Installing DCC to Your AMS Plymouth Diesel in On30 or On3

1.0 Introduction

The Plymouth switcher is a DCC ready Engine. The circuit board provides an NMRA standard 8-pin socket to plug your decoder into. The circuit board also provides a 1.5 volt power source for all the lights so there is no need to replace the bulbs. The decoder can be any 1 amp or higher decoder with an 8-pin plug that will fit in the space provided. Once installed, the decoder will control the headlight, taillight, and motor. The marker lights are not controlled by the decoder and will always be on. The decoder used in this discussion is a small HO/N scale decoder with an 8-pin plug attached by a short length of wire known as a plug short.

2.0 Tools needed

Installing a DCC decoder into an AMS Plymouth Switcher requires just a few tools. You will need tweezers and a Philips head screwdriver to remove the shell. If you are installing a decoder with a wire harness you will need a piece of heat shrink tubing for each of the extra function wires and a means to shrink it (a hair dryer will work). You may also need a piece of double back sticky tape.

Figure 1. Tools required

3.0 Selecting a Decoder

When selecting a decoder there are several factors to consider. The first two factors are room for the decoder (and speaker if adding sound) and decoder capacity (maximum amperage and number of functions). First you need to determine the maximum or stall amperage needed. This is the number of amps the motor will consume when it is stalled (stopped from spinning with power applied). The stall amperage for AMS Plymouth Switcher is 0.8 amps, and therefore the decoder needs to have a stall amperage greater then that. The next factor to consider is space. For AMS Plymouth Switcher, a decoder with an integrated 8-pin plug or one with a wire harness can be used. Figures 2 and 3 show the space available for a decoder with an integrated plug.

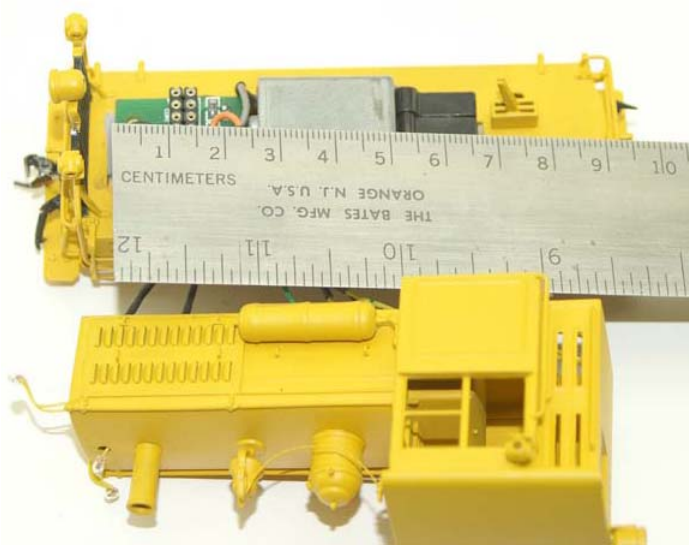

Figure 2. The overall length and socket position of an integrated socket decoder

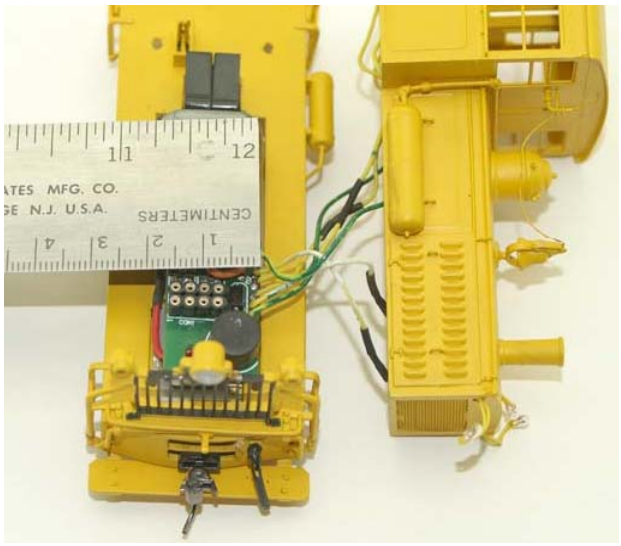

Figure 3. The overall width and socket position of an integrated socket decoder

As you can see a decoder with an integrated plug cannot be more then 25 mm long by 18mm wide. The integrated plug should be located accordingly. If you intend to use a decoder with a wire harness then the decoder can be any size as long as it fits under the shell.

