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Tech Talk 61: Battery Isolation Switch

This tech talk should be read in conjunction with tech talk 46: *Wiring electronics on road tankers.*

Scope: This document applies to Battery Isolation Switches (BIS's) mounted on trucks in the petro-chemical industry.

Function: A BIS is a device that provides a means of completely isolating battery power from truck mounted and ancillary electrical equipment.

Method of Operation: An actuator in the form of a switch (auxiliary or chassis mounted) when activated will break all poles including the neutral. This ensures the battery is completely isolated from any electrical equipment by isolating both the battery negative and positive.

Applicable Standards:

1. Australian

AS2809 states the following –

A battery isolation switch shall be provided for use in an emergency only. In such a case, it is necessary to isolate the battery. Reconnection should only be made when the hazard has been removed. The means of operating the isolating switch shall be located on the driver's side and to the immediate rear outside of the cabin, in such a position that is clearly visible and easily accessible to a person outside the vehicle, and shall be clearly labelled. The battery isolation switch shall have fully enclosed contacts and be weatherproof.

2. European Standards – Restructured ADR European Agreement, Dangerous Goods:

A switch for breaking the electrical circuits shall be placed as close to the battery as practicable.

A control device to facilitate the disconnecting and reconnecting functions of the switch shall be installed in the driver's cab. It shall be readily accessible to the driver and be distinctively marked. It shall be protected against inadvertent operation by either adding a protective cover, by using a dual movement control device or by other suitable means. Additional control devices may be installed provided they are distinctively marked and protected against inadvertent operation. The switch shall have a casing with protection degree IP65 in accordance with IEC Standard 529.



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The cable connections on the switch shall have protection degree IP54. However, this does not apply if these connections are contained in a housing that may be the battery box. In this case it is sufficient to insulate the connections against short circuits, for example with a rubber cap.

Variants: The Lucas BIS has been the industry standard for many years. Recently the intellectual property behind this BIS was sold and now Lucas equivalent BIS's are available.

Another BIS manufactured under the Menbers name offers more flexibility and has other advantages over the Lucas type. It is suited for remote switching requirements.

The Menbers BIS is manufactured in a 4-pin and 7-pin model. Note, Liquip recommends use of the 7-pin model.

The 7-pin is a 12V (BMS106) and 24V (BMS107) model. It is positive switching, designed for battery isolation via remote switches. It is turned both on and off electrically via the use of any number of chassis mounted switches.

Advantages/disadvantages between Menbers (12 & 24V) & Lucas (12 & 24V):

1. Advantages of Menbers over Lucas -

- More flexibility. Suitable for remote switching applications as opposed to manual.
- Based on ADR standard specifying button in cab and outside of vehicle.
- Draws less current and is thus a more reliable and safer alternative.
- Better (more reliable) internal contacts.
- Lighter.
- Smaller.
- Rated to IP67.

2. Advantages of Lucas over Menbers -

- More robust and thus better suited to Australian environment. Outer casing of Menbers is plastic mould.
- Customers more familiar with Lucas type.
- Can gain access to internals. Lid of Menbers is pop-riveted to outer mould.
- Manual operating switch is large solid positive switch mounted on lid.
- Cheaper. Menbers cost increased by external switches and cabling.
- Easy replacement on trucks fitted with Lucas type if faulty unit needs changing.



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Characteristics:

SPECIFICATION	MENBERS 12V	LUCAS REPL. 12V	MENBERS 24V	LUCAS REPL. 24V
Short time operating current	2500A for 5sec max	-	2500A for 5sec max	-
Max continuous current	250A max	200A @ 5min	250A max	200A @ 5min
Max current aux contacts	2A	-	2A	-
Operating temp	-40 to +70degC	-	-40 to +70degC	-
Housing	Plastic	Metal	Plastic	Metal
IP rating	67	65	67	65
Dimensions (LxWxD) max	191x90x117	189x153x174	191x90x117	189x153x174

Liquip Part Numbers:

Members 12V – P6963 (7-pin).

Members 24V – P6962 (7-pin).

Lucas repl. 12V – P1325.

Lucas repl. 24V – P1324.