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MINUTES

OF

2ND ANNUAL CONFERENCE

MAY 1 AND 2, 1952.

MINUTES OF TRAMWAY MAINTENANCE CONFERENCE HELD ON THURSDAY AND FRIDAY, 1ST AND 2ND MAY, 1952, AT CONFERENCE ROOM, ELECTRICITY SUPPLY DEPARTMENT BUILDING, 238 FLINDERS STREET, MELBOURNE.

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Departmental Tramways Supt.
Manager, Ballarat Branch
Works Supt., Ballarat
Manager, Bendigo Branch
Works Supt., Bendigo
Manager, Geelong Branch
Works Supt., Geelong
Supplies & Transport Officer

After opening the conference, the Chairman advised that, as a result of a Branch request, a visit to one of the Melbourne & Metropolitan Tramways Board workshops and running depots would be arranged at a later date, as there was insufficient time for an inspection of this nature during the present conference.

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Item 1 (A - I) was a resume of outstanding items from the 1951 conference, action taken to date, results, and further discussion where desired. The item also covered additional relative topics.

ITEM 1.A TYRES AND WHEEL CENTRES.

(1) Bulk supply.

ACTION REQUESTED AT 1951 CONFERENCE:

To be the subject of further correspondence. After thorough perusal of drawings supplied and a survey of wheel centres, Branches to advise Works Division of the possibility of adopting M. & M.T.B. tyres, and to give the average annual usage.

REMARKS:

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Works Division stated that all Branches had advised that tyres to M. & M.T.B. standards would be acceptable, and estimated average annual usages were notified as requested.

However, another difficulty has arisen to prevent a bulk order being placed in that the condition of tyres requested by each Branch differs - Bendigo require rough-turned all over, Ballarat unmachined all over, and Geelong machined internally. To allow a bulk order to be placed on Thompsons, some uniformity in relation to machining also will need to be obtained. It is understood that Thompsons rough-turn for the M. & M.T.B. to 3/16" on all diameters, and it was suggested that the Commission also accept tyres in this condition. Latest advice from Thompsons was that the "rolled" size shown on the tyre drawing submitted to the conference last year was not definite, and more metal usually is available than the drawing indicated.

Bendigo stated that they could adopt types in a condition suitable to Thompsons, although the Bendigo lathe is not very satisfactory for heavy work.

Ballarat had requested tyres unmachined as there appeared to be barely enough metal in the finished "rolled" size to give the desired final diameter. However, if the "roughturned" size from Thompsons left no less metal than the "rolled" size shown on the drawing, the wheels would be suitable to that Branch.

Geelong also would accept tyres to within 3/16" diameters, but it again was stressed as at the previous conterence that such would mean an increase of turning on their already overloaded, badly worn, obsolete lathe. In this regard Works Division advised that inquiries for a suitable lathe, new or secondhand, already had been initiated.

ACTION:

Works Division to place a bulk order for tyres on Thompsons, specifying that rough-turning be carried out leaving 3/16" on all diameters.

ITEM 1.A. TYRES AND WHEEL CENTRES

(2) Tools found most suitable for turning tyres.

ACTION REQUESTED AT 1951 CONFERENCE:

Works Division to make inquiries regarding the type of tool mentioned by Geelong.

REMARKS:

A tool similar to that suggested, and as used by Thompsons at Castlemaine, was manufactured and tried at Richmond. This tool was made on the principle of that used at Thompsons but it was not until very recently that the exact details of the Thompson tool were obtained. However, the tool used at Richmond has given quite good results on cast steel, and from the limited trials does not dull as quickly as tipped tools and appears to have possibilities.

It was suggested that it be tried at a Branch, although its diameter would limit the application to facing and roughturning. The tool actually used by Thompsons is of smaller diameter and probably would give still better results. Another tool based on the sample from Thompsons can be manufactured if desired.

As the lathe at Ballarat recently has been reconditioned it was decided to send the tool to that Branch for trial and a report on its use.

Geelong stated that they had had no experience in the use of tools of special design for the turning of tyres, and they had never found an entirely satisfactory high speed tool steel for tram tyre turning. It was considered that this was not so much the fault of the steel as of the condition and design of the obsolete lathe.

Some tool steels had given reasonable satisfaction for the initial turning but were unsuitable for the re-turning of tyres which have been work-hardened and spot-hardened as a result of skidding on wet days. Best results have been obtained from the English Steel Corporation's Super Cyclone quality which has the following analysis:-

.77	-	.85
4.0	-	4.75
1.0	-	1.5
21.0	-	22.0
11.5	-	12.5
.3	-	.4
	.77 4.0 1.0 21.0 11.5 .3	.77 - 4.0 - 1.0 - 21.0 - 11.5 - .3 -

Recently a batch of T.E.C. high speed steel 18% tungsten was received, but it is not giving as good a performance as the Super Cyclone.

A circular tool working on a cam principle which would be suitable for cutting into corners was suggested by Geelong.

Bendigo still use "Ultra Capital" for turning new tyres, and since October 1951 have been using "Ultra Capital Plus 1" on used work-hardened tyres. Considering the condition of the wheel-turning lathe this tool steel is of noticeable improvement.

The Bendigo wheel-turning lathe was erroneously reported at the previous conference as being suitable, mainly because there had not been any complaint from the workshop, but, on discussion of this feature with the Workshop Foreman after the conference, a report on machine tools was prepared which concerned the wheelturning lathe as follows:-

"This machine is not actually a wheel lathe but is a 20" centre engine lathe and is not satisfactory for wheel turning. The main trouble lies in the saddle which is too light in construction and has too much overhang at the front. When taking a heavy cut, chatter is so bad that it is necessary to place a bottle jack under the saddle and use the top slide as a hand feed. The tail stock is also of light construction. A significant feature of this lathe is that the original head stock has been replaced by a steel fabrication. This suggests that the original head was of similar light construction to the saddle and tail stock and had to be replaced for that reason."

ACTION:

Ballarat to take tool manufactured by Works Division for trial and to report on results.

ITEM 1.A. TYRES AND WHEEL CENTRES.

(3) Minimum dimensions of type flanges for safe operation.

REMARKS:

Geelong submitted this item in an endeavour to obtain information in regard to what should be the minimum dimensions of tyre flanges for safe working conditions, so that, subsequently, tyre defect gauges can be manufactured and supplied to Branches where they do not now exist. Rapid periodical tests of tyre wear then can be effected.

Because of a lack of definite knowledge in this regard, and in order to obtain increased tyre mileage, there has been a tendency to permit operation of tramcars with tyres which should have been re-turned, ground or rejected.

Gauges for the measurement of tyre thickness and the amount of coning of the tread are in use in Geelong, but no "defective" flange gauge is used, it being left to visual observation to determine when a tyre needs attention.

The manufacture of gauges is a simple operation once a standard has been determined, and some standard should be set in regard to minimum width and minimum height of flanges.

Bendigo stated that the British Standard Spec. No. 101-1929, gives dimensions of a new flange as approximately 9/16"high by 3/4" wide, but no mention is made of any minimum safe operating dimensions. Bendigo practice has been to re-flange the tyres down to a minimum tread thickness of 1-3/8" with approximately $3/8" \times 3/8"$ flange before scrapping. It is felt that in giving consideration to a minimum dimension for flanges the condition of the track should be a deciding influence.

Ballarat remarked that the extent to which tyres are run in that Branch depends on the profile of the flange, that is whether it is pointed or of reasonably level dimensions. Ballarat considered that in the light of their experience 1-3/8"for tread thickness was wasteful as they had never experienced any evidence of trouble down as thin as 1".

Departmental Tramways Superintendent considered that in the past tyres often were run until they would not work -3/8" height of flange is the minimum, and if tyres are run to the limit the track suffers in consequence. It also depends on the seasonal conditions. A tyre can be run to 3/4" thick in winter but not less than 1" in summer.

Geelong also were of the opinion that there had been a tendency to run tyres past the stage of safe dimensions in an endeavour to get increased mileage. However it is now desired to set a standard and make certain that the depot foreman adheres to it both in connection with thickness of tyre and width and height of flange.

If the depot man is the first person that notices

something wrong with the tyre then he should be provided with a simple method of checking, and it is desired to provide him with a gauge to show whether or not the tyre is satisfactory: therefore Works Division considered it best that, as a matter of guidance, the M. & M.T.B. should be contacted to ascertain their practice.

ACTION:

ity

Works Division to ascertain M. & M.T.B. practice in relation to minimum dimensions of tyre thickness and flange width and height, and to communicate this information to Branches together with suggested minimum sizes for the provincial city tramways.

ITEM 1.B. TRUCK MAINTENANCE.

ACTION REQUESTED AT 1951 CONFERENCE:

Works Manager to take up with Industrial Oificer the question of definition of duties of shedmen, etc.

REMARKS:

This now comes under the heading of "Employees' Duties", refer Item 4.A, Page 31.

ITEM 1.C. TRACKS.

(1) Points and crossings.

ACTION REQUESTED AT 1951 CONFERENCE:

Drawings of special work requirements to be forwarded to Works Division by each Branch. Ballarat to send copy of special crossing repair drawing to Geelong, Bendigo and Works Division.

REMARKS :

Works Division queried how far the Branches had proceeded with this matter.

As there would be an enormous amount of work involved in preparing drawings of the various "special" works requiring replacement during say the next five years, then a schedule giving all details should be sufficient in lieu of full drawings. This suggestion was made by Geelong and certainly appears to be a reasonable one. As new manganese castings probably would be difficult to obtain, it was considered that all future replacements possibly could be fabricated from standard rail sections. In this regard, Thompsons of Castlemaine had verbally advised their ability to hendle small numbers of special works in the shop continually employed on similar work for the Railways. Thompsons construct points and crossings from key dimensions and drawings would not need to be provided by the Commission.

Thompsons did indicate that they were very keen to avoid manganese steel castings or anything in connection with manganese steel.

It now is desired to ascertain the number of points and crossings that must be replaced in the Branches during the next few years; also it is desired to hear opinions on the possibility of adopting the Railway type points and crossings.

Ballarat were extremely doubtful as to the possibility of using the plain Railway type point for replacement in tramway tracks. The problem is that of boxing in on both sides, having it all below ground level, and providing for the paving around it. Geelong queried the possibility, apart from switches, of all special work being fabricated out of standard rail in the Branches, but it was pointed out that at the last conference Branches stated they would prefer not to do fabrication because of other work in hand.

As at the last conference, Geelong stated that there were four alternative methods for special work treatment :-

(a) Building up by welding,

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- (b) Welding a steel strip to the head or check,
- (c) Fabrication of special work from grooved rail,
- (d) Replacement with new manganese casting.

Repair of special work has continued in Geelong by welding, using mainly E.M.F. "Austerods" which have been quite satisfac-"Murex Austex B.59" electrodes also have been tried, tory. these being unusual in so far that they have a mild steel core and the chromium, nickel and molybdenum are included in a powder form in the flux. The latter electrodes also have been satisfactory.

At the last conference, Geelong reported that method (b) had been tried where large "build-ups" to the head and checks of special works were required. A recent inspection has revealed that approximately 80% of this work is still in a satisfactory condition. Hardened spring steel used for ramping to the "build-ups" is unsatisfactory. Spring steel in the annealed state is better than mild steel which seems to vary considerably.

In connection with alternatives (c) and (d), it is considered the position has not yet been reached in Geelong where either or both of these alternatives is necessary. Since the last conference an inventory of all special work has been compiled, and although a survey of the actual condition of that work has not been completed, it is considered that there will be no major requirements in Geelong for the next twelve months.

Bendigo advised that there were 49 pairs of switch mates and blades and 48 crossings in their system, and of these it was considered that the following possibly will require attention during the next twelve months:-

- 1 8'3" crossing
- 1 13' mate 1 12'6" switch mate and crossing
 - 2 9' switches
 - 2 8'6" crossings.

However, further consideration must be given before recommending whether building up or complete replacement will be necessary.

Ballarat have not yet prepared a complete statement of requirements as it is their opinion that it would be necessary to take a very detailed check of everything. These are many positions that are limited, where the length of the special work cannot be increased or shortened and an absclute replica of the existing piece will be required. A complete survey of the system has been commenced in order to ascertain the minimum number of types of pieces that would be required. At present it appears that there would be no great difficulty in keeping the Ballarat system running for another five years, but in the five years following that replacements definitely will be required. Three crossings now have been fabricated in Ballarat, and there is no reason why fabricated points could not be developed. The greatest problem at present is spare blades for existing points, and if the system is to run for some years hence replacement of The the worst of these as soon as possible is desirable.

Works Division replied that maintenance can only be based on the assumption that tramway systems are to continue indefinitely.

In view of this, Ballarat considered it desirable that everybody concerned complete a survey as soon as possible in order to ascertain to what extent existing special work could be replaced to some set standards, thus minimising the number of variations required. As it is somewhat difficult to identify patterns against existing switch blades, Ballarat requested Vorks Division to prepare a sketch of all switch blade patterns available.

ACTION:

Works Division to prepare a drawing showing all switch blade patterns available.

All Branches to make a survey of special works to ascertain requirements over the next five years.

ITEM 1.C. TRACKS.

(2) Oiling and maintenance.

ACTION REQUESTED AT 1951 CONFERENCE:

Vorks Division to advise Branches concerning lanoline base oils available.

