

Union Pacific Self-Propelled Cars

by Clive Carter

Union Pacific operated self-propelled cars for over fifty years, being one of the first railroads to introduce them. More than fifty were in system-wide service by 1930. This article discusses both the mechanical transmission and gas-electric types, and the trailers that ran with them. Duties are reviewed.

Mechanical Transmission Cars

The first rail motor vehicle was turned out by the UP Omaha Shops in March 1905. Basically an experimental prototype, this wood-bodied 31' car was carried on four 42" wheels. Prominent features were a wedge-shaped front, rounded rear, and an elliptical roof. It had square windows, and seats installed for 25 passengers who gained access through a pair of doors at the rear. William R. McKean Jr., UP's Superintendent of Motive Power and Machinery, was the designer. It's been said his design was influenced by the shape and performance of navy torpedo boats. A marine 6-cylinder 100 hp gasoline engine, modified for rail application, was used to power the car. Mechanical transmission was employed; specifically a chain driving the front axle. A gas-electric system was considered, but rejected on the grounds of cost and complexity.

A 55' version, seating 57 passengers, was introduced several months later. Overall features were similar to the smaller car except the all-steel body was carried on 4-wheel trucks. The pair of driven wheels were 42" diameter, whereas non-powered wheels were 33". Engine starting and friction clutch

operation were by compressed air, an air tank being kept charged by the engine. Reputedly, engine starting after an overnight stand was always problematical due to loss of pressure. Four more were built, with some getting a baggage compartment; each had a 100 hp motor. Maroon paint with gold lining was applied to the body, and the trucks were olive green.

Starting with the seventh car, the body design was changed. A lowered central door, with an inside step, was provided on both sides, and 2' diameter circular windows were used. This resulted in a unique appearance - destined to become known as



the McKen style. There was a further modifications with the next unit, a 6-cylinder 200 hp engine, designed by McKen and built in UP Shops, becoming a standard feature. Several such cars were built for the UP.

A separate organization, the McKen Motor Car Company, was formed in 1908 as a UP subsidiary. McKen resigned his position with the Union Pacific to become president. A portion of Omaha Shops was assigned for its use. One of the first actions of the new company was to offer a 70' size, as well as a wide choice of interior arrangement for mail, baggage and passenger capacity. Accommodation in the 55' all-passenger cars was typically 50 seats; 70' cars normally had 48-75 seats, depending upon the configuration. Mechanical transmission, round windows, center door, and a wedge front continued as characteristics. Purchases by UP affiliates from the McKen Company included six 70' passenger and baggage cars by the Oregon Short Line (OSL), two having mail compartments, and six by the St. Joseph & Grand Island. The Los Angeles and Salt Lake (LA&SL) also bought one. All were delivered between 1909 and 1911. By 1913, the Oregon, Washington Railroad & Navigation (OWR&N) owned four each of the 55' and 70' passenger and baggage cars. Many of the cars produced went to railroads other than UP.

The UP ordered two 70' passenger cars in 1909, and several years later obtained two baggage and mail cars fitted with McKen engines upgraded to 300 hp. In addition, the UP later acquired a number of second-hand McKen cars from affiliates and other railroads, built to a variety of specifications. As a result, UP eventually had a varied collection of designs. A summary is provided in Table 1. It should be mentioned that car M-26 was

almost certainly second-hand, although this has not been confirmed.

A repair shop was constructed at Grand Island, NE in 1910 to handle these motor cars. Eventually this became the system-wide center.

Union Pacific's Annual Report for 1915 noted 697,000 miles were covered by revenue motor cars. This was 13.1% less than the previous year. *Railway Age* commented astutely that as the number of mixed trains increased by 8% during the same period, they may have been used to replace motor cars. Also, the fact that the OSL sold three cars to the UP after only a few years operation might reflect dissatisfaction with their performance.

Prior to 1915, the cars were numbered in each company's passenger series. The 1915 system-wide renumbering introduced a unified M-series. UP cars started at M-1, OSL at M-60, and OWR&N at M-76; LA&SL, added later, began at M-100.

McKen Company faced stiff competition for orders by the end of WWI. Absence of a gas-electric option from their catalog put it at a severe disadvantage, and the extraordinary appearance did not help. Consequently, the UP dissolved the company in 1920.

The UP experimented with various fuels to find a cheaper alternative to gasoline. Distillate fuel, otherwise known as ordinary furnace fuel, was finally selected. A special carburetor was required for the engine to burn the low grade oil; gasoline was necessary for starting the engine and idling. All the cars on the system, except M-11, had been equipped to burn this fuel by 1929. Table 2 lists the distillate fueling stations open in 1946. Usage was on the decrease by this time with several stations no longer offering this fuel, and by 1951, it was available at only two locations.

