Bachmann GE Dash 9 Battery Power with the AIRWIRE D60X CONVRTR

Meet the D60X CONVRTR, specifically designed for Bachmann GE Dash 9 large scale diesel. A game-changer in the world of garden railroads, our new product allows for easy connection of 3rd party DCC sound decoders and converts them into AIRWIRE compatible decoders.

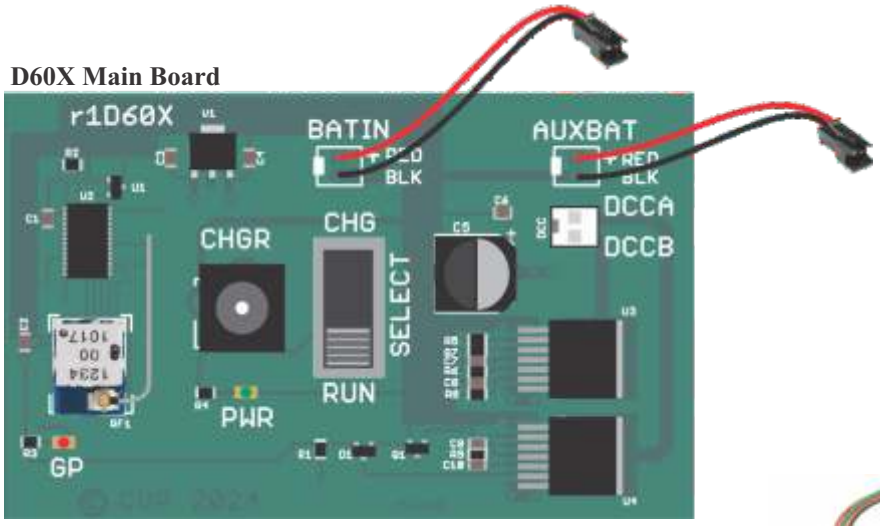
Designed For Bachmann Large Scale GE-9 Diesel Locomotive Converting the locomotive to battery power is easy when you combine the existing RC/DCC socket inside the chassis with the new AirWire900 D60X.

Effortless Installation Installation is a breeze with our full color illustrated Installation Guide. All connectors, wiring harnesses, and hardware are included.

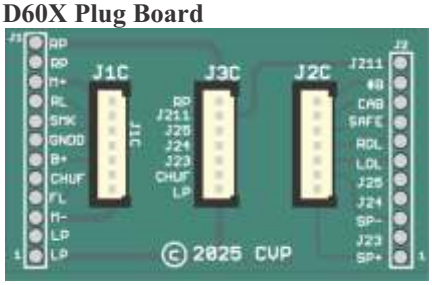
Easily Connect 3rd Party DCC decoders Connections between the sound decoder and the D60X are done using the provided wiring harnesses. The ends are already stripped and tinned. All you need is a screwdriver - no soldering is required.

Alleviate Your Concerns The D60X CONVRTR works seamlessly with all AirWire900 Wireless Controllers and throttles.

D60X Main Board



D60X Plug Board



Wiring Harnesses

Charger Pigtail

DCC Pigtail

Hardware Kit

$159*

The D60X main board mounts under the locomotive's roof access hatch using the included hardware kit. This makes accessing the charger jack and the power selector switch very convenient. The 3rd party sound decoder mounts beneath the DCC/RC socket and is wired to the D60X plug board with the included wiring harnesses. There is more than enough room to mount a BAT2 inside the loco.

Part#	Description
D60Xr.	Plug-In CONVRTR for Bachmann GE Dash 9 rated at 6 Amps
	Includes the DCC/RC Plug, D60X board, Installation Guide, battery charger connector, DCC Connector, two wiring harnesses, and extra hardware kit
	Requires a BAT2 (or equivalent) battery, and a large-scale 3rd party DCC sound decoder of your choice.

CVP Products www.cvpusa.com

r1 NOV 2025

*MSRP - Now Shipping

D60X CONVRTR Specifications

Use an AirWire programming throttle, like the T6000, to setup the CVs in either the attached sound decoder or the D60X. Only a few CVs are used by the D60X and these are usually programmed at the same time as when programming an attached decoder.

When programming the locomotive address, the throttle will automatically send the proper sequence of CVs to the attached sound decoder regardless of the number of digits in the address.

The D60X accepts both SERVICE PROGRAM commands and OPS PROGRAM commands.

However, do not use OPS PROGRAM to change the locomotive address.

CV #	Factory Value	Value Range	Description
1	3	0-99	1-99 Primary Address
8	135	135	CVP Manufacturer ID
17	0	0-605	Loco Address Hi-Byte
18	0	0-605	Loco Address Lo Byte
29	2	0-605	Decoder configuration
200	0	0-16	Frequency Used

D60X Warranty Information

This warranty covers substantial defects in materials and workmanship in the D60X module.

What This Warranty Does Not Cover

This warranty does not cover any problems which result from improper installation, modifications, battery polarity reversal, improper operation, leaking batteries, excessive battery voltages, excessive decoder current draw, incorrect connections to decoders, abuse, accidents, or acts of God such as excessive heat, wildfires, floods, damage caused by exposure to moisture and rain, lightning, earthquakes, volcanic events, tidal waves or hurricanes.

Warranty Duration

The coverage of this warranty lasts for 90 days. After this period, standard repair rates apply. Depending on the problem, CVP reserves the right to repair or replace.

Help, Repairs and Returns

If you purchased your D60X from one of our AirWire900 dealers, please call them first. They are your best and quickest source for answers to questions about D60X. They are also experts in installation and offer such services should it be required. If you purchased your D60X ***direct*** from CVP Products, please give us a call.

If you are asked to return an item to CVP for service, you must follow the instructions on the website listed under the bright red box labeled "REPAIR SERVICES" on the cvpusa.com home page. There you will find the repair submission form, and the shipping address.

Do not send items to us for repair without first obtaining authorization and an RMA.

D60X CONVRTR Electrical Ratings

Maximum Input Battery Voltage . . . . . **22 Volts DC**
Minimum Input Battery Voltage . . . . . **11.1 Volts DC***
Minimum Surge Current without Tripping **55A**
Maximum Continuous Current (thermally limited) . . . . . **6A at 100°C**
Over-Current Trip (Min/Max) . . . . . **55A to 98A**
Reverse Polarity . . . . . **Not Protected**
FCC ID Number X7J-A10040601 . . . . . **Part 15 Compliant**

*Decoder dependent - it might need a higher input voltage to operate reliably

r1 APR 2025

AirWire900®

D60X™ CONVRTR

Installation And User Guide

For The Bachmann GE Dash 9

Using 3rd Party DCC Sound Decoder

AIRWIRE® 900

CVP Products
www.cvpusa.com

*** Requires the factory installed RC/DCC socket in the Bachmann GE Dash 9 locomotive with original locomotive wiring.**

*** Requires a 3rd party DCC Sound Decoder (Soundtraxx, TCS or other brand).**

Package Contents
D60X Main Board
D60X Plug Board
Two Harness Pigtails
DCC and Charger Pigtails
JST-SKT & JST-PLUG Pigtails
Hardware Kit
This User Guide

D60X CONVRTR Familiarization

Caution: The D60X CONVRTR plugs into the factory installed socket located inside the locomotive. If your locomotive does not have the "DCC/RC" socket, the D60X cannot be used.

The D60X CONVRTR kit contains two circuit boards plus wiring harnesses and a hardware kit. Check your kit against the pictures on this page to ensure you have all of the components and to familiarize yourself with the various names of each of the components.

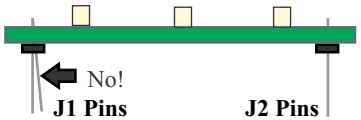
D60X Main Board contains the radio receiver, power supply and drivers for converting a 3rd party decoder into an AirWire compatible decoder. It also includes the RUN/CHARGE selector switch as well as a jack for plugging in the battery charger.

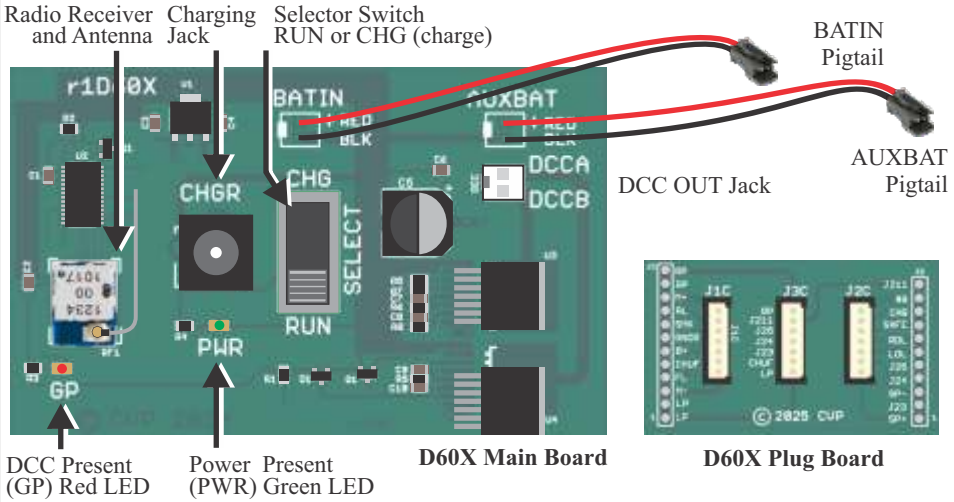
The D60X Plug Board plugs into the matching socket inside the locomotive. Remove and discard the protective foam from the pins when you are ready to install it.

Check For Bent Pins on the Plug Board. After removing the protective foam, insure that all J1 and J2 pins are straight and perpendicular to the circuit board. Gently bend pins with needle-nose pliers until all are straight.

A single bent pin will prevent proper insertion of the decoder into the locomotive DCC socket. A bent pin will miss the socket.

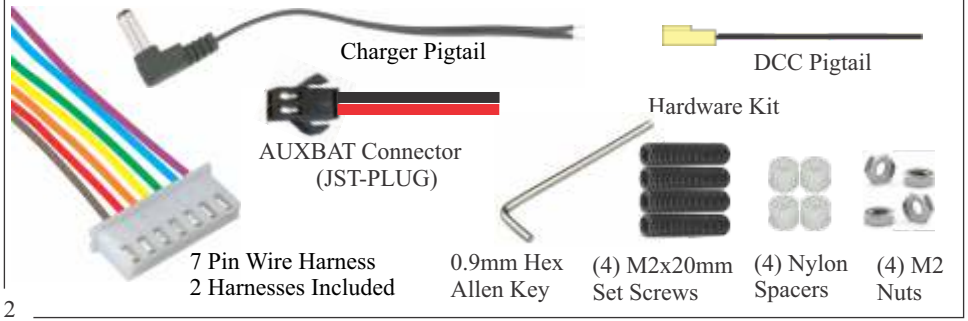
Side View of D60X Plug Board





Wire Harnesses, Connectors, Pigtails, Hardware Kit

TheD60X CONVRTR kit includes the required wiring harnesses, pigtails and hardware needed for installation. Verify that your kit has these items included before you start.



