High Iron Simulations

Realistic Routes and Packs for Train Simulator Classic

Saluda Grade:

Asheville - Spartanburg Route

TABLE OF CONTENTS

HIGH IRON SIMULATIONS

As a Partner Programme member, High Iron Simulations collaborates with Dovetail Games to produce a variety of realistic North American content for Train Simulator Classic. Our products include Train Simulator Classic routes, retro and locomotive packs, and scenario packs, all of which are available at the Steam Store.

LEGENDARY SALUDA

Saluda. In American railroading, it is a single word that require no introduction. To append the phrase that made Saluda both legendary and almost mystical, Saluda was “The steepest standard gauge, mainline railway grade in the U. S.”

Tucked away in the southwest corner of North Carolina along the east face of the towering and magnificent Blue Ridge Mountains, Saluda Mountain stood astride the Southern Railway (later Norfolk Southern) Carolina Division. While the Carolina Division was large and bustling, extending from Charleston and Spartanburg, South Carolina to Asheville, North Carolina, it was the miles standing between the tiny mountain hamlets of Melrose and Saluda, North Carolina that made the route both an American railroading icon and a name to be respected, and on occasion feared, by railroaders. Over three miles between Melrose, and Saluda, stood a grade of 4.7 percent (and in fact a short stretch that reached 5.1 percent) – thus, Saluda’s claim to being America’s steepest standard-gauge main line grade.

How could it be that a key rail route of the great Southern Railway hosted a grade of 5 percent? Simply put, there was no other choice. The Blue Ridge Mountains are among the tallest in the Appalachian Chain (not far from Saluda stands Mount Mitchell, at 6,684 feet the tallest mountain in the eastern U.S.). The Saluda line was the great endeavor of Southern Railway predecessor Spartanburg & Asheville, and the route’s chief engineer, Charles W. Pearson, quickly realized that the east face of the Blue Ridge west of Tryon, North Carolina, was an abrupt and sheer climb, without the foothills that typically allowed a rail line to wander and weave its way upgrade more gently. And so the Spartanburg & Asheville climbed the mountain the hard (which is to say, steep) way, opening in 1878.

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LEGENDARY SALUDA *(continued)*

In the 19th century age of small steam locomotives and less-than-reliable air brakes, Saluda took its vengeance. By the time Southern Railway took control of the line in 1894, at least 29 railroaders and passengers had been killed in run-away trains on the line. Southern Railway had only moderately more initial success operating steep Saluda, and when three run-away trains occurred in 1903, the railroad added two run-away safety tracks, one midway down the grade and a second at Melrose.

The advent of pressure-maintaining brakes and diesel dynamic brakes further enhanced the railroad's ability to manage Saluda, although extra precautions were always taken, which involved testing air brakes and dynamics prior to the de-scent and setting retainers at Saluda, then releasing such at Melrose. As for climbing Saluda, that almost always in-volved a throttle in "Notch 8" and more often than not "doubling the hill" (or often tripling the hill).

In 1982, Southern and Norfolk & Western joined to form today's Norfolk Southern, and a decade later came one of Saluda's most remarkable moments, when Norfolk & Western J-class 4-8-4 611 climbed the grade. Norfolk Southern continued to operate freight traffic over Saluda until December 2001, when tonnage on the line (which NS designated its "W Line") no longer justified its use as a through route.

Today, the Norfolk Southern continues to operate the line from Spartanburg to Landrum (16 miles east of Melrose), while regional railroad Blue Ridge Southern operates over the trackage between Asheville and Flat Rock, North Carolina (nine miles west of Saluda).

