

# DRAPER®

INSTRUCTIONS FOR

# Lead Acid Battery Charger/Starters

Stock No. 11966    Part No. BCSD300T  
11967                      BCSD400T

**IMPORTANT:** PLEASE READ THESE INSTRUCTIONS CAREFULLY TO ENSURE THE SAFE AND EFFECTIVE USE OF THIS PRODUCT.



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DRAPER®

## GENERAL INFORMATION

These instructions accompanying the product are the original instructions. This document is part of the product, keep it for the life of the product passing it on to any subsequent holder of the product. Read all these instructions before assembling, operating or maintaining this product.

This manual has been compiled by Draper Tools describing the purpose for which the product has been designed, and contains all the necessary information to ensure its correct and safe use. By following all the general safety instructions contained in this manual, it will ensure both product and operator safety, together with longer life of the product itself.

All photographs and drawings in this manual are supplied by Draper Tools to help illustrate the operation of the product.

Whilst every effort has been made to ensure the accuracy of information contained in this manual, the Draper Tools policy of continuous improvement determines the right to make modifications without prior warning.

# 1. TITLE PAGE

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## **1.1 INTRODUCTION:**

USER MANUAL FOR:

## **LEAD ACID BATTERY CHARGER/STARTER**

Stock nos. 11966, 11967

Part nos. BCSD300T, BCSD400T

## **1.2 REVISIONS:**

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As our user manuals are continually updated, users should make sure that they use the very latest version.

Downloads are available from: <http://www.drapertools.com/b2c/b2cmanuals.pgm>

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## **1.3 UNDERSTANDING THIS MANUALS SAFETY CONTENT:**

**WARNING!** Information that draws attention to the risk of injury or death.

**CAUTION!** Information that draws attention to the risk of damage to the product or surroundings.

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# 2. CONTENTS

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## 2.1 CONTENTS

		<i>Page</i>
1	TITLE PAGE	
	1.1 INTRODUCTION .....	2
	1.2 REVISION HISTORY .....	2
	1.3 UNDERSTANDING THIS MANUAL .....	2
	1.4 COPYRIGHT NOTICE .....	2
2	CONTENTS	
	2.1 CONTENTS .....	3
3	GUARANTEE	
	3.1 GUARANTEE .....	4
4	INTRODUCTION	
	4.1 SCOPE .....	5
	4.2 SPECIFICATION .....	5
	4.3 HANDLING & STORAGE .....	5
5	HEALTH & SAFETY INFORMATION	
	5.1 GENERAL SAFETY INSTRUCTIONS FOR BATTERY CHARGERS .....	6
	5.2 CONNECTION TO THE POWER SUPPLY .....	7A
6	TECHNICAL DESCRIPTION	
	6.1 IDENTIFICATION .....	8B
	6.2 MAIN COMPONENT DESCRIPTIONS .....	8A
7	UNPACKING & CHECKING	
	7.1 PACKAGING.....	9
	7.2 WHAT'S IN THE BOX? .....	9
8	PREPARING THE CHARGER/STARTER	
	8.1 FOOT AND WHEELS .....	10
	8.2 APPLICATION GUIDE .....	11
	8.3 MAINTENANCE TYPE BATTERY .....	11
9	CONNECTING THE BATTERY	
	9.1 CONNECTING THE CHARGER TO THE BATTERY .....	12
	9.2.1 CHARGING SEQUENCE (BCSD300T).....	13
	9.2.2 CHARGING SEQUENCE (BCSD400T).....	14
	9.3 STARTING PROCEDURE (BCSD300T).....	15
	9.4 STARTING PROCEDURE (BCSD400T).....	16
10	TROUBLESHOOTING	
	10.1 TROUBLESHOOTING.....	17
	10.2 WIRING DIAGRAM .....	17
11	MAINTENANCE	
	11.1 MAINTENANCE.....	18
12	EXPLANATION OF SYMBOLS	
	12.1 EXPLANATION OF SYMBOLS .....	18
13	DISPOSAL	
	13.1 DISPOSAL .....	19
14	GLOSSARY	
	14.1 GLOSSARY .....	19
	DECLARATION OF CONFORMITY .....	ENCLOSED

## 3. GUARANTEE

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### 3.1 GUARANTEE

Draper tools have been carefully tested and inspected before shipment and are guaranteed to be free from defective materials and workmanship.

