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269 BRIDLE PATH ROAD,
FERRYMEAD, CHRISTCHURCH

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Christchurch Hills Car #24

What we will cover

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- What is a Hills Car (or Hills tram)
- Why did we decide to restore Hills Car #24
- Changes to appearance over life
- Restoration Timetable To Date
- Remaining Steps to completion
- Discoveries & lessons learnt so far

What is a Hills Car

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- Designed and built for the (only) hill route in Christchurch (hence name)
- Built by Boon and Company, Christchurch for the CTB
- Small saloon at one end with longitudinal seating
- Large Open convertible section with transverse seating with aluminium lower panels and windows that could be slid up into roof
- 2 x Peckham 14D5 max traction trucks, uprated motors
- 10 cars (series 1) 162 – 171 entered service 1912
- 3 cars (series 2) 24 – 26 entered service 1920/21
  - used trucks, electrical equipment and fleet numbers from original double decker trams 24 – 26
- Hills cars ran until last day of service and were used to “close” the tramway
  - Typically towed trailers in service – particularly during peak periods

Why did we decide to restore #24

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- Current major Society restoration project (#26) was progressing towards completion and next tram restoration project needed
- Society wanted an “all weather” tram.
  - Current running fleet at Ferrymead were not ideal for cold/wet weather as all had open sections.
  - Existing fully enclosed trams all leased to CTL (eg #178, #11)
- Needed good carrying capacity – which ruled out 4-wheelers
- It was there – i.e. in Society ownership – acquired in 1968
- Body was relatively complete, and trucks and electrics a known quantity
- Idea of a “matched pair” with Dreadnought Trailer 118

Restoration Considerations

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Best practice: Before commencing any project, especially heritage restoration project, a plan is required.

It was decided that a conservation plan was required, which would cover:

- Cultural and historic significance
- How much of original fabric of object exists, and condition
- Wanted authenticity, not a replica
- Documented information on Tram's appearance in each era – photos, plans, etc
  - Restoration needed to reflect appearance (and condition) of the tram in a particular era
- Availability of parts/components/materials
- Future use, practicality and adaption
- Importance of ICOMOS Charter to document and drive decisions made
  - *"**INTERNATIONAL CHARTER** FOR THE **CONSERVATION**. AND RESTORATION OF MONUMENTS AND SITES"*

