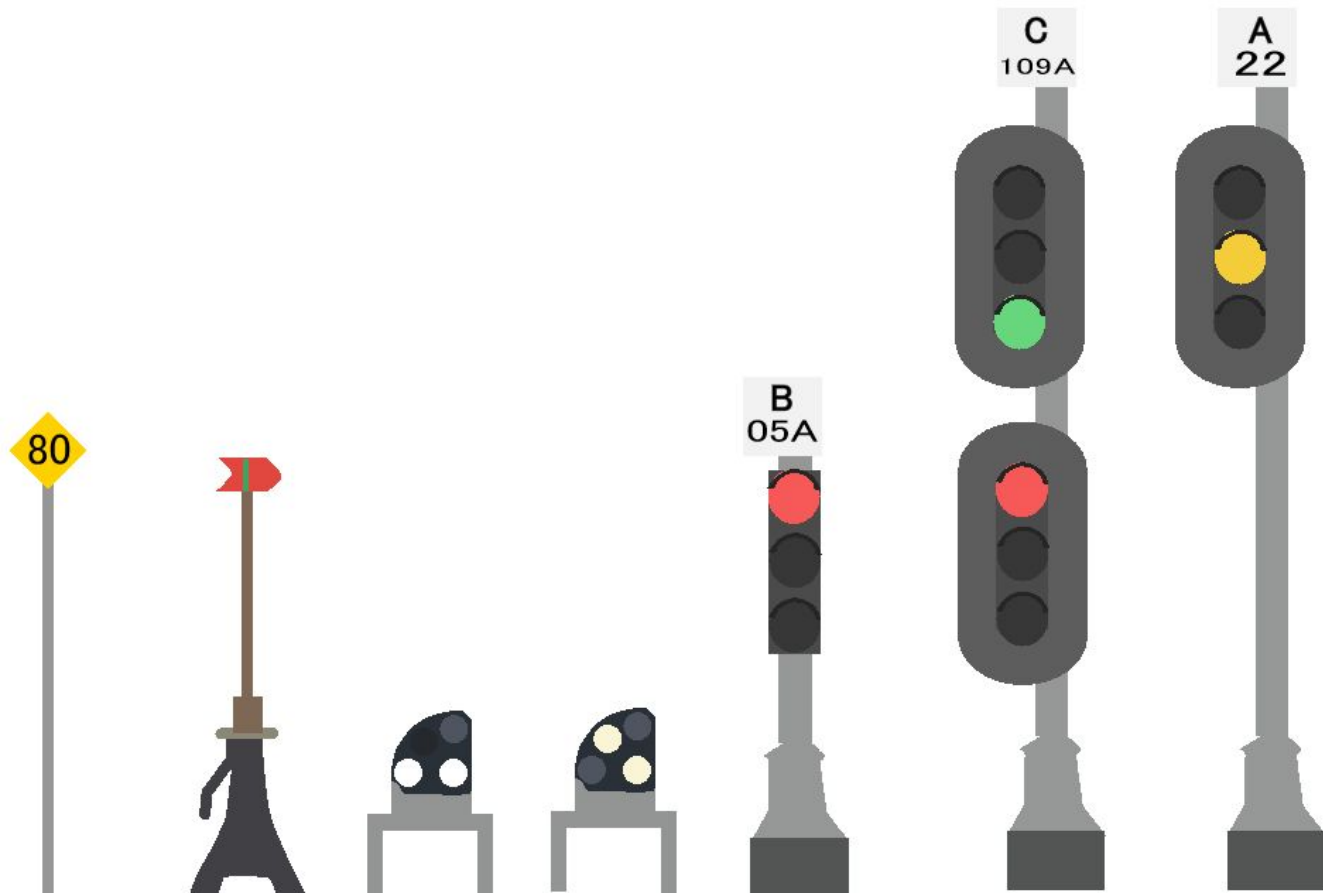


# Train Signal Spotting Guide



# **Welcome to the CTrain Signal Spotting Guide!**

## **Before we begin, you need to learn some definitions:**

Block - A section of track between two signals. The signal at the beginning of the block "protects" it.

