

SEALEY POWER PRODUCTS

INSTRUCTIONS FOR: STARTER/CHARGER Model: **ElectroStart 500**

Thank you for purchasing a Sealey product. Manufactured to a high standard this product will, if used according to these instructions and properly maintained, give you years of trouble free performance.



IMPORTANT: PLEASE READ THESE INSTRUCTIONS CAREFULLY. NOTE THE SAFE OPERATIONAL REQUIREMENTS, WARNINGS & CAUTIONS. USE THE PRODUCT CORRECTLY AND WITH CARE FOR THE PURPOSE FOR WHICH IT IS INTENDED. FAILURE TO DO SO MAY CAUSE DAMAGE AND/OR PERSONAL INJURY AND WILL INVALIDATE THE WARRANTY. PLEASE KEEP INSTRUCTIONS SAFE FOR FUTURE USE.

1. SAFETY INSTRUCTIONS


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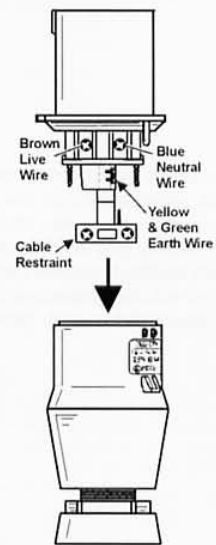
**FINAL
OFFICE DRAFT**

1.1. ELECTRICAL SAFETY

WARNING! It is the user's responsibility to read, understand and comply with the following:

You must check all electrical equipment and appliances to ensure that they are safe before using. You must inspect power supply leads, plugs and all electrical connections for wear and damage. You must ensure the risk of electric shock is minimised by the installation of appropriate safety devices. An RCCB (Residual Current Circuit Breaker) should be incorporated in the main distribution board. We also recommend that an RCD (Residual Current Device) is used with all electrical products. It is particularly important to use an RCD with portable products that are plugged into an electrical supply not protected by an RCCB. If in doubt consult a qualified electrician. You may obtain a Residual Current Device by contacting your Sealey dealer. **You must** also read and understand the following instructions concerning electrical safety.

- 1.1.1. The Electricity At Work Act 1989 requires all portable electrical appliances, if used on business premises, to be tested by a qualified electrician, using a Portable Appliance Tester (PAT), at least once a year.
- 1.1.2. The **Health & Safety at Work Act 1974** makes owners of electrical appliances responsible for the safe condition of the appliance and the safety of the appliance operator. **If in any doubt about electrical safety, contact a qualified electrician.**
- 1.1.3. Ensure that the insulation on all cables and the product itself is safe before connecting to the mains power supply. See 1.1.1. & 1.1.2. above and use a Portable Appliance Tester (PAT).
- 1.1.4. Ensure that cables are always protected against short circuit and overload.
- 1.1.5. Regularly inspect power supply leads and plugs for wear and damage and power connections to ensure that none is loose or damaged.
- 1.1.6. Important: Ensure the voltage marked on the product is the same as the electrical power supply to be used.
- 1.1.7. DO NOT pull or carry the powered appliance by its power supply lead.
- 1.1.8. DO NOT pull power plugs from sockets by the power cable.
- 1.1.9. DO NOT use worn or damage leads, plugs or connections. Replace or have repaired by a qualified electrician.
- 1.1.10. This product requires an electrical supply in excess of 13 amps, and NO plug is fitted. You must therefore contact a qualified electrician to ensure that a 30 amp supply is available. We recommend that you discuss the installation of a industrial round pin plug and socket with your electrician. Ensure that the unit is correctly earthed via a three-pin plug, as shown.
 - a) **Connect the GREEN/YELLOW earth wire to the earth terminal** .
 - b) **Connect the BROWN live wire to live terminal 'L'.**
 - c) **Connect the BLUE neutral wire to the neutral terminal, 'N' or unmarked.**
 - d) **After wiring, check that there are no bare wires, that all wires have been correctly connected, that the external insulation extends beyond the cable restraint and that the restraint is tight.**
- 1.1.11. Cable reels. When a cable reel is used it must be fully unwound before connection. A reel with an RCD fitted is recommended since any product which is connected to it will be protected. The section of the cable cores must be at least 2.5mm² for this product.