Should the tool develop a fault, please return the complete tool to your nearest distributor or contact Draper Tools Limited, Chandler's Ford, Eastleigh, Hampshire, SO53 1YF. England. Telephone Sales Desk: (023) 8049 4333 or Product Helpline (023) 8049 4344.

A proof of purchase must be provided with the tool.

If upon inspection it is found that the fault occurring is due to defective materials or workmanship, repairs will be carried out free of charge. This guarantee period covering parts/labour is 12 months from the date of purchase except where tools are hired out when the guarantee period is ninety days from the date of purchase. The guarantee is extended to 24 months for parts only. This guarantee does not apply to normal wear and tear, nor does it cover any damage caused by misuse, careless or unsafe handling, alterations, accidents, or repairs attempted or made by any personnel other than the authorised Draper warranty repair agent.

Note: If the tool is found not to be within the terms of warranty, repairs and carriage charges will be quoted and made accordingly.

This guarantee applies in lieu of any other guarantee expressed or implied and variations of its terms are not authorised.

Your Draper guarantee is not effective unless you can produce upon request a dated receipt or invoice to verify your proof of purchase within the guarantee period.

Please note that this guarantee is an additional benefit and does not affect your statutory rights.

Draper Tools Limited.

## 4. INTRODUCTION

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### 4.1 SCOPE

This portable charger/starter is designed for charging 12V and 24V lead acid batteries. It is also equipped to start mechanically sound (functioning) vehicles.

Any other application is considered misuse.

### 4.2 SPECIFICATION

Stock no .....	11966 .....	11967
Part no .....	BCSD300T.....	BCSD400T
Rated input:		
Rated voltage .....	230V~ .....	230V~
Rated frequency .....	50Hz .....	50Hz
Power .....	1,600W/8,000W.....	1,600W/10,000W
Current .....	4.5/6.5A .....	5.5/8A
Rated output:		
Rated voltage .....	12V/24V .....	12V/24V
Current		
Charge setting 1 .....	23A/21A .....	16A/15A
Charge setting 2 .....	30A/27A .....	20.5A/20A
Charge setting 3 .....	40A/36A .....	27A/26A
Charge setting 4 .....	N/A .....	32A/31A
Charge setting 5 .....	N/A .....	40A/37A
Charge setting 6 .....	N/A .....	49A/47A
Start .....	24V=260A 12V=310A .....	24V=360A 12V=430A
Battery amperage range.....	40-700Ah .....	50-800Ah
Ingress protection (IP) .....	20 .....	20
Fuse .....	2x50A .....	1x110A
Time delay fuse (°C) .....	115° .....	115°
Dimensions (cm) .....	27x24x56 .....	40.5x31.5x61.5
Weight (kg).....	14 .....	23

### 4.3 HANDLING & STORAGE

These battery chargers are portable requiring only a single person to safely move them. When transferring them, care should be taken to prevent damage.

The working environment of this type of machine can very often be harmful to its working life. Make sure the machine is disconnected from the power supply and stored in a clean, dry atmosphere out of the reach of children.

## 5. HEALTH & SAFETY INFORMATION

---

### **5.1 GENERAL SAFETY INSTRUCTIONS FOR BATTERY CHARGERS**

**WARNING! Explosive gases.** When a battery is charged it can produce hydrogen gas which is explosive. Charging should be carried out in a well ventilated area and away from sources of heat flames and sparks.

**Indoor use only.** This charger must not be used outside in rain or snow conditions.

**Disconnect the mains cable.** Before making or breaking the connection to the battery terminals, remove the plug from the power supply.

**Connect the charger carefully.** Make sure the red clamp is attached to the battery positive terminal. The black clamp attaches to the negative. Do not reverse the clamps or allow them to touch each other.

**Refer to the vehicle manufacturers information.** Follow these instructions fully to make sure no damage occurs to the vehicle or it's equipment.

**Do not cover the charger.** Allow air to the charger as it will overheat. The charger is equipped with a time-lag fuse inside. Over-heating will trip the fuse to prevent damage and will not reset until sufficiently cooled.

