

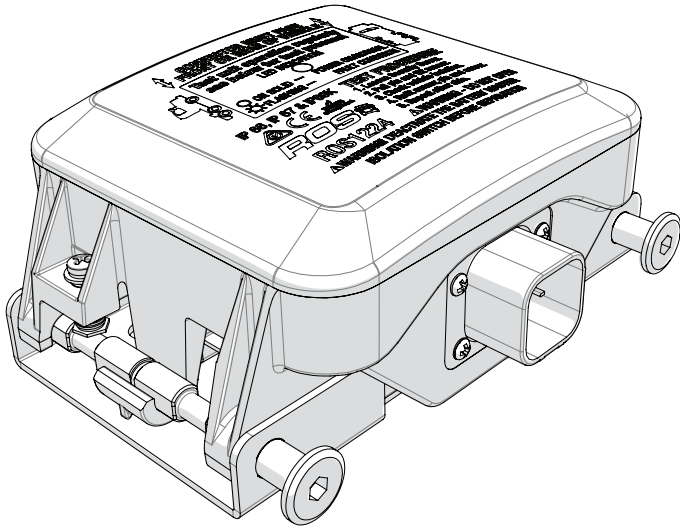
ROS



by REDARC

Roll Over Sensor

ROS1224



THE ROLL-OVER SENSOR

The REDARC Rollover Sensor (ROS) represents a significant improvement over the existing rollover sensors in the market. It enables trucks to meet the roll-over sensing requirements of AS2809:2008, signalling the isolation switch to disconnect power to the truck system in the event of a truck rollover. It has been designed for high reliability, undergoing thorough environmental and lifetime testing.

The REDARC ROS has been designed for easy periodic testing with a simple pin-removal and tilt mechanism featuring retained pins to prevent them being lost.

WARNINGS & SAFETY INSTRUCTIONS

SAVE THESE INSTRUCTIONS - This manual contains **IMPORTANT SAFETY INSTRUCTIONS** for the ROS.

DO NOT OPERATE THE ROLL OVER SWITCH UNLESS YOU HAVE READ AND UNDERSTOOD THIS MANUAL AND THE ROLL OVER SWITCH IS INSTALLED AS PER THESE INSTALLATION INSTRUCTIONS.

⚠ WARNING

1. **ALWAYS SECURELY MOUNT THE ROS ON A FLAT, HORIZONTAL SURFACE. FAILURE TO CORRECTLY MOUNT THE ROS MAY RESULT IN HAZARDOUS SITUATIONS DUE TO UNEXPECTED OPERATION.**
2. **USE APPROPRIATE FUSES TO PREVENT FIRE IN CASE OF DAMAGED WIRING.**

⚠ CAUTION

1. **DO NOT TEST THE ROS WHILE THE ENGINE IS RUNNING. THIS MAY CAUSE DAMAGE TO OTHER ELECTRICAL SYSTEMS ON THE VEHICLE.**
2. **WIRE ONLY ACCORDING TO AN APPROVED REDARC WIRING DIAGRAM.**

FEATURES

- Easy periodic test by pin-removal and tilt mechanism
- Suitable for 12V or 24V systems
- Uses dual accelerometers designed for automotive safety applications, giving high accuracy, reliability and ability to detect fault conditions
- Resilient to truck electrical environments
- Immune to vibration, bumps, shock, turning, or electrical transients
- Built for high reliability using automotive grade parts, and redundant sensors and controllers
- Custom industrial design housing
- Fault detection and indication LED on the unit and via an optional dash mounted lamp

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SPECIFICATIONS

Input Voltage	9V to 32V (12V or 24V systems)
Current Draw (into VIN+)	16mA (typical)
Ambient Temperature	-40°C to +85°C
Ambient Humidity	0% to 100%
Switching point	45-64°, 55° typical
Timing	>2s (3s max)
Output trigger	3 x 40 millisecond ground pulses at 0.5s intervals
Reverse polarity protection	Yes
Dash warning LED Lamp	12V LED suitable
Dimensions	150x122x65mm
Weight	0.7kg
Environmental protection	IP66/IP67/IP69K

1 CONNECTIONS

1.1 Component locator diagram

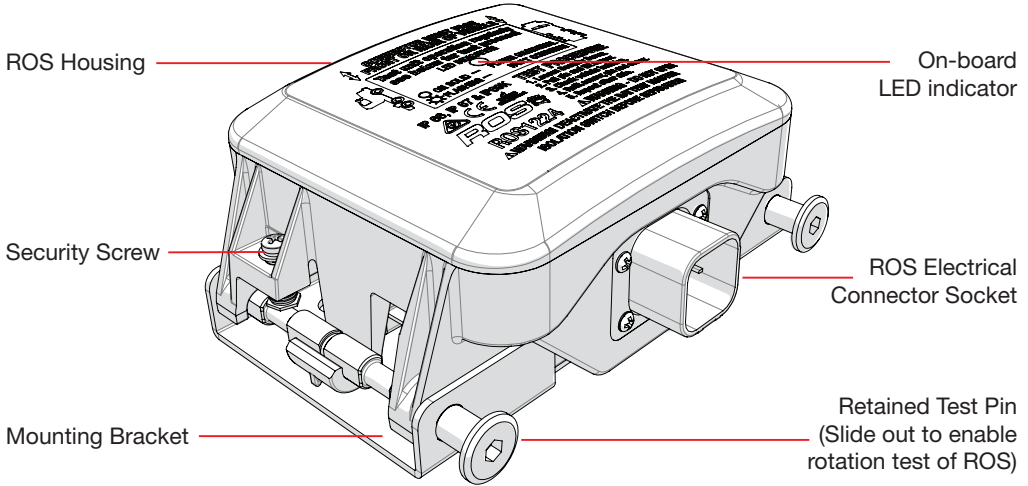


Figure 1.1.1 - Component Locator

1.2 Connections

Connector series: AMPSEAL 8-pin

Description	Part Number	Quantity
ROS Connector Plug	776286-1	1
Crimp Terminal	770854-3	5
Heat Shrink Boot	202K132-100-0	1