REMARKS:

Works Division stated that samples of lubricants were sent to each Branch in September, 1951, together with a covering letter and report after preliminary tests had been carried out at Richmond. Ballarat subsequently requested an additional sample of "Caltex Vega OO" as they found that this had possibilities of a good all-round lubricant, that is, it would remain in position after heavy rain and yet collect little dust. This confirmed the experimental results at Richmond. However, the cost of this lubricant is high compared with the 5% "Crater Compound" in sump oil as used at Ballarat, and its general use probably would not be warranted. (Actual cost comparison given in Bendigo's remarks.)

Reports from the three Branches in connection with their experiments were as follows:-

Geelong:

Frequency of oiling	:	Points - weekly. Curved rails - twice weekly.
Material used		Points - engine oil. Curved rails - sump oil, graphite and "Crater Compound."

"Prior to the last conference we were oiling with a mixture of sump oil and graphite and on the advice of Ballarat are now adding approximately 5% "Crater Compound" to this mixture with beneficial effect. Regarding the tests that have been conducted on the four samples submitted, the results have been very inconclusive, mainly because of the limited samples supplied, the method of test, and weather variability. Generally, it can be said that the greases were too difficult to apply and that those samples which have a graphite base were superior, because there was evidence after rain that some of the vehicle had disappeared but the graphite remained. None of the samples tested seemed to have any superior qualities over our present mixture and we are satisfied to continue with its use. Sunday work for track cleaners has been eliminated since the last conference."

Bendigo:

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Frequency of oiling : Tracks are oiled five days a week only, four main points are oiled daily, the remainder of the curves and points approximately on alternate days.

"On information imparted by Ballarat at the last conference that "On information imparted by Ballarat at the last conference that a 5% "Crater Compound" mixed with sump oil had been found satis-factory, we tested the samples supplied and included a sample of sump oil with "Crater Compound." The tests were carried out during October and November, 1951, giving both wet and dry con-ditions as then prevailing in Bendigo. It was found that the "Caltex Lubricant No. 1 (curved rail)" and the "Caltex Vega 00" indicated that they would dry out on the rail and powder. The "Shell Regraph" was too thick to apply continually and the "Golden Fleece Point Oil B" did not adhere to the side of the The rail with increase in temperature but dropped to the bottom of the groove. Samples of sump oil with 5%, 10% and 15% of "Crater Compound Grease No. 5" added, were tried, and the combi-nation of 10% "Crater" was found to be most suitable and since then has been used on the track. The 5% "Crater" sample was too then has been used on the track. The 5% "Crater" sample was thin and the 15% became subsequently too dry. The cheapest sample submitted, i.e. "Caltex Vega 00" at 3-5/8d. per lb. is much dearer than sump oil at 4d. per gallon and "Crater No. 5" at 7/4d. per lb., comparison being 3-5/8d. per lb. "Caltex" and approximately 1-1/8d. per lb. sump oil and "Crater." Tests also were carried out by fitting strips of felt saturated with oil in the groove at each end of curve to coat flanges first. This was found to be satisfactory but our need has not made it necessary for this method to be extended.

Ballarat:

Frequency of oiling : Curved rails - alternate days, some may go three days. Th without difficulty. The weekend is spanned

"Tests were made on three greases under the weather conditions existing in October last year. All three greases gave evidence of remaining a longer time. "Vega 00" was the most effective, but it was more difficult to apply than the oils. Further tests on a larger scale were made with "Vega 00" grease during summer conditions. These were less effective as it ran off the base and collected in the groove. If a condition existed or arose where it would be necessary to have the maximum length of time between lubrication, there would be a definite advantage in the grease. At present we cannot economise in manpower, and unless some mechanical application could be evolved the difficulties would be appreciable and consequently there would be no ultimate advantage in its use. In summer we slightly increase the 5% of "Crater Compound"; our application varies between 10% in summer and 5% in winter, which confirms Bendigo's findings."

Geelong and Bendigo expressed thanks to Mr. Mounter of Ballarat for having recommended the sump oil and "Crater Compound" mixture which has proved of great assistance.

ACTION: Nil.

ITEM 1.C. TRACKS.

(3) Tram rail stock.

REMARKS:

Bendigo introduced this item to determine whether either of the other two Branches intend to order new rail in the near future. The present stock of new rail in Bendigo is:-

80 lb. B.H.P. "T" rail - 1 only 45 ft. length.

It is considered that requirements during the next twelve months

can be satisfied by either sole plating the ball of 750 ft. of "Lorain" rail or replacing same with new rail. Reference was made to a report from the Branch Manager to Engineer and Manager dated 28th April, 1948, wherein it was stated that the track condition was fairly good, but indicated that 28,200 ft. of rail would be required to operate the trams for another 15 years, four years of which have now passed. Bendigo intend to extend the type of work carried cut during the past twelve months, that is of transferring 35 lb. check rail from locations where wear is evident, particularly on curves, and replacing it with check from other portions of the same track. Use of this type of rail, that is "T" rail with independent check, cffers this adventage over the grooved rail.

Bendigo also queried whether rail stocks could be held in some central store to eliminate the necessity for each Branch to carry substantial stocks.

In Geelong the stocks are:-

96	16.	grooved rail	789-1/2	feet
90	1b.	grooved rail	S.H. 77	feet
80	1b.	"T" rail S.H	1. 78-2/3	feet

Due to the limited amount of stock Geelong have been reluctant about replacement of rail, and although no survey has been made there is a fair amount of rail that requires replacement, particularly in regard to curves.

Ballarat stocks are:-

96 lb. grooved rail, approximately 1,000 feet.

This rail was obtained specifically for replacement, but the work was never carried out due to lack of labour. However, it probably will be used to replace the most worn sections of curves in the next few years. Therefore, there is enough rail in Ballarat to meet immediate requirements and no further stocks will be required for three or four years

From discussions, Works Division considered that each Branch should review possible rail replacements, say for a fiveyear period. The possibility of a bulk order will have to be taken up, also whether or not it should be stored centrally. The poundage and type of rail to be sought, that is "T" or grooved, also will require investigation as there are many types of rails existing between the Branches.

Geelong stated that, apart from crossings, "T" rail without any check at all is being used and in some cases without concrete blocks.

The type and size of rail in use at Yallourn was queried by Bendigo, and the Supplies & Transport Officer agreed to ascertain details in this regard, also from whom it is purchased and where it is stored.

Until new stocks of rails are obtained, any urgent replacements will be a matter of movement of stock between Branches.

ACTION:

them.

Branches to review rail requirements for a period of five years in order that Works Division can ascertain the possibility of placing a bulk order.

Supplies & Transport Officer to ascertain what size and type of rail is being used at Yallourn, from whom it is purchased and where it is stored.

ITEM 1.C. TRACKS.

(4) Periodicity of major overhauls.

REMARKS:

1 miles

Geelong desired to bring to the attention of the conference the fact that they were not satisfied with the progress being made in regard to maintenance of tracks, and that for some years to come track maintenance costs of that system would be high. As a comparison, Geelong stated that last year Bendigo Branch replaced only seven sleepers whereas 303 had been replaced in Geelong. It was felt that the present method of opening up a section of track each morning and reinstating it by evening was wasteful. It was considered that with the use of some mechanical aids such as a rooter or plough it would be far more economical to open up a considerable length of track. In order to formulate a future policy for track maintenance, Geelong placed a number of questions before the conference, to which Bendigo and Ballarat replied as follows:-

QUESTION	REPLIES						
	BENDIGO	BALLARAT					
1. What was the condition of the Ballarat and Bendigo tracks prior to their reconstruction - Rails? Sleepers? Surface condition?	Very bad.	Shocking.					
2. What age were these tracks at time of recon- struction?		30 years.					
3. To what extent were the tracks reconstructed - Track drains? Sleepers? New screenings? Rails?	-	Right back to clay for installation of drain. 40% of rails replaced.					
4. Do other Bran- ches ever open up a length of track and leave it open with the requisite protection over- night?	Yes. The Council and Police are advised that the track will be opened.	There have been occas- ions in connection with replacement of curves where the tracks have been left open over- night. Our work has been confined to re- packing of low sections, no complete excavation. In general, it is not often that there is nore than a day's work on adjacent sections. It may be more economic to leave tracks open, but traffic difficulties have not warranted it so far.					

OTTERTON	REPLIES								
QUEDITON	BENDI GO	BALLARAT							
5. If so, as in 4, are night watch- men employed at the scene?	No. We have left tracks open for three weeks, using white barricades both ends for about 40 ft., and also red, green and white lights.	-							
6. Is there any standard in re- gard to minimum dimensions of rails at which point they should be replaced, e.g. the minimum thick- ness of tread and check?		No standard, but one factor is the bottoming of a "below-size" wheel flange.							
7. Are the agree- ments with the municipal councils regarding respon- sibility for maintenance the same in all Branches?	Yes.	Yes.							
8. Are Councils at Ballarat and Ben- digo carrying out their obligations in this regard?	If we open up to replace sleepers we fill in - the Council should pay for portion of this but they never do. The Council have defi- nite responsibi- lities to raise the level of the road when we find the track is high- er than the road, but they only do what is barely necessary.	There has been no case where the Council has done any major work be- tween tram tracks except on one major intersection. Recon- struction of tracks was so satisfactory that there has been very little work for them to do. The general policy seems to be that we take it in turns to do the whole width of track, but the Council have spent nothing in rela- tion to work between tram rails.							

Geelong defined a major overhaul as one where a complete section of track is opened up and left open for some time. They stated that the patching of 9" each side of the rail is not done very frequently as the condition of the tracks renders the opening of the whole track and replacement of sleepers a necessity. In Geelong, the Councils are not fulfilling their obligations in regard to maintenance between rails and between tracks. They have an arrangement to supply the Commission with "Pre-mix" but they do not carry out the work or pay for it. It is considered that the Councils' responsibilities should be brought to their attention periodically.

Bendigo considered that, with the general condition of the permanent ways of the provincial cities, organised overhauls at regular intervals are not precticable, since past experience indicates that attention is usually given where it is required

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most and often these requirements cannot be foreseen. Planning of overhauls, of course, is necessary as far as possible, to avoid unnecessary transport of maintenance equipment, that is, roller, compressor, etc.

In relation to sleepers, Ballarat advised that there are practically none in the Ballarat system; there is stringer construction in the outskirts and raft construction in the centre of the city.

ACTION:

14

Works Manager to discuss with Engineer and Manager whether it is necessary to write to Councils and remind them of their obligations in relation to track maintenance.

ITEM 1.D. CAR RENOVATION.

(1) Painting of bodies.

ACTION REQUESTED AT 1951 CONFERENCE:

Arrangements to be made for a visit to Ballarat in company with a "Dulux" representative.

REMARKS:

Works Division requested the opinion of the Branches on the comparison of Taubman's "Pearline" with B.A.L.M. "Dulux", although it was realised that life comparison could not be made at this early stage.

In the case of Bendigo, two maximum traction trams were received by that Branch from the M. & M.T.B. last year: the first (No. 17) was painted with "Pearline" and placed in service 21st December, 1951; the second (No. 18) was painted with "Dulux" and placed in service 11th January, 1952. The working surfaces of both these trams were considered to be fair, and therefore they were treated with wet and dry paper only. In the case of No. 17, two coats of Taubman's synthetic undercoat and one finishing coat of Taubman's "Pearline" were applied. The treatment of No. 18 consisted of two coats of "Dulux Ivory Surfacer No. 366-215" broken down with Green No. 388-15175, and one finishing coat of 388-15175 Green and 388-15176 Cream. Pale Gold "Dulux" No. 388012 was used as a 3/8" liner. On inspection of the two trams together it was not possible to distinguish very much difference between their appearance, and it was considered by the painters that application of the material was very much the same. Flotetion of pigments in the "Dulux" was noticed and pointed out to Mr. Wearne of B.A.L.M. on one of his recent visits to the Branch.

Geelong reported, as at the last conference, that they had been in almost continual trouble in regard to the quality of enamels and undercoats used on trancars. Four trans Nos. 17, 23, 38 and 40, now have been painted with the "Dulux" brands and no trouble has been experienced. Comments in regard to each were given as follows:-

> "Remix" red lead primer for woodwork. ... Good "Dulux" ivory surfacer for cream undercoat. .. Good "Dulux" ivory surfacer mixed with 15% of green finishing for green undercoat. .. Good

Characteristic	Cream Finishing	Green Finishing
Application Drying Gloss Flow Colour Durability	Good Good Fair Fair Good Too early to ascertain	Good Good Fair Fair Good Too early to ascertain

The "Dulux" white hard putty No. 366-64 is very good for shallow fillings but a suitable putty is still required for deep fillings such as screw holes, etc.

Ballarat hed found that application of "Dulux" was easier and a somewhat better gloss resulted, although one undesirable feature was the flotation of pigments as mentioned by Bendigo. "Dulux" appeared to dry harder than Taubman's "Pearline" and Ballarat favoured the continued use of "Dulux".

Ballarat intend to experiment further with a clear "Duluy" to give the tram a "refresher" coat, as had been carried out some years ago.

In connection with Geelong's statement about a suitable putty for deep fillings, Ballarat also desired information on this matter as a suitable putty had never been obtained by them.

The Supplies & Transport Officer requested that it be arranged for storekeepers to state the purpose for which paint is required when requisitions are raised, as otherwise Stores may send any brand of the same colour. Arrangements should be made to specify that it must be "Dulux" and is for tramway maintenance purposes. However, Works Division stated that present stocks of "Pearline" should be used up.

ACTION:

Works Division to make inquiries concerning putties for deep fillings, and advise Branches.