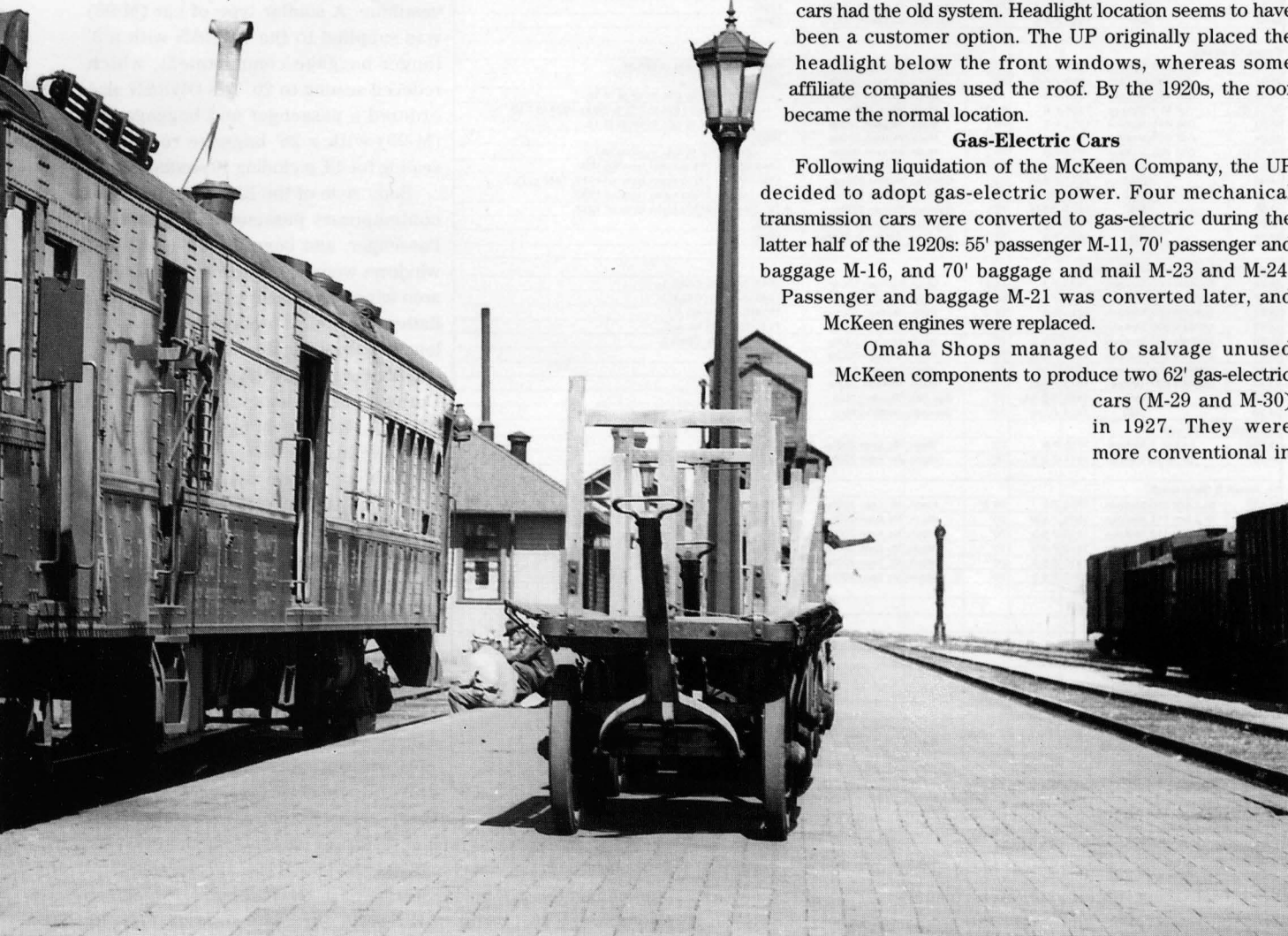
Acetylene gas lighting was used for a number of years, however, by 1929, only the OSL and OWR&N mechanical transmission cars had the old system. Headlight location seems to have been a customer option. The UP originally placed the headlight below the front windows, whereas some affiliate companies used the roof. By the 1920s, the roof became the normal location.

Gas-Electric Cars

Following liquidation of the McKen Company, the UP decided to adopt gas-electric power. Four mechanical transmission cars were converted to gas-electric during the latter half of the 1920s: 55' passenger M-11, 70' passenger and baggage M-16, and 70' baggage and mail M-23 and M-24.