Changes

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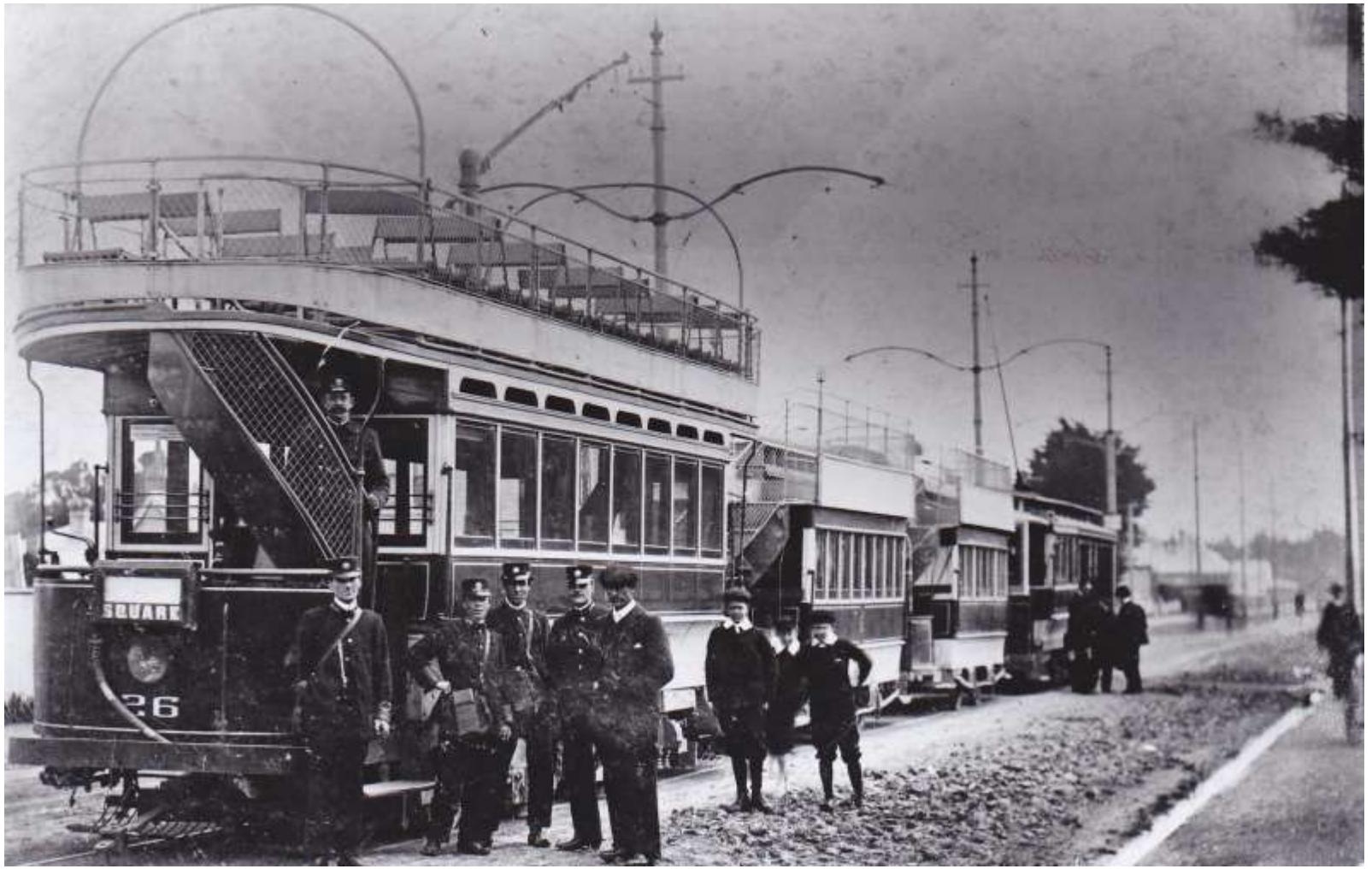
- Series 1 trams went into service in 1912
- Due to 1913 Tramways Amendment Act (aka “centre aisle” legislation), full width cross bench seats were replaced by “garden” seats with centre aisle and doors in bulkheads to motorman’s cabins.
  - Series 2 trams built from new in this form.
- Series 2 trams – in 1926 had uprated GE 203 50hp motors and track brakes fitted to allow operations on hills
- 1936 – upholstered seats fitted
- 1937-39 – “streamlined” destination boxes fitted
- 1943 – sliding doors fitted and aluminium shutters left down, running boards shortened
- 1943 (approx.) pram hooks fitted, and panels on drivers doors covered in hardboard.
- 1944-45 - #162 & #165 (only) converted to have sloping fronts
- Paint schemes:
  - Started with green & white with lining out, full sign writing and varnished interior
  - 1930s – change to white with green livery, no lining out.
  - 1945 (approx.) – overall green with yellow “light stone” window frames and stripe down side, interiors repainted brown/tan
  - 1950s – as for 1945, but stone stripe not replaced when repainted

Appearance over the years - 1905

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Actually this is #26 in 1905 but #24 was an identical double decker – one of three.

Not appropriate. #24 was "re-bodied" with a Hills Car body in 1920, but retaining same fleet number, electricals and trucks (and old body became "facing mother" single deck trailer #143 on a new truck).

Appearance over the years - 1912

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Actually this is a series 1 Hills tram.

Not chosen as not appropriate since #24 was a series 2 Hills tram, not series 1. There are differences between the two series.

Appearance over the years

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Closeup of Peckham 14D5 maximum traction truck as fitted to Hills trams showing additional track brakes.

Track brakes not fitted to #24 until 1926.

(Also, this is a series 1 Hills tram).

Appearance over the years - 1920

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Yes, this is #24 in 1920 when it first went into service.

Not chosen as existing body more worn than this. Also, the aluminium sides normally left up in service except in bad/cold weather and the Society wanted an “all weather tram”

