ALLISON

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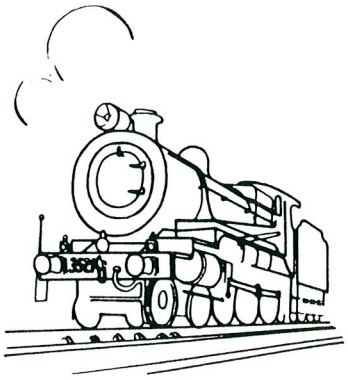


'Newsletter'

Vol. 24. No. 4
November 1996

The Development of the Steam Locomotive on the N.S.W. Railways.
by Mr. C.A.Cardew. Continued.

More than 30 years was to elapse following the introduction of the first of these standard classes of goods locomotive before any further advance in goods locomotive power was made although, admittedly, these standard locomotives themselves had, by detail improvement, been uprated meanwhile in hauling capacity, the increase being in the order of about 16%. The opinion might here be expressed, however, that this should not have been so, and that well within the period mentioned a more powerful goods locomotive should have been evolved and that, possibly, this should have done when the construction of the last class of the so called standard design, the D 55 Class, was under consideration, and some such locomotive produced in lieu of this.

However, when at last a new locomotive for the goods service was designed it was of 4-8-2 (or Mountain) type, being the first of this type to be seen in New South Wales, and it represented an enormous increase in power on the previous standard goods locomotive classes. It was designated in the year of its appearance as the D 57 class. As compared with the initial of the standard classes, which went into service some thirty years before, the tractive effort at 56,000 lbs. was practically doubled, while the total weight at 230 tons was rather more than twice as much, and the rigid wheel base at 15' 9" (with 5' 0" diameter coupled driving wheels) was the longest ever to be incorporated in a locomotive design on the New South Wales Railways. But, as to this latter point, of course, by this time on the lines where this class would be permitted to run the previously numerous, excessively sharp, curves of 8 chains radius had been practically eliminated and replaced by curves, still very sharp for a main line of railway, but mostly of 12 chains radius, or more. The maximum axle loading, at 22 tons 17 cwt. on the main driving wheel axle, was also the greatest ever carried on any axle on these railways while, departing from the more conventional practice in steam locomotive construction of two cylinder drive, there was a third cylinder provided, located inside between the frames, and driving by a crank axle the same driving wheels as the two outside ones. This resort to the three cylinder arrangement was had for the reasons that, with two cylinders, the desired tractive effort could not (without using an unduly high boiler pressure) be obtained, since the diameter of the cylinder necessary would infringe on the loading gauge and foul station platforms and other wayside structures. Also, the approximately 120 degree crank axle setting resulting from the use of three cylinders affords a more even turning action on the driving wheels, thereby lessening the slipping tendency likely with the low adhesion factor, which could not be avoided because the rigid wheelbase could not be extended to allow for another pair of coupled wheels being included, and the weight imposed on those that were provided was already as great as could be permitted, and so could not be increased.. Also, at the time, there was a tendency, especially in England, for big locomotives to employ three or four cylinders (all high pressure, not compound) very much for the same reasons. The class of locomotives under review, also, for the first time in Australia (indeed, probably for the first time anywhere outside of the U.S.A.) had a single piece cast steel main frames , thou without the cylinders in the same casting and this frame casting was the only part of this locomotive that was not wholly designed and made in New South Wales. It should also be remarked that, likewise for the first time with a N.S.W. Railways locomotive, the boiler had a wide fire box , a feature which made necessary the pair of idle trailing wheels placed under it in the sideways

radially moving carrying truck which accommodated them. In respect of the wide firebox, heretofore the good coal available for locomotive purposes in New South Wales, and the moderate demand in previous types of locomotives for the rate of steam generation required had made it possible successfully to employ the long, narrow, type of firebox located between the frames but, with this locomotive, by reason of the high rate of steam demand for which the size of the engine was responsible, a much larger firegrate than had ever previously been used (and, indeed, the largest ever provided) was required, and thus a wide type firebox became an essential part of the boiler design. Also, and for the first time on the New South Wales Railways, a mechanical stoker, which was of the screw conveyor steam jet distributing type, was applied.

