

## 2CV LOW OIL PRESSURE BEEPER AND LIGHTS ON BEEPER

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Revision 1

### Background

The 2CV incorporates an oil pressure warning light which turns on whenever the engine oil pressure falls below a safe value. The warning light also turns on during engine startup.

Figure 1 below shows an earlier 2CV instrument panel, with the oil pressure warning light in the lower right corner, immediately above the red starter button.



*Figure 1 Instrument panel from an earlier 2CV.  
Um... is this where you left your car?*

Figure 2 below shows a later 2CV instrument panel. The oil pressure warning light is also in the lower right corner, immediately below the wiper switch.



*Figure 2 Instrument panel from a later 2CV*

### Oil Pressure Warning Light:

The oil pressure warning light is operated by an oil pressure switch. During normal engine operation, the oil pressure is sufficient to hold the switch open, which keeps the warning light turned off. Should the oil pressure fall below the safe value, the oil pressure switch closes and turns on the warning light to alert the driver that the engine has *insufficient oil* for its safe operation and is *potentially in a catastrophic situation!* Insufficient oil can result from a range of causes, including a failure to top up the oil (lack of maintenance). It can also result from oil loss due to items such as a loose fitting oil union or leaking oil pipe, leaking oil cooler or seals, leaking oil pressure switch, improperly fitted oil filter or rocker cover gasket, an unlatched oil breather cap or from the engine oil seals because of insufficient crankcase vacuum.

**The principle:** During the operation of the vehicle, if the oil pressure warning light turns on, the *immediate* safety of the engine relies upon the driver *immediately* recognising the warning light and *immediately* turning off the engine! *Don't wait an extra second!*

**The reality:** Should the driver be giving full attention to the driving task (which we generally agree has merit!), the driver may fail to observe the illuminated warning light. A possible loss of engine power or engine noises or smells may be the next thing to seize the driver's attention! \$\$Ouch!

**The goal:** The elapsed time between the illumination of the warning light and its recognition by the driver needs to be *absolutely minimised* for the safety of the engine.

**The Question:** How can the driver's attention be *immediately* drawn to the warning light the moment it illuminates?

**The Answer:** By sounding an audible alarm.

### Purpose of Article

This article describes the fitting of an audible warning beeper which is activated *immediately* the oil warning light comes on. The driver can *immediately* confirm the warning light is on and *immediately* stop the engine before harm is done!

It also describes the fitting of a second audible warning beeper which is activated whenever the ignition switch is turned off with the lights on. The beeper acts as a reminder to turn off the lights to prevent a flattened battery!

### Circuit Diagram:

Figure 3 below shows the relevant vehicle electrical system area with three components added. Beeper B1 is the low oil pressure warning beeper; beeper B2 is the lights-on warning beeper, and diode D1 operates in conjunction with beeper B2. Note the three connection points labelled A, B and C. Much more follows.

### Wiring Diagram:

Figure 4 below shows the wiring diagram for the added components. Diode D1 has, as is conventional with all diodes, a coloured band at the cathode end of its body to indicate the cathode lead, while the other end is the anode lead. The cathode connects to the oil pressure switch, i.e., the banded end connects to the oil pressure switch. The anode end connects to the negative wire of beeper B2. *Don't reverse the connections to the diode or the beepers.*

Note the three connection points labelled A, B and C in Figure 4. These are the *same* connection points, respectively, as the connection points A, B and C shown in Figure 3. Figure 4 is a subset of Figure 3.