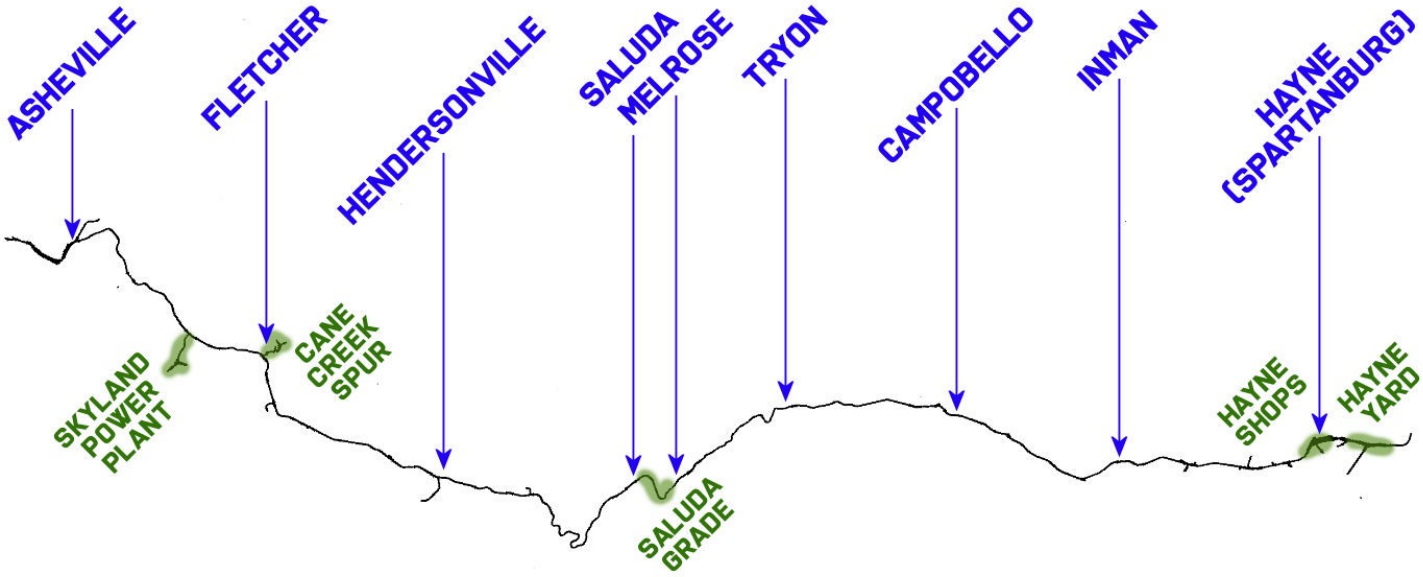
SALUDA GRADE: ASHEVILLE - SPARTANBURG ROUTE

NOTE: The Saluda Grade: Asheville—Spartanburg route is a resource-intensive route with advanced features. It is recommended that the 64-bit edition of Train Simulator Classic be utilized when operating this route.

As created for Train Simulator Classic by High Iron Simulations, the Saluda Grade: Asheville —Spartanburg route extends 70 route miles between two busy and important cities on the Norfolk Southern (ex-Southern Railway) system: Asheville North Carolina and Spartanburg, South Carolina.

Asheville, a city set amid the magnificent Blue Ridge mountains is a famous tourist destination and home to the Biltmore Mansion of railroad tycoon George Vanderbilt. In railroading terms, it was (and is) a focal point of railroading, as Southern Railway lines from all directions converged at Asheville, including the Saluda Grade route (known in the Southern era as the “A&S” and in the NS era as the “W Line”) to the southeast and important Asheville District lines to the north and east.

Spartanburg, South Carolina, similarly was (and is) a busy junction point between Southern Railway lines including the Saluda Grade route and the Southern’s main line (stretching between Washington, D. C. and New Orleans, Louisiana) . Both Asheville and Spartanburg (Hayne) are home to large rail yards and Spartanburg was also home to Southern Railway’s Hayne Car Shops into the 1990s.



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SALUDA GRADE: ASHEVILLE - SPARTANBURG ROUTE *(continued)*

Between Asheville and Spartanburg, the Saluda Grade route crosses the rugged and beautiful Blue Ridge Mountains. The legendary climb to Saluda from Melrose, with its 4.7 per cent average grade is the signature element of the line, but it is far from the sole compelling and challenging feature of the route. In crossing the Blue Ridge, the line features numerous additional grades of more than one per cent, and the rolling “saw tooth” profile of the line makes operating trains a constant challenge of effective throttle and braking use.

The route is also remarkably rich in rail-served lineside industries and lengthy spurs. There are in fact more than 40 rail-served industries along the line, including a large coal-fired power plant, plus wood and lumber yards, as well as chemical, cement, stone, manufacturing, and warehousing facilities.

Particularly notable among these tonnage-producing industries is the branch serving the large coal-fed electric Asheville power plant at Skyland and a sprawling industrial complex at Cane Creek, North Carolina.

The Saluda Grade: Asheville-Spartanburg route is set circa 1984-1994, in the formative years of Norfolk Southern operations. During this ~ ten-year period some details of the actual route and aspects of operations changed. We have chosen to model in a fashion representative of the overall era rather than specific to a single moment in time.

ROUTE OPERATING FEATURES

The Saluda Grade route was for railroaders an extraordinary operating challenge and those challenges are realistically captured and re-created in this Train Simulator edition.

THE SALUDA GRADE

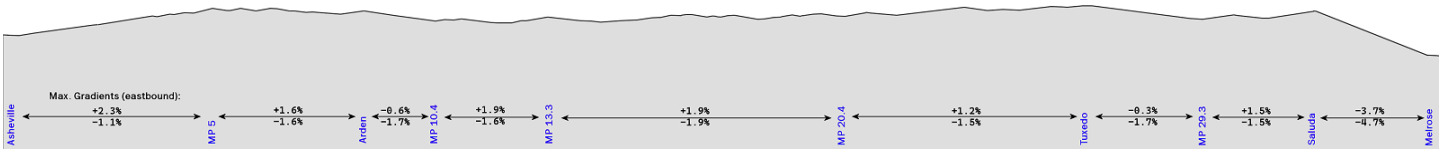
No single challenges exceeded that of ascending and descending the 4.7 grade between Saluda and Melrose, and extensive special operational requirements were utilized to ensure safe operations.

