Diesel Simulation Data

Release version 1.0 (2008-01-25)

1 Introduction

All locomotives in Rail Simulator require engine simulation data to operate. This is effectively the virtual engine that runs the train.

The detail in this document relates to the Engine Simulation Blueprints created in the Asset Editor.

To begin creating an Engine Simulation Blueprint, expand the Engine Simulation Component field, and then the Subsystem field, and click 'Insert First'. From here you can choose which type of Engine Simulation blueprint you wish to create.

2 Diesel Electric Simulation

Diesel Electric locomotives have a Generator which takes power from the Engine and converts it to Electricity to power the Traction Motors which power the wheels. The Class 47, Class 55 and Class 43 are examples of Diesel Electric locos

For setting up a Diesel simulation blueprint, click "Insert First" and select "Diesel Electric Sub System Blueprint" from the pop-up box.

2.1.1 Display Name

This is the name of your engine as seen when using the World Editor in Scenario Tool mode. Localisation fields are available for multiple languages.

2.1.2 Other

This allows for other languages to be specified if they are not in the list provided.

2.1.3 Lang ID

A numeric identifier for the additional language, if more than one is implemented.

2.1.4 String

Specify the location of the language file here.

3 Diesel Electric Sub System

3.1.1 Loco Brake Assembly

This defines the vehicle's locomotive brakes. See separate Brake Blueprint Documentation.

3.1.2 Train Brake Assembly

This defines the train brakes. See separate Brake Blueprint Documentation.

3.1.3 Max Power (KW 0-20000 (1kW = 1.341HP)

This is the maximum power output of the locomotive, in kilowatts. It is more important to performance when travelling at high speeds.
In Train Simulator terms this is MaxPower

3.1.4 Max Force (kN 0-10000 (1kN = 225lbf)

This is the maximum Tractive Effort of the locomotive, in kilowatts. This is more important for performance at low speeds. Tractive Effort is important when starting a train.
In Train Simulator terms this is MaxForce.

3.1.5 Max Speed (Mph 0-300)

This is the point at which the simulation will stop producing any driving force to the wheels It scales from 90% of this speed = Full simulation force & 100 % = 0 simulation force. This should ideally be set slightly higher than actual max speed of a given loco.
In Train Simulator terms this is MaxVelocity.

3.1.6 Startup Time

This is the time in seconds taken to start up the Locomotive until the engine is idling.

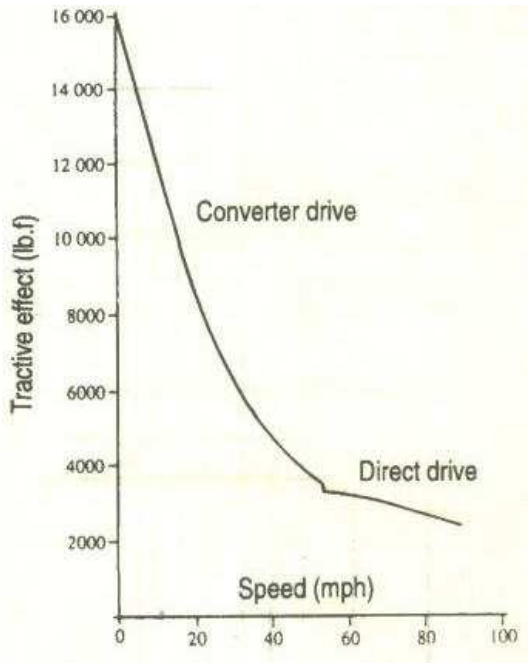
3.1.7 Shutdown Time

This is the time in seconds taken to shut down the engine from idle.

3.1.8 Tractive Effort VS Speed

In This section a custom 'Tractive Effort curve' can be supplied in the form of a .csv (Comma Separated Variable) file. Tractive Effort curves are quite easily found for the more common locomotives and usually show a distinctive curve with Tractive Effort tailing off as the speed increases. The example shown below is for a two-car Class 165 Unit (UK).

The .csv must be in the format shown below with Speed in Column 1 and Tractive Effort in Column 2

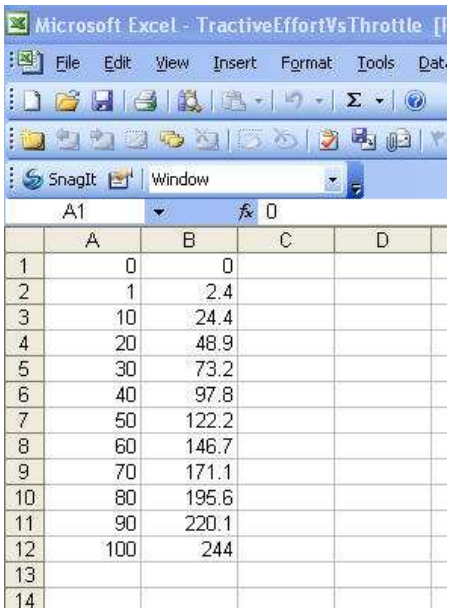


The Simulation code uses this .csv to limit Tractive Effort at a particular speed.

3.1.9 Tractive Effort VS Throttle

In this section you can specify a custom 'Tractive Effort vs Throttle curve' can be supplied in the form of a .csv (Comma Separated Variable) file. Generally this would be a linear relationship but the facility is there to use non-linear values.

The .csv must be in the format shown below with %Throttle in Column 1 and Tractive Effort in Column 2



	A	B	C	D
1	0	0		
2	1	2.4		
3	10	24.4		
4	20	48.9		
5	30	73.2		
6	40	97.8		
7	50	122.2		
8	60	146.7		
9	70	171.1		
10	80	195.6		
11	90	220.1		
12	100	244		
13				
14				

3.1.10 Anti-Slip Brake Cyl Pressure (PSI (0 – 90)

This is the pressure that the brake cylinder would be set to if it goes into anti slip.

