



PATENTED.  
2004/104/EEC TYPE APPROVAL  
(Automotive)

Installation and Use Handbook  
for  
"BRIDGE" (Code 941 )



SINCERT



*Azienda con Sistema Qualità certificato UNI EN ISO 9001:2000*

# BRIDGE

( code 941 )


**DO NOT install any voltage booster together with the Bridge!**

The present handbook describes safety, installations, use and maintenance measures for the **dual power multifunctional Bridge connector** developed by Elettromeccanica Gasperini, the “BRIDGE”.

Please read this handbook carefully before installing, using or taking maintenance measures.

<b>INDEX</b>
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- 1.0 Field of Application
- 1.1 Safety

<b>For the technician performing the installation</b>		
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- 2 Kit content
- 3 Connection arrangement – installation - tests

<b>For the User / Customer</b>
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- 4 The potentials of BRIDGE – Modalities of use
- 5 Suggestions for use
- 6 LEDs Key
- 7 FAQ
- 8 Technical Features

Note: The Self-Energy EG20 is an energy system (12V 20A) developed by Elettromeccanica GASPERINI S.r.l. ( [www.egasperini.com](http://www.egasperini.com) )

1.0	<b>Field of Application</b>
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The Bridge code 941 was specifically created for leisure vehicles (motor-caravans, caravans, motorhomes). It controls - manually or automatically - the connection between two or more 12V batteries.

1.1	<b>Safety</b>
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It is necessary to read and understand this handbook before performing the installation and use the product.

The Bridge can be exclusively used with a 12V voltage circuit (direct current).

The installation must be performed by specialised and skilled motor vehicle electricians.

If it is necessary to operate on the electric installation of the vehicle (including batteries and bridge), do not forget to switch OFF the Bridge.




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(Automotive)

## Installation and Use Handbook for "BRIDGE" (Code 941)




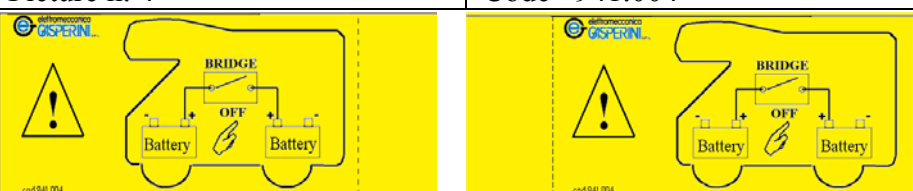
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### 2 Kit content (code 941.xxxx)

2.1	Picture n. 1	Code 941.001
"Bridge" module		

2.2	Picture n. 2	Code 941.002
Remote module		

2.3	Picture n. 3	Code 941.003 / x
Bridge - remote module connection cable		

2.4	Picture n. 4	Code 941.004
2 warning labels (to be placed on + batteries cables)		

2.5	Picture n. 5	
Installation and use handbook		




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2004/104/EEC TYPE APPROVAL  
(Automotive)

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"BRIDGE" (Code 941 )



2.6 **OPTIONAL** Materials NOT included in the kit

Description	Available at Elettromeccanica GASPERINI	Code Elettromeccanica GASPERINI	Picture / Remarks
2 MIDI type fuses with their fuse supports	YES	941.KF1	
16 mm <sup>2</sup> red cable	YES	931.CAV16.RO	
2,5 mm <sup>2</sup> cable	YES	CAV2.5NE	
Fixing screws	NO	-----	
Clamps	NO	-----	



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2004/104/EEC TYPE APPROVAL  
(Automotive)

