

OPERATION AND PARTS MANUAL



MODEL QP3TY TRASH PUMP (Yanmar L70EE-D Diesel Engine)

Revision #2 (11/15/10)

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publication, visit our website at:
www.multiquip.com



THIS MANUAL MUST ACCOMPANY THE EQUIPMENT AT ALL TIMES.



WARNING



CALIFORNIA — Proposition 65 Warning

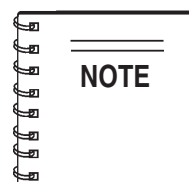
Diesel engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects and other reproductive harm.

QP3TY Trash Pump

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Yanmar L70EE-D Engine

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Specification and part number are subject to change without notice.

PARTS ORDERING PROCEDURES

Ordering parts has never been easier! Choose from three easy options:

Effective:
January 1st, 2006



Order via Internet (Dealers Only):

Order parts on-line using Multiquip's SmartEquip website!

- View Parts Diagrams
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If you have an MQ Account, to obtain a Username and Password, E-mail us at: parts@multiquip.com.

To obtain an MQ Account, contact your District Sales Manager for more information.

Goto www.multiquip.com and click on **Order Parts** to log in and save!

Use the **internet** and qualify for a **5% Discount** on *Standard orders* for all orders which include complete part numbers.*

Note: Discounts Are Subject To Change



Order via Fax (Dealers Only):

All customers are welcome to order parts via Fax.

Domestic (US) Customers dial:
1-800-6-PARTS-7 (800-672-7877)

Fax your order in and qualify for a **2% Discount** on *Standard orders* for all orders which include complete part numbers.*

Note: Discounts Are Subject To Change



Order via Phone: Domestic (US) Dealers Call:
1-800-427-1244

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Contact your local Multiquip Dealer for parts or call 800-427-1244 for help in locating a dealer near you.



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When ordering parts, please supply:

- | | |
|---|--|
| <input type="checkbox"/> Dealer Account Number | <input type="checkbox"/> Specify Preferred Method of Shipment: |
| <input type="checkbox"/> Dealer Name and Address | <input checked="" type="checkbox"/> UPS/Fed Ex <input checked="" type="checkbox"/> DHL |
| <input type="checkbox"/> Shipping Address (if different than billing address) | <input type="checkbox"/> Priority One <input checked="" type="checkbox"/> Truck |
| <input type="checkbox"/> Return Fax Number | <input type="checkbox"/> Ground |
| <input type="checkbox"/> Applicable Model Number | <input type="checkbox"/> Next Day |
| <input type="checkbox"/> Quantity, Part Number and Description of Each Part | <input type="checkbox"/> Second/Third Day |

NOTICE

All orders are treated as *Standard Orders* and will ship the same day if received prior to 3PM PST.

WE ACCEPT ALL MAJOR CREDIT CARDS!



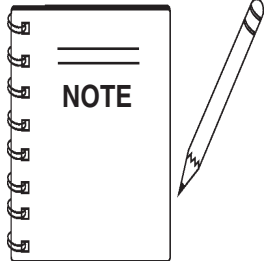
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QP3TY — SAFETY MESSAGE ALERT SYMBOLS

FOR YOUR SAFETY AND THE 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 Owner's Manual has been developed to provide complete instructions for the safe and efficient operation of the Multiquip **Model QP3TY Trash Pump**. Refer to the engine manufacturers instructions for data relative to its safe operation. **Before using this pump, ensure that the operating individual has read and understands all instructions in this manual.**

SAFETY MESSAGE ALERT SYMBOLS

The three (3) 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.

Potential hazards associated with the QP3TY Trash Pump operation will be referenced with Hazard Symbols which appear throughout this manual, and will be referenced in conjunction with Safety Message Alert Symbols.

HAZARD SYMBOLS

Lethal Exhaust Gases



Engine 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.

Explosive Fuel



GASOLINE 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. **NEVER**

Burn Hazards



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

Rotating Parts



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

QP3TY — SAFETY MESSAGE ALERT SYMBOLS



Accidental Starting



OFF

ALWAYS place the engine ON/OFF switch in the **OFF** position when the pump is not in use.



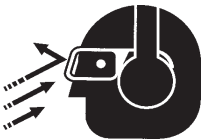
Respiratory Hazard



ALWAYS wear approved respiratory protection.



Sight and Hearing hazard

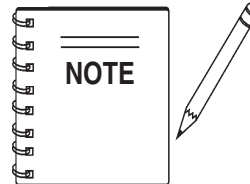


ALWAYS wear approved eye and hearing protection.



Equipment Damage Messages

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



This pump, other property, or the surrounding environment could be damaged if you do not follow instructions.

RULES FOR SAFE OPERATION

DANGER

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.

The following safety guidelines should always be used when operating the **trash pump**:

GENERAL SAFETY

- **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 taking medicine.



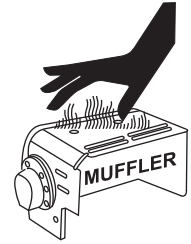
- **NEVER** operate this equipment under the influence of drugs or alcohol.



- Whenever necessary, replace nameplate, operation and safety decals when they become difficult read.
- **ALWAYS** check the machine for loosened threads or bolts before starting.
- **ALWAYS** wear proper respiratory (mask) hearing and eye protection equipment when operating the pump.

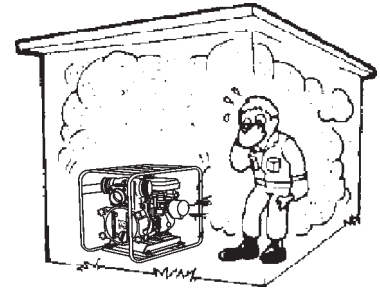


- **NEVER** touch the hot exhaust manifold, muffler or cylinder. Allow these parts to cool before servicing engine or pump.



- **High Temperatures** – Allow the engine to cool before adding fuel or performing service and maintenance functions. Contact with *hot* components can cause serious burns.

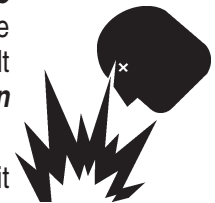
- The engine of this pump requires an adequate free flow of cooling air. **NEVER!** operate the pump in any enclosed or narrow area where free flow of the air is restricted. If the air flow is restricted it will cause serious damage to the pump or engine and may cause injury to people and property. Remember the pump's 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 machine. Fire or explosion could result from fuel vapors, or if fuel is spilled on a hot engine.

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



- Topping-off to filler port is dangerous, as it tends to spill fuel.

- Refer to the **Engine Owner's Manual** for engine technical questions or information.

- **NEVER** use accessories or attachments, which are not recommended by Multiquip 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.

RULES FOR SAFE OPERATION

- **NEVER** Run engine without air cleaner. Severe engine damage may occur.
- **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** leave the pump unattended, turn off engine when unattended.
- Unauthorized equipment modifications will void all warranties.
- **NEVER** pump volatile, explosive, flammable or low flash point fluids. These fluids could ignite or explode.
- **NEVER** operate the pump in an **explosive** atmosphere.
- Before starting the pump, check that the clean-out cover is securely fasten.
- **ALWAYS** ensure pump is on level ground before use.
- Become familiar with the components of the pump before operating.
- **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.
- **NEVER** open the pump housing during operation or start the pump with the clean-out cover removed. The rotating impeller inside the pump can cut or sever objects caught in it.
- **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.

- **High Temperatures** – Always stop engine and allow the engine to cool before adding fuel, oil or performing service and maintenance functions. Contact with *hot* components can cause serious burns.
- **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.

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 machinery in proper running condition.
- Fix damage to the machine immediately and always replace broken parts, or missing decals.
- 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 an emergency.



QP3TY — SPECIFICATIONS/DIMENSIONS (PUMP)

Table 1. Specifications (Pump)		
Pump	Model	QP- 3TY
	Type	Trash Pump
	Suction & Discharge Size	3.00 in. (76 mm.)
	Maximum Pumping Capacity	383 gallons/minute (1,450 liters/minute)
	Max. Solids Diameter	1.50 in. (38 mm.)
	Max. Lift	25 ft. (7.62 meters)
	Max. Head	90 ft. (27.0 meters)
Dimension (L x W x H)	27.8 x 20.0 X 25.0 in. (705 X 510 X 635 mm.)	
Dry Net Weight	159 lbs. (72 Kg.)	

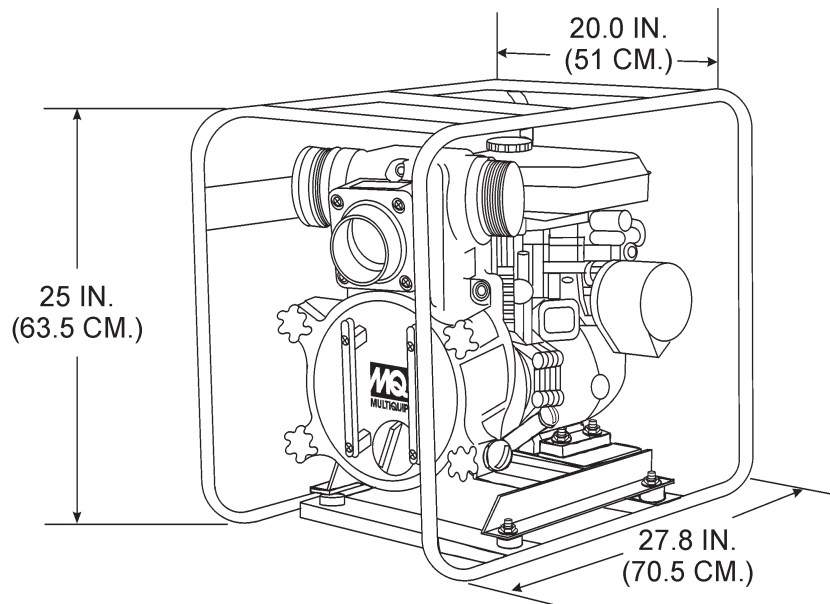
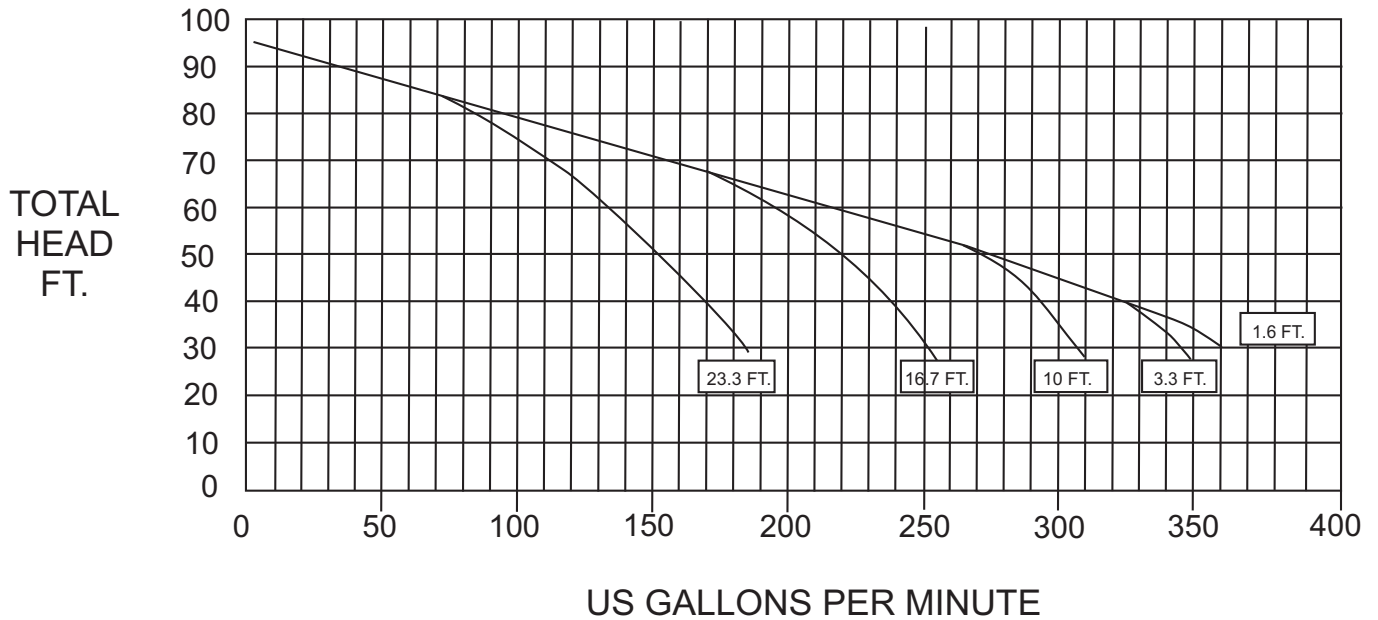


Figure 1. QP3TY Dimensions

QP3TY — SPECIFICATIONS (ENGINE)

Table 2. Engine Specifications (YANMAR)

Engine Make	YANMAR
Engine Model	L-70EE-D
Engine Type	Air-cooled 4-cycle Diesel Engine
Cylinder Bore X Stroke	3.07 x 2.44 in (78 x 62 mm)
Displacement	10.01 fl oz (296 cc)
Maximum Output	6.7 HP @3,600 RPM
Fuel Tank Capacity	3.5 quarts (3.31 liters)
Oil Capacity	1.16 quarts (1.10 liters)
Starting Method	Recoil
Dry Net Weight	72.75 lbs. (33 kg)
Dimensions (L x W x H)	15.11 x 16.57 x 17.71 in (384 x 421 x 450 mm)



APPLICATION

The **QP3TY Trash Pump** is designed to be used for dewatering applications. Both the suction and discharge ports on the QP3TY trash pump use a 3-inch diameter opening, which allows the pump to pump at a rate of approximately 383 gallons/minute (gpm) or 1,450 liters/minute (lpm).

Trash or self-priming pumps are designed to purge air from the suction line and create a partial vacuum in the pump body. The reduced atmospheric pressure inside the pump allows water to flow through the suction line and into the pump body. The centrifugal force created by the rotating impeller pressurizes the water and expels it from the pump.

Engine

This trash pump is powered by an 6.7 horsepower, air-cooled, 4-stroke, **YANMAR L70EE-D** diesel engine.

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 generally handle solids up to 1/2 the size of the discharge opening making them less likely to clog. 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 "**without tools**" and easily cleaned when clogged.

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 25 feet rather than the 18 feet at sea level. Table 3 shows suction lift at various elevations.

Table 3. 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)
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 4 shows percentage drops in performance as elevation increases.

