



---

# Exhaust gas analysers

A report on the supply in the UK of the service of  
calibrating and servicing gas analysing equipment

---





MONOPOLIES AND MERGERS COMMISSION

# Exhaust gas analysers

A report on the supply in the UK of the service of calibrating and servicing gas analysing equipment

**Presented to Parliament by the Secretary of State for Trade and Industry by Command of Her Majesty  
November 1993**

LONDON : HMSO

Cm 2386



**Members of the Monopolies and Mergers Commission as at  
31 August 1993**

Mr G D W Odgers (*Chairman*)  
Mr P H Dean CBE (*Deputy Chairman*)  
Mr D G Goyder (*Deputy Chairman*)  
Mr H H Liesner CB (*Deputy Chairman*)  
Mr A Armstrong  
Mr C C Baillieu  
Mr I S Barter  
Professor M E Beesley CBE  
Mrs C M Blight  
Mr F E Bonner CBE  
Mr P Brenan  
Mr J S Bridgeman  
Mr R O Davies  
Professor S Eilon  
Mr J Evans<sup>1</sup>  
Mr A Ferry MBE  
Mr N H Finney OBE  
Sir Archibald Forster  
Sir Ronald Halstead CBE  
Ms P A Hodgson  
Mr M R Hoffman  
Mr D J Jenkins MBE  
Mr A L Kingshott  
Miss P K R Mann  
Mr G C S Mather  
Mr N F Matthews  
Professor J S Metcalfe CBE  
Mrs D Miller MBE  
Professor A P L Minford  
Mr J D Montgomery  
Dr D J Morris  
Mr B C Owens<sup>1</sup>  
Professor J F Pickering<sup>1</sup>  
Mr L Priestley  
Dr A Robinson  
Mr J K Roe<sup>1</sup>  
Dr L M Rouse  
Mr D P Thomson  
Professor G Whittington

Mr S N Burbridge CB (*Secretary*)

---

<sup>1</sup>These members formed the group which was responsible for this report under the chairmanship of Mr B C Owens.

## **Note by the Department of Trade and Industry**

In accordance with section 83(3) and (3A) of the Fair Trading Act 1973, the Secretary of State has excluded from the copies of the report, as laid before Parliament and as published, certain matters, publication of which appears to the Secretary of State to be against the public interest, or which he considers would not be in the public interest to disclose and which, in his opinion, would seriously and prejudicially affect certain interests. The omission is indicated by a note in the text.

# Contents

	<i>Page</i>
<i>Chapter</i> 1	Summary . . . . . 1
2	Background to the reference . . . . . 3
3	The market for the calibration and servicing of exhaust gas analysers . . . 6
4	Financial performance of the major companies . . . . . 23
5	Views of independent calibrators of EGAs and those servicing garage equipment . . . . . 33
6	Views of EGA users and other parties . . . . . 39
7	Views of the Vehicle Inspectorate, the National Measurement Accreditation Service and SIRA Test & Certification Limited . . . . . 51
8	Views of EGA suppliers . . . . . 62
9	Conclusions . . . . . 84
10	Pattern approval and calibration arrangements . . . . . 97
	Glossary . . . . . 101
 <i>Appendices</i> (The numbering of the appendices indicates the chapters to which they relate.)	
1.1	Conduct of the inquiry . . . . . 103
2.1	Legislative provisions concerning the MOT test . . . . . 105
2.2	Required calibration procedure . . . . . 110
3.1	NAMAS charges . . . . . 113
3.2	VI list of approved equipment . . . . . 114
3.3	SIRA vehicle exhaust gas analyser calibration service . . . . . 116
3.4	Survey of MOT stations . . . . . 117
5.1	VI list of approved calibrators . . . . . 123
7.1	SIRA price list: valid from 1 November 1992 . . . . . 124
8.1	Practices referred to in the issues letter . . . . . 126
8.2	Other EGA suppliers . . . . . 127
9.1	Issues put to the main suppliers . . . . . 128
9.2	Steps, actions or omissions relating to the existence of the monopoly situation . . . . . 129
	Index . . . . . 130





# 1 Summary

1.1. On 4 February 1993 we were asked to investigate and report on the supply in the UK of the service of calibrating and servicing gas analysing equipment. Our inquiry is limited by its terms of reference (see Appendix 1.1) to equipment used to analyse exhaust gas emissions from motor vehicles as part of the MOT test. We refer to this equipment as exhaust gas analysers (EGAs).

1.2. Tests of exhaust gas emissions were introduced to the MOT test in November 1991. Their purpose is to reduce atmospheric pollution from poorly-tuned engines. To carry out the test every MOT station is required to have an EGA of a type approved by the Vehicle Inspectorate (VI). The EGA must be calibrated regularly, normally every three months, in order to ensure that it continues to give accurate readings. The VI requires these periodic calibrations to be carried out by an engineer approved by the National Measurement Accreditation Service (NAMAS). An engineer needs separate approval for each model of EGA which he is to calibrate.

1.3. We found that a complex monopoly situation exists within the meaning of the Fair Trading Act 1973 in favour of four leading suppliers of EGAs and the companies appointed by two of them to calibrate their brands of EGAs. These companies supply over 60 per cent of the calibration and servicing of EGAs. They all restrict access to the manuals that would be needed by a potential competitor seeking NAMAS approval to calibrate their EGAs.

1.4. The market for calibration and servicing of EGAs barely existed before the MOT test requirement was introduced. Now there are over 19,000 EGAs installed in MOT stations. There was strong competition among over 30 companies for the supply of these EGAs. However, as far as calibrating and servicing them is concerned, there is very little competition since in general only the EGA supplier or his calibration agent has the necessary NAMAS approval for a particular brand. Some companies (but not those involved in the monopoly situation) have helped independent 'agents' to gain approval. But only one small firm (with some associates) has entered the market independently of the main suppliers to compete with them.

1.5. As well as withholding access to manuals, some suppliers also make it difficult for third parties to enter the calibration market by limiting access to the software used in calibration and by declining to offer training. These practices also impede entry to the market for servicing EGAs since an EGA has to be recalibrated after it has been repaired. Restrictions in warranties also help to maintain the monopoly situation.

1.6. The suppliers argue that calibration and servicing are part of the same market as the original supply of the EGA. In this single market customers base their choice of EGA not only on the price and quality of the machine but also on the costs and quality of after-sales service, including calibration and servicing. The suppliers go on to argue that since the market for the original equipment is highly competitive, a monopoly supplier of calibration and servicing for a particular brand of EGA will not be able to exploit his

monopoly position. To do so would lead to a loss of sales not only of EGAs but also of other garage equipment.

1.7. We accept that the market, as it is currently organized, has these characteristics. Although the suppliers' practices make it difficult for independent calibration firms to enter the market they do not have adverse consequences for users. This is confirmed by the lack of any significant evidence of disbenefits in terms of high prices, excessive profits or customer dissatisfaction with the quality of service. We therefore conclude that none of the facts found in our investigations operate, or may be expected to operate, against the public interest.

1.8. We recognize, however, that the market is still comparatively new and it is possible it will develop in a way which allows the practices to have adverse effects. In those circumstances it would be open to the Director General of Fair Trading to exercise his powers under the Fair Trading Act 1973 or the Competition Act 1980 if there were evidence of such effects.

1.9. Finally, we comment on some aspects of the EGA approval arrangements and the calibration requirements which were raised during the course of our inquiry. We propose some changes which could enhance competition in the calibration and servicing of EGAs. We believe that the relevant government agencies should consider whether these are practicable when they review the MOT arrangements.

## 2 Background to the reference

### Introduction

2.1. This reference was made to the MMC by the Director General of Fair Trading following complaints to his office that certain manufacturers of EGAs used in MOT tests on vehicle emissions were preventing access to markets for calibrating and servicing these instruments by independent operators. This chapter describes the background to the introduction of tests on vehicle emissions and the systems introduced to maintain the accuracy of the instruments used.

### Vehicle emission tests

2.2. In its White Paper on Britain's Environmental Strategy 'The Common Inheritance' published in September 1990 (Cm 1200) the Government proposed '... to take immediate steps to include an emissions check in the MOT test to ensure that vehicles are kept in tune'. This was in the context of proposals then under consideration by the EC to improve the fuel consumption of motor vehicles. The Government's decision was taken in the knowledge that these EC proposals were likely to lead to an emission test requirement but in advance of any agreed EC Directive specifying vehicle emission limits. This came later in EC Directive 92/55/EEC (see Appendix 2.1).

2.3. The vehicle emission limits to be applied in Great Britain were introduced by Statutory Instrument No 1526 of 1991 (The Road Vehicles (Construction and Use) (Amendment) (No 1) Regulations 1991) laid before Parliament on 10 July 1991 to come into force on 1 November 1991. The latter date became the start date for the introduction of vehicle emission tests. The specified limits were for carbon monoxide (CO), not to exceed 4.5 per cent by volume for vehicles first used on or after 1 August 1983 (or 6 per cent for others), and for hydrocarbons (HC), not to exceed 0.12 per cent by volume (see Appendix 2.1).

2.4. The introduction of the tests was organized by the VI, an Executive Agency in the Department of Transport (DOT) established in 1989 to operate and administer schemes for the inspection and testing of vehicles. The necessary consultations and arrangements took place over an 18-month period prior to the start date of 1 November 1991. There were two essential prerequisites for the start of the exhaust emission tests by that date. First, each of approximately 18,000 MOT stations wishing to continue to carry out MOT tests had to have an EGA approved by the VI for that purpose. Second, arrangements had to be made for the calibration of these instruments.

2.5. As the standard of approval for EGAs to be used in MOT tests the VI adopted an existing international standard set by the Organisation Internationale de Métrologie Légale (OIML). The OIML is a world-wide inter-governmental organization whose main task is to harmonize the metrological regulations and controls applied by the national metrological services of its member states. OIML's recommended standard for EGAs (OIML R 99) set specifications for two classes of instrument (Class I and II), Class I having, for example, the more stringent maximum permissible errors and digital indication requirements. On the advice of the Transport Research Laboratory (TRL), also an Executive Agency in the DOT, and others the VI specified that EGAs conforming to the requirements of either Class I or Class II of OIML R 99 would be approved for use in MOT exhaust gas emission tests.

2.6. Prior to the introduction of emission tests only a minority of MOT stations had EGAs. These had for many years been sold as part of a more comprehensive set of instruments used in engine testing and tuning. Some of these EGA models had obtained approval broadly equivalent to OIML classification from accredited laboratories in other European countries and were already in place or were acquired by MOT stations when the introduction of emissions tests was announced. Approximately 60 of these models were approved by the VI for MOT tests provided they were in place by 1 November 1991. The VI also arranged with NAMAS, part of the National Physical Laboratory, to accredit laboratories in the UK for the pattern approval of EGAs to the OIML standard. Two such laboratories, operated by Sira Test & Certification Limited (SIRA) and GEC Avionics Ltd, were subsequently accredited by NAMAS for EGA pattern approval. This enabled UK manufacturers to submit EGAs, some specifically designed for the MOT test requirements, for approval in time for them to be marketed in the period up to and immediately after 1 November 1991. Some 16,000 EGAs were sold in this period and another 2,000 in 1992.

## Calibration of EGAs

2.7. EGAs contain considerable electronic circuitry and, in some cases, controlling software and are technically more sophisticated and more complex than other measuring instruments, such as brake or headlamp-aim testers, used in MOT tests. The VI requires that all instruments used in MOT tests are calibrated periodically, eg every six months for brake and headlamp-aim testers. For calibration of these other instruments the MOT station may choose between the manufacturer, an appointed agent, a calibration specialist or an experienced member of its own staff. The carrying out of these calibrations is checked by the VI on its annual inspection of each MOT station. For the calibration of EGAs the VI consulted the manufacturers (through their trade association the Garage Equipment Association (GEA)) and NAMAS. An agreed document setting out the requirements for the calibration of EGAs at MOT test stations was drawn up by the VI in August 1991 (Appendix 2.2).

2.8. The VI also decided, in consultation with NAMAS, that because of the greater sophistication of EGAs the calibration should be carried out by an operator independent of the MOT station, who had been assessed by a NAMAS accredited laboratory and individually approved by NAMAS. Four laboratories subsequently received NAMAS accreditation for this purpose; SIRA, Sun Electric UK Limited (Sun), Tecalemit Garage Equipment Co Ltd (Tecalemit) and Hermann Electronics (UK) Ltd (Hermann). The frequency of calibration was determined by the DOT's Vehicle Standards and Engineering Division, following advice from the VI and others. This was set at once every three months for OIML Class II instruments, every six months for certain OIML Class I instruments and annually for a limited number of EGAs equipped with a self-calibrating facility.

2.9. Apart from the three EGA suppliers which established their own NAMAS accredited laboratories (Sun, Hermann and Tecalemit) the bulk of UK manufacturers and a number of independent calibrating companies obtained NAMAS approval for their calibrators through SIRA. This is an independent laboratory active in the field of scientific instrument development, testing and calibration. SIRA also drew up a draft scheme for the calibration of EGAs to the NAMAS requirements. This proposed that engineers employed by manufacturers or calibration companies would be trained by their employer to calibrate the instrument for which NAMAS approved signatory status was sought. SIRA would provide any necessary assessment to comply with NAMAS and VI requirements and would put the candidates forward to NAMAS for approval. The calibrator would carry out the calibrations under a contract between SIRA and his employer. The scheme also provided that SIRA would prepare calibration procedure manuals (again in line with NAMAS and VI requirements) for each EGA for which calibrators sought NAMAS approval, would provide and control the issue of calibration certificates and would regularly (every six months) audit the performance of each calibrator approved by NAMAS through its scheme.

2.10. The draft SIRA scheme was discussed at a meeting with all the interested parties towards the end of June 1991 (ie the VI, NAMAS, the GEA and a number of manufacturers). It was broadly accepted and with some minor adjustments (see paragraph 7.60) is essentially that which is currently in operation. Some 250 engineers have been approved by NAMAS through the SIRA laboratory, about 50 through Sun, 13 through Tecalemit and 5 through Hermann. These latter three laboratories submit their candidates for approval directly to NAMAS and are also responsible for twice-yearly

auditing of their performance. In addition NAMAS has undertaken a programme of itself carrying out an audit check on the performance of each of its approved calibrators over a three-year cycle.

2.11. All these arrangements had to be in place by 1 November 1991 and, in the event, it was not possible for all the companies involved to achieve NAMAS approval of a sufficient number of engineers to calibrate the EGAs they had contracted to cover by that date. As a result the VI had to issue a temporary one-month dispensation to 1 December 1991 allowing machines calibrated by manufacturers' unapproved employees to be used in MOT tests for that limited period. The limited time available also partly accounted for the fact that most suppliers sought NAMAS approval for their engineers through the SIRA route rather than establish their own NAMAS-accredited laboratory.

2.12. These calibration requirements were given legal force through their introduction by the VI into a revised appendix to its 'MOT Inspection Manual'. This manual constitutes the VI's instructions to MOT stations for carrying out MOT tests. As such it has legal force under the VI's statutory authority deriving from the Secretary of State for Transport through the Motor Vehicle (Tests) Regulations 1981 (see Appendix 2.1).

# 3 The market for the calibration and servicing of exhaust gas analysers

## Contents

	<i>Paragraph</i>
The product .....	3.1
Demand .....	3.18
Supply of EGAs .....	3.25
Distribution of EGAs .....	3.46
Calibration .....	3.59
Servicing .....	3.74
Market definition .....	3.85

## The product

### *The EGA*

3.1. The function of an EGA is to measure the composition of the exhaust gases produced by a petrol-engined vehicle. Although there are a number of models of EGA they all work on the same principle. A sample of the exhaust gases is collected by a probe inserted into the tailpiece of the vehicle's exhaust pipe. The sample is drawn by a pump through filters, which remove water droplets and particulate matter, and across an infra-red detector (the 'gas bench') which measures the gas content. The measurements are translated into an electronic display on the front of the EGA and, on some models, may be printed out to give a permanent record.

3.2. The emissions from a vehicle include CO, CO<sub>2</sub> (carbon dioxide), HC and O<sub>2</sub> (oxygen). An EGA will measure the volume of these components present in the emission. The simplest machines will measure only two components—CO and HC. Others will measure three gases or four gases and the most sophisticated will also calculate lambda, a ratio indicating whether combustion in the engine is as complete as possible (lambda = 1) or whether the mixture of air and fuel entering the engine is too rich or too lean.

3.3. The gas bench is at the 'heart' of an EGA. It measures the extent to which infra-red light of a given wavelength is absorbed by the gas mixture and this provides the basic data from which the EGA calculates the volume of a particular gas in the mixture. The gas bench can account for as much as 60 per cent of the production cost of an EGA. We understand that there are only three manufacturers in the world, none in the UK and the largest being Andros of the USA.

3.4. An EGA can be a stand-alone machine, performing only the gas analysis function, or it can form part of a more comprehensive engine diagnostic unit which a garage would use to diagnose faults and to tune and adjust various components. Prior to the introduction of the MOT emission test most EGAs in the UK were used for diagnostic purposes to assist the tuning of the engine rather than to measure the pollution it produced.

3.5. The exhaust emissions check was introduced to the MOT test on 1 November 1991 and involves using an EGA approved by the VI to measure the volume of CO and HC present in the emissions. To gain pattern approval an EGA model has to meet the requirements of the OIML R 99 standard (see paragraph 2.5). Approval to either Class II or the more accurate Class I is acceptable.

3.6. Pattern approval is obtained after testing against the OIML standard at a laboratory accredited by NAMAS for the purpose. There are currently two such laboratories, one operated by SIRA and one by GEC Avionics Ltd. Any suitably equipped organization can apply to become an accredited laboratory by fulfilling the criteria set down by NAMAS (see paragraph 7.32 for details and Appendix 3.1 for NAMAS's charges). Pattern approval can also be obtained from nationally accredited laboratories in other West European countries.

3.7. The VI recognized in 1991 that some MOT stations might have EGA models already installed that were not OIML approved but were capable of carrying out the new test. As a concession, the VI approved such existing equipment for use provided it was installed before 1 November 1991 if the model had some form of recognized approval from another European country (eg PTB approval in Germany). A complete list of approved EGAs is at Appendix 3.2.

3.8. The VI has indicated that all of the equipment currently approved will remain acceptable until cars now required to be fitted with catalytic converters first come within the scope of the MOT test in 1996. From 1 January 1996 a more stringent test for such cars must be introduced to meet EC requirements (see Appendix 2.1). EGAs will then need to meet a higher specification, which has yet to be determined. It is expected, however, that equipment will have to be of Class I standard and capable of measuring four gases plus lambda.

### *Calibration*

3.9. It is a statutory requirement that each EGA used for MOT purposes should be calibrated periodically against a calibration gas of known composition. Normally calibration is required every three months and must be carried out by an engineer from a laboratory accredited by NAMAS for the purpose. In the case of OIML Class I models with an approved automatic gas calibration facility (known as a 'self-gassing' facility) every alternate calibration can be carried out by the MOT station itself. Exceptions have been made in respect of Class I Bosch models, where the intermediate calibration can be dispensed with, and Class I Bear models, where calibration by a NAMAS-approved engineer is required only once a year provided monthly calibration checks are carried out by the MOT station.

3.10. As with pattern approval, any suitable organization can apply to become a NAMAS-accredited laboratory through which engineers may seek NAMAS approval to calibrate EGAs. NAMAS has accredited four laboratories to date. Three—Sun, Tecalemit and Hermann—are operated by suppliers of EGAs for their own staff. The other, SIRA, is independent. Most suppliers use SIRA for approval of engineers. Currently 253 engineers from 32 firms (listed in Appendix 3.3) are NAMAS-approved through SIRA and 60 through the other three laboratories (42 from Sun, 13 from Tecalemit and 5 from Hermann).

3.11. Approval of an engineer involves an assessment by the NAMAS-accredited laboratory. The engineer must also have a calibration manual for the EGA to be calibrated (see paragraphs 7.60 and 7.61). The successful applicant is recommended to NAMAS for approval to calibrate a particular model and to become an 'authorized signatory' of calibration certificates on behalf of the laboratory. We were told that the level of skill required to become a calibration engineer is at about Ordinary National Certificate or Diploma (ONC/OND) level.

3.12. Calibration is required periodically so that the EGA continues to give readings within acceptable error limits since over time the readings tend to 'drift' from the true composition of the gas mixture. The EGA must be calibrated to within 3 per cent of the actual values of both CO and HC in a calibration gas mixture of known composition (in a cylinder of gas certified by a NAMAS-accredited laboratory). After calibration a certificate is issued to the EGA user for three (or six) months from the date of the test and a white calibration label (the seal) is fixed to the EGA. Any EGA that fails the test is tagged with a red label and may not be used for MOT tests until it has been repaired and recalibrated to the required standard.

3.13. The calibration procedure for a particular model is set out in detail in the calibration manual drawn up by the accredited laboratory. To comply with the VI's requirements (see Appendix 2.2) the procedure includes the following tasks for the engineer:

- measure and record the ambient temperature and pressure (using instruments calibrated by a NAMAS-approved procedure);
- before carrying out any adjustments, use the EGA to take initial readings of the composition of the certified calibration gas and record the results;
- check the condition of the hoses, filters, electrical connections, etc;
- carry out a gas calibration (using the certified calibration gas) and adjust the EGA to bring it within the calibration limit (after making any necessary correction for ambient pressure);
- complete and affix calibration seals; and
- complete and issue a calibration certificate of a type approved for the purpose by NAMAS and the VI.

### ***Servicing***

3.14. The calibration procedure involves some routine servicing (eg filter replacement) but no maintenance or repair. In this chapter we use the term 'servicing' to denote maintenance or repair going beyond this routine activity.

3.15. Servicing is not a statutory requirement but it is particularly important that EGAs used for MOT purposes are adequately maintained. Most MOT stations have only one EGA (see Appendix 3.4) and they have to suspend MOT testing, and suffer the consequential loss of income, for any period when their EGA is out of action.

3.16. If the calibration seal is broken during servicing (ie if the machine's casing has to be removed) then the EGA has to be recalibrated by an approved engineer. It is thus unlikely that repairs will be carried out by an organization that does not have engineers approved for carrying out calibrations.

### ***Consumables***

3.17. External filters and hoses need to be changed regularly, the frequency depending on the level of use of the EGA and any accidental damage. These parts can be replaced by the user without disturbing the calibration seal.

### **Demand**

#### ***The user group***

3.18. There were 17,749 MOT stations in March 1993 dealing with petrol engined vehicles other than motor cycles and therefore using an approved EGA.

3.19. We carried out a survey of some 800 MOT stations to obtain up-to-date information on their experience of calibration and service arrangements for EGAs (Appendix 3.4). The results indicated that garages offering MOT tests vary considerably in size from small independent outlets specializing in MOT tests to large motor dealers whose main business is the sale of new cars under franchise arrangements. The survey also indicated that over 75 per cent of outlets offering MOT tests are single site operators. Only 8 per cent of survey respondents said that they had more than one EGA.



3.20. Although the average number of MOT tests per station carried out by respondents in 1992 was 1,277 (some 25 per week) the majority carried out fewer than 1,000 tests.

