

# OPERATION AND PARTS MANUAL



**MODELS**  
**QP4TZT10P**  
**QP4TZTMP16F**  
**QP4TZTMPXF**  
**TRASH PUMP**  
**(Hatz 1B40U-2203A Diesel Engine)**

Revision #1 (08/29/11)

To find the latest revision of this  
publication, visit our website at:  
[www.multiquip.com](http://www.multiquip.com)



**THIS MANUAL MUST ACCOMPANY THE EQUIPMENT AT ALL TIMES.**



**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.

## REPORTING SAFETY DEFECTS

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If you believe that your vehicle has a defect that could cause a crash or could cause injury or death, you should immediately inform the National Highway Traffic Safety Administration (NHTSA) in addition to notifying Multiquip at 1-800-421-1244.

If NHTSA receives similar complaints, it may open an investigation, and if it finds that a safety defect exists in a group of vehicles, it may order a recall and remedy campaign. However, NHTSA cannot become involved in individual problems between you, your dealer, or Multiquip.

To contact NHTSA, you may either call the Vehicle Safety Hotline toll-free at 1-888-327-4236 (TTY: 1-800-424-9153), go to <http://www.nhtsa.dot.gov>; or write to:

Administrator  
NHTSA  
1200 New Jersey Avenue S.E.  
Washington, DC 20590

You can also obtain information about motor vehicle safety from  
<http://www.safercar.gov>.

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### NOTICE

Specifications and part numbers are subject to change without notice.

# PARTS ORDERING PROCEDURES

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

Effective:  
January 1<sup>st</sup>, 2006

www.multiquip.com



### Order via Internet (Dealers Only):

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

- View Parts Diagrams
- Order Parts
- Print Specification Information



If you have an MQ Account, to obtain a Username and Password, E-mail us at: [parts@multiquip.com](mailto:parts@multiquip.com).

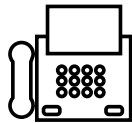
To obtain an MQ Account, contact your District Sales Manager for more information.

Goto [www.multiquip.com](http://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

### Non-Dealer Customers:

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



**International Customers** should contact their local Multiquip Representatives for Parts Ordering information.

## 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!



# SAFETY INFORMATION

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



## SAFETY MESSAGES

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

## SAFETY SYMBOLS

**! DANGER**

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

**! WARNING**

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







**! CAUTION**

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

**NOTICE**

Addresses practices not related to personal injury.

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

Symbol	Safety Hazard
	Lethal exhaust gas hazards
	Explosive fuel hazards
	Burn hazards
	Respiratory hazards
	Accidental starting hazards
	Eye and hearing hazards

# SAFETY INFORMATION

## GENERAL SAFETY

### CAUTION

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

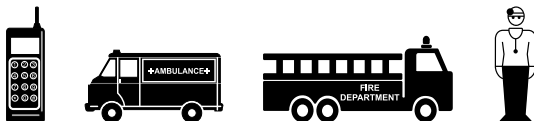


- **NEVER** operate this equipment when not feeling well due to fatigue, illness or when under medication.
- **NEVER** operate this equipment under the influence of drugs or alcohol.



### NOTICE

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



## PUMP SAFETY

### DANGER

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



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



### WARNING

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



# SAFETY INFORMATION

## CAUTION

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

## NOTICE

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

## ENGINE SAFETY

### WARNING

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



## CAUTION

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



## NOTICE

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



## FUEL SAFETY

### DANGER

- **DO NOT** start the engine near spilled fuel or combustible fluids. Fuel is extremely flammable and its vapors can cause an explosion if ignited.
- **ALWAYS** refuel in a well-ventilated area, away from sparks and open flames.
- **ALWAYS** use extreme caution when working with flammable liquids.
- **DO NOT** fill the fuel tank while the engine is running or hot.
- **DO NOT** overfill tank, since spilled fuel could ignite if it comes into contact with hot engine parts or sparks from the ignition system.
- Store fuel in appropriate containers, in well-ventilated areas and away from sparks and flames.
- **NEVER** use fuel as a cleaning agent.
- **DO NOT** smoke around or near the equipment. Fire or explosion could result from fuel vapors or if fuel is spilled on a hot engine.





# SAFETY INFORMATION

## BATTERY SAFETY (ELECTRIC START ONLY)

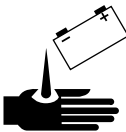
### DANGER

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



### WARNING

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



### CAUTION

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

## TRANSPORTING SAFETY

### CAUTION

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

### NOTICE

- Before lifting, make sure that the equipment parts are not damaged and screws are not loose or missing.
- **ALWAYS** make sure forklift forks are inserted into pockets (if applicable) as far as possible when lifting the pump.
- **ALWAYS** shutdown engine before transporting.
- **NEVER** lift the equipment while the engine is running.
- Tighten fuel tank cap securely and close fuel cock to prevent fuel from spilling.
- Use one point suspension hook and lift straight upwards.
- **DO NOT** lift machine to unnecessary heights.
- **ALWAYS** tie down equipment during transport by securing the equipment with rope.
- Never allow any person or animal to stand underneath the equipment while lifting.

# SAFETY INFORMATION

## TOWING SAFETY


### CAUTION

- Check with your local county or state safety towing regulations, in addition to meeting **Department of Transportation (DOT) Safety Towing Regulations**, before towing your generator. 
- Refer to MQ Power trailer manual for additional safety information.
- In order to reduce the possibility of an accident while transporting the generator on public roads, **ALWAYS** make sure the trailer that supports the generator and the towing vehicle are mechanically sound and in good operating condition.
- **ALWAYS** shutdown engine before transporting
- Make sure the hitch and coupling of the towing vehicle are rated equal to, or greater than the trailer “gross vehicle weight rating.”
- **ALWAYS** inspect the hitch and coupling for wear. **NEVER** tow a trailer with defective hitches, couplings, chains, etc.
- Check the tire air pressure on both towing vehicle and trailer. **Trailer tires should be inflated to 50 psi cold.** Also check the tire tread wear on both vehicles.
- **ALWAYS** make sure the trailer is equipped with a **safety chain**.
- **ALWAYS** properly attach trailer’s safety chains to towing vehicle.
- **ALWAYS** make sure the vehicle and trailer directional, backup, brake and trailer lights are connected and working properly.
- DOT Requirements include the following:
  - Connect and test electric brake operation.
  - Secure portable power cables in cable tray with tie wraps.
- The maximum speed for highway towing is **55 MPH** unless posted otherwise. Recommended off-road towing is not to exceed **15 MPH** or less depending on type of terrain.

- Avoid sudden stops and starts. This can cause skidding, or jack-knifing. Smooth, gradual starts and stops will improve towing.
- Avoid sharp turns to prevent rolling.
- Trailer should be adjusted to a level position at all times when towing.
- Raise and lock trailer wheel stand in up position when towing.
- Place **chock blocks** underneath wheel to prevent **rolling** while parked.
- Place **support blocks** underneath the trailer’s bumper to prevent **tipping** while parked.
- Use the trailer’s swivel jack to adjust the trailer height to a level position while parked.

## ENVIRONMENTAL SAFETY

### NOTICE

- 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.



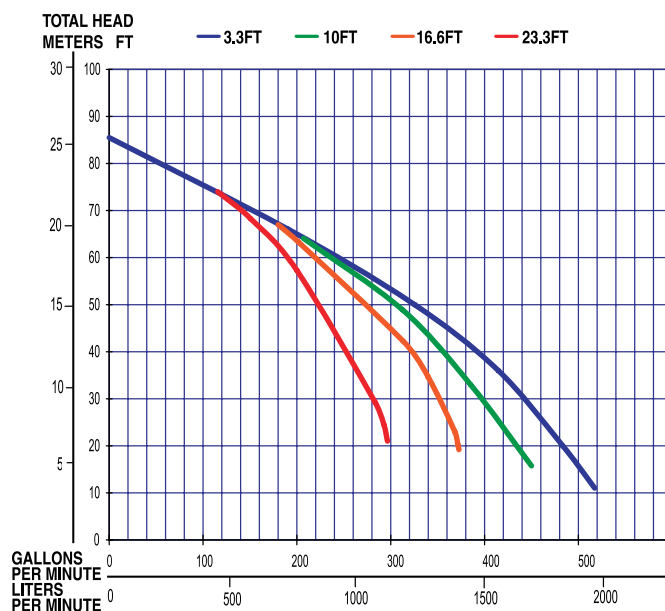
# SPECIFICATIONS

**Table 1. Pump Specifications**

Model	QP4TZT10P	QP4TZTMP16F	QP4TZTMPXF
Type	Trash Pump		
Suction x Discharge Size	4 x 4 in. (100 x 100 mm)		
Maximum Pumping Capacity	526 gal/minute (2000 liters/minute)		
Maximum Solids Diameter	1.50 in. (38 mm)		
Maximum Lift	25 ft. (7.62 m)		
Maximum Head	85 ft. (26 m)		
Dry Net Weight (Pump)	265 lb (120 kg)		
Dry Net Weight (Pump and Trailer)	550 lb (250 kg)	665 lb (302 kg)	735 lb (334 kg)
Fuel Tank Capacity	5.2 quarts (5 liters)	16 gal (60.6 liters)	28 gal (106 liters)

**Table 2. Engine Specifications**

Engine Make	HATZ 1B40U-2203A
Engine Type	Air-Cooled, 4-Stroke, Single Cylinder, Diesel Engine
Cylinder Bore x Stroke	3.5 x 3in (88 x 76 mm)
Displacement	29 in. <sup>3</sup> (462 cm <sup>3</sup> )
Maximum Output	9.9 HP @3600 RPM (7.4 kW)
Fuel Tank Capacity	5.2 quarts (5 liters)
Oil Capacity	1.6 quarts (1.5 liters)
Starting Method	Electric/Recoil Start
Dry Net Weight	121.25 lbs (55 kg)



**Figure 1. Performance Curve**

# DIMENSIONS

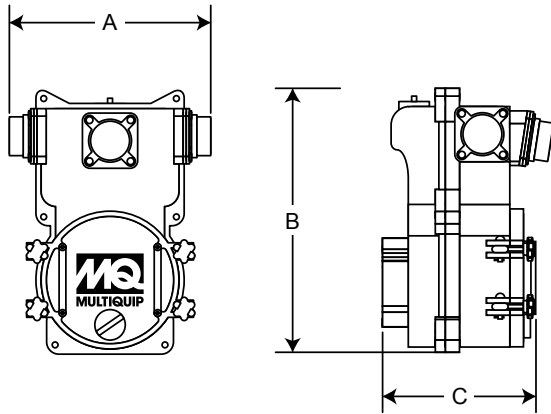


Table 3. Dimensions		
Reference Letter	QP4TZTMP16F/ QP4TZTMPXF in. (mm)	QP4TZT10P in. (mm)
A	19 (485)	
B	24.2 (615)	
C	13.5 (343)	
D	49 (1,245)	
E	56.5 (1,435)	52.4 (1,331)
F	44.5 (1,130)	
G	23.5 (597)	
H	102 (2,591)	91.6 (2,327)
J	25 (635)	
K	67 (1,702)	
L	28.4 (721)	

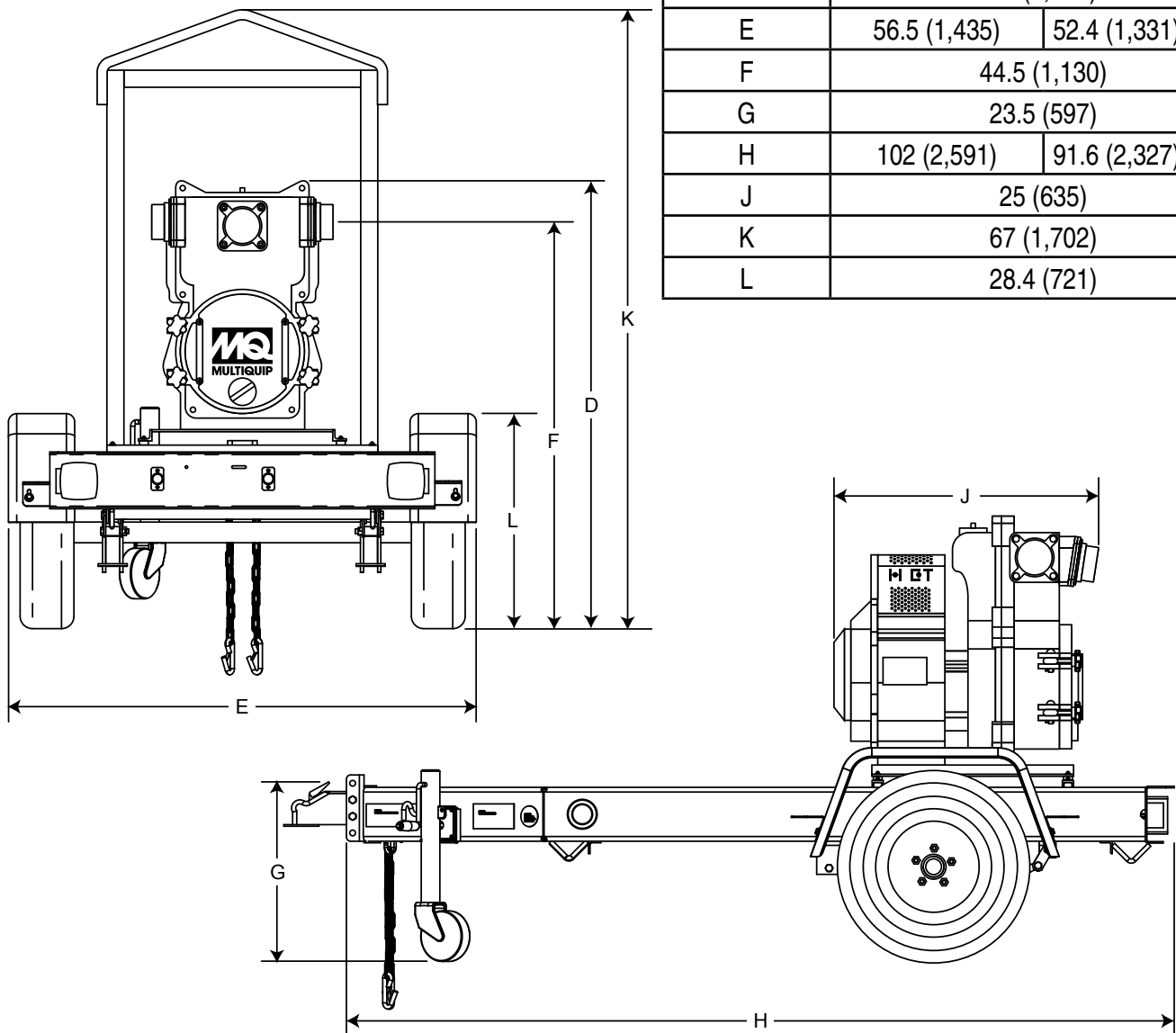


Figure 2. Dimensions

# GENERAL INFORMATION

## APPLICATION

The QP4TZ Trash Pump is designed to be used for dewatering applications. Both the suction and discharge ports on the trash pump use a 4-inch diameter opening, which allows it to pump at a rate of approximately 526 gallons/minute (gpm) or 2,000 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 a 9.9 horsepower, air-cooled, HATZ 1B40 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 handles 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.

## TRAILER

The QP4TZT10P is equipped with the TRLR10P trailer (without fuel cell) for basic trailer application.

The QP4TZTMP16F is equipped with the 16-gallon Multi-Purpose TRLRMP16FP trailer.

The QP4TZTMPXF is equipped with the 28-gallon Multi-Purpose TRLRMPXFP trailer.

## 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 4 shows suction lift at various elevations.

**Table 4. Suction Lift at Various Elevations**

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

Table 5 shows percentage drops in performance as elevation increases.

**Table 5. 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%

## COMPONENTS (PUMP)

Figure 3 shows a typical application using the QP4TZ 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 (38 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.

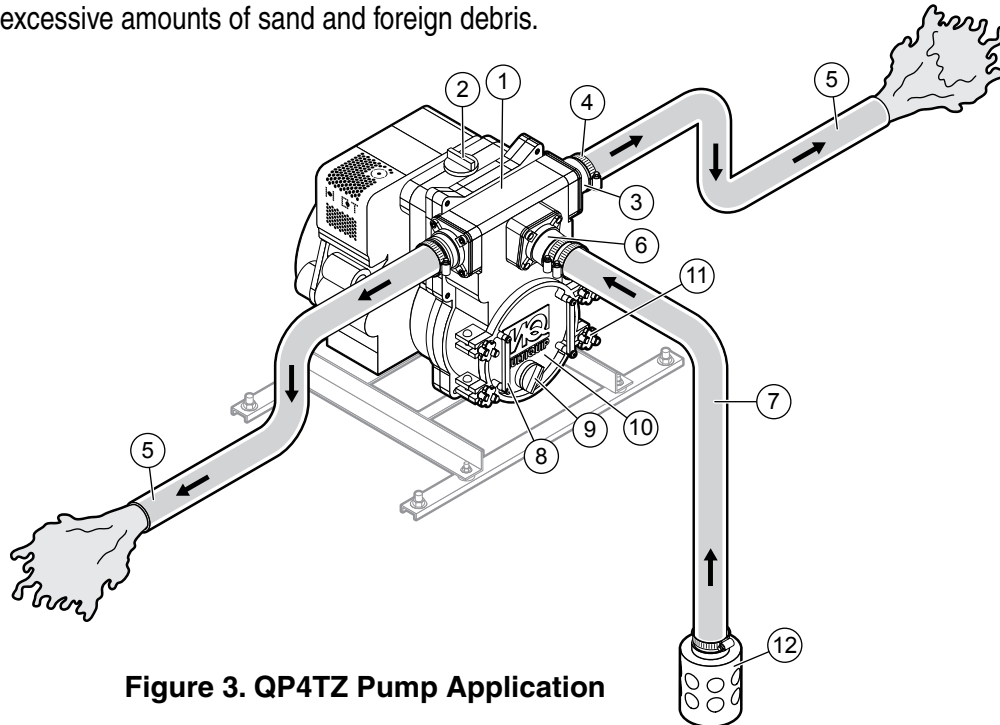
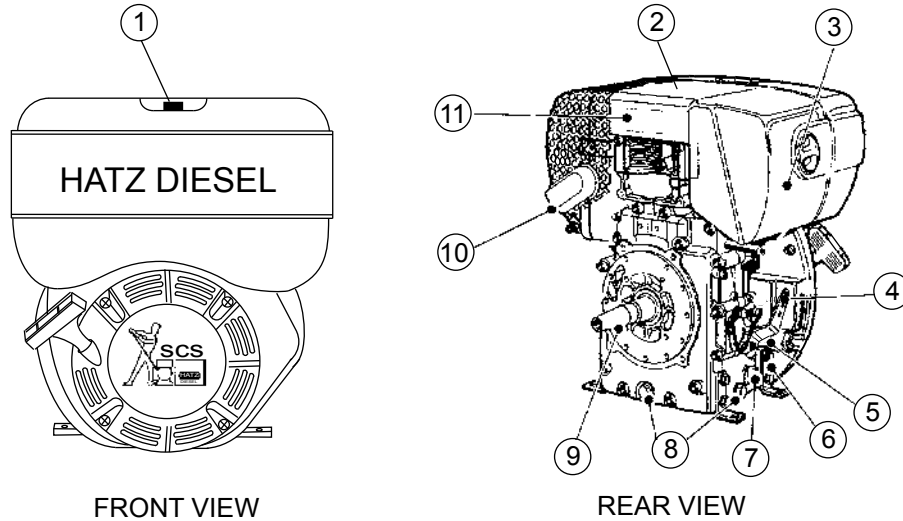


Figure 3. QP4TZ Pump Application

- 1. Pump** — The model QP4TZ is a 4-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 4-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 4-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.




**Figure 4. Engine Controls and Components**

## INITIAL SERVICING

The engine (Figure 4) must be checked for proper lubrication and filled with fuel prior to operation. Refer to the manufacturer's engine manual for instructions and details of operation and servicing.

1. **Fuel Filler Cap/Fuel Tank** — Pull this latch to add diesel fuel to the tank. After refueling, always make sure the fuel cap is latched properly. **DO NOT** over fill. For additional information refer to engine owner's manual.

**⚠ DANGER**




Adding fuel to the tank should be accomplished 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.

2. **Engine Lifting Straps/Cover** — Remove the air cleaner cover, then lift this cover (the one with decals on it) to gain access to the engine lifting straps.
3. **Air Cleaner/Cover** — Prevents dirt and other debris from entering the fuel system. Remove wing-nut on side of air filter cover to gain access to filter element.
4. **Speed Control Lever** — This lever is connected to the throttle control which is located on the side of the engine compartment cover. Use this lever to control engine speed.

5. **Dip Stick** — Remove dipstick to determine if the engine oil level is low. If low, add oil as specified.
6. **Engine Motor Mounts** — Attach these engine mounts to the pump frame. Tighten securely.
7. **Oil Filter** — Remove this bolt to gain access (internal) to the engine oil filter. Service the oil filter as recommended in the maintenance section of this manual.
8. **Oil Drain Plugs** — There are two oil drain plugs, one is underneath the flywheel, the other on the side of the engine. Remove these plugs to drain engine oil from the engine crankcase.
9. **Crankshaft** — Connect this shaft to the input of the transmission.
10. **Muffler** — Used to reduce noise and emissions.
11. **Nameplate** — Contains information about the engine.

**⚠ WARNING**



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


**NOTICE**

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




# INSPECTION (ENGINE)

**DANGER**



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

**CAUTION**



**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.

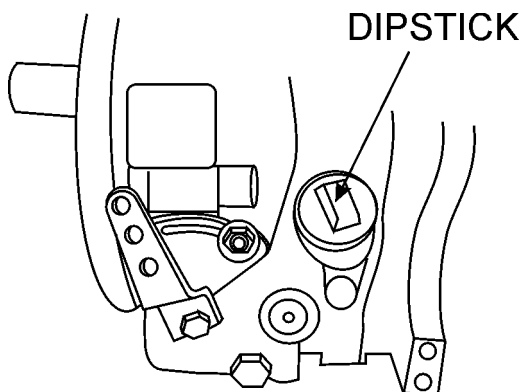


Figure 5. Engine Oil Dipstick (Removal)

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 6). Maximum oil capacity is 1.6 quarts (1.5 liters).

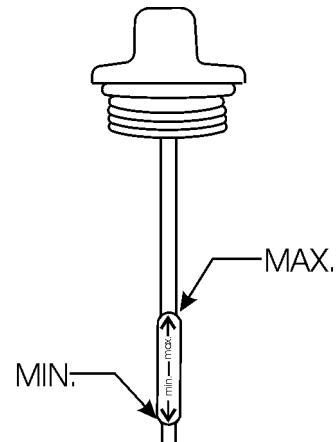



Figure 6. Engine Oil Dipstick (Oil Level)

Table 6. Oil Type		
Season	Temperature	Oil Type
Summer	25°C or Higher	SAE 10W-30
Spring/Fall	25°C ~ 10°C	SAE 10W-30/20
Winter	0°C or Lower	SAE 10W-10

**DANGER**



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

## Fuel Check

1. Remove the fuel cap located on top of fuel tank.
2. Visually inspect to see if the fuel level is low. If fuel is low, replenish with diesel 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. Move the trailer as near to the water as possible.
3. To prime pump, remove fill cap (Figure 3) and fill pump casing with water. If the pump casing is not filled with water before starting, it will not begin pumping.

### NOTICE

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 3) 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 3) 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.

### NOTICE

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

6. 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.
7. Make sure the suction strainer (Figure 3) 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.

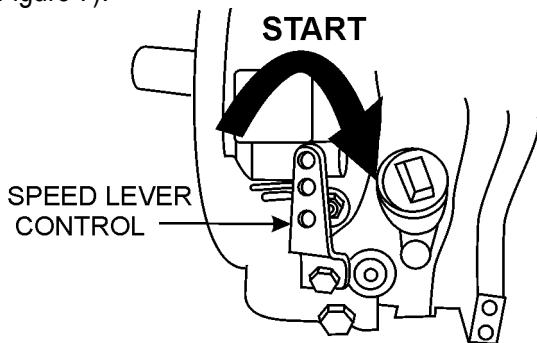
**CAUTION**



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

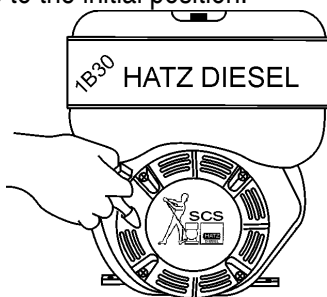
## STARTING THE ENGINE - RECOIL START

1. Move the speed lever control to the START position (Figure 7).



**Figure 7. Engine Speed Lever Control (START)**

2. Grasp the starter grip (Figure 8) and slowly pull it out until you feel the strongest resistance then return the starter grip to the initial position.



**Figure 8. Starter Grip**

**CAUTION**

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

3. Pull the starter grip again, hard and fast, pulling it all the way out to start engine.
4. If the engine does not start, repeat steps 2 and 3.

**CAUTION**

ALWAYS run engine at full speed while pumping.

## Engine Indicators

**Engine Running (Happy Face)** — indicates that the engine and associated components are functioning correctly.

**Battery Charge** — indicates that the battery charging system is not working correctly. If this LED remains on, stop the engine and correct the problem.

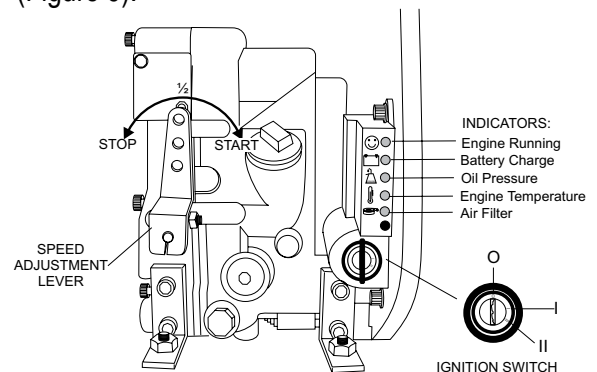
**Oil Pressure** — indicates that the oil pressure is low. If this LED remains on, stop the engine and correct the problem.

**Water Temperature** — indicates that the water temperature is too high. If this LED remains on, stop the engine and correct the problem.

**Air Filter** — indicates that the filter is dirty and is not functioning correctly. If this LED remains on, stop the engine and correct the problem.

## STARTING THE ENGINE — ELECTRIC START

1. Move the speed lever control to the START position (Figure 9).



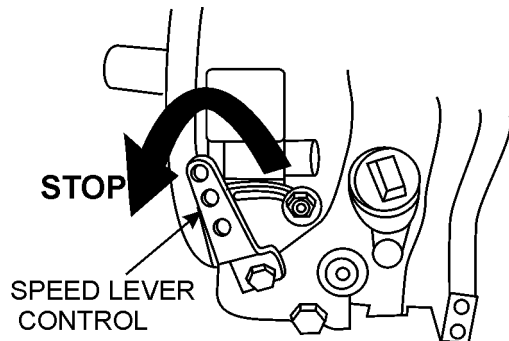
**Figure 9. Engine Electric Start**

2. Turn the key in the ignition switch to position I and verify that the BATTERY CHARGE indicator comes on (Figure 9).
3. Continue turning the ignition key to position II. Verify that the BATTERY CHARGE indicator and the OIL PRESSURE indicator goes off and the ENGINE RUNNING indicator comes on immediately as soon as the engine starts.
4. Release the key as soon as the engine runs. The key should spring back to position I and remain there during operation.
5. If the engine does not start, return the key to position I before starting the engine again.

## 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 10).



**Figure 10. Engine Speed Lever Control (STOP)**

3. Slowly pull the starter grip (Figure 8) 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

To perform the pump vacuum test do the following:

### NOTICE

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.

1. Remove the pump fill cap (Figure 3), and fill the pump with water.
2. Start the engine as outlined in the initial start-up section, and wait for the pump to begin pumping.
3. As shown in Figure 11, 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 11) 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.

### NOTICE

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

7. If the vacuum tester gauge indicates a reading below -20 in. Hg, it can then be assumed that the pump is not functioning
8. 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.

### NOTICE

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 wears 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

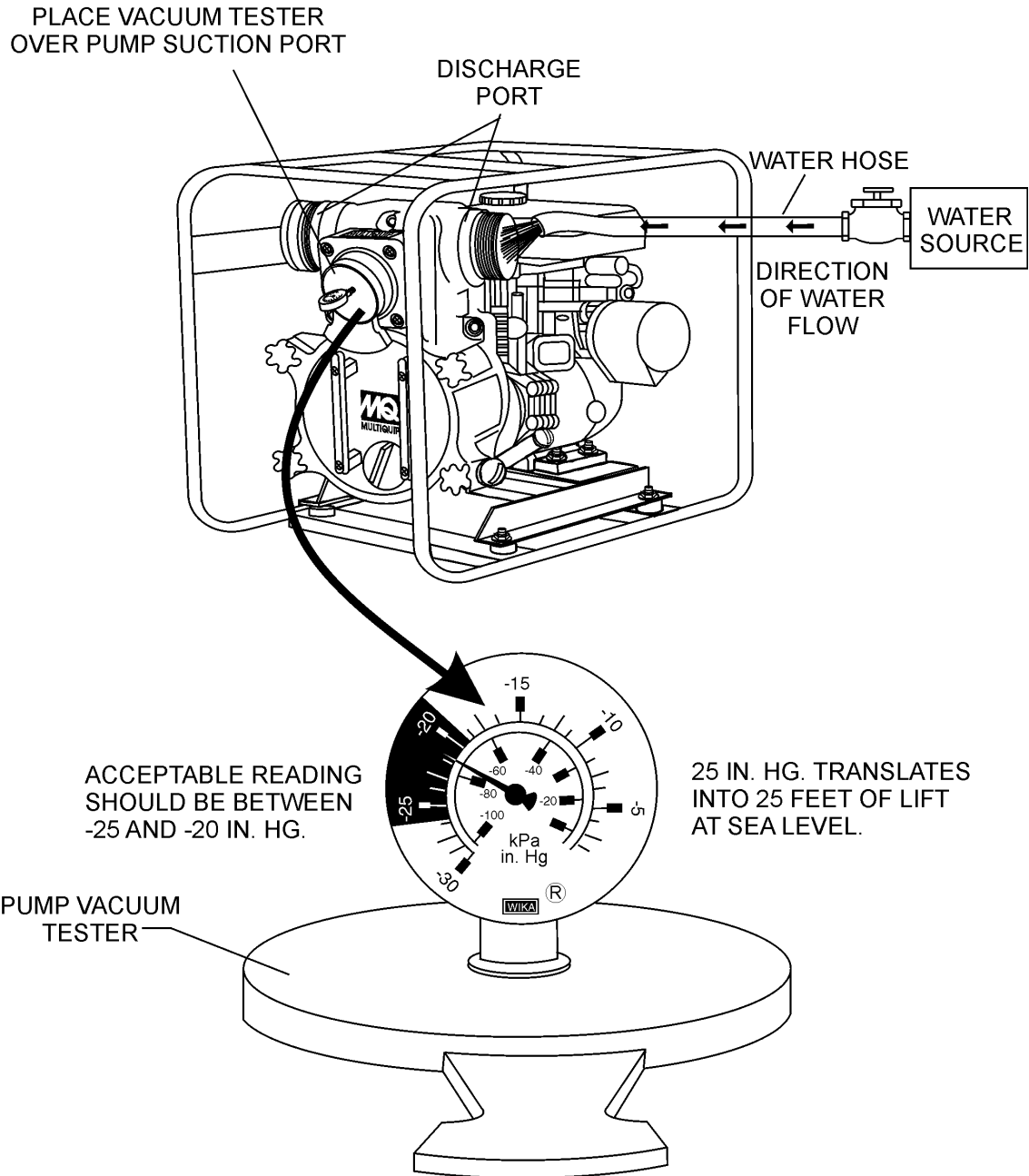
After pumping water containing large amounts of dirt and debris, perform the following:

1. Remove the drain plug from the pump housing (Figure 3) 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.



**Figure 11. Pump Vacuum Tester**

## ENGINE MAINTENANCE

Perform engine maintenance procedures as referenced by Table 7 below:

Table 7. Engine Maintenance Schedule							
DESCRIPTION (3)	OPERATION	BEFORE USE	FIRST MONTH OR 10 HRS.	EVERY 3 MONTHS OR 25 HRS.	EVERY 6 MONTHS OR 50 HRS.	EVERY YEAR OR 100 HRS	EVERY 2 YEARS OR 200 HRS
Engine Oil	CHECK	X					
	CHANGE		X				
Air Cleaner	CHECK	X					
	CHANGE			X (1)			
All Nuts and Bolts	Retighten 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)					
<i>(1) Service more frequently when used in dusty areas.</i>							
<i>(2) These items should be serviced by your service dealer, unless you have the proper tools and are mechanically proficient. Refer to the Hatz shop manual for service procedures.</i>							
<i>(3) For commercial use, log hours of operation to determine proper maintenance intervals.</i>							

### NOTICE

Refer to engine manual for specific servicing instructions.

