

OPERATION AND PARTS MANUAL



***ESSICK* SERIES**

MODEL PRO12/

PRO12E51/PRO12E53

HYDRAULIC PLASTER/MORTAR MIXER

(HONDA GX390RT2-QNB2 GASOLINE ENGINE

TECO WESTINGHOUSE 5HP ELECTRIC MOTOR)

Revision #3 (09/25/14)



THIS MANUAL MUST ACCOMPANY THE EQUIPMENT AT ALL TIMES.

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CALIFORNIA — Proposition 65 Warning


Engine exhaust and some of its constituents, and some dust created by power sanding, sawing, grinding, drilling and other construction activities contains chemicals known to the State of California to cause cancer, birth defects and other reproductive harm. Some examples of these chemicals are:

- Lead from lead-based paints.
- Crystalline silica from bricks.
- Cement and other masonry products.
- Arsenic and chromium from chemically treated lumber.

Your risk from these exposures varies, depending on how often you do this type of work. To reduce your exposure to these chemicals: **ALWAYS** work in a well ventilated area, and work with approved safety equipment, such as dust masks that are specially designed to filter out microscopic particles.

SILICOSIS/RESPIRATORY WARNINGS

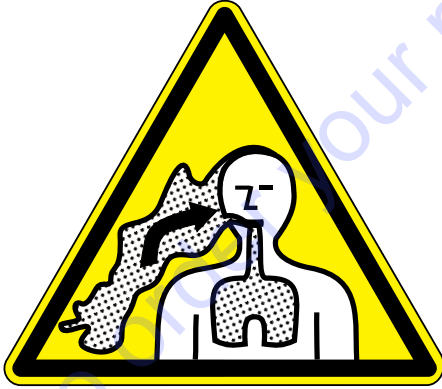
! WARNING



SILICOSIS WARNING

Grinding/cutting/drilling of masonry, concrete, metal and other materials with silica in their composition may give off dust or mists containing crystalline silica. Silica is a basic component of sand, quartz, brick clay, granite and numerous other minerals and rocks. Repeated and/or substantial inhalation of airborne crystalline silica can cause serious or fatal respiratory diseases, including silicosis. In addition, California and some other authorities have listed respirable crystalline silica as a substance known to cause cancer. When cutting such materials, always follow the respiratory precautions mentioned above.

! WARNING



RESPIRATORY HAZARDS

Grinding/cutting/drilling of masonry, concrete, metal and other materials can generate dust, mists and fumes containing chemicals known to cause serious or fatal injury or illness, such as respiratory disease, cancer, birth defects or other reproductive harm. If you are unfamiliar with the risks associated with the particular process and/or material being cut or the composition of the tool being used, review the material safety data sheet and/or consult your employer, the material manufacturer/supplier, governmental agencies such as OSHA and NIOSH and other sources on hazardous materials. California and some other authorities, for instance, have published lists of substances known to cause cancer, reproductive toxicity, or other harmful effects.

Control dust, mist and fumes at the source where possible. In this regard use good work practices and follow the recommendations of the manufacturers or suppliers, OSHA/NIOSH, and occupational and trade associations. Water should be used for dust suppression when wet cutting is feasible. When the hazards from inhalation of dust, mists and fumes cannot be eliminated, the operator and any bystanders should always wear a respirator approved by NIOSH/MSHA for the materials being used.

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NOTICE

Specifications and part numbers are subject to change without notice.

SAFETY INFORMATION

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



SAFETY MESSAGES

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

SAFETY SYMBOLS

! DANGER

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

! WARNING

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

! CAUTION

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

NOTICE

Addresses practices not related to personal injury.

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

Symbol	Safety Hazard
	Lethal exhaust gas hazards
	Explosive fuel hazards
	Burn hazards
	Rotating parts 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.



- Avoid wearing jewelry or loose fitting clothes that may snag on the controls or moving parts as this can cause serious injury.

- **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.



- **ALWAYS** clear the work area of any debris, tools, etc. that would constitute a hazard while the equipment is in operation.

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

- **DO NOT** use the equipment for any purpose other than its intended purposes or applications.

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.



SAFETY INFORMATION

MIXER SAFETY

DANGER

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



- **DO NOT** mix **flammable** or **explosive** substances.

WARNING

- **NEVER** place your hands inside the drum while starting or operating this equipment.
- **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.
- Before operating mixer, ensure that safety grate is in position and correctly fitted.



CAUTION

- **NEVER** lubricate components or attempt service on a running machine.

NOTICE

- **ALWAYS** keep the machine in proper running condition.
- **ALWAYS** ensure mixer is on level ground before mixing.
- Fix damage to machine and replace any broken parts immediately.
- **DO NOT** tip mixer onto drum mouth when the drum is rotating.
- Ensure the drum is rotating while filling and emptying the drum.
- **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.
- **ALWAYS** deploy stabilizer jack stands prior to use.

ENGINE SAFETY (GASOLINE MODELS ONLY)

DANGER

- 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.



WARNING

- **DO NOT** place hands or fingers inside engine compartment when engine is running.
- **NEVER** operate the engine with heat shields or guards removed.
- Keep fingers, hands hair and clothing away from all moving parts to prevent injury.
- **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 mixer.



CAUTION

- **NEVER** touch the hot exhaust manifold, muffler or cylinder. Allow these parts to cool before servicing equipment.
- Make certain the operator knows how to and is capable of turning the engine OFF in case of an emergency.



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.

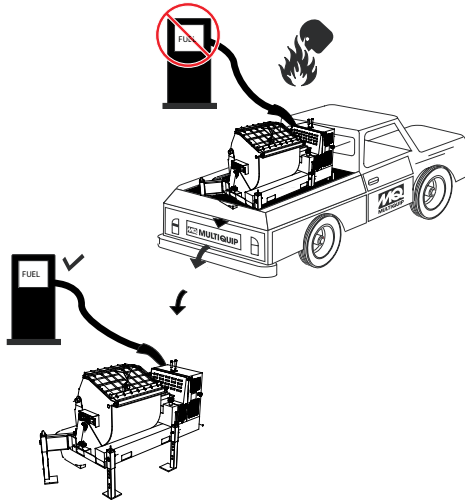


SAFETY INFORMATION

FUEL SAFETY (GASOLINE MODELS ONLY)

DANGER

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



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



GENERATOR SAFETY

If using a generator to power mixer, refer to applicable generator manual safety information section.



ELECTRIC MOTOR SAFETY (ELECTRIC MODELS ONLY)

NOTICE

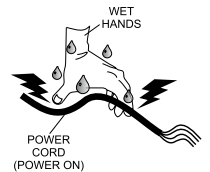
- Operate electric motor only at the specified voltage indicated on the nameplate.
- **DO NOT** spray water onto electric motor.
- **ALWAYS** disconnect AC power plug from power source before moving mixer.
- **ALWAYS** make sure the ON/OFF switch on the electric motor is in the OFF position when not in use and before inserting the mixer's power plug into an AC receptacle.



Power Cord/Cable Safety

DANGER

- **NEVER** let power cords or cables **lay in water**.
- **NEVER** use **damaged** or **worn** cables or cords when connecting equipment to generator. Inspect for cuts in the insulation.
- **NEVER** grab or touch a live power cord or cable with wet hands. The possibility exists of **electrical shock, electrocution or death**.
- Make sure power cables are securely connected. Incorrect connections may cause electrical shock and damage to the mixer.



CAUTION

- Ensure that cables and cords will not be tripped over or trapped underneath the mixer.

NOTICE

- **ALWAYS** make certain that proper power or extension cord has been selected for the job.

SAFETY INFORMATION

TRANSPORTING SAFETY

CAUTION

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

NOTICE

- **ALWAYS** make sure forklift forks are inserted into pockets (if applicable) as far as possible when lifting the mixer.
- **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.
- **DO NOT** lift machine to unnecessary heights.
- **ALWAYS** tie down equipment during transport by securing the equipment with rope.
- **NEVER** tip the engine to extreme angles during lifting as it may cause oil to gravitate into the cylinder head, making the engine start difficult.

ENVIRONMENTAL SAFETY/DECOMMISSIONING

NOTICE

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

- **DO NOT** pour waste or oil directly onto the ground, down a drain or into any water source.
- Contact your country's Department of Public Works or recycling agency in your area and arrange for proper disposal of any electrical components, waste or oil associated with this equipment.



- When the life cycle of this equipment is over, remove battery if equipped and bring to appropriate facility for lead reclamation. Use safety precautions when handling batteries that contain sulfuric acid.

- When the life cycle of this equipment is over, it is recommended that the mixer frame and all other metal parts be sent to a recycling center.

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

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

EMISSIONS INFORMATION

NOTICE

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

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

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

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

Emission Control Label

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

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

If a replacement emission label is needed, please contact your authorized engine distributor.

SPECIFICATIONS

Table 1. Mixer Specifications

Capacity	12.0 cu. ft (340 liters)
Bag Capacity	3 to 4 bags
Operating Weight	1580 lbs. (716.68 kg.)
Maximum Aggregate Size	1 in. (25.4 mm)
Adjustable Drum Discharge Height	Up to 42.5 in. (1079.5 mm.)
Drive System	Hydraulic
Dump Action	Hydraulic

Table 2. Engine Specifications

Model	Honda GX390RT2-QNB2
Type	Air-cooled 4 stroke, Horizontal Shaft, Gasoline Engine
Bore X Stroke	3.46 in. X 2.51 in. (88 mm x 64 mm)
Displacement	23.7 cu. in. (389 cc)
Max Output	11.7 H.P./3600 R.P.M.
Continuous Output	9.0H.P./3600 R.P.M.
Fuel Tank Capacity	Approx. 5.0 U.S. Gallons (18.9 Liters)
Fuel	Unleaded Gasoline
Lube Oil Capacity	1.16 qt. (1.1 liter)
Speed Control Method	Centrifugal Fly-weight Type
Starting Method	Electric Start

Table 3. Electric Motor Specifications

Model	Teco Westinghouse Model 3415	Teco Westinghouse Model 3481
Enclosure	TEFC	TEFC
Horsepower	5	5
Input Voltage (VAC)	230	230/460
Phase	1	3
Frequency (Hz)	60	60
Max Output@RPM	5 HP@1745	5 HP@1725
Full Load Amps	30	12.24/6.12
Weight	103 lbs (46.7 kg)	103 lbs (46.7 kg)
Dimensions (LxWxH)	18.03 x 8.8 x 10.5 in (458 x 223.5 x 266.7 mm)	15.79 x 8.8 x 10.5 in (401 x 223.5 x 266.7 mm)

DIMENSIONS

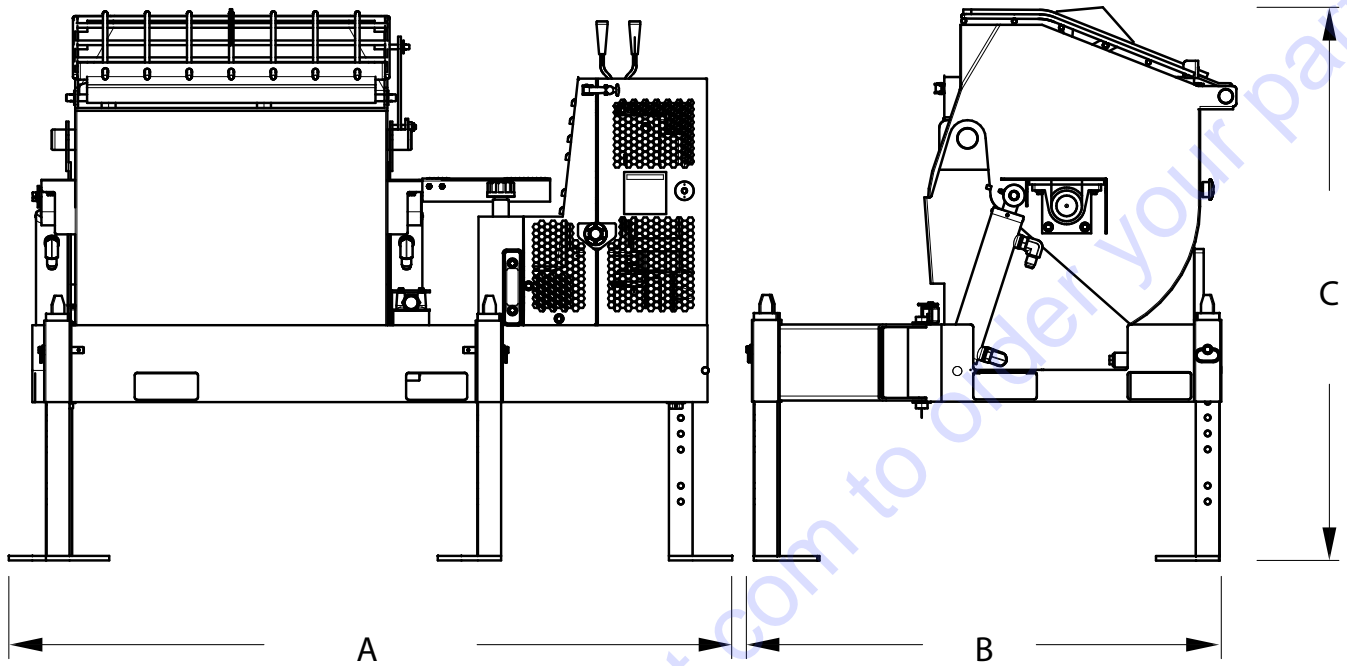


Figure 1. Mixer Dimensions

Table 4. Mixer Dimensions

Reference Designator	Dimension in. (mm.)
A (Length)	73.5 (1917.7)
B (Width)	35.0 (889)
C (Height)	45.0 (1143)

GENERAL INFORMATION

APPLICATION

The Multiquip PRO12 hydraulic mixer (with drum capacity of 12.0 cu. ft./340 liters) is shipped completely assembled, factory-tested, and ready for use.

This mixer is only intended for the mixing of plaster and mortar. The mixer must be used for its intended purpose and is not suitable for mixing flammable or explosive substances. The mixer must not be used in an explosive atmosphere. This mixer has a batch capacity between 3-1/2 and 4-1/2 bags.

POWER PLANTS

This hydraulic mixer is powered by either a 11.7 HP Honda GX390RT2-QNB2 air-cooled, 4-stroke, gasoline engine (Reference Table 2), or a 5 HP electric motor. Reference Table 3 for more detailed information regarding the electric motor.

HARDWARE

Check all hardware on the mixer before starting. Periodically inspect all hardware. Loose hardware can contribute to early component failure and poor performance. Keep all mixer hardware components tight.

ENGINE MAINTENANCE

For basic engine maintenance, refer to the engine maintenance section in this manual. For a more detailed engine maintenance, refer to the Honda Engine Owner's manual furnished with the engine.

ELECTRICAL

If mixer is equipped with an electric motor, make sure that the power being supplied to the motor corresponds to the voltage rating label on the motor. Supplying the wrong voltage to the electric motor will cause severe electrical damage to the motor. Reference Table 3 for electric motor specifications.

Always make sure the **OFF/ON** switch on the electric motor is in the **OFF** position before applying power.

EXTENSION CABLES

The extension cable should be a 3-wire configuration that includes a ground wire that conforms to UL code. The wire cross section must be a minimum of 2.5 mm². Choose an extension cord of adequate current carrying capacity as referenced in Table 7. Remember **cable distance** affects the current-voltage capacity of the extension cable.

Ensure that the extension cable is carefully laid out avoiding **wet areas**, **sharp edges** and locations where vehicles might run over it. Avoid allowing the extension cable to be trapped underneath the mixer.

Unroll the extension cable fully or it will overheat and could catch fire. Make sure that all extension cable connections are dry and safe. Replace any defective or badly worn extension cable immediately.