### ***Purchasing decisions***

3.21. MOT stations are generally experienced purchasers and users of garage equipment. Some 80 per cent of franchised dealers and 60 per cent of independents in the survey used diagnostic equipment other than an EGA in their workshops.

3.22. We were told that awareness of products and their servicing arrangements was likely to be high, given local information networks, the trade press, and advice of trade associations. Some 9,000 MOT stations are members of the Retail Motor Industry Federation Limited (RMIF).

3.23. Although the fixed MOT test fee, currently £24, suggests that operators of MOT stations have a particular incentive to keep costs down and are likely to be discerning customers, most garages obtain income from servicing vehicles as well as from the test fee. Service may be purchased prior to the test to ensure success, or may be required prior to a retest. The DOT recently reported that some 40 per cent of cars and light goods vehicles fail the annual MOT test at their first attempt.

3.24. We asked MOT stations in the survey about the factors that influenced their choice of EGA. Price appears to be the most important with 73 per cent saying that they were influenced by this (44 per cent greatly). 63 per cent said that they were influenced by the service arrangements (34 per cent greatly) and 52 per cent by the calibration arrangements (24 per cent greatly). 69 per cent of respondents also said that their experience of calibration and servicing of a piece of equipment influenced their decision whether or not to purchase other equipment from the same manufacturer (45 per cent greatly).

### **Supply of EGAs**

#### ***Main suppliers of EGAs***

3.25. The main UK manufacturers are Sun, FKI Crypton Limited (FKI Crypton), V L Churchill Ltd (Churchill) and Richard Oliver Limited (Oliver).

3.26. Sun (a subsidiary of Sun Electric Corporation of the USA) has manufactured garage equipment, including EGAs and other electronic equipment, for many years. Its plant at King's Lynn produces EGAs for the whole of Europe and these are then sold through fellow subsidiaries in the other countries.

3.27. FKI Crypton has also manufactured garage equipment, including electronic diagnostic equipment, for many years at its plant in Bridgwater, Somerset.

3.28. Churchill is an established manufacturer of garage equipment at its Daventry plant but had not manufactured electronic diagnostic equipment until 1991 when it entered the EGA market with its Autogas 4 model. Previously it had imported electronic diagnostic equipment made by Allen in the USA.

3.29. Oliver has many years' experience as a manufacturer of gas analysis equipment used in research and development of all types of engines, including aircraft engines. It had not supplied the garage trade until it developed its Gas Check 2000 EGA to meet the demand by MOT stations in 1991. Since Oliver had no established distribution channel to the garage trade it reached agreement with the Garage Equipment Maintenance Co Ltd (GEMCO) for that company to act as sole distributor for the Gas Check 2000 and provider of calibration and servicing.

3.30. Other established suppliers of engine diagnostic equipment to the UK garage trade, such as Bear Automotive (UK) Ltd (Bear) and Robert Bosch Limited (Bosch), import from their overseas production plants.

3.31. In addition to Churchill and Oliver some 13 other suppliers entered the market for EGAs in 1991. They tended to be suppliers or distributors of other garage equipment but obtained their EGAs, usually on an exclusive basis, from manufacturers in the UK or overseas. Most of these manufacturers already had experience of selling stand-alone EGAs elsewhere in Europe and either developed new models for the UK market or modified existing ones. The largest importer of such models is H Young (Operations) Limited which, trading as Kamasa Tools (Kamasa), imports EGAs manufactured by Protech in Italy.

### *Installed base*

3.32. We estimate that the total number of EGAs being used for MOT purposes at the end of 1992 was 19,400 (see Table 3.1). This exceeds the number of MOT stations because, according to our survey, some 8 per cent of MOT stations have more than one EGA and, in addition, some suppliers of servicing keep a number of machines in stock to loan out to those whose EGAs are being repaired.

3.33. A further 7,446 EGAs were purchased for uses other than the MOT test. Suppliers estimated that, while most were part of more comprehensive diagnostic equipment, sales of stand-alone EGAs had increased because garages wished to test for exhaust emissions as part of pre- or post-MOT servicing of vehicles. Thus of the total installed base of EGAs in 1992 only 72 per cent are used for MOT purposes.

3.34. Table 3.1 shows that some 75 per cent of the installed base used for MOT purposes at the end of 1992 consisted of models approved to the OIML standards (44 per cent Class I and 31 per cent Class II). The remaining 25 per cent were approved by the VI for use in the MOT test as being installed before November 1991.

TABLE 3.1 **Installed base by classification of EGA, 1992**

<i>Classification</i>	<i>Installed base 1992*</i>
OIML Class I	8,622
OIML Class II	5,939
Other VI approved	<u>4,839</u>
Total MOT approved	19,400
Non-MOT total	<u>7,446</u>
Total number of EGAs	26,846

Source: MMC estimates from information provided by companies.

---

\*Installed base at 31 December 1992.

### *Sales of EGAs*

3.35. Over 80 per cent of EGAs that had been installed for MOT use by the end of 1992 were acquired in 1991 when the VI's requirements for exhaust emission testing became known (see Table 3.2). Most of this surge in demand was for stand-alone models. Sales declined markedly in 1992, once the VI's deadline for the introduction of EGAs had passed, to some 13 per cent of their 1991 level. Table 3.3 gives corresponding figures for the supply of all EGAs (ie including those not used for MOT purposes).

TABLE 3.2 Supply of EGAs for MOT use in the UK,\* 1989 to 1992

	1989†	1990†	1991	1992
Installed base at year end (units)	1,208	2,451	17,149	19,400
EGA sales (units)	1,092	1,243	15,628	1,953
EGA sales (£m)	5.9	5.2	29.0	3.9

Source: MMC estimates from information provided by suppliers and others.

\*Some companies had difficulty providing detailed figures for EGAs supplied solely for MOT purposes. EGAs may have been purchased by garages wishing to offer non-MOT work that requires accurate emission testing such as pre-MOT checks, engine maintenance, diagnostics and tuning.

†Figures for 1989 and 1990 relate to machines originally purchased for other purposes but subsequently used for MOT tests.

TABLE 3.3 Supply of all EGAs in the UK, 1989 to 1992

	1989	1990	1991	1992
Installed base at year end (units)	5,607	7,357	23,105	26,846
EGA sales (units)	3,636	2,684	17,167	3,050
EGA sales (£m)	11.3	11.0	34.4	8.2

Source: MMC estimates from information provided by suppliers.

3.36. In addition to the sales of EGAs, there is an after-market for their calibration and servicing and the supply of consumables such as external filters. We estimate from information provided by the larger suppliers that this after-market is worth about £8 million to £10 million a year.

### *Replacement sales of EGAs*

3.37. The suppliers estimate that EGAs have an economic life of from five to ten years depending on the level of use. The high level of sales of new EGAs in 1991 means that a replacement market has yet to develop to any significant extent. Currently only EGAs satisfying the OIML Class I or II standard are approved for installation for MOT use so that users have less choice of EGA than in 1991 when other machines could be purchased provided they were installed before 1 November (see paragraph 3.39).

3.38. The pattern of replacement sales may be affected by the proposed tightening of the exhaust emission test in 1996 (see paragraph 3.8) which will probably require the use of EGAs certified to OIML Class I. The figures in Table 3.1 suggest that some 55 per cent of the current installed base of EGAs (comprising 30 per cent OIML Class II, and 25 per cent approved for installation prior to 1 November 1991) would have to be replaced to meet such a change. Furthermore some of the Class I machines will also need to be upgraded or replaced since not all of them measure four gases plus lambda.

### *Shares of individual suppliers*

3.39. The VI circular to MOT stations lists 35 makes of EGAs that are approved for MOT use (Appendix 3.2). The most recent list we have obtained from SIRA suggests there are some 25 makes and 65 models of EGA in use in MOT stations. Currently, prospective purchasers of EGAs for MOT purposes have some 25 makes and 35 approved models (ie OIML Classes I and II) to choose from.

3.40. Table 3.4 shows the estimated market shares of the 11 suppliers that have a market share of 3 per cent or more. The four largest suppliers, Sun, FKI Crypton, Churchill and GEMCO, accounted for some 63 per cent of the installed base at the end of 1992.

TABLE 3.4 Shares of installed base of EGAs for MOT use, December 1992

Supplier	Units	Share %
Sun	4,615	24
FKI Crypton	3,177	16
Churchill (parent SPX)	2,699	14
Oliver	1,770	9
Kamasa	1,005	5
Tecalemit	920	5
Bear (parent SPX)	855	4
Bosch	756	4
Souriau	738	4
Sykes-Pickavant	578	3
Analyze	500	3
Others	<u>1,787</u>	<u>9</u>
Total	19,400	100

Source: MMC estimate from data provided by companies.

3.41. The current suppliers of EGAs comprise those long-established in the UK market and new entrants attracted by the surge in demand in 1991. Table 3.5 shows the pattern of sales from 1989 to 1992 and the extent of market entry in 1991. Almost half the EGAs supplied for MOT use in 1991 were from new entrants. Apart from Churchill, which entered the market with an OIIML Class I machine, most new entrants tended to concentrate on OIIML Class II EGAs.

TABLE 3.5 Shares of individual suppliers (MOT units sold), 1989 to 1992

Supplier	1989*		1990*		1991		1992	
	Units	%	Units	%	Units	%	Units	%
Sun	344	32	339	27	3,582	24	350	18
FKI Crypton	136	12	355	29	2,845	19	487	26
Churchill (parent SPX)	-	-	50†	4	2,612	17	37	2
Oliver	-	-	-	-	1,600	11	170	9
Kamasa	-	-	-	-	825	5	180	10
Tecalemit	-	-	-	-	731	5	189	10
Bear (parent SPX)	79	7	66	5	572	4	138	7
Bosch	236	22	100	8	297	2	74	4
Souriau	202	18	104	8	394	3	38	2
Sykes-Pickavant	-	-	-	-	908	6	188	10
Analyze	-	-	-	-	460	3	40	2
Others	<u>95</u>	<u>9</u>	<u>229</u>	<u>18</u>	<u>802</u>	<u>5</u>	<u>62</u>	<u>3</u>
Total	1,092	100	1,243	100	15,628	100	1,953	100

Source: MMC estimates from data provided by companies.

\*Sales of EGAs in 1989 and 1990 were originally made for uses other than the MOT.

†This figure represents Allen EGAs imported from the USA.

Note: Percentages do not necessarily total to 100 because of rounding.

TABLE 3.6 Shares of individual suppliers (value of MOT units sold), 1989 to 1992

Supplier	1989*		1990*		1991		1992	
	£m	%	£m	%	£m	%	£m	%
Sun	3.0	51	2.5	49	10.2	35	1.4	35
FKI Crypton	1.1	19	0.7	15	3.8	13	0.7	19
Churchill (parent SPX)	-	-	0.5	9	5.4	19	0.1	3
Oliver	-	-	-	-	2.3	8	0.3	7
Kamasa†	-	-	-	-	-	-	-	-
Tecalemit	-	-	-	-	1.1	4	0.3	7
Bear (parent SPX)	0.6	11	0.7	13	2.0	7	0.4	10
Bosch	0.4	6	0.3	6	1.1	4	0.3	7
Souriau	0.5	9	0.3	6	0.7	2	0.1	3
Sykes-Pickavant	-	-	-	-	1.1	4	0.3	7
Analyze	-	-	-	-	0.9	3	0.1	3
Others†	<u>0.3</u>	<u>4</u>	<u>0.2</u>	<u>2</u>	<u>0.4</u>	<u>1</u>	<u>0.0</u>	<u>0</u>
Total	5.9	100	5.2	100	29.0	100	3.9	100

Source: MMC estimates from data provided by companies.

\*Sales of EGAs in 1989 and 1990 were originally made for uses other than the MOT.

†Kamasa did not supply figures for value of sales.

Notes:

1. In many cases the specifications of equipment from particular suppliers will have changed over the period and hence the unit values are not comparable.

2. Columns do not necessarily add to the total because of rounding.

3.42. There is some badging of equipment whereby the same model is sold under different brand names. Those supplied by Tecalemit are manufactured by Omitec, whose machines were also supplied under the Triton and Camic labels. Servitron (sold by Analyze) and Tecnotest (sold by Sykes-Pickavant Ltd) are supplied by the same Italian manufacturer.

3.43. EGA suppliers are generally long-standing suppliers of other garage equipment (eg FKI Crypton, Sun and Tecalemit) and sales of EGAs generally represent less than 10 per cent of their annual turnover.

### *Change in pattern of supply*

3.44. Prior to the MOT requirement EGAs had been supplied mainly as modules of more comprehensive engine diagnostic equipment. From 1991 all suppliers faced a new demand for stand-alone models. This led to fundamental changes on the supply side of the market. The existing EGA suppliers in the UK such as Sun, FKI Crypton, Bear and Bosch had suitable stand-alone products but most did not qualify for OIIML status and gained VI approval only for sale prior to 1 November 1991 (eg FKI Crypton's 267 and 270 models). These companies have had to replace or upgrade their non-OIIML models to remain in the market. Most of them chose to replace their existing models with OIIML Class I EGAs (eg Sun MGA 1200, FKI Crypton 290, Bosch 831, Bear 42-400).

3.45. The main importers of EGAs were Kamasa, Bear, Bosch and Souriau (UK) Ltd (Souriau). Altogether some 27 per cent of the installed base in 1992 was imported (see Table 3.7).

TABLE 3.7 Imports of EGAs for MOT use: share of installed base, December 1992

<i>Supplier</i>	<i>Installed base units</i>	<i>Imported EGAs units</i>	<i>Imports' share of installed base* %</i>
Sun	4,615	440	2.3
FKI Crypton	3,177	0	0.0
Churchill (parent SPX)	2,699	147†	0.8
Oliver	1,770	0	0.0
Kamasa	1,005	1,005	5.2
Tecalemit	920	0	0.0
Bear (parent SPX)	855	855	4.4
Bosch	756	756	3.9
Souriau	738	738	3.8
Sykes-Pickavant	578	289	1.5
Analyze	500	500	2.6
Others	<u>1,787</u>	<u>413</u>	<u>2.1</u>
Total	19,400	5,143	26.5

Source: MMC estimates from data provided by companies.

\*Column does not sum to the total because of rounding.  
 †Allen EGAs imported from the USA.

## Distribution of EGAs

### *Channels of distribution*

3.46. Most EGA suppliers already supplied garage equipment to the motor trade before 1991 and had established distribution arrangements. In some cases these consist of a mixture of national and regional distributors and agents, normally operating on a non-exclusive basis.

3.47. There are, however, wide variations in the extent to which distributors are used. At one extreme, Sun, Bear and Hermann do not use distributors but sell directly to the end user. They say that this allows more flexibility in pricing and discounting and a closer relationship with customers. Bosch and Souriau also have some direct sales. At the other extreme, Sykes-Pickavant Ltd distributes EGAs through its 1,500 national and regional outlets for its general garage equipment.

3.48. As noted in paragraph 3.29, Oliver has an exclusive distribution agreement with GEMCO. Similarly Kamasa has an exclusive agreement with Lucas Service UK Ltd (Lucas) for the distribution, calibration and servicing of the Protech EGAs it imports.

### *Main customers*

3.49. The main customer base is made up of individual MOT stations. There are relatively few large accounts (such as Halfords, Associated Tyre Services, BT and franchised car dealer groups) and these tend to buy from more than one supplier. The larger suppliers have some national accounts or special arrangements with such customers. Some 85 per cent of MOT stations in the survey had purchased their EGAs outright. Most of the remainder were leased.

### *Warranties*

3.50. All EGAs are supplied under warranty, usually covering parts and labour for one year, although Sun extended the warranty for its MGA 1200 model to two years in 1992.

3.51. The warranties of Sun, FKI Crypton, Bear, Kamasa and Horiba impose two main conditions not generally applied by other manufacturers:

- any calibration and servicing required during the warranty period must be carried out by them or their authorized supplier; and
- authorized spare parts must be used.

3.52. An EGA under normal use requires frequent changes of the external filter. Most EGAs have two filters: a coarse filter, which is washable and reusable, to separate the water and larger particles, and a fine filter which needs to be replaced regularly. EGA manufacturers and suppliers do not produce filters. Filters are manufactured by four companies (Finite Inc, Headline Filters Ltd, Balston Inc, and Porous Media Inc) that operate world-wide. They manufacture filters for EGA manufacturers or other suppliers to specification. Users can obtain filters from their EGA supplier or from an independent supplier such as Prosol (see paragraphs 6.79 and 6.80). The exhaust probes also require replacement from time to time.

3.53. As noted in paragraph 3.51, the warranty conditions for some EGAs specify that only authorized spare parts may be used during the warranty period and this could affect users' freedom to obtain consumables from other sources. However, in our survey some 70 per cent of MOT stations said that they were not obliged under the terms of supply of the EGA to obtain spare parts from the EGA supplier. Moreover 44 per cent said they were aware that identical parts were available elsewhere.

### *Prices*

3.54. EGAs approved for MOT use in the UK have been supplied only since mid-1991 so the evidence of price changes over time is limited. EGAs are typically offered at list prices from which discounts are available. The prices quoted by the main suppliers on their best-selling models in the years 1991 to 1993 are set out in Table 3.8. List prices are generally higher for OIML Class I models reflecting their higher quality (including longer calibration interval and suitability for more stringent tests should they be introduced). With a few exceptions list prices have remained constant over the three years.

TABLE 3.8 EGA list prices, 1991 to 1993

		£		
<i>Supplier</i>	<i>Model</i>	<i>1991</i>	<i>1992</i>	<i>1993</i>
<i>OIML Class I</i>				
Sun	MGA 1200	2,995	2,990	2,990
FKI Crypton	290	4,250	4,250	4,250
Churchill	Autogas 4	-	2,640	2,640
Bosch	831	5,500	4,400	5,300
Sykes-Pickavant	T488	-	4,950	4,950
<i>OIML Class II</i>				
FKI Crypton	282	2,280	2,150	2,150
Oliver/Gemco	Gascheck 2000	2,100	2,100	2,100
Kamasa/Lucas	PR2000	2,495	2,495	2,495
Tecalemit	TD2044	-	2,350	2,350
Sykes-Pickavant	T481	-	3,950	3,950
Analyze	Servitron 173	1,790	1,790	1,790

Source: MMC from data supplied by companies.

3.55. Discounts offered by suppliers are typically 30 per cent or more for distributors and very large direct accounts and 10 to 15 per cent for smaller customers.

### *Competition for sales of EGAs*

3.56. Most sales for MOT use took place in 1991, with some 40 per cent in the fourth quarter according to our survey. There was keen competition between suppliers hoping to take advantage of

the once-and-for-all surge in demand from MOT stations. Models of EGA that were approved by the VI if purchased prior to 1 November 1991 would have had no market once the deadline had passed.

3.57. Competition was based mainly on price, although availability, quality and after-sales service were also important. Substantial discounting took place as the November 1991 deadline approached so that OIML Class II EGAs were reduced to £1,200 to £1,500 and OIML Class I to £1,700 to £3,000. The prices of the EGAs supplied by Bear and Bosch remained well above this level.

3.58. The RMIF, which has some 9,000 members amongst MOT station operators, negotiated a special discount with Churchill for members that purchased the Autogas 4 model. The RMIF told us that this special discount led to a downward pressure on prices generally since an MOT station which was an RMIF member could purchase an OIML Class I EGA for little more than a Class II model.

## Calibration

3.59. Prior to the introduction of the MOT requirements, all the EGA suppliers made arrangements to ensure that a calibration service was available for operators of their EGAs throughout Great Britain. Engineers were recruited, trained and NAMAS-approved to provide such a service. The procedure for gaining approval is set out in paragraphs 3.10 and 3.11.

### *Calibration arrangements*

3.60. Table 3.9 provides a summary of the main suppliers and their calibration arrangements. These arrangements have changed little since their introduction. They take two main forms.

3.61. The *larger suppliers* (Sun, FKI Crypton, Churchill, GEMCO and Kamasa) tend to use their own engineers to carry out calibrations or to appoint a sole agent for the purpose. Thus FKI Crypton has appointed its sister company FKI Transervice Limited (FKI Transervice) and Kamasa has appointed Lucas. The *smaller suppliers* achieve national coverage by appointing a number of agents operating in broadly contiguous geographical areas. These agents are often single engineers (eg Almac in Scotland and Automotive Test Equipment (ATE)) and may act as calibrator for more than one supplier (see Table 3.9). Typically the supplier provides training, and arranges for the engineer's NAMAS approval for the calibration of its machine. This involves the release of the calibration manual to the agent. The supplier and agent may or may not have a formal contract.

3.62. While GEMCO's own engineers carry out most calibrations it has helped two distributor/agents (ATE and Everquip) to achieve NAMAS approval to calibrate the Oliver EGA that it sells.

3.63. Calibration by engineers independent of the EGA suppliers is rare though Kaltek UK and its associates (Kaltek) calibrate a number of Sun EGAs. Kaltek has been able to obtain NAMAS approval without the release of Sun's calibration manual since the founder of Kaltek, an ex-employee of Sun, had sufficient knowledge to be able to write his own manual. Servtec engineers approved to calibrate Omitec EGAs are also able to calibrate the identical EGAs supplied under the Tecalemit 'badge' without separate approval.



TABLE 3.9 EGA suppliers\* and their calibration arrangements

Supplier	Supply of EGAs		Suppliers of calibration services		
	Manufactured by	Distributor	Main supplier	Agent	Independent
Sun	Sun	Sun	Sun		Kaltek UK CES† Celtech UK† Celtech South†
FKI Crypton	FKI Crypton	FKI Crypton (direct and indirect)‡	FKI Transervice		
Churchill	Churchill Allen (USA)	Churchill (direct and indirect)	Churchill		
GEMCO	Oliver	GEMCO (direct and indirect)	GEMCO	ATE Everquip	
Kamasa	Protech (Italy)	Lucas Brown Bros (Dana)	Lucas		
Tecalemit	Omitec	Tecalemit	Tecalemit		Servtec Almac ATE
Bear	Bear (USA)	Bear (direct)	Bear		
Bosch	Bosch (Ger)	Bosch		TAE Hermann CES Gen Diag Celtech UK ADE Angstrom	
Souriau	Souriau (France)	Souriau (direct and indirect)	Souriau§	ATE QTech Gabriel Corry	
Sykes-Pickavant	Sykes-Pickavant Tecnotest (Italy) Sensors Inc (USA) Motortest (Ger)	Sykes-Pickavant (indirect)	Sykes-Pickavant	Multiquip	
Analize	Servitron (Italy)	Analize (direct and indirect)	Analize	Transtec Euro-Tec Electrons¶ Gott¶ TES¶ Hilliers¶ Lambda¶	
Servtec	Omitec	Servtec	Servtec	ATE Almac	

Source: MMC from information provided by companies.

\*Suppliers whose EGAs account for more than 1 per cent of the supply of calibration services.

†Associates of Kaltek UK.

‡Indirect sales are those made via other national or regional distributors or agents.

§Tecalemit took over the calibration and servicing operation of Souriau in July 1993.

¶NAMAS approval in the name of Analize.

### *Shares of calibration services*

3.64. The number of EGAs calibrated by each calibration company (including any agents) is given in Table 3.10. The numbers broadly reflect the installed base of each EGA supplier. This is to be expected given that most calibrations are carried out by the EGA supplier or his agent. Only some 3 per cent of EGAs are calibrated by an independent calibrator.

