

**Reading Society
of Model
Engineers
Charity Number
1163244**



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234**

The Prospectus

December 2024



The Club Class 08 after a rebuild by Mike Manners and Alf Cusworth seen in the summer sunshine! See page 7.
Photo Mike Manners

**TRUSTEE NEWS
COMPRESSED STEAM
MARTIN EVANS AND TEA
LOCO BEAKDOWNS
SUPERHEATED LOCO**

THE VIEW FROM THE CHAIR

John Billard

Here we are on a bleak and windy late November afternoon contemplating another Prospectus for the month. Yesterday the rain and wind stopped all club running. But I'm pleased that my request for additional pieces has produced a useful crop of writings. Please keep it coming. It can be a little dispiriting trying to fill pages with there's really not a lot on file.

The November trustee meeting was the last until January as we will be fully engaged with the Santa specials happening very soon. The grotto is just about ready and we are sold out for tickets. I hope as many members will be able to help out on those days and also provide engines to run if at all possible.

We have heard that Hollybrook finance who have conducted an annual examination of our accounts have given us a clean bill of health. Keeping financial records is no mean task for the club and we are very grateful for all the effort put into this particularly by Jim Brown assisted by Peter Culham.

(After note. The final report was received from Hollybrook a few hours after the meeting concluded. The report did not raise any concerns.)

Actions following the recent AGM included setting out trustee roles for the coming year. This did not take long as the trustees present agreed to continue as before. Miram Farley has agreed to be a Co opted trustee again in order to provide legal advice to the club as the occasion arises. There was a discussion about implementing the resolution that was passed at the AGM. This decided that the raised track extension should be formally terminated and the funds released to those who had donated for the purpose. Sadly the main remaining donator has recently died and this has led to further complication. It was agreed to consider whether it was practical to contact the remaining family or to find some other solution to the issue. This includes finding out who is dealing with the estate of the late member.

Moving on to other items it was explained that the budget for the workshop refurbishment has now all been allocated and the refurbishment can now be declared complete. It was noted that the club will not have any additional income for unexpected expenditure over the winter bearing in mind the clubs main expenditure includes the March 2025 insurance bill.

There were no reports made about our current membership levels which has remained static and there was no immediate discussion required relating to projects and maintenance.

It was agreed that a reminder had to be sent to members regarding the requirement for locomotives to be connected to trains with a solid bar and that trains on the ground level track must have vacuum brakes connected and working. This would be a matter for the track marshals decision at the time.

Additional items included potential plans for an open day in 2025 and the waste track carriage bogies which are still causing problems. At the recent AGM a request was made for better lighting at the site entrance. The failed lamp post on the bath road has been reported to Reading Borough Council.

Finally the trustees noted with pleasure that Van and Richard Coleman have again very kindly organised a club Christmas lunch for the 19th of December. Menus and names attending are on the club notice board.

The trustees next meet on January 13th 2025.

In the meantime the trustees wish all members a very Merry Christmas and a Happy New Year 2025

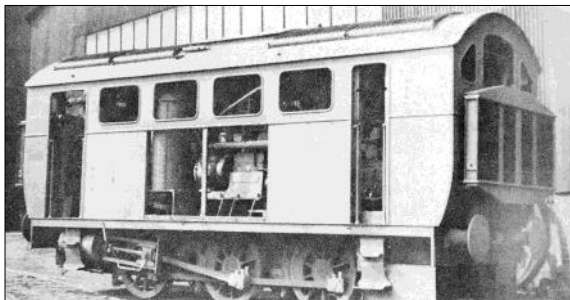
Unusual Diesel Transmission Systems- Part 4 Alec Bray Diesel-Compressed Steam

Paragon-Christiani Compressed Steam System

This was a diesel-steam hybrid that used steam both for power transmission as well as for actual power generation as in a “normal” steam locomotive – which can be considered as using “compressed” steam anyway (steam under pressure).

Patents for the system were held by Severino Cristiani and Secondo Sacerdole in Italy and it was promoted in England by Captain William Peter Durnall. The Cristiani Compressed Steam System used the process of mechanical vapour recompression. The basic idea was that, once the locomotive was under way, a diesel engine would compress steam into a high-pressure reservoir, which included a heat exchanger, from which the steam would be fed to conventional steam engine cylinders via the regulator and normal valve gear. The exhaust steam would then pass through a low-pressure reservoir and from there back to the compressor where it would be re-compressed and used again.

