

Instructions for Operating

LIONEL REMOTE CONTROL

No. 022 SWITCHES

WITH AUTOMATIC NON-DERAILING FEATURE

Railroad track switches, also known to railroaders as 'turnouts', are used to connect two lines of track so that the train can switch over from the main line to a siding, a spur line or to a different line entirely.

Lionel No. 022 switches are made to match 'O' gauge track. They have the same length and radius as ordinary straight and curved 'O' track sections and are installed in the track layout in the same way, with each switch replacing one straight and one curved track section.

Switches are generally sold in pairs, consisting of a right-hand and a left-hand switch. An easy way to tell the difference is this: If a train proceeding along the main line has to turn out to the left, it uses a left-hand switch; one turning out to the right uses a right-hand switch.

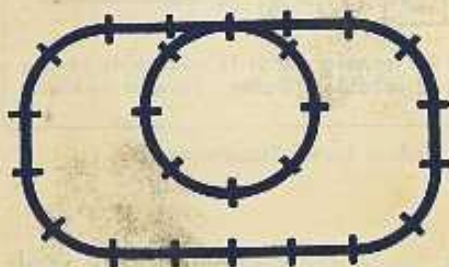


Figure 1

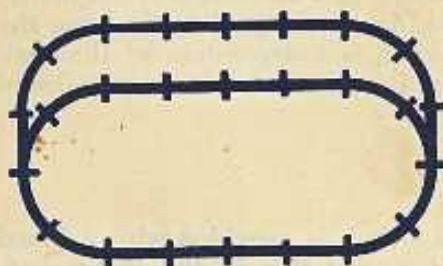


Figure 2

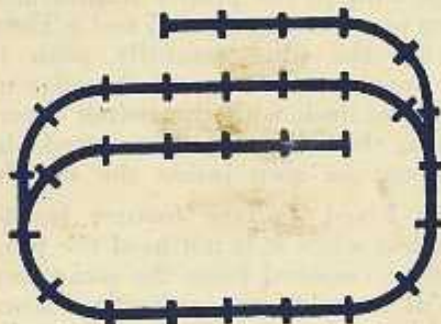


Figure 3

Track switches can be used in a great variety of ways some of which are illustrated in the simple layouts on the left. Except when used to enter a dead-end siding, as in Figure 3, a pair of switches is generally required in the layout so that a train has a way of getting back on the main track without backing out of the siding. The pairs of switches can be installed in a layout together, as in Figure 1, or separately, as in Figure 2.

These layouts, of course, merely illustrate how switches may be used. Innumerable other layouts can be developed through the use of crossings and additional track and switches. See your instruction booklet for additional layout ideas.

To install switches in the layout carefully line up the switch pins to the adjoining track sections and press the track firmly to the switch. You may find in some layouts that the switch pins interfere with those in the regular track. In this case remove the pins from the regular track if possible; don't disturb any of the pins in the switch.

Track pins are removed most easily with a pair of diagonal cutting pliers. Grasp the pin firmly with the cutting edges as close to the end of the rail as possible and pry it out gradually by using the rail flange as a lever point.

