CLEAR CREEK OLD TIMER ROLLING STOCK PACK

Milepost Simu ations

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1. Introduction

This pack features a selection of rolling stock that would have worked on the Clear Creek Narrow Gauge lines during the 1890s. During this period the line was under control of the Union Pacific Railroad as part of the Union Pacific Denver and Gulf Railroad.

This pack includes rolling stock lettered for the Denver Leadville and Gunnison (DL&G), Union Pacific, Union Pacific Denver and Gulf as well, some still lettered for the Denver South Park and Pacific (predecessor to the DL&G). All these lines were operated by the Union Pacific and shared rolling stock.

The locomotive included is a Denver Leadville and Gunnison Consolidation locomotive which were later rebuilt into the Colorado and Southern B4Ds.

The rolling stock is equipped with link and pin couplings expect the passenger cars that had a Miller Hook coupling an early type of knuckle coupling to reduce slack and improve smoothness. Due to this the baggage car has a different coupling at each end to allow it to work with the locomotive.

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2. Baldwin Narrow Gauge Consolidation Locomotive



The loco included is a Baldwin 1890 built 2-8-0 Consolidation provided in as built condition. This locomotive was built for the Denver Leadville and Gunnison Railway, the successor to the Denver South Park and Pacific Railroad. When the locomotives were built they were the most powerful locos on DL&G and well suited to the mountain grades and tight curves of the Colorado narrow gauge. These locos saw use on the Denver Leadville and Gunnison lines as well as the Union Pacific Denver and Gulf narrow gauge lines as they were both under common ownership by the Union Pacific at the time.

In 1902-1903 the class were heavily rebuilt by the Colorado & Southern at Denver. They were renumbered 63-70 by the C&S and classified as B4D. The B4Ds continued to work the Clear Creek and South Park lines up until closure.

Boiler Pressure	150 psi
Traffic Effort	17,643 lbs
Driver Diameter	37 inches
Cylinder Size	16x20 inches
Tender Coal Capacity	4 ¹ / ₂ tons
Tender Water Capacity	1,600 gallons
Weight of Locomotive	38 tons
Weight of Loaded Tender	21 tons
Combined Loco and Tender Weight	60 tons

Some of the specifications of the locomotive are shown in the table below.

Unfortunately all the B4Ds were scrapped once the C&S closed their narrow gauge system apart from #69 and #70 which were acquired by the US army during WWII to work on the White Pass and Yukon. Sadly they too were also scrapped after the war in 1946.

The locomotives were given the following maximum trailing tonnage ratings on the route. If you are created a scenario, it is recommended you keep the total tonnage of a train at least 15% lower than these figures. The weight of rolling stock is given in the rolling stock section.

Line Section	Maximum Tonnage Rating
Golden to Forks Creek	160
Forks Creek to Idaho Springs	150
Idaho Springs to Georgetown	210
Georgetown to Silver Plume	150
Forks Creek to Central City	120

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3. Locomotive Controls M(D С L В Ε J F Η G A D Q M K 0 Ρ W S Т

	Control	Key		Control	Key
A	Reverser	W & S	Μ	Brake Pipe Pressure	-
B	Regulator	A & D	Ν	Cab Light	click
С	Whistle	Space	0	Blower	Ν
D	Bell	В	Р	Water Gauge	-
E	Train Air Brake	;&'	Q	Fire Rate Dial (for auto fireman only)	Е
F	Cylinder Cocks	С	R	Steam Lever for Fireman's Injector	Ι
G	Sander	Х	S	Water Lever for Fireman's Injector	Κ
Η	Locomotive Brake	[&]	Т	Damper	Μ
Ι	Steam Lever for Driver's Injector	0	W	Firebox Doors	F
J	Water Valve for Driver's Injector	L	-	Stoking	R
K	Boiler Pressure	-	-		
L	Air Reservoir Pressure	-	-		

4. Driving the Locomotive

Controls are conventional Rail Sim Controls with three exceptions:

- 1. Both injectors are set up to function as live steam injectors.
- 2. The Firing Rate Control has been added to allow a scripted auto fireman to take over firing duties with restrictions discussed in a separate section below.
- 3. The ideal fire mass is 750 lbs; the maximum fire mass is 1,000 lbs. The fire mass may safely vary from 600 lbs-800 lbs depending upon the steam demands of the locomotive.

While the water level will start at 100%, it is good practice to keep it in the range from 40% to 75%. Keeping the volume lower than the max allows for use of the injectors to keep the boiler from wasting steam when the steam usage is low.

