ALAM Newsletter

Autumn 2019

What's Been Happening

There's various reports from one-day events and recent conferences.

We are always open to ideas and suggestions from members for future one-day updates, and names of useful contacts would be most welcome. Please contact the ALAM secretary, Graham Higginson.

2020 Conference

We are planning one of our five-yearly overseas trips. We are in the process of finalising a programme of training and updating with various companies in western Austria. The planned programme will include Case Steyr, Voestalpine Steel, Pottinger, Lindner, Teufelberger and Wintersteiger.

See inside for more details, and get the dates into your diaries!

One-Day Events

We have plans for a day at Pottinger UK headquarters in Corby, which will be on Monday 17 February 2020 - again, see inside for details.

#

Membership

You will find a list in this newsletter of all the paid-up members for the 2018-19 year, as at the end of March 2019.

At the last AGM, it was decided that after many years we would increase our subscription to £20 a year, with an introductory rate of £10 for a new member's first year.

Alongside this, we will be getting in touch with everyone to check we have correct details.

Contents

ALAM Committee 2019-20

Chairman	Ian Coleman	**Committee**	John Gough
Secretary	Graham Higginson		Roger Madge
Treasurer	David Heminsley		Charles Szabo
Chair Elect	Mike Seaman		Peter Maclure
Conference Organiser 2020			Nigel Macpherson
	Ian Coleman & John Gough	**I Agr E rep**	Lance Butters

FUTURE ALAM EVENTS

ALAM Spring Event - Pottinger

Monday 17th February 2020

With thanks to Pottinger uK, this Spring Seminar will focus on Tillage and Seeding Technologies.

To be hosted at Pottinger's UK Office at 15 ST Marks Road, Corby, NN`18 8AN

Price £60 members, £80 guests.

Organiser - Graham Higginson.

If you wish to reserve your place for this event,
please send an email to ghigginson@harper-adams.ac.uk

ALAM Annual Conference - Austria

12th to 19th July 2020

This year your committee is in the process of finalising a development programme of training and updating with the following companies and organisations:- Case Steyr, Voestalpine Steel, Pottinger, Lindner, Teufelberger and Wintersteiger. They are all located in Western Austria, a country that we have not previously visited, but upon investigation, have a wide range of innovative industrial companies which produce high quality products which are internationally recognised and appreciated.

At this stage we wanted to make you aware of the outline details of what we are working on and to give you sufficient time to plan and secure the necessary funding should you wish to attend. The provisional cost for this week of staff /personal development is anticipated to be in the region of £400 to £450, there will be a limit on numbers and priority will be given to existing members.

If you wish to secure a place on this study tour
please contact ian.coleman280559@gmail.com or gough.j@btinternet.com

A deposit of 50% of the cost will be due before the end of March in order to secure a place.

We hope that you will be able to attend what promises to be an interesting and varied programme of subject matter.

ALAM BOOK NEWS

The Hard Way Round

ALAM member Ian Whitehead has produced this book from the diary of Ernest Bell, and his round-the world trip on a Norton Dominator.

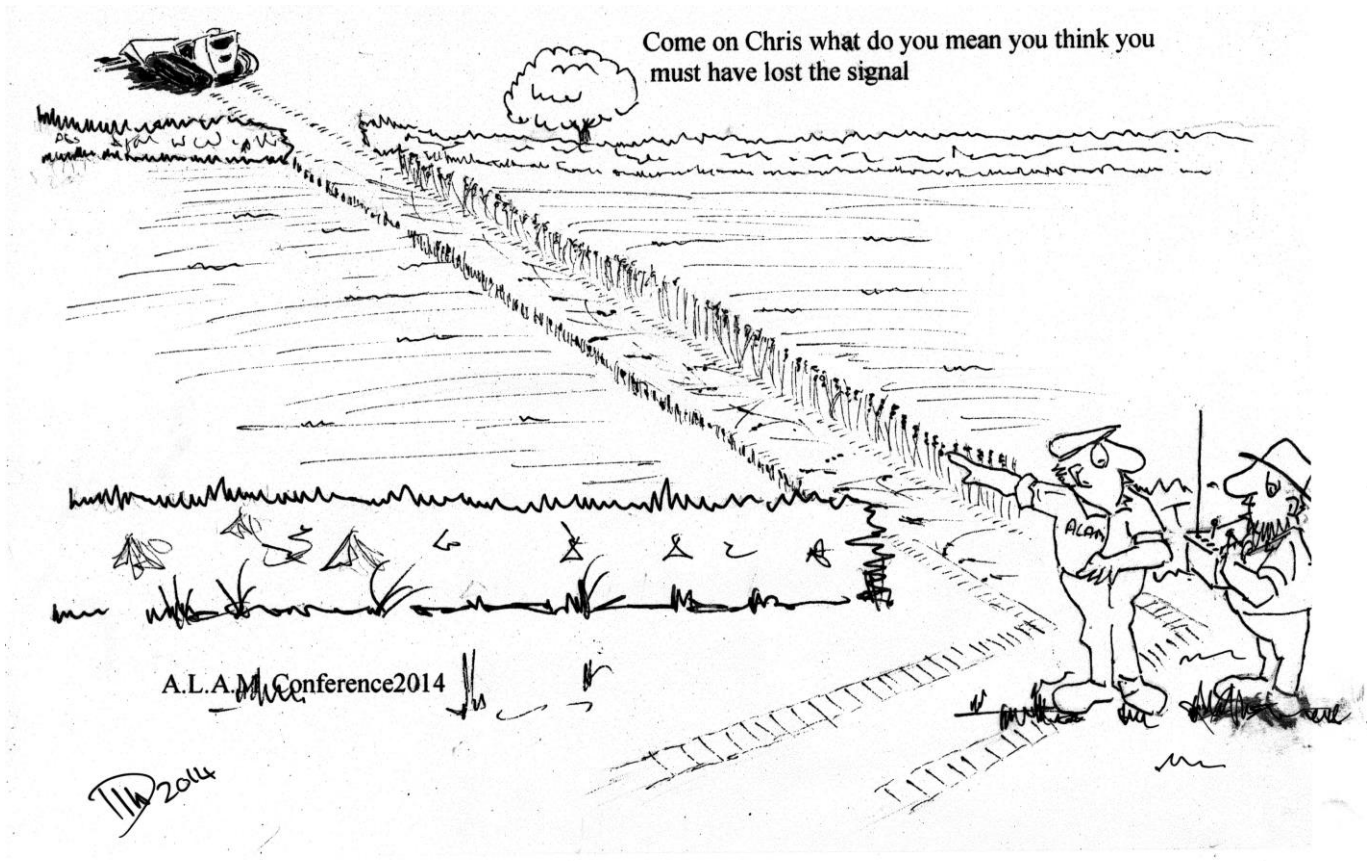
This epic trip was undertaken in 1954, when every border crossing needed a Visa, there were no mobile phones (and few landlines), different currencies in every country, and no roll-on roll-off ferries.

The text is transcribed direct from Ernest's own notes, which makes the read more compelling.

Copies are available for £7 from:
Ian Whitehead
Springfields
Court Mill Lane
Wadeford
Chard
Somerset
TA20 3AX

Alternatively, ask your local book shop for ISBN 978-1-904-686-23-1

Hartpury 2014 – The Driverless McConnell Remote Control Flail Mower



INDUSTRY ONE DAY EVENT

LE-TEC Trailblazer Apprenticeships

Summary of information released at the Pershore College meeting on 10th July 2018.

Speakers included David Kirschner, LE-TEC Apprenticeship Specialist, Glen Nash, Service Manager Turney Group, Darren Layton, Warwickshire College, Sally Green, Development Manager City & Guilds & Steve Walker from Ofqual.