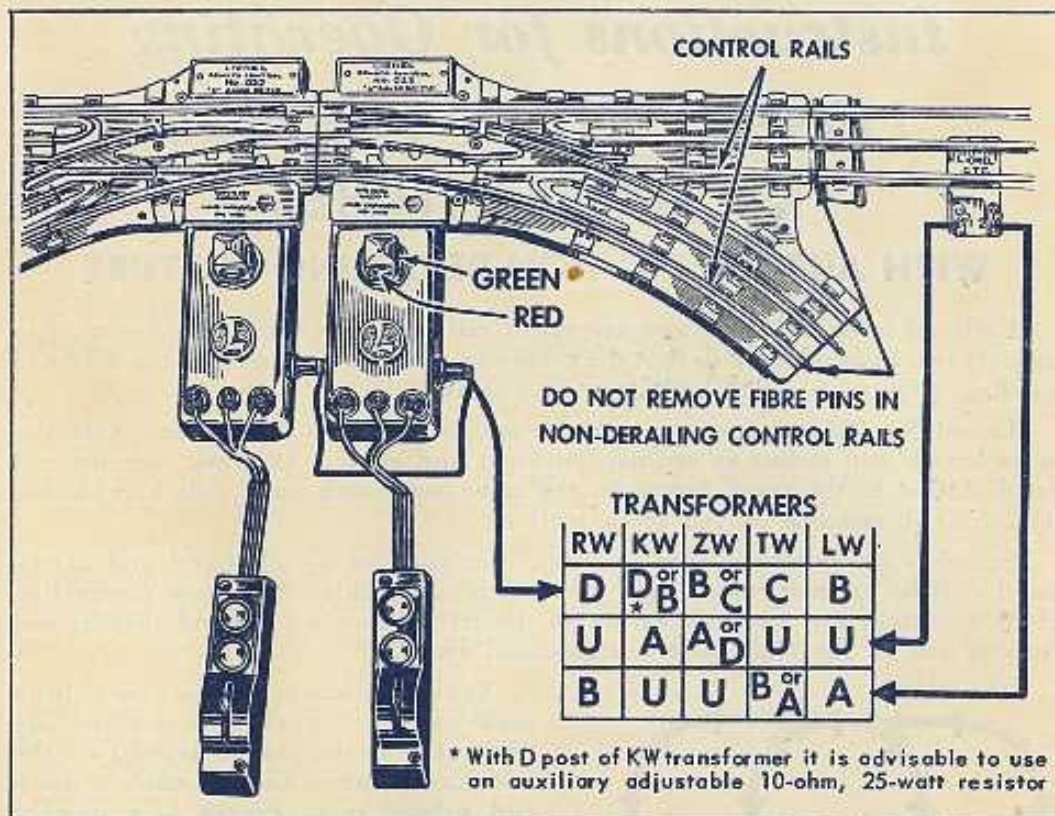


Figure 4—How to Connect 022 Switches to Modern Lionel Transformers.

SWITCH POWER CONNECTIONS

When the switch is installed in the layout, its power connections are made automatically so that it gets the regular track voltage. In most smaller layouts this arrangement is quite satisfactory. However, in larger layouts, it is frequently desirable to supply the switch mechanism with *fixed* voltage directly from the transformer. With fixed voltage supply the switch is independent of the variable track voltage and operates with a snap even though track voltage is reduced to slow down the train or is turned off entirely.

FIXED VOLTAGE PLUGS

To make fixed voltage connections No. 022 switch is provided with a Fixed Voltage Plug which fits into a socket located on the side of the switch box. Connect the wire leading from the Fixed Voltage Plug to the proper transformer binding post. See Figures 4, 5 and 6. Then centering the plug carefully push it firmly into the socket until the edge of the plug is flush with the switch cover. The plug should fit over the slotted pin which can be seen inside the switch.

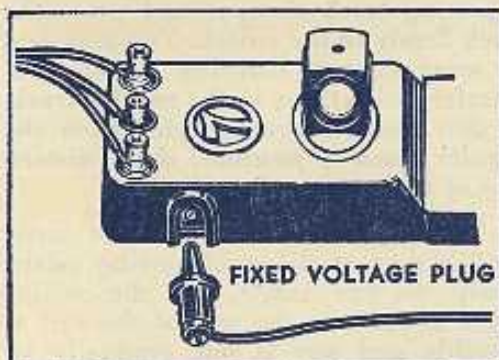


Figure 5—Fixed Voltage Plug.

The Fixed Voltage feature is optional, but when it is not used the plug should be removed from the socket because its insertion automatically disconnects the switch mechanism from its normal track power supply.