Note About Using Other Brands of Sound Decoders

If you are using a different manufacturer's sound decoder, make sure you have made the 2 changes below to prevent unwanted operation. These steps are not required for Soundtraxx decoders.

1. Turn Off Decoder Analog Conversion Use the SVC PROGRAM mode to set CV29 to one of the following values based on the decoder's locomotive address. Failure to make the change to CV29 will result in unexpected high speed runaway if the decoder is powered on without a throttle powered on and set to the D60X frequency. For address between 1 and 99: Set CV29 to a value of 2. For address between 100 and 9999: Set CV29 to a value of 34.

2. Set The Decoder Packet Timeout Value To 0 Use the SVC PROGRAM mode to set CV11 to a value of 0. This will permanently disable the feature. Without setting CV11's value to 0, the locomotive will stop if it goes out of range of the throttle. The preferred setting of 0 allows the locomotive to continue running at its current speed until it comes back into the throttle's range.

Do Not Use ESU-LOKSOUND Decoders

ESU decoders do not support a programmable DCC packet timeout. The time out is fixed and cannot be changed.

As a result, when the locomotive goes out of range of the throttle or if the throttle frequency or locomotive number is changed no DCC packets are received and the locomotive comes to a halt.

Always confirm that the DCC decoder supports CV11 and that the CV can be set to a value that disables packet timeout.

When used in an AirWire installation, the attached decoder must support a programmable CV11. It must allow a value to be programmed into CV11 that disables the packet time out feature. Usually, the value is 0.

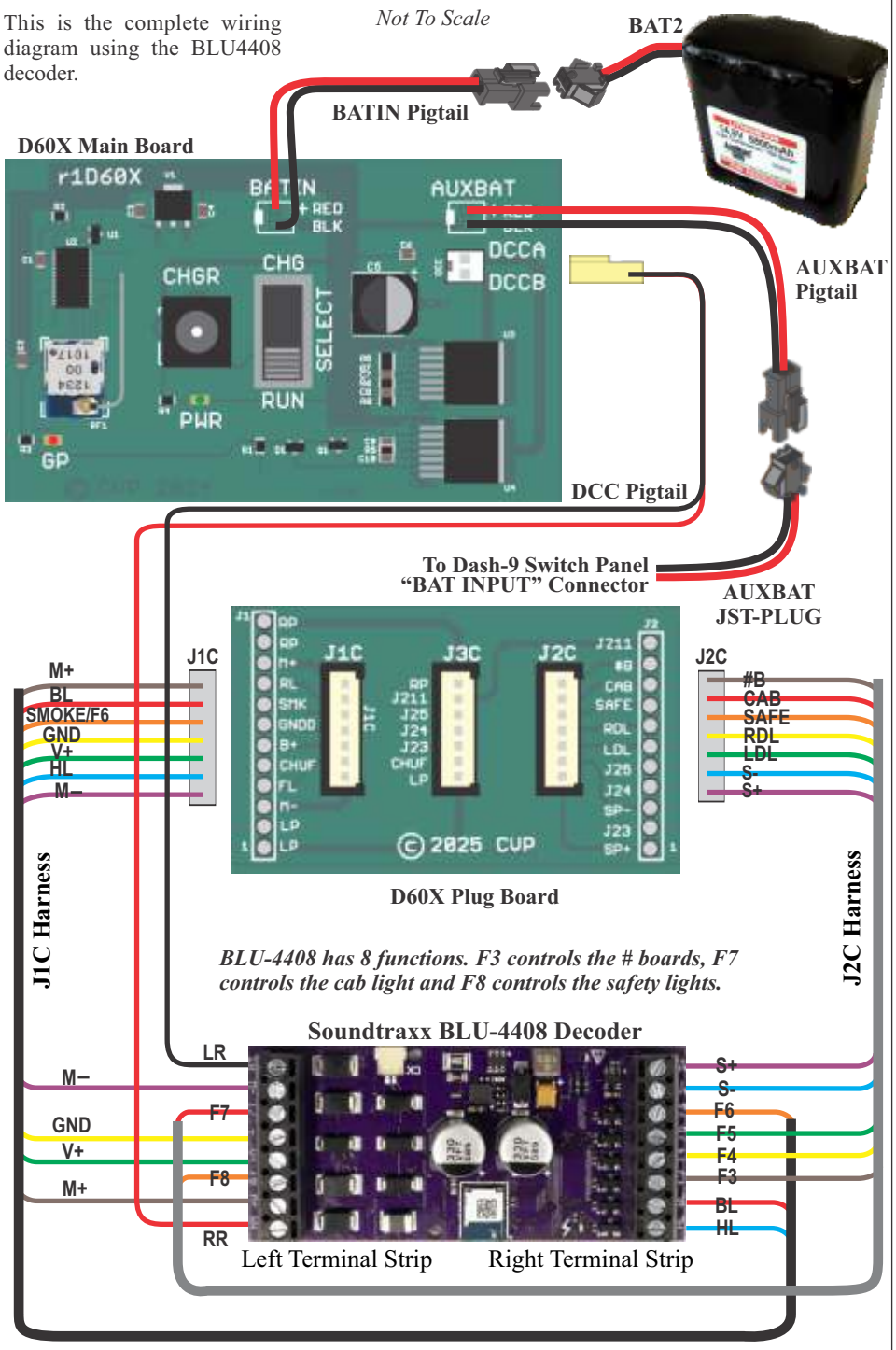
Soundtraxx Technical Support

CVP does not provide technical support for the Soundtraxx sound decoder. If you have any TSU4400 troubles contact Soundtraxx. They will be happy to help.

(970)259-0690 support@soundtraxx.com

D60X + BLU-4408 Complete Hookup Diagram

This is the complete wiring diagram using the BLU4408 decoder.



Before You Begin: Get The Extra Stuff

The following items are needed in addition to the D60X Convrtr kit. Some are optional [OPT].

DCC Sound Decoder: The Soundtraxx TSU4400 for GE Diesel Models is required for use with the D60X Convrtr. It has sufficient amperage to drive the Bachmann GE Dash 9 motors, lights, sound and smoke unit. The Soundtraxx decoder requires very little programming which is best if you are new to DCC sound decoders. If you run into any issues or have a question regarding the sound decoder, call or send an email to Soundtraxx. They provide excellent support for their products with fast and accurate responses.

Soundtraxx https://www.soundtraxx.com

Soundtraxx TSU4400-DIESEL [PN 885018 For GE Diesel Models]

Circuit board colors may vary

ESU/LOKSOUND decoders are not recommended since they do not support a user programmable CV11.

14.8V 6800mAh rechargeable battery: The BAT2 from CVP is recommended. The CVP BAT2 is a robust 8-cell, 14.8V, 6800mAh, Lithium-Ion rechargeable battery. It will run the locomotive for several hours, depending upon the layout design and number of cars pulled.

Li-Ion Smart Battery Charger: The CHARGER1 Li-Ion Smart Charger, from CVP is recommended. The Drop-In decoder comes with a plug that is attached to the charger.

3M VHB Double-Sided Tape: extra strong used for attaching the battery. It does not disintegrate like classic double sided foam tape. Get it at office supply stores, Home Depot or Amazon.

Small 6 inch Plastic Zip Ties: For bundling wires. Get them at Home Depot.

Heatshrink Tubing: This is used to cover spliced wire solder joints. Amazon offers many different kits of tubing. Search Amazon using the phrase "heat shrink tubing." Plastic electrical tape may also be used.

Soldering Iron: Bigger is not better for these jobs. We use Hakko and Weller (Apex) temperature controlled irons. They might cost more but they will last a lifetime. See the Weller W60P3-ND sold by Digikey. www.digikey.com

No-clean flux solder: This is the preferred solder for small soldering jobs. Solder joints are clean and shiny without any brown, sticky or burned rosin flux residues. Use 63/37 solder having a 0.020" diameter. The Digikey part number is WBNCC633720-4OZ. www.digikey.com. Also check ZORO.com for the same item. Their price is usually less than Digikey.

Small Wire Cutters: Diagonal wire cutters with small narrow jaws are best.

Jewelers Screwdriver with 0.08 in (2mm) flat blade. Used on decoder terminal screws.

Long, Thin Shaft Phillips Screwdriver: You must have a thin-shafted, #1 phillips-head screwdriver that is at least 4 inches long to reach the screws embedded deep down in the chassis. This one is from General and has a 4 inch long, narrow shaft with a #1 Philips tip. It is also magnetized which comes in handy for pulling the screws from deep recesses.

Attaching Charger Plug Pigtail To Charger

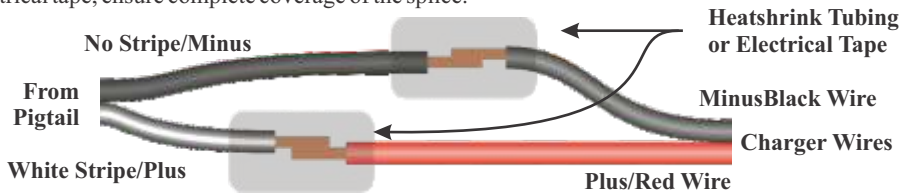
The charging pigtail needs to be permanently attached to the charger output wires. First, open up the charger box. Inside will be the charger with alligator clips and the AC power cord.

Locate the charger pigtail that came with your D60X CONVRTR. The 2-conductor pigtail comes with stripped wires on one end and a right angle plug on the other.

Wire polarity is very important. On the pigtail, the plus wire is the wire with the white stripe. The minus wire is the solid black wire. On the charger, the red wire is plus and the black wire is minus.

Take the pigtail and separate the 2 wires for about 2 inches. Cut the plus wire so it is 1 inch shorter than the minus wire. Remove about ½ inch of insulation from the plus wire. Twist the strands together and apply solder to the twisted end of the plus wire. This is called tinning and keeps the twisted wires from unraveling. Next, remove about ½ inch of the insulation from the minus wire. Twist the strands together and touch a tiny bit of solder to the twisted wire.

