

OPERATOR'S SAFETY AND SERVICE MANUAL



MM120

This manual covers the following serial numbers
and higher for each model listed:

MM120 7070040



MORTAR & PLASTER MIXERS

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WARNING



CALIFORNIA PROPOSITION 65 WARNING

Engine exhaust and some of its constituents are known in the state of California to cause cancer, birth defects, and other reproductive harm.

SAFETY INFORMATION

Introduction



This Safety Alert Symbol is used to call attention to items or operations which may be dangerous to those operating or working with this equipment. The symbol can be found throughout this manual and on the unit. Please read these warnings and cautions, along with all decals, carefully before attempting to operate the unit. Make sure every individual who operates or works with this equipment is familiar with all safety precautions.

WARNING

GENERAL WARNING. Indicates information important to the proper operation of the equipment. Failure to observe may result in damage to the equipment and/or severe bodily injury or death.

CAUTION

GENERAL CAUTION. Indicates information important to the proper operation of the equipment. Failure to observe may result in damage to the equipment.

Safety Precautions



LETHAL EXHAUST GAS: An internal combustion engine discharges carbon monoxide, a poisonous, odorless, invisible gas. Death or serious illness may result if inhaled. Operate only in an area with proper ventilation. **NEVER OPERATE IN A CONFINED AREA!**



DANGEROUS FUELS: Use extreme caution when storing, handling and using fuels, as they are highly volatile and explosive in vapor state. Do not add fuel while engine is running. Stop and cool the engine before adding fuel. **DO NOT SMOKE!**



SAFETY GUARDS: It is the owner's responsibility to ensure that all guards and shields are in place and in working order.



IGNITION SYSTEMS: Breakerless, magneto, and battery ignition systems can cause severe electrical shocks. Avoid contacting these units or their wiring.



SAFE DRESS: Do not wear loose clothing, rings, wristwatches, etc. near machinery.



NOISE PROTECTION: Wear OSHA specified hearing protection devices.



EYE PROTECTION: Wear OSHA specified eye shields, safety glasses, and sweat bands.



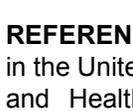
FOOT PROTECTION: Wear OSHA specified steel-tipped safety shoes.



HEAD PROTECTION: Wear OSHA specified safety helmets.



DUST PROTECTION: Wear OSHA specified dust mask or respirator.



OPERATOR: Keep children and bystanders off and away from the equipment.

REFERENCES: For details on safety rules and regulations in the United States, contact your local Occupational Safety and Health Administration (OSHA) office. Equipment operated in other countries must be operated and serviced in accordance and compliance with any and all safety requirements of that country. The publication of these safety precautions is done for your information. MBW does not by the publication of these precautions, imply or in any way represent that these are the sum of all dangers present near MBW equipment. If you are operating MBW equipment, it is your responsibility to insure that such operation is in full accordance with all applicable safety requirements and codes. All requirements of the United States Federal Occupational Safety and Health Administration Act must be met when operated in areas that are under the jurisdiction of that United States Department.

Safety Decals

Carefully read and follow all safety decals. Keep them in good condition. If decals become damaged, replace as required. If repainting the unit, replace all decals. Decals are available from authorized MBW distributors. Order the decal set listed on the following page(s).

CAUTION(PRECAUCIÓN)

Improper towing can lead to damage or injury.

Before Towing:

1. Check running gear and tow bar.
2. Lock drum in tow position.
3. Check tow pin for proper installation and good condition.

4. USE SAFETY CHAINS when towing.

MAXIMUM TOW SPEED: 50 mph
Un remolque incorrecto puede provocar daños materiales o lesiones.

Antes del remolque:

1. Revise el funcionamiento de los engranajes y de la barra de remolque.
2. Bloquee el tambor en la posición de remolque.
3. Verifique que el pasador de remolque esté bien instalado y en buen estado.
4. USE CADENAS DE SEGURIDAD al remolcar la máquina.

MÁX. VELOCIDAD DE REMOLQUE: 80 KPH

15072

15072



CAUTION(PRECAUCIÓN)



Read the operating instructions before operating this piece of equipment. Lea las Instrucciones Operativas antes de hacer funcionar esta parte del equipo.



Keep unauthorized, inexperienced, untrained people away from this equipment. Mantenga a las personas no autorizadas y sin entrenamiento alejadas de este equipo.



ROTATING AND MOVING PARTS! Make sure all guards and safety devices are in place.

¡HAY PIEZAS ROTATIVAS Y MÓVILES! Asegúrese de que todas las guardas y dispositivos de seguridad estén colocados en sus lugares.



DO NOT RUN this machine in an enclosed area. The engine produces carbon monoxide, a **POISONOUS** gas.

NO HAGA FUNCIONAR esta máquina en una zona encerrada. El motor produce monóxido de carbono, un **GAS VENENOSO**.



SHUT OFF the engine before servicing, cleaning or adding fuel to engine or machine. **APAQUE** el motor antes de hacerle el servicio, limpiarlo o agregarle combustible.

Failure to comply could result in serious bodily injury

El no cumplir con estas instrucciones puede producir como resultado lesiones corporales graves.

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U.S. PATENT 6,695,467

17349



17129

17129



01554 - Not included with decal set

Safety Decals (Decal Set #15074)



WARNING
ADVERTENCIA



ENGINE EXHAUST IS HAZARDOUS IF INHALED
USE ONLY IN A WELL VENTILATED AREA
EL GAS DEL ESCAPE DEL MOTOR ES
PELIGROSO SI SE INHALA
USE LA MÁQUINA SÓLO EN UNA ZONA BIEN
VENTILADA

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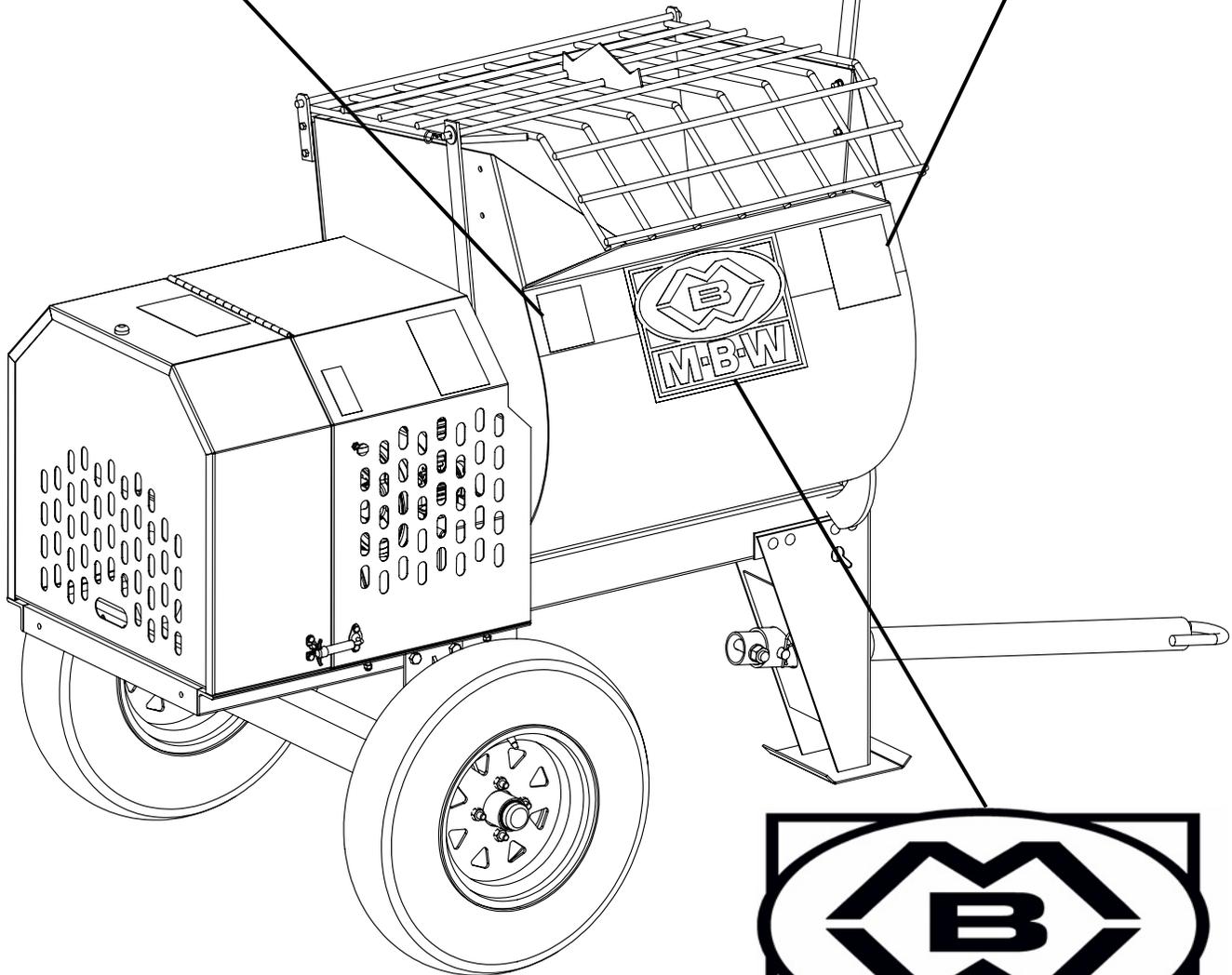
WARNING
ADVERTENCIA



MOVING PARTS CAN CRUSH AND CUT
KEEP HANDS CLEAR!
SHUT OFF ENGINE OR MOTOR
BEFORE SERVICING.
LAS PIEZAS MÓVILES PUEDEN IMPACTAR Y CORTAR
¡MANTENGA ALEJADAS SUS MANOS!
APAGUE EL MOTOR ANTES DEL SERVICIO.

