

PART 236 - RULES, STANDARDS, AND INSTRUCTIONS GOVERNING THE INSTALLATION, INSPECTION, MAINTENANCE, AND REPAIR OF SIGNAL AND TRAIN CONTROL SYSTEMS, DEVICES, AND APPLIANCES.

§ 236.0 Applicability of this Part.

This section specifies that the Rules, Standards and Instructions (RS&I) apply to each railroad that operates on standard gauge which is part of the general system of railroad transportation. Further, this section also prescribes the criteria requiring the installation of block signal systems, automatic train stop, train control, or cab signal systems.

Application:

This rule requires that a block signal system complying with the RS&I or a manual block system complying with the provisions of this section be installed where passenger trains operate at 60 or more miles per hour or freight trains operate at 50 or more miles per hour. Further, an automatic train stop, train control, or cab signal system shall be installed where any train operates at 80 or more miles per hour.

This section details how a manual block system shall operate and requires that it be permanently in effect, i.e., all trains must be operated by manual block system rules.

A manual block system is a method of train operation by mandatory directives or voice rules, in non signaled territory (or against current of traffic), which authorizes movements between defined limits or blocks, and conforms with §236.0(c)(1),(2),(3),&(4).

The individual operating rules of a carrier will determine if the method of operation conforms to a manual block system.

Note that a methodology, such as the track warrant control rules of some carrier's, which permit and establish yard limits within designated blocks; does not conform to the above manual block system, because trains are permitted to enter the main track within designated yard limit areas without direct authority or regard for block occupancy.

This section does not authorize the discontinuance of any signal system without FRA approval.

CLASSIFICATION OF DEFECTS

236 0000 01 Block signal system not installed or manual block system not permanently in effect on line where freight train operates at 50 or more miles per hour.

236 0000 02 Block signal system not installed or manual block system not permanently in effect on line where passenger train operates at 60 or more miles per hour.

236 0000 03 Manual block system provided where freight train operates at 50 or more miles per hour not permanently in effect.

236 0000 04 Manual block system provided where passenger train operates at 60 or more miles per hour not permanently in effect.

236 0000 05 Manual block system permits a passenger train to be admitted without flag protection to a block occupied by another train.

236 0000 06 Manual block system permits a train to be admitted without flag protection to a block occupied by a passenger train.

236 0000 07 Manual block system permits a train to be admitted without flag protection to a block occupied by an opposing train.

236 0000 08 Manual block system permits a freight train entering a block occupied by preceding freight train to exceed a speed that will permit stopping within one-half the range of vision.

236 0000 09 Manual block system permits a freight train entering a block occupied by preceding freight train to exceed 20 miles per hour.

236 0000 10 Automatic cab signal, train stop, or train control system not provided where train operates at 80 or more miles per hour.

Subpart A – Rules and Instructions All Systems General

§ 236.1 Plans, where kept.

Plans are necessary for the installation, inspection, maintenance, and repair of signal systems and are required to be correct and legible.

Application:

Track layout plan, circuit plan including circuits to approach signals, and locking sheet and dog chart where mechanical locking is used, shall be kept at each interlocking.

Circuit plan including circuits to approach signals shall be kept at each controlled point.

Circuit plans shall be kept at each automatic signal in automatic block signal territory, traffic control territory, automatic train stop, train control, or signal territory in other systems such as spring switch protection, slide protection, etc.

Plans are required to be legible and correct. Plans that are torn, faded, or those having experienced more than one change in colored pencil are not considered to be legible and correct.

CLASSIFICATION OF DEFECTS

- 236 0001 01 Track layout plan not kept at interlocking.
- 236 0001 02 Circuit plan not kept at interlocking.
- 236 0001 03 Locking sheet and dog chart not kept at interlocking where mechanical locking is used.
- 236 0001 04 Circuit plan not kept at controlled point.
- 236 0001 05 Circuit plan not kept at automatic signal.
- 236 0001 06 Track layout plan for interlocking not correct.
- 236 0001 07 Circuit plan for interlocking not correct.
- 236 0001 08 Locking sheet and dog chart for interlocking where mechanical locking is used not correct.
- 236 0001 09 Circuit plan for controlled point not correct.
- 236 0001 10 Circuit plan for automatic signal not correct.

236	0001	11	Profile plan not correct. (Includes plan not drawn to scale or not showing location of all signals, grades and alinement).
236	0001	12	Track layout plan for interlocking not legible.
236	0001	13	Circuit plan for interlocking not legible.
236	0001	14	Locking sheet and dog chart for interlocking not legible.
236	0001	15	Circuit plan for controlled point not legible.
236	0001	16	Circuit plan for automatic signal not legible.
236	0001	17	Profile plan not legible.
236	0001	18	Profile plan not available.

§ 236.2 Grounds.

Vital circuits shall be kept free of grounds equal to or in excess of 75% of the release value of relay or electromagnetic device in circuits. Track circuits, common return wires of single-wire, single-break signal control circuits grounded by design, and alternating current power distribution circuits grounded in the interest of safety are excluded.

Application:

Vital circuits designed to be ground free are required to be kept free of any ground current equal to or in excess of 75% of the release value of any relay or electromagnetic device in the circuit. There is no difference between an accidental or intentional ground.

Extreme care shall be exercised when testing for grounds. Carrier employee shall perform test. Testing shall not be conducted while trains are approaching or passing, and the meter shall be watched at all times. If the meter indicates the energization of a relay, the meter shall be immediately disconnected. An unobserved meter shall never be left connected to a vital circuit and ground.

Ground test shall be performed at every instrument case or house inspected. The preliminary test shall be with a voltmeter connected from line or track arrester ground to a track circuit which will prove the meter is operating and the integrity of the ground circuit.

AC power shall be interrupted during tests in order to check AC lighting circuits having DC stand by.

These requirements apply to highway-rail grade crossing warning devices, dragging equipment protection, slide detectors, etc., where signal control circuits are selected through relays energized by the power supply of such protection.

The railroad should take prompt action to correct a ground.

CLASSIFICATION OF DEFECTS

236	0002	01	Circuit grounded sufficiently to permit flow of current equal to or in excess of 75% of release value of relay or other electromagnetic device in circuit.
-----	------	----	--

§ 236.3 Locking of signal apparatus housing.

Housings of signal apparatus shall be secured to prevent unauthorized entry.

Application:

All outdoor housing of mechanical or power-operated devices used to operate signal or interlocked units must be kept locked, sealed, or secured. This includes signal cases, instrument cases, switch circuit controllers, facing-point locks, switch machines, junction or terminal boxes and battery boxes.

Power interlocking machine cabinets shall be locked or sealed to such extent that entry to or manipulation of the devices contained in the cabinet can only be accomplished by unlocking the lock or breaking the seal.

Time release and exposed electric locks must be locked or sealed.

Cabinets or cases containing apparatus designed to release locking in emergencies shall be locked or sealed.

Wrench or nut-locking with bell is acceptable.

CLASSIFICATION OF DEFECTS

236	0003	01	Signal case not secured against unauthorized entry.
236	0003	02	Instrument case not secured against unauthorized entry.
236	0003	03	Power interlocking machine cabinet not secured against unauthorized entry.
236	0003	04	Time release not secured against unauthorized entry.
236	0003	05	Exposed electric lock not secured against unauthorized entry.

§ 236.4 Interference with normal functioning of device.

Safety of train operation must be provided before interfering with the normal functioning of any device.

Application:

The intent of this rule is to insure carriers maintain the integrity of signal systems by prohibiting procedures or practices which defeat or nullify the minimum requirements of the RS&I.

Interference is any condition that circumvents, hinders, impedes, or diminishes whatsoever the intended protection of a device and may be accomplished by testing, installing, repairing, replacing, operating, or manipulating a signal component indicating or affecting the indication of safe passage for trains. There is no difference between accidental or intentional interference with respect to the enforcement of this rule.

Tests of signal equipment should not be conducted until it has been ascertained no train movements will be affected. No test should be conducted during the passage of a train, Hi-rail vehicle or motor car.

Areas where interference can occur include all components, devices, mechanisms, or apparatus in vital circuits including shunt and fouling wires of switches and turnouts.

Unless measures are taken to provide safety of train operation, the following are some examples of interference with various types of equipment and procedures:

1. Testing such as falsely energizing relays, jumpering contacts, turning relays upside down; operating hand-operated switch, adjusting switch circuit controller or shunt fouling circuit, in advance of approaching train; operating power-operated switch without permission of dispatcher or operator; performing ground

tests while train is approaching or moving over power-operated switch; defeating predetermined time interval of time release or time relay; and release of electric or mechanical locking.

2. Performing efficiency tests by removal of lamp bulbs that do not provide an approach aspect to the darkened signal; placing a shunt in advance of a signal after a train has passed its approach signal.
3. At interlockings, the unnecessary breaking of seals to force indications, defeat time, approach or route locking requirements. Note: The procedure to move trains through interlockings under flag protection and appropriate rules is not considered interference.
4. Defeat of protective features to avoid train delay or to expedite train movements such as disconnecting shunt or fouling wires, turning relays upside down, jumpering contacts, falsely energizing relays or circuits, or releasing electrical locking.

The following will be considered interference under all circumstances:

Performing repairs and replacements of equipment or apparatus such as relays, cables, and conductors without proper testing afterwards; replacing rails in shunt fouling circuits leaving fouling wires and rail bonds broken and disconnected; replacing ties under switch machines or switch circuit controllers and leaving the circuit controller improperly adjusted; and leaving a switch in mid-stroke position.

Excerpt from letter of January 3, 1985,
From: FRA Associate Administrator, Mr. J. W. Walsh,
To: Mr. L. M. Himmel, Sr., Executive Director
Communications and Signal Division, AAR

Section 236.4 Interference with normal functioning of device.

The AAR requested that during operational tests of locomotive engineers, a signal made dark without establishing an approach aspect not be considered as interference. The AAR recommends that FRA's Technical Manual be revised to make the requirements of this rule applicable only at controlled points and automatic interlockings.

