

*Revised*

LIST OF CARS AND BUSES WHICH HAD NOT BEEN REPAIRED UP TO 31st DECEMBER 1915.

<u>CARS.</u>				<u>BUSES.</u>			
No.	Year Built.	Station.	No.	Year Built.	Station.		
403.	1907	Spare	439/42	1906	Spare		
404.	"	"	443	1907	"		
433.	"	"	445/8	"	"		
435.	"	"	451	"	"		
457.	"	"	454	"	"		
496/501	"	"	*457/8	"	"		
510/15	1911	"	460	"	"		
<u>322</u>	1909	Windsor.	<u>462</u>	"	"		
<u>18</u>			<u>15</u>				

LIST OF CARS AND BUSES WHICH HAD NOT BEEN REPAIRED SINCE THE DATES MENTIONED.

<u>CARS.</u>				<u>BUSES.</u>			
No.	Station.	Not repaired since	No.	Station.	Not repaired since		
93	D. & Q.	1909	113.	D. & Q.	1909		
203	"	1908	114.	"	"		
226	Spare	1910	115.	"	"		
246	Spare	1904	358.	"	"		
233	D. & Q.	1909	359.	"	"		
354	"	"	360.	"	"		
376	"	"	363/72.	"	"		
382	"	"					
383	"	"					
384	"	"					
385	K. Melbourne	1910					
386	D. & Q.	1910					
396/8	"	1909					
299	"	1909					
<u>16</u>			<u>16</u>				

The above shows that new cars do not require much expenditure upon repairs during their early life..



*Red Dole 16*

LIST OF PERIODICAL REPAIR AND OVERHAUL OF BO "Aard"

and 14 more recently built DUMMIES effected in 1915. (usually onn three or four years) Damages excluded.

Lowest consecutive numbers selected.

Built 1885/6.	Built 1887.	Built 1889.	Built 1890.	Built 1907 & 1912.
Nov. 1 to 71. No. 100/179. No. 246/323. No. 355/429. No. 449/477				
33. 8. 7	30. 8. 11	41. 5. 7	37. 2. 1	31. 12. 4 6 yrs.
36. 18. 7	34. 12. 7	39. 12. 8	42. 11. 2	29. 0. 0 * *
33. 13. 9	37. 16. 11	39. 4. 3	42. 1. 4	31. 14. 9 * *
36. 1. 9	37. 2. 11	24. 10. 11	38. 17. 10	28. 12. 5 * *
41. 16. 3	43. 14. 0	33. 16. 10	37. 18. 0	29. 18. 1
32. 5. 11	45. 15. 2	40. 4. 10	36. 13. 6	34. 9. 7
23. 11. 10	40. 19. 10	35. 16. 0	40. 17. 10	30. 16. 6
35. 15. 2	41. 12. 3	36. 11. 3	37. 13. 10	30. 6. 0
37. 6. 3	54. 13. 11	34. 15. 7	43. 1. 11	27. 16. 6
34. 7. 2	44. 14. 5	37. 16. 10	34. 19. 3	29. 8. 9
33. 2. 9	35. 19. 6	35. 6. 11	36. 13. 10	30. 15. 7
31. 16. 2	37. 18. 6	35. 17. 1	38. 1. 3	28. 9. 7
34. 5. 8	39. 2. 11	41. 7. 4	39. 14. 2	33. 2. 9
44. 9. 6	36. 9. 7	51. 6. 10	36. 7. 9	29. 12. 2
41. 5. 10	36. 14. 8	41. 10. 3	37. 18. 8	
36. 16. 2	25. 16. 8	32. 17. 9	32. 15. 9	
32. 19. 6	34. 10. 9	31. 19. 8	35. 16. 2	
36. 2. 7	33. 0. 6	36. 18. 5	32. 15. 1	
35. 0. 3	31. 12. 1	32. 13. 8	41. 7. 11	
31. 1. 11	34. 15. 10	19. 0. 6	14. 5. 5	
<u>709. 5. 7</u>	<u>767. 11. 11</u>	<u>744. 15. 2</u>	<u>757. 12. 9</u>	<u>418. 6. 0</u>
15. 9. 3	38. 7. 7	37. 4. 9	37. 17. 7	29. 17. 7

Average 30  
Dummies.

