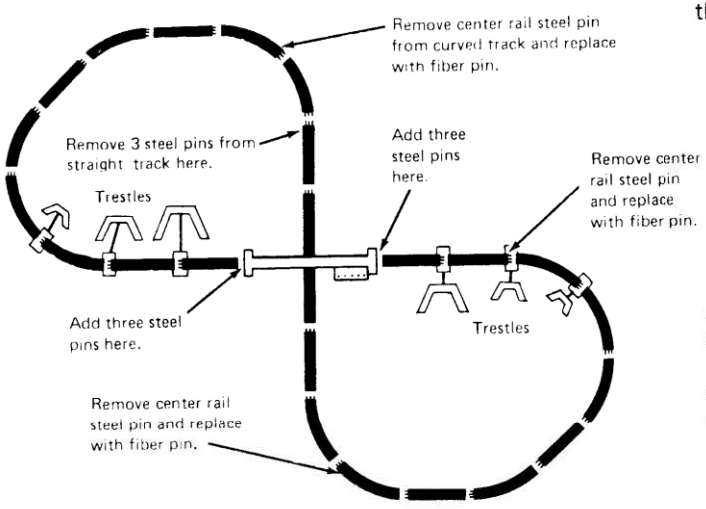
NO. 6-2317 DRAWBRIDGE

The No. 6-2317 Drawbridge adds action and realism to any layout. Your train is automatically stopped and started again as you raise or lower the drawbridge by remote control.

SETTING UP THE TRACK LAYOUT

FIGURE 1 shows the basic drawbridge track layout. Lay out the track, drawbridge and trestle piers as shown but do not join the track sections together yet. At least one, and preferably two full straight track sections must always be used on both ends of the drawbridge as shown, or the connecting link or house and step assembly may be hit and damaged by the passing train. Extended layouts are possible by adding track sections to the ends of the basic figure eight.

FIGURE 1



The fiber insulating pins provided must be inserted exactly where shown. Three center rail steel pins must, therefore, be removed.

TRACK REQUIREMENT:

12 Straight
12 Curved

Notice that steel pins are needed at each end of the drawbridge and that there is an overlap of pins between a straight section and a curved section. (Refer to FIGURE 1) Remove the three steel pins from the straight section. You should now have a total of six steel pins. Three additional steel pins have been packed with the drawbridge for your use, if necessary, because you may damage some when removing them. Install three pins in each end of the drawbridge. Join the track sections together to finish the track assembly.

Included with your drawbridge are three pairs of graduated trestle piers. These are designed to elevate the track from ground level to the height of the drawbridge. The piers should be placed one full track section apart so that each pier supports the joint between two track sections. See Page 31 for installation procedure of tie channels andtrestle piers.

WIRING THE LAYOUT

The layout must be wired according to FIGURE 3 if the drawbridge is to operate properly. Two lockons are provided with your drawbridge. Note that FIGURE 3 calls out for three lockons. Use the lockon that came with your train set as the third one.

Install the lockons where shown in FIGURE 3

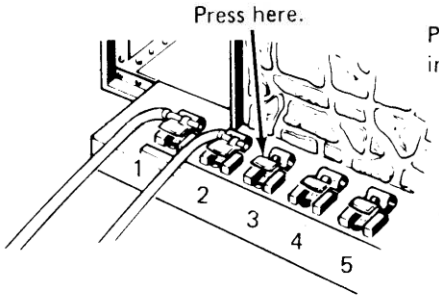


FIGURE 2

Following the wiring diagram shown in FIGURE 3 very carefully, connect one wire from the left-hand transformer terminal to drawbridge clip No. 1. FIGURE 2 shows how to make drawbridge connections. Be careful that the wires do not touch adjacent clips and cause short circuits.

Connect another wire from the right-hand transformer terminal to drawbridge clip No. 2. With another wire make a connection from drawbridge clip No. 3 to the control switch. Connect another wire from the other end of the control switch to drawbridge clip No. 2. Connect a wire from drawbridge clip No. 4 to the No. 1 clip of lockon "A".

