

# OPERATION AND PARTS MANUAL



**MULTIQUIP®**

***ESSICK* SERIES**

**MODEL**

**EM12M**

**EM12ME51**

**EM12ME53**

**Mechanical Drive**

**PLASTER/MORTAR MIXER**

**(HONDA GX390U1QA2 GASOLINE ENGINE)**

Revision #1 (08/25/17)



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## FUEL AND CHEMICAL EXPOSURE WARNINGS

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### WARNING

Gasoline 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

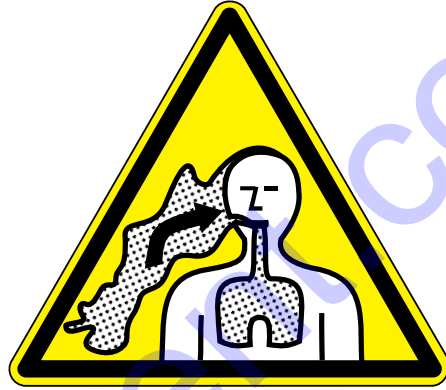
## ⚠️ WARNING



### 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.

## TRAINING CHECKLIST

Training Checklist			
No,	Description	OK?	Date
1	Read operation manual completely.		
2	Machine layout, location of components, checking of engine oil levels.		
3	Fuel system, refueling procedure.		
4	Operation of controls (machine not running).		
5	Safety controls, safety stop switch operation.		
6	Emergency stop procedures.		
7	Machine transport and storage.		

# 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
	Hydraulic fluid 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.



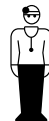
- **ALWAYS** clear the work area of any debris, tools, etc. that would constitute a hazard while the equipment is in operation.

- **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.

- **NEVER** use your hand to find hydraulic leaks. Use a piece of wood or cardboard. Hydraulic fluid injected into the skin must be treated by a knowledgeable physician immediately or severe injury or death can occur.



### 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.

## 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.



# SAFETY INFORMATION

## 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 (GASOLINE MODELS ONLY)

### 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.



## GENERATOR SAFETY (ELECTRIC MODELS ONLY)

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



## ELECTRIC MOTOR SAFETY (ELECTRIC MODELS ONLY)

### NOTICE

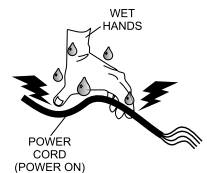
- Operate electric motor only at the specified voltage indicated on the nameplate.
- **DO NOT** spray water onto electric motor.
- **ALWAYS** disconnect AC power plug from power source before moving mixer.
- **ALWAYS** make sure the ON/OFF switch on the electric motor is in the OFF position when not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



# SAFETY INFORMATION

## ⚠ 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.

## 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.

## 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 mixer.
- In order to reduce the possibility of an accident while transporting the mixer on public roads, **ALWAYS** make sure the towing vehicle is mechanically sound and in good operating condition.
- **ALWAYS** shutdown engine before transporting.
- **ALWAYS** inspect the hitch and coupling for wear. **NEVER** tow a mixer with defective hitches, couplings, chains, etc.
- Check the tire air pressure on both towing vehicle and mixer **Mixer tires should be inflated to 50 psi cold**. Also check the tire tread wear on the vehicle and mixer.
- **ALWAYS** make sure the mixer is equipped with a **safety chain**.
- **ALWAYS** properly attach mixer's safety chains to towing vehicle.
- 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.
- Mixer should be adjusted to a level position at all times when towing.
- Raise and lock mixer wheel stand in up position when towing.
- Place **chock blocks** underneath wheel to prevent **rolling** while parked.



# SAFETY INFORMATION

## ENVIRONMENTAL SAFETY/DECOMMISSIONING

### NOTICE

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

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

# MIXER SPECIFICATIONS/NOISE AND VIBRATION

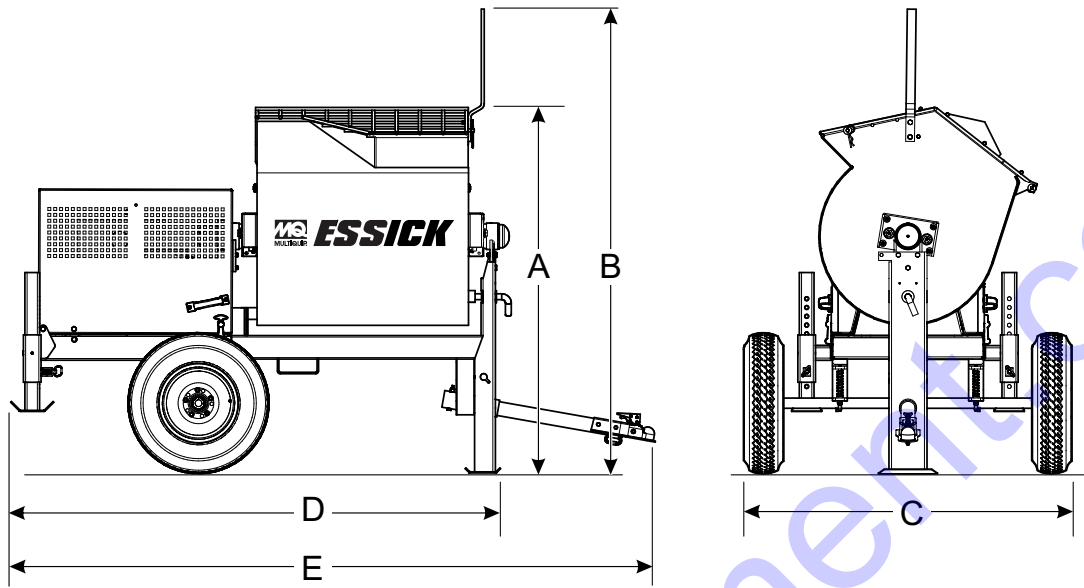


Figure 1. Dimensions

Table 1. EM12M Series Dimensions/Specifications	
Reference Letter/Parameter	Dimensions in. (mm)
A (Height-Grate)	60.8 (1,544)
B (Height-Drum Handle)	77.2 (1,961)
C (Width-Wheelbase)	54.7 (1,389)
D (Length-Jack Stand/Frame)	83.4 (2,118)
E (Length-Jack Stand/Tow Bar)	109.7 (2,786)
Maximum Mixing Capacity	12 cu. ft. (339.8 liters)
Bag Capacity	3.5 ~ 4 bags
Weight Approx.	1,090 lbs. (495 kg)

Table 2. EM12M Noise And Vibration (Gasoline)	
Guaranteed ISO 11201:2010 Based Sound Pressure Level at Operator Station in dB(A)	TBD
Guaranteed ISO 3744:2010 Based Sound Power Level in dB(A)	TBD

**NOTES:**

1. Sound Pressure and Power Levels are "A" weighted Measures per ISO 226:2003 (ANSI S1.4-1981). They are measured with the operating condition of the machine which generates the most repeatable but highest values of the sound levels. Under normal circumstances, the sound level will vary depending on the condition of the material being worked upon.
2. The vibration level indicated is the vector sum of the RMS (Root Mean Square) Values of amplitudes on each axis, standardized to an 8 hour exposure period, and obtained using operating condition of the machine that generates the most repeatable but highest values in accordance with the applicable standards for the machine.

# ENGINE/ELECTRIC MOTOR SPECIFICATIONS

Table 3. Engine Specifications/Dimensions	
Model	GX390U1QA2
Type	Air cooled 4-stroke OHV petrol engine, 25° inclined cylinder, horizontal shaft, cast iron sleeve
Bore X Stroke	3.2 in. X 2.5 in. (88 mm x 64 mm)
Displacement	389 cm <sup>3</sup>
Max. Output	11.7 H.P. (8.7 kW) @ 3600 RPM
Continuous Rated Power	6.4 kW (8.6 HP)/3,000 rpm 7.0 kW (9.4 HP)/3,600 rpm
Max. Net Torque	26.5 Nm/2.70 kgfm/2,500 rpm
Ignition System	Digital CDI with variable ignition timing
Fuel Tank Capacity	1.61 U.S. Gallons (Approx. 6.1 Liters)
Fuel	Unleaded Gasoline
Lube Oil Capacity	1.06 qt. (1.1 liters)
Oil Type	4-Stroke API, SF or SG SAE 10W-30 General Use
Speed Control Method	Centrifugal Flyweight Type
Cooling System	Forced Air
Starting Method	Recoil Start
Spark Plug Type	BPR6ES NGK
Spark Plug Gap	0.028-0.031 in. (0.70 - 0.80 mm)
Dimension (L x W x H)	16.0 x 18.1 X 17.6 in. (406 X 460 X 448 mm)
Dry Net Weight	69.9 lbs (31.7 Kg.)

Table 4. Electric Motor Specifications		
Model	Baldor Model 37E365W796	Baldor Model 37ES97X87
Enclosure	TEFC	TEFC
Horsepower	5	5
Input Voltage (VAC)	230	230/460 <sup>1</sup>
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)
<sup>1</sup> Factory set at 230 VAC		

# GENERAL INFORMATION

## APPLICATION

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 the mixing of **flammable** or **explosive** substances. The mixer **must not be used** in an explosive atmosphere.

The drum capacity of this hydraulic mixer is 12.0 cu. ft. (340 liters) with a batch capacity between 3-1/2 and 4-1/2 bags. Mixer is shipped completely assembled and has been factory tested and is ready for use.

## POWER PLANTS

Mixer is powered by a 11.7 HP, air-cooled, 4-stroke gasoline engine or a 5HP electric motor. Refer to Table 3 or Table 4 for specific engine or electric motor specifications.

## HARDWARE

Check all hardware on the mixer before starting. Periodically inspect all hardware. Loose hardware can contribute to early component failure and poor performance. Use Table 5 as general guideline when the torqueing of mixer hardware is required. Remember to keep all mixer hardware components tight.

**Table 5. Hardware Torque Recommendations**

Hardware Diameter	Torque (ft-lbs)
5/16-inch x 18	14
3/8-inch x 16	24
3/8-inch x 24	37
1/2-inch x 13	39
1/2-inch x 13 (Grade 8)	90

## ENGINE MAINTENANCE

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

## TOWING TIPS

### CAUTION

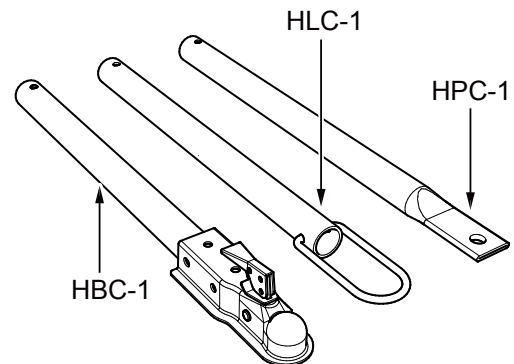
**DO NOT** tow or lift the mixer unless the mixing drum is completely empty.

### CAUTION

Use a lifting device to lift tow bar onto vehicle coupler. If lifting device is not available, have 2 persons of similar height lift the tow bar. When lifting, do not attempt to lift by bending forward. Bend hips and knees to squat down to your load, keep it close to your body, and straighten your legs to lift.