THE SUPPLY TO THE ELECTROSTART 500 MUST BE FITTED WITH A **30 AMP FUSE OR BREAKER**



DANGER! - BE AWARE, LEAD-ACID BATTERIES GENERATE EXPLOSIVE GASES DURING NORMAL BATTERY OPERATION. FOR THIS REASON, IT IS VERY IMPORTANT TO READ AND FOLLOW THESE INSTRUCTIONS CAREFULLY, EACH TIME YOU USE THE CHARGING EQUIPMENT. Follow these instructions and those published by the battery manufacturer, and the maker of any equipment you intend to use in the vicinity of the battery. Remember to review warning marks on all products and on engines.

1.2. PERSONAL PRECAUTIONS

- ✓ When working with or near a lead-acid battery ensure there is another person within hearing range and close enough to come to your aid, should a problem arise.
- ✓ Wear safety eye protection and protective clothing. Avoid touching eyes while working near battery.
- ✓ Have fresh water and soap nearby in case battery acid contacts skin, clothing, or eyes.
- ✓ Wash immediately with soap and water if battery acid contacts skin or clothing. If acid enters eye, flush eye immediately with cool, clean running water for at least 15 minutes and seek immediate medical attention.
- ✓ Remove personal metallic items such as rings, bracelets, necklaces and watches. A lead-acid battery can produce a short-circuit current high enough to weld a ring or the like to metal, which may cause severe burns.
- ✓ Ensure hands and clothing, including belts, are clear of fan blades and other moving or hot parts of the engine. Remove ties and contain long hair.
- x DO NOT smoke or allow a spark or flame in the vicinity of the battery or the engine.



1.3. GENERAL SAFETY INSTRUCTIONS

- ✓ Familiarise yourself with the applications, limitations and potential hazards relating to the starter/charger. Also refer to the vehicle manufacturer's handbook. **IF IN ANY DOUBT CONSULT A QUALIFIED ELECTRICIAN.**
- ✓ Ensure the starter/charger is in good order and condition before use. If in any doubt, do not use the unit and contact an electrician.
- ✓ Only use genuine parts. To use unapproved parts may be dangerous and will invalidate your warranty.
- ✓ Use the starter/charger in the horizontal position only and ensure it stands on a stable surface which will adequately support the weight.

- ✓ Ensure the charger is switched off and disconnected from the mains power supply before attaching the power clamps to the battery.
- ✓ Check the "OFF" LED to ensure the charger is registering "OFF" before handling the power cables.
- ✓ Keep tools and other items away from the engine and ensure that you can see the battery and working parts of the engine clearly.
- ✓ Ensure the voltage on the charger is set to the same voltage as the battery.
- ☐ **WARNING!** For nickel-cadmium batteries, ensure you understand the element numbers before charging.
- ✓ If the battery has removable caps to access the battery fluid, remove the caps and check the fluid level before connecting the power leads. If necessary top the battery up with distilled water by referring to the battery manufacturer's instructions, (Apply the personal safety precautions described in para. 1.2.).
- ✓ The cables may become hot with excessive use. If so, allow a few minutes for them to cool down before attempting to re-use.
- ✓ If the starter/charger receives a sharp knock or blow, the unit must be checked by a qualified service agent before using.
- ✓ If the battery terminals are corroded or dirty, clean them before attaching the starter/charger clamps.
- ✓ Keep children and unauthorised persons away from the work area.
- ✗ DO NOT dis-assemble the starter/charger for any reason. It must be checked by qualified service personnel only.
- ✗ DO NOT try to charge a non-rechargeable battery.
- ✗ DO NOT try to start or charge a frozen battery.
- ☐ **WARNING!** DO NOT allow metal tools to touch both battery terminals at the same time. The resulting spark or short circuit may cause an explosion.
- ✗ DO NOT allow clamps to touch each other or to make accidental contact with any part of the vehicle.
- ✗ DO NOT cross-connect power leads from starter/charger to the battery. Ensure positive (+ RED) is to positive and negative (- BLACK) is to negative. If symbols cannot be distinguished, remember that the negative terminal is normally the one directly connected to the vehicle bodywork.
- ✗ DO NOT pull the cables or clamps from the battery terminals.
- ✗ DO NOT use the starter/charger outdoors, or in damp, or wet locations, and DO NOT operate within the vicinity of flammable liquids or gases.
- ✗ DO NOT situate charger inside a vehicle or under the vehicle bonnet. Ensure that there is sufficient ventilation and do not cover or obstruct the starter/charger ventilation louvres.
- ✗ DO NOT use this product to perform a task for which it is not designed.
- ☐ **WARNING!** DO NOT simultaneously charge different types of batteries (i.e. traditional, gel or Ni-Cd).
- ☐ **WARNING!** If a fuse blows, ensure that it is replaced with one of identical type and rating.
- ✓ When not in use, store the starter/charger carefully in a safe, dry, childproof location.