There must have been a small boiler to generate the initial charge of steam but it is not clear how this part of the steam circuit was integrated into the design. The steam has to be superheated: if saturated steam is compressed, the result is water. Superheated steam is needed so that the higher pressure does not condense the steam. In the Cristiani system, it was always intended that the actual prime mover would be the diesel engine. The steam was used mainly as a transmission system (through the energy stored and released during the compression-decompression cycle) but the locomotive does also



count as a diesel-steam hybrid because some steam storage was provided. A possible advantage of the system was that it could let existing steam locomotive chassis be converted to diesel operation, but this did not come to fruition.

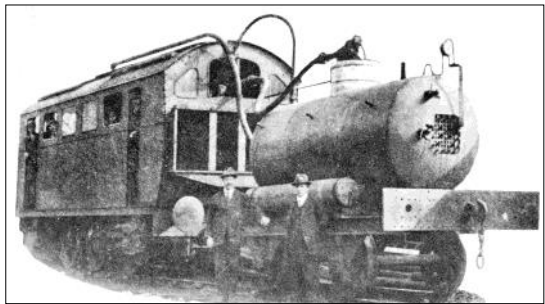
A trial was made in Eng-

land, using two "Paragon" marine petrol engines (not diesel engines!), and it went by the name "Paragon-Cristiani". The engines, compressors and high- and low- pressure storage cylinders were mounted on a 0-6-0 chassis (works number 3513/1923) built by Hawthorn Leslie and Company. This was quite a tidy set-up – no jackshafts, no extra gears or extra levers, and a set of familiar steam circuit controls.

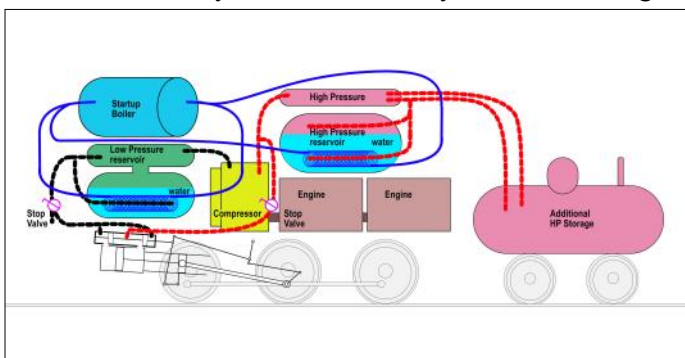
Benefits of mechanical vapour recompression include significant energy savings, lower energy requirements and therefore lower operating cost. In addition, either no boiler or a very small capacity boiler is needed although presumably distilled water is likely to be used in the primary circuit to prevent scale formation: more than 97% of the water can be recovered and recycled in the process.

In spite of these advantages, the Paragon-Cristiani compressed steam system was not a success: Very early on during the trials it was clear that the High-Pressure steam reservoir was far too small. The answer to that was to put the “boiler” – the steam storage tank – of a fireless locomotive on a four wheeled chassis and close-couple this to the locomotive with the “boiler” plumbed into the locomotive’s steam circuit.

Generally, the test results cannot have been very good, and no further experiments were done for a while. The locomotive chassis was converted into a conventional 0-6-0ST named "Stagshaw" which went on to work at Shotton Colliery and is currently preserved on the Tanfield Railway.



Captain William Peter Durnall had not finished with mechanical vapour recompression. On 22nd December 1919, “The Times” reported that Durnall, formerly of the British Royal Air Force, together with Commander



G.T. Bowles R.N., had completed tests at Manchester on a new type of aeroplane engine that would be silent and from which the danger of fire in the air had been removed. No gasoline was



carried. The fuel consisted of heavy oil "... into which one might safely throw a lighted cigar..." Heat from an oil-burning diesel-type engine's internal combustion cylinders, usually wast-

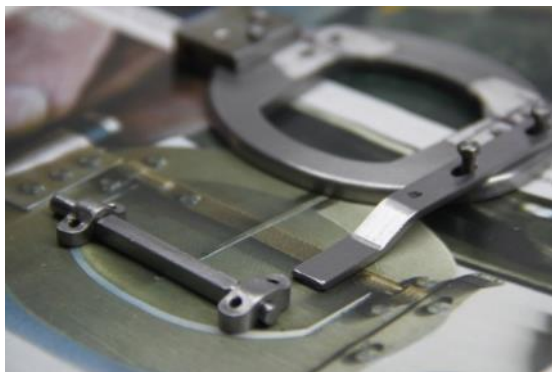
ed, was to be utilized to generate low-pressure steam into a high-pressure steam reservoir, from there the steam was to be fed to steam-engines to drive the propellers, and the exhaust then went into a low-pressure reservoir, from which it returned to the diesel engine to be compressed again: the whole assembly was described as combining the reliability of the steam-engine with the lightness of the internal-combustion engine: The steam was used over and over in a closed steam circuit.

