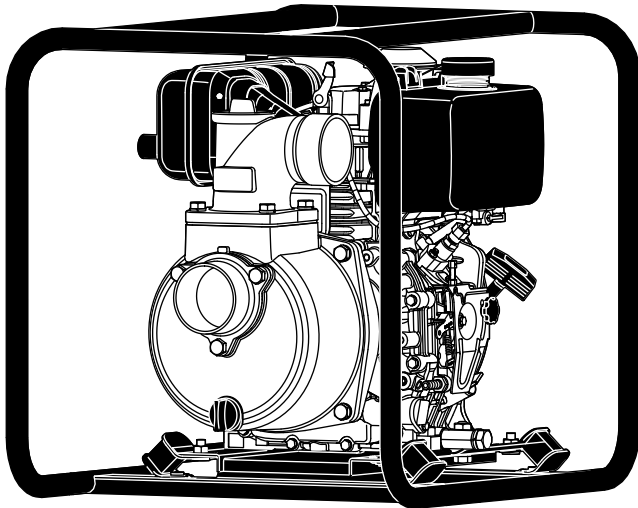


KOSHIN



ENGINE DRIVEN PUMP

DIESEL

OPERATION MANUAL

SEV-50D, SEV-80D

Applications

Water transportation

Do not use it for any purpose other than its intended purpose.

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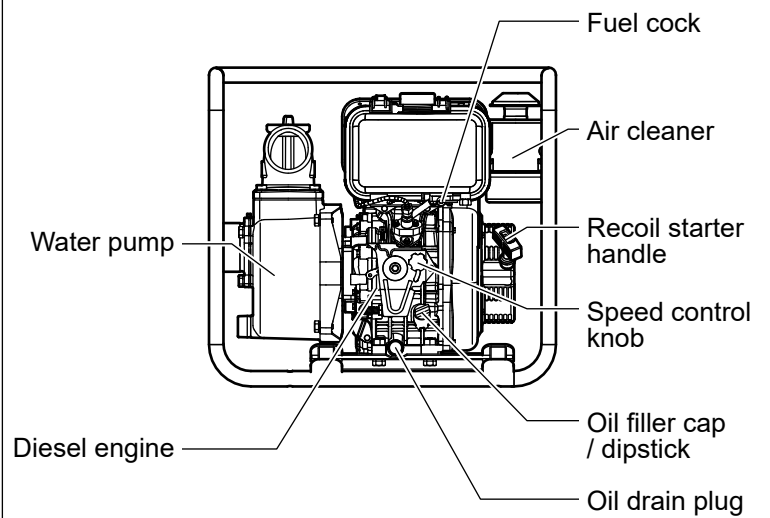
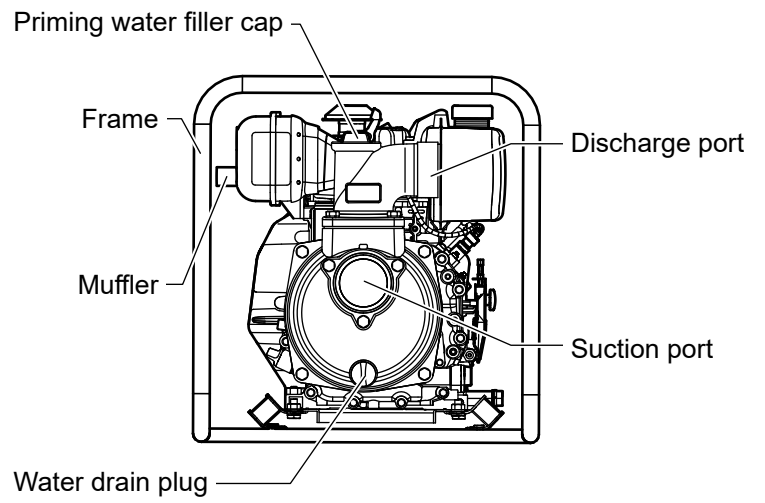
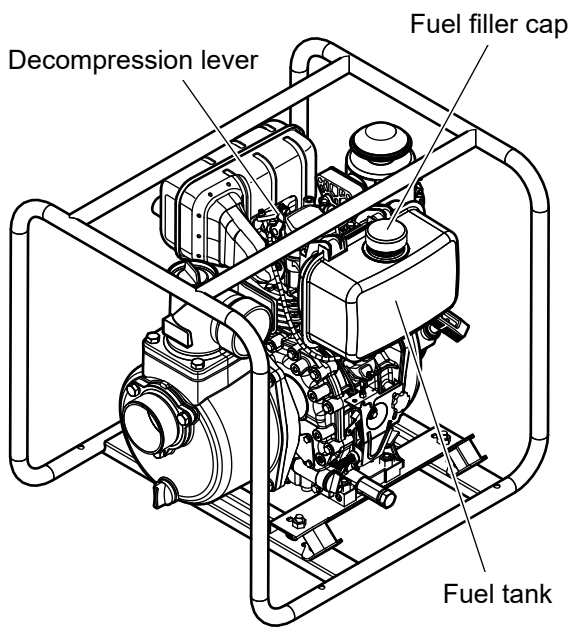
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Thank you for purchasing this product.

- Read this manual carefully before using the product.
- Store the manual once you have finished reading it.
- Those who do not understand the content of this operation manual should not operate the product.
- If you lend this product to another person, explain how to use the product and instruct them to read the operation manual carefully.

Please note that the illustrations and content in this operation manual may differ to the actual product due to changes to the specifications.




NAME OF PARTS





SAFETY PRECAUTIONS

Read these safety precautions carefully before using the product. The cautions shown here are for using the product correctly and to prevent hazards and injury to those using the product and other people.

- Injuries and hazards that may occur if the displayed content is ignored and the product is used incorrectly are categorized as "DANGER", "WARNING", and "CAUTION". All categories are important for safety, so always follow them.

 DANGER	Content for which it is considered highly likely a person will die or be seriously injured.
 WARNING	Content for which it is assumed a person may die or be seriously injured.
 CAUTION	Content for which it is assumed a person may be moderately injured and property damage may occur.

- Content that you must follow is described in categories.

 "PROHIBITED" content that you must not do.	 "EXECUTE" content that you must comply with.
---	---

- Other indications: **NOTICE** ...Indicates the correct way to operate the product, and notes on inspection and maintenance.

WARNING

PREVENTING FIRES

Never add fuel to the fuel tank while the engine is running. Wipe away all fuel spills with a clean cloth. Keep gasoline, kerosene, matches, other explosives and flammable away from the product, since the temperature around the exhaust muffler is very high during operation.