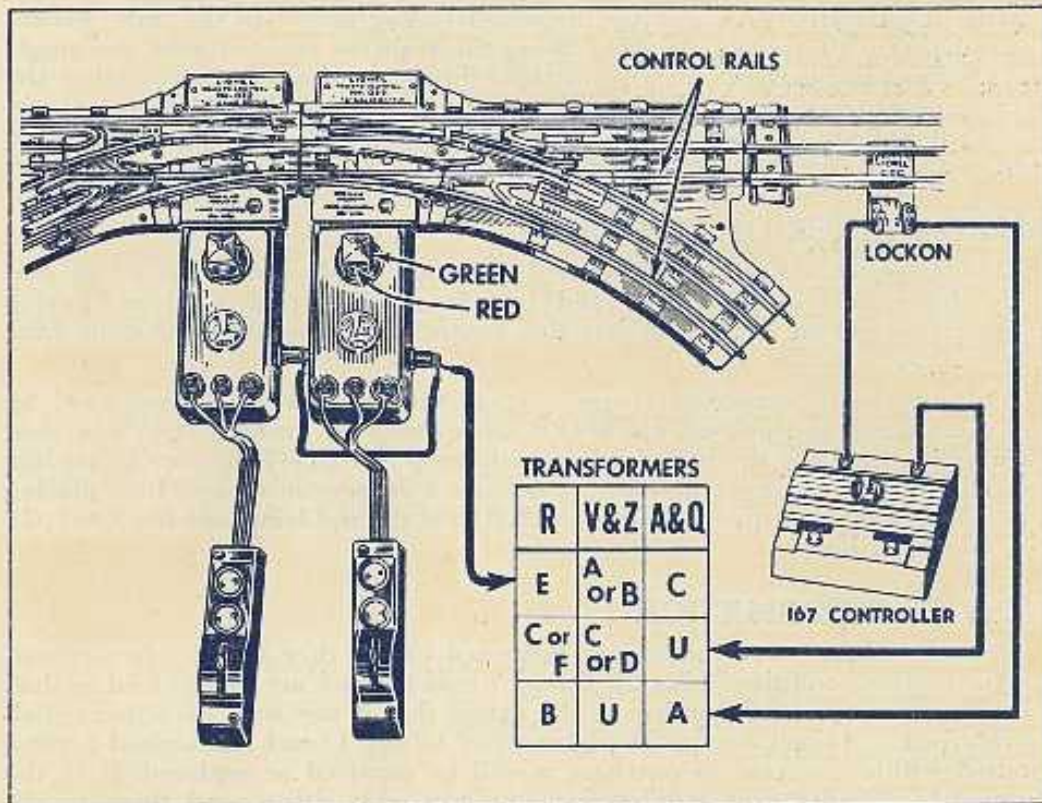


Figure 6—How to Connect 022 Switches to Transformers Requiring Separate No. 167 Whistle Controllers.

ADJUSTING THE SWITCH INDICATOR LIGHTS

No. 022 Switch is operated by means of its controller which is connected to the three binding posts by a 3-wire cable. After the switch is installed in the track layout, connect the center controller wire to the center post of the switch. Then connect the outside wires to the outside posts, and turn on the power. The lamp in the switch and one of the two lamps in the controller will light. Now, as the controller lever is moved forward or backward one of the indicator lamps in the controller will go out and the other will light instead. At the same time, the swivel rail of the switch will snap from one side to the other causing the lamp hood on the switch housing to rotate.

When the switch is in position for the train to proceed along the main line, green lamp should be on in the controller and the green light in the lamp hood should shine along the straight track. If red controller lamp is on, interchange the two outside wires connecting the controller to the switch. If the red side of the lamp hood is pointed along the straight track, lift up the lamp hood and snap it back into the ring correctly.

Note that no action takes place if the controller lever is moved more than once in the same direction. If, however, the lever is pressed in the reverse direction, the position of the switch swivel rail and lamp hood will change and the corresponding lamp in the controller will go on instead. By connecting and adjusting the controller in this way, you will know the position of the switch swivel rail even though it may be concealed, by merely noting whether the red or green controller indicator is on.