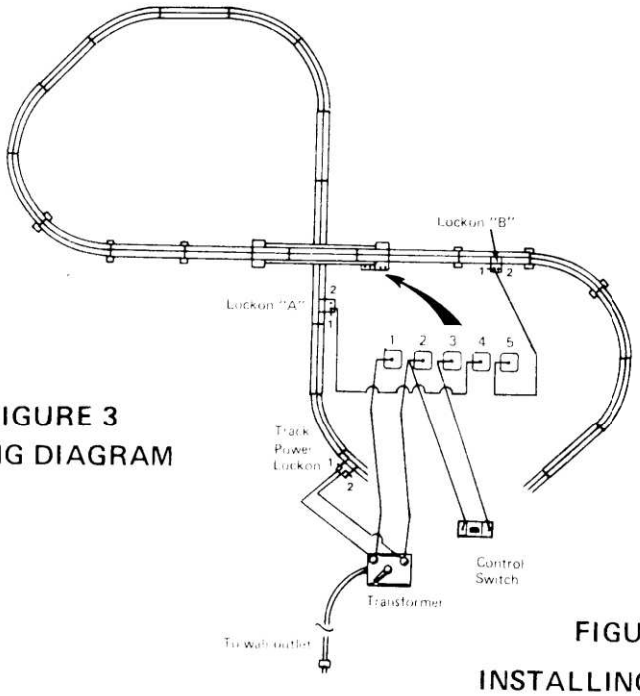


FIGURE 3
WIRING DIAGRAM

Similarily connect a wire from drawbridge clip No. 5 to the No. 1 clip of lockon "B". Using the two lockon wires that were provided with your train set, connect one wire from the left-hand transformer terminal to the No. 1 clip of the track power lockon. Likewise connect the other wire from the right-hand transformer terminal to the No. 2 clip of the track power lockon.

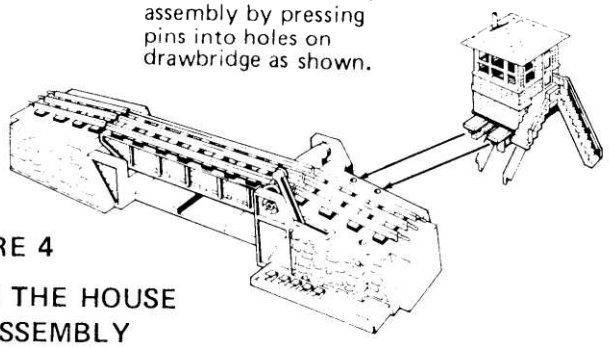


FIGURE 4

INSTALLING THE HOUSE AND STEP ASSEMBLY

NOTE: If a multiterminal transformer is used, connect the wires exactly as shown in FIGURE 5. This will allow the drawbridge to be operated on the fixed voltage terminals A and C. The drawbridge will operate at the same speed, independent of the track variable voltage.

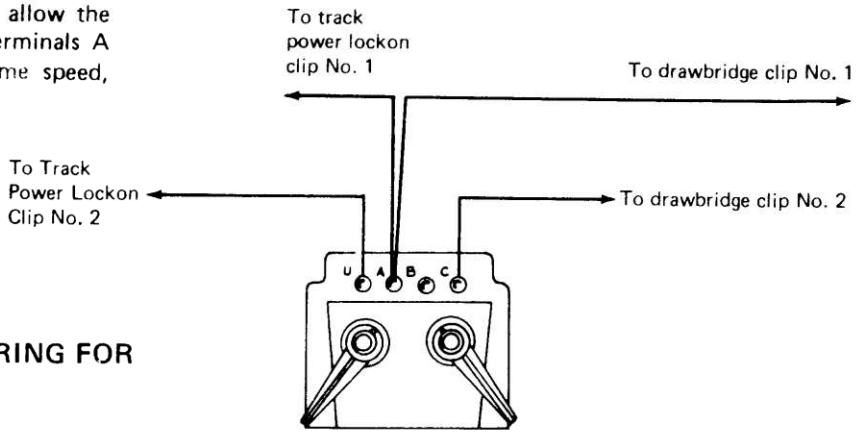
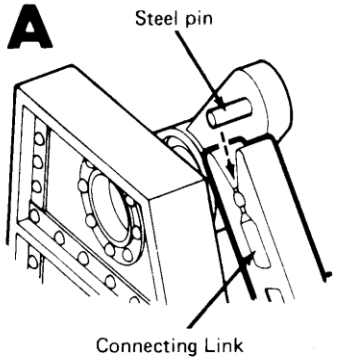