MIXER COMPONENTS

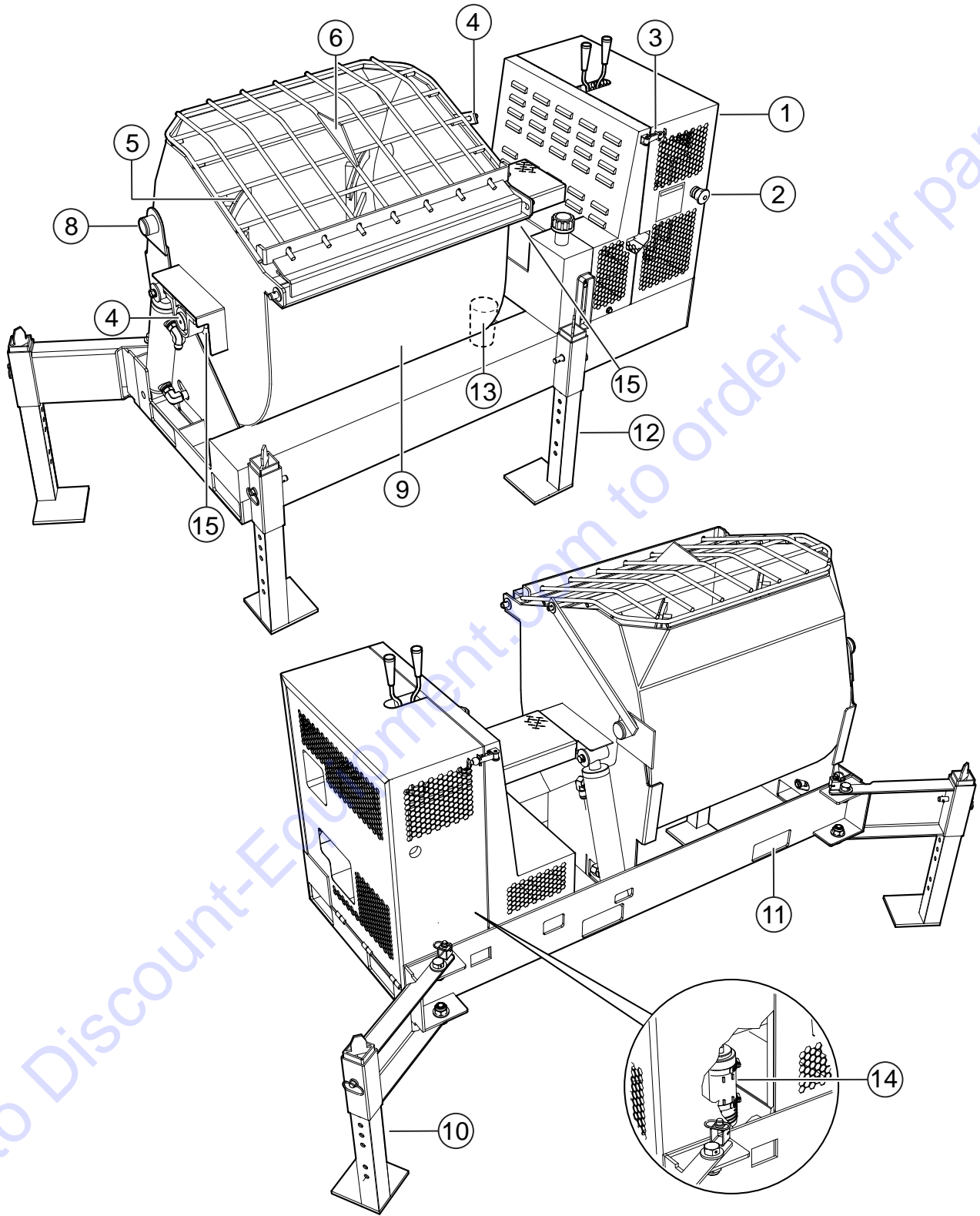


Figure 2. Mixer Components

MIXER COMPONENTS

1. **Engine Cover** — Lift this cover to gain access to the engine or electric motor.
2. **Start/Stop Switch** — This switch is located on the side of the engine cover. When activated it will shut down the engine (gasoline only).
3. **Latch** — Use this latch to secure the engine compartment enclosure.
4. **Drum Bearing** — There is a pillow block bearing on each end of the mixing drum. Bearings require daily greasing with lithium-based EP grease.
5. **Mixing Paddles** — This mixer uses plastic and rubber mixing paddles for the mixing of plaster and mortar. Always clean paddles after each use.
6. **Bag Cutter** — This feature allows mixing bags to be opened easily, therefore allowing the contents of the bag to fall directly into the mixing drum.
7. **Safety Grill** — Provided for operator safety. This safety grill is designed to keep hands and solid objects out of the mixing drum when in use. This grill should be closed at all times when mixer is in use. **DO NOT** remove the grill or grill opening bar. Keep the grill clean by washing it down daily.
8. **Pivot Point/Zerk Fitting** — There is a zerk grease fitting on each end of the mixing drum. These fittings lubricate the dumping mechanism. Lubricate both fittings at least twice a week.
9. **Mixing Drum** — Drum capacity is 12 cu. ft (340 liters). Mixing materials such as mortar and plaster are to be placed into this drum for mixing. Always clean drum after each use.
10. **Swivel Jack Stands** — These jack stands swivel out to support the mixer.
11. **Forklift Pockets** — When lifting of the mixer is required, use these fork lift pockets to lift the mixer. Remember to insert the forks of the forklift a minimum of 24 inches into the lift pockets.
12. **Adjustable Stabilizer Jack Stands** — Use these jack stands to adjust the mixer to the desired height.
13. **Hydraulic Oil Filter** — 10 micron hydraulic filter. Filters out small particles that are harmful to the hydraulic system.
14. **Charcoal Canister** — A container filled with activated charcoal that traps gasoline vapors emitted by the fuel system. A container filled with activated charcoal that traps gasoline vapors emitted by the fuel system (gasoline only).
15. **Shaft Seals** — There is a zerk grease fitting at each end of the mixing drum. These grease fittings lubricate the paddle shaft seals. Fittings require daily greasing with lithium-based EP grease.

HYDRAULIC COMPONENTS

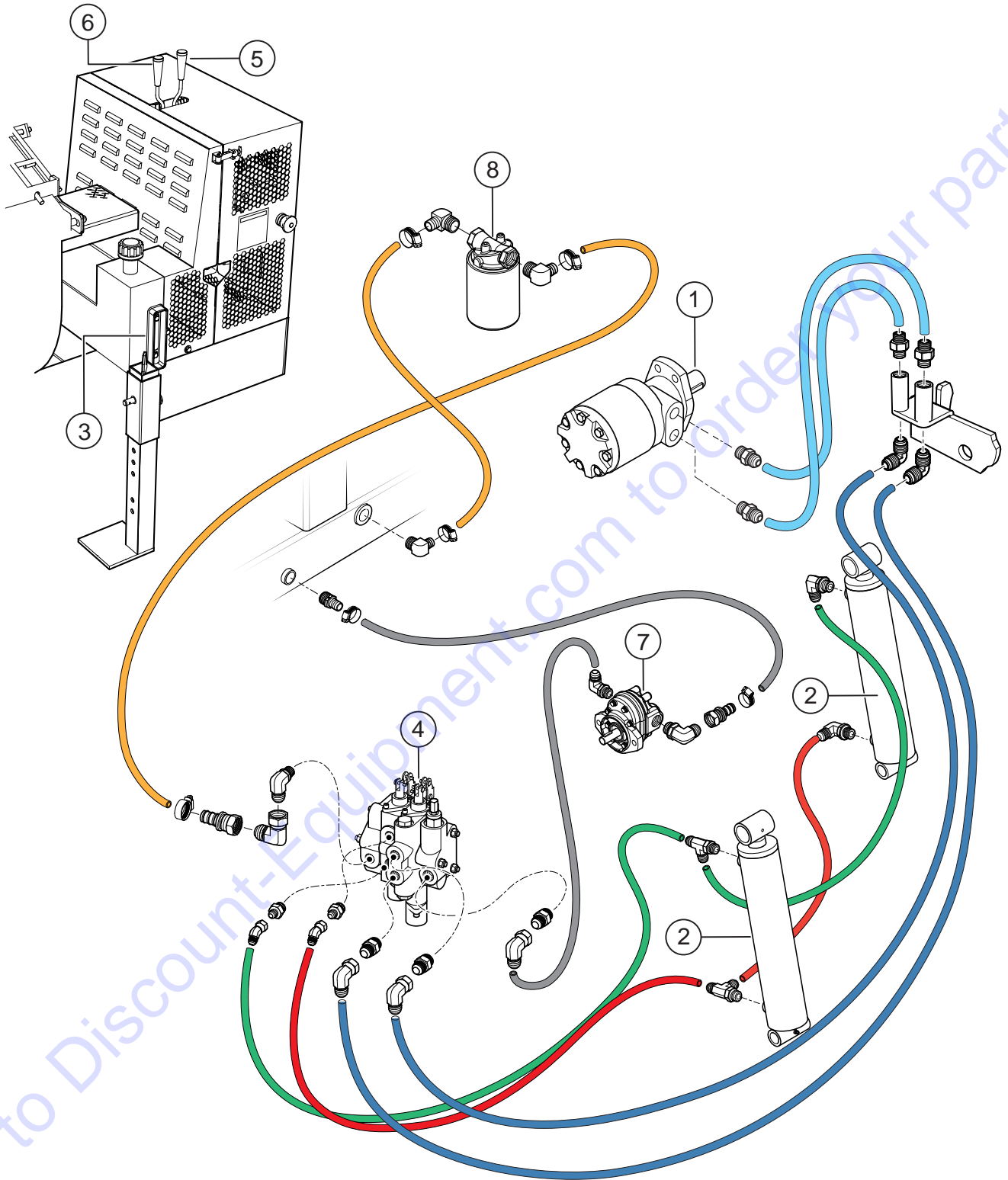


Figure 3. Hydraulic Components

HYDRAULIC COMPONENTS

1. **Hydraulic Motor** — Bi-directional hydraulic motor that is used in conjunction with the directional control valve to operate the hydraulic dump cylinder and paddle shaft.
2. **Hydraulic Dump Cylinder** — When activated, this cylinder will cause the mixing drum to rotate to the dump position. This cylinder is provided on mixers with hydraulic dump capability.
3. **Hydraulic Oil Sight Gauge** — This gauge indicates the level and temperature of the hydraulic oil. For normal operation, oil level should be visible at the midpoint on the sightglass.
4. **Hydraulic Valve** — Directional hydraulic control valve. Controls the direction of hydraulic fluid supplied to the dump cylinder and paddle shaft.
5. **Hydraulic Dump Lever** — This lever is only provided on mixers with hydraulic dump capability. Pull lever outward to activate dump cylinder.
6. **Hydraulic Paddle Blade Lever** — 3-position lever. Push inward for clockwise mixing rotation of blades. Place in center position for no rotation (neutral/off).
7. **Pump** — Supplies hydraulic fluid to the hydraulic control valve.
8. **Hydraulic Oil Filter** — 10 micron hydraulic filter. Filters out small particles that are harmful to the hydraulic system.

BASIC ENGINE

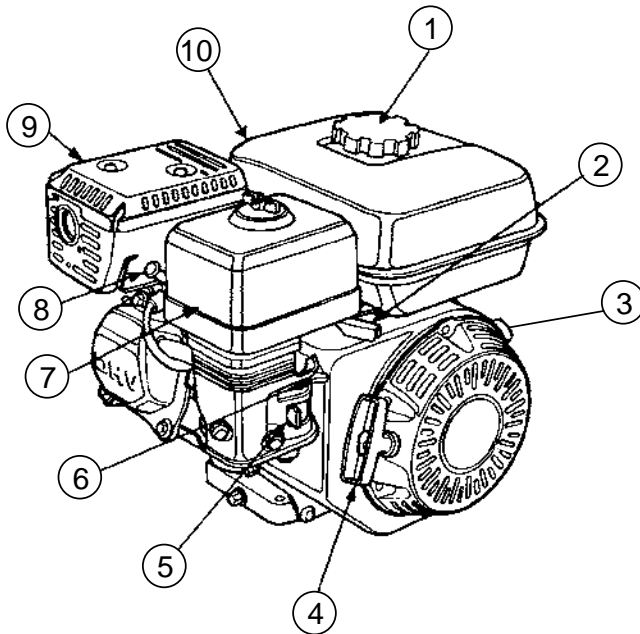


Figure 4. Engine Components

INITIAL SERVICING

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

1. **Fuel Filler Cap** — Remove this cap to add unleaded gasoline to the fuel tank. Make sure cap is tightened securely. **DO NOT** over fill.

DANGER



Adding fuel to the tank should be done only when the engine is stopped and has had an opportunity to cool down. In the event of a fuel spill, **DO NOT** attempt to start the engine until the fuel residue has been completely wiped up, and the area surrounding the engine is dry.

2. **Throttle Lever** — Used to adjust engine RPM speed (lever advanced forward **SLOW**, lever back toward operator **FAST**).
3. **Engine ON/OFF Switch** — **ON** position permits engine starting, **OFF** position stops engine operations.
4. **Recoil Starter (pull rope)** — Manual-starting method. Pull the starter grip until resistance is felt, then pull briskly and smoothly.
5. **Fuel Valve Lever** — **OPEN** to let fuel flow, **CLOSE** to stop the flow of fuel.
6. **Choke Lever** — Used in the starting of a cold engine, or in cold weather conditions. The choke enriches the fuel mixture.
7. **Air Cleaner** — Prevents dirt and other debris from entering the fuel system. Remove wing-nut on top of air filter cannister to gain access to filter element.

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.

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.

8. **Spark Plug** — Provides spark to the ignition system. Set spark plug gap to 0.6 - 0.7 mm (0.028 - 0.031 inch) Clean spark plug once a week.
9. **Muffler** — Used to reduce noise and emissions.
10. **Fuel Tank** — Holds unleaded gasoline. For additional information refer to engine owner's manual.

ELECTRIC MOTOR COMPONENTS

ELECTRIC MOTOR

For lubrication care and operation of the electric motor, refer to your electric motor instruction booklet furnished with the motor.

Protect the electric motor from dust as much as possible and keep ventilating openings clean

⚠ CAUTION

DO NOT spray water at any time on the electric motor.

DO NOT operate electric motor in an explosive environment.

The electric motors (Figure 5) used on these mixers is available in two types of configurations, 5 HP 1Ø @230 VAC or 5 HP 3Ø @230/460 VAC. Pay special attention to the nameplate on the electric motor when supplying power to the electric motor. Applying incorrect power to the motor can severely damage the motor and **may cause serious bodily injury!**

Always make certain that the correct voltage is being supplied to the motor. The input voltage requirements can be found on the electric motor's nameplate.

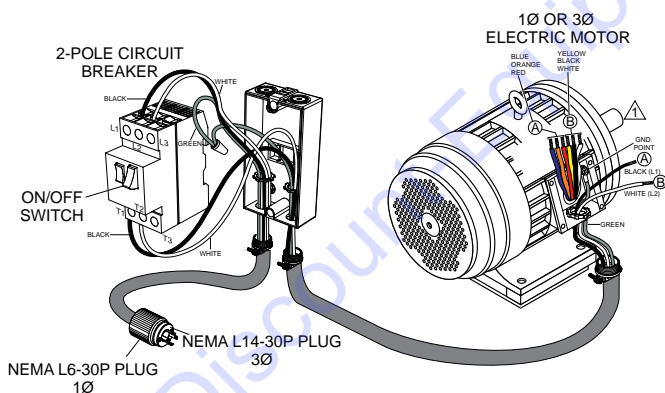


Figure 5. Electric Motor

ELECTRIC MOTOR POWER CONNECTIONS

The electrical motors used on these mixers are equipped with either a 3-prong (1Ø) or a 4-prong (3Ø) plug. Reference Figure 5 for connection to a power source. Reference Table 5. to determine the required NEMA mating receptacle.

NOTICE

It is strongly recommended that all electrical wiring be done by a **licensed electrician**. Pay special attention to the nameplate on the electric motor. Make certain that the voltage supplied to the electric motor matches the required operating voltage printed on the nameplate.

