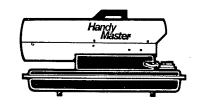
# Handy Master



**MODEL HM28** 

## OWNER'S OPERATING, MAINTENANCE AND SERVICE MANUAL WITH PARTS LIST



#### AMCA INTERNATIONAL

CONSUMER & AUTOMOTIVE PRODUCTS DIVISION 2701 INDUSTRIAL DRIVE BOWLING GREEN, KY 42101

## **Safety Requirements**

IMPORTANT: READ AND UNDERSTAND OWNER'S MANUAL BEFORE START-ING OR SERVICING!

IMPROPER USE OF THIS HEATER CAN RESULT IN SERIOUS BODILY INJURY DUE TO HAZARDS OF FIRE OR EXPLOSION, CARBON MONOXIDE POISONING, BURN, AND ELECTRICAL SHOCK.

NEVER USE GASOLINE, NAPHTHA, PAINT-THINNERS, ALCOHOL OR OTHER VOLATILE FUELS!

USE ONLY IN AREAS FREE OF FLAMMABLE VAPOR OR HIGH DUST CONTENT. NEVER USE HEATER WHERE GASOLINE, PAINT THINNER OR OTHER HIGHLY FLAMMABLE VAPORS ARE PRESENT.

USE ONLY IN WELL VENTILATED ROOMS. PROVIDE VENTILATION OF AT LEAST ONE (1) SQUARE FOOT.

NEVER ATTACH DUCT WORK TO FRONT OF HEATER.

USE ONLY WITH ELECTRICAL VOLTAGE AND FREQUENCY SPECIFIED ON MODEL PLATE.

USE ONLY A PROPERLY GROUNDED THREE-WIRE EXTENSION CORD.

MAKE SURE HOT AIR OUTLET IS AT LEAST FIVE (5) FEET FROM COMBUSTIBLE MATERIALS.

FOR BEST RESULTS, USE ONLY KEROSENE OR NO. 1 FUEL OIL.

UNPLUG HEATER BEFORE FILLING FUEL TANK.

HEATER MUST BE LEVEL WHILE HOT OR OPERATING, OR A FIRE MAY OCCUR.

DO NOT MOVE, HANDLE OR SERVICE A HOT OR OPERATING HEATER.

WHEN USED WITH THERMOSTAT, HEATER MAY START ANYTIME!

KEEP CHILDREN AWAY FROM HEATER AT ALL TIMES. <u>NEVER LEAVE</u> A HEATER PLUGGED IN WITHOUT AN ADULT PRESENT IF CHILDREN OR ANIMALS ARE LIKELY TO BE PRESENT.

NEVER USE HEATER WHILE SLEEPING.

STORE IN A LEVEL POSITION WHEN FILLED OR FUEL LEAKAGE MAY OCCUR.

USE ONLY IN ACCORDANCE WITH LOCAL ORDINANCES AND CODES.

Safety requirements and model plate data comply with AMERICAN NATIONAL STANDARD INSTITUTE, INC. Safety Requirements: ANSI A10.10-1970.

## TABLE OF CONTENTS

Congratulations – You have just purchased one of the finest oil-fired heaters on the market today. Your HandyMaster heater has been designed and engineered to provide you with years of warm comfort. You will need to read this manual carefully before using your HandyMaster heater.

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## **UNPACKING**

- 1. Remove all protective material which may have been applied to the heater for shipment.
- 2. Remove the heater from the carton.
- Check the heater for possible shipping damage, if any damage is found, IMMEDIATELY notify the dealer where you purchased the heater.

## **VENTILATION**

WARNING: USE ONLY IN WELL VENTILATED AREAS.

FRESH AIR OPENING REQUIREMENTS

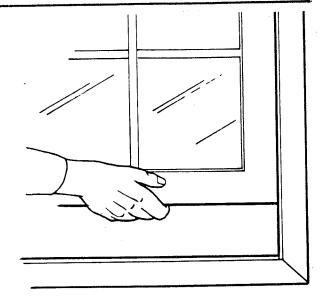
HEATER SIZE

SOUARE FOOT OPENING

28,000 BTU

1.0

Note: If more than one heater is being used provide additional fresh air.



### **FUELS**

- 1. Use only kerosene or #1 fuel oil.
- Never use gasoline, naptha, paint thinners, alcohol or other volatile fuels.
- Use of #2 fuel oil or #2 diesel oil may result in:
  - More frequent clogging of fuel filter and nozzle.
  - b. The formation of carbon on the spark plug.

