AHB Auto Half Barrier Circuit

Based on MKII installation

This document is not endorsed by Network Rail. It is NOT for installation, commissioning, testing or maintenance purposes, it is for information only. Network Rail's own documents must be followed at all times, however; this contains re-written extracts from railway standards.

Version One May 2015

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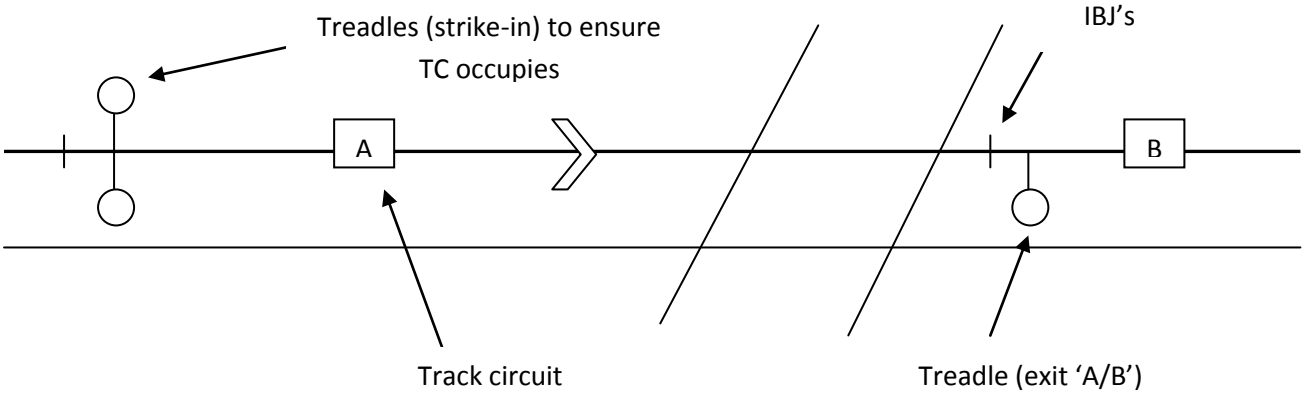

Use the basic track layout above with the following flowchart:

THESE STYLE BOXES DESCRIBE THE FUNCTION OF THE RELAY

THESE STYLE BOXES DESCRIBE THE SEQUENCE OF OPERATION

THESE STYLE BOXES DESCRIBE WHAT IS HAPPENING AT LC & SB

REPEAT RELAY OF TPR & TR (TRACK CIRCUIT OCCUPIED/CLEAR)

TRAIN OCCUPIES TRACK CIRCUIT 'A'

SIGNALLER RECEIVES 'WORKING' INDICATION

'A' T1PR DROPS

STRIKE IN TC STICK RELAY. DROP WITH STRIKE IN TC. WILL NOT REPICK UNTIL EXIT CONDITIONS MET/TIME RELEASE ACTIVATED/OR BARRIERS RAISED USING LCU

'A' TPSR DROPS

FOLLOWS JCSR, IF TJR's DON'T PICK WITHIN 3 SECS OF EACH OTHER, THIS RELAY WILL PICK

'A' SR PICKS

TJPSR DROPS

10 SECOND TIMER RELAYS. THESE DROP WHEN STRIKE-IN TC OPERATED AND THEN START TO TIME. THIS IS TO ENSURE BARRIERS ACTIVATE AT THE CORRECT DISTANCE

AFTER 10 SECONDS, 1 & 2 TJR'S DROP

COMPARES TIME OF TJR's AND IF 3 SECS DIFFERENCE IT WILL RE-PICK THEM

(CON)SR DROPS

JCSR PICKS

DROPS (CON)JPR AFTER 7.5 SECONDS AFTER AMBER LIGHTS HAVE LIT

(CON)JR DROPS

AFTER 3 SECONDS

AMBER LIGHTS SHOW

YODALS SOUND

AFTER 7.5 SECS

HJR DROPS

TIMER RELAY ENSURES AMBER ROAD LIGHTS SHOW FOR 3 SECONDS

(CON)JPR DROPS

HJPR DROPS

CUTS FEED OFF TO BARRIER VALVES

DROPPING ACTIVATES RED ROAD LIGHTS. IT CAN ONLY RE-PICK IF BARRIERS ABOVE 42 DEGREES AND RE-DROPS IF EJR DROPS

RED ROAD LIGHTS SHOW

SEE NEXT PAGE (A)

SEE NEXT PAGE (B)

