Clarke®

POWER WASH

HOT WASHER

MODEL NO: KING 145

PART NO: 7320165

OPERATION & MAINTENANCE INSTRUCTIONS

CE

LS1009

INTRODUCTION

Thank you for purchasing this CLARKE Hot Washer.

This machine is a portable, high pressure power washer, designed for DIY and light commercial use only.

It comprises an electric motor, a pump, a high pressure hose with a trigger and lance, and an adaptor for injecting foam or cleaning agents into the water jet. Additionally, a burner is incorporated to provide hot water when required for hot washing.

Before attempting to use this product, please read this manual thoroughly and follow the instructions carefully. In doing so you will ensure the safety of yourself and that of others around you, and you can look forward to your purchase giving you long and satisfactory service.

GUARANTEE

This product is guaranteed against faulty manufacture for a period of 12 months from the date of purchase. Please keep your receipt which will be required as proof of purchase.

This guarantee is invalid if the product is found to have been abused or tampered with in any way, or not used for the purpose for which it was intended.

Faulty goods should be returned to their place of purchase, no product can be returned to us without prior permission.

This guarantee does not effect your statutory rights.

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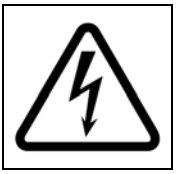
GENERAL SAFETY RULES

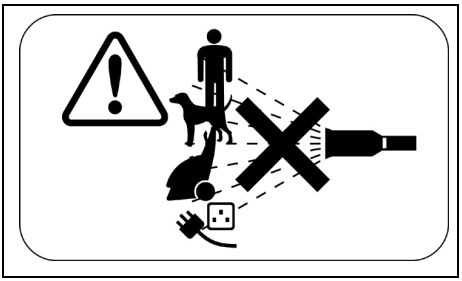
WARNING: Water at high pressure can be dangerous and can cause damage to persons or property if the operator is careless. Never allow anyone to operate this equipment unless they are thoroughly reliable, and familiar with the safety precautions.

1. It is important to read all parts of this operator's manual carefully before using the power washer.
2. **NEVER** direct the spray towards any person or animal.
3. **NEVER** direct the spray towards electrical wiring or equipment.
4. **NEVER** hold your finger over the high pressure nozzle.
5. **ALWAYS** remember that the exhaust, exhaust gases and the metal lance can get very hot during use.
6. **NEVER** allow children to use this machine.
7. **NEVER** operate the machine with any of the covers removed.
8. **NEVER** attempt any repairs to this machine. Always refer to a qualified service agent.
9. **NEVER** supply any liquid other than water to the water inlet.
10. **NEVER** use the detergent bottle to spray solvents, e.g. paint thinners, petrol, oil etc.
11. **ALWAYS** release any residual pressure in the system by turning off the water supply and operating the trigger before disconnecting any hose or accessory.
12. **NEVER** disconnect the plug by pulling on the power supply cable, and never move the power washer by pulling on the high pressure hose.
13. **ALWAYS** keep the machine itself dry and well clear of water spray.
14. **ALWAYS** wear protective clothing and safety glasses. Loose particles and other debris may be propelled at high speed by the water jet.
15. **ALWAYS** grip the gun firmly before pressing the trigger, expect the gun to 'kick' when starting.
16. **ALWAYS** respect the requirements of the local water company. Power washers may only be connected to the mains drinking water supply, if a backflow preventer valve is installed in the supply hose.
17. When not in use, **ALWAYS** disconnect from the water supply, and ensure the system is completely drained. Store in a cool dry location.

SAFETY SYMBOLS

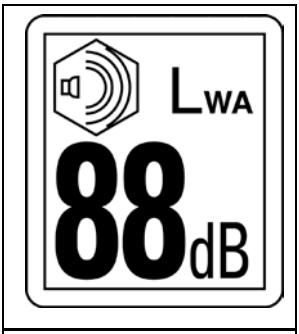


WARNING: Risk of electrocution.



NEVER direct spray at persons or animals.

NEVER direct spray toward any electrical device or electrical outlet.



Guaranteed sound power level .

WARNING: Hot surface / Exhaust gasses.

ELECTRICAL CONNECTIONS

WARNING! Read these electrical safety instructions thoroughly before connecting the product to the mains supply.

Before switching the product on, make sure that the voltage of your electricity supply is the same as that indicated on the rating plate. This product is designed to operate on 230VAC 50Hz. Connecting it to any other power supply may cause damage.

This product may be fitted with a non-rewireable plug. If it is necessary to change the fuse in the plug, the fuse cover must be refitted. If the fuse cover becomes lost or damaged, the plug must not be used until a suitable replacement is obtained.

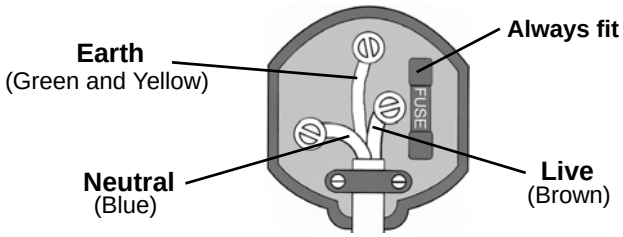
If the plug has to be changed because it is not suitable for your socket, or due to damage, it should be cut off and a replacement fitted, following the wiring instructions shown below. The old plug must be disposed of safely, as insertion into a mains socket could cause an electrical hazard.