Perform the engine maintenance procedures as indicated below:

## DAILY

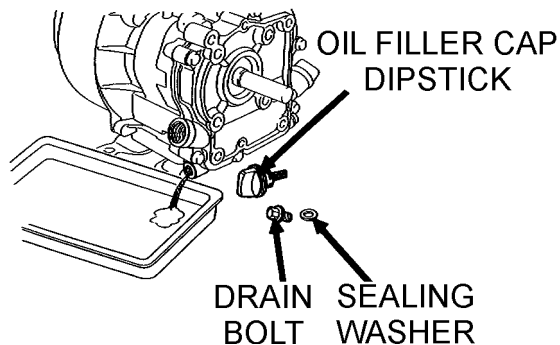
1. Thoroughly remove dirt and oil from the engine and control area.
2. Clean or replace the air cleaner elements as necessary. Check and retighten all fasteners as necessary.
3. Check the spring box and bellows for oil leaks. Repair or replace as needed.

## WEEKLY

1. Remove the fuel filter cap and clean the inside of the fuel tank.
2. 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 12.

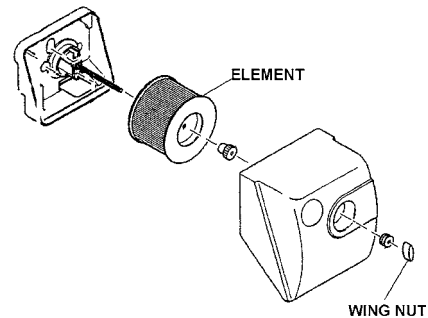


**Figure 12. Engine Oil (Draining)**

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 6. Engine oil capacity is 1.6 quarts (1.5 liters). DO NOT overfill.
4. Install drain bolt with sealing washer and tighten securely.

## ENGINE AIR CLEANER

1. Loosen the wing nut and detach the cover of the air cleaner shown in Figure 13.



**Figure 13. Engine Air Cleaner**

2. Tap the element (Figure 13) several times on a hard surface to remove dirt, or blow compressed air, not exceeding 30 psi (207 kPa, 2.1 kgf/cm<sup>2</sup>), 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.



## TRAILER MAINTENANCE

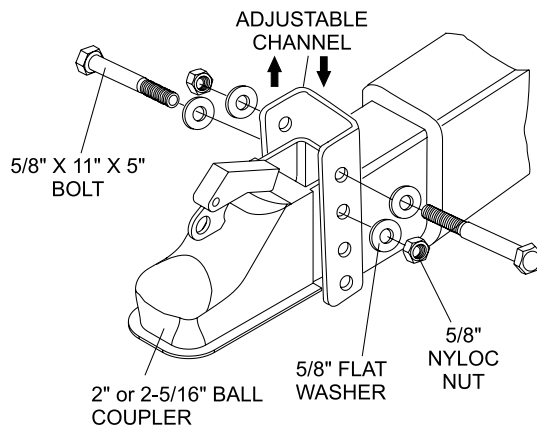
The following trailer maintenance guidelines are intended to assist the operator in preventive maintenance.

### Adjustable Channel

Your trailer may be equipped with an adjustable channel (Figure I) that allows the coupler to be raised or lowered to a desired height. Periodically check the channel bolts for damage or loosening.

#### NOTICE

When replacing channel mounting hardware (nuts, bolts and washers), **NEVER** substitute substandard hardware. Pay close attention to **bolt length** and **grade**. **ALWAYS** use manufacturer's recommended parts when replacing channel mounting hardware.



**Figure I. Adjustable Channel**

### Wheel Bearings

Wheel bearings (Figure II) must be inspected and lubricated once a year or 12,000 miles to insure safe operation of your trailer.

If trailer wheel bearings are immersed in water, they must be replaced.

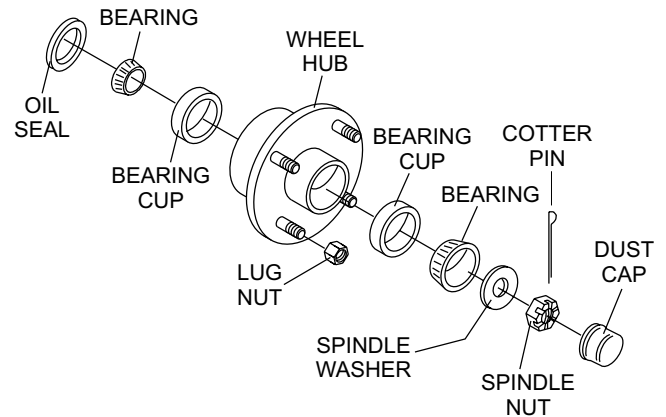
#### **DANGER**

If trailer wheels are under water for a long period of time, wheel bearings may fail. If this is the case, service wheel bearings immediately.

The possibility exists of the wheels falling off causing equipment damage and severe bodily harm even death!

If the trailer has not been used for an extended amount of time, have the bearings inspected and packed more frequently, at least every six months and prior to use.

Follow the steps below to disassemble the wheel hub and service the wheel bearings. See Figure II.



**Figure II. Wheel Hub Components**

- After removing the dust cap, cotter pin, spindle nut and spindle washer, remove the hub to inspect the bearings for wear and damage.
- Replace bearings that have flat spots on rollers, broken roller cages, rust or pitting. Always replace bearings and cups in sets. The inner and outer bearings are to be replaced at the same time.
- Replace seals that have nicks, tears or wear.
- Lubricate the bearings with a high quality EP-2 automotive wheel bearing grease.

### Wheel Hub Adjustment

Every time the wheel hub is removed and the bearings are reassembled, follow the steps below to check the wheel bearings for free running and adjust.

- Turn the hub slowly, by hand, while tightening the spindle nut until you can no longer turn the hub by hand.
- Loosen the spindle nut just until you are able to turn it (the spindle nut) by hand. Do not turn the hub while the spindle nut is loose.
- Install a new cotter pin through the spindle nut and axle.
- Check the adjustments. Both the hub and the spindle nut should be able to move freely (the spindle nut motion will be limited by the cotter pin).

## **! DANGER**

**NEVER** crawl under the trailer unless it is on firm and level ground and resting on properly placed and secured jackstands.

The possibility exists of the trailer falling thus causing equipment damage and severe bodily harm even death!

## **! DANGER**

When performing trailer inspection and maintenance activities, you must jack up the trailer using jacks and jackstands.

When jacking and using jackstands, place them so as to clear wiring, brake lines, and suspension parts (i.e., springs, torsion bars). Place jacks and jackstands inside of the perimeter strip on the supporting structure to which the axles are attached.

## **! DANGER**

Improper weld repair will lead to early failure of the trailer structure and can cause serious injury or death.

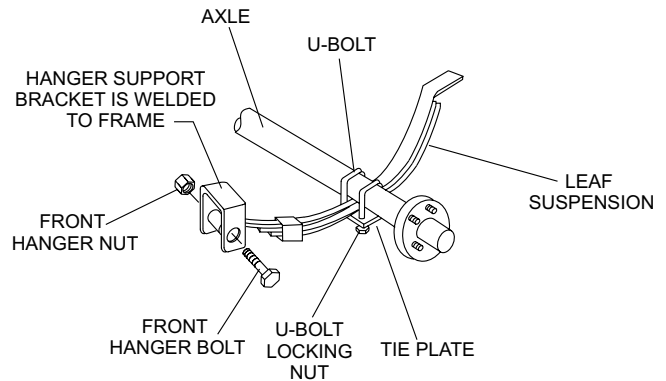
**DO NOT** repair cracked or broken welds unless you have a certified welder perform the repair. If not, have the welds repaired by your dealer.

## **! WARNING**

If the trailer is involved in an accident, have it inspected immediately by qualified personnel. In addition, the trailer should be inspected annually for signs of wear or deformations.

## Leaf Suspension

The leaf suspension springs and associated components (Figure III) should be visually inspected every 6,000 miles for signs of excessive wear, elongation of bolt holes, and loosening of fasteners. Replace all damaged parts (suspension) immediately.



**Figure III. Leaf Suspension Components**

## **! DANGER**

Worn or broken suspension parts can cause loss of control, damage to equipment and severe bodily injury, even death!

Check suspension regularly.

# TRAILER SAFETY GUIDELINES

The following guidelines are intended to assist the operator in the operation and handling of a trailer.

Safety precautions should be followed at all times when operating a trailer. Failure to read, understand and follow the safety guidelines could result in injury to yourself and others. Loss of control of the trailer or tow vehicle can result in death or serious injury.

## COMMON CAUSES FOR LOSS OF TRAILER

- Driving too fast for the conditions (maximum speed when towing a trailer is 55 mph).
- Overloading the trailer or loading the trailer unevenly.
- Trailer improperly coupled to the hitch.
- No braking on trailer.
- Not maintaining proper tire pressure.
- Not keeping lug nuts tight.
- Not properly maintaining the trailer structure.
- Ensure machine is towed level to tow vehicle.

## TRAILER TOWING GUIDELINES

- Recheck the load tiedowns to make sure the load will not shift during towing.
- Before towing, check coupling, safety chain, safety brake, tires, wheels and lights.
- Check the lug nuts or bolts for tightness.
- Check coupler tightness after towing 50 miles.
- Use your mirrors to verify that you have room to change lanes or pull into traffic.
- Use your turn signals well in advance. Allow plenty of stopping space for your trailer and tow vehicle.
- Allow plenty of stopping space for your trailer and tow vehicle.
- **DO NOT** drive so fast that the trailer begins to sway due to speed.
- Allow plenty of room for passing. A rule of thumb is that the passing distance with a trailer is 4 times the passing distance without the trailer.

- Shift your automatic transmission into a lower gear for city driving.
- **ALWAYS** use lower gears for climbing and descending grades.
- **DO NOT** ride the brakes while descending grades, they may get so hot that they stop working. Then you will potentially have a runaway tow vehicle and trailer.
- To conserve fuel, don't use full throttle to climb a hill. Instead, build speed on the approach.
- Slow down for bumps in the road. Take your foot off the brake when crossing the bump.
- **DO NOT** brake while in a curve unless absolutely necessary. Instead, slow down before you enter the curve and power through the curve. This way, the towing vehicle remains in charge.
- **DO NOT** apply the brakes to correct extreme trailer swaying. Continued pulling of the trailer, and even slight acceleration, will provide a stabilizing force.
- Anticipate the trailer "swaying." Swaying is the trailer reaction to the air pressure wave caused by passing trucks and buses. Continued pulling of the trailer provides a stabilizing force to correct swaying. **DO NOT** apply the brakes to correct trailer swaying.
- Use lower gear when driving down steep or long grades. Use the engine and transmission as a brake. Do not ride the brakes, as they can overheat and become ineffective.
- Be aware of your trailer height, especially when approaching roofed areas and around trees.
- Make regular stops, about once each hour. Confirm that:
  - Coupler is secure to the hitch and is locked.
  - Electrical connectors are secure.
  - There is appropriate slack in the safety chains.
  - There is appropriate slack in the breakaway switch pullpin cable.
  - Tires are not visibly low on pressure.

# TRAILER SAFETY GUIDELINES

## DRIVING CONDITIONS

When towing a trailer, you will have decreased acceleration, increased stopping distance, and increased turning radius (which means you must make wider turns to keep from hitting curbs, vehicles, and anything else that is on the inside corner). In addition, you will need a longer distance to pass, due to slower acceleration and increased length.

- Be alert for slippery conditions. You are more likely to be affected by slippery road surfaces when driving a tow vehicle with a trailer, than driving a tow vehicle without a trailer.
- Check rearview mirrors frequently to observe the trailer and traffic.
- **NEVER** drive faster than what is safe.

### WARNING

Driving too fast for severe road conditions can result in loss of control and cause death or serious injury.

Decrease your speed as road, weather, and lighting conditions deteriorate.

Always check for local trailer tow speed limits in your area.

### WARNING

Do not transport people on the trailer. The transport of people puts their lives at risk and may be illegal.

## COUPLING TO THE TOW VEHICLE

Follow all of the safety precautions and instructions in this manual to ensure safety of persons, equipment, and satisfactory life of the trailer. Always use an adequate tow vehicle and hitch. If the vehicle or hitch is not properly selected and matched to the Gross Vehicle Weight Rating (GVWR) of your trailer, you can cause an accident that could lead to death or serious injury.

If you already have a tow vehicle, know your vehicle tow rating and make certain the trailer's rated capacity is less than or equal to the tow vehicle's rated towing capacity. If you already have (or plan to buy) a trailer, make certain that the tow rating of the tow vehicle is equal to or greater than that of the trailer.

The trailer VIN tag contains the critical safety information

for the use of your trailer. Again, be sure your hitch and tow vehicle are rated for the Gross Vehicle Weight Rating of your trailer.

### WARNING

Proper selection and condition of the coupler and hitch are essential to safely towing your trailer. A loss of coupling may result in death or serious injury.

- Be sure the hitch load rating is equal to or greater than the load rating of the coupler.
- Be sure the hitch size matches the coupler size.
- Observe the hitch for wear, corrosion and cracks before coupling. Replace worn, corroded or cracked hitch components before coupling the trailer to the tow vehicle.
- Be sure the hitch components are tight before coupling the trailer to the tow vehicle.

### WARNING

An improperly coupled trailer can result in death or serious injury.

**DO NOT** move the trailer until:

- The coupler is secured and locked to hitch.
- The safety chains are secured to the tow vehicle.
- The trailer jack(s) are fully retracted.

**DO NOT** tow the trailer on the road until:

- Tires and wheels are checked.
- The trailer brakes are checked.
- The breakaway switch is connected to the tow vehicle.
- The load is secured to the trailer.
- The trailer lights are connected and checked.

### WARNING

Use of a hitch with a load rating less than the load rating of the trailer can result in loss of control and may lead to death or serious injury.

Use of a tow vehicle with a towing capacity less than the load rating of the trailer can result in loss of control, and may lead to death or serious injury.

Be sure your hitch and tow vehicle are rated for the Gross Vehicle Weight Rating of your trailer.

# TRAILER SAFETY GUIDELINES

## INOPERABLE BRAKES, LIGHTS OR MIRRORS

Be sure that the brakes and all of the lights on your trailer are functioning properly before towing your trailer. Check the trailer taillights by turning on your tow vehicle headlights. Check the trailer brake lights by having someone step on the tow vehicle brake pedal while you look at trailer lights. Do the same thing to check the turn signal lights. See Trailer Wiring Diagram section in this manual.

Standard mirrors usually do not provide adequate visibility for viewing traffic to the sides and rear of a towed trailer. You must provide mirrors that allow you to safely observe approaching traffic.

### WARNING

Improper electrical connection between the tow vehicle and the trailer will result in inoperable lights and can lead to collision.

Before each tow, check that the tail lights, brake lights and turn signals work.

## TRAILER TOWING TIPS

Driving a vehicle with a trailer in tow is vastly different from driving the same vehicle without a trailer in tow. Acceleration, maneuverability and braking are all diminished with a trailer in tow.

It takes longer to get up to speed, you need more room to turn and pass, and more distance to stop when towing a trailer. You will need to spend time adjusting to the different feel and maneuverability of the tow vehicle with a loaded trailer.

Because of the significant differences in all aspects of maneuverability when towing a trailer, the hazards and risks of injury are also much greater than when driving without a trailer. You are responsible for keeping your vehicle and trailer in control, and for all the damage that is caused if you lose control of your vehicle and trailer.

As you did when learning to drive an automobile, find an open area with little or no traffic for your first practice trailering. Of course, before you start towing the trailer, you must follow all of the instructions for inspection, testing, loading and coupling. Also, before you start towing, adjust the mirrors so you can see the trailer as well as the area to the rear of it.

Drive slowly at first, 5 mph or so, and turn the wheel to get the feel of how the tow vehicle and trailer combination responds. Next, make some right and left hand turns. Watch in your side mirrors to see how the trailer follows the tow vehicle. Turning with a trailer attached requires more room.

Stop the rig a few times from speeds no greater than 10 mph. If your trailer is equipped with brakes, try using different combinations of trailer brake and tow vehicle brake. Note the effect that the trailer brakes have when they are the only brakes used. When properly adjusted, the trailer brakes will come on just before the tow vehicle brakes.

It will take practice to learn how to back up a tow vehicle with a trailer attached. Take it slow. Before backing up, get out of the tow vehicle and look behind the trailer to make sure that there are no obstacles.

Some drivers place their hands at the bottom of the steering wheel, and while the tow vehicle is in reverse, “think” of the hands as being on the top of the wheel. When the hands move to the right (counterclockwise, as you would do to turn the tow vehicle to the left when moving forward), the rear of the trailer moves to the right. Conversely, rotating the steering wheel clockwise with your hands at the bottom of the wheel will move the rear of the trailer to the left while backing up.

If you are towing a bumper hitch rig, be careful not to allow the trailer to turn too much because it will hit the rear of the tow vehicle. To straighten the rig, either pull forward or turn the steering wheel in the opposite direction.

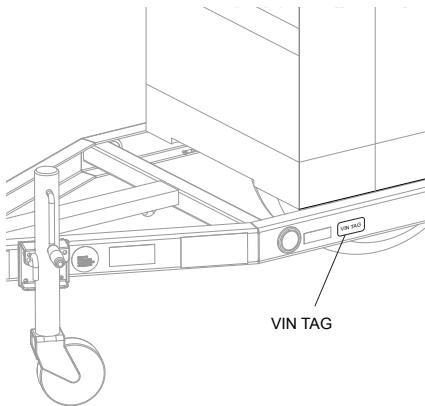
## TRAILER VIN TAG

Figure A below is a sample of the Vehicle Identification Number (VIN) Tag which is typically located on the left front of the trailer. See Figure B for location.

UFACTURED BY / FABRIQUE PAR:		DATE	
R / PNRV	KG ( LB)		
R (EACH AXLE) / PNRB (CHAQUE ESSIEU)	KG ( LB)	TIRES / PNEU	
/ JANTB			
I INFL. PRESS. / PRESS. DE GONFL. A FROID	KPA (	PSI / LPO	<input type="checkbox"/> SINGLE <input type="checkbox"/> DUAL
VEHICLE CONFORMS TO ALL APPLICABLE U.S. FEDERAL MOTOR VEHICLE SAFETY STANDARDS IN EFFECT ON THE DATE OF MANUFACTURE SHOWN ABOVE.			
VEHICLE CONFORMS TO ALL APPLICABLE STANDARDS PRESCRIBED UNDER THE CANADIAN MOTOR VEHICLE SAFETY REGULATIONS IN EFFECT ON THE DATE OF MANUFACTURE. - LE VEHICULE EST			
JONCE A TOUTES LES NORMES QUI LIJ SONT APPLICABLES EN VERTU DU REGLEMENT SUR LA SECURITE DES VEHICULES AUTOMOBILES DU CANADA EN VALEUR A LA DATE DE SA FABRICATION.			
/ N.I.N.:	TYPE / TYPE: TRAILER TRA / REM		FD-306 REV A

Figure A. Vehicle VIN Tag

# TRAILER SAFETY GUIDELINES



**Figure B. VIN Tag Location**

The trailer VIN Tag contains the following critical safety information for the use of your trailer.

**GAWR:** The maximum gross weight that an axle can support. It is the lowest of axle, wheel, or tire rating.

Usually, the tire or wheel rating is lower than the axle rating, and determines GAWR.

**GVWR:** The maximum allowable gross weight of the trailer and its contents. The gross weight of the trailer includes the weight of the trailer and all of the items within it. GVWR is sometimes referred to as GTWR (Gross Trailer Weight Rating), or MGTW (Maximum Gross Trailer Weight). GVWR, GTWR and MGTW are all the same rating.

The sum total of the GAWR for all trailer axles may be less than the GVWR for the trailer, because some of the trailer load is to be carried by the tow vehicle, rather than by the trailer axle(s). The total weight of the cargo and trailer must not exceed the GVWR, and the load on an axle must not exceed its GAWR.

**PSIC:** The tire pressure (psi) measured when cold.

**VIN:** The Vehicle Identification Number.

**EMPTY WEIGHT:** Some information that comes with the trailer (such as the Manufacturer's Statement of Origin) is not a reliable source for "empty" or "net" weight. The shipping documents list average or standard weights and your trailer may be equipped with options.

To determine the "empty" or "net" weight of your trailer, weigh it on an axle scale. To find the weight of the trailer using an axle scale, you must know the axle weights of your tow vehicle without the trailer coupled. Some of the trailer weight will be transferred from the trailer to the tow vehicle axles, and an axle scale weighs all axles, including the tow vehicle axles.

## TOW VEHICLE

The towing hitch attached to your tow vehicle must have a capacity equal to or greater than the load rating of the trailer you intend to tow. The hitch capacity must also be matched to the tow vehicle capacity. Your vehicle dealer can provide and install the proper hitch on your tow vehicle.

## SUSPENSION SYSTEM

Sway bars, shock absorbers, heavy duty springs, heavy duty tires and other suspension components may be required to sufficiently tow the trailer and pump.

## SIDE VIEW MIRRORS

The size of the trailer that is being towed and your state law regulations determine the size of the mirrors. However, some states prohibit extended mirrors on a tow vehicle, except while a trailer is actually being towed. In this situation, detachable extended mirrors are necessary. Check with your dealer or the appropriate state agency for mirror requirements.

## HEAVY DUTY FLASHER

A Heavy Duty Flasher is an electrical component that may be required when your trailer turn signal lights are attached to the tow vehicle flasher circuit.

## ELECTRICAL CONNECTOR

An Electrical Connector connects the lights on the trailer to the lights on the towing vehicle.

## EMERGENCY FLARES AND TRIANGLE REFLECTORS

It is wise to carry these warning devices even if you are not towing a trailer. It is particularly important to have these when towing a trailer because the hazard flashers of your towing vehicle will not operate for as long a period of time when the battery is running both the trailer lights and tow vehicle lights.

# TRAILER SAFETY GUIDELINES

## SAFETY CHAINS

If the coupler connection comes loose, the safety chains can keep the trailer attached to the tow vehicle. With properly rigged safety chains, it is possible to keep the tongue of the trailer from digging into the road pavement, even if the coupler-to-hitch connection comes apart.

## JACKSTAND

A device on the trailer that is used to raise and lower the coupler. The jack is sometimes called the “landing gear” or the “tongue jack”.

## COUPLER TYPES

Two types of coupler used with the trailer are discussed below.

- Ball Hitch Coupler
- Pintel Eye Coupler

## BALL HITCH COUPLER

A ball hitch coupler (Figure C) connects to a ball that is located on or under the rear bumper of tow vehicle. This system of coupling a trailer to a tow vehicle is sometimes referred to as “bumper pull.”

A ball hitch trailer may be fitted with a tongue jack that can raise and lower the coupler. The tongue jack is mounted to the A-frame (front or tongue) part of the trailer. By rotating the jack handle clockwise, the jack will extend and raise the tongue of the trailer.

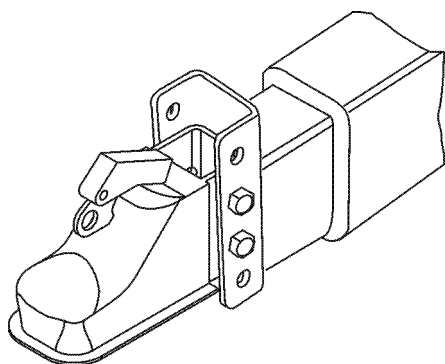


Figure C. Ball Hitch Coupler

Before each tow, coat the ball with a thin layer of automotive bearing grease to reduce wear and ensure proper operation.

Check the locking device that secures the coupler to the ball for proper operation.

If you see or feel evidence of wear, such as flat spots, deformations, pitting or corrosion, on the ball or coupler, immediately have your dealer inspect them to determine the proper action to prevent possible failure of the ball and coupler system. All bent or broken coupler parts must be replaced before towing the trailer.

The coupler handle lever must be able to rotate freely and automatically snap into the latched position. Oil the pivot points, sliding surfaces, and spring ends with SAE 30W motor oil. Keep the ball socket and latch mechanism clean. Dirt or contamination can prevent proper operation of the latching mechanism.

The load rating of the coupler and the necessary ball size are listed on the trailer tongue. You must provide a hitch and ball for your tow vehicle where the load rating of the hitch and ball is equal to or greater than that of your trailer.

Also, the ball size must be the same as the coupler size. If the hitch ball is too small, too large, is underrated, is loose or is worn, the trailer can come loose from the tow vehicle and may cause death or serious injury.

THE TOW VEHICLE, HITCH AND BALL MUST HAVE A RATED TOWING CAPACITY EQUAL TO OR GREATER THAN THE TRAILER **Gross Vehicle Weight Rating (GVWR)**. IT IS ESSENTIAL THAT THE HITCH BALL BE OF THE SAME SIZE AS THE COUPLER.

The ball size and load rating (capacity) are marked on the ball. Hitch capacity is marked on the hitch.

### WARNING

Coupler-to-hitch mismatch can result in uncoupling, leading to death or serious injury.

Be sure the **LOAD RATING** of the hitch ball is equal or greater than the load rating of the coupler.

Be sure the **SIZE** of the hitch ball matches the size of the ball coupler.

# TRAILER SAFETY GUIDELINES

## **WARNING**

A worn, cracked or corroded hitch ball can fail while towing and may result in death or serious injury.

Before coupling trailer, inspect the hitch ball for wear, corrosion and cracks.

Replace worn or damaged hitch ball.

## **WARNING**

A loose hitchball nut can result in uncoupling, leading to death or serious injury.

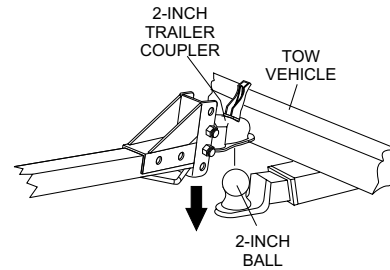
Be sure the hitch ball is tight to the hitch before coupling the trailer.

- Rock the ball to make sure it is tightened to the hitch, and visually check that the hitch ball nut is solid against the lock washer and hitch frame.
- Wipe the inside and outside of the coupler. Clean and visually inspect it for cracks and deformations. Feel the inside of the coupler for worn spots and pits.
- Be sure the coupler is secured tightly to the tongue of the trailer. All coupler fasteners must be visibly solid against the trailer frame.
- The bottom surface of the coupler must be above the top of the hitch ball. Use the tongue jackstand to support the trailer tongue. Wood or concrete blocks may also be used.

## **Coupling the Trailer to the Tow Vehicle (Ball Coupler)**

- Lubricate the hitch ball and the inside of the coupler with a thin layer of automotive bearing grease.
- Slowly back up the tow vehicle so that the hitch ball is near or aligned under the coupler.
- Using the jackstand at the front of trailer (tongue), turn the jackstand crank handle to raise the trailer. If the ball coupler does not line up with the hitch ball, adjust the position of the tow vehicle.
- Open the coupler locking mechanism. Ball couplers have a locking mechanism with an internal moving piece and an outside handle. In the open position, the coupler is able to drop fully onto the hitch ball.

- Lower the trailer (Figure D) until the coupler fully engages the hitch ball.



**Figure D. Ball Hitch Coupling Mechanism**

- Engage the coupler locking mechanism. In the engaged position, the locking mechanism securely holds the coupler to the hitch ball.
- Insert a pin or lock through the hole in the locking mechanism.
- Be sure the coupler is all the way on the hitch ball and the locking mechanism is engaged. A properly engaged locking mechanism will allow the coupler to raise the rear of the tow vehicle. Using the trailer jackstand, verify that you can raise the rear of the tow vehicle by 1 inch after the coupler is locked to the hitch.
- Lower the trailer so that its entire tongue weight is held by the hitch.
- Raise the jackstand to a height where it will not interfere with the road.

## **NOTICE**

Overloading can damage the tongue jack. **DO NOT** use the tongue jack to raise the tow vehicle more than one inch.

If the coupler cannot be secured to the hitch ball, do not tow the trailer. Call your dealer for assistance. Lower the trailer so that its entire tongue weight is held by the hitch and continue retracting the jack to its fully retracted position.



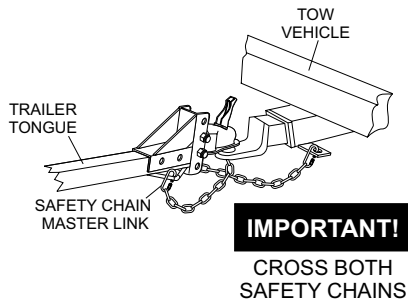
# TRAILER SAFETY GUIDELINES

## Attaching Safety Chain

Visually inspect the safety chains and hooks for wear or damage. Replace worn or damaged safety chains and hooks before towing.

Attach the safety chains so that they:

- Cross underneath the coupler. See Figure E.



**Figure E. Attaching Safety Chain (Ball Hitch)**

- Loop around a frame member of the tow vehicle or holes provided in the hitch system (DO NOT attach them to an interchangeable part of the hitch assembly).
- Have enough slack to permit tight turns, but not be close to the road surface, so if the trailer uncouples, the safety chains can hold the tongue up above the road

### **WARNING**

Improper rigging of the safety chains can result in loss of control of the trailer and tow vehicle, leading to death or serious injury, if the trailer uncouples from the tow vehicle.

- Fasten chains to frame of tow vehicle. DO NOT fasten chains to any part of the hitch unless the hitch has holes or loops specifically for that purpose.
- Cross chains underneath hitch and coupler with enough slack to permit turning and to hold tongue up, if the trailer comes loose.

## Connecting Trailer Lights

Connect the trailer lights to the tow vehicle's electrical system using the electric connectors at the front of the trailer (tongue). Refer to the wiring diagram shown in the trailer wiring diagram section of this manual. Before towing the trailer check for the following:

- Running lights (turn on tow vehicle headlights).
- Brake Lights (step on tow vehicle brake pedal).

- Backup Lights (place tow vehicle gear shift in reverse).
- Turn Signals (activate tow vehicle directional signal lever).

### **WARNING**

Improper electrical connection between the tow vehicle and the trailer will result in inoperable lights and electric brakes, and can lead to collision.

Before each tow:

- Check that the taillights, brake lights and turn signals work.
- Check that the electric brakes work by operating the brake controller inside the tow vehicle.

## Uncoupling the Ball Hitch

Follow these steps to uncouple ball hitch from tow vehicle:

- Block trailer tires to prevent the trailer from rolling, before jacking the trailer up.
- Disconnect the electrical connector.
- Disconnect the breakaway brake switch cable. Promptly replace the pullpin in the switchbox.
- Before extending jackstand, make certain the ground surface below the jackstand foot will support the tongue load.
- Rotate the jackstand handle (or crank) clockwise. This will slowly extend the jack and transfer the weight of the trailer tongue to the jack.

# TRAILER SAFETY GUIDELINES

## PINTLE HITCH COUPLER

A pintle eye coupler (Figure F) connects to a pintle-hook hitch that is located on or under the rear bumper of the tow vehicle. This system of coupling a trailer to a tow vehicle is sometimes referred to as a “lunette eye, tow ring or G.I. hitch.”

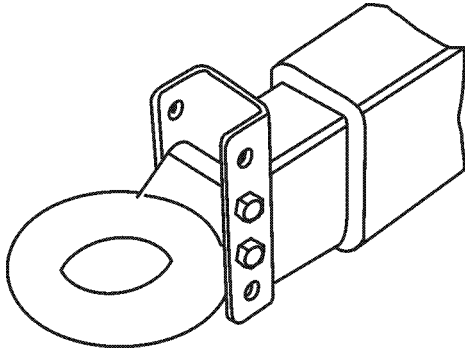


Figure F. Pintle Hitch Coupler

A pintle hitch trailer may be fitted with a tongue jackstand that can raise and lower the coupler. The tongue jack is mounted to the A-frame (front or tongue) part of the trailer. By rotating the jack handle clockwise, the jack will extend and raise the tongue of the trailer.

The load rating of the coupler and the necessary pintle hitch size are listed on the trailer tongue. You must provide a pintle hitch and pintle coupler for your tow vehicle, where the load rating of the pintle hitch and pintle coupler is equal to or greater than that of your trailer.

Also, the pintle hitch size must be the same as the pintle coupler size. If the hitch is too small, too large, underrated, loose or worn, the trailer can come loose from the tow vehicle, and may cause death or serious injury.

### Pintle Coupler and Pintle Hook

Before each tow, check the locking device that secures the coupler to the pintle hook assembly.

The pintle hook lever must be able to operate freely and automatically snap into place into the latched position. Lightly oil the pivot points and sliding surfaces with SAE30W motor oil to prevent rust and help ensure proper operation of the latching mechanism.

If you see or feel evidence of wear, such as flat spots, deformations, pitting or corrosion, on the pintle hook or coupler, immediately have your dealer inspect them to determine the proper action to prevent possible failure of the ball and coupler system. All bent or broken coupler parts must be replaced before towing the trailer.