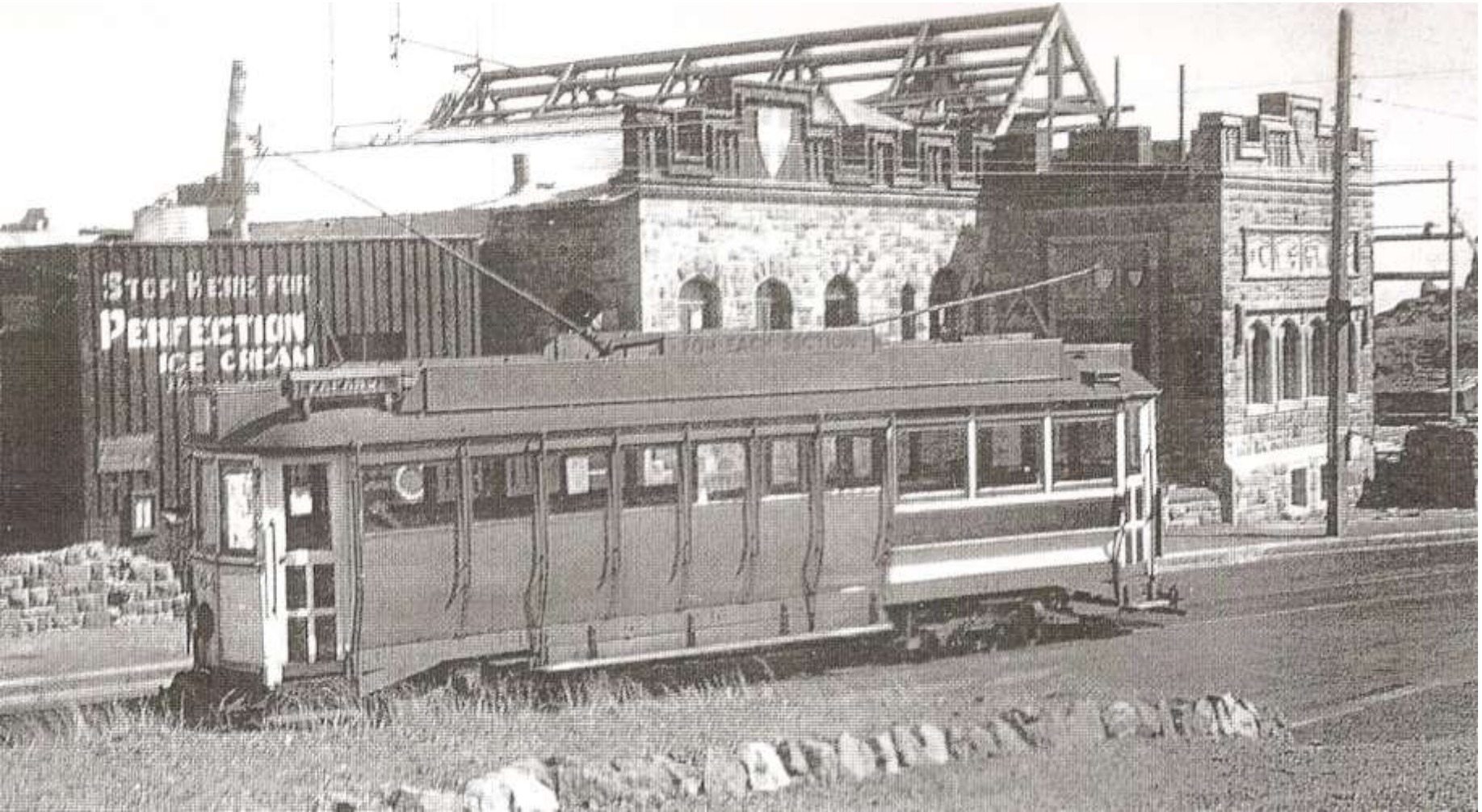


Appearance over the years – 1930s

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A Hills tram at the Sign of the Takahe terminus (building still under construction).

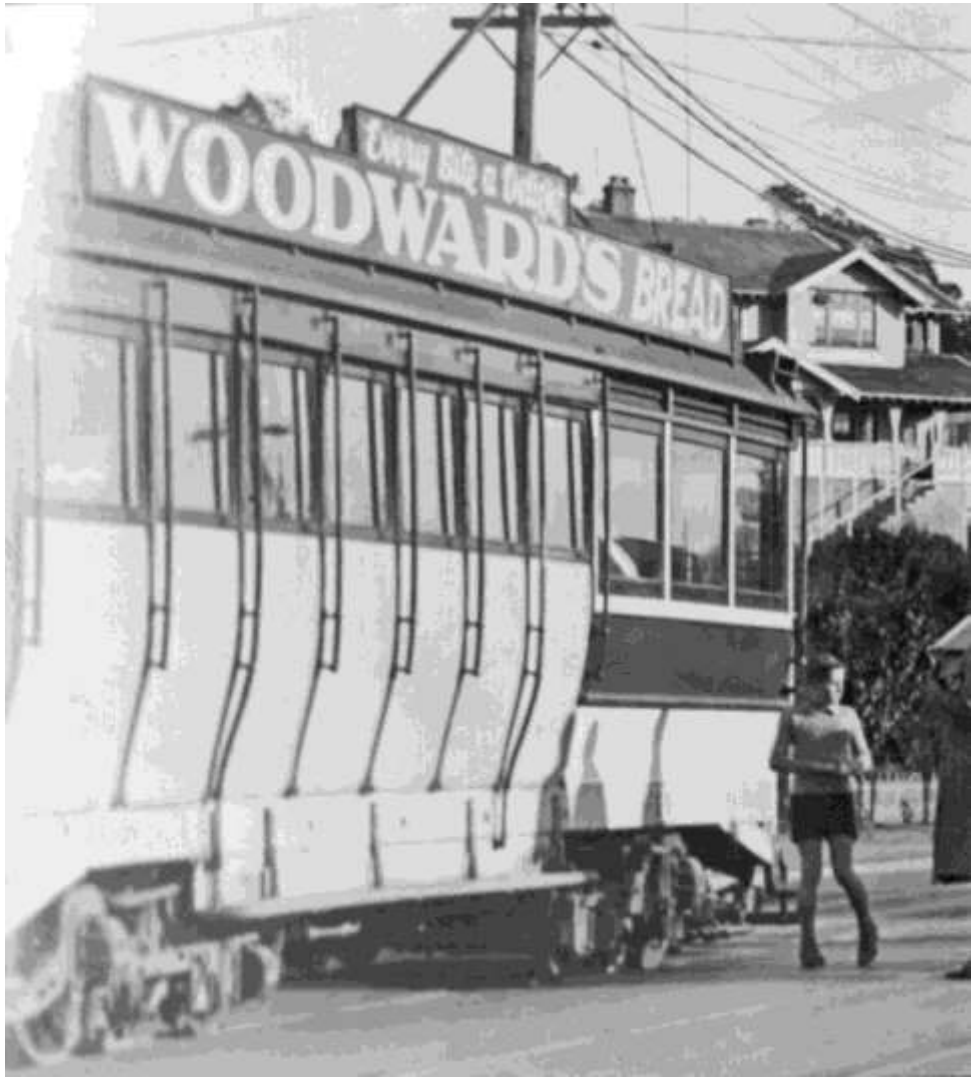
"White" colour scheme, stream lined destination boxes, shortened running boards, but no sliding door. Side panels down – and starting to weather.