= 37. 4. 10

Average  
14 Dummies

Shows sum that the average repair of 30 Dummies built 1885/1890 was.... 37. 4. 10

Whilst the same repair to 14 Dummies built 1907/12 was .... 29. 17. 7

29. 17. 7  
2. 7. 2. 3



The "Aged" Dummies therefore, cost 24.6% more to repair than Dummies built in 1907 & 1912. In addition to this, the "Aged" Dummies appear to come in for overhaul oftener than the newer cars.

Notes.- 80 "Aged" dummies were selected at random, and the whole of the more recently built dummies which were repaired in 1915, were taken. (Fourteen).  
Four of the fourteen dummies were 0 years old before coming in for overhaul.



COST OF PERIODICAL REPAIR AND OVERHAUL OF 60 DUMMIES

effected in 1914. Dummies excluded.

Lowest consecutive numbers selected.

Built 1885/6. No. 1/48.	Built 1887 No. 102/40.	Built 1889 No. 247/97.	Built 1899 No. 356/675.	Built 1906/12. No. 437/666.
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40. 1. 1	38. 7. 5	47. 1. 6	38. 18. 3	33. 5. 3
34. 4. 8	39. 10. 5	51. 5. 10	34. 4. 11	35. 1. 2
30. 10. 2	36. 9. 1	29. 0. 5	36. 12. 8	22. 19. 4
31. 19. 0	33. 19. 3	41. 5. 8	40. 7. 3	
38. 14. 0	21. 12. 5	42. 8. 4	43. 5. 4	
37. 6. 11	46. 7. 3	36. 1. 3	46. 4. 9	
37. 13. 8	39. 14. 6	41. 14. 1	46. 16. 11	
38. 17. 10	43. 12. 9	46. 4. 9	45. 11. 11	
33. 3. 2	40. 14. 4	37. 4. 11	42. 4. 7	
47. 3. 8	33. 10. 7	35. 9. 5	37. 11. 2	
41. 3. 3	35. 15. 6	32. 11. 8	45. 8. 2	
46. 8. 0	30. 16. 8	40. 12. 8	38. 13. 2	
41. 9. 8	31. 5. 10	44. 8. 3	38. 14. 10	
48. 13. 1	43. 5. 2	39. 15. 6	37. 19. 3	
30. 16. 0	35. 19. 2	46. 4. 11	28. 19. 1	
51. 8. 11	33. 1. 10	38. 13. 11	33. 9. 5	
57. 10. 9	28. 19. 8	43. 5. 4	38. 13. 6	
45. 9. 6	42. 2. 2	46. 7. 10	33. 3. 0	
49. 15. 8	36. 11. 2	34. 9. 8	39. 3. 2	
43. 15. 5	42. 4. 1	19. 10. 5	39. 10. 4	
826. 12. 7	743. 19. 3	809. 16. 4	785. 11. 8	91. 5. 9

Average 41. 6. 7 37. 3. 11 40. 9. 9 39. 5. 7 30. 8. 7  
 Average 60 Dummies ) 2 & 39. 11. 6 Average for 3 Dummies...

Shows that the average repair of 60 Dummies is 39. 11. 6  
 built 1885/1890 was.....  
 whilst the average repair of 3 Dummies built in 1906/12 was....  
30. 6. 2

The "aged" dummies therefore cost 30% more to repair & 9. 2. 11 than the three Dummies built in 1906/12.

None - Only three dummies built in 1906/12 were repaired in 1914 & two of the three dummies were 8 & 7 years old respectively without previous repair. Three dummies in too small a number upon which to base a fair figure, but the figures, so far as they go, practically agree with the larger averages shown in the previous statement.