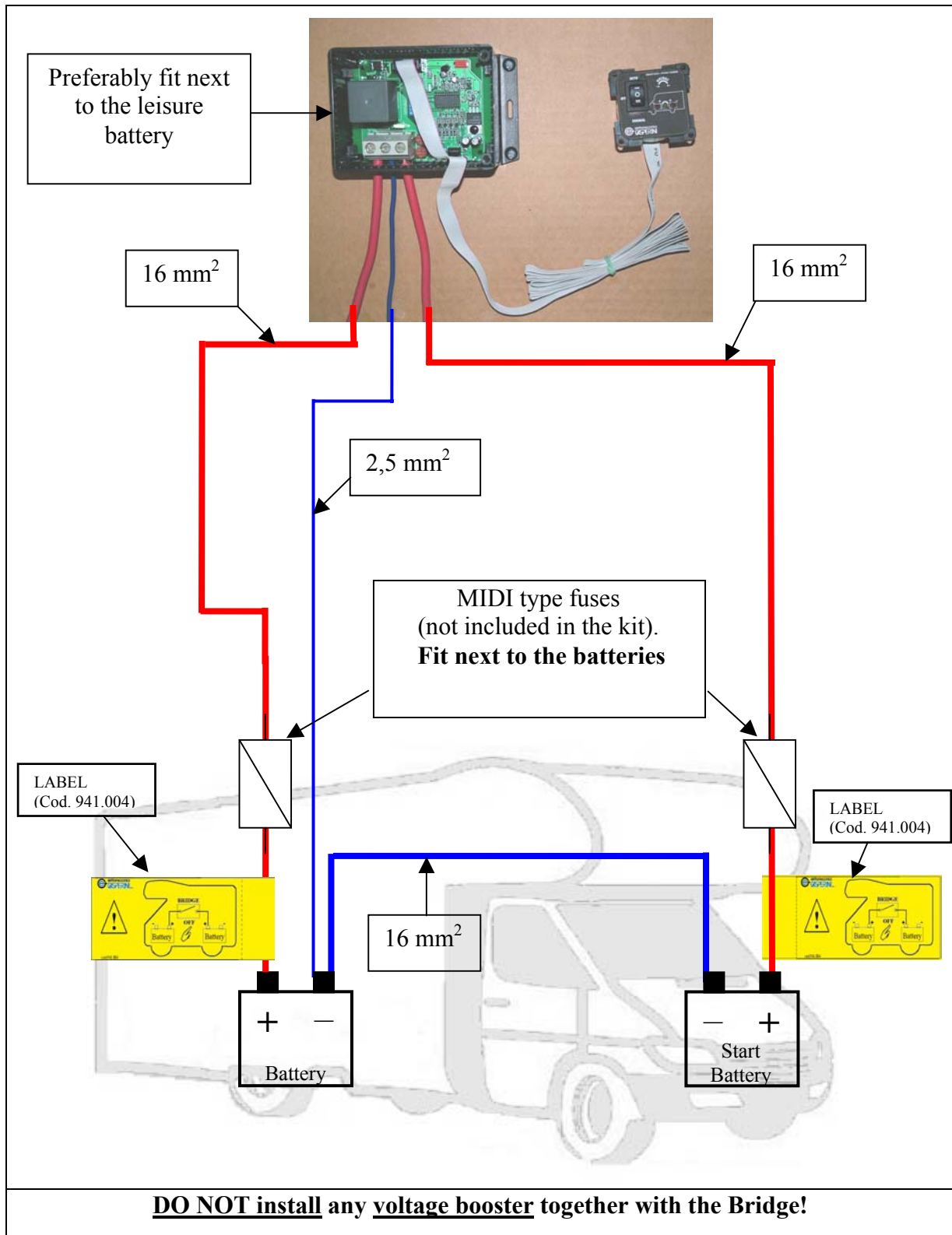
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3-3.1 For the technician performing the installation



Connection arrangement – installation



Modification and updating can be done without any notice.

[file: 170108-MUM-Bridge(ING)]

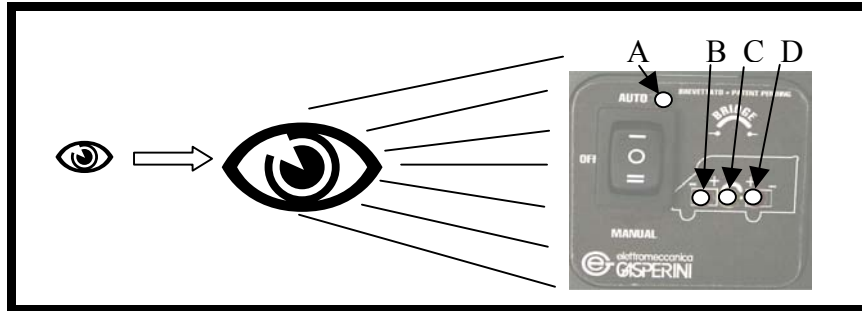


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3.2	For the <b>technician</b> performing the <b>installation</b>		Remote module LEDs
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3.3	<b>Installation steps</b>
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I1	Bridge fixing	I2	Remote module connection	I3	"OFF"
I4	Battery connection	I4	Battery connection	I4	Battery connection