4.0 Preparing the decoder

This step depends on the type of decoder you are installing. If you are installing a decoder with an integrated 8-pin plug or that does not have extra function wires you may skip this step.

When installing a decoder it is very important to make sure that the bare ends of any extra wires do not come in contact with anything that could cause a short. The decoder can be damaged if the end of any wire comes in contact with a potential short. To prevent this from happening, the ends of the wires must be covered. There are many ways to achieve this but only one method will be described here.

1) Cut a 1/2 inch piece of heat shrink tubing for each wire to be covered
2) For each of the wires to be covered, bend over about a 1/4 inch of wire
3) Slip a piece of shrink tubing over the end of each wire
4) Use a heat source (hair dryer, etc.) to shrink the tubing.
5) Give each piece of tubing a slight tug to make sure it is firmly in place. If it falls off, start over at step one. In figure 4, the arrows show that the ends of the extra function wires have been covered with yellow shrink tubing.

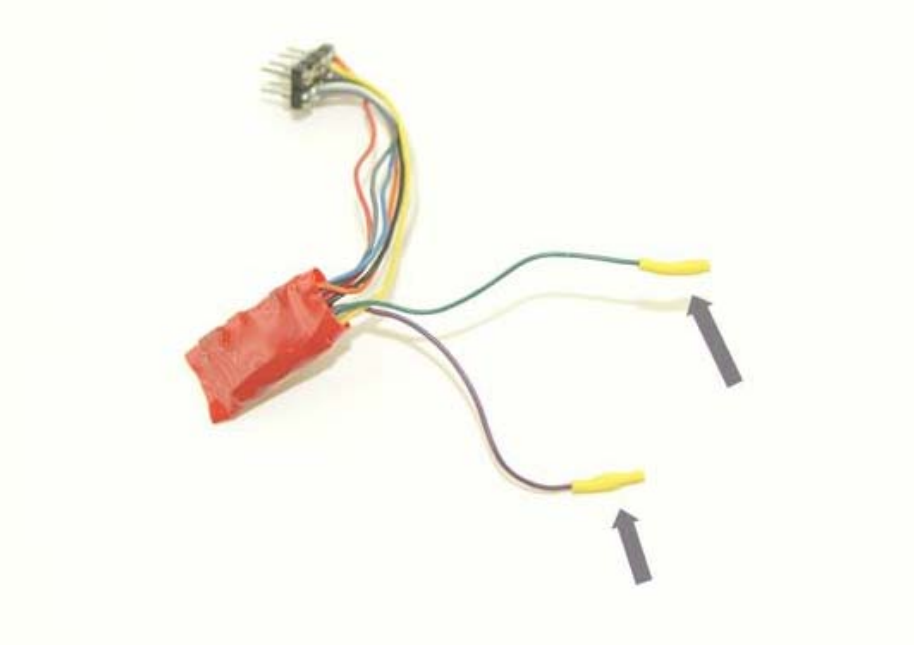

Figure 4. Covering the ends of the extra function wires

5.0 Removing the shell

Removing the shell involves little more then freeing the head light and front marker lights and removing four screws. Start by carefully removing the head light and front marker lights. Use your tweezers to gently pull the bulb out of the casting (See Figure 5). Be sure to be gentle.