3.1.11 Thyristor Control (True/False)

This determines whether the Thyristor or Throttle controls the power.

A Thyristor is a type of diode with a controlling gate which allows current to pass through it when the gate is energized. Thyristors (also referred to as choppers) are used for traction power control in more modern locos in place of resistance control systems.

3.1.12 Quick Power off at 0 throttle (True/False)

This turns the power off when the throttle reaches 0

3.1.13 Slow Speed Fitted present (True/False)

Slow Speed Control allows a loco to be driven automatically at very low speed (1-2mph) for discharging coal for example. This is currently not used in Rail Simulator.

3.1.14 Slow Speed Fitted Limit (Mph (1 - 10)

This is the max speed of the loco when driven under Slow Speed Control. As above this is not used in Rail Simulator at present.

3.1.15 Press for Brake to Cut Power (PSI (0 – 30)

<Undefined>

3.1.16 Max Continuous Force (kN/Lbf (0 – 30,000)

This is the maximum force a locomotive can produce over an extended period of time; usually 1 hour. This takes over from MaxForce in limiting the force at higher speeds.

3.1.17 Diesel Used/Hour Max (Gallons/hour (1 – 200)

This is the maximum amount of Diesel Fuel used per hour, when the loco is at maximum power.

3.1.18 Diesel Used/Hour Idle (Gallons/hour (0 – 1.0)

This is the minimum amount of Diesel Fuel used per hour, when the loco is idling.

3.1.19 Time to Get to Max Force (Secs (10 – 200)

This is the time taken for the Maximum Tractive Effort to be reached from standing.
In Train Simulator terms this is RunUpTimeToMaxForce

3.1.20 Max Current (Amps (250 – 15000)

This is the maximum Current produced by the generator of a Diesel Electric Loco. Currently this is only used by the Ammeter in the Cab view.

3.1.21 Overload Current (Amps (250 – 10000)

If the current drawn is greater than this power, this resets the current to zero.

3.1.22 Air System

3.1.22.1 Has Low Pressure Test (True/False)

When Brakes are released in an Air Brake System, the pressure in the Main Reservoir falls. If 'True' is selected here, once the pressure falls to a certain pressure Restart Pressure(1.4.4) then the Generator kicks in and restores Main Reservoir Pressure

3.1.22.2 Min Air Pressure

<undefined>

3.1.22.3 Cut Out Pressure (PSI)

This is the Main Reservoir Pressure at which the Generator cuts out.

3.1.22.4 Restart Pressure (PSI)

This is the Main Reservoir Pressure at which the Generator cuts in.

3.1.22.5 Reservoir Volume (PSI)

This is the Volume of the Main Reservoir. This affects how much the Main Reservoir Pressure falls when the Air Brakes are released.

3.1.22.6 Main Res Max Air Pressure (PSI)

This is the maximum pressure in Main Reservoir, and will normally be the same as 'Restart Pressure'

3.1.23 Compressor

The Compressor supplies the Air in an Air Brake System. More than one can be added if more than one is present. Simply click the Arrow on the left, in ”Insert First” at the top.

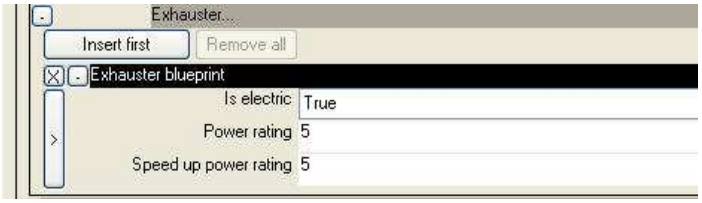
3.1.23.1 **Type** (Electrical / Mechanical)

Select the type of compressor present on the locomotive.

3.1.23.2 Power Rating (PSI /sec)

This is where you can specify the rate the compressor works at.

3.1.24 Exhauster



3.1.24.1 Is Electric

Define here if the exhauster is electrical or not.

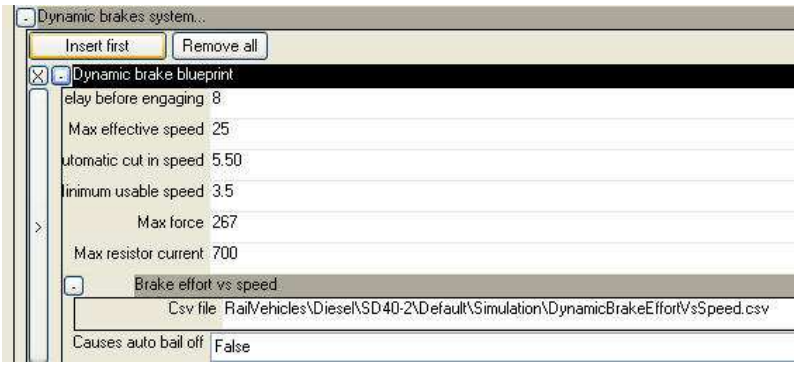
3.1.24.2 Power Rating (Inches/sec)

This is where you can specify the rate the exhauster works at.

3.1.24.3 Speed Up Power Rating (Inches/sec)

This is where you can specify how much the exhauster rating is increased when sped up.

