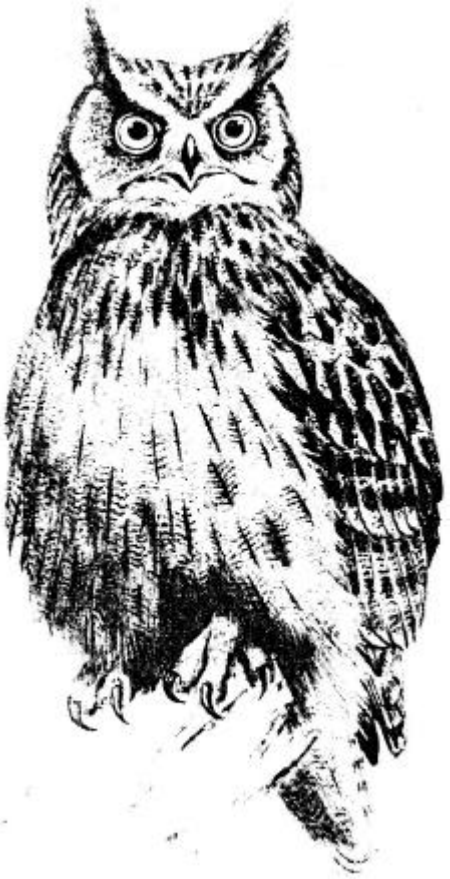
ALAM

Newsletter

Spring 2007



The Association of
Lecturers in Agricultural Machinery

www.alam.org.uk

Contents

ALAM Newsletter Summer 2006

2006 Conference

The 2006 conference at Sparsholt College, Hampshire, organised by Nigel Macpherson, was yet another good ALAM conference. Hondas, Helicopters, Transits and Training were all on the agenda, and the first reports are in this Newsletter. Many thanks to Nigel for putting it all together!

2007 Conference

Plans are in place for a move towards the north east, to Bishop Burton College. There's details and a booking form in this edition.

Engine Training Day

We've got the first of a number of reports from the different sections of this day at JCB, held in October 2006.

Membership Subscription

For the vast majority (98 out of 106 members), subscriptions will be collected by standing orders on 1st April again. Many thanks to everyone who pays by this method, as it provides a regular income and stable membership list from year to year - in the past it was always very time-consuming keeping members on the books when we are scattered across the whole country.

The membership list as at the end of January is at the back of this newsletter - please have a look through to make sure you and your colleagues are on the list (occasionally some standing orders have "dried up" as bank details change, etc, etc.).

Committee Members

The list of contact details for your committee members is in this newsletter, and will be a regular page in every newsletter. There are a number of changes, updates and corrections this time, so please make sure you use the latest information.

Classified Advertisements

Parts Offer

John Gough has a range of warranty return items sourced from JCB, which are available for colleges to use for teaching.

For full info about what is available, contact John by email at:

gough.j@btinternet.com - **note this is a new email address**

Phone - **01630 685 942 - evenings 7 to 10pm**, please.

ALAM Committee 2006-07

Any changes since the last Newsletter are in **bold type**.

Position	Name	Work			Home	
		Place	Tel	Email	Tel	Email
Chairman	Nigel Macpherson	Sparsholt College	01962 776441	nmacpherson @sparsholt.ac.uk	01980 862102	
Secretary	Peter Walley	Warwickshire College	01926 318269	pwalley @warkscol.ac.uk	01926 640883	
Treasurer	David Heminsley	JCB Training	01889 591300	david.heminsley @jcb.com	01889 566882	
Conference Organisers 2007	**Charles Szabo**	**Bishop Burton**				
	John Gough	Walford College	01939 262100 ext 2158	j.gough @wnsc.ac.uk	01630 685942	gough.j @btinternet.com
Committee	Duncan Wilson	Duchy College	01209 722100	duncan.wilson @cornwall.ac.uk	01326 376710	
	Brian Kessell	Duchy College	01209 722100	brian.kessell @cornwall.ac.uk		
	Ryan Roberts	Retired				mail@ ariel1965.freeserve.co.uk
	Graham Higginson	Reaseheath College			**01948 667982**	graham.higginson @ntlworld.com

ALAM ANNUAL CONFERENCE 2007

Bishop Burton 2007

Bishop Burton, North Humberside.