**Do not use the charger within the vehicle.** Stand it on a level firm surface to prevent damage to the charger or vehicle.

**Do not tamper with this product.** Repairs and maintenance must be carried out by an authorized service agent. Only use genuine Draper spare parts. Do not modify this product in any way.

**Wear approved safety goggles (not safety glasses) and latex/nitrile gloves.** Before charging a maintenance type battery the electrolyte (battery acid) must be filled to the maximum marked levels. Never use tap water. Distilled water or electrolyte must be used.

**Never attempt to charge non-rechargeable batteries.** Only charge lead acid batteries within the voltage and amp hour capacities of the charger.

**Never attempt to charge a frozen battery.**

**Never attempt to charge a damaged or distorted battery.**

**Keep out of the reach of children.**

The battery terminal not connected to the chassis has to be connected first. The other connection is to be made to the chassis, remove from the battery and fuel line. The battery charger is then to be connected to the mains.

## 5. HEALTH & SAFETY INFORMATION

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When working around batteries, remove metal jewellery and take care where any tools are placed, e.g. spanners. A short circuit caused by bridging the live terminal and ground can result in severe burns.

If battery acid contacts the skin or eyes, flush immediately with clean water for 15 minutes and then seek medical attention.

### ***5.2 CONNECTION TO THE POWER SUPPLY***

Make sure the power supply information on the machine's rating plate are compatible with the power supply you intend to connect it to.

Because it is constructed mostly of metal parts, it is a Class 1 machine; meaning, it must have an earth connection in the power supply. This is to prevent electrocution in the event of a failure.

This machine should be connected to a 16A power supply, for the starting function a 32A supply is highly recommended.

This machine must be fitted with a suitable plug before use (16A/32A). The plug must be fitted by a qualified electrician or other suitably qualified technician.

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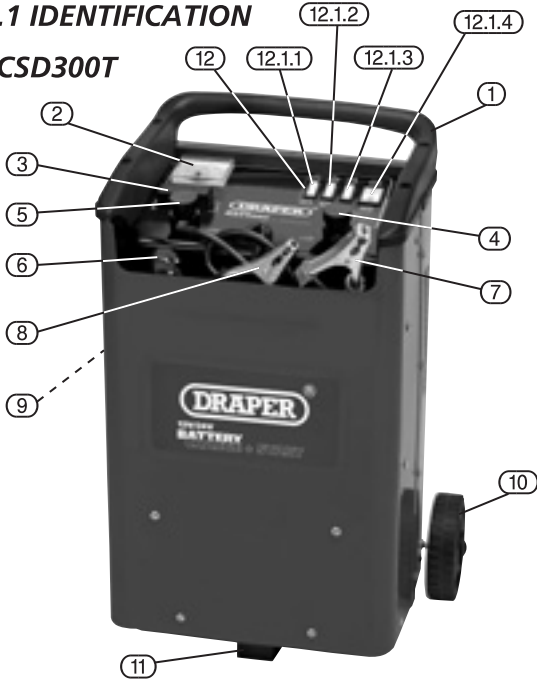
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# 6. TECHNICAL DESCRIPTION