3.1.25 Dynamic Brakes System



3.1.26 Delay Before Engaging (Sec (1 – 10)

This is the delay after Dynamic Brakes are selected before the Traction Motors go into reverse and braking starts taking effect.
In Train Simulator terms this is the DynamicBrakesDelayTimeBeforeEngaging

3.1.27 Max Effective Speed (No units (2 - 200)

This is the maximum speed at which Dynamic Brakes are useable.
In Train Simulator terms this is the DynamicBrakesMaximumEffectiveSpeed

3.1.28 Automatic Cut in Speed (Mph (2 - 200)

<Undefined>

3.1.29 Minimum Usable Speed (Mph (0 – 50)

This is the minimum speed at which Dynamic Brakes are useable.
In Train Simulator terms this is the DynamicBrakesMaximumEffectiveSpeed

3.1.30 Max Force (kN (200 – 20000)

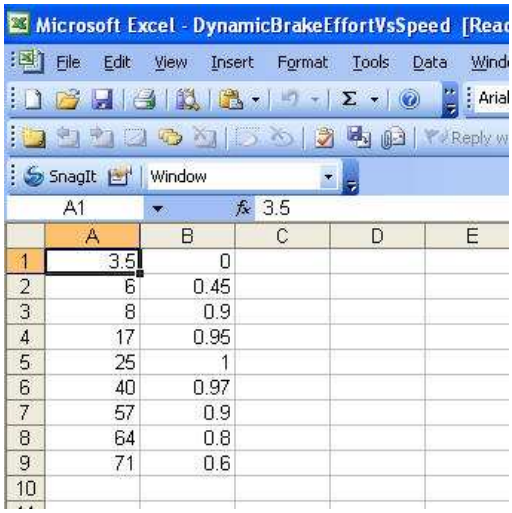
This is the maximum Braking Force from the Dynamic Brakes.
In Train Simulator terms this is the DynamicBrakesMaximumForce

3.1.31 Max Resistor Current (Amp (0.1 – 7500)

<Undefined>

3.1.31.1 Brake Effort VS Speed

In this section you can specify a custom 'Brake Effort vs Speed' can be supplied in the form of a .csv (Comma Separated Variable) file. This controls the effectivity of the Dynamic Brakes over a range of speeds.

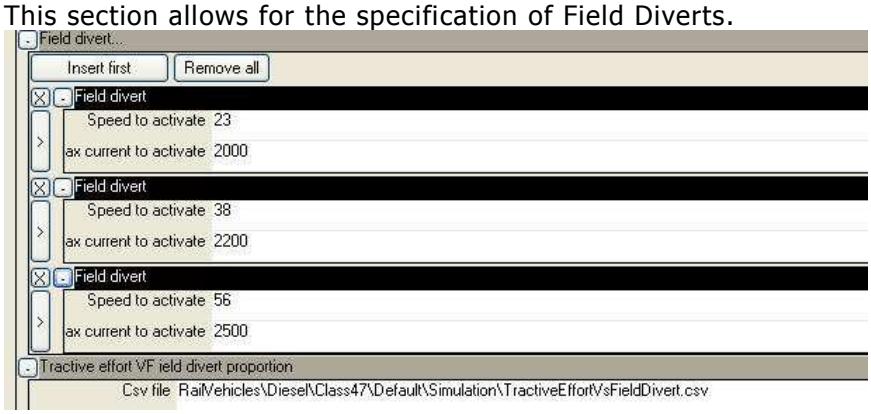


	A	B	C	D	E
1	3.5	0			
2	6	0.45			
3	8	0.9			
4	17	0.95			
5	25	1			
6	40	0.97			
7	57	0.9			
8	64	0.8			
9	71	0.6			
10					

3.1.31.2 Causes Auto Bail Off (True/False)

3.2 Field Divert

This section allows for the specification of Field Diverts.



3.2.1 Speed to Activate

This is the speed at which the specific Field Divert is activated.

3.2.2 Max Current to Activate

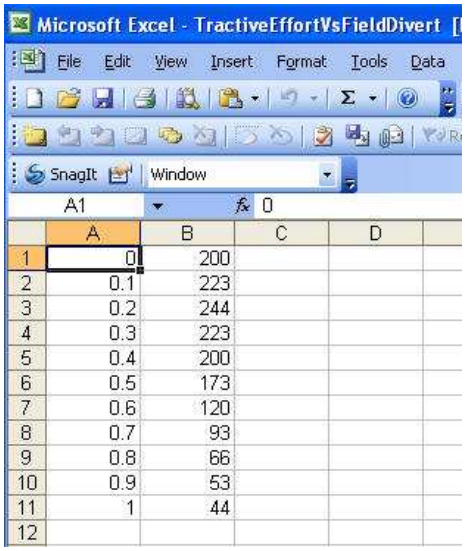
This is the current above which the specific Field Divert is prevented from activation.

For example if you have a Field Divert at 23mph with Max Current 2000Amps, if the current is already at 2050Amps when you reach 23mph then the Field Divert isn't activated.

3.2.3 Tractive Effort VS Field Divert Proportion

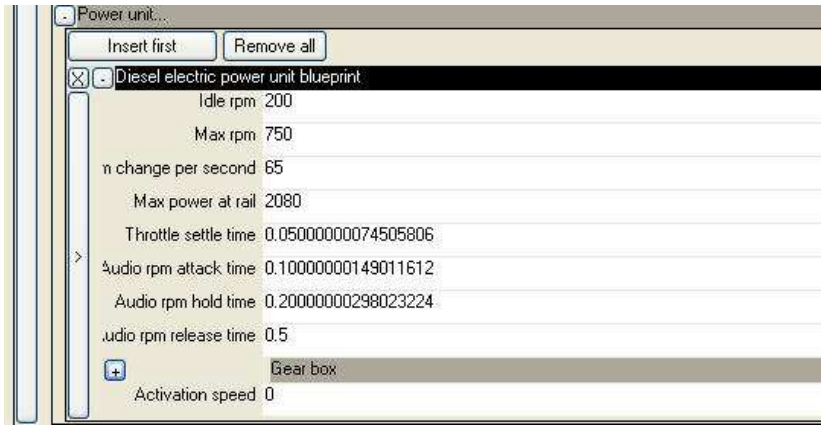
Here a custom 'Tractive Effort vs Field Divert curve' can be supplied in the form of a .csv (Comma Separated Variable) file. This controls the Max Tractive Effort available throughout the Field Divert. For example if the Field Divert was from 20mph to 60mph, at 40mph (half way through the way through the Divert) the Max Tractive Effort would be 173kN.

