



Feather River Canyon Oroville to Quincy



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1 Route Information

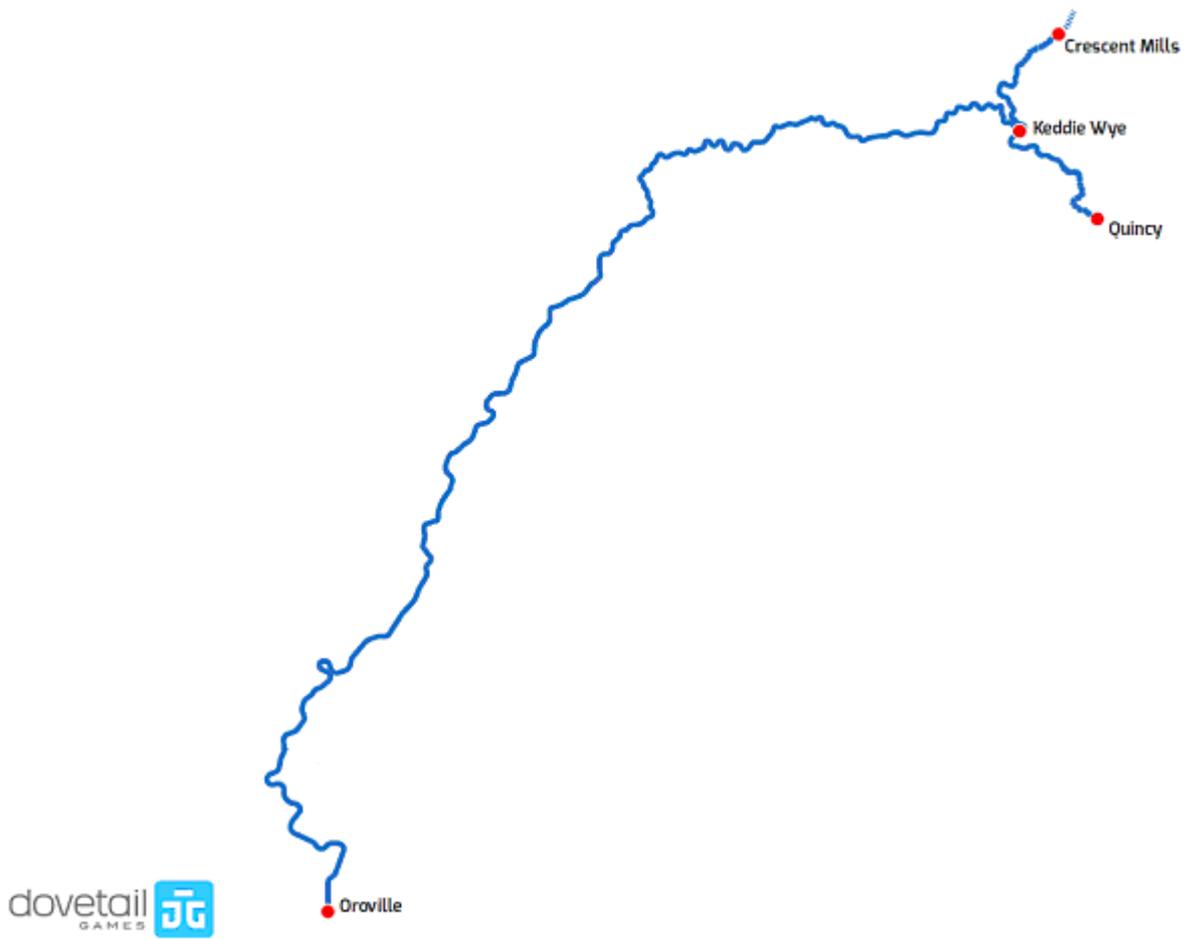
1.1 Background

Western Pacific's Feather River Canyon route is one of the most dramatically scenic and highly-engineered railroad lines in North America. The Western Pacific was a late comer to America's railroad scene – WP was not incorporated to build its main line from Salt Lake City to the San Francisco Bay Area until 1903, and its final spike was not driven until 1909. As a result, the Western Pacific was constructed to exceptional engineering standards that featured numerous high trestles, bridges, and tunnels, and a routing that topped the rugged Sierra Nevada with an eastbound ruling grade of 1 percent.