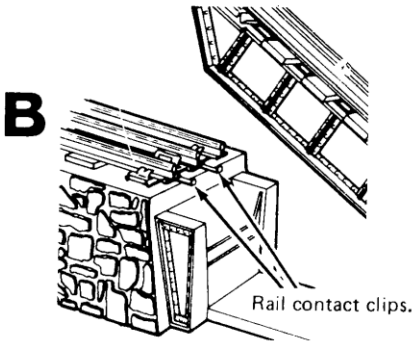
FIGURE 5

ALTERNATE TRANSFORMER WIRING FOR TYPE 4090 TRANSFORMER

OPERATING THE LAYOUT



The connecting plastic link of the drawbridge has been carefully designed so that if the drawbridge is forced down from the up position, or up from the down position, the connecting steel pin on the moving portion of the drawbridge will disengage, thus reducing the possibility of damage to the internal gears. If this should happen, simply snap the steel pin into the plastic link as shown.



The rail contacts shown must make good electrical contact with the rails of the full straight track on the bridge section. Carefully reposition them if necessary.

LOCATION & DIRECTION OF TRAIN

Place your engine and cars of the train on the track in the location shown in FIGURE 6. The engine must be behind the fiber pin.

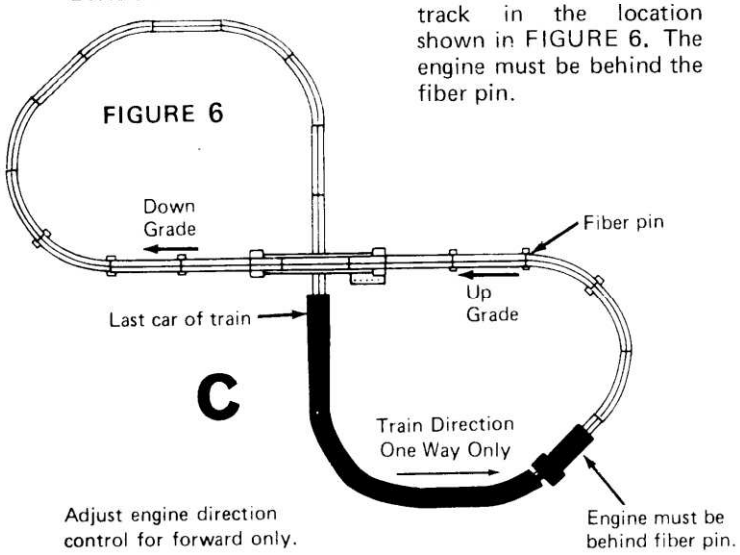


FIGURE 6

Plug the transformer into a wall outlet. Hold the engine with your hand and advance the voltage control arm. Adjust the direction control of the engine so it is trying to move forward. If your engine has an E-unit turn it off so the engine will always run forward. Release the engine and adjust the voltage so the train proceeds over the drawbridge. The train will automatically stop on the insulated track section in front of the drawbridge. When it stops, press the control switch for a second or two to make the drawbridge start to raise. The drawbridge will continue automatically, sounding a warning bell as it raises. When it is all the way up, the warning bell stops and track voltage is automatically provided to the track so the train passes the raised bridge. When it reaches the other insulated track section near the second trestle pier it will again stop automatically. When this happens, simply press the control switch as before and the drawbridge will lower, sounding the warning bell as before. When the drawbridge is down, the warning bell stops and track voltage is again automatically provided to the track so the train will proceed over the drawbridge. Keep your hand on the voltage control arm of the transformer, because the train will speed up as it runs down the incline of the trestle.

