



40118 – Restoration Diary 2006

January & February 2006

40118's final TOPS reports have been added to the Early Days section.

2005 finished with this website achieving over 10000 visits during the year! Thank you to everyone who looks at the site and who gets in touch with comments and questions. They are always welcome and will always be answered (if possible!)

So far the year has started quietly, but work has continued on the control cubicle, with the final motor contactor being completed, following the re-fitting of its auxiliary contact tips.

In addition, a full photographic survey of the two reversers has been undertaken to allow a record of their current condition, and to assist in planning their removal and overhaul. A set of photos of the reversers, in current condition can be accessed [here](#) (as a PDF file). Work to label and disconnect all the cables will start this coming weekend.

The locomotive has two reversers, and reverser 'K' has been selected as the first for overhaul. The air ram assembly situated at the bottom of the reverser has been removed and stripped. The housing has now been cleaned, checked and painted. The air piston assemblies have been stripped, checked and re-packed with artic grease. The air ram has been re-assembled, and the copper pipe supplying air to the valves has been re-annealed. The two electro-pneumatic valves have been refurbished and re-fitted to the now complete air ram assembly. The air ram assembly of the second reverser has now been removed and is also undergoing overhaul. During the overhaul it has been discovered that one of the two electro-pneumatic valves needed replacing as the rubber valve pieces and seals had all perished. A spare has, therefore, been taken from storage and is being overhauled in its place.

The centre cam of reverser K has been removed, cleaned checked and painted. A survey of the wiring to the reversers has been conducted, which means we will now be able to remove the wiring and progress with cleaning and checking the components.

The motor start contactors, having been overhauled are now being 'set up' on the locomotive - this involves checking the contact tips are set squarely and the auxiliary contact arms are set at the correct distance from the terminals. All three motor contactors are now set up, and are ready to re-wire.

Welding of the cant rail grills in the boiler area is now complete. In late 2005, a grill was fitted but the 'seam' welding required to prevent water penetrating behind the grill needed completion. This has now been undertaken.

The locomotive fuel system is being looked at, with the fuel strainer being removed and cleaned. It is now ready for painting before re-fitting. The fuel lift pump was removed and

found to be seized. The pump has, therefore, been cleaned and checked. During this check it was discovered that the electric pump motor is faulty, with a damaged commutator. The damage would necessitate extensive repair work, so the decision has been made to replace the motor with a spare. This spare motor has been stripped, and tested at Dowding & Mills prior to receiving a through overhaul at their Birmingham factory. Part of the overhaul identified that the motor frame was cracked, so the two motors are being stripped to make one new motor, using the 'original' frame and the spare commutator. The non-electrical parts of the fuel pump are being overhauled at Tyseley.

Work has also continued in the rebuilding of the power unit 'free end', with the radiator fan drive being worked on. The drive shaft covers have now been cleaned and painted and re-fitting work has started. The drive shaft safety cover has now been fitted. The water cooling system has also seen more pipework refitted to the engine. More of the oil system pipework has now been re-fitted.

The control cubicle roof section has been polished and compounded ready for its re-fitting to the locomotive. Paintwork has also been touched up as necessary.

The control cubicle itself continues to receive doors after re-furbishment, with a further door now primed ready for re-fitting.

Work on the restoration of our workshop coach continues, with new windows being fitted. The window frame that was previously the toilet area of the coach has been refitted and new glass fitted. This uses the second of the three fibreglass moulds required for the coach. All the paint has been scraped off the glass and work has progressed on the coach corner post.

Although some time will elapse before we start to overhaul the boiler fitted to 40118, we have been surveying the equipment and determining what is missing. Thanks must go to the 6024 preservation group, (yes a steam group have helped a diesel group...) They have let us have a calibrated, genuine, Stones Boiler gauge which we will need in due course for 40118. The survey has determined that we possess all the spare parts necessary to overhaul the locomotive boiler except for two water gauges. If any reader has any boiler water gauges they would be interested in seeing used on 40118, please contact the group to discuss the items. Also discovered during the survey was the lack of a water return flow gauge, which should be adjacent to the boiler control cubicle. This has, in BR days, been removed as part of a modification to the pipework. We have a gauge which will, potentially, be refitted.