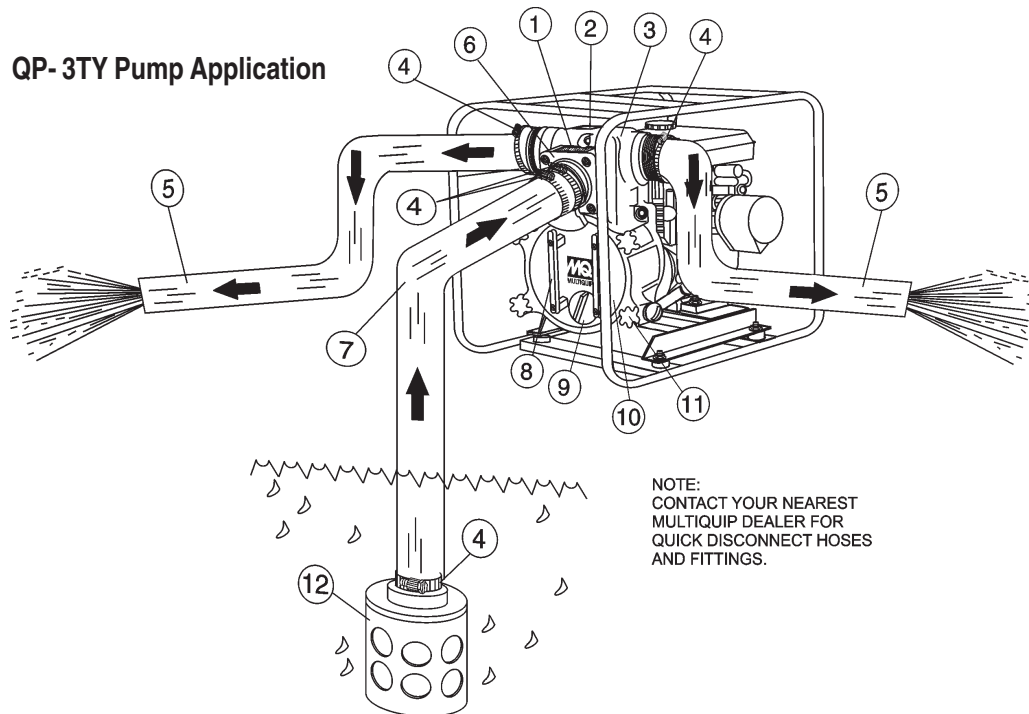
Table 4. Performance Loss at Various Elevations

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%

QP3TY — PUMP COMPONENTS

Figure 2 shows a typical application using the QP3TY 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 1.5 inch (30 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.

Figure 2. QP- 3TY Pump Application



NOTE:
CONTACT YOUR NEAREST
MULTIQUIP DEALER FOR
QUICK DISCONNECT HOSES
AND FITTINGS.

1. **Pump** – The model QP3TY is a 3-inch trash pump used in general dewatering applications. Typical dewatering applications consist of manholes, septic tanks, fast and slow seepage ditch water, silt water, mud water and muck water.
2. **Fill Cap** – Prior to operation, the pump casing should be filled with water. Remove this cap to add water to the pump. After the initial prime, a sufficient amount of water will be retained in the casing so that the operator will not need to re-prime later.
If the casing is dry or has insufficient water, the pump will have difficulty in priming which could lead to premature mechanical seal wear thus causing damage to the pump.
3. **Discharge Port** – Connect a 3-inch discharge hose to either port (one of two ports).
4. **Worm Clamp** – Used to secure the hose to the inlet and outlet ports on the pump. Use two clamps to secure the hose on the inlet side of the pump.
5. **Discharge Hose** – Connect this flexible rubber hose to the discharge port on the pump. Make sure that the hose lays flat and is not kinked. Use only recommended type discharge hose. Contact Multiquip Parts Department for ordering information.
6. **Suction Port** – Connect a 3-inch inlet hose to this port. Use two worm clamps to secure the hose.
7. **Suction Hose** – Connect this flexible rubber hose to the suction portion the pump. Make sure that the hose lays flat and is not kinked. Use only recommended type suction hose. Contact Multiquip Parts Department for ordering information.
8. **Clean-out Cover Handles** – To gain access to the pump's clean-out area, grip both handles, then pull to remove cover. Make sure both locking knobs have been released before attempting to remove clean-out cover.
9. **Drain Plug** – Remove this plug to drain water from the pump.
10. **Clean-out Cover** – Remove cover to gain access to the clean-out area.
11. **Locking Knobs** – Turn both knobs clockwise to secure clean-out cover, turn counterclockwise to release cover.
12. **Strainer** – Always attach a strainer to the 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.



DANGER

Adding fuel to the tank should be done only when the engine is stopped and has had an opportunity to cool down. In the event of a fuel spill, **DO NOT** attempt to start the engine until the fuel residue has been completely wiped up, and the area surrounding the engine is dry. If pump is placed in a truck bed with a plastic liner, **REMOVE** pump from truck bed and place on ground (Figure 3) to refuel. The possibility of **fire** or **explosion** exists, due to static electricity.

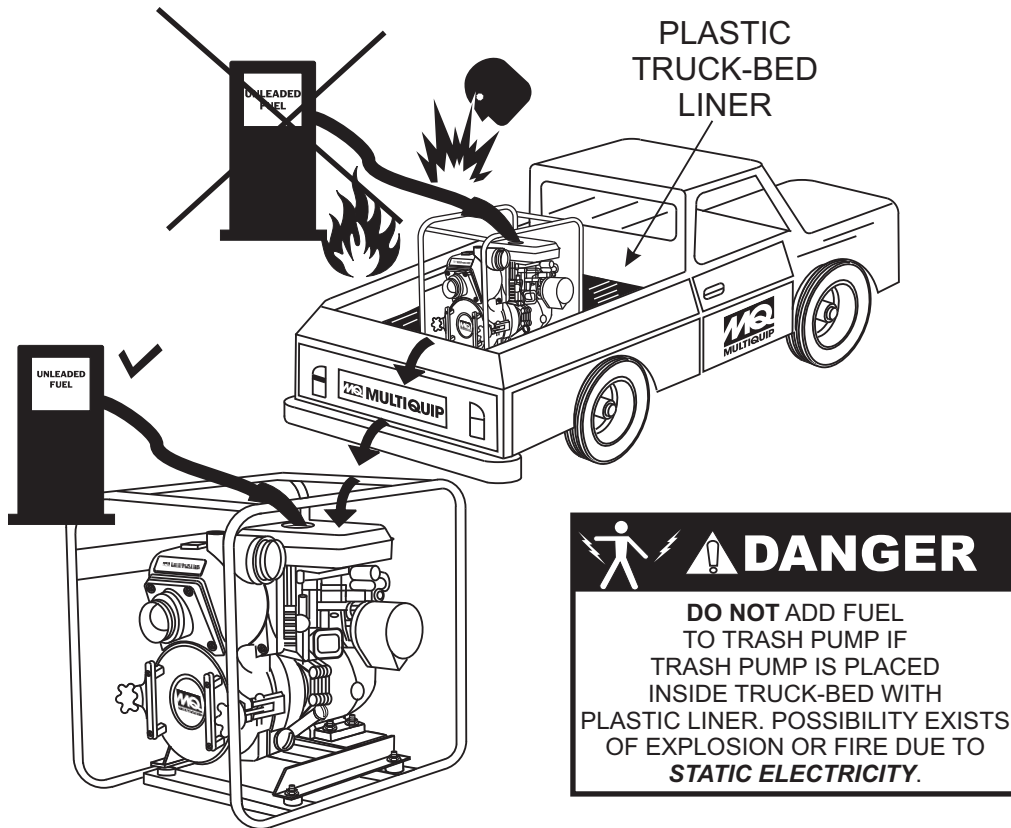


Figure 3. Pump Refueling

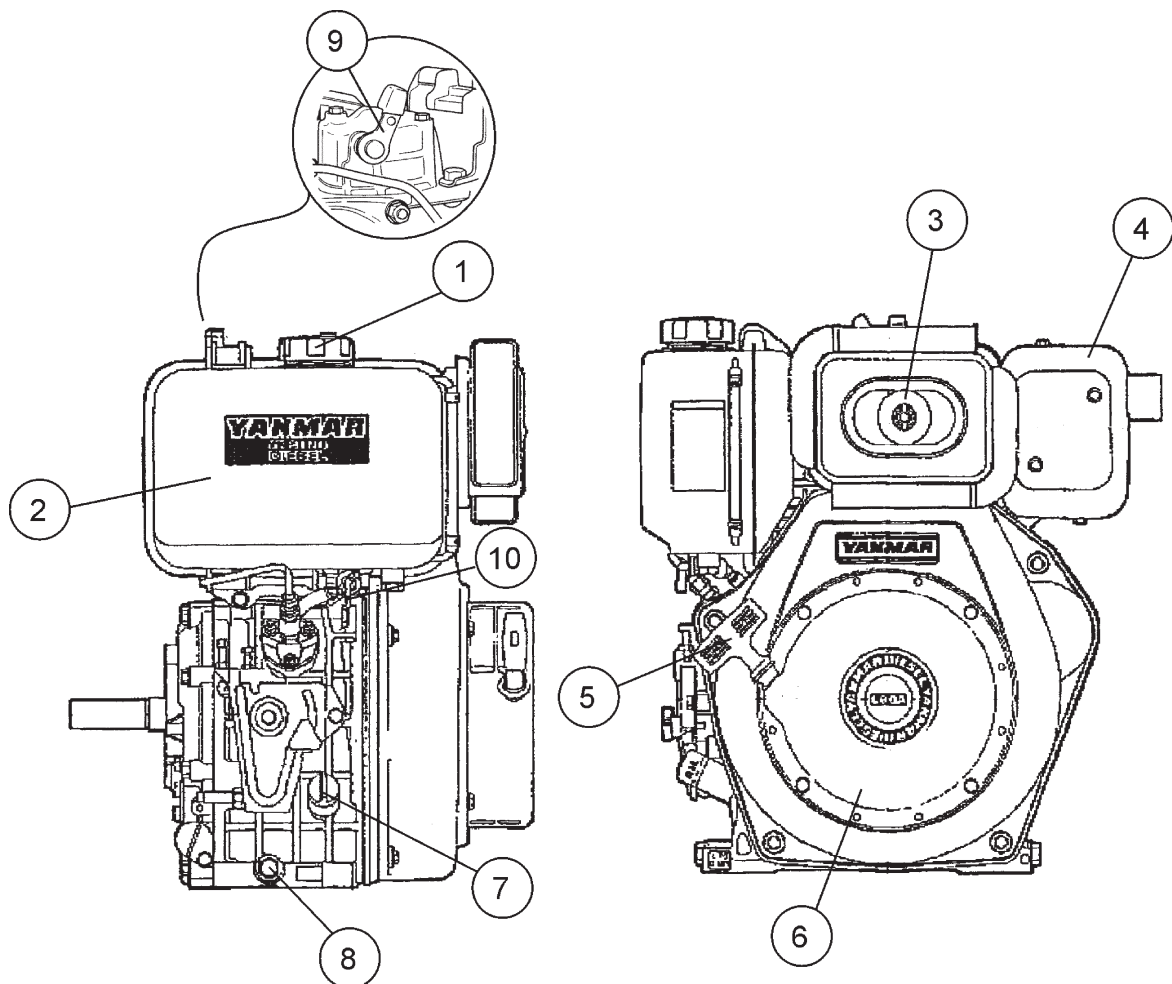


Figure 4. Engine Controls and Components

ENGINE COMPONENTS

Figure 4 illustrates the location of the major components of the engine. Each component is described below:

1. **Fuel Filler Cap** – Remove this cap to add diesel fuel to the fuel tank. Make sure cap is tightened securely. **DO NOT** overfill.
2. **Fuel Tank** – Capacity is 3.5 quarts (3.3 liters) of diesel fuel.
3. **Air Cleaner** – Prevents dirt and other debris from entering the fuel system. Remove wing-nut on top of air filter cannister to gain access to filter element.
4. **Muffler** – Used to reduce noise and emissions.
5. **Recoil Starting Handle (pull rope)** – Used to start engine.
6. **Recoil Starter** – Manual-starting method. Pull the starter grip until resistance is felt, then pull briskly and smoothly.
7. **Oil Filler Cap / Dipstick** – Remove this cap to add oil to the engine crankcase. Read dipstick to determine if oil level is low. **DO NOT** overfill.
8. **Oil Drain Plug** – Unscrew plug to drain oil from engine crankcase. Dispose of oil in a safe manner.
9. **Decompression Lever** – Press down before starting engine. To prevent damage to engine, **DO NOT** use for any other purpose.
10. **Fuel Cock** – Controls the flow of diesel fuel to the carburetor. Must be in the ON position when starting and running the engine.

QP3TY — PRE-INSPECTION (ENGINE)

CAUTION



NEVER operate the pump in a confined area or enclosed area structure that does not provide ample **free flow of air**.

ALWAYS wear approved eye and hearing protection before operating the pump.



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 (Figure 5) and wipe clean.

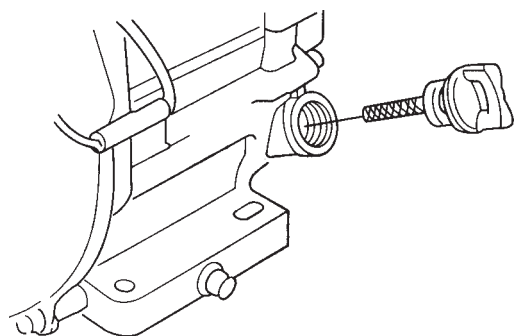


Figure 5. Engine Oil Dipstick (Removal)

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 (Figure 6), fill to the edge of the oil filler hole with the recommended oil type (Table 5). Maximum oil capacity is 1.16 quarts (1.1 liters)

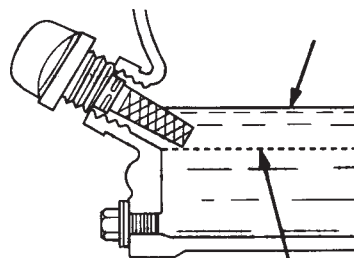


Figure 6. Engine Oil Dipstick (Oil Level)

Table 5. 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

Explosive Fuel



DANGER

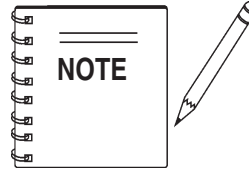
Motor fuels are highly flammable and can be dangerous if mishandled. **DO NOT** smoke while refueling. **DO NOT** attempt to refuel the pump if the engine is **hot!** or **running**.

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!**

Before Starting

1. Read safety instructions at the 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 2) and fill pump casing with water. If the pump casing is not filled with water before starting, it will not begin pumping.



Suction and discharge hoses are available from Multiquip. Contact your nearest dealer for more information.

CAUTION

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

WARNING

DO NOT open **fill cap** if pump is **hot!** Water inside may be under pressure.

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

Hoses and Clamps

1. Check that all hoses are **securely** attached to the pump. Make certain suction hose (Figure 2) 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 (suction) 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 2) 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. 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.
6. Make sure the **suction strainer** (Figure 2) 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.