Aspect - The visual appearance of the signal; the light combination.

Indication - The meaning of a signal aspect that tells the train operator what to do.

Favourable Indication - Signal indication that a train can safely pass.

Interlocking Signal - Signal that can indicate which way a switch is lined (excluding switch stands).

Dwarf Signal - Block signal on a low mast, usually used in yard and switch tracks. Signal head often indicates slower speeds.

Mast - Pole that block (excluding dwarf) signals are mounted on.

## More Jargon:

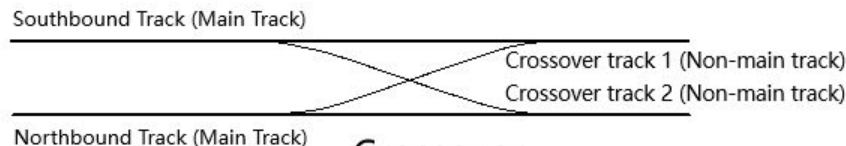
Switch - A type of track that can be moved side to side, enabling trains to move from one track to another.

Turnout - A switch track lined for the reverse position

Normal Position - When a switch is lined so that trains travel through it to continue on the main track. This usually means going straight through the switch.

Reverse Position - When a switch is lined so that trains travel through it to leave the main track. This usually means turning through the switch and not going straight.

Crossover - Example:



Track Circuit - A track circuit is an electrical system that detects the absence of a train on a section of track.

Yard - Many tracks close together used for the storage and maintenance of railcars.

# FIRST THING TO KNOW

Signals are always placed on the right side of the tracks. In the event that there are signals placed in rows, the signal to the right of the track you are on is the one that governs your train.

# Signal #1: Permissive Track Speed Sign

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This is the most simple signal on the CTrain system!

It's posted on the right side of the track. It tells the operator of the train the track speed (maximum speed) that trains can go.

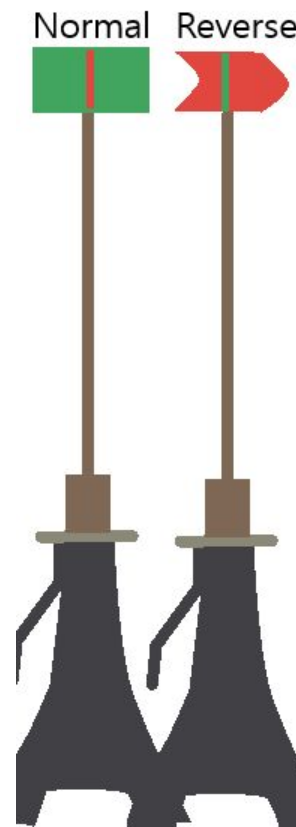
The speed limit stays in effect until the next sign.

The number on the sign is always in Kilometers Per Hour. 80 KM/H is the fastest track speed found on the CTrain network.

# Signal #2: Manual Switch Stand

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These are used for lesser-used switch tracks on the network. The switch stand displays the direction the switch is lined.



A green aspect means that the switch is lined for the normal position, and a red, arrow-shaped aspect means the switch is lined for the reverse position. The arrow faces in the direction the train will take through the turnout.

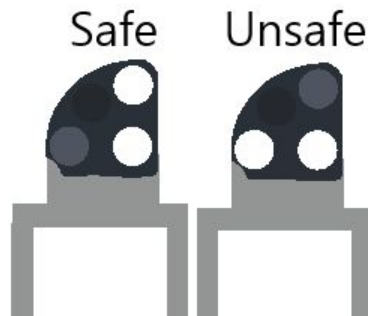
The switch stands have handles on them so crews can throw the switch, as they cannot be controlled automatically.

# Signal #3: Crossing Protection Signal

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These signals are in front of all road crossings and use white lights.