There were 25 engines in this class, all built to Departmental drawings in New South Wales by the Clyde Engineering Company and, if I recollect aright, for the remarkably low contract price of approximately 23,000 Pounds (Australian) for each locomotive and tender complete. With 13 of an order for 25 of a later slightly modified design, which was undertaken in Departmental workshops some twenty years later, they provided a fleet of 38 very powerful locomotives which most effectually moved enormous train loads (1000, 1100, even 1500 tons over some sections) on the lines on which they were used. Unfortunately, they were very circumscribed in the area in which they could operate (between Sydney and Junee on the main Southern, to Lithgow on the main Western, and Thirroul on the South Coast, lines only) on account of weight and dimensional limitations on the various lines applying. But even so, of course, working on these lines they did find their place on some of the main traffic arteries, where they were most needed because conditions were most severe and the traffic heavy. Actually, the older D57 class was generally regarded as giving better operating results in train service than the later D58 class. The only material modifications of the latter over the former related to the cylinders which, being reduced by 1 3/4" in diameter, involved the use of a later cut-off once the train was under way, if hauling the same load at the same speed on a like grade, as compared with the D57 class, with a consequent loss of efficiency in steam usage, and the ingenious variation in the design in the mechanism for operating , from the valve motion of the outside valves, the movement of the valve for the inside cylinder, which motion, while giving excellent valve events when the gear was in good mechanical condition, did not long remain so in service, and required a lot of upkeep in the endeavour to maintain it in the necessary first class working order.

There remains one final development in the progress towards increased power capacity and in the size of locomotive intended for goods train working on the New South Wales Railways to which reference must be made. This took the form of the Beyer-Garratt patent locomotive of Messrs. Beyer, Peacock & Co. ,Ltd., of Manchester, England, and which on the stock list of these Railways is shown as the AD60 class. Built in England , partly because of the position on the Company concerned both in respect of propriety interests and technical ability to deal with this special form of locomotive, and partly because of the pre-occupati at the time of Departmental workshops with the construction of the D58 class engines, these locomotives were the first to be built for the New South Wales Railways outside of the State for nearly 40 years. The general and detailed design was worked out jointly between the Design Office of the Mechanical Branch of the New South Wales Railways, in Sydney, and that of Messrs. Beyer, Peacock & Co., in Manchester, and the first locomotive of the class was delivered, and took up running duties on these railways, in 1952.

The object in view in providing these locomotives was to extend to those lines on which, because of considerations of axle weights and dimensional limitations, the D57 and D58 class engines could not be run, the operating advantages to be derived from the use in train working of motive power units of very great hauling capacity. And so, to conform with the restrictions imposed by light permanent way, etc., instead of the maximum axle loading of the D57 class of 22 tons 17cwt., a maximum of 16 tons only was incurred with the AD 60's , an achievement made possible because the necessary adhesion weight (total, at maximum, of 128 tons for the AD60 , as against 91 tons with the D57) for the high tractive effort desired was obtained through the articulated arrangement of the patent Beyer-Garrat Design. By reason of this latter two groups, each of eight driving wheels coupled, could be provided for the purpose, one in the front,

and one in the back, engine unit of the locomotive, the rigid wheelbase thus involved actually being confined to a length of 14' 3",
with a 4' 7" diameter coupled wheel. and free movement round sharp curves being catered for by the flexibility which is afforded by the articulation of the front and back units, both with the main frame carrying the boiler, and with one another, each unit being in effect a swivelling bogie on which the main frame, like a carriage, is carried. These locomotives, also, although having the heaviest total weight of any locomotive, not only in New South Wales, but in Australia (the figure being approximately 263 tons) do not infringe weight restrictions on bridges, for the reason that, because of the particular arrangement, the gross weight is not concentrated, but is spread out over a considerable length of the engine, with a gap in the middle where there is no wheel loading at all, so that on most bridges the whole weight is not imposed on any one span at a time. This class consisted of 42 locomotives in all. And, finally, it should be recorded that, as slightly modified in recent years (late 50's , early 60's) (as a total of 30 of the class were) they have the greatest starting tractive effort of any locomotive of any kind in Australia this, in accordance with the standard method of computing the rated tractive effort of a locomotive, being 63,000 lbs.

to be continued.

