

A Brakes Breakdown

Train Brakes

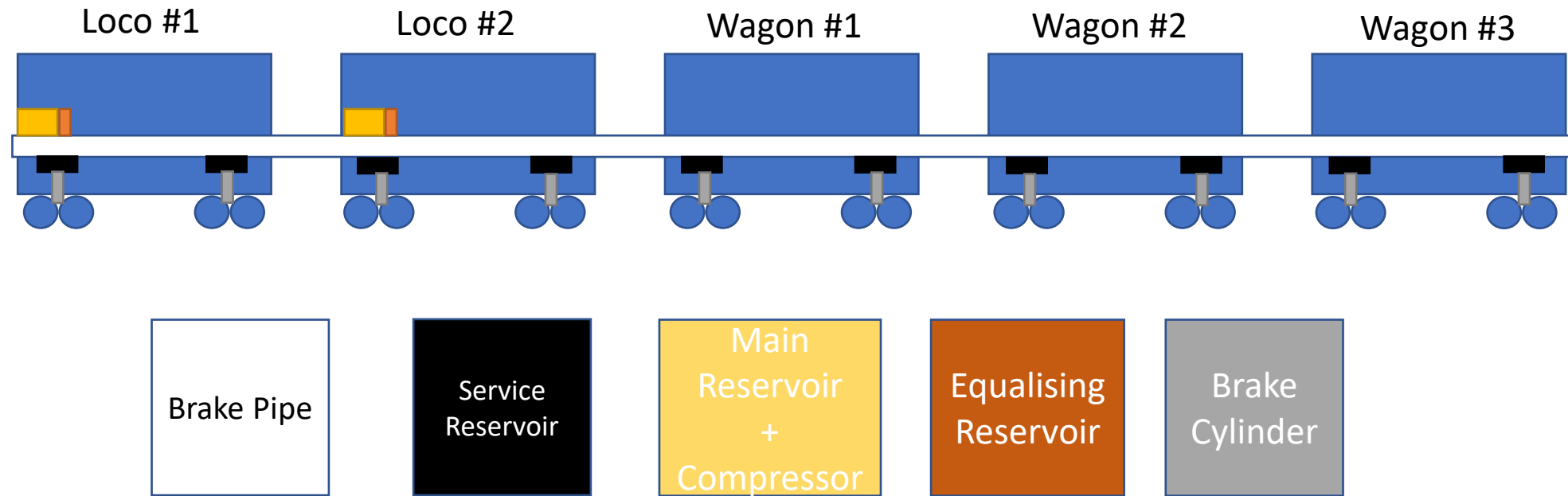
Disclaimer

- This covers brakes in Train Sim World and should not be used or considered a tutorial for brakes on real world trains.
- There may be a lot of similarities, but do not consider this to be any replacement for real world professional training.
- Please do not operate real trains without the appropriate professional training, certification and permission. Keep it in the sim.
- This will take many short cuts in the explanation so that it fits in a sensible timescale and is understandable by a wider audience. If you want to find out more detail you can do your own research using the overall structure and guidance that this provides.
- This has a relatively heavy leaning towards the US style, because that's where players are mostly experiencing problems. However UK and German brakes are equally relevant in most cases.

Session Overview

- There are many types of brakes used on trains
 - And often have different names in different trains and in different countries!
- How trains stop, broad overview of how brakes work and where the various things you see on gauges come from
- What each common type of brake does on that system and when to use it
- More specifics on US, UK and German locos
- Braking procedures for coming down gradients or slowing in general, and how to stop.

