

AIRMAN

PG

INSTRUCTION MANUAL

SCREW COMPRESSOR

PDS185S-5C2

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

HOKUETSU INDUSTRIES CO., LTD.

Preface

Thank you for having selected our “AIRMAN” product.

- ◆ This manual explains about the proper operation and daily inspection and maintenance of this machine.
- ◆ In order to use the machine safely, people with sufficient knowledge and sufficient technology need to deal with it.
- ◆ Before operating the machine, read the manual carefully, fully understand its operation and maintenance requirement. Maintain “SAFETY OPERATION AND PROPER MAINTENANCE OF THE MACHINE”.

Be sure to follow safety warnings and cautions given in the manual.
Unsafe operation could cause serious injury or death.

- ◆ For details of handling, maintenance and safety of the engine, see the Engine Operation Manual.
- ◆ Keep the manual available at all times for the operator or safety supervisor.
- ◆ When this manual is missing or damaged, order it from our office nearby or distributor.
- ◆ Be sure that the manual is included with the machine when it is handed over to another user.
- ◆ There may be some inconsistency in detail between the manual and the actual machine due to improvements of the machine. When you have anything unclear or you want to advise us, contact our office nearby or distributor.
- ◆ If you have any questions about the machine, please inform us the model and serial number. A plate stamped with the model and serial number is attached to side of the machine.

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

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

A130375



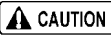

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1.Safety

This manual explains and illustrates general requirements for safety.

Read all safety requirements carefully and fully understand the contents before starting the machine.

For your better recognition, according to the degree of potential danger, safety messages are classified into three hierarchical categories, namely, , , and  with a caution symbol  – attached to each message.

When one of these messages is shown, please take preventive measures and carry out “SAFETY OPERATION AND PROPER MAINTENANCE OF THE UNIT”.



DANGER indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury. This signal word is to be limited to the most extreme situations.



WARNING indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.



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 indicates important caution messages for the performance or durability of the unit.

Follow warnings mentioned in this manual. 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.

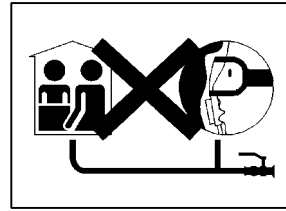
1.Safety

1.1 Caution before Operation

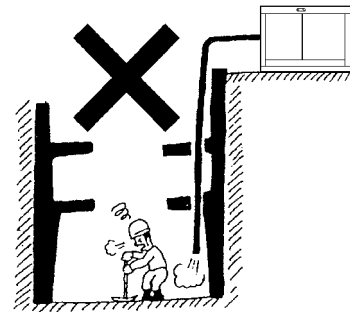
DANGER

Compressed air is prohibited to be used for human respiration

- Compressed air by this unit contains poisonous materials. Absorption of the compressed air can cause serious injury. Never provide this compressed air for human respiration.
- This unit 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 unit 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.



TR0201-1

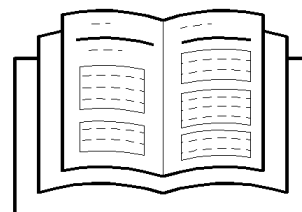


A080001

WARNING

Follow the safety instructions

- Read each instruction plate which is displayed in the manual or on the unit carefully, understand its content and follow the indications thereof.
- Keep the Safety Warning labels clean. When they are damaged or missing, apply new ones.
- Do not modify the machine without prior approval. The safety may be compromised, functions may be deteriorated, or machine life may be shortened.
- Never use the unit for the purpose of compression of gases other than air, or as a vacuum pump. Otherwise, serious accidents may occur.

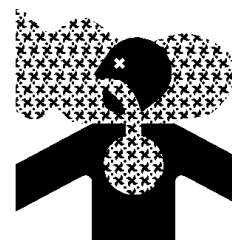


TR0086

WARNING

Ventilation

- Exhaust gas from the engine is poisonous, and could cause death when inhaled. Avoid using the machine in an insufficiently ventilated building or tunnel.



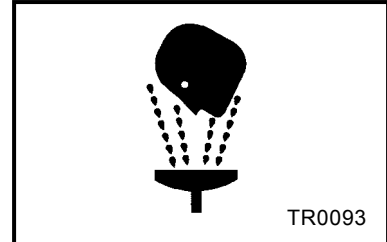
PC002

1.Safety

WARNING

- Keep flames away from battery.
- Battery may generate hydrogen gas and may explode.
- Battery electrolyte is dilute sulfuric acid.
In case of mishandling, it could cause skin burning.
- When you deal with a battery, please be sure to wear protection implements, such as protection glasses and a glove.
- Dispose of battery, observing local regulations.

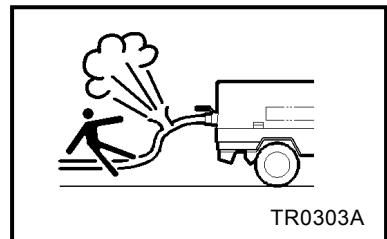
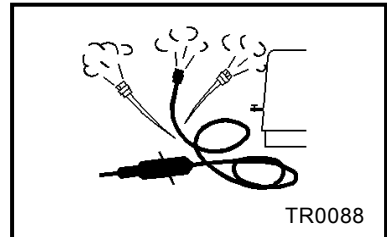
Handling battery



WARNING

Cautions of hose attachment and removal

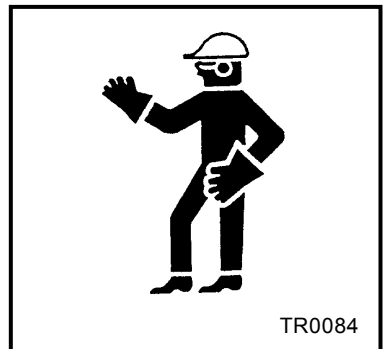
- Piping or the hose from this machine service valve should use what can be borne enough for the discharge pressure of this machine.
- Please connect piping or a hose to this machine service valve firmly before operation and during operation. If the connection part is loosening, there is a possibility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



WARNING

Safety outfit

- When handling machine, do not wear;
 - Loose clothes
 - Clothes with unbuttoned sleeves
 - Hanging tie or scarf
 - Accessories such as dangling jewelry
- Such outfit could be caught in the machine or dragged in the rotating portion of the machine, and this could cause a serious injury.



1.Safety

WARNING

Maintain both physical and mental health

- Do not operate the machine when you are tired or drunk or under the influence of drugs. Otherwise, a hasty conclusion or careless handling may cause unexpected injury or accident.
Manage your physical and mental health and be cautious in handling the machine.

CAUTION

- Please wear protection implements, such as a helmet, protection glasses, earplugs, safety shoes, a glove, and a protection-against-dust mask, according to the contents of work for safety.

Protection equipments



TR0085

CAUTION

- Have first-aid boxes and fire extinguishers near the unit ready for emergency situations such as injuries and a fire.
- It is advisable to have a list of phone numbers of doctors, ambulance and the fire department available in case of emergency.

Safety fittings



TR0096

CAUTION

Safety around the machine

- Such things as unnecessary equipment and tools, cables, hoods, covers and pieces of wood which are a hindrance to the job, have to be cleaned and removed. This is because operators and/or personnel nearby may stumble on them and may be injured.
- Place safety enclosures at the entrance of and around working site to prevent children or outside people from entering the site.

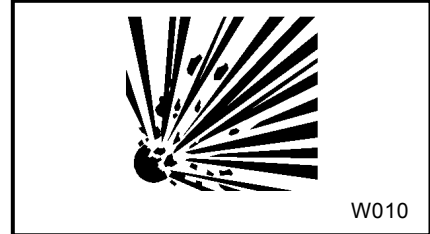
1.Safety

1.2 Caution during Operation

WARNING

Do not replenish compressor oil during operation

- Do not, under any circumstance, open the oil filler cap of separator receiver tank while running or immediately after stopping operation.
It is very dangerous because the oil filler cap could be blown off and high temperature compressed air and oil could jet out from the filler port, and cause serious injury.



WARNING

Draining during operation prohibited

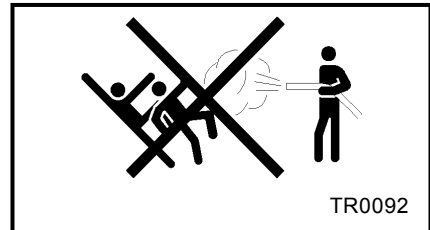
- Do not, under any circumstance, open the portions below during operation:
- Separator receiver tank drain valve
- Coolant drain valve and plug
- Engine oil drain valve
- Oil cooler drain valve
- Fuel tank drain valve and plug



WARNING

Never direct the compressed air to people and foods

- 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.
- Blowing compressed air on food is prohibited.



WARNING

Hands off from rotating parts and belts

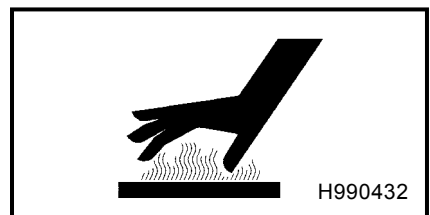
- Keep hands off from the rotating portion or belts while running.
It could cause serious injuries if hands should be caught in.



CAUTION

Do not remove radiator cap during operation

- Do not, under any circumstance, open the radiator cap while running or immediately after stopping operation. Otherwise high temperature steam jets out and this could cause scalding.

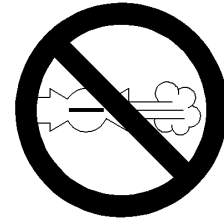


1.Safety

CAUTION

Operation with compressed air supply port opened is prohibited

- 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.

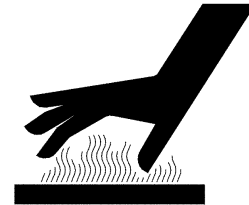


D003

CAUTION

Do not touch hot parts

- 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, 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 unit is running.



H990432

CAUTION

Fire prevention

- Do not, under any circumstance, bring lit cigarettes or matches near such oils as engine oil and compressor oil, etc. They are extremely flammable and dangerous, so be careful when handling.
- Refilling oils should be done in an outdoor well-ventilated place.
- Refuel after stopping the engine, and never leave the fuel nearby the machine. Do not spill. It may cause a fire. When it is spilt, wipe it up completely.
- **Do not fill fuel oil up to the cap lever. When fuel tank is filled up to the cap level, fuel oil 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 machine.**
- Such parts as muffler and exhaust pipe can be extremely hot. Remove twigs, dried leaves, dried grass and waste paper, etc. from the exhaust outlet of the muffler.
- Keep a fire extinguisher available by the machine in case of a fire.



D004



H990433

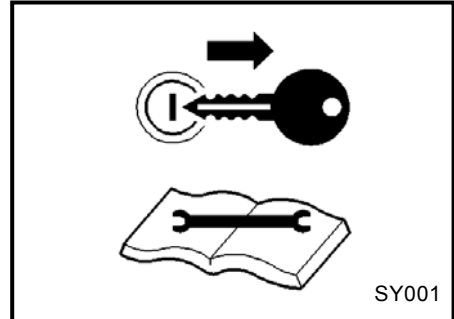
1.Safety

1.3 Caution during Inspection and Maintenance

WARNING

Hang a “Now Checking and under Maintenance” tag

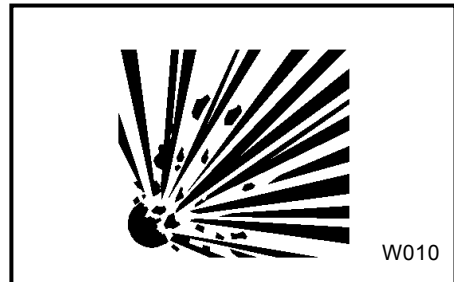
- Remove the starter key from the starter switch before starting inspection, and hang up a “Now Checking and under Maintenance” tag where it can be easily seen. The checker must keep the key during checking and maintenance.
- Remove the negative (-) side cable from the battery. If the above procedure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



WARNING

Refilling of compressor oil

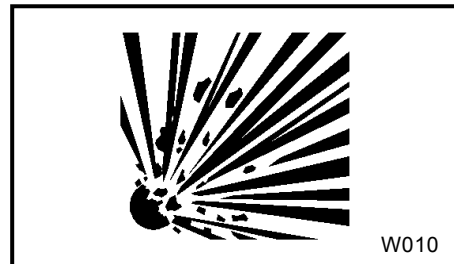
- When you refill the separator receiver tank with compressor oil, stop the engine, and make sure that the pressure gauge indicates 0MPa and there is no residual pressure in it, and then gradually loosen the oil filler cap for refilling oil.
- Note residual pressure in the separator receiver tank could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



WARNING

Be careful of high-pressurized air blowout

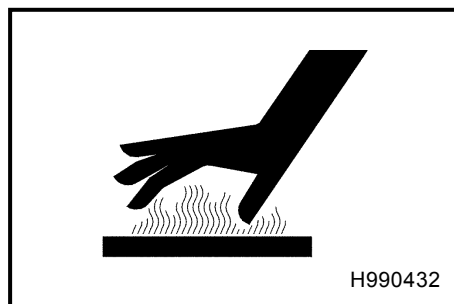
- After stopping the engine, make sure that pressure gauge indicates 0MPa. Even when the gauge shows 0MPa, open a service valve and further do not fail to make sure that there is no residual pressure in the air piping. Then start such a job as repair and maintenance.
- Residual air under pressure will blow off and severely injure operator.



WARNING

Draining separator receiver tank

- 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 separator receiver tank could force both extremely hot compressed air and oil to jet out and you may be scalded or seriously injured.



1.Safety

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.

Adjusting tension of belt

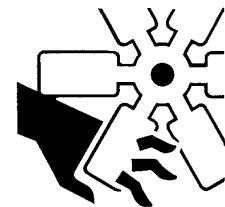


TR0304

WARNING

- Be sure to stop the engine and remove the starter key whenever check or maintenance work is carried out near the cooling fan.
- If the cooling fan is rotating, it may catch the operator or part of his body into the fan, and it could cause a serious injury.

Hands off from cooling fan



W009

WARNING

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

Cleaning by air-blow

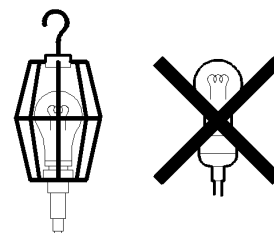


M003

CAUTION

- It is recommended to use a lamp with safety guard fitted where the site is dark. Operating the machine gropingly or by relying on one's intuition could cause unexpected accidents.
- Any lamps without safety guard are not recommended since they can be broken and they could ignite flammables such as fuel, etc.

Lighting apparatus



TR0206

1.Safety

CAUTION

Opening coolant water drain valve cap

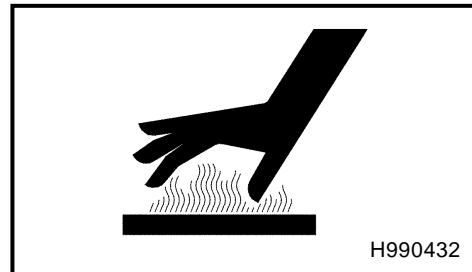
- Be sure to stop the engine, and let the coolant water sufficiently cool down before draining it.
- If the drain valve is opened before the coolant water is cooled enough, hot water could jet out, and it could cause scalding.



CAUTION

Refilling or draining of engine oil

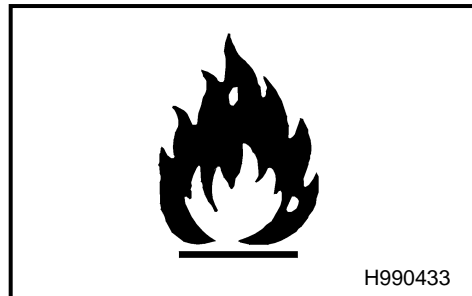
- After stopping the engine, wait for 10 to 20 minutes until the engine oil cools off. Then check the level of the engine oil, or refill or drain the oil.
- The engine oil is very hot during operation and just after it stops. Be careful because the hot oil also pressurized blows off and it can cause burning.



CAUTION

Fear of fire

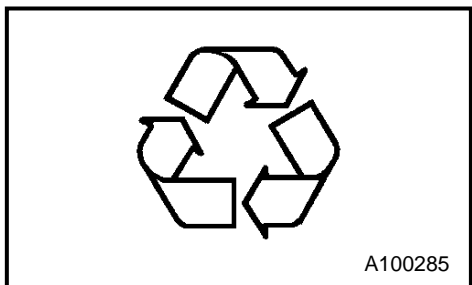
- Be sure to perform the periodical check of compressor oil and oil separator.
- Neglecting checks could cause overheat of the oil, resulting in a fire.



CAUTION

Treatment of organic wastes

- 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.



1. Safety

1.4 Safety Warning Labels

Following labels are attached to the machine.

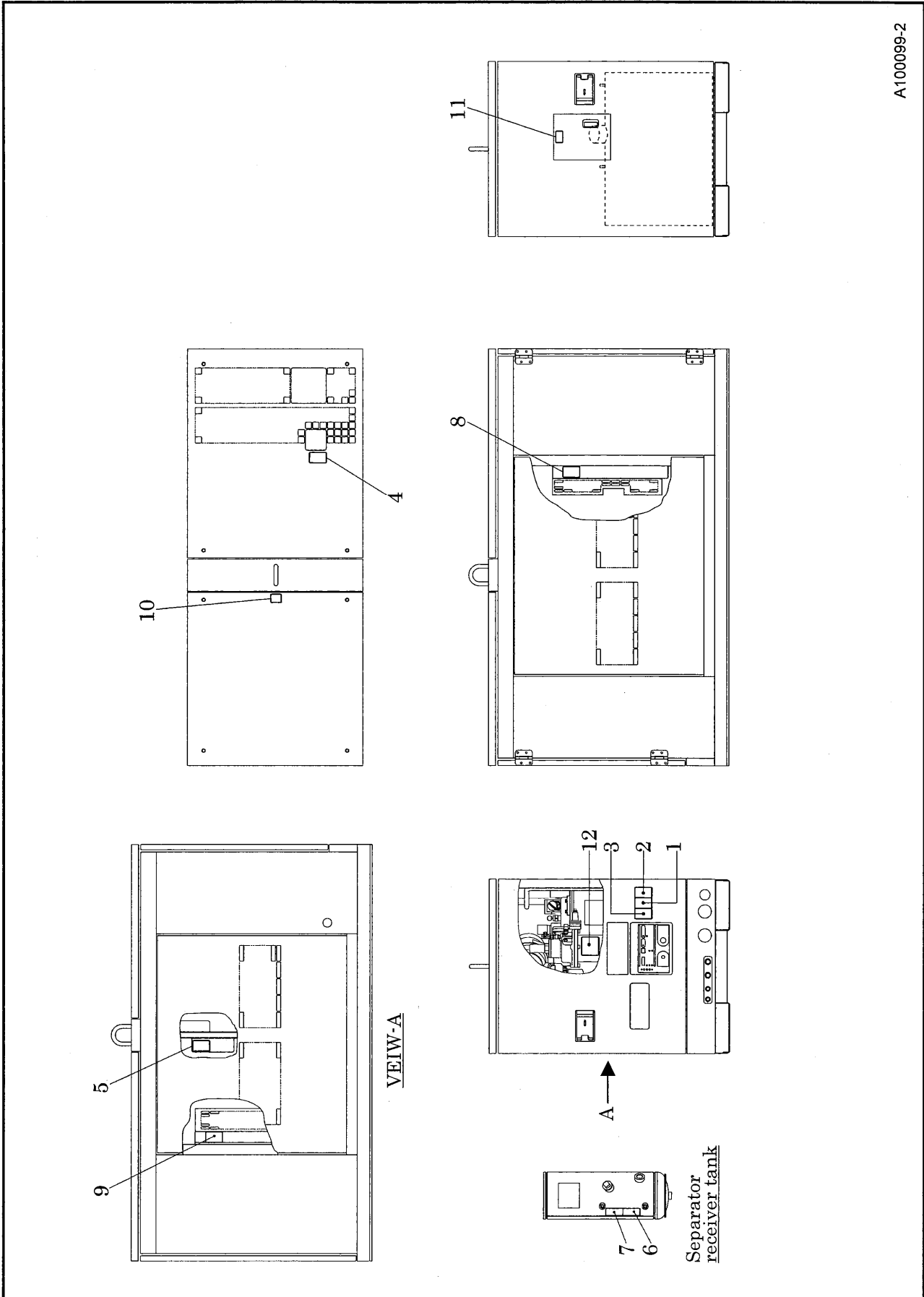
Keep them clean at all times. If they are damaged or missing, immediately place an order with your nearest dealer for replacement. Part numbers are indicated on the lower right corner of the label.