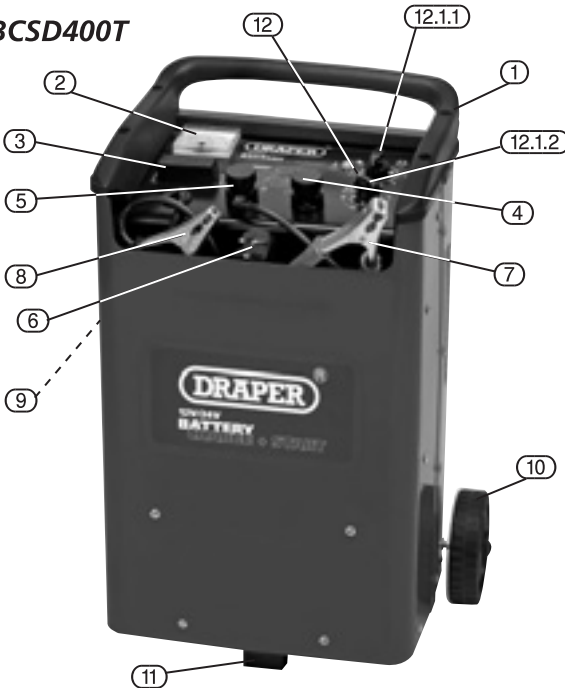
## 6.1 IDENTIFICATION

### BCSD300T



- ① Transport Handle
- ② Ammeter-output charge current
- ③ Output fuse - overcharge protection
- ④ 12V terminal
- ⑤ 24V terminal
- ⑥ Mains cable and plug
- ⑦ Positive (RED) clamp
- ⑧ Negative (BLACK) Clamp
- ⑨ Ventilation grilles
- ⑩ Wheels
- ⑪ Foot
- ⑫ Switch panel
  - ⑫.1.1 1/2 switch
  - ⑫.1.2 Min/Boost switch
  - ⑫.1.3 Charge/Start switch
  - ⑫.1.4 On/Off switch

### BCSD400T



- ① Transport Handle
- ② Ammeter-output charge current
- ③ Output fuse - overcharge protection
- ④ 12V terminal
- ⑤ 24V terminal
- ⑥ Mains cable and plug
- ⑦ Positive (RED) clamp
- ⑧ Negative (BLACK) Clamp
- ⑨ Ventilation grilles
- ⑩ Wheels
- ⑪ Foot
- ⑫ Switch panel
  - ⑫.1.1 7 position Start/Charge switch
  - ⑫.1.2 Timer switch

## 6. TECHNICAL DESCRIPTION

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### **6.2 MAIN COMPONENT DESCRIPTIONS**

The **12V/24V** terminals are used when charging between single 12V (or multiple 12V batteries wired in **parallel**) and two 12V batteries in **series**.

The **min/boost switch** changes the output current.

The **1/2 switch** (BCSD300T) steps the output current when charge current is set on min.

The **charge/start switch** activates the high current output for starting a vehicle.

**NOTE:** Due to the current draw this must be used 3 seconds on 120 seconds off (with a maximum of 5 cycles).

The **ammeter** displays the charge current being applied to the battery. When it reaches zero the battery is charged (or the timer (BCSD400T) has completed).

The **timer switch** (BCSD400T) controls the output current when the charge switch is in positions 4, 5 and 6.

# 7. UNPACKING & CHECKING

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## 7.1 PACKAGING

Carefully remove the charger from the packaging and examine it for any sign of damage that may have happened during shipping. If the charger is damaged or any parts are missing; please contact the Draper Helpline (the telephone number appears on the Title page) and do not attempt to use the charger.

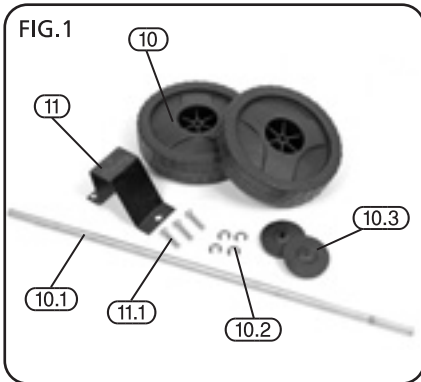
The packaging material should be retained at least during the guarantee period: in case the machine needs to be returned for repair.

Warning! Some of the packaging materials used may be harmful to children. Do not leave any of these materials in the reach of children.

If any of the packaging is to be thrown away, make sure they are disposed of correctly; according to local regulations.

## 7.2 WHAT'S IN THE BOX?

As well as the charger/starter; there are several parts not fitted to it.



- (10) Wheels x 2
- (10.1) Axle
- (10.2) Circlip x 4
- (10.3) Hubs x 2
- (11) Foot
- (11.1) Screws x 3

## 8. PREPARING THE CHARGER/STARTER

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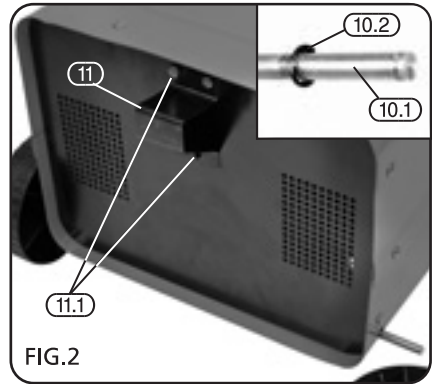
To set up, adjust and operate this machine you will require some additional tools that are not supplied.

