

HISTORY COLORADO

COLORADO STATE REGISTER OF HISTORIC PROPERTIES NOMINATION FORM

SECTION I

Name of Property

Historic Name D&RGW Brake Shoe Car AX- 22019

Other Names D&RGW flatcar No. 22019, DRGW Brake Shoe Car RGAX-22019

Address of Property

[] address not for publication

Street Address 800 Seminole Road

City Denver County Denver Zip 80204

Present Owner of Property

(for multiple ownership, list the names and addresses of each owner on one or more continuation sheets)

Name Museum of Railway Workers

Address P.O. Box 3498 Phone 303-579-1506

City Boulder State Colorado Zip 80307

Owner Consent for Nomination

(attach signed consent from each owner of property - see attached form)

Preparer of Nomination

Name Daniel Quiat Date 7/30/2011

Organization Museum of Railway Workers

Address P.O. Box 3498 Phone 303-579-1506

City Boulder State Colorado Zip 80307

FOR OFFICIAL USE:

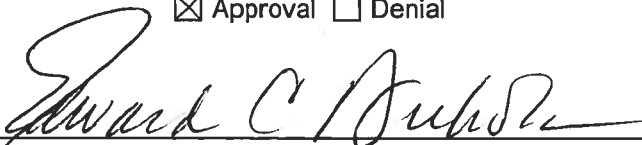
Site Number 5DV.11239

1-31-2012 Nomination Received

5-18-2012 Review Board Recommendation
 Approval Denial

5-24-2012 HC Board State Register Listing
 Approved Denied

Listing Criteria A B C D E



Certification of Listing: President, HISTORY COLORADO

5/29/2012
Date

COLORADO STATE REGISTER OF HISTORIC PROPERTIES

Property Name D&RGW Brake Shoe Car AX-22019

SECTION II

Local Historic Designation

Has the property received local historic designation?

no

yes --- individually designated designated as part of a historic district

Date designated _____

Designated by _____ (Name of municipality or county)

Use of Property

Historic TRANSPORTATION/Rail-related

Current NOT IN USE

Original Owner Denver & Rio Grande Western Railroad

Source of Information car, folio sheet

Year of Construction 1944, modification in 1971

Source of Information Brake car, folio sheet

Architect, Builder, Engineer, Artist or Designer Mt. Vernon Car Company, later modified by the railroad

Source of Information car, folio sheet

Locational Status

Original location of structure(s)

Structure(s) moved to current location

Date of move Last movement in August 2009

SECTION III

Description and Alterations

(describe the current and original appearance of the property and any alterations on one or more continuation sheets)

COLORADO STATE REGISTER OF HISTORIC PROPERTIES

Property Name D&RGW Brake Shoe Car AX-22019

SECTION IV

Significance of Property

Nomination Criteria

- A** - property is associated with events that have made a significant contribution to history
- B** - property is connected with persons significant in history
- C** - property has distinctive characteristics of a type, period, method of construction or artisan
- D** - property is of geographic importance
- E** - property contains the possibility of important discoveries related to prehistory or history

Areas of Significance

- | | | |
|---|--|--|
| <input type="checkbox"/> Agriculture | <input type="checkbox"/> Economics | <input type="checkbox"/> Landscape |
| <input type="checkbox"/> Architecture | <input type="checkbox"/> Education | <input type="checkbox"/> Architecture |
| <input type="checkbox"/> Archaeology – prehistoric | <input checked="" type="checkbox"/> Engineering | <input type="checkbox"/> Law |
| <input type="checkbox"/> Archaeology – historic | <input type="checkbox"/> Entertainment/ Recreation | <input type="checkbox"/> Literature |
| <input type="checkbox"/> Art | <input type="checkbox"/> Ethnic Heritage | <input type="checkbox"/> Military |
| <input type="checkbox"/> Commerce | <input type="checkbox"/> Exploration/ Settlement | <input type="checkbox"/> Performing Arts |
| <input type="checkbox"/> Communications | <input type="checkbox"/> Geography/ Community Identity | <input type="checkbox"/> Politics/ Government |
| <input type="checkbox"/> Community Planning and Development | <input type="checkbox"/> Health/Medicine | <input type="checkbox"/> Religion |
| <input type="checkbox"/> Conservation | <input type="checkbox"/> Industry | <input type="checkbox"/> Science |
| | <input type="checkbox"/> Invention | <input checked="" type="checkbox"/> Social History |
| | | <input checked="" type="checkbox"/> Transportation |