The society also assisted Tyseley Locomotive Works by spending some time repairing and re-commissioning an electric point motor controlling part of the sites infrastructure.

March and April 2006

With spring approaching, we have turned our attentions to the power unit fitted to 40118. Work has commenced on removing, cleaning and re-fitting the cam followers (the link between the locomotive cam shaft and the fuel injectors and valves - 'push rods' which operate the equipment on the cylinder heads of the engine).

Work started on the 'A' side of the power unit, and so far 9 valve cam followers and one fuel pump follower have been prepared to re-fitting. Unfortunately during removal and cleaning we discovered that a large number had components worn below scrap size.

However, we have a large number of spare parts and these have been used to make up the 'completed' cam followers. We have bought a complete set of new cam follower bushes and roller pins from MAN Diesels to replace the 'A' side components. In the later years of BR life, the cam follower design was changed slightly, and the phosphor bronze bearing reduced in size. The cam-followers on 40118 were largely the old design. However, we have a set from 50 043 of the 'new' specification and we will standardise on the new size. This will allow new bronze bushes to be used throughout. An extraction tool is required in order to change the bushes to the new items, and a design has been finalised, with Tyseley Locomotive Works staff having manufactured the necessary tools.

These tools were put to good use on 15th April with the whole of the 'A' bank air and exhaust cam followers being worked on. All 16 of these cam followers were removed, cleaned and the rollers changed. The roller itself came from 50 043, but with brand new pins and bushes being fitted. This means that 40118 will now operate with a full set of the 'late' design rollers. Whilst being re-fitted, opportunity was taken to renew both gaskets and to re-fit the push rod tubes. The fuel pump cam followers for the 'A' bank were re-fitted on 29 April, following inspection of the cam-shaft fuel lobes.

We also stripped the entire 'B' side of the power unit to remove the fuel pumps, cam followers and associated equipment. In order to undertake this task we had to remove the valve 'bridge' pieces, which link to the cam followers. Work will then commence on checking the 'B' side components for damage/excessive wear. As part of this work, checks have been undertaken on the governor, previously overhauled. This has shown that the metal mounting shim fitted to the locomotive was too thick - which would affect the correct operation of the governor, and potentially the whole engine. A new shim has been manufactured by members and fitted to the locomotive. This means that the governor now sits at the correct height (being 1.5 mm thick) to obtain the correct back lash on the bevel gears (5 1/2 thou of an inch).

We have now re-assembled the locomotive fuel pump after cleaning and overhaul. The electric motor will be returned from its overhaul soon, which will allow the pump and motor to be re-fitted to the engine. The electric motor has now been returned from Dowding & Mills after overhaul and is ready for re-fitting, however, the end cover (which was retained at Tyseley) needs some aluminium welding to a broken mounting hole. This will be done over the next few weeks.

The fuel strainer has been cleaned and re-assembled.

The oil filter housings have also been cleaned and painted ready for re-fitting.

The engine high water temperature detector has been cleaned and tested. This has shown that the detector does not work, therefore we will need to replace the sender unit. Teddington Controls manufactured the original item, so we will need to discuss the item with them to see if it can be re-supplied or repaired.

The cooling water header tank on the 'B' side has now been cleaned and painted, with the pipework in the vicinity also being re-fitted and re-painted.

All of the motor start contactors are now set up mechanically, reconnected to the air supply pipes and have had all of the auxiliary contact wiring reconnected. The coil wiring has been tested and re-connected. The main traction motor wires have now been checked and re-connected.