WARNING! The wires in the power cable of this product are coloured in accordance with the following code:
Blue = Neutral Brown = Live Yellow and Green = Earth

If the colours of the wires in the power cable of this product do not correspond with the markings on the terminals of your plug, proceed as follows.

- The wire which is coloured **Blue** must be connected to the terminal which is marked **N** or coloured **Black**.
- The wire which is coloured **Brown** must be connected to the terminal which is marked **L** or coloured **Red**.
- The wire which is coloured **Yellow and Green** must be connected to the terminal which is marked **E** or ⏚ or coloured **Green**.

Plug must be BS1363/A approved.



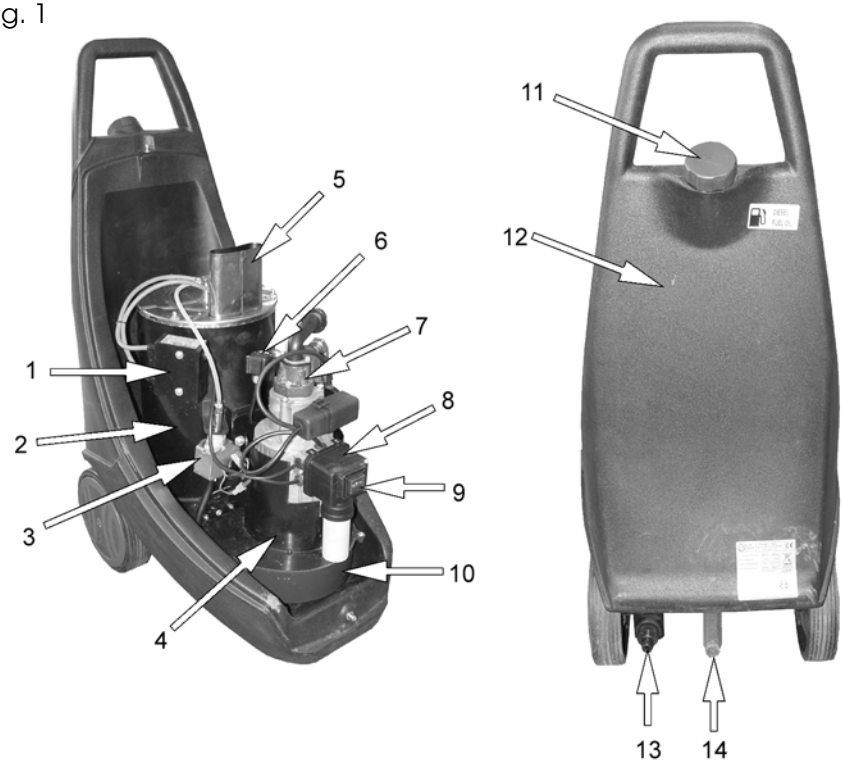
Ensure that the outer sheath of the cable is firmly held by the clamp

We strongly recommend that this machine is connected to the mains supply via a Residual Current Device (RCD)

If in any doubt, consult a qualified electrician. DO NOT attempt any repairs yourself.

OVERVIEW

Fig. 1



NO	DESCRIPTION	NO	DESCRIPTION
1	Transformer	8	Electrical system box
2	Boiler	9	Hot / Cold selector switch
3	Fuel delivery pump	10	Cooling fan
4	Electric motor	11	Diesel tank cap
5	Exhaust vent	12	Diesel tank
6	Pressure switch	13	Water inlet
7	High pressure water pump	14	Pressurised water outlet

UNPACKING

Unpack your power washer and check to ensure the following items are present.

Contact your Clarke dealer immediately if any parts are missing or damaged.

- Hose
- Gun/lance
- Detergent bottle

ASSEMBLY

On first use or after a long period out of use, connect only the water intake hose for a few minutes, in order to flush any dirt out of the high pressure hose outlet.

ELECTRICAL CONNECTION

Check that the mains voltage is the same as the voltage on the data plate. Check that the mains system is earthed and is fitted with a RCD Circuit breaker.

FILLING UP WITH FUEL

1. Remove the fuel cap.
2. Fill the tank with Diesel as shown in Fig 2.
   - Refuel carefully to avoid spilling fuel.
   - Do not overfill.
3. Replace the fuel cap and tighten securely.

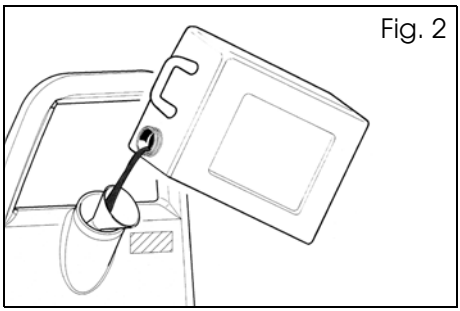


Fig. 2

WARNING: ALWAYS REFUEL IN A WELL VENTILATED AREA AWAY FROM ANY HEAT SOURCES.

