San Francisco, August 15, 1924.

Mr. J. H. Dyer:-

As requested in yours of November 26th, 1923, Mr. Small, when East, investigated the Mack Rail car equipped with a single 120 H.P. gasoline motor as illustrated in the Railway Review of October 27th, 1923, and reports that the manufacturers have abandoned this design substituting therefore a double engine gasoline rail car that they expect to demonstrate the latter part of this year.

As Mr. McCormick did not concur in Mr. Small's recommendation that we change out present engine in McKeen car substituting Diesel engine with planetary transmission costing $21,300, he now recommends rebuilding an abandoned or spare McKeen car body making both ends rounded for double end operation, applying secondhand "Walk-Over" type seats in place of the present ones, overhauling and bringing up-to-date as far as possible present McKeen engine, and install three-speed planetary transmission in place of present two-speed transmission at a total expenditure of approximately $12,000. Do you think we should try out one car?

Am satisfied that we should develop some unit reliable and economical in operation to replace steam trains in branch line service wherever possible to meet highway bus competition.

The operation of such units from steam line rails over subsidiary electric property rails to center of cities would overcome terminal advantage the highway buses now enjoy.

Gray

415-22

San Francisco, March 11th, 1924.

Mr. Geo. McCormick:-

We are making an exhaustive study into the curtailment of passenger train service, where trains do not earn operating expenses. In connection therewith, there are a number of Peninsula trains, operating between San Francisco and San Jose and intermediate points, that do not pay for themselves.

In line therewith, am enclosing copy of communication from Mr. Paul Shoup, accompanied by print showing design of motor rail car which it is suggested be acquired to replace steam service between San Francisco and Mayfield.

I am asking Superintendent Worthington to furnish you promptly a report of the average number of passengers handled per day on Trains 152, 153, 160 and 161; also amount of baggage and express, if any, in order to determine whether the Service rail car will provide sufficient accommodations for the patronage.

If it is not deemed advisable to purchase one of the Service rail cars for trial, wish you would give consideration to the alternative of assignment of one of our McKeen motor cars.

A point has been reached in our passenger train operations where we must devise ways and means of eliminating the loss sustained from operation of trains that do not have sufficient patronage to pay operating expenses.

Encl.

(Signed) J. H. DYER

CC - Mr. T. H. Williams,
Mr. F. M. Worthington.

WET:oc

Note - Mr. Worthington:
In supplying the information to Mr. McCormick on number of passengers handled on the trains listed, please also detail to him the manner in which crews operating the foregoing trains may perform any other service within their present tour of duty. In supplementing steam service on certain trains, we, of course, must look to saving in expense thereby through eliminating train and engine crews.

415-22

Feb. 18, 1924.

Office Memo

Statistics of Gas Motor Car Passenger Train Service 1923 show that our gross revenue per motor car miles was (cents) 29.66 against operating expenses of 39.64, so that within two hundreds of a cent we lost ten cents a mile on a distance we ran of over 500,000 motor car miles.

This loss of $50,000 a year is not a pleasant thing to contemplate. It shows the failure of the motor car to accomplish the results we expected of it.

There are six runs on which we lost over $5000 each for the year, namely:

Between	Sacramento	and	Walnut Grove
"	Orland	"	Harrington
"	Reno	"	Hazen
"	Salem	"	Falls City
"	Mill City	"	Albany
"	Silverton	"	Salem

The situation shows the wisdom of setting Mr Small aside from his regular official duties in order to give him a chance to make a close-up and persistent study of some means of operation that will get rid of these losses.

It is obvious we need some vehicle that can be operated for at least one-half the present costs of the McKean car.

Wm. Sproule

cc Mr Shoup
cc Mr Dyer
Mr Parsons

WS-TW

415-22

San Francisco, January 22d, 1924.

Mr. Paul Shoup:-

Referring to your letter of December 29th, relative to making test of Diesel-electric drive in one of our electric motor coaches or one of the new suburban coaches ordered for Peninsula service:

I have had this matter up with General Superintendent of Motive Power McCormick, who reports as follows:

"In reply to your letters of January 2d and 15th, file 415-22, would advise that the new suburban coaches now on order have progressed too far to modify for Diesel-electric drive.

As to equipping a 58-ft. electric motor coach; I do not consider this would be economical. The Diesel-electric arrangement would, in my opinion, require a specially designed car to carry the heavy Diesel-electric machinery.