In giant passenger planes, Durnall proposed, the double acting steam-engines would be placed in the cantilever-type wings. The transforming engine in the fuselage would be separated from the forward passenger cabin by a collision bulkhead.

Just imagine! A steam-powered aeroplane! (Well, actually, many people did! Concept drawings were made in the 1960s for Don Johnson of Thermodynamic Systems Inc., Newport Beach, California, for a compact cylindrical double-acting uniflow steam engine that was to be installed in a Hughes 300 helicopter, but no prototype was ever made.)

AFTERNOON TEA WITH MARTIN EVANS by David and Lily Scott

The name drops into conversation after meeting up with him at a recent



Midland Exhibition. Martin is the current editor of the *Model Engineer* so has quite a high standing in all things model also of the same name-sake of the model locomotive designer who also once edited the magazine.

I am currently having a rest from his 01 Nigel Gresley design due to regulator and superheater construction issues. I have gone for the pull

open double lever regulator but have abandoned screwing the assembly into the boiler with four screws. Instead going for a sheet backhead held in place firmly with a flap and door assembled onto a 3/16" plate, press fitted onto the firehole. This is as per most LNER locomotives. The top bit will have to hold onto the cab front sheet. Now just in time for my construction, Doug Hewson came out with all the drawings and photos of them. Of course I had to modify as the opening was not big enough.

It was in Mote Park, home of Maidstone Model Engineers, and an I.M.L.E.C. event that we first met Martin. Martin was trying hard to blend into the audience and not be recognised when I passed him. "Martin Evans I presume!" he replied quoting Stanley's finding Doctor David Livingstone in the middle of Africa. Fittingly the sun had come out so very close. Also useful for a photo with him driving which later graced the hallowed pages. In the non-payment sections of course, he laughs.

The following year we travelled over to Guildford to watch Young Billy Stock defend his win from Maidstone. Many 30 year in the making Britannia builders had not yet forgiven him. KIT?

We re-entered the refreshment tent as the goods now on display looked tempting. My wallet was a bit ill after the Polly Models stand had been visited so we both needed a rest. "David!" said Martin.

And we sat either side once his previous guest had departed. Just like a racecourse we discussed the running as it was between the Germans and the British. I assisted with a northern Manchester accent, as mi Mum wer born int city. Martin did his best Faulty Towers episode (don't mention the ...) in case he was asked to do a speech and the German loco had been more efficient. I offered to buy some cake, but Martin had been given two cake vouchers so they were free. Money towards the photos published he jokes.

Southport was a bit far for the following year. But we met up with Martin at



The Midland. I was chatting with Cherry Hill and admiring her models. We were wearing new disguises as well. We decided not to be in her photo which came out in the smallest possible size. Honestly our

A year passed and the M6 had been explored on't to road to Wigan Pier and a 75th anniversary.

A new book signing at Cheltenham started it, and a rediscovery of the afternoon tea plate together with some chocolate topping preserved. Now if I dust off the plate and take it to the Midland to signature Martin will not be there...

Problems With Battery Electric Locomotives by Mike Manners

The 7¼" 08 Locomotive

For many years the 08 loco rested in a non-working state at the back of the ground level bunker until I decided something had to be done to get it going and stop it rotting away. With approval from the trustees and permission to spend some money I took it home. I then spent a few weeks stripping out all the old redundant electrics and replacing them with a modern 4QD control system and a sound system. The bodywork was strengthened and repaired and a new control panel fitted. A pair of new batteries were purchased and fitted. The loco was then returned to the club for some trial runs.