Do not allow your spark plug to get a carbon buildup on the electrodes.

Carbon deposits on the spark plug can cause interrupted starting and raw fuel emission from the heater.  $\,$ 

#### FUEL SOURCE

FUELS CAN BE PURCHASED AT YOUR LOCAL GASOLINE SERVICE STATION OR LOOK IN THE TELEPHONE DIRECTORY UNDER "KEROSENE" TO FIND ANOTHER SOURCE.

## SPECIFICATIONS

Output Rating (BTU Per Hour)
Fuel
Fuel Tank Capacity (U. S. Gallons)
Fuel Consumption (Approx. U. S. Gal. Per Hr.)
Electric Requirements
Amperage
Motor RPM
Hot Air Output (Approx. CFM)
Air Pump Pressure (PSI)
Shipping Weight (Approx. Lbs.)
Heater Weight Without Fuel (Approx. Lbs.)

28,000 Use Only Kerosene or #1 Fuel Oil 2.25 0.24 120 Volt 60 Hz 2.5 1740 100 3 32 28

### **OPERATION**

#### THEORY OF OPERATION

There are four basic systems within the heater. The fuel system, the air system, the ignition system, and the flame-out control system.

An air pump on one end of the motor shaft forces air through the air tube and out of the burner nozzle. The moving air creates a pressure differential in the burner head causing fuel to be drawn from the tank. The fuel and air mix is sprayed into the combustion chamber in a fine mist.

Additional air is supplied to the combustion chamber by a fan on the opposite end of the motor shaft. Ports around the burner head allow a portion of the air being moved by the fan to enter the combustion chamber to support combustion. The remaining air is directed around and over the combustion chamber. This air mixes with the heated air from the combustion chamber and is ejected as a jet of clean, heated air.

The ignition system consists of a transformer and a spark plug. The transformer creates a spark between the electrodes of the spark plug and ignites the fuel and air mixture within the combustion chamber. The spark plug fires constantly during operation.

A light sensitive (photo) cell detects the flame. If the flame should fail, the photocell causes the safety control to automatically trip the circuit breaker, thereby causing the heater to shut down.

#### STARTING PROCEDURE

- Fill fuel tank with correct fuel. See charts on fuel.
- The heater has a short power cord; use an extension cord of at least six (6) feet long.
- Make sure the front, hot air outlet, is at least five (5) feet from any flammable materials.
- 4. Check reset button to be sure it is pushed in.
- Heater will start when plugged in. Outlet must be grounded.

### **STORAGE**

WARNING: Always unplug heater before servicing.

Store heater in a dry location, free of corrosive fumes and dust.

FUEL TANK

Flush tank with clean fuel before storing. Drain all fuel from tank.

#### AIR FILTERS

Remove and clean or replace filters if necessary.

#### SPARK PLUG

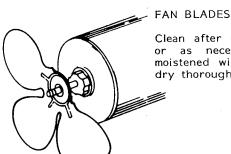
Clean and adjust spark plug, or replace if necessary.

### **MAINTENANCE**

**WARNING:** 

Always unplug heater before

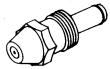
servicing.



Clean after every 500 hours of operation or as necessary. Use a soft cloth moistened with kerosene or solvent, then dry thoroughly.

#### NOZZLE

Clean at least once during heater season. Remove burner head. Use a socket wrench to remove nozzle. Blow through the face (outlet) end ONLY. IMPORTANT: Protect nozzle face from damage while out of the heater.



#### SPARK PLUG

After every 300 hours of operation, clean and adjust spark plug electrodes. Adjust gap or replace spark plug as required. Spark plug gap: .05 inches.



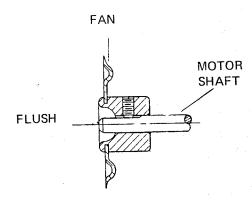


#### ADJUSTMENT OF PUMP PRESSURE

- Remove the plug from the air filter housing and install the pressure gauge, HA1180.
- To adjust the pump pressure, turn the pressure relief valve in to raise, out to lower.
- After adjustment, remove the gauge and replace the plug.