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.

CAUTION

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.

CAUTION

This pump uses a water-cooled **mechanical seal** to prevent water from seeping into the engine. The passage of water through the pump casing lubricates the seal and prevents it from overheating. **NEVER!** operate the pump without water in the casing as this will cause damage to the mechanical seal.

QP3TY — INITIAL START-UP (ENGINE)

CAUTION



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

This section is intended to assist the operator with the **initial start-up** of the trash pump. It is extremely important that this section be read carefully before attempting to use the pump in the field.

Starting the Engine (YANMAR engine)

2. Open the fuel cock (Figure 7).

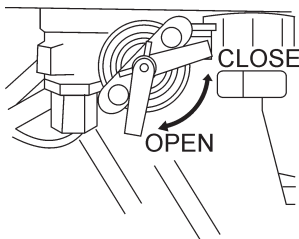


Figure 7. Open Fuel Cock

3. Move the engine speed lever to the **START** position (Figure 8).

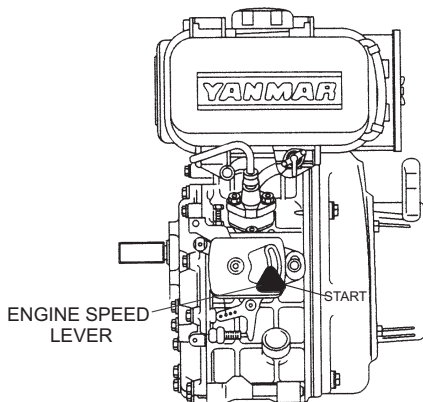


Figure 8. Engine Speed Lever (START position)

4. Grasp the starter grip (Figure 9) and slowly pull it out until you feel the strongest resistance then return the starter grip to the initial position.

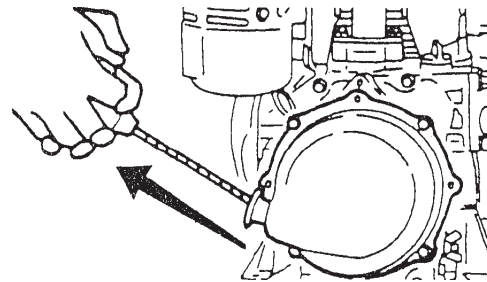


Figure 9. Starter Grip

CAUTION

Do not allow the starter grip to snap back against the engine. Return it gently to prevent damage to the starter.

5. Push down decompression lever (Figure 10) and release.

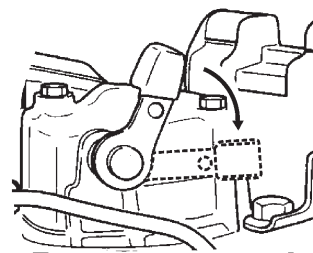


Figure 10. Decompression Lever

6. Pull the starter grip again, hard and fast, pulling it all the way out to start engine.
7. If the engine does not start, repeat steps 4 to 6.

CAUTION

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

Stopping The Engine

Normal Shutdown

1. Move the engine speed lever to the low speed and run the engine for about three minutes with no load.
2. After the engine cools, move the engine speed lever to the **STOP** position (Figure 11).

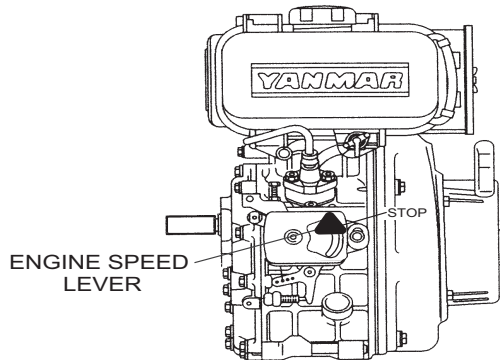


Figure 11. Engine Speed Lever (STOP Position)

3. Close the fuel cock (Figure 12).

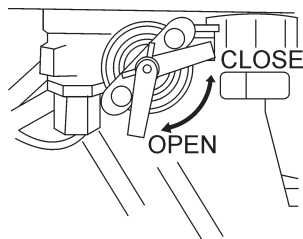


Figure 12. Close Fuel Cock

4. Slowly pull the starter grip (Figure 9) until strong resistance is felt and leave it in this position. This prevents rust from forming while the engine is not in use.

CAUTION

When stopping the engine, reduce the load slowly. Do not stop engine suddenly since it may cause the temperature to rise abnormally.

Emergency Shutdown

1. To stop engine immediately, quickly place the engine speed lever to the STOP position.

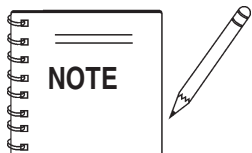
Pump Vacuum Test

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 (Figure 2), 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 13, 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 (Figure 13) 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 reset 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.

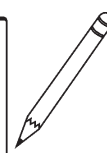
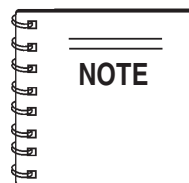


25 in. Hg. (inches of mercury) translates into 25 feet of lift at **sea level**.

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.
6. To test the **flapper valve**, shut down 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.

Adjusting Impeller Clearance

1. If it is necessary to replace impeller or volute, be sure clearance between impeller and volute is adjusted correctly.
2. The impeller should be as close to the volute as possible without rubbing against it. Clearance is adjusted by adding or removing **shims** from behind the impeller.
3. Check clearance between impeller and insert by slowly pulling starter rope to turn impeller. Remove spark plug to make it easier to turn impeller.



It is important not to remove too many shims or the clearance between the impeller and volute will become **too wide** and pump performance will be reduced. Remember as the impeller wear

down, additional shims may be required to maintain the clearance between the impeller and insert.

4. Check the impeller **every six months** for wear, and for clearance between the impeller face and the volute. Also check the shaft seal for wear, as well as the shaft sleeve.

Pump Cleaning

After pumping water containing large amounts of dirt and debris, perform the following:

1. Remove the drain plug from the pump housing (Figure 2) and drain any water left in the pump.
2. Loosen the two locking hand knobs (turn counterclockwise) and remove **clean-out cover**.
3. Clean and remove dirt, debris from pump casing. Inspect impeller and volute for wear. Replace any damaged or worn parts.

CAUTION

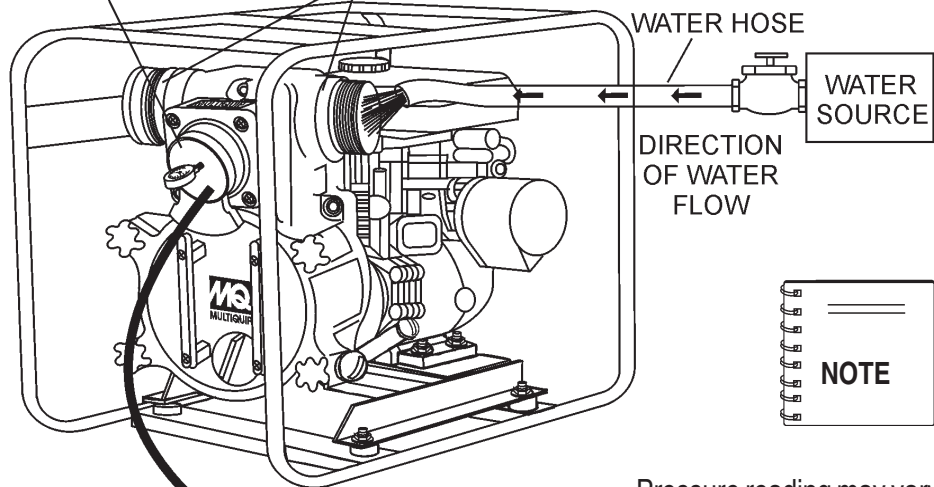
The impeller may develop **sharp edges**. Use extreme care when cleaning around the impeller to prevent being cut.

CAUTION

DO NOT RUN PUMP
WITHOUT WATER.

PLACE VACUUM TESTER
OVER PUMP SUCTION PORT

DISCHARGE
PORT



Pressure reading may vary depending on altitude. See Tables 3 and 4 on page 12.

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

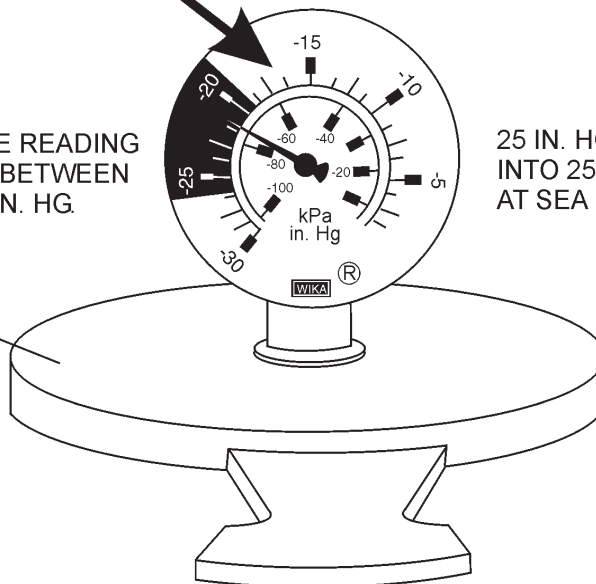


Figure 13. Pump Vacuum Tester

QP3TY — MAINTENANCE (ENGINE)

Engine Maintenance

Perform engine maintenance procedures as referenced by Table 6 below:

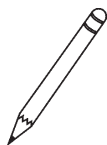
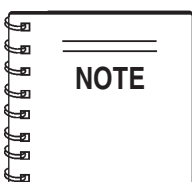
Table 6. Engine Maintenance Schedule

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 & Bolts	Re-tighten If Necessary	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 YANMAR shop manual for service procedures.

(3) For commercial use, log hours of operation to determine proper maintenance intervals.



Reference manufacturer engine manual for specific servicing instructions.

Maintenance

Perform the engine maintenance procedures as indicated below:

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. Check the spring box and bellows for oil leaks. Repair or replace as needed.

WEEKLY

- Remove the fuel filter cap and clean the inside of the fuel tank.
- Remove or clean the filter at the bottom of the tank.

ENGINE OIL

1. Drain the engine oil when the oil is **warm** as shown in Figure 14.
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 0.85 quarts (0.8 liters). **DO NOT** overfill.
4. Install drain bolt with sealing washer and tighten securely.

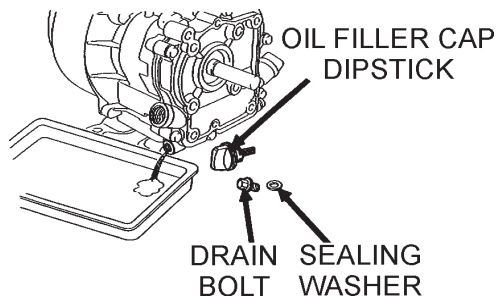


Figure 14. Engine Oil (Draining)

DANGER

DO NOT use gasoline as a cleaning solvent, because that would create a risk of fire or explosion.

ENGINE AIR CLEANER

1. Loosen the wing nut and detach the cover of the air cleaner shown in Figure 15.
2. Tap the element (Figure 15) several times on a hard surface to remove dirt, or blow compressed air [not exceeding 30 psi (207 kPa, 2.1 kgf/cm²)] through the element, side. **NEVER** wash the element with detergent because the element is oil-soaked type. Replace the element when the output decreases or bad exhaust color is noticed.

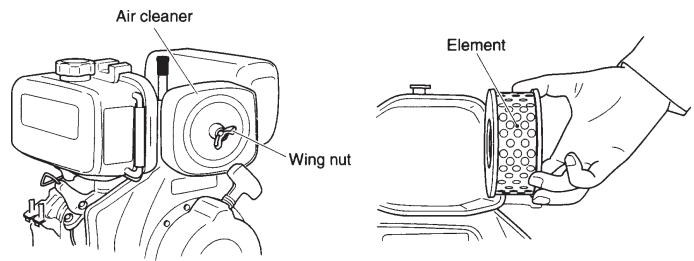


Figure 15. Engine Air Cleaner

QP3TY — PREPARATION FOR LONG -TERM STORAGE

Pump Storage

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

- Drain the fuel tank completely.
- Run the engine for about 3 minutes and then stop.
- Stop the engine. Drain the engine crankcase oil while the engine is still warm. Fill engine crankcase with fresh oil.
- Remove the rubber plug (Figure 16) on the rocker arm cover and add about 2 cc of lube oil. Reinstall rubber plug.

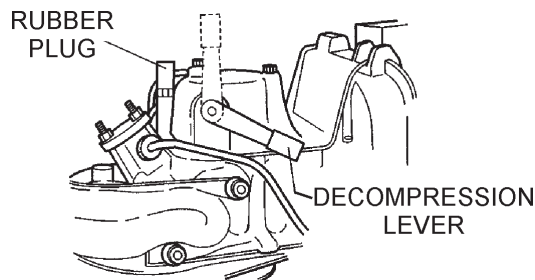


Figure 16. Decompression Lever

- Push the decompression lever down (non-decompression position, Figure 16) and hold it while you pull the recoil starter grip (Figure 17) 2 or 3 times. **DO NOT** start the engine.

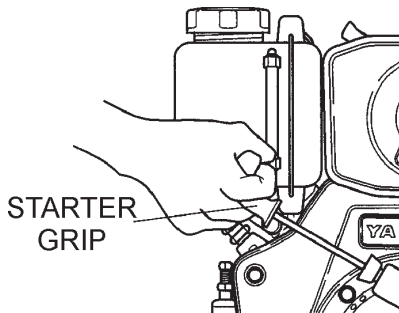


Figure 17. Recoil Starter Grip

- Pull the decompression lever up. Pull the recoil starter grip slowly. **STOP** when it feels tight. This closes the intake and exhaust valves (compression position), and helps prevent rust from forming.
- Wipe any oil or dirt that may have accumulated on the engine.
- Remove the drain plug from the pump and drain out any water left in the housing.
- Remove the pump cover and clean the inside of pump housing. Coat the 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.

