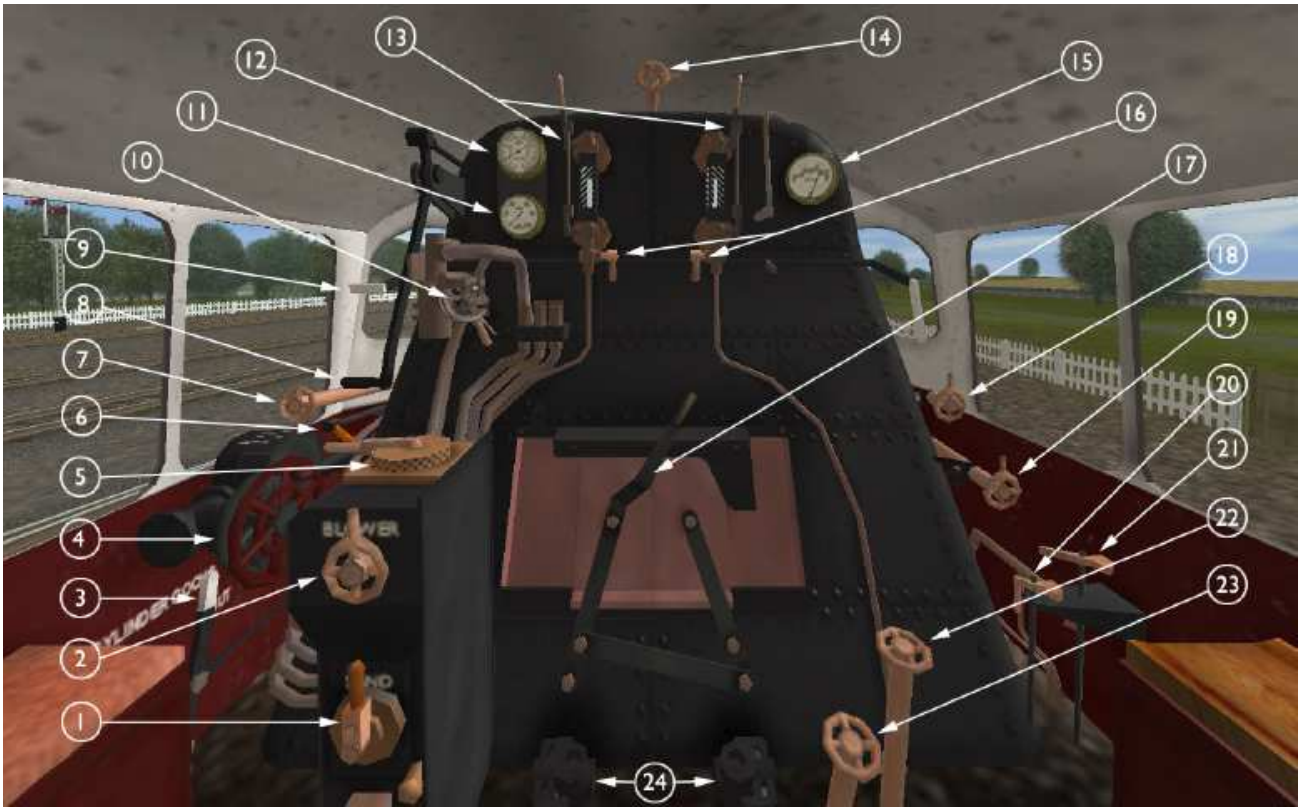
Driving the 9F on ‘Class C goods’

This is a guide to driving a 9F on the Settle and Carlisle line on the Class C goods session and partly takes the form of a narrative of one such run. The guide takes you through driving and firing the loco from Skipton to Horton in Ribblesdale and then gives you a few pointers for further on in the route and the continuation of the session.

Controls

The complete manual for the loco can be downloaded from;
http://www.lestorouteworks.com/html/br9f.htm

Let’s take a look at the controls first.



Controls listed in bold type perform a function in Trainz.

1) Sanding lever
2) Blower valve
3) Cylinder drain cock lever
4) Reversing wheel
5) Vacuum brake handle
6) Small exhaust steam ejector spindle
7) Large exhaust steam ejector spindle
8) Regulator handle
9) Whistle
10) Driver’s graduated steam brake
11) Speedometer
12) Vacuum gauge
13) Water gauge shutoff levers
14) Steam manifold valve
15) Boiler pressure gauge
16) Water gauge drain cocks
17) Fire hole door
18) Live steam injector steam spindle
19) Exhaust steam injector steam spindle
21) Live steam injector water spindle
22) Rear damper control
23) Front damper control

Now let’s go through the session and look at what happened, what we need to do, and also what we were seeing in the loco performance panel.

Leaving Skipton.

On this run of the Class C goods session we start at Skipton with BR Standard 9f 92125 of Kettering Shed. The train is the Class C goods from Leeds (Hunslet) to Carlisle.
The maximum permitted speed for this Class of train is 55mph.