THE TOW VEHICLE, PINTLE HITCH AND PINTLE COUPLER MUST HAVE A RATED TOWING CAPACITY EQUAL TO OR GREATER THAN THE TRAILER **Gross Vehicle Weight Rating (GVWR)**.

IT IS ESSENTIAL THAT THE PINTLE HITCH BE OF THE SAME SIZE AS THE PINTLE COUPLER.

The coupler size and load rating (capacity) are marked on the coupler. Hitch capacity is marked on the hitch.

### **WARNING**

Coupler-to-hitch mismatch can result in uncoupling, leading to death or serious injury.

Be sure the **LOAD RATING** of the pintle hitch hook is equal or greater than the load rating of the pintle eye coupler.

Be sure the **SIZE** of the pintle hitch hook matches the size of the pintle eye coupler.

### **WARNING**

A worn, cracked or corroded pintle hitch hook can fail while towing, and may result in death or serious injury.

Before coupling trailer, inspect the pintle hitch hook for wear, corrosion and cracks.

Replace worn or damaged pintle hitch hook.

- Rock the pintle eye coupler to make sure it is secured tightly to the hitch.
- Wipe the inside and outside of the pintle coupler. Clean and inspect it visually for cracks and deformations. Feel the inside of the coupler for worn spots and pits.
- Be sure the coupler is secured tightly to the tongue of the trailer. All coupler fasteners must be visibly solid against the trailer frame.

# TRAILER SAFETY GUIDELINES

- Raise the bottom surface of the coupler to be above the top of the pintle hitch hook. Use the tongue jackstand to support the trailer tongue. Wood or concrete blocks may also be used.

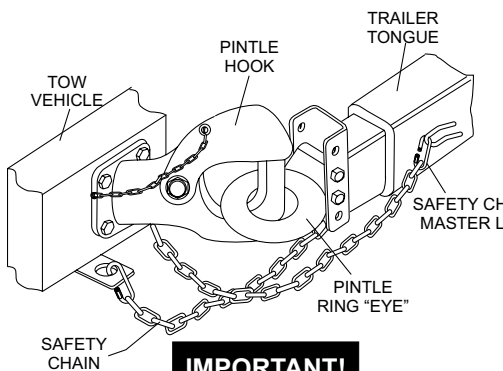
## **WARNING**

A defective pintle hitch not properly fastened can result in uncoupling, leading to death or serious injury.

Be sure the pintle hook is securely tightened to the tow vehicle before coupling the trailer.

## **Coupling Trailer to Tow Vehicle (Pintle Coupler)**

- Slowly back up the tow vehicle so that the pintle hitch hook is near or aligned under the pintle eye ring coupler.
- Using the jackstand at the front of trailer (tongue), turn the jackstand crank handle to raise the trailer. If the pintle eye coupler does not line up with the pintle hitch hook, adjust the position of the tow vehicle.
- OPEN the pintle hook locking mechanism (Figure G). Place the hook inside the eye coupler. CLOSE the pintle hook mechanism.



**IMPORTANT!**

CROSS BOTH

## **Figure G. Attaching Safety Chain (Pintle Hitch)**

- Insert a pin or lock through the hole in the locking mechanism.
- Be sure the pintle hook is inserted completely through the eye ring and the locking mechanism is engaged. A properly engaged locking mechanism will allow the coupler to raise the rear of the tow vehicle. Using the trailer jack, test to see that you can raise the rear of the tow vehicle by 1-inch after the coupler is locked to the hitch.

- Lower the trailer so that its entire tongue weight is held by the hitch.
- Raise the jackstand to a height where it will not interfere with the road.

## **TIRE SAFETY**

### **Unsafe Tires, Lug Nuts or Wheels**

Trailer tires and wheels are more likely to fail than car tires and wheels because they carry a heavier load. Therefore, it is essential to inspect the trailer tires before each tow.

If a tire has a bald spot, bulge, cuts, is showing any cords, or is cracked, replace the tire before towing. If a tire has uneven tread wear, take the trailer to a dealer service center for diagnosis.

Uneven tread wear can be caused by tire imbalance, axle misalignment or incorrect inflation.

Tires with too little tread will not provide adequate tracking on wet roadways and can result in loss of control, leading to death or serious injury.

Improper tire pressure causes an unstable trailer and can result in a tire blowout and loss of control. Therefore, before each tow you must also check the tire pressure. Tire pressure must be checked when tires are cold.

Allow 3 hours cool-down after driving as much as 1 mile at 40 mph before checking tire pressure. Trailer tires will be inflated to higher pressures than passenger vehicle tires.

Since trailer wheels and lug nuts (or bolts) are subjected to greater side loads than automobile wheels, they are more prone to loosen. Before each tow, check to make sure they are tight.

The proper tightness (torque) for lug nuts is listed in the lug nut tightening section of this manual. Use a torque wrench to tighten the lug nuts. If you do not have a torque

# TRAILER SAFETY GUIDELINES

wrench, use a lug wrench (from your tow vehicle) and tighten the nuts as much as you can. Then have a service garage or trailer dealer tighten the lug nuts to the proper torque.

## **WARNING**

Metal creep between the wheel rim and lug nuts will cause rim to loosen and could result in a wheel coming off, leading to death or serious injury.

Tighten lug nuts before each tow.

Lug nuts are also prone to loosen after first being assembled. When driving a new trailer (or after wheels have been remounted), check to make sure they are tight after the first 10, 25 and 50 miles of driving and before each tow thereafter.

Failure to perform this check can result in a wheel parting from the trailer and a crash, leading to death or serious injury.

## **WARNING**

Lug nuts are prone to loosen after initial installation, which can lead to death or serious injury.

Check lug nuts for tightness on a new trailer or when wheel(s) have been remounted after the first 10, 25 and 50 miles of driving.

## **WARNING**

Improper lug nut torque can cause a wheel parting from the trailer, leading to death or serious injury.

Be sure lug nuts are tight before each tow.

## **WARNING**

Improper tire pressure can result in a blowout and loss of control, which can lead to death or serious injury.

Be sure tires are inflated to pressure indicated on side wall before towing trailer.

## Determining Load Limit of Trailer

Determining the load limits of a trailer includes more than understanding the load limits of the tires alone. On all trailers there is a Federal certification/VIN label that is located on the forward half of the left (road) side of the unit.

This certification/VIN label will indicate the trailer's Gross Vehicle Weight Rating (GVWR). This is the most weight the fully loaded trailer can weigh. It will also provide the Gross Axle Weight Rating (GAWR). This is the most a the axle can weigh.

There is a vehicle placard (Figure H) located in the same location as the certification label described above. This placard provides tire and loading information. In addition, this placard will show a statement regarding maximum cargo capacity.

TIRE	SIZE	COLD TIRE PRESSURE
FRONT		
REAR		
SPARE		

**Figure H. Trailer Tire Placard**

If additional work items (hoses, tools, clamps etc.) are going to be added to the trailer, be sure they are distributed evenly to prevent overloading front to back and side to side. Heavy items should be placed low and as close to the axle positions as reasonable. Too many items on one side may overload a tire.

Excessive loads and/or underinflation cause tire overloading and, as a result, abnormal tire flexing occurs. This situation can generate an excessive amount of heat within the tire. Excessive heat may lead to tire failure. It is the air pressure that enables a tire to support the load, so proper inflation is critical. The proper air pressure may be found on the certification/VIN label and/or on the Tire and Loading Information placard. This value should never exceed the maximum cold inflation pressure stamped on the tire.

Perform the following steps to determine the load limit of your trailer.

### Step 1.

Locate the statement, "The weight of cargo should never exceed XXX kg or XXX lbs.," on your vehicle's Tire and Loading Information placard (Figure I). This value equals the available amount of equipment load capacity.

# TRAILER SAFETY GUIDELINES

## Step 2.

Determine the weight of the equipment being loaded on the tow vehicle. That weight may not safely exceed the available equipment load capacity. The trailer's Tire Information Placard is attached adjacent to or near the trailer's VIN (Certification) label at the left front of the trailer (See Figure I).

## Determining Load Limit of Tow Vehicle

### Step 1.

Locate the statement, "The combined weight of occupants and cargo should never exceed XXX lbs.," on your vehicle's placard.

### Step 2.

Determine the combined weight of the driver and passengers who will be riding in your vehicle.

### Step 3.

Subtract the combined weight of the driver and passengers from XXX kilograms or XXX pounds.

### Step 4.

The resulting figure equals the available amount of cargo and luggage capacity. For example, if the "XXX" amount equals 1400 lbs. and there will be five 150 lb. passengers in your vehicle, the amount of available cargo and luggage capacity is 650 lbs. (1400-750 (5 x 150) = 650 lbs.).

### Step 5.

Determine the combined weight of luggage and cargo being loaded on the vehicle. That weight may not safely exceed the available cargo and luggage capacity calculated in Step 4.

If your vehicle will be towing a trailer, load from your trailer will be transferred to your vehicle. Consult the tow vehicle's manual to determine how this weight transfer reduces the available cargo and luggage capacity of your vehicle.

Studies of tire safety show that maintaining proper tire pressure, observing tire and vehicle load limits (not carrying more weight in your vehicle than your tires or vehicle can safely handle), avoiding road hazards and inspecting tires for cuts, slashes and other irregularities are the most important things you can do to avoid tire failure, such as tread separation or blowout and flat tires. These actions,

along with other care and maintenance activities, can also:

- Improve vehicle handling.
- Help protect you and others from avoidable breakdowns and accidents.
- Improve fuel economy.
- Increase the tire life.

Use the information contained in this section to make tire safety a regular part of your vehicle maintenance routine. Recognize that the time you spend is minimal compared with the inconvenience and safety consequences of a flat tire or other tire failure.

## TIRE FUNDAMENTALS

Federal law requires tire manufacturers to place standardized information on the sidewall of all tires (Figure I). This information identifies and describes the fundamental characteristics of the tire and also provides a tire identification number for safety standard certification and in case of a recall.

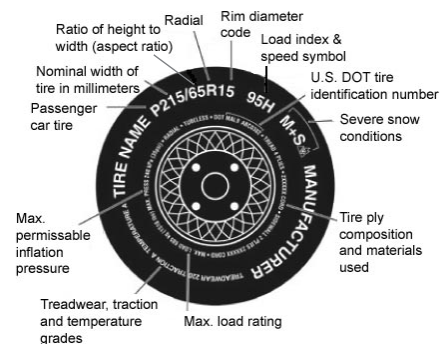


Figure I. Standard Tire Sidewall Information

**P:** The "P" indicates the tire is for passenger vehicles.

**Next number:** This three-digit number gives the width in millimeters of the tire from sidewall edge to sidewall edge. In general, the larger the number, the wider the tire.

**Next number:** This two-digit number, known as the aspect ratio, gives the tire's ratio of height to width. Numbers of 70 or lower indicate a short sidewall for improved steering response and better overall handling on dry pavement.

**P:** The "R" stands for radial. Radial ply construction of tires has been the industry standard for the past 20 years.

# TRAILER SAFETY GUIDELINES

**Next number:** This two-digit number is the wheel or rim diameter in inches. If you change your wheel size, you will have to purchase new tires to match the new wheel diameter.

**Next number:** This two- or three-digit number is the tire's load index. It is a measurement of how much weight each tire can support. You may find this information in your owner's manual. If not, contact a local tire dealer. *Note:* You may not find this information on all tires because it is not required by law.

**M+S:** The "M+S" or "M/S" indicates that the tire has some mud and snow capability. Most radial tires have these markings; hence, they have some mud and snow capability.

**Speed Rating:** The speed rating denotes the speed at which a tire is designed to be driven for extended periods of time. The ratings range from 99 miles per hour (mph) to 186 mph. These ratings are listed in Table A. *Note:* You may not find this information on all tires because it is not required by law.

Letter Rating	Speed Rating
Q	99 mph
R	106 mph
S	112 mph
T	118 mph
U	124 mph
H	130 mph
V	149 mph
W	168* mph
Y	186* mph

**U.S. DOT Tire Identification Number:** This begins with the letters "DOT" and indicates that the tire meets all federal standards. The next two numbers or letters are the plant code where it was manufactured, and the last four numbers represent the week and year the tire was built. For example, the numbers 3197 means the 31st week of 1997. The other numbers are marketing codes used at the manufacturer's discretion. This information is used to contact consumers if a tire defect requires a recall.

**Tire Ply Composition and Materials Used:** The number of plies indicates the number of layers of rubber-coated fabric

in the tire. In general, the greater the number of plies, the more weight a tire can support. Tire manufacturers also must indicate the materials in the tire, which include steel, nylon, polyester, and others.

**Maximum Load Rating:** This number indicates the maximum load in kilograms and pounds that can be carried by the tire.

**Maximum Permissible Inflation Pressure:** This number is the greatest amount of air pressure that should ever be put in the tire under normal driving conditions.

## Uniform Tire Quality Grading Standards (UTQGS)

**Treadwear Number:** This number indicates the tire's wear rate. The higher the treadwear number is, the longer it should take for the tread to wear down. For example, a tire graded 400 should last twice as long as a tire graded 200.

**Traction Letter:** This letter indicates a tire's ability to stop on wet pavement. A higher graded tire should allow you to stop your car on wet roads in a shorter distance than a tire with a lower grade. Traction is graded from highest to lowest as "AA", "A", "B", and "C".

**Temperature Letter:** This letter indicates a tire's resistance to heat. The temperature grade is for a tire that is inflated properly and not overloaded. Excessive speed, underinflation or excessive loading, either separately or in combination, can cause heat build-up and possible tire failure. From highest to lowest, a tire's resistance to heat is graded as "A", "B", or "C".

Refer to Figure J for additional tire information for light trucks.

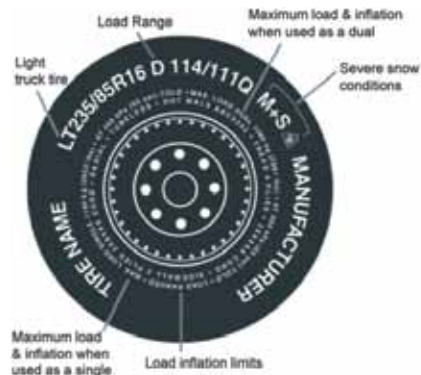


Figure J. UTQGS Tire Information

# TRAILER SAFETY GUIDELINES

Tires for light trucks have other markings besides those found on the sidewalls of passenger tires.

**LT:** The “LT” indicates the tire is for light trucks or trailers.

**ST:** An “ST” is an indication the tire is for trailer use only.

**Max. Load Dual** kg (lbs) at kPa (psi) Cold: This information indicates the maximum load and tire pressure when the tire is used as a dual, that is, when four tires are put on each rear axle (a total of six or more tires on the vehicle).

**Max. Load Single** kg (lbs) at kPa (psi) Cold: This information indicates the maximum load and tire pressure when the tire is used as a single.

**Load Range:** This information identifies the tire’s load-carrying capabilities and its inflation limits.

## Tire Safety Tips

- Slow down if you have to go over a pothole or other object in the road.
- **DO NOT** run over curbs or other foreign objects in the roadway, and try not to strike the curb when parking.
- Check tire inflation pressure weekly during use to insure the maximum tire life and tread wear.
- **DO NOT** bleed air from tires when they are hot.
- Inspect tires for uneven wear patterns on the tread, cracks, foreign objects, or other signs of wear or trauma.
- Remove bits of glass and foreign objects wedged in the tread.
- Make sure your tire valves have valve caps.
- **ALWAYS** check tire pressure on tow vehicle and trailer before towing. Check tire pressure at least once a month.
- **DO NOT** overload tow vehicle. Check the tire information and loading placard for safe allowable tire loading conditions.

## Tire Repair







The proper repair of a punctured tire requires a plug for the hole and a patch for the area inside the tire that surrounds the puncture hole. Punctures through the tread can be repaired if they are not too large, but punctures to the

sidewall should not be repaired. Tires must be removed from the rim to be properly inspected before being plugged and patched.


## Replacing Worn or Damaged Tires

Replace the tire before towing the trailer if the tire treads have less than 1/16 inch depth or the telltale bands are visible. Check inflation pressure weekly during use to insure the maximum tire life and tread wear. A bubble, cut or bulge in a side wall can result in a tire blowout. Inspect both side walls of each tire for any bubble, cut or bulge; and replace a damaged tire before towing the trailer.

Table B below will help pinpoint the causes and solutions of tire wear problems.

Wear Pattern		Cause	Solution
	Center Wear	Over inflation.	Adjust pressure to particular load per tire manufacturer.
	Edge Wear	Under inflation.	Adjust pressure to particular load per tire manufacturer.
	Side Wear	Loss of camber or overloading.	Make sure load does not exceed axle rating. Align wheels.
	Toe Wear	Incorrect toe-in.	Align wheels.
	Cupping	Out-of-balance.	Check bearing adjustment and balance tires.
	Flat Spots	Wheel lockup and tire skidding.	Avoid sudden stops when possible and adjust brakes.

**WARNING**

 **ALWAYS** wear safety glasses when removing or installing force fitted parts. **DO NOT** attempt to repair or modify a wheel. **DO NOT** install an inner-tube to correct a leak through through the rim. If the rim is cracked, the air pressure in the inner tube may cause pieces of the rim to explode (break off) with great force and cause serious eye or bodily injury.

# TRAILER SAFETY GUIDELINES

## Wheel Rims

If the trailer has been struck, or impacted, on or near the wheels, or if the trailer has struck a curb, inspect the rims for damage (i.e. being out of round); and replace any damaged wheel. Inspect the wheels for damage every year, even if no obvious impact has occurred.

## Wheels, Bearings and Lug Nuts

A loose, worn or damaged wheel bearing is the most common cause of brakes that grab.

To check wheel bearings, jack trailer and check wheels for side-to-side looseness. If the wheels are loose, or spin with a wobble, the bearings must be serviced or replaced. Check inflation pressure weekly during use to insure the maximum tire life and tread wear. Most trailer axles are built with sealed bearings that are not serviceable. Sealed bearings must be replaced as complete units.

3. Check to see if the lug nuts are tight after the first 10, 25 and 50 miles of driving and before each tow thereafter

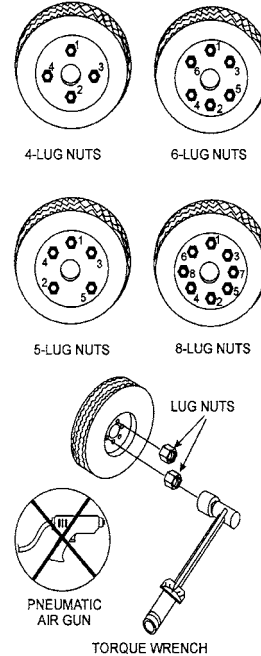


Figure K. Wheel Lug Nuts Tightening Sequence

Table C. Tire Torque Requirements

Wheel Size	First Pass FT-LBS	Second Pass FT-LBS	Third Pass FT-LBS
12"	20-25	35-40	50-65
13"	20-25	35-40	50-65
14"	20-25	50-60	90-120
15"	20-25	50-60	90-120
16"	20-25	50-60	90-120

### **WARNING**

Lug nuts are prone to loosen after initial installation, which can lead to death or serious injury. Check all wheel lug nuts periodically.

## Lug Nut Torque Requirements

It is extremely important to apply and maintain proper wheel mounting torque on the trailer. Be sure to use only the fasteners matched to the cone angle of the wheel. Proper procedure for attachment of the wheels is as follows:

1. Start all wheel lug nuts by hand.
2. Torque all lug nuts in sequence. See Figure K. DO NOT torque the wheel lug nuts all the way down. Tighten each lug nut in 3 separate passes as defined by Table C.

### **NOTICE**

**NEVER** use an pneumatic air gun to tighten wheel lug nuts.

Over-tightening lug nuts will result in breaking the studs or permanently deforming the mounting stud holes in the wheels.

## Lights and Signals

Before each tow, check the trailer taillights, stoplights, turn signals and any clearance lights for proper operation.

Replace any broken or burned-out lamps as necessary. Check the wire harness for cuts, fraying or other damage. If it needs replacing, contact your dealer.

### **WARNING**

Improper operating taillights, stoplights and turn signals can cause collisions.

Check all lights before each tow.



# TRAILER SAFETY GUIDELINES

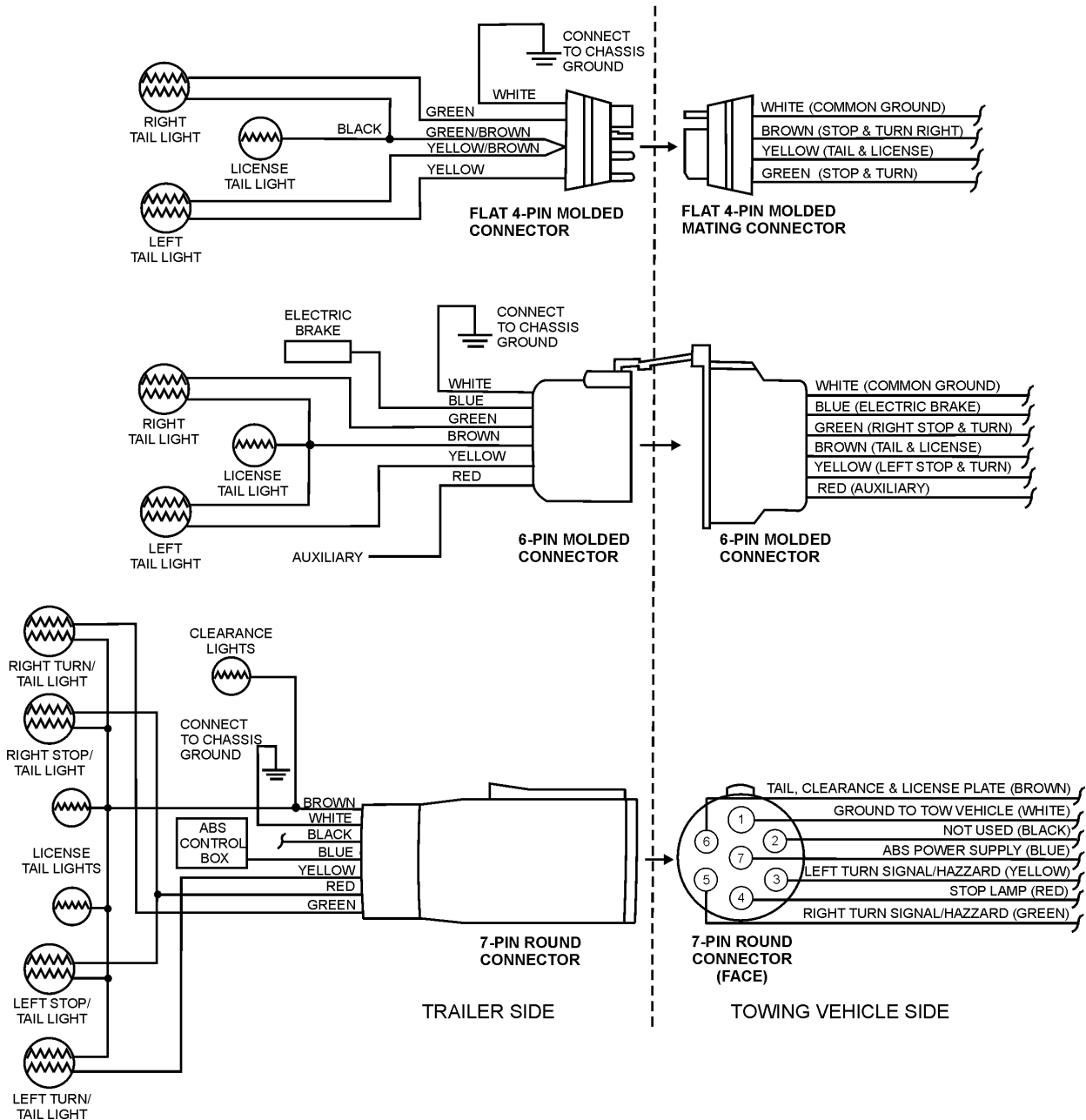


Figure L. Trailer to Tow Vehicle Wiring Diagram

# TROUBLESHOOTING

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

# TROUBLESHOOTING

<b>Troubleshooting (Engine)</b>		
<b>Symptom</b>	<b>Possible Problem</b>	<b>Solution</b>
Engine will not start or start is delayed, although engine can be turned over.	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 pump not working correctly?	Repair or replace fuel pump.
	Oil pressure too low?	Check engine oil pressure.
	Low starting temperature limit exceeded?	Comply with cold starting instructions and proper oil viscosity.
	Defective battery?	Charge or replace battery.
	Air or water mixed in fuel system?	Check carefully for loosened fuel line coupling, loose cap nut, etc.
At low temperatures engine will not start.	Engine oil too thick?	Refill engine crankcase with correct type of oil for winter environment.
	Defective battery?	Replace battery.
Engine fires but stops soon as starter is switched off.	Fuel filter blocked?	Replace fuel filter.
	Fuel supply blocked?	Check the entire fuel system.
	Defective fuel pump?	Replace fuel pump.
Engine stops by itself during normal operation.	Fuel tank empty?	Add fuel.
	Fuel filter blocked?	Replace fuel filter.
	Defective fuel pump?	Replace fuel pump.
	Mechanical oil pressure shutdown sensor stops the engine due to low oil?	Add oil. Replace low oil shutdown sensor if necessary.
Low engine power, output and speed.	Fuel tank empty?	Replace fuel filter.
	Fuel filter clogged?	Replace fuel filter.
	Fuel tank venting is inadequate?	Ensure that tank is adequately vented.
	Leaks at pipe unions?	Check threaded pipe unions tape and tighten unions as required.
	Speed control lever does not remain in selected position?	See engine manual for corrective action.
	Engine oil level too full?	Correct engine oil level.
	Injection pump wear?	Use No. 2-D diesel fuel only. Check the fuel injection pump element and delivery valve assembly and replace as necessary.

# TROUBLESHOOTING

<b>Troubleshooting (Engine) - continued</b>		
<b>Symptom</b>	<b>Possible Problem</b>	<b>Solution</b>
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.
Engine overheats.	Too much oil in engine crankcase?	Drain off engine oil down to uppermark on dipstick.
	Entire cooling air system contaminated/ blocked?	Clean cooling air system and cooling fin areas.
	Fan belt broken or elongated?	Change belt or adjust belt tension.
	Coolant insufficient?	Replenish coolant.
	Radiator net or radiator fin clogged with dust?	Clean net or fin carefully.
	Fan, radiator, or radiator cap defective?	Replace defective part.
	Thermostat defective?	Check thermostat and replace if necessary.
Head gasket defective or water leakage?	Replace parts.	



# 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.

## SUGGESTED SPARE PARTS

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### QP4TZ TRASH PUMP WITH 1B40U-2203A ENGINE

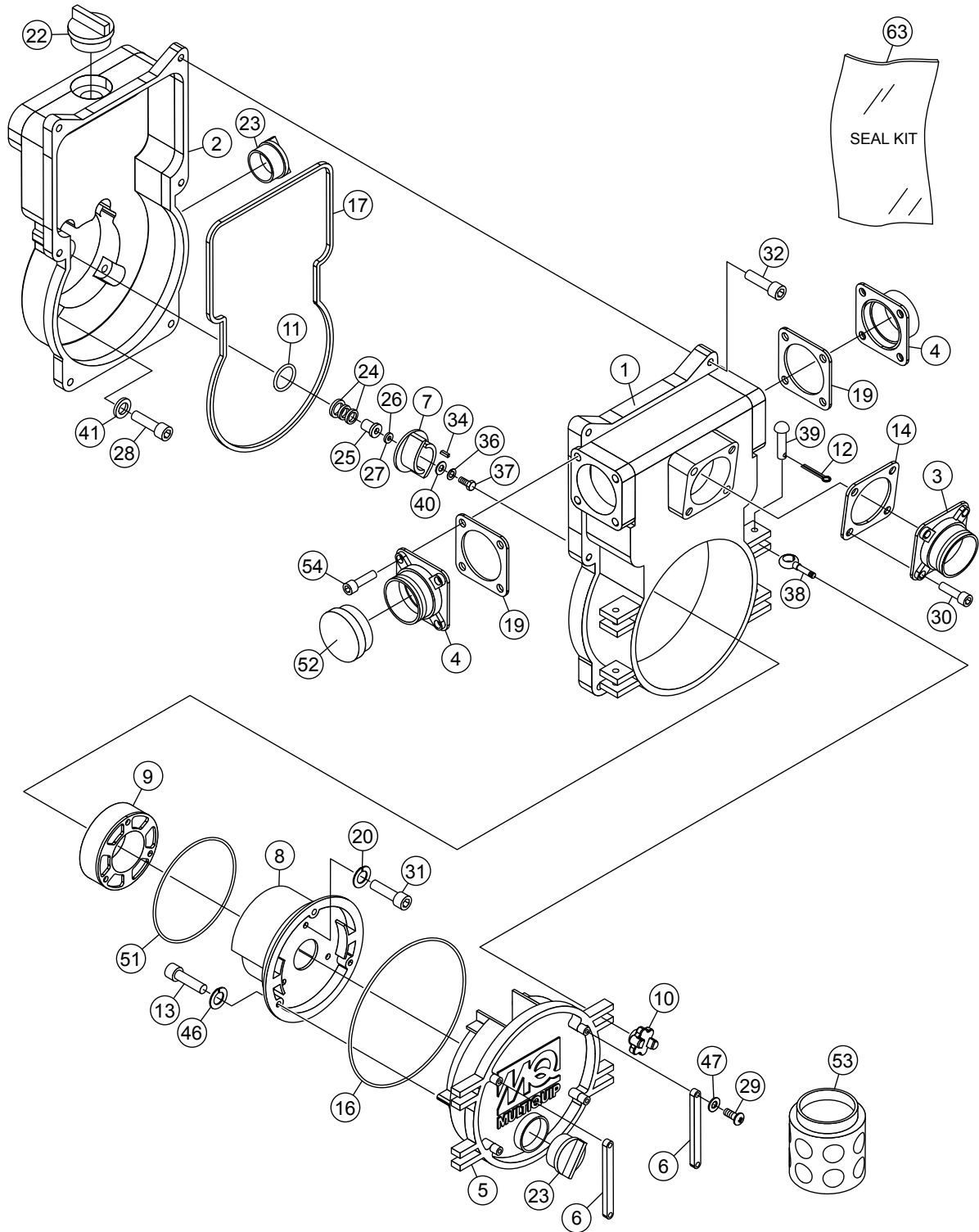
1 to 3 units

Qty.	P/N	Description
2	KIT4TH	KIT, MECHANICAL SEAL, O-RINGS
1	1471040030	IMPELLER
4	0631211159	FLOODING CAP
3	50484100	ELEMENT, AIR CLEANER
1	05088901	ROPE STARTER
1	01535302	CAP, FUEL TANK
3	50404900	KEY, STARTER SWITCH
3	01542702	OIL SUCTION FILTER ASSY

#### NOTICE

Part numbers on this Suggested Spare Parts list may supersede/replace the part numbers shown in the following parts lists.

