

AUTOMATIC SIGNALLING

SYSTEM

(CHAPTER-9)

TOPICS

CHAPTER - IX

**AUTOMATIC BLOCK
SIGNALLING SYSTEM**

DISCUSSION

- How trains b/w stations are run?
- Depends on system of working
- What is System of working?
- What are the systems available in Indian railways?

Essentials of Automatic Block System

The line shall be provided with continuous

- **Track circuiting** or

- **Axle counters**
-

Essentials of Automatic Block System

The line between two adjacent block stations be divided into a series of automatic block signalling sections, each of which is the portion of the running line between two consecutive Stop signals, and the entry into each of which is governed by a Stop signal

GR 9.01. Essentials of the Automatic Block System

On double line

(1) Where trains on a double line are worked on the Automatic Block system,

(a) the line shall be provided with continuous track circuiting or axle counters,

(b) the line between two adjacent block stations may, when required, be divided into a series of automatic block signalling sections, each of which is the portion of the running line between two consecutive Stop signals, and the entry into each of which is governed by a Stop signal, and

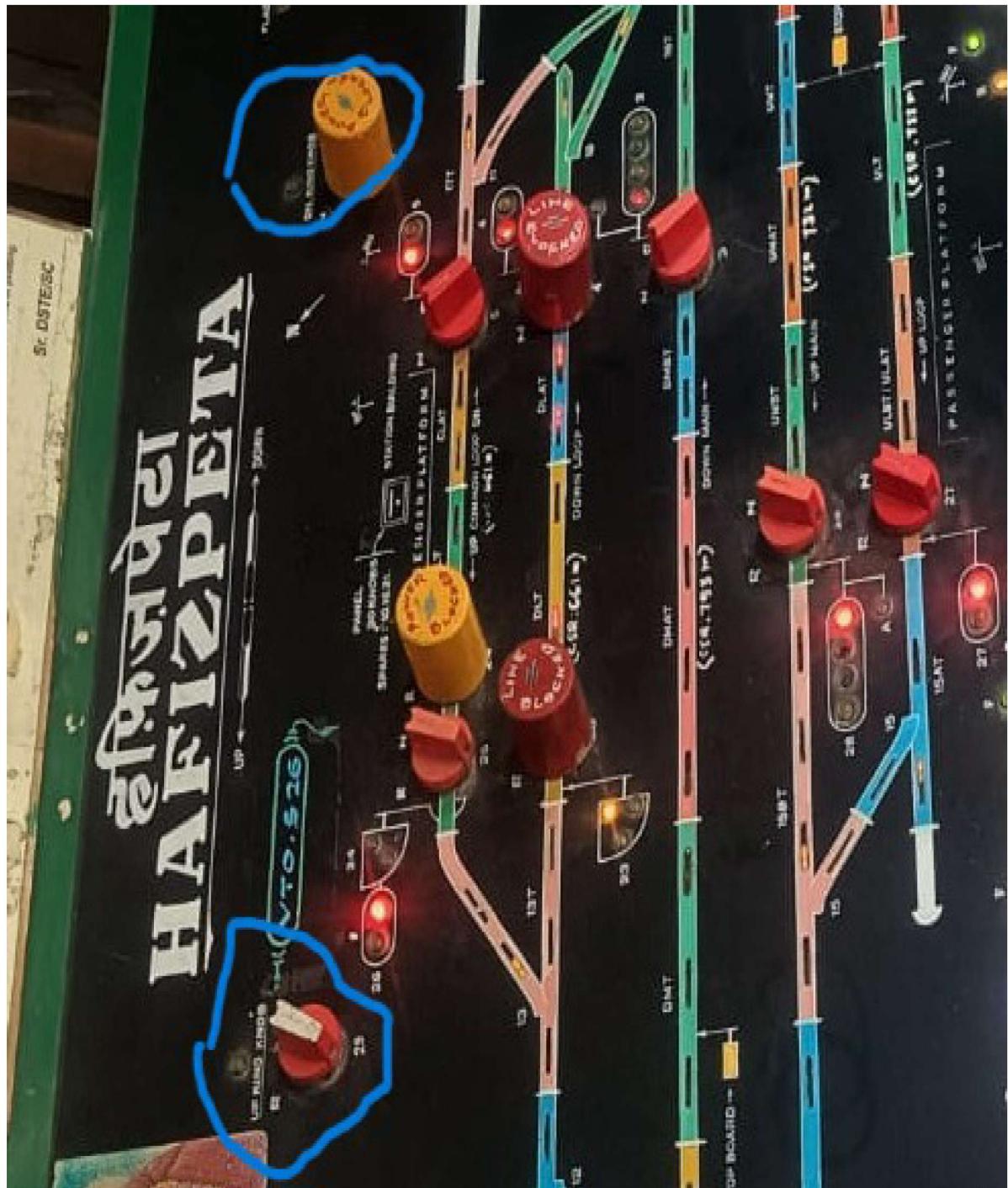
(c) the track circuits or axle counters shall so control the Stop signal governing the entry into an automatic block signalling section that-

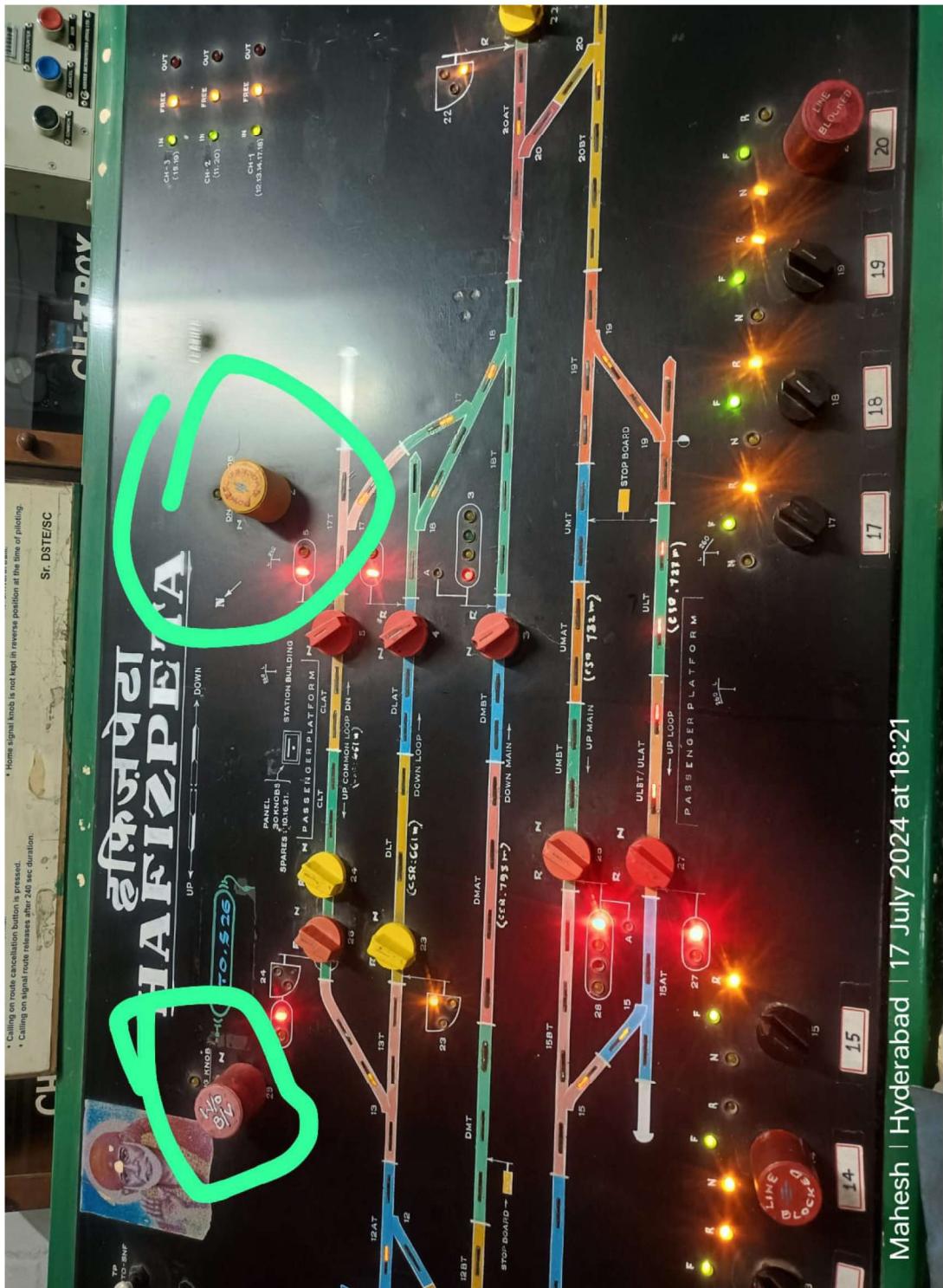
- (i) the signal shall not assume an 'off' aspect unless the line is clear not only up to the next Stop signal in advance but also for an adequate distance beyond it, and
- (ii) the signal is automatically placed to 'on' as soon as it is passed by the train.