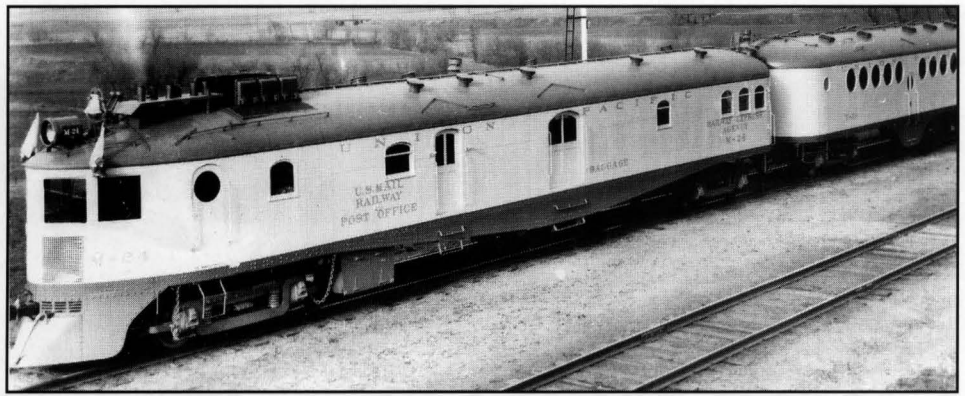
Passenger and baggage M-21 was converted later, and McKen engines were replaced.

Omaha Shops managed to salvage unused McKen components to produce two 62' gas-electric cars (M-29 and M-30) in 1927. They were more conventional in



Cache Junction 1942, W.C. Whittaker collection.

Location	Distillate	Gasolene	Butane
Council Bluff IA	X	X	
Omaha NE	X	X	
Columbus NE	X	X	X
Grand Island NE	X	X	X
Kearney NE	X	X	X
Lincoln NE			X
Junction City KS		X	
Salina KS		X	X
St. Joseph KS		X	
Marysville KS		X	
Oakley KS	X	X	
Minidoka ID	X	X	
Shoshone ID	X	X	
Ontario OR	X	X	
Weiser ID		X	
Salt Lake City UT	X	X	
Cache Junction ID	X	X	
Spokane WA	X	X	
Yakima WA	X	X	
X - Fuel available			



M-24 and passenger trailer T-18 display their streamliner colors applied in 1935. A fishbelly sill was used for the baggage and mail car. The trailer was rebuilt from a motor car in 1929, when the 70' power car was converted to diesel-electric. J. Harrison photo, W.C. Whittaker collection

capacities were 26 and 18 in the passenger and smoking compartments, respectively, the baggage compartment was 23'6" long. Both series were equipped to burn distillate fuel. A Union Pacific shield was applied to the sides by the two builders; the EMC examples did not get this. Two 70-seat passenger cars (M-69 and M-70), for the OSL came from Brill in 1930. Table 1 summarizes the gas-electric cars.

Seating capacity of the passenger cars operating over UP lines was reduced by 1946. Brill and EMC cars typically lost four seats, and the Pullmans 19. Extension of the baggage compartment in OWR&N M-99 to 28'8" absorbed a dozen seats.

Seven gas-electric cars were converted to burn butane as a fuel by 1942. They were: M-23; M-35, M-36, M-39; M-41; M-65; M-66. Table 2 shows butane available at five fueling stations in Nebraska and Kansas, where these cars were employed. No mention was made of butane in an official UP list of fuel stations issued in 1951.

Gas-electric cars were painted Pullman Green until 1952, when Armor Yellow and Harbor Mist Gray became the common standard. Numbers M-29, M-32, M-33, M-36, M-39 M-40 M-41 and M-69 can be confirmed as getting the new livery.

Fleet Summary

A summary of the fleet size at various times is shown below:

	1910	1922	1930	1935	1946	1951
UP	18	21	35	32	17	16*
OSL	2	3	8	8	6	-
OWR&N	2	8	10	8	2	-
LA&SL	-	1	2	1	-	-
Total	22	33	55	49	25	16

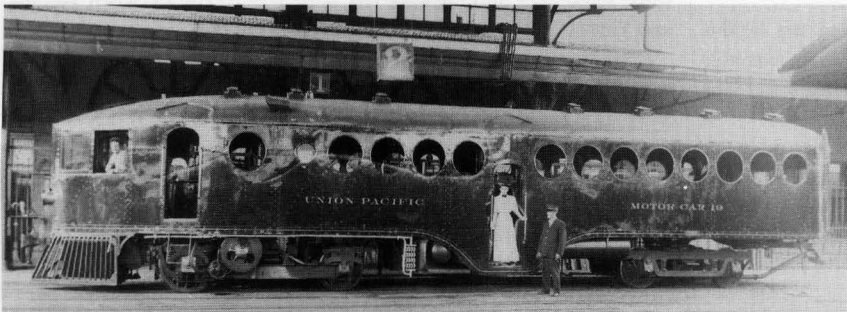
* includes three from OSL

Over thirty mechanical transmission cars were in service during the 1920s, but all were retired by the mid-1940s. McKeen style cars converted to gas-electric were still operational in 1946, M-16 surviving until 1952.

Retirement of the gas-electrics built by contractors began in 1946. Nine of the all-passenger class survived into the 1950s, the last being withdrawn in 1958. Note the last three OSL cars were owned by the UP by 1951.

