

Lionel™ 0-6-0 Docksider Command Upgrade Board

TAS-1306



SV3007

Kit Contents

- 2 2-position wire harnesses
- 1 4-Position wire harness
- 1 Docksider Command Board with Radio Board
- 1 New replacement handrail (antenna)
- 1 1uF 50V non-polarized electrolytic capacitor
- 8 Pieces of heat shrink tubing (for covering solder joints)

Required tools

We recommend you have the following tools available for the successful installation of this upgrade kit.

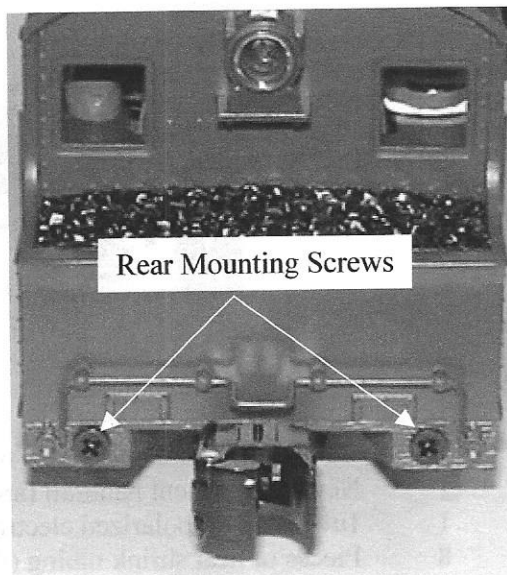
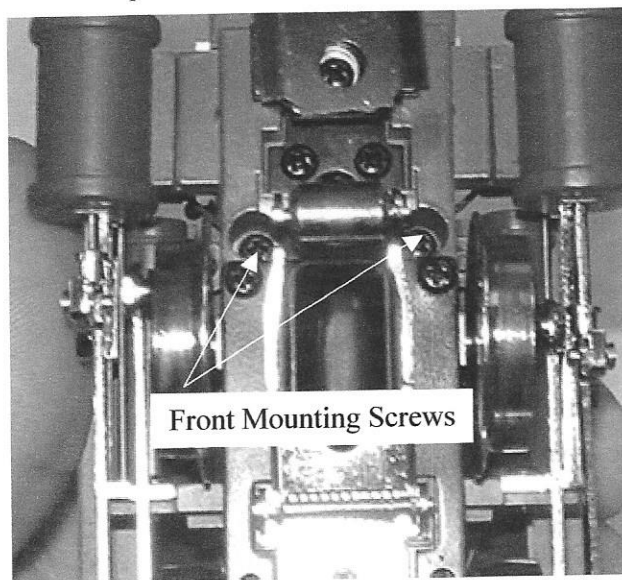
- #1 Phillips head screwdriver
- #2 Phillips head screwdriver
- Small needle nosed pliers
- Wire cutters (side cutters)
- Wire stripping tool
- Soldering iron with pencil tip head
- Rotary tool with cut off wheel (Dremel Tool)
- Electrical tape
- Cigarette lighter (or matches)
- Super glue (cyanoacrylic cement)
- Patience

We have included shrink tubing in this kit. Please read the directions thoroughly before starting the installation. You will want to place the shrink tubing on the wire prior to soldering the joint. Then move the tubing over the joint and shrink it with heat from a lighter or matches. If you forget to slide the shrink tubing on before you solder the joint you can take the wires out of their connectors and install the wire, no need to unsolder the joint to apply the shrink tubing.

This command upgrade kit was designed specifically for the Lionel 0-6-0 series Docksider locomotives. The mounting holes, wiring harnesses, etc. are all designed for this locomotive specifically. Please follow the instructions step by step, as each step is reliant on the previous step. Going out of order will only confuse you and make the installation difficult.

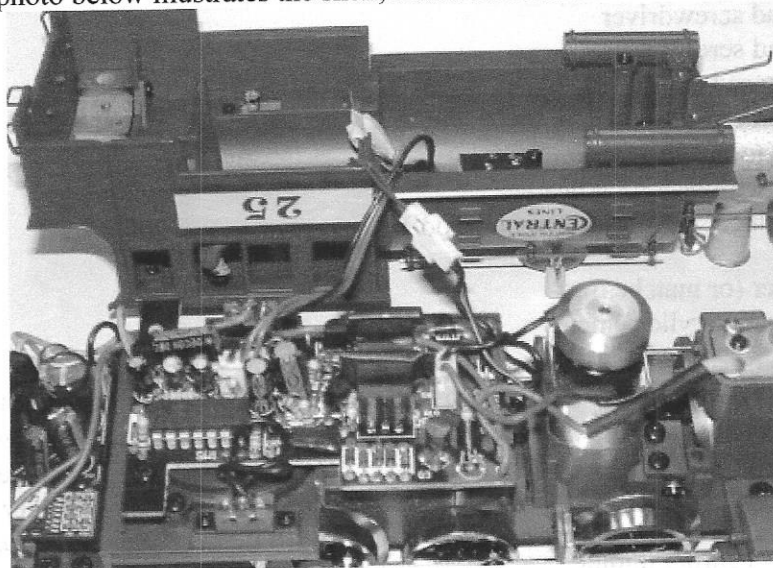
Preparing the Locomotive

Begin the installation by removing the 4 screws that hold the shell to the frame. The photos below illustrate the location of these screws.

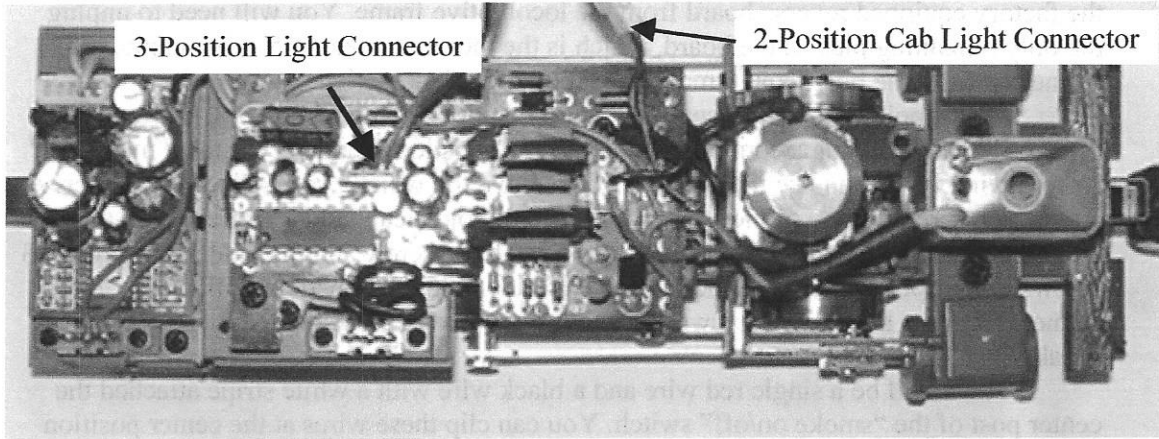


Once the screws are removed, set them aside (you will need them to reattach the shell to the frame once the installation is completed).