Monday 16th to Thursday 19th July.

The programme this year is again wide ranging and varied to offer something of interest for all members and others who may wish to come along!

We have the area of Humberside and Yorkshire to explore and draw upon for our engineering inspiration as it is many years since ALAM last visited this part of the country.

? A tour of the Humber Suspension Bridge has been organised together with the opportunity to discuss the maintenance issues which a structure of this size present to those responsible for its upkeep.

? There is the Armed Forces National Driver Training Establishment nearby and they have agreed to acquaint us with the techniques and skills which they employ in their training for drivers of the various vehicles which are used.

? We have a visit to a hydraulics company who will give us an insight into the techniques involved in the manufacture of flexible hydraulic hoses and the way to achieve correct selection and reliability of these components in service.

? BAE Systems will provide an opportunity to look into advanced materials and their use and techniques involved in assembly and maintenance.

? Green energy generation and use is a subject of increasing importance. Come and see how they put wind power to good use in this part of the world.

? Further development of Common Rail fuel injection systems are now regarded as the major key to producing diesel engines which are able to meet the ever more stringent emissions requirements. Bosch have agreed to come along and update us on their system and the associated developments in diagnostics as well.

All this and more in the company of like minded people has to be an opportunity not to be missed; so get your application in early and put some of that staff development money to very good use.

Please complete the application form if you wish to come along . Places may need to be limited so an early response is advised.

Your booking form is on the reverse of this page

ALAM ANNUAL CONFERENCE 2007

Booking Form
Bishop Burton 2007

The total conference fee will be **£200** for members and **£220** for non-members including accommodation. If anyone wishes to attend for certain days or will not require certain meals or accommodation, will they please contact me and I will work out separate price for you

Cheque enclosed payable to ALAM for £_____

or

Please invoice me at the address below:

Name ..... Address: .....

Telephone: Home ....

Work..... .....

Mobile ....

E-mail: ..... @ .....

Signature ..... Date:.....

Please return to:

John Gough,
Engineering Department,
Walford & North Shropshire College,
Baschurch,
Shrewsbury,
Shropshire,
SY4 2HL

Or email the above information to j.gough@wnsc.ac.uk

ALAM TECHNICAL UPDATE

JCB Engines

ALAM visit to JCB Power Systems Diesel Engine Plant, Dove Valley Park, Foston, Derbyshire

In August 2003 JCB announced that it was moving into engine production thus ending 25 years of industry speculation.

A new company JCB Power Systems was formed to make the engines.

The facility, spotlessly clean with an air of newness and quality is situated about 10 miles from the main factory at Rocester and has a workforce of over 100.

The plant and all it's suppliers are all certified to QS 9000 APQP. Components such as block and cylinder head arrive fully machined from Cosworth Engineering, Wellingborough, Northamptonshire. As part of the in- process quality systems each part is checked for correctness by automatic scanning machines (HMIs), if not deemed fit for purpose it is rejected.

HMI stands for Human Machine Interface. I think that the last HMI I encountered just about deemed me fit for retirement!!

The con-rod and big end for strength are forged in one piece, a laser etches a fracture line similar to a glass cutter on a pane. Under hydraulic persuasion the rod and cap separate cleanly.

D.C Direct Current tooling machines applied sealants as deftly as a professional cake decorator applying icing.

The “star performer” was the “Entwicklungsegesellshaft” a German machine which set the valve clearances in just over 4 minutes; lungs breathing - get it?!!

Currently 90 engines per day are made translating to about 25 000 units per year, this will rise to 40,000 with 20% going to other customers.