Engineers Controls

The locomotive was not designed for great speed but is more than satisfactory for the Clear Creek line where uneven grades of up to 4% can be encountered. Anticipating changes in grade is essential to good performance so the fireman will not be caught with too much or too little steam.

The locomotive can generate a maximum of 10,500 lbs/hr steam with about 1,000 lbs/hr needed for appliances such as the injectors, generator, and air compressor. If using the F5 HUD it is possible to monitor the generation vs use rate for steam. This should not be seen as, as the simulation cannot supply all the sensory data that one gets in a real locomotive. Using the F4 HUD presents less information and also impacts the way the engine is fired if fired manually.

When the engine has been sitting for some time, the cylinder cocks should be open when steam if first admitted to the cylinders. These should remain open for several rotations of the drivers. To start, the reverser should be fully open and the regulator applied with care until the locomotive begins to move. As speed picks up, the reverser should be pulled back towards the center and the regulator valve opened more. For most operating conditions on this route, the reverser should not be dropped below about 35% and the throttle should be kept as fully open as needed to maintain speed.

Heavy grades will require the reverser to be in the 65 - 75% range in order to keep the train from losing speed. The regulator should always be fully open when climbing steep grades. The reverser should be advanced gradually as speed decreases and advanced no further than is needed to maintain a workable speed (say 5 - 9 mph) so that steam usage is kept at a minimum. Once the train begins to accelerate, the reverser should be cut back.

Braking

The locomotive has both engine brakes and train brakes. The engine brakes should not be used to brake a long train. Using the engine brake will cause the other cars to buck the engine – not a good thing. The train brake stand is a Westinghouse A-series that has only Release, SelfLapped, Apply, and Emergency positions.

Release - This is the position used when running. If brakes have been applied, moving even briefly to Release will cause the brakes to fully release. To achieve a partial release you can go briefly to Release then quickly back to Apply until a satisfactory pressure is achieved.

SelfLapped - If brakes have been applied using the Apply position, this position will maintain the cylinder pressure reached. It will not stop an Emergency application.

Apply - The rate of application of brakes depends on how far into the position the handle is moved. Maximum benefit is reached at 45 psi; slowing trains on the route's grades usually requires no more than 18 lbs while stopping on a grade may require above 30 psi.

Emergency - The meaning of this is clear. Once this position is touched, the brakes will go to maximum cylinder pressure. Avoid unless absolutely necessary.

Firing the B4D

There are 4 distinct ways to fire the B4D:

- 1. Manually firing using the F5 HUD.
- 2. Manually firing using the F4 HUD.
- 3. Using the built-in automatic fireman.
- 4. Using the scripted automatic fireman.

These are separately enumerated because each has different implications for the firing process.

- 1. Manually firing with the F5 HUD (or no HUD) is the best way to learn about how steam locomotives behave. The recommended ranges for the fire mass and water levels are given above. The most important thing to keep in mind is that the fireman must anticipate the demands for steam and have the boiler ready before reaching a grade or beginning to descend the grade. It is not possible on this route to play catch-up once boiler pressure begins to seriously drop. When preparing for a change in steam demand, first get the fire and water levels to the desired levels and then try to replace both fuel and water at as close to use rates as possible, keeping levels fairly even.
- 2. The F4H UD forces both the stoking and injectors to function at either fully on or fully off. While it is possible to anticipate changes in demand this way, it is difficult to match use rates for replacement of fuel and water.
- 3. The built-in automatic fireman has its limitations and isn't necessarily always responsive. This means there may be delays, making it difficult to maintain steam pressure under conditions of heavy use.
- 4. The scripted fireman is discussed in detail below.

The Scripted Automatic Fireman

This is available to users with certain limitations:

- 1. The built-in auto fireman must be off.
- 2. The F4 HUD must not be used.
- 3. F3 Display can be used without impact.

The scripted fireman has 5 levels of firing to simulate different rates of firing for different running conditions.

The E Key increases the rate; key shift-E decreases the rate. There is a gauge on the fireman's side of the cab that will show the level.

Level 0 - The script does nothing allowing for one of the other firing options to control. If the built-in auto fireman or the use of the F5 HUD is detected, the script will shut down if it has not already been set to zero.

- Level 1 Used if the locomotive is using steam mainly for appliances but not for moving.
- Level 2 Light movement in switching and other yard movement or drifting downgrade.
- Level 3 Light work on the mainline where upgrades are slight.
- Level 4 For running at speeds near the route limits or climbing shorter grades.
- Level 5 For climbing steep grades with tonnage trains.

For each level the auto fireman can be set to control just the fire (red) as well as the fire and water levels in the boiler (blue). You can go between red default setting and the blue setting be continuing to press the E key. Once you get to level 5 red, this will take you to level 1 blue. The colour of the needle on the fire rate dial changes colour.