Table 5. Electric Motor Wiring Information		
Electric Motor Horsepower Rating	230 VAC - 1Ø	230/460 VAC - 3Ø
5 HP	NEMA Plug Connector 3-Prong L6-30P	NEMA Plug Connector 4-Prong L14-30P
	NEMA Receptacle Connector 3-Prong L6-30R	NEMA Receptacle Connector 4-Prong L14-30R

PADDLE BLADE ADJUSTMENT

STEEL DRUM

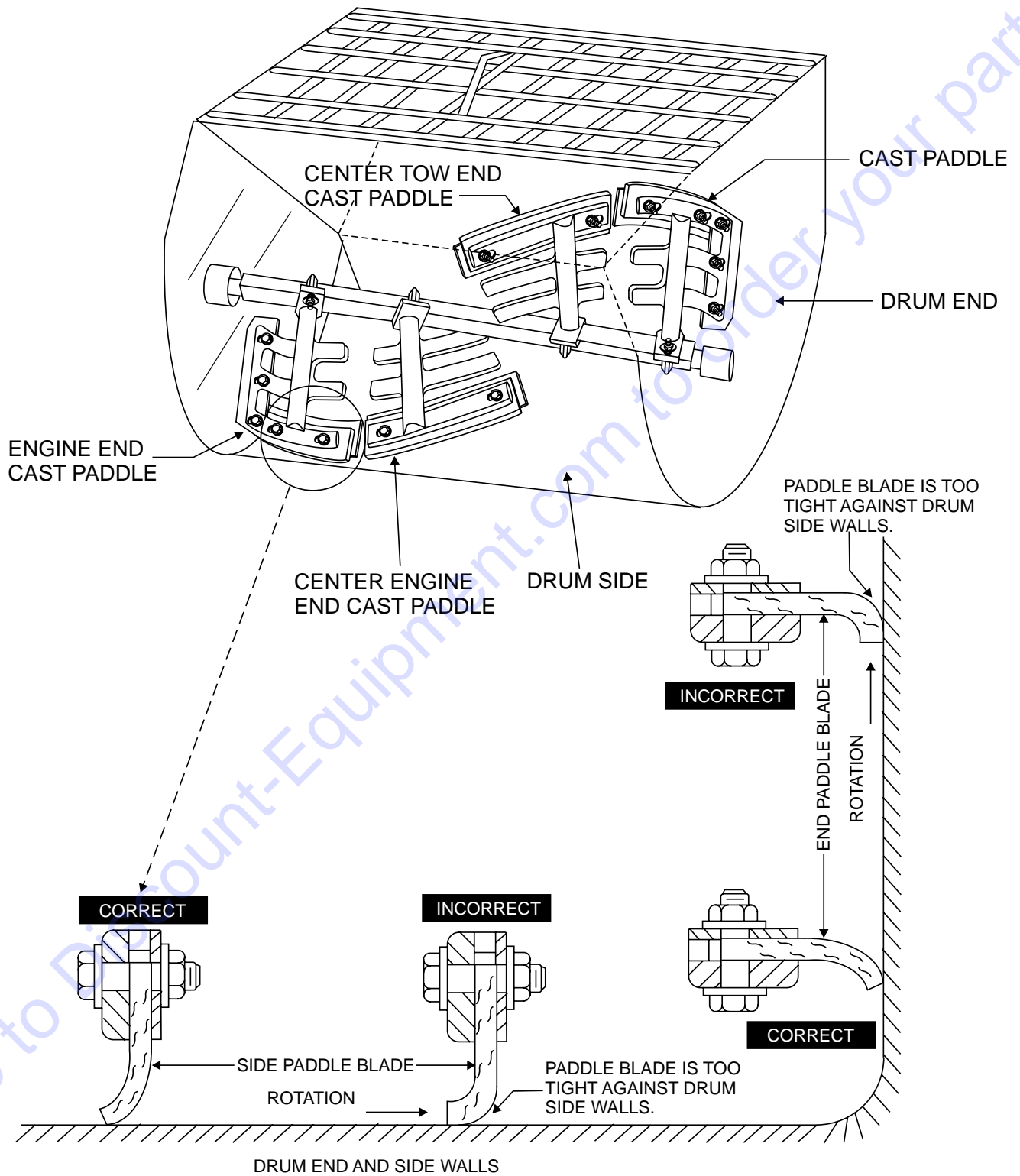


Figure 6. Paddle Blade Adjustment

BEFORE STARTING

1. Read safety instructions at the beginning of manual.
2. Clean the mixer, 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 mixer on secure level ground with the engine stopped.
2. Remove the filler dipstick from the engine oil filler hole (Figure 7) and wipe clean.

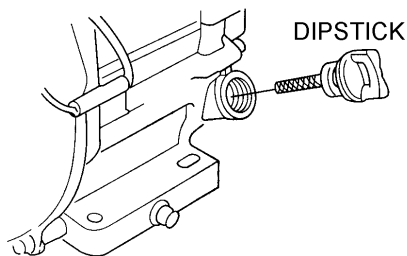


Figure 7. Engine Oil Dipstick (Removal)

3. Insert and remove the dipstick without screwing it into the filler neck. Check the oil level shown on the dipstick.
4. If the oil level is low (See Figure 8), fill to the edge of the oil filler hole with the recommended oil type as listed in Table 6. Maximum oil capacity is 1.16 quarts(1.1 liters).

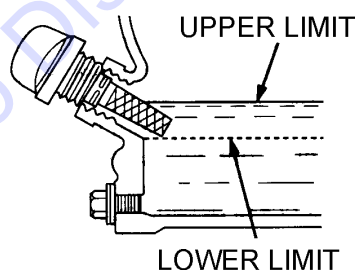


Figure 8. Engine Oil Dipstick (Oil Level)

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

START/STOP SWITCH CHECK

This switch should be tested every time the engine is started.

! CAUTION

NEVER disable or disconnect the start/stop switch. It is provided for operator safety. Injury may result if it is disabled, disconnected or improperly maintained.

HYDRAULIC OIL

Check hydraulic oil sight gauge (Figure 9) to ensure that hydraulic oil is at the midway level.



Figure 9. Hydraulic Oil Sight Gauge

HYDRAULIC HOSES

Check hydraulic hoses (Figure 3) to make sure they are not worn, frayed or defective.

GREASE FITTINGS (SHAFT SEALS)

Check the zerk grease fittings (Figure 10) at each end of the mixing drum. These grease fittings lubricate the paddle shaft seals. Grease daily with lithium-based EP grease, preferably at the end of the day. Grease until visible inside drum to assure cavity area is free of contamination.

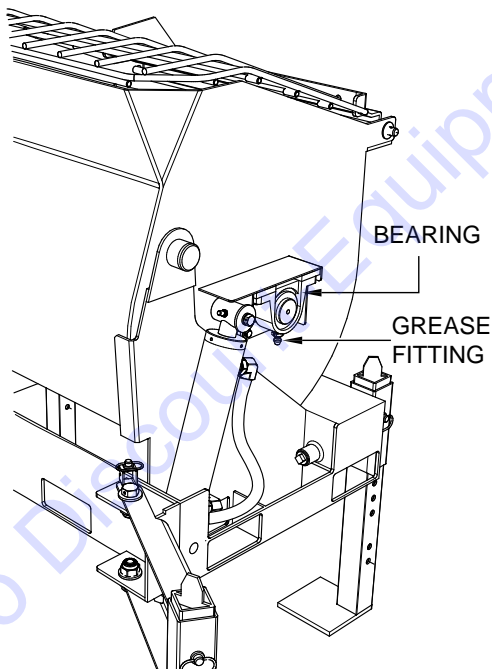


Figure 10. Grease Fittings (Bearings and Seals)

GREASE FITTINGS (BEARINGS)

Check the zerk fittings on pillow block bearings (Figure 10). Grease with two shots of lithium-based EP grease daily.

GREASE FITTING (DUMP CYLINDER)

Check the zerk grease fittings on the dump cylinder (Figure 11). Give the fittings a shot of lithium-based EP grease every week. This grease fitting lubricates the hydraulic dumping mechanism.

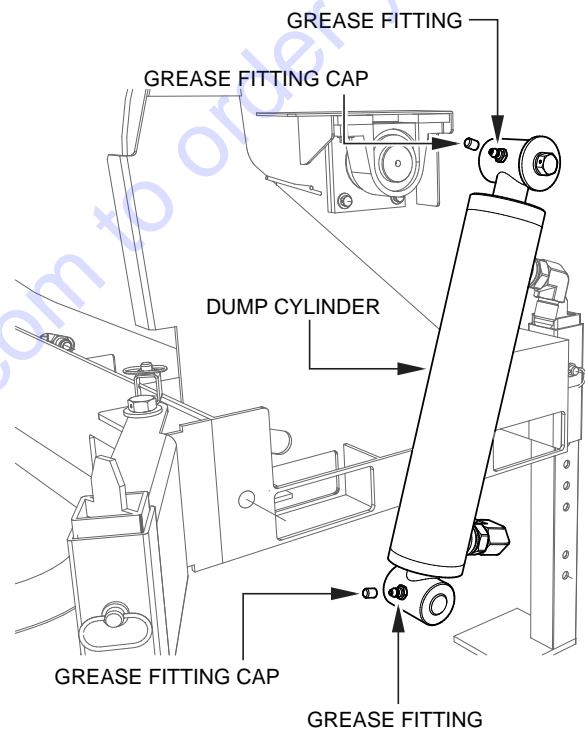


Figure 11. Grease Fittings (Dump Cylinder)

STARTUP (GASOLINE ENGINE)

CAUTION



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

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

STARTING THE ENGINE (GASOLINE)

1. Place the engine fuel valve lever (Figure 12) to the "ON" position.

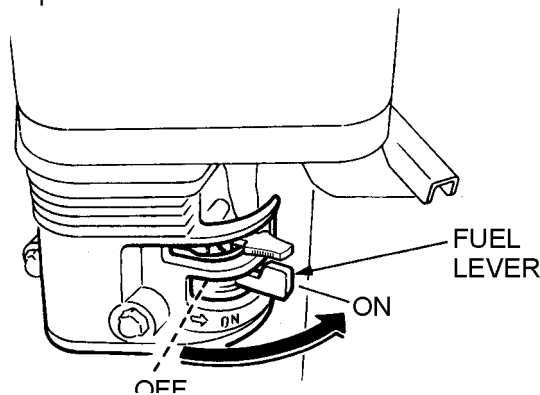


Figure 12. Engine Fuel Valve Lever (ON Position)

2. Move the throttle lever (Figure 13) away from the slow position, about 1/3 of the way toward the fast position.

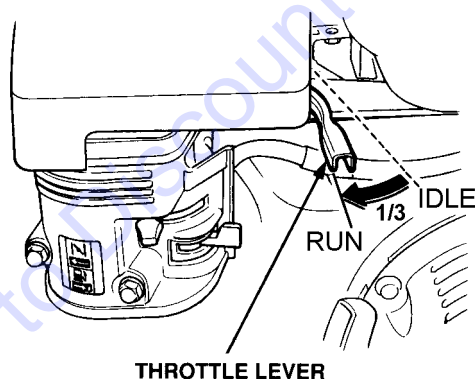


Figure 13. Throttle Lever (1/3 Start Position)

3. Place the choke lever (Figure 14) in the "CLOSED" position if starting a cold engine.

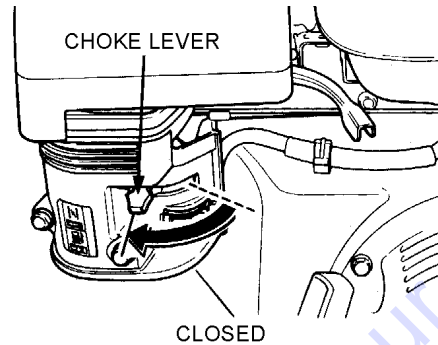


Figure 14. Engine Choke Lever (Closed)

4. Place the choke lever (Figure 15) in the "OPEN" position if starting a warm engine or the temperature is warm.

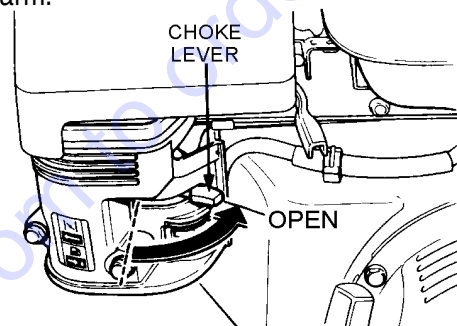


Figure 15. Engine Choke Lever (Open)

5. Place the engine ON/OFF switch (Figure 16) in the "ON" position.

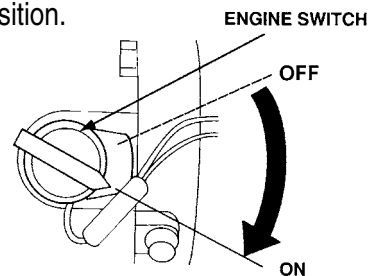


Figure 16. Engine ON/OFF Switch (ON Position)

6. Pull the Start/Stop Switch, located on the engine cover, outward to start the engine (Figure 17).

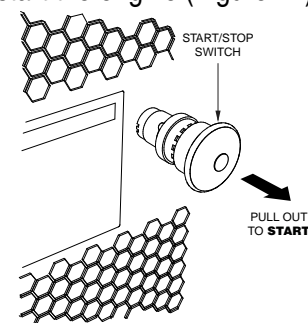


Figure 17. Start/Stop Switch (Start Position)

STARTUP (GASOLINE ENGINE)

- Turn the engine ignition key (Figure 18) to the **START** position and hold it until the engine starts. When engine starts, release the key, allowing it to return to the **ON** position.

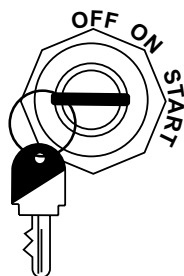


Figure 18. Engine Ignition Key

- If the choke lever was moved to the **"CLOSED"** position to start the engine gradually move it to the **"OPEN"** position (Figure 19) as the engine warms up. If the engine has not started repeat steps 1 through 6.

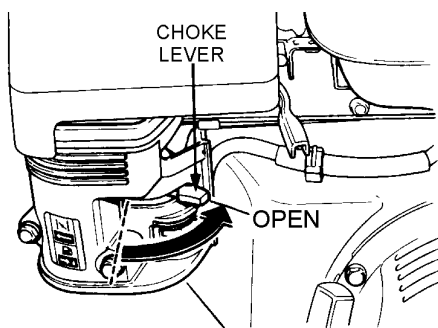


Figure 19. Choke Lever (Open)

- Before the mixer is placed in to operation, run the engine for several minutes. Check for fuel leaks, and noises that would associate with a lose component.
- To begin mixing, place the throttle lever (Figure 20) in the **"RUN"** position.

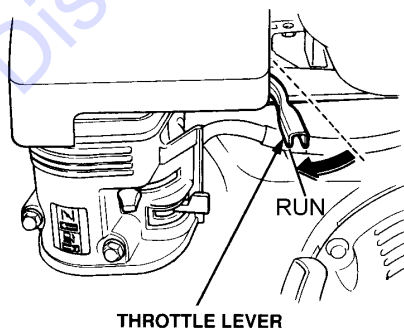


Figure 20. Throttle Lever (Run)

STOPPING THE ENGINE

Normal Shutdown

- Move the throttle lever to the **IDLE** position (Figure 21) and run the engine for three minutes at low speed.

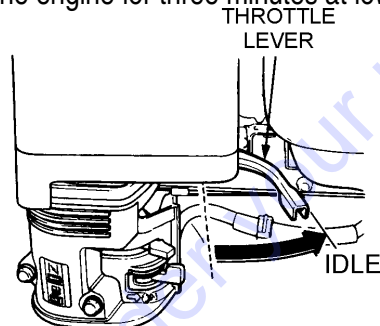


Figure 21. Throttle Lever (Idle)

- After the engine cools, push the Start/Stop switch on the engine cover inward to the **"OFF"** position (Figure 22).

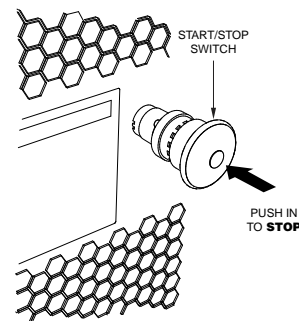


Figure 22. Start/Stop Switch (OFF Position)

- Place the fuel shut-off lever (Figure 23) in the **"OFF"** position.

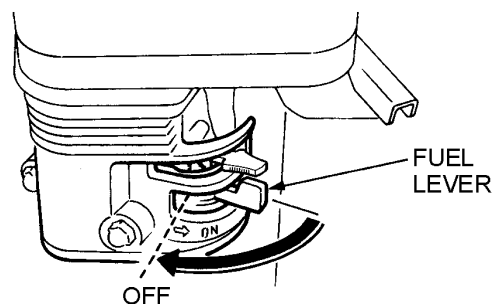


Figure 23. Fuel Valve Lever (OFF)

Emergency Shutdown

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

STARTUP (ELECTRIC MOTOR)

STARTING THE ELECTRIC MOTOR

- Using an adequate size extension cord (Table 7), connect one end of the extension cord to the plug on the electric motor, connect the other end to the power source. Make sure the motor is configured for the proper operating voltage.

Table 7. Cable Selection							
Cord Length ft/m	Amperage/Load Rating						
	0-2	2-5	5-7	7-10	10-12	12-15	12-20
10 (3.0)							12 GA
25 (7.6)	16 GA	16 GA	16 GA	16 GA	14 GA	14 GA	
50 (15.2)	16 GA	16 GA	16 GA	14 GA	14 GA	12 GA	
100 (30.5)	16 GA	16 GA	14 GA	12 GA	12 GA		
150 (45.7)	16 GA	14 GA	12 GA	12 GA			
200 (61.0)	14 GA	14 GA	12 GA	10 GA			

CAUTION: Equipment damage can result from low voltage

NOTICE

Extensions cords must be rated "**Heavy Duty**" or "**Extra Heavy Duty**" and must be a continuous length.

- To start the electric motor, press the black **ON/START** switch (Figure 24).