From Oroville, on the eastern edge of California's Great Valley, the Western Pacific Railroad's route through the Sierra Nevada Mountains clung to the canyons of the Feather River's Middle and North Forks, climbing from an elevation of less than 200 feet above sea level at Oroville to the 5,200-foot summit of Beckwourth Pass near the California-Nevada border, then descending into the desert of the Great Basin.

An early advocate of diesel motive power, Western Pacific in the middle decades of the twentieth century was renowned for battling mountains and desert country with magnificent silver-and-orange diesels and perhaps, most notably, for representing the western leg of the passage for the renowned Burlington-Rio Grande-Western Pacific California Zephyr.

Train Simulator's Feather River Canyon route recreates the Western Pacific main line from Oroville to Quincy Junction, California, as it existed in the late 1960s and early 1970s and the route also includes a segment of the Inside Gateway (Western Pacific's important connection with the Great Northern and later Burlington Northern) from Keddie to Crescent Mills, as well as the trackage of the lumber-hauling Quincy Railroad short line. Included are the remarkable features of the Feather River Canyon, including famous Keddie Wye and Spanish Creek trestle (where the Inside Gateway connected with the Western Pacific east-west main line), bustling Oroville yard and roundhouse, the famous rail and road bridges of Pulga, and the nearly countless tunnels, such as the "Honeymoon Tunnels" near Belden, that Western Pacific's visionary builders used to form the WP into an railroad engineering marvel.



2 Western Pacific Railroad U30B Diesel Locomotive

2.1 General Electric U30B

General Electric's "Universal" line of road diesels – nicknamed "U-Boats" – debuted with the 2,500-horsepower U25B in 1959 and was progressively developed and expanded until GE introduced its "Dash 7" line of diesels in the late 1970s. GE's 3,000-horsepower, four-axle U30B, built from 1966 through 1975, was one of the best-selling and successful of the U-Boats, with 291 units constructed. Although a long-time customer for Electro-Motive power, Western Pacific in 1967 began purchasing the U30B, in large part due to its high tractive effort, and assigned the orange-and-silver units to priority main line tonnage. Through 1969, Western Pacific purchased 19 U30Bs (WP 751-769) and the railroad added two ex-GE demonstrator units (WP 770-771) in 1971.

