NPS Form 10-900
(Rev. 10-90)

OMB No. 1024-0018

968

United States Department of the Interior
National Park Service

NATIONAL REGISTER OF HISTORIC PLACES
REGISTRATION FORM

This form is for use in nominating or requesting determinations for individual properties and districts. See instructions in How to Complete the National Register of Historic Places Registration Form (National Register Bulletin 16A). Complete each item by marking "x" in the appropriate box or by entering the information requested. If any item does not apply to the property being documented, enter "N/A" for "not applicable." For functions, architectural classification, materials, and areas of significance, enter only categories and subcategories from the instructions. Place additional entries and narrative items on continuation sheets (NPS Form 10-900a). Use a typewriter, word processor, or computer, to complete all items.

1. Name of Property

historic name: McKeen Motor Car #70
other names/site number: Virginia And Truckee Railway Motorcar #22

2. Location

street & number Nevada State Railroad Museum not for publication N/A
city or town Carson City vicinity N/A
state Nevada code NV county Carson City code 510 zip code 89703

3. State/Federal Agency Certification

As the designated authority under the National Historic Preservation Act of 1986, as amended, I hereby certify that this __X__ nomination ____ request for determination of eligibility, meets the documentation standards for registering properties in the National Register of Historic Places and meets the procedural and professional requirements set forth in 36 CFR Part 60. In my opinion, the property __X__ meets ____ does not meet the National Register Criteria. I recommend that this property be considered significant __X__ nationally ___ statewide ___ locally. (___ See continuation sheet for additional comments.)

Ronald M. James, SHPO — July 27, 2005
Signature of certifying official/Title — Date

State or Federal agency and bureau

In my opinion, the property ____ meets ____ does not meet the National Register criteria. (___ See continuation sheet for additional comments.)

Signature of commenting or other official — Date

State or Federal agency and bureau

4. National Park Service Certification

I hereby certify that this property is:

✓ entered in the National Register
___ See continuation sheet.
____ determined eligible for the National Register
___ See continuation sheet.
____ determined not eligible for the National Register
____ removed from the National Register

____ other (explain):

for Beth L. Seagle — 9-6-05
Signature of Keeper — Date of Action

5. Classification

Ownership of Property (Check as many boxes as apply)

___ private
___ public-local
_X_ public-State
___ public-Federal

Category of Property (Check only one box)

___ building(s)
___ district
___ site
_X_ structure
___ object

Number of Resources within Property (Do not include previously listed resources in the count.)

Contributing	Noncontributing	
0	0	buildings
0	0	sites
0	0	structures
1	0	objects
1	0	Total

Number of contributing resources previously listed in the National Register N/A

Name of related multiple property listing (Enter "N/A" if property is not part of a multiple property listing.) N/A

6. Function or Use

Historic Functions (Enter categories from instructions)

Cat: TRANSPORTATION Sub: Rail-related

Current Functions (Enter categories from instructions)

Cat: WORK IN PROGRESS Sub:

7. Description

Architectural Classification (Enter categories from instructions)

OTHER/Self-propelled rail car

Materials (Enter categories from instructions)

foundation WOOD (interior floor)
roof WOOD (interior ceiling
walls WOOD (interior paneling)
other METAL/Iron
METAL/Steel

Narrative Description (Describe the historic and current condition of the property on one or more continuation sheets.) See continuation sheets.

8. Statement of Significance

Applicable National Register Criteria (Mark "x" in one or more boxes for the criteria qualifying the property for National Register listing)

- X **A** Property is associated with events that have made a significant contribution to the broad patterns of our history.
- ____ **B** Property is associated with the lives of persons significant in our past.
- X **C** Property embodies the distinctive characteristics of a type, period, or method of construction or represents the work of a master, or possesses high artistic values, or represents a significant and distinguishable entity whose components lack individual distinction.
- ____ **D** Property has yielded, or is likely to yield information important in prehistory or history.

Criteria Considerations (Mark "X" in all the boxes that apply.)
Property is:

- ____ A owned by a religious institution or used for religious purposes.
- ____ B removed from its original location.
- ____ C a birthplace or a grave.
- ____ D a cemetery.
- ____ E a reconstructed building, object, or structure.
- ____ F a commemorative property.
- ____ G less than 50 years of age or achieved significance within the past 50 years.

Areas of Significance (Enter categories from instructions)
TRANSPORTATION
ENGINEERING

Period of Significance 1910-1946
Significant Dates 1910, 1932, 1945, 1946
Significant Person (Complete if Criterion B is marked above) N/A
Cultural Affiliation N/A
Architect/Builder McKeen Motor Car Company, Omaha, Nebraska

Narrative Statement of Significance (Explain the significance of the property on one or more continuation sheets.) See continuation sheets.

9. Major Bibliographical References

Bibliography (Cite books, articles, and other sources used in preparing this form on one or more continuation sheets

Previous documentation on file (NPS):

- ___ preliminary determination of individual listing (36 CFR 67) has been requested.
- ___ previously listed in the National Register
- ___ previously determined eligible by the National Register
- ___ designated a National Historic Landmark
- ___ recorded by Historic American Buildings Survey #
- ___ recorded by Historic American Engineering Record #

Primary location of additional data

- ___ State Historic Preservation Office
- X Other State agency
- ___ Federal agency
- ___ Local government
- ___ University
- ___ Other

Name of repository: Nevada State Railroad Museum, Carson City

10. Geographical Data

Acreage of Property Less than one acre

UTM References (Place additional UTM references on a continuation sheet)

	Zone	Easting	Northing		Zone	Easting	Northing
1	11	260830	4336700	3			
2				4			

See continuation sheet.

Verbal Boundary Description (Describe the boundaries of the property on a continuation sheet.)

Boundary Justification (Explain why the boundaries were selected on a continuation sheet.)

11. Form Prepared By

name/title Michael A. "Bert" Bedeau
organization Nevada State Historic Preservation Office date May 2, 2005
street & number 100 N. Stewart Street telephone 775-684-3445
city or town Carson City state NV zip code 89701

Additional Documentation

Submit the following items with the completed form:

Continuation Sheets

Maps

A USGS map (7.5 or 15 minute series) indicating the property's location.
A sketch map for historic districts and properties having large acreage or numerous resources.

Photographs

Representative black and white photographs of the property.

