BM69 replacement board assembly guide

- version 0.0.2 –

 Please read this manual carefully before carrying out the installation!!! Although our products are very robust, incorrect wiring may destroy the module!

During the operation of the device the specified technical parameters shall always be met. At the installation the environment shall be fully taken into consideration. The device must not be exposed to moisture and direct sunshine.

A soldering tool may be necessary for the installation and/or mounting of the devices, which requires special care.

During the installation it shall be ensured that the bottom of the device should not contact with a conductive (e.g. metal) surface!

Content

1. Required tools

-tweezer
-screwdriver
-cutting plier
-cutter
-soldering station

2. Required materials

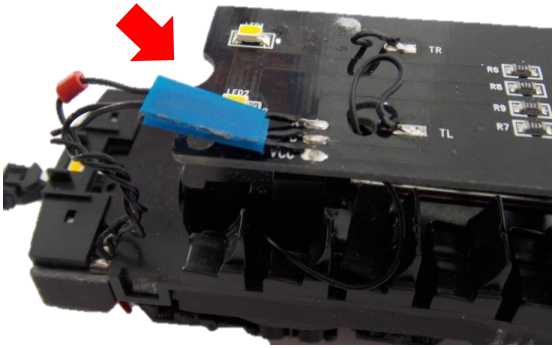
-adhesive tape
-soldering wire
-10- 15 cm isolated wire

3. Disassembly of the units

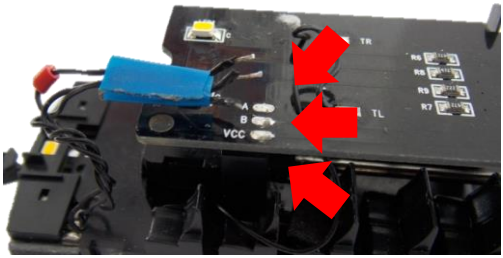
Pull the housing in side direction at the indicated points and lift it above the base. Remove the housing from the body of the unit.

Remove the black adhesive mask above the 2 front LEDs.

Cut a small piece of adhesive tape and label the 3 wires which connect the front lighting boards. You have to solder them to the replacement board in the same order.

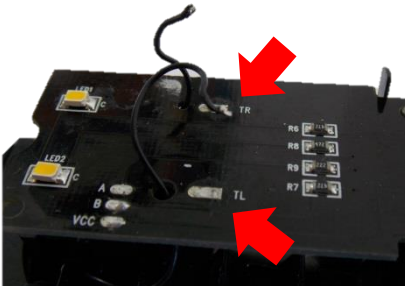


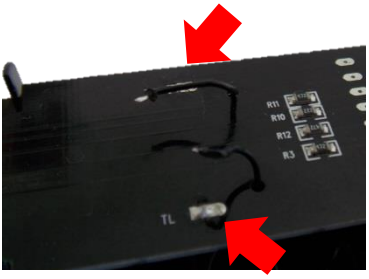
Unsolder the 3 wires, holding them with a tweezer might help.



The solder pads of the replacement boards are situated in the same location as on the originals, so the positioning of the wires on the replacement board is straight forward.

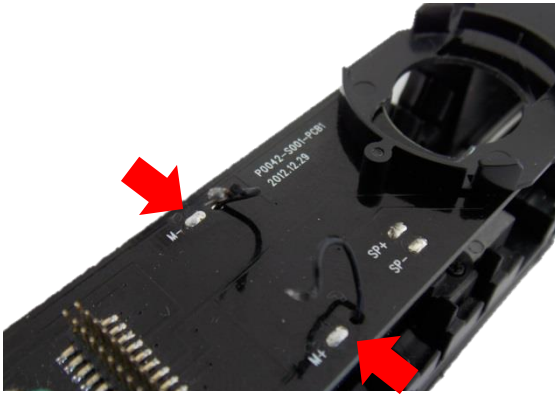
Unsolder the 4 pickup connection wires, 2 on each side of the board.



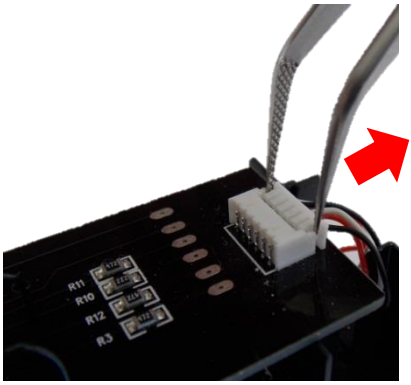


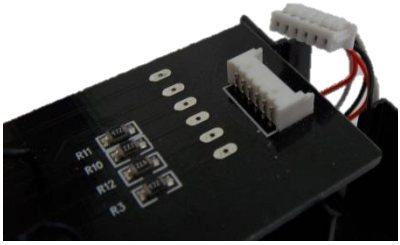
Unsolder the speaker connection wires, and remove the speaker from the plastic holder.