ITEM 1.D. CAR RENOVATION.

(2) Periodicity of repaints.

REMARKS:

Geelong desired to ascertain if there were any standard or objective in regard to the periodicity of repaints. Five trams are painted, on an average, per year in that Branch, which means that each car will be painted approximately once every six years.

Ballarat had no statistics regarding painting, but investigation had indicated that five years would be the maximum period between repaints to maintain a reasonable standard of appearance. However, it was hoped that the "refresher" coat of varnish as mentioned in Section 1.D.(1), applied after three or four years, would extend the life between repaints to six or seven years.

In relation to "refresher" coats, Geelong at one time used a varnish, but the trouble was that this had to be removed with ammonia before repainting. However, the same may not apply to clear synthetic enamel.

Bendigo considered that a regular period for repainting of trams is not practicable, since some trams are in service more than others, and the older a tram gets the more attention it requires. The period, of course, could be governed by the mileage covered, but Bendigo considered that the matter would be best if left to the discretion of each Branch.

These comments appeared to satisfy the question at present, and further information would be obtainable if and when Ballarat tried the "refresher" coats.

ACTION: Nil.

ITEM 1.D. CAR RENOVATION.

(3) Painting of ceilings.

ACTION REQUESTED AT 1951 CONFERENCE:

All ceilings to remain varnished.

REMARKS:

Bendigo drew the attention of the conference to the remark on page 14 of the 1951 conference minutes where it was stated that Bendigo had painted the ceiling of one car with Taubman's white "Enameline" and removed the lamp shades, leaving the pearl lamps and ceiling cnly for reflection. A comparison of light intensity was made in this car and one with a newlyvarnished ceiling in March, 1951, and, as previously mentioned, no difference existed at that time in the light intensities. A further test, however, was conducted in November, 1951, between the ceilings of the same trams, and the white ceiling maintained its reflecting properties, no dust being evident, which was rather surprising. The tram with the varnished ceiling had lost its gloss and the intensity had dropped by approximately 25%.

Works Division stated that the last conference decided that all ceilings should remain varnished in lieu of being painted white, this decision being mainly brought about by the fact that it was considered that the rain would splash in the ventilators and continual cleaning would be necessary. However, Geelong have fitted a centre panel to one of the new maximum traction cars and painted it white. Ballarat since have fitted a similar panel. These panels are lower than the ventilators and should not be affected by the weather. Fitting of this panel certainly enhances the appearance of the interior, but the idea could not be carried out on single truck cars with large hand-operated ventilators.

Geelong also drew attention to their remarks at the previous conference, that they consider the best finish for a ceiling is white synthetic enamel. The Bendigo "Birney" tram cars were given this treatment when in Geelong, and on a number of occasions at subsequent repaints it was necessary to only wash the ceiling. However, care must be exercised in using this treatment, as in other cars with ventilators opening on to the side roof it will be found that the white ceiling becomes extremely dirty with water splashing off the roof when it rains.

A sketch was submitted to the conference showing the panel treatment referred to above, and which had been inspected in Geelong by all present other than the Bendigo representatives, the finished job receiving very favourable comment. The treatment consists of the installation of a water-proof three-ply panel held to the under side of the roof by two 1" x 3/4" mountain ash cover strips. The three-ply panel is primed with "Remix" on both sides and then given one coat of "Dulux" surfacer and one cost of "Dulux" white finishing on the visible side. The mountain ash cover strips are stained and varnished to match adjacent varnished work.

The method of fixing the centre panel was not carried out in Ballarat as in Geelong, but it is realised that the Geelong method is the better. In Ballarat, lamp holders were placed below the ceiling instead of above it. Ballarat were strongly in favour of using the white panel throughout the maximum traction rolling stock, but also considered it doubtful for use in trams with "lantern top."

As a result of the discussion, and of the visit to Geelong previously mentioned, it was decided to rescind last year's action and recommend the adoption of a white panel throughout the maximum traction cars.

ACTION:

at.

Use of a central white panel as initiated by Geelong recommended for installation in all maximum traction cars.

ITEM 1.D. CAR RENOVATION.

(4) Floor coverings.

ACTION REQUESTED AT 1951 CONFERENCE:

Works Division to obtain information on rubber tiles and bituminous tiles.

Bendigo to cover the floor of one car with rubber in saloon and "Flintkote" in the entrances.

REMARKS:

In relation to the tiles, this matter was investigated during the year and became the subject of separate correspondence from Works Division dated 26th July, 1951.

In relation to the experimental flooring, Bendigo advised the following: -

"As arranged at the last conference, this Branch, in September, 1951, installed rubber flooring in the saloon of maximum traction tram oar No. 23, and "Flintkote" on the entrances of the same tram. The 1/4" rubber flooring was obtained from Dunlop Rubber Co. through Works Division and was 50" wide. This width was not enough to cover under the seats, nor would it be economical to do so, therefore the under portion of the seats was closed in with 1/4" standard "Masonite" screwed to wooden battens and supported in aluminium moulding for appearance. The rubber was then cut to 46" width and completely covered the floor over the 10 ft. length of each saloon. The rubber was fixed with the solution supplied, and although Dunlop suggested that they should lay the rubber, the Branch tradesmen did so with considerable success. The removable motor inspection hatches created a problem, for it was foreseen that as the hatches were lifted the rubber at the edge might lift also. This was overcome by using aluminium angle 1" x 1" x 1/16" on all sides, and this has proved very successful and is wearing well. The rubber has stretched and lifted slightly at one doorway but this could be overcome in any future installation by allowing approximately 3/32" stretch clearance against the metal door plate. The dutiec of the car cleaners have been simplified by closing in under the seats, and they appreciate sweeping on the rubber compared with the worn "Ormanoid", etc. The public also have expressed appreciation of the pleasant colouring of the rubber.

"The slats on the entrances were removed and approximately 3/8" to 1/2" of "Flintkote" was applied in accordance with the instructions supplied at the last conference. Several hair line cracks developed after drying out but these did not extend. On inspection last week it was considered that the application was well worth while, although further cracks have developed where movement occurred in the floor boards. This is to be expected, and is not considered to be serious. This type of floor also enables the cleaners to make a cleaner car in a shorter time. The natural black colour of the "Flintkote" was maintained.

Material S	Schedule:					
Saloon I	Floors	-	20 ft. 1/4" rubber flooring 1 gal. solution 2 bottles "Shellite" 1/2 lb. "Shellac" 1 pint. methylated spirits	£29 1	5731	16759
			72'1" x 1" x 1/16" alum. angle	1 £32	17	11
Panels -	under Seats	-	72 sq.ft. 1/4" "Masonite" 80'1-1/2" x 1-1/4" Oregon 144, 1" x 8G wood screws 48, 8G screw caps 60' alum. moulding	£1 2 £5	12 18 1 7 -	10-1469
Platfor	m Floor	1	13 gals. "Type 3 Flintkote" i bag cement	£6 <u>£6</u>	6 10 16	10
Labour (e	stimated):					

Rubber flooring		60 24	man	hours	at at	7/-7/-		£21 8	8	
Entrance floor	-	40	man	hours	at	7/-		14 £43	- 8	-

TOTAL PRICE - £88/-/6.

Works Division remarked on the general good appearance of this tram and queried whether such flooring now should be adopted as standard, but Ballarat considered that a further period of trial should be allowed. Works Division therefore requested Bendigo to keep Richmond informed of how this rubber wears and what happens to it.

Ballarat have made no further experiments with floor coverings. At the last conference they spoke of being somewhat disappointed with "Flintkote" applied to tram floors compared with other floors, but recent experiments with power station floors indicate that a greater degree of working before applying may be necessary to prevent cracking. Cracking shows up mainly if floor boards move. Regarding rubber, Ballarat considered that it may be possible to use a lighter material and still obtain reasonably long life.

However, Norks Division considered that one of the troubles with lighter rubber is "bubbling", this having been experienced with installations at Richmond. The Departmental Tramways Superintendent considered that rubber would bubble in any position where there is a screwing action of the foot.

Geelong have continued to use 3-ply "Malthoid" for covering tramcar floors and steps. It is fixed with "Ormanoid" roof dressing and tacked on the edges. With patching, this three-ply "Malthoid" lasts approximately five years. It does not wear as well as "Lastroleum" which was used previously and which it is understood is now unobtainable. "Flintkote" has not been tried. Open sections of maximum traction cars are still slatted.

Geelong queried the desirability of ascertaining the availability of "Lastroleum", but Supplies and Transport Officer considered such inquiries would not be worth while because of the fact that it is English and is subject to the present import restrictions.

In order that each Branch may have first hand knowledge of rubber flooring, and that it be tried under various conditions, Works Division suggested that a single truck tram in Geelong and Ballarat be treated similarly to the saloon of the maximum traction car at Bendigo. The two Branches agreed to this suggestion.

ACTION:

1 the

Ballarat and Geelong to cover the saloon floor of a single truck tram with rubber.

ITEM 1.D. CAR RENOVATION.

(5) Seat coverings.

REMARKS:

Following recent discussion at Geelong with a representative of "Vynoid" plastic materials, Ballarat informed Richmond that the seats in most of the trams in that Branch would need complete re-covering in the next 1-1/2 to 2 years. Works Division therefore desired to ascertain the condition of tram car seats in other Branches to allow a bulk order for material, plastic or otherwise, to be placed if required. This, of course, depended on whether all the tram seats would need complete re-covering about the same period, or whether the condition of seats in each tram varied to the extent that re-covering was a continual process.

Bendigo advised that solid hide coverings are installed in all single truck cars and have either Latex rubber or upholstery springs under the leather. The condition of the leather is fair, and it is not expected to make any replacements in the near future. The covering over the Latex rubber is of better condition than that over the springs, mainly because of the even surface of the rubber compared with the irregular placing of the springs. It was considered by this Branch that "Vynoid" would make very good covering, although it was not intended to upholster any more seats than those now existing.

Geelong to date have used only genuine hides for seat coverings, there being only about 10 trams with upholstered seats in that Branch. Geelong queried whether Bendigo or Ballarat periodically apply leather dressing, clear or coloured, in an endeavour to prevent the "crocodiling" of the leather surface. For the re-covering of seats in future Geelong considered that it appeared more practicable to use the polyvinylchloride fabric "Vynoid." On the other hand, it may be more expensive when taking vandalism into account.

Ballarat doubted if the use of this material would be justified as it costs about twice as much as the ordinary ducocovered leather cloth, but they would requisition for it for trial purposes only on the first occasion on which it was found necessary to re-upholster a seat.

ACTION: Nil.

ITEM 1.E. TROLLEY WHEELS.

ACTION REQUESTED AT 1951 CONFERENCE.

Works Division to arrange for a batch of trolley wheels of 3-spoke "U" profile pattern to be cast to a known specification; these wheels to be sent to each Branch who will put identification marks on them and arrange for a trial.

REMARKS:

Norks Division stated that trolley wheels sent to Branches in September, 1951, were cast very close to a requested specification after the second order for such. Costings were made by a Yarraville Foundry.

19.

Requested	:	Copper	88%	Actual	•	Copper	90.2%
		Tin Phosphorus	10.5%			Tin Phosphorus	9.4%
				1 2 2 2 3		Lead	0.1%

The specification was taken from a Geelong drawing dated 1938, and is that which it is understood was used when trolley wheels were purchased from M. & M.T.B. and which always gave good results.

Each Branch then was requested to report on the sample wheels, and replied as follows:-

Geelong :

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In regard to the two sample trolley wheels referred to, these were turned to the Ballarat/Bendigo profile and gave the mileages as under.

Trolley Wheel marked "Geelong Test 1":

	Installed in Tram No. Removed Trolley wheel mileage	33 - No. 1 End on during period	4/10/1951 24/3/1952 6,931 miles.
Crolley W	heel marked "Geelong Te	est 2":	
	Installed in Tram No. Removed Trolley wheel mileage	2, on during period	4/10/1951 15/1/1952 5,940 miles.
	After re-turning, inst Tram No. Removed Trolley wheel mileage	talled in 39,No. 2 End on during period	9/ 2/1952 3/ 4/1952 2,119 miles.
	Total mileage		8,059 miles.

It will be noted from the worn samples submitted that the wheels are double grooved. Also, during the period that these wheels were in operation, numerous complaints were received about nonoperation of signal lights and leaving the trolley wire at frogs.

The same trouble has been experienced with the M. & M.T.B. trolley wheels that were existing on the maximum traction trams when received.

Most of the special work and overhead has been manufactured for use of our particular "V" profile. This would account for difficulty experienced with profile manufactured to Ballarat and Bendigo standards. A lot of work would be involved in Geelong if we were to use the standard three-spoke "U" wheel.

Bendigo:

The mileages of the two test samples Nos. 1 and 2 were 3,900 and 6,014 respectively. Two samples were also taken at random from stock, the latter group being numbered 52 and 53, and these gave mileages of 2,400 and 1,859 respectively. The average mileage of trolley wheels in this Branch for 1950/51 was 7,728 and for 1949/50 5,478. No explanation can be given for the considerable margin between the mileages of samples Nos. 1 and 2. We would like a comparison made between wheels received from each Branch to compare the difference in profiles.

Ballarat:

One sample wheel has done 5,000 miles to date and the other 11,000. It is estimated that there is another 10,000 in the second but it is too early to estimate the life of the former. The life may be dependent on the wheel tensions on the trolley wire, which is 18 lb. at 18 ft. in Ballarat. What do the other Branches use?