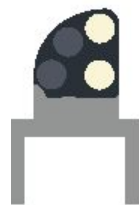
At road crossings, when the two lights are horizontal, the crossing gates are not down and it is not safe to proceed through the crossing. When the lights are vertical, it is safe to proceed.



# Signal #4: Switch Protection Signal

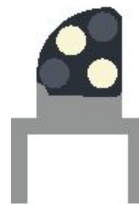
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Normal



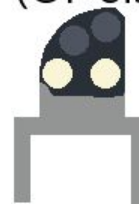
These signals are in front of all manual switches. They are not to be confused with Crossing Protection Signals. Switch Protection Signals have yellow lights and have three different aspects instead of two.

Reverse



These signals warn operators of switches not in either the normal or reverse position, or a switch lined against you if you are coming from behind it. Traveling through a switch like this could derail your train.

Stop  
(Or else)



Two lights in a vertical line means the switch is set to the normal position. A diagonal line means the switch is set to the reverse position. Horizontal means it is not safe to go through the switch as it may be misaligned.

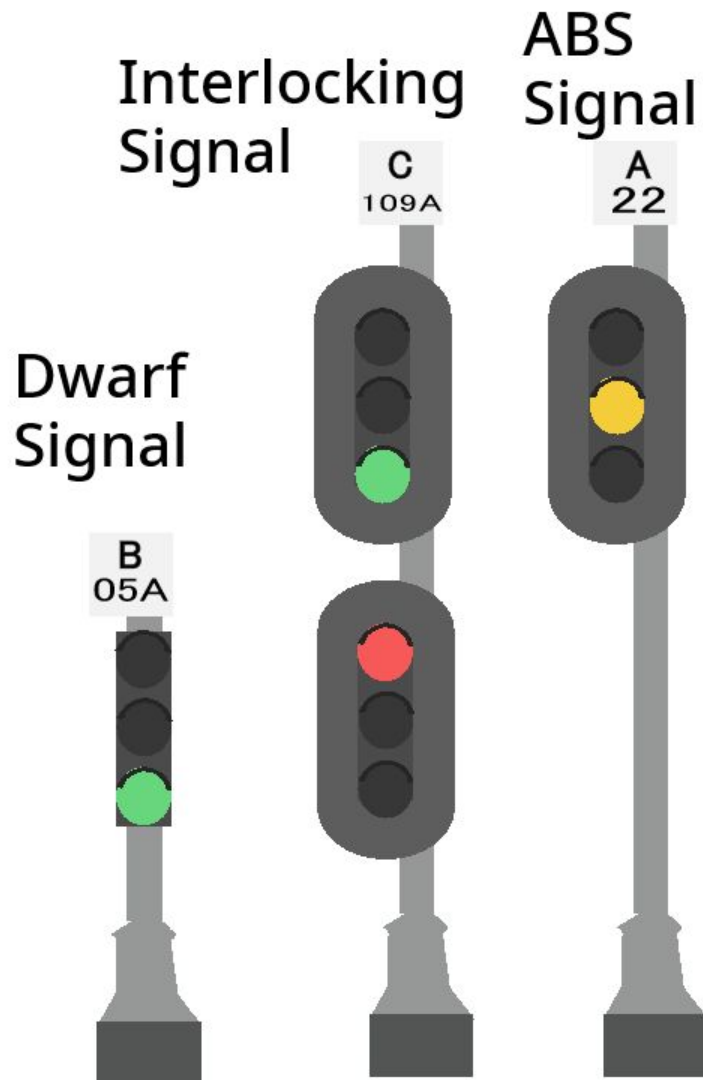


# **PART 2: Fixed Block Signalling**

Meet the block signals!

These signals tell the operators of trains how many blocks ahead of them are clear, which way automatic switches are lined, and to speed up or slow down.