Others present included Ruth Bailey from the AEA, Keith Christian BAGMA and Alastair Taylor & Chris Biddle from the I Agr E.

LE- TEC Ltd The Landbased Training and Education Committee (LE-TEC Ltd), a Private Company Limited by Guarantee, is sponsored by three main industry bodies: The Agricultural Engineers Association (AEA), British Agriculture and Garden Machinery Association (BAGMA) and the Institution of Agricultural Engineers (IAgrE). Its aims are to promote training and education for people working with farm and horticultural machinery and associated areas. LANTRA 's role in this arrangement is at present is unclear.

These notes were taken at the meeting and will hopefully convey some of the information which was presented during the day.

There are approximately 30,000 people in the Agricultural Engineering workforce.

There is a need to promote industry recruitment.

There is a serious shortage of industrially competent people coming forward to apply for teaching jobs.

The Institute For Apprenticeships was formed in the spring of 2017 and now has the following functions:

- developing and maintaining quality criteria for the approval of apprenticeship standards and assessment plans
- supporting the development of standards and assessment plans by employer groups
- publishing approved standards and assessment plans
- advising on the maximum amount of government funding that can be drawn down by employers for individual apprenticeship standards
- quality assuring the delivery of apprenticeship end-point assessments
- ensuring that all end-point assessments are quality assured

They are a crown, non-departmental public body of approximately 80 staff based in London and Coventry, sponsored by the Department for Education.

Trailblazer Apprenticeships are available to anyone in the workforce, the 16 to 19 year olds are the age group which would be anticipated to predominate. All schools have to open their sites to Training Providers to allow them access to pupils to enable career training options to be presented.

To improve recruitment a number of other initiatives were mentioned, Tractors taken into schools to give a better understanding of their purpose and the technology used. Promote Open Farm Sundays in your area. Social media. Agritech – a scheme to bring teachers into colleges to raise awareness of the breadth of skills which are delivered / taught. Harper Adams 2018 /2019 Big Bang days.

- Level 2 Service Engineering 18 - 24 Months Guide Times
- Level 3 "Technician" Apprentice 36 – 48 months Guide Times

Minimum requirement of 20% of off the job training. There is the facility to add particular subject matter to the qualifications at both levels to meet individual employer needs as required.

Only assess the trainee when they are ready.

College cost for Registration approx. £180.00

We are delivering a qualification in the Apprenticeship.

Funding. The contract is between the Employer and the Training Provider.

Assessment is carried out by outside independent organisations, eg. City & Guilds & IMI who have both applied for approval to become Assessment providers and if approved will be looking for suitably qualified assessors.

During their apprenticeship the trainee needs to keep a Log of Progression which is their record of the process.

The qualification standards have to be approved by the Institute for Apprenticeships and the quality link is maintained by Ofqual.

Funding for the Level 2 qualification is £18,000 and the Level 3 is £23,000, of which 80% is paid over the duration of the training and 20% on successful completion.

The old apprenticeship qualification framework will be discontinued in 2020 / 21.

The Employer / Dealer needs to undertake an entry point interview and assessment of any potential apprentice trainee. The assessment has a 65% pass level which the trainee must achieve before they can be accepted for the apprenticeship. Only 3 attempts are permitted for this assessment to this apprenticeship. The fee for each assessment attempt is £25.00. It is unclear if this assessment has yet been written.

End point assessment at both levels of the Apprenticeship involves theory questions which have to be undertaken and externally marked before the candidate is able to go forward to complete the practical tasks overseen by an external assessor. Level 3 candidates also have to deliver a presentation and are interviewed by the External Assessor. The candidate only has one attempt at successfully achieving this end point assessment. There may be the possibility to re-sit individual units but this is still to be clarified.

Further information is available by following the links below:-

- https://iagre.org/kcfinder/upload/files/documents/David%20Kirschner%20Presentation.pdf
- https://www.instituteforapprenticeships.org/apprenticeship-standards/land-based-service-engineer/
- https://www.instituteforapprenticeships.org/apprenticeship-standards/land-based-service-engineering-technician/

We will continue to monitor and report on the rollout of this new qualification through ALAM

(I have tried to accurately represent the material which was delivered at the meeting but there may be inaccuracies in this report so would advise on double checking the facts with the appropriate organisation before making any critical decisions.)

John Gough
July 2019

ANNUAL CONFERENCE 2019

City & Guilds NPTC Update

An Update from City & Guilds on Land Based Engineering Qualifications, July 2019

This section of the programme was presented by Mr John Wray who is a Technical Advisor for Land and covers the northern area of the country and Ireland advising centres delivering the C&G NPTC qualifications. John explained that prior to joining C&G he is from an agricultural background and has worked at a college in Northern England in various roles so has a full understanding of the pressures and difficulties currently experienced in the Further Education sector.

He then went on to explain the C&G office at Stareton was closing and two new bases were being established at Burntwood, Staffordshire and Wakefield, West Yorkshire where it is business as usual for the City & Guilds NPTC suite of qualifications.

NPTC. From 1st September 2019 updated versions of the following Level 2 Certificates will be available (this release has been put back a couple of months, but centres still obviously have access to the current qualifications, Principal Verifers will be able to discuss more in detail if this is required):-

Tractor Driving and related Operations.

Safe use of All Terrain Vehicles.

Fork Lift Truck Operations, which has an additional optional unit for bulk handling which can be included at the discretion of the centre for a small additional fee.

Safe use of Hand Held Hedge Cutters.

Safe use of Mowers.

Safe use of Tractor Mounted Hedge and Verge Cutters.

There is a new number to contact the Quality & Support team - 0300 303 5352 option 2 for Land and the email address is - qasupport@cityandguilds.com

Results/certificates will be processed from our Wakefield/Burntwood Offices by the LBS Customer Services team – email address - information@cityandguilds.com

Chain Saw qualifications are unaltered.

Pesticides, These are due for review and update, PA1 is updated annually.

Given the current focus on the environment and Integrated Pest Management (IPM) this qualification would give recognition of professional pesticide management, the 021663 - City & Guilds Level 3 Award in Responsible Pesticide Management for supervisors of pesticide operatives

https://www.nptc.org.uk/qualificationschemedetail.aspx?id=529

Current students may be able to obtain reduced rates for NPTC assessments , this offer is at the discretion of individual centres.

Integrated and Independent assessment

All legislative qualifications will continue to be independently assessed to ensure the appropriate rigour is maintained within the qualification.

City & Guilds NPTC have also responded to requests for non-independent assessment within non legislative qualifications. Where this is possible the guidance will be that assessment will not take place until all the teaching is complete i.e. it will be a separate process the assessor will undertake at the end of the training.

The new wording for the non-independent assessment methodology is as follows:

Practical assessment with oral questioning by a City & Guilds NPTC approved assessor. The assessor can be the same individual who carried out the training or could be a different person. The assessor must be approved and registered with City & Guilds NPTC.

The assessment must be a stand-alone process that is separate to the training and cannot be spread out across the length of the training course i.e. the assessment is conducted at the end of the training course or on a separate day.

If centres wish to develop or have their own self developed qualifications our Assured service can help with;

- Recognition of world-class training
- Gain Assured status for your in-house training to set yourself apart from the competition
- https://www.cityandguilds.com/what-we-offer/centres/assured

Paul Aldridge – Lead Principal Verifier for Pesticides, Machinery and Livestock has said he is more than willing to speak to delegates either by email or phone - paulgaldridge@btinternet.com or 07974 087565 to discuss qualifications in detail – anytime!