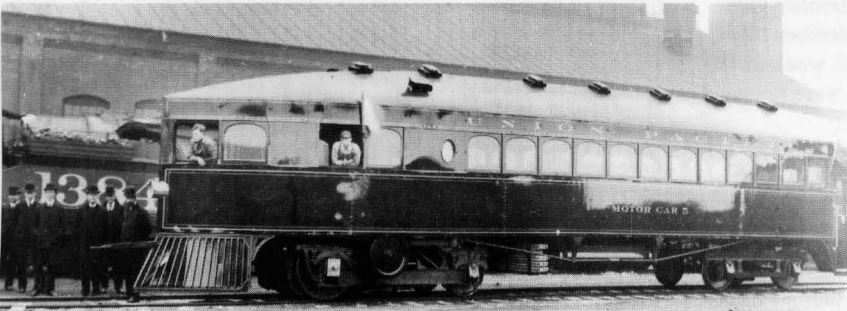
Trailer Cars

Union Pacific constructed nine 31' trailers (T-1 to T-9) between 1905 and 1908, to be paired with self-propelled cars. They had rounded ends, with a pair of doors on each side. Roof configuration was the same as the power cars. Seven were baggage and mail, T-5 and T-7 being initially classed as baggage. Oregon Short Line purchased one from the McKeen Company in 1911.



Above: Round windows and a lowered center door became standard features as illustrated by 55' passenger motor car 19. Union Pacific Railroad photo

Below: The initial series of 55' self-propelled cars is illustrated by motor car 5, built by the UP in 1906. W.C. Whittaker collection



UP No.	Builder	Built	Length	Notes
Union Pacific				
T-1	UP	1905	31'	1
T-2	UP	1906	31'	
T-3	UP	1906	31'	1
T-4	UP	1906	31'	1
T-5	UP	1907	31'	1, 2
T-6	UP	1907	31'	1
T-7	UP	1907	31'	1, 2
T-8	UP	1908	31'	1
T-9	UP	1908	31'	
T-10	Pullman	1928	71'	
T-11	Pullman	1928	71'	
T-12	Pullman	1928	71'	
T-13	Pullman	1928	71'	
T-14	Pullman	1928	71'	
T-15	Pullman	1928	71'	
T-16	Pullman	1928	71'	
T-17	Pullman	1928	71'	
T-18	-	-	50'	3
T-19	-	-	50'	4
Oregon Short Line				
T-51	McKeen	1911	31'	5
T-52	-	-	31'10"	6
T-53	Pullman	1930	71'	
T-54	Pullman	1930	71'	
Baggage & Mail Trailers except where noted.				
Notes				
1. Mail cpt. removed by 1929.				
2. Classed as Baggage until c1912.				
3. Rebuilt 1929 as Passenger Trailer from M-8.				
4. Rebuilt 1929 as Passenger Trailer from M-7.				
5. Originally OSL 1.				
6. Rebuilt 1924 from M-62 [2].				
Sources: Reference 2 and various issues of Union Pacific				
Form 70 "List of Officers, Agencies, Stations, etc"				



Salina, Kansas, May 1955, W.C. Whittaker collection

Three of the early 55' motor cars were rebuilt as trailers. One was converted in 1924, to produce a 31' baggage and mail trailer for the OSL. The other two were remodeled during 1929 into 50' 49-seat passenger trailers (T-18 and T-19) to run with baggage and mail M-23 and M-24, concurrently modified to gas-electric. Their original wedge-end was altered to rounded.

In 1928, the UP bought eight 71' trailers (T-10 to T-17) from Pullman Car & Manufacturing Corporation, matching the gas-electric cars from the same source. A 15' postal compartment was installed to appropriate standards at one end, the remainder being a 54' baggage compartment with a door on each side. An additional pair (T-18 & T-19) went to the OSL in 1930.

Arrival of the new cars precipitated withdrawal of the 1905-8 built 31' cars; only three remained by 1935. However, T-51 was still on the roster in 1951. Pullman trailers lasted until at least the late 1950s. Table 3 lists the trailer cars.

McKeen applied his structural concepts to the design of a 66' coach for steam train service. Coach No. 499 was built in 1907 with round windows and lowered central door. An official photo shows it in use later as a trailer, although never renumbered into the trailer series.

Duties

The August 23, 1907 issue of *The Railroad Gazette* reported that the Union Pacific Railroad had four regular motor car services:

Route	Commenced
Kearney, NE-Callaway, NE	October 1905
Lawrence, KS-Leavenworth, KS (with trailer)	February 1906
Beatrice, NE-Lincoln, NE	September 1906
Loup City, NE-St. Paul, NE	September 1906

According to reference 1, motor cars 1 and 2 worked the Kearney branch, and No. 4 ran to Loup City; Nos. 5-6 were assigned to the Ord branch.

An Omaha-Council Bluffs service was operated for UP employees. M-10 was used during the late 1920s, M-22 and M-23 doing the honors in later years.