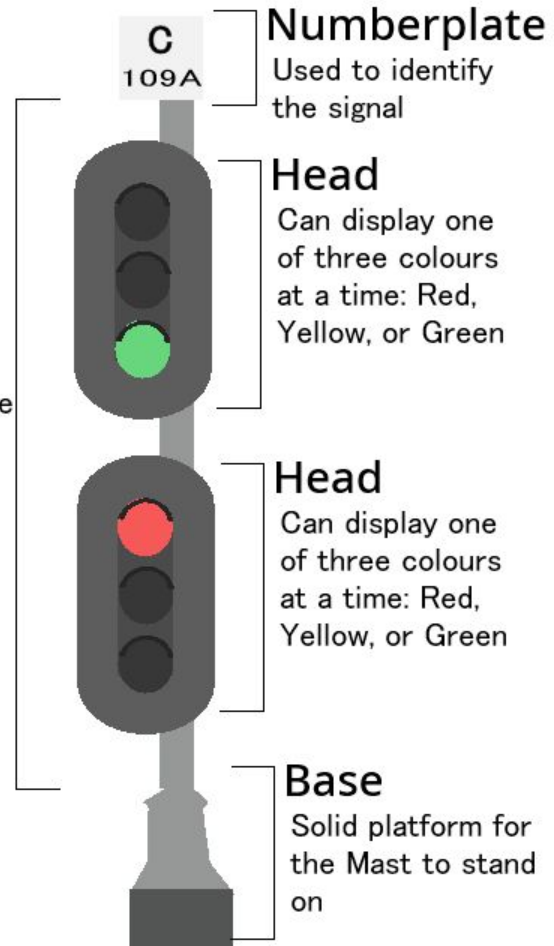
Let's break it down.



Here are the components of a signal. CTrain signals have up to two heads on them.

The entire signalling system is built off of one-headed ABS signals. Let's explore that system once you get familiar with the components of a signal.

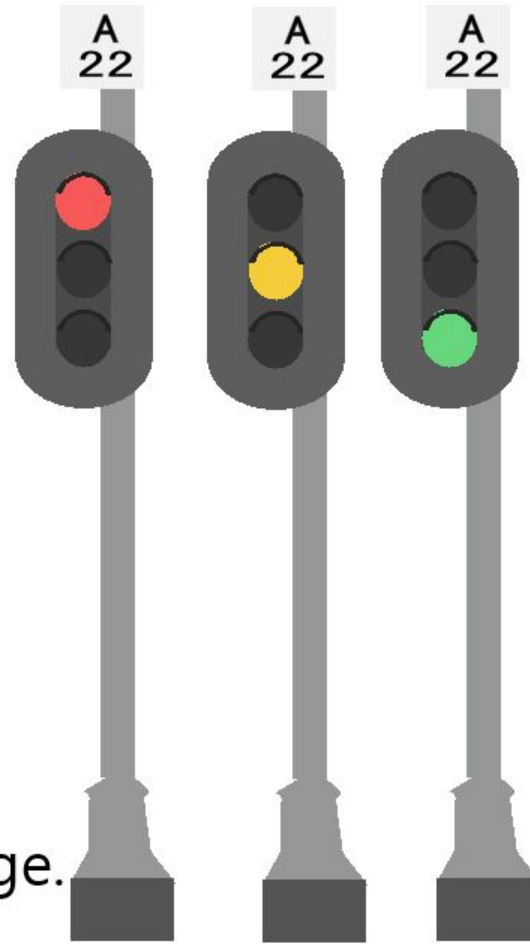
**Mast**  
Pole for mounting the Head(s) and the Numberplate. Sits on the Base.



ABS stands for Automatic Block Signal. These signals are controlled automatically by track circuits.

These signals can be identified by the fact that they will ALWAYS have one head.

ABS signals have one sole purpose - and that's to tell operators how many blocks ahead of them are clear. ABS signals display 3 aspects. We'll talk about that on the next page.





A red aspect means that you must stop and wait for a favourable aspect (yellow or green).

