



Electronic Service Manuals

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Parts & Instruction Manual

28" Mirage Propane Burnisher - M220028K13H

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IMPORTANT SAFETY INSTRUCTIONS

READ and UNDERSTAND all instructions and warnings before operating this machine!



WARNING

Do not store or use gasoline or other flammable vapors and liquids in the vicinity of this machine. Always store equipment away from heater rooms, boilers, gas-fired water heaters or any other source of open flame. Propane is highly flammable. Always store LPG tanks (full or empty) outside in a secure, well ventilated area.

NO SMOKING, NO SPARKS, NO FLAMES NEAR UNIT OR LPG TANK.

Operate only in well ventilated areas. Buildings must be provided with:

- A. A continuous mechanical ventilation that removes the products of combustion to the outdoors of not less than 300 CFM for each 10,000 BTUH or fraction thereof; or
- B. Natural ventilation of not less than 300 CFM for each 10,000 BTUH input or fraction thereof, based on a maximum of one-quarter air exchange per hour for the net building volume.

If you smell LPG gas, stop the unit and check for leaks. Also open windows, don't touch electrical switches, extinguish any open flames. Call your gas supplier if no leaks are found.

Do not adjust the fuel system without the proper analysis equipment.



WARNING

Never tilt the equipment on its side for pad, belt or brush replacement. It is designed to tilt back on its rear wheel and handle for maintenance and repair. A second person should aid in lifting and securing equipment for repair.

Never tilt & transport while engine is running.

Keep hands and feet clear of all moving parts.

Never try to replace parts or repair equipment with machine running.

Turn the gas off at the tank to kill the engine.

Remove the LPG tank and store it in an approved area when not in use. A "NO SMOKING" sign should be permanently displayed at the storage area.

Always vent an over-full bottle using the tank's bleed valve, out of doors away from all closed places and away from any fire or flame producing device. Vent until the white vapor turns clear.

Keep all objects clear of the exhaust system during and after operation.

Do not leave this machine unattended while the engine is running.

Do not operate equipment in one location for more than a few seconds. Damage to floor surface can occur.

Always store equipment away from possible damage by falling objects in warehouse-type areas. Always store LPG tanks outside in a secure, well-ventilated area.

When the LPG tank is attached to the machine and not running, the operator should not leave the machine unattended except for short periods of time such as rest stops, washroom or meal stops.

The operator must completely understand all instructions, warnings and operating procedures before using this machine.

This machine must be maintained in accordance with this manual's recommended maintenance instructions and the engine manufacturer's recommended maintenance procedures. Failure to do so may cause damage to the machine, equipment, furniture, buildings or personal injury!

A maintenance record should be kept indicating date of service, hours on engine, and work done.

TRANSPORT & PREPARATION



WARNING

Follow the instructions given in this booklet, the Engine's Owners Manual and the training given by your supervisor for the safe operation of this machine. Failure to do so can result in personal injury and/or damage to the machine or property.

DO NOT OPERATE THIS MACHINE IN AN EXPLOSIVE ENVIRONMENT!

THIS PROPANE MACHINE IS INTENDED FOR COMMERCIAL USE.

 WARNING

Do not use "T" handle when attempting to tilt back machine for service or cleaning. The "T" handle is designed for control during operation only.

Do not use excessive vertical pressure.

I. PREPARATION

A. Check that the suggested maintenance schedule has been observed:

All machines are equipped with a multi-function maintenance meter. The functions include the following: hour meter, service alert and tachometer. (See Engine Maintenance Meter Instructions on p4).

B. Check the engine oil before every operation:

Make sure the machine is level when checking the oil. Always take 2 readings of the dipstick before adding oil. If the oil level is below the full mark, add just enough oil to the engine to bring the oil level up to the full mark. **Never over fill.** Follow the guidelines in your Engine Owners Manual. Check for foreign material on the dipstick.

C. Properly fill and check your LPG tank and all LPG fuel lines for leaks:

1. Every tank has been pressure and leak tested. However, every time a tank is filled and/or connected to the machine it should be soap tested. All LPG lines must be pressurized and every inch of line and connections must be sprayed. If you find a leak, make the proper repairs before operating the machine.

NOTE: The connection and disconnection of the LPG tank must be done in a well ventilated area with NO source of ignition within 10 feet (3 meters) from the point of connection.

2. **Never over fill the LPG tank!** The LPG tank is designed to hold just 20 pounds of propane. Make sure to weigh the tank as it is being filled. The gross weight of a full tank should not exceed 48 pounds. If while operating the machine, you notice frost forming on the LPG lines or the regulator, your tank has been over filled. If you continue to operate the machine in this condition, damage will occur. The excess propane in the tank must be removed before normal operations resume. The bleeding of a propane tank should be done in a safe location outside the building. In some cases the regulator must defrost before restarting the engine.

D. Connecting the high pressure hose to the LPG Tank:

Make sure the couplers are in line and screwed together hand tight. If this is not done properly, fuel will not pass through to the regulator. Never complete the connection of the tanks to the machine by using a wrench. Always do it by hand. Listen for the rush of fuel to the lock-out device when you open the tank valve. If you hear this, it indicates a good connection has been made at the tank.

 WARNING

NEVER CHANGE OR ALTER THE PROPANE CONTROL EQUIPMENT!