- To prevent fire hazards and to provide adequate ventilation, keep the pump at least 1 m (3 ft) away from the building and other equipment during operation.
- Operate the pump on a flat, level, and firm surface. If the pump is tilted, fuel spillage may result.

PREVENTING EXHAUST GAS INHALATION

- Exhaust gas contains poisonous carbon monoxide.
- Never use the pump in poorly ventilated locations such as indoors or inside tunnels. If indoor operation is unavoidable, provide proper ventilation so that people and live stock will not be affected.

PREVENTING BURNS

- Never touch the muffler, muffler cover or engine body while the engine is running or hot.

OTHER SAFETY ITEMS

- As this product is heavy, you may be injured if you drop it on your feet or hurt your back when moving it, so use several people to move it.
- Know how to stop the pump quickly and understand how to deal with all of the controls. Never permit anyone to operate the pump without proper instructions.
- Always wear a helmet and safety shoes (non-skid soles) and proper clothes.
- Do not operate under influence of alcohol.
- Keep children and pets away from the pump when it is in operation.
- Keep away from rotating parts while the pump is running.
- Work according to rules and regulations of work area.

NOTICE

- Clear water refers to water-supply water, well-water with no heavy filth (such as slit, clay, heavy mud).
Also, it is not suitable for seawater.

OTHER PRECAUTIONS

While the engine is still new, applications of heavy loads may shorten the life of the engine. During the first 20 hours, follow the break-in procedures.

1. Avoid overloads

During break-in period, avoid applying heavy loads before the engine is stabilized.

2. Change engine oil regularly

About one month or 20 hours after initial starting and every 3 months or 100 hours thereafter, change the engine oil while the engine is still warm.

NOTICE

- Be sure to drain the oil while the engine is warm, otherwise it may be difficult to drain the oil completely.

PREPARATIONS FOR STARTING

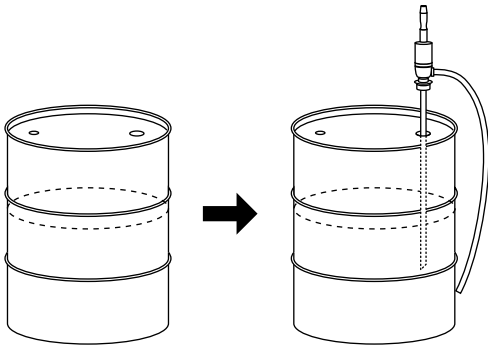
Selection and Handling of Fuel Oil

1. Selection of fuel oil

Use the most suitable diesel fuel oil for the engine.

2. Keep dust and water out of the fuel

When filling the fuel tank from drums, make sure no dust or water are mixed in with the fuel since this may lead to serious fuel injection pump and nozzle problems.



After purchasing fuel: Allow drum to stand 3–4 days

After 3–4 days : Put a suction pipe halfway into the drum (Water and dust accumulate in the lower portion of the drum)

CAUTION

Only use the recommended diesel fuel oil.

Use of non-recommended fuel may cause clogging in the fuel oil strainer, fuel injection pump and fuel injection nozzle. This clogging often causes sudden engine stops just after starting.

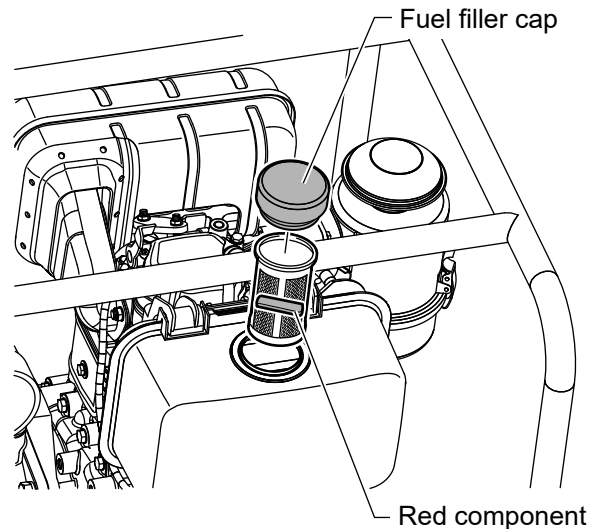
The fuel should have a Cetane value of more than 45 in order to prevent difficult starting, misfiring and white exhaust smoke.

Diesel fuel oil substitutes are not recommended; they may be harmful to fuel system components.

The fuel should be free of water and dust, because these can cause trouble in the fuel injection pump and nozzle.

3. Do not overfill

Overfilling is dangerous. With the engine level, do not fill the fuel beyond the top of the red component in the fuel tank filter.



NOTICE

- Always check the fuel limit position on the red component inside the fuel tank filter.
- Check the indication when the product is level. If the product is on an angle, you will not get an accurate reading.

PREPARATIONS FOR STARTING

⚠ WARNING

Refuel in a well ventilated area with the engine stopped. Also check that the engine has sufficiently cooled.

Do not smoke or allow flames or sparks in the area where the engine is refueled or where fuel is stored.

Do not overfill the tank and make sure the filler cap is securely closed after refueling.

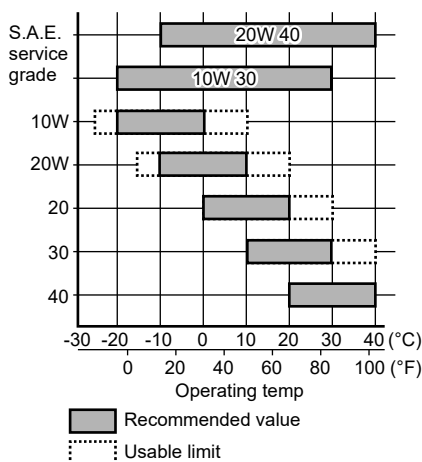
Be careful not to spill fuel when refueling. If any fuel is spilled, make sure the area is dry before starting the engine.

Selecting and Handling Engine Oil

Use proper engine oil.

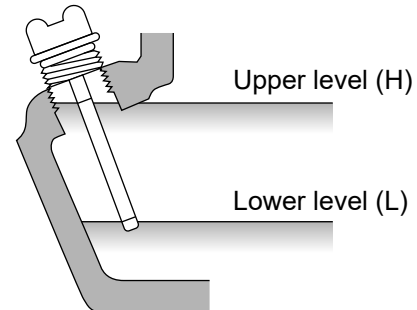
If inferior oil is used, or if the engine oil is not changed regularly, the risks of piston seizure, piston ring sticking, accelerated wear of the cylinder liner, bearings and other moving components increases significantly. The pump's life may be seriously shortened. We recommend CD or Higher oil of API grade classification.