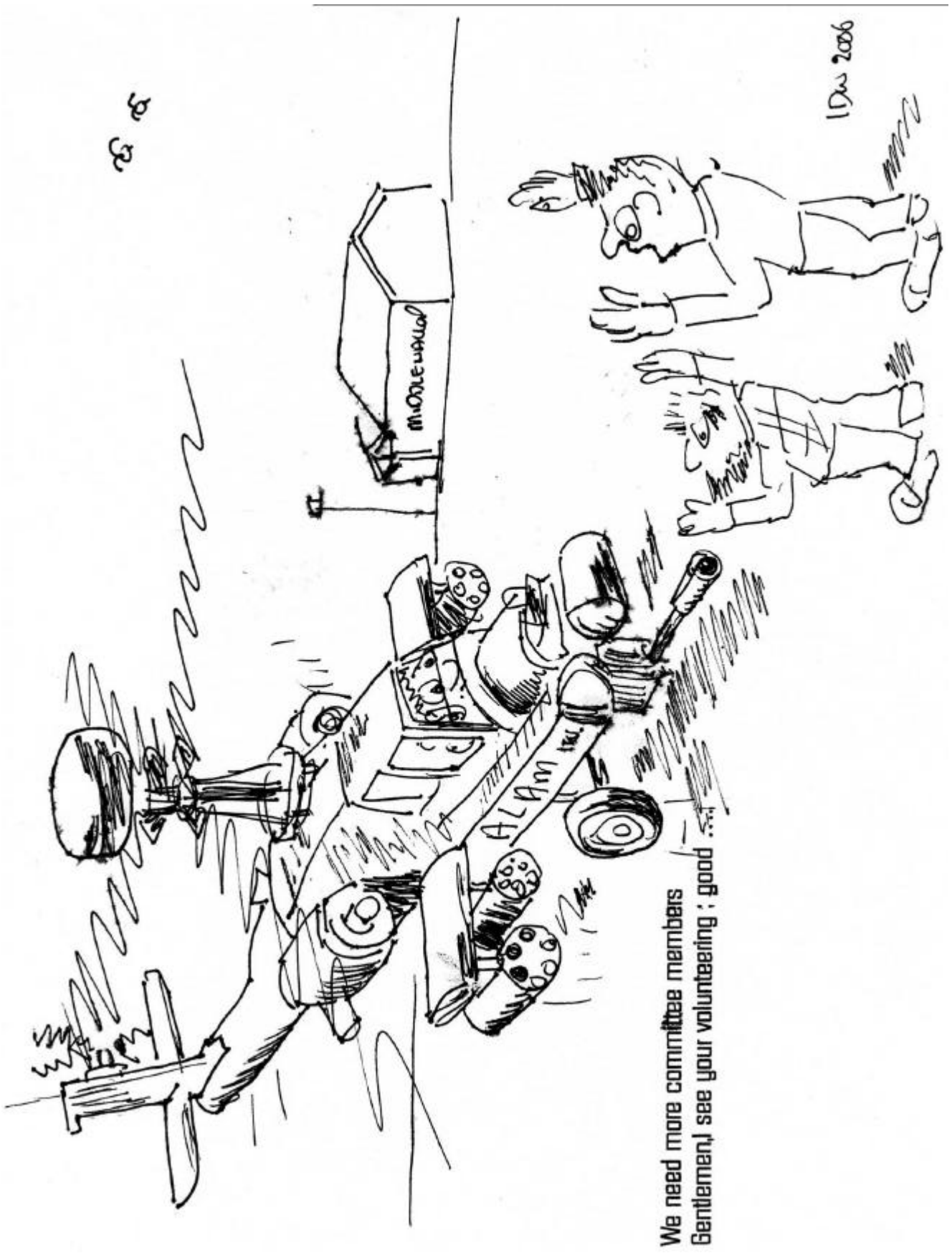
On completion the engines are placed on pre-rigged trolleys which mechanically dock to a test bed. The electrical energy from the two dynamometers is fed to the factory.

An excellent visit many thanks to Jon Shepherd, Rob Taylor, Dave Smith and David Heminsley.