This rule imposes on each carrier the requirement to prohibit procedures or practices which defeat or nullify the safety of its signal systems without first taking measures to provide for the safety of train operations.

The comments of the AAR clearly indicated that a dark signal is regarded as the most restrictive indication that can be given at that signal and that an engineer is required to act on the preview of the dark signal to reduce train speed or stop in compliance with the restrictive indication.

Section 236.23 requires that a yellow light, a lunar light, or a series of lights or a semaphore blade in the upper or lower quadrant at an angle of 45 degrees to the vertical be used to indicate that speed is to be restricted and stop may be required.

The FRA cannot condone a practice that is hazardous to the safety of train operation or that is contrary to its regulations. Accordingly, an aspect complying with Section 236.23 is required in approach to any signal made dark for operational tests.

CLASSIFICATION OF DEFECTS

236 0004 01 Interference with normal functioning of device without taking measures to provide safety of train operation.

§ 236.5 Design of control circuits on closed circuit principle.

This rule requires that control circuits which affect the safety of train operation be designed on the closed circuit principle.

Application:

Excludes circuits for roadway equipment of intermittent automatic train-stop systems, shunt fouling circuits, and normally open track circuits on auxiliary tracks used to approach light wayside signals.

Includes all vital circuits and track circuits through which signal control circuits are selected. Circuits should be so designed that failure of any part or component of the circuit will cause signals to display their most restrictive aspects.

CLASSIFICATION OF DEFECTS

236 0005 01 Control circuit, the function of which affects safety of train operation, not designed on closed circuit principle.

§ 236.6 Hand-operated switch equipped with switch circuit controller.

Hand-operated switch equipped with switch circuit controller connected to the point, or hand-operated switch equipped with facing-point lock and circuit controller, is required to shunt track circuit or open control circuits, or both, when point is open one-fourth inch or more on facing-point switch and three-eighths inch or more on trailing-point switch. Facing-point lock shall be so adjusted that it cannot be locked when point is so opened. Switch circuit controllers, facing-point locks, and switch-and-lock movements, and their connections must be securely fastened in place.

Contacts must open at least one-sixteenth inch when the contacts are fully open. Where switch circuit controller is connected to the point, the switch circuit controller shall be connected to the normally closed switch point.

The FRA has in the past and will continue to require each switch circuit controller to be connected to the switch point over which train movements are governed by signal indications. The utilization of a rigid front rod can meet this requirement.

Application:

This rule does not apply to power-operated switches, spring switches, or to the electric lock mechanisms on hand-operated switches.

Test should be made by placing appropriate gage between point and stock rail, six inches from the end of the point, and applying pressure against the gage until it cannot be removed.

Where control circuits are opened through switch circuit controller or through switch repeating relay, it is not a requirement that shunt wires be provided or that shunt wires be doubled.

CLASSIFICATION OF DEFECTS

236 0006 01 Switch circuit controller on hand-operated facing-point switch not adjusted to shunt track circuit or open control circuits when switch point is open one-fourth inch or more.

236 0006 02 Switch circuit controller on hand-operated trailing-point switch not adjusted to shunt track circuit or open control circuits when switch point is open three-eighths inch or more.

- 236 0006 03 Hand-operated facing-point switch equipped with facing-point lock and circuit controller can be locked when switch point is open one-fourth inch or more.
- 236 0006 04 Hand-operated trailing-point switch equipped with facing-point lock and circuit controller can be locked when switch point is open three-eighths inch or more.
- 236 0006 05 Switch circuit controller not securely fastened in place.
- 236 0006 06 Facing-point lock not securely fastened in place.
- 236 0006 07 Switch-and-lock movement not securely fastened in place.
- 236 0006 08 Contact opening of switch circuit controller contact less than one-sixteenth inch.
- 236 0006 09 Switch circuit controller connections not securely fastened.
- 236 0006 10 Switch-and-lock movement connections not securely fastened.
- 236 0006 11 Facing-point lock connections not securely fastened.
- 236 0006 12 Switch circuit controller not connected to normally closed switch point.

§ 236.7 Circuit controller operated by switch-and-lock movement.

Circuit controller operated by switch-and-lock movement is required to be maintained so that normally open contacts will remain closed and normally closed contacts will remain open until switch is locked.

Application:

Applies to hand-operated, mechanical, or power-operated switch-and-lock movements including such machines as models M-22, M-23, 5, 55, T-20, etc. Before locking bar is completely withdrawn from lock rod, normally closed contacts must open and normally open contacts must close and remain so until locking bar has again engaged lock rod.

CLASSIFICATION OF DEFECTS

- 236 0007 01 Contacts of circuit controller operated by switch-and-lock movement not adjusted so that normally open contacts remain closed until the switch is locked.
- 236 0007 02 Contacts of circuit controller operated by switch-and-lock movement not adjusted so that normally closed contacts remain open until the switch is locked.

§ 236.8 Operating characteristics of electromagnetic, electronic, or electrical apparatus.

Operating characteristics of electromagnetic, electronic, or electrical apparatus in service shall be in accordance with the limits within which it is designed to operate.

Application:

Rules 101, 102, 105, 106, 107, 108, 109, 551, 552, 588, and 589 address those devices so important to safety of train operation that periodic tests are required to ascertain that operating characteristics remain unchanged.

Applies to all electromagnetic, electronic, or electrical devices used in or associated with vital circuitry or switch machine operation.

Each carrier should have specifications setting forth the pick-up values, release values, working values, and condemning limits of these values for all electromagnetic, electronic, or electrical devices in use on its property. Some examples of deficient operating characteristics are:

- a. Pick-up value too high.
- b. Pick-up value too low.
- c. Release value too high.
- d. Release value too low.

Manufacturer specifications or carrier standards compatible with manufacturer specifications shall be used to determine such values.

Some examples of electromagnetic devices covered by this rule not requiring periodic tests are:

- a. Switch machine controllers.
- b. Thermal relays of switch machine controllers.
- c. Indicating magnets on interlocking machines.
- d. Coils of forced drop electric locks.

CLASSIFICATION OF DEFECTS

236 0008 01 Pick-up value of electromagnetic device not in accordance with the limits within which it is designed to operate.

236 0008 02 Drop-away value of electromagnetic device not in accordance with the limits within which is it designed to operate.

236 0008 03 Working value of electronic or electrical apparatus not in accordance with the limits within which the apparatus is designed to operate.

§ 236.9 Selection of circuits through indicating or annunciating instruments.

Signal control and electric locking circuits are required to be selected through contacts of safety relays.

Application:

This rule does not prohibit the use of annunciating or indicating devices, but does prohibit selecting vital circuits through contacts operated by such devices.

Some examples of annunciating or indicating devices are:

- a. Switch indicator
- b. Block indicator
- c. Cab indicator
- d. Approach indicator
- e. Track indicator

- f. OSing device
- g. Semaphore indicator
- h. Manually-operated calling-on device.

Test such devices that are in non-compliance by manually moving indicator to energized position and observing if armature and contacts are actuated. If so, contacts of such devices may not be used in vital circuitry.

CLASSIFICATION OF DEFECTS

236 0009 01 Signal control circuit selected through contacts of indicator or annunciator in which the indicating element attached to the armature is arranged so that it can in itself cause improper operation of the armature.

236 0009 02 Electric locking circuit selected through contacts of indicator or annunciator in which the indicating element attached to the armature is arranged so that it can in itself cause improper operation of the armature.

§ 236.10 Electric locks, force drop type; where required.

This rule requires that electric locks applied to new installations and new electric locks applied to existing installations be of the forced-drop type.

Application:

Applies to all electric locks installed after October 1, 1950, on new locations.

Applies to all electric locks on hand-operated switches and interlocking machines.

Tests should be made to determine that the locking dog is forced down into the locking sector. This test can be made by observing movement of the locking dog as the switch lock is locked in normal position.

Since most forced-drop type locks are spring loaded, they should be checked to determine that the spring is of sufficient strength so that normal operation does not release the locking dog unless the lock is energized.

A non-forced-drop electric lock may be removed from service, repaired and restored to service only when replacing another non-forced-drop type electric lock.

CLASSIFICATION OF DEFECTS

236 0010 01 Electric lock not forced-drop type. (Applies only to electric lock installed after October 1, 1950.)

236 0010 02 New electric lock applied to existing installation not forced-drop type.

§ 236.11 Adjustment, repair, or replacement of component.

This rule requires a carrier to determine the cause of a signal aspect that is not in accordance with known operating conditions and requires that a failed signaling component which adversely affects safety of train operation be adjusted, repaired, or replaced without undue delay.

Application:

A signal aspect "not in correspondence with known operating conditions," means a signal aspect other than that intended by normal signal system operation.

A carrier is required to determine the cause of each "stop" or "stop and proceed" aspect resulting from an unknown condition. If that condition is the result of the failure of a signaling component and is a hazard to the safety of train operation, corrective action is required before the next train movement. Should train operation require night-time or weekend corrections, they must be made.

Conditions which cause false stop or false restrictive indications may cause inconvenience and additional expense to train movements. Examples of such conditions that do not necessarily pose a threat to safety of train operation are a burned out lamp, a broken track circuit connector, or a broken line wire.

Applies to adjustable components which, when improperly adjusted, creates a safety hazard such as circuit controller, point detector and lock rod adjustments exceeding the requirements; insufficient predetermined time intervals; and excessive track circuit values.

Applies to components which, if not repaired, creates a safety hazard such as grounded circuits; insecure circuit controllers, switch machines, pipeline carriers and cranks; and bent, worn, or insecure connecting rods, lock rods, and point detector rods.

Applies to components which, if not replaced, creates a safety hazard such as broken connecting rod, lock rod, point detector rod, pipeline, or crank; broken fouling wires, shunt wires, and bond wires in fouling circuit; defective relays, cable, and conductors.

Test equipment and instruments are excluded.

CLASSIFICATION OF DEFECTS

236 0011 01 Component, essential to the safety of train operation, failing to perform its intended function not adjusted without undue delay.

236 0011 02 Component, essential to the safety of train operation, failing to perform its intended function not repaired without undue delay.