TABLE 3.10 Supply of calibration/servicing,\* 1992

<i>Company name</i>	<i>EGAs calibrated number</i>	<i>Share %†</i>
Sun	4,215	23
FKI Transervice	3,341	18
Churchill (parent SPX)	2,699	15
GEMCO	1,476	8
Lucas	1,005	5
Bear (parent SPX)	855	5
Bosch	756	4
Souriau	738	4
Tecalemit	702	4
Kaltek	606	3
Sykes-Pickavant	579	3
Analize	500	3
Servtec	200	1
Others	834	5
Total	18,506	100

Source: MMC from data supplied by companies.

\*Servicing of an EGA is generally carried out by the same company that calibrates it (see paragraph 3.76).

†Percentages do not total to 100 because of rounding.

### *Calibration contract arrangements*

3.65. MOT stations are required by the VI to have a calibration contract. Our survey found that some 40 per cent of contracts were for calibration only, while 60 per cent were for calibration and servicing combined. The payment methods are shown in Table 3.11.

TABLE 3.11 Calibration contract arrangements

	%
Annual contract: payment in advance	46
Annual contract: quarterly payments	20
Payment per calibration	32
Free calibration under warranty or offer	2

Source: MMC survey of MOT stations.

### *Calibration prices*

3.66. The prices charged per calibration in 1992 were typically between £60 and £80 and varied little between suppliers (see Table 3.12). Some discounts are available on an individual basis for large customers with a chain of MOT stations, or for customers that have other items of garage equipment calibrated or serviced at the same time or that are located close to an engineer. Discounts have also been available in the form of free calibrations. Over half of the respondents to the survey of MOT stations had received at least one free calibration.

TABLE 3.12 Prices for calibration services, 1992

Company	Annual contract £/cal	Single calibration £/cal	Discount available Yes/no
Sun	60	65	No
FKI Transervice	62.50	*	Yes
Churchill	65	*	No
GEMCO	55	65	Yes
Lucas	62.50	69	No
Bear	*	60	No
Bosch	†	†	No
Souriau	†	†	Yes
Tecalemit	*	67	Yes
Kaltek	50	55	Yes
Sykes-Pickavant	71.25	81	Yes
Analyze	69	69	No

Source: MMC from information supplied by the companies.

\*The service is not offered by the company.

†The information is not available to the MMC.

3.67. Our survey found that 90 per cent of users were satisfied with the calibration service they received both in terms of price and quality. Nearly 80 per cent of those questioned said that calibration charges had remained unchanged since the EGA was purchased. However, we were told that a few suppliers (eg GEMCO, Souriau and Tecalemit) had raised their prices in the last year.

### *Uniform prices*

3.68. With few exceptions each supplier of calibration services charges its customers the same price irrespective of the location of the MOT station. This means that the charge for any particular MOT station is not directly related to the costs of supplying calibration at that station. Hence there is a cross-subsidy from customers in low-cost areas (eg densely-populated areas) to those in high-cost areas (eg lightly-populated or remote areas). This is shown by the analysis in paragraphs 4.21 and 4.22 of financial information provided by three companies.

3.69. The suppliers' explanations for their adoption of uniform pricing are similar. First, the system is simple to operate since it reduces administration costs and allows standardized promotion and marketing. Sun is typical when it claims that the cost of developing and administering a cost-based charging system would probably outweigh the benefits to any party of eliminating the cross-subsidy. Second, since MOT stations are limited by the VI in the price they can charge for the MOT test it is in some sense 'fair' to charge each MOT station the same price for the calibration service.

3.70. Analysis of the costs of providing these services would be difficult because the service is new; start-up costs may have had a disproportionate effect; and some suppliers had established national service networks for other garage equipment so that costs may be shared. Furthermore there are unlikely to be substantial economies of scale in the provision of calibration services. While there are some overhead costs for a national operator (eg training facilities, administration and co-ordination centre) the service is mainly supplied locally.

### *Barriers to entry as a supplier of calibration services*

3.71. The main barrier to entry is the EGA suppliers' refusals to allow third parties access to the calibration manual which is required to obtain NAMAS approval as a calibration engineer. A few suppliers have said that they would refuse to supply a calibration manual if asked (Sun, FKI Crypton,

Churchill<sup>1</sup> and Kamasa). Analize and Bear claim that they have insufficient numbers of EGAs to warrant further calibrators. Others (GEMCO, Bosch, Tecalemit and Sykes-Pickavant) have said that they may be willing to supply manuals on a chargeable basis. There is a particular incentive for market entry where there is a large installed base of EGAs. Generally suppliers with the larger installed bases have received requests for manuals from potential third party calibrators.

3.72. A further barrier is present in the case of some EGA models, that is an electronic key or password programmed into the EGA which has to be known to the engineer. Sun has such a password for some of its models and in the case of Churchill's Autogas 4 a special cartridge (containing the calibration software) must be plugged into the EGA. FKI Crypton said that an engineer could write his own manual by carrying out 'reverse engineering' on an EGA where no password or cartridge is required.

3.73. Fees required for laboratory accreditation, engineer approval and auditing may act as a further barrier to entry for those who would only operate on a small scale (see Appendix 3.1 and paragraph 7.64).

## **Servicing**

3.74. As noted in paragraph 3.15, although there is no statutory requirement for servicing, it is extremely important to the MOT station to have access to an on-demand repair and maintenance service because of the necessity for a working EGA for the conduct of MOT tests. Most servicing is carried out on site and may involve the repair of a fault discovered at the time of calibration or a call-out of the engineer at other times because the machine has ceased to function properly. The alternative is for the MOT station to be provided with a replacement machine while its own EGA is returned to the supplier's factory for repair. Churchill alone among the major suppliers operates such a system.

3.75. During the warranty period (normally a year) the supplier of any servicing is likely to be the EGA supplier. With the exception of Sun's MGA 1200, warranty periods are now ended for most EGAs purchased in 1991 but as yet requirements for servicing have remained low because most EGAs are in the early years of their life.

3.76. The supplier of servicing of an EGA is in almost all cases the same as the supplier of calibration services. This is because of the requirement that when the seals fitted at the time of calibration are broken—as is likely if the instrument is repaired—then the EGA has to be recalibrated. It is uneconomic for calibration and servicing to be supplied by different suppliers so that in practice any supplier of servicing must also be able to calibrate the EGA. In our survey of MOT stations, 95 per cent of respondents said that the company that supplied their calibration service also maintained the EGA(s). Thus the relative market shares of servicing are likely to be the same as those for calibration (see Table 3.10).

## ***Service arrangements***

3.77. Service contracts are voluntary and in our survey 55 per cent of MOT stations said that they had an annual service contract while 41 per cent had no service contract, preferring to pay on a call-out basis. (The other 4 per cent includes some with shorter contracts and some machines still under warranty.) Most annual contracts are for combined calibration and servicing. Sun is unusual in offering a choice of service only, calibration only, and combined contracts.

3.78. Some 90 per cent of those surveyed said that they were satisfied with the maintenance service they received.

---

<sup>1</sup>But see paragraphs 8.86 and 8.87 for Churchill's current position.

### ***Spare parts availability***

3.79. Spare parts are available from EGA manufacturers. They have told us that they are willing to supply spare parts to any creditworthy third party. As most EGAs are relatively new and servicing is carried out mainly by the EGA supplier there has been little demand for spare parts from third parties so far.

### ***Servicing of other types of garage equipment***

3.80. The suppliers told us that their service arrangements for other types of electronic garage equipment are similar to those for the servicing of EGAs. The only difference is that, other than for EGAs and smoke meters, there is no statutory requirement to have an independent calibration of the equipment traceable to the national measurement standards.

3.81. Fewer independent engineers are able to offer servicing of sophisticated electronic equipment, in part because of the specialized knowledge required to deal with computer components and software and partly because spare parts are increasingly expensive to keep in stock. Moreover modern equipment tends to be more reliable and require less servicing than earlier models, so reducing the incentive for independent operators to enter the market.

3.82. Sun, FKI Transervice and Churchill said that although they were aware that some servicing of their equipment is carried out by third parties, they could not quantify it.

3.83. The evidence from our survey shows that some 70 per cent of MOT stations consider it usual to have equipment serviced by the equipment supplier. However, independent service engineers say that they service most types of equipment.

3.84. Suppliers refuse or are reluctant to supply independents with manuals for electronic equipment such as engine diagnostic equipment but service engineers that formerly worked for suppliers appear to be able to obtain manuals or operate without them (using their own knowledge acquired in previous employment or through reverse engineering). Some suppliers acknowledge the existence of independent servicers by making spare parts available. Sun, FKI Transervice and Churchill, for example, say that they sell spare parts to anyone who is creditworthy.

### **Market definition**

3.85. Our inquiry concerns the calibration and servicing of EGAs rather than the supply of the EGAs themselves. We therefore have to identify the market forces acting on suppliers of the secondary products (ie calibration and servicing). The notion of the 'relevant market' provides a framework which can help to identify and assess market forces.

3.86. In this case there are a number of competing brands of the primary product (ie EGAs) each of which generates an after-market for calibration and servicing. A test that can be applied in order to define the relevant market is to consider whether a hypothetical sole supplier of calibration/servicing for a model of EGA (which is the *de facto* case for most models) would have the power to raise prices for calibration/servicing above a competitive level. If the answer is yes, then the calibration/servicing markets for each brand of EGA are distinct from one another and from the EGA market. Thus there would be *multiple markets* each limited to the calibration/servicing of a particular brand of EGA.

3.87. If the answer is no, there are two possibilities. There may be a *single market* in which all brands compete for the sale of EGAs *and* their subsequent calibration/servicing. In this case the price of calibration/servicing is constrained by competition for the sale of the EGA since purchasers will base their decisions not only on the price and quality of the EGA but also on the price and quality of the calibration/servicing that is available for it.

3.88. Alternatively there may be *dual markets*: one in which all brands of EGA compete for the original sale of the EGA and a separate market in which all suppliers compete for the calibration and servicing of EGAs regardless of brand. In this case the price charged by the hypothetical sole supplier of calibration/servicing for a particular brand is constrained by the ability of other calibration/servicing suppliers to switch to the model in question.

3.89. Since we know that in practice the NAMAS approval requirements and other restrictions make it difficult for calibrators to switch from one model to another, the dual market does not seem to be an acceptable description of the market. We are therefore left with two possibilities: multiple markets, where calibration/servicing of each brand constitutes a separate market, and a single market, where competition takes place between brands at the time of the sale of the EGA.

3.90. A judgment between these two possible market structures would take account of the following factors:

- the degree of competition between suppliers of EGAs;
- the extent to which the quality/features of EGA models and their calibration/servicing arrangements vary;
- the level of consumers' knowledge of available EGA models and calibration/servicing arrangements;
- the extent to which the reputation of suppliers influences purchasing decisions of MOT stations for new EGAs and other garage equipment;
- the proportion of the 'whole-life' costs of owning an EGA which are accounted for by calibration/servicing costs;
- the degree to which users are satisfied with their calibration/servicing arrangements; and
- the level of profits from calibration/servicing activities.

3.91. We assess these factors on the basis of the evidence before us in Chapter 9 and reach a conclusion about the relevant market in which to consider the behaviour of the suppliers of calibration and servicing.

# 4 Financial performance of the major companies

## Contents

	<i>Paragraph</i>
Introduction .....	4.1
The major companies	
Sun Electric UK Limited .....	4.2
FKI Transervice Limited and FKI Crypton Limited .....	4.6
SPX United Kingdom Limited .....	4.8
V L Churchill Ltd .....	4.10
Garage Equipment Maintenance Co Ltd .....	4.13
Product profitability	
Profitability of calibration and servicing .....	4.14
Profitability of servicing other products .....	4.19
Profitability of the supply of EGAs .....	4.20
Uniform pricing .....	4.21
Life-cycle costs of EGAs .....	4.23
Charging-out rates for calibration and servicing .....	4.24
Productivity and cost of service engineers .....	4.26
Costs of training and NAMAS approval for engineers .....	4.29
Costs of developing manuals and software .....	4.30
Payments in advance for service and calibration contracts .....	4.31

## Introduction

4.1. We asked four of the major companies calibrating and servicing EGAs in the UK to provide us with detailed financial information on their operations, with particular emphasis on trading in the reference services. The companies were Sun, FKI Transervice, Churchill and GEMCO. We also asked for detailed financial information from FKI Crypton which supplies the EGAs serviced and calibrated by FKI Transervice, from Oliver which manufactures the EGAs serviced and calibrated by GEMCO and from Bear, a sister company of Churchill. We sought separate information on the calibration and servicing of EGAs, the supply of EGAs and the servicing of other products. The companies were asked to give figures for stand-alone EGAs separately from those which formed part of a more comprehensive engine diagnostic unit (referred to as 'major equipment'). Oliver was unable to provide any segmented information.

## Financial performance of the major companies

### *Sun Electric UK Limited*

4.2. Sun is a subsidiary of Sun Electric Holdings Ltd, which is itself a subsidiary of Sun Electric Corporation of the USA. Sun Electric Corporation owns all the Sun companies in Europe. Its ultimate parent company is the Snap-on-Tools Corporation, also of the USA, which acquired Sun Electric Corporation in October 1992.

4.3. Sun reports its results to Sun Electric International BV which is also the parent company of Sun Electric Europe BV, both of the Netherlands. Sun's export production is sold to Sun Electric Europe BV which sells on throughout Europe, to the Middle East, and elsewhere. Sun is the only company in the group which manufactures EGAs in Europe.

4.4. The overall financial results of Sun, including the manufacture of EGAs, for each of the three financial years up to 31 October 1992 show returns on sales of [ \* ] per cent, [ \* ] per cent and [ \* ] per cent respectively and a return on average capital employed of [ \* ] per cent in 1992. There was a marked fall in operating profits in 1992 when demand for EGAs fell.

4.5. The results of trading in EGAs, of servicing and calibrating them and of servicing other products are given from paragraph 4.14 onwards.

### ***FKI Transervice Limited and FKI Crypton Limited***

4.6. FKI Transervice and FKI Crypton are subsidiary companies of FKI plc (FKI). They operate within the process control group of FKI. FKI Crypton manufactures a range of garage equipment including EGAs which it sells via its authorized distributors to the final user. It carries out no servicing or calibration but has a substantial presence in the supply of EGAs. FKI Transervice is a specialist service company which undertakes all FKI Crypton's after-sales service and calibration and also carries out warranty work on behalf of FKI Crypton and charges FKI Crypton for it. In addition FKI Transervice services other equipment like garage hoists and parking systems supplied by FKI group companies.

4.7. The summarized results of FKI Transervice show returns on sales for each of the three financial years up to 31 March 1992 of [ \* ] per cent, [ \* ] per cent and [ \* ] per cent respectively and a return on average capital employed in 1992 of [ \* ] per cent. FKI Transervice achieved very high returns on capital employed; such high returns often occur in service companies which employ little by way of fixed assets. The results of trading in the calibration and servicing of EGAs and other equipment are given in paragraph 4.14 onwards. Figures for the servicing of machines with major equipment are not available separately from stand-alone machines and other equipment.

### ***SPX United Kingdom Limited***

4.8. SPX United Kingdom Limited (SPX) owns two companies in the UK which supply EGAs. They are Churchill and Bear. Its ultimate parent company is SPX Corporation in the USA.

4.9. Churchill and Bear sell EGAs in the UK and Churchill's results are discussed in paragraphs 4.10 to 4.12. The companies operate independently of each other and their parent.

### ***V L Churchill Ltd***

4.10. Churchill has entered into an agency agreement with its parent whereby all its trading transactions are as agent for SPX. Consequently its recent statutory accounts are those of a dormant company. The results shown here are taken from the accounts used for consolidation purposes and the company's management accounts.

4.11. The company has sold automotive tools and garage equipment for many years and in 1990 made a decision to manufacture and sell a stand-alone gas analyser, the Autogas 4. The company also distributes Allen brand EGAs, manufactured in the USA by Allen, a company acquired by the SPX group in June 1993, and falling into the category of EGAs combined with major equipment. The summarized trading results of the company show returns on sales for each of the three financial years up to 31 December 1992 of [ \* ] per cent, [ \* ] per cent and [ \* ] per cent respectively and a return on average capital employed of [ \* ] per cent in 1992. The results of calibration and servicing and trading in EGAs are given in paragraph 4.14 onwards. The company trades profitably in its traditional business, but has incurred losses on its EGA business.

---

\*Figures omitted. See note on page iv.



4.12. The company is unique in the operation of its servicing facilities for the Autogas 4. These are calibrated at the MOT station by engineers trained only to calibrate. If any repairs are required, the machines are sent to the factory in Daventry for servicing and a replacement machine is provided in the meantime.

### *Garage Equipment Maintenance Co Ltd*

4.13. GEMCO supplies the Gascheck 2000 EGA manufactured by Oliver and carries out the calibration and servicing of this model. GEMCO also supplies and services a large range of other garage equipment. Its trading results show returns on sales for each of the three financial years up to 30 June 1992 of [\*] per cent, [\*] per cent and [\*] per cent respectively and a return on average capital employed of [ \* ] per cent in 1992. The results of calibration and servicing and trading in EGAs are discussed in paragraph 4.14 onwards. The company itself sold the great majority of Oliver's machines direct to their final users.

## **Product profitability**

### *Profitability of calibration and servicing*

4.14. We asked the major companies to analyse the results of their trading between the supply of EGAs, the servicing and calibration of EGAs, the servicing and calibration of other garage equipment and other activities. In all the cases the companies told us that they had to make some assumptions about the allocation of costs to each of the trading segments since their own management accounting systems did not differentiate calibration and servicing of EGAs from the balance of their business. Sun was unable to split its calibration and service results between stand-alone equipment, machines with major equipment and other equipment. Its results are all included under stand-alone machines in Table 4.1. Due to the number of contracts for servicing combinations of equipment, FKI Transervice could only split out the results of stand-alone machines. Its results for machines with major equipment are included in Table 4.3 which shows the profitability of calibrating and servicing equipment other than EGAs.

4.15. Table 4.1 shows the trading results of calibrating and servicing stand-alone EGAs and those combined with major equipment. The table ranks the results by operating profit percentage over the three years reviewed.

TABLE 4.1 Profitability of calibration and servicing of EGAs in four major companies for each year—1990, 1991 and 1992 ranked in order of operating margin

<i>per cent</i>					
<i>Stand-alone machines*</i>			<i>Machines with major equipment†</i>		
<i>Company/ annual results‡</i>	<i>Gross margin</i>	<i>Operating margin</i>	<i>Company/ annual results‡</i>	<i>Gross margin</i>	<i>Operating margin</i>
1	19.4	12.6	9	50.0	10.0
2	65.9	5.3	10	23.5	(2.0)
3	34.5	(2.8)	11	27.4	(23.0)
4	59.8	(10.3)			
5	(3.4)	(15.4)			
6	29.4	(23.5)			
7	44.7	(27.3)			
8	(65.7)	(185.7)			
Weighted average	45.8	(7.9)	Weighted average	29.9	(12.4)

Source: MMC from companies' data.

\*Sun was unable to split its EGA calibration and servicing results between stand-alone machines and machines with major equipment. We have included Sun's results under stand-alone machines.

†FKI Transervice was unable to split its results for calibration and servicing EGA machines with major equipment and other equipment. Its results for EGA machines with major equipment and other equipment are shown together in Table 4.3.

‡The results shown do not identify the company or the year in which the result was incurred.

The companies generally incurred losses on their calibration and servicing of EGAs of both types at the operating profit level. The weighted average operating loss of those companies able to provide data was 7.9 per cent of turnover in calibration and servicing of stand-alone machines and 12.4 per cent on machines with major equipment. There were three examples of companies making profits compared with eight making losses.

4.16. The MOT emission test regulations came into operation in November 1991 by which time the bulk of demand for new machines had been satisfied. Most companies operate a 12-month warranty and some companies also offered a free calibration service for the first year. Generally the results for 1992 included in Table 4.1 are depressed by the costs incurred in repairing EGAs under warranty and in providing free calibration. However, as noted in paragraph 4.6, one company (FKI Transervice) receives income from its sister company for warranty work, and this income, together with similar income from other group companies, is reflected in its margins shown for stand-alone machines in Table 4.1 and for calibrating and servicing other equipment in Table 4.3.

4.17. The cost of carrying out warranty work can be considered as part of the cost of supplying the original equipment. One company, using a recently-introduced computer system, provided us with an estimate of the cost of carrying out warranty work on all its products. The difference between its operating profits including and excluding warranty work are shown in Table 4.2. These results are, of course, specific to the company concerned and, in that company's view, are likely to overstate the costs of warranty.

TABLE 4.2 Example of profitability of servicing and calibrating all products including and excluding the cost of warranty work for three years (ranked in order of operating margin)

	<i>per cent</i>	
	<i>Operating margin including cost of warranty work</i>	<i>Operating margin excluding cost of warranty work</i>
Year 1	5.3	19.7
2	(10.3)	7.4
3	(27.3)	(3.9)

Source: MMC from company data.

4.18. Companies allocated overheads to their business segments in a manner they considered appropriate to their businesses. Most of the companies adopted as a basis a proportion of their sales revenue. The figures used were in the range of 40 to 50 per cent of turnover in most cases, although one company allocated overheads which accounted for around 70 per cent of its turnover in this business segment in its last two years and 60 per cent in the first year under review. This company adopted an approach to allocation which was more considered than the other companies. Its accounting system was able to identify more costs which were specific to the reference activities than other companies could.

### *Profitability of servicing other products*

4.19. Companies were usually more profitable at servicing equipment other than EGAs (see Table 4.3). With a single minor exception the companies made operating profits on their other businesses. The gross margins made in this segment of business are usually in line with those of servicing EGAs as is the proportion of overheads allocated.

TABLE 4.3 Profitability of calibration and servicing of equipment other than EGAs\* in three major companies for each year—1990, 1991 and 1992 ranked in order of operating margin

Company/ annual results†	per cent	
	Gross margin	Operating margin
1	29.2	21.7
2	27.0	19.8
3	23.3	17.2
4	31.2	6.2
5	50.8	2.6
6	24.2	2.5
7	20.2	1.5
8	40.3	1.4
9	50.3	(0.2)
Weighted average	27.2	13.6

Source: MMC from companies' data.

\*FKI Transervice was unable to split its results for calibrating and servicing other equipment from EGAs with major equipment. Its results are shown together in this table.

†The results shown do not identify the company or the year in which the result was incurred.

### Profitability of the supply of EGAs

4.20. The results relating to the supply of machines, split between stand-alone and combined with major equipment, are shown in Table 4.4.

TABLE 4.4 Profitability of the supply in the UK of EGAs in four major companies for each year—1990, 1991 and 1992 ranked in order of operating margin

Stand-alone machines			Machines with major equipment		
Company/ annual results*	Gross margin	Operating margin	Company/ annual results*	Gross margin	Operating margin
1	45.9	24.1	11	51.3	29.5
2	46.7	18.1	12	42.8	27.9
3	32.0	16.9	13	45.2	16.6
4	22.2	10.2	14	45.5	16.0
5	17.2	8.9	15	25.8	13.7
6	20.3	6.8	16	26.2	7.7
7	21.0	(0.6)	17	34.7	(1.8)
8	3.8	(12.4)	18	37.3	(8.9)
9	4.8	(24.8)	19	6.5	(9.8)
10	18.4	(313.8)			
Weighted average†	32.1	11.2	Weighted average	46.4	20.2

Source: MMC from companies' data.