OPTIONAL LAYOUT WIRING USING AN EXTRA LOCKON, FIBER PIN, AND WIRE FOR TWO-WAY OPERATION

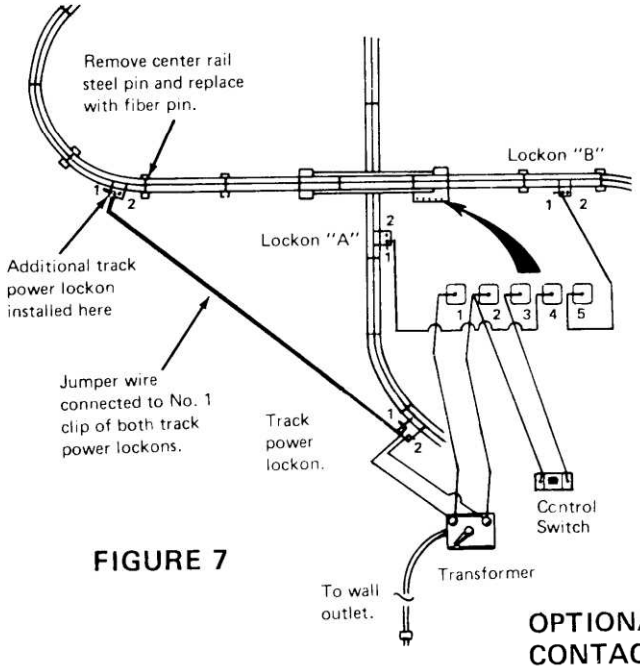


FIGURE 7

Your layout can be wired for two-way operation by using one additional lockon, fiber pin, and wire, available from your nearest Lionel Approved Service Station.

Install the fiber pin in place of the steel pin as shown in FIGURE 7. Connect the lockon and wire where shown, making sure that the wire is connected between clip No. 1 of both track power lockons.

This completed layout will enable your train approach the drawbridge from either direction, an important feature if you are using reversing loops.

OPTIONAL LAYOUT WIRING AND OPERATION USING NO. 145C CONTACTORS FOR COMPLETELY AUTOMATIC OPERATION

Your layout, as wired according to FIGURE 7 , can be modified for completely automatic one-way operation by using two No. 145C contactors and additional wire available from your nearest Lionel Approved Service Station.

Parts required:

two No. 145C contactors
two lockon type wires, approximately 3 feet long
one lockon type wire, approximately 4 feet long
one lockon type wire, approximately 6 feet long

If you wire your layout according to FIGURE 9 , it will operate automatically so that in addition to your train stopping and starting, the drawbridge will raise and lower without pressing the remote control button.

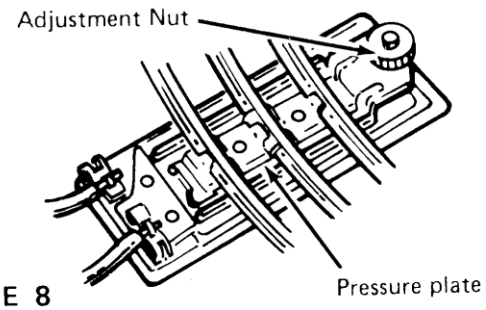


FIGURE 8

CONTACTOR IN INSTALLED POSITION

The optional layout must be wired according to FIGURE 9 . The fiber pin near lockon "B" must be removed and replaced by a steel pin. Install the fiber pin in the center rail where shown in FIGURE 9 . You must now determine where to place the contactors. To do this, run your train around the layout in the direction shown in FIGURE 9 . After it passes over the drawbridge and automatically stops, note where the center of the engine is located. This is where you install contactor "A". The contactors are activated by the weight of the engine passing over the track section above the contactors.

So, if your layout is fastened to a board or platform, loosen several sections on both sides of the contactor. The track must be flexible enough to bend under the weight of the engine. Slide the contactor beneath the track so that the track tie nearest the center of the engine rests firmly upon the pressure plate. Again run your train until it automatically stops near the base of the first trestle. Loosen track sections if fastened down and install contactor "B" under the track tie nearest to the center of the engine.

Following the wiring diagram shown in FIGURE 9 very carefully, connect a three foot wire from one of the clips of contactor "A" to the No. 2 clip of lockon "A". Likewise, connect the other three foot wire from one of the clips of contactor "B" to the No. 2 clip of lockon "B". Connect the six foot wire from the other clip of contactor "A" to the other clip of contactor "B". Finally, connect the four foot wire from the clip of contactor "B" that is holding the six foot wire, to the No. 3 clip of the drawbridge.