The .csv must be in the format shown below with Throttle (0-1) in Column 1 and Tractive Effort in Column 2



	A	B	C	D
1	0	200		
2	0.1	223		
3	0.2	244		
4	0.3	223		
5	0.4	200		
6	0.5	173		
7	0.6	120		
8	0.7	93		
9	0.8	66		
10	0.9	53		
11	1	44		
12				

3.3 Power Unit – Diesel Electric



3.3.1 Idle RPM (RPM (50 – 2000)

This is the RPM of the loco when idling; i.e. with the throttle at 0.

3.3.2 Max RPM (RPM (500-5000)

This is the maximum RPM of the loco overall.

3.3.3 Max RPM Change per Second

This is how quickly the engine 'ramps up and down' in RPM per second

3.3.4 Max Power at Rail

This is the Maximum Drawbar Power after losses to other systems using the resource. This is usually about 70-80% of the Max Power parameter.

3.3.5 Audio RPM Attack Time

This is defined in the Audio Documentation

3.3.6 Audio RPM Hold Time

This is defined in the Audio Documentation

3.3.7 Audio RPM Release Time

This is defined in the Audio Documentation

3.3.8 Gear Box

This area is used to specify details about the units Gear box

3.3.8.1 Gear

Not used for Diesel Electrical Locomotives

3.3.8.2 Engine Braking

Choose from the three available options as to which is appropriate for your locomotive.

3.3.8.3 Coasting Resistance

This is the resistance of the mechanism while the unit is coasting.

3.3.8.4 Force for Engine Slowing

This is the resistance of the mechanism while the unit is slowing down.

3.3.8.5 Automatic True / False

Specify if the gears should change automatically or manually using the Gear Control keys <E> or <Shift E>.

3.3.8.6 Engine Braking Force

This is the force exerted by the sheer mechanics of the engine itself when no power is applied.

3.3.8.7 Change Up Point

This is how close to the Max Speed for the specified gear it is possible to change up to the next one. With an Automatic Gearbox this determines the speed at which the gear change happens.

3.3.8.8 Change Down Point

This is how close to the Max Speed for that specified gear it is possible to change down to the next one. With an Automatic Gearbox this determines the speed at which the gear change happens

3.3.9 Activation Speed

This is the speed at which the Gearbox is activated.

3.4 Script Component

3.4.1 Name

Use this field to specify the LUA Simulation Script file (.lua)

4 Diesel Hydraulic Simulation

Diesel Hydraulic locomotives have a Fluid filled Torque Converter which takes power from the Engine and transmits it to the wheels. The Class DB BR294 and Class 166 are examples of Diesel Hydraulic locos.

For setting up a Diesel simulation blueprint, click "Insert First" and select "Diesel Hydraulic Sub System Blueprint" from the pop-up box.

4.1.1 Display Name

This is the name of your engine as seen when using the World Editor in Scenario Tool mode. Localisation fields are available for multiple languages.

4.1.2 Other

This allows for other languages to be specified if they are not in the list provided.

4.1.3 Lang ID

A numeric identifier for the additional language, if more than one is implemented.

4.1.4 String

Specify the location of the language file here.

5 Diesel Hydraulic Sub System

5.1.1 Loco Brake Assembly

This defines the vehicle's locomotive brakes. See separate Brake Blueprint Documentation.

5.1.2 Train Brake Assembly

This defines the train brakes. See separate Brake Blueprint Documentation.

5.1.3 Max Power (KW 0-20000 (1kW = 1.341HP)

This is the maximum power output of the locomotive, in kilowatts. It is more important to performance when travelling at high speeds.
In Train Simulator terms this is MaxPower

5.1.4 Max Force (kN 0-10000 (1kN = 225lbf)

This is the maximum Tractive Effort of the locomotive, in kilowatts. This is more important for performance at low speeds. Tractive Effort is important when starting a train.
In Train Simulator terms this is MaxForce.

5.1.5 Max Speed (Mph 0-300)

This is the point at which the simulation will stop producing any driving force to the wheels It scales from 90% of this speed = Full simulation force & 100 % = 0 simulation force. This should ideally be set slightly higher than actual max speed of a given loco.
In Train Simulator terms this is MaxVelocity.

5.1.6 Startup Time

This is the time in seconds taken to start up the Locomotive until the engine is idling.

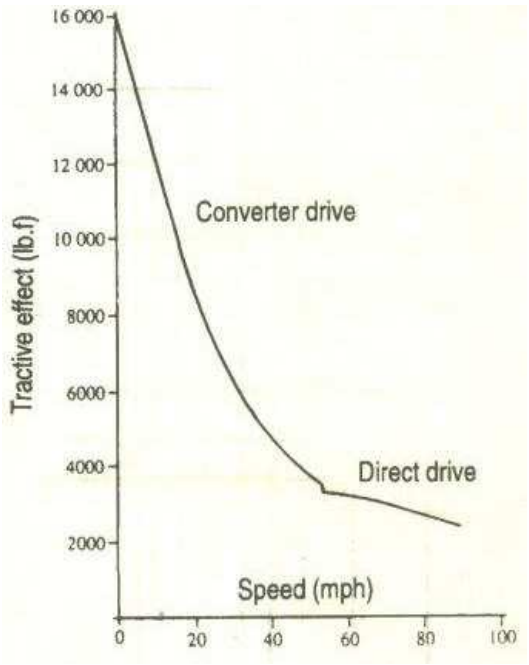
5.1.7 Shutdown Time

This is the time in seconds taken to shut down the engine from idle.

5.1.8 Tractive Effort VS Speed

In this section you can specify a custom 'Tractive Effort curve' can be supplied in the form of a .csv (Comma Separated Variable) file. Tractive Effort curves are quite easily found for the more common locomotives and usually show a distinctive curve with Tractive Effort tailing off as the speed increases. The example shown below is for a two-car Class 165 Unit (UK).

