

Ivatt Diesel Re-creation Society Business Plan

September 2019



10000 on its launch day at Derby, 5th December 1947.

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I. EXECUTIVE SUMMARY

I.1 Organisational summary

The society is a charity established in 2011 to construct and operate a new-build D16/1 design locomotive. The first loco of this design, 10000, Britain's first mainline diesel, was scrapped in 1968.

The project is viable because essential components are still available in currently operational locomotives. Key items, including a donor locomotive, a power unit with very low running hours and a pair of bogies are now owned by the Society.

Our aim is to construct a loco that looks and sounds as similar to the original as possible, using as many original or contemporary parts as possible. In addition, an educational package will tell the story of the original loco and its place in British post-war engineering history.

The project is financed by donations, subscriptions and sponsorship.

I.2 Market summary

The intent is to produce a locomotive that will demonstrate a key missing link in British traction development as well as providing an asset to be used on heritage railways. The general public will have the opportunity to learn about the history of British locomotive design and to see a demonstration in practice. The original loco was a pioneer and prototype for many later designs and the reconstructed loco will be unique among heritage railway locomotives.

The society currently owns a donor locomotive, a 1947 16SVT engine, stored at Peak Rail, and a set of bogies almost identical to the original, stored at the Midland Railway-Butterley. We have recently leased a workshop that will allow us to prepare the components we have gathered for the build process, and to modify the chassis to accept the EM2 bogies. This shed is not big enough or suitably located to allow us to build the complete locomotive there. Our longer term aim is to make an arrangement with a heritage railway which would allow us to build a loco shed to allow the build to commence in earnest. The construction plan would see the finished loco based exclusively on that line for the first few seasons of operation, with agreed periods of loan to other railways following this period. We anticipate a great deal of interest from the rail enthusiast community, and this will be of financial and reputational benefit to the home railway.

I.3 Financial summary

The Society is funded entirely by donations. Previously a 'Buy-a-Litre' campaign funded purchase of the power unit. Following the successful funding campaign in late 2018, which allowed us to purchase the EM2 bogies, up to September 2019 we have raised an additional xxxxxx which will allow us to begin refurbishment work on the bogies and purchase additional items that we will require for the build. The majority of this funding came from one-off donations or life membership fees. In September 2018 the society restructured the membership system to create a more consistent and predictable flow of income via monthly donations.

Our funding strategy is to build upon visible success. Now that the bogies have been purchased and we have a visible presence in our new workshop, potential donors will be able to see measureable progress during 2019, as the restoration process will begin as soon as funding is available.

New campaigns for 2019 have focussed on encouraging new donors via our information stand at galas, a '100 club' lottery for which the Society is registered, and targeted appeals for specified items. The first of these targeted appeals was to raise funding to dismantle, inspect, shotblast, paint and store the bogies. This has now been completed, and the Society is now continuing to raise funds to purchase some of the remaining items that will be required, while they are still available.

1.4 What we need to make it happen

- a) Completion of the refurbishment of the EM2 bogies
- b) Modification of the Class 58 chassis
- c) Additional parts from redundant main-line locos
- d) Sufficient income to obtain the above.

Please see the appendices for more details.

2. ABOUT THE SOCIETY

The society is a not for profit organisation, registered as a charity, and made up of volunteers with a shared interest in the re-creation and operation of this historic locomotive

The Society was formed by a core team of engineers, current railway staff and business professionals. The current management structure comprises six trustees, supported by a growing membership, which now extends across the world. We have good contacts in the rail industry, close ties with a number of heritage railways, and other preservation groups in the UK.

2.1 The Vision

To recreate the sight, sound and performance of the first successful mainline diesel engine for future generations to enjoy.

2.2 History

The Society was formed in 2011 by a core team of engineers, current railway staff and business professionals, supported by a small group of members. We were successful in the purchase of a English Electric 16SVT engine and a class 58 loco. A great deal of preparatory engineering research has been undertaken since 2011 to identify the most suitable options for the re-creation.

