No. E28442 01404A

Engine Compressor

Instruction Manual

DAS-100 LB / LB-C
180 LB / LB-C

- Before using, be sure to read this manual for the sake of safety.
- Be sure to observe the items under symbol marks "⚠ WARNING" and "⚠ CAUTION" for the sake of safety.
- Always keep this manual at your machine for the sake of safety.

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FOREWORD

◆ Your machine is a portable type diesel engine compressors.

◆ Do not install, operate or repair this machine without reading this operating manual.

◆ This compressor (machine) must be operated by a person having sufficient knowledge and skill for the sake of safety.

◆ This instruction manual describes proper handling and necessary maintenance of your compressor to use it as efficiently as possible.

Improper handling may result in a serious or fatal accident. Read this manual carefully and understand the contents before using your compressor.

Be sure to read "Safety Precautions" on pages 1 to 10 and items marked with ⚠**Warning** and ⚠**Caution** to ensure safety.

◆ Keep this manual with your compressor so you can refer to it as required during operation.

◆ See the separately supplied instruction manual of the engine for detailed maintenance procedures.

◆ See the attached product warranty clause for details of product warranty.

- If this manual becomes illegible by spot or damage, contact distributor or our office to get a new manual.

- Note that the contents of this manual may slightly differ from the description of your compressor because of modification of equipment specifications and other reasons.

- Contents -

1. Safety Precautions

In order to ensure safe operation, the following symbols are used for explanation of the machine operation.

The following symbols, found throughout this manual, alert you to potentially dangerous conditions to the operator, service personnel, or the equipment.

⚠WARNING: This symbol refers to a hazard or unsafe practice which can result in severe personal injury or death.

⚠CAUTION: This symbol refers to a hazard or unsafe practice which can result in personal injury or product or property damage.

[Note]: This symbols show handling precautions for effective operation and many years of satisfactory operation.

Some of the items shown by "⚠CAUTION" may also cause death or serious injury. Be sure to observe all the items, as they are important for safe operation.

* If the machine is used by an outsider, you are requested to explain him correct handling and advise him to read this instruction manual carefully.
* Do not modify the machine at your discretion, as it affects the safety, or the life of the machine.
* If the machine is modified or it is used incorrectly against this manual or unauthorized parts are used, the warranty of manufacturer will become invalid.

Safety label

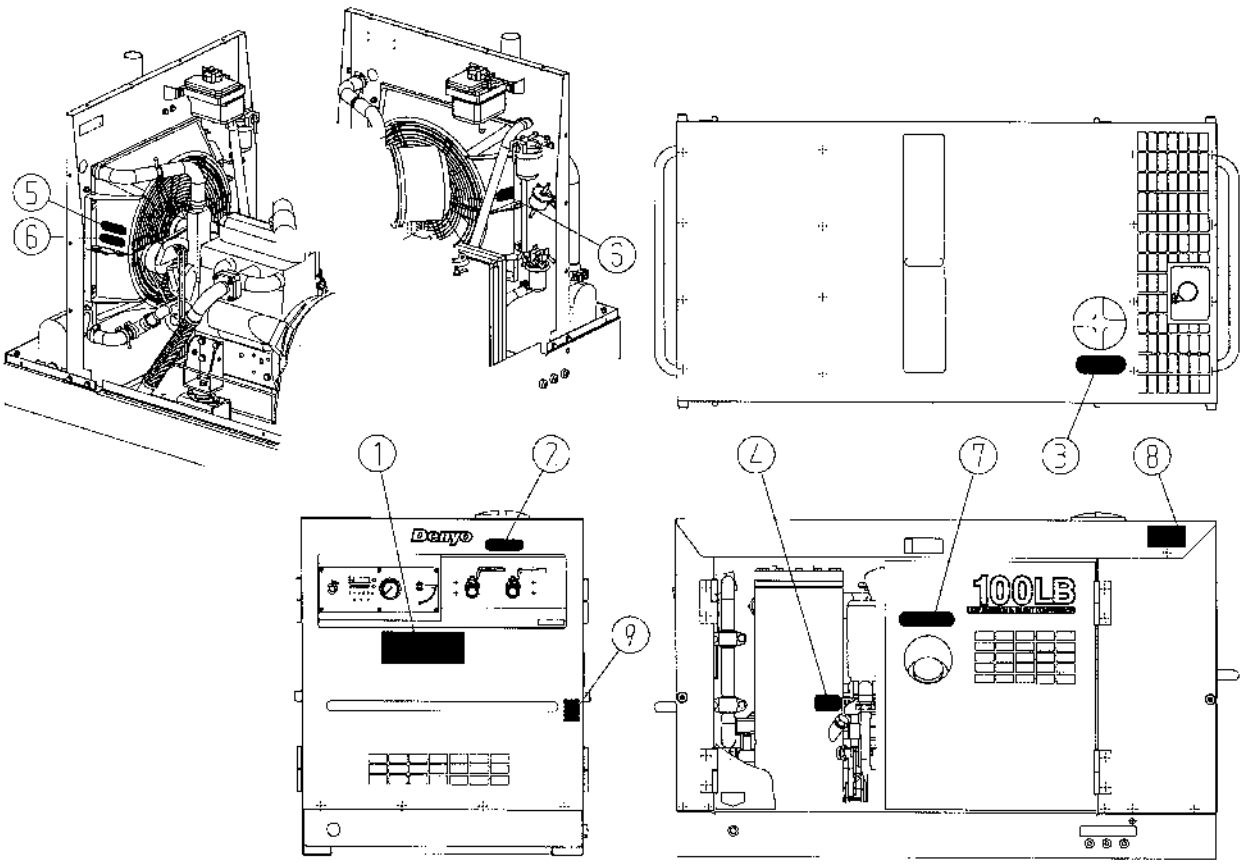
Safety labels are attached to the following positions of the machine.

* Keep these safety labels clean at all times.
* When safety labels are spoiled or lost, contact distributor or our office specifying the nameplate No. shown below and ask for new ones.

DAS-100LB / LB-C

1. Safety Instructions (E9111 0120)
   Warning : Engine exhaust
   Warning : The air delivered
2. Caution : Residual pressure (E9411 0120)
3. Warning : Hot coolant (B9041 0030)
4. Caution : High pressure (E9411 0110)
5. Caution : Hot parts (E9042 0010)
6. Warning : Moving parts (B9040 0100)
7. Warning : Diesel fuel (B9045 0220)
8. Warning : Against exhaust gas (B9052 0000A)
9. Caution : Support Hook (B9121 0020B)

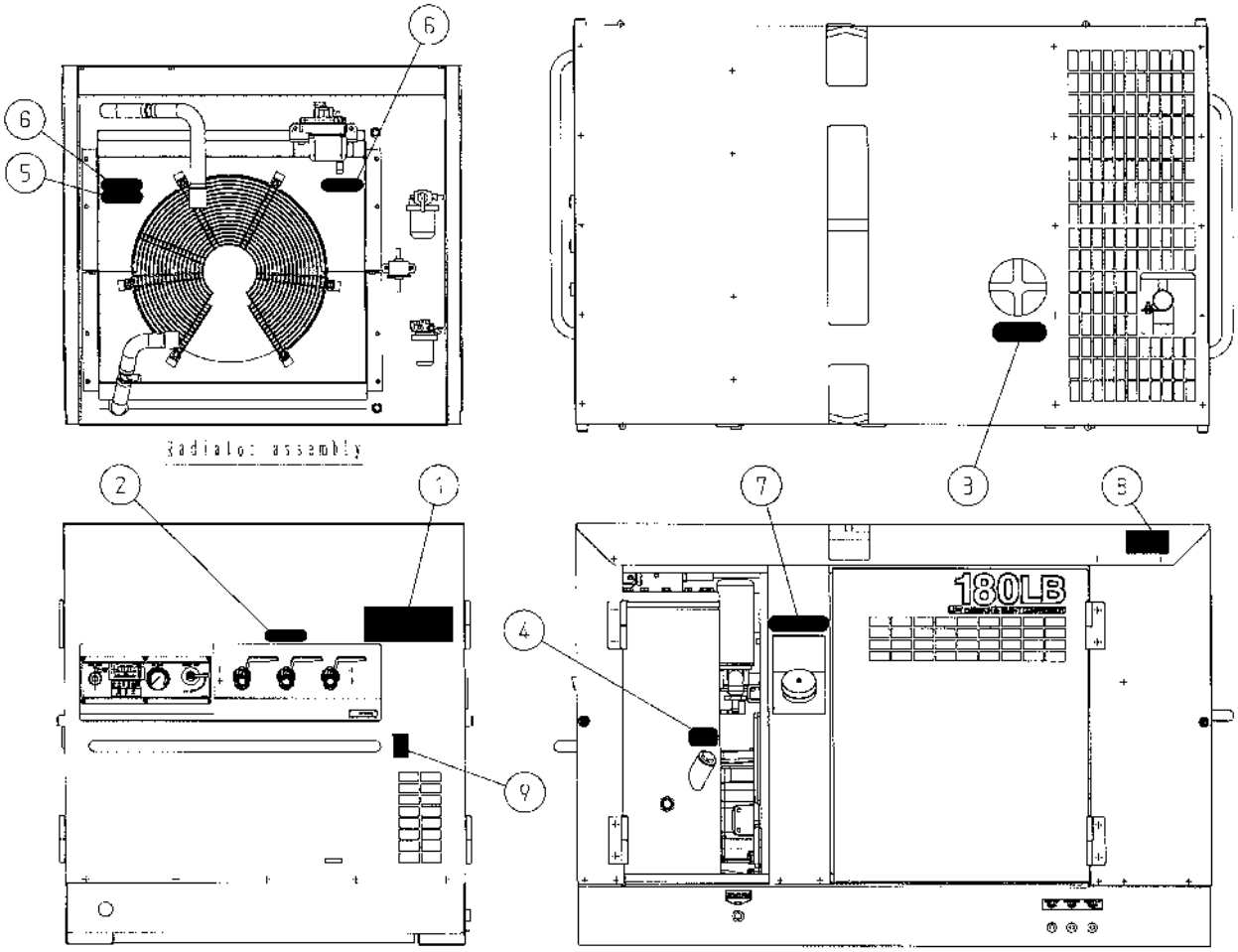
Following is DAS-100LB



DAS-180LB / LB-C

1. Safety Instructions (E9111 0120)
   Warning : Engine exhaust
   Warning : The air delivered
2. Caution : Residual pressure (E9411 0120)
3. Warning : Hot coolant (B9041 0030)
4. Caution : High pressure (E9411 0110)
5. Caution : Hot parts (E9042 0010)
6. Warning : Moving parts (B9040 0100)
7. Warning : Diesel fuel (B9045 0220)
8. Warning : Against exhaust gas (B9052 0000A)
9. Caution : Support Hook (B9121 0020B)

Following is DAS-180LB



⚠ WARNING

ENGINE EXHAUST can kill

■ Insufficient ventilation may lead to death due to lack of oxygen or poisoning by exhaust gases.

* Do not use the machine in a place of poor ventilation or in a place where exhaust gases stays.
* Do not use the machine indoors or in storehouse, tunnel, ship hold, tank, etc. of poor ventilation.
* If it becomes necessary to use the machine in the above places, the exhaust pipe should be extended to a well ventilated place. In this case, use a ventilate or to ensure proper ventilation.
* Do not direct the exhaust outlet to nearby pedestrians and houses.

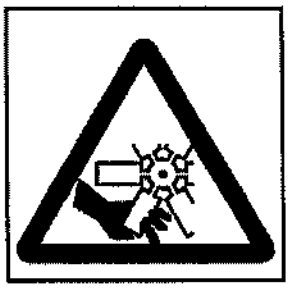
⚠ WARNING

THE AIR DELIVERED can kill

■ Do not allow to breathe the air delivered by compressor. Otherwise, it may result in death accident the compressor must not be used for raising air pressure in a room or for supplying air for diver's breathing.

⚠ WARNING

MOVING PARTS can cause severe injury



■ Rotary unit which runs at a high speed is located in the machine.
(Note that it is very dangerous if you touch it.)

* Be sure to close the door and lock it during operation.
* When the door needs to be opened during operation, do not get your hands and head in the machine to prevent them from being caught in the machine which may lead to injury.
* When making check or maintenance of the machine, be sure to stop the machine in advance.

⚠ CAUTION

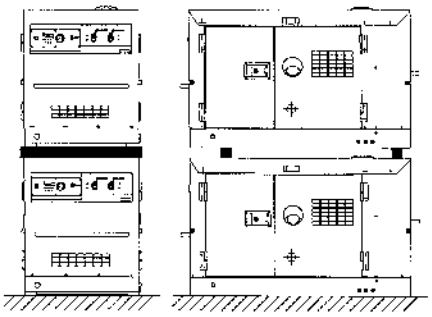
DIESEL FUEL can cause fire or explosion

■ Fuel and oil are flammable. Incorrect handling results in danger of ignition or fire.

* When fuel needs to be supplied to the machine, be sure to stop the engine. Refrain from smoking. Keep the machine away from fire.
* Do not leave flammable objects (paper, wood chips, etc.) and hazardous objects (oil, powder, etc.) near the machine.
* Wipe off spilt fuel and oil.

⚠ CAUTION

STACKING



■ Improper stacking of machines may cause falling or dropping accidents. When stacking other machines on this machine, be sure to observe the following points.

* Check that the bonnet of the machine is free from damage and that the fixing bolts are not loosened and missing.
* Put the machine horizontally on a solid foundation which withstands the weight of stacked machines.
* Machines can be stacked up to 2 stages. The weight and size of stacked machines should be less than those of this machine.
* Using square timbers as shown right, put each machine making sure that the weight is even.

■ Do not operate the machines in the state of stacking to prevent falling or dropping accidents.

⚠ CAUTION

HOT PARTS can burn skin

■ High temperature units are located in the machine. (Note that these units are very dangerous if they are used incorrectly.)

* Be sure to close the door and lock it during operation.
* If the door needs to be opened during operation, do not get your hands and head in the machine to prevent unexpected burns.
* When making check or maintenance of the machine, be sure to stop the machine.
* The bonnet is still hot even after the machine is stopped. Be careful until the engine is completely cooled.

⚠ CAUTION

HOT COOLANT can cause severe scalds

■ If the radiator cap is opened while the water temperature is high, steam or hot water will spout out.

* During operation or immediately after stopping the machine, do not open the radiator cap while the water temperature is high.
* When cooling water needs to be checked or supplied, wait until the engine is cooled (50℃ or less as measured with the water temperature gauge).

⚠ CAUTION

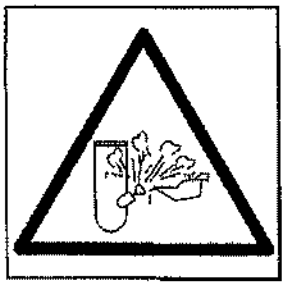
NOISE

■ This machine generates large noise, if the door is open. Surrounding to large noise may cause hearing trouble.

* Close and lock the door during operation.
* If opening the door is necessary during operation, be sure to put on the ear protector.

⚠ CAUTION

HIGH PRESSURE



■ Dangerous High Pressure.
Never open the oil filler port, while high pressure remains inside. Otherwise, a serious injury can result. Be sure to stop engine and release the inside pressure before filling oil.

⚠ CAUTION

USE OF COMPRESSED AIR

■ Improper pipe connections may result in injury.
■ Do not discharge compressed air toward other workers to prevent injury.
■ Do not spray compressed air on food.

* Use exclusive joints and hoses that can endure the discharge pressure for the connection of the compressor to air tools, and connect them securely.
* Do not perform dangerous acts such as discharging compressed air toward other workers. Do not spray compressed air on food.

⚠ CAUTION

HIGH PRESSURE REMAINS

■ Dangerous Residual Pressure.
Never take off the pipings keeping residual pressure, for it can cause a serious injury. Be sure to release the residual pressure before taking off.