E. Install fresh pads before every job:

To install a fresh pad, set the machine down in the rear. Unscrew and remove the pad-centering ring. Remove the old pad and center the new pad onto the pad driver. Reinstall the pad-centering ring. Never "flip" a pad. Keep the same side down throughout the life of the pad. Even after a pad is cleaned, you can tell the down side by the centering ring indentation. This practice will increase the pad life and help maintain a properly functioning pad driver. **NEVER TILT A MACHINE ON ITS SIDE!**

II. STARTING THE ENGINE

A. Open propane (LPG) tank valve (counter clockwise).

B. Set throttle control at idle.

C. Battery start – turn key to the start position & move throttle toward fast position. If engine does not start, release key and return to step "B".

D. Electric start – push "Start" button and move throttle toward fast position until engine starts. Starter should not be engaged for more than 10 seconds at a time.

- **When a propane tank is overfilled it may temporarily cause the fuel regulator to malfunction. Remove the tank to a well ventilated location. Release some gas until the cloud disappears and escaping gas is "clear." Reinstall tank.**

- **All machines are equipped with tamper proof fuel systems. If a fuel problem exists, contact an authorized service center.**

- **Propane tanks should be removed & stored in a protected off site area.**

III. OPERATION

Provide and use ear protection during operation.

Never let an untrained person operate or perform repairs on the machine. They may hurt themselves, damage the floor or the equipment.

Engine speed not to exceed 3400 RPM.

This machine is not suitable for picking up hazardous dust.

Do not use on surfaces with a gradient exceeding 2%.

IV. STOPPING THE ENGINE

Turn the propane tank valve clockwise to a closed position and turn the key OFF.

NOTE: The exhaust system will be very hot and takes several minutes to cool, so keep yourself and all materials clear.

V. PROCEDURES

Follow machine (straight ahead) at moderate walking speed. Keep moving.

- **Do not operate the machine in one location for more than a few seconds — it will damage — “burn” the finish.**
- **When operation is completed remove tank and store in a secure, protected off site (preferably outdoor) location.**
- **Do not use for scrubbing operations.**
- **Never tilt back machine to maintenance position while engine is running.**
- **Never reach under protective shroud when engine is running.**

VI. MAINTENANCE

A. Machine & engine maintenance

1. Refer to engine manufacturer's owners manual and comply completely with the instructions. Change the oil and filter according to the Engine Owners Manual.
2. Keep a good service log on each machine with the date, hour meter reading, type(s) of service performed and the name of the person who performed them.
3. Clean the entire unit after each use. When

cleaning the unit, check for possible loose nuts and bolts.

B. Engine maintenance meter

This multi-function meter acts as a preventive maintenance tool, which benefits you with increased fuel economy, less down-time and longer engine life.

The meter's displays are:

Hour Meter: Displays total run hours when machine is off.

Tachometer: Indicates engine RPM during operation.

Service Alert: The display flashes to alert you to lube and change the oil at 25 hour intervals. The service alert only flashes during operation and it warns you to change the oil for only two hours. After the two hours is reached, the alert will automatically reset to the next 25 hour interval. Therefore, it is recommended that a separate maintenance log be kept to track oil changes.

Remember that being safe is a full-time, every day job. Follow all information posted on the machine and the LPG tank.

Never allow anyone to operate this machine who has not read or cannot understand the given instructions.

C. Troubleshooting the electrical system

1. Check all wire connections for obvious problems. Remove LPG tank, then remove battery box cover. Check all connections visibly and physically. If any “loose”, damaged or unconnected wires are noticed, replace or repair as needed.

2. Check the battery posts and wires. **Always wear a face shield, safety glasses and protective clothing when working around a battery!** The gases can be explosive and the acid is highly corrosive to metals, cloth and ALL HUMAN TISSUE (skin, eyes, etc.) If the battery post(s) are corroded, remove the wires and clean posts and wires. Applying some axle grease on the posts of the battery after they are cleaned will slow down the battery corrosion process.

If nothing obvious is noted, a more detailed investigation is warranted. Before any such troubleshooting begins, the following things should be done:

- a. Replace propane LPG tank with one from a machine that runs.

b. Charge the battery or provide an absolute source of 12 volt DC power capable of 50 amperes total output. (A pair of good jumper cables from your car or truck battery will suffice.) Equip yourself with an inexpensive 12 volt test light.

c. If the trouble seems to be in the electrical control equipment, you may wish to disconnect the starter from the system so as to check the system without spinning the engine.

d. Battery rundown. A common problem is letting the battery run down. What usually happens is that it takes the crew a few jobs to get used to the whole system, so the machine is stopped and started quite often. Key left in on position, when engine is turned off, will result in battery running down – dying.

D. Belt Inspection & Replacement

Inspection

- Fold T-Handle to forward position
- Tilt machine back on rear of body & handle
- If belt is worn, cracked or shredding, belt needs to be replaced.

Replacement

- Place 3/4" wrench on end of the shaft on the top of the buffer body.
- Turn pad driver counter-clockwise to remove.
- Take belt off by turning 3/4" wrench on shaft and removing belt from pad driver pulley and engine crank pulley.
- Check pad driver pulley & engine crank pulley for correct alignment.
- Install new belt on engine crank pulley & pad driver pulley, using 3/4" wrench.
- Install belt on tension pulley
- Install pad drive onto shaft, and return buffer to operating position.

E. Adjusting Pad Pressure

The pad pressure may be adjusted by moving the wheels:

- Forward to reduce weight on the buffer pad
or
- Backward to increase the weight

This adjustment may be required to adjust to different floor finishes or to the weight variance of aluminum or steel propane tanks.