They were not a total success. The primary drive from the motors is by a pair of small chains. For some reason the loco kept throwing these chains. We could see nothing wrong with the chain tension or sprocket alignment so the chains were replaced. There were some initial problems with the 4QD control system so it was returned to 4QD for investigation. They found a

fault, repaired it and returned the controller all free of charge. The loco then went to Alf for a new paint job and the addition of some scale detailing. Alf did a brilliant job and the loco was soon available for use.

We then had a many months with the loco being use at club running and public running sessions. Unfortunately, a couple of months ago, disaster struck when the loco dropped a coupling rod. This resulted in a twisted rod with a misplaced and distorted centre bearing. It looked like I had more work to do. Various club members were consulted on possible repair options. It looked like there were only three realistic options ranging from make a complete new conn rod to get it hot and try and hammer it back into shape.

After thinking about it for a couple of weeks I decided I would go a sort of middle route and remake just the centre bearing and knuckle joint. I would cut the coupling rod in half and weld on the new section. My big worry about all this was not the making the new part but getting the between centres distance correct and avoiding any twisting, bending and shrinkage when welding. I made up an adjustable gauge, set it





up on the loco over the crank pins and then took it home and made a jig that was a good fit on the gauge. The jig was then bolted to a one inch square steel bar and half of the old rod and the newly made part were firmly clamped to it. Some careful MIG welding completed the job.

At the last Wednesday work day I tried the completed rod on the loco and was relieved to see that it worked perfectly. Step one complete. Now all I need to do is complete the knuckle joint and fit the second part of the rod. This should be a relatively easy job. With any luck the 08 should be back in operation within the next couple of weeks.

The Raised Track Battery Electric Locomotives

I have tried not to get involved with these but I can't help trying to fix things when I see them going wrong. My involvement started with Peter asking me to look at a couple of the controllers. Some fairly simple jobs that only required a meter to be re-fixed and a wire re-soldered.

Then one of the usual loco drivers was complaining that the Class 37 he had been driving was lacking in power and was running very rough. I asked if anyone had checked that all the motors were working. All I got was blank looks and "how do we do that". I ended up organising lifting of the loco and blocking up the buffer beams. I could not believe what I found.

The loco has 4 motors and only one of these was actually working. Two of the others could be made to rotate but were very rough and lacking in power. The fourth motor was totally dead and had been made to rotate by the motion of the loco. I then had various comments ranging from "no problem, we have some spare motors" to "you can't get those motors anymore. They are unobtainable" and "they can't be repaired".

Well we found spare motors but only one of them worked. This was when we appreciated all the work that





had gone into the workshop refurbishment. There was plenty of bench space to work on the loco. It was soon hoisted up on to the new bench. The working spare motor was fitted to the bogie with the good motor. That gave us half a

loco working.

As I can't refuse an engineering challenge, I took one of the faulty motors home for an investigation and to see if I could do any sort of repair. The first challenge was trying to get the end plates off the motors. They are held on by rods that run the full length of the motors with a single nut at each end. Unfortunately the nuts are recessed into the cast end plates so are virtually impossible to get a spanner on. Normal spanners were out of the question and socket spanners would not fit in the recesses in the end castings. It would probably be possible to turn them with a thin walled tube spanner but I did not have such a thing. I could get some thin nosed flat ended pliers on them but they were immovable. Further investigation revealed that one of the nuts at each end of the motor had been crushed onto the threads to prevent it rotating and the other nut had been made immovable with thread lock! Well, not to be beaten, I got out the oxypropane torch and soon had the rod and thread locked nut glowing bright orange. That did the trick. The pliers soon had the nuts off, the rods out and the motor end plates off. A careful examination of the rotor revealed that two of the windings had broken off the commutator. Not a problem. A large soldering iron and some careful soldering soon had the winding reconnected. It was only a few minutes work to reassemble the motor and test it. It worked, all good.

Over the next few weeks I took all of the faulty motors home and repaired them. They were all suffering from the same fault with disconnected rotor windings. It looks like this is a manufacturing fault caused by the way the windings are attached to the commutator. Tabs on the commutator are bent over the rotor windings and pressed down to hold and make contact with the windings. It looks like this has made the metal of the commutator partially cut into the winding wire resulting in a weak point that eventually leads to a

fracture, overheating and failure.

The repaired motors were fitted to the loco and all was well for a couple of weeks before I was told the loco had caught fire. It turned out that the old motor controller had developed a fault and burnt out so I had another problem to fix. We decided to fit a new 4QD controller so more work for me in the new workshop.

