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OPERATION AND PARTS MANUAL



***WHITEMAN* SERIES**
PLASTER/MORTAR MIXER
MODEL WM45H
(Honda GX160UT1HX2 Gasoline Engine)
MODEL WM45E
(1 HP Electric Motor)

Revision #0 (09/27/12)

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THIS MANUAL MUST ACCOMPANY THE EQUIPMENT AT ALL TIMES.

SILICOSIS/RESPIRATORY WARNINGS

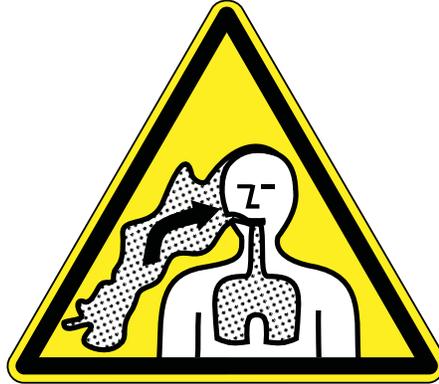
⚠ WARNING



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.

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| <input type="checkbox"/> Return Fax Number | <input type="checkbox"/> Ground |
| <input type="checkbox"/> Applicable Model Number | <input type="checkbox"/> Next Day |
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NOTICE

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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.

ENGINE SAFETY

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.

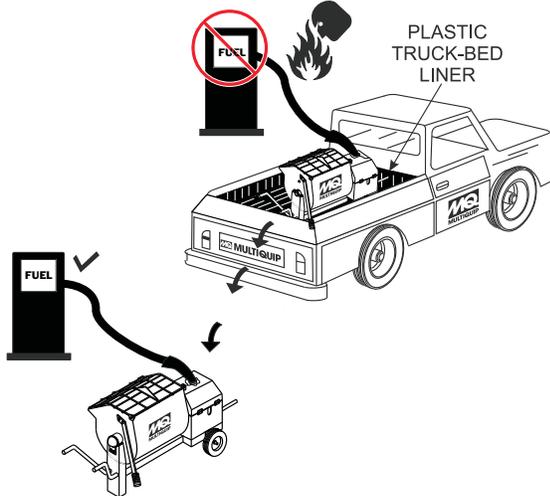


SAFETY INFORMATION

FUEL SAFETY

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.



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

NOTICE

- Dispose of hazardous waste properly. Examples of potentially hazardous waste are used motor oil, fuel and fuel filters.
- **DO NOT** use food or plastic containers to dispose of hazardous waste.
- **DO NOT** pour waste, oil or fuel directly onto the ground, down a drain or into any water source.



SPECIFICATIONS

Table 1. Mixer Specifications	
Capacity	4.5 cu. ft (127 liters)
Bag Capacity	1-1/2 to 2-1/2 bags
Weight	380 lbs. (172 kg.)
Height W/Dump Handle	57.5 in. (146 cm.)
Discharge Height	7.5 in. (19 cm.)
Drive	V-Belt/Gear
Dump Action	Manual

Table 2. Engine/Electric Motor Specifications			
Engine	Model	Honda GX160UT1HX2	BALDOR 35S772T980G1
	Type	Air-cooled 4 stroke, Single Cylinder, OHV, Horizontal Shaft Gasoline Engine	1.0 HP 115/230 VAC Single-Phase, 60 Hz Electric Motor
	Bore X Stroke	2.70 in. X 1.80 in. (68 mm x 45 mm)	N/A
	Displacement	9.9 cu. in. (163 cc)	N/A
	Max Output	4.8 H.P./3600 R.P.M.	1.0 HP @ 1725 RPM
	Fuel Tank Capacity	Approx. 0.95 U.S. Gallons (3.6 Liters)	N/A
	Fuel	Unleaded Gasoline	N/A
	Lube Oil Capacity	0.63 qt. (0.6 liter)	N/A
	Speed Control Method	Centrifugal Fly-weight Type	N/A
	Starting Method	Recoil Start	N/A
Dimensions (L x W x H)		12.3 x 14.3 x 13.6 in. (312 x 362 x 346 mm)	13.25 x 8.93 x 8.56 in. (336 x 227 x 217 mm)
Dry Net Weight		40.8 lbs. (15 Kg.)	22 lbs. (10 Kg.)