Significance Statement

(explain the significance of the property on one or more continuation sheets)

Bibliography

(cite the books, articles, and other sources used in preparing this form on one or more continuation sheets)

SECTION V

Locational Information

Lot(s) N/A Block N/A Addition N/A

USGS Topographic Quad Map Fort Logan

Verbal Boundary Description of Nominated Property

(describe the boundaries of the nominated property on a continuation sheet)

COLORADO STATE REGISTER OF HISTORIC PROPERTIES

Property Name D&RGW Brake Shoe Car AX-22019

SECTION VI

Photograph Log for Black and White Photographs

(prepare a photograph log on one or more continuation sheets)

SECTION VII

ADDITIONAL MATERIALS TO ACCOMPANY NOMINATION

Owner Consent Form

Black and White Photographs

Color Prints or Digital Images

Sketch Map(s)

Photocopy of USGS Map Section

Optional Materials

Use of Nomination Materials

Upon submission to the Office of Archaeology and Historic Preservation, all nomination forms and supporting materials become public records pursuant to CRS Title 24, and may be accessed, copied, and used for personal or commercial purposes in accordance with state law unless otherwise specifically exempted. History Colorado may reproduce, publish, display, perform, prepare derivative works or otherwise use the nomination materials for History Colorado and/or State Register purposes.

For Office Use Only

Property Type: [] building(s) [] district [] site [X] structure [] object [] area

Architectural Style/Engineering Type: Brake Shoe Car

Period of Significance: 1944-1996; 1971

Level of Significance: [X] Local [] State [] National

Multiple Property Submission: N/A

Acreage N/A

P.M. 6th Township 4 S Range 68 W Section 4 Quarter Sections NW SW SE

UTM Reference: Zone 13 Easting 499 599 Northing 4397 339 NAD27

Property Name D&RGW Brake Shoe Car AX-22019

DESCRIPTION and ALTERATIONS

Setting

D&RGW Brake Shoe Car AX-22019 is located at 800 Seminole, Denver, CO, which is the Burnham Yard, near the intersection of I-25 and 6th Avenue. Since the 1870s, various railroads have used this yard for freight cars, and it continues to host a variety of rail-related freight traffic. The former Denver & Rio Grande Western (D&RGW) Burnham yard is still a major locomotive facility for the Union Pacific Railroad.

Description

D&RGW Brake Shoe Car AX22019 (contributing structure, 1944, 1971)

The car is a 53'-6"-long, 10'-6"-wide flatcar, with a body that measures approximately 3'-high. Constructed in 1944, later modified in 1971, the car was capable of carrying up to 50 tons. Other than the wood decking and box enclosure, the rest of the body is made of steel. The support structure consists of steel sills that form a box (side sills connecting to end sills) with intermediate sills interspersed regularly along the length (parallel to the width) to provide additional support. Together the steel sills create a strong riveted lattice.

The unpainted wood deck lies on top of the sills and is composed of oak boards that run parallel to the width of the body. Atop the decking are short wood walls that create a box, with the plank walls held in place by wood supports that are inserted into the stake pockets on the decking. On the wood deck are six metal, rectangular chutes for brake pads to pass through the decking to the rail below. Two chutes are located opposite of one another on each end of the car, and the remaining two chutes in the center are placed off-center and diagonal from one another. Each chute is metal with a rectangular design.

There are steel couplers on either end of the car. On one end of the deck is the hand brake, which consists of a rod with a wheel that tightens the brakes. The rod connects to a chain that secures the brakes on one axle, and hand brake assembling is retractable to be flush with the car. The car's axles utilize friction bearings, which are still intact. The bearings consist of blocks of brass that rest on top of the wheel axle, which was lubricated by oil-saturated wool that was housed within a hinged-lid journal box.

The car has two sets of trucks that the car rests upon simultaneously. Each truck consists of two axle sets (axle and two wheels) and the truck bolster that holds the entire truck together and provides ride suspension. Connected to one truck is the chain from the handbrake. Each axle has a tread brake that is activated by air from the locomotive.

