
OPERATION & PARTS MANUAL



MODEL: QP60TD/S3L
TRASH PUMP
(MITSUBISHI S3L DIESEL ENGINE)
Revision: #1 (July 09)

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QP60TD TRASH PUMP

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TRAINING CHECKLIST

This checklist lists some of the minimum requirements for machine maintenance and operation. Please feel free to detach it and make copies. Use this checklist whenever a new operator is to be trained or it can be used as a review for more experienced operator's.

TRAINING CHECKLIST			
NO.	DESCRIPTION	OK?	DATE
1	Read Operator's Manual completely.		
2	Machine layout, location of components, checking of engine and oil levels.		
3	Fuel system, refueling procedure.		
4	Pump priming procedure.		
5	Emergency stop procedures.		
6	Engine start-up procedure.		
7	Lifting of machine (lifting bail)		
8	Pump applications (lift, uses etc.)		
9	Suction strainer placement.		
10	Hose connections.		
11	Pump placement.		
12	Trailer safety guidelines.		
13	Protective clothing guidelines.		
14	Vacuum test procedure.		
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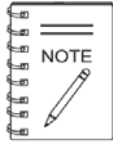
DAILY PRE-OPERATION CHECKLIST

DAILY PRE-OPERATION CHECKLIST	
1	Check engine oil level.
2	Check fuel level (and for clean fuel).
3	Check cooling fins and cooling air flow.
4	Check engine air cleaner.
5	Check engine battery and cable connections.
6	Check pump interior (impeller and volute).
7	Check vacuum pump seal oil.
8	Check bearing housing oil.
9	Check pump seal.
10	Check pump casing for cracks.
11	Check trailer wheel lug nuts for tightness.
12	Check trailer wheel bearings.
13	Check trailer hitch and ball.
14	Check trailer springs and hardware (jack stand).
15	Check trailer tyre pressure.
16	Check trailer lights.

SAFETY

FOR YOUR SAFETY AND SAFETY OF OTHERS!

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.



This manual has been developed to provide complete instructions for the safe and efficient operation of this equipment. Refer to the engine manufacturer's instructions for data relative to its safe operation.

Before using this equipment ensure that the operating individual has read and understood all instructions in this manual.

SAFETY MESSAGE ALERT SYMBOLS

The three 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 three words: **DANGER**, **WARNING**, or **CAUTION**.

⚠ DANGER

You **WILL** be **KILLED** or **SERIOUSLY INJURED** if you **DO NOT** follow these directions.

⚠ WARNING

You **CAN** be **KILLED** or **SERIOUSLY INJURED** if you **DO NOT** follow these directions.


⚠ CAUTION

You **CAN** be **INJURED** if you **DO NOT** follow these directions.

HAZARD SYMBOLS


Potential hazards associated with the operation of this equipment will be referenced with Hazard Symbols which appear throughout this manual, and will be referenced in conjunction with Safety Message Alert Symbols.

⚠ WARNING — Lethal Exhaust Gas Hazards



Engine fuel exhaust gases contain poisonous carbon monoxide. This gas is colorless and odorless, and can cause death if inhaled. **NEVER** operate this equipment in a confined area or enclosed structure that does not provide ample free flow air.


⚠ WARNING — Explosive Fuel Hazards



Fuel is extremely flammable and its vapors can cause an explosion if ignited. **DO NOT** start the engine near spilled fuel or combustible fluids.


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. Store fuel in approved containers, in well-ventilated areas and away from sparks and flames.

⚠ WARNING — Burn Hazards



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

⚠ WARNING — Respiratory Hazards



ALWAYS wear approved respiratory protection when required.


SAFETY

⚠ CAUTION — Rotating Parts Hazards




NEVER operate equipment with covers or guards removed. Keep fingers, hands, hair and clothing away from all moving parts to prevent injury.

⚠ CAUTION — Overspeed Conditions



NEVER tamper with the factory setting of the engine governor. Personal injury and equipment damage can result if operating in speed ranges above the maximum allowable.

⚠ CAUTION — Accidental Starting Hazards




ALWAYS place the equipment ON/OFF switch in the OFF position when the equipment is not in use.

⚠ CAUTION — Equipment Damage Hazards

Other important messages are provided throughout this manual to help prevent damage to your equipment, other property, or the surrounding environment.

⚠ CAUTION — Eye and Hearing Hazards



ALWAYS wear approved eye and hearing protection when required.

RULES & REGULATIONS

GENERAL SAFETY

⚠ WARNING — Read This Manual

Failure to follow instructions in this manual may lead to serious injury or even **DEATH!** This equipment is to be operated by trained and qualified personnel only! This equipment is for industrial use only.

DO NOT operate or service this equipment before reading this entire manual.



This equipment should not be operated by persons under 18 years of age.

NEVER operate this equipment without proper protective clothing, shatterproof glasses, steel-toed boots and other protective devices required by the job.



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.



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.

NEVER use accessories or attachments that are not recommended by Aussie Pumps for this equipment. Damage to the equipment and/or injury to user may result.

Manufacturer does not assume responsibility for any accident due to equipment modifications. Unauthorized equipment modification will void all warranties.

Whenever necessary, replace nameplate, operation and safety decals when they become difficult to read.

ALWAYS check the equipment for loosened threads or bolts before starting.

NEVER touch the hot exhaust manifold, muffler or cylinder. Allow these parts to cool before servicing engine or pump.



ALWAYS allow the engine to cool before adding fuel or performing service and maintenance functions. Contact with hot components can cause serious burns.

NEVER operate this equipment in any enclosed or narrow area where free flow of the air is restricted. The engine of this equipment requires an adequate free flow of cooling air. If the air flow is restricted it will cause serious damage to the equipment or engine and may cause injury to people and property. Remember the engine gives off **DEADLY** gases.



ALWAYS refuel in a well-ventilated area, away from sparks and open flames.

ALWAYS use extreme caution when working with flammable liquids. When refueling, stop the engine and allow it to cool.

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.



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.



DO NOT top-off fuel tank. Topping-off is dangerous as it causes fuel to spill.

ALWAYS store the equipment in a clean, dry location out of the reach of children.

NEVER run engine without air cleaner. Severe engine damage may occur.

NEVER leave the equipment unattended with the engine running. Turn off engine when unattended.

CAUTION must always be observed while servicing this equipment. Rotating parts can cause injury if contacted.

RULES & REGULATIONS

ALWAYS read, understand, and follow procedures in Operator's Manual before attempting to operate equipment.

ALWAYS be sure the operator is familiar with proper safety precautions and operation techniques before using pump.

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.

NEVER pump volatile, explosive, flammable or low flash point fluids. These fluids could ignite or explode.

NEVER operate the pump in an **explosive** atmosphere.

ALWAYS ensure pump is on level ground before use.

Become familiar with the components of the pump before operating.

ALWAYS replace any worn or damaged warning decals.

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 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.

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.

In winter drain water from pump housing to prevent freezing.

ALWAYS make sure that the pump's trailer is placed on solid level ground so that it cannot slide or shift around, endangering workers. Deploy jack stands for stabilization. Place blocks under the trailer's bumper to make it level (prevents tipping), and use a chocked block underneath the wheels to prevent rolling. Also keep the immediate area free of bystanders.

Before starting the pump, check that the clean-out cover is securely fastened.

NEVER start the pump with the clean-out cover removed. The rotating impeller inside the pump can cut or sever objects caught in it.

⚠ WARNING — Do Not Run the Pump Dry

If the pump loses prime while operating, the remaining water in the casing will reach near-boiling temperatures within approximately 15 minutes. **NEVER** operate the pump without water flowing through the pump. Allow pump casing to cool to the touch before opening the fill or drain caps or before removing any hoses to avoid serious burns and bodily injury to the operator.

RULES & REGULATIONS

TRANSPORTING

ALWAYS shutdown engine before transporting.

Tighten fuel tank cap securely and close fuel cock to prevent fuel from spilling.

ALWAYS make sure pump is correctly secured to the trailer. Check all connections attaching the pump to the trailer and make sure they are tight.

MAINTENANCE SAFETY

NEVER lubricate components or attempt service on a running machine.

ALWAYS allow the machine a proper amount of time to cool before servicing.

Keep the equipment in proper running condition.

Fix damage to the equipment immediately and always replace broken parts.

Dispose of hazardous waste properly. Examples of potentially hazardous waste are used motor oil, fuel and fuel filters.

DO NOT use food or plastic containers to dispose of hazardous waste.

DO NOT pour waste, oil or fuel directly onto the ground, down a drain or into any water source.

EMERGENCIES

ALWAYS know the location of the nearest fire extinguisher.



ALWAYS know the location of the nearest first aid kit.



In emergencies, 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 case of emergency.