QP3TY — TROUBLESHOOTING (ENGINE)

TABLE 7. ENGINE TROUBLESHOOTING

SYMPTOM	POSSIBLE PROBLEM	SOLUTION
Engine will not start or start is delayed, although engine can be turned over.	Speed control lever is in "STOP" position?	Set speed control lever to "START" position.
	No fuel reaching injection pump?	Add fuel. Check entire fuel system.
	Defective fuel pump?	Replace fuel pump.
	Fuel filter clogged?	Replace fuel filter and clean tank.
	Faulty fuel supply line?	Replace or repair fuel line.
	Compression too low?	Check piston, cylinder and valves. Adjust or repair per engine repair manual.
	Fuel injector not working correctly?	Repair or replace injector in accordance with engine repair manual.
	Oil pressure too low?	Check engine oil pressure.
	Low starting temperature limit exceeded	Comply with cold starting instructions and proper oil viscosity.
At low temperatures engine will not start.	Fuel separates has inadequate resistance to low temperatures?	Check whether clear (not turbid) fuel emerges from the fuel line (detach from injection pump). If the fuel is turbid or separated, warm up the engine or drain the complete fuel supply system. Refuel with winter grade diesel fuel.
	Engine oil too thick?	Refill engine crankcase with correct type of oil for winter environment.
Engine fires but stops soon as starter is switched off.	Fuel filter blocked?	Replace fuel filter.
	Fuel supply blocked?	Check the entire fuel system.
Engine stops by itself during normal operation.	Fuel tank empty?	Add fuel.
	Fuel filter blocked?	Replace fuel filter.
Low engine power, output and speed.	Fuel tank empty?	Fill with No.2 diesel fuel.
	Fuel filter clogged?	Replace fuel filter.
	Fuel tank venting is inadequate?	Ensure that tank is adequately vented.
	Speed control lever does not remain in selected position?	See engine manual for corrective action.
	Engine oil level too full?	Correct engine oil level?
Low engine power output and low speed, black exhaust smoke.	Air filter blocked?	Clean or replace air filter.
	Incorrect valve clearances?	Adjust valves per engine specification.
	Malfunction at injector?	See engine manual.

QP3TY — TROUBLESHOOTING (PUMP)

TABLE 8. 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 volute.	Adjust clearance by adding shims or replace impeller. Min. .006" - Max. .020"
	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.

QP3TY — EXPLANATION OF CODE IN REMARKS COLUMN

The following section explains the different symbols and remarks used in the Parts section of this manual. Use the help numbers found on the back page of the manual if there are any questions.

NOTICE

The contents and part numbers listed in the parts section are subject to change **without notice**. Multiquip does not guarantee the availability of the parts listed.

SAMPLE PARTS LIST

NO.	PART NO.	PART NAME	QTY.	REMARKS
1	12345	BOLT.....	1	INCLUDES ITEMS W/%
2%		WASHER, 1/4 IN.....		NOT SOLD SEPARATELY
2%	12347	WASHER, 3/8 IN....	1	MQ-45T ONLY
3	12348	HOSE		A/R ...MAKE LOCALLY
4	12349	BEARING	1	S/N 2345B AND ABOVE

NO. Column

Unique Symbols — All items with same unique symbol

(@, #, +, %, or >) in the number column belong to the same assembly or kit, which is indicated by a note in the “Remarks” column.

Duplicate Item Numbers — Duplicate numbers indicate multiple part numbers, which are in effect for the same general item, such as different size saw blade guards in use or a part that has been updated on newer versions of the same machine.

NOTICE

When ordering a part that has more than one item number listed, check the remarks column for help in determining the proper part to order.

PART NO. Column

Numbers Used — Part numbers can be indicated by a number, a blank entry, or TBD.

TBD (To Be Determined) is generally used to show a part that has not been assigned a formal part number at the time of publication.

A blank entry generally indicates that the item is not sold separately or is not sold by Multiquip. Other entries will be clarified in the “Remarks” Column.

QTY. Column

Numbers Used — Item quantity can be indicated by a number, a blank entry, or A/R.

A/R (As Required) is generally used for hoses or other parts that are sold in bulk and cut to length.

A blank entry generally indicates that the item is not sold separately. Other entries will be clarified in the “Remarks” Column.

REMARKS Column

Some of the most common notes found in the “Remarks” Column are listed below. Other additional notes needed to describe the item can also be shown.

Assembly/Kit — All items on the parts list with the same unique symbol will be included when this item is purchased.

Indicated by:

“INCLUDES ITEMS W/(unique symbol)”

Serial Number Break — Used to list an effective serial number range where a particular part is used.

Indicated by:

“S/N XXXXX AND BELOW”

“S/N XXXX AND ABOVE”

“S/N XXXX TO S/N XXX”

Specific Model Number Use — Indicates that the part is used only with the specific model number or model number variant listed. It can also be used to show a part is NOT used on a specific model or model number variant.

Indicated by:

“XXXXX ONLY”

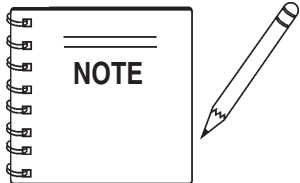
“NOT USED ON XXXX”

“Make/Obtain Locally” — Indicates that the part can be purchased at any hardware shop or made out of available items. Examples include battery cables, shims, and certain washers and nuts.

“Not Sold Separately” — Indicates that an item cannot be purchased as a separate item and is either part of an assembly/kit that can be purchased, or is not available for sale through Multiquip.

QP3TY TRASH PUMP 1 TO 3 UNITS W/YANMAR L48EE-D

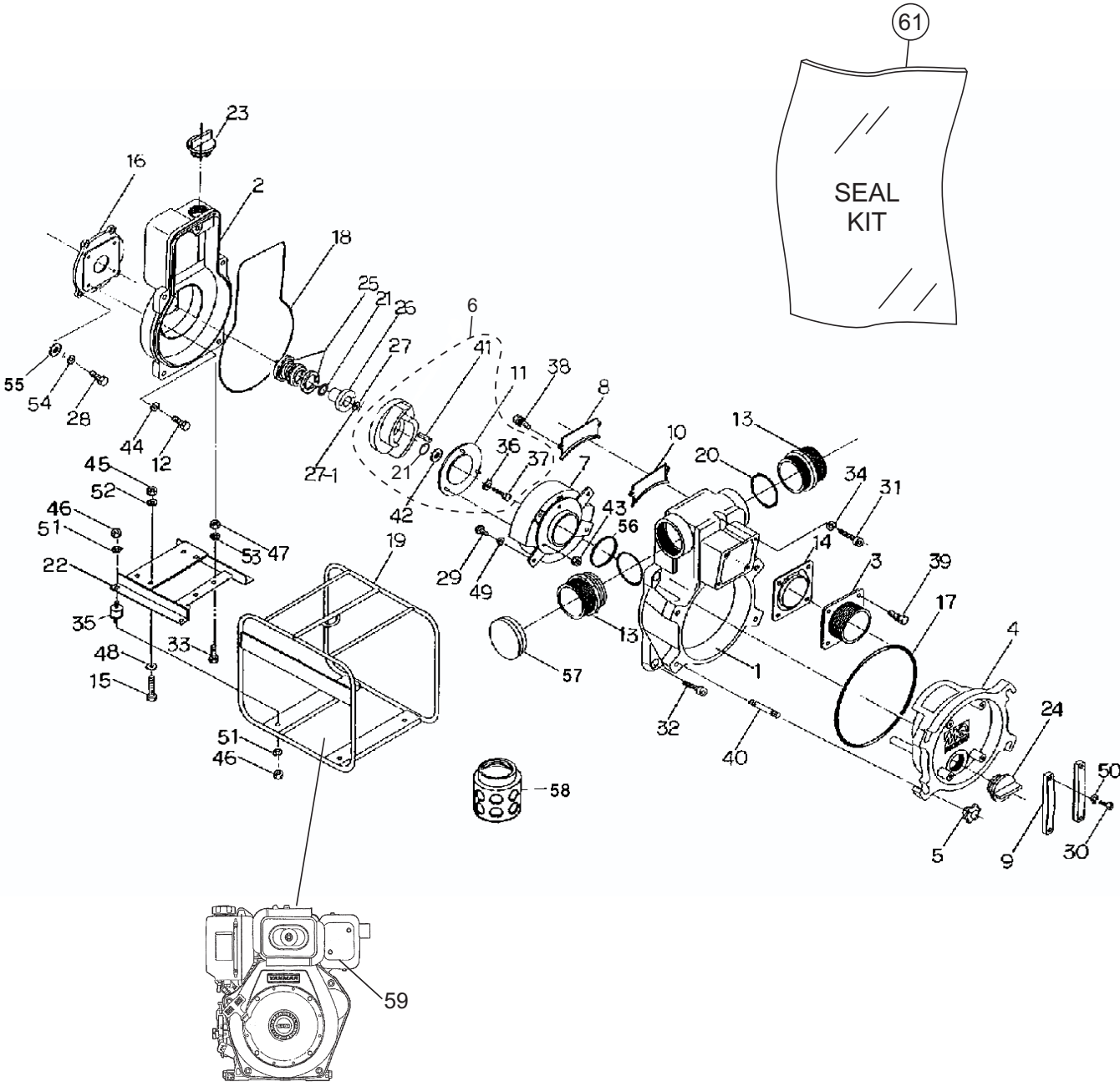
Qty.	P/N	Description
2	KIT3T	KIT, MECHANICAL SEAL, O-RINGS
1	1992040032	IMPELLER
2	0631211159	FLOODING CAP, W/ O-RING
3	11425012581	ELEMENT, AIR CLEANER
1	16081076630	ROPE STARTER
1	11428855040	CAP, FUEL TANK
3	11425055121	FUEL FILTER, GAS TANK
1	11425035110	STRAINER, OIL LUB
1	71487153100	FUEL INJECTION VALVE ASSY
1	11425055100	FUEL STRAINER, GAS TANK



Part number on this Suggested Spare Parts List may supersede/replace the P/N shown in the text pages of this book.

QP3TY — PUMP ASSY.

PUMP ASSY.



PUMP ASSY.

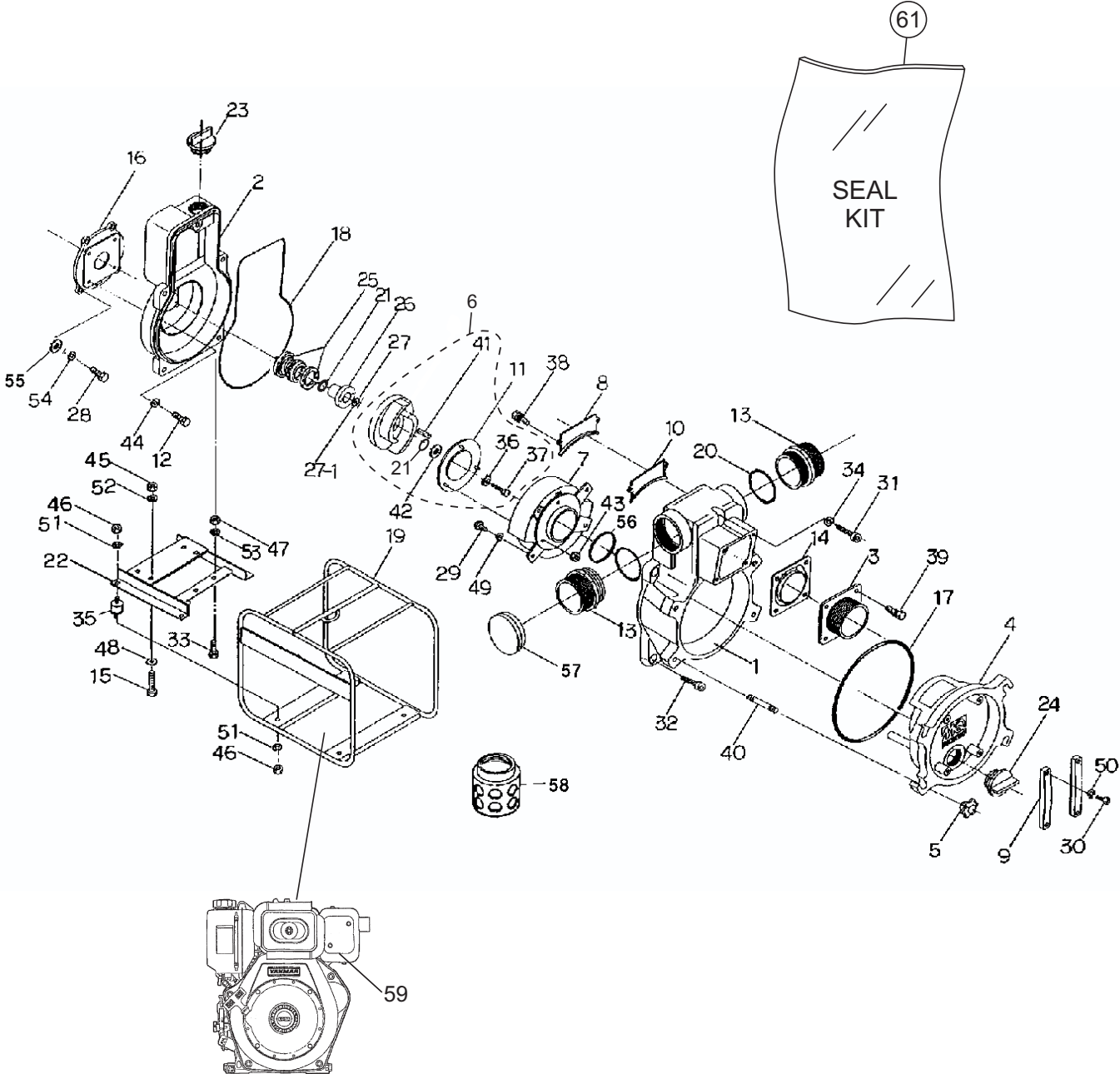
<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	1992100011	CASING	1	
2	1992100020	CASING COVER	1	
3	13910001600014	SUCTION COVER	1	
4	1992100173	DRAIN COVER	1	
5	19920002200014	DRAIN COVER HANDLE	4	
6	2367040033ASSY	IMPELLER KIT	1	INCLUDES ITEMS W/#
7	1992000110	VOLUTE CASING	1	
8	1992100742	SUCTION PLATE	1	
9	1247100250	DRAIN COVER SET HANDLE	2	
10	1992330410	SUCTION PLATE PACKING	1	
11	1992250700	WEAR PLATE	1	
12	0105090820	BOLT(CASING COVER), M8 x 20	4	
13	07904330300014	NIPPLE, NPS3" X NPT3"	2	
14	1378350350	CHECK VALVE	1	
15	0105091045	BOLT(ENGINE), M10 X 45	4	
16	43130006000014	CASING COVER SET PLATE	1	
17@	0483602250	O-RING (DRAIN COVER)	1	
18	0489403400	O-RING (CASING), 4 X 340 MM	1	
19	2367214010P002	BASE, SS400	1	
20	0481310800	O-RING (NIPPLE)	2	
21#	0482200240	O-RING, IMPELLER, MECH SEAL	2	SEE NOTE BELOW
22	23672140200014	ENGINE BASE,SS400	1	
23	0631211159	FLOODING CAP, PF1 1/2" W/ O-RING	1	
24	0631211159	DRAIN CAP, PF1 1/2" W/ O-RING	1	
25@	0803442930	MECHANICAL SEAL	1	
26@	0811885446	MECHANICAL SEAL SLEEVE, DIA. 30MM	1	
27@	0852834525	ADJUST LINER, 45 x 25.4 MM T0.3	1	
27-1@	0852854525	ADJUST LINER, 45 x25.4 MM T0.5	1	
28	0105090825	BOLT(CASING COVER SET PLATE) M8 X 20	4	
29	0131190823	CAP SCREW (VOLUTE CASING), M8 X 20	4	
30	0141090825	SCREW (DRAIN COVER SET HANDLE),M8 X 25	4	
31	0131191290	CAP SCREW (CASING), M12 X90	1	
32	0131191235	CAP SCREW (CASING), M12 X 35	4	
33	0105091055	BOLT (PUMP),M10 X 55	2	
34	0459220120	SEAL WASHER(CASING), M12	1	
35	0723302040	CUSHION RUBBER 40 X 20 MM M10	4	
36#	0458220100	SEAL WASHER, IMPELLER	1	
37#	0191190750	BOLT, IMPELLER	1	



ITEM 21, O-RING, IS INCLUDED IN IMPELLER KIT, ITEM 6. WHEN ORDERED AS PART OF THE KIT, QUANTITY OF O-RING IS ONE. REPLACEMENT OF IMPELLER REQUIRES TWO O-RINGS, SO IT IS NECESSARY TO ORDER ONE ADDITIONAL O-RING.