Alterations

In 1971, the Denver & Rio Grande Western Railroad modified flatcar AX-22019 to a brake shoe car. The Denver & Rio Grande Western added chutes to the car by cutting the wood deck and installing chutes. They appear to be designed to fit in between the center sill and

Property Name D&RGW Brake Shoe Car AX-22019

intermediate sills. At the same time the railroad repainted the car silver from its original black paint. In order to prevent loads of brake shoes from falling off of the flat bed, they also installed a wood box on the deck. The side portion of the box allows for partial removal of the side, enabling easy loading of brake shoe boxes, or at other times crews simply dumped loose brake shoes onto the deck (Sam Shuman interview, 11/15/2011; Mike Goddard interview, 11/11/2011). Since the end of its service, most of the side boards were removed.

Integrity

The D&RGW Brake Shoe Car AX-22019 demonstrates the evolving uses of flatcars in the mid-twentieth century, with its historic modifications apparent on the structure, providing this resource with a high level of integrity for design, materials, and workmanship. When the railroad modified the car in 1971 from a standard flatcar to a brake shoe car, many of the original features remained intact and the historic changes are readily apparent. When the car was placed in brake shoe service, the brake shoe loads meant it was never near its 100,000 lbs. capacity, allowing it to retain its original trucks and friction bearings. Since its last use in 1996 it likely sat in Pueblo Yard until sold, and as such it has remained unchanged since 1971, other than standard maintenance. As it remains in a freight-related railroad setting at the Burnham Yard, it retains a high degree of integrity to its setting, location, association, and feeling.

Property Name D&RGW Brake Shoe Car AX-22019

SIGNIFICANCE STATEMENT

Denver & Rio Grande Western (D&RGW) Brake Shoe Car AX-22019 is eligible to the Colorado State Register under Criterion A in the area of Transportation from 1944 to 1996 for its rail service in Colorado. Built during the highpoint of riveted flatcars, it is an example flatcar built during the period of World War II. The railroad modified this flatcar into a brake shoe car in 1971, and it served this function until 1996. Additionally, it is eligible under Criterion C in the area of Engineering from 1971 to 1996. The car demonstrates innovation by the railroad in the use of a car for the loading, movement and unloading of brake shoes. The Denver & Rio Grande's method of brake shoe movement had never been used previously. Additionally, this car has its original friction-bearing trucks, once a prominent feature of rail cars, but now are a rare resource due to changes in operating regulations.

TRANSPORTATION

The D&RGW Brake Shoe Car AX-22019 was built in January of 1944 by Mt. Vernon Car Company. It was one in a series of 200 cars purchased by the D&RGW (Eager, p.104; D&RGW RR folio sheet). The flatcar body is assembled by steel rivets, a common feature of railcars during the first half of the twentieth century. Using the casting technique, cars were stronger, but also heavier in weight. Riveting was more labor intensive, but created a lighter weight car. By the 1950s car production switched to welding, and in essentially all cars, with the exception of coal cars (due to the unique functional nature of coal cars). As more cars disappear from this era due to scrapping, there are fewer which exemplify this period design (John Tudek Interview, 11/15/2011).

After operating in Colorado for nearly thirty years as a flatcar, the railroad redesigned the car to distribute brake shoes. As such, the most prominent engineering feature of this car is its 1971 redesign into a brake shoe car. As part of standard maintenance on railroad cars, brake shoes require periodic replacement. Typically, this work was done while the train was stopped at a station point. Originally, crews moved brake shoes by wheelbarrow or cart, which was laborious and very time consuming. As trains became longer this method became even more difficult.

The Denver and Rio Grande Western Railroad (Rio Grande) found innovative methods to reduce cost and time in all of their operations (John Tudek interview; Marv McCall interview). Brake shoe distribution was no different. An idea, likely conceived in the car department, was to create a rail car that distributed brake shoes and then modify a car to test the idea. The railroad developed and built the first brake shoe car from a 1926 car, the D&RGW 21503. That car began as a boxcar, and had already been converted into a flatcar prior to its final conversion into a brake shoe car. For brake shoe service, workers added four chutes placed in the middle of the car. It was re-numbered X-3171 (John Tudek interview, 11/15/2011; Eager, p.104).

Car X-3171 was based in Denver and served two purposes. First, the car carried brake shoes to nearby locations on the D&RGW system. Secondly, once the car arrived to its destination, a locomotive pushed the car while employees dropped brake shoes down the chutes. The brake

Property Name D&RGW Brake Shoe Car AX-22019

shoes dropped along the edge of the rail. This way the brake shoes were distributed so that they were readily available for replacing condemned brake shoes on trains without wasting unnecessary time. When placed in service, car X-3171 proved a success.