Full Time Landbased Engineering. – Technical's

The Technical's sit under the Agriculture tab – 0171

- Level 2 Technical Certificate in Land-Based Engineering 0171-28 is a 1yr 360 GLH qualification 10 Units
- • Level 3 Advanced Technical Extended Diploma in Land-Based Engineering 0171-38 is a 2yr 1080 GLH qual 19 Units and 6 assignments
- To note on the L3 there are no 360, 540 or 720 options for this qualification – some centres do not like that model
- Employer involvement is key to the technical's whatever the discipline

A possible alternative to 0171-38?

Some centres want to do Land engineering but due to several reasons – staffing expertise, resource implications, learner/employer requirements may find the L3 Land-based engineering not exactly what they require.

Some centres have opted to offer the 0171 – 33 Level 3 Advanced Technical Extended Diploma in Agriculture (1080) (Farm Mechanisation) option (this gives agriculture learners a good understanding of both crop and animal husbandry alongside a very useful insight into a range of engineering topic areas) so although probably not equipping learners for a life as an engineer in an engineering dealership, it should create good hands on learners in a farm workshop/crop,livestock arena and reduce the resource burden on stretched departments.

Level 1 – 0361 – 12, 13, 14.

- Although not an engineering qualification, City & Guilds have re written the 0361 qual with multiple pathways inc a general land based studies route and an agriculture route.
- With appropriate unit selection that would provide a feeder qualification for the L2 Technical in Land based engineering – if that is what centres require.

Land Based Service Engineering Apprenticeships

- You are probably aware that framework funding in England only is planned to be switched off, if an appropriate standard has been developed on 31st July 2020.
- You might also be aware that the decision has been made by City & Guilds that we will not be End Point Assessment Organisation for either the L2 LBSE or the L3LBSE Technician standards.
- However there is nothing to stop centres using the Work-based Land-based Service Engineering (0059) qualification for the underpinning knowledge and also as a secondary qualification.

John Gough
July 2019

ANNUAL CONFERENCE 2019

Trailblazer Apprenticeships

An Update from the Institute Of Motor Industry, July 2019

Following the opening of the conference we welcomed Mr Chris Cotterill from the IMI who outlined the operation of the Landbased Engineering level 2 & 3 qualifications used in the IMI Trailblazer Apprenticeship. He mentioned that some students on the John Deere Training scheme had already been through the End Point Assessment process on the IMI programme.

The old Apprenticeship framework will be withdrawn on 31st July 2020

The Trailblazer apprenticeships scheme is partly funded by an industry levy of 0.5% which is paid by employers who have more than 50 employees and a £3million turnover, these companies will get 95% Government funding for each apprentice which they train. Businesses with fewer employees who have apprentices will have each funded at 100% by Government.

The qualification / programme has 2 levels for the apprentice training but it is unlikely that funding would be available to enable progression from level 2 to take place. However, the level 3 programme incorporates all the subject matter contained in the level 2 and enables the level 3 diagnostic material to also be completed and funded. It is therefore important to assess the potential capabilities and ambition of each prospective apprentice before they enter a programme.

The level 2 programme is funded at £18,000 and is expected to be completed in 18 to 24 months.

The level 3 programme is funded at £21,000 and should be completed in 36 to 48 months.

The process is led by the employer who will need to identify a person in his workforce who will act as a mentor to the apprentice. The mentor will guide and judge the progress of the apprentice and decide when they are ready to be entered for the End Point Assessment process. The training provider will work with the employer and provide the off the job training. The Training Organisation will schedule and run the End Point Assessment which will take place at the training provider premises. Interim optional assessments are recommended at intervals during the training to monitor progress and give all parties the necessary information to decide if the candidate is ready to continue to the next stage.

The apprentice will keep a log of what they have done and this is monitored and signed by their mentor. They will also have achieved Maths and English at level 1 or 2 depending upon which Level of the apprenticeship they are on. At the point when the apprentice is judged by both the mentor and the training provider to have satisfactorily completed the training then the E.P.A. process can be triggered. This takes 90 days to organise and usually takes place during the last block of training. There are 3 stages, the first being an invigilated, 90 minute, closed book, computer based test of questions which have to result in 65% pass level before proceeding to the next stage – result received on the day for level 2 and within 14 days for level 3. Stage 2 comprises of 3 practical tasks each of 1hr 45min duration run over a 6 hour period. The 3rd stage is a 60 minute professional interview and may include a 15 minute presentation. The candidate is given one week notice of the subject area he will discuss with the Assessor. There will be a maximum period of 21days for the candidate to receive the result of the assessments. This is important as the any re-scheduling for resits uses up the valuable limited time remaining before the funding ceases.

The results for each section of the E.P.A. will be graded as Pass 65 -75%, Merit 75 -85%, and above 85% Distinction. The fee for the first E.P.A.is covered by the government funding but retakes are paid for by the employer. It was stated that the approximate cost of the E.P.A. was between £1,200 and £1,800. For the Level 2 E.P.A. the 90 minute, closed book questions will be 45 multiple choice, and for Level 3 E.P.A. will comprise of 6 multiple choice, 12 short answer and 12 structured answer questions .

John Gough
July 2019

ALAM ONE DAY EVENT

Bomford Turner Ltd

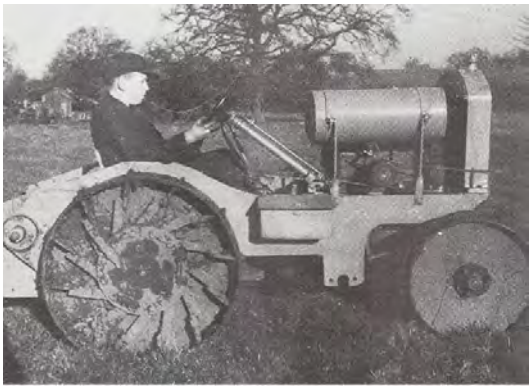
October 2014

Our hosts were Chris Tucker (Marketing Manager), Mike Blackbrough (Chief Engineer) and Trevor Long (Chief Design Engineer).

Chris Tucker welcomed delegates and gave an over view of the company and its products. Bomford is part of the Alamo Group which comprises of 12 sister companies including Bush Hog, Faucheux, Mc Connell, Spearhead and Twose.

A bit of History

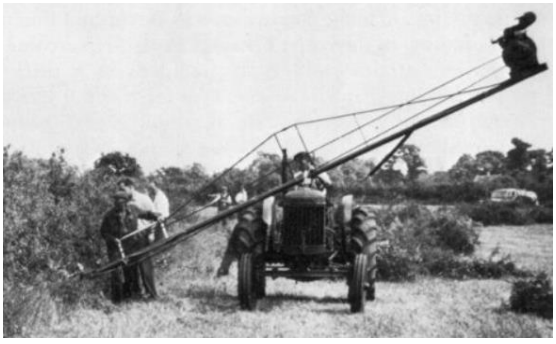
The end of the Napoleonic wars saw a boom in among other things, road building in England, the Bomford family who had farmed in Worcestershire for generations diversified into contracting which lead them to develop steam driven machines including road scarifiers.



The Midget Tractor.

Fitted with a Morris Cowley engine, could be specified with either spiked steel or pneumatic wheels.

The Bomford company was registered in 1904, this lead to the development of a variety of cultivation machines that could be used in conjunction with steam powered agricultural vehicles. In the late 40's Bomford developed the first balance arm hedge cutter.



The first balance arm hedge cutter.

Currently Bomford design, manufacture and distribute over 100 different model options to all corners of the world, supplying markets in Hedge and Verge mowing, Stewardship management and cultivation, there are 200 employees, 60% of output is for the export market built on the ‘batch building’ principle, France is the largest importer of Bomford products.

We were given a thorough familiarisation and application of the Bomford range of machines which included Arm and flail mowers, mower heads, toppers, animal bedding and feeding equipment, sweepers, cultivation, forestry mulchers and stump augers. This was followed by a tour of component manufacturing, assembly, testing and parts facilities. The new powder coating painting facilities and huge assembly hall were impressive recant additions, the lazer cutting and dynamic balancing stations are also impressive.