Take the charger wires and split the red and black wires apart for about 3 inches. Cut off the alligator clips and cut the minus (black) wire so it is 1 inch shorter than the plus (red) wire. Remove about ½ inch of the insulation from both the black and red ends of the wires. Twist and tin the two wires. Slide a piece of heatshrink tubing onto each wire. Solder the charger pigtails to the charge pigtails. Position the heatshrink to completely cover the splice and heat it with your soldering iron to shrink it. If using electrical tape, ensure complete coverage of the splice.



Verify Battery Pack Connector Polarity

Check The Battery Pack For Proper Polarization. The CVP BAT2 battery pack has a mating plug that is properly polarized for the BATIN pigtail that is attached to the D60X Main Board.

The drawing shows the red and black wire orientation for both the BAT2 plug and the JST-SKT pigtail. Orient the battery plug and the D60X JST-SKT socket as if they were to be inserted. Confirm the wire colors and connector orientation match the picture below. Notice that the socket's release lever is pointing away from you.

CVP'S BAT2 Battery Pack

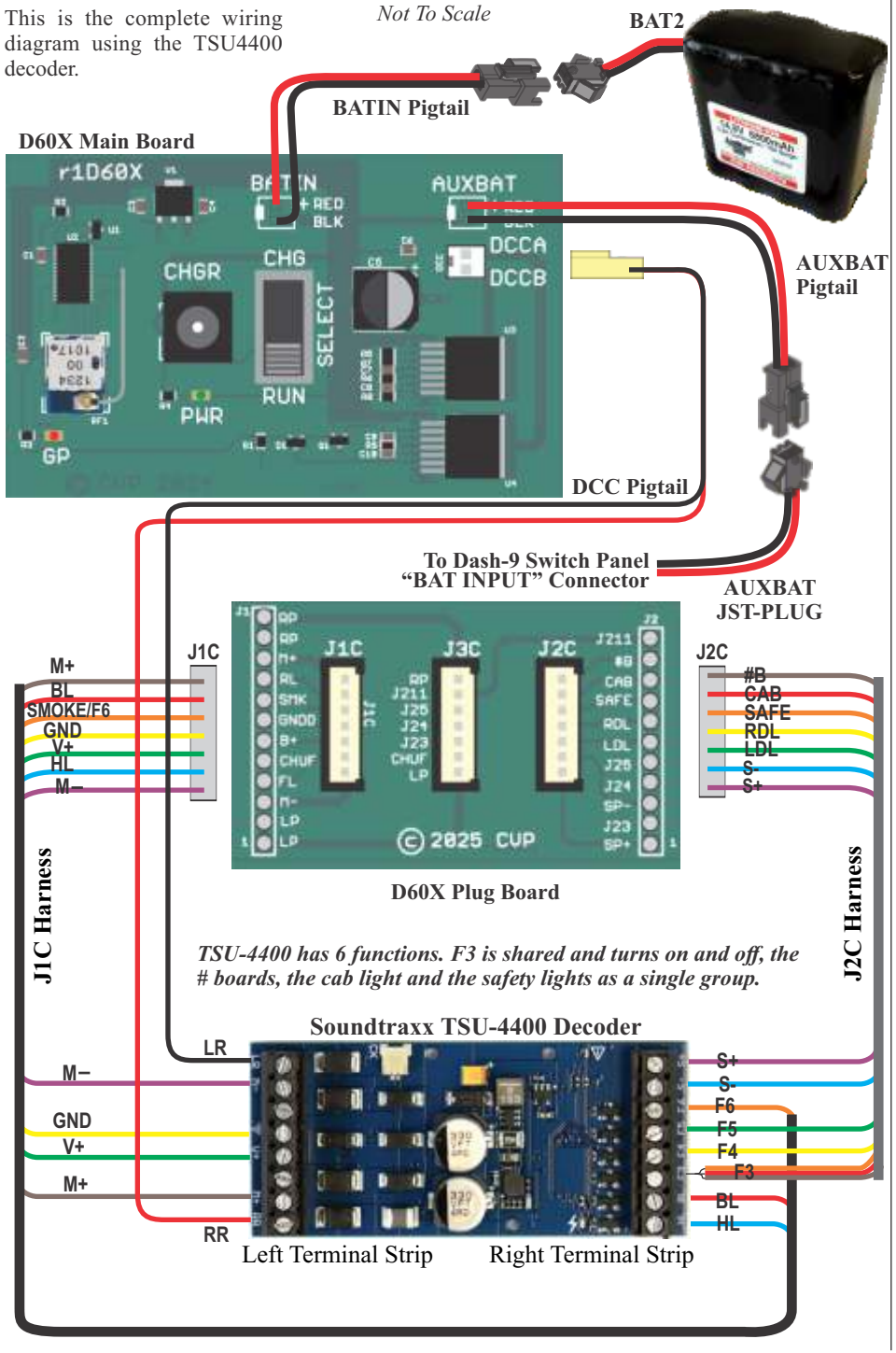
Never remove the plug from the battery. Doing so voids the warranty.

If you are using a different brand of battery, you must verify the polarity is correct before using it. Get help if you are not sure.

D60X + TSU-4400 Complete Hookup Diagram

This is the complete wiring diagram using the TSU4400 decoder.

Not To Scale



Troubleshooting Tips

Locomotive Was Running But Suddenly Stops and Won't Restart

1) Battery is depleted. Recharge the battery.

2) Jamming. Make sure that another throttle is not jamming your frequency and/or address.

3) Mechanical failure inside the locomotive.

4) Some kind of fault with the attached DCC decoder

Locomotive Won't Run At All After Installation

1) Battery is depleted. Recharge the battery

2) Jamming. Make sure another throttle is not jamming your frequency or address.

3) Throttle not set to proper frequency or address. Set the throttle correctly or use the JUMP MODE to program the D60X to the desired frequency. If you are not sure what the frequency is, follow the instructions in the section labeled, 'Forgotten Frequency."

Operational Considerations

Beware of Lurking Locomotives When Using SERVICE PROGRAM Mode

SERVICE PROGRAM mode is a broadcast command that can be heard and understood by any other AIRWIRE decoder or CONVRTR sharing the same frequency as the D60X. If another decoder receives the command, it too will be programmed. Play it safe and make sure to turn off power to all locomotives not being programmed.

Beware of Other Transmitters

The D60X operates in an unlicenced band shared by many other transmitters. These transmitters can create interference, cause intermittent throttle operation or failure of one or more of the 17 frequencies. The sources of these external interfering signals can be from your own home or from adjacent homes and businesses. They can also be from other CVP wireless equipment.

Here's a list of devices known to have caused interference problems to AirWire900 equipment: wireless devices attached to computers, EasyDCC Wireless Throttles, TV/Radio/Entertainment-center, remote controls, cordless telephones, alarm systems, baby monitors, unlicenced personal communication devices, lawn sprinkler controllers, remote starter switches, cordless light switches, outdoor lighting controllers, toys, wireless headphones, and games. Of course, if you have additional AirWire throttles, make sure each is on its own frequency; two throttles on the same frequency will jam each other.

If you find a strong interfering signal on one or more of your frequencies, don't use those frequencies. You must select another, different frequency.

D60X LED Indicators For Troubleshooting

The D60X LED indicators can provide you with some hints as to the causes of poor, erratic, or non-operation.

The PWR Green LED will always be on if power of the correct polarity is applied and turned on. Even if the voltage is above or below normal, this LED will be on. If it is off, when you think it should be on, check that the power switch is set for RUN. Confirm the battery is charged.

The GP Red LED offers several indications that can serve as an effective aid to troubleshooting.

Steady On: it says the throttle frequency matches the D60X frequency.

Slow Flash: D60X is in count down mode prior to entering Jump Mode (see above). You must turn on a throttle with a matching frequency to cancel Jump Mode. The GP LED will go dark after one minute.

Dark: there is no throttle present that matches the D60X frequency setting and it has now entered Jump Mode and is temporarily set to frequency 0. To cancel this mode, power cycle the D60X and make sure the throttle is set to the D60X's frequency.

Erratic blinking on and off: the throttle is set to a power level that is too low or the throttle is too far away or both.

Preparing The Locomotive for Disassembly

A Soft Work Surface Pays Big Dividends

Spread a couple layers of thick towels on your work surface to serve as a cushion while working on the locomotive. A foam engine cradle is also suitable.

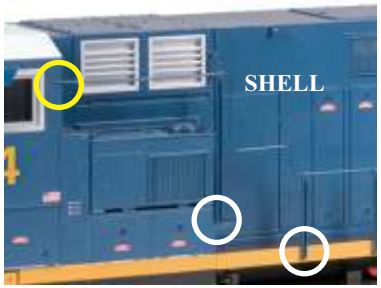
The top shell must be removed to make the battery installation easier. Separating the top shell from the bottom chassis is not difficult. Take your time and be careful. Many detail parts are fragile and easily snapped off.

Remove Left and Right Side Hand Rails

The left and right side hand rails are friction fit into their mounting holes. The paint is easily damaged. Use a small flat blade screwdriver to pry the stanchion from the chassis. Place the screwdriver between the stanchion (white circle) and the chassis and gently pry it out.

The ends of the hand rails are press fit into holes on the cab (yellow circle) and on the rear steps. Use a pair of needle nose pliers to gently pull the hand rail end from its hole. Take care not to damage the paint.

Set the hand rails aside where they will not be bent or otherwise mangled as you continue working on the locomotive.



Remove Front Step Left and Right Hand Rails

These two hand rails (arrow) attach to left and right sides of the shell and the chassis. Friction keeps them in their mounting holes. They need to be removed to allow the shell to be separated from the chassis. Use your needle nose pliers to gently pry each end out of their mounting holes. Take care not to bend or scratch them. *The BN loco photo was used because the hand rail is easy to see.*

Remove The Roof Hatch

The center portion of the roof is removable to expose the smoke generator as well as the various selector switches. It also contains the exhaust stack as well as the air-horn detail. The hatch is friction fit and was very tight on our model. Each end off the roof has a locking tab molded into it and these need to be carefully released. A small flat blade screwdriver was used to pry up each end away from the shell. Alternate between each end when prying. Take care not to scratch the paint. Set the roof hatch aside.

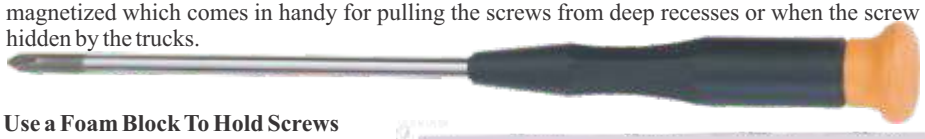
The next series of steps will separate the top shell from the chassis.