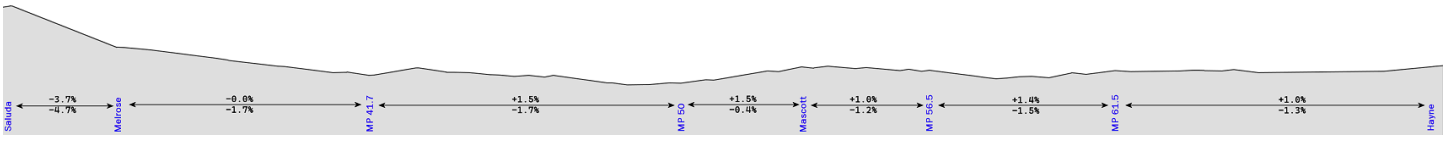
For the majority of trains climbing the grade westbound, “doubling” or “tripling” the grade between Melrose and Saluda was required. Trains which arrived at Melrose were taken up to Saluda in sections. Once the first section was taken to Saluda, the locomotives would return running light to Melrose and repeat the process. When the entire train was atop Saluda and reassembled, the train would continue west to Asheville.

Descending the grade was perhaps an ever greater challenge. The descent process began when trains arrived at Saluda. Eastbound trains with 30 cars or less were required to stop west of STOP BOARD No. 1, while longer trains made their stop no later than STOP BOARD No. 1. Once stopped, a brake inspection was conducted and retainers were often set on a portion of the consist.

Upon the brakes being charged and retainers set, the train could begin its descent and dynamic brakes were to be immediately applied. Air brake applications were used as necessary in concert with the dynamic braking. Descent speed was not to exceed 8 MPH for trains and 15 mph for light locomotives. For a train moving at 8 mph, this required 22 minutes from Saluda to pass the timing board near Melrose. Manifest trains with 75 percent of their tonnage in coal were limited to 6 mph on the descent (this did not apply to the Belmont Coal Train given its use of head-end and mid-train power). Retainers were reset upon reaching either Melrose or Tryon pending the weight of the train. Related information appears in the separate accompanying air brake manual.

ROUTE PROFILE





ROUTE OPERATING FEATURES *(continued)*

NOTABLE TRAINS AND OPERATIONS

Manifest Freights: Manifest (mixed consist) freights were the workhorses of the route. During the late Southern and early Norfolk Southern eras, the trains, operating between Asheville and Spartanburg, utilized 100– and 200-series numbers.

The Belmont Coal Train: Over the final decades of Saluda operations, the queen of the line was the massive Belmont Coal Train which operated east over the route while making a trip from a mine at Andover, Virginia to a powerplant at Belmont, North Carolina. To bring these loaded trains of up to 13,500-tons down the Saluda Grade required extraordinary care. The loaded trains often were equipped with four six-axle locomotives on the head-end and three more placed mid-train. The returning Belmont empties often were also routed via Saluda and because the entire train was empty, these trains could ascend the grade in a single section.

Woodchip Trains: A major tonnage staple on the Saluda route in its later years was dedicated woodchip trains operating west and bound for a paper mill in Canton, North Carolina. These were typically the heaviest tonnage trains to ascend Saluda Grade. Over the length of the line, the trains operated with consists of 39 heavily loaded woodchip hoppers and from Melrose to Saluda the trains were taken to the summit in three 13-car cuts.

Locals and Turns: To serve its many lineside rail shippers, the route called upon a range of locals and “turns.” Notable among these was a busy local/switching job working out of Hayne Yard nicknamed “the Rouster Job;” full-distance Spartanburg-Asheville turns; and turns serving the “TR Line” branch from Hendersonville and the Skyland power plant.

LOCOMOTIVES

Included and featured with the Train Simulation Classic Saluda Grade: Asheville—Spartanburg route are three types of Norfolk Southern diesels locomotives authentic to the line and area. Each of these locomotives feature accurate details, performance, and engineer's control stands as used in the specific locomotive types.

ELECTRO-MOTIVE GP35

The Electro-Motive GP35 was born of the 1960s "horsepower race," Powered by the builder's successful 567-series V-16 diesel power plant and rated at 2,500 horsepower, the four-axle (B-B) GP35 was constructed during 1963-1964 with a production total of 1,334 units.