DIMENSIONS

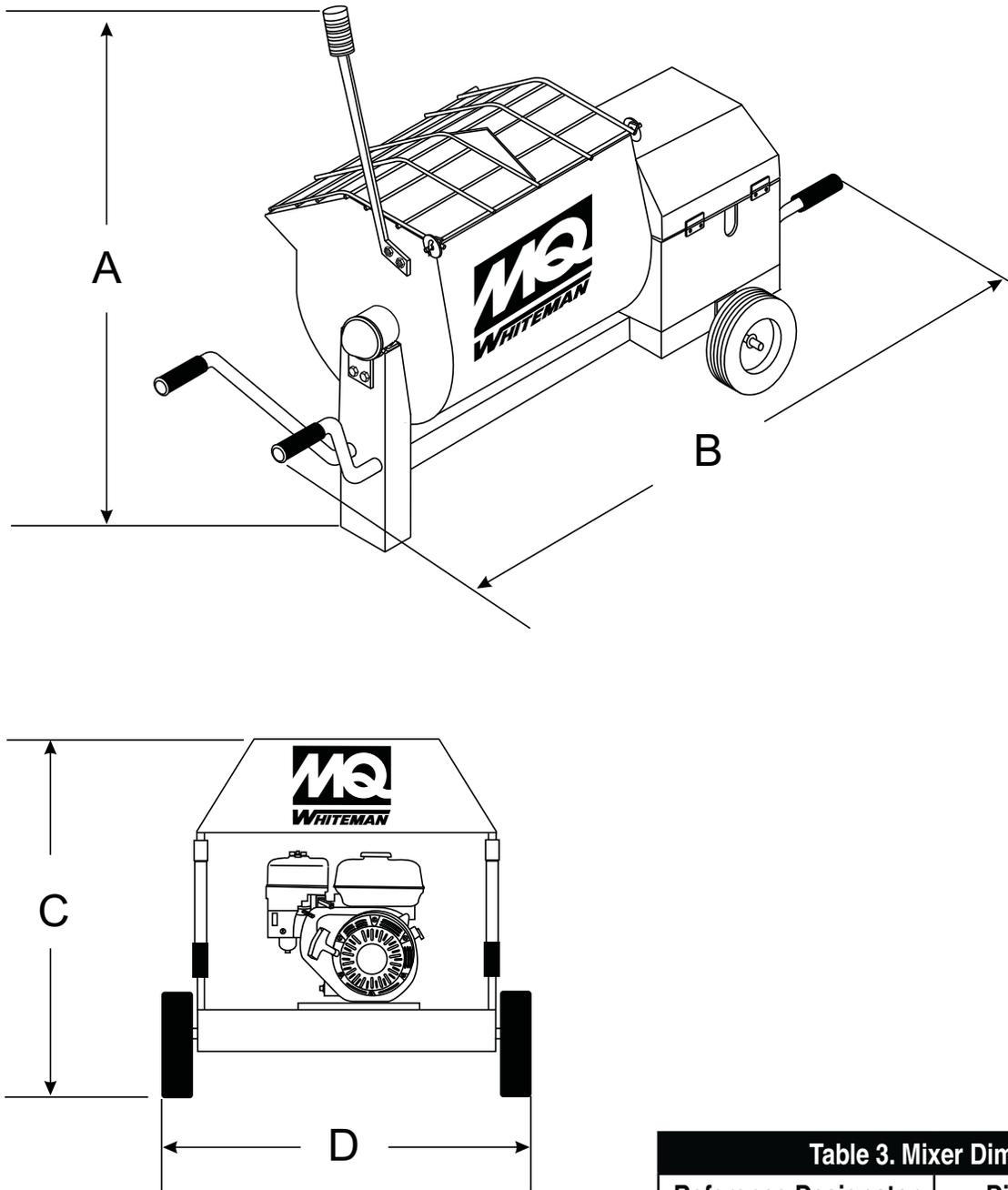


Figure 1. Dimensions

Table 3. Mixer Dimensions	
Reference Designator	Dimension in. (cm.)
A	57.5 (146)
B	74.0 (188)
C	32.5 (82)
D	29.0 (74)

GENERAL INFORMATION

GENERAL

The MQ Model WM45H and WM45E plaster and mortar mixers are shipped completely assembled and each mixer has been factory tested.

The drum batch capacity of these mixers is between 1.5 and 2.5 bags. With proper care it will give continuous service year after year.

These mixers can be powered by either a Honda GX160 gasoline engine or a 1 HP electric motor (115/230 VAC, 60 Hz). The shaft of the engine or electric motor is connected to a drive belt pulley which is attached to a main gear. As the main gear rotates it causes the paddle shaft to rotate.

Before Starting

Before starting if using a gasoline model mixer, read the engine owner's manual and thoroughly understand the safety information.

Check the items listed below:

Oil Levels (Gasoline Model Only)

Be sure to check the oil levels in the engine and engine reduction unit before starting the unit (gasoline model only).

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 the torque chart below as a general guideline and keep all hardware tight:

HARDWARE DIA	TORQUE (lb./ft.)
5/16" - 18	24
3/8" - 24	37
1/2" - 13	39
1/2" - 13 (Grade 8)	90

Gasoline Engine Care

For care and operation of the Honda engine, refer to the maintenance procedures in this manual and the engine manufacturer's operating instructions furnished with the engine. We recommend draining and refilling the engine crankcase at least every thirty hours of operation. Check the engine oil level daily.

ON/OFF Switch (Gasoline Model Only)

This feature is on gasoline engine mixers only. Located on the side of the engine cover. The purpose of this switch is to start and stop the mixer in normal operation.

ON/OFF Switch (Electric Model Only)

This feature is on electric motor mixers only. This switch is located on top of the motor. Lift the engine cover to gain access to this switch. The purpose of this switch is to start and stop the mixer in normal operation. **NEVER** use the electric motor in an explosive environment.