Unsolder the 2 motor connection wires. There is no polarity indicated (the wires have the same color). It is recommended to not interchange them, else the train will be driven in opposite direction.

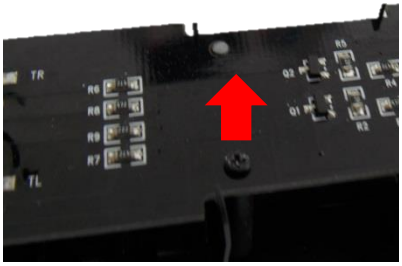


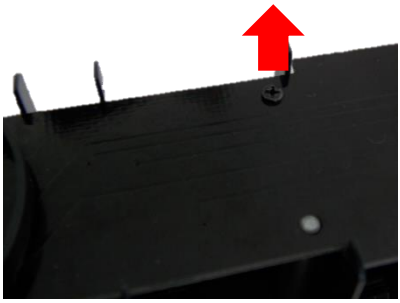
Extract the inter unit connector from the end of the board. Using a tweezer might help.



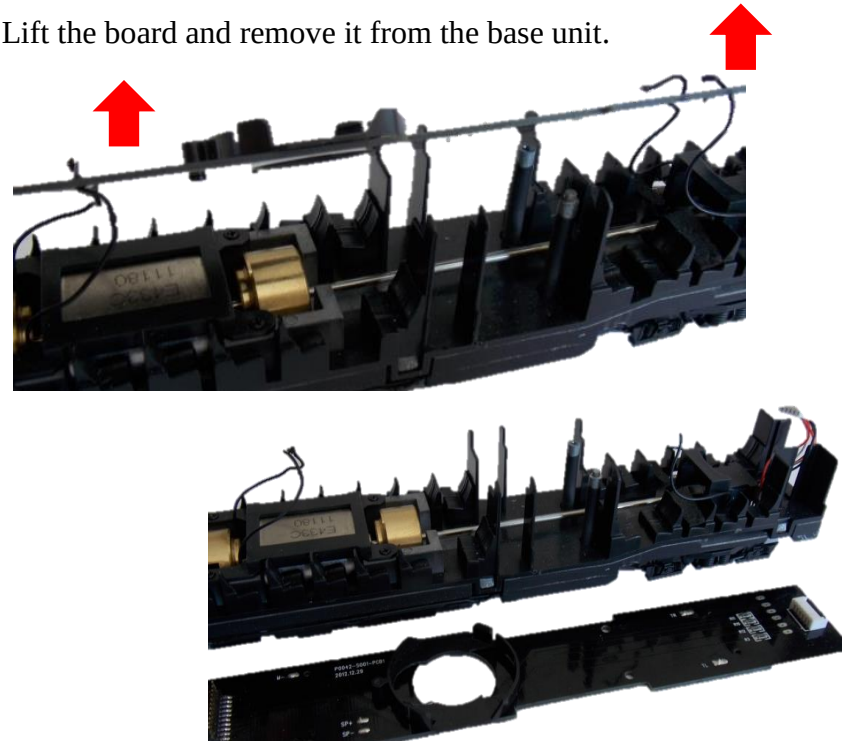


Release the 2 screws that hold the board to the base of the unit. On each side of the unit the screws are not interchangeable.





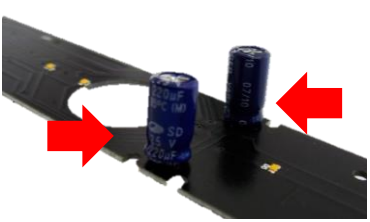
Lift the board and remove it from the base unit.

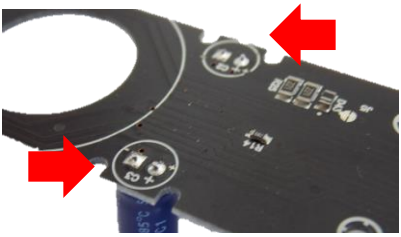


Release the screw and remove the speaker housing from the bottom side of the board. It will be assembled to the new replacement board.