Adhere a new one to the original location.

<p>1</p> <p>▲ DANGER</p>  <p>DO NOT BREATHE COMPRESSED AIR</p> <p>Do not use this compressed air for breathing air because it can cause fatal accidents. Never breathe it.</p> <p>39176 73600</p>	<p>2</p> <p>▲ WARNING</p>  <p>BEWARE OF EXHAUST GASES</p> <p>When you operate machine INDOORS or in TUNNEL, provide good ventilation. Poor ventilation can cause fatal accident.</p> <p>39176 73300</p>	<p>3</p> <p>▲ WARNING</p>  <p>BEWARE OF RESIDUAL PRESSURE</p> <p>Release residual pressure inside pipings and hoses and then disconnect them. Disconnection with residual pressure still left can cause serious injury.</p> <p>39176 73400</p>	<p>4</p> <p>▲ CAUTION</p>  <p>PREVENT BURNING ACCIDENT</p> <p>Do not open radiator cap while it is still hot.</p> <p>39176 69600</p>	<p>5</p> <p>▲ CAUTION</p>  <p>PREVENT BURNING ACCIDENT</p> <p>When work is required near hot parts, wait for the parts to cool down fully before starting work.</p> <p>39176 69500</p>		
<p>6</p> <p>▲ WARNING</p>  <p>BEWARE OF HIGH PRESSURE AIR BLOW OUT</p> <p>Oil supply and/or maintenance jobs with residual pressure left in tank are very dangerous. So release the residual pressure first.</p> <p>39176 69800</p>	<p>7</p> <p>▲ CAUTION</p>  <p>PREVENT FIRE ACCIDENT</p> <p>Periodically check compressor oil and oil separator surely. Failure of this fire accident.</p> <p>39176 69700</p>	<p>8</p> <p>▲ WARNING</p>  <p>BEWARE OF ENTANGLEMENT</p> <p>Keep your hands AWAY from fan during operation. Entanglement in the fan can cause serious injury.</p> <p>39176 73500</p>	<p>9</p> <p>▲ WARNING</p>  <p>BEWARE OF ENTANGLEMENT</p> <p>Keep your hands AWAY from moving parts such as V-belts, pulleys etc.. Entanglement in them can cause serious injury.</p> <p>39176 73800</p>	<p>10</p>  <p>LIFTING BAIL</p> <p>39176 69300</p>		
<p>11</p> <p>DIESEL FUEL  FLAMMABLES </p> <p>Do not use any fuel other than diesel fuel</p> <ul style="list-style-type: none"> • Engine can be damaged if you use any fuel other than diesel fuel. • Stop operation and keep away from flammable during refueling. 39178 99730 	<p>12</p> <table border="1"> <tr> <td data-bbox="699 1527 898 1787"> <p>▲ DANGER</p>  <p>ATTENTION TO EXPLOSION</p> <p>If there is damage, dent and rust on the housing, it is in danger of explosion. Must be changed the new one.</p> </td> <td data-bbox="906 1527 1106 1787"> <p>▲ WARNING</p>  <p>ATTENTION TO BLOWOUT</p> <p>During operation or pressure is left at compressor, it is dangerous to remove the housing because of blowout of gas. Compressor must be halted and cut off the power supply. Then remove the housing after making sure the pressure gauge is 0Pa.</p> </td> <td data-bbox="1114 1527 1313 1787"> <p>▲ WARNING</p>  <p>ATTENTION TO MAINTENANCE</p> <p>Maintain Oil Separator according to the instruction manual. Separator element and housing should be changed at the same time. Attention to heated surface of the housing during operation.</p> </td> </tr> </table> <p>39176 72400</p>			<p>▲ DANGER</p>  <p>ATTENTION TO EXPLOSION</p> <p>If there is damage, dent and rust on the housing, it is in danger of explosion. Must be changed the new one.</p>	<p>▲ WARNING</p>  <p>ATTENTION TO BLOWOUT</p> <p>During operation or pressure is left at compressor, it is dangerous to remove the housing because of blowout of gas. Compressor must be halted and cut off the power supply. Then remove the housing after making sure the pressure gauge is 0Pa.</p>	<p>▲ WARNING</p>  <p>ATTENTION TO MAINTENANCE</p> <p>Maintain Oil Separator according to the instruction manual. Separator element and housing should be changed at the same time. Attention to heated surface of the housing during operation.</p>
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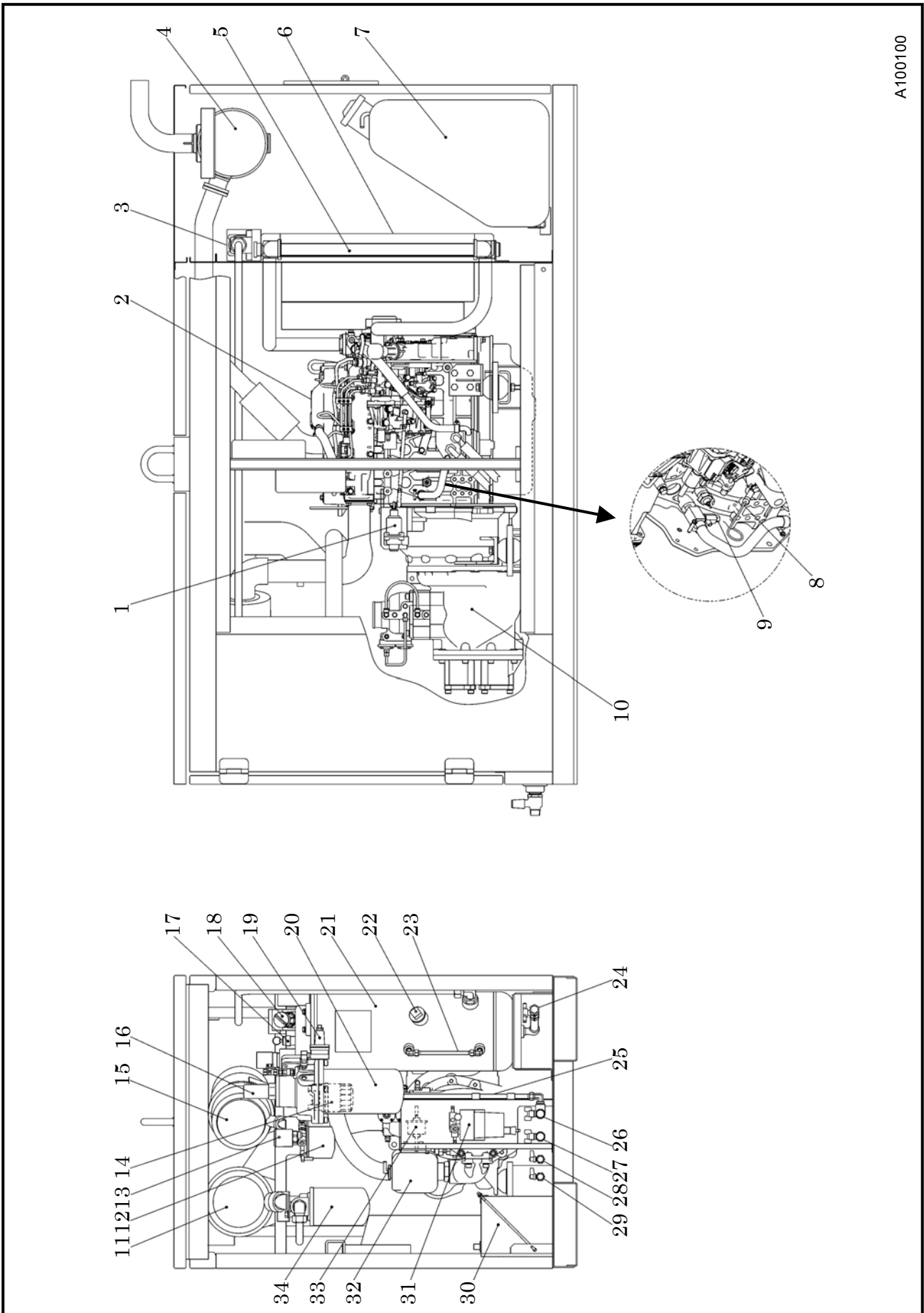
1.Safety

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



2.Part Names

2.1 Internal Components and Part Names



2.Part Names

No.	Description	Function
1	Speed regulator	For adjusting engine speed in the system.
2	Engine	For driving the compressor.
3	By-pass valve	For keeping compressor oil at proper temperature.
4	Exhaust muffler	Equipment which muffles an engine exhaust sound.
5	Radiator	For cooling the coolant for engine because it is water-cooled.
6	Oil cooler	For cooling compressor oil circulating in the system.
7	Fuel tank	For storing diesel fuel oil.
8	Engine oil level gauge	For checking engine oil level.(Right side of engine)
9	Coolant drain valve	For draining engine coolant.
10	Air-end	For compressing intake air.
11	Air filter(For compressor)	For filtering the dust floating in the intake air.
12	Fuel filter	For filtering diesel fuel oil.
13	Solenoid valve for AUTO IDLE mode	For reduction of power under unloaded operation
14	Engine oil filter	For filtering engine oil
15	Air filter(For engine)	For filtering the dust floating in the intake air.
16	Pressure control valve	For keeping the receiver tank pressure higher than 58PSI in the tank.
17	Safety valve	For releasing compressed air to the atmosphere when the pressure rises higher than the rated pressure.
18	Engine oil filler port	For supplying and replenishing engine oil to engine.
19	Pressure regulator	For regulating intake air volume.
20	Oil separator	For separating oil mist mixed in compressed air.
21	Separator receiver tank	For separating compressor oil from compressed air sent into the tank.
22	Compressor oil filler port	For supplying and replenishing compressor oil.
23	Compressor oil level gauge	For checking compressor oil level.
24	Compressor oil drain valve	For draining compressor oil from separator receiver tank.
25	Engine oil level gauge	For checking engine oil level.(Operation side)
26	Engine oil drain valve	For draining engine oil for replacement of it and for maintenance.
27	Fuel tank drain valve	For draining condensate and water accumulated at the bottom of the fuel tank.
28	Radiator drain valve	For draining engine coolant at the bottom of radiator.
29	Oil cooler drain valve	For draining compressor oil at the bottom of oil cooler.
30	Battery	For electrically starting engine.
31	Sedimenter	For separating water mixed in fuel oil.
32	Reserve tank	For feeding engine coolant.
33	Electromagnetic pump	For air bleeding in fuel pipe system and also for fuel feeding to engine.
34	Compressor oil filter	For filtering compressor oil circulating in the system.

3. Installation

3.1 Transportation

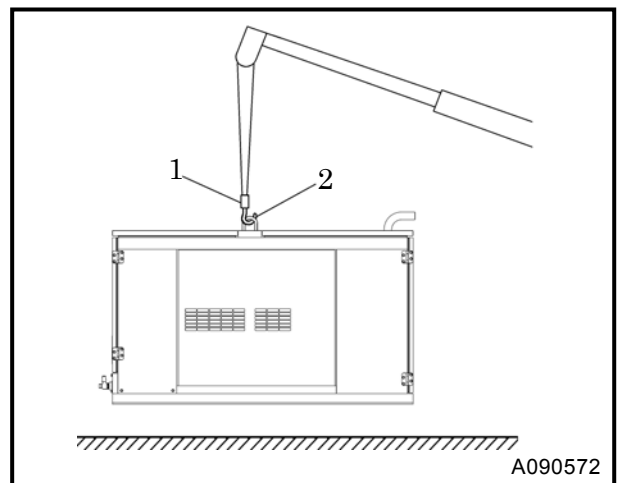


Transportation

- When loading and unloading unit, be sure to use the lifting bail provided on the center of the unit top.
- Never get under the unit which is lifted up, because it is very dangerous.
- When unit is transferred or moved from working site, be sure to place it on truck bed, and fasten it by ropes.
- Never lift unit which is still in operation, or it could cause critical damage to each component or lead to serious accident.
- When lifting unit up, make sure that all the fixing bolts on the bonnet are surely tightened because it is feared that the unit may fall.

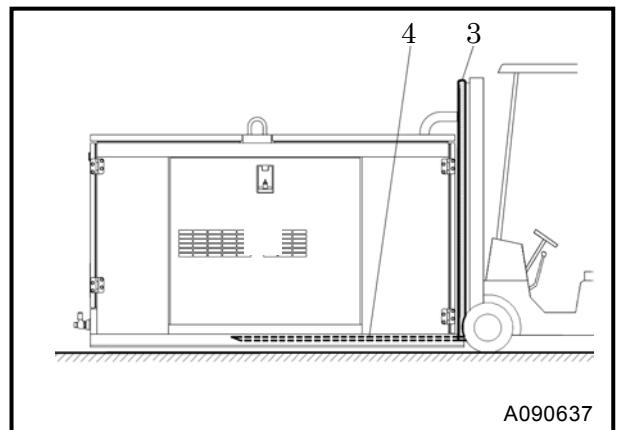
3.1.1 Lifting up

- ① Before lifting the unit up, make sure to check the lifting bail for any crack and loosened bolts.
- ② Connect the hook "1" of the crane or shackle with lifting bail "2" eye fitted at the top center of the unit, and make sure that there is no person standing around the unit. Then perform hoisting operation.
- ③ Select a truck or a crane with capacity sufficient for weight and size of the unit by referring to the values shown in Chapter 8 "Specifications" of the manual.



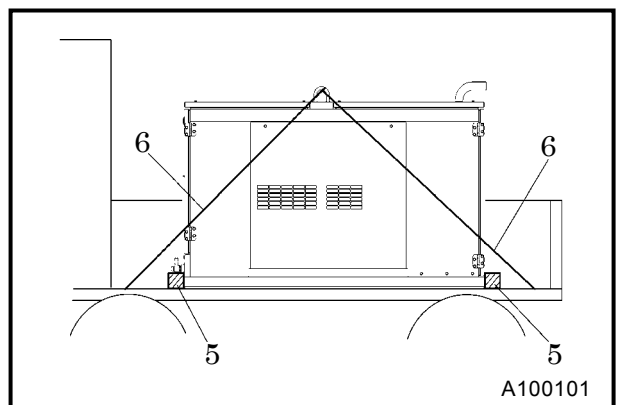
3.1.2 Movement with a forklift

- Protect the package from damage with cushion material "3"
- Make sure to insert the fork "4" more than half of the length of the unit for security.



3.1.3 Mounting the unit on the truck bed

- Be sure to put chocks "5" at the front and rear frames to the machine.
- Hook the rope "6" as shown in the figure. Thus secure the unit on the truck bed.

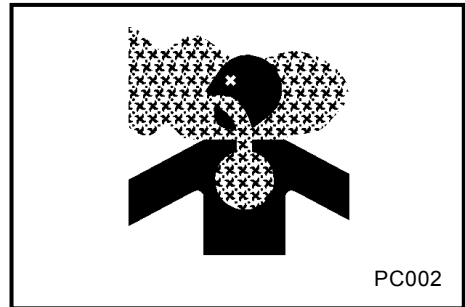


3. Installation

3.2 Installation



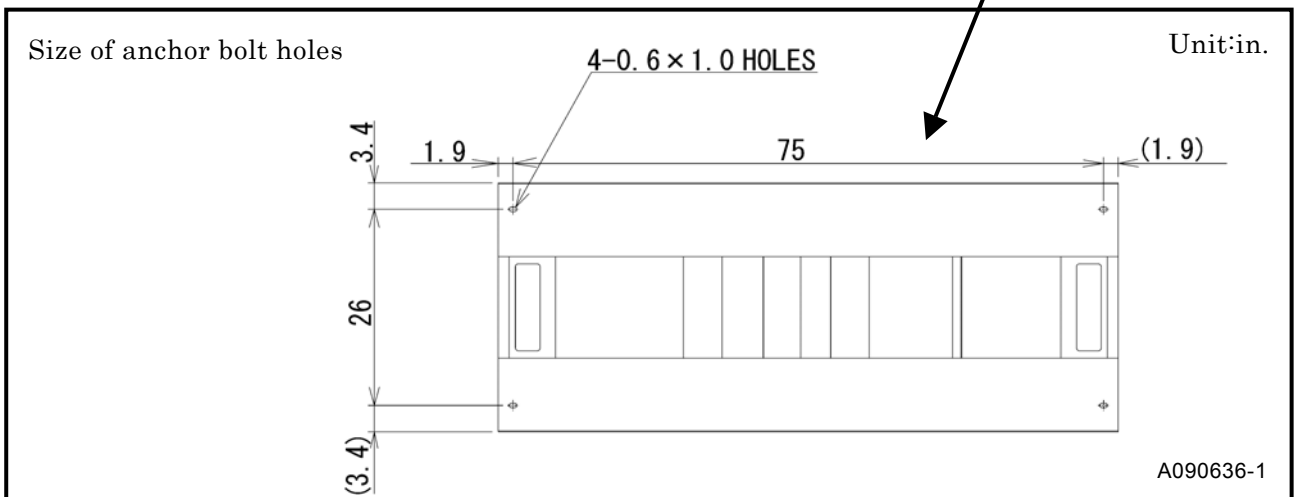
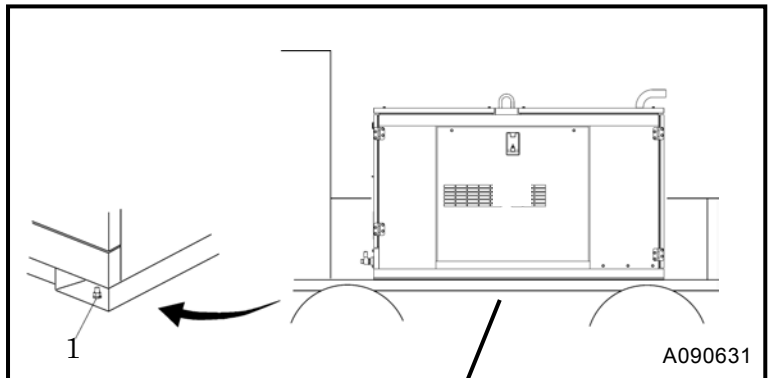
- Exhaust gas from the engine is poisonous, and could cause death when inhaled.
Avoid using the machine in an insufficiently ventilated building or tunnel.
- Do not position the exhaust gas outlet in direction of a person or a house.