2. INTRODUCTION & SPECIFICATION

Fully electronic, microprocessor controlled battery starter/charger designed to meet the requirements of modern battery technology. Powerful and 'intelligent' charging and boost starting from heavy-duty transformers. Suitable for Gel, Lead Acid, Lead Calcium and Ni-Cad batteries. Instant visual check of battery condition, charge current, voltage and charging rate on LED display. Instant control of power delivery prevents polarity reversal by cutting output power - no fuses to blow and no trips to re-set. Stabilised charging current allows improved charging efficiency and reduced charging times using Intellicharge circuitry. Fitted with standby feature - provides stabilised power to vehicle's electronic circuits through accessory socket enabling battery to be disconnected. Includes circuitry to provide surge and spike protection during charging and starting thus preventing damage to vital systems such as ABS, air bag sensors, ignition and music systems. Turbo-Fan cooled, heavy-duty transformer. Wipe-clean touch sensitive control panel. The equipment casing protects to IP20.

Power Supply	.....230V - 1ph	Starting Current (EN60335-2-29)	.....300A
Power Absorbed (starting)	.....7.5kW	Starting Current (max)	.....400A
Charging Voltages	.....6-12-24V	Supply Fuse	.....10A
Charging Current (EN60335-2-29)	.....40A	Auxiliary Circuits Fuse	.....1A
Charging Current (max)	.....45A	Weight	.....35kg

3. CHARGING MODES

- ☐ **WARNING!** Ensure you have read and understood the safety instructions and operational instructions before connecting starter/charger power clamps to the battery. Only when you are sure that you understand the charging modes and procedures is it safe to proceed with the actual charging process.

3.1. CHARGING MODES

There are three modes as follows:

3.1.1. STAND-BY fig. 1.A

The "Stand-by" mode produces an auxiliary output which will maintain the vehicle's essential electronic functions when the battery is disconnected. Use the auxiliary power lead and connect it to the cigarette lighter socket in the vehicle before disconnecting the battery.

3.1.2. START fig. 1.B

In the "Start" mode a micro-processor located inside the unit automatically controls the settings for starting.

3.1.3. CHARGE fig. 1.C

For normal battery charging select a charge current which is approximately a tenth of the battery capacity.

Example: Battery capacity = 120Ah

Charge current = $120/10 = 12A$

Select the closest available current setting, in this case 10A.

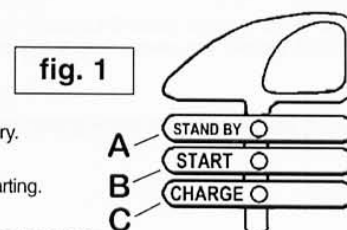
Select the charging time that will give full charge at the current selected. If the above battery was approximately 50% charged then a charge of 60Ah would be required to achieve full charge. At 10 amps this would take 6 hours which, therefore, would be the selection in this instance.

3.2. SAFETY CUT-OUT

The starter/charger has a safety "cut-out" device which will protect it if any of the following problems occur:

- a) Overload (an excessive current)
- b) Short circuit (charging clamps are touching).
- c) Cross-polarity connection to the battery terminals.

- ☐ **WARNING!** If a fuse blows, ensure that it is replaced with one of identical type and rating. The use of an incorrect fuse is dangerous and may cause damage and/or personal injury.



4. CONTROL PANEL

Selection is performed by pressing various buttons until LED corresponds with required mode or setting. A buzzer indicates that the required setting is successful.

4.1. BATTERY SELECTION fig. 2.(1)

Select the type of battery to be charged. This will automatically modify battery voltage thresholds to suit.

Battery types: "GEL" Lead-acid battery with solid electrolyte (2.3V/cell).
 "WET" Lead-acid battery with liquid electrolyte (2.4V/cell).
 "Ni-Cd" Nickel-cadmium battery (1.4V/element).

4.2. BATTERY VOLTAGE SELECTION fig. 2.(2)

Select the battery voltage. The working voltages are: 6, 12 & 24V.