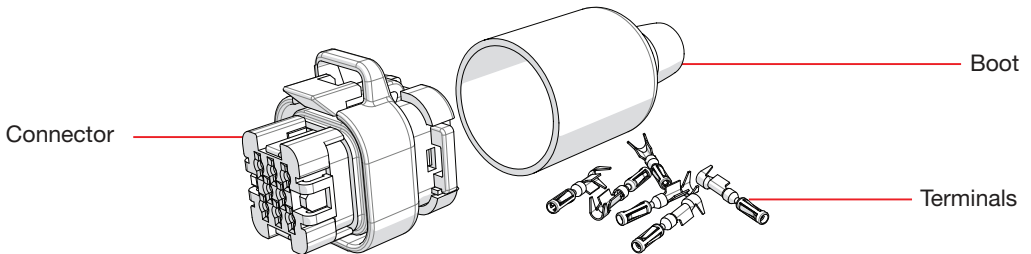


Figure 1.2.1 - Connector Component Locator

Note: These are included in the packaging with the REDARC ROS.

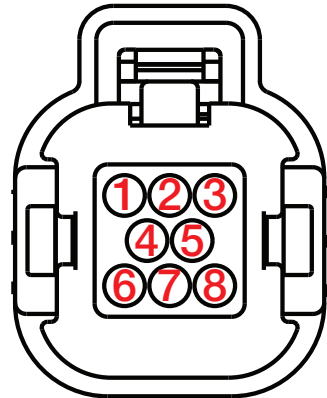
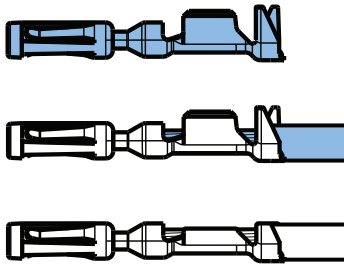
Wiring: REDARC recommend the use of 16 - 20 AWG wire. Note, for Lucas/Big Red refer *Note1 in wiring diagram section

1 CONNECTIONS

Connection Name	Connector pin locations	Function
AUX STATUS LAMP	1	Dash Warning LED lamp output. Use low-current LED lamp.
VIN+	3	12/24V positive power supply.
OUTPUT TRIGGER	5	Isolation switch control output. Switches to ground on rollover.
Redarc BMIS Trigger enable	6	Trigger enable for Redarc BMIS
VIN-	8	Ground connection for electronics.

Do not connect other pins: they are reserved for future use.

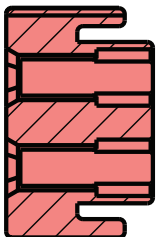
Recommended Crimping Tool: Tool 58529-1 (TE - Pro Crimper III)
Die Assembly 58529-2



Rear View

3

Close red cap until 'click' is felt.



1

Insert terminals with cables attached.



2

Ensure pin is fully inserted.



Push until end stop.

Pull cable to test retention.

2 FUNCTION

2.1 On-board LED Indicator and optional Dash Warning Lamp

An LED on the unit and Dash warning lamp (optional) indicates the status of the ROS. During normal operation of the ROS, the on-board LED will be on solid and the dash lamp will be off. If there is a fault with the ROS or associated wiring, the on-board LED will flash and the dash warning lamp will be on solid.

The following are causes for Fault indication :

- Failure to return unit to level condition following a tilt test
- Connection between ROS and isolation switch lost
- High ambient or internal temperature
- Internal accelerometer failure
- Internal self test fail

If the ROS is left at an angle greater than 10 degrees due to not being locked down after testing, the ROS will indicate a fault.

Once the fault has been rectified by locking down the ROS flat into its base, the ROS must have power disconnected and reconnected to clear the fault.

On first power up the ROS will turn the dash warning lamp on for 10 seconds, it will then turn off.

The dash warning must be a low-current LED lamp suitable for 12 or 24V systems

Condition	LED Indicator	Dash Lamp
Power off	Off	Off
Startup	Flash (1 sec)	On (up to 10s)
Normal Mode	On Solid	Off
Fault Mode	Flashing	On Solid

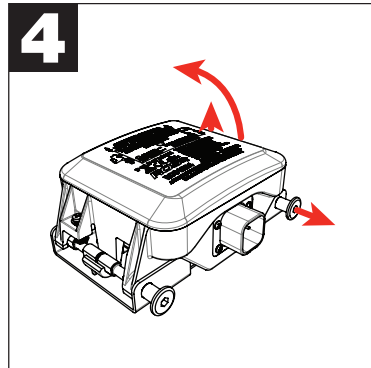
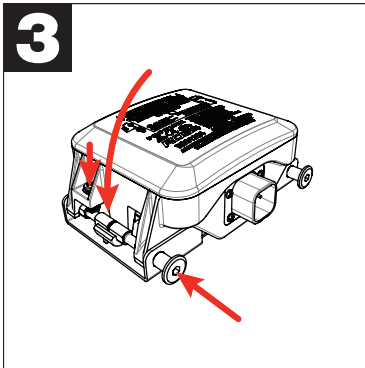
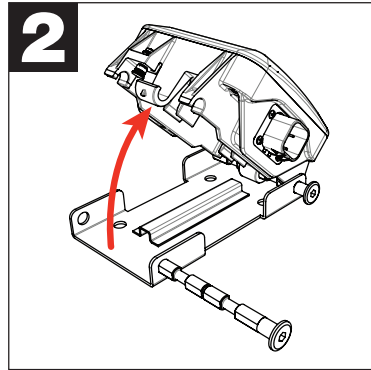
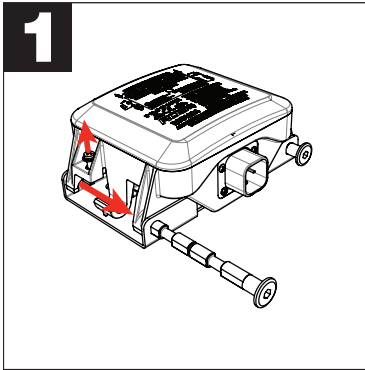
2.2 Periodic Testing

The requirements of AS2809 state that the roll over switch must be tested periodically. For maximum safety, the REDARC ROS is designed to be tested by physically moving the ROS, simulating a vehicle rollover.