After conversion to gas-electric in 1929, baggage and mail cars M-23 and M-24 were assigned to the Leavenworth-Miltonvale branch (having previously worked between Kearney and Stapelton) paired

with trailers T-18 and T-19. Each made a daily one-way trip. Both pairs were specially repainted in Streamliner Yellow and Leaf Brown in 1935, then put into Lincoln, NE-Manhattan, KS service.

Union Pacific Magazine for February 1927 reviewed the duties planned for the ten new cars ordered from EMC. Four passenger cars from the M-31-M-35 series were to be assigned in Kansas, one pair to the Belleville-Junction City line, and the other pair to operate between Salina and Oakley. The fifth passenger car was for Denver-Fort Collins service. Passenger, baggage and mail cars M-65 M-68 were to operate in Idaho on Cache Junction to Preston, Shoshone to Ketchum, Ashton to Victor, and Blackfoot to MacKay runs. Passenger and baggage car M-99 was to run between Wallula and Yakima in Washington.

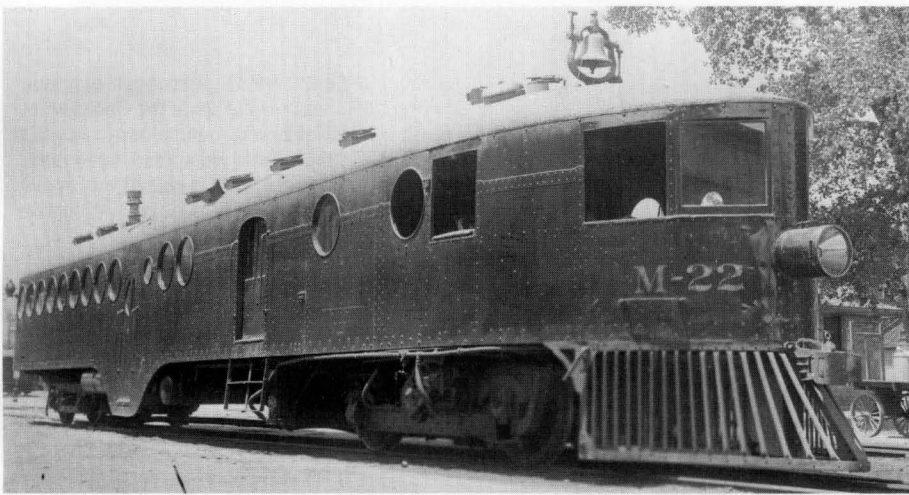
The January 1929 issue of this magazine gave details of the services worked by Pullman and Brill built passenger cars, noting they had replaced other motor cars. Pullman M-36-M-39 were running between Lincoln, NE and Manhattan, KS, and Salina and Oakley including the Plainville, KS branch. Brill cars M-40 and M-41 had gone into service between Fort Collins and Denver.

With new deliveries completed by 1930, and the McKeen fleet still largely intact, the system-wide total reached its peak of over

Table 4 Motor Car Duties - 1930

Route	Number of Cars	Route	Number of Cars
UP		UP (cont.)	
Valparaiso NE-Beatrice NE	1	Salina KS-McPherson KS	1
Central City NE-Valparaiso NE	1	Oakley KS-Denver CO	2
Marysville KS-Lincoln NE	1	Denver CO-Sterling CO	1
Marysville KS-Topeka KS	1	Denver CO-Boulder CO	1
Columbus NE-Norfolk NE	1	Denver CO-Fort Collins CO	1
Columbus NE-Albion NE	1	La Salle CO-Fort Collins CO	1
Columbus NE-Spalding NE	2	OSL	
Omaha NE-Council Bluffs IA	1	Cache Jct. ID-Preston ID	1
Grand Island NE-Ord NE	2	Blackfoot ID-Mackay ID	1
Grand Island NE-Loup City NE	2	Minidoka ID-Buhl ID	1
Hastings NE-Stapleton NE	2	Minidoka ID-Bliss ID	1
Miltonvale KS-Leavenworth KS	2*	Shoshone ID-Ketchum ID	1
Marysville KS-Manhattan KS	2	OWR&N	
Junction City KS-Belleville KS	1	Ontario OR-Burns OR	1
Salina KS-Beloit KS	1	Yakima WA-Walla Walla WA	1
Salina KS-Oakley KS	2*	Moscow ID-Colfax WA	1
Salina KS-Plainville KS	1	Tekoa WA-Winona WA	1

* one car each way



Right: After the formation of the McKeen Motor Car Company, both 55' and 70' versions were produced. 70' baggage and passenger M-22 is shown at Boulder, Colorado in 1917. Otto Perry, Western History Department, Denver Public Library

Below: Several mechanical transmission cars were converted to gas-electric, including 70' baggage and passenger car M-21. It was photographed late in life with a lower body reinforcing strap extending aft from the front door. W.C. Whittaker collection

fifty motor cars. Therefore, this is an appropriate period to examine where the cars were used. Information extracted from the June 1930 public timetable is shown in Table 4. Routes having motor car service are listed, together with the number of cars required. On most, the schedules indicate a single car made a daily return trip. Only a one-way trip could be made on longer distance services, so two cars were required.