This means that the block in front of this signal is occupied by a train

Passing a red signal is known as a SPAD, or Signal Passed At Danger and is a very dangerous thing that operators are not allowed to do unless they receive specific permission from Rail Traffic Control.

This indication is known as Stop.



A yellow aspect tells the operator that the next signal is red. That means that block in front of this signal is clear, but the one after it is occupied by a train.

When you see this signal, you should slow down and prepare to stop at the next signal. You should proceed no faster than 60 km/h or posted speed if it is lower than 60 until you pass a Clear signal.

This indication is known as Approach, or sometimes Clear to Stop.

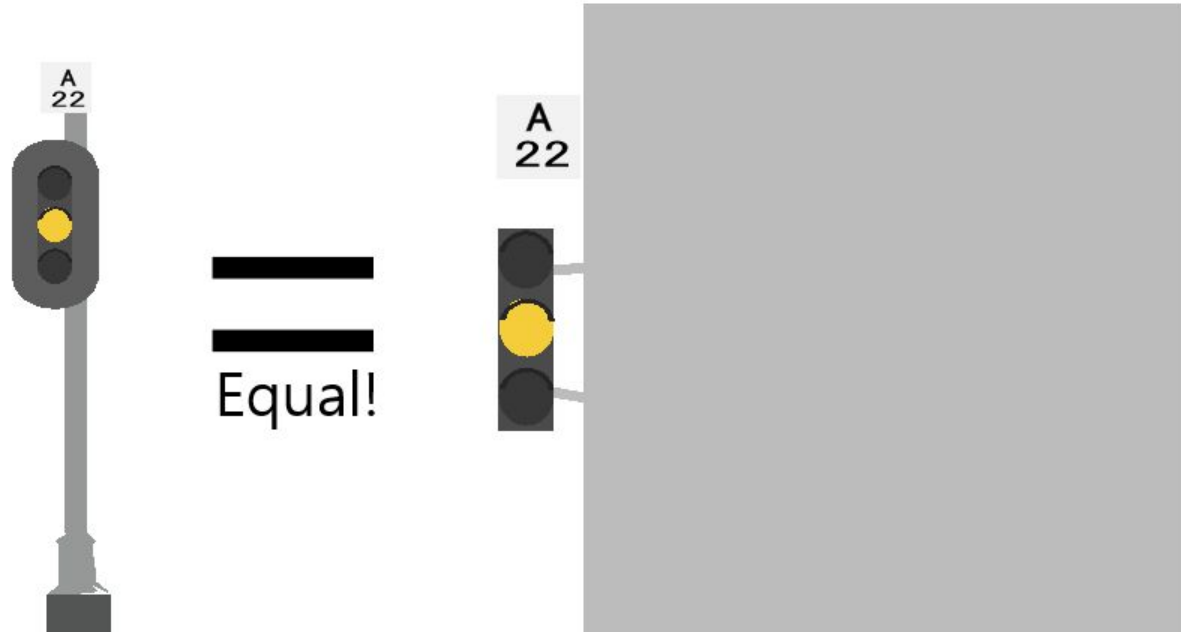


A green aspect tells the operator that at least two blocks ahead of the signal are clear. That means that the next signal could be yellow or green.

This is the most permissive aspect an ABS signal can display. It basically means that you have at LEAST two blocks ahead of you to do whatever the heck you want as long as you stay under the maximum speed and stop at all the stations.

This indication is known as Clear.

Sometimes ABS signals are mounted on walls beside the track. This is sometimes used in tunnels. When this happens, often the "target" around the lights are removed for better clearance. If you see a signal like this, it's a normal ABS signal and doesn't change the aspect or indication.