We then had another problem. Someone had plugged the wrong controller into the Class 58 and blown up another controller. We decided we would try and standardise on the 4QD controllers with standardised wiring and DIN plug connectors. That should mean that any controller would work with any loco.

The Class 58 was hoisted onto the bench in the workshop and work began on installing the new controller. We also decided to test the motors while we had it on the bench. Another sorry tale of failed motors but there was worse news. One of the plastic gears was worn to the point where the motor pinion was not engaging and a number of the wheels were loose on their axles. Reluctantly Nigel took them home to bore out, bush and re-fix. Not an easy job.

I was busy at home ordering more 4QW parts and making up a new hand control box. Eventually we had the new controller fitted and working with the new hand control box. Nigel had done a good job with the wheels and axles. We soon had the bogies refitted and thanks to some new plug and socket connections all the wheels were rotating in the same direction. All we had to do now was work out how the horns were meant to work and connect them up to the new hand control box. Andy and I worked for most of a Wednesday on this but got there in the end. The horns work and the Class 58 is back and ready for use.

Let's hope this is the end of the story, at least for a few weeks.

Well, must get back to fixing the 08 connecting rod.

A SPIRITED LOCO

Part 4

by Terry Wood

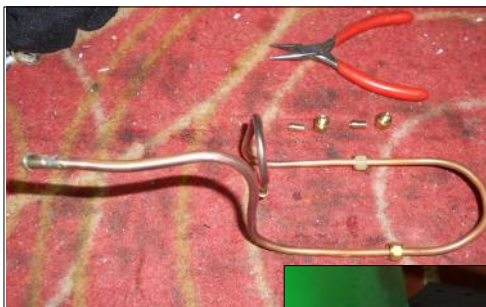
The steam that will be coming out of the boiler will be wet so some kind of super heater will be required before its emitted into the cylinder and this involved bending a piece of 3/16 copper pipe into a very strange shape in order to form a lope entering the meths burner then forming a lope going around the top of the boiler then back up to the input of the regulator.

At first, I was going to run the superheater on the outside of the spirit burner but decided it would be more efficient if it was inside and would look a lot neater being hidden away from sight, this proved to be a lot more fiddly when it came to assemble everything. The superheater was very close to the pressure gauge, so it took a lot of moving things back and forth until it all fitted ok.

The next thing to do was to silver solder the tapers to the copper pipe ends

making sure that the brass nuts that tighten the tapers to the pipe fittings were round the correct way before you soldered the tapers up, you must heat the copper pipe away from the brass tapers first in order to get just enough heat to make the silver solder flow if you get the tapers too hot they will split and the taper will be scrap and you will have to start all over again as I found out the hard way!

Once I had soldered the tapers to the ends of the pipe it was just a matter of making fine adjustments in order to screw the fittings down. The loco is now ready for its first steaming and I have made some spacers to lift the driving wheels off the bench in order to run it and find out if there are any leaks which I'm sure there will be!



Photos Terry Wood



2024 RSME CHRISTMAS LUNCH

Thursday 19th December 2024 12.45

Southcote Beefeater

Two Course Starter/Main £20.95

Two Course Main/Dessert £20.95

Three Course Starter/Main/Dessert £24.95

Drinks payable at the Bar

**Please add names and menu choices to the notice
in the Club House**

Payment to Richard/Val Coleman before 28 November

DIARY

DECEMBER 2024

Saturday	7th	Santa Specials	Setting up from
Sunday	8th	Santa Specials	08.00
Saturday	14th	Santa Specials	Setting up from
Saturday	14th	Santa Specials	08.00
Thursday	19th	Christmas Lunch	12.45
		Beefeater, Southcote	
Saturday	21st	Club running	10.30 onwards
		There will be no Trustees meeting in December	

JANUARY 2025

Sunday	5th	Public running	Setting up from
			09.30 onwards
Saturday	11th	Club running	10.30 onwards
Monday	13th	Trustees meeting	19.30
Saturday	25th	Club running	10.30 onwards

Speaker tbc

Meetings are held every Thursday at 19.30 in the club house.

Opinions expressed in PROSPECTUS are the personal views of the contributor and cannot be taken as reflecting the views of the trustees or editor.

The deadline for the January issue is 20 December

Contributions may be submitted in hard or soft copy to the editor.

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