AIRMAN

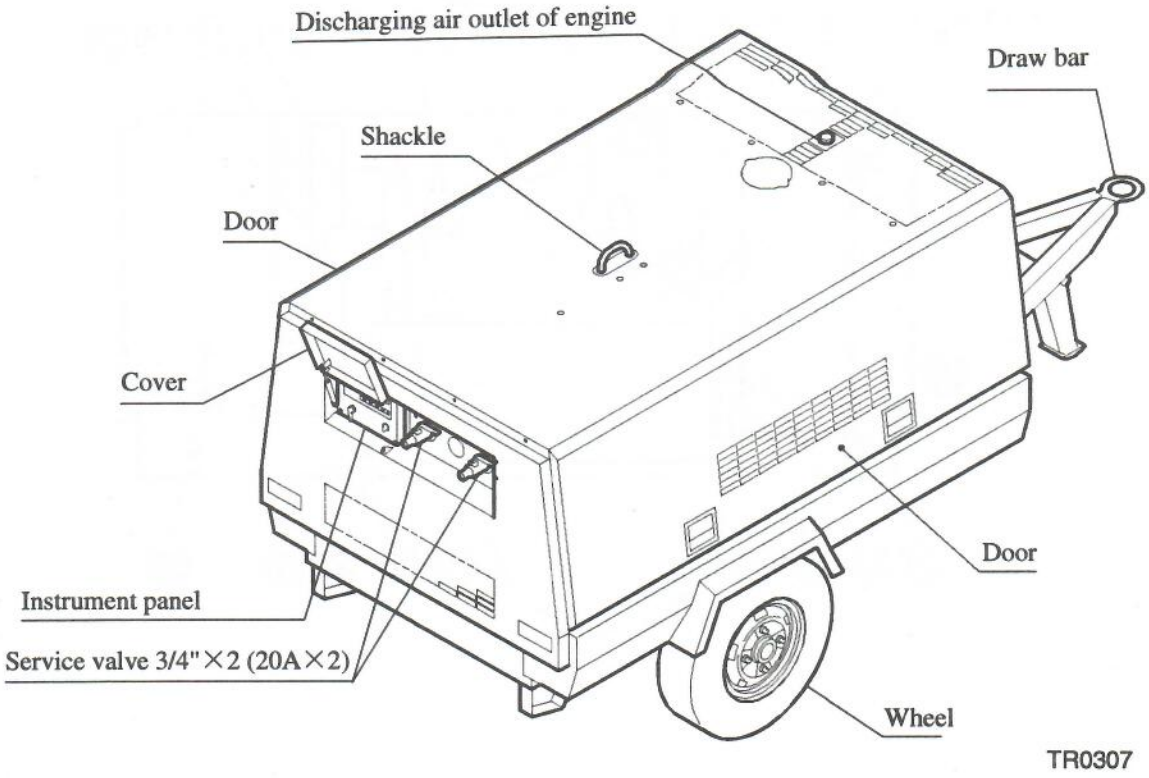
INSTRUCTION MANUAL

PDS185S
6A1

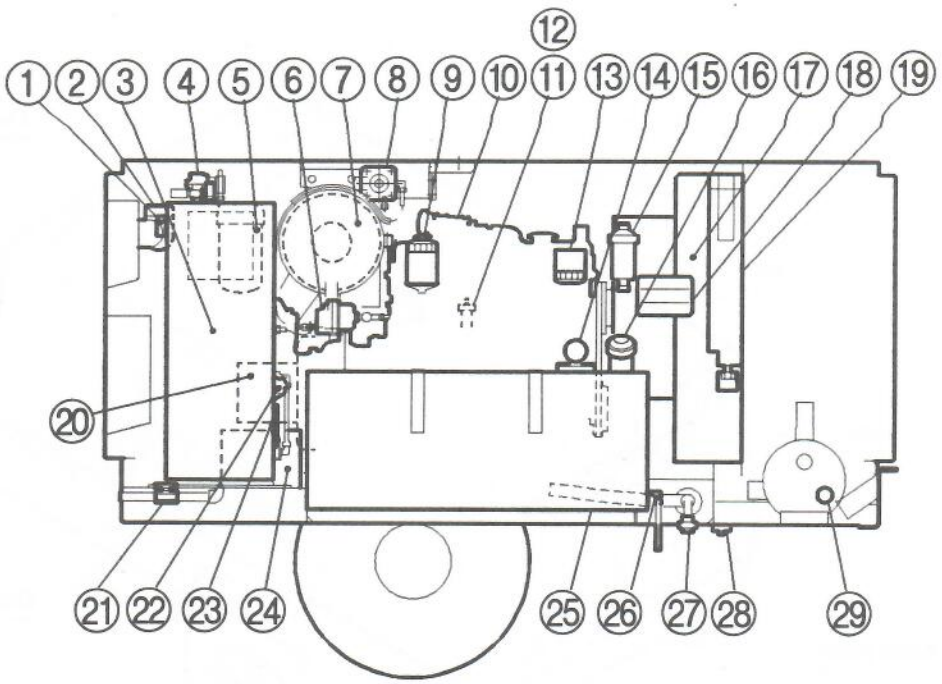
HOKUETSU INDUSTRIES CO.,LTD.

2.Operation

2.1 Unit Appearance and Part Names



2.2 Main Components and Part Names

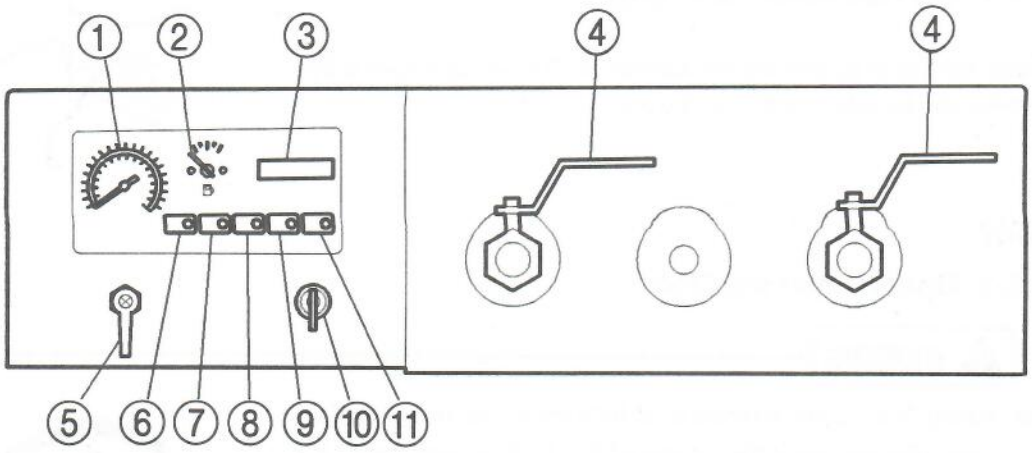


TR0308

① Safety valve
② Pressure control valve
③ Separator receiver tank
④ Auto-relief valve
⑤ Compressor oil filter
⑥ Speed regulator
⑦ Air filter
⑧ Pressure regulator
⑨ Engine oil filter
⑩ Engine
⑪ Engine oil level gauge
⑫ Engine oil filler port
⑬ Fuel filter
⑭ Electromagnetic pump for fuel air drain
⑮ Water sedimenter
⑯ Fuel filler port
⑰ Oil cooler
⑱ Reserve tank
⑲ Radiator
⑳ Air-end
㉑ Separator receiver tank drain valve
㉒ Compressor oil filler port
㉓ Compressor oil level gauge
㉔ Battery
㉕ Fuel tank
㉖ Fuel tank drain valve
㉗ Engine oil drain plug
㉘ Coolant drain plug
㉙ Exhaust muffler

2. Operation

2.3 Instrument Panel



TR0309

① Discharge pressure gauge
② Fuel gauge
③ Hour meter
④ Service valve
⑤ Starting unloader valve
⑥ Warning lamp for low engine oil pressure
⑦ Warning lamp for high coolant temp.
⑧ Warning lamp for high discharged air temp.
⑨ Warning lamp for charging
⑩ Starter switch
⑪ Preheating lamp

Warning Display

- When the warning lamp is on, be sure to take appropriate measures to correct the situation immediately.