\*The results shown do not identify the company nor the year in which the result was incurred.

†One company reported only start-up costs in 1990 which are not shown in the annual results but reflected in the calculation of the weighted average.

### Uniform pricing

4.21. The major companies have all adopted a pricing policy whereby a standard charge is made irrespective of the location of the MOT station or garage. We asked each of the major companies to estimate the profits or losses arising from the work carried out by their service and calibration engineers working in areas of the country with different population densities of EGAs. Companies

were asked to provide information for low, medium and high densities. Three companies (Churchill, FKI Transervice and Sun) were able to provide us with the information and the aggregate results of all three companies are shown in Table 4.5. The companies were not able readily to split out the servicing and calibration of stand-alone analysers separately from those combined with major equipment. Churchill's stand-alone machines were calibrated at the MOT station, but if servicing was required it was carried out at the factory. FKI Transervice engineers serviced extensively equipment other than EGAs, and Sun was not able to split stand-alone machines from the rest of the equipment it serviced. Consequently the figures shown are for a combination of service visits, comprising EGAs and other garage equipment. Some companies had difficulty in identifying areas with different density characteristics since their engineers frequently worked simultaneously in two or more types of areas and on different types of equipment. In particular, Churchill gave us figures for a combination of two engineers working a single area. Table 4.5 therefore is the combined results of four engineers working for three companies.

TABLE 4.5 Estimated profitability of calibration and servicing garage equipment in areas of different EGA population densities

	<i>Total for three companies</i>		
	<i>Low</i>	<i>Medium</i>	<i>High</i>
Number of visits carried out	1,781	2,247	2,736
Annualized turnover arising from engineers' activities:	£	£	£
Total income	132,663	153,945	199,386
Total direct costs	(114,814)	(114,781)	(128,654)
Gross profit	17,849	39,164	70,732
Direct overheads	(13,954)	(20,224)	(23,057)
Allocated overheads	(34,631)	(34,631)	(34,631)
Operating profit	(30,736)	(15,691)	13,044
Gross income per visit	74.49	68.51	72.88
Direct cost per visit	(64.47)	(51.08)	(47.02)
Operating profit per visit	(17.26)	(6.98)	4.77

Source: MMC from companies' data.

4.22. Table 4.5 shows that the income per visit of all types was relatively constant throughout the country while the direct costs of doing the work varied from £47 per visit in high-density to £51 per visit in medium to £64 per visit in low-density areas. Using the companies' methods of allocating overheads, operating profits varied from a loss of £17 a visit in the low to a profit of £5 a visit in the high-density areas. It was only in high-density areas, ie where engineers made around 700 visits of all types per annum, that companies were able to make an operating profit. We have no reason to believe that these figures are unrepresentative of a visit comprising a service and calibration of an EGA.

### Life-cycle costs of EGAs

4.23. We asked the major manufacturers to estimate the total costs to an MOT station of buying, maintaining and calibrating an EGA over its useful life. Companies were asked both to assess the costs and estimate the life of their best-selling stand-alone EGA. Most companies estimated seven years as the effective life of their machines. The results are summarized in Table 4.6. Also shown in Table 4.6 as a comparison are the estimated costs over an eight-year life of maintaining and repairing a small petrol-engined motor car. These figures are taken from April 1993 figures supplied by the Automobile Association and costs include oil, tyres, servicing and repairing but not petrol. A further example is personal computer maintenance which is usually offered on a basis of 10 to 12.5 per cent of capital cost. Costs have been discounted at 8 per cent.

TABLE 4.6 Life-cycle costs of servicing and calibrating EGAs and other equipment

	Churchill Autogas 4	Sun MGA 1200	GEMCO Gascheck 2000*	1000cc motor car	Computer maintenance 10% 12.5%	
Costs of service etc discounted:†						
(a) as a proportion of capital cost (%)	90	58	126	68	62	78
(b) as a proportion of discounted life-cycle costs (%)‡	47	37	56	41	38	44

Source: MMC from companies' data and Automobile Association.

\*GEMCO allocated a five-year life to the Gascheck 2000.

†The discount rate used was 8 per cent.

‡Capital cost plus servicing and calibration.

Compared with computer maintenance at 12.5 per cent of capital cost, which gives servicing costs of 44 per cent as a percentage of discounted lifetime costs, owners of EGAs incur costs in the range of 37 to 56 per cent on the same basis.

## Charging-out rates for calibration and servicing

4.24. We asked the companies to provide us with the charging rates they used when determining the prices of servicing and calibration. The companies provided us with service engineers' hourly rates that applied to both the length of time spent travelling to sites and the time spent on site servicing and calibrating equipment. These travel and service and calibration rates of between £25 and £33 per hour are shown in Table 4.7. However, in some cases users benefit from discounts.

TABLE 4.7 Service engineers' charging-out rates for both calibration and servicing and travel time\*

	£/man-hour
Company 1	25
2	29
3	30
4	33

Source: The companies.

\*One company, whose rate is included in the table, uses slightly higher rates in London and a lower rate where EGA servicing is combined with other work on the site.

4.25. The RMIF told us that average labour charging-out rates used in the servicing of motor cars in garages were £22 per hour for independent garages and £28 to £30 for franchised dealers.

## Productivity and cost of service engineers

4.26. We asked the major companies to give us estimates of the number of hours worked by engineers who serviced and calibrated EGAs. Companies varied in their methods of operation. Some engineers were used on specific types of equipment, some only calibrated EGAs and did not service them. The results for the two companies that could provide data are shown in Table 4.8. Information is shown only for a medium-density population area of EGAs.

TABLE 4.8 Productivity of service and calibration engineers working in a medium-density area

	Company 1	Company 2
<i>Number of visits carried out</i>		
<i>Calibration and servicing:</i>		
Stand-alone machines	674	260
Machines with major equipment	90	-
Other equipment	-	369
Total visits	764	629
<i>All types of equipment</i>		
<i>Number of hours worked per annum (including overtime):</i>		
Site time	764	887
Travelling time	1,665	510
Training time	49	28
Other time	-	186
Total hours	2,478	1,611
<i>All types of equipment</i>		
<i>Number of hours worked (including overtime) per visit:</i>		
Site time	1.00	1.41
Travelling time	2.18	0.81
Training time	0.06	0.04
Other time	-	0.30
Total hours worked	3.24	2.56

Source: MMC from companies' data.

\*One company's stand-alone EGAs are serviced and calibrated by engineers specific to that product. EGAs with major equipment are serviced by engineers who work on other products.

4.27. The average site time was one hour per visit for one company and 1.4 hours for the other. The corresponding travelling times were 2.2 and 0.8 hours per visit.

4.28. FKI Transervice provided us with a typical example of the savings it made when offering large customers a discount for servicing more than one piece of equipment on the same visit. The customer paid £190 per EGA per annum compared with FKI Transervice's normal price of £250, a saving of 24 per cent. FKI Transervice estimated that in a recent 12-month period, on visits to sites with an FKI Crypton EGA and other items of FKI Crypton equipment, it made a saving in travel time equivalent to a cost saving of some £14 per EGA contract, representing 5 to 6 per cent of the £250 normal contract cost.

### Costs of training and NAMAS approval for engineers

4.29. We asked the major companies to estimate the costs they incurred over the last two years in maintaining NAMAS approval for their engineers. For those companies able to provide figures, they are shown in Tables 4.9 and 4.10. The costs incurred by the companies in the first year of operation were around £300 for each engineer. Company 3's costs are not typical since they include the costs of setting up its own calibration laboratory. Table 4.10 shows that the ongoing annual costs of keeping engineers trained and approved were up to £1,900 per engineer.

**TABLE 4.9 Costs of initial NAMAS approval of calibration engineers**

	<i>Company 1</i> 1992	<i>Company 2</i> 1992	<i>Company 3</i>	
			1991	1992
Number of new engineers approved during period	28	60		49
	£	£	£	£
<i>Costs of NAMAS approval</i>				
Direct costs	8,000	16,000	5,000	178,000
Other costs			<u>20,000</u>	
Total costs	<u>8,000</u>	<u>16,000</u>	25,000	<u>178,000</u>
Costs of training and NAMAS approval per engineer	286	267		4,143*

Source: MMC from companies' data.

\*Company 3 set up its calibration laboratory between October and December 1991. Consequently no engineers were approved at the end of its 1991 financial year in October. The calculations therefore are made on 1992 figures of engineers in the field and the combined initial costs of 1991 and 1992.

**TABLE 4.10 Costs of training and of maintaining NAMAS approval for calibration and service engineers**

	<i>Company 1</i> 1992	<i>Company 2</i> 1992	<i>Company 3</i> 1992
Average number of calibration and service engineers employed during year:			
Based in the field	22	59	43
Based at the factory	7	7	6
Annual costs of NAMAS approval and training:			
Direct costs	13,000	31,000	7,000
Overhead allocation	-	<u>44,000</u>	-
Total costs	<u>13,000</u>	75,000	<u>7,000</u>
Other costs of training:			
Direct costs	3,000	29,000	30,000
Overhead allocation	-	24,000	-
Other costs	<u>1,000</u>	-	<u>15,000</u>
Total other training costs	4,000	53,000	45,000
Total approval and training costs	17,000	128,000	52,000
Continuing costs, for engineers in place, per engineer	586	1,939	1,061

Source: MMC from companies' data.

## Costs of developing manuals and software

4.30. We asked the major companies to estimate the costs of developing their service manuals and associated software for individual products. The results are shown in Table 4.11. One company could not split out the software costs separately.

TABLE 4.11 Development costs of service and calibration manuals and software

	£			
	1990	1991	1992	Total
<i>Company 1</i>				
SIRA charge	-	5,000	-	5,000
Software development	-	30,000	-	30,000
Total development costs over three years				35,000
<i>Company 2</i>				
Systems development and other associated costs	156,000	166,000	162,000	
Total development costs over three years				484,000
<i>Company 3*</i>				
Safety and engineering approvals	-	-	110,000	110,000
Service manual developments	-	-	41,000	41,000
Total development costs over three years				151,000

Source: MMC from companies' data.

\*Company 3 also incurred software development costs in another group company which are not shown in this table.

### Payments in advance for service and calibration contracts

4.31. We asked the companies to analyse the payments they received in advance in respect of servicing and calibration contracts. FKI Transervice was the only company that reported significant payments in advance. As at 31 March 1993 it had received £594,000 in advance of contracts for calibrating and servicing EGAs which was 57 per cent of sales in the preceding year. Sun made only a round sum provision in its accounts for advance payments and other companies only accounted for small amounts received in advance.



## 5 Views of independent calibrators of EGAs and those servicing garage equipment

5.1. The MMC wrote to all the calibrators on the VI's list of approved calibrators (Appendix 5.1). This list covers calibrators employed by EGA manufacturers/suppliers as well as independents. The replies from independent calibrators together with letters received from other firms servicing garage equipment are set out in this chapter. Some of the complaints they raise are answered in Chapter 8.

### Views of independent calibrators

#### Addtronics

5.2. Addtronics (Somerset) submitted as evidence copies of its correspondence with the Office of Fair Trading (OFT). In May 1992 it had bought a Hermann EGA which required quarterly calibration. Addtronics said that even a simple operation such as removing the instrument case to replace an internal filter would require the calibration seal to be broken so that recalibration and certification by a NAMAS-approved engineer were necessary. Addtronics considered that as NAMAS would only approve manufacturers' engineers this was a restrictive practice resulting in monopolies for certain companies. Users had to pay whatever the calibrating company decided, since the MOT station had no alternative but to pay if it were to continue to offer MOT testing.

5.3. The proprietor, Mr Addison, said that in 1991 he had given Hermann technical support, enabling it to achieve NAMAS laboratory accreditation. He had acted as Hermann's calibrator charging the company £50 per visit; the MOT stations were charged £80 by Hermann.

5.4. Mr Addison said that he had been in the garage equipment business since joining Crypton as a service engineer in 1965 and had run his own company since 1979. He became sole repair agent for Hermann equipment in 1988 and subsequently acted as Technical Service Manager, as a sub-contractor, and enabled Hermann to achieve NAMAS accreditation in the latter half of 1991. This enabled Hermann to calibrate any gas analyser irrespective of make or model. Mr Addison told us that he simply needed to write a calibration procedure for each model and prove to NAMAS that he was capable of carrying out calibrations in accordance with the procedures that he had written.

5.5. Mr Addison said that during 1992 he personally carried out 90 per cent of all the calibrations attributed to Hermann/Autocraft and completed all the repairs and modifications.

5.6. Mr Addison told us that due to increasing difficulties in obtaining payment for work which he had carried out, he finally stopped undertaking work on Hermann's behalf in November 1992. As he refused to undertake any further work on Hermann's behalf, he was now in the situation where he was unable to undertake repairs and calibration of MOT equipment even though it was he who had written the service/calibration instructions to enable Hermann to obtain NAMAS accreditation. He had also trained and appraised Hermann's staff to enable them to conduct calibrations.

5.7. Mr Addison explained that both Addtronics and Hermann had a mutual customer with the Opus 4 gas analyser that had a faulty oxygen sensor—approximate repair cost £100. Hermann had refused to rectify it even though its warranty did not expire until June 1993. It had completed the latest three-month calibration visit and charged the customer accordingly, but was refusing to carry out the necessary repairs to the oxygen circuit and accept the costs incurred. Addtronics believed that

Hermann was waiting until the 12-month guarantee period had expired so that it might charge the customer in full. Mr Addison suspected that he was, in any event, the only person with the requisite knowledge to complete a satisfactory repair. This particular equipment had already been the subject of a number of repairs and Addtronics was concerned that it might not have been of merchantable quality or suitable for the purpose for which it was purchased.

## Kaltek UK

5.8. Kaltek, an association established by a former employee of Sun (Mr Gostling), and with eight engineers in different areas of the UK, referred the MMC to the evidence it had sent to the OFT prior to the reference. Kaltek also attended a hearing, and subsequently forwarded supplementary evidence. Kaltek had NAMAS approval, through the SIRA scheme, to calibrate certain of the EGAs manufactured by Sun. Kaltek told us that this had led to a dispute with Sun which had subsequently issued writs against Mr Gostling<sup>1</sup> and some of his colleagues.

5.9. In summary Kaltek alleged that Sun had taken a number of actions designed to impede Kaltek's calibration/servicing business.<sup>2</sup> Those actions were as follows:

- (a) Sun had retrospectively increased the warranty on its EGAs from one to two years to attract back Kaltek's customers.
- (b) Sun had subsequently threatened to invalidate the second year warranty of the EGAs concerned, and simultaneously offered some free calibrations, if the MOT stations concerned were willing to sign a calibration contract with Sun.
- (c) Kaltek believed that in some cases suspension of warranty had been carried out.
- (d) Sun had also 'blacklisted' Kaltek's customers.
- (e) Sun had changed its terms and conditions of warranty to require calibration by Sun thereby denying the user a choice of calibrator other than Sun's own employees.
- (f) Sun was now installing, during its routine or free calibration visits, new software (version 3.8) which had a password that changed daily, and a 'lockout' advising the user that the equipment calibration had expired. This lockout could only be reset by use of the appropriate password for the day which was only available to Sun's employees.
- (g) Sun had also told its customers that parts approved to the OIML standard for its machines were available only from Sun.
- (h) Sun had written a letter to owners of its EGAs saying that if parts other than those approved and obtainable only from Sun were used in its OIML Class I EGAs, this would have to be notified to the VI, and would result in calibration frequency being increased from twice to four times a year.
- (i) In December 1991 SIRA sent a list of NAMAS-approved calibrating companies to the trade press to publicize them because of the very heavy volume of calls to SIRA enquiring about approved calibrators. When the list was published in the February 1992 edition of *Motor Retailer* the names of Kaltek and two other independent companies had been deleted as calibrators of Sun instruments and that of Sun and another EGA supplier inserted in their place. Kaltek alleged that this was due to intervention by Sun.<sup>3</sup>

---

<sup>1</sup>The first writ was issued approximately one year after he had been operating.

<sup>2</sup>See paragraphs 8.34 to 8.40 for Sun's response.

<sup>3</sup>This point was raised with the editor of *Motor Retailer* who told us that a corrected version of the list was published in the March 1992 edition of *Motor Retailer*.

5.10. Kaltek was asked whether it was the cost, rather than the availability of information, that prevented Kaltek gaining approval to calibrate other manufacturers' EGAs. It agreed that it was necessary to examine each proposition to see if it were viable. It said that there were ways for Kaltek to calibrate other companies' products if it wished. Kaltek considered that the SIRA route would be closed, because it believed SIRA had a rule that it would only operate with one manual to one product; and if the owner of that manual would not allow its release Kaltek would have to approach another calibration house, for example Hermann.

5.11. Kaltek told the MMC that for the first time in many years Sun had not increased its calibration/service prices in 1992. This, it considered, was due to the competition the company was facing and this, Kaltek believed, was in the public interest. Moreover this year Sun 'warranties' would expire, so Kaltek would have a considerable opportunity to compete further. However, Kaltek believed that Sun and other leading manufacturers which were members of the GEA would seek to restrict its ability to compete. This was, in Kaltek's view, now becoming evident in the calibration market for smoke meters used in the emission test for diesel-engined vehicles.

### **Servtec Limited**

5.12. Servtec Limited (Servtec) (of Guildford) attended a hearing at the MMC. It told us that it was incorporated in October 1991 specifically for carrying out calibrations on gas analysers. Mr Skan, its Managing Director, explained that Omitec Instrumentation Ltd, which made gas analysers under three labels and was purely a manufacturing company, asked him to put together a network of service engineers for them. All Servtec's three calibrators had gained NAMAS approval through SIRA.

5.13. Mr Skan told us that the costs of securing approval through SIRA consisted of £750 for preparation of the manual, a £400 initial assessment charge and a further £400 for the training of each individual engineer. In addition there was an ongoing audit fee for each engineer of £430 a year payable in quarterly instalments. Each calibration certificate issued cost £2.25 from SIRA. All the equipment used, the manometer, multimeters and insulation testers, had to be calibrated once a year by SIRA, for which it charged an average of about £50 a piece.

5.14. Mr Skan considered that the system of securing approval through SIRA was working quite well. He feared that for the market to be thrown open to more engineers would be harmful. The only way Servtec could carry out calibrations for a uniform price was by careful and selective scheduling of visits.

5.15. Mr Skan said that he could see both sides of the argument. He understood that localized 'cherry-picking' would endanger some in the trade, or otherwise lead to higher-priced calibrations in the remoter locations. He did not want to lose work, but considered that some regulation on price was needed, based on how much the job was worth. He said that while most people charged about £65.50, Souriau had decided that it took two hours to calibrate an analyser and that it took £40 travelling costs, so it charged £110 per calibration. Servtec charged £65.50 per calibration. Mr Skan was not in favour of the larger manufacturers' practice of levying an annual charge.

5.16. Mr Skan said that he did not disagree with the argument that the manufacturers of the EGAs needed to be able to exercise some control over those who calibrated their machines in order to protect their interests, ie their copyright and other intellectual property rights, the integrity of the MOT test and their reputation in general.

5.17. While not sure what a reasonable charge would be, Mr Skan considered that a possible solution would be for the manufacturers to charge third parties who wished to use their manuals in order to secure NAMAS approval.

5.18. Asked, on a hypothetical basis, about possible remedies for the present situation, Mr Skan said that it would always be sensible for there to be more than one company capable of calibrating/servicing any machine, because a company could always disappear, or go bankrupt. He was in favour of some controls on the market, otherwise there would be a tendency for companies to

concentrate on the densely populated areas and that would not be in the interests of MOT stations in the remoter locations.

### **Mr Neil Jeffery**

5.19. Mr Jeffery (trading as Automotive Test Equipment), an independent calibrator approved by NAMAS to calibrate Oliver, Souriau, Omitec, Tecalemit and Triton EGAs, told the MMC that he was about to lose his accreditation to calibrate Souriau EGAs, since its calibration and servicing operation was being taken over by Tecalemit in July 1993. He thought at the time that no NAMAS approval for calibrating an EGA was possible without the support of the service agent or the EGA supplier. He understood from SIRA that Souriau owned the 'copyright' of its manual and could therefore withdraw permission to use the manual at any time. His contract with Souriau specified the calibrations that he could carry out but there was only a verbal agreement to charge the same price. Souriau had just raised its price (£65 to £110, non-contract; £85, contract).

5.20. Under the terms of his contract with GEMCO,<sup>1</sup> Mr Jeffery could only calibrate those Gascheck 2000 (Oliver) EGAs which he had sold. Its calibration manual could not be reproduced and would have to be returned to GEMCO if he ceased to be its agent. A charge of £125 was made for the calibration manual. GEMCO had not specified a calibration charge. He was concerned that although GEMCO had raised its calibration charge to £115 he was not allowed to calibrate any EGAs supplied by GEMCO even though he was only charging £58. However, he did calibrate some second-hand machines. He could only buy spare parts through GEMCO, not from Richard Oliver.

5.21. Mr Jeffery said that he had wished to tender as the second calibrator/servicer (after GEMCO) to BT's nation-wide operation. GEMCO had no objection to Mr Jeffery offering such a service but had effectively spoilt his tender by stipulating that he could not hire other engineers.

5.22. Mr Jeffery considered that users of EGAs should have a choice of calibrator. In his opinion any engineer in this field with minimal training would be capable of carrying out a calibration. He estimated that 150 to 200 calibration customers would be required to support one engineer. Servicing could not be carried out separately from calibration. He considered that he had the skill to carry out calibration and servicing of any make of EGA given the correct information. In practice he was unlikely to have the resources to offer calibration for a large number of models over a wide area. He recognized that the major suppliers operated broadly efficient calibration/servicing operations and that the charging of a uniform price was justifiable because of its simplicity—he did that himself.

5.23. In Mr Jeffery's view EGA suppliers were over-reacting to the threat of independents taking their customers if the market was opened up. Independents were unlikely to take much of the market. Most users of the 75 per cent of EGAs now out of warranty would be likely to remain with their existing supplier for calibration and servicing. Nevertheless he believed that users should have a choice and the presence of independent calibrators/servicers might benefit the main suppliers. He pointed out that if there were an increase in the number of calibrators for a particular model of EGA it might well enhance the reputation of the supplier on the analogy of an older car being maintained by an independent garage. It was in the interests of the independents to provide positive support to the new car suppliers since the independents relied on their selling cars (here EGAs) for business.

### **Mr Derek Whittaker**

5.24. Mr Derek Whittaker told the MMC that as an FKI Transervice service engineer he had been tested and approved by a SIRA examiner to carry out calibrations of FKI Crypton EGAs. He had also been quality audited 'in the field' in July 1992. On 29 September 1992 he had been made redundant and the following morning found three FKI Transervice representatives waiting outside his house, one of whom stayed to withdraw his SIRA-approved calibration manuals, his accreditation identity card, all relevant stickers, reports and anything at all to do with calibration of MOT equipment.

---

<sup>1</sup>See paragraph 8.129 for GEMCO's response.