Among the buyers of the GP35 were Norfolk Southern predecessors Southern Railway and Norfolk & Western, both of which purchased the units, as was typical for the two roads at the time, in "high hood" configuration. Southern Railway and its subsidiaries acquired 78 GP35s, the majority of which rode on AAR-style trucks (rather than EMD's Blomberg trucks) from traded-in Alco locomotives. Southern's GP35s utilized a single control stand placed alongside the engineer and these stands were called "bi-directional" controls by the railroad. As modeled for Train Simulator Classic, the GP35 included with the Saluda Grade route features these unique Southern details.

LOCOMOTIVES (continued)

ELECTRO-MOTIVE SD40-2 (ex-Southern Railway)

Simply put, the Electro-Motive SD40-2 was one of American railroading's most successful diesel locomotives. Constructed between 1972 and 1989, the 3,000-horsepower, 645-series powered six-axle (C-C) diesel tallied a remarkable 3,982 units constructed.

The Southern Railway purchased 128 examples of the SD40-2 ,all of which were equipped in "high-hood" configuration and with a single "bi-directional" control stand, features which are replicated in the model. The long-hood was designated the "front "of these locomotives although they typically operated with either end leading.

ELECTRO-MOTIVE SD40-2 (ex-Norfolk & Western)

Between 1973 and 1980, Norfolk Southern predecessor Norfolk & Western acquired 163 SD40-2 locomotives. While N&W's earliest purchases of the type utilized the "high-hood" configuration, its final units were built with EMD's standard "Spartan cab" low nose. The locomotive as included with this route represents the railroad's order of 1980 which featured a standard forward-facing control stand. The N&W diesels also differed from their Southern Railway sisters in having brake cylinders applied to each truck axle.

The above features are recreated in the ex-N&W model for the Saluda Grade route and in the case of both the ex-Southern and ex-N&W locomotives the model is an all-new creation featuring accurate external dimensions and advanced braking and operational features.

LOCOMOTIVE CONTROLS

EMD GP35 CONTROLS

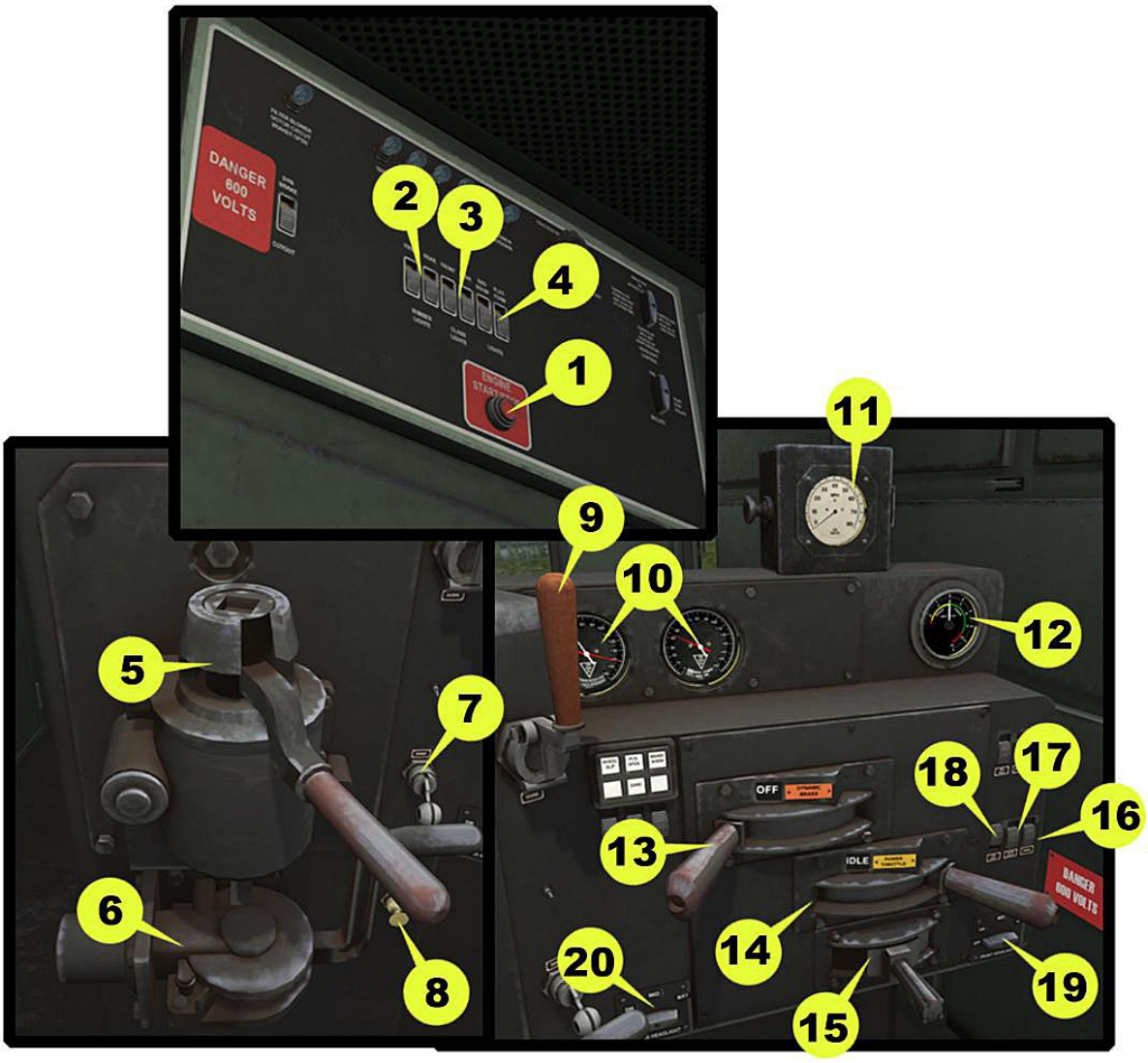
1. Train Brake
2. Horn
3. Sander
4. Air Gauges
5. Ammeter
6. Speed Recorder
7. Warning Lights
8. Wipers
9. Instrument Lights
10. Cab Lights
11. Selector
12. Independent Brake
13. Throttle
14. Reverser
15. Bell
16. Headlights
17. Numberboard Lights
18. Class Lights
19. Platform Lights
20. Engine Stop.