Precision cutting

Dynamic balancing

Assembly hall

Machine testing

After lunch Trevor Long Chief Design Engineer gave us an inspiring talk on the considerations from machine concept to manufacturing, this was split into several topics: -

Landscape of the industry

- Industry undergoing a lot of change.
- Economic demands increasing.
- Efficiency demands increasing.
- Environmental demands increasing.
- Legislation demands increasing.
- Functional demands increasing.
- As machines become more sophisticated operators technical knowledge and ability is not matching the technological developments.

Developments

- Industry trends.
- Sensitivity to running costs and environmental considerations.
- Greater machine capability and expectations.
- Less operator care.
- Larger more powerful tractors with less ‘operator feel’ of attached machine.
- Reluctance of operator to get off tractor.
- More mounting formats.

Trends and Issues

- Structural fatigue.
- Tractor pull down on start up.
- Diversity of hydraulic flow rates.
- Higher hydraulic response speeds.
- Machine stability.
- Gravitationally induced hydraulic cavitation.
- Flow throttling at valves.
- Operator demand and structural overload.
- Necessity to incorporate machine protection systems/devices.

We had a lively discussion with Mike Blackbrough, chief engineer, on system testing and acceptable efficiencies of systems and components the main points were: -

- 3:1 PTO to pump – pump 1600 rpm.
- PRV 210 bar now rising to 310 bar on current machines.
- Pump no load flow 200-300 L/min.
- Pilot operated system runs at a higher temperature than open centre systems.
- Piston pumps 90% efficient – 10% deficiency.
- Gear pumps 85% efficient – 15% deficiency.
- Need to have 75% of pump efficiency for machine operation to manufacturer’s specification.
- Hydraulic motor leakage 10% of pump no load flow.
- Test on pressure lines – not return, will ‘blow’ motor seals.

Due to an increase of min till and a change in cultivation practices the Dyna Drive has been further developed and re launched.

Dyna Drive S.

Ian Coleman

ALAM ONE-DAY EVENT

Morgan Cars - The Fusion of Classic and Cutting Edge.

Visit by ALAM members to Morgan Cars, Malvern, February 2016

Arrival, 0830 Refreshments were served in the Café area while the group assembled.

0840 Mr Richard Gilbert, Business Trade Manager for Halfords, was invited to give a short presentation and explained that the company is keen to build links with engineering students and trainees by offering them preferential terms on tools and workshop equipment.

0850 The group moved to the presentation and briefing area to be greeted and addressed by John Wright, our guide, who told us a little about the history of the company and explained the necessary health and safety instructions relating to our tour of the works. The company is family owned and Mr H Morgan, who has recently retired, is the third generation to have run the company.

In the early 1900's Harry Morgan started the company following an engineering apprenticeship with Great Western Railways. In 1909 the first car was produced, a three-wheeled vehicle powered by a single cylinder motorcycle engine. Harrods of London were appointed the first distributor, and the shop displayed the vehicle in its shop window!

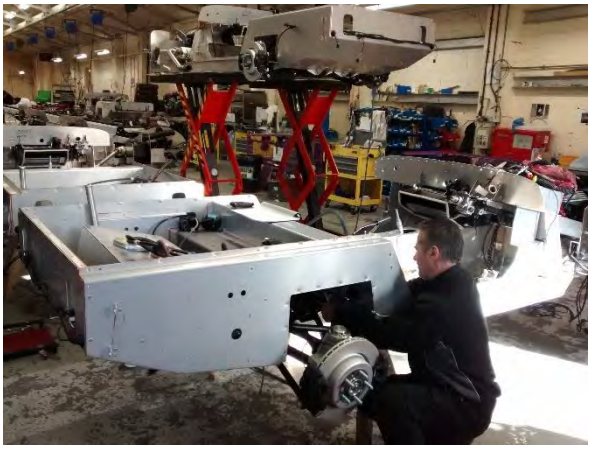
Our factory tour started at the top of the site which is situated on a slope, in the building where we found a collection of historically important cars. The building dates from 1914 and houses an assembly area with offices situated along one wall; however, the cars stimulated much more interest within the group! The cars included a silver Aero Special Commission fixed-head coupe with extended rear platform and two quarter rear-windows fitted in the sweeping tail, a blue competition Classic fitted with a Rover V8 engine, another fixed-head Aero in metallic blue, two Competition Aeros, one privately owned in red and silver and the other a black and silver works entered Le Mans 24-hour race car, and, at the end of the row, a red 1963 fibreglass bodied Morgan SLR Plus 4 Plus, one of only 28 made.

We then went down into the current production area where we were shown the three types of chassis which are used; first was the black ladder frame with front wishbone suspension with live rear axle and rear leaf springs, used for the road-going Classics; second was the red ladder chassis, denoting the competition models with front wishbones and live L.S.D. rear axle located on "Autolink" linkages with a coil spring over shock absorber assembly on each side. The third type of chassis was a bonded and riveted aluminium alloy sheet monocoque construction used for the Aero models and the V6 engined Classic. On entry to the line each chassis is accompanied by a build spec sheet and a stillage containing the correct parts for the car.

Engines, gearboxes, rear axles and wheels are fed in as the chassis is transformed over a period of about five days into a full rolling chassis. Each chassis is placed on two wooden trestles and is individually built by one member of staff who signs off the work on the spec sheet on

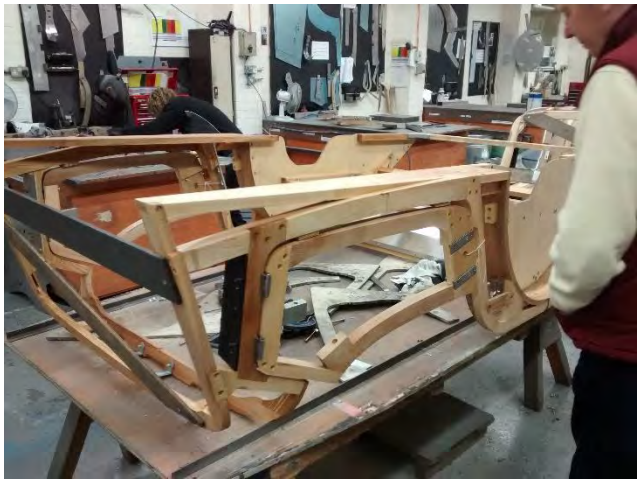
completion. In this primary build area there were the chassis of about 12 cars in various stages of assembly. Current engine options for these cars were Ford Sigma 1600cc 115bhp, Ford D I Duratec 2.0L 150bhp, both fitted with 5-speed Mazda manual gearboxes, Ford roadster(Mustang) 3.7L V6 285bhp with 6-speed Ford manual gearbox and BMW 4.8L V8 370bhp with a 6-speed manual or a 6-speed ZF automatic transmission.

When completed the rolling chassis goes down a ramp into the next area where the wooden frame and body panels are built on.



The body and sheet-metal shop incorporates a press-brake with a 2.0 metre bed, a number of fly presses, a welding bay with MIG and TIG equipment and steel tables on which the sheet metal panels are trimmed, shaped and formed, we watched a wired edge being formed on a bonnet hood while other staff were welding, setting up the press and fitting panel work to cars. The fly presses are used to form the 8 bonnet louvers on each half one at a time, a task requiring two people, one to hold the panel in line while the other checks accurate positioning and operates the press handle. This operation is then repeated for the second half of the bonnet.