So far as I am aware, there has not been developed in this country a suitable Diesel-electric drive mechanism for this class of service and it would seem that the first logical step to be taken in this matter would be to select a Diesel engine design, together with the necessary electric generating and drive mechanism for this purpose. It would then be a simple matter to either select a proper car, if we have one, or work out a design suitable for the application of the Diesel-electric mechanism.

After this study is completed we would then be in position to determine whether or not the proposed Diesel-electric car would be more economical than some of the rail motor cars now on the market, built by various concerns, which embody the result of many years of experimental and development work."

Believe we should proceed to obtain all of the detailed information practicable, relative to Diesel-electric drive engines, both in this and foreign countries, with the purpose in view of deciding upon the most

suitable type of engine for a motor car, and then constructing a car that will incorporate not only the preferred type of motor, but also passenger-carrying facilities representative of the highest development to date, both in capacity and comfort for patrons.

Undoubtedly Mr. Small can secure this data, and with the co-operation of Mr. Geo. McCormick and possibly that of Mr. Babcock, we can get the same in shape for consideration, with estimates of costs, etc.

Believe the subject worthy of development along the foregoing lines.

(Signed) J. H. DYER

MET:oc

San Francisco, December 29, 1923.

Mr. J. H. Dyer:

I note from your letter of November 26th, file 415.22, that our Mr. McCormick after further study is satisfied it would be unwise to attempt to fit up one of our McKeen motor cars with a Diesel engine and direct transmission as suggested by Mr. Small, and I presume that he is satisfied that from a mechanical viewpoint it will not operate successfully.

Suggest Mr. McCormick give us an opinion as to the advisability of making a test of Diesel-electric drive in one of our 58 ft. electric motor coaches or in one of the new suburban coaches ordered for the Peninsula service.

Diesel-electric drive has been in successful operation in Sweden and other foreign countries with operating economies of less than one half our present branch line steam service, and a light reduction in costs of operation on our Peninsula service would be very attractive.

Will you ask Mr. McCormick to give us his views and have him call upon Mr. Small if he can be of any assistance.

Jane Shoup

415-22

San Francisco, December 8th, 1923.

Mr. Geo. McCormick:-

It is noted the President has sent you copy of his letter to me of December 4th, on article appearing in the "OIL ENGINE POWER", pertaining to Diesel-electric drive.

As previously advised, we should keep fully abreast of the times, in the development of the Diesel engine, and application of the same to locomotives, motor car and marine equipment.

This brings to mind the recommendation of Mr. F. F. Small of the substitution of Diesel for gasoline engines on one of our motor cars, a subject which I would be pleased to have you keep before our Engineers.

(Signed) J. H. DYER
W. E. T.

Inct JHD

WET:oc

December 4, 1923.

Mr J H Dyer:

You will be interested in reading following editorial entitled "Our Leading Article" from page 538, Oil Engine Power, for November 1923. It deals with the application of Diesel-electric drive to railroad service:

"What is the significance of this remarkable development in Sweden? What benefit can we derive from it?

Let us speak plainly. Our railroads, for no matter what reason, have overlooked a development of prime importance. Their franchises lay upon them the duty of economical operation, and the Diesel-electric system provides one line of economy which they must practice. The people will not stand for higher rates- the next revision will be downward. Economy therefore must - and finally will - prevail.

Prejudice of a misguided - even if sincere - professional character and obstruction of a jealous financial nature will of course impede the adoption of the Diesel-electric car and locomotive in this country. That is to be expected and it must be faced squarely.

Enlightened men, however, are not entirely lacking in the railroad business today, and from them will come the impetus that will usher this most modern type of motive power equipment into the American railroad world.

If we name as an example of the progressive railroad administrative man J. Kruttschnitt, the Chairman of the Executive Board of the Southern Pacific, it is because he has furnished the most striking illustration of impartial, unprejudiced, clear-sighted thinking on the subject of motive power economy that any railroad man has given to the public these last few years.

In selecting the title for his address at the last meeting of the International Railway Fuel Association, he showed his whole thought: "Railway Fuel - A reducible 13% of Operating Expenses." That title gives the key to future development. Small wonder that Mr Kruttschnitt found his way to the Diesel engine and expressed hope that it would be developed for railroad work.