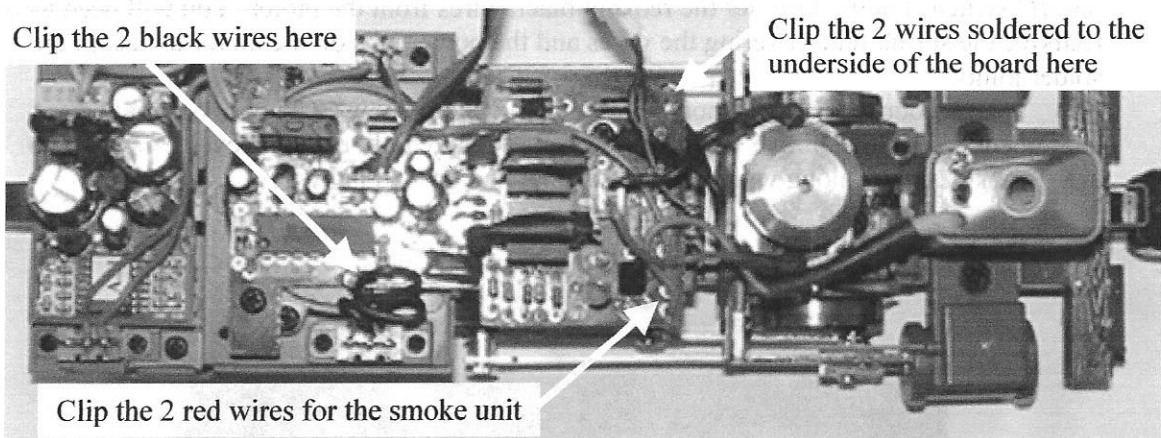
The photo below illustrates the shell, removed from the frame.



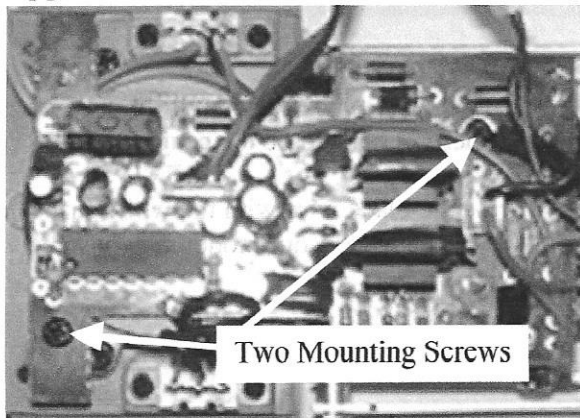
Now you want to separate the shell and the frame. To do this you will need to disconnect a few connectors. The photo below illustrates which connectors must be unplugged to separate the two assemblies.



Separate the shell from the frame at this time. Now that the frame is separated it is time to remove the factory equipped reverse unit. To do this you will first need to clip some wires that are attached to various switches on the locomotive frame. The photo below illustrates the location of these wires.



Once these 3 sets of wires have been clipped from the original reverse unit you are ready to remove the two PC Board mounting screws. Once you remove these screws be sure to set them aside, as you will reuse them to install the new 0-6-0 Command Upgrade Board. The location of these mounting screws is shown in the photo below.



There will be a ground solder lug attached to a black wire on the forward most screw, **DO NOT** cut this wire! You will need to reuse it in the installation of the command board. Now that the two mounting screws have been removed you can remove the factory equipped reverse board from the locomotive frame. You will need to unplug the only remaining plug in the board, which is the motor connector. Simply unplug this connector from the board and remove the circuit board altogether.

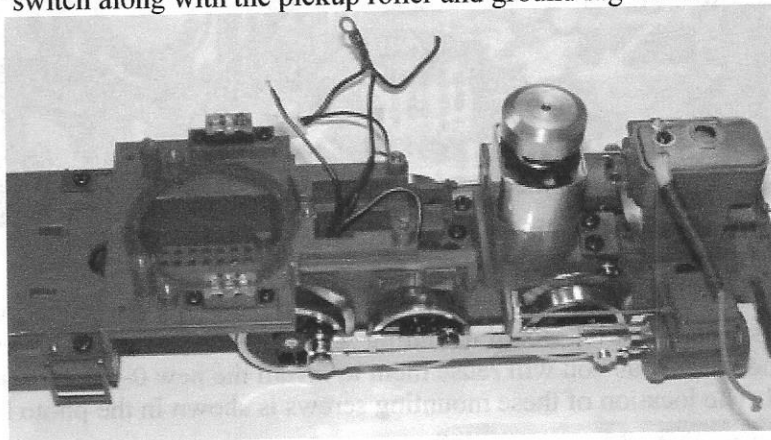
At this point you can remove the factory equipped whistle board. Unfortunately the 0-6-0 board will not accommodate the factory whistle sounds in command mode, so by removing it you can use it elsewhere. To remove the whistle you will need to unscrew a total of 6 screws. (One of these screws is used to hold a cab ladder to the frame, once you remove the ground terminal be sure to reinstall the screw and the ladder!) There are 3 screws in the speaker housing and 2 screws used to hold the whistle on/off switch to the frame. Once you have these screws out you can remove the whistle board and the speaker.

There will be a single red wire and a black wire with a white stripe attached the center post of the "smoke on/off" switch. You can clip these wires at the center position of the switch to remove the whistle board.

At this point the locomotive frame should not have any circuit boards on it. But, before we start installing the command board you need to complete one final step.

Using a soldering iron you need to unsolder the following wires; the two black wires attached to the "reverse on/off" switch, the single red wire attached to the "smoke on/off" switch; finally unsolder the red and black wires from the motor. You will need to Remove the shrink tube covering the wires and the power tabs on the motor to access the solder joints.