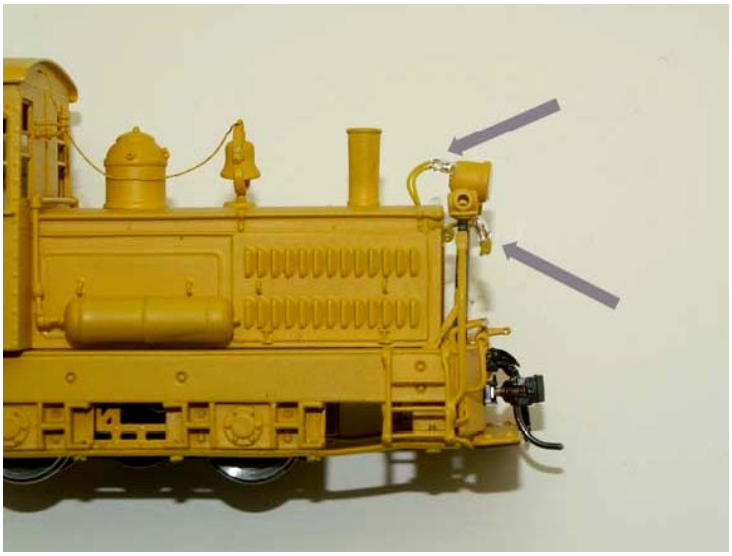

Figure 5. Removing the bulbs from the head light and front marker lights

Once the bulbs are free from the casting (See Figure 5), turn locomotive over and locate the four screws that hold the shell on (See Figure 6). Use the Philips head screwdriver to remove all four screws. Be careful not to lose them.

Figure 6. The screws that hold the shell to the frame

Now the shell can be lifted off the frame. As you gently lift the shell off the frame you may have to angle it to clear the circuit board. Be careful not to hit the radiator (See Figure 7).

Figure 7. When removing the shell be careful not the hit the radiator and the circuit board

6.0 Installing the decoder

Now that the shell is off, the circuit board is exposed. In the middle of the circuit board there is an 8-pin socket with an 8-pin plug. Carefully remove the plug, and then locate the number one pin (shown by arrow in figure 8). Be sure to plug in your decoder so the number one pin (orange wire) is aligned with this hole. If you are using a decoder with an integrated 8-pin connector, you are finished with this step.

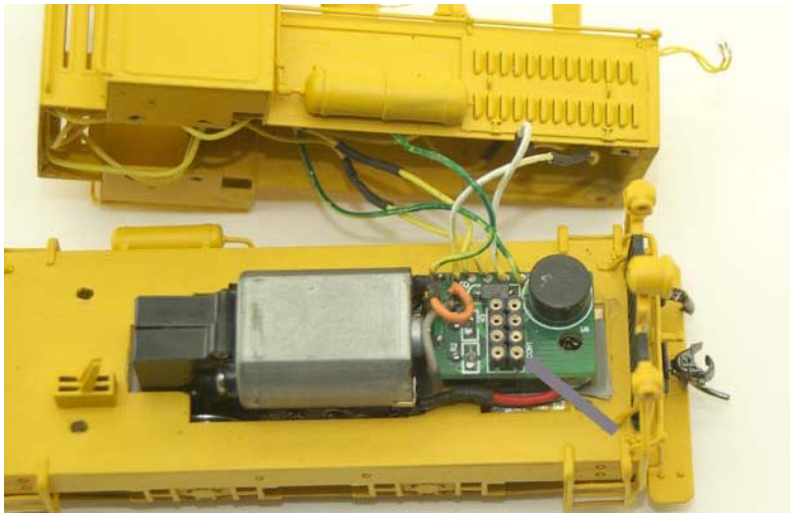

Figure 8. Decoder alignment.

For decoders with wire harnesses, you may want to use a piece of double back sticky tape to tape the decoder to the top of the motor. Be sure the decoder does not sit more then 11/16 of an inch above the walkway otherwise the shell will not sit down on the deck properly.

7.0 Replacing the shell

Replacing the shell is a little more complicated then removing it. Be aware of the decoder and decoder wires if a harness is used. Be careful not to pinch a wire between the shell and the frame. Start by slowly lowering the shell over the decoder and circuit board. You may have to wiggle the shell to clear the corners of the circuit board (See Figure 7). Before mating the shell to the frame, be sure that none of the wires are between the shell and frame (See Figure 9).

Figure 9. When replacing the shell watch for stray wires

Don't forget to look into the cab for stray wires, only the wires running to the marker lights and tail light should be present. When all the wires are neatly tucked up into the shell, bring the shell and the frame together. Now turn the locomotive upside-down and replace the four screws (See Figure 6). Using your tweezers gently slide the head and marker light bulbs back into their respective castings.

Congratulations! You have finished installing a decoder into your AMS Plymouth Diesel Switcher.