Item	Trouble	Measures	Reference
Charging	Lamp goes on when alternator is not charging.	• Check wiring • Check Alternator.	——

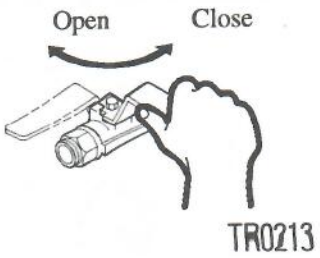
Emergency Display

- The Compressor stops when the emergency lamp goes on. Be sure to follow the measures shown below before starting the unit again.

Item	Trouble	Measures	Reference
Discharged air temp	Lamp goes on when the air temperature at the outlet of the compressor reaches 271°F (115°C.)	See Troubleshooting.	See 6.4
Engine oil pressure	Lamp goes on when working pressure of the engine oil decreases below 21 psi (0.15 MPa).		
Coolant temperature	Lamp goes on when coolant temperature reaches 230°F (110°C.)		

2.4 Compressed Air Service Valve

2.4.1 Service Valve 3/4" (20A)



TR0213

- Close the valve by turning the handle clockwise, and open it by turning the handle counterclockwise.

2.5 Door

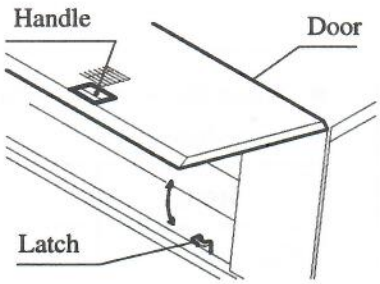
2.5.1 Open/Close the Door.

⚠ WARNING

- Keep the doors closed and locked while running the unit. (Do not lock the cover of the instrument panel.)
- 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 to the operator.
- Be sure to engage the stay into the slot of the door receptacle, so that it is firmly held against wind or vibration.


PK0028

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



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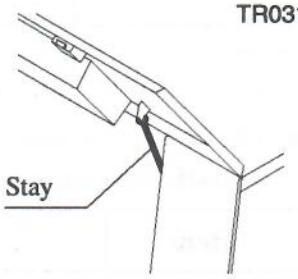