Key Z—toggles snow effect around trucks.

NOTE: Refer to the separate AIR BRAKE MANUAL for further operating information.

LOCOMOTIVE CONTROLS *(continued)*

EMD SD40-2 CONTROLS



1. Engine Stop
2. Numberboard Lights
3. Class Lights
4. Platform Lights
5. Train Brake
6. Independent Brake
7. Sander

Key Z—toggles snow effect around trucks.

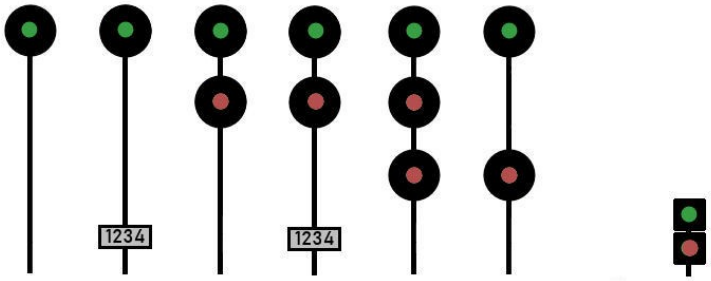
8. Bell
9. Horn
10. Air Gauges
11. Speed Recorder*
12. Ammeter
13. Dynamic Brake
14. Throttle
15. Reverser
16. Wipers
17. Instrument Lights
18. Cab Lights
19. Front Headlights
20. Rear Headlights

* Placement of speed recorder differs between SD40-2 versions.

NORFOLK SOUTHERN SIGNALS

The Saluda Grade route main line is signaled single track with long passing tracks at key locations. Track speed on much of the main line is 40 mph, with 20 mph limits on the most treacherous portions of the line. The follow charts demonstrate signal indications as used by Norfolk Southern. **Note:** Information for game use only.

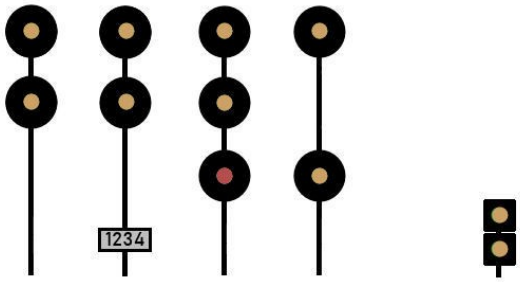
CLEAR



Indication:

Proceed at authorized speed.

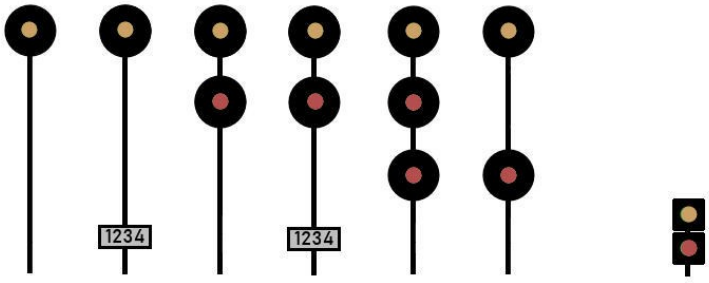
ADVANCE APPROACH



Indication:

Proceed prepared to stop at second signal.

APPROACH



Indication:

Proceed preparing to stop at next signal. Train or engine exceeding medium speed must reduce speed.