☐ WARNING! Nickel-cadmium batteries are available in three voltages, the element numbers for which are as follows:

a) 5 elements - 6V b) 10 elements - 12V c) 20 elements - 24V

4.3. OPERATING MODE SELECTION fig. 2.(3)

This key will select one of the following operating modes:

STAND-BY, CHARGE OR START

- The "Stand-by" function gives a stabilised output which will provide power, via the cigarette lighter socket, for vehicle electronic equipment and for maintaining security coded items, when the battery is disconnected. This function, which is only available when the cigarette lighter lead provided is plugged into the multi-pin socket at the front of the starter/charger, can be combined with either the "Start" or "Charge" functions.
- The "Charge" function gives initial charging of the battery at constant current with the value selected (see 4.5.), for the time selected (see 4.4.).
 - If the battery voltage is very low, a very small current will be delivered until threshold voltage is reached.
 - When threshold has been achieved the starter/charger will supply current as selected.
 - If the battery has not reached required voltage level within the selected time, a further two hours charge may be given after which time the unit will automatically switch off.
 - If however the battery reaches the required voltage before the end of the set time, the starter/charger will automatically switch off.
- The "Start" function gives automatically regulated starter current with timed cycles of: 'On' for 5 seconds and 'Off' for 20 seconds.

4.4. CHARGE TIME fig. 2.(4)

This key selects the time span of the "Charge" function. The time settings are: 2, 4, 6 & 10 hours.

4.5. CHARGE CURRENT fig. 2.(5)

This key is used to select the required current level depending on whether "Charge" or "Start" has been selected with key (3). The "Charge" current settings are: 2, 5, 10, 20, 30 & 40 amps. By setting key to "Start", the current available is 300 amps (12V) on regular duty cycle, peaking at 400 amps.

4.6. DISPLAY CURRENT/VOLTAGE/TIME fig. 2.(6)

Three different displays can be selected with this key:

- "I" is the current in "Charge" and "Start" modes.
- "V" is the output voltage.
- "TIME" is the elapsed charging time in hours and minutes.

4.7. "ON" fig. 2.(7)

Identified by "I" this key allows the starter/charger to deliver power. **Important:** Before pressing this key ensure that you have selected all required settings. If function selected with key (3) is "Start", starter/charger will provide output only when the vehicle starter is operated.

4.8. "OFF" fig. 2.(8)

This key, identified by an "O", interrupts delivery of the current during "Charge" or "Start" status.


☐ WARNING! When "Off" key is activated, the machine remains fully powered.

4.9. BATTERY CHARGE STATUS INDICATOR fig. 2.(9).

Three LEDs indicate battery charge status based on voltage. The top LED indicates battery is charged (battery voltage equal to, or higher than, the end-of-charge voltage). Middle LED indicates battery is low, and may take a charge current, but charge level is acceptable. Bottom LED indicates battery is flat.

4.10. ALARMS & SAFETY CUT-OUT DEVICE fig. 2.(10).

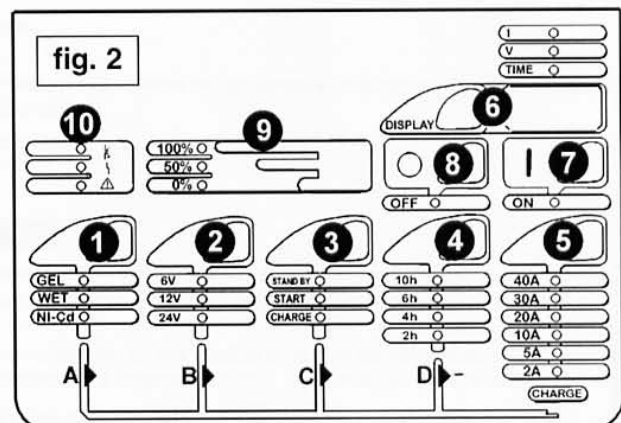
The machine is protected against overloads, short circuits and inversion of polarity by means of an internal electronic safety cut out device. Three LEDs indicate status:

 = thermal cut-out activated to protect machine against overload.

 = a short circuit general alarm, i.e. there is no battery voltage, low battery voltage, or clamps are touching.

 = inversion of polarity.

Note: All alarm conditions stop the delivery of current to the battery but do not affect the auxiliary power supply, which is equipped with an independent safety device, thus ensuring that the electrical equipment on the vehicle is protected.



5. BATTERY CHARGING & VEHICLE STARTING



WARNING! Ensure you have read, understood and follow all safety and operating instructions before attempting to charge or start.