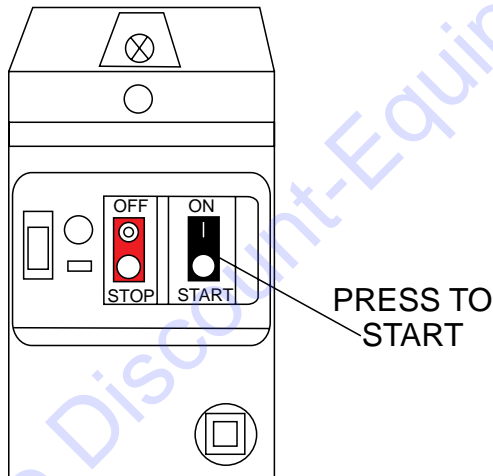


Figure 24. Electric Motor On/OFF Switch (Start)

STOPPING THE MIXER (ELECTRIC MOTOR)

- To stop the electric motor, press the red OFF/STOP switch (Figure 25).

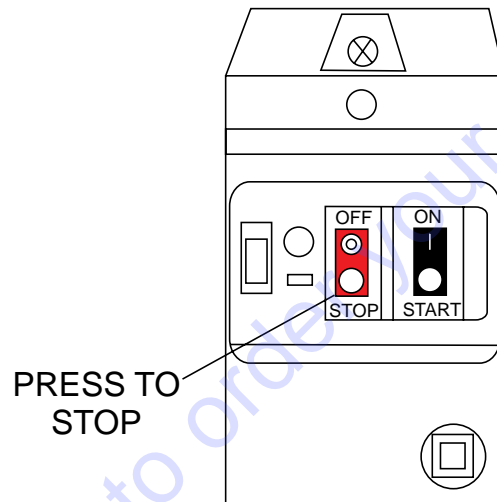


Figure 25. Electric Motor On/OFF Switch (Stop)

- Disconnect the electric motor's extension cord from its power source.
- Clean mixer as referenced in the maintenance section of this manual.

MIXING

1. On the hydraulic valve, push lever inward (Figure 26) for clockwise mixing rotation of blades.

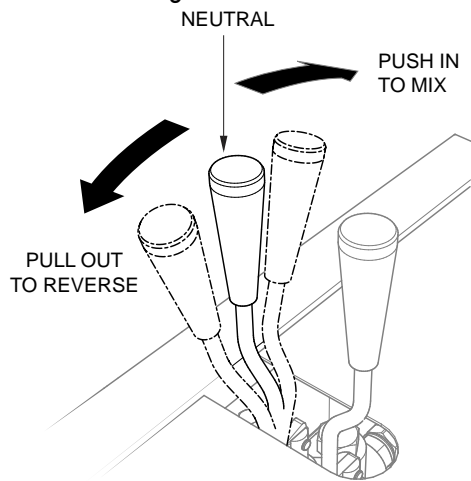


Figure 26. Hydraulic Paddle Lever

2. The paddle shaft inside the drum should be rotating at this time.
3. Add a small amount water to the mixing drum.
4. Lift the mixing bag compound onto the steel safety grate over the bag cutter and let the contents fall into the drum. Add more water if desired and mix compound to desired consistency.

DUMPING

1. Push hydraulic dump lever (Figure 27) outward to place drum in dump position (Figure 28).

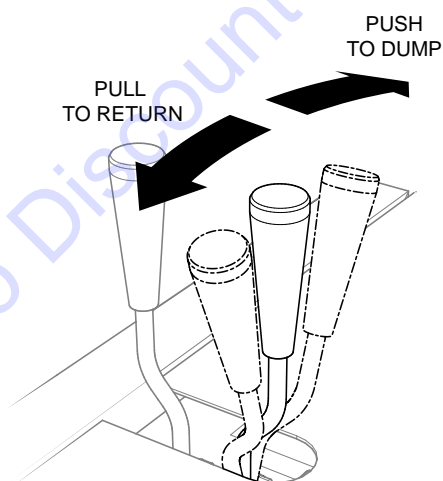


Figure 27. Hydraulic Dump Lever

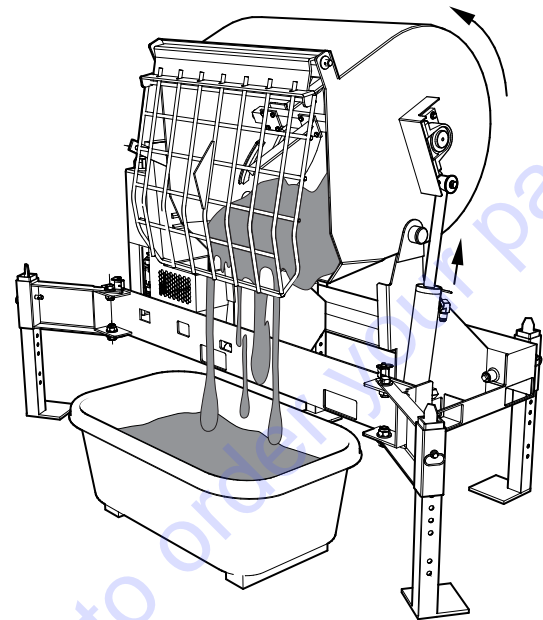
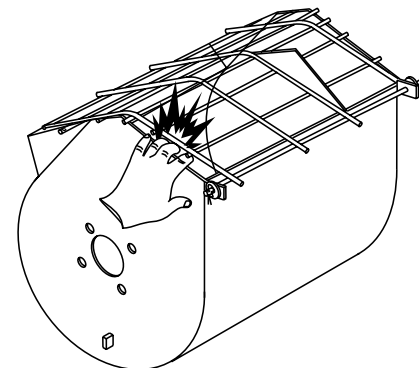


Figure 28. Hydraulic Dump

2. Pull hydraulic dump lever inward to place drum back in upright position.

WARNING

When rotating the mixing drum from the dump position to the upright position, keep hands clear of safety grate. The possibility exists of hands or fingers being crushed.



MAINTENANCE

Perform engine maintenance procedures as scheduled in Table 8.

Table 8. Engine Maintenance Schedule							
Description (3)	Operation	Before	First Month or 10 hrs	Every 3 Months or 25 hrs	Every 6 Months or 50 hrs	Every Year or 100 hrs	Every 2 Years or 200 hrs
Engine Oil	CHECK	X					
	CHANGE		X				
Air Cleaner	CHECK	X					
	CHANGE			X (1)			
All Nuts and Bolts	Re-tighten If Necessary	X					
Spark Plug	CHECK-CLEAN				X		
	REPLACE						X
Cooling Fins	CHECK				X		
Spark Arrester	CLEAN					X	
Fuel Tank	CLEAN					X	
Fuel Filter	CHECK					X	
Idle Speed	CHECK-ADJUST					X (2)	
Valve Clearance	CHECK-ADJUST						X (2)
Fuel lines	CHECK	Every 2 years (replace if necessary) (2)					

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

NOTICE

Refer to engine manufacturer's manual for specific servicing instructions.

Table 9. Mixer Maintenance Schedule

Description	Operation	DAILY	WEEKLY	Every 500 hrs
Bearings	GREASE	X		
Shaft Seals	GREASE	X		
Cylinder Pivot	GREASE		X	
Hydraulic Oil	INSPECT	X		
	REPLACE			X

Perform the engine maintenance indicated below:

Daily

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

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.
3. Remove and clean the spark plug (Figure 29), then adjust the spark gap to 0.028~0.031 inch (0.6~0.7 mm). This unit has electronic ignition, which requires no adjustments.

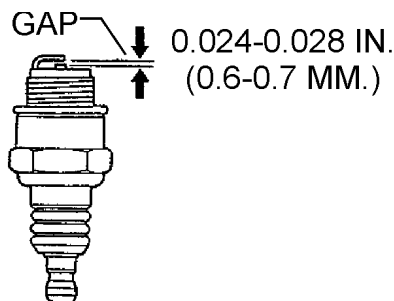


Figure 29. Spark Plug Gap

ENGINE OIL

1. Drain the engine oil when the oil is **warm** as shown in Figure 30.

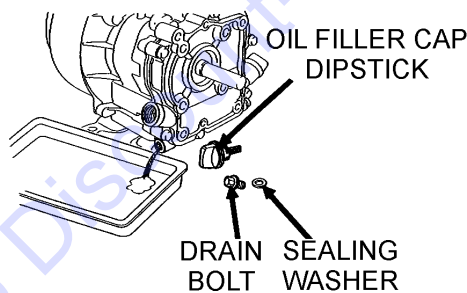


Figure 30. Engine Oil (Draining)

2. Remove the oil drain bolt and sealing washer and allow the oil to drain into a suitable container.
3. Install drain bolt with sealing washer and tighten securely.

4. Replace engine oil with recommended type oil as listed in Table 6. Engine oil capacity is 1.16 quarts (1.1 liters). **DO NOT** over fill.

! DANGER

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

ENGINE AIR CLEANER

1. Remove the air cleaner cover and foam filter element as shown in Figure 31.
2. Tap the paper filter element (Figure 31) several times on a hard surface to remove dirt, or blow compressed air [not exceeding 30 psi (207 kPa, 2.1 kgf/cm²)] through the filter element from the air cleaner case side. **NEVER** brush off dirt. Brushing will force dirt into the fibers. Replace the paper filter element if it is excessively dirty.
3. Clean foam element in warm, soapy water or non-flammable solvent. Rinse and dry thoroughly. Dip the element in clean engine oil and completely squeeze out the excess oil from the element before installing.

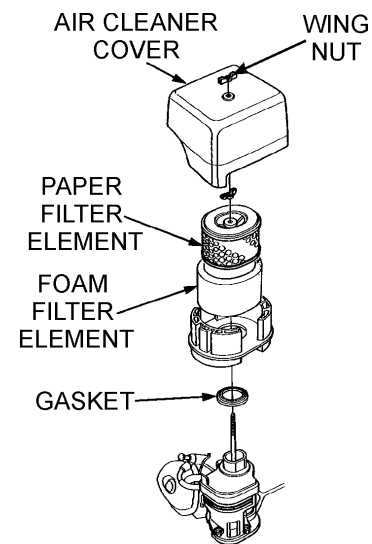


Figure 31. Engine Air Cleaner

HYDRAULIC OIL FILTER

Replace hydraulic oil filter (Figure 32) every 500 hours. Hydraulic tank capacity is 12 gallons (45 liters). Refill with Shell Tellus 46 hydraulic oil or equivalent.

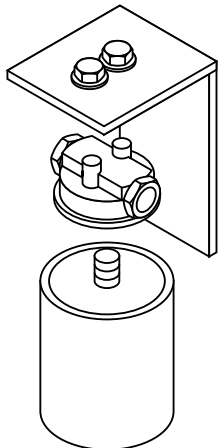


Figure 32. Hydraulic Oil Filter

MIXER CLEANING

It is important that the drum interior is free of dried material. Obstructions can cause the paddle blades to lock against the drum resulting in sudden dump handle movement.

1. Stop the engine. Push the Start/Stop switch on the engine cover inward to the "OFF" position.
2. Place the hydraulic paddle lever in "neutral" position to disengage.
3. **ALWAYS** disconnect the spark plug wire or disconnect electrical power source before cleaning the inside of the drum.
4. Place "Do Not Operate" tag on mixer.
5. Make sure the rear section of safety grate is connected to the mixing drum.
6. At the end of each day's operation, place mixer drum in an upright position and spray inside of tub immediately with water to prevent lumps of dried mortar or plaster from forming and contamination of future batches. **DO NOT** allow a buildup of materials to form on the blades or anywhere inside the drum.
7. Rotate mixer to dump position and remove debris.
8. Thoroughly clean the entire mixer, cabinet, and frame.

9. **NEVER** pour or spray water over the engine or electric motor (Figure 33).



Figure 33. No Spraying of Water

10. When cleaning of the entire mixer is done, return mixing drum to an upright position.

MIXER STORAGE

For storage of the mixer for over 30 days, the following is recommended:

1. Drain the fuel tank completely, or add STA-BIL to the fuel.
2. Run the engine until the fuel is completely consumed.
3. Completely drain used oil from the engine crankcase and fill with fresh clean oil, then follow the procedures described in the engine manual for engine storage.
4. Clean the entire mixer and engine compartment.
5. Place the mixing drum in the down position (mouth facing downward).
6. Cover the mixer and place it a clean dry area, that is protected from harsh elements.

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TROUBLESHOOTING (ENGINE)

Practically all breakdowns can be prevented by proper handling and maintenance inspections, but in the event of a breakdown, please take remedial action following the diagnosis based on the troubleshooting tables. If the problem cannot be remedied, please leave the unit as is and consult our company's service department.

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

TROUBLESHOOTING (ENGINE)

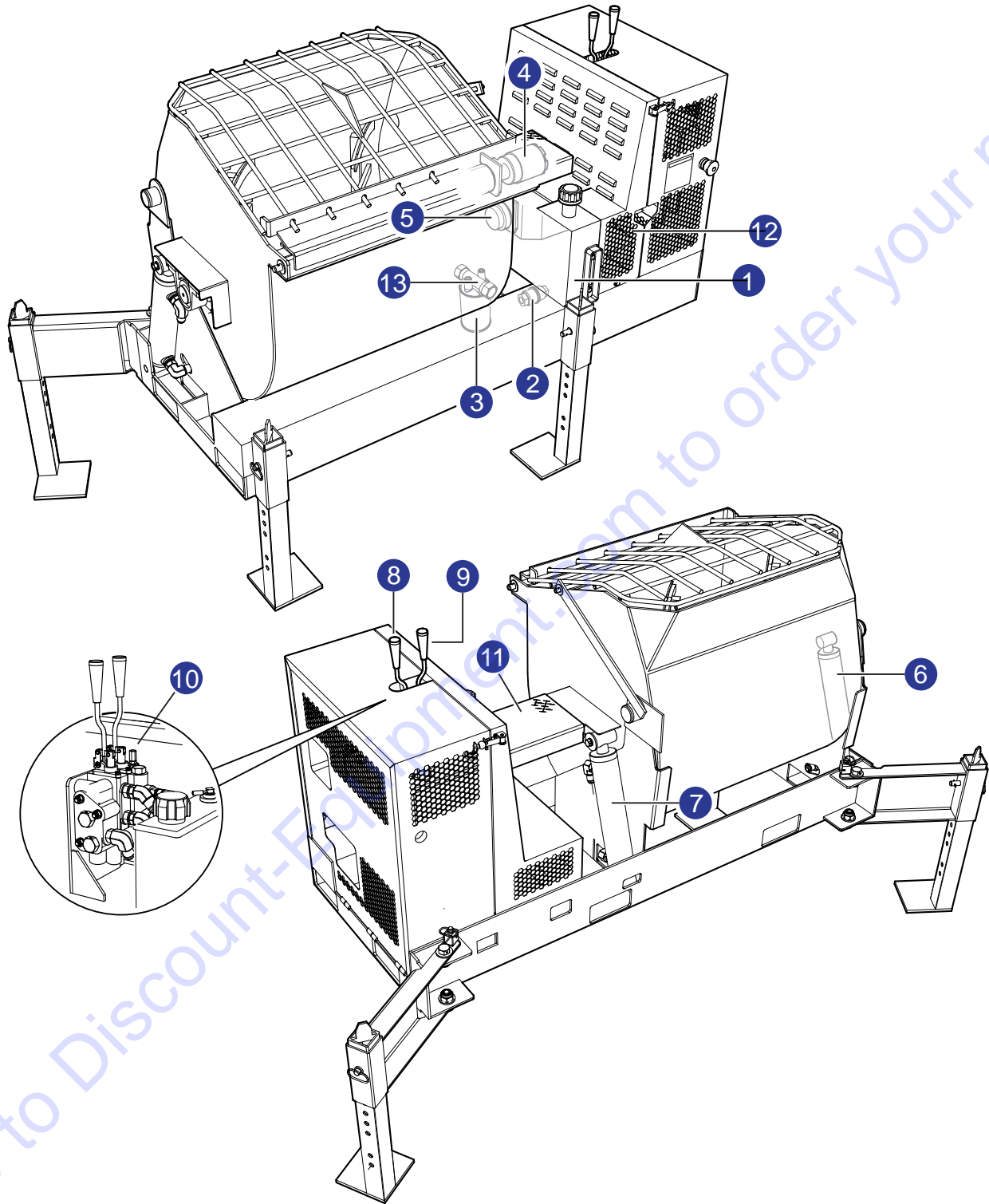
Troubleshooting (Engine) - continued		
Symptom	Possible Problem	Solution
Weak in power, compression is proper and does not misfire.	Air cleaner dirty?	Clean or replace air cleaner.
	Improper level in carburetor?	Check float adjustment, rebuild carburetor.
	Defective spark plug?	Clean or replace spark plug.
	Improper spark plug?	Set to proper gap.
Weak in power, compression is proper but misfires.	Water in fuel system?	Flush fuel system and replace with correct type of fuel.
	Dirty spark plug?	Clean or replace spark plug.
	Ignition coil defective?	Replace ignition coil.
Engine overheats.	Spark plug heat value incorrect?	Replace with correct type of spark plug.
	Wrong type of fuel?	Replace with correct type of fuel.
	Cooling fins dirty?	Clean cooling fins.
	Intake air restricted?	Clear intake of dirt and debris. Replace air cleaner elements as necessary.
	Oil level too low or too high?	Adjust oil to proper level.
Rotational speed fluctuates.	Governor adjusted incorrectly?	Adjust governor.
	Governor spring defective?	Replace governor spring.
	Fuel flow restricted?	Check entire fuel system for leaks or clogs.
Recoil starter malfunctions. (if applicable)	Recoil mechanism clogged with dust and dirt?	Clean recoil assembly with soap and water.
	Spiral spring loose?	Replace spiral spring.
Starter malfunctions.	Loose, damaged wiring?	Ensure tight, clean connections on battery and starter.
	Battery insufficiently charged?	Recharge or replace battery.
	Starter damaged or internally shorted?	Replace starter.
Burns too much fuel.	Over-accumulation of exhaust products?	Check and clean valves. Check muffler and replace if necessary.
	Wrong spark plug?	Replace spark plug with manufacturer's suggested type.
Exhaust color is continuously "white".	Lubricating oil is wrong viscosity?	Replace lubricating oil with correct viscosity.
	Worn rings?	Replace rings.
Exhaust color is continuously "black".	Air cleaner clogged?	Clean or replace air cleaner.
	Choke valve set to incorrect position?	Adjust choke valve to correct position.
	Carburetor defective, seal on carburetor broken?	Replace carburetor or seal.
	Poor carburetor adjustment, engine runs too rich?	Adjust carburetor.
Will not start, no power with key "ON". (if applicable)	ON/OFF device not activated ON?	Turn on ON/OFF device.
	Battery disconnected or discharged?	Check cable connections. Charge or replace battery.
	Ignition switch/wiring defective?	Replace ignition switch. Check wiring.

