

What Is the Future of Train Control?*

Reasons advanced for the belief that the coded-continuous system will be installed extensively

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THE purpose of this discussion is to consider the present status of automatic train control as it appears at the conclusion of an extremely active period of development, application, and operation, and to forecast, as far as that may be practicable, the probable developments of the future. The extent of automatic train control today makes it a factor of importance in railroad operation. Fifty railroads in this country operate some or all of their trains under its protection, 20,000 miles of equipped track carry these trains into 35 states, and over 9,000 equipped locomotives and electric cars are now operating over these tracks. Over 14 per cent of the locomotives now operating in the United States, and nearly 7 per cent of our track mileage are now equipped for automatic train control.



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Four distinct types of automatic train control equipment have been applied extensively by the railroads, either in compliance with the first and second orders of the Interstate Commerce Commission, or voluntarily: (1) automatic stop of the continuous type with forestaller; (2) automatic stop of the intermittent type with forestaller; (3) speed control of the continuous type, and (4) continuously-controlled cab signals. These four systems need no detailed description, except possibly the cab signal system without automatic brake applying equipment. With this system, two cab signal units are installed in the cab, one on the engineman's side, and one on the fireman's side. An audible device in the form of a warning whistle is arranged to blow at every change of indication downward, and it continues to blow until the engineman acknowledges his change of indication. Therefore, if the engineman is incapacitated and fails to take action, the fireman is apprised of the situation.

Comparison of Strictly Train Stop Systems

Considering each of these systems in turn, to what degree do they afford protection against the hazards of train operation? Taking first the intermittent automatic stop with forestaller, which system was intended to afford protection in the event of an incapacitated engineman, when the train passes a restrictive wayside signal, or when the engineman overlooks such a signal. This system does not prevent a reckless or a careless engineman from taking chances after passing the restrictive signal. This fact may lead to a hazardous situation, when a number of caution signals have been passed in succession, and the expectation that the next signal will be a caution or clear signal, approaches certainty in the mind of

the engineman. This hazard is eliminated when a continuously-controlled cab signal is associated with the train stop system, because no engineman, in his right mind, would drive on toward the next signal at stop, while the signal in his cab told him positively and continuously that the next signal had not cleared.

Consider then the automatic stop system with the continuously controlled cab signal, which does all that is claimed for the intermittent stop, and in addition has other advantages of great value. This system provides continuous information for the engineman in his cab, thereby removing all question concerning the signal in advance, making it inconceivable that the engineman, after passing the caution signal, will proceed at high speed, while the signal in advance remains at

at the position indicating stop.

Maximum protection is obtained in the hazardous situation which may arise when traffic conditions in advance become more restrictive after the train has passed a signal location, such as may occur when a switch is opened in advance of a train. With the continuous system, under such conditions, the cab signal changes immediately, and the brakes apply automatically if the prescribed action is not taken by the engineman.

Increased traffic capacity results, because a train may resume speed at once when restrictive traffic conditions in advance clear up, since the engineman receives an immediate indication of the change, even though the signal in advance cannot be seen. For these reasons, when the train stop is supplemented by a continuously-controlled cab signal, the value of the system is greatly increased.

Speed Control Is a Benefit

With the automatic speed control system, the hazards of carelessness, recklessness, or bad judgment in speed are recognized, and automatic means are provided for enforcing prescribed speed limits under all signal aspects. Therefore, to the automatic speed control system with the continuous cab signal, we can credit all that we have claimed for the preceding systems, plus the additional advantages accruing from the enforcement of speed restrictions.

Some operating officers have been concerned mainly with the risks attendant upon high speed and have insisted that a high-speed limit be enforced by the automatic equipment. Others have placed emphasis upon the necessity for caution in approaching the occupied block or the "stop" signal. Having obtained the enforcement of a low-speed limit in approaching the occupied block or stop signal, they have been satisfied to allow the engineman to use

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