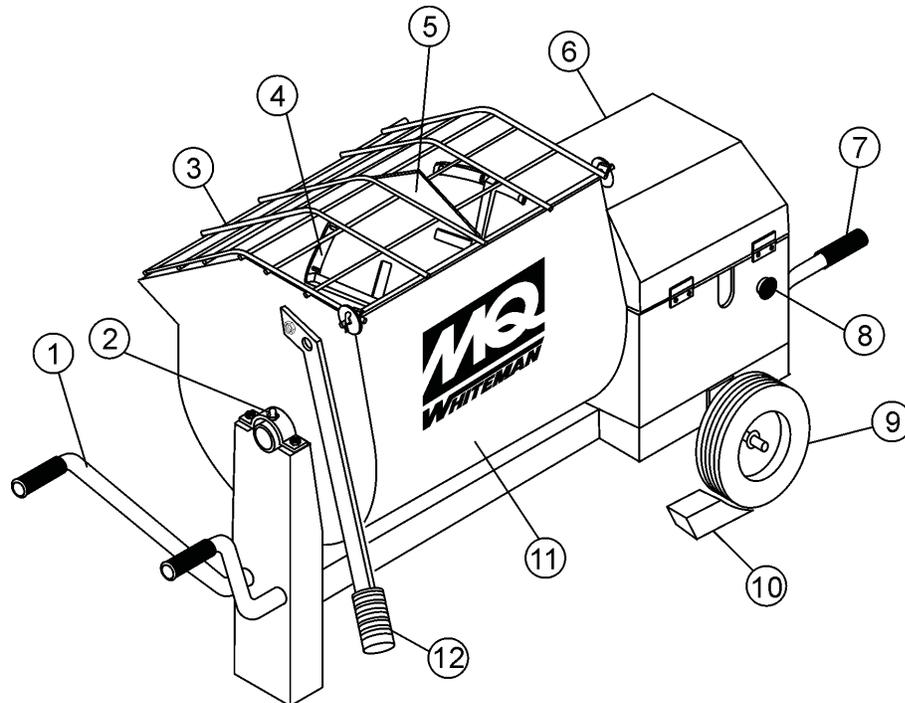


Figure 2. Major Components

Figure 2 illustrates the basic components and controls of the WM45H and WM45E mixer.

1. **Lifting Handle Bars** — Use these handle bars to lift and maneuver the mixer.
2. **Pivot Point/Zerk Fitting** — There is, on each end of the mixing drum a zerk grease fitting. These fittings lubricate the dumping mechanism. Lubricate both fittings at least twice a week.
3. **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.
4. **Mixing Paddles** — Used in the mixing of material. This unit uses four different types of paddles to provide a fast uniform mix.
5. **Bag Cutter** — This feature allows compound mixing bags to be opened easily, therefore allowing the contents of the bag to fall directly into the mixing drum.
6. **Engine Cover** — Lift this cover to gain access to the engine compartment.
7. **Lifting Handle Bars (Engine Side)** — Use these fold-down handle bars to lift and maneuver the mixer.
8. **Engine ON/OFF Switch** — Pull switch outward to start engine. Push inward to stop engine. This feature is on gasoline models only.
9. **Tires** — Replace tires with the recommended type tire of 12 x 3.
10. **Chock Blocks** — Place these blocks (not included as part of the mixer package) under each mixer wheel to prevent rolling.
11. **Steel Mixing Drum** — Mixing materials such as mortar, plaster are to be placed into this drum for mixing. Always clean the drum after each use
12. **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.

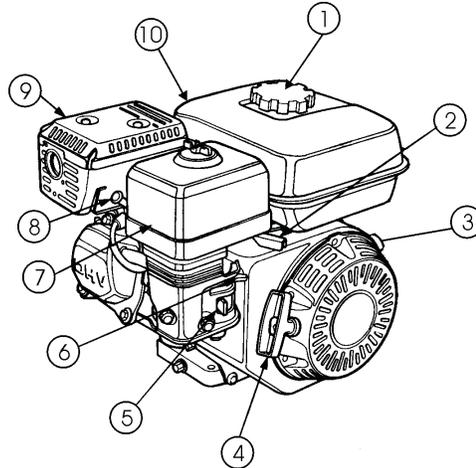


Figure 3. Engine Controls and Components

INITIAL SERVICING

The engine (Figure 3) 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. **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.

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.
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 canister to gain access to filter element.

NOTICE

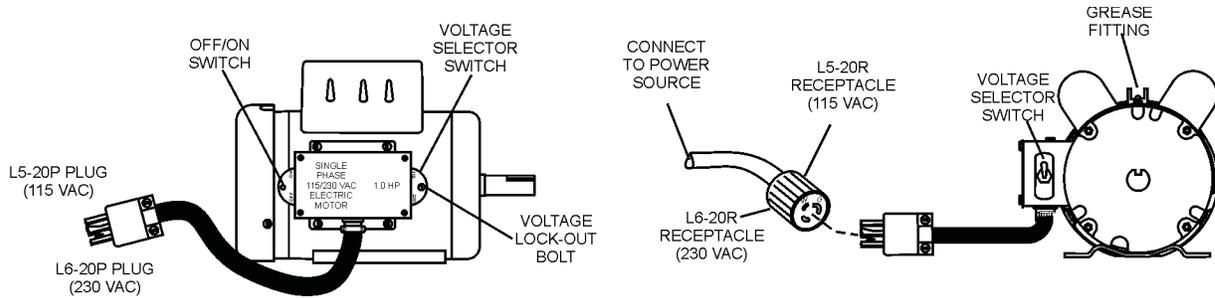
Operating the engine without an air filter, with a damaged air filter, or a filter in need of replacement will allow dirt to enter the engine, causing rapid engine wear.

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.



**Figure 4. Single-Phase Electric Motor
18-Inch Pigtail Cable**

Electric Motor

For maintenance 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.

The electric motor used in this mixer is a single-phase 1.0 HP motor. The input voltage requirement for this motor is either 115 or 230 VAC only.

Electric Motor Connection

A 12 inch electrical cable (Figure 4) with a pigtail at one end is provided with the electrical motor for hookup to a power source. Table 4. shows the required NEMA connector for the desired motor horsepower rating. In addition, Table 3 also shows the matching NEMA approved connector for the required extension cord.