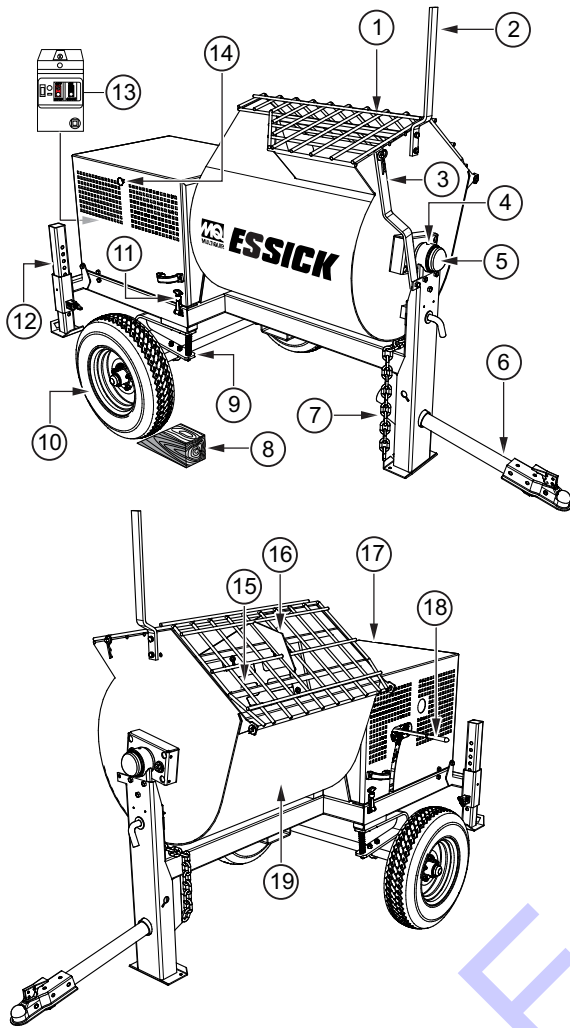
## OPTIONAL TOW BARS

This mixer can be configured for use with various types of tow bars (ball, loop and pin). Reference Figure 2. Contact MQ sales department for the desired tow bar.



**Figure 2. Optional Tow Bars**

## BASIC COMPONENTS (MIXER)



**Figure 3. Mixer Major Components**

1. **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.
2. **Dump Handle** — Pull this handle downward to dump the contents of the drum. Push the handle upward to return the drum to its vertical position.
3. **Safety Grill Lock Handle** — To prevent injury to hands and arms, the safety grill should **ALWAYS** be locked when the mixing of plaster or mortar is required. Also when transporting the mixer the safety grill should be locked. The safety grill should only be unlocked when cleaning of the blades and drum is required.
4. **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 once a month.
5. **Drum Bearing** — There is a sealed bearing on each end of the mixing drum. Bearings are packed and sealed at the factory and require no further maintenance.
6. **Tow Bar/Coupler** — This mixer uses various towing bars, please reference the frame assembly drawing and parts list in this manual to determine which tow bar meets your requirements.
7. **Safety Chain** — This mixer uses a 3/16-inch thick, 72 inches long zinc-plated safety chain. **ALWAYS** connect the safety chain when towing.
8. **Chock Blocks (Option)** — Place these blocks (not included as part of the mixer package) under each mixer wheel to prevent rolling, when mixer is not connected to the towing vehicle.
9. **Cantilever (U-Type) Suspension** — This mixer uses a cantilever type suspension. Check the mounting hardware for bolt hole elongation and tightness. See maintenance section of this manual for recommended maintenance.
10. **Tires Ply** — The tire ply (layers) number is rated in letters. This mixer uses 13-inch 2-ply tires. Replace with only recommended type tires.
11. **Cabinet/Latch** — Encloses engine and electric motor (option). **NEVER** run mixer with cabinet removed. Use latches to secure engine compartment cabinet.
12. **Jack Stand (Option)** — Use this jack stand to level and support the rear end of the mixer during operation. **NEVER** deploy on un-level ground and always check for firmness of ground.
13. **Electric Motor ON/OFF Switch** — This switch is located on the inside of the engine cover. When activated, it will start and stop the electric motor.
14. **Engine ON/OFF Switch** — This switch is located on the side of the mixer frame. When activated it will shut down the engine. Pull out when starting the engine.
15. **Mixing Paddles** — This mixer uses rubber mixing paddles for the mixing of plaster and mortar. Always clean paddles after each use.
16. **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.
17. **Engine Cover** — Lift this cover to gain access to the engine or electric motor.
18. **Clutch Engagement Lever** — Push the clutch lever forward, toward the tow end of the mixer to engage clutch. Once the clutch is engaged the paddle shaft will begin to rotate. To disengage clutch pull the clutch backwards towards the engine.
19. **Mixing Drum** — Steel mixing drum. Drum capacity is 12 cu. ft (340 liters). Mixing materials such as mortar, plaster are to be placed into this drum for mixing. Always clean the drum after each use. **DO NOT** use this mixing drum for the mixing of **volatile or hot liquids**.



# ENGINE COMPONENTS

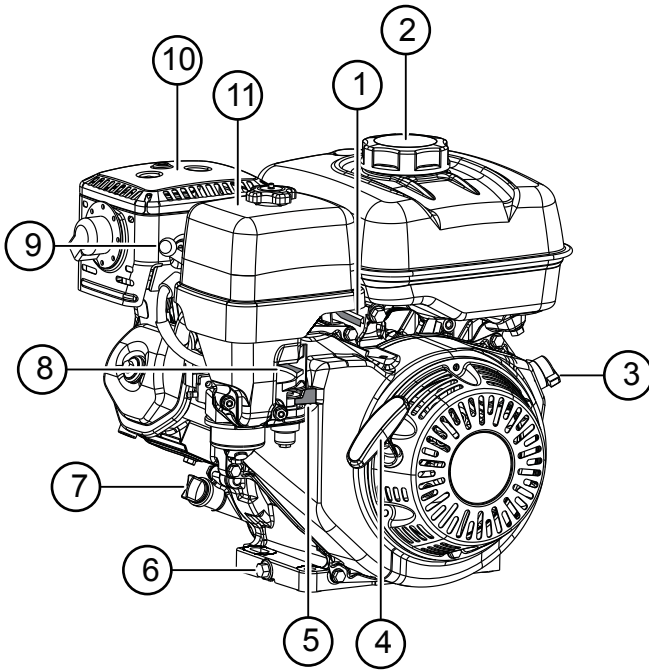


Figure 4. Engine Components

## INITIAL SERVICING

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

1. **Throttle Lever** – Used to adjust engine RPM speed.
2. **Fuel Filler Cap/Fuel Tank** – Remove this cap to add unleaded gasoline to the fuel tank. Fill with unleaded gasoline. Refer to Table 3 for fuel tank capacity. Make sure cap is tightened securely. **DO NOT** over fill. For additional information refer to Honda engine owner's manual.

### DANGER



Add fuel to the tank 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.

3. **Engine On/Off Switch** – **ON** position permits engine starting, **OFF** position stops engine operation.
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. **Oil Drain Plug** – Remove this plug to remove oil from the engine's crankcase.
7. **Dipstick/Oil Filler Cap** – Remove this cap to determine if the engine oil is low. Add oil through this filler port as recommended in Table 7.
8. **Choke Lever** – Used in the starting of a cold engine, or in cold weather conditions. The choke enriches the fuel mixture.
9. **Spark Plug** – Provides spark to the ignition system. Set spark plug gap according to engine manufacturer's instructions. Clean spark plug once a week.
10. **Muffler** – Used to reduce noise and emissions. **NEVER** touch when *hot!*
11. **Air Cleaner** – Prevents dirt and other debris from entering the fuel system. Remove wing-nut on top of air filter canister 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.

# 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 (Table 6) 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. **Electric motor is factory set to 230 VAC.**

## 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 Table 6 for connection to a power source. Reference Table 6. 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 6. Electric Motor Wiring Information		
Electric Motor HP Rating	1Ø -230 VAC, 60 HZ	3Ø -230/460 VAC, 60 HZ
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

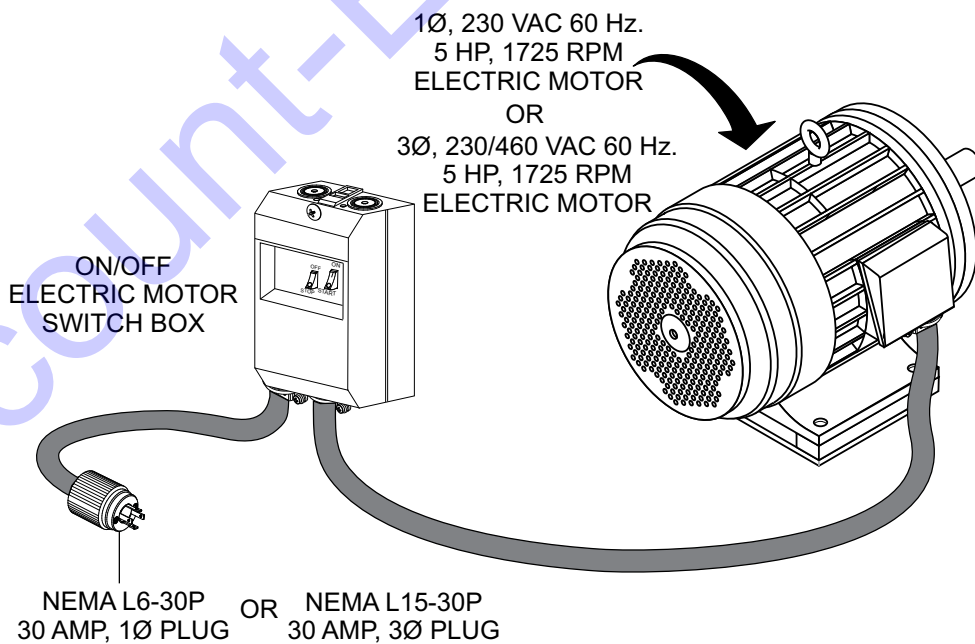


Figure 5. Electric Motor



# TOWING GUIDELINES

## TOWING SAFETY PRECAUTIONS

### CAUTION

Check with your county or state safety towing regulations department before towing your *mixer*.

To reduce the possibility of an accident while transporting the mixer on public roads, always make sure that the mixer towing components and the towing vehicle are in good operating condition and both units are mechanically sound.

The following list of suggestions should be used when towing the mixer:

- Make sure that the hitch and coupling of the towing vehicle are rated equal to, or greater than the trailer "gross vehicle weight rating" (GVWR).
- **ALWAYS** inspect the hitch and coupling for wear. **NEVER** tow the mixer with defective hitches, couplings, chains etc.
- **CHECK** the tire air pressure on both the towing vehicle and the trailer. Also check the tire tread wear on both vehicles.
- **ALWAYS** make sure the mixer is equipped with a "Safety Chain."
- **ALWAYS** attach trailer's safety chain to the frame of towing vehicle.
- **ALWAYS** make sure that the towing vehicle's directional, backup, and brake lights are working properly.
- Remember in most cases the maximum speed unless otherwise posted for highway towing is **55 MPH**, however before towing your mixer, check your local state, and county vehicle towing requirements. Recommended off-road towing is not to exceed **15 MPH** or less depending on type of terrain.
- Place **chocked blocks** underneath wheels to prevent **rolling**, while parked, if disconnected from towing vehicle.
- Inflate tires to correct pressure, inspect tires for cuts, and excessive wear. See Table 10 (Tire Wear Troubleshooting).
- When towing of the mixer is required, place the drum in the up position (mouth facing upwards).