⚠ CAUTION

BATTERY

■ Battery generates flammable gases. Improper handling may lead to explosion or serious injury.

* Battery should be charged in a well ventilated location. Otherwise, flammable gases are accumulated which may be ignited and exploded.
* When connecting a booster cable, do not jumper the terminals (+ and -). Otherwise, the flammable gases generated from the battery may be ignited and exploded by sparks.
* For maintenance of the machine, disconnect the ground cable on the ground side.

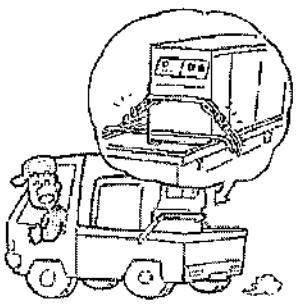
■ The battery acid is dilute sulfuric acid. Improper handling will cause unexpected burns.

* When the battery acid gets on your clothes or skin, wash it out with a large volume of water immediately.
* If it gets in your eyes, wash with a large volume of water immediately and consult your doctor.
  - In the worst case, it will put out your eyes.

■ For checking or handling of the battery, be sure to stop the engine.

⚠ CAUTION

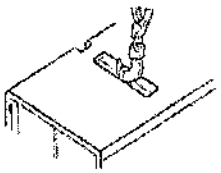
TRANSPORTATION



■ Do not lift the machine at the support hook or the ladder because it is not strong enough for lifting and may cause a falling accident.

* When lifting the machine, use the hanger located at the roof center.

* Keep out under the lifted machine.



■ Do not lift or do not transport the machine during operation, as it may cause damage to the fan or serious trouble.

* When loading the machine on the truck or the like, fix the machine firmly by support hooks on the both side.
The detail as machine size is referred to 「10-2. Outline drawing　See p.57, 58」

⚠ CAUTION

OPERATOR

■ Do not operate the machine, if operator is tired too much or drinks some alcohol or take some drugs.

* Otherwise, it may cause unexpected accidents or injury.

■ During checking or maintenance, be sure to put on suitable clothes and protectors.

* Do not put on baggy clothes, necklace, etc., because they are easily caught by projections which may cause injuries.

⚠ CAUTION

RUN AWAY

- Be sure to set the wheel stoppers expect for moving. Otherwise, the unit may move or run away and can cause a serious accident.

⚠ CAUTION

SAFETY INSTRUCTIONS ON TRAILER

Improper operating of the trailer can result in the accident to severe injury or death. For moving or parking, be sure to keep the following instructions.

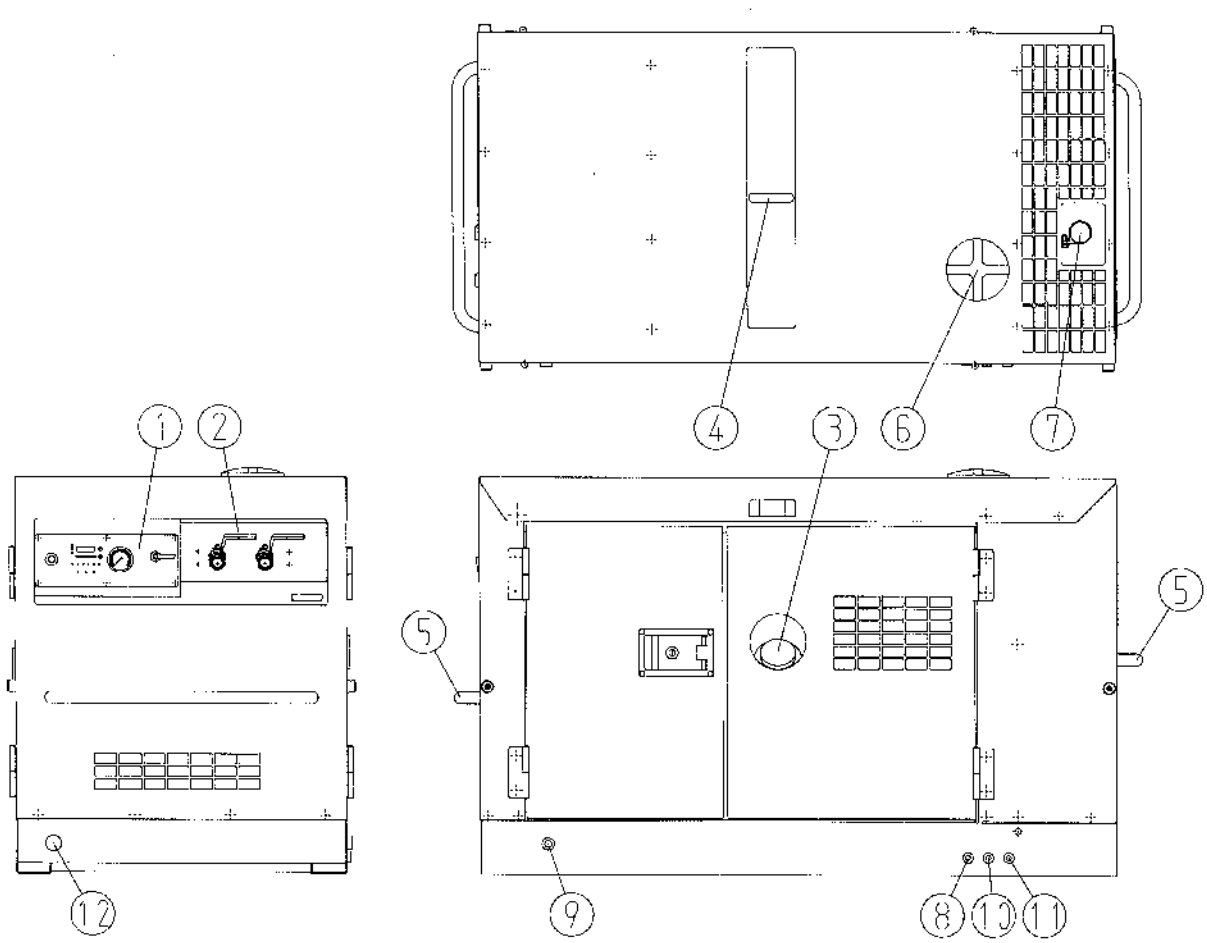
Only pavement ground and going slowly.

1. Place the unit on a level and hard ground. Placing on an inclined location may cause free moving or tumbling down to injury.
2. Except for moving, sccurely pull the parking brake, if it is fitted, and always put the wheel stoppers. For the 2-wheeled trailer, sct up the standing bar or caster to fix the unit securely.
3. For moving, remove the stoppers and relcasc the parking brake if it is fitted. Use the parking brake only for parking, and never use it for braking the unit when transporting.
4. For moving, securely connect the unit to the towing system of the towing vehicle which should have an enough towing capability and should be driven by a qualified driver.
5. Never move the unit at thc towing speed of over 10km/h.
6. Put the unit on a truck for transporting the unit from a workshop.

2. Construction

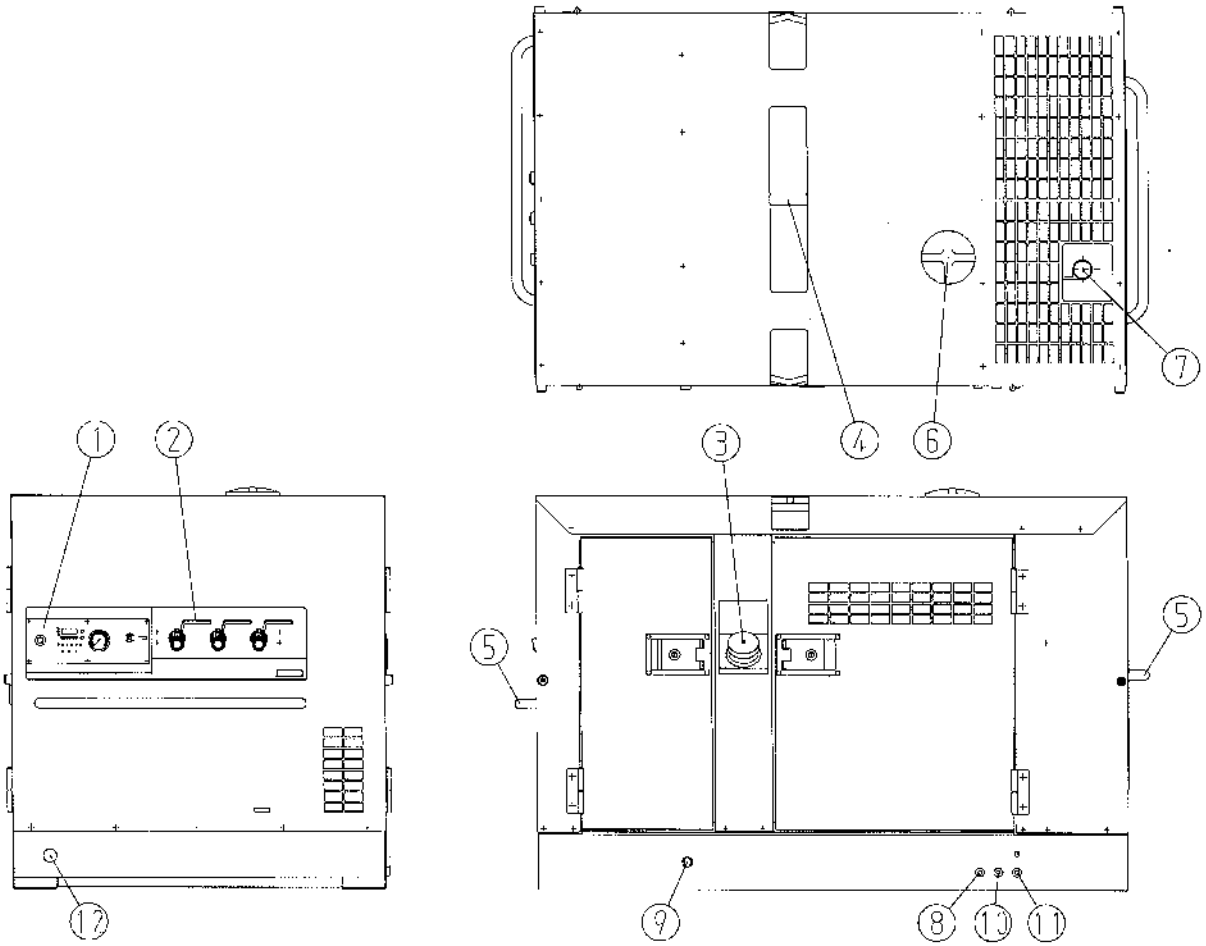
2-1 Outline and part names

<DAS-100LB/LB-C>



1. Instrument panel
2. Air outlet valve(s)
3. Fuel inlet port
4. Lifting hook
5. Rope hook
6. Coolant inlet
7. Exhaust gas outlet port
8. Fuel drain port
9. Compressor lube oil drain port
10. Engine lube oil drain port
11. Coolant drain port
12. After-cooler drain [LB-C]

<DAS-180LB/LB-C>



1. Instrument panel
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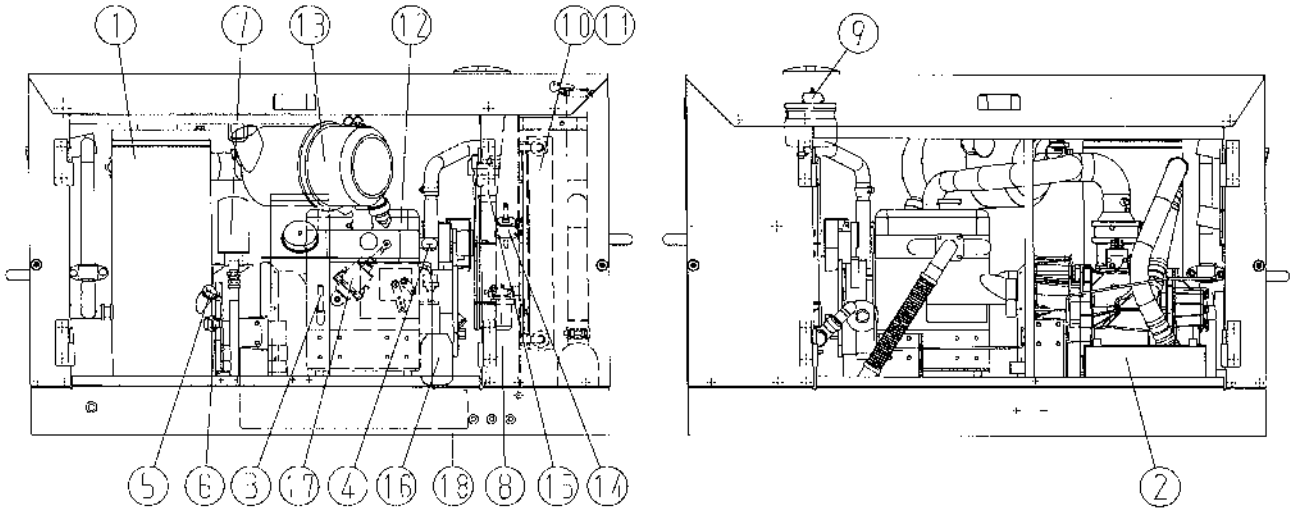
10. Engine lube oil drain port
11. Coolant drain port
12. After-cooler drain [LB-C]

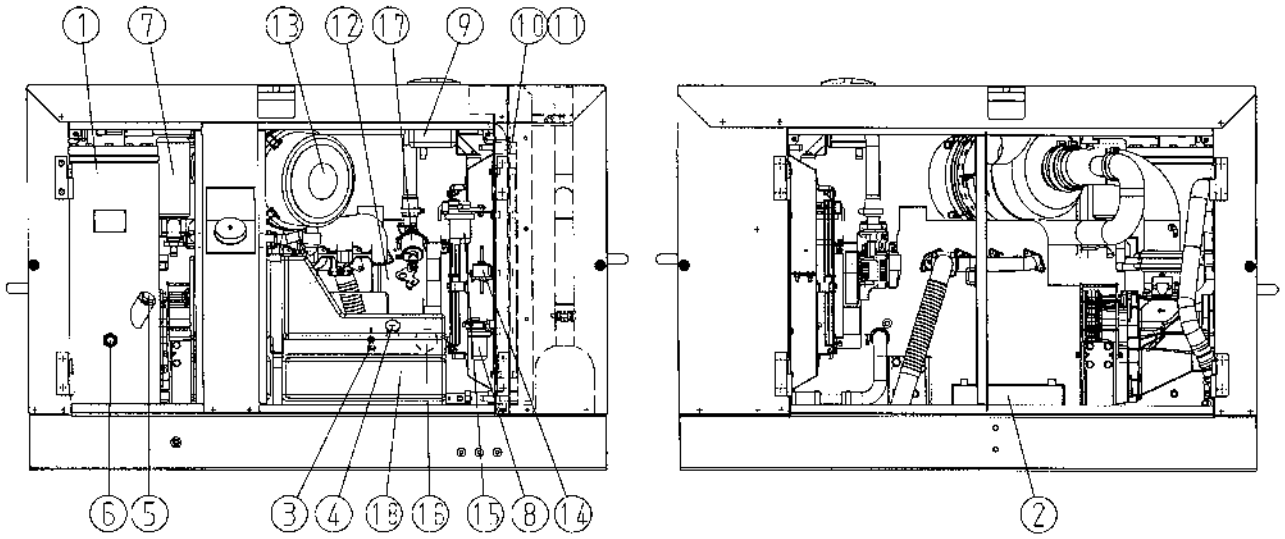
2-2 Inside part names

2-2-1 Side view and operation surface

<DAS-100LB/LB-C>

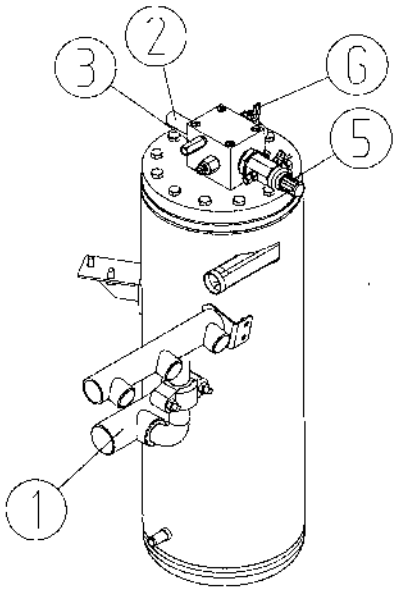


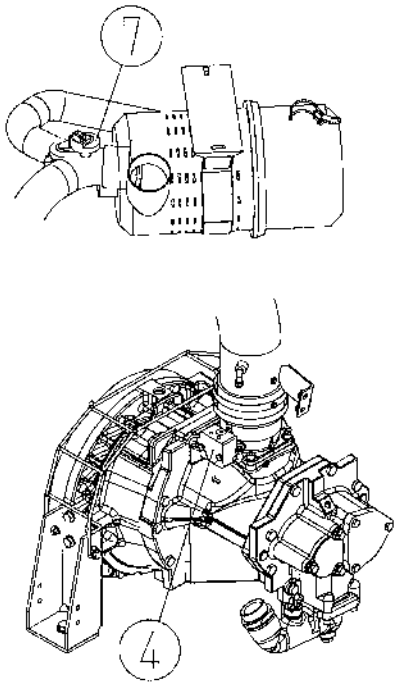
<DAS-180LB/LB-C>



① Compressor oil chamber
② Battery
③ Engine oil level gauge
④ Engine oil filler
⑤ Compressor oil filler
⑥ Compressor lube oil level gauge
⑦ Compressor oil filter
⑧ Water separation filter
⑨ Cooling water reserve tank
⑩ Compressor oil cooler
⑪ Radiator
⑫ Engine and Compressor
⑬ Air cleaner
⑭ Fuel pump
⑮ Fuel filter
⑯ Engine oil filter
⑰ Speed regulator
⑱ Fuel tank