Always use oil with the right viscosity for the ambient temperature in which the engine is being operated. Use the chart below when choosing the engine oil.

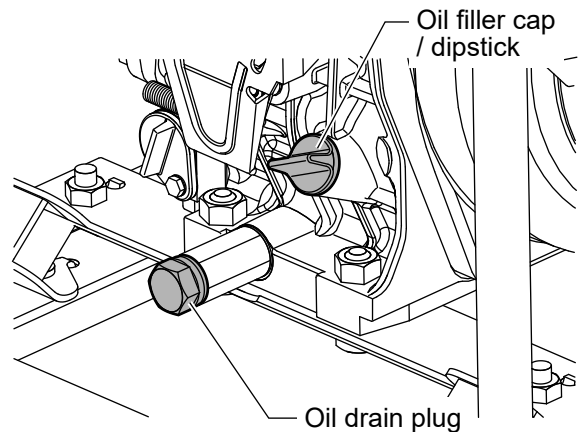


Fill the oil up to the mouth of the filler port with the engine placed on the level.

Engine oil capacity	1.1 L
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Fill up to the top of the filler port with the engine on the level



⚠ WARNING

Before checking the oil level, make sure the pump is sitting level.

If it is tilted, you may add either too much or too little oil. Consequently, you may overfill and the engine will consume too much oil and the oil temperature will become dangerously high: or you may not add enough oil, and the engine could seize up. Faults caused by engine seizure are not covered by the warranty.

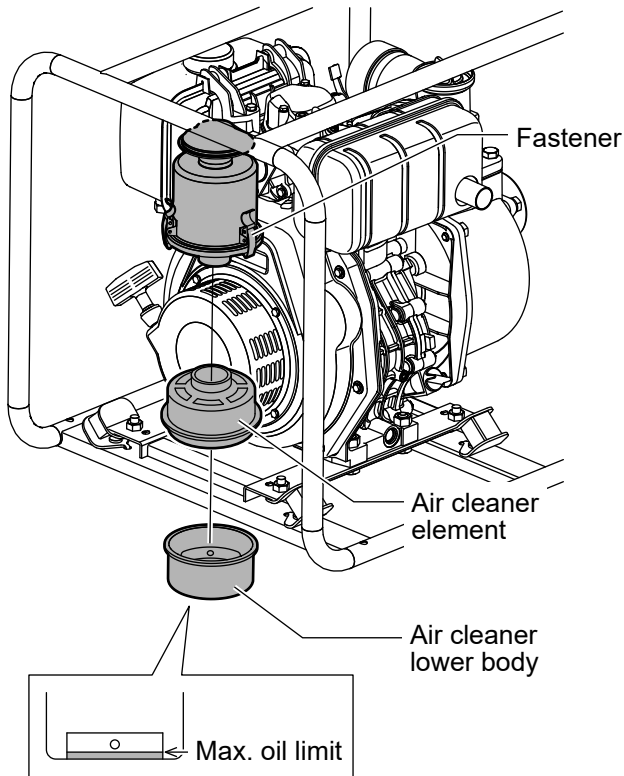
⚠ CAUTION

When checking the oil, simply dip the dipstick into the oil pan. Do not screw in the dipstick.

Be sure to check the engine on a level surface with the engine stopped.

PREPARATIONS FOR STARTING

Servicing the Air Cleaner



1. Open the fasteners and remove the various parts.
2. If the engine oil in the oil bath is dirty, dispose of it and wash it with parts cleaner, kerosene, or gasoline.
3. Fill new engine oil under the bore (Max. oil limit).

Specified amount	20 mL
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4. Refit the various parts.

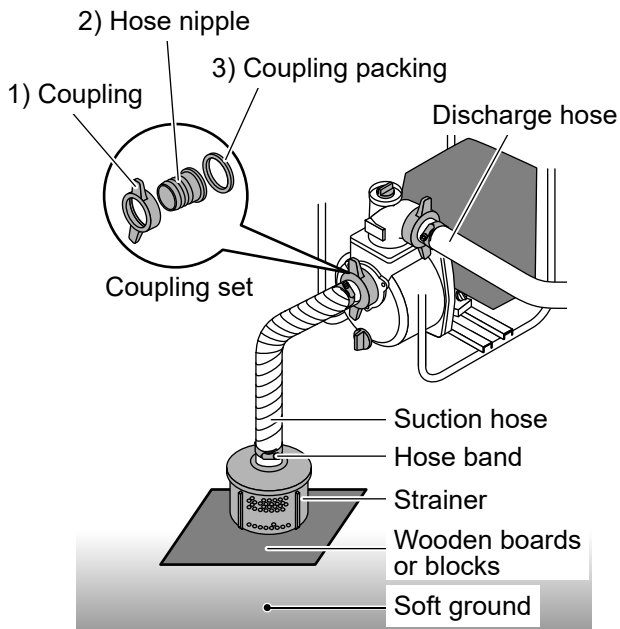
⚠ CAUTION

Replace the element if output falls or a bad exhaust color is noticed.

Never operate the pump without an air cleaner element and an engine oil. Sand or foreign matter is prone to getting inside the engine, which may hasten engine wear and tear.

PREPARATIONS FOR PUMP OPERATION

Different accessories are suitable for different models. Please check connection diameter and install correct parts.



How to Install the Coupling

Please install coupling in order of :

1) -> 2) -> 3).

If you install coupling packing not in above order, air leakage may result, affecting water suction efficiency.

Preparations for Pump Operation

1. Fix the strainer at the end of the suction side hose and tighten it with the hose band. Then place it in the water.

Make sure suction hose is connected properly. In case of no self-priming after filling pump with water and engine is started, check suction hose connection carefully again. Most cases of no self-priming are caused by improper hose connection.

NOTICE

- Use suction hose for suction side.
- Do not change pump diameter by altering suction hose.

- Pump failure will occur if the suction strainer is not properly fitted.

The strainer keeps the size of the suspended solids entering the pump to the predetermined size the pump has been designed to handle.

- The strainer should be installed in the position where water accumulates most easily. When installing on soft ground, such as gravel or sand, position wooden boards or blocks, etc. below the strainer to prevent it from sinking into the ground. Alternatively, suspend the hose avoiding the bottom.