Additional items (Check with the SHPO or FPO for any additional items)

Property Owner

(Complete this item at the request of the SHPO or FPO.)

name State of Nevada
street & number 2180 S. Carson Street telephone
city or town Carson City state NV zip code 89703

Narrative Description

McKeen Motor Car #70 is a self-propelled gasoline engine railway motorcar built by the McKeen Motor Car Company of Omaha, Nebraska, for the Virginia & Truckee Railway Company. It was ordered in October 1909 at a cost of $22,000 and outshopped in May 1910. It entered regular service on the V&T line between Carson City and Minden, Nevada on June 2, 1910. This car was operated by the V&T until sold in 1945—a remarkable record spanning 35 years and well over 500,000 miles of service.

Description: As Built 1910

Number 70 was an example of McKeen's largest motorcar design. The car possessed an overall length of 72 feet 9 ¾ inches, a maximum width of 10 feet 2 ¾ inches, a height of 11 feet 9 3/16 inches and a gross weight of 68,000 pounds. It could carry a maximum of eighty-four passengers and was operated by two crewmen, a motorman and a conductor/baggage man.

The trucks, underframe and car-body were all constructed of steel. Both the front and rear trucks had four wheels that were designed to operate on a standard gauge rail line (4 feet 8 ½ inches). The front truck had a wheelbase of 9 feet 5 inches and housed a pair of 42-inch diameter driving wheels along with a non-driving pair of 33-inch diameter wheels. The rear truck had four 33-inch diameter non-driving wheels and an overall length of 7 feet. Total wheelbase for #70 was 52 feet 7 inches. The underframe featured an 8-inch 15-pound I-beam center sill and two 6 inch, 6 pound channel section side sills. The car-body was of braced riveted structural steel. The car-body roof and walls were of unitary construction, much like a modern airplane, and the roof was curved for additional structural strength.

The overall shape of the McKeen car was an early exercise in aerodynamic design. The front of the car was tapered to a knife-like vertical point much like the prow of a ship. As mentioned, the roof and sidewalls were curved to avoid sharp angles and the riveted exterior steel sheeting was left relatively free of projections. Roof mounted air intakes and ventilators were left low and unobtrusive to improve aerodynamic performance. The rear of the car was rounded in keeping with early twentieth century ideas about air resistance.

The forward end of the car housed the engine room containing the motorman's seat, operating controls and a six-cylinder water-cooled 200 horsepower gasoline engine manufactured by McKeen, patterned after the Standard Motor Works of Newark, New Jersey. This engine gave the McKeen an official maximum speed of 32.5 miles per hour. The engine was placed directly on the front truck behind the drive wheels which were driven by a Morse silent chain transmission. The transmission had two forward gears and one reverse gear with the clutches and shifter operated by two air cylinders attached to the underframe. A New York Air Brake Company straight air brake system was supplemented by a hand-operated brake. A 120-gallon gasoline tank was also mounted on the underframe.

The right and left sides (as one faced forward) of the McKeen Car were almost identical. The engine compartment, located in the front of the car had two rectangular windows on either side of the pointed nose. To the rear of these

on the left side was the arched-top motorman's door with a small fixed porthole window and a large porthole window. To the rear on the right were a third rectangular window and large porthole. To the rear of the engine room was the baggage room that featured large sliding baggage doors on both sides of the car. These arched-top doors also had a large fixed porthole window. Rearward of the baggage room is the smoking compartment with a maximum seating capacity of 30 passengers. This compartment had five large porthole windows on the left, four large and one small porthole windows on the right. The small window provided light for the gentlemen's toilet. Behind the smoking compartment was the main passenger compartment with seating for fifty persons. At the front of the passenger compartment on both sides were depressed paired passenger doors. These were also arched-topped with a semi-circular window in each half of the paired doors. Access to the main compartment level was via two stairs. The left side of the main compartment featured ten large porthole windows and one small porthole window that provided light to the ladies' toilet. The right side had eleven large porthole windows. The rearmost windows followed the curve of the end of the car-body and there was an additioal large porthole window facing directly to the rear of the car. All of the large porthole windows were 24 ¾ inches in diameter, operable, and constructed of brass-finished aluminum. The small porthole windows were 14 inches in diameter, wood-framed and fixed. The rectangular windows were 25 ½ inches square, also wood frame, and both operable and fixed.

The interior of the car was finished with a variety of materials. The floors were 3 ½ inch maple tongue-in-groove. The passenger compartments and baggage room had 2 inch horizontal mahogany tongue-in-groove wainscoting. This same material was mounted vertically in the rounded rear end of the passenger compartment. The wall panels in the main compartment and smoking compartment were finished in mahogany veneer. The ceiling is ¼-inch painted and stripped plywood. Seating consisted of one semi-circular 10-seat couch at the rear of the main compartment, twenty-two fixed frame three-seat units and four fixed frame two-seat units. All seating was upholstered in dark green imitation leather over innerspring cushions. All interior lighting, as well as the factory provided headlamp located at the nose of the car, was fueled by acetylene gas. Heat for all compartments was provided by hot water pipes fed by jacket water from the engine. A water cooler was located next to the passenger compartment lavatory.

Significant Changes Prior to Restoration Effort, 1910-1996

As with any piece of transportation equipment, McKeen Car #70 underwent a variety of alterations during its years of service. This is particularly true given that the car operated for thirty-five years, from 1910 to 1945. Minor changes such as elimination of the acetylene lighting system in favor of electricity, the addition of an air horn, a larger headlamp, and other minor changes were undertaken in the 1910s and 1920s. The most significant changes to the car were made in 1932. As the automobile became more popular in the 1920s, passenger revenues from the McKeen car began to decline. As such the V&T began to operate smaller motorcars on its line, reserving the McKeen for specials and extras when a heavy traffic demand was anticipated. Beginning with the stock market crash in October, 1929, V&T decided to remove their McKeen car from passenger service and it was laid up at the V&T shops in Carson City. In 1930 the V&T began a campaign to utilize the McKeen as a Railway Post Office and Railway Express Agency freight and baggage car. It took until early 1932 to convince the U.S. Post Office Department to accept conversion of the McKeen for this purpose. Conversion work was conducted during the summer of that year at the Carson City shops. The main passenger compartment was divided with a new bulkhead

and the rear of the car converted for freight and baggage handling. This included removal of the seats and the addition of two sliding freight doors, one on either side of the car. New freight doors were also added to the smoking compartment which was also stripped of its seating and converted into a Railway Post Office. The McKeen's passenger capacity was now limited to twenty-four passengers in the forward portion of the old main passenger compartment. Service in this new configuration was inaugurated in October of 1932 on a three day/week schedule between Reno, Carson City and Minden.