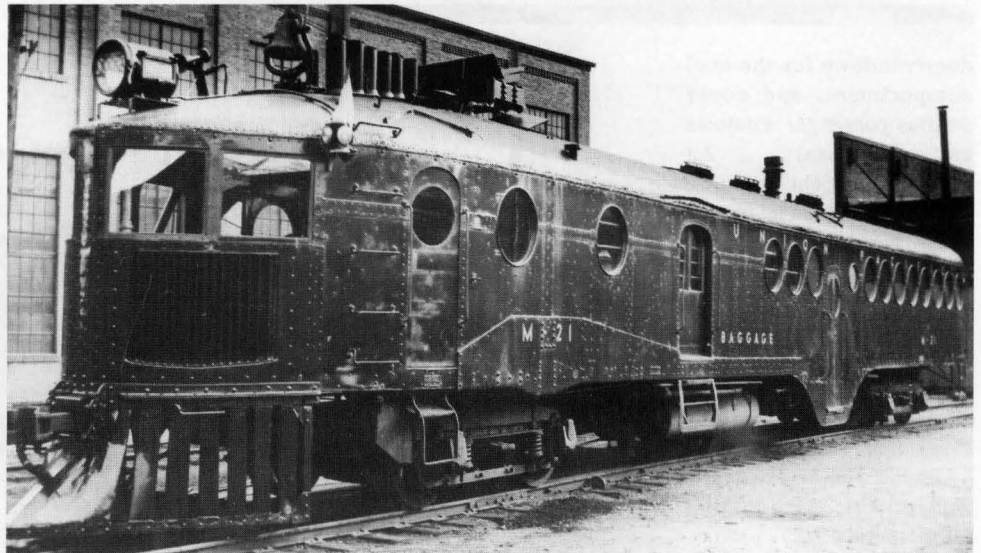
Around 30 of the 35 cars assigned to UP lines were in regular service in 1930. The largest proportion were assigned to lines in Nebraska, but Kansas required a dozen, and Colorado branchlines had their share (M-32 and M-35 operated from Denver in the 1930s). Based on the *Union Pacific Magazine*, McKeen cars would have predominated in Nebraska, and new cars in Kansas.

Utilization was lower on the OSL branches, with five new cars covering the daily duties. The OWR&N specified regular assignments for only half its fleet; the company probably limited its commitments because just two cars were new.

The depression resulted in major reductions in service. By 1939, only two dozen cars had regular employment, ten had been retired. Some had been transferred to implement service on other branches: Junction City, KS-Concordia, KS, Salt Lake City, UT-Malad, UT, Montpelier, ID-Paris, ID and Spokane, WA-Wallace, ID.

By 1949, nine motor car services remained. Four operated from Grand Island to Lincoln, Central City, St. Joseph and Kansas City. The latter two requiring one car each way. Dual cars were also needed for each of the Kearney-Stapleton, Salina-Oakley, and Junction City-Concordia services. Single cars sufficed on the Minidoka-Buhl and Weiser-New Meadows branches in Idaho. By 1951, the Malad branch had its motor car reinstated, while passenger service was withdrawn from the New Meadows branch. Specific cars used on the branches can be identified, thanks to the foresight of some photographers.

Service	Car	Year
Grand Island, NE-Lincoln, NE	M-41	1947
Salina, KS-Oakley, KS	M-36	1955
(Plainville branch)	M-38	1955-7
	M-39	1956
	M-69	1956
Kearney, KS-Stapleton, KS	M-29	1950, 1954
Topeka, KS branch	M-69	1955
Minidoka, ID-Buhl, ID	M-32	1952



M-33 1952

Most ran with a Pullman trailer. Note that M-69 (and M-70) had moved from the OSL to Kansas. The last service in operation was the Plainville branch which ceased in May 1958.

As might be expected from the few services remaining, the number of fuel stations open by 1951 was considerably less than in 1946 (Table 3). Gasoline was available at Grand Island, Salina, Oakley, St. Joseph, Marysville, Salt Lake City, Minidoka, Ontario and Weiser. Distillate fuel could be obtained at Salt Lake City and Weiser.

Model Considerations

Model brass importers have offered relatively few Union Pacific prototypes in HO scale. Overland /Ajin produced a model of McKeen style mail and baggage M-24 and trailer pair about fifteen years ago. W&R Enterprises sold an EMC passenger, baggage and mail car based on M-66 and M-67, around the same time.