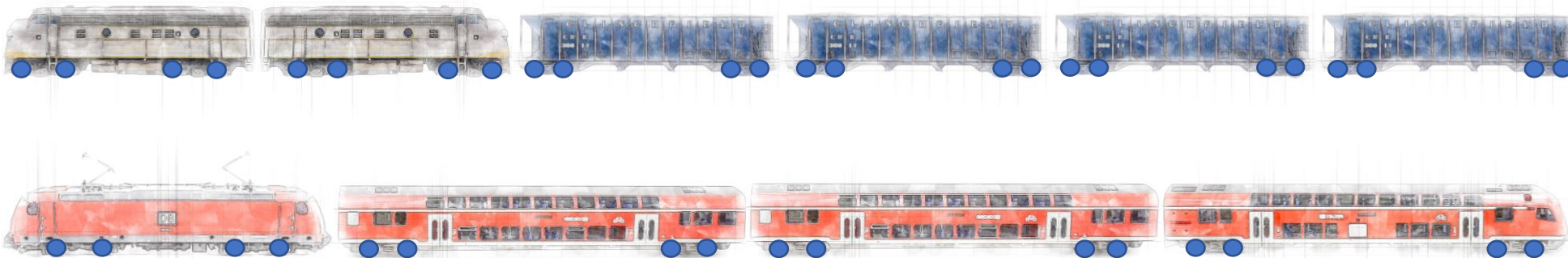
How Trains Stop



This is greatly simplified, and different trains have their own variations!

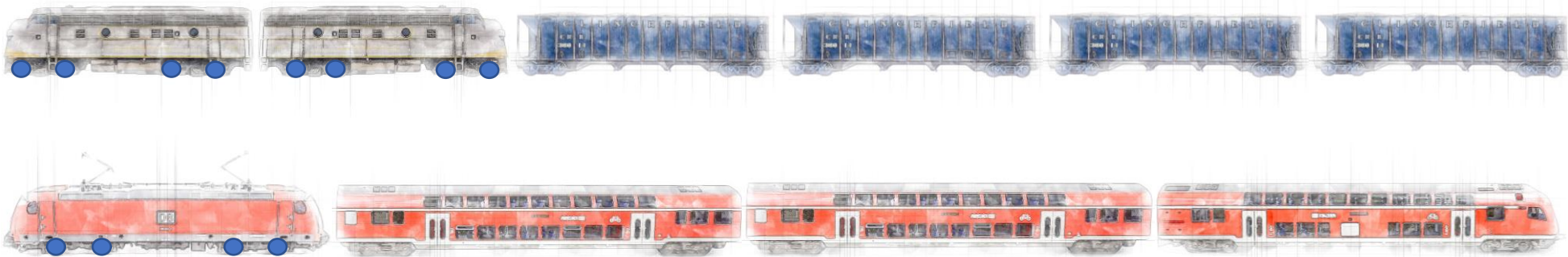
Train Brake

- Type: Friction Brake
- AKA: Automatic Brake, Drivers Brake
- Applies the brakes on the entire train, every axle that has brake equipment.
- When to use: Slowing, Stopping