McKeen Motor Car #70 operated in this fashion until its last run on October 31, 1945. By the end of the Second World War, the V&T had been in receivership for many years. Revenue has been steadily declining since the 1920s due to improved highways resulting in increased competition from trucks and autos. These conditions only worsened with the economic hardships of the Great Depression. Management decided to consolidate service on the V&T and eliminated motorcar service in favor of a single daily mixed train operated with steam locomotives.

The V&T management attempted to find another railroad operator to buy the McKeen but had no luck. As such, in August, 1946 the car was sold to Carson City restaurant operators Alva H. Dennison and Dudley Klein for the sum of $1000. The V&T retained the trucks and engine from the McKeen and the de-trucked car was moved to 1111 North Carson Street (US Route 395) in Carson City. All railway furnishings were removed and the car-body opened as Denny's Diner in late 1946. It was moved to a new location at 1604 North Carson Street in 1948 and again to 1400 South Carson Street in 1955. It was at this time that additional door openings were cut into the side of the car-body and that several existing doors were widened. By the early 1960s it had ceased to be used as a restaurant and served as storage and later offices for a local plumbing and heating firm. In 1995 the owners of Al's Plumbing and Heating, the Bernhard family, donated the McKeen car to the Nevada State Railroad Museum and it was moved to its present location for restoration.

Restoration 1995-present

Following acquisition of McKeen Motor Car #70 in 1995 the Nevada State Railroad Museum undertook an exhaustive examination of the then-present condition of the car and its potential for restoration. They found that while the trucks, engine and a portion of the braking system had been scrapped in 1946; the car-body and underframe were reasonably intact. New freight and baggage doors had been added in 1932. An additional door had been cut into the car-body circa 1948 and several existing doors had been extended in 1955. The structural system of the car was intact and in relatively good condition and most of the original windows remained. On the interior, the three original compartment bulkheads were intact although the doors were missing and the door openings had been expanded. The 1932 partition installed to create the rear Railway Express Agency section had been removed. Original flooring and wall finishes, while deteriorated in places, remained intact throughout the car. All seating and other furnishings had been removed, as had the complete contents of the engine room.

After considering all possibilities the Nevada State Railroad Museum decided to conduct museum quality restoration of McKeen Motor Car #70. They chose to return the car to its 1910-1912 appearance and to make the car operable for the public. This restoration approach meant that the NSRM would retain all salvageable historic material from

the car and replace or replicate missing items. Unfortunately, modern public safety concerns restrict the replication of certain aspects of the McKeen car's original construction. A new 200-horsepower Cummins diesel engine will be purchased for use in the McKeen, as an antique McKeen engine was not available. All of the operating controls will be of modern design, again for safety reasons. The original Morse chain drive transmission could not be replicated due to safety requirements; therefore a hydrostatic transmission system will be utilized in its place. Likewise, all mechanical systems will have to meet current life safety standards. As such it will not be possible to utilize the original acetylene gas lighting system. Provision has been made to use an electrical lighting system with replicated original fixtures and designed to emit light of a frequency similar to acetylene. The missing trucks will be replicated so they appear as the originals but meet current safety specifications; the rear truck has already been fabricated. All original interior and exterior finishes will be replicated.

As of this writing (May 2005) the restoration work has progressed considerably. The car-body, windows and underframe have been rehabilitated. The non-original door openings have been returned to their original appearance. The rear truck has been fabricated and attached. The engine and control systems have been designed. The interior restoration, including replicated seating and light fixtures is presently underway. The front truck has yet to be fabricated.

Statement of Significance: Summary

McKeen Motor Car #70 is eligible for listing in the National Register of Historic Places under Criterion A for its association with nationally significant developments in rail transportation in the early twentieth century. Specifically McKeen Motor Car #70 is the best remaining example of a rail motor-car designed by railroad engineer and innovator William Riley McKeen Jr. (1869-1946). The McKeen Motor Car Company (1905-1920) produced the first commercially viable application of internal combustion power to American rail transportation. McKeen Car #70 is a vital precursor of the transition from steam power, dominant in the nineteenth century, to petroleum-based locomotion that emerged as the preferred means of propulsion for rail transportation in the twentieth century. In addition, the McKeen Motor Car presaged the rise of the streamlined all-steel passenger train of the 1930s. McKeen's use of clean exterior lines, nautically inspired porthole windows, an aerodynamic wedge-shaped nose and rounded tail, and a self-supporting tensed steel car-body were all innovations which would become the industry standard in the mid-twentieth century—many years after the McKeen Motor Company had ceased production. As noted railroad historian James H. White, Jr. (1978:594) wrote, "The resulting McKeen car represented the real beginning of the main-line gasoline rail car. It was the first to be built in any significant number, and it marked the origin of a serious interest in such rolling stock by an American Railroad. It was also one of the most distinctive and imaginative rail vehicles ever produced."

McKeen Motor Car #70 is also eligible for listing in the NRHP under Criterion A at the statewide level of significance for the role it played in providing rail passenger and freight service to Carson City, Minden, and Reno during the early twentieth century as part of the expansion of the Virginia and Truckee Railway Company. The V&T was the most significant shortline in Nevada history if not in the mining West. It was built to serve the Comstock Mining District, a place of legendary wealth and historical significance commemorated by the listing of the Virginia City Landmark District, with a period of significance of 1859 to 1942. Although the V&T acquired the McKeen Car after the Comstock had begun its decline, the Car is nevertheless associated with a period of continued statewide and indeed national significance of the Comstock Mining District. The importance of the Virginia and Truckee Railway Company is not to be underestimated in this context, representing as it continues to do, one of the most important railroad lines to railroad enthusiasts internationally. In addition, the McKeen Car was purchased to serve the agricultural communities of the Carson Valley. The development of this agricultural region at the beginning of the 20th century was extremely important to both the V&T and Nevada as a whole. The transition to a settled and stable agricultural economy signaled a major change from Nevada's earlier mining economy, which was subject to violent and unstable episodes of boom and bust. The V&T extension to Minden and the service McKeen Car #70 provided to this important region of the state from 1910 to 1945 are indicative of a growing maturity and stability enjoyed by the state during this time.

McKeen Motor Car #70 is being restored to its 1910-1912 appearance by the Nevada State Railroad Museum. Although this project is still a work in progress, McKeen Motor Car #70 does and will continue to retain a high level of historic integrity.