ALWAYS, make certain that the power source required for the electric motor is correct and always use the correct **NEMA** configuration plug. Failure to supply the correct voltage to the motor can severely damage the motor.

The motor supplied is wired for 115 VAC grounded operation. Make certain that the correct size grounded (3-wires) extension cord is used. See Table .

Motors can burn out when the line voltage falls 10% below the voltage rating of the motor. Failure to use proper voltage will cause the motor to overheat and actuate the overload switch.

If overload protection should activate because of improper voltage or any other malfunction, turn the main switch on the motor to the "OFF" position and correct the problem, press the reset switch button, and turn the main switch to the "ON" position.

Electric Motor Voltage Switch

1. **ALWAYS** make certain the electric motor switch is "OFF" (Figure 4) and the power cord has been disconnected from the power source.
2. Remove the voltage lock-out bolt. Change the position of the voltage change toggle switch from 115 VAC to 230 VAC. The mixer is factory wired for 115 VAC operation.
3. Re-install voltage lock-out bolt.
4. Important!, when changing the electric motor input voltage from 115 to 230 VAC the plug on the motor power cord must also be changed. See Table 5.

Table 4. Electric Motor Wiring Information

HP/Voltage	115-230 VAC Single Phase	
	NEMA Plug	Mating NEMA Receptacle
1.0/115VAC	L5-20P P/N EM 940537	SAE 10W-30
1.0/230VAC	L5-20P P/N EM 940537	SAE 10W-30/20

Table 5. Recommended Extension Cord Sizes

Model	Motor	Voltage	50 ft. (15 m)	75 ft. (23 m)	100 ft. (30 m)	200 ft. (61m)
WM45E	1 HP	115	No. 12	No. 10	No. 8	No. 6
		230	No. 14	No. 12	No. 12	No. 8

NOTICE

ALWAYS make certain that the power source required for the electric motor is correct and always use the correct **NEMA** configuration plug. Failure to supply the correct voltage to the motor can severely damage the motor.

PRE-INSPECTION (ENGINE/MIXER)

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 5) and wipe clean.

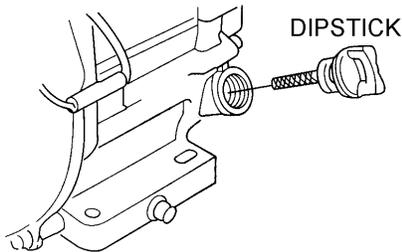


Figure 5. Engine Oil Dipstick (Removal)

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

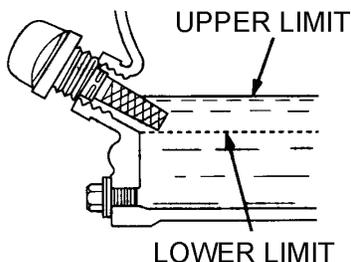


Figure 6. Engine Oil Dipstick (Oil Level)

Table 6. Oil Type

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

! DANGER



Motor fuels are highly flammable and can be dangerous if mishandled. **DO NOT** smoke while refueling. **DO NOT** attempt to refuel the mixer 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!**

V-Belt Check (Electric Model Only)

A worn or damaged V-belt can adversely affect the performance of the mixer. If a V-belt is defective or worn simply replace the V-belt as outlined in the maintenance section of this manual.

Blade Check

Check for worn or paddle blades. Make sure that all blades are adjusted properly. See blade adjustment procedure in this manual. Replace all defective or damaged blades immediately.

Start/Stop Switch Check (Gasoline Model Only)

This switch (Figure 11B) should be tested every time the gasoline engine is started.

Grease Fittings (Dumping Mechanism)

Check the zerk grease fittings at each end of the mixing drum. These grease fittings lubricate the dumping mechanism. If the dumping handle is stiff or hard to move lubricate these fittings.

INITIAL START-UP (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.

1. Place the engine fuel valve lever (Figure 7) to the “ON” position.

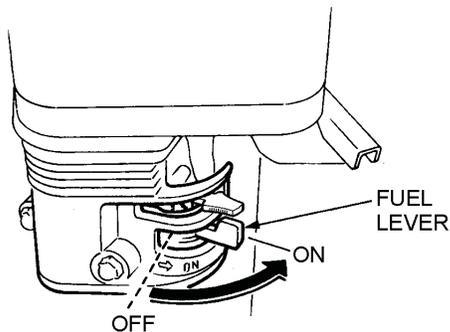


Figure 7. Engine Fuel Valve Lever (ON Position)

2. Move the throttle lever (Figure 8) away from the slow position, about 1/3 of the way toward the fast position

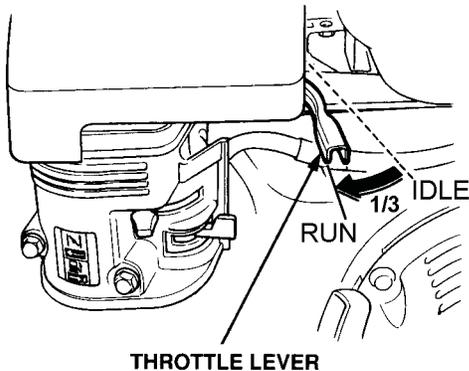


Figure 8. Throttle Lever (1/3 Start Position)

3. Place the choke lever (Figure 9) in the “CLOSED” position if starting a cold engine.

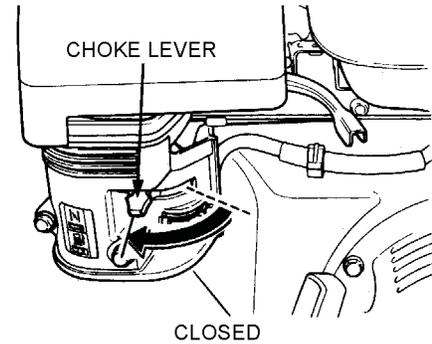


Figure 9. Engine Choke Lever (Closed)