15069

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01554 - Not included with decal set

Safety Decals (Decal Set #15074)

MIXER(MEZCLADORA)

OPERATING INSTRUCTIONS INSTRUCCIONES DE OPERACIÓN

1. Check oil in engine crankcase.
2. MAKE SURE grid is CLOSED before starting and during operation.
3. Place engage lever in "IDLE" position before starting engine.
4. Open fuel valve.
5. Close choke on engine. A warm engine may not need to be choked.
6. Open throttle to "FAST" position.
7. Pull starter rope.
8. After starting, turn choke off, let engine warm up at idle.
9. Open throttle to "FAST" position, CLOSE SHROUD! Place engagement lever in "MIX" position, charge mixer.
10. TO STOP: Place engagement lever in "IDLE" position, return throttle to idle, close fuel valve, press stop button.
11. Before towing, check that drum is locked in towing position, and tow pin is properly installed and in good condition.

1. Revise el aceite en el cárter del motor.
2. CERCÍORESE de que la rejilla esté CERRADA antes del arranque y durante la operación.
3. Coloque la palanca de engranaje en la posición de "RALENTÍ" antes de arrancar el motor.
4. Abra la válvula de combustible.
5. Cierre el estrangulador del motor. Si el motor está tibio, puede que no requiera estrangulamiento.
6. Abra el acelerador a la posición "RÁPIDA". ¡CIERRE LA CUBIERTA! Coloque la palanca de engranaje en la posición de "MEZCLA", cargue la mezcladora.
7. Tire de la cuerda de arranque.
8. Tras el arranque, apague el estrangulador y deje que el motor se caliente en ralentí.
9. Abra el acelerador y póngalo en la posición "RÁPIDA", ¡CIERRE LA CUBIERTA! Coloque la palanca de engranaje en la posición de "MEZCLA", cargue la mezcladora.
10. PARA DETENERLA: Coloque la palanca de engranaje en la posición "RALENTÍ", vuelva el acelerador a ralentí, cierre la válvula de combustible y pulse el botón de parada.
11. Antes del remolque, verifique que el tambor esté bloqueado en la posición de remolque, y que el perno esté correctamente instalado y en buen estado.

MAXIMUM TOW SPEED: 50 MPH

MÁX. VELOCIDAD DE REMOLQUE: 80 KPH

**PUSH
TO
STOP**
**PULSE PARA
DETENER**

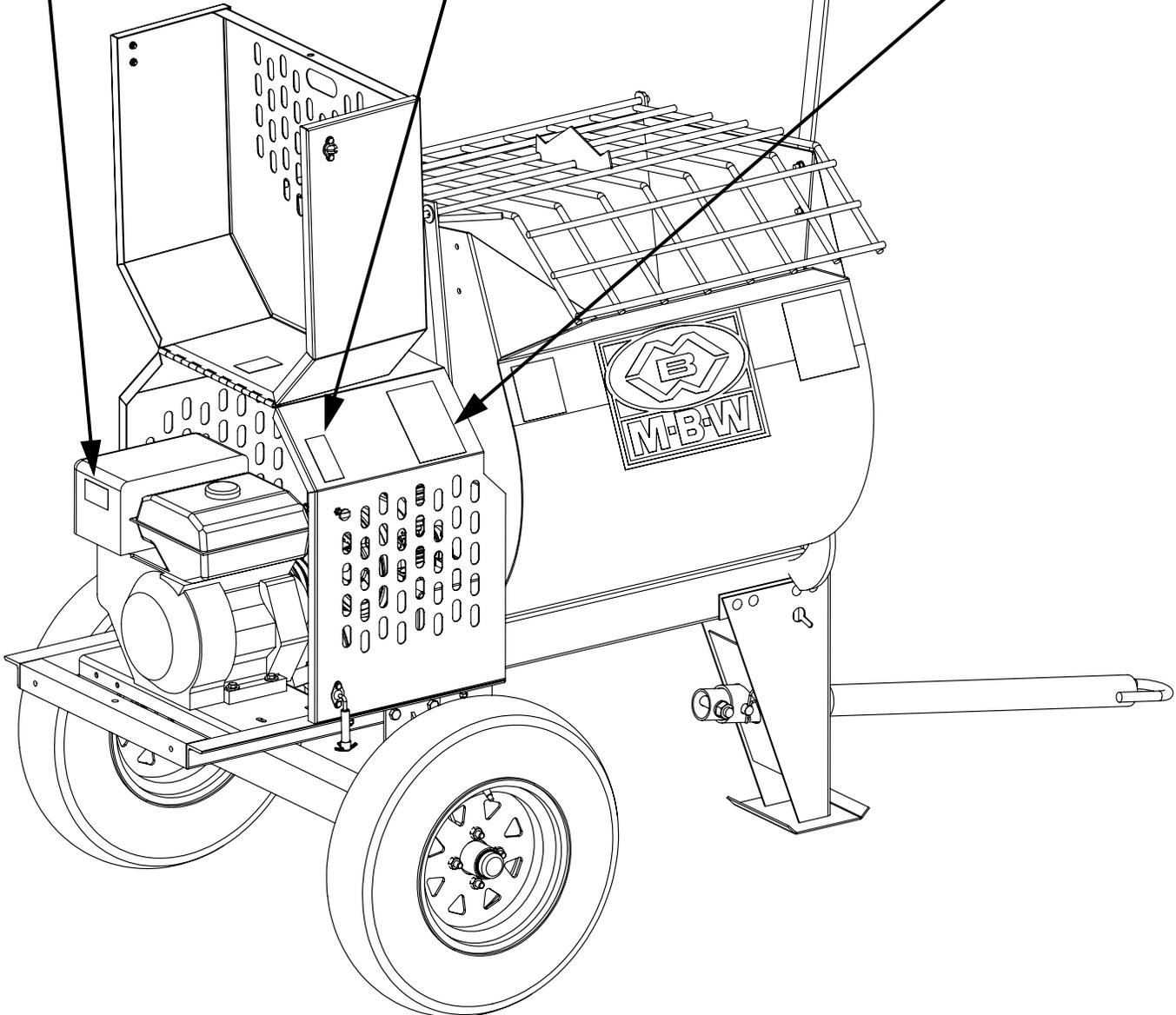


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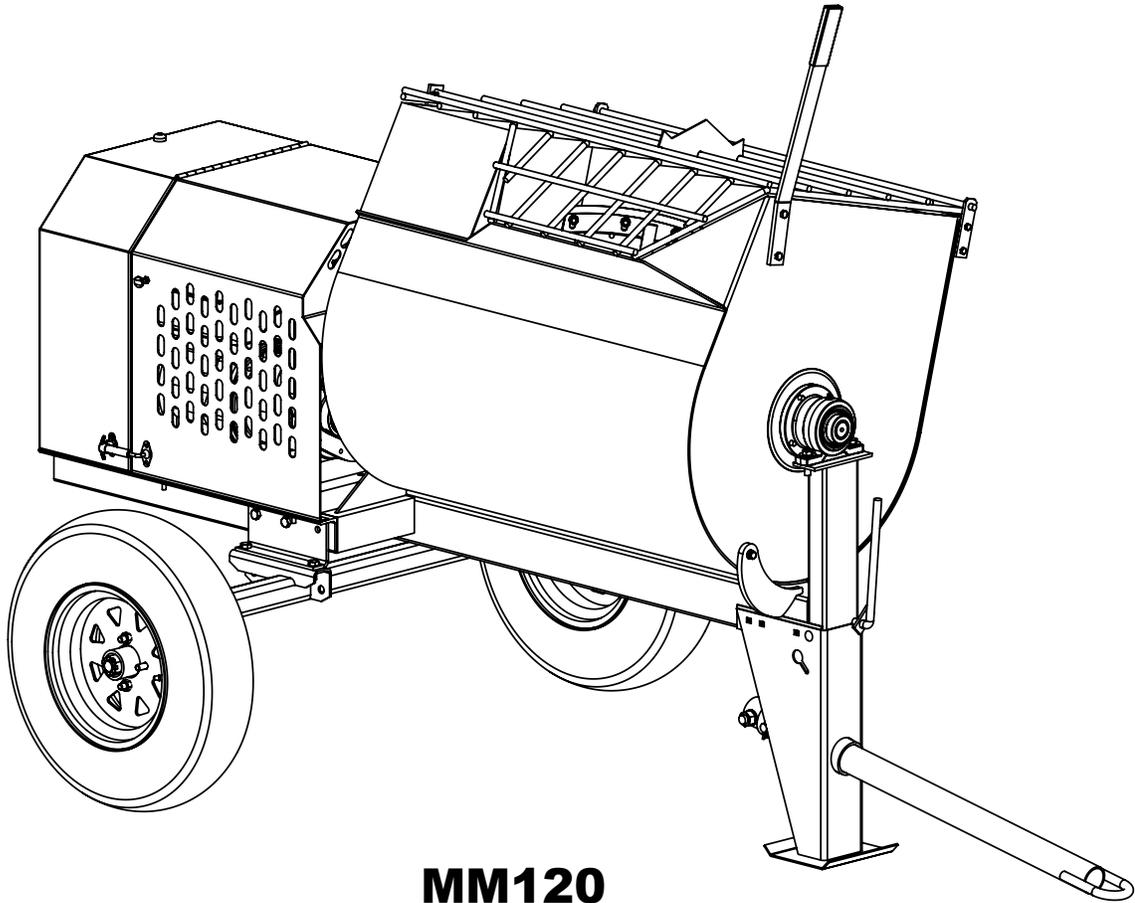
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Safety Decals (Decal Set #15074)

SPECIFICATIONS



MM120

	MM120
Batch Capacity	12 cu. ft. (0.34 cu. m.)
Batch Size	3.5 - 4.5 bags
Gas Engine	Honda GX390 20.6 in. ³ (389 cm ³)
Engine Speed	3300 rpm
Drivetrain	Enclosed Gearbox and Mechanical Clutch
Axle	61" torsion axle
Wheels	ST175/80D13 high-speed
Size - W x L x H	61 x 86 x 57 in (155 x 218 x 145 cm)
Weight	985 lbs (447 kg)
Charging Height	49 in (124 cm)

Specifications subject to change without notice.

OPERATION

Introduction

MBW equipment is intended for use in very severe applications. They are powered by four cycle engines and are available in different sizes and a selection of engines.

This parts manual contains only standard parts. Variations of these parts as well as other special parts are not included. Contact your local MBW distributor for assistance in identifying parts not included in this manual.

