



COLORADO RAILCAR



SAVE
\$1 per
boarded
passenger
see pg 7

49 CFR Part 238
Compliant
Self-Propelled Railcar

CLEAN AND QUIET DMU PAYS FOR ITSELF

Clean and Quiet DMU PAYS FOR ITSELF

72%
less pollution
than a locomotive

75%
less noise
than a locomotive

- ✓ Costs less to purchase
- ✓ Saves millions in operating costs
- ✓ Saves millions in infrastructure costs

PLUS

Complies with
49 CFR Part 238

- No waivers necessary

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South Florida Regional Transportation Authority (SFRTA)
Double Deck DMU and Double Deck Coach, for the DMU
Demonstration Project, jointly funded by FRA and Florida DOT.

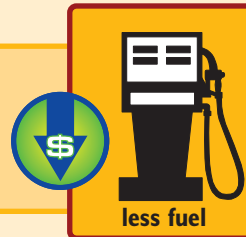


The DMU Pays for Itself Because...

✓ It costs less to purchase



✓ It saves millions of dollars in operating costs over its lifetime



✓ It saves millions in infrastructure costs



Contents

DMU Pays for Itself**3**

What is a DMU?.....**5**

DMU Saves Millions on Operating Costs.....**6**

Double Deck Maximizes Seating Capacity.....**8**

DMUs Cost Less to Purchase **10**

DMUs Save on Infrastructure Costs..... **11**

Independent Fuel Economy Test **12**

Clean and Quiet DMU .. **14**

49 CFR Part 238 Compliant **15**

DMU Uses Proven Components **16**

A Look Inside the DMU **18**

Colorado Railcar Information **19**

Technical Details **22**

The DMU Will Perform Well in Your Service **27**



Congressman John Mica presided over a running demonstration of the DMU from Orlando to Winter Park, Florida on October 25, 2002.

What is a DMU?

A Self-Propelled Passenger Railcar for Commuter Rail or Intercity Rail Service

DMU = Diesel Multiple Unit

➔ A diesel self-propelled railcar, which can be run in multiple combinations of unpowered coaches and powered cars



The DMU contains **propulsion engines** and **passenger seating** in one railcar, unlike a locomotive hauling coaches

A Colorado Railcar DMU has the power to **pull unpowered coaches**

The DMU Saves Millions in Operating Costs Over

How Much?

A Double Deck DMU Saves:



Fuel: 50% or more → \$4 million or more over DMU's lifetime



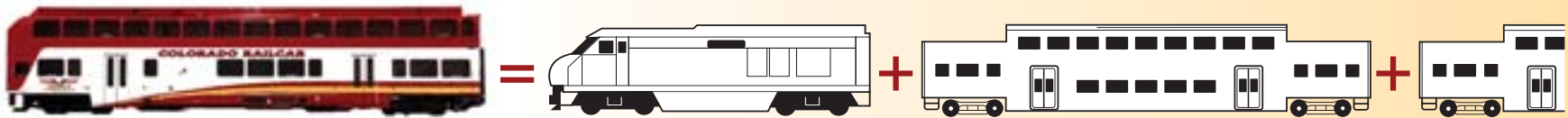
Maintenance: 30% or more → \$3 million or more over DMU's lifetime



Its Lifetime Compared to Locomotive-Hauled Service

Why?

1. Fewer Vehicles



One double deck DMU replaces a locomotive, plus a bi-level coach, plus another 1/3 coach

Because:

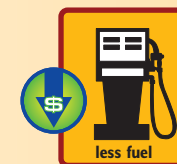
- ➔ DMU provides both propulsion and seats
- ➔ double deck maximizes seating capacity

2. More Efficient Engines

The DMU's engines are the right size for the vehicles they are propelling: you do not need a 3500 horsepower locomotive to pull a few coaches. Plus, the engines are less expensive and easier to maintain.