2-2-2 Compressor oil chamber assembling

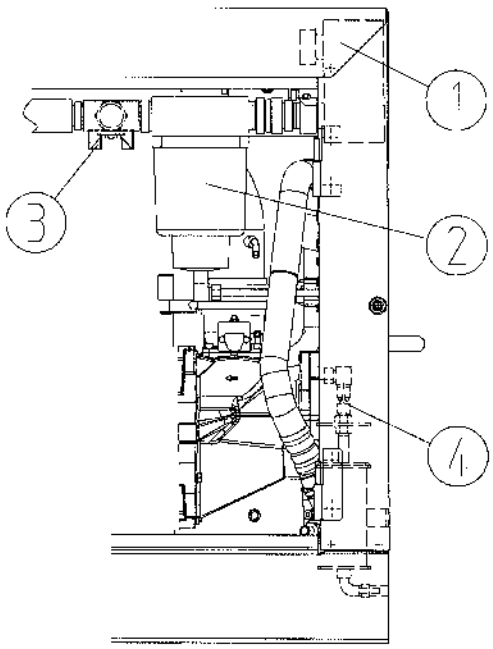




① Minimum pressure valve
② Safety valve
③ Oil return orifice
④ Blowdown valve
⑤ Pressure adjusting valve
⑥ Start-run valve
⑦ Air cleaner indication

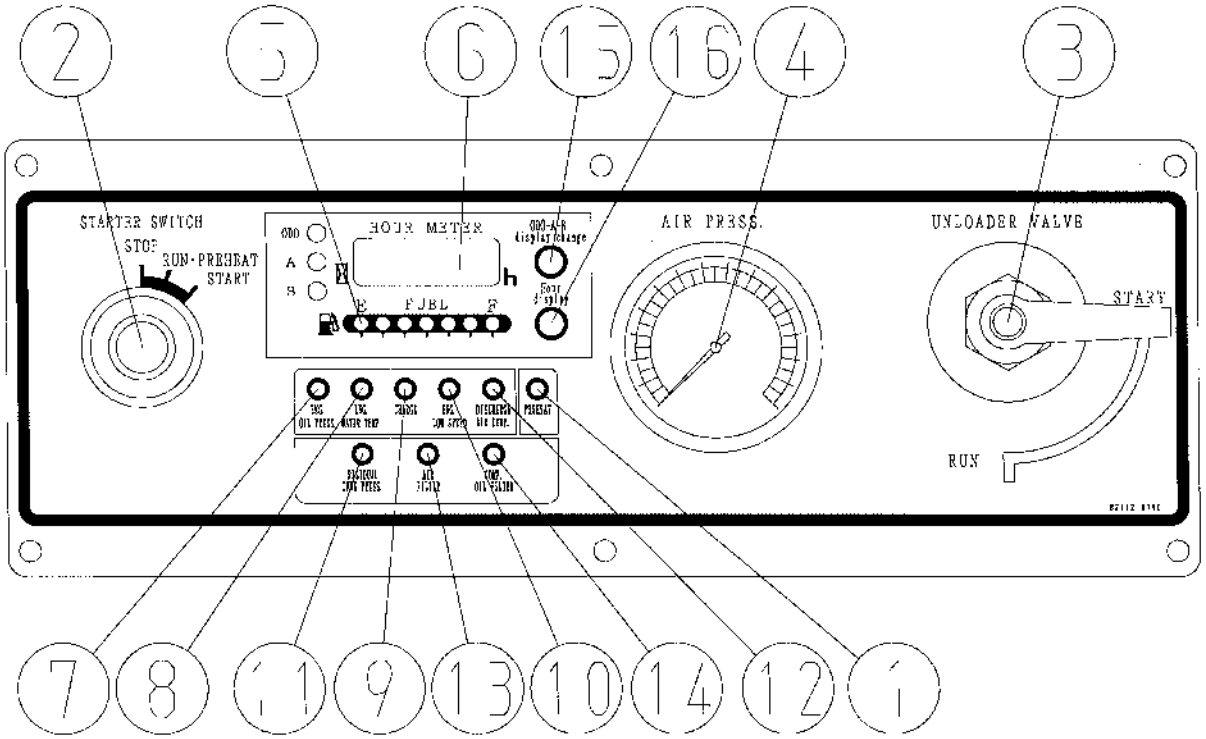
<DAS-100/180LB-C>

① After cooler
② Drain separator
③ Air piping conversion valve
④ Drain filter



2-3 Instrumental panel and part names

The instruments panel contains all the meters, instruments and switches necessary for operating the machine:

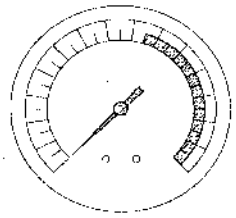


1. Preheat lamp
2. Starter switch
3. Unloader valve
4. Delivery air pressure gauge
5. Fuel level gauge
6. Hour meter
7. Engine lube oil pressure warning lamp
8. Water temperature warning lamp
9. Charging warning lamp
10. Engine low speed warning lamp
11. Residual tank pressure starting lamp
12. Discharge air temperature warning lamp
13. Air filter warning lamp
14. Compressor oil filter warning lamp
15. Hour meter select switch
16. Hour meter check switch

2-4 Meter · Indication / warning lamps

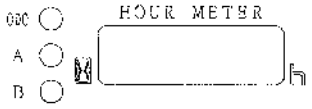
Meter

(1) Delivery air pressure gauge



This meter indicates pressure of delivered air by compressor.

(2) Hour meter



Normally, the hour meter indicates the integrating operation hours (ODO). When the engine starts its operation, the meter will counts the time and the point next to the right end of the hour indication will be blinking.

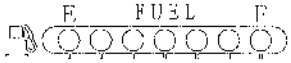
(3) Hour meter select switch

By pushing the ODO-A-B display change switch, it is possible to count 2 types A and B of operation hours (trip meter function). Whenever the ODO-A-B display change switch is pushed with the operation switch set to ON and with the residual fuel indicated, the indication and function will be changed over in the order of ODO→A→B. When the ODO-A-B display change button is continuously pressed during the trip indication for A or B, the trip time can be reset. This function can be used as a timer for regular inspection and maintenance to be made at the time of oil replacement.

(4) Hour meter check switch

Without using the operation switch key, the hour meter and the residual fuel quantity can be checked only by pushing the Hour display switch right bottom on the engine monitor. Those indications will be lighting while the hour display button is being pressed.

(5) Fuel gauge



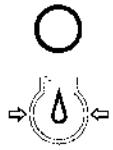
This meter indicates the level of fuel in fuel tank. When the starter switch is at the "RUN" position or pushing the hour display switch.

Indication / warning lamps

(1) Preheat lamp

The lamp lit on if the starter switch is turned to the "RUN" position. When the preheat lamp lit off, it indicates that preheating is completed.

(2) Engine lube oil pressure warning lamp

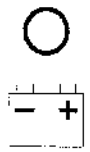


The lamp lit on if the engine oil pressure decreased. If the machine is in normal operation, this lamp stays off.

(3) Engine water temperature warning lamp

The lamp lit on if the engine water temperature rises abnormally. This is normal when this lamp lit off during operation.

(4) Charging warning lamp



The lamp lit on if a charging error occurs, such as the engine coolant fan belt breaking while the engine is running. This is normal when this lamp lit off during operation.

(5) Engine low speed warning lamp

The lamp lit on if the engine speed decreases abnormally during operation. When the lamp lit on during operation, the engine stops automatically (100LB/LB-C : 1700 min^{-1} or lower, 180LB/LB-C : 1200 min^{-1} or lower). This is normal when this lamp lit off during operation.

(6) Discharge air temperature warning lamp

The lamp lit on if the temperature of the air delivered rises abnormally. This is normal when this lamp lit off during operation.

(7) Residual tank pressure starting lamp

The lamp flashes for 5 seconds if the engine start is attempted while pressure is remaining in the oil chamber. The engine starter is not rotated at this time. Wait until the pressure gauge indicates "0" and then restart the engine.

(8) Air filter warning lamp (Engine)

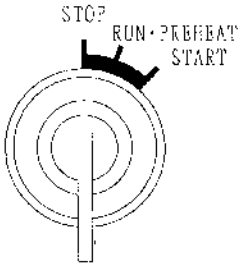
Displays the state of clogging of the air cleaner of the engine. Maybe lit on depending on the operation status. If the lamp lit on, clean up or replace the element. (Even if the lamp is kept off, replace the element once every 500 hours of operation.)

(9) Compressor oil filter warning lamp

Displays the state of clogging of the compressor oil filter. Maybe lit on depending on the operation status. If the lamp lit on, replace the element. (Even if the lamp is kept off, replace the element once every 1000 hours of operation.)

2-5 Use of switches and controllers

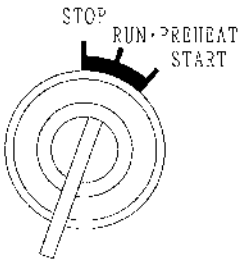
(1) Starter switch



Functions:

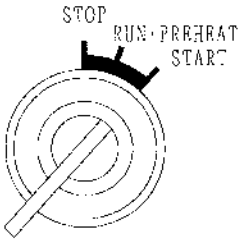
① STOP

This switch should be set in this position unless the machine is in operation. The key can be inserted or pulled out in this position.



② RUN

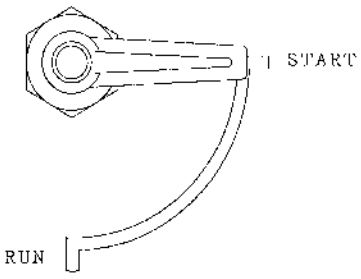
This switch should be set in this position when the machine is in operation.



③ START

This is the position to start the engine. When your hand is released from the key after starting, it is automatically set in the position of "RUN".

(2) Unloader valve



Functions:

① START

This is the position to start the engine. When engine start, warming up the engine for 5 to 10 minutes.

② RUN

After warming up the engine, set the unloader valve to the "RUN" position. You can use delivered air by compressor.

2-6 Safety valve

The pressure safety valve is factory adjusted to 1.0 MPa and sealed prior to shipment of the compressor. Do not remove the seal or try to adjust the valve.

2-7 Regulator

The compressor has been correctly adjusted prior to shipment from the factory, and rarely requires further adjustment, if ever.
Should it require any adjustment, however, as a result of overhauling or other cause, follow the following procedures.

(1) Prior to starting the engine, check whether or not the engine governor lever is set to the high-speed stopper.
Otherwise, the engine will not run at the maximum speed during full-load condition.

(2) Start the engine only after confirming that the unloader valve is set to the "START" position.
Should the engine stop running immediately after starting, restart it only after confirming that the delivery air pressure gauge indicates zero.

(3) After the engine starts, the warm-up for a few minutes.
When the engine is sufficiently warmed, set the unloader valve to the Run position. Then the engine runs at a no-load condition at an idle speed.

(4) Gradually close the service valve from the Full open position.
Adjust the screw on the pressure regulating valve so that the governor lever shifts to the low-speed side as soon as the air pressure exceeds 0.70 MPa.
(Always set the working pressure to the range from 0.60 to 0.70 MPa.)

(5) Repeat opening and closing the service valve and confirm that the regulators work smoothly.

3. Operation

- From pre-start check to shut down -

Be sure to check the machine prior to starting.

1. Checking prior to operation
2. Startup
3. Starting under cold weather
4. Precautions during operation
5. Stopping
6. Emergency stop and monitor display

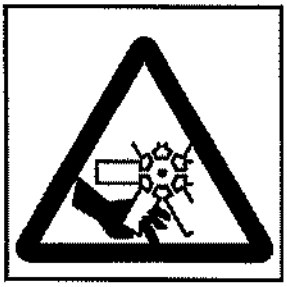
3-1 Checking prior to operation

⚠ WARNING

MOVING PARTS can cause severe injury

- Rotary unit which runs at a high speed is located in the machine. (Note that it is very dangerous if you touch it.)

  * Be sure to close the door and lock it during operation.
  * When making check or maintenance of the machine, be sure to stop the machine in advance.



To prevent unexpected trouble, be sure to check the following points.

(1) Check on engine oil (lubricating oil)
(2) Check on compressor oil
(3) Draining through oil chamber drain
(4) Check on engine cooling water
(5) Checking on fuel
(6) Discharge of drain within fuel tank
(7) Checking on battery acid
(8) Battery cable connection
(9) Checking on fan belt
(10) Checking Wiring at each part
(11) Checking Piping at each part
(12) Removal of foreign matter inside and outside the machine
(13) Checking the withstand pressure of connecting
(14) Checking the Fuel pipe and hose

Inspection:

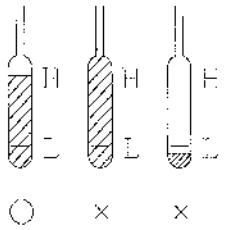
(1) Checking on engine oil

(Read the instruction manual for the engine furnished separately.)

① Checking the level of engine oil by the dipstick.
Make sure the oil level is always between H and L.

② When it is below the low limit, supply oil immediately.

③ At the same time, check condition of oil by the dipstick.

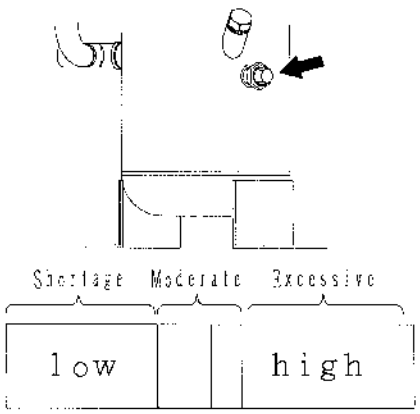


[Note]

Oil is consumed gradually during operation. When the machine is to be used continuously for a long time, be careful with lack of oil.