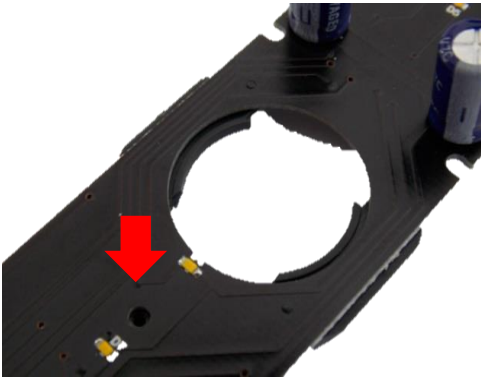
4. Installing the replacement kit

Solder the supplied 2 capacitor to the motorized board. Take care about the polarity (the rounded pad is the positive the squared one is the negative terminal). After soldering the capacitors cut the extra lengths of the pins with the help of a plier.

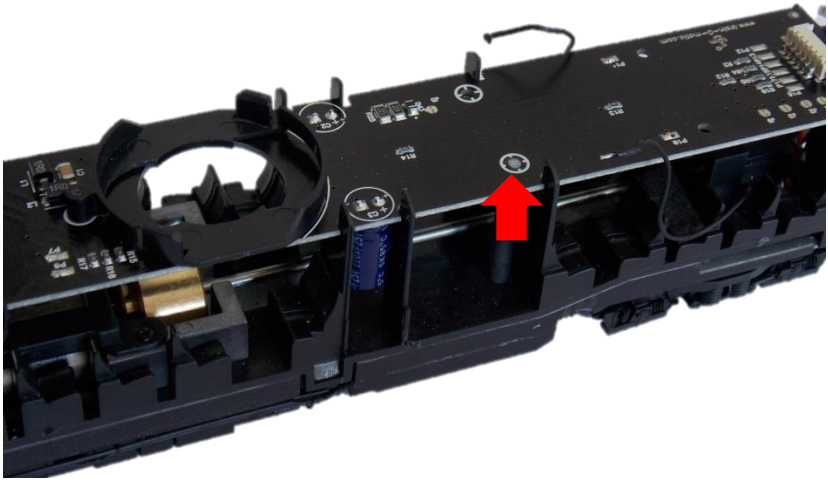




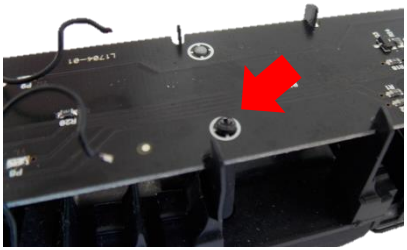
Fit the speaker housing in the bottom of the new board. Take care to match the 2 plastic dowel pins of the speaker housing to the holes in the board.



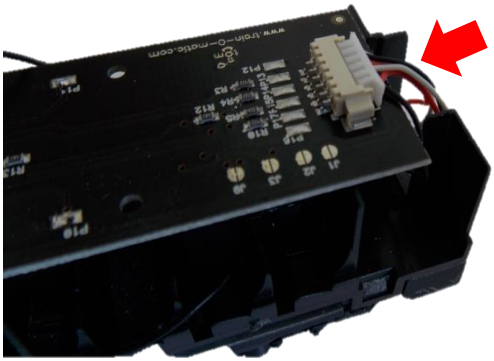
Place the board in the base of the unit,



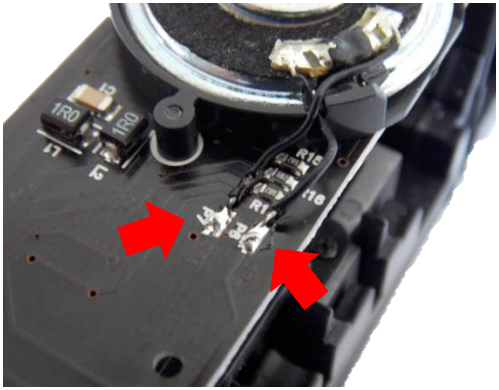
and fasten it with the 2 screws. Two dovel pins of the body will guide the positioning of the board in the base.