5.25. Having found a job with a much smaller garage equipment servicing company which he could have enabled to offer calibration of FKI Crypton EGAs, as indeed he might have done on a self-employed basis, Mr Whittaker told us that his attempts to find out why he was unable to do so had met with evasion and unhelpfulness from SIRA. It warned him of the prohibitive cost of reapproval. Mr Whittaker considered that if he were still an employee of FKI Transervice the question of reapproval would not have arisen since approval was a 'one-off' process and did not require an annual fee or retest in order to continue calibrating. Mr Whittaker said that throughout his training it was repeatedly pointed out to him that the process of calibrating FKI Crypton equipment was intended to be exclusively FKI Transervice business.

5.26. Mr Whittaker said he had no doubt that the main purpose of the alliance of NAMAS, SIRA and FKI Transervice was to create an uncompetitive practice from which all three in their own way had extracted the maximum amount of profit. Mr Whittaker considered, however, that FKI Crypton/Transervice were only adopting the same practices as their competitors.

## Views of garage equipment servicing companies

5.27. *Brover & Co Ltd* (Brover) (West Drayton) described itself as an independent garage equipment and service and installation company not tied to any manufacturer or importer of EGAs.

5.28. Brover said that originally it had anticipated seeking accreditation to protect its existing share of the MOT calibration market. It was fully competent to carry out calibrations of all known car brake testers and headlight testers and saw the EGAs as an extension to this service. Brover pointed out, however, that the rules now adopted by manufacturers, importers and the VI unfortunately precluded it from obtaining a share of this market and could easily lead to a loss of existing business for Brover because MOT operators might not want to pay for two separate companies to calibrate equipment in the same MOT bay.

5.29. Even if a number of manufacturers were prepared to allow Brover to calibrate their units, Brover would need separate approval for each manufacturer's equipment and it considered that this would not be a viable proposition.

5.30. *Tune & General Garage Equipment Limited* (Tune), a garage equipment specialist from Newbury, told the MMC that it was a distributor of EGAs principally of the FKI Crypton make. Its sales were made directly to motor vehicle testing stations—and it had sold quantities equivalent to 20 to 25 per cent of the local MOT testing station market. It had withdrawn from general servicing and calibration, as it considered that it was not viable to compete with the manufacturers' service organizations due to the high cost of NAMAS approval. Furthermore calibration manuals were not made available by manufacturers.

5.31. Tune said that a few of its customers had expressed a desire to change from what they regarded as a monopolistic situation covering calibration of EGAs, but at current market rates it still would not be viable for a small company such as Tune to try to compete with a major national organization.

5.32. A distributor for one of the leading EGA suppliers also attended a hearing with the MMC. He told us that before the start of the calibration scheme he had bought and sold some 250 of his supplier's EGAs and had also arranged to hold a small number of calibrated units to offer a replacement service to his customers whose EGAs required attention. He had assumed that his engineers' experience of his supplier's diagnostic equipment would enable them to secure NAMAS approval as calibrators when the calibration scheme started.

5.33. The distributor had attended the meeting in June 1991 of all the interested parties at which the draft calibration scheme prepared by SIRA had been discussed (paragraph 2.10). It was only there

that he learned from statements by two of the leading EGA suppliers, including his own supplier, that they did not intend to allow calibration of their instruments by third parties. He was subsequently told by his supplier that its calibration manual would not be released to him to enable his engineers to seek NAMAS approval as calibrators. When he was informed of the calibration charges proposed by his supplier and put these to some 200 of his customers, about 120 had written back to complain about the level of the charges and the absence of any choice of calibrator.

## 6 Views of EGA users and other parties

6.1. The MMC commissioned a telephone survey of a sample of 801 of the 18,000 MOT stations in the UK (see Appendix 3.4). The MMC also wrote to 200 individual MOT stations as well as 23 MOT chains, six Government departments, the Confederation of British Industry, the Trades Union Congress, trade and consumer organizations, filter suppliers and a number of other likely users of EGAs (including car manufacturers, petrol forecourt companies, car fleet operators and other major UK companies). The views of those organizations which responded as well as those of eight other companies are summarized in this chapter. Some of the complaints raised are answered in Chapter 8.

### Government departments

6.2. In March the Northern Ireland Office told us that in Northern Ireland the Driver and Vehicle Testing Agency had been carrying out visual checks on exhaust emissions during the annual MOT test. The use of exhaust gas analysers (requiring calibration) was to start on 1 April 1993, and the necessary equipment had recently been purchased. Tests on motor vehicles in Northern Ireland were subject to separate legislation and not carried out under the Motor Vehicle (Tests) Regulations 1981. Accordingly in the Department's view the calibration and servicing of EGAs in Northern Ireland did not fall within the terms of this reference.

6.3. The Scottish Office told us that it had consulted a variety of users of EGAs and found that most garages were generally content with their current servicing arrangements. Some smaller independent garages in Scotland were aware that certain EGA suppliers were operating restrictive maintenance contracts; such garages generally avoided dealing with those companies. The Scottish Office found that the larger garage companies in Scotland fell into two categories: those who were content to enter into binding agreements for the ongoing maintenance of their EGAs with their suppliers, and those who actively avoided such arrangements. The former were able to offset the higher service costs by their own economies of scale and/or by passing on higher costs to their customers. The latter were able to use their size to secure more favourable maintenance contracts with smaller local servicing companies.

### MOT chains

6.4. Of the 23 multiple MOT station operators approached five offered views.

6.5. *T Cowie plc* (Cowies) told us that it had carried out 7,500 MOT tests in its 14 test centres in 1992. It considered it intolerable that there was no competition in the market for the calibration of EGAs. In Cowies' view at least three companies should be able to calibrate each type of EGA in order to allow competitive tenders to be sought. It said that ideally anybody should be able to calibrate this equipment once their competence had been established and they were licensed. For its own EGAs (Sun and Protech models) Cowies had national calibration contracts costing £280 per annum. Its 12 Protech machines were calibrated by Lucas, and its two Sun EGAs by Sun. Cowies said that there was no choice of calibrators, with only one source as far as it was aware being licensed to calibrate each make of machine. No spare parts had yet been fitted.

6.6. *Henlys Limited* (Henlys) said that 16 of its branches carried out some 20,532 MOT tests in 1992. They had 19 EGAs between them: 7 Kamasa (Protech), 5 Sun, 3 Lucas, 3 Bear and 1 Bosch.

It also had several other EGAs requiring calibration, but they were not used for MOT testing. The fees paid and frequency of each calibration varied, but most EGAs were calibrated quarterly, the cheapest being £48 per quarter, and the most expensive £81.08 per quarter. All its EGAs were calibrated by the manufacturer except that the Bosch EGAs could be calibrated by anyone of Henlys' choice, and the Kamasa EGAs were currently contracted to Lucas, although this was not imposed upon Henlys.

6.7. *Inchcape Motors Retail* (Inchcape), comprising the grouping of the trading businesses Mann Egerton and Company Ltd (Mann), Wadham Kenning Motor Group Ltd (Wadhams) and Cooper Group Ltd, said that the latter company only operated one MOT station, but Mann operated 26 and Wadhams 36. Mann had conducted 26,960 MOT tests in 1992 and Wadhams 33,612. These two companies had some 62 EGAs, of which 34 were Churchill, 14 Oliver, 6 Sun, 3 Crypton, 2 Bosch, 2 Souriau and 1 Hermann.

6.8. Inchcape said that the fees it was charged for the calibration of the machines varied from £65 + VAT per visit, for one manufacturer, up to £85 plus VAT for another. Most machines were tied to an annual prepaid contract with the manufacturer. Inchcape said that the manufacturers appeared to be using the VI requirement for a written calibration contract to exert pressure on customers for an annual prepaid fee. With the exception of one unit all of its EGAs were calibrated by the manufacturer concerned.

6.9. Inchcape recollected very few approaches having been made by independent calibrators offering to calibrate its EGAs. It said that it was aware that garage equipment servicing firms would like to break into this market, but, in its view, the manufacturers' control from original EGA supply (to meet the VI installation date) to ongoing calibration had been very tight.

6.10. Inchcape concluded that three factors needed to be reviewed:

- (a) *Frequency of calibration*: It considered that the VI requirement of quarterly calibration was too onerous. Churchill EGAs were self-calibrating, relying on microchip technology. The machine automatically recalibrated itself on each test. Inchcape told us that its Churchill EGAs were sold to it on this basis, but the VI requirement for quarterly calibration had overridden this selling point.
- (b) *Cost of calibration*: Inchcape considered that the manufacturers had a monopoly which coupled with the prepaid contracts they had put in place enabled them to charge a high price per calibration. The quarterly calibration requirement was advantageous to the manufacturers who charged accordingly.
- (c) *Calibration agency*: Inchcape's view of the requirement for technicians who calibrate the EGAs to be NAMAS-approved was that this was sensible to ensure a national standard. It considered that true competition could only be established if users were able to contract with whoever they wished for calibration and service arrangements. Inchcape said that it would be concerned that technical knowledge and spare parts might be strongly controlled to prevent independent businesses being able to compete.

6.11. *Lex Retail Group Limited* (Lex) told us that of its 79 branches 55 were approved testing stations. It currently had 129 EGAs in use, and had completed 55,508 MOT tests in 1992.

6.12. Nearly all its branches had locally negotiated maintenance contracts for their analysers. Each EGA was being calibrated by the respective manufacturer. The calibration fees currently paid by the group ranged from £60 to £144, with extra charges being made for parts as required.

6.13. Lex said that on average each of its locations had a choice of three suppliers when placing a calibration contract. It considered that the existence of more than one supplier of calibration services and the range of contract prices indicated that fair competition had been created, indeed it considered that charges at the bottom of the range were not unreasonable at today's labour rates, and therefore, at this stage, Lex was not seeking any safeguards.



6.14. *The Perry Group plc* (PG) with 15 test centres said that it had carried out 25,000 tests in 1992. It had 17 EGAs used for MOT test purposes—6 Sun, 5 Crypton, 3 Souriau, 1 Churchill, 1 Oliver and 1 Kamasa. Its calibration arrangements had been made locally and were frequently included with a more general maintenance contract for the machine, and in some cases other workshop equipment. Fees for calibration had ranged from £50 to £90 depending on who had carried it out, and whether a more general maintenance contract existed. 70 per cent had been calibrated by the manufacturer. On choice of calibrator, PG recommended that the MMC consider what guidance (if any) was issued by the VI at the time of the run-up to the introduction of the emissions test.

6.15. PG said that if it were approached by manufacturers with an offer to calibrate, this was a logical route to take, particularly if it had enjoyed an ongoing understanding with that supplier. If dealers were unaware of the possibility of independent calibration, they would not have considered such an alternative. It therefore suggested that the MMC inquiry should encompass the following:

- (a) If manufacturers were not required to make their technical manuals freely available they had the means to limit those approved to calibrate their equipment to their own staff or independents subcontracted by them.
- (b) If on the other hand a free market existed for calibration, was this widely known among the MOT testing stations? If not, what should be done to make its availability more widely known? Could the VI publish a list of approved organizations?
- (c) Prior to the introduction of gas testing into the MOT test the VI issued a list of machines approved for use in the test. What information did they make available regarding those organizations approved to calibrate equipment? Were any independents approved at that time?

In conclusion PG said that if the availability of independents was not widely known, then it was not surprising that the manufacturers capitalized on the opportunity to provide the service.

## MOT stations

6.16. A number of MOT stations wrote to us to give their views.

6.17. *Anglian Vehicle Services* (AVS) (March) said that it had purchased an EGA from GEMCO. After three weeks it had started to malfunction. AVS had therefore intended to withhold payment until it was working. AVS said that knowing that no other company could look at the machine, GEMCO had insisted on full settlement before sending out an engineer to rectify the problem. AVS reluctantly paid, and seven visits later the machine still malfunctioned and had cost it four weeks' business in MOT testing. AVS said that despite this it had been told that the quarterly calibration fee had increased from £65 to £115, an increase of some 78 per cent in six months. AVS doubted whether its costs would have been a fraction of those it had incurred if an open market had prevailed.

6.18. In AVS's view there was no doubt that a monopoly situation existed, and that it was against the public interest. AVS supported any action to open up this market, thereby reducing service and calibration charges in line with those for other MOT test equipment.

6.19. *BDK Motor Services* of Coventry (BDK) told us that it had one Churchill EGA. It had carried out 4,000 tests in 1992. It said it had no choice of calibrator other than Churchill's 'Mandatory Calibration Contract' costing £260 a year (four visits). On contacting its usual garage equipment repairers for advice it had been informed that it was highly unlikely that it would be able to find anybody to calibrate its equipment other than the manufacturer, as it was not cost-effective for small companies such as itself to seek NAMAS approval so that it could issue the NAMAS calibration certificate as required by the VI.

6.20. BDK considered that the calibration service was too expensive at £65 for a visit of approximately 20 minutes and strongly objected to having to pay a year in advance. It said that it only did so because like all MOT stations its hands were tied in so far as it had to have an EGA to carry out an MOT test and that machine could only be calibrated by the manufacturer.

6.21. *Cornish Ford* (CF) told us that it had two EGAs. For its petrol EGA it had a Bear testing contract which it considered good value at £70 a year. For its Churchill diesel EGA, it had no choice for servicing. CF said that it had been told that a three-day SIRA course leading to a NAMAS approval would cost £870. However, CF understood Churchill would not release information on its machines even to approved engineers. CF considered that manufacturers'/suppliers' manuals should be freely available so that any competent engineer could carry out EGA calibration. Alternatively the DOT, through the VI, should do the calibrating itself. CF also believed that the users should be allowed to employ any approved engineer.

6.22. *R C Edmondson (Spalding) Ltd* said that it had one Bosch EGA, calibrated by Bosch's distributor, which it had used in carrying out 1,169 MOT tests in 1992. The average calibration fee had been £88.13 including VAT. The company believed that at the time of purchase it had no choice of calibrator, but now that the EGA's warranty had run out it presumably had a choice.

6.23. *Hartnoll Motors* (Hartnoll) (Chard), a Renault specialist, explained that it was an authorized MOT station, and also serviced, repaired and tuned various makes of vehicles. Mr Blewer, its director, said that a machine which cost £3,500 should not need calibrating every three months. He believed that had been borne out by his Sun EGA, purchased in 1991, which although calibrated as required had needed no adjustment to date.

6.24. Mr Blewer considered that every garage owner or any senior technician would be quite capable of calibrating their analyser if they so wished. In his opinion one calibration per year by an outside agent should be sufficient bearing in mind that MOT stations would do a leak check every morning and that the machine was self-calibrating and therefore automatically indicated if a service was required.

6.25. Mr Blewer had timed the calibrator on three or four occasions. He said that the calibration took approximately 15 minutes at a cost of £65 + VAT—an hourly equivalent rate of £260 which seemed excessive.

6.26. Mr Blewer considered that some equipment manufacturers had persuaded the VI to agree to the three-month calibration interval knowing that this would enable them to make money for very little effort or investment. It was also his view that the price Hartnoll paid for its EGA in comparison with other highly technical equipment such as computers, videos, televisions, music systems etc was enormously high. Such everyday household items sold in the high street did not need checking every three months. Many of them were guaranteed for five years. Thus it seemed that the garage trade had to put up with high cost and lower value for money equipment that the general public would not tolerate.

6.27. Mr Blewer told us that in the run-up to the introduction of the emission test the EGA manufacturers or their agents had in his view acted in a disgraceful way, giving conflicting and misleading information about their machines and those of their competitors. Thus the description 'up to Class I standard' did not mean that it was a Class I certified machine. Hartnoll had been caught out by this and was later told that it would have to spend another £150 and hire a gas cylinder from British Oxygen Company in order to bring its analyser up to the required Class I standard.

6.28. *Lou's Tyres & Exhausts* (Lou's) (Scunthorpe), having written to both its VI district manager and its local MP about what it considered to be the high cost of servicing and calibration of its MOT equipment, copied its correspondence with them to the MMC. Lou's explained that the cost of calibration had risen after the first year. Its FKI Transervice full cover annual contract on three pieces of equipment used in MOT tests cost over £1,000.

6.29. *Midway Motors* (Barnstaple), a small garage with an MOT bay, complained that the cost of calibrating and servicing EGAs was excessive. Including VAT it paid £82.25 a quarter for its calibrations, and £352.50 a year for its extended warranty.

6.30. *Peach's Garage* (Reading) had one Sun EGA. It carried out approximately 400 MOT tests a year. It said that it had chosen Kaltek to do its calibrations from a choice of three calibrators. Its average calibration charge was £100 plus £20 for spare parts.

6.31. *Pratt & Gelsthorpe* (Newark) sent us a copy of a letter which it had sent to Souriau (a manufacturer whose calibrator/agent was ATE). Mr Gelsthorpe considered that Souriau's calibration charge, which had risen from £65 + VAT, as charged by ATE in October 1992, to £110 + VAT some three months later, was excessive. Pratt & Gelsthorpe had reported this increase in fee to Peugeot.

6.32. *Rosary Garage* (Rosary) (Bramshaw) told us that it had an FKI Crypton EGA and carried out approximately 650 MOT tests a year. It was charged £250 + VAT a year for calibration. Rosary also told us that FKI Crypton specified that only FKI Transervice was approved to calibrate its machines. FKI Crypton had been unwilling to negotiate Rosary's calibration fee, and had referred to Ministry requirements regarding the frequency of 'servicing'. Rosary said that although individual call-outs were permitted, they were less cost-effective than an annual arrangement. Although none of its calibrations had taken longer than 20 minutes, the engineer had been instructed to charge for a minimum of 1 hour and the hourly rate was over £30. FKI Crypton had told Rosary that no other calibrators had the required equipment. Rosary was concerned that it could not select its spares on the basis of the most competitive price. Rosary also considered that as it carried out so few MOT tests calibrating its machines four times a year was excessive, particularly in view of the reliability of FKI Crypton's machines.

6.33. Mr Teasdale, the proprietor of *St Cleer Motor Company*, sent us copies of a letter and enclosures he had sent to the OFT. He asked that we take into account his examples of unfair trading when conducting our inquiry into what he considered to be a monopoly arising from mandatory MOT requirements. He further considered that this would give rise to extortionate costs which would in due course be passed on to the general public. He made four complaints about Churchill:

- (a) using advertising mailshots (to all UK MOT stations) which appeared to contravene the Trade Descriptions Act and were misleading (in particular claiming that a contract for the calibration/servicing of Churchill machines was VI mandatory);
- (b) refusing to replace or refund unmerchantable goods;
- (c) charging for two calibrations which were not carried out; and
- (d) adopting 'monopoly' tactics to extort payment for calibrations not carried out.

6.34. Mr Teasdale also pointed out that calibrations should take place 'on site', ie at the MOT station where the equipment was used, not in Churchill's own workshop, since the environment, humidity etc could affect the calibration and the machine's accuracy. Mr Teasdale concluded by saying that a manufacturer such as Churchill was in a very strong position to insist on payment of a disputed 'overdue' account, since the MOT station would otherwise not be given its next service and without the use of its EGA could not continue to offer MOT tests. Mr Teasdale said that he had been threatened with withdrawal of calibration, and had been 'forced' to pay two disputed calibration charges while being refused further calibrations on a cash-on-delivery basis, pending agreement of the disputed amounts.

6.35. *Vauxhall Welch Limited* (Bristol) welcomed the investigation. It said that there was a monopoly in as much as MOT stations were restricted as to where they could go for their calibration service. One of its main concerns was that as the cost of the EGA services could not be negotiated by the MOT stations they could be forced to pay increased rates without being able to 'shop around' for a better deal.

## Trade associations

6.36. Some 14 trade associations were approached for their views.

6.37. *The Automotive Aftermarket Association* said that our deadline for views had not allowed it sufficient time to seek views from its 600 members. However, none of its members had in the past raised the question of a monopoly situation in this sector.

6.38. The *Retail Motor Industry Federation Limited (RMIF)* and the *Scottish Motor Trade Association (SMTA)* made joint representations and attended a joint hearing. The RMIF told us that it represented over 12,000 members involved in the motor industry, of which approximately 9,000 were involved in testing vehicles within the MOT scheme or preparing those vehicles for testing.

6.39. The RMIF said that while the initial MOT vehicle emission requirements only covered carbon monoxide and hydrocarbon emissions, the RMIF and SMTA advised their members that in deciding which equipment to purchase they needed to recognize the fact that from 1 July 1992 cars manufactured in the EC had to be equipped with catalytic exhaust gas converters and also that there had for some time previously been sales of vehicles equipped with catalytic converters in this country which would progressively come within the scope of the MOT scheme. Testing the emissions of such vehicles required a four-gas analyser capable of testing oxygen and carbon dioxide emissions in addition to carbon monoxide and hydrocarbons. The RMIF understood that the DOT was about to publish additional requirements for the compulsory testing of such vehicles from 1996.

6.40. The RMIF explained that one of the grounds for criticism and concern on the part of MOT stations was that the manufacturers of all the currently approved EGAs were insisting that external inspections could only be carried out by their own engineers. Each manufacturer claimed that its reason for this insistence was that third party engineers might fit parts not made by the equipment manufacturer and that these could alter the performance of the equipment and subsequently affect the integrity of the test readings.

6.41. We were told that RMIF and SMTA members recognized the importance of maintaining the integrity of the equipment and would have no objection to a requirement that only parts made by the equipment supplier must be used in connection with servicing or calibration. However, the same manufacturers had networks of distributors throughout the UK who regularly sold, serviced and calibrated a wide range of equipment. These distributors also had access to the genuine replacement parts made by or for the EGA manufacturers. The RMIF and the SMTA and their members had yet to receive a satisfactory explanation as to why distributors with experienced staff capable of qualifying as NAMAS-approved engineers were not allowed by the manufacturers to become EGA service engineers. The fact that in certain circumstances the staff of MOT stations who did not have specific qualifications could carry out two of the four required calibrations a year made the manufacturers' insistence that only their own employees carry out the remainder even more difficult to understand.

6.42. RMIF and SMTA members involved in MOT testing considered that the resulting lack of competition must be contributing to what it considered to be the present relatively high costs for calibration services. We were told that in 1992 calibration fees ranged from £60 to £85 payable on or after calibration. The RMIF and the SMTA said that in 1993 the costs had increased, in some cases by as much as 40 per cent, and manufacturers were demanding payment for the entire year in advance. MOT stations which refused to pay would not be able to obtain the calibration service and would therefore lose their authority to test. The RMIF and the SMTA set out the following considerations in order to put the cost implications into perspective:

- the average capital outlay on equipment required by an MOT station was now around £30,000 which, if written down over a period of five years, gave an essential overhead cost of around £120 per week;
- in addition to the equipment cost, the test station had to provide premises, some 45 minutes of qualified mechanic time and some 18 minutes of less qualified assistant time per test;
- the service and calibration costs for MOT stations now totalled over £1,000 per annum, adding a further £20 to weekly costs; and
- for a test station averaging 1,000 MOT tests a year, the equipment-related costs were in the region of £7 to £8 a test.

6.43. The RMIF and SMTA considered that as the scope of the MOT tests extended towards a fully comprehensive safety and performance check, which the RMIF and the SMTA were urging should be truly annual (ie from the first anniversary of a vehicle's registration onwards, not from the

third), it would be vitally important that the service and calibration market for all items of equipment essential to the test should be as competitive as was consistent with maintaining the integrity of the equipment in use.