GX270/GX390 Tuneup

Valve clearance	IN: 0.15 ± 0.02 mm (cold)
	EX: 0.20 ± 0.02 mm (cold)

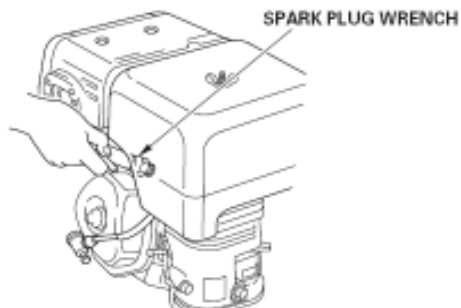
SPARK PLUG SERVICE

Recommended spark plugs: BPR6ES (NGK)
W20EPR-U (DENSO)

NOTICE

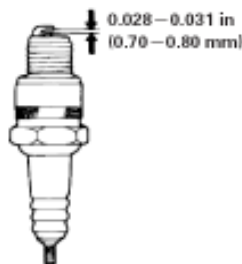
An incorrect spark plug can cause engine damage.

1. Disconnect the spark plug cap, and remove any dirt from around the spark plug area.
2. Remove the spark plug with a 13/16-inch spark plug wrench.



3. Inspect the spark plug. Replace it if the electrodes are worn, or if the insulator is cracked or chipped. Clean the spark plug with a wire brush if you are going to reuse it.

4. Measure the spark plug electrode gap with a suitable gauge. The gap should be 0.028–0.031 in (0.70–0.80 mm). Correct the gap, if necessary, by carefully bending the side electrode.



5. Install the spark plug carefully, by hand, to avoid cross-threading.

6. After the spark plug seats, tighten with a 13/16-inch spark plug wrench to compress the washer.

If reinstalling the used spark plug, tighten 1/8–1/4 turn after the spark plug seats.

If installing a new spark plug, tighten 1/2 turn after the spark plug seats.

NOTICE

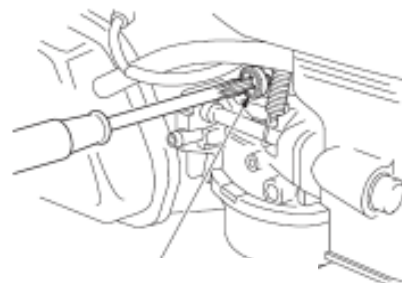
A loose spark plug can overheat and damage the engine. Overtightening the spark plug can damage the threads in the cylinder head.

7. Attach the spark plug cap.

IDLE SPEED ADJUSTMENT

1. Start the engine outdoors, and allow it to warm up to operating temperature.
2. Move the throttle lever to its slowest position.
3. Turn the throttle stop screw to obtain the standard idle speed.

Standard idle speed: 1,400 $\pm$ 200 rpm



Quick Reference Information

Fuel	Type	LPG with a propane content of 95 % or higher
Engine Oil	Type	SAE 30, API SJ, for general use
	Capacity	1.16 US qt (1.10 l)
Spark Plug	Type	NGK: BPR6ES , DENSO: W20EPR-U
	Gap	0.028–0.031 in (0.70–0.80 mm)
Carburetor	Idle speed	1,400 $\pm$ 200 rpm
Maintenance	Before each use	Check engine oil level. Check air filter.
	First 20 hours	Change engine oil.
	Subsequent	Refer to the maintenance

ENGINE OIL CHANGE

Drain the used oil while the engine is warm. Warm oil drains quickly and completely.

1. Place a suitable container below the engine to catch the used oil, then remove the filler cap/dipstick and the drain plug.
2. Allow the used oil to drain completely, then reinstall the drain plug, and tighten it securely.

Please dispose of used motor oil in a manner that is compatible with the environment. We suggest you take used oil in a sealed container to your local recycling center or service station for reclamation. Do not throw it in the trash, pour it on the ground, or down a drain.

3. With the engine in a level position, fill to the outer edge of the oil filler hole with the recommended oil.

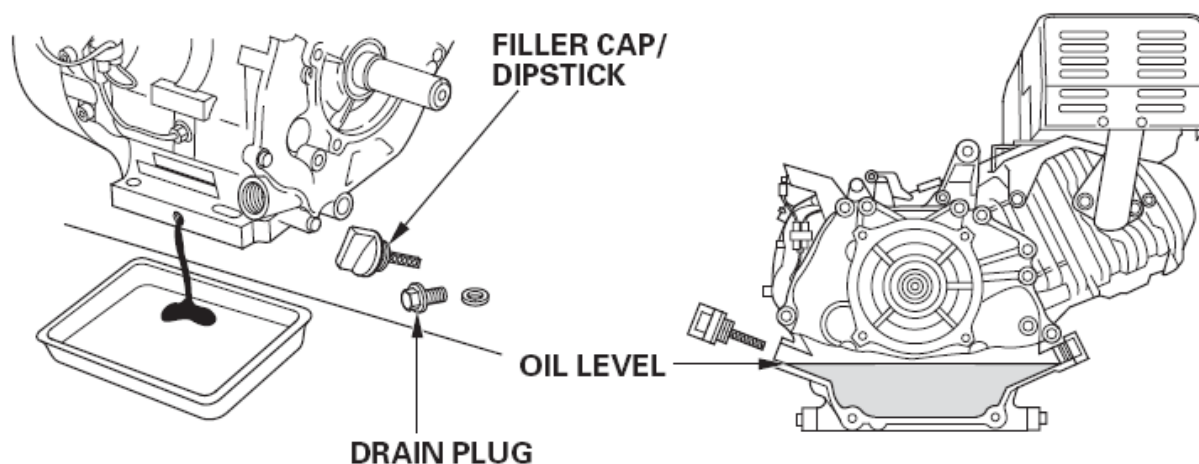
Engine oil capacity: 1.16 US qt (1.10 ℓ)

NOTICE

Running the engine with a low oil level can cause engine damage.