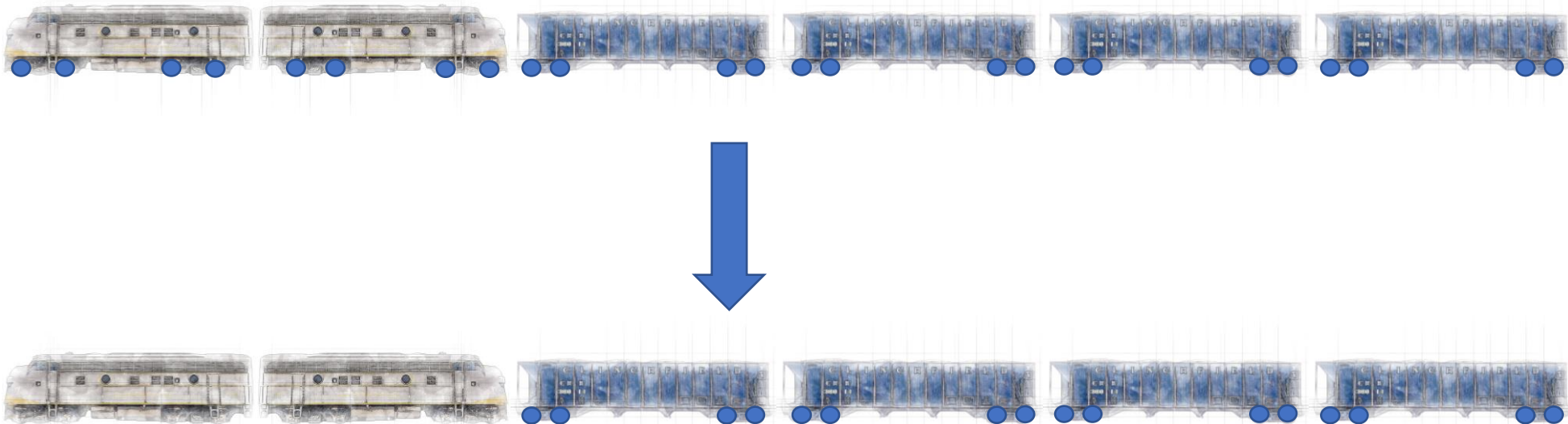
Locomotive Brake

- Type: Friction brake
- AKA: Independent Brake, Straight Air Brake, Direct Brake
- Applies the brakes only on the lead locomotive and all those tied together but not other locos elsewhere in the consist.
- Bail Off
- When to use: Moving without wagons, or when shunting at slow speed



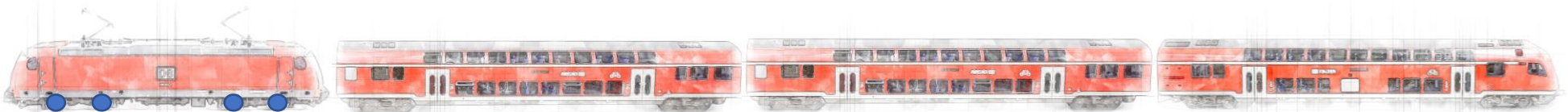
Locomotive Brake Bail Off

- Allows the locomotive to release its brakes while keeping the train brakes applied on the rest of the train
- Use when you want to use dynamic brakes
- Use when you're stopping to help stretch the train

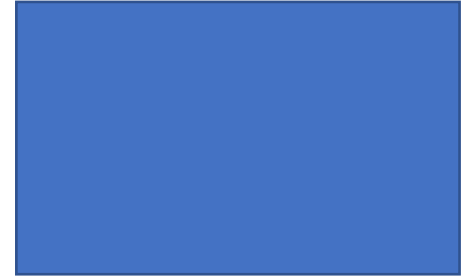


Electric Brake

- Type: Electric Brake
- AKA: Dynamic Brake
- Setup time
- Only applies on the lead locos
- Bail off your locomotive brakes (USA)
- When to use: Descending grades, maintaining speed

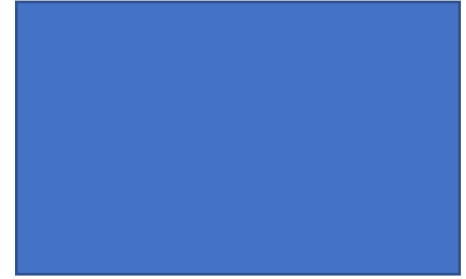


Parking Brake



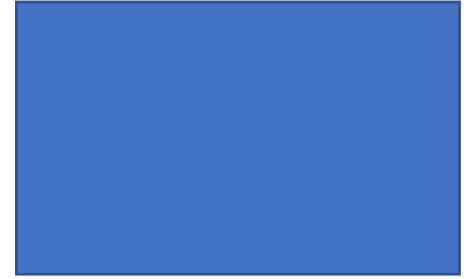
- Type: Friction Brake
- Will likely not stop your train and is not intended to do so
 - May make it harder to start moving but certainly won't stop you
- Only there to hold it in place while other brakes are or may be released