6.44. In this context both associations considered it relevant that, in contrast to the environment-related emission tests, the equipment prescribed for use in connection with the safety-related aspects of the MOT test, ie brake testers, and headlamp beam setters, could be calibrated and serviced by third party engineers. They said that for this reason too it was difficult to see any justification for the manufacturers' insistence on use of their own engineers, other than an attempt to retain the service and calibration work and related pricing for exhaust emission testing equipment within their own direct control.

6.45. The RMIF also said that information it had received from distributors suggested that EGA calibration charges could be reduced by up to 50 per cent if distributors were allowed to compete for this work. Such a price change would reduce MOT station costs and help RMIF and SMTA members to maintain a cost-effective service to their customers. Both parties said that they were strongly opposed to the idea of calibrating EGAs four times a year. They felt that it was excessive and once or possibly twice a year would be sufficient. They did not agree with the market-place being so tightly controlled.

6.46. In terms of changes envisaged for the emission test in 1996/97 the RMIF told us that it had recently received a paper from the DOT which it was discussing with the Department and the VI. In general, it was in agreement with the proposals so far. When smoke meters were introduced for testing diesel-engined vehicles its concerns had been listened to as only one calibration a year was required, although the first would be six months after installation of the equipment. It acknowledged, however, that smoke meters were less complex than EGAs. Both parties considered that one calibration a year for Class I EGAs and two for Class II would be ideal.

6.47. The *Society of Motor Manufacturers and Traders* (SMMT) and the *Garage Equipment Association* (GEA) attended a joint hearing with the MMC. The SMMT also submitted the results of a survey compiled from the responses of eight of its relevant members. The SMMT had 49 members who were franchised vehicle distributors, the majority of which carried out MOT tests. The GEA, a specialist trade section of the SMMT, had 14 member companies involved in the supply, calibration or servicing of EGAs.

6.48. Both organizations considered it of vital importance to all MOT stations, vehicle owners, the DOT and the environment generally that EGAs functioned correctly at all times, were accurate and that the public's confidence was maintained in the MOT test results. They believed this could be ensured by servicing and calibrating the EGAs within the scheduled intervals, by the use of correct short-life parts such as sample probes, hoses and filters, and by employing approved, well-trained engineers to carry out the work. They asked that these important considerations concerning the operation of the current system should play a significant part in the inquiry and that these issues should be taken into account by the MMC if they were to make any recommendations for change to the current accreditation and approval procedures.

6.49. The SMMT and the GEA welcomed the MMC's inquiry, since they considered that the OFT's press release at the time of the reference made it clear that it extended to related issues which could affect competition in the market such as technical and procedural requirements and the accreditation process. The two organizations considered that due regard should be given by independent operators within the market to the intellectual property rights of those manufacturers which had generated computer programs and manuals to control their calibration and servicing procedures. The two parties said that access to an equipment manufacturer's computer program, procedure manual or both was often required in order to carry out the calibration and servicing of EGAs. In their view the EGA manufacturers had the exclusive right, under the provisions of the Copyright, Designs and Patents Act 1988, to copy this work, to decide whether or not to issue copies of the work to the public, or to make an adaptation of the work either in relation to the work as a whole or any substantial part of it and to do so either directly or indirectly. The SMMT said that the creation and development of this intellectual property had resulted in the SMMT's members incurring a large and continuing financial cost.

6.50. The SMMT also told us that most manufacturers had produced EGAs for annual testing requirements in Europe and the USA for some 20 years. These programmes were very carefully controlled. The UK emissions programme had been defined in January 1991 for introduction in September 1991 for testing HGVs and November 1991 for all other MOT tests. The manufacturers themselves had set out the methodology and protocol for calibrating their own equipment. These had then been discussed with NAMAS and agreed as the methodology for each and every manufacturer. The SMMT considered that at that time there had been little discussion between the UK manufacturers and NAMAS and there was no agreed approval standard for Great Britain. The VI had subsequently adopted a specification based on an existing European standard but, in the SMMT's view, the equipment manufactured for the UK market was unique and not acceptable within the rest of Europe.

6.51. The SMMT considered that the provision of a nation-wide comprehensive calibration and servicing network offered by all manufacturers and suppliers of this equipment was vital to ensure that all EGA users had access to high-quality, reasonably priced calibration and servicing options for their equipment. Manufacturers and suppliers each had the support of a comprehensive database which logged their own EGAs together with their calibration and servicing histories and the equipment's location. This would allow each manufacturer to rationalize its calibration and service operations and reduce costs to users. The SMMT also believed that accurate and up-to-date information on the location of every analyser and its calibration status was vital to ensure that updates and modifications to equipment were incorporated and that correct calibration and servicing were carried out by a fully trained engineer. Efficient scheduling of site visits by engineers reduced costs to users to a minimum and ensured that EGAs always had a valid certificate of calibration enabling their continuous use.

6.52. In the SMMT's view incorrect calibration of equipment might cause inaccurate readings resulting in vehicles wrongly failing their MOT emission test, and if procedures for servicing and calibration were not adhered to then damage to EGAs could easily result. In addition, if a unit could not be successfully calibrated then the garage using it was required to stop its MOT testing programme, thereby inconveniencing vehicle owners and resulting in a substantial loss of revenue to the garage. The SMMT considered its survey to show that service and calibration charges for EGAs were by no means unreasonable. Most manufacturers reported in the survey that updates to equipment were frequently introduced and independent operators would be unable to provide this service adequately.

6.53. Both the SMMT and the GEA submitted that the market in relation to both the manufacture and sale of the EGAs themselves, and their calibration and servicing, was highly competitive. A wide choice of equipment was offered by manufacturers at different prices and with a full range of servicing options. The manufacturers competed strongly with each other for the business of selling the equipment to garage users and this included a variety of provisions for servicing and calibration. These were relevant considerations for all equipment purchasers when they were setting up and operating their own MOT stations. The manufacturers had no doubt that as the garage trade accumulated experience in the reliability and running costs of the various manufacturers' equipment these factors would be taken into account in making purchasing decisions.

6.54. The SMMT considered that any EGA calibration system had to maintain and safeguard the reputation and goodwill of the equipment manufacturers as well as the functioning and reliability of their equipment in the context of the statutory testing requirements. The monitoring carried out by the VI and NAMAS was not, in the SMMT's view, sufficient to ensure this; it needed to prevent any element of reduced reliability or accuracy in equipment. This was something the SMMT felt should be considered were the MMC to recommend any changes in this market.

6.55. The two organizations said that it was important for the MMC to ensure that the number of out-of-calibration EGAs did not increase as a result of any reduced level of expertise operating within the market and that the fitting of parts and components which were substandard and not approved by the manufacturer did not result in increased failure and inaccuracy. They also said that it had to be recognized that any financial or technical failure by an independent operator would affect the reputation of the manufacturers and importers of the equipment he serviced.

6.56. The SMMT said that its survey demonstrated overwhelming support for the equipment manufacturers' general practice of charging a standard nation-wide fee for their calibration and servicing operations which were conducted through their national networks of engineers.

6.57. Both the SMMT and the GEA said that as the requirement to undergo an MOT test was mandatory, manufacturers and suppliers of MOT test equipment had both a legal obligation to ensure that the equipment supplied was of the highest quality and a commercial obligation to ensure that it was then serviced and calibrated with complete accuracy and consistency to cover the full period of use that occurred between the calibration and servicing intervals laid down by the VI.

## **Consumer and other associations**

6.58. We wrote to seven organizations representing consumers or other automobile interests outside the garage or garage equipment field.

6.59. The *Automobile Association* considered that the service and supply agreements in the industry did not create a damaging monopoly, and that there was no serious adverse effect on the public interest.

6.60. *RAC Motoring Services Limited* (RAC) said that it was aware that costs for calibration and servicing were not minor. Such work did, however, have to be carried out by competent and accredited organizations. The RAC's concern centred on the costs of exhaust gas analysis to the motorist. It assumed that these costs were in part based upon the capital cost of the equipment and part upon its running costs, including servicing and calibration. It considered that any measures which would lead to greater competition among service providers, which might in turn be expected to lead to lower vehicle servicing charges, would be welcome, provided technical competence continued to be guaranteed by an appropriate form of accreditation.

## **Car manufacturers**

6.61. We approached eight major car manufacturers.

6.62. *Honda (UK)* (Honda) said that it approved the use of only one of Sun's EGAs by its dealers and strongly advised them to have the equipment calibrated by Sun which, it considered, offered a standard which was consistent throughout the UK whereas independent companies might vary from area to area. Honda also said that the costs of calibration must be carefully monitored but, to date, it was not aware of costs being a problem.

6.63. *Ford Motor Company Limited* said that it had little direct knowledge of the reference market. The company's principal concern was that its dealers should have suitable arrangements in place to ensure that their analysers, in line with all their other workshop equipment, were properly maintained. Had there been a significant concern among Ford dealers about conditions in the market, it would normally expect to have been told about it, but no such concern had come to its attention.

6.64. *Renault UK Ltd* (Renault) considered that the practices of certain suppliers of EGA equipment together with the rules for approval of calibrators had prevented a number of independent service companies from supplying service and calibration for such equipment.

6.65. Renault said that this restriction of the role of independent service companies had reduced the choice of service supplier available to its dealer network and had resulted in higher servicing costs than would be the case if service and calibration could have been obtained from independent service companies.

6.66. The majority of Renault's authorized dealers were approved MOT stations. As such they needed an approved EGA which (in accordance with the DOT requirements and with quality standards set by Renault for its authorized dealer network) had to be serviced and calibrated at regular intervals. To obtain better terms on their dealers' behalf, Renault had negotiated a servicing

package with an independent servicing company which, for a fixed fee, serviced and calibrated all the dealer's measuring equipment. Its dealers had been able to benefit from advantageous terms negotiated by Renault and to obtain servicing for all measuring equipment at one time, instead of facing the administrative complexities of dealing with a series of different companies. The dealers had remained free to take up the package arranged by Renault, or to make their own arrangements. Renault told us that it estimated that obtaining servicing for EGAs from an independent servicing company would provide dealers with a cost saving of approximately £30 to £50 per year or 6 to 10 per cent, depending on the make of EGA involved.

6.67. As far as Renault was aware, none of the four independent companies which to its knowledge offered servicing and calibration for measuring equipment in the UK were able to offer calibration or servicing of EGAs as part of their service. It understood that this was principally due to the difficulties faced by such companies in obtaining the necessary technical data on EGAs to satisfy the VI's approval requirements. Renault understood that persons seeking approval had to have access to the calibration procedures manual which was produced by the manufacturer and approved by SIRA. Such manuals contained the technical specifications necessary for the engineer to demonstrate that he was able to calibrate and service the equipment. Renault said that to its knowledge, at least two suppliers of gas analysing equipment, Tecalemit and Churchill, had refused to supply the relevant calibration manuals to independent service companies.

6.68. Renault considered that the refusal of EGA manufacturers to make available the information necessary for independent servicing companies to obtain NAMAS approval prevented such companies from satisfying DOT requirements, and therefore from providing calibration and servicing for EGAs to authorized Renault dealers and other potential customers. Dealers were therefore restricted in their choice of service suppliers and could not benefit from the competition between such suppliers which would take place if the necessary information were made available.

6.69. Renault suggested that such a restriction could be removed by requiring manufacturers of EGAs to release the technical information necessary for independent servicing companies to obtain NAMAS approval, thereby enabling them to carry out calibration and servicing of such equipment.

## **Car fleet operators**

6.70. Five of the largest fleet operators were approached.

6.71. The *Meteor Group plc* (Meteor) made a consolidated group response on behalf of its motor dealership subsidiaries Meteor Ford, Drayton of Stoke Ltd (Mercedes), Guy Salmon Jaguar Ltd (Jaguar and Land Rover) and Guy Salmon Honda Ltd. The group used a variety of EGAs in its workshops, but mainly those manufactured by Sun and Hermann.

6.72. The equipment had been recalibrated as often as once a month and not less than every six months. Calibration in some cases had been carried out by its own staff using specialist equipment and sample gases. Meteor said that once its equipment was past warranty it did not have a problem in using independent repairers for calibration service at reasonable prices. In some cases it had an annual maintenance agreement. For its Hermann EGAs the cost was about £600 per annum including a biannual calibration.

6.73. For Sun equipment the maintenance agreement cost £500 per annum, but did not include calibration which was £60 extra per occasion. However, it understood that to have Sun equipment calibrated by Sun (when the EGA was not already covered by a Sun maintenance agreement) could cost £320 a visit for a calibration taking less than 1 hour. Meteor said that whilst it was not directly affected, it would seem that a registered MOT station that needed calibration by Sun of equipment not covered by one of Sun's maintenance contracts was likely to suffer excessive costs for the work involved.

6.74. Meteor considered that the MMC's investigation might well be in the best interests of the trade and customers.



## Filter suppliers

6.75. *Headline Filters Ltd* (HFL) said that it had a vital interest, being the only UK or indeed European manufacturer of disposable microfibre filter elements for this market. HFL wished to draw the MMC's attention to the fact that HFL had been blacklisted as a supplier to Sun Electric companies throughout the world, as a result of supplying HFL products to independent servicing companies in the UK.

6.76. HFL explained that disposable microfibre filter elements were manufactured by just four companies, Balston Inc, Finite Filters Inc, and Porous Media Inc, all US corporations, and HFL, a private British company. HFL sold its filter elements throughout the world in competition with the three US manufacturers and had established a substantial market share, especially in the US, UK, French and German markets. In France and Germany, Souriau and Bosch were important customers, whilst in the UK it supplied Churchill, FKI Crypton, Oliver, Bear, and several independents, notably Kaltek and Prosol. Between 1986 and 1992 HFL had also supplied Sun, Sun Electric Europe in Holland and other Sun companies in Germany, Austria and France. Its total sales to all Sun companies had been about £60,000 a year and increasing.

6.77. In 1992 HFL had begun selling to Kaltek and Prosol elements which were identical to those which HFL supplied to Sun. The two elements in question were standard catalogue items sold to hundreds of customers throughout the world. HFL told us that in May 1992 it was informed by Sun that unless HFL stopped supplying elements to the independents, or direct to garages, Sun would no longer use HFL as a supplier. HFL told us that Sun subsequently switched to imported Finite Filter elements and requested all other Sun companies by letter not to purchase from HFL. HFL had subsequently received no further orders from Sun companies.

6.78. HFL resented Sun's action against it, since Sun had thereby excluded the only European manufacturer from a major portion of the European market, and Sun's attempts to restrict HFL's sales of filter elements through independents, if successful, would further damage HFL.

6.79. *Prosol UK*, primarily involved with mail order supplies to the automotive trade, made representations and attended a hearing. It said that its main concern was that the EGA manufacturers were trying to prevent the supply of filters by third parties implying that they were of inferior quality, though it was highly probable that the manufactured source might be identical to theirs. Prosol said that this had resulted in the EGA manufacturers retaining at least a 90 per cent share of the relevant filters market. Prosol also considered that the leading manufacturers were charging the EGA users far more for their filters, it estimated up to 700 per cent more, than Prosol. Prosol gave some examples of the price differences; in one case Sun, having first supplied filter elements prior to Prosol's market entry at £4.97 per filter, more than twice Prosol's current £2.40 price, now charged 97p for the same filter.

6.80. Prosol told us that the filters used in the EGAs were technically more sophisticated than necessary; for example, they would even remove bacteria from an air sample. It understood the filters removed particles down to 0.1 of a micron; and they would remove on average about 98 to 99 per cent depending on the filter grade. This efficiency should be set against exhaust gas contaminants of 5 microns or more. Prosol considered that the filters from all three principal UK sources were of comparable efficiency and it made little practical difference from which company they were obtained.

## Other companies

6.81. *Esso Petroleum Company Limited* told us that EGAs were used at its Research Centre. No concerns or difficulties had arisen in the servicing of this equipment.

6.82. *Hickley Valtone* (HV) (Taunton), a motor factor, told us that it considered calibration and servicing were directly connected with the sale of EGAs to the garage or workshop. It said that at the selling stage there was considerable competition between manufacturers and their agents against a large range of motor factors. Once a sale was made, the independent sector of the market was unable to offer to service and calibrate the equipment they had sold but customers had to be directed to the

manufacturer for future servicing at whatever charge the manufacturer cared to make, knowing that no competition existed.

6.83. HV was of the opinion that the competence needed for such servicing, although specialized, was not such that service engineers already employed within the independent factor sector could not achieve it with proper training, either through a technical college or through the training facilities of the equipment manufacturers themselves. HV considered that an alternative range of competent servicing personnel nation-wide would introduce the element of price competition; equally the service itself, in terms of time that a machine would be out of use, would be considerably shortened. HV said that the user needed to get the instrument running again within an hour or so, so that the previously booked flow of work was not interrupted.

6.84. HV also considered the present monopoly unfair in that once a manufacturer's agent was regularly calling on a garage, there were opportunities for further equipment sales and servicing of other types of equipment. Were it not for the introduction by the independent motor factor, at the time of the original sale, the customer's venue would not even be known to the servicing firm.

6.85. *Wincanton Ltd* (part of Unigate plc) said that after an in-depth survey it had decided to buy its EGAs from a single manufacturer, which was one of the market leaders. It considered that as correct equipment calibration was vital, and since specialist skills were required, it would certainly utilize the equipment supplier for calibration and servicing. In view of the small sums involved it preferred not to risk incorrect servicing as use of another repairer/calibrator could not yield much of a saving. It considered it reasonable that only manufacturer-trained engineers should undertake servicing without adverse effect on the warranty. It also said that it was normal for most suppliers of equipment to limit warranty cover to equipment serviced by them or their appointed agents.

# 7 Views of the Vehicle Inspectorate, the National Measurement Accreditation Service and Sira Test & Certification Limited

7.1. As indicated earlier (paragraph 2.4), the VI was responsible for organizing the introduction of tests on vehicle exhaust emissions into the MOT test. The VI consulted NAMAS on arrangements for the pattern approval of EGAs to be used in MOT emission tests (paragraph 2.6) and on the calibration of these instruments (paragraphs 2.7 and 2.8). As a number of EGA manufacturers and service companies were unable in the time available to set up arrangements for obtaining NAMAS approval for their staff, who were to carry out EGA calibrations, a scheme for this purpose was set up by SIRA which had obtained NAMAS accreditation as a laboratory for this purpose. This chapter summarizes the views of each of these organizations on their respective roles in establishing and operating the current system for EGA calibration and servicing (calibration only in the case of NAMAS and SIRA) and on a number of specific issues put to each of them by the MMC in the course of our inquiry. The MMC also wrote to 200 individual MOT stations as well as 23 MOT chains, six Government departments, the Confederation of British Industry, the Trades Union Congress, trade and consumer organizations, filter suppliers and a number of other likely users of EGAs (including car manufacturers, petrol forecourt companies, car fleet operators and other major UK companies).

## Vehicle Inspectorate

7.2. The VI attended a meeting with MMC staff and provided a written submission of its views as well as written answers to a number of questions put to it by the MMC.

### Introduction of emission tests

7.3. The VI described its role as manager of the MOT testing scheme on behalf of the DOT. As such it had laid down its requirements for the calibration of EGAs used in the MOT tests and for the calibrators to carry them out.

7.4. These requirements were also subject to the DOT's objective that MOT tests be available nation-wide at a fee which was seen as good value for money by the motoring public. Part of this objective, the VI told us, could be met by ensuring that EGA calibration was also available nationally at the lowest possible cost, but the VI had never seen this as a separate objective. In the VI's view it was necessary to allow market forces to dictate demand and price.

7.5. Against this background the VI's basic aim in setting calibration procedures for EGAs had been to ensure that the accuracy of the equipment was maintained at an acceptable level without incurring undue costs. Because of the need to keep the MOT test fee to a minimum the VI regarded costs as crucial. The fee had had to be increased to enable garages to recover the cost of calibrating and servicing EGAs. As the fee was fixed nationally the ability of garages to recover these additional costs would depend on the number of tests carried out. In the case of garages with a low testing throughput it would be for them to decide whether continued testing was viable.

7.6. The VI had examined practices in other countries and had considered their application to the MOT scheme. Many other countries had centralized testing schemes under direct government control so that equipment and procedures were not always comparable. While regular inspection and calibration of EGAs was clearly necessary the VI took the view that it should not stipulate exactly who

should carry out these checks. The VI was, however, concerned that those involved should be competent to carry out the work. With the agreement of all the interested parties the VI had approached NAMAS to devise arrangements to ensure that EGA calibrators were properly qualified.

## **Current operation of the scheme**

7.7. The VI told us that EGA models submitted for approval for use in MOT tests were independently tested by the laboratories accredited by NAMAS to determine whether they met the specification set by the DOT (paragraph 2.5). The VI saw the test reports before recognizing compliance with the requirements and issuing an approval certificate. The VI issued a list of approved equipment which was updated periodically (Appendix 3.2). At times when enquiries were likely to be more frequent—such as on the introduction of the smoke meter test on diesel exhausts on 1 January 1993—the approved list would be updated and issued monthly. At other times the issue of an updated list might only be done annually but the VI's local District Offices always had an up-to-date list from which to advise garages.

7.8. The VI had also issued a list of approved calibrators when emission testing was introduced (Appendix 5.1). This was based on advice from NAMAS and the four NAMAS-accredited calibration laboratories (paragraph 2.8). The VI planned to issue an updated list in the near future.

7.9. The four NAMAS-accredited laboratories also accumulated data on EGA calibrations so that the VI could objectively review calibration requirements. The VI had recently agreed to relax the frequency of calibration for two EGAs based on data provided by SIRA.

## **Future trends**

7.10. We asked the VI about likely future developments on the vehicle emission test. We were told that the DOT proposed to revise the test in 1996 to accommodate vehicles equipped with exhaust catalytic converters to reduce emissions. The TRL had been commissioned to carry out research on the most appropriate test procedure. The trade associations would be consulted about the test and specifications for the equipment when the TRL had completed its research around the middle of 1994. The VI said that it was in regular contact with the garage equipment manufacturers and the garage trade to keep them in touch with developments.

7.11. In this context we also asked the VI how many of the EGAs currently listed by it as approved for MOT tests, and purchased by MOT stations, were likely to need replacing in 1996. We were told that it would not be possible to say which of the present day EGAs would still be acceptable until the TRL had completed its research. But in the VI's view, because the emissions from vehicles equipped with catalytic converters were of an order of magnitude lower than those from conventionally tuned engines the accuracy requirements of the EGAs were likely to be tightened significantly. It was also likely that the EGAs would be required to measure four gases, oxygen and carbon dioxide in addition to CO and HC, plus lambda. The VI said that it had stressed to MOT stations many times that some of the equipment currently in use would need to be changed in 1996.

7.12. Some four gas/lambda instruments were already on the market but we put to the VI the suggestion made to us that the current emission test had been rather hurriedly introduced on 1 November 1991 (see paragraph 7.48). The VI told us that it had received no complaints to the effect that the garages or their representatives had been pressurized into accepting the change. In its view it was unlikely that a longer lead time would have resulted in any significant difference to the test introduced. Nor, with the benefit of hindsight, did the VI consider that any aspects of the current approval and calibration requirements would have been different if more time had been available. The VI was working to a similar lead time for the introduction of the 1996 changes.