Be sure to use padding under the locomotive when it is set upside down. It will not sit straight but will want to lean to one side. Have somebody hold it or brace it while you are working on it.

Locomotive Shell and Chassis Disassembly

You Must Have The Proper Screwdriver

You must have a thin-shafted, #1 phillips-head screwdriver that is at least 4 inches long to reach the screws. This one is from General and has a 4 inch long, narrow shaft with a #1 Philips tip. It is also magnetized which comes in handy for pulling the screws from deep recesses or when the screw is hidden by the trucks.



Use a Foam Block To Hold Screws

Take a rectangular sheet of foam and label it F and B to represent the loco's front (cab) and back end. As each screw is removed, position it in the foam in about the same location as found on the locomotive.

You may also use small plastic bags but be sure to make a note of their location.

The important point is to keep track of the number of screws, their sizes and their locations because they are not all the same.

Screw Heads Are Easily Stripped. They are made from relatively soft metal. Use the correct size screwdriver and apply downward pressure on the screwdriver to keep it seated in the screw head.

Remove The Fuel Tank [4]

There are 4 screws holding the fuel tank to the chassis. Remove all 4 screws. Lift the fuel tank and set aside. Position the screws in the center of the foam block. Or use a plastic bag to hold the screws and label it "Fuel Tank." The bracketed number [4] represents the number of screws for this part of the disassembly.

Remove Screws Hidden By Fuel Tank [4]

With the fuel tank out of the way, there are 4 screws visible that must be removed. Place the 4 screws into the foam or plastic bag.

Remove Screws Near Back Truck and Inner Axle of Rear Truck [4]

There are two screws located on the chassis and somewhat obscured by the truck. Rotate the truck to gain access to the two screws under the inner axle. Don't confuse these with the two screws holding the rear deck. The deck screws should not be removed.

There are two more screws under the outer axle of the rear truck. Rotate the truck to gain access to the screws. Place all 4 screws into the foam or plastic bag.

Remove Screws Near Cab End [2]

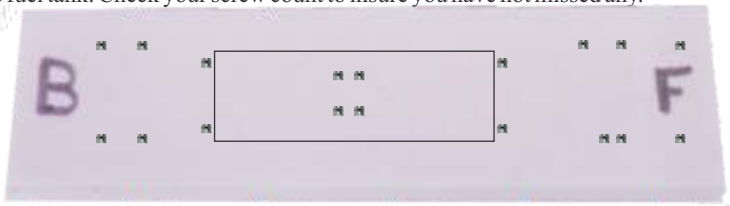
There are two screws located in the extreme corners holding the cab to the chassis. Don't confuse these with the two screws holding the front deck. The deck screws should not be removed. Place the 2 screws into the foam or plastic bag.

Remove Screws Under Front Truck [4]

There are two screws on the engineers side that are about a half inch apart. There are two more on the fireman's side that are about 2 inches apart.

Total Screw Count Is 18

The picture below shows all 18 of the removed screws stored in the foam block. The black rectangle represents the fuel tank. Check your screw count to insure you have not missed any.



Programming The Locomotive Address

If you need to program the locomotive number (address), use the following keystroke sequence on your T6000 throttle. The T5000 can also be used. Most users will program the decoder number to match the cab number. Always look at the display to verify you have pressed the correct keys.

- Push the green MENU key once;
- Push and hold the green ENT key. Release the key when the menu page 1 appears;
- Push the green MENU key once again. Menu page 2 appears;
- Push the 4 key;
- Push the 1 key followed by the ENT key;
- Push the number keys for the desired loco number;
- Push the ENT key. The decoder will chirp indicating it received the command.
- Push the ESC key. The new loco number will be present on the screen.

As a check, push the 2 key and verify the horn activates.

Changing/Setting The D60X CONVRTR Frequency

As delivered, the D60X is set to frequency 0. If you want to use a different frequency, follow the series of steps below. For easier remembering, select a frequency derived from the loco number. For example, use the first digit or the last digit of the cab number. This makes it easy to remember what frequency the loco is using.

The procedure below uses the **OPS PROGRAM** mode of your programming throttle. A T6000 is used for this example. Verify that all other locos sharing the same frequency are turned off or they too will be changed.

Press MENU, Press and Hold ENT, press 0 (OPS PROGRAM), press 2,0,0 (the frequency CV), press ENT. Press the keys to enter the desired frequency (from 0 to 16), then press ENT. Press ESC to end programming. Notice that your throttle is automatically set for the new frequency.

Forgotten Frequency? - Resetting D60X Frequency

There may come a time when the D60X no longer responds to what you believe is the correct frequency, or you can not remember the correct frequency. If this occurs, follow this procedure called the "Jump Mode." This feature will temporarily force the D60X to frequency 0 where you can make a permanent frequency change.

Warning: make sure there are no powered on locomotives assigned to frequency 0 or they too will have their frequency changed.

1. Turn off all AirWire throttles. This is very important.
2. If the locomotive power is on, turn it off. Count to 10. Now turn on the locomotive power.
3. Wait a minimum of 60 seconds before continuing.
4. Turn on your throttle. Make sure it is set to frequency 0.
5. Use SVC PROGRAM to set CV200 to the desired frequency.
6. Push ESC to end programming.

Resetting D60X To Original Factory Settings

CV8 is used to reset the D60X back to original factory settings of loco address 3 and frequency 0. You must use a programming throttle like the T6000 or T5000. Set the throttle to the same frequency as the D60X. **The D60X's reset command WILL NOT reset the attached decoder.**

Press MENU, Press and Hold ENT, press MENU again, press 4 (SVC PROGRAM), press 8 (the reset CV), and press ENT. Press 1,3,5 then press ENT. Press ESC to end programming. Notice that your throttle is automatically set for the default loco number of 3 and the default frequency of 0.

Remember, the attached DCC sound decoder is still on its original locomotive address. Now is the time to set both the D60X and the attached loco decoder to their desired address.

SoundTraxx TSU4400 Basic Setup

All Soundtraxx decoder setup is done using your AirWire T6000 or T5000 wireless controller. No other equipment is required. Except for the loco address number, all programming is done using OPS mode programming [OPS PROGRAM].

Decoder Address (CV1): ONLY use **Service Mode Programming** [SVC PROGRAM] for setting or changing the decoder address (loco number). We recommend using the cab number for the loco address. Here is the keystroke sequence using the T6000 Wireless Controller.

> Press MENU, Press and Hold ENT, Press MENU again, press 4 (SVC PROGRAM), press 1 (the address CV), press ENT, press the keys to enter the desired loco number then press ENT. Press ESC to end programming. Notice that your throttle is now set for the new loco number.

Master Volume (CV128) : As delivered from the factory, the master volume default setting is 128 which is about half of the maximum volume available. This is very loud for indoor use so we recommend setting CV128 to a value of 16 for indoor use which is about one sixteenth of full volume. To make the volume louder, program a larger value into CV128 up to the maximum of 255. The change takes effect immediately. Caution: setting the volume to 255 could damage the speaker.

Prime Mover (CV123): The default prime mover used in the prototype GE Dash 9 is the GE 7FDL-16. This is the default setting for Soundtraxx TSU4400 which is a value of 2 in CV123.

Primary Air Horn (CV120): The Nathan K3LA horn was the most commonly heard horn for the GE Dash 9. It is the default horn which is selected by setting a value of 0 in CV120.

Reset TSU4400 To Original Settings (CV8) : Using OPS programming, program CV8 to a value of 8. Invoking this master reset command will change all TSU4400 CV values back to their original factory settings. There are subsets of the master reset that cover specific groups of CVs. See the Soundtraxx technical reference for details.

Function Key Assignments: The table below shows some of the default throttle function key assignments for the TSU4400-GE sound effects. Note, for F0, the direction setting (**f**wd or **r**ev) determines which headlight is on. See the Soundtraxx technical reference manual for how to change function key definitions as well as other effects that are available. The front headlight must be turned on for the ditch lights to work. Ditch lights and the front headlight are turned off if the direction is set for reverse.

Tsunami2 Diesel Technical Reference: There are literally hundreds of different TSU4400 settings and configurations. Download the technical reference from the Soundtraxx website.

Function Key	Effect	Function Key	Effect
F0(f)	Front Headlight and Dynamo	F9	Grade Crossing Horn
F0(r)	Backup Light and Dynamo	F10	Toggle idle to 8 and back
F1	Bell	F13	Couple/Uncouple
F2	Airhorn	F19	-
F3	Short Airhorn	F22	Cab Chatter
F4	Dynamic Brake	F23	All Aboard/Coach Doors
F5	RPM+	F24	Safety/Cab/# Boards
F6	RPM-	F25	Ditch Light Right
F7	Headlight Dimmer	F26	Ditch Light Left
F8	Mute Sound	F27	Smoke Generator

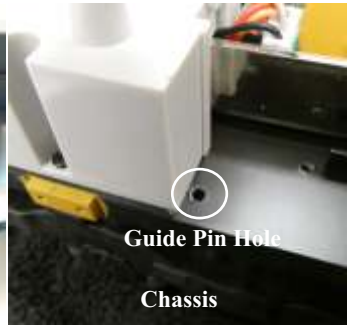
Locomotive Shell and Chassis Separation

Grasp the shell and chassis together so they can't come apart. Flip the locomotive so it is right side up. That is, the wheels are down and the shell is up.

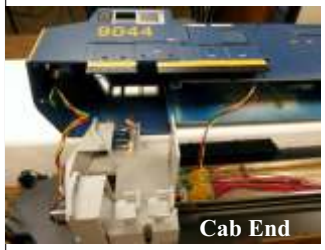
Because the wire harnesses are a bit short, we recommend using the top half of the styrofoam shipping box as a raised platform on to which the shell is placed. Position the styrofoam top next to the locomotive. Its open cavity needs to be face down.

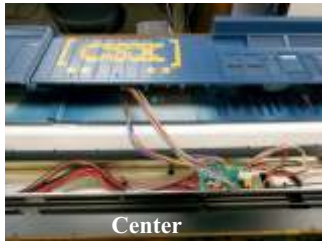
Grasp the two ends of the shell and evenly lift the shell vertically off the chassis. The cab and hood should all come off as one piece. **STOP if the shell doesn't lift off.** You might have missed a screw. You must verify that all 18 screws are removed.

> During disassembly our Dash 9 cab was very reluctant to release from the chassis. It seemed like a screw had been missed. however, after a thorough inspection, no more screws were found.
>
> So a flat blade screwdriver was used to persuade the cab area to separate from the chassis. We could then see that the cause of the binding was a plastic guide pin behind the fireman's seat at the junction of the cab molding and the narrow hood molding. This pin fits into a hole on the chassis. Our model's guide pin was slightly off center and slightly outward of the chassis hole making it tough to pull out.



