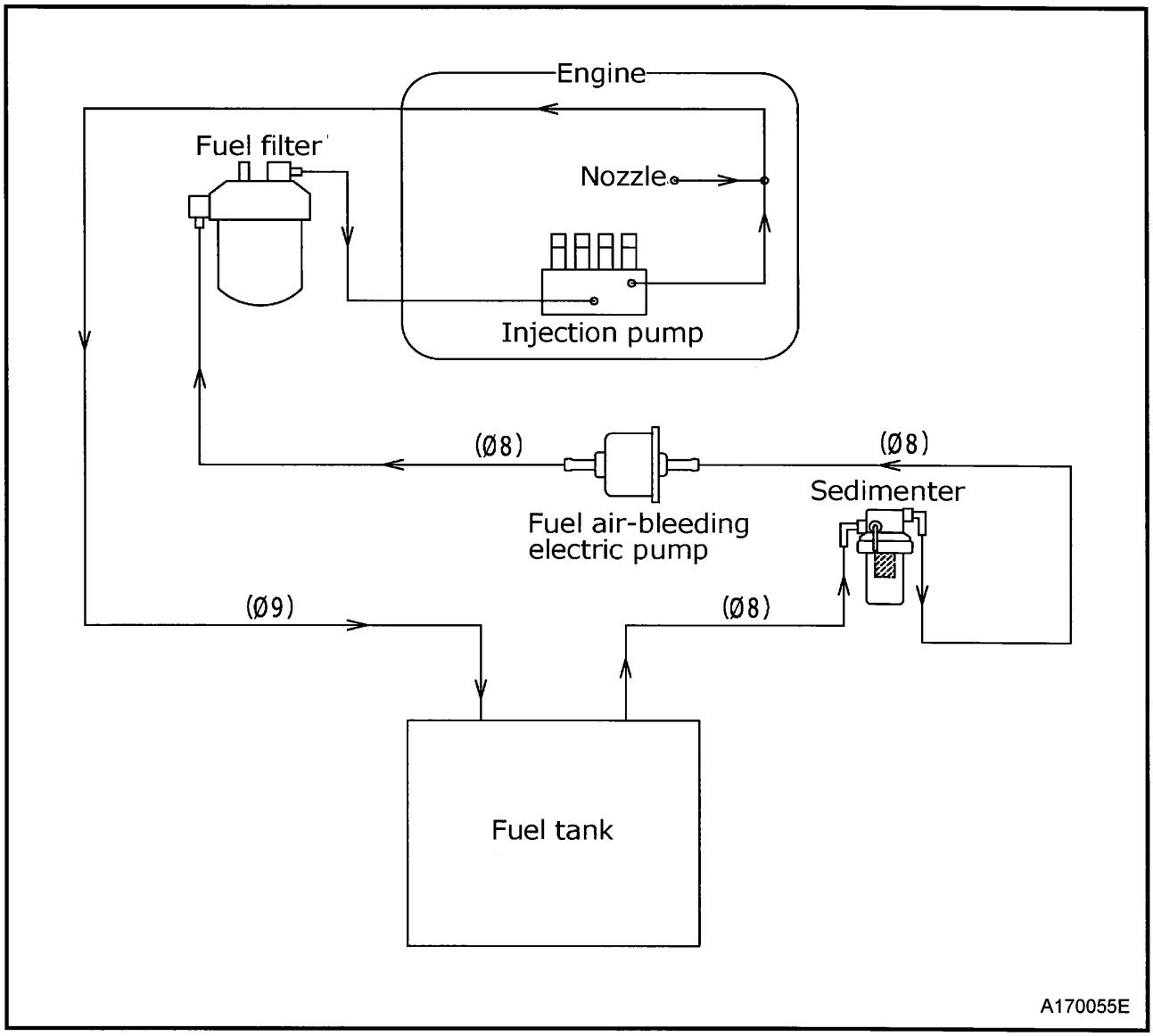


7.Specifications

FAC-113PC (After-cooler type)



7.4.2 Fuel Piping



MEMO

OPERATION LOG

OPERATION DATE	OPERATION TIME		TOTAL OPERATION HOURS (h)	DISCHARGE AIR PRESS.(MPa)	AMBIENT TEMP.(°C)	DISCHARGE AIR TEMP. (°C)	COOLANT TEMP.(°C)	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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