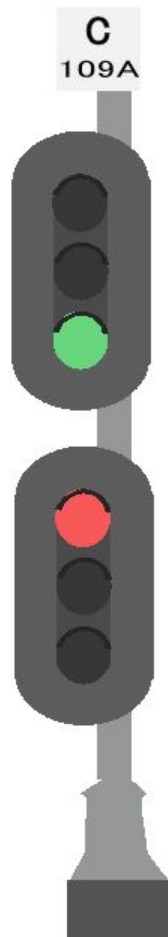




## Meet the Interlocking Signal!

Interlocking Signals can be identified by the fact that they always have two heads. They are controlled by Rail Traffic Controllers at Westbrook Control Centre. They're always placed in front of automatic switches.

An automatic switch is a switch that does not have a switch stand and cannot be controlled manually. Automatic switches are controlled remotely from Westbrook.



# THE MOST IMPORTANT RULE ABOUT INTERLOCKING SIGNALS

If the bottom head is red, the bottom head is to be COMPLETELY IGNORED and the top head is to be read like an ABS signal. Pretend the bottom head doesn't exist.

Red over Red = Stop

Yellow over Red = Approach

Green over Red = Clear

If the bottom head is yellow or green, then the top head will ALWAYS be red and the top head is to be COMPLETELY IGNORED.

We'll talk about the bottom head next.

# What happens when Interlocking Signals are not treated like ABS signals?

That means you're about to go through a turnout or you're entering a yard. There are 3 aspects an Interlocking Signal can display when the top head is red and not to be AT ALL treated like an ABS signal.

The first one is least commonly seen: Red over Yellow. This indication is called Restricting and is only really ever seen when a train is entering/moving around/leaving a yard.

It tells trains to travel really slowly and to be on the lookout for people, other trains, switches lined against you, broken rails etc.



# Turnout Aspects

When automatic switches are lined for the reverse position, interlocking signals tell this to the operator.

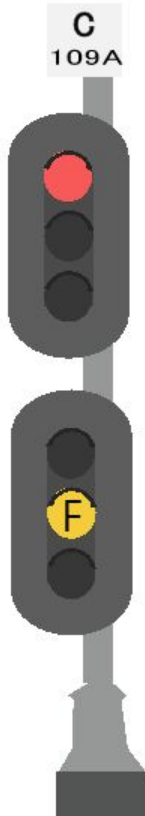
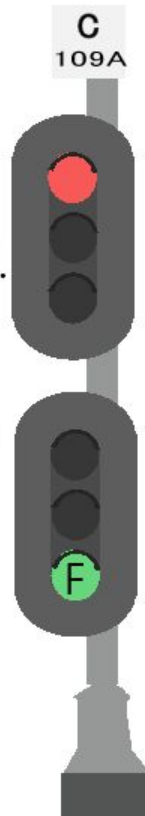
Slow to Clear (Red over flashing Green) means to go 20 km/h through the turnout and then proceed at maximum track speed.

Slow Approach (Red over flashing Yellow) means to go 20 km/h through the turnout, then proceed at a max of 60 km/h, or posted speed if it is less than 60, preparing to stop at the next signal.

**Note: An "F" on a light indicates that the light is flashing.**

Slow to Clear

Slow Approach



# IN-STREET TURNOUTS

When you take a turnout in in-street areas where there's pavement in between the rails such as on 7th Ave in the Downtown, you are required to move at 15 km/h until you're through the turnout instead of 20 km/h in out-of street areas.

# DWARF SIGNALS

Dwarf signals are used in yards and where yards meet the main line. Dwarf signals have one head like ABS signals, but can be told apart from them as dwarfs sit on low masts. Dwarf signals lack a "target" like most ABS signals do, but some ABS signals do as well, so you cannot tell them apart that way. The difference is that dwarfs are in only in yards and have low masts, while ABS signals are not in yards and have high masts.

A dwarf signal represents the bottom head of an interlocking signal and can display 3 aspects.