HOW TO REVERSE POSITION OF MOTOR UNIT

If you are constructing a layout in which you find the motor unit of the switch projecting too far from the side of the switch, and if you have room for the motor unit on the other side, you may change the position of the motor unit as follows:

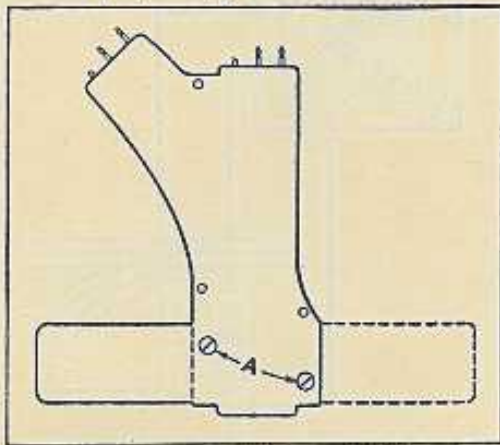


Figure 7—How to Change Position of Switch Motor Unit.

Remove the two mounting screws indicated by letters "A" in Figure 7 and detach the motor unit from the switch. Insert the motor unit in position on the opposite side of the switch as indicated by dotted lines. Be sure that the driving pin is inserted in slot of swivel rail and replace the mounting screws. (If the lamps in the controller are adjusted to conform with the position of the switch as described in a previous section it will be necessary to interchange the lamps when reversing the position of the motor.)

NON-DERAILING FEATURE

Note that two of the rails of the 022 switch end with fibre pins, instead of regular steel pins. These pins insulate the control portions of the switch rails from the regular grounded outside rails and are part of the automatic non-derailing feature. The control rails are connected internally to the switch coils. As a locomotive approaches an 'open' switch its wheels and axles bridge one of the control rails to the opposite outside rail. This action completes the electrical circuit of the proper switch coil and throws the swivel rails of the switch to the correct position for the train to pass through. For good operation keep the control rails clean and free of rust or grease.

SPECIAL USES OF THE NON-DERAILING FEATURE

If desired, various track signals and accessories such as No. 153 Block Signal, No. 151 Semaphore, No. 145 Gateman, No. 445 Switch Tower and others can be connected to the outside binding posts of the switch boxes so that these accessories are controlled by the control rails of the switches. The wiring diagrams for such installations are shown in Figure 8 and 9 on this and following page. In some cases accessories connected to the switch will cause both lights in the switch controller to remain on continuously.

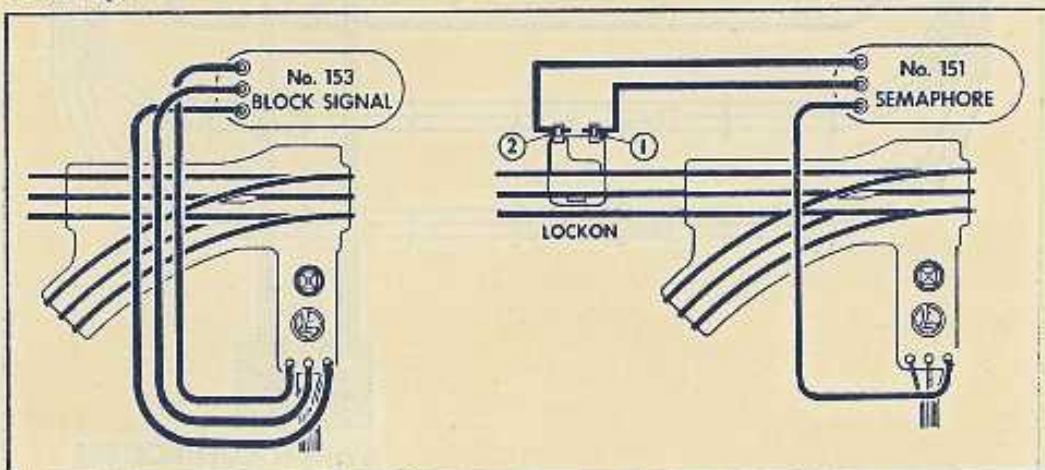


Figure 8—Left: How to Connect 153 Block Signal to 022 Switches.
Right: How to Connect 151 Semaphore to 022 Switches.