(2) Checking on compressor oil

Check whether or not the oil level is within the scope of the level gauge while the engine is off.



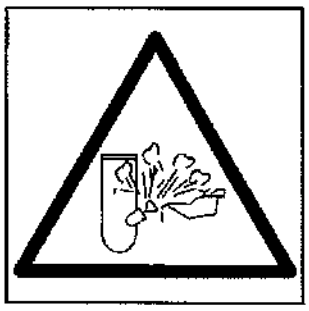
[Note]

If the compressor oil level gauge or the O-ring at the filler is found damaged, immediately replace it with a new one.

⚠ CAUTION

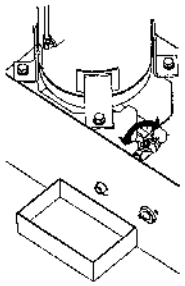
HIGH PRESSURE

■If the filler or compressor oil drain is opened when pressure is remaining inside, serious injury may result. Be sure to stop operation and release the remaining pressure before opening these ports.



(3) Draining through oil chamber drain

Open the drain valve slightly and extract drainage. Close it immediately after oil flows out.



(4) Check on engine cooling water

(Read the instruction manual for the engine furnished separately.)

⚠ WARNING

HOT COOLANT can cause severe scalds

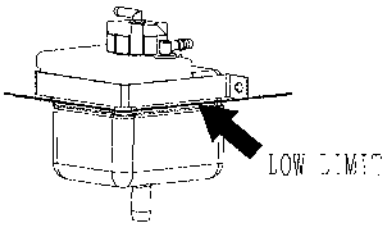
- If the radiator cap is opened while the water temperature is high, steam or hot water will spout out.

  * During operation or immediately after stopping the machine, do not open the radiator cap while the water temperature is high.
  * When cooling water needs to be checked or supplied, wait until the engine is cooled (50℃ or less as measured with the water temperature gauge).

① Check (to see) that cooling water in the reserve tank is over the low limit.

② When it is below the low limit, supply (additional) water immediately.

③ Normally, only the water level of the reserve tank needs to be checked. But, the radiator cap should be opened once a week to check that water is full in the radiator.



[Note]

When closing the radiator cap after water level is checked or water is supplied, turn the cap fully clockwise so that it can be firmly tightened. Otherwise, cooling water is evaporated which results in serious damage to the engine.

(5) Check on fuel

Be sure to check the quantity of fuel prior to operation to prevent lack of fuel during operation.

(6) Discharging of drain within fuel tank

Open the fuel drain valve and discharge the drain. Be sure to close the fuel drain valve securely after the drain is discharged.

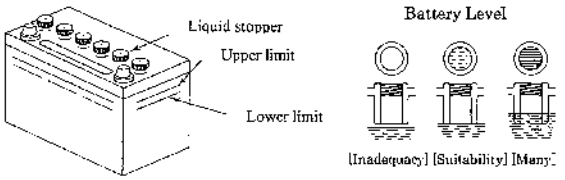
(7) Check on battery acid

⚠ CAUTION

■The battery acid is dilute sulfuric acid. Improper handling will cause unexpected burns.

* When the battery acid gets on your clothes or skin, wash it out with a large volume of water immediately. If it gets in your eyes, wash with a large of water immediately and consult your doctor. In the worst case, it will put out your eyes.

Remove the battery acid plug (cap) and check the liquid level (10-12mm above the electrodes).
Supply distilled water if necessary.



(8) Battery cable connection

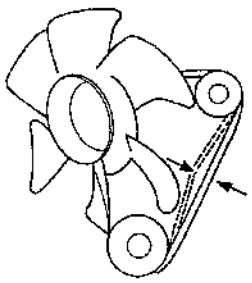
Connect the battery cable, being careful not to reverse the polarity. Reversed polarity may damage the electric parts in a short time.

(9) Checking on fan belt

(Read the instruction manual for the engine furnished separately.)

① Check the belt for tension and elongation. Also, check it for damage. Replace if necessary.

② For adjustment or replacement of the belt, refer to the instruction manual for the engine.



Press {about 100N(10kg)} the position shown by arrow mark (middle of belt) with your thumb. The bend should be within the range of 10mm.

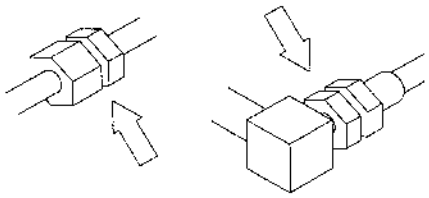
Parts number of fan belt	
DAS-100LB/LB-C	Y06020 15263 (KUBOTA 16394-97011)
DAS-180LB/LB-C	Y06020 11476 (KUBOTA 17112-97012)

(10) Checking wiring at each part

Check the wiring for loose connections and wear. Repair or replace erroneous parts, if found.

(11) Checking piping at each part

Check the piping for loose connections, oil leakage, or cooling water leakage.
Also check hoses for wear. Replace erroneous parts, if found.

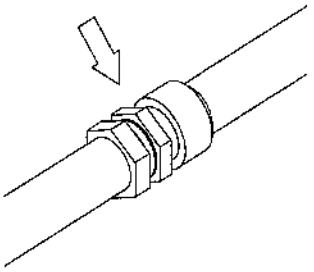


(12) Removal of foreign matter inside and outside the machine

- Check that tools and cleaning cloth are not left in the machine. Remove if necessary.
- Check the surroundings of the muffler and engine for presence of dust and flammable objects. Remove if necessary.
- Check that the cooling air inlet and the cooling air outlet of the machine are not clogged with dust or other objects. Remove if necessary.

(13) Checking the withstand pressure of connecting

Check that the pipes and working machine sufficiently endure the discharge pressure.
Check the pipe connections for looseness and hoses for wear.
Replace erroneous parts, if any.



[Note]

Be sure to release the pressure remaining within the pipe before removing the pipes (hoses) connected to the machine.

(14) Checking the fuel pipe and hose

The fuel pipe and the hose are very important parts for ensuring safety. Be sure to perform the following checkups.

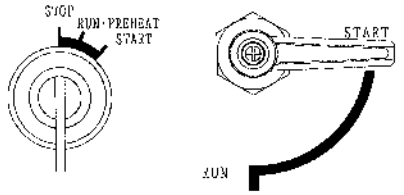
- Check the connecting parts and clips for looseness, and securely fasten loose parts, if any.
- Check the fuel pipe for flaw, rust, and wear, and the hose for degradation. Replace the pipe or hose, if any abnormality is found.

[Note]

Fuel leakage (from each pipe and hose connection included) may cause fire, thus posing great danger. If leakage is found, replace the gasket at each connection, or retighten the connections.

3-2 Start up

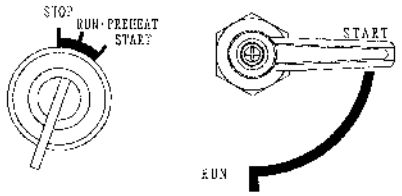
(1) Turn the Unloader valve to the "START" position.



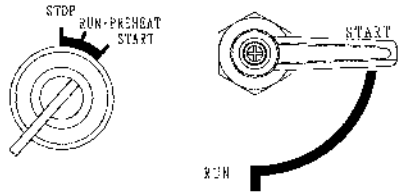
[Note]

Starting the engine with the unloader valve set to the "RUN" position will shorten the life of the machine and may cause hazards to an operator and neighboring persons. Be sure to start it after confirming start the unloader valve is set to the "START" position.

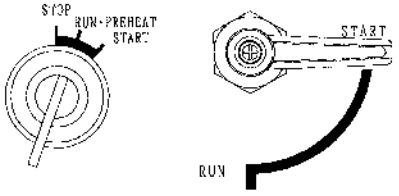
(2) Turn starter switch to "RUN · PREHEAT" and preheat plugs until preheat lamp turn off.



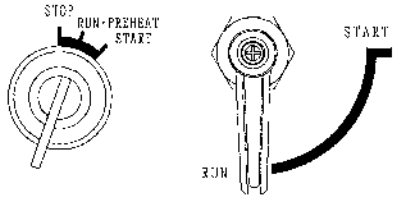
(3) Turn the starter switch to the "START" position to start the engine.



(4) Release the starter switch key if the engine is started. The key is automatically reset to the "RUN" position.



(5) After warming up the engine for 5 to 10 minutes, set the unloader valve to the "RUN" position.

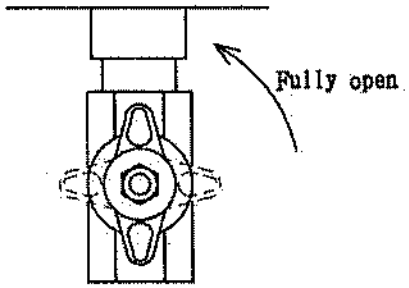


(6) Open the air outlet valve(s) to deliver compressed air, while confirming that the engine evenly increases speed by opening the valve and smoothly decreases it by closing the valve.

3-3 Starting under cold weather

The engine may not be started smoothly under cold weather. Start it in the following manner under the cold weather:

(1) Fully open the start-run valve



(2) Set the unloader valve to the "START" position and then start the engine.

(3) After warming up the engine for a few minutes, slowly close the start-run valve while observing the rotation of the engine.

(4) After confirming that the engine has been fully warmed up, set the unloader valve to the "RUN" position.

3-4 Precautions during operation

Occasionally check all gauges and meters on the operation panel to ensure that the compressor is operating under the standard conditions stated below:

Delivery air pressure gauge (MPa)	0.70(load)	0.73～0.89 (no-load)
Monitor lamps	Not lit on	

3-5 Stopping

(1) Close air outlet valve(s). The speed regulator will reduce engine speed to the idle cycle. Keep performing cool-down operation in this state for approximately 5 minutes.

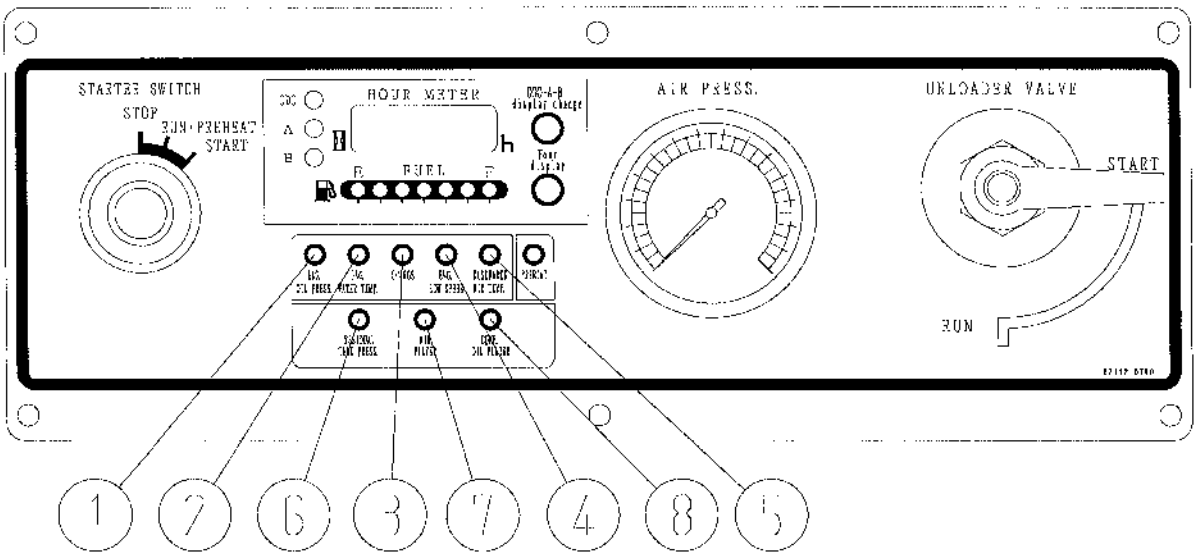
(2) Turn the key to the "STOP" position. The engine stops and the compressed air remaining in the compressor will be automatically discharged. Do not attempt to quickly discharge it through the air outlet valve(s) or the start-run valve.

[Note]
Never discharge the compressed air through the start-run valve in cold weather, oil may sometimes be mixed with the discharged air.

(3) The residual air will be discharged in about 90 to 120 seconds. Restart the engine after confirming that the pressure gauge reads zero.

3-6 Emergency stop and monitor display

The monitor indicates the following:



1. Engine lube oil pressure warning lamp (lower than 49 kPa)
   This lamp comes on if the engine lube oil pressure abnormally low. Should it come on during operation, the emergency stop device will immediately stop the engine.

2. Water temperature warning lamp (over than 110℃)
   This lamp comes on if the cooling water temperature rises abnormally high. Should it come on during operation, the emergency stop device will immediately stop the engine.

3. Charging warning lamp
   This lamp comes on if the battery charging error.
   Should it come on during operation, the emergency stop device will immediately stop the engine.

4. Engine low speed warning lamp (lower than 1,700min^{-1} (DAS-100LB/LB-C)
   1,200min^{-1} (DAS-180LB/LB-C))
   This lamp comes on if the engine speed abnormally decreases.
   Should it come on during operation, the emergency stop device will immediately stop the engine.

5. Discharge air temperature warning lamp (over than 120℃)
   This lamp comes on when the discharge air temperature rises abnormally high.
   Should it come on during operation, the emergency stop device will immediately stop the engine.

6. Residual pressure starting lamp (over than 0.05MPa)
   This lamp comes on when the engine start is attempted while pressure is remaining in the oil chamber. The engine starter is not rotated at this time.
   Wait until the pressure gauge indicates "0" and then restart the engine.

4. Protection device

Protection devices and emergency stop devices are provided for protection of the machine against trouble during operation. When the running caution lamp lights, stop the engine immediately. Check and remove the cause of trouble.

Table of protection device

Indicate by warning lamp

action / warning lamp	stop the engine	indicate	function
Engine lube oil pressure	○	○	When the oil pressure falls abnormally low ,the device act. **Set point : 49 kPa**
Water temperature	○	○	When the cooling water temperature rises abnormally high, the device acts. **Set point : 110 ℃**
Charging	○	○	When a charging error occurs, such as the engine fan belt breaking while the engine is running, the device acts.
Engine speed	○	○	When the engine speed decreases abnormally during operation, the device acts. **Set point : 1700 min^{-1}** **Set point : 1200 min^{-1}**
Discharge air temperature	○	○	When the Discharge air temperature rises abnormally high, the device acts. **Set point : 120 ℃**
Residual pressure starting	-	○	when the engine start is attempted while pressure is remaining in the oil chamber. **Set point : 0.05 MPa**

5. Lubrication, cooling water and fuel etc.

5-1 Engine oil

Use specified engine oil, otherwise, it greatly affects the startup operation and life of the engine.