7.13. We asked the VI about possible further changes to the required frequency of calibration of EGAs in the light of experience. The Inspectorate told us that it had hitherto relied on approaches from individual EGA manufacturers to prompt a review of calibration frequency. It now considered that it would soon have access to sufficient accumulated data to consider a relaxation for all EGAs

approved under the OIML Class I specification. Resources permitting, the VI hoped to start such an exercise later this year. The VI also pointed out that, in its view, not all EGA manufacturers or calibrating companies would necessarily welcome a reduction in calibration frequency as it would also result in reduced revenue.

7.14. We also put to the VI the possibility that the frequency of EGA calibration should relate more to the volume of gas throughput rather than a fixed time interval. It had been pointed out to us that it was difficult to justify the same calibration frequency for EGAs used in urban MOT stations carrying out thousands of MOT tests a year as for those in rural locations where the number of tests might be as few as 100 a year. The VI's view was that it would be very difficult to develop an effective calibration system based on the amount of use of an EGA. This might, however, be possible for instruments controlled by a microprocessor and it was something worth considering for the new equipment to be introduced in 1996.

7.15. We enquired whether the VI was considering extending to other MOT testing equipment the independent NAMAS-accredited calibration procedures it had introduced for EGAs. The VI said that it was examining how NAMAS might be able to help with this but no specific proposals were currently in the pipeline.

## Complaints

7.16. We raised with the VI a number of complaints we had received in evidence about the functioning of the EGA calibration and servicing system. In particular, on servicing we understood that the OFT had included this in the reference on the VI's recommendation. We asked the reason for this recommendation. The VI told us that it had become aware of pressure being exerted on MOT stations to use only spare parts for an EGA supplied by the manufacturer. The GEA had, in fact, asked the VI to write to MOT stations to tell them that only manufacturers' spare parts were acceptable for EGAs. The VI considered this issue to be relevant if the matter were referred to the MMC.

7.17. Asked for its own view on the spare parts issue, the VI said that as long as the accuracy of the equipment were not jeopardized the source of replacement parts should be open. This should help to keep costs down so helping to minimize the overall MOT scheme costs. In the VI's view the calibration procedure would ensure that the performance of EGAs was maintained so that only spare parts that did not adversely affect performance could, in practice, be fitted. The VI was, consequently, of the opinion that pressure on MOT stations to use only EGA manufacturers' spare parts had been unwarranted.

7.18. In this context we put to the VI the possible remedy (paragraph 10.8) of encouraging competition in spare parts while maintaining the integrity of the instruments if specifications for spares such as filters were published and a procedure established through which suppliers could have their products independently certified as meeting the required standard. In the light of its approach set out above (paragraph 7.17), the VI considered such a proposal unnecessary. In its view the EGA should be specified in terms of performance to be achieved and not in terms of its design and construction.

7.19. On the associated issue of the alleged use by some manufacturers of the terms of their warranties to prevent the use of spares other than their own, the VI told us that it would deplore any move by manufacturers to restrict the supply of spares. This would, in its view, unnecessarily increase the costs incurred by MOT stations. The VI did not, however, have any remit or powers to intervene in practices such as this.

7.20. We also raised with the VI a number of aspects of the apparent unwillingness of some EGA manufacturers to release their calibration/service manuals to third parties, so preventing them from obtaining NAMAS approval to calibrate the manufacturer's EGAs. The VI saw the restriction of calibration of their EGAs by some manufacturers to their own employees as another measure that unnecessarily increased the costs borne by MOT stations. The VI considered the opening up of the market as necessary to introduce an element of competition which it believed could be provided by

a number of independent calibrators whom it considered capable of carrying out the work to the standard set by the NAMAS accreditation system.

7.21. We also asked the VI about a proposal it had referred to in its discussions with the OFT to make approval of smoke meters for use in MOT emission tests on diesel engines subject to the condition that manufacturers' calibration manuals should be made available to third parties. This was apparently dropped subsequently because of objections by the GEA. The VI told us that this condition was originally accepted in principle by the GEA at a meeting held on 9 April 1992, but it subsequently made strong representations that it be dropped. The VI had in consequence reconsidered the issue and concluded that the proposal was perhaps outside its mandate to keep MOT testing costs to a minimum. The VI did not believe that it was within its remit to intervene in commercial practices. The proposal was replaced by a clause making availability of third party calibration an option.

7.22. We also referred in this context to charges on a per capita basis proposed by the VI for the making available by manufacturers to third parties of copies of their smoke meter calibration manuals or controlling software. We were interested in the method used to calculate the charges and whether the VI considered that similar charges would be reasonable if, on an entirely hypothetical basis, the MMC were to recommend the future application of such a condition to the continued approval of EGAs currently in use as well as new ones. The VI said that the proposed fees were very much 'top of the head' figures although they had been agreed with key equipment manufacturers. Its discussions at that stage had been concentrating more on policy than on detail. The VI would wish to see the level of such fees negotiated with the GEA within reasonable guidelines but would prefer that the trade came to its own conclusions on the actual figures. It was not something the VI would wish to set or to police.

7.23. We drew the VI's attention to its Special Notice 9/92 issued to MOT stations in September 1992 in connection with the tests on diesel-engined vehicles due to commence on 1 January 1993. This had listed approved smoke meters and subdivided these between manufacturers which had indicated that calibration of their meters would be open to third parties and those that had not. We enquired why similar guidance had not apparently been given on the introduction of emission tests by EGAs. The VI told us that it did not have a record of those companies that allowed third party calibration because permitting such calibration was not a condition of approval for EGAs. The VI believed there might be a case for changing the conditions of approval for new EGAs so that the manufacturer was required to make clear whether or not third party calibration was acceptable. This too was something the VI was willing to consider when changes were made to the test requirement in 1996.

7.24. On another aspect of the attitude of EGA manufacturers to calibration of their instruments by third parties, we asked the VI for its views on some conflicting evidence we had received. This concerned the discussion in June 1991 of the draft scheme drawn up by SIRA (paragraph 2.10). It had been suggested to us that a number of manufacturers had indicated, at that time, a willingness to allow calibration by third parties but had subsequently gone back on that undertaking. The VI told us that statements had been made by representatives of several of the major manufacturers to the effect that they would make calibration information available to third parties. With hindsight, however, the VI was unsure whether this commitment applied to any third party or simply to the manufacturers' appointed agents.

7.25. We also put to the VI concerns expressed to us about the level of fees charged for EGA calibration, the increases in 1993 as compared with 1992 and the growing practice of some manufacturers of promoting annual calibration/service contracts payable in advance. The VI told us that it regretted such practices but it had no power to intervene.

7.26. We drew the VI's attention to a specific complaint against one manufacturer which in promoting an annual calibration contract had suggested that this was mandatory under Appendix D to the MOT Instruction Manual (paragraph 2.12). This appendix does require a written contract where an MOT station employs either the manufacturer or a calibration specialist to calibrate a test instrument. A certificate for each calibration is also required. The VI told us that this requirement was first set out in a Special Notice sent to all MOT stations in December 1983. Its extension to EGAs had been automatic. The requirement helped to ensure not only that equipment was within the calibration requirements when the VI made its annual inspection of the test station but also that

calibration was maintained throughout the year. In line with this aim the VI normally expected such contracts to run for a year.

7.27. We sought the VI's views on one of the arguments advanced by some manufacturers against allowing unrestricted access to their calibration manuals by third parties. These manufacturers told us that they operated a national calibration service charging uniform fees. They feared that access by third parties to their manuals would result in 'cherry-picking' of the more concentrated and profitable urban test stations leaving them with the less profitable outlying areas. The VI told us that the DOT would not wish to see any reduction in the number of test stations in remote areas. This might be the effect of any significant increase in calibration costs. On the other hand it might be possible for local technicians in remote areas to secure NAMAS approval if manuals were more freely available. The VI was aware that in Scotland, for example, technicians involved in calibrating equipment for the oil and gas industry had shown interest in EGA calibration.

7.28. We enquired of the VI about special arrangements for the more remote test stations with a very limited throughput of tests per year. The VI told us that these arrangements applied to smoke meters only where a simple eye test for the worst polluters had been substituted. This applied to test stations testing fewer than 350 vehicles a year and 15 miles or more from the nearest station with a smoke meter. Something less than a dozen stations qualified for this exemption. Such an exemption could not be granted for EGA tests as CO and HC content could not be assessed from a visual inspection of petrol engine exhaust emissions.

## **The National Measurement Accreditation Service**

7.29. NAMAS provided a written submission of its views on this reference, attended a hearing with the members of the MMC conducting the inquiry and answered in writing some specific points about its role raised by other parties in their evidence to the MMC.

### **NAMAS's role**

7.30. NAMAS told us that its involvement in the subject of this reference was restricted solely to the accreditation of the site calibration of the EGAs by approved operators. It did not extend to approval of the competence of the operators to service the equipment.

7.31. NAMAS said that it had been formed in 1985 by the amalgamation of the activities of the British Calibration Service (BCS) and the National Testing Laboratory Accreditation Scheme (NATLAS), the two former laboratory accreditation services of the National Physical Laboratory (NPL), which was itself an Executive Agency in the Department of Trade and Industry. NAMAS-accredited laboratories were part of the UK National Measurement System constituting a major channel for the dissemination of measurement standards and the provision of authenticated calibration and testing services. In NAMAS's view these measurements were essential to underpin manufacturing industry, to ensure that goods and services purchased were reliable, and in the support of regulatory activities.

7.32. NAMAS said that its accreditation was granted to laboratories only after a rigorous assessment against stringent criteria detailed in the NAMAS accreditation standard, which is aligned with the European standard EN45001 and the International ISO Guide 25. This document contained the requirements relating to management, quality system, staff, facilities, equipment and procedures that all laboratories had to satisfy. Laboratories were required to maintain compliance with the Accreditation Standard at all times and NAMAS carried out regular surveillance to ensure that standards were being maintained.

7.33. NAMAS told us that its first involvement in the MOT exhaust emission scheme concerned the pattern approval of instruments to be used for measuring vehicle emissions. The VI acted as the pattern approval authority and required instruments to meet the requirements of the OIML international recommendation 'Instruments for measuring vehicle exhaust emissions', OIML R 99. Several UK manufacturers had complained of being seriously disadvantaged as there were no

accredited laboratories in the UK capable of performing tests to ensure compliance with the OIML specification. In early 1991 the VI sought the assistance of NAMAS in accrediting UK facilities. The testing requirements covered the analytical performance of the instrument and its performance characteristics when subjected to influence factors such as temperature, pressure, humidity, electrical power variations and electromagnetic radiation. Two laboratories (GEC Avionics Ltd and SIRA) subsequently received NAMAS accreditation for testing to the OIML specification. NAMAS said that it had followed its prescribed procedures in accrediting despite a tight time schedule set by the DOT. Both organizations had to demonstrate their ability to generate and measure the appropriate influence factors and to operate the gas analysers according to the manufacturer's instructions; performance of the tests required by the OIML specification were actually witnessed by NAMAS staff at both laboratories.

7.34. The VI had also sought NAMAS advice on the site calibration of instruments at MOT testing stations to ensure their ongoing satisfactory performance. In collaboration with the GEA and NAMAS the VI drew up EGA calibration requirements which were formally published as document V14/07/20/CAL/EM (Appendix 2.2). These requirements consisted of initial readings of the composition of a calibrant gas mixture, certain simple functional tests such as the examination of the hose and filters, the integrity of internal pipework, voltage of the gas bench and electrical safety of the input socket, and then adjustment of the instrument using the calibrant gas mixture to bring its readings within the permitted tolerance. Except for certain Class I instruments this calibration procedure was to be carried out at MOT stations every three months by designated approved operators from NAMAS-accredited laboratories. NAMAS reiterated that its accreditation covered only the calibration of the instruments and not their servicing.

7.35. NAMAS said that many instrument manufacturers were concerned that they did not possess the knowledge or the resources necessary to prepare for NAMAS accreditation, especially within a tight time schedule. In the circumstances it was agreed that SIRA would formally contract the staff of these manufacturing organizations and independents to operate from within the SIRA aegis with some 250 individuals having approved operator status. Three other organizations (Hermann, Sun and Tecalemit) achieved NAMAS accreditation for performing site calibrations under their own name and these organizations covered some 70 to 80 approved operators in total. NAMAS told us that in its assessment procedure it looked at the calibration competence of individual approved operators and the capability of the laboratory as a whole to control the work of its personnel. In NAMAS's view calibration competence was not a preserve of the market leaders in the supply of equipment but without a detailed knowledge of the operation of specific types of analysers—passwords, adjustable potentiometers, etc—personnel could not be granted NAMAS-approved operator status.

7.36. NAMAS also told us that during its initial assessment of laboratories NAMAS staff had observed a third of the calibration staff performing calibrations in a simulated MOT station in accordance with their documented procedure and it was planned to observe the performance of each approved operator at least once in every three-year period. As part of the laboratory quality system each NAMAS-approved operator was also monitored in an MOT station by trained auditors of the accredited laboratory every six months.

7.37. In this context we asked NAMAS about evidence from Sun to the effect that NAMAS requirements prevented it from training anyone other than its own employees in its NAMAS accredited laboratory. NAMAS told us that it saw no problem if Sun wished to enable others to seek NAMAS calibration approval through its accredited laboratory. It would be possible for third parties to operate under the Sun aegis; this already happened in the SIRA scheme.

7.38. NAMAS's role also extended to the accreditation of laboratories supplying cylinders of the standard gas mix used in the calibration of EGAs. NAMAS told us that it had accredited two such laboratories, the British Oxygen Company at Deer Park and Gas and Equipment Limited at Aberdeen. This enabled these companies, and others which might subsequently qualify, to supply the cylinders carrying a NAMAS certificate of accreditation declaring the composition of the gas. This was a mixture consisting nominally of 6 per cent CO, 15 per cent CO<sub>2</sub>, 2,400 parts per million of propane and the balance nitrogen.



7.39. In the light of the general concern expressed by the VI and EGA users about costs we asked NAMAS about the charges for its services in this field. NAMAS said that its fees consisted of an applicant fee, an initial assessment fee and an annual subscription. These fees covered the cost of surveillance, reassessment and audit surveys. The fees varied with the size of the operation and the range of measurement or tests for which accreditation was sought. (Examples of fees charged by NAMAS for the accreditation of testing associated with EGA approval are shown in Appendix 3.1.)

## **Operation of the EGA calibration system**

7.40. We put to NAMAS a number of points about the operation of the EGA calibration system including some criticisms we had received in evidence.

7.41. We asked NAMAS about the knowledge and experience required to carry out an EGA calibration and whether in its view the procedure could be described as highly technical. For example, was previous employment or training by the manufacturer essential in seeking NAMAS approval as the calibrator of a particular model of EGA? NAMAS thought not. In its view the requirements did not rest in the knowledge of one particular manufacturer's products but more in the knowledge of the principles on which the instrument operated and on which the calibration procedure rested. The procedure was not highly technical but it did require some level of technical competence which varied widely from instrument to instrument. With some, a fair degree of experience in electronics was needed; connection of meters to correct terminals, adjusting for certain voltage readings, adjusting gas regulators etc. In some the operation was simplified to connecting the gas supply and pushing a button. There were no hard and fast requirements; each applicant for approval was individually assessed.

7.42. We put to NAMAS allegations made by some EGA manufacturers that the standards and checks it had introduced at the start of the accreditation process had subsequently been eroded; for example, by the approval of some insufficiently experienced or qualified operators as calibrators. NAMAS said that it was particularly concerned to maintain its standards. There was regular monitoring of each approved operator twice a year by each of the four accredited laboratories; NAMAS would also have monitored each of them over a three-year period.

7.43. We further put to NAMAS the case of a particular operator who, it was alleged, had been accepted as an approved EGA calibrator through SIRA for another employer only a few weeks after being made redundant by a major EGA manufacturer because he had no electronics experience and was judged unsuitable for retraining. The same manufacturer said that in this NAMAS had broken its own requirements of a history of electronics employment and experience in calibrating equipment of the EGA type. NAMAS was also alleged to have told this manufacturer that new engineers joining the company had to be employed for a minimum period of four months before approval could be considered. NAMAS denied making the stipulations of four months' experience and a history of electronics employment. It reiterated the emphasis it placed on individual assessment and said that it would not rule a candidate out solely on the basis of his past experience. The candidate concerned had no experience in either electronics servicing or precise measurement and so NAMAS placed particular importance on his record during training for calibration and on its direct assessment of the candidate carrying out the calibration procedure. This engineer had demonstrated his ability to perform required calibrations at the time he was first assessed and during subsequent audits.

7.44. We sought NAMAS's views on the belief of some EGA manufacturers that they should be able to control or at least influence the selection of those approved to calibrate their instruments. NAMAS said that it considered it an unnecessary requirement that to calibrate EGAs adequately one had to be employed by a manufacturer.

7.45. We asked NAMAS why it was necessary, under the present approval procedure, that an operator was withdrawn from the list of approved calibrators if he changed his employment. NAMAS said that an approved calibrator worked to the quality system of an accredited laboratory. If he changed his employment NAMAS had no knowledge of the quality system in which he was working and whether it met NAMAS's requirements. Even if he moved to another accredited laboratory NAMAS would have to re-examine him to ensure he was working correctly to the quality system of the new company. On the case of an employee seeking to set up on his own as a calibrator he could

apply in the normal way, through SIRA or any other accredited laboratory, and NAMAS would assess the quality system to which he was proposing to work. This was not, NAMAS pointed out, simply a question of the candidate's own competence. Adequate back-up from the management organization was an integral part of the calibration capability.

7.46. Although servicing of EGAs was outside NAMAS's remit we sought its views on the possible effect of inadequate spare parts, particularly filters, on an instrument's performance and, possibly, on its pattern approval. NAMAS agreed that poor-quality spares, such as filters with too large a pore size, could degrade performance of an EGA. In its view the only aspect over which NAMAS had any control was the calibration. If this were correctly carried out and the instrument calibrated satisfactorily that was the limit of NAMAS's interest.

7.47. We asked NAMAS's opinion of a suggestion made to us that problems over EGA spares could be avoided if pattern approval of the instruments included specifications for the components that might be fitted as spares. Alternatively spares might be submitted directly by their suppliers to a pattern approval laboratory for certification as meeting the required standard. NAMAS considered that this would be a helpful procedure but felt that it was a matter for those who set the pattern approval standard, ie the VI.

7.48. We drew NAMAS's attention to its remarks about the tight time-scale for the introduction of the EGA approval scheme (paragraph 7.35). We asked if in retrospect there were any aspects that might have been treated differently if there had been more time. NAMAS told us that it had been put under particular pressure with staff having to work over evenings and weekends. It was particularly important that corners were not cut when seeking to work to an international standard. NAMAS thought that the lesson for the changes to be introduced in 1996 should be that the DOT and the VI should give it more notice than on the previous occasion. So far NAMAS had not been approached by the VI about 1996 and was not aware of the changes that might be necessary.

7.49. We sought NAMAS's views, on an entirely hypothetical basis, about the possibility that the MMC might wish to recommend that manufacturers be required to release copies of their calibration manuals and controlling software on a royalty basis to competent third parties who wished to become calibrators. NAMAS considered that such an approach would not be unreasonable, but in the extreme where a third party acquired documentation for a large number of different instruments, and wished to calibrate them all correctly, the accreditation or approval would be extremely complicated for NAMAS and expensive for the third party concerned.

## Complaints

7.50. We put to NAMAS the complaints made by Mr Addison (paragraphs 5.2 to 5.7) and Mr Whittaker (paragraphs 5.24 to 5.26). In the case of Mr Addison, NAMAS commented that it was not the case that repairs to MOT gas analysers could be undertaken only by engineers affiliated to NAMAS. NAMAS only accredited organizations in respect of calibration and this did not require the express permission of the manufacturer or his agent. Any organization or individual could apply for accreditation provided they could demonstrate to NAMAS their technical competence to carry out the calibration (which might require access to a manufacturer's information and instructions) and that they operated a quality system in accordance with NAMAS requirements. NAMAS also told us that Mr Addison was now a NAMAS-approved operator for gas analyser calibration through the SIRA scheme; he had been registered with SIRA on 16 March 1993 and approved by NAMAS on 30 March 1993.

7.51. On the case of Mr Whittaker, NAMAS commented that it was not clear whether he (or his current employers) had made a formal request to SIRA for him to become an approved operator, nor if SIRA had specifically declined to contract him (or his current employer). NAMAS said that it was for SIRA to decide who they would accept as subcontractors. NAMAS was only concerned that all approved operators could demonstrate their technical competence and were contracted to work within a quality system meeting NAMAS requirements. Mr Whittaker (or his current employer) was free to apply directly to NAMAS for accreditation if he so wished.

## **Sira Test & Certification Limited**

7.52. SIRA made a written submission of its views and answered a number of written questions from the MMC. Members of the MMC made a visit to SIRA's laboratory during which they were given a presentation covering SIRA's role in the current arrangements for the calibration of EGAs and a demonstration of the EGA calibration procedure.

### **SIRA's role**

7.53. SIRA told us that its laboratory was accredited by NAMAS both for the pattern approval of EGAs to be used in the MOT test and for the assessment of engineers seeking NAMAS-approved signatory status for calibrating EGAs.

### **Pattern approval**

7.54. SIRA said that as one of the two NAMAS-accredited laboratories for the pattern approval testing of analysers to VI requirements, it was concerned that there was no control of the modification of instruments in use by, for example, the fitting of inappropriate spares, and that such modifications might affect the performance of the EGA and therefore the validity of its certification by the VI. SIRA confirmed that filters and probes were the most frequently replaced items that might possibly affect an instrument's performance but, in its view, if any electronic components were replaced with other than identical items significant and unpredictable effects on performance could result.

7.55. SIRA considered that manufacturers should be able to protect the integrity of their products and suggested that an appropriate solution on the supply of spare parts, which might avoid accusations of monopoly practices, would be for product certification of spare parts to be carried out under the aegis of the NACCB (National Accreditation Council for Certification Bodies). This could protect the integrity of the product in use.

### **Calibration**

7.56. SIRA said that under its calibration scheme (paragraph 2.9) it was unlikely that a typical individual seeking NAMAS-approved signatory status could achieve a technical standard of competence to satisfy either NAMAS or SIRA (and both organizations had to be satisfied) without receiving training either from the manufacturer or from a service company. Nevertheless, employment or training by a manufacturer was not a precondition for achieving NAMAS-approved signatory status.

7.57. SIRA told us that its assessment of applicants was typically of one or two hours' duration for each model of EGA that it was proposed they be approved to calibrate. The time depended partly on the competence of the applicant. During the assessment each applicant would undertake a full NAMAS calibration including the issue of a certificate, and give the assessor a spoken explanation of what he was doing and why. SIRA said that it could not comment precisely on the duration of training provided by the manufacturer or service company prior to the applicant attending SIRA for assessment (or being assessed on his employer's premises). SIRA believed that it was usually a minimum of two or three days depending on the knowledge and experience of the applicant.