Before Starting & Operating

- **REMEMBER!** It is the owner's responsibility to communicate information on the safe use and proper operation of this unit to the operators.
- Review ALL of the Safety Precautions listed on page 1 of this manual.
- Familiarize yourself with the operation of the machine and confirm that all controls function properly.
- Know how to STOP the machine in case of an emergency.
- Make sure hands, feet, and clothing are at a safe distance from any moving parts.
- **OIL LEVEL** - Check the oil level in the engine. For more information see "Lubrication" under the respective engine's "Owners Manual" or the Maintenance section of this manual.
- **AIR CLEANER** - Check to ensure element is in good condition and properly installed.
- **FUEL SUPPLY** - The engines on MBW equipment require an automotive grade of clean, fresh, unleaded gasoline.
- **FUEL FILTER** - If clogged or damaged, replace.

Starting Engine

1. Check that engagement lever is in the "IDLE" position.
2. Open fuel valve.
3. Pull out the stop switch on engine shroud, turn engine switch to "ON" position.
4. Set throttle to idle.
5. Choke engine if necessary (you may not need to choke a warm engine).
6. Pull starter rope repeatedly until engine starts.
7. Move choke lever to open position.

8. Allow engine to warm up for one or two minutes.

Operating

1. Open throttle fully.
2. Close the engine shroud.



WARNING



Never operate the mixer with the shroud open.

3. Move engagement lever to the "MIX" position.
4. Add half of the required amount of sand and water for the batch to be mixed.
5. Add the total required amount of mortar mix.
6. Add the remaining amounts of sand and water and allow time to mix properly.
7. Unlock the drum by rotating the locking bar out of engagement with the frame.
8. Tip the drum forward to discharge the batch.
9. Return drum to mixing position and check that it is locked in place.
10. If another batch is to be mixed, add water for the next batch.



CAUTION



Always clean the drum after each day's operation. See Cleaning, page 8.

Stopping Engine

1. Move throttle to idle position.
2. Let engine idle for one or two minutes.
3. Push in the stop switch on engine shroud.
4. Close fuel valve.



WARNING



Always stop the engine before:

Adding fuel.

Leaving the equipment unattended for any amount of time.

Towing

1. Stop the engine.
2. Close fuel valve.

3. Close and latch the engine shroud.
4. Rotate the drum into the locked position, and check that it is locked in place.
5. Secure the tow pole and safety chains to the vehicle.



WARNING



Always check that axle, front leg, and tow bar hardware is tight before towing.

Make sure safety bolt is in place.

Check the condition of the pin on the tow bar and make sure it is secure.

Remove any loose debris from the mixer before towing on roads.

Check that safety chains cross each other when attached.

MAXIMUM TOW SPEED: 50 mph

MAINTENANCE



WARNING



Always exercise the stopping procedure before servicing or lubricating the unit.

After servicing the unit, replace and fasten all guards, shields, and covers to their original positions before resuming operation.



CAUTION



Always verify fluid levels and check for leaks after changing fluids.

Do not drain oil onto ground, into open streams, or down sewage drains.

Maintenance Schedule

SYSTEM	MAINTENANCE	EACH USE	EVERY 40 HOURS	EVERY 100 HOURS	YEARLY
Axle	Check tire pressure		X		X
	Grease wheel bearings				X
Drum	Grease trunnions & pillow blocks	X			
Engine	Refer to engine operator/owner manual	X			
Gearbox	Check enclosed gearbox oil		X		
	Change enclosed gearbox oil ³				X
Hardware	Check and tighten all hardware ^{1, 2}				X

1. Check all hardware after the first 5 hours of use, then follow the maintenance schedule.

2. Retorque the lug nuts, and front leg and axle hardware after the first 25 miles traveled, then follow the maintenance schedule.

3. Change gearbox oil after first 20 hours, then follow the maintenance schedule.

Fluid Levels

SYSTEM	FLUID VOLUME	RECOMMENDED OIL
Enclosed Gearbox Oil	32 oz.	Chevron 680 (140-wt.) Worm Gear Oil
Engine	Refer to engine operator/owner manual	

Engine Maintenance

Refer to the engine owner's manual for maintenance intervals and procedures.

Engine Speed

Engine speed is factory set according to the speeds listed in the Specifications section of this manual. Refer to the engine owner's manual for procedure on setting operating speed if necessary.

Cleaning

Always clean the mixer thoroughly after each day's operation. Dried mortar inside the drum can damage the paddles

and shorten the life of the mixer. Additionally, future batches of mortar can be contaminated if the drum is not clean.



CAUTION



Do not beat on the drum to clean dried mortar; this will cause damage to the drum.



WARNING



Always stop engine or motor and disconnect spark plug wire before placing hands or objects inside drum.

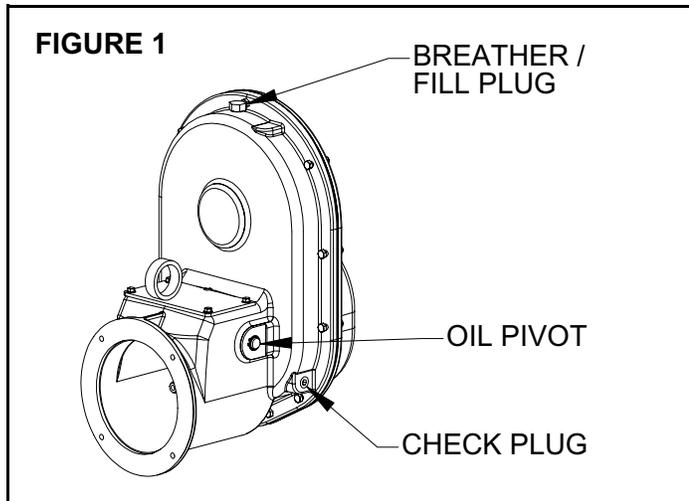
Always reconnect safety grid opener to grid after cleaning drum.

Lubrication

1. Grease both trunnions and pillow blocks daily. There are two grease fittings on each side of the drum.
2. Oil clutch yoke shaft every 50 hours at the pivot points (see Figures 1 & 2).

Checking Gearbox Oil

1. Remove check plug on side of gearbox.
2. Oil level should be even with bottom of check plug.
3. If low, add oil by removing the breather plug on top of gearbox. Change oil if it appears dark brown or smells burnt. Gearbox is shipped with 32 oz. of Chevron 680 (140-wt.) worm gear oil. Any 90-wt., or heavier, gear oil is acceptable for this gearbox. Do not mix different types of oil.
4. Apply pipe sealant to check plug and breather plug and reinstall them.



Changing Gearbox Oil

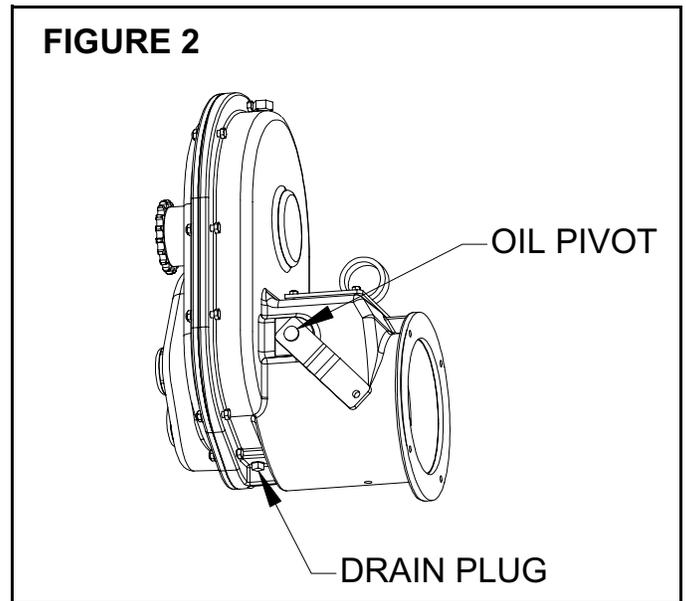
1. Remove breather plug on top of gearbox.
2. Remove magnetic drain plug on bottom of gearbox and drain oil into pan.
3. Clean drain plug thoroughly.
4. Apply pipe sealant to drain plug and reinstall.
5. Add 32 oz. of gear oil. Chevron 680 (140-wt.) worm gear oil is recommended, however any 90-wt., or heavier, gear oil is acceptable.
6. Apply pipe sealant to breather plug and reinstall.

Adjusting Clutch

If clutch begins to slip, or if a positive snap is not felt when engaging or disengaging clutch, the clutch should be adjusted. Failure to do so could result in premature clutch failure. The following procedure is easier if shroud is removed (see Engine Shroud Removal, page 11).

1. Move engagement handle to "IDLE" position.

FIGURE 2



2. Stop engine and disconnect spark plug wire. Allow gearbox and clutch to cool before continuing.
3. Remove the access cover which is secured with four bolts.
4. Using the recoil starter, rotate the clutch so the locking tab and bolt are facing up. Loosen bolt.
5. Hold the clutch body from rotating, and turn the adjusting plate clockwise to increase the pressure on the clutch disk. NOTE: It is easiest to use a flat screwdriver against the teeth on the adjusting plate to rotate it. Rotate the plate a small amount and check it by engaging the mixer. If a positive snap is not felt, rotate the plate further. If excessive force is required to engage it, or if it does not engage, rotate the adjusting plate counter-clockwise to decrease the pressure.
6. Retighten the locking tab onto the teeth to hold the adjusting plate in place.
7. Using a sprayable grease, lubricate all linkages and moving parts of the clutch to increase the life of the clutch.
8. Reinstall the access cover and tighten all four bolts.
9. Reconnect spark plug wire and start engine. Check that a positive snap is still felt while running.