(2) Unless otherwise directed by approved special instructions, the adequate distance referred to in sub-clause (i) of clause (c) of sub-rule (1) shall not be less than 120 metres.

GR 3.12 KINDS OF FIXED STOP SIGNALS AUTOMATIC BLOCK TERRITORIES

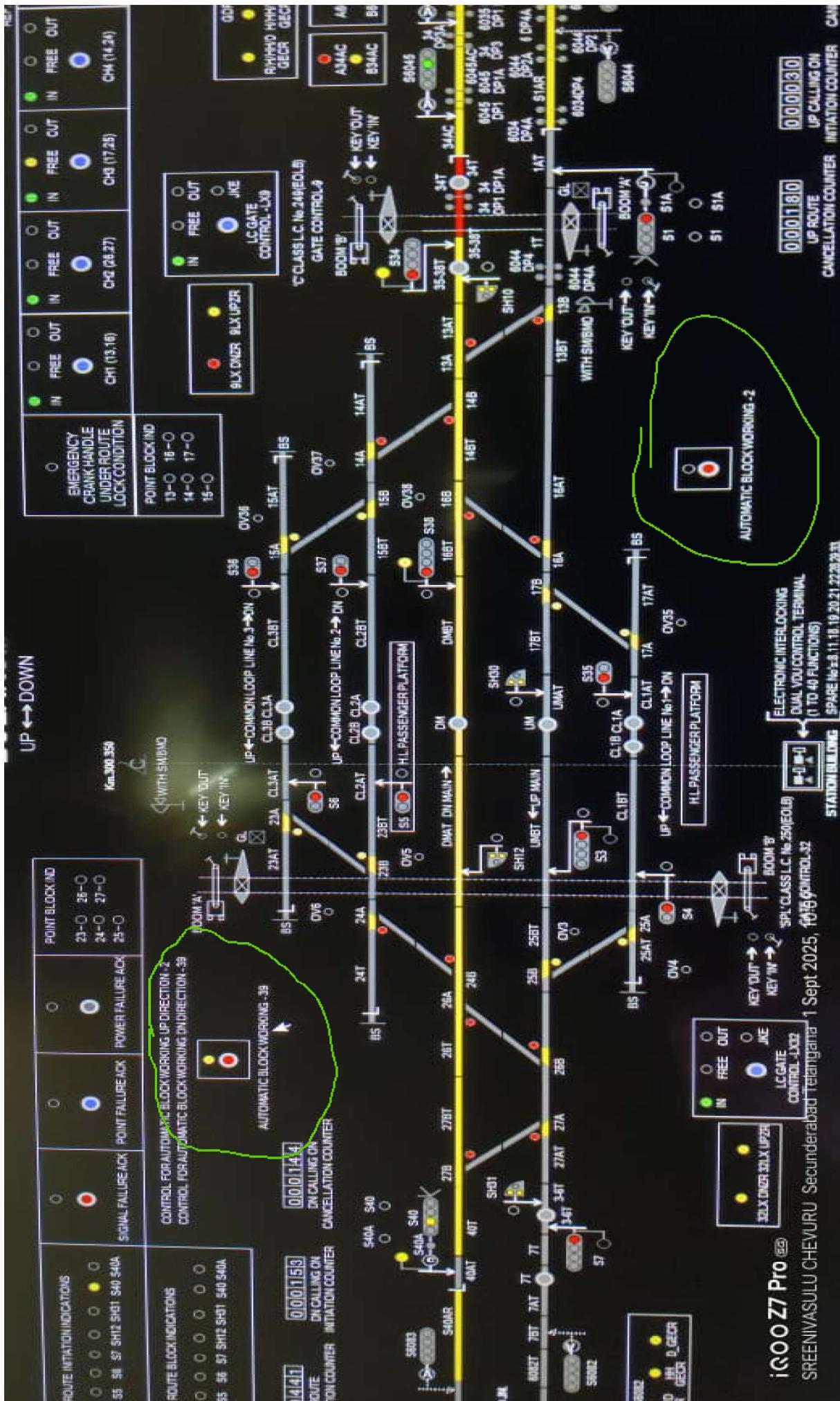
1. AUTOMATIC STOP SIGNAL
2. SEMI-AUTOMATIC STOP SIGNAL
 - I. AUTOMATIC OR
 - II. MANUAL
- (KING KNOB-NORMAL-MANUAL;REVERSE-AUTOMATIC)
- (VDU-AUTO WORKING-CANCEL AUTO WORKING)
3. MODIFIED SEMI-AUTOMATIC STOP SIGNAL
4. MANUAL STOP SIGNAL

