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Vol. 5, No. 2

Motor Coach Photo-Feature Magazine

DEREGULATION

TROLLEY BUS WORKSHOP

Trailways combo at Dallas

HISTORIC SALT LAKE CITY TBs

BUS World

Motor Coach Photo-Feature Magazine

February, 1983 Vol. 5, No. 2

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Cover Photo: Trailways combo at Dallas is half bus and half freighter. Joe Richards photo. (More on combos in Bus Lines.)

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Pioneer Trolley Coaches

On early test run the first Salt Lake City trackless trolley shows ability to swing far from overhead. Railway Negative Exchange.

EDITOR'S NOTE: This article is based on a master's thesis prepared in 1932 by the engineer who designed and installed the system.

By Van Wilkins

Edward A. West, General Manager of the Utah Light & Traction Company, examined with much interest a Fageol Twin Coach 40-pasenger bus at the American Electric Railway Association convention in Cleveland in October, 1927. He had to decide whether to rebuild deteriorating track and streetcars or to replace them—but with what?

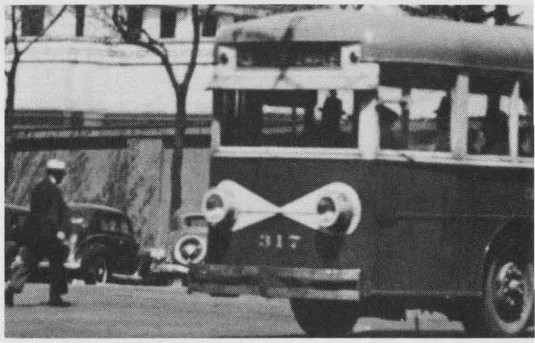
The coach he was looking at had deep leather seats, pneumatic tires, an attractive and modern body design, and gas-electric propulsion. In this type of system, a gasoline engine drove a generator which provided power to electric motors driving the wheels. It was said to give smoother acceleration and less driver fatigue, although it was heavier than a conventional transmission and used more fuel.

Mr. West knew that most trolley coach installations in the U. S. had not lasted, and the few in operation used small, ungainly vehicles built on truck chassis running on hard rubber tires. They were certainly not capable of replacing 50-passenger streetcars.

But the Twin Coach was another matter. It was large, attractive and comfortable. Could a pair of overhead wires and trolley poles substitute for the engine and generator? He thought perhaps they could.

Mr. West dispatched his engineer traveling companion, Mr. Jedediah F. Wooley, to Rochester, N. Y. to have a look at the small but relatively successful trolley coach operation there. On his return, Mr. Wooley reported five distinct advantages of the TC over the gas bus. These were lower operating costs, better traction, greater safety with less driver fatigue, better heating and ventilation, and no oil or gas fumes.

Detailed analysis and study followed, and it was decided to ask permission to replace streetcars with trolley coaches on one route. They estimated operating costs per mile (including depreciation and interest) for the TC at 32.5 cents, compared to 55.5 cents for the gas bus and 39.8 cents for the streetcar. They were thinking in terms of complete replacement of the streetcars with the new mode, estimating annual savings at $450,000—a very large sum for those days.



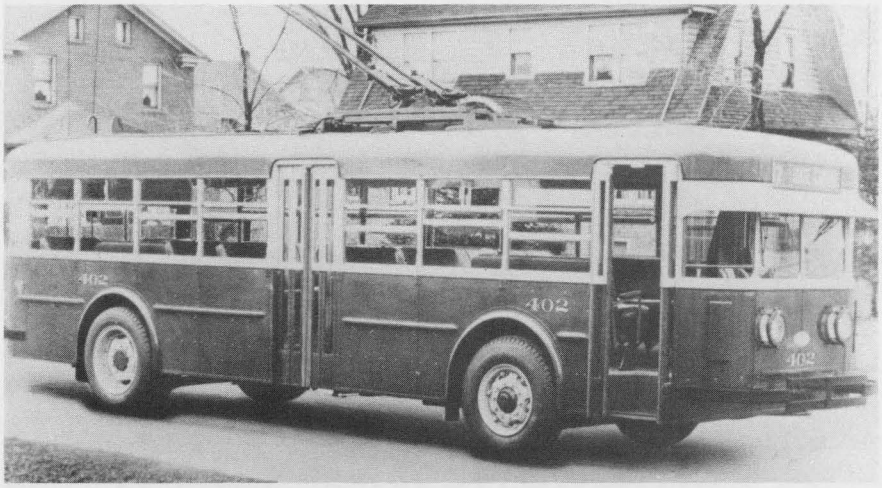
No. 317 is in downtown Salt Lake City.