# QP4TZ PUMP ASSY.

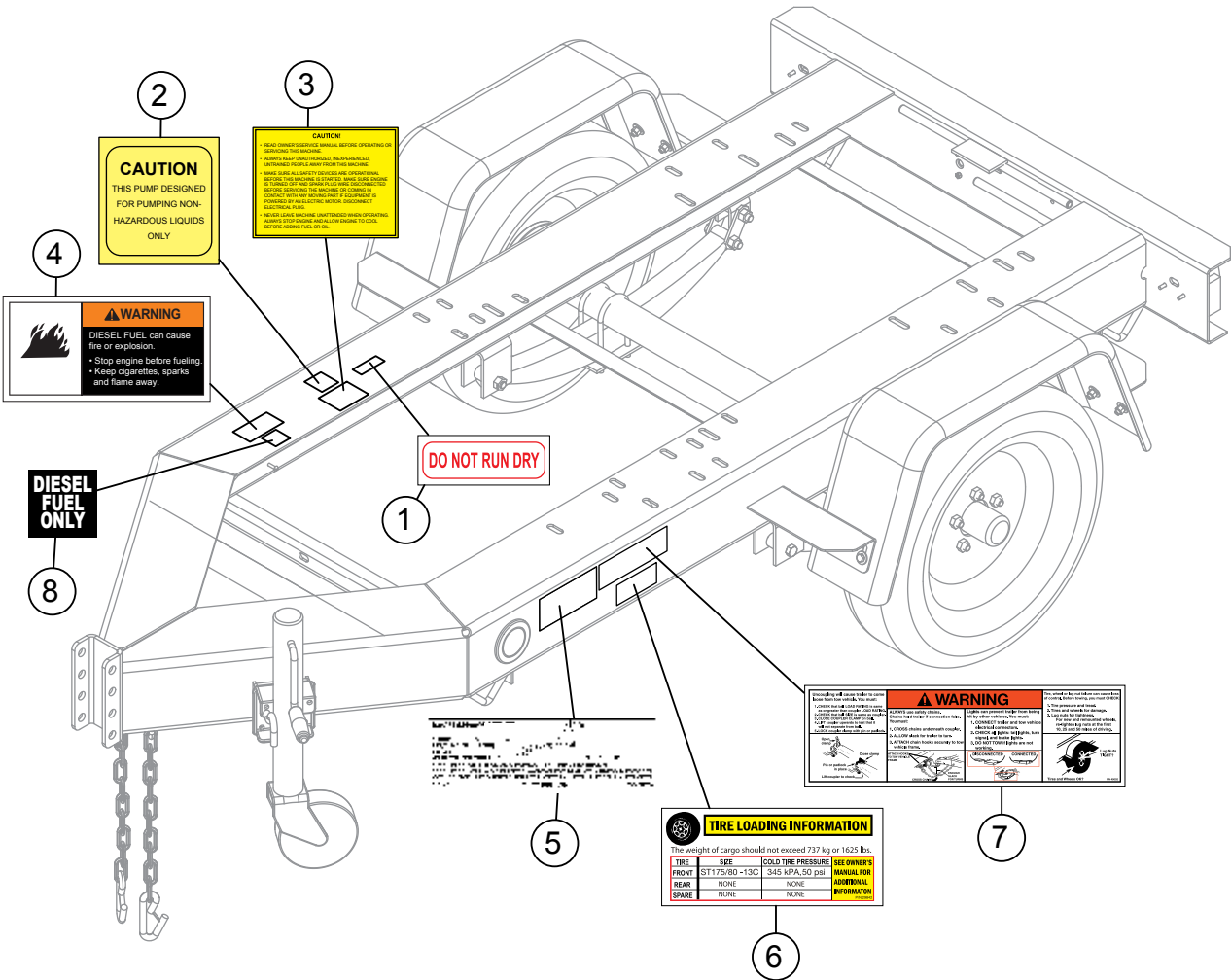




## QP4TZ PUMP ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	14660600100002	CASING	1	
2	14460600210002	CASING COVER	1	
3	14660000900002	SUCTION COVER	1	
4	14660000900002	DELIVERY COVER	2	
5	14660601700002	DRAIN COVER	1	
6	12470002500002	DRAIN COVER KNOB	2	
7	1471040030	IMPELLER	1	
8	1466000130	VOLUTE CASING	1	
9	1466040700	SUCTION PLATE	1	
10	14660002200002	DRAIN COVER SET HANDLE	4	
11#	0482200240	O'RING (MECHANICAL SEAL SLEEVE)	1	
12	0641400430	SPLIT PIN	4	
13	0131190820	CAP SCREW (VOLUTE CASING)	3	
14	1401350350	CHECK VALVE	1	
16#	0483602750	O'RING (DRAIN COVER)	1	
17	1466330460	O'RING (CASING)	1	
19	1401330360	DELIVERY COVER PACKING	2	
20	0451290080	SPRING WASHER M8	3	
22	0631211159	FLOODING CAP, PF 1 1/2"	1	
23	0631211159	DRAIN CAP, PF1 1/2"	2	
24#	0803442930	MECHANICAL SEAL	1	
25#	0811885433	MECHANICAL SEAL SLEEVE	1	
26#	0852834525	ADJUST LINER, 45 x 25.4 MM T0.3	1	
27#	0852854525	ADJUST LINER, 45 x25.4 MM T0.5	1	
28	0131091065	CAP SCREW (CASING), M10 X 65	4	
29	0141050825	SCREW (DRAIN COVER SET HANDLE), M8 X 25	4	
30	0131151225	CAP SCREW (SUCTION COVER), M12 X 25	4	
31	0131190820	CAP SCREW (WEAR PLATE), M8 X 20	3	
32	0131151230	CAP SCREW (CASING), M12 X 30	6	
34	0520040451	KEY	1	
36	0451290070	SPRING WASHER, IMPELLER	1	
37	0107090645	BOLT, IMPELLER	1	
38	1466200270	HINGE BOLT M10 X 65	4	
39	1446220280	HINGE PIN	4	
40	1466251240	IMPELLER WASHER	1	
41	0458220100	SEAL WASHER (CASING COVER), M10	4	
46	0451290080	SPRING WASHER (VOLUTE CASING), M8	3	
47	0451250080	SPRING WASHER (DRAIN COVER HANDLE), M8	4	
51#	0481572500	O-RING (VOLUTE CASING)	1	
52	1466068050	CAP	1	
53	0742214100	STRAINER	1	
54	0131151220	CAP SCREW (DELIVERY COVER)	8	
63	KIT4TH	KIT, MECHANICAL SEAL, SLEEVE, O-RINGS.....	1	INCLUDES ITEMS W/ #

# QP4TZTMP16F/QP4TZTMPXF DECALS

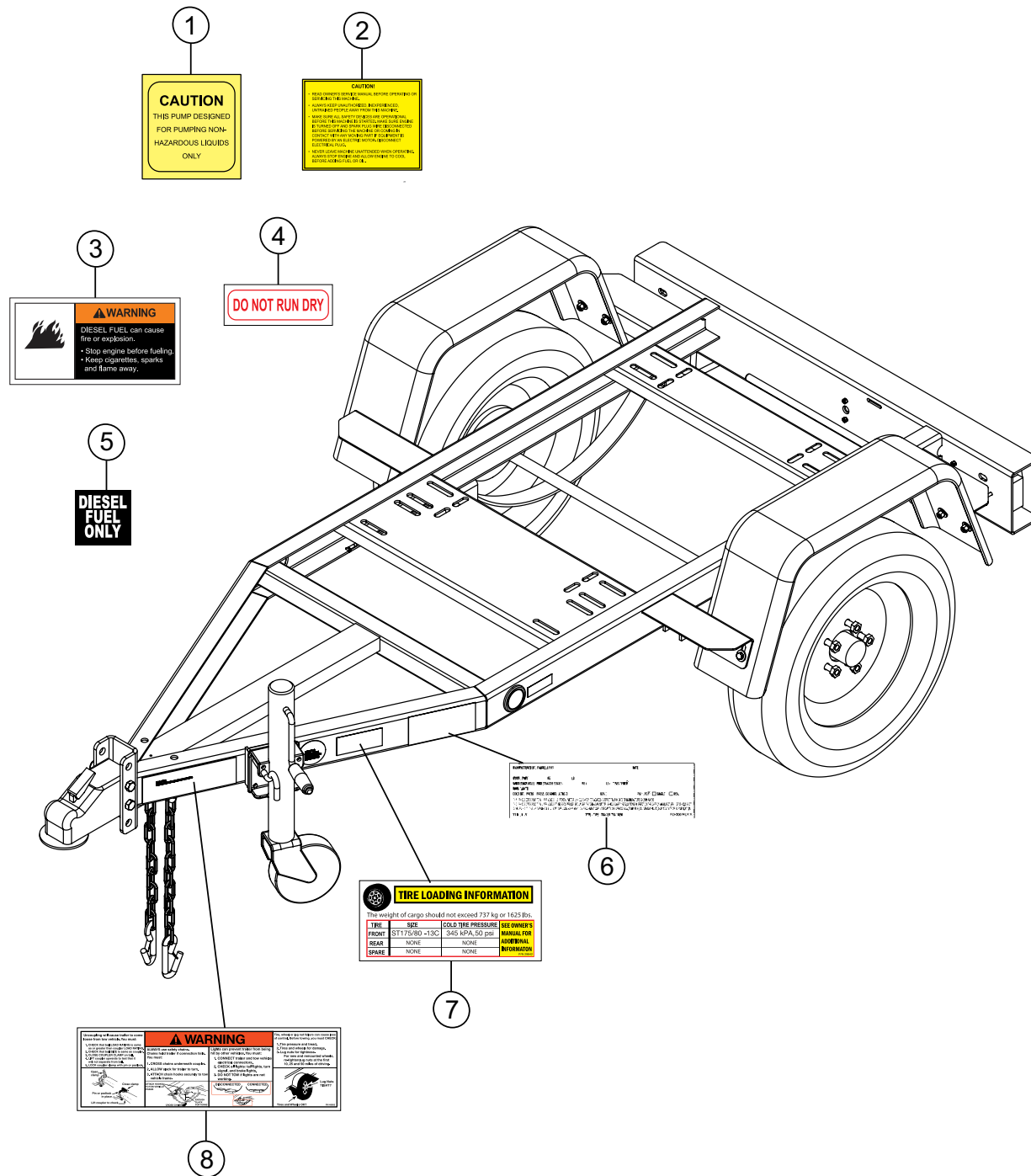


## QP4TZTMP16F/QP4TZTMPXF DECALS

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<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	27188	DECAL, DO NOT RUN	1	
2	DCS02	DECAL, PUMP SAFETY	1	
3	920203290	DECAL, CAUTION.....	1.....	NPA329
4	B9504500004	DECAL, WARNING	1	
5	29680	DECAL, MULTIPLE TRAILER, VIN	1	
6	29842	DECAL, TIRE LOADING	1	
7	49002	DECAL, TRLR HITCH/WHEEL WARNING	1	
8	1630680004	DECAL, DIESEL FUEL ONLY	1	

# QP4Tzt10P DECALS

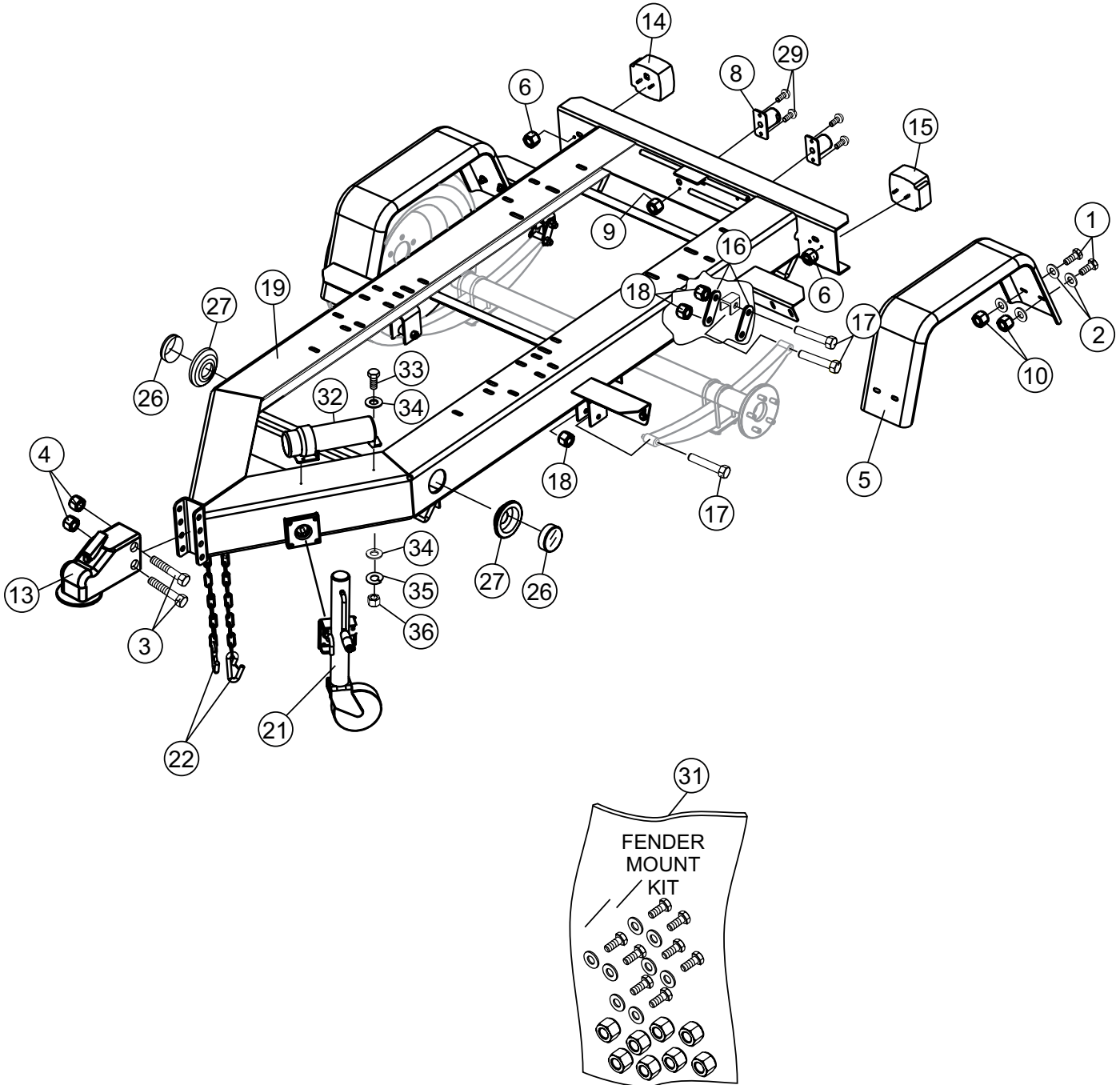


## QP4TZT10P DECALS

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<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	DCS02	DECAL, PUMP SAFETY	1	
2	920203290	DECAL, CAUTION .....	1	NPA329
3	B9504500004	DECAL, WARNING .....	1	
4	27188	DECAL, DO NOT RUN .....	1	
5	1630680004	DECAL, DIESEL FUEL ONLY	1	
6	9315	DECAL, TRAILER 10, VIN	1	
7	29842	DECAL, TIRE LOADING	1	
8	49002	DECAL, TRLR HITCH/WHEEL WARNING	1	

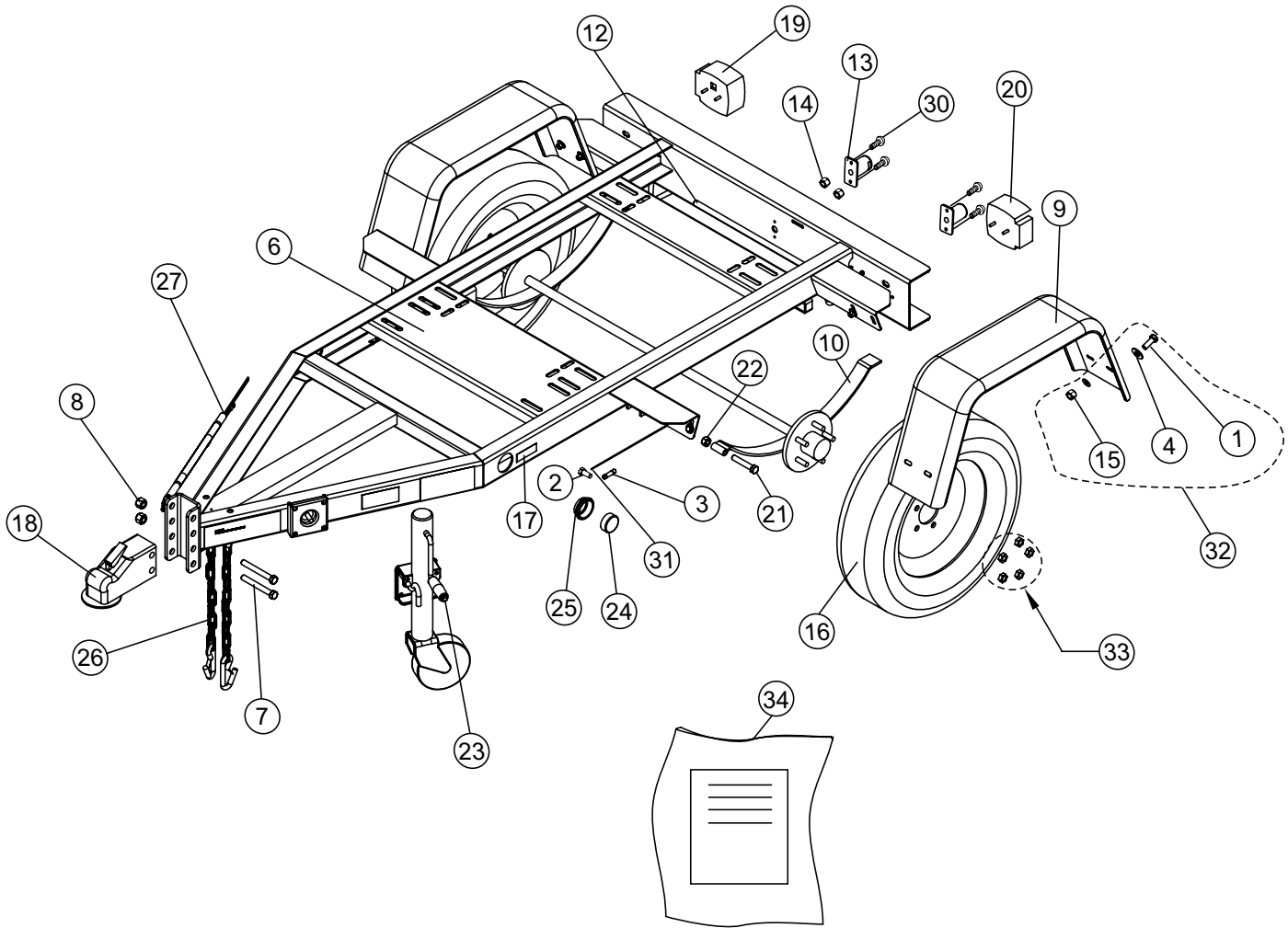
# TRAILER ASSY. (QP4TZTMP16F/QP4TZTMPXF)



## TRAILER ASSY. (QP4TZTMP16F/QP4TZTMPXF)

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	0205	SCREW, HHC 3/8 - 16 x 1	8	
2	4001	WASHER, FLAT USS 3/8 PLD	16	
3	9502	SCREW, HHC 5/8 - 11 x 4-1/2 GR8	2	
4	9503	NUT, NYLOC 5/8 - 11	2	
5	9505	FENDER, 8 x 30 x 13	2	
6	6\$%	NUT	4	
8	9514	LIGHT ASM., LICENSE PLATE	2	
9	10019	NUT, NYLOC 10-32	4	
10	10133	NUT, NYLOC 3/8 - 16	8	
13	29228	COUPLER, 2" BALL 600# GVWR	1	
14	29242	LIGHT, TAIL RT (CURB) SIDE M440	1	INCLUDES ITEMS W/ \$
15	29243	LIGHT, TAIL LT (ROAD) SIDE M440L	1	INCLUDES ITEMS W/ %
16	29247	SHACKLE, AXLE MOUNTING	4	
17	29248	SCREW, HHC 9/16 - 18	6	
18	29249	NUT, 9/16-18 AXLE MOUNTING, N-2	6	
19	29370	FRAME, W/ A TRLRMP	1	
21	29496	JACK, SIDEWIND 10", BOLT THRU	1	
22	29572	CHAIN ASSY., SAFETY 7600 LB	2	
26	29898	LIGHT, 2 - 1/2 SIDE MARKER, AMBER, 143A	2	
27	29900	GROMMET W/ WIRE KIT, 2 - 1/2", 14248K	2	
29	5065 B	SCREW, PHP 10 - 32 x 1/2	4	
31	29754	FENDER MOUNT KIT	1	
32	23297	MANUAL HOLDER, PICTOGRAPH SAE J232	1	
33	0202	SCREW, HHC 5/16-18X1	2	
34	0300 B	WASHER, FLAT 5/16 MED	4	
35	0161 C	WASHER, LOCK 5/16 MED	2	
36	5283	NUT, 5/16 X 18	2	

# TRAILER ASSY. (TRLR10P)

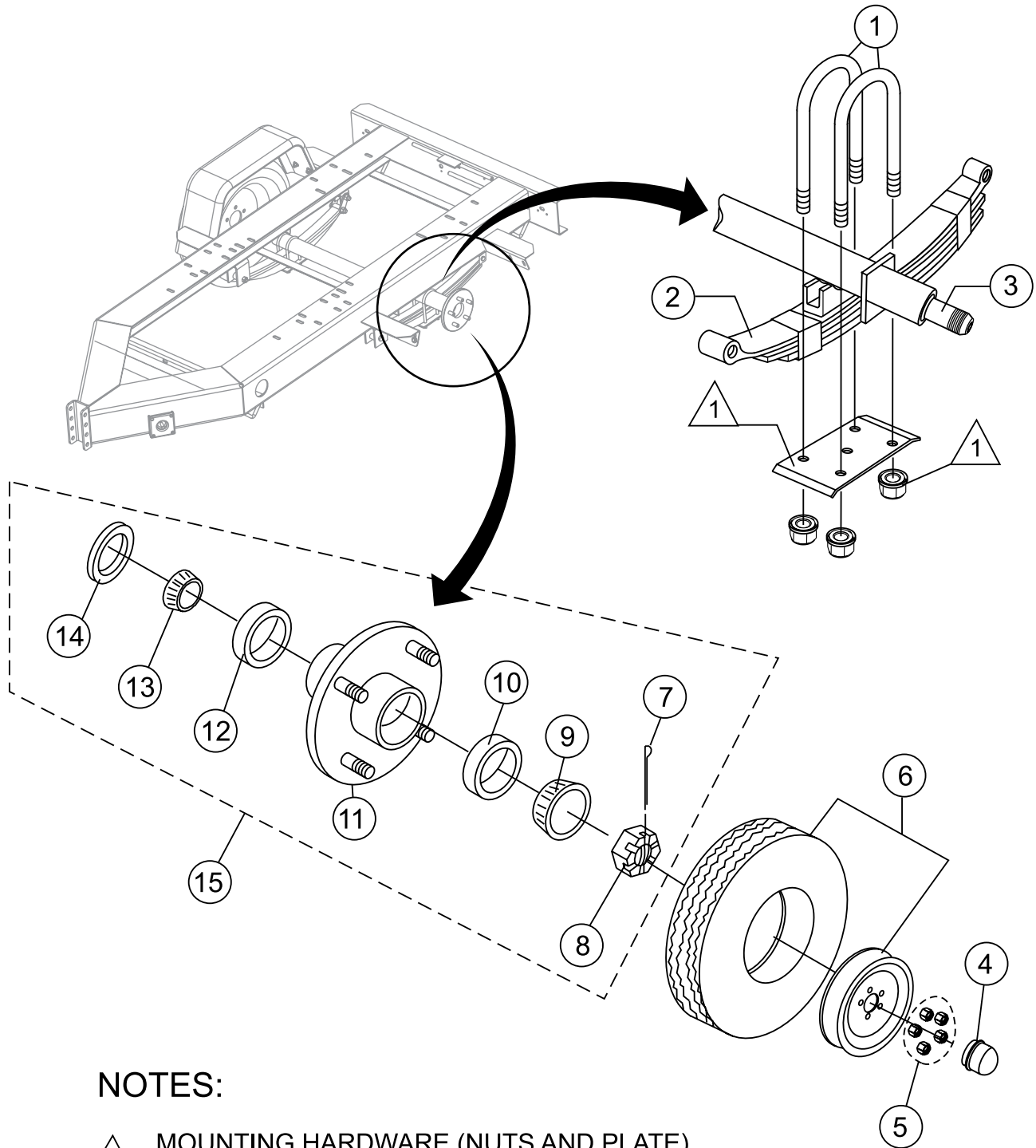




## TRAILER ASSY. (TRLR10P)

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1#	0205	SCREW, HHC 3/8-16 X 1.0	8	
2	1273	SCREW, HHST 8-32 X 3/8	2	
3	2540	CONNECTOR, BUTT SPLICE, 16-14	2	
4#	4001	WASHER, FLAT USS 3/8 PLD	16	
6	9500	FRAME, TRLR10W W/A	1	
7	9502	SCREW, HHC 5/8-11 X 4-1/2 GR8	2	
8	9503	NUT, NYLOC 5/8-11	2	
9	9505	FENDER, 8X30X13	2	
10	9506	AXLE SPRG ASSY, 43" HF, 27" SPRG CTR	1	
11	9509	SCREW, TEK 12 x 3/4 SELF TAP	1	
12	9512	INSULATOR, WIRING .50D X .31ID X .5L	8	
13	9514	LIGHT, LICENSE PLATE	2	
14	10019	NUT, NYLOC 10-32	4	
15#	10133	NUT, NYLOC 3/8-16	8	
16	EE45318	WHEEL ASSY, ST175/80 D13, LOAD RATE C	2	
17	29158	REFLECTOR, AMBER, PETERSON B491A	2	
18	29228	COUPLER, 2" BALL 6000#GVWR	1	
19	29242	LIGHT, TAIL RT (CURB) SIDE(M440)	1	
20	29243	LIGHT, TAIL LT (ROAD) SIDE(M440L)	1	
21	29248	SCREW, HHC 9/16-18 x 3.0, AXLE MOUNT	2	
22	29249	NUT, HEX AXLE 9/16-18 N-2	2	
23	29496	JACK, SIDEWIND 10", BOLT-ON 1/2 PIN	1	
24	29563	LIGHT, 2" ROUND AMBER M146A	2	
25	29564	GROMMET/WIRE KIT, 2", 24146-18K	2	
26	29572	CHAIN ASSY, SAFETY 7600 LB	2	
27	29784	HARNESS, TRLR, 48" LOOM	1	
30	5065 B	SCREW, PHP 10-32 X 1/2	4	
31	60018	WIRE, 16 GA. BROWN, SAE J1128	3	
32	29754	KIT, HARDWARE, FENDER MOUNT .....	1.....	INCLUDES ITEMS W/ #
33	29755	KIT, HARDWARE, LUG NUT	1	
34	2764	BAG, OPERATION AND PARTS MANUAL	1	

# AXLE ASSY.



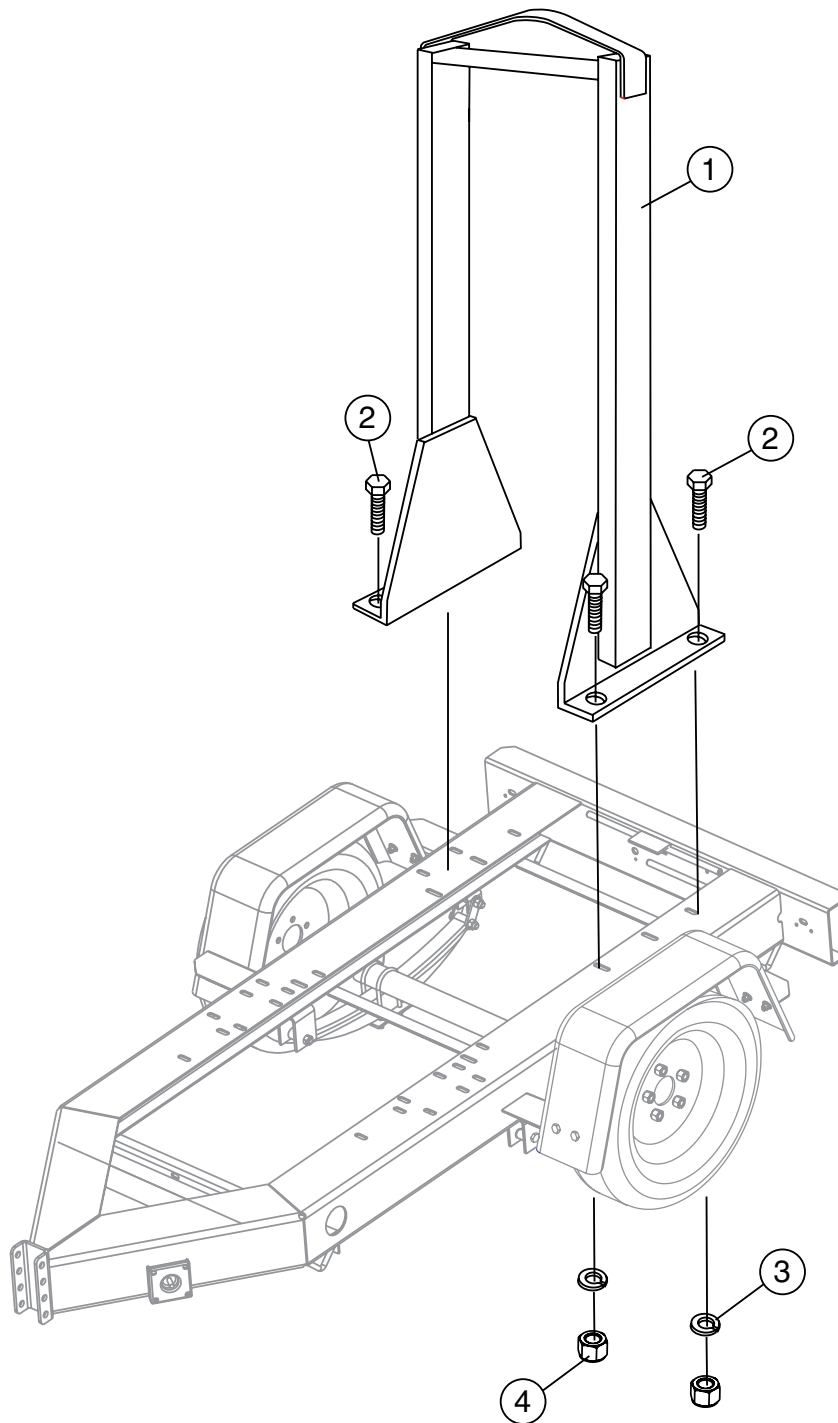
## NOTES:

- △ 1 MOUNTING HARDWARE (NUTS AND PLATE)  
INCLUDED WITH U-BOLTS (ITEM 1).