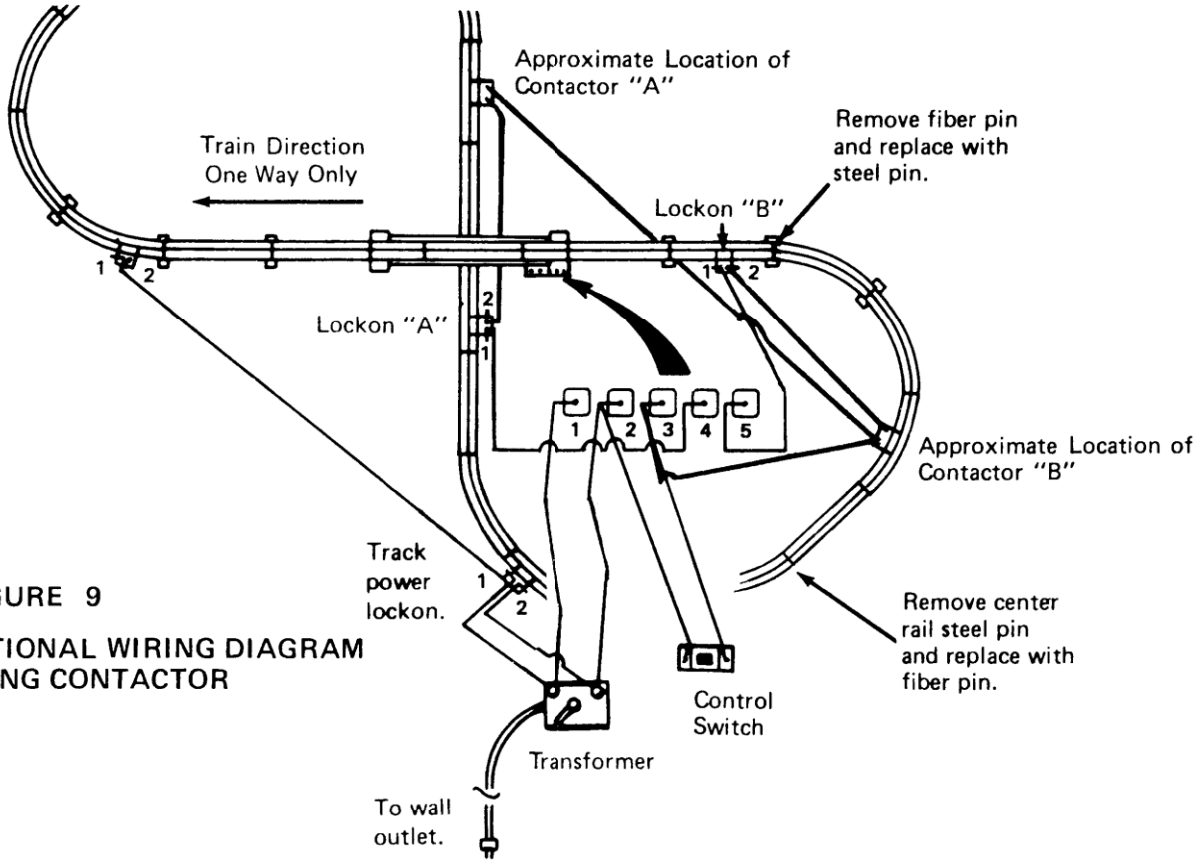


FIGURE 9

OPTIONAL WIRING DIAGRAM USING CONTACTOR

After the wire connections are made, turn the adjustment nuts on the contactors clockwise as far as they will turn. Turn the transformer on and run the train until it automatically stops on the insulated track section at contactor "A". Slowly turn the adjustment nut of contactor "A" counterclockwise, if necessary, until the drawbridge begins to raise. The train will automatically start and proceed when the drawbridge is raised. When the train automatically stops on the insulated track section at contactor "B", slowly turn the adjustment nut on contactor "B" counterclockwise, if necessary, until the drawbridge begins to lower. When the drawbridge is lowered the train will automatically proceed.

CAUTION: Only the weight of the engine must activate the contactors. The cars must not activate the contactors because the drawbridge may raise or lower when the cars are passing over or under it. Extreme care must be taken when adjusting the contactors. Heavy cars should be placed near the front of the train. Also, the train speed must be carefully regulated so that the engine stops directly over the contactors.

Relays can be used for completely automatic operation which allows the train to approach the drawbridge from either direction. You can obtain the wiring diagram and information on these commercially available relays from your Lionel Approved Service Station or by writing to the Lionel Service Department, 50925 Richard W. Blvd., Mt. Clemens, Michigan 48043.