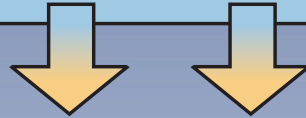
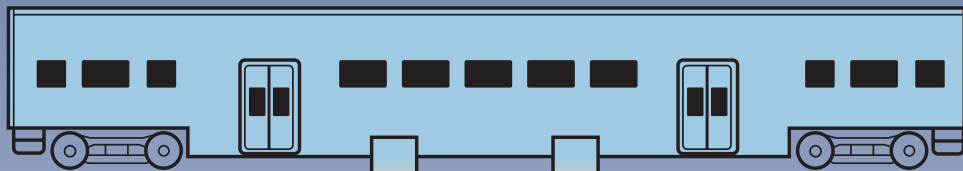
Why Is This So Important?

Having fewer vehicles and more efficient engines will save you millions on fuel & maintenance. In fact, you can save \$1 or more per boarded passenger.

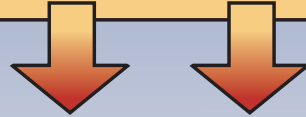
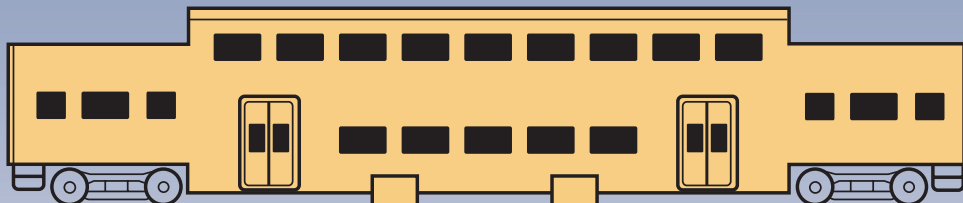


Colorado Railcar's Double Deck Maximizes Seating so that You Save

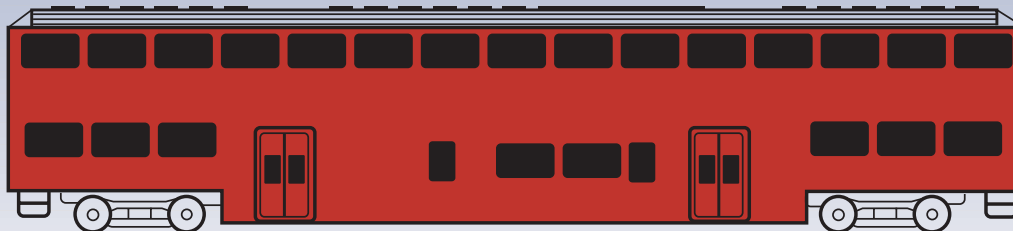
A LONG, LONG
TIME AGO



1978



1988



Colorado Railcar's patented two full floor design
was introduced in coaches in 1988.

