

Replacement page No. 11 to BWMS (TL) upto and including AS-4

Note: The above lever lock is dispensed with in case of single line token less block instrument with colour light signal.

x) Outdoor Apparatus:

The Outdoor apparatus is installed as under –

i) First Vehicle Track Circuit:

This is fixed slightly in advance of the Last Stop Signal. As soon as the engine or first vehicle of a train going from 'X' To 'Y' passes over the First Vehicle Track Circuit, the indication 'Train On Line' is displayed automatically on the block instrument at stations 'X' and 'Y'. In addition an audible warning sounds at the receiving station, which is intermittent, until acknowledged by the receiving station.

ii) Electrical signal reverser:

This equipment is provided where semaphore signalling is adopted and is actuated by the First Vehicle Track Circuit and it replaces the Last Stop Signal at 'X' to 'ON' immediately as the engine or the first vehicle of the train going to 'Y' , passes over the First Vehicle Track Circuit.

iii) Last Vehicle Track Circuit:

This is fixed at an adequate distance inside the First Stop Signal. When the last vehicle of the train passes over the Last Vehicle Track Circuit, the buzzer gives alarm at 'Y' and continue to do so until 'Y' replaces the SM's Control slide/lever/knob for the Home signal to normal.

1.4. Parts and Description of Axle Counter proven Block Panel (UFSBI & SSBPAC (D) Single Line):

(See Figure Nos. 6 & 7 at the end of this Chapter)

A set of two block panels and their associated equipment as shown in the diagrams will be used as a pair, one at station 'X' and the other at station 'Y'. Telephone communications is provided in conjunction with block panels.

a) DESCRIPTION OF BLOCK PANEL FOR SINGLE LINE (UFSBI & SSBPAC (D) Single Line:

(I) Keys		
Key	Function	
SM's Key	The key, when out, prevents the following operations.	
	a)	Transmission of BELL code.
	b)	Transmission of LINE CLEAR enquiry request.
	c)	Resetting of Axle Counter.
	d)	Cancellation of Line Clear.
	e)	Release of Shunt Key.

AXLE COUNTER RESET KEY	Axle Counter reset key where provided /when pressed resets the axle counter provided reset co- operation is available from other station.
MAINTAINER BACK COVER LOCK KEY	A lock is provided at the back of block panel for maintenance Purpose.
SM's BACK COVER LOCK	For double lock arrangement, a lock on the back of block panel is provided which can be operated by key kept in the custody of Station Master
SHUNT RELEASE KEY	Shunt Release Key (normally turned and kept OUT). a) The following operation is possible when IN, To take out SHUNT KEY from electric key transmitter (EKT), that serves as tangible authority for Loco-pilot to shunt beyond Last Stop Signal and up to First Stop Signal. b) The following operations are not possible when IN; (i) To take LINE CLEAR. (ii) Other side station to take LINE CLEAR. (iii) Closing of block. (iv) To take Last Stop Signal to "OFF".
CATCH/SLIP SIDING	This key where provided is USED to perform CATCH/SLIP SIDING operation.
(II) Push buttons (non locking type)	
Push button	Function s
BELL	To transmit BELL codes to station at other end of Block section. To take LINE CLEAR, when pressed along with TRAIN GOING TO button. To cancel LINE CLEAR, when pressed along with CANCEL button. To extend co-operation for cancellation to other station, when pressed with RESET button.
TRAIN GOING TO	Station Master of sending station operates it along with bell button. This sets sending block panel to TGT condition, and receiving station block panel to TCF condition.
CANCEL	It is operated with 'Bell button' to enable cancellation of 'Line clear' condition, if the train has not entered the block section or after the train has pushed back to the station. Station Master at train receiving station does cancellation operation.
ACKN	It is operated to acknowledge the section occupied or section free condition. It silences the 'SECTION OCCUPIED/FREE BUZZER'
LINE CLOSED YELLOW	Circular indication in between the directional arrowhead. To indicate Block Section free from vehicles and LINE CLEAR not granted/received at train Receiving /train sending station respectively.