With the success of the first brake shoe car, the railroad built another one in August 1971. This time the railroad used a steel underframe flatcar, D&RGW 22019, built in January 1944 (Eager, p. 58). The new car had six chutes unevenly placed along the outside edge of the car. More chutes allowed more brake shoes to drop. Indeed, often the newer car had as many as ten people dropping brake shoes down the chutes (Mike Goddard interview, 11/9/2011; John Tudek interview, 11/15/2011). According to Sam Schuman, the D&RGW at their greatest capacity had four of these brake shoe cars located at Salt Lake City, Grand Junction, Denver, and Pueblo (Sam Schuman interview, 12/2/2011).

The D&RGW's goal was to use cars where and when they were needed. The older car, X-3171, was based in Denver, and the newer car AX-22019, was based in Pueblo. This accurately reflected the "Pueblo brake shoe loading only" guideline stenciled on the car. In addition to being used in the Pueblo yard, D&RGW AX-22019 was also used in other nearby terminals. Brake shoes were loaded on the car and then shuttled to nearby yard terminals. Near Pueblo, there were large yards in Salida and Alamosa that likely used the brake shoe car. Once empty, the car returned to Pueblo and was re-filled (Marv McCall interview). The cars were constantly being moved from location to location. Indeed, Mike Goddard, who was involved in dropping brake shoes, mentioned the yard had a short window before the car had to be released for use elsewhere in the system. The goal was to drop as many brake shoes as possible as the locomotive pushed them along (Mike Goddard interview, 11/11/2011; Sam Schuman interview, 11/11/2011). Once unloaded, there were sufficient brake shoes for about a year (John Tudek interview, 11/15/2011).

The first brake shoe car, X-3171, was retired in August 1973 and dismantled (D&RGW X-3171 Car Card). A new car replaced it a short time later. A third brake shoe car, AX 22404, was placed into service in November 1973. AX 22404 was originally built as D&RGW 22102 and was in the same car series as AX-22019 (D&RGW 22404 Car Card). There is no information on the retirement of AX 22404, but a check of the Union Pacific car inventory and the national car inventory (Umler) indicates the car no longer exists. No photos or additional information has been found with respect to it or the other cars.

With respect to brake shoe car AX- 22019 it was still in use after the D&RGW – Southern Pacific merger in 1988, and right up to the Southern Pacific merger with the Union Pacific in 1996 (John Tudek interview). In 1996, AX-22019 was no longer used in brake shoe service for two reasons. The first was a safety concern by the D&RGW's successor, Southern Pacific, that a brake shoe could be a tripping hazard. Secondly, Mules, akin to heavy-duty golf carts, were capable of carrying brake shoes to various locations. The drawback to Mules, however, is that they cannot always get alongside a rail car due to clearance issues between tracks in the yard. This means, ironically, that car-men once again often have to carry the shoes to their intended location (John Tudek interview).

Property Name D&RGW Brake Shoe Car AX-22019

Another method of distribution was using a 1-1/2-ton truck. As it traveled on a road along side the track, car-men would toss brake shoes. This required empty yard tracks and required a good throw, otherwise the shoes could land in or on cars. Brake shoe cars were much more efficient in distributing shoes than using a truck (John Tudek interview, 11/21/2011).

After the car's end from brake shoe service and before its retirement in 2008, it was used to store materials for track maintenance. After its retirement, the car was sold to Progress Rail, a scrapper, and then purchased by the Museum of Railway Workers. The Museum was aware of the car long before its sale and this facilitated its preservation. After the purchase, the car was moved from Pueblo to the former D&RGW Burnham yard in Denver. The car could not move by rail because of the friction bearing trucks, and instead the Museum of Railway workers transported the car by semi-truck.

ENGINEERING

D&RGW Brake Shoe car AX-22019 was one in a series of 200 flatcars built for the railroad by Mt. Vernon Car Company in January and February 1944 (Eager, p.58). It typifies the period design of cars built during World War II. Some of these distinct features include: poling pockets, friction-bearing trucks, and riveted construction.

The first distinctive design was an indentation incorporated into the end sills on both sides. Called a poling pocket it was incorporated into all cars built during that period. The indentation helped to allow people or machines to move the car. A pole could be placed to push the car. By carefully observing the indentations, one will notice the pocket has an uneven pattern. Since cars were often coupled together, it was common that one car could only be moved by pushing around the prior car. Hence, the indentation formed so that a pole could be used successfully at an angle to the car (John Tudek interview).