WARNING: LET THE POWER WASHER COOL DOWN BEFORE REFUELLING.

WARNING: DO NOT LEAVE FUEL WITHIN THE REACH OF CHILDREN.

WATER SUPPLY CONNECTION

1. Connect the water supply hose (1) to the inlet connection (2). See Fig. 3.

NOTE: A reinforced hose with inside diameter of at least 10 mm should always be used.

NOTE: The water supply flow rate must be at least 6.1 l/min. and the inlet temperature must not exceed 40 °C.

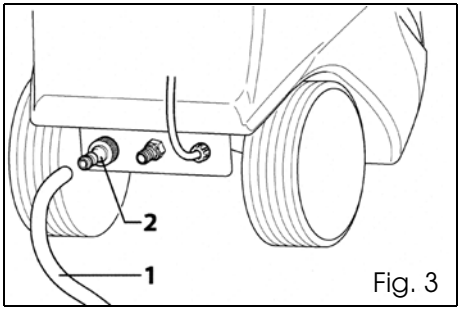


Fig. 3

THE HIGH PRESSURE HOSE

1. Connect one end of the high pressure hose (3) to the gun (4). See Fig. 4.
2. Connect the other end of the high pressure hose to the outlet (5), tightening firmly.

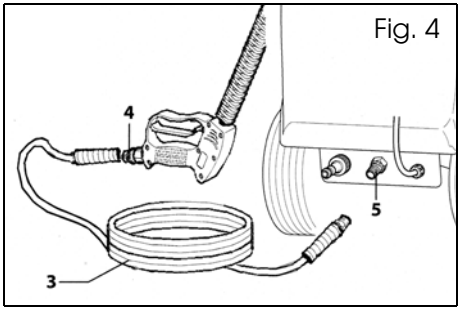


Fig. 4

FITTING THE LANCE

1. Take hold of the gun (1) in one hand and fit the lance (2) on to the gun as shown in Fig. 5.
2. Tighten the collar (3) to secure. See Fig. 5.

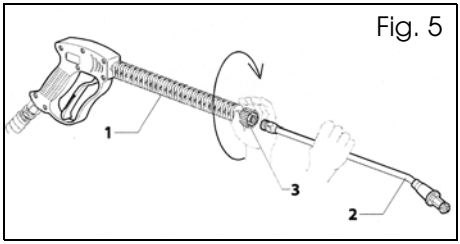


Fig. 5

USING YOUR POWER WASHER

- Stand on a stable surface and grip gun/spray wand firmly with both hands.
- Do not allow vehicles to drive over the hoses.
- Never obstruct the exhaust in any way.

COLD WATER OPERATION

1. Turn on the water supply tap to supply water to the power washer.

WARNING: FAILURE TO TURN ON THE WATER WILL CAUSE DAMAGE TO THE HOT WASHER

2. Set the Hot / Cold selector switch **(I / 0/II)** to **(I) to** start the power washer operating with cold water. See Fig. 6.
   - Pump will start

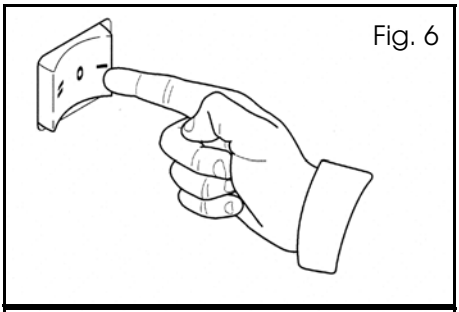


Fig. 6

3. Take hold of the lance and press the trigger (A) as shown in Fig. 7.
   - Expect the gun to kick when the trigger is pulled.
   - Check that the water jet is strong and continuous; otherwise, remove the nozzle, clean it and put it back in place.
4. Release trigger to stop water flow.

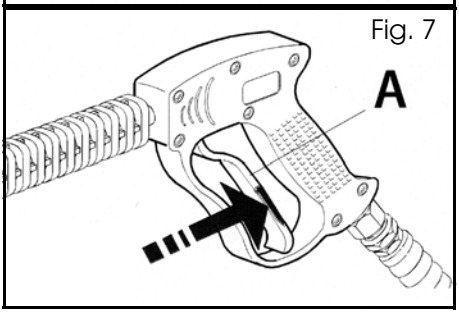


Fig. 7

NOTE: The power washer will then automatically go into bypass mode.

WARNING: DO NOT ALLOW THE POWER WASHER TO OPERATE IN BYPASS MODE FOR MORE THAN 5 MINUTES. OVERHEATING CAN CAUSE DAMAGE TO PUMP.

HOT WATER OPERATION

1. Turn on the water supply tap to supply water to the power washer.

WARNING: FAILURE TO TURN ON THE WATER COULD CAUSE DAMAGE TO THE PUMP.