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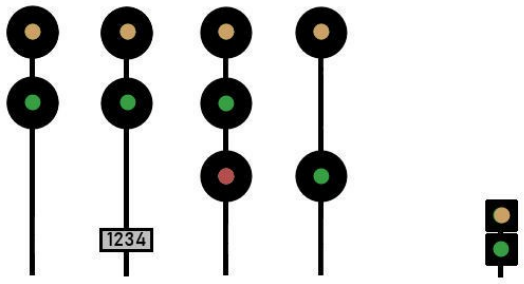
NORFOLK SOUTHERN SIGNALS *(continued)*

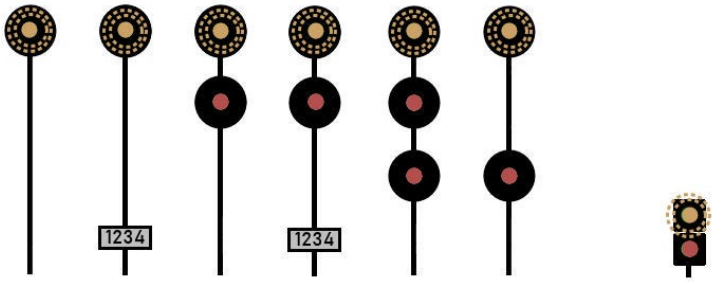
APPROACH DIVERGING



Indication:

Proceed preparing to take diverging route beyond next signal at authorized speed.

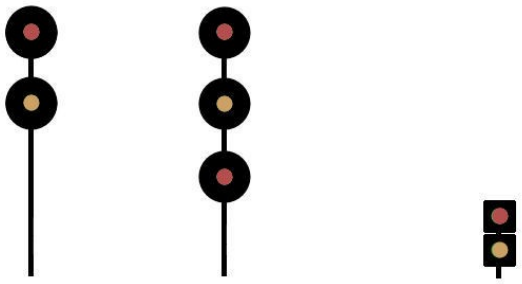
APPROACH RESTRICTING



Indication:

Proceed, approaching next signal at restricted speed. Train or engine exceeding medium speed must reduce speed.

DIVERGING APPROACH



Indication:

Proceed onto diverging route, observing authorized speed through turnouts or crossovers, preparing to stop at next signal. Train or engine exceeding medium speed must reduce speed.

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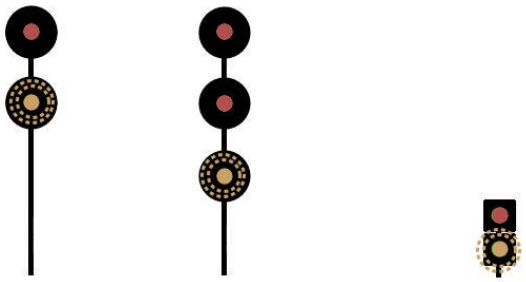
NORFOLK SOUTHERN SIGNALS *(continued)*

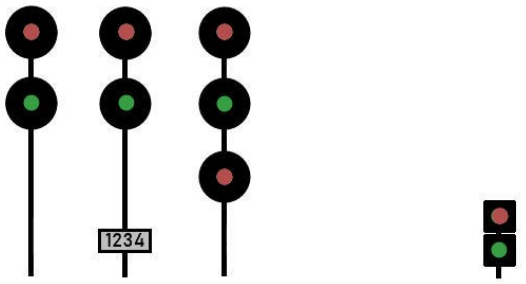
DIVERGING APPROACH RESTRICTING



Indication:

Proceed through diverging route, observing authorized speed through turnouts or crossovers, approaching next signal at restricted speed. Train or engine exceeding medium speed must reduce speed.

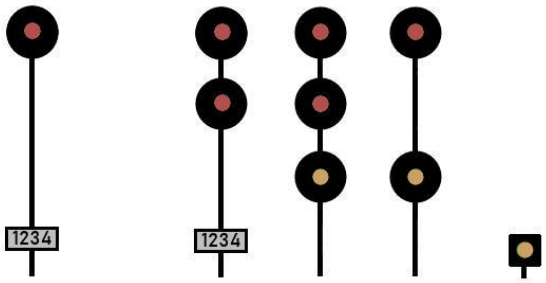
DIVERGING CLEAR



Indication:

Proceed through diverging route, observing authorized speed through turnouts or crossovers) .

RESTRICTING



Indication:

Proceed at restricted speed. Restricted speed must be observed until the leading end of the movement reaches the next signal.