Another period design was the use of friction-bearing trucks. While friction-bearing trucks appear similar to today's roller-bearing trucks, the axle movement is different. Friction-bearing trucks had axles that rotated on two brass bearings. Not unlike the common engine crankcase, the friction bearing uses a thin layer of oil to prevent seizing. While friction bearings were used on railroads for almost 150 years, they required constant attention to make sure the bearings had enough oil, otherwise a fire could result. Constant inspection was too labor intensive and other technological advances made friction bearings on rolling stock obsolete. Freight cars began receiving the more reliable roller bearings during the 1950s. During the 1970s, the railroads made a concerted effort to remove friction-bearing cars from service and by the 1980s they were banned from interchange service (John Tudek interview).

On the D&RGW, cars of this age were not uncommon. Since the D&RGW was constantly keeping an eye on revenues, many of its older cars were used for "non-revenue" or work service. All of the flatcars in this series had friction bearings, but as the cars moved to work service, the car department tried to replace the friction-bearing trucks as surplus roller-bearing trucks became available. Often, the D&RGW might get such trucks from a derailment where a damaged car was scrapped, but the trucks were saved (Marv McCall Interview).

Property Name D&RGW Brake Shoe Car AX-22019

While D&RGW revenue cars had roller bearings, many work cars still had friction bearings by the time of the merger with the Southern Pacific in 1988. A concerted effort to scrap cars by the Southern Pacific meant that by the merger with the Union Pacific almost all friction-bearing cars were gone. Likewise, the Union Pacific also tried to scrap the few friction bearing cars that remained: "This car simply slipped through the cracks" (John Tudek, 11/21/2011).

This car is a rare remaining example of the series almost as-built. It was very likely overlooked by virtue of its job. The movement of brake shoes from one point to another did not require a great deal of extreme wear on the trucks. Often, the car simply sat until the next run. The car is in close to its as-built appearance coupled with the 1971 brake shoe service modifications giving it a good to high degree of integrity.

Property Name D&RGW Brake Shoe Car AX-22019

BIBLIOGRAPHY

Interviews

Goddard, Mike. Interviewed 11/11/11, by Daniel Quiat at Union Pacific's North Yard. Denver, Colorado.

McCall, Marv. Interviewed various times during 2010 and 2011 by Daniel Quiat at Marv's home in Kremmling, Colorado, and by phone.

Shuman, Sam. Interviewed 11/11/11, by Daniel Quiat at Union Pacific's North Yard. Denver, Colorado.

Tudek, John. Interviewed at various times during 2010 and 2011 by Daniel Quiat at the Colorado Railroad Museum Library in Golden, Colorado, and by phone.

Written Sources

Beebe, Lucius and Charles Cleeg. *Rio Grande Mainline of the Rockies*. Berkeley, CA: Howell North, 1962.

Denver & Rio Grande Western Car Card for (RG)X – 3171, copy courtesy of Colorado Railroad Museum.

Denver & Rio Grande Western Car Card for D&RGW 22404.

Denver & Rio Grande Western Railroad, Folio sheet 22000-22199 series flatcars, copy courtesy of Colorado Railroad Museum.

Eager, Jim. *Rio Grande Color Guide to Freight and Passenger Equipment*. Edison, IL: Morning Sun Books, Inc., 1996.

Railway and Locomotive Society, Inc. "Guide to Railroad Records at the National Archives." Finding Aid for: "Part III (B): Federal Regulation and Oversight of Railroads, Section C," Records of the War Production Board, National Archives, Record Group 179. Accessed on 11 November 2011. rlhs.org/Services/Guides/part_IIIC_3.shtml

Schafer, Mike, Joe Welsh and Kevin J. Holland. *The American Passenger Train*. St. Paul, MN: MBI Publishing Company, 2001.

Property Name D&RGW Brake Shoe Car AX-22019

GEOGRAPHICAL DATA

VERBAL BOUNDARY DESCRIPTION

The State Register nomination includes only D&RGW Brake Shoe Car AX-22019 as it sits within the boundaries of the Union Pacific Railroad's Burnham yard at 800 Seminole Rd., Denver. No real property (i.e., land) is included in this nomination.