2. Fix the suction side hose to the suction port of the pump and tighten it with a band.

3. Fix the discharge port side hose to the pump and tighten it with a band.

4. Fix the end of the hose to the place where water is required.

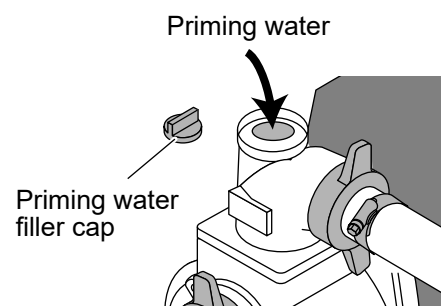
Ensure no obstacle is at discharge hose side.

Do not block, kink, or obstruct the flow of liquid through the discharge hose.

5. Fill the water pump with water. (This water is called "priming water".) Remove the priming water filler cap and pour the water with a bucket or cup. Fill up until water is discharged from the discharge port.

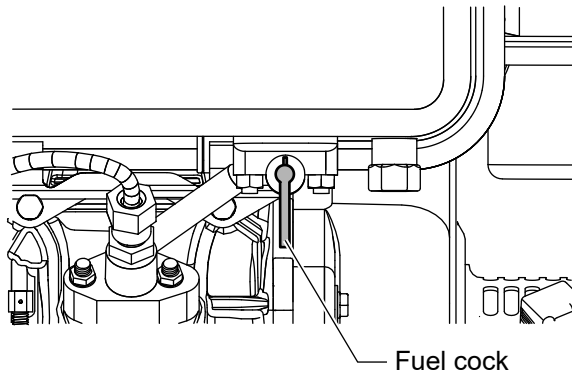
As pump is self-priming type, fullfill water fully from priming port into pump casing before running.

Breakdowns caused by dry running are not covered by the warranty.

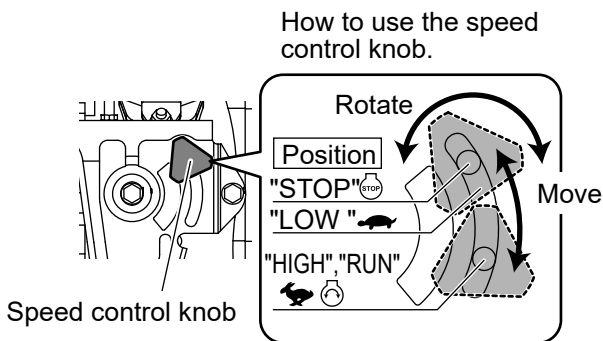


STARTING THE ENGINE AND PUMP

1. Open the fuel cock.

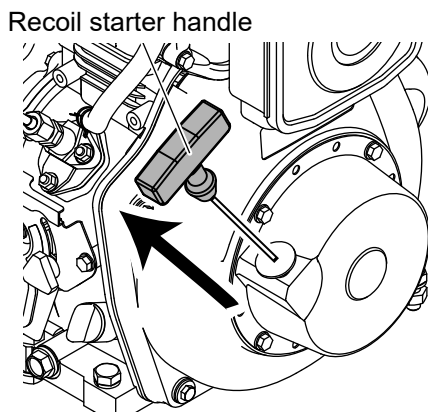


2. Put the engine speed control knob on the "RUN" position. "Run" and "High" are the same position.



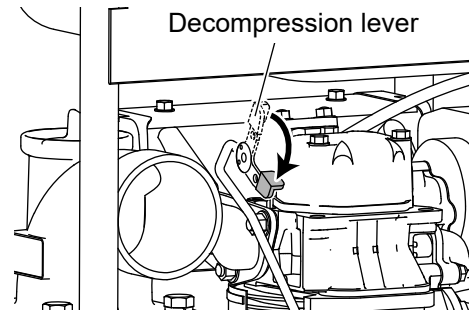
3. Pull out the recoil starter handle to the point where you feel strong resistance, and then slowly return it to the initial position.

If you do not return it slowly, the handle will move around violently and may hit other parts damaging them.



4. Push down the decompression lever.

It will return automatically when the recoil starter (rope) is pulled.

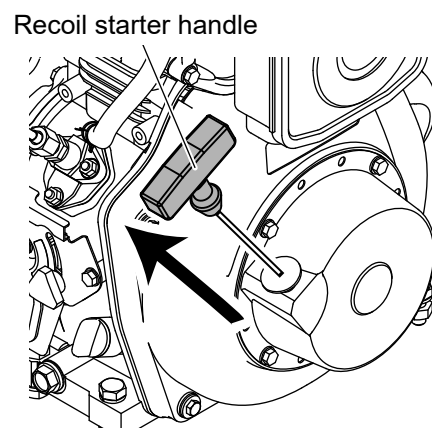


NOTICE

- Make sure to lower the decompression lever and then pull the recoil starter handle. Not doing so may cause engine failure. Engine faults caused by not using the decompression lever are not covered by the warranty.

5. Pull out the recoil starting handle briskly with both hands.

Once the engine starts, slowly return the handle to its initial position. If you do not return it slowly, the handle will move around violently and may hit other parts damaging them.



NOTICE

- Do not pull the handle after starting the engine. Doing so may cause engine failure.

STARTING THE ENGINE AND PUMP

How to identify and treat engine reversal

If the engine reverses, engine oil will not be sent to each part, which may cause a major failure in a short period of time, so please be careful.

Precautions when reversing the engine

⚠ CAUTION

- If the engine reverses, the work equipment reverses and moves in the opposite direction, which may lead to an unexpected accident.
- If the engine reverses, exhaust gas will blow out to the intake side, and the air cleaner may burn and cause a fire.

How to distinguish engine reversal

- (1) The engine oil pressure drops extremely.
 - (2) Since the intake side becomes the exhaust, the engine sound changes, and the exhaust gas blows out from the air cleaner.
 - (3) At the beginning of reversal, the knocking sound becomes high.
6. Until engine rotations stabilize, put the speed control knob into the “LOW” position (warming up).

NOTICE

- Note that if the knob position goes too far, the engine will stop.

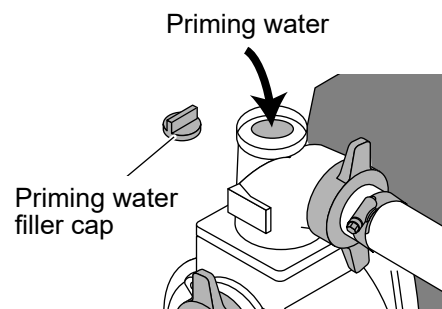
7. Wait for a while (for 2–3 minutes) until water is discharged. If no water is discharged, perform the following actions.

⚠ CAUTION

Stop the engine when priming.

If the priming plug is removed during operation, hot water in the pump may spray out and cause burns.