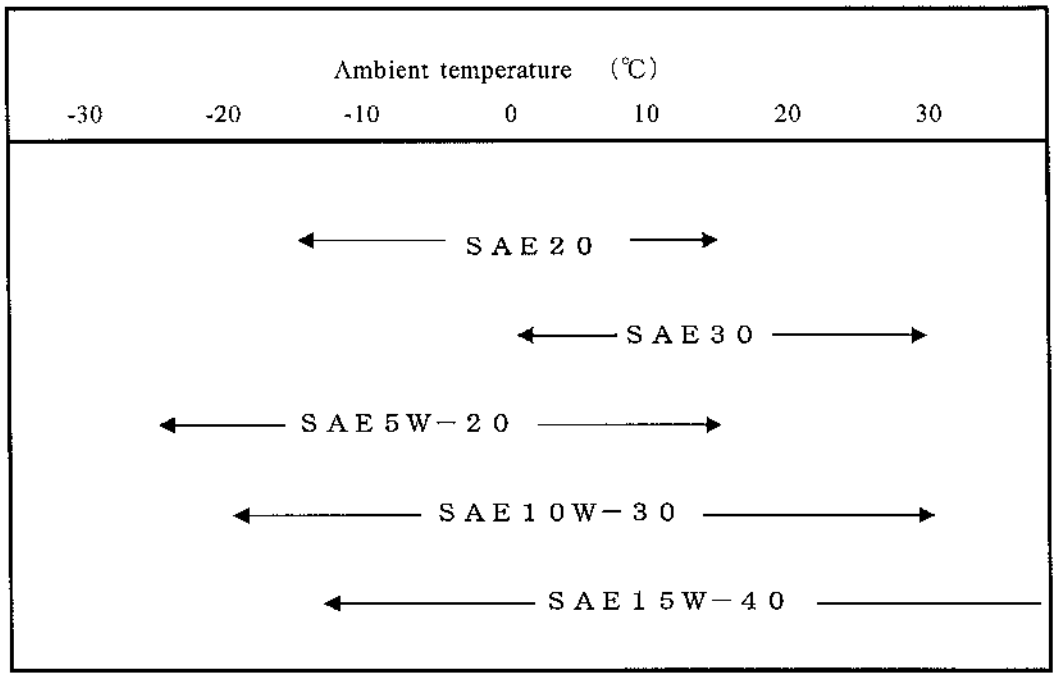
(1) Kind of oil

Use oil, CD class or higher, classified by API service.

(2) Oil viscosity

Recommended oil viscosity is SAE 10W-30, all-season type.

Use oil according to ambient temperature referring to the table below.



[Note]

Do not mix with different kind of oil, or else, it deteriorates the oil quality.

(3) Quantity of replacement oil

DAS-100LB / LB-C	5.1 L
DAS-180LB / LB-C	9.7 L

Including capacity of oil filter.

5-2 Cooling water

(1) Cooling water to be used

Mix long-life coolant (LLC) of anti-freeze and anti-rust aluminum radiator into soft water of good quality such as tap water, and use it as cooling water.
Mixing rate of LLC should be selected within the range of 30-50%.
If the mixing rate decreases to 30% or lower, rust prevention effect decreases, and if it increases to 50% or higher, freezing prevention properties deteriorate.
Standard mixing rate of LLC and operating ambient temperature are as shown below.

30%: -10℃
40%: -20℃
50%: -30℃

In general, LLC needs to be replaced after 2 years of use.

(2) Total quantity of cooling water

DAS-100LB / LB-C	4.5 L
DAS-180LB / LB-C	8.4 L

Included reserve tank capacity.

5-3 Fuel

Fuel to be used #2 Diesel Fuel

⚠ CAUTION

If other kinds of fuel is used or fuel being used contains water or dust, it deteriorates the engine performance or leads to a serious trouble.

[Note]

Never use gasoline. If gasoline is fed by mistake, drain it completely.
Otherwise fire or break of the engine may occur, posing great danger.

- Do not use low-quality oil or fuel substitute. Engine trouble caused by the use of such oil is not covered by the warranty.
- Replenish fuel, being careful not to let dust or water mix in the fuel.
- Keep the refueling cap securely tightened. Remove the drain plug placed at the bottom of the tank before operation, and discharge the sediment and water at the bottom of the tank along with the fuel.

5-4 Compressor lube oil

Use lube oil exclusively for this series of rotary compressors.
For engine lube oils, refer to the Engine Instruction Manual.

(1) Recommended compressor lube oil and its standard replacement interval

Compressor lube oil : Mineral Compressor Oil PAROIL M
Replacement interval : Every 1000 hours for normal operation

(2) Precautions on oil replacement

Never mix lube oils of different brands or fresh lube oil with in the tank.
Such mixing occasionally produces insoluble glue, lacquer, or shellacs, which may cause the oil filter to become clogged and break down or cause abnormal wear of the rotor or bearings, resulting in serious damage.
Periodically check the lube for degradation, discoloration, excessive viscosity, and impurities. When the machine is operated under the following conditions, the lube oil changing intervals may have to be shortened to about 500 hours.

1) Operation in poorly ventilated locations where the ambient temperature rises excessively.

2) Operation for long duration of time, especially in a tunnel or high humidity.

3) Operation in dusty or sandy locations. Be sure to change the initial lube oil after 500 hours of operation.
Your compressor is provided with "Mineral Compressor Oil PAR OIL M" at the factory prior to shipment.
If you replace it with an lube oil of a different brand, be sure to fully be sure to fully extract the old oil before feeding the fresh one.

(3) Quantity of replacement oil

DAS-100LB / LB-C	12 L
DAS-100LB / LB-C	19 L

(4) Lube oil changing procedures

1) Operate the compressor for a while to warm the oil so that it may be drained easily.

2) Shut down the compressor and confirm that the air pressure has reached zero.
Then, open the drain valve on the lower part of the oil chamber and drain. Disconnect the oil cooler pipe joints and drain the oil remaining in each pipe and oil cooler.

3) Close the drain valve and securely tighten the pipe joints.

4) Fill the oil chamber with fresh oil until the oil level reaches the upper limit.

5) Operate the compressor and thoroughly check each part for any oil leakage.

6) Stop the engine. After confirming that the air pressure gauge indicates zero, check the oil level. Add oil necessary.

(5) Recommended compressor lube oils

Brand	Manufacturer
Mineral Compressor Oil PAROIL M	Denyo Genuine Oil
Corena S2 RJ32	Shell
FAIRCOL RA32	JXTG Nippon oil & Energy
Mobil Rarus 424J	Exxon Mobil

(6) Cold weather operation

The pour point of the Mineral Compressor Oil PAROIL M which is provided to the compressor at the factory is -33℃. Use lube oil with the pour of -20℃ or lower for ambient temperature below -5℃.

6. Handling of battery

⚠ CAUTION
BATTERY

■ Battery generates flammable gases. Improper handling may lead to explosion or serious injury.

* Battery should be charged in a well ventilated location. Otherwise, flammable gases are accumulated which may be ignited and exploded.
* When connecting a booster cable, do not jumper the terminals (+ and -). Otherwise, the flammable gases generated from the battery may be ignited and exploded by sparks.
* For maintenance of the machine, disconnect the cable on the ground side.

■ The battery acid is dilute sulfuric acid. Improper handling will cause unexpected burns.

* When the battery acid gets on your clothes or skin, wash it out with a large volume of water immediately. If it gets in your eyes, wash with a large volume of water immediately and consult your doctor.
  - In the worst case, it will put out your eyes.

■ For checking or handling of the battery, be sure to stop the engine.

6-1 Caution on battery charge

Charging of loaded battery

* Disconnect the wiring cable from the battery terminals before charging.
  (Otherwise, the alternator may be damaged due to unusual voltage applied to the alternator.)

* When disconnecting the wiring cables from the battery terminals, remove the ground cable first. (If a tool touches the space between the "+" terminal and the machine, electric spark will occur which is very dangerous.)
  When connecting the wiring cables to the battery terminals, connect the ground cable last.

* While the battery is being charged, open all the liquid plugs to discharge the gas.
  Keep the battery away from fire to prevent unexpected explosion.
  Handle the battery carefully to prevent electric sparks.

* If the battery is overheated (liquid temperature above 45℃), stop charging for a while.

* At the completion of charging, stop charging immediately.
  (The relation between battery charge condition and specific gravity See p.41)

  If the battery is still charged, the following trouble will occur.
  1) Battery overheat
  2) Decrease in battery acid
  3) Deterioration of battery performance

* Do not connect the battery polarity in reverse (connection of "+" and "-" or "-" and "+") to prevent damage to the alternator or the like.

6-2 Connection of booster cable, and installation

When the engine is started using booster cables, connect the cables as follows.

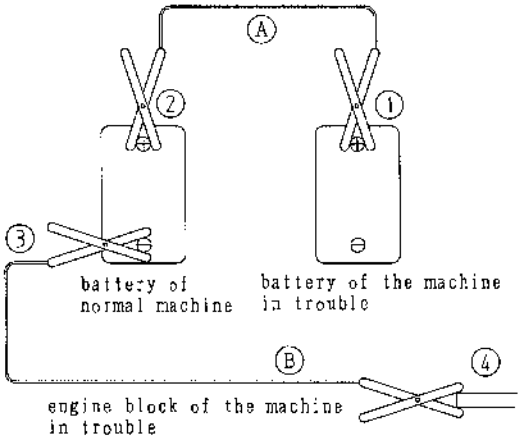
(1) Connection of booster cable

① Connect the clip of the booster cable "A" to the terminal "+" of the machine in trouble.

② Connect the other clip of the booster cable "A" to the terminal "+" of normal machine.

③ Connect the clip of the booster cable "B" to the terminal "B" to the terminal "−" of normal machine.

④ Connect the other clip of the booster cable "B" to the engine block of the machine in trouble.



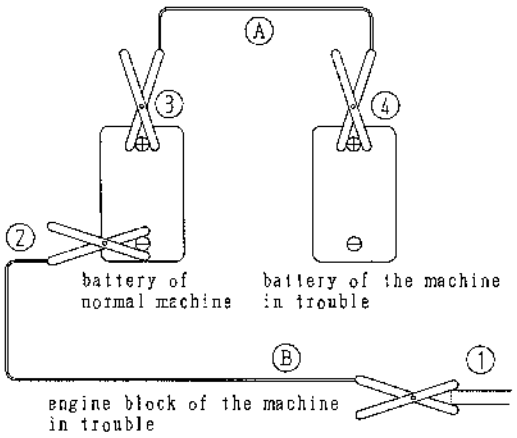
(2) Removal of booster cable

① Remove the clip of the booster cable "B" connected to the engine block of the machine in trouble.

② Remove the clip of the booster cable "B" connected to the terminal "−" of normal machine.

③ Remove the clip of the booster cable "A" connected to the terminal "+" of normal machine.

④ Remove the clip of the booster cable "A" connected to the terminal "+" of the machine in trouble.



(3) Caution on handling of booster cable

① Use booster cables and clips of the size that matches the size of battery.

② The battery used for normal machine should be the same in capacity as the battery of the machine in trouble.

③ After connection, check that clips are firmly connected.

④ When connecting booster cables, make sure that the terminal "+" does not touch the terminal "−".

⑤ The engine block should be connected at a place more than 30cm away from the battery.

7. Periodical checking and maintenance

7-1 Maintenance schedule

50 hours : Checking / first 50hours
* Replacement of engine oil
* Replacement of engine oil filter cartridge
* Replacement of compressor oil filter cartridge

100 hours : Checking / every 100 hours
* Cleaning of engine fuel filter element
* Lubricating speed regulator
* Cleaning of air cleaner element
* Cleaning of after-cooler filter (LB-C)

200 hours : Checking / every 200 hours
* Replacement of engine oil
* Replacement of engine oil filter cartridge

250 hours : Checking / every 250 hours
* Checking on battery specific gravity
* Checking/Cleaning of drain filter (LB-C)
* Checking/Cleaning of drain separator element (LB-C)

400 hours : Checking / every 400 hours
* Replacement of fuel filter element
* Replacement of engine oil filter cartridge

500 hours : Checking / every 500 hours
* Checking/Cleaning oil return orifice
* Checking operation of the safety valve (or once 1 year)
* Replacement of air cleaner element (or once 2 years)

1000 hours : Checking / every 1000 hours
* Replacement of compressor oil
* Replacement of compressor oil filter cartridge
* Checking/Replacement of seal in speed regulator
* Checking/Replacement of seal in air suction capacity regulator valve
* Checking/Replacement of pressure regulator valve
* Checking of minimum pressure valve
* Checking/Replacement of seal washer in compressor oil filler cap
* Cleaning of radiator and oil cooler, after cooler (LB-C)
* Cleaning of inside fuel tank
* Checking of rubber suspension
* Checking on lining

Other service requirements
* Replacement of oil separator element (every 2000 hours)
* Replacement on nylon pipe and rubber hose (ever 2000 hours or once 3 years)
* Replacement of coupling element (every 4000 hours)
* Replacement of engine cooling water (every 2000 hours or once 2 years)
* Replacement of drain separator element (LB-C) (every 2000 hours or once 2 years)

On the engine system, main checking items only are shown in this manual.
For details, refer to the instruction manual for the engine furnished separately.

7-2 Checking / first 50 hours

(1) Replacement of engine oil

Replace the engine oil at 50 hours only first time and every 200 hours after second time.

① Remove the engine oil drain plug and discharge oil completely. It can be discharged easily when the engine is warm.

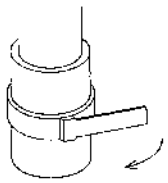
② After engine oil is discharged, tighten the plug firmly.

③ Charge new engine oil from the oil filler until it reaches the notched line of the "H" on the dipstick. For oil quantity. (See p.31)

④ After engine oil is supplied, run the engine for a few minutes. Check that oil is supplied to the level between H and L.

(2) Replacement of engine oil filter cartridge

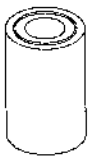
Replace the engine oil filter cartridge at 50 hours only first time and every 200 hours after second time.



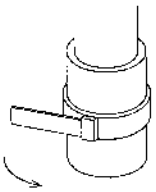
① Remove the cartridge type element using filter wrench.

② Clean the filter base. Coat the packing of new cartridge with engine oil thin. Then, mount the cartridge.

- When mounting, tighten the cartridge from 1-1/4 turn by using filter wrench after the packing is fitted to the seal of the filter base.



③ After the element is replaced, run the engine for a while. Then, check to see that oil is supplied to the suitable level.



Parts number of engine oil filter cartridge	
DAS-100LB / LB-C	Y06020 41174 (KUBOTA : 16271-32093)
DAS-180LB / LB-C	Y06020 41173 (KUBOTA : 16414-32434)

(3) Replacement of compressor oil filter cartridge

Replace the compressor oil filter cartridge at 50 hours only first time and every 1000 hours after second time.

Replacing procedures Refer to 「7-8 (2) Replacement of compressor oil filter cartridge See p.43」

Parts number of compressor oil filter cartridge
Y06033 10150 (6211472250)

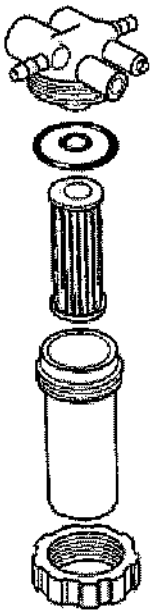
7-3 Checking / every 100 hours

(1) Cleaning of engine fuel filter element

① Turn the fuel filter cock to the close position. Remove the ring screw and take out the filter cup and element.

② Rinse the element using diesel fuel and also, clean the inside of the filter cup using diesel fuel.

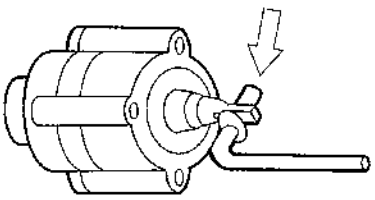
③ After cleaning, fit the fuel filter back to its original position. Make sure when the fuel filter is being refitted that it is not overly dusty.



Parts number of fuel filter element
Y06020 42174 (KUBOTA 15521-43161)

(2) Lubricating speed regulator

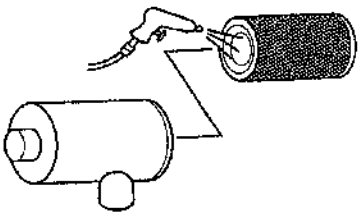
Apply grease to the sliding part of the governor rod.



(3) Cleaning of air cleaner element

<When dry dust is attached>

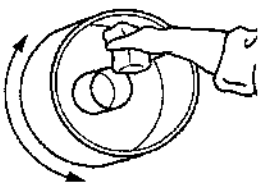
Remove the air cleaner element, and inject dry and clean compressed air to the element to clean it.



<When carbon or oil is attached>

① Immerse the element in water to which neutral detergent is dissolved for approximately 30 minutes, and then rinse it.

② Then rinse it with clean water, and let it dry naturally in a well-ventilated place.