Geelong : 18 lb. to clear the wire.

Bendigo could not quote,

Ballarat then stated that it would appear from examination of the Geelong wheels that there was more sign of pitting in the groove than on Ballarat wheels. It is considered that arcing is a far greater feature in wear than mechanical application, and it may be possible that differences in friction is a major factor.

Works Division stated that as far as the metal is concerned it appears that a suitable specification has been obtained, and that further factors must be investigated if greater life of wheels is to be obtained. Geelong were still not satisfied with the use of the "U" section, and in view of their overhead fittings probably should revert to the "V" section. All Branches should check on the tension, and Ballarat send a worn trolley wheel to Bendigo, Geelong and Eichmond for comparison of the degree of pitting.

Bendigo queried what minimum dimension for scrapping of trolley wheels is adopted in other Branches and what method is used for determining same, to which both Ballarat and Geelong replied "observation only."

Bendigo also remarked that on the newly-painted trams considerable oil had been noticed above the driver's cabin, and on inquiries it was learnt that the trolley bearings are oiled very frequently. This procedure appeared to be wrong for "selflube" bearings, but on checking it was found that these bearings of size 1" by 7/8" with 5/8" bore had never been impregnated by the suppliers. Subsequent to this discovery a representative of Glover & Goode visited Bendigo unexpectedly and took the 97 bearings back for treatment. Two-inch long bearings had been ordered in the past but 1" only were supplied. Bendigo desired to ascertain if the other Branches found it necessary to lubricate trolley wheel bearings, and if so how often. It also was desired to ascertain what size bushes are supplied to the other Branches.

Ballarat replied that it had been their practice at frequent intervals to dismantle and clean the trolley wheel and lubricate the spindle. Much trouble had been experienced, even with graphite-based lubricants, with the wheel becoming dry, but since changing to "Shell Compound No. 3" the trouble has been eliminated and this compound appears to resist all weather changes.

Bendigo also queried whether other Branches reversed the trolley wheels and it was learnt from Ballarat and Geelong that this is done approximately once per week in Ballarat but less frequently in Geelong.

In relation to the bushes referred to by Bendigo, Geelong advised that they now are using a Morganite Crucible Co. bush. Oliver J. Nilson also had supplied bushes to Geelong.

Details of bushes at Ballarat were not to hand but it was agreed to advise Bendigo at a later date.

Geelong queried Ballarat concerning their experience with regard to lubricating the groove with graphite, to which Ballarat advised that it was applied once a week by mixing with oil and grease. However, Ballarat did not consider this a vital factor with regard to longer life.

ACTION:

The second

Ballarat to send Branches a worn trolley wheel so that the degree of pitting can be compared.

After return of special sample trolley wheels to Richmond Works Division to cut these into sections and send pieces to each Branch for comparison of profile. Ballarat to advise Bendigo of size and type of bush used in trolley wheels.

ITEM 1.F. PURCHASE REQUISITIONS AND ANNUAL REQUIREMENTS.

ACTION REQUESTED AT 1951 CONFERENCE:

(i) Branches to arrange for technical requisitions to be vetted by a technical officer, and for each separate item (except small routine ones) to be on a separate requisition.

(ii) Works Division to arrange for copies of requisitions raised or re-drafted at Richmond to be forwarded direct to Branches in order that the officers concerned will sight them.

(iii) Supplies and Transport Officer, with Works Division, to give consideration to inclusion of a tramway section in Stores Vocabulary.

(iv) Branches to forward as many tramway requisitions as possible annually in order that requirements can be consolidated and thus bulk ordered. In the case of electrodes, as these now are an annual contract, Branches to forward to Works Division a note of the type they find best and a request will be made to Mechanical Branch to have these included as a special.

(v) Supplies and Transport Officer to prepare a list of items that may best be handled as an annual contract.

REMARKS:

Here.

(i) Works Division stated that there has been a general improvement in the making out of technical requisitions since the last conference, but some are still being received with so little detail that the Branches concerned have to be contacted for further information. The present need, therefore, of checking technical and/or unusual requisitions to make sure the article required is fully described, together with purpose required, delivery point and inspection clause where applicable, is again stressed. Wherever possible drawings or samples should be supplied, even when the requisition refers to a previous order on a certain firm. Raising of tramway requisitions certainly will be standardised when there is a tramway section in the Stores Vocabulary and stock cards give the full specification.

Supplies and Transport Officer stated that six drawings are required with all requisitions that are to be sent out for quotations. (This does not apply in the majority of cases involving castings.)

(ii) Copies of requisitions raised or re-drafted at Richmond have been forwarded direct to Branches during the year.

(iii) Action for the inclusion of a tramway section in the Stores Vocabulary has not commenced during the twelve months as the pattern list and drawing list have been the main "fill-in" jobs for this period, and also they were considered to be of higher importance. However, a vocabulary containing standard nomenclature is to be the next main job. It is suggested that a list giving all tramway components held in the Branch stores, together with card number and maximum and minimum holdings, be forwarded to Richmond for consolidation as in the case of the drawings.

After consolidation by Norks Division the list will be submitted to each Branch for criticism, and then when satisfactory to all will be submitted to Stores Branch requesting its inclusion in the Stores Vocabulary. (iv) Works Division stated that there was nothing about annual requirements requiring particular discussion this year. In regard to electrodes to be included in the annual contract, no special requests have been received, so it is assumed that the electrode worry has not been of consequence during recent months.

When a Branch requires an item such as electrodes, which is covered by an annual contract but this contract does not include a brand or grade which has proved most suitable for the job, then the requisition should state that "it is the only type suitable" or "it is the most satisfactory."

Ballarat stated that they were aware of requisitions for annual requirements having been sent out without proper information, but there now has been some tightening up in the Branch to remedy this.

Geelong also remarked that in relation to the current year's annual requirements a breakdown had occurred. The matter was attended to by the Stores Supervisor, in the absence of the Storekeeper, without any reference to the Yorks Superintendent, with the result that very few items were included. Measures have been taken to prevent a reoccurrence of this breakdown.

(v) Works Division remarked that Supplies & Transport Officer had prepared a list of items requisitioned over a 12 to 18 months' period, for consideration of the items that may best be handled as an annual contract, but to date nothing further has been done in this regard.

Ballarat drew attention to the present short-term maximum holdings, but Works Division pointed out that it is up to Branches to keep the matter well forward when it comes to items which it is necessary to have in stock, and of which it becomes necessary to procure more than short-term holdings. Although present financial restrictions may affect this point to a certain degree, where it is considered more economical to procure a quantity in excess of the current stores holdings the matter should be taken up as a special.

ACTION:

prov

Branches to forward to Works Division lists of all tramway components held in Branch stores, together with card number and maximum and minimum holdings, to enable a consolidated list to be prepared.

Works Division to prepare a draft schedule giving standard nomenclature for all tramway items with a view to inclusion in the Stores Vocabulary. Draft schedule to be sent to each Branch for comment.

When a Branch requires an item such as electrodes, which is covered by an annual contract but this contract does not include a brand or grade which has proved most suitable for the job, then the requisition should state that "it is the only type suitable" or "it is the most satisfactory."

ITEM 1.G. CASTINGS.

ACTION REQUESTED AT 1951 CONFERENCE:

After further investigation, Vorks Division to amend specification list, firstly in regard to bearings, and Branches to advise any other changes considered advisable in view of experience.

REMARKS:

Nothing further has been done about finalizing material specifications, it being left until it is known that the specification to which each casting now is being made is satis-factory.

Works Division desired to ascertain if there was any special complaint regarding quality of castings received during the past twelve months. Chemical tests of important components are being made, and all castings are being superficially inspected for cracks, blow holes and other obvious faults and "stamped" before despatch from the foundry. It was known that a batch of bearings which were porous internally had been delivered to Ballarat; this case was taken up with the foundry and is the only known case of faulty supply. Geelong received 24 "Q" fell cleaner blades, but the error in these mainly was due to the pattern. In addition, it was considered that the batch was not inspected before despatch, as it appeared to be an old order only just completed.

Geelong remarked that the arrangement for the testing and inspection of castings by the Commission's Engineer at the foundry before delivery has improved quality. However, improvement still can be effected and, in this regard, as the Commission's Engineers become more femiliar with important points relating to the various castings, beneficial results should be attained. It was considered that the Engineers carrying out the inspection, because of inexperience, are not yet wholly conversant with the Branches' requirements. The stamp used by the Inspector on castings was unsuitable, firstly because it was too small and hence too difficult to find on castings, and secondly because it made very little impression on manganese and other hard castings. As the marking on the casting was only required for a temporary duration, it may be practicable to use a large stencil.

Works Division suggested that a daub of paint could be placed in the vicinity of the stamp.

Ballarat inquired whether delivery is made before or after chemical analysis. Works Division replied that, although it was considered that the analysis should be made first, the urgency of the supply in most cases did not allow this procedure. It therefore was the responsibility of the Branches to watch requisitioning and not leave it so late that lack of supply would be an embarrassment. Requisitions placed well in advance would allow analysis to be completed before delivery.

Ballarat also queried whether there were any foundries producing castings of a standard somewhere near our tentatively selected analysis, and whether Bendigo or Geelong had given any particular attention to bearing specification.

It was advised that one Melbourne foundry in particular was reliable, as a naval inspector was employed there full-time.

ACTION:

Works Division to arrange for a daub of paint to be placed on castings to indicate position of inspector's stamp.

Works Division to give further consideration to the preparation of a standard specification list.

ITEM 1.H. DRAWINGS.

ACTION REQUESTED AT 1951 CONFERENCE:

Branches to send lists to Works Division for consolidation. The lists to cover makers' drawings. Each Branch to send a copy of the list sent to Works Division to the other Branches to give them an opportunity of criticizing the consolidated list when completed.

After this was done, copies of any drawings prepared by any one Branch in future to be sent automatically to the other Branches and Works Division.

REMARKS:

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Works Division advised that drawing lists were sent by each Branch to Richmona as requested. Consolidation of these lists was almost complete, but of the 509 different drawing titles received 60 could not be identified, and letters had been forwarded to the appropriate Branches regarding clarification of these drawings.

Geelong considered that beneficial results had been noticed already in that Branch in regard to the arrangement made at the last conference relating to the interchange of drawings. On a number of occasions during the year, requisitions had been placed quoting Ballarat or Bendigo drawing numbers, and thus economies had been effected and delay eliminated as a result of not having to prepare special drawings.

ACTION:

Sending of copies of drawings produced by any one Branch to the other Branches and Works Division should continue to be strictly adhered to, as this action is very valuable to all.

ITEM 1.I. PATTERNS.

ACTION REQUESTED AT 1951 CONFERENCE:

Pattern list to be amended at a later date to include drawing numbers.

Similarly, all drawings produced in the Branches to show pattern numbers.

REMARKS:

During the year the majority of patterns were positively identified, although it is realized that some titles are still subject to alterations. An amended pattern list, therefore, has been produced which includes, wherever possible, drawing number and material. This list has been produced in two sections, one giving pattern numbers in numerical order, the other listing patterns under the various sections such as track, overhead, rolling stock, etc.

It is apparent that no patterns exist for many of the components, and these will need to be made if and when such components require replacing. Additions to the pattern list, therefore, will be advised from time to time as carried out in the past.

Bendigo suggested that when a casting drawing is produced a copy could be sent to Richmond for inclusion of the pattern number, then returned to Branch for finalising and authorisation of drawing.

Works Division stated that a telephone call would be sufficient for obtaining a number for a new pattern, but a drawing should be sent for identification of an old one. Geelong stated that they already were following this procedure.

Geelong also remarked, as at the last conference, that

they were unable to say whether a casting from a Ballarat or Bendigo pattern is suitable unless the drawing or pattern is available for checking.

In this regard, Works Division considered that inclusion of drawing numbers in the list would be of assistance, but a pattern could always be sent to a Branch for checking if desired.

ACTION:

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The inclusion of pattern numbers on new drawings (numbers obtainable from Richmond per phone) should continue to be strictly adhered to in order that the list may be kept up to date. Similarly, details of any new pattern produced in a Branch should be referred to Richmond.

Norks Division to advise all Branches periodically of any amendment or addition to the list.

Works Division, if requested, to forward patterns to Branches for checking.

ITEM 2. RULES GOVERNING EMPLOYEES.

REMARKS:

This item was raised by Bendigo in order that a general discussion could take place relative to a letter and a draft copy of "Rules Governing Employees" dated 6th June, 1951, sent from the Engineer and Manager to the three Branches.

Bendigo replied to the above letter on 27th August, 1951, but have since received no further advice of subsequent action taken. It is understood that no copies of "Rules Governing Employees" have ever been issued to depot personnel, and it is desired by Bendigo that these men should be supplied with such as soon as possible.

The Departmental Tranways Superintendent remarked that the issue of rules to depot personnel had been considered. A draft set of rules for traffic personnel was first drawn up but it then was considered desirable that they include a section relating to depot employees.

The main points now raised for discussion are: -

- (i) Section 2.D. Tools and Appliances.
- (ii) Section 2.F. Working on electrical circuits or apparatus of tram in the depot.
- (iii) Section 3. Electrical apparatus, instructions for safe operation, adjustment, etc.

(iv) Testing of line circuit breakers.

(i) With reference to Section 2.D, this states that each employee is provided with a kit of tools appropriate for his work. He is held responsible for these and must report to the depot foreman any loss, breakage or theft. Tools suitable for the particular job must be used, and any worn, damaged or ill-fitting tools must be referred to the depot foreman for attention.