Now, your locomotive should look like the photo below. The only original equipment on the locomotive frame should be the smoke unit, motor, "reverse" switch and "smoke" switch along with the pickup roller and ground lug wires.

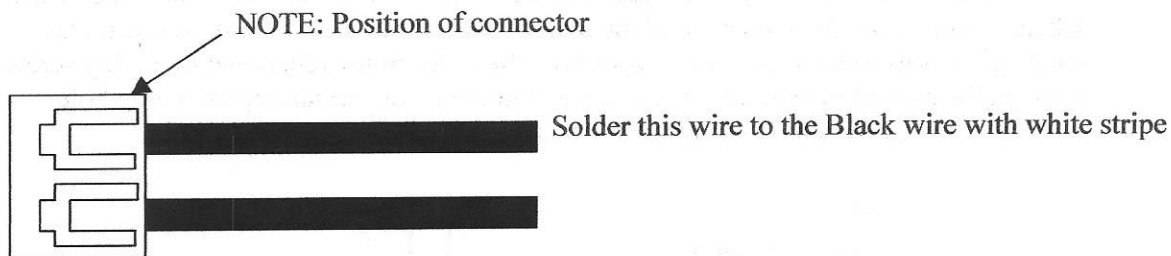


Installing the Docksider TMCC Board

To begin the installation you will need to solder a couple wires **PRIOR** to mounting the Command Board in the locomotive. These wires will be the center rail pickup roller wire and the chassis ground wire.

Referring to the photo on the next page locate the black wire with the white stripe terminating from the center rail pickup roller of the locomotive. Your model may have

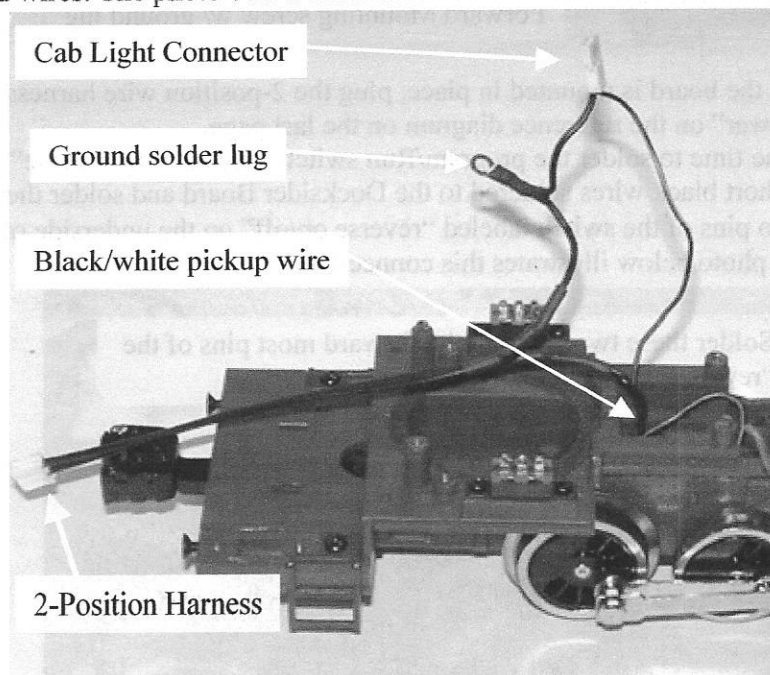
one or two of these color-coded wires. If you have two of them that are not connected to anything, solder both in this connection. Locate a 2-position wire harness. You will need to solder one of these wires to the black wire with the white stripe. The diagram below illustrates exactly which wire is soldered to the black wire with the white stripe. (We recommend you cut these wires to approximately 4 inches long (from the connector), to reduce the amount of wire inside the locomotive body.)



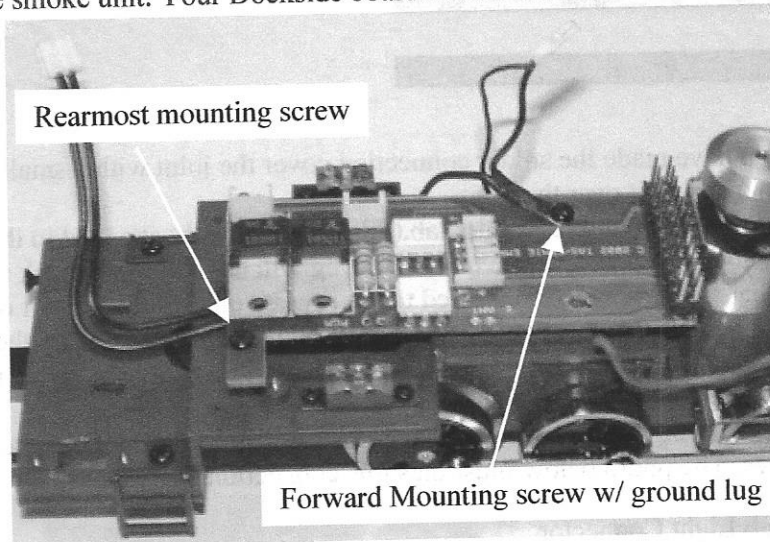
Once you have made the solder connection cover the joint with a small piece of shrink tubing and shrink it over the joint.

Now locate the ground lug solder tab (this was originally attached to the mounting screw on the factory equipped reverse unit). This lug will have a single black wire attached to it (that was originally connected to the reverse unit, but you cut it off during the preparation phase of this installation). Solder the single black wire from the ground lug to the remaining wire in the 2-position harness you soldered above. Cover the solder joint with heat shrink tube and shrink it over the joint.

At this point you should have a single 2-position harness soldered to your pickup and ground wires. The photo below illustrates this connection.