4. Place the choke lever (Figure 10) in the “OPEN” position if starting a warm engine or the temperature is warm.

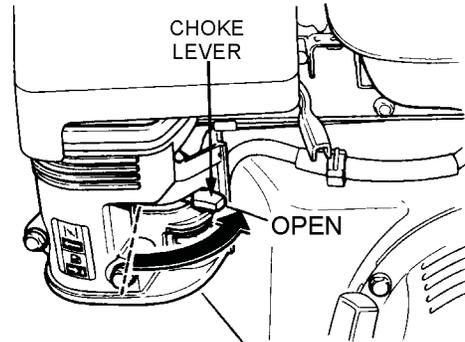


Figure 10. Engine Choke Lever (Open)

5. Place both engine ON/OFF switches (Figure 11) in the “ON” position.

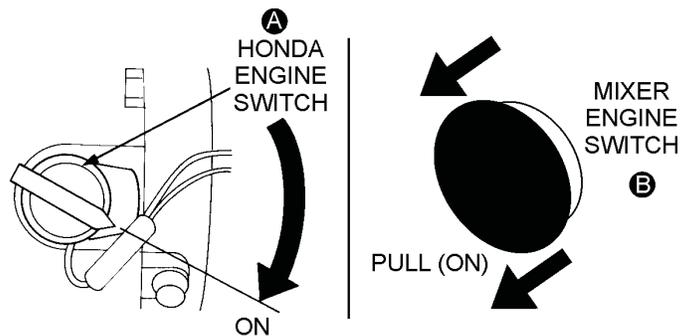


Figure 11. Engine ON/OFF Switches (ON Position)

INITIAL START-UP (ENGINE/ELECTRIC MOTOR)

1. Grasp the starter grip (Figure 12) and slowly pull it out. The resistance becomes the hardest at a certain position, corresponding to the compression point. Pull the starter grip briskly and smoothly for starting.

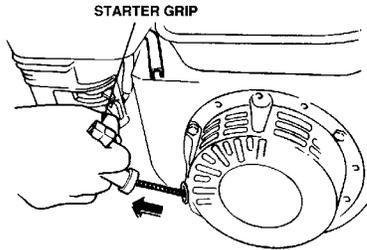


Figure 12. Starter Grip

2. If the engine has started, slowly return the choke lever (Figure 13) to the "CLOSED" position. If the engine has not started repeat steps 1 through 6.

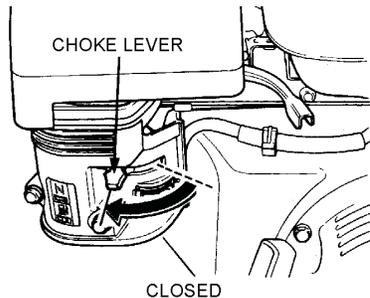


Figure 13. Choke Lever (Closed)

3. 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.
4. To begin mixing, place the throttle lever (Figure 14) in the "RUN" position.

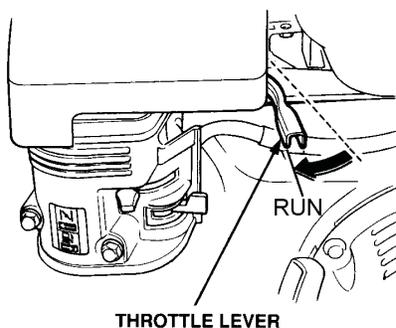


Figure 14. Throttle Lever (Run)

CAUTION

ALWAYS run engine at *full speed* while mixing.

STARTING THE ELECTRIC MOTOR

1. Using an adequate size extension cord (see Table 4), 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.
2. Set the electric motor's ON/OFF switch (Figure 15) to the **ON** position.



Figure 15. Electric Motor ON/OFF Switch (ON)

Mixing Dumping

1. The paddle shaft inside the drum should be rotating at this time.
2. Lift the mixing bag compound onto the steel grate over the bag cutter and let the contents fall into the drum.
3. Add water, and mix compound to desired consistency.

CAUTION

Be sure to stand clear of the dump handle when the mixer is operational. Any binding of material between the mixer blades and the drum will cause the drum handle to move to the discharge position, thus causing bodily harm.

CAUTION

NEVER disable or disconnect the engine start/stop switch (Figure 17). It is provided for operator safety. Serious Injury may result if it is disabled, disconnected or improperly maintained.

STOPPING THE ENGINE

Normal Shutdown

1. Move the throttle lever to the **IDLE** position (Figure 16) and run the engine for three minutes at low speed.

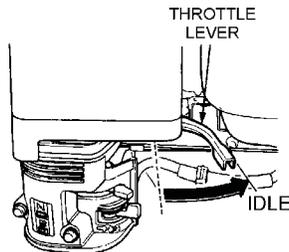


Figure 16. Throttle Lever (Idle)

2. After the engine cools, push the engine ON/OFF switch inward to the "**OFF**" position (Figure 17).

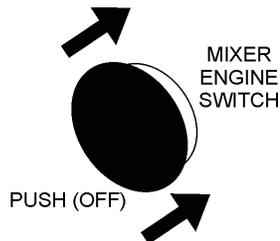


Figure 17. Engine ON/OFF Switch (OFF)