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2004/104/EEC TYPE APPROVAL  
(Automotive)

Installation and Use Handbook  
for  
"BRIDGE" (Code 941)



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I4	Leisure battery connection	I5	👁️												
		<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td style="text-align: center;">A</td><td style="text-align: center;">Off</td></tr> <tr><td style="text-align: center;">B</td><td style="text-align: center;">On</td></tr> <tr><td style="text-align: center;">C</td><td style="text-align: center;">Off</td></tr> <tr><td style="text-align: center;">D</td><td style="text-align: center;">Off</td></tr> <tr><td style="text-align: center;">Buzzer</td><td style="text-align: center;">Off</td></tr> </table> <p style="text-align: center;">For other warnings, see table</p>			A	Off	B	On	C	Off	D	Off	Buzzer	Off	
A	Off														
B	On														
C	Off														
D	Off														
Buzzer	Off														
I6	Connection of the batteries' negative poles	I7	Engine battery connection	I8	👁️										
				<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td style="text-align: center;">A</td><td style="text-align: center;">Off</td></tr> <tr><td style="text-align: center;">B</td><td style="text-align: center;">Off</td></tr> <tr><td style="text-align: center;">C</td><td style="text-align: center;">Off</td></tr> <tr><td style="text-align: center;">D</td><td style="text-align: center;">Off</td></tr> <tr><td style="text-align: center;">Buzzer</td><td style="text-align: center;">Off</td></tr> </table> <p style="text-align: center;">For other warnings, see table</p>		A	Off	B	Off	C	Off	D	Off	Buzzer	Off
A	Off														
B	Off														
C	Off														
D	Off														
Buzzer	Off														
* = label code 941.004															

3.4	For the <b>technician</b> performing the <b>installation</b>	👉	<b>tests</b>
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V1	"MANUAL"	👁️		V2	"AUTO"	👁️																					
		<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td style="text-align: center;">A</td><td style="text-align: center;">Off</td></tr> <tr><td style="text-align: center;">B</td><td style="text-align: center;">Off</td></tr> <tr><td style="text-align: center;">C</td><td style="text-align: center;">On</td></tr> <tr><td style="text-align: center;">D</td><td style="text-align: center;">Off</td></tr> <tr><td style="text-align: center;">Buzzer</td><td style="text-align: center;">Off</td></tr> </table>	A	Off	B	Off	C	On	D	Off	Buzzer	Off	For other warnings, see "Point 6"			<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td style="text-align: center;">A</td><td style="text-align: center;">On</td></tr> <tr><td style="text-align: center;">B</td><td style="text-align: center;">Off</td></tr> <tr><td style="text-align: center;">C</td><td style="text-align: center;">On/Off</td></tr> <tr><td style="text-align: center;">D</td><td style="text-align: center;">Off</td></tr> <tr><td style="text-align: center;">Buzzer</td><td style="text-align: center;">Off</td></tr> </table>	A	On	B	Off	C	On/Off	D	Off	Buzzer	Off	For other warnings, see table "Point 6"
A	Off																										
B	Off																										
C	On																										
D	Off																										
Buzzer	Off																										
A	On																										
B	Off																										
C	On/Off																										
D	Off																										
Buzzer	Off																										





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(Automotive)

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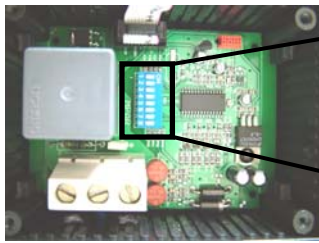


### 3.5

For the technician performing the installation



Intervention thresholds



N.B.:  
The voltage is directly measured on the Bridge's terminals.