BATTERY SAFETY (FOR ELECTRIC START)

The battery contains acids that can cause injury to the eyes and skin. **ALWAYS** wear safety glasses to avoid eye irritation.



ALWAYS wear well-insulated gloves when picking up the battery.

ALWAYS keep the battery charged. If the battery is not charged, a buildup of combustible gas will occur.

DO NOT charge battery if frozen. Battery can explode. When frozen, warm the battery to at least 61° F (16° C).

ALWAYS make sure battery terminals are properly connected. Inadequate battery connections may cause poor starting of the equipment and create other malfunctions.

ALWAYS keep battery cables in good working condition. Repair or replace all worn cables.

ALWAYS recharge the battery in an vented air environment, to avoid risk of a dangerous concentration of combustible gases.

ALWAYS disconnect the negative battery terminal before performing service on the equipment.

If the battery liquid (dilute sulfuric acid) comes in contact with clothing or skin, rinse skin or clothing immediately with plenty of water.

If the battery liquid (dilute sulfuric acid) comes in contact with your EYES, rinse eyes immediately with plenty of water and contact the nearest doctor or hospital to seek medical attention.

⚠ DANGER — Explosion Hazards

The risk of an explosion exists when performing service on the battery. To avoid **severe injury** or **DEATH**:

DO NOT drop the battery. There is the possibility of risk that the battery may 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 in contact with a flame or spark, an explosion could occur.

SPECIFICATIONS

TABLE 1: PUMP SPECIFICATIONS	
Maximum Pumping Capacity	4,100 lpm
Maximum Suction Lift	7.6 metres
Maximum Total Head	30.4 metres
Maximum Pressure	43.2 psi
Maximum Solids	30.5mm
Suction & Discharge Diameter	152mm
Weight (no fuel)	707kg
* Based on pump operating at sea level. Maximum suction lift will be less at higher altitudes.	

TABLE 2: ENGINE SPECIFICATIONS	
Engine Make	MITSUBISHI
Engine Model	S3L
Engine Type	Water cooled, 4 stroke, in line diesel engine
Number of Cylinders	3
Bore/Stroke	78 x 78.5mm
Continuous Engine HP	24HP @ 3000 RPM
Oil Grade	See table 5
Fuel Type	Diesel
Fuel Capacity	24 litre
Starting Method	12 volt electric start

DIMENSIONS (PUMP/TRAILER)

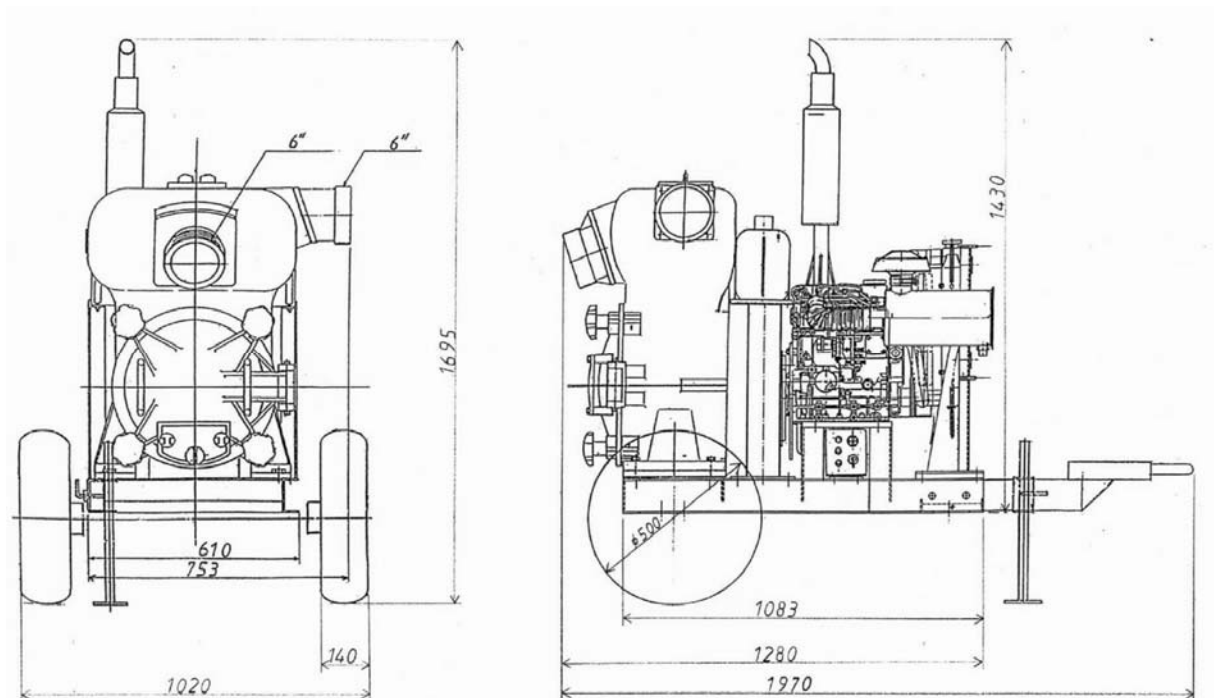


Figure 1. Pump & Trailer Dimensions

GENERAL INFORMATION

The QP60TD trash pump is a self-priming trash pump powered by a 24 horsepower water-cooled, 3-cylinder, four stroke Mitsubishi diesel engine. Both the intake (suction) and discharge ports on the pump incorporate a 6-inch diameter opening, which allows the pump to discharge at a rate of approximately 4,100 lpm.

This is a self-priming pump design, the pump casing must be filled with water before the pump can be used. The engine drives a rotating disc with two (or more vanes) called an impeller that creates an area of low pressure inside the pump. Priming is accomplished when all air is purged from the pump and suction line allowing water to flow continuously into the pump.

TRASH PUMP

Trash pumps derive their name from their ability to handle a greater amount of debris and solids than standard centrifugal pumps. This pump can handle solids up to 2- inches (51 mm). Also trash pumps are capable of handling water with 25% solids by weight.

The advantage of using a trash pump is that it can be quickly and easily disassembled in the field to remove debris in the event the pump becomes clogged.

SUCTION LIFT

This pump has a maximum suction lift up to 7.6 meters at sea level. **At elevations above sea level suction lift decreases at a rate of 30cms of suction lift per 300 metres of elevation.** It is recommended that the pump be located as close to the source as possible to minimize suction lift.

PUMP SUPPORT

NEVER place the pump on **soft soil**. The pump should always be placed on solid stationary ground in a level position. To prevent the trailer from tipping, place blocks under the trailer's bumper. In addition, place chock blocks behind each wheel to prevent the trailer from rolling.

ELEVATION

Elevations over 1,000 metres 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.

A general rule of thumb is that for every 300 metres of elevation above sea level a pump will lose 30cm of priming ability.

PUMP CLEAN-OUT

The clean-out cover on the pump has been designed for easy removal that allows for easy access to the wear plate and impeller for cleaning and servicing.

HOSES

Suction and discharge hoses 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.

MECHANICAL SEAL LUBRICATION

The pump uses an oil lubricated mechanical seal to prevent water from seeping into the engine. The oil in the seal chamber lubricates the seal and prevents it from overheating. Never operate the pump without water in the casing as this may cause the seal to fail. (See section on seal maintenance).

ENGINE SAFETY

Internal combustion engines present special hazards during operation and fueling! Failure to follow the safety guidelines described in the Rules for Safe Operation section of this manual and the Mitsubishi Engine Operator's Manual could result in severe injury or death.

ACCESSORIES

Aussie Pumps offers a complete line of fittings, hoses, and clamps to properly connect the pump to match various job conditions.

APPLICATIONS

Figure 3 below shows a typical application using the trash pump. Please note that this pump is intended for the removal of clean water and water containing some debris and solids. Maximum size of solids should not exceed 2 inches (51 mm) in diameter. **DO NOT** set strainer on bottom of water bed. Placing the strainer above the water bed will prevent the pump from drawing in excessive amounts of sand and foreign debris.

TERMS TO KNOW

The following terms are usually used when referring to lift or head:

1. **Static Suction Lift** – The vertical distance from the water line to the center of the impeller.
2. **Static Discharge Head** – The vertical distance from the discharge outlet to the point of discharge or liquid level when discharging into the bottom of a water tank.
3. **Dynamic Suction Head** – The static suction lift plus the friction in the suction line. Also referred to as total suction head.
4. **Dynamic Discharge Head** – The static discharge head plus the friction in the discharge line. Also referred to as total discharge head.
5. **Total Dynamic Head** – The Dynamic Head Suction Head plus the Dynamic Discharge Head. Also referred to as total head.

