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ASC+ Universal Split Charge/Isolator/Protector System

ASC+

Auto Split Charge

User Guide and Installation Instructions

Applies to Part Nos 90907, 90908, 90917, 90918

FM 37786
ISO 9001:2000

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IMPORTANT SAFETY INFORMATION

Please read and observe the installation instructions.

WARNING: Explosive gasses may be generated by a battery on charge. To prevent ignition, allow time for gasses to disperse before attempting to connect this unit.

When systems which affect the driver's control of the vehicle are powered from the protected battery, the system's blue "ignition" input must be connected – its function is to inhibit battery isolation while the vehicle is being driven.

Wiring protection:

It is the responsibility of the system installer to ensure that steps are taken to minimise the risk of fire & other hazards in the event of a wiring fault.

The ASC+'s control wiring is protected by systems within the ASC+ itself, provided all external control wiring is of 0.75mm^2 cross section or greater.

The high current power circuits are not internally protected & measures must be taken to limit or interrupt any fault current which may occur within the ASC+ or the connected power wiring. The best way to provide this protection is normally by fusing at the source of the potential fault current, which in most cases is the connected vehicle battery. Bear in mind that any fuses may have to carry cranking current & may also be required to carry the maximum alternator output without rupture. In most 12 volt van applications, a 350amp MEGA fuse on the starter battery & a 300amp Antares stud fuse on the auxiliary batteries will be sufficient.

Type Approval – Information (APPROVAL PENDING)

Concerning directive 72/245/EEC as amended by 95/54/EC & last amended by directive 2006/28/EC;

Conditions of use for which the type approval (e mark) applies:

This equipment is designated as an electronic sub-assembly;

It is intended for use on-board road-going vehicles;

Engine start battery protection systems are intended to be connected directly to a vehicle engine starting battery and to be used to disconnect the battery's loads so as to preserve charge for engine starting.

Auxiliary battery protection systems are intended to be connected directly to a vehicle's auxiliary battery (Auxiliary batteries are those which cannot affect the driver's control of the vehicle) and to be used to disconnect the battery's loads so as to provide deep-discharge protection when no useable capacity remains.

Automatic split charge & assured start systems are intended to connect an auxiliary battery to a charging source, & to connect the auxiliary battery to the vehicle's engine start battery when assisted starting is activated.

Note that non-vehicular & marine applications are specifically excluded, as the system has not been verified against the particular EMC standards that apply.

Non approved conditions of use:

This unit may be suitable for use in other applications, but it can only be supplied as a component in this respect, in which case the type approval does not apply. If the unit is used in this way, then it is supplied solely on the condition that it is the responsibility of the manufacturer of the apparatus to ensure that the apparatus complies with the requirements of the relevant legislation, and apply the CE marking should it be required. In this case, this user manual does not apply, and reference should be made to Antares (Europe) Limited for any information required for compliance with the legislation.

System overview

Equipment description

The ASC+ Auto Split Charge System comprises the following equipment: -

Controller module

This module contains the following: -

- Micro-controller and necessary components to power & operate the system
- Connection point for the contactor
- Connection point for the user switch panel
- Connection point for the low-power permanent feed (not usually used in this version)
- Connection point for the ignition input (not usually used in this version)

User switch panel

This panel (see Figure 1) contains the following: -

- Push switch with integral green LED
- Mounting panel with label and fixing hardware

Figure 1: Typical switch mounting positioning:

Control cables

The system consists of the following control cables:-

- 1 off, 6 way control to user panel loom (only 3 cores used in this version)
- 1 off, 4 way control to contactor looms