236 0011 03 Component, essential to the safety of train operation, failing to perform its intended function not replaced without undue delay.

236 0011 04 Cause not determined for signal component out of correspondence with known operating conditions.

§ 236.12 Spring switch signal protection, where required.

This rule prescribes signal protection for spring switches in interlockings and for spring switches installed after October 1, 1950, in automatic block signal, train stop, train control or cab signal territory where movements over the switch exceed 20 miles per hour.

Application:

This rule prescribes where spring switch protection is required. Rules 236.13 and 236.14 prescribes how it will operate. This rule prescribes where spring switch protection is required. Rules 236.13 and 236.14 prescribes how it will operate.

On all spring switches installed after October 1, 1950, in automatic block signal, train stop, train control, and cab signal territory where the speed exceeds 20 miles per hour, signal protection is required in the facing and both trailing routes.

Protection is required only with the current of traffic on track signaled for movement in one direction.

Protection is required for movements against the current of traffic from the reverse main of main tracks to a single main track.

CLASSIFICATION OF DEFECTS

236 0012 01 Signal protection not provided for facing movements through spring switch within interlocking limits.

236 0012 02 Signal protection not provided for trailing movements through spring switch within interlocking limits.

236 0012 03 Signal protection not provided for trailing movements through spring switch in automatic block signal, train stop, train control, or cab signal territory where train movements over switch exceed 20 m.p.h. (Applies only to spring switch installed after October 1, 1950.)

236 0012 04 Signal protection not provided for facing movements over spring switch in track signaled for movements in both directions within automatic block signal, train stop, train control, or cab signal territory where train movements over switch exceed 20 m.p.h. (Applies only to spring switch installed after October 1, 1950.)

§ 236.13 Spring switch; selection of signal control circuits through circuit controller.

This rule requires that control circuits of signals governing facing movements over a main track spring switch be selected through the switch circuit controller or a relay repeating the position of such circuit controller.

Application:

This rule applies to interlockings, automatic block signal and other protective systems. Rules 236.303 and 236.342 apply to spring switches in interlocking and traffic control systems.

This rule requires point protection for facing movements over spring switch. Trailing protection is not required.

Control circuits for facing movements must be selected through either switch circuit controller or track relay where switch shunting circuit is used.

This rule applies to spring switch provided with signal protection in non-signaled territory. It does not require such protection be provided, but if protection is provided, it must meet these requirements.

Test of spring switch shall be made by placing a one-fourth inch gage six inches from the end of the switch point on either the normal or reverse side and then placing the spring switch throw lever in either the full normal or reverse position as appropriate.

CLASSIFICATION OF DEFECTS

236 0013 01 Control circuits of signal governing facing movements over main track spring switch not selected through contacts of switch circuit controller or through contacts of relay repeating the position of switch circuit controller.

236 0013 02 Signal governing facing movements over main-track spring switch does not display its most restrictive aspect when normally closed switch point is open one-fourth inch or more. (Does not apply where separate aspect is displayed for facing movement over the switch in the reverse position.)

236 0013 03 Signal governing facing movements over main-track spring switch in both the normal and reverse positions does not display its most restrictive aspect when the switch points are open one-fourth inch or more from either the normal or reverse position.

§ 236.14 Spring switch signal protecting; requirements.

This rule prescribes how spring switch signal protection required by Rule 236.12 shall operate in automatic block signal territory when it governs movements with the current of traffic from a siding to main track signaled for movements in one direction; when it governs movements from a siding to a main track signaled for movements in either direction; and when it governs movements from the end of double track territory signaled for movements in one direction with the current of traffic to single track territory. It permits the use of approach or time locking.

Application:

Applies to automatic block signal territory only.

Paragraph (a) sets forth the requirements for signals governing movements from siding to main track signaled for movements with the current of traffic.

Paragraph (b) sets forth the requirements for signals governing movements against the current of traffic from the reverse main of main tracks to single track or from siding to main track signaled for movements in either direction when block into which signal governs is occupied by preceding trains or by opposing trains.

Paragraph (c) sets forth the requirements for signals governing movements against the current of traffic from the reverse main of main tracks to single track or from siding to main track signaled for movements in either direction when a train is approaching the switch within 1,500 feet in approach of the approach signal located stopping distance from the main track signal governing trailing movements over the spring switch.

Tests to determine compliance with paragraph (a) should be conducted by placing a shunt in the block of the signal governing movements from siding to main track. The signal should then be observed to determine its aspects is not more favorable than "Proceed at Restricted Speed."

Tests should then be made by shunting each track circuit on the main track, from at least 1,500 feet in approach to the approach signal to the main track signal governing trailing movements over the switch. The leave siding signal should be observed to determine that its aspect is "STOP" when each track circuit is shunted. This test procedure is the same whether the main track signal governing trailing movements over the switch is located adjacent to the leave siding signal or located a mile or more in approach of the switch.

A time release, push button or key release may be provided that, when operated, causes the main track signal to indicate "Stop" or "Stop and Proceed" and will permit the leave siding signal to clear after a predetermined time interval.

Test to determine compliance with paragraph (b) should be conducted by making an operational shunt test in approach to and then in the block of the main track signal governing trailing movements over the switch into single track and observing the reverse main or leave siding signal aspect to determine it is not more favorable than "Proceed at Restricted Speed" for a following movement. Test should then be made

by making an operational shunt test on single track in the facing direction and observing the reverse main or leave siding signal aspect to determine it is "stop" for an opposing movement.

Tests to determine compliance with paragraph © should be conducted by making an operational shunt test from at least 1,500 feet in approach to the approach signal to the main track signal governing trailing movements over the switch and observing the reverse main or leave siding signal aspect to determine that it indicates "Stop" until the switch is passed.

CLASSIFICATION OF DEFECTS

236 0014 01 Indication of signal governing movements from siding to main track with the current of traffic on track signaled for movements in only one direction through spring switch in automatic block signal territory, less restrictive than "Proceed at Restricted Speed" when the block, into which movements are governed by the signal, is occupied.

236 0014 02 Indication of signal governing movements from siding to main track with the current of traffic on track signaled for movements in only one direction through spring switch in automatic block signal territory, not "Stop" when main track is occupied by a train approaching switch within at least 1,500 feet in approach of the approach signal for the main track signal governing trailing movements over switch.

236 0014 03 Indication of signal governing movements against the current of traffic from the reverse main of main tracks to single track through spring switch in automatic block signal territory, less restrictive than "Proceed at Restricted Speed" when the block, into which movements are governed by the signal, is occupied by a preceding train.

236 0014 04 Indication of signal governing movements from siding to main track signaled for movements in either direction, through spring switch in automatic block signal territory, less restrictive than "Proceed at Restricted Speed" when the block, into which movements are governed by the signal, is occupied by a preceding train.

236 0014 05 Indication of signal governing movements against the current of traffic from reverse main of main tracks to single track through spring switch in automatic block signal territory, not "Stop" when the block on the single track into which the signal governs is occupied by an opposing train.

236 0014 06 Indication of signal governing movements from siding to main track signaled for movements in either direction through spring switch in automatic block signal territory, not "Stop" when the block on the single track into which the signal governs is occupied by an opposing train.

236 0014 07 Indication of signal governing movements against the current of traffic from the reverse main of main tracks to single track through spring switch in automatic block signal territory, not "Stop" when the normal direction main track of the double track is occupied by a train approaching the switch within at least 1500 feet in approach of the approach signal for the main-track signal governing trailing movements over switch.

236 0014 08 Indication of signal governing movements from siding to main track signaled for movements in either direction through spring switch in automatic block signal territory, not "Stop" when the single track signaled for movements in both directions is occupied by a train approaching the switch within at least 1500 feet in approach of the approach signal for the main-track signal governing trailing movements over the switch.

236 0014 09 Indication of signal governing movements from siding to main track with the current of traffic on track signaled for movements in only one direction through spring switch in automatic block signal territory less restrictive than "Proceed at Restricted Speed" when the block into which movements are governed by the signal is occupied and approach or time locking is ineffective.

236 0014 10 Indication of signal governing movements from siding to main track, with the current of traffic, on track signaled for movements in only one direction through spring switch in automatic block signal territory, not "Stop" when main track is occupied by a train approaching switch within at least 1500 feet in approach of the approach signal for the main track signal governing trailing movements over the switch and approach or time locking is ineffective.

§ 236.15 Timetable instructions.

This rule requires automatic block, traffic control, train stop, train control, and cab signal territory be designated in timetable instructions.

Application:

May be published in either timetable or special instructions in any manner carrier chooses. Interlockings are not required to be so designated.

CLASSIFICATION OF DEFECTS

236	0015	01	Automatic block signal territory not designated in timetable instructions.
236	0015	02	Traffic control territory not designated in timetable instructions.
236	0015	03	Automatic train stop territory not designated in timetable instructions.
236	0015	04	Automatic train control territory not designated in timetable instructions.
236	0015	05	Automatic cab signal territory not designated in timetable instructions.

§ 236.16 Electric lock, main track releasing circuit.

This rule sets forth the requirements for main track releasing circuit for electric lock on hand- operated switch.

Application:

This rule does not require that a main line quick release circuit be installed at electrically locked switches.

However, where such circuits are installed, the rule prohibits the electric lock releasing circuit on the main track from being of such length that distance or curvature of track will prevent a crew member standing at the switch from observing a train or car occupying the releasing circuit.

The rule also requires that where the electric lock releasing circuit extends into the fouling section of turnout, train shall be prevented from occupying the fouling section by pipe- connected or independently operated, electrically locked derail at the clearance point. The releasing circuit shall be considered as extending into the fouling section if it extends further than the heel of the switch points.

CLASSIFICATION OF DEFECTS

236	0016	01	Length of electric lock releasing circuit on main track too long to permit crew member standing at the switch to see a train or car occupying the releasing circuit.
236	0016	02	Curvature of track on which electric lock releasing circuit is provided prevents crew member standing at the switch from seeing a train or car occupying the releasing circuit.