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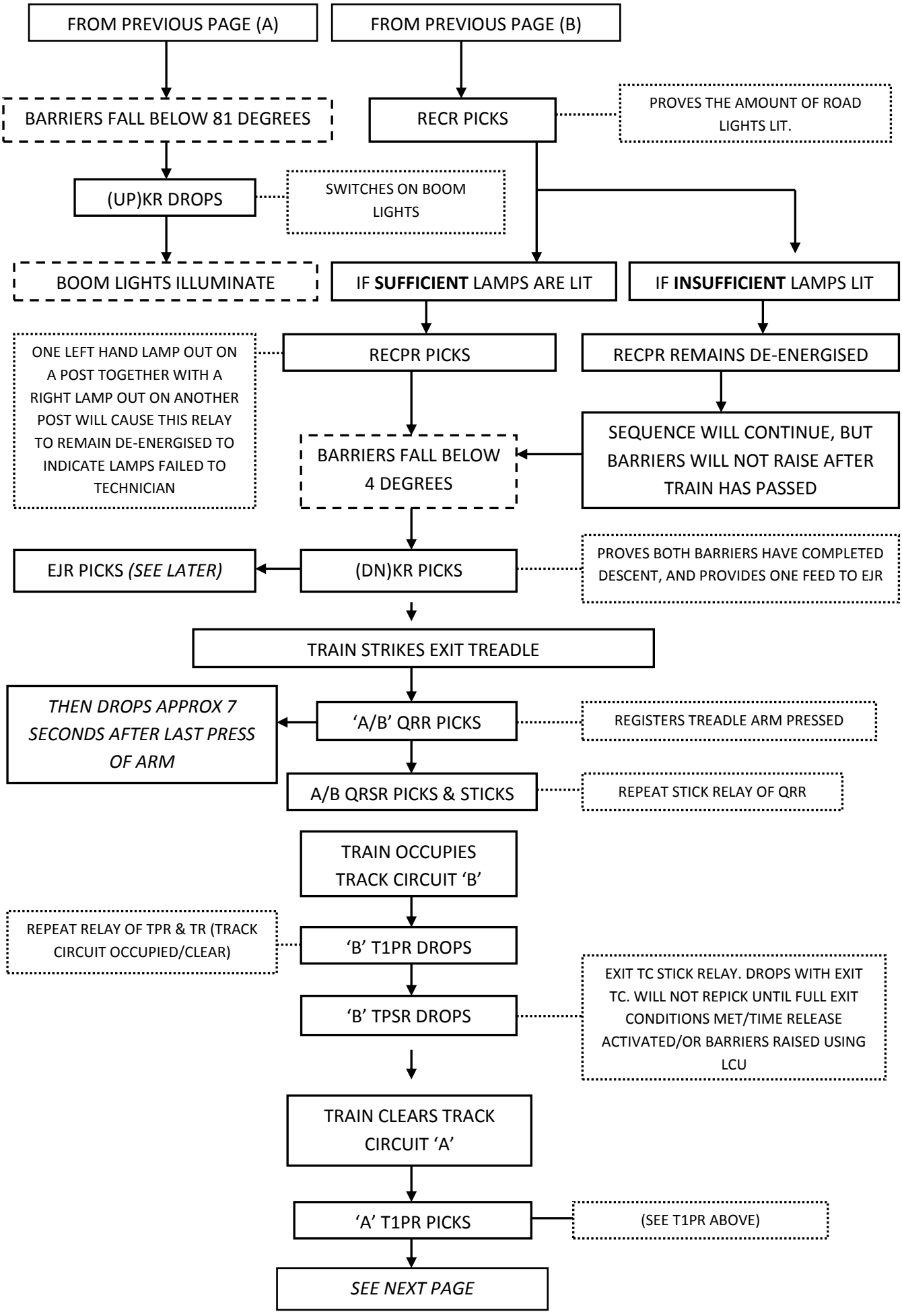

