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SYSTEM SPECIFICATION
FOR
BRITISH RAILWAYS AUTOMATIC WARNING SYSTEM

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Director of Signal and Telecommunications Engineering
British Railways Board
Macmillan House
Paddington
London, W2 1PT
BRITISH RAILWAYS BOARD

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AUTOMATIC WARNING SYSTEM

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Foreword

Usual Foreword

References.

References in this specification is made to :-

British Railways Specifications

967 - Railway Signalling Apparatus Environmental Conditions.

1944 - Automatic Warning System, Reed Receiver.

BRITISH RAILWAYS AUTOMATIC WARNING SYSTEM SPECIFICATIONS.

10 - Standard and Extra Strength Permanent Magnets for AWS and Temporary Speed Restrictions.

36 - Static Voltage Convectior

37 - New Pattern Electro Inductors and Suppressors Inductors, Stsndard and Extra Strength.

RAILWAY INDUSTRY ASSOCIATION SPECIFICATIONS

12 - Electronic Equipment In Rolling Stock Control Systems.

13 - General Specification for Electronic Equipment

STANDARD SIGNALLING PRINCIPLE.

43 - Automatic Warning System

46 - Warning Indicators for Permanent Speed Restrictions

48 - Requirements for Simplified Bi-Directional Signalling.

1. SCOPE

This specification outlines the principles and describes the operation and equipment of the British Railways Automatic Warning System.

Only the basic system is covered in detail with a brief account of the major variations being given in the Appendices e.g. use in dc electric traction areas; extended applications.

1.1

2. DEFINITIONS

The following definitions will be used throughout this specification.

2.1 AWS or System - British Railways Automatic Warning System.

2.2 Brake application - AWS initiated train brake application.
The brake application may be either a full service or emergency application depending on the type of vehicle/operating requirements.

2.3

AWS Audible Cab Indication		Lineside Signal		
Indication	Sound	Condition	Aspect	Position
Caution	Horn	Restrictive	Red, Yellow, Double Yellow/On	
Clear	Bell	Clear	Green/Off	

2.4 Ready State - receiver N contact made when running between signals, no audible indication or brake application, the indicator may be in either position.

2.5 Primed State - receiver S contact for up to 1 second after detecting a permanent magnet.

2.6 Caution Indication - the horn sounding, with a 2 second or 3 second delay to allow for acknowledgement before a brake application is initiated.

2.7 Acknowledgement) - operation of the reset switch to reset the
Reset) system to the Ready state, in acknowledgement
Initialisation) of a caution indication or on power up.

2.8 Clear Indication - the bell sounding for a nominal [second following which the system automatically restores to the Ready state.

3. PRINCIPLES

3.1 The primary function of the AWS is to draw the drivers attention, by means of an audible indication in the cab, to a lineside signal as his train approaches it. Different tones are used for clear and restriction signals.

3.2 At a restrictive signal the driver is required to take positive action to acknowledge the audible caution indication. This action has the following results.

3.2.1 silence the audible indication.

3.2.2 prevent a brake application.

3.2.3 reset the system to its Ready state.

3.3 If acknowledgement of the caution indication is not made by the time the leading vehicle has reached the line signal post then a brake application is immediately initiated. Under normal conditions such a brake application will bring the train to a stand at or before the next stop signal in sequence. The AWS audible indication continues to sound until an acknowledgement is made.

In the event of a brake application it is possible to make an acknowledgement at any time this will silence the audible indication and reset the system to its Ready state. The brake release may be immediate or delayed for a predetermined period.

3.4 A visual indicator is provided as a reminder for restrictive signals. This indicator is set to display black and yellow when an acknowledgement is made following a caution indication. It is reset to display all black by the permanent magnet associated with each signal. When displaying all black the indicator should be ignored by the driver.

A means is provided of proving the display is black and yellow before the system can be reset.

3.5 In respect of the system no response is required from the driver for a clear indication.

3.6 It is required that the system is operative before the vehicle can be driven. This is achieved by providing an interlock between the system supply and vehicle traction control. A sealed emergency isolating switch is provided that can be used in cases of system failure to override the interlock.

4. INTRODUCTION

- 4.1 The system is designed to draw the driven attention, by means of audible cab indication, to a lineside signal as the train approaches that signal. The system is intermittent with the receiver on the train only having to respond at each equipped signal.

The system is comprised of two sub-systems: (1) the track sub-system; (2) the vehicle sub-system.

- 4.2 Track sub-system consists of two magnets of opposite polarities mounted in the 4ft, in the centre of the track, on the approach side of the signal. The first magnet is a permanent magnet with its South pole uppermost this is immediately followed by an electro magnet which, when energised, has its North pole uppermost. Typical track layouts are shown in Fig. 5.1. The power to the electro magnet is switched by the associated signal controls.

The permanent magnet Primes the vehicle sub-system and if an energised electro magnet is not detected within 1 second a caution indication is given. If the lineside signal is clear the electro magnet is energised and provided that this is detected within 1 second of the receiver detecting a permanent magnet then a clear indication is given.

In some instances on lines signalled for bi-directional working permanent magnets are fitted with a suppressor coil. This coil is energised, to suppress the permanent magnet field, for trains travelling in the 'opposite' direction.

- 4.3 Vehicle sub-system consists of: - a receiver, usually mounted on the vehicle bogie, which detects the track magnets and is a latched bi-stable device; a decoder (relay unit) to process the signals from the receiver and control the audible and visual indications, the brake application and acknowledgement/reset signals; clear (bell) and caution (horn) audible indications, a visual indicator; a reset switch; emergency isolating switch; a power supply and in some cases an air supply; an interlock between the systems and traction control.