

# WMH-20 Installation – Flying Leads

This document is online at <http://www.wifitrax.com/appNotes/quickStart/WMH-20F-Quick-Start.pdf>. Please see our website for information on our limited warranty.

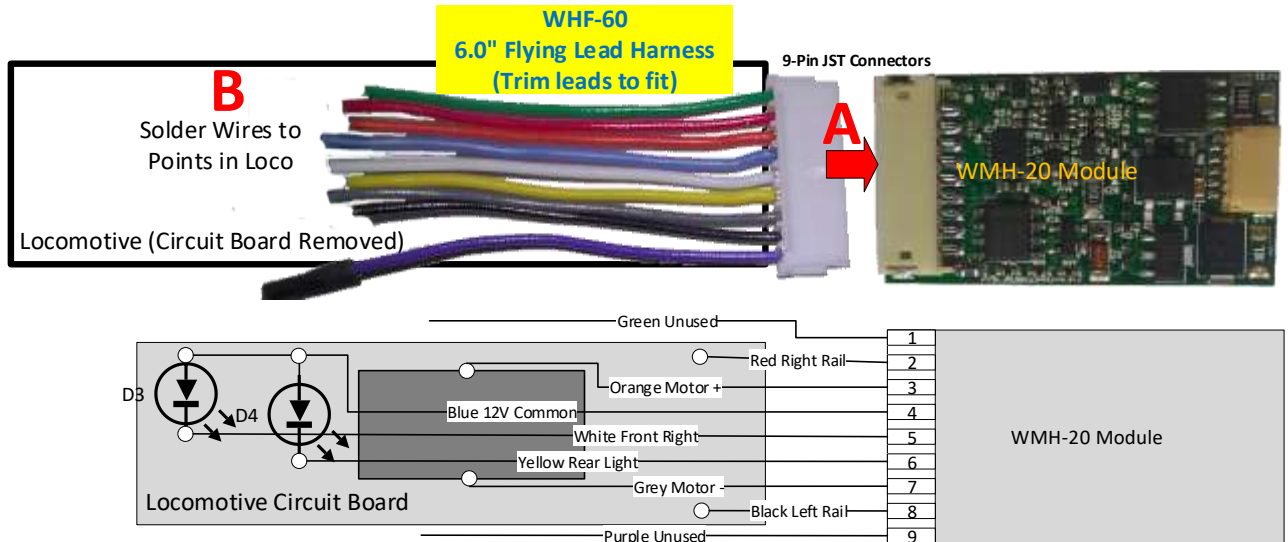


Figure 1. Connection Diagram

## Installation Instructions

- (1) Ensure your locomotive is working properly. Do not install our unit in locomotives with damaged motors. Remove the plastic shell from your model locomotive.
- (2) **Make sure that the motor is isolated from the track power!** This is most important – if one side of the motor is connected to the track, perhaps through the frame, you will have to re-wire the locomotive before you start. You will not have this problem with DCC or DCC-Ready Locos.
- (3) Remove the circuit board from the locomotive if one is present. Locate the track pickups (Right Rail and Left Rail). Locate the connections to the motor, Motor + and Motor – in Figure 1. Locate the connections to the front and rear lights. LEDs must be used. If your locomotive uses filament lamps, obtain LEDs from our web site or your hobby electronics store.
- (4) Check the intended location of the WMH-20 unit in the loco. Insulate any exposed metal that will be underneath it with electrical tape. **This is very important.** We do not recommend putting shrink wrap around the unit as this may cause it to overheat.
- (5) Determine how you will solder the ends of the flying lead harness to the loco connection points. You may have to solder “wire to wire” with a piece of heat shrink sleeving over the joint. Often the motor has tags that you can solder to.
- (6) Trim the lengths of the flying leads to the required length. Allow just enough slack otherwise the leads will foul the body or the mechanism. Solder the leads to the connection points that your determined.
- (7) Connect the flying-lead harness to the 9-pin JST socket. See A on Figure 1. Make sure it is the right way around. **Do not force it in the wrong way around or you will break the socket.**
- (8) Check everything carefully for pinched wires or accidental contacts.
- (9) Place your locomotive on the track and apply power we recommend 12 – 14 volts (Note 3).
- (10) Verify that the front and rear lights flash briefly when the track power is turned on. Replace the shell.

### Notes and Cautions

1. **Be sure to insulate all metal parts of the module from the locomotive frame or any electrical connections. You can use a strip of electrical tape to do this.**
2. The 12V Common (Blue) is provided by the WMH-20 module. DO NOT CONNECT THIS TO THE TRACK POWER. This is used to supply power to the LED front and rear lights. If your loco's LEDs are not bright enough, there may be a series resistor that you can remove. Our unit already has a 1K $\Omega$  series resistor. Alternatively, you can buy LED's from our website chosen especially for our units.
3. The track voltage must not exceed 18 volts. We recommend 12-14 volts. The polarity of the track voltage does not matter. If you run at 18 volts and full speed, you may overheat some locomotive motors and/or the unit may shut down due to its over-temperature protection. Try to locate the unit so that there is as much exposure to the air as possible.
4. The polarity of the motor connection does not matter as you can change the direction in the configuration variables during tuning.
5. If you need to remove the 9-pin JST connector, grasp ALL the wires firmly between your thumb and first finger of your left hand and the unit with the thumb and first finger of your right hand. Pull smartly. If you pull on only one or two wires you will pull them out of their crimped ends and break the harness. Be careful not to damage the JST connectors as they are rather delicate.

If you need more help please visit our website. There are very detailed application notes for a selection of locomotives as well as full specifications for the WMH-20. You can also find detailed tuning information on our website including giving it a name and making the loco run in the correct direction!

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