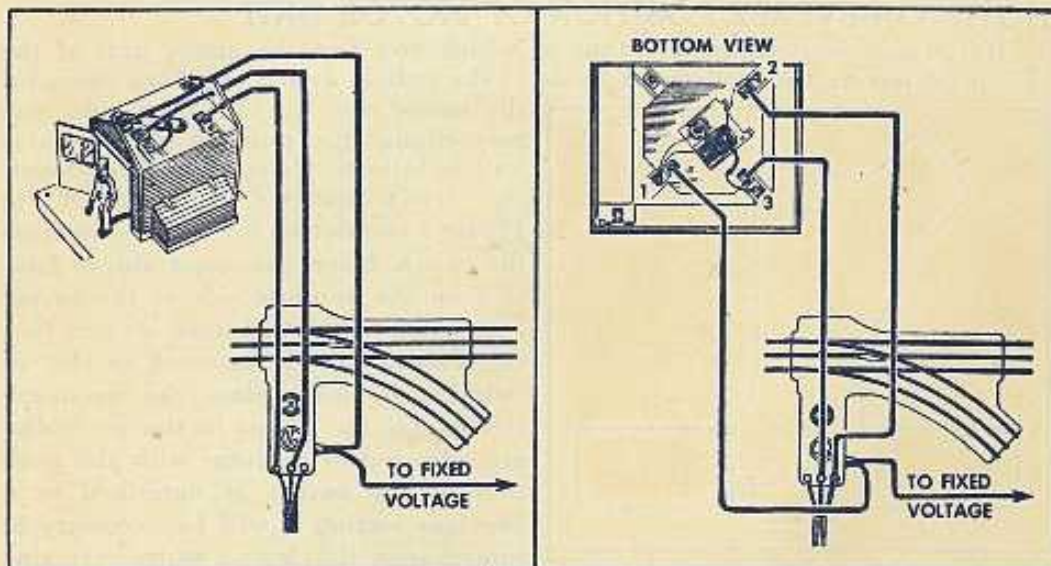


Figure 9—Left: How to Connect 145 Gateman to 022 Switches.
 Right: How to Connect 445 Switch Tower to 022 Switches.

In Figure 9 the accessories are shown connected to fixed voltage through the switch fixed voltage plug. If this voltage is too high, track voltage can be used instead by connecting the power wire to No. 1 clip of a track lockon instead of the fixed voltage plug.

The control rails and mechanism of No. 022 switches can be used for several other interesting applications. If the outside posts of the switches are interconnected as shown in Figure 10, the switches will control each other. Train