3. Place the fuel shut-off lever (Figure 18) in the "**OFF**" position.

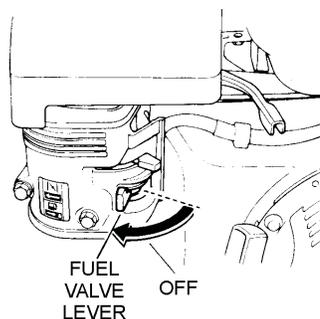


Figure 18. Fuel Valve Lever (OFF)

Emergency Shutdown

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

STOPPING THE ELECTRIC MOTOR

1. Place the electric motor's ON/OFF switch (Figure 19) in the **OFF** position.

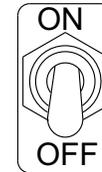


Figure 19. Electric Motor ON/OFF Switch (ON)

2. Disconnect the electric motor's extension cord from its power source.

Storage (Daily)

1. Clean drum of all debris and foreign matter.
2. Store mixer in a clean dry location.

Storage (30 days) Gasoline Models Only

1. Drain the fuel tank completely, or add STA-BIL to the fuel.
2. Run the engine until the gasoline in the carburetor is completely consumed.
3. Completely drain the oil from the crankcase and refill with fresh oil.
4. Remove the spark plug, pour 2 or 3 cc of SAE 30 oil into the cylinder and crank slowly to distribute the oil.
5. Slowly rotate the engine a few times with the starter rope and install a new plug.
6. Pull out the starter rope slowly and stop at the compression point.
7. Clean all external parts of the mixer with a cloth.
8. Cover the mixer and store in a clean, dry place

MAINTENANCE (ENGINE)

ENGINE MAINTENANCE

Perform engine maintenance procedures as referenced by Table 7 below:

Table 7. 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

Reference manufacturer engine manual for specific servicing instructions.

MAINTENANCE (ENGINE)

MAINTENANCE

Perform the engine maintenance procedures as 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. Check the spring box and bellows for oil leaks. Repair or replace as needed.

Weekly

1. Remove the fuel filter cap and clean the inside of the fuel tank.
2. Remove or clean the filter at the bottom of the tank.
3. Remove and clean the spark plug (Figure 20), 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.

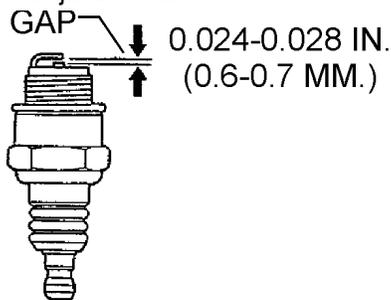


Figure 20. Spark Plug Gap

ENGINE OIL

1. Drain the engine oil when the oil is **warm** as shown in Figure 21.
2. Remove the oil drain bolt and sealing washer and allow the oil to drain into a suitable container.
3. Replace engine oil with recommended type oil as listed in Table 6. Engine oil capacity is 1.16 quarts (1.1 liters). **DO NOT** over fill.
4. Install drain bolt with sealing washer and tighten securely.

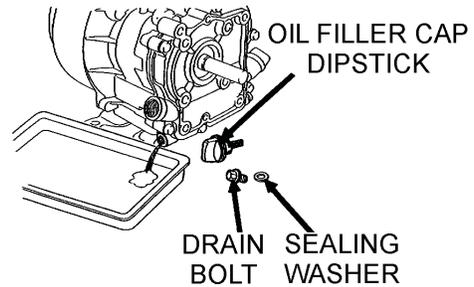


Figure 21. Engine Oil (Draining)

! DANGER



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

ENGINE AIR CLEANER

1. Remove the air cleaner cover and foam filter element as shown in Figure 22.
2. Tap the paper filter element (Figure 22) 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.

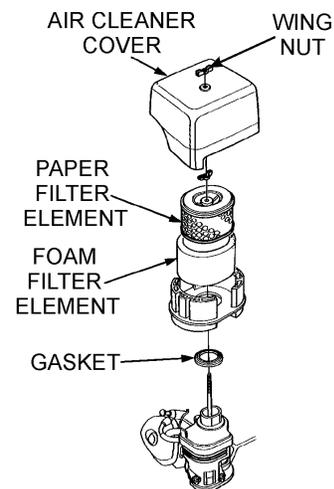


Figure 22. Engine Air Cleaner

MAINTENANCE (MIXER)

Drum Head Seals

There is 1 set of drum head seals (Figure 23) that will require lubrication.

NOTICE

Important- Drum Head Seal Care

Grease seals every **40 hours of operation** using any grade #1 lithium base grease. Apply grease until visible of mixing tub (over grease). This will purge seal system of contamination.

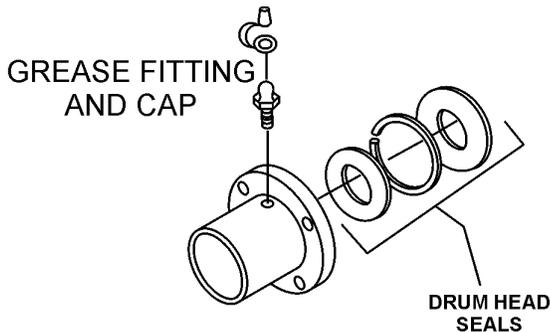


Figure 23. Grease Fittings (Drum Head Seals)

Drum Bearing Bracket Lubrication

There is 1 set of drum bearing brackets (Figure 24) 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.