TR0311

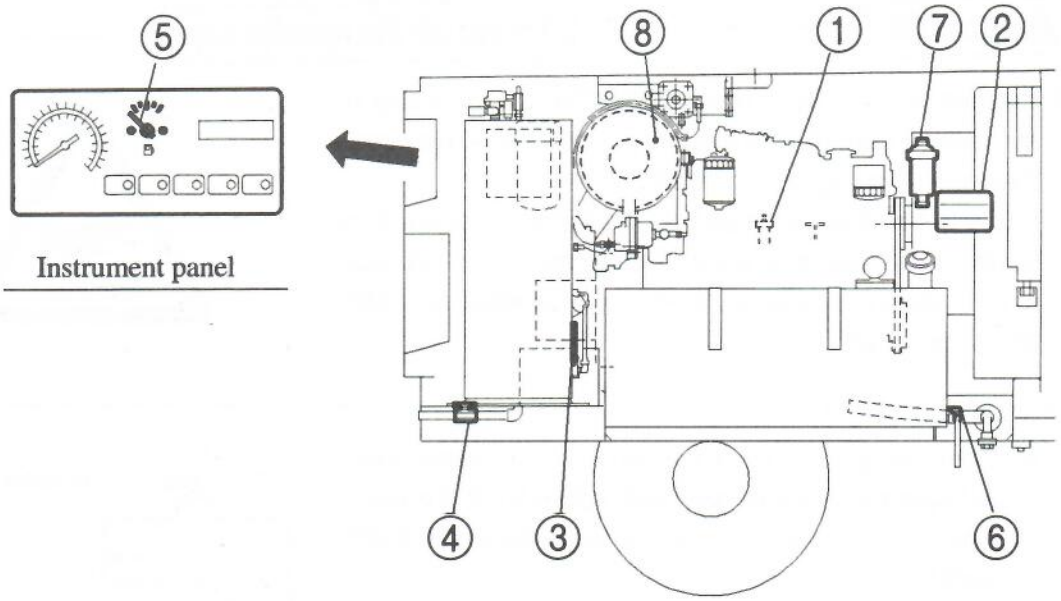
2.6 Check before Starting the Unit

⚠ CAUTION — ***Check before starting the unit***

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

2. Operation

2.6.1 Check Items and Places



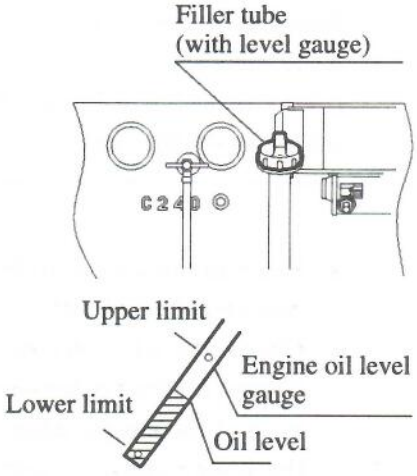
Instrument panel

TR0312

① Engine oil level check
② Coolant level check
③ Compressor oil level check
④ Compressor oil drain
⑤ Fuel check
⑥ Drain fuel tank
⑦ Water sedimenter drain
⑧ Check clogging of air filter element
- Check wiring of each part
- Check piping of each part

2.6.2 Engine Oil Level Check

- Unit should be level before checking oil levels.
- Wait 10 minutes after stopping engine, before checking the oil levels.



TR0313

(Procedure)

① Turn the cap on the filler tube and pull the engine oil level gauge out of it, and wipe it with a clean cloth.
② Then, re-insert the gauge and pull it out again. If the oil level shows between upper and lower limits on the gauge, it is normal.
③ When the oil level is below its lower limit, add engine oil. (See 5.5.1.)

- While checking oil level, check and locate cause for contamination, if the oil shows contamination, change the oil. (See 5.5.1.)

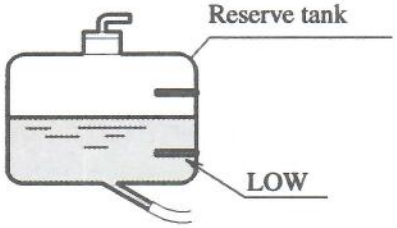
2.6.3 Coolant Level Check

⚠ CAUTION — *Taking off the radiator cap*

- Be sure to stop the machine after the coolant water is sufficiently cooled and the inner pressure is released, then take the cap off to check coolant level.
  If this procedure is neglected, its inner pressure can blow off the cap, and steam jetting out of the radiator could result in scalding. Follow the procedure under any circumstances.

W005

- Check the quantity of the coolant left in the reserve tank, and open the cap of the tank and replenish it if it is lower than the limit. (Level must be kept above the LOW mark)
- If no coolant is left in the reserve tank, replenish the radiator and reserve tank. (See 5.11.6.)



TR0314

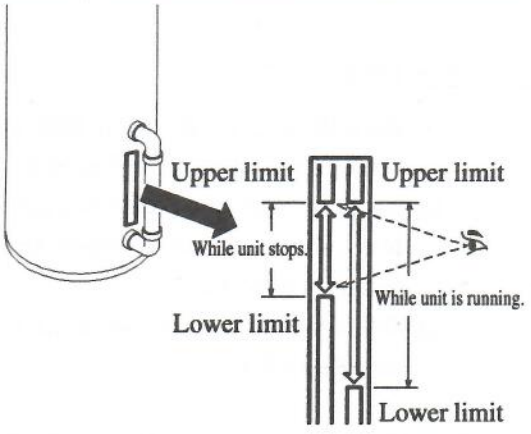
2.6.4 Compressor Oil Level Check

⚠ 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 0 psi (0 MPa) 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.