A variety of completed panels were stored against one wall suggesting that items were made in batches. A large stock of templates for the different models are used for marking out, some parts are fitted to the individual car for final marking before final trimming takes place, bonnet to bulkhead were an example given. Some body panels such as the front wings for the Aero model are made by a company called Superform in Worcester, they use a procedure which involves heating the metal to a plastic state 450°C evacuating the air under the panel and forming it into shape over a former (buck) the shape of the inside of the wing. The gradual increase of air pressure on the outside of the panel up to 2000psi helps to push the sheet down into the fully developed panel shape without rupturing the material. Morgan also holds templates for older models so that panels can be produced as required for repair or restoration work.



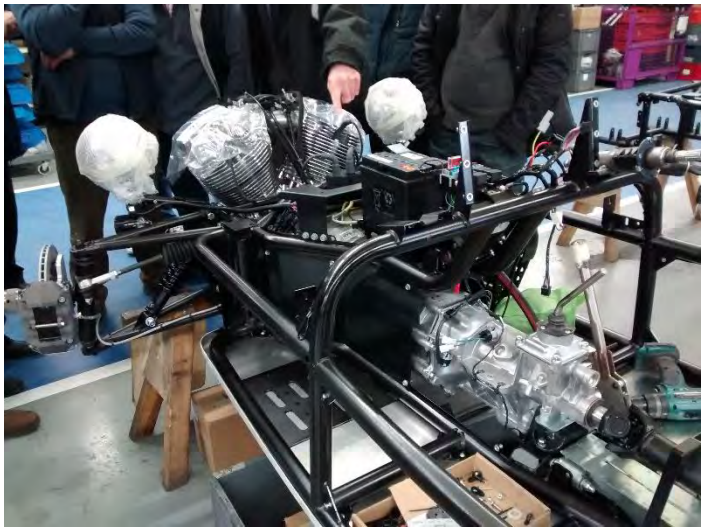
We then moved down to the woodwork and timber-frame shop; the company holds a two-year stock of English ash timber which is supplied from Lincolnshire and Suffolk. A scheme is in place to plant ash saplings in the areas from which the timber is drawn in an attempt to replenish the stock over the longer term. Templates were again used in the marking out process, we witnessed door frames being built, rear wingframes being laminated and assembled onto the cabin and boot framework for the Classics.

The veneered dash is produced in three different woods and has a high-gloss finish. Some of the frame glueing is carried out in a vacuum which has the effect of clamping the surfaces together. When completed the cabin and bootframe assembly is fitted to the chassis and the panels are added. Once this has been done the car is moved across the works road to the paint shop where the metal panels are removed, before painting with water-based high build etch primer and colour coats with final gloss lacquer. There is a choice of 9 solid colours and a specialist metallic range as optional extras. Basic models are finished with a solid colour matt finish which the customer presumably then has finished to their own taste!

Following the painting, the vehicle moves down to the upholstery, trim and final assembly before

being run up and road tested. Seats and interior trim are upholstered in black or tan leather as standard using up to four hides, with other colours as options, and a water-proof leather which is supplied from Germany. Lighting and panel reassembly is then undertaken to complete the build process. Following the road test the vehicle goes into the new dealer / customer PDI area equipped with a number of vehicle lifts and well-lit bays for the final inspection before dispatch or customer collection.

Back across the yard, we then visited the Three-Wheeler production area, re-established in 2011 and trading as a separate company. The machine is made up of a tubular space frame with a V-twin 90bhp air-cooled S & S American motorcycle engine mounted at the front.



Drive from its crankshaft goes through a vibration damper and alternator assembly, clutch and Mazda MX 5 gearbox. The propshaft takes the drive to a rear bevel box with final drive to the rear wheel through a toothed belt; the rear wheel being mounted much like a motorbike in a swinging-arm and monoshock sprung damper assembly. The machine weighs 575kg, has a 0 to 60 mph time of 6.5 sec. and a max speed of 115mph. Price £32,500.00. Looks like fun (and can be hired for the day from the company). Beyond the production area, there is a machine shop and sub-assembly facility which builds pedal boxes, suspension wishbones, disc & hub units for the different models and machines and a range of items for production.

The company's period of maximum production was in the 1920's and 30's when they were making 2500 vehicles per year; with the four-wheeled car being introduced in 1935. Production is currently running at about 900 cars per year with the Plus 4 model being the most popular. Three-wheeler output is increasing year by year.

To complete our tour, we were taken back to our starting point via the Company museum, where we were able to spend some time viewing a wide range of materials, machines and information about the evolution of the company to its present day.

Our guide John Wright, Angela on Reception and Anne from Catering were all thanked for their part in making our visit enjoyable and interesting.

Suppliers to Morgan:

- HydraTorque LSD supplied by BRC
- Bonded Aluminium alloy chassis supplied by Radshape Aston Birmingham
- Superform Worcester for aero wings and other body parts

J.Gough
February 2016

ANNUAL CONFERENCE 2019

Storth Slurry Systems

Visit by ALAM members to Storth, July 2019

A very hot day, but fortunately 21st century students need cooling and Hartpury's minibus had air conditioning that was very welcome!

We were welcomed by Julian Lopez, Allan Johnson and John Hird. After signing in and safety gear distributed we went to the lecture theatre.

John attended Rycotewood College in the early 70s so many of us reminisced with him although some deprived members had only 'seen' Rycotewood!

The two founders of Storth Ltd, a well-recognised slurry management company, are Chris Richardson and Alan Looker both of which had no choice but to set up a new business in 1999 to enable them to continue working in this industry as their previous employer Malgar went into administration.

Alan had worked with Malgar for 25 years gaining a wealth of knowledge & experience, ranging from fabrication, installation, parts and service and becoming a Departmental Manager. Chris who was with Malgar for 11 years worked on the installation & service sector. Both of them had gained great experience in the farming industry and the installation and servicing of equipment.

Having bought their first van for Chris to commence servicing the equipment, Alan started fabricating parts for the automatic scraper systems in a small shed in Alan's dad's back yard. Soon it was apparent that the service side needed more help and within the first six months they employed an experienced work colleague who again also had 20 years' experience in the installation and service side of scraper systems. They then had two service vans to keep customers happy as service is a key factor with automatic scrapers. Soon, customers were asking if they could make a full hydraulic scraper system as they had all the knowledge of what a system needs to be on the farm and what the farmer wanted. Alan started to design the full hydraulic scraper system in the small workshop and it was installed locally, modified and developed to provide the system Storth sells today.

Feedback from farmers are an important factor in developing existing and new products as this helps to continually improve products and services. Research & development of the scraper sector continued and automatic scrapers, pro rope scrapers and chain scraper systems were added to the range.

Chris soon identified their scraper system was unique to the market place as they had developed a scraper system with no ram box which none of their competitors had at that time. Chris then travelled all over the UK promoting the unique scraper system and developing business relationships and increasing the customer base. Demand was fantastic and additional personnel were employed for the workshop. After two years, Storth had a request to manufacture a Lagoon Mixer which proved a great success as they built it much stronger than available at the time in the market.

In 2003 both products were taken to the Royal Show and the Royal Welsh Show. The outcome was extremely positive and had a great response to British manufactured products. In 2004 they purchased some land and built a new 75ft x 40ft workshop. This allowed more space to match the demand from the farming sector for additional products to assist with slurry management. The development of pump products increased interest greatly. Alan had designed a pump which was well received and demand grew from strength to strength. Expansion of the workshop was required as space was running out. An extension was built to the workshop, doubling its size to 150ft x 40ft, and the staff numbers also increased to 12 by 2005.

The company was moving forward and this was a result of Chris and Alan's hard work: 7 days a week and 14-hour days became a regular occurrence. The company continued developing and improving products which we see today, with over 20 products on the market there is now three workshops and a staff of 48 FTE. We also attend over 25 shows/exhibitions per year in the UK and abroad. Our sales team has grown from just Chris to an additional six personnel providing global coverage, all having experience & knowledge of the farming industry, enabling them to provide excellent support and advice to the farmers, network of dealers and AD plant managers regarding waste management solutions.