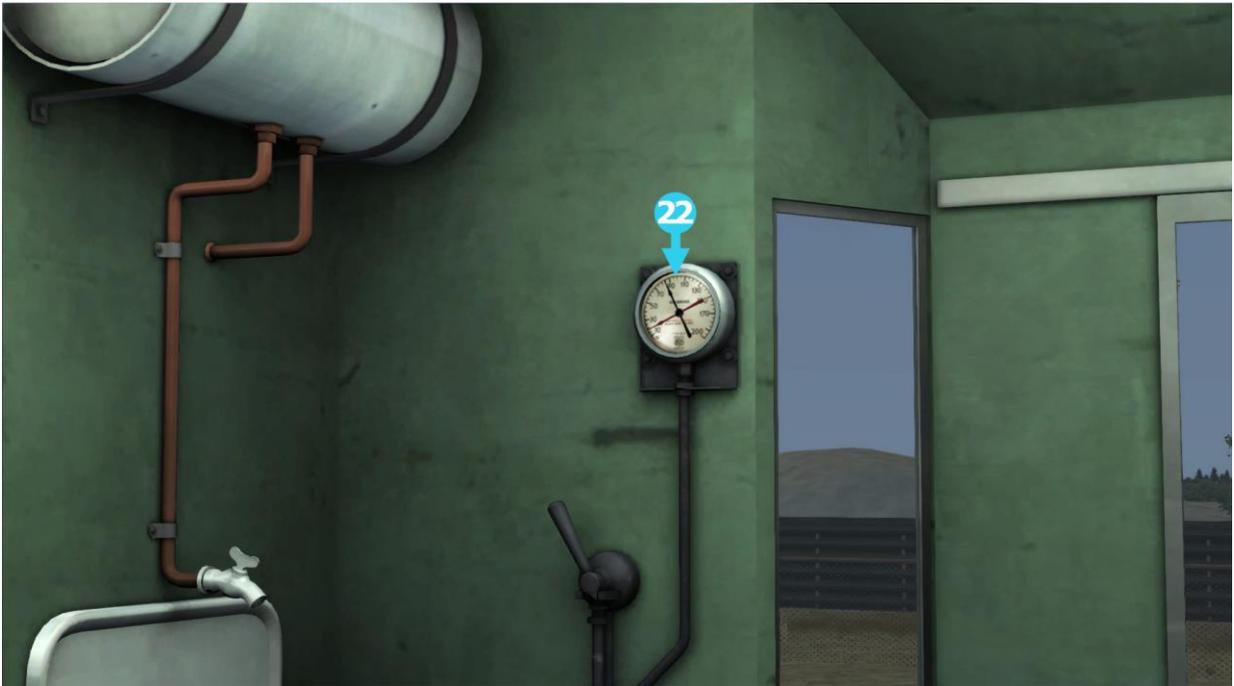
2.2 Design & Specification

Builder	General Electric Transportation Systems
Locomotive Weight	274,385 lbs (124.46 tonnes)
Vehicle Length	60ft 2in (18.2m)
Vehicle Width	9ft 11in (3.02m)
Top Speed	70 mph (112km/h)
Brake Types	Dynamic/Regenerative/Electropneumatic
Tractive Force	70,000lbs (starting) 64,000lbs (continuous)



2.3 Cab Controls





2.4

1	Throttle	12	Sander
2	Reverser	13	Bell
3	Dynamic Brake	14	Ammeter
4	Train Brake	15	Speedometer
5	Independent Brake	16	Main/EQ Reservoirs
6	Horn	17	Brake Cylinder/Brake Pipe
7	Front headlights	18	Number Board Switch
8	Rear headlights	19	OSC Light Switch
9	Cab Light	20	Wiper Switches
10	Instrument Lights	21	Engine On/Off
11	Step Lights	22	Caboose Brake Pipe Gauge

2.4 Keyboard Controls

Key Equivalent	Action
T	Load/Unload passengers or freight.
H	Headlights. Repeatedly pressing will cycle through headlight states where appropriate.
V	Windscreen Wipers. Press once to switch on and again to switch off.
Z	(Expert) Engine Stop/Start. By default engines will already be running at the start of a scenario. Press this button to stop and then again to restart the engine.
X	(Expert) Sander. Causes sand to be laid on the rails next to the wheels to assist with adhesion. Press once to activate sander and press again to deactivate.
Spacebar	Horn. Sound the Horn
B	Bell. Sound the Bell
/	Handbrake. Toggle the train handbrake on and off.
U	Sun Visors. Toggle or raise and lower the sun visors.
K	Step Lights. Toggle platform/step lighting on and off.
J	Gyra Lite. Cycle the Gyra Lite (OSC Light) control.
Shift+J	
Ctrl+1	Class Lights. Cycle the classification lights.
Ctrl+Shift+C	Couple manually.

3 Western Pacific Railroad F7 Diesel Locomotive

3.1 Electro-Motive F7

Produced between February 1949 and December 1953 by General Motors Electro Motive Division (EMD) and General Motors Diesel (GMD), the EMD F7 was a Diesel Electric locomotive which operated in North America. Initially promoted as a freight hauling unit, the F7 was also used in passenger service.