QP3TY — PUMP ASSY.

PUMP ASSY.

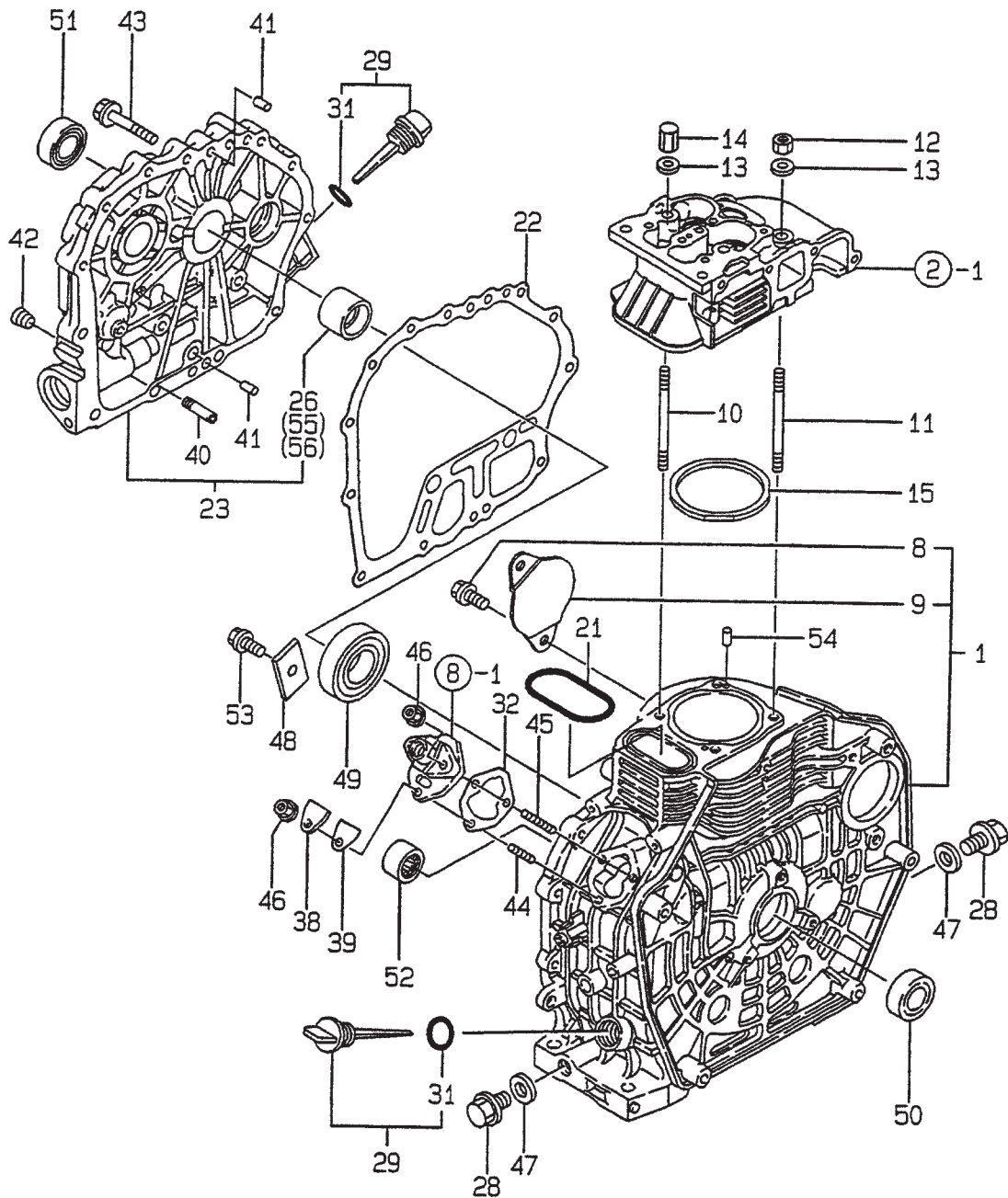


PUMP ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
38	0181090820	BOLT SET W/ SPRING WASHER (SUCTION PLATE) M8 X 20	2	
39	0181090825	BOLT SET W/ SPRING WASHER (SUCTION COVER) M8 X 25	4	
40	0151191257	STUD BOLT (DRAIN COVER HANDLE)	4	
41#	0520040431	KEY, IMPELLER	1	
42	43342012400011	IMPELLER WASHER 42 X 12 MM T4.5	1	
43	0204490060	U-NUT WEAR PLATE, M6	3	
44	0458220080	SEAL WASHER (CASING COVER), M8	4	
45	0205490100	NUT (ENGINE), M10	4	
46	0205490100	NUT (CUSHION RUBBER), M10	8	
47	0205490100	NUT (PUMP), M10	2	
48	0401650100	WASHER (ENGINE), M10	4	
49	0451290080	SPRING WASHER (VOLUTE CASING), M8	4	
50	0451290080	SPRING WASHER (DRAIN COVER SET HANDLE), M8	4	
51	0451290100	SPRING WASHER (CUSHION RUBBER), M10	8	
52	0451290100	SPRING WASHER (ENGINE), M10	4	
53	0451290100	SPRING WASHER (PUMP), M10	2	
54	0451290080	SPRING WASHER (CASING COVER SETPLATE), M8	4	
55	0401650080	WASHER (CASING COVER SETPLATE), M8	4	
56	0480570850	O-RING (VOLUTE CASING)	1	
57	1992108050	CAP	1	
58	0742214080	STRAINER	1	
59	L70EE-D	ENGINE, YANMAR	1	
61	KIT3T	KIT, MECHANICAL SEAL, SLEEVE, & O-RINGS ..	1	INCLUDES ITEMS W/@

YANMAR L70EE-D — CYLINDER BLOCK ASSY.

CYLINDER BLOCK ASSY.



② — See Cylinder Head and Cover Assy Drawing

⑧ — See Fuel Injection Pump Assy Drawing

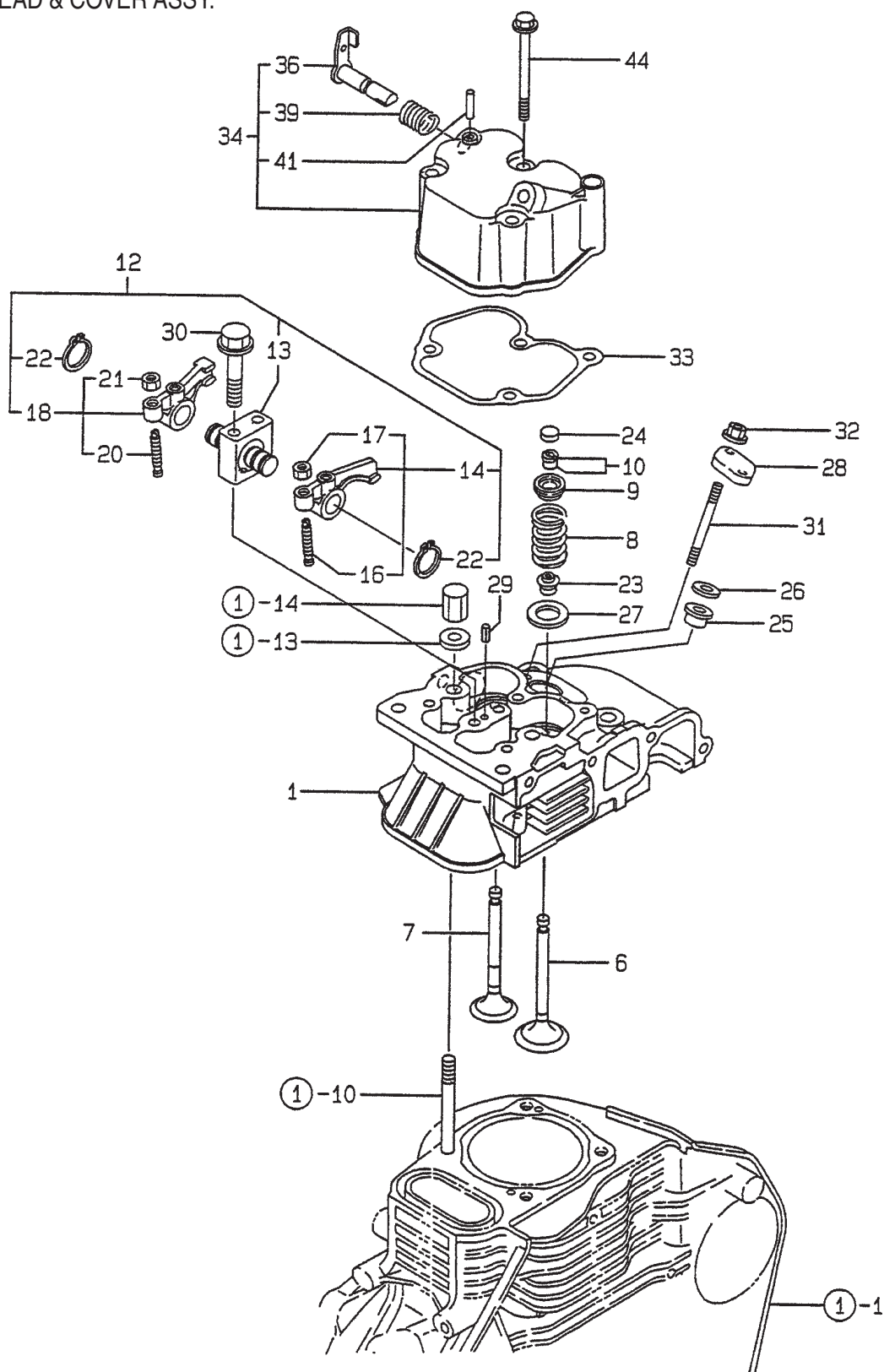
YANMAR L70EE-D — CYLINDER BLOCK ASSY.

CYLINDER BLOCK ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	71487101560	BLOCK ASSY., CYLINDER	1	INCLUDES ITEMS W/ *
8*	11435001700	COVER, STARTER	1	
9*	26106100122	BOLT M10X 12 PLATED	2	
10	11435001200	STUD, CYL. HEAD	2	
11	11435001210	STUD, CYL. HEAD	2	
12	11435001220	NUT 9	2	
13	10522501240	WASHER	4	
14	11435001250	NUT 9	2	
15	11487101330	GASKET, CYL. HEAD CMP	1	
21	11435001380	O-RING	1	
22	11435001412	GASKET, CRANK CASE	1	
23	11436801453	COVER (D), CRANK CASE	1	INCLUDES ITEMS W/ \$
26\$	11435002100	BEARING, MAIN	1	
28	10542501690	PLUG M16	2	
29	11469901760	CAP, W/LUB. OIL GAUGE	2	INCLUDES ITEMS W/ #
31#	11429901950	O-RING	2	
32	11425001800	SHIM SET	1	
38	11425001830	COVER, INSPEC. WINDOW	1	
39	11425001841	GASKET	1	
40	11425035150	PIPE, L.O. INLET	1	
41	11427001600	PARALLEL PIN 8 X 12	2	
42	23876010000	PLUG PT 1/8, SCREW	1	
43	26106080352	BOLT M 8X 35 PLATED	15	
44	26226060182	STUD M 6X 18 PLATED	1	
45	26226060222	STUD M 6X 22 PLATED	2	
46	26366060002	NUT M 6	3	
47	22190160002	SEAL WASHER 16S	2	
48	11429902030	RETAINER	1	
49	11435002113	BALL BEARING	1	
50	16011002220	SEAL, OIL	1	
51	16011002220	SEAL, OIL	1	
52	24162152112	NEEDLE BEARING	1	
53	26106080122	BOLT M 8X 12 PLATED	1	
54	22312040080	PIN 4 X 8, STRAIGHT	2	
55	11435002200	MAIN BEARING US = 0.25	1	UNDER SIZED PART
56	11435002210	MAIN BEARING US = 0.50	1	UNDER SIZED PART

YANMAR L70EE-D — CYLINDER HEAD & COVER ASSY.

CYLINDER HEAD & COVER ASSY.