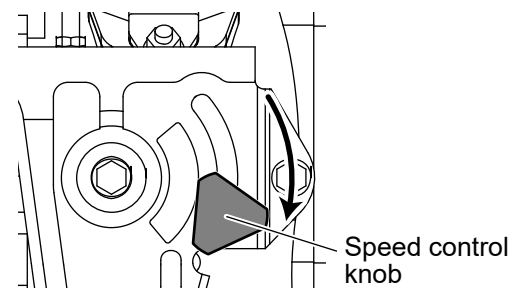
- Remove the cap and add priming water.



- Confirm that the strainer on the suction port side is under the water level.

NOTICE

- If the water pump is operated for a long time without discharging water, the inside of the pump may be damaged. Breakdowns caused by dry running are not covered by the warranty.
8. When water is discharged, set the engine speed knob according to the discharging-Volume.
- Adjust the engine speed using the engine speed control knob.



STARTING THE ENGINE AND PUMP

Checks during Operation

WARNING

Never remove plugs or hoses if there is heat or pressure inside the pump.

If the pump is operated for a long time with the discharge closed or self-suction defect, the water in the pump becomes hot and high-pressure.

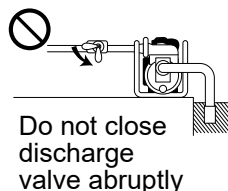
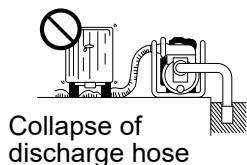
If the plug or hose is removed in this condition, hot water may spray out and cause burns.

Never refuel the engine while it is running or when it is hot even if the engine is stopped.

NOTICE

- Beware of water hammering

Do not allow any vehicle to run over the discharge hose. Do not close the discharge valve abruptly because water-hammer may occur. This may result in heavy damage to the pump.



- Any abnormal sound or vibration?
- Is the engine misfiring or running rough?
- What about the color of the exhaust gas? (Is it black or too white?)
- Is there a fuel leak?
- Has the product moved due to engine vibrations?

If you notice any of the above, stop the engine and consult with the nearest dealer.

Operating Condition

- Temperature: 5 to 45 °C
- Humidity: 85 % or below
- Height: 1000 m or below

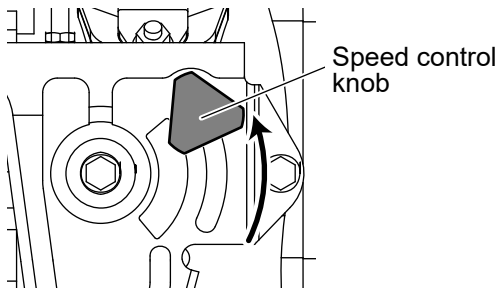
STOPPING THE ENGINE AND PUMP

1. Cooling-down before stopping the engine, turn the engine speed knob to the "SLOW" position and turn the engine for about three (3) minutes.

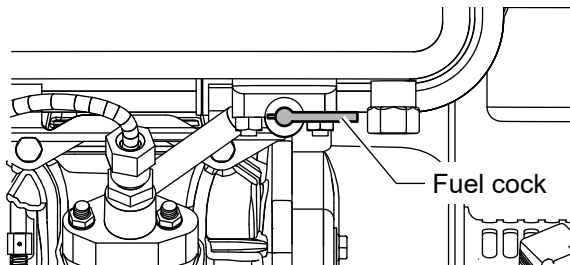
⚠ CAUTION

Reduce the load slowly when stopping the engine. Do not stop the engine suddenly since this may cause the temperature to rise abnormally.

2. Turn the engine speed control knob to the "STOP" position.



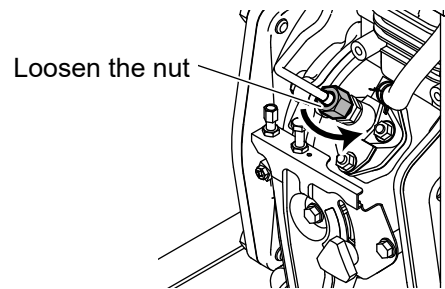
3. Close fuel cock.



⚠ WARNING

If the engine continues to run even when speed control knob is in the "Stop" position, close fuel cock or loosen the nut on pump's high pressure fuel pipe.

Make sure to ask your dealer to tighten the nut after that. As this part is under high pressure, it is dangerous if the nut is not tightened correctly.

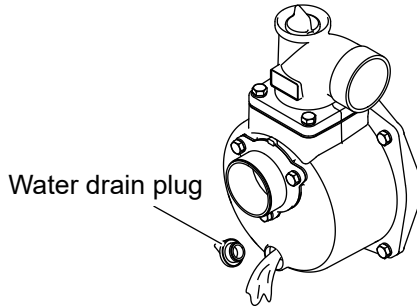


4. Slowly pull out the recoil handle until pressure is felt (that is, to the point in the compression stroke where the intake and exhaust valves are closed), and leave the handle in this position. This prevents rust from forming while the engine is not in use.

AFTER USING THE PRODUCT

1. Drain water after use

- After use, remove the drain plug at the bottom and pour water from the suction / discharge ports so that the remaining sand is forced out of the pump.



NOTICE

- Water inside may freeze at below 0 °C in winter and may damage pump. Frosen cracks of pump are not covered by the warranty.
2. **Fill the fuel up to red component of the fuel tank filter.**
 3. **Confirm that the bolts and nuts are tightened properly, and if not, tighten them.**
 4. **Wipe away any dust and dirt on the outside of the engine with a clean cloth.**

PERIODIC CHECKS AND MAINTENANCE

To keep the engine in good condition and durable for a long time, periodic checks and maintenance are very important.

The chart below indicates what checks to make and when to make them.

The mark (●) indicates that special tools and skills are required. Consult with the dealer.

⚠ WARNING

Shut off the engine before performing any maintenance. If the engine must be run, make sure the area is well ventilated. The exhaust contains poisonous carbon monoxide gas.

⚠ CAUTION

After the pump has been used clean the pump immediately with a cloth to prevent corrosion or to remove sediment.

Always use the specified parts. The use of replacement parts which are not of equivalent quality may damage the product.

NOTICE

- Service more frequently when using the pump in dusty areas.
- These items should be serviced by an authorized dealer, unless you have the proper tools and are mechanically proficient.

Maintenance schedule

○:Check ◇:Replenishment ■:Cleaning □:Changing

●:Contact your authorized dealer for these maintenance services.