Property Name D&RGW Brake Shoe Car AX-22019

PHOTOGRAPH LOG

The following information pertains to photograph numbers 1- 8 except as noted:

Name of Property: D&RGW Brake Shoe Car AX-22019
Location: Burnham Yard, Denver, Colorado
Photographer: Daniel Quiat
Date of Photographs: January 27, 2011
Negatives: TIFF images on file with the Office of Archaeology and Historic Preservation, Denver, Colorado

Photo No. Photographic Information

- 1 D&RGW Brake Show Car AX-22019 friction-bearing truck. When built, the car could carry 50 tons. Note the car's rivets.
- 2 The car's end sill. Note the "poling pocket" to allow poles or other items to push the car manually.
- 3 Close-up view of a brake shoe chute. Note how the chute narrows towards the bottom.
- 4 Note the chute as it comes out from under car. Also the build date is noted on the car "1- 1944."
- 5 The car's identifier for its service. Notation of "Pueblo" infers it was sent from Pueblo to other locations on the system.
- 6 The car's number in silver paint has had an "AX" placed in front of it to signify its use in work service. "MWM" is a stencil for the Association of American Railroads signifying it is a maintenance-of-way flatcar. Note that the painter used a single "W" stencil for all three letters.
- 7 This photo offers some good insight on the car's history. The car was converted to brake shoe service in 1971. The car was painted silver in Pueblo in August (month 8), 1971 (year 71). Silver is the work service color for cars. Most cars were repainted in Denver, but in Pueblo, the painters added some non-standard lettering and a non-standard "D&RGW" logo.
- 8 The deck demonstrates the irregular grouping of the brake chutes.

Property Name D&RGW Brake Shoe Car AX-22019

Historic Image Log

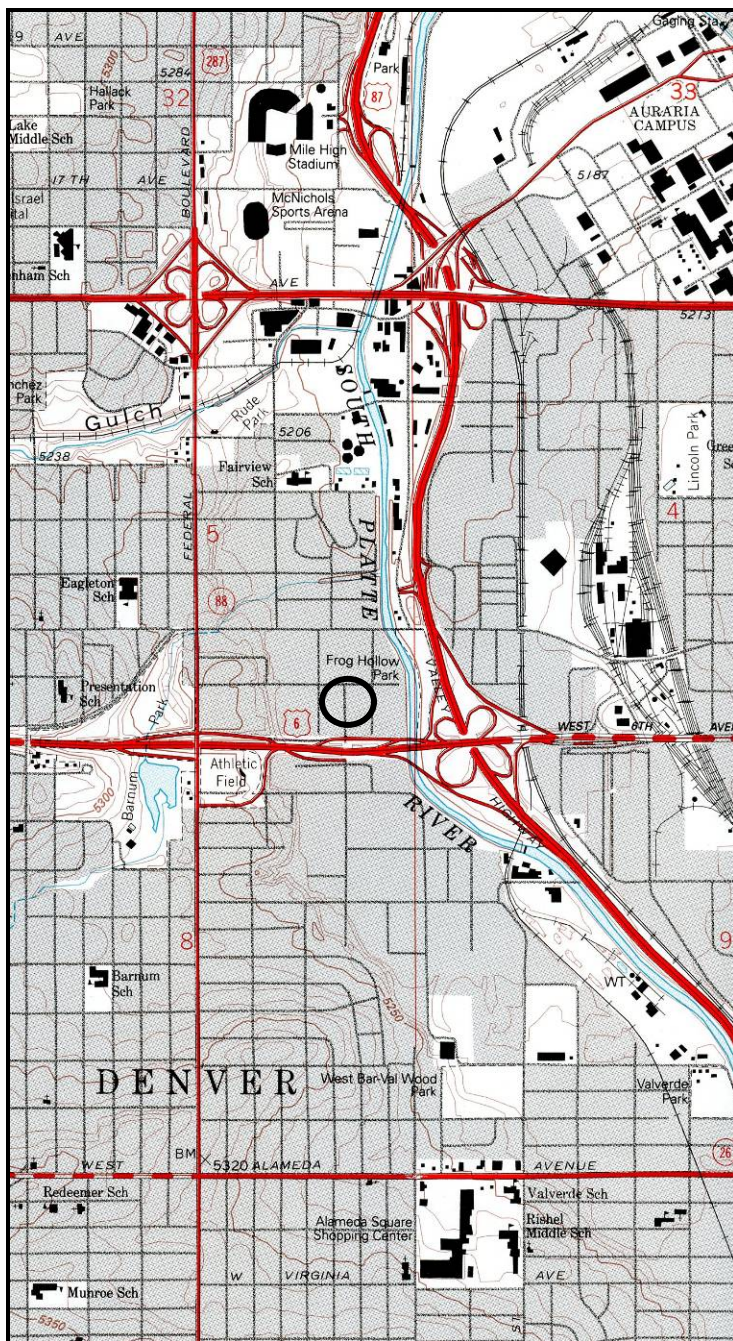
H001 – Copy of Folio sheet – *Colorado Railroad Museum*

H002 - This is a photo of the car in May 1975 at Burnham Yard, taken by Con Sweet. Con Sweet Collection, Denver, Colorado, used with permission.
with Permission.