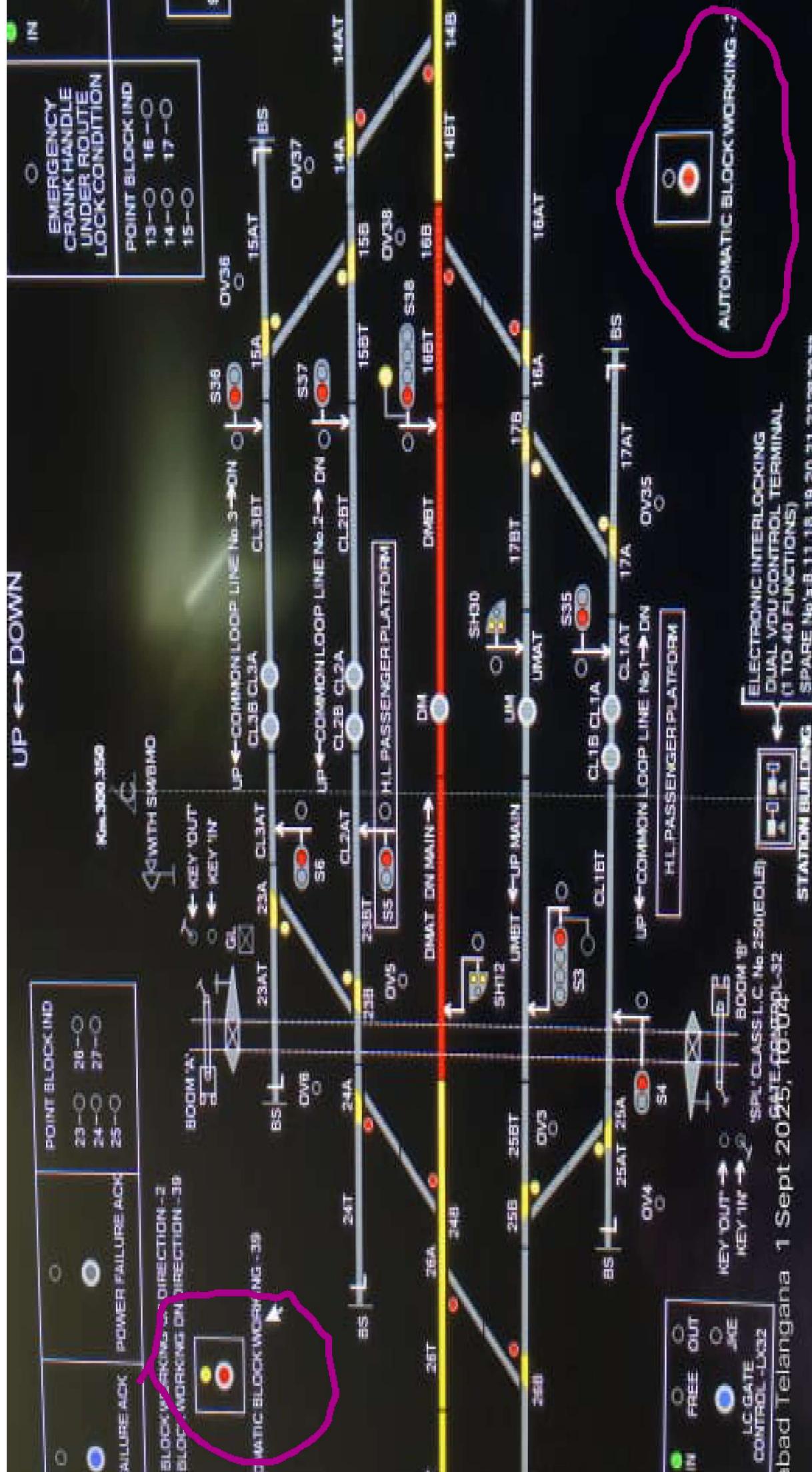


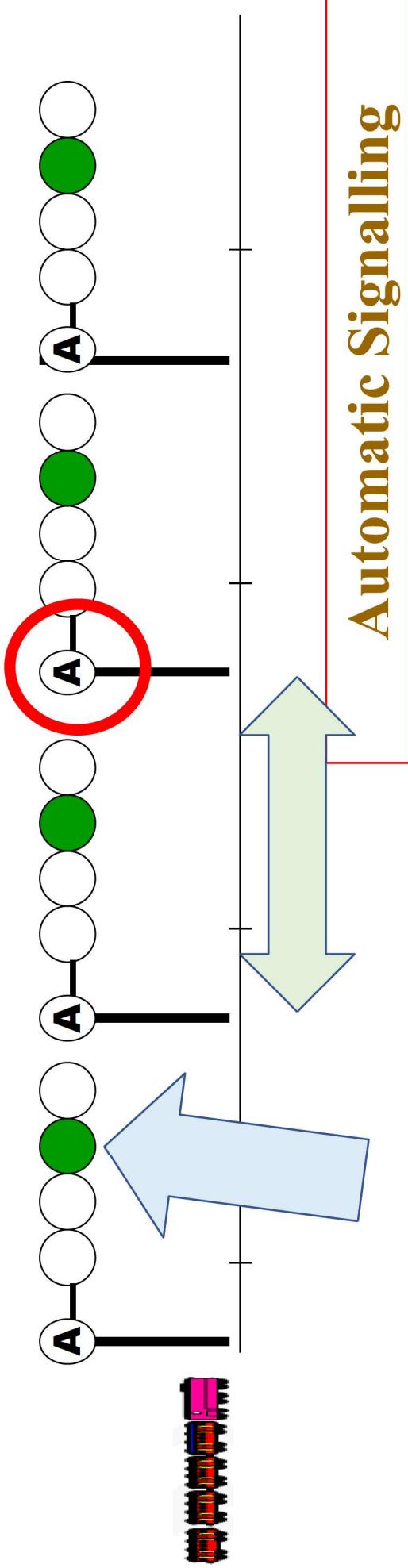


Mahesh | Hyderabad | 17 July 2024 at 18:21

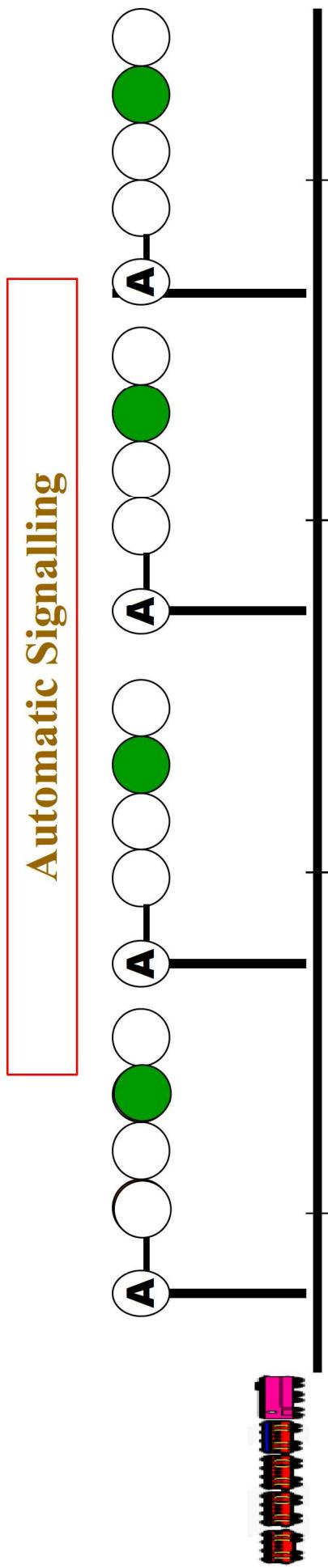
Monday, November 3, 2025



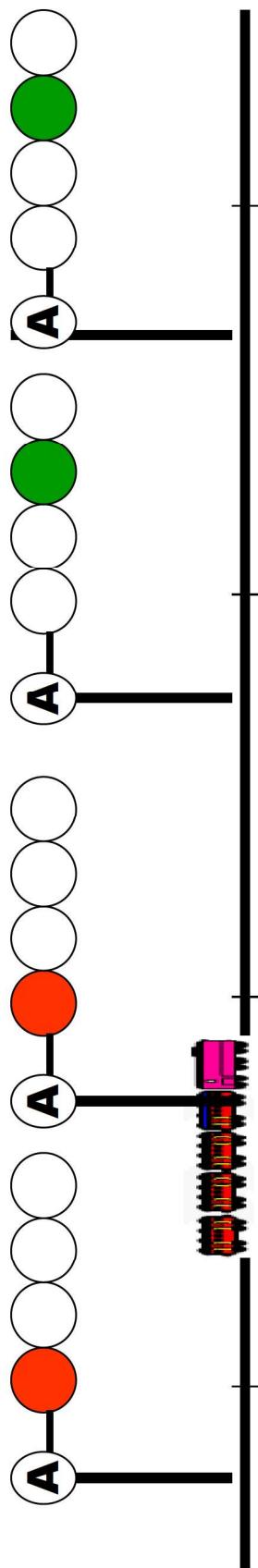




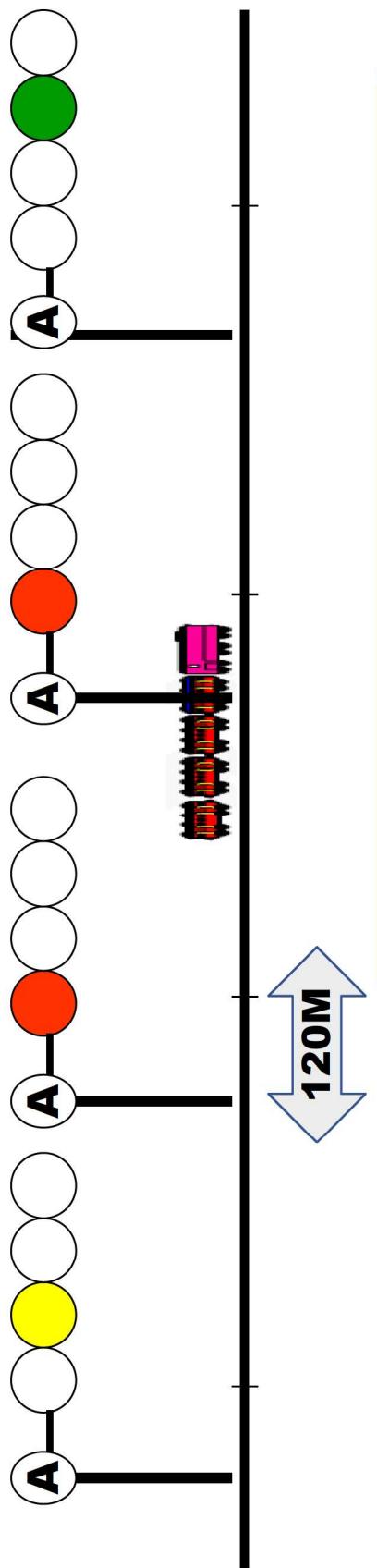
- Section between two block stations are divided into number of automatic signalling sections controlled by an automatic signal.
- Signal identified by 'A' marker board.
- Normal aspect of signal is PROCEEDED
- Signal Clearance automatically done by Train Movements