Historic Video Tapes. By Jim Ranford.

For those interested in the technical side of things the following notes on the video tapes which I have donated to the Society might be of interest.
The original films were taken with a small bolex camera fitted with a Chinon 3 x zoom lens with built in exposure meter. Standard 8 mm Kodak film was used throughout and the exposures were made between 1960 and 1975. After splicing and editing I striped them with 1 mm wide magnetic tape made for the purpose. Sound was recorded with a small portable tape recorder, edited to suit, and dubbed to the tape on the film with a Eumig projector which was of course also used for projection. In conjunction with the striping appliance the projector was used as the motive power for driving this attachment.

Transfer to the video tape was accomplished after much experimentation. Initially, a transfer box was used, but the camera was virtually looking straight into the projector lens and excessive flare occurred. No matter what I tried I could not get rid of it. Finally, projection on a beaded screen was used, although white semi-gloss paper proved just as good. However flare is still very much in evidence and small signs etc., are not very satisfactory. The video camera used was a Sharp 'video-eight' VL-S6X with 12 X zoom and many other good features. There is a considerable loss of quality, (definition etc.,) but that's to be expected. There is also slight imperfections in the apparent steadiness of the image (flicker) due to the difference in speed between the original film and the video tape. Anyway, if you can see **who** it is and **what** it is I guess that's what matters most.

The video copies were made direct to the VHS tape via the main VCR by not loading the camera tape. This stops the camera from turning itself off and provides a first generation VHS master copy. The shorter tapes are then made from the master tapes.

I've kept the films short, so hopefully , boredom will not occur, and on 1 hr. tapes for easy accessibility. I hope those with the fore-bearance to watch them are enlightened and also enjoy them.

ARHS Christmas Party & Club Christmas Tea.
The Australian Railway Historical Society (NSW Division) Christmas party will be on the 7 December. This will be an all day affair and members can come early and leave whenever. The ARHS will be having lunch and will arrive before lunch. We should be under way from 10.00am. This will be a day for scale rolling stock and some unusual train working as well as the usual passenger hauling. Hopefully we will also see some invited friends along with their locos. Bring those wagons and trucks! Remember that the proceeds

of this day will go to the Malcolm Sergeant Cancer Fund. Our own Christmas tea and run will follow this event so stay around and run into the evening. This will be a time for members families and friends. BYO everything for a BBQ tea.

More Concrete!
Lionel and his merry band have kept on with the concreting. His work looks good and will save us work in maintenance.

Ground Level Rolling Stock
Work has been progressing on the upgrade to the ground level rolling stock. This involves fitting ballast weights and high end boards to the cars. A sample has been done and if we are happy with it then we will proceed with the others. Hopefully this will improve the stability. We also have new brake diaphragms which will be fitted progressively. Any volunteers?
Also as part of the carriage upgrade we have acquired 3 additional 6 ft cars from Roger Jones. These are the same pattern as the club trucks and have padded seats. These have been plumbed for brakes although one car is still to receive its bogies. It is proposed that future trucks will be built to this pattern.

SLSLS On the Web!
As part of your Chairman's distraction from the workshop we now have a presence on the Internet. This probably makes us the fourth model engineering society in Australia to do this although there are plenty overseas. The other Australian clubs are Bendigo (Victoria), Evandale (Tasmania) and Bankstown. If you have access look for us at *http://www.pnc.com.au/~wallison/index.html.* There is a description of our tracks (elevated & ground level), the signalling, our trains & our members together with some photos of our operation.