236 0016 03 Electric lock releasing circuit on main track extends into fouling circuit where the turnout is not equipped with a derail at the clearance point either pipe-connected to the switch or independently locked, electrically.

§ 236.17 Pipe for operating connections; requirements.

This rule prescribes steel or wrought-iron pipe one inch or larger for operating connections of pipe-connected appliances, with each joint fully screwed into coupling with each end of pipe secured by two rivets. Pipe shall be supported on carriers not more than 8 feet apart on tangent and curves of less than 2 degrees and not more than 7 feet apart on curves of more than 2 degrees. Pipeline shall be properly aligned and compensated and couplings shall not foul carriers. Up-and-down rods of mechanically operated signals may be three-fourths inch pipe or solid rod.

Application:

Steel or wrought-iron pipe prescribed by this rule is one-inch nominal inside diameter pipe, or 1.315 inch actual outside diameter pipe. Three-fourths inch pipe measures 1.05 inch actual outside diameter.

Pipelines should be operated and carefully observed for bowing when pipe is under compression. The pipeline shall be so installed that when a device is obstructed, the pipeline shall be prevented from bowing enough to permit latching of lever or full drive of power operated machine.

Carriers must be complete and properly assembled and spacing strictly adhered to. Pipeline must be kept in proper alinement and carrier foundations must be secure and permit no movement when pipeline is operated. Bent or damaged pipe is prohibited.

This rule does not apply to pipeline used as "helper rods" associated with power-operated switch machines.

CLASSIFICATION OF DEFECTS

236	0017	01	Operating connection for switch, derail, movable-point frog, facing-point lock, rail-locking device of movable bridge protected by interlocking or mechanically operated signal not made of steel or wrought-iron pipe one inch or larger, or member of equal strength. (Does not apply to up-and-down rod of mechanically operated signal.)
236	0017	02	Pipe not fully screwed into coupling.
236	0017	03	Pipe not riveted to pipe plug with 2 rivets.
236	0017	04	Pipe line out of alinement sufficiently to interfere with proper operation.
236	0017	05	Pipe line not properly compensated for temperature changes.
236	0017	06	Pipe line carriers spaced more than 8 feet apart on tangent or on curve of less than 2 degrees.
236	0017	07	Pipe line carriers spaced more than 7 feet apart on curve of 2 degrees or more.
236	0017	08	Coupling in pipe line fouls carrier.

Roadway Signals and Cab Signals

§ 236.21 Location of roadway signals.

This rule requires that roadway signal be positioned and aligned so that it is clearly associated with track it governs.

Application:

This rule requires that each signal be positioned and aligned so that the aspect it displays is clearly associated with the track it governs.

Inspectors must be alert for installation where it is possible to mistake the aspect of one signal for that of another.

The FRA relies heavily on the inspector's judgment whether the location and alignment of a signal complies with the intent of this rule.

CLASSIFICATION OF DEFECTS

236 0021 01 Roadway signal not positioned and aligned so that the indication aspects it displays can be clearly associated with the track it governs.

§ 236.22 Semaphore signal arm; clearance to other objects.

This rule requires one-half inch clearance between a semaphore arm and any object which may interfere with its operation.

Application:

Operational test of semaphore signal should be made to insure any object, including light unit, clears arm, and spectacle at least one-half inch throughout its arc of travel.

CLASSIFICATION OF DEFECTS

236 0022 01 Semaphore arm clears object that may interfere with its operation less than one-half inch.

§ 236.23 Aspects and indications.

This rule prescribes how aspects shall be shown, that each aspect shall be named and indicate action to be taken and the fundamental indications of the aspects.

It provides that signals may be qualified and prohibits the use of reflector lenses or buttons or other devices depending upon reflected light for visibility in lieu of signal aspects. It prescribes that the names, indications, and aspects be defined in the carrier's operating rule books or special instructions on file with the FRA.

Application:

Applies to all system. Each aspect and indication is required to be defined in carrier's rule book or special instructions.

Use of single white light is prohibited except for indicators of protective devices such as hotbox or dragging equipment detectors and for use as a qualifying appurtenance.

It is permissible for carriers to qualify red aspect to permit its use to indicate "Proceed at Restricted Speed" without requiring stop (see Rule 236.204). Yellow or lunar aspect must be used to approach such signals.

The absence of a semaphore arm on a semaphore signal is an imperfectly displayed signal and does not meet these requirements.

Fixed signal aspects, without lights or which depend for visibility upon a reflected light from an external source, is in violation of this part for night train operation.

The rule prohibits future installation of reflective devices in lieu of signal aspects such as the yellow triangle that will permit a higher speed when certain aspects are displayed.

The failure of a lamp in a light signal, a false restrictive position of a semaphore arm or the absence of a qualifying appurtenance shall not cause a signal to display a more favorable aspect than intended.

CLASSIFICATION OF DEFECTS

- | | | | |
|-----|------|----|---|
| 236 | 0023 | 01 | Aspects of roadway signal shown by means other than position of semaphore blade, color of lights, position of lights, flashing of lights, or combination thereof. |
| 236 | 0023 | 02 | Single white light used for aspect of roadway signal. |
| 236 | 0023 | 03 | Reflector lenses, buttons, or other devices which depend for visibility upon reflected light from an external source used in night aspect of roadway signal. |
| 236 | 0023 | 04 | Aspects of cab signals shown by means other than lights, illuminated letters, or illuminated numbers. |
| 236 | 0023 | 05 | Signal aspect not identified by name. |
| 236 | 0023 | 06 | Signal aspect does not indicate action to be taken. |
| 236 | 0023 | 07 | More than one name and indication applies to aspects indicating the same action to be taken. |
| 236 | 0023 | 08 | Same aspect used with more than one name and indication. |
| 236 | 0023 | 09 | Aspect other than a red light, a series of horizontal lights or a semaphore blade in the horizontal position, used to indicate stop. |
| 236 | 0023 | 10 | Aspect other than a yellow light, a lunar light, a series of lights, or a semaphore blade in the upper or lower quadrant at an angle of approximately 45 degrees to the vertical, used to indicate that speed is to be restricted and stop may be required. |
| 236 | 0023 | 11 | Aspect other than a green light, a series of vertical lights, or a semaphore blade in a vertical position in the upper or 60° or 90° in the lower quadrant, used to indicate proceed at authorized speed. |
| 236 | 0023 | 12 | Names, indications and aspects of roadway signals and/or cab signals not defined in carrier's block signal and interlocking rules currently in effect. |
| 236 | 0023 | 13 | Copy of modification of carrier's block signal and interlocking rules not filed with the Federal Railroad Administration within thirty days after such modification became effective. |
| 236 | 0023 | 14 | Night aspects of roadway signals not shown by lights. |

236 0023 15 Signal displays a less restrictive aspect than intended when arm of semaphore signal assumes a false restrictive position.

236 0023 16 Signal displays a less restrictive aspect than intended when a lamp fails in a light signal.

236 0023 17 Signal displays a less restrictive aspect than intended when a qualifying appurtenance is missing from its normal location on the signal mast.

§ 236.24 Spacing of roadway signals.

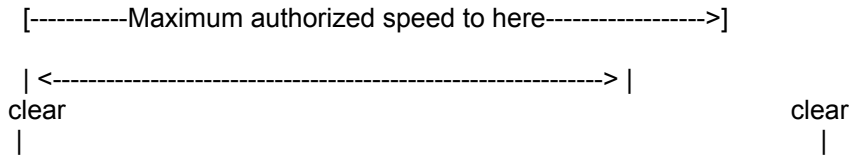
This rule requires signals to be adequately spaced to provide proper distances for reducing speeds or stopping by use of other than an emergency brake application before reaching the point where reduced speed or stopping is required.

This rule also requires that in ACS, ATCS and ATS territory, these braking distances be adequate to compensate for the 8 second delay time which is designed into almost all ACS, ATCS and ATS systems. Section 236.563 states in part, ". . . and the spacing of signals to meet the requirements of §236.24 shall take into consideration the delay time." Thus, the proper spacing of signals must also include the spacing of code change points so that a train may comply with the indications of a cab signal, train stop or train control system without using an emergency brake application before reaching the point where reduced speed or a stop is required.

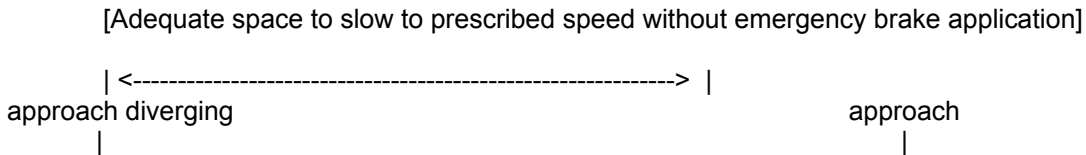
Application:

Carrier's braking distance charts shall be used to determine proper spacing. In event a carrier does not have a braking distance chart, braking tests may be required at suspected locations.

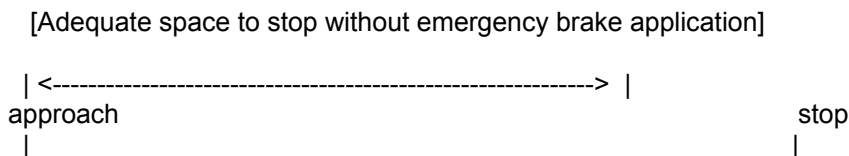
A proceed aspect authorizes maximum authorized speed to next signal without regard of preview of next signal:



A reduced speed aspect requires spacing adequate to slow to prescribed speed before reaching next signal:



An aspect requiring stop at next signal, whether operative or inoperative, requires spacing adequate to stop without emergency brake application before reaching next signal:



These requirements apply to all systems including protective devices such as slide protection, high water protection, movable bridges, spring switches, etc. Where speed is increased, profiles and circuit plans should be reviewed for proper braking distances.

Where yellow or lunar aspect does not provide stopping distance to stop aspect, an advance approach or successive restrictive signals are necessary.

CLASSIFICATION OF DEFECTS

236 0024 01 Roadway signal not located with respect to the next signal or signals in advance which governs train movements in the same direction, so that when it displays a restrictive aspect the indication of that aspect can be complied with by means of a brake application, other than an emergency application initiated at such signal, by stopping at the signal where a stop is required.