- **ALWAYS** make sure that the fuel valve lever is in the **OFF** position (gasoline models only).
- Check wheel mounting lug nuts with a torque wrench. Torque wheel lug nuts as described in the maintenance section of this manual.
- Check tightness of U-clamp nuts, torque suspension hardware as referenced in the maintenance section of this manual.
- Avoid sudden stops and starts. This can cause skidding, or jackknifing. Smooth, gradual starts and stops will improve gas mileage.
- Avoid sharp turns to prevent rolling.

### CAUTION

If the mixer tow bar is deformed or damaged replace entire tow bar. **NEVER** tow the mixer with a defective tow bar. There exist the possibility of the trailer separating from the **towing vehicle**.

## TOW BAR TO VEHICLE (COUPLER ONLY)

1. Check the vehicle hitch ball, and mixer's coupler for signs of wear or damage. Replace any parts that are worn or damaged before towing.
2. Use only a 2-inch ball diameter (towing vehicle), this will match the mixer's 2-inch coupler. Use of any other ball diameter will create an extremely dangerous condition which can result in separation of the coupler and ball or ball failure.
3. After tow bar has been connected to mixer (see next page), attach mixer's coupler to the hitch ball on the towing vehicle securely and make sure the lock lever is in the down position (locked).

## MIXER TOW BAR VEHICLE (PINTLE AND LOOP)

1. Make sure the bumper on the towing vehicle is equipped to handle either a pintle or loop type tow bar configuration.
2. After tow bar has been connected to mixer (see next page), secure either type of tow bar to the towing vehicle, following state and county towing regulations
3. As a minimum, use a 1/2-inch bolt and nylock nut grade 5 when securing either tow bar to the towing vehicle.

# SAFETY CHAIN CONNECTION

## CAUTION

**NEVER** tow the mixer with the safety chain removed. The safety chain is intended to prevent complete separation of the mixer from the towing vehicle in the event of a tow bar failure.

## TOW BAR TO MIXER CONNECTION

1. Insert the tow bar through the round opening at the bottom of the mixer stand (Figure 6).

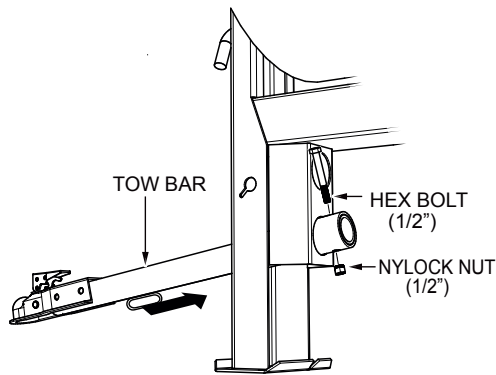


Figure 6. Inserting Tow Bar

2. Align the hole on the tow bar with the hole on the mixer frame (Figure 6), and insert 1/2-inch bolt through tow bar and frame. Secure tow bar to frame with 1/2-inch nylock nut. Tighten to 40 ft.-lbs.
3. Route the safety chain through the holes just above the tow bar, located on each side of the mixer stand.

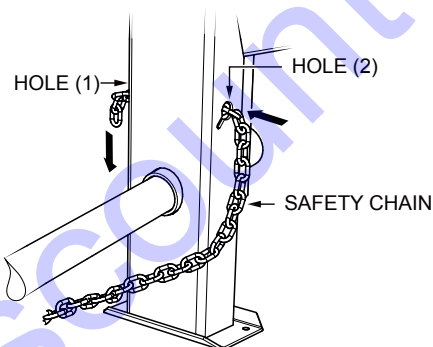


Figure 7. Attaching Safety Chains to Mixer Stand

4. Loop (cross) the safety chain (Figure 8) and place under the tow bar. Secure the loop with the safety chain connector link.

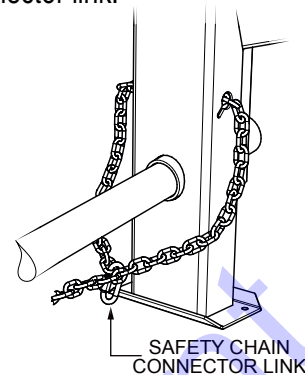


Figure 8. Crossing The Safety Chain

5. Extend the safety chain along the length of the tow bar (Figure 9), looping it through the tow bar's connector link. Remove any excess chain slack.

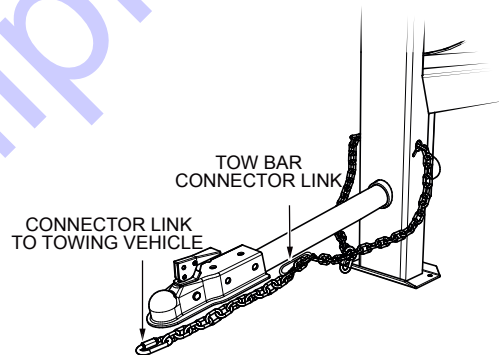


Figure 9. Extending Safety Chain

6. Connect the free end of (connector link) the safety chain to the towing vehicle (Figure 9). Remember it is critical that the length of the chain be properly adjusted, to prevent the draw bar and the front of the mixer stand from dropping to the the ground (contact) in the event the draw bar becomes disconnected from the towing vehicle.

Adjust paddles as shown in Figure 10.

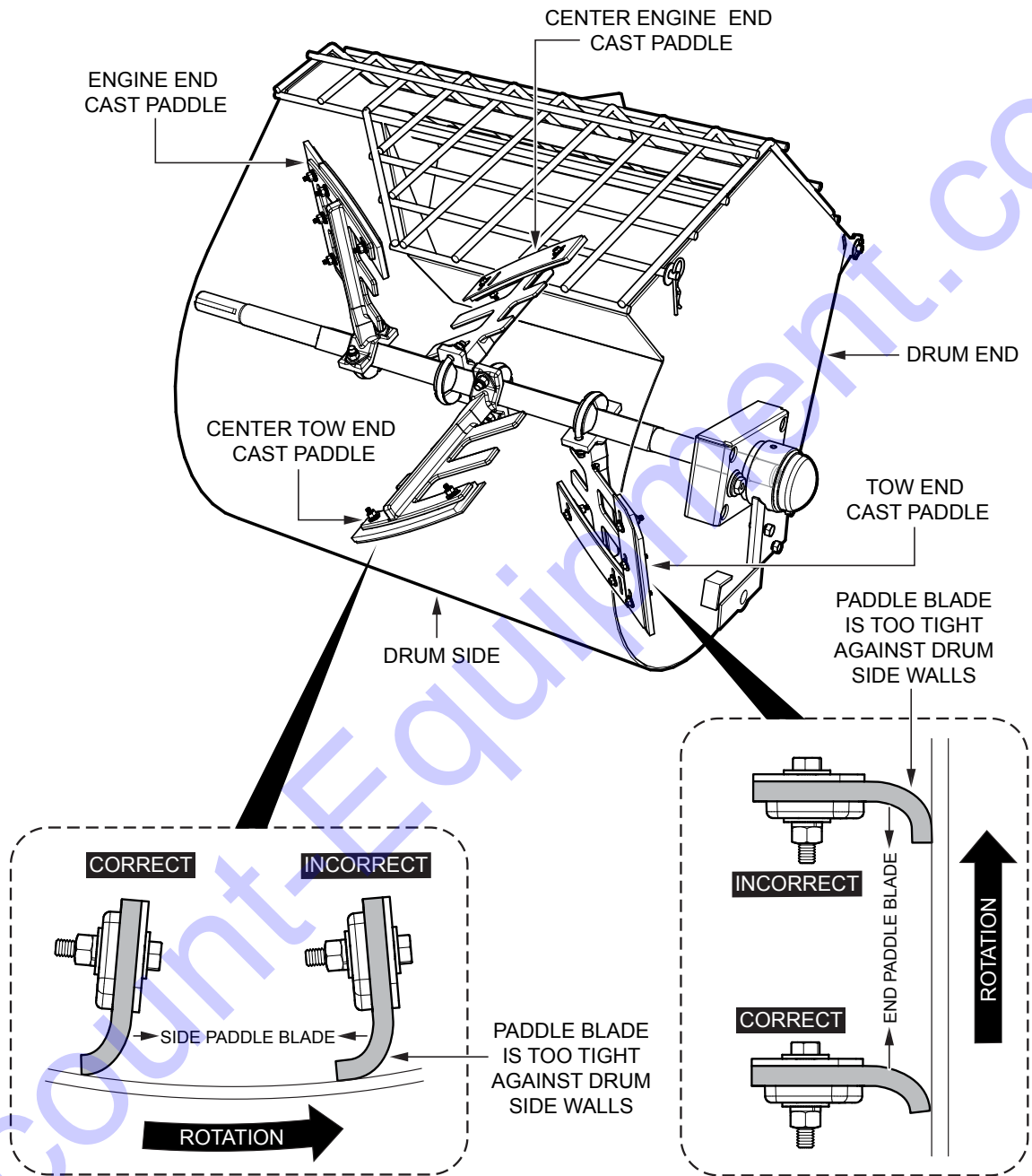


Figure 10. Paddle Blade Adjustment

# INSPECTION

## BEFORE STARTING

1. Read all safety instructions at the beginning of manual.
2. Clean the unit, 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.

### CAUTION



**ALWAYS** wear approved eye and hearing protection while operating the mixer.

### CAUTION



**NEVER** place hands or feet inside the engine guard cover while the engine is running. **ALWAYS** shut the engine down before performing any kind of maintenance service on the mixer.

## ENGINE OIL CHECK

1. To check the engine oil level, place the unit on secure level ground with the engine stopped.
2. Remove the filler dipstick from the engine oil filler hole (Figure 11) and wipe it clean.

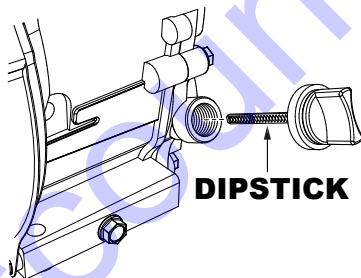


Figure 11. Engine Oil Dipstick (Removal)

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 12), fill to the edge of the oil filler hole with the recommended oil type (Table 7). Maximum oil capacity is 2.33 pints (1.09 liters).

### NOTICE

Reference engine manufacturer's manual for specific servicing instructions.

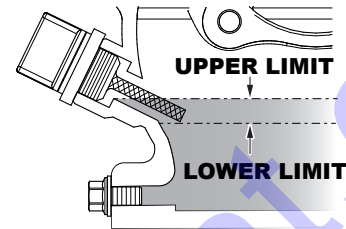


Figure 12. Engine Oil Dipstick (Oil Level)

Table 7. Engine 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

## FUEL CHECK

### DANGER



If your mixer has a gasoline engine, determine if the engine fuel is low. If fuel is low, remove the fuel filler cap and fill it with **unleaded** gasoline. Motor fuels are **highly flammable** and can be dangerous if mishandled. **DO NOT** smoke while refueling. **DO NOT** attempt to refuel the mixer if the engine is **hot!** or **running**.

### 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.

1. Remove the gasoline cap located on top of fuel tank.
2. Visually inspect to see if 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.

## PADDLE BLADE CHECK

Check for **worn** or **defective** paddle blades (Figure 13). Make sure that all blades are adjusted properly. See blade adjustment procedure in this manual. Replace all defective or damaged blades immediately using the part numbers referenced in the parts section of this manual.