W011

- Place the machine on level ground when checking the oil level.
- Check the oil level of the compressor. Correct oil level is between upper and lower limit of the gauge, when the unit stops. If the gauge shows lower than the middle level, replenish oil. (See 5.8.1.)



TR0315

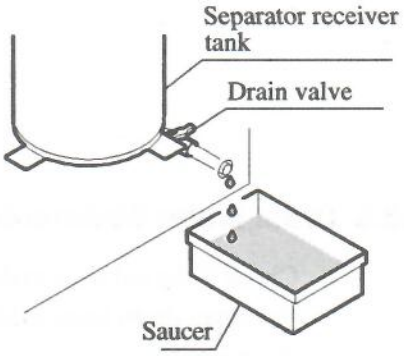
2.6.5 Compressor Oil Drain

⚠ WARNING — *Draining of compressor oil*

- After stopping the engine, confirm that the pressure gauge indicates 0 psi (0 MPa), 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.

W005

- Open the drain valve at the bottom of the separator receiver tank little by little to discharge the oil.
- Be careful not to fully open the valve. Otherwise, oil will be discharged too fast.
- After draining the oil completely, close the drain valve firmly.
- Dispose of the waste oil according to the designated regulations.



TR0316

2.6.6 Fuel Check

⚠ CAUTION — *Fire prevention*

- Do not, under any circumstance, smoke cigarettes or light matches during fueling.
- Fuel is extremely flammable and dangerous. It is, therefore, very easy to start a fire when you handle fuel around flames.
- 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.

D004

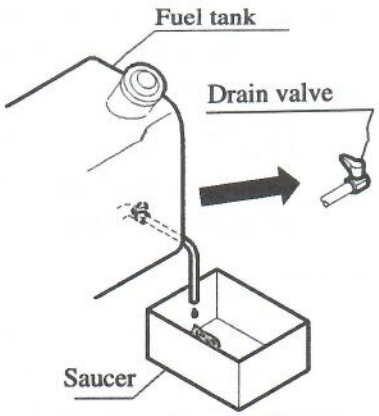
IMPORTANT — *Choose appropriate fuel*

- Be sure to use diesel fuel oil for diesel engine use.
  (Using other oil will cause low power or damage to the engine.)
- Capacity of the fuel tank is 21 gal. (80 L)

- Check fuel gauge before operation. Replenish fuel if it is low.
- Be sure to fasten the cap firmly to the fuel tank after replenishment. If fuel is spilt, wipe it up completely.

2.6.7 Drain Fuel Tank

- Open drain valve at the bottom of the fuel tank to discharge fuel left in the tank.
- When completely drained, firmly close the drain valve.
- Dispose of the old fuel according to the designated regulations.



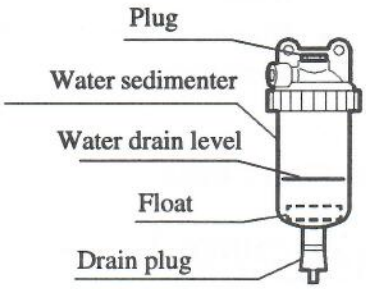
TR0317

2.6.8 Drain Water Sedimenter

- Check if the red float in the water sedimenter raises up to the water drain level mark. Drain water if it is near the drain level.

(Procedure)

① Loosen the drain plug to discharge water from inside.
② After drainage, fasten the plug firmly.



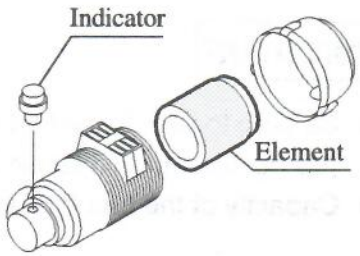
TR0318

2.6.9 Check Clogging of Air Filter Element

IMPORTANT ***Be sure to properly clean air filter element***

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

- When the air-filter clogging indicator turns red, take the element out and clean it.
- When it can not be cleaned, replace the element with a new one. (See 5.9.2.)