- The machine should be operated in following conditions:
 - **Ambient temperature** **5°F to 104°F (-15°C ~ +40°C)**
 - **Humidity** **Less than 90%**
 - **Altitude** **Lower than 1,500 m above sea level**
- Make sure to install the unit, keeping more space than 5 inches from any solid object nearby, for prevention of cooling performance drop.
- If more than two machines are placed parallel in operation, keep enough distance so that exhaust air from one machine does not effect the other one.
- Also, a machine has to be installed in the environment where fresh air is always available.
- Keep enough space around the unit for inspection and maintenance access.

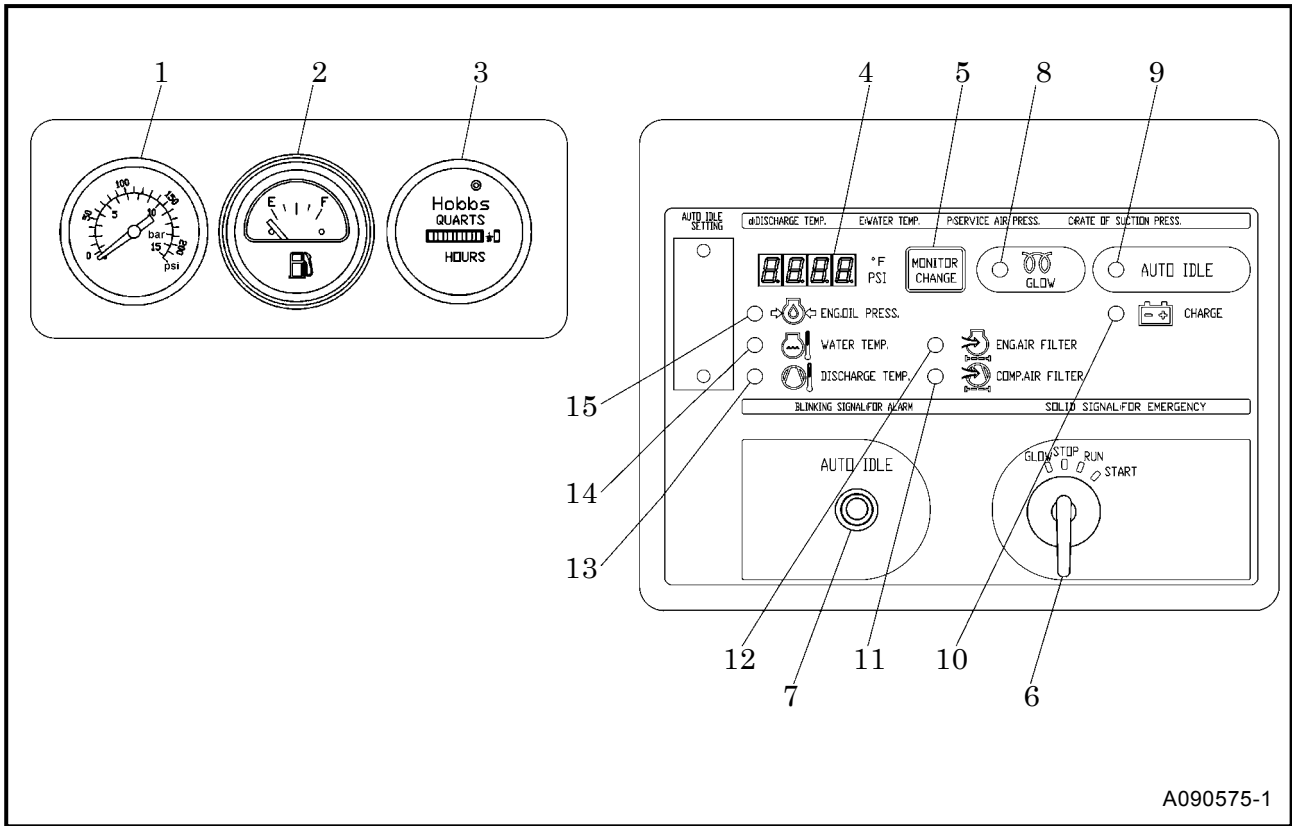
3.2.1 Mounting the unit on the truck bed

- Make sure to fix the unit, using anchor hole "1" of frame as shown in the fig.
Tightening torque of the bolts :
M12 : 43N · m



4. Operation

4.1 Instrument panel



A090575-1

1. Discharge pressure gauge
(For pressure in separator receiver tank)
2. Fuel level gauge
3. Hour meter
4. Digital monitor indicator
(temperature/pressure/rate of suction press.)
5. Selector switch for digital monitor indication
6. Starter switch
7. Auto idle switch(Purge control)

< Indicator lamp >

8. Glow
9. Auto idle(Purge control)

< Warning lamp >

10. Charge
11. Compressor air filter clogging
12. Engine air filter clogging

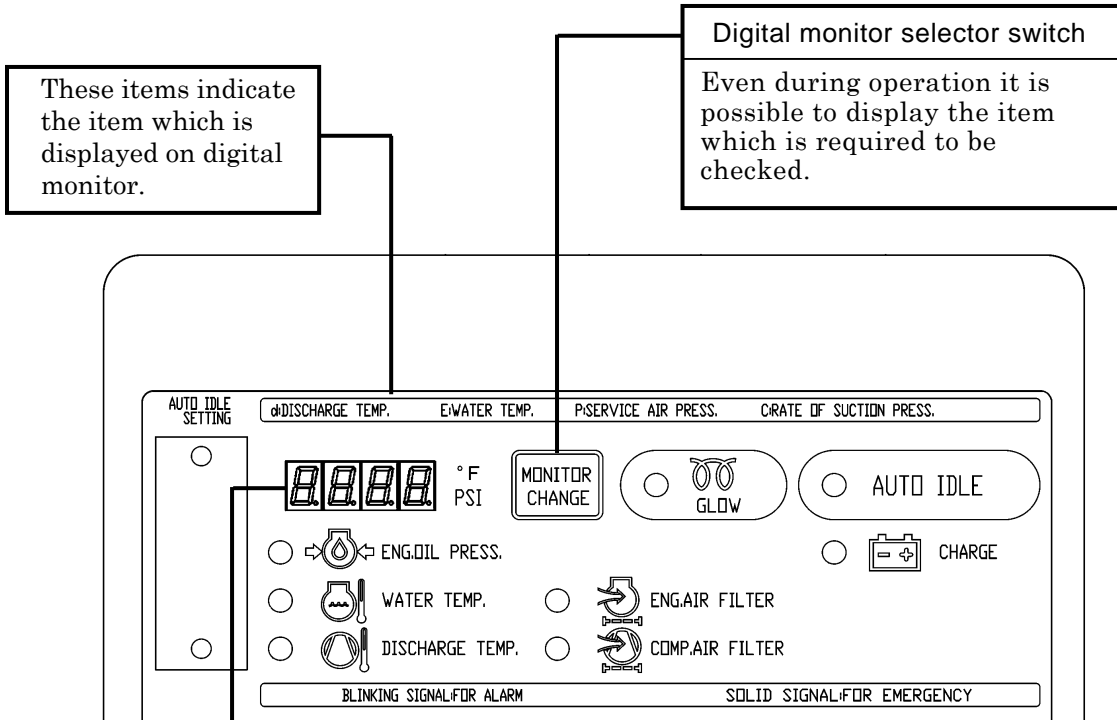
< Emergency stop lamp >

13. Discharge air temperature
14. Water temperature
15. Engine oil pressure

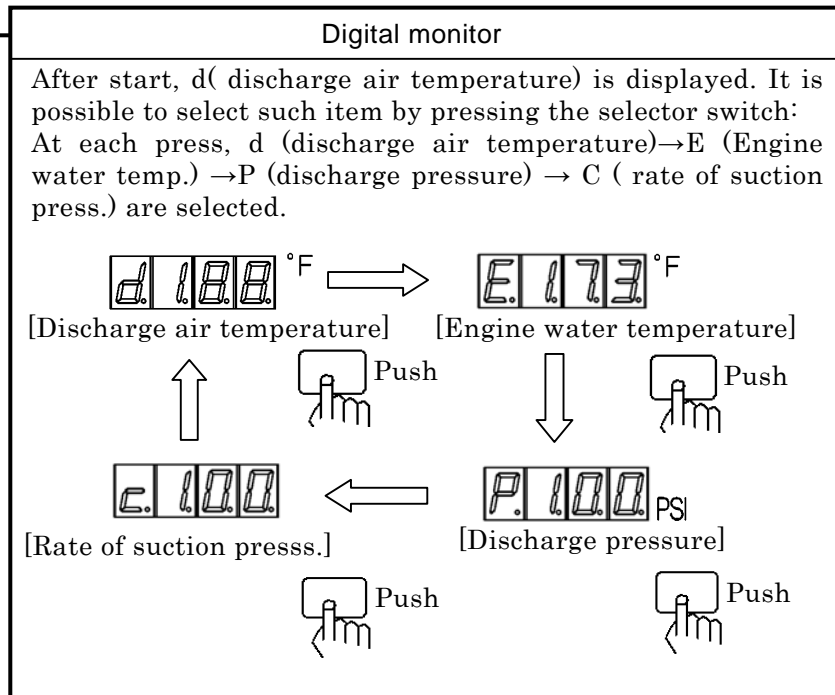
4. Operation

4.1.1 Digital monitor indicator

- Place starter switch “RUN” and then digital monitor indicator goes on.
- Press monitor selector switch for selection of digital monitor display.



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4. Operation

4.1.2 Indicator lamp

Indicator lamp






Turn the starter switch to “RUN” position. Then the lamp goes on.

Item	Contents	Measures	Monitor
GLOW	Turn the starter switch “GLOW” and the lamp goes on and after preheating is finished, the lamp will be off.	—	
AUTO IDLE	During operation, push the AUTO IDLE switch (purge control) “ON” and then lamp goes on.	—	—

Warning lamp

When some little trouble occurs during operation, the lamps will flickers.




When the warning lamp flickers, take appropriate measures to recover the situation swiftly.

Item	Contents	Measures	Monitor
DISCHARGE TEMP.	Lamp flickers when the air temperature at the outlet of the air-end reaches the set temperature of 239°F (115°C).	See “Troubleshooting”	
WATER TEMP.	Lamp flickers when coolant temperature reaches 225°F (107°C).		
CHARGE	Lamp flickers when alternator is not charging.	Check wiring. Check alternator.	
COMP. AIR FILTER	Lamp flickers when air filter gets clogged and suction resistance increases.	Clean Replace	
ENG. AIR FILTER	[Actuating resistance is more than 0.9psi(0.062bar).]		

Emergency stop lamp

The compressor stops when the emergency stop lamp goes on.

Be sure to follow the measures shown below before starting the unit again.

Item	Contents	Measures	Monitor
DISCHARGE TEMP.	Lamp goes on when the air temperature at the outlet of the air-end reaches the set temperature of 248°F (120°C).	See “Troubleshooting”	
WATER TEMP.	Lamp goes on when coolant temperature reaches 230°F (110°C).		
ENG. OIL PRESS.	Lamp goes on when engine oil pressure drops. [The function pressure is below 7.3psi(0.5bar).]		

4. Operation

4.2 Lubricating oil · Coolant · Fuel

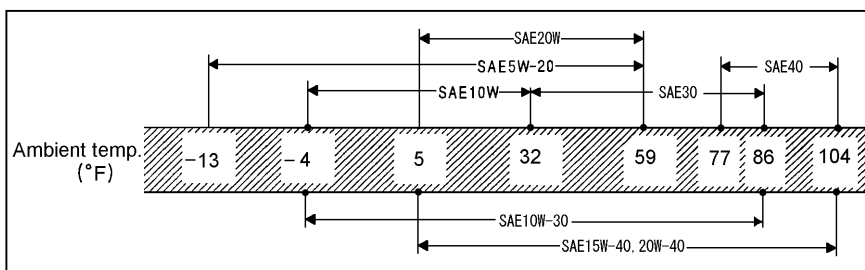
4.2.1 Engine oil

IMPORTANT

Oil should use the recommendation oil

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

Ambient temperature range and oil viscosity (SAE)



A100293E

- Use engine oil recommended by us.

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

- Be sure to use CD class engine oil or superior class. (Using engine oil with poor quality may shorten the life of the engine).
- Follow the designated regulations to dispose of engine oil.

*** Unit is delivered ex. factory, filled with engine oil recommended by engine manufacturer.**

4.2.2 Compressor oil

IMPORTANT

Oil should use the recommendation oil

- Be sure to use recommended oil listed below.

Maker and Brand of Recommended Oil

Maker	Brand
HULS	ANDEROL 3032
MOBIL	RARUS SHC 1024
TEXACO	SYN-STAR DE32

- Even continuous oil replenishment cannot improve its deteriorated condition. Be sure to change the oil completely at every scheduled interval.
- Do not mix it with other brand oil, or it will cause poor performance and shorten the life of the compressor oil. (But fresh compressor oil could accept a mixture of small amount of different brands.)
- Running the unit with old and deteriorated compressor oil will cause damage to bearings, or serious accident like ignition in a separator receiver tank. Be sure to change the oil completely at every scheduled interval.
- Follow the designated regulations to dispose of compressor oil.

*** Unit is delivered ex. factory, filled with "AIRMAN OIL LONG LIFE".**

4. Operation

4.2.3 Coolant

IMPORTANT

Quality of coolant and antifreeze

- Use soft water of good quality such as tap water for coolant.
- 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.
- When the unit is used in a cold region and possible freezing is expected, it is recommended to use LLC (Antifreeze) for the coolant.
- Adjust mixing ratio of LLC (Antifreeze) with water according to the temperature.
- Use LLC (Antifreeze) within the range of its mixing ratio between 35 and 60%.
(Upon delivery from the factory, LLC density is 55%)
- If LLC (Antifreeze) in the water exceeds more than 60%, it may decrease its antifreezing effect.
- Follow the designated regulations to dispose of LLC.

4.2.4 Fuel

IMPORTANT

Choose appropriate

- Be sure to use diesel fuel oil.
(Using other oil will cause low power output or damage the engine.)
- 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.

4. Operation

4.3 Check before starting unit

CAUTION

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.
- 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.

4.3.1 Check Engine Oil Level

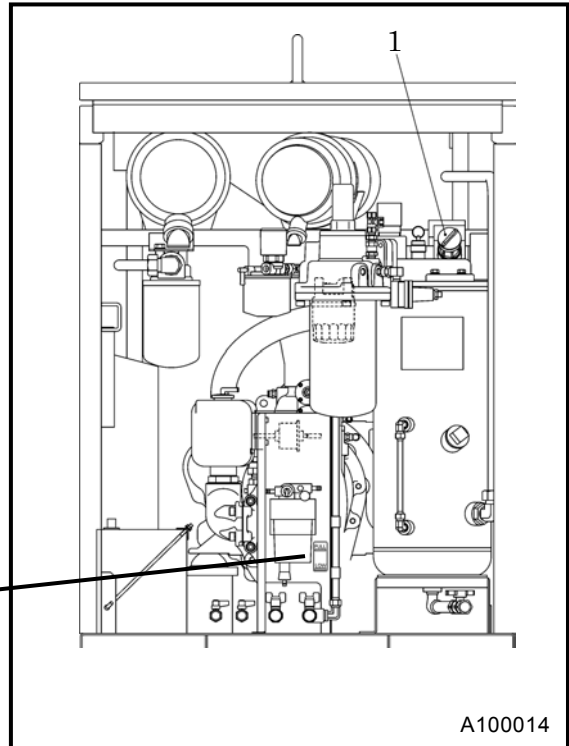
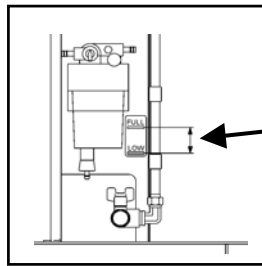
<Procedure>

In case of checking and confirming oil level with level gauge at operation panel side.

- Place the machine on level ground when checking the oil level.
- ① Make sure to check and confirm that oil level is between “FULL” and “LOW” .
- ② In case that oil level is lower than “LOW” , replenish engine oil through oil filler port “1” .
- 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.

IMPORTANT

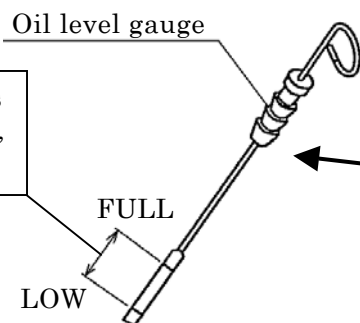
- Unless unit is placed on level, correct oil level cannot be checked and confirmed.



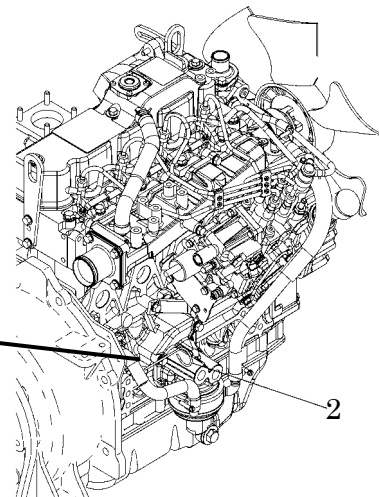
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<Procedure> In case of checking and confirming oil level with engine level gauge.