Appearance over the years – 1930s again

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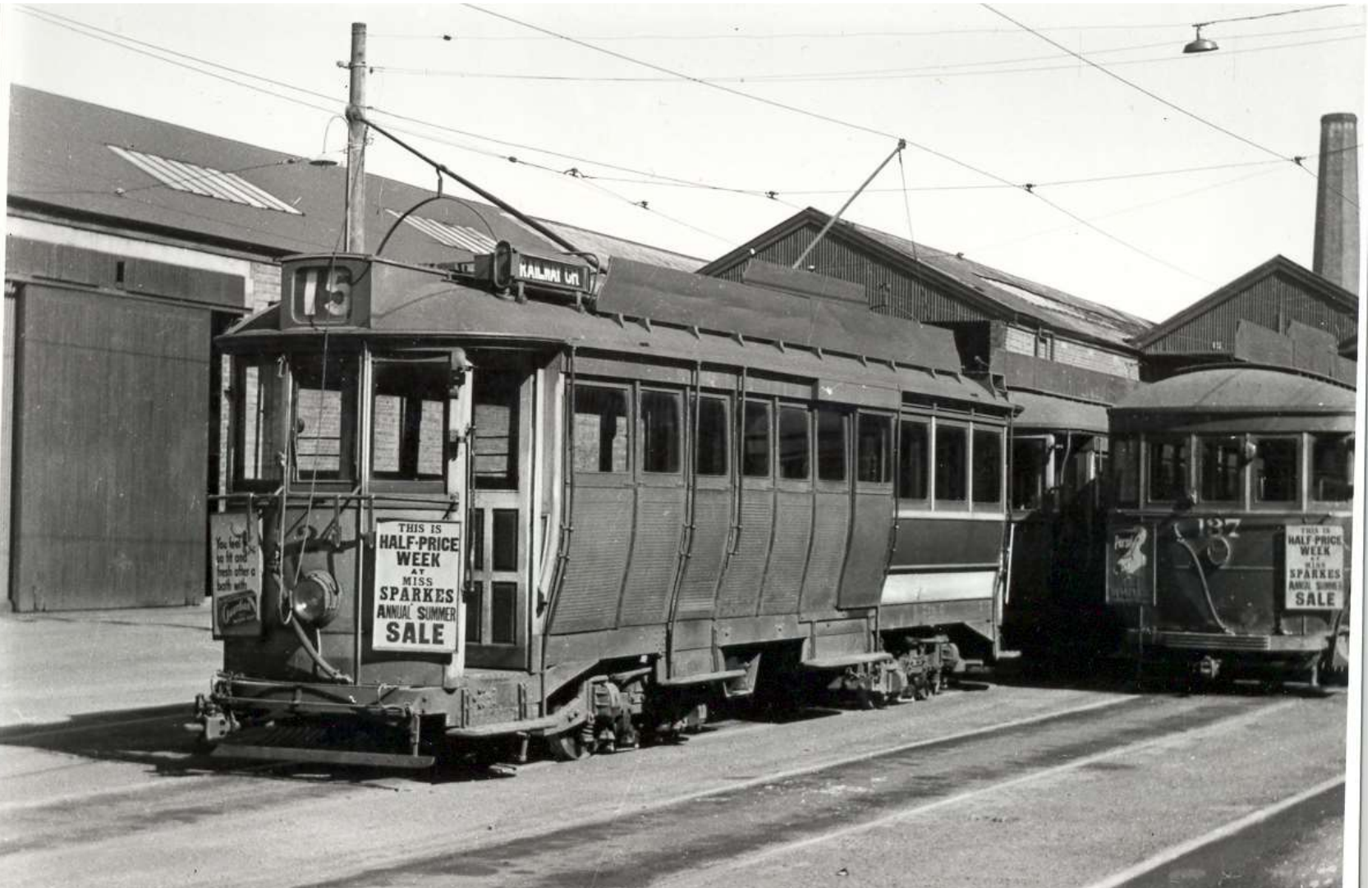
Closeup of the side panels in closed position.