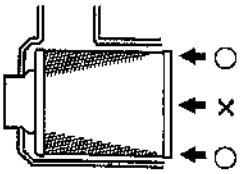


This element should be cleaned, regardless of operating time.

* While it is being cleaned, check the element for any damage. Replace if necessary.

* Before installing the air cleaner, wipe off dirt on the element cover.

* When insert the element, insert the element completely pressing equal edge of element.



Parts number of air cleaner element	
DAS-100LB / LB-C	Y06020 46665 (3002606500)
DAS-180LB / LB-C	Y06020 46664 (6211474350)

(4) Cleaning of after-cooler filter (LB-C)

First take off the after-cooler air intake duct, and inject dry and clean compressed air to the filter to clean it.

7-4 Checking / every 200 hours

(1) Replacement of engine oil

Replacement is refer to 「7-2 (1) Replacement of engine oil See p.39」.

(2) Replacement of engine oil filter cartridge

Replacement is refer to 「7-2 (2) Replacement of engine oil filter cartridge See p.39」.

7-5 Checking / every 250 hours

(1) Checking on battery specific gravity

If battery is likely to be discharged due to failure in startup of the engine, measure the specific gravity of battery acid.

The relation between battery charge condition (charging rate) and specific gravity is as shown below.

Charging rate \ Liquid temp	20 ℃	0 ℃	-10 ℃
100 %	1.28	1.29	1.30
90 %	1.26	1.27	1.28
80 %	1.24	1.25	1.26
75 %	1.23	1.24	1.25

Note : Each value has a deviation of ±0.01.

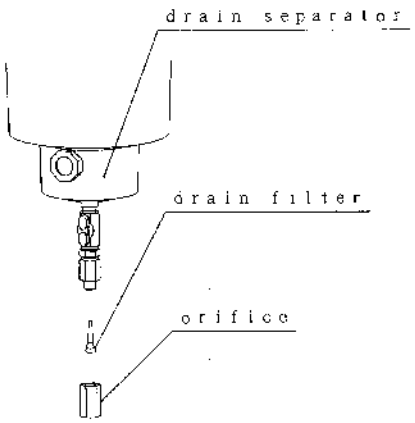
When the charging rate is below 75%, the battery needs to be recharged.

「6-1 Caution on battery charge See p.36」

(2) Checking / Cleaning of drain filter (LB-C)

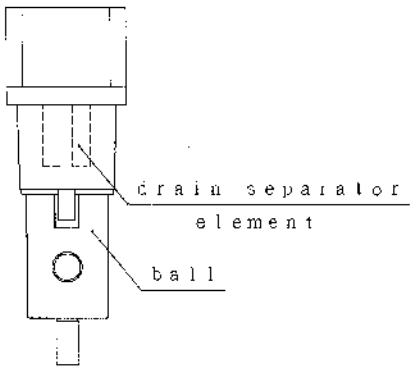
First, take off the drain filter, and clean the filter and orifice with clean well-pressed air.

Parts number of drain filter
E91191 00404A



(3) Checking / Cleaning of drain separator element (LB-C)

First, take off the boll, and take off the element.
Check and clean a drain separator element.



7-6 Checking / every 400 hours

(1) Replacement of engine fuel filter element

Replacement is refer to 「7-3 (1) Cleaning of engine fuel filter element See p.40」.

(2) Cleaning of water separation filter element

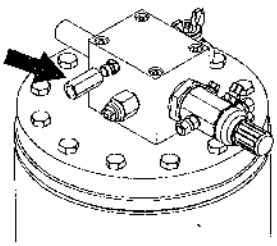
① Remove the element from the filter.
② Clean the element.
③ Remove the dirt and foreign matter on the mounting surface, if any.
④ Mount the element main unit securely.

Parts number of water separation filter element
Y06020 42751 (KUBOTA RD819-51281)

7-7 Checking / every 500 hours

(1) Checking / Cleaning of oil return orifice

The return orifice should be checking and cleaning referring.



(2) Checking of safety valve operation (or once 1 year)

Confirm daily that the safety valve operates correctly. If the safety valve releases air by pulling the lever in a no-load condition (0.85 to 0.95 MPa at the receiver pressure), it is normal.

(3) Replacement of air cleaner element (or once 2 year)

The element should be replaced referring to

「7-3 (3) Cleaning of air cleaner element See p.40」

7-8 Checking / every 1000 hours

(1) Replacement of compressor oil

Replacing procedures Refer to 「5-4 (4) Lube oil changing procedures See p.34」

(2) Replacement of compressor oil filter cartridge

① Remove the cartridge type element using filter wrench.

② Clean the filter base. Coat the packing of new cartridge with compressor oil thin. Then, mount the cartridge.

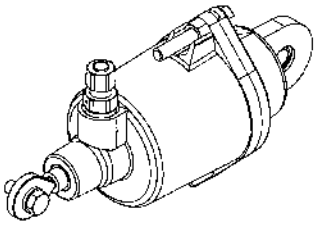
- When mounting, tighten the cartridge about from 2/3turn by using filter wrench after the packing is fitted to the seal of the filter base.

③ After the cartridge is replaced, run the engine for a while. Then, check to see that oil is supplied to the suitable level., after confirming that the delivery air pressure gauge reads zero.

(3) Checking / Replacement of seal in speed regulator

Check the seal in speed regulator, and replace it with a new one as required.

Parts number of speed regulator service kit
Y06034 24174 (2911005200)



(4) Checking / Replacement of seal in air suction capacity regulator valve

Check the seal in air suction capacity regulator valve, and replace it with a new one as required.

Parts number of air suction capacity regulator valve service kit
Y06033 24171 (2911005100)

(5) Checking / Replacement of pressure regulator valve

Check the pressure regulator valve, and replace it with a new one as required.

Parts number of pressure regulator valve ASS'Y
Y06034 00030 (1615766480)

(6) Checking of minimum pressure valve

Check the minimum pressure valve.

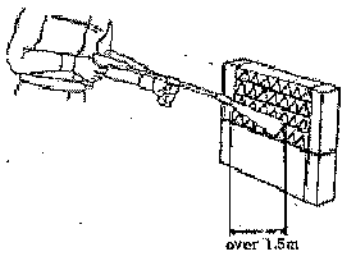
(7) Checking / Replacement of seal washer in compressor oil filler cap

Check the seal washer in compressor oil filler cap, and replace it with a new one as required.

Parts number of seal washer	
DAS-100LB / LB-C	Y06030 42808 (1092445100)
DAS-180LB / LB-C	Y06030 42619 (0661100031)

(8) Cleaning of radiator and oil cooler, after cooler (LB-C)

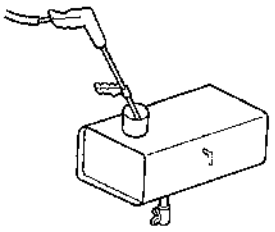
When the fin or tube is blinded, it should be cleaned with steam or high pressure water.



[Note]
When a high pressure washer is used, spray water from a place about 1.5m away to prevent damage to the fin or tube.

(9) Cleaning of inside fuel tank

Drain the fuel in the fuel tank completely, and wash out deposits and water collected inside the tank.



(10) Checking of rubber suspension

Check on the rubber suspension, whether it is damaged or deformed by the oil. Contact distributor or our office to replace the rubber suspension, if necessary.

(11) Checking on lining

If the sound absorbing material (lining) is found severely deteriorated, contaminated with oil, or peeled off, contact our service factory for replacement.

Contact distributor or our office to replace the lining, if necessary.

7-9 Other service requirements

Contact our service factory for details.

(1) Replacement of air oil separator element

(Every 2000 hours of operation in normal cases)

Replace the oil separator element when oil is starting to come out of the air outlet valves.

[Note]

The service life of the oil separator element cartridge varies greatly depending on the operating conditions.

Parts number of oil separator element kit	
DAS-100LB / LB-C	Y06032 10080 (1625001069)
DAS-180LB / LB-C	Y06032 10081 (1625001071)

(2) Replacement on nylon pipe and rubber hose

(Normally about every 2000 hours or once 3 years)

Check on the nylon pipe and rubber hose, whether they are hardened or deteriorate.

Contact distributor or our office to replace the nylon pipe hose and rubber hose, if necessary.

(3) Replacement of coupling element (normally about every 4000 hours)

Replace the coupling element if cracking is found on the surface, or deformation, discoloration, or abnormal hardness is found.

Contact distributor or our office to replace the coupling element, if necessary.

(4) Replacement of engine cooling water (Every 2000 hours or once 2 years)

■ Cautions on handling of long-life coolant

[Note]

* Never drink cooling water because it is toxic. If it is swallowed by mistake, immediately induce vomiting, and seek medical attention.
* If cooling water is splashed into eyes, clean them with clear water, and seek medical attention.

[Note]

* Cooling water is flammable. Do not hold a flame near it.
* If cooling water is attached to skin or clothes, immediately wash it off, and clean it with soap water.

■ Replacement of the cooling water within the engine

* Replace the cooling water in a state in which the cooling water temperature has decreased to sufficiently low level.

① Open engine drain plug to discharge the cooling water.

② On completion of the discharge, close drain plug.

③ After cooling water (long-life coolant + tap water) is fed, perform sufficient idle running to bleed the air within the engine and the piping, increase the water temperature to appropriate range, and continue idling operation for approximately 10 minutes or longer.

[Note]

Never operate the compressor without cooling water. Otherwise the water pump may fail or the engine may be burnt.

(5) Replacement of drain separator element (every 2000 hours or once 2 years)

Parts number of separator element Ass'y	
DAS-100LB / LB-C	E19241 00214A (SNo.~3893540) E19241 00304 (SNo.3893541~)
DAS-180LB / LB-C	E29241 00184

7-10 Table of periodical maintenance and checking

◇: Check or Clean ●: Replacement

	Inspection and maintenance item	Daily	Every 100 h	Every 200 h / 250 h	Every 500 h	Every 1000 h	Every 2000 h	Note
Common	Checking of oil, water, or fuel leakage	◇						
	Checking of loose piping connections and wear of hoses	◇						
	Checking of loose wiring connections and wear of wiring	◇						
	Checking of operation status of each instrument and alarm lamps	◇						
	Checking of clogging of air cleaner	◇						
	Removal of foreign matter inside and outside the compressor	◇						
	Cleaning of air cleaner element		◇					
	Replacement of air cleaner element				●			or 2 years
	Checking of rubber suspension					◇		
	Checking of (sound absorbing material) lining					◇		
	Cleaning of radiator, oil cooler, after cooler (LB-C)					◇		
Compressor	Checking of compressor oil lube and state of contamination	◇						
	Discharge of oil chamber drain	◇						
	Checking of withstand pressure of connected piping	◇						
	Checking/Cleaning of oil return orifice				◇			
	Checking of safety valve operation				◇			or once 1 year
	Checking/Cleaning of drain filter (LB-C)			◇				
	Checking/Cleaning of drain separator element (LB-C)			◇				
	Replacement of compressor oil					●		
	Replacement of compressor oil filter cartridge					●		first 50hr
	Checking/replacement of seal in speed regulator					●		
	Checking/replacement of seal in air suction capacity regulator valve					●		
	Checking/replacement of pressure regulator valve					●		
	Checking of minimum pressure valve					◇		
	Checking/replacement of seal washer in compressor oil filler cap					●		
	Cleaning of after-cooler filter (LB-C)		◇					
	*1 Replacement of oil separator element						●	
	*1 Replacement of nylon pipe and rubber hose						●	or once 3 year
	Replacement of coupling element							4000hr
	Replacement of drain separator element						●	or once 2 year

	Inspection and maintenance item	Daily	Every 100 h	Every 200 h / 250 h	Every 400 h	Every 1000 h	Every 2000 h	Note
Engine	Checking of water separation filter element	◇						
	Checking of engine oil lube and contamination	◇						
	Checking of engine cooling water	◇						
	Checking of fuel lube	◇						
	Checking of battery acid	◇						
	Discharge of drain within fuel tank	◇						
	Checking of fan belt tension (replacement)	◇	◇					
	Replacement of engine oil			● (200hr)				first 50hr
	Replacement of engine oil filter			● (200hr)				first 50hr
	Cleaning of fuel filter element		◇					
	Lubricating speed regulator		◇					
	Replacement of fuel filter element				●			
	Cleaning of water separation filter element				◇			
	Checking of battery specific gravity			◇ (250hr)				
	*1 Checking/cleaning of injection nozzle					1000hr		
	*1 Checking/cleaning of injection pump					1000hr		
	*1 Checking/adjustment of valve clearance					800hr		
	Replacement of engine cooling water						●	or once 2 year
	Cleaning of interior of fuel tank					◇		

Note:
*1: Contact our service factory for the items marked with *1.

See the "Table of periodic inspection/maintenance" in separately supplied "Instruction manual of the engine" for details of periodic inspections/maintenance of the engine.

8. Trouble shooting and Countermeasures

Should the machine be out of order during operation, check for causes and take appropriate measures:

8-1 ENGINE DOES NOT START:

Starter does not rotate or rotates only slowly.

Battery has been discharged.	Check electrolyte level and specific gravity.
Battery terminals are disconnected, loosened, and / or degraded.	Clean and securely connect.
Grounding is not sufficiently conducted.	Securely connect the grounding wire.
Starter switch, magnet switch, safety relay, and / or starter are defective.	Call service shop.

Starter rotates but the engine does not start

No fuel.	Replenish fuel.
Fuel filter is clogged.	Clean or Replace fuel filter.
Fuel used is deteriorated or improper.	Use light fuel.
Preheating system is defective.	Call service shop.
Failed air-bleeding.	Bleed air.
Solenoid does not work.	Check fuse. If blown out, check for cause and replace it. Check and replace solenoid. Call service shop.

Cold weather

Fuel is frozen.	Use fuel for cold weather. (such as ASTM No.3)
Water accumulated in fuel system is frozen.	Warm the system to fully extract water contained in the fuel tank, filter, and pipes.
Engine oil is excessively viscous.	Replace with oil of appropriate viscosity.
Compressor oil is excessively viscous.	Use oil with pour point lower than -30℃.
Battery is not fully charged.	Charge.

8-2 ENGINE STOPS DURING OPERATION

(1) IF THERE IS SOMETHING WRONG WITH THE COMPRESSOR:

Pressure setting is too high

Pressure regulator is not correctly adjusted.	Lower pressure setting of the regulator.
Pressure regulator is defective.	Call service shop.
Air leaks from pressure regulator pipes.	Check and repair leaking portions.
Pressure regulator is frozen.	Check and repair frozen parts.
Pressure regulator pipes are frozen.	Check and repair frozen parts.

Others

Compressor oil is excessively.	Replace with less viscous oil.

(2) IF THERE IS SOMETHING WRONG WITH THE ENGINE:

Problems in fuel system

Fuel tank is empty.	Replenish fuel.
Air is not fully extracted.	Fully extract air from fuel.
Fuel filter is clogged.	Clean or replace fuel filter.
Fuel is deteriorated or different.	Use light fuel.
Fuel injection system is defective.	Call service shop.
Engine oil level is higher than the upper limit.	Reduce it to the upper limit.
Engine oil is excessively viscous.	Replace with less viscous oil.
Overheating.	Compressor sucks exhaust gas from other compressors operated in parallel.

Low engine oil pressure

Insufficient engine oil.	Replenish oil.
Defective oil pressure switch.	Replace switch.
Clogging of engine oil filter.	Replace filter.

Others

Warming is insufficient viscous.	Start the engine with the unloader valve set to the "START" position to fully warm the engine.
Governor rod is not correctly adjusted.	Readjust.

(3) IF THERE IS SOMETHING WRONG WITH ELECTRIC INSTRUMENTATION:

Emergency stop circuit is abnormal

Switch or sensor is defective.	Check and repair.
Wiring to water temperature switch, oil pressure switch, discharge air temperature sensor is disconnected.	Call service shop.
Engine control unit is defective.	Check and repair. Call service shop.