5.1. CHARGING refer to fig. 3

- 5.1.1. Establish the battery type, voltage, and required charge rate/time.
- 5.1.2. Plug starter/charger into mains power supply, switch on at rear panel and press key 8 "Off".
- 5.1.3. Connect clamps to the battery terminals, ensuring correct polarity.
- 5.1.4. Use keys 1,2,3,4 and 5 to select required charging performance.
- 5.1.5. Finally, press key 7 "On". All functions will now operate automatically.

Note: The starter/charger is surge protected which minimises the risk of damage to the electronics on the vehicle.

5.2. STARTING refer to fig. 3

- 5.2.1. Establish the battery type and voltage.
- 5.2.2. Plug starter/charger into mains power supply, switch on at rear panel and press key 8 "Off".
- 5.2.3. Connect clamps to the battery terminals, ensuring correct polarity.
- 5.2.4. Use keys 1,2,3,4, and 5 to delivery a brief charge to the battery.
- 5.2.5. Press key 7 "On" and set display, key 6, to "V" to show battery voltage.
- 5.2.6. When an increase in voltage is noted, press key 3 to switch from "Charge" to "Start".
- 5.2.7. Operate the vehicle starter (nothing will happen until the starter is operated). There will be 5 seconds of starter current, followed by 20 seconds "down time". After the 20 seconds, the starter may be operated again, for a further 5 seconds. Alternatively this sequence may be bypassed by switching the starter/charger off and then on again.

CAUTION! Repeatedly switching off and on overrides the safety circuit and may cause overheating. We recommend therefore that you use the 20 second "down time" protection when trying to start a "stubborn" engine.

5.3. WHEN CHARGE/START IS COMPLETE

When the battery is charged/engine started switched the starter/charger off and unplug from the mains power supply. Detach power clamps from battery terminals.

Carefully wipe any spillage of acid from the battery top and replace the caps. Disconnect the auxiliary cable if used. Ensure all tools etc. are removed before closing the bonnet.

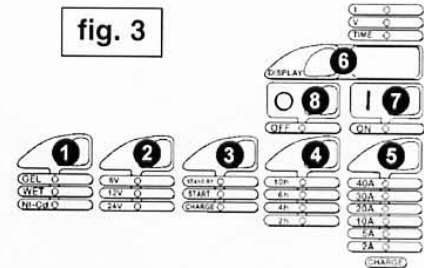
Clean the starter/charger and store in a safe, dry, childproof location.

5.4. CHARGING MORE THAN ONE BATTERY

Simultaneous charging of several batteries is possible. However this procedure must be performed with *great caution*, and additional equipment will be required. Contact your local Sealey dealer for information.

WARNING! DO NOT simultaneously charge different types of batteries.

fig. 3



6. DECLARATION OF CONFORMITY

Declaration of Conformity We, the sole importer into the UK, declare that the product listed below is in conformity with the following standards and directives.

**Starter/Charger
Model: ElectroStart 500**

89/336/EEC EMC Directive
73/23/EEC LV Directive



The construction file for this product is held by the Manufacturer and may be inspected, by a national authority, upon request to Jack Sealey Ltd.

Signed by Mark Sweetman

12th October 2001

For Jack Sealey Ltd. Sole importer into the UK of Sealey Power Products.

NOTE: It is our policy to continually improve products and as such we reserve the right to alter data, specifications and component parts without prior notice.

IMPORTANT: No liability is accepted for incorrect use of this equipment.

WARRANTY: Guarantee is 12 months from purchase date, proof of which will be required for any claim.

INFORMATION: For a copy of our latest catalogue and promotions call us on 01284 757525 and leave your full name and address, including postcode.

SEALEY POWER PRODUCTS

Sole UK Distributor,
Sealey Group,
Bury St. Edmunds, Suffolk.