There are other railroad men who think along the same lines. We know them and know their hopes. They may not move at once: they put it up to their engineers and these are afraid to take the direct responsibility.

The first railroad president or chairman who takes the responsibility for the Diesel-electric car away from his engineers and assumes the burden himself is going to be the man who introduces the Diesel-electric system to an American track.

He will not listen to the old wail "It can't be done," but will retort "It has been done." He will give no hearing to the man who says "I spent a small fortune on development and couldn't make the thing go," the obvious rejoinder being "Why talk of the failure you made while others were reaping success?"

The oil engine has won a place in the domain of industry and in the public utilities. It has gained extraordinary success at sea. Who or what can keep it off the railroads?"

W Proule

cc-Mr G.McCormick
Mr F F Small

San Francisco, November 26th, 1923.

Paul Shoup:-

Referring to your letter of October 18th and previous correspondence, relative to Mr. Small's report on rail cars, and to his suggestion that we apply Diesel engine and planetary transmission in one of our McKeen motor cars for trial, also put in service a couple of motor cars with Hall-Scott or Winton marine type gasoline engines:

As to fitting up one of our McKeen motor cars with a Diesel engine; called upon General Superintendent of Motive Power McCormick for his recommendations. Under date of November 2d he states that after further study of this matter, he is still convinced that it would be unwise to attempt to change out the present engine on one of our McKeen motors, and refers to his views upon that feature as quoted in my letter to you of September 17th.

As to purchasing two service rail cars, Mr. McCormick reports as follows:

"Item 2 recommending that we place in service two rail cars with Hall-Scott or Winton marine type gasoline engine. Before the management decides upon the purchase of this equipment, the transportation department should definitely determine the territory where such cars can supplant present steam service by earning sufficient passenger revenue to warrant the investment. Report should be made of the steam equipment that will be displaced, also what would be required of the motor equipment with respect to seating capacity, baggage space, etc.

The Pennsylvania Railroad by modification of a mack truck have produced what is claimed to be a very satisfactory rail motor car. This is described in the Railway Review of October 27th and it would be well to have careful study made of the car in question."

Have been looking into the feasibility of using such design of rail car between Oakland Pier and Stonehurst, as well as on our Valencia Street line, San Francisco. Find that the present steam service on these two lines could not be adequately cared for by motor cars. There are no facilities at Stonehurst for turning of the motor car. On the Valencia Street line it developed that the patronage on the westbound train would be far beyond the capacity of a motor car.

It is my suggestion that Mr. Small, if he has not already done

so, look into the rail motor car used by the Pennsylvania Railroad, to which reference is made by Mr. McCormick.

If Mr. Small, in consultation with our Traffic and Operating officers, can find some service in which the recommended design of car can be used, and a sufficient return secured on the investment to justify acquirement of two of the rail motor cars, I would be agreeable to further consideration being given to their use.

(Signed) J. M. DYE

MJT:oc

San Francisco, September 17th, 1923.

Mr. Paul Shoup:-

Referring to your letter of August 15th, with further reference to the question of substituting Diesel engine for the present gasoline type of engine in one of our old McKeen motor cars:

Am quoting below from report of General Superintendent of Motive Power McCormick, after the various phases of the situation were presented to him and his consideration thereof requested:

"Your personal Sept. 12th, file 415-22, having reference to previous correspondence covering suggestion that we spend $21,300 on one of our old McKeen motor cars by substituting Diesel engine for the present gasoline type of engine.

I have gone into all phases of the proposition and am sure we would make a mistake in spending this amount of money experimenting along the lines suggested.

Appreciate our executives are interested in developing a type of vehicle that can be operated on branch lines in competition with motor buses; however, if it is up to me to approve the expenditure of above amount for merely changing out the engine in one of our McKeen motor cars on the theory that we will obtain more desirable service at less expense for maintenance and operation, I cannot see my way clear to concur in Mr. Small's recommendation; therefore, as outlined in concluding paragraph of your letter September 12th, I believe that some other solution of the problem is essential, and doubtless Mr. Small will devote his energies in this direction."

WET:oc

#15-22

San Francisco, August 15, 1923.