Test procedure:

Ensure the vehicle is stationary and level with the engine off, park brake on, and isolation switch on (ROS must be powered for at least 15 seconds)

1. Loosen the security screw, remove pin.
2. Tilt the ROS until it hits the stop, wait 3 seconds and ensure that the batteries have been isolated. The ROS on-board LED should be off now. If the batteries do not isolate, refer to the troubleshooting guide.
3. Return the ROS to the correct flat position, return the pin and security screw. Re-connect the isolation switch by turning the handle or as per switch instructions.
4. Repeat steps 1 - 3, except lift the other side. Upon completion, double check that the ROS is fastened properly.



3 INSTALLATION

3.1 Mounting Detail

Must be mounted in a flat, level location. The accuracy of the level mounting will directly affect the accuracy of the switching angle.

Mounting direction should be with the connector in line of the vehicle (pointing front or rear) with the label facing upwards to make Tilt testing easier.

Recommendations:

- Mount in a location protected from debris/ impact
- Do not mount near exhaust or other extreme heat sources
- Mount away from fueling points.
- Check and ensure that the connection cable is supported yet flexible enough to allow rotation motion during tilt testing

Test operation after installation

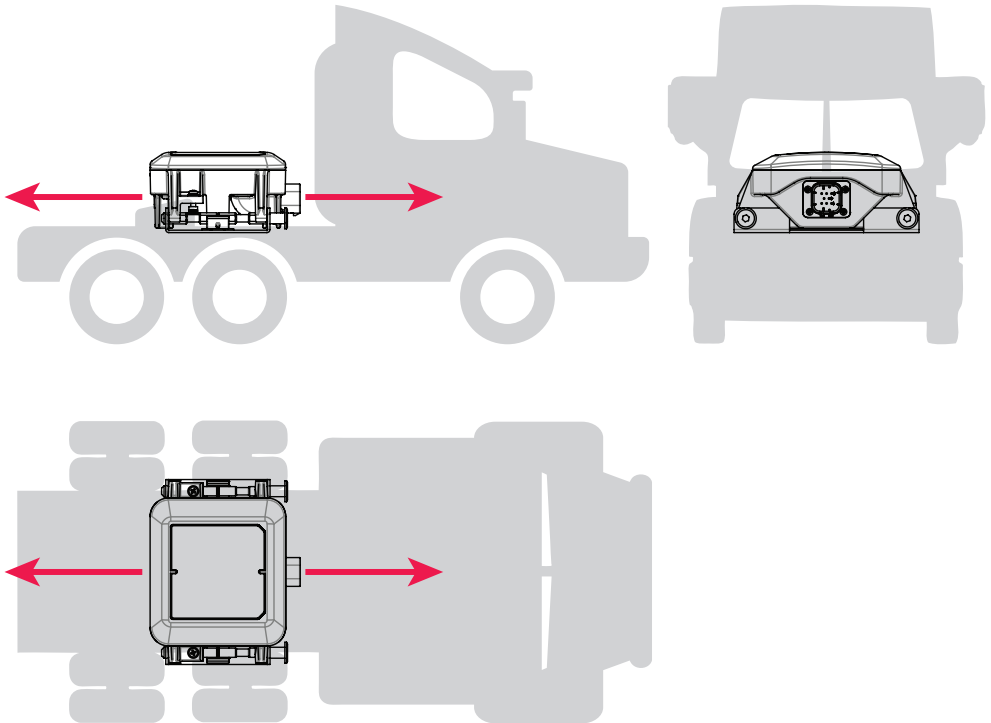
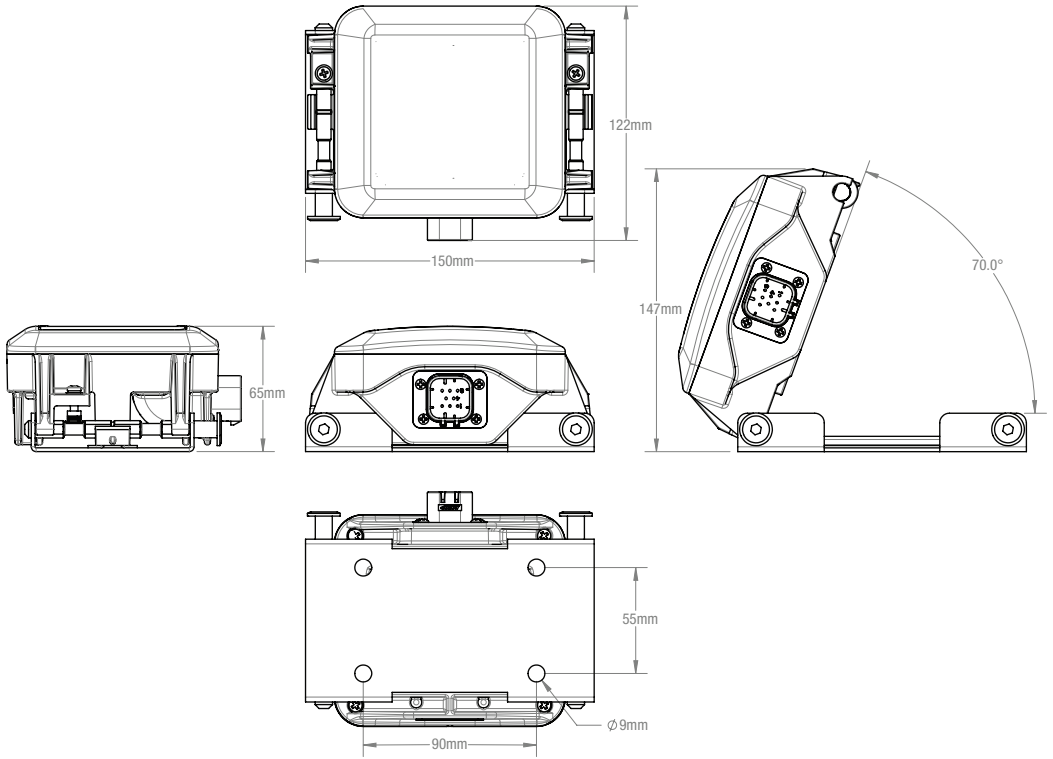