- ① Pull out the oil level gauge “2” , and wipe it with a clean cloth.
 - ② Then, re-insert the oil level gauge “2” fully and pull it out again. If the oil level gauge “2” shows the oil level between LOW and FULL, it is normal.
 - ③ When the oil level is below its LOW, add engine oil from oil filler port “1” .
- 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)
 - Never fill oil more than FULL level.



When oil level is within this zone, it is normal.



A100103

4. Operation

4.3.2 Check Coolant Level

CAUTION

- Be sure to stop the machine and allow time to cool. Then loosen the radiator cap one notch. After the coolant water is sufficiently cooled and the inner pressure is released, take the cap off.
If this procedure is neglected, the inner pressure can blow off the cap. Steam jetting out of the radiator could result in causing scalding. Follow this procedure under all circumstances.

Taking off the radiator cap

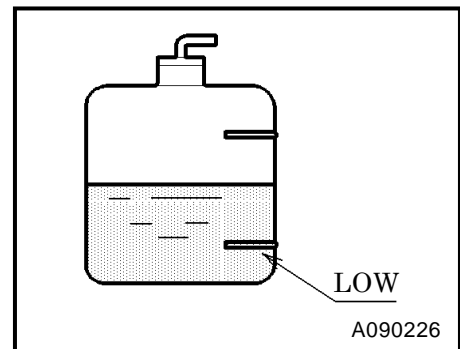


IMPORTANT

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

<Procedure>

- 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 tank, if necessary. (See 5.5.14)

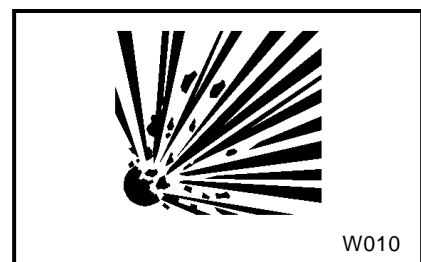


4.3.3 Check compressor oil level

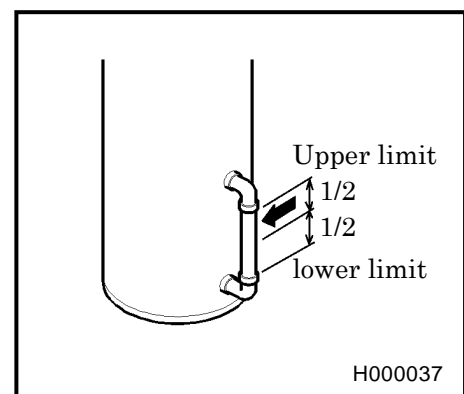
WARNING

- 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.
- 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.

Refilling of compressor oil



- Place the machine on level ground when checking the oil level.
- After checking and confirming that the residual pressure in separator receiver tank is 0MPa, replenish the tank with compressor oil at higher level than the middle between the upper limit and lower limit of oil level gauge when the machine is on. (See 5.5.5)
- ※ Supply of excessive oil can cause deterioration of oil separation performance and the like. Never supply oil at a higher level than the upper level of oil level gauge.



4. Operation

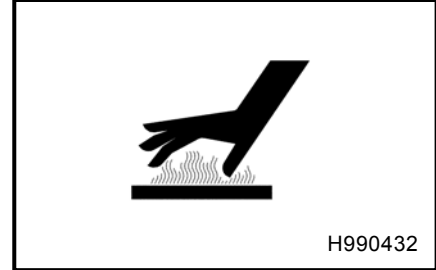
4.3.4 Drain separator receiver tank



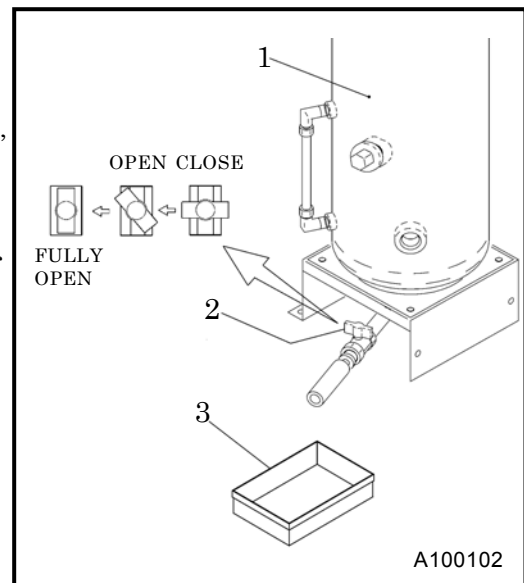
WARNING

Draining of Separator receiver tank

- 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.



- 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.



4.3.5 Check fuel

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



CAUTION

Fire prevention

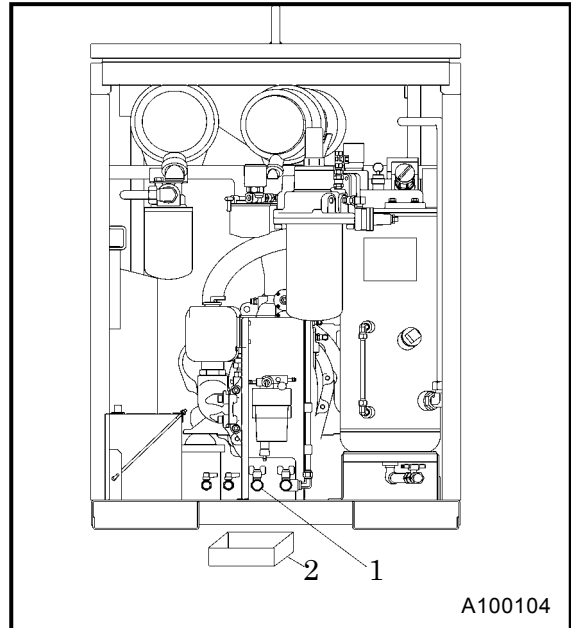
- Do not, under any circumstance, bring lit cigarettes and/or matches to the fuel.
- The fuel is extremely flammable and dangerous. Be careful of fire because it is very likely to catch fire.
- Refuel only after stopping the engine, and never leave open fuel can near the machine. Do not spill. It could cause a fire. When it is spilt, wipe it up completely.
- Refilling fuel tank should be done in an outdoor well-ventilated place.
- **Do not fill fuel oil up to the cap lever. When fuel tank is filled up to the cap level, fuel oil 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 machine.**



4. Operation

4.3.6 Drain fuel tank

- Opening the drain valve “1” fitted under the fuel tank, drain the condensate from the tank.
- When completely drained, firmly close the drain valve “1” .
- Drain the condensate in container “2”, and then dispose of condensate according to the designated regulations.

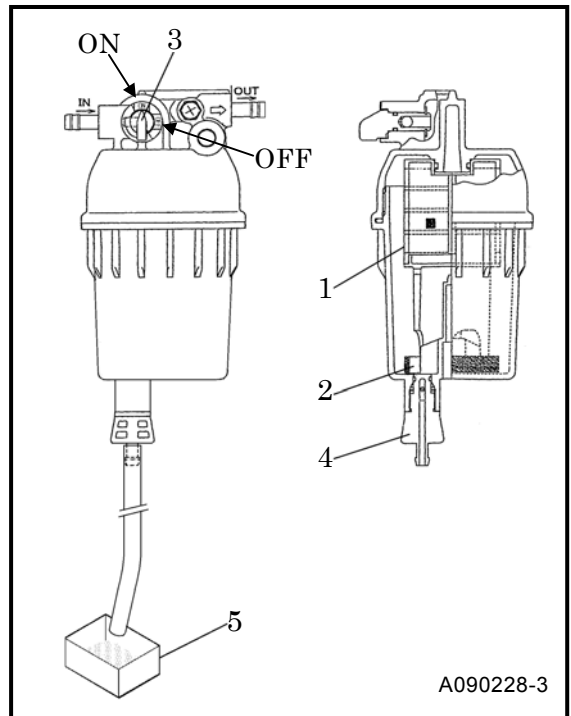


4.3.7 Check sedimenter for condensate

When red float “2” under element “1” in sedimenter is raised up to upper level, drain water.

<Procedures>

- 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.



4.3.8 Check wiring of each part

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

4.3.9 Check piping of each part

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

4. Operation

4.3.10 Check belt tension

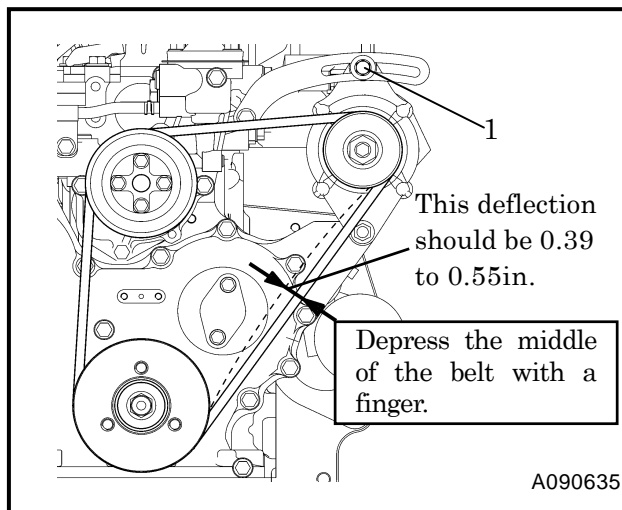
IMPORTANT

- 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.

- Follow the procedure below to adjust tension of belt for fan and alternator.
- Adjust the tension by loosening the fastening bolt of the alternator.

<Procedure>

- ① Visually check if there are any cracks or tears in the belt. Change the belt if it is damaged.
- ② Adjust the belt tension by loosening the fixing bolt "1" of the alternator so that the belt can deflect 0.39 to 0.55in.(10 to 14 mm) when pressed at the center of the belt with approx.22lbf (98N) force.
- 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.

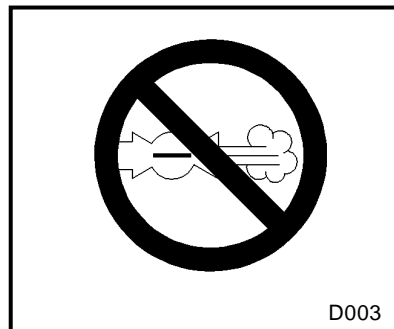


4.4 Operation

CAUTION

Operation with compressed air supply port opened is prohibited

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



WARNING

- Keep the door closed and locked while running the unit.
- When the door has to be opened, be careful not to touch portions that are rotating or very hot.
Careless touch may cause serious injury.
- Pull the handle forward to open the door.
- Be sure to close the door tightly so that its latch is firmly caught.



4. Operation

4.4.1 Procedure to start the unit

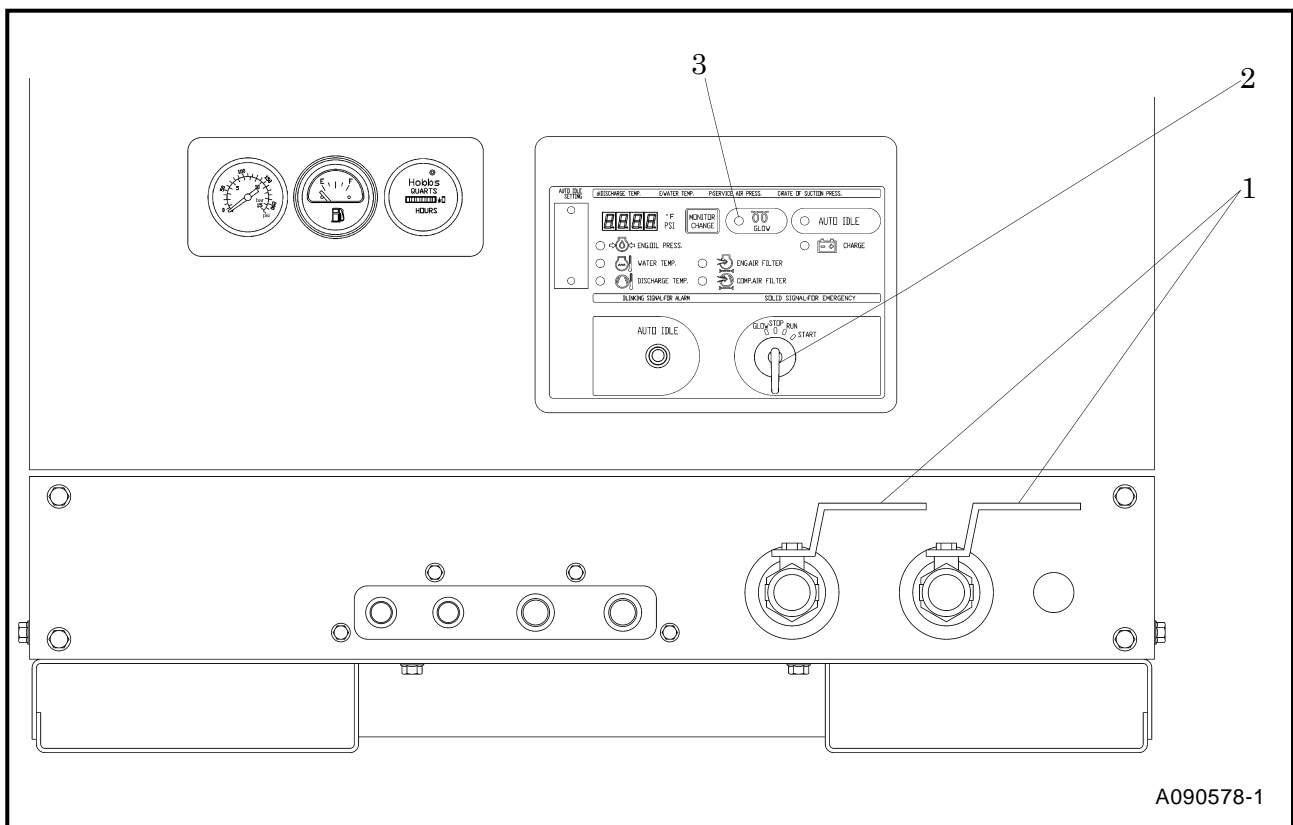
IMPORTANT

Be sure to warm-up

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

<Procedure>

- ① Close fully air valves “1” .
- ② Keep starter switch “2” turned to “GLOW” position, then glow lamp “3” goes on. (Preheating time is about 15 seconds.)
- ③ As soon as the glow lamp “3” has gone out, turn the starter switch “2” fully clockwise to start up the engine.
(Never hold the key in the “START” position for longer than 15 seconds or the starter motor will overheat.)
- ④ Once the engine has started up, leave it running to warm-up for 5 minutes.
- ⑤ After finishing warming up operation, open the air valve “1” provided at the outlet of compressed air and start service job.



[Explanation on automatic starting unloader]

- Automatic starting unloader starts automatically.

This system keeps the pressure in separator receiver tank at the pressure of approx. 58psi (4bar) for 10 seconds after engine starts. Then it proceeds to ordinary unloader operation.

4. Operation

4.4.2 Operating Procedures when Engine Fails to Start up on First Attempt

- When the engine fails to start up even after performing the startup procedures ① to ③, do not keep the starter running, but set the starter switch back to "STOP" and wait about 30 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:
 - No fuel
 - Clogging of fuel filter
 - Discharge of battery (Low cranking speed)
 - Low ambient temperature

4.4.3 How to start the unit at low temperature

IMPORTANT

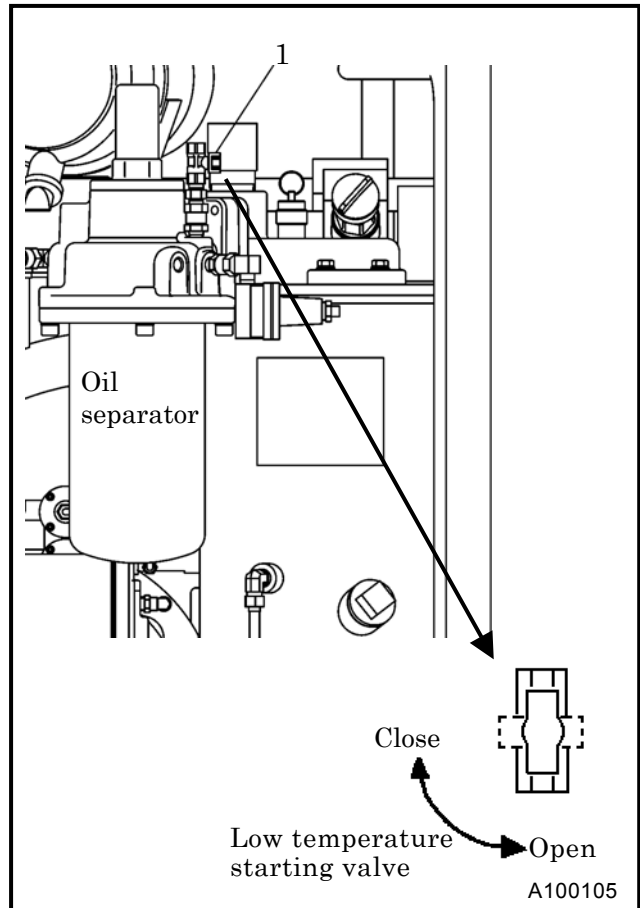
Operation under Cold Weather Conditions below 23°F (-5°C)

- Use SAE10W-30 (CD class) 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.

When it is difficult to start engine in cold weather, take the following measures.

<Procedure>

- ① Fully close the air valve, and fully open the valve "1" which is provided at the top of separator for starting under the conditions of low temperature.
- ② Perform normal starting operation first and gradually close the low temperature starting air valve "1", watching the rising engine speed.











4. Operation



4.4.4 Gauge Indication while Operating

IMPORTANT

- Minimum discharge air pressure is approx.58psi (4bar) during load operation.
- Continuing equipment operation at a lower pressure than the above pressure may cause overheating, since it affects the separation of lubricating oil inside the oil separator and reduces the oil flow to the compressor air-end, resulting in temperature rise.

- 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 values mentioned in following table are standard ones, so they sometimes vary upon operation conditions.

Protection device		Emergency stop Lamp			Warning Lamp		
		Discharge temperature	Water temperature	Engine oil pressure	Charge	Compressor air filter	Engine air filter
Monitor							
Starting	Starter switch set to "RUN" position	● OFF	● OFF	● OFF	 ON	● OFF	● OFF
In Operation		 OFF					

Protection device		Indicator lamp	
		Glow	Auto idle
Monitor			AUTO IDLE
Starting	Starter switch set to "RUN" position	● OFF	● OFF
In Operation		 ※1 OFF	

Note)※1 : The lamp lights on when AUTO IDLE is selected.

		Discharge air pressure gauge
In operation	Full load	58-100 psi (4-6.9 bar)
	Unload	104-131 psi (7.2-9.0 bar)
	Auto idle	50-65 psi (3.5-4.5 bar)

4. Operation

4.5 Stopping

WARNING

- The unit is equipped with a built-in check valve. Therefore, some pressure will be left in pipes after the unit stops. Be sure to release such residual pressure from the pipes by opening the air valve gradually after the unit stops.