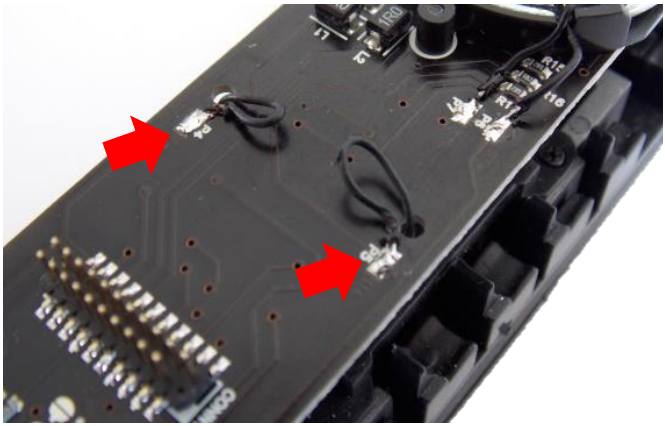
Plug in the inter unit plug into the board.



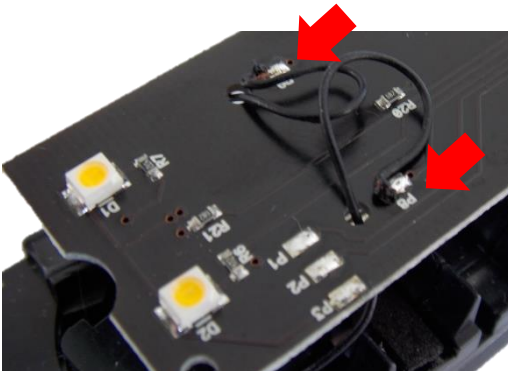
Place the speaker in the holder and solder the wires.

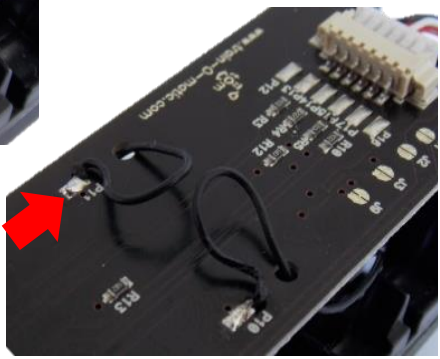


Insert the motor connection wire through the holes with the help of the tweezer and solder them to the board solder pads. Lay down the extra wires to the board.

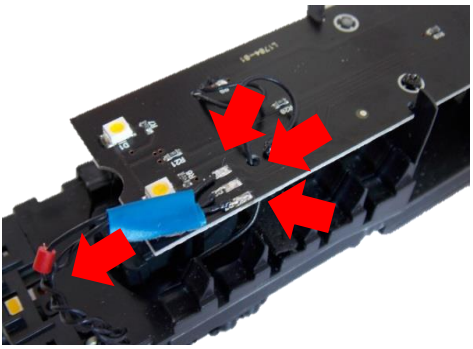


Insert the 4 pickup connection wire through the holes with the help of the tweezer and solder them to the board solder pads. Lay down the extra wires to the board.



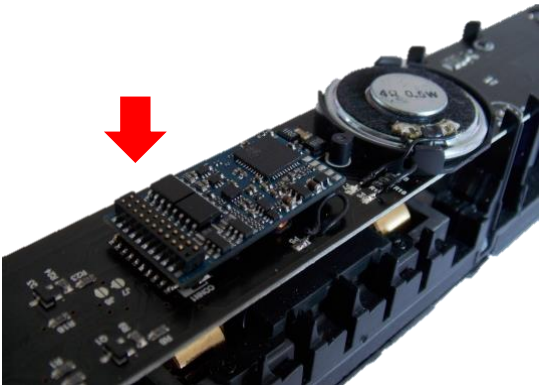


Solder the 3 wires which connect the front lighting board, keep the same wire sequence as it was on the original board. Remove the adhesive tape from the wires.

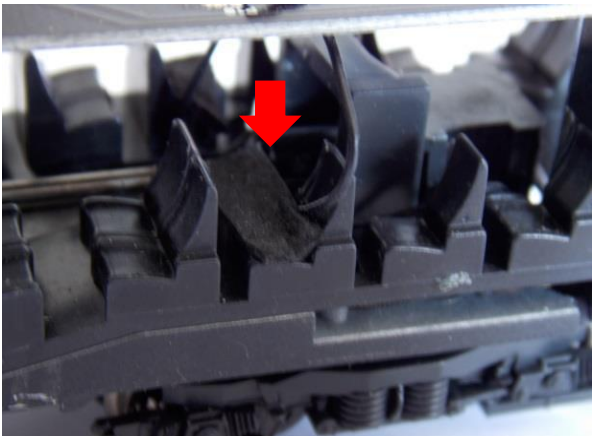


Place over the LEDs the adhesive black mask (take care to fit the openings exactly over the 2 LEDs). Lay it and press over the complete surface to ensure that it sticks to the board.