Don't lift the shell up too far since there are several cable harnesses still joining the shell to the chassis that must be unplugged. Place the shell onto its side on top of the styrofoam.





With the shell separated from the chassis, there are 5 different wiring harnesses visible. There are two near the cab end, two in the center and one at the rear end.

The harness plug is held by friction to the socket. To remove the harness plug, grasp the plug (not the wires) and rock it side to side so it releases from the socket. Lift upwards by the connector edges and avoid pulling on the wires.

At the cab end and the rear end, unplug each of the harnesses at their sockets on the chassis.

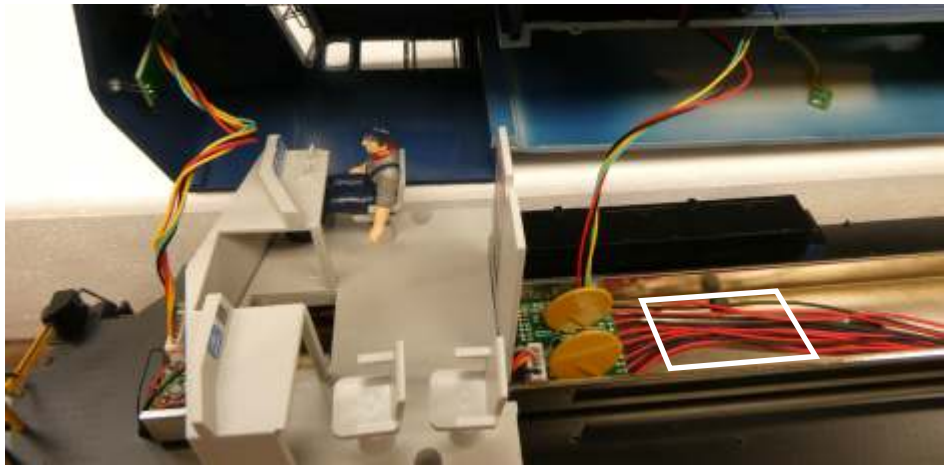
The center two harnesses are plugged into the shell's switch panel. Unplug both wiring harnesses at their sockets inside the shell.

To avoid damage to the connectors or wires, use some tape to fasten the harnesses to the inside of the shell. Set the shell aside for now.

Battery Mounting

The recommended battery is the CVP Products BAT2. It neatly fits inside the chassis center channel and has the JST-PLUG that matches the D60X BATIN Pigtail. You may use a different brand or type of battery. Be sure to validate it fits in the space available.

The battery is mounted behind the circuit board next to the cab in the location marked by the white rectangle. A bunch of red and black wires come from the circuit board. These wires must lie in the channel floor between the two black rubber plugs and under the battery.



For the most solid battery mounting, the internal wires must not get between the battery and the chassis floor.

Use a 1/4 inch wide strip of VHB mounting tape between the two rubber bumpers. Use tweezers to manipulate the wires and stick them to the tape.

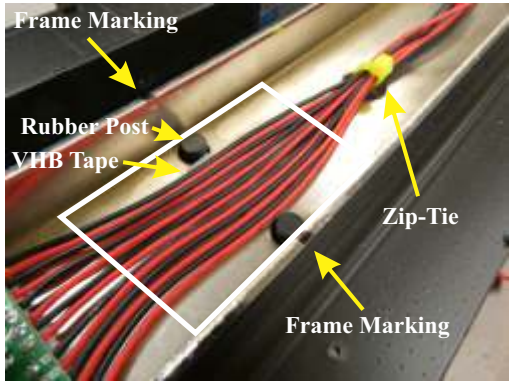
A 6 inch plastic zip-tie (bright yellow) is used to bundle the wires and keep them away from where the battery mounts.

Use a felt tip marker to mark the locations of the rubber posts on the metal frame. These will be used to center the battery in the proper location.

Cut the VHB tape to into strips that are about 1/4 inch wide by one inch long. Three strips are used create a 3 layer stack on the corners of the battery.

The photo shows the bottom of the battery ready to mount. Notice the space in the middle where the rubber posts sit.

The end of the battery, where the wires emerge, is positioned closest to the cab and the center of the battery is in the area you marked with the felt pen. Once you have checked for no obstructing wires, press down hard to permanently mount the battery to the chassis.



The 3M VHB tape shown is cut into 1 inch by 1/4 inch wide strips. Stack 3 strips as shown to clear the rubber posts in the frame.

Charging The Battery

To recharge the battery, plug the charger into the jack next to the switch on the D60X.

Set the D60X switch to the CHG (charge) position.

Verify the charger's indicator has turned red showing that it is charging the battery.

If your locomotive has a CVP BAT2 installed, and you are using the CVP CHARGER1, a fully depleted battery will require about 4.6 hours to recharge.

Placing the switch in the run mode, disconnects the charger from the battery and applies battery power to the electronics.

You cannot charge the battery and run the locomotive at the same time.

Powering Down or Turning Off The Locomotive

The RUN/CHG selector switch serves as an on and off switch too. The locomotive will be disconnected from the battery when the selector switch is in the CHG position.

Charging the battery will not power up the locomotive electronics. The charger power is routed directly to the battery.

Position Antenna And Reinstall Roof Panel

The antenna can lie horizontal near the smoke generator (above picture). Or a small diameter hole may be drilled in the roof to let it stand vertical. The vertical position gives the best range.

Because our roof panel was such a tight fit, we trimmed off one of the locking tabs to make access easier. Reinstall the roof panel to complete the installation.

Smoke Unit Use and Control

The Dash 9 is equipped with a smoke generator that can be turned on and off from the throttle.

If the SMOKE switch, under the D60X Main Board, is set to "ON," the generator can be turned on and off via a throttle function key. The function key used is determined by the decoder programming. As delivered from the factory the TSU-4400 uses function key 27 for the smoke generator.

A new locomotive comes with a plastic vial of smoke fluid. Before operating the smoke generator, be sure to add between 5 and 10 drops of smoke fluid via the smoke stack.

On the T6000 throttle, push the Fxx key twice to bring up functions starting with a 2. Then push the 7 key for function 27. Sending F27 the first time turns on the generator. Sending F27 a second time, turns off the generator.

Do not operate the smoke generator without fluid. Doing so can cause the smoke unit to burnout.

Preliminary Check *continued*

- Turn on F25. Push ESC twice followed by the 5 key which turns on function command 25. This turns on one of the ditch lights. Note: ditch lights will only turn on when the front headlight is turned on. The lights go out if the rear headlight is on, or if the headlights are turned off.
- Turn on F26. Push ESC twice followed by the 6 key which sends function command 26. This turns on the other ditch light.
- Push F2 to sound the horn and start the alternating flash of the ditch lights. You can also push F9 to blow the horn for a grade crossing.

  See the sound decoder user manual if you wish to change the activation function or apply special lighting effects.
- Its best to hold the locomotive for this last test. Turn up the speed knob slightly and you will observe the locomotive attempt to move. Turn the speed back to zero and then reverse the direction. Turn up the speed knob and you will observe the locomotive attempt to move in the other direction.

This completes the checkout. If all worked as expected, you are ready for the last task which is to reassemble the chassis and shell.

Reassembling The Locomotive's Chassis and Shell

Before reassembling the locomotive, make one last check that all plugs are fully seated into their sockets. Arrange the loose wires so they stay inside the shell. Consider using some of the blue tape to keep the wires in place during reassembly. Zip ties can also be used. Finally, take care when mating the two halves back together. Inspect both sides for loose wires that may have become lodged between the shell and the chassis.

This step is actually several steps combined as the shell is placed onto the chassis. If it doesn't go together the first time, lift the shell up, inspect for interfering wires and try again. There is not much detail here because the task is mostly lifting, pushing, pulling and fitting to get everything all lined up.

Bring the shell down evenly onto the chassis, keeping it level from front to back. The tall gray panel at the back of the cab can sometimes foul against the shell. Don't forget the guide pin may also keep the cab from seating flush to the chassis. Also, the cab assembly itself is loose and can sometimes begin to lift away from the shell. If this happens, gently push it back so it is flush with the bottom of the shell.

When the shell is flush with the chassis all the way around, there will be very little if any space between the two halves.

Carefully check for visible wires. All wires must be inside the shell. If you see an errant wire, gently lift the shell and push the wire back inside.

Flip the locomotive over and place it on some thick towels. Verify the two halves are still closely mated.

Install The Chassis Screws The screw heads are relatively soft metal and the head can be easily damaged if the correct size screwdriver isn't used.

Position the styrofoam block so it is oriented the same way as the locomotive chassis. Starting at either end, begin to install the screws. If the screws spin in their holes, the shell and chassis are not properly aligned. The shell and chassis may have to be separated to determine the cause of the mismatch. Take your time!

The last step is to re-install the fuel tank and its 4 screws.

Fully Charge The Battery
See the next page

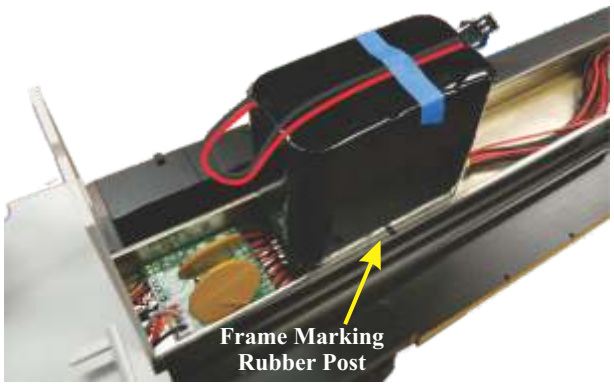
Battery Mounting *continued*

The battery connector has been temporarily taped to the top of the battery to keep it out of the way.

For this type of temporary use, blue carpenters masking tape works well. It comes off relatively easily and does not leave a residue.

Wiggle the battery to insure it is firmly fastened to the VHB tape and the VHB tape to the chassis.

Once the battery is attached, it will be very difficult to remove - get it right the first time!



Unplug Speaker From The Bottom Of Switch Panel

The speaker is plugged into a jack underneath the switch panel. The jack is labeled "SPK" shown by the yellow circle.

With the shell turned upside down, follow the two wires from the speaker to its plug. Grasp the plug housing and pull it straight out from the jack. Avoid pulling on the wires.

The switch panel is now ready to be removed from the shell.