Contactor type & rating

The system consists of 2 off latching contactors; see Table 1 for rating

System operating values (nominal)					Contactor contacts rating			
System No	DC Voltage	Operating Voltage Range	System current draw *IQ mA	*State change Pulse current	Continuous Current	Peak current 5 Sec Max	Cranking Current	Heavy Load 3 Min Max
90907	12V	8V-16V	18/8/1	1.6A	125A	800A	600A	280A
90908	12V	8V-16V	18/8/1	2.6A	250A	1500A	1200A	650A
90917	24V	18V-32V	18/8/1	0.8A	125A	800A	600A	280A
90918	24V	18V-32V	18/8/1	1.5A	250A	1500A	1200A	650A

*IQ: A/B/C A = Switch LED + Controller, B = Controller Normal, C = Controller Sleep Mode (controller enters sleep mode 24 hours after contactor off)

**State change:* Pulse current at nominal voltage during the contactor change of state (Pulse length 100ms)

Table 1

Power cables

The system requires power cables to connect to the batteries. These are not normally part of the ASC+ system and should be ordered separately as required.

Installation

Installation should only be carried out by suitably qualified personnel who are familiar with sophisticated vehicle electrical systems. They should have a full knowledge of the vehicle into which the ASC+ is being installed, and a full understanding of the ASC+ system. We strongly recommend that the installation engineer read all of this installation section before commencing the installation.

Choosing a location

The ASC+ is intended for use in a sheltered location only, and must not be exposed to road spray, pressure washing (or similar cleaning processes), water spillage or areas where condensation is likely. Areas subject to high temperature or vibration must also be avoided if performance and reliability are not to be impaired.

Control module installation

The controller module must be mounted in the cab area; a location behind the dashboard is ideal.

Contactor installation

The contactor assemblies may be mounted close to the batteries / loads, but exposure to road spray, or water from any source must be prevented.

Switch installation

See separate manual Part No 13369 for switch assembly and installation.

Safety Notices

INCORRECT CONNECTION MAY CAUSE DAMAGE PLEASE FOLLOW THE INSTRUCTIONS CAREFULLY.

CONNECTIONS MUST BE MADE USING THE SEQUENCE DETAILED BELOW.

WARNING: Explosive gasses may be generated by a battery on charge. To prevent ignition, allow time for gasses to disperse before attempting to connect this unit.

Before beginning the electrical installation, be aware that the battery isolation contactor is a latching type, and may initially rest in either the ON or OFF state. If ON, then the load stud will be live as soon as battery is connected to the battery stud.

Installation sequence

Once the component parts have been mechanically mounted follow the steps listed below. (See Figure 2, Page 10 for wiring diagram):

Step 1

The controller module should have its battery -ve ground connection made first. This is the black wire terminated with a ring terminal – connect to the bodywork or battery negative.

Step 2

- Using the supplied 6 way loom (82516), connect the controller to the switch panel. The loom may be shortened at the free end if required. Match the loom wire colours with the switch wire colours at the switch end.

Note: the 3 unused cores can be individually insulated, it is however advisable not to cut these cables short as they are used in other versions of the ASC+ systems.

- Using the supplied crimps, crimp the wires and use a heat gun to shrink and seal the joints.
- Plug the 6 way connector into the mating connector on the controller marked “Control”.
- The blue option “ignition” wire is not used as standard and should be insulated.

Step 3

Do not plug the 4 way loom into the controller until the free ends have been wired to the contactor.

Carry out the following for the contactor.

- Using the supplied 4 way loom (82524) connect the free ends of the 4 way loom to the wire ends from the contactor assembly in the following order:
  1. Black wire to contactor assembly wire marker “1” (Coil supply).
  2. Red wire to contactor assembly wire marker “2” (Coil supply).
  3. Orange wire to contactor assembly wire marker “3” (Battery +ve), also denoted by a red sleeve at the battery stud end.
  4. Yellow wire to contactor assembly wire marker “4” (Load +ve).
- Using the supplied crimps, crimp the wires and use a heat gun to shrink and seal the joints.
- Plug the contactor loom into the mating connector on the controller marked “Primary” identified by a black wire on pin 1.