In 2015 the Society was beset by a number of issues that slowed progress significantly, although the purchase of our donor loco 58022 was completed. The Society had not attracted sufficient active members, and was not very active publicly. At this point there was no social media and minimal website activity, so public awareness was limited. Some trustees stepped back from active involvement, and sadly, another key trustee, the society Secretary, passed away, which resulted in the loss of a great deal of knowledge and of contacts within the industry.

However, the society 'relaunched' in 2017 with four new trustees and further volunteers taking regular part in activity. Contact with members and the wider public has increased markedly. The society Facebook page now has around 1200 followers, and we are also active on our website and on Twitter. Membership and income have been raised considerably. There is still much to be done, but progress is being made on all fronts.

2.3 Where we are now

The society now has regular communication with members. We are active on social media and our information stand has attended events at preserved railways across the UK to raise public awareness about the project.

Since the new trustees came onboard the key milestones achieved are:

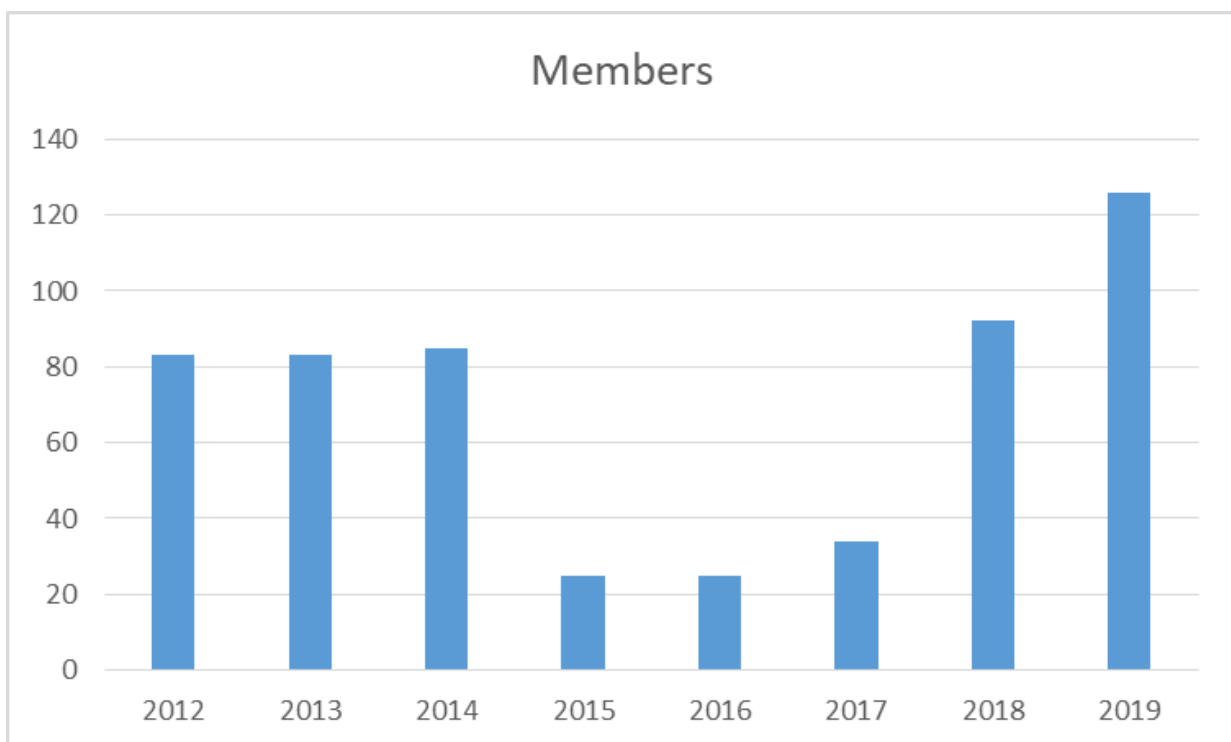
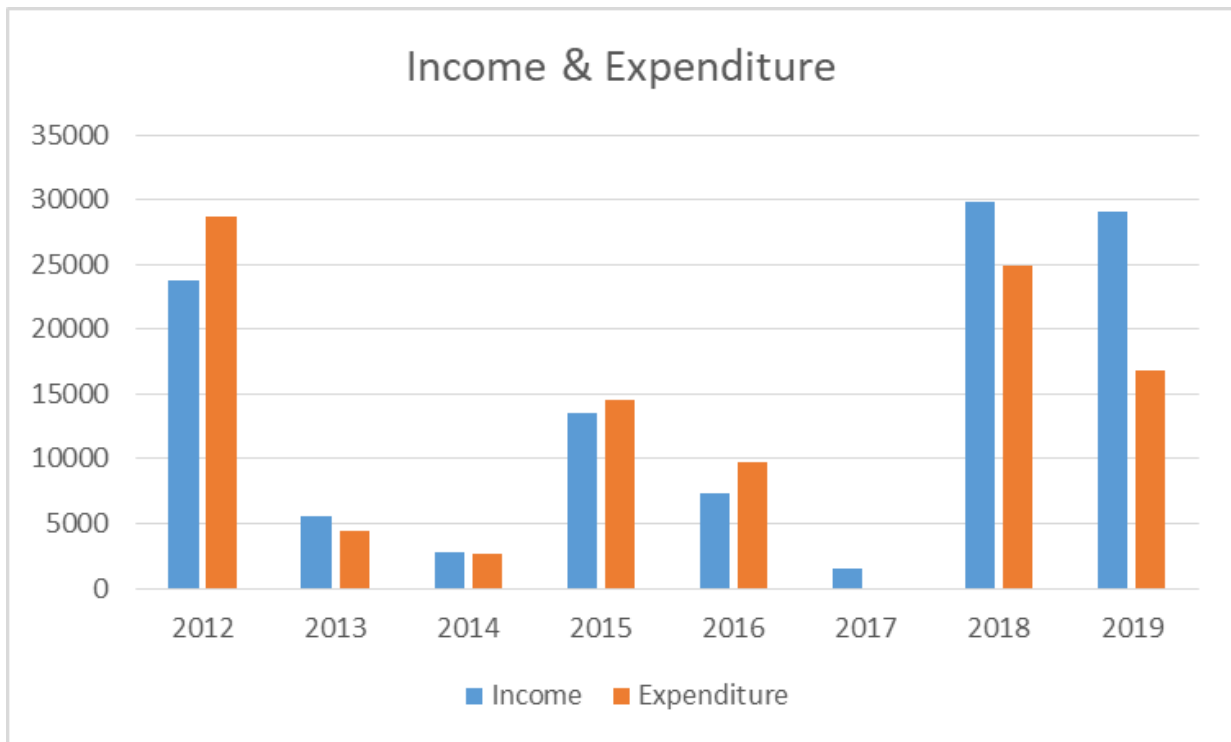
- a new website has been launched, which is currently receiving almost 5000 visitors per month
- membership has more than doubled, and continues to increase
- income has increased by a factor of 8 compared to the previous year
- The bogies have been purchased
- A workshop has been leased
- Several promotional videos have been produced
- Public awareness has been greatly increased by the presence of our sales and information stand at a wide range of events
- A variety of parts and historically relevant items have been obtained

We have also taken steps to ensure that no information is held by only one person, to protect against the loss of any individual.

Now that the society is on a strong footing once again, with fundraising increasing and progress being made with the purchase of the bogies, our next priority is the acquisition of covered accommodation.

The tables below indicate the significant change in fortune of the society since the relaunch.

