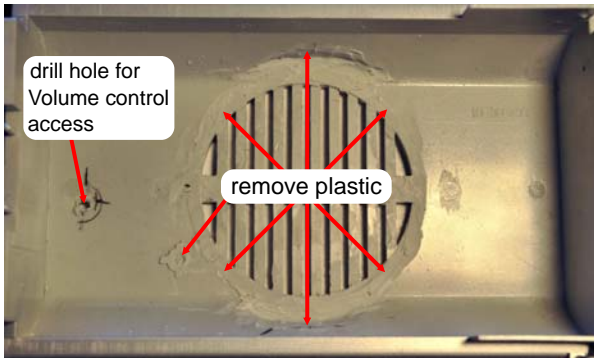


Installation of 3" speaker in a USA Trains diesel

This installation is for standard DC track power with a battery backup. The fuel tank is the only location on most USA Trains diesel engines to mount a speaker of decent size. EMD type sound units demand a good, large, speaker in order to reproduce the low frequencies that it provides. Unfortunately, the shell is full of obstructions which prevent mounting a speaker of larger size.

First step is to remove the fuel tank. Next, the raised molded plastic needs to be removed and cut flush to allow the speaker to be mounted flat. The side edges of the fuel tank also need to be thinned in order for the speaker to mount low enough. This requires careful cutting as to not go through the side walls. The sound card is mounted on the one end of the fuel tank with the rechargeable battery mounted to the other. An access hole was put in the bottom of the fuel tank to allow for the volume control to be accessed. A stack of double sided tape was placed behind the volume control to prevent it from becoming bent back if extra pressure is used from the screwdriver when adjusting the volume. The notch control was not given access since it's not something that needs to be adjusted after it's set. Full CCW or to 11 o'clock is a good setting for most users.



1 - route sides to clear speakers edge. Also remove other plastic to allow for flush or near flush mounting. Periodically test your speaker fit to make sure you have removed enough side wall plastic. Make sure you do not go through!

If using the rechargeable battery configuration, refer to page 2 and drill the switch mounting hole at this stage.



2 - Position and glue speaker as flush as possible. Fill in edges to prevent air from circulating ("Quick Grip", found at most craft shops, was used for this installation. It fills voids and remains a bit flexible as well as making a quick glue job).

3 - Outer wall of speaker baffle (printed to the right). Cut along red lines and roll into a cylinder. The bottom edge gets glued up to the blue line when forming the cylinder. Make sure it is perfectly square / flat on the top and bottom. You can test the diameter of your construction by placing it onto the speaker.

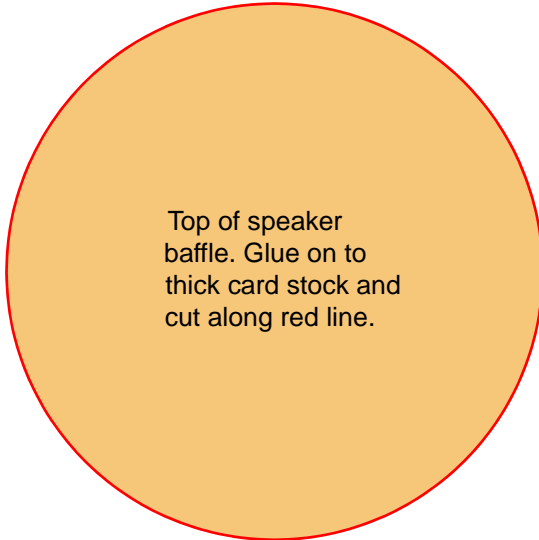
4 - Solder wires to speaker terminals.

5 - Glue against the speaker back side as shown allowing wires to pass through. Again make sure this is air tight.



6 - Position and glue speaker top baffle enclosure as shown above. flush to the front with no air gaps as pictured. Make sure that there are no air gaps to the entire enclosure. If any are found, seal them up.

7 - Proceed to mount the sound unit and other items that may be used in your installation. Page 2 shows conventional installation with reed switch operation and #996 battery backup.