Step 4

- Having mounted the contactor, connect one end of power cable “Power Cable A” see Figure 2 (not normally supplied) to the contactor “Battery Positive” stud.
- Connect the other end of power cable “Power Cable A” see Figure 2 to the Main / Engine battery positive.
- The control module should now be powered.

Note: Whenever the control module has powered applied, calibration data is read from memory. Once this is completed; both switch indicator LEDs flash twice to indicate a successful read. For other flash patterns, see **Error! Reference source not found.** on Page 12.

Note: If all of the above steps have been carried out correctly and the “Battery Link” switch LED is “Off”, then the contactors “Load Positive” stud should not be Live. If however, the “Battery Link” switch LED is “On” then the “Load Positive” stud will be live therefore take care in the following step.

- Connect one end of the “Power Cable B” see Figure 2 (not normally supplied) to the contactor “Load Positive” stud ensuring that the other end is insulated.

Note: If the “Battery Link” switch LED is “On” the next step is likely to cause a spark, so ensure that any battery gasses are dispersed before making this connection.

- Connect the other end of “Power Cable B” to the auxiliary battery positive.

Step 5

Testing the assembly

- Press the “Battery Link” switch, the contactor should close and link the Main & Auxiliary batteries together. If there is no charging voltage present the contactor with remain closed for 60 seconds, during this period the “Battery Link” switch LED will flash.

This completes the installation and testing.