- 1 x combination pliers
- 1 x 10mm spanner
- 1 x No.2 cross slot screwdriver.

### 8.1 FOOT AND WHEELS (Fig.2)

Although the charger/starter has been assembled in the factory, some final assembly will be required.

- i Carefully lay the charger down.
- ii Line up the foot (11) with the three holes on the underneath.
- iii With a No.2 cross slot screwdriver, secure the foot (11) in place using the 3 screws (11.1).
- iv. With a pair of pliers, snap one of the circlips (10.2) onto the axle (10.1).  
**NOTE:** Make sure the circlip locates properly in the groove.
- v. Slide one of the wheels (10) onto the axle (10.1).
- vi. Guide the axle through the housing.
- vii. Position the remaining wheel before fitting the other circlip (10.2).  
**NOTE:** Make sure the wheels are correctly fitted before attaching the circlip.
- ix. Push the hubs (10.3) into the centre of the wheels (10).



## 8. PREPARING TO CHARGE A BATTERY

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### 8.2 APPLICATION GUIDE

Before beginning the charge of any battery, make sure the battery is of the correct type and within the recommended amperage range (see table below).

PART No.	RECOMMENDED MIN. Ah.	RECOMMENDED MAX. Ah.
BCSD300T	40Ah	700Ah
BCSD400T	50Ah	800Ah

If the battery amperage rating is not stated or you are unsure about the rating please see table below.

Examples of Typical Vehicle Battery Ah Ratings (For guidance only).

Engine Capacity					
<1300cc	5 - 15Ah	15 - 30Ah	35 - 45Ah	-	60 - 110Ah
>1300cc	-	-	45 - 65Ah	45 - 65Ah	60 - 110Ah
Diesel	-	-	60 - 90Ah	60 - 90Ah	60 - 110Ah

### 8.3 MAINTENANCE TYPE BATTERY

Maintenance batteries have caps to access the chambers containing the plates and the **electrolyte**. For a battery to function correctly and to ensure its working life, the level of the electrolyte must be kept up to the maximum mark inside the chambers. This is particularly important before charging. When topping up it is vitally important that eye protection and rubber gloves are worn. It is necessary to maintain the **electrolyte** levels with distilled water, never use tap water. When adjusted, the caps should remain off throughout the charging process.

## 9. CONNECTING THE BATTERY

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**WARNING!** Do not make any of the following adjustments with the charger connected to the power supply.

### 9.1 CONNECTING THE CHARGER TO THE BATTERY (Fig 3.)

**NOTE:** We recommend that the battery is disconnected from the vehicle. This will avoid any possible damage to the alternator. Loss of codes for audio and security systems can be avoided by connecting a Draper Memory Saver (Part No.CMS1-Stock No.38330) or similar product before disconnecting the battery. Check the car battery voltage matches that of the charger.

Before connecting the battery charger to the battery ensure that the charger and battery are on a level surface. If the battery has cell filler caps loosen or remove them to assist the escape of charging gases.

If the battery is maintenance type, see section 8.3.

- i. Adjust the 12V/24V switch (4) to the appropriate setting.
- ii. Connect the red positive lead (7) to the battery positive (+) terminal.
- iii. Connect the black negative lead (8) to the battery negative (-) terminal.

**CAUTION!** Double check the polarity connection before proceeding. Incorrectly setting 24V for a 12V battery will result in damage.

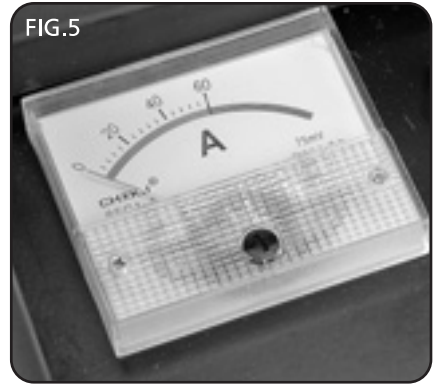


## 9. CHARGING THE BATTERY

### 9.2.1 CHARGING SEQUENCE (BCSD300T) (Figs 4 & 5)

During the charging process the battery voltage must be continually monitored and the charging output current adjusted.