	Members	Income	Expenditure
2012	83	23775.73	28718.88
2013	83	5612	4418
2014	85	2737	2640
2015	25	13583	14504
2016	25	7351	9688
2017	34	1506	0
2018	92	29879	24951
2019	126	29131.37	16772.35



2.4 Legal status

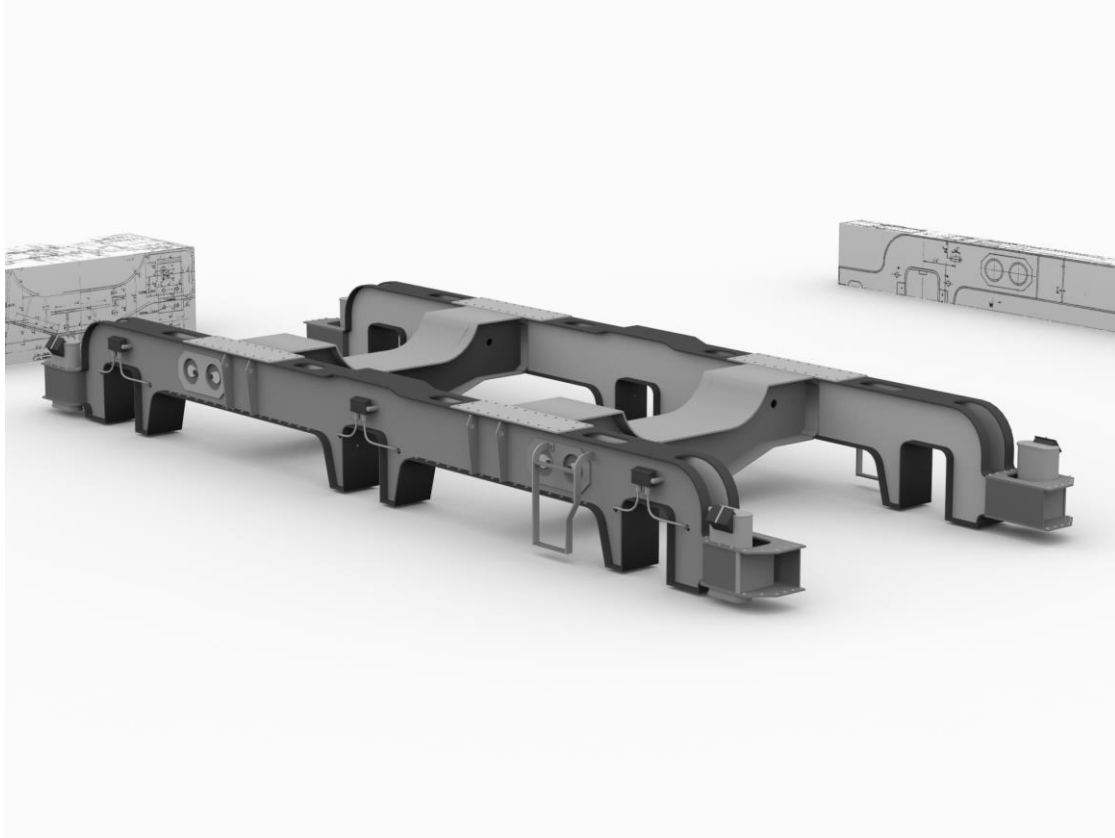
The Ivatt Diesel Re-creation Society is a registered charity in the UK, registration number 1147032.

3. OPERATIONAL PLAN

3.1 Milestones

The key future milestones for the project will be contained in a detailed Engineering Overview document, which is available on our website at www.lms10000.co.uk.