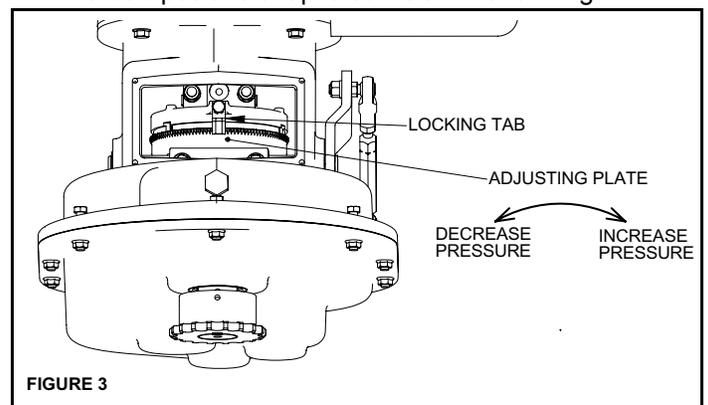


FIGURE 3

Greasing Wheel Bearings

1. Jack the rear end of the mixer and support by side rails so that mixer is stable.
2. Remove the wheel.
3. Remove the dust cover.
4. Remove the cotter pin from the spindle nut.
5. Unscrew the spindle nut.
6. Remove the hub from the spindle, being careful not to allow the outer bearing cone to fall out. The inner bearing cone will be retained by the seal.
7. Remove the grease seal.
8. Wash all grease and oil from the bearing cones and inspect each roller. If any pitting, spalling, or corrosion is present, then the bearing cup and cone must be replaced.
9. Pack the entire bearing with grease, apply a light coat of grease to the bearing cup, and install.
10. Tap a new grease seal into place with a clean block.
11. Slide the hub onto the spindle.
12. While rotating the hub slowly, tighten the spindle nut to approximately 50 lb-ft.
13. Loosen the spindle nut, but DO NOT rotate the hub.
14. Finger tighten the spindle nut until snug.
15. Back the spindle nut out slightly until the first castellation lines up with the cotter pin hole and insert the cotter pin.
16. Bend over the cotter pin legs to secure the nut.
17. Tap the dust cover into the hub.
18. Install wheel and torque lug nuts to 90 lb-ft.

SERVICE

Assembly and disassembly should be performed by a service technician who has been factory trained on MBW equipment. The unit should be clean and free of debris. Pressure washing before disassembly is recommended.

- Prior to assembly, wash all parts in a suitable cleaner or solvent.
- Check moving parts for wear and failure. Refer to the Replacement section in this manual for tolerance and replacement cycles.
- All shafts and housings should be oiled prior to pressing bearings. Also, ensure that the bearings are pressed square and are seated properly.
- All bearings should be replaced when rebuilding any exciter or gearbox.
- All gaskets and seals should be replaced after any disassembly.

Torque Chart

SIZE	GRADE 2	GRADE 5	GRADE 8
1/4-20	49 in·lbs	76 in·lbs	9 ft·lbs
1/4-28	56 in·lbs	87 in·lbs	10 ft·lbs
5/16-18	8 ft·lbs	13 ft·lbs	18 ft·lbs
5/16-24	9 ft·lbs	14 ft·lbs	20 ft·lbs
3/8-16	15 ft·lbs	23 ft·lbs	33 ft·lbs
3/8-24	17 ft·lbs	26 ft·lbs	37 ft·lbs
7/16-14	24 ft·lbs	37 ft·lbs	52 ft·lbs
7/16-20	27 ft·lbs	41 ft·lbs	58 ft·lbs
1/2-13	37 ft·lbs	57 ft·lbs	80 ft·lbs
1/2-20	41 ft·lbs	64 ft·lbs	90 ft·lbs
9/16-12	53 ft·lbs	82 ft·lbs	115 ft·lbs
5/8-11	73 ft·lbs	112 ft·lbs	159 ft·lbs
5/8-18	83 ft·lbs	112 ft·lbs	180 ft·lbs
3/4-16	144 ft·lbs	200 ft·lbs	315 ft·lbs
1-8	188 ft·lbs	483 ft·lbs	682 ft·lbs
1-14	210 ft·lbs	541 ft·lbs	764 ft·lbs
1-1/2-6	652 ft·lbs	1462 ft·lbs	2371 ft·lbs
M 6	3 ft·lbs	4 ft·lbs	7 ft·lbs
M 8	6 ft·lbs	10 ft·lbs	18 ft·lbs
M 10	10 ft·lbs	20 ft·lbs	30 ft·lbs

CONVERSIONS

in·lbs x 0.083 = ft·lbs

ft·lbs x 12 = in·lbs

ft·lbs x 0.1383 = kg·m

ft·lbs x 1.3558 = N·m

Engine Shroud Removal

Refer to Gearbox Drivetrain Assembly, page 20.

1. Disconnect wiring harness (#7) from engine by unscrewing ring terminal from engine and unplugging bullet connector.
2. Remove automatic safety grid lifter from safety grid.
3. Remove four bolts (#22), washers (#24), and locknuts (#23) securing shroud to frame.
4. Carefully lift shroud straight up to avoiding damaging engine or drive components. Approximate weight is 100 pounds.

Engine Shroud Installation

Refer to Gearbox Drivetrain Assembly, page 20.

1. Lift shroud over engine and drive components and lower it straight down onto frame. Hold grid opener out of the way while lowering.
2. Align shroud with edges of frame and tighten bolts (#22), washers (#24), and locknuts (#23) in place.
3. Lift grid opener into position and pin to safety grid.
4. Connect wiring harness (#7) to engine by grounding the ring terminal to the engine and inserting the bullet connector into the splice terminal.

Drum Removal

Refer to Drum Assembly, page 16.

1. Remove engine shroud before attempting to remove mixing drum.
2. Disassemble connecting link on chain coupling and remove chain.
3. Mark the front and rear pillow block (#5) locations on the frame to aid in the alignment during installation.
4. Remove all four bolts (#25), washers (#28 & #10), lockwashers (#27), and locknuts (#26) holding drum pillow blocks to frame.
5. If lifting drum by hoist, wrap chain around main shaft and pass chain through paddles to stabilize. If lifting drum by forklift, place blocks on forks to prevent drum from rolling. Approximate weight is 400 pounds.

Drum Installation

Refer to Drum Assembly, page 16.

1. Lower drum onto frame supports. Pillow blocks (#5) should be snug to trunnions (#8) to eliminate excessive endplay.

2. Check alignment between the two coupler sprockets. Sprockets must be parallel and in-line. Adjust drum location if necessary.
3. Bolt pillow blocks to frame using four bolts (#25), washers (#28 & #10), lockwashers (#27), and lock-nuts (#26).
4. Dump drum to check for binding. If binding is noticed, loosen bolts and realign pillow blocks.
5. Reassemble the coupling chain and install the connecting link.
6. Reinstall the engine shroud.

Drum Bearing & Seals Replacement

Refer to Drum Assembly, page 16.

1. Remove mixing drum from mixer. See Drum Removal, page 11.
2. Loosen set screws and remove coupling sprocket from main shaft. Use a puller if necessary.
3. Slide pillow blocks (#5) off of trunnions (#8).
4. Loosen set screw and remove locking collars from trunnion bearings (#4) by rotating the collars against the mixing direction of the paddles.
5. Remove four bolts (#19) and nuts (#22) holding each trunnion to the drum.
6. While supporting the main shaft, slide the trunnion off of each end.
7. Pull the triple seal kit (#9) out of the back side of each trunnion and discard.
8. Remove the retaining ring (#7) from each trunnion.
9. Remove the ball bearing and grease shield (steel washer) from the front side of each trunnion.
10. Inspect the bearings, and replace both if needed.
11. Thoroughly clean all grease from the trunnions.
12. Apply a medium strength thread locking compound to each outer bearing surface and reinstall the bearings and grease shields into the trunnions.
13. Reinstall the retaining rings.
14. Install new seal kits into the back side of each trunnion in the following order: Steel Washer, Soft Black Seal, Steel Washer, Soft Black Seal, Steel Washer, Hard Red Seal.
15. Slide trunnions onto each shaft end and bolt in place.
16. Slide bearing locking collar onto front shaft end and align shaft flush with collar.
17. Lock collar in place by driving in the mixing direction.
18. Tighten set screw using a medium strength thread locking compound. Torque set screw to 20 ft/lbs.
19. Repeat process for rear bearing.

20. Begin pumping grease into trunnion cavity while rotating main shaft back and forth. NOTE: If grease comes out through ball bearing seals, check that grease shield (steel washer) is installed and that bearing is fully seated in trunnion and cannot move.
21. Continue pumping grease until drum seals "pop out" into drum. Clean any excess grease from inside drum.
22. Slide pillow blocks onto trunnions and grease until a film of grease is seen all around the trunnion.
23. Reinstall the chain coupler sprocket. Tighten set screws using a medium strength thread locking compound.
24. Reinstall mixing drum onto frame. See Drum Installation, page 11.

Engine & Gearbox Removal

Refer to Gearbox Drivetrain Assembly, page 20.

1. Remove engine shroud before attempting to remove engine and gearbox. See Engine Shroud Removal, page 11.
2. Disengage clutch by moving engagement handle into "IDLE" position.
3. Disassemble connecting link (#15) on chain coupling and remove chain (#10).
4. Unbolt ball joint from actuator (#12) by removing nut (#27) and lockwasher (#28).
5. Remove four bolts (#25), washers (#29), lockwashers (#28), and nuts (#26) holding engine to frame.
6. Lift engine and gearbox (#14) off of frame by lifting eye located on clutch housing cover. Approximate weight is 200 pounds.

Engine & Gearbox Installation

Refer to Gearbox Drivetrain Assembly, page 20.

1. Lower the engine and gearbox onto the mixer frame.
2. Align holes and install bolts (#25), washers (#29), lockwashers (#28), and nuts (#26) to secure engine. Do not tighten.
3. Line up both coupling sprockets (#11). If they are out of vertical alignment, loosen the jam nuts (#31) on the shock mount (#2) and adjust the height. Retighten jam nuts.
4. Reassemble coupling chain (#10) to sprockets and install connecting link (#15).
5. Tighten engine hardware.
6. Bolt ball joint to actuator (#12) using nut (#27) and lockwasher (#28). If linkage does not fit properly, adjust length by loosening both jam nuts and turning rod. Retighten jam nuts.

Engine & Gearbox Disassembly

Refer to Gearbox Drive Assembly, page 18.