Blended Brakes



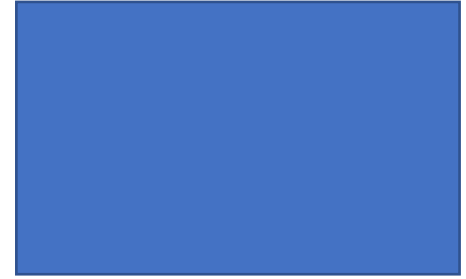
- Train brakes and Electric brakes are going to be operated as one and varied automatically.
 - F40PH-2CAT
 - Many German trains

Manual vs Self Lapping



- Self Lapping
 - Set to the position you want. 50% is more than 10% etc.
 - CSX SD40-2
 - BR Class 47
 - Most German Locomotives
- Manual Lapping
 - Has fundamentally a “release”, “hold” and “apply” state
 - Clinchfield F7
 - Caltrain F40PH-2CAT
 - BR Class 101

Running out of Air



- Caused by repeatedly applying and releasing brakes
- Brake reservoirs take time to re-pressurize when you release brakes
- If you don't let everything recharge before you next apply, you could find yourself needing to lower the brake pipe lower to get the same performance
- At an extreme, this can mean you get no brakes at all!
- Emergency brakes will always be available (they have their own reservoir) except on the very oldest US trains
- If in doubt, STOP and let the system build its air back up.

US Locomotives



- MU-2A Valve
- Cut-off Valve
- Setting up multiple headers
- Changing Ends

Trailing Loco #2
MU-2A : Trail 24
Cut-Off : Cut Off

Trailing Loco #1
MU-2A : Trail 24
Cut-Off : Cut Off

Lead Loco
MU-2A : Lead
Cut-Off : Freight



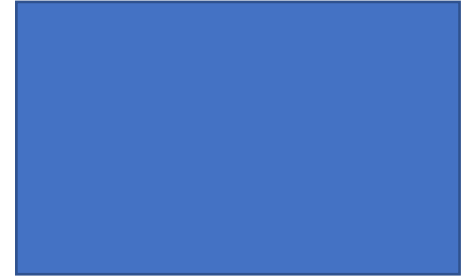
UK locomotives

- Changing cab ends
 - Class 45 NTP
 - Class 66 ECW
- Class 66 cut-out control
- Air and Vacuum Brakes
 - Release cords on BG's
 - Class 08

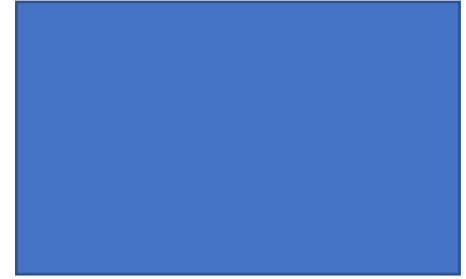


German Locomotives

- Brake switch on dosto's, BR 112 etc
- Changing Ends (BR 112 + Dosto example)
- Mixed braking on the Talent 2