2. Set the Hot / Cold selector switch **(I / 0/II)** to **(II)**, to start the power washer operating with hot water. See Fig. 8.
   - Pump will start

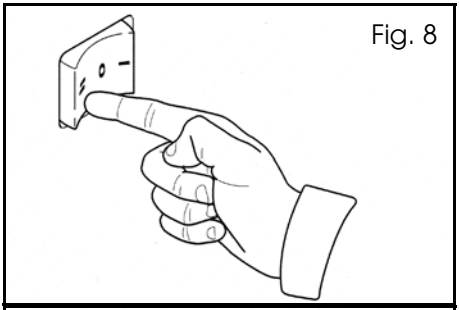


Fig. 8

3. Take hold of the lance and pull the trigger (A) as shown in Fig. 9
   - Expect the gun to kick when the trigger is pulled.
   - Check that the water jet is strong and continuous; otherwise, remove the nozzle, clean it and put it back in place.
4. Wait a few moments to allow the water to heat up.
5. Release trigger to stop water flow.

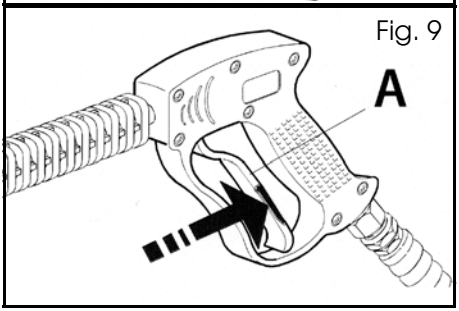


Fig. 9

NOTE: The power washer will then automatically go into bypass mode.

WARNING: DO NOT ALLOW THE POWER WASHER TO OPERATE IN BYPASS MODE FOR MORE THAN 5 MINUTES. OVERHEATING CAN CAUSE DAMAGE TO PUMP.

STOPPING THE POWER WASHER

1. Release the gun trigger (A) Fig. 10
2. Set the Hot / Cold selector switch **(I / 0/II)** to **(0)**, to stop the power washer
3. When the power washer has stopped, pull the trigger (A) a few times to discharge any residual pressure left in the hose.
4. Engage the safety catch (B) of the gun trigger. See Fig. 11.

Fig. 10

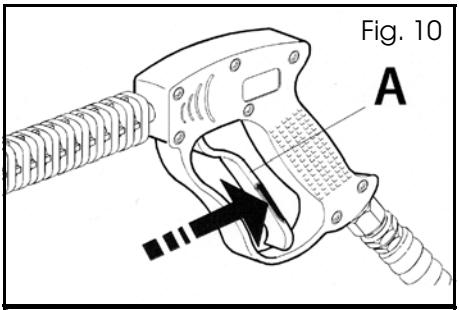
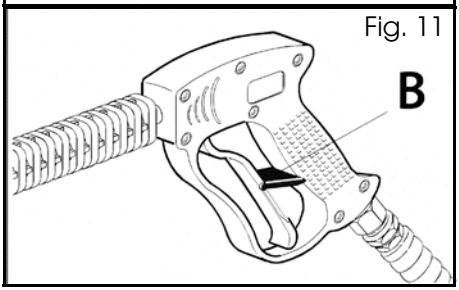


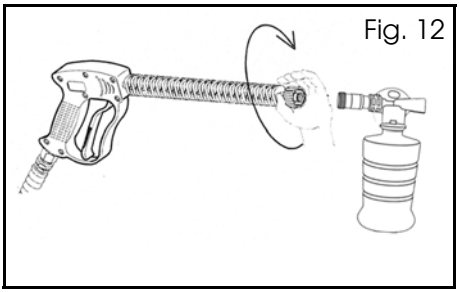
Fig. 11



APPLYING CHEMICALS AND CLEANING AGENTS

1. Take hold of the gun in one hand.
2. Fill the detergent bottle with suitable power washer detergent available from your Clarke dealer.
3. Fit the detergent bottle onto the gun as shown in Fig. 12
4. Tighten the collar to secure.
5. After use, rinse the detergent bottle thouroughly.

Fig. 12



SHUTTING DOWN

1. Place the three-position switch to **(0)** to turn the power washer off.

   NOTE: NEVER turn the water off with the pump running.
2. Turn water supply off.
3. Pull trigger on spray gun to relieve any water pressure.
4. See page 13. in this manual for proper storage procedures.

STORAGE

1. Drain all water from the hose and gun by holding the gun/lance vertically with the nozzle pointing down and pulling the trigger.
2. Engage the gun safety catch and coil up the electricity supply cable and the high pressure hose to prevent damage.
3. Store the power washer in a place where it is protected from frost and the risk of unauthorized use.

MAINTENANCE

CLEANING THE INSIDE OF THE HEATING COIL (FIG.13)

The coil must be cleaned periodically, at intervals depending on the hardness of the water supply being used.