(II) Push buttons (non locking type) (contd.)	
Push button	Functions
Axle Counter reset Co-op	It is operated to extend co-operation from a station where evaluator of axle counter has not been provided for resetting of 'Axle counter'.
(III) INDICATORS:	
Indicators	Functions
TRAIN COMING FROM [TCF]	In a directional arrowhead pointing downward for incoming traffic towards station.
GREEN	To indicate LINE CLEAR has been obtained, when TRAIN GOING TO Button and BELL button have been pressed at sending station and the conditions for the granting of LINE CLEAR at receiving station have been complied with and a rectangular indication named TCF lights up GREEN.
RED	To indicate TRAIN ON LINE on entry of incoming train on LINE CLEAR and a rectangular indication named TOL lights up RED.
FLASHING GREEN	To indicate: <ul style="list-style-type: none"> a) Block section clear after arrival of train, but associated Signals and their controls not normal at either station. b) Cancellation of LINE CLEAR before entry of train in Block Section. c) Block section clear after arrival of train, associated signals and their controls at normal at both stations but after unintentional insertion of Shunt Release Key IN, when the train was in section.
TRAIN GOING TO [TGT]	In a directional arrowhead pointing upward for outgoing traffic away from station at train sending station.
GREEN	To indicate LINE CLEAR received when TRAIN GOING TO button and BELL button have been pressed on Block Panel of train sending station and the condition for taking the LINE CLEAR have been complied with at both stations and a rectangular indication named TGT lights up GREEN.
RED	To indicate TRAIN ON LINE on entry of outgoing train on LINE CLEAR and a rectangular indication named TOL lights up RED.
FLASHING GREEN	To indicate: <ul style="list-style-type: none"> a) Block Section clear after arrival of train at other station, but associated signals and their controls not normal at either or both stations i.e. SNK off or Shunt key indication 'RED'. b) LINE CLEAR cancelled before entry of train in block section.

(III) INDICATORS (Contd.)	
Indicators	Functions
LAST STOP SIGNAL RED GREEN	Its shape is circular monogram of signal. Red indication means Last Stop Signal is at 'ON'. Green indication means Last Stop Signal is at 'OFF'.
RESET/ CANCELLATION CO- OPERATION YELLOW	Its shape is circular and is placed near reset key. It indicates that co-operation has been received from block panel where reset co-operation button has been provided.
CANCEL FLASHING YELLOW	Circular LED. To indicate progress of LINE CLEAR cancellation timer of 120 seconds. The indication lights up on pressing of CANCEL along With BELL button, when TRAIN COMING FROM is displaying FLASHING GREEN indication.
LINE FREE GREEN	Indicates line is clear of vehicles.
LINE OCCUPIED RED	Indicates line is occupied.
SNKE YELLOW	It is provided near TRAIN GOING TO directional Arrow head. When lit yellow it indicates LSS, First stop signal & controls on signals are at ON/ Normal.
SNOEK YELLOW	It is provided near TRAIN COMING FROM with directional arrowhead. When lit, it indicates LSS, FSS, Controls are normal and TCF indication is not available at station on other end of block section.
SM KEY(IN) GREEN	Indicates SM Key is 'IN' and turned.
SHK-IN/OUT GREEN/RED	When lit Green indicates Shunting Key has not been taken out. When lit Red indicates Shunting Key has been extracted.
TRAIN ACKNOWLEDGEMENT IN/OUT YELLOW	Lit at the time of train entry into and exit from the block section. It remains lit until acknowledged.
CO-OPERATION TIMER	It starts flashing when cancellation process starts and flashes for 120 seconds.
SSBPAC OK indication	Where provided, glows GREEN when SSBPAC (D) is OK otherwise Extinguished.
SSBPAC FAIL indication	Where provided, glows RED when SSBPAC (D) goes into a failure mode otherwise Extinguished.
Communication LINK FAIL indication	Glows steady YELLOW when LINK FAILS otherwise flickering.