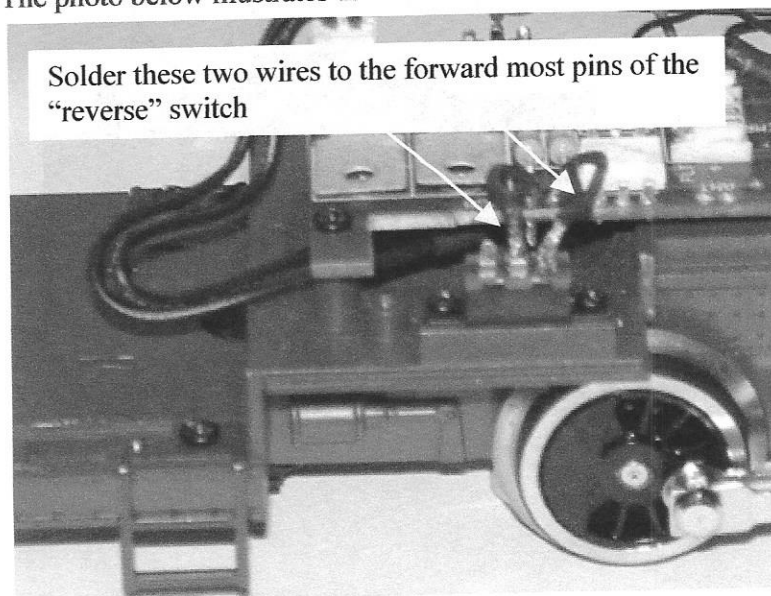


Once you have the 2-position harness soldered in place it is time to mount the board to the locomotive. Locate the Dockside Command Board from the installation kit. Unplug the black R2LC radio board from the green Docksider board and set the R2LC aside for now. Place the Dockside Command Board onto the frame, lining up the holes in the board with the posts on the frame. Referring to the photo below, route the 2-position harness between the rear most mounting posts, under the board. Locate the red wire soldered to the bottom of the Docksider board and route it out the side towards the switch labeled "smoke" on the underside of the locomotive. Install the mounting screw on the small tab closest to the rear of the locomotive. Next, insert the remaining mounting screw through the ground lug solder tab and screw it into the only remaining mounting hole closest to the smoke unit. Your Dockside board should look like this:

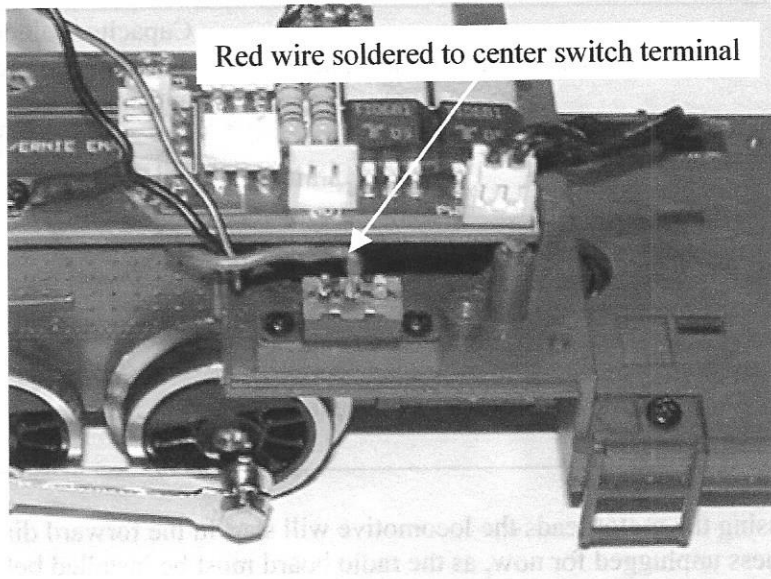


Now that the board is mounted in place, plug the 2-position wire harness into the plug labeled "Power" on the reference diagram on the last page.

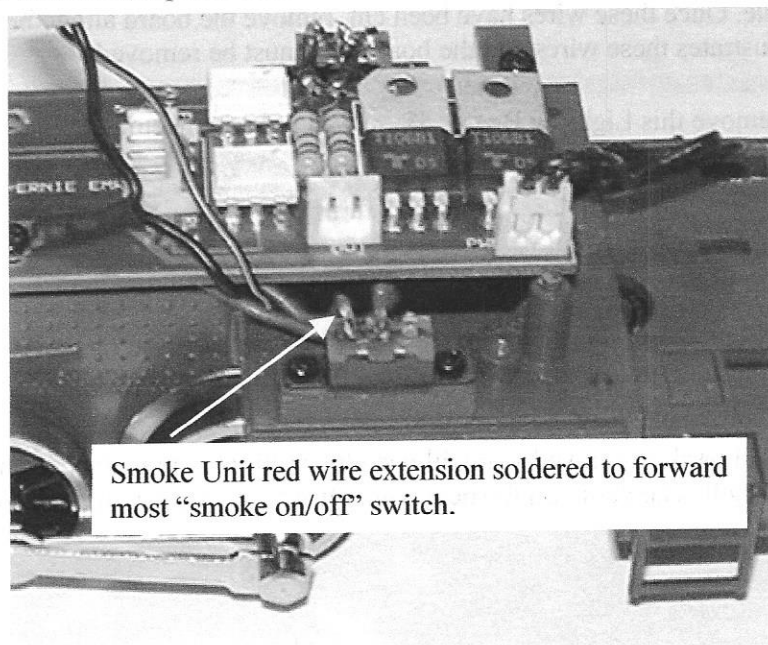
Now is the time to solder the program/Run switch wires to the "reverse" switch. Locate the two short black wires soldered to the Docksider Board and solder them to the forward most two pins of the switch labeled "reverse on/off" on the underside of the locomotive. The photo below illustrates this connection.



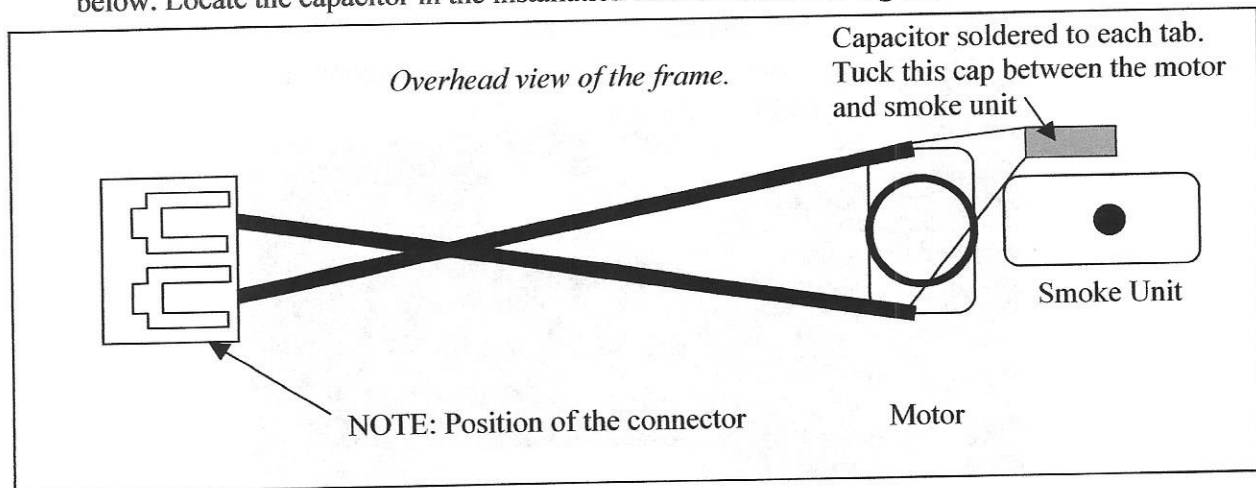
Now locate the single red wire from the bottom of the Dockside Board. This wire is long for a reason. Cut off approximately 3 inches from the unsoldered end of the wire. This wire will be used in the next step. The red wire soldered to the underside of the Dockside Board should be soldered to the center pin on the “smoke” on/off switch. The photo below illustrates this connection.