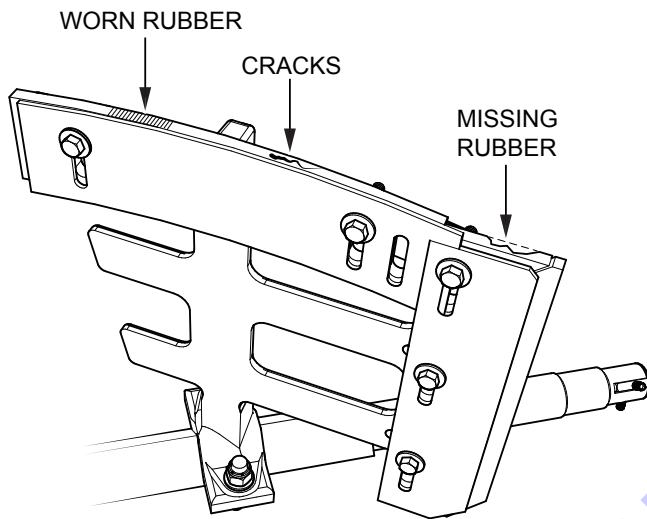


Figure 13. Worn Mixing Blade

## TIRES

Check for **worn** or **defective** tires (Figure 14). Replace any defective or worn tires immediately.

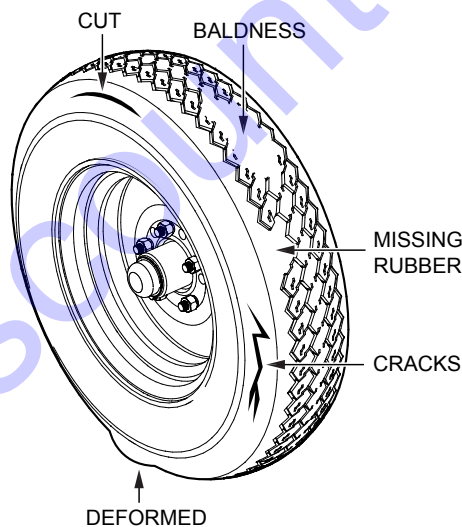


Figure 14. Tire Wear

## START/STOP SWITCH (GASOLINE ENGINE)

1. Pull the engine **start/stop** switch (Figure 28) outward to start the engine

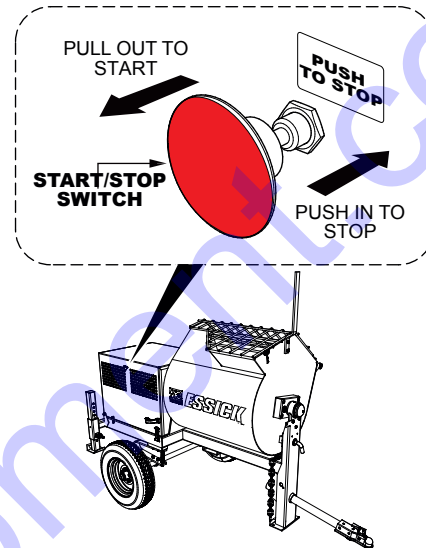


Figure 15. Start/Stop Push Button Switch (Gasoline Model Only)

## START/STOP SWITCH (ELECTRIC MOTOR)

This unit has been equipped with a electric motor start/stop switch (Figure 16), which should be tested every time the unit is started.

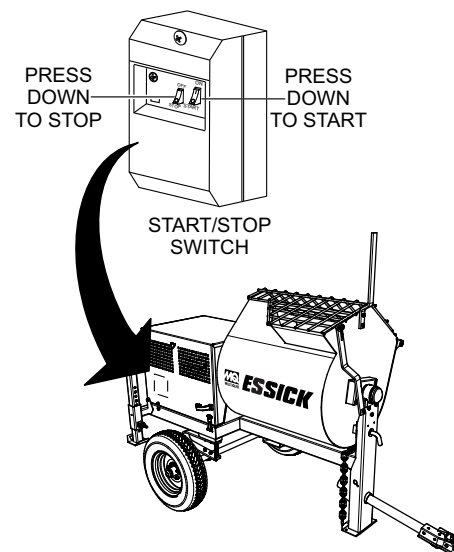


Figure 16. Start/Stop Push Button Switch (Electric Motor Models Only)



# START-UP

This section is intended to assist the operator with the initial start-up of the unit. It is extremely important that this section be read carefully before attempting to use the mixer in the field. **DO NOT** use your mixer until this section is thoroughly understood.



## WARNING

Failure to understand the operation of the mixer could result in severe damage to the mixer or personal injury. Reference Figure 3 and Figure 4 for the location of any components referenced in this manual.

## CAUTION



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

## STARTING THE MIXER (GASOLINE ENGINE)

The following steps outline the procedure for starting the engine.

1. Place the fuel shut-off lever (Figure 17) in the **ON** position.

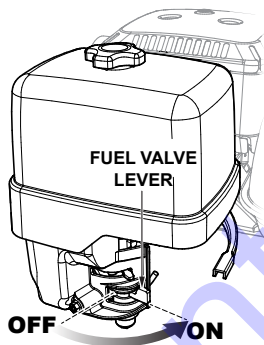


Figure 17. Fuel Shut-Off Lever

2. To start a cold engine, move the choke lever (Figure 18) to the **CLOSED** position.

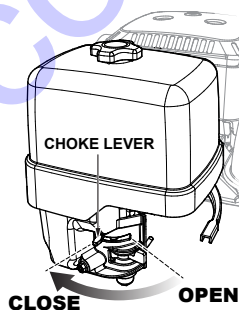


Figure 18. Choke Lever

3. Move the throttle lever (Figure 19) away from the slow position, about 1/3 of the way toward the fast position.

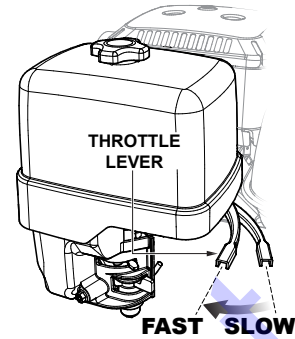


Figure 19. Throttle Lever

4. Turn the engine switch (Figure 20) to the **ON** position.

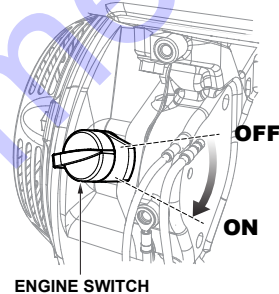


Figure 20. Engine On/Off Switch

5. Located at the rear of the mixer frame is the main **start/stop** button (Figure 21). Pull this button outward to start the engine.

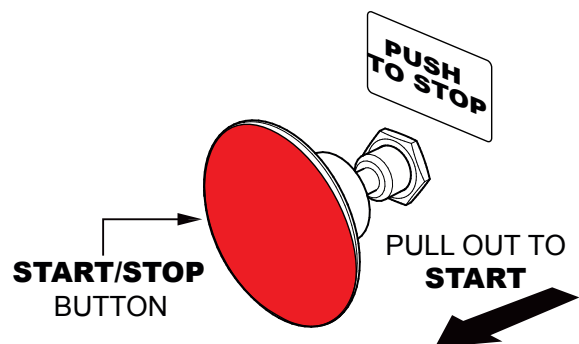
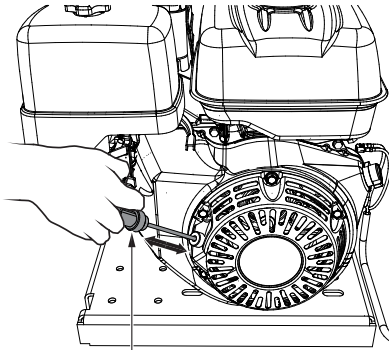


Figure 21. Engine Start/Stop Button

# START-UP/OPERATION

- Pull the **starter grip** (Figure 22) lightly until you feel resistance, then pull briskly. Return the starter grip gently.



STARTER GRIP

Figure 22. Starter Grip

## STARTING THE MIXER (ELECTRIC MOTOR)

The following steps outline the procedure for starting the electric motor.

- Using an adequate size extension cord (Table 8), 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 8. 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 23).

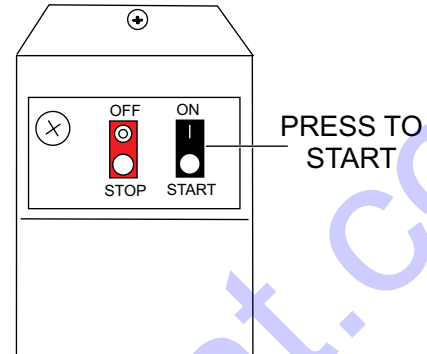


Figure 23. Electric Motor ON/START Switch

## MIXING

- Push the clutch engagement lever forward (Figure 24), toward the tow end of the mixer.

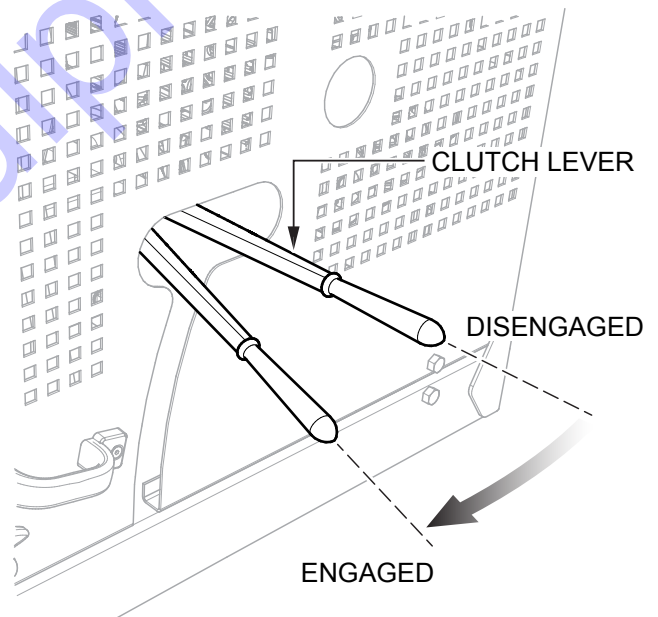


Figure 24. Clutch Engagement Lever

- The paddle shaft inside the drum should be rotating at this time.
- Add a small amount water to the mixing drum (Figure 25).
- Lift the mixing bag compound (Figure 25) 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.



## OPERATION

1. Pull down on the dump handle (Figure 26) to place the drum in **dump** position.

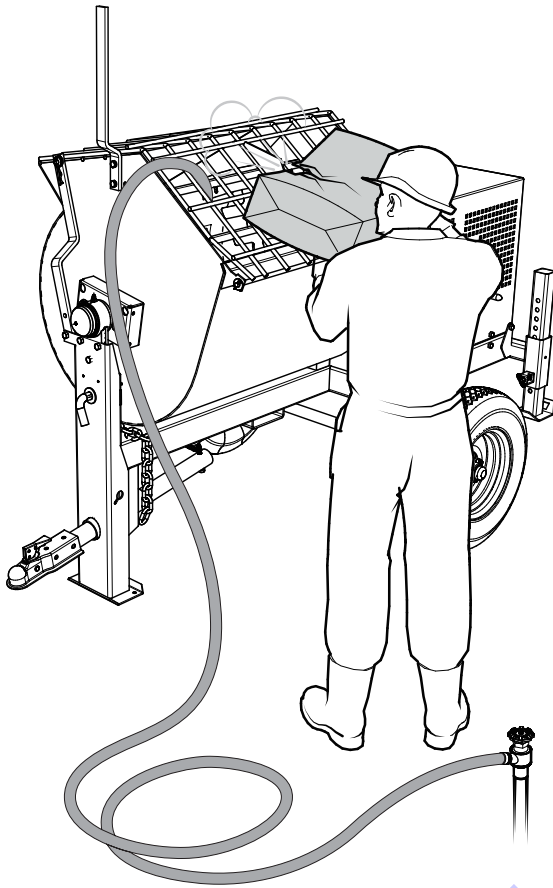


Figure 25. Filling Mixing Drum

### CAUTION



**NEVER** stand in **front** or **behind** the mixing drum while it is being placed in the **dump position**. Stay clear of the mixing drum while it is being positioned.