236 0024 02 Roadway signal not located with respect to the next signal in advance governing movements in the same direction, so that when it displays a restrictive aspect the indication of that aspect can be complied with by means of a brake application, other than an emergency application, initiated at such signal, by a reduction in speed to the rate prescribed by the next signal in advance.

§ 236.26 Buffing device, maintenance.

This rule requires that buffing device be so maintained that it cannot cause a signal to display a less restrictive aspect than intended.

Application:

Operational test should be made to observe that oil or air buffers operate properly.

In the event the buffing device causes a signal to display a less restrictive aspect than intended, a false proceed report shall be filed with the FRA.

CLASSIFICATION OF DEFECTS

236 0026 01 Buffing device causes signal to display a less restrictive aspect than intended.

Track Circuits

§ 236.51 Track circuit requirements.

This rule is the standard by which all track circuits which control home signals or locking circuits shall be designed and installed. This rule is not applicable to track circuits which do not affect the safety of train operation.

Application:

Applies to all types of track circuits which control home signals or locking circuits. Does not apply to track circuits that do not affect safety of train operation such as annunciator circuits or approach lighting circuits on non-signalized sidings.

Automatic train stop, train control, and cab signal systems track circuits required to be de-energized under this rule include those superimposed on track circuits of the conjunctive system.

Maximum authorized speed through a turnout equipped with shunt fouling circuit is 45 mph. Exception should not be taken to series or parallel type track circuits where a small section of the turnout is provided with a shunt fouling circuit.

Track relay shall be de-energized or device that functions as a track relay shall be in its most restrictive state when a rail is broken or a rail or switch frog is removed; when any part of the track circuit or fouling section is occupied by a train, locomotive or car; and, where switch shunting circuit is used, when switch is not in proper position, facing point lock is not locked, or independently operated derail is not in derailing position.

It is not a violation if the track relay is not de-energized or the device that functions as a track relay is not in its most restrictive state when a rail is broken or removed in a shunt fouling circuit; when a break occurs between the end of a rail and track circuit connector, within the limits of a rail-joint bond appliance, or other protective device; as a result of leakage current or foreign current in the rear of a point where a break occurs; or as a result of sand, rust, dirt, grease or foreign matter preventing shunting.

Where sand, rust, dirt, grease, or other foreign matter is known to prevent or possibly prevent effective shunting, the carrier is required to take adequate measures to safeguard safety of train operation.

Track relay must be in de-energized position or device that functions as a track relay must be in its most restrictive state when a rail is removed.

Non-shunting sections caused by insulated rail joint stagger on short track circuits and in connection with crossing frogs are one of the most overlooked variances with this rule. Staggered insulated rail joints in excess of five (5) feet create the possibility of cars or locomotives occupying part of a track circuit undetected.

CLASSIFICATION OF DEFECTS

236 0051 01 Track relay not in de-energized position or device that functions as track relay not in its most restrictive state in rear of broken rail.

236 0051 02 Track relay not in de-energized position or device that functions as a track relay not in its most restrictive state when rail or switch frog is removed from track.

236 0051 03 Shunt fouling circuit used where permissible speed through turnout is greater than 45 miles per hour.

236 0051 04 Track relay not in de-energized position or device that functions as a track relay not in its most restrictive state when a train, locomotive, or car occupies any part of the track circuit, except fouling section of turnout of hand-operated main-track crossover. (Explain fully condition of rails with respect to presence of rust, dirt, grease or other foreign matter).

236 0051 05 Adequate measures to safeguard train operation not taken when it is known that a condition of sand, rust, dirt, grease or other foreign matter exists that has prevented effective shunting of a track circuit when occupied by a train, locomotive, or car.

236 0051 06 Track relay not in de-energized position or device that functions as a track relay not in its most restrictive state when switch points are not closed in normal position, where switch shunting circuit is used.

236 0051 07 Track relay not in de-energized position or device that functions as a track relay not in its most restrictive state when switch is not locked where switch is equipped with facing-point lock with switch circuit controller and where switch shunting circuit is used.

236 0051 08 Track relay not in de-energized position or device that functions as a track relay not in its most restrictive state when independently operated fouling-point derail equipped with switch circuit controller is not in derailing position, where switch shunting circuit is used.

236 0051 09 Track circuit of an automatic train stop, train control or cab signal system not de-energized in rear of broken rail.

236 0051 10 Track circuit of an automatic train stop, train control or cab signal system not de-energized when rail or switch frog is removed from track.

236 0051 11 Track circuit of automatic train stop, train control or cab signal not de-energized in the rear of a train, locomotive or car when such equipment occupies any part of a track circuit, except the fouling section of turnout of hand-operated main-track crossover. (Explain fully condition of rail with respect to presence of rust, dirt, grease, or other foreign matter.)

236 0051 12 Adequate measures to safeguard train operation not taken when it is known that a condition of sand, rust, dirt, grease or other foreign matter exists that has prevented effective de-energization of a track circuit of automatic train stop, train control or cab signal system in the rear of train, locomotive, or car when track circuit is occupied by such equipment.

236 0051 13 Track circuit of automatic train stop, train control, or cab signal system not de-energized when switch points are not closed in normal position, where switch shunting circuit is used.

236 0051 14 Track circuit of automatic train stop, train control, or cab signal system not de-energized when switch is not locked where switch is equipped with facing-point lock with circuit controller and where switch shunting circuit is used.

236 0051 15 Track circuit of automatic train stop, train control, or cab signal system not de-energized when independently operated fouling-point derail equipped with switch circuit controller is not in derailing position, where switch shunting circuit is used.

§ 236.52 Relayed cut-section.

This rule requires that where energy of non-coded direct-current track circuit is supplied through contacts of adjoining non-coded track relay, energy circuit shall be opened and track circuit shunted when relay is de-energized.

Application:

Apply at relayed cut-section of non-coded direct-current track circuit only, including polar, neutral or biased relays.

CLASSIFICATION OF DEFECTS

236 0052 01 Where relayed cut-section is used in territory where non-coded direct current track circuits are in use, the energy circuit to the adjoining track circuit not open when track relay at the cut-section is in de-energized position.

236 0052 02 Where relayed cut-section is used in territory where non-coded direct current track circuits are in use the adjoining track circuit not shunted when the track relay at the cut section is in de-energized position.

§ 236.53 Track circuit feed at grade crossing.

At crossing-at-grade of a non-electrified railroad using non-coded direct-current track circuits with electrified railroad, this rule requires the battery end of direct-current track circuit be located at the crossing.

Application:

This rule is not applicable unless foreign current is proven to be present.

CLASSIFICATION OF DEFECTS

236 0053 01 At grade crossing with electric railroad where foreign current is present, the electric energy for non-coded direct current track circuit feeds toward the crossing.

§ 236.54 Minimum length of track circuit.

This rule permits the use of track circuits shorter than the inner wheelbase of any locomotive or car provided other means are used to provide the equivalent of track circuit protection.

Application:

Track circuits shorter than the inner wheelbase of any car or locomotive operating over the track are prohibited unless supplemented with other protective devices or circuits that provide protection equivalent to a track circuit.

This rule is applicable to all track circuits which control home signals or electric locking circuits. The rule does not apply to track circuits used exclusively for approach lighting circuits on sidings or auxiliary tracks or to annunciator circuits or other non vital type track circuits.

In addition to trap circuits, directional stick circuits, and check-in check-out circuits permitted in the past, carriers may now provide devices that detect the presence of locomotives or cars if such devices are so interconnected with the signaling system that it will perform equivalent to a track circuit of proper length.

CLASSIFICATION OF DEFECTS

236 0054 01 Length of track circuit used for controlling signaling facilities that is less than maximum inner wheelbase of locomotive or car, not supplemented by special circuit or protective device that provides equivalent of full track circuit protection.

§ 236.55 Dead section; maximum length.

This rule prohibits the use of dead section longer than the shortest outer wheel base of a carrier's locomotive but in no case longer than 35 feet without protecting it with a special circuit.

Application:

This rule applies to the outer wheelbase of locomotives only and does not apply to cars.

Trap circuits are more commonly used to protect dead sections; however, directional stick circuits fall into the category of special circuits.

Presence detector or other such devices satisfy the requirement of this part.

This rule is not applicable to non-shunting section caused by the stagger of insulated rail joints. Apply rule 51 where stagger of insulated rail joints permit cars to span a live rail of the track circuit.

CLASSIFICATION OF DEFECTS

236 0055 01 Dead section exceeds 35 feet and special circuit not installed.

236 0055 02 Length of dead section exceeds length of outer wheelbase of locomotive operating over such dead section and special circuit not installed. (Applies where length of outer wheelbase of locomotive is less than 35 feet.)

§ 236.56 Shunting sensitivity.

This rule requires that track circuit controlling signal aspects or electric locking shall be maintained so that when a shunt of 0.06 ohm resistance is connected across the rails of the track circuit at any location in the circuit, including shunt fouling section, the track relay shall assume the de-energized position or if an electronic device is used in lieu of a track relay, such electronic device shall assume its most restrictive state.

Application:

This requirement applies to any type track circuit of which the rails form a part of the circuit and used for controlling signal aspects or electric locking. Does not apply to approach lighting circuits on non-signalized track, annunciator circuits, etc.

The most difficult time to shunt a track circuit is when the ballast is dry or frozen.

Car frame type track circuit must comply with this section.

Each turnout has three fouling sections which should be tested.

Most restrictive state is defined in § 236.813a as the mode of an electronic device that is equivalent to a track relay in its de-energized position. Regardless of the type of track circuit, this rule requires that signals governing movements over the track circuit must display their most restrictive aspects when the track circuit is shunted with a resistance of 0.06 ohms.

CLASSIFICATION OF DEFECTS

236 0056 01 Track relay not in de-energized position or device that functions as a track relay not in its most restrictive state with a shunt of 0.06 ohm resistance connected across rails of track circuit, when track circuit is dry.

§ 236.57 Shunting and fouling wires.