Figure 3.1.1 - The connector socket should be aligned with the direction of travel (pointed forwards or backwards are both acceptable)

3 INSTALLATION

3.2 Part Dimensions



3.3 Installation Diagrams

Fuses must be installed on the power supply circuit as indicated in wiring diagrams. The ROS does not protect external wiring from a short circuit.

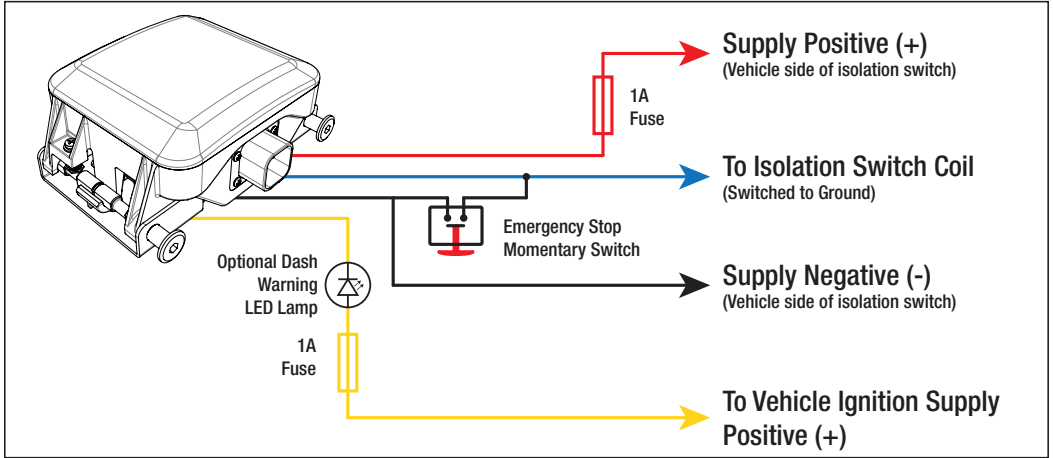


Figure 3.3.1 - General Connection Diagram

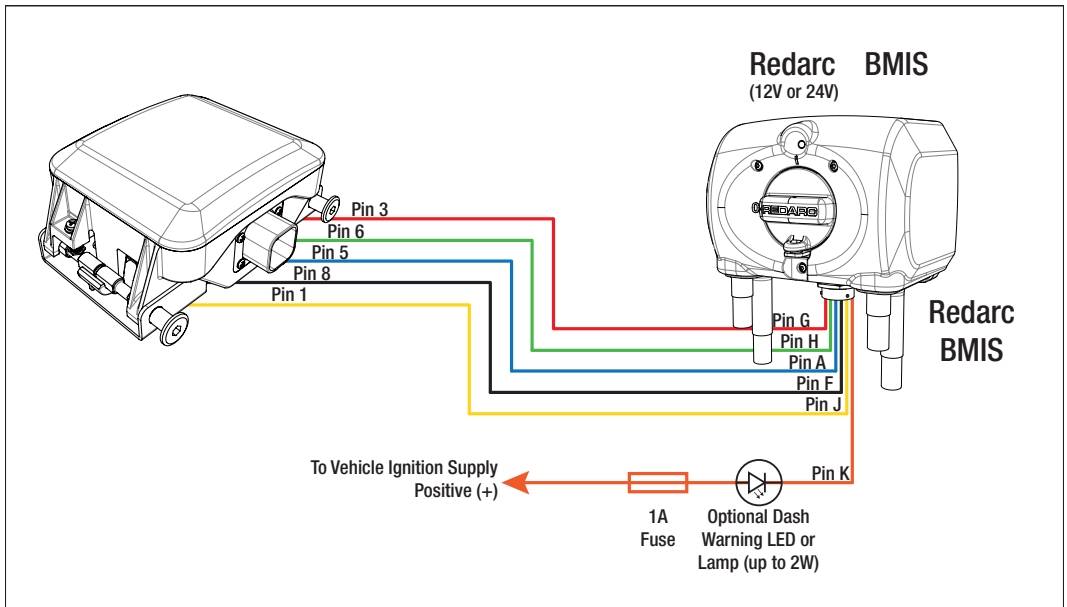


Figure 3.3.2 - REDARC BMIS Setup

3 INSTALLATION

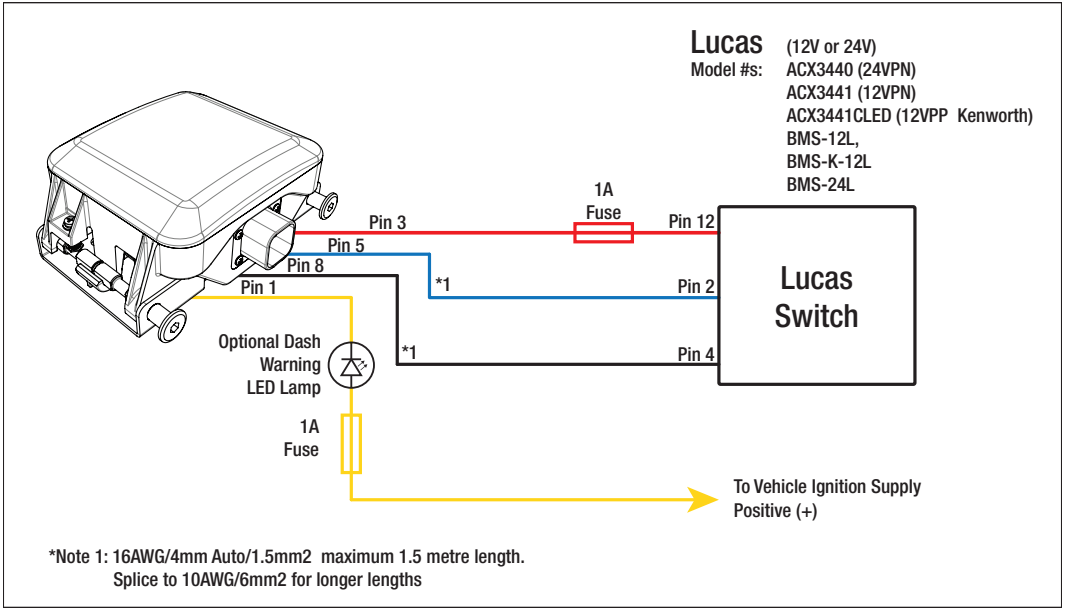