Double Deck Is the
Natural Evolution in
Cost Effectiveness

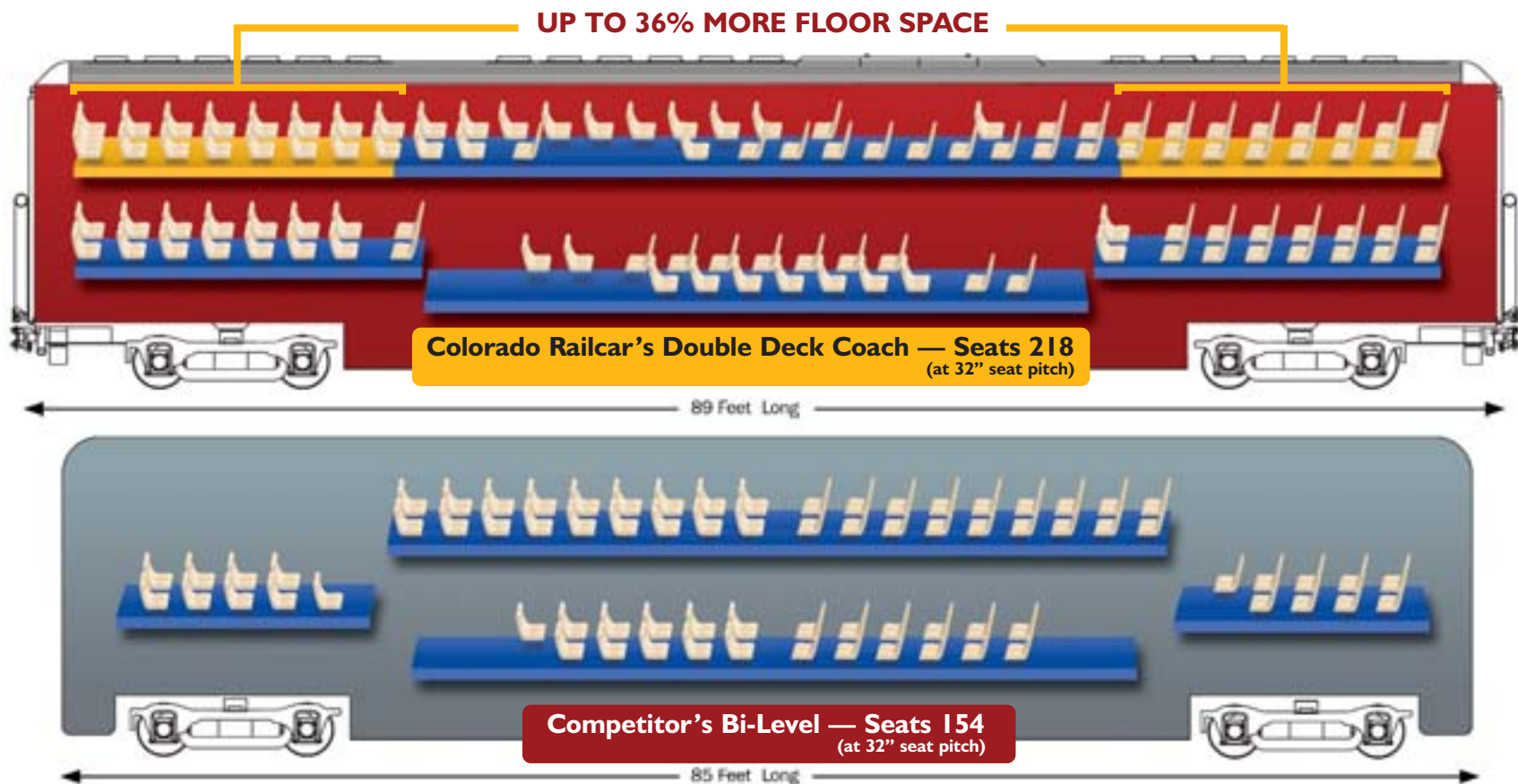
The rail industry moved from
single to bi-level for amazing
new cost efficiencies



The next step is the
patented two full floors
of the Double Deck,
only available from
Colorado Railcar

Capacity so that You Need Fewer Vehicles Millions in Operating and Infrastructure Costs

Two Full Floors of Double Deck Coach Create 36% More Floor Space



The 36% more floor space is like adding another top floor to a bi-level coach.

DMUs Cost Less to Purchase: Our Cost Per Seat is the Lowest in the Industry

To match our cost per seat, you would need to buy a locomotive and coaches for below market prices.



Consider seating 400 people at today's market prices:



The Colorado Railcar DMU saves **13%** per seat

All of the Operational Cost Savings with DMUs are **FREE!**
You Don't Pay More Upfront to Save Money Later



DMUs Save on Infrastructure Costs

DMUs need 43% less platform, so you save all the money you would have spent to build this piece of platform.



Fewer vehicles means:

- ✓ Shorter platforms
- ✓ Smaller yards
- ✓ Smaller and less complex maintenance facilities

When compared to locomotive-hauled trains

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 passenger
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smaller yards, shorter platforms and less complex maintenance facilities

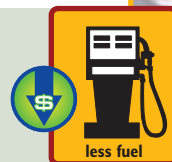


Independent Fuel Economy Test Proves That the DMU Pays for Itself with Fuel Savings Alone

In 2004, Tri-Rail ran a fuel economy test comparing a locomotive-hauled consist to a single level DMU and bi-level coaches with the same total seating capacity.