TROUBLESHOOTING

Troubleshooting (Electric Motor)		
Symptom	Possible Cause	Solution
Electric motor will not start.	Is there power?	Check power source. Check reset button.
	Is power cable plugged in?	Plug in power cable.
	Is ON/OFF switch placed in ON position?	Place ON/OFF switch in ON position.
	Defective cable?	Check cable.
Electric motor continuously stops.	Reset button OK?	Check power source.
Electric motor RPM's too low.	Low voltage?	Check input voltage.
Electric motor RPM's too high.	High voltage?	Check input voltage.

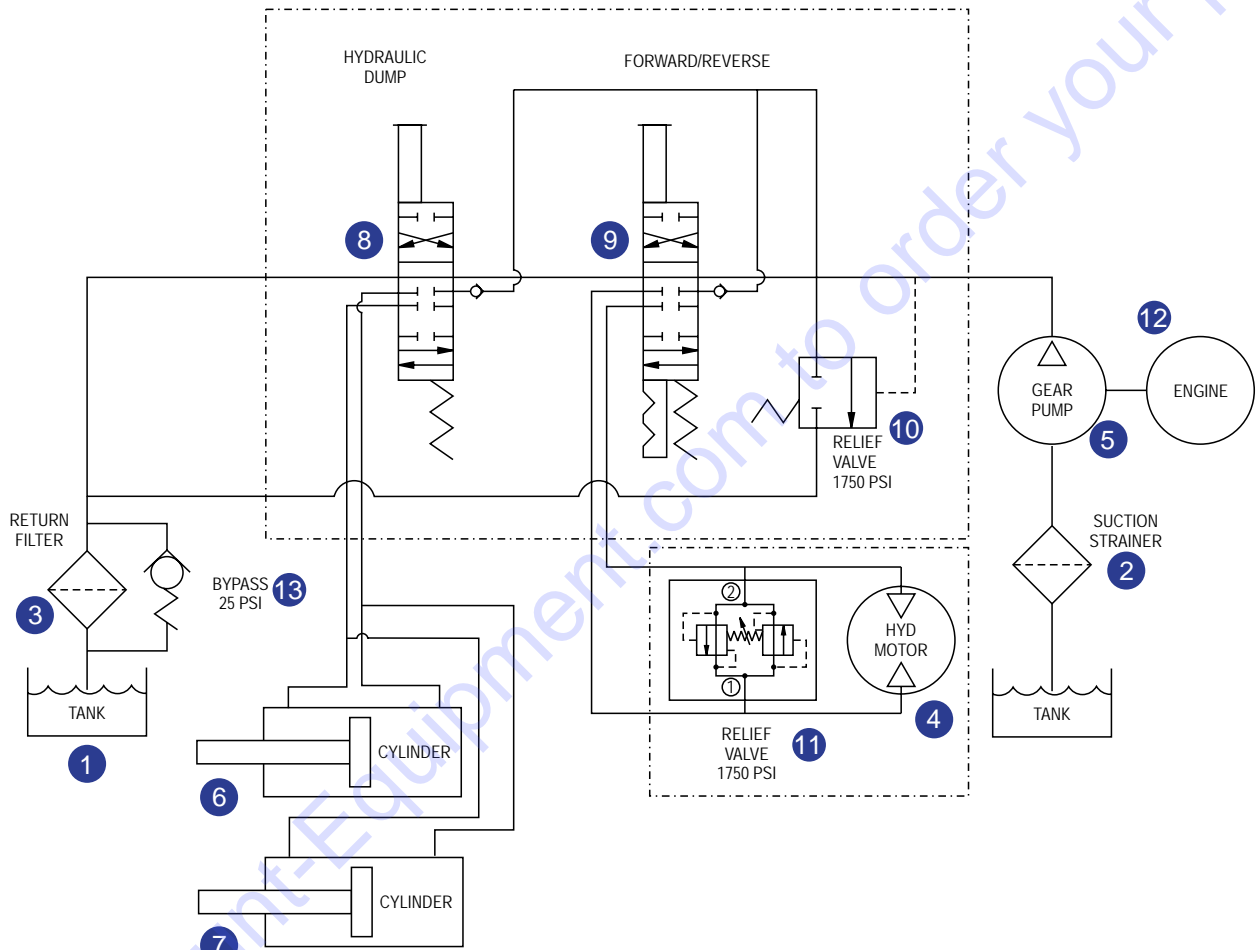
Troubleshooting (Mixer)		
Symptom	Possible Problem	Solution
Blades will not rotate.	Contaminated relief cartridge?	Inspect relief pressure (1750 psi).
	Material load too heavy, exceeding mixer capability?	Reduce amount of material being mixed.
	Object stuck inside mixing drum, jamming paddle rotation?	Stop engine. Empty out drum contents. Remove obstruction.
	Improper engine speed?	Check and adjust engine speed.
Material leaking from drum ends.	Worn or defective paddle shaft seals?	Replace seals.

HYDRAULIC SYSTEM LOCATOR



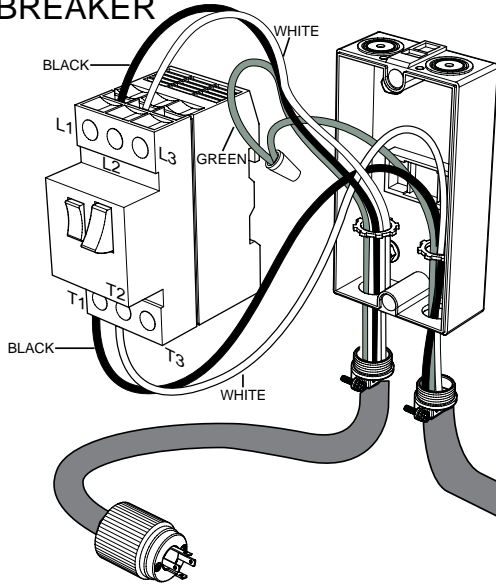
HYDRAULIC SYSTEM DIAGRAM

HYDRAULIC SYSTEM DIAGRAM



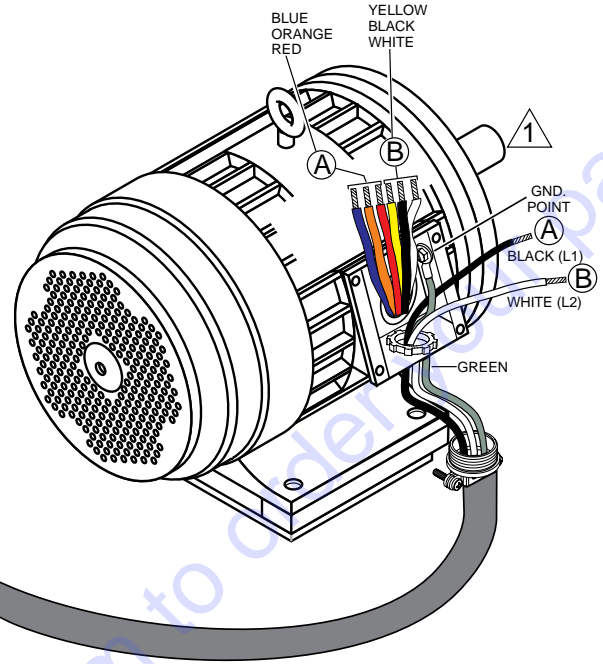
ELECTRIC MOTOR (SINGLE PHASE) WIRING DIAGRAM

2-POLE CIRCUIT BREAKER

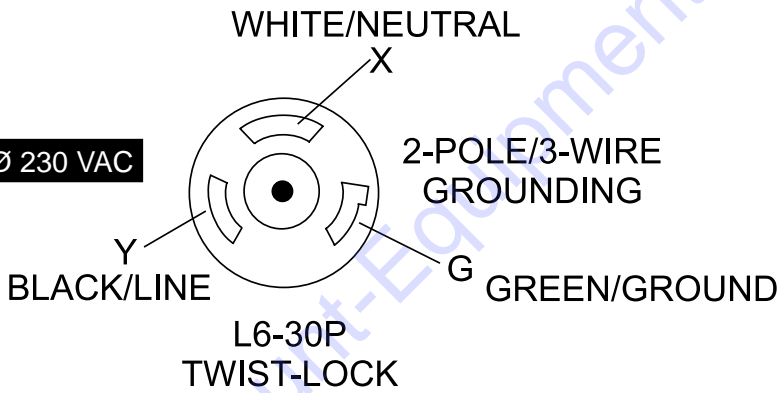


L6-30P
TWIST LOCK

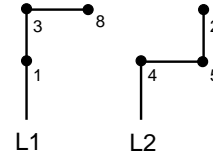
1Ø ELECTRIC MOTOR



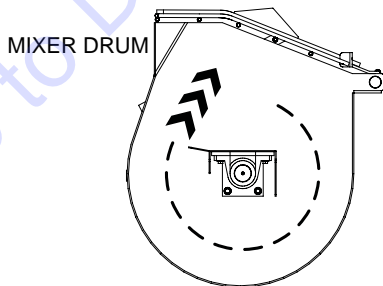
1Ø 230 VAC



230 VAC WINDING CONNECTIONS (LOW VOLTAGE)



COLOR CODE	
WIRE NO.	COLOR
1	BLUE
2	WHITE
3	ORANGE
4	YELLOW
5	BLACK
6	PURPLE
7	PINK
8	RED
9	GRAY

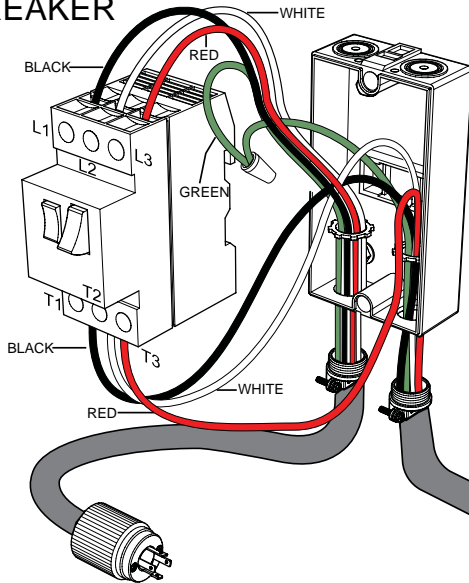


PADDLE ROTATION
TOW END VIEW

NOTE:
 △1 TO REVERSE DIRECTION OF SHAFT ROTATION. INTERCHANGE WHITE AND BLACK WIRE LEADS
 △2 FACTORY WIRED 230 VAC.

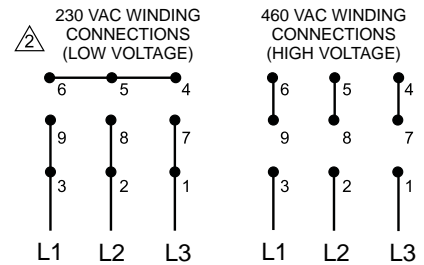
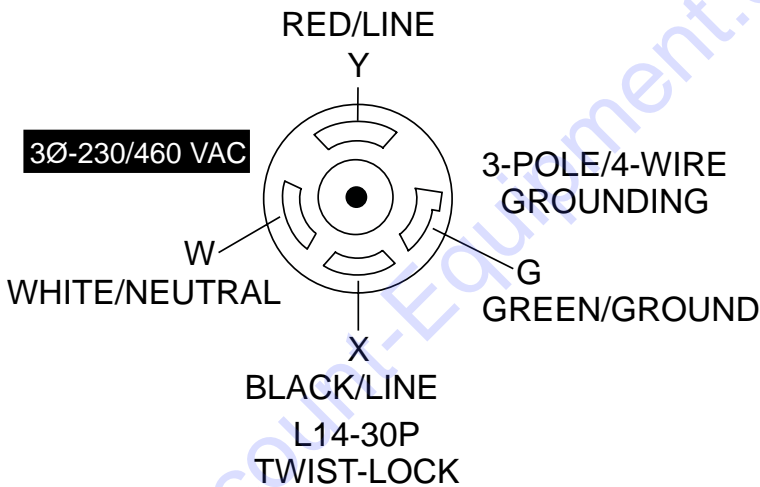
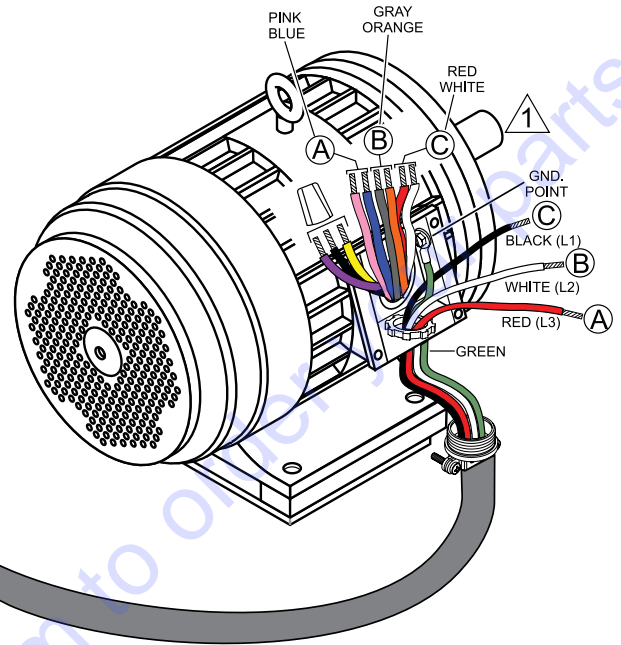
ELECTRIC MOTOR (THREE-PHASE) WIRING DIAGRAM

3-POLE CIRCUIT BREAKER

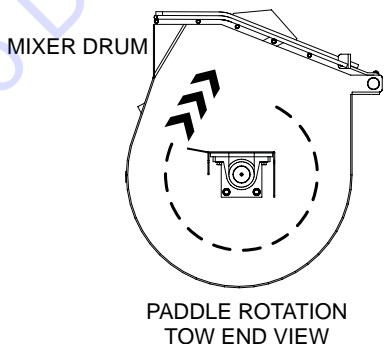


L14-30P
TWIST LOCK

3Ø-PHASE ELECTRIC MOTOR



COLOR CODE	
WIRE NO.	COLOR
1	BLUE
2	WHITE
3	ORANGE
4	YELLOW
5	BLACK
6	PURPLE
7	PINK
8	RED
9	GRAY



NOTE:
 TO REVERSE DIRECTION OF
 SHAFT ROTATION. INTERCHANGE
 RED AND BLACK WIRE LEADS
 ⚠️ FACTORY WIRED 230 VAC.