Figure 3.3.3 - Lucas Switch 12V or 24V Setup

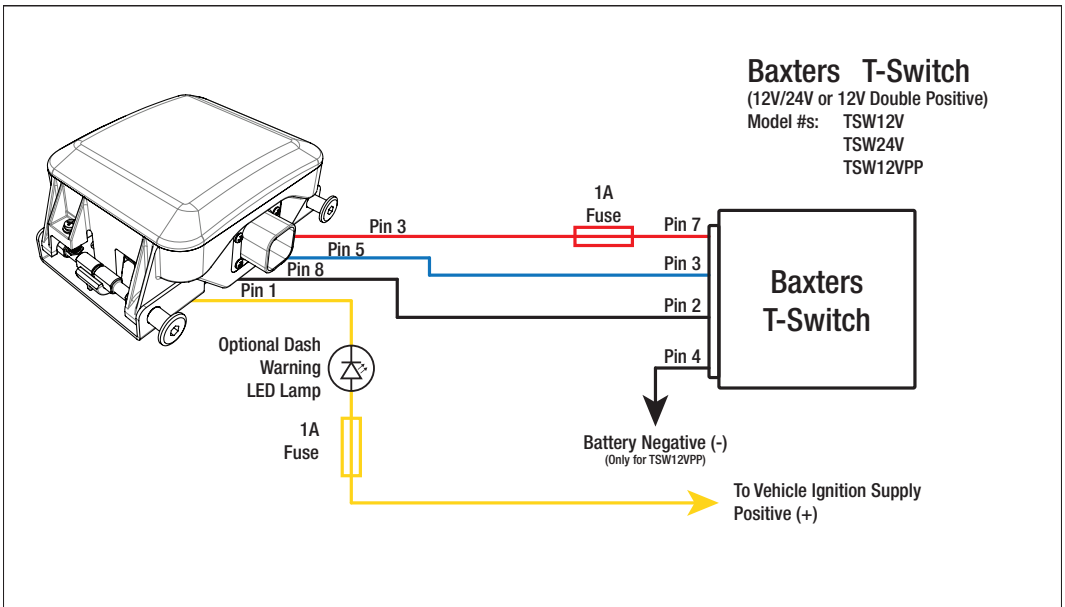


Figure 3.3.4 - Baxters T-Switch Setup

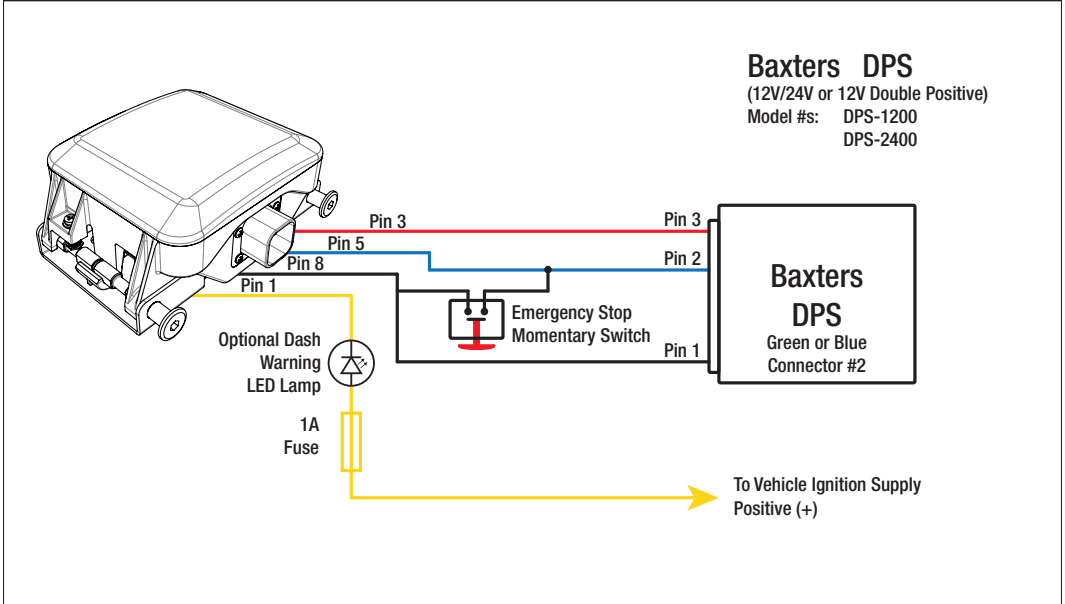


Figure 3.3.5 - Baxters DPS Setup

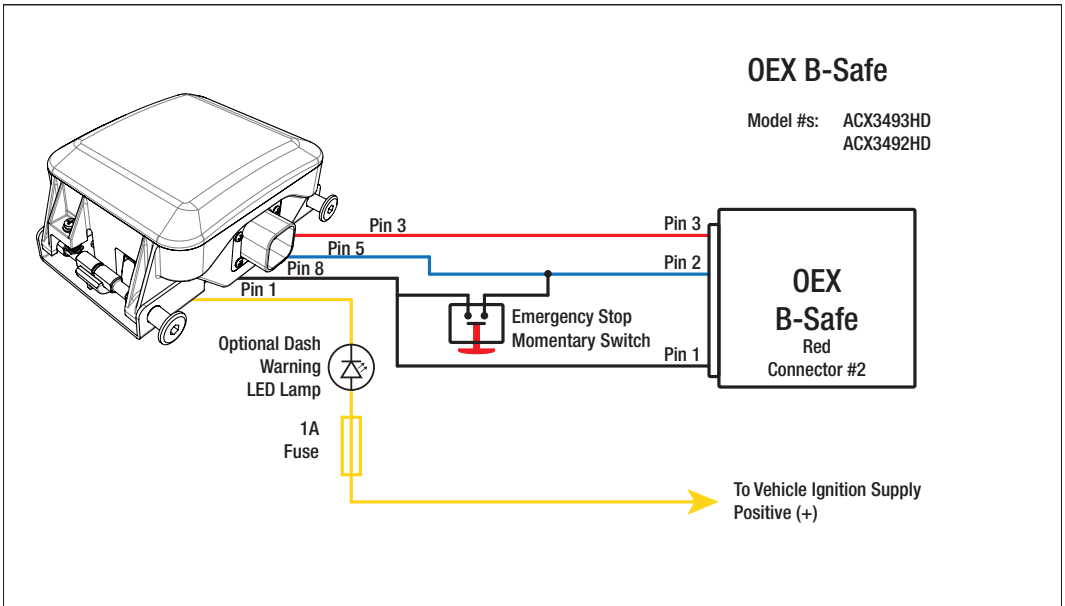
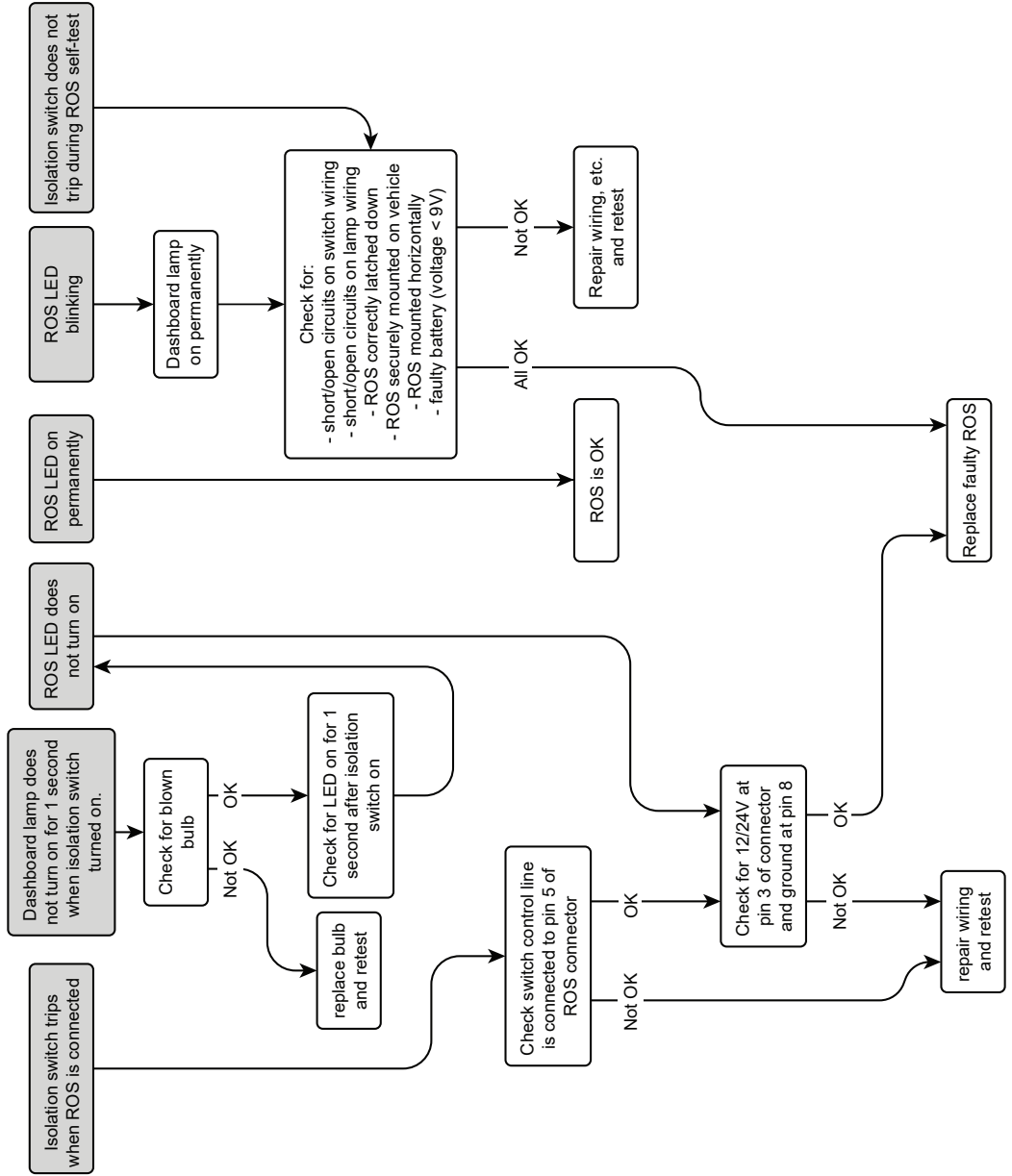