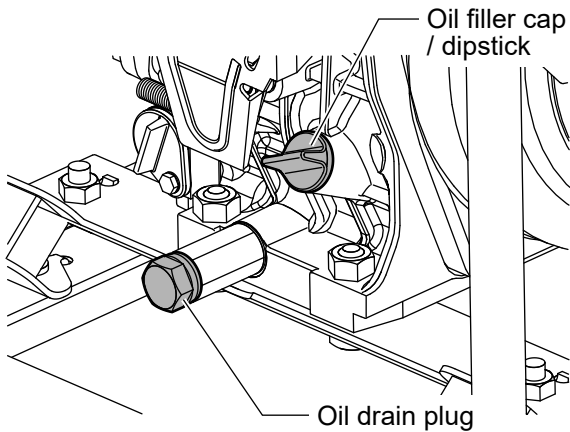
Check item	Daily	20 hours or 1 month after initial operation	100 Hours or Every 3 months	500 Hours or Every 6 months	1000 Hours or Every year
Tightening nut and bolt	○				
Engine oil	○◇	□	□		
Oil filter		■		■	□
Oil leakage	○				
Air filter		■ 50 hours or every month		□	
Fuel tank	■ Every month				
Fuel filter				■	□
Nozzle ●				○■	
Injection pump ●				○	
Pipeline of fuel				○ (Change if necessary)	
Valve clearance ●		○ 1st time		○	

PERIODIC CHECKS AND MAINTENANCE

How To Change the Engine Oil

Remove the oil filler cap and drain plug and drain the old oil while the engine is still warm. The plug is located on the bottom of cylinder block.

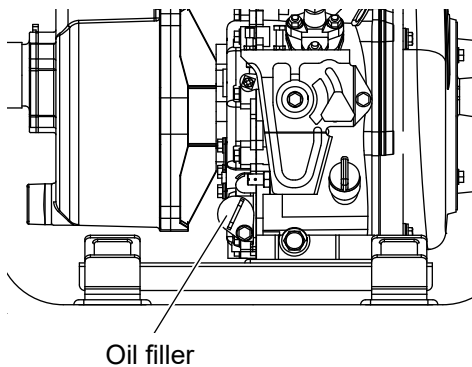
Tighten the drain plug and refill with the recommended oil. (See the section under "Preparations for starting".)



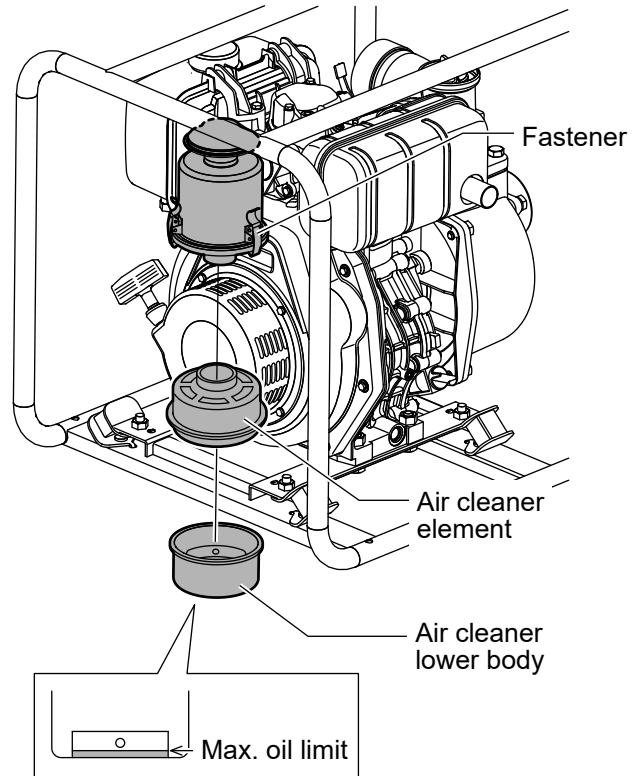
Cleaning Oil Filter

Loosen the fixing bolt and then pull out the oil filter.

Cleaning time	Every 6 months or 500 hours
---------------	-----------------------------



Clean / change the Air Cleaner parts



Change air cleaner element	500 hours or every 6 months (or earlier if dirty)
Clean air cleaner lower body	every month or 50 hours (or earlier if dirty)

See the section for changing the air cleaner element under "Preparations for starting".

PERIODIC CHECKS AND MAINTENANCE

Drain the Fuel Tank and Replace Fuel Filter

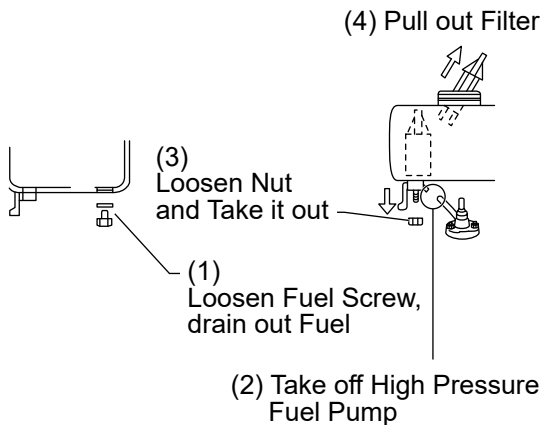
⚠ DANGER

Always wipe up all spills immediately.

Diesel fuel is flammable and explosive under certain conditions. Store any containers containing fuel in a well-ventilated area, away from any combustibles or sources of ignition. Wipe up all spills immediately and never use a shop rag to catch spilled fuel.

NOTICE

- Always be environmentally responsible.
- Follow the guidelines of the EPA or other governmental agencies for the proper disposal of hazardous materials such as engine oil, diesel fuel and engine coolant. Consult the local authorities or reclamation facility.



Clean	Every 6 months or 500 hours
Change	Every year or 1000 hours

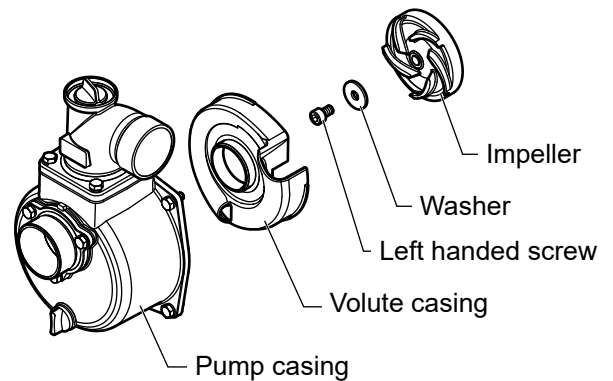
1. Remove the fuel cap.
2. Remove the drain plug (1) of the fuel tank and discharge the fuel.
3. Remove the clamp and remove the fuel hose (2).
4. Loosen and remove the two fuel filter nuts (3).
5. Pull out the fuel filter (4) from the bottom of the tank.
6. Fit a new filter.