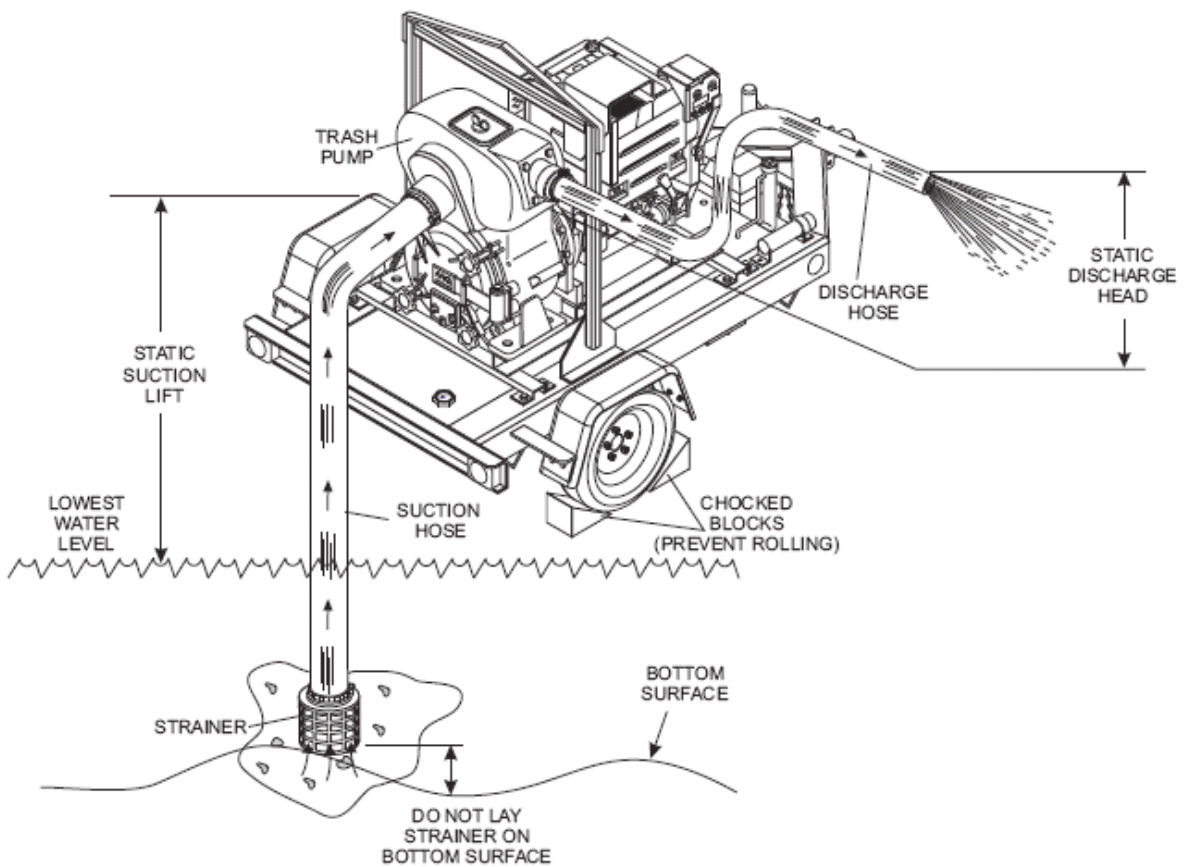


Figure 3. Pump Application

PUMP COMPONENTS

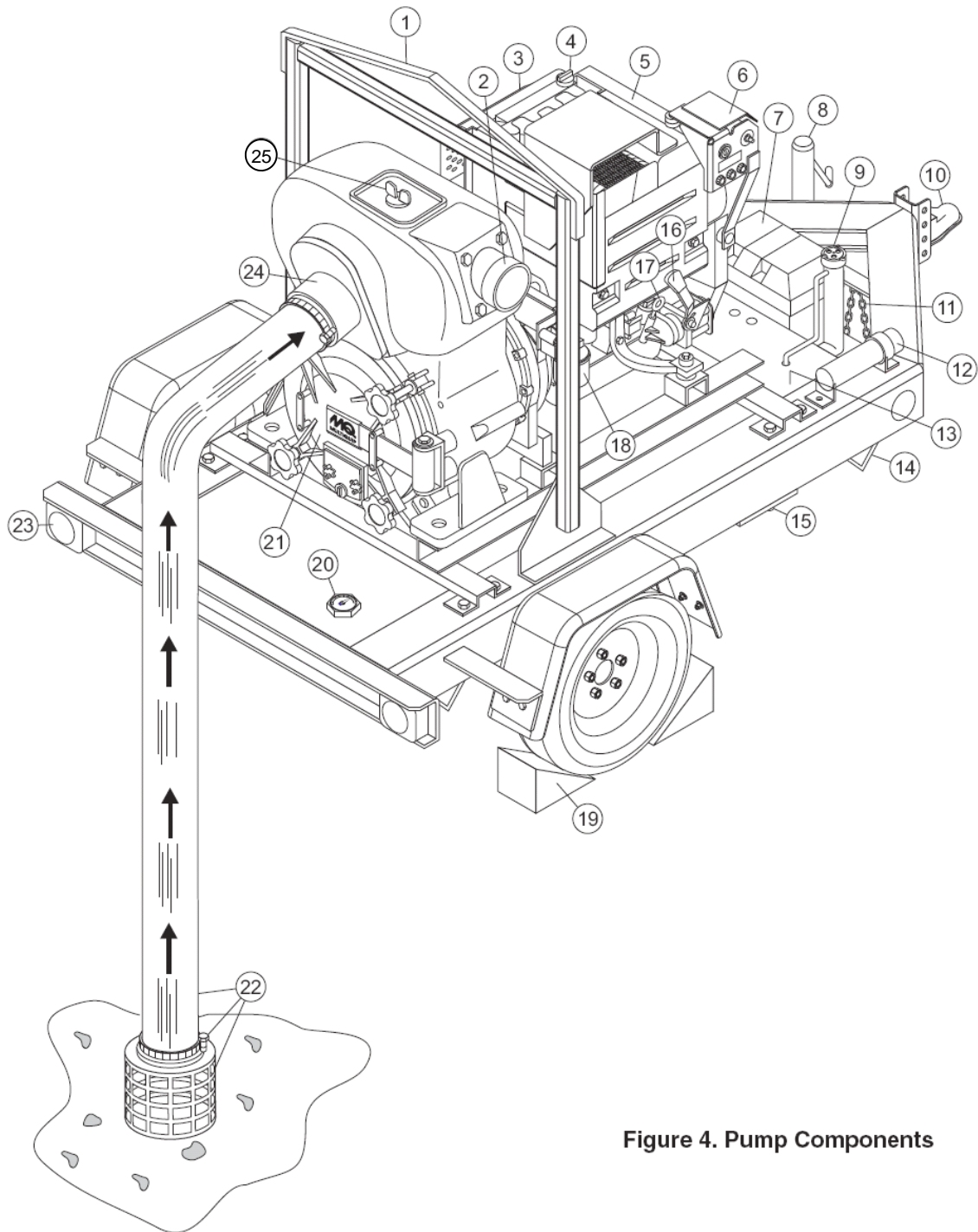


Figure 4. Pump Components

Note: above diagram shows Deutz air cooled version of Aussie QP60TD trash pump,

PUMP COMPONENTS

Figure 4 shows the location of the components and basic components for the QP60TD trash pump, The function of each component or control is described below:

1. **Lifting Bail** – When lifting of the trash pump by crane is required, use this lifting bail. Note: this lifting bail is balanced for a fully configured trash pump; removal of any trash pump components will un-balance the lifting bail.
2. **Pump Discharge Port** – Discharges water and debris from the pump.
3. **Muffler/Guard** – **DO NOT** touch the muffler when engine is running. The muffler can become extremely hot, causing severe burns. **NEVER** run the pump with the muffler guard removed.
4. **Oil Filler** – Fill as recommended in the maintenance section of this manual.
5. **Engine (Diesel)** – This pump uses a 24HP Mitsubishi S3L, 4-stroke diesel engine. See the Mitsubishi Operation manual supplied with the trash pump for additional engine information.
6. n/a to Mitsubishi version
7. **Battery** – +12 VDC battery compartment.
8. **Tow End Jack Stand** – When connecting the pump to a ball type towing hitch, use this jack stand to raise and lower the pump.
9. n/a to Mitsubishi version
10. n/a to Mitsubishi version.
11. n/a to Mitsubishi version
12. n/a to Mitsubishi version
13. n/a to Mitsubishi version
14. n/a to Mitsubishi version
15. n/a to Mitsubishi version
16. n/a to Mitsubishi version
17. **Dipstick** – Read this gauge to determine the oil level in the engine crankcase. Fill with only recommended type oil as referenced in the maintenance section of this manual.
18. **Fuel Filter** – Replace or clean the fuel filter as specified in the maintenance section of this manual.
19. **Chock Blocks** – Place these blocks (not included as part of the trash pump package) under each trailer wheel to prevent rolling.
20. **Fuel Gauge** – Read this gauge to determine if the fuel level is low. If fuel level is low, replenish with only recommended type diesel fuel.
21. **Clean-Out Cover** – Remove this cover to clean and remove foreign debris from the trash pump.
22. **Accessories** – Hoses, strainers and clamps are the required accessory components for normal operation of this trash pump. **Contact** your nearest Aussie Pumps dealer for information on the components.
23. n/a to Mitsubishi version
24. **Pump Intake Port** – Intakes water and debris from the source.
25. **Fill Cap** – Remove this cap to prime the pump with water.