TR0319

2.6.10 Check Wiring of Each Part

- Check wiring for looseness in the connecting part, damage to the insulating cover, disconnected, or electric short circuits.

2.6.11 Check Piping of Each Part

- Check piping for loose connections, tear in hose or tube, or leakage of air or oil from the piping.

2.7 Unit Operation

⚠ 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

Quick Glow System

- Since this equipment is provided with a quick glow system (quick preheating device), **you do not have to turn the starter switch counterclockwise** from STOP position.
- Turn the starter switch to the "Operation" position, and the preheating will be completed in several seconds and the preheating lamp will go out. Then, turn the Starter Switch to the Start position to start up the engine.
- When the engine is already warm, the preheating operation is automatically omitted. Even though the preheating lamp lights up momentarily, ignore the lamp status, and start up the engine.

WARNING – Because of the quick glow system, never use ether to start engine.

2.7.1 Procedure to start the unit

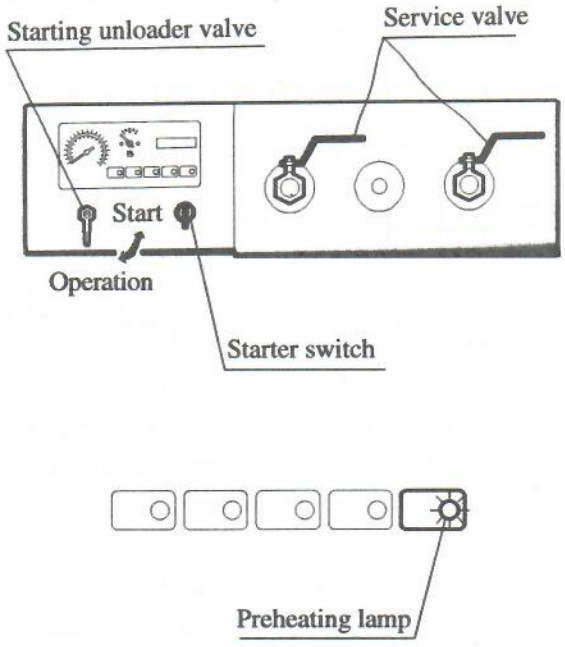
IMPORTANT — ***Be sure to warm-up***

- 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 the alarm lamps are off.

(Procedure)

① Fully close the service valve.
② Set the starting unloader valve to "Start."
③ Turn the starter switch to "Operation" position, and the preheating lamp lights up.
④ As soon as the preheating lamp has gone out, turn the starter switch fully clockwise to start up the engine.
⑤ Once the engine has started up, leave it running to warm up for five minutes. The discharge air pressure in this condition ranges from **57 to 100 psi (0.39 to 0.69 MPa)**.
⑥ After warm-up of the unit, put the starting unloader valve back to its "Operation" position, and open the service valve. The unit is now ready to operate.

- Be sure to turn the starting unloader valve to "Operation" position prior to work. The discharge pressure does not increase as long as the starting unloader valve stays at "Start" position.



TR0320

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

- When the engine fails to start up even after performing Steps ① to ④ of the startup procedures, do not continue cranking, but set the starter switch back to Stop and wait for 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.
  - the fuel filter and/or filter inside the fuel air-bleeding electromagnetic pump are clogged.
  - the battery is at a low-level charge.

2.7.3 EFPA (Automatic Air Bleeder)

If the unit runs out of fuel, the electromagnetic pump attached to the unit will automatically bleed air out of the fuel system.

(Procedure)

① Replenish fuel.
② Turn the starter switch to its "Operation" position. The electromagnetic pump starts pumping and automatically discharges air caught in the fuel pipes.
③ Air-drain will be completed within 40 to 50 seconds.

2.7.4 How to Start the Unit at Low Temperature

- When temperature is very low and it is difficult to start engine, follow the procedure shown below to start the unit.

(Procedure)

① Fully open the service valve.

② Follow the regular starting procedure to start the engine. By watching how the engine rotates, gradually close the service valve as the engine speeds up. Beware of the compressed air discharged from the service valve.

③ When the valve is completely closed, keep the unit running in this way for a while to warm-up.