- Bogie refurbishment:** The bogies have been stored outdoors for many years, and will require full dismantling, shot-blasting and painting. An order has been placed for this work to be carried out by an external contractor. Some strengthening and alterations will be carried out, as 10000 will be approximately 20 tonnes heavier than the loco they were previously used on.
- Covered accommodation:** A workshop has been leased to give us dry accommodation and a solid working surface to move forward. The workshop will require some minor modifications and refitting to allow it to be used to modify the chassis and fit it to the EM2 bogies.
- Stripping of the Class 58:** The bogies and all items above the solebar will be removed to release the chassis.
- Alteration of the chassis:** Some alterations and strengthening of the chassis will be completed to create the correct tapered profile in the cab sections and prepare the chassis to accept the refurbished EM2 bogies.
- Reassembly of chassis and bogies:** This will be a key milestone, enabling work to commence on the key electrical and mechanical parts of the loco, and will also allow the loco to be moved as necessary.
- Installation of the engine and other internal components:** Many of these items will be obtained either from the class 58, or from redundant class 20, 37 and 56 locomotives which are expected to become available in the near future.
- Subject to the parts being in a good enough condition, it is expected that parts of the braking and electrical system from the class 58 loco will be retained. The original motors purchased with the EM2 bogies will be refurbished and re-used. The radiator elements from the class 58 will be reused, installed in a new or modified frame. Should any of these components not be in a suitable condition for re-use, or if the necessary spare parts are not available, the fall-back plan will be to use items removed from class 20, 37 and 56 locomotives as they become available.
- Construction of bodywork:** This will mostly be carried out in house, with key items such as cabs and nose ends manufactured by external contractors.



Our CAD Team are currently at work digitising our extensive drawing collection to produce material to be used as part of the design and approval process. The pictures above are examples of their current work on the bogies and cabs.

3.2 Non-engineering milestones for 2019

- Increase the rate of donations with the launch of a campaign to raise £100,000 by the 100th birthday of our President, Stan Fletcher
- Continue the development of our local core group in the Midlands/Derbyshire
- Build links with local business, colleges and universities
- Hold trustee progress review meetings to review the business plan and engineering plan and progress against aims.

3.3 Costings

All costings are estimates based on the experience and research carried out by the Society's engineering team. If more detailed costings are required, these can be provided on request.

Key project targets and costs:

- Hire of external crane contractor.
- Use of our existing lifting beams.
- Basic one/ two road shed, constructed on a 45 x 10 metre rafted concrete pad.
- Use parts from class 58 electrical system, wiring, brake system and modified cooler group.
- Use of class 20/37/56 fixtures fittings, fire protection system vacuum braking system.
- Design analysis of bogies to assess modifications.
- Bogies refurbished and repaired utilizing original traction motors and aesthetically modified to match originals.
- Calibration and repair/replacement of all apparatus and instruments as required.
- Replacement alternator rectifier and control modules and electrical system repairs as required.
- Replacement brake system parts and other repairs as required.
- New tyres or wheel pans
- General tooling and consumables

Total estimate £450,000 minimum.

Additional cost of a DC generator Loco based on class 37/0 if the EM2 / class 58 items are not suitable or in adequate condition, including full rewire of the loco, as class 37/0 wiring is likely to be life expired.

Total estimate: £250,000

4. PEOPLE, MANAGEMENT AND GOVERNANCE

President: Mr Stanley Fletcher:

We are honoured to have Stan Fletcher as our Society President. Stan was the English Electric engineer with special overall responsibility for commissioning the original locomotives, and clocked up over 150,000 miles behind 10000 and 10001. His knowledge of the original locos, and their good and bad points, has been invaluable to the project.

Day to day running of the society is the responsibility of the six trustees, who have a wide variety of experience in organising and completing projects of all kinds:

Chair: Mark Walker: Mark works as the Local Resilience Forum Co-ordinator for Warwickshire, and is currently involved in restoring an ex-NCB locomotive at the Midland Railway Centre.

Secretary: Andrew Hoseason: Andrew has a background in industrial photography followed by serving as a trustee for Citizen Advice, a money advice worker and a school governor. He has experience of running various charities.

Treasurer: Michael Prince: Michael has worked as emergency services support staff for 18 years and previously worked for the Land Registry. He qualified as a professional artist to Master's level, as well as gaining a business and accountancy diploma.

Engineer: Paul Etherington: Paul has many years experience working within the power and petrochemical industry, starting as an apprentice, culminating in managing outage projects on rotating plant and equipment. He has a vast railway interest and knowledge. Paul is supported in Engineering issues by Vaughan Cole, an experienced engineer with many years of railway experience.

Project Manager: Hanson Haigh: Hanson spent 27 years running his own Road Haulage business until 2002 and has been Operations Manager for a steel stockholder and processor overseeing around 55 shop floor staff and drivers.

