

OPERATION MANUAL



MODEL QP15HP HIGH PRESSURE CENTRIFUGAL PUMP (HONDA GXH50UWKE4 GASOLINE ENGINE)

Revision #3 (06/03/20)



THIS MANUAL MUST ACCOMPANY THE EQUIPMENT AT ALL TIMES.

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PROPOSITION 65 WARNING



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QP15HP Centrifugal Pump

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NOTICE

Specifications and part numbers are subject to change without notice.

SAFETY INFORMATION

Do not operate or service the equipment before reading the entire manual. Safety precautions should be followed at all times when operating this equipment. Failure to read and understand the safety messages and operating instructions could result in injury to yourself and others.



SAFETY MESSAGES

The four safety messages shown below will inform you about potential hazards that could injure you or others. The safety messages specifically address the level of exposure to the operator and are preceded by one of four words: **DANGER**, **WARNING**, **CAUTION** or **NOTICE**.

SAFETY SYMBOLS

! DANGER

Indicates a hazardous situation which, if not avoided, **WILL** result in **DEATH** or **SERIOUS INJURY**.

! WARNING

Indicates a hazardous situation which, if not avoided, **COULD** result in **DEATH** or **SERIOUS INJURY**.





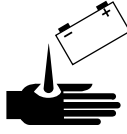

! CAUTION

Indicates a hazardous situation which, if not avoided, **COULD** result in **MINOR** or **MODERATE INJURY**.

NOTICE

Addresses practices not related to personal injury.

Potential hazards associated with the operation of this equipment will be referenced with hazard symbols which may appear throughout this manual in conjunction with safety messages.

| Symbol | Safety Hazard |
|-------------------------------------------------------------------------------------|----------------------------|
|  | Lethal exhaust gas hazards |
|  | Explosion hazards |
|  | Burn hazards |
|  | Pressurized fluid hazards |
|  | Battery acid hazards |
|  | Eye safety hazards |

SAFETY INFORMATION

GENERAL SAFETY

CAUTION

- **NEVER** operate this equipment without proper protective clothing, shatterproof glasses, respiratory protection, hearing protection, steel-toed boots and other protective devices required by the job or city and state regulations.



- **NEVER** operate this equipment when not feeling well due to fatigue, illness or when under medication.



- **NEVER** operate this equipment under the influence of drugs or alcohol.



NOTICE

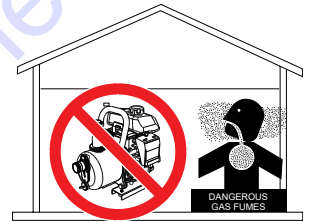
- This equipment should only be operated by trained and qualified personnel 18 years of age and older.
- Whenever necessary, replace nameplate, operation and safety decals when they become difficult read.
- Manufacturer does not assume responsibility for any accident due to equipment modifications. Unauthorized equipment modification will void all warranties.
- **NEVER** use accessories or attachments that are not recommended by Multiquip for this equipment. Damage to the equipment and/or injury to user may result.
- **ALWAYS** know the location of the nearest fire extinguisher.
- **ALWAYS** know the location of the nearest first aid kit.
- **ALWAYS** know the location of the nearest phone or **keep a phone on the job site**. Also, know the phone numbers of the nearest **ambulance, doctor** and **fire department**. This information will be invaluable in the case of an emergency.



PUMP SAFETY

DANGER

- **NEVER** pump volatile, explosive, flammable or low flash point fluids. These fluids could ignite or explode.
- The engine fuel exhaust gases contain poisonous carbon monoxide. This gas is colorless and odorless, and can cause death if inhaled.
- The engine of this equipment requires an adequate free flow of cooling air. **NEVER** operate this equipment in any enclosed or narrow area where free flow of the air is restricted. If the air flow is restricted it will cause injury to people and property and serious damage to the equipment or engine.



- **NEVER** operate the equipment in an explosive atmosphere or near combustible materials. An explosion or fire could result causing severe **bodily harm or even death**.



WARNING

- **NEVER** pump corrosive chemicals or water containing toxic substances. These fluids could create serious health and environmental hazards. Contact local authorities for assistance.
- **NEVER** open the priming plug when pump is hot. Hot water inside could be pressurized much like the radiator of an automobile. Allow pump to cool to the touch before loosening plug. The possibility exists of scalding, resulting in severe bodily harm.
- **NEVER** disconnect any **emergency or safety devices**. These devices are intended for operator safety. Disconnection of these devices can cause severe injury, bodily harm or even death. Disconnection of any of these devices will void all warranties.



SAFETY INFORMATION

CAUTION

- **NEVER** lubricate components or attempt service on a running machine.
- **NEVER** block or restrict flow from discharge hose. Remove kinks from discharge line before starting pump. Operation with a blocked discharge line can cause water inside pump to overheat.

NOTICE

- **ALWAYS** fill the pump casing with water before starting the engine. Failure to maintain water inside the pump housing will cause severe damage to the pump and mechanical seal.
- In winter drain water from pump housing to prevent freezing.
- **NEVER** start the pump with the clean-out cover removed. The rotating impeller inside the pump can cut or sever objects caught in it. Before starting the pump, check that the clean-out cover is securely fastened.
- **ALWAYS** keep the machine in proper running condition.
- **ALWAYS** ensure pump is on level ground before use.
- Fix damage to machine and replace any broken parts immediately.
- **ALWAYS** store equipment properly when it is not being used. Equipment should be stored in a clean, dry location out of the reach of children and unauthorized personnel.

ENGINE SAFETY

WARNING

- **NEVER** operate the engine with heat shields or guards removed.
- **DO NOT** remove the engine oil drain plug while the engine is hot. Hot oil will gush out of the oil tank and severely scald any persons in the general area of the pump.



CAUTION

- **NEVER** touch the hot exhaust manifold, muffler or cylinder. Allow these parts to cool before servicing equipment.



NOTICE

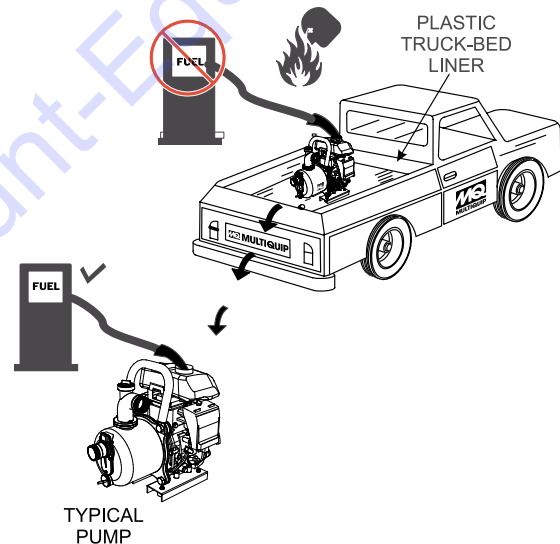
- **NEVER** run engine without an air filter or with a dirty air filter. Severe engine damage may occur. Service air filter frequently to prevent engine malfunction.
- **NEVER** tamper with the factory settings of the engine or engine governor. Damage to the engine or equipment can result if operating in speed ranges above the maximum allowable.



FUEL SAFETY


DANGER

- **DO NOT** add fuel to equipment if it is placed inside truck bed with plastic liner. Possibility exists of explosion or fire due to static electricity.




- **DO NOT** start the engine near spilled fuel or combustible fluids. Fuel is extremely flammable and its vapors can cause an explosion if ignited.
- **ALWAYS** refuel in a well-ventilated area, away from sparks and open flames.
- **ALWAYS** use extreme caution when working with flammable liquids.
- **DO NOT** fill the fuel tank while the engine is running or hot.
- **DO NOT** overfill tank, since spilled fuel could ignite if it comes into contact with hot engine parts or sparks from the ignition system.