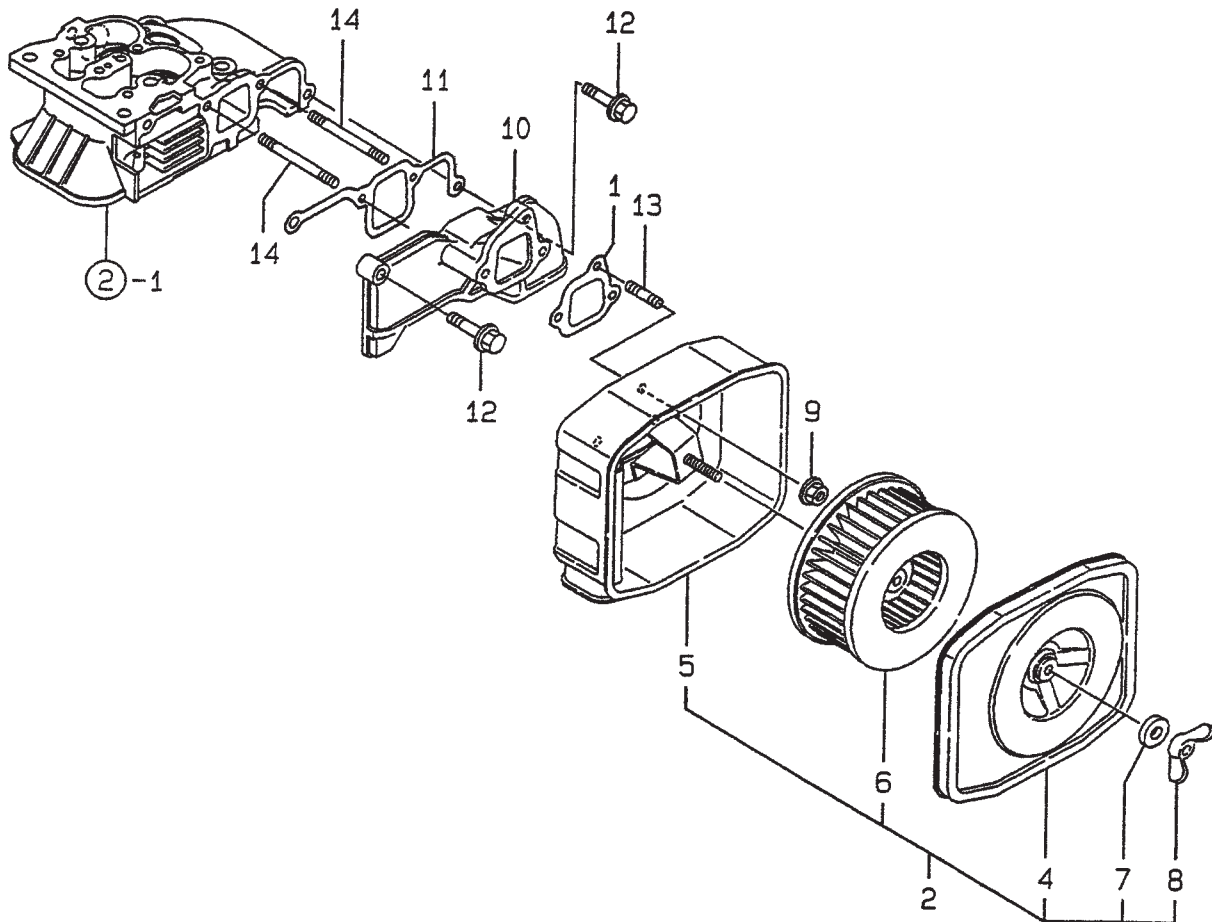
YANMAR L70EE-D — CYLINDER HEAD & COVER ASSY.

CYLINDER HEAD & COVER ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	11487111020	CYLINDER HEAD	1	
6	11487111100	VALVE, SUCTION	1	
7	11487111110	VALVE, EXHAUST	1	
8	11435011120	SPRING, VALVE	2	
9	10115811180	RETAINER, SPRING	2	
10	27310060001	COTTER ASSY	2	
12	11477111250	SUPPORT CAM, ARM	1	INCLUDES ITEMS W/ *
13*	11477111260	SUPPORT, ROCKER ARM	1	
14*	11477111650	ARM ASSY, INTAKE	1	INCLUDES ITEMS W/ %
16*%	11425011240	SCREW, VALVE ADJUST.	1	
17*%	26856060002	LOCK NUT 6	1	
18*	11477111660	ARM ASSY, EXHAUST	1	INCLUDES ITEMS W/ +
20*+	11425011240	SCREW, VALVE ADJUST.	1	
21*+	26856060002	LOCK NUT 6	1	
22*	22242000120	CIRCLIP 12	2	
23	11435011340	SEAL, VALVE STEM	2	
24	10501011490	CAP, VALVE	2	
25	11477111461	GASKET, NOZZLE	1	
26	11477111470	SPACER, NOZZLE	1	
27	11425011600	WASHER	2	
28	11425011901	RETAINER	1	
29	22351040008	SPRING PIN 4X 8	1	
30	26106060452	BOLT M 6X 45 PLATED	2	
31	26226060602	STUD	2	
32	26366060002	NUT M 6	2	
33	11477111310	GASKET, BONNET	1	
34	11477111950	BONNET ASSY, HEAD	1	INCLUDES ITEMS W/ \$
36\$	11425003591	SHAFT ASSY, DECOMP.	1	
39\$	11425003640	SPRING	1	
41\$	22312030160	PARALLEL PIN 3X16	1	
44	26106060552	BOLT M 6X 55 PLATED	3	

YANMAR L70EE-D — AIR CLEANER ASSY.

AIR CLEANER ASSY.



② — See Cylinder Head and Cover Assy Drawing

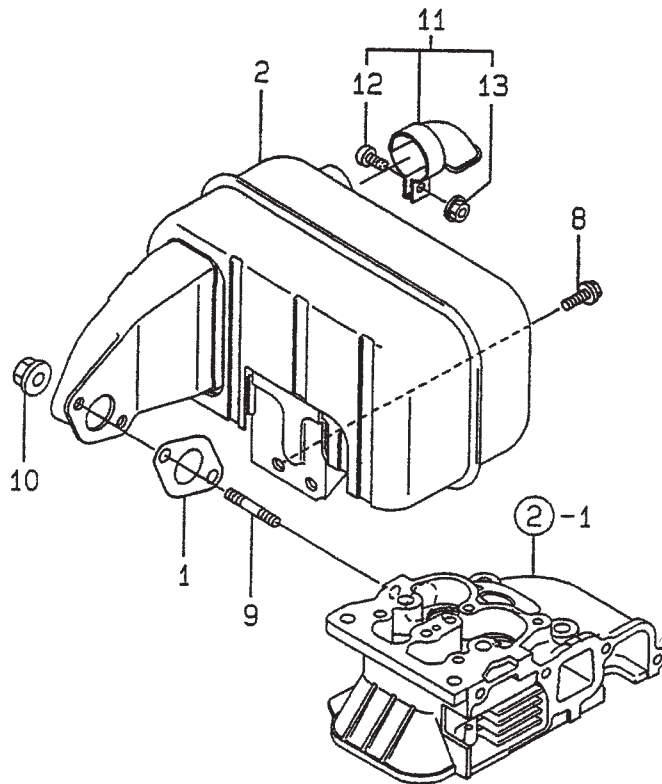
YANMAR L70EE-D — AIR CLEANER ASSY.

AIR CLEANER ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	11425012211	GASKET, AIR CLEANER	1	
2	71425012560	CLEANER ASSY, AIR	1	INCLUDES ITEMS W/ *
4*	11425012520	COVER, AIR CLEANER	1	
5*	11425012530	CASE, AIR CLEANER	1	
6*	11425012581	ELEMENT, WET AIR	1	
7*	11425012560	WASHER M 6, SEAL	1	
8*	11425012550	WING — NUT, M 6	1	
9	11425012300	U — NUT	3	
10	11439912010	PIPE, AIR INTAKE	1	
11	11435012202	GASKET, AIR INTAKE	1	
12	26106060252	BOLT M 6X 25 PLATED	2	
13	26226060142	STUD M 6X 14 PLATED	1	
14	26226060552	STUD M6X 55 PLATED	2	

YANMAR L70EE-D — MUFFLER ASSY.

MUFFLER ASSY.



② — See Cylinder Head and Cover Assy Drawing

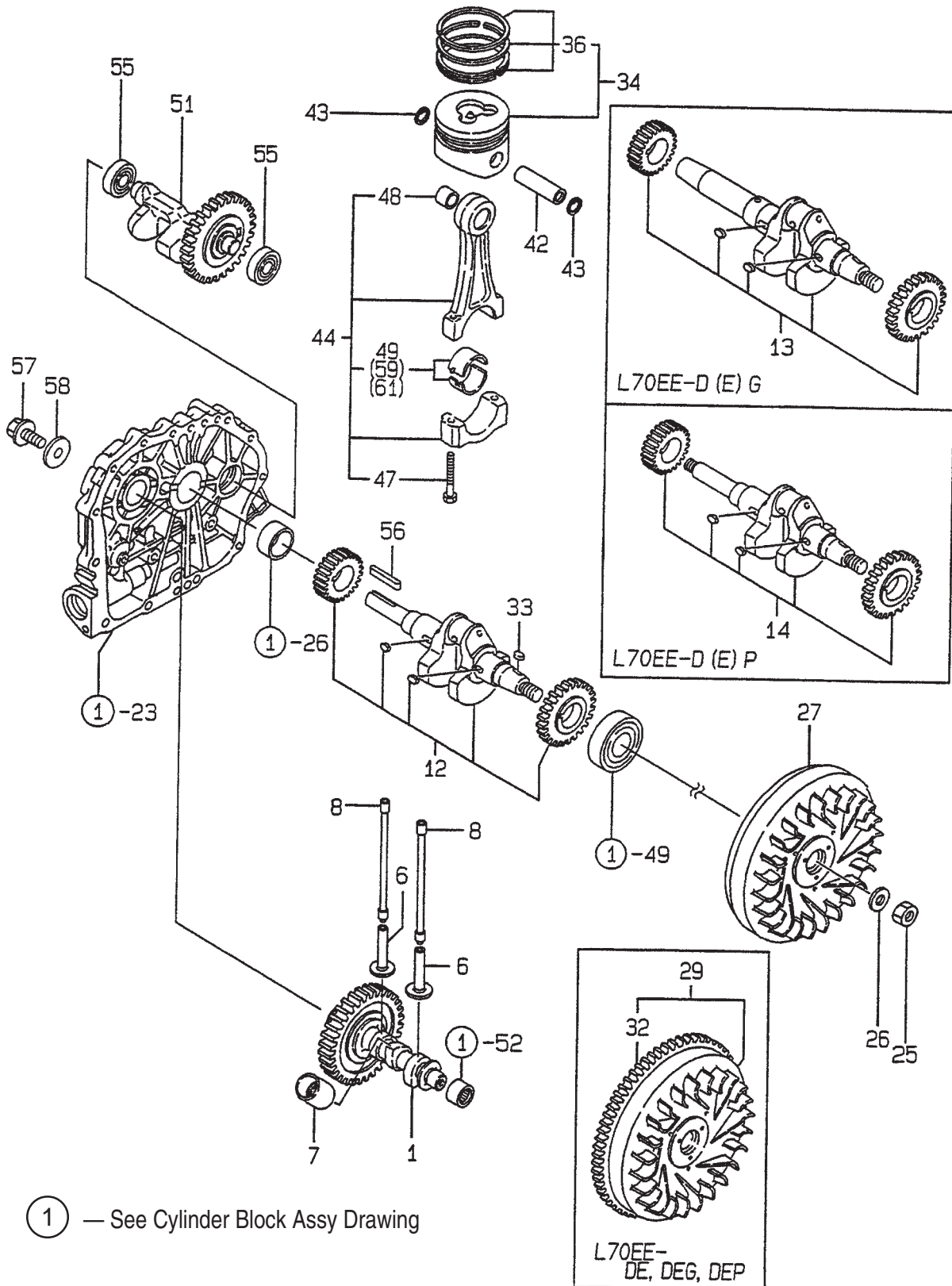
YANMAR L70EE-D — MUFFLER ASSY.

MUFFLER ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	11425013201	GASKET (NON — ASB.)	1	
2	11487013551	MUFFLER ASSY	1	
8	26106060122	BOLT M 6X 12 PLATED	2	
9	26216080182	STUD M 8X 18 PLATED	2	
10	26366080002	NUT M 8	2	
11	11428813800	DEFLECTOR EXH	1	INCLUDES ITEMS W/ *
12*	26554060182	SCREW M 6X 18	1	
13*	26367060002	U — NUT M6	1	

YANMAR L70EE-D — CRANKSHAFT, PISTON & CAMSHAFT ASSY.

CRANKSHAFT, PISTON & CAMSHAFT ASSY.



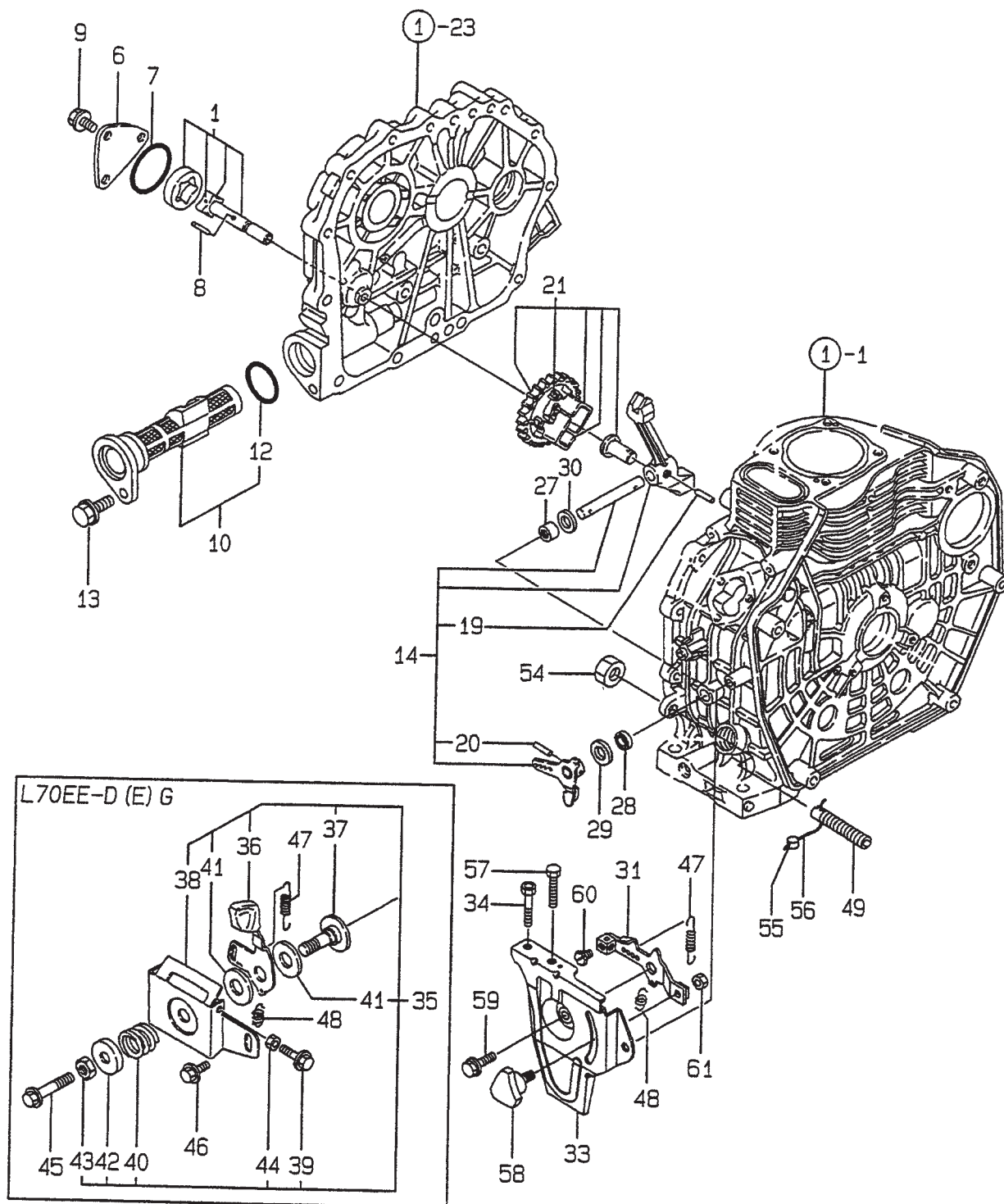
YANMAR L70EE-D — CRANKSHAFT, PISTON & CAMSHAFT ASSY.