Mr. J. H. Dyer:

Yours of the 9th, proposed conversion McKeen Motor Cars:

Mr. Small advises that there are no motor cars equipped with Diesel engines in this country at present, but that there are several in Sweden, Switzerland and Germany, one of which Mr. Kruttschnitt mentions in his article on fuel conservation and the Railway Age, May 20th, 1922 issue, page 1183, also describes one. These are all electric drive and in that respect differ from the recommended design which is a simple planetary transmission and, excepting size, is the same as used by all Ford autos.

Suggest Mr. McCormick investigate the service performed by Diesel engines in tug boat service around the bay, also the planetary reverse gear used in these boats which is a modified form of the planetary reduction gear recommended. The work performed in marine service should enable him to form a conclusion as to results we can anticipate from similar installation in motor cars and will be glad to have his judgment as to the mechanical features involved at your convenience.

It is not intended that any large sum be expended for experimental purposes. If for any unforseen reason the design should not prove successful the engine can be used in the M. of W. or Steamer Dept. and our losses will be represented by the cost of the planetary transmission and alterations in truck, all of which should not exceed six thousand dollars.

I am satisfied that whatever improvements are made in Rail Cars will have to come from the Railway Companies and not the car builders and after all the expense of such developments will have to be borne by the Railways and it will be cheaper to handle the work directly. Certainly the operating economies possible thru the use of a properly designed motor rail car seem to justify the expenditure of more than the amount involved.

Paul Shoup

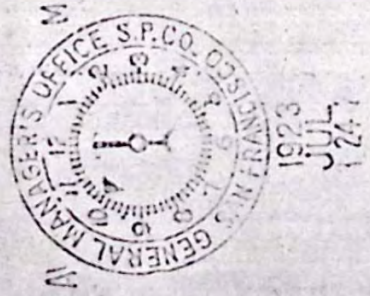
M.P.33-152

SOUTHERN PACIFIC COMPANY
Pacific System

DELAYS TO GASOLINE MOTOR CARS DUE TO MOTOR FAILURES
Month of June, 1923.

Motor Number	Motor Car Mileage	Miles Run Per Failure	Cause of Failure			
			TOTAL	Machinery	Air Brake	Hot Bearing
15	--	--	--	--	--	--
25	--	--	--	--	--	--
27	2,518	--	--	--	---	--
29	2,511	--	--	--	--	--
31	2,552	--	--	--	--	--
37	3,422	--	--	--	--	--
39	4,628	--	--	--	--	--
41	--	--	--	--	--	--
43	4,038	--	--	--	--	--
45	2,096	--	--	--	--	--
47	4,461	--	--	--	--	--
49	1,827	1,827	1	1	--	--
51	--	--	--	--	--	--
53	292	--	--	--	--	--
55	2,242	--	--	--	--	--
57	3,637	--	--	--	--	--
61	1,730	--	--	--	--	--
63	--	--	--	--	--	--
65	3,019	--	--	--	--	--
67	4,496	--	--	--	--	--
TOTAL	43,469	43,469	1	1	--	--
Prev.Month	47,247	47,247	1	1	--	--
Last Year	40,271	40,271	1	1	--	--

Office Genl.Supt.Motive Power,
San Francisco, July 23rd, 1923.



COPY

File 416.1

June 23, 1923.

Mr. Shoup:

RECONSTRUCTION McKeen MOTOR CARS:

There seems to be some difference of opinion as to the service performed by the present McKeen motor cars:

It is argued by some that these cars in their present condition are giving service equal to that performed by branch line locomotives at a reasonable cost, therefore are functioning as well as can be expected and should not be changed.

Others claim that these cars should be taken out of service entirely as they are now and have been in the past so unreliable in operation that instead of developing business they have actually been the means of driving business to other channels.

The March records indicate a fine improvement in performance of the McKeen motor cars, but the net revenue continues to fall off, and from my observation of the operation of these cars I believe some action should be taken at this time to put them in such a condition mechanically that there will be no question as to their reliable operation in service. In my opinion this can be accomplished only by renewing engine and changing the method of transmitting power from engine to wheels.

The engines and transmissions do not conform to modern design and practice and are worn out, and I do not think we are justified in spending any money in overhauling either the engine or transmission as they cannot be made to function with the degree of reliability and economy essential to the building up of suburban or interurban business or the handling of business to and from main line connections.