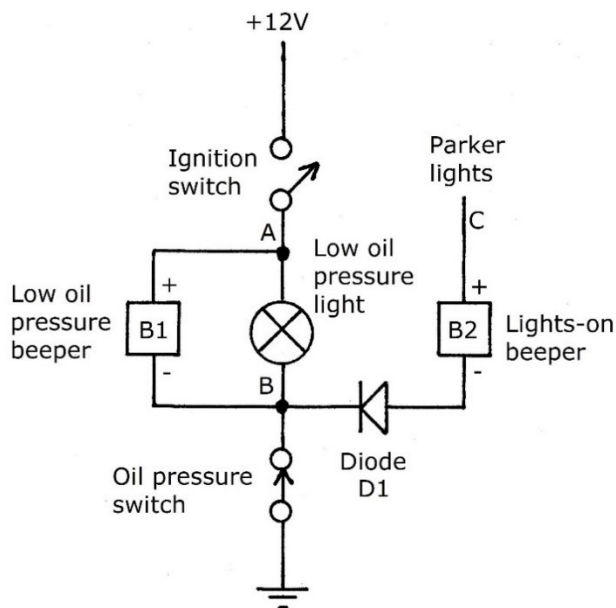


Figure 3 Circuit Diagram

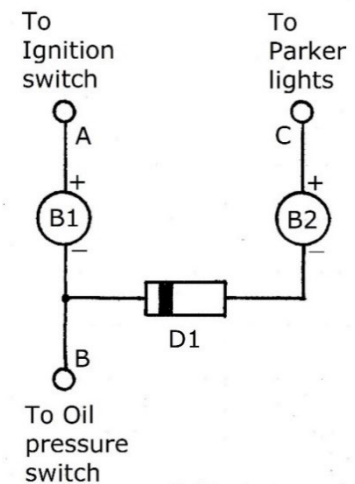


Figure 4 Wiring Diagram

### Diode:

Figure 5 at right shows the 1N4004 diode used in this project. This is a 1 amp, 400 volt general purpose silicon diode with a plastic body around 5mm long. The (left) end with the coloured band signifies the cathode end. The other end is the anode.



Figure 5 1N4004 Diode

### Low oil pressure warning beeper:

From Figure 3, the low oil pressure warning beeper is implemented as a 12V beeper *connected in parallel* with the oil pressure warning light. In operation, whenever the oil pressure light comes on, the beeper will sound. This includes during engine startup as previously noted.

### Lights-on warning beeper:

From Figure 3, the lights-on warning beeper is implemented as a 12V beeper wired with a series-connected diode. The positive wire from the beeper connects to the parker lights connection on the light switch, from which it receives 12V whenever the lights are on. (Here, parker lights refer to the two front parking lights, the two rear tail lights and the speedometer light, all of which are operated by the light switch whenever the lights are on.)

The lights-on beeper operates as follows. Consider the situation when the engine is switched off (the oil pressure switch is closed) and the lights are on. The positive wire on the beeper connects to 12V at the parker lights connection on the light switch, and the cathode of the diode connects to ground via the oil pressure switch. Through the series connection of the oil pressure switch, the diode and the beeper, the diode is forward-biased and conducts, operating the beeper and alerting the driver.

Now consider the situation when the engine is running (the oil pressure switch is open). The cathode of the diode connects to 12V from the ignition switch via the oil pressure warning light. This prevents the diode being forward-biased, regardless of the position of the light switch, so the diode does not conduct and the beeper does not operate.

### Types of Warning Beepers:

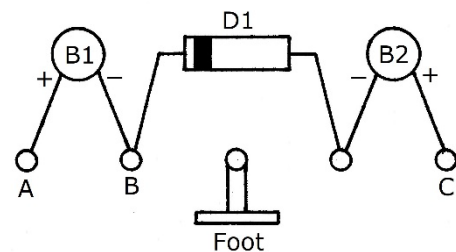
There are different types of beepers available with differences in operating voltages, sound intensities and tones (constant tone, pulsing tone, rising tone, melodic tone, etc). This article requires beepers which operate at 12V DC and have a sound level which will be heard above the operating noises, oops, sorry, the purring tones, of the 2CV!

### Mounting of parts:

The two beepers and diode in Figure 4 are assembled in a small plastic box with a removable lid. Mount the two beepers on the outside face of the bottom of the box, and mount the diode inside the box. All wiring connections and terminations are done inside the box using a tag strip to terminate the diode and the wiring connections.

### Tag Strip Wiring Connections:

Figure 6 at right shows the wiring connections inside the plastic box. A 5-terminal tag strip is mounted inside the box and used for soldering the beepers, the diode and the three external connecting wires at points A, B and C. The unused centre terminal has a mounting foot for mounting the tag strip to the inside face of the plastic box using a small screw, washer and nut.



*Figure 6 Tag Strip Wiring*

As noted, B1 is the low oil pressure beeper and B2 is the lights-on beeper. The beepers show their plus and minus polarity requirements. For the suggested beepers, the plus wire is coloured red and the minus wire is coloured black. D1 is the diode, with its cathode (banded) end connected to B1 and its anode end connected to B2. The Figure 6 connection points A, B and C are the same, respectively, as those in Figures 3 and 4.