The fourth model in the successful line of F-Unit locomotives, the F7 is by far the highest selling cab unit of all time. The F7 came in two variants; cab equipped lead A-units, of which 2,366 were built, and cabless booster B-Units, of which 1,483 examples were built.

It was difficult to distinguish late production F3 units from the early F7s, as the major differences involved electrical system changes. However, later F7 units featured variations on the grill design which aided identification.

The F7 is considered to be the apex of cab unit diesel freight locomotive design, evidenced by its popularity on North American and Canadian Railroads (the latter of which utilised these locomotives up until the 1970s), although the locomotives were unpopular with yard crews due to their relative difficulty to alight from, or to see hand signals from ground crew.

As a 1,500 horsepower (1,100 kW) locomotive, the F7's operational speed averaged 50 mph (80km/h), although the unit was capable of speeds of up to 70 mph (127 km/h).

F7s have been used to power some of the most famous trains in North America, such as the Santa Fe's Super Chief, El Capitan, and Great Northern's Empire Builder.

3.2 Design & Specification

Power Type	Diesel-Electric
Locomotive Weight	247,300 lbs (112.2t)
Vehicle Length	A Unit - 50ft 8in (15.44m) B Unit - 50ft 0in (15.24m)
Build Date	1949-1953
Vehicle Power	1,500hp (1,100 kW)
Top Speed	70mph (112 km/h)
Brake Types	Air and Dynamic Braking



3.3 Cab Controls



- | | | | |
|---|-------------------|----|------------------|
| 1 | Throttle | 8 | Headlight Switch |
| 2 | Reverser | 9 | Cab Light |
| 3 | Train Brake | 10 | Horn |
| 4 | Loco Brake | 11 | Bell |
| 5 | Dynamic Brake | | |
| 6 | Windscreen Wipers | | |
| 7 | Sander Control | | |

4 Rolling Stock

4.1 [FR] U30B



4.2 [FR] F7 WPRR A-Unit



4.3 [FR] F7 WPRR B-Unit



4.4 [FR] WPRR Caboose



4.5 [FR] Flat car with Trailer Load



4.6 [FR] Flat car with Timber Load



4.7 [FR] Plug-door Insulated Boxcar



4.8 [FR] 50ft Double-door Boxcar



5 Advanced Braking Controls

The U30B locomotive included in the route contains all new scripting, based upon a 26L brake stand, to provide prototypical braking performance.

There are four levels of 'braking difficulty' which may be changed by pressing Ctrl-Shift-1 to decrease the setting and Ctrl-Shift-2 to increase.

Level 1 – Easiest	All scripting is bypassed
Level 2 – Easy	1/3 rd full brake timing simulation implemented
Level 3 – Medium	2/3 rd full brake timing simulation implemented
Level 4 – Hard	Full brake timing simulation implemented

When braking it is important to monitor the information shown on the two brake gauges.

The left-hand gauge shows the pressures held Main Reservoir (red needle) and Equalising Reservoir (white needle), and the right-hand gauge shows pressures in the locomotive Brake Cylinder (red needle) and the Brake Pipe pressure (white needle).

Moving the Train Brake lever forwards to set the brakes and rearwards to release them directly affects the equalising reservoir pressure, which would normally be at 90psi and reduces as the braking level increases.



In the example above the brakes are released and both the Equalising Reservoir gauge and Brake Pipe gauge show 90psi.



The Train Brake lever has a series of distinct stages to aid the driver. From the release position the first stage produces an almost instantaneous initial reduction of 6psi.



By moving the Train Brake lever further forwards (after a brief pause) the pressure in the Equalising Reservoir will rapidly reduce and show the 'target' Brake Pipe pressure. Air will be released from the system until the Brake Pipe pressure matches that of the Equalising Reservoir and how rapidly the air is released is dependent upon the train length. In the picture above the Brake Pipe pressure is dropping while the Brake Cylinder pressure is increasing.



After a period of time the Brake Pipe pressure matches that of the Equalising Reservoir and the desired brake application has been made.