Using the 3 inch long length of wire you just cut in the step above solder it to the red wire coming out of the smoke unit. Be sure to cover the solder joint with a piece of heat shrink tubing and shrink it over the joint. Now, route the red wire you just soldered around the motor, under the Dockside Board and pull it out close to the “smoke on/off” switch. You will need to solder this end of the red wire to the forward most pin on the smoke on/off switch. The photo below illustrates this solder connection.



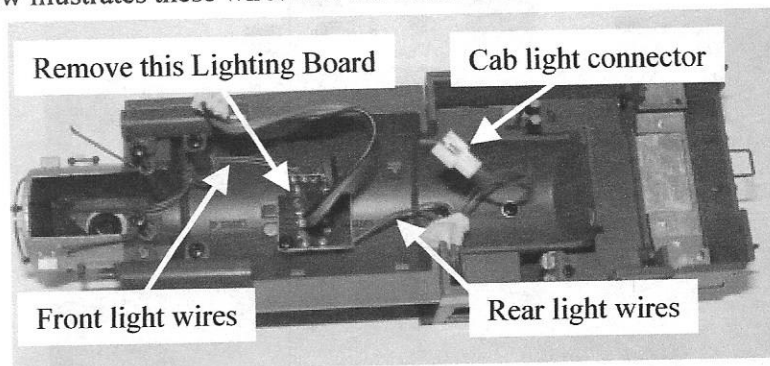
Locate the only remaining 2-position harness, cut the wires to exactly $2\frac{3}{4}$ inches long. You will need to solder these wires to the tabs on the motor (you removed the factory leads during the preparation phase of these instructions). To make the locomotive start in the forward direction you will need to solder the leads as shown in the diagram below. Locate the capacitor in the installation kit and solder one leg to each motor tab.



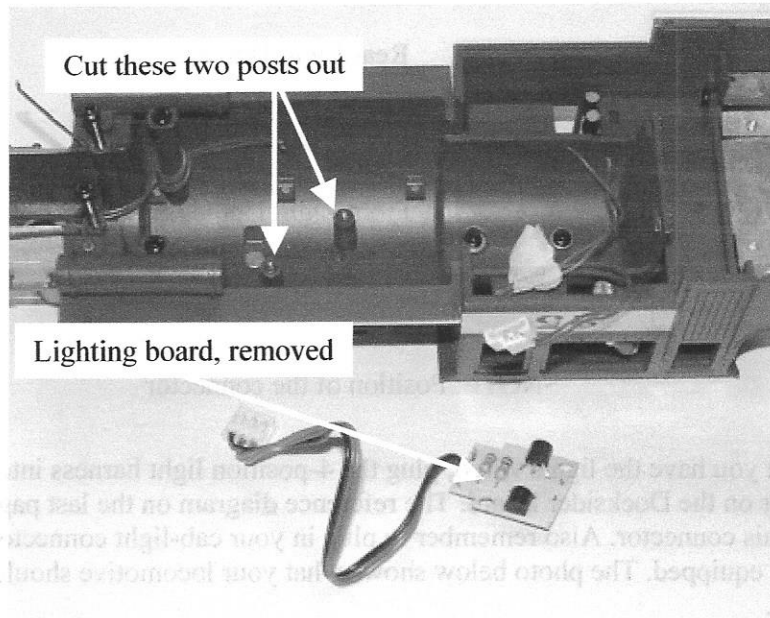
By crossing the motor leads the locomotive will start in the forward direction. Leave this harness unplugged for now, as the radio board must be installed before you plug the harness into the plug.

Locomotive shell preparation

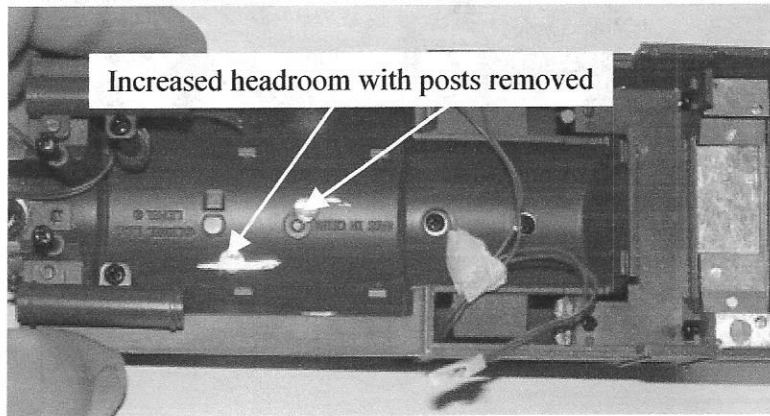
The shell currently has a small lighting board (with a 3-position connector) screwed to the inside top of the shell. This board must be removed to make adequate space for the Docksider Board. Remove the 2 screws that hold this board to the shell. Carefully cut both sets of the wires for the front light and the rear light as close to the board as possible. Once these wires have been cut, remove the board altogether. The photo below illustrates these wires and the board that must be removed.