CONTROL BOX

Figure 6 illustrates the location of the basic components for the control box. The function of each component is described below:

1. **Ignition Switch** – Used to start and stop the engine
2. **Oil Pressure Status Indicator** – When lit indicates that the oil pressure is not within specified limits.
3. **Water Temperature Status Indicator** – When lit indicates that the water temperature has exceeded its limit.
4. **Charge Indicator** – When lit indicates that the charging system is not working properly.



Figure 6. Control Box

ENGINE COMPONENTS

S3L/S3L2

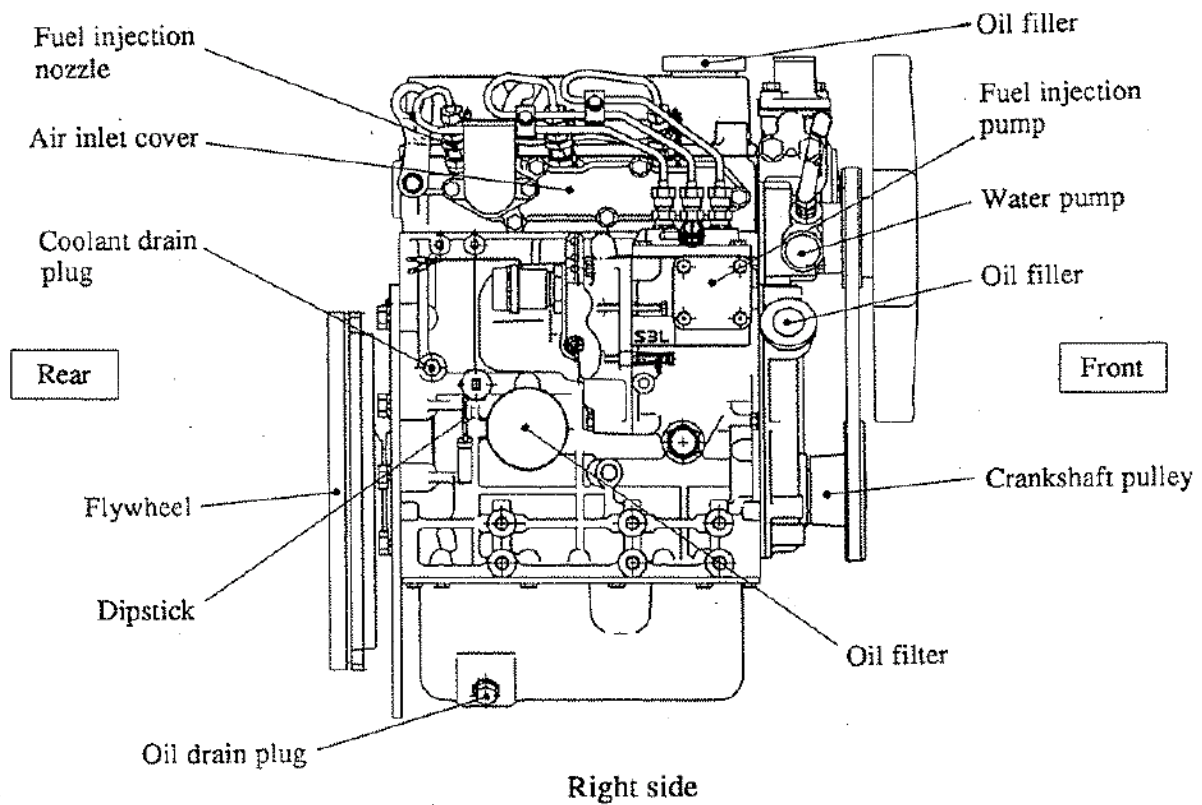
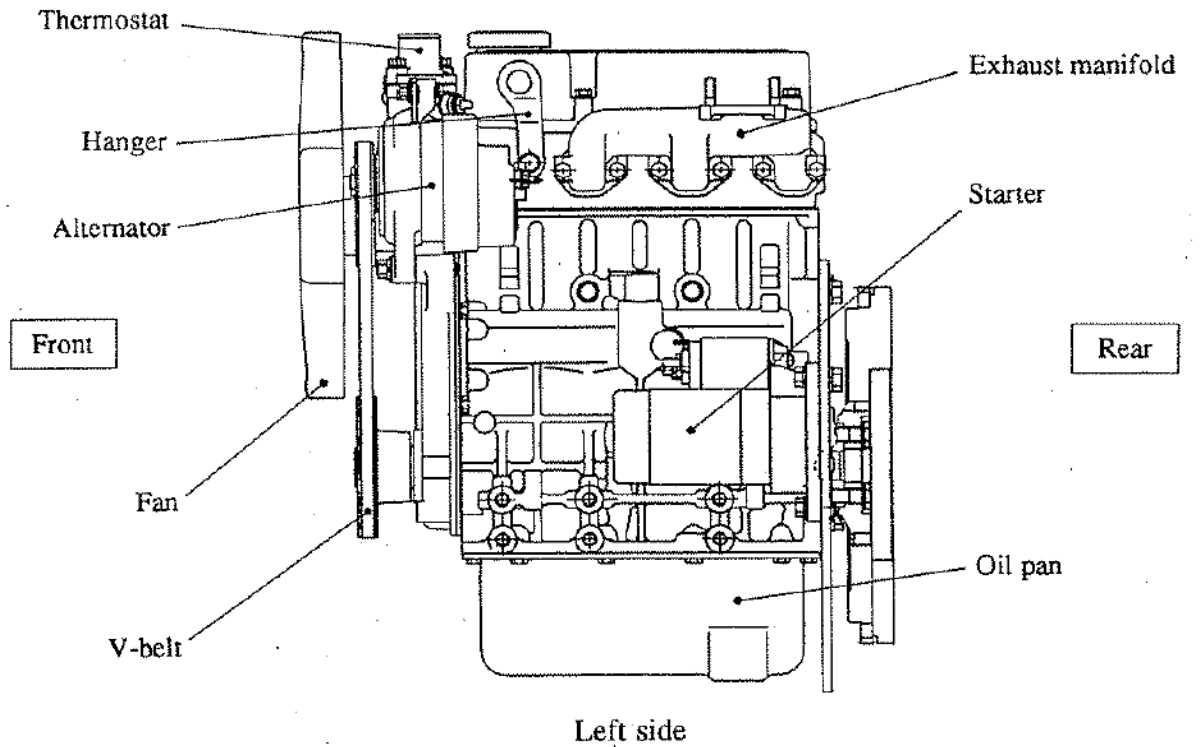


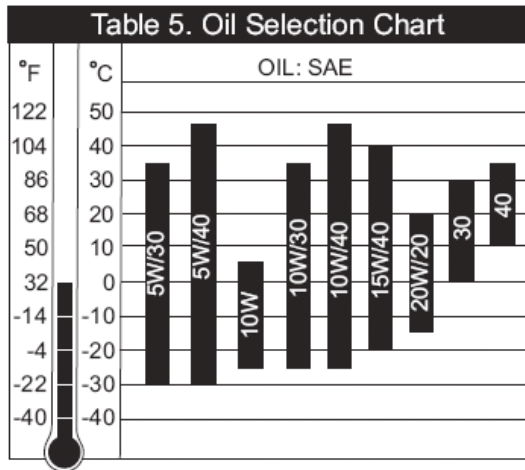
Figure 5. Engine Components

INSPECTION

Engine Oil

1. Make sure pump/engine is on level ground.
2. Pull the engine oil dipstick from its holder.
3. Verify that oil level is maintained between the two notches on the dipstick.
4. If engine oil is low, fill engine crankcase with lubricating oil through filler hole, but do not overfill.
5. The oil listed in Table 5 is recommended to ensure better engine performance. Use class CD or higher grade motor oil.

Mitsubishi recommends all-season type engine oil of SAE 10W-30.



For more information on the engine consult manufacturer's manual.

Battery

This unit is of negative ground. **DO NOT** connect in reverse. Always maintain battery fluid level between the specified marks. Battery life will be shortened, if the fluid levels are not properly maintained. Add only distilled water when replenishment is necessary.

DO NOT over fill. Check to see whether the battery cables are loose. Poor contact may result in poor starting or malfunctions. Always keep the terminals firmly tightened.