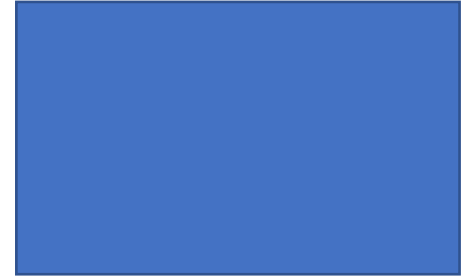


Descending Grades with Electric Brakes

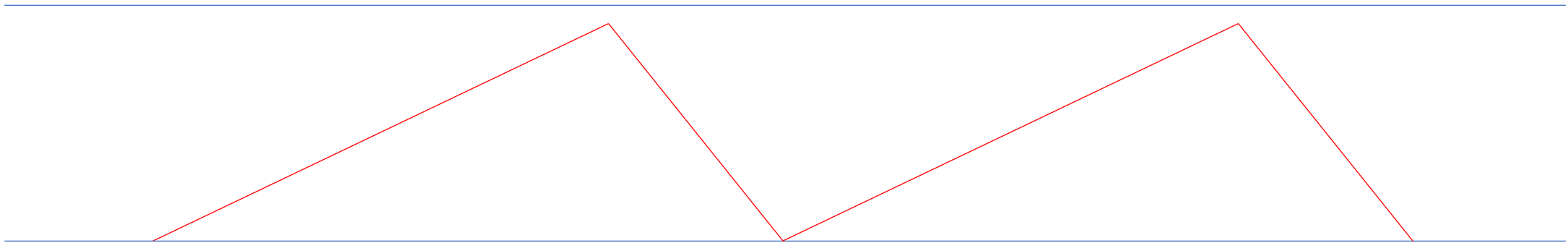


- As the train crests the summit, start applying dynamics
- Adjust dynamics until you're at a higher setting
- Put on an initial set on the air brakes and then dial back the dynamics as the train brakes under the friction brakes
 - Remember to bail off your loco brakes to make your dynamics remain effective
- Balance your speed with the dynamics, make minimal changes to air brakes.
- Add air only if dynamics can't cope.
- Be 2 steps ahead of the train and the route, many changes to air brakes put you at risk of running out of air.
- If in doubt, stop.

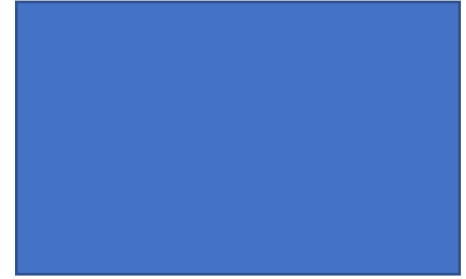
Descending Grades without Electric Brakes



- Sawtooth Pattern for speed management

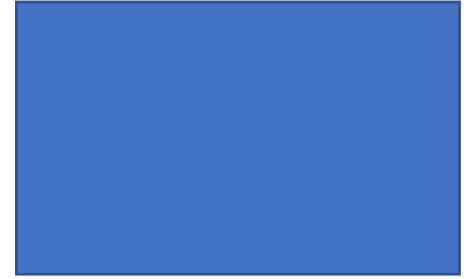


Getting Started



- Check your brakes have released properly
- Get a little speed up and try to free roll
- Early in the journey, apply brakes and slow down a bit, ensure you can stop and that you understand the braking characteristics of your train before opening it up fully.

Coming to a Stop



- Dynamic brakes won't stop the train on their own.
- Dynamic brakes can be used to slow the train but you may need to use air brakes for more effective deceleration.
- Use the train brakes to bring the train to a stop
- You may want to bail off the loco brakes to help keep the train stretched as you come to a stand.

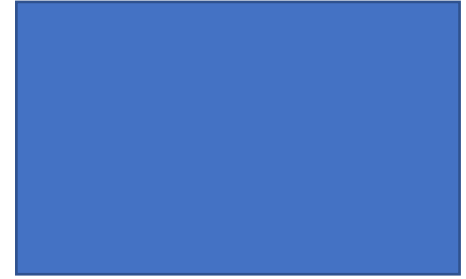
Hill Starts



- Some trains won't apply any power unless the train brake is released
 - Apply full locomotive brake
 - Release train brake and wait for the consist to settle
 - In reality you can snap couplers here if you're not careful
 - Apply power and confirm power to the motors
 - Slowly release locomotive brake.
- Or if they will:
 - Apply full locomotive brake
 - Apply power and confirm power to the motors
 - Release locomotive brake and start pulling gently on the consist
 - Release train brake and adjust power to obtain and maintain positive movement

Let's come to a stop...

- Think and plan ahead of your train
- Think and plan ahead of your route
- Small changes infrequently
- The gauges don't tell you everything





Let's practice