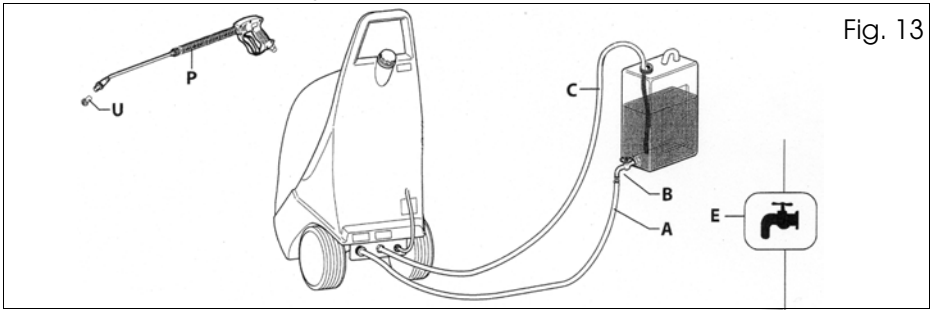


Fig. 13

1. Dilute 1 kg of de-scaler, with 10-15 litres of cold water into a container.
2. Connect the inlet hose (A) to the tap (B) of the container. See fig. 13.
3. Place the end of the high pressure hose (C) in the container.
4. Operate the power washer for about 20 minutes on cold setting.
5. After cleaning, disconnect the hose (A) from the tap (B) and connect it to the mains water tap (E). See fig. 13.
6. Remove the end of the high pressure hose (C) from the container and connect it to the gun (P). See fig. 13.
7. Remove the nozzle (U) from the lance (P), turn on the mains water tap (E). Operate the power washer with the lance with no nozzle fitted until the water flowing from the hose runs clear.
8. Replace the nozzle (U) on the lance and dispose of the water in the container.

EVERY 2 WEEKS OR 50 WORKING HOURS

WARNING: BEFORE DOING ANY WORK ON THE POWER WASHER, DISCHARGE THE PRESSURE FROM THE HOSE AND DISCONNECT THE ELECTRICITY SUPPLY PLUG, REMOVE THE HOSE FROM THE TAP TO DISCONNECT THE WATER SUPPLY.

Check the filter in the water inlet connection (A) fig. 14.

CLEANING THE WATER INLET FILTER

This screen filter should be checked periodically and cleaned if necessary.

1. Remove filter from the water inlet as shown.
2. Clean filter by flushing from both sides with water.
3. Replace the filter into the water inlet.

Do not operate power washer without filter installed.

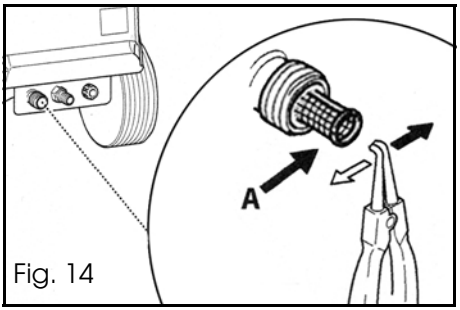


Fig. 14

EVERY 4 WEEKS OR 100 WORKING HOURS:

1. Unscrew the two screws indicated and lft off the outer cover.
2. Pull off the 2 spark plug leads.

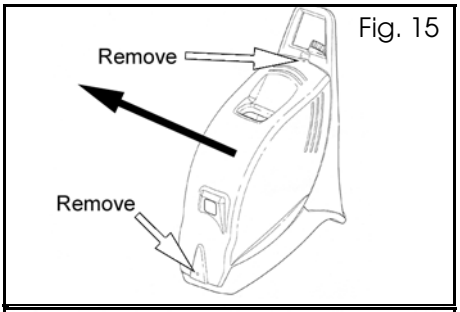


Fig. 15

3. Unscrew the three blind nuts shown and cadefully lift off the cover plate taking care not to damage the fuel pipe.
4. Check the gap between the electrodes.
   - The gap should be 3 mm.
   - Wipe the electrodes clean.
5. Reassembly is the reverse of the removal procedure .

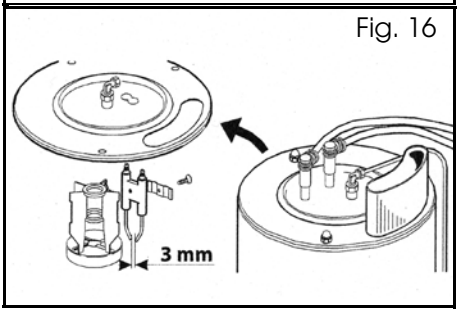


Fig. 16

EVERY 3 MONTHS OR 300 WORKING HOURS:

CHANGE THE FUEL FILTER AND FUEL PUMP FILTER.

(this operation must be carried out by CLARKE service engineers).

PARTS AND SERVICING

For Parts & Servicing, please contact your nearest dealer, or CLARKE International, on one of the following numbers.

PARTS & SERVICE TEL: 020 8988 7400
PARTS & SERVICE FAX: 020 8558 3622
or e-mail as follows:
PARTS: Parts@clarkeinternational.com
SERVICE: Service@clarkeinternational.com

TROUBLESHOOTING

If the following does not solve your problem, please contact the CLARKE service department. See page 15.