<Procedure>

- ① Close the air valves 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.

4.6 Air Bleeding in fuel pipe

Should the machine stop due to the shortage of fuel, perform the air bleeding operation according to the following procedures.

<Procedure>

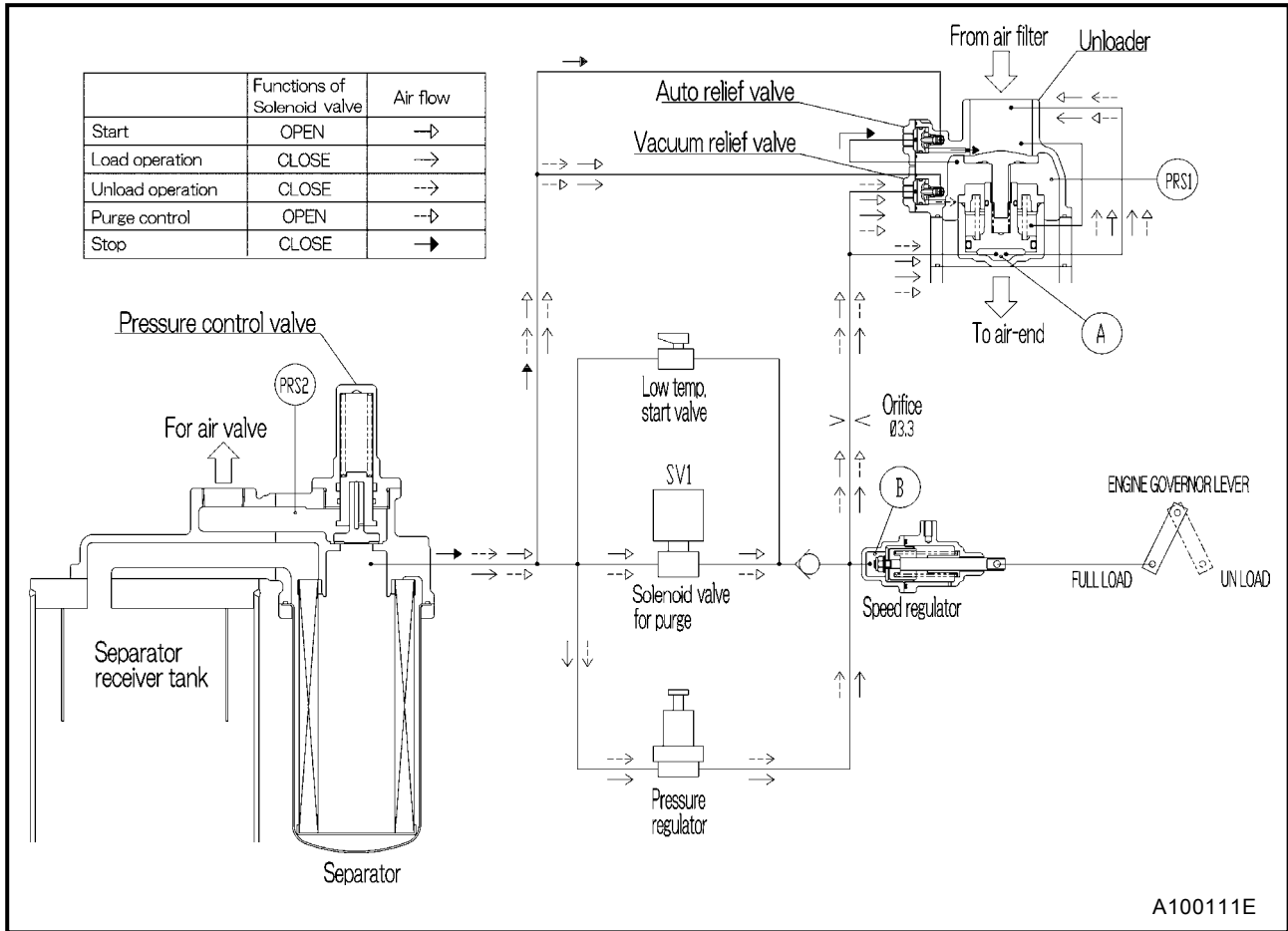
- ① Replenish fuel.
- ② Turning the starter switch to “RUN” position, the electromagnet pump functions to bleed the air in fuel pipe system automatically.
- ③ The air bleeding operation can be finished within 1 minute.

IMPORTANT

- Engine will never startup until finish air breeding even though starter switch is turned to “START” position.
- Never hold the key in the “START” position for longer than 15 seconds or the starter motor will overheat.
- When the engine fails to startup even after performing the startup procedures, do not keep the starter running, but set the starter switch back to “STOP” and wait about 30 seconds. Then, repeat the startup procedure once again.

4. Operation

4.7 Capacity Control Device



Step	Response
Start	When starting operation, purge solenoid valve SV1 opens. And compressed air is sent to unloader chamber (A) and speed regulator chamber (B). The pressure in chamber (A) rises soon, and unloader valve fully closes due to low pressure. Thus the load required for starting is reduced. The pressure in chamber (B) rises soon too, and speed regulator fully stroke to unload position.
Load operation	After starting operation, SV1 valve closes after 10 seconds have passed. The air volume sent to the chambers (A) and (B) from pressure regulator increases or decreases according to the rise and drop of discharge air pressure. Thus according as unloader valve position and engine speed change, free air delivery is steplessly and automatically regulated from 0 to 100%.
Suction port closing unload operation	When air consumption is reduced, and the pressure exceeds the rated one, speed regulator functions to lower the engine speed in proportion to the pressure rise and, at the same time, to close unloader valve. Under unloaded operation, the interior of compressor air-end becomes vacuum and vacuum noise is caused. In order to prevent occurrence of vacuum noise, it functions to open the vacuum relief valve, detecting the secondary pressure of pressure regulator and thus it prevents high vacuum state inside the compressor air end from being caused.

4. Operation

<p>AUTO IDLE (Purge control) operation</p>	<p>During unloaded operation, when the certain set time(it can be changed.) has passed at lower pressure than the set negative pressure, detecting the negative pressure inside the compressor air end with a pressure sensor PRS1, solenoid valve SV1 opens and it closes unloader valve. At the same time, it functions to relieve the compressed air from separator receiver tank to the atmosphere and thus it lowers the pressure. Thus the compressor power is saved. When air consumption increases, and the pressure used for load drops below the set pressure, pressure sensor PRS2 detects it and it disengages the purge control (SV1 closes) to start full load operation.</p>
<p>Stop</p>	<p>When stopping operation, it opens Auto relief valve to relieve the compressed air in separator receiver tank to atmosphere, detecting the pressure inside compressor air-end.</p>

4.7.1 AUTO IDLE (Purge control)

This model is equipped with AUTO IDLE (Purge control).

This operation mode is recommendable for such use.

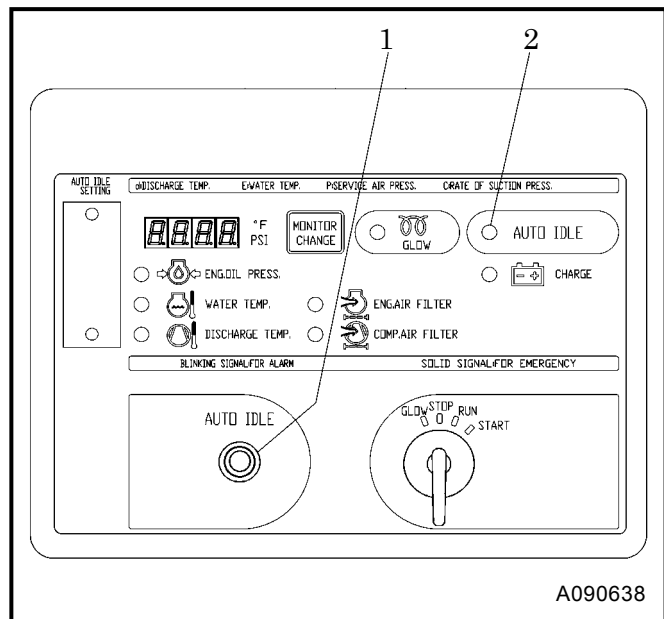
Not so much air consumption is required and it is used continuously and also power consumption under unloaded operation is required to be saved.

Use this mode, depending upon the need and demand. For the selection of this mode, switch on "AUTO IDLE" on the operation panel.

Select this operation mode freely, according to required air consumption.

<Procedure>

- ① During operation(After start up the engine), push on the switch "1" "AUTO IDLE".
- ② Then the indicator lamp "AUTO IDLE" "2" goes on.
- ③ In order to stop this operation mode, push again "AUTO IDLE" switch "1" and then the lamp "2" goes out to disengage this purge mode.
- As "AUTO IDLE" mode is reset when key switch "STOP" is switched on, it is necessary to select it whenever starting operation.



[Explanation on AUTO IDLE]

- This system is for reduction of fuel consumption, which is attained by lowering the pressure loaded in separator receiver tank during unloaded operation
Separator receiver tank internal pressure in AUTO IDLE : approx.58psi(4bar)

4. Operation

[Function of AUTO IDLE (Purge control)]

Function	Conditions of “AUTO IDLE” lamp
① First engine speed drops to the minimum speed by speed regulator, owing to reduction of air consumption. Later the air consumption is reduced further, the unloader valve gradually closes and intake negative pressure increases. In this stage, the pressure sensor detects the intake negative pressure. Then when the intake negative pressure becomes higher than the set pressure, the “AUTO IDLE” lamp flickers at short intervals.	Lamp flickers at short intervals.
② When this condition continues for a certain time, the solenoid valve (SV1) functions to start purge mode operation. Consequently, the pressure inside separator receiver tank drops and reduces the power of compressor air end. In this stage, the lamp “AUTO IDLE” flickers at longer intervals.	Lamp flickers at longer intervals.
③ Next, when the pressure for load down to the purge releasing pressure owing to the increase of air consumption, the solenoid valve (SV1) operation gets “OFF” and it is transferred to normal operation. In this stage, the lamp “AUTO IDLE” goes on.	Lamp goes on.

[Standard set values prior to delivery ex-works]

Item	Setting knob	Set prior to delivery ex-works	Setting range
Purge releasing pressure	VR3	80 psi (5.5bar)	50-95 psi (3.5 – 6.6bar)
Purge starting rated of suction pressure	VR2	30%	0 - 80%
Timer for purge mode operation	VR1	10 seconds	10 - 112 seconds

4. Operation

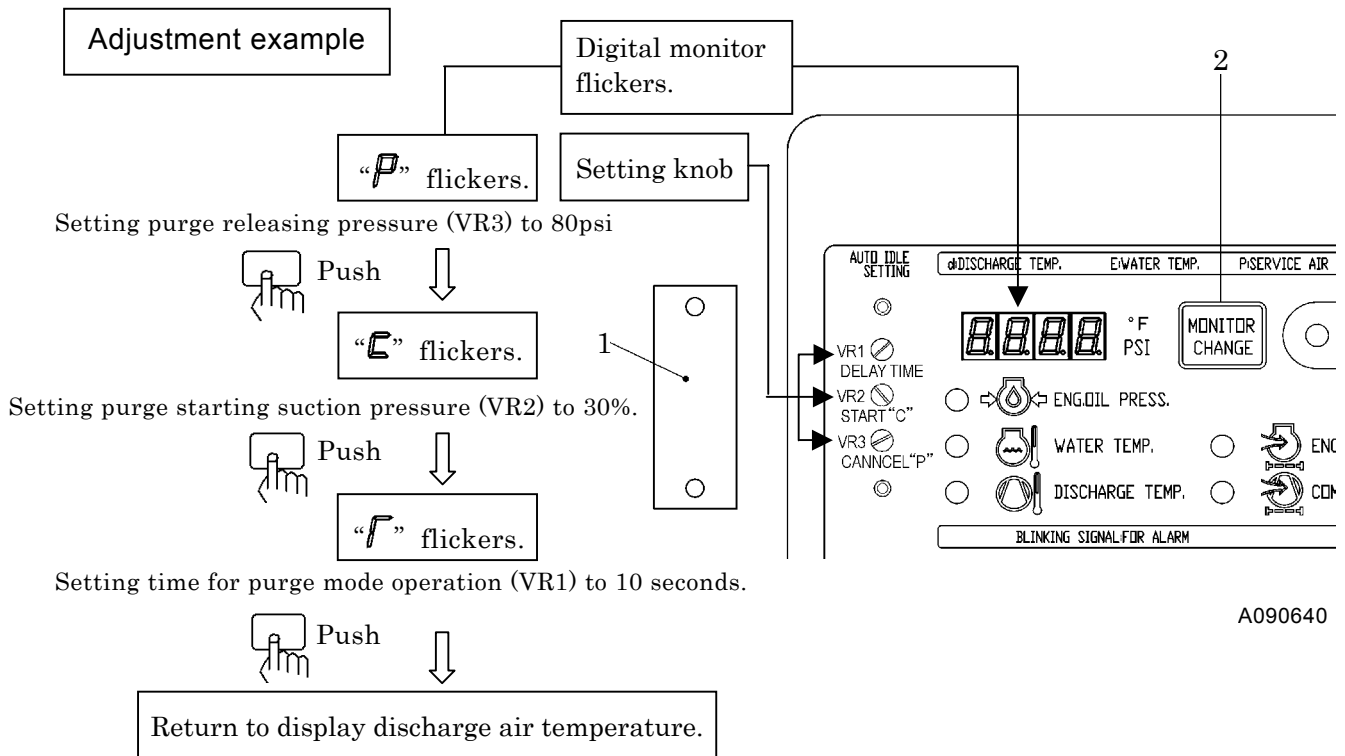
4.7.2 How to adjust setting values of AUTO IDLE(Purge control)

CAUTION

- AUTO IDLE(Purge control) is already arranged prior to delivery from factory. Therefore, it is not necessary to perform any adjustment in usual case.
- For adjustment of VR1, VR2 and VR3, follow the under-mentioned procedures.
- For adjusting set value with knob, turning the knob to left lowers the set value, while turning the knob to right raises the value.

<Procedure>

- ① Remove the cover "1".
- ② Place the starter switch "RUN".
- ③ At first keep pressing digital monitor selector switch "2" for 5 seconds.
- ④ Then, digital monitor "P" flickers. Adjust the purge releasing pressure (VR3) to the set pressure value.
- ⑤ Then push digital monitor selector switch "2" the digital monitor "C" flickers. Then adjust the purge starting suction pressure (VR2) to the set value.
- ⑥ Then push digital monitor selector switch "2" the digital monitor "I" flickers. Then adjust the time (VR1) for purge mode operation to the set value.
- ⑦ Then push the digital monitor selector switch "2" the digital monitor returns to display discharge air temperature.
- ⑧ Install the cover "1".



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5. Periodic Inspection/Maintenance

5.1 Important Items at Periodic Inspection and Maintenance or after Maintenance

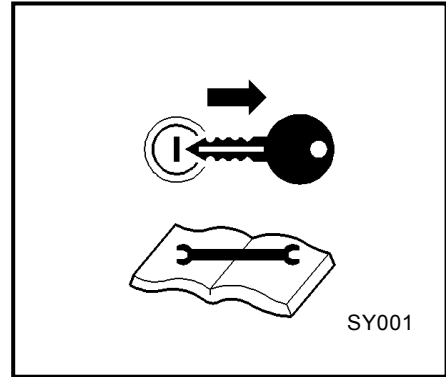
The following table shows the inspection and maintenance intervals under normal operation conditions. When used or operated under hard environmental conditions, it is impossible to warrant the unit even if the above conditions are performed according to the intervals listed in the above table.



WARNING

Hang a "Now Checking and under Maintenance" tag

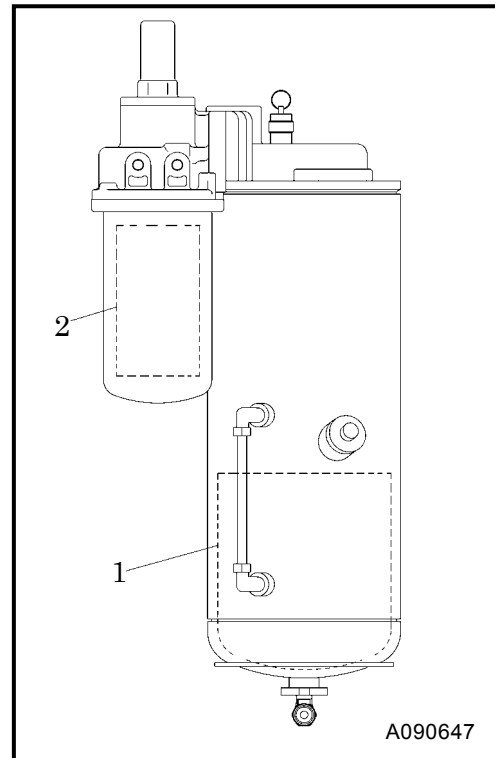
- Remove the starter key from the starter switch before starting inspection, and hang up a "Now Checking and under Maintenance" tag where it can be easily seen. The checker must keep the key during checking and maintenance.
- Remove the negative (-) side cable from the battery.
If the above procedure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



CAUTION

Prevention of oil separator from catching fire

- Be sure to perform oil change basically according to the specified interval. But if such oil is found much more contaminated before the interval, change the oil even before the specified period comes. In doing so, replace the oil completely and use our recommended oil.
- Be sure to perform following periodic inspection and maintenance:
 1. Check and change compressor oil
 2. Change oil separator
- Never mix the oil of different brands, or the mixed oil may deteriorate the oil quality.



5. Periodic Inspection/Maintenance

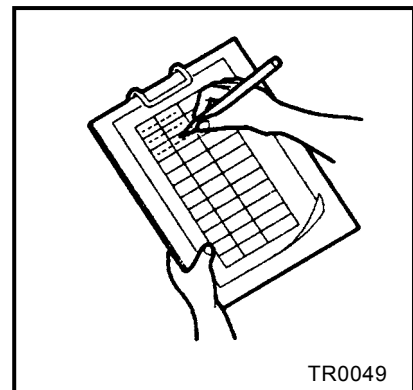
IMPORTANT

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

- Be sure to use recommended fuel, oil, grease, and LLC(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 leakproof 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 Daily Inspection and Operation Log

- Be sure to carry out daily inspection every morning before operation. See Chapter 4 "Operation" of the manual for the details of inspection.
 - Pay attention to and carefully observe the following points during daily operation or inspection and maintenance work. If any trouble or abnormality is found, immediately investigate its cause and make repairs. If the cause is unknown or not traceable, or if the trouble involves a part or component not described in the manual, ask your nearest dealer for information.
- (a) Controls and instruments function properly.
 - (b) Quantity and any leak of water, fuel, and oil or any contamination should be checked.
 - (c) Appearance, abnormal noise or excessive heat should be checked.
 - (d) Loose bolt or nut should be checked.
 - (e) Any damage, wear or shortage of machine components and parts should be checked.
 - (f) Performance of each part or component should be proper.