ASC+ Auto Split Charge (ASC) wiring details

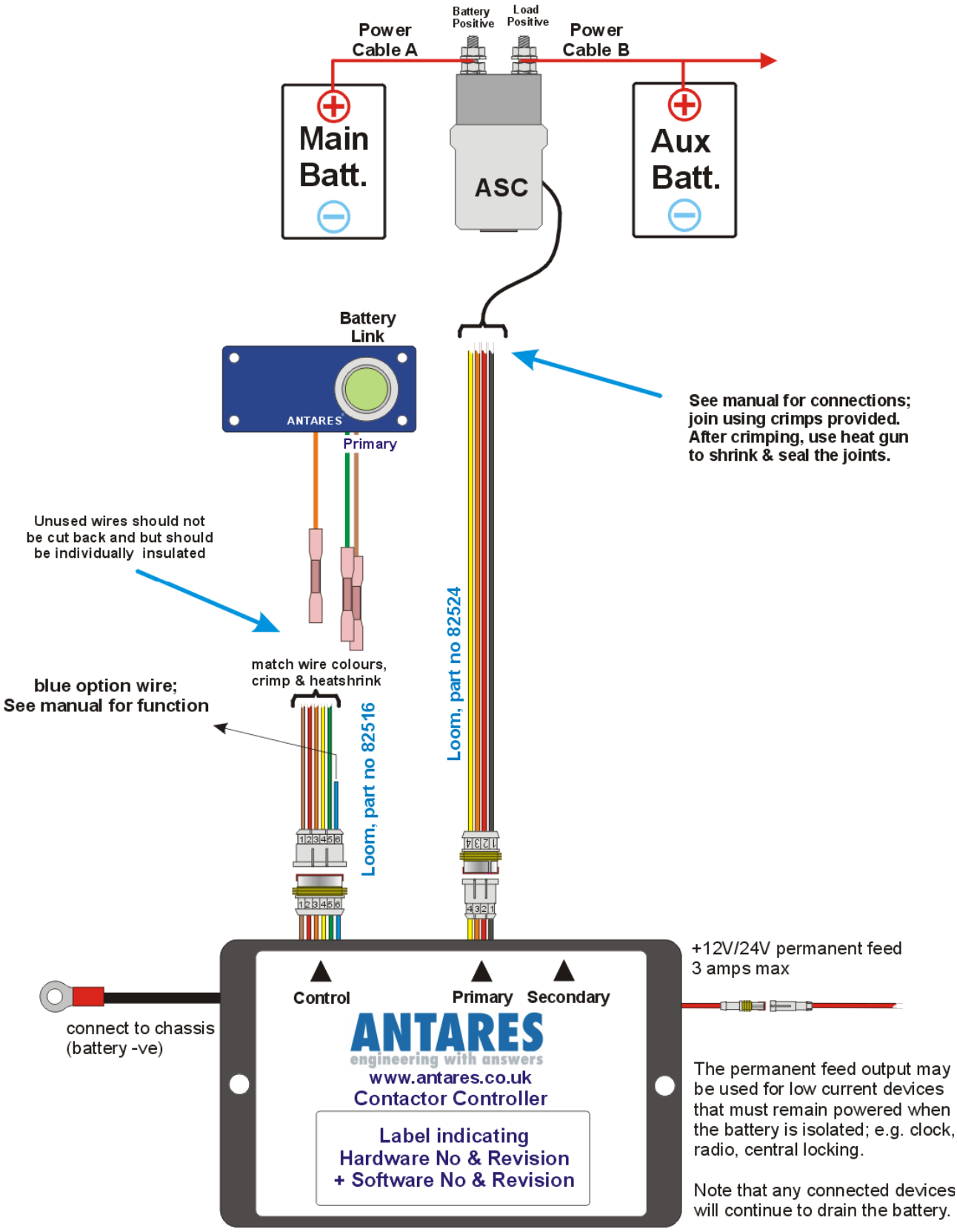

Figure 2

System operation

ASC (Auto Split Charge) operation

Using Battery Link (Emergency / Assured Start) function

If the main battery is depleted the auxiliary battery can be linked to the main battery to assist starting, to use this feature depress the “Battery Link” switch. The ASC contactor will be pulsed closed to link the batteries and the “Battery Link” switch LED will flash to indicated “Battery Linked” mode.

If a charging voltage is seen (i.e. the vehicle starts) then the ASC contactor will remain closed (see ASC standard operation) and the “Battery Link” switch LED will stay on.

If after 60 seconds a charging voltage is not seen (i.e. the vehicle doesn’t start) then the ASC contactor will be pulsed open to stop both batteries being depleted.

Note: The battery link switch can only be operated up to 3 times in a 5 minute period.

See the flow chart Figure 3 on page 12 for the flash patterns during this mode.

ASC standard operation

The ASC contactor “Battery Positive” terminal is monitored. When a charging voltage is detected the ASC contactor will be pulsed closed to link the “Battery Positive” terminal and the “Load Positive” terminal. The “Battery Link” switch LED will illuminate to indicate that the batteries are linked.

The ASC contactor remains closed until the battery voltage falls to a level which indicates that the MAIN battery is being discharged. At this point, the ASC contactor will be pulsed open. See Table 2 for open & close voltages.

Note: When a charging voltage is detected and the ASC closes, it will remain closed for a minimum of 30 seconds regardless of the voltage.

See the flow chart Figure 4 on page 13 for the flash patterns during this mode.

ASC dual sense operation

This function is identical to ASC standard operation, except that the “Load Positive” terminal is also monitored and acted upon. This allows the MAIN battery to be charged if the auxiliary is being charged. The “Battery Link” switch LED will illuminate to indicate that the batteries are linked. See Table 2 for open & close voltages.

System Voltage	Closing Voltage	Opening Voltage
12V	13.18V	12.70V
24V	26.36V	25.40V

Table 2

ASC battery protect

In any of the above operations both studs are monitored. If a voltage of 3V or less is detected on either stud, the ASC contactor will not close. This is to prevent a short circuit being placed on the batteries. The “Battery Link” switch LED will flash to indicate a system fault. See flow charts Figure 3 and Figure 4 for the flash patterns during this mode.

Fault finding and flow charts

The controller monitors the contactor studs via the 4 way loom, these 2 supplies are fused at the contactor end with in-line fuses, check these fuses if the system is not functioning correctly.