Bear in mind that the brakes are self-lapped, so if the Train Brake lever on the HUD (for ease of reference) is moved to 48% the pressure in the Equalising Reservoir will be reduced **at that rate** until a full brake application has been made.

Once the desired Equalising Reservoir pressure has been reached the Train Brake lever may be moved back to the step prior to the Release position so that the Equalising Reservoir pressure is stabilised.

Note also that the Brake Cylinder needle indicates locomotive braking effort and not that applied to the entire train.

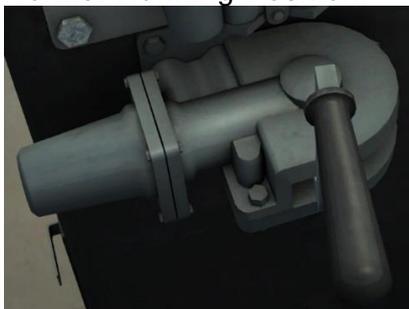


With the Equalisation Reservoir and Brake Pipe pressures balanced the locomotive Independent Brake may be 'Bailed Off' (by moving the Independent Brake lever backwards slightly). This practice removes the danger of the locomotive skidding under braking. In the above picture the locomotive brakes have been Bailed Off with the Train Brake application as before.

It should also be noted that prior to Bail Off the 'J' Valve in the locomotive brakes will 'remember' the value initially set by the Train Brake application. This allows additional effort to be applied to the locomotive brakes if desired, although it will not reduce below that initially set by the Train Brake until the locomotive brakes are Bailed Off.

The pictures below show the two positions for the Independent Brake lever.

Normal Running Position:



Bail Off Position:



****If an emergency brake application is required a brief pause is required before the Train Brake lever can be moved between its maximum application setting and the Emergency Brake setting to avoid accidental application.****

In the event of an emergency brake application the locomotive Pneumatic Control Switch (PCS) has been simulated and is indicated both by a Popup message and the illumination of the 'PCS Open' light in the cab.



Once the PCS has been tripped all locomotive engines will be returned to Idle regardless of the Throttle setting.

Should the PCS have not been tripped by a manual application (e.g. if a train brake pipe breaks) it requires resetting by moving the Train Brake lever into the Emergency position before moving it back to Release, which will only take effect once the Brake Pipe pressure has reached 0psi. The locomotive Throttle lever will also need to be moved to the idle position.



A Popup will appear to indicate that the PCS has been reset and the 'PCS Open' light will be extinguished.

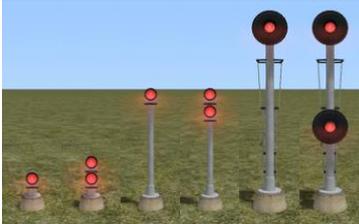
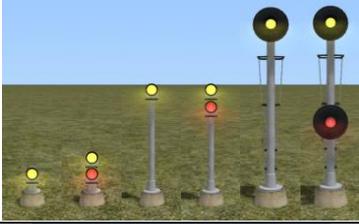
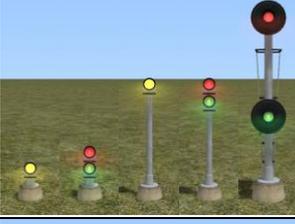
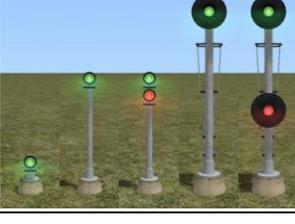
Partially releasing the train brakes is not an option and so caution should be exercised when they are first applied and the locomotive Dynamic brakes should be used as much as possible!

The train brakes will release and locomotive gauges will appear normal a long time before each car in the consist has fully recharged its own reservoir from the brake

pipe. There is no indication of the actual state of the car's reservoir pressures either prototypically or in the simulation, and repeated application and release of the train brake will result in running out of air and a subsequent run-away!