Both reversers are being worked on, with them being entirely removed from the locomotive - Both reversers have had the air ram equipment overhauled and re-assembled. Both centre cam bars have also been cleaned, checked and made ready for re-fitting. The actual contact blocks are, in common with the rest of 40118's electrical system, in need of more comprehensive work. 4 sets of reverser contact tips have been burned and will need to be replaced. The contact faces are silver squares soldered on to a mounting block, and discussions have been had with GEC to confirm the method of changing. The old contact faces need to be ground off, and the new blocks soldered on. The solder has a melt point of 650 degrees Celsius, and after soldering the whole assembly needs to be set up on a miller to ensure 'squareness'. We have been able to purchase two re-conditioned reversers from a class 20 locomotive, which will provide the four new sets of reverser contacts. The old class 20 reversers have been stripped to recover the other parts that are compatible with a class 40, and after indexing will be placed into store. The mounting brackets for reverser L have been cleaned and re-painted ready for refitting. The auxiliary contact block for reverser 'L' has now been stripped, cleaned and re-assembled. Its resistance has been checked and found to be as low as practical (virtually 0 ohms).

The radiator fan drive shaft has had its safety cover repaired and refitted.

The power unit crank case breather pipe (which allows potentially harmful gasses to vent rather than build-up in the engine) has been removed, cleaned and is ready for re-fitting. New gaskets have been made for this section of pipework.

May & June 2006

The society would like to offer congratulations to Tim & Christine on their marriage on 30 May 2006. However, the honeymoon is now over - work must go on!

Our suppliers list has been up-dated. These companies have all helped the society and understand the needs of preservationists, so will be able to help if needed.

A copy of the waybill document put on 40118 (or 97408 as it was know at the time) when it was dragged to Tyseley has been added to the Early Days section, as has a 1985 photo of 97408 at Stafford in June 1985.

May has started with work on the power unit continuing. The 'B' bank cam shaft is being removed to permit repair work on the cam shaft lobes and general cleaning of the shaft and bearings. The cam shaft has now been removed, with all four sections being removed during the weekends of 6 May and 10 June 2006. At least one of the cam shaft lobes will need replacing, fortunately, we possess the necessary spare parts, in addition, some of the bearing surfaces on the power unit itself are scored and will need attention to remove the marks. It is probable that oil contamination has caused this scoring, and was the reason why, as a precaution, we decided to remove the cam shafts. The first three cam shaft sections have now been cleaned, checked and re-fitted to the 'B' bank of the power unit. This leave the one remaining section to repair before re-fitting.

The boiler filler shoot on the 'B' side has now been bolted back into place (after being loose fitted some months ago). It has been sealed with polyurethane sealant around the top to prevent water ingress into the engine room. This required Hammerite paint to cover the white PU sealant. Now fully fitted, the filler shoot has been painted in undercoat, prior to its final grey gloss coat. The floor panels in its immediate vicinity have also been re-fitted after de-greasing. The opportunity has also been taken to finalise the paintwork on

the pipes at the radiator end of the power unit, touching up the bolts etc of the mass of pipes re-fitted in this area over the winter.

Work has re-started on the oil soaked main resistor bank removed from the locomotive a couple of years ago. This contains many large, open wound, resistors that were sprayed with oil just before 40118 was withdrawn - the source being a turbo oil pipe leak. Obviously hot electrical contacts covered in oil poses a serious fire risk, so all the resistors are being removed from the mounting frame and de-greased. The bodyside on which the resistor frame mounts has now been de-greased, and had the old paint removed, prior to being repainted in primer, undercoat and grey gloss. The resistors themselves need de-greasing, and this work was being undertaken on 17 June 2006. In order to remove the oil (and associated contamination) a combination of solvent cleaner, soft wire brushes and time!

The power unit crank case breather has been re-fitted to the locomotive. with the breather drain pipe now having been re-fitted, and the floor area in the vicinity being fully de-greased, and re-fitted to the locomotive. This involved refitting bolts for the first time in many years to the floor section.