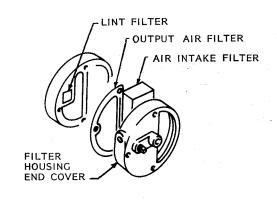
#### CAUTION

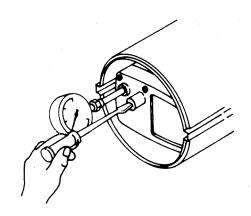
When removing the motor from the heater, always remove the fan first. The weight of the motor resting on the fan could damage the fan pitch. When replacing the fan on the motor shaft, place the fan hub flush with the motor shaft as shown.



#### AIR FILTERS

Check frequently for dust film. To clean, remove the filter from housing, wash with mild detergent and dry thoroughly before replacing. Replace once each season. IMPORTANT: Do Not oil the filter elements.





## **TROUBLESHOOTING**

SYMPTOM	POSSIBLE CAUSE	CORRECTIVE ACTION
	Electrical -	Froubles
Motor does not start; thermostat (if used) is set to call for heat.	<ol> <li>No power or low voltage at heater.</li> </ol>	1a. Be sure power is reaching heater; check condition of heater cord. Repair or replace.
		<ul> <li>b. Use extension cord with wires heavy enough to carry the electrical load of the heater.</li> <li>c. Be sure voltage at outlet is same as shown on heater instruction plate.</li> </ul>
	2. Damaged motor.	2. Check motor. Replace damaged motor.
	3. Thermostat damaged (if used).	3. Replace. Not a serviceable part.
	Mechanical 1	roubles
	Fan obstructed by mechanical damage or dirt.	<ul><li>1a. Check for bent outer shell.</li><li>b. Check for damaged fan; replace if damaged.</li></ul>
		<ul><li>c. Check for damaged motor mount; replace if damaged.</li><li>d. Check for tight pump; replace if damaged.</li></ul>
	Fuel System	Troubles
Heater will not ignite, but motor runs for a short time.	1. Fuel tank empty, water in fuel, wrong fuel.	<ul> <li>1a. Add fuel to tank.</li> <li>b. Check for water in tank; clean tank and fuel filter if water is found (water in the tank will form globules in the bottom which you can see).</li> <li>c. Add fresh, clean fuel to tank.</li> </ul>
	2. Fuel filter clogged.	2. Remove and wash in clean fuel. Blow dry and replace.
	3. Nozzle plugged or damaged.	<ul><li>3a. Clean by blowing compressed air through nozzle from outlet end of nozzle.</li><li>b. Replace nozzle if cleaning does not solve the problem.</li></ul>
	4. Extremely low temperature may cause fuel to thicken and not flow.	4. Use a non toxic anti-icer such as "Heet", "Methanol Alcohol", or "Frostex."
	5. Dirty air filters.	5. Be sure air filters are clean.
	6. Air leak at fuel filter.	<ol> <li>Check fuel filter for air leaks and for tightness of fit where it is connected to fuel line.</li> </ol>