➤ Signal assumes **STOP ASPECT**
as soon as train passes over

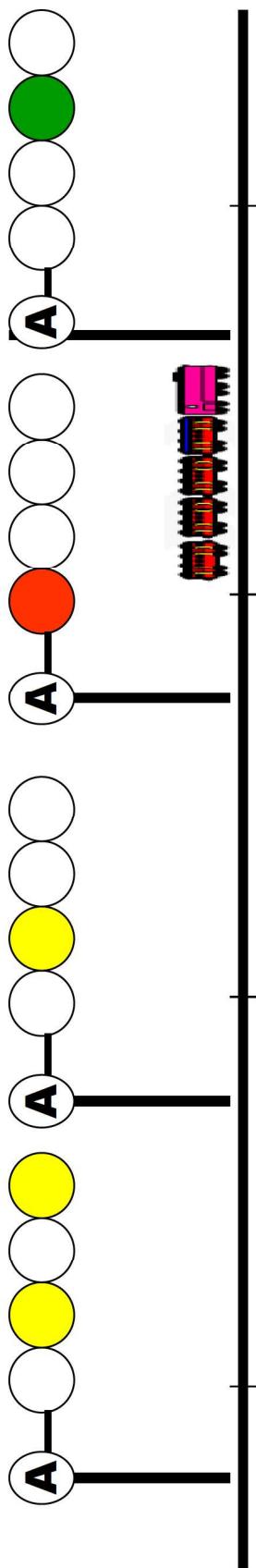


Automatic Signalling



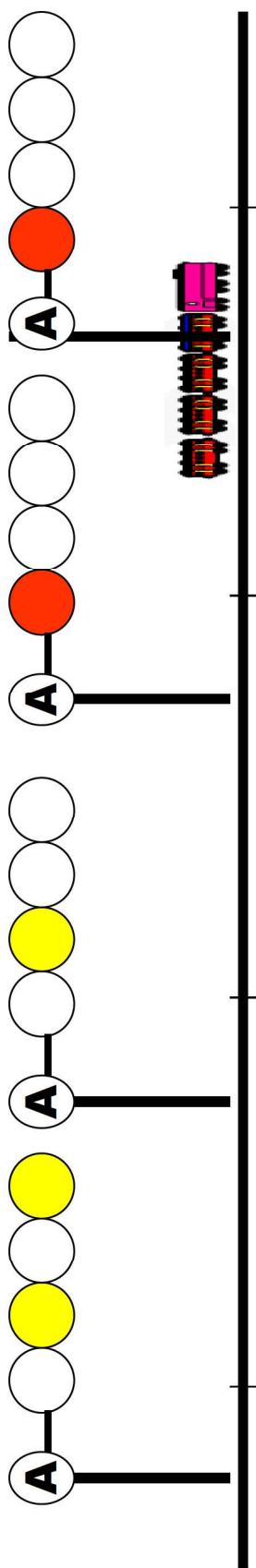
Automatic Signalling

► Signal assumes off position only after train
clears one signalling section and adequate
distance 120m



Automatic Signalling

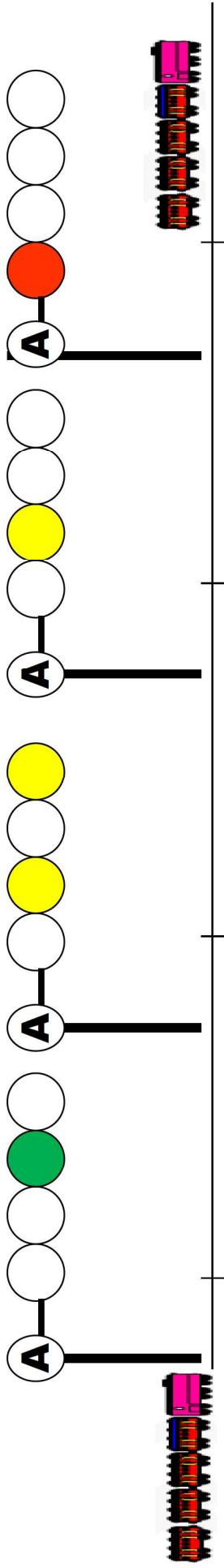
Signal Clearance automatically done by Train Movements



Automatic Signalling

Signal Clearance automatically
done by Train Movements

Automatic Signalling



When exhibiting

- Stop aspect- signalling section is occupied or signal defective or rail breakage in auto signal section
- Caution aspect- one signalling section + adequate distance free
- Attention aspect – Two signalling sections+ adequate distance free
- Proceed aspect – Minimum three signalling sections + adequate distance free

MODIFIED SEMI-AUTOMATIC STOP SIGNAL

- **Under special instruction**, one of the automatic stop signal between two stations in the automatic block signalling territory in each direction may be made as modified semi-automatic stop signal;
- When the 'A' marker is illuminated the signal works as Automatic Stop signal
- When the 'A' marker is extinguished, it works as modified Semi-Automatic stop signal and assumes 'off' aspect automatically or is taken 'off' manually as required

MODIFIED SEMI-AUTOMATIC STOP SIGNAL

- The mid-section modified semi-automatic stop signal so provided shall be interlocked with the signals of the station ahead through track circuits or axle counters or both
- It Shall be controlled by the Station Master of the station ahead
- The relevant indications whether the signal is in normal automatic mode or modified semiautomatic mode shall be available to the Station Masters at both the ends

MODIFIED SEMI-AUTOMATIC STOP SIGNAL

Advanced starter signal of the station in rear shall be interlocked with the mid-section modified semi-automatic stop signal in such a way that when working with 'A' sign extinguished, the Advanced starter shall assume 'off' aspect or be taken 'off' only when the line is clear upto an adequate distance beyond the mid-section modified semi-automatic stop signal;

MODIFIED SEMI-AUTOMATIC STOP SIGNAL

- Similarly, the mid-section modified semi-automatic stop signal shall assume 'off' aspect automatically or be taken 'off' only when the line is clear upto an adequate distance beyond the Home signal of the station ahead;
- **During normal conditions, mid-section modified semi-automatic stop signal shall work as normal automatic stop signal.**

MODIFIED SEMI-AUTOMATIC STOP SIGNAL

- During abnormal conditions like fog, bad weather impairing visibility, the mid-section modified semi-automatic stop signal may be worked by extinguishing A marker in the manner prescribed
 - under special instructions
- This action shall also ensure that the A marker of the Advanced starter signal of the station in rear and Home signal of the station in advance shall also be extinguished

MODIFIED SEMI-AUTOMATIC STOP SIGNAL

- When the Loco Pilot finds mid-section modified semi-automatic stop signal with A marker extinguished in on ‘position,’
 - He shall stop his train in the rear of the signal and inform this fact to the **Station Master of the station ahead** on approved means of communication as prescribed under special instructions

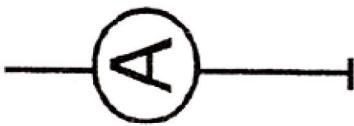
MODIFIED SEMI-AUTOMATIC STOP SIGNAL

The Station Master of the station ahead may authorize the Loco Pilot to pass the mid-section modified semi-automatic stop signal working in "on" position through extinguished in "off" position of communication after approved means of communication after ensuring conditions and procedure prescribed under special instructions

MODIFIED SEMI-AUTOMATIC STOP SIGNAL

In case the Loco Pilot is unable to contact the Station Master of station ahead, he shall pass the signal at = on '**AFTER WAITING FOR FIVE MINUTES AT THE SIGNAL**' and proceed cautiously and be prepared to stop short of any obstruction, at a speed not exceeding ten kilometers an hour (10KMPH) upto the next Signal and act as per aspect of this signal;