Appearance over the years – 1945

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#24 in 1945.

Still in “White” colour scheme but distinctly grubby.

Now has sliding doors, pram hooks and shortened running boards. Sliding panels permanently down.

Appearance over the years – 1945-50

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#24 7th January 1950.

Has been repainted in green with “light stone” window frames and stripe.

Appearance over the years – 1950s

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#24 10th Sept 1954 – last day of public service.

"Final appearance" – overall green with no "light stone" stripe.

Appearance over the years – Slopey Front

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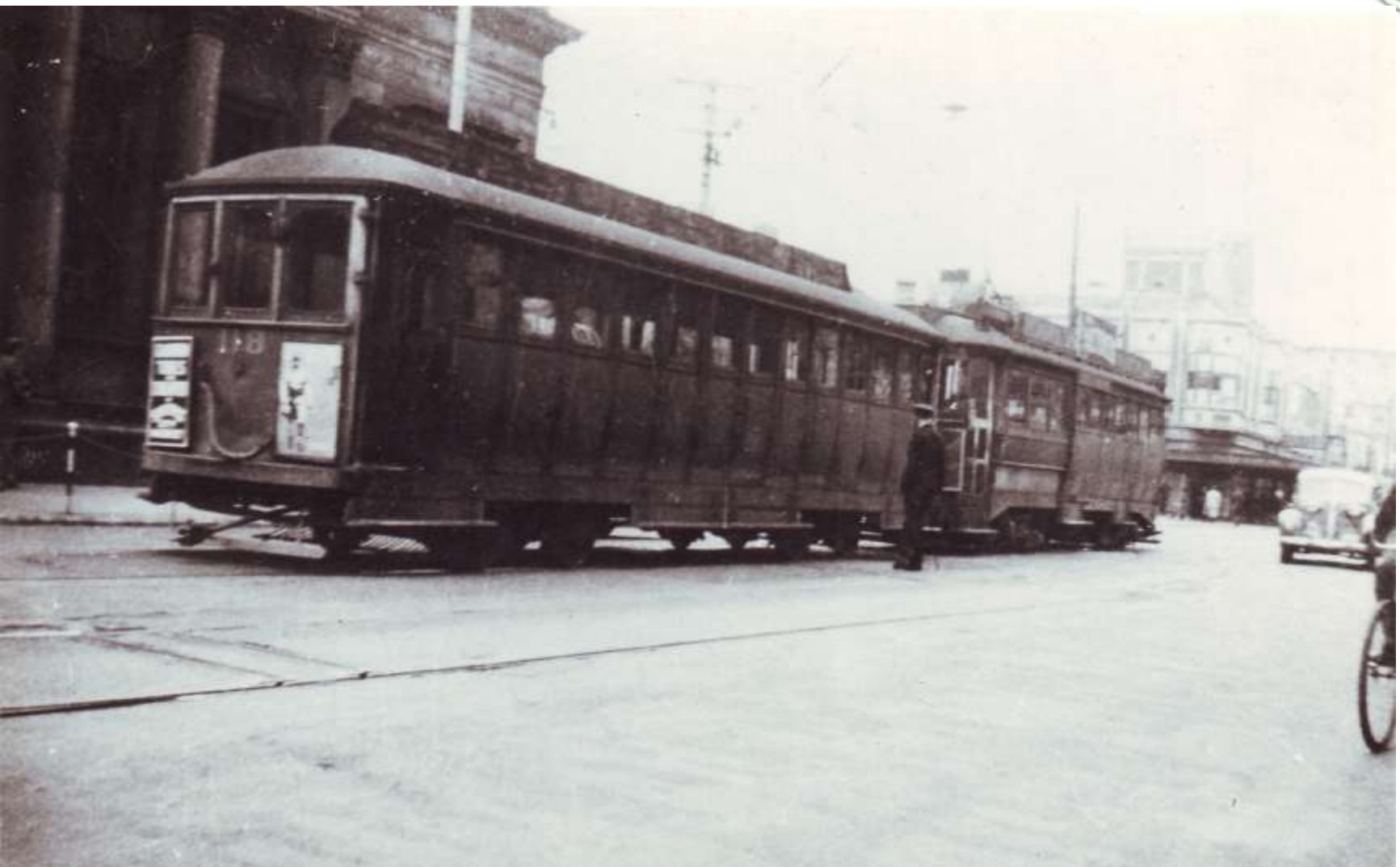
Actually not appropropriate – only #162 & #165 were converted to have slopey fronts.