The Oil Alert® system (applicable engine types) will automatically stop the engine before the oil level falls below the safe limit. However, to avoid the inconvenience of an unexpected shutdown, fill to the upper limit, and check the oil level regularly.

4. Screw in the filler cap/dipstick securely.



ENGINE OIL RECOMMENDATIONS

Oil is a major factor affecting performance and service life. Use 4-stroke automotive detergent oil that is designed for engines operating on LPG.

SAE 30 (API service classification SJ) is recommended for general use. The following are examples of oils that meet Honda's requirements for LPG-fueled engines:

- Pennzoil HD 30
- Valvoline HPO 30
- Castrol HD 30

For operation in temperatures below 32°F (0°C), 5W-30 synthetic oil may be used for easier starting. Do not use 5W-30 synthetic oil when the air temperature is above 32°F (0°C).

NOTICE

Do not use multigrade mineral-based oils. The use of multigrade mineral-based oils may result in premature engine wear and/or damage.

Engine Troubleshooting

ENGINE WILL NOT START	Possible Cause	Correction
1. Check control positions.	Fuel valve OFF.	OPEN valve.
	Choke OPEN.	Move lever to CLOSED.
	Engine switch OFF.	Turn engine switch to ON.
2. Check fuel.	Out of fuel.	Refuel.
3. Remove and inspect spark plug.	Spark plug faulty, fouled, or improperly gapped.	Clean, gap, or replace spark plug.
	Spark plug wet with fuel (flooded engine).	Dry and reinstall spark plug. Start engine with throttle lever in FAST position.
4. Take engine to an authorized Honda servicing dealer, or refer to shop manual.	Carburetor malfunction, ignition malfunction, valves stuck, etc.	Replace or repair faulty components as necessary.

ENGINE LACKS POWER	Possible Cause	Correction
1. Check air filter.	Filter element(s) clogged.	Clean or replace filter element(s).
2. Take engine to an authorized Honda servicing dealer, or refer to shop manual.	Carburetor malfunction, ignition malfunction, valves stuck, etc.	Replace or repair faulty components as necessary.

MAINTENANCE SCHEDULE

REGULAR SERVICE PERIOD (3) ITEM Perform at every indicated month or operating hour interval, whichever comes first.			Each use	First month or 20 Hrs.	Every 3 months or 50 Hrs.	Every 6 months or 100 Hrs.	Every year or 200 Hrs.
•	Engine oil (LPG model)	Check level	○				
		Change		○	○		
	Reduction gear oil (Equipped model)	Check level	○				
		Change		○		○	
•	Air filter	Check	○				
		Clean			○ (1)		
		Replace					○ (*)
•	Sediment cup	Clean				○	
•	Spark plug	Check-adjust				○	
		Replace					○
	Spark arrester (optional parts)	Clean				○	
•	Idle speed	Check-adjust					○ (2)
•	Valve clearance	Check-adjust					○ (2)
•	Combustion chamber	Clean	After every 250 Hrs (2)				
•	Fuel tube (LPG model)	Check	○				
•	Fuel tube	Check	Every 2 years (Replace if necessary) (2)				

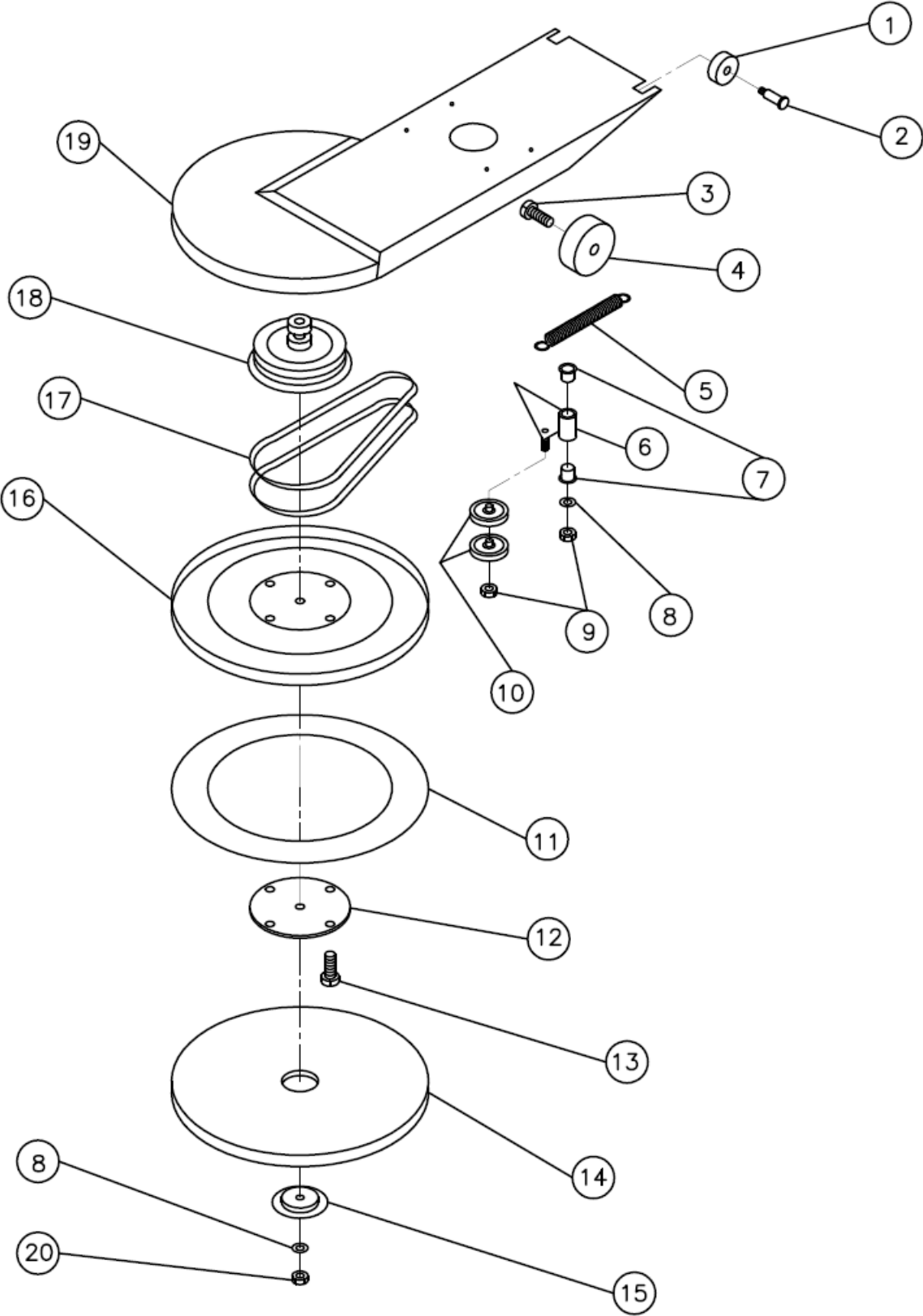
- Emission-related items.