8-3 NO AIR IS DELIVERED

Coupling element is abnormal.	Check and replace coupling element.
Unloader valve is set to "START" position.	Rotate to "RUN" position.
Minimum pressure valve is abnormal.	Overhaul and clean.
Pressure regulator valve is abnormal.	Check and replace diaphragm.

8-4 UNLOADER ROTATION IS EXCESSIVE

Governor rod is not correctly adjusted.	Readjust.
Air leaks from control pressure pipe.	Check and repair.
Air leaks from air suction capacity regulator valve seal.	Check and repair.
Coupling element is abnormal.	Check and replace coupling element.
Speed regulator seal is defective.	Replace.

8-5 SAFETY VALVE OPERATES

Pressure regulator valve is not correctly adjust.	Readjust.
Pressure regulator valve interior or pipe is frozen.	Check and repair frozen parts.
Air leaks from control pressure pipe.	Check and repair.
Pressure regulator valve is assembly abnormal.	Check and repair.
Safety valve is abnormal.	Check and repair.
Air leaks from air suction capacity regulator valve seal.	Check and repair.

8-6 ENGINE SPEEDS DOWN BEFORE AIR PRESSURE REACHES 0.70 MPa

Unloader valve is not set to "RUN" position.	Reset.
Governor rod is not correctly adjusted or abnormal.	Readjust or repair.
Pressure regulator valve is not correctly adjusted.	Readjust.
Engine air cleaner is clogged.	Clean or replace.
Fuel filter is clogged.	Clean or replace.
Air is not fully extracted.	Fully extract air from fuel.
Fuel is deteriorated or different.	Use light oil.
Engine fuel system is abnormal.	Call service shop.
Engine is defective.	Call service shop.

8-7 UNLOADER ROTATION IS LOW

Air is not fully extracted.	Fully extract air from fuel.
Governor rod is not correctly adjusted or abnormal.	Readjust or repair.

8-8 DELIVERY AIR VOLUME IS SMALL (pressure is insufficient)

Unloader valve is not set to "RUN" position.	Reset.
Engine does not reach rated speed due to poor adjusted governor rod.	Readjust.
Engine does not reach selected speed.	See 8-6.
Air cleaner is clogged.	Clean or replace.
Clogging of oil separator element cartridge.	Replace oil separator.
More air is consumed by load.	Recheck air consumption by the load.
Air leaks in a load-side pipe.	Check the pipe.
Pressure regulator valve is not correctly adjusted.	Readjust.
Compressor oil filter is clogged.	Replace filter.
Capacity regulator does not work correctly.	Check and repair the regulator.

8-9 OVERHEATING

Check ambient conditions and inside the machine.	Eliminate diffusion of discharged air and suction of dust.
Cooling water is emptied or short.	Check and replenish cooling water. Check and replace radiator cap.
Defective water temperature sensor.	Check and replace.
Fan belt is loosened.	Check and retighten.
Defective engine water pump or engine fan.	Check and repair.
Radiator and oil cooler cores are clogged.	Clean.
Engine thermostat is abnormal.	Check and replace.

8-10 OIL IS MIXED IN DELIVERED AIR (oil not fully separated)

The machine is not installed on level ground.	Install it on level ground. (allowable inclination is 5° Forward / backward and left / right directions)
Compressor oil level is higher than the upper limit.	Confirm than the level is within the specified range when the engine is stopped.
Drainage is larger than usual.	Open the drain valve to extract drainage in the oil chamber.
Orifice of the oil return pipe are clogged.	Check and clean the orifice.
Engine was started with the unloader valve set to "RUN" position.	Start the engine with the unloader valve set to "START" position and operate it in a no-load condition.
Service valve(s) or start run valve has been quickly opened after the engine stopped.	Do not attempt to quickly discharge it through the air outlet valve(s) after the engine stopped.
Life of the oil separator has cartridge come to an end.	Replace.
Too low discharge pressure.	Overhaul, check and adjust minimum pressure valve.

8-11 COMPRESSOR AIR TEMPERATURE IS HIGH

Check ambient conditions and inside the machine.	Eliminate diffusion of discharged air and suction of dust.
Compressor oil filter cartridge is clogged.	Replace.
Fan belt is loosened.	Check and retighten.
Oil cooler cores are clogged.	Clean.
Compressor oil is short.	Replenish.
Defective discharge air temperature sensor.	Check and replace.

8-12 Does not blow off

Improper operation of blow down valve.	Disassemble and check.

9. Long-term storage

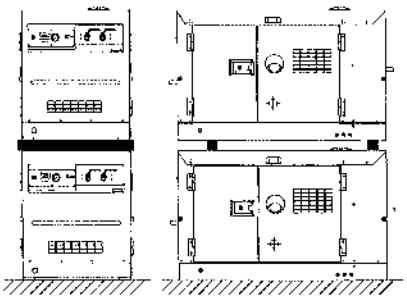
When the machine is to be stored for a long period of time, choose a cool place free from moisture and dust, and observe the following points.
Do not cover the compressor with a sheet directly for storage to prevent rusting.

(1) Remove dirt clung the machine and clean it thoroughly. If painting is peeled off, it should be repaired.
(2) Remove the battery from the machine. The battery should be charged completely before it is stored. Battery is discharged of itself. Recharge it once a month.
(3) If any defects are found, check and repair the machine so that it can be used for future operation.
(4) Replace the compressor oil and engine oil. Also replace the oil filters with new ones.
(5) Completely drain the fuel and the cooling water.
(6) Check that the feeding port of the fuel tank and the cooling water feeding port completely, and seal the opening of the muffler and the air cleaner with cloth tape.
(7) Apply grease to the sliding part of the governor rod.
(8) Apply anti-corrosive agent to pipe connections.
(9) For details of handling the engine, refer to the instruction manual for the engine provided separately.

⚠ CAUTION
STACKING

■ Improper stacking of machines may cause falling or dropping accidents. When stacking other machines on this machine, be sure to observe the following points.

* Check that the bonnet of the machine is free from damage and that the fixing bolts are not loosened and missing.
* Put the machine horizontally on a solid foundation which withstands the weight of stacked machines.
* Machines can be stacked up to 2 stages. The weight and size of stacked machines should be less than those of this machine.
* Using square timbers as shown below, put each machine making sure that the weight is even.



■ Do not operate the machines in the state of stacking to prevent falling or dropping accidents.

10. Service data

10-1 Specifications

MODEL	DAS-100LB	DAS-100LB-C
COMPRESSOR		
Type	Single stage, oil-cooled, screw type rotary compressor	
Actual free air delivery	2.80 m^3/min (100 CFM)	
Operating pressure	0.70 MPa (102 psi)	
Lube oil capacity	12 L (3.2 gal.)	
Oil chamber capacity	27 L (7.1 gal.)	
Air outlet valve	20A×2	
ENGINE		
Maker and model	KUBOTA D1105-K3B	
Type	4-cycle, water-cooled diesel engine	
Bore × stroke	78 mm × 78.4 mm (3.07 in. × 3.09 in.)	
Displacement	1.123 L (68.6 cu.in.)	
Rated output / speed	20.2 kW / 3,400 min^{-1}	
Speed, rated / no-load	3,400 / 1,900 min^{-1}	
Lubricate oil capacity	5.1 L (1.4 gal.)	
Cooling water capacity	4.5 L (1.2 ga.l)	
Fuel	Diesel fuel (ASTM No.2 or equivalent)	
Lubricating oil	API service class (CF class or higher)	
Fuel tank	32 L (8.5 gal.)	
Battery	95D32R × 1	
SET		
Length	1,580 mm	
Width	760 mm	
Height	920 mm	
Dry weight	520 kg (1,146 lbs)	540 kg (1,190 lbs)
Total weight	575 kg (1,268 lbs)	595 kg (1,312 lbs)

The above specifications and set dimensions are subject to change.

Dry weight : This weight does not contain the cooling water, engine oil and fuel.

Total weight : This weight contains the cooling water, engine oil and fuel.

MODEL	DAS-180LB	DAS-180LB-C
COMPRESSOR		
Type	Single stage, oil-cooled, screw type rotary compressor	
Actual free air delivery	5.10 m^3/min (180 CFM)	
Operating pressure	0.70 MPa (102 psi)	
Lube oil capacity	19 L (5.0 gal.)	
Oil chamber capacity	39 L (10.3 gal.)	
Air outlet valve	20A×3	40A, 20A×2
ENGINE		
Maker and model	KUBOTA V2403-K3A	
Type	4-cycle, water-cooled diesel engine	
Bore × stroke	87 mm × 102.4 mm (3.43 in. × 4.03 in.)	
Displacement	2.434 L (148.6 cu.in.)	
Rated output / speed	36.0 kW / 2,700 min^{-1}	
Speed, rated / no-load	2,700 / 1,350 min^{-1}	
Lubricate oil capacity	9.7 L (2.6 gal.)	
Cooling water capacity	8.4 L (2.2 gal.)	
Fuel	Diesel fuel (ASTM No.2 or equivalent)	
Lubricating oil	API service class (CF class or higher)	
Fuel tank	90 L (23.8 gal.)	
Battery	95D32R × 1	
SET		
Length	1,700 mm	
Width	1,000 mm	
Height	1,060 mm	
Dry weight	735 kg (1,620 lbs)	765 kg (1,687 lbs)
Total weight	840 kg (1,852 lbs)	870 kg (1,918 lbs)

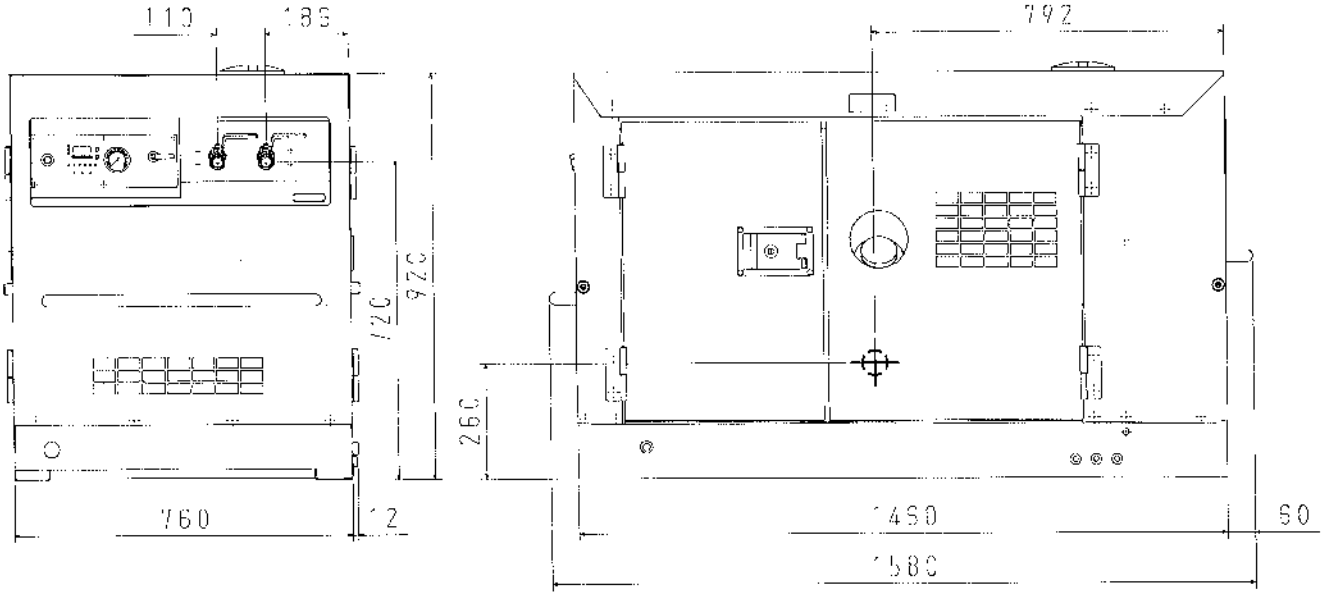
The above specifications and set dimensions are subject to change.

Dry weight : This weight does not contain the cooling water, engine oil and fuel.

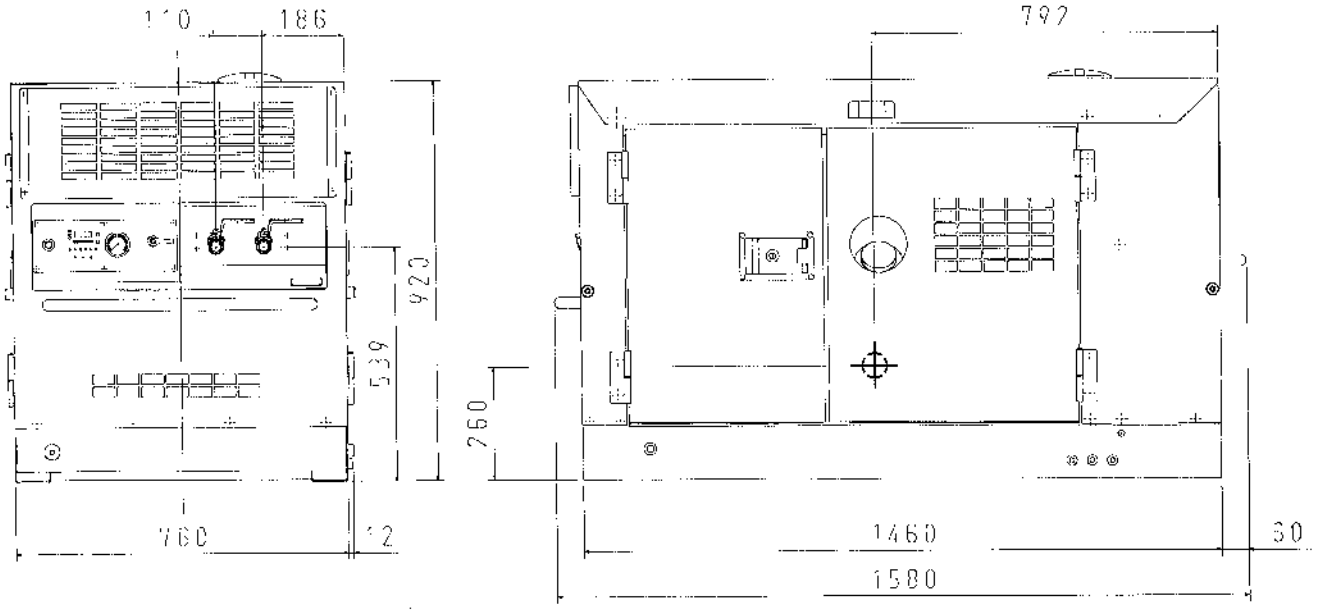
Total weight : This weight contains the cooling water, engine oil and fuel.