6 Signalling

6.1 Signal Aspects

ASPECT	NAME	INDICATION
	Stop	Stop
	Caution	Be prepared to stop at the next signal
	Proceed at slow speed prepared to stop	Proceed over junction at slow speed
	Clear	Proceed at line speed

Where a train is routed into a yard with manual junctions, the entry signal will remain at red until the front of the locomotive is within 100 meters, when it will change to a proceed at slow speed prepared to stop aspect.

7 Line Speeds

7.1 Speed Signs

Speeds over switches, crossovers and sidings are controlled by fixed signals, described in the previous section. At other locations between these points speed reductions and increases are denoted by wayside signs.

7.1.1 Permanent Speed Sign



Where the speed limit on the main line decreases, a sign showing the maximum speed is placed at the location. Speed increases are unsigned.

7.1.2 Other Line Speeds

All speed changes are shown on the player HUD. Unless otherwise stated loops are at 20mph and sidings at 15mph.

8 Scenarios

*****For driving tutorials, please visit the Academy from the main TS2016 menu screen*****

8.1 [U30B] 1. Keddie Consignment: Part 1

Manifest train 142, bound for Portola, is scheduled to leave and you are the assigned Engineer. Fuel up your locomotive and then drive the first part of the northbound run between Oroville and James on a clear summer's morning.

Difficulty: Medium
Duration: 50 Minutes

8.2 [U30B] 2. Keddie Consignment: Part 2

Train 17 has now passed and you've been given the all clear. Continue your run towards Keddie with manifest train 142 as far as Belden.

Difficulty: Easy
Duration: 75 Minutes

8.3 [U30B] 3. Keddie Consignment: Part 3

The final segment of the three-part run to Keddie has you running train 142 between Belden and Keddie. The weather remains fine and you have a clear run all the way.

Difficulty: Easy
Duration: 60 Minutes

8.4 [F7] 4. Crescent Mills to Keddie

This afternoon you will be taking a short cut of box cars from Crescent Mills to the sidings at Keddie. Although snow is falling in the mountains the weather shouldn't cause you any issues.

Difficulty: Medium
Duration: 35 Minutes

8.5 [U30B] 5. Oroville Bound: Part 1

The first of three scenarios traversing the route in the southbound direction. The first snows of winter are falling in the mountains, visibility is poor and you'll be in charge of train 153 between Keddie and Belden.

Difficulty: Hard
Duration: 65 Minutes

8.6 [U30B] 6. Oroville Bound: Part 2

The second southbound scenario has you in charge of train 153 between Belden and Poe as the journey continues towards Oroville. The weather has improved and you should have a trouble free run.

Difficulty: Medium
Duration: 65 Minutes

8.7 [U30B] 7. Oroville Bound: Part 3

In the final part of the journey between Keddie and Oroville you take the controls of train 153 at Poe. The weather has continued to improve although darkness is falling and so you need to remain vigilant.

Difficulty: Medium
Duration: 50 Minutes

9 Railfan Mode Scenarios

Railfan Mode provides a unique chance to observe and enjoy the operations of trains without the pressure and involvement of driving them. Railfan Mode scenarios are positioned at various key points along the route and provide camera functionality to sit back and watch the action unfold.

These scenarios are located on the **Drive** screen under the **Career** tab.

9.1 [RailfanMode] 1. Oroville

- Duration 10 Minutes

9.2 [RailfanMode] 2. James

- Duration 5 Minutes

9.3 [RailfanMode] 3. Rock Creek

- Duration 5 Minutes

9.4 [RailfanMode] 4. Tobin

- Duration 5 Minutes

9.5 [RailfanMode] 5. Camp Rodgers

- Duration 10 Minutes

9.6 [RailfanMode] 6. Rich Bar

- Duration 5 Minutes

9.7 [RailfanMode] 7. Virgilia

- Duration 5 Minutes

9.8 [RailfanMode] 8. Keddie

- Duration 10 Minutes

10 Advanced Braking Quick Reference Guide

10.1 Getting Moving

- Move the Train Brake handle towards Release - it will latch around 17%
- Release the keyboard button
- Wait a second
- Move it towards release again and it will move towards 0% and release
- Observe ER moves to 90psi
- Observe BP rises towards 90psi
- Observe BC drops towards 0psi
- Once BC is at 0psi, brakes are released on the loco and will begin releasing down the length of the train
- Apply Run 1 throttle and wait for the train to begin to move, once it begins to move you can start to apply more power