The fuel economy test results:

- ✓ DMU **saved 200 gallons roundtrip** (approx.) on the 144-mile roundtrip
 - The locomotive burned 325 gallons (=2.3 gallons per mile)
 - The DMU burned 128 gallons (=0.9 gallons per mile)
- ✓ The DMU would **save 150,000 gallons per year** running 3 round trips per day, 5 days a week
- ✓ The DMU would **save 4.5 million gallons over 30 years**
- ✓ At \$1.80 per gallon, the DMU would **save \$8 million over 30 years, more than 2 times the purchase price of the DMU.**
- ✓ As fuel costs rise, the savings generated by the DMU increase rapidly



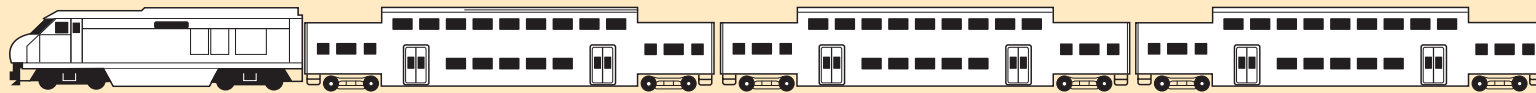
Even in Locomotive-Hauled Service Double Deck Coaches Pay for Themselves

When Used Instead of Bi-Level Coaches

Double Deck Coaches pay for 75% of their purchase cost in maintenance savings alone.
The fuel and infrastructure savings can easily pay the remaining 25%.

Consider seating 400 people:

With bi-level coaches, you need 3 coaches:



With Colorado Railcar's Double Deck Coaches, you need only 2 coaches total—one less coach than with bi-levels:



No third coach needed.
Save \$90,000/yr on maintenance.

A locomotive pulling two Double Deck Coaches seats approx. 400 people.



Having one less coach to maintain can save \$90,000 or more per year, which is equal to \$4.5 million over 30 years, including inflation. That \$4.5 million pays 75% of the purchase cost of two coaches.

Clean and Quiet DMU Will Please Community Residents

72% lower emissions
than a locomotive-hauled train

- ✓ Much cleaner engines
- ✓ More fuel efficient, and therefore less pollution

75 % less noise
than a locomotive-hauled train

- ✓ Smaller, quieter engines
- ✓ No overnight idling, and engines can be shut on and off at anytime
- ✓ Less unsprung weight = less pounding of the rail = less ground vibration



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World's Only 49 CFR Part 238 Compliant DMU

No Waivers and No Time Separation Needed

Meets or exceeds new FRA and APTA structural safety specifications for:

- 800,000 Pound Compressive End Load Strength
- 300,000 Pound Cab Corner Post Strength
- 500,000 Pound Cab Collision Post Strength
- 100,000 Pound Cab Anti-Climbing Mechanism
- Side Structure Impact Strength
- Roof Structure Rollover Strength



On February 26, 2002, the single level DMU was tested and shown to be the only self-propelled commuter railcar to meet the FRA's newest 49 CFR Part 238 structural requirement.



The double deck DMU structure also meets the FRA's newest 49 CFR Part 238 structural requirements.

DMU Uses Service Proven Components



Transmission — The best rail transmission in the world



- Voith T212 BRE Turbo Hydrodynamic Transmission
- The “Mercedes” of heavy duty transit transmissions
- 2300 transmissions of this class in use worldwide and 75,000 total transmissions in use worldwide
- Hydraulic retarder
- Electronic control management system
- 760,000 miles before first major overhaul
- Readily overhauled in agency’s shops

Engine — The world’s fuel efficiency leader

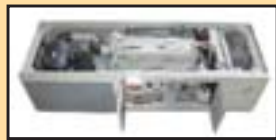


- Two 600 horsepower Detroit Diesels
- Electronic DDEC engine management system
- Overhead cam, fuel injected
- Factory warranted lay-down configuration developed by Colorado Railcar
- Two year warranty, extended warranty available
- Parts/Service availability at 1300 outlets nationwide



Generator — Powers the DMU plus two more cars

- 800,000 engines in use worldwide running over a billion miles per week
- Engines are durable and easy to maintain
- EPA compliant
- Very fuel efficient at 2-3 mpg for single power car



STADCO 175kw

- 175 kw Stadco 480 volt, 3 phase
- Deutz water-cooled diesel
- Provides power for DMU and up to two coaches — Full redundancy when paired with another DMU or generator-equipped coach

Trucks — Millions and millions of miles of proven service



GSI 36630

- GSI low clearance truck
- Inside swing hanger
- Primary and secondary springs
- Inboard disk brakes
- Used by METRA, Caltrain and many other transit agencies
- Voith KE553 final drive used in each truck

A Look Inside the Colorado Railcar DMU and Coach

Colorado Railcar offers many options for seating...