You can fit in the MTC21 connector either the delivered dummy plug or a suitable decoder.



When assembling the housing, take care to arrange the wires to avoid their visibility from the outside. In the pickup wires area, on the insets (chairs) there are small adhesive black mask, which can be used to hold the wires in the proper position. In the cabin (cockpit) area, the wires which connect the front lighting boards can be tied together, and in this way they will be invisible from the outside.



The non-motorized unit of the BM69 unit has to be processed almost in the same way. The differences are that you have to solder only the 3 wires to the front lighting board, and connect the inter unit connector. This part does not have motor, speaker and pickup connection wires.

In case of using a sound decoder, note that the speaker inside the unit has an impedance of 4 Ohms (not suitable for Loksound3 and 3.5)!!!

The decoder has to be programmed according to its manual.

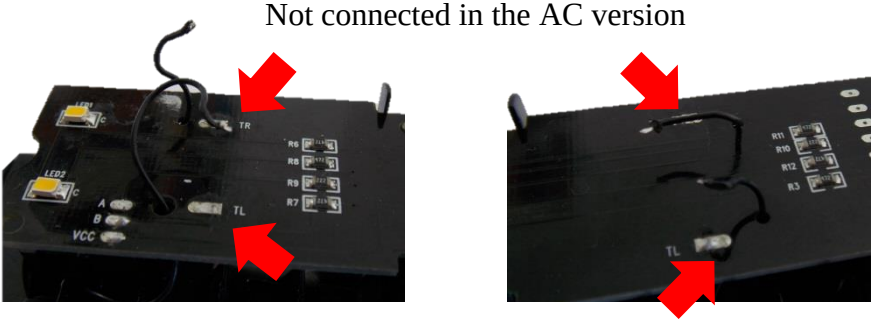
While programming the decoder please take in consideration The mapping of the lights to the MTC21 connector

FL	front light (white) on the motorized unit and rear/tail light (red) on the non-motorized unit
RL	front light (white) on the non-motorized unit and rear/tail light (red) on the motorized unit
AUX1	central reflector on the motorized unit
AUX2	central reflector on the non-motorized unit
AUX3	cockpit lights on both units
AUX4	interior light on both units

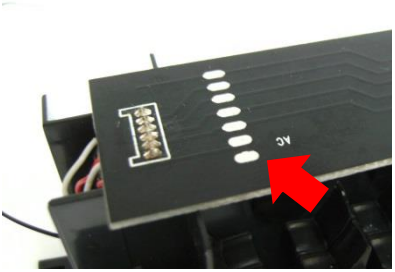
5. DCC/Marklin 3 rail operation

In the AC/ 3 rail version, the current pickups of the motorized unit are connected to the circuit board to the solder pads marked with TL. The connection of the solder pads marked with TR is made thru the inter unit cable, to the power pickup shoe in the non-motorized unit.

Not connected in the AC version



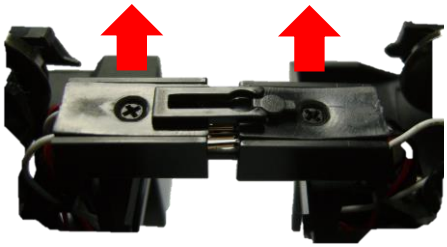
Connected to the current pickups in the AC version



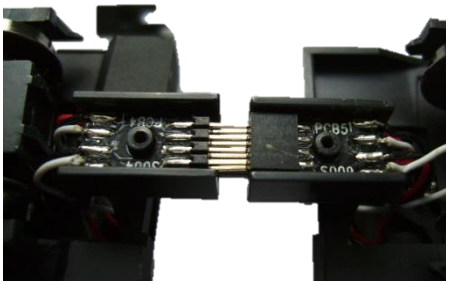
Connection of the power pickup shoe in the non-motorized unit

The available 2 extra contacts in the inter-unit connector are used to route the pickup shoe to the pcb in the motorized unit.