1. Remove engine and gearbox from mixer. See Engine & Gearbox Removal, page 12.
2. Remove the access cover (#13) which is secured by four bolts (#15).
3. Remove the two bolts (#14) and lock washers (#18) and loosen the two set screws (#17) from the clutch yoke (#7). Clutch must be disengaged to gain access to bolts.
4. Remove retaining ring (#3) on yoke shaft (#11).
5. Slide shaft out of gearbox and remove clutch yoke.
6. While maintaining support of gearbox, remove four bolts (#16) securing gearbox (#6) to engine adapter plate (#10).
7. Slide engine and clutch out from inside gearbox.
8. Loosen two bolts on clutch body to remove from engine crankshaft.

Engine & Gearbox Assembly

Refer to Gearbox Drive Assembly, page 18.

1. Assemble bushing (#2) and key (#8) to engine crankshaft.
2. Bolt adapter plate (#10) to engine (#1).
3. If clutch (#9) is not disengaged (popped out), pry throw-out bearing away from adjusting plate to disengage it.
4. Slide disengaged clutch (#9) onto crankshaft. Be sure that clutch pilot bearing is bottomed out in clutch body, and leave a clearance of 0.030" - 0.060" between bearing and crankshaft. Tighten clutch bolts alternately, and apply a final torque of 23 lb-ft.
5. Slide gearbox (#6) onto engine. Rotate gearbox while assembling to line up spline shafts.
6. Install four bolts (#16) and tighten gearbox in place.
7. Apply grease to forks of clutch yoke (#7), and place inside housing on top of clutch pins.
8. Slide yoke shaft (#11) into housing and through yoke.
9. Install retaining ring (#3) onto shaft.
10. Bolt yoke to shaft using two bolts (#14) and lock washers (#18) and tighten set screws (#17) in yoke.
11. Install access cover (#13) using four bolts (#15).

Gearbox Disassembly

Refer to Gearbox Assembly, page 22.

1. Disassemble gearbox from engine before continuing. See Engine & Gearbox Disassembly, page 13.

2. Support gearbox so it stands upright. Remove magnetic drain plug (#6) and drain oil.
3. Tip gearbox down onto a support so clutch housing faces down.
4. Remove sprocket from output shaft. Use a puller if necessary.
5. Remove all 11 bolts (#27) and nuts (#28) from gearbox perimeter.
6. Lightly tap gearbox cover and pull it straight up to remove from housing.
7. Simultaneously lift up on all three large gears until the bearings are free from the housing. Then slide gears apart from one another and remove from housing.
8. Remove retaining ring (#3) securing input shaft (#11).
9. Remove input shaft by pulling straight up.
10. Remove both seals (#22 & #23) from housing and cover.

The following steps are only necessary if bearings or gears need to be replaced.



Always replace any bearings which are removed with a bearing puller.

11. Press bearing (#26) off of input shaft (#11). NOTE: Always support bearings by inner race when pressing off of or onto shafts.
12. Using a bearing puller, remove both bearings (#1) from pinion shaft (#10).
13. Remove retaining ring (#20) from shaft.
14. Press gear (#14) off of shaft and remove key (#2).
15. Pull both bearings (#5) off of pinion shaft (#9).
16. Remove retaining ring (#19) from shaft.
17. Press gear (#13) off of shaft and remove key (#24).
18. Pull both bearings (#17) off of output shaft (#15).
19. Remove retaining ring (#21) from shaft.
20. Press gear (#12) off of shaft and remove key (#18).

Inspect all keys and replace if they look worn or damaged.

Gearbox Assembly

Refer to Gearbox Assembly, page 22.

1. Press bearing (#26) onto input shaft (#11). NOTE: Always support bearings by inner race when pressing onto or off of shafts.
2. Install key (#2) into pinion shaft (#10).
3. Press gear (#14) onto shaft and install retaining ring (#20).

4. Press both bearings (#1) onto shaft.
5. Install key (#24) into pinion shaft (#9).
6. Press gear (#13) onto shaft and install retaining ring (#19).
7. Press both bearings (#5) onto shaft.
8. Install key (#18) into output shaft (#15).
9. Press gear (#12) onto shaft and install retaining ring (#21).
10. Press both bearings (#17) onto shaft.
11. Support gear case (#7) with clutch housing facing down, and press seal (#22) into gear case.
12. Install assembled input shaft (#11) into gear case and install retaining ring (#3).
13. Place all three assembled gear shafts into housing and push them together until the bearings line up with the bores and they drop into place.
14. Install two dowel pins (#4) and a new gasket (#16).
15. Assemble cover (#8) and press down firmly until seated.
16. Bolt cover to housing using all 11 bolts (#27) and nuts (#28).
17. Press seal (#23) into cover. NOTE: Do not cut seal on keyway.
18. Assemble key and sprocket to output shaft.
19. Use pipe sealant and install check plug (#29) and magnetic drain plug (#6).
20. Fill with 32 oz. of 90-wt., or heavier, gear oil and install breather plug (#25). Chevron 680 (140-wt.) worm gear oil is recommended.

Parts Replacement Cycles and Tolerances

Bearings	Replace anytime a bearing is rough, binding, discolored or removed from housing or shaft.
Clutch	Adjust clutch (see maintenance section of this manual) as needed.
Engine Components	Refer to your engine manufacturer's Owner's Manual.
Hardware	Replace any worn or damaged hardware as needed. Replacement hardware should be grade 5 and zinc plated unless otherwise specified.
Safety Decals	Replace if they become damaged or illegible.
Seals & Gaskets	Replace if a leak is detected and at every overhaul or teardown.
V-Belts	Replace if cracked, torn, or stretched to the point the belt won't tension properly.

REPLACEMENT PARTS

The warranty is stated in this book on page 18. Failure to return the Warranty Registration Card renders the warranty null and void.

MBW, Inc. has established a network of reputable distributors with trained mechanics and full facilities for maintenance and rebuilding, and to carry an adequate parts stock in all areas of the country. Their sales engineers are available for professional consultation. If you cannot locate an M-B-W distributor in your area, contact MBW, Inc. or one of our Sales Branches listed below.

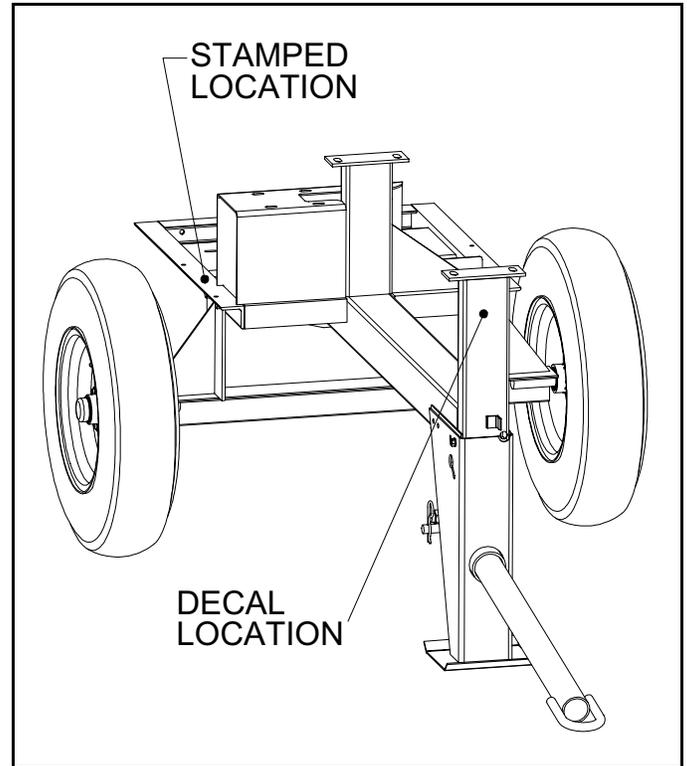
When ordering replacement parts, be sure to have the following information available:

- Model and Serial Number of machine when ordering M-B-W parts
- Model and Serial Number of engine when ordering engine parts
- Part Number, Description, and Quantity
- Company Name, Address, Zip Code, and Purchase Order Number
- Preferred method of shipping

REMEMBER - You own the best! If repairs are needed, use only M-B-W parts purchased from authorized M-B-W distributors.

Write Model Number here

Write Serial Number here



The unit's serial number can be found in the following locations:

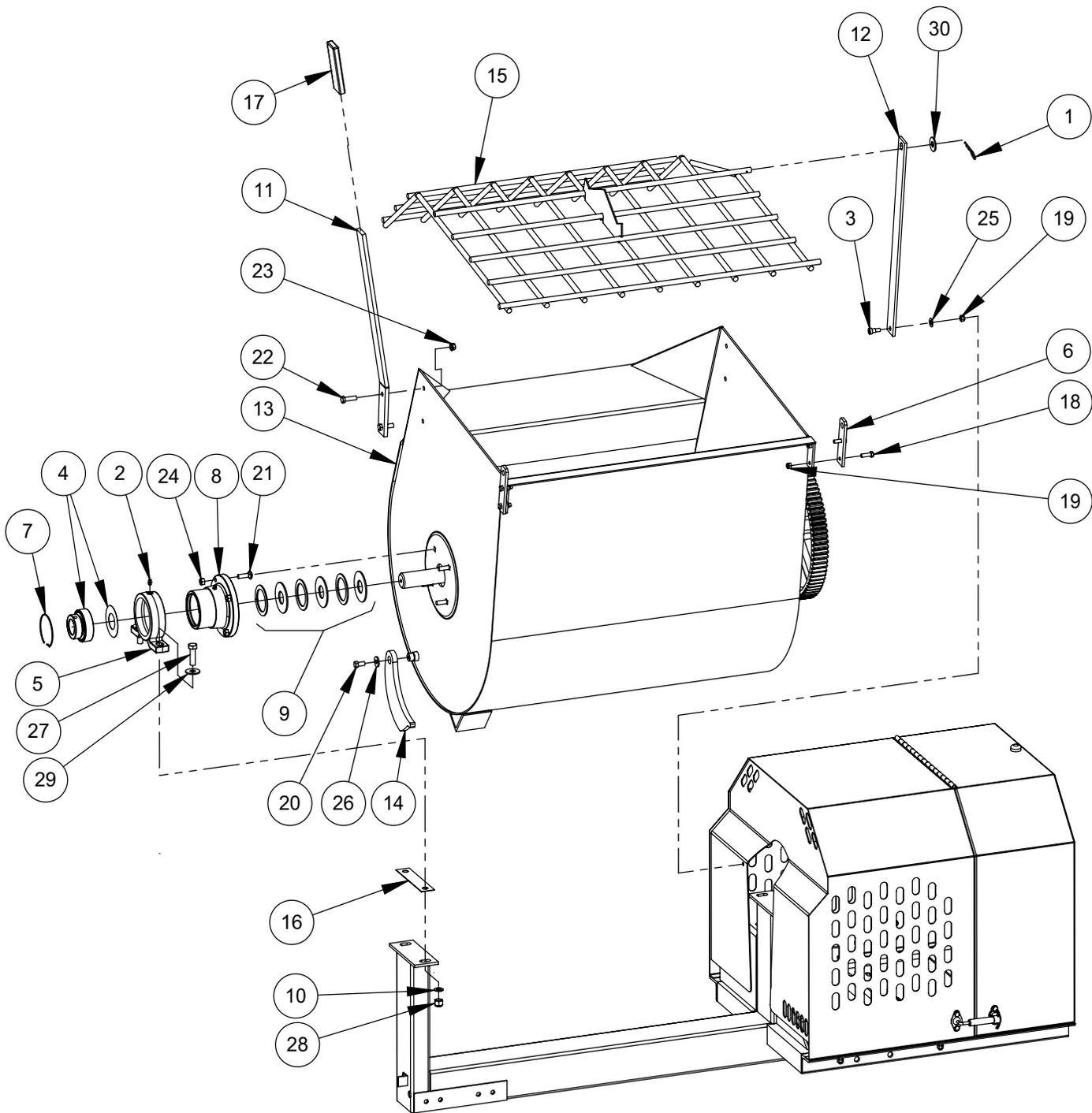
- The model/serial number decal is located on the front drum support, below the pillow block.
- The serial number is stamped on the mixer frame between the shroud mounting holes.
- The serial number is stamped on the gearbox to the right of the breather.