The .csv must be in the format shown below with Speed in Column 1 and Tractive Effort in Column 2

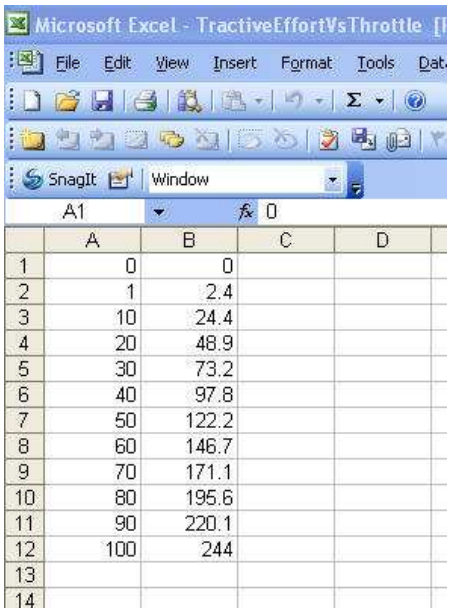


The Simulation code uses this .csv to limit Tractive Effort at a particular speed

5.1.9 Tractive Effort VS Throttle

In this section you can specify a custom 'Tractive Effort vs Throttle curve' can be supplied in the form of a .csv (Comma Separated Variable) file. Generally this would be a linear relationship but the facility is there to use non-linear values.

The .csv must be in the format shown below with %Throttle in Column 1 and Tractive Effort in Column 2



	A	B	C	D
1	0	0		
2	1	2.4		
3	10	24.4		
4	20	48.9		
5	30	73.2		
6	40	97.8		
7	50	122.2		
8	60	146.7		
9	70	171.1		
10	80	195.6		
11	90	220.1		
12	100	244		
13				
14				

5.1.10 Anti-Slip Brake Cyl Pressure (PSI (0 – 90)

This is the pressure that the brake cylinder would be set to if it goes into anti slip.

5.1.11 Thyristor Control (True/False)

This determines whether the Thyristor or Throttle controls the power.

A Thyristor is a type of diode with a controlling gate which allows current to pass through it when the gate is energized. Thyristors (also referred to as choppers) are used for traction power control in more modern locos in place of resistance control systems.

5.1.12 Quick Power off at 0 throttle (True/False)

This turns the power off when the throttle reaches 0

5.1.13 Slow Speed Fitted present (True/False)

Slow Speed Control allows a loco to be driven automatically at very low speed (1-2mph) for discharging coal for example. This is currently not used in Rail Simulator.

5.1.14 Slow Speed Fitted Limit (Mph (1 - 10)

This is the max speed of the loco when driven under Slow Speed Control. As above this is not used in Rail Simulator at present.

5.1.15 Press for Brake to Cut Power (PSI (0 – 30)

<Undefined>

5.1.16 Max Continuous Force (kN/Lbf (0 – 30,000)

This is the maximum force a locomotive can produce over an extended period of time; usually 1 hour. This takes over from MaxForce in limiting the force at higher speeds.

5.1.17 Diesel Used/Hour Max (Gallons/hour (1 – 200)

This is the maximum amount of Diesel Fuel used per hour, when the loco is at maximum power.

5.1.18 Diesel Used/Hour Idle (Gallons/hour (0 – 1.0)

This is the minimum amount of Diesel Fuel used per hour, when the loco is idling.

5.1.19 Time to Get to Max Force (Secs (10 – 200)

This is the time taken for the Maximum Tractive Effort to be reached from a standing start.
In Train Simulator terms this is the RunUpTimeToMaxForce.

5.1.20 Air System

5.1.20.1 Has Low Pressure Test (True/False)

When Brakes are released in an Air Brake System, the pressure in the Main Reservoir falls. If 'True' is selected here, once the pressure falls to a certain pressure Restart Pressure(1.4.4) then the Generator kicks in and restores Main Reservoir Pressure

5.1.20.2 Min Air Pressure

<undefined>

5.1.20.3 Cut Out Pressure (PSI)

This is the Main Reservoir Pressure at which the Generator cuts out.

5.1.20.4 Restart Pressure (PSI)

This is the Main Reservoir Pressure at which the Generator cuts in.

5.1.20.5 Reservoir Volume (PSI)

This is the Volume of the Main Reservoir. This affects how much the Main Reservoir Pressure falls when the Air Brakes are released.

5.1.20.6 Main Res Max Air Pressure (PSI)

This is the maximum pressure in Main Reservoir, and will normally be the same as 'Restart Pressure'

5.1.21 Compressor

The Compressor supplies the Air in an Air Brake System. More than one can be added if more than one is present. Simply click the Arrow on the left, in ”Insert First” at the top.

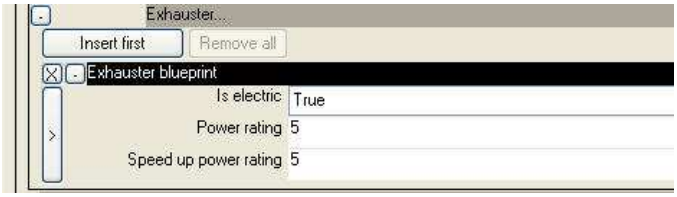
5.1.21.1 **Type** (Electrical / Mechanical)

Select the type of compressor present on the locomotive.

5.1.21.2 Power Rating (PSI /sec)

This is where you can specify the rate the compressor works at.

5.1.22 Exhauster



5.1.22.1 Is Electric

Define here if the exhauster is electrical or not.