Over the last three years, Storth commenced exporting their quality products to various countries including New Zealand & Canada and latterly China. Sales Director Chris Richardson sees great

potential in the export market without losing focus on the UK market as this is the largest and most important market place for Storth. The company would not be here without the support of UK farmers and without their loyalty to British manufacturers stories like ours would disappear.

A long discussion dealt with CE marking and the looming Brexit.

Storth hire a directive specialist who deals with the day to day intricacies to enable a Declaration of Conformity which will still be needed even if the UK leaves the EU.

We were shown the power of the megamix dealing with very thick crusts that had formed on neglected storage facilities .

We then toured the works, the cut metal comes from another site nearby and is welded into the main constituent parts that are then sent to Manchester to be galvanised. On their return they are delivered to the assembly shop where they are finished and then just across the yard is a small tower containing water where the pumps are tested.

Many of the machines are tailor made for their application. One megamix was so large it had to be trailed, weighing 2 tonnes and needing at least 180hp tractor to drive it!

Storth are looking ahead and trying to diversify from agriculture. We saw an example of a reel setup made for a water authority to bypass repair works on large mains. Other possibilities included fire fighting equipment.

Overall a tremendous success story, very well organised, delivering well paid jobs in an area where they are much needed, a family atmosphere resulting in a low staff turnover. A company where ‘thinking out of the box’ is a prerequisite.

Much more detail can be found on their website.

Jonty Rostron, who in an earlier existence had handled slurry in its early days gave the vote of thanks.

Jonty Rostron
August 2019

ALAM ONE-DAY EVENT

Cameron Engineering - Practical Manufacturing and Restoration

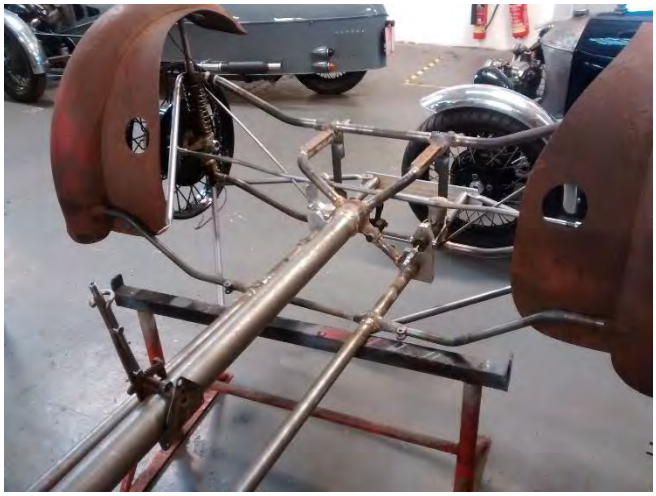
Visit by ALAM members to Cameron Engineering, Malvern, March 2016

After a short drive to an adjacent industrial estate in Malvern we arrived at Cameron Engineering, tucked away at the edge of the site. We were greeted by Tracy who ushered us into a room containing three interesting motorcycles from before the age of ECU's. Once we had all squeezed in we were joined by Ewan Cameron, the proprietor, who started by telling us a little of the history of the J.A.P. engine company and his part in the continuation of the mark.

J. A. Prestwich started manufacturing engines in 1902 at Tottenham in London; the engines were initially for motorbikes but he quickly found many other applications for them. Brough became one of his customers using the vee-twin in the Superior model and another was Morgan, which used the JAP engine in the three-wheelers which they made. JAP engines were exported to many other countries throughout the world, including Germany which severed their ties with the make shortly before the Second World War. JAP engines were successfully used for many years in motorcycle competition such as drag racing, scrambling, trials and speedway up until the 1960s. The company was floated on the stock market some time after the Second World War and in 1957 it was taken over by the Villiers company from Birmingham. The first motorcycle we were shown a 1960's road race Manx Norton with a vee-twin JAP engine neatly fitted into the Featherbed frame, a very smart and businesslike machine. Against the back wall of the room was a Hagon - framed drag bike with a JAP engine, next was a Brough Superior with a vee - twin Matchless engine which was an alternative to the JAP. Brough only made around 800 machines in total during their time in business.

After this brief introduction and without further ado we were led into the workshops which revealed a 1926TT Bentley which had returned from the Peking-to-Paris rally and was in for a "service"! Next was a grey three wheeler Morgan which had had the body modified, to make a compartment behind the driver for the dog to come along for the ride. A 1960s Ford Mk1 Lotus Cortina in the traditional white and green livery was also there being prepared for the coming competition season, the engine having been rebuilt and refitted, with a 4-week deadline looming! Next was a 1930s competition Morgan three wheeler in green with a vee-twin JAP engine owned by a Swiss customer, again being prepared for the coming season. This machine is said to have lapped Mallory Park as fast as a Sierra Cosworth! Opposite this machine, laid out on a bench, was a tubular frame, recognisable as a "chassis" for a Morgan three wheeler.

Apparently Cameron Engineering has produced a number of these in the process of restoring old models as they become available. The main part of the chassis is at the front, where the engine and front suspension are fitted; going down to the back there is a central torque tube of about 2.5 inches diameter which carries the drive shaft to a small gearbox to drive the rear wheel.



Moving on round this area we came to a green Jaguar D type, owned by Mr Norman Dewis, who was a development engineer for Jaguar at the time that this car was built. It has an aluminium monocoque body, an innovation at that time; the company then built a fibreglass body for the car and tested it, found it wanting in some respects and reverted to the original material. Apparently, Mr Dewis has had the wisdom to have also retained the fibreglass body!

We then moved into the machine-shop section which contained a number of CNC lathes and milling machines, all busily working away. The company does undertake some outside work but predominantly it machines parts for engines and projects on which it is working. Using the JAP engine design, it has developed and produced a number of the vee-twin engines with parts machined from the correct specification and grade of raw material. Connecting rods, crank pins, flywheels, crankcase halves, cylinder barrels and cylinder heads are all made here. We were shown a machined finned cylinder barrel; on the floor below were a number of cylindrical billets of metal from which such items were made. We asked why they didn't get these items cast. It was explained that standard casting produces coarse-grained cast iron which, when machined, can expose faults in the material resulting in rejected parts. The billets used are pressure poured, a process which puts the molten metal under pressure when it is transferred into the mould, resulting in finer grain-structure and improved consistent quality. The difference in cost is also significant, £25 for the billet, nearly £100 for the casting. Connecting rods are machined from 80 ton / sq in. tensile steel billet and then polished producing a strong and well finished item. Two connecting rods are fitted onto the single crankpin, roller bearings are packed into the space between the journal and the rods and then the flywheels are pressed together. The crankpin has a 4 thousandths of an inch interference fit in the flywheels. Then the assembly is suspended on an alignment frame or v blocks and checked using a dial gauge on each flywheel centre shaft: If found to be out, one flywheel is shocked loaded (knocked) to move it slightly in the appropriate direction until there is no run out. Following alignment, the balancing has to be carried out, something of a dark art in itself!

At the top end of the benches was an Aston Martin OHC cylinder head whose original cam follower arms had failed where the arm bears on the valve stem. A new cam-follower arm had been machined out of aluminium in three stages and its operating face had been re-profiled to overcome the problem. This was then fitted to the head and checked to ensure that it would work before the parts were machined out of the correct material heat treated and fitted, another job in progress!

While talking about materials, we were asked if anyone knew the origin of the code "E.N." relating to steel grades, puzzled expressions all round! Ewan explained that they were introduced during the Second World War to simplify things and the initials stood for Emergency Number!