SAFETY INFORMATION


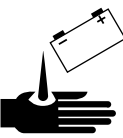
- Store fuel in appropriate containers, in well-ventilated areas and away from sparks and flames.
- **NEVER** use fuel as a cleaning agent.
- **DO NOT** smoke around or near the equipment. Fire or explosion could result from fuel vapors or if fuel is spilled on a hot engine. 

BATTERY SAFETY (ELECTRIC START ONLY)

DANGER

- **DO NOT** drop the battery. There is a possibility that the battery will explode.
- **DO NOT** expose the battery to open flames, sparks, cigarettes, etc. The battery contains combustible gases and liquids. If these gases and liquids come into contact with a flame or spark, an explosion could occur. 

WARNING

- **ALWAYS** wear safety glasses when handling the battery to avoid eye irritation. The battery contains acids that can cause injury to the eyes and skin. 
- Use well-insulated gloves when picking up the battery.
- **ALWAYS** keep the battery charged. If the battery is not charged, combustible gas will build up.
- **DO NOT** charge battery if frozen. Battery can explode. When frozen, warm the battery to at least 61°F (16°C).
- **ALWAYS** recharge the battery in a well-ventilated environment to avoid the risk of a dangerous concentration of combustible gases.
- If the battery liquid (dilute sulfuric acid) comes into contact with **clothing or skin**, rinse skin or clothing immediately with plenty of water. 
- If the battery liquid (dilute sulfuric acid) comes into contact with **eyes**, rinse eyes immediately with plenty of water and contact the nearest doctor or hospital to seek medical attention.

CAUTION

- **ALWAYS** disconnect the **NEGATIVE** battery terminal before performing service on the equipment.
- **ALWAYS** keep battery cables in good working condition. Repair or replace all worn cables.

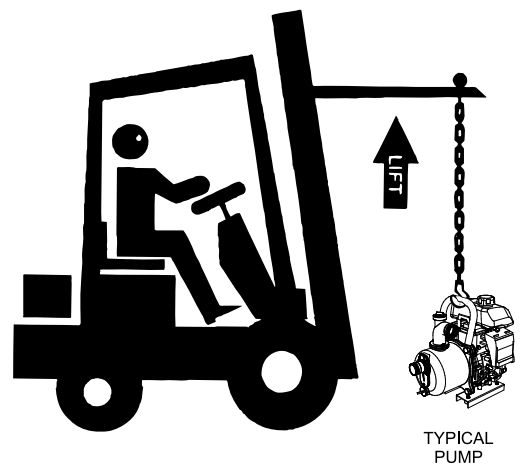
TRANSPORTING SAFETY

CAUTION

- **NEVER** allow any person or animal to stand underneath the equipment while lifting.

NOTICE

- Before lifting, make sure that the equipment parts (hook and vibration insulator) are not damaged and screws are not loose or missing.
- Always make sure crane or lifting device has been properly secured to the lifting bail (hook) of the equipment.
- **ALWAYS** shutdown engine before transporting.
- **NEVER** lift the equipment while the engine is running.
- Tighten fuel tank cap securely and close fuel cock to prevent fuel from spilling.
- Use adequate lifting cable (wire or rope) of sufficient strength.
- Use one point suspension hook and lift straight upwards.



- **DO NOT** lift machine to unnecessary heights.
- **ALWAYS** tie down equipment during transport by securing the equipment with rope.

SAFETY INFORMATION

ENVIRONMENTAL SAFETY/DECOMMISSIONING

NOTICE

Decommissioning is a controlled process used to safely retire a piece of equipment that is no longer serviceable. If the equipment poses an unacceptable and unrepairable safety risk due to wear or damage or is no longer cost effective to maintain (beyond life-cycle reliability) and is to be decommissioned (demolition and dismantlement), be sure to follow rules below.

- **DO NOT** pour waste or oil directly onto the ground, down a drain or into any water source.
- Contact your country's Department of Public Works or recycling agency in your area and arrange for proper disposal of any electrical components, waste or oil associated with this equipment.
- When the life cycle of this equipment is over, remove battery and bring to appropriate facility for lead reclamation. Use safety precautions when handling batteries that contain sulfuric acid.
- When the life cycle of this equipment is over, it is recommended that the trowel frame and all other metal parts be sent to a recycling center.



Metal recycling involves the collection of metal from discarded products and its transformation into raw materials to use in manufacturing a new product.

Recyclers and manufacturers alike promote the process of recycling metal. Using a metal recycling center promotes energy cost savings.

EMISSIONS INFORMATION

NOTICE

The gasoline engine used in this equipment has been designed to reduce harmful levels of carbon monoxide (CO), hydrocarbons (HC) and nitrogen oxides (NOx) contained in gasoline exhaust emissions.

This engine has been certified to meet US EPA Evaporative emissions requirements in the installed configuration.

Attempting to modify or make adjustments to the engine emission system by unauthorized personnel without proper training could damage the equipment or create an unsafe condition.

Additionally, modifying the fuel system may adversely affect evaporative emissions, resulting in fines or other penalties.

Emission Control Label

The emission control label is an integral part of the emission system and is strictly controlled by regulation(s).

The label must remain with the engine for its entire life.

If a replacement emission label is needed, please contact Discount-equipment.

SPECIFICATIONS (PUMP)

| Table 1. Specifications (Pump) | |
|--------------------------------|-----------------------------------|
| Model | QP15HP |
| Type | High Pressure Centrifugal |
| Suction | 1.5 in. Male NPT (38 mm) |
| Discharge | 1.5 in. Male NPT (38 mm) |
| MAX Capacity (Flow) | 55 GPM (210 liters/minute) |
| MAX Head | 197 ft. (60 m) |
| MAX Pressure | 86 psi (6 kg/cm ²) |
| MAX Solid Size | 0.09 in. (2.2 mm) |
| MAX Suction Lift | 25 ft. (7.6 m) |
| Weight (DRY) | 22 lbs. (10 kg.) |

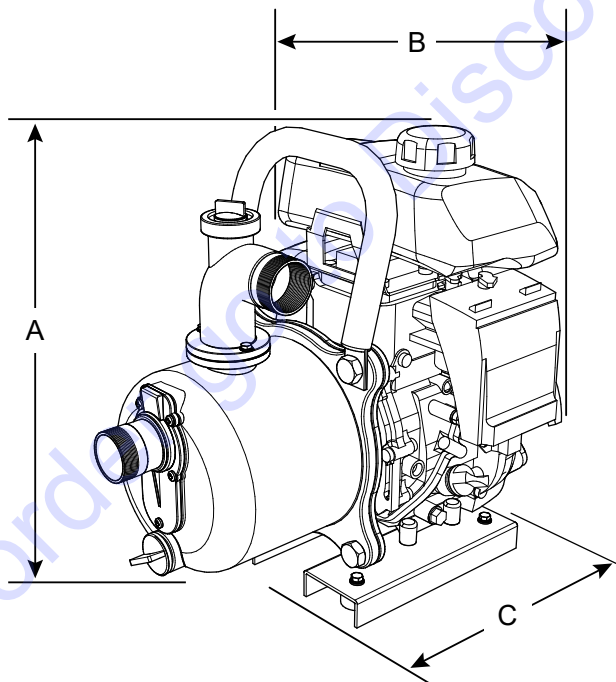


Figure 1. QP15HP Dimensions

| Table 2. Dimensions | |
|---------------------|--------------------|
| Reference Letter | Dimension in. (mm) |
| A | 14.8 (37.5) |
| B | 10.8 (27.5) |
| C | 15.7 (40) |