50 TUMMIES BUILT 1906 to 1912.

COST OF REPAIRS (excluding damages); including "accrued" repairs to 31st December 1915 during the whole of the lives of 50 Tummies built 1906 to 1912.

Car No.	Built.	Repairs effected to 1915.	Accrued at 31/12/15.
327		7. 5. 8	11.16. 5
8		8.18. 3	3.18. 8
435		7.14. 1	3.16. 0
6	10 Tummies	23.11. 1	18.14. 0
7	built	40.18. 8	8. 1. 4
8	in 1906.	11. 1. 4	16.10.10
9			2. 4. 8
440			4. 6. 8
1			3. 5. 0
2			6. 7. 8
443			3. 5. 0
4			1.12. 4
5			6.15. 0
6			3.13. 8
7			8.19. 8
8			8.15. 4
9			4. 8. 4
450			2.23. 8
1	50 Tummies	35.19. 1	1.14. 8
2	built	35. 1. 2	3. 0. 8
3	in 1907	29. 0. 0	3.18. 0
4			2.12. 0
5			4.15. 0
6			2. 3. 4
7			1. 5. 0
8			1.19. 0
9			1.19. 0
460			6.14. 4
1			1.14. 8
2			2.12. 0

£ 291. 6.10

£7.11.11



Car No.	Units,	Repairs effected to 1915.	Accrued at 31/12/15
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463	Forward	£ 791. 8.10	157.11.11
4			9.17. 0
5			10. 4. 4
6			1.14. 8
7			12. 6. 8
8			2. 3. 4
9			3. 5. 6
470			1.19. 0
1	20 Dummies built	27.16. 6	3.11. 8
2			1.17. 8
3			2.12. 0
4			2.12. 0
5			2.12. 0
6			3. 3. 0
7			2.19. 8
8			2. 7. 8
9			1.19. 0
480			1.19. 0
1			21. 1. 6
2			12. 3. 0
			18. 6. 8
			5.14. 4
			1.19. 0
			<u>279. 9. 2</u>
			<u>631.17. 3</u>
			<u>911. 6.10</u>

Average for 50 dummies £ 18. 4. 8 (excluding dummies)

The average of these 50 dummies was, in 1915; over 8 years.

The above total represents the actual cost of repairing the

Dummies for their whole lives up to 31st December 1915 including the "accrued" repairs to 31st December 1915..

For estimate?

18.4.8 =  
 10  
 2.13.0  
 over



of the earliest dunnies.

I can obtain no statistics to show whether 8 years car mileage of the later dunnies is equivalent to 3 years car mileage of the earliest dunnies.

It shows that the average annual repair of "aged" dunnies costs over twice as much as the annual repair of newer dunnies, use of the earliest dunnies, equivalent to about 3 years' use of the latest 50 dunnies is. It is assumed that the 8 years' use of the latest 50 dunnies is average of 8 years. Portion of the dunnies were "spares".

The cost of repairing (including "spare" repairs) 50 dunnies built 1906 to 1912 was \$18,408 extending over an

in 1885/1890 (see sheet No. 4) was \$38,802. The average cost of the tri-annual repair of 160 dunnies built

came in for periodically overhauled about every three years, the years 1890 to 1915 - 28 years. The dunnies therefore (damages) 613 times - an average of 5.52 times each - in

"Company," "Kendall & Co." were overhauled (excluding The first 111 dunnies built in 1885/7 Nos. 1 to 111 pages 16/18

any particular station, being used as "spares". 24 of the 50 dunnies do not appear to have been allotted to





H. A. WILCOX, GENERAL MANAGER.  
W. O. STRANGWARD, SECRETARY.

*Tramway Board,*

*673 Bourke Street,*

*Melbourne.*

30th Septr. 1916

P. J. Pringle Esq.,

59, William Street,

MELBOURNE..