Meat Chopper Couplings
Running scale rolling stock presents some differences to normal passenger hauling. In particular the usual coupling bar and pins are not very satisfactory. This is because when propelling 4 wheel carriages they tend to push the truck to one side very greatly improving the chances of the flanges going the wrong way at 'K' and 'V' crossings. In full size pushing trucks used either buffers or more recently auto couplings. On narrow gauge meat choppers were popular, and the central push they give is a big improvement on bars. These are easy to make (although not exactly prototypical). The drawing shows the arrangements. One point to check is that the standard 5" gauge fork which is normally fitted to the wagon should still be provided, but make sure the edges are rounded to permit the RHS to slip over it. Uncoupling is performed by a piece of wire bent to an angle. Just insert this under the hooks and lift. If this is inconvenient, silver solder a tab on the top of the hook.

New Member
David Lee has been accepted as a full member at the October meeting. David is by now well versed in being guard. Welcome to the Society.

AALS Constitution
We have received and now returned the document voting on the proposed alterations to the draft constitution. Hopefully this will give a way forward. A copy of our response is in the AALS folder in the clubhouse for members information. Also there is a copy of the AALS Newsletter which is worth reading.

Easter Convention
We have received booking forms and information for the convention next Easter at Cobden, Victoria. By all accounts this is going to be different to normal conventions; there is certainly something for everyone, and

families seem to be particularly well catered for. Have a look and I'm sure you will be impressed! As it is in a country area book early to ensure you obtain the accommodation you want.

New Loco

Lionel has taken delivery of his new 3811. This is a Sandberg started, Potter finished work and very fine it is to. Come on Lionel-lets put it to work!

Members

A list of all members of the Society, past and present has been researched and is on display in the display cases. It is interesting to see that of a total of 142 members over 48 years, we still have a membership of 69, almost half.

Running Days.

Since the last Newsletter we have enjoyed three successful running days. The weather had been fine although the forecast each time had been somewhat uncertain. On the August running day we were treated to the spectacle of a triple headed 5 car train on the elevated. Wayne Fletcher's 3 1/2" 'Schools' class, Ken Baker's 'Simplex' and Brian Kilgour's 'Nigel Gresley'.

September saw Lionel's 5" C3811 on show in the ground level loco. and Bernie's SMR 10 class went into revenue service on the elevated with Brian's 'Nigel' and 5 cars. The drivers kept the train speed down to a very realistic rate providing a spectacle in both sight and sound. Even members of the public have made favourably comments about the realism of the slower running.

The October running day was rather hot with not too large a crowd. Ron Larkin ran his C35 class light engine, running in after a heavy overhaul. SMR 10 class and "Nigel" were again on a 5 car train. With the light traffic the opportunity was taken to set back the train into the siding for a 'crib' break during the afternoon - most civilised, and a good excuse to operate the lever frame.

The latest product from **Allison and Son. Locomotive and Carriage Builders.**, a four wheel Brake van was travelling round at the end of the train hauled by V1224. This is a model of a QR brake van of about 1860's vintage such as the one behind the A10 in Queens Park, Ipswich, Qld. This van was built by Andrew Allison, aged 11 years, not a bad way to start.

It was good to see **Mrs. Eyre** back with the ladies in the canteen after a spell of ill health.

Elevated Passenger Carriages.

The requirement for additional elevated passenger carriages has shown up with the arrival of new and not so new 5" gauge locomotives over the past few months.

A long time abandoned chassis at the far end of the shed was taken out and a decision made to use it for a new car. The carriage is now complete and will be a running mate for the yellow seated car already in service. Profiles for both these cars are the same, the new one being 3" longer. Vacuum braked Sandberg bogies are fitted.