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

PRO12 HYDRAULIC MIXER WITH HONDA GX390RT2-QNB2 ENGINE

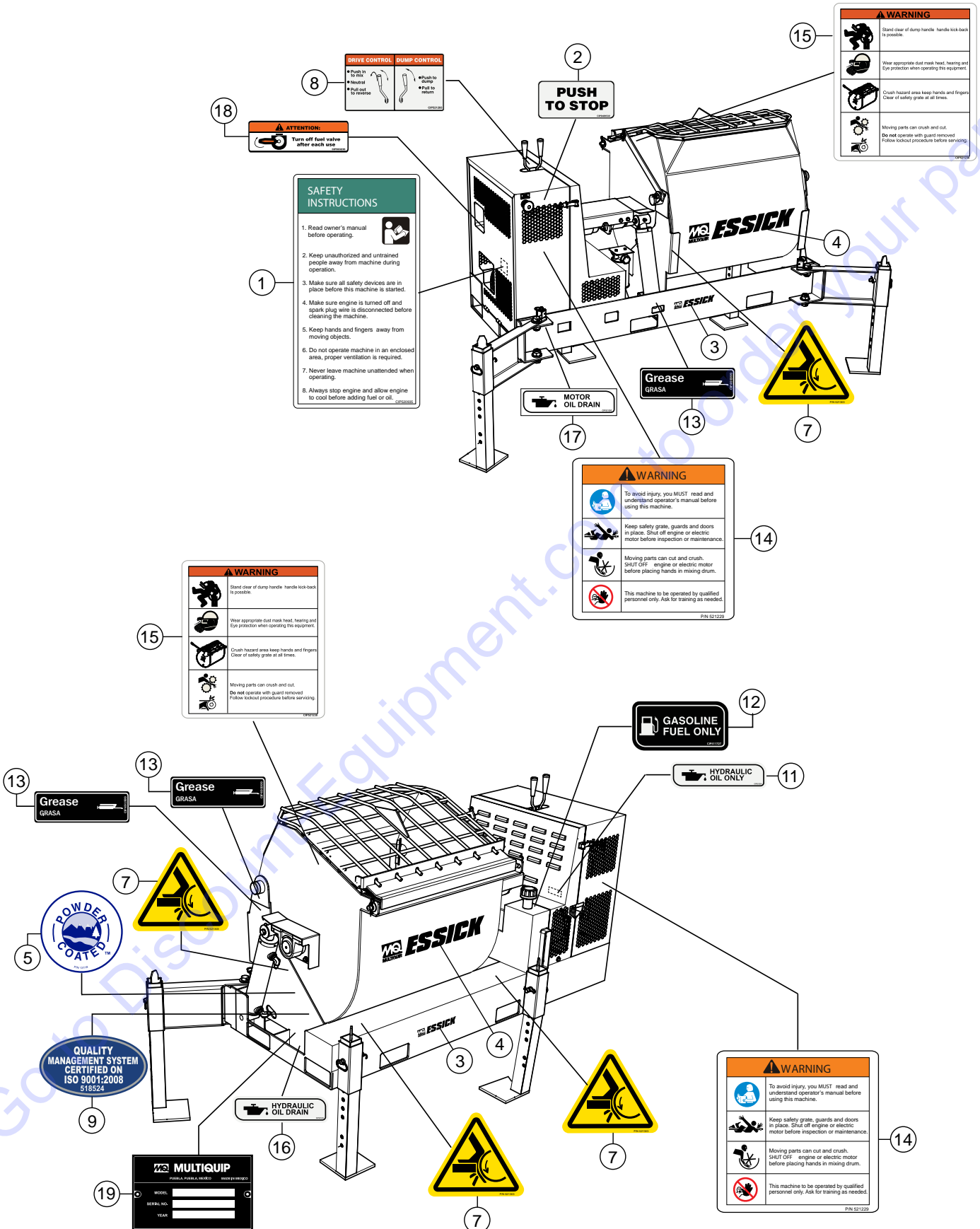
1 to 3 units

Qty.	P/N	Description
1	521426	KIT, RUBBER BLADES, SCRAPERS & HWD.
6	802366	SEAL, PADDLE SHAFT
4	802367	SEPARATOR, PADDLE SHAFT SEALS
2	802368	COVER, SEAL
1	10958	SWITCH, IGN., W/KEYS
2	11078	KEYSET, IGNITION
1	29173-001	SWITCH, PUSH-PULL, W/O KNOB
1	29174-001	KNOB-MUSHROOM
1	491010	LATCH KIT, ENGINE HOUSING
1	3353	CAP, FILLER/BREATHER
3	17210ZE3505	ELEMENT, A/C DUAL
3	9807956846	SPARK PLUG BPR6ES
3	EM20763	FILTER, FUEL, IN-LINE
2	508667	ELEMENT, OIL, HYDRAULIC

NOTICE

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

NAMEPLATE AND DECALS

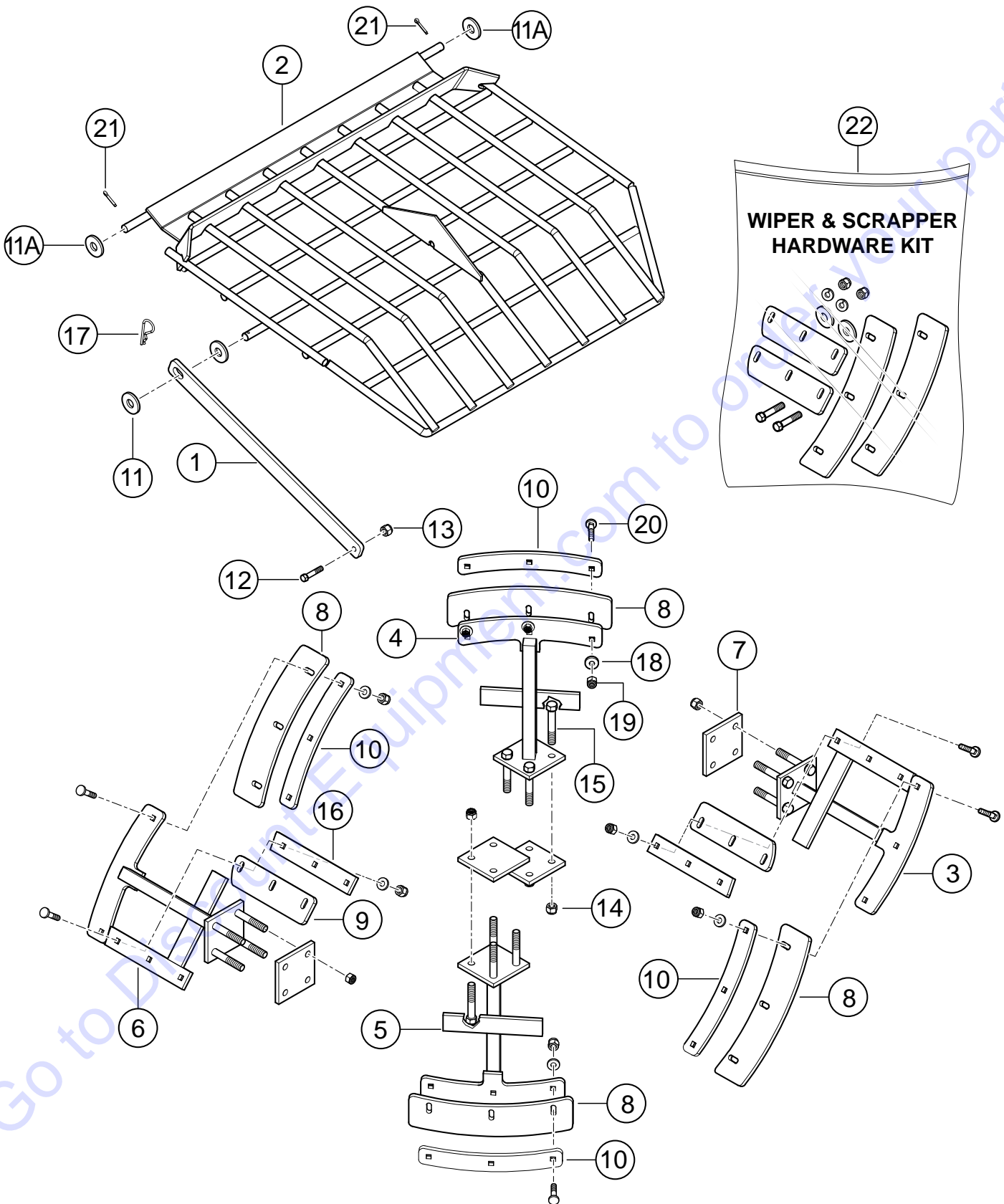


NAMEPLATE AND DECALS

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	520935	DECAL, SAFETY INSTRUCTIONS	1	
2	EM948630	DECAL, PUSH TO STOP	1	
3	EM510891	DECAL, MQ ESSICK MEDIUM	2	
4	EM510883	DECAL, MQ ESSICK LARGE	2	
5	13118	DECAL, POWDER COATED	1	
7	521303	DECAL, PINCH POINT	5`	
8	521293	DECAL, DRIVE/DUMP CONTROL 1	1	
9	518524	DECAL, ISO 9001:2000 EXPORT	1	
11	EM985	DECAL, HYDRAULIC OIL ONLY	1	
12	511727	DECAL, GASOLINE FUEL ONLY	1	
13	491999	DECAL, GREASE	8	
14	521229	DECAL, WARNING 4 POINTS	2	
15	521230	DECAL, PREVENT ACCIDENTS	2	
16	521291	DECAL, HYDRAULIC OIL DRAIN	1	
17	521292	DECAL, MOTOR OIL DRAIN	1	
18	803236	DECAL, TURN OFF FUEL VALVE	2	
19		PLATE, SERIAL NUMBER.....	1CONTACT DISCOUNT-EQUIPMENT

Go to Discount-Equipment.com to order your parts

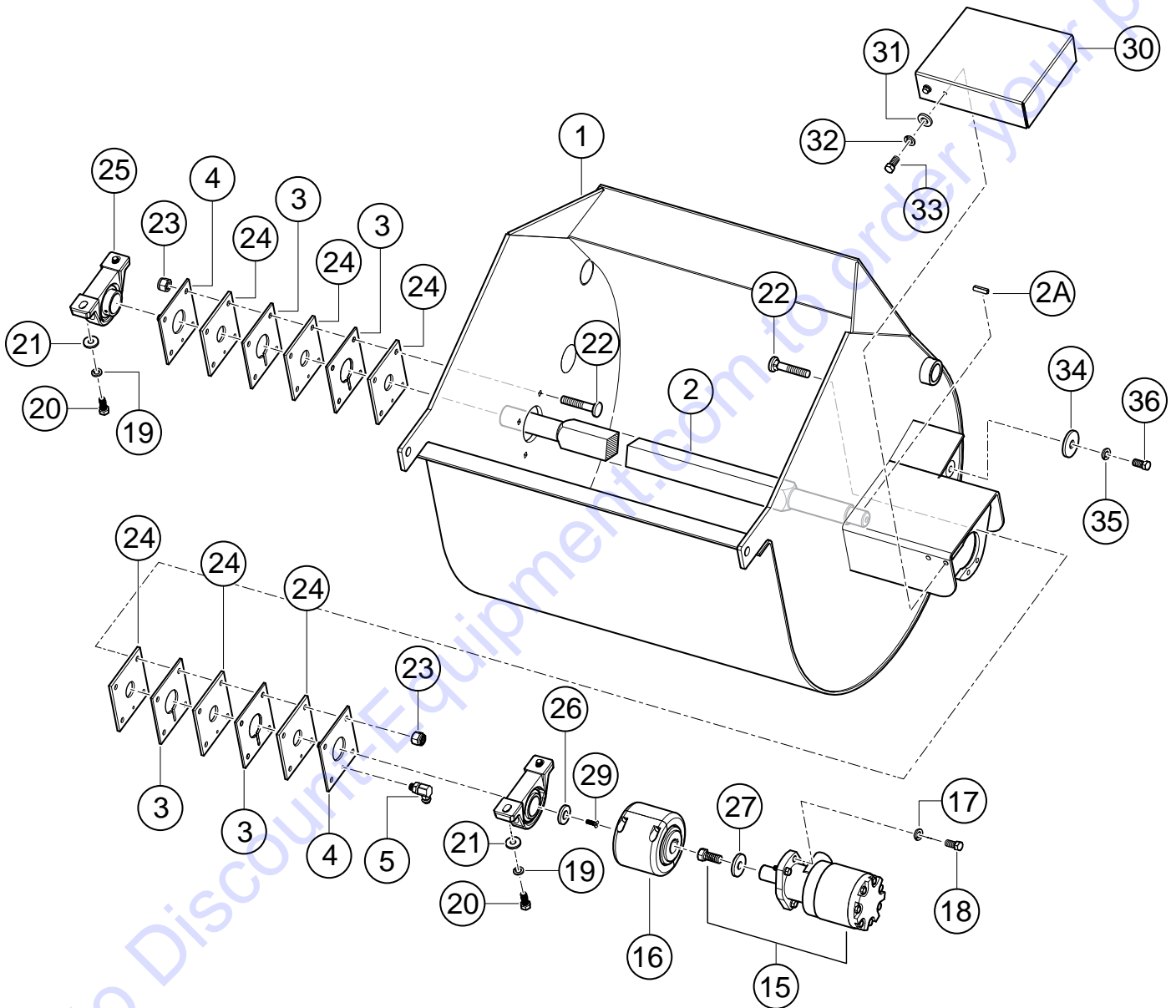
PADDLE BLADES ASSY.



PADDLE BLADES ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	802329	BAR, GRATE LATCH	1	
2	802385	GRATE	1	
3	802452	PADDLE ARM, END	1	
4	802453	PADDLE ARM, CENTER	1	
5	802454	PADDLE ARM, CENTER ENGINE END	1	
6	802455	PADDLE ARM, ENGINE END	1	
7	802443	RETAINER BASE, PADDLE ARM	4	
8\$	802447	RUBBER BLADE, SIDE	4	
9\$	802448	RUBBER BLADE END	2	
10\$	802451	STEEL BLADE, SIDE	4	
11	0401450160	WASHER FLAT 5/8"	4	
11A	507444	SPACER	2	
12	492378	BOLT, HHCS, GRD5	1	
13	EM969013	NUT, 3/8" .NYLOK GRD88	1	
14	492584	NUT LOCK 1/2" DIA NC GRD5	16	
15	3215	SCREW HHC 1/2-13 X 3-1/2" GRD5	16	
16\$	802449	STEEL BLADE, END	2	
17	EM745	HAIR PIN C 5/8-3/4"	1	
18\$	3019092	WASHER, FLAT 3/8"	18	
19\$	EM969013	NUT, 3/8" NYLOC G8	18	
20\$	505883	SCREW, 3/8-NC X 2" GRD5	18	
21	EM924015	PIN COTTER	2	
22	521426	KIT, RUBBER BLADES, SCRAPPERS, HWD....1.....		INCLUDES ITEMS W/\$

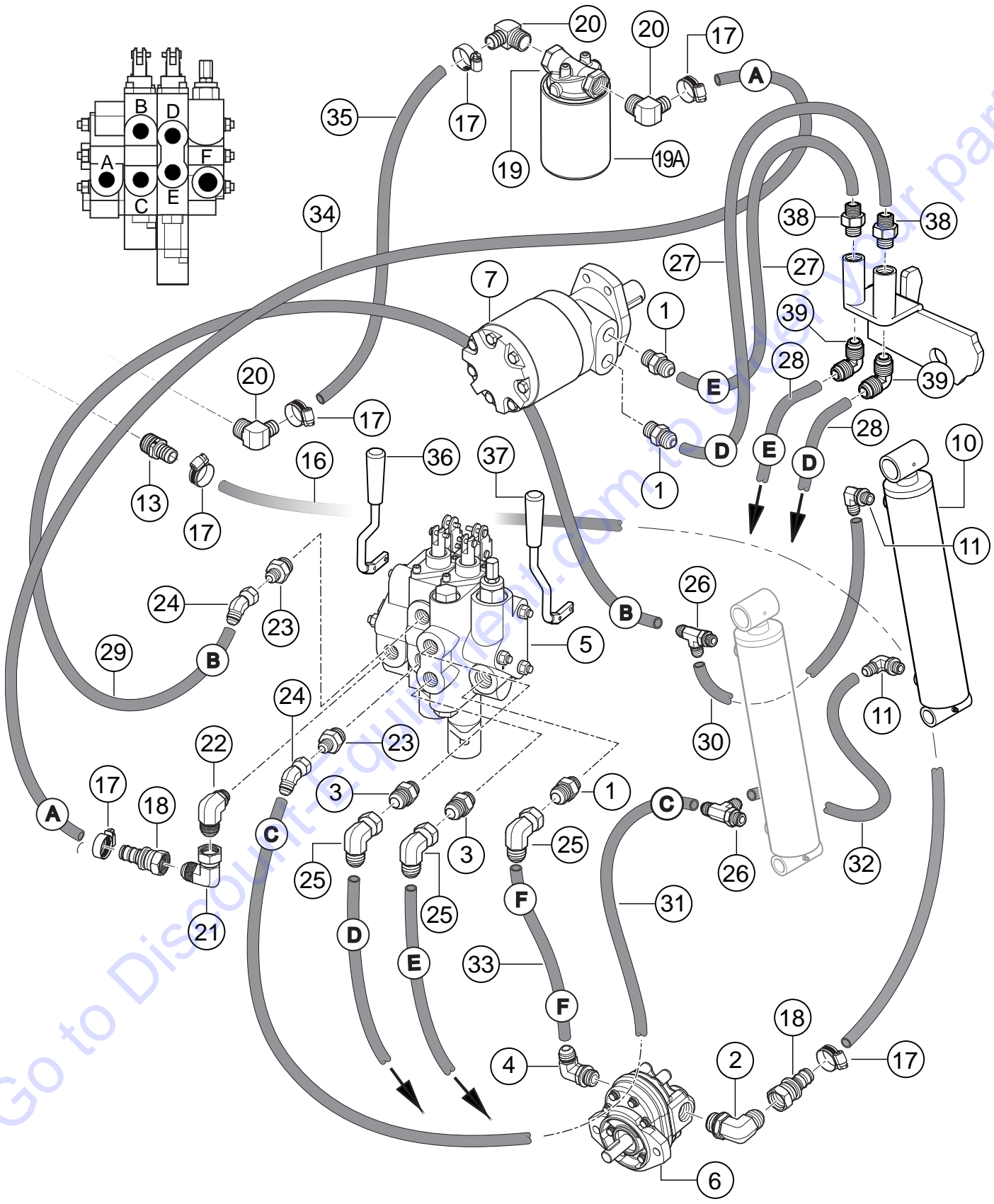
DRUM ASSY.