iv) COUNTERS	
Counters	Functions
CANCEL	It keeps record of cancellation of 'line clear' when train has not entered block section or train has been done 'push back' operation.
RESET	Reset Counter on block panel at the station where Axle Counter Reset Key is provided. It keeps record of number of successful resets of Axle Counter.
v) BUZZERS	
Buzzers	Functions
BLOCK	It gives signal as per BELL CODE sent by operator at station at other end of block section.
SECTION	Its audible signal informs SM that train has either occupied or cleared the Block Section.

vi) **BLOCK TELEPHONE:** For Speech Communication with SM at other end of Block Section.

vii) **SHUNT KEY OF EKT:**

An auxiliary EKT is provided with SM's Block Panel to serve as SHUNTING Authority.

The Key of this transmitter is normally 'IN' and taken 'OUT' to use as tangible authority given to Driver of a train to perform shunting upto opposing First Stop Signal (FSS).

Released when SHUNT RELEASE KEY of Block Panel is turned to 'IN'.

a) **Indoor Apparatus:**

Electric Lock on Last Stop Signal:

An electric lock is provided on the Last Stop Signal lever which is released only when 'Train Going To' indication is displayed on the block instrument of the concerned block section.

Note: The above lever lock is dispensed with in case of single line tokenless block instrument with colour light signals.

b) **Outdoor Apparatus:**

i) **First Vehicle Track Circuit:**

This is fixed slightly in advance of the Last Stop Signal. As soon as the engine or first vehicle of a train going from 'X' to 'Y' passes over this FVT, the indication 'TOL' is displayed automatically on the Block panel at stations 'X' and 'Y'. In addition, an audible warning sounds at the receiving and sending stations, until acknowledged by the receiving and sending stations.

ii) Electrical Signal Reverser:

This equipment is provided where Semaphore Signalling is adopted and is actuated by the First Vehicle Track Circuit and it replaces the Last Stop Signal at 'X' to 'ON' immediately the engine or the first vehicle of the train going to 'Y' passes over the FVT.

iii) Last Vehicle Track Circuit:

This is provided at an adequate distance beyond First Stop Signal. When the last vehicle of the train passes over this LVT, the buzzer gives alarm at 'Y' and continue to do so until 'Y' replaces the SM's Control slide/lever/knob for the First Stop Signal to normal.

c) Resetting of Axle counter:

After complete arrival of the train or after the shunting is completed or when no train entered the block section, if the 'Section occupied' indication (Red) is lit, the Station Masters at both ends of the block section shall arrange for resetting of the Axle Counter. Station Master at 'Evaluator end' Block Panel resets the axle counter with the co-operation of the 'Non evaluator end' of Block panel Station Master. Non-evaluator end Block panel Station Master presses the Axle Counter reset button on his Block panel. Evaluator end Block panel Station Master on receiving the Axle Counter reset co-operation indication, inserts the resetting key, unlocks and presses the resetting button. Before resetting the Axle Counter, it has to be verified that the block section is clear. The following shall be ensured by the Station Masters on both ends of block section.

I. Receiving end Station Master-

- i. Get the particulars of the last train despatched by the sending end Station Master supported by Private Number;
- ii. Ensure that the last despatched train has arrived complete into his station by verifying the Tail board/ Flashing Tail lamp.
- iii. If there is no Tail board/ Flashing Tail lamp, the Station Master on duty shall send "Train passed without tail board/ Flashing tail lamp" signal to concerned station and wait for confirmation about complete arrival of the train supported by Private Number (e.g. presuming a train from 'X' passed through 'Y' without tail board/lamp to Z, then 'Y' sends "Train passed without tail board/ Flashing tail lamp signal to Z).

II. Sending end Station Master-

He shall give the particulars of the last train he has despatched to the receiving station and give Private Number.