E.H. Harriman, W.R. McKeen Jr. and the McKeen Motor Car Company

The McKeen Motor Car resulted from the convergence of two extraordinary figures in American railroad history: Edward Henry Harriman and William Riley McKeen, Jr. Of the two, Harriman is better known. He was born in 1848 into a family that had been in the mercantile business in and around New York City for three generations (Klein 2000:28-29). Like many in his family Harriman had a talent for figures and the hardboiled business dealing typical of America in the mid-nineteenth century. His financial career began at the tender age of fourteen as a messenger and order-taker in the wide open Wall Street during the Civil War years (Klein 2000:32-33). Harriman quickly rose to prominence becoming a member of the New York Stock Exchange in 1870 (Klein 2000:33). Over the next several decades Harriman came to amass a substantial fortune and to place himself, both through shrewd business acumen and family ties to most of the New York business elite, at the very center of American industry and finance. He developed an affinity for taking troubled companies and returning them to robust financial health through innovation, investment and scrupulous cost control. This was particularly true of railroad companies (Klein 2000:45-47).

In 1898, Harriman undertook his greatest corporate rejuvenation in the form of the financially prostrate Union Pacific Railroad. One of the original companies to build the first transcontinental railroad in the 1860s, by the 1890s Union Pacific was in dire financial straits and was considered by many on Wall Street and in the railroad industry to be a lost cause. Scandal-ridden and under-capitalized almost from its inception the UP had lapsed into bankruptcy during the Panic of 1893 and still had not emerged five years later. The railroad was in deplorable physical condition with outmoded equipment and competitors on all sides waiting for what seemed to be the inevitable fire sale (Klein 2000:105-107). Harriman took on the UP and subjected every aspect of its operation and financial structure to close and unbiased scrutiny. He undertook a massive capital improvement campaign and began to question every expense and means of conducting business in a meticulous search of maximum cost efficiency (Klein 2000:123-129). By 1901, Harriman was in a position to add the Southern Pacific Railroad to his holdings creating a rail empire second to none in the United States (Klein 2000: 217-221).

In obtaining the UP, Harriman also acquired the services of an extraordinary engineer. William Riley McKeen Jr., born in 1869, had literally grown up in the railroad business. His father had been a well known Indiana banker and president of the Terra Haute & Indianapolis Railroad. McKeen graduated from the Rose Polytechnic Institute in Terra Haute, Indiana in 1889. He then went on to graduate work in mechanical and electrical engineering at the Johns Hopkins University in Baltimore, and at the Charlottenburg Polytechnikum in Berlin. McKeen began his railroad career in 1891 in Columbus, Ohio and was soon after appointed master car builder, and general foreman of the Terre Haute & Indianapolis Railroad's car and locomotive shops. Subsequently he returned to Rose Polytech and earned a Masters of Science in 1896 and a Masters of Engineering in 1898. That same year he moved to North Platte, Nebraska to work as district foreman for the Union Pacific. By 1901 McKeen working as master mechanic for the UP operations at Cheyenne, Wyoming, and in June 1902 he became superintendent of motive power and machinery at Union Pacific's massive main shop complex in Omaha, Nebraska (Drew 1997:3).

It is unclear where the initial inspiration for the McKeen car came from. Some sources attribute it to developments in marine architecture and engineering. (Drew 1997:3, White 1978:594) Other sources say that Harriman drew inspiration following an automobile tour during a 1903 trip to Europe (Klein 2000:263). It is clear that experiments with self-propelled rail cars had been undertaken prior to the development of the McKeen car (White 1978:579). It

is also clear that E.H. Harriman made a financial success of his business ventures by examining every aspect of corporate operations and mercilessly hunting for efficiency and ways to cut costs. One of the costs that Harriman wished to cut at Union Pacific was the expense of branch line passenger operations. In order to generate freight revenue, particularly agricultural products, many mid-western and far-western railroads had constructed webs of branch lines to serve lightly populated rural areas. Union Pacific had many such lines, especially in Nebraska. Passenger operations on many of these lines were not profitable and a drain on the corporate bottom line. Harriman determined that finding a low-cost substitute for steam passenger trains on these lines was an important part of his efforts to maintain a resuscitated Union Pacific (White 1957:593-594).

In 1903 Harriman turned this idea over to his chief mechanical officer McKeen. McKeen immediately set to work to design an efficient self-propelled rail car that would meet the needs of branch line passengers and operating cost reduction. McKeen fixed his attention on the internal combustion engine as the most efficient and reliable means of propulsion. As such, a two-person crew would be adequate to operate the new vehicle, half the labor cost of a traditional steam train. His prototype car, a 31-foot long wooden version of the later steel car, was completed in early 1905 and dubbed Union Pacific M-1. The M-1 was gasoline-powered and exhibited the same "aerodynamic" design that came to typify a McKeen car.

The M-1 was immediately dispatched on a publicity tour of the Union Pacific system traveling from Omaha to Portland Oregon and back. Following this journey the M-1 was placed in revenue service on a UP branch line between Kearny and Calloway, Nebraska. The tour generated significant interest in the odd looking car—sufficient to encourage additional work at UP's Omaha shops. The M-2, which was McKeen's first 55-foot long car featuring all steel construction, emerged in 1905. The M-7 of 1906 was the first McKeen to have the signature porthole windows and depressed center entry doors. Response to these efforts was positive enough that Union Pacific established a subsidiary company, with McKeen as president, to produce gasoline railway motor-cars. The McKeen Motor Car Company occupied a series of buildings at the north end of the massive Union Pacific shop complex in Omaha (White 1978:595).

Between 1908 and 1920 the McKeen Motor Car Company produced approximately 160 railway motor cars that were used across the United States and in Mexico and Australia (Drew 1997:8-9). The distinctive vehicle designed by William R. McKeen incorporated several innovations to railroad engineering and design, innovations which presaged more widespread changes which would revolutionize rail transportation in the twentieth century and also contribute to the ultimate decline of most rail passenger operations.

Internal Combustion Propulsion

Perhaps the most important innovation associated with the McKeen car is the application of new power source—the internal combustion engine. Almost from the beginning railroad companies sought less expensive ways to provide transportation service. The concept of a self-propelled rail car, as opposed to a car pulled by a separate locomotive, had been experimented with as early as the late 1850s. Throughout the nineteenth century a variety of power sources were applied to rail equipment in a search for a less costly alternative to the traditional steam train. Perhaps the best success on these lines came from street railways or trolleys that, using electric power, rapidly became the primary mode of urban public transportation. Indeed by 1900, interurban electric cars had made steady inroads into

traditional steam railroad territory and profits (White 1978:579).