Before boarding the cab and moving off from Skipton, we make a check around the engine to make sure everything is in good condition and the loco is fit for the climb up the S&C.

Once we receive the right of way from the signalman we open the blower to full, turn on one injector until it is half on, and place a couple of shovels of coal onto the fire.
We leave the injector on until the water level is about 95%-100%.

We will keep firing at the start of the run to maintain a coal level around 95% - 100%.

Releasing the brakes, we give a sharp blast on the whistle, set the cut off on the reverser to 75%, and open the regulator to about 4%.

On approaching the steel road over bridge we open the regulator further to about 7%.

As we pass the 40mph sign we open the regulator further still to about 10%.

Passing the combined signal KN2 we increase the regulator again to about 20%.

On passing Skipton Loco signal box the status is as follows:

Speed	15mph
Boiler	242psi
Regulator	19.20%
Cut off	75%
Water	95%
Steam chest	68psi
Coal level	97%

As we reach 15mph the cut off is set back to about 60%.
At this point one injector was turned on full to top up the water to 100%.

At 20mph the regulator was opened further to about 26% and the cut off set to 50%.

The safety valves popped on passing signal KJ15
One injector was turned on full and the regulator opened to 52%.
The injector was turned off once the safety valves had stopped blowing off.

As the speed hit 32mph the cut off was changed again to 40%.

On passing the white house opposite KJ1 the status was as follows:

Speed	37mph
Boiler	246psi
Regulator	52.80%
Cut off	40%
Water	89%
Steam chest	181psi
Coal level	96%

The safety valve lifted not long after passing the white house.
One injector was turned on full and left on until the boiler pressure reads 240psi.

At 40mph the regulator was opened up to 68% and the cut off set to 31%.

Status report on passing Delaney's sidings signal box is as follows:

Speed	40mph
Boiler	248psi
Regulator	68.10%
Cut off	31%
Water	83%
Steam chest	241psi
Coal level	98%

The safety valve lifted on passing Delaney's sidings signal box and both injectors were turned on full. They were turned off when the water level was at 93% and the boiler pressure at 238psi.

It is important to note at this stage in the journey that the main concern is getting a bright, white hot fire, and having a boiler pressure and water level that leaves us in good shape for the assault on the S&C. This main assault will begin at Settle junction, which is a couple of miles past Hellifield.
At the moment we will be running late but, this lost time will be made up with ease once the climb begins from Settle junction. As such, don't worry about time keeping on this first part of the run.

After passing signal GG1 the safeties popped once more and again both injectors where turned on full until either the boiler was at 240psi or the water level reached 100%.

Gargrave was passed at 9:06:45; the train is running 2mins 45seconds late.

Status at Gargrave is as follows;

Speed	34mph
Boiler	245psi
Regulator	68.10%
Cut off	31%
Water	96%
Steam chest	236psi
Coal level	97%

At Gargrave station the safety valves lift again, one injector is turned on full and the regulator is opened to about 85%.
We shut off the injector when the boiler pressure is at 240psi or the water level reaches 100%.

Safeties pop again at signal GG12, one injector is opened up to full and the regulator opened up to 100%.

The injector was shut off when the boiler pressure reached 240psi.
Water level was now at 97%.

If the safety valves blow now the procedure is to turn on 1 injector to full until the water level is either 100% or the boiler pressure is at 240psi.

Now that the boiler is steaming freely an adjustment in the cut off to 37% is warranted to take advantage of the extra steam being produced, especially on the climb up to Bell Busk.

Bell Busk signal box was passed at 9:11:39, now running 2mins 40 seconds late.

Speed 38mph
Boiler 243psi
Regulator 100%
Cut off 37%
Water 98%
Coal level 93%

Safety valves lift on passing signal BB16, and again on passing HS31.

The cut off is adjusted to about 40%, the blower is also now turned off.

With the regulator fully open, the cut off reading 39% and speed at 37mph there is sufficient draft on the fire to maintain the current settings.

On descending towards Hellifield, at milepost 230, one injector is turned on by 1/4, as the speed hits 40mph the cut off is decreased once more to about 30%.

This decrease in cut off means a reduced demand on steam and the safety valves pop again. The second injector is turned on and the first injector left as it is.

Passing the white house on the approach to Hellifield the cut off is set to 25%.

Firing has now stopped due to the high steaming rate and the greatly reduced demand for steam. The boiler is now steaming freely and ready for the climb up the S&C.

Hellifield is passed at 9:17:01; the train is now running 2mins late.

Speed 40mph
Boiler 250psi, blowing off
Regulator 100%
Cut off 25%
Water 100%, injector off
Steam chest 245psi
Coal level 92%

As the safety valves were blowing off through Hellifield and the water level is at 100% the cut off is increased to 35% to make use of the steam.