Reclining cloth commuter seating
Note the large windows.



Leather bucket seating
Note the dome windows and standard commuter seats.



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Booth seating
*Note the emergency exit windows.
 Power outlets available at the booth tables.*



Flip up seating
*Note the ADA parking space. ADA restrooms,
 ADA lifts, and baggage storage are also available.*

... and many options for cabs



Full width cab



Half width cab with walk-through

Well-Built Products from an American Company with Over 18 Years in the Passenger Railcar Business



Alaska Railroad's Aurora private car at the plant, just before shipping.

The Facility

Colorado Railcar's 75,000 square foot manufacturing facility is located in Ft. Lupton, 21 miles north of Denver, Colorado. The plant is adjacent to the Union Pacific mainline and has a spur running into the facility. A new state-of-the-art full car paint facility is located on the spur.

Colorado Railcar's exclusive design utilizes heavy steel tubular construction for end-of-car collision posts, corner posts, and floor structure to meet 49 CFR Part 238 requirements.



Manufacturing Plant



Colorado Railcar's Facility

New Railcars Near Completion

18 Years of Excellence Building Double Deck Railcars Colorado Railcar's Customers



Royal Caribbean and Celebrity Cruise Lines



Florida DOT, FRA and South Florida Regional Transportation Authority (SFRTA)



Princess Cruises and Tours



Holland America Cruises



Rocky Mountaineer Railtours



Alaska Railroad

General Technical Data



Colorado Railcar General Data

Car Structure	Low-alloy, high-tensile Corten© steel Tubular frame construction
Doors	Microprocessor or relay controlled, pneumatic or electrically actuated Per customer specification
Trucks/Bogies	GSI low-clearance 36630 or per customer specification, 8'-6" axle centers
Truck centers	59'-6" or 63'-6"
Wheelslide protection	Yes
Brakes	Inboard disk brakes standard or Per customer specification
Heating	Electric forced-air heat, plus optional base board heat
Air conditioning	20-40 tons per car, as required for climatic conditions

Electrical supply

Power Supply	480 V, 3 ph, 60 Hz, up to 175 kW on board generator, or external head end power
Low-voltage power supply	LVPS supplying 12, 24, 36, 64/72 VDC as customer specified
Interior lighting	Fluorescent / Halogen / L.E.D
MU	All units are MU capable

Performance Data (using GSI 36630 trucks)

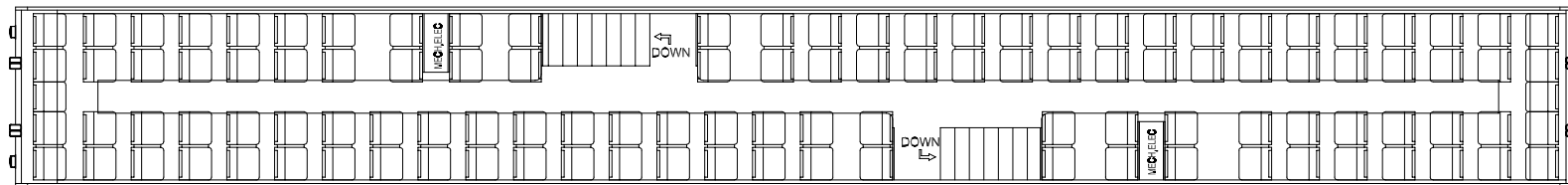
Maximum design speed	100 mph
Maximum Operating speed	90 mph
Service Braking	2.0 mphps
Emergency Braking	2.5 mphps
Minimum horizontal curve radius	250 ft
Minimum vertical curve radius	2,000 ft