A major problem was the convincing of municipal authorities that the trolley coach was a suitable public conveyance. Photos of a Twin Coach from several angles were obtained, trolley poles were added, and the results were then skillfully superimposed on photos of downtown Salt Lake City. A section of double overhead was erected in the business district, where the Fire Chief could test and see that the wires would not interfere with fire equipment. Finally, a hurry-up request was made to Rochester, where Eastman Kodak provided a movie of the installation there. The film was the clincher, and approval was given in March, 1928.

Mr. West and Mr. Wooley knew what they wanted, but had trouble convincing the builders. The pair insisted on dynamic (regenerative) braking, two 50 hp motors, and controls similar to gasoline buses. They also specified a center exit, rather than a door behind the rear axle as in the Twin Coach design.

The Fageols were unwilling to meet the requirements, but the Versare Corporation of Albany, N. Y. was. A builder of three-axle gas electrics of advanced design and construction, they apparently pushed hard for the job. Contracts were let on May 23, 1928 for ten coaches, Westinghouse electrical gear, and overhead. Service was to begin in September! With no environmental impact statements or Federal red tape, they moved fast in those days.

The first coach was tested at Cohoes, N. Y. on August 1st and arrived in Salt



Utah Light & Traction liked the ride provided by the large tires and long springs on the Twin Coach 40TT, but insisted on the unusual (for Twin Coach) location of the rear exit. Motor Bus Society.

Lake City on the 10th. It was tested on the route the same day. On the 20th there was a demonstration for officials. On the 29th the remaining nine vehicles arrived, and regular service began on September 9, 1928. This was less than four months from the time the contracts were let and less than a year from the day Mr. West looked at the bus in Cleveland.

While the basic concepts were not new, the technology was, and there were problems. This was the first time that TC's had shared overhead with streetcars. They were to use the positive wire already in place, but adding the negative wire presented new problems. It was finally decided that the negative wire would be continuous where it crossed a positive

Motor Bus Society.

wire (at turnouts, for instance), to minimize the danger of a stalled trolley coach. It was also necessary to design locally new wire frogs, to ensure that the coach's poles followed the correct route. Even testing the overhead presented difficulties, as it had to be ready when the first coach arrived. This was solved by mounting a pair of poles on a motor truck. Later at least one gasoline bus was also fitted with poles, perhaps for the same purpose.

The vehicles, dubbed "Salt Lake City Electric Coaches," were quite successful in attracting new riders. Fortunately Versare had built an eleventh identical coach for exhibition, and it was quickly shipped to Utah to handle the increased loads.

By and large the company was pleased with the coaches, but there were difficulties. If a pole left the wire the dynamic braking ceased to function, leaving the operator with only the mechanical brakes—a safety defect. In addition, a serious problem developed with drive shaft breakage. This, coupled with a rougher than expected ride provided by the trunion-mounted pair of rear axles, resulted in a decision to convert the coaches to a single rear axle with larger tires. This was accomplished in 1929.

The streetcar route selected for conversion had been chosen in part to ensure that such problems would come to light before more vehicles were ordered. It was the South 4th East line, and it required that the coaches operate over gravel, asphalt, and cobblestones and included a 10 per cent grade. Evidently the selection was a good one.

A minor but annoying problem was the build-up of static electricity, resulting in a slight shock to a boarding or alighting passenger under certain conditions. This was solved by adding a "drag chain" which discharged the electricity to the ground.

The Fageols remained convinced that their ideas were better and in January, 1929 shipped a trolley coach to Salt Lake City for trial. It appears to have closely resembled their original proposals. It had two 36 hp motors, no dynamic braking, and the exit behind the rear axle. It was also equipped with General Electric electrical components. It proved to be underpowered, and it was soon kept off the streets in bad weather because of a tendency to skid. The dynamic braking on the Versares provided even braking, even on ice or snow. There was also increased expense for maintenance. The Twin Coach required relining of brake shoes after only 7,000 miles. The Versares, whose mechanical brakes took over only when speed dropped to two or three miles per hour, got 100,000 miles from a set of shoes.