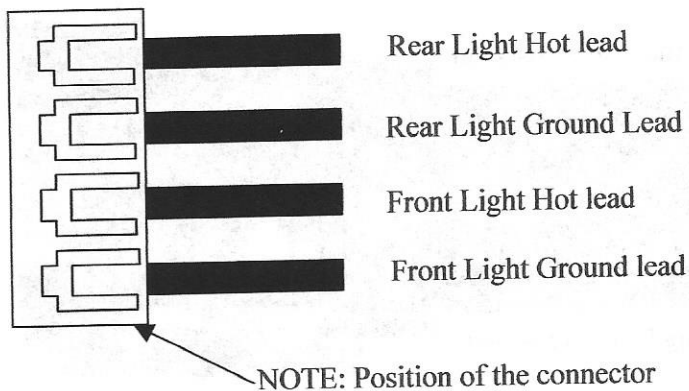
Once this board is removed you will need to carefully cut the die cast mounting posts out of the shell. The photo on the next page illustrates the posts we are referring to.



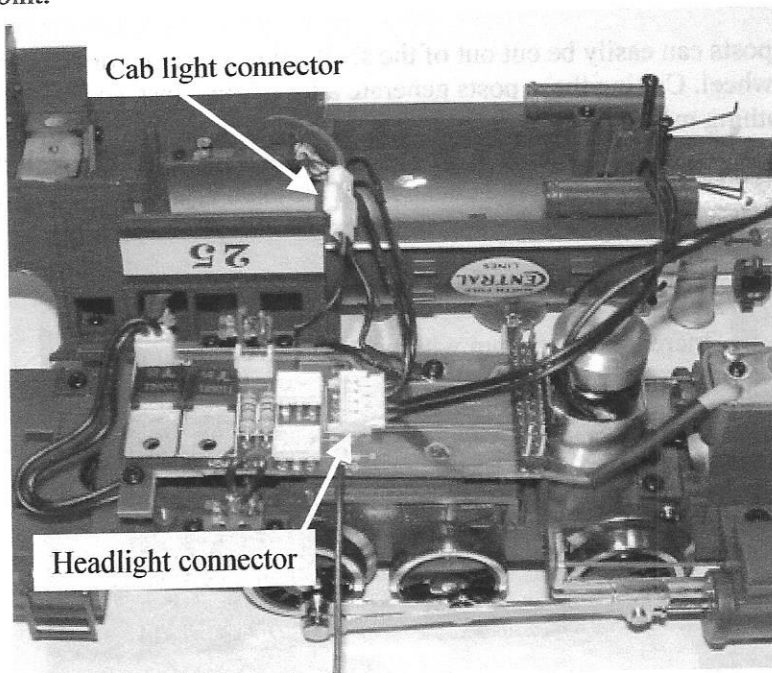
These posts can easily be cut out of the shell using a Dremel or similar rotary tool with a cut off wheel. Cutting these posts generate a lot of zinc dust, so we recommend wearing a breathing mask and eye protection. Furthermore we also recommend you perform this task in a well-ventilated area. Try to cut the posts off as close to the inside of the shell as possible. Don't worry, the thickness of the shell is substantial, so nicking the inside of the shell will not do any damage to the exterior appearance.



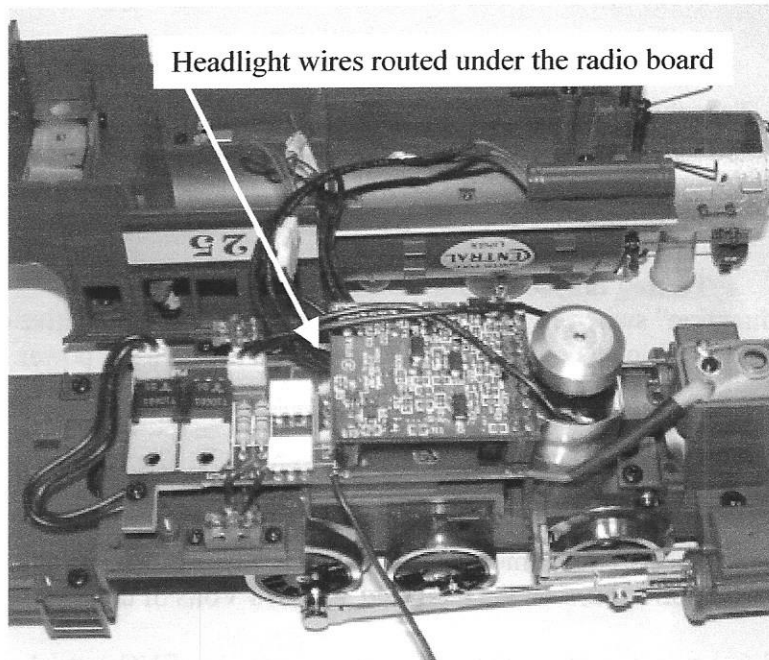
Once the posts are removed locate the only remaining 4-position harness. This harness is for the front and rear directional lights. The harness has a total of 4 wires, 2 for each light. Using the diagram on the next page, locate the two wires for the front light and solder them to the front light wires. (The front light is the one closest to the smoke stack.) Once you have made the solder connections we recommend covering the solder joint with heat shrink tubing and shrinking it over the joint. Perform the same task for the rear light, using the remaining two wires from the 4-position harness.



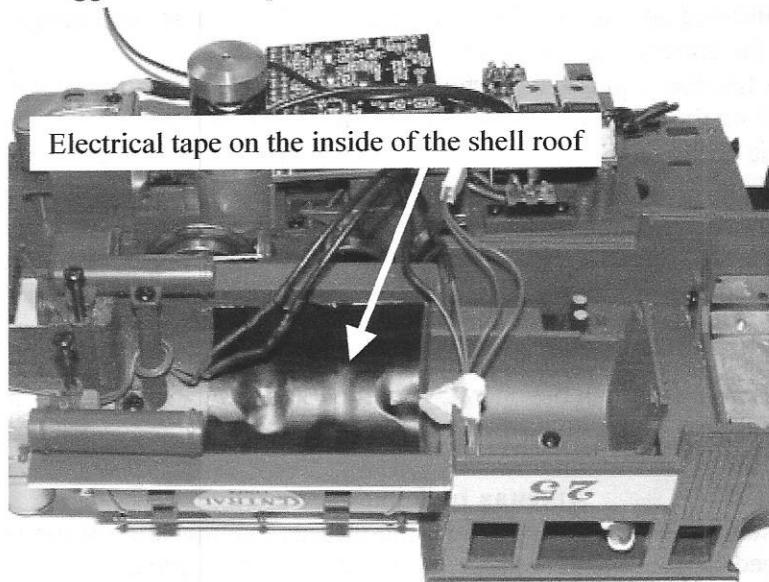
Now that you have the lights wired, plug the 4-position light harness into the 90-degree connector on the Docksider Board. The reference diagram on the last page shows the location of this connector. Also remember to plug in your cab-light connector if your locomotive is so equipped. The photo below shows what your locomotive should look like at this point.