New Double Deck DMU

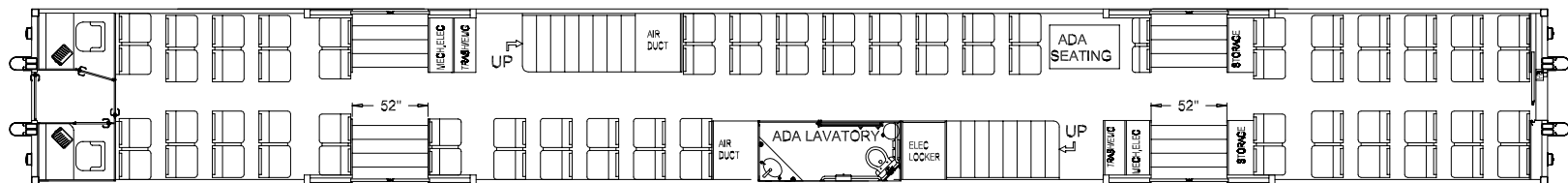


Seats	188
Length (over coupler pulling faces)	89'
Width (over side sheets)	10'
Total height (above top of rail)	19' -9 1/2"
Floor height (above top of rail)	51"
Engine	Two Detroit Diesel Series 60 Each rated at 600 hp
Transmission	Two Voith T212 BRE with KB190 retarder
Final Drive	Two Voith KE553

188 Seat Double Deck DMU



PLAN VIEW
UPPER LEVEL - 114 SEATS @ 32" PITCH



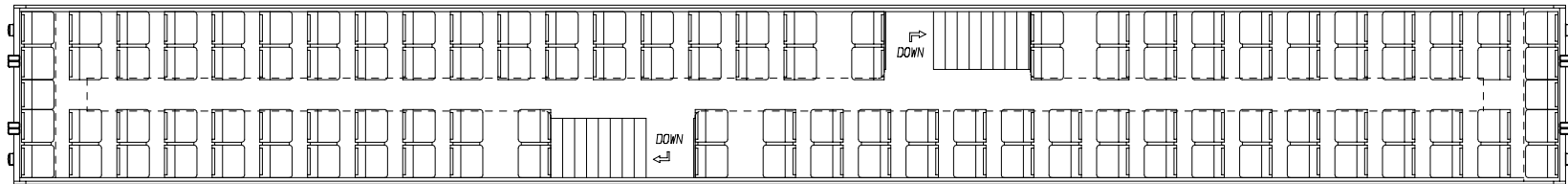
PLAN VIEW
LOWER LEVEL - 74 SEATS @ 32" PITCH

218 Seat Low Floor Double Deck Coach

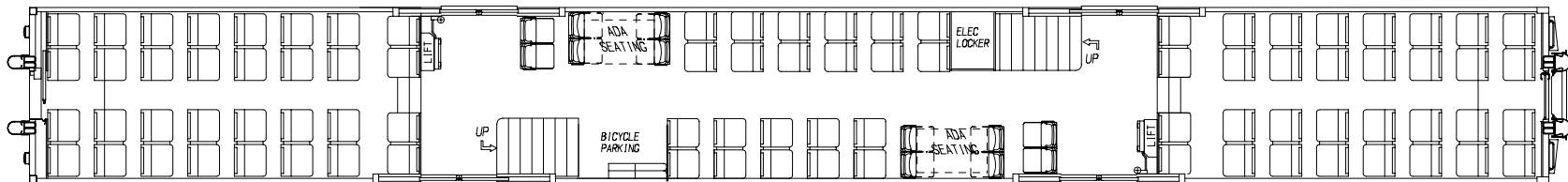


Seats	218
Length (over coupler pulling faces)	89'
Width (over side sheets)	10'
Total height (above top of rail)	19' -9 1/2"
Low floor height (above top of rail)	25"
Control cabs	Available for push-pull operation