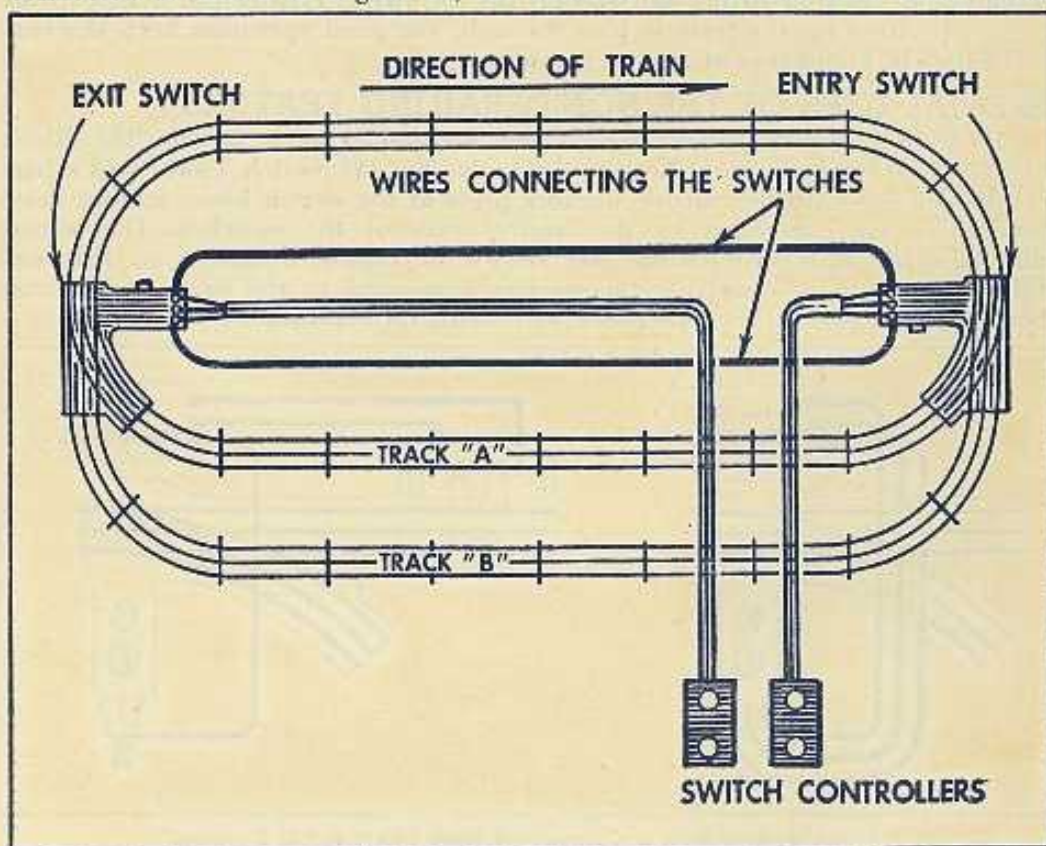


Figure 10—How to Inter-Connect Two Switches to Control Each Other.

leaving track section 'A' operates the non-derailing device in the 'exit' switch, throwing it to the position which allows the train to proceed onto the single track. Simultaneously the 'entry' switch is thrown to the position to allow the train to enter track section 'B'. As the train leaves section 'B' it will again throw both switches, but this time to the opposite direction, thus enabling it to go back into section 'A' on the next circuit of the track.

MAINTENANCE OF SWITCHES

Lionel switches have been designed to be as simple and foolproof as possible. Keep the switches clean and free from interfering particles, paying particular attention to the non-derailing control rails. Do not remove the fibre pins in the switch.

To take out a burned-out lamp on the switch remove the lamp hood by grasping firmly and pulling upward. Remove lamp by pushing it in and then turning it slightly to the left. Replace with lamp No. L145. Be sure to replace the lamp hood in correct position as described on previous page. In replacing the lamps in the controller, use No. L432(R) for the red lamp and No. L432(G) for the green lamp.

SERVICE INFORMATION

These switches were thoroughly inspected before they left the factory and are in perfect condition. Like all Lionel products they are guaranteed against faulty material or workmanship to the extent that if any such defective switch is returned to Lionel Service Department or to any Lionel Authorized Service Station within one year of purchase it will be repaired or replaced. If in the future they should ever require servicing you may either send them to the Factory Service Department, or take them to your nearest Lionel Service Station listed in the general instruction booklet.

If you decide to mail the switches to us, be sure to pack carefully to avoid damage in transit. Use the original box, if possible, and enclose in another corrugated box or strong container. A letter in a stamped envelope stating fully the service desired *must be pasted to the outside wrapper* since postal regulations do not permit a letter or any written message to be placed inside the package.

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