## **TROUBLESHOOTING**

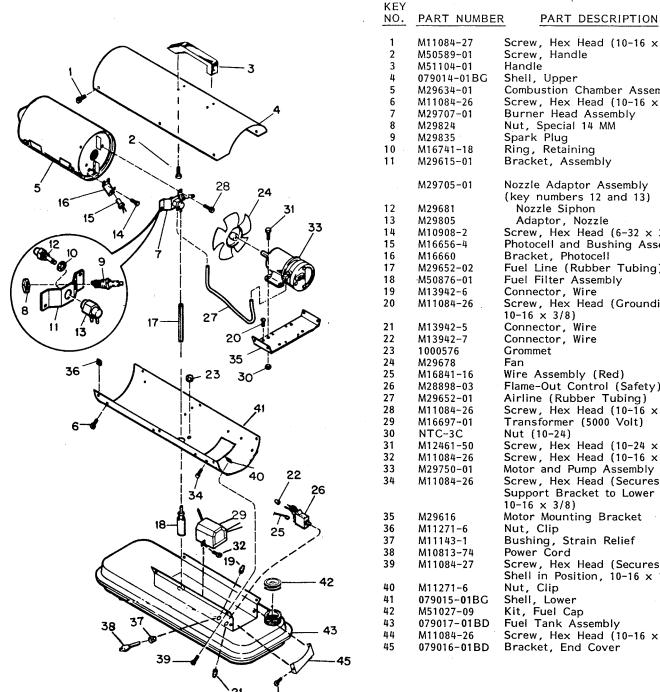
SYMPTOM		POSSIBLE CAUSE	CORRECTIVE ACTION
	Ignition Troubles		
(Continued)			CAUTION: Disconnect heater cord!
Heater will not ignite, but motor runs for a short time.	1.	Spark plug wire disconnected from plug.	1. Check to be sure wire is tight.
	2.	Damaged spark plug (wrong gap, plug wet with fuel or electrodes carboned, or plug damaged).	<ul> <li>2a. Gap between electrodes should be .05" or about thickness of a dime. Adjust electrode gap b. Inspect plug for worn or eroder electrodes.</li> <li>c. Replace a damaged spark plug</li> </ul>
	3.	Damaged transformer.	CAUTION: High Voltage 3. Connect heater cord. Disconne spark plug wire and chec transformer for spark; replacif no spark can be obtained
			Fuel-Air Enough Fuel)
Heater burns, but puffs of smoke can be seen; heater will not burn steady; heater burns with odor; heater smokes continuously.	1.	Heater running out of fuel; water condensation in fuel tank; wrong fuel.	<ul> <li>1a. Shut heater off; check fue tank. If you can see globule of water in the bottom, drai and flush the tank and filte with clean fuel.</li> <li>b. Add fresh, clean fuel to tank</li> </ul>
	2.	Dirty air filters causing reduced air flow through nozzle, resulting in low fuel flow.	<ol> <li>Remove and clean the a filters. Be sure air intake not blocked.</li> </ol>
	3.	Fuel filter loose, dirty or connection loose.	<ul><li>3a. Remove and wash fuel filter in clean fuel.</li><li>b. Check condition of connection between fuel line and burners.</li><li>c. Replace with new fuel line</li></ul>
	4.	Dirty nozzle.	4a. Remove and clean the burne
			head.  b. Blow compressed air throug nozzle from outlet end. Neve use a drill, wire, or other tool to open a nozzle passage
	5.	Fan blade.	<ol> <li>Check for excessive di accumulation on fan blade which could be causing motor to slo down.</li> </ol>
	6.	Loose air output line connections between filter housing and burner.	6. Be sure connections are tigh
	7.	Rubber sleeve on shank of nozzle is leaking (remote possibility).	7. If heater puffs intermittently replace the rubber sleet (handle parts carefully prevent damage, assemble the carefully to preservairtightness).

## **TROUBLESHOOTING**

SYMPTOM	POSSIBLE CAUSE	CORRECTIVE ACTION
	Improper Fuel- (Too much fuel, or for amount of fuel	not enough air
Flames come out front of heater.	<ol> <li>Dirty fan, or air passageway through heater blocked by dirt or trash.</li> </ol>	Clean the fan. Be sure the air passageway through the heater is clean. Keep the heater
	<ol><li>Fan loose or improperly located on shaft.</li></ol>	clean. 2. Check fan; tighten or reposition.
	3. Bent or damaged fan.	3. Replace. Do not attempt repair of fan.
	4. High pump pressure.	4. Check pressure.
	Electrical Sys	tem Troubles
Heater cycles intermittently.	Damaged electrical supply or damaged connections.	1a. Be sure extension cord and heater service cord are in good condition, without intermittent
		open circuits.  b. Check mechanical and electrical soundness of all wiring connections in the heater and service cord.
Heater ignites, but button of safety control circuit breaker pops out anyway.	1. Dirty photocell.	Check to see if glass face of cell is so dirty it cannot "see" the flame; clean glass if
	2. Damaged photocell.	dirty. 2. Replace photocell.
	3. Damaged safety control. 4. Damaged electrical connections through photocell and safety control.	<ol> <li>Replace safety control.</li> <li>Be sure all solder joints and wiring connections are secure. Check wiring diagram.</li> </ol>
Safety control circuit breaker fails to trip when a no-flame condition exists.	1. Damaged circuit breaker.	1. Replace circuit breaker.
	2. Safety control dirty or damaged.	2. Replace safety control.
	3. Photocell electrical leads shorted.	<ol> <li>Check photocell leads for shorted leads. Replace photocell if damaged.</li> </ol>
Button on safety control circuit breaker will not stay in when	Resetting is tried too soon     after the breaker trips.	1. Wait five (5) minutes and try again.
pressed.	2. Damaged circuit breaker.	2. Replace circuit breaker.

## PARTS - MODEL HM28

This list contains replaceable parts used in your heater. When ordering parts, be sure to provide the correct model and assembly numbers (from the nameplate decal), then the part number and description of the desired part.