SPECIFICATIONS (ENGINE)

| Table 3. Specifications (Engine) | | |
|----------------------------------|-----------------------------|-------------------------------------------------|
| Engine | Model | HONDA GXH50UWKE4 |
| | Type | Air-cooled 4 Stroke OHV Horizontal Shaft Engine |
| | Bore x Stroke | 1.65 in. x 1.42 in. (41.8 mm x 36 mm) |
| | Displacement | 49.4 cc (3.0 cu-in) |
| | Net Power | 2.1 HP/7,000 RPM |
| | Fuel Tank Capacity | 0.24 US gallons (0.9 liters) |
| | Fuel | Unleaded Automobile Gasoline |
| | Lube Oil Capacity | 0.26 quarts (0.25 liters) |
| | Speed Control Method | Centrifugal Fly-weight Type |
| | Starting Method | Recoil Start |
| Dimension (L x W x H) | | 8.9 x 10.8 x 13.9 in. (225 x 274 x 353 mm) |
| Dry Net Weight | | 12.1 lbs (5.5kg.) |

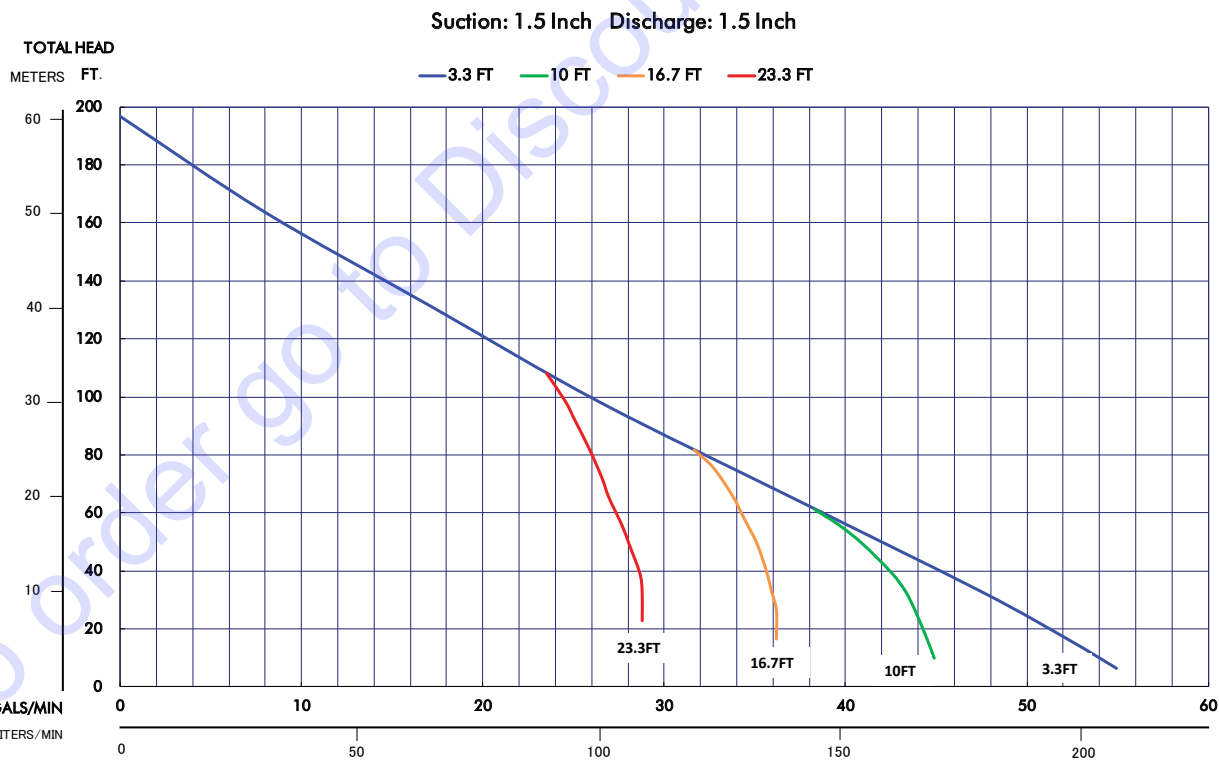


Figure 2. QP15HP Performance Curve

GENERAL INFORMATION

APPLICATION

The QP15HP is an engine-powered centrifugal pump designed to provide high head and pressure performance. This type of pump is best operated by moving generally clean, clear water, and has a very low tolerance for fluid that contains high levels of debris.

The suction and discharge ports are NPT type 1.5 inch diameter. The pump is engineered for 55 GPM Flow, 115 feet of Head and 86 PSI pressure.

This Wet Primed pump requires that the pump casing is first filled with water to assist with initial self-priming operations. Once a partial vacuum is created within the unit, the reduced atmospheric pressure allows water to flow through the suction line and the centrifugal force of the impeller/volute assembly permits water to be expelled from the discharge ports.

POWER PLANT

This centrifugal pump is powered by a 2.1 horsepower air cooled 4-stroke, single cylinder HONDA GXH50UWKE4 gasoline engine.

STANDARD CENTRIFUGAL PUMP

Standard centrifugal pumps provide an economical choice for general purpose dewatering. These types of pumps should only be used in clear water applications (agricultural, industrial, residential) as they have a limited solid handling capability of only 10% by volume.

SUCTION LIFT

This pump is intended to be used for dewatering applications and is capable of suction lifts up to 25 feet at sea level. For optimal suction lift performance keep the suction hose or line as short as possible. In general always place the pump as close to the water as possible.

PUMP SUPPORT

The pump should always be placed on solid stationary ground in a level position.

NEVER place the pump on **soft soil**. The suction hose or pipe connection should always be checked for tightness and leaks. A small suction leak in the hose or fittings could prevent the pump from priming.

Elevation

Higher elevations will effect the performance of the pump. Due to less atmospheric pressure at higher altitudes, pumps **DO NOT** have the priming ability that they have at sea level. This is due to the “thinner air” or lack of oxygen at higher altitudes.

A general rule of thumb is that for every 1,000 feet of elevation above sea level a pump will lose one foot of priming ability.

For example, in Flagstaff, Arizona where the elevation is approximately 7,000 feet, the pump would have a suction lift of only 18 feet rather than the 25 feet at sea level. Table 4 shows suction lift at various elevations.

| Altitude Feet (Meters) | Suction Lift in Feet (Meters) | | | |
|------------------------|-------------------------------|--------------|--------------|--------------|
| Sea Level | 10.0 (3.048) | 15.0 (4.572) | 20.0 (6.096) | 25.0 (7.620) |
| 2,000 (610) | 8.80 (2.680) | 13.2 (4.023) | 17.6 (5.364) | 22.0 (6.705) |
| 4,000 (1,219) | 7.80 (2.377) | 11.7 (3.566) | 15.6 (4.754) | 19.5 (5.943) |
| 6,000 (1,829) | 6.90 (2.103) | 10.4 (3.169) | 13.8 (4.206) | 17.3 (5.273) |
| 8,000 (2,438) | 6.20 (1.889) | 9.30 (2.834) | 12.4 (3.779) | 15.5 (4.724) |
| 10,000 (3,048) | 5.70 (1.737) | 8.60 (2.621) | 11.4 (3.474) | 14.3 (4.358) |

Table 5 shows percentage drops in performance as elevation increases.

| Altitude Feet (Meters) | Discharge Flow | Discharge Head |
|------------------------|----------------|----------------|
| Sea Level | 100% | 100% |
| 2,000 (610) | 97% | 95% |
| 4,000 (1,219) | 95% | 91% |
| 6,000 (1,829) | 93% | 87% |
| 8,000 (2,438) | 91% | 83% |
| 10,000 (3,048) | 88% | 78% |

PUMP COMPONENTS

Figure 3 shows a typical application using the QP15HP centrifugal pump. This pump is designed to move clean water with minimal amounts and size of debris.