Figure 3.3.6 - OEX B-Safe Setup



5 STANDARDS & TESTING

Automotive Component Qualification (where applicable)	AEC-Q100 Rev-G	Stress Qualification For Integrated Circuits
	AEC-Q101 Rev-D	Stress Test Qualification For Discrete Semiconductors
	AEC-Q200	Rev-D Stress Test Qualification For Passive Components
EMC and EMI compliance Group 1 Class A	AS/NZS CISPR11 Group 1 Class A	Industrial, scientific and medical (ISM) radio-frequency equipment Electromagnetic disturbance characteristics – Limits and methods of measurement
	ISO10605	Road Vehicles—Test Methods for Electrical Disturbances from Electrostatic Discharge
	IEC 61000-4-3 Ed. 3.2 SAE J1113-4,-21 ISO 11452-2,-4	Electromagnetic compatibility (EMC) - Part 4-3: Testing and measurement techniques - Radiated, radio-frequency, electromagnetic field immunity test
	IEC 61000-4-6 Ed. 3.0	Electromagnetic compatibility (EMC) - Part 4-6: Testing and measurement techniques - Immunity to conducted disturbances, induced by radio-frequency fields
		CE Automotive directive
Environmental and Lifetime testing	IEC 60068-2-1 Ed. 6.0	Environmental testing - Part 2-1: Tests - Test A: Cold
	IEC 60068-2-2 Ed. 5.0	Environmental testing - Part 2-2: Tests - Test B: Dry heat
	IEC 60068-2-14 Ed. 6.0	Environmental testing - Part 2-14: Tests - Test N: Change of temperature
	IEC 60068-2-30 Ed. 3.0	Environmental testing - Part 2-30: Tests - Test Db: Damp heat, cyclic (12 h + 12 h cycle)
	IEC 60068-2-38 Ed. 2.0	Environmental testing - Part 2-38: Tests - Test Z/AD: Composite temperature/humidity cyclic test
	ISO16750-3	Road vehicles — Environmental conditions and testing for electrical and electronic equipment — Part 3: Mechanical loads Test VII: - Equipment mounted on sprung masses (vehicle body)
	IEC 60529 Ed. 2.1	Degrees of protection provided by enclosures (IP Code)
		UV/Light
		Impact
	ASTMD3170:1996	Gravel bombardment
	ASTM B117 1000Hrs	Salt fog
	UL94	Tests for flammability of basic materials for parts in devices and appliances
	ISO60068-2-74 (MOD) ISO 8092-2	Automotive fluid resistance
	IEC 60068-2-38	Environmental testing – Part 2-38: Tests – Test Z/AD: Composite temperature/humidity cyclic test
	Other Applicable standards	AS 2809.2:2008
AS/NZS ISO 9001:2008		Quality management systems - Requirements

6 TWO YEAR PRODUCT WARRANTY

Over the last three decades our company has established a reputation as the power conversion specialist.

A 100% Australian-owned company, we have met the needs of customers in transport and other industries through exciting, innovative thinking.

We believe in total customer satisfaction and practice this by offering our customers:

- Technical advice free of jargon and free of charge
- Prompt turnaround of orders throughout Australia and globally
- Friendly, personalised, professional service and product support

In the unlikely event that a technical issue arises with a Redarc product, customers are encouraged to initially contact the Redarc Technical Support Team on (08) 8322 4848 or power@redarc.com.au for prompt and efficient diagnosis and product support.

Our goods come with guarantees that cannot be excluded under the Australian Consumer Law. You are entitled to a replacement or refund for a major failure and compensation for any other reasonably foreseeable loss or damage. You are also entitled to have the goods repaired or replaced if the goods fail to be of acceptable quality and the failure does not amount to a major failure.

The benefits of this Warranty are in addition to other rights and remedies available at law in respect of the Products and shall not derogate from any applicable mandatory statutory provisions or rights under the Australian Consumer Law.

Redarc Electronics Pty Ltd aff the Redarc Trust trading as Redarc Electronics ("Redarc") offers a warranty in respect of its Products where the Products are purchased from an authorised distributor or reseller of Redarc by a person ("Purchaser"), on the terms and conditions, and for the duration, outlined below in this document ("Warranty").

1. In this Warranty, the term **Products** means:

- 1.1 all products manufactured or supplied by Redarc (excluding its solar products which are covered by Redarc's Solar Product Warranty); and
- 1.2 any component of or accessory for any product in clause 1.1 manufactured or supplied by Redarc.

Offer and duration of product warranties

2. Redarc warrants that its Products will be free, under normal application, installation, use and service conditions, from defects in materials and workmanship affecting normal use, for **2 years** from the date of purchase (**Warranty Period**).

3. Where a Product malfunctions or becomes inoperative during the Warranty Period, due to a defect in materials or workmanship, as determined by Redarc, then subject to further rights conferred by the Australian Consumer Law on the Purchaser, Redarc will, in exercise of its sole discretion, either:

- 3.1 repair the defective Product;
- 3.2 replace the defective Product; or
- 3.3 provide a refund to the Purchaser for the purchase price paid for the defective Product,

without charge to the Purchaser.

4. The warranty given by Redarc in clause 3 covers the reasonable costs of delivery and installation of any repaired or replaced Products or components of Products to the Purchaser's usual residential address notified to Redarc, together with the reasonable costs of removal and return of any Products determined by Redarc to be defective.

5. If the Purchaser incurs expenses of the nature referred to in clause 4 in the context of making a claim pursuant to this Warranty that is accepted by Redarc, the Purchaser will be entitled to claim for reimbursement of those expenses which Redarc determines, in exercise of its sole discretion, to be reasonably incurred, provided that the claim is notified to Redarc in writing at the postal address or email address specified in clause 21 and includes:

- 5.1 details of the relevant expenses incurred by the Purchaser; and
- 5.2 proof of the relevant expenses having been incurred by the Purchaser.