Appearance over the years – with trailer

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Hills tram with "Dreadnaught" trailer #118

Restoration Appearance

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Selected appearance as at 1945 – 1950's – i.e.

- 1945-1950 (approx.) – overall green with yellow "light stone" window frames and stripe down side, interiors repainted brown/tan

Why:

- Tram essentially represented in this form when acquired and bodywork mostly complete => not replacing existing "worn" componentry with "new" replica componentry, and retaining maximum heritage fabric
- Fully enclosed – i.e. what we wanted
- People remember trams running in Christchurch streets in this form
- Would be restored to late era rather than new-ish appearance
- Originally planned to restore 118 to same era as a matched set as they would have run together. #118 restoration currently deferred.

Restoration Timetable - To Date

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- 2007 AGM – decision that restoration of #24 & #118 as a "matching set" to be next Society Tram restoration project
- 2008-2009 - #24 emptied out so body could be assessed, conservation plan produced
- 2009 - #163 (series 1) car acquired but not moved on site. #162 and #165 in same location but not good condition but useful for parts
  - First of a number of visits to assess condition and retrieve parts
- 2009 – Birney #15 selected for "urgent" restoration for CTL extension – put #24 restoration on hold until space and resources available. Joint THS/HTT/CTL project
- 2010 - #24 body restoration (deconstruction) commences – slowly due to lack of storage space. Work on truck frames commences, but focus on #15

Restoration Timetable - To Date (continued)

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- 2011 – Earthquakes. Trams leased to CTL relocated to Ferrymead – even more pressure on storage space.
  - Focus on urgent building of TB3, and progress on #24 slows but some progress on trucks – machining side frames and castings.
  - But – Birney restoration continued
- 2012 – TB3 completed & city trams put under cover. Storage issue eased and additional pallet racking installed
  - #24 body clean out completed and deconstruction/removal of fittings continuing
  - Start work on rebuilding 3 x very incomplete K-10 controllers
  - Start work on overhaul of motors for new trucks
- 2013 – scaffolding erected around body to allow chassis to be separated and removed (July) and chassis to be dismantled and refurbished by HTT (December)

Restoration Timetable - To Date (continued)

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- 2014
  - Visit to Ruapuna to see #163, #162 & #165, and raid parts off #162 & #165 – including a complete “streamlined” destination box to use as a pattern
  - Ongoing construction on new trucks, plus pony wheels cast, axles machined
  - Starting to build up body on refurbished chassis - #24 is now essentially in two places, with HTT labour helping to refurbish saloon bulkheads and refit to chassis, then rebuild saloon
- 2015
  - Fitting of new floor
  - Refitting panels and seat bases to saloon interior
  - Ongoing work on open section pillars
- 2016
  - Refurbish and fit remaining bulkhead
  - Make and temporarily fit top plates
  - Start building ‘B’ end motorman’s cabin
  - Refit open section pillars and seat bases.