HEATER	EXPL	ODED.	VIEW
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1 2 3 4 5 6 7 8 9	M11084-27 M50589-01 M51104-01 079014-01BG M29634-01 M11084-26 M29707-01 M29824 M29835 M16741-18	Screw, Hex Head (10-16 x 1/2) Screw, Handle Handle Shell, Upper Combustion Chamber Assembly Screw, Hex Head (10-16 x 3/8) Burner Head Assembly Nut, Special 14 MM Spark Plug Ring, Retaining	6 2 1 1 1 4 1 1 1
11	M29615-01	Bracket, Assembly	1
	M29705-01	Nozzle Adaptor Assembly (key numbers 12 and 13)	
12	M29681	Nozzle Siphon	1
13	M29805	Adaptor, Nozzle	1
14	M10908-2	Screw, Hex Head $(6-32 \times 3/8)$	2
15	M16656-4	Photocell and Bushing Assembly	1
16	M16660	Bracket, Photocell	1
17	M29652-02	Fuel Line (Rubber Tubing)	1
18	M50876-01	Fuel Filter Assembly	1
19	M13942-6	Connector, Wire	1
20	M11084-26	Screw, Hex Head (Grounding, 10-16 x 3/8)	1
21	M13942-5	Connector, Wire	1
22	M13942-7	Connector, Wire	1
23	1000576	Grommet	2
24	M29678	Fan	1
25	M16841-16	Wire Assembly (Red)	1
26	M28898-03	Flame-Out Control (Safety)	1
27	M29652-01	Airline (Rubber Tubing)	1.
28	M11084-26	Screw, Hex Head (10-16 x 3/8)	2
29	M16697-01	Transformer (5000 Volt)	1
30	NTC-3C	Nut (10-24)	4
31	M12461-50	Screw, Hex Head $(10-24 \times 3/8)$	4
32	M11084-26	Screw, Hex Head $(10-16 \times 3/8)$	2
33	M29750-01	Motor and Pump Assembly	1
34	M11084-26	Screw, Hex Head (Secures Motor Support Bracket to Lower Shell, 10-16 x 3/8)	4
35	M29616	Motor Mounting Bracket	1
36	M11271-6	Nut, Clip	6
37	M11143-1	Bushing, Strain Relief	1
38	M10813-74	Power Cord	1.
39	M11084-27	Screw, Hex Head (Secures Lower	. 4
		Shell in Position, $10-16 \times 1/2$ )	
40	M11271-6	Nut, Clip	4
41	079015-01BG	Shell, Lower	1
42	M51027-09	Kit, Fuel Cap	1
43	079017-01BD	Fuel Tank Assembly	1
44	M11084-26	Screw, Hex Head $(10-16 \times 3/8)$	2
0.0	07001C 01DD	Decolor Fuel Course	•

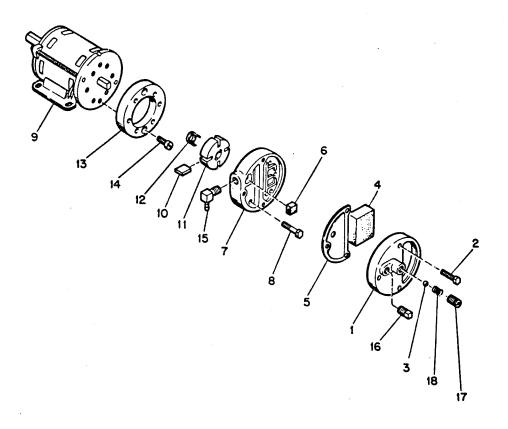
QTY

#### PARTS AVAILABLE--NOT SHOWN

1	078949-01	Decal, Tradename
2	078949-02	Decal, Tradename
3	M30728	Decal, Wiring Diagram
4	M50011	Decal, Spark Plug
5	079039-01	Decal, Warning
6	079018-01	Decal, Information