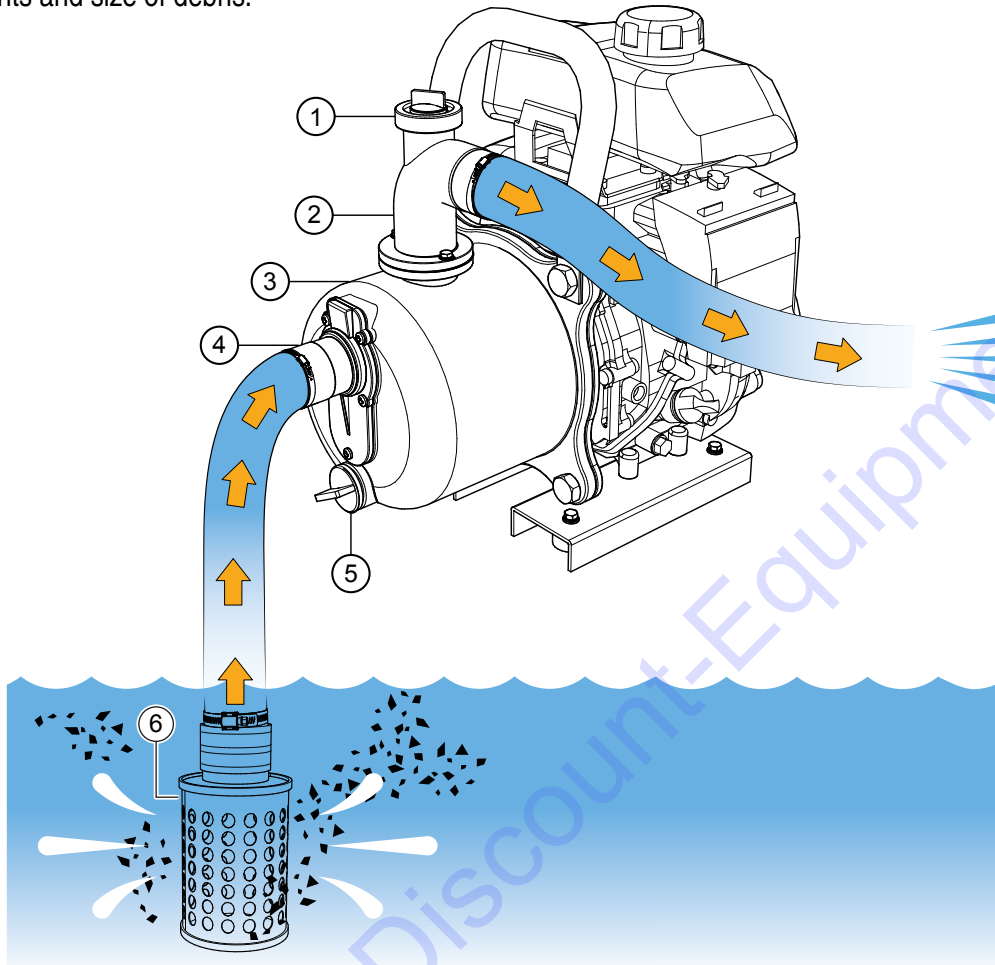


Figure 3. Pump Application

- 1. Fill Cap** — Prior to operations, the pump casing **MUST BE** filled with water to initiate the pump priming process. Unthread this cap to add water and re-secure. Prior to any dewatering/watering operations, ensure that the casing is full of clean water.
- 2. Discharge Port** — The pump is equipped with a discharge port. This port is a 1.5" male NPT thread and can accommodate discharge hose or pipe. Quick disconnect (Cam & Groove lock) hoses can be fitted onto the discharge ports with an optional coupler (A150A). Contact Discount-equipment for ordering assistance.
- 3. Pump** — The QP15HP is a very compact, powerful high-pressure pump that is engineered to produce 86 PSI of pressure. The die-cast aluminum casing is specially designed to ensure fast priming, trusted water flow and head performance.
- 4. Suction Port** — This pump is fitted with a 1.5" male NPT thread suction port and can accommodate either a threaded or quick disconnect (Cam & Groove lock) hose. For quick disconnect connections, an optional coupler (A150A) is necessary. Contact Discount-equipment for ordering assistance.
- 5. Drain Plug** — After usage, and for storage, remove this plug and drain all water from the pump casing.
- 6. Strainer** — Always attach a strainer to bottom side of the suction hose to prevent large objects and debris from entering the pump. Strainer should be positioned so that it will remain completely under water. Running the pump with the strainer above water for long periods can damage pump.

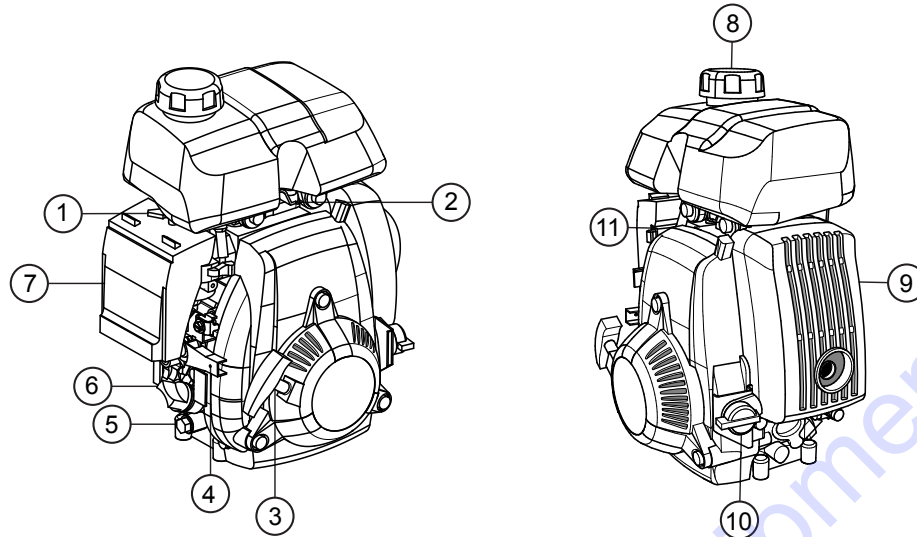


Figure 4. Engine Components

INITIAL SERVICING

1. **Choke Lever** — Used in the starting of a cold engine, or in cold weather conditions. The choke enriches the fuel mixture.
2. **Spark Plug** — Provides spark to the ignition system. Clean the spark plug once a week.
3. **Recoil Starter** — Manual starting mechanism. Slowly pull the starter grip until resistance is felt, then pull briskly and smoothly to start the engine.
4. **Throttle Lever** — Adjusts engine RPM speed.
5. **Oil Drain Plug** — Remove this plug to remove oil from the engine's crankcase.
6. **Dipstick/Oil Filler Cap** — Remove to determine if engine oil is low. Add oil through this port as recommended in Table 6.
7. **Air Cleaner** — Prevents dirt and other debris from entering the fuel system. Press the latch tabs on top of the air cleaner cover and remove the cover to gain access to the filter elements.


NOTICE

Operating the engine without an air filter, or with a damaged or worn air filter in need of replacement, will allow dirt to enter the engine, causing rapid engine wear.

8. **Fuel Tank/Fuel Filler Cap** — The fuel tank holds 0.24 gallons (0.9 liters) of unleaded gasoline. Remove the fuel filler cap to add unleaded gasoline to the fuel tank. Make sure the cap is tightened securely. **DO NOT** overfill.

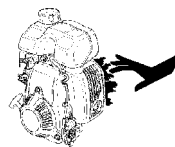
DANGER

DO NOT fill the fuel tank while the engine is running or hot. In the event of a fuel spill, **DO NOT** start the engine until all fuel residue has been wiped up and the area surrounding the engine is dry. Fuel is **extremely flammable** and can ignite if it comes into contact with hot engine parts or sparks from the ignition system.



9. **Muffler** — Reduces noise and emissions. **NEVER** touch the muffler while it is hot.

WARNING



Engine components can generate extreme heat. To prevent burns, **DO NOT** touch these areas while the engine is running or immediately after operating. **NEVER** operate the engine with the muffler removed.

10. **Engine ON/OFF Switch** — **ON** position permits engine starting, **OFF** position stops the engine.
11. **Fuel Valve Lever** — Open to allow the flow of fuel, and close to prevent the flow of fuel.