Dear Sir,

Herewith I enclose copies of portions of my calculations which, (as far as they are fair averages) prove that the annual charges for Maintenance of Cars and Dummies increase with the advancing age of such vehicles.

Yours faithfully,

A handwritten signature in cursive script, reading 'W. O. Strangward'. The signature is written in dark ink and is positioned above the typed name 'Secretary'.

Secretary.

Encl.



SUMMARY.

The averages in the Company's exhibit "A. 1" on pages 1 and 3 show the average annual repair (including damages) for the 17 1/2 years from 1898 to 1915 as follows:—

Sheet No. 7	20 Imported Cars..	£ 237. 9. 10
8	12 Cars built in 1886..	<u>457. 1. 7</u>
		<u>57</u>
	Average per annum.....	£ 13. 3. 8

Upon the first page of Exhibit "A. 1" the average cost per annum of repairing all Standard Cars for 17 1/2 years, 1896 - 1915 is stated to be £ 9. 8. 9.

The cost per annum of repairing the balance of the cars must therefore have been considerably less than £ 9. 8. 9.

Notes.— The examples selected are from the oldest cars and probably from those in heavy traffic. Many of the remaining cars were used as "Spares" or were built at a more recent date.

The figures point to the conclusion that many of the older cars require a much heavier expenditure upon maintenance than the more recently built cars or those which have been less used.



APPENDIX.

"A"

The averages in the Company's exhibit "A 1" on pages 1 and 3 show the average annual repair (including damages) for the 17 1/2 years from 1898 to 1915 as follows:-

Sheet No. 7	20 Imported Cars.	£ 237. 9. 10
8	17 Cars built in 1886..	<u>£ 457. 1. 7</u>
		<u>£ 694. 11. 5</u>
	Average per annum.....	£ 12. 3. 8

Upon the first page of exhibit "A 1" the average cost per annum of repairing all Standard Cars for 17 1/2 years, 1898 - 1915 is stated to be £ 9. 8. 9.

The cost per annum of repairing the balance of the cars must therefore have been considerably less than £ 9. 8. 9.

Note. - The examples selected are from the oldest cars and probably from those in heavy traffic. Many of the remaining cars were used as "spares" or were built at a more recent date. The figures point to the conclusion that many of the older cars require a much heavier expenditure upon maintenance than the more recently built cars or those which have been less used.



S U M M A R Y.

21. 9. 16

COST OF REPAIRING STANDARD CARS (excluding damages)  
 but including "accrued" repairs; <sup>to 31 Dec 1915</sup> during the years  
 1912 to 1915 inclusive - Four years.

Sheet No.	No. of Cars.	Year Built.	Cost of repairs.	Average per Car per annum.
1.	10.	1885 (Imported)	612.12. 8	15. 6. 4
1.	10.	1886.	566. 9. 9	14. 3. 3
2.	10.	1887.	519. 3.10	12.19. 7
2.	10.1888	1888	611. 2. 6	15. 5. 6
3.	5	1889.	306. 2. 8	15. 6. 2
3.	10.	1890.	615.19. 2	15. 8. 0
4.	5.	1891.	<u>260.15. 9</u>	13. 0. 9
			<u>3492. 6. 4</u>	
		Average cost per car per annum.....	£ <u>14.11. 0</u>	
		Average date put into traffic.....	1888.	
		Average years in traffic in 1915...	27.	

Sheet

No. 5. 13 Cars built in 1900 & 1901 apparently put into traffic <sup>about</sup> in the Year 1905; and therefore about 10 years in traffic in 1915.

Cost of Repairs... £ 584.18. 2

Average cost per car per annum... £11.5/-

Sheet

No. 6. 9 Cars built in 1907 and 1911. Average date put into traffic 1910; and therefore about 5 years in traffic in 1915.