DRUM ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	802320	DRUM	1	
2	802361	PADDLE SHAFT	1	
2A	502727	WEDGE	1	
3	802367	SEPARATOR	4	
4	802368	COVER, SEAL	2	
5	491704	FITTING ZERK	2	
15	34570	MOTOR, HYDRAULIC W/BOLT	1	
16	802414	COUPLER	1	
17	0166 A	WASHER, LOCK 3/8"	4	
18	EM963610	BOLT, 3/8-NC X 1-1/4" GRD5	4	
19	6109180	WASHER, LOCK 1/2"	4	
20	EM963102	CAPSCREW, HHC 1/2-NC X 1-1/4" GRD5	4	
21	492599	WASHER, FLAT 1/2"	4	
22	505883	BOLT, 3/8-NC X 2" GRD5	8	
23	EM969013	NUT, NYLOC	8	
24	802366	SEAL, PADDLE SHAFT	6	
25	802415	BEARING	2	
26	802667	WASHER, 5/16"	1	
27	802912	WASHER, 5/8"	1	
29	506176	BOLT, 5/16-18 X 1" FHAS	1	
30	802945	COVER	1	
31	509161	WASHER, FLAT 5/16"	4	
32	EM923343	WASHER, LOCK 5/16"	4	
33	492362	BOLT, 5/16-NC X 5/8"	4	
34	530183	WASHER, FLAT 1/2"	2	
35	6109180	WASHER, LOCK 1/2"	2	
36	EM963692	CAPSCREW, HHCS 1/2-13 X 1-1/2"	2	

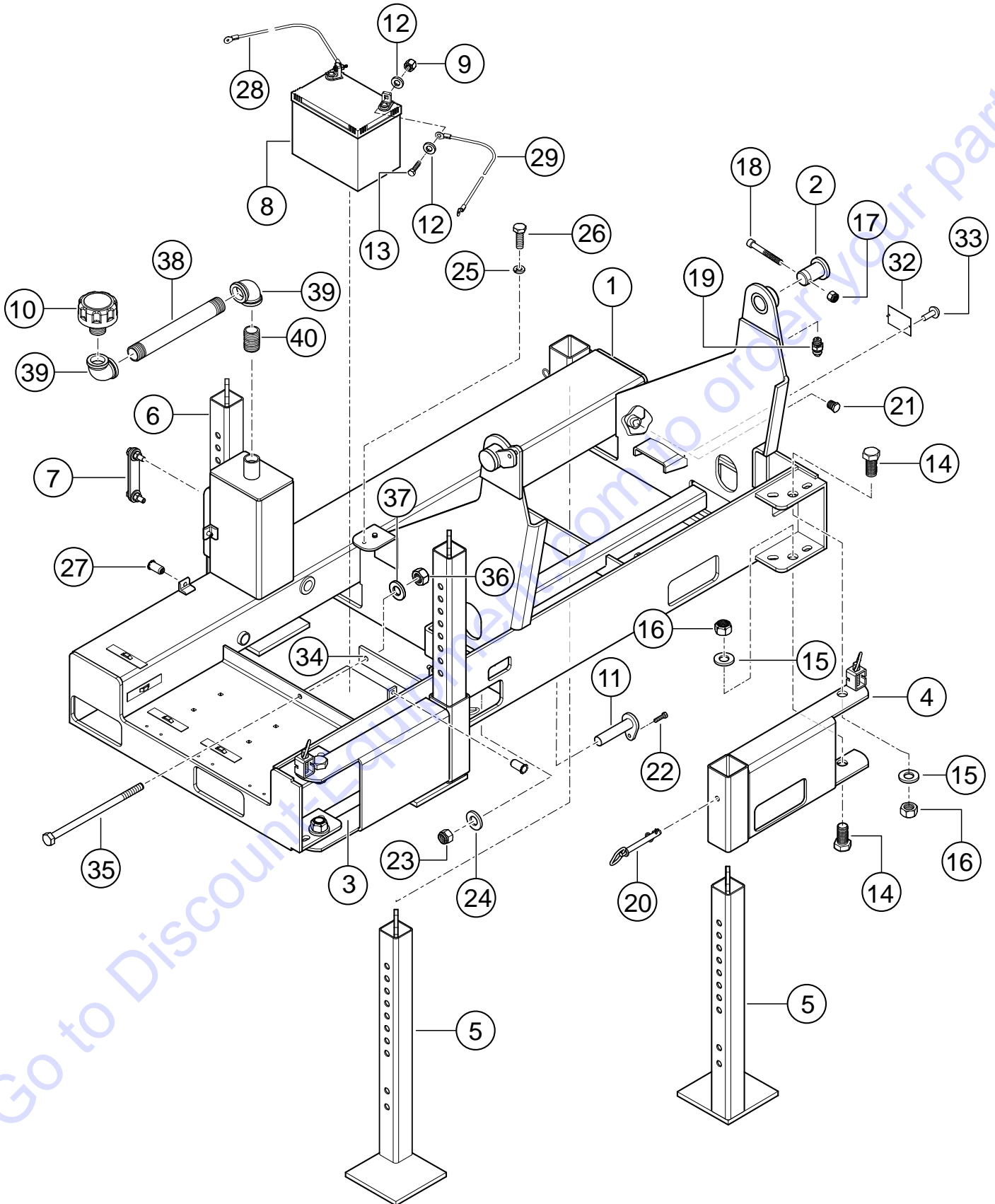
HYDRAULIC ASSY.



HYDRAULIC ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	3365	FITTING, STR.	3	
2	EM25459	ELBOW, 3/4"-90°	1	
3	16587	FITTING, STR	2	
4	3322	FITTING, 90°	1	
5	34585	VALVE, FOUR WAY	1	
6	13374	PUMP, EATON W/BOLT	1	
7	34570	MOTOR, HYDRAULIC	1	
10	802280	CYLINDER, HYD.	2	
11	506196	ELBOW	2	
13	13220	FITTING, STR 12BARB-3/4MP	1	
16	13380	HOSE, 3/4ID X 18-1/2" SAE100R4	1	
17	506207	CLAMP HOSE HS-16	6	
18	511847	FITTING	2	
19	8051	FILTER ASSY., HYD OIL	1	INCLUDES ITEM W/\$
19A\$	508667	ELEMENT, HYD. OIL	1	
20	3367	FITTING, 90°	3	
21	509353	ADAPTER, ELBOW	1	
22	515219	FITTING, VALVE	1	
23	512190	ADAPTER, STRAIGHT	2	
24	512234	ADAPTER, ELBOW	2	
25	512201	ADAPTER, ELBOW	3	
26	802938	ADAPTER	2	
27	802999	HOSE, 850MM	2	
28	803000	HOSE, 1000MM	2	
29	803001	HOSE, 1440MM	1	
30	803002	HOSE, 1585MM	1	
31	803003	HOSE, 1270MM	1	
32	803004	HOSE, 980MM	1	
33	803005	HOSE, 656MM	1	
34	803006	HOSE, 1100MM	1	
35	803007	HOSE, 130MM	1	
36	803048	HANDLE, VALVE, LEFT	1	
37	803049	HANDLE, VALVE, RIGHT	1	
38	516675	ADAPTER, STR.	2	
39	509784	ADAPTER, ELBOW 90°	2	

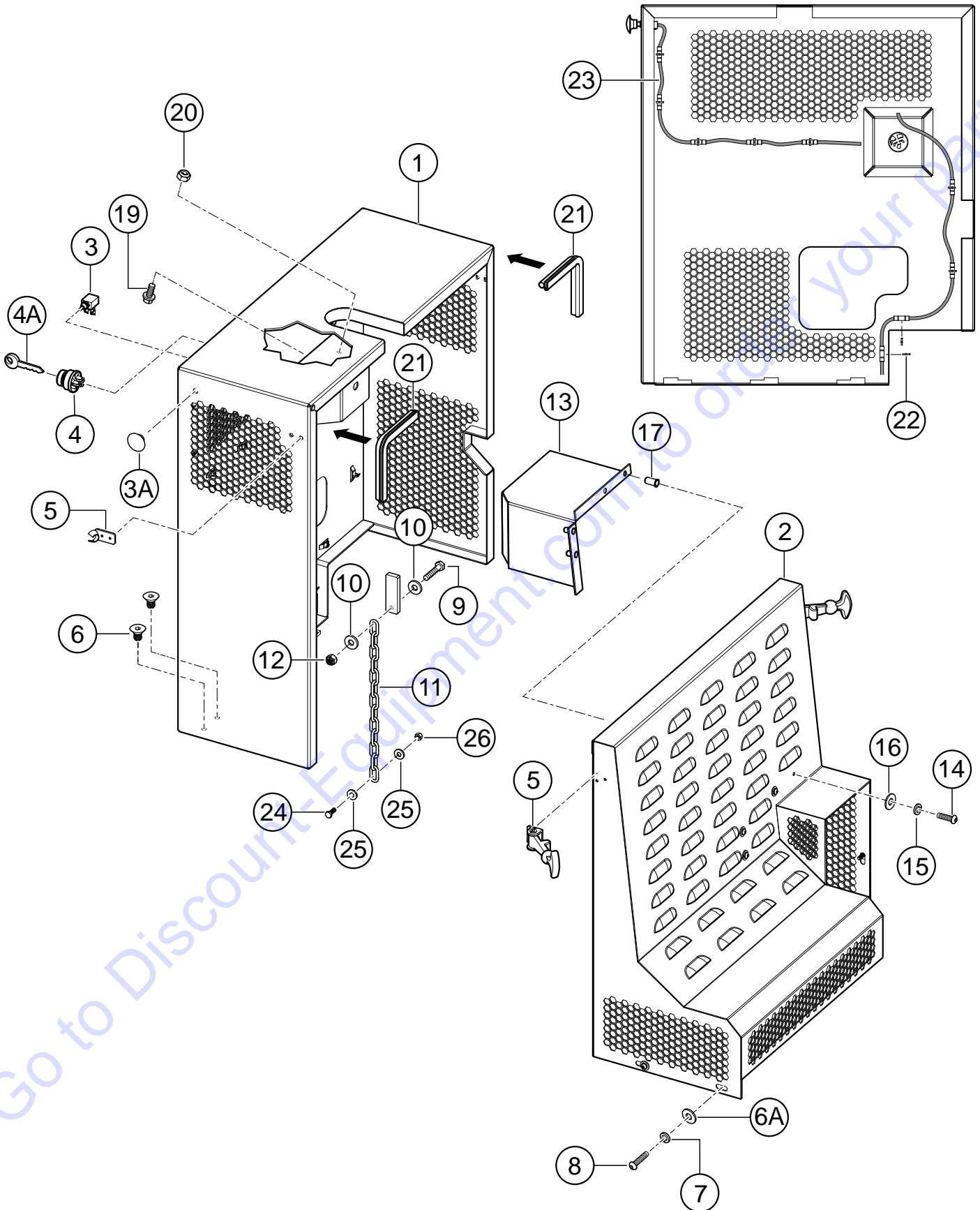
FRAME ASSY.



FRAME ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	802300	FRAME	1	
2	802362	CAP	2	
3	802331	LEG, LEFT	1	
4	802333	LEG, RIGHT	1	
5	802335	STAND, ADJUSTABLE	2	
6	802336	STAND, ADJUSTABLE	2	
7	18052	SIGHT GAUGE	1	
8	4671	BATTERY 12V GROUP U1 WET CELL	1	
9	503119	NUT, LOCK	2	
10	3353	CAP, FILLER/BREATHER	1	
11	802363	RETAINER, CYLINDER	2	
12	492595	WASHER, FLAT 3/16"	4	
13	503118	BOLT, 3/16" X 1"	2	
14	502125	BOLT, 1"-NF X 2" GRD5	4	
15	3047	SPACER	4	
16	TK86D16	NUT, 1"-NF	4	
17	EM969013	NUT, NYLOC	2	
18	520894	BOLT, 3/8-NC X 3" GRD8.8	2	
19	EM916019	FITTING, GREASE	2	
20	EM744	PIN, 1/2" X 4"	4	
21	506094	PLUG, 1/2NPT GALVANIZED	1	
22	492303	BOLT, 5/16-NC X 1-1/4"	2	
23	2105164	NUT, NYLON 5/16-18	2	
24	EM923023	WASHER, FLAT 5/16"	2	
25	2101402	WASHER, LOCK 1/4"	2	
26	492356	BOLT 1/4" X 3/4"	2	
27	DULT100602	NUT, M6	4	
28	512557	CABLE (-) BATTERY	1	
29	511250	CABLE (+) BATTERY	1	
32	520800	PLATE, SERIAL, EMISSION CONTROL	1	
33	491757	RIVET, ID PLATE	2	
34	802314	RETAINER BAR	1	
35	13217	SCREW, HHC 3/8-16 X 6" GRD5	2	
36	492551	NUT, 3/8-16	2	
37	0166 A	WASHER, LOCK 3/8"	2	
38	803069	PIPE, 1"NPT X 10" GALV.	1	
39	491189	ELBOW, 90° 1"NPT GALV.	2	
40	491160	PLUG, PIPE 1"NPT	1	

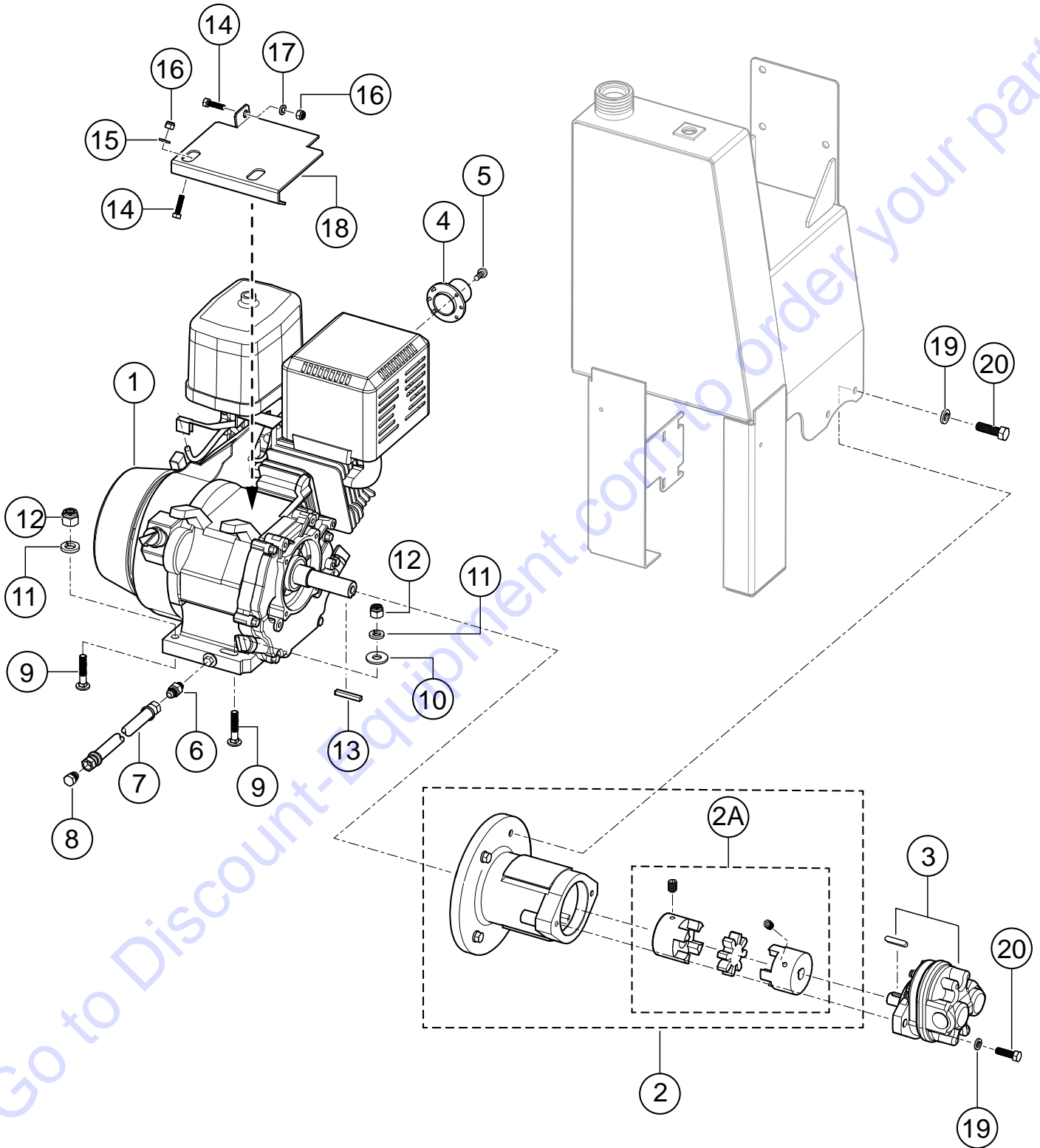
COVER ASSY.