Shunt wires and fouling wires are each required to be of sufficient conductivity and maintained in such condition that the track relay will be de-energized when the track circuit is shunted. Two completely separate conductors are required, except where switch circuit controller is used to both open control circuits and shunt the track circuit.

Application:

This rule prohibits the installation of a single duplex wire with single plug as fouling or shunt wires. The single plug constitutes a single conductor. Existing installations having single duplex wires with single plug for shunt or fouling wires may be continued in use until such time as they require repair or replacement. The use of two duplex wires with single plug is acceptable.

A conductor consisting of many small strands, such as that with the trade name "Bondstrand," can only be considered as a single conductor.

Two fouling wires are required at the heel of the reverse switch point, and toe and heel of the switch frog, and between the outer rails of the main track and turnout.

Shunt wires to switch circuit controller shall consist of two separate conductors connected to each rail and extending to the terminals of switch circuit controller.

This rule is not applicable to rail joint bonds in fouling section.

CLASSIFICATION OF DEFECTS

236 0057 01 Shunt or fouling wires do not consist of at least two discrete conductors. (Does not apply to shunt wires to switch circuit controller through which signal control circuits are controlled and track circuits are shunted, or where track circuit is opened and relay side of track circuit is shunted.)

236 0057 02 Shunt wires not of sufficient conductivity so that track relay is in de-energized position or device that functions as track relay is in its most restrictive state when circuit is shunted.

236 0057 03 Shunt wires not maintained in such condition that track relay is in de-energized position or device that functions as track relay is in its most restrictive state when circuit is shunted.

236 0057 04 Fouling wires not of sufficient conductivity so that track relay is in deenergized position or device that functions as track relay is in its most restrictive state when circuit is shunted.

236 0057 05 Fouling wires not maintained in such condition that track relay is in deenergized position or device that functions as track relay is in its most restrictive state when circuit is shunted.

§ 236.58 Turnout, fouling section.

The fouling section of each turnout is required to be bonded and to extend to the clearance point.

Application:

This rule requires that the fouling section of each turnout shall extend to a point on the turnout where a standing car or engine will clear a movement on the main track under all circumstances, such as overhang of cars.

This rule requires that each rail joint in the fouling section be bonded. The rule does not require double bonding of the rail joints.

CLASSIFICATION OF DEFECTS

236 0058 01 Fouling section of turnout does not extend to clearance point.

236 0058 02 Rail joint in shunt fouling section not bonded.

§ 236.59 Insulated rail joints.

Insulated rail joints are required to be maintained in such condition as to prevent energy from flowing between adjoining track circuits.

Application:

Applies to all insulated rail joints in all systems.

An insulated rail joint is considered defective when tests prove insulation is worn, deteriorated or otherwise bypassed so as to conduct sufficient current between adjoining track circuits to cause track circuit failure.

The breakdown of insulation in a single insulated rail joint is considered a failure of a track circuit even though the insulated rail joint on the other rail is in good condition.

CLASSIFICATION OF DEFECTS

236 0059 01 Insulated rail joint not maintained in condition to prevent flow of sufficient track circuit current between rails separated by the insulation to cause failure of the track circuit.

236 0059 02 Insulated rail joint not maintained in such a condition that the track circuit through the switch circuit controller can be opened when switch point open.

236 0059 99 Insulation in insulated rail joint in bad condition.

§ 236.60 Switch shunting circuit, use restricted.

This rule prohibits the installation of switch shunting circuit except where track or control circuit is also opened through the switch circuit controller.

Application:

This rule applies to all systems including signal arrangements such as tunnel protection, slide detector or high water detector.

This rule prohibits the use of a switch shunting circuit as the only method of protection. The rule permits the use of a circuit to shunt the track circuit only if the circuit controller also opens the track circuit or a signal control circuit.

This rule permits the continued use of existing installations of switch shunting circuits.

The rule applies to all new switch locations in revenue service. The FRA has defined a new switch as:

An additional switch installed in a system existing on February 27, 1984;

All switches of each system installed after February 26, 1984; and

A switch installed as the result of the shortening or lengthening of a siding or other auxiliary track except when such switch is moved for routine track maintenance (including rail relay) or the angle of the switch frog is changed as the result of a change in carrier track standards.

CLASSIFICATION OF DEFECTS

236 0060 01 Switch shunting circuit installed where track circuit or control circuit not opened by switch circuit controller. (Does not apply to installations made before February 27, 1984.)

Wires and Cables

§ 236.71 Signal wires on pole line and aerial cable.

Signal wires carried on pole lines are required to be securely fastened to insulators. Cable used aerially is required to be supported by messenger.

Application:

The intent of this rule is that all signal wires, including A.C. power supply carried on pole line, are required to be tied in on insulators that are securely fastened to a crossarm or bracket attached to a pole or fixture. Signal wire is required to be maintained clear of all other wires.

Particular attention should be given to vertical runs of cable. These are frequently found tied off at the top of the run at which point the entire weight of the cable is self-supported. The cable is required to be supported throughout by messenger.

CLASSIFICATION OF DEFECTS

- 236 0071 01 Signal wire carried on pole line not securely tied in on insulator.
- 236 0071 02 Signal wire not secured because of broken, missing or burnt pole.
- 236 0071 03 Signal wire not secured because of broken, burnt, or missing crossarm.
- 236 0071 04 Signal wire interferes with or is interfered by another wire.
- 236 0071 05 Cable used aerially not supported on insulators or by messenger.

§ 236.73 Open-wire transmission line; clearance to other circuits.

This rule requires that open-wire transmission lines of 750 volts or more be placed at least four feet above the nearest crossarm carrying signal or communication wires.

Application:

Applies where power of 750 volts or more is transmitted by open-wire line.

CLASSIFICATION OF DEFECTS

- 236 0073 01 Open-wire transmission line operating at voltage of 750 volts or more, less than 4 feet above nearest crossarm carrying signal or communication circuits.

§ 236.74 Protection of insulated wire; splice in underground wire.

This rule requires insulated wire be protected from mechanical injury. It prohibits puncturing insulation for test purposes and requires that splice in underground wire have insulation resistance at least that of the wire spliced.

Application:

Insulated wire shall be placed in wire runs, strung on pole line, or messenger, or buried in a manner that it cannot be damaged by the operation of apparatus, vehicles, tools, workmen, or by closing doors.

No insulated wire or conductor, whether in housing or outside, should be punctured for test proposes.

This rule does not permit temporary installation of cable or wires on top of the ground.

CLASSIFICATION OF DEFECTS

- 236 0074 01 Insulated wire not protected from mechanical injury.
- 236 0074 02 Insulation of insulated wire punctured for test purposes.
- 236 0074 03 Splice in underground wire does not have insulation resistance value at least equal to the wire spliced.

§ 236.76 Tagging of wires and interference of wires or tags with signal apparatus.

Each wire is required to be tagged or otherwise marked so it can be identified at each terminal. Nomenclature shall correspond to that of the circuit plan. Tags or other marks of identification are required to be made of insulating material and wires and tags are prohibited from interfering with moving parts of signal apparatus.

Application:

Applies to each wire at each terminal in all housings including switch circuit controllers, switch machines, and terminal or junction boxes.

Shunt wires inside switch circuit controllers are not required to be tagged as long as the carrier's nomenclature is uniform and corresponds to its circuit plans.

Signal wiring shall be tagged or otherwise marked at a terminal. A terminal is any point the wire terminates from its point of origin to and including the point of final termination. The wire may be tagged or marked in any manner so that it can be identified.

Breaks in a relay or other breaks that are identified on the circuit plan by the terminal post number meet the requirements of this rule. However, the circuit plan must be available in the signal case in such instances. If a carrier identified their wires in this manner, it would require every signal and cut section to have a circuit plan. If they do not, and the wires cannot be identified, the installation does not comply with this part.

All tag or wire identification should correspond with the circuit plan. All tags and identification should be of insulating material. Wires and tags shall not interfere with the moving parts or apparatus. This includes the contact members of relays, switch machines, interlocking machines, semaphore signal mechanism and apparatus, etc.

If it is necessary to pull the wire to identify it, the carrier is in non-compliance.

CLASSIFICATION OF DEFECTS

236	0076	01	Wire not tagged or otherwise marked so it can be identified at terminal.
236	0076	02	Nomenclature of tag or wire identification does not correspond to that of circuit plan.
236	0076	03	Tag or other mark of identification in instrument case or apparatus housing not made of insulating material.
236	0076	04	Tag interferes with moving parts of apparatus.
236	0076	05	Wire interferes with operating part of mechanism.

Inspections and Tests; All Systems

§ 236.101 Purpose of inspections and tests; removal from service of relay failing to meet test requirements.

This rule prescribes certain inspections and tests of vital importance be made. The inspections and tests must be performed in accordance with carrier specifications which are subject to FRA approval. Electronic device, relay or other electromagnetic device which fails to meet requirement of specified tests must be removed from service and not restored to service until its operating characteristics are within the limits prescribed by the manufacturer.

Application:

Applies to all systems.

Purpose of inspections and tests is to determine if operating characteristics of relays, electronic apparatus and electromagnetic devices are within specified values and that apparatus and equipment is being maintained in condition to assure safety of train operation.

CLASSIFICATION OF DEFECTS

236 0101 01 Relay which failed to meet requirements of specified tests not removed from service.

236 0101 02 Relay which failed to meet requirements of specified tests restored to service with operating characteristics not in accordance with the limits within which the relay is designed to operate.

236 0101 03 Electromagnetic device other than relay, which failed to meet requirements of specified tests not removed from service.

236 0101 04 Electromagnetic device other than relay, which failed to meet requirements of specified tests restored to service with operating characteristics not in accordance with the limits within which the electromagnetic device is designed to operate.

236 0101 05 Electronic device which failed to meet requirements of specified tests not removed from service.

236 0101 06 Electronic device which failed to meet requirements of specified test restored to service with operating characteristics not in accordance with the limits within which the electronic device is designed to operate.

§ 236.102 Signal mechanism.