Cost of Repairs £331.19. 6

Average cost per car per annum.. £ 9. 4. 5



METHOD ADOPTED IN AVERAGING THE COST OF  
REPAIRS TO CARS AND TRUCKS - FOUR YEARS - 1912  
to 1915 INCLUSIVE.

CARS BUILT 1885 to 1891.

The following methods were adopted in order to produce a fair average cost of repairs to these cars:-

- (1) No car which had not been repaired in the year 1911 was taken, so that "accrued repairs" from previous years should not be included in the averages for 1912 to 1915.
- (2) Where possible, 10 cars built in each of the ~~above~~ years were selected. In the years 1889 and 1891 only 5 cars conformed to the principles adopted and were therefore taken.
- (3) In every case the cars bearing the lowest consecutive numbers built in the respective years were selected.
- (4) The cost was first averaged over the cars selected for each year, and the results were again averaged over the whole of the 7 years.
- (5) All cars which had not been actually repaired during 1912 to 1915 were ignored.

CARS BUILT IN THE YEARS 1900 and 1901 (20 in all).

13 Cars were selected.

Of the remaining seven, three had not been repaired in the year 1911 and were therefore excluded, and there had been no expenditure upon repairs during the years 1912 to 1915 upon the other four.

CARS BUILT IN THE YEARS 1907 and 1911 (30 in all).

9 Cars were selected which had been actually repaired during the years 1912 to 1915. No repairs had been effected to the balance (21 cars) up to and including the year 1915. Had these 21 cars and their corresponding "accrued repairs" been

1885-1891  
✓



included in the averages, a much lower final average would have been obtained.

GENERAL.

In every case where a car was included in the averages, the "accrued repairs" to the 31st December 1915 was added to the actual expenditure for the years 1912 to 1915.

In every case "damages" were omitted, but the car if it conformed to the conditions in other respects, was taken.



S U M M A R Y.

Cost of Repairing Dummies (excluding damages) but including "accrued" repairs to 31st December 1915; during the years 1912 to 1915 inclusive - four years.

Sheet No.	No. of Dummies.	Year built.	Cost of Repairs.	Average per dummy per annum.
9	15.	1885.	746.17.11	12. 9. 0
10	9.	1886.	424. 1. 9	11.15. 7
10	15.	1887.	664.14. 2	11. 1. 7
11	3.	1888.	128.15. 1	10.14. 7
11	15.	1889.	673. 8.10	11. 4. 6
12	11.	1890.	467.14. 4	10.12. 7
	<u>68</u>		<u>3105.12. 1</u>	
	Average cost per dummy per annum		£ <u>11. 6. 2</u>	
	Average date in traffic.....		1888.	
	Average years in traffic....		28.	

## Sheet No. 13

12 Dummies built in 1906/7 apparently put into traffic averaging about the year 1907 and therefore about 8 years in traffic in 1915.

Cost of Repairs.... £ 375. 5. 1  
 Average cost per dummy per annum... £ 7.16. 4

## Sheet No. 14.

13 Dummies built in 1912 apparently put in traffic about June 1912 and therefore 3 1/2 years in traffic in 1915.

Cost of Repairs.... £ 396. 7. 11  
 Average cost per dummy per annum... £ 8.14. 3



DUMMIES BUILT 1885/1890.

These dummies were dealt with upon the same principles as cars built from 1885 to 1891.

In the years 1886/1888 and 1890, only 9, 3 and 11 dummies respectively conformed to the conditions adopted.

THEY-128 BUILT IN 1906/7.

12 Dummies were selected.

The balance (18) had not been repaired during 1912/15 and were therefore excluded.

The accrued repairs from 1906/7 upon the 12 selected were paid for during 1912/15 and therefore the average per annum is unduly high.

DUMMIES BUILT IN 1912.

13 Dummies were selected.

The balance (7) had not been repaired during 1912/15 and were therefore excluded.

As the cars had only been in traffic a little over 36 years they were averaged on that basis.