Electrification, however, required substantial investment in new infrastructure in addition to new rolling stock. As such it was not cost effective in lightly populated markets. Similarly, self-propelled steam cars never provided sufficient results to encourage mass production (White 1978:579-581). It was the development of the internal combustion engine powered by petroleum distillates such as diesel and gasoline that provided the most hope for true innovation and cost savings. As early as the 1880s primitive gasoline engines had been experimented with and affixed to a variety of carriages, horse-cars and rail equipment. Early experiments were conducted by a number of companies, none of which resulted in anything more than unique experiments. The only car even tested by a railroad company was the *Eureka*—a gasoline car built by the colorfully named Vimotum Hydrocarbon Car Company of Chicago. Despite tests by both the New York Central and Pennsylvania Railroads in 1899, the *Eureka* did not perform well enough to interest either company and Vimotum quickly disappeared (White 1978:593).

By the time William McKeen began planning his car in 1903 and 1904 however, developments in engine design and increasing power production by gasoline motors induced him to select a 200-horsepower gasoline engine for his power plant. His first car was equipped with a motor purchased from Standard Motor Works of Newark, New Jersey. Every one of his subsequent cars had McKeen-manufactured gasoline motors, modeled after the Standard Motor example. While large engines of this sort had been installed in watercraft, the McKeen was the first practical application of this new technology in rail transport (White 1978:593). Other companies quickly followed the McKeen lead. General Electric began working on gasoline-electric motor cars and began production for sale in 1909 (White 1978:597-598). Additional companies which produced motor cars prior to World War I included: the Kuhlman Car Company of Cleveland, the Strang Gas Electric Car Company of New York and the Hall-Scott Company of Berkeley, California (White 1978:600). All in all more than 250 gasoline motor cars had been put in operation between 1905 and 1917—approximately 160 built by McKeen (Drew 1997:9).

Streamlining

The slow speed of early trains did not make air resistance a worthy consideration in railroad design. As train speeds increased in the mid-nineteenth century, however, air resistance was identified as a clear obstacle to operation at high speeds. S.R. Calthrop patented an early design for a streamlined train on August 8, 1865. This train bears a striking similarity to the McKeen as it has a pointed nose, an arched roof and is covered with an uninterrupted outer skin to reduce drag. Needless to say Calthrop's train was never produced but it did embody both the detail and the concept of reducing air resistance, as it was understood in the nineteenth century. This early design may have given inspiration to another and more tangible attempt at streamlined design—the Adams *Windsplitter*. Fredrick U. Adams was an engineer associated with the Baltimore & Ohio Railroad. Beginning in the late 1880s Adams began to research the concept of wind resistance and design as applied to rail transportation. He published a book in 1892 on the subject titled *Atmospheric Resistance in its Relation to the Speed of Trains* in which he proposed a design for an aerodynamic train that incorporated many features of the Calthrop design. In 1899 he constructed an experimental set of cars that became known as the Adams *Windsplitter*. The Baltimore & Ohio conducted tests in 1900 using this train set. The results, however, could not justify the construction of new cars for B&O passenger operations and the experimental cars were quickly dismantled (Mencken 1957:83-86).

In the fall of 1903 a series of high speed rail tests were conducted on a specially constructed line running between Berlin and Zossen in the German state of Prussia. The "Studierengesellschaft," a cooperative venture between German industry and the Imperial government, conducted these tests. All aspects of high-speed electric rail transport were examined and tested including rudimentary experiments involving air resistance and wind. Experimental railcars were fitted with both rounded and pointed ends in an attempt to increase efficiency (Berlin-Zossen 1905:15-16).

Primitive experiments were conducted measuring the amount of air resistance generated from 50 to 200 kmph in each design and compared to results from a traditional blunt ended car. The report (Berlin-Zossen 1905:32) concluded that "The pointed noses diminish the air resistance very considerably--for instance, at a speed of 200 kmph (124 mph) it is reduced about 8%. If from the start, in constructing the car, the most favorable form for overcoming the air resistance is used, the air resistance can be still further diminished."

There is a striking similarity between the modified car design used in these tests and the design that McKeen used for his rail cars. The German tests were published in the United States in 1905 the same year that McKeen designed his first railcar for Union Pacific, known as the M-1. McKeen credited the 1903 Berlin-Zossen tests and an experimental electric car demonstrated at the 1904 St. Louis World's Fair as the genesis of his pointed front and rounded rear (White 1978:595, Zeitler 1921:30). Given that efficiency was a mania with his backer E.H. Harriman and that the entire purpose of self-propelled rail cars was cost savings, it is not surprising that even a modest 8% reduction in wind resistance would be more than sufficient reason for McKeen to adopt this earliest mass-produced example of what came later to be know as streamlined design.

It is also important to note that McKeen was a consummate showman and promoter. It is just as likely the desire to make a bold and attention-grabbing visual impact with his new car played an important role in his decision to utilize these sources for his motor-car design (Drew: 1997:6). Other commentators have noted the nautical character of the McKeen—described as an "upside down boat" or a "submarine on rails" (White 1978:595). As with the gas engine, McKeen took experimental elements and applied them for the first time to a production rail vehicle. The result was visually imposing and unusual, if not particularly sound from a modern aerodynamic perspective.

Steel Construction of Railroad Cars

McKeen was not the first railroad engineer to employ steel construction. Indeed, fire had been a major problem with wooden cars for many decades and the use of iron, steel, and other fireproof materials had been examined and experimented with often during the later half of the nineteenth century (White 1978:117-130). Railroads resisted the introduction of steel cars as being too costly to construct and, as they were heavier than wooden cars, less cost-efficient to operate. Indeed steel cars were first produced for electrified subway trains. In 1902 the Interborough Rapid Transit Company selected all steel cars for New York's first subway line. Following a horrific fire in the Paris subway, the added safety of a steel car was a key factor in enticing a skeptical New York public to ride on the new subway (White 1978:131).

McKeen had similar concerns about safety and marketability for his motor car. As with underground railways, gasoline engines were new to the traveling public in 1905. Moreover early gasoline engines were prone to fire. The

loss on the wooden M-1 to fire only reinforced the need for steel construction if the McKeen car was to achieve wide acceptance (White 1978:595). McKeen also wrestled with the need for keeping the car-body as light as possible. While steel was durable and fire resistant, it was also heavy. McKeen devised a unique construction design based on arched steel trusses. This combined with stressed steel skin and the round windows allowed the shell of the car-body to serve as a combination plate and trussed girder. The result was a highly innovative lightweight car-body with exceptional strength. This design would not be used again in rail transportation until lightweight streamlined passenger units were developed in the early 1930s (Drew 1997:6).