**Sales Manager:
Tony Ellershaw:** Tony is a retired mainframe storage analyst with experience over 16 years including disaster recovery and testing.

In addition to the Trustees, the Society also has a media team, responsible for producing AutoCAD drawings of all parts of the locomotive, and the production of promotional videos.

Great efforts have been made to ensure that the society has no single points of failure, and this project is now complete. All files, drawings and documents are held centrally online, and all accounts and passwords etc are held by at least two trustees.

Future aspirations

The trustees would like to expand the team. Additional engineers with extensive rail experience have been added to the team in recent months. More would be ideal, particularly those with rail industry experience.

We are mindful of our limitations, and are keen to attract dedicated volunteers with prior experience in fundraising, publicity and project management to augment the current team.

5. RISKS

Risk	Likelihood	Impact	Mitigation tactics
Loss of Trustee	Low	Medium	All information centrally held, and all account details and passwords held by at least two trustees. Initial impact may be higher, but long-term impact will be low.
Lack of funding	Medium	High	Significant effort made to publicise the society, and the progress made. Approaches to be made to large rail industry partners when visible restoration progress is made.
Non-availability of parts	Low	High	Project work underway to identify appropriate mechanical and electrical options and identify parts required while they are still available. Contact with key staff within the rail industry has already been made.
Lack of covered accommodation	Low	High	Discussions to take place to arrange a long-term home base with undercover accommodation. Trustees are exploring non-railway sites where restoration of smaller parts could be undertaken if limited or no covered accommodation was immediately available.

Appendix I – BACKGROUND

The Ivatt 'Twins', No's 10000 and 10001 were designed by H.G. Ivatt and built by the London, Midland and Scottish Railway (LMS) at Derby Works. 10000 was completed in 1947 as an LMS loco, and 10001 in 1948 following the formation of British Railways. They were the first main line diesel locomotives and successfully set the shape of UK diesel traction for decades to come.

H.G. Ivatt, the LMS Chief Mechanical Engineer was given the task to design and build two diesel prototypes to test their suitability for use on the main line in direct comparison with steam locomotives. Highly successful as prototypes, they operated until the mid-1960s, travelling around 2 million miles between them.

The Ivatt diesels were built in an 'Art Deco' style. With their smooth lines, shiny black paintwork and raised aluminium numerals they were the cutting edge of design and technology for their time.

10000 and 10001 ran until 1963 and 66 respectively and both had been scrapped by 1968 before the railway preservation movement had turned its attention to diesel locomotives.

The aim of the Ivatt Diesel Re-creation Society is to build, exhibit and operate a re-creation of LMS 10000. Whilst undertaking this task, we are also collating an archive of the locomotives, from the people that built, commissioned and worked with them, to information, drawings, and workings of 10000 and 10001 as an educational resource for future generations.

The society owns a class 58 locomotive, which was purchased to provide the chassis for the recreated locomotive, and an original 16SVT engine, from the same batch as the original engines used in 10000 and 10001, which has been well maintained and has a low number of hours use. Following a quiet period, the group was relaunched in 2017 with several new Trustees. Over the last 12 months, the priority has been to raise the profile of the society and raise funds for the purchase and restoration of a set of bogies which are virtually identical to those used under the original locos.

Appendix 2 - BENEFICIARIES

From the start of the project, it was known and accepted that this was very unlikely to be a profit-making venture. Although we anticipate significant interest in the loco, the potential income is not expected to recoup the full costs of the re-creation. The beneficiaries of the project are;

- The home railway that the loco is based on. Our hope is to make an arrangement with a local heritage railway to construct a small shed and workshop, which would see the finished loco based exclusively at that site for the first few seasons of operation. We anticipate a great deal of interest from the rail enthusiast community, and this will be of financial and reputational benefit to the home railway.
- Rail enthusiasts. The feedback we have received so far indicates that there will be great interest in the loco by enthusiasts, given its position as the first successful mainline diesel engine, and a missing link in the history of modern traction.
- The general public. In comparison to steam engines, there is a 'they all look the same' attitude to preserved diesel traction from the public. However, 10000 will have the benefit of a striking appearance, with its unique black and silver livery, and an impressive soundtrack to match, from the 16SVT engine. Added to its position as the first of its kind, we expect public interest to be significantly higher than in other preserved diesels.