Power on flash pattern (2 or 5 flashes)

Whenever the control module has powered applied, calibration data is read from memory. Once this is completed; both switch indicator LEDs flash twice to indicate a successful read. This should only be seen when the system is first connected; if this is seen during operation, it indicates a DC supply problem.

If 5 flashes are seen when the system is first connected; this indicates that there was a problem reading the calibration data. The module will still function, but with reduced accuracy. This indicates a fault, which should be investigated as soon as possible.

“Battery Link” switch LED flow chart when the switch has been operated.

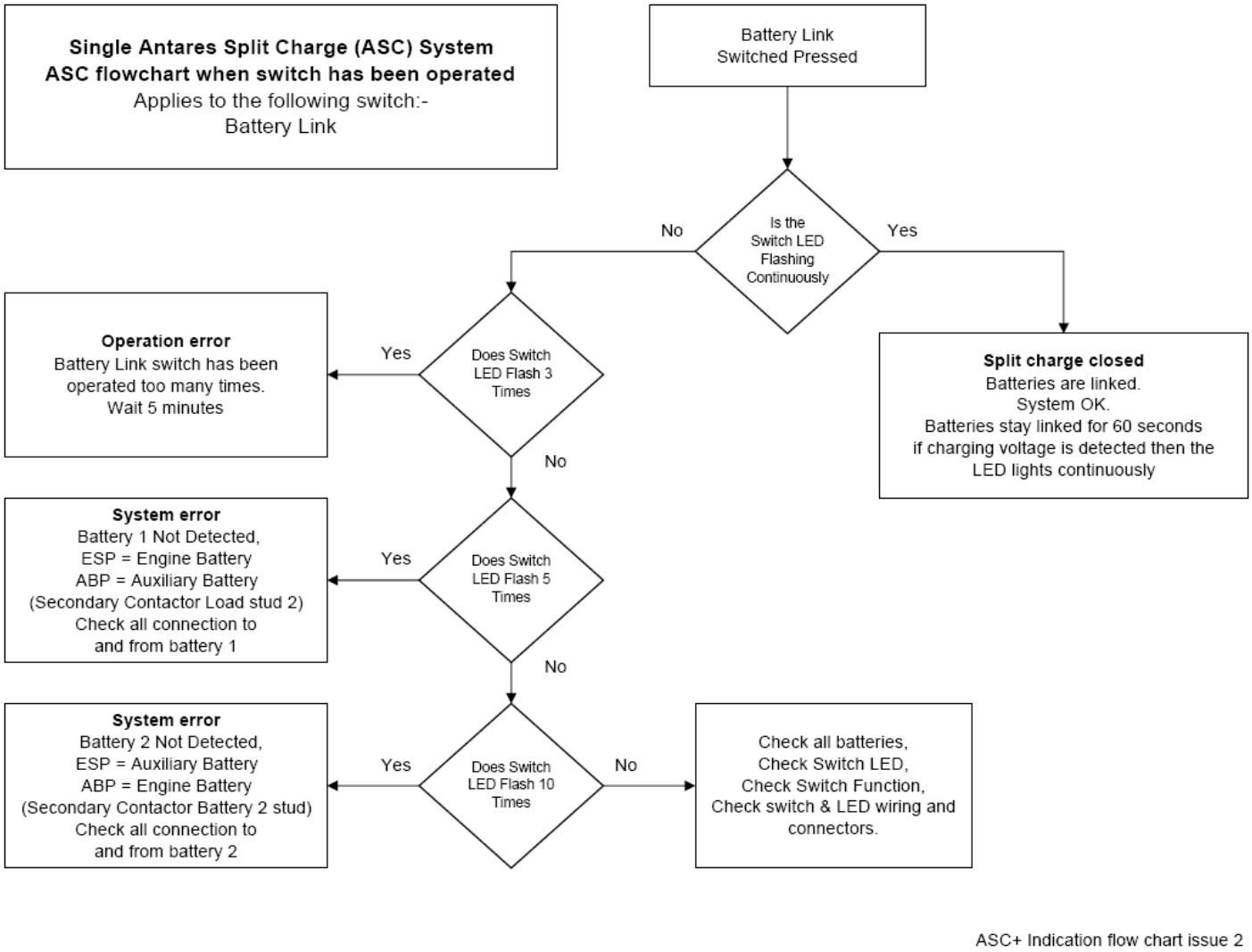

Figure 3

"Battery Link" switch LED flow chart when the switch has not been operated

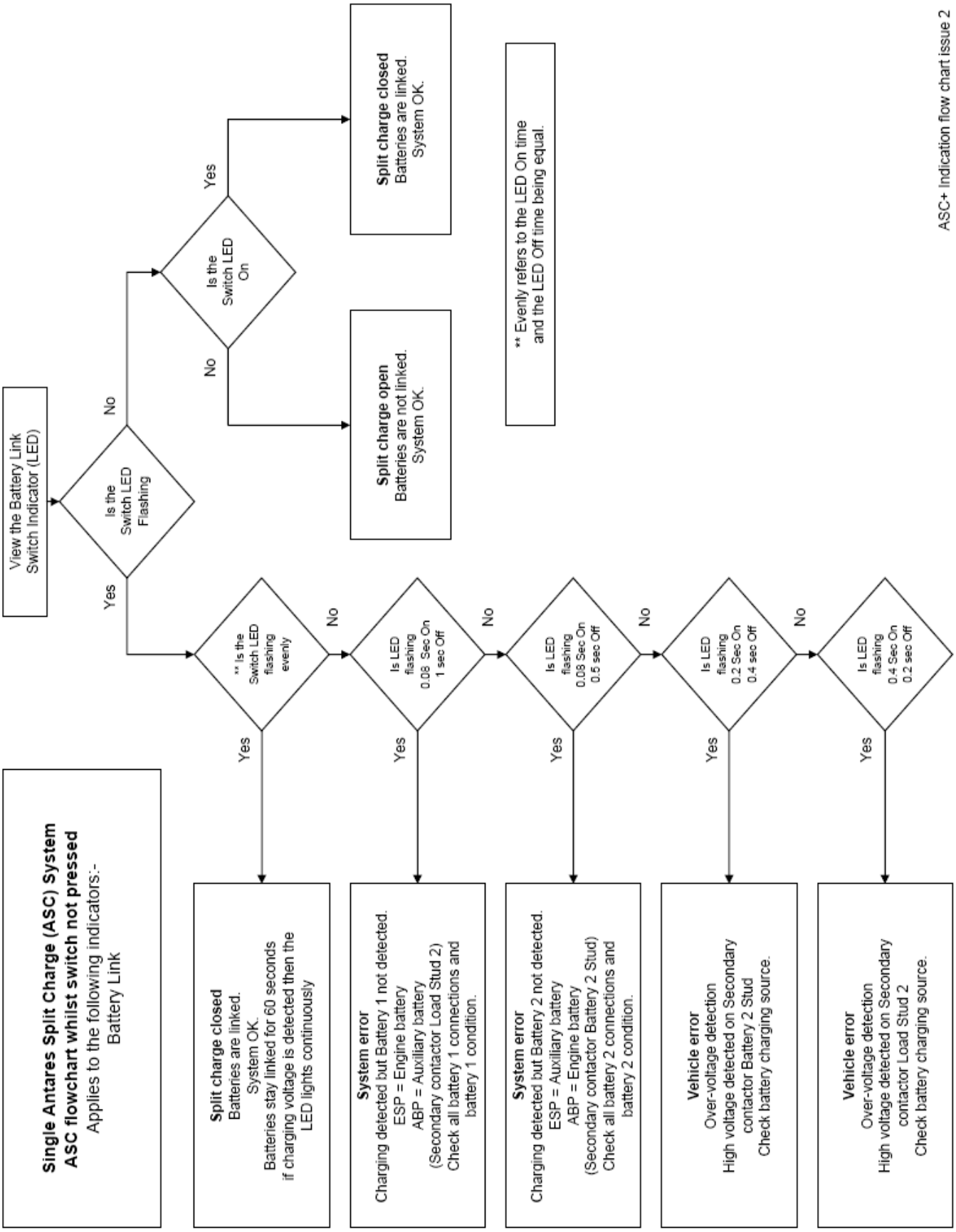

Figure 4

Within the ASC+ functions are user defined options which may be provided, on request, in place of the standard settings listed below.

Software controlled system variables

The ASC+ software offers the following factory configurable functions, any two of which may be employed within a single ASC+ module:

ESP - Engine start protection
ABP – Auxiliary battery protection
ASC – Automatic split charge