Gwynfor Williams

ALAM ANNUAL TECHNICAL CONFERENCE 2006

Conference Cartoons



ALAM ANNUAL TECHNICAL CONFERENCE 2006

The Honda Institute

The Honda Institute is where Honda runs most of its training courses in the UK, for all levels of its dealers from management through to technicians, and this is done in a very individual-centred way, where all attendees pick the specific modules that they wish to study. The aim of the institute is that all technicians are to be "licensed" by Honda, renewable every two years. In 2005, the Honda Institute delivered 23,000 days of learning, at a typical ratio of one trainer to four technicians!

The day of the visit was very, very hot, and was preceded by a tour of the M25 & M3 car parks. The approach to the Honda Institute was by no means as impressive as might have be imagined, it being situated at the westerly end of the runway of Heathrow airport (and judging by the closeness of the wheels of the 747s to the roof, only just at the end!!), through a rather insalubrious industrial estate.

The reality however upon entering the fairly standard-looking large (45,000 sq feet) grey industrial unit took everyone's breath away. Lined up in neat rows were many new cars, bikes, quads, outboards and…. well all sorts of mechanical devices made by Honda. The whole place looked spotless, with the floor being clean enough to eat dinner off, and numerous mobile workstations, air lines, power supplies and benches punctuated what would otherwise have appeared to be a massive prestige dealer showroom. In short it looked just like what many of us have probably foolishly dreamed about as the ideal workshop for motor-vehicle, but never realised could actually exist.

Along one wall were a total of ten glass-walled training rooms arranged in two floors (air-conditioned / comfy chairs / PowerPoint / video / interactive whiteboards etc etc) into one of which we were gratefully ushered to be introduced to the company and the staff who were to kindly (bravely!) show us round.

After an introduction from Geoff Mathews, and an in-depth talk and discussion of new acronyms from Raj Johal and Bernard Snell, we were allowed round the workshop, a tour that took the usual ALAM stance of intense scrutiny, woeful longing, multiple pictures, testing technical questions and the all too frequent call of

" I wonder what will happen if we just push this button ….. Oh Dear !!"

A splendid visit was enjoyed by all, as was the delicious lunch laid on afterwards in one of the classrooms.

Thank you Honda!

There now follows a brief description of the various new and significant acronyms and technology that was discussed;

LKAS - Lane Keeping Assist System

LKAS (called ADAS in other markets!!) detects lane markings using the images of a camera mounted inside the upper front windscreen and transmits the appropriate input to the EPS (Electronic Power Steering) to help keep the car in its lane. The system needs straight roads(or a curve of 230m or more in radius), and works between 30-180 km/h. This does not keep the car in the lane; the driver has to have some steering input (at least every 14 seconds!)

ACC - Adaptive cruise Control

ACC uses a mille-wave radar mounted in the front grill and the lane keeping camera to keep the car at a minimum user-set time (1.0, 1.35 or 2.0 seconds) behind any vehicle in front,

modifying cruise control settings and using the brakes/ acceleration as necessary to try to maintain the desired speed setting.

CMBS - Collision Mitigation Braking System
Using the above mentioned sensors, this system detects that there is likely to be a crash, and firstly sounds a warning tone, then a combination of a tone and tugs on the seatbelt. Finally, if a crash is inevitable, the system pre-tensions the seatbelts and applies some braking to mitigate the effects.

AFS - Adaptive Front lighting System
Step motors controlling the headlights move the beam in response to inputs from steering angle and speed sensors, in order to improve the light pattern.

SH-AWD - Super Handling All Wheel Drive
Here some interesting mechanicals as well as electronics affect yaw and vector torque to the wheel(s) that need it most in order to attempt to improve handling and reduce over/under steer.

i-SHIFT - Intelligent Shift
Here a normal gearbox and clutch are “automated” by actuators so that the effect is of having an automatic gearbox, but without the inefficiencies. Gear lever and paddle shift operation is also available.