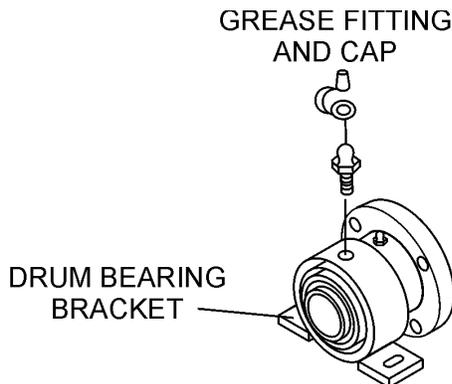


Figure 24. Grease Fittings (Dumping Mechanism)

NOTICE

Lubricating Grease Fittings

Failure to lubricate the drum bearing grease fittings periodically will cause the dumping mechanism to stiffen, making the mixing drum hard to dump.

Countershaft Bearing Lubrication

There is 1 set of countershaft bearings (Figure 25) that will require lubrication. Lubricate the grease fitting for each countershaft bearing every **40 hours of operation** using any grade lithium base grease.

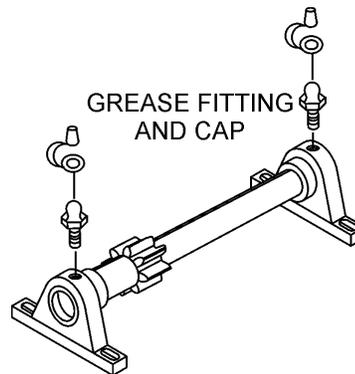


Figure 25. Grease Fittings (Countershaft)

Grease Fittings (Zerk) Maintenance (Electric Motor)

1. There are two grease (Figure 18) fittings at each end of the electric motor that will require lubrication. Lubricate these fittings about **every 16 months**.
2. Use Poleyrex EM (Exxon Mobil) or equivalent lubricant. Clean grease fitting, apply grease gun to fitting (1/2 shot). Remember too much grease or injecting grease too quickly can cause premature bearing failure. Slowly apply the recommended amount of grease, taking a minute or so to apply.

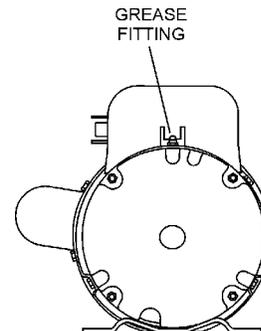


Figure 26. Grease Fittings Electric Motor

MAINTENANCE (MIXER)

Main Gear and Drive Pinion Alignment

3. Disconnect the spark plug wire. In addition make sure the clutch engagement lever is dis-engaged to relieve V-belt tension.
4. The countershaft and drive pinion are mounted on a slotted base. To align drive pinion with main gear, loosen the pillow block mounting bolts and move them until the necessary alignment has been made. Remember gears must be paralleled aligned not skewed.
5. Using your hand, slightly move (rock) the drive pulley back and forth to determine the amount of backlash. Insert feeler gauge between gears to determine backlash distance. Backlash should range between 0.007- 0.012 inches (Figure 27).

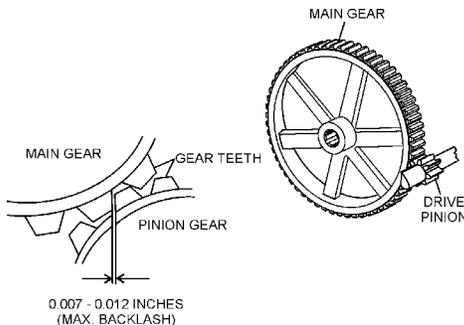


Figure 27. Drive Pinion and Main Gear (Backlash)

Inspect Tooth Contact Between Main Gear and Drive Pinion

1. Coat 3 or 4 teeth at 3 different positions on the main gear with yellow paint.
2. Rotate the drive pulley in both directions.
3. Inspect the tooth pattern.
4. If gear teeth are not contacting properly (Figure 28), adjust pillow block to correct the problem.

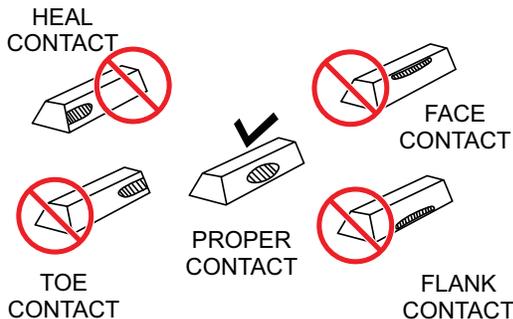


Figure 28. Gear Teeth Alignment

Gear Lubrication

The surface of the pinion and main gear (Figure 29) should be very lightly greased.

NOTICE

Re Grease main and pinion gears **every 250 hours** of operation. **IMPORTANT!** avoid over-greasing. Excess grease will accumulate contaminates and cause premature wear.

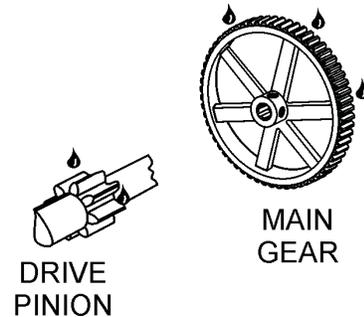


Figure 29. Pinion and Bull Gear Lubrication

NOTICE

Mixer Cleaning

ALWAYS disconnect the spark plug wire before cleaning inside of mixing drum.

NEVER pour or spray water (Figure 30) over engine or electric motor.

