

# QSI Chip Upgrade Installation Instructions

**Loco:** Broadway Ltd F7s

**Software ID numbers** (ho104) -0, -1 and -2 non-dynamic brakes,  
(ho143) -0, -1 and -2 with dynamic brakes

**Rev** 3/23/07

[Quantum Chip Upgrade](#)

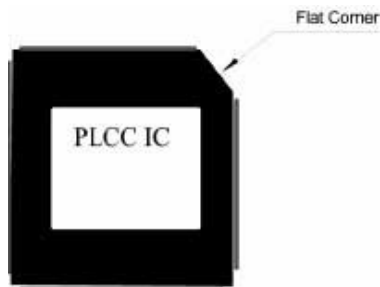
## **Caution: See ESD Information Below and "Notice" below!**

The Upgrade chip and loco electronics are ESD (Electrostatic Sensitive Device) and must be handled in accordance with the following instructions:

Common static electricity that you have experienced by walking on a carpet or combing your hair will damage the Upgrade Chip and possibly the loco electronics if not discharged. Prior to the extraction and installation of the Chip try to minimize doing things that you know will generate static electricity. To discharge, (you should always do this whether you think your charged up or not), ground yourself to a pipe or the face plate screw of a wall outlet.

Now you can begin with the chip extraction.

### **Chip Extraction:**



- Check that the Chip you received is the proper software for your loco. See upgrade codes at <http://qsisolutions.com/products/techinfo/qchip/q-chip-upgrade-codes.html>.
- Test your loco first to verify it operates normally, run and program.
- Choose a suitable, uncluttered work area; gather the tools you will need.

### About the Chip:

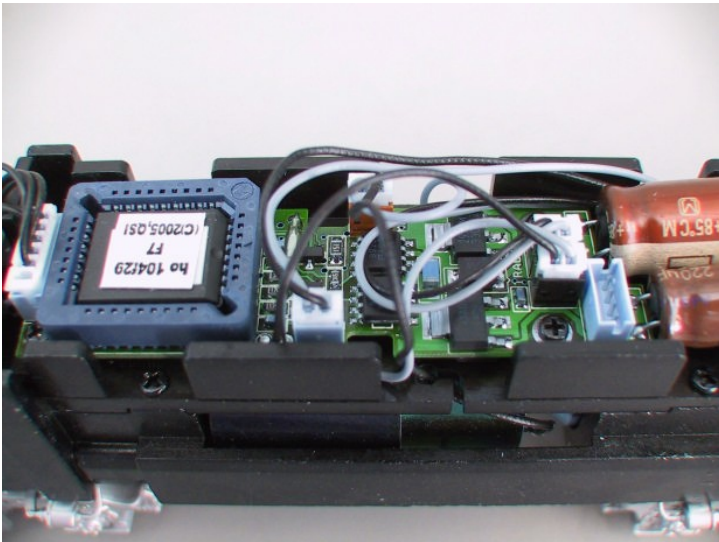
- The chips are in a PLCC package. There is a special low cost tool for removing the existing chip called a PLCC Extractor. These are available in most large electronic supply stores or at your dealer.

### Remove the loco body shell:

To take the shell off the front coupler needs to be removed. The coupler is held in place with a small Philips head screw. Next, to remove the shell, the tabs holding the shell to the frame have to be released.