ON  1 2	< 12,5 V ⇔ ( default )		ON  3 4	> 13,0 V ⇔ ( default )	
ON  1 2	< 12,4 V ⇔		ON  3 4	> 12,9 V ⇔	
ON  1 2	< 12,3 V ⇔		ON  3 4	> 12,8 V ⇔	
ON  1 2	< 12,6 V ⇔		ON  3 4	> 13,1 V ⇔	

ON  5 6	< 11,2 V ⇔ ( default )	Picture A	ON  7 8	< 11,8 V ⇔ ( default )	Picture B
ON  5 6	< 11,1 V ⇔	Picture A	ON  7 8	< 11,7 V ⇔	Picture B
ON  5 6	< 11,3 V ⇔	Picture A	ON  7 8	< 11,9 V ⇔	Picture B
ON  5 6	< 11,4 V ⇔	Picture A	ON  7 8	< 12,0 V ⇔	Picture B

Picture A	Picture B

Modification and updating can be done without any notice.

[file: 170108-MUM-Bridge(ING)]





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2004/104/EEC TYPE APPROVAL  
(Automotive)

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4

### The "Bridge" potentials

The Bridge **controls and monitors** the parallel connection between the Engine Battery and the Leisure Battery/ies.

Its software checks the batteries charge level and enables **the engine battery to become a further temporary energy supply**. The Bridge is particularly useful **when it comes to higher energy consumption of on-board appliances** (hairdryer, vacuum cleaner, micro-wave oven, kettle, etc.).

**In order to take full advantage of the Bridge's potential, it is necessary to have an energy source that can restore the charge levels of the batteries. We therefore recommend using the "Self-Energy EG20" (see note 1 in the Index).**

4.1

#### Batteries protection

##### **Flat or low engine battery**

Visual and acoustic warning signalling.

##### **Flat or low leisure battery**

Visual and acoustic warning signalling.

##### **Engine start-up**

The Bridge software controls and provides parallel connection so that the engine battery has enough charge to start-up the engine.

##### **Parallel connection not allowed**

For security reasons, when the tension of one or both batteries is lower than a predetermined minimum threshold. For example in case of eventual short circuit of one or more cells.

##### **Difficult situations**

The Bridge allows energy exchange between the engine battery/ies and the leisure battery/ies and becoming a valid help in difficult situations. As for example, if the engine battery is not fully efficient (inactivity, low temperature, etc.)

##### **Engine battery overload**

The " Bridge" disables the parallel connection if the tension of the leisure battery exceeds the maximum threshold set.

##### **Bridge Energy Consumption**

The Bridge constantly checks all batteries charge levels, but is only supplied by the leisure battery with a low consumption level (see technical details).









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2004/104/EEC TYPE APPROVAL  
(Automotive)

## Installation and Use Handbook for "BRIDGE" (Code 941 )



### 4.2

### Working modalities of the Bridge (Automatic, Manual, Off-Mode)

<p><b>Automatic</b> (green light = ON)</p>	 	<p>The Bridge constantly controls the charge level of the engine and leisure batteries and activates the connection between the two when the leisure battery level is over 13V. If the tension of the batteries remains between 12,5 V and 13 V for 8 hours, the parallel connection is disabled. The connection is disabled when the charge goes under 12,5V</p>
<p><b>Manual</b> (yellow light = ON)</p>	 	<p>The engine and leisure batteries are always connected in parallel until the tension is &gt; 13,V. If the tension of the batteries remains between 12,5 V and 13 V for 8 hours, the parallel connection is disabled. With the engine battery &lt; 12,5 V, the connection works for a time varying between 5 and 30 minutes (not longer), depending on the conditions registered in both batteries.</p>
<p><b>Switched off</b></p>	 	<p>The Bridge never connects the two batteries</p>

The "battery charge under minimum threshold" warnings are always on



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2004/104/EEC TYPE APPROVAL  
(Automotive)

Installation and Use Handbook  
for  
"BRIDGE" (Code 941 )



5

Suggestions for use

5.1

For **normal use** → set the **Bridge in "Automatic"** (or OFF) mode

5.2

When using **heavy energy loads** (hairdryer, kettle, etc.) :

- A) Set the Bridge to "Manual" (yellow LED ON, green LED OFF)
- B) Check that the red LEDs (Engine Battery And Leisure Battery) are on OFF or FLASH
- B1) if you have a Self-Energy EG20, push the manual start switch
- C) **Using a load**

**Note 1:** with heavy loads, the connection works from 5 to no longer than 30 minutes.

**Note 2:** After using the load, it is necessary to set the Bridge to Automatic connection and perform a battery charge cycle (through the "Self-Energy EG20" or other energy sources).