The first of the reverser side contact bars has now been completed, with replacement components being used and is ready for re-fitting to the control cubicle. The first parts of reverser 'L' were re-fitted on 20 May 2006, ready for re-wiring. It is interesting to note that the reversers are referred to as 'L' & 'K', rather than forward or reverse, or front or rear, simply because it is safer to do this as otherwise confusion could arise as to which 'end' of the engine is being referred to. The second side bar of reverser 'L' has now been stripped, cleaned and re-varnished. The side contact bar has now been re-assembled, receiving four new contact assemblies and has been refitted to the locomotive. Work has now started on overhauling the centre contacts of reverser L. Along with the side contacts, it will receive four new sets of contacts, taken from a class 20, which will allow a pool of spare parts to be created for future use. Reverser K side bars have been stripped, and the top and bottom mounting castings cleaned, and re-fitted to the locomotive. The contact assemblies themselves have been cleaned and are ready for re-fitting. This means that both centre cam bars and both sets of side contacts have now been completed, leaving only the centre contactors to complete. This will signify the completion of the cubicle overhaul!

The cubicle itself has been cleaned ready for painting in the area where the reversers have been removed. The wiring loom in the vicinity of the reversers has been checked and re-loomed. This work revealed several wires that needed re-placement.

The engine governor has now been re-united with the power unit identification plate, which has been repainted and generally spruced up. The fuel pump has now been completed, after the fitting of new gaskets. This will be re-fitted to the locomotive shortly.

The water thermostat, manufactured by Teddington Equipment has been returned by the manufacturers after overhaul..

July & August 2006

The August Bank Holiday was spent undertaking the second body lift for class 47 596 (the first being on 30 December 2005). This work whilst not directly linked to the restoration of 40 118 has, however, helped other preservationists and kept our own volunteers up to speed on loco lifts. [Film](#) of the body lift is on the site, alongside [photos](#) of the December lift.

Work has also moved to the fuel pumps, as we have generated sufficient funds to enable our fuel pumps to be professionally overhauled at Colchester Pumps. The pumps have, therefore, be delivered to Colchester for overhaul.

Our [suppliers](#) list has been up-dated. These companies have all helped the society and understand the needs of preservationists, so will be able to help if needed.

July started with work on the power unit continuing. The oil priming pump has been removed, ready for overhaul. The electric motor will be sent to Dowding & Mills for overhaul, with the pump itself being overhauled at Tyseley. The oil pump unit has now been stripped down into its components to allow each to be checked. This has revealed that the main pump shaft has extensive corrosion around the seal. This will require specialist repair before being re-fitted to the oil pump.

The oil pump itself is sited within the radiator fan room, an area thick with oil and dirt. Therefore we have started to clean and de-grease this area to allow for painting before the oil pump is refitted. This work was started by steam cleaning the room - a difficult and dirty task. Degreasing by hand has continued, concentrating on the area occupied by the oil priming pump. A preliminary survey of the radiator water elements was also carried out which has shown 6 elements that will need repairing or replacing.

The remaining floor panels surrounding the 'b' side of the power unit have now been replaced, after cleaning and de-greasing.

The last of the control cubicle doors from the generator side has been cleaned, straightened and primed ready for re-fitting to the cubicle. These are not, at this stage, being glossed as cleaning work on the generator has not yet been undertaken, and the final paint work will be applied after that.

The foot step next to the generator has now been cleaned and painted ready for re-fitting.

The cooker mounting and wiring assemblies are being worked on, to restore this piece of equipment to the locomotive. The wiring conduit has been overhauled and fitted with a new plug socket cover. The cooker power point, local start switch and associated conduit have now been re-fitted to the engine. The cooker mounting frame has also been steam cleaned and degreased ready for re-painting.

The electrical unit of the water temperature thermostat has been fitted to the side of the water tank, and awaits re-wiring. The thermostat itself is linked to the water system by way of a probe. The probe itself needs fitting to the water pipe, where it sits within a sleeve protecting it from direct contact with the cooling water.

The 'B' bank oil pressure switch has been overhauled and is now re-fitted to the locomotive, along with the oil pipe linking it to the oil system.