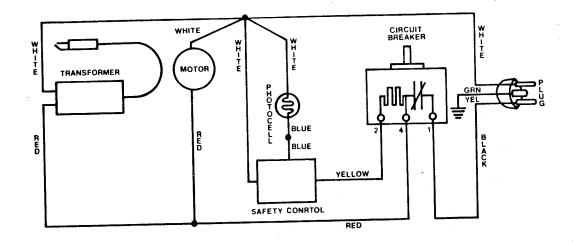
### **PARTS**

KEY NO.	PART NUMBER	PART DESCRIPTION	QTY
	M29750-01	MOTOR AND PUMP ASSEMBLY	
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16	M29609 M12461-31 M8940 M29633 M29612-01 M29632 M29608 M12461-31 M29780-01 M8643 M22456-1 M22009 M8645 FHPF3-4C M50016 M22997	Filter End Cover Screw, Hex Head (10-32 x 1) Ball, Steel (1/4 Dia) Intake Air Filter Output Filter Assembly Lint Filter Pump End Cover Screw, Hex Head (10-32 x 1) Motor (120 V, 60 Hz) Blade Rotor, Pump Insert, Rotor Pump Body Screw, Fillister Head (10-32 x 1/2) Elbow, 90° Plug, Pipe Screw, Pressure Adjustment	1 3 1 1 1 1 6 1 4 1 1 1 2 1
18	M10993-1	Spring, Pressure Relief	1



MOTOR AND PUMP ASSEMBLY EXPLODED VIEW

## WIRING DIAGRAM

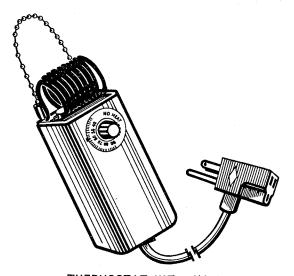




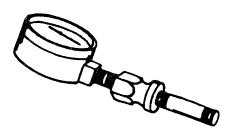
WHEELS AND HANDLE KIT - HA1181

Makes heater even more portable and convenient.

Easy to assemble.



THERMOSTAT KIT - HA1200 Keeps your building at the temperature you select day and night.



AIR GAUGE KIT - HA1180 Special tool to check air pressure.

#### **OWNER'S REGISTRATION**

Model	Serial No	·	
Customer Name			
Address			
Date Purchased	Phone No. ()_		
This Will Be Used: On Farm_		onstruction Site	For Rental
Age of Purchaser: 30 or less_	31 to 4041 to	50 51 to 60_	61 & over
	Female		
	100 to \$30,000\$30,00	0 or more	,000 to \$24,000
Where Do You Live? City	Suburb Rural		
What Influenced You To Purch	ase Your Heater?		
TV Ad Magazine Ad Price Warranty	Local Newspaper Feature or Featur	Ad	
Other			
What Price Did You Pay For Y	our Heater? \$		
Store Name:			
Store Address:			State
Type of Store: Department	Hardware Discount _ _ Other(specify)	Farm Hom	ne Center

#### **KEEP THIS WARRANTY**

1odel		
Serial No.		
)ate Purchase	1	
	Cill is show information for your own regard	

ALWAYS SPECIFY MODEL AND SERIAL NUMBERS WHEN COMMUNICATING WITH THE FACTORY.

WE RESERVE THE RIGHT TO AMEND THESE SPECIFICATIONS AT ANY TIME WITHOUT NOTICE. THE ONLY WARRANTY APPLICABLE IS OUR STANDARD WRITTEN WARRANTY. WE MAKE NO OTHER WARRANTY, EXPRESSED OR IMPLIED.

#### LIMITED SIX MONTH WARRANTY (U.S.A.)

AMCA International, warrants this product of be free from defects in materials and workmanship for six months from the date of first purchase when operated and maintained in accordance with instructions.

This warranty covers only the cost of parts and labor required to restore this heater to proper operating condition. Transportation and incidental costs associated with warranty repairs are not reimbursable under this warranty.

Warranty service is available only from authorized dealers or service centers.

This warranty does not cover repairs necessary due to normal wear, misuse, accidents, or lack of proper maintenance. Regular routine maintenance is the responsibility of the owner.

AMCA International assumes no responsibility for indirect, incidental or consequential damages. Some states do not allow the exclusion or limitation of incidental and consequential damages so the above may not apply to you.

THIS EXPRESS WARRANTY IS GIVEN IN LIEU OF ANY OTHER WARRANTY EITHER EXPRESS OR IMPLIED, INCLUDING WARRANTIES OR MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

This warranty gives you specific legal rights and you may have other rights which vary from state to state.

For information, write: AMCA International, P.O. Box 719, Bowling Green, Kentucky 42101
Attention: Customer Service Dept.



BUSINESS REPLY CARD

No Postage Stamp Necessary If Mailed In The United States



CONSUMER AND AUTOMOTIVE PRODUCTS DIVISION 2701 INDUSTRIAL DRIVE BOWLING GREEN, KY 42101

FIRST CLASS