Coat the terminals with an approved battery terminal treatment compound. Replace battery with only recommended type battery.

The battery is sufficiently charged if the specific gravity of the battery fluid is 1.28 (at 68° F). If the specific gravity should fall to 1.245 or lower, it indicates that the battery is dead and needs to be recharged or replaced. Before charging the battery with an external electric source, be sure to disconnect the battery cables.

Battery Cable Installation

ALWAYS be sure the battery cables are properly connected to the battery terminals as shown in Figure 9. The **RED** cable is connected to the positive terminal of the battery, and the **BLACK** cable is connected to the negative terminal of the battery.

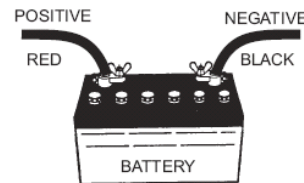


Figure 9. Battery

INSPECTION

Fuel


1. Determine if engine fuel is low by reading fuel gauge (Figure 8) located on the side of the fuel tank. If the fuel level is low, remove the fuel cap from the tank and fill with the recommended type diesel fuel. **DO NOT** fill the tank beyond capacity.



Figure 8: Fuel tank


2. Handle fuel in a safety container. If the container does not have a spout use a funnel.
3. Pay attention to the fuel tank capacity when replenishing fuel. Refer to the fuel tank capacity listed in Engine Specification Table 2.
4. Tighten fuel cap securely after filling.

⚠ DANGER — Fire/Explosion



NEVER fill the fuel tank while the engine is running or in the dark. Fuel spillage on a hot engine can cause a fire or explosion. If fuel spillage occurs, wipe up the spilled fuel completely to prevent fire hazards.

⚠ DANGER — No Smoking

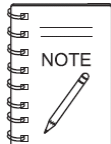


DO NOT smoke while refueling, motor fuels are highly flammable and can be dangerous if mishandled.

SETUP

Before Starting

1. Read safety instructions at beginning of manual.
2. Place pump as near to water as possible, on a firm flat, level surface.
3. To prime pump, remove fill cap (Figure 4) and fill pump case with water. If the pump case is not filled with water before starting, it will not begin pumping.



Pump casing **must** be filled with water before using pump, otherwise pump will not be able to begin pumping.

4. Check for **leaks** between pump and engine. If water is leaking between the pump and bearing housing, the seal inside the pump may be worn or damaged.
5. Continued operation of the pump is not recommended.
6. Further usage of the pump under these conditions may cause severe water damage to bearing housing assembly.

Hoses, Clamps and Strainer

1. Check that all hoses are **securely** attached to the pump. Make certain suction hose (Figure 4) does not have any air leakage. Tighten hose clamps and couplings as required.
2. It is recommended that 2 clamps be used when securing the suction hose to the inlet side of the pump.
3. Remember suction hoses must be **rigid** enough not to collapse when the pump is in operation.
4. Check that the **discharge** hose (Figure 4) is not restricted. Place hose so that it lays as straight as it is possible on the ground. Remove any twists or sharp bends from hose which may block the flow of water.
5. Make sure the **suction strainer** (Figure 4) is clean and securely attached to the water end of the suction hose. The strainer is designed to protect the pump by preventing large objects from being pulled into the pump. Failure to use a strainer could cause damage to the pump, impeller, pump shaft, pump bearings, or wear plate. Pump casing must be filled with water before using pump, otherwise pump will not be able to begin pumping.
6. Shorter suction lift and suction hose length will produce better performance.
7. The discharge hose is usually a **collapsible** (thin walled) hose, however if a thin-walled discharge hose is not available, a rigid suction hose can be substituted in its place.

! DANGER — High Pressure

PVC discharge hoses and thin-walled rubber hoses can easily fail at the end of the hose fittings. Leaks from the hoses can cause high-pressure liquid to be discharged, causing dangerous conditions. Make sure pressure rating of hoses exceeds the pump maximum pressure to prevent hose failure.

8. Pipes, hoses, fittings and elbows all produce friction that can significantly reduce the flow of water. Keep hose length to a minimum and minimize the use of elbows and other fittings to reduce friction.
9. Always use a suction hose or pipe that matches the size of the pump inlet to insure optimum performance and reduce the risk of damage to the pump.
10. It is recommended that the discharge hose or pipe match the size of the pump outlet to reduce friction as much as possible. Using a discharge line that is larger than the pump outlet will reduce friction and improve water flow. Similarly, a smaller line will reduce water flow by increasing friction.

! CAUTION — Strainer Placement

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.

! CAUTION — Equipment Damage Hazards

DO NOT pump flammable fluids, corrosive chemicals or fluids containing toxic substances. These fluids can create potentially dangerous health and environmental hazards. Contact local authorities for assistance.

STARTUP/OPERATION

STARTUP

⚠ CAUTION — Equipment Damage Hazards

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

1. Insert ignition key into ignition switch, turn ignition key clockwise to **ON**, and verify that all three status indicator lights are **ON**.
2. Turn the starter switch key to **HEAT** position (Figure 9) and continue to hold it there for about 20 seconds. Do not use the glow plugs for more than 1 minute at a time.

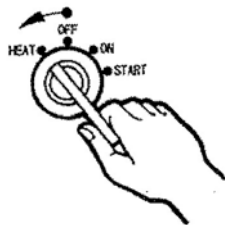
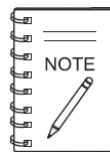


Figure 9. Ignition switch

OPERATION

1. The pump should begin pumping water within a minute depending on the length of suction hose and height the pump is above water.
2. If pump does not begin to pump water after a few minutes, check for loose connections or air leaks in suction hose. Make sure there is water in the pump end and strainer is not clogged with debris, reference Table 11 (Pump Troubleshooting).



Longer suction hoses will require more time for the pump to begin pumping water.

3. When the glow plug indicator goes off, move the speed control lever to **FULL THROTTLE** position and turn the key to **START** position. The glow plug indicator will also come on when the key is in **START** position.
4. Release the key when the engine starts. The key will return to **ON** position when released.
5. Verify that all three status indicator lights are **OFF** when the engine is started.
6. If the charge light remains on while the engine is running, refer to the Mitsubishi Engine Repair Manual.

SHUTDOWN/STORAGE

ENGINE SHUT-DOWN

1. Turn ignition key counter clockwise to **OFF** position. The engine will take about 5 seconds to stop after the key has been turned to **OFF** position.



Figure 10. Ignition switch

2. Remove ignition key and place key in safe location where it will not get lost.

⚠ CAUTION — Ignition Key Safeguarding

When pump is not in use, keep ignition key in a safe place, out of the reach of unauthorized persons.

PUMP INSPECTION AFTER USE

It is recommended that the pump be inspected after each use for damage or wear.

1. Visually inspect the pump for any signs of wear or damage. Replace any worn or defective components as specified in the maintenance section of this manual.
2. Open pump clean-out cover and remove any foreign debris that may have accumulated.
3. Inspect all hoses, fittings and clamps. If defective, replace immediately.
4. Inspect impeller for wear or damage and measure impeller clearance if it appears worn. Inspection interval should be about every 1000 hours. This inspection should be done when the pump is scheduled for maintenance inspection.

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 in the injection system 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 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.

MAINTENANCE

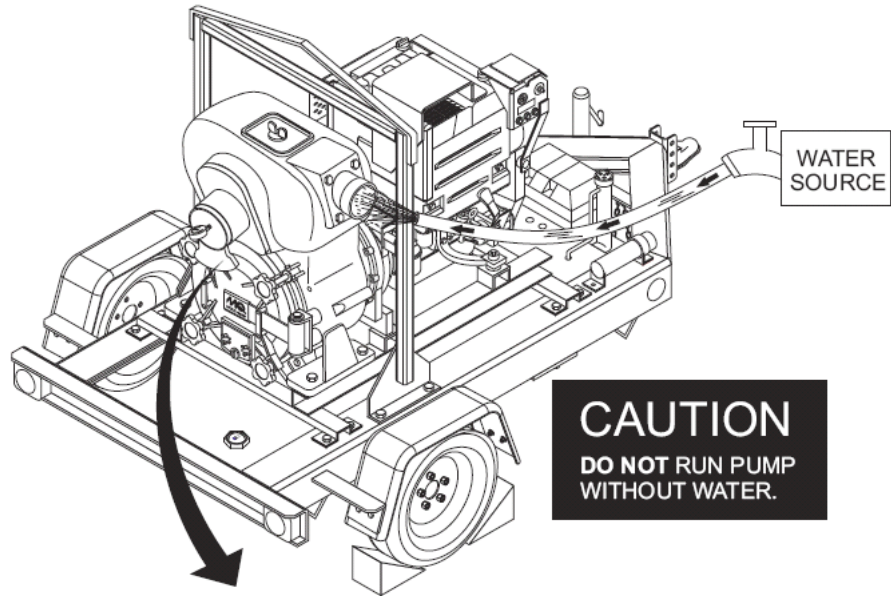
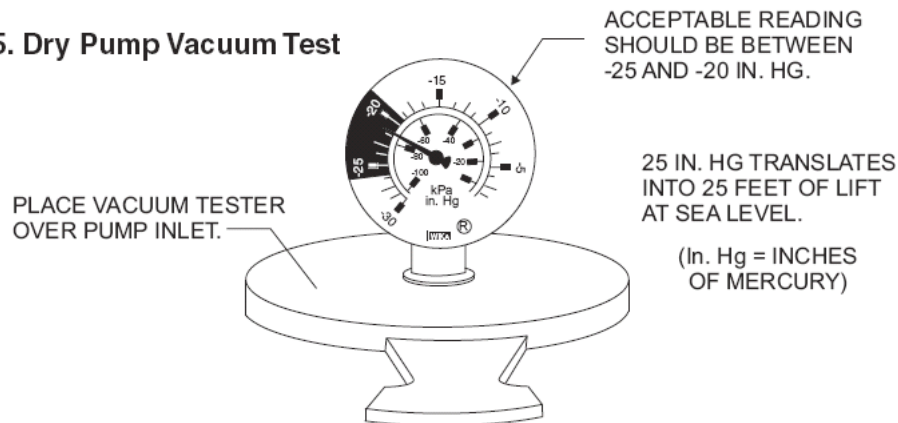