- i. To begin, set the charge/start switch (12.1.3) to CHARGE.
- ii. Set the 1/2 switch (12.1.1) to 1 and the min/boost switch (12.1.2) to MIN.
- iii. Connect the mains supply and set the on/off switch (12.1.4) to ON.  
**NOTE:** As the battery voltage increases, set the 1/2 switch (12.1.1) to 2.
- iv. Monitor the battery voltage with a suitable meter. When the voltage of the charging battery reaches 12V (or 24V accordingly) switch the min/boost switch (12.1.2) to boost.
- v. When the battery reaches a full charge 14V (or 27V accordingly) the input current will reduce to zero on the ammeter (2). Switch the charger off.
- vi. Disconnect the mains supply before following section 9.1 in the reverse order.



## 9. CHARGING THE BATTERY

### 9.2.2 CHARGING SEQUENCE (BCSD400T) (Fig 6)

During the charging process the battery voltage must be continually monitored and the charging output current adjusted.

- i. To begin charging, set the switch (12.2.1) to position 1.
- ii. Connect the mains supply.
- iii. Monitor the battery voltage with a suitable meter. As the voltage increases, up the output current by moving the switch (12.2.1) to positions 2 and 3. When the voltage of the charging battery reaches 12V (or 24V accordingly) move the switch (12.2.1) to 4, 5 or 6.  
**NOTE:** The charge current will be cut completely until the timer is activated.
- iv. Rotate the time switch (12.2.2) clockwise to select the minutes (max. 60mins).  
**NOTE:** The charge current will only be produced while the timer is counting down.
- v. When complete, the timer will sound and the charge current will halt.
- vi. Disconnect the mains supply before following section 9.1 in the reverse order.





## 9. STARTING

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### 9.3 STARTING PROCEDURE (BCSD300T)

Engine cranking requires a large amount of current and as such will heat the components inside this product. Consequently the on/off cycles detailed below **must** be followed to the letter.

The engine that requires starting must be in a good mechanical condition as pro-longed cranking is not possible.

When attempting to crank vehicles equipped with large capacity batteries or in severe climates (cold) it will be necessary to charge the battery for approximately 15 minutes to avoid the appliance drawing excess amperage and tripping the mains supply.

**CAUTION!:** It is not possible to use the start facility connected to a standard 12 Amp domestic supply.

- i. Connect the mains supply and set the on/off switch (12.1.4) to ON.
- ii. Begin cranking the car; at the same time setting the charge/start switch (12.1.3) to the charge position for 3 seconds **maximum**.  
**NOTE:** You will require an assistant to sit in the vehicle while you operate the starter facility.
- iii. If the vehicle does not start within 3 seconds, stop, move switch (12.1.3) back to the charge setting and wait for 120 seconds (2 minutes) before trying again.
- iv. If after 5 start attempts the vehicle has not started, you must wait for the charger to cool down. Continuing to make start attempts will raise the temperature of the cable and will result in damage to the product and may cause the mains supply to trip.
- v. Disconnect the mains supply before following section 9.1 in the reverse order.

## 9. STARTING

---

### 9.4 STARTING PROCEDURE (BCSD400T)

Engine cranking requires a large amount of current and as such will heat the components inside this product consequently the on/off cycles detailed below **must** be followed to the letter.

The engine that requires starting must be in a good mechanical condition as pro-longed cranking is not possible.

When attempting to crank vehicles equipped with large capacity batteries or in severe climates (cold) it will be necessary to charge the battery for approximately 15 minutes to avoid the appliance drawing excess amperage and tripping the mains supply.

**CAUTION!:** It is not possible to use the start facility connected to a standard 12 Amp domestic supply.

- i. Connect the mains supply and set the on/off switch (12.1.4) to ON.
- ii. Begin cranking the car; at the same time setting the charge/start switch (12.2.1) to the charge position for 3 seconds **maximum**.  
**NOTE:** You will require an assistant to sit in the vehicle while you operate the starter facility.
- iii. If the vehicle does not start within 3 seconds, stop, move switch (12.2.1) back to the charge setting and wait for 120 seconds (2 minutes) before trying again.
- iv. If after 5 start attempts the vehicle has not started, you must wait for the charger to cool down. Continuing to make start attempts will raise the temperature of the cable and will result in damage to the product and may cause the mains supply to trip.
- v. Disconnect the mains supply before following section 9.1 in the reverse order.