Remove Switch Panel From Shell

Orient the shell right side up with the cab to the left. There are some thin panels on the fireman's side of the cab that prevent the shell from sitting squarely on the table top.

To fix this, set the shell on top of the raised styrofoam packing with the panels hanging over the edge. The shell will sit squarely on top of the styrofoam. An edge of a table also works well as shown in the photo to the right.

There are 6 screws holding the switch panel to the shell shown by the white circles. Unscrew and remove all 6 screws. Tweezers are helpful to fish out the small screws. Place them into a plastic bag or onto the foam block and label them.

Remove Switch Panel From Shell *continued*

Separate The Switch Panel From the Shell

Now that the screws are removed, the switch panel can be slipped out of the shell.

Grasp the switch panel near the smoke generator and lift at an angle. It's sort of like taking your foot out of a shoe. When the panel clears the right edge of the shell, slide out the entire switch panel and circuit board assembly from the shell towards the rear.

Install 4 Hex Set-Screws

Your D60X hardware kit includes a 0.9mm allen hex key that fits the 4 included setscrews. However, a much better tool is a 0.9mm hex screwdriver. We got ours from Amazon in a relatively inexpensive kit of 14 different size metric hex screwdrivers (brand was Lozagu).

The hex set-screws are threaded into the holes that used to hold the switch panel. They must be installed in the correct holes or the D60X main board won't fit. The photo shows the 4 holes to be used with a yellow circle. The far right holes will use two of the original screws removed earlier. The cab is on the left end of the photo.

Reconnecting Shell And Chassis Plugs and Sockets

Prepare the area by bringing back the top of the styrofoam shipping box and placing it as close as possible to the chassis.

Turn the shell on its side and place it on top of the styrofoam oriented to match the chassis.

Remove the tape used to fasten down the shell's light connectors.

Starting at the middle, plug in the two large connectors to the bottom of the switch panel. The connectors are sized differently so getting the correct socket is easy. The wires are somewhat short so move the shell close to the chassis and center it with respect to the chassis.

Connect the cab lighting plug from the shell to the socket at the front end of the locomotive in front of the cab. Be gentle since the small wires are easily broken.

Connect the safety light plug from the shell to the socket behind the cab near the battery. Be gentle since the small wires are easily broken.

Finally, connect the rear light plug from the shell to the socket at the rear end of the chassis. Be gentle since the small wires are easily broken.

The last step is to plug in the battery to the BATIN pigtail coming from the D60X Main board. Take care not to allow the pigtail to wrap around or other wise foul any of the lighting wires.

There are a set of plugs and sockets servicing the trucks and motors. On our unit, the front truck plug was loose and was not allowing power to the motor. Firmly pushing on it, reseated it and the motor worked normally. Since it is easy to do, now is the time to check that both the front and rear truck plugs are firmly seated in their respective sockets.

Pick up the shell and gently place it onto the chassis. It is not necessary to seat it completely. This insures no broken wires if the locomotive moves during testing. Before joining the chassis and shell, now is a good time to check basic functionality of the AirWire installation.

Preliminary Check

There are 3 big assumptions for this check.

1. The sound decoder and the D60X are still on their original factory settings. The original settings are locomotive address/number 3 and frequency 0.
2. The battery has some power. If not, it will need to be charged. See page 21.
3. You have set the locomotive switches on the switch panel in the correct position. See page 17.

Position yourself so the top of the D60X and its LED indicators can be seen.

Turn on the throttle. Set the throttle to loco 3 and frequency 0 and turn it on. Set speed to 0 and direction to forward.

Slide the D60X selector switch to the RUN position.

- Verify the D60X green PWR LED is on steady and bright. This shows there is battery power.
- Verify the D60X red GP LED is on steady and bright. It means the throttle and the D60X frequency settings match.
- Verify the sound module is powered up and has started the prime mover sound. You can also lift the shell and verify the TSU4400 blue LED is on steady.
- Blow the horn by pushing F2. Just push the 2 key on the throttle. This sends a function 2 command (F2). This will sound the air horn. This confirms the sound decoder is on the original frequency setting of 3. If the 2 key does not activate the horn, but the sound decoder's blue LED is on and the idle sound is heard, this indicates the locomotive is not on the factory default address of 3. See the next page 23 for how to program the sound decoder's locomotive address.
- Push the 0 key (F0) which turns on the headlights. Push F0 to turn them off.
- Change the throttle direction to reverse. This will turn on the rear headlights and turn off the front headlights. Change the direction back to forward.
- Turn on Function 24 (F24). To do this, push the ESC key twice followed by the 4 key which sends F24. The cab interior light, the number boards and the safety lights will all turn on. Push F24 again and the lights will turn off.

Shell And Switch Panel Reassembly

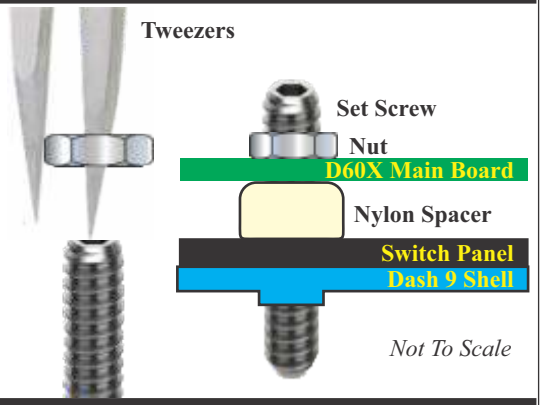
Grasp the switch panel assembly with the loose D60X Main Board and slip the switch panel into the shell and mount it onto the 4 set screws. If there is any difficulty encountered getting the switch panel into and under the roof, lower the set screws to provide a bit more clearance.

Once the switch panel is in place, with the set screws protruding through the panel's mounting holes, raise the set screws until they are about a third of an inch above the switch panel. They need to be tall enough to fit the nylon spacer, D60X main board and a hex nut.

D60X Permanent Mounting To Switch Panel

Raise the D60X Main Board and slide a nylon spacer onto each set screw. With all 4 spacers installed, set the D60X Main Board onto the spacers. Verify the set screw is high enough to provide plenty of exposed threads for the hex nut.

Install the 4 hex nuts. An easy way to get the nut started on the set screw is to use a pair of narrow tweezers. Hold the nut with the tweezer end going through the center of the nut. Place this end of the tweezers into the hollow set screw. Use your finger to spin the nut until it is started on the thread. Tighten all hex nuts finger tight.



Final 2 Screws Into Switch Panel

Take two original switch panel screws and reinstall them into the last two holes on the switch panel to the right of the smoke generator.

It is important that the switch panel screws as well as the nuts are tight so the switch panel doesn't move or pull away from the shell. Pull up on the D60X charging jack to confirm the switch panel is firmly attached to the shell.

Plug In Speaker

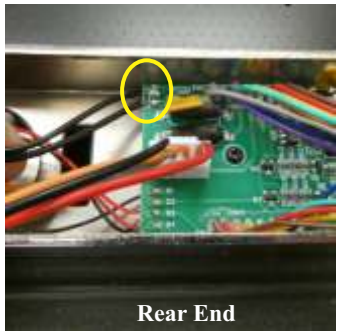
To complete the switch panel mounting to the shell, turn the shell over and locate the speaker wire. Plug it into the socket labeled SPK on the switch panel board.

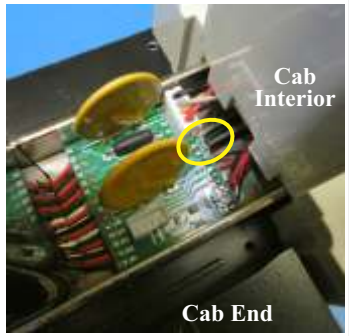
What To Do With The Extra Battery Connectors?

At each end of the locomotive chassis, adjacent to each coupler, is a standard JST-SKT connector. As it comes from the factory, these are intended to connect from the powered locomotive to a trailing car containing the battery. Unfortunately, they are not wired correctly to be useful for the AirWire D60X installation. They also have a bad habit of interfering with coupler operation. It is recommended to remove and discard them.

To remove the rear end connector, unsolder or clip the two black wires at the board edge and pull the connector away from the locomotive.

Do the same at the front end. You can remove the cab interior for easier access to the front end wires.


Rear End



Cab End

Install 4 Set-Screws *continued*

Some of the setscrews might have a tiny bit of flash on the head that partially blocks the hex driver from being inserted completely. Just press the driver head firmly into the setscrew and it will eventually go in.

To start the screw, push down while twisting the hex key clockwise so the threads bite into the plastic. The plastic is already partially threaded so the setscrew will start fairly easily. Continue pushing down while tightening the screw. The screw is long - take your time. Keep the setscrew vertical - don't bend it or the plastic boss might be damaged or broken. Install all 4 set-screws.

Leave about 1/4 inch of thread showing on the setscrews closest to the cab end. The middle setscrews can have about 1/2 inch of thread showing. These will be adjusted later when the switch panel is reinstalled.

Set aside the shell for now. Next step is to mount and hookup the DCC decoder and RC/DCC plug.

Remove The Dummy DCC/RC Plug

As delivered from the factory, there is a dummy circuit board plugged into the DCC/RC socket found on the switch panel. This dummy circuit board must be unplugged.

Unplug the board from the socket. It is a tight fit. It helps to rock the board left and right as it is pulled from the socket.

The dummy board will no longer be used. However, don't discard it. Keep it with the other unused accessories that came with the locomotive.

Plug In The New D60X Plug Board

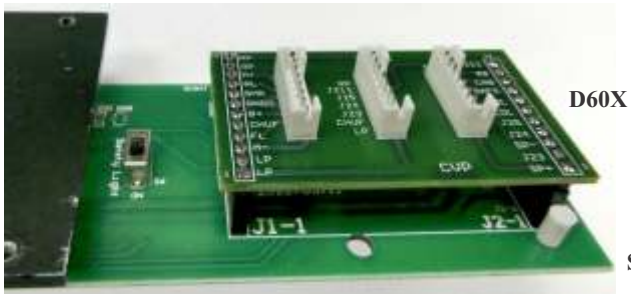
The D60X Plug Board uses the same 23 pin arrangement. Notice that one end of the board has 11 pins and the other has 12 pins. This plug only fits the socket when oriented correctly.

Orient the D60X Plug Board properly and then place it on the socket. Do not push it in yet. The lettering on the socket and the lettering on the D60X Plug Board will be oriented the same way.

Verify that all pins are ready to insert into their holes. Inspect for any bent pins that might cause the pin to miss the socket. Check that all pins have a corresponding socket. If the plug board is backwards, the pins will not plug into the socket.