Figure 15. Dry Pump Vacuum Test



PUMP VACUUM TEST

To perform the pump vacuum test do the following:

1. Remove the pump fill cap, 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. Confirm engine is operating at 3,000 RPM.
3. As shown in Figure 15, 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* over the pump inlet opening (Figure 15) 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 re-seat vacuum tester.
6. Run the pump for a few minutes while monitoring the vacuum gauge. A pump will lose approximately one foot of suction lift for every 300 metres of elevation. Depending on the elevation, the gauge should read between 20-29 in. Hg. (inches of mercury). This is an indication that the pump is working correctly.
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.

MAINTENANCE (ENGINE)

TABLE 6: INSPECTION / MAINTENANCE		10 Hrs	50 Hrs	100 Hrs	500 Hrs	1000 Hrs	Every 2 years	When required
ENGINE	Check Engine Fuel & Oil Levels	X						
	Check Coolant Level	X						
	Check Fan Belt Condition	X						
	Check for Leaks	X						
	Check for Loosening of Parts	X						
	Drain water & sediment from fuel tank		X					
	Check Battery electrolyte level & specific gravity		X					
	Replace Engine Oil and Filter *1			X				
	Clean Radiator Fins			X				
	Check & adjust valve clearance (0.25 mm for both inlet & outlet valves)				X			
	Change Fuel Filter Element				X			
	Check & Adjust Injection Pressure (140kg/cm ² (1991 psi))				X			
	Check & Adjust Fan Belt				X			
	Check Glow Plugs				X			
	Check all Hoses and Clamps					X		
	Check starter					X		
	Check Alternator					X		
	Change Coolant						X	
	Prime fuel system							X
	Clean air cleaner element							X
Change air cleaner element							X	

*1 Replace engine oil and oil filter at 50 hours, first time only.

*2 Replace primary air filter element when restriction indicator show RED

General Inspection

Prior to each use, the pump should be cleaned and inspected for deficiencies. Check for loose, missing or damaged nuts, bolts or other fasteners. Also check for fuel, and oil, refer to the Engine Instruction Manual.

Air Cleaner

Every 250 hours: Remove air cleaner element (Figure 16) and clean the heavy duty paper element with light spray of compressed air. Replace the air cleaner as needed.

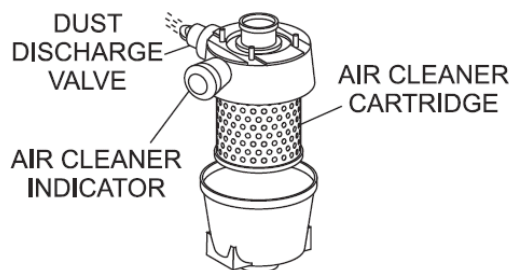


Figure 16. Air Cleaner

Generic air filter illustrated

Check Oil Level

Check the engine crankcase oil level prior to each use, or when the fuel tank is filled. Make sure the pump is level. The oil level must be between the two notches on the dipstick as shown in Figure 17.

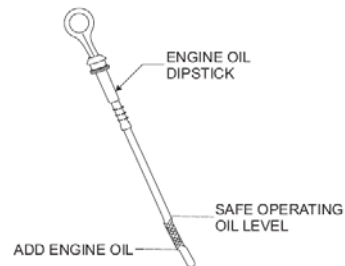


Figure 17. Dipstick

Changing Engine Oil

1. Change engine oil after first 50 hours of operation. Drain and refill engine crankcase with the correct type and amount of oil (reference Table 5) after 100 hours of operation hours thereafter.
2. Remove drain plug and sealing washer and let engine oil flow into a suitable container while engine is still warm.
3. Reinstall drain plug and seal washer. Tighten drain plug securely. Add engine oil through the filler hole.
4. Refer to engine manual for full details.

MAINTENANCE (ENGINE/BATTERY)

Changing Oil Filter

1. Replace engine oil filter after first 50 hours of operation and then every 100 hours, refer to engine manual for full details.
2. Remove oil filter canister from engine by turning canister counterclockwise.
3. Lubricate oil filter gasket with a small amount of oil. Reinstall oil filter by rotating canister clockwise. **DO NOT** over-tighten.

Changing Fuel Filter

1. Replace fuel filter every 500 hours, refer to engine manual for full details.
2. Remove oil filter canister from engine by turning canister counterclockwise.
3. Lubricate oil filter gasket with a small amount of oil. Reinstall oil filter by rotating canister clockwise. **DO NOT** over-tighten.

Battery Maintenance

⚠ CAUTION — Battery Hazards

Wear **safety glasses** or **face mask**, **protective clothes**, and **rubber gloves** when working with battery.



Mishandling of the battery shortens the service life of the battery and adds to maintenance cost. When handling the battery do the following:

Be careful not to let the battery electrolyte come in contact with your body or clothing.

ALWAYS wear **eye protection** and **rubber gloves**, since the battery contains sulfuric acid which burns skin and eats through clothing.

ALWAYS check the battery terminals periodically to ensure that they are in good condition.

Use wire brush or sand paper to clean the terminals.

ALWAYS check battery for cracks or any other damage.

If white pattern appears inside the battery or paste has accumulated at the bottom, replace the battery.

If the pump will not be in operation for a long period of time, store in cool dry place and check the battery charge level every month to maintain the performance of the battery.

Check the battery regularly and make sure that each electrolyte level is to the bottom of the vent well (Figure 21). If necessary add only distilled water in a well-ventilated area.

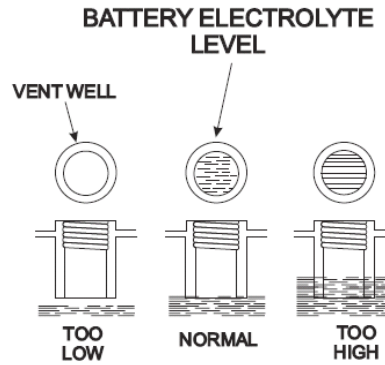
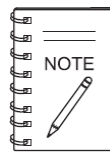


Figure 21. Battery Electrolyte Levels

ALWAYS place a small amount of battery terminal treatment compound around both battery terminals. This will ensure a good connection and will help prevent corrosion around the battery terminals.

Inadequate battery connections may cause poor starting of the generator, and create other malfunctions.



If the battery cables are connected incorrectly, electrical damage to the alternator, engine control box and other electrical components may result. Pay close attention to the polarity of the battery when connecting the battery cables.