### Connecting the Wires from the Plastic Box:

The plastic box, which contains the Figure 6 items, will have three wires exiting from it, from the connection points A, B and C. These connect to the vehicle wiring per Figure 4, and are (1) the wire to the switched 12V line from the ignition switch labelled A, (2) the wire to the oil pressure switch labelled B, and (3) the wire to the parker lights at the light switch labelled C.

Fit a rubber grommet in the small hole in the plastic box where the wires exit. The three connecting wires will need to be anchored inside the box in a safe manner to prevent them being unintentionally pulled from the box and damaging the internal connections.

### Vehicle Installation:

Figures 4 and 6 are identical electrically. They have the same components B1, B2 and D1 wired in the same manner, and include the same three wiring connection points A, B and C. The three connection points connect to the connection points A, B and C, respectively, in the vehicle wiring diagram at Figure 8 following, using three lengths of insulated wire with different coloured insulation for identification. More follows.

### Plastic Box Mounting:

You will need to select a suitable secure and protected mounting location for the plastic box. It could be positioned behind the instrument panel or underneath the parcel shelf. The three wires from the box should be securely routed, supported and protected from movement and physical damage. When the implementation is completed, the added components and wiring become an integral part of the vehicle's electrical system.

### Installation Notes:

Because of the variety of different wiring installations used by Citroen over the 43 years of 2CV manufacture, it is not possible to provide a definitive procedure to connect the three wires from the plastic box to the vehicle's wiring. However, some points are essential, and also apply in general to vehicle electrical components and connections:

1. All wiring connections should be done with physical and electrical integrity in mind. Solder all connections.
2. All electrical connections and components should be insulated from each other, including all 12V wiring, all ground wiring, other components and all structural metalwork (ground).
3. The diode and beepers need to be mounted in a manner which physically supports and protects them and their connecting wires from damage and stress, including electrical connections, and physically located and secured so they don't move or flex during vehicle operation.
4. The diode is a small plastic encapsulated component which may be damaged if excessive tension is applied to the leads, if the leads are bent too closely to the body or if excessive heat is applied during soldering. The diode leads should be safely anchored to mounting points with proper strain-relief applied.

### Parts Required:

- 2 x Beepers, B1 and B2: The Jaycar beeper No: AB3462 is suggested. This beeper is 22mm in diameter, 12mm high and is fitted with two mounting tabs. It has two connection wires. The red wire is the positive connection and the black wire is the negative connection. The beeper is shown at Figure 7 at right.



*Figure 7 Jaycar beeper AB3462*

- 1 x Silicon diode, D1: Type 1N4004, 1A, 400V.
- Small plastic box with removable cover to mount the two beepers and the diode, and to terminate the three connecting wires.
- Rubber gromet to protect the three wires where exiting the plastic box.
- Five-terminal tag strip with central mounting foot. More follows.
- Three lengths of connecting wire of different colours.

Note: All parts are available from Jaycar. Other suppliers may provide equivalent parts.



## 2CV 1981 Wiring Diagram:

Figure 8 below shows the wiring diagram for the 1981 2CV (my grateful thanks to the unknown author), modified by the addition of three connection points marked with circles with the inscribed letters A, B and C. The *wire* adjacent to the “A” circle is the switched 12V wire from the ignition switch, which connects to a spade connector on the oil light globe holder. The *wire* adjacent to the “B” circle is the wire from the oil pressure switch, which connects to the other spade connector on the globe holder. The *wire* adjacent to the “C” circle is the parker lights connection terminal at the light switch. The three wires from the plastic box connect to these three connecting points. More follows.