PUB - Pop Up Bonnet
Sensors in the front bumper detect that a pedestrian has been hit and activate pyrotechnic rams at the rear of the bonnet, lifting it up by around 100mm (and ripping apart the hinges) to help give some cushioning space between the relatively soft deformable bonnet and the more rigid engine

GPS-CC - GPS-Linked Climate Control System
Information from the GPS system helps to control the heat/ cooling that is directed to each part of the car to allow for sunshine heating up one side more than the other.

VANS - Voice Activated Navigation Systems
Relatively descriptive; the navigation system can be worked by voice control!

ANCS - Active Noise Cancellation System
Two microphones situated above the front and rear passengers are used together with the audio system to produce “anti-noise” (i.e. a sound wave that is of similar magnitude and frequency to the target, but the exact opposite) in order to quieten the target noise.

IMA - Integrated Motor Assist
This is part of the Honda Civic Hybrid car (only available in 4 door, and not the futuristic Civic that we are more used to in the UK), which as well as a petrol engine, has a 10Kw electric motor next to the clutch, some large batteries and capacitors, and lots of electronics. These can be used in lots of ways, depending on what the car is doing, with the main aim of increasing fuel economy/ reducing emissions.

For more information, try the Honda website;
www.honda.co.uk

Tony Houghton

ALAM AGM & TECHNICAL UPDATES 2005

Forte Liquid Engineering Solutions

Our opening speaker for this years summer conference was Mr Julian Buckley from Forte lubricant systems based in Coventry. The company was originally established in South Africa where it is still producing its products but has now grown to become an international company with bases in many countries throughout the world. The company started by producing oil treatments for vehicle engine lubrication systems and has gone on to develop a wide range of other products to help to overcome and prevent problems in many other vehicle systems.

Over many years the company has been working with internal combustion engines and has built up a considerable breadth of knowledge and understanding of both the developments that have taken place and some of the problems which have accompanied those developments. It has to be recognised that some of these problems are owner inflicted while others are a result of designs required to meet the ever tougher emissions regulations! Then there are those problems which are a result of market forces; the lease hire companies to be specific. They have a keen eye on profitability and less vehicle servicing means more money for them, which in turn has caused the car manufacturers to increase service intervals. The engine oil that comes out of the sump at 20,000 miles is going to be carrying a lot of contaminants. They include laquers, tar, varnish, gums, resins, nitric, sulphuric and hydrochloric acids, and the oil will have suffered oxidation. We were told that when engine oil is changed up to 15% of the old oil remains in the engine and when the new oil is added its quality is immediately diluted and degraded. The result of this is that due to this contamination the service interval should be reduced to 17,000 miles for the next oil change but it isn't. The result is that a build up of unwanted sludge starts to form in places where it shouldn't; starting to restrict oilways to vital components which in turn start to suffer wear or do not function correctly. Examples given included hydraulic valve lifters, variable valve timing devices, piston rings sticking and restricted oil circulation to vital parts.

Another engineering innovation that seemed to have caused almost as many problems as it solved was the exhaust gas recirculation (EGR) system. This system is vacuum operated and allows 15% of the exhaust gas to be recirculated through a valve into the inlet manifold and back through the engine. The effect of this is to lower the combustion temperature and increase the burn time in the cylinder which reduces the formation of nitrous oxides. The other effect is increased carbon deposits in the cylinder combustion chamber and valves and the formation of those same deposits on the EGR valve. We were shown some pictures of a jammed valve assembly which controls the flow of exhaust gas into the inlet manifold; to say that it needed a decoke would be a serious understatement! Some vehicles seemed to be particularily prone to this problem and oil and fuel treatments help to keep the valve assembly operating freely.

We were also told about a catalytic converter regeneration system used by Citroen Peugeot on the HDi common rail models where they spray fuel into the front of the converter when the pressure difference front to back exceeds 1.5 bars indicating a restriction. This operation is normally carried out when the vehicle is travelling along at about 50 m.p.h. and controlled by the on board computer. However on one occasion the system was demonstrated to a group in the workshop and the control circuit was energised and the catalytic converter was cleaned by this "internal burnout". Not only did it clean out the exhaust, the temperature generated also burnt the paint off a large area of the workshop floor where the vehicle had been standing at the time.