Restoration - Pictures

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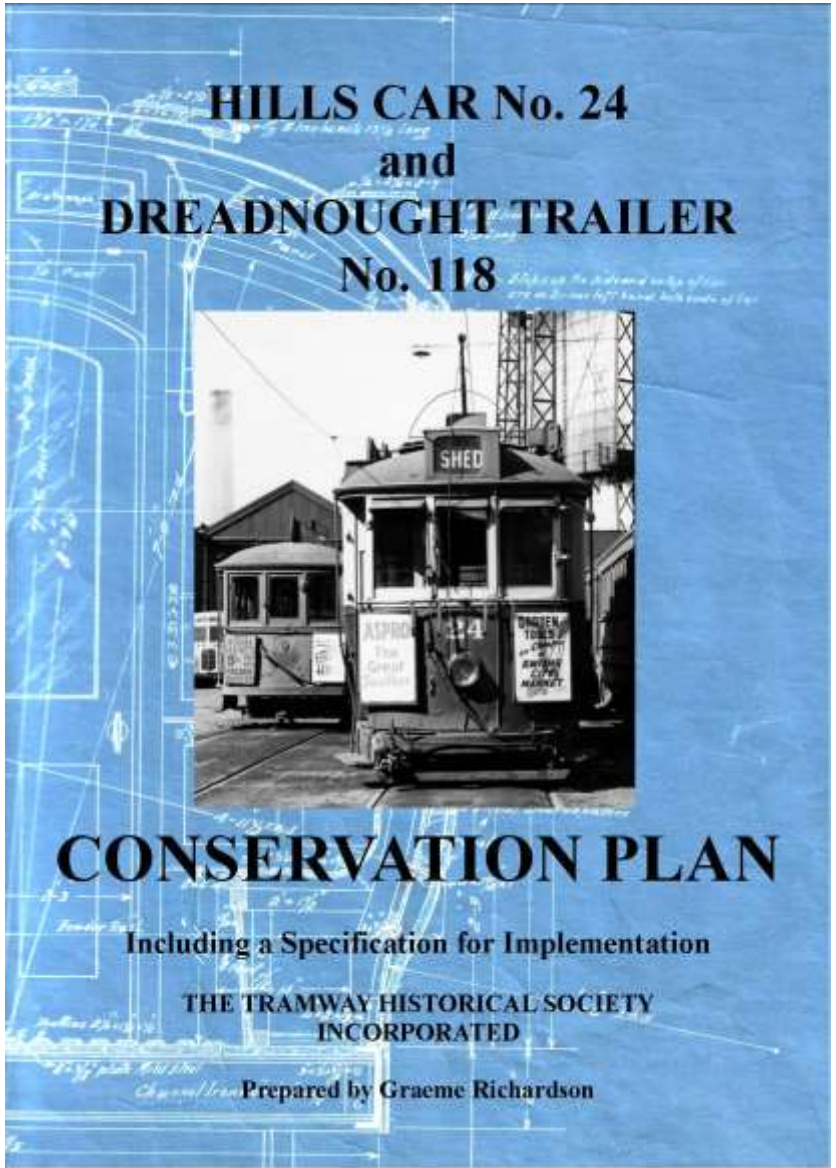
Prior to restoration commencing

Restoration - Pictures

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The Conservation Plan

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Motor overhaul

Restoration - Pictures

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Parts for “new” replica Peckham 14D5 - castings

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Making “new” replica Peckham 14D5 trucks

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Rebuilding K-10 controllers

←What we have

What we need →



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Scaffolding (and 178) to allow…

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…separation of body and chassis. This allows…

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…dismantling the chassis, and then…







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…rebuilding the chassis





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Visiting #162, #163 & #165 at Ruapuna for research (and raiding parts)







Restoration - Pictures

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Restoring saloon bulkheads and rebuilding saloon



Restoration - Pictures

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Fitting new floor –

and what is under the paint.

