• What's the ANSWER? •

D.C. TRACK CIRCUIT TROUBLE

"What is the best and quickest way, especially at night, to find a partial short on a d.c. track circuit, such as that caused by a fouling bond touching a rail anchor and shorting the circuit just enough to prevent a two-ohm relay from picking and holding up, but which results in no appreciable difference in volts at any point in the circuit when checking with a voltmeter?"

With Ammeter

By P. W. GAGE
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I WOULD suggest the following method of locating a partial short in a d.c. track circuit:

First, cut out all series resistance at the battery end of the circuit. Then, place an ammeter in series with the relay, using the scale which will position the needle in about the center of the dial. Observe the needle closely while the meter is resting on a solid surface and while someone pounds each bootleg riser, insulated joint, insulated gage plate, spread rod and gage rod. If the needle fluctuates slightly when the hammer strikes, it is quite certain that the partial short is in that insulation.

Meter and Exploring Coil

By D. GUIGUE
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FIRST, find out if the trouble is in the nature of a short or an open circuit, that is, whether electric power leaks, or it is prevented from getting to the relay by too much resistance in its path. To find this out, it is only necessary to take a voltage reading across the limiting resistance. For example if, when using a two-volt battery, the voltmeter reads one, when its leads are connected to each side of the resistance, it shows that there is a large flow of current to the track. The power, then, must be finding some other path or leaking out before reaching the relays.

Possibly, the rails are not sufficiently insulated from one another. Of course, the leak could be through the balast, but assuming that there are good ballast conditions, the most likely place for the trouble would be around a switch or turnout that is, where cotter pins or other pieces of metal are most likely to bridge insulation. The quickest and easiest way to locate trouble of this kind is usually by means of an exploring coil. If that is not available, however, one must resort to very close inspection with the eyes.

Wherever there is insulation, it should be thoroughly examined. Hammering at the same time that a reading is being taken on the track will usually reveal if there is trouble at the point hammered. Cotter pins sometimes touch where they are not supposed to. Grindings, scales and other rail abrasion may cause trouble at insulated joints, especially those in turnouts. Fouling wires or bonds may come in contact with rails they are supposed to be clear of.

STOPPING DISTANCE ON GRADES

"When dealing with the problem of locating signals in relation to the braking distance of trains, what is the general method of calculating the plus or minus allowance for the stopping distance on grades?"

Lot of Variable Factors For Freight Trains

By R. E. TAYLOR
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THE braking distance for a freight train is dependent upon a number of variable factors, which are difficult to reliably evaluate. Some of these are: speed of the train; weight of the train; number of cars; condition of the brake system; ratio of braking efficiency; condition of the rails; grade; and alignment. If a value can be established for a given train for stopping on a level tangent track, compensation for grades and speed can be quite accurately computed.

To Be Answered In a Later Issue

(1) In a teleprinter tape relay office, what practice is used to assure transmisson of multiple-addressed messages to each address?

(2) Where shelter is not otherwise available, do you prefer to use boxes or booths to house telephones in the field, such as at the ends of passing tracks, at signals, in interlockings and elsewhere? Why? Please explain the advantages of your particular practice.

(3) When installing submarine-type communication or signal cables across rivers or other bodies of water, what practices and procedures have you found to be most effective in preventing the cable from being damaged due to dragging or snagging on the bottom?

(4) When pulling signal, telephone or telegraph line wires under power circuits which cross overhead, what precautions should be observed by the men doing this work from the standpoint of safety?

(5) What use is being made of lunar white by itself, or in combination with red, green or yellow, to provide additional or distinctive signal aspects?

(6) What is the safest, most reliable and satisfactory method of connecting tap wires from the rail to underground cable—inside or outside of the bootleg pedestals, and should these connections be made mechanically or soldered? Why?

If you have a question you would like to have answered, or, if you would like to answer any of the above questions, your comments will be welcomed. Address: "What's the Answer?" Department, Railway Signaling and Communications, 79 West Monroe Street, Chicago 3, Ill.