We then retraced our steps into the car section and out of the roller shutter door to the yard at the back, passing a vee-twin engine mounted on a testbed stand. Someone in the group had asked if we could see and hear it running…….we were offered ear plugs but many were secretly looking forward to the "pure" experience, I suspect. With a bit of encouragement from an ingeniously mounted mains electric motor and v belts, the beast growled into life followed a few seconds later by the waft of Castrol R in the air. The engine burbled on for a couple of minutes, giving us time to feel how smoothly it ran by touching the rocker covers or crank cases. Then peace returned to this leafy corner of Malvern!

And then it was time to thank our hosts, Ewan and Tracy, (and their 11 employees) for restoring our enthusiasm and faith in British Engineering, which was certainly fit and well in this corner of Malvern!

John Gough & Ian Coleman
February 2016

ANNUAL CONFERENCE 2015

Claas Headquarters

Visit by ALAM members to Claas Headqurters, Harswinkel, April 2015

On Thursday 7th April 2015 we left our accommodation at 08.00am to travel to the Claas factory at Harswinkel.

On arrival, we were taken to their lecture theatre hosted by Corinna Kotula (Customer Care Corporate Marketing) and Willi Schulz (Guide).

Willi started our morning with a presentation firstly welcoming us to their headquarters and the factory which produces combines, forage harvesters and Zerions.

Willi (81) explained that he started with Claas in 1948 as an apprentice and although he did leave for a while to include a period of study in 1967 before returning, has worked for the company for over 50 years.

Willi continued with an overview of the history of the site. A company was founded here in 1913 and started to produce a" stroh binder" (straw binder). In 1919 Claas bought that factory which covered an area of 2000m2 and continued to produce binders. The site has since expanded to an area of 40 hectares. The patenting of their knotter was very successful and allowed them to make a lot of money, with an image of the knotter still being used today in Claas's marketing.

- In 1930 Claas produced their first combine which was based around a Lanz bulldog tractor.
- In 1936 they introduced the legendary Claas MDB trailed machine producing 6 tonnes per day.
- 1953 saw the production of the first self-propelled machine, a Claas Hercules (bagger).
- In 1966 the production of the Senator (tanker) combine started – this coincided with a new colour , seed green also being introduced.
- In 1969 Claas acquired another factory in Bad Salgau to manufacture forage harvesters.
- In 1970 (i) the Dominator combine was launched and (ii) the company bought a patent for a chopper and then produced their first self-propelled forage harvester.

As a company, Claas did not have a tractor range although they did work closely with Valmet.

In 2003 Claas bought the Renault tractor factory at Le Mans (France) and started to produce their own tractor range.

With the expansion of harvesting machinery in both Chinese and Indian markets; in 2003 Claas Agrosystems became Claas-E systems. GPS Systems continued to advance at a pace and they now have systems to work with every manufacturer in the industry. In 2008 they built a factory in the Punjab (India) to produce the TIGER combine for that market.

2014 saw the introduction of a new TUCANO combine because some countries are unable to work with electronics.

Claas now have 11 production plants around the world. However, they are still family-owned with Helmut Claas (88) the eldest son of the founder still involved with his daughter, Cathrina Claas-Mulhauser in running the company.

They have a turnover of 3.8 billion euros and sales of 155,000,000 euros.

Claas employ a workforce of 3,500 at Harswinkel and 11,100 worldwide, plus an additional 656 apprentices and 300 volunteers.

This concluded Willi's presentation.

We were then split into two groups to go on a factory tour.

As mentioned earlier, the site now covers 40 hectares with 20 hectares under cover. Due to this vast area, the company has 800 bicycles for employees to speed up getting around. 20 minutes walking is achieved in 5 minutes on a bicycle.

The factory houses 5 assembly lines which are over 2 floors with a crane used to lift from the ground to the first floor.

In the factory there are 13km of transport lines for moving parts around, all linked to a barcode system. The first floor also houses the 13 tanks used for degreasing and rinsing prior to painting. 30kg of paint is required for a forage harvester and 60kg for a combine.

Back downstairs we started in the pre-production area; visited the 2 welding departments one for small jobs, the other for larger ones. Both employees and robots carry out welding processes with the employees rotating on a 3 weekly rota to give them a range of jobs.

Next, we moved to the production lines. There are 2 lines for combines, one solely for Lexion machines which accommodates 190 people working at 12 stations with the employees changing their role within their team on a daily basis. The other line is for the Dominator, Tucano and Avero ranges. 40 combines are produced per day, one every 40 minutes. All are made to order and sold to 150 different countries.

The factory adopts a shift system that changes in July and November to give a high and low season. In the high season the employees work a 9 hour shift and in the low season a 7 hour shift with extra hours accrued being added as holiday in their two extra holiday breaks.

The next assembly line was for the production of the Zerion where production is at 3 units per day and all are made to order. Several versions are produced; the 4000; 4500 and 5000 (425 HP). Cab versions available are (i) fixed, (ii) in the middle with the option of turning through 180o or (iii) fixed in front of the engine.

Our next assembly line was for Jaguar forage harvesters producing a total of 10 a day from the 800 and 900 series models. MAN or Mercedes engines are purchased with the largest one being 884 HP. The chopping unit is made in Claas's Bad Saulgau factory. On arrival it is completely finished and is ready to just be slotted in.

Machine audit takes place throughout the plant. Completed machines from the various assembly lines are picked at random and subjected to a quality test which in some cases can take up to 3 weeks to complete.

As we got to the end of our visit we entered the technical training centre which saw a number of apprentices being taught by their teachers. One of their final assessments which is a test of their hand skills is to produce a model combine out of metal.

Successful apprentices are given an opportunity to have a placement as part of their training programme in a country of their choice. Examples of recent placements are USA , England , India and Hungary.

Our final destination before conclusion was to visit the museum which included an original straw binder, the first combine and the first forager .

Lunch followed to close a very informative and successful morning.

Nick Bevan
Sparsholt College

ANNUAL CONFERENCE 2015

Claas Transmissions, Gears And Hydraulics

Visit by ALAM members to Claas Production Facility, Paderborn, April 2015

After spending the morning going around the assembly plant and having been fed well we took the coach to a separate factory at Paderborn where Claas manufacture their transmissions, gears and hydraulics. This unit had the aroma of a machine shop and we were surprised to be greeted by a young lady who informed us in very good English that she had finished her university degree in November last year and she was now learning the ways of the manufacturing plant.

The first machine tool seen was a large vertical broach which rather tested our guide's vocabulary of technical English; however we managed to get an explanation together by a joint effort. We saw stub axles being machined, gears being deburred and chamfers being put on the leading edge of gears now by a grinding machine which cost some 200k Euro's. Typically the first and last component of a batch will go to Quality Control as has been the tradition for many years. There was much evidence of component washing and attention to cleanliness.

Next we saw a typical machining centre where three of a type were in action.

Deburring, always a problem with components, was carried out by the use of water jets and brushes. The water jet is capable of reaching 1000bar so it was carried out automatically behind closed guards.

They assemble Axles on a fifteen station machine and carry out an automatic test with data provided thro' a data bank.

Not all components are made in-house and they rely on the supplier to meet the specification as they do not do a separate inspection process prior to assembly.

They manufacture their own CVT (Continuously variable transmission) including the hydraulics and assemble them using various jigs and fixtures with the aid of a part identity system to ensure correct parts go into the various assemblies.

A manual torque wrench is still used on the critical bolts and all units are run for approx. 30 minutes which includes road and field speeds. They are then shipped to the tractor plant at Le Man's.

We were able to see the tracks which are now becoming more common. The design is by Claas and is a rubber track with spokes and is self cleaning. In Germany we were told a road speed of 40kph is allowed on tracks ands 30kph on wheels. The newer machines have self levelling in the cabs.