CRANKSHAFT, PISTON & CAMSHAFT ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	71488014580	CAMSHAFT (D) ASSY	1	
6	11425014200	TAPPET	2	
7	11477114260	TAPPET, F.O.	1	
8	11435014450	ROD, PUSH	2	
12	71487621730	CRANKSHAFT ASSY	1	
25	10385401221	NUT M16	1	
26	11425021550	WASHER, FLYWHEEL	1	
27	11488021400	FLYWHEEL (D)	1	
33	22512040120	KEY 4X 12	1	
34	71487222720	PISTON W/RINGS	1	INCLUDES ITEMS W/ *
36*	71487022500	RING SET, PISTON	1	
42	11439922300	PISTON PIN	1	
43	22252000210	CIRCLIP 21	2	
44	71438023700	ROD ASSY, CONNECTING	1	INCLUDES ITEMS W/ \$
47\$	11820023200	BOLT, ROD	2	
48\$	11438023100	BUSH, PISTON PIN	1	
49\$	71438023600	BEARING, CRANK PIN	1	
51	71435028520	SHAFT ASSY, BALANCER	1	
55	24101062024	BALL BEARING	2	
56	16084221150	KEY 6.3X50	1	
57	16084221250	BOLT 7/16 — 20UNF	1	
58	16084221260	WASHER	1	
59	71438023610	BEARING, PIN (U.S = 0.25)	1	UNDER SIZED(U.S.=0.25)
61	71438023620	BEARING, PIN (U.S = 0.50)	1	UNDER SIZED(U.S.=0.50)

YANMAR L70EE-D — LUB. OIL PUMP & GOVERNOR ASSY.

LUB. OIL PUMP & GOVERNOR ASSY.



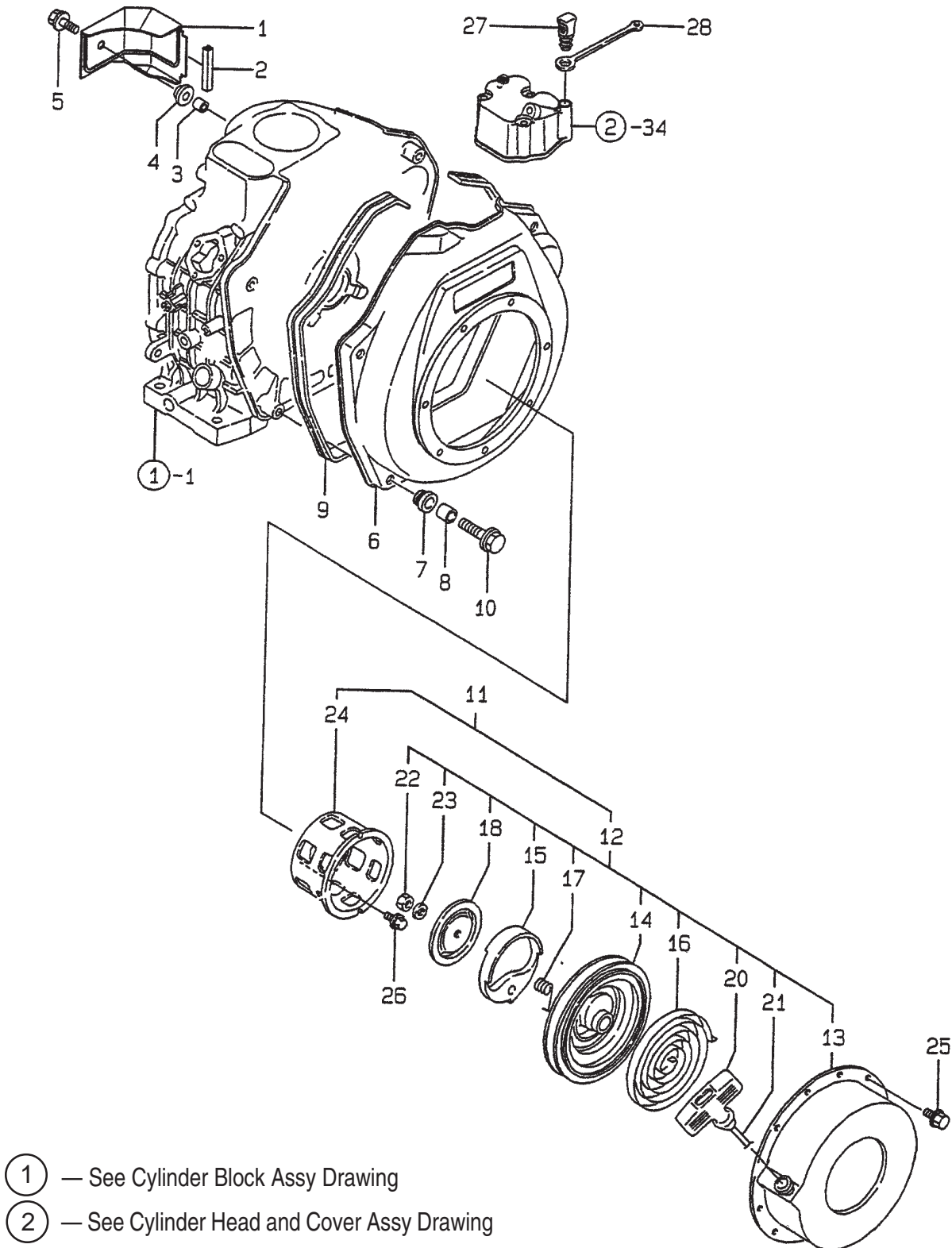
YANMAR L70EE-D — LUB. OIL PUMP & GOVERNOR ASSY.

LUB. OIL PUMP & GOVERNOR ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	11425032010	PUMP ASSY, LUB. OIL	1	
6	11425032070	COVER, LUB. OIL PUMP	1	
7	10333832570	O — RING	1	
8	22312030160	PARALLEL PIN 3 X 16	1	
9	26476060142	BOLT M 6X 14, TAPPING	3	
10	11425035110	STRAINER, LUB. OIL	1	INCLUDES ITEMS W/ *
12*	24341000224	O — RING 1A S — 22.4	1	
13	26106060162	BOLT M 6X 16 PLATED	1	
14	71435061500	LEVER ASSY, GOVERNOR	1	INCLUDES ITEMS W/ \$
19\$	22322030200	TAPER PIN 3X20	1	
20\$	22322030200	TAPER PIN 3X20	1	
21	71477061100	GOVERNOR ASSY	1	
27	11477061520	BEARING, NEEDLE	2	
28	11477061600	SEAL, OIL	1	
29	11477061610	WASHER, THRUST	1	
30	11477061190	WASHER	1	
31	11425066050	HANDLE, REGULATOR	1	
33	11429966100	STAY, HANDLE	1	
34	11425066440	BOLT, ADJUSTING	1	
47	11487066010	SPRING, REGULATOR	1	
48	11425066200	SPRING, RETURN	1	
49	11487166550	TORQUE SPRING ASSY	1	
54	26696100002	NUT M10	1	
55	13521061090	LEAD	2	
56	22451060000	WIRE 0.6	2	
57	10210067080	BOLT, ADJUSTING	1	
58	16072578350	KNOB (W/M6X15)	1	
59	26106060142	BOLT M 6X 14 PLATED	1	
60	26117040088	BOLT 4 * 8	1	
61	26347060002	U — NUT 6	1	

YANMAR L70EE-D — COOLING & STARTING DEVICE ASSY.

COOLING & STARTING DEVICE ASSY.



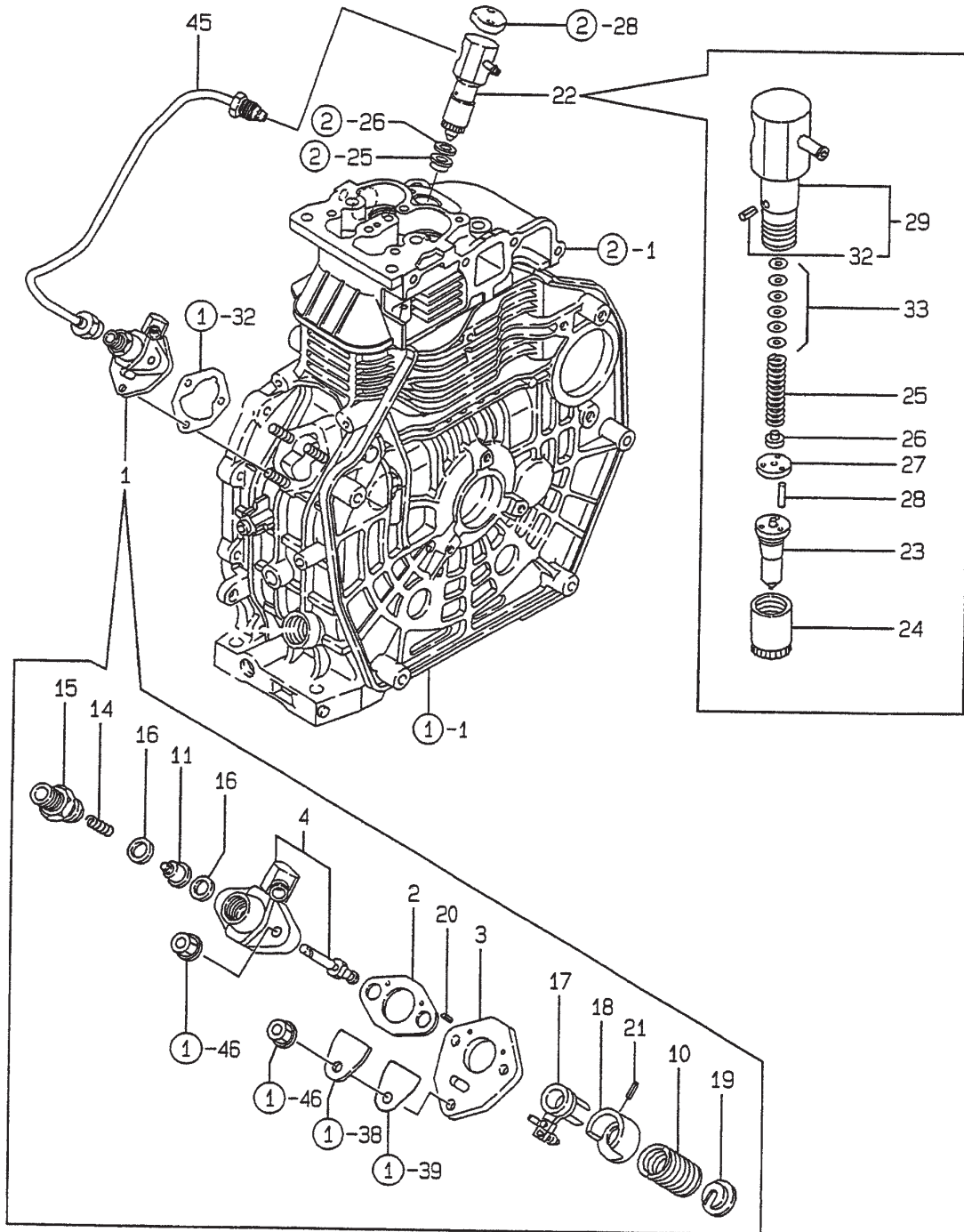
YANMAR L70EE-D — COOLING & STARTING DEVICE ASSY.

COOLING & STARTING DEVICE ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	11487045201	COVER	1	
2	11435045320	RUBBER, SEAL	1	
3	11435045340	COLLAR	1	
4	18372055210	GROMMET	1	
5	26106060202	BOLT M 6X 20 PLATED	1	
6	11436045101	CASE, FAN (SILVER) (17)	1	
7	11425045301	RUBBER, CUSHION	4	
8	11425045310	COLLAR	4	
9	11425045330	SEAL, FAN CASE	1	
10	11437045351	BOLT, FAN CASE	4	
11	11488076050	STARTER ASSY, RECOIL	1	INCLUDES ITEMS W/ *
12*	11488076250	RECOIL ASSY	1	
13*	11488076510	CASE, STARTER	1	
14*	16081076520	REEL, RECOIL	1	
15*	16084076530	RATCHET	1	
16*	16081076540	SPRING, SPIRAL	1	
17*	16084076560	SPRING, FRICTION	1	
18*	16081076580	PLATE, FRICTION	1	
20*	16081076620	KNOB, STARTER	1	
21*	16081076630	ROPE, STARTER	1	
22*	18113076680	NUT	1	
23*	18113076700	WASHER	1	
24*	11435076590	PULLEY, STARTER	1	
25	26106060082	BOLT M 6X 8 PLATED	4	
26	26106060122	BOLT M 6X 12 PLATED	3	
27	11425076600	PLUNGER	1	
28	11425076610	HOLDER, PLUNGER	1	

YANMAR L70EE-D — FUEL INJECTION PUMP ASSY.

FUEL INJECTION PUMP ASSY.