Work on the reversers continues, with two of the centre contactor assemblies now fully overhauled and refitted to reverser 'L', a fifth centre contactor has been fully overhauled and is waiting to be re-fitted, with a sixth being re-assembled. This can be seen in the [latest photos](#) section. The last of the reverser auxiliary contact sets has been fully overhauled. During the overhaul it was found to require a new mounting board after two of the insulators were found broken. The new board was retrieved from store. Wiring work on the reversers has commenced with the first of the high voltage (traction motor) cables being reconnected, along with the auxiliary contact wiring. These wires have been tested to ensure the integrity of insulation before re-fitting.

The last of the 'B' bank cam shaft sections has now been re-fitted and the cam shaft re-connected to the drive cog. This completes the cam shaft overhaul. The cam shaft inspection hatches need to be re-fitted.

The cubicle roof section has now had the rubber seal retaining clips fitted.

Work continues on the overhaul of our workshop coach, more details of which can be found [here](#). The area around the droplight window has been removed, to allow for new oak posts to be cut and fitted.

[Page Top](#)

September & October 2006

The [Early Days](#) section of the website has been updated with several new photos of 40118 in her BR days, as well as a new class 40 audio recording.

September has started well with progress being made on several important jobs.

Firstly, the oil priming pump centre shaft has now been returned from [Dowding & Mills](#). The company have extensively re-metalled and re-machined the part returning it to its designed shape and size. A close up can be seen in the [latest photos](#) section. The oil pump is now being re-assembled, however, the electric motor still needs to be overhauled before re-fitting. The electric motor has been de-greased and primed, but will be sent to Dowding & Mills for overhaul. The 'mechanical' section of the oil priming pump has now been re-assembled and painted and is waiting on the electric motor overhaul (this can be seen in the [latest photos](#) section). The mechanical part of the oil priming pump has now been refitted in the radiator room of the locomotive (this can be seen in the [latest photos](#) section).

The five overhauled reverser contacts have now been fitted and wired. The sixth and final reverser contact for reverser 'L' has now been completed and will shortly be re-fitted, this will allow the first reverser to be completed and tested. All the components for reverser L have been overhauled and are ready for fitting. This can be seen in the [latest photos](#) section. Attention has turned to the centre contacts on Reverser 'K'. All six have been stripped from the central mounting bar, and are being broken down to enable cleaning and checking of spring lengths. Three of the contact tips will need replacing. The springs have all been checked and found to have the correct free length (1 5/16"). After checking they have been sprayed with black hammerite for protection. 'Production line' checking of components started, with all the spring mounts, pivot pins and spring carriers checked and cleaned. This can be seen in the [latest photos](#) section. The first four contactors from reverser K have now been re-assembled, and the fifth is almost complete. With the

exception of the three damaged contact tips, it is anticipated that all the other components will originate from 40118.

The temporary cover over the boiler and cubicle has been un-taped from the loco on the boiler side to allow access for painting and the last body repairs in that area that were not previously possible when it was all stuck down. This is in preparation for the re-fitting of the two overhauled roof sections. The new grill fitted next to the boiler has seen some attention with the welds being flattened and filled. Primer has been applied to begin the paint job on this area. This can be seen in the [latest photos](#) section. The top weld on the grill box is slightly proud, so needs grinding back to allow the roof section to sit totally flat. This has been done, and has been filled ready for painting. The grinding was difficult as it had to be done using a small (4") air grinder as it was the only tool small enough to fit into the confined space. The engine room window adjacent to the A bank (generator end) has had the paint and corrosion removed from the window surround. This will require some remedial work before re-painting. (this can be seen in the [latest photos](#) section).

The fuel pumps have now been delivered to Colchester for overhaul and early indications from the firm are that they are in remarkably good condition. They have now been fully overhauled and returned. [Colchester Fuel Injection Ltd](#) deserve particular mention as their enthusiasm and helpfulness has been probably some of the best customer service we have seen in a long time. Their knowledge of their products and services are also very extensive. All in all highly recommended for fuel system queries. The fuel injectors will be sent to Colchester for overhaul in the coming weeks.