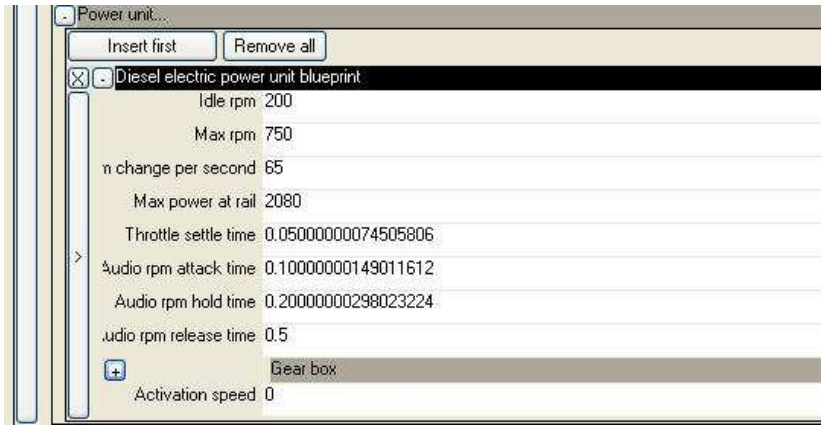
5.1.22.2 Power Rating (Inches/sec)

This is where you can specify the rate the exhauster works at.

5.1.22.3 Speed Up Power Rating (Inches/sec)

This is where you can specify how much the exhauster rating is increased when sped up.

5.2 Power Unit – Diesel Geared



5.2.1 Idle RPM (RPM (50 – 2000)

This is the RPM of the loco when idling; i.e. with the throttle at 0.

5.2.2 Max RPM (RPM (500-5000)

This is the maximum RPM of the loco overall.

5.2.3 Max RPM Change per Second

This is how quickly the engine 'ramps up and down' in RPM per second

5.2.4 Max Power at Rail

This is the Maximum Drawbar Power after losses to other systems using the resource. This is usually about 70-80% of the Max Power parameter.

5.2.5 Audio RPM Attack Time

This is defined in the Audio Documentation

5.2.6 Audio RPM Hold Time

This is defined in the Audio Documentation

5.2.7 Audio RPM Release Time

This is defined in the Audio Documentation

5.2.8 Gear Box

This area is used to specify details about the units Gear box

5.2.8.1 Gear

Add an entry per gear that is present in the gear box.

5.2.8.1.1 Direct Drive True / False

Specify here if the system is a direct drive gearbox or not?

5.2.8.1.2 Max Speed

This is the maximum speed attainable in this Gear

5.2.8.1.3 Maximum Tractive Effort

This is the maximum tractive effort for this Gear

5.2.8.2 Engine Braking

Choose from the three available options as to which is appropriate for your locomotive.

5.2.8.3 Coasting Resistance

This is the resistance of the mechanism while the unit is coasting.

5.2.8.4 Force for Engine Slowing

This is the resistance of the mechanism while the unit is slowing down.

5.2.8.5 Automatic True / False

Specify if the gears should change automatically or manually using the Gear Control keys <E> or <Shift E>.

5.2.8.6 Engine Braking Force

This is the force exerted by the sheer mechanics of the engine itself when no power is applied.

5.2.8.7 Change Up Point

This is how close to the Max Speed for the specified gear it is possible to change up to the next one. With an Automatic Gearbox this determines the speed at which the gear change happens.

5.2.8.8 Change Down Point

This is how close to the Max Speed for that specified gear it is possible to change down to the next one. With an Automatic Gearbox this determines the speed at which the gear change happens

5.2.9 Activation Speed

This is the speed at which the Gearbox is activated.

5.3 Script Component

5.3.1 Name

Use this field to specify the LUA Simulation Script file (.lua)

6 Diesel Mechanical Simulation

No Diesel Mechanical trains are supplied with Rail Simulator out of the box.

For setting up a Diesel simulation blueprint, click "Insert First" and select "Diesel Mechanical Sub System Blueprint" from the pop-up box.

6.1.1 Display Name

This is the name of your engine as seen when using the World Editor in Scenario Tool mode. Localisation fields are available for multiple languages.

6.1.2 Other

This allows for other languages to be specified if they are not in the list provided.

6.1.3 Lang ID

A numeric identifier for the additional language, if more than one is implemented.

6.1.4 String

Specify the location of the language file here.

7 Diesel Mechanical Sub System

7.1.1 Loco Brake Assembly

This defines the vehicle's locomotive brakes. See separate Brake Blueprint Documentation.

7.1.2 Train Brake Assembly

This defines the train brakes. See separate Brake Blueprint Documentation.

7.1.3 Max Power (KW 0-20000 (1kW = 1.341HP)

This is the maximum power output of the locomotive, in kilowatts. It is more important to performance when travelling at high speeds.
In Train Simulator terms this is MaxPower

7.1.4 Max Force (kN 0-10000 (1kN = 225lbf)

This is the maximum Tractive Effort of the locomotive, in kilowatts. This is more important for performance at low speeds. Tractive Effort is important when starting a train.
In Train Simulator terms this is MaxForce.

7.1.5 Max Speed (Mph 0-300)

This is the point at which the simulation will stop producing any driving force to the wheels It scales from 90% of this speed = Full simulation force & 100 % = 0 simulation force. This should ideally be set slightly higher than actual max speed of a given loco.
In Train Simulator terms this is MaxVelocity.

7.1.6 Startup Time

This is the time in seconds taken to start up the Locomotive until the engine is idling.

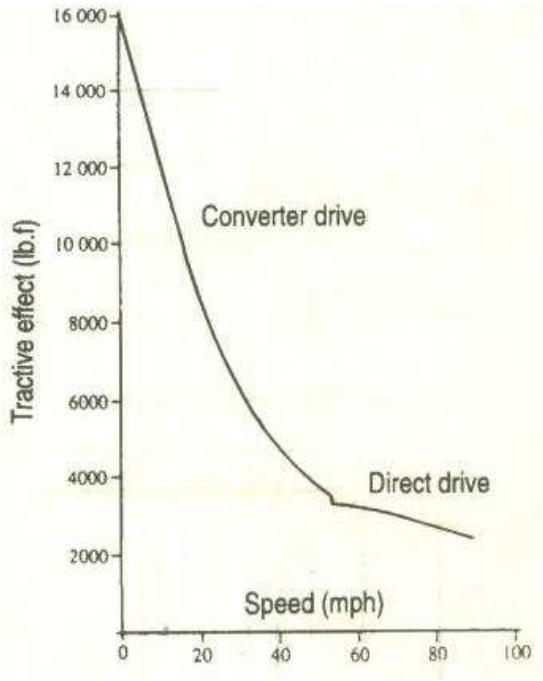
7.1.7 Shutdown Time

This is the time in seconds taken to shut down the engine from idle.