**Note 3:** We recommend using the "manual" mode only when the user is there.



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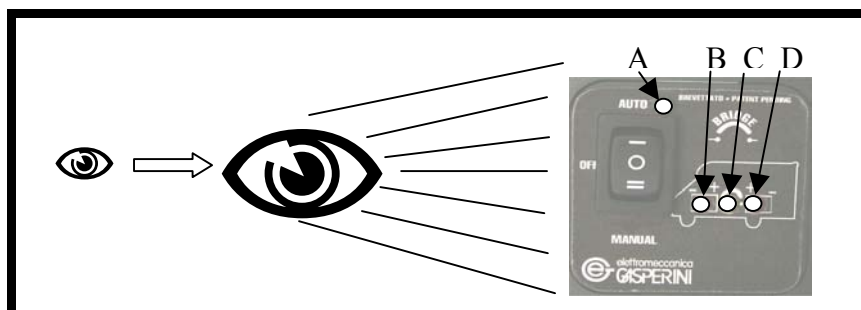
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6

### LEDs Key



	A	B	C	D	BRIDGE STATUS
	---	---	---	---	<b>Switched off</b>
	ON	---	---	---	<b>Automatic</b>
	OFF	OFF FLASH	ON	OFF FLASH	<b>Manual connection Suitable for heavy loads</b>
	---	ON	ON	---	<b>Manual connection NOT suitable for heavy loads</b>
	---	---	OFF	---	<b>Parallel connection NOT available</b>

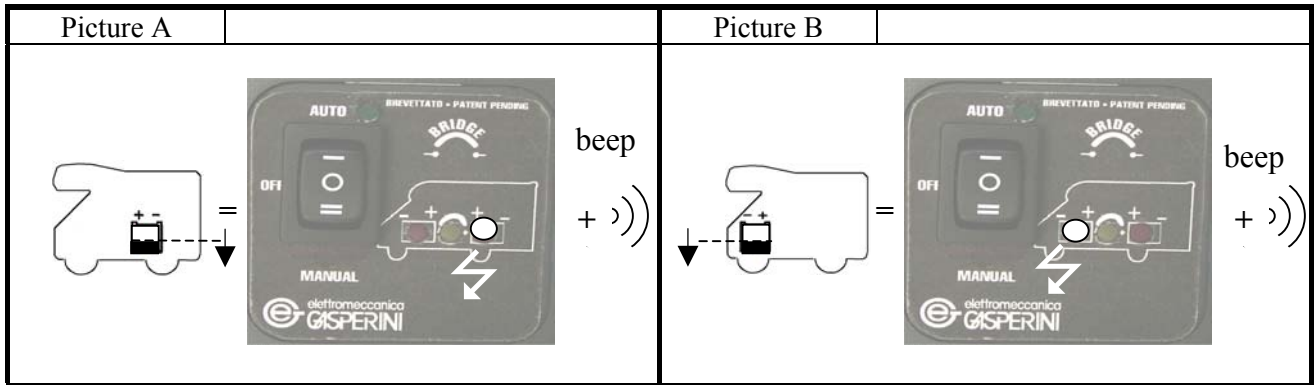


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(Automotive)

Installation and Use Handbook  
for  
"BRIDGE" (Code 941 )



<b>FLASH</b>	OFF FLASH	ON OFF	ON OFF	<b>Engine Battery <u>under</u> the threshold</b>	Picture B
ON OFF FLASH	<b>FLASH</b>	ON OFF	ON OFF	<b>Leisure Battery <u>under</u> the threshold</b>	Picture A





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2004/104/EEC TYPE APPROVAL  
(Automotive)

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7

### FAQ

7.0

Must the customer who mounts the Bridge have an energy source in order to charge the batteries back up ?

Yes

7.1

Is it possible use in parallel connection different lead batteries (A-battery, gel, Pb-Ca) ?

Yes, if there is an energy source (such as the Self-Energy EG20) to charge the batteries.

7.2

The vehicle's headlights have been inadvertently left on and the engine does not start. What is to be done?

It is possible to use the leisure battery charge:  
**A1)** switch off all appliances ( also headlights, lights etc).  
**A2) set the Bridge to manual mode** if you have a Self-Energy EG20, push the manual start switch  
After 10 minutes, try to start the vehicle.