Fuel systems were also covered and some time was spent looking at the common rail diesel systems. It is recognised that these systems have transformed the performance and acceptability of diesel engined cars but there are one or two things we should be mindful of!

? They only run on pure clean diesel and NOTHING else.

? Mistakes at the fuel pumps are very expensive. If the vehicle is started the system becomes quickly contaminated with metal filings from the pump which on the latest generation of vehicles is working at 2000bar or 29,400 psi for those of us who have not yet gone metric!

Injector nozzle hole sizes have been reduced from 0.4mm using a working pressure of 200 bar to 0.2mm with 1200bar, and now down to 0.1mm using 1600bar working pressure. The injector opening is electronically controlled and can deliver up to 9 shots of fuel during the injection period starting at 30 deg BTDC. Bosch are using injectors which have piezo crystal controlling the opening process which has a reaction time of 0.1milliseconds signal-to-opening. This is claimed to give a 5% increase in torque and 20% emissions reduction with 75% less moving parts in the injector. The wires which control these injectors often run inside the rocker cover and consequently it is important that the engine oil used is compatible with the wiring insulation.

Heater plugs are also high tech having porcelain tips which reach 800°C in about 2 seconds.

We were given a few hints on how to keep this new technology running and these are;

? Never run the fuel system dry, some cars apparently have a built in cut out device which stops the engine when the fuel level drops below a certain point; I know it has the same effect….. the engine stops….. but you don't get the big bill!

? Never steam clean the fuel system of the common rail engines or its electrical controls and sensors.

? Always prime the fuel filter and bleed the pipework to the pump thoroughly.

? Check for wiring wear marks on both wires and any covers that they normally hide under.

The technical presentation was well received by the group and interesting questions followed about the range of products available, how they worked and what miracles they might be able to work on the range of vehicles which we repair or run! Our thanks to Mr. Julian Buckley for agreeing to come along and share this information with us.

Forte produce a very useful Technical Solutions booklet which explains what their products do and gives some interesting information about fault diagnosis and emissions.