The engine overspeed trip has been removed, stripped and cleaned. The casing has been primed in a two pack etching primer (because it is aluminium, and normal primer can not be used). The thread in the trip plunger assembly was found to be damaged so has been repaired. It has now been re-assembled, and re-fitted to the engine. This can be seen in the [latest photos](#) section. The two camshafts have been seeing attention over the last few months (as previously discussed), however, both have now had their 'end float' checked (and measured at 0.01", which is within the tolerance of 0.01" & 0.012"). The cam shaft work is, therefore complete, leaving the timing chain tension to be checked. Work has started on cleaning and reassembling the cam followers using new bushes and roller pins purchased for the overhaul. Unfortunately during the work on overhauling the cam followers it has been decided that 17 of the cam follower rollers are scrap and will need replacing - this is in addition to the 32 pins and bushes already replaced with new items. 14 of the new rollers have been sourced from our spares originally removed from 50 043 'Eagle' leaving three rollers to be purchased from MAN. All of the cam followers have now been re-fitted, and are waiting for the fuel pumps (overhauled) to be fitted, and the injectors to be overhauled and fitted. Several photos of the new cam follower parts can be seen in the [latest photos](#) section.

The radiator fan room has now been cleaned and painted in grey gloss. The floor (as can be seen in the [latest photos](#) section) has been degreased ready for the re-installation of the oil priming pump (when its overhaul is completed). The checker plate flooring immediately outside the radiator room has been de-greased and re-fitted to the engine.

The cooker mounting frame has now been cleaned and painted and is ready to be re-fitted. The cooker itself needed a new plug, and one has been purchased to suit. However, a piece of flexible conduit will be required to link the cooker to the plug. This has been assembled from new (this can be seen in the [latest photos](#) section). The floor below the cooker mounting has been lifted to allow the oil contamination to be cleared - (as can

be seen in the [latest photos](#) section). The window adjacent to the battery box has now been re-fitted to the engine, using new window rubber and sealing strip. This is in readiness for the planned Christmas work of replacing the large battery box and roof section to 'seal' that area of the locomotive.

Considerable progress has been made with the overhaul of our workshop coach. The entire end section having been stripped and new oak sections manufactured. This is detailed in the [coach restoration](#) section.

November & December 2006

At new year the society had the Saturday off and went to visit 40 135 putting in some fine performances on the East Lancashire railway. Whilst there we spent the time discussing our main bearing problems. The issue has generated a great deal of comment on various news groups. We anticipated the problem - working on the principle that as everything else on the engine was worn out the main bearings were also likely to be worn out - hence the decision to remove for checking now, before the 'top end' overhaul is completed. The bearings can be replaced or re-metalled, but the cost of about £5000 means the restoration funds will be rapidly depleted..

Roll on 2007!

November started as October had finished with work being carried out on bodywork, power unit and electrical systems.

Work has commenced on the planned power unit bearing examination. The first bearing to be examined was the main bearing between numbers 4 & 5 cylinders. The restoration programme has suffered a serious setback. The first bearing was found to be scrap, having worn through the white metal, revealing a large amount of the copper shell.. Fortunately the crank shaft shows no sign of damage. Unfortunately the remainder of the main and big end bearings will now have to be removed and inspected to determine the extent of the damage. This discovery fits in with the pattern of faults found throughout the power unit.

The bearing examination continued this weekend, with two further bearings being removed for checking. In the same vain as last weekend, all the bearings that were removed and inspected were scrap. Two had worn through the white metal and had large areas of the copper showing through (the bearings between 4 & 5 cylinder and between 6 & 7 cylinder), whilst another had the white metal de-laminating from the copper base (bearing found by the main generator). All part numbers have been recorded from the bearing shells and the thicknesses measured with a micrometer for reference. The remainder of the main bearings will be removed so that the part numbers can be recorded and the crank shaft inspected. The crankshaft will need to be inspected for damage and also to ensure we have no undersize main journals. Photos illustrating the bearings and their removal are available in the [latest photos](#) section.