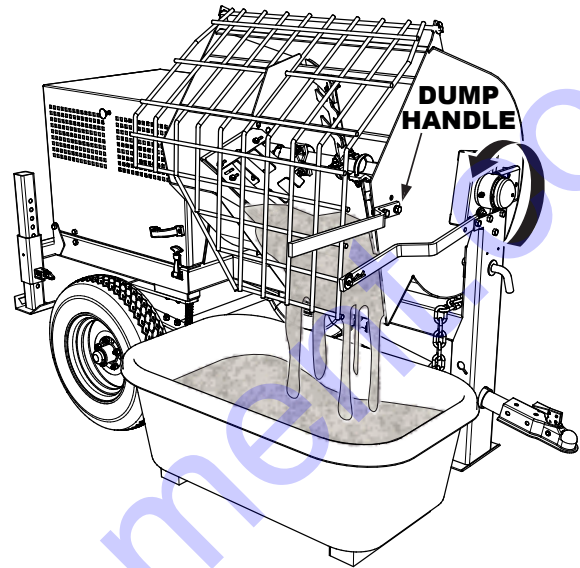
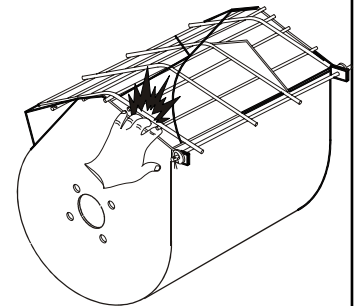


Figure 26. Dump Handle

### 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.



2. Pull upward on the dump handle (Figure 26) to place the drum in the **upright** position.

## OPERATION

### STOPPING THE MIXER (GASOLINE ENGINE)

1. Place the throttle lever (Figure 27) in the slow (idle) position, and let the engine idle 3~5 minutes.

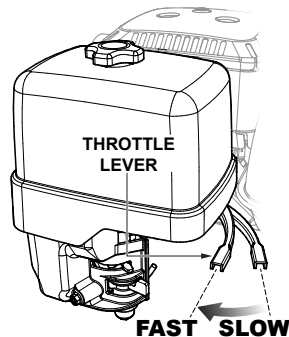


Figure 27. Throttle Lever (Idle)

2. Push the engine **start/stop** switch (Figure 28) inward to stop the engine.

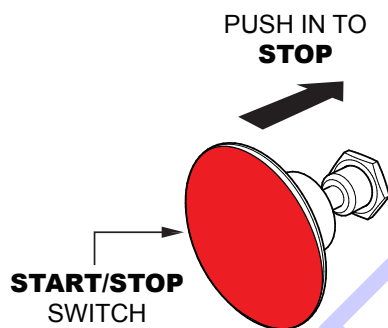


Figure 28. Start/Stop Button (Stop Position)

3. Place fuel shut-off lever (Figure 17) in the **OFF** position.

### STOPPING THE MIXER (ELECTRIC MOTOR)

1. To stop the electric motor, press the **RED** OFF/STOP switch (Figure 29).

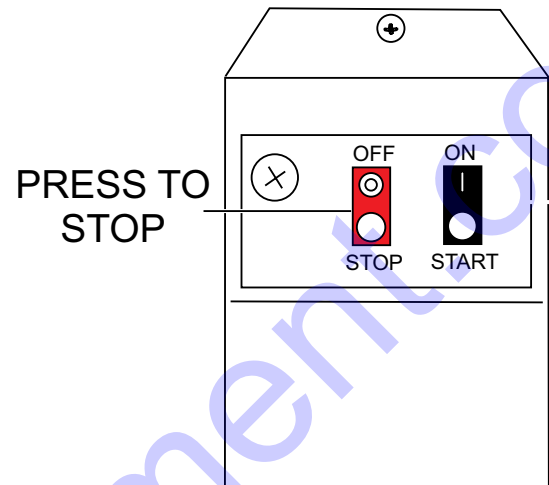


Figure 29. Electric Motor OFF/STOP Switch

2. Remove extension cord from electric motor plug.

## MAINTENANCE (ENGINE)

Use Table 9 as a general maintenance guideline when servicing your engine. For more detail engine maintenance information, refer to the engine owner's manual supplied with your engine.

Table 9. 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 Plugs	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.

# MAINTENANCE (ENGINE)

## MAINTENANCE

Perform the scheduled maintenance procedures as defined by Table 9 and below:

### DAILY

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

### Wiring

Inspect the entire mixer for bad or worn electrical wiring or connections. If any wiring or connections are exposed (insulation missing) replace wiring immediately.

### Piping and Hose Connection

Inspect all piping, oil hose, hydraulic hose and fuel hose connections for wear and tightness. Tighten all hose clamps and check for leaks. If any hose lines are defective replace them immediately.

### Fuel Strainer

- Thoroughly clean the area around the fuel cap.
- Remove the fuel cap from the fuel tank.
- Next, remove, inspect and clean the fuel strainer (Figure 30) with solvent.

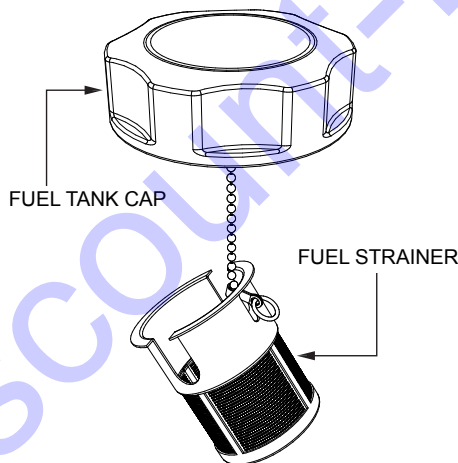


Figure 30. Fuel Strainer

### Spark Plug

- Remove and clean the spark plug (Figure 31), then adjust the spark gap to 0.024 ~0.028 inch (0.6~0.7 mm). This unit has electronic ignition, which requires no adjustments.

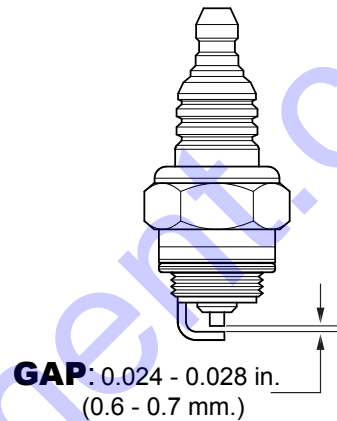


Figure 31. Spark Plug Gap

### ENGINE OIL

- Drain the engine oil when the oil is warm as shown in Figure 32.
- Unscrew the oil filler dipstick from its holder.
- Next, remove oil drain bolt and sealing washer and allow the oil to drain into a suitable container.
- Replace engine oil with recommended type oil as listed in Table 7. For engine oil capacity, see Table 3 (Engine Specifications). **DO NOT** overfill.
- Install drain bolt with sealing washer and tighten securely.

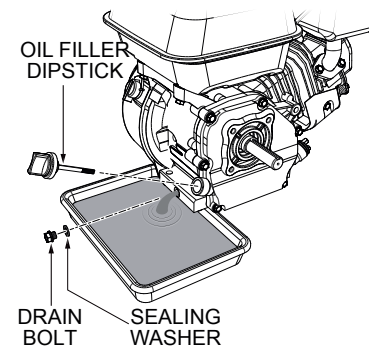


Figure 32. Draining Engine Oil

# MAINTENANCE (ENGINE)

## ENGINE AIR CLEANER

1. Remove the air cleaner cover and foam filter element as shown in Figure 33.
2. Tap the paper filter element (Figure 33) 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 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 nonflammable solvent. Rinse and dry thoroughly. Dip the element in clean engine oil and completely squeeze out the excess oil from the element before installing.

### DANGER

**DO NOT** use gasoline as a cleaning solvent to avoid creating the risk of fire or an explosion.

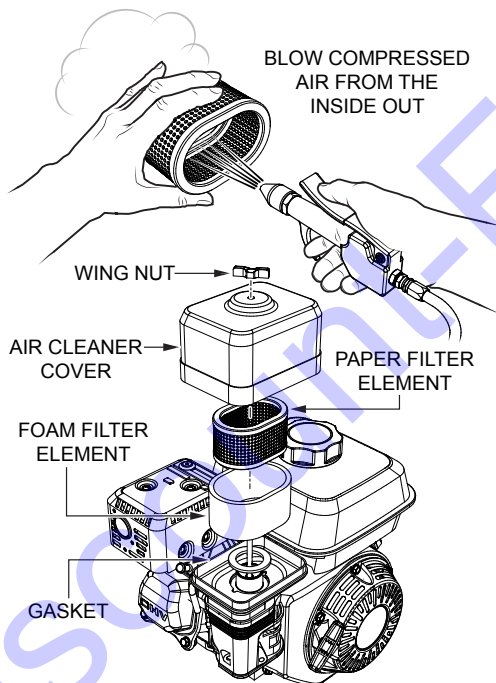


Figure 33. Engine Air Cleaner

## SPARK ARRESTER CLEANING

Clean the spark arrester every 6 months or 100 hours.

1. Remove the 4 mm screw (3) from the exhaust deflector (Figure 34), then remove the deflector.

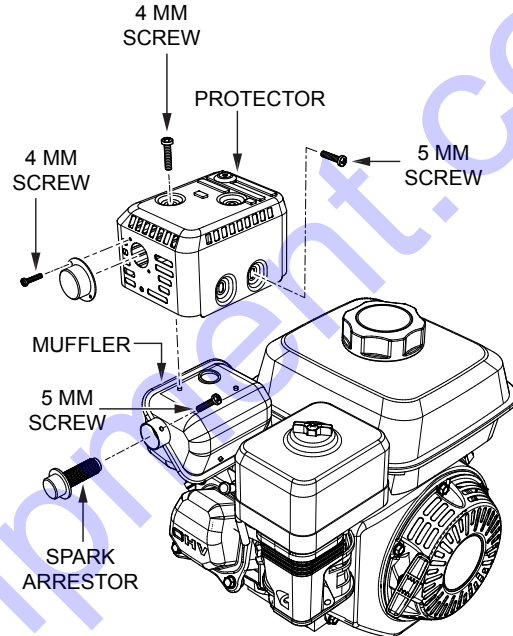


Figure 34. Spark Arrester

2. Remove the 5 mm screw (4) from the muffler protector, then remove the muffler protector.
3. Carefully remove carbon deposits from the spark arrester screen (Figure 35) with a wire brush

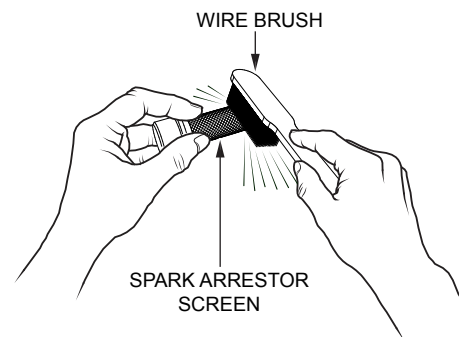


Figure 35. Cleaning The Spark Arrester

4. If the spark arrester is damaged and has breaks or holes, replace with a new one.
5. Reinstall the spark arrester and muffler protector in reverse order of disassembly.