7. Fit the fuel hose to the tank with a clamp.
8. Fill the fuel tank with fuel and check for leaks.

Repair or replace parts as necessary.

Cleaning the Inside of the Pump Casing

Remove debris from impeller.
(Do not remove the impeller unless replacing parts.)

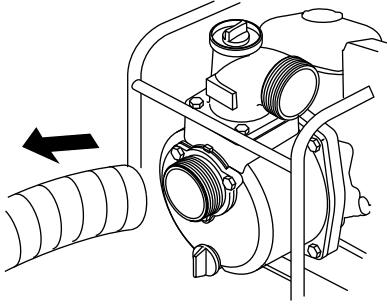


PERIODIC CHECKS AND MAINTENANCE

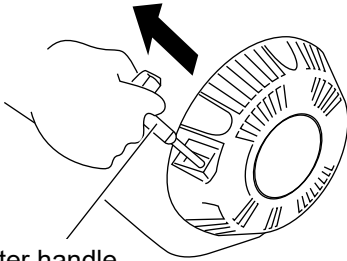
Check hose at suction side

Check suction hose. In case of no suction or small discharge, the cause is usually due to air leakage at suction side. In such case:

1. Remove suction hose.



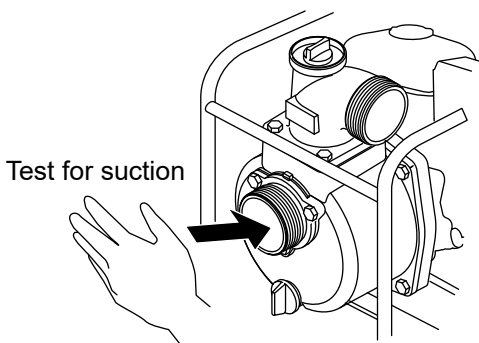
2. Start engine with water inside the pump.



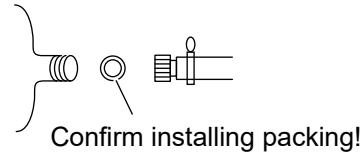
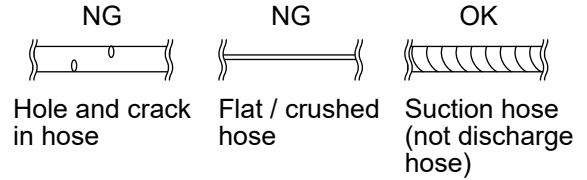
Recoil starter handle

3. Press the palm of your hand to cover the suction hole and wait 30 seconds.

If you feel suction on your palm, the pump is working fine but hose connection needs correction.

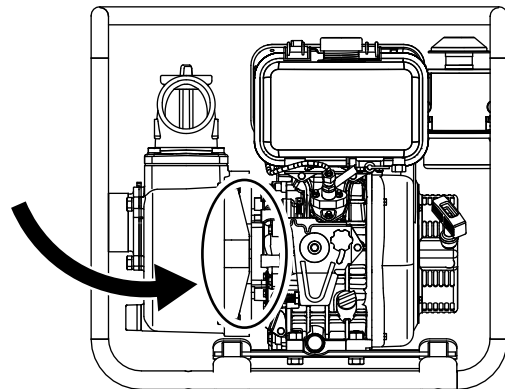


4. Please check if rubber / gasket packing is installed and if there is any hole and crack in suction hose.



Leak between the pump casing and the engine

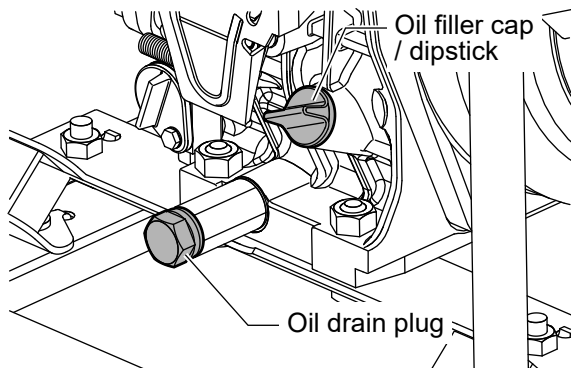
A leak between the pump casing and the engine is usually due to a damaged mechanical seal. Refer to a dealer.



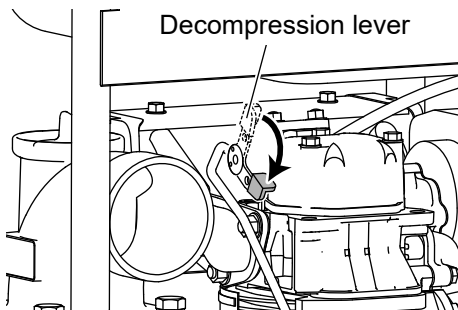
LONG-TERM STORAGE

When storing the pump for long periods, make the following preparations.

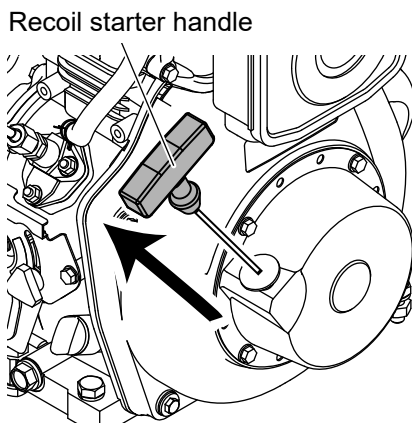
1. Fill the pump with clean water and run the engine for about 2 minutes at low speed.
2. Stop the engine and close the fuel cock. Drain the engine oil while the engine is still warm and fill with new oil.



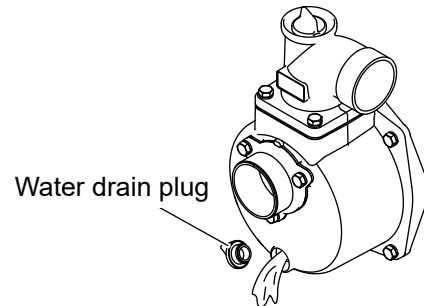
3. Push the decompression lever down (non-compression position) and hold it while you pull the recoil starter 2 or 3 times. (Do not start the engine.)



4. Pull the decompression lever up. Pull the recoil starter slowly. Stop when it feels tight. (This closes the intake and exhaust valves in compression position and prevent from rusting).



5. Wipe the oil and dirt from the engine and store in a dried place.
6. Remove the drain plug on pump and drain water from pump fully.