H003 - Car as seen in Pueblo, Colorado, April 2008.

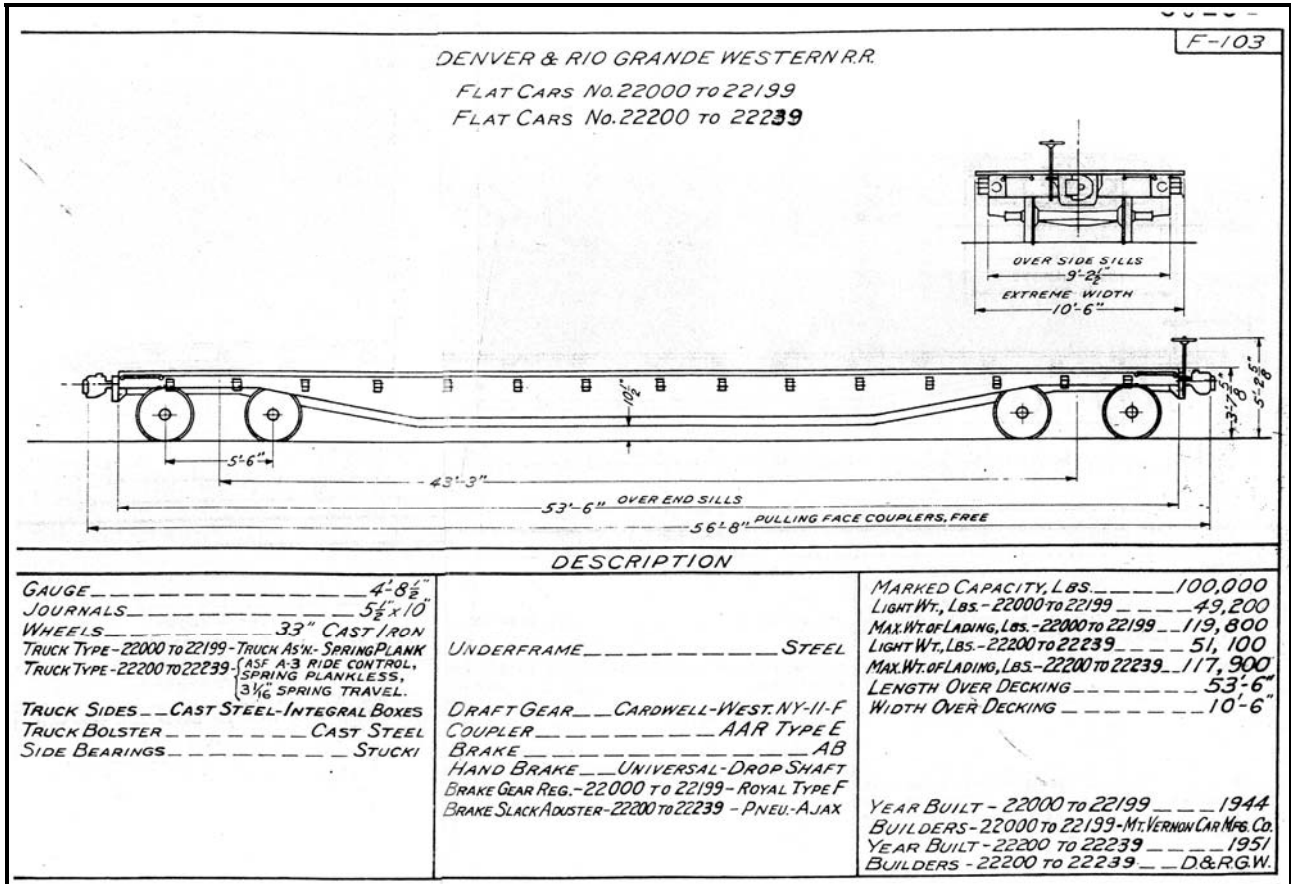
Property Name D&RGW Brake Shoe Car AX-22019