## AXLE ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	29381U	KIT, U-BOLT	4	
2	29381S	SPRING, 4 LEAF 25.25	2	
3	29381B	AXLE BEAM	1	
4	46749	DUST CAP.....	2.....	HENDERSON
5	29755	LUG NUT KIT	1	
6	EE45318	WHEEL ASSY, ST175/80 D13	2	
7%	491688	COTTER PIN	1	
8%	114	SPINDLE NUT .....	1.....	HENDERSON
9%	L44649	OUTER BEARING CONE.....	1.....	HENDERSON
10%	L44610	OUTER BEARING CUP.....	1.....	HENDERSON
11%	10-215S	IDLER HUB, 5 X 4.5" .....	1.....	HENDERSON
12%	L68111	INNER BEARING CUP .....	1.....	HENDERSON
13%	L68149	INNER BEARING CONE .....	1.....	HENDERSON
14%	58846	GREASE SEAL.....	1.....	HENDERSON
15	29381H	HUB KIT .....	1.....	INCLUDES ITEMS W/ %

# LIFTING BAIL ASSY. (QP4TZTMP16F/QP4TZTMPXF)

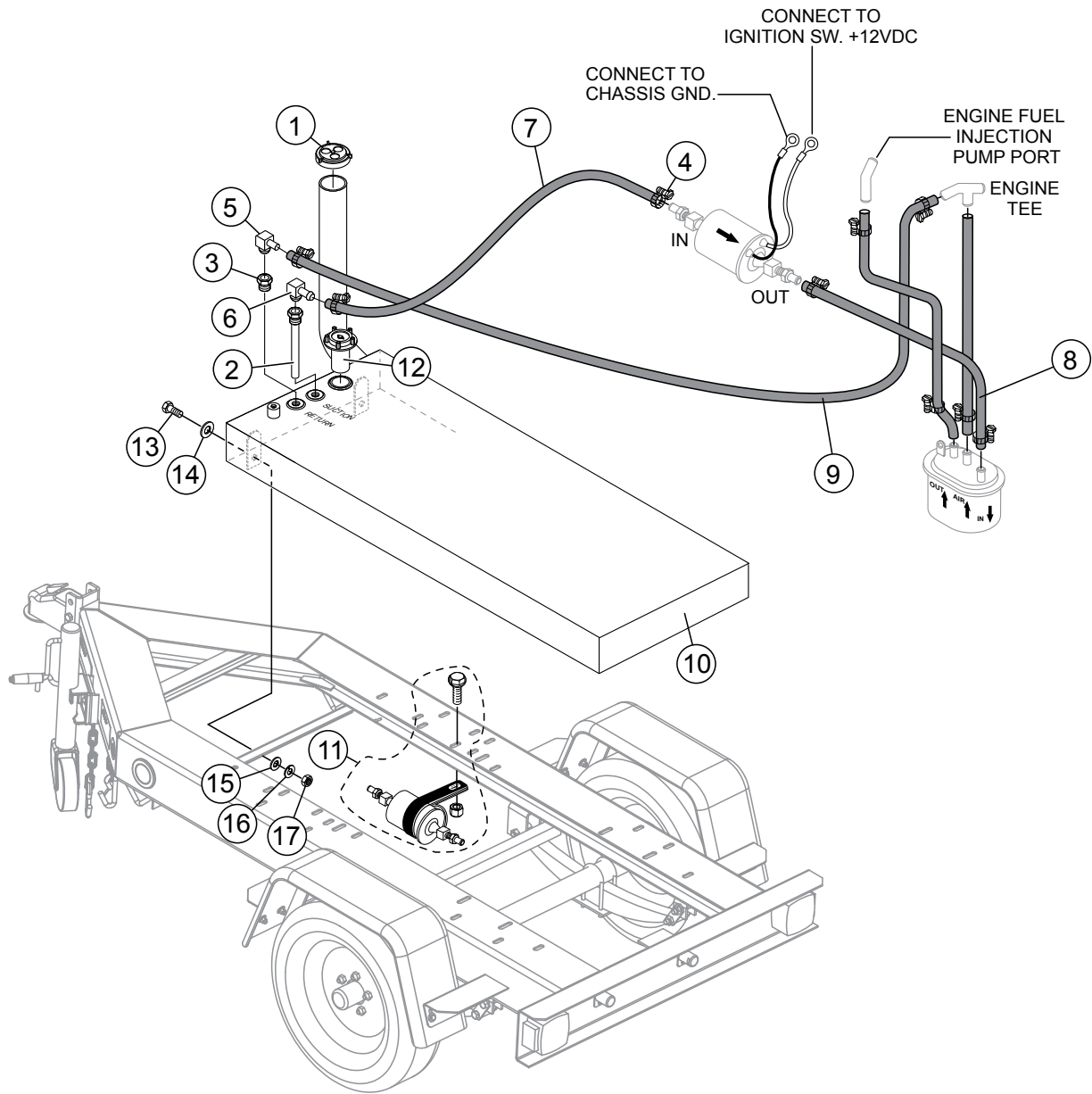


## **LIFTING BAIL ASSY. (QP4TZTMP16F/QP4TZTMPXF)**

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<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	MPQ102	LIFTING BAIL	1	
2	0105051640	BOLT 3/4-10 X 2 GRD 8	4	
3	030216400	WASHER, 3/4	4	
4	020316130	NUT, 3/4 X 10	4	

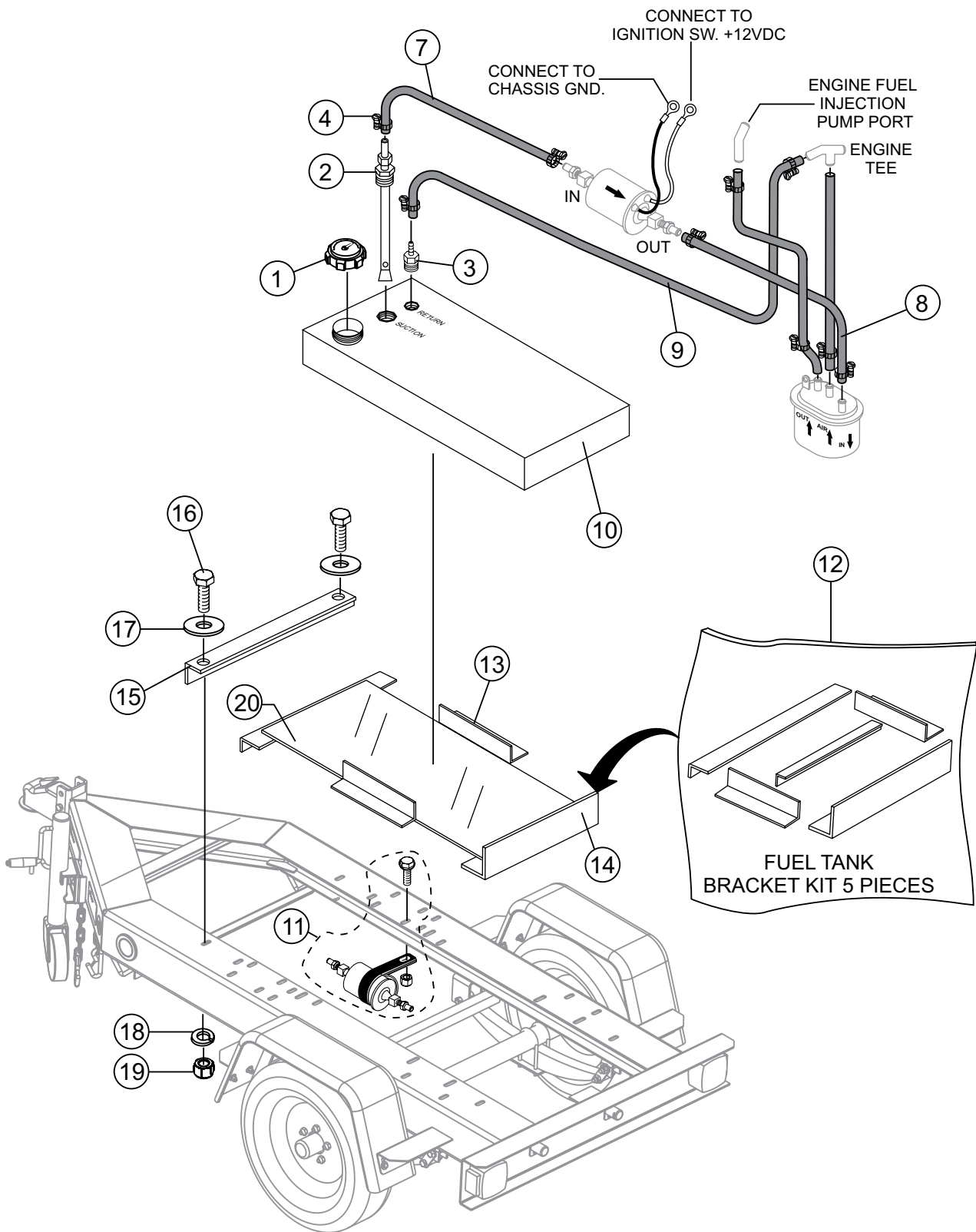
# FUEL ASSY. (QP4TZTMPXF)



## FUEL ASSY. (QP4TZTMPXF)

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	7V3177002	CAP	1	
2	PICKUPTUBE	PICK UP TUBE	1	
3	5284	BUSHING, HEX PIPE 3/8 X 1/4"BRASS	1	
4	6109152	CLAMP	7	
5	6109204	FITTING, HOSE	1	
6	84454	ELBOW BRASS 1/4 MALE NPT	2	
7	60028	FUEL HOSE 5/16, 25"	1	
8	6635BULK	FUEL HOSE 1/4, 28"	1	
9	6635BULK	FUEL HOSE 1/4, 65"	1	
10	EE55144	TANK, FUEL 28 GAL.	1	
11	EM14401	FUEL PUMP	1	
12	31223FG	FUEL GAUGE	1	
13	6109210	BOLT, 1/2-13 X 1-1/2"	2	
14	13211	WASHER, FLAT 1/2 X 1-1/4 USS	2	
15	6109170	WASHER, FLAT 1/2 X 1	2	
16	6109810	WASHER, LOCK 1/2"	2	
17	6109160	NUT, 1/2"	2	

# FUEL ASSY. (QP4TZTMP16F)

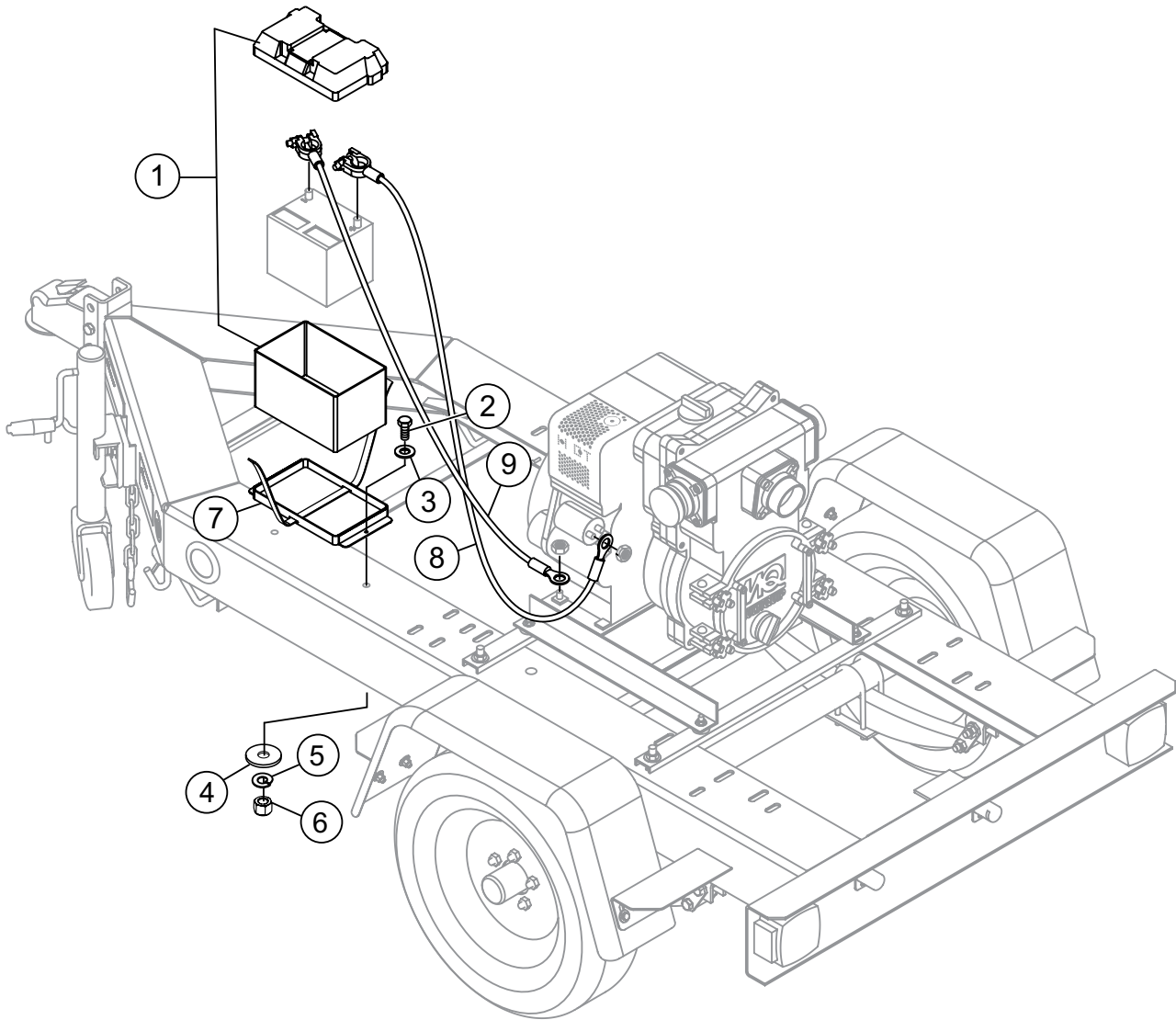




## FUEL ASSY. (QP4TZTMP16F)

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	19340	FUEL GAUGE	1	
2	19089	TUBE, TANK SUCTION	1	
3	19086	FITTING, STR-1/4MP	1	
4	6109152	CLAMP	9	
7	6635BULK	FUEL HOSE, 25"	1	
8	6635BULK	FUEL HOSE, 28"	1	
9	6635BULK	FUEL HOSE, 60"	1	
10	19029	TANK, FUEL 16 GAL.	1	
11	EM14401	FUEL PUMP	1	
12	ANGLEKIT16F	ANGLE KIT .....	1	INCLUDES ITEMS W/ #
13	34577#	ANGLE, 2X2X1/8X13" MILD BLACK STEEL	2	
14	34590#	ANGLE, 2X2X1/8X32" MILD BLACK STEEL	2	
15	34591#	ANGLE, 1X1X1/8X26" MILD BLACK STEEL	1	
16	0202	BOLT, 5/16X18X1	2	
17	3233	WASHER, FENDER 3/8X1-1/2"	2	
18	0161 C	WASHER, LOCK 5/16 MED	2	
19	2105164	NUT, 5/16-18	2	
20	34592	SHEET, STEEL 1/16X45X15-3/4 IN.	1	

# BATTERY ASSY. (QP4TZTMP16F/QP4TZTMPXF)

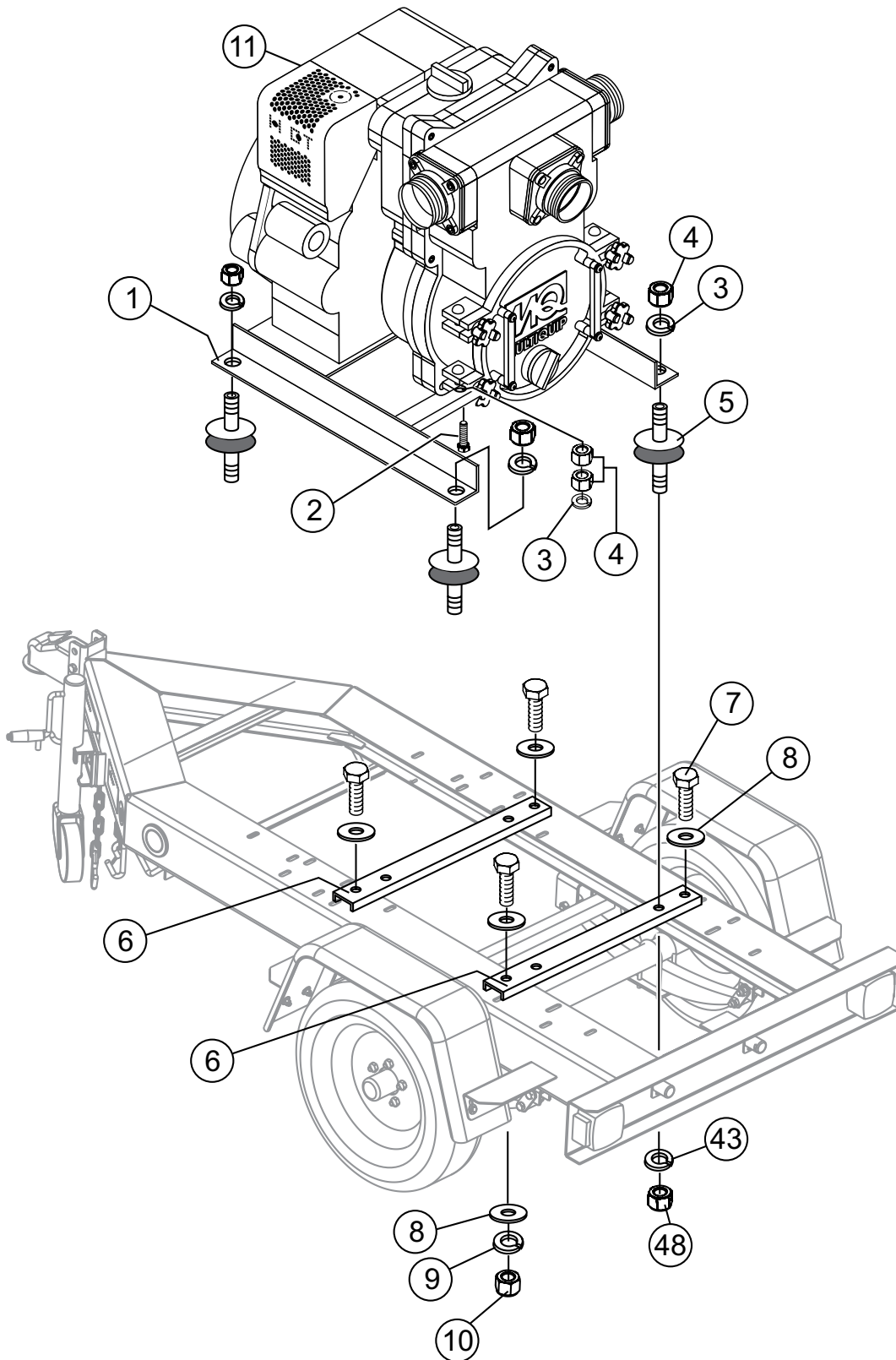


## **BATTERY ASSY. (QP4TZTMP16F/QP4TZTMPXF)**

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<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	34506	BATTERY BOX	1	
2	0202	SCREW, HHC 5/16-18X1	2	
3	0300 B	WASHER, FLAT 5/16 MED	2	
4	3233	WASHER, FENDER 3/8 X 1 1/2	2	
5	0161 C	WASHER, LOCK 5/16 MED	2	
6	2105164	NUT, 5/16 X 18	2	
7	34584	BRACKET, BATTERY	1	
8	34597	POSITIVE BATTERY CABLE	1	
9	34596	NEGATIVE BATTERY CABLE	1	

# PUMP ASSY. (QP4TZTMP16F/QP4TZTMPXF)

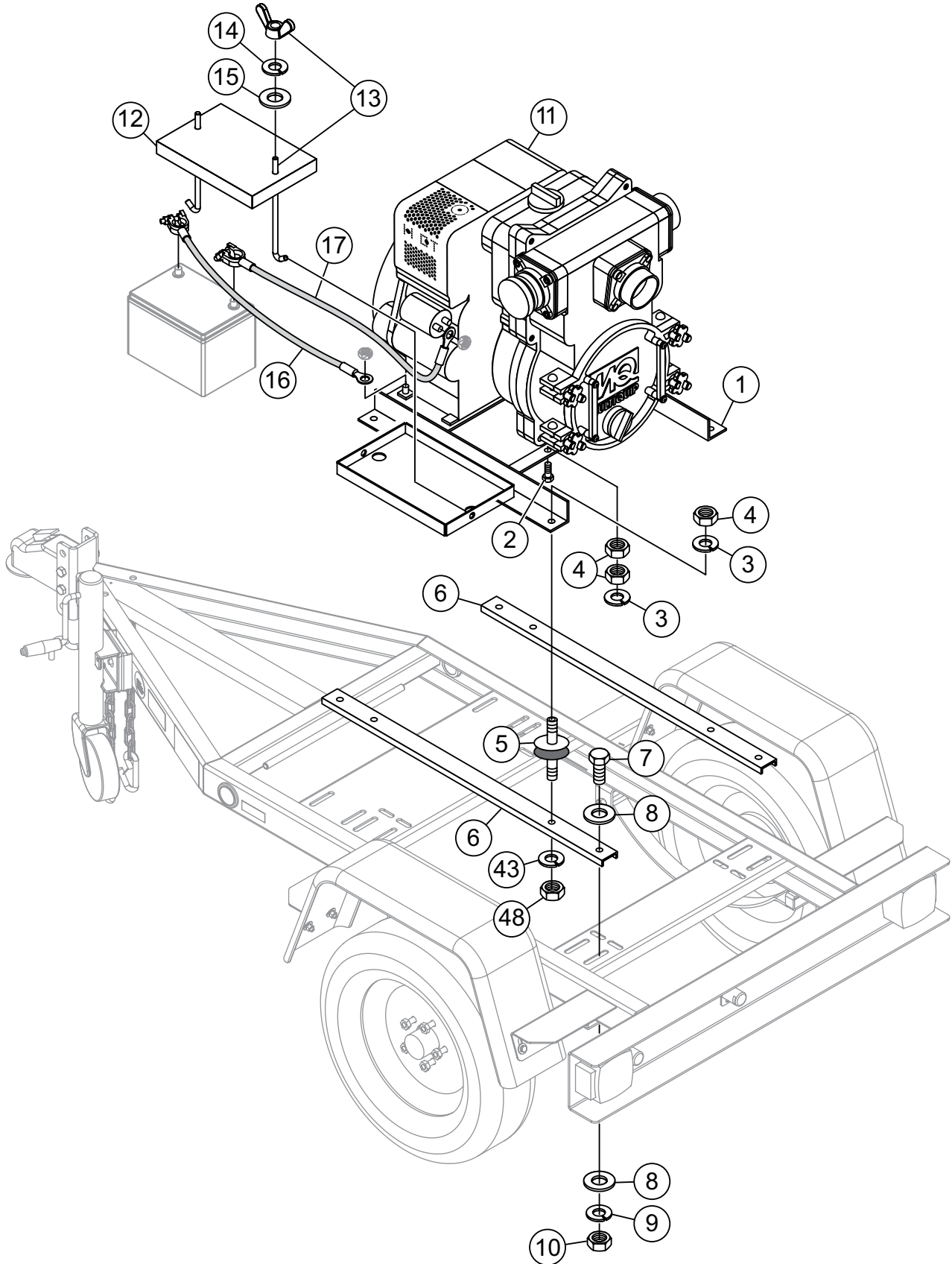


## **PUMP ASSY. (QP4TZTMP16F/QP4TZTMPXF)**

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<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	24592140210014	ENGINE BASE (NO BATTERY TRAY)	1	
2	0105051040	BOLT (PUMP), M10 X 40	2	
3	0451250100	WASHER, LOCK M10	6	
4	0205450100	NUT, M10	8	
5	0723302546	CUSHION RUBBER	4	
6	29175	BRACKET, CHANNEL	2	
7	6109184	BOLT, HEX 1/2-13 X 2-1/2	4	
8	6109170	WASHER, FLAT 1/2"	8	
9	6109180	WASHER, LOCK 1/2"	4	
10	6109160	NUT, HEX 1/2-13	4	
11	1B40U-2203A	ENGINE, HATZ	1	

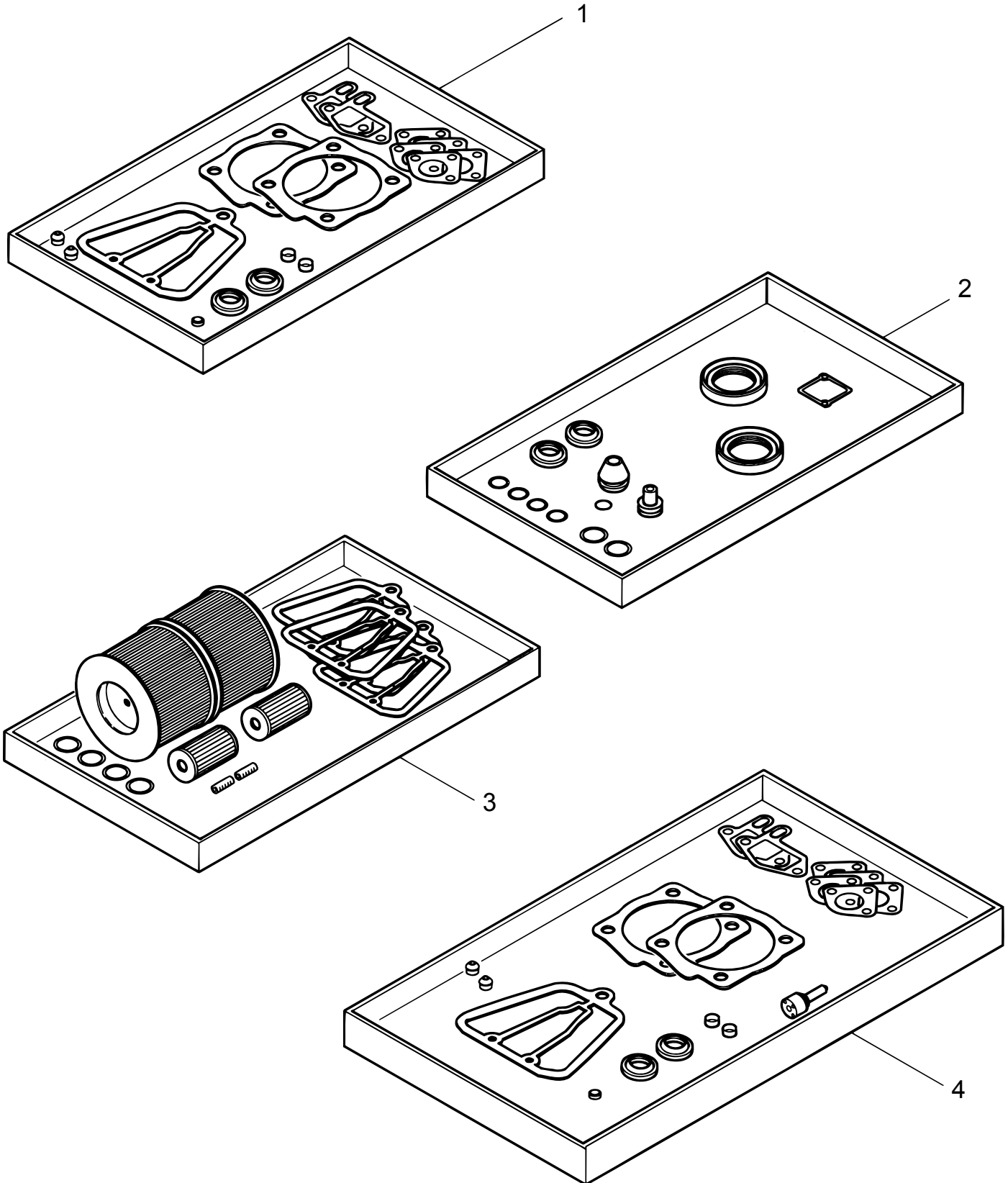
# PUMP AND BATTERY ASSY. (QP4TZT10P)



## **PUMP AND BATTERY ASSY. (QP4TZT10P)**

<b><u>NO.</u></b>	<b><u>PART NO.</u></b>	<b><u>PART NAME</u></b>	<b><u>QTY.</u></b>	<b><u>REMARKS</u></b>
1	14712140200014	ENGINE BASE, SS400	1	
2	0105051040	BOLT (PUMP), M10 X 40	2	
3	0451250100	WASHER, LOCK M10	6	
4	0205450100	NUT, M10	8	
5	0723302546	CUSHION RUBBER	4	
6	29175	BRACKET, CHANNEL	2	
7	6109184	BOLT, HEX 1/2-13 X 2-1/2	4	
8	6109170	WASHER, FLAT 1/2"	8	
9	6109180	WASHER, LOCK 1/2"	4	
10	6109160	NUT, HEX 1/2-13	4	
11	1B40U-2203A	ENGINE, HATZ	1	
12	09592250000014	COVER, BATTERY	1	
13	0950241265AP002	BOLT WITH NUT, BATTERY	2	
14	0451250080	SPRING WASHER, BATTERY	2	
15	0401450080	WASHER, BATTERY	2	
16	0975209300	NEGATIVE BATTERY CABLE	1	
17	0976209450	POSITIVE BATTERY CABLE	1	

# HATZ 1B40U-2203A — SPARE PARTS KIT



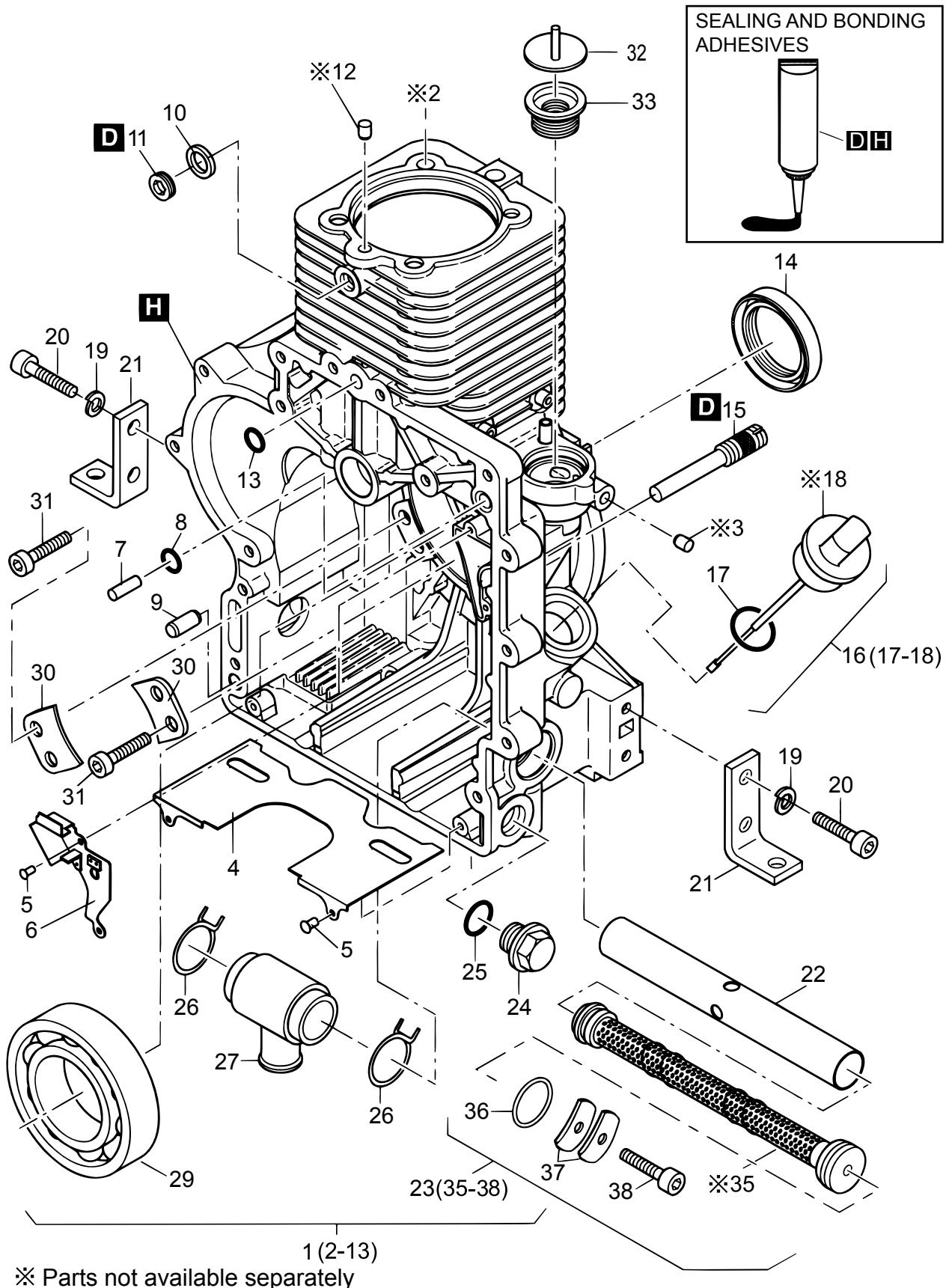


## HATZ 1B40U-2203A — SPARE PARTS KIT

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<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	01679202	GASKET SET CYL.HEAD	1	
2	01679302	GASKET SET CRK.CASE	1	
3	01679400	1000H MAINTK.KIT	1	
4	01679510	EMERGENCY KIT	1	

# HATZ 1B40U-2203A — CRANKCASE KIT



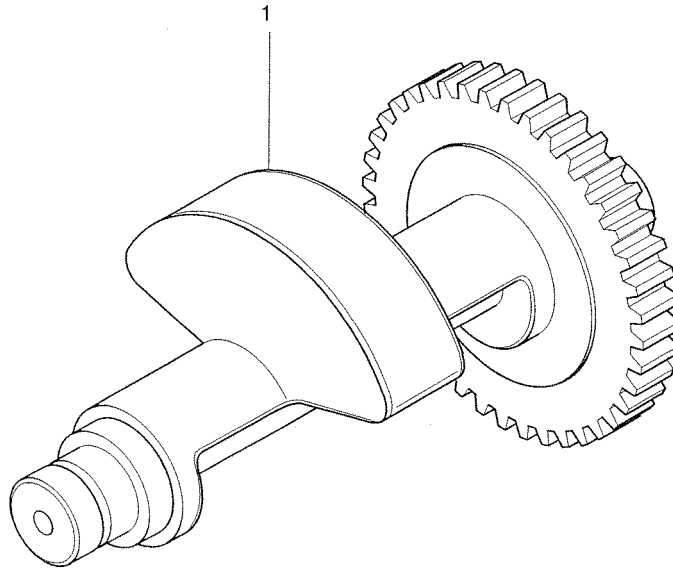
# HATZ 1B40U-2203A — CRANKCASE KIT

## CRANKCASE KIT

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
D	50223300	LOCTITE221 50ML	1	
H	50282501	SILICON 30ML	1	
1	01679100	CRANKCASE ASSY .....	1	INCLUDES ITEMS W/ #
2#		CRANKCASE.....	1	NOT SOLD SEPARATELY
3#		PLUG .....	1	NOT SOLD SEPARATELY
4#	04141600	COVER SHEET	1	
5#	40002600	BLIND RIVET3.2	1	
6#	01336400	COVER SHEET (SIDE)	4	
7#	50502801	CYL.PIN M6X24	1	
8#	50440300	O-RING 8X1.5	1	
9#	50249102	CYL.PIN M6X24	1	
10#	50062400	JOINT A10X13.5	1	
11#	50062300	CLOS.SCREW M10X1	1	
12#		PLUG .....	1	NOT SOLD SEPARATELY
13#	40022300	O-RING 8X2	1	
14	50479000	OIL SEAL 45X60X8	1	
15	04144401	GRUB SCREW	1	
16	01342800	DIPSTICK ASSY .....	1	INCLUDES ITEMS W/ \$
17\$	04125000	SEALING RING	1	
18\$		DIPSTICK .....	1	NOT SOLD SEPARATELY
19	50208500	SPRING WASHER 8	8	
20	04219500	ALLEN SCREW M8X40	8	
21	04144701	ENGINE BRACKET	4	
22	04141500	TUBE F.OIL FILTER	1	
23	01542702	OIL SUCTION FILTER ASSY .....	1	INCLUDES ITEMS W/%
24	50373100	DRAIN PLG.MAGNT.M22	1	
25	50001600	JOINT A22X27	1	
26	05036900	HOSE CLIP	2	
27	04163000	T-PIECE	1	
29	50478900	GROOV.BALLBEAR.6310	1	
30	04133800	PLATE	3	
31	50564200	ALLEN SCREW M6X18	6	
32	01555800	COVER	1	
33	03568701	OIL SUPPLEMENT PLUG	1	
35%		FILTER, OIL SUCTION .....	1	NOT SOLD SEPARATELY
36%	50475901	O-RING 20X4	1	
37%	05148200	PLATE SPRING	2	
38%	50170700	ALLEN SCREW M6X16	1	