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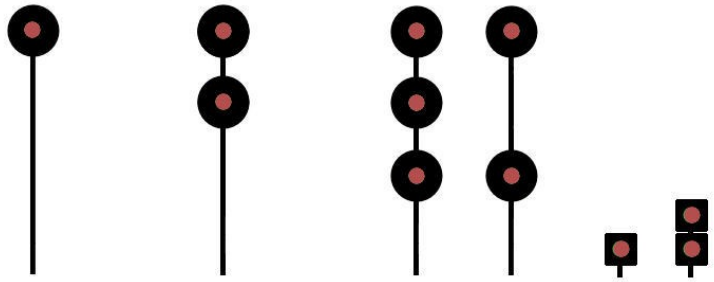
NORFOLK SOUTHERN SIGNALS *(continued)*

STOP



Indication:

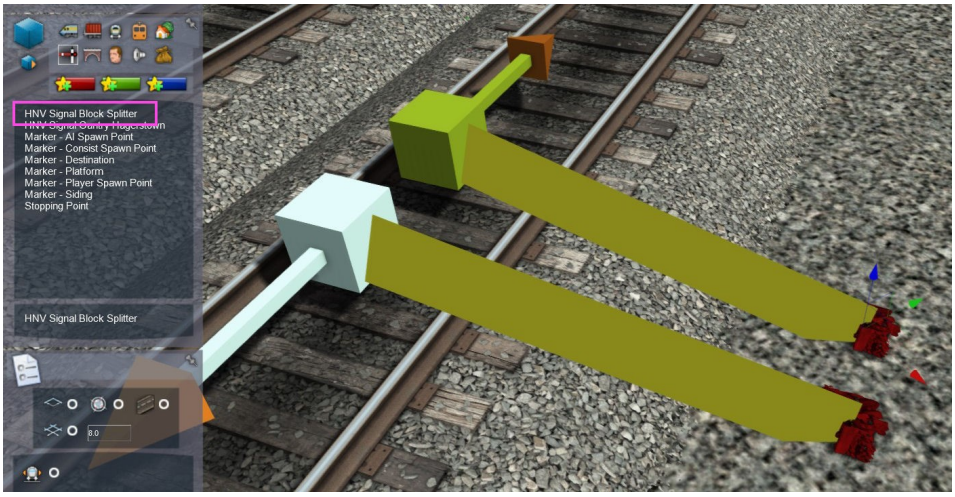
Stop prior to passage of signal.

SIGNAL BLOCK SPLITTER

While the Saluda Grade route is a signaled route, it can be useful, in the creation of custom scenarios, to on occasion utilize signal block splitters, which are included with the route assets. Look for the "**HIS Signal Block Splitter**" in the **scenario editor.**

These are very simple signals that split the track network into additional signal blocks. You should always **place them in pairs** with the link arrows pointing away from each other to fully separate two blocks. This mimics the link placement of two normal single-link signals placed opposite each other. To change the direction the link defaults to during placement, hold down the Shift key when placing it on the tracks. The screenshot below illustrates the recommended placement:

This example (at right) creates two signal blocks: one to the right and one to the left of the two signals . As far as the Train Simulator Classic dispatcher is concerned, these are perfectly normal signals. You can create as many and as large or small signal blocks as needed for your planned traffic flow.



ROLLING STOCK

The Saluda Grade: Asheville-Spartanburg route includes and features ten types of authentic freight rolling stock appropriate to the era.

The car types are featured in multiple liveries, including Norfolk Southern, Southern Railway, Norfolk & Western, and unbranded, are available in empty and loaded configuration, and several feature multiple loads.

The freight car types include:

- 50-foot boxcar
- Bulkhead flatcar
- Center-beam flatcar
- Low gondolas
- 100-ton coal hopper
- 3-bay covered hopper
- 2-bay covered hopper
- Ballast hopper
- Woodchip gondola
- Tank car

SCENARIOS

The Saluda Grade: Asheville —Spartanburg route features a selection of ten realistic career scenarios, three free-roam scenarios, and is Quick-Drive (QD) enabled.

CAREER SCENARIOS

Belmont Empties

You are the engineer of Norfolk Southern Train 269 totting the empty hoppers of the Belmont coal train back to Andover, Virginia. With its all-empty consist, this train was one of the few that could climb Saluda Grade without doubling the hill. Empties or not, it will take all the horsepower of your quartet of Norfolk Southern Electro-Motive SD40-2s to reach the Saluda summit.

Duration: ~ 85 minutes.

Featured: Norfolk Southern EMD SD-40-2 (ex-Southern Railway.).

The Rouster Job

Norfolk Southern's local and switching job which served the extensive number of lineside shippers north of Hayne Yard was nicknamed the "Rouster Job." You are the engineer of the local and its duo of GP35s and, as the scenario begins, the local has worked west to Inman and is now ready to handle more switching duties en route to Hayne.

Duration: ~ 60 minutes.

Featured: Norfolk Southern EMD GP35.

SCENARIOS (continued)

The Belmont Coal Train

During the final decades of Saluda line operations, the “big event” was the regular passage of the eastbound loaded Belmont Coal Train down the 4.7 percent grade. You are the engineer of the ponderous train, equipped with four SD40-2s on the point and three more SD40-2s positioned mid-train. As the scenario begins, you have stopped at Saluda depot to have the road foreman of engines (RFE) climb aboard for the daunting descent.

Duration: ~ 50 minutes.