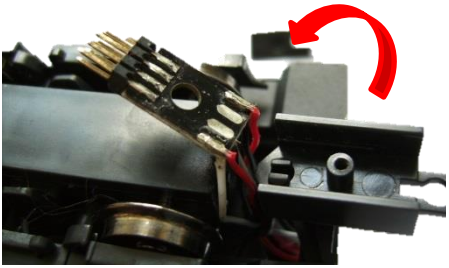
Release the 2 screw which holds the connector covers,

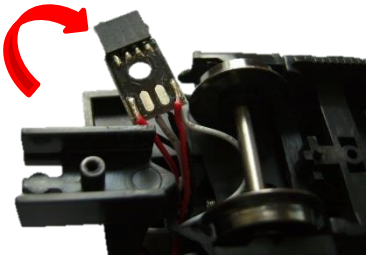


and remove the plastic covers

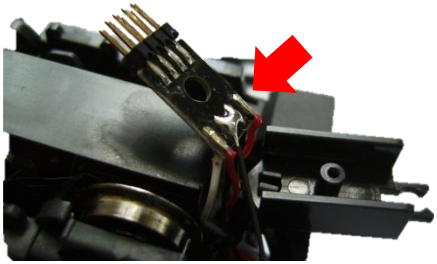


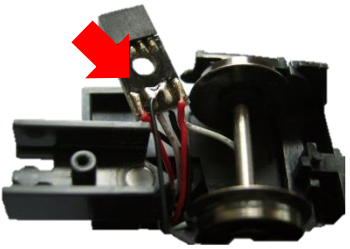
Remove the connector's body from the housing on both units.



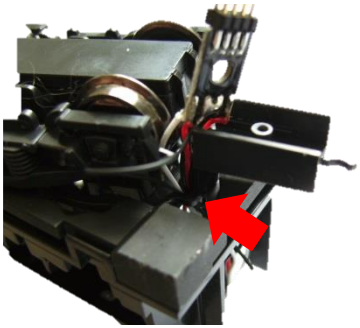


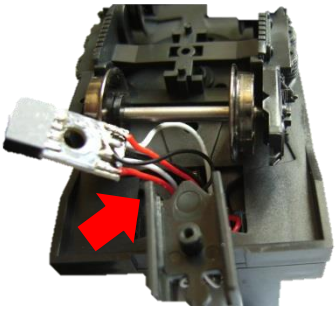
On both connectors are available 2 unused solder pads. These will be used to route the pickup shoe to the pcb. On the motorized unit solder a 10 cm long isolated wire to both solder pads, on the non-motorized unit solder the wire connected to the pickup shoe to both solder pads. (Please note, on the motorized unit the connector is a pin type, on the non-motorized unit it has receptacles.)



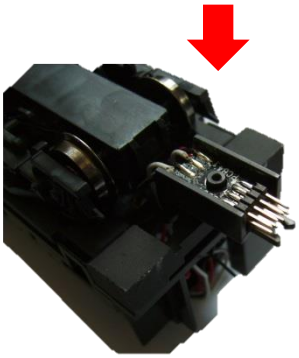


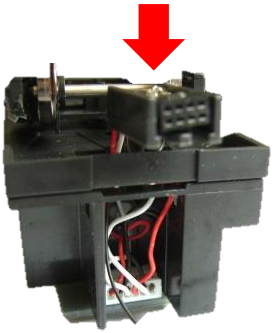
The wires can be routed inside the body of the carriages together with the original wires.



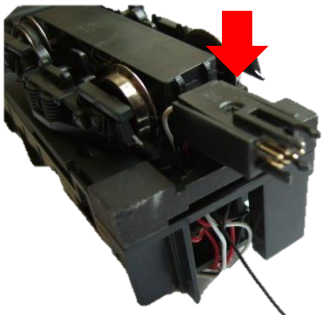


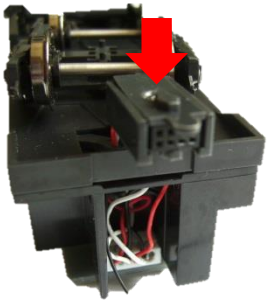
Replace the connectors in their housing.





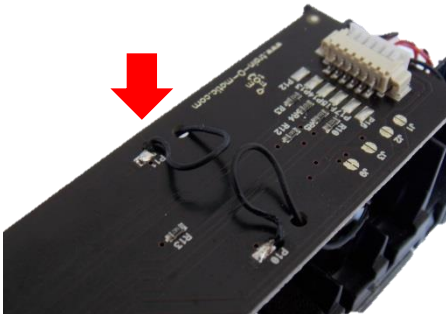
Place the plastic covers over the connectors and hold them in place with the screws.





Check the fit of the connectors between the 2 units.

Solder the newly routed wire in the motorized unit to the pickup connection marked P11 on the replacement board.



The wires from the axles in the motorized unit must be connected to the solder pads of the replacement board marked with P8 and P10. The solder pad marked with P9 can be left open.

6. Notes