10-2 Outline drawing

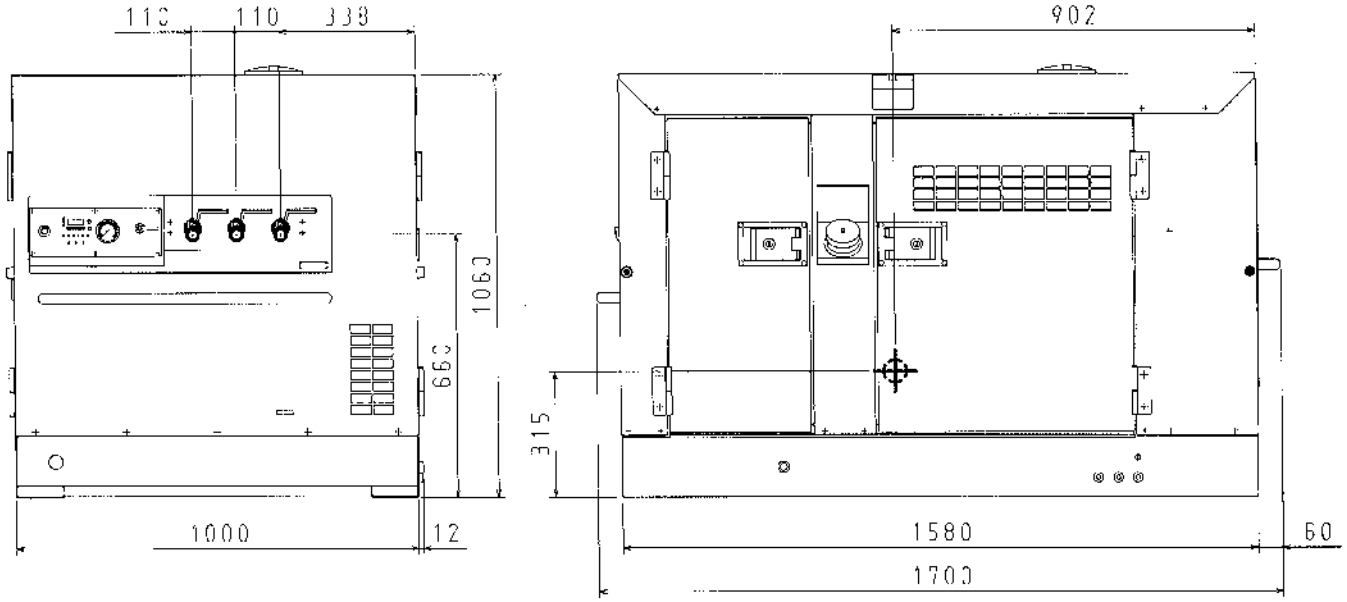
【DAS-100LB】



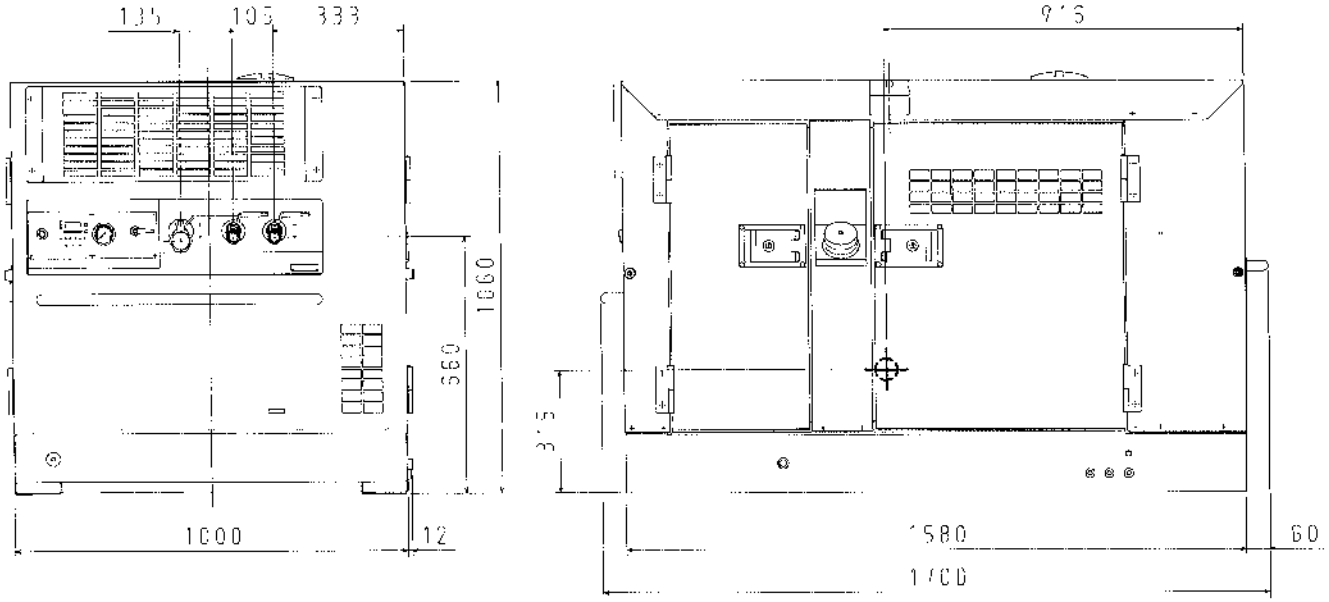
【DAS-100LB-C】



【DAS-180LB】

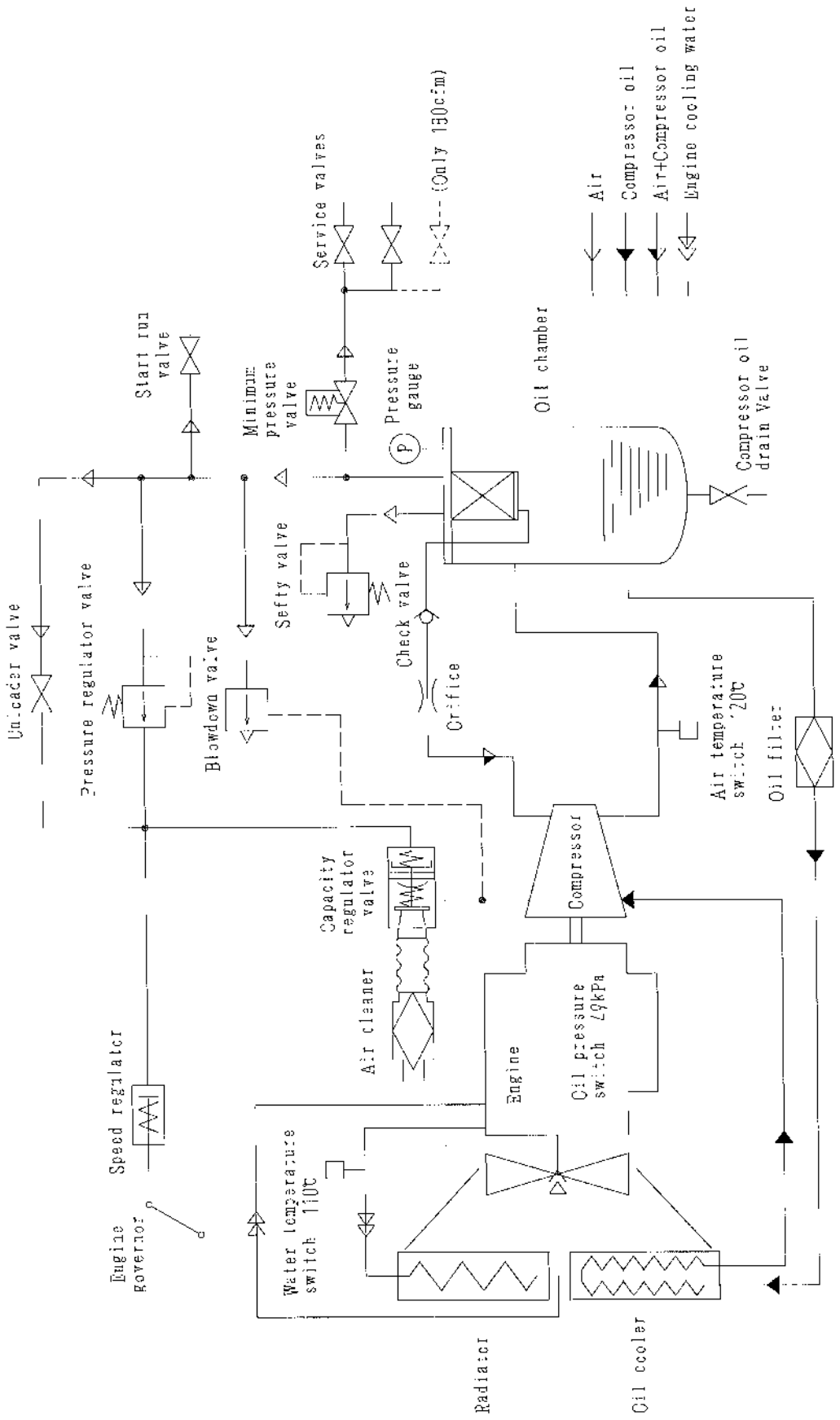


【DAS-180LB-C】

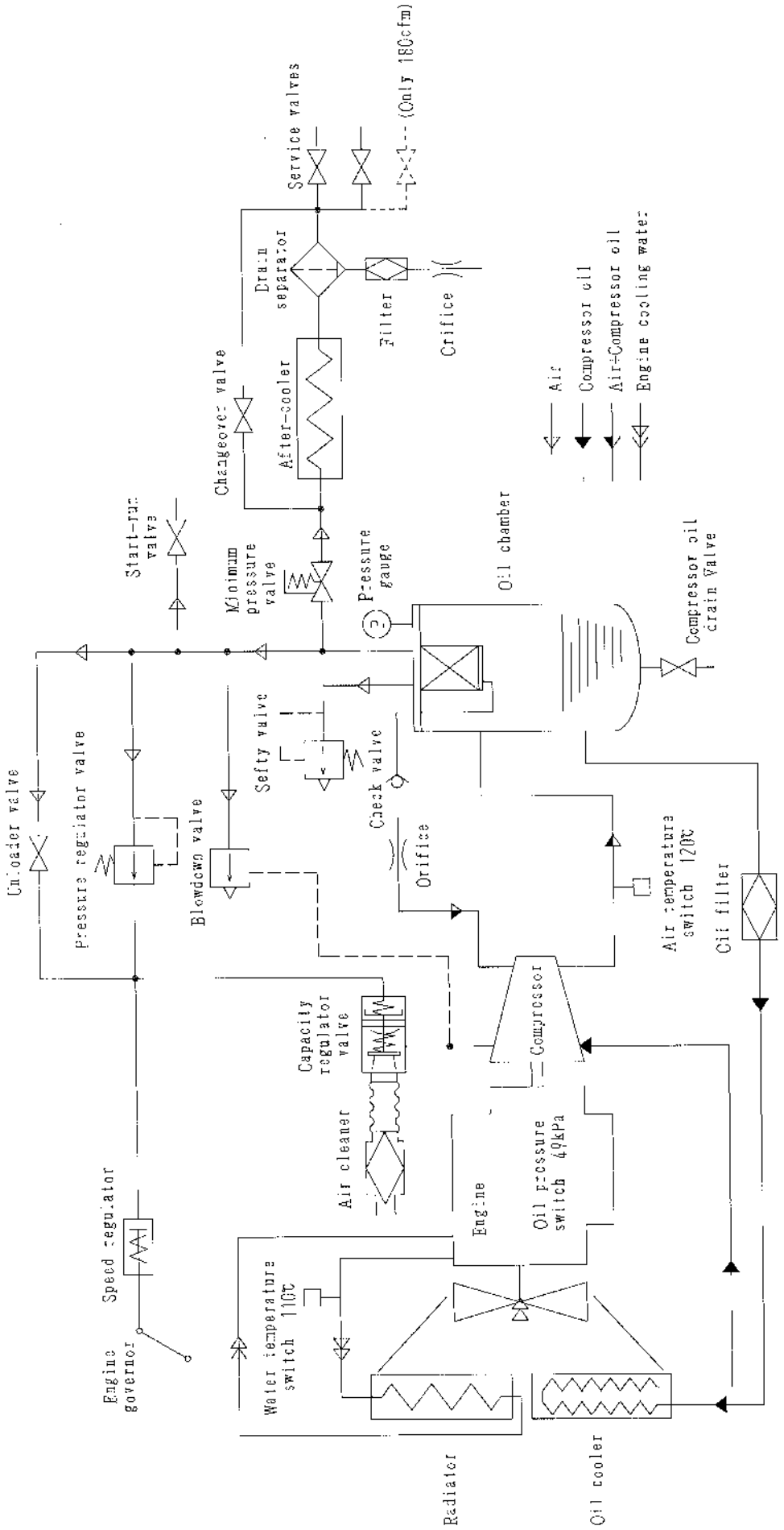


10-3 Combined Piping Diagram

【DAS-100/180LB】

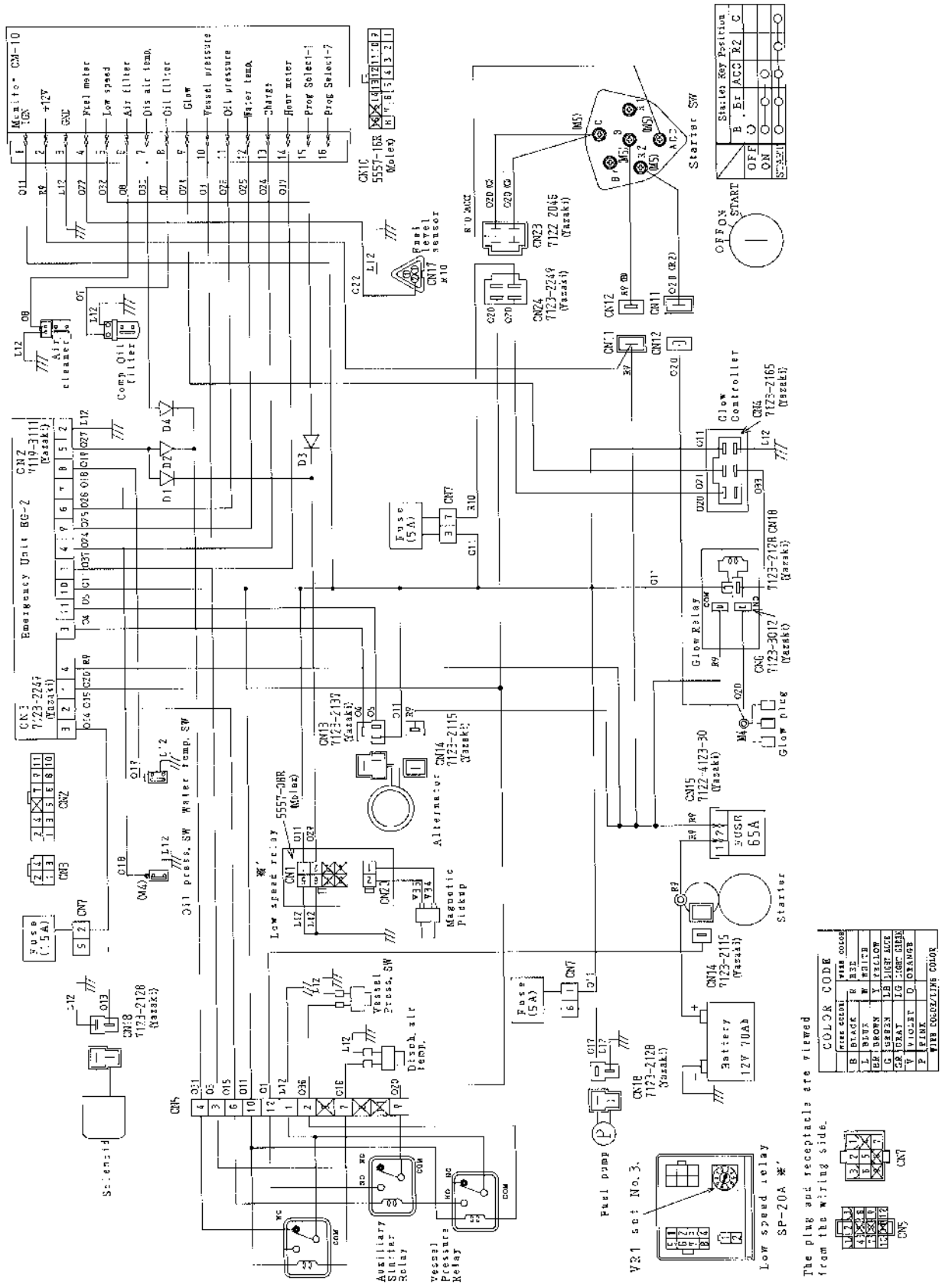


【DAS-100/180LB-C】



10-4 Engine wiring diagram

【DAS-100LB/LB-C】



【DAS-180LB/LB-C】