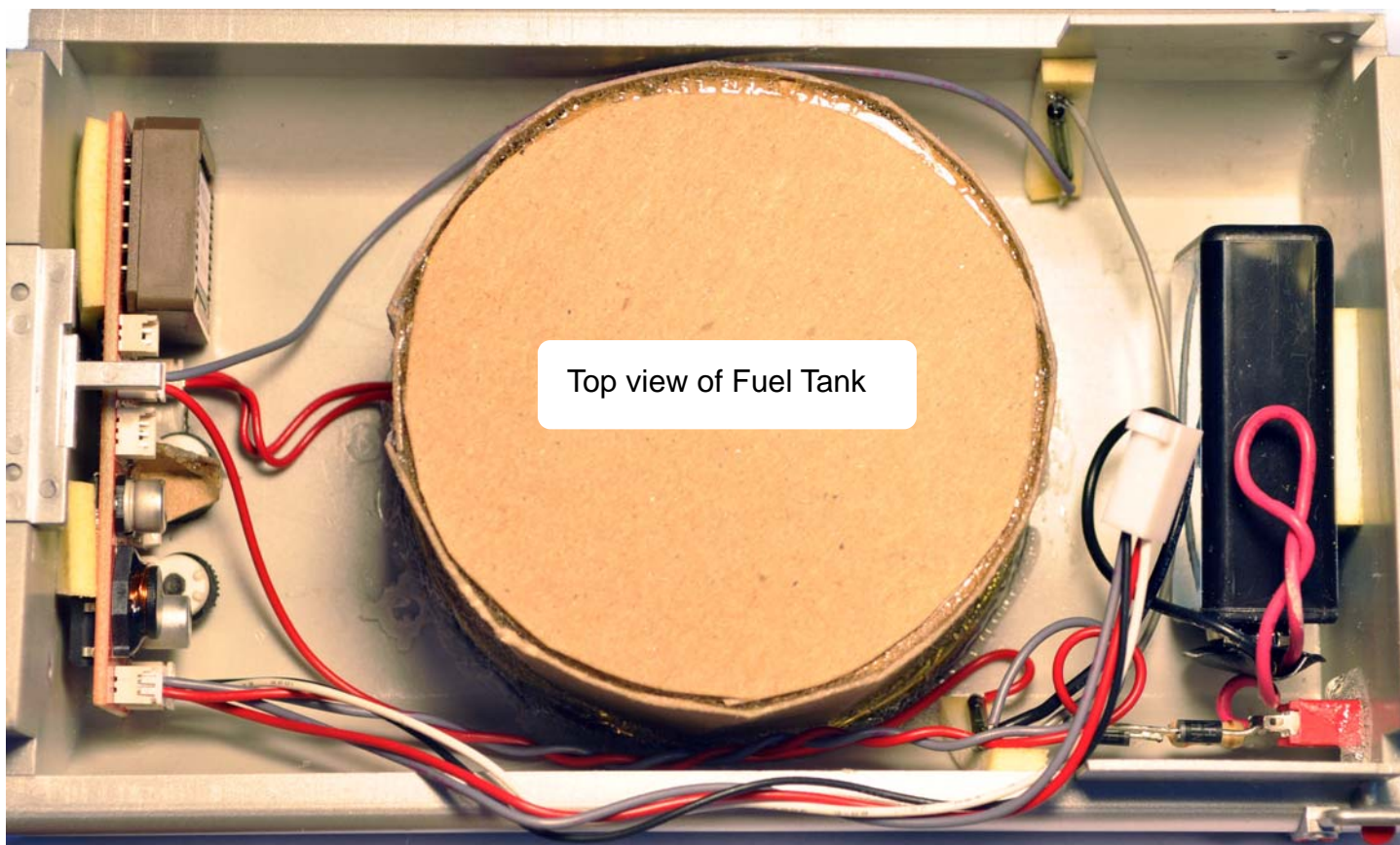


Speaker templates:

Glue templates to stiff, thick, card stock.

Then cut out along the red lines.

If the card stock is not thick enough, proper sound won't be produced.



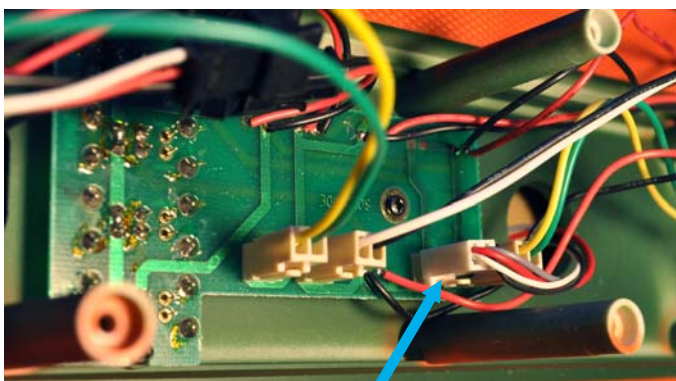
8 - With the volume control properly positioned, mount the sound unit.
 9 - If using the rechargeable battery configuration, mount the on/off switch as well as connecting the other components. Mount the battery after installing the reed switches.

10 - Prepare and mount the two reed switches.

Red - Horn (J4-1), Gray - Bell (J4-2), Black goes to J2 gray.

Double sided tape, item #388, was used to secure them instead of glue. This allows them to be mechanically insulated from extraneous vibrations to help prevent breakage.

USA Trains mother board.



Sound unit power connection.

11 - Complete wiring of all items. The sound power can be connected with either item #992 for "plug-n-play" or you can make your own with connector pack #520. Otherwise the wires would have to be soldered to USA Trains mother board.

12 - Plug the sound power cable onto the USA Trains mother board (picture shown bottom left). Make sure it's sound power switch is turned on for the sound unit to receive track power.

While rechargeable batteries are not charged when new, they still have a residual test charge in them and will normally power the sound unit a bit to allow you to turn the battery power switch on to hear everything work. You can use a magnet, item #988, to operate the Horn and Bell as well.

Since USA Trains has a "Sound Power" switch you can turn all power off to the sound system. Remember that the rechargeable battery will not charge when the power to the unit is turned off. If you want to charge the battery fully without running the engine, turn the motor switch off and the sound units volume down (if you don't want to hear it) and place the engine on a powered track for 14 hours at 16 volts. Otherwise the rechargeable battery will charge from the track power while running at voltages higher than 12 volts. Don't forget that you have the engine charging and the volume turned down (which is why there would be "no sound" when you think it should be working).