USGS TOPOGRAPHIC MAP
Fort Logan Quadrangle, Colorado
7.5 Minute Series



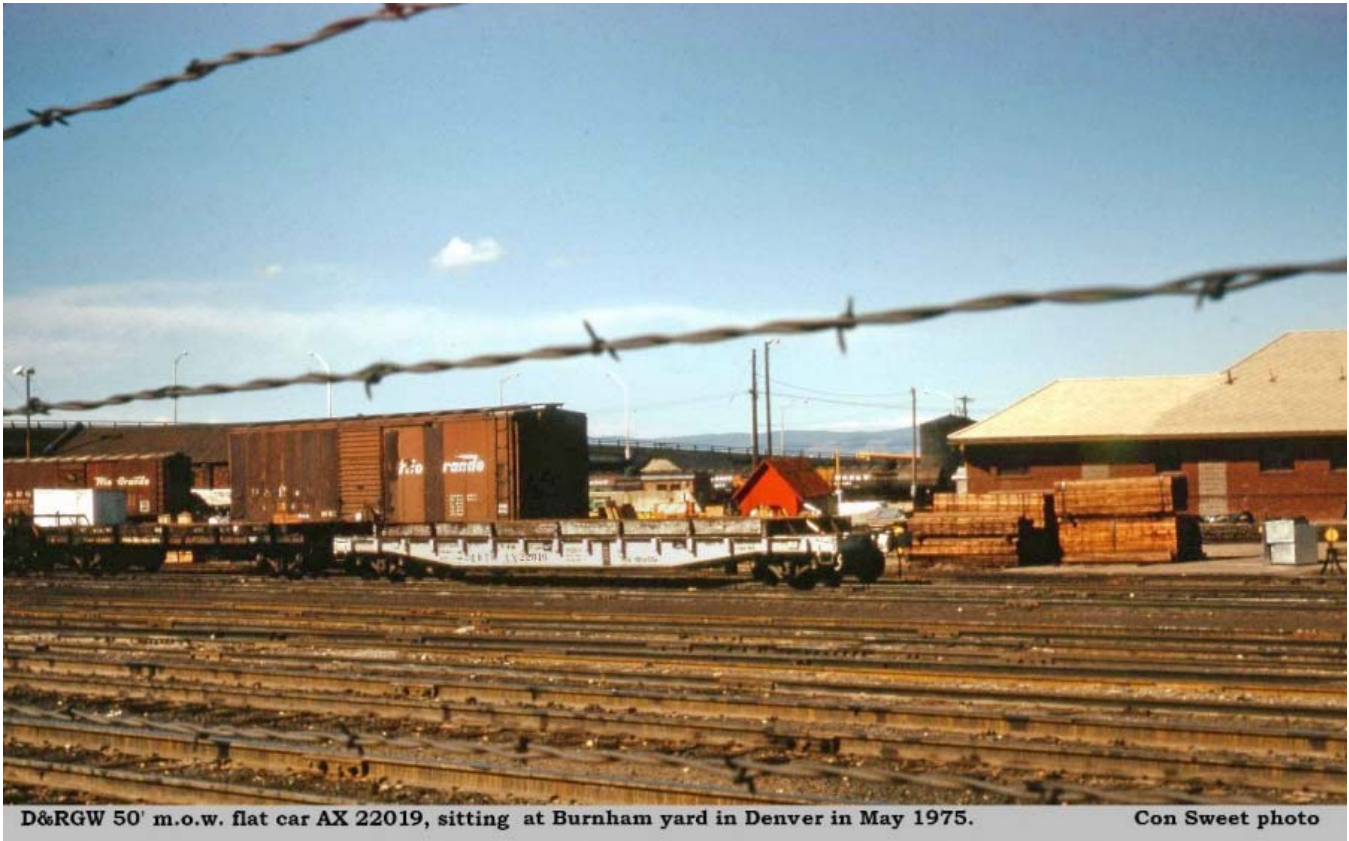
Property Name D&RGW Brake Shoe Car AX-22019

Historic Images



H001 - Copy of Folio sheet - Colorado Railroad Museum

Property Name D&RGW Brake Shoe Car AX-22019



H002 - This is a photo of the car in May 1975 at Burnham Yard, taken by Con Sweet. Con Sweet Collection, Denver, Colorado, used with permission.
with Permission.

Property Name D&RGW Brake Shoe Car AX-22019



H003 - Car as seen in Pueblo, Colorado, April 2008.