Bachmann's recently introduced HO gas-electric car is of potentially major interest here. However, it's based on an EMC passenger and baggage car, and UP had just one example. It seems to be a fair representation of M-99, although lack of photos of the prototype doesn't help in making a judgment, the lone illustration was found in the June 1928 issue of the *Union Pacific Magazine*. Bachmann offers the car in UP Armor Yellow, a scheme which the prototype never carried, having been withdrawn in 1946. An appropriate choice is the one available in Pullman Green (unlettered), which can be decaled appropriately.

Kitbashing the Bachmann car offers some opportunities. It wouldn't be too difficult to build a passenger, baggage and mail version - move the baggage compartment door aft, add a



Left: OWR&N passenger, baggage and mail M-98 at the Spokane, Washington roundhouse in August 1947. Pilots were fitted when new, but most were replaced with snow plows by the 1950s. W.C. Whittaker collection

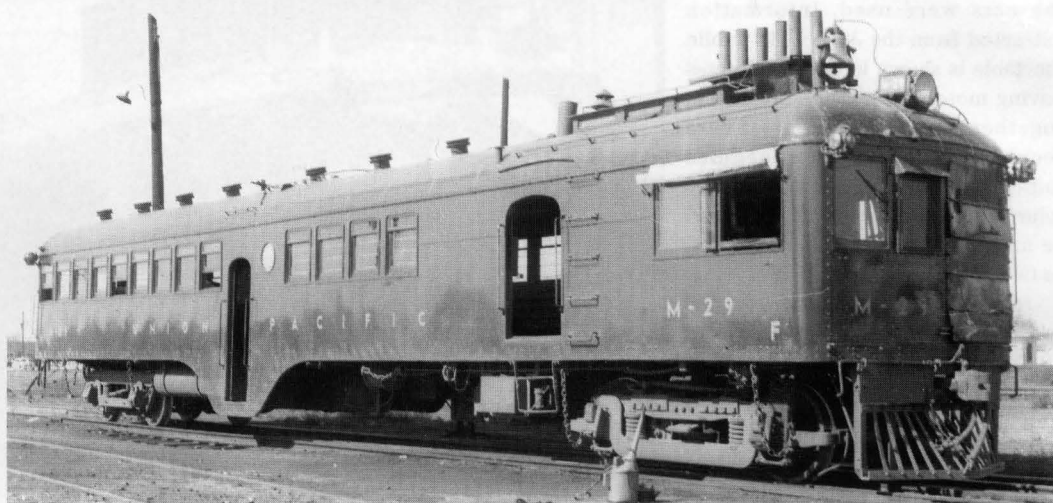
Below: Union Pacific's Omaha shops built two gas-electric cars from surplus components that remained after McKean Motor Car Company ceased production. M-29 is shown at Kearney, Nebraska in October 1948. W.C. Whittaker collection

door/windows for the mail compartment, and cover surplus passenger windows as necessary. An all-passenger car could be made, although an additional shell would have to be purchased to provide the extra windows.

References

W. Kratville and H. E. Ranks *Motive Power of the Union Pacific*, Barnhart Press, 1960

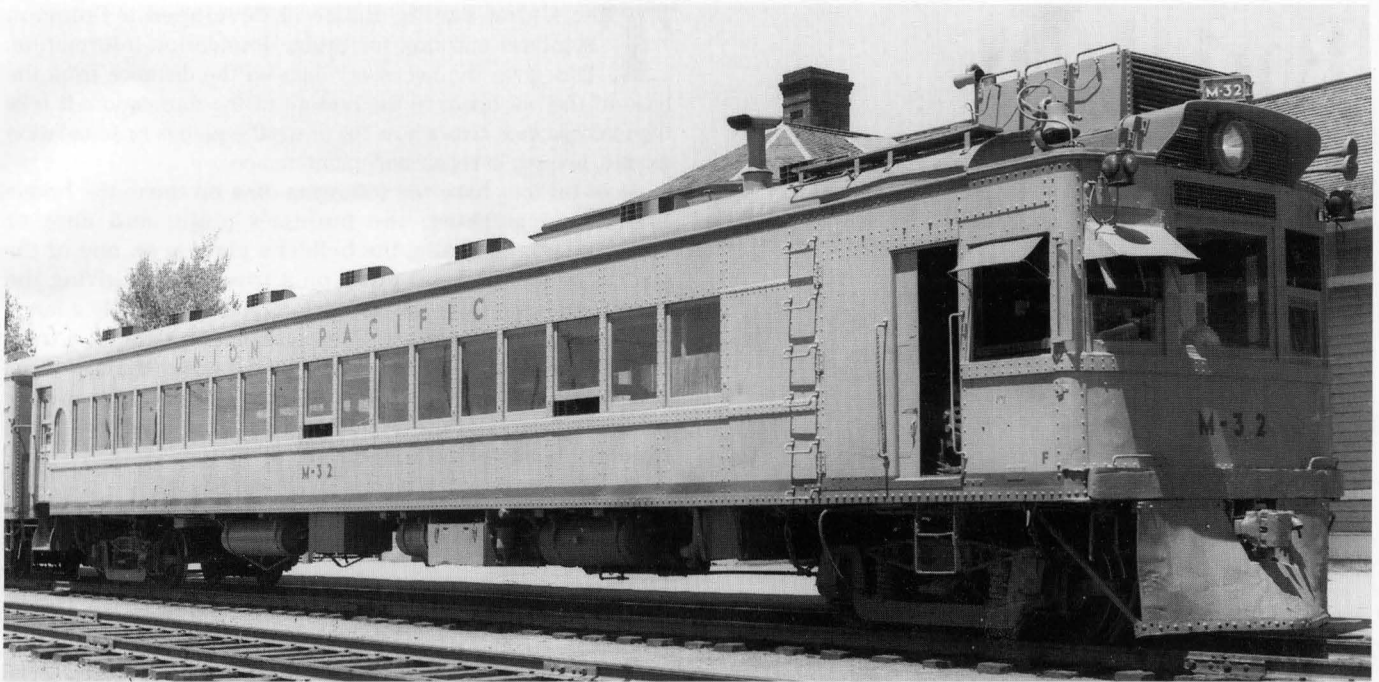
Union Pacific Passenger Equipment, Harbor Mist Publications, 1987.