Considering the design of the engines and transmissions, great credit is due the Mechanical Department for keeping these cars in service with the showing they have made, particularly the record of the past three months. 33 11 15

This Company owns thirty McKeen motor cars, eleven of which have been retired. ✓ These cars cost onan average of $11,686 for the bodies and truck, and $8,302 for the engines. The average depreciated value at present is:- bodies and trucks $5890 and engine $4069. I estimate the reproduction value of one of these cars bodies at $22,000. The engines represent a loss equal to the present book value of $4069 less the scrap value which is nominal.

These bodies closely conform to the most modern design of single-end operated suburban electric passenger cars, excepting the seats which should be reupholstered or new ones applied, and when overhauled these bodies will be as good as new. It is a fact that the passengers have always liked the arrangement of the McKeen motor car body.

I do not consider the slight increase in weight of these bodies over a body of more modern design to be an objection.

48% of our local steam passenger trains do not earn net revenue on basis of 79.27¢ per train mile system average for March.

Most of these runs could be handled satisfactorily with McKeen cars and cut the cost of operation per train mile in half providing we had enough cars to do so, and if we can get the eleven retired cars back in service it will help the situation, therefore, I would suggest that we take one of these retired cars, overhaul and lengthen the body, re-upholster or change the seats, alter the driving truck and install a Diesel engine with planetary transmission at an estimated cost of:

Diesel engine	$14,300
Transmission	2,850
Cost of Installing	2,850
Cost to Lengthen Car Body	1,300
Total	$21,300

The arrangement of Diesel engine and planetary transmission is shown on prints Nos. 1619, 1620 and 1621, and for your information will say that the change consists principally in placing the engine in the truck parallel with instead of at right angles to the center line of car which replaces all of the present complicated driving mechanism with a simple transmission with bevel gear and pinion drive on rear axle of truck which is exactly the same principle as the driving mechanism of the Ford automobile excepting it is larger and has no reverse gear, the reversing being handled by engine.

The expected economies in operation are:

	Cents per Car Mile Present Car	Proposed Car
Running Repairs	6.62	3.0
Fuel	7.22	0.6
Motormen	7.51	7.51
Trainmen	11.79	11.79
Other Expenses	3.68	3.68
Shop Repairs	5.47	3.0
Accident Repairs	.43	.43
Total all Expenses	42.72	30.01

Total Saving per Mile - - - - - -12.71

On basis of operating 79 miles per day, this represents a saving of $3,664 per year or the interest on $61,000 at 6%. These figures are conservative and I believe that we will make a better showin than indicated.

If for some unforeseen reason this engine should not work out

satisfactorily, we are only out the cost of remodeling the truck and the cost of transmission as the engine can be used for some other purpose in the M. of W. or Steamer Department.

On the other hand if this arrangement works successfully, and I think it will, it can then be applied to our O.A.& B. type of interurban car body or to the new type 72 ft. passenger cars now being built for the peninsula service and operated between San Francisco and San Jose as single cars on frequent headway schedule between the heavy peak load hours morning and evening.

All rail cars should be painted a bright red color the same as our interurban electric lines.

In a separate report I am giving you the full result of my investigations of other rail cars.

(Sgd) Fred F Small

cc Mr Geo McCormick

Southern Pacific Company,
Executive Committee,
April 19, 1923.

In connection with McKeen Gasolene Motor Cars, and trailers, owned by Arizona Eastern Railroad Co., and standing on its books as of June, 1922, on the basis of original cost, less depreciation, at valuations as follows:

Car No. 1	$12,320.89
Car No. 2	12,320.91
Car No. 3	14,644.93
Car No. 4	11,613.02
Car FCdeS No. 50	9,283.99
Trailer T-1	2,513.52
Trailer T-2	2,513.51;

CC to
Chmn.
Cont.
Pres.(2)

the Chairman stated that he concurred with President Titcomb of said Railroad Company in recommending that the sale of all or any part of the above mentioned equipment, on terms not to be substantially less advantageous than a reduction of 25% of the depreciated book value thereof, as above listed, be approved by this Company as a holder of stock in said Arizona Eastern Railroad Company.

Whereupon, on motion duly seconded, it was unanimously

RESOLVED, That the Chairman's recommendation is hereby approved.

A TRUE COPY

Attest: Hugh Neill
Secretary

415-22 415-22
Sacramento, March 2, 1931.