It was ascertained that no separate issue of tools has yet been made in any Branch to shedmen or shedman's assistants. In this regard, Bendigo suggested the following basic set of tools, the procedure of issue to be as for tradesmen:-

- 1
- 10" adjustable wrench 1
- 6" screw driver 1
- 1 1-1/2 lb. Engineer's hammer 1 cold chisel to be made in workshop
- 1 pair pliers.

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(ii)Section 2.F states that before commencing work on the electrical equipment of the tram, the pole must be pulled down from the overhead wire and the rope secured to the hook provided on the tram buffer.

Bendigo remarked that no discussion was actually necessary if this section was generally agreed to. Ballarat very much favoured the withdrawing of trolley poles before commencement of work. Objection had been raised about occasions where trouble may occur while the tram was in service at night, but it was considered that the number of occasions would be so rare that it would not matter if the tram were in darkness for minor adjustment, as any major correction would be done in the depot in any case.

(iii) As far as the "Rules Governing Employees" are concerned, Works Division considered that the final book should definitely include a section covering depot employees. Bendigo were in favour of this idea but Ballarat were not. The Departmental Tramways Superintendent mentioned that in the case of a fatality due to electric shock, the Commission would have to submit evidence as to what instructions had been issued to employees. Works Division suggested that perhaps certain sections of the "Blue Book" could be applied.

Geelong at first thought it best to keep the book purely for traffic employees, and anything for depot employees could be made a separate issue. In Geelong the only man who does any "live" work in the depot is issued with a "Blue Book." However, in Geelong a number of shed employees operate in traffic. On occasions there has been such a demand for chartered trams that all shedmen on duty have been driving.

Works Division remarked that it definitely was necessary that the Commission be covered in respect to any accident where a shedman or a motorman is driving. Therefore, a book covering both groups of employees would appear to have an advantage. Bendigo considered that the book also should make some reference to the work that traffic personnel may or may not do on electrical apparatus.

Ballarat considered it unnecessary to have anything in the "Traffic Code" relating to shed employees, although it was agreed that some instructions for depot employees are necessary, but it was thought that these latter instructions could vary from Branch to Branch. Ballarat's idea is that if any depot employee as part of his duty has to go out into traffic he should be trained in all respects and made conversant with the traffic regu-Ballarat suggested that each Branch should submit a lations. draft set of rules for depot employees, keeping in mind local conditions as well as certain uniform requirements, which should be considered by all concerned and further discussed if necessary before finalization.

After further general discussion it was agreed that "Rules Governing Employees" should cover both depot employees and traffic personnel.

(iv) Bendigo desired to ascertain the procedure adopted in other Branches for testing tram circuit breakers. It is understood that several years ago circuit breakers were subjected to a predetermined overload current test by using water pot resistance, but when the pot had reached the end of its useful life the practice was discontinued. At present circuit breakers on single truck cars are tested by the so-called "hit and miss" method of adjusting the breaker by overloading cars by rapid acceleration on the road. On maximum traction cars this is not possible because the line breaker is underneath the truck, therefore the method adopted is that of operating the controls when the car is stationary in the depot.

Geelong advised that circuit breakers are sent to the workshop and overhauled, and go back to Meter & Tests for final testing. Edison cells and carbon rheostats are employed with resistance in series parallel connection setting at approximately 280 amp. for single truck trams. There have been occasions when the main breaker in the power station has opened as a result of a fault in a tram car which had not been isolated by a circuit breaker on the tram.

The equipment receives a thorough overhauling by dismantling, renewing contacts where necessary, and cleaning and lubricating components. It is quite possible that as a result of this regular overhauling the breakers in Geelong do not require any additional adjustment of the setting.

Ballarat stated that an attempt was made to standardize circuit breakers by testing in the laboratory. A test equipment design was completed but this had never been manufactured. Consequently the unsatisfactory "hit and miss" method is still in use in Ballarat,

Bendigo also queried whether any other Branches had experienced trouble on maximum traction trams with the controllers being alive when it was thought they were dead. This particular incident had not been noted in Geelong or Bellarat because of the circuit breaker, but there had been cases of faulty operation of the circuit breaker itself in Ballarat.

ACTION:

Itom

Branches to prepare a set of rules for shedmen and track men giving the principles rather than too much detail. After review and finalization, these rules to be included in the book of "Rules Governing Employees,"

Brancheg to forward new comments concerning the draft set of rules prepared by the Departmental Tramways Superintendent, in view of the discussion at this conference.

Geelong to advise Bendigo of the procedure adopted for testing line circuit breakers, sending copies to Ballarat and Works Division.

ITEM 3. TRAMVAY STATISTICS.

- (a). What records are kept and what stationery is used?
- (b) Annual report use of a standard form.

REMARKS:

This item was raised by both Geelong and Works Division, Geelong being mainly concerned with what records are kept and what stationery is used, and Works Division with the use of a standard form for preparation of the annual report. (i) Standardisation of records kept.

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- (ii) Standardisation of method of keeping these records.
- (iii) Elimination of what are considered to be unnecessary records.
- (iv) Improvement of what ere considered to be unsatisfactory records in the Geelong Branch.

Records now being kept in Geelong are: -

Tramcar mileage record	on	sheet Syn	bol TYE	1-46
Trolley Wheel	on	card		
Armature	on	card		
Axles	in	exercise	book	
Tyres	in	exercise	book	
Wheel Centres	in	exercise	book	
Brake Shoes	in	exercise	book	
Bodies	on	card		
Body Painting	in	exercise	book	
Track Repairs	in	exercise	book.	

Records of tramcar bodies overhauled and painted, labour and material involved, are recorded on workshop job cards.

In Bendigo, tabbed 8" x 5" cards are typed and ruled by the office staff, and statistics are recorded by the depot foreman as follows:-

Series of cards for each respective tram for items such as body, truck, electrical, air equipment and brake blocks.

Individual cards for axles, armatures, trolley wheels and batteries are held, and as each item is installed in a particular tram, the appropriate card is filed under the respective tram number.

A daily report sheet on the condition of cars is entered by each motorman when the tram is returned to the depot. This enables any repairs, etc., required to be followed up. The depot foreman keeps a daily diary of work in progress and from this he preparesthemonthly progress report.

Ballarat advised that, in the past, maintenance records were similar to Bendigo, comprising for each tram car a card on which was entered work performed, separate cards for each wheel and axle, armature and trolley wheels being grouped with the car card. Hcwever, recently it was considered that a more detailed record of work was desirable, and a master record system has been introduced.

As much information as possible was collected from previous records so that the master record could be progressive and not just a series of loose cards which could be **lost** or disposed of. A loose leaf binder is kept for filing the records, there being a sheet for each car, on which, very briefly, the history of the maintenance of the car with dates is recorded. Supplementary sheets are held for the body, brake gear, electrical equipment and truck, and although it means more duplicate recording, not everything that is entered on the supplementary sheet goes on to the master sheet. In other words, the individual sheets, such as for body and truck, are viewed for the more detailed information.

Mileages are entered individually on cards from the statistics provided by the Traffic Branch.

The Departmental Tramways Superintendent considered that, with the keeping of extensive statistics, there is a tendency to make the depot foreman into a clerk, as he is the one who keeps most of the records.

In relation to the annual report, Works Division stated that when the reports are received each year the information given by each Branch differs considerably and, therefore, it is difficult to make comparisons. For instance, one Branch will give car numbers upon which certain work is carried out, another will give the number (or quantity) of cars; one will state on which route track was replaced, another will state the length of track only; one will give materials used for certain work, another will not; and so on. In view of this, it is suggested that standard sheets be used, one sheet for rolling stock, one for permanent way and one for ancillary equipment. It also may be possible for the standard report sheets to facilitate record keeping in the Branches, although in some instances records kept in the Branch may not be of interest to Richmond. It may appear on first glance that the sheets request a considerable amount of information, but what is included has been given by some Branch or other in the annual report.

All Branches welcomed the suggestion that standard forms be used for the annual report, and, from a hurried survey of the samples, considered that, although the information requested could be supplied from existing records, some of it may be superfluous. Bendigo stated that they always had some doubt as to what should be included in the annual report and what use was made of it.

As far as the present samples were concerned, Works Division stated that there was no time to finalize anything for the coming annual report, and it would be appreciated if information in accordance with items on these sheets could be supplied, except, of course, in the case where the information is not readily available and a lot of segregation would be necessary. An endeavour then would be made to obtain for future use some uniformity that is suitable to all. This can only be done after perusal of the samples by Branches and criticism resulting therefrom submitted to Richmond.

From a quick survey, Ballarat considered that one desirable amendment would be in the case of wheels and axles, as the interest is not in the tram numbers but in the wheels and axles: in other words, statistics should relate not to the cars but to the wheels and axles only. The same applies to "in situ" trueing. It also was suggested that the item showing re-canvassing would be better as roof treatments or repairs.

Works Division agreed that some recognizable marking on wheels and axles was desirable. It is understood that it is the practice in the M. & M.T.B. to number all parts separately.

Bendigo suggested that each Branch supply samples of its existing records to Richmond in order that these can be analysed and consolidated in the best form.

ACTION:

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Branches to examine proposed annual report forms and advise Works Division of suggested amendments and/or additions or deductions.

Branches to send Works Division sample copies of existing records in order that these can be analysed and consolidated in a form most suitable to all concerned.

ITEM 4. EMPLOYEES' DUTIES.

(a) Duties for the various classification of employees.

REMARKS:

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A brief history of how this item originated was given by Works Division as follows:-

After visits to each Branch by the Works Manager it was discovered that similar duties in each depot were being carried out by employees of different classification, and only in Geelong did it appear that certain more advanced technical duties were being carried out by tradesmen.

Ballarat had requested from the Industrial Officer some clarification in relation to work that could be carried out by shedmen and assistants, as the existing industrial agreement did not define these duties. Depot manning trouble was being experienced in Ballarat in that they could not obtain shedmen as these men were actually being paid less than assistant shedmen when assistants were working week-end shifts.

On 20th August, 1951, a questionnaire was forwarded to the Branches to obtain details of the classification of employees carrying out the various depot duties. It was considered that receipt of this information would facilitate the decision whether an increase in marginal rates to shedmen or a general revision of duties should be recommended. After receipt of the completed questionnaire from the Branches the information was summarised and forwarded to Works Division from Engineer and Manager.

Although "employees' duties" and "depot manning" started as one item, there are now two separate sections. "Employees' duties" is the one which concerns the conference, as "depot manning", in this instance, is confined to Ballarat.

Briefly, duties were divided into four groups - A,B,C,D. Geelong and Ballarat agreed with the suggestions of Groups A and B, and Geelong also agreed with C. Group D is subject to review. Bendigo differed and did not desire any change from their existing procedure.

Ballarat then gave their view on the matter and stated that the question appeared to devolve into two aspects. Firstly, the removal of any anomalies or injustices to employees concerned, inasmuch as shedmen have been called upon to perform work which in any other organisation would have to be performed by tradesmen. Therefore, there was a need to increase the remuneration of shedmen. Secondly, Ballarat could not get anybody to undertake the duties of shedmen unless more remuneration were offered. The suggestion that certain duties of shedmen should be paid at tradesmen's rates gave that Branch a fair approach to the problem, and enabled them to demand a higher standard of work.

Bendigo remarked that they had received a copy of a letter dated 5th March, 1952, from the Works Manager to Manager, Ballarat Branch, giving permission for tradesmen's rates to be paid for certain depot duties. The granting of these increases was contrary to the opinions set out in a letter to Works Manager from Manager, Bendigo Branch, dated 10th January, 1952. Bendigo also stated that no disability or discontent had been experienced in that Branch through shedmen receiving less money than shedman's assistants. It was considered that the difference between their total earnings is irrelevant to the matter as the higher wages received by the shedman's assistants is due to the disabilities of shift work and, therefore, should not be a case for complaint by the shedmen. It also was considered undesirable and unnecessary to define duties of shedmen or shedman's assistants as requested by Ballarat from the Industrial Officer. In relation to the duties, and in the interests of flexibility, it is preferred that both classes of employee be trained to perform the same duties, the shedmen being more experienced and, therefore, deserving of the higher hourly rate and better conditions of day work.

There is a parallel case in the "B" and "C" grade linesmen. Both grades should be capable of performing the same duties, but when the "C" grade linesman has attained the required standard of experience and competence he is eligible for promotion to "B" grade when a vacancy occurs in the prescribed establishment.

In addition, Bendigo considered that the work on trams was not really skilled tradesmen's work and so the higher rate would mean an increase in costs without getting any extra return.

Works Division replied that, although this matter was raised because of Ballarat's difficulty, it did at the same time raise the point that unskilled men were being asked to perform work that normally required a skilled man, and that was the reason why the duties were scheduled and sent out for discussion. The Metal Trades Award and its definition of tradesmen is taken as the basis for all decisions as far as tradesmen and their duties are concerned, and some of the duties that shedmen are being asked to perform are definitely defined as those of a tradesman. For this reason it was considered wrong to ask the shedmen to do them and expect the same standard as a tradesman while paying him only shedmen's rates.

In Geelong, tradesmen are used or shedmen paid tradesmen's rates for performing this class of work. By paying these additional rates a better standard of work could be demanded and a mechanical fitter could work alongside a shedman if desired. It was pointed out to Bendigo that the time may come when additional shedmen may be required and it may then be an advantage to engage a mechanical fitter in lieu.