Exclusions and limitations

6. This Warranty will not apply to, or include any defect, damage, fault, failure or malfunction of a Product, which Redarc determines, in exercise of its sole discretion, to be due to:

- 6.1 normal wear and tear or exposure to weather conditions over time;
- 6.2 accident, misuse, abuse, negligence, vandalism, alteration or modification;
- 6.3 non-observance of any of the instructions supplied by Redarc, including instructions concerning installation, configuring, connecting, commissioning, use or application of the Product, including without limitation choice of location;
- 6.4 failure to ensure proper maintenance of the Product strictly in accordance with Redarc's instructions or failure to ensure proper maintenance of any associated equipment or machinery;
- 6.5 repairs to the Product that are not strictly in accordance with Redarc's instructions;
- 6.6 installation, repairs or maintenance of the Product by, or under the supervision of, a person who is not a qualified auto electrician or technician, or if non-genuine or non-approved parts have been fitted;
- 6.7 faulty power supply, power failure, electrical spikes or surges, lightning, flood, storm, hail, extreme heat, fire or other occurrence outside the control of Redarc;
- 6.8 use other than for any reasonable purpose for which the Product was manufactured;
- 6.9 any indirect or incidental damage of whatever nature outside the control of Redarc.

7. Warranty claims in respect of a Product must be made in writing to Redarc at the postal address or email address specified in clause 21 within the Warranty Period. Such claims must include the following:

- 7.1 details of the alleged defect or fault and the circumstances surrounding the defect or fault;
- 7.2 evidence of the claim, including photographs of the Product (where the subject of the claim is capable of being photographed);
- 7.3 the serial number of the Product, specified on the label affixed to the Product; and
- 7.4 proof of purchase documentation for the Product from an authorised distributor or reseller of Redarc, which clearly shows the date and place of purchase.

The return of any Products without the prior written instructions of Redarc will not be accepted by Redarc.

8. Without limiting any other clause in this Warranty, Redarc has the right to reject any Warranty claim made by a Purchaser pursuant to this Warranty where:

- 8.1 the Purchaser does not notify Redarc in writing of a Warranty claim within the Warranty Period;
 - 8.2 the Purchaser does not notify Redarc in writing of a Warranty claim within 1 month of becoming aware of the relevant circumstances giving rise to the claim, so that any further problems with the Product are minimised;
 - 8.3 the serial number of the Product has been altered, removed or made illegible without the written authority of Redarc;
 - 8.4 the Purchaser is unable to provide proof of purchase documentation in accordance with clause 7.4 or evidence that the Product was properly installed and removed (if relevant), and that proper maintenance has been performed on the Product, by, or under the supervision of, a qualified auto electrician or technician, in accordance with the instructions of Redarc.
9. If the Product is found to be working satisfactorily on return to Redarc or upon investigation by Redarc, the Purchaser must pay Redarc's reasonable costs of testing and investigating the Product in addition to shipping and transportation charges. Where Redarc is in possession of the Product, the Product will be returned to the Purchaser on receipt of the amount charged.
10. Any replaced Products or components of Products shall become the property of Redarc.
11. Redarc may, in exercise of its sole discretion, deliver another type of Product or component of a Product (different in size, colour, shape, weight, brand and/or other specifications) in fulfilling its obligations under this Warranty, in the event that Redarc has discontinued manufacturing or supplying the relevant Product or component at the time of the Warranty claim, or where such Product or component is superior to that originally purchased by the Purchaser.

Other conditions of Warranty

12. If the Purchaser acquired a Product for the purpose of resupply, then this Warranty shall not apply to that Product.
13. In particular, the sale of a Product via an online auction, online store or other internet website by a party that is not an authorised distributor or reseller of the Product will be deemed to be a resupply within the meaning of the Australian Consumer Law and will render this Warranty void, as Redarc has no control over the storage, handling, quality or safety of Products sold by such persons.
14. A Purchaser shall only be entitled to the benefit of this Warranty after all amounts owing in respect of the Product have been paid.
15. While Redarc warrants that the Products will be free from defects in materials and workmanship in the circumstances set out in this Warranty, to the maximum extent permitted by law Redarc does not warrant that the operation of the Products will be uninterrupted or error-free.
16. To the maximum extent permitted by law, Redarc's determination of the existence of any defect and the cause of any defect will be conclusive.
17. Spare parts or materials for the Products are guaranteed to be available for a period of at least 2 years after purchase of the Products.
18. The agents, officers and employees of any distributor or reseller of the Products and of Redarc are not authorised to vary or extend the terms of this Warranty.
19. Redarc shall not be responsible or liable to the Customer or any third party in connection with any non-performance or delay in performance of any terms and conditions of this Warranty, due to acts of God, war, riots, strikes, warlike conditions, plague or other epidemic, fire, flood, blizzard, hurricane, changes of public policies, terrorism and other events which are beyond the control of Redarc. In such circumstances, Redarc may suspend performance of this Warranty without liability for the period of the delay reasonably attributable to such causes.
20. If a clause or part of a clause in this Warranty can be read in a way that makes it illegal, unenforceable or invalid, but can also be read in a way that makes it legal, enforceable and valid, it must be read in the latter way. If any clause or part of a clause in this Warranty is illegal, unenforceable or invalid, that clause or part is to be treated as removed from this Warranty, but the rest of this Warranty is not affected.

Redarc's contact details

21. Redarc's contact details for the sending of Warranty claims under this Warranty are:

Redarc Electronics Pty Ltd
23 Brodie Road (North), Lonsdale SA 5160
Email: power@redarc.com.au
Telephone: +61 8 8322 4848

THE POWER OF
REDARC®

Free technical assistance!

please contact

REDARC Electronics

23 Brodie Road North, Lonsdale SA

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www.redarc.com.au

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