But the Twin had one great advantage—four large balloon tires and longer springs. These gave a ride far better than that of the Versares, with their smaller (though pneumatic) tires on three axles.

The Cincinnati Car Company, seeing Versare's success in building trolley coaches and gas electric buses, quickly bought the company in late 1928. Not to be outdone by the Fageols, in March, 1929 Cincinnati shipped to Salt Lake City another coach much like the first eleven, but also equipped with GE gear. It did have dynamic braking, however. It also was on loan.

Meanwhile, the transit company made plans to convert a second car line and again asked for bids. The only major changes were for a single rear axle instead of two, dynamic braking independent of the overhead, and balloon tires. For reasons not now known, GE gear was specified.

This time the Fageols were willing to change their design to conform to Salt Lake City experience. Cincinnati, anxious to sell more TC's, had by this time designed a new coach and also bid. The result was that the order was split, with Cincinnati providing seven and Twin Coach providing six. Both samples were also bought at this time.

The new equipment began to arrive in late 1929, and the existing South 4th East route was extended to replace streetcars on South 9th East, in a "U" shaped routing through downtown. TC service to the State Capitol was discontinued.

Apparently there was little difficulty with the Twin Coaches, but the Cincinnati products did not work out as well. The single rear axle was subject to excessive breakage, owing perhaps to an underestimating of the more powerful torque of the electric motors and its effect on components designed for use with internal combustion engines. (Prior to the Salt Lake City installation, virtually all trolley

Demonstrator 311 was probably built at the Versare plant but equipped with General Electric equipment in Cincinnati before shipment to Salt Lake City. Motor Bus Society.

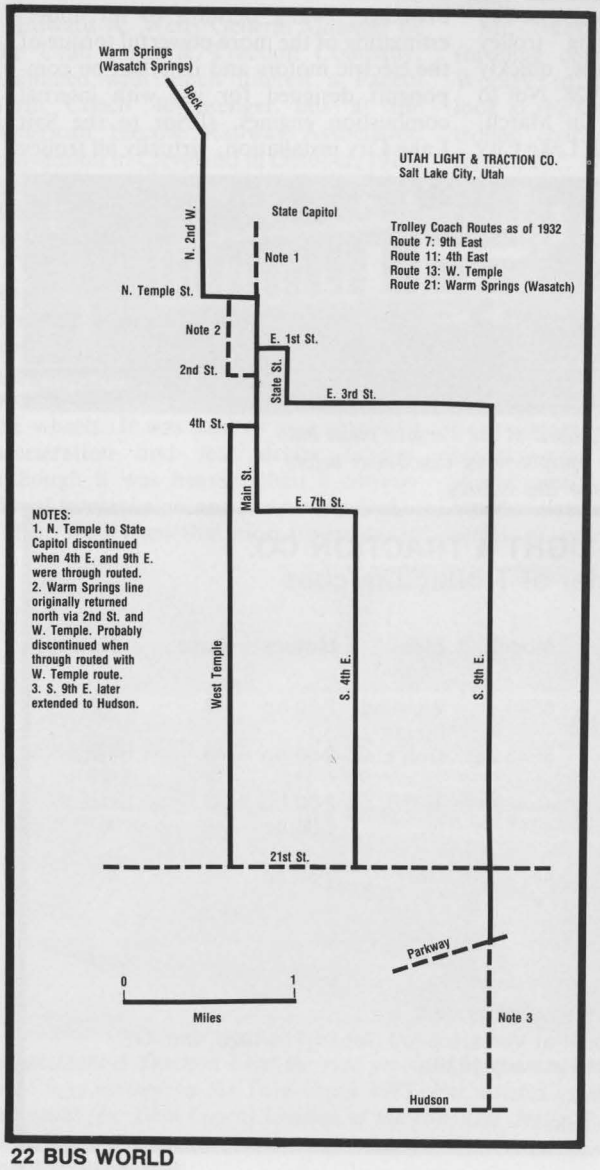
UTAH LIGHT & TRACTION CO.
Roster of Trolley Coaches

Fleet No.	Builder	Year	Model	Elec. Equip.	Motors	Pass.	Notes
300-310	Versare	1928	6E43	Westing-house	2-50 hp	43	1,2.
311	Versare/ Cincinnati	1929	6E43	Gen Elec.	2-50 hp	43	1,2,3.
315-321	Cincinnati	1929	4E430	GE	2-50 hp	43	
399	Twin Coach	1928	40TT	GE	2-36 hp	40	4.
400-405	Twin Coach	1929	40TT	GE	2-50 hp	41	5.