(*) Replace the paper element type only.

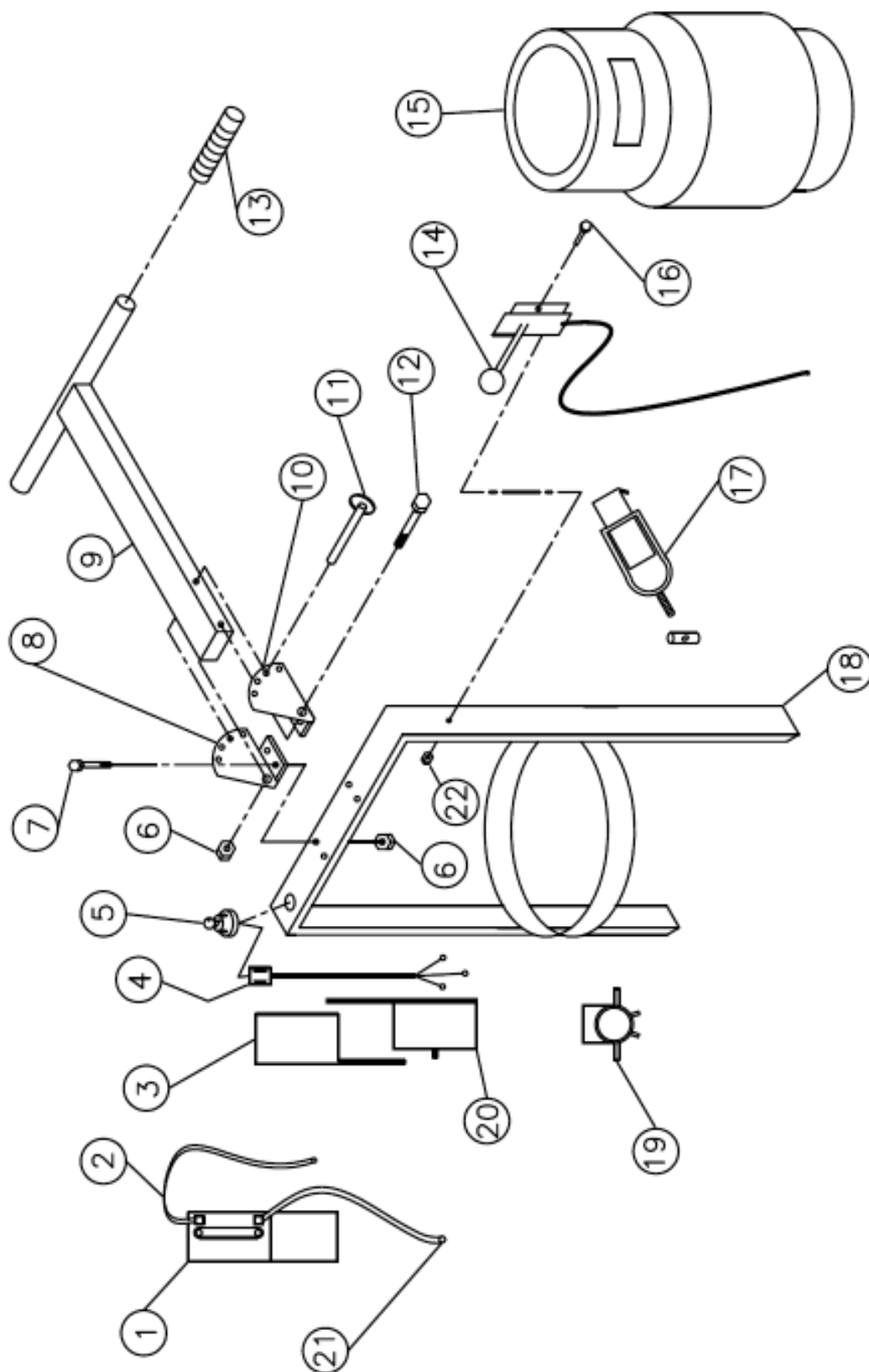
(1) Service more frequently when used in dusty areas.