COVER ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	802340	COVER, MOVEABLE	1	
2	802346	COVER, FIXED	1	
3	29173-001	SWITCH, PUSH PULL W/O KNOB	1	
3A	29174-001	KNOB-MUSHROOM	1	
4	10958	SWITCH, IGN, W/KEYS.....	1	INCLUDES ITEM W/\$
4A\$	11078	KEYSET, IGNITION	1	
5	491010	LATCH KIT ENGINE HOUSING	2	
6	510476	BOLT, 5/16-NC X 1/2"	4	
6A	EM923057	WASHER , FLAT1/4"	4	
7	2101402	WASHER LOCK 1/4"	4	
8	DULT100443	BOLT, M6 X 20 P-1 GRD2	4	
9	EM492358	BOLT 1/4-NC X 1-1/4"	1	
10	EM923057	WASHER, FLAT 1/4"	2	
11	803057	CHAIN	1	
12	492581	NUT, 1/4-20 NYLOC	1	
13	802962	HEAT SHIELD, MUFFLER	1	
14	DULT100443	BOLT, M6 X 20 P-1 GRD2	3	
15	2101402	WASHER, LOCK 1/4"	3	
16	EM923057	WASHER, FLAT 1/4".	3	
17	DULT100602	NUT, M6	3	
19	512367	BOLT, 3/16-NC X 1/2" GRD2	2	
20	503119	NUT, LOCK 3/16" NC	2	
21	800033	WEATHER STRIPING, 1.5FT.....	2	1PC=1FT
22	EM491028	WRAP, CABLE TIE, BLACK	9	
23	510573	HARNESS CABLE, ENGINE	1	
24	492356	BOLT, 1/4" X 3/4"	1	
25	EM923057	WASHER, FLAT 3/4"	2	
26	492581	NUT, 1/4-20 NYLOC	1	

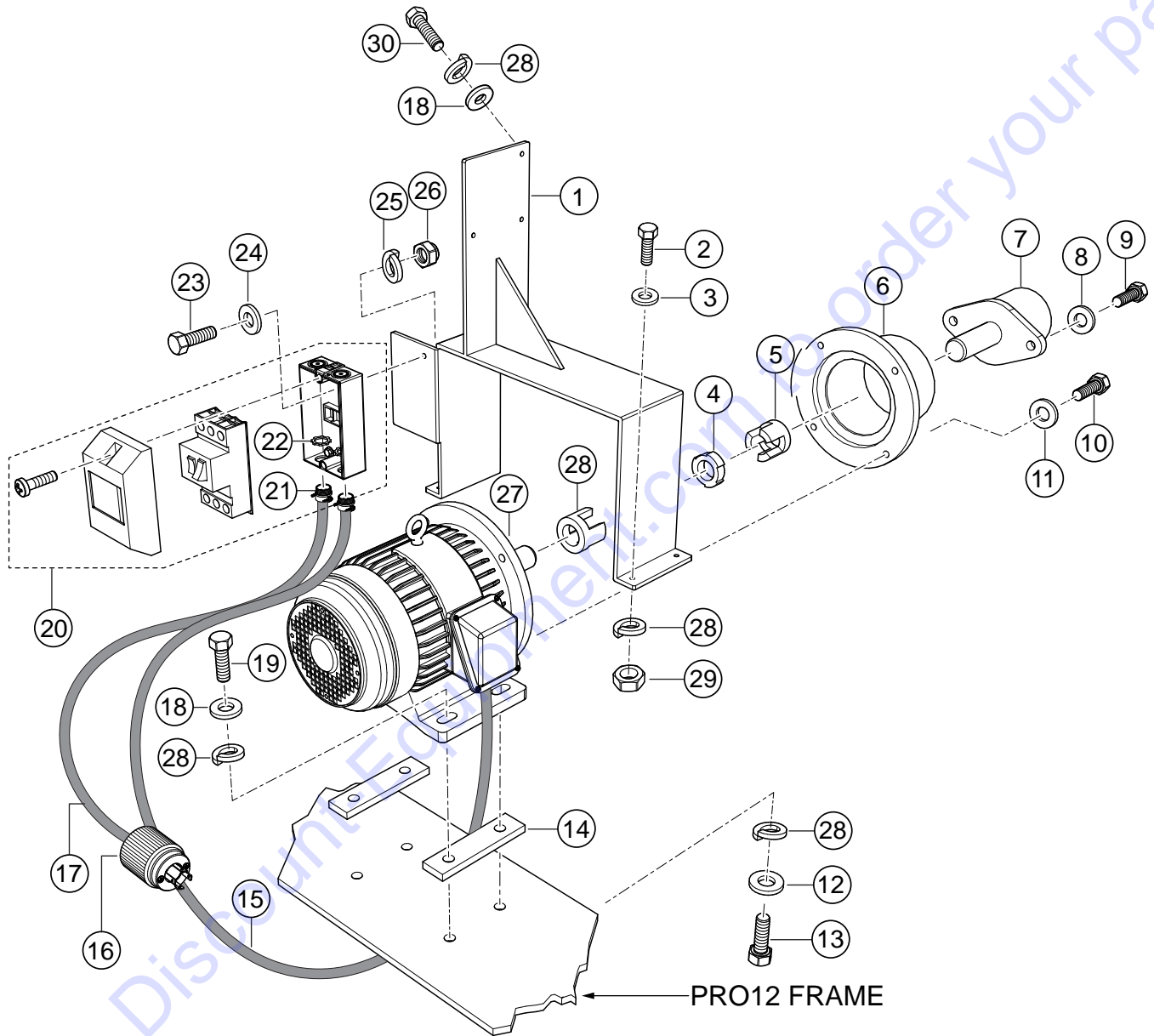
ENGINE ASSY.



ENGINE ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	520766	ENGINE, HONDA, ELEC START. 13HP EPA.....1.....	1	GX390RT2-QNB2
2	516282	COUPLING ASSY.	1	
2A	516282C	JAW COUPLER	1	
3	13374	PUMP, EATON W/KEY	1	
4	803028	MUFFLER, EXHAUST	1	
5	491757	RIVET	6	
6	800780	ADAPTER, 6M12F870MX	1	
7	800776	HOSE, DRAIN	1	
8	513619	FITTING	1	
9	505883	BOLT, 3/8-NC X 2" GRD5	4	
10	3019092	WASHER, FLAT 3/8"	2	
11	0166 A	WASHER, LOCK, 3/8" MED	4	
12	EM969013	NUT, NYLOC, 3/8-NC	4	
13	90745ZE2600	KEY, 6.3 X 6.3 X 43MM	1	
14	492303	BOLT, 5/16-NC X 1-1/4" GRD5	3	
15	EM923057	WASHER, FLAT 1/4"	2	
16	2105164	NUT, NYLOC, 5/16-NC	3	
17	508344	WASHER, FLAT, 5/16"	1	
19	0166 A	WASHER, LOCK, 3/8" MED	6	
20	EM963610	CAPSCREW, 3/8-NC X 1-1/4" GRD8	6	

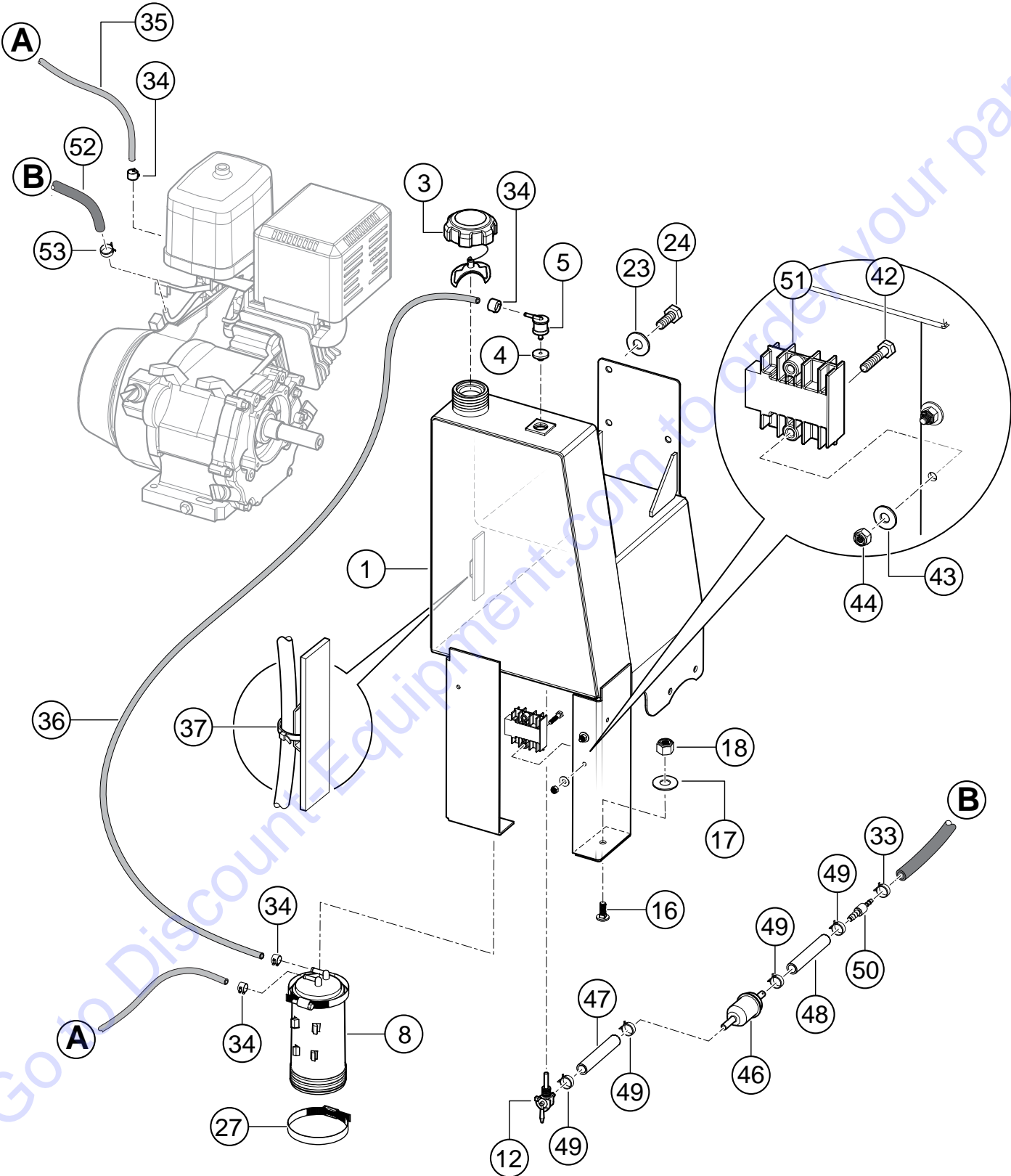
ELECTRIC MOTOR ASSY.



ELECTRIC MOTOR ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	EM98283	BRACKET, SUPPORT VALVE	1	
2		BOLT, 3/8-16 X 1-1/4"	4	OBTAIN LOCALLY
3		WASHER, FLAT 3/8"	4	OBTAIN LOCALLY
4	3418	INSERT ,RUBBER	1	
5	3420	COUPLER, PUMP END		
6	3416	ADAPTOR, PUMP	1	
7	13375	PUMP, EATON	1	
8	0166 A	WASHER, LOCK, 3/8" MED	1	
9	EM963610	CAPSCREW 3/8-NC X 1-1/4" GRD8	1	
10	981635	BOLT, HEX 1/2-13 X 1"	1	
11	6109180	WASHER, LOCK 1/2",	4	
12		WASHER, FLAT 3/8"	4	OBTAIN LOCALLY
13		BOLT, 3/8-16 X 1-1/4"	4	OBTAIN LOCALLY
14	13289	BAR, MOTOR MOUNT	2	
15	124	WIRE, 12-4 ELECTRICAL, 25" L.....	3	1PC=1FT
16	940547	RECEPTACLE (L6-30P) 1PH 230 VOLT	1	
16	TBD	RECEPTACLE (L15-30P) 3 PH 250 VOLT	1	
16	EM98285	RECEPTACLE (L16-30P) 3 PH. 460 VOLT	1	
17	124	WIRE, 12-4 ELECTRICAL, 35" L.....	3	1PC=1FT
18		WASHER, FLAT 3/8"	7	OBTAIN LOCALLY
19		SCREW, 3/8-16 X 1-1/4"	4	OBTAIN LOCALLY
20	EM98187	SWITCH ASSY., 230V 1 PH.	1	
20	EM98191	SWITCH ASSY., 230V 3 PH.	1	
20	EM98284	SWITCH ASSY., 460V 3 PH.	1	
21	TBD	RING	2	
22	TBD	NUT	2	
23		BOLT, 1/4-20 X 1"	2	OBTAIN LOCALLY
24		WASHER, FLAT 1/4"	2	OBTAIN LOCALLY
25		WASHER, LOCK 1/4"	2	OBTAIN LOCALLY
26		NUT, 1/4-20.....	2	OBTAIN LOCALLY
27	3414	MOTOR, ELEC 5HP, 1 PH.	1	
27	3481	MOTOR, ELEC 5HP, 3 PH.	1	
28		WASHER, LOCK 3/8"	15	OBTAIN LOCALLY
29		NUT, 3/8-16.....	4	OBTAIN LOCALLY
30		BOLT, 3/8-16 X 3/4"	3	OBTAIN LOCALLY

FUEL TANK ASSY.



FUEL TANK ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	802353	TANK, GASOLINE	1	
3	520820	CAP, FUEL EPA	1	
4	203403	GROMMET, ROLL OVER VALVE	1	
5	202772	VALVE, ROLL OVER	1	
8	23506	CANISTER, CARBON, 800CC	1	
12	22081	VALVE, FUEL SHUTOFF	1	
16	504586	BOLT, 3/8-NC X 1" GRD5	2	
17	0166 A	WASHER, LOCK 3/8"	2	
18	EM969013	NUT, NYLOC 3/8-NC	2	
23	0166 A	WASHER, LOCK 3/8"	3	
24	EM963055	HEX HEAD CAPSCREW	3	
27	493108	CLAMP	2	
33	802573	CLAMP, BAND TENSION D=9.5	1	
34	802498	CLAMP, BAND TENSION D=11.1	4	
35	520833	HOSE, GASOLINE, EPA 3/16" X 0.96M 40"L.....	4	1PC=1FT
36	520833	HOSE, GASOLINE, EPA 3/16" X 0.73M 25"L....	3	1PC=1FT
37	EM491028	WRAP, CABLE TIE, BLACK	2	
42	EM492358	BOLT, 1/4-NC X 1-1/4" GRD5	2	
43	EM923057	WASHER, 1/4"	2	
44	492581	NUT, 1/4-20 NYLOK	2	
46	EM20763	FILTER, FUEL IN-LINE	1	
47	520611	HOSE, GASOLINE, EPA 1/4" X 0.051M 2"L.....	1	1PC=1FT
48	520611	HOSE, GASOLINE, EPA 1/4" X 0.076M 2"L.....	1	1PC=1FT
49	802574	CLAMP, BAND TENSION D=11.7	4	
50	802405C	REDUCER, 1/4" - 3/16"	1	
51	31600ZE2861	REGULATOR	1	
52	91424Z5L822	TUBE, FUEL 4.5 X 580MM	1	
53	950024080008	CLAMP, TUBE	1	

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