CONVERTING AN AMERICAN FLYER 740 HANDCAR TO A REVERSING HANDCAR

Written by: David A. Avedesian

Have you wish you could have your AF 740 handcar go in the reverse direction? The reason the AF 740 does not reverse is because there is no way to reverse the polarity of the electrical field around the motor. The direction of the handcar is fixed because the unit is hard wired without an E-unit.

A long time ago, I decided to run my American Flyer trains on DC instead of the traditional AC method. As most of us know the American Flyer open frame motors for the stream and diesel engines including the handcar is a universal motor. A universal motor can operate on either direct or alternating current.

My primary objective in converting to American Flyer DC Hi-rail was to eliminate the four position E-unit and to improve slow speed performance. In order to eliminate the E-unit, it has to be replaced with a bridge rectifier. A bridge rectifier is four diodes pre-wired in such a fashion that it will take AC as an input and produce DC as an output. When a bridge rectifier is installed in between the power feed from the track and the motor/field, you will be able to reverse the direction of the AF 740 handcar by reversing the polarity of the track DC feed.

HOW TO MAKE THE CONVERSION?

Remove the AF 740 handcar shell and carefully examine the existing wiring diagram. You will note that there are two wires that go to the field and two wires that go to the brushes for the motor. We will be installing the bridge rectifier in between the wires.

I used a Radio Shack #276-1152, 100V, 1.4A, silicon bridge rectifier. This rectifier is small and is able to fit under the shell without much difficulty. Study the diagram on the back of the Radio Shack package. One lead is identified as positive (+). The other leads are in relation to the positive lead. The opposite lead is negative (-). The remaining two leads are AC. When wiring the rectifier, it is important to soldier the correct wire to the positive and negative leads. When making the AC connections, it will not make a difference which wire is soldered to the AC leads.

After you have studied the existing wiring and the new wiring scheme - Figure 1, let's make the connections as required one step at a time. The following are the steps to convert you AF 740 into a reversing handcar:

- Un-solder the lead which goes to the insulated wheel pick up at the wheel pick up solder point.
- Solder a new wire to the insulated wheel pick up point.
- Solder the other end of the wire in step above to one of the AC leads on the rectifier.
- Un-solder the lead to the brush at the brush end of the wire which goes to the coil.
- Solder a new wire to the other AC lead on the rectifier.
- Solder the other end of the wire in step above to the end of the brush that was just un-soldered.
- Solder one of the field wires to the positive(+) lead on the rectifier.
- Solder the other field wire to the negative(-) lead on the rectifier.
- You should note that the grounded lead from the chassis to the other brush is not changed.
- Test the handcar action for forward and reverse. If the test fails, first check the quality of the connections. If it still fails, reverse the field connections on the positive/negative leads on the rectifier. You also can use a set of jumper leads to test the handcar before making the solder connections.
- Carefully tuck the rectifier and short wires under the shell and reassemble the handcar. If you are not careful, it is possible to lift the brushes away from the motor. This can be avoided if the wires are kept very short.
- Another suggestion is to use heat-shrink tubing to insulate all the connections.
- Lubricate the bearings and gears as normal.

This is an easy project which will take about an hour to complete. The AF 740 handcar will now operate in both directions when the polarity of the track feed is reversed.

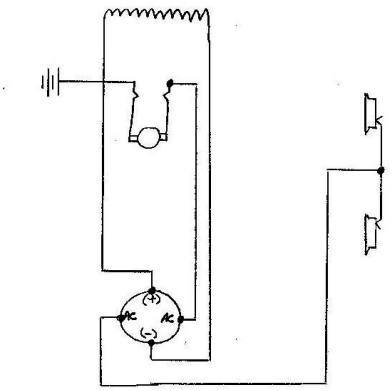

Figure 1.