# MAINTENANCE (MIXER)

## DRUM HEAD SEALS

On each end of the mixing drum there is a drum head containing self-adjusting graphite seals. These seals consist of packing rings, split gland and spring activated adjusters. A properly maintained seal prevents material from working around the shaft, causing excessive wear. The following is the suggested procedure of maintenance for protection of the paddle shaft.

1. Keep drum head clean of material build up so the spring adjusters are free to work.
2. As the seals naturally wear, material will seep from the drum head. Tighten the adjusting nuts equally until a slight pressure is felt (Figure 36). The seals are now tight. This procedure should be done periodically as the seals leak.

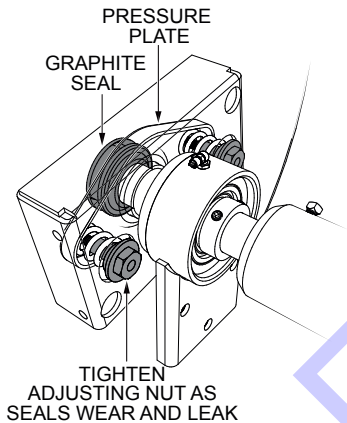


Figure 36. Drum Seal Adjusting Nuts

3. Once the pressure plate touches the drum, its time to replace the graphite seals (Figure 37).

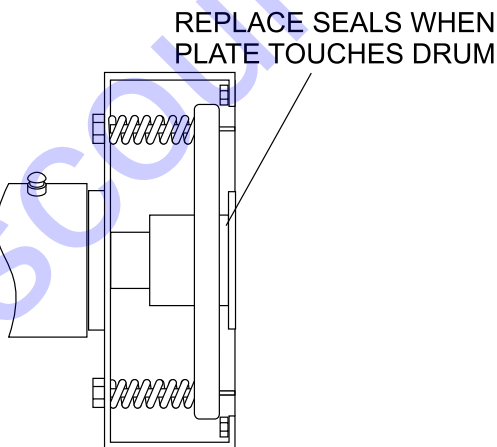


Figure 37. Replacing Drum Seals

## DRUM BEARING BRACKET LUBRICATION

There is 1 set of drum bearing brackets (Figure 38) that will require lubrication. These brackets are intended to make the drum rotate freely. Lubricate the grease fitting for each drum bearing bracket **every month or when the drum becomes difficult to position** using multi-purpose grade grease.

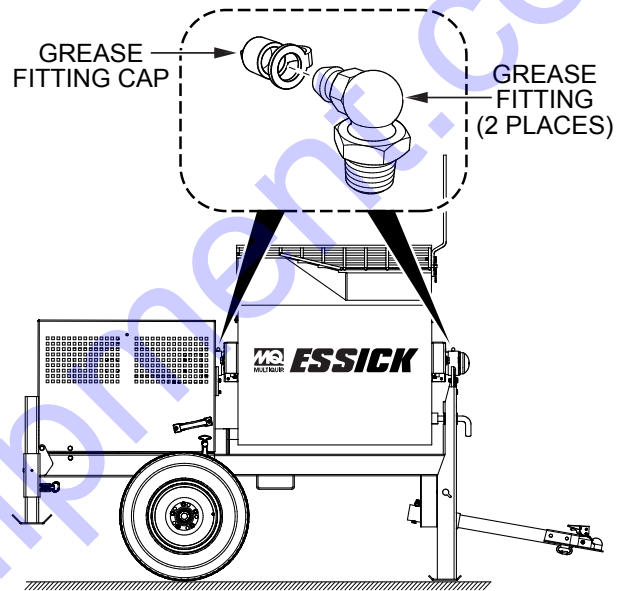


Figure 38. Grease Fittings (Dumping Mechanism)

## BALL SOCKET AND CLAMP FACE MAINTENANCE

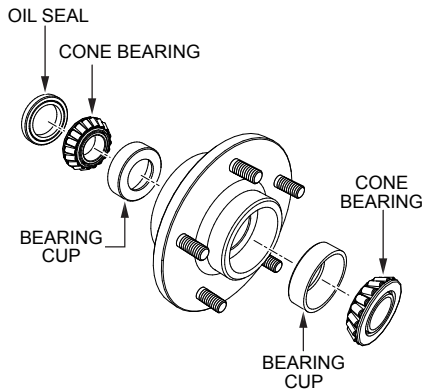
1. If the towing vehicle is equipped with a ball socket, smear socket periodically with multi-purpose grease. This will keep the ball socket well lubricated.
2. Periodically oil **pivot points** and **clamp face** surfaces of coupler with SAE 30 WT. motor oil.
3. When parking or storing your mixer. Keep the coupler off the ground so dirt will not build up in the ball socket.

## WHEEL BEARINGS

1. After **every 3 months** of operation, remove the hub dust cap and inspect the wheel bearings (Figure 39). Once a year, or when required, disassemble the wheel hubs remove the old grease and repack the bearings forcing grease between rollers, cone and cage with a good grade of high speed wheel bearing grease (never use grease heavier than 265 A.S.T.M. penetration ("No. 2.")).



## MAINTENANCE (MIXER)



**Figure 39. Wheel Hub and Bearings**

2. Fill the wheel hub (Figure 39) with grease to the inside diameter of the outer races and also fill the hub grease cap. Reassemble the hub and mount the wheel. Then tighten the adjusting nut, at the same time turn the wheel in both directions, until there is a slight bind to be sure all the bearing surfaces are in contact.

Then back-off the adjusting nut 1/6 to 1/4 turn or to the nearest locking hole or sufficiently to allow the wheel to rotate freely within limits of .001" to .010" end play. Lock the nut at this position. Install the cotter pin and dust cap, and tighten all hardware.

### BOLT CONNECTOR

A 5/8 " x 4 1/4" bolt is used as a connector pin located between the reduction gear assembly and the paddle shaft. It is designed to protect the transmission in the event a rock or other object should get caught between the paddle blade and the drum, this pin may shear. It is recommended that an extra bolt be kept on hand (**use only a grade 2 or 5 size bolt**) so as to quickly make a replacement, if necessary.

### CLUTCH ADJUSTMENT

If the rotating mixing paddles appear to be losing rotational speed, it may be necessary to adjust the clutch. For optimum performance Multiquip recommends 35-55 lbs. applied pressure to the hand clutch lever. After the initial operating hours (8) check the clutch for proper engagement pressure.

#### **CAUTION**

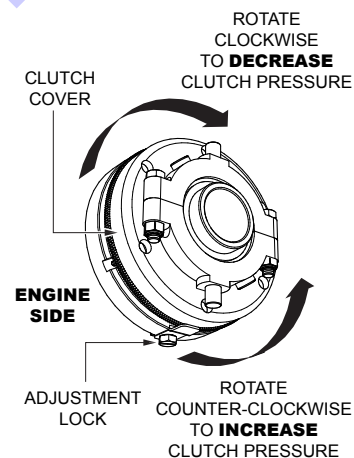
**ALWAYS** stop the engine, disconnect the spark plug or electrical power cord before attempting this procedure.

1. To gain access to the " Gear Reduction Compartment" remove the four 9/16-inch hex head bolts that secure the hood to the engine and remove engine hood.
2. Drain the clutch compartment oil by removing the magnetic 3/8 plug located at the bottom of the Gear Reduction Assembly.
3. To gain access to the " clutch Inspection door" remove the six 1/2-inch capscrews and lockwashers that secure the clutch inspection door. Remove door and gasket.

#### NOTICE

The Gear Reduction Compartment consist of two compartments, a lower and upper. The lower compartment houses the clutch, the upper compartment contains the actual gear reduction. Each compartment requires a different type of lubricating oil.

4. Check that the clutch is disengaged by pulling the shifter lever towards the rear of the mixer.
5. Refer to Figure 40 for steps 5A through 5G:



**Figure 40. Clutch Adjustment Lock Location**

#### NOTICE

If the clutch cannot be adjusted, it may be necessary to inspect or replace the clutch.

- a. Rotate the clutch using the recoil starter until the adjustment lock is visible. Using a flat blade screwdriver loosen the adjustment bolt just enough to release the adjustment lock.



# MAINTENANCE (MIXER)

- b. Using a punch, rotate the adjusting ring one notch at a time in the counter-clockwise direction until a firm 35 to 55 lbs. pressure is felt when engaging the clutch lever (the lever should snap into the engaged position).
- c. When the clutch has been satisfactorily adjusted reinstall the adjustment lock and tighten lock bolt.
- d. Reinstall the clutch inspection door using the six 1/2-inch capscrews and lockwashers, and also check that the gasket is not worn or broken.
- e. When the clutch has been satisfactorily adjusted reinstall the adjustment lock and tighten lock bolt.
- f. Remove the 3/8-inch square head pipe plug located on the lower clutch compartment. Refill the clutch compartment with 1.5 liters of SAE 30 motor oil to the level of the plug. When done reinstall plug.
- g. Reinstall spark plug wire or electric power cord. Start engine, check for proper clutch engagement and inspect for any oil leaks.

## CLUTCH REDUCTION ASSEMBLY LUBRICATION

The clutch reduction assembly has two separate compartments. Each of which must be filled with its proper lubricant and checked at regular intervals.

The clutch compartment should be filled with a good grade of number 30 SAE engine oil which can be poured through the filler hole located just above the clutch inspection door on the opposite side of the transmission. Fill the clutch compartment with 30 SAE engine oil until it overflows the oil level plug located on the shifter side of the clutch compartment. Check this oil level every two or three months and add oil as required. Drain and refill once a year. Capacity is 1.58 quarts (2.1 liters).

The reduction gear, upper compartment should be filled with number 90 SAE oil, as used in automobile transmissions. The filler plug is at the top of the reduction gear case and the oil level plug is on the same side of the case as the clutch lever. Fill the reduction gear compartment with 90 SAE transmission oil until it overflows the oil level plug. Check this oil level every two or three months and add oil as required. Drain and refill once a year. Capacity is 2.21 quarts (2.1 liters).

## PADDLE SHAFT BEARINGS

The paddle shafts in this mixer rotate in sealed ball bearings, which require no additional lubrication as they are packed and sealed at the factory.

There is, on each end of the mixing drum, an zerk grease fitting. Oil these fittings two or three times each week as they lubricate the dumping mechanism of the mixing drum.

### NOTICE

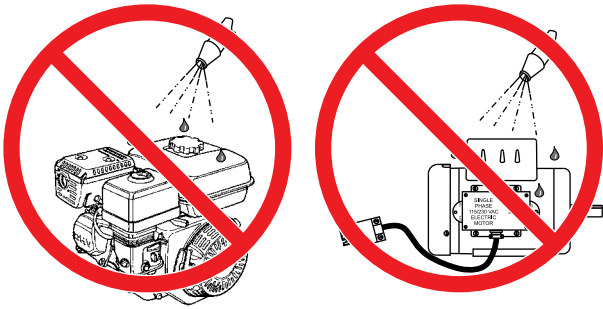
**Failure** to lubricate the zerk grease fittings two or three times a **month** will cause the dumping mechanism to stiffen, making the mixer hard to dump..