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- Keep the operation log to record constant inspection of each component, so that trouble of the unit can be easily discovered and preventive measures can be taken.
It is very useful to record information such as discharge pressure, oil level, as well as running hour, maintenance items and replenishment of lubricant on a daily maintenance log.

5. Periodic Inspection/Maintenance

5.3 Periodic Inspection List

(Unit:Hour)

Maintenance	Daily	Every 250	Every 300	Every 500	Every 1,000	Every 2,000	Every 3,000	Page
Check compressor oil level.	○							4-7
Drain separator receiver tank.	○							4-8
Check looseness in pipe connecting part, and wear and tear of pipe.	○							4-9
Check oil, water, fuel and air leak.	○							4-13
Check functions of all instruments and devices.	○							4-13
Change compressor oil.			○ First time	○				5-8
Change compressor oil filter.			○ First time		○			5-9
Clean strainer in the scavenging orifice.				○				5-9
Clean and change air filter element.		○ (Clean)		○ (Change)				5-10
Clean outside of the oil cooler.					○			5-11
Change diaphragm of speed regulator.					☆●			5-11
Change oil separator.						●		5-13
Change nylon tubes.						☆●		5-13
Change o-ring of unloader.							★●	5-14
Change spacer of unloader.					※1●		★●	
Change pressure regulator.							●	5-14
Check hoses.							★●	5-14
Check o-ring of auto-relief valve/ vacuum relief valve.							★●	5-15
Performance check of pressure control valve							●	5-15
Check/Change o-ring of pressure control valve.							★●	5-16
Check/Change piston of pressure control valve.							●	5-16
Check solenoid valve. (In case no abnormality is found, it can be used again.)							●	

Such items marked ○ shall be carried out by customers.

For the following items or clauses marked ●, contact us directly or our distributors because they require expert technical knowledge on them.

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 as time passes.

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

Regarding the item marked ※1, check the function of the unloader. In case the unloader malfunctions, change O-ring or bushing of unloader. This is because either of both parts may be worn out.

5. Periodic Inspection/Maintenance

◎ Refer to engine operation manual for inspection and maintenance of an engine.

(Unit:Hour)

Maintenance		Daily	Every 50	Every 250	Every 500	Every 1,000	Every 2,000	Every 3,000	Page
Engine	Drain fuel tank	○							4-9
	Check sedimenter for condensate	○							4-9
	Check fuel	○							4-8
	Check engine oil level.	○							4-6
	Check coolant level.	○							4-7
	Check looseness in pipe connectors, terminals and tear in wiring.	○							4-9
	Check belt tension.	○							4-10
	Change engine oil.		○ First time	○					5-6
	Change engine oil filter.		○ First time	○					5-7
	Check battery electrolyte.			○					5-7
	Clean and change air-filter element.			○ (Clean)	○ (Change)				5-7
	Clean of element in sedimenter				○				5-10
	Change fuel filter				○				5-11
	Change coolant.					☆○			5-12
	Clean outside of radiator.					○			5-11
	Clean inside of radiator.					●			5-11
	Change fuel rubber hose.						☆●		5-14
	Clean inside of fuel tank.						●		5-13
Change radiator hoses.							☆●	5-16	

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 as time passes.

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		41290 01000 (YANMAR 129150-35153)	1
Air filter element	Compressor side	32143 11800	1
	Engine side	32143 11700	1
Compressor oil filter		37438 05501	1
Fuel filter element		43541 02500 (YANMAR 119802-55801)	1
Element in sedimenter	Element	YANMAR 129242-55730	1
	O-ring(For element)	YANMAR 24311-000160	1
	O-ring(For body)	YANMAR 24321-000750	1
Oil separator	Separator	34220 16101	1
	O-ring	03402 15140	1
Diaphragm of speed regulator		36437 01500	1
Pressure regulator		36400 19000	1
Auto-relief valve & vacuum-relief valve	O-ring "1"	21221 02100	2
	O-ring "2"	03402 25021	2
	O-ring "3"	03402 25008	2
Unloader valve	O-ring "1"	03402 10125	2
	O-ring "2"	03402 10070	1
	O-ring "3"	21441 04800	1
	O-ring "4"	21441 04900	1
Pressure control valve	O-ring "1"	03402 15075	1
	O-ring "2"	03402 25032	1
	Spring "3"	22144 07700	1
	Piston "4"	35303 03300	1
Solenoid valve	For auto idle mode	46811 24100	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 250 hours thereafter]

CAUTION

Caution in filling or discharging engine oil

- 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.
- Supply engine oil slowly and carefully because it may overflow from oil filler port.
- 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.

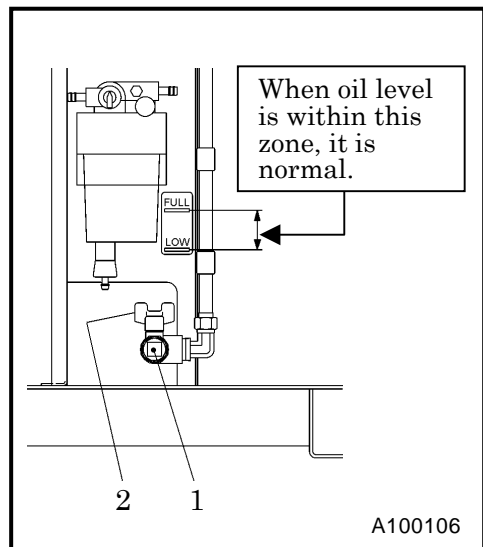


<Procedure> In case of checking and confirming oil level with oil level gauge at operation panel side.

- Place the machine on level ground when checking the oil level.
- ① Remove the drain plug “1” attached outside the plane, open a drain valve “2” inside the plane, and discharge engine oil drain.
- ② When the oil is completely drained, close the drain plug “1” and drain valve “2” firmly and refill new engine oil through the engine oil filler “3” .

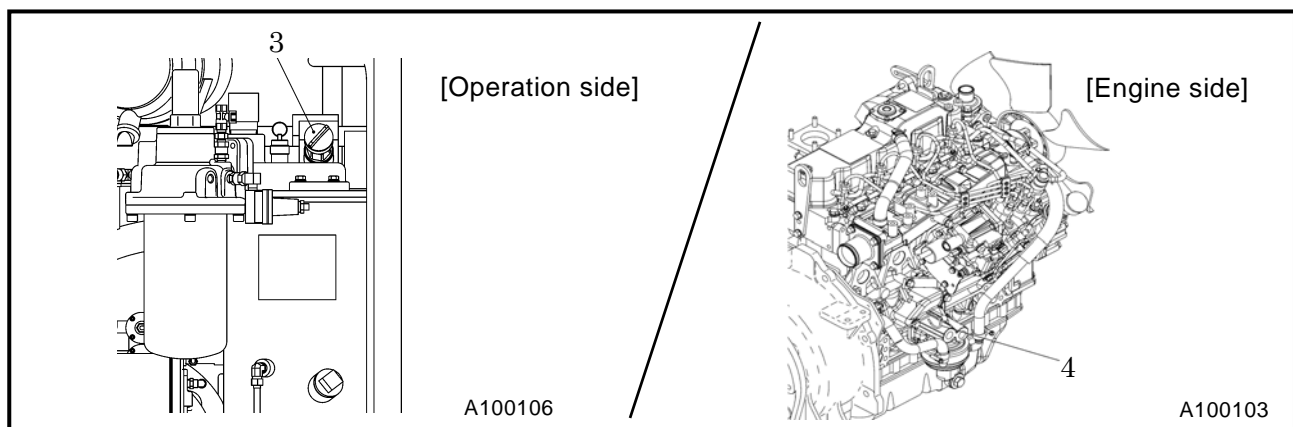
[Quantity of oil : approx.1.95gal.(7.4L)]

- ③ After replenishment is finished, check and confirm that oil level is between “FULL” and “LOW” .



IMPORTANT

- Unless unit is placed on level, correct oil level will not be checked and confirmed.
- When changing engine oil, drainage takes a longer time if oil is cold. but it is absolutely necessary to drain oil completely without fail.



<Procedure> In case of checking and confirming oil level with engine level gauge.

- ① Remove the drain plug “1” attached outside the plane, open a drain valve “2” inside the plane, and discharge engine oil drain.
- ② When the oil is completely drained, close the drain plug “1” and drain valve “2” firmly and refill new engine oil through the engine oil filler “3”
- ③ After supplying oil, pull out the oil level gauge “4” and wipe it out.
- ④ Then, re-insert the oil level gauge “4” fully and pull it out again. If the dipstick shows the oil level between upper limit and lower limit, it is normal.

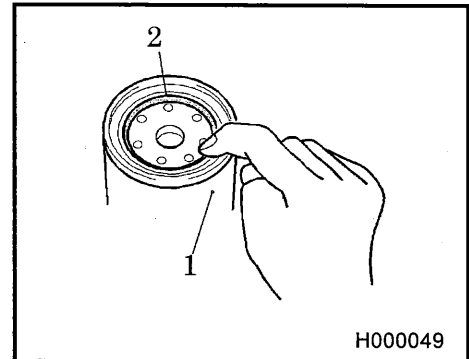
5. Periodic Inspection/Maintenance

5.5.2 Change engine oil filter

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

< Procedure >

- ① Remove the cartridge "1", using a filter wrench.
- ② Screw in the new cartridge "2" with the packing coated slightly with oil. (See 5.4)
- ③ After the packing touches the sealing face, tighten another 1 turn by hand.
- ④ After installing the oil filter, check it for any leak during operation.



5.5.3 Check battery electrolyte [Every 250 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:

1. 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 6.1. for method of specific gravity measurement and recharging the battery.

2. Enclosed type battery:

Check the indicator on top surface of the battery.

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

5.5.4 Check and clean air filter element [Every 250 hours]

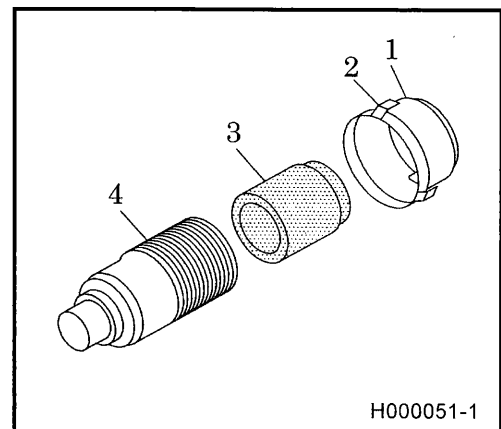
IMPORTANT

Cleaning of Air Filter Element should be perfectly performed

- Clogged or cracked or pitted element could allow entrance of dust into engine and compressor to cause earlier wear of moving parts. Periodical inspection and cleaning of element should be performed to maintain life of compressor and engine long.

< Procedure >

- ① After removing the cap "1" by loosening its latch "2", clean its interior properly.
- ② Remove the element "3", and clean it.
- ③ When installing the cap "1" after finishing the cleaning job, push the element into the case "4" surely by hand, and then make sure that the latch "2" fixing the cap surely hooks the case "4". Finally tighten it.
- ④ If the element is found heavily dusty, replace it with a new one. (See 5.4)



5. Periodic Inspection/Maintenance

5.5.5 Change compressor oil

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

WARNING

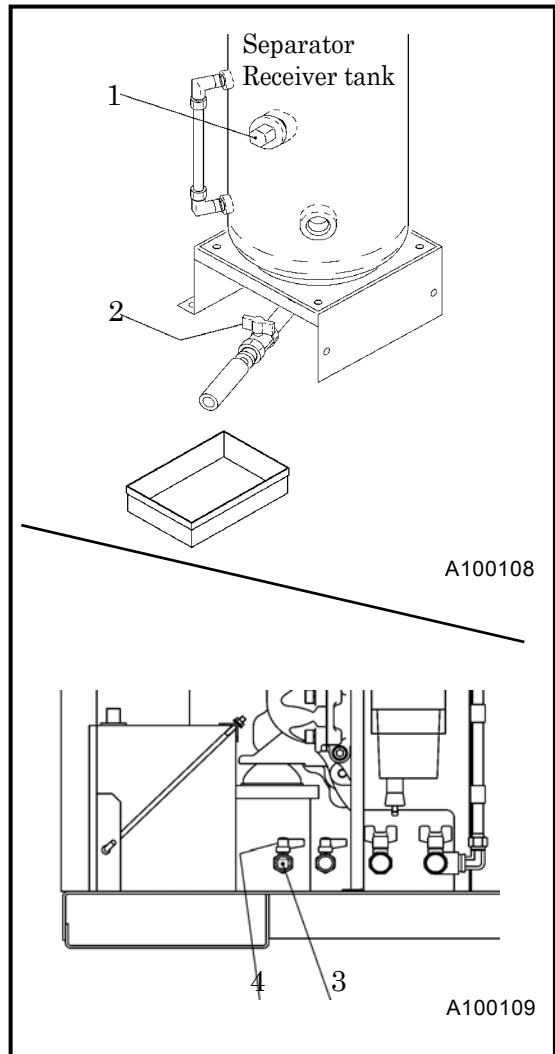
Refilling of compressor oil

- 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 receiver tank could force both extremely hot compressed air and oil to jet out and you may be scalded or seriously injured.
- Even continuous oil replenishment cannot improve its deteriorated condition. Be sure to change the oil completely at every scheduled interval.
- Do not mix it with other brand oil, or it will cause poor performance and shorten the life of the compressor oil. (But fresh compressor oil could accept a mixture of small amount of different brands.)
- Running the unit with old and deteriorated compressor oil will cause damage to bearings, or serious accident like ignition in a separator receiver tank. Be sure to change the oil completely at every scheduled interval.
- Follow the designated regulations to dispose of compressor oil.



< Procedure >

- ① Remove the oil filler cap “1” of separator receiver tank.
 - ② Open drain valve “2” to discharge waste oil from the tank.
 - ③ After removing drain plug “3” of oil cooler, open drain plug “4” provided inside and also dispose of condensed oil and water from oil cooler.
 - ④ Completely discharge all the oil left separator receiver tank, pipes and oil cooler. If wasted oil is left in the unit, this residual oil will greatly shorten the life of the newly replenished oil.
 - ⑤ Be sure to close drain valves “2” , “4” and close the drain plug “3” after the used oil is completely discharged.
 - ⑥ Fill the designated quantity of new oil through the oil filler port. **[Quantity of oil : approx.3.96gal.(15L)]**
 - ⑦ After oiling, tighten the cap “1” in its place while paying attention not to let dust get in the tank.
 - ⑧ Start the engine for a short while, then replenish the oil to fill shortage. Repeat this procedure for 1 to 2 times to check if the oil level has reached its appropriate point. Be careful not to overfill the oil.
- When changing compressor oil, drainage takes a longer time if oil is cold. But it is absolutely necessary to drain compressor oil completely without fail.



5. Periodic Inspection/Maintenance

5.5.6 Change compressor oil filter

[At 300 hours for the first change and every 1,000 hours thereafter]

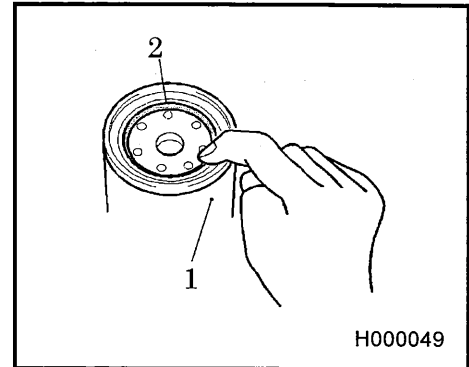
IMPORTANT

Use our genuine oil filter

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

< Procedure >

- ① Remove the cartridge "1", using a filter wrench.
- ② Screw in the new cartridge "1" with the packing "2" coated slightly with oil. (See 5.4)
- ③ After the packing "2" 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.

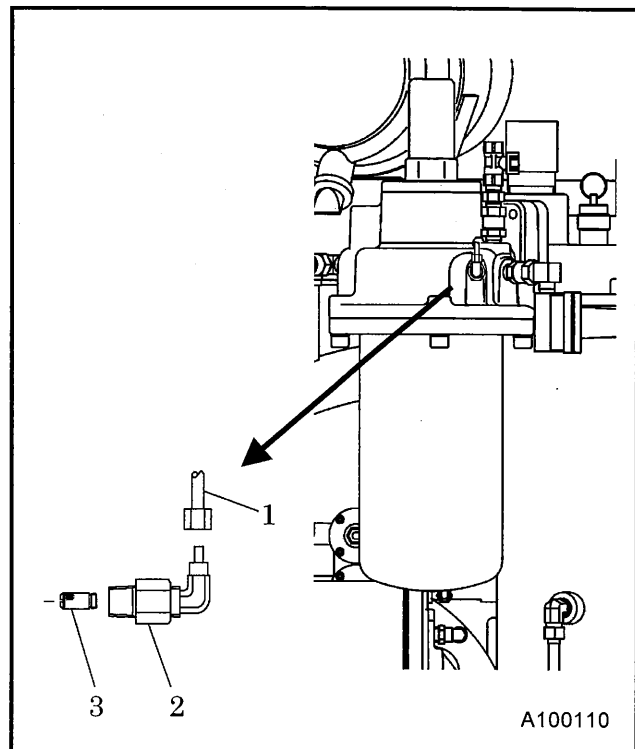


5.5.7 Clean strainer in the scavenging orifice

[Every 500 hours]

< Procedure >

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



5. Periodic Inspection/Maintenance

5.5.8 Change air filter element

[Every 500 hours]

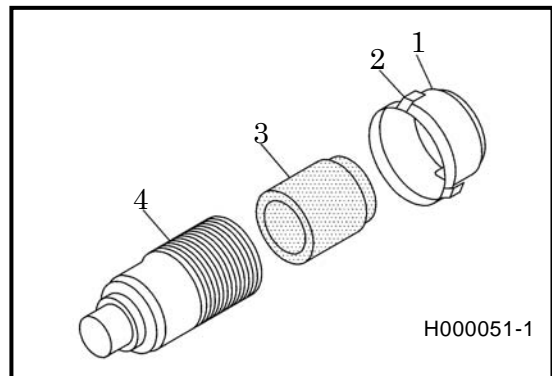
IMPORTANT

Use our genuine part

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

<Procedure>

- ① After removing the cap "1" by loosening its latch "2", clean its interior properly.
- ② Remove the element "3" and then replace it with a new one. (See 5.4)
- ③ When installing the cap "1" after replacing it, properly push the element into the case "4" by hand and then make sure that the hooks for fixing the cap are surely set. Finally tighten it.