For consistent performance, long life and high quality mixing, thoroughly clean the mixer inside and out at the end of each day's operation. To prevent lumps of dried mortar from forming and contamination of future batches, do not allow a buildup of materials to form on the blades or anywhere inside the drum.

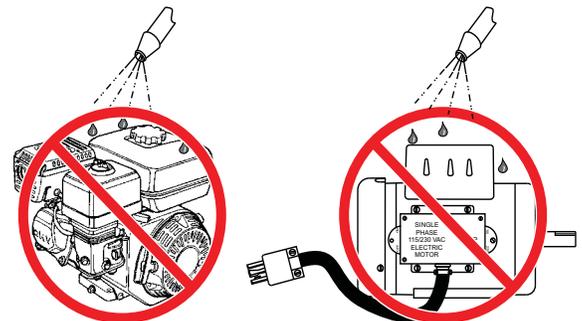


Figure 30. No Spraying of Water

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.
	Fuel reaching carburetor?	Check fuel line.
	Water in fuel tank?	Flush or replace fuel tank.
	Fuel filter clogged?	Replace fuel filter.
	Stuck carburetor?	Check float mechanism.
	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.
	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.

TROUBLESHOOTING (ENGINE/MIXER)

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 just as it is and consult our company's service department.

Troubleshooting (Mixer)		
Symptom	Possible Problem	Solution
Blades will not rotate.	Worn or defective V-belt?	Replace V-belt.
	Adjustment lever mis-aligned?	Check position of adjustment lever. Adjust if necessary.
	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.
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 (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 electric motor ON/OFF switch?	Replace switch.
	Defective motor windings?	Repair windings or replace windings.
	Defective extension cord?	Replace extension cord.
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.

WIRING DIAGRAM (ELECTRIC MOTOR)

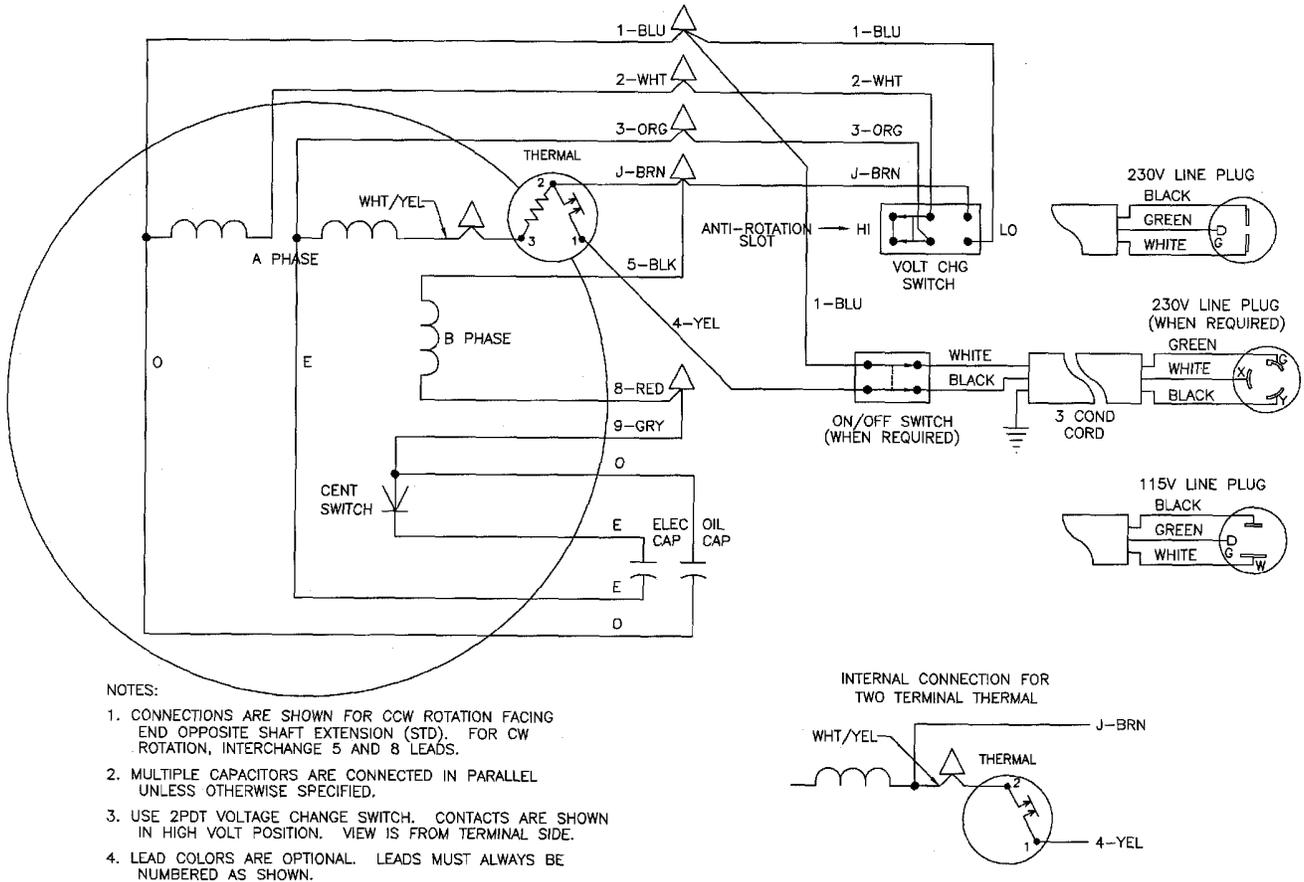


Figure 31. Electric Motor Wiring Diagram