Geelong considered that the duty schedules as submitted were based on the practice existing in Geelong for a number of years, shedmen and assistant shedmen being looked upon as individuals carrying out running repairs only. In addition, Geelong strongly favoured the establishment of a line of distinction between the duties of shedmen and assistant shedmen.

Works Division then asked Bendigo to reconsider the position in the light that paying tradesmen's rates for certain work enabled them to demand a better standard and use various personnel, that is, electrical and mechanical, in the tram depot, as it then did not matter if shedmen and tradesmen were working together when they were being paid the same rates.

A general discussion followed and a final arrangement of duties into Groups A, B and C, was agreed upon.

Works Division requested that where standard gauges are used for testing, such as pressure gauges, these standards should be checked every twelve months.

ACTION:

m

Works Division to forward amended duty schedules A, B and C, to Branches.

Works Division to investigate, in collaboration with Branches, the possibility of separating the duties of shedmen and shedman's assistants.

Works Division to ascertain the possibility of altering the title of "Shedman's Assistant" to "Shed Assistant."

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Branches to arrange for standard gauges to be checked every twelve months.

ITEM 4. EMPLOYEES' DUTIES.

(b) Comparison of personnel complements of tram depot and track maintenance gangs.

REMARKS:

A.

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Each Branch gave details of the complements of the two gangs in question, and the information is summarized as under:-

DEPOT										
Ballarat	Bendigo	Geelong								
Foreman L.H. Depot Mech. Shedmen Assistant Shedmen (5 rostered, 1 day shift)	Foreman 1 Shedmen 2 Assistant Shedmen 5 (4 rostered. 1 day shift. Relief duties carried out by a	Foreman 1 Depot Sub-Foreman 1 Shedmen 3 Assistant Shedmen 5								
Car Cleaners	2 Car Cleaners 3	Car Cleaners 4								
(1 staff foreman also assists in depot.)		Charworker								
1.	3 11	15								
	TRACK									
Foreman Leading Hand Welder	Foreman1Welder1T.A. for Welder1	Foreman1Leading Hands2Welder1T.A. for Welder1Total Driver1								
Truck Driver*	Track Benairers 3	Track Repairers 9								
Roller Driver*	1 Roller Driver* 1	Roller Driver 1								
Track Cleaners	2 Track Cleaners 2 (one of whom relieves as shed assistant.)	Track Cleaners 2								
1	3 10	18								
* also act as track	repairers.									

Ballarat stated that a number of shed assistants perform a considerable amount of car cleaning in that Branch.

In view of the comparison, Geelong decided to review their personnel. It was considered by Geelong that the extra mileage and number of trams would account for that Branch requiring the greater number of employees.

ACTION:

Geelong to review the complements of their depot and track maintenance gangs.

ITEM 5. ONE-MAN OPERATION.

(a) Effect on maintenance.

REMARKS:

m.

The Departmental Tramways Superintendent stated that the extension of one-man operation was now under consideration and, in view of this, it is necessary, first of all, to find out to what extent the Branches are able to supply trams to the traffic section as one-man trams and, secondly, to consider the effect in relation to maintenance and work in tramway depots generally, if the depot were called upon to change trams frequently during different periods of the day.

Of course the ideal arrangement, whether one-man or two-man conditions are in force, would be to have all trams of the combined type, so that they can be used irrespective of how traffic is operating. However, in view of the fact that one-man operation is applied more to the volume of traffic being carried than to the size of the vehicle, it certainly would be a problem to the Traffic Section if it were the practice to make all trams suitable for either operation. It appears that, under present conditions, in relation to one-man operation maximum traction trams have brought a complication into the system.

If one-man operation were extended about 50% it would mean that all one-man trams would be required in the morning until midday, and all one-man trams again after 8 p.m. This may cause a waste of time and interference with maintenance as the usage of trams over the day would be much greater than at present.

Ballarat advised that, from previous experience a few months ago when there were conditions existing in traffic making desirable the alternate use of single truck and maximum traction trams and their subsequent changing during the day, it certainly would be inconvenient to the depot staff, particularly in Ballarat where the depot is not in the centre of the system. At the time previously mentioned, it kept one man engaged continually taking trams in and out, and greatly interfered with the work of the depot. In consequence, Ballarat considered it very undesirable from a depot operation point of view.

Bendigo advised that their position was similar to Ballarat, in that the depot is not centrally situated. It was considered that, with smaller mileages, the maintenance per week per tram must be reduced, but at the same time a greater number of cars would be in use, thereby requiring additional inspection by depot staff. It appeared that it would be rather disorganising in the depot to be changing trams frequently during the day.

In Geelong, the position is somewhat different, as the proposed practice is at present in partial operation. The effect of this on tramcar maintenance is as follows:-

- (a) A portion of the time of an Assistant Shedman is spent on changing cars over and hence he is not available for maintenance work.
- (b) As more cars have to be available for traffic it becomes difficult to make them available for maintenance jobs that may take half a day or more.

Minor maintenance jobs taking approximately half an hour should not be affected.

The extent to which this proposal can be carried out will be determined largely by the number of cars in each Branch. In Geelong there are 17 trams suitable for one-man operation and 14 unsuitable - that is, 10 maximum traction and 4 Pengelly.

The Departmental Tramways Superintendent added that it was obvious that one-man operation would have to be extended, otherwise the Commission would peg the expenditure. This then would mean that for every substantial increase in costs one tram would go off the road.

ACTION: Nil.

ITEM 5. ONE-MAN OPERATION

(b) Conversion of maximum traction trams

REMARKS:

man

After discussion on this subject it generally was agreed that the maximum traction trams could be successfully converted for one-man operation and made quite safe, although there undoubtedly would be a few associated disadvantages.

It was considered undesirable that any action be taken at this stage to actually convert or experiment on a tram. However, it was suggested and agreed to hold a meeting later in Ballarat, where a discussion could take place on site and all concerned could submit their ideas for criticism, from which a definite plan can be established.

ACTION:

Works Division to arrange a meeting at an appropriate time in Ballarat to discuss the conversion of maximum traction tram cars for one-man operation.

ITEM 6. BRAKES.

(a) Shoes - difference in patterns.

REMARKS:

It recently was reported at Bendigo that considerable difficulty had always been experienced in inserting the brake shoe pin after having fitted pony brake blocks to the shoe holder. This tapered rectangular section pin secures the brake block to the holder and, on inspection, it appeared that the cause of the difficulty was the dimension of the rectangular hole in the lug of the pony brake block which fits into the shoe holder. Inquiries through Richmond revealed that Ballarat were experiencing the same trouble, but not Geelong, and in view of this a shoe was sent to Bendigo from Geelong (Central Foundry) for comparison with a shoe from Ballarat (Harding's Foundry). It was then found that the blocks differed in geveral dimensions and, in the particular dimension concerned, the Geelong block was 1/8" larger. Bendigo suggested a minor alteration to the pattern.

Ballarat reported that they had experienced the same trouble on both driver and pony, but more especially on the pony. The modification suggested by Bendigo would solve the difficulty in Ballarat also.

As a matter of interest, information regarding brake shoes used in Geelong was given as follows:-

		Tł	nere	are	thre	ee ty	rpes	of	brake	shoes	in	use	in (Heelor	ıg,
VIZ.	No.	1	Patt	ern	No.	TP.1	89	On	trams	1-10, 31-40	16,	17,2	4,26	5 and	28,
	No.	2	Patt	ern	No.	TP.2	225	On	trams	18-23	(B	rill	Rad	liax)	
	Pony	•	Patt	ern	No.	407		On	trams	31-40	•				

New brake shoe holders were installed on trancar No. 16 on 3rd August, 1949, and on trancar No. 17 on 15th August, 1951, (these trans having the Brill Radiax trucks) in order that No. 1 brake shoes could be used instead of No. 2. These new brake shoe holders are giving every satisfaction.

Sufficient new brake shoe holder castings now have been received to convert the brake gear on the remaining Brill Radiax trucks (18-23), and when fitted there will be only two types of brake shoes used in Geelong, namely No. 1 and pony.

All No. 2 brake shoes will be used up before the conversion of the last trampar.

In relation to the Geelong shoes, Works Division advised that a No. 2 pattern was in stock, but it now appeared that this could be scrapped in the near future.

ACTION:

Pra

Ballarat to alter pattern being used by Harding's to overcome the fitting trouble being experienced at Ballarat and Bendigo.

ITEM 6. BRAKES

(b) Standard renewable cups.

REMARKS:

Geelong first raised the question of using standard renewable cups in December, 1951, and a copy of their drawing was sent to Bendigo and Ballarat from Richmond requesting the number of pressings required, if these Branches concurred with the idea, it being intended to produce them in bulk at Works Division.

Ballarat already were using similar types of cups in the brake holders but a solid piece for the hanger links or straps Bendigo were anxious to obtain supplies, and submitted a drawing of an extra size they required which was not on the Geelong drawing. However, before requirements were consolidated Geelong advised that they intended to obtain their supplies from Ballarat. It now is desired to ascertain :-

- (a) if both Geelong and Bendigo's requirements can be satisfied by Ballarat, and
- (b) is there not more work in using a solid piece for the hanger strap instead of a cup.

In reply to (a), Ballarat considered they could supply all requirements, but as the consumption may be appreciable it probably would be more economical for a central workshop to provide them as no facilities for stamping the blanks existed at Ballarat.

In relation to (b), it had been found, as it subsequently was in Geelong, that to use the cup in the brake shoe housing some alteration to the pattern would have to be made, as there is not enough metal to allow its insertion. In addition, the central holes through the half ball projections of the links are often worn and use of a solid piece automatically corrects this trouble as a hole is provided in the insert.

Bendigo had already stated in previous correspondence that they are very much in favour of the idea and wish to adopt it as soon as possible. Bendigo prefer the cups both for hanger and brackets in lieu of the method used by Ballarat since, having once built up the half ball on the hanger link and mechined same to suit the standard cups, new cups can be readily fitted. However, the necessary alteration of the housing may warrant use of the solid piece.

After some discussion it generally was agreed that solid pieces and cups probably were preferable, and that both could be produced in quantity at Richmond.

ACTION:

Tr.

Works Division to produce drawing of cups and solid pieces required to suit all trams, submit to Branches for approval, and obtain from Branches revised estimates of requirements.

ITEM 6. BRAKES.

(c) Use of standard settings and periodicity of check.

REMARKS:

Works Division raised this item as it was understood from the Departmental Tramways Superintendent that a close investigation into the brakes of single truck trams was made in Bellarat in 1947 but, as far as can be ascertained, the information was not promulgated to other Branches at that time. There have been several instances over the last few years where the efficiency of a tram's brakes has been open to question. In Ballarat a standard brake setting was arrived at that would give the maximum efficiency under the varying conditions of load, air pressure and make of tram.

It now is desired to ascertain: -

- (a) Are the Branches following any standard setting for brake mechanism such as that criginally devised in Ball. and proved satisfactory?
- (b) Would a similar setting be useful for maximum traction and other trams if not already existing?
- (c) How often are the brakes tested?

If it is decided to adopt standard settings, drawings showing same should be prepared. This evidently was not done in 1947.

The Departmental Tramways Superintendent then gave a brief history of the case by advising that some years ago the matter of braking was raised by the Union. At that date it was alleged that :-

- (i) a brake became less efficient at night time, that is, after a full day's running,
- (ii) the full air brake did not seem to have the retarding effect it should have particularly when the tram was heavily loaded,
- (iii) as it was a rule that "reverse power" was not to be used for emergency braking, motormen claimed that they were handicapped in avoiding accidents.

An inquiry was then forwarded to all Branches from the Engineer and Manager, following which a number of the allegations were denied. However, Ballarat were well aware that the braking efficiency of some trams was not as good as that of others; in particular, the W.H. equipped trams were inferior to the G.E. equipped trams. A detailed investigation therefore was carried out and a complete report subsequently forwarded to the Engineer and Manager. It was found that some components and/or settings were not standard, and this resulted in a pressure difference per wheel of 7,250 lbs. to 4,960 lbs. Thus, although in correct adjustment, at the worst condition of being on a down grade with a loaded tram the brake would have an apparent loss of efficiency. The first figure quoted was for G.E. equipment with maximum air pressure (top of range) and the latter for W.H. equipment with minimum air pressure (bottom of range). As air pressure range, brake cylinder dimensions, piston travel and setting between brake beam and equaliser bar already had been standardized, it left only the brake cylinder crosshead lever to be attended to. These levers subsequently were altered to provide a lever ratio of 20:40-1/4, and this now gives equal braking on all single truck trams.

Bendigo replied that brake settings on single truck cars were standardized in that city in approximately 1948, by the standard drilling of brake levers. Piston travel is now set at 3-1/2" with a 3/8" gap between the brake beam and the equaliser bar. Brake settings on single truck cars are checked daily and adjusted when required. In the case of the maximum traction trams the piston travel is standard at 6" with the slack adjuster in working condition. The position of the slack adjuster is checked and adjusted if necessary on alternate days.

Geelong advised that they had previously known nothing of adjustments as carried out in Ballarat, but gave the following settings as used by them.

Tramcars Nos. 1-10, 24, 26 and 28 (Brush and Brill Single trucks):-

Air pressure 60-75 lbs./sq. inch. Brake cylinder 8" diameter, 12" long.

The brakes of these cars are adjusted to keep the space between the equalising bars between 3/8" and 1/2". This gives a brake cylinder piston travel of 4" to 4-1/2".