Coal level has now fallen to 88% so a couple of shovels of coal are added to keep the fire in a healthy state. The coal level at the end of firing is 92%.
The safety valves are still blowing through Long Preston and water level has dropped sufficiently to turn on the injectors.
Both injectors are turned on to try and control the blowing off of the safeties.

On approaching Settle junction coal level is at 75%, the climb is nearing so more coal is added till the coal level reads 95%.

Settle junction is passed at 9:20:31; we're now running 30 seconds late.

Speed 61mph (max 60mph)
Boiler 250psi, still blowing off
Regulator 100%
Cut off 35%
Water 97%, injector on
Steam chest 245psi
Coal level 91%

As the 1 in 100 gradient has now begun, firing has resumed and cut off increased to 40%.

The safety valves are now popping frequently on the climb, the speed is also decreasing but the cut off will not be adjusted to counter this.

Settle station is passed at 9:23:05; the train is now 1min ahead of schedule.

Overall the speed will continue to decrease for a while but the boiler output and front end power will allow the loco to continue on the current settings from now on and remain on schedule.

Speed 35mph
Boiler 250psi, blowing off
Regulator 100%
Cut off 40%
Water 100%, injector off but turned on when water is low enough.
Steam chest 245psi
Coal level 97%

In hindsight, with the almost continuous blowing off from Hellifield it would have perhaps been best to let the boiler water run down to around 60% - 70%. This would have aided in controlling the boiler blowing of with the injector in the run from Hellifield to Settle station.

On passing Stainforth sidings the boiler has stopped blowing off.
The injector was turned on by ¼ to help control the pressure level in the boiler.

Firing has been kept up now to maintain 95% - 100% coal level.

At milepost 239 the loco blew off for a moment, the injector was turned on full to stop this.

Once the blowing off had stopped it was dropped back down to ¼. The second injector could also have been used to avoid adjusting the first injector's setting.

On approaching Helwith bridge granite loader the injector was dropped down a bit to allow a slight increase in boiler pressure.

Helwith bridge signal box was passed at 9:31:17; we are now running 1min 40seconds ahead of time.

Speed 38mph
Boiler 247psi
Regulator 100%
Cut off 40%
Water 90%, injector about ¼ on
Steam chest 245psi
Coal level 97%

Near signal HB12 both injectors were turned on full to raise boiler water to 93%, and boiler pressure changes to 238psi.

Approaching Horton in Ribblesdale the safety valves pop and both injectors are turned on full until the boiler pressure reads 240psi.

Horton in Ribblesdale was passed at 9:33:50; the train is now running 3mins ahead of time.

Speed 25mph
Boiler 243psi
Regulator 100%

Cut off 40%
Water 96%
Steam chest 235psi
Coal level 91%

The safety valves lifted briefly after passing Horton in Ribblesdale. The injector was turned on full until the pressure dropped to 240psi.

On passing mile post 244 the cut off was reduced to 31%
The boiler blew off and the injectors where turned on until the boiler pressure read 240psi.

The speed will now decrease somewhat but, with the train running comfortably ahead of time it was best to decrease demands on the boiler and allow the boiler water level to recover somewhat.

It is here that we end this account and let you find your own way for the rest of the journey.

Route knowledge is ideal when driving and firing a steam loco. Knowing when you can mortgage the boiler water level to either aid in possible blowing off or increase cut off to gain the extra power when climbing a hill is vital.

When firing try not to put coal on when either one of both injectors are fully on. Adding coal to the fire will momentarily decreased the available heat, especially if the fire is somewhat down the pan.

If you can, try and turn on the injectors just before the boiler pressure exceeds maximum, the cooling effect of the water should then stop the safety valves from lifting. Real skill is achieved if you can top up the boiler water level at this point while stopping the blowing off.

A tip for when reaching Ais Gill summit is to have a rather low water level and also to run down the coal level somewhat, say 40% - 50% water and 70% coal. For a long part of the run from here on you will be going down hill and either be coasting or running with only a breath of steam at the front end. Before this though you will have probably been working the engine hard, and because of this you will have a very hot fire. The low water level will allow you to turn on one, if not both, injectors to add water to avoid the safeties lifting without over filling the boiler.

As you won't be using a lot of steam for a long part of the descent the boiler will cool down somewhat and when it comes to those last few hills near Carlisle you may find the boiler won't be in a position to cope with these sudden demands of steam. Try and pre-empt this by turning on the blower to full and perhaps opening the regulator slightly if the speed allows this. The combined action of this will increase the fire temperature somewhat too and you will hopefully avoid over-reaching the boiler. Again, near the end of the run, allow the fire to run down but keep the boiler level topped up some what. This will make the disposal crew's job easier when the loco goes on shed at Carlisle Kingmoor, and they will be grateful for this action.

This guide was originally posted on the UKTrainz forum by Rob Hill and was re-edited and prepared for this guide by Mike Banfield.