Although Claas have traditionally made a lot of their own hydraulic valves we only saw the manufacturer of a small solenoid unit there being evidence of hydraulic units being bought if from the likes of Linde and Bucher. We did however see the 04 valve being assembled, a manual task, each unit being tested but I suspect it was on oil laden compressed air not pure oil. (Rexroth adopts a similar system for solenoid valves).

For deburring such units as manifold blocks they use an explosion system which effectively defuzzes the internal wrags of drill ways.

There was much evidence of component washing before assembly to ensure good cleanliness levels.

The last machine we saw was an induction hardening unit for gears which enables the process to be reduced to four minutes per item, a considerable saving on traditional methods of heat treatment.

The factory was traditional (it smelt like a machine shop) but with up to date machinery and methods with direct links between the design office and the machine tools.

They make a positive emphasis of their supply many of their competitors and associates such as AGCO, New Holland, Merlo, John Deere and of course their neighbours Amazone, Grimme and Krone.

Oliver Dunthorne
April 2015

THE ASSOCIATION OF LECTURERS IN AGRICULTURAL MACHINERY

Accounts - Year ending 31st March 2019

Income and Expenditure

	2017-18				2018-19			
			Income	Expenditure			Income	Expenditure
Subscriptions			718.00				700.00	
Committee Expenses				167.32				659.30
Newsletter				0.00				0.00
Conference	2017	Kubota	2,925.00	4,677.00	2017	Kubota	0.00	0.00
					2018	Easton	1,200.00	1,143.80
					2019	0	0.00	0.00
Courses	Feb18	Manitou	60.00	100.14	Feb18	Manitou	180.00	0.00
	Apr18	Harper	0.00	0.00	Apr18	Harper	900.00	945.76
					Feb19	Agco	755.00	0.00
					0	0	0.00	0.00
Interest							0.00	
Miscellaneous			232.00	210.00			10.00	0.00
NFAEE fund			0.00	0.00			0.00	0.00
Surplus/Deficit	Deficit		1,219.46		Surplus			996.14
TOTAL			5,154.46	5,154.46			3,745.00	3,745.00

Statement of Affairs

Bank Account as on 1 April 2018	12,482.05	Bank Account as on 31 March 2019	13,674.99
Plus uncleared incoming cheques	0.00	Plus uncleared incoming cheques	0.00
Less uncashed outgoing cheques	0.00	Less uncashed outgoing cheques	196.80
Plus Surplus	996.14		
	13,478.19		13,478.19
Of which NFAAE stands at	3,811.78	Of which NFAAE stands at	3,811.78

ALAM ACCOUNTS

Annual accounts 2018-19

ALAM MEMBERSHIP 2019-20

This is the list of all those whose membership has been renewed as of August 2019.

We still have a couple of unresolved issues with unidentifiable standing orders so please ask your colleagues to check their bank statements– if any have standing orders taking money from their bank but are not on this membership list, please get in touch with the treasurer.

Name	Member No.	College
Bruce Badger	19/034	Sparsholt College
Tim Ball	19/060	Reaseheath College
Nick Bevan	19/046	Sparsholt College
Robin Blackford	19/011	Hayter
Denis Bloomfield	19/057	Otley College
Chris Brown	19/026	
Denis Cartmel	19/049	Rodbaston College
Richard Clarke	19/039	Otley College
Paul Clarke	19/050	Newton Rigg College
Ian Coleman	19/013	Hartpury
Chris Creasy	19/055	Otley College
Kevin Davenport	19/043	Myerscough College
Alan Davey	19/041	Cannington College
Wynn Davies	19/023	
Neal Dodd	19/025	Coleg Powys
Oliver Dunthorne	19/064	
Sandy Ellis	19/040	Askham Bryan College
James Foster	19/062	Royal Ag University
Nigel Fox	19/032	Sparsholt College
Richard Gargett	19/063	Newton Rigg College
Philip Goddard	19/058	Walford College
John Gough	19/007	Walford College
William Helen	19/017	Claas UK
David Heminsley	19/008	JCB
David Henley	19/029	Bicton College
Trevor Hicks	19/030	Hartpury College
Graham Higginson	19/012	Harper Adams
Vic Hird	19/061	Brackenhurst College
Tony Houghton	19/015	Myerscough College
Phillip Hurrell	19/033	South Cheshire College
Tim Hutchinson	19/048	Warwickshire College
David James	19/020	Coleg Meirion Dwyfor
John Jones	19/051	Newton Rigg College

Name	Member No.	College
Chris Keeble	19/006	Otley College
Brian Kessell	19/019	Duchy College
Nigel Macpherson	19/010	Sparsholt College
Patrick McLeod	19/037	Hartpury College
Chris Morgan	19/016	Walford College
Tym Morgan	19/052	Warwickshire College
Richard Newman	19/044	
Brian Nicholls	19/035	Reaseheath College
Tim Northmore	19/024	Kingston Maurward College
Mike O'Dowd	19/002	
Robert Patmore	19/056	
Brian Poulson	19/014	
Freddie Pullan	19/042	
Robert Rattray	19/054	
Jonty Rostron	19/009	Newton Rigg College
Jon Sarsfield	19/027	Rodbaston College
Michael Sidlow	19/059	Lackham College
Graeme Smith	19/047	Reaseheath College
Roger Soper	19/053	
Charles Szabo	19/018	Bishop Burton College
Emlyn Thomas	19/031	
Tom Turney	19/001	
Mark Tyson	19/045	
Arthur Walker	19/003	
Peter Walley	19/038	
Mike Wellham	19/036	Hartpury College
John Welwood	19/021	
Ian Whitehead	19/004	
Gwynfor Williams	19/005	Myerscough College
David Wilson	19/022	
Peter Woodliffe	19/028	

Honorary members are:
Robin Blackford, John Gough, David Heminsley, Graham Higginson, Chris Keeble, Nigel Macpherson, Mike O'Dowd, Jonty Rostron, Tom Turney, Arthur Walker, Ian Whitehead, Gwynfor Williams, Ian Coleman.

ASSOCIATION OF LECTURERS IN AGRICULTURAL MACHINERY

Membership Application Form

Title	Initials	Forename		Surname	
Home Address			College Name		
			Address		
Postcode			Postcode		
Phone			Email		
My connection with education in agricultural/horticultural engineering is:					
Signed			Date		
Proposer (Member of ALAM) If you don't know any members, just return the form and we'll arrange contact with one in your area.					

HOW TO PAY- The current rate is £20 per annum, payable on April 1st each year.

By cheque: Cheques should be crossed and made payable to "The Association of Lecturers in Agricultural Machinery", and sent with this form to the treasurer.

By standing order: It will help us provide an efficient service to members if you pay subscriptions by Standing Order, by completing the following, and returning the whole form to the treasurer.

Bank Name	Name of Account
Branch	Account No.
Address	Sort Code
	Payment Reference
	Please write your Initial and Surname as a Payment Reference in the space above, to ensure ALAM can clearly identify your payments.
Postcode	

Please pay to Lloyds Bank, 12 Lendal, York, YO1 2AF, (Sort Code 30-99-99) in favour of The Association of Lecturers in Agricultural Machinery (Account Number 1373714), the sum of £10 immediately, and then annually on the first of April each year, until cancellation by me of this standing order, debiting the account specified above.

This order cancels and replaces all previous orders in favour of The Association of Lecturers in Agricultural Machinery.

Signed	Date

Standing Orders are for a fixed amount, which can only be altered by you. It is not a Direct Debit, which allows the payee to vary the amount drawn.

Return completed forms to David Heminsley, ALAM Treasurer,
The Old Byre, Lower Street, Doveridge, Ashbourne, DE6 5NS.

For use by the treasurer							
Details recorded		Payment received		Bank Order processed		Member number	

Form revised June 2009