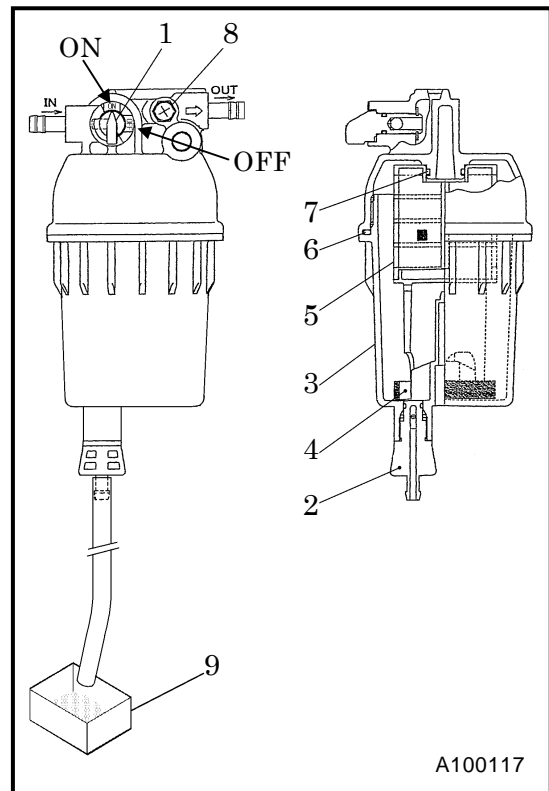


5.5.9 Clean of element in sedimenter

[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 "3" because it is filled with fuel. Wipe out split fuel completely.
 - ④ Remove float "4" inside cup "3"
 - ⑤ Washing element "5" and the cup inside with new fuel.
 - ⑥ Replace element "5" and O ring "6", "7" if they are found broken or damaged. (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.



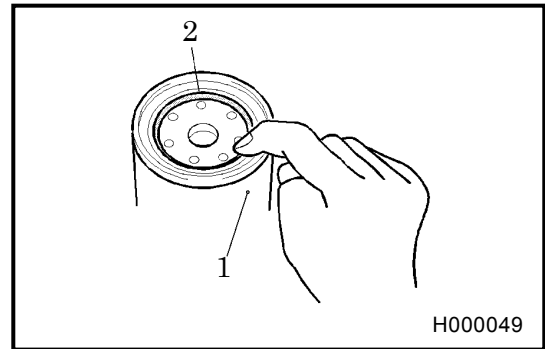
5. Periodic Inspection/Maintenance

5.5.10 Change fuel filter

[Every 500 hours]

<Procedure>

- ① Take out the cartridge “1” by using a filter wrench.
- ② After coating fuel on the new cartridge “1” packing “2”, screw it in. (See 5.4)
- ③ After the packing “2” touches the sealing face, tighten it by approximately two-thirds turn using the filter wrench.
- ④ Bleed the air of fuel. (See 4.6)
- ⑤ After installing the fuel filter, check for fuel leakage during operation.

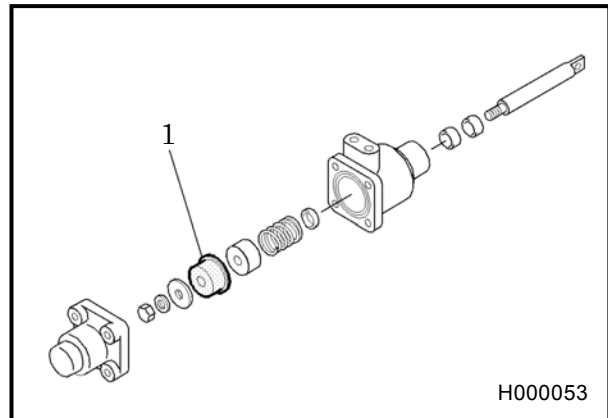


5.5.11 Change diaphragm of speed regulator

[Every 1,000 hours]

<Caution during diaphragm replacement>

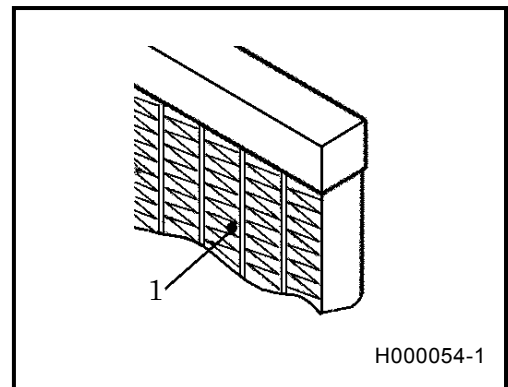
- When installing diaphragm “1”, be sure to use the special jig to prevent it from twisting.
- Before installing diaphragm “1”, be sure to apply molybdenum disulfide (paste spray) to inside of the diaphragm “1”.
- Install it so that its outside surface should be rubber and its inside cloth. (See 5.4)
- Replacing speed regulator requires expert technical knowledge. So contact directly us or distributor.



5.5.12 Clean outside of the Radiator and 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 diaphragm “1”, from being damaged.



5.5.13 Clean inside of Radiator

[Every 1,000 hours]

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

5. Periodic Inspection/Maintenance

5.5.14 Change Coolant

[1,000 hours or every 2 years]



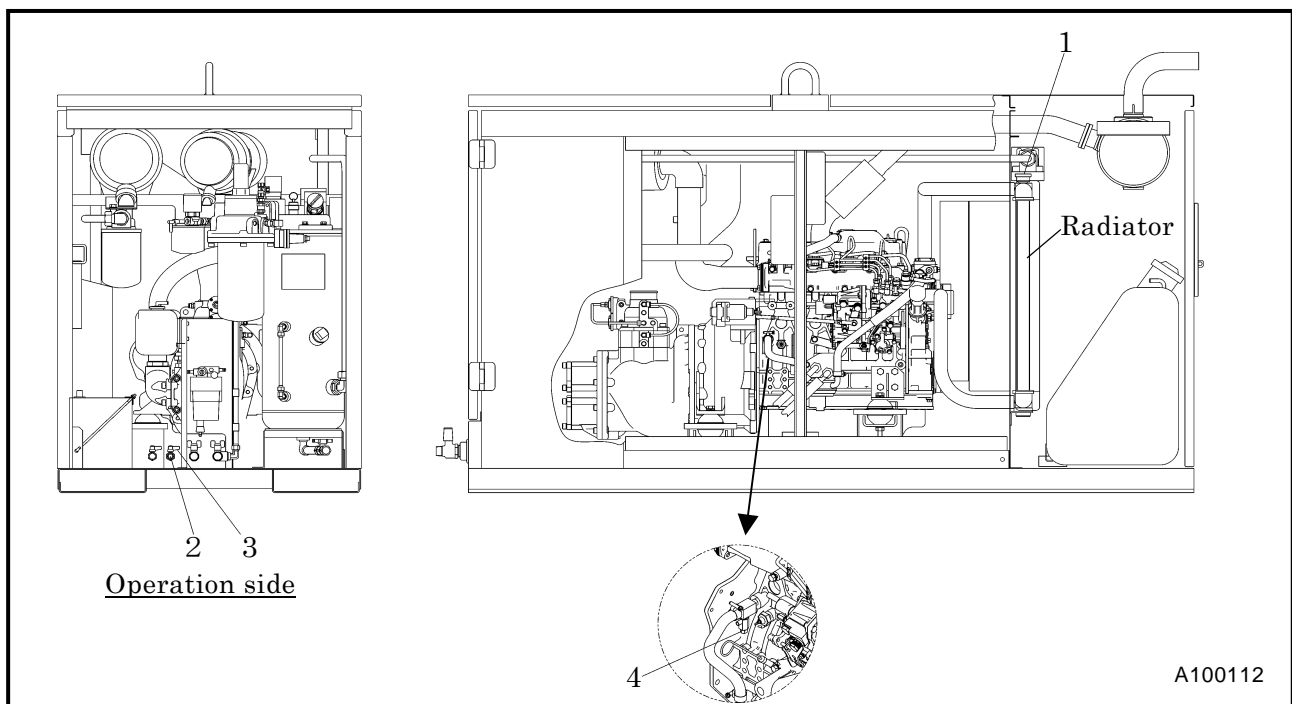
Caution in filling or discharging engine oil

- Be sure to stop the machine and allow time to cool. Then loosen the radiator cap one notch. After the coolant water is sufficiently cooled and the inner pressure is released, take the cap off.
If this procedure is neglected, the inner pressure can blow off the cap. Steam jetting out of the radiator could result in causing scalding. Follow this procedure under all circumstances.
- 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.



<Procedure>

- ① To drain coolant, remove the radiator cap "1" Remove operation side radiator drain plug "2" and open drain valve "3" for drainage.
 - ② Loosen the drain plug "4" provided on engine to drain engine.
 - ③ After drainage is finished, tighten drain plug "2", "4" and then close radiator drain valve "3".
- [Quantity of water : approx.1.6gal.(6.0L)]**
- ③ After changing the coolant, operate the machine for 2 to 3 minutes at the unloaded condition and stop it. Then check the coolant level again, and replenish if it is short.



5. Periodic Inspection/Maintenance

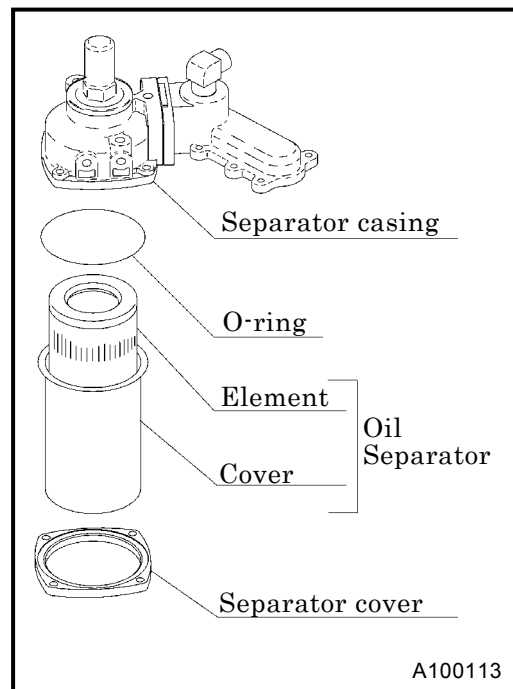
5.5.15 Change Oil Separator

[Every 2,000 hours]

IMPORTANT

- When changing the oil separator, both cover and element must be replaced with new ones.

- Even before the periodic interval time of replacement, replace the oil separator whenever the oil consumption increases and also oil is found mixed in the discharge air.
- When consumption of the oil is still unusual even after cleaning strainer in the scavenging orifice (See 5.5.7), change the oil separator with a new one. (See 5.4)
- Replacement of the oil separator requires expert technical knowledge. So contact directly us or distributor.



5.5.16 Change Nylon Tubes

[Every 2,000 hours]

- Replace nylon tubes used for the oil and air pipings.
- Replacement of the nylon tube requires expert technical knowledge. So contact directly us or distributor.

5.5.17 Clean inside of Fuel Tank

[Every 2,000 hours]

- Cleaning the inside of fuel tank. requires expert technical knowledge. So contact directly us or distributor.

5. Periodic Inspection/Maintenance

5.5.18 Change Fuel rubber 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.
- Replacement of the fuel rubber hoses requires expert technical knowledge. So contact directly us or distributor.

5.5.19 Change Pressure Regulator

[Every 3,000 hours]

- Remove pressure regulator and replace with a new unit. (See 5.4)

5.5.20 Change O-Ring of Unloader

[3,000 hours or every 3 years]

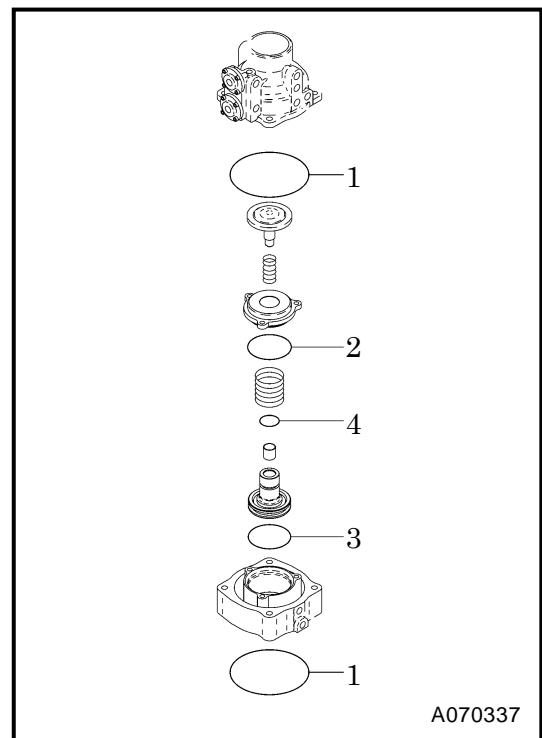
IMPORTANT

- 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.

(Caution during O-ring replacement)

Supply grease to O-ring "1", "2", "3", "4" after replacement. (See 5.4)

- Replacement of O-ring requires expert technical knowledge. So contact directly us or distributor.



5.5.21 Check Hoses

[3,000 hours or every 3 years]

- Check hoses used for oil piping for any crack or tear, and replace when an abnormality is found.
- Replacement of the hoses requires expert technical knowledge. So contact directly us or distributor.

5. Periodic Inspection/Maintenance

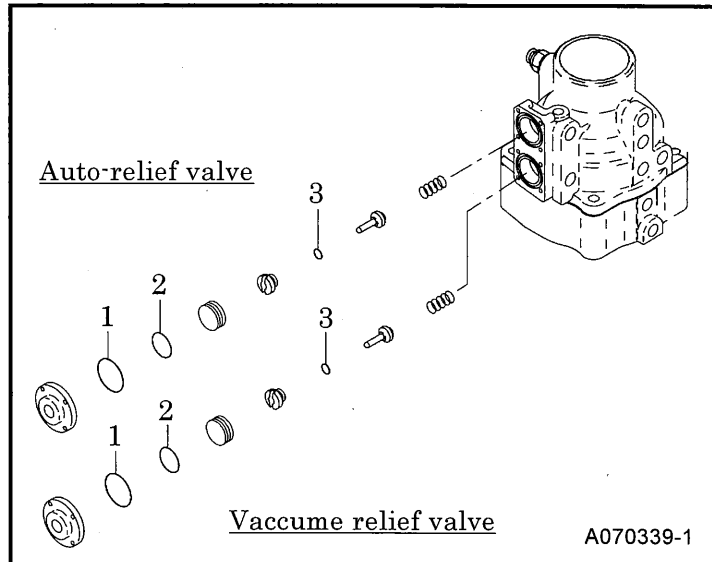
5.5.22 Check o-ring of auto-relief valve/ vacuum relief valve

[3,000 hours or every 3 years]

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.

- Disassemble and clean the component, and check O-ring "1", "2", "3". Then, replace O-ring "1", "2", "3", if hardened. (See 5.4)
- Replacement of O-ring requires expert technical knowledge. So contact directly us or distributor.



5.5.23 Performance Check of Pressure Control Valve

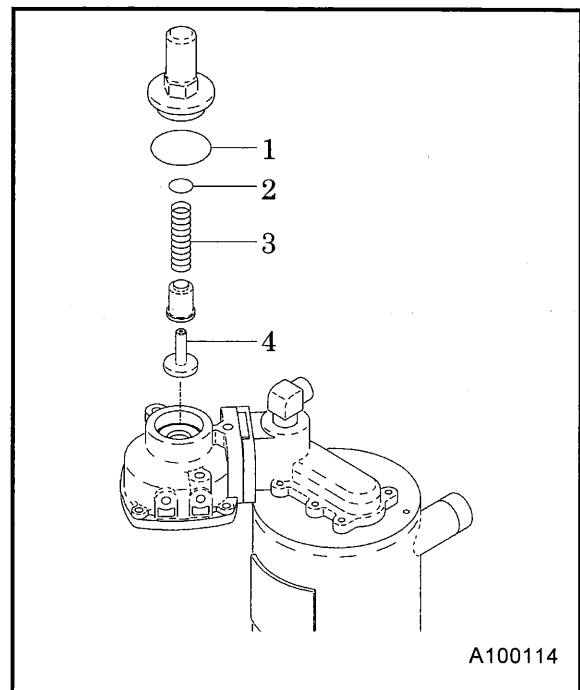
[3,000 hours or every 3 years]

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.

<Procedure>

- ① When fully opening the air valves while the machine is running, make sure that the discharge pressure gauge shows the figure between 49-68psi(3.4-4.7bar).
- ② When the pressure is lower than 49psi(3.4 bar) , replace spring "3" with a new one. (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.



5. Periodic Inspection/Maintenance

5.5.24 Check Pressure Control Valve O-Ring and Piston

[3,000 hours or every 3 years]

- Disassemble and clean the component, and check O-ring “1” , “2” and the piston “4” shown in 5.5.23. Then, replace O-ring “1” , “2” and rubber on the piston “4” , if they are hardened.
(See 5.4)
- After replacement, run the machine to check its function (See 5.5.23), air-leak or any disorder.
- Replacement of O-ring requires expert technical knowledge. So contact directly us or distributor.

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.
- Replacement of the radiator hoses requires expert technical knowledge. So contact directly us or distributor.

6. Maintenance

6.1 Maintenance of Battery

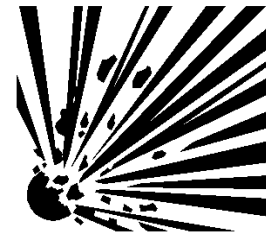


- Keep flames away from battery.
- Battery may generate hydrogen gas and may explode.
- Therefore, recharging should be done at a well-ventilated place.
- Do not spark near the battery nor light a match, nor bring lit cigarette and match close to the battery.
- Do not check the battery by short-circuiting 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" and "LOWER" level without any delay.
- 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.
- When you deal with a battery, please be sure to wear protection implements, such as protection glasses and a glove.
- 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.
- Dispose of battery, according to the designated regulations.

Handling battery



D004



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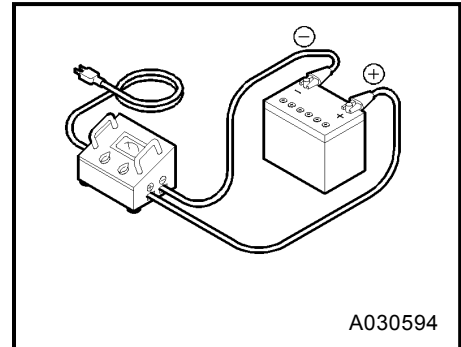


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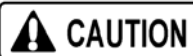
6. Maintenance

6.1.1 Charge Battery

- Be sure to read the operation manual of the battery charger to know if it is applicable, before using it.
- Disconnect the cable between battery and the unit, 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.