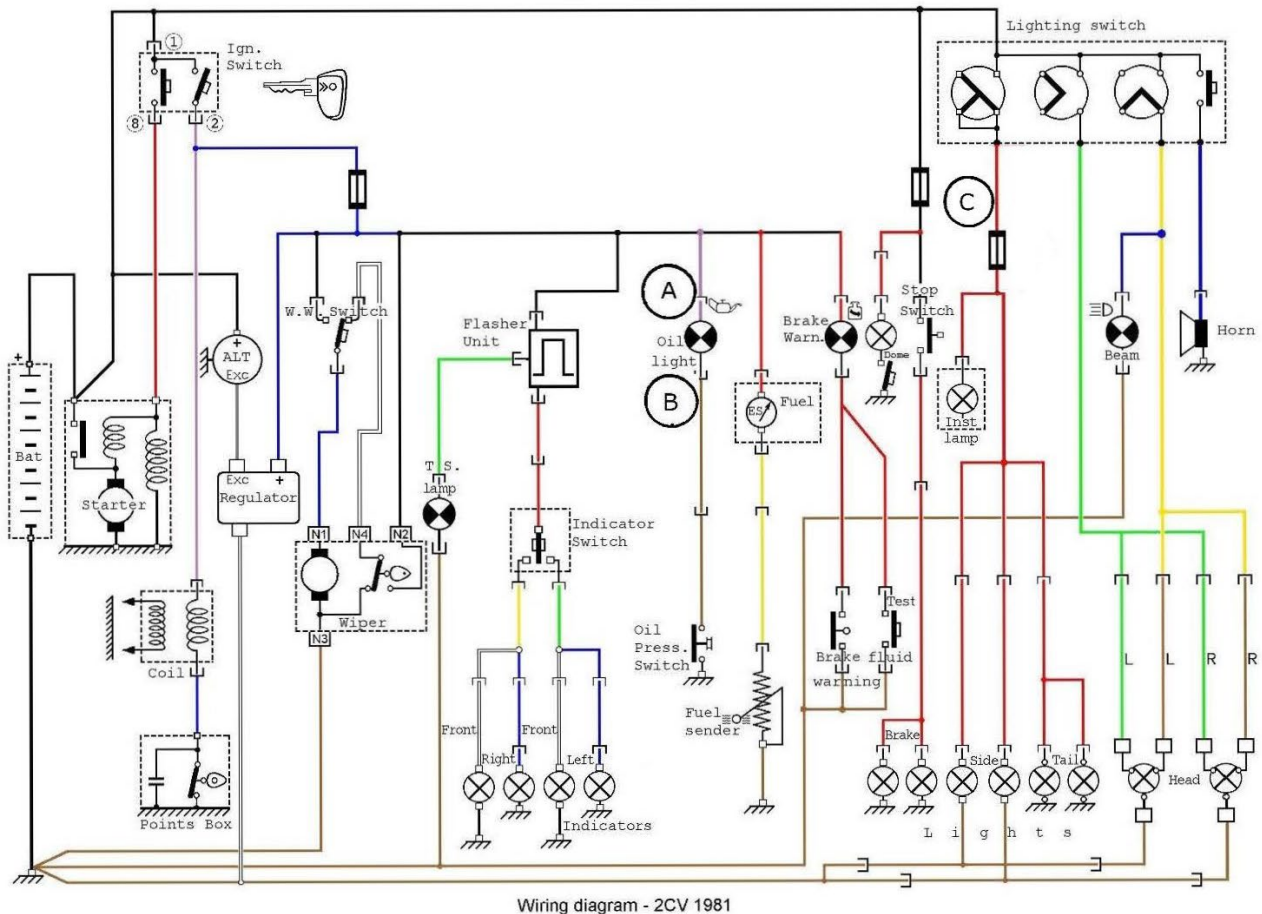