The Rise and Demise of the McKeen Motor Car Company and Later Developments in American Railroading

The McKeen Motor Car Company met with initial success. Their motor-cars were innovative and striking, receiving much attention in the press. As Harriman and the Union Pacific owned a large interest in the McKeen Company, it is logical that a large number of McKeen cars were purchased by Union Pacific, Southern Pacific and other Harriman-affiliated roads. Indeed, thirty-two of thirty-eight cars produced by McKeen between 1905 and 1909 went to Harriman companies. However, other railroads also took an interest, including the Virginia & Truckee Railway which purchased McKeen Motor Car #70 in 1910. By 1912, 125 McKeen cars were in service and ultimately fifty different railroads would operate McKeen equipment (Drew 1997:10).

Success, however, was short-lived. Beginning in 1913 sales of McKeen cars began to fall off. With U.S. involvement in World War I in 1917, materials for new rail cars disappeared and operations at the McKeen shops were halted. Some have claimed that difficulties with McKeen's mechanical transmission, which was balky and primitive, were responsible for declining sales (Drew 1997:8-9). It is more likely, however, that the gasoline motor car fell victim to other changes in the American economy. This is born out by the fact that General Electric and other manufacturers that did not rely on a mechanical transmission also experienced a steep decline in sales in the years immediately prior to World War I. Certainly the meteoric rise and popularity of the automobile is a factor in this decline. In 1905 the automobile was an unreliable toy for the very wealthy. By 1917 it had become a fixture on the American scene. Given the improvement in automobiles (and trucks) and highways during this period, it is not surprising that the demand for rail cars, always used and marketed for short haul operations, should decline. Moreover is it likely that there were only a limited number of rail operations that were suitable for gasoline motor cars. By the mid-1910s, it is likely that the market had been saturated (White 1978:596-602).

Whatever the reason for decline of the McKeen Motor Car Company, very few cars were ordered after 1917. After the end of World War I, the United States entered a recession with rural areas hit particularly hard. In 1920 the McKeen Motor Car Company was liquidated and William McKeen retired to an avocado ranch in Montecito, California where he lived until his death in 1946 (Drew 1997:9). Despite the closure of the McKeen operation, the gasoline motor car did continue on. In the 1920s railroads faced increased competition from autos and trucks in addition to increasing costs. A second generation of self-propelled rail cars emerged during this period, which relied on electric rather than mechanical transmissions. The true vindication of McKeen's radical ideas did not fully emerge on the American scene until the advent of the Streamliners (White 1978:605-611).

By the early 1930s America was in the depths of the Great Depression. The economic downturn that began with the 1929 stock market crash sent the already shaky railroads reeling. Revenues and passenger ridership plummeted. Many branch line operations were terminated. However, new technology made the innovations first introduced by McKeen in 1905 worth another look, not for low capacity branch line service, but rather for new high-speed intercity passenger trains. It is no coincidence that the first streamlined train to be introduced was built at the direction of W. Averill Harriman, son of E.H. Harriman, for the Union Pacific Railroad. The M-10,000 was designed by W.B. Stout and ordered from the Pullman Company in 1933. It incorporated internal combustion propulsion, aerodynamic design, and lightweight metal construction, all innovations utilized by McKeen thirty years before. When the three car articulated train, renamed *City of Salina*, debuted in early 1934 it caused a national sensation (White 1978:613). Over the next twenty years virtually every major railroad in America converted to diesel-powered lightweight streamlined passenger equipment. By the 1950s internal combustion had taken over freight operations as well. By 1960 steam operated trains were a novelty (White 1978: 615). McKeen was indeed thirty years ahead of his time and his motor car showed the way for the development of rail transportation in the twentieth century.

McKeen Car #70 and The Virginia & Truckee Railway

The Virginia & Truckee Railroad (renamed the Virginia & Truckee Railway following bankruptcy reorganization in 1904) is perhaps the most famous and mythologized short line railroad in the United States. Its most eloquent chronicler, the late Lucius Beebe (Beebe and Clegg 1957:9) wrote: "The legend of this sparkling railroad to Golconda has so often been invoked by true believers in the faith of steam locomotion that there are those who imagine it to be a railroad of elfland, one with Babe the blue ox and the Big Rock Candy Mountain of the drifters and bindle stiffs." Since the beginning of mining on the Comstock Lode, in what is now Storey County, Nevada, logistics and transportation were of paramount concern. The mines were primarily located in Virginia City and Gold Hill, precariously perched on the treeless slopes of bone dry Mount Davidson at an elevation of more than 6,000 feet above sea level. The milling of raw ore into relatively pure gold or silver ingots requires a substantial and steady water source, which was not available on the Lode. As such, mills were established along the Carson River fifteen miles south of, and 1,200 feet lower than, the Comstock region. As the mines exhausted surface diggings and went underground, an enormous amount of timber was needed to shore up the workings. Again there was no timber available on the Comstock and wood had to be cut and hauled up the hill (Elliot 1973 126-127).

Transportation in the 1860s in Nevada relied on horse, mule, and ox power; as such, it was expensive and capacity was limited. This meant that the costs of extracting ore from ever-deeper mines were quite high. So much so that by the mid-1860s the Comstock mines entered their first serious downturn or *borrasca*. At this time the Bank of California began to consolidate its holdings on the Comstock. Under the direction of William Sharon and the Bank, the Union Milling and Mining Company achieved control of most of the mines and mills on the lode (Beebe and Clegg 1957:10). Along with consolidation "the Bank Crowd," as they were known, began to consider the need for less expensive and more reliable transportation. If the cost of hauling timber and supplies uphill and the cost of hauling ore downhill could be reduced, profits might rise dramatically. Sharon and his financial partners determined that the only viable solution to the transportation problem was a steam railway linking the mines in Virginia City/Gold Hill with the mills along the Carson River and to Carson City where logging flumes brought timber down out of the Sierra Nevada (Beebe and Clegg 1949:11). The first rail for the Virginia & Truckee Railroad was spiked

down in September of 1869. By this time the scope of the enterprise had expanded to linking Virginia City with the newly completed transcontinental railroad at Reno. The line was completed from Carson City to Gold Hill on November 29, 1869 and to Virginia City on January 29, 1870. The line from Carson to Reno was completed in 1872 (Wyatt 1997:Sec.1, p.1).