Appendix 3 - EDUCATION

As an initial step an education leaflet has been produced explaining the history of I0000 and its influence along with its setting within cold war Britain. Our intention is to provide three forms of education, subject to funding from grants, sponsors or donations:

1. Within a shed building - a permanent display centred around I0000
2. Internet education package aimed at enthusiasts, adults and school children
3. A mobile display which can be transported with I0000 when it leaves the home base

The topic in each case will be I0000 and its place in British post war engineering history.

- a) the history of I0000 and it's context within British locomotive development.
- b) the history of I0000's descendants, such as classes 40 and 50 and the links to other English Electric designs and to the EM2 and D600 Warships etc
- c) Background to the I6SVT power unit showing the history of British engineering in a wider scope to reflect the power unit's use by the Ministry of Defence.
- d) Background to the bogies showing the design, similarity to other builds, use of the bogies in the UK and Holland, and the improvements and alterations made for their re-use.

Appendix 4 - FINANCIAL

The society is funded entirely by donations. Around £45,000 was raised to purchase a class 58 loco, to provide the chassis for the recreated loco, and an original English Electric I6SVT engine, in working order, from the same batch as the engine originally fitted to I0000 and I0001. At the time of writing we are negotiating the purchase price of a set of EM2 bogies of an almost identical design to the originals, for which funding is available. The next priority following the purchase of the bogies will be the purchase and erection of a loco shed to provide undercover and secure accommodation.

Since the relaunch of the society in 2017, fundraising has been increasingly successful. Feedback from enthusiasts and rail industry contacts are that donations will increase once the project progresses mechanically. Although donations from members will always be a necessary source of income, it is anticipated that interest from the rail industry will result in larger donations being made.

Appendix 5 - FURTHER STEPS

The milestones required to enable us to complete the project are:

- **Covered accommodation.**

The society has leased a workshop, which provides a location to refurbish the items we have obtained, modify the chassis and fit it to the EM2 bogies. However, the workshop is not suitable to build the complete locomotive, and a larger loco shed will be required in the future. The accommodation will include space for storage of components and a visitor area including the educational display. This will be a key part of our long term project.

- **Donor loco**

We are currently looking at a number of different options for the remaining components required to complete 10000. The final option will depend on the availability and cost of parts, and the condition of parts when dismantled. The preferred options are:

- Refurbishment of the existing traction motors in the EM2 bogies.
- The use of the alternator and parts of the electrical system from the class 58 loco, supplemented with class 56 items to replace missing items and improve reliability.
- Use of the parts of the existing braking system from the class 58 loco, with the addition of class 56 and 37 items to create a dual brake system

Additional parts will be required to complete the braking and electrical system, as some brake parts and, more recently, all the control cards from the electrical system have been removed from the loco.

Should some or all of these options not be possible, the alternative plan is:

- Replacement of the existing traction motors with class 20 alternatives, which will require the wheelsets to be altered or replaced.
- Use of the traction motors already available from the class 58.
- The use of the electrical system and brakes from a class 37/0 loco. Should this option be chosen, we already have a compatible electrical cubicle available.

- **Additional parts**

Whichever of the above options is taken for the main components of the loco, a large number of smaller parts will be required. These will be obtained mainly from class 20 and 37 locomotives which are expected to be withdrawn from mainline service in the next few years. If the key items are obtained from the class 58, it will likely not be necessary to purchase a donor class 37/0 loco.

Appendix 6 - SAFE OPERATING PROCEDURE

A detailed safe operating procedure has been produced to promote safe working practices during the upcoming mechanical work, and is available on request.



Photo: Keith Long

www.LMS10000.co.uk