Contact Information

MBW, Inc.
250 Hartford Rd • PO Box 440
Slinger, WI 53086-0440
Phone: (262) 644-5234
Fax: (262) 644-5169
Email: mbw@mbw.com
Website: www.mbw.com

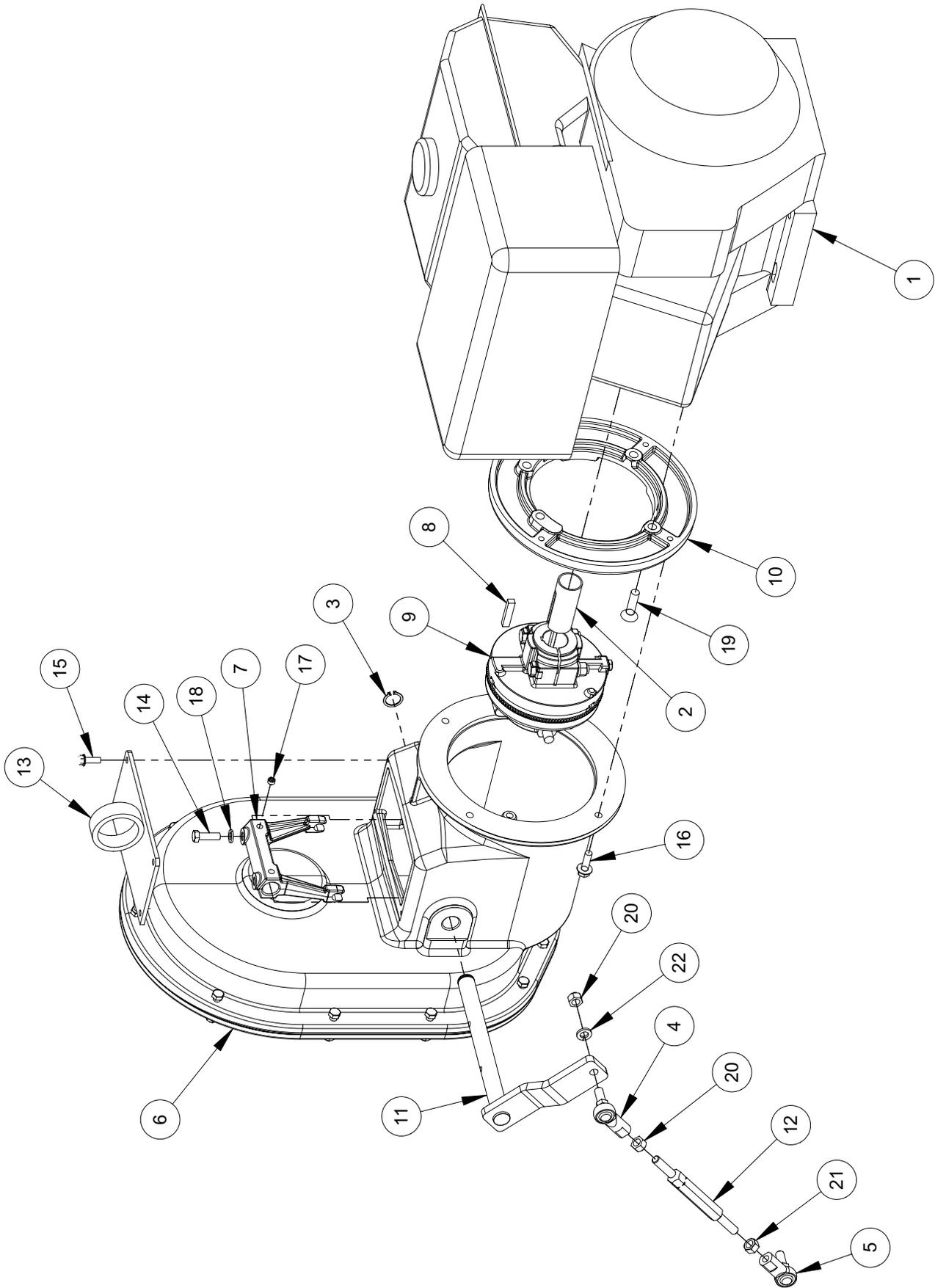
MBW (UK) Ltd.
Units 2 & 3 Cochrane Street
Bolton BL3 6BN, England
Phone: 01204 387784
Fax: 01204 387797

MBW FRANCE S.A.R.L.
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60540 BORNEL
FRANCE
Phone: +33 (0) 3 44 07 15 96
Fax: +33 (0) 3 44 07 41 28
Email: mbwfrance@free.fr