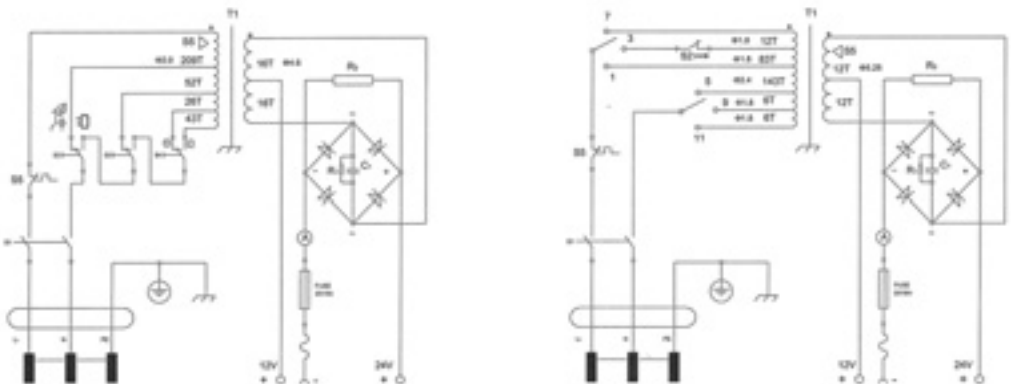
# 10. TROUBLESHOOTING

## 10.1 TROUBLESHOOTING

Remove the plug from the socket before carrying out any adjustment, servicing or maintenance.

FAULT	POSSIBLE CAUSE	SOLUTION
No power light while switched on (before using).	Blown fuse in mains plug.	Check and replace with an identical fuse.
No power light while switched on (during use).	Overheating caused time delay fuse to activate.	Switch off machine and allow time for charger to cool. The fuse will reset itself.
Power light with no output current.	Over current fuse blown.  Timer not set (BCSD400T)	Check fuse on front panel and replace. Check connection polarity.  Select another setting or start the timer.

## 10.2 WIRING DIAGRAM



# 11. MAINTENANCE

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## 11.1 MAINTENANCE

After use the machine should be cleaned of any dirt or grease before coiling up the leads and storing it away in a dry, clean environment out of the reach of children.

# 12. EXPLANATION OF SYMBOLS

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## 12.1 EXPLANATION OF SYMBOLS



Do not dispose of WEEE\* as unsorted municipal waste. (General household rubbish).



For indoor use only.



Warning!



Danger! explosive gases.



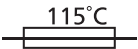
Read instruction manual before use.



Positive.



Negative.



115°C time delay fuse.



Start.

\*Waste Electrical & Electronic Equipment.

# 13. DISPOSAL

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## 13.1 DISPOSAL

- At the end of the machine's working life, or when it can no longer be repaired, ensure that it is disposed of according to national regulations.
- Contact your local authority for details of collection schemes in your area.

In all circumstances:

- Do not dispose of power tools with domestic waste.
- Do not incinerate.
- Do not abandon in the environment.
- Do not dispose of WEEE\* as unsorted municipal waste.



\* Waste Electrical & Electronic Equipment.

# 14. GLOSSARY

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## 14.1 GLOSSARY

### *Alphabetical list of words relating to this manual*

<b>Ammeter</b>	Analogue dial displaying amps (A).
<b>Electrolyte</b>	The hazardous liquid solution in which lead plates are submerged, made up of sulphuric acid and other chemicals.
<b>Parallel</b>	Multiple batteries wired together (negative terminal of first battery is connected to the positive terminal of the second). The voltage increases but the amperage remains the same. e.g. 12V 48A x 12V 48A = 24V 48A.
<b>Series</b>	Multiple batteries wired together (positive of all batteries are linked together, negative of all batteries are linked together). The voltage remains constant but the amperage increases. e.g. 12V 48A + 12V 48A = 12V 144A.

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- **General Enquiries:** (023) 8026 6355
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