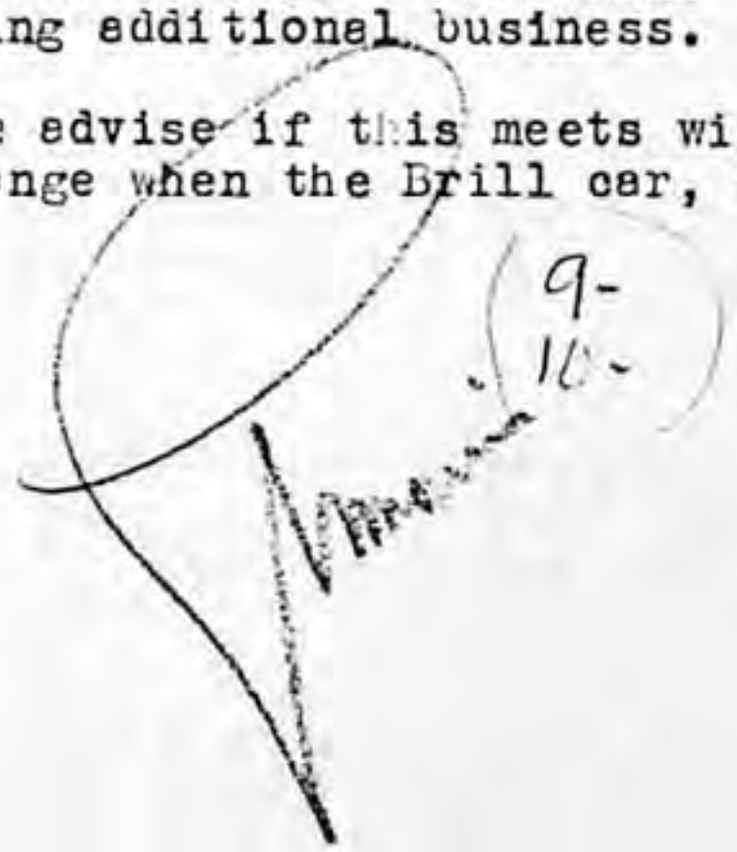
Mr. F.L.Burckhalter:

Now that it has been decided that Trains 31 and 32 on the Portland Division will be discontinued, we will have available for permanent assignment a Brill motor car which is now at Sacramento undergoing repairs.

At the present time the Sacramento Division has assigned for its use to handle Trains 53 and 54 and 42 and 41 one of the small 400 h.p. gas-electric cars and one of the 600 h.p. Brill cars. The 400 h.p. car is not large enough to make the schedules on trains 41 and 42 with combination car and coach, and in order to handle these runs successfully day in and day out from now on, account Express business increasing, we should have two of the 600 h.p. gas-electric cars assigned to these runs. Therefore, when the 600 h.p. car that was recently sent to the Stockton and San Joaquin Divisions for service relieving similar car that required shop attention, is released, recommend this car be assigned to the Sacramento Division. This will release the 400 h.p. gas-electric car and I strongly recommend this car be kept on the Sacramento Division and operated on Trains 47 and 48 between Sacramento and Chico in place of the McKeen motor car that is operating on this run. The operation of these three cars on Trains 53-54, 41-42 and 47-48 on the Sacramento Division will give an average mileage of 6896 miles per month per motor or an average of about 230 miles per day. The extra gas-electric car placed in this pool of runs will many times avoid the necessity of operating steam train, which is necessary under present arrangement when one of the gas electric cars has to be held off run for repairs. This extra expense can, in many cases, be eliminated by doubling one of the other two cars, if there are three cars in the pool.

While the McKeen car that has been operating on 47 and 48 has been maintaining schedule, the car itself is not at all suitable to handle the traffic that patronizes this high class train. The lighting of the car is poor, does not ride comfortably and has only limited seating capacity, which makes it necessary to operate a steam train at times, which could be avoided if the small gas-electric car was placed on this run, as this car will handle two additional coaches.

At last time-table meeting the Passenger Department insisted upon keeping on this connection for competitive reasons, and inasmuch as it has been decided this will be done, I think we should go all the way and furnish the better service on this connection. In this regard we may be instrumental in attracting additional business.

Will you please advise if this meets with your approval, and if so, we will make the change when the Brill car, which is now in shops is turned out.

cc—Mr. R. L. Ruby