Note: Never use ether as a starting aid.

IMPORTANT

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

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

2.7.5 Gauge Indication while Operating

IMPORTANT

- Minimum discharge air pressure is 57 psi (0.39 MPa) during 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.

- Be sure to periodically check to see if gauges, for each component of the unit, are properly working, and 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 table below gives standard values. They may vary slightly depending on the operating conditions and other factors.

		Alarm Lamp				
		Engine oil pressure	Coolant Temp.	Discharge air Temp.	Battery charge	Preheating
Before Startup	Starter switch set to "Operation" position.	☼ On	● Off	● Off	☼ On	* ● Off
In Operation		● Off				

		Air Pressure Gauge (kgf/cm²)
In Operation	Unload	102 to 114 psi (0.71 to 0.78 MPa)
	Full load	57 to 100 psi (0.39 to 0.69 MPa)

Asterisk*: Turns off when preheating completes

2.7.6 Performance check of safety valve

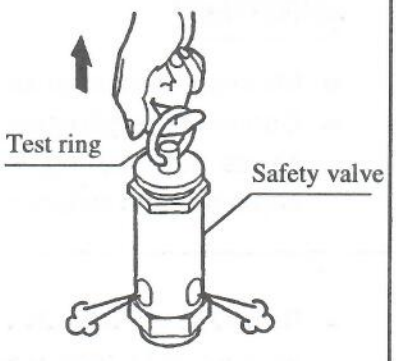
⚠ WARNING

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

IMPORTANT

CAUTION – Wear safety glasses.

- Be sure to check the safety valve performance once a day.
- Close the service valve completely and pull the test ring of the safety valve to check the performance. Discharge pressure gauge should be between 102 to 114 psi (0.71 to 0.78 MPa) when you check the performance. It is performing normally when the pressure inside the safety valve jets out with a little pull at a discharge pressure between 102 to 114 psi (0.71 to 0.78 MPa).
- Pressure setting for safety valve is 141 psi (0.97 MPa).



PK0064

2.8 Stopping procedures

(1) Close the service valve completely and operate the equipment about five 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 operation. Keep the key and be careful not to lose it.

3. Hauling and Pulling the Unit

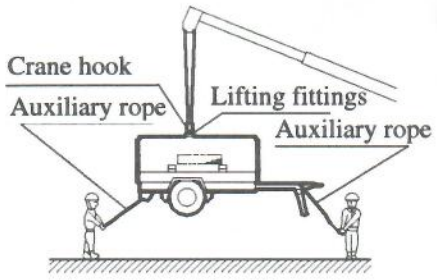
3.1 Hauling

⚠ WARNING — ***Cares required while hauling the unit***

- When hauling the unit in a truck bed, fasten it firmly to the bed with ropes.
- 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 "Specification" of the manual.
- Never lift the unit while it is running, or this could cause a serious accident.

(1) Lifting

- Before lifting the unit, check if any crack or loose bolt is found in lifting fittings or their mounting points.
- Hook shackles of the crane to the lifting fittings at the center top surface of the unit. After confirming there is no other person near the working area, lift the unit by the crane.
- Use an auxiliary rope and communicate with the other personnel using signs and signals while lifting operation, so that no swinging motion or twisting happens to the lifted unit.



TR0324

(2) Pulling down

- Pull the unit down onto a level place which can sustain the weight of the unit.
- After placing the unit down, put wheel chocks to lock the wheels before unfastening the crane's shackles.

3.2 Pulling the Unit

⚠ WARNING

- Before towing the unit, check the following points and be sure to repair failures, if any:
  - Air-pressure in the tires.
  - Loose wheel bolts or nuts.
  - Abnormal wear or damage to the tires.
  - Damage of draw bar.
- Be sure to use a vehicle with tractive ability heavier than the weight of compressor.
- Do not tow the unit without unfastening tool, equipment, and hoses.
  Keep hands and fingers clear during hook-up or unhooking draw bar.
- Be sure to follow the above instructions. Otherwise, such improper operation will cause serious injury or even death to the personnel.