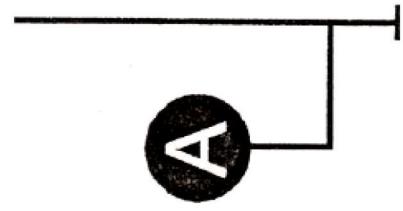
**Automatic Stop
Signal**



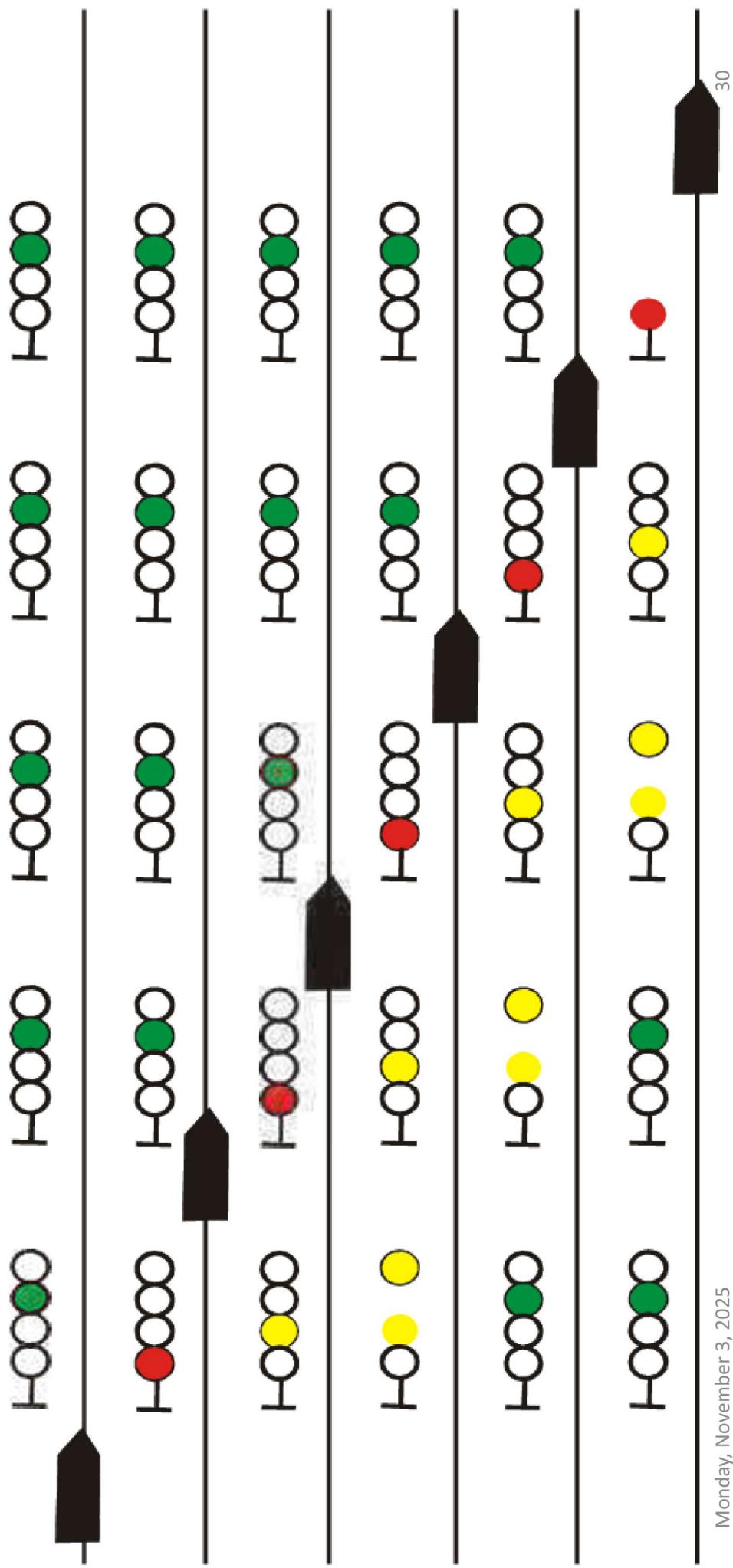
**Letter 'A' in black on
white circular disc**

White illuminated letter 'A'
against black background
when working as an
Automatic Stop signal,
and letter 'A' extinguished
when working as a
manual Stop Signal.

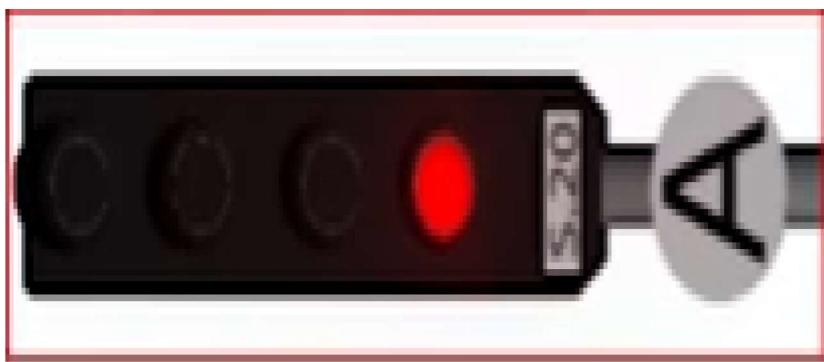
**Semi-automatic
Stop Signal**



AUTOMATIC CHANGE OF SEQUENCE OF ASPECT BEHIND THE TRAIN IN FOUR ASPECT SIGNALLING TERRITORY



- GR 9.02. DUTIES OF LOCO PILOT AND GUARD WHEN AN AUTOMATIC STOP SIGNAL ON DOUBLE LINE IS TO BE PASSED AT ON**
- STOP AT THE FOOT OF THE SIGNAL
 - ONE LONG WHISTLE
 - GUARDS DUTIES- ensure LV|-show **STOP HAND SIGNAL**
 - WAIT FOR ONE MINUTE BY DAY AND TWO MINUTES BY NIGHT
 - LOCO PILOT SHALL PROCEED **WITH GREAT CAUTION** UNTIL THE NEXT STOP SIGNAL IS REACHED
 - THE LOCO PILOT SHALL **NOT EXCEED 15 KMPH** SO **AS STOP SHORT OF ANY OBSTRUCTION**



DUTIES OF TMR WHEN PASSING AUTOMATIC

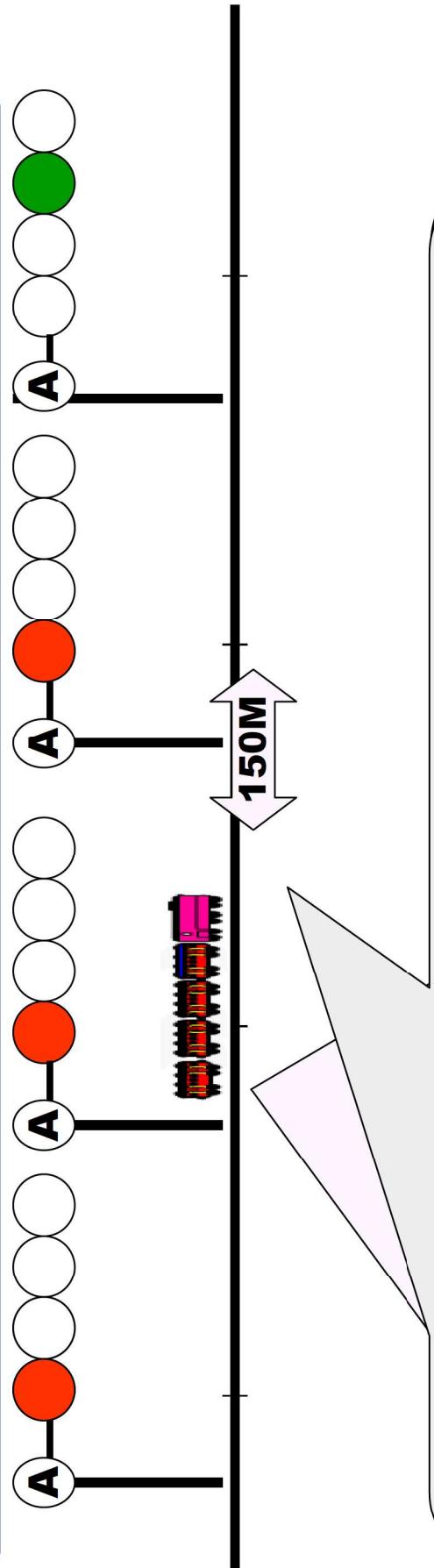
SIGNAL AT ON:

1. ENSURE THE VISIBILITY OF LAST VEHICLE INDICATOR
2. SHOW STOP HAND SIGNAL CONTINUOUSLY TOWARDS REAR
3. ENSURE LP IS FOLLOWING PRESCRIBED RULES TO PASS AUTOMATIC SIGNAL AT ON
4. WAIT ONE MINUTE BY DAY OR WAIT TWO MINUTE BY NIGHT
5. PASS AUTOMATIC SIGNAL AT SPEED NOT EXCEEDING 15 KM/PH UPTO NEXT AUTOMATIC SIGNAL
6. IF LP IS NOT FOLLOWING THE SPEED RESTRICTION, THEN FOLLOW GR 4.45 i.e DROP THE BP GRADUALLY

SR 9.02.4:

SM shall watch out for running time taken by a train encountering signal failure and on noticing any unexpectedly less running time, shall immediately report the matter to TLC through SCOR, for further investigation.