## 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.

1. Push the “**Engine Stop**” button inward to the **OFF** position to stop the engine.
2. Place the clutch engagement lever (Figure 24) in the **disengage** position.
3. **ALWAYS disconnect the spark plug wire** (gasoline engines) before cleaning the inside of the drum. If mixer is equipped with an electric motor **remove power cord from AC power source**. In addition make sure the clutch engagement lever is **disengaged**.
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.
7. **DO NOT** allow a buildup of materials to form on the blades or anywhere inside the drum.
8. Rotate mixer to **dump** position and remove debris.
9. **Thoroughly clean** the entire mixer, wheels, cabinet and frame.
10. **NEVER!** pour or spray water over the engine or electric motor (Figure 41).

# MAINTENANCE (MIXER)




**Figure 41. No Spraying of Water**

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

## Tires/Wheels/Lug Nuts

Tires and wheels are a very important and critical components of the trailer. When specifying or replacing the trailer wheels it is important the wheels, tires, and axle are properly matched.

**! WARNING**




**DO NOT** attempt to repair or modify a wheel. **DO NOT** install an inter-tube to correct a leak through the rim. If the rim is cracked, the air pressure in the inter-tube may cause pieces of the rim to explode (break-off) with great force and can cause serious eye or bodily injury.

## Tires Wear/Inflation







Tire inflation pressure is the most important factor in tire life. Pressure should be checked cold before operation. **DO NOT** bleed air from tires when they are hot. Check inflation pressure weekly during use to insure the maximum tire life and tread wear.

**! WARNING**



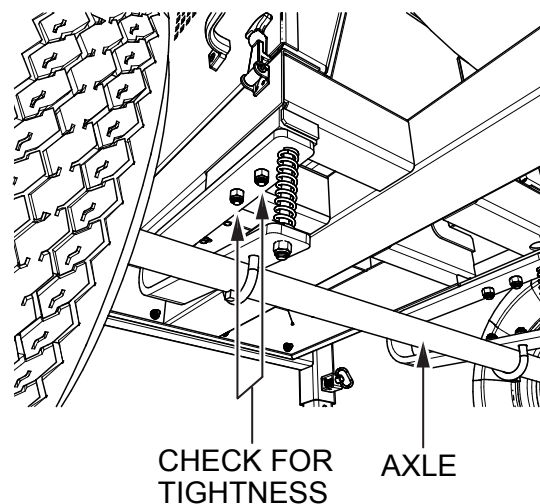
**ALWAYS** wear safety glasses when removing or installing force fitted parts. Failure to comply may result in serious injury.

Table 10 (Tire Wear Troubleshooting) will help pinpoint the causes and solutions of tire wear problems.

Table 10. Tire Wear Troubleshooting			
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 chamber 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.

## Suspension

The cantilever (U-Type) suspension springs and associated components (Figure 42) should be visually inspected monthly for signs of excessive wear, elongation of bolt holes, and loosening of fasteners. Replace all damaged parts (suspension) immediately. Torque locknut securing U-clamp to spring leaf between 45 and 50 ft.-lbs.



**Figure 42. Suspension Components**

# MAINTENANCE (MIXER)

## Lug Nut Torque Requirements

It is extremely important to apply and maintain proper wheel mounting torque. 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 43. **DO NOT** torque the wheel lug nuts all the way down. Tighten (torque) each lug nut in 3 separate passes as defined by Table 11.

### NOTICE

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

3. After first road use, retorque all lug nuts in sequence. Check all wheel lug nuts periodically.

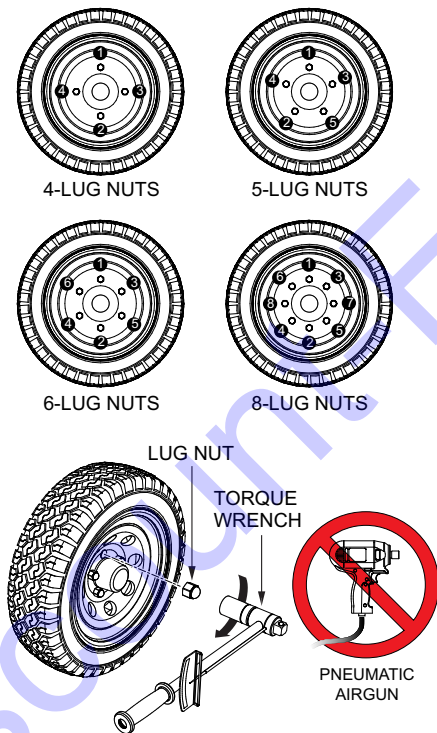


Figure 43. Wheel Lug Nuts Tightening Sequence

Table 11. 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

## MIXER STORAGE

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

- Drain the fuel tank completely, or add STA-BIL to the fuel.
- Run the engine until the gasoline in the carburetor is completely consumed.
- Completely drain the oil from the crankcase and refill with fresh oil.
- Remove the spark plug, pour 2 or 3 cc of SAE 30 oil into the cylinder and crank slowly to distribute the oil.
- Slowly rotate the engine a few times with the starter rope and install a new plug.
- Pull out the starter rope slowly and stop at the compression point.
- Clean the entire mixer and engine compartment.
- Clean drum of all debris and foreign matter.
- Clean all external parts of the mixer with a cloth.
- Cover the mixer and place it a clean dry area, that is protected from harsh elements.

## TROUBLESHOOTING (MIXER)

Troubleshooting (Mixer)		
Symptom	Possible Problem	Solution
Blades will not rotate. Engine stalls.	Material load too heavy, exceeding mixer capability?	Reduce amount of material being mixed.
	Improper engine speed?	Check and adjust engine speed.
Paddles will not rotate.	Broken connector pin?	Replace connector pin.
	Paddle slips under load?	Adjust clutch.
Material leaking from drum ends.	Worn or defective paddle shaft seals?	Replace or adjust seals.
Drum difficult to discharge (tilt).	Defective or worn drum support brackets?	Apply grease to bracket or replace.
	Blades adjusted too tight.	Adjust blades until they almost touch side walls of drum.

# TROUBLESHOOTING (ENGINE)

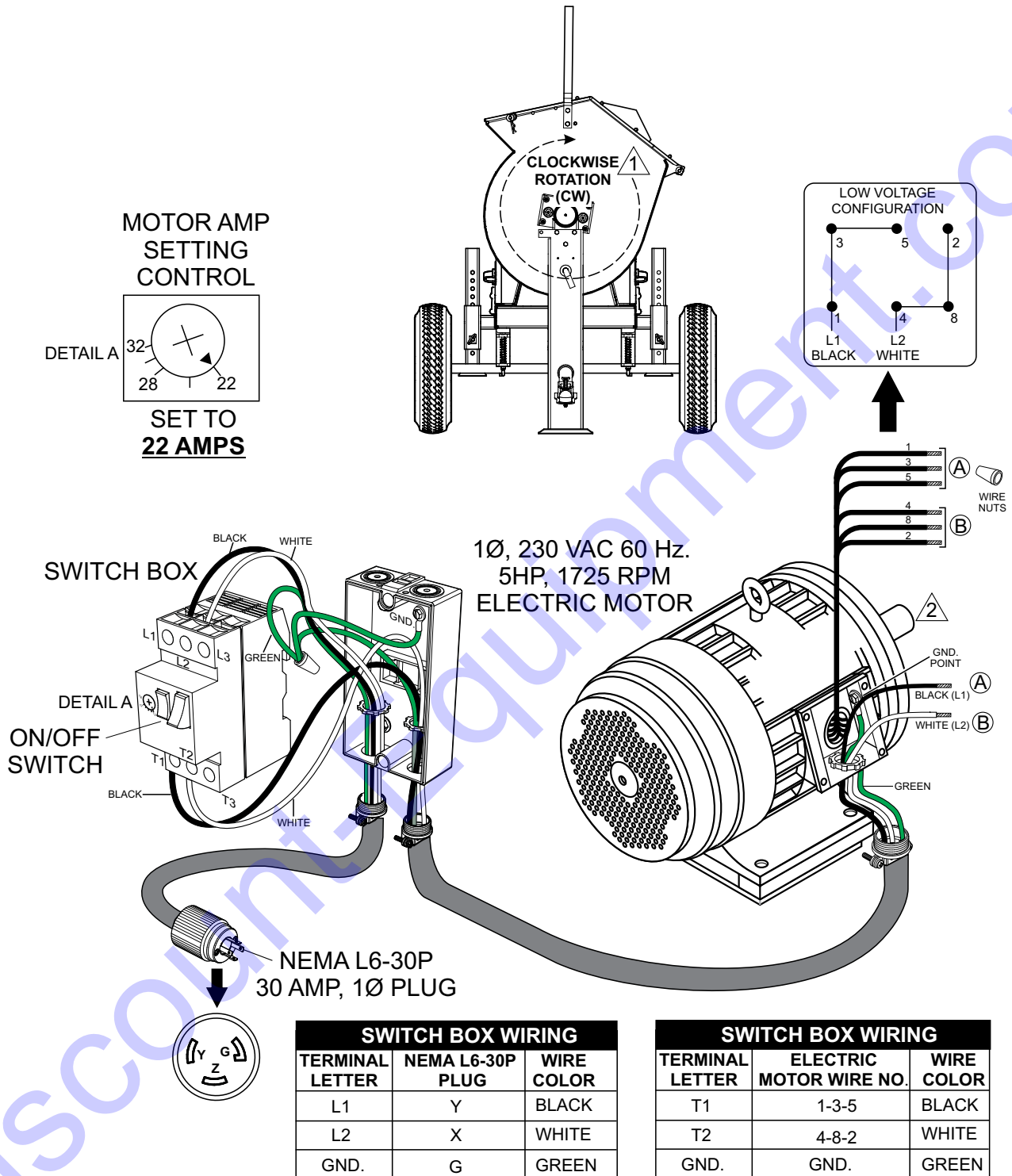
Troubleshooting (Engine)		
Symptom	Possible Problem	Solution
Difficult to start, fuel is available, but no spark at spark plug.	Spark plug bridging?	Check gap, insulation or replace spark plug.
	Carbon deposit on spark plug?	Clean or replace spark plug.
	Short circuit due to deficient spark plug insulation?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