The reduction in transportation costs had the desired effect and the mines returned to high production and profitability. By 1873 the V&T was earning more than $100,000 in profits per month (Beebe 1957:16). Virginia City and the Comstock mines continued to prosper during the 1870s. By 1880, however, mining on the Lode had begun to fall off. The ore quality became too low to mill profitably, particularly with the expense of maintaining a mining infrastructure that in some cases reached more than 3,000 feet below the surface (James 1998:235-257).

The V&T in the early twentieth century

Various attempts to revive the Comstock mines in the latter part of the nineteenth century came to naught and by 1900 the V&T found itself with only a fraction of its former income. The company was also dogged by bad luck. In 1900 the V&T sold the Carson & Colorado--its subsidiary narrow-gauge line. The C&C, also known as The "Slim Princess" was constructed in the 1880s to serve various short-lived mining communities in central Nevada. The C&C was never a paying proposition for the V&T and when asked about its prospects, V&T President D.O. Mills stated "either we have built the railroad 300 miles too long or 300 years too soon" (Beebe and Clegg 1957:74). As such, the V&T gratefully sold the C&C to Southern Pacific. One month later the next "Big Bonanza" the C&C had been built in hope of exploiting materialized in the form of Jim Butler's legendary gold strike at Tonopah. This set off the last great American mineral rush that in turn made the C&C a paying proposition for its new owners. The V&T did reap a bit of revenue from interchange traffic with the C&C. It was soon bypassed, however, by a new line built by the Southern Pacific to connect its main line with the C&C (Beebe and Clegg 1957:75-76).

Revenues continued to decline for the V&T and in 1904 it was forced into bankruptcy reorganization. V&T directors realized that a new source of traffic was needed in order to return the line to profitability. In 1905 the decision was made to build a new line connecting Carson City with the growing and prosperous agricultural region to the south. A new town, Minden, Nevada, was platted for the line's terminus and construction began in earnest in the spring of 1906. The first train into Minden arrived on August 1, 1906 and the new line quickly became the dominant revenue producer for the V&T (Dangberg 1972:120).

This new line also required a reassessment of V&T equipment. In 1901 all of the V&T locomotives were at least twenty-five years old. They consisted mainly of 4-4-0 (American) and 2-6-0 (Mogul) engines with what, by the turn of the century, would be considered relatively low maximum speeds and hauling capacity. The new Minden line had relatively few sharp curves and much easier grades than the Virginia City line. For their new line the V&T opted to purchase new and more efficient equipment. Beginning in 1905 the V&T began to purchase new locomotives and rolling stock (Ferrell 1999:149).

By 1909 the new Minden branch had produced substantial revenue for the V&T. For the fiscal year ending June 30th of that year, the Minden branch has accounted for 9,084 paying passenger tickets with operating revenue of

$10,262.20 (Drew 1997: 17). Initially the V&T operated a single daily steam-powered passenger train on the Minden line. Virginia &Truckee management concluded that supplemental passenger service on this line could be profitable if costs could be kept down. A self-propelled motor car seemed to be the answer. Motor cars of the time required less fuel cost per passenger mile than a standard steam train. In addition, a motor car only required a two-man crew thereby saving half the labor costs of a traditional steam train (Drew 1997:17-18).

McKeen Motor Car #70 (V&T Motor Car #22)

The first indication of interest in a McKeen car by the V&T is to be found in the private files of Henry M. Yerington, General Manager and Vice-President. It appears that Yerington began to examine the question of a motor car for the V&T in early 1909. His motor car file, now preserved at the Special Collections Department of the University of Nevada-Reno Library, contains a trade clipping dated June 24, 1909 showing a 55-foot McKeen car (Drew 1997: 18).

By September of that year V&T President D.O. Mills had received correspondence from William R. McKeen regarding the purchase of a McKeen car. Mills was already familiar with the motor car since another railroad owned by the Mills family, the Bellingham Bay & British Columbia Railroad, had purchased and operated a 70-foot McKeen car. Mills sent McKeen's letter, presumably with his endorsement, to Yerington in Carson City. On September 9, 1909 the *Carson Appeal* ran a front-page story indicating Yerington's interest in a McKeen motor car for the Minden branch of the V&T. Two days later Yerington wrote to McKeen requesting a draft contract and price for a 70-foot McKeen car (Drew 1997:18-19). By October 6, 1909 final details had been agreed upon and the order for the V&T McKeen car was placed. Final price for a 70-foot, 84-passenger car complete with extra wide baggage doors was $22,000 f.o.b. Omaha to be delivered by March 20, 1910 (Drew 1997:21-22).

McKeen Motor Car #70, now painted dark red with "VIRGINIA AND TRUCKEE RAILWAY" and the numeral 22 in gold, was completed by the agreed-upon date, March 20, 1910. In early April of that year, the V&T dispatched machinist Ed Peterson to Omaha to receive training in the operation and maintenance of the new motor car and to bring it to its new home in western Nevada (Drew 1997:24).

The V&T continued to post modest profits through the 1910s into the early 1920s. By the mid-1920s, however, improvements in roads and motor transportation began to eat into both the freight and passenger revenue on the line. As a result the V&T posted a loss in 1924 (Dangberg 1972:120).

McKeen Motor Car #70 continued in regular service as the fortunes of the V&T dwindled through the 1920s and 1930s. Declining revenues were only accelerated by the onset of the Great Depression in 1929. In that year passenger operations on the V&T were scaled back and McKeen Motor Car #70 was taken out of regular service. For the next two years it was used only for specials and extras while the V&T management worked to win governmental approval to convert the car for use as a Railway Post Office and Railway Express handler. Intervention by Postmaster General Walter Folger Brown at the behest of Odgen Livingston Mills, Secretary of the Treasury and son of the late V&T President D.O. Mills, resulted in Post Office approval for conversion in the spring of 1932. Conversion work consisted in converting the smoking compartment into a Railway Post Office and placing a new partition in the main compartment. The rear of the car had two new freight doors added and was used

for the Railway Express operation. The center of the car retained seating for 24 passengers. McKeen Motor Car #70 operated fairly consistently in this configuration for an additional thirteen years (Drew 1997:57).

V&T operations during the 1930s continued to lose money. With the death of O. L. Mills in 1937 V&T management could no longer avoid the continued losses. The company entered receivership in 1938 and it was quickly announced that the Virginia City-to-Carson City portion of the line would be abandoned (Wyatt 1997:Sec 1, p.4). World War II brought a reprieve for the V&T as restrictions on gasoline and rubber use increased demand for both freight and passenger service. Following the war the V&T once again was faced with severe losses and lack of demand for services. In addition her equipment was once again aging to the point where maintenance and repair costs greatly increased operating expenses (Beebe and Clegg 1957:21). Following the end of the war management decided that it was time to retire McKeen Car #70 after thirty-five years of service. Her last revenue run was on October 31, 1945—Nevada Admission Day. In her time with the V&T, the McKeen car had traveled more than a half a million miles on her original engine and served many thousands of passengers—a truly remarkable record (Drew 1997:61-62).