With the completion of this new carriage a programme of maintenance and enhancement of the fleet will be commenced. Since our decision to brake all passenger carriages was made, the modifications to fit braked bogies has resulted in carriage riding heights being changed. Over time all the carriages will be fitted with new end beams and coupling heights corrected. All vacuum pipes will be located in one standard position and dumb buffers fitted to protect the pipes.

The use of commercial pipe fittings has made the job of piping -up a lot easier and bulkhead fittings will enable speedy change of damaged pipes if the buffers fail to do their job.

Drawbars have been a constant problem. In the past about 30 go missing each year. The drawbars will be bolted on at the trailing end of each car and new draw pins with retaining clips will be fitted at the leading ends. Pins and clips will be secured to the vehicles in the hope of cutting down the time wasted looking for suitable devices at the last minute when it is time to run.

All carriages will finally get their numbers painted on which will make incident reporting easier and also assist with the maintenance records.
Finally we are looking for volunteers to help with the programme of modification and rebuilding of the two flat top work wagons into passenger carriages. There are materials available for stirrups, end beams etc., which need cutting. Sketches can be supplied.

Bernard, Ron, Ken, Jim & Brian.

Doble Steam Cars.
Bill Richards would like to return the two video tapes that someone lent to him, Bill can't remember who it was so could the owner please remind him who they belong to.

AMBSC Boiler Certificate Expiry Dates To End Of 1997.

Larkin	N.A.73.56.	5" 4-4-2.	3-4-96. expired
Lee	N.A.79.88.	5" 4-6-0	4-9-96. expired
Sorensen	N.A.77.89.	5" 4-6-0.	16-2-97.
Hurst. B.	N.A.70.29.	2.5" 2-6-0.	5-3-97.
Allison.	N.A.90.131S.	5' 2-8-2.	20-5-97.
Hurst. J.	N.A.69.15.	5" 4-8-2.	25-6-97.
Spencer.	Q.A.73.17.	5" 4-6-2.	20-8-97.
Shiels.	N.P. 84.03.	5" 4-8-2.	20-8-97.
Collins.	N.M.91.34.	5" 2-6-0.	1-10-97.
Lyons.	N.A. 76.79.	3.5" 2-6-0	17-12-97

Boiler Inspector , Brian Kilgour, would like to make known that it will not be possible to carry out any boiler testing on public running days. When boiler testing is required please contact brian so as to sort out a time that is convenient to all concerned.

Duty Roster.

Dec. '96.	B.Richards, R.Larkin, S.Larkin, R.Lee, M.Lee, J.Leishman, J.Ranford, M.Tyson.
Jan. '97.	W.Allison, R.Barlow, H.Brammer, T.Geraghty, B.Greenfield, J.Mulholland, L.Pascoe.
Feb. '97.	H.Spencer, P.Brotchie, F.Collins, W.Fletcher, M.Gay, D.Lee, J.Noller, G.Robertson.
Mar. '97.	A.Mackellar, G.Esdaile, J.Grey, B.Kilgour, C.Leggett, V.Scicluna, P.Sharp, P.Shiels.

Gate Roster. Dec. J.Tulloch, Jan. M.Tyson, Feb. M.Yule.

Editorial.

This Newsletter, for me, completes twenty years as your Editor. A total of 81 Newsletters, 5 in the first year but I found it was less stress to run 4 per year from then on. There have been some changes in the method of production as the years went by. At first I used the typewriter and the wax Gestetner stencils running them off on my school's duplicator. When the school invested in a second hand off-set press we had an improvement in quality once I had mastered the operation of the off-set .
A change of school resulted in a step back to the Gestetner duplicator till a staff member with an on the side printing business provided an off-set production again. This proved to be a bit unreliable at times and caused some headaches at production time. I then found an Instant printing place in Blacktown and have used their services ever since. At first it was an off-set production but as photocopy technology improved