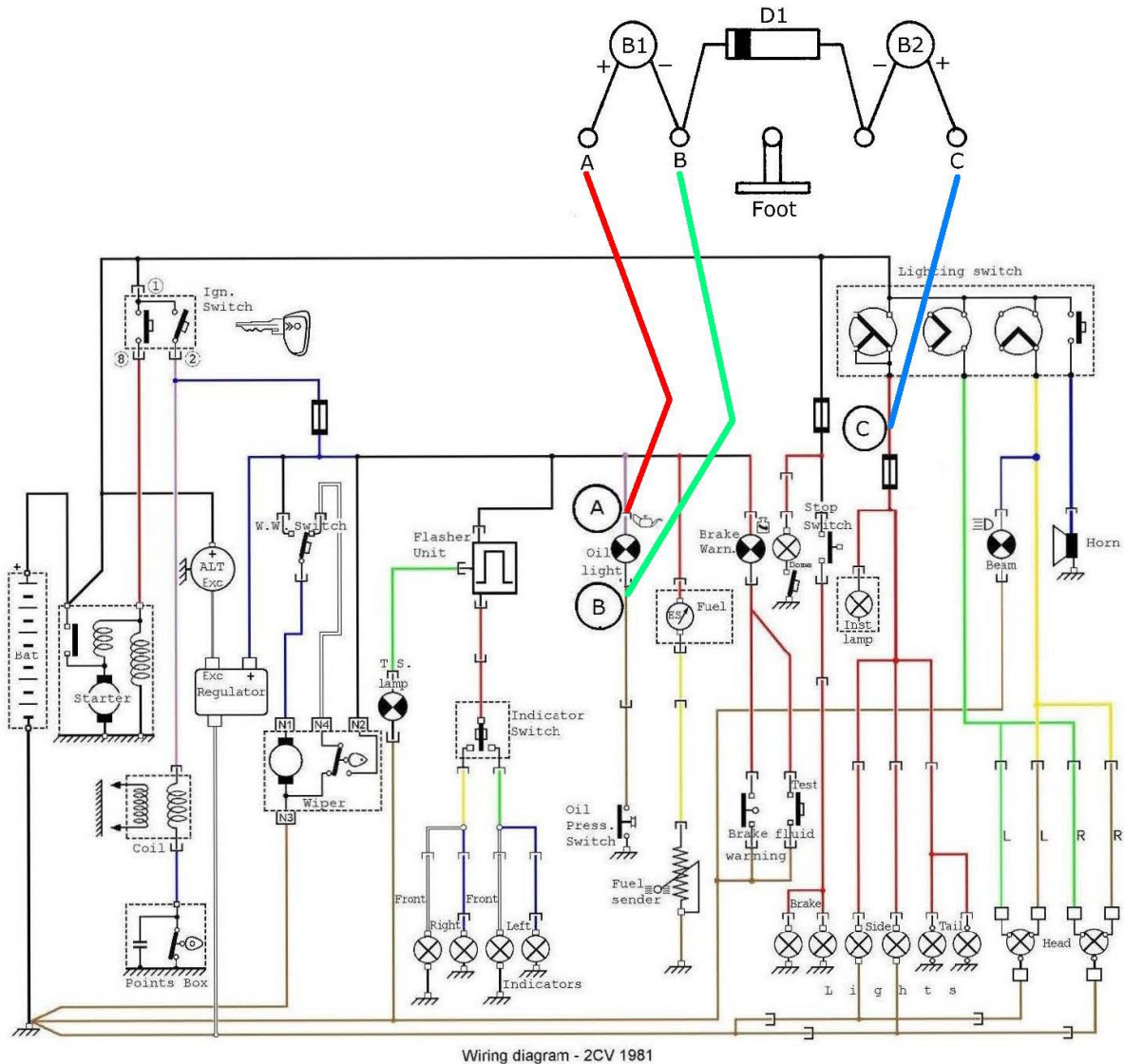