INSPECTION (ENGINE)

CAUTION



DO NOT attempt to operate the pump until the Safety Information, General Information and Inspection sections of this manual have been read and thoroughly understood.

BEFORE STARTING

1. Read safety instructions at the beginning of manual.
2. Clean the pump, removing dirt and dust, particularly the engine cooling air inlet, carburetor and air cleaner.
3. Check the air filter for dirt and dust. If air filter is dirty, replace air filter with a new one as required.
4. Check carburetor for external dirt and dust. Clean with dry compressed air.
5. Check fastening nuts and bolts for tightness.

Engine Oil Check

1. To check the engine oil level, place the pump on secure level ground with the engine stopped.
2. Remove the filler dipstick from the engine oil filler hole (See Figure 5) and wipe clean.

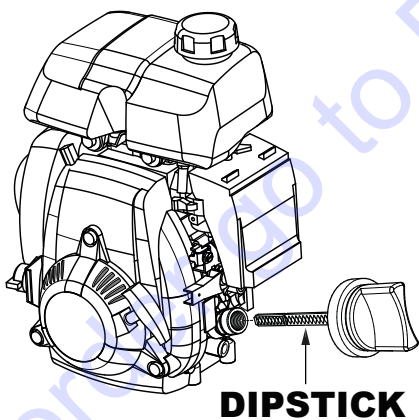


Figure 5. Engine Oil Dipstick (Removal)

3. Insert and remove the dipstick without screwing it into the filler neck. Check the oil level shown on the dipstick.
4. If the oil level is low (See Figure 6), fill to the edge of the oil filler hole with the recommended oil type (Table 6). Maximum oil capacity is 0.26 quarts (0.25 liters).

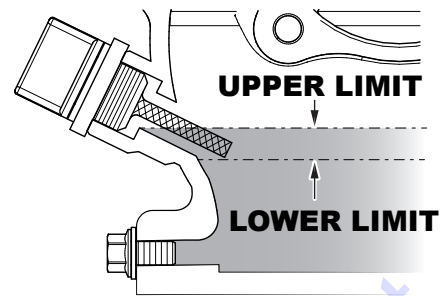


Figure 6. Engine Oil Dipstick (Oil Level)

CAUTION



You **must** frequently check the oil level of the engine. There is no low oil shutoff feature for protection and operating the pump with low oil levels will cause severe damage to the engine.

Table 6. Oil Type

| Season | Temperature | Oil Type |
|-------------|----------------|---------------|
| Summer | 25°C or Higher | SAE 10W-30 |
| Spring/Fall | 25°C~10°C | SAE 10W-30/20 |
| Winter | 0°C or Lower | SAE 10W-10 |

DANGER



Motor fuels are highly flammable and can be dangerous if mishandled. **DO NOT** smoke while refueling. **DO NOT** attempt to refuel the pump if the engine is **hot!** or **running**.

Fuel Check

1. Remove the gasoline cap located on top of fuel tank.
2. Visually inspect to see if the fuel level is low. If fuel is low, replenish with unleaded fuel.
3. When refueling, be sure to use a strainer for filtration. **DO NOT** top-off fuel. Wipe up any spilled fuel **immediately!**

Reference Figure 3.

1. It is advantageous to place the pump as close as possible to the water source (Figure 7) on a solid, level operating surface. The most critical factor for successful pump operations is not to exceed 25' Total Suction Lift (at sea level).
2. Ensure that the pump has the proper level of fuel and engine oil.
3. Initially prime the pump by removing the fill cap (see Figure 3) and filling the casing with water. If the pump casing is not filled with water prior to operations, it will not be able to start the pumping process and you risk overheating the mechanical seal assembly.
4. Attach the proper suction and discharge hoses to the pump ports. Ensure that the hose O-rings are in place, and that hose do not show any cracks, gouges, or holes. The hoses should not be kinked, and must be secured tightly to their respective ports.
5. A proper suction hose is commonly reinforced with rigid PVC helix and is specifically designed to safeguard against collapsing during pumping operations. It is essential that the pump utilize a suction hose with the same diameter as the suction port.

6. Ensure that the strainer is placed on the end of the suction hose, and that the hose is placed in the water source in such a manner as not to bury the strainer into sand or silt.

⚠ CAUTION

The strainer should be positioned so it will remain completely **under water**. Running the pump with the strainer above water for long periods can damage the pump.

7. The discharge side may utilize proper discharge hoses, PVC pipe, or concrete pipe.
8. Check that discharge hoses lay flat and as straight as possible. Remove any sharp bends or kinks from the hose so the water flow cannot be blocked.
9. Once the engine is started; and depending on the application set-up, the priming process will take a few moments before water begins to flow.
10. The performance of the pump (Flow, Head, Water Velocity, and Pressure) is dependent on the many factors that surround the application. These factors include, but are not limited to: operating altitude, suction lift, discharge and suction hose diameter and length, overall friction loss coefficients, the specific gravity of the fluid to be pumped, the fluid temperature, and total discharge head.

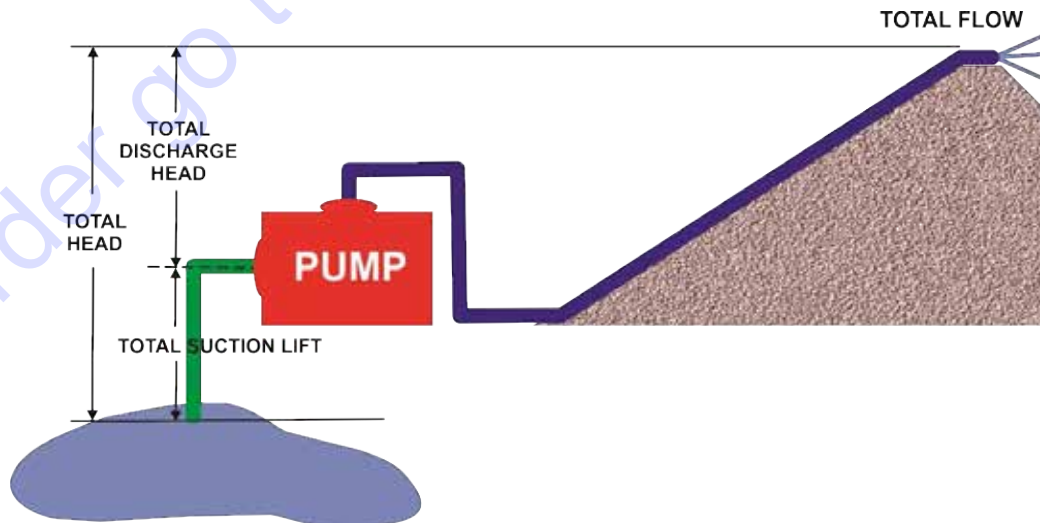


Figure 7. Pump Placement

CAUTION

DO NOT attempt to start the engine unless the pump has previously been primed with water. Severe pump damage will occur if pump has not been primed.