# HATZ 1B40U-2203A — COMPENSATION OF MASSES ASSY.

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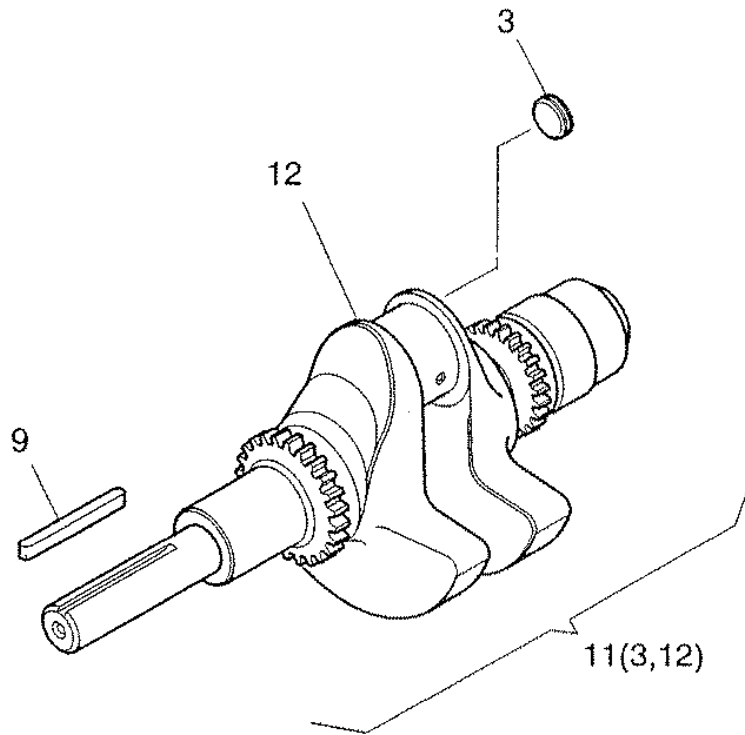
# **HATZ 1B40U-2203A — COMPENSATION OF MASSES ASSY.**

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COMPENSATION OF MASSES ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	01349201	COMPENSATING SHAFT	1	

# HATZ 1B40U-2203A — CRANKSHAFT ASSY.



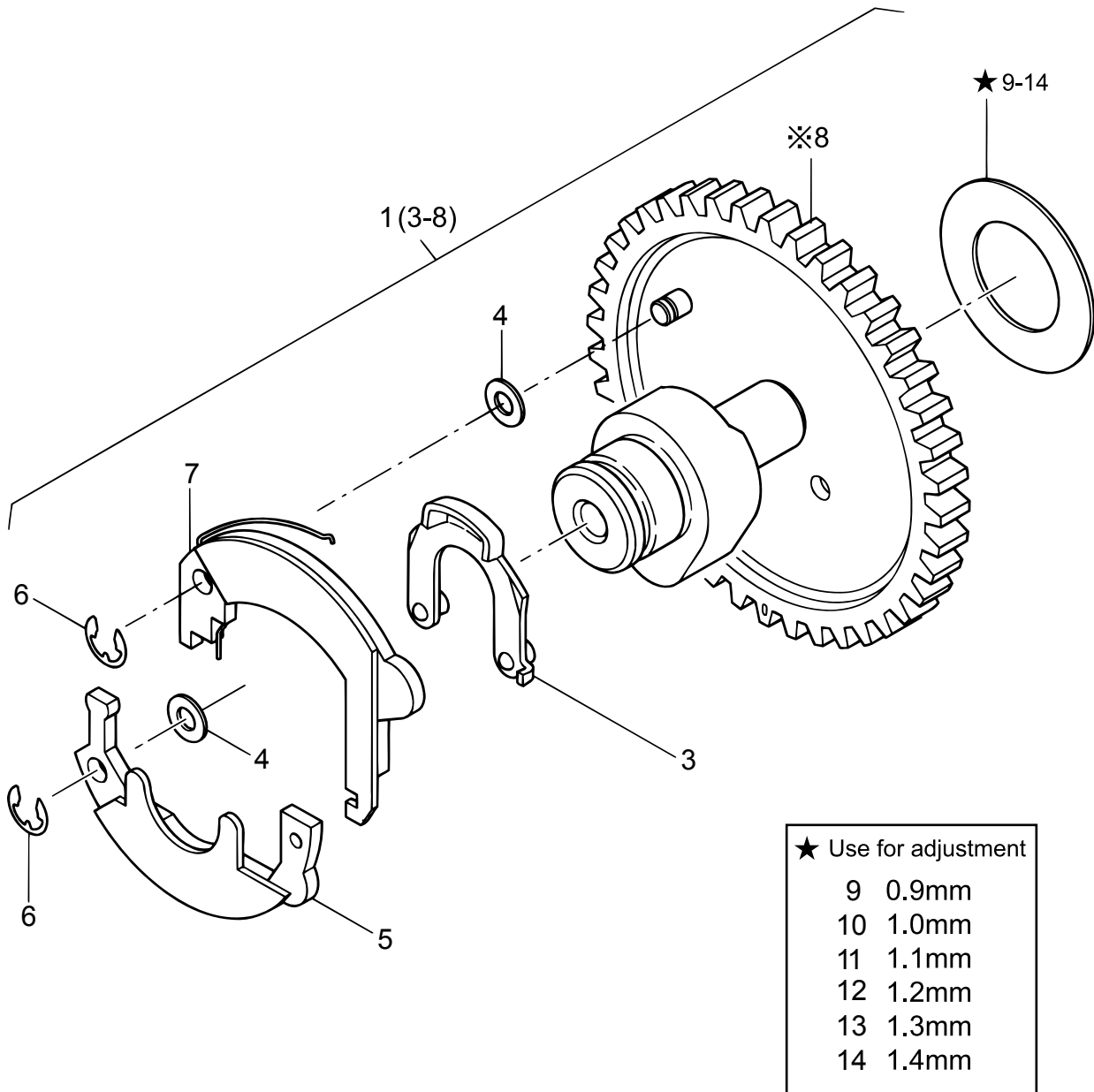
# HATZ 1B40U-2203A — CRANKSHAFT ASSY.

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CRANKSHAFT ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
3#	50529700	COVER 14	1	
9	05141600	KEY 6,35X61	1	
11	01359201	CRANKSHAFT ASSY .....	1.....	INCLUDES ITEMS W/ #
12#		CRANKSHAFT.....	1.....	NOT SOLD SEPARATELY

# HATZ 1B40U-2203A — CAMSHAFT ASSY.



※ Parts not available separately

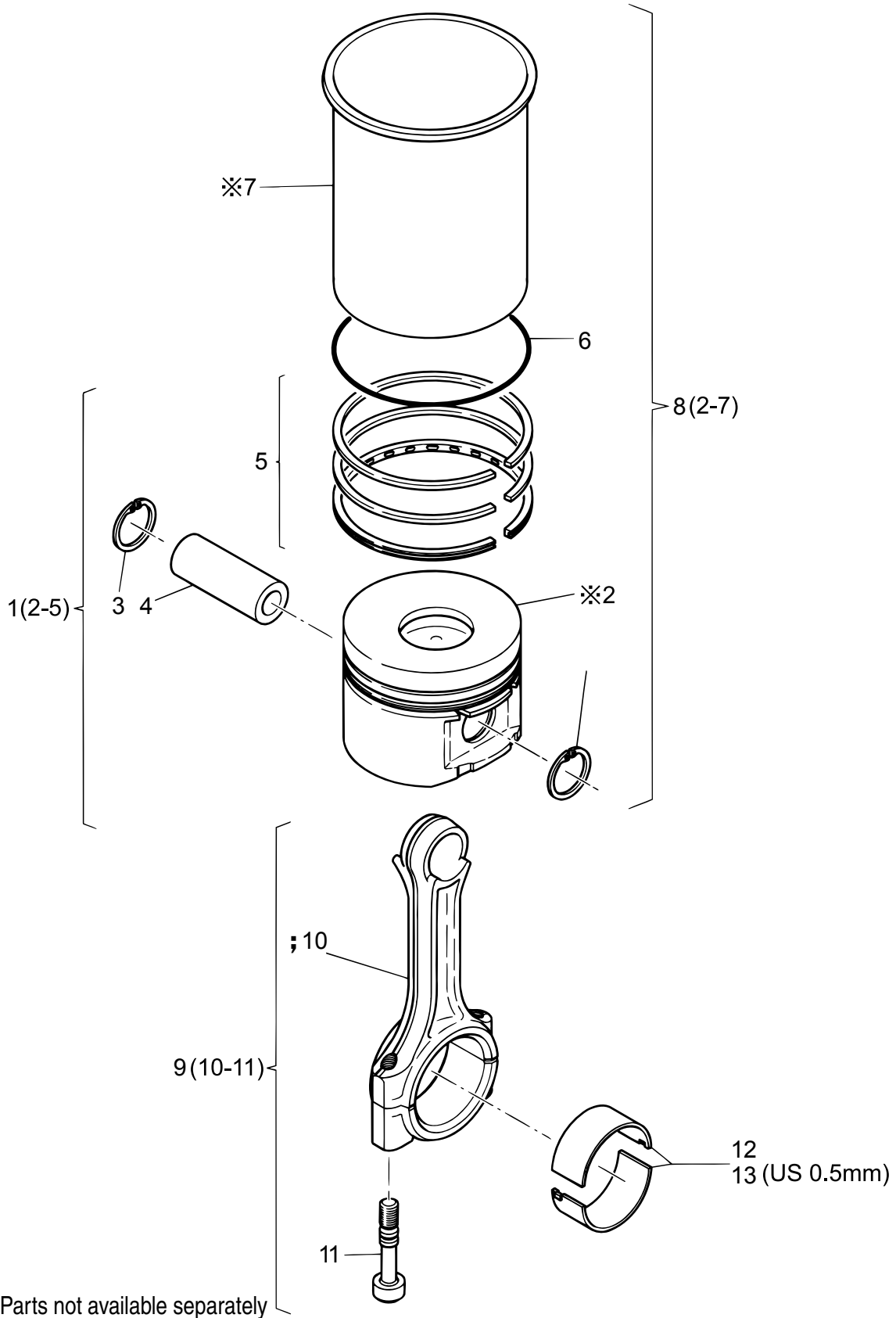


# HATZ 1B40U-2203A — CAMSHAFT ASSY.

## CAMSHAFT ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	01345003	CAMSHAFT ASSY. ....	1.....	INCLUDES ITEMS W/#
3#	01326401	CAMLEVER	1	
4#	50123200	SHIM 5X10X0.5	2	
5#	01326600	FLYWEIGHT	1	
6#	50255300	LOCKING WASHER 3.2	2	
7#	01326501	F.WEIGHT HAND-ST.	1	
8#		CAMSHAFT .....	1.....	NOT SOLD SEPARATELY
9	04121700	SHIM 23X38X0.9	1	
10	04112100	SHIM 23X38X1.0	1	
11	04112200	SHIM 23X38X1.1	1	
12	04112300	SHIM 23X38X1.2	1	
13	04125100	SHIM 23X38X1.3	1	
14	04125200	SHIM 23X38X1.4	1	

# HATZ 1B40U-2203A — PISTON, CONROD, CYLINDER ASSY.

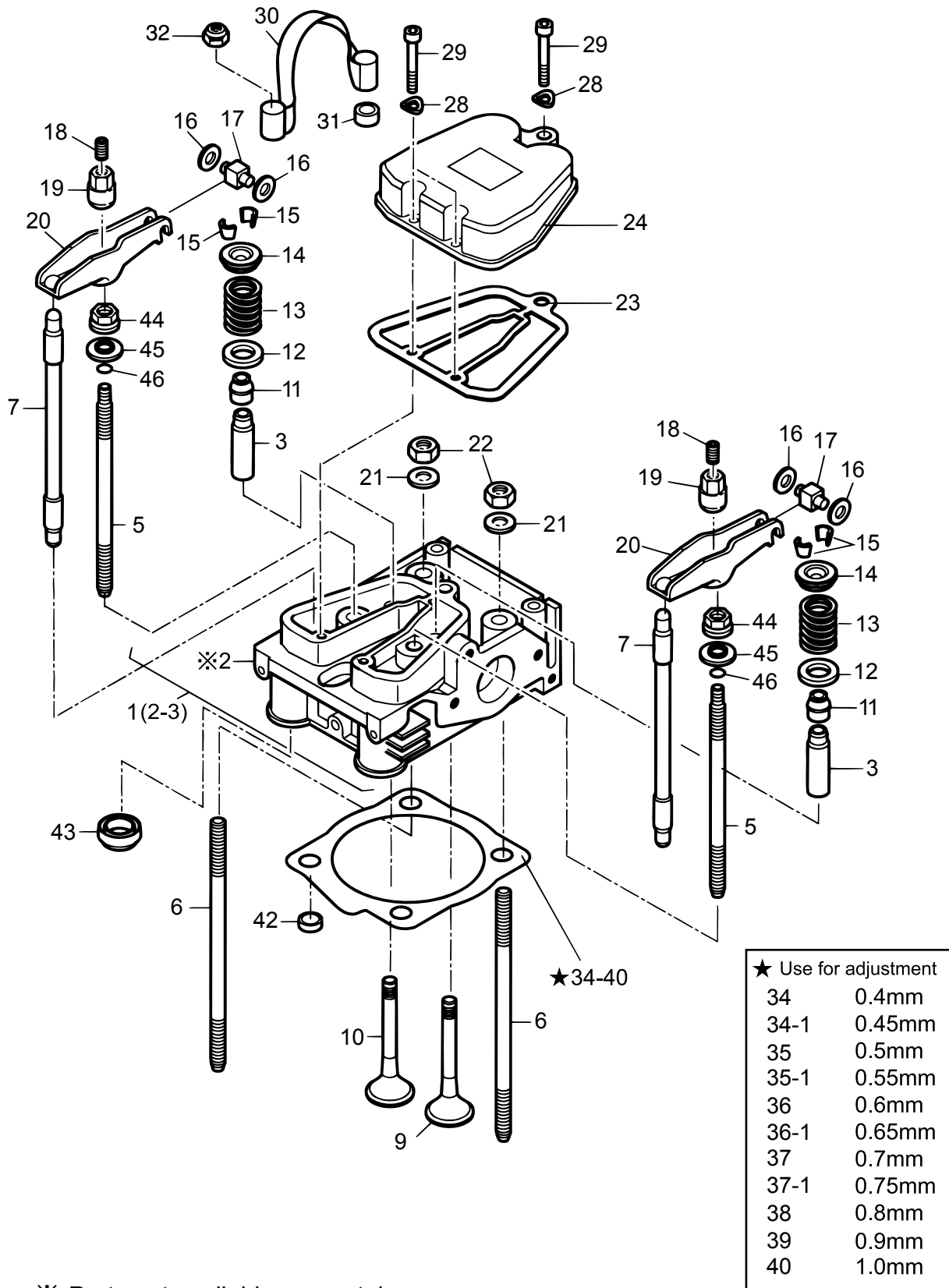


# HATZ 1B40U-2203A — PISTON, CONROD, CYLINDER ASSY.

PISTON, CONROD, CYLINDER ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	01374810	PISTON ASSY 88 EPA2 .....	1.....	INCLUDES ITEMS W/ %
2#%		PISTON.....	1.....	NOT SOLD SEPARATELY
3#%	50482300	CIRCLIP 22X1	2	
4#%	50527100	GUDGEON PIN	1	
5#%	01374701	PISTON RING SET 88	1	
6#	50479301	O-RING 93 X 1.5	1	
7#		CYLINDER.....	1.....	NOT SOLD SEPARATELY
8	01679610	CYLINDER W/ PISTON ASSY.....	1.....	INCLUDES ITEMS W/ #
9	01343500	CONROD ASSY .....	1.....	INCLUDES ITEMS W/ \$
10\$		CONROD .....	1.....	NOT SOLD SEPARATELY
11\$	04100500	CONROD SCREW	2	
12	01679800	BIG END BEARING	1	
13	01692700	BIG END BEAR.US0.5	1	

# HATZ 1B40U-2203A — CYLINDER HEAD ASSY.



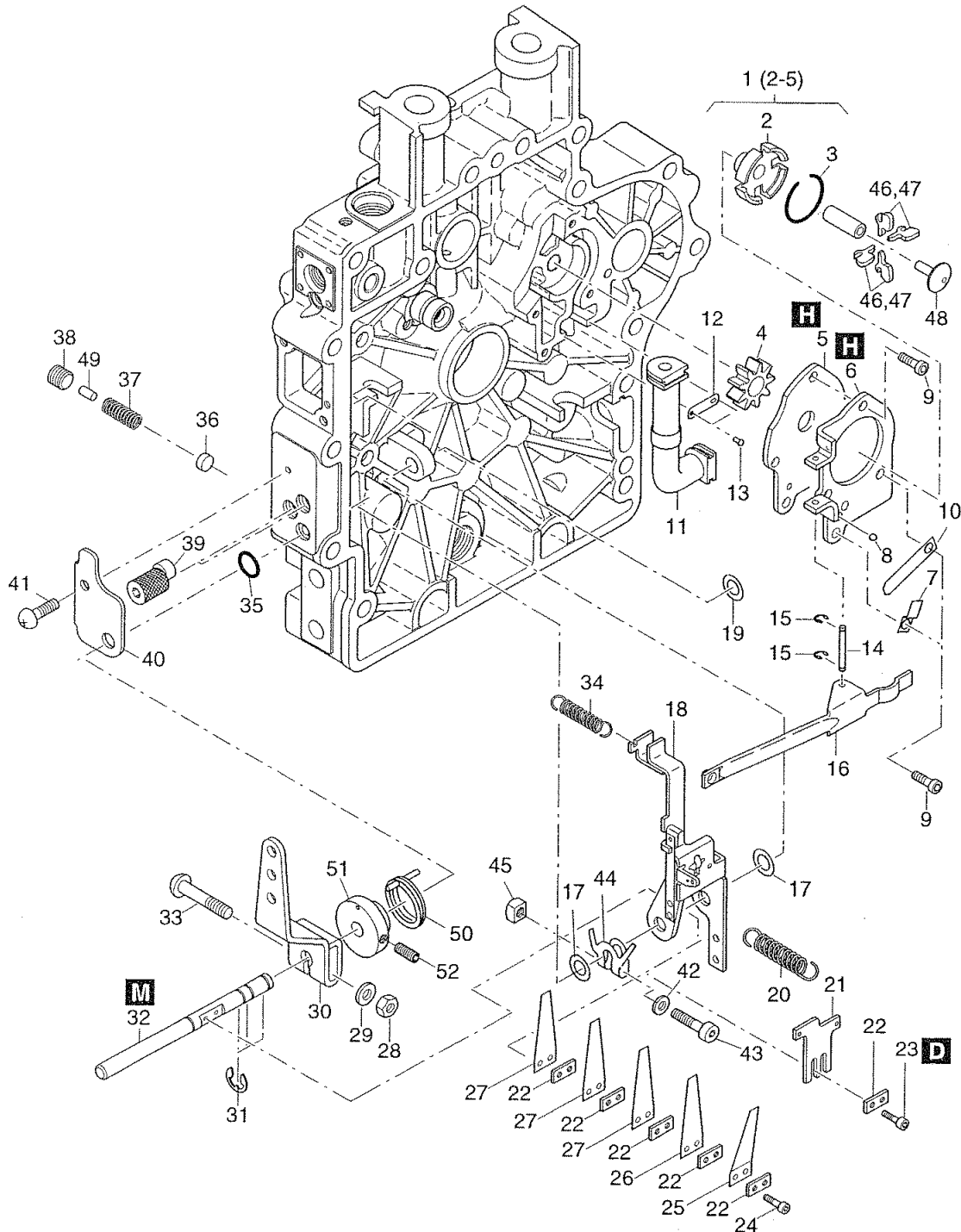
※ Parts not available separately

## HATZ 1B40U-2203A — CYLINDER HEAD ASSY.

### CYLINDER HEAD ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	01850900	CYLINDER HEAD ASSY EPA2 .....	1.....	INCLUDES ITEMS W/ #
2#		CYLINDER HEAD.....	1.....	NOT SOLD SEPARATELY
3#	05209700	VALVE GUIDE	2	
5	05159600	STUD CYL. HEAD	2	
6	05159700	STUD CYL. HEAD	2	
7	01374000	PUSHROD	2	
9	05145100	VALVE INLET	1	
10	05145200	VALVE EXHAUST	1	
11	50425800	STEM SEAL CAP	2	
12	04147100	WASHER	2	
13	04146900	VALVE SPRING	2	
14	04147000	SPRING PLATE	2	
15	50425700	COLLET	2	
16	05240700	SUPP.DISCS 6X12X1.35	4	
17	05091101	SLIDER	2	
18	50513100	GRUB SCREW M8X10	2	
19	05054700	NUT F. ROCKERARM	2	
20	05146701	ROCKER	2	
21	05099300	WASHER 10.1X24X3	2	
22	50396600	HEXAGON NUT M 10	2	
23	05156401	GASKET CYL. HEAD	1	
24	05146501	COVER F. CYL. HEAD	1	
28	50081200	SPRING WASHER A 6	3	
29	50374900	ALLEN SCREW M 6X35	3	
30	04117701	LIFTING STRAP	1	
31	04126100	PROTECTION HOSE	2	
32	40028600	HEX.NUT M10	2	
34	05158903	GASKET F.CYL.HEAD 0.4	1	
34-1	04248400	GASKET F.CYL.H. 0.45	1	
35	04248500	GASKET F.CYL.H. 0.55	1	
35-1	05159003	GASKET F.CYL.H. 0.5	1	
36	05159103	GASKET F.CYL.HEAD 0.6	1	
36-1	04248600	GASKET F.CYL.H. 0.65	1	
37	05159203	GASKET F.CYL.HEAD 0.7	1	
37-1	04248700	GASKET F.CYL.H. 0.75	1	
38	05159303	GASKET F.CYL.HEAD 0.8	1	
39	05159403	GASKET F.CYL.HEAD 0.9	1	
40	05159503	GASKET F.CYL.HEAD 1.0	1	
42	04174500	CENTR.BUSH	2	
43	04106500	SEALING RING TIM.COV.	2	
44	03171800	COLLAR NUT	2	
45	04243700	DISC 8.1X12X2.0	2	
46	50563900	O-RING 10X2.5	2	

# HATZ 1B40U-2203A — OIL PUMP AND GOVERNOR ASSY.

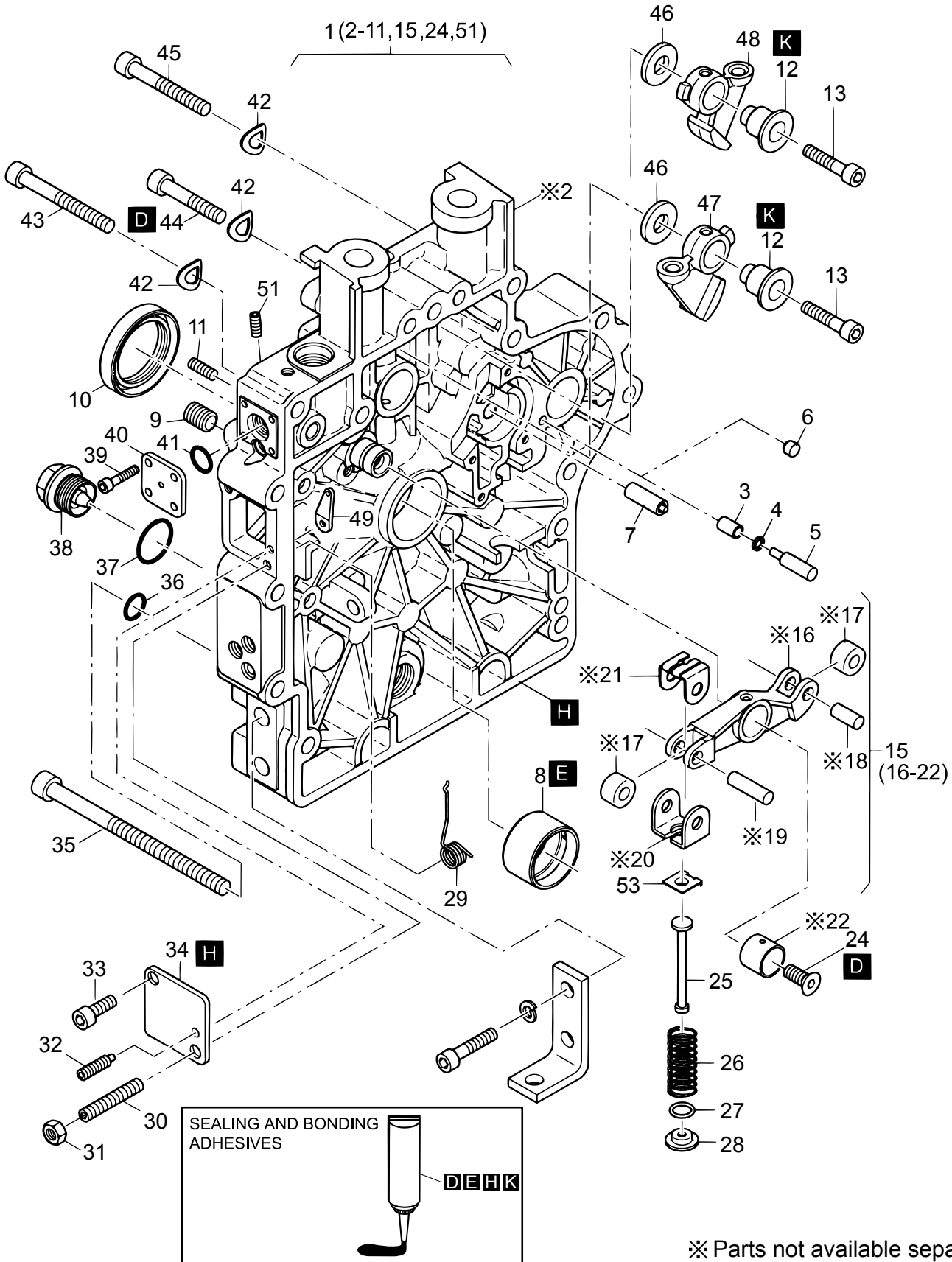


# HATZ 1B40U-2203A — OIL PUMP AND GOVERNOR ASSY.

## OIL PUMP AND GOVERNOR ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
D	50223300	LOCTITE221 50ML	1	
H	50282501	SILICON 30ML	1	
M	50485100	SCHLEIF PASTE 80G	1	
1	01344510	OILPUMP CP. ASSY .....	1	INCLUDES ITEMS W/ #
2#		OIL PUMP .....	1	NOT SOLD SEPARATELY
3#	04210910	CIRCLIP	1	
4#		GEAR, OIL PUMP.....	1	NOT SOLD SEPARATELY
5#		HOUSING, OIL PUMP .....	1	NOT SOLD SEPARATELY
6	05078110	COVER, OIL PUMP	1	
7	05097100	RETAINING STRAP	1	
8	50447900	BALL 3.5 MM G100	1	
9	50429400	ALLEN SCREW M5X12	4	
10	05097300	FLAT SPRING 0.4	1	
11	01346000	TUBE OIL SUCTION	1	
12	04153400	FISHPLATE	1	
13	40002600	BLINDRIVET3.2	2	
14	05078600	SHAFT	1	
15	50434800	CIRCLIP 1.9	2	
16	01345901	LEVER	1	
17	50422400	SHIM 8X14X1	2	
18	01365200	GOVERNOR LEVER	1	
19	50125800	DISC 8X14X0.5	1	
20	05130910	GOVERNOR SPRING	1	
21	05130800	STOP	1	
22	05079800	INTERMEDIATE PLATE	1	
23	50465300	ALLEN SCREW M3X8	2	
24	50435000	ALLEN SCREW M3X12	2	
25	05148600	STOP SPRING	1	
26	05078900	GOV. SPRING 0.3	1	
27	05131600	GOV. SPRING 0.2	1	
28	50346500	HEXAGON NUT, M6	1	
29	50144500	FLAT WASHER	1	
30	04095600	LEVER	1	
31	50092700	CIRCLIP 7	1	
32	05079301	SHAFT	1	
33	03927300	SCREW M6 X 32	1	
34	50563400	TENSION SPRING	1	
35	40022401	O-RING 8X2 GRAY	1	
36	05151700	PLUG	1	
37	50488700	PRESSURE SPRING	1	
38	50475700	GRUB SCREW M10X10	4	
39	05178810	ECCENTRIC SCREW	1	
40	05178400	PLATE	1	
41	50492300	FILL.HEAD SCREW M5X12	1	
42	50216300	WASHER 5.3	2	
43	50492200	ALL.SCR. M5X25	1	
44	05178500	STOP	2	
45	50422700	SQUARE NUT M5	1	
46	05079611	CENTRIFUGAL WEIGHT	2	
47	05160211	CENTRIFUGAL WEIGHT	1	
48	05078502	GOVERNOR SLEEVE	1	
49	50057900	CYL.PIN 4 M6X8	1	
50	05179100	SPRING	1	
51	05179000	BUSHING	1	
52	50400600	GRUB SCREW M5 X 10	1	

# HATZ 1B40U-2203A — TIMING COVER ASSY.



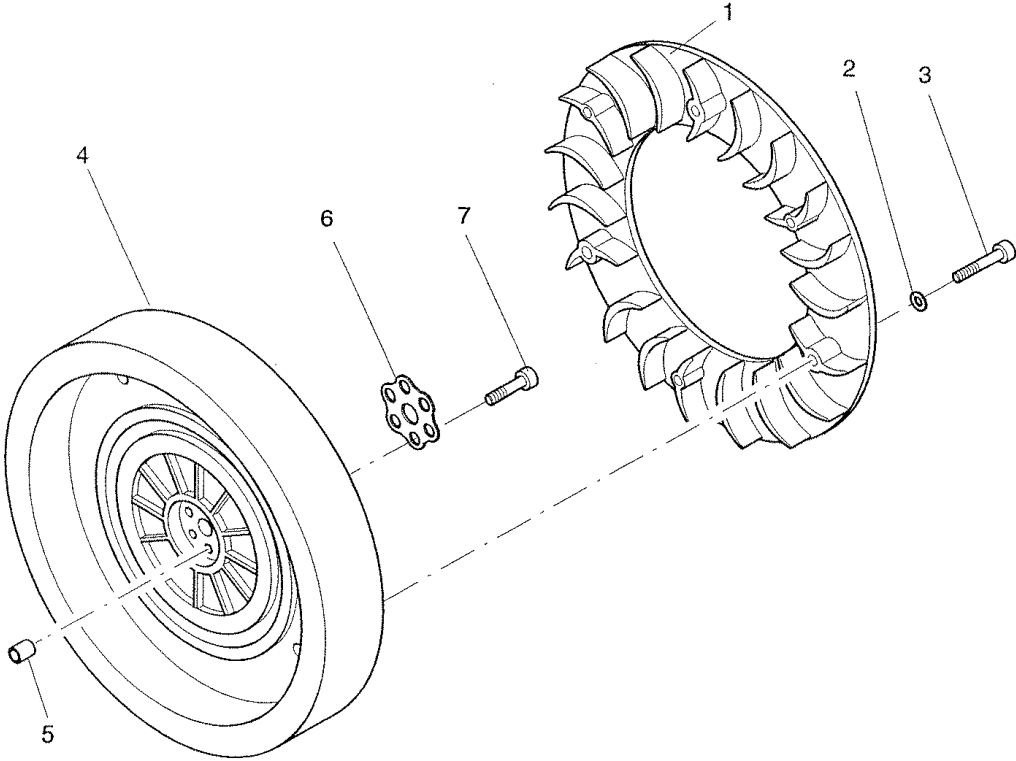


# HATZ 1B40U-2203A — TIMING COVER ASSY.

## TIMING COVER ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
D	50223300	LOCTITE221 50ML	1	
E	50223400	LOCTITE648 10ML	1	
H	50282501	SILICON 30ML	1	
K	50342601	HOCHTEMP.FETT 400G	1	
1	01894200	TIMING COVER CP. ASSY .....	1	INCLUDES ITEMS W/ #
2#		TIMING COVER .....	1	NOT SOLD SEPARATELY
3#	04185800	CLOSING PLUG	1	
4#	50464100	O-RING 2X1	1	
5#	04185700	CLOSING PLUG 4X15	1	
6#	04168600	PLUG 4.3	1	
7#	01344600	BOLT F.GOV.HOUSING	1	
8#	04148800	MAIN BEARING	1	
9#	50530600	GRUB SCREW M8X10	4	
10#	50479500	OIL SEAL 35X47X7	1	
11#	50400600	GRUB SCREW M 5X10	2	
12	03794201	CAM FOLLOW SP.	2	
13	50469900	ALLEN SCREW M6X30	2	
15#	01346710	ROCKER LEVER ASSY .....	1	INCLUDES ITEMS W/ \$
16\$		ROCKER LEVER .....	1	NOT SOLD SEPARATELY
17\$		BUSHING, ROCKER LEVER .....	1	NOT SOLD SEPARATELY
18\$		PIN, ROCKER LEVER .....	1	NOT SOLD SEPARATELY
19\$		PIN, ROCKER LEVER .....	1	NOT SOLD SEPARATELY
20\$		CLAMP, ROCKER LEVER.....	1	NOT SOLD SEPARATELY
21\$		CLAMP, ROCKER LEVER.....	1	NOT SOLD SEPARATELY
22\$		SPINDLE .....	1	NOT SOLD SEPARATELY
24#	50561800	CTR.SUNK SCREW M6X40	1	
25	04094700	DRAW ROD	1	
26	04095700	PRESSURE SPRING	1	
27	04133900	DISC 10.7X19X0.5	1	
28	04094802	CUP	1	
29	05095210	SPRING F.GOVERNOR	1	
30	50499300	GRUB SCREW M6X35	1	
31	50144400	HEXAGON NUT M6	1	
32	50499400	GRUB SCREW M4X25	1	
33	50384200	ALLEN SCREW M6X12	1	
34	04095210	COVER	1	
35	50463000	ALLEN SCREW M8X130	2	
36	50162900	JOINT A8X14	2	
37	50459100	JOINT A22X27	1	
38	50373100	DRAIN PLG.MAGNT.M22	1	
39	50397100	ALLEN SCREW M4X10	4	
40	01351700	COVER	1	
41	50329000	O-RING 9.5X2.5	1	
42	50095100	SPRING WASHER A8	15	
43	50288800	ALLEN SCREW M8X55	11	
44	50177500	ALLEN SCREW M8X40	2	
45	50392900	ALLEN SCREW M8X50	2	
46	03794100	WASHER	2	
47	04146600	CAM FOLLOWER	1	
48	04146000	CAM FOLLOWER	1	
49	05127100	LEVER	1	
51#	50262400	THREADED PIN M6X10	1	
53	04189500	CUP	1	