Their technical helpline number is 024 7642 1131

Their UK address is, 4 Parbrook Close, Coventry, CV4 9XY

Tel. 024 7647 4069

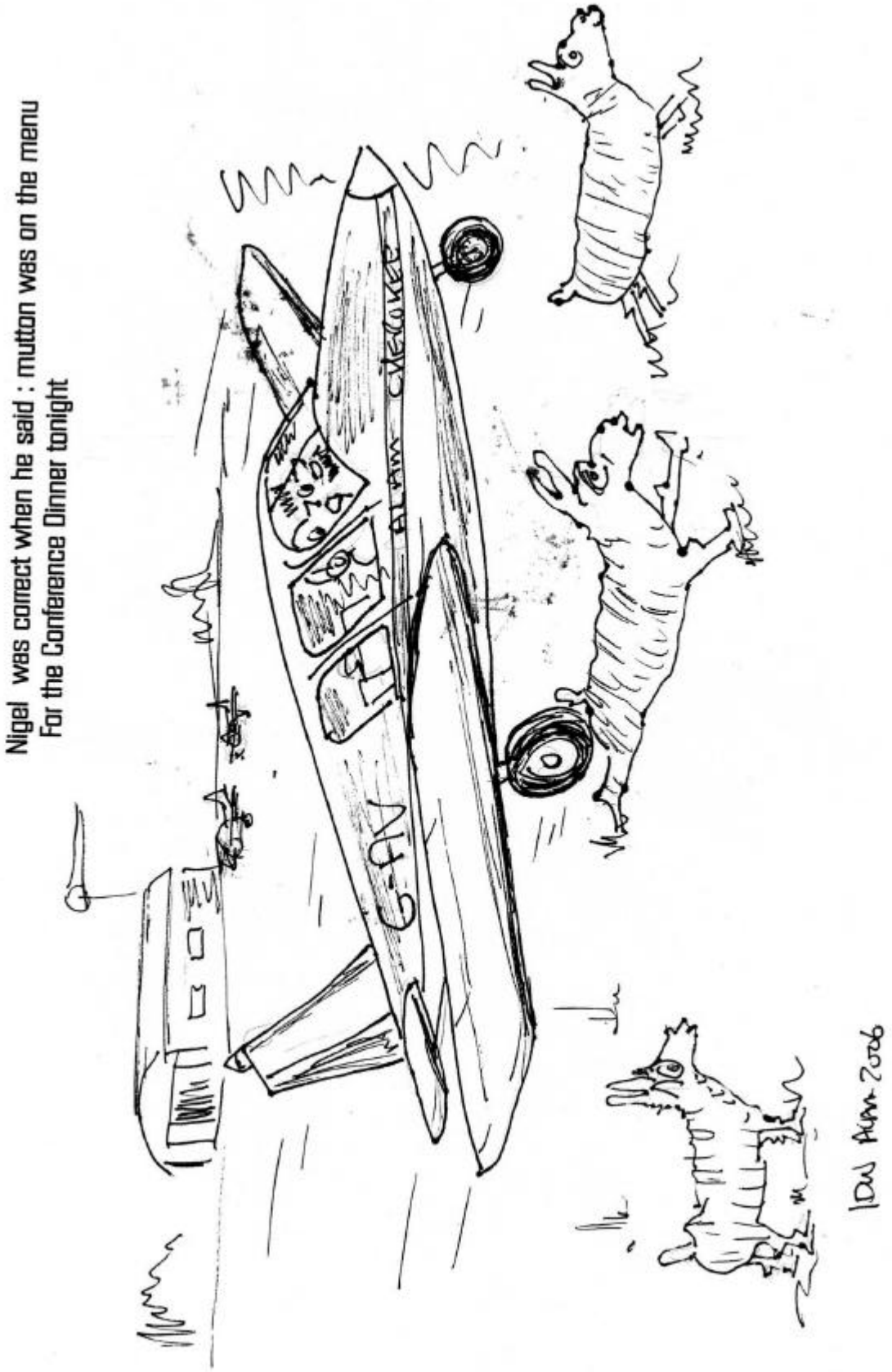
www.forteuk.co.uk

John Gough

Walford College

ALAM ANNUAL TECHNICAL CONFERENCE 2006

Conference Cartoons



Member List 2006-07

Correct as of the end of January 2007

Forename	Surname	Member Number	Contact : Address
Brian	Alexander	06/104	Home address
Gerald	Anderson	06/089	Easton College
Bruce	Badger	06/075	Sparsholt College
Tim	Ball	06/095	Reaseheath College
Martin	Baxter	06/035	Bishop Burton College
Nick	Bevan	06/006	Sparsholt College
Tom	Binkley	06/102	South Cheshire College
Robin	Blackford	06/041	Hayter Ltd
Denis	Bloomfield	06/098	Otley College
John	Bumby	06/HON	Home address
Brian	Cairns	06/093	Writtle College
Denis	Cartmel	06/054	Home address
Nicholas	Cartwright	06/087	Home address
Harry	Catling	06/060	Royal Agricultural College
Stuart	Christie	06/003	Cannington College
Richard	Clarke	06/077	Otley College
Keith	Coldwell	06/068	Home address
Ian	Coleman	06/007	Hereford College of Technology
Peter	Coleman	06/045	Home address
Stewart	Cousins	06/009	Home address
Chris	Creasy	06/050	Home address
Kevin	Davenport	06/053	Myerscough College
Alan	Davey	06/038	Cannington College
John	Dixon	06/061	Lackham College
Neal	Dodd	06/024	Coleg Powys
Oliver	Dunthorne	06/096	Home address
Peter	Eland	06/070	Llysfasi College
Duncan	Elliott	06/046	Duchy College
Sandy	Ellis	06/088	Askham Bryan College
Colin	England	06/040	Kingston Maurward College
Alan	Fagg	06/064	Evesham College
Lionel	Foreman	06/074	Home address
Nigel	Fox	06/090	Sparsholt College
Andrew	Frank	06/015	Reaseheath College
Carl	Gilbert	06/103	Hartpury College
John	Gough	06/029	Walford College
Julian	Greenman	06/033	Sparsholt College
Richard	Gregory	06/073	Sparsholt College
Steve	Hackett	06/043	Writtle College
David	Harris	06/048	Brinsbury College
Paul	Harrison	06/083	Otley College
Steve	Hasell	06/037	Cannington College
Richard	Heath	06/014	Lackham College
William	Helen	06/020	Home address
David	Heminsley	06/057	JCB Training
David	Henley	06/058	Kingston Maurward College
Graham	Higginson	06/091	Reaseheath College
Paul	Hill	06/025	Writtle College
Vic	Hird	06/072	Brackenhurst College
Peter	Homer	06/063	Home address