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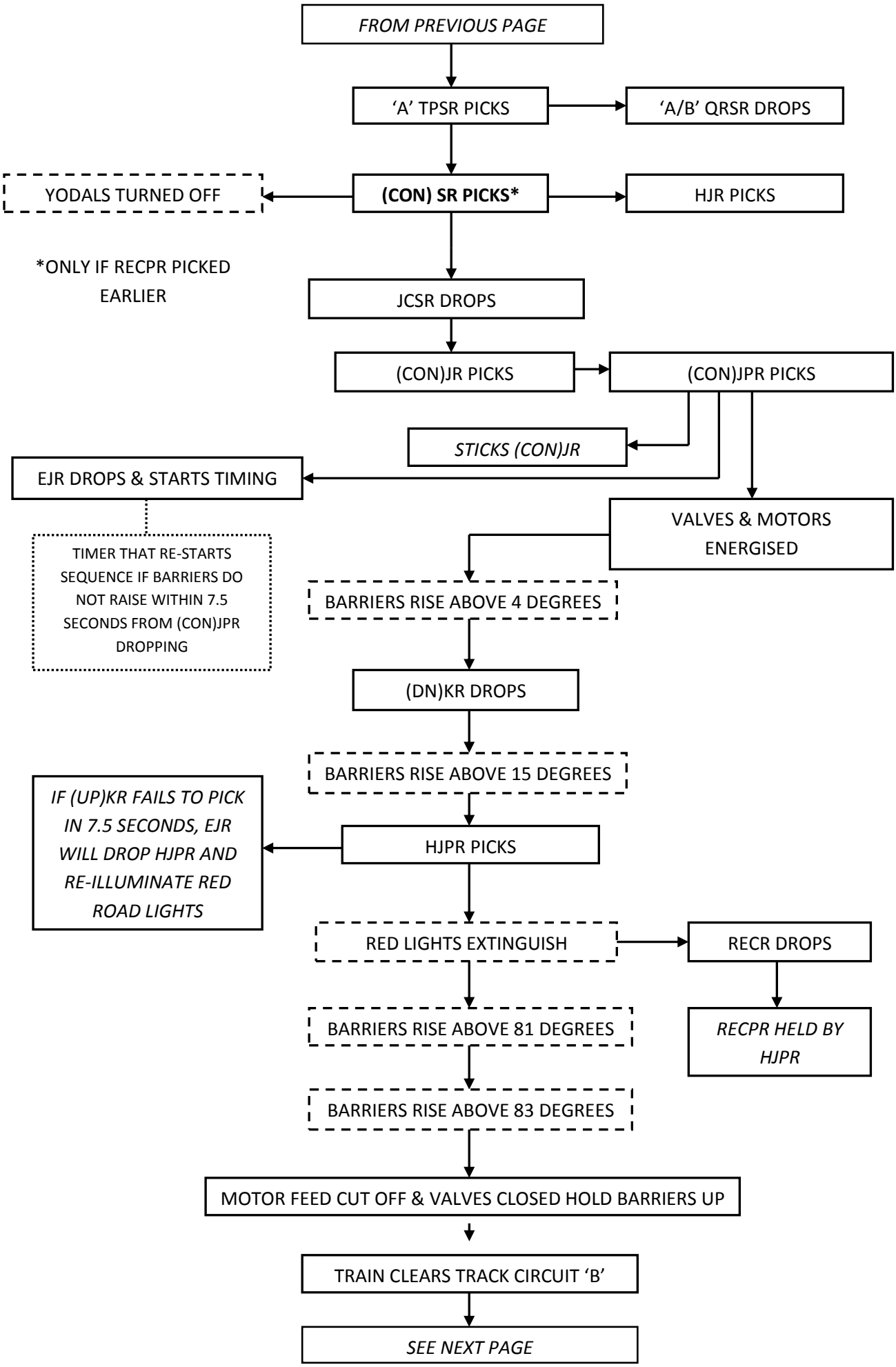

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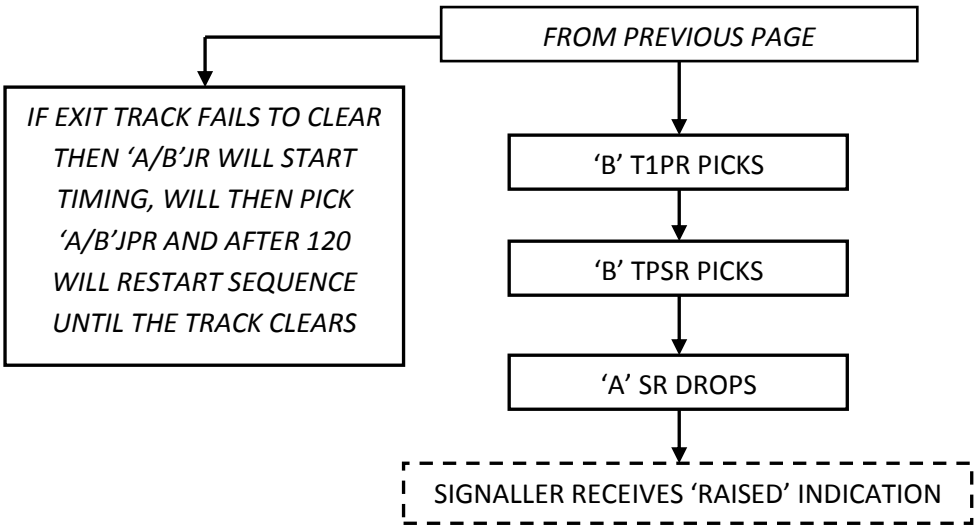

