

# Requirement 7c Study Guide

*Describe a way to signal a train for an emergency stop.*

There are two ways to consider;

- Getting the **train dispatcher** to stop any nearby train(s).
- How to do it yourselves, by communicating with any locomotives that come your way.



## **How to get the train Dispatcher to stop the train(s).**

Note that we specify the **Train Dispatcher** here. In most cities, calling 9-1-1 will get you to a *regional* Highway Patrol dispatch center. They will have difficulty reporting the problem, because they probably will not know which railroad to call, and how to report it. This page will offer you the clues that the 9-1-1 operator probably won't have.

For most of the Class 1 (large) railroads, the Dispatchers all sit in the same building, looking at computer screens that monitor sections of track that each Dispatcher controls. Each dispatcher can talk to the trains on their part of the railroad using remote-control radios in the area of the tracks.

Each train dispatcher can be responsible for tracks that pass through many dozens of cities. Most of those cities have a **Main Street**, a **First St or Ave**, as well as streets named after Presidents, and the Alphabet streets. It would be difficult for them to remember all of the street crossings in their territory. (Sometimes a dispatcher will need to be responsible for a different territory for a few days or a couple weeks, filling in for someone who is out sick, or on vacation, and they wouldn't get to know all of those new crossings in such a short time.) The chance for confusion about which street in which city is too great, and that may be magnified during the stress of an emergency.

This problem has already been addressed, by the U.S. Department of Transportation (US DOT), and the Federal Railway Administration (FRA). Each of the road/railroad Grade Crossings with electric crossing gates will have a metal cabinet near the street crossing. That cabinet also has been assigned a unique **DOT Number**, which is an alpha-numeric sequence. There is no duplication of the numbers on different railroads.

*If you have the DOT Number, that is all you need to tell the train dispatcher. But how do you find the Dispatcher?*

The DOT Number of the crossing is posted at the intersection, on a large sign, on the big, metal cabinet that contains the controls for the crossing. It is near the crossing, usually painted silver or grey. The signs, by rule, have a white background, with large, black letters. The signs have a bunch of information, but you only need to find the two shown in **bold pring** below;

- The name of the Railroad who owns the tracks
- The name of the street
- The *Milepost* (M.P.) number
- **The Federal DOT Number**
- **The number to call for problems at this crossing**



**If your problem is near a crossing, and you can make a phone call, you just need to find the signal cabinet, call the phone number on the sign, and tell them what emergency you have "located at DOT Number \_\_\_\_\_".**

*When you make the call, you will be talking to a Signal Maintainer. When you tell them about the emergency, also quickly tell them the **DOT Number**. This will let them look up the crossing in a computer, and the computer will tell them which train dispatcher handles that set of tracks. Your call will then be transferred to the train dispatcher for those tracks, and you can tell the dispatcher about the problem. The dispatcher will know, from the DOT number, where your problem is, and the dispatcher will be able to see which trains may be in the area, and then they can tell the trains about the problem.*



### **How to stop a train in an emergency, by yourself**

At some point, you may be in a situation where the information above will not be helpful. If you don't have a phone, or your cellphone can't get a signal, or you can't find the DOT number, or you are not near a crossing with a marked signal case, you need another plan.

First, you need to think about a few things, before you make decisions;

- How much time do we have? When will the next train come by?
- How fast is the train likely to be? How much distance will it need to stop?
- How much time do we need? Can we clear up the problem or not?

Imagine you are out for a hike with your pack, and you see a problem on the tracks. If you live around these tracks, you might have a good idea whether to expect a freight or passenger train, about when to expect it, and from which direction it may come. In this case, you would be prepared to answer the questions above. But, what if you are going to go out hiking at a camporee, somewhere away from home? You will need more information.

Let's remember, for the sake of safety, that **trains are big, and they take a long time to come to a stop**. You have heard this in school, but have you thought about WHY a train takes so much distance to stop? Understanding this will help you to be better prepared to stop a train!

First thing to know: **Locomotives are very heavy!** They need to be heavy, to hold their wheels down against the track, so that the wheels do not spin when they are trying to pull those very heavy trains behind them.

Second thing to know: **Train wheels don't touch a lot of rail at once**. That is, the train wheel is large, and the top of the rail is also slightly rounded, so only a little bit touches the rail. This design reduces the *Rolling Resistance* (friction) of the train, which can help with fuel economy, but it makes it harder to stop a train quickly.

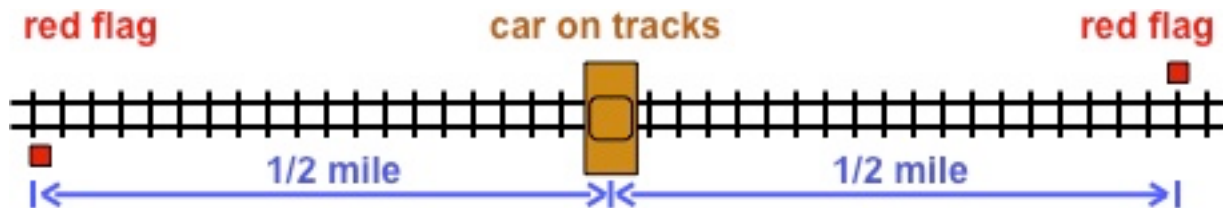
Third thing to know: **Train brakes don't usually cause wheels to skid**. Because of the small contact area between the wheels and the rails, the brakes are designed to try to slow down fast, but not enough to skid the wheels. (This is

NOT like the anti-lock braking on a car!) The reason for this design is simple: If you skid the wheels, lots of bad things can happen, including a derailment of the train, and damage to the train, the tracks, and anything near the tracks.

In the movies, you may see train wheels skid, causing all kinds of sparks. This is a special effect, meant to cause drama. In fact, if the wheels could do that, the rails themselves would try to slide in the direction of the train travel, but it cannot slide much, because of the rail ahead of it. As a result, the rail is going to bend away from the center of the track, or towards the center of the track. In either case, the wheels of the train will come off the track, causing an accident.

Fourth thing to know: **Freight trains are very heavy, and passenger trains are fast.** Many of the freight trains running today are more than a half-mile long. While they usually travel slower than 50 miles per hour, it will take a long distance for all of that weight to quickly slow down to a stop. On the other hand, while passenger trains are a lot shorter and not as heavy, they can run at speeds up to 80 miles per hour, so they will still take a long time to quickly slow down to a stop.

Now that you know why it takes a train a long time to stop, how far will the train travel from when the train starts to put on the brakes until the train finally stops? It could be **up to 1/2 mile!** If you plan to get a train to stop before it gets to the car or tree or rock on the tracks, **you will need to go up the tracks about half of a mile, so that you give the engineer enough time to stop the train before he gets to the problem.** And, if you don't know from which direction the train may come, you need to send someone 1/2 mile in each direction, as shown below.



Now you need to know how to signal an engineer to stop the train. This is done by displaying a **Red Flag, on the Engineer's side of the track.** A *red flag* needs to be red, but it could be a neckerchief, or a square bandana, a pullover sweater or the red lining of your jacket. The important things you need to remember are;

- Place the red flag far enough away that the train can stop in time
- Put it on the engineer's side of the tracks, to increase the chance of seeing it
- Make sure that it is near the tracks, but off to the side (not between the tracks)
- Make sure that it is facing the engineer (not blowing in the wind)
- If you are holding it when the train approaches, don't wave it wildly