
**Recommended Vital Design Guidelines for Field Track Blocking at Interlockings
and Controlled Points**

Revised 2025 (3 Pages)

A. Purpose

This Manual Part recommends vital circuit design guidelines for field track blocking at interlockings and controlled points. It does not provide guidance for the implementation of track blocking at a control office.

B. General

1. The vital circuit design guidelines provided in this Manual Part shall also apply to equivalent vital software applications.
2. The vital circuit design guidelines provided in this Manual Part represent one method for implementing field track blocking. Certain features of the representative design may vary depending on the design standards and operating practices of the individual railroads.

C. Design

1. During normal operation, it is customary to remove a section of track from service for routine maintenance or other purposes. To support these activities, field track blocking is implemented to prevent the inadvertent display of permissive signal aspects into blocked track sections . For example:

When track 1 west of signal 11E at C.P. Brannen is blocked, signals 1W, 1WD and 2W must not display permissive aspects for routes exiting at track #1. In addition, route initiation and associated locking sequences should be inhibited. Refer to Manual Part Drawing 16.50.2, Line Circuit in Traffic Control Systems.

2. Field track blocking may be provided on all routes, or on specific signaled routes through the interlocking or controlled points.
3. Field track blocking may be initiated from the control office or from the local control panel at the field location.
 - a. Field track blocking is normally initiated from the control office in the form of a control code transmitted to the location where the track block is applied.
 - b. Normally, Track Blocking Request Relay (TBZR) in the field is energized, indicating that track blocking is not in effect.

4. When the dispatcher initiates a track block request, a control code (non-vital) is sent to the field resulting in the de-energizing of a corresponding TBZR, which in turn de-energizes a Track Block Stick Relay (TBSR).

The track section to the west of signal 11E at CP Brannen will remain unblocked, as long as the 11ETBSR relay remains energized over the front contact of 11ETBZR or through the maintained contact on the local control panel.

5. When field track blocking is in effect, route initiation and display of proceed aspects from any signal leading to the blocked track will be prevented.

In this example, front contacts of the TBSR are used in the route check network and the home network to inhibit the operation of both networks when the TBSR is de-energized and the route is lined into the section of track that is blocked. See Manual Part 16.4.4 Recommended Vital Circuit Design Guidelines for Route Check Networks at Interlockings and Control Points.

6. An indication for the section of track that is blocked shall be sent from the field to the control office and should be displayed on the local control panel.

- a. These indications should be derived directly from the back contact of the corresponding TBSR.

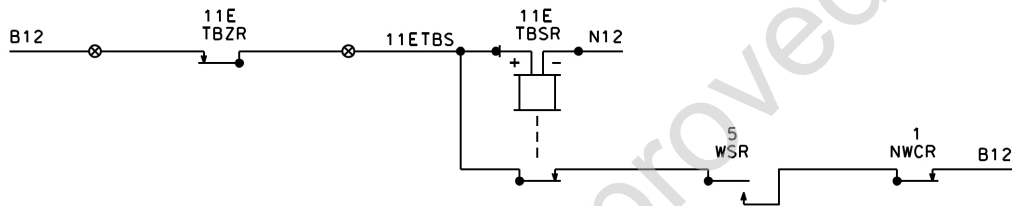
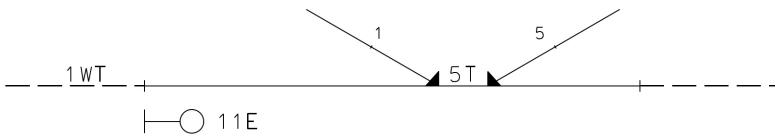
7. For some railroads, the design of the track block circuit requires a feature to prevent the dispatcher from inadvertently blocking a section of track that has a route established into it. Refer to Figure 16440-1.

8. Where code systems deliver the field track blocking function, consideration shall be given in the design to prevent the code system from unintended removal of the field track blocking. For example, track blocking may be applied with one control and removed with two controls.

- a. Where track blocking logic is provided by a vital processor, all track blocks shall default to the blocked state when the processor is powered up or reset/restarted.

- b. Automatic removal of the track blocks by the control office shall be prevented when communications with the office are lost or re-established after a system startup/reset cycle occurs.

9. Where redundant processor systems are employed, design shall ensure synchronization of track blocking states to ensure that track blocks are not removed by the system that assumes control during system transfer. Examples of a Boolean equivalent expression and a ladder logic diagram for the 11ETBSR relay circuit are shown in Figure 16440-1:



BOOLEAN EQUIVALENT

$$11ETBSR = 11ETBZR + 11ETBSR * .N.5WSR * 1NWCR$$

LADDER LOGIC EQUIVALENT

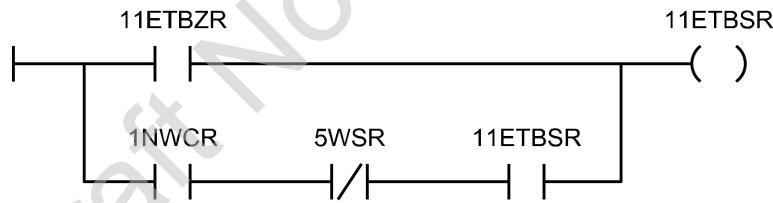


Figure 16440-1: Example Track Block Stick Circuit