STARTING THE ENGINE

1. Place the engine fuel valve lever (See Figure 8) to the **ON** position.

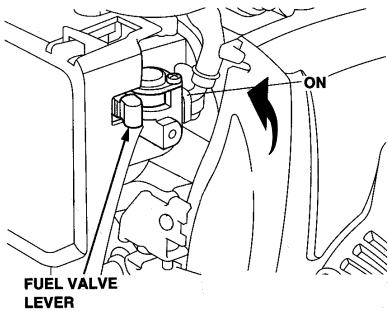


Figure 8. Engine Fuel Valve Lever (ON Position)

2. Move the throttle lever (See Figure 9) to the idle position.

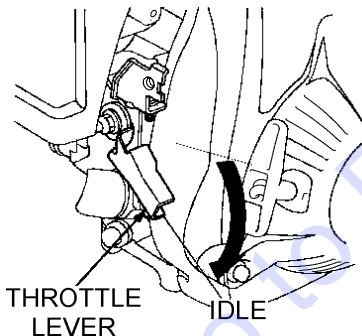


Figure 9. Throttle Lever (Idle)

3. Place the choke lever (See Figure 10) in the **CLOSED** position if starting a cold engine.

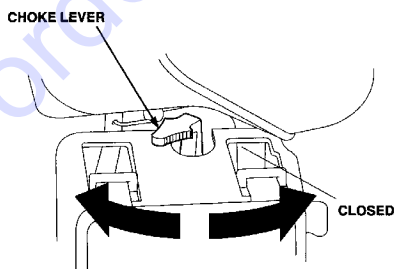


Figure 10. Engine Choke Lever (Closed)

4. Place the choke lever (See Figure 11) in the **OPEN** position if starting a warm engine or the temperature is warm.

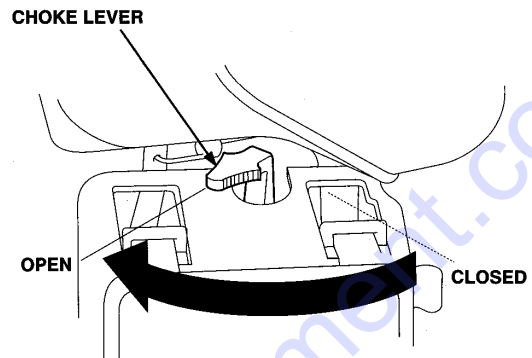


Figure 11. Engine Choke Lever (Open)

5. Place the engine **ON/OFF** switch (See Figure 12) in the **ON** position.

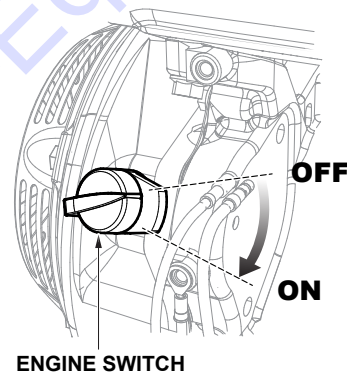


Figure 12. Engine ON/OFF Switch (ON Position)

6. Grasp the starter grip (See Figure 13) and slowly pull it out. The resistance becomes the hardest at a certain position, corresponding to the compression point. Pull the starter grip briskly and smoothly for starting.

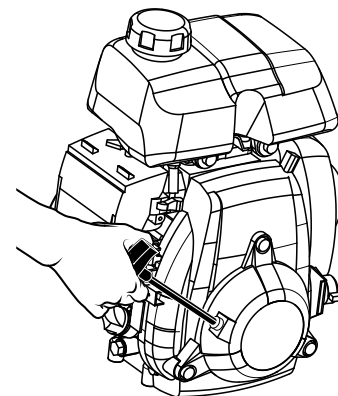


Figure 13. Starter Grip

- If the engine has started and the choke lever was moved to the **CLOSED** position to start the engine, gradually move the choke lever to the **OPEN** position (Figure 14) as the engine warms up. If the engine has not started repeat steps 1 through 6.

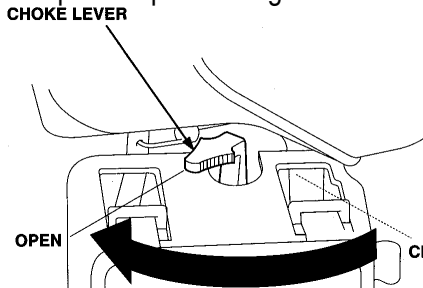


Figure 14. Choke Lever (Open)

- Before the pump is placed in to operation, run the engine for several minutes. Check for fuel leaks, and noises that would associate with a lose component.
- To begin pumping, place the throttle lever (See Figure 15) in the **RUN** position. If water is not flowing out of the discharge port, turn off the engine and check for and clear any obstructions within the suction hose.

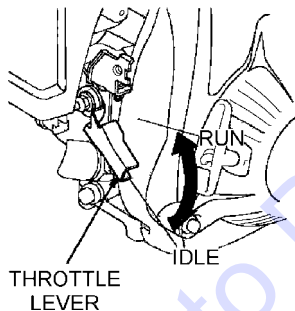


Figure 15. Throttle Lever (Run)

WARNING

Water must always be flowing through the pump casing while the engine is running. Loss of flow may be the result of a loss of prime, restricted water flow or a dead-head situation. Please note that in such a condition, water in the pump can reach temperatures of 150-200°F in 15 to 20 minutes. This can cause serious burns if this hot water comes into contact with unprotected skin.

Before touching or opening the fill plug or drain plug, first turn off the engine and allow the pump casing to cool to the touch, and then open the pump carefully. Be cautious of any built up water pressure.

CAUTION

ALWAYS run engine at **full speed** while pumping.

STOPPING THE ENGINE

Normal Shutdown

- Move the throttle lever to the **IDLE** position (See Figure 16) and run the engine for three minutes at low speed.

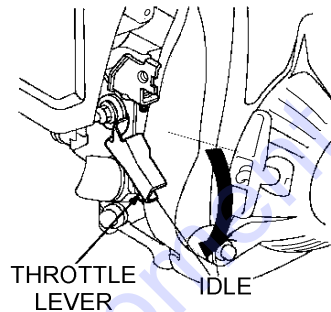


Figure 16. Throttle Lever (Idle)

- After the engine cools, turn the engine **ON/OFF** switch to the **OFF** position (See Figure 17).

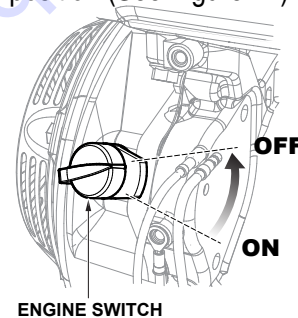


Figure 17. Engine ON/OFF Switch (OFF)

- Place the fuel shut-off lever (See Figure 18) in the **OFF** position

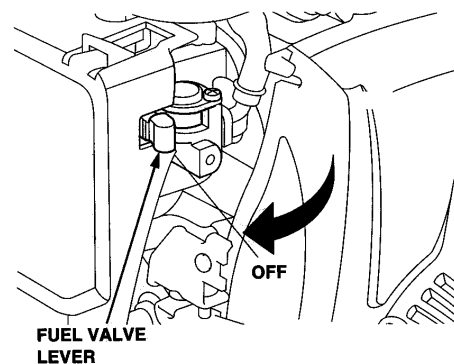


Figure 18. Fuel Valve Lever (OFF)

Emergency Shutdown

- Move the throttle lever quickly to the **IDLE** position, and place the engine **ON/OFF** switch in the **OFF** position.

MAINTENANCE (PUMP)

PUMP VACUUM TEST

CAUTION

DO NOT attempt to start the engine unless the pump has previously been **primed** with water. Severe pump damage will occur if pump has not been primed.

To perform the pump vacuum test do the following:

1. Remove the pump fill cap (See Figure 3), and fill the pump with water.
2. Start the engine as outlined in the initial start-up section, and wait for the pump to begin pumping.
3. As shown in Figure 19, place a water hose inside the discharge opening of the pump, and turn on the water. This flow of water into the discharge opening will **prevent** the pump from running dry.
4. Place the Pump Vacuum Tester (P/N 7000030) over the pump suction (inlet) opening (See Figure 19) with the vacuum gauge facing upwards. It may be necessary to apply a small amount of water around the rubber seal of the vacuum tester to make a good suction fit.

5. Check and make sure that there are no air leaks between the vacuum tester and the inlet port on the pump. If air leaks are present reseal vacuum tester.
6. Run the pump for a few minutes while monitoring the vacuum gauge. If the gauge indicates a reading between -25 and -20 in. Hg. (inches of mercury) then it can be assumed that the pump is working correctly.