Tony	Houghton	06/085	Home address
David	Howells	06/002	Warwickshire College
Colin	Hughes	06/065	Welsh College of Horticulture
Phillip	Hurrell	06/067	South Cheshire College
David	James	06/082	Coleg Meirion Dwyfor
Melvin	Johnson	06/022	Reaseheath College
Alexander	Johnston	06/023	Reaseheath College
John	Jones	06/055	Home address
Chris	Keeble	06/084	Home address
Brian	Kessell	06/081	Duchy College
David	Lankester	06/039	Writtle College
Tony	Leonard	06/012	Bishop Burton College
Nigel	Macpherson	06/071	Sparsholt College
Patrick	McLeod	06/031	Hartpury College
Chris	Miller	06/105	Otley College
Les	Milne	06/005	Writtle College
Chris	Morgan	06/016	Walford College
Tym	Morgan	06/034	Warwickshire College
Richard	Newman	06/042	Home address
Brian	Nicholls	06/032	Reaseheath College
Tim	Northmore	06/010	Kingston Maurward College
Mike	O'Dowd	06/HON	Home address
Robert	Patmore	06/056	Home address
Evelyn	Pearce	06/027	Rycotewood College
Clive	Perrins	06/051	Writtle College
Brian	Poulson	06/080	Home address
Robert	Rattray	06/049	Home address
Tony	Roberts	06/018	Home address
Ryan	Roberts	06/099	Home address
David	Ross	06/069	Newton Rigg College
Jonty	Rostron	06/078	Home address
Ed	Rowbury	06/097	Newton Rigg College
Jon	Sarsfield	06/092	Home address
Chris	Saulter	06/106	Otley College
Michael	Sidlow	06/030	Lackham College
Andrew	Soar	06/052	Home address
David	Sparks	06/004	Home address
David	Stephenson	06/047	Home address
Rick	Sunderland	06/036	Bishop Burton College
Charles	Szabo	06/008	Bishop Burton College
Paul	Talling	06/011	Askham Bryan College
Ian	Taylor	06/026	Barony College
Alastair	Taylor	06/013	Home address
Emlyn	Thomas	06/062	Home address
Roger	Tiller	06/079	Sparsholt College
Martin	Towsey	06/021	Brackenhurst College
Tom	Turney	06/HON	Home address
Mark	Tyson	06/028	Home address
Shaun	Van Den Bos	06/100	Bishop Burton College
Arthur	Walker	06/HON	Home address
Steve	Warr	06/044	Writtle College
Richard	Waterson	06/076	Home address
Stephen	Watson	06/066	De Montfort University
John	Welwood	06/086	Home address
Ian	Whitehead	06/HON	Home address
Gwynfor	Williams	06/HON	Home address
David	Williams	06/101	Llysfasi College
Duncan	Wilson	06/019	Duchy College
David	Wilson	06/017	Home address
Peter	Woodliffe	06/059	Home address
Paul	Wray	06/001	Home address