If everything looks good, push the plug board firmly into the socket. It will look like the photo below after it is fully inserted.

Make one last check that all pins are seated and the D60X Plug Board is flush to the top of the socket.



D60X Plug Board

Switch Panel Board

Mount The DCC Sound Decoder

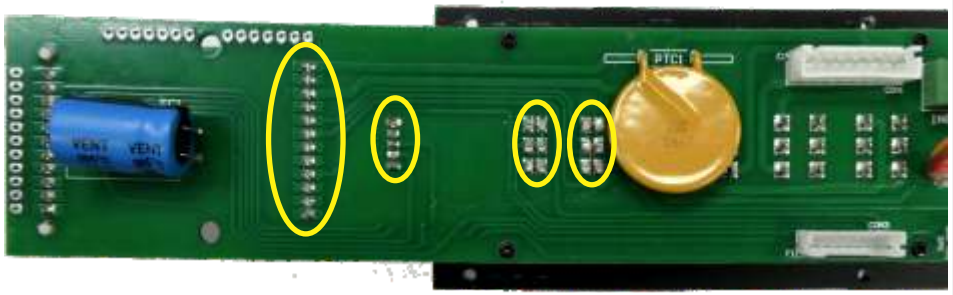
A Soundtraxx TSU-4400 GE sound decoder is used for the example 3rd party sound decoder. For other brands of sound decoders, be sure to follow their hookup instructions because they will be different.

Before mounting the sound decoder, trim the decoder's terminal strip pins. Be sure to protect your eyes from flying pin scraps.

There are also several solder joints on the switch panel board that are sharp and also must be trimmed. Use your wire cutters to trim off the solder joint's sharp points at the locations circled in yellow.

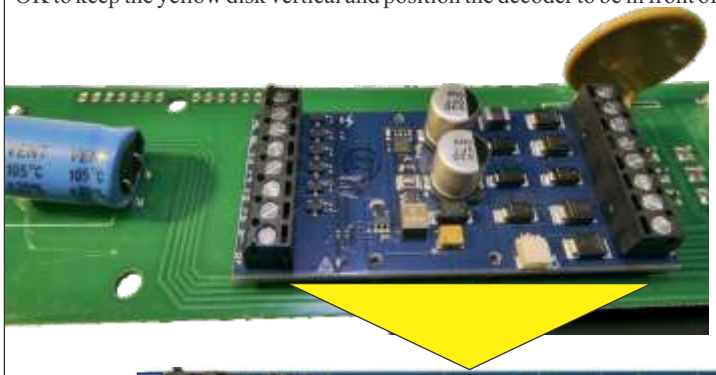
Don't skip this step. Trim the solder joints and pins to prevent future problems.

It is OK to bend the big yellow disc vertical and out of the way if necessary. It can stay vertical.



The sound decoder is mounted to the bottom of the switch panel board with two layers of the VHB tape. This is the same tape used to mount the battery. Place two layers of VHB tape on each end of the sound decoder. Make sure the tape covers the solder joints of the decoder terminal strips. Be sure to use **two** layers. A single layer is not thick enough to prevent sharp solder points from piercing the tape.

Position the decoder to insure adequate clearance from the big blue capacitor marked "VENT" It is OK to keep the yellow disk vertical and position the decoder to be in front of it.



Orient the decoder with the terminals labeled RR and LR on the right (near the yellow disk). The terminals with the lighting and speaker connections will be on the left.

The enlarged photo shows both the terminal labels and the proper orientation.

Lighting and Speaker Terminals

RR and LR Terminals

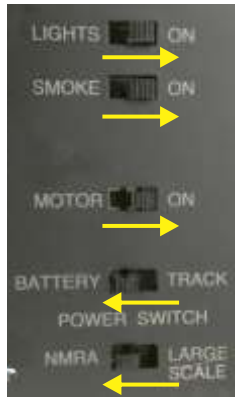
12

Set Switches On Switch Panel

Set the 5 switches on the switch panel for AirWire operation. These switches will be hidden by the D60X Main board once it is installed. Now is the time to set them. Slide the switch in the direction of the arrow.

LIGHTS. . . . . ON	To be controlled by throttle
SMOKE . . . . . ON	To be controlled by throttle
MOTOR . . . . . ON	To be controlled by throttle
BATTERY . . . selected	Required for battery power
NMRA . . . . . selected	Mandatory Setting

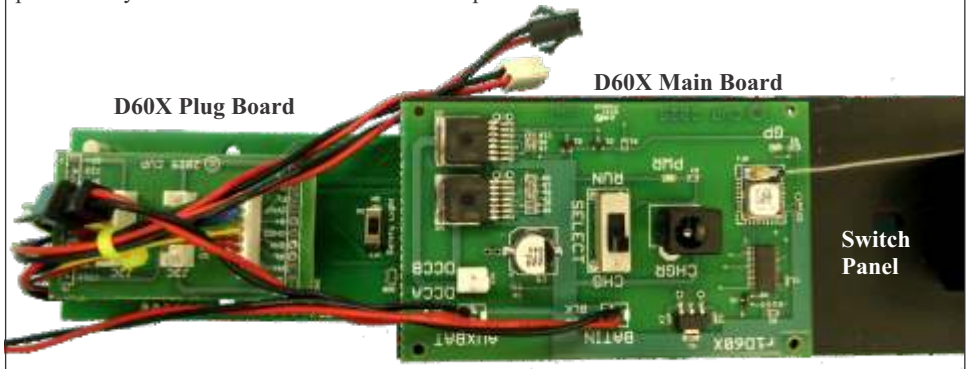
The two power switches **must** be set as shown or there is risk of damage to the D60X decoder due to incorrect battery polarity.



Connecting D60X Main Board

While the switch panel is out of the locomotive, connecting the D60X main board is simple.

Flip the switch panel right side up with the D60X Plug Board to the left. Position the 60X main board close to the left most switch panel mounting holes. It just needs to be close to the holes. It will be permanently fastened down later after the switch panel is reinstalled in the shell.

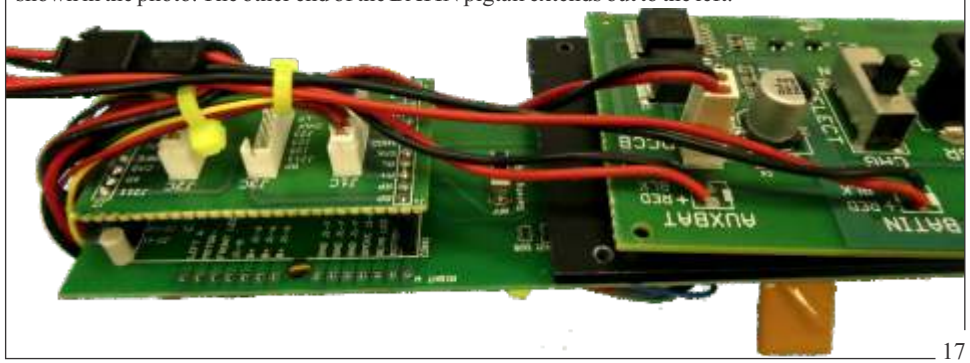


Plug the DCC pigtail into the matching header on the main board.

Connect the AUXBAT pigtail, from the bottom circuit board into the AUXBAT JST-SKT connector on the D60X. This connector is the shorter of the two JST-SKT connectors.

Route the long BATIN JST-SKT connector over the top center of the wire bundles.

Wrap a zip tie around the existing wire bundle and over the new wires to hold everything in place as shown in the photo. The other end of the BATIN pigtail extends out to the left.



Connect DCC Pigtail

Connect The DCC Pigtail. There are two terminals remaining on the sound decoder. The RR and LR terminals. These two terminals connect to the D60X Main Board using the DCC pigtail. Do not shorten the wires. The entire length is needed.

Strip back about 1/2 inch of insulation from both wires. Twist the strands tightly and apply a bit of solder to keep the strands from unraveling. Trim the tinned wires so only about 1/4 inch of bare wire is showing.

Insert the red wire into the decoder's right terminal labeled RR and tighten the screw. Insert the black wire into the decoder's right terminal labeled LR and tighten the screw.

Route the connector and wires over the top of the sound decoder and to the top side of the switch panel, over the D60X plug board.

Connect The AUXBAT Input Connector

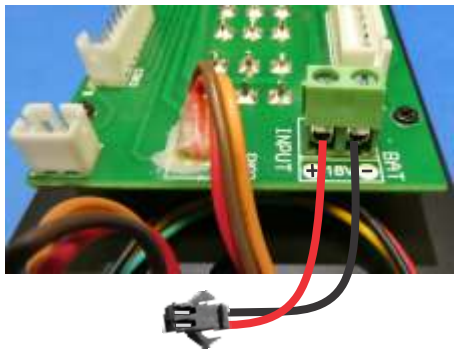
On the switch panel's circuit board, locate the BAT INPUT terminal strip. It is labeled BAT INPUT. The terminals are also labeled with polarity symbols. The terminals are where the D60X AUXBAT connector (JST-PLUG) is connected.

Do not trim the JST-PLUG wires. Strip, twist and tin both wires. Trim the tinned end of the wire to about 1/4 inch.

Attach the red wire to the plus (+) terminal.

Attach the black wire to the minus (-) terminal.

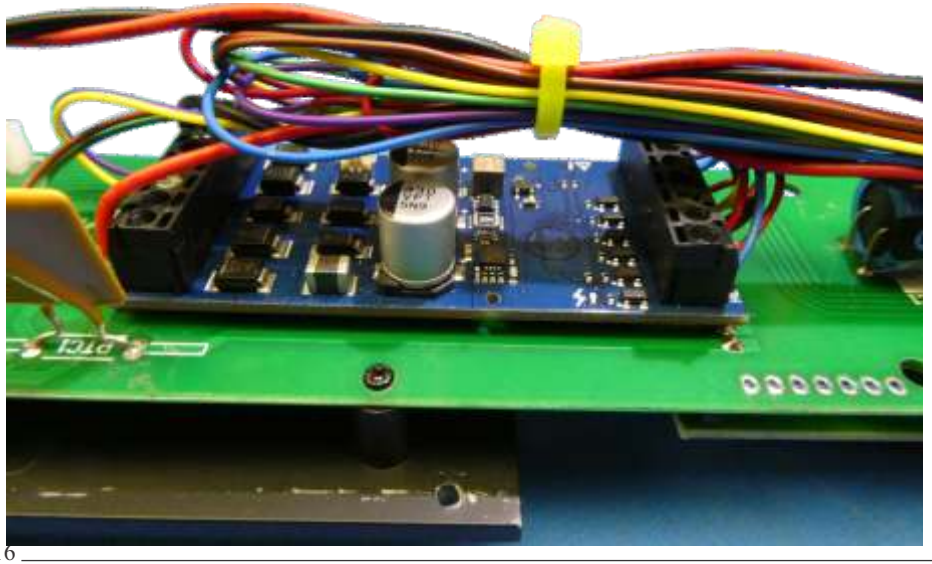
Route the connector and wires over the top of the sound decoder and to the top side of the switch panel, over the D60X plug board.