6.1.2 How to Use Booster Cable

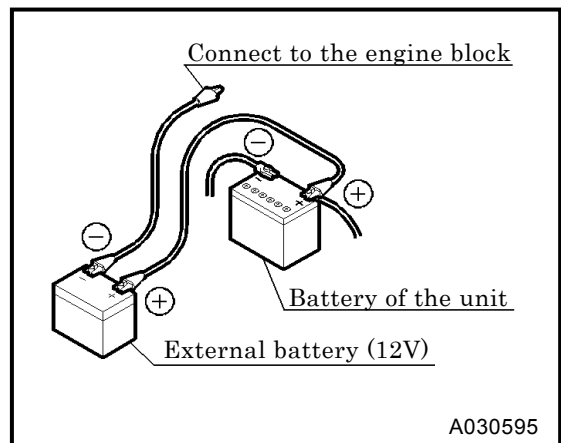


Do not connect the cable reversely

- If a booster cable has to be used or when cables are connected at battery replacement, be careful not to connect (+) and (-) terminals backwards. Such a wrong-connection will cause spark and damage each component.

<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 in reverse procedure.



6. Maintenance

6.2 Troubleshooting

- Should any trouble occur 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 unit, the faster you can find a problem and solution.
- This chapter describes the state, cause and countermeasures of important troubles in detail:

Symptom	Cause	Countermeasures
Low starter revolution speed.	(1) Battery malfunction.	Check battery→ Charge, change
Starter rotates but engine does not start.	(1) Fuel filter clogging. (2) Malfunction of fuel cut solenoid. (3) No fuel.	Disassemble, clean, and change Check fuse Change solenoid Check connector Replenish fuel
※Engine does not reach its maximum speed.	(1) Improper length in speed regulator rod. (2) Orifice clogging. (3) Faulty speed regulator. (4) Engine trouble. (5) Fuel filter clogging. (6) Water accumulated in sedimentor (7) Air filter element clogging.	Re-adjust Disassemble/Clean Disassemble/Check Call your nearest dealer Disassemble/Change Drain water Clean element or change
Revolution drops before discharge air pressure reaches 100psi(6.9bar).or discharge air pressure does not reach 100psi(6.9bar)	(1) Pressure regulator insufficient adjustment. (2) Trouble of pressure regulator.	Re-adjust (Fasten) Change
Engine does not reach minimum speed at unload.	(1) Improper length in speed regulator rod. (2) Faulty speed regulator.	Re-adjust Disassemble/Check
Safety valve relieves at unload.	(1) Pressure regulator insufficient adjustment. (2) Faulty speed regulator (3) Unloader damaged (4) Faulty safety valve. (5) Improper length of speed regulator rod	Re-adjust (loosen) Disassemble/Check Disassemble/Check Change Re-adjust (elongate)
Oil mixes in Air. (Poor oil separation)	(1) Scavenging orifice strainer clogging. (2) Excessive oil in tank. (3) Low discharge pressure. (4) Oil separator deteriorated.	Disassemble/Clean Drain to its proper level Disassemble/pressure Control valve/check Disassemble/Change
Insufficient free air delivery.	(1) Air filter element clogging. (2) Unloader valve cannot fully open. (3) Engine does not reach its maximum speed. (4) Air leak	Clean element or change Call your nearest dealer See above※ Check air leak from piping

6. Maintenance

Symptom	Cause	Countermeasures
Engine oil pressure lamp goes on. and engine stops.	(1) Engine oil shortage. (2) Engine oil filter clogging. (3) Faulty oil pressure switch. (4) Loosened or disconnected wiring or connector.	Replenish oil Change Change Check/Fasten
Water temperature lamp goes on. and engine stops.	(1) Radiator clogging. (2) Faulty thermostat. (3) Faulty coolant temp. switch. (4) Low coolant level. (5) Belt slippage. (6) Loose wiring, connectors and disconnection	Clean Change Change Replenish Re-adjust tension/change Check/retighten
Discharge air temperature lamp goes on. and engine stops.	(1) Oil cooler clogging. (2) Compressor oil filter clogging. (3) Faulty discharged air temp. switch. (4) Loose wiring connectors and disconnection. (5) Slippage of belt. (6) Shortage of compressor oil. (7) Malfunction of by-pass valve	Clean Change Check/inspect Check and retighten Re-adjust tension/change Replenish oil Check/change

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

7. Storage of the Unit

7.1 Preparation for Long-term Storage

When the unit 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 unit in a temporary cabin if it is stored outside. Avoid leaving the unit outside with a sheet cover directly on the paint for a long time, or this will cause rust to the unit.
- 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 Spread lubricant on moving parts like speed regulator and rod end, beforehand.
- ③ Completely charge the battery and disconnect grounding wires. Remove the battery from the unit, if possible, and store it in a dry place. (Charge the battery at least once every month.)
- ④ Drain coolant and fuel from the unit.
- ⑤ 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 getting in the unit.
- ⑥ Be sure to repair any trouble and maintain the unit so that it will be ready for the next operation.

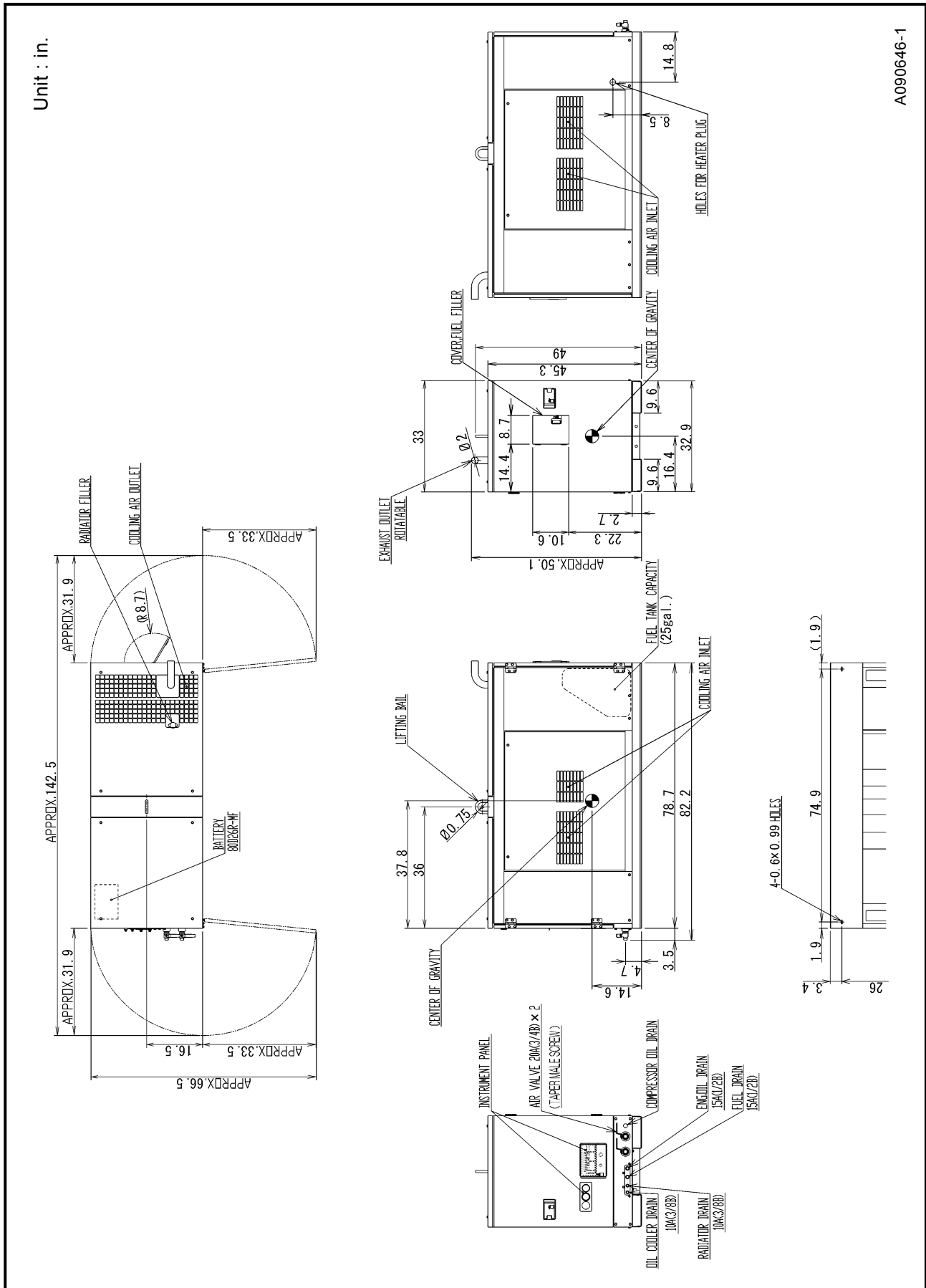
8. Specifications

8.1 Specifications

Model		PDS185S-5C2		
Compressor	Type		Single-stage oil cooled, screw type compressor	
	Free air delivery	cfm (m ³ /min)	175 (5.0)	
	Working pressure	psi (bar)	100 (6.9)	
	Lubricating system		Forced Lubrication by compressed pressure	
	Driving system		Direct driving with gear coupling	
	Receiver tank capacity	cu in. (m ³)	1,221 (0.020)	
	Lubricating oil capacity	gal. (L)	3.96 (15)	
Engine	Model		YANMAR 4TNV88-BDHK	
	Type		Water-cooled 4-cycle direct injection type	
	Number of cylinders, bore stroke	in. (mm)	4-3.46in. × 3.54in. (4- 88mm × 90 mm)	
	Total displacement	cu in. (L)	133.6 (2.190)	
	Rated output	Gross	kW/min ⁻¹	36.4/ 3,000
		Net		34.5/ 3,000
	Lubricating oil capacity	gal. (L)	2.0 (7.4)	
	Coolant capacity (including radiator)	gal. (L)	1.6 (6.0)	
	Battery		80D26R (12V) equivalent	
	Fuel tank capacity	gal. (L)	25 (95)	
General Specifications	Overall length	in. (mm)	78.7 (2,000)	
	Overall width	in. (mm)	33 (838)	
	Overall height (Bonnet only)	in. (mm)	43.5 (1,150)	
	Overall height	in. (mm)	50.1 (1,273)	
	Net dry mass	lb (kg)	1,687 (765)	
	Operating mass	lb (kg)	1,929 (875)	

8. Specifications

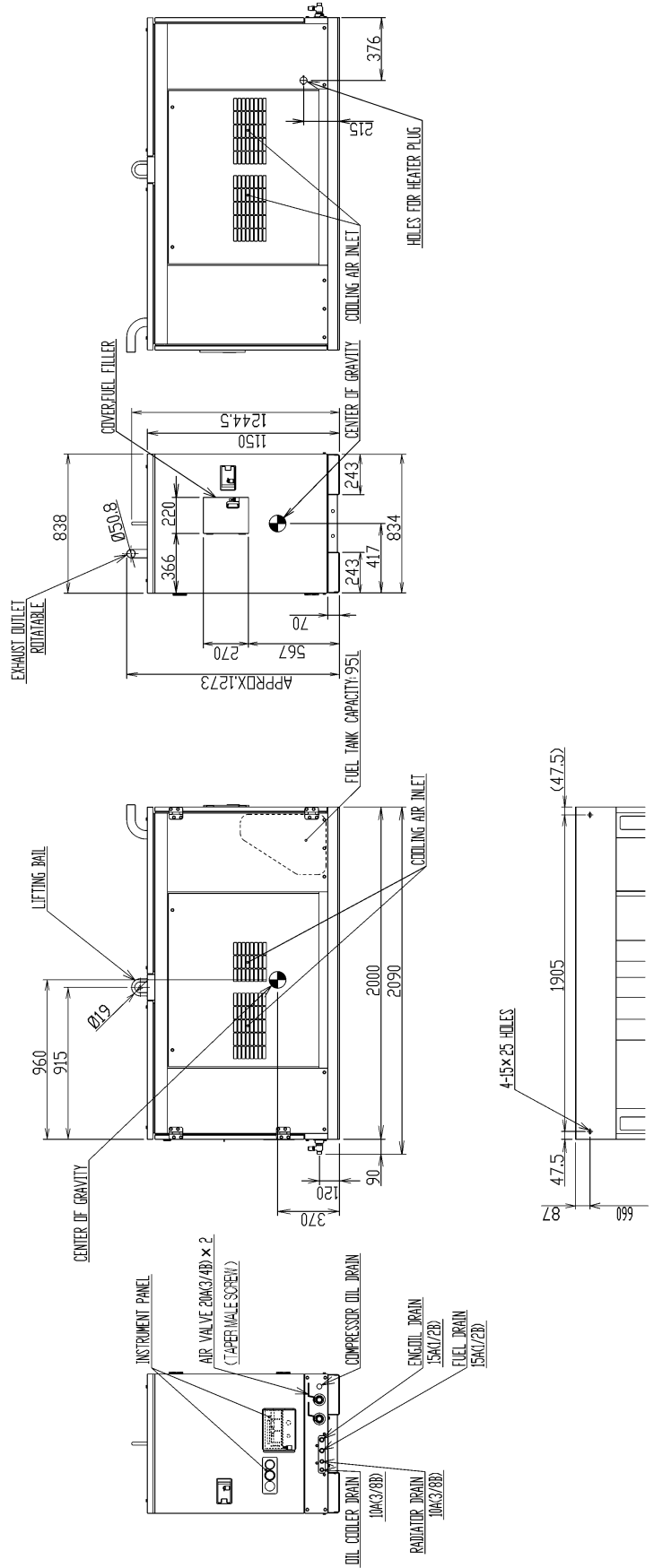
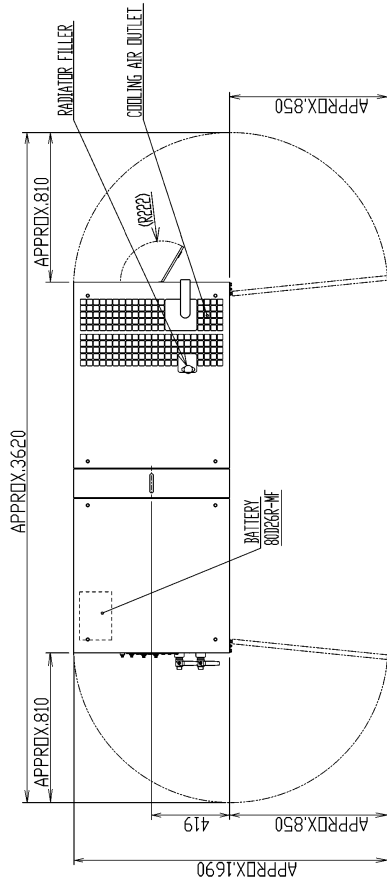
8.2 Outline drawing



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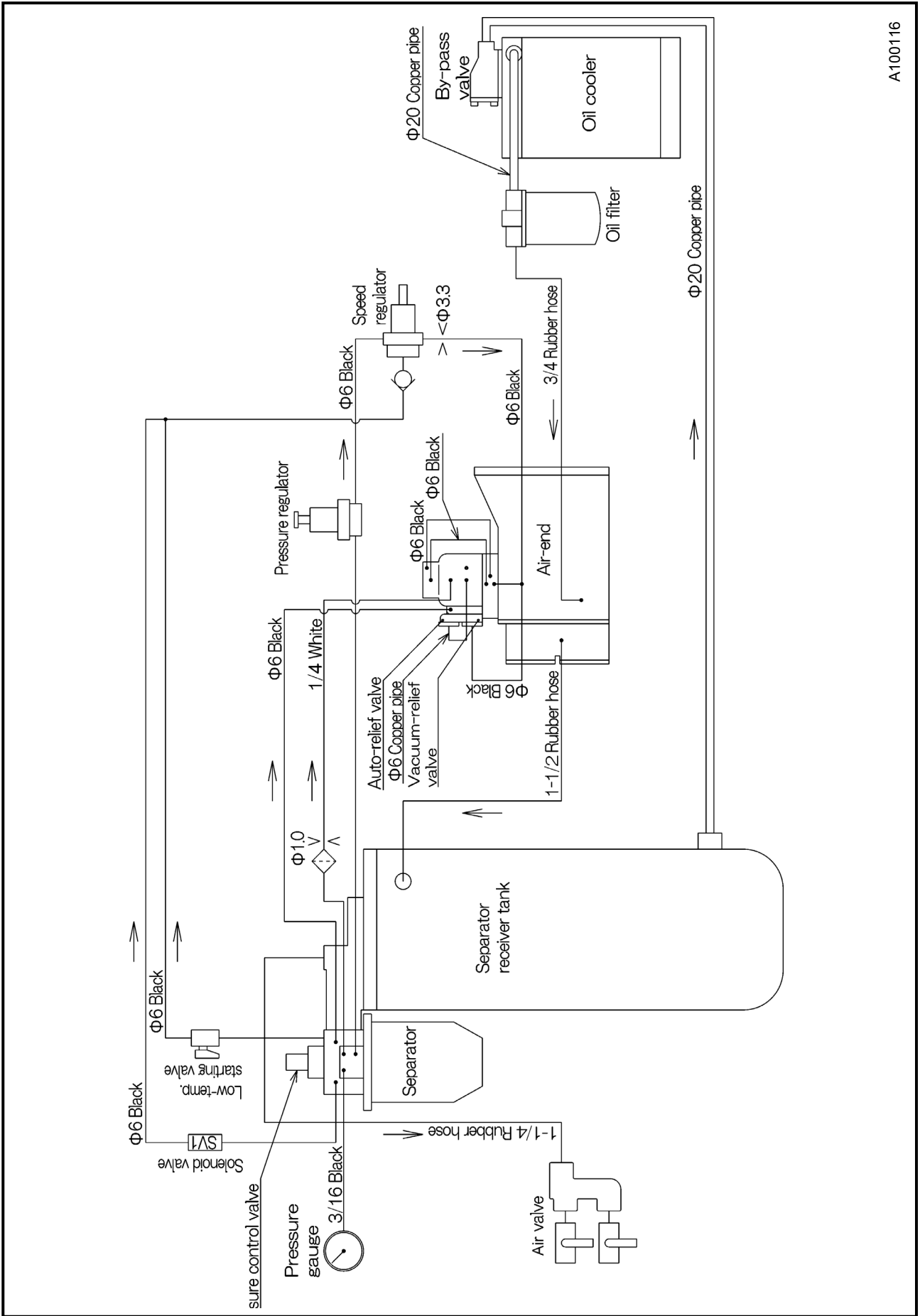
8. Specifications

Unit : mm



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10.Piping Diagram



A100116

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