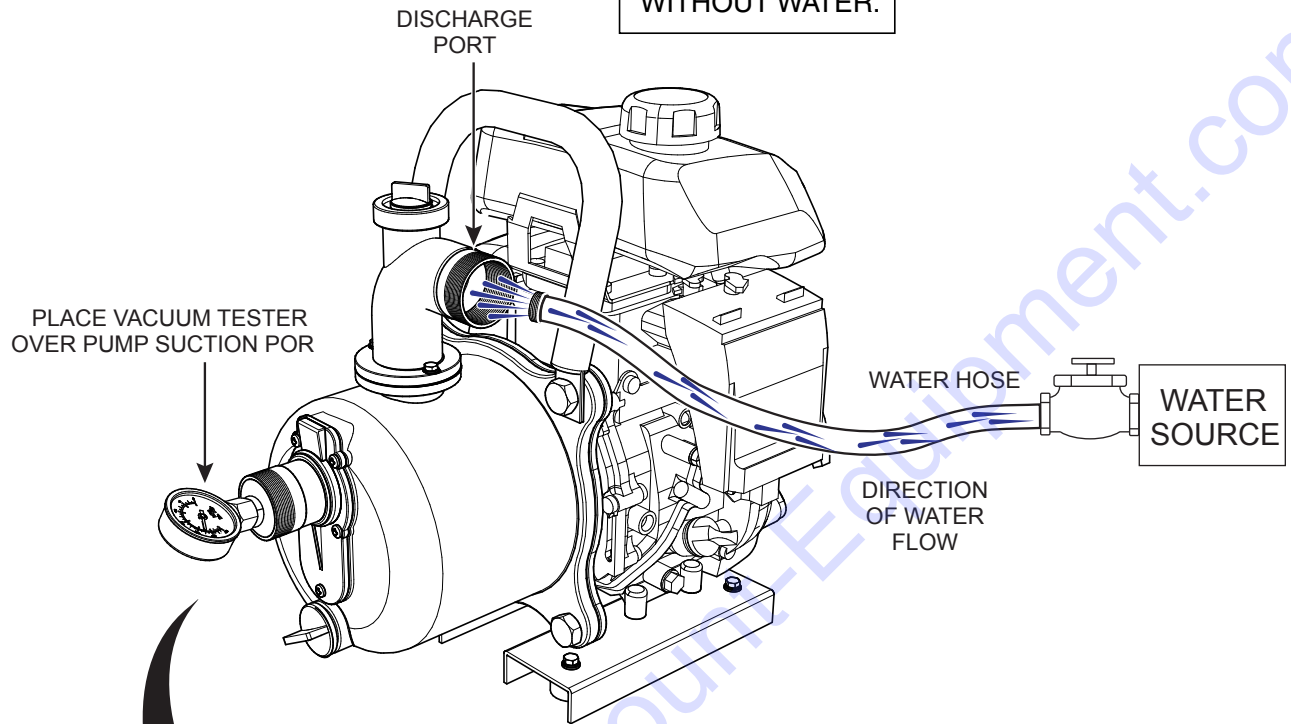
NOTICE

25 in. Hg (inches of mercury) translates into 25 feet of lift at **sea level**.

7. If the vacuum tester gauge indicates a reading below -20 in. Hg, it can then be assumed that the pump is not functioning correctly, and corrective action needs to be taken.
8. To test the flapper valve, shutdown the engine. The vacuum tester should remain attached to the pump suction inlet port by vacuum. This indicates the pump's flapper valve is seating properly to hold water in the suction hose when the engine is stopped. This prevents backflow and allows for faster priming when the engine is restarted.

MAINTENANCE (PUMP)

CAUTION
DO NOT RUN PUMP
WITHOUT WATER.



PLACE VACUUM TESTER
OVER PUMP SUCTION POR

DISCHARGE
PORT

WATER HOSE

WATER
SOURCE

DIRECTION
OF WATER
FLOW

ACCEPTABLE READING
SHOULD BE BETWEEN
-25 AND -20 IN. HG.

25 IN. HG. TRANSLATES
INTO 25 FEET OF LIFT
AT SEA LEVEL.

PUMP VACUUM
TESTER

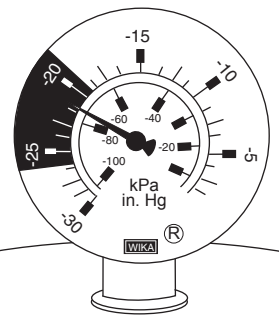


Figure 19. Pump Vacuum Tester

MAINTENANCE (ENGINE)

ENGINE MAINTENANCE

Perform engine maintenance procedures as referenced by Table 7 below:

| Table 7. Engine Maintenance Schedule | | | | | | | | |
|--------------------------------------|-------------------------|--------|------------------------------------------|--------------------------|--------------------------|-----------------------|--------------------------|--|
| Description (3) | Operation | Before | First Month or 10 hrs | Every 3 Months or 25 hrs | Every 6 Months or 50 hrs | Every Year or 100 hrs | Every 2 Years or 200 hrs | |
| Engine Oil | CHECK | X | | | | | | |
| | CHANGE | | X | | | | | |
| Air Cleaner | CHECK | X | | | | | | |
| | CHANGE | | | X (1) | | | | |
| All Nuts and Bolts | Re-tighten If Necessary | X | | | | | | |
| Spark Plug | CHECK-CLEAN | | | | X | | | |
| | REPLACE | | | | | | X | |
| Cooling Fins | CHECK | | | | X | | | |
| Spark Arrester | CLEAN | | | | | X | | |
| Fuel Tank | CLEAN | | | | | X | | |
| Fuel Filter | CHECK | | | | | X | | |
| Idle Speed | CHECK-ADJUST | | | | | X (2) | | |
| Valve Clearance | CHECK-ADJUST | | | | | | X (2) | |
| Fuel lines | CHECK | | Every 2 years (replace if necessary) (2) | | | | | |

1. Service more frequently when used in **DUSTY** areas.
2. These items should be serviced by your service dealer, unless you have the proper tools and are mechanically proficient. Refer to the HONDA shop Manual for service procedures.
3. For commercial use, log hours of operation to determine proper maintenance intervals.

NOTICE

Refer to manufacturer engine manual for specific servicing instructions.

MAINTENANCE (ENGINE)

DAILY

Thoroughly remove dirt and oil from the engine and control area. Clean or replace the air cleaner elements as necessary. Check and retighten all fasteners as necessary.

SPARK PLUG

1. Remove and clean the spark plug (See Figure 20), then adjust the spark gap to 0.024~0.028 inch(0.6~0.7 mm). This unit has electronic ignition, which requires no adjustments.

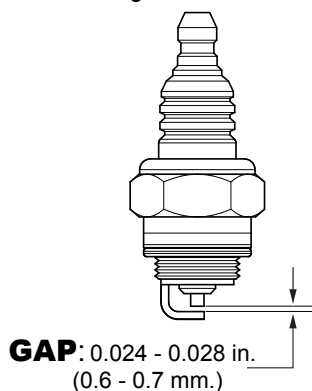


Figure 20. Spark Plug Gap

ENGINE OIL

1. Drain the engine oil when the oil is **warm** as shown in Figure 21.
2. Remove the oil drain bolt and sealing washer and allow the oil to drain into a suitable container.
3. Replace engine oil with recommended type oil as listed in Table 5. Engine oil capacity is 0.26 quarts (0.25 liters). **DO NOT** over fill.
4. Install drain bolt with sealing washer and tighten securely.

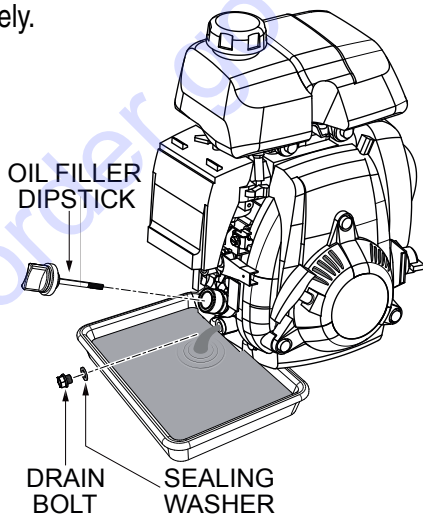


Figure 21. Engine Oil (Draining)

ENGINE AIR CLEANER

DANGER



NEVER use gasoline or low flash point solvents to clean the engine or any of its components. The possibility exists of **fire** or **explosion** which can damage the equipment and cause **severe bodily harm** or even **DEATH**.