This rule requires a visual inspection of semaphore and searchlight signal mechanism at least once every six months. Tests of the operating characteristics are required to be made every two years.

Application:

Applies to all semaphore and searchlight type signal mechanisms. Record of six-month inspection is not required. The rule requires the observation of the searchlight mechanism while it is operated to all positions during the six-month inspection.

Tests of operating characteristics include pick-up, release, and working values. They may be recorded in either voltage or current values.

CLASSIFICATION OF DEFECTS

236 0102 01 Signal mechanism not inspected at least once every six months.

236 0102 02 Tests of signal mechanism operating characteristics not made at least once every two years.

236 0102 03 Mechanical movement to all positions of searchlight mechanism not observed at least once every six months.

§ 236.103 Switch circuit controller or point detector.

Switch circuit controllers and point detectors are required to be inspected and tested at least once every three months.

Application:

Applies to all switch circuit controllers and point detectors in all systems required by Rules 236.6, 236.13, 236.51, 236.57, 236.202, 236.203, 236.334 and 236.342.

Inspection should determine general condition, such as extent of wear of bearings and connections, secure fastening, condition of contacts and shunt wires, wiring, gaskets, etc. in compliance with these rules.

Test should be made with gage placed between the stock rail and the switch point, six inches from the end of switch point, to determine proper adjustment and operation.

This rule is not applicable to a switch that is removed from revenue service and is effectively spiked, clamped, or blocked in proper position. Inspectors should be aware of carriers procedure for removal of switches from service.

CLASSIFICATION OF DEFECTS

236	0103	01	Switch circuit controller not inspected at least once every three months.
236	0103	02	Tests of switch circuit controller not made at least once every three months.
236	0103	03	Point detector not inspected at least once every three months.
236	0103	04	Tests of point detector not made at least once every three months.

§ 236.104 Shunt fouling circuit.

Shunt fouling circuit is required to be inspected and tested at least once every three months.

Application:

Applies to all shunt fouling circuits in all systems.

Inspection should determine bonds and fouling wires are applied in compliance with Rules 236.51, 236.56, 236.57, and 236.58 at the proper places, intact and in good condition.

Test should be made at clearance point and on both sides of insulated rail joints between points and frog by connecting 0.06 ohm shunt across rails and determining if the associated track relay is in de-energized position, or the device that functions as a track relay is in its most restrictive condition.

A switch removed from revenue service does not eliminate the requirements of this rule.

CLASSIFICATION OF DEFECTS

236	0104	01	Shunt fouling circuit not inspected at least once every three months.
236	0104	02	Tests of shunt fouling circuit not made at least once every three months.

§ 236.105 Electric lock.

This rule requires that electric locks be tested once every two years. It excludes forced drop type electric locks.

Application:

Applies to all systems and interlocking machines.

Locks failing to meet test requirements must be replaced. Electric locks of the non-forced drop type may be removed from service, repaired, and replaced in service.

Tests of operating characteristics include pick-up, release, and working values. They may be recorded in either voltage or current values.

CLASSIFICATION OF DEFECTS

236 0105 01 Tests of electric lock not made at least once every two years. (Does not apply to electric locks of forced-drop type.)

§ 236.106 Relays.

This rule requires that each relay used in vital circuits of wayside equipment be tested at intervals prescribed for its type of design.

Application:

Applies to relays used in vital circuits of wayside equipment in all systems.

Each relay is required to be tested at least once every four years except:

1. Centrifugal relays shall be tested at least once every 12 months.
2. Vane relays and D.C. polar relays shall be tested at least once every two years.
3. Relays with soft iron magnetic structure which tends to become permanently magnetized, shall be tested at least once every two years.

This rule is applicable only to relays in service. A new relay placed in service shall be tested at intervals prescribed for its type of design. A shopped relay, after being tested or repaired in the shop, is not considered in service until it is installed within a signal system.

A relay that has broken glass, high resistance contacts, burnt contacts, burnt ribbons, broken or bent contacts, improperly installed ribbons, or evidence of moisture or other foreign matter inside its housing is not properly maintained and is prohibited.

Tests of operating characteristics include pick-up, release, and working values. They may be recorded in either voltage or current values.

CLASSIFICATION OF DEFECTS

236 0106 01 Tests of relay in service not made at least once every four years.

236 0106 02 Tests of centrifugal relay in service not made at least once every twelve months.

236 0106 03 Tests of AC vane relay, D.C. polar relay, or relay with soft iron magnetic structure not made at least once every two years.

§ 236.107 Ground tests.

This rule requires a test for grounds on vital circuitry be made when placed in service and at least once every three months thereafter.

Application:

This test shall be made at energy buses supplying power to signal control circuits. The test is not required to be made on track circuit wires, AC distribution circuits grounded in the interest of safety or common return wires of grounded common single break circuits.

Test shall be made by measuring the voltage potential between each energy bus and ground. If a voltage potential is detected between energy bus and ground, a current reading shall be taken to determine whether the ground is in excess of that permitted by Rule 236.2. In no case shall a current reading be taken when a train is closely approaching or passing, or a meter connected between an energy bus and ground be left unattended.

The ground test should also be applied to each output circuit of those electronic devices installed to provide one or more individual isolated power supplies from a single common storage battery or power supply.

CLASSIFICATION OF DEFECTS

236 0107 01 Ground test on energy bus which furnishes power to circuits, the functioning of which affects the safety of train operation, not made when installed or at least once every three months.

§ 236.108 Insulation resistance tests, wires in trunking and cable.

This rule requires tests of insulation resistance of wires in trunking and cable be made when installed and at least once every ten years thereafter. Conductors having insulation resistance of less than 500,000 ohm shall be tested annually.

In no case shall a conductor with insulation resistance of less than 200,000 ohms be left in service.

Application:

Tests must be made when wires, cables, and insulation are dry. However, wet conditions do not under any circumstances provide relief from Section 236.2.

Insulation resistance tests of each wire within trunking or within a cable must be tested to ground and tested against all other wires within the trunking or cable.

Single-conductor wire buried underground shall be tested to ground, but is not required to be tested against all other wires in the cable run.

This rule applies to conductors and cables used for signal power.

Track wires, line wires and case wiring are excluded from the requirements of this rule.

Where a conductor is found with insulation resistance of less than 500,000 ohms, prompt action is required for repair or replacement of the defective wire or cable. Until repair or replacement, insulation resistance tests must be made annually. The reason for this provision is to allow lead time for acquisition

of new cable or scheduling of manpower. However, if material and manpower are available to effect repairs or replacement, corrective action shall be taken immediately.

Where a conductor is found with insulation resistance of less than 200,000 ohms, it shall be either repaired or removed from service.

CLASSIFICATION OF DEFECTS

- | | | | |
|-----|------|----|--|
| 236 | 0108 | 01 | Tests of insulation resistance not made within specified period. |
| 236 | 0108 | 02 | Action not taken to promptly repair or renew conductor when its insulation resistance is below 500,000 ohms. |
| 236 | 0108 | 03 | Circuit permitted to function on a conductor having insulation resistance value less than 200,000 ohms. |

§ 236.109 Time releases, timing relays and timing devices.

This test requires that time releases, time relays, and timing devices be tested once every twelve months, and that timing be maintained at not less than 90% of the predetermined time interval, which shall be shown on the plans or marked on the time release, time relay, or timing device.

Application:

Applies to all systems. Tests should not be conducted while rail traffic is approaching or within any route involved in the test.

This test is required to determine the length of time that a time release, time relay, or timing device must run before the locking is released.

Test shall be conducted by starting time release, time relay or timing device and checking the length of time from the instant the device is started or from the opening of check contact (if used) until release of lever lock or energization of electric stick locking relay.

Releasing time must not be less than 90% of that shown. It may be any amount of time over the predetermined time. Predetermined time interval must be shown on plans or marked on the time release or relay.

CLASSIFICATION OF DEFECTS

- | | | | |
|-----|------|----|---|
| 236 | 0109 | 01 | Time release not tested at least once every twelve months. |
| 236 | 0109 | 02 | Timing relay not tested at least once every twelve months. |
| 236 | 0109 | 03 | Timing device not tested at least once every twelve months. |
| 236 | 0109 | 04 | Timing of time release less than 90 percent of predetermined time interval. |
| 236 | 0109 | 05 | Timing of timing relay less than 90 percent of predetermined time interval. |
| 236 | 0109 | 06 | Timing of timing device less than 90 percent of predetermined time interval. |
| 236 | 0109 | 07 | Predetermined time interval not shown on plans or marked on time release, timing relay, or timing device. |

§ 236.110 Results of tests.

This rule requires that the results of vital tests be recorded and filed in the office of the responsible division officer. It specifies those results to be recorded, prescribes the general format to be used and requires that the recording be made by the employee who makes the test.

Application:

The result of each required test must be recorded on preprinted or computerized form designed for that purpose. Results of tests recorded on other than prescribed form is prohibited.

The form must show name of carrier, place, date, equipment tested, results of tests, repairs, replacements, adjustments, condition in which apparatus was left and signature of employee making the test. This required information may be shown in any order the carrier chooses and forms may provide for several tests. Equipment tested refers to each piece of equipment tested in compliance with Rules 236.102 to 236.109, inclusive; 236.376 to 236.387, inclusive; 236.576; 236.577; and 236.586 to 236.589 inclusive.

Each form required by this rule shall be filed in the office of a supervisory official having jurisdiction. The divisional officer may be an assistant signal supervisor, signal supervisor, or any other divisional officer. ATCS, ATS and ACS test records shall be kept at test points.

Except for the results of tests made in compliance with section 236.587, all such records of tests shall be kept on file until the next record of the same tests are made and put on file. The records of tests made at intervals of less than one year shall be retained for at least one year.

The records of results of tests made in compliance with section 236.587 shall be kept on file for at least 92 days.

(Reference Technical Bulletin S-96-05)

CLASSIFICATION OF DEFECTS

236	0110	01	Record of tests not made.
236	0110	02	Tests not recorded on form.
236	0110	03	Record of tests not complete.
236	0110	04	Record of tests not filed with a supervisory official having jurisdiction.
236	0110	05	Record of test form does not show name of railroad, place and date, equipment tested, repairs, replacements, adjustments made, condition in which apparatus was left, and signature of employee making the test.