The default parameters for these functions are loaded into the standard software listed within this manual. However, the software is structured such that the user may specify alternative values, which can be supplied on request. Each set of user specified parameters will be assigned a unique software part number which will be shown on the product label.

The variable parameters & their default values are listed below:

ESP settings:

Parameter	Default	Alternative settings
Auto-close on battery stud	Disabled	Enabled when charging voltage detected
Auto-close on load stud	Disabled	None
Timed disconnect enable/disable	Disabled	Enabled when ignition is off
Timed disconnect – timed period	Not applicable	May be set in the range 1 to 90 minutes
Battery disconnect voltage	12.25 or 24.5 volts	May be set in the range 10 to 12.25 volts or 20 to 24.5 volts

ABP settings:

Parameter	Default	Alternative settings
Auto-close on battery stud voltage	Enabled only when ignition on	Enabled on charging voltage or Disabled
Auto-close on load stud voltage	Disabled	Enabled on charging voltage
Timed disconnect enable/disable	Disabled	Enabled
Timed disconnect – timed period	Not applicable	May be set in the range 1 minute to 90 days

Battery low disconnect voltage	Single ABP: 10.5 or 21 volts. Dual ABP: 10.5 & 12.2 volts, or 21 & 24.4 volts.	May be set in the range 10 to 12.25 volts or 20 to 24.5 volts

ASC settings:

Parameter	**Default**	**Alternative settings**
Dual voltage sense	Enabled	Main sense only or Aux sense only