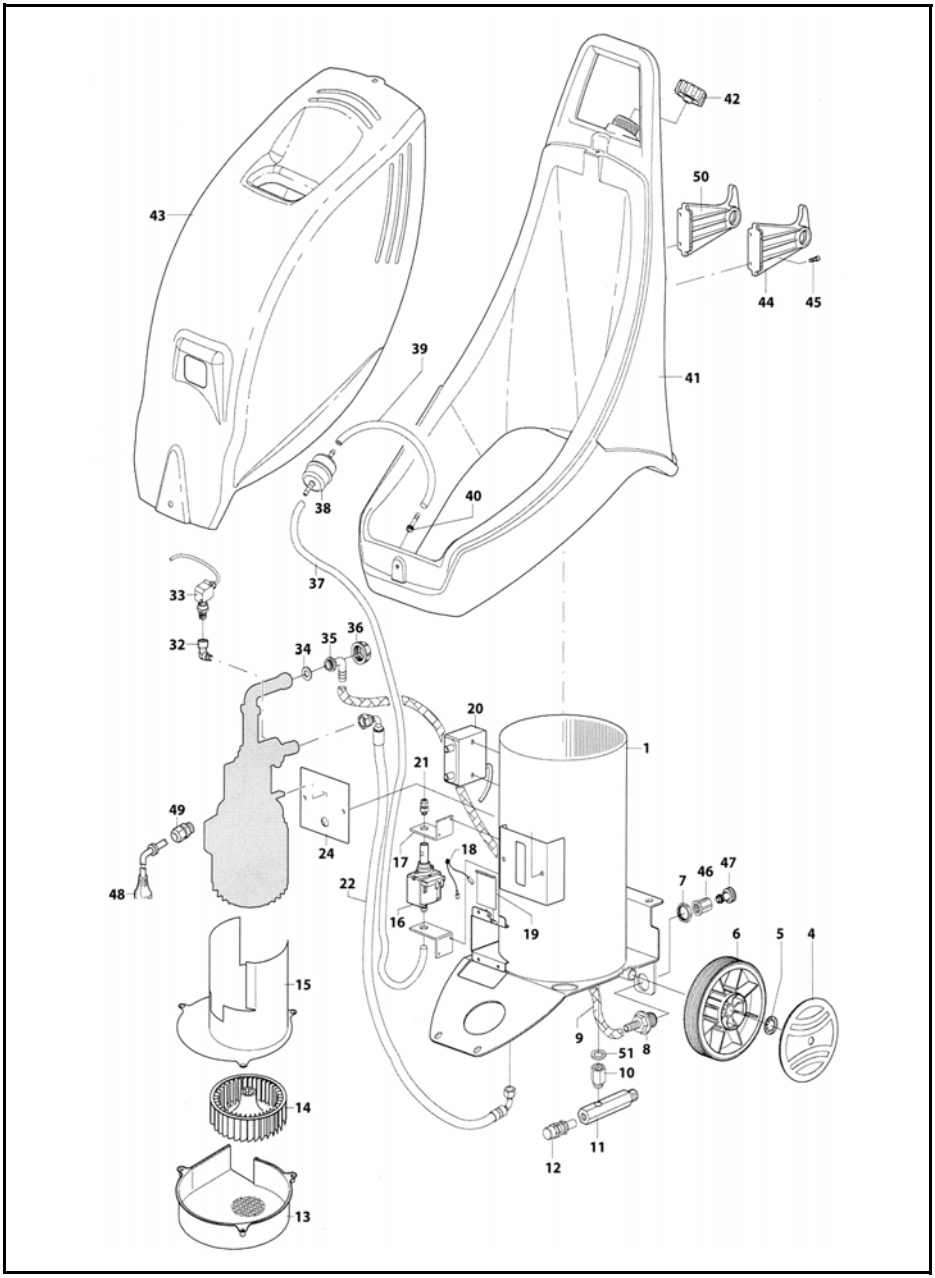
PROBLEM	CAUSE	SOLUTION
The pump turns but does not reach the required pressure.	The pump is sucking in air	Check that all pipes and hoses are secure
	Worn out valves	Replace the valves
	Worn out nozzle	Replace the water nozzle
	Worn out gaskets	Replace the gaskets
	Blocked/dirty water filter	Clean the water filter
Pressure fluctuates	Worn out suction and/or delivery valves	Replace the valves
	Foreign body caught in the valve	Check the valve and clean if needed
	Air being sucked in	Check that all pipes and hoses are secure
	Worn out gaskets	Replace the gaskets
Pressure drops	Worn out suction and/or delivery valves	Replace the valves
	Foreign body caught in the valve	Check the valve and clean if needed
	Air being sucked in	Check that all pipes and hoses are secure
	Worn out gaskets	Replace the gaskets
	Worn out water nozzle	Replace the nozzle
Water leaks from the piston head	Worn out piston	Replace the piston
	Casing side seal rings worn out	Replace the seal rings
	Worn out or dirty valves	Replace the valves
Insufficient water temperature	Scale build up on the heating coil	Clean (See page 13)
	Soot build up may be blocking the boiler	Clean
	Worn out nozzle	Replace the water nozzle