The key to getting the best from this option is to anticipate what level of demands will be required. For most of the route going upgrade from Golden, levels 4 and 5 will be the best options. When descending that same grade, levels 1 or 2 will be satisfactory.

5. Rolling Stock

The pack includes a selection of both passenger and freight narrow gauge rolling stock that would have worked on the route in the late 19th century.



The boxcars included were built for the DSP&PRR in the 1880s and were used to transport a huge variety of freight including ore which was too valuable to be placed in open gondola cars.



The refrigerator cars were built for the DSP&PRR in 1880s and were originally in white but when renumbered for the Union Pacific, they were also repainted in yellow. They were used to transport perishable goods on the narrow gauge lines.



The gondola cars were built by the Union Pacific for the DSP&PRR in the early 1880s. They were mainly used to move to coal as well as low grades ores.



The cabooses were originally built during the late 1870s for Denver South Park and Pacific and were initially known as Way Cars. Some were lettered for the Union Pacific when they were renumbered.

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The baggage-mail-express cars were built for the Colorado Central by the Union Pacific in 1880 for use on the Clear Creek lines. The cars have a link and pin coupling on one end and a Miller Hook coupling on the other end.



The passenger car included were built for the Union Pacific Denver and Gulf in the mid-1890s for use on the Clear Creek lines.



The excursion cars built in 1883 by the Union Pacific for use on excursion trains to the Georgetown Loop. They had no heat or lights and ran with freight car trucks/bogies when built. They remained in use on excursion trains to the Georgetown Loop until the mid-1920s when regular passenger trains to the loop ended.

6. Scenarios

The pack includes 5 career scenarios as well as Quick Drive consists. The scenarios are based from the actual timetable for the line in the 1890s.

Scenario Tips

When switching, if you are uncoupling a train on an uphill grade, make sure the train is about to slowly start moving forward, so it does not roll back into the cars you just uncoupled, thus giving you an operational error.

When stopping a passenger train at a platform make sure at least one passenger car is fully on the platform to enable the doors of at least one car to open.

There is no need to ask permission to pass a signal at danger by pressing the Tab key as the route has no signals and uses a train order system explained in the signalling section. You must always do what your train order states which may override what pressing the Tab key says.

It should be noted that all switches/points are manual so will not automatically be lined for you ahead and if are performing a move off the mainline you will need to check which way the switches are set.

Career Scenarios

The following career scenarios are included with the route. The freight scenarios are set up slightly different from normal with a starting score of 1000 and you lose points for operational errors. Passenger scenarios are set up the normal way. In all scenarios you have a few mph leeway before you lose points for speeding. It is recommended you complete the scenarios in order so you get to know how to drive the B4D locomotive before putting your skills to the test on a heavy uphill freight.

[OT1] Downhill Freight

Duration: 40 minutes **Difficulty:** Easy **Route Travelled:** Lawson-Idaho Springs Take a freight train from Lawson to Idaho Spring with a pickup at Hoosac Mill on a foggy Autumn day.

[OT2] Sunday Excursion to the Loop Part 1

Duration: 60 minutes **Difficulty:** Medium **Route Travelled:** Golden-Forks Creek Every Summer Sunday Excursion Train #55 left Denver for a day trip to the Georgetown Loop and back again. In this part take the train from Golden to Forks Creek.

[OT3] Sunday Excursion to the Loop Part 2

Duration: 60 minutes **Difficulty:** Medium **Route Travelled:** Forks Creek-Dumont Every Summer Sunday Excursion Train #55 left Denver for a day trip to the Georgetown Loop and back again. In this part take the train from Forks Creek to Dumont.

[OT4] Sunday Excursion to the Loop Part 3

Duration: 80 minutes **Difficulty:** Hard **Route Travelled:** Dumont-Silver Plume Every Summer Sunday Excursion Train #55 left Denver for a day trip to the Georgetown Loop and back again. In this part take the train from Dumont to Silver Plume.

[OT5] Black Hawk Switching

Duration: 30 minutes Difficulty: Medium Route Travelled: Around Black Hawk

Perform switching in round Black Hawk delivering cars to various mills and mines in the area on a damp and gloomy Summer morning.

[OT6] Freight round the Loop

Duration: 50 minutes Difficulty: Medium Route Travelled: Empire-Silver Plume

Take a freight train from Empire to Silver Plume on a perfect Winter's day performing some switching along the route.

7. Credits

Rolling Stock created by Jonathan Lewis. Train physics and simulation by Bill Hobbs. Thanks go to Edward Gates and Simon Sauntson at Dovetail Games for their help with project.