7.3

What kind of warnings would the Bridge activate in case the engine battery is faulty?



The Bridge indicates a possible failure when:  
- switch off all appliances, the red led related to the engine battery lights (flashing or On) few minutes after the turning off of the engine.

In such cases, switch OFF the Bridge and go to the nearest workshop that will effect a careful check.

7.4

Can only those who have a Self-Energy EG20 install and use the Bridge?

No.  
The Bridge used jointly with a Self-Energy EG20 is the ideal solution, but it is possible to use other energy sources (solar panels, battery chargers, mains hook-up, etc...).

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<b>8</b>	<b>Technical Features</b>
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VOLTAGE	12 V DC from the leisure battery only.
Voltage input for working	8÷18 Vcc (in the leisure battery)
Working modalities	OFF-mode + charge level monitoring AUTO-mode + charge level monitoring MAN-mode + charge level monitoring (see note 1)
Maximum energy absorption in OFF-mode and without warnings	6 mA
Maximum energy absorption in AUTO-mode with deactivated connection in parallel and without warnings.	11 mA
Maximum energy absorption in any mode for a voltage range between 10 and 15 V.	200 mA
Maximum impulsive current allowed for commutation	150A
Maximum DC allowed	50A
Voltage drop to 50A	<0,1 V
Connection features	Bi-directional
Precision of event nominal thresholds	< ±50 mV
Planning of event thresholds	Through dip-switch
Working Temperature	-20 ÷ +90 °C
Maximum moisture level allowed	90% with no condensate
Protection level (if installed with cable outlet towards the bottom)	IP 44
Installation connection	Through terminal board
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Note 1 :

It is suggested to use the Bridge in “manual” when the user is present.

The Bridge enables absorption of intense power from the engine battery only for a limited amount of time (from 5 to 30 minutes max.).

When the warning LED-light “engine battery not available” is switched on, it is necessary to charge the batteries (through the Self-Energy EG20 or other energy sources), before using the parallel manual switch again for some time.





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2004/104/EEC TYPE APPROVAL  
(Automotive)

Installation and Use Handbook  
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"BRIDGE" (Code 941 )



**WARRANTY**

The "BRIDGE" is covered by a warranty for any defect in the materials used or in manufacturing discovered within 24 months after the date of installation. The installation must be carried out within 6 months (\*) after the date of end of production and no later (the date is indicated on this form). The warranty provides free repair of the "BRIDGE", which has to be sent to Elettromeccanica Gasperini s.r.l premises or to an approved repair station. The two-way transport and disassembling/assembling on the camper are always at the Customer's expense. The present warranty does not cover damages caused by external factors or by mistakes due to inexperience or carelessness of the installer/user. The present warranty does not cover possible refunds requested by the customer (direct or indirect damages caused by system breakdown or malfunctioning, etc.). Place of lawful jurisdiction for any controversy is the court of justice of Bologna (Italy).

(\*): In some exceptional cases (for some "BRIDGE" identification numbers and within 6 months after the end of production), the retailer/workshop can ask for a postponement of the installation deadline. The request must be sent to Elettromeccanica Gasperini, who will evaluate it and state whether the conditions for a postponement are valid. Request and authorization must be written and faxed through to Elettromeccanica Gasperini s.r.l.

**In order for the product to be covered by the warranty, the following requirements must be fulfilled**

- A) Please fit and use the Bridge only as described in the use and installation handbook.
- B) Within 10 days after installation, please fill in this Warranty Form and send it to Elettromeccanica GASPERINI (fax: +39 051782428, e-mail: [ggaspe@tin.it](mailto:ggaspe@tin.it) )

**The Warranty will not be valid if requirements (A) and/or (B) are not fulfilled.**

"BRIDGE" serial number	Production date

**Customer/ User:**  
 Name: \_\_\_\_\_ Surname: \_\_\_\_\_  
 Address: \_\_\_\_\_ ZIP code: \_\_\_\_\_ City: \_\_\_\_\_  
 Tel/mob: \_\_\_\_\_ e-mail: \_\_\_\_\_

Your personal data will be used with IT or manual means for after-sales technical assistance purposes.

Purchase and Installation date	Customer/User's signature	Signature and Stamp of the Company installing the Product