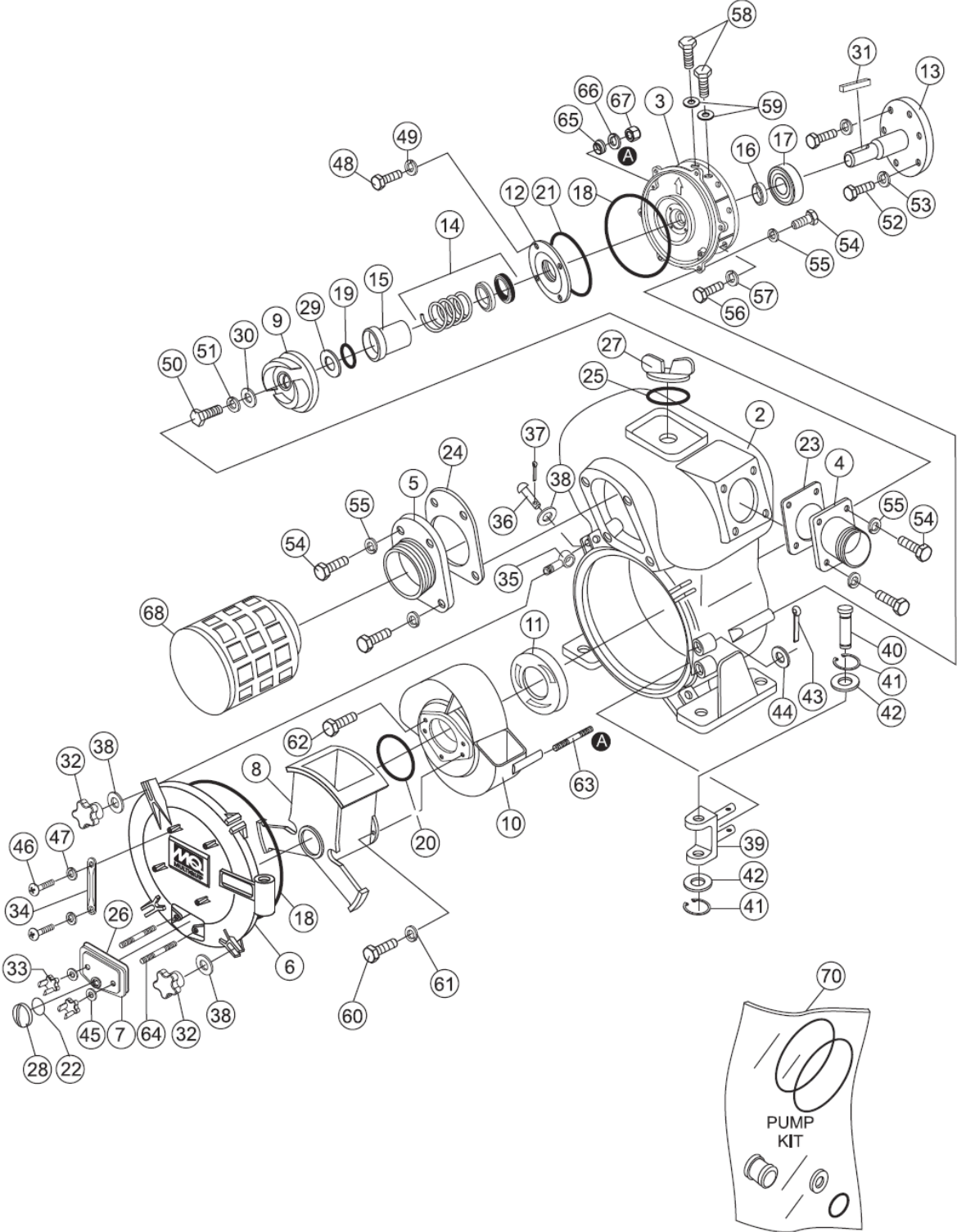
TROUBLESHOOTING (PUMP)

Practically all breakdowns can be prevented by proper handling and maintenance inspections, but in the event of a breakdown, please take a remedial action following the diagnosis based on the Troubleshooting (Table 11) information shown below. If the problem cannot be remedied, please leave the unit just as it is and consult our company's business office or service plant.

TABLE 11: PUMP TROUBLESHOOTING		
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 wear plate.	Adjust clearance by adding shims or replace impeller. Min. .010" -Max. .020
	Water leaking out weep hole between pump and engine?	Check condition of mechanical seal and gaskets, between pump end and engine housing.
Suction lift or dis-charge head too high.	Check hose/pipe installation.	
Pump takes in water, little or no discharge.	Engine speed too low?	Increase throttle speed
	Suction strainer partially plugged?	Clean strainer
	Impeller/Wear Plate worn?	Adjust clearance by adding shims or replace impeller/wear plate.
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 hose 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 wear plate binding?	Adjust clearance by removing shim from behind impeller.
	Defective engine?	See Mitsubishi Engine Owners Manual.

Engine Troubleshooting; refer to engine manufacturer's manual

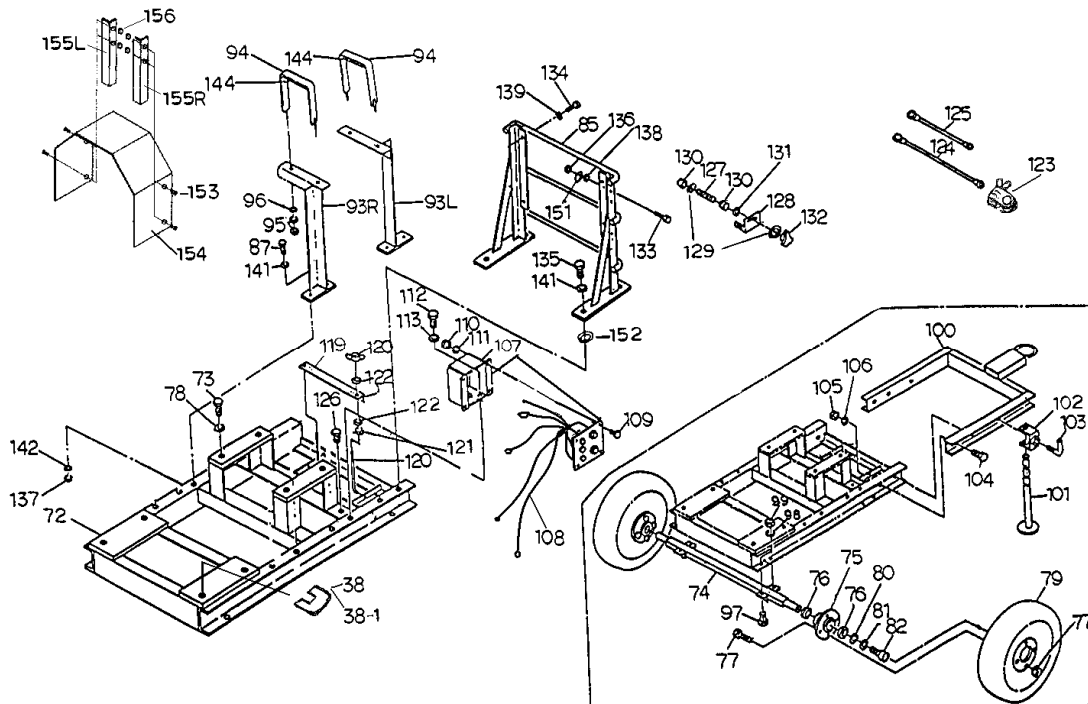
TRASH PUMP ASSEMBLY



SPARE PARTS (PUMP)

NO.	PART NO.	PART NAME	QTY.
2	2601-000010-0001	CASING 1	
3	2620-000023-0001	CASING COVER	1
4	4601-000090-0001	DISCHARGE FLANGE	1
5	4601-000160-0001	SUCTION FLANGE	1
6	2608-000170-0001	CLEANOUT COVER	1
7	2601-000210-0001	DRAIN COVER	1
8	2601-000800	SUCTION CASE	1
9	2602-000032	IMPELLER	1
10	2620-000130	VOLUTE CASING	1
11	4607-000700	WEAR PLATE	1
12	4607-000750	MECHANICAL SEAL HOUSING	1
13	2632-221010	SHAFT, D-F2L511W	1
14%	080133-4545	MECHANICAL SEAL	1
15%	081138-4576	MECHANICAL SEAL SLEEVE	1
16%	086245-6209	OIL SEAL	1
17	067002-6209	BALL BEARING	1
18%	048360-4300	O-RING (CASING DRAIN COVER)	2
19%	048035-0380	O-RING (MECHANICAL SEAL SLEEVE)	1
20%	048057-1400	O-RING (VOLUTE CASING)	1
21%	048220-1000	O-RING (MECHANICAL SEAL HOUSING)	1
22	048035-0300	O-RING (DRAIN CAP)	1
23	1601-330360	DISCHARGE FLANGE PACKING	1
24	1601-350350	CHECK VALVE	1
25	074132-0503	FILL CAP PACKING	1
26	1601-330380	DRAIN COVER B PACKING	1
27	063121-1202-0002	FILL CAP	1
28	063121-1100	ASSY DRAIN CAP	1
29	085285-6439	ADJUST LINER, SHIM	1-3
30	4607-201240-0011	IMPELLER WASHER	1
31	0511081054	KEY	1
32	2601-000190-0001	CLEANOUT COVER SET	4
33	2601-000220-0001	HANDLE DRAIN KNOB	2
34	1247-100250-0001	CLEANOUT COVER HANDLE	2
35	2601-200270-0001	HINGE BOLT	4
36	2601-200280-0001	HINGE PIN	4
37	064140-0430	SPLIT PIN	4
38	085283-0000	WASHER	4
38-1	085285-0000	WASHER	4
39	2601-200260-0001	DRAIN COVER SET HINGE	1
40	2601-200300-0001	HINGE SET PIN	1
41	046272-1915	E-RING, SNAP	2
42	040145-0200	WASHER	2
43	064230-0528	SPLIT PIN	2
44	040145-0160	WASHER	2
45	040145-0120	WASHER	2
46	014105-0825	SCREW (DRAIN COVER HANDLE)	4
47	045125-0080	WASHER, LOCK	4
48	010509-0820	BOLT (MECHANICAL SEAL HOUSING)	4
49	045129-0080	WASHER, LOCK	4
50	010509-1225	BOLT, IMPELLER	1
51	045129-0120	WASHER, LOCK	1
52	010505-1235	BOLT, SHAFT	6
54	010505-1645	BOLT, CASING	14
55	045125-0160	WASHER, LOCK	14
56	010705-1030	BOLT, CASING COVER	6
57	045125-0100	WASHER, LOCK	6
58	010505-2030-0001	BOLT (OIL CAP)	3
59	4607-287110	OIL CAP WASHER	3
60	010509-1030	BOLT (SUCTION CASE)	2
61	045129-0100	WASHER, LOCK	2
62	013119-1020	CAP SCREW (WEAR PLATE)	3
63	015116-1035	STUDIO BOLT (VOLUTE CASING)	2
64	015115-1230	STUD BOLT (DRAIN COVER B)	2
65	045822-0100	SEAL WASHER	2
66	045125-0100	WASHER, LOCK	2
67	020445-0100	NUT VOLUTE CASING	2
68	074221-1150	STRAINER	1
70	KITMQ62	KIT, SEAL AND O-RINGS 1 INCLUDES ITEMS W/%	