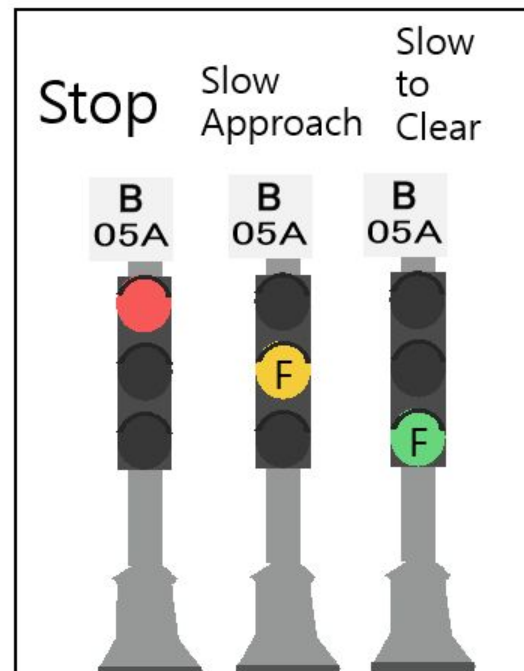




Red on a dwarf signal tells you to stop and wait for one of the other two aspects. You cannot pass a stop signal without authorization from Rail Traffic Control.

Flashing yellow means means to go 20 km/h through the turnout, then proceed at a max of 60 km/h, or posted speed if it is less than 60, preparing to stop at the next signal.

Flashing green means means to go 20 km/h through the turnout and then proceed at maximum posted (track) speed.



CONGRATULATIONS - You learned CTrain signalling!  
Now that you know the theory, here is a cheat sheet for the block signals you can use while riding/watching the CTrain.



Stop -  
Stop and wait  
for favourable  
indication

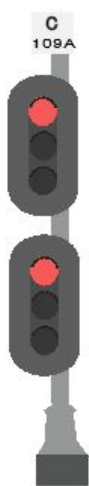


Approach -  
Next signal displaying  
Stop, max 60 km/h or  
max posted speed if it's  
lower than 60, preparing  
to stop at next signal

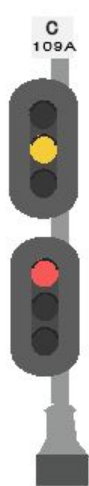


Clear -  
At least two blocks ahead  
are clear. Max posted speed  
permitted.

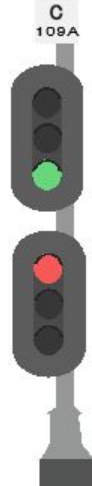




Stop -  
Stop and wait  
for favourable  
indication



Approach -  
Next signal displaying  
Stop, max 60 km/h or  
max posted speed if it's  
lower than 60 to  
next signal



Clear -  
At least two blocks ahead  
are clear. Max posted speed  
permitted.



Slow to Clear -

20 km/h (15 in-street)  
through turnouts,  
then proceed at  
maximum track speed.



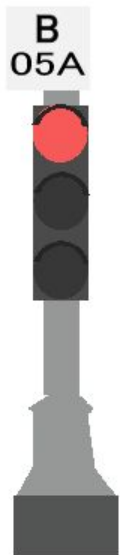
Slow Approach -

20 km/h (15 in-street)  
through turnouts,  
then proceed at max  
60 km/h, or posted speed  
if it is less than 60,  
preparing to stop  
at the next signal.

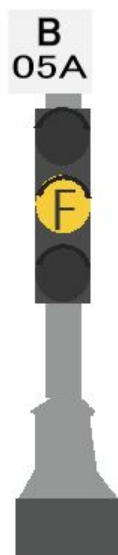


Restricting -

Proceed very slowly, be on the  
lookout for people, other trains,  
switches lined against you,  
broken rails, and be able to  
stop within one-half the range  
of vision.



Stop -  
Stop and wait  
for favourable  
indication



Slow Approach -  
20 km/h (15 in-street)  
through turnouts,  
then proceed at max  
60 km/h, or posted speed  
if it is less than 60,  
preparing to stop  
at the next signal.



Slow to Clear -  
20 km/h (15 in-street)  
through turnouts,  
then proceed at  
maximum track speed.