Subpart B - Automatic Block Signal Systems Standards

§ 236.201 Track-circuit control of signals.

This rule requires that aspects of signals with indications more favorable than "Proceed at Restricted Speed" be controlled automatically by track circuits extending through the entire block.

Application:

Applies to automatic block and traffic control systems.

Rule 236.708 requires the limits of the block for last signal be defined.

The aspect and indication determine compliance with this rule. A carrier is in non-compliance if any aspect with an indication more favorable than "Proceed at Restricted Speed" is used even though the speed may be 20 miles per hour or less.

A block extends from signal to signal or from signal to its defined limits at end of the system.

This rule is not applicable to so-called distant or approach signals outside of a system.

CLASSIFICATION OF DEFECTS

236 0201 01 The control circuits for home signal aspects more favorable than "proceed at restricted speed" not controlled automatically by track circuits extending through the entire block.

§ 236.202 Signal governing movements over hand-operated switch.

Signal governing movements over hand-operated switch is required to display its most restrictive aspect when the points are not in proper position.

Application:

Applies to both automatic block and traffic control systems.

This rule requires each switch to be so interconnected with the signal system that when the switch is not in proper position each signal governing movements over the switch will display its most restrictive aspect.

This rule does not apply to spring switches.

This rule applies to the circuitry necessary to comply with the requirements of the rule, but does not apply to defective conditions such as circuit controller adjustments, absence of shunt wires, etc.

CLASSIFICATION OF DEFECTS

236 0202 01 Signal does not display its most restrictive aspect when points of facing-point hand- operated switch over which it governs movements are open one-fourth inch or more.

236 0202 02 Signal does not display its most restrictive aspect when points of trailing-point hand- operated switch over which it governs movements is open three-eighths inch or more.

236 0202 03 Signal which displays a separate aspect for facing movements over hand-operated switch in the normal and in the reverse position does not display its most restrictive aspect when the switch points are open one-fourth inch or more from either the normal or reverse position.

§ 236.203 Hand-operated crossover between main tracks; protection.

This rule requires that hand-operated crossover between main tracks provide protection for train movements by either an arrangement of one or more track circuits and switch circuit controllers; facing-point locks on both switches operated from a single lever; or, by electric locks on both switches of the crossover.

Signals governing movements over either switch must display their most restrictive aspect: where switch circuit controller and track circuits are used, when either switch is not in proper position, or the crossover is occupied by a train, locomotive, or car; where facing-point locks are used, either switch is unlocked;

and, where electric locks are used, before the electric locking releases. Relief is provided for certain conditions adverse to shunting.

Application:

Applies to both automatic block and traffic control systems.

Relief of the shunting requirements does not exceed that of rule 236.51 - where such conditions are known to exist, adequate measures to safeguard train operation must be taken.

These requirements apply to crossovers between main track and signaled siding in traffic control territory.

Time or approach locking must be provided for electric locking.

Inspectors should be alert for staggered insulated rail joints that will permit undetected occupancy by a locomotive or car where one or more track circuits and circuit controllers are used. Such defective conditions are prohibited by rule 236.51.

Arrangements meeting the requirements of paragraphs (2) or (3) do not require the use of track circuits.

This rule prohibits the use of shunt fouling circuits only to provide protection against the occupancy of the turnouts between the two main tracks.

CLASSIFICATION OF DEFECTS

236 0203 01 At hand-operated crossover between main tracks protection not provided by one of the following: (1) An arrangement of track circuits and switch circuit controllers, (2) facing-point locks on both switches of the crossover, with both locks operated by a single lever, or (3) electric locking of the switches of the crossover.

236 0203 02 Signal governing movements over switch of hand-operated crossover between main tracks does not display its most restrictive aspect when either switch of the crossover is open, where crossover protection is provided by track circuits and switch circuit controllers.

236 0203 03 Signal governing movements over switch of hand-operated crossover between main tracks does not display its most restrictive aspect when crossover is occupied by a train, locomotive, or car in such manner as to foul the main track, where crossover protection is provided by track circuits and switch circuit controllers. (Explain fully condition of rail with respect to presence of sand, rust, dirt, grease or other foreign matter.)

236 0203 04 Signal governing movements over switch of hand-operated crossover between main tracks does not display its most restrictive aspect when either switch of crossover is unlocked, where switches of crossover are provided with facing-point locks operated by a single lever.

236 0203 05 Signal governing movements over switch of hand-operated crossover between main tracks does not display its most restrictive aspect before electric locking releases, where switches are electrically locked.

236 0203 06 Electric locking releases before the expiration of predetermined time interval after signals display their most restrictive aspect. (Applies only to electric locking of switches of hand-operated crossover between main tracks.)

§ 236.204 Track signaled for movements in both direction, requirements.

This rule requires that on track signaled for movements in both directions, a train shall cause one or more opposing signals ahead of it to display the most restrictive aspect. Signals are required to be spaced or arranged to provide stopping distance for opposing trains.

Application:

In absolute permissive block signaling when a train passes a head block signal it must cause the opposing head block signal to display an aspect not more favorable than "stop."

Headblock Signal is defined by Part 1.1.1 of the AAR Signal Manual as, "A home signal governing entrance into the block between sidings on single track.

Braking distances should be obtained from carrier's braking distance chart.

CLASSIFICATION OF DEFECTS

236 0204 01 On track signaled for movements in both directions a train does not cause one or more opposing signals immediately ahead of it to display the most restrictive aspect the indication of which is not more favorable than "proceed at restricted speed."

236 0204 02 On track signaled for movements in both directions where opposing signals are spaced stopping distance apart for movements in one direction only, signals not arranged so that a restrictive aspect will be displayed by at least one of the signals in approach of the opposing signals, when such approach signals are passed simultaneously by opposing trains.

236 0204 03 On track signaled for movements in both directions where opposing signals are spaced less than stopping distance apart for movements in one direction, signals not arranged so that restrictive aspects will be displayed by both signals in approach of the opposing signals for trains passing such approach signals simultaneously

236 0204 04 In APB signaling, train passing head block signal does not cause opposing head block signal to display an aspect not more favorable than "stop."

§ 236.205 Signal control circuits; requirements.

Control circuits are required to be installed so that each signal will display its most restrictive aspect when the block it governs is occupied by a train, locomotive, or car; a switch is not in proper position; an independently operated derail equipped with switch circuit controller is not in derailing position; when a track relay is in de-energized position or device that functions as a track relay is in its most restrictive state; or when a signal control circuit is de-energized.

Application:

Applies to both automatic block signal and traffic control systems.

A signal must display its most restrictive aspect when any of the conditions listed under (a), (b), (c) or (d) of this rule occur. However, it is permissible, after the signal's most restrictive aspect has been displayed for such conditions, for a push button, switch, lever or other device to be operated manually by the operator or trainman and an indication not more favorable than "proceed at restricted speed" then be obtained.

This rule is applicable to the design and installation of control circuits and does not apply to defective conditions which appear to affect this rule, such as circuit controller adjustments, missing shunt or fouling wires, dead section, track circuit adjustments, grounds, etc.

This rule does not require that the most restrictive aspect be a red or stop aspect.

CLASSIFICATION OF DEFECTS

236 0205 01 Circuits not so installed that signal will display its most restrictive aspect when the block into which it governs train movements is occupied by a train, locomotive, or car.

236 0205 02 Circuits not so installed that signal will display its most restrictive aspect when points of a switch in the block into which it governs train movements are not closed in proper position.

236 0205 03 Circuits not so installed that signal will display its most restrictive aspect when an independently operated fouling-point derail equipped with switch circuit controller in the block into which it governs train movements is not in derailing position.

236 0205 04 Circuits not so installed that signal will display its most restrictive aspect when a track relay within the block into which it governs train movements is in de-energized position.

236 0205 05 Circuits not so installed that signal will display its most restrictive aspect when a device that functions as a track relay within the block into which it governs train movements is in its most restrictive state.

236 0205 06 Circuits not so installed that signal will display its most restrictive aspect when its control circuit is de-energized.

§ 236.206 Battery or power supply with respect to relay; location.

This rule requires that the source of energy be located at the end of the circuit farthest from the relay where open-wire circuit or common return circuit is used.

Application:

Applies to automatic block signal and traffic control systems. Does not apply to interlockings.

This rule prohibits use of loop circuits in vital circuitry.

CLASSIFICATION OF DEFECTS

236 0206 01 Battery or power supply for signal control relay circuit not located at the end of the circuit farthest from the relay. (Applies only to open-wire circuit or common return circuit.)

§ 236.207 Electric lock on hand-operated switch; control.

Electric lock on hand-operated switch is prohibited from being unlocked before control circuits of signals governing movement over switch are opened.

Approach or time locking must be provided.

Application:

This rule is applicable only to automatic block signal systems.

There are no requirements for the installation of electric locks in automatic block signal territory. However, if an electric lock is installed on a hand-operated switch in ABS territory, such electric lock must comply with this rule, including the provision that approach or time locking be provided. The testing requirements for approach and time locking do not apply to ABS systems, therefore the carrier is not required to make periodic tests of the approach or time locking within automatic block signal systems.

CLASSIFICATION OF DEFECTS

- 236 0207 01 Electric lock on hand-operated switch can be unlocked before control circuits of signals governing movements over such switch have been opened.
- 236 0207 02 Approach or time locking not provided for electric lock on hand-operated switch.
- 236 0207 03 Electric lock on hand-operated switch can be unlocked before expiration of predetermined time interval where time locking is provided.
- 236 0207 04 Electric lock on hand-operated switch can be unlocked before expiration of predetermined time interval with approach circuit occupied where approach locking is provided.
- 236 0207 05 Approach locking not effective.
- 236 0207 06 Time locking not effective.
- 236 0207 07 Approach or time locking of electric lock on hand-operated switch can be defeated by the unauthorized use of emergency device which is not kept sealed in the non-release position.