7. Always keep the outside of the water pump clean.

Storage Condition

- Temperature: -20 to 60 °C
- Humidity: 85 % or below
- Location: Outdoors

TROUBLESHOOTING

SYMPTOM	POSSIBLE CAUSE(S)	CORRECTIVE ACTION
Cannot pull or hard to pull recoil starter handle	Old fuel	Replace fuel. If there is no improvement, repair engine
	Rusting inside engine	Repair
	Burn out of engine	Repair
	Blocked impeller	Dismantle & clean the impeller
	Debris at impeller	Dismantle & clean the impeller
	The decompression lever has not been lowered	Push down the decompression lever.
Low discharge volume	Air leakage from suction side	Check hose at suction side
	Low output from engine	Check and repair engine
	Damage of mechanical seal	Replace mechanical seal (Repair)
	The total head (particularly the suction head) is too high	Reduce the total head within the specification.
	Thin or too long or kinks of hose	Thicken or shorten or straight.
	Water leaking from discharge hose or pipe	Check and stop leakage of water
	Debris at impeller	Dismantle & clean the impeller
	Worn or broken impeller	Replace the impeller (Repair)
Suspended solid percentage is too high	Check the specifications and reduce the ratio	
Pump does not prime water	Air leaking in from suction side	Check hose and connections at suction side
	Insufficient priming water inside pump casing	Fill pump with water for priming
	Drain plug is not tightened	Tighten drain plug firmly.

TROUBLESHOOTING

SYMPTOM	POSSIBLE CAUSE(S)	CORRECTIVE ACTION
Pump does not prime water	Engine speed / rpm is too low	Repair
	Damage to mechanical seal	Replace mechanical seal (Repair)
	Wrong suction hose used	Use suction hose correctly
	The atmospheric or water temperature is too hot	Use the product with water that is 45 °C (113 °F) or lower
	Clogged strainer	Clean strainer
	Engine rpm too low	Put speed control knob on "HIGH" position
Engine does not start	fuel cock is not open	Open fuel cock
	Injection nozzle is choked / blocked	Repair
	Air cleaner dirty	Clean air cleaner.
	Incorrect engine oil level	Repair the engine if it seizes
	The fuel pump is blocked	Repair or replace it
	No diesel fuel	Refuel fuel system
	Speed control knob is not in "RUN" position	Put it on "RUN" position
	Check the position of the decompression lever (low position)	Make sure to lower the decompression lever and then pull the recoil starter handle
	Recoil starter is pulled slowly	Pull it quickly and firmly
	Diesel fuel does not reach fuel injection pump or nozzle	Check the injection pump or nozzle
	Abnormal sound from fuel injection nozzle	Check the injection nozzle
	After checking above points, still engine does not start	Possibility of damage, inner parts of engine (Repair)
Oil leakage from muffler or air cleaner	Tipping of engine	Clean engine (air cleaner, injection nozzle, muffler and etc.)

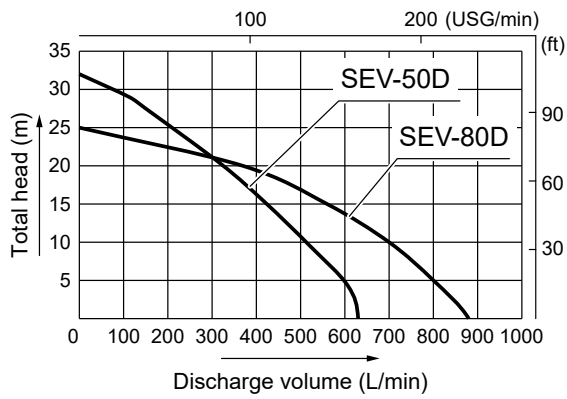
SPECIFICATIONS

Product category			Water pump	
Product name			Engine driven pump	
Model name			SEV-50D	SEV-80D
Pump	Connection dia	Suction	50 mm (2")	80 mm (3")
		Discharge	50 mm (2")	80 mm (3")
	Connection thread		Outer pipe thread BSP	
	Total head		32 m (104 ft)	25 m (82 ft)
	Discharge volume		630 L/min (166 USG/min)	880 L/min (232 USG/min)
Max. suction head		8 m (26 ft)		
Engine	Type		Forced air-cooled 4-stroke diesel engine	
	Model		KOSHIN KD300	
	Displacement		296 cm ³	
	Rated output		4.0 kW (5.4 PS) / 3600 rpm	
	Max. output		4.4 kW (6.0 PS) / 3600 rpm	
	Fuel		Diesel fuel	
	Fuel tank capacity		Tank size: 3.5 L (0.92 USG), Usage level: 3 L (0.79 USG)	
	Engine oil		CC or CD, Winter: 5W-30, Other season: 10W-30	
	Engine oil capacity		1.1 L (0.29 USG)	
	Continuous operating time		Approx. 2.3 hrs	Approx. 2.2 hrs
	Starting method		Recoil starter	
Applicable Liquids	Consistency		Clear water	
	Suspended solid percentage		-	
	Max. solids size		-	
	Temperature		5-45 °C (41-113 °F)	
Standard accessories			1 Strainer, 2 Coupling sets, 3 Hose bands, 1 Engine tool	
Net weight			46.1 kg (101.6 lbs)	48.6 kg (107.1 lbs)
Gross weight			50.8 kg (111.9 lbs)	53.8 kg (118.6 lbs)
Product dimensions L x W x H			600 x 520 x 550 mm (24" x 21" x 22")	
Packing dimensions L x W x H			633 x 553 x 580 mm (25" x 22" x 23")	

* For the purpose of improvement, specifications are subject to changes without notice.

* Self-priming performance may decrease due to atmospheric pressure or outside air temperature. If self-priming lift is not enough, add priming water to pump casing.

PERFORMANCE CARVE

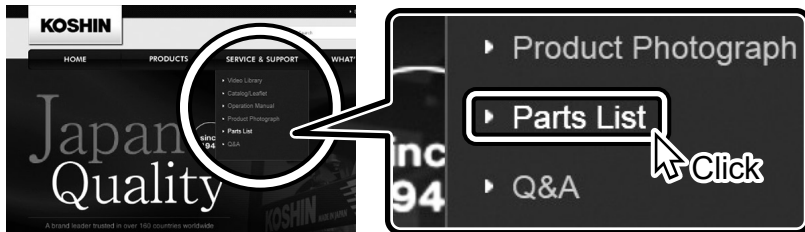


NOTICE

- Performance ratings are guaranteed minimum, not inflated maximum.

SPAREPARTS

SPAREPARTS



For spareparts information, visit



<http://www.koshinpump.com>

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