NOTE: IF STRIKE-IN TRACK CIRCUIT FAILS WITHOUT PRESENCE OF A TRAIN, THE SEQUENCE WILL BE INITIATED AND BARRIERS WILL REMAIN DOWN. WHEN THE TRACK CLEARS, THE 'A/B'JR WILL START TO TIME OUT AND PICK 'A/B'JPR, RAISE BARRIERS AND RESTORE BARRIERS RAISED INDICATION. THIS WILL HAPPEN IF TRACKS WERE TESTED ON MAINTENANCE UNLESS THE LC WAS TAKEN ON LOCAL CONTROL, THEN LCU 'UP'CIRCUIT WILL MAINTAIN (CON)SR STICK PATH.

Indication to the signalbox is sent via either three or four wire operation. Three wire uses a common negative, and the other two wires used for 'raised' and 'power off' indication. No voltage gives 'working' indication.

With four wire operation both the negatives are maintained all the time. Only the positive uses one of the two other wires for 'raised power on' and the other wire for 'raised power off', no voltage gives 'working' indication to the signaller.

- **Relay normal positions when crossing normal (barriers raised):**

Relay UP	**Relay DOWN**
A T1PR	A SR
A TPSR	B SR
B T1PR	A/B QRR
B TPSR	A/B QRSR
(LCU)DOOR CR	A/B JR
(Y/Z)CR (BARRIER DOORS)	A/B JPR
(LCU) (N) CSR (NOT ON LOCAL CONTROL)	(DN)KR
(PO)PR (POWER ON)	JCSR
(UP)KR	EJR
1 TJR	RECR
2 TJR	
(CON)SR	
HJR	
HJPR	

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Relay UP	Relay DOWN
(CON)JR	
(CON)JPR	
RECPR	
TJPSR	

- **Relays not mentioned in flowchart above:**

(CON)YR	Combines the directional controls for all four approaches on double-line bi-directional AHB's.
ZCSR	Prevents sequence of road lights if LCU lower/hand switch is turned with barriers up and either pedestal door open or Y/Z(DOOR)CR has failed.
TZSR	Track special relay used for a berth track for a regulated signal. Once dropped it requires overrun track circuit occupied or a treadle activated. It is used to prevent a train disappearing due to rusty rails.
TZJR	Timer used for above relay.
(UP) QRCSR or (DN)QRCSR	Used in conjunction with QRSR, it proves the treadle for direction it states has been normalised after passage of a train
(NS)R	Non-stopping train repeat of button in SB
(NS)SR	Stick relay for above
(DWL)R	Drivers white relay
(DWL)ECR	Drivers white light proving relay

- **Differences between Mark I and Mark II installations:**

Mark One	Mark Two
'Penguin' style pedestal mounted on a concrete pillar, with metal framework, hydraulic power pack with hoses. Removable top and bottom very flimsy plastic covers (called guillotine covers).	One piece steel '843 type' pedestal with two hinged access doors and microswitch on handle side. Contains sealed hydraulic power pack. But better weather protection compared with a Mark One.
LCU inside one of the pedestals, with push buttons and lever over auto button.	LCU in post near one of the pedestals containing three-position switch.
Road lights and bells (later Yodals) fixed to same concrete post as the pedestals.	All four road lights have their own post. Two yodals fixed to two posts.
Barrier booms made from wood.	Barrier booms made from tubular metal.
Barrier weights inside pedestals.	Barrier weights on end of barriers.
Earlier installations had neon 'Another Train Coming' signs (later abolished).	Another Train Coming signs are metal retro reflective type.
Telephones to signalbox inside flap on pedestals.	Telephones on their own posts.
Relay (CON)R used.	Relay changed to a stick relay [(CON)SR]
ECR's used in light circuits.	RECR relays used.
The circuitry between both varies with some relays abolished/added.	

>>>END<<<