Figure 8 2CV 1981 wiring diagram

### Complete Wiring Diagram: (Well, what took you so long??!)

Figure 9 below shows the complete wiring diagram providing the 2CV with a low oil pressure warning beeper and a lights-on warning beeper. Figure 9 is a composite of Figures 6 and 8, and shows Figure 6, the plastic box components, connected to Figure 8, the 2CV electrical system, via the three coloured connecting wires joining the points A-to-A (red), B-to-B (green) and C-to-C (blue). More follows.



*Figure 9 2CV Wiring Diagram with the Warning Beepers*

### Instrument Panel Lights:

Figure 10 below shows a 2CV instrument panel light assembly which holds the various warning light globes. The item on the left is the coloured bezel visible on the instrument panel, which for the oil pressure warning light is coloured red. It passes through the panel and screws into the centre item, the body, which sits behind the panel. The item at right is the light globe holder, which fits into the rear of the body. The electrical connections to the globe holder are made via the two spade connectors shown at the right-most end of the globe holder. More follows.



*Figure 10 2CV instrument panel light assembly.  
Note the spade connectors at far right.*

Figure 11 below shows a 2CV light holder with a range of coloured bezels.



*Figure 11*

### Plastic Box Wiring Connections:

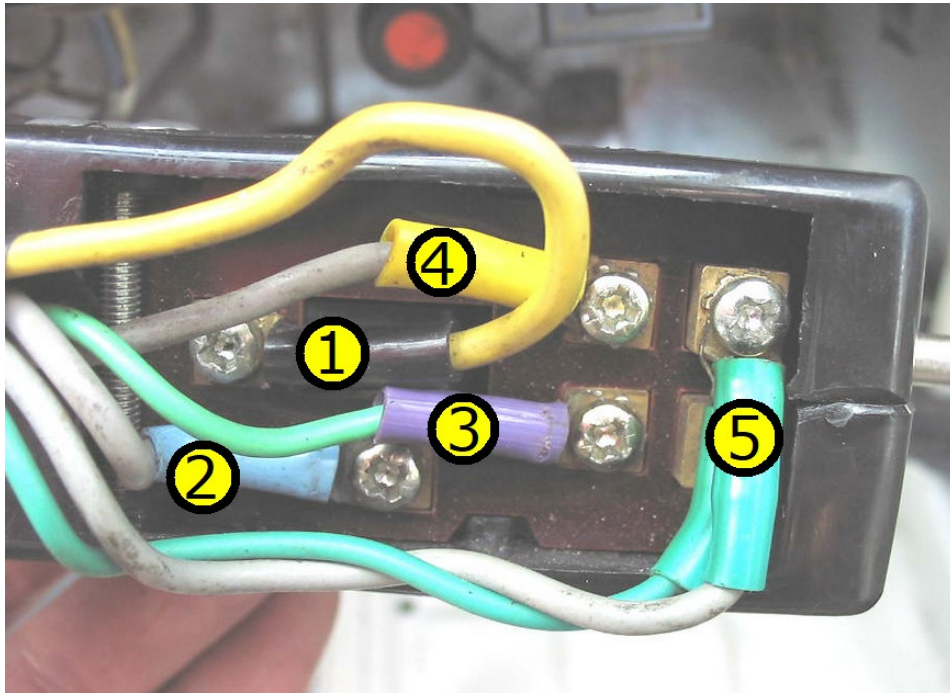
In Figure 9, and as already noted, the wires adjacent to the “A” and “B” circles *terminate at the spade connectors* on the oil light globe holder. The *wires* A and B from the plastic box connect to the *wires fitted to the spade connectors*. The *wire* at one spade connector runs to the 12V wire from the ignition switch. The wire A from the plastic box connects to this *wire*. The *wire* at the other spade connector runs to the oil pressure switch, and the wire B from the plastic box connects to this *wire*. A multimeter will help identify the globe holder *wires* accordingly.

The wire C from the plastic box connects to the *screw connector* at the light switch which feeds the parker lights. This is the circle “C” wire in Figures 8 and 9 and connection number “3” in Figure 12 following.



### Light Switch Wiring Connections:

Figure 12 shows the light switch wiring connections (attributed to Ken Hanna). The parker lights connection is numbered “3”, and is where the plastic box wire C terminates.



*Figure 12 Light switch wiring connections*

### Wire and sleeve colours:

- 1: Yellow wire/black sleeve: From battery.
- 2: Grey wire/blue sleeve: To horn.
- 3: Green wire/lilac sleeve: To parker lights.
- 4: Grey wire/yellow sleeve: To high beam lights.
- 5: Grey wire/green sleeve and green wire/green sleeve: To low beam lights.

### Fitting of star lock washers:

In Figure 12, the star lock washers on the light switch connection screws should be fitted *underneath* the wiring terminals to prevent the terminals rotating when the screws are tightened.

### Optional Switch to Disable Lights-On Beeper:

You may find there are times when you need to have the lights on with the engine off. On these occasions, the lights-on beeper will be activated, as is intended. To temporarily disable the beeper at these times, wire a switch in series with the beeper. In Figure 9, connect the switch in series with the blue wire, i.e., between the C-to-C connection points. When the switch is off, the 12V feed from the parker light switch is disconnected, preventing the beeper from operating. Don't forget to turn the switch on afterwards.

### Final Check:

Check and then recheck that the wiring inside the plastic box is in accordance with Figure 6, and that the three wires from the plastic box are connected to the vehicle wiring in accordance with Figure 9 and the foregoing text.

## **FINAL STATEMENT**

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