PROBLEM	CAUSE	SOLUTION
The boiler is producing excessive fumes	Presence of water in the fuel tank	Empty the fuel tank and refill with clean fuel.
	The starter electrodes are not positioned correctly	Check the distance of the electrodes
	The fuel nozzle is dirty	Clean the fuel nozzle
	The fuel nozzle has worn out	Replace the fuel nozzle
	The boiler coil is blocked	Clean the boiler coil
	The fuel pump is dirty	Clean the fuel pump
	The fuel valve is not working	Replace the fuel valve
The boiler switches itself off	The fuel tank is empty	Refill the fuel tank
	The filter on the fuel suction tube is dirty	Clean the fuel filter
	Presence of water in the fuel tank	Empty the fuel tank and refill with clean fuel.
	The transformer is broken	Replace the transformer
	The electrodes are not positioned correctly	Check the distance of the electrodes
	The fuel nozzle is dirty	Clean the fuel nozzle
	The fuel nozzle has worn out	Replace the fuel nozzle
	The fuel pump is damaged	Replace the fuel pump
	The fuel valve is damaged	Replace the fuel valve
Water is present in the pump oil	Casing side seal rings are worn out	Replace the seal ring
	Gaskets are worn out	Replace the gaskets
	Air being sucked in	Check that all pipes and hoses are secure
	Dirty water filter	Clean the water filter
	Insufficient water supply	Ensure the water supply can supply the minimum volume required
Noise	The springs on the suction and/or delivery valves are worn out or broken	Replace the valves
	Foreign body caught in the suction and/or delivery valves	Check the valve and clean if needed
	Worn out ball bearings	Replace the ball bearings
	Worn out gaskets	Replace the gaskets