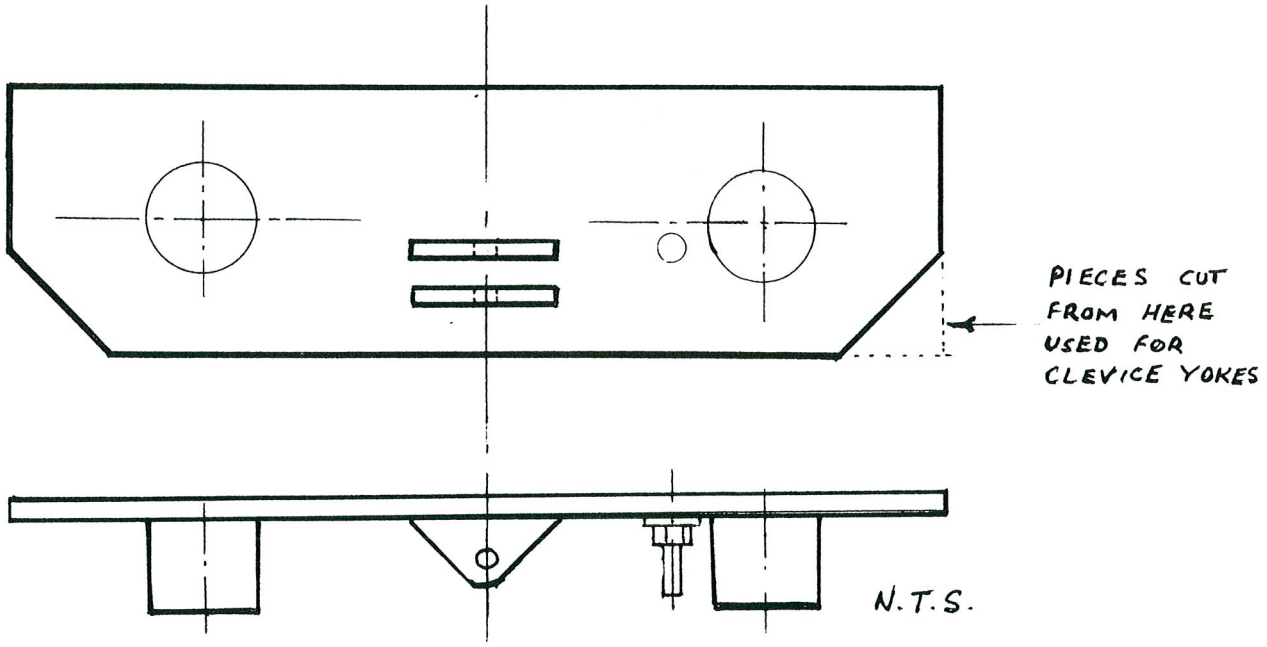
a change was made to this method of reproduction. Along the way we also changed format from foolscap to A4 standard size.
Photocopy technology has continued to improve, now ,for example with this issue the seven original sheets will be put on to the copier, it will be programmed with my requirements and they will be copied back to back where needed, collated and stapled
The typewriter has long been a dust catcher. When Peter invested in a computer we entered into the world of word processing . With the last couple of Newsletters the contributions from President Warwick have been given to me on disk for me to modify and merge with what ever I had prepared and there we are.

Many thanks to those members who have contributed material for the Newsletter over the years. I hope that in the future even more members might find the time to provide material for our publication.

To end 1996, best wishes to all members and friends of the Society for the Christmas season and I hope we can all look forward to a prosperous New Year.

John Lyons.