> Tramcars Nos. 16-23 (Brill Radiax trucks):-Air pressure 65-80 lbs./sq. inch. Brake cylinder 8" diameter, 8" long.

The brakes of these cars are adjusted to give a brake cylinder piston travel of 4-1/4" - 4-3/4". The brake adjuster works when piston has travelled 5-3/4".

Tramcars Nos. 31-40 (Maximum Traction):-

Air pressure 60-70 lbs./sq. inch. Brake cylinder 8" diameter, 12" long.

Brakes on these cars are adjusted to give a brake cylinder piston travel of 4-1/4" - 4-3/4". The brake adjuster works when piston has travelled 5-3/4".

All safety valves are set to operate at 10 lbs./sq.inch above cut-out pressure.

The brakes of all trancars in traffic are inspected daily and adjusted where necessary. Working parts are lubricated every second day. The only test applied at present in the depot is that, after adjustment, the tram is moved a few yards over the pit and the brakes applied to ascertain whether the shoes are gripping the tyre firmly and squarely.

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Geelong then queried whether there were any other tests that could be applied to tramcar brakes such as applying the brakes and giving the tram a notch or two of power. The Departmental Tramways Superintendent considered that the most critical part of brake adjustment is the position of angles on the brake lever. The tram should not start on the first or second notch of power, and should only creep away on the third notch.

Works Division stated that it seemed apparent that standard settings for all trams should be devised and a drawing prepared showing these settings. It would also be necessary to determine what tests should be applied to the trams after the brake has been adjusted.

Ballarat spoke of a discovery recently made in connection with the hand brakes of maximum traction trams. It appeared that when apparently fully applied the brake was only 30-40% effective, and due to fouling of components would not go any further. The shape of the joggle lever has had to be altered to give full hand braking efficiency.

Norks Division requested that, in view of Ballarat's discovery, Branches thoroughly check hand brake mechanisms.

ACTION:

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Branches to make certain that hand brake mechanism is fully effective on all trams.

Works Division, after further consultation with each Branch, to arrange for preparation of drawings showing standard settings for brake components on each type of tram.

ITEM 7. WEATHER BLINDS.

(a) Rollers for sun blinds.

REMARKS:

Bendigo have, in the past, experienced difficulty in obtaining 15/16 dia. x 33" long metal rollers for saloon sun blinds. Fortyeight now are required, and it was decided to ascertain if the other Branches also had requirements. A roller was fabricated from 1" screwed conduit some time ago, but this method was considered uneconomical for a large quantity. Also required by Bendigo is the 1-1/4" metal roller 30" and 48" long for platform blinds.

Ballarat have not had to replace any rollers to date and have several spares from scrapped cars for this purpose when required.

As regards Geelong, the rollers used on the sun blinds in the motorman's cabin are of the ordinary domestic type, and no difficulty has been experienced in regard to supplies of these. As the sun blinds in the tramcar saloons are very rarely used in Geelong - perhaps two or three times a year - no maintenance problems have been experienced with these either. However, difficulty has been experienced in obtaining the larger size rollers used for weather blinds, and Furchasing Office have advised that supplies are unobtainable at present.

ACTION:

Supplies & Transport Officer to make inquiries regarding availability of metal weather blind rollers, present requirements being :-

48 - 15/16" dia. x 33" long rollers 36 - 1-1/4" dia. x 30" and 48" long rollers.

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ITEM 7. WEATHER BLINDS.

(b) (i) results of colour dyeing.

REMARKS:

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Works Division stated that during the past year each Branch has been supplied with either complete new blinds or material for their manufacture:-

Geelong - complete blinds of the multi-colour pattern, Bendigo - material only of the same multi-colour pattern, Ballarat - complete blinds of brown and white stripe, and also complete blinds of plain white for the purpose of colouring green.

At the same time as the plain white blinds were despatched to Ballarat, three small pieces of the same material were sent for dyeing and eventual distribution to Geelong, Bendigo and Richmond. It now is desired to ascertain how this work is progressing and whether any standard can be established.

It is understood that Geelong also have tried further dyeing or spraying over the last twelve months.

The following comments were passed: -

Ballarat : After experimental dycing it was found that dyes were not permanent enough to be satisfactory. Lacquer coating then was tried, comprising one of the ordinary enamels with a plasticising thinner. Quite a number of blinds have been treated in this manner. It seemed to improve the appearance in the case of the brown and white and the plain white blinds, and also it is anticipated that a longer life will result, although it is too early to speak with certainty on that point. The blinds still remain sufficiently flexible to operate satisfactorily on the rollers. Regarding the white samples, the supply of plasticising thinners delayed this job, but these are now to hand and the colouring will be completed as soon as possible.

Geelong : We have not attempted to actually dye blinds. The only experience we have had in this connection has been where some of the blinds have become dirty and faded and, in order to brighten them up, we have sprayed on the weather side one or two coats of Taubman's "Riverlac" flexible lacquer, colour Marsh Green No. 12793. Having in mind the objective, the treatment has been effective. Some of the treated blinds have been on the trams for four or five years after spraying.

Ballarat : We originally did the same as Geelong, but we have since, from a point of view of improving the appearance of material as well as securing longer life, given an initial treatment which also acts as water proofing. The technique we now adopt to prevent too much accumulation of the lacquer and consequent thickening of the material, is that of almost saturating the material with water before it is painted. From experience we estimate that a ratio of 4 or 5 to 1 would be added to the life if sprayed. Blinds do not wear out, they rot.

Bendigo: We have not tried colour dyeing because we have procured stocks of the multi-coloured sun blind material which is preferred in this Branch.

Geelong supported the suggestion of Works Division that a standard should be adopted as soon as possible. Geelong preferred this as it would enable one blind to be changed and the blinds to be interchangeable between trams. White duck may be the most satisfactory as it could be dyed to the colour required. It was suggested that inquiries be made from M. & M.T.B. to ascertain the type of blind used by them, as the pale green blinds fitted to the maximum traction trams were fairly old and still had colour in them.

The Supplies & Transport Officer stated that dyeing in the roll may create problems such as resulted from dyeing "uniform" material, but suggested that some firm may be prepared to dye materials in quantities suitable for a batch of blinds. From a Stores point of view it would be much better to buy the material already dyed.

ACTION:

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Works Division to ascertain the possibility of having white duck dyed before the blinds are made up.

Works Division to ascertain from the Tramways Board the material used for their blinds in the past and at present.

ITEM 7. WEATHER BLINDS.

(b) (11) Use of plastic material.

REMARKS:

orks Division advised that following the recent discussion at Geelong on the plastic covering "Vynoid" which is manufactured from Poly-Vinylchloride by Plastic Coatings, Limited, of Sydney, a sample later was left at Richmond for the purpose of testing its properties as a weather blind. The linen backing of the material required proofing and a solution also was supplied for this purpose. However, difficulty was experienced in the application of this solution. As regards proofing, some of the standard products may be satisfactory. None was tried in this instance.

It originally was hoped that the sample blind could be tried for a short period in each Branch before the conference, but unfortunately this has not been possible. However, the blind is now in circulation and comments in due course would be appreciated. It is of a green colour and reputed to be fadeless, resistant to acids, oils, etc., waterproof, and will not peel, scratch or crack. If it does appear a good material after tricl, it could replace the canvas blinds entirely, but in view of the cost its capabilities would need to be well proven.

The sample blind has been made to a size that should be suitable to a maximum traction tram in each Branch.

Ballarat considered that the plastic material would be preferable if it could be obtained with grey or some other neutral colour on the inside instead of white, but queried the cost of the plastic when compared with canvas, and was advised that it is probably twice as much.

ACTION:

If after trial the material appears to be generally preferable to the canvas, Works Division to ascertain the possibilities of getting the material with a different backing from the present white colour, or obtaining some suitable proofing solution.

ITEM 8. RENEWABLE PANS FOR FROGS.

This item was cancelled before commencement of the conference as it does not appear common to all Branches.

ITEM 9. TRACK DRAINS.

REMARKS:

Works Division queried whether the trouble experienced in Ballarat, and referred to in last year's report, viz. "it was necessary to excavate track drain outlet pipes in a number of points to clear blockages", could have been reduced by regular flushing (if this is not already carried out), or was the trouble particularly bad in that city due to the large number of trees along some of the tram routes. No mention of blocked drains was made in the reports from Bendigo and Geelong, although Bendigo did mention that drains were flushed regularly.

Ballarat replied that the cases referred to were in the drain under the track at the outlet point letting storm water away. This trouble was caused by tree roots, etc. Trouble was also experienced through leaves and silt. Any drain that shows signs of blocking is flushed weekly and the same with the agricultural main track drain.

As stated under Item 4, Bendigo have two track cleaners one of whom acts as relieving assistant shedman when necessary. When not in the depot the usual practice is for the two cleaners to take out the cleaner car, and the duties comprise flushing drains once per week. Four-inch agricultural drains are installed under the centre of the tracks and these drain to pits in suitable places, and the pits in turn are drained to gutters or culverts, whichever is the nearest, by either 4" earthenware pipes or 3" boiler tube. Earthenware pipes have not proved satisfactory because tree roots, etc., break into the pipes, and it has been found also that 3" boiler tube, apparently left over from the Bendigo Power Station, is too small. It is intended to replace this when required with obsolete 4" cast iron water mains from the State Rivers & Water Supply Commission. Blocked drains are usually caused by tree roots, leaves and sand, and provided regular flushing is carried out it is considered that no difficulty should be experienced.

In Geelong, no periodical flushing of agricultural pipes used as track drains takes place. However, after rain, inspections are made to ascertain if drains are discharging into drain boxes. The drains leaving the drain boxes and running to street gutters or council barrel drains are flushed out at approximately four-monthly intervals. In the last two years, Geelong have had three blocked drains, twice in the same location in Aberdeen Street and caused by the roots of poplar trees, and once in Melbourne Road, North Geelong.

Geelong queried whether some blockages in track drains are indicative of too much fines in the aggregate used for track construction, and also the possibility of using some poison down the drain for action against tree roots. Creosote is used in Geelong at present.

A general discussion followed in connection with the elimination of tree roots by poison. Works Division suggested the use of "Arzeen" or "Sodium TCA" poured down drains after blocking off sections as required.

ACTION:

Works Division to make inquiries regarding suitable

poisons.

ITEM 10. BROOMS FOR TRACK CLEANING.

REMARKS:

Supplies & Transport Officer raised the question whether the type of broom now being supplied for track cleaning was suitable for the work, as usage rate appeared very high. It was queried, also, whether a full width broom was necessary to sweep rail grooves and whether the same type of broom was the right type for car cleaning.

Geelong stated that the American Millet Straw Broom now in use was certainly not giving the service that was obtained when 9" pure bass carpet brooms were supplied.

As the same broom is used for both purposes, Works Division wondered if the broom could be used first for car cleaning and then passed out for track cleaning, in order to reduce usage. Ballarat and Geelong thought that the idea had possibilities, but Bendigo considered that a hair broom is better for car work.

It generally was agreed that the straw type broom was the most suitable for track cleaning, and that a wire one, as suggested by Geelong, would not be flexible enough for curves, points and crossings.

The Departmental Tramways Superintendent suggested the possibility of dipping the new brooms taken for track work in some kind of oil before use, to make them less brittle, and also considered that the full width broom is necessary as the roadway adjacent to points and crossings usually is swept at the same time.

ACTION:

Branches to keep a check on broom usage and investigate the possibility of using the broom first for carcleaning and subsequently for track cleaning.

Supplies & Transport Officer to ascertain the availability of a pure bass carpet type broom which Geelong stated had given better service in the past.

ITEM 11. INTERCHANGE OF IDEAS AND EXPERIENCES, AND DISCUSSION ON GENERAL MATTERS.

(i) Fi⁺ting of lubricators to certain parts of truck and body.

REMARKS:

Ballarat advised that some years ago ordinary standard grease lubricators were fitted to the half ball brake hanger components and the main fulcrum point of brake rigging to allow the use of a grease gun. This was done to give better lubrication than obtainable with an oil can.

Drip feed oil lubricators also have been fitted under the saloon seats of the maximum traction cars to provide adequate lubrication for the top and side wearing plates of the side bearing.

These fittings have proved very beneficial.

No such lubricators are fitted in these positions in either Geelong or Bendigo, but it generally was agreed that the idea was well worthy of investigation.

> (ii) Sealing of gutter around roof to stop leaking and subsequent rusting.

REMARKS:

Ballarat consider that this trouble has been eliminated in that Branch by using a made-up plasticised bitumen and pouring in quickly to seal the gutter. In one case a non-drying roof treatment material "Hydroseal" was used, but the bitumen method is quicker and proved very satisfactory.

In Bendigo, flat galvanised iron is used around the roof gutter and the only treatment given is the lead paint when the roof is painted each Autumn. No leaking or rusting has been experienced.

In Geelong 1/2" diameter holes have been drilled in the vertical face of the gutter at each end of the tram car to drain water away. Sealing is by using stone lead base paint.

(iii) Lubrication of motorman's valve.

REMARKS:

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Bendigo are at present using "Texaco Star No. 3" grease on motorman's valves, but this dries out and requires more frequent attention than a green coloured grease which it is understood from the Acting Depot Foreman was used prior to the war. It therefore was desired to ascertain what the other Branches use, but this information was not available for the conference.

ACTION:

Ballarat and Geelong to advise Bendigo of lubricant used in motorman's valves.

(iv) Roof covering.