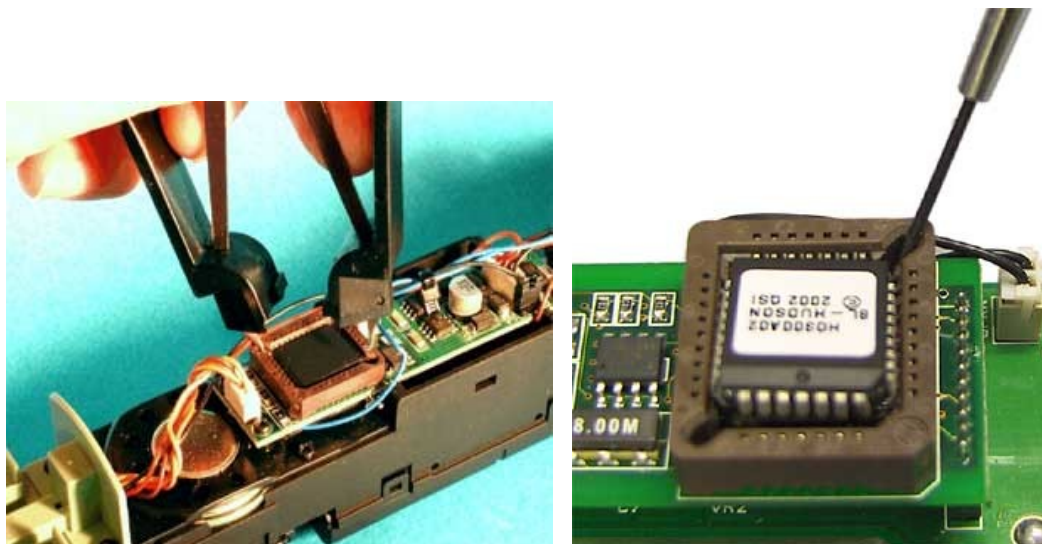
This is the typical way that diesel body shells are held to the engine frames. There are several tabs on each side of the E7. They are released by flexing the shell away from the frame with a small flat blade screwdriver. To hold the released tabs open, toothpicks were inserted between the frame and shell. Once both sides released the shell slipped off. The Chip is

readily visible on the main circuit board. Be sure not to disturb or damage any components on the circuit board or loco. Set aside and save the shell and coupler screw.



Remove the old Chip (the chip removal picture here is not the F7, it is intended as a visual aid only):

*Caution: ground yourself as stated above as an additional precaution.*



*PLCC Extractor hooks go under the chip. Then just squeeze the tool.*

The PLCC Extractor tool (recommended) can be used to remove the old chip out of its socket. The tool is placed over the chip, the prongs engaged under the chip and just a squeeze of the tool and the chip comes up and out of the socket. These chips have a very small flat on one corner. This is lined up with the corresponding flat corner on the socket.

If you do not have the extraction tool, you may use a fine forceps or a very fine flat bladed screw driver to remove the old chip. Gently place it in one of the two corner cut-outs on the socket and pry up gently to raise up slightly. Then repeat for the opposite corner until chip is free from socket ... do not use excessive force, the chip and socket contacts are very delicate.

**Install the New Chip:**

- Ground yourself again.  
Remove the new Chip from the ESD protective packaging using forceps.  
This is a good time to place the old chip in the protective bag and store as a back up.  
The old chip cannot accept the new software or be reprogrammed.
- Orient the Chip so the flat on the Chip corner is aligned with the flat on the socket corner. Make sure the label on the Chip is facing up.
- Place the chip level on the socket.... A gentle push in the center of the new chip with a thumb and the chip is in place. Sometimes, when the chip is installed, one corner may stay up, simply raise chip to level and try again.
- Test the Loco prior to installing the shell:  
Turn off track power and place the loco on the track, turn on power.  
Observe 3 Beeps indicating that the loco recognizes them new chip. Test run and program as before. New software is at default CV's, ad=3. Test all modes of operation now, F 1-12, Fwd/Rev and Speed control before programming.

**Re-Assembly:**

- Install the shell and then the front coupler with mounting screw
- Re-test as above.

Enjoy all the new performance features.

The locomotive operation manual for this loco/chip is at <http://qsisolutions.com/pdf/q1a-diesel-p-man.pdf> (PDF).

The complete user manuals are here: DCC at <http://qsisolutions.com/pdf/q-dccman30.pdf> & Analog at <http://qsisolutions.com/pdf/q-dcman-31.pdf>.

**Using CV2 (Start Voltage) to Fine Tune your Upgrade Performance.**

The QSI Upgrade Chip factory default setting for CV 2 is 8. This was chosen to give good average performance for a wide range of loco types. Since each loco is different you can enhance a specific locomotive's overall performance by programming CV 2 as described in the instructions below.