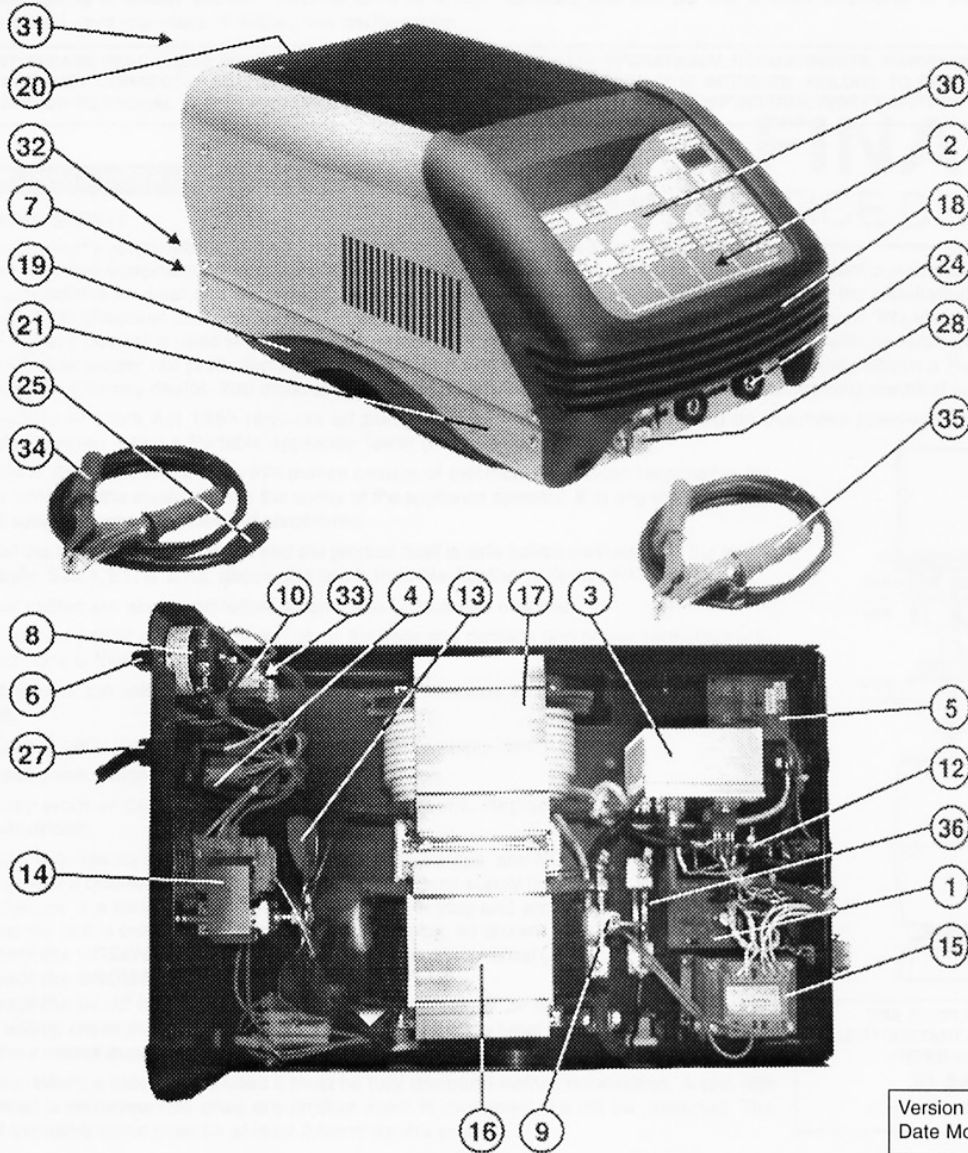


01284 757500



01284 703534

E-mail: sales@sealey.co.uk



Version No: 1
Date Modified: 091001

Item	Part No.	Description	Item	Part No.	Description
1	120/112399	Standby PCB	18	120/322481	Front Panel
2	120/990134	Kit Control PCB	19	120/322463	Handle
3	120/113022	Rectifier	20	120/655001	Top Cover
4	120/112798	Primary Filter Card	21	120/644031	Bottom
5	120/112799	Secondary Filter Card	24	120/712035	Dinse Socket
6	120/122058	Switch Knob	25	120/712039	Dinse Plug
7	120/122159	Fuse Holder	27	120/990046	Kit Cable Bush & Ring Nut
8	120/122444	Switch	28	120/990330	Socket Kit
9	120/122525	Thermostat	29	120/120019	Lighter Connection Cable
10	120/122842	Fuse Holder	30	120/313000	Front Panel & Card
12	120/152017	Shunt	31	120/648718	Back Panel
13	120/152054	Fan Blade	32	120/122760	Fuse
14	120/152110	Fan Motor	33	120/122841	Fuse, 10A
15	120/164918	Auxiliary Transformer	34	120/712001	Work Clamp
16	120/164919	Transformer	35	120/712002	Positive Clamp
17	120/164951	Reactance	36	120/122450	Fuse, 1A