① — See Cylinder Block Assy Drawing

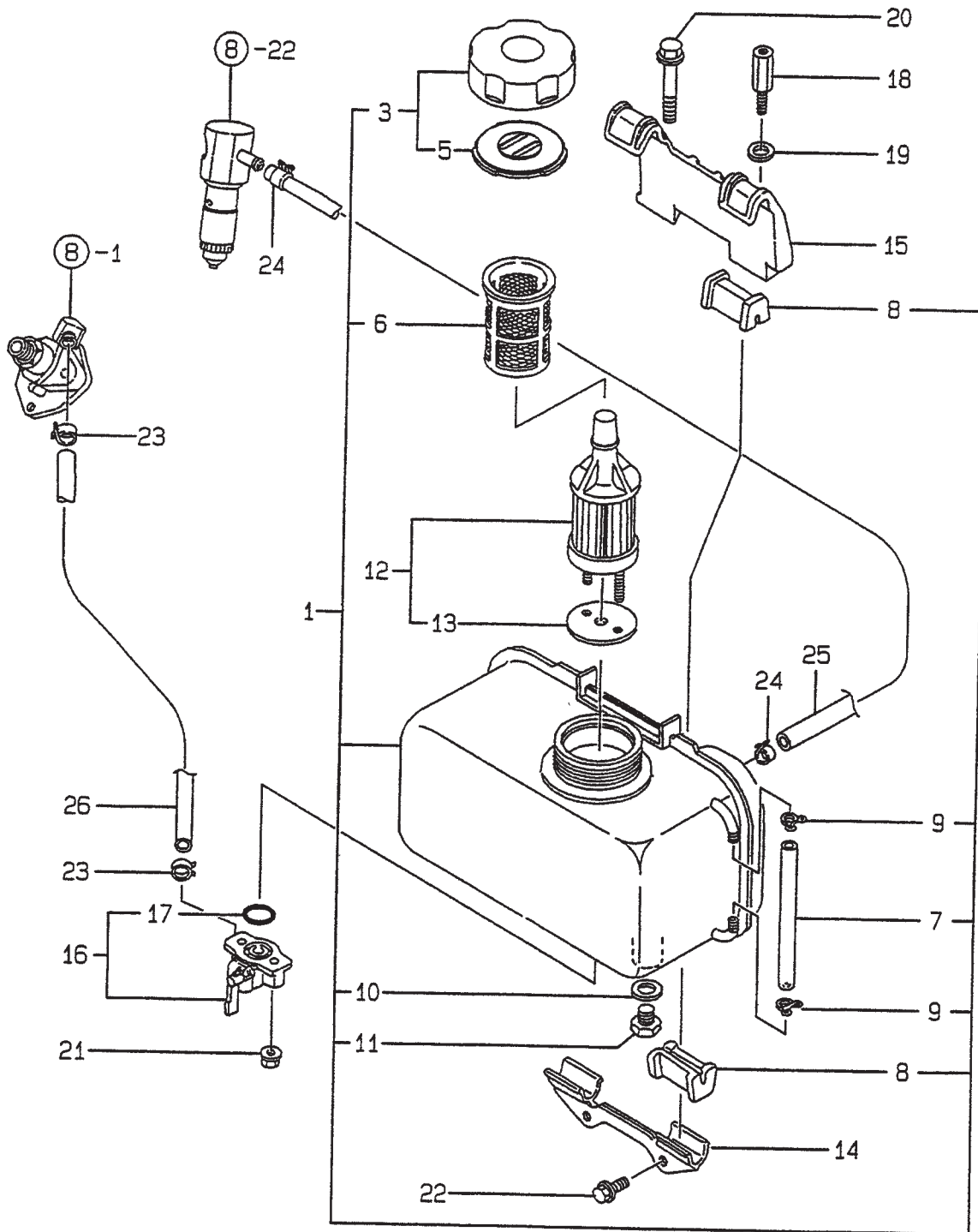
② — See Cylinder Head and Cover Assy Drawing

YANMAR L70EE-D — FUEL INJECTION PUMP ASSY.

FUEL INJECTION PUMP ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	71465051100	PUMP ASSY, F. INJECT.....	1	INCLUDES ITEMS W/ *
2*	10554651020	GASKET	1	
3*	11425051080	PLATE	1	
4*	11465051100	BODY, F.I. PUMP	1	
10*	11425051160	SPRING	1	
11*	11465051300	VALVE ASSY, DELIVERY	1	
14*	10554651330	SPRING, DELIV. VALVE	1	
15*	11425051340	HOLDER, F.I.P. DELIVE	1	
16*	12455051350	GASKET, DELIVERY	2	
17*	11425051600	LEVER ASSY, CONTROL	1	
18*	11425051640	SEAT (A), SPRING	1	
19*	11425051650	SEAT (B), SPRING	1	
20*	22351020006	SPRING PIN 2X 6	2	
21*	22351030008	SPRING PIN 3X 8	1	
22	71487153100	VALVE ASSY, F. INJECT	1	INCLUDES ITEMS W/ \$
23\$	11487153000	NOZZLE ASSY	1	
24\$	11959353080	NUT, NOZZLE CASE	1	
25\$	11425053120	SPRING, NOZZLE	1	
26\$	11959353130	RETAINER, SPRING	1	
27\$	11477553140	SPACER, VALVE STOP	1	
28\$	11477553210	PIN	2	
29\$	11477553100	HOLDER ASSY	1	INCLUDES ITEMS W/ #
32\$#	11477553330	PIN	1	
33\$	11425053400	SHIM PACK	1	
45	11487159802	PIPE, FUEL INJECTION	1	

YANMAR L70EE-D — FUEL TANK & FUEL LINE ASSY.



⑧ — See Fuel Injection Pump Assy Drawing

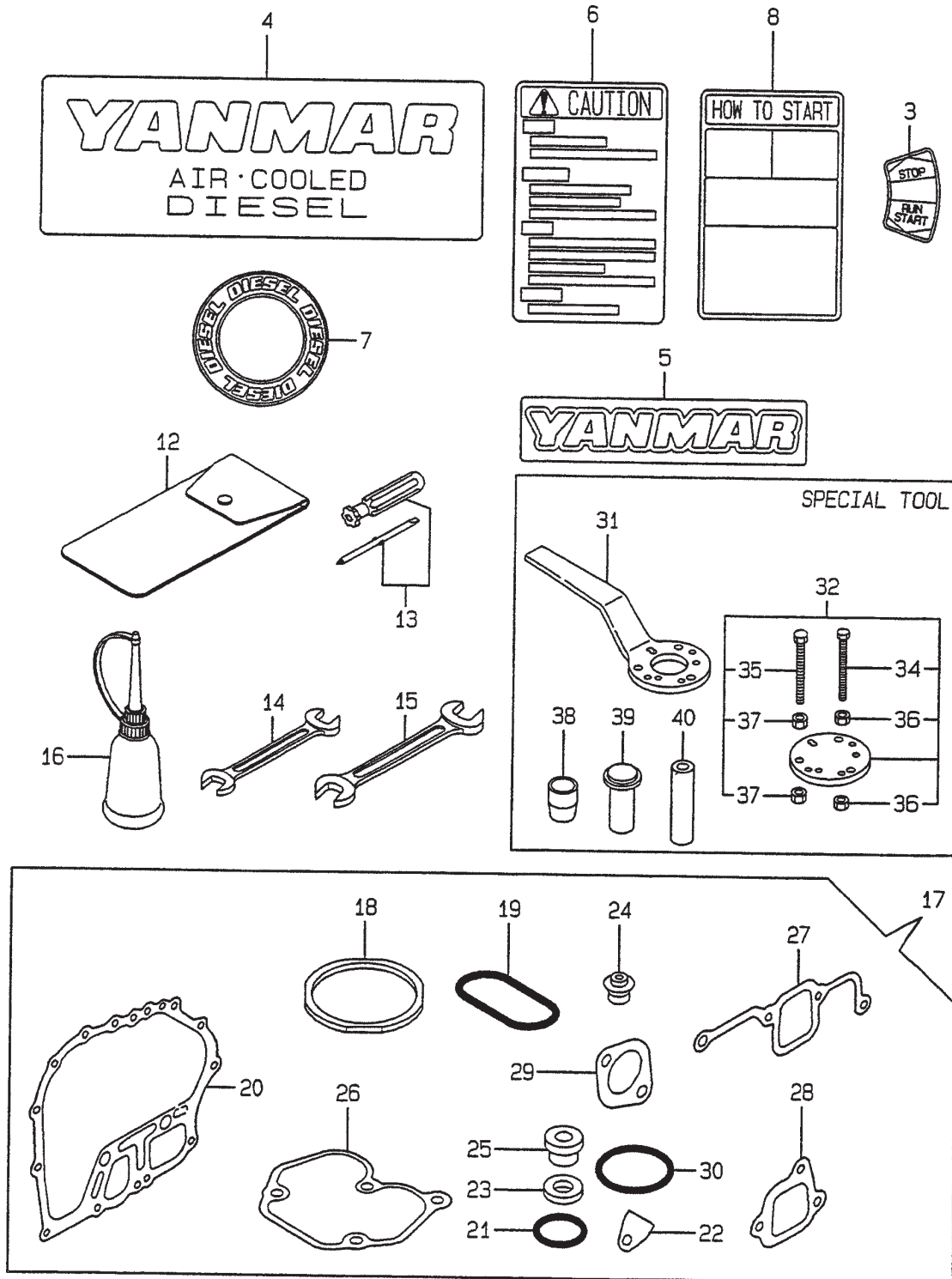
YANMAR L70EE-D — FUEL TANK & FUEL LINE ASSY.

FUEL TANK & FUEL LINE ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	71435055711	TANK, FUEL (RED) (50)	1	INCLUDES ITEMS W/ *
3*	11428855040	CAP ASSY, TANK	1	INCLUDES ITEMS W/ \$
5*\$	11428855080	VALVE	1	
6*	11425055100	FILTER, FUEL	1	
7*	11435055150	PIPE, GAUGE	1	
8*	11425055201	DAMPER, FUEL TANK	4	
9*	10385455220	CLAMP	2	
10*	23414080000	GASKET 8, ROUND	1	
11*	10530055080	PLUG, DRAIN	1	
12	11425055121	FILTER, FUEL OIL	1	INCLUDES ITEMS W/ +
13+	11425055130	GASKET	1	
14*	11429955210	STAY	1	
15	11439955230	STAY (B)	1	
16	11425055300	COCK ASSY, FUEL	1	INCLUDES ITEMS W/ ■
17■	24341000150	O — RING 1A S — 15.0	1	
18	11465055810	BOLT, LIFTING	1	
19	22117080000	WASHER 8	1	
20	26106080452	BOLT M 8X 45 PLATED	1	
21	26366060002	NUT M 6	2	
22*	26476060142	BOLT M 6X 14, TAPPING	2	
23	10699044660	CLIP, HOSE	2	
24	12472259050	CLAMP 9	2	
25	11425059060	PIPE, FUEL RETURN	1	
26	11426859061	PIPE, FUEL OIL	1	

YANMAR L70EE-D — TOOL, LABEL & GASKET SET ASSY.

TOOL, LABEL & GASKET SET ASSY.



YANMAR L70EE-D — TOOL, LABEL & GASKET SET ASSY.

TOOL, LABEL & GASKET SET ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
3	18325007230	LABEL, OPERATION		
4	11425007090	LABEL, AIR COOLED	1	
5	11425007111	LABEL, YANMAR	1	
6	11426807240	LABEL, CAUTION	1	
7	11426107350	LABEL	1	
8	11426807350	LABEL, HOW TO START	1	
12	11425092600	BAG, TOOL	1	
13	16033092730	SCREWDRIVER	1	
14	28110100120	WRENCH 10X12	1	
15	28110140170	WRENCH 14X17	1	
16	28210000150	FEEDER, OIL	1	
17	71487192600	GASKET SET	1	INCLUDES ITEMS W/ *
18*	11487101330	GASKET, CYL. HEAD CMP	1	
19*	11435001380	O — RING	1	
20*	11435001412	GASKET, CRANK CASE	1	
21*	11429901950	O — RING	2	
22*	11425001841	GASKET	1	
23*	22190160002	SEAL WASHER 16S	2	
24*	11435011340	SEAL, VALVE STEM	2	
25*	11477111461	GASKET, NOZZLE	1	
26*	11477111310	GASKET, BONNET	1	
27*	11435012202	GASKET, AIR INTAKE	1	
28*	11425012211	GASKET, AIR CLEANER	1	
29*	11425013201	GASKET (NON — ASB.)	1	
30*	10333832570	O — RING	1	
31	11425092101	F.W. LOCKING HANDLE	1	
32	11425092130	REMOVER, FLYWHEEL	1	INCLUDES ITEMS W/ %
34%	26116060454	BOLT M 6X 45 PLATED	4	
35%	26116080454	BOLT M 8X 45 PLATED	3	
36%	26716060002	NUT 6	8	
37%	26716080002	NUT M 8	6	
38	11436892300	GUIDE, OIL SEAL	1	
39	11435092311	INSTALLING TOOL	1	
40	11435092350	INSTALLING TOOL	1	

TERMS AND 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. Multiquip's 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 Multiquip is \$15.00 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 Material Authorization must be approved by Multiquip prior to shipment.
2. To obtain a Return Material Authorization, a list must be provided to Multiquip Parts Sales that defines item numbers, quantities, and descriptions of the items to be returned.
 - a. The parts numbers and descriptions must match the current parts price list.
 - b. The list must be typed or computer generated.
 - c. The list must state the reason(s) for the return.
 - d. The list must reference the sales order(s) or invoice(s) under which the items were originally purchased.
 - e. The list must include the name and phone number of the person requesting the RMA.
3. A copy of the Return Material Authorization must accompany the return shipment.
4. Freight is at the sender's expense. All parts must be returned freight prepaid to Multiquip's designated receiving point.
5. Parts must be in new and resalable condition, in the original Multiquip package (if any), and with Multiquip part numbers clearly marked.
6. The following items are not returnable:
 - a. Obsolete parts. (If an item is in the price book and shows as being replaced by another item, it is obsolete.)
 - 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. Any line item with an extended dealer net price of less than \$5.00.
 - d. Special order items.
 - e. Electrical components.
 - f. Paint, chemicals, and lubricants.
 - g. Decals and paper products.
 - h. Items purchased in kits.
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.
10. In cases where an item is accepted, for which the original purchase document can not be determined, the price will be based on the list price that was effective twelve months prior to the RMA date.
11. Credit issued will be applied to future purchases only.

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.

Multiquip 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.

SPECIAL EXPEDITING SERVICE

A \$35.00 surcharge will be added to the invoice for special handling including bus shipments, insured parcel post or in cases where Multiquip must personally deliver the parts to the carrier.

LIMITATIONS OF SELLER'S LIABILITY

Multiquip 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 Multiquip be liable for loss of profit or good will or for any other special, consequential or incidental 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 Multiquip. 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 Multiquip 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

OPERATION AND PARTS MANUAL

HERE'S HOW TO GET HELP

PLEASE HAVE THE MODEL AND SERIAL
NUMBER ON-HAND WHEN CALLING

UNITED STATES

Multiquip Corporate Office

18910 Wilmington Ave. Tel. (800) 421-1244
Carson, CA 90746 Fax (800) 537-3927
Contact: mq@multiquip.com

Mayco Parts

800-306-2926 Fax: 800-672-7877
310-537-3700 Fax: 310-637-3284

Service Department

800-421-1244 Fax: 310-537-4259
310-537-3700

MQ Parts Department

800-427-1244 Fax: 800-672-7877
310-537-3700 Fax: 310-637-3284

Warranty Department

800-421-1244, Ext. 279 Fax: 310-537-1173
310-537-3700, Ext. 279

Technical Assistance

800-478-1244 Fax: 310-631-5032

MEXICO

MQ Cipsa

Carr. Fed. Mexico-Puebla KM 126.5 Tel: (52) 222-225-9900
Momoxpan, Cholula, Puebla 72760 Mexico Fax: (52) 222-285-0420
Contact: pmastretta@cipsa.com.mx

UNITED KINGDOM

Multiquip (UK) Limited Head Office

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Global Lane, Fax: 0161 339 3226
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Contact: sales@multiquip.co.uk

CANADA

Multiquip

4110 Industriel Boul. Tel: (450) 625-2244
Laval, Quebec, Canada H7L 6V3 Tel: (877) 963-4411
Contact: jmartin@multiquip.com Fax: (450) 625-8664

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This manual MUST accompany the equipment at all times. This manual is considered a permanent part of the equipment and should remain with the unit if resold.

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