SPARE PARTS (TRAILER)



NO.	PART NO.	PART NAME	QTY.	NO.	PART NO.	PART NAME	QTY.
72	2632-214010-0005	BASE	1	122	045125-0060	SPRING WASHER	2
73	010505-1230	BOLT	4	123	096903-3000	TERMINAL SET	1set
74	2629-219040-0005	AXLE WITH TRAY	1	124	097209-9900	CORD(+)	1
(74-1)	(2629-219040)	(AXLE TRAY)		125	097209-9300	CORD(-)	1
75	2620-219101-0005	WHEEL	2	126	010505-0810	BOLT	1
76	067006-6206	BALL BEARING	4	127	017116-0630	THROTTLE BOLT	1
77	2629-209170	BOLT SET	8	128	2632-219250-0005	CONTROL PANEL	1
78	045125-0120	SPRING WASHER	4	129	040145-0060	WASHER	3
79	098500-1061	TIRE	2	130	020445-0060	U-NUT	2
80	2629-209160	WASHER	4	131	020545-0060	NUT	1
81	045125-0180	SPRING WASHER	2	132	2629-992910	KNOB NUT	1
82	013115-1825	CAP SCREW	2	133	010505-0816	BOLT	2
85	2632-214210-0005	RADIATOR BASE	1	134	010505-0816	BOLT	4
87	010505-1025	BOLT	4	135	010505-1025	BOLT	4
93R	2632-214101-0005	FUEL TANK BASE	1	136	020545-0080	NUT	2
93L	2632-214111-0005	FUEL TANK BASE	1	137	020545-0100	NUT	4
94	2632-214130-0005	FUEL TANK BAND	2	138	045125-0080	SPRING WASHER	2
95	020545-0080	NUT	8	139	045125-0080	SPRING WASHER	4
96	045125-0080	SPRING WASHER	4	141	045125-0100	SPRING WASHER	8
97	010505-1225	BOLT	4	142	045125-0100	SPRING WASHER	4
98	045125-0120	SPRING WASHER	4	144	2634-434270	TANK BAND PACKING	2
99	020545-0120	NUT	4	145	010505-1655	BOLT (SUCTION COVER)	4
100	2629-219050-0005	DRAWING BAR	1	146	074111-0150	HOSE COUPLING	2
101	2629-219070-0005	STAND	1	147	074124-0150	HOSE JOINT	2
102	2629-219080-0005	STAND HOLDER	1	148	074132-1501	HOSE COUPLING PACKING	2
103	2611-209090-0005	STAND HANDLE	1	149	093225-0160	WIRE HOSE BAND	1
104	010505-1830	BOLT	4	150	093225-6000	WIRE HOSE BAND	2
105	020545-0180	NUT	4	151	040145-0080	WASHER	4
106	045125-0180	SPRING WASHER	4	152	040145-0100	WASHER	4
107	2629-219240-0005	CONTROL BOX	1	153	018105-0820	BOLT SET WITH SPRING WASHER	4
108	2632-996800	HARNESS (ENGINE)	1	154	2632-214490-0005	WATERPROOF COVER WITH DITCH RUBBER	1
109	010505-0610	BOLT	4	(154-1)	(1471-338510)	(DITCH RUBBER)	(2)
110	020545-0060	NUT	4	155R	2632-204480-0005	WATERPROOF COVER STAY	1
111	045125-0060	SPRING WASHER	4	155L	2632-204470-0005	WATERPROOF COVER STAY	1
112	010505-0810	BOLT	2	156	020915-0080	FLANGE NUT	1
113	045125-0080	SPRING WASHER	2				
119	095021-1240-0005	BATTERY SET PLATE	1				
120	095021-1240A	BOLT WITH NUT	2				
121	020545-0060	NUT	2				

TERMS & CONDITIONS OF SALE - PARTS

PAYMENT TERMS

Terms of payment for parts are net 30 days.

FREIGHT POLICY

All parts orders will be shipped collect or prepaid with the charges added to the invoice. All shipments are F.O.B. point of origin. Aussie Pumps' responsibility ceases when a signed manifest has been obtained from the carrier, and any claim for shortage or damage must be settled between the consignee and the carrier.

MINIMUM ORDER

The minimum charge for orders from Aussie Pumps is \$50.00 net. Customers will be asked for instructions regarding handling of orders not meeting this requirement.

RETURNED GOODS POLICY

Return shipments will be accepted and credit will be allowed, subject to the following provisions:

1. A Returned Goods Authorization must be approved by Aussie Pumps prior to shipment.
2. To obtain a Return Goods Authorization, a list must be provided to Aussie Pumps Parts Sales that defines item numbers, quantities, and descriptions of the items to be returned.
 - a. The parts numbers and descriptions must match the invoice.
 - b. The list must state the reason for the return.
 - c. The list must reference the sales order (s) or invoice (s) under which the items were originally purchased.
 - d. The list must include the name and phone number of the person requesting the RGA.
3. A copy of the Return Goods Authorization must accompany the return shipment.
4. Freight is at the sender's expense. All parts must be returned freight prepaid to Aussie Pumps' designated receiving point.
5. Parts must be in new and resalable

condition, in the original Aussie Pumps package (if any), and with Aussie Pumps part numbers clearly marked.

6. The following items are not returnable:
 - a. Obsolete parts.
 - b. Any parts with a limited shelf life (such as gaskets, seals, "O" rings, and other rubber parts) that were purchased more than six months prior to the return date.
 - c. Parts that are used, soiled, damaged, or not in a resalable condition and not more than 12 months old.
7. The sender will be notified of any material received that is not acceptable.
8. Such material will be held for five working days from notification, pending instructions. If a reply is not received within five days, the material will be returned to the sender at his expense.
9. Credit on returned parts will be issued at dealer net price at time of the original purchase, less a 15% restocking charge.

PRICING AND REBATES

Prices are subject to change without prior notice. Price changes are effective on a specific date and all orders received on or after that date will be billed at the revised price. Rebates for price declines and added charges for price increases will not be made for stock on hand at the time of any price change. Aussie Pumps reserves the right to quote and sell direct to Government agencies, and to Original Equipment Manufacturer accounts who use our products as integral parts of their own products.

LIMITATIONS OF SELLER'S LIABILITY

Aussie Pumps shall not be liable hereunder for damages in excess of the purchase price of the item with respect to which damages are claimed, and in no event shall Aussie Pumps be liable for loss of profit or good will or for any other special, consequential or incident

tal damages.

LIMITATION OF WARRANTIES

No warranties, express or implied, are made in connection with the sale of parts or trade accessories nor as to any engine not manufactured by Aussie Pumps. Such warranties made in connection with the sale of new, complete units are made exclusively by a statement of warranty packaged with such units, and Aussie Pumps neither assumes nor authorizes any person to assume for it any other obligation or liability whatever in connection with the sale of its products. Apart from such written statement of warranty, there are no warranties, express, implied or statutory, which extend beyond the description of the products on the face hereof.

Effective: February 22, 2006

Reliable Products ...
Reliable People



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