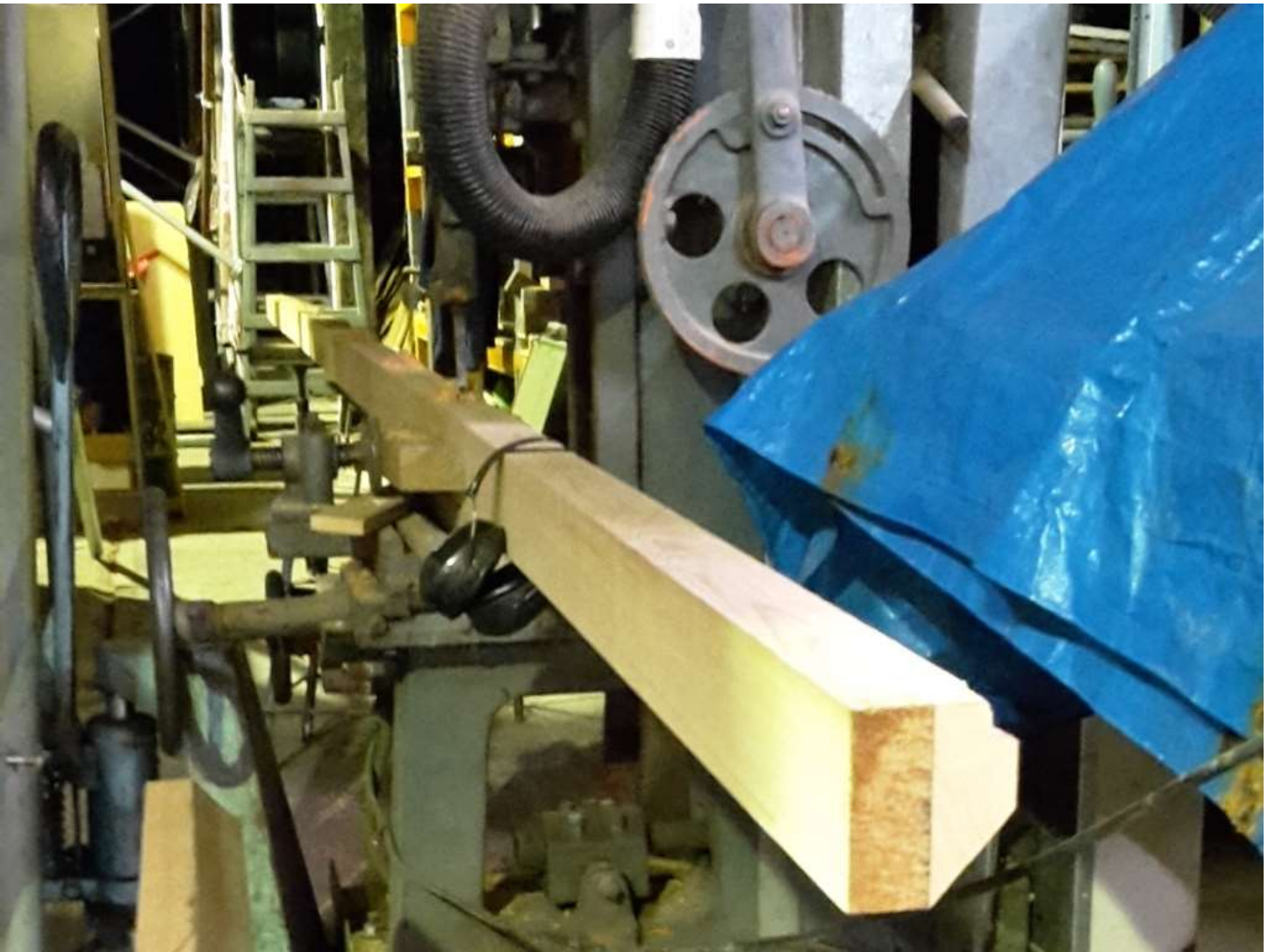


Restoration - Pictures

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Making (and morticing) new top plates – timber is 10m long!

Restoration - Pictures

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Refitting open section pillars



Restoration Timetable - To Complete

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- Roof - Lower roof from scaffolding to allow repair and refurbish, fit to new top plates then final fitting to tram body; Complete both motormans platforms and end canopys, recanvas roof.
- Refit monitor roof, recanvas, fit catwalks and pole bases and trolley poles, destination boxes etc
- Saloon - Finish and fit rocker panels, seats, windows and remaining fittings
- Open section – Fit “garden seats”, ceilings, aluminium panels, windows, sliding doors and interior fittings
- Fit downpipes, aprons and other exterior fittings
- Complete and fit controllers and remaining fittings
- Complete truck frames, cast and machine driving wheel sets, fit motors brakes and fit to tram
- Fit compressor, brake cylinders, complete brake system - including track brakes
- Paint in final colour scheme – interior and exterior, including (minimal) sign writing
- Commission

What have I learnt so far – part I

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- Did not appreciate the number of differences between series 1 & series 2 Hills cars – and a lot of differences discovered - Eg Rivet counting on the chassis
- Unlike Brill built and Stephenson built cars, Boon cars did not arrive as "kitsets"
  - Actually constructed more like a house – bottom up, and need to be rebuilt the same way
  - Also, not designed to come apart!
- Variable quality of workmanship – especially later years
- Body condition is not as good as we thought/hoped - but even if components cannot be used, they are still important for patterns
  - Borer & rot require replacement of original fabric – especially in structural components.
  - Lots of evidence of accident damage and repairs
  - But worn parts can be reused (since latter era) unless safety issue
- Chassis repair strategy worked well, and is/will be replicated on other projects – eg Dunedin Cable Car #103

What have I learnt so far – part II

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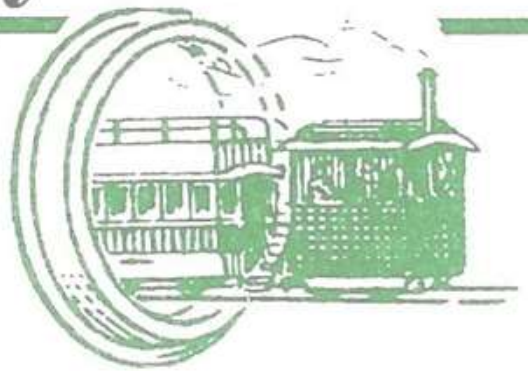
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- Discovery that previous (replica) Peckham trucks manufactured not as “CTB” authentic as we had thought
  - Eg Driving wheels ex Melbourne #9 trucks, Pony wheels were spoked
  - Trucks for #24 specific to be specific this tram as will have track brakes and different motors
- Should soon be able to build “brand new” K-10 controllers
- Some materials now becoming difficult to find
  - eg slotted wood screws which are generally no longer available locally,
- Similarities (and differences) with other models of Boon built trams and trailers
- Amazing source of photographs ex Graham Stewart (including #24) of latter era Hills cars in service

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- Come see work in progress in Tram Barn
- Monitor progress as reported in Tracts
- Any final questions?