# HATZ 1B40U-2203A — BLOWER AND FLYWHEEL ASSY.



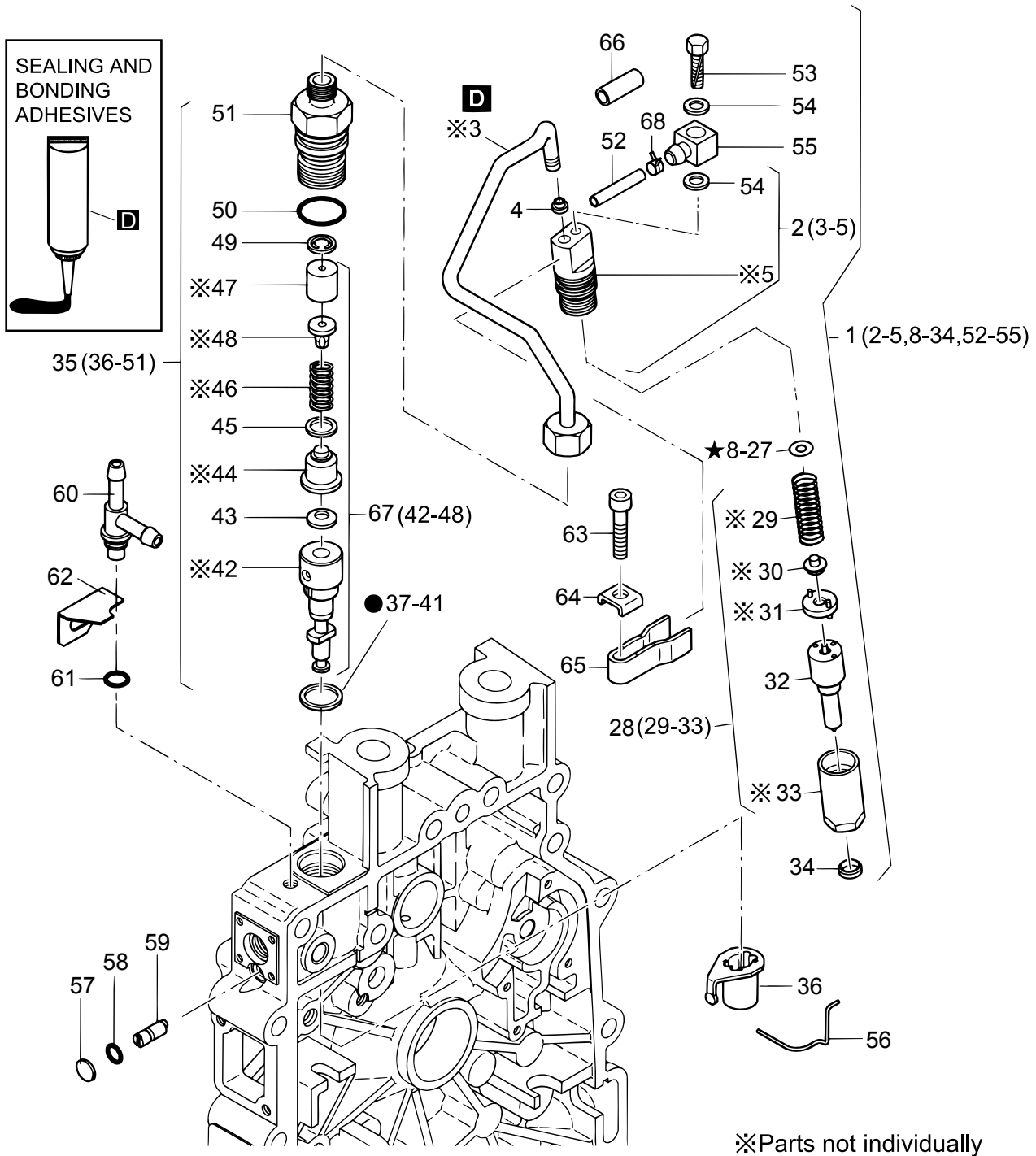
# HATZ 1B40U-2203A — BLOWER AND FLYWHEEL ASSY.

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## BLOWER AND FLYWHEEL ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	04205800	BLOWER RING	1	
2	50003400	SPRING WASHER A4	6	
3	50327300	ALLEN SCREW M4X20	6	
4	04153901	FLYWHEEL	1	
5	50205600	ROLL PIN 10 X 12	1	
6	04155101	PLATE	1	
7	50502501	ALLEN SCREW M8X35	6	

# HATZ 1B40U-2203A — INJECTION EQUIPMENT ASSY.



● Use for adjustment	
37	0.2mm
38	0.3mm
39	0.4mm
40	0.5mm
41	0.6mm

★ Use for adjustment					
8	1.00mm	13	1.24mm	18	1.50mm
9	1.04mm	14	1.30mm	19	1.54mm
10	1.10mm	15	1.34mm	20	1.60mm
11	1.14mm	16	1.40mm	21	1.64mm
12	1.20mm	17	1.44mm	22	1.70mm
				23	1.74mm
				24	1.80mm
				25	1.84mm
				26	1.90mm
				27	1.94mm

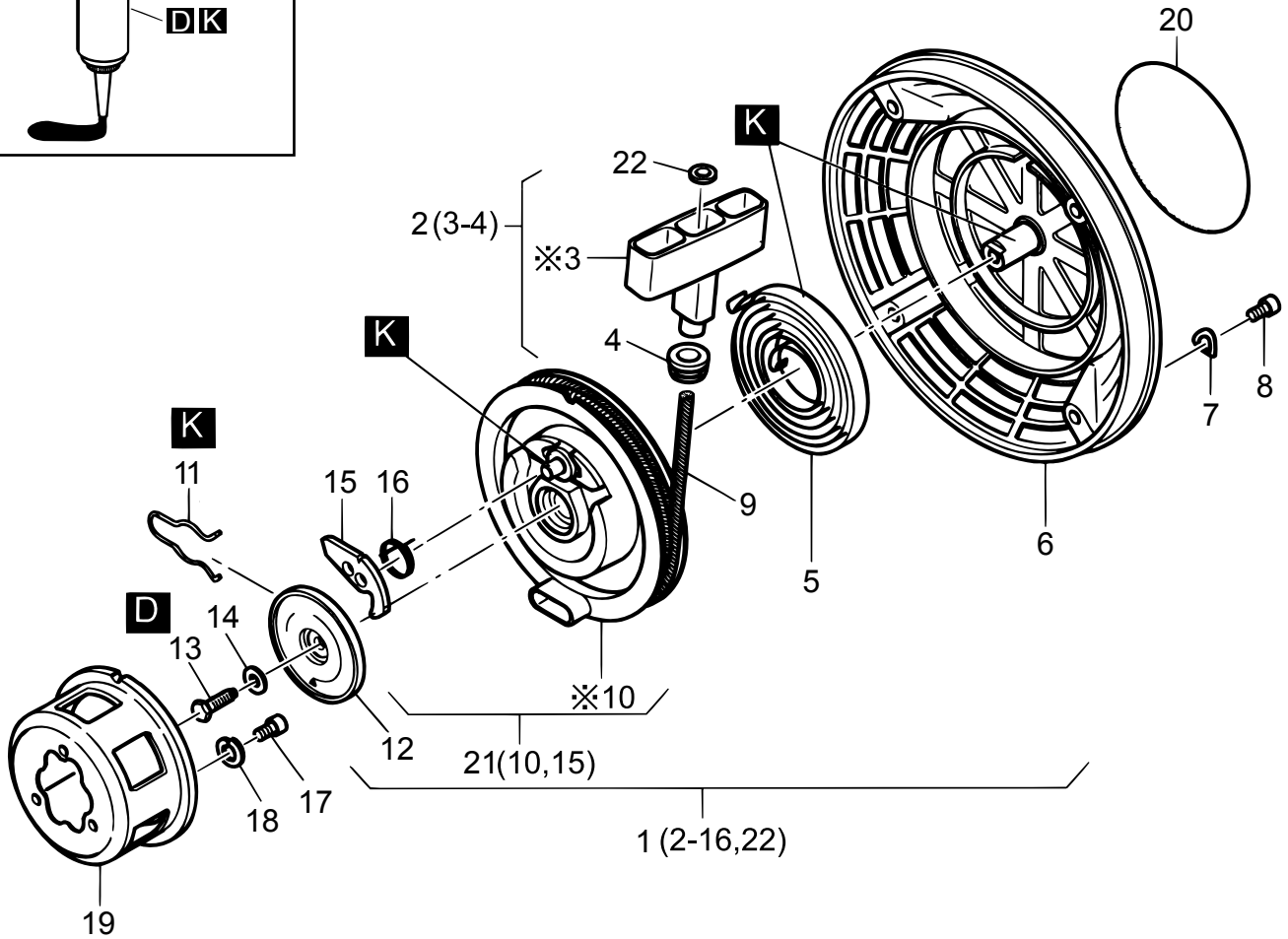
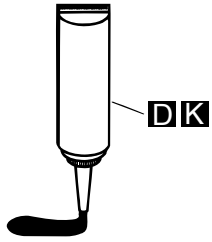
# HATZ 1B40U-2203A — INJECTION EQUIPMENT ASSY.

## INJECTION EQUIPMENT ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
D	50223300	LOCTITE221 50ML	1	
1	01389700	INJECTOR CPL. ....	1	INCLUDES ITEMS W/ %
2%	01680600	NOZZLE HOLD.+PIPE .....	1	INCLUDES ITEM W/ &
3%&		PIPE.....	1	NOT SOLD SEPARATELY
4%&	05070601	SEALING CONE	1	
5%&		NIPPLE BODY .....	1	NOT SOLD SEPARATELY
8%	50436400	SHIM 1.0	1	
9%	50436500	SHIM 1.04	1	
10%	50436600	SHIM 1.10	1	
11%	50436700	SHIM 1.14	1	
12%	50436800	SHIM 1.20	1	
13%	50436900	SHIM 1.24	1	
14%	50437000	SHIM 1.30	1	
15%	50437100	SHIM 1.34	1	
16%	50437200	SHIM 1.40	1	
17%	50437300	SHIM 1.44	1	
18%	50437400	SHIM 1.50	1	
19%	50437500	SHIM 1.54	1	
20%	50437600	SHIM 1.60	1	
21%	50437700	SHIM 1.64	1	
22%	50437800	SHIM 1.70	1	
23%	50437900	SHIM 1.74	1	
24%	50438000	SHIM 1.80	1	
25%	50438100	SHIM 1.84	1	
26%	50438200	SHIM 1.90	1	
27%	50438300	SHIM 1.94	1	
28%	01389900	PARTS SET NOZZLE ASSY EPA .....	1	INCLUDES ITEMS W/ \$
29\$%		SPRING .....	1	NOT SOLD SEPARATELY
30\$%		SPRING WASHER.....	1	NOT SOLD SEPARATELY
31\$%		PLATE.....	1	NOT SOLD SEPARATELY
32\$%	50566600	NOZZLE	1	
33\$%		BODY .....	1	NOT SOLD SEPARATELY

# HATZ 1B40U-2203A — RECOIL STARTER ASSY.

## SEALING AND BONDING ADHESIVES



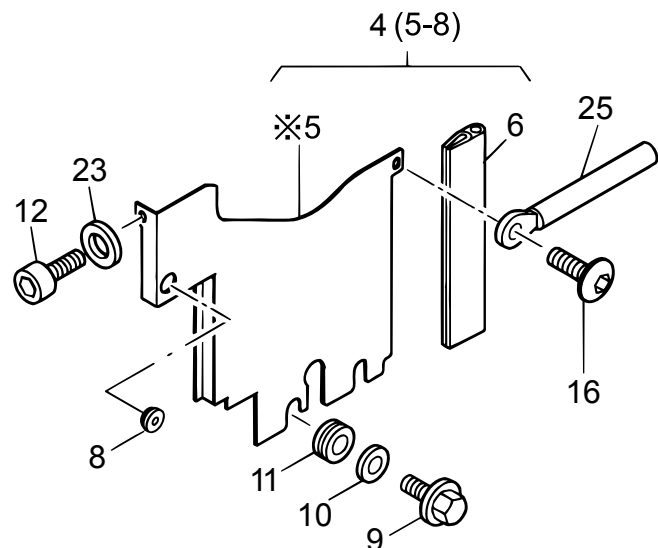
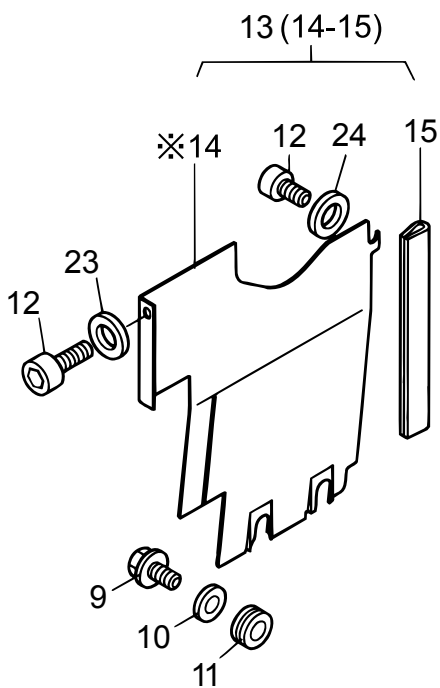
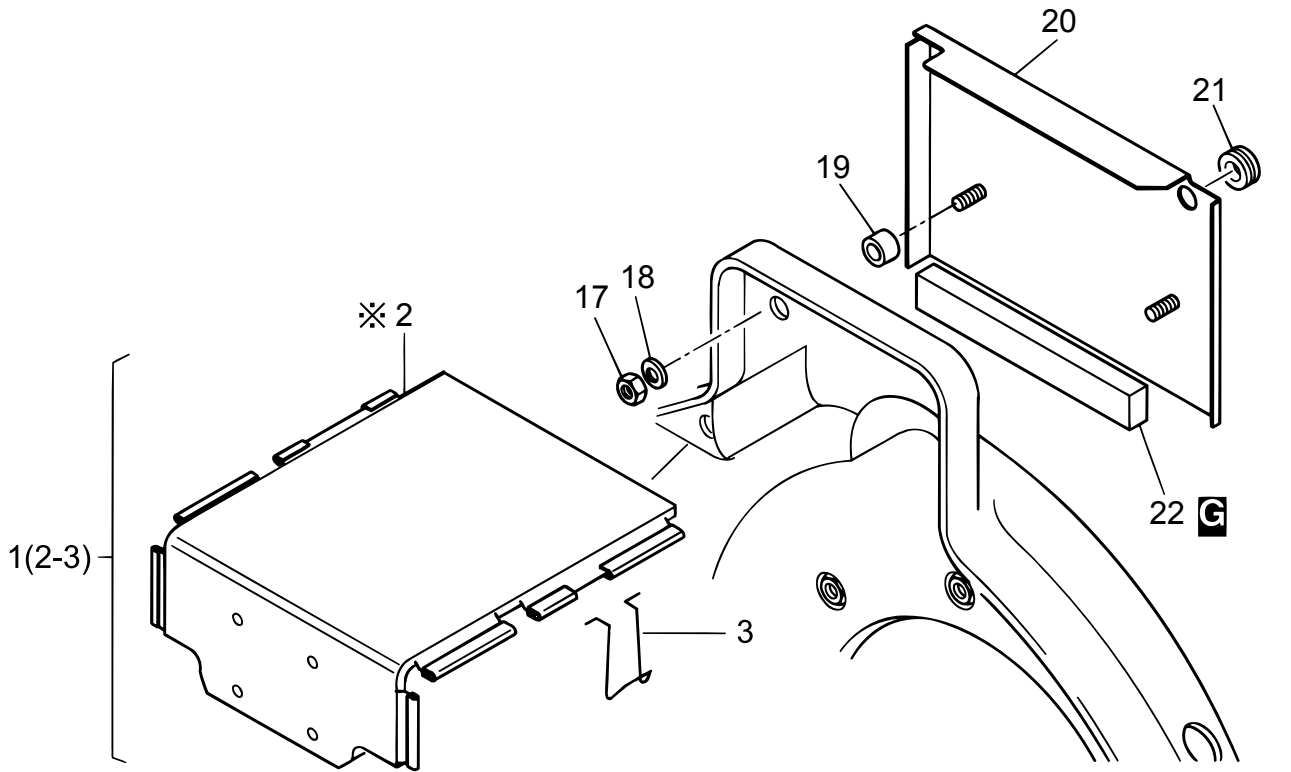
※ Not available separately

# HATZ 1B40U-2203A — RECOIL STARTER ASSY.

## RECOIL STARTER ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
D	50223300	LOCTITE221 50ML	1	
K	50342601	HOCHTEMP.FETT 400G	1	
1	01851900	RECOIL-STARTER .....	1	INCLUDES ITEMS W/ %
2%	01497800	HANDLE ASSY. ....	1	INCLUDES ITEMS W/ #
3%#		HANDLE .....	1	NOT SOLD SEPARATELY
4%#	03665200	RUBBER SLEEVE	1	
5%	05045201	RETURN SPRING	1	
6%	01569300	HOUSING F.R.START	1	
7%	50081200	SPRING WASHER A6	4	
8%	50062700	ALLEN SCREW M6X10	4	
9%	05088901	ROPE F.R.START	1	
10%\$		ROPE PULLEY .....	1	NOT SOLD SEPARATELY
11%	05044901	BRAKE SPRING	1	
12%	05045001	BRAKE DISC	1	
13%	50146300	HEX SCREW M6X18	1	
14%	50390701	CON.SPR.WASHER 6	1	
15%\$	05044800	RATCHET	1	
16%	05061300	RETURN SPRING	1	
17	50062700	ALLEN SCREW M6X10	3	
18	50170900	SPRING WASHER 6	3	
19	04155000	DRIVING SLEEVE	1	
20	05298100	STICKER LABEL	1	
21	01548800	ROPE PULLEY .....	1	INCLUDES ITEM W/ \$
22%	50514600	WASHER 5.3	1	

# HATZ 1B40U-2203A — AIR DUCTING ASSY. (A)



※ Parts not available separately

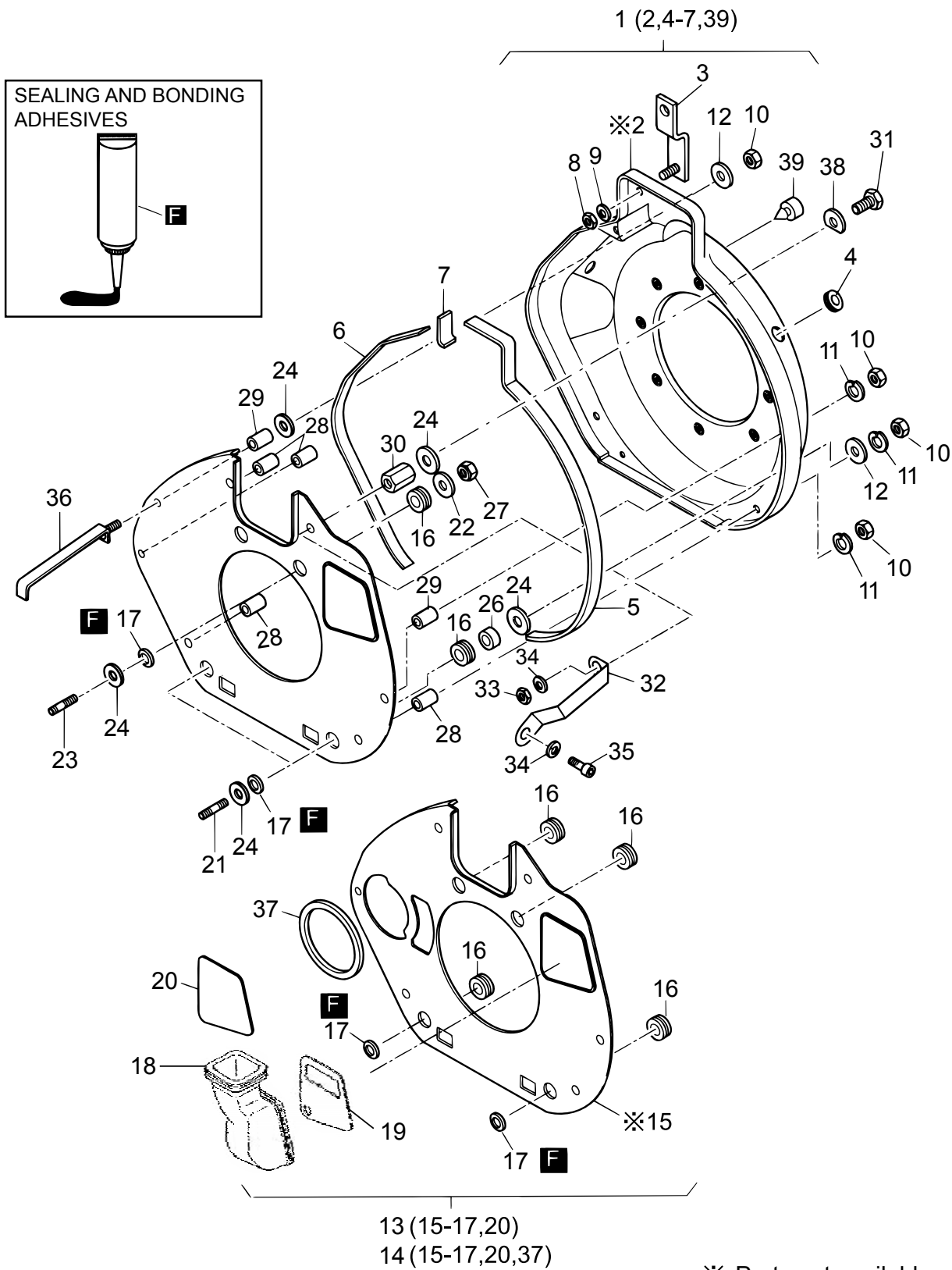


## HATZ 1B40U-2203A — AIR DUCTING ASSY. (A)

### AIR DUCTING ASSY. (A)

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
G	50256501	LOCTITE IS407 20G	1	
1	01853100	HOOD ASSY.....	1	INCLUDES ITEM W/ #
2#		HOOD .....	1	NOT SOLD SEPARATELY
3#	05152100	SPRING CLIP	1	
4	01345400	COOLING AIR DUCT ASSY.....	1	INCLUDES ITEM W/ \$
5\$		AIR DUCT .....	1	NOT SOLD SEPARATELY
6\$	04144200	SEALING STRIP 119MM	1	
8\$	50334800	RUBBER SLEEVE	1	
9	50445401	FILL.HEAD SCREW M4X10	4	
10	50441600	WASHER 4.3	4	
11	50163801	RUBBER SLEEVE	4	
12	50528100	ALLEN SCREW M6X16	3	
13	01345300	COOLING AIR DUCT ASSY.....	1	INCLUDES ITEMS W/ %
14%		AIR DUCT .....	1	NOT SOLD SEPARATELY
15%	04144200	SEALING STRIP 119MM	1	
16	50495000	SCREW M6X12	1	
17	50144400	HEXAGON NUT M6	2	
18	50170900	SPRING WASHER 6	2	
19	03354600	SPACER BUSH	2	
20	01698200	COVER	1	
21	50334800	RUBBER SLEEVE	1	
22	03577200	SEALING STRIP	1	
23	50144500	FLAT WASHER 6.4	2	
24	04060600	WASHER 6.4X16X1.5	1	
25	05001200	CLIP	1	

# HATZ 1B40U-2203A — AIR DUCTING ASSY. (B)

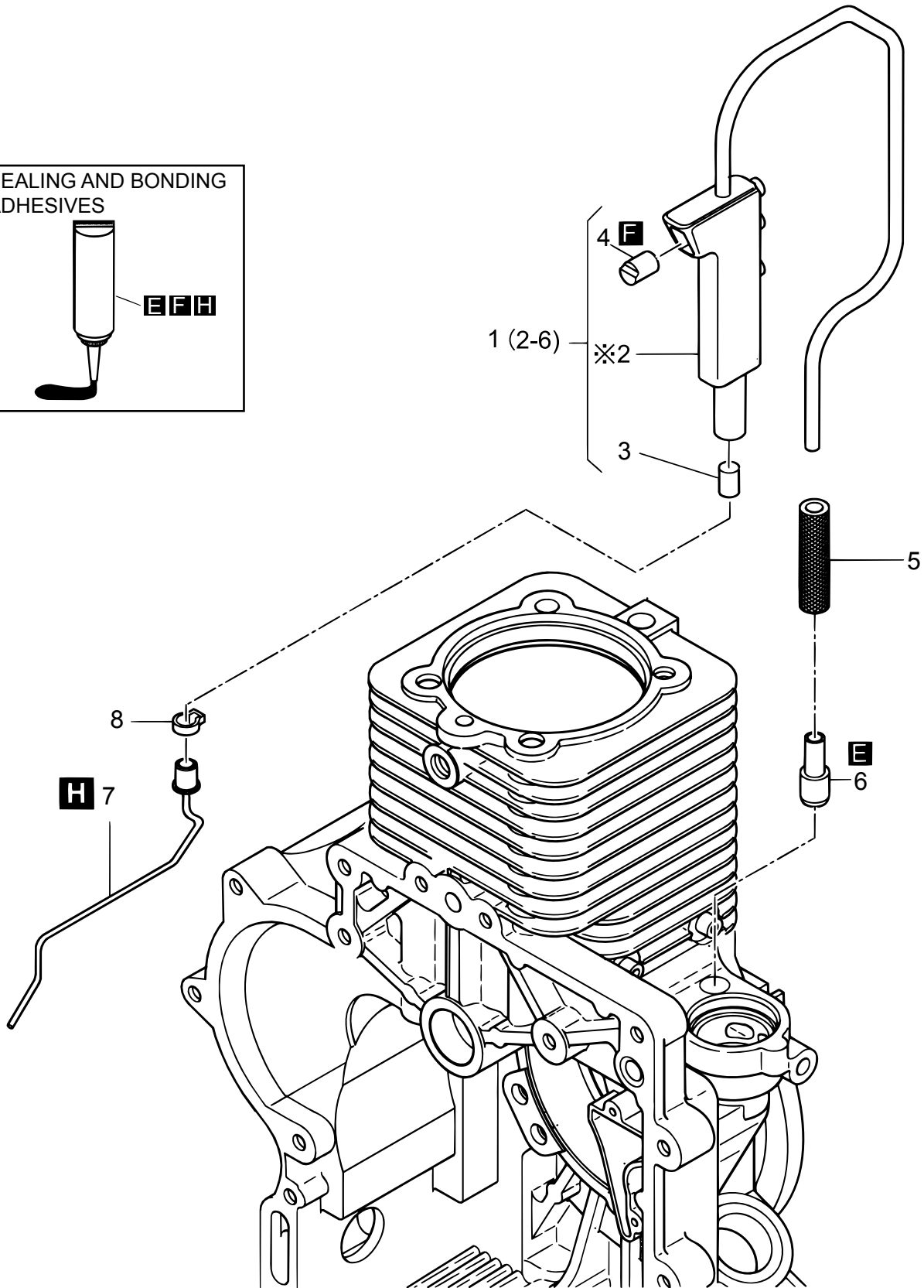


## HATZ 1B40U-2203A — AIR DUCTING ASSY. (B)

### AIR DUCTING ASSY. (B)

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
F	50223800	TECHNICOLL8058 0.75KG	1	
1	01831300	BLOWER DUCTING ASSY .....	1	INCLUDES ITEMS W/ #
2#		BLOWER DUCTING .....	1	NOT SOLD SEPARATELY
3	01331300	SUPPORT	2	
4#	50453300	RUBBER SLEEVE	1	
5#	05189400	SEALING STRIP 655MM	1	
6#	05189300	SEALING STRIP	1	
7#	05227000	SEALING STRIP 54MM	1	
8	50144400	HEXAGON NUT M6	2	
9	50170900	SPRING WASHER 6	2	
10	50144400	HEXAGON NUT M6	7	
11	50170900	SPRING WASHER 6	8	
12	50120000	DISC A6.4	3	
13	01661900	PARTING SHEET ASSY .....	1	INCLUDES ITEMS W/ \$
14	01347600	PARTING SHEET ASSY E-ST.NO FT .....	1	INCLUDES ITEMS W/ %
15\$%		PARTING SHEET .....	1	NOT SOLD SEPARATELY
16\$%	01378300	SPACER BUSH	4	
17\$%	03575500	RUBBER SEAL RING	4	
18	04146800	RUBBER INSERT	1	
19	04150800	COVER, RUBBER INSERT	1	
20\$%	04215200	CLOSING COVER	1	
21	50458100	STUD M6 X45	2	
22	50114300	DISC 6.4	2	
23	50464401	STUD M6FO X35	2	
24	04042000	WASHER 6.5X22.5X1	7	
26	05188600	SPACER BUSH 7X12X7	2	
27	50328300	HEXAGON NUT VM6	2	
28	04139000	SPAC.TUBE 6.5X12X18	4	
29	04098400	SPAC.TUBE 7X12X16.3	2	
30	05184000	HEXAGON NUT M6X17	1	
31	50026400	HEXSCREW M6X35	1	
32	01669400	SUPPORT	1	
33	50144400	HEXAGON NUT M6	1	
34	50170900	SPRING WASHER 6	2	
35	50170700	ALLEN SCREW M6X16	1	
36	01683300	SUPPORT	1	
37%	04099500	SEALING RING	1	
38	05140900	WASHER	1	
39#	50392610	RUBBER BUSH	1	

# HATZ 1B40U-2203A — CRANKCASE BREATHING SYSTEM ASSY.



※ Parts not available separately

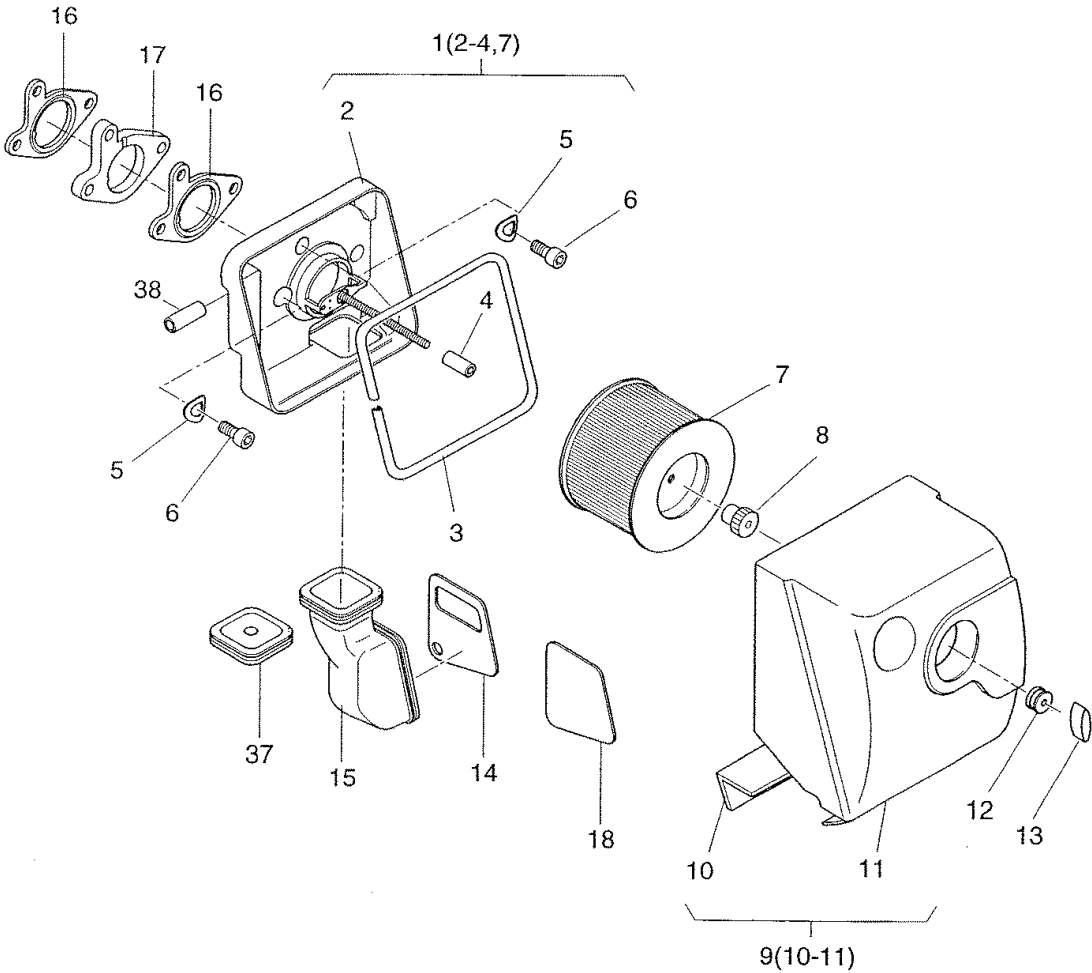
# HATZ 1B40U-2203A — CRANKCASE BREATHING SYSTEM ASSY.