7.1.8 Tractive Effort VS Speed

In this section you can specify a custom 'Tractive Effort curve' can be supplied in the form of a .csv (Comma Separated Variable) file. Tractive Effort curves are quite easily found for the more common locomotives and usually show a distinctive curve with Tractive Effort tailing off as the speed increases. The example shown below is for a two-car Class 165 Unit (UK).

The .csv must be in the format shown below with Speed in Column 1 and Tractive Effort in Column 2

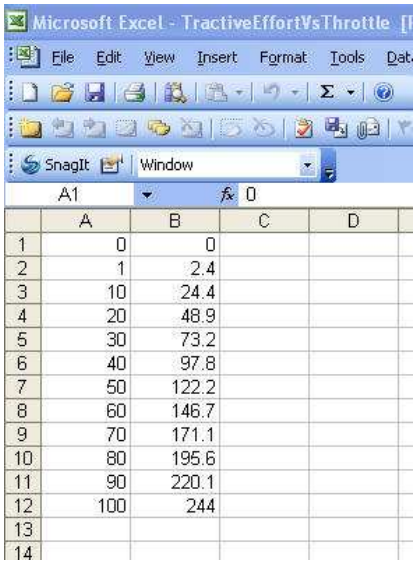


The Simulation code uses this .csv to limit Tractive Effort at a particular speed

7.1.9 Tractive Effort VS Throttle

In this section you can specify a custom 'Tractive Effort vs Throttle curve' can be supplied in the form of a .csv (Comma Separated Variable) file. Generally this would be a linear relationship but the facility is there to use non-linear values.

The .csv must be in the format shown below with %Throttle in Column 1 and Tractive Effort in Column 2



	A	B	C	D
1	0	0		
2	1	2.4		
3	10	24.4		
4	20	48.9		
5	30	73.2		
6	40	97.8		
7	50	122.2		
8	60	146.7		
9	70	171.1		
10	80	195.6		
11	90	220.1		
12	100	244		
13				
14				

7.1.10 Anti-Slip Brake Cyl Pressure (PSI (0 – 90)

This is the pressure that the brake cylinder would be set to if it goes into anti slip.

7.1.11 Thyristor Control (True/False)

This determines whether the Thyristor or Throttle controls the power.

A Thyristor is a type of diode with a controlling gate which allows current to pass through it when the gate is energized. Thyristors (also referred to as choppers) are used for traction power control in more modern locos in place of resistance control systems.

7.1.12 Quick Power off at 0 throttle (True/False)

This turns the power off when the throttle reaches 0

7.1.13 Slow Speed Fitted present (True/False)

Slow Speed Control allows a loco to be driven automatically at very low speed (1-2mph) for discharging coal for example. This is currently not used in Rail Simulator.

7.1.14 Slow Speed Fitted Limit (Mph (1 - 10)

This is the max speed of the loco when driven under Slow Speed Control. As above this is not used in Rail Simulator at present.

7.1.15 Press for Brake to Cut Power (PSI (0 – 30)

<Undefined>

7.1.16 Max Continuous Force (kN/Lbf (0 – 30,000)

This is the maximum force a locomotive can produce over an extended period of time; usually 1 hour. This takes over from MaxForce in limiting the force at higher speeds.

7.1.17 Diesel Used/Hour Max (Gallons/hour (1 – 200)

This is the maximum amount of Diesel Fuel used per hour, when the loco is at maximum power.

7.1.18 Diesel Used/Hour Idle (Gallons/hour (0 – 1.0)

This is the minimum amount of Diesel Fuel used per hour, when the loco is idling.

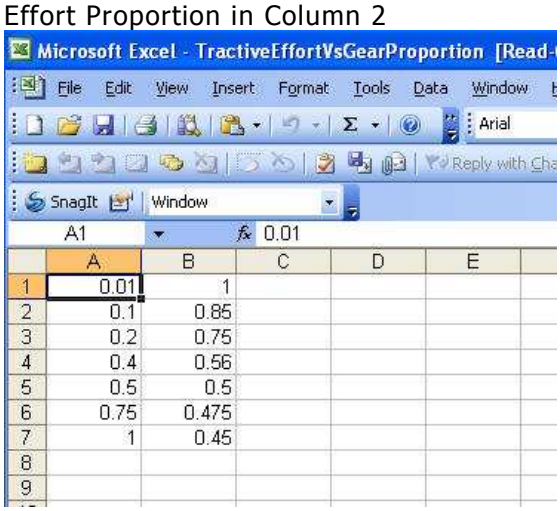
7.1.19 Time to Get to Max Force (Secs (10 – 200)

This is the time taken for the Maximum Tractive Effort to be reached from a standing start.
In Train Simulator terms this is the RunUpTimeToMaxForce.

7.1.20 Tractive Effort VS Gear Proportion

Here a custom 'Tractive Effort vs Gear Proportion curve' can be supplied in the form of a .csv (Comma Separated Variable) file. For a geared vehicle, this controls the Tractive Effort over the range of a Gear. For example in the .csv below, if 1st Gear was from 0 to 50mph then at 25mph, half the max Tractive Effort would be available.