Featured: Norfolk Southern EMD SD-40-2 (ex-Southern Railway)

Bound for Belmont

In this continuation of the career scenario “The Belmont Coal Train,” you are the engineer of the heavy unit train and, as the scenario begins, the road foreman of engines (RFE) has climbed down at Tryon and you are ready to make the run eastbound to Hayne Yard in Spartanburg.

Duration: ~ 55 minutes.

Featured: Norfolk Southern EMD SD-40-2 (ex-Southern Railway)

SCENARIOS (continued)

Coal to Skyland

At Skyland, North Carolina, a branch extended to a large coal-fired power plant providing electricity to the Asheville region. You have been called at Asheville Yard as engineer of a turn to Skyland which will deliver 40 loads of coal to the power plant, then pick up empties to return It's a pleasant spring afternoon and your power is a trio of EMD diesels.

Duration: ~ 65 minutes.

Featured: Norfolk Southern EMD SD40-2 (ex-Norfolk & Western).

Woodchips West

Among the heaviest trains to operate westbound on the Saluda Grade route were woodchip trains destined for a paper mill at Canton, North Carolina. These trains regularly ran out of Hayne Yard with 39 loads and upon arrival at Melrose, the trains would triple Saluda Grade. In this scenario, you have 39 heavy woodchip loads and are ready to make the climb west to Melrose with a trio of EMD SD40-2s as power.

Duration: ~ 70 minutes.

Featured: Norfolk Southern EMD SD-40-2 (ex-Norfolk & Western)

SCENARIOS (continued)

Cane Creek Industrial

The Saluda Grade route hosted more than 40 lineside industries and one source of tonnage was the busy Cane Creek Industrial Park located at Fletcher, North Carolina. You are the engineer of a Norfolk Southern westbound Asheville Turn and, as the scenario begins, you have arrived at Fletcher and will be making a number of setouts and pick-ups on the Cane Creek Spur.

Duration: ~ 45 minutes.

Featured: Norfolk Southern EMD GP35.

Third Climb

Most trains ascending the steep grade from Melrose to Saluda required “doubling or tripling the hill” from Melrose to Saluda. On a winter day, you are the engineer of a 39-car westbound woodchips train and, as the scenario begins, the first two 13-car cuts of woodchips gondolas have been taken to Saluda. You’re now ready for the third and final climb of the 4.7 percent grade, then, at Saluda, you will reassemble the 39-car consist and continue westbound.

Duration: ~ 60 minutes.

Featured: Norfolk Southern EMD SD40-2 (ex-Southern Railway).

SCENARIOS (continued)

Brevard Turn

At Hendersonville, a branch known as the TR Line extended 19 miles from the main line to Brevard. You are the engineer of an Asheville-Brevard-Asheville turn, and as the scenario begins, you're at Hendersonville waiting to come off the branch and return, with additional work en route, to Asheville Yard. Your motive power is a veteran duo of ex-Southern EMD GP35s.

Duration: ~ 60 minutes.

Featured: Norfolk Southern EMD GP35.

Midnight Descent

Norfolk Southern manifest freight No. 270 is making its scheduled nocturnal journey between Asheville and Spartanburg and, as the scenario begins, you are stopping at the crest of Saluda Grade to set retainers and begin the arduous descent of the legendary grade. Your power is a trio of Electro-Motive SD40-2s.

Duration: ~ 50 minutes.

Featured: Norfolk Southern EMD SD-40-2 (ex-Norfolk & Western).

ACKNOWLEDGEMENTS AND CREDITS

Contributors

Michael Stephan: Track Work, Signaling, Route Building, 3D Assets, Rolling Stock Development and Liveries.

Gary Dolzall: Research, Route Building, and Scenario Development.

DTM and Cesar Pach: EMD GP35, EMD SD40-2 (Southern and N&W versions), tank car.

Wayne Campbell: Procedural Scenery, Distant Scenery, Terrain Texturing, 3-D Assets, Technical Testing and Advisory.

Smokebox and Mike Rennie: Locomotive Air Brakes. Refinements to Locomotive and Rolling Stock Performance, Air Brake Video Tutorials.

GTrax and Rick Grout: Custom 3D Assets

Paul Dolzall: Custom 3D Assets

Thanks go to Dovetail Games, including Simon Sauntson, Laura Joyce, David Walker, Mike Richardson, and the QA

CONTACTS

Train Simulator Classic is available at the Steam Store: http://store.steampowered.com

All High Iron Simulations products are also available at the Steam Store: http://store.steampowered.com

For Train Simulator Classic and scenario product support, visit: https://dovetailgames.freshdesk.com/support/home

For the latest news and information on High Iron Simulations and our scenario products, visit our Facebook page at: https://www.facebook.com/HighIronSimulations/

High Iron Simulations

Realistic Routes and Packs for Train Simulator Classic