Passing Automatic signal at ON



AFTER PASSING AUTOMATIC SIGNAL AT ON IF ANY OBSTRUCTION IS THERE HE SHOULD STOP HIS TRAIN AT A DISTANCE OF 150M OR TWO OHE MASTS AND IN CASE OF SHORT TRAINS STOP AT A DISTANCE OF 75M OR ONE OHE MAST

GR 9.11. LOCO-PILOT TO REPORT THE FAILURES

An automatic Stop signal should be considered to have failed when

- The signal exhibits no aspect at all
- The signal displays more than one aspect (bobbing / flickering)
- The signal displays stop aspect due to Axle counter failure
- The signal displays stop aspect despite the Automatic Block Signalling section protected by it being clear.

GR 9.11. LOCO-PILOT TO REPORT THE FAILURES

- Whenever failure of Automatic signal has taken place, **the Loco Pilot shall sound the prescribed whistle code -00 (one long two short) while running through the next block station** and, on approaching the next reporting station, inform the Station Master on duty, duly giving the Signal number passed at on
- Reporting station shall be the next block station at which the train stops

GR 9.14. SEMI-AUTOMATIC STOP SIGNAL AT 'ON'

- If A marker **ILLUMINATED** , WORKS AS **AUTOMATIC**
- If A marker **ILLUMINATED** and SIGNAL at **ON** then follow **PASSING AUTOMATIC SIGNAL AT ON**

GR 9.14. SEMI-AUTOMATIC STOP SIGNAL AT 'ON'

➤ If A marker **EXTINGUISHED** signal work as

MANUAL STOP SIGNAL

➤ If A marker **EXTINGUISHED** and SIGNAL at ON

then **WAIT UNTIL TAKEN OFF OR CALLING-ON IS**

GIVEN OR T/369 (3b)

GR 9.15 GATE STOP SIGNAL IN AUTOMATIC SIGNALLING TERRITORY

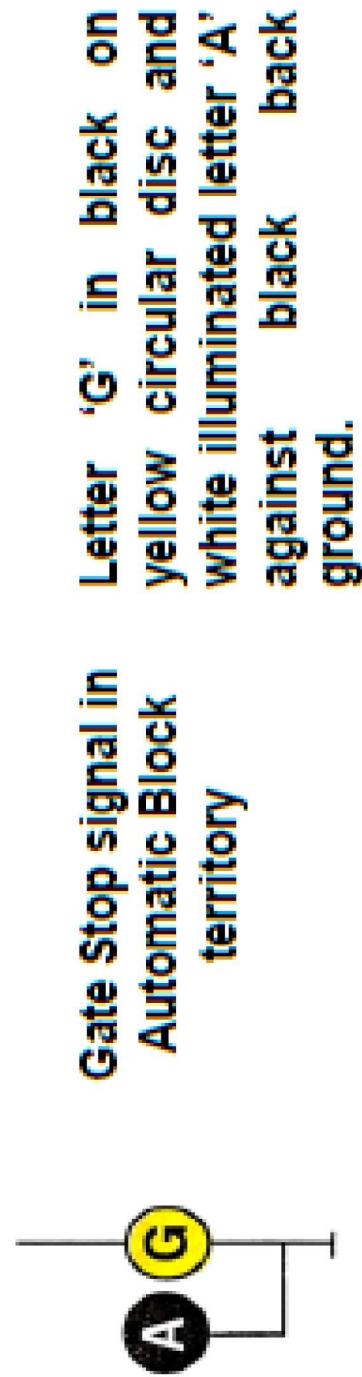
- ✓ AUTOMATIC SIGNALS INTERLOCKED WITH LEVEL CROSSING GATES ARE DISTINGUISHED BY THE PROVISION OF 'G' MARKER I.E., LETTER 'G' IN BLACK ON YELLOW CIRCULAR DISC AND WHITE ILLUMINATED LETTER 'A' AGAINST BLACK BACK GROUND.
- ✓ WHEN **GATE IS IN OPEN CONDITION**, GATE SIGNAL EXHIBITS STOP ASPECT WITH EXTINGUISHED 'A' MARKER.
- ✓ WHEN **GATE IS IN CLOSED CONDITION**, IT WORKS AS AUTOMATIC STOP SIGNAL WITH ILLUMINATED 'A' MARKER.





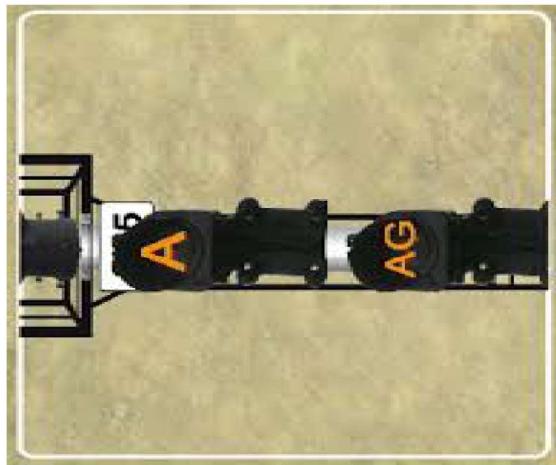
GR 9.15 GATE STOP SIGNAL IN AUTOMATIC SIGNALLING TERRITORY

- ✓ IF 'A' MARKER IS **ILLUMINATED** AND THE SIGNAL IS AT 'ON', THE LOCO PILOT SHALL FOLLOW THE RULES FOR **PASSING THE AUTOMATIC SIGNAL AT 'ON'**.
- ✓ IF 'A' MARKER IS **EXTINGUISHED** AND SIGNAL IS AT 'ON' THE LOCO PILOT HAS TO FOLLOW **THE GATE RULES AND THEN AUTOMATIC RULES**



Note: Letter 'A' shall be lit only when the gates are closed and locked against road traffic.