At this point, locate the radio board you removed early in the installation. Plug the radio board into the Docksider Board, be sure to route the headlight wires under the radio board so they do not interfere with the flywheel. Once the radio board is seated, locate the motor connector and plug it into the 2-position connector on the Docksider Board (refer to the reference diagram on the last page). The entire assembly should look like the photo on the next page.



Due to the tight tolerances of this board we strongly recommend that you electrically isolate the inside top of the locomotive shell with electrical tape. This will prevent the radio board from making contact with the shell, in the event the radio board should ever wiggle loose. The photo below illustrates this.



The final step before reattaching the shell to the frame is to locate the antenna wire. When you reinsert the frame into the shell you want to route this antenna wire into the cab and through one of the front windows of the cab. The antenna will be soldered to a new antenna, which will be a new handrail around the fatter part of the boiler. Now, route the antenna wire into the cab and through the window and insert the frame into the shell. Take your time in this step, there are a lot of sharp corners on the body that wires

can get hung up on. Take the time to ensure you do not pinch any wires between the shell and the frame. Once you are confident the shell and frame are mated well you can perform a test on the locomotive (prior to attaching the mounting screws). Leave the antenna hanging out of the window for the testing phase.

Testing the Dockside Command Board

Place the "direction" switch in the "on" position and place the locomotive onto a track that is connected to a Lionel command base. Apply 18 Volts of track power. Using the Lionel Cab-1 remote press the following keys;

ENG + ## + SET + AUX1 + 8. (## can be any number from 1-99). The headlight will flicker when you press the SET key.

Turn the track power off and remove the locomotive. Slide the "reverse" switch to "off" and place the locomotive back on the track and apply 18 Volts of track power.

Using the Cab-1 remote address the locomotive by pressing ENG + the 1 or 2 digit ID number you assigned to the locomotive. Turn the red thumbwheel and verify the locomotive starts moving in the forward direction (the front headlight should be on as well).

Now press the DIR key one time and verify the rear headlight has turned on. Turn the red thumbwheel again and verify the locomotive runs in reverse.

If your locomotive does not run in one direction or both, verify you plugged the motor harness into the correct plug on the Dockside Board.

If the motor harness is plugged in, check the orientation of the program/run switch (marked "direction" on the bottom of the locomotive frame) to ensure that the "on" position is where the switch contacts both wires. If this is reversed then the locomotive is in the program mode in "off" and the run mode in the "on" position. If this is the case, reprogram the locomotive using these positions and retest the locomotive.

Each board is thoroughly tested prior to shipping, so if it is not working it is most likely something wired wrong, or some part of the board shorting out or wires pinched between the shell and the frame.

Once you are satisfied with the operation of the locomotive continue on to the last section to complete the antenna installation.

Antenna Installation

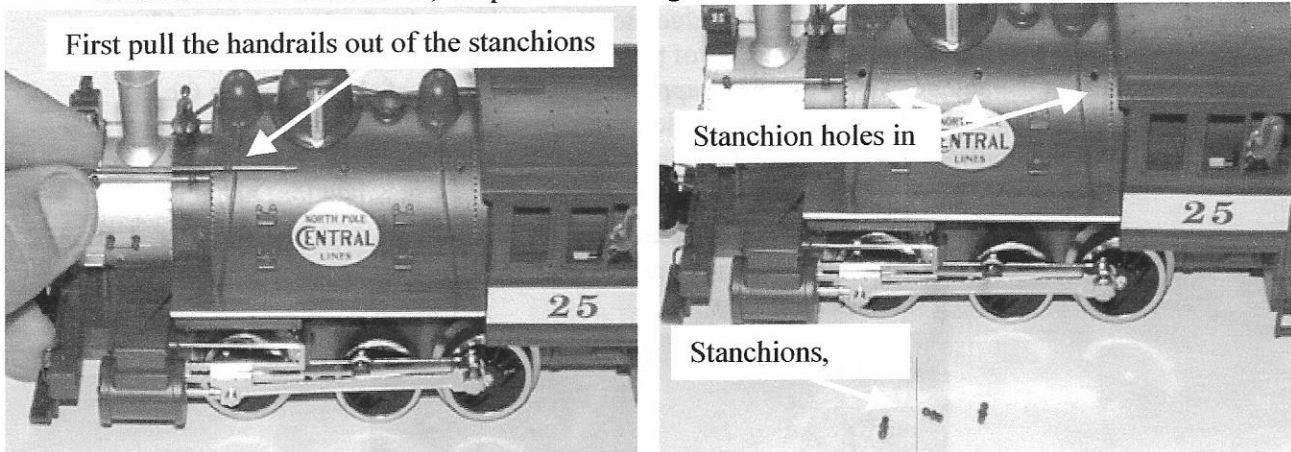
Due to the small size of this locomotive and the fact that the entire locomotive is die cast we are forced to fabricate a new handrail to be used as an antenna. (Don't try to solder to the existing handrails, as they are steel, but you will melt the stanchions before the solder sticks to them and the handrails will become discolored.

Luckily the stanchions are made of plastic and are ideal for the installation of a new handrail to be used as an antenna. The installation kit includes a piece of tin plated copper bus wire that replaces the existing handrail and fits inside the stanchion holes perfectly. Locate this piece of wire and straighten it out as best as possible. You will want to wrap the antenna around the fat part of the boiler, to provide adequate antenna for