The .csv must be in the format shown below with Gear Proportion in Column 1 and Tractive Effort Proportion in Column 2



	A	B	C	D	E
1	0.01	1			
2	0.1	0.85			
3	0.2	0.75			
4	0.4	0.56			
5	0.5	0.5			
6	0.75	0.475			
7	1	0.45			
8					
9					

7.1.21 Air System

7.1.21.1 Has Low Pressure Test (True/False)

When Brakes are released in an Air Brake System, the pressure in the Main Reservoir falls. If 'True' is selected here, once the pressure falls to a certain pressure Restart Pressure(1.4.4) then the Generator kicks in and restores Main Reservoir Pressure

7.1.21.2 Min Air Pressure

<undefined>

7.1.21.3 Cut Out Pressure (PSI)

This is the Main Reservoir Pressure at which the Generator cuts out.

7.1.21.4 Restart Pressure (PSI)

This is the Main Reservoir Pressure at which the Generator cuts in.

7.1.21.5 Reservoir Volume (PSI)

This is the Volume of the Main Reservoir. This affects how much the Main Reservoir Pressure falls when the Air Brakes are released.

7.1.21.6 Main Res Max Air Pressure (PSI)

This is the maximum pressure in Main Reservoir, and will normally be the same as 'Restart Pressure'

7.1.22 Compressor

The Compressor supplies the Air in an Air Brake System. More than one can be added if more than one is present. Simply click the Arrow on the left, in "Insert First" at the top.

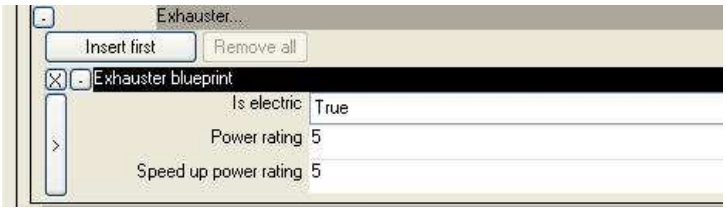
7.1.22.1 **Type** (Electrical / Mechanical)

Select the type of compressor present on the locomotive.

7.1.22.2 Power Rating (PSI /sec)

This is where you can specify the rate the compressor works at.

7.1.23 Exhauster



7.1.23.1 Is Electric

Define here if the exhauster is electrical or not.

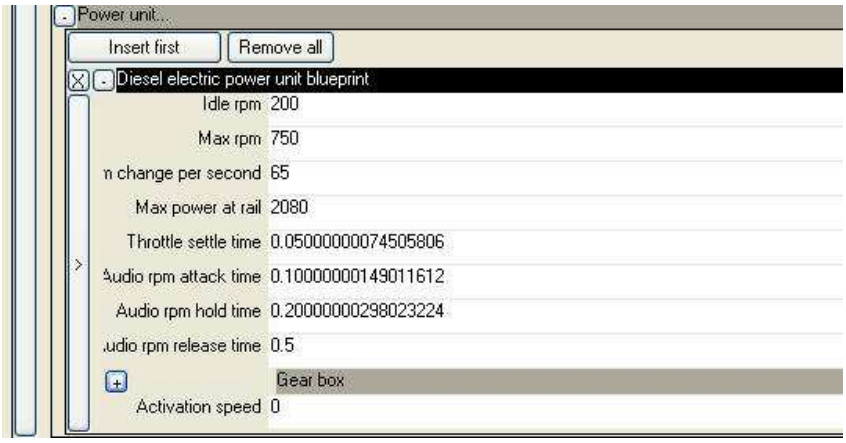
7.1.23.2 Power Rating (Inches/sec)

This is where you can specify the rate the exhauster works at.

7.1.23.3 Speed Up Power Rating (Inches/sec)

This is where you can specify how much the exhauster rating is increased when sped up.

7.2 Power Unit – Diesel Geared



7.2.1 Idle RPM (RPM (50 – 2000)

This is the RPM of the loco when idling; i.e. with the throttle at 0.

7.2.2 Max RPM (RPM (500-5000)

This is the maximum RPM of the loco overall.

7.2.3 Max RPM Change per Second

This is how quickly the engine 'ramps up and down' in RPM per second

7.2.4 Max Power at Rail

This is the Maximum Drawbar Power after losses to other systems using the resource. This is usually about 70-80% of the Max Power parameter.

7.2.5 Audio RPM Attack Time

This is defined in the Audio Documentation

7.2.6 Audio RPM Hold Time

This is defined in the Audio Documentation

7.2.7 Audio RPM Release Time

This is defined in the Audio Documentation

7.2.8 Gear Box

This area is used to specify details about the units Gear box

7.2.8.1 Gear

Add an entry per gear that is present in the gear box.

7.2.8.1.1 Direct Drive True / False

Specify here if the system is a direct drive gearbox or not?

7.2.8.1.2 Max Speed

This is the maximum speed attainable in this Gear

7.2.8.1.3 Maximum Tractive Effort

This is the maximum tractive effort for this Gear

7.2.8.2 Engine Braking

Choose from the three available options as to which is appropriate for your locomotive.

7.2.8.3 Coasting Resistance

This is the resistance of the mechanism while the unit is coasting.

7.2.8.4 Force for Engine Slowing

This is the resistance of the mechanism while the unit is slowing down.

7.2.8.5 Automatic True / False

Specify if the gears should change automatically or manually using the Gear Control keys <E> or <Shift E>.

7.2.8.6 Engine Braking Force

This is the force exerted by the sheer mechanics of the engine itself when no power is applied.

7.2.8.7 Change Up Point

This is how close to the Max Speed for the specified gear it is possible to change up to the next one. With an Automatic Gearbox this determines the speed at which the gear change happens.

7.2.8.8 Change Down Point

This is how close to the Max Speed for that specified gear it is possible to change down to the next one. With an Automatic Gearbox this determines the speed at which the gear change happens

7.2.9 Activation Speed

This is the speed at which the Gearbox is activated.

7.3 Script Component

7.3.1 Name

Use this field to specify the LUA Simulation Script file (.lua)