10.2 Going Down Hill

- Move the Dynamic Brake handle to Setup
- Move the Train Brake towards Apply, it will latch at around 24% for Initial Application
- Observe the ER moves to 84psi (6lb application)
- Observe BP rapidly drops to 84psi to follow
- Observe BC rapidly applies and stabilises around XYZpsi
- Brakes are now on a minimum application at the loco, the rest of the brakes on the train should respond relatively rapidly
- Once approximately 10 seconds have elapsed after the Dynamic Brake handle was moved to Setup, begin moving it further towards Apply in order to achieve more braking
- If Dynamic Brakes are not holding the loco, gently move the Train Brake a small amount to apply some more air brake but note that beyond the initial application the brakes are much slower to respond and it will take time to get the extra braking effort along the length of the train
- If you find yourself slowing too much even without Dynamic Brakes then you should bring the train to a stop, then release the brakes. It will take some time for the brake pipe to recharge and if you try to release the brakes while moving you may be going too fast before you can re-apply the brakes.

- At the top of a steep incline, you may wish to set handbrakes on some wagons using the coupling view - this is equivalent to standard railroad practice of using retainer valves to maintain air brake pressure on some freight cars which would allow a minimum amount of braking even if you've released the main air brakes. Stop your train before applying hand brakes and then proceed.

- Above all, braking requires a lot of forward thinking and careful management. Remember, safety first - if in doubt, stop the train. If you need to stop the train and release the brakes while on a gradient in order to allow a full recharge of the brake pipe then set all the hand brakes first.

10.3 Stopping

- Move the Train Brake towards Apply, it will latch at around 24% for Initial Application

- Observe the ER moves to 84psi (6lb application)

- Observe BP rapidly drops to 84psi to follow

- Observe BC rapidly applies and stabilises around XYZpsi

- Brakes are now on a minimum application at the loco, the rest of the brakes on the train should respond fairly rapidly.

- If you need further application to come to a stop then continue to move the train brake towards Apply gently, remember that the more air you let out of the BP the longer it will take to get the BP recharged again once you get going.

10.4 PCS Light Illuminated

- Ensure the Throttle handle is in the Idle position

- Move the Train Brake into the Emergency position before moving it back into Release

10.5 FAQ

The train won't move when the brake cylinder says the brakes are off

Remember all the gauges on the front refer only to the state of the brakes on the locomotive, as you use the air brakes a pressure wave makes its way down the train and it can take sometimes minutes for the effect of your braking to take effect along the length of the train. Therefore, make small changes and wait for their effect. Forward thinking and small, careful changes are crucial in the safe operation of US freight trains.

The train won't slow down even though the BC is at 65psi!

You've most likely run out of air in the reservoirs down the train which can happen after a number of repeated applications and releases without allowing time for all the reservoirs to recharge.

There is no way to know what pressure the car reservoirs are holding so it is important to allow the train plenty of time after a brake release for everything to recharge, more so if the last application was a strong application since more air would have been used.

If you find yourself in this situation, move the Train Brake handle to its maximum application position, wait a second or two and then move it further to the Emergency position. This will make an emergency application of the brakes using a separate dedicated emergency reservoir and bring the train to a stop.

You should now set ALL handbrakes on the train so that it is pinned down safely and then you can release the Train Brake handle and let the brake system fully recharge, which may take 10-20 minutes on the hardest difficulty setting.

Once recharged you can make a minimum service application, release all the handbrakes and then continue on your journey.

11 Credits

Dovetail Games would like to thank the following people who made the Feather River route possible:

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