Trailer T-13 was one of eight trailers built by Pullman in 1928. Salina, Kansas May 1955, W.C. Whittaker collection

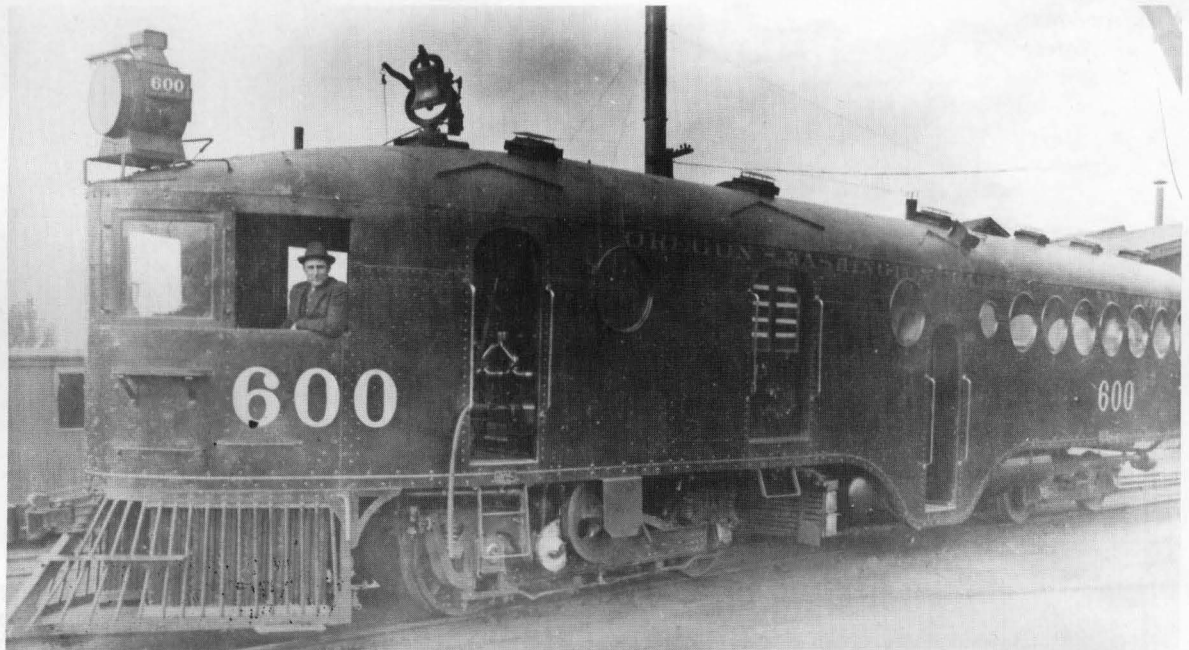
Right: Brill M-40 in operation near Denver, Colorado in February 1929. Otto Perry, Western History Department, Denver Public Library.





M-32 was one of five gas-electric passenger cars built by the Electromotive Company in 1927. It had just been repainted Armor Yellow when photographed at Twin Falls, Idaho in May 1952 while working the Minidoka, Id - Buhl, Id service. W.C. Whittaker collection

McKeen Company products were bought by Union Pacific affiliates. This Oregon-Washington Railway and Navigation 55' passenger and baggage car was photographed sometime between 1910 and 1915, reidentified as OWR&N 600 from OR&N 1, but prior to renumbering to M-76. W.C. Whittaker collection



Passenger, baggage and mail car M-67 is at Ogden Utah in May 1948, partnered by trailer T-51 built in 1911. W.C. Whittaker collection