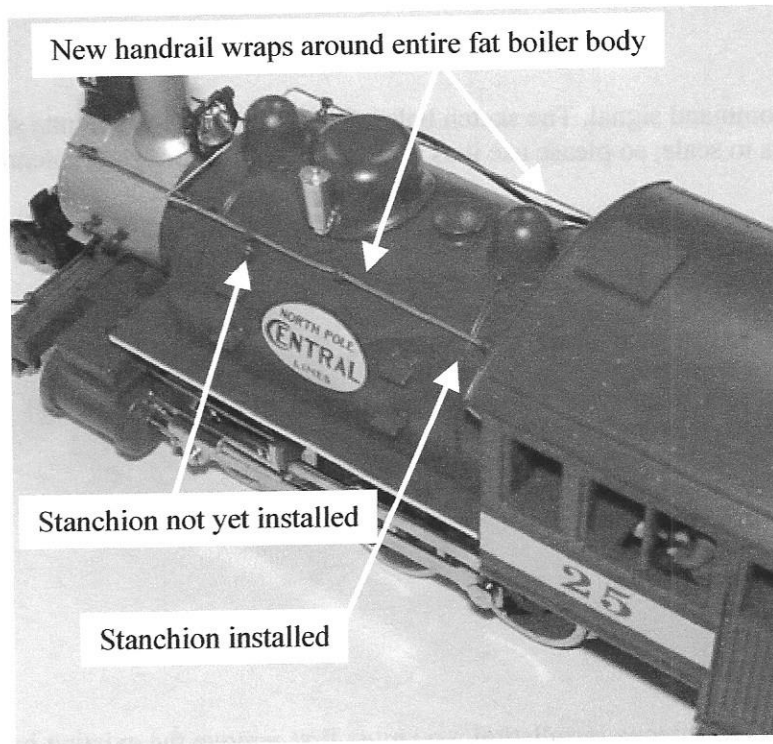
receiving the command signal. The sketch below illustrates how the antenna should be configured. It is to scale, so please use it as a template for bending your antenna.

To begin the antenna installation, you must first remove the existing handrails on the locomotive. Begin the removal process by first sliding the factory handrails out of the stanchions. Next, simply pull the stanchions out of the shell. These stanchions are made of plastic and simply slide into the die cast shell, they are not glued in the holes and will come out with very little effort.

Once you have removed a total of two handrails with 6 stanchions you must slide the 6 stanchions off the factory handrails. The photo below on the left shows the handrails on the locomotive, the photo on the right shows the handrails removed.



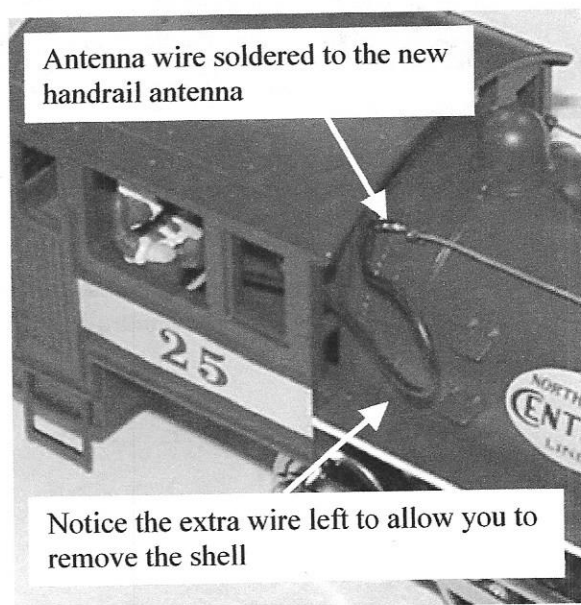
Now that the stanchions are removed, place three on each side of the new antenna handrail. The photo on the next page illustrates what the handrail should look like on your model, while reinserting the stanchions.



Once you have the new handrail installed on the shell we recommend that you check the position of the ends of the handrails and ensure they are NOT touching the cab. It is imperative that the antenna does not touch the shell or ground. Once you are certain the antenna is not touching the cab we recommend you apply a dab of super glue to the handrail and a couple stanchions to hold the antenna in place, so it does not touch the cab in the future and force the locomotive to lose the radio signal.

Once the antenna is in place and glued to the stanchions the final step is to solder the antenna wire (from the front window of the locomotive cab) to the new handrail antenna. Cut the antenna wire so there is approximately 3 inches of slack between the antenna handrail and the window. (This is done so you can remove the shell in the future for any reason without having to unsolder the antenna lead.)

The photo below illustrates the solder connection on the new handrail antenna.



Once you have the antenna wire soldered to the new handrail you can tuck the remaining wire into the cab window.

Now try another test with the locomotive on the track to ensure you are receiving a clear command signal. When you place the locomotive on the track the front headlight should stay a constant brightness. If the headlight is flickering this tells you the locomotive is having trouble receiving the radio signal from the track. If your headlight is flickering, check the handrail and ensure it is not touching the boiler anywhere. After that, check the antenna wire and ensure it is not touching the shell either.

Reinstalling the screws

After you have completed the test run mentioned above it is time to reinstall the screws in the locomotive to hold the shell on. Locate the 4 mounting screws you removed earlier and screw them into the frame. (For locations of these screws please see the preparation portion of the instructions.) Be careful when installing the screws! Make sure you do not smash any wires between the shell and the frame and that the shell seats properly on the frame. You may need to rearrange some of the wires under the cab portion of the shell to help the shell seat better on the back end near the cab.

Once you have the screws installed the locomotive is ready for the layout!

Notes

The Docksider locomotives have a small gear on the motor shaft, in addition to the drive wheels. This cam is the slide actuator for the puffing smoke unit and adds additional drag on the motor at the first couple of speed steps. If you notice your locomotive is laboring to move when you first turn the red thumbwheel, chances are it is the cam forcing the motor to work harder to get the locomotive moving, this is normal.

All basic TMCC controls apply to this locomotive; stall speed, momentum and high speed settings, etc.

This locomotive has a similar setting as with most other locomotives (in regards to the auxiliary radio board setting). This setting is 8. This setting applies voltage to the heating element of the smoke unit constantly. The standard keys; AUX1 + 9 will turn the smoke unit on and AUX1 + 8 will turn the smoke unit off, will function as well. Do not leave the smoke unit on if you are not running the locomotive, as damage may be done to the heating element in the smoke unit.

Unfortunately there are no coil couplers that will fit the Lionel Docksider locomotives, so no provisions have been made for wiring coil couplers to this board.

Troubleshooting

Symptoms	Corrections
Loco will not run at all	Check the headlight for clear signal reception Ensure the handrail antenna is not touching ground Reprogram the loco ID number and retry
Headlight flickers erratically	Check the antenna handrail, ensure it does not touch the shell. Place your hand over the locomotive, does the

Flickering stop? If so, it is a signal reception Problem, call the office for tech support.

Smoke unit does not turn on

Reprogram the loco using this sequence on Cab-1
ENG + ## + SET + AUX1 + 8. Remember, the
Smoke unit will turn on and stay on until you turn
it off.

If you encounter a problem not listed here, please call our technical support line at 330-533-7181 Monday-Friday 9a-5p EDT.