218 Seat Double Deck Coach



PLAN VIEW
UPPER LEVEL - 118 SEATS ■ 32" PITCH



PLAN VIEW
LOWER LEVEL - 100 SEATS ■ 32" PITCH

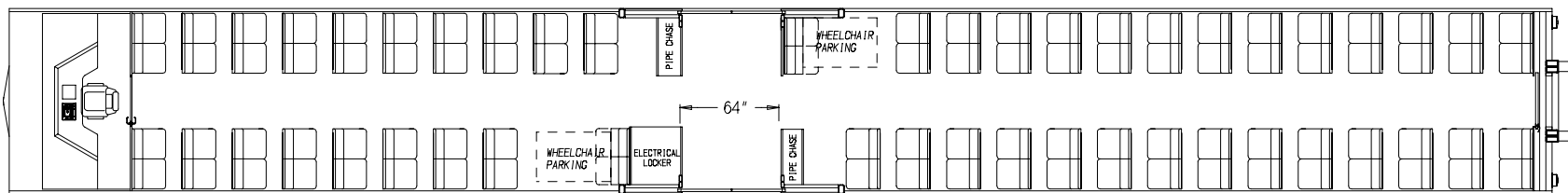


Single Level DMU



Seats	94
Length (over coupler pulling faces)	85' or 89'
Width (over side sheets)	10'
Total height (above top of rail)	14' 11"
Floor height (above top of rail)	51"
Engine	Two Detroit Diesel Series 60 Each rated at 600 hp
Transmission	Two Voith T212 BRE with KB190 retarder
Final Drive	Two Voith KE553

94 Seat Single Level DMU



PLAN VIEW

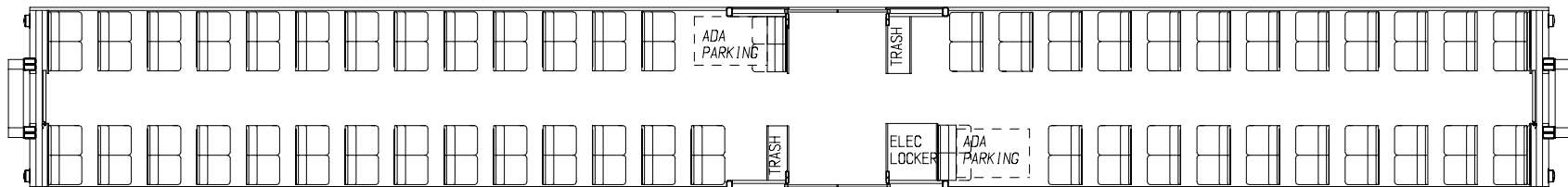
94 SEATS (INCLUDING 4 FLIP SEATS OR 2 WHEELCHAIR PARKING SPOTS)

Single Level Coach



Seats	102
Length (over coupler pulling faces)	85' or 89'
Width (over side sheets)	10'
Total height (above top of rail)	14'11"
Floor height (above top of rail)	25" or 51"

102 Seat Single Level Coach



PLAN VIEW

102 SEATS (INCLUDING 4 FLIP SEATS OR 2 WHEELCHAIR PARKING SPOTS)

The DMU Will Perform Well in Your Service

Revenue Service in South Florida and New Jersey Proves That the DMU Will Perform for You



- **South Florida:** The DMU maintained the rigorous schedule between Miami and West Palm Beach in several months of testing during the spring of 2004 in South Florida at Tri-Rail (South Florida Regional Transportation Authority). The single level DMU pulled two bi-level coaches in regular revenue service, and the comfortable railcar was a big hit with the passengers.



- **New Jersey:** The DMU again proved its performance on the “Dinky Line” in New Jersey, between Princeton and Princeton Junction. The DMU sprinted up and down the 2.7 mile line in two days of revenue service testing on April 29 and April 30, 2004.



- **Alaska:** The DMU conquered the mountainous grades of Alaska, proving its power. As a test, the DMU stopped in the middle of a steep 3.2% grade, turned off an engine, and accelerated out of the stop with no problems, while pulling the Alaska Railroad’s private car.

You may have been told that the DMU will not be able to run your schedule. Don't believe it — ask us to run the model for you.

If you want to know how the DMU will perform in your service, contact Christina Messa, Director of Economics and Environment, at (303) 670-1585 ext. 303.





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www.ColoradoRailcar.com

For more information, contact Tom Janaky or Arthur Rader
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