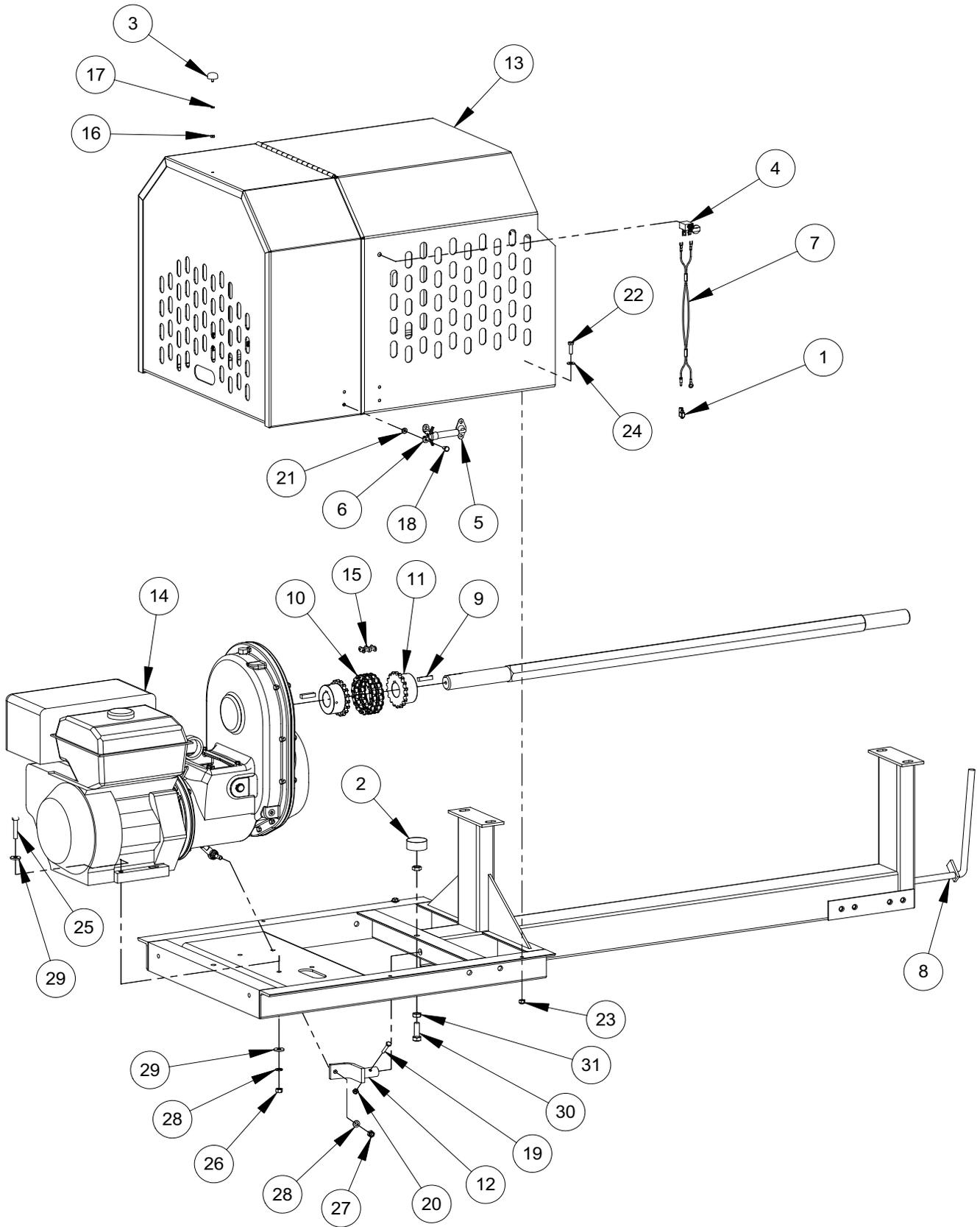


Drum Assembly

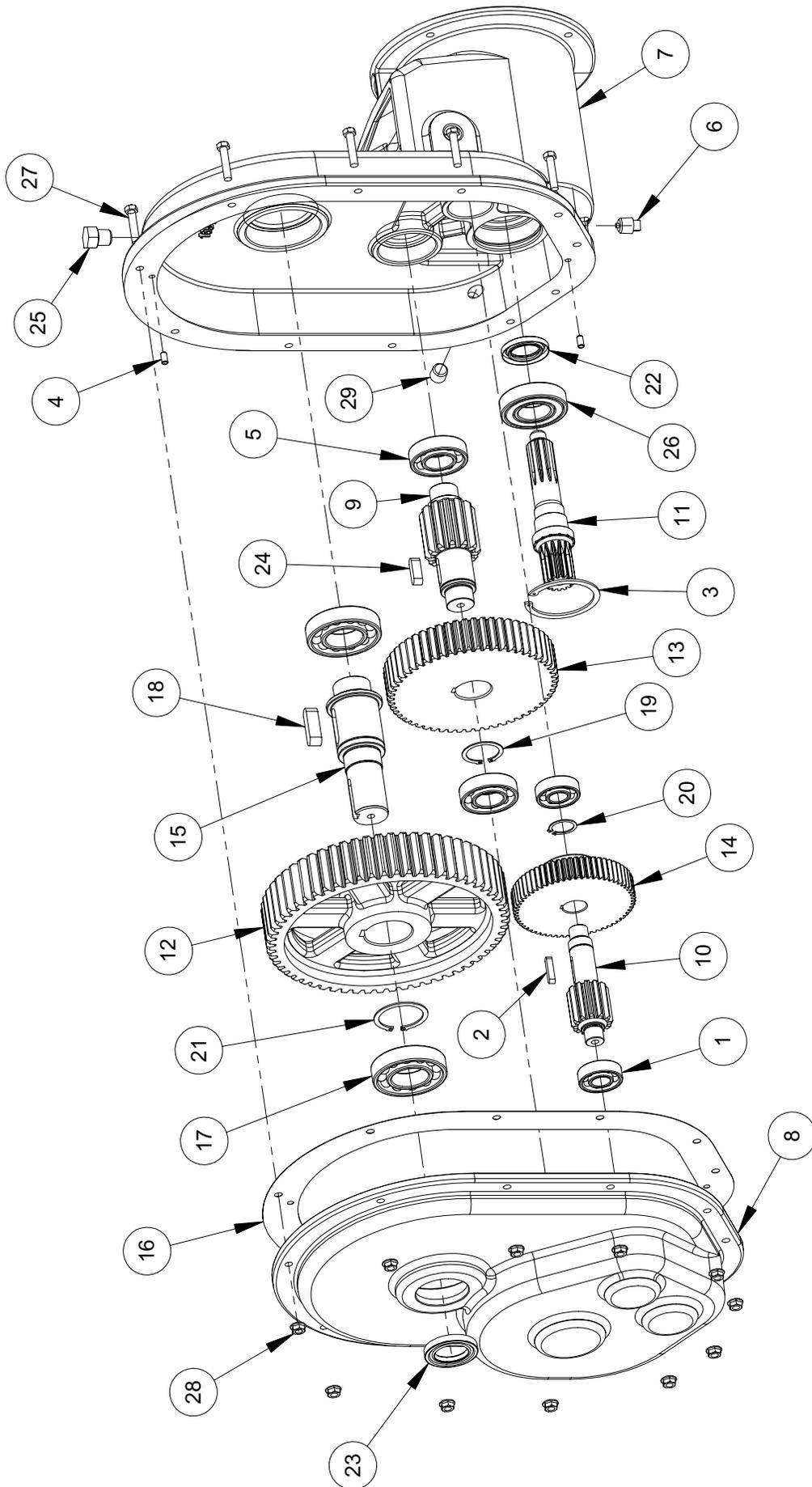
ITEM	PART NO.	DESCRIPTION	QTY.
1.	01056	HAIRPIN, 1/8" x 2-3/8" LONG	1
2.	01177	GREASE FITTING	4
3.	01280	SOCKET HEAD SHOULDER SCREW, 3/8" x 3/8"	1
4.	01550	BALL BEARING (Includes seal & locking collar)	2
5.	05002	PILLOW BLOCK	2
6.	05082	BRACKET, GRID SUPPORT	2
7.	05475	RING, RETAINING	2
8.	05665	TRUNNION	2
9.	05918	SEAL KIT	2
10.	06327	WASHER	4
11.	16737	HANDLE, DUMP	1
12.	16782	OPENER, GRID	1
13.	17026	DRUM, MM120	1
14.	17079	LOCKING BAR	1
15.	17109	GRID, MM120	1
16.	18896	SHIM, MIXER DRUM (AS REQUIRED)	
17.	18903	HANDLE GRIP	1
18.	F051808HCS	HEX HEAD CAP SCREW, 5/16-18 x 1"	4
19.	F0518ELN	ELASTIC LOCKNUT, 5/16-18	5
20.	F061606HCS	HEX HEAD CAP SCREW, 3/8-16 x 3/4"	1
21.	F061610CB	CARRIAGE BOLT, 3/8-16 x 1-1/4"	8
22.	F061610HCS	HEX HEAD CAP SCREW, 3/8-16 x 1-1/4"	2
23.	F0616ELN	NYLOC LOCKNUT, 3/8-16	2
24.	F0616HN	HEX NUT, 3/8-16	8
25.	F06PW	WASHER, 3/8" SAE	1
26.	F06SW	WASHER, 3/8"	1
27.	F081314HCS	HEX HEAD CAP SCREW, 1/2-13 x 1-3/4"	4
28.	F0813ELN	NYLOC LOCKNUT, 1/2-13	4
29.	F08SW	WASHER, 1/2"	5
		REPLACEMENT KITS	
	01427	GREASE FITTING CAPS (Set of 12)	1
	06090	TRUNNION ASSEMBLY (Includes 4,7-9)	2
	17233*	DRUM ASSEMBLY, MM120	1
		* Includes trunnions, pillow blocks, shaft, paddles, & grid	