It is best to use, "Programming on the Main" or "Operations Mode Programming" to do this.

- Change Locomotive from RTC, (Regulated Throttle Control) default, to STC, (Standard Throttle Control). You can do this by Programming on the Main, CV 49= 4 and CV 56=0. The loco will give a voice response when each CV is programmed
- Set your throttle to the 128 speed step range and advance throttle speed to speed step 8.
- Program CV2 to Increase CV2 values until the locomotive starts to move.
- Program CV2 to Decrease CV2 values until the locomotive just stops.
- Return to RTC, (Regulated Throttle Control). Again you can do this by Programming on the Main, CV 49= 4 and CV 56=1. The loco will give a voice response when each CV is programmed. Note CV 49=4 must be programmed here again even though you programmed it above to the same value.

This last CV2 value is the one that is used. The reason for setting CV2 when the locomotive is just moving or stopping is to ensure that it can achieve the minimum speed. Sometimes, because of sticky gears, CV2 can be very large to get the locomotive going but much lower for stopping. If this difference is large, say 10 or more, then the locomotive might start out fine at speed step eight but would still be moving when reduced to speed step 4, 2, etc. and would never get to the minimum speed.

The default value of CV2= 8 that QSI uses is arbitrary and is chosen to provide enough headroom for locomotives that may be smoother running and would start sooner. Also, setting CV2 in this way allows for more reliable consisting of locomotives since they all start out at approximately the same value.

Reference chart for determining QSI upgrade software (model #) for QSI equipped locomotives is at <http://qsisolutions.com/products/techinfo/qchip/q-chip-upgrade-codes.html>, see NOTES Below.

### **Operational Warning for QSI Upgrade Chip**

There are several new features in the software upgrade (Disconnect, Standby or Shutdown) that - when accidentally or intentionally enabled - will cause your loco not to respond to speed commands.

Pressing F9 twice (accidentally or intentionally) while in neutral (zero speed) will put the engine into Disconnect, Standby or Shutdown.

Pressing F6 (Startup) twice when your loco is in Disconnect, Standby or Shutdown will return your engine into normal speed commands. Also, when your loco is in Disconnect, Standby or Shutdown, pressing F10 (Status) will cause the engine to speak out its Disconnected state.

Note:

Disconnect, Standby or Shutdown is considered a single description for this application and is stated as such because the different systems produce different vocal responses.

NCE: Disconnect, MRC: Disconnect, LENZ: Standby, Digitrax: Disconnect

**NOTICE:**

Thank you for your purchase of the QSI Upgrade Chip from QSI Solutions. Here are a few of the more than 53 improvements you will get.

1. DC operators can now control all sounds using Quantum Engineer.
2. BEMF and RTC give incredibly smooth low-speed performance and auto speed matched consist control.
3. "Sound of Power" feature gives load responsive exhaust and user speed-queued exhaust volume control.
4. The New Chip allows for unlimited download options.

The QSI Upgrade Chip is guaranteed for one year from the date of purchase. During this year, defective Upgrade Chips will be replaced at no charge. If you order the incorrect chip we will send the correct version for \$5.00 when an incorrect chip is returned.

Please read and follow all the installation instructions included with each Upgrade Chip before proceeding with extraction-installation.

**Agreement of Acceptance:**

QSI Chip Upgrades  
QSI Solutions

By accepting this order you, the purchaser, assume all responsibility for damage to your Locomotive and/or the Upgrade Chip that may result or occur in conjunction with the Upgrade Chip installation process.

We have made every effort to provide comprehensive, easy to follow instructions for each locomotive. Please use them. Generally the extraction-installation process is not complex; following instructions and exercising care will end in the desired result. If you have questions please contact your dealer or email: [info@qsisolutions.com](mailto:info@qsisolutions.com).

If after evaluating the information and instructions, and if you are uncertain about your ability to perform the installation, we recommend you contact your dealer to perform the installation for you. You may also return your order for a refund.