1. Press the latch tabs on top of the air cleaner cover and remove the cover and foam filter element (Figure 22).

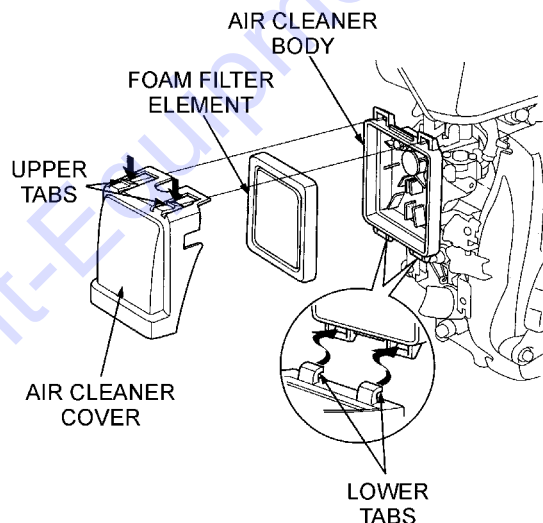


Figure 22. Engine Air Cleaner

2. Clean the foam element (Figure 23) in warm, soapy water or non-flammable solvent. Rinse and dry thoroughly.

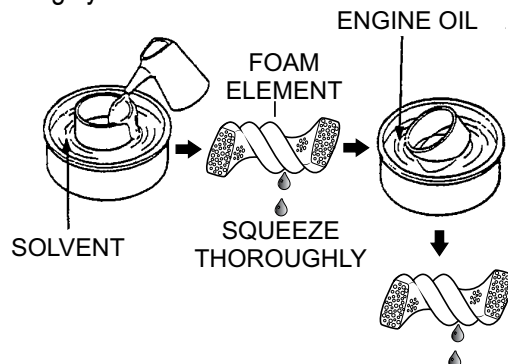


Figure 23. Foam Element

3. Dip the element in clean engine oil and completely squeeze out the excess oil from the element (Figure 23).
4. Reinstall the foam element and air cleaner cover.

PUMP STORAGE

For storage of the pump for over 30 days, the following is required:

- Drain the fuel tank completely.
- Run the engine until the fuel is completely consumed.
- Completely drain used oil from the engine crankcase and fill with fresh clean oil, then follow the procedures described in the engine manual for engine storage.
- Remove the drain plug from the pump and drain out any water from left in the housing.
- Remove the pump cover and clean inside of pump housing. Coat inside of pump housing with a light film of oil to reduce corrosion. A spray can of oil works well for this application.
- Cover suction and discharge ports with duct tape to prevent any foreign matter from falling into pump.
- Cover pump and engine with plastic covering or equivalent and store in a clean, dry place.
- To protect the water cooled-seals, place one-half pint of lubricating oil (new or used) through the discharge opening on the pump and crank the engine several times. This will prevent excessive corrosion and also keep the mechanical seal lubricated.

TROUBLESHOOTING (ENGINE)

| Troubleshooting (Engine) | | |
|------------------------------------------------------------------------------------|---------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Symptom | Possible Problem | Solution |
| Difficult to start, fuel is available, but no spark at spark plug. | Spark plug bridging? | Check gap, insulation or replace spark plug. |
| | Carbon deposit on spark plug? | Clean or replace spark plug. |
| | Short circuit due to deficient spark plug insulation? | Check spark plug insulation, replace if worn. |
| | Improper spark plug gap? | Set to proper gap. |
| | Spark plug is red? | Check transistor ignition unit. |
| | Spark plug is bluish white? | If insufficient compression, repair or replace engine. If injected air leaking, correct leak. If carburetor jets clogged, clean carburetor. |
| | No spark present at tip of spark plug? | Check if transistor ignition unit is broken, and replace defective unit. Check if voltage cord cracked or broken and replace. Check if spark plug if fouled and replace. |
| | No oil? | Add oil as required. |
| | Oil pressure alarm lamp blinks upon starting? (if applicable) | Check automatic shutdown circuit, "oil sensor". (if applicable) |
| Difficult to start, fuel is available, and spark is present at the spark plug. | ON/OFF switch is shorted? | Check switch wiring, replace switch. |
| | Ignition coil defective? | Replace ignition coil. |
| | Improper spark gap, points dirty? | Set correct spark gap and clean points. |
| | Condenser insulation worn or short circuiting? | Replace condenser. |
| | Spark plug wire broken or short circuiting? | Replace defective spark plug wiring. |
| Difficult to start, fuel is available, spark is present and compression is normal. | Wrong fuel type? | Flush fuel system, replace with correct type of fuel. |
| | Water or dust in fuel system? | Flush fuel system. |
| | Air cleaner dirty? | Clean or replace air cleaner. |
| | Choke open? | Close choke. |
| Difficult to start, fuel is available, spark is present and compression is low. | Suction/exhaust valve stuck or protruded? | Reseat valves. |
| | Piston ring and/or cylinder worn? | Replace piston rings and/or piston. |
| | Cylinder head and/or spark plug not tightened properly? | Torque cylinder head bolts and spark plug. |
| No fuel present at carburetor. | Head gasket and/or spark plug gasket damaged? | Replace head and spark plug gaskets. |
| | No fuel in fuel tank? | Fill with correct type of fuel. |
| | Fuel cock does not open properly? | Apply lubricant to loosen fuel cock lever, replace if necessary. |
| | Fuel filter/lines clogged? | Replace fuel filter. |
| | Fuel tank cap breather hole clogged? | Clean or replace fuel tank cap. |
| | Air in fuel line? | Bleed fuel line. |

TROUBLESHOOTING (PUMP)

| Troubleshooting (Pump) | | |
|------------------------------------------------|------------------------------------------------------|---------------------------------------------------------------------------------------|
| Symptom | Possible Problem | Solution |
| Pump does not take on water. | Not enough priming water in the housing? | Add water. |
| | Engine speed too low? | Increase throttle. |
| | Strainer plugged? | Clean strainer. |
| | Suction hose damaged? | Replace or repair hose, and clamps. |
| | Air leak at suction port? | Check that fittings are tight and properly sealed. |
| | Pump is located too high above water line? | Move pump closer to water. |
| | Debris collecting in pump housing? | Clean pump housing. |
| | Too much distance between impeller and volute? | Adjust clearance by adding shims or replace impeller. Min. .006 inch - Max. .020 inch |
| | Water leaking out weep hole between pump and engine? | Check condition of mechanical seal and gaskets, between pump end and engine housing. |
| Pump takes in water, little or no discharge. | Engine speed too low? | Increase throttle speed. |
| | Suction strainer partially plugged? | Clean strainer. |
| | Impeller/Volute worn? | Adjust clearance by adding shims or replace impeller/volute. |
| Suction hose leaks at inlet. | Fittings/clamps are not sealed properly? | Tighten, replace or add clamp. (Keep extra seals on pump). |
| | Hose diameter is too large? | Use smaller diameter hose or replace hose. |
| Discharge does not stay on coupling. | Pressure too high? | Check pressure, add additional clamp. |
| | Hose kinked or end blocked? | Check hose. |
| Impeller does not turn, pump is hard to start. | Impeller jammed or blocked? | Open pump cover and clean dirt and debris from inside housing. |
| | Impeller and volute binding? | Adjust clearance by removing shim from behind impeller. |
| | Defective engine? | See Engine Owner's Manual. |

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