(2) These items should be serviced by your servicing dealer, unless you have the proper tools and are mechanically proficient. Refer to Honda shop manual for service procedures.

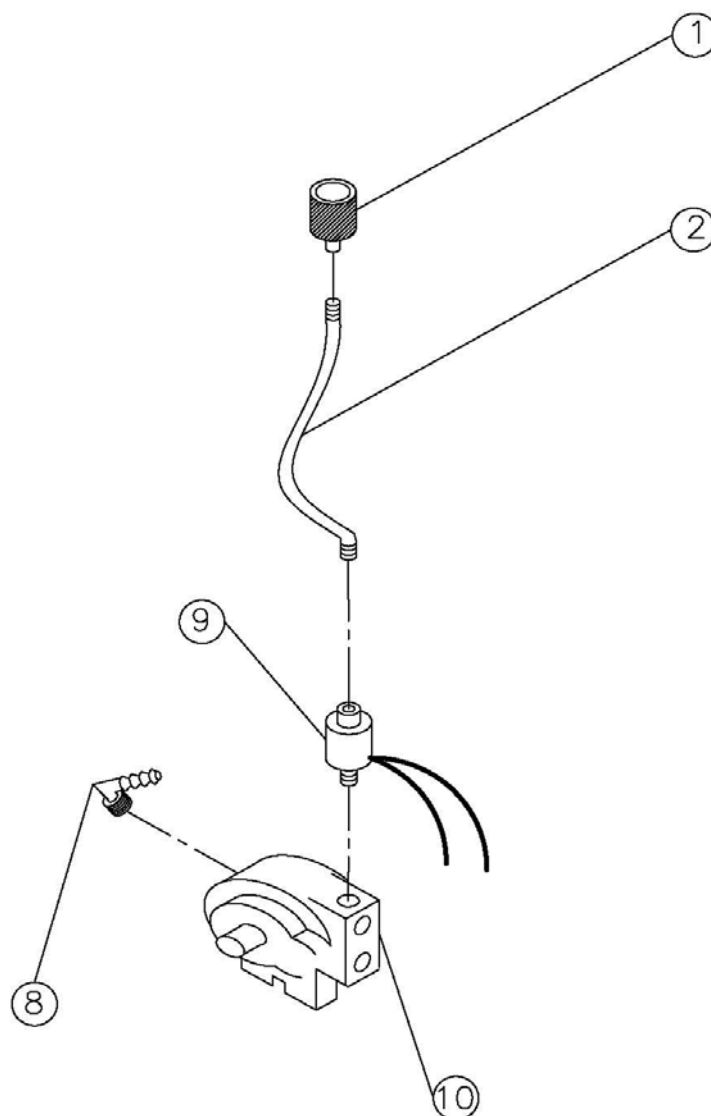
(3) For commercial use, log hours of operation to determine proper maintenance intervals.



PARTS LIST FOR 28" BUFFER BODY ASSEMBLY			
ITEM	PART NUMBER	DESCRIPTION	QTY
1	271120	POLYWHEEL	2
2	271121	1 3/4" SHOULDER BOLT	2
3	271054	BOLT 3/8-16 X 2	2
4	271060	5" WHEEL	2
5	271122	TENSION SPRING	1
6	271123	BELT TENSION IDLER	1
7	271124	NYLON BUSHINGS	2
8	271125	5/16 FLAT WASHER	2
9	271126	3/8-16 HEX NUT	2
10	271118	BELT TENSION PULLEY	2
11	271092	28" MIGHTY	1
12	271127	WASHER PLATE	1
13	271128	3/8-16 X 3/4" BOLT	4
14	REF ONLY	28" BEIGE PAD	1
15	271129	DRAWN CUP	1
16	271116	PAD DRIVER	1
17	271117	BELT	2
18	271130	DRIVESHAFT	1
19	271119	BODY FRAME	1
20	271100	3/8-16 STOVER LOK NUT	1