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## CRANKCASE BREATHING SYSTEM ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
E	50223400	LOCTITE648 10ML	1	
F	50223800	TECHNICOLL8058 0.75KG	1	
H	50282501	SILICON 30ML	1	
1	01885800	CRANKCASE BREATHER CP .....	1	INCLUDES ITEMS W/ #
2#		OIL SEPARATOR .....	1	NOT SOLD SEPARATELY
3#	05102900	FILTER BREATHING SYSTEM	1	
4#	05098100	PLUG	1	
5#	05197200	FUEL PIPE LW 7X35	1	
6#	05196000	NIPPLE	1	
7	01626900	SUCTION PIPE	1	
8	50456800	CLAMP	1	

# HATZ 1B40U-2203A — AIR FILTER ASSY.

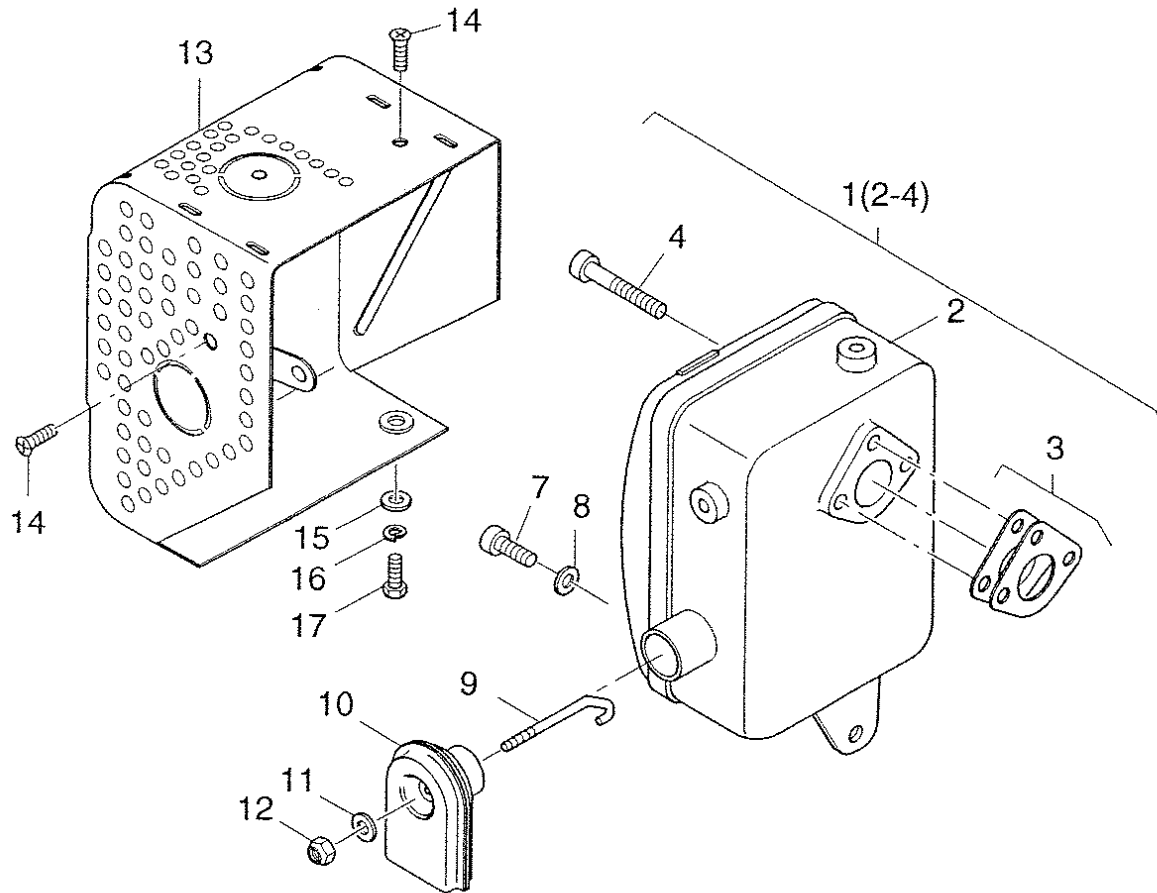


## HATZ 1B40U-2203A — AIR FILTER ASSY.

AIR FILTER ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	01637410	AIR FILTER HOUSING ASSY.....	1.....	INCLUDES ITEMS W/ #
2#		AIR FILTER HOUSING .....	1.....	NOT AVAILABLE SEPARATELY
3#	05167700	SEALING STRIP 665MM	1	
4#	05166200	RUBBER SHELL 32MM	1	
5	50095100	SPRING WASHER A8	3	
6	50171500	ALLEN SCREW M 8X 25	3	
7#	50484100	AIR FILTER ELEMENT	1	
8	50454300	KNURLED NUT M6	1	
9	01822000	COVER ASSY, AIR FILTER .....	1.....	INCLUDES ITEMS W/ \$
10\$	05158000	SEALING STRIP	1	
11\$		COVER, AIR FILTER .....	1.....	NOT AVAILABLE SEPARATELY
12	50435800	RUBBER SLEEVE	1	
13	50452200	WING NUT M6	1	
14	04150800	COVER, RUBBER INSERT	1	
15	04146800	RUBBER INSERT	1	
16	05149900	GASKET AIR FILTER	2	
17	05149800	INSULATING FLANGE	1	
18	04215200	CLOSING COVER	1	
37	04215300	CLOSING COVER	1	
38	05309300	BREATHER TUBE	1	

# HATZ 1B40U-2203A — EXHAUST SILENCER ASSY.



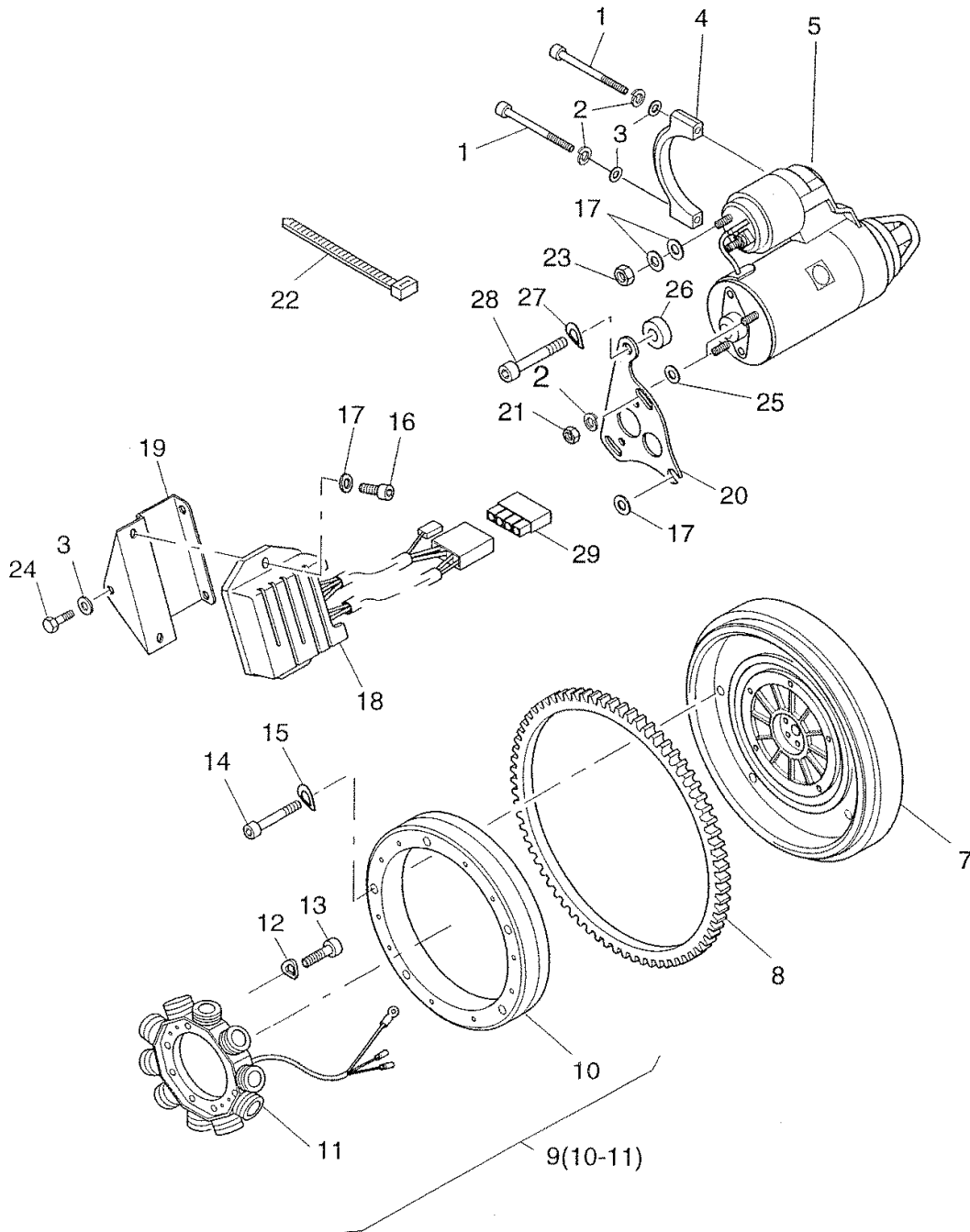


# HATZ 1B40U-2203A — EXHAUST SILENCER ASSY.

## EXHAUST SILENCER ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	01682501	EXHAUST SILENCER ASSY.....	1.....	INCLUDES ITEMS W/ #
2#		EXHAUST SILENCER.....	1.....	NOT SOLD SEPARATELY
3#	01732701	GASKET MUFFLER	1	
4#	50403900	ALLEN SCREW M8X25	3	
7	50474200	ALLEN SCREW M6X16	1	
8	50114300	DISC 6.4	1	
9	05177900	THREADED BOLT M6	1	
10	01655601	EXHAUST END PIPE	1	
11	50144500	FLAT WASHER	1	
12	40028300	HEX NUT M6	1	
13	01629000	PROTECT. GUARD EXHAUST	1	
14	50422500	CTR. SUNK SCREW M6X12	2	
15	50114300	DISC 6.4	1	
16	50170900	SPRING WASHER 6	1	
17	50177100	HEX SCREW M6X16	1	

# HATZ 1B40U-2203A — STARTER, ALTERNATOR ASSY.

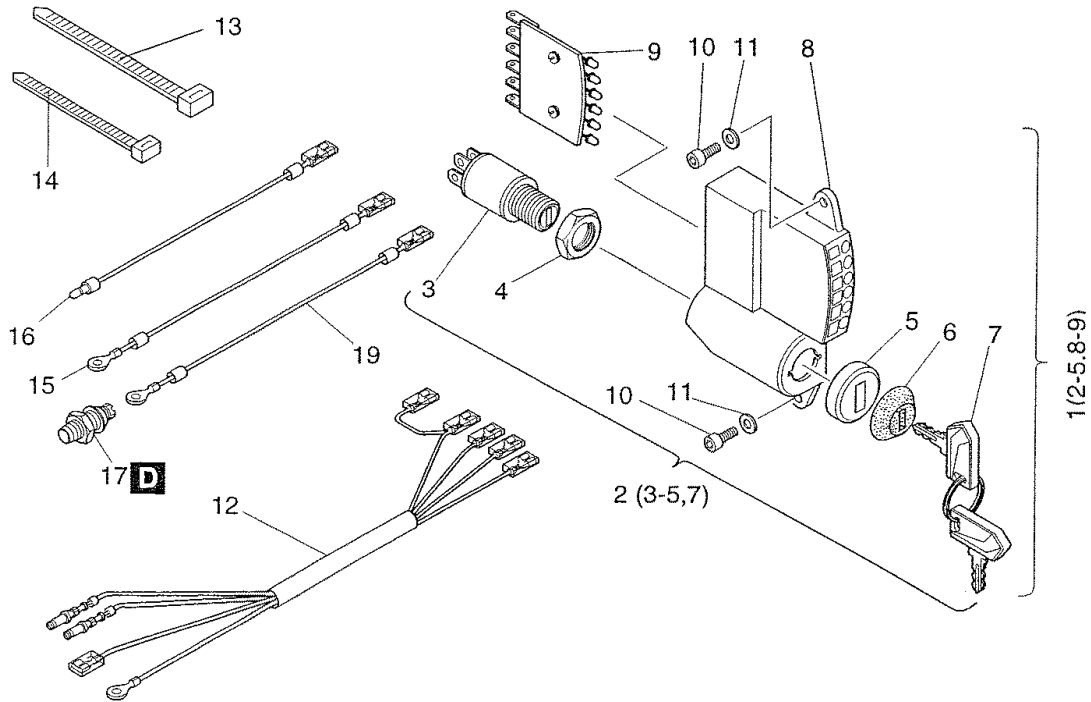


# HATZ 1B40U-2203A — STARTER, ALTERNATOR ASSY.

STARTER, ALTERNATOR ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	50402300	ALLEN SCREW M6X70	2	
2	50170900	SPRING WASHER 6	4	
3	50144500	FLAT WASHER 6.4	3	
4	04099100	RETAINING BRACKET	1	
5	50483500	EL. STARTER 12V 1.0KW	1	
7	04161502	FLYWHEEL	1	
8	04151100	GEAR RING	1	
9	50495100	ALTERNATOR ASSY 12V 200W .....	1.....	INCLUDES ITEMS W/ #
10#		FLYWHEEL COVER .....	1.....	NOT SOLD SEPARATELY
11#		ALTERNATOR.....	1.....	NOT SOLD SEPARATELY
12	50081900	SPRING WASHER A5	4	
13	50547000	ALLEN SCREW M5X25	4	
14	50236600	ALLEN SCREW M6X25	5	
15	50081200	SPRING WASHER A6	5	
16	50165400	ALLEN SCREW M8X16	2	
17	50148100	FLAT WASHER 8.4	6	
18	05100701	TENS. REGULATOR 12V	1	
19	01663000	SUPPORT	1	
20	05182912	SUPPORT	1	
21	50144400	HEXAGON NUT M6	2	
22	50439500	STRAP 2.6X200	3	
23	50344700	HEXAGON NUT M8	1	
24	50025400	HEXSCREW M6X10	1	
25	50120000	DISC A6.4	2	
26	03714100	SPACER BUSH	1	
27	50095100	SPRING WASHER A8	1	
28	50392900	ALLEN SCREW M8X50	1	
29	50402100	PLUG SLEEVE HOUSING	1	

# HATZ 1B40U-2203A — ELECTRIC EQUIPMENT, WIRING ASSY.

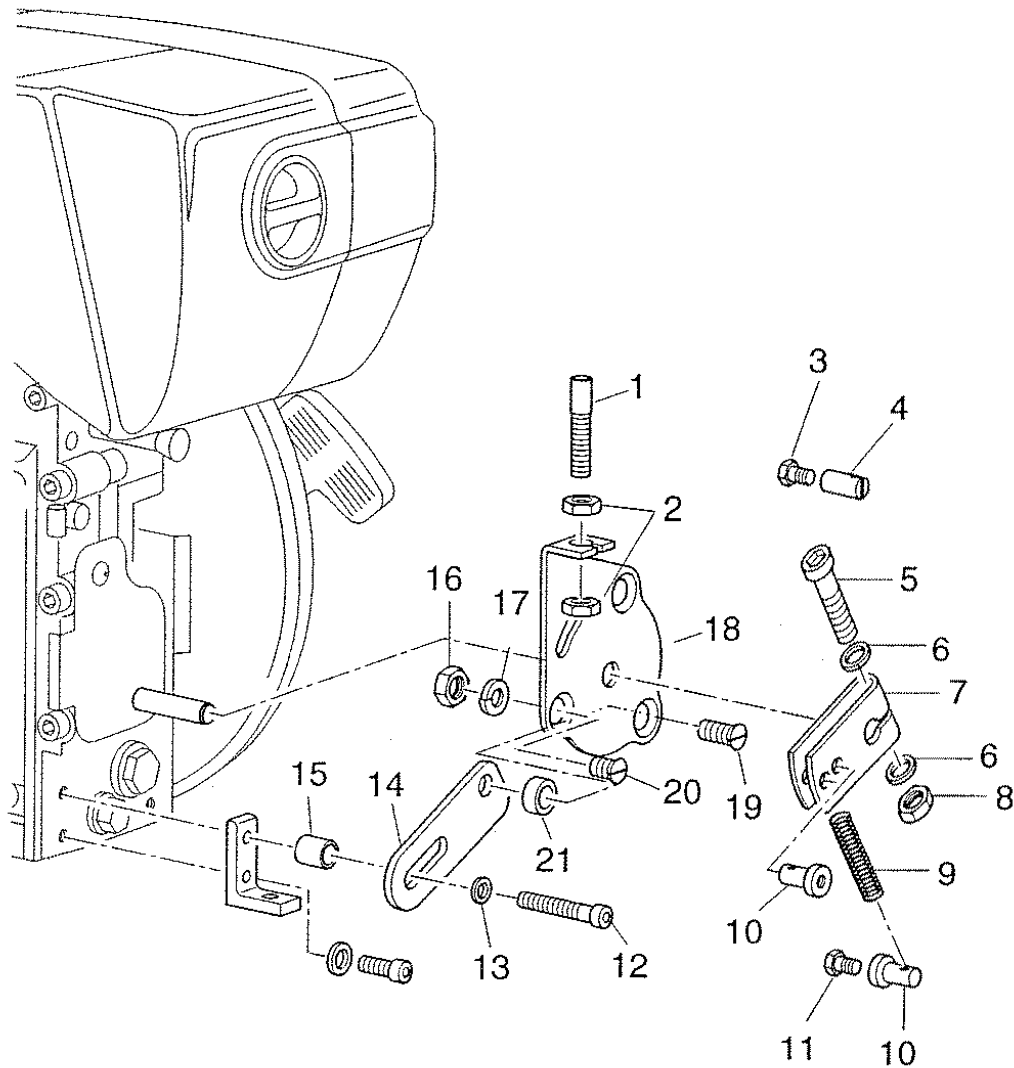


# HATZ 1B40U-2203A — ELECTRIC EQUIPMENT, WIRING ASSY.

## ELECTRIC EQUIPMENT, WIRING ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	01560802	INSTRUMENT BOX .....	1.....	INCLUDES ITEMS W/ #
1	01796500	INSTRUMENT BOX, AUTOMATIC	1	
2#	50384401	STARTING SWITCH .....	1.....	INCLUDES ITEMS W/ \$
3#\$		STARTING SWITCH BODY .....	1.....	NOT SOLD SEPARATELY
4#\$		NUT, STARTING SWITCH .....	1.....	NOT SOLD SEPARATELY
5#\$		FACE PLATE, STARTING SWITCH.....	1.....	NOT SOLD SEPARATELY
6	05126402	PROTECTION CAP	1	
7#\$	50404900	KEY, SWITCH BOX	1	
8#		HOUSING, INSTRUMENT BOX .....	1.....	NOT SOLD SEPARATELY
9#		LED DISPLAY .....	1.....	NOT SOLD SEPARATELY
10	50149100	ALLEN SCREW M6 X 12	2	
11	50144500	FLAT WASHER	2	
12	01785900	WIRING HARNESS	1	
13	50167400	STRAP	1	
14	50439500	STRAP 2.6X200	4	
15	01546800	ELECTRIC WIRE	1	
16	01778000	ELECTRIC WIRE	1	
17	50469100	OIL PRESSURE SWITCH	1	
19	01546500	ELECTRIC WIRE	1	

# HATZ 1B40U-2203A — SPEED CONTROL ASSY.

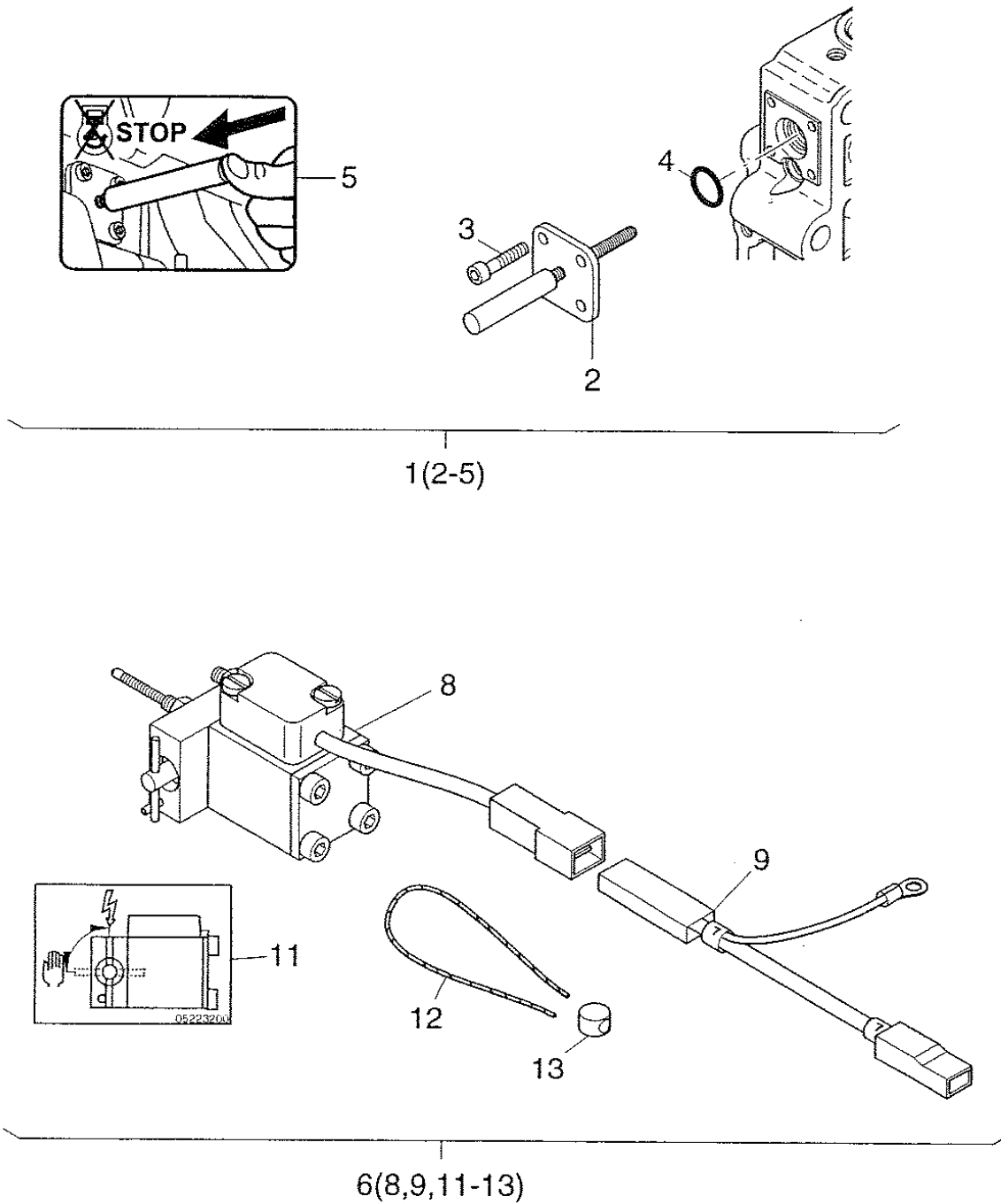


# HATZ 1B40U-2203A — SPEED CONTROL ASSY.

## SPEED CONTROL ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	05141200	ADJUSTING SCREW	1	
2	50144400	HEXAGON NUT M6	2	
3	50025000	HEX SCREW M 4X10	1	
4	50483000	CABLE CLAMP	1	
5	50511900	ALLEN SCREW M 5X30	1	
6	50216300	WASHER 5.3	2	
7	05117700	LEVER	1	
8	50094300	HEXAGON NUT M5	1	
9	50484600	PRESSURE SPRING	1	
10	50483100	CABLE CLAMP 2.2MM	2	
11	50025000	HEX SCREW M 4X10	1	
12	50342400	ALLEN SCREW M 8X50	1	
13	50148100	FLAT WASHER 8.4	1	
14	05189600	PLATE	1	
15	03599600	SPACER BUSH	1	
16	50328300	HEXAGON NUT VM6	1	
17	50208500	SPRING WASHER 8	1	
18	05117610	CONSOLE	1	
19	50423900	CTR.SUNK SCREW M6X20	1	
20	50380800	CTR.SUNK SCREW M6X10	1	
21	03292900	SPACER TUBE	1	

# HATZ 1B40U-2203A — ENGINE STOP DEVICE ASSY.



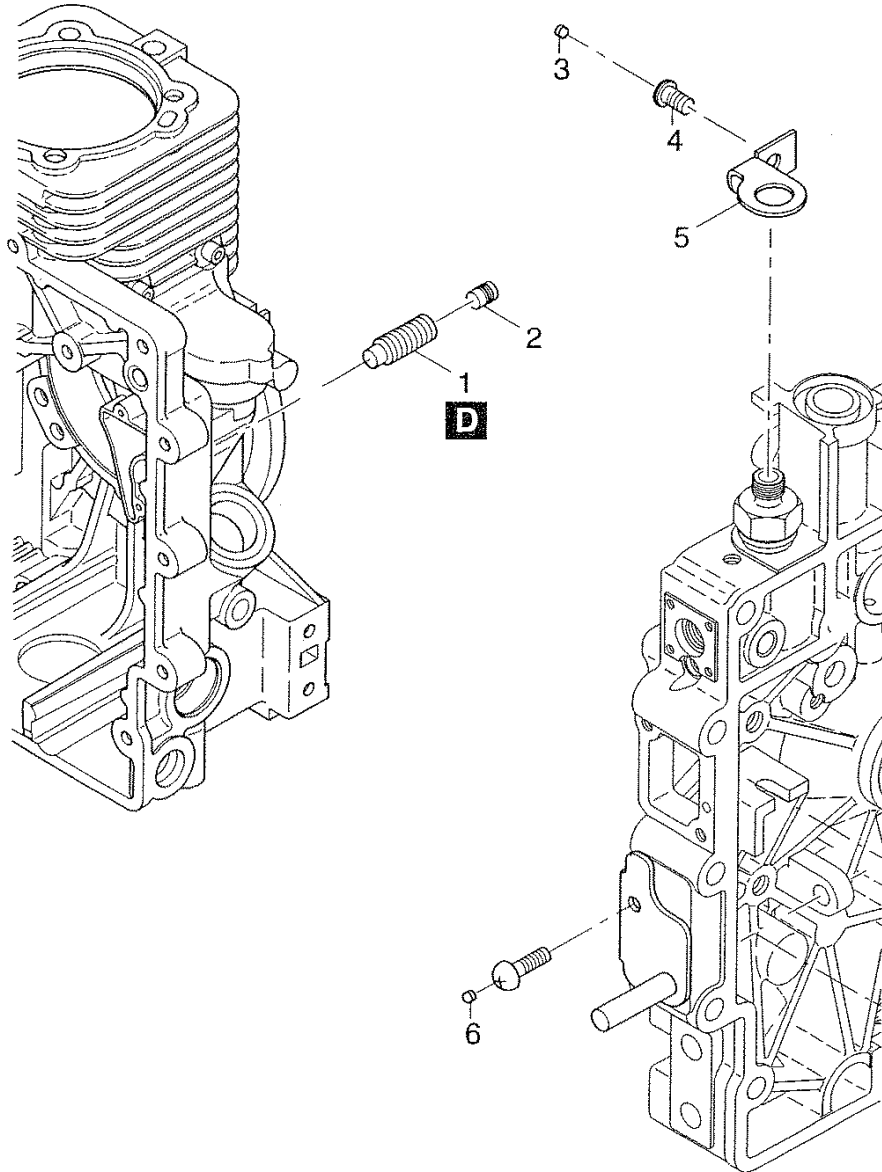


# HATZ 1B40U-2203A — ENGINE STOP DEVICE ASSY.

## ENGINE STOP DEVICE ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	01786400	STOP DEVICE ASSY .....	1.....	INCLUDES ITEMS W/ #
2#		STOP DEVICE.....	1.....	NOT AVAILABLE SEPARATELY
3#	50446900	ALLEN SCREW, M4 X 16	4	
4#	50329000	O-RING	1	
5#	05221301	STICKER LABEL	1	
6	01786000	LIFT, MGT. EG. STOP ASSY .....	1.....	INCLUDES ITEMS W/ \$
8\$		LIFT, MGT. EG. STOP .....	1.....	NOT AVAILABLE SEPARATELY
9\$	01547101	ELECTRICAL WIRE	1	
11\$	05223200	STICKER LABEL	1	
12\$	40021500	SEAL WIRE	1	
13\$	40021400	LEAD SEAL, 8 MM	1	

# HATZ 1B40U-2203A — ENGINE SPECIAL EPA EQUIPMENT



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## ENGINE SPECIAL EPA EQUIPMENT

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	04198800	GRUB SCREW	1	
2	04202600	PLUG	1	
3	04170600	PLUG	1	
4	50495000	SCREW M6 X 12	1	
5	04195700	GUARD	1	
6	05201500	CLOSING PLUG	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

# NOTES


# 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.  
Carson, CA 90746  
Contact: mq@multiquip.com

Tel: (800) 421-1244  
Fax (800) 537-3927

#### ***Service Department***

800-421-1244  
310-537-3700

Fax: 310-537-4259

#### ***Technical Assistance***

800-478-1244

Fax: 310-943-2238

#### ***MQ Parts Department***

800-427-1244  
310-537-3700

Fax: 800-672-7877  
Fax: 310-637-3284

#### ***Warranty Department***

800-421-1244  
310-537-3700

Fax: 310-943-2249

### MEXICO

#### ***MQ Cipsa***

Carr. Fed. Mexico-Puebla KM 126.5  
Momoxpan, Cholula, Puebla 72760 Mexico  
Contact: pmastretta@cipsa.com.mx

Tel: (52) 222-225-9900  
Fax: (52) 222-285-0420

### CANADA

#### ***Multiquip***

4110 Industriel Boul.  
Laval, Quebec, Canada H7L 6V3  
Contact: jmartin@multiquip.com

Tel: (450) 625-2244  
Tel: (877) 963-4411  
Fax: (450) 625-8664

### UNITED KINGDOM

#### ***Multiquip (UK) Limited Head Office***

Unit 2, Northpoint Industrial Estate,  
Globe Lane,  
Dukinfield, Cheshire SK16 4UJ  
Contact: sales@multiquip.co.uk

Tel: 0161 339 2223  
Fax: 0161 339 3226

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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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