

## **Rebuilding VR 41 to a Modern Serviceable Condition**

### **Craig Tooke – MTPA**

When Tony Smith the General Manager of the MTPA first floated the idea of restoring VR41 back to an operating condition there were those of us on the museum Board that either thought he had gone completely mad because of his long hours working as a train driver or that he was playing a joke on us all.

The thought of a small tram museum such as ours taking on a project the size of the restoration of VR41 was to many a pipe dream.

Was it really a pipe dream or could we turn it into reality ?



The decision was taken yes we could do the restoration but what about all of the parts and equipment that was needed to complete the task ?

Foresight on the part of a number of our early members had seen the necessary parts and components obtained when they were still readily available in the late 1970's.

The principle source of parts were VR 37 and MMTB L Class 105.

From VR37 we were able to obtain necessary body components such as the saloon bulkheads and window frames.



From L105 which we obtained minus traction motors and air compressor we obtained most of the necessary electrical and mechanical components



The question then arose we were going to restore this tram but back to what condition and how authentically ?

Any tram restoration is in essence really only at best a recreation for I put the proposition that it is very rare almost never that work such as this does not see the use of new material and as such technically really only a recreation.

The decision was made to take the tram back to as near as possible to it's original as built condition.

Because of the sheer size of the project work was commenced and a commercial partnership established with the Bendigo Trust to undertake most of the body work.



Following a series of meetings and conversation a risk analysis of the project was carried out.

For those who are not familiar with a risk analysis each task is analyzed the risks identified and assigned a rating around the likelihood of a problem occurring and the result of the problem occurring.

From this a number of key areas were identified specifically in relation to the future ongoing operation of the tram and they included;

- The need to replace the manual circuit breakers inside the drivers cabin
- The use of modern wiring
- Fitting self lapping brake valves to the tram
- The use of safety glass

Care was also exercised not to dismiss some of the engineering features that were built into the tram by the Victorian Railways.

It is fair to say that no one tram building organization has all the best ideas that are available in their trams and this was the case with the Victorian Railways.

For example their design of lifeguard system was far superior.



So then what did we incorporate to bring the tram up to a modern serviceable condition ?

Firstly the manual cab mounted circuit breakers which were identified as being a hazard to the tram driver if they operated. We changed the electrical control system by fitting a line breaker whilst utilizing the manual circuit breakers as line breaker control switches and incorporating control fuses mounted in of all places the area originally set aside for the tram crews to store their lunch and spare tickets.





For the wiring in the tram use was made of Radox cable which has the features that it has a rating of 125 degrees Celsius and secondly if it does catch on fire it does not give off toxic fumes which happens when normally PVC insulated cable

catches on fire. Use was also made of modern PVC conduit and wooden cable toughing.



When built the trams were fitted with an emergency air tap that when operated allowed the conductor to apply the brakes in the event of the driver becoming unable to.

This system worked on the principle that once the brakes were applied to the wheels if the controller was in any notch the current would drastically rise because of the added mechanical load of the brake shoes on the wheel tread.

Although perhaps satisfactory in the 1920's when there was little other road traffic about we took the opportunity of fitting an additional control switch under one of the saloon seats that when operated interrupts the line breaker control circuit causing the line breaker to instantly open.



External mirrors were also fitted to both sides of the drivers cabs which whilst enhancing safety also allowed for the tram to look far more even in appearance than when only one mirror was fitted.

Although not authentic it is in the day a virtual modern requirement.







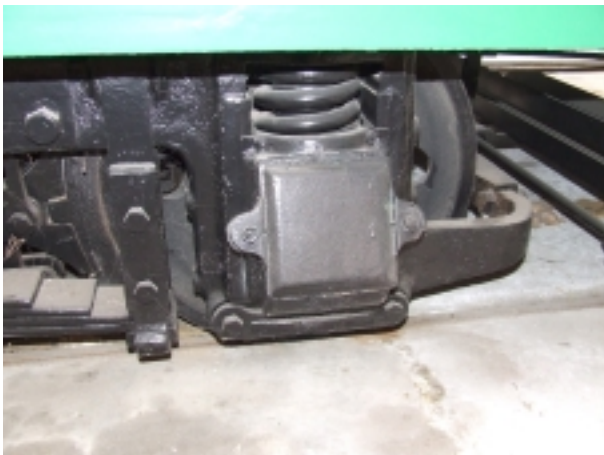
Another differences that were carried out included the fitting of standard ex Melbourne trolley poles fitted with carbon collector skids.





As I mentioned earlier in this paper no one tram building company incorporates every possible best idea into their design.

An example of this is the axle box covers on the Brill 77E trucks. We have been able to utilize the standard MMTB covers and incorporate specially cut steel to allow them to give the appearance of the original axle box covers.



Another example is the headlights which were originally fitted with two cast metal bars which the idea was to prevent stones from hitting the lens and breaking it.

These bars made cleaning the lens difficult and were removed very quickly once the trams were in regular service. With careful work and pictures found in a General Electric catalogue we have been able to reproduce them.



## **Conclusion**

A major restoration project such as VR 41 presents many challenges but it also presents numerous opportunities.

We live in a modern era, what may have been acceptable in the 1920's may and I emphasize may not be acceptable today, or then again it may be acceptable in this day and age.

I will leave you with some key points from our experience restoring VR41;

- When commencing a restoration always do a risk analysis and identify things that can be improved or need improving
- Remember any restoration is in most instances a recreation
- Projects such as this can only be successfully completed through careful planning and forming partnerships
- Do not be afraid of modern technology. A balance is needed here do not use modern technology for the sake of it and sacrifice historic merit or appearance
- And finally remember the 11<sup>th</sup> commandment – Keep thy rail regulator happy !

Would we do it all again ?

Certainly but in hindsight perhaps slightly differently again.

In closing I want to pay tribute to Tony Smith, Lindsay Bounds, John Withers, Arthur Ireland, Kym Smith along with myself who were instrumental along with the staff of the Bendigo Tramways in seeing this project through to completion.

I look forward to everyone enjoying a ride on VR41 on Sunday at Haddon and please feel free to discuss any further issues relating to the restoration throughout the Conference.