Actual wire length is much longer

Tidy Up The Wire Bundles

Use 6 inch plastic zip ties to bundle and hold the wires together. We got a big bag from the local hardware store. We used the bright yellow zip ties since they are easily seen in the photos. Excess wire is folded together and held in place by the zip ties. The zip ties were applied after the wires were coiled, folded and positioned towards the center of the board.



Connecting The D60X Plug Board To The Decoder

These hookup instructions are for the Soundtraxx TSU-4400 decoder. For other brands and models, please follow the manufacturer's hookup instructions.

The connections between the D60X Plug Board and the Soundtraxx decoder are done one wire at a time. Each wire will be described and connected to the appropriate terminal in sequence. Use the complete hookup diagram at the back of this guide as a check of your progress.

Uniquely mark the two wire harnesses that come with the D60X. The harnesses have the same color wires in the same locations. Use a narrow point felt-tip pen and put a single dot between the two ridges of the plug on one of the harnesses. This marks the J1C harness. Put two dots on the other plug to mark it as the J2C harness. The wires will be connected one at a time starting with the J2C harness followed by the J1C harness.

The two 7-wire harnesses are identical. However, the orange wire may actually appear to be more brown than orange. It will be easy to confuse with the actual brown wire. As a reminder, we will refer to the orange wire as the "orange/brown" wire. The brown and the orange/brown wires are not interchangeable.

During the hookup, it is important to double check that you have selected the correct color wire from the correct harness. Use the physical location of the wire where it leaves the plug to confirm you have the proper wire.

Unscrew all of the sound decoder terminal screws to allow the wires to enter. Inspect each location where a wire goes into the terminal strip. There is a small metal clamp that moves down to clamp the wire into place as the terminal screw is tightened. Sometimes, after unscrewing, the clamp is still down and obstructs the wire insertion opening.

In the picture, the middle terminal's clamp blocks were the wire goes. The two terminals on either side are OK since the clamps are raised.

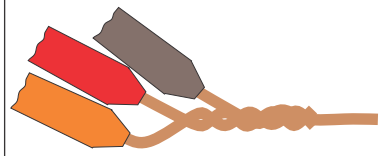
The clamps must be high enough to allow the insertion of a bare wire. If a clamp is blocking the opening, insert a round toothpick underneath the clamp. Use the toothpick to force the clamp up and out of the way.

Plug the J2C wire harness into the socket labeled J2C. Turn the switch panel over and route the wires around the end of the switch panel and towards the sound decoder.

Don't trim the wires. The wires come already pre-stripped about a quarter inch and tinned. You can always strip more if needed. The excess wire will be coiled up once the hookups are completed.

Joining Three Wire Into A Single Wire

The Soundtraxx TSU-4400 decoder only has 6 functions. So it does not have enough function outputs to individually control all of the Dash 9 accessory lights. We decided to group together the Safety Lights, Cab Light and Number Board lights and let them be controlled by a single function output - F3 in this case. This group will be turned on and off by a single function output, Fx3.



Three of the J2 harness wires must be spliced together. Strip back about 1 inch of insulation from the brown, red and orange/brown wires of the J2C harness. Next, tightly twist the orange/brown and the red wires together and tin them to keep them from unraveling. Next, twist and tin the brown wire. Now tightly twist the dual-wire splice to the brown wire. Leave about 1/4 inch of the end of the bare brown wire a bit long. It will be inserted into the terminal strip.

continued on next page

The Soundtraxx BLU-4408 and other brands of decoders having more than 6 functions will allow the Safety Lights, Cab Light and Number Board Lights to be independently controlled. There is no need to combine J2C wires.

Connecting The D60X Plug Board To The Decoder *continued*

The amount of bare wire is exaggerated in the drawing. Keep it to a minimum so as not to touch adjacent wires.

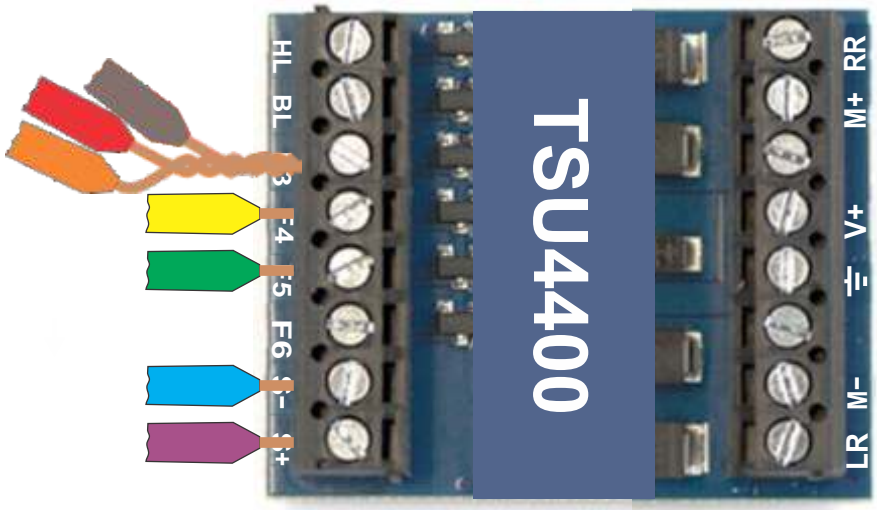
Since this group of 3 wires is ready to attach to the sound decoder, lets do it first. Using a small jewelers screw driver, locate the F3 terminal on the left terminal strip of the sound decoder. Insert the wire into the terminal and tighten the screw. Gently pull on the wire to insure it is held tightly. Check off the "DONE" box when the connection is made. Continue with the remaining J2C wires.

The drawing below shows all J2C wires connected to the sound decoder terminals.

J2C Pin Number	J2C Harness Wire Color	Function or Name	Decoder Terminal	TSU Label	Done
7	Brown	# Boards	Left Term Strip	F3	
6	Red	Cab Lite			
5	Orange/Brown	Safety Lites			
4	Yellow	RDL	Left Term Strip	F4	
3	Green	LDL	Left Term Strip	F5	
2	Cyan	Speaker -	Left Term Strip	S-	
1	Magenta	Speaker +	Left Term Strip	S+	

For a different brand of decoder, create a similar chart

J2C Harness Hookup To Sound Decoder (J1C wires not shown)



Left Terminal Strip **Right Terminal Strip**

If using another brand of decoder, the connections to the decoder will be different. Please see the decoder's instruction sheet for details.

The D60X Plug Board's middle connector, J3C, is not used in this installation

Connecting The D60X Plug Board To The Decoder *continued*

Plug in the J1C wire harness into the socket labeled J1C. Turn the switch panel over and route the wires towards the sound decoder. The wires will be connected to the sound decoder, one at a time.

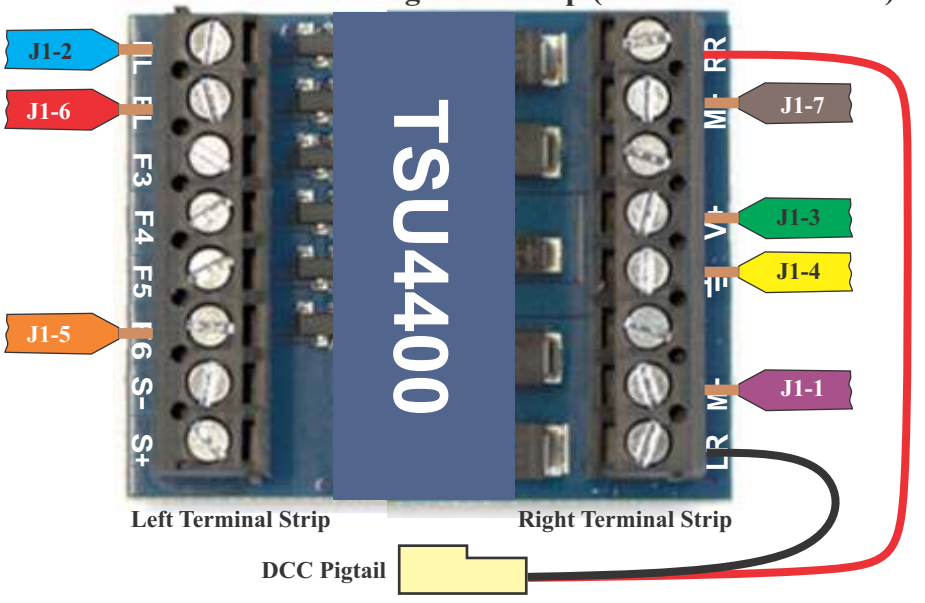
It is not necessary to trim the wires. Excess wire will be coiled up once the hookup is completed. Also, the wires are pre-stripped about a quarter inch and tinned. You can always strip back a bit more if needed.

J1C wire connections to sound decoder. Find the first wire from the J1C harness list which is the brown colored wire. Next locate the terminal on the decoder to which it connects. As shown in the list, it is the right terminal labeled M+. Insert the wire and tighten the screw using a small jewelers screw driver. Gently tug on the wire to insure it is held tightly. Check off the "DONE" box when the connection is made. Continue with the remaining J1C wires. Be aware that J1C wires connect to both left and right terminal strips. Pay attention to the "Decoder Terminal" column in the chart.

J1C Pin Number	J1C Harness Wire Color	Function or Name	Decoder Terminal	TSU Label	Done
7	Brown	Motor +	Right Term Strip	M+	
6	Red	Rear Headlite	Left Term Strip	BL	
5	Orange/Brown	Smoke Generator	Left Term Strip	F6	
4	Yellow	Decoder GND	Right Term Strip	⏚	
3	Green	Decoder V+	Right Term Strip	V+	
2	Cyan	Front Headlite	Left Term Strip	HL	
1	Magenta	Motor -	Right Term Strip	M-	

DCC Pigtail	Function or Name	Decoder Terminal	TSU Label	Done
RED	Right Rail Input	Right Term Strip	RR	
BLACK	Left Rail Input	Right Term Strip	LR	

J1C Harness And DCC Pigtail Hookup (J2C wires not shown)



Left Terminal Strip **Right Terminal Strip**

DCC Pigtail