CONCEPT OF A & AG MARKER

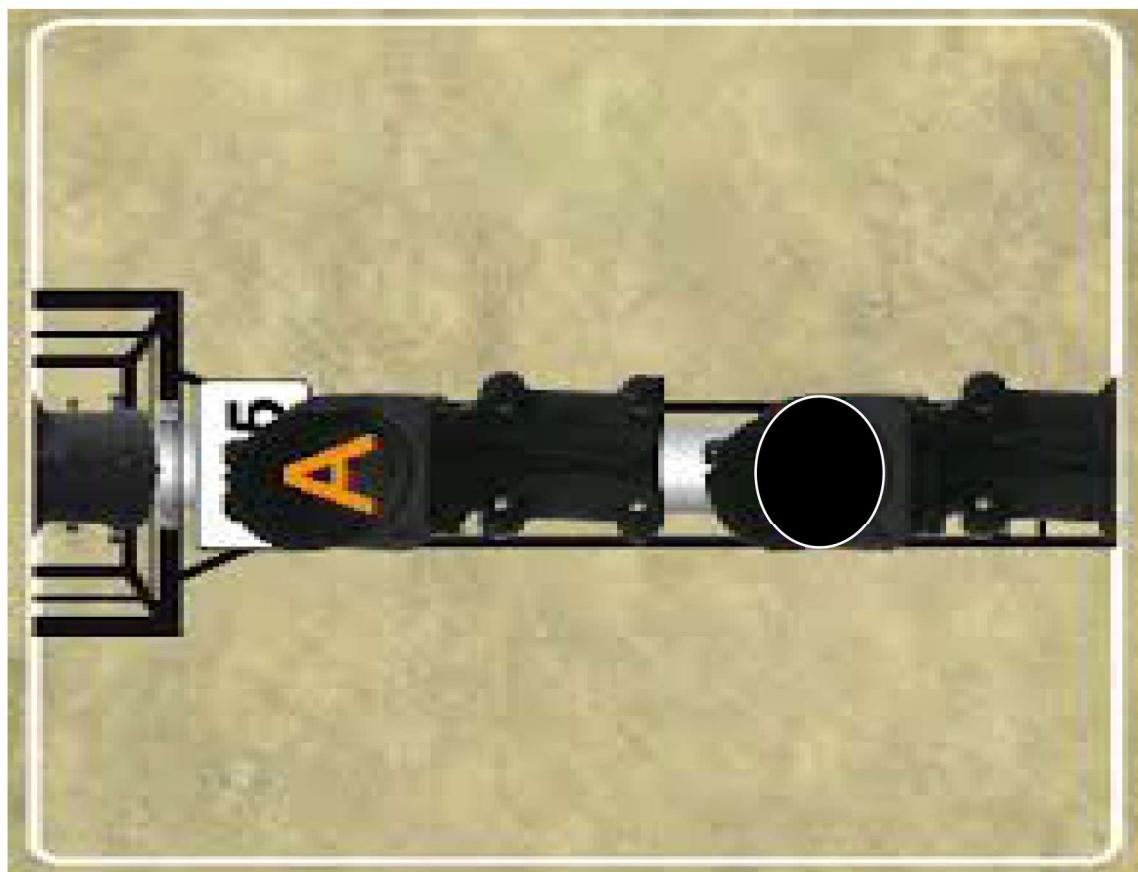


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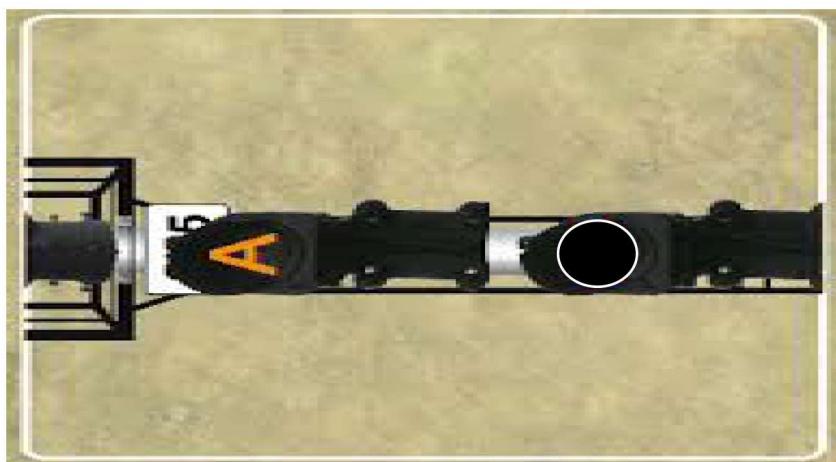
In Automatic signalling territory, when a semi-automatic stop signal is required to protect a level crossing gate in addition to points, the signal shall be provided with an illuminated AG marker, in addition to the illuminated A marker against black background.

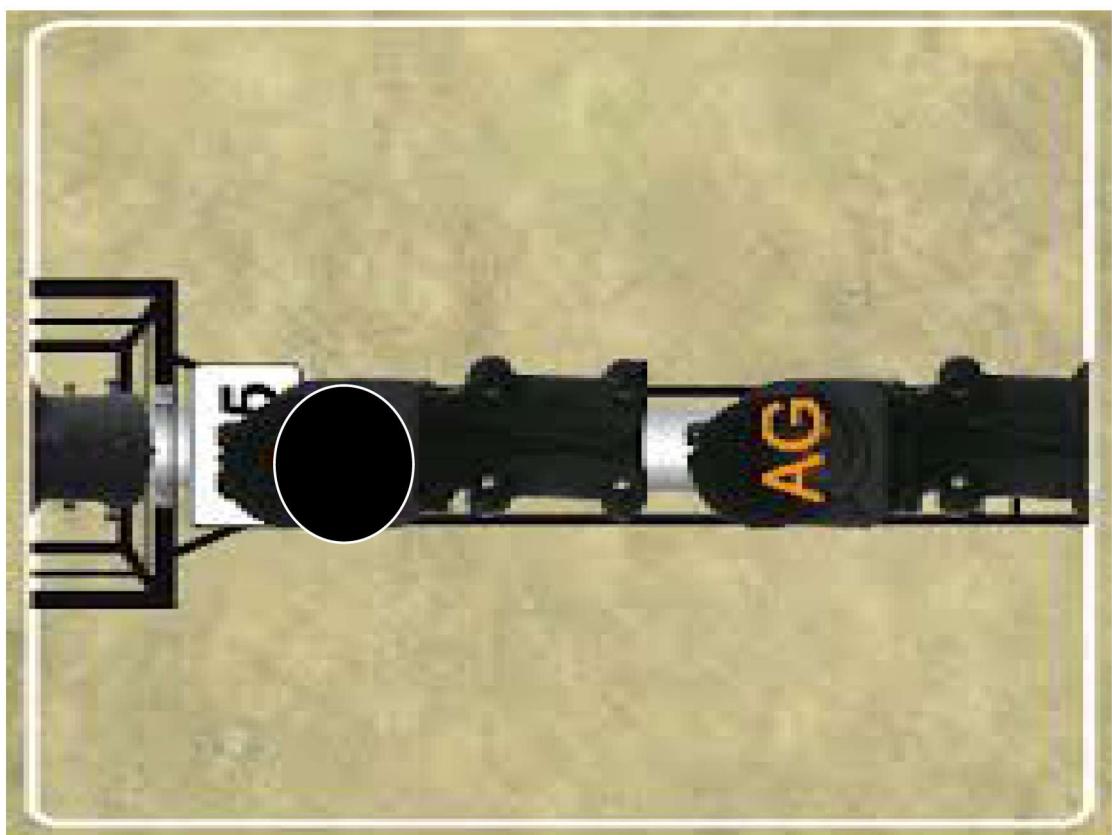
The indication of such signal shall be –

- a) When the level crossing gate is closed and locked against road traffic and points where existing, are correctly set for mainline and locked for the route, only A marker shall be lit.
- b) When the level crossing gate is either open to road traffic or has failed, but points, where existing are correctly set for main line and locked for the route, only AG marker shall be lit.



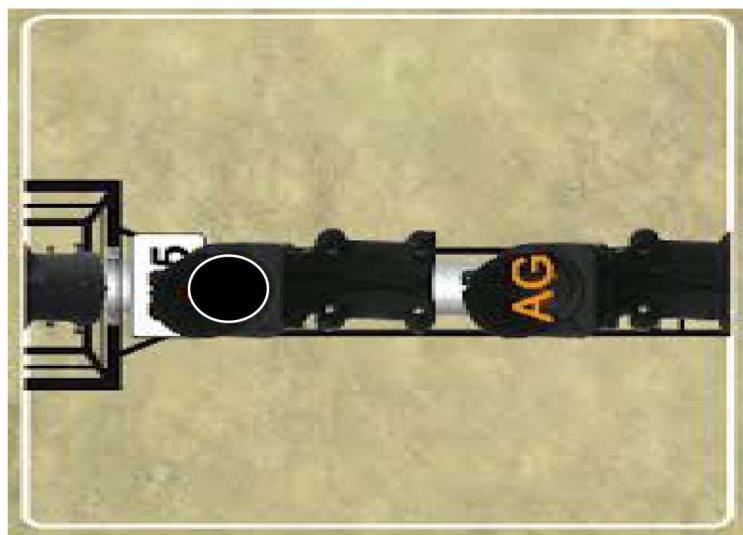
**'A' marker lit
Level crossing Gate is
secured against road
traffic and points are
correctly set for main
line**





'AG' marker lit

Level crossing gate is either open to road traffic or has failed, but points are correctly set for main line. LP to follow Gate & automatic rules.