## 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.
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.

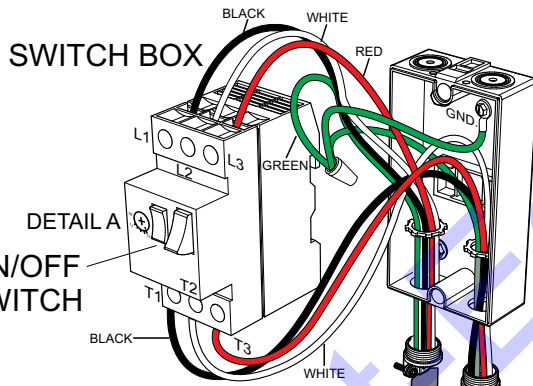
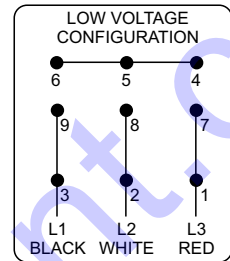
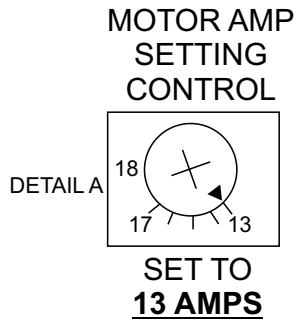
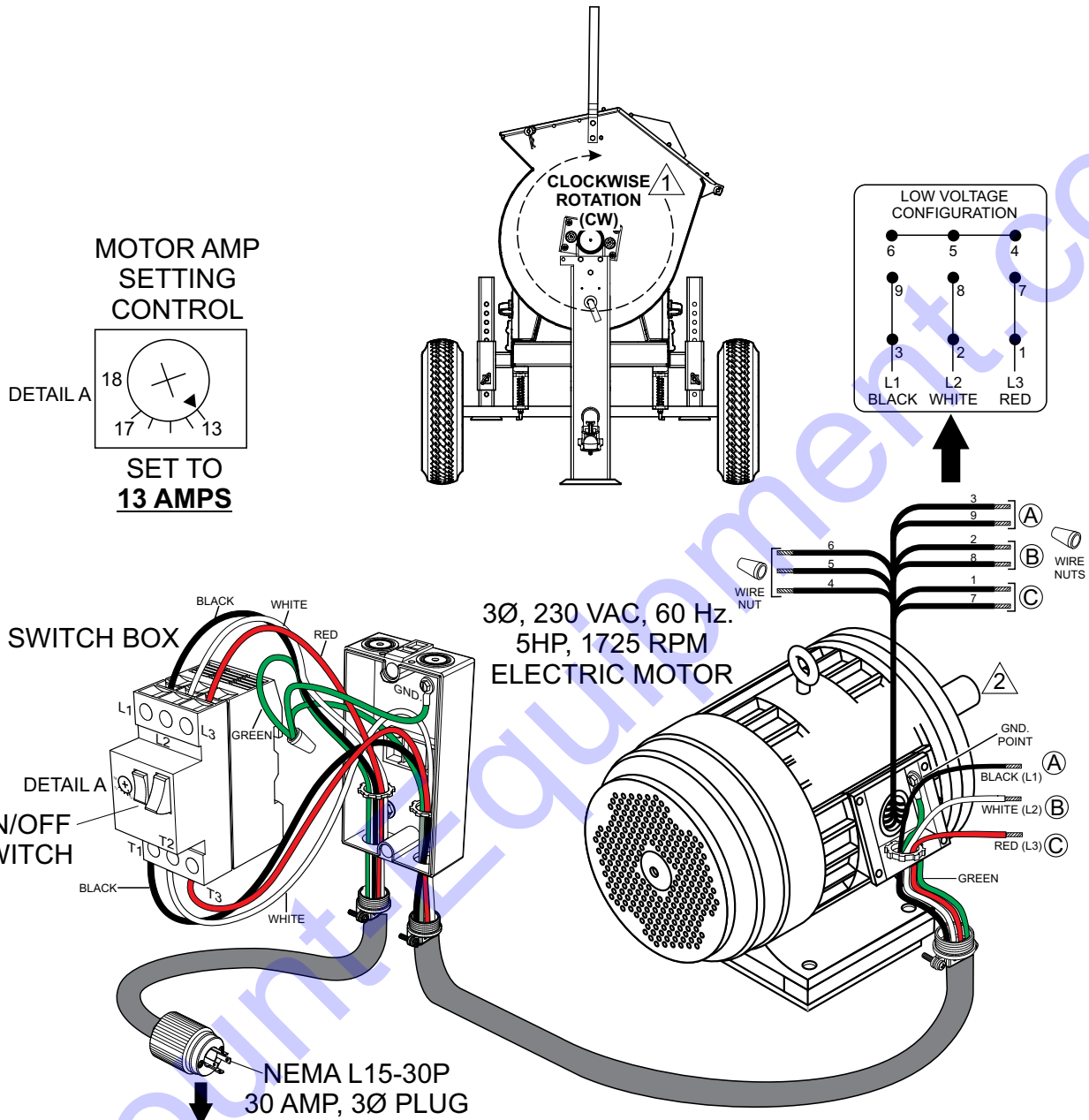


# ELECTRIC MOTOR WIRING 1Ø, 230 VAC, 60 HZ

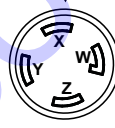
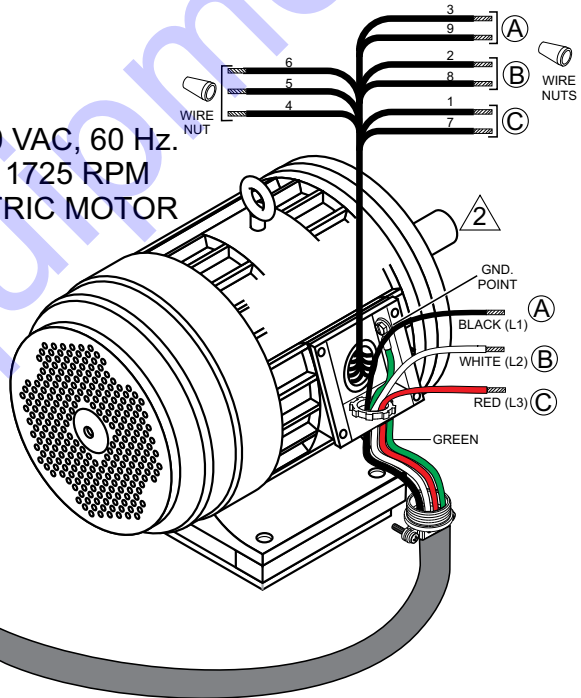




# ELECTRIC MOTOR WIRING 3Ø, 230 VAC, 60 HZ



3Ø, 230 VAC, 60 Hz.  
5HP, 1725 RPM  
ELECTRIC MOTOR



SWITCH BOX WIRING		
TERMINAL LETTER	NEMA L15-30P PLUG	WIRE COLOR
L1	X	BLACK
L2	Y	WHITE
L3	Z	RED
GND.	W	GREEN

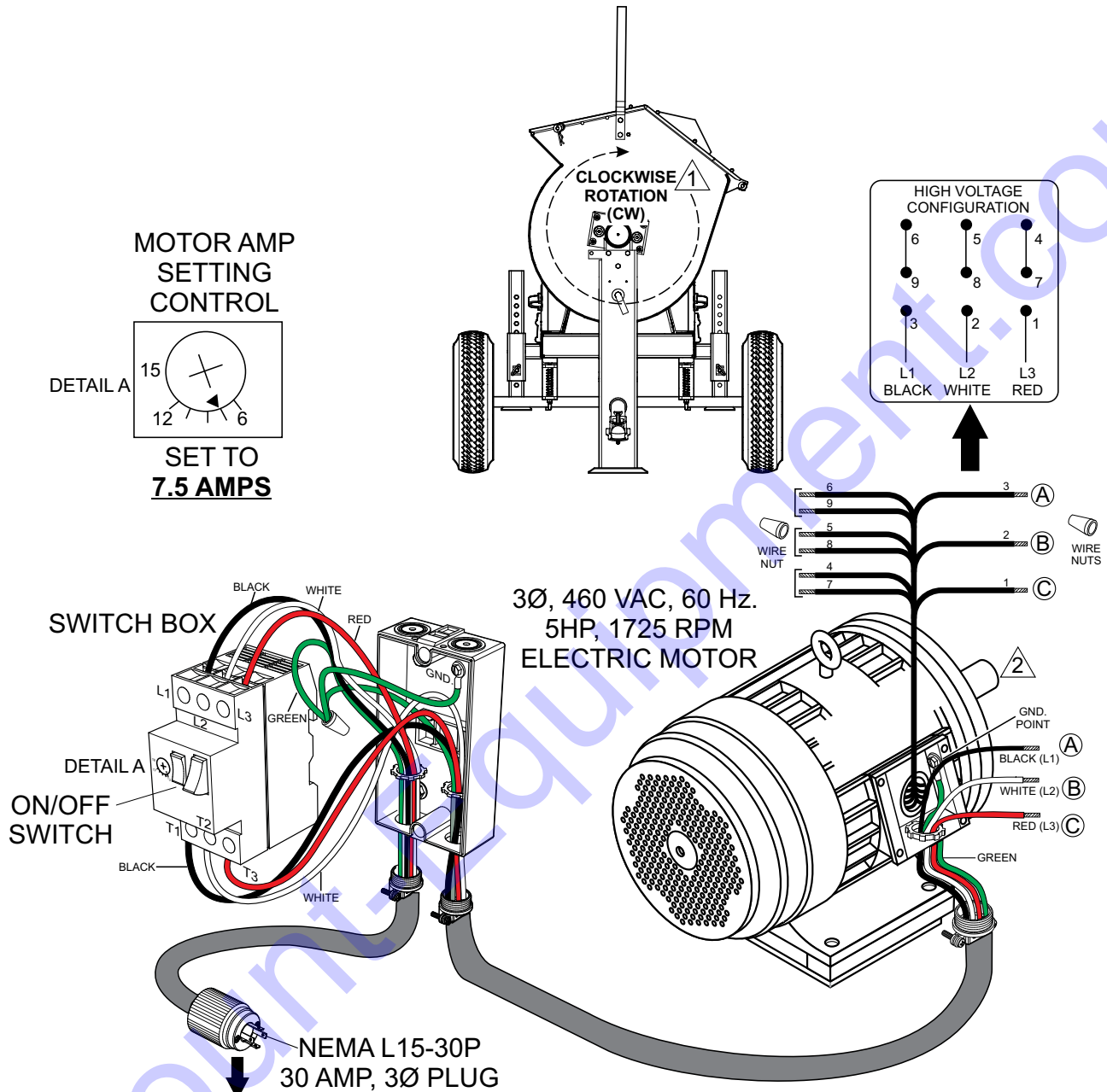
SWITCH BOX WIRING		
TERMINAL LETTER	ELECTRIC MOTOR WIRE NO.	WIRE COLOR
T1	3~9	BLACK
T2	2~8	WHITE
T3	1~7	RED
GND.	GND.	GREEN

CONNECT ELECTRIC MOTOR WIRES 4, 5 AND 6 TOGETHER

**NOTES:**

- 1 THIS MIXER APPLICATION REQUIRES (CW) PADDLE ROTATION. CW IS VIEWING THE PADDLE SHAFT FROM THE MIXER'S TOW END.
- 2 INTERCHANGE ANY TWO LINE WIRES TO REVERSE ROTATION.

# ELECTRIC MOTOR WIRING 3Ø, 460 VAC, 60 HZ



SWITCH BOX WIRING		
TERMINAL LETTER	NEMA L15-30P PLUG	WIRE COLOR
L1	X	BLACK
L2	Y	WHITE
L3	Z	RED
GND.	W	GREEN

SWITCH BOX WIRING		
TERMINAL LETTER	ELECTRIC MOTOR WIRE NO.	WIRE COLOR
T1	3	BLACK
T2	2	WHITE
T3	1	RED
GND.	GND.	GREEN

CONNECT ELECTRIC MOTOR WIRES AS PAIRS:  
6-9, 5-8 AND 4-7.

**NOTES:**

- 1 THIS MIXER APPLICATION REQUIRES (CW) PADDLE ROTATION. CW IS VIEWING THE PADDLE SHAFT FROM THE MIXER'S TOW END.
- 2 INTERCHANGE ANY TWO LINE WIRES TO REVERSE ROTATION.