Ignition off forces ASC off	Disabled	Enabled
Battery sensing (battery present or absent)	Enabled	Disabled
Assured start activation	External switch	Crank signal input or Automatic detection
Switching hysteresis	Standard	May be set in the range 0.1 to 2.0 volts

Spares

12V System spares		
Antares Part No	Description	Type / Value
80244	Contactor	12V, 125A Latching
80298	Contactor	12V, 250A Latching
81334	Switch Kit	12V, 1 x Switches ASC
56178	LED	12V Green
82524	Contactor Loom	4 way, 5M, Connector to free end
82516	Switch Assembly Loom	6 way, 5M, Connector to free end
See note 1 below	Controller	12V, 1 x contactor control

24V System spares		
Antares Part No	Description	Type / Value
80245	Contactor	24V, 125A Latching
80299	Contactor	24V, 250A Latching
81338	Switch Kit	24V, 1 x Switches ASC
56180	LED	24V Green
82524	Contactor Loom	4 way, 5M, Connector to free end
82516	Switch Assembly Loom	6 way, 5M, Connector to free end
See note 1 below	Controller	24V, 1 x contactor control

Note 1: Identifying the controller

The controller (a black box approximately 100mm x 70mm) has a label on the front, this label contains two numbers that identify the controller's hardware (HW) and software (SW) and therefore function and options fitted e.g.:-

HW: 81744-01 – SW: 17164-02

Both of these numbers must be quoted when requesting a replacement.

End of manual.

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