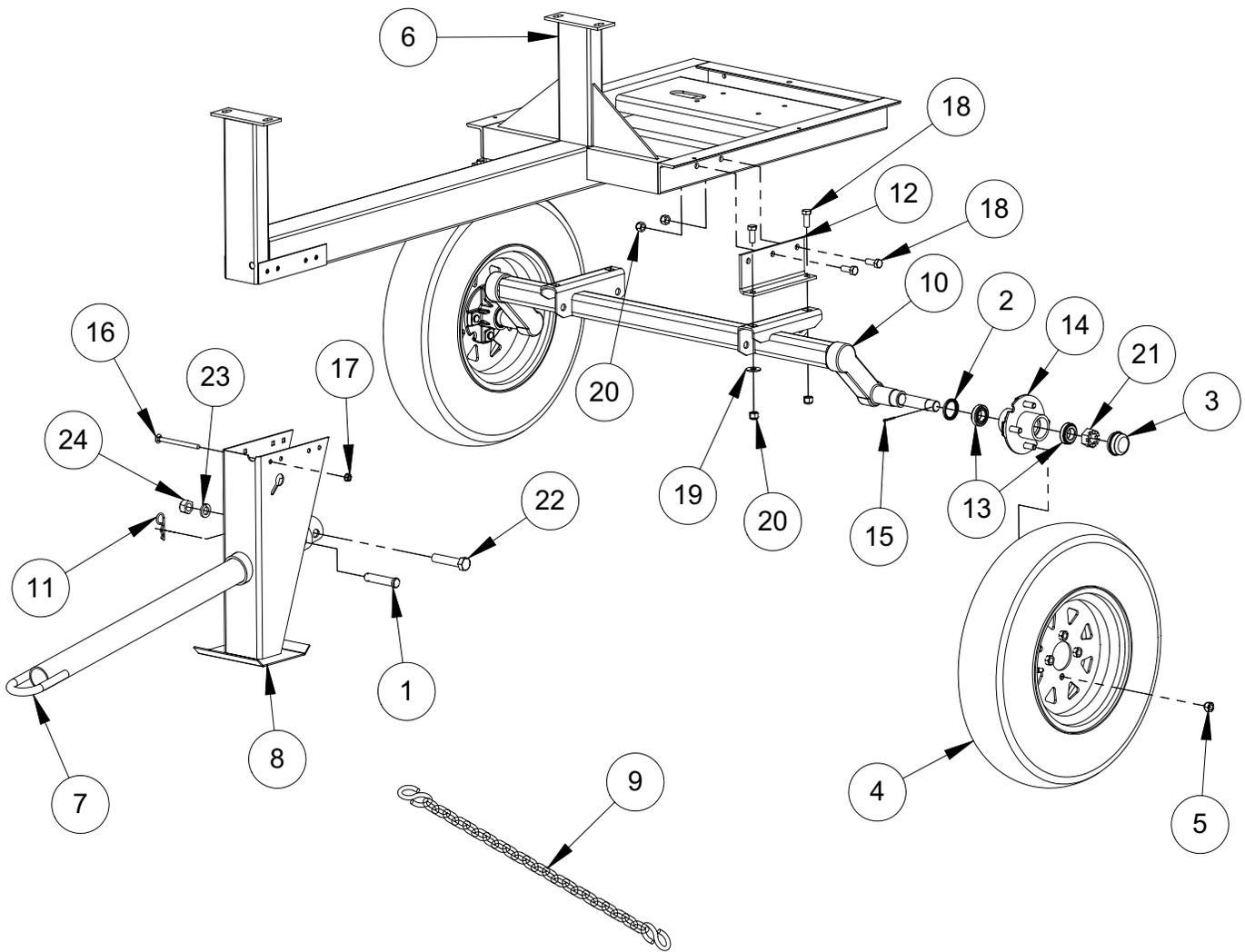
Gearbox Drive Assembly



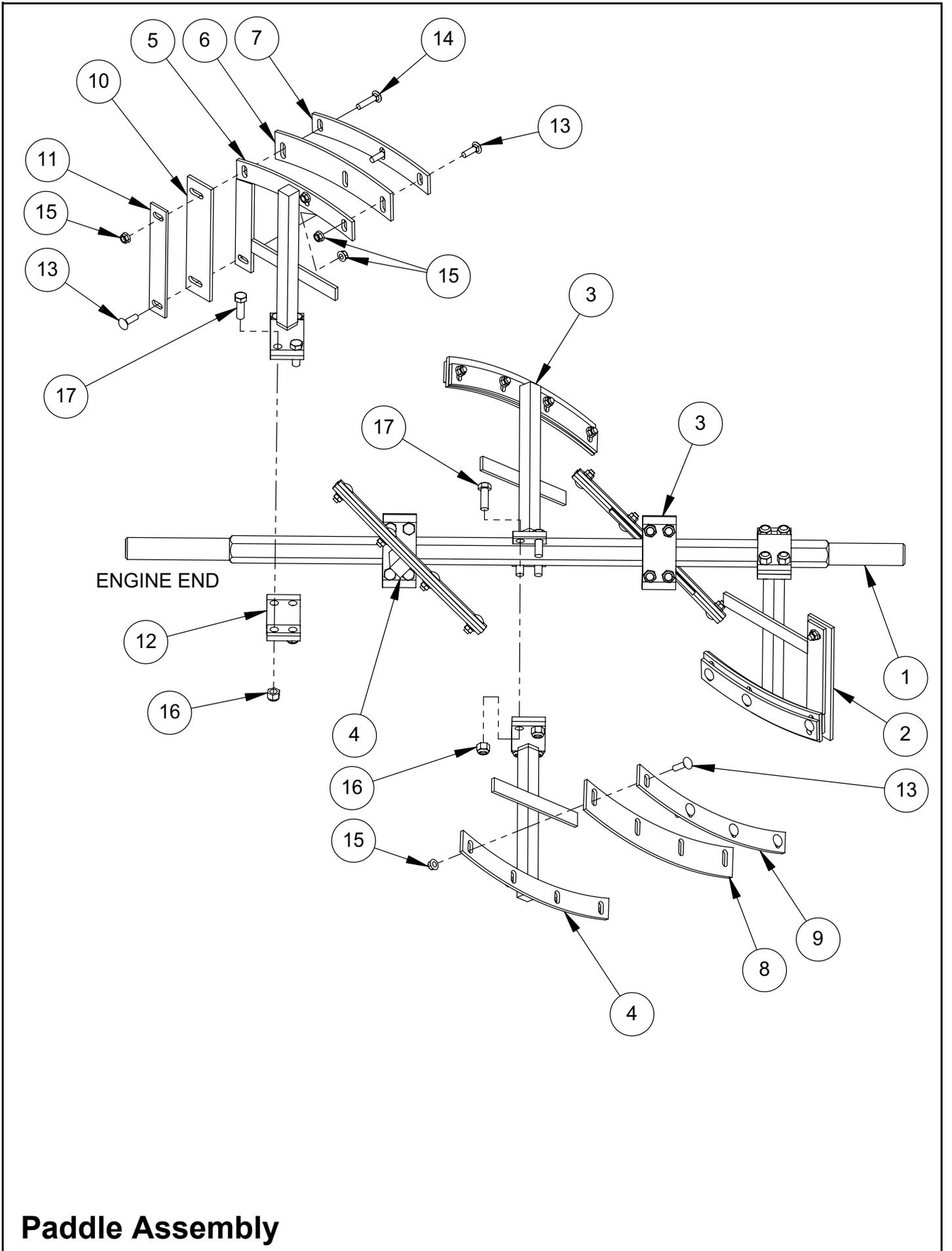
Gearbox Drivetrain Assembly



Gearbox Assembly



Frame & Axle Assembly



WARRANTY

WHAT DOES THIS WARRANTY COVER? MBW, Incorporated (MBW) warrants each New Machine against defects in material and workmanship for a period of twelve (12) months. "New Machine" means a machine shipped directly from MBW or authorized MBW dealer to the end user. This warranty commences on the first day the machine is sold, assigned to a rental fleet, or otherwise put to first use.

MBW warrants each Demonstration Machine against defects in material and workmanship for a period of six (6) months. "Demonstration Machine" means a machine used by MBW or its agents for promotional purposes. This warranty commences on the first day the machine is sold, assigned to a rental fleet, or otherwise put to first use.

This warranty covers the labor cost for replacement or repair of parts, components, or equipment on New Machines or Demonstration Machines, and MBW shall pay labor costs at MBW's prevailing rate to affect the warranted repair or replacement. MBW reserves the right to adjust labor claims on a claim-by-claim basis.

This warranty covers the shipping cost of replacement parts, components, or equipment via common ground carriers from MBW to an authorized MBW dealer. Air freight is considered only in cases where ground transportation is not practical.

MAY THIS WARRANTY BE TRANSFERRED? This warranty is non-transferable and only applies to the original end user of a new machine or demonstration machine.

WHAT DOES THIS WARRANTY NOT COVER?

1. This warranty does not cover any Used Equipment. "Used Equipment" means any MBW machine or equipment that is not a New Machine or a Demonstration Machine. All Used Equipment is sold **AS IS/WHERE IS WITH ALL FAULTS**.

2. This warranty does not cover any New Machine, Demonstration Machine, or their equipment, parts, or components altered or modified in any way without MBW's prior written consent. This warranty does not cover the use of parts not specifically approved by MBW for use on MBW products. This warranty does not cover misuse, neglect, shipping damage, accidents, acts of God, the operation of any New Machine or Demonstration Machine in any way other than recommended by MBW in accordance with its specifications, or any other circumstances beyond MBW's control. This warranty does not cover any New Machine or Demonstration Machine repaired by anyone other than MBW factory branches or authorized MBW distributors.

3. This warranty does not cover, and MBW affirmatively disclaims, liability for any damage or injury resulting directly or indirectly from design, materials, or operation of a New Machine or Demonstration Machine or any other MBW product. MBW's liability with respect to any breach of warranty shall be limited to the provisions of this document and in no event shall exceed an amount equal to the purchase price of the New Machine or Demonstration Machine purchased from MBW.

4. This warranty does not cover engines, motors, and other assemblies or components produced by other manufacturers and used on a New Machine or Demonstration Machine, as said engines, motors, and other assemblies or components may have warranties provided by the manufacturer thereof. This warranty does not apply to consumable items, such as v-belts, filters, trowel and screed blades, seals, shock mounts, batteries, and the like, all of which are sold **AS IS/WHERE IS WITH ALL FAULTS**.

5. This warranty does not cover the cost of transportation and other expenses which may be connected with warranty service but not specifically mentioned herein.

6. This warranty does not cover any updates to any New Machine, Demonstration Machine, or any other MBW product. MBW reserves the right to improve or make product changes without incurring any obligation to update, refit, or install the same on New Machines or Demonstration Machines previously sold.

WHAT MUST YOU DO TO OBTAIN WARRANTY COVERAGE? Each New Machine or Demonstration Machine is accompanied by a Warranty Registration Card. You must sign, date, and return the Warranty Registration Card to the place of origin of the New Machine or Demonstration Machine, either to MBW, Inc. at P.O. Box 440, Slinger, Wisconsin 53086, MBW (UK), Ltd. at Units 2 & 3 Cochrane Street, Bolton BL3 6BN, United Kingdom or MBW FRANCE SARL at ZA D'Outreville, 5 Rue Jean Baptiste Neron, Bornel 60540 France, within ten (10) days after purchase, assignment to a rental fleet, or first use. This signed warranty card is the buyer's affirmation that he has read, understood, and accepted the warranty at the time of purchase. Failure to return the warranty card as specified herein renders the warranty null and void. In order to receive warranty coverage consideration, warranty claims must be submitted within thirty (30) days after the New Machine or Demonstration Machine fails. Warranty claims must be submitted to MBW, Inc., MBW (UK), Ltd. or MBW FRANCE SARL, and written authorization for the return of merchandise or parts under the warranty must be obtained before shipment to MBW.

WHAT WILL MBW DO? MBW's obligation under this warranty is limited to the replacement or repair of parts for a New Machine or Demonstration Machine at MBW factory branches or at authorized MBW distributors, and such replacement or repair is the exclusive remedy provided hereunder. Labor must be performed at an authorized MBW distributor. MBW reserves the right to inspect and render a final decision on each warranty case, and MBW's repair or replacement is solely within the discretion of MBW.

IT IS EXPRESSLY AGREED THAT THIS SHALL BE THE SOLE AND EXCLUSIVE REMEDY UNDER THIS WARRANTY. UNDER NO CIRCUMSTANCES SHALL MBW BE LIABLE FOR ANY COSTS, LOSS, EXPENSE, DAMAGES, SPECIAL DAMAGES, INCIDENTAL DAMAGES, OR PUNITIVE DAMAGES ARISING DIRECTLY OR INDIRECTLY FROM THE USE OF THE NEW MACHINE OR DEMONSTRATION MACHINE WHETHER BASED UPON WARRANTY, CONTRACT, NEGLIGENCE, STRICT LIABILITY, OR ANY OTHER LEGAL THEORY.

THE FOREGOING WARRANTY IS EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR USE, AND FITNESS FOR A PARTICULAR PURPOSE, AND ALL OTHER OBLIGATIONS OR LIABILITY ON MBW'S PART. MBW NEITHER ASSUMES NOR AUTHORIZES ANY OTHER PERSON TO ASSUME ON BEHALF OF MBW ANY OTHER LIABILITY OR WARRANTY IN CONNECTION WITH THE SALE OR SERVICE OF ANY NEW MACHINE, DEMONSTRATION MACHINE, OR ANY OTHER MBW PRODUCT.

EXTENDED RAMMER WARRANTY - MODELS R422, R442, R482 & R483.

This extended warranty commences on the last day of MBW's standard, one year, "limited warranty" and runs for an additional four years (48 months). This extended warranty is limited to part replacement and shipping costs of rammer **bellows and non-metallic slide bearings only**. This extended warranty does not cover labor, down time, or any other cost beyond that of component replacement and freight. This extended warranty is subject to all limitations set fourth in MBW's "limited warranty", above.

NOTES