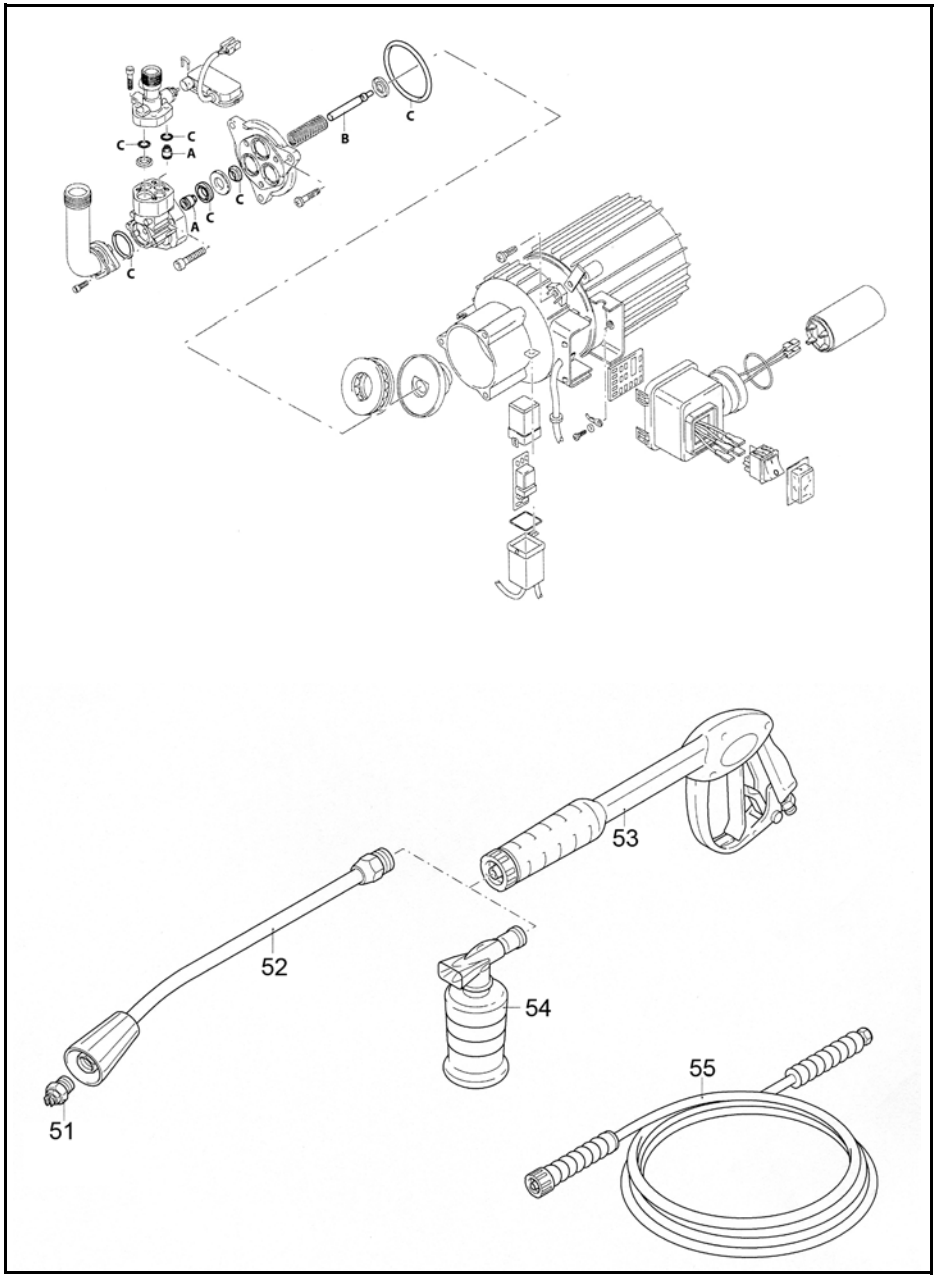
SPECIFICATIONS

	Motor Insulation	Class F
	Motor Protection	IPX5
	Voltage	230V 50Hz
	Power	1.8 kW
	Fuel Capacity (L)	12 Litres
Water supply		
	Max. feed temperature	40^{O}C
	Min. feed volume	6.1 l/m
Performance Data		
	Working pressure	90 Bar / 9 MPa
	Max. pump pressure	110 Bar / 11 MPa
	Max. water flow (l/min.)	6.1
	Max. water temperature	90^{O}C
	Guaranteed sound power level L_{WA} dB (A)	88
	Measured sound power level L_{PA} dB (A)	80
Dimensions		
	Length (mm)	400
	Width (mm)	610
	Height (mm)	940
	Hose length	10 m
	Weight (kg)	44

WATER SYSTEM DIAGRAM



KITS AND ACCESSORIES



PARTS LIST

NO	DESCRIPTION	PART NO	NO	DESCRIPTION	PART NO
1	Boiler	AR3162090	33	Pressure Switch	AR3162890
4	Red Wheel Cover	AR3163220	34	Gasket	AR3162300
5	Circlip	AR3162010	35	Fitting	AR3162310
6	Wheel	AR3160240	36	Ring Nut	AR3160490
7	Nut	AR2180740	37	Pipe	AR3162320
8	Hose Barb	AR3160150	38	Filter	AR3161520
9	Pipe	AR3160140	39	Pipe	AR3162330
10	Fitting	AR3160430	40	Fitting	AR3160340
11	Fitting	AR3162140	41	Frame/fuel Tank	AR3162340
12	Pressure Relief Valve	AR3160540	42	Fuel Cap	AR50933
13	Duct	AR3162150	43	Red Outer Cover	AR3163260
14	Fan	AR3162160	44	Right Bracket	AR3160010
15	Pump Housing	AR3162170	45	Screw	AR1681080
16	Fuel Pump	AR3162180	50	Left Bracket	AR3160020
17	Anti-vibration Mount	AR3162190	51	Nozzle	AR3729
18	Fuse	AR3162200	52	Lance	AR50690
19	Plate	AR3162210	53	Gun	AR40824
20	Transformer	AR50717	54	Detergent Bottle	AR40320
21	Inline Fitting	AR3162220	55	High Pressure Pipe	AR50689
22	Pipe	AR3162230	A	Kit A	ARKIT2574
24	Plate	AR3162250	B	Kit B	ARKIT2508
32	Elbow Fitting	AR3161220	C	Kit C	ARKIT42421

DECLARATION OF CONFORMITY

CE

Clarke®
INTERNATIONAL

Hemnall Street, Epping, Essex CM16 4LG

DECLARATION OF CONFORMITY

This is an important document and should be retained.

Product Description:	Hot Washer
Model number(s):	King145
Serial / batch Number:	N/A
Date of Issue:	01/06/2009
(Noise Conformity)	
Notified Body:	European Manufacturer
	(Contact details as below)
Technical Documentation Holder:	A R Pond
	Clarke International
	2a Shrubland Road
	London E10,7RB
	UK
Conformity Assessment Procedure:	to 2000/14/EC Annex VI
Manufacturer:	Clarke International
Noise Related Value:	366 l/h
Measured Sound Power Level:	81 dB
Guaranteed Sound Power Level:	88 dB

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DECLARATION OF CONFORMITY

CE

Clarke®
INTERNATIONAL

Hemnall Street, Epping, Essex CM16 4LG

DECLARATION OF CONFORMITY

This is an important document and should be retained.

We hereby declare that this product(s) complies with the following directive(s):

2004/108/EC	*Electromagnetic Compatibility Directive.*
2006/42/EC	*Machinery Directive.*
2006/95EC	*Low Voltage Equipment Directive*
2002/95/EC	*Restriction of Hazardous substances*
2000/14/EC	*Noise Emissions Directive (amended by 2005/88/EC).*

The following standards have been applied to the product(s):

EN 60335-1, EN60335-2-79, EN 55014-1, EN 55014-2, EN 61000-3-2, EN 61000-3-3, EN 61000-3-11, EN 60704-1,ISO 3744

The technical documentation required to demonstrate that the product(s) meet(s) the requirement(s) of the aforementioned directive(s) has been compiled and is available for inspection by the relevant enforcement authorities.

The CE mark was first applied in: 2008

Signed:

J.A. Clarke
Managing Director

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Clarke® INTERNATIONAL Hemnall Street, Epping, Essex CM16 4LG
www.clarkeinternational.com