In 1946 the V&T removed the engine and trucks from McKeen Car #70 and sold the car-body for use as a restaurant locally. Known variously as Denny's Diner, The V&T Diner and the Super Chief Diner, the car-body occupied several locations in Carson City. In 1955 it was moved to 1400 South Carson Street where it remained until 1995. From 1962 until 1995 the McKeen car was part of Al's Plumbing and was used as storage and offices for the enterprise. In 1995 Al Bernhard and his family generously donated McKeen Motor Car #70 to the Nevada State Railroad Museum (Drew 1997:70-72). The car-body was moved to the museum in 1996 where it has been in the process of restoration ever since.

Scarcity, Integrity and Conclusion

The above narrative has demonstrated the significance of the McKeen motor car within a national railroad transportation context and also established the local significance of McKeen Motor Car #70. In making a case for national significance, however, it is necessary to demonstrate that this particular McKeen motor car is the best resource in existence with the ability to convey that national significance. It is self-evident that the best type of resource to illustrate technological innovations in the realm of rail transportation is an example of that innovation itself as opposed to the site where it was manufactured or stored or the home of its inventor. As such, given that a case has been made that a McKeen motor-car is a nationally significant object, we must therefore consider whether this McKeen car is the best remaining McKeen car and whether this McKeen car will posses sufficient physical integrity when restored to convey that significance to the public. The answer to both questions is yes.

As part of the rehabilitation study for McKeen Motor Car #70, the Nevada State Railroad Museum compiled a list of all known McKeen manufactured equipment still in existence. Only four motor cars were identified. Of the other McKeen products still in existence, none even approximates #70's state of preservation. It is one of two 70-foot car-bodies remaining. The other was rebuilt with significant modifications to the car-body and made into a diesel electric switcher. As of 1997 the other 70-foot car-body was located at the Kettle Moraine Railway in North Lake, Wisconsin. Two other motor car bodies (50-foot and 58-foot) also remain. Each has been radically modified, one converted to a passenger car and one cut in half and used for a storage shed (Drew 1997:122). The 50-foot car-

body is in private ownership in Anchorage, Alaska and the two pieces of the 58-foot car-body were in private ownership in Price, Utah (Drew: 1997:122). Of the four, McKeen Motor Car #70 clearly had the most physical integrity. In all other cases the car-body had been significantly altered and in all cases the power plant had been removed (Drew 1997:122).

The importance of the McKeen car #70 is underscored by railroad history expert Stephen Drew (1997:2), "One of approximately 200 motor cars and trailers produced from 1905 until the McKeen Motor Car Company dissolved in 1920, the Virginia & Truckee McKeen is the best survivor of this revolutionary streamlined Nebraska motor car builder.... As both a rare surviving product of the highly-regarded McKeen Company and a half-million-mile veteran of Nevada's famous Virginia & Truckee Railway [it] is a national treasure."

The restored McKeen Motor Car #70 also possesses sufficient integrity to convey its significance. It is true that the original McKeen engine, trucks, and furnishings were discarded in 1946. We are most fortunate that both specifications and photographs for the motor-car exist. The Nevada State Railroad Museum has carefully executed its restoration plan in order to preserve all remaining historic material that is salvageable. All new materials have been fabricated to replicate original components with the exception of the new engine and controls. These per force must be new in order to meet operational requirements. They are contained in the engine compartment, the least publicly-accessible space in the car. The ability to operate is critical to conveying the true historic character of this vehicle, as its entire purpose is to move. The introduction of new operational controls and a modern gasoline engine will ultimately make it possible for this remarkable machine to carry passengers—its original purpose and goal is to keep with the best practices of both historic preservation and public history. As such, McKeen Motor Car #70 is eligible for listing in the National Register of Historic Places under Criterion A at the national level of significance for its association with the evolution of American rail transportation in the twentieth century and at the state level of significance for its association with passenger operations on the Virginia & Truckee Railway from 1910 to 1932.

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10. Geographical Data

Boundary Description

The National Register boundary for the McKeen Motor Car #70 is the grounds of the Nevada State Railroad Museum, 2180 S. Carson Street, Carson City, Nevada.

Boundary Justification

Resource boundaries include all land commonly associated with the Nevada State Railroad Museum, 2180 S. Carson Street, Carson City, Nevada.

Attachment: Photo Log (all digitally stored at Nevada State Historic Preservation Office)

1) Right side, angle view from front. Nevada Railroad Museum, May 26, 2005. Photographer : Chris DeWitt.

2) Right side, angle view from rear. Nevada Railroad Museum, May 26, 2005. Photographer : Chris DeWitt.

3) Right side. Nevada Railroad Museum, May 26, 2005. Photographer : Chris DeWitt.

4) Front, angle view. Nevada Railroad Museum, May 26, 2005. Photographer : Chris DeWitt.

5) Frontal view. Nevada Railroad Museum, May 26, 2005. Photographer : Chris DeWitt.

6) Left side. Nevada Railroad Museum, July 19, 2005. Photographer : Chris DeWitt.

7) Interior, restored main passenger compartment, facing rear of car. Nevada Railroad Museum, May 26, 2005. Photographer : Chris DeWitt.

8) Interior, restored smoking compartment, facing rear of car. Nevada Railroad Museum, May 26, 2005. Photographer : Chris DeWitt.

9) Builder's plate, interior of car. Nevada Railroad Museum, May 26, 2005. Photographer : Chris DeWitt.

10) First operation of car, Minden, NV, 1910. Photographer : Bill Recker. Original print at Nevada Railroad Museum, Ted Wurm Collection.

11) McKeen Motor Car #70 as mail car, Reno, NV, March 25, 1935. Photographer unknown. Original print at Nevada Railroad Museum, Guy Dunscomb Collection.

12) McKeen Motor Car #70 as mail car, July 1938. Photographer and location unknown. Original print at Nevada Railroad Museum, Guy Dunscomb Collection.

13) McKeen Motor Car #70 as diner, undated (ca. 1950). Unknown photographer. Original print at Nevada Railroad Museum.

14) McKeen Motor Car #70 as Al's Plumbing and Heating, April 12, 1981. Photographer : Daun Bohall. Original print at Nevada Railroad Museum.