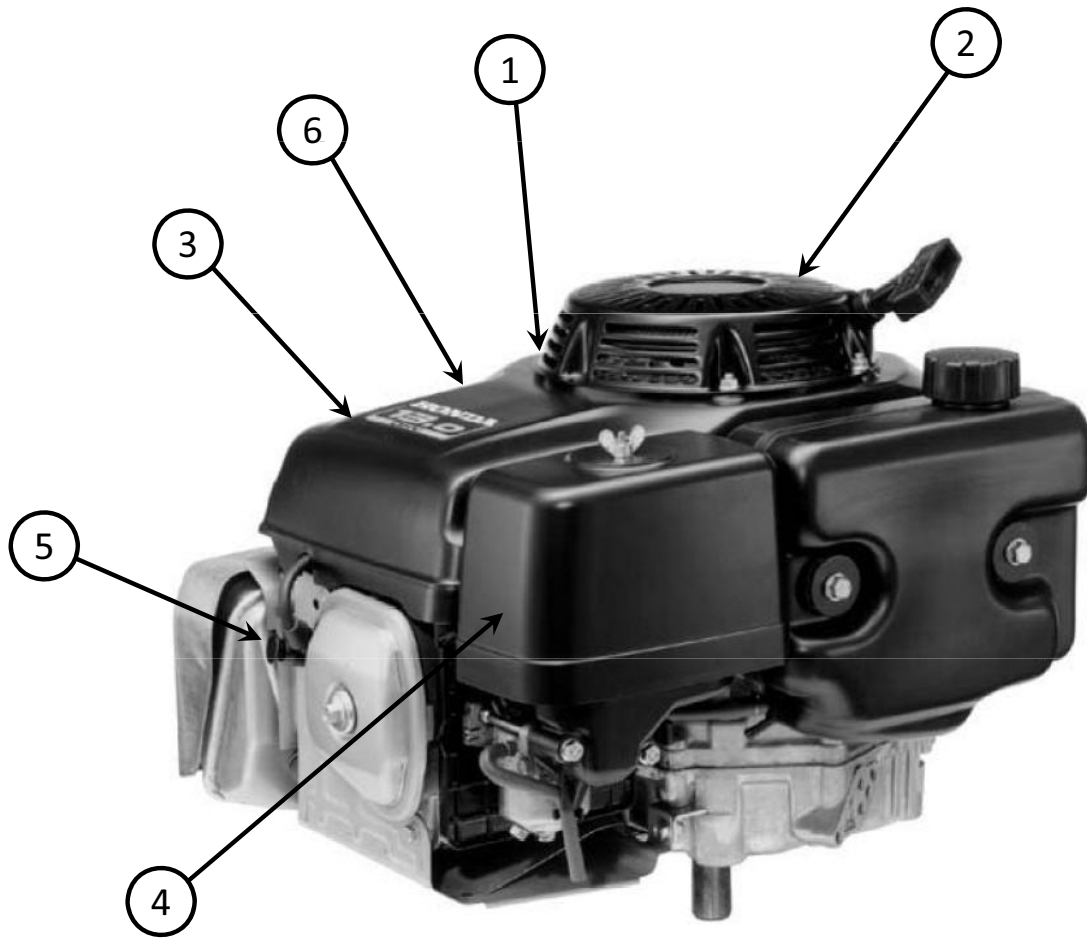


PARTS LIST FOR BUFFER HANDLE ASSEMBLY			
ITEM	PART NUMBER	DESCRIPTION	QTY
1	REF ONLY	12V BATTERY (NOT ALL MODELS)	1
2	271030	(-) BATTERY CABLE 26"	1
3	REF ONLY	BATTERY BOX TOP COVER (NOT ALL MODELS)	1
4	REF ONLY	WIRE HARNESS (NOT ALL MODELS)	1
5	REF ONLY	KEYSWITCH (NOT ALL MODELS)	1
6	271100	3/8-16 STOVER LOK NUT	5
7	271073	3/8-16 X 1" HEX BOLT	4
8	271072	RIGHT HANDLE BRACKET	1
9	271070	T-HANDLE	1
10	271071	LEFT HANDLE BRACKET	1
11	271080	LOCK PIN	1
12	271074	3/8-16 X 3" HEX BOLT	1
13	271101	HANDLE GRIP	2
14	271011	THROTTLE CABLE	1
15	271076	20# LP CYLINDER	1
16	271012	1/4-20 X 1 1/2" HEX BOLT	1
17	271115	TOGGLE & NUT	1
18	271113	HANDLE FRAME	1
19	REF ONLY	STARTER SOLENOID (NOT ALL MODELS)	1
20	REF ONLY	BATTERY BOX BOTTOM COVER (NOT ALL MODELS)	1
21	REF ONLY	(+) BATTERY CABLE 16.5" (NOT ALL MODELS)	1