REMARKS:

Bendigo referred to the roof treatment carried out as an experiment on single truck car No. 19 during April, 1951. The monitor roof of this car was covered with 3/16" tempered "Masonite" using five 4' x 5'9" sheets. The sheets were fitted across the roof, joints being formed over the cross ribs of the roof, and these joints sealed with white lead. The "Masonite" was screwed down with 1" x 8 gauge countersunk head wood screws at 5" centres, and then painted with one coat of undercoat and two coats of finishing oil lead paint. The lower portion of the roof was covered with 21 oz. white duck. The roof was painted and the duck tacked down while the paint was wet. After tacking, the duck was treated with two coats of paint. At present both "Masonite" and duck on this roof are in good condition, but it possibly will be three years before any definite comparison can be made.

(v) Shock from controller - maximum traction cars.

REMARKS:

A complaint recently was received in Ballarat in connection with shock from the controller of a maximum traction car, and on investigation a broken earth lead (broken at the lug) was found and, in fact, no connection existed between the earth system of the car and the rail. The controller has the earth connection on to it, then out to the earth bus, the earth bus becoming alive when the car is in operation. It therefore was possible for the controller to be alive at 500 volts to the brake handle. It was considered a remote possibility that the two earth connections could be broken at the same time, but it had occurred. In order to safeguard completely against a reoccurrence it was decided to positively connect the controller to the brake rigging so that there could be no difference of potential.

ACTION:

Other Branches to inspect maximum traction cars and consider the fitting of an independent earth connection from the earth pin to the frame of the car.

(vi) Expansion joints in rails.

REMARKS:

Geelong spoke of a peculiar incident experienced by them when reconditioning some "T" rail on the Eastern Park and East Geelong routes which indicated the need for an expansion joint. A section of the track was opened, reconditioned, the rails straightened, concrete blocks placed in position, and the track eventually re-sealed. Next day an adjacent section was opened, the work progressing day by day along the route. However, it was found that when the second section was straightened the bend was restored to the rail supposedly straightened the previous day. It finally was decided to open up the rail and take out 1/2" but the gap provided immediately closed up. A further 1/2" was removed and the same thing happened. Before success was obtained, 2" had been removed from the rail which had a total length of just over 3/4 mile. The work was not carried out in summer weather.

Geelong then queried whether similar trouble had occurred in other Branches, and it was ascertained that it had in Bendigo.

Ballarat stated that they had found that in certain cases where expansion joints had been left, although checks had been taken no evidence of seasonal movement was noticeable.

However, the Departmental Tranways Superintendent recalled some trouble experienced in Sturt Street West some years ago. During the reconstruction, the rail was straightened but difficulty was experienced in keeping it straight. The cause at the time was attributed to the fact that one side of the track was paved whereas the other was only earth; therefore there was no mechanical strength to hold the track rigid on that side. Eventually it was decided to put in expansion joints and after this was done the track remained straight.

(vii) Windscreen wipers.

REMARKS:

The Departmental Tramways Superintendent stated that the Purchasing Officer had advised that the probability of obtaining supplies against the current requisition for Ballarat and Geelong was very indefinite (overseas supply), and it was decided to ascertain to what extent these wipers are vital what are the minimum requirements - do Bendigo require any are there any spares available in the Branches. If the requirements can be reduced to a small number, the M. & M.T.B. may be able to oblige.

ACTION:

Branches to advise Works Division of the minimum requirements of windscreen wipers.

REMARKS:

As batteries now have been installed in tram cars for some years, it was considered by Ballarat that they may be nearing the end of their useful life.

ACTION:

Branches are advised to keep this matter well forward in case the position in regard to the availability of batteries deteriorates.

SCRAPPING OF TRAMS IN BADLY DAMAGED CONDITION

REMARKS:

This item was raised by Works Division following a recommendation received from Bendigo that they scrap a tram which had been badly damaged in an accident. The cost of repair was estimated to be £500.

Considering that the Commission's fleet of trams probably cannot be added to for some considerable period, if ever, it was queried how far the fleet could be reduced by writing trams off after accidents while still maintaining an effective service with sufficient reserves for maintenance and peak loading. It is a matter of whether or not a decision to write off a tram may be regretted if one is more severely damaged in an accident within a short period. Therefore, it is a question of determining in principle whether trams should be scrapped or repaired.

Bendigo stated that a good deal of thought had been given before recommending the specific scrapping. The tram was hit by a heavy truck right side front and the whole of the chassis was badly bent to such an extent that the doors at the other end of the tram would not even close. The timber work of the tram is in poor condition and it has completed many more miles than other trams already listed for scrapping.

Works Division queried whether, up to the present time, all trams involved in crashes had been repaired and not scrapped after accidents, to which the Departmental Tramways Superintendent replied that some years ago in Bellarat one tram was so badly damaged that the cost of repair exceeded the purchase price of a maximum traction car from M. & M.T.B. Consequently the tram was scrapped.

In Geelong, however, no trams have ever been scrapped following accidents.

Works Division then queried how many trams could be scrapped before reaching the state where replacement or repairs would be necessary irrespective of damage. Bendigo considered that they have a good reserve at present but are getting to the stage where the maintenance on the single truck cars is becoming excessive and, as a result of this, they are making more use of the "Birney" car. Until comparatively recently the "Birney" cars obtained from Geelong had hardly been used in Bendigo due to some prejudice, but they are now being used to a greater extent and have been favourably commented upon by the public. Bendigo queried what disadvantage Geelong had found in the "Birney" car, to which Geelong replied that it was from a loading point of view only. In the days when these trams were transferred to Bendigo therefore were too small for certain routes.

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Ballarat considered that, although they now had a sufficient reserve of rolling stock, in general it would be the policy to repair rather than scrap because of the trouble in securing further trancars. However, if the damage were really of a major nature, repairs probably would not be economical.

Geelong stated that the recent acquisition of four maximum traction cars allowed for the retirement of some trams, it being intended to retire the three "Meadowbank" cars of 6'6" wheel base. However, in view of the possibility of extending one-man operation, this action has been temporarily postponed.

Works Division then advised that the case for scrapping of Tram No. 2 in Bendigo would be supported and, as carried out by Bendigo in this instance, careful thought relative to individual cases must be given before future scrappings.

CONCLUSION OF CONFERENCE.

It unanimously was agreed that a further conference should be held next year.

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In view of the possibility of his not attending further tramway conferences, owing to Departmental reorganization, Mr. Mounter expressed his thanks to all conference members for their assistance in tramway matters.

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VORKS	DIVISIO	
Item	1.4.1	: Works Division to place a bulk order for tyres on Thompsons, specifying that rough-turning be carried out leaving 3/16" on all diameters.
Item	1.A.3	: Vorks Division to ascertain M. & M.T.B. practice in relation to minimum dimensions of tyre thick- ness and flange width and height, and to communi- cate this information to Branches together with suggested minimum sizes for the provincial city tramways.
Item	1.0.1	: Works Division to prepare a drawing showing all switch blade patterns evailable from Richmond.
Item	1.C.4	: Works Manager to discuss with Engineer and Manager whether it is necessary to write to Councils and remind them of their obligations in relation to track maintenance.
Item	1.D.1	: Works Division to make inquiries concerning putties for deep fillings, and advise Branches.
Item	1.E	: After return of special sample trolley wheels to Richmond, Jorks Division to cut these into sections and send pieces to each Branch for comparison of profile.
Item '	1.F	: Works Division to prepare a draft schedule giving standard nomenclature for all tramway items with a view to inclusion in the Stores Vocabulary. Draft schedule to be sent to each Branch for comment.
Item	1.G	Norks Division to arrange for a daub of paint to be placed on castings to indicate position of inspector's stamp.
Item	1.1	 Works Division to give further consideration to the preparation of a standard specification list for castings. Works Division to advise all Branches periodically of any amendment or addition to the pattern list.
		Works Division, if requested, to forward patterns to Branches for checking.
Item	4.A	Works Division to forward amended duty schedules A, B and C, to Branches.
		Works Division to investigate, in collaboration with Branches, the possibility of separating the duties of shedmen and shedman's assistants.
		Works Division to ascertain the possibility of altering the title of "Shedman's Assistant" to "Shed Assistant."
Item	5.B	Works Division to arrange a meeting at an appro- priate time in Ballarat to discuss the conversion of maximum traction tram cars for one-man opera- tion.
Item	6.B	Works Division to produce drawing of cups and solid pieces required to suit all trams, submit to Branches for approval, and obtain from Branches revised estimates of requirements.

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WORK	S DIVISIO	<u>ON</u> :	
Item	6.0	:	Works Division, after further consultation with each Branch, to arrange for preparation of drawings showing standard settings for brake components on each type of tram.
Item	7.B.(i)) :	Works Division to ascertain the possibility of having white duck dyed before the blinds are made up.
			Works Division to ascertain from the Tramways Board the material used for their blinds in the past and at present.
Item	7.B.(ii	.):	Works Division to ascertain the possibilities of getting the material with a different backing from the present white colour, or obtaining some suitable proofing solution, if after trial the material appears to be generally preferable to the canvas.
Item	9	:	Works Division to make inquiries regarding suitable poisons.
BRANC	HES:		
			ALL BRANCHES:
Item	1.0.1	:	All Branches to make a survey of special works to ascertain requirements over the next five years.
Item	1.0.3	:	Branches to review rail requirements for a period of five years in order that Works Division can ascertain the possibility of placing a bulk order.
Item	1.D.3	:	Use of a central white panel as initiated by Geelong recommended for installation in all maximum traction cars.
Item	1.F	:	Branches to forward to Works Division lists of all tramway components held in Branch stores, together with card number and maximum and minimum holdings, to enable a consolidated list to be prepared.
-			When a Branch requires an item such as electrodes, which is covered by an annual contract but this contract does not include a brand or grade which has proved most suitable for the job, then the requisition should state that 'it is the only type suitable" or "it is the most satisfactory."
Item	1.H	:	Sending of copies of drawings produced by any one Branch to the other Branches and Works Division should continue to be strictly adhered to, as this action is very valuable to all.
Item	1.I	:	The inclusion of pattern numbers on new drawings (numbers obtainable from Richmond per phone) should continue to be strictly adhered to in order that the list may be kept up to date. Similarly, details of any new pattern produced in a Branch should be referred to Richmond.
Item	2	: I 8 1 1	Branches to prepare a set of rules for shedmen and track men giving the principles rather than too much detail. After review and finalization, these rules to be included in the book of "Rules doverning Employees."

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ALL BRANCHES:

- Item 2 : Branches to forward new comments concerning the draft set of rules prepared by the Departmental Tramways Superintendent, in view of the discussion at this conference.
- Item 3 : Branches to examine proposed annual report forms and advise Works Division of suggested amendments and/or additions or deductions.

Branches to send Works Division sample copies of existing records in order that these can be analysed and consolidated in a form most suitable to all concerned.

- Item 4.A : Branches to arrange for standard gauges to be checked every twelve months.
- Item 6.C : Branches to make certain that hand brake mechanism is fully effective on all trams.
- Item 10 : Branches to keep a check on broom usage and investigate the possibility of using the broom first for car cleaning and subsequently for track cleaning.
- Item 11 (vii) : Branches to advise Works Division of the minimum requirements of windscreen wipers.
- Item 11 (viii): Branches are advised to keep the matter of tail light batteries well forward in case the position in regard to the availability of batteries deteriorates.

GEELONG:

- Item 1.D.4 : Geelong to cover the saloon floor of a single truck tram with rubber.
- Item 2 : Geelong to advise Bendigo of the procedure adopted for testing line circuit breakers, sending copies to Ballarat and Works Division.
- Item 4.B : Geelong to review the complements of their depot and track maintenance gangs.
- Item 11 (iii) : Geelong to advise Bendigo of lubricant used in motorman's valves.
- Item 11 (v) : Geelong to inspect maximum traction cars and consider the fitting of an independent earth connection from the earth pin to the frame of the car.

BENDIGO:

Item 11 (v) : Bendigo to inspect maximum traction cars and consider the fitting of an independent earth connection from the earth pin to the frame of the car.

BALLARAT:

- Item 1.A.2 : Ballarat to take tool manufactured by Works Division for trial and to report on results.
- Item 1.D.4 : Ballarat to cover the saloon floor of a single truck tram with rubber.

BALLARAT:

Item	1.E.	:	Bal	larat	t to	send	Bran	ches	a wo	rn -	trol	ley	wheel	
			SO	that	the	degre	ec of	pitt:	ing	can	be	comm	bared.	1

- Item 6.A : Ballarat to alter pattern being used by Hardings to overcome the fitting trouble being experience. at Ballarat and Bendigo.
- Item 11 (iii) : Ballarat to advise Bendigo of lubricant used in motorman's valves.

DEPARTMENTAL TRAMWAYS SUPERINTENDENT:

Item 2 : Departmental Tramways Superintendent to prepare new set of rules after Branches have further reviewed existing draft.

SUPPLIES & TRANSPORT OFFICER:

- Item 1.C.3 : Supplies & Transport Officer to ascertain what size and type of rail is being used at Yallourn, from whom it is purchased and where it is stored.
- Item 7.A : Supplies & Transport Officer to make inquiries regarding availability of metal weather blind rollers, present requirements being :-
 - 48 15/16" dia. x 33" long rollers 36 - 1-1/4" dia. x 30" and 48" long rollers.
- Item 10 : Supplies & Transport Officer to ascertain the availability of a pure bass carpet type broom which Geelong stated had given better service in the past.