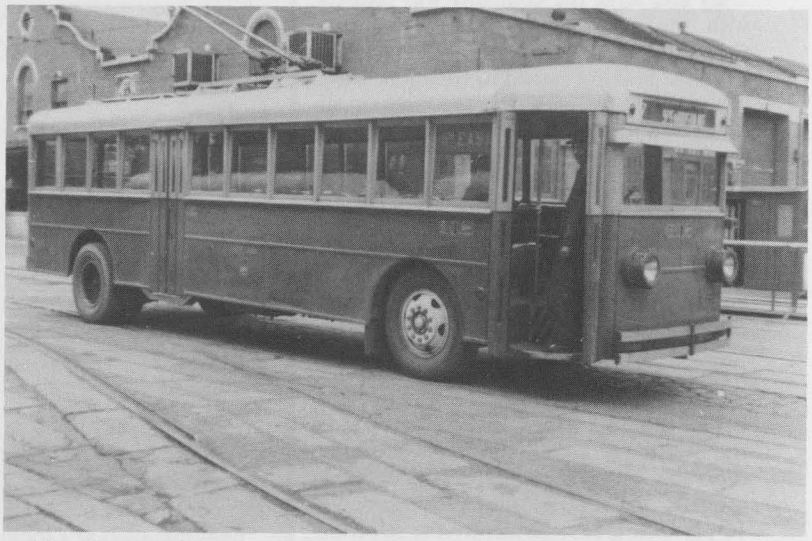
Notes

1. Built as 3-axle; converted to 2-axle in 1929.
2. Model assumed, based on Versare system.
3. Demonstrator probably built at Versare plant (Albany) in 1928, with GE gear installed at Cincinnati in early 1929.
4. Demo. No dynamic braking.
5. Exit door forward of rear axle.

Salt Lake City trolley coaches were the first to share extensive overhead with streetcars. Motor Bus Society.



In 1928 Salt Lake City became the first city to use trackless trolleys on major transit routes.



After Cincinnati Car Co. bought Versare, they produced this new and surprisingly modern design. Railway Negative Exchange.

coaches had solid rubber tires because their higher starting torque could pull pneumatic tires from the rim!)

It is possible that the axle breakage problem may also have given Cincinnati coaches a bad name and thus was a major factor in the company's selling only a handful of vehicles to other operators.

Unfortunately, in Salt Lake City as elsewhere ridership dropped as the effects of the Depression were felt, and the company found that they had a surplus of trolley coaches. This led to additional conversions. In November, 1930 the Warm Springs line changed over, and a year later the West Temple line was converted and linked to it to form another through routing. Permission was obtained to convert the West 4th North and North 5th West lines as well, but apparently this was never done. Further conversions were to gasoline buses.

Experimentation continued. Trolley wheels versus shoes were evaluated (shoes caused more wear), and round versus grooved wire was also tested (grooved was quieter). Eventually the axle problem with the Cincinnati products was solved.

Then in 1944 National City Lines bought the property and converted the system to internal combustion two years later. This was at a time when other companies were converting to the trolley coach, and this was the first major system to be scrapped.

The impact of the Salt Lake City installation cannot be underestimated. It demonstrated beyond a doubt that large trolley coaches were feasible as replacements for streetcars. It also served as a laboratory for development of the technology. The vehicles themselves were essentially sound once the axle problems were solved. In fact, of the 27 owned by UL&T, all but one were still on the property when National City Lines took over.

The installation excited great interest nationally. Some 50 U. S. operators inquired about or sent visitors to the system in its first years. Of these, 25 eventually decided to adopt the trolley coach in their operations. This represents about one half of the total trackless trolley installations in the United States. There were numerous foreign inquiries, as well.

Obviously, if Salt Lake City had not taken the leap, inevitably some other city would have. Nevertheless, this system was the pioneer, and Mr. West and Mr. Wooley and their colleagues deserve great credit for having the courage to take the step.

Author's note: Much of the material for this article came from a thesis by Mr. Wooley unearthed by Ms Susannah Breaden at the University of Utah. Additional information on transit in Salt Lake City, on the Versare Corp. or on the location of other theses dealing with transit developments of this period would be welcome. Mr. John Hoschek of the Motor Bus Society also deserves credit for inducing the author to undertake the research.