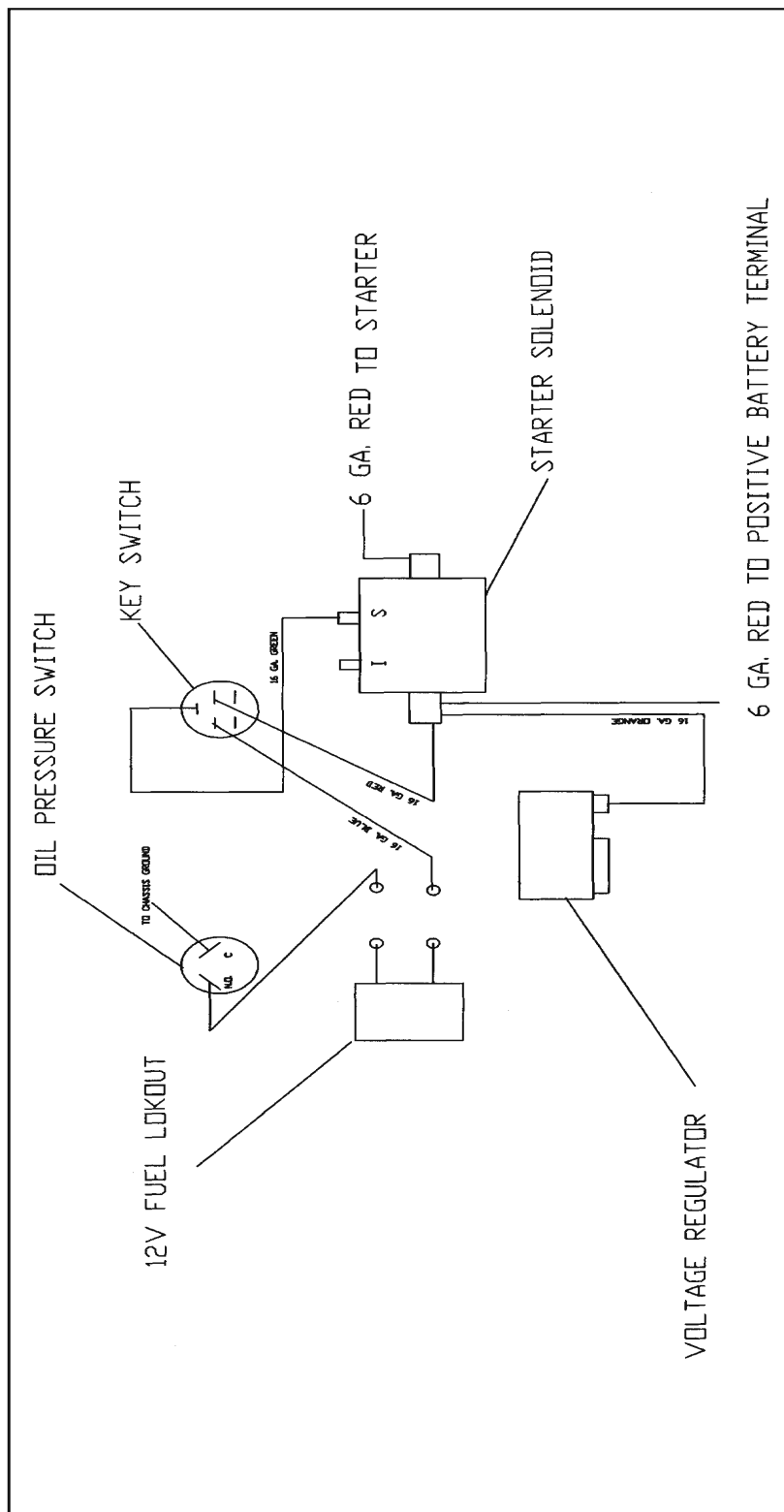
12 VOLT START MODELS

PARTS LIST FOR BUFFER FUEL SYSTEM			
ITEM	PART NUMBER	DESCRIPTION	QTY
1	271043	QUICKCOUPLER	1
2	271042	LPG HOSE 14"	1
8	271044	FUEL HOSE FITTING	1
9	REF ONLY	FUEL LOK-OUT (12VOLT) (NOT ALL MODELS)	1
10	271131	FUEL REGULATOR(T60-E)	1



GXV390K1

HONDA 13HP ENGINE			
ITEM	PART NUMBER	DESCRIPTION	QTY
1	271106	OIL FILTER (NOT SHOWN)	1
2	271109	FOAM BAND (PULL START)	1
2A	271110	FOAM HAT (NON-PULL START) (NOT SHOWN)	1
3	271108	IGNITION COIL (NOT SHOWN - UNDER COVER)	1
4	271107	AIR/PRE-FILTER	1
5	271105	SPARK PLUG	1
6	271111	110 VOLT STARTER (NOT SHOWN)	1



Minuteman International Made Simple Commercial Limited Warranty
REVISION E
EFFECTIVE 1/1/2009

Minuteman International, Inc. warrants to the original purchaser/user that the product is free from defects in workmanship and materials under normal use. Minuteman will, at its option, repair or replace without charge, parts that fail under normal use and service when operated and maintained in accordance with the applicable operation and instruction manuals. All warranty claims must be submitted through and approved by factory authorized repair stations.

This warranty does not apply to normal wear, or to items whose life is dependent on their use and care, such as belts, cords, switches, hoses, rubber parts, electrical motor components or adjustments. Parts manufactured by Minuteman are covered by and subject to the warranties and/or guarantees of their manufacturers. Please contact Minuteman for procedures in warranty claims against these manufacturers.

Special warning to purchaser -- Use of replacement filters and/or prefilters not manufactured by Minuteman or its designated licensees, will void all warranties expressed or implied. A potential health hazard exists without original equipment replacement.

All warranted items become the sole property of Minuteman or its original manufacturer, whichever the case may be.

Minuteman disclaims any implied warranty, including the warranty of merchantability and the warranty of fitness for a particular purpose. Minuteman assumes no responsibility for any special, incidental or consequential damages.

This limited warranty is applicable only in the U.S.A. and Canada, and is extended only to the original user/purchaser of this product. Customers outside the U.S.A. and Canada should contact their local distributor for export warranty policies. Minuteman is not responsible for costs or repairs performed by persons other than those specifically authorized by Minuteman. This warranty does not apply to damage from transportation, alterations by unauthorized persons, misuse or abuse of the equipment, use of non-compatible chemicals, or damage to property, or loss of income due to malfunctions of the product.

If a difficulty develops with this machine, you should contact the dealer from whom it was purchased.

This warranty gives you specific legal rights, and you may have other rights which vary from state to state. Some states do not allow the exclusion or limitation of special, incidental or consequential damages, or limitations on how long an implied warranty lasts, so the above exclusions and limitations may not apply to you.

Cord Electric Group..... Three years parts, two years labor, ninety days travel (Not to exceed two hours)

Exceptions..... Port-A-Scrub, one year parts, six months labor
MPV 13, one year parts
V Series Upright Vacuums, One year parts, one year labor
MPV 14 and 18, two years parts, one year labor
RapidAir blower, one year parts, one year labor
Explosion-Proof Vacuum, one year parts, one year labor
X12 and X12H, one year parts, one year labor
TRS 14, one year parts, one year labor
E17/E20 electric scrubbers, one year parts, six months labor

Battery Operated Group..... Three years parts, two years labor, ninety days travel
(Not to exceed two hours)

Exceptions..... Sweepers, one year parts, one year labor, ninety days travel
(Not to exceed two hours)

Internal Combustion Group....One year parts, one year labor, ninety day travel
(Not to exceed two hours)

Exceptions.....Mirage propane burnisher, one year parts, one year labor

Battery Chargers.....One year replacement

Replacement Parts.....Ninety days

Batteries.....0-3 months replacement, 4-12 months pro-rate

Polypropylene Plastic Tanks... Ten years, no additional labor