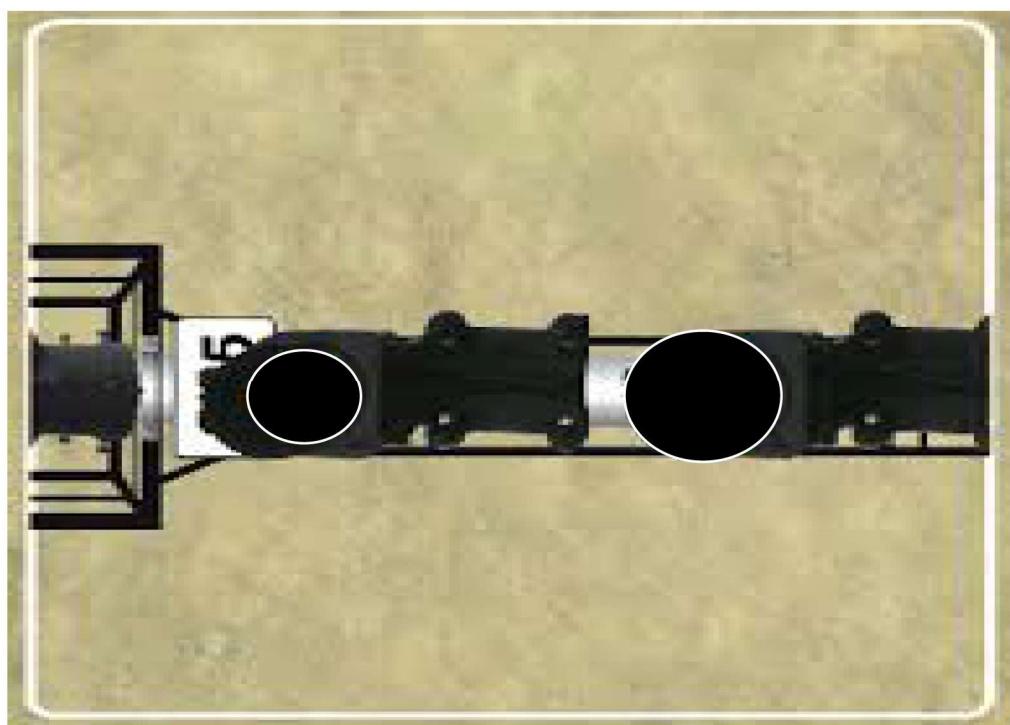


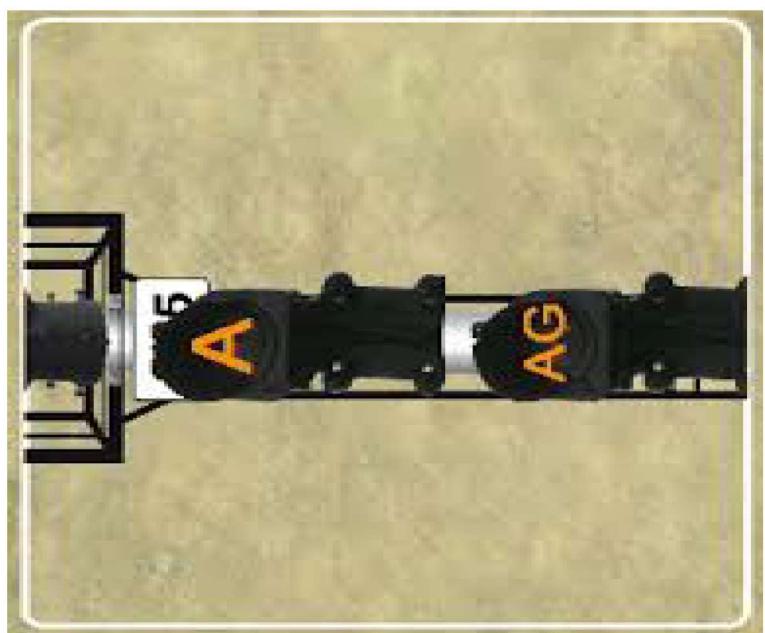
c) When points, where existing, **are not correctly set and locked for the route or have failed, irrespective of LC gate position,** no marker shall be lit.

d) If **both A and AG marker are extinguished**, signal above shall be deemed to work as a **Manual stop signal.**

e) Illuminated A and AG markers shall not be lit together.

In case of A and AG markers are lit together, signal above shall be deemed to **work as a Manual stop signal.**



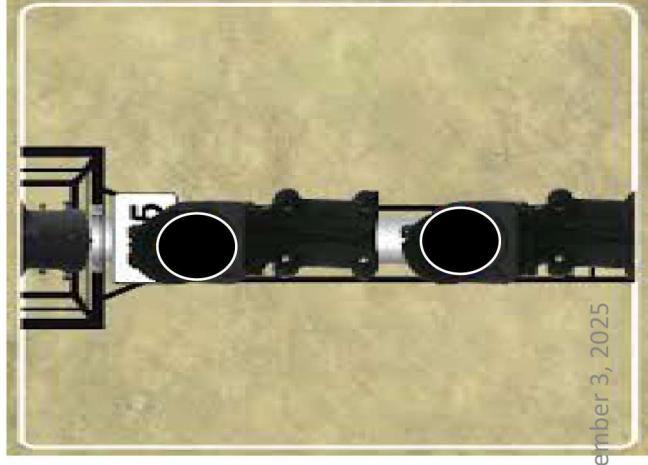
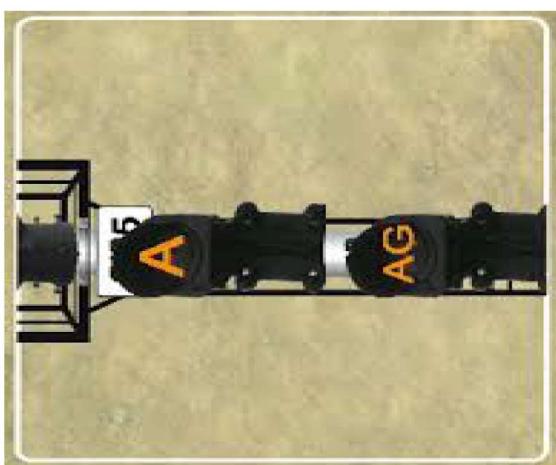


'A' & 'AG' marker lit

Signal above shall be deemed to work as a Manual stop signal and LP shall pass only on assumption of 'off' position or on receipt of T/369(3b) and PHS

'A' & 'AG' marker extinguished

Points are not correctly secured or failed, irrespective of LC gate position. Signal shall be deemed to work as a Manual stop signal and LP shall pass only on assumption of 'off' position or on receipt of T/369(3b) and PHS



- When a Loco Pilot finds a Semi-Automatic Stop signal with ILLUMINATED 'A' MARKER at 'on',**
- (a) Where there is **NO PROVISION OF 'AG' MARKER**, loco pilot shall bring the train to a stop in rear of it and follow the **AUTOMATIC RULES**
- (b) Where there is a **PROVISION OF 'AG' MARKER**, and **'AG' MARKER IS EXTINGUISHED**, loco pilot shall bring the train to a stop in rear of it and follow the AUTOMATIC RULES
- (c) Where there is a **PROVISION OF 'AG' MARKER, AND 'AG' MARKER IS ILLUMINATED**, loco pilot shall bring the train to a stop in rear of it and shall pass such signal only on assumption of 'off' position or on receipt of written authority T/369(3b) and PHS.

WHEN A LOCO PILOT FINDS A SEMI-AUTOMATIC STOP SIGNAL WITH EXTINGUISHED 'A' MARKER AT 'ON'

- (a) Where there is **no provision of 'AG' marker**, loco pilot shall bring the train to a stop **in rear of it** and shall pass such signal only on assumption of 'off' position or on receipt of written authority T/369(3b) and PHS.
- (b) Where there is **a provision of 'AG' marker, and 'AG' marker is illuminated**, loco pilot shall bring the train to a stop **in rear of it** and shall follow the instructions given in GR 9.15(b) GATE RULES
- (c) Where there is a provision of 'AG' marker, and **'AG' marker is extinguished**, loco pilot shall bring the train to a stop **in rear of it** and shall pass such signal only on assumption of 'off' position or on receipt of written authority T/369(3b) and PHS.

Running of trains in Foggy whether

Fog safety device Provided –

Green- 75 kmph

Double yellow – 30 kmph

Single yellow – Restricted speed

to stop short of next signal

Fog Safety device not provided-

Green- 60 kmph



Any Questions?

Who

When

Why

Where

How

What