The final reverser centre contact has now been rebuilt. This has completed the reverser overhaul and will allow all of the reverser parts to be re-fitted and tested in situ. The completion of the reverser overhaul has meant that the society has reached a major milestone as we have now overhauled the entire control cubicle, and after the refitting and testing of reverser contacts will signal the end of reverser work.

A survey has been conducted on the load regulator in order to assess its condition and plan the work required on the equipment. This survey has revealed that the load regulator was inoperative. The contactor (T6) which makes the machine operate was incapable of 'making' so the load regulator could not run up under any circumstances. This accounts for the reports of poor power characteristics on the locomotive in its last days in BR service. One load regulator terminal is broken and one is bent. Fortunately we have a complete set of spares. As is our practice the electric motor will be sent to Dowding & Mills for overhaul with the rest of the load regulator done on site.

A series of photos on the load regulator are available in the latest photos section.

Stripping work on the load regulator has started with the electric motor being removed. This has shown that the linkage between the motor and the gear box is badly worn and will probably need replacing. We have also found, so far, 4 broken contact fingers. The decision has, therefore, been taken to strip each contact into its constituent parts and then use chemical crack detection on the main spring bar to look for signs of cracking. Any faulty contact will be changed for new items. Crack detection has been started but will be a long and laborious task. A photo of a contact tip stripped to show its constituent parts is available on the latest photos section. The gear box of the load regulator has been stripped down and we are starting to examine the parts to check for damage and wear. New ball bearing races will be fitted throughout. We have, however, identified the cause of the excessive back lash ('wobble') on the gears - this was caused by a straight pin being used to secure the cog assembly rather than the specified taper pin. This allowed the gear to fret and wear the locating hole. This has been reamed out to take the next size of taper pin and has cured the back lash problem. The central clutch assembly of the load regulator, which was found to be seized has been fully overhauled and freed. This is the last item to be fitted (but had to be the first to be removed).

The window adjacent to the control cubicle and boiler has seen attention with the frame cleaned of corrosion, filler applied to smooth the surface and primer applied. A photo appears in the latest photos section. The window behind the cooker has also been removed and the frame cleaned of corrosion. This has been primed and undercoated in preparation for the window to be re-fitted. The frame around the boiler side hatch has also been cleaned of all corrosion and painted in primer. A photo appears in the latest photos section. The loco roof adjacent to the number 1 cab has been cleaned, and filled ready for painting. A close up can be seen in the latest photos section.

The cooker power flex has now been painted, and a photo of this work can be seen in the latest photos section. The cooker has been fitted to the locomotive. A photo appears in the latest photos section.

The first of two resistor mounting boards found adjacent to the generator has been re-fitted after overhaul and complete re-wiring - this work can be seen in the latest photos section. The individual resistors will be fitted as each is cleaned and tested. The first mounting board has now had all of the resistors re-fitted, after having been cleaned of the oil deposited on them by a previous split oil pipe on the turbo chargers. These will be wired over the coming weeks. This work can be seen in the latest photos section. Having completed the first board, attention has moved to the second board which contains the large load regulator resistors. These resistors are connected to the higher numbered load regulator contacts and serve to alter the generator field resistance and help to produce more traction current. These have been cleaned and re-mounted on the mounting bars before being re-fitted to the locomotive. However the insulating washers used to protect

the ceramic insulators will need replacing as the originals are damaged beyond repair. Part of this work can be seen in the [latest photos](#) section.

One of the compressed air control pressure switches (the number 2 cab exhaust speed up switch, which uses compressed air from the brake system to speed up the rate the vacuum exhauster operates) has been stripped for overhaul, following checks it has now been re-assembled ready for pressure testing, which it failed owing to a weak spring. A new spring has been obtained and swapped with the faulty spring which meant the unit then passed a pressure test. Testing the relay (A photo of which appears in the [latest photos](#) section) is quite complex but the relay has been checked to its specification and the relay opens its electrical contacts at 51.5 PSI, but not close them again until 65 PSI. Similar relays are used in the air and vacuum brake systems.

Considerable progress has been made on reassembling the end section of our workshop coach - photos of the work are shown in the [coach restoration](#) section.