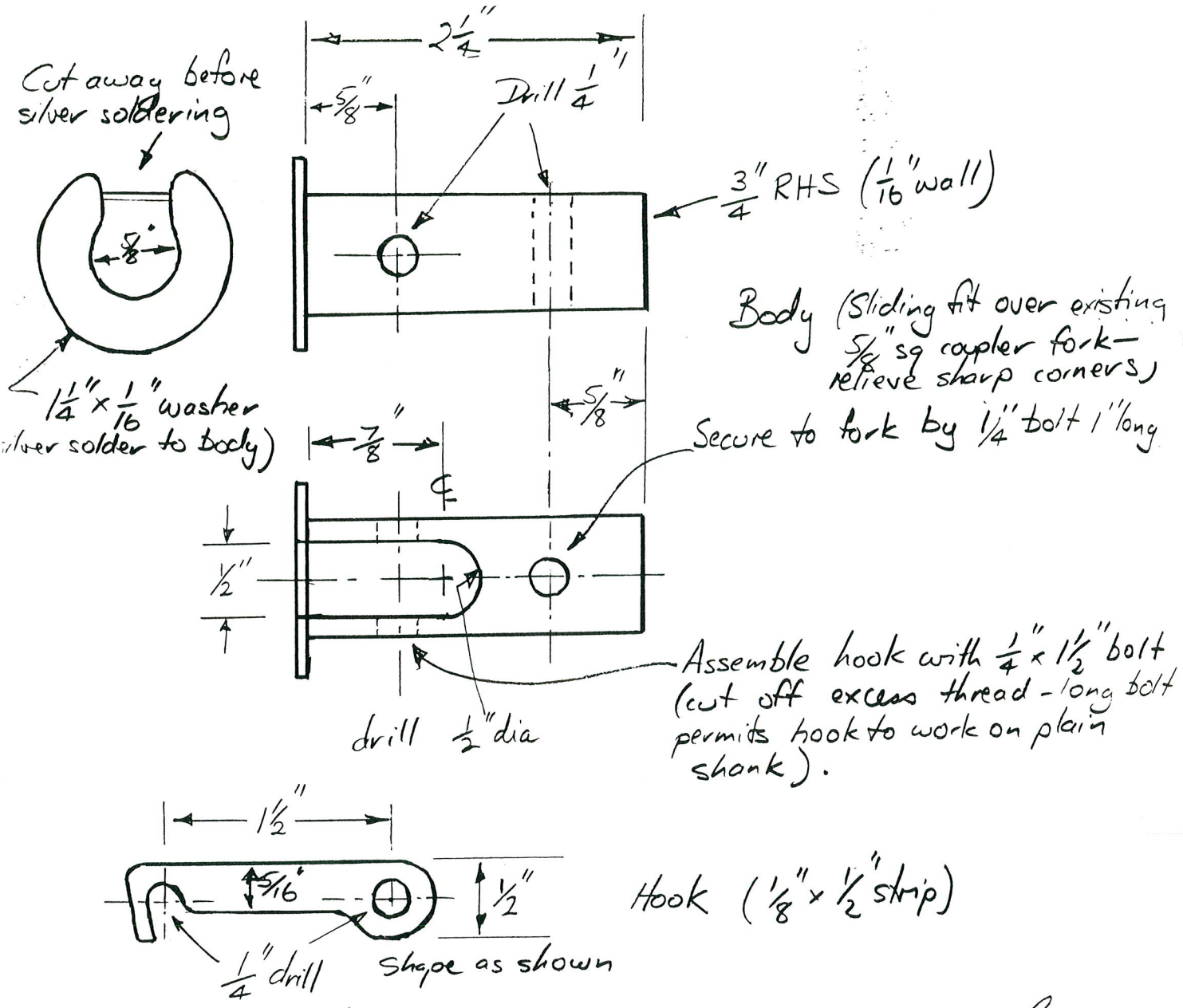
TYPICAL LAYOUT OF NEW ELEVATED CARRIAGE END.



ACTUAL HEIGHT OF BEAM DEPENDS ON RIDE HEIGHT OF CARRIAGE.

COUPLING HEIGHT AS PER STANDARD.

Meat Chopper Coupling



Body (Sliding fit over existing ⅝" sq coupler fork — relieve sharp corners)

Hook (⅛" x ½" strip)

Suitable for 1½" scale 5" gauge scale rolling stock

RWA
14-10-96.