7.58. SIRA said that in assessing the applicant's competence it did not consult anyone other than the individual and his employer; it made no difference whether the employer was a manufacturer or a service company. An individual's approved signatory status was maintained as long as he demonstrated competence. This was likely to improve with experience. Competence was assessed and guidance offered at the routine twice-yearly audits of performance carried out by SIRA of each of the around 250 calibration engineers approved through its laboratory. Additional audits were organized by SIRA if any engineer's performance caused SIRA concern. In addition NAMAS would conduct audits of each signatory at approximately three-yearly intervals. SIRA had also undertaken surprise audits to ensure that standards were being maintained. SIRA considered that with these provisions

for monitoring performance complete reassessment should not be necessary, except when an extension to an approved signatory's scope to cover additional EGAs was sought.

7.59. SIRA explained that every calibration engineer operating under its calibration scheme had to operate within the terms of a contract between his employer and SIRA. This provided, amongst other things, that NAMAS-approved signatory status was valid only while the employee was operating under that contract. SIRA said that it was for this reason that when a calibration engineer ceased to be an employee of a company operating under the SIRA scheme he lost his NAMAS approval. If such an employee joined another company having a current contract with SIRA he might have to requalify for approval to calibrate different EGA models. If he became self-employed constraints might be imposed by his former employer on his freedom to calibrate that employer's products. In such situations SIRA believed this was clearly a matter to be settled between employee and former employer. SIRA had to be assured in such situations that the employee was able to continue with calibration work and the former employer was the obvious source of information on that point. (A list of those companies within the SIRA scheme is at Appendix 3.3.)

7.60. We questioned SIRA about evidence we received from some EGA manufacturers which believed that their endorsement was required by SIRA for every applicant for NAMAS approval by way of a letter providing evidence of his technical competence. This had been one of the provisions of the original draft of the SIRA scheme discussed with it (paragraph 2.10). SIRA explained that it had originally envisaged that only manufacturers would join its scheme as access to calibration instructions was unlikely from any other source. SIRA learned at the meeting at which its draft scheme was discussed that some of these instructions were in the public domain and so it dropped the requirement. It was in SIRA's view unnecessary as each applicant for NAMAS approval was required to demonstrate his competence on the EGA model for which he sought approved signatory status. SIRA told us that it understood no special steps were taken to inform everyone attending the June 1991 meeting at which its scheme was discussed of subsequent changes.

7.61. We also asked SIRA about the status of the calibration procedure document it drew up for those manufacturers and service companies operating under its scheme. These documents were copyright to SIRA and this had led to the belief that a manufacturer was accordingly prevented from agreeing to release his calibration manual to a third party. SIRA explained that the information on which the calibration procedure document was based was supplied by the company with which SIRA had a contract. The document was copyright to SIRA to prevent its release to any other company. This was in any event prohibited by the terms of the contract without the consent of the company concerned. SIRA also told us that when another company requested a copy of an existing calibration procedure document it was advised to contact SIRA's original customer. SIRA told us that it was in the process of revising the wording of its copyright on the front of its calibration procedure documents to make this position clear.

7.62. SIRA said that, in its view, the current calibration frequency of four times a year for most instruments was appropriate. SIRA believed that as more data became available trends would become more apparent and sensible predictions could be made. Responsibility for defining the calibration interval rested with the VI and not the calibration laboratory. In SIRA's view more frequent calibration than four times a year might be justified for some instruments.

7.63. SIRA carried out an analysis on behalf of the MMC of the calibration data it had so far collected. This was derived from some 58,800 individual calibrations covering the range of EGA models calibrated by the NAMAS-approved engineers operating under the SIRA scheme. The analysis showed that the different EGA models varied widely in the extent to which they drifted out of calibration between calibration visits. Those models showing the least drift between calibrations, and these included one of the market leaders, had only 4 to 10 per cent of their readings outside the permitted  $\pm 3$  per cent tolerance in the VI's calibration requirements (Appendix 2.2). Other models had over 50 per cent of their calibration readings outside the  $\pm 3$  per cent limit.

## **SIRA's charges**

7.64. SIRA told us that its charges for the pattern approval testing of an instrument were typically £8,650 for a four-gas analyser and £8,250 for a two-gas analyser. SIRA said that its calibration scheme was financed mainly from the charge for calibration certificates and there was no annual charge for membership. The initial charge for assessing an applicant for approved signatory status was typically £250, but this depended on where the applicant was assessed and whether overnight accommodation was necessary. If two applicants were assessed on the same day at the same site the charge per applicant was usually reduced by about 30 per cent. The charges were based on the actual costs incurred. There was an annual charge of £445 per approved signatory. This fee included the cost of a minimum of two audit visits per year and all supporting quality assurance services such as updating procedures manuals, etc. SIRA also provided details of the fees for calibration certificates, labels, etc (Appendix 7.1).

# 8 Views of EGA suppliers

## Contents

	<i>Paragraph</i>
Introduction .....	8.1
Sun Electric UK Limited .....	8.3
FKI Crypton Limited, FKI Transervice Limited and FKI plc .....	8.45
V L Churchill Ltd .....	8.71
H Young (Operations) Limited (trading as Kamasa Tools)/Lucas Service UK Ltd .....	8.100
Richard Oliver Limited/Garage Equipment Maintenance Co Ltd .....	8.116
Tecalemit Garage Equipment Co Ltd .....	8.131
Souriau (UK) Ltd .....	8.133
Hermann Electronics (UK) Ltd .....	8.135
Other suppliers .....	8.137

## Introduction

8.1. The MMC received evidence from 17 EGA suppliers (manufacturers and importers). This mainly took the form of factual submissions in response to a detailed questionnaire. Four suppliers in whose favour we provisionally found that a complex monopoly situation existed (Sun, FKI Crypton with FKI Transervice, Churchill and Kamasa with Lucas) provided further information in reply to a letter informing them of our provisional finding and seeking their views on related issues (the 'issues letter'). The letter identified four practices which prevent, restrict or distort competition and these are reproduced in Appendix 8.1. It appeared that each of the companies involved in our provisional finding engaged in at least one of the practices.

8.2. In addition a number of suppliers responded to complaints from other parties which we put to them. Hearings were held with four of the major suppliers (Sun, FKI Crypton/Transervice, Churchill and Oliver/GEMCO).

## Sun Electric UK Limited

### *The reference services*

8.3. Sun told us that it was strongly opposed to the calibration and servicing of its equipment by third parties. It was concerned that its world-wide reputation for product quality and reliability could be severely damaged. Sun also believed that the standard of EGA calibration and servicing would be likely to deteriorate with increasing involvement of independent service companies and this could have adverse implications for the integrity of the MOT exhaust emissions test as well as exposing Sun to potential product liability claims.

8.4. Sun said that it accordingly did not make manuals or software (including passwords) for its EGAs available to third parties seeking NAMAS approval to calibrate its instruments. Sun also made it a condition of its warranties that calibration and servicing were carried out by its own staff and that only its authorized spare parts were used.

8.5. In Sun's view its manuals and software represented a considerable investment in developing its equipment. Making them available either directly or indirectly to third parties including, potentially, rival manufacturers would enable these manufacturers to evaluate the product and improve their own products at minimum cost. Moreover, Sun told us, it was not empowered under the terms of its copyright licence from Sun Electric Europe BV (paragraph 4.3) to make its manuals and software available to third parties.

8.6. Sun also considered that the servicing and calibration of EGAs was a natural monopoly because the small size of the market and the magnitude of economies of scale implied that these services were provided at the lowest cost by just one supplier. In this situation the entry of independent service companies would in the company's view raise industry costs and prices to the detriment of customers. Sun believed that independent engineers could not achieve economies of scale over a range of different manufacturers' EGAs because of the difficulties of being trained for each model, the large number of manuals they would have to carry and the extensive range of spare parts they would need to stock.

8.7. Sun expressed strong reservations about the true 'independence' of third party service companies because, in its view, they did not make a full contribution to the cost of developing calibration and servicing procedures, did not contribute to EGA manufacturers' training costs and imposed on manufacturers the additional costs of monitoring the quality of third parties' work to safeguard their reputations.

8.8. On the relationship between calibration and servicing, Sun considered that while these could be carried out separately by engineers from different companies this was likely to prove substantially more costly and much less convenient to the user. This was particularly so, in Sun's view, as the EGA had to be recalibrated immediately after servicing before it could be used in the MOT test; furthermore a routine calibration often identified the need for servicing or other attention.

8.9. On servicing of its EGAs, Sun said that it regarded these instruments as highly sophisticated computerized machines which in its view could not be adequately serviced by third parties without the lengthy and continuing specialist training Sun gave to its own engineers.

8.10. Sun told us that it operated its own laboratory which was accredited by NAMAS for the approval of EGA calibration engineers. Sun said that it had not been approached by third parties seeking such approval, nor had it received any requests for the use of its manuals or software. Sun also told us that it was, in any event, unable to assist third parties to obtain calibration approval from NAMAS because of a restriction imposed by NAMAS itself. On servicing EGAs, Sun said that its training facilities were fully employed in ongoing training of its own engineers and it had no spare capacity for third parties.

8.11. Sun regarded the NAMAS requirements for the approval of engineers to calibrate EGAs as essential to the integrity of the MOT exhaust emission test. Sun also considered appropriate the current procedures for determining the frequency of EGA calibration.

### *Calibration and servicing charges*

8.12. Sun told us that its call-out charges for calibrating and servicing its EGAs were generally standard throughout the UK. The company appreciated that the actual cost for a particular customer depended on such factors as the customer's location in relation to Sun's engineer, the size of the area covered by the engineer and the dispersion of customers within that area. But Sun believed that a charging system based on individual site visits would significantly increase its administrative costs and these increases would have to be passed on to customers in higher charges. Moreover, charging actual costs to customers in remote areas might cause their MOT business to become unprofitable. Sun also maintained that its charges for the reference services were comparable to other business service operations such as the repair of washing machines or central heating systems, both, in its view, considerably less complex than an EGA.

### ***The complex monopoly situation***

8.13. In its response to the issues letter, Sun accepted that a complex monopoly might technically exist in the supply of the reference services, including itself and the other suppliers named in the letter. Sun nevertheless maintained that the business practices it had adopted for the calibration and servicing of its EGAs were neither anti-competitive nor exploiting a monopoly position. They had in Sun's view been adopted for the specific purposes of maintaining the integrity and accuracy of the EGAs it supplied and the company's reputation as a supplier of reliable, high-quality equipment.

8.14. In response to the four practices listed in the issues letter (Appendix 8.1), Sun reiterated its reasons for not making manuals, software or training available to third parties (paragraphs 8.3 to 8.10) and confirmed that it imposed warranty conditions requiring the use of its own employees and authorized spare parts for the reference services. Sun said that it supplied proprietary spare parts to creditworthy customers and on contracts of employment Sun told us that it had not until recently imposed restrictions designed to prevent former employees taking up employment with a competitor. The restrictions it had now introduced were for the express purpose of preserving the confidentiality of its commercially valuable know-how and information.

### ***Restrictions on access to manuals, training and software***

8.15. In an economic analysis of the market submitted to the MMC, Sun argued that these restrictions, whilst inhibiting competition from independent providers of the reference services and so possibly increasing the market share of the EGA suppliers, did not enhance or create market power which could be abused by, for example, raising prices. In support of this Sun drew our attention to a 1992 research paper prepared for the OFT by National Economic Research Associates (NERA) which recognized that 'tying' customers to purchasing secondary services from manufacturers might not enable them to raise service charges if purchasers' choices of the primary product were based upon its total 'whole-life cost', in other words the initial equipment cost plus future service charges. It was suggested in the paper that in this situation over the longer term manufacturers could not afford to acquire a reputation for expensive secondary services, because buyers would avoid purchasing their products. NERA accordingly argued that in such situations secondary services did not constitute a separate market but were part of the primary product market.

8.16. Sun drew our attention to two MMC reports, those on Motor car parts<sup>1</sup> in 1992 and on Indirect electrostatic photocopiers<sup>2</sup> (IEPs) in 1991, which it said had accepted this NERA argument. For example, in the report on IEPs the MMC had observed that 'there is a wide choice of IEPs available to end-users at the time of purchase; given this healthy competition in the supply of IEPs themselves, there is little scope for uncompetitive behaviour by suppliers in the provision of maintenance, since suppliers have to ensure that the package as a whole, ie IEP and maintenance which customers demand, is competitive' (paragraph 9.137). Sun accordingly argued that in assessing the scope for EGA suppliers to raise the prices of the reference services it was necessary to take into account the intensity of competition in the supply of EGAs (which in turn would 'drive' competition in the supply of the reference services), and the sensitivity of users' future choice of EGAs to the quality and price of these services.

8.17. In Sun's view the competition between suppliers of EGAs was so vigorous that the instruments and their associated services had to be supplied on highly competitive terms. As evidence of this Sun pointed out that there were over 20 UK suppliers of EGAs offering a wide range of over 30 models; there had been 15 new entrants into the market since 1991; EGA prices had fallen in real terms and significant discounts off price lists, in some cases as much as 25 per cent, had had to be offered by the company to secure orders.

---

<sup>1</sup>*Motor car parts: a report on the wholesale supply of motor car parts within the United Kingdom*, Cm 1818, February 1992.

<sup>2</sup>*Indirect electrostatic photocopiers: a report on the supply by manufacturers and importers of indirect electrostatic photocopiers in the United Kingdom*, Cm 1693, October 1991.



8.18. Sun ascribed to this intensity of competition in the EGA market what it saw as the company's low overall profits in 1992. In that year Sun told us that its UK operation (excluding exports) achieved a return on capital employed of 7.4 per cent and a return on sales of 4.1 per cent.

8.19. Sun also emphasized in its economic analysis its view that MOT stations were sophisticated purchasers of a wide range of garage equipment. Minimizing any period for which an EGA was out of action was essential as for most garages, which had only one instrument, this would interrupt their MOT income until the fault was put right. This, Sun believed, necessarily focused particular attention on the availability and price of the reference services and strongly influenced EGA purchasing decisions.

8.20. In examining some of the issues raised by these restrictions on access to manuals and software and Sun's justification for them, we asked Sun what steps it took to publicize the 'whole-life' costs of its EGAs in promoting their sale. Sun told us that the cost of the reference services formed part of the normal cycle of negotiations conducted by its sales staff so that customers were aware of the cost of EGA calibration and the cost of maintenance. Sun said that it did not endeavour to sell service contracts as part of the initial EGA sale and believed that this was fairly common in the industry.

8.21. In this context we examined the analogy drawn by Sun (paragraph 8.16) between the servicing of EGAs and the MMC's findings on the restrictions on maintenance in their report on IEPs. We understood that one of the factors taken into account by the MMC in that report was that the IEP was service-intensive as it was mechanically complex and required frequent maintenance. We asked Sun for evidence that the EGA could also be described as service-intensive. We pointed out that some evidence to the contrary could be inferred from Sun's decision to increase the period of its warranty on its MGA 1200 EGA—the model most widely sold for the MOT test—from one to two years. Sun said that it had taken this decision to the benefit of its customers because it knew the reliability of its product and that the additional cost to the company would be very small. Sun also told us that while initially only 2 per cent of its customers had taken out service contracts at the time of sale some 25 per cent currently had combined calibration/service contracts. Sun ascribed this increase largely to the VI's requirement that MOT stations have a contract for calibration. The frequency of service visits over the 12 months ending June 1993 had been:

No service calls	–	39 per cent
1–2 service calls	–	42 per cent
3–5 service calls	–	17 per cent
Over 5 service calls	–	2 per cent

Sun reiterated its view (paragraph 8.8) that calibration and servicing could not be separated. In this context Sun regarded the EGA as service-intensive because it was a mechanically complex piece of equipment and customers had to rely on effective and prompt calibration and servicing to avoid any significant down-time.

8.22. We also raised with Sun the immaturity of the market in EGAs and in the reference services, which had been in operation for some 18 months only. We questioned whether the company's assertion that these services, on the NERA argument, formed part of the EGA primary product market could have been established in so short a time without any significant competition from service companies independent of EGA suppliers being allowed to develop. Sun pointed out that its view was based on many years' experience in the servicing of diagnostic equipment (including EGAs) throughout the world. The company also reiterated its argument (paragraph 8.6) that the entry of independent service companies would be likely to raise industry costs and prices for the reference services.

8.23. On the issue of its uniform charges for the reference services (paragraph 8.12), we put to Sun the possibility that greater competition from independents might benefit both EGA suppliers and their customers by reducing the travelling time costs to the suppliers by providing the reference services in remoter areas. Sun told us that in its view it was not possible for an independent to make a living on that basis and it was for that reason that the independents were situated in or serving conurbations. Sun also said that in its view the possibility we had suggested did not appear to offer any further choice to users in such remote areas.

8.24. We asked Sun whether its profits in 1992 which it considered to be low (paragraph 8.18) might not be considered reasonable if allowances were made for the costs of free warranty work arising from EGA sales in 1991. Sun told us that in its view it was unlikely that the profit levels of either 1991 or 1992 would be repeated in 1993 as a consequence of the decline in EGA sales, the squeezing of margins and the present recessionary period.

8.25. Concerning the barrier to entry by independents posed by the restrictions on access to manuals, training and software we asked Sun for its view on the consequent reduction in consumer choice. Sun reiterated its contention that in the supply of the reference services greater competition would result inevitably in higher costs to customers in the longer term because the independents would not seek to provide a complete competitive choice against Sun but would rather concentrate their efforts in areas with a high density of EGAs. This, the company argued, was what had happened in the case of Kaltek (paragraph 8.35). This would mean that in the last resort the independents' customers would only have Sun to turn to if things went wrong with a consequent increase in the company's costs. This would in Sun's view be especially so if it had to provide its current service with its cost base spread more thinly and amongst its more remote customers.

8.26. On another aspect of the barrier to entry by independents, we asked Sun about its stated inability (paragraph 8.10) to assist third parties to obtain NAMAS approval to calibrate its EGAs because of a restriction imposed by NAMAS. We put to Sun NAMAS's statement that it saw no problem if Sun wished to do this (paragraph 7.37). Sun said that it had been told by NAMAS that it would have to make substantial further investment, which Sun estimated at about £24,000 to £25,000, for such approval of third parties. In response to a further question as to Sun's policy if the NAMAS restriction did not exist, the company said that it would be willing to compete with SIRA in assisting third parties to obtain NAMAS approval for calibrating its EGAs. Sun said that it was not, however, in a position to offer training for this as it did not have sufficient training capacity.

### *Restrictions on warranties*

8.27. Sun confirmed that its warranty contained provisions causing it to be invalidated if calibration, servicing or repair were carried out by a third party or unauthorized parts were fitted. Sun expressed surprise that this practice should be taken to be evidence of the existence of a complex monopoly as, in the company's view, it was a practice pursued by the vast majority of manufacturers of technical equipment. Sun considered that its exposure to warranty provisions for repairs, adjustments, claims for consequential loss and potential product liability claims required it to impose these restrictions. Sun believed it should have the right to withdraw cover in the event of unauthorized interference. Sun told us that in practice it had never exercised this right, preferring to keep customers happy by rectifying EGAs that had been calibrated, serviced or otherwise tampered with by third parties.

8.28. We questioned Sun about the need to apply this restriction to calibration given that this could only be carried out by engineers approved by NAMAS. Sun argued that its product liability insurance cover would not extend to calibration by such third parties. Moreover, calibration sometimes revealed the need for servicing or repair.

8.29. In the context of Sun's claim never to have exercised its right to invalidate a warranty, we drew the company's attention to letters received by a number of its customers in 1992. These were customers whose EGAs were calibrated by third parties and the letters appeared to threaten to invalidate warranty unless it was restored by contracting Sun to carry out future calibrations. Sun denied that this interpretation could be put on the letter. Sun told us that something over 140 of those who had received the letters had asked Sun to carry out work under warranty and this work had been done free of charge. Sun also denied that it had required any customer who had previously had his EGA calibrated by a third party to enter into a contract with Sun for future calibration in order to have their equipment repaired. Sun justified the sending of the letters as necessary to make certain customers aware that they were risking their warranty and the validation of their equipment for MOT purposes by using third parties to calibrate, service and repair their EGAs. Sun was also concerned that in these circumstances its product liability cover might well be voided if it failed to make these risks clear to customers.

### ***Restrictions on the supply of proprietary spare parts***

8.30. Sun told us that apart from making their use a condition of its warranty (paragraph 8.4) it considered the use of its authorized spare parts essential to the integrity of its EGAs. In Sun's view the use of unauthorized spare parts could invalidate the instrument's OIML pattern approval. Sun said that such a situation need not arise as its proprietary spare parts, although available only from Sun, were supplied to anyone who was creditworthy at the prices specified in its current price list. In addition non-proprietary spare parts were available from commercial suppliers.

8.31. We questioned Sun about its policy on filters for its EGAs. Sun told us that its filter supplier was free to supply to third parties the filters it supplied to Sun provided it did not use Sun's part number. On pricing of its filters, Sun had told us that the current price for a box of ten of its Class I filters was £12 excluding VAT. We put to Sun the suggestion that this price had been in the region of £40 at the time EGAs started to be sold for the MOT test. We asked how the significant price reduction had been achieved and whether it was a deliberate move by the company to undercut third party suppliers of filters for its EGAs. Sun denied this and told us that its price as at 1 November 1991 had been £31.40 for ten filters. The price reduction had resulted from the significant increase in the demand for filters following the introduction of the exhaust gas emission test into the MOT test. Sun said that it had been able to negotiate substantial reductions in the price at which it purchased filters from its suppliers and these reductions were passed on to its customers with effect from 1 June 1992.

### ***Restrictions in contracts of employment***

8.32. Sun told us that it had recently changed its contract of employment for new employees on legal advice. This had been done following what Sun described as the defection of a number of its employees to a competitor in the reference services, Kaltek (paragraph 5.8) with which it was currently in litigation. A restriction had been included as an addendum to the contract requiring the employee to confirm:

For a period of 12 months after the date of termination of my employment I will not, either on my own, or with others or as an employee of any agency or organisation whatsoever calibrate any Sun Electric Equipment for which I require NAMAS accreditation.

8.33. Sun said that its principal concern in imposing this restriction was to prevent its competitors benefiting immediately from its confidential know-how. Sun did not consider that such provisions were unreasonable or could be taken as evidence of a complex monopoly since they were well-established standard provisions of most employment contracts. Sun believed that such provisions should not be imposed for any longer than was necessary to protect an employer's know-how, recognizing their doubtful enforceability at law if expressed to be for a longer period.

### ***Complaints***

8.34. We asked Sun for its comments on a number of specific complaints made against it by Kaltek (paragraph 5.9) and, on the question of filter supplies, by HFL (paragraphs 6.75 to 6.78) and Prosol (paragraphs 6.79 and 6.80). We also asked Sun to comment on a number of general complaints directed at EGA suppliers which the MMC had received from users.

8.35. In commenting on the complaints from Kaltek, Sun told us that this organization had been established by a Mr C Gostling, a former Sun employee and manager of its service operations in South and Central England. Mr Gostling had contributed to preparation of the Sun calibration procedures required for training engineers for NAMAS approval. He had left the company to take employment with another EGA supplier but subsequently set up in business with a number of other former Sun employees trading as Kaltek UK. Sun explained that it was currently in litigation with those employees, alleging that they were in breach of their duties of confidentiality to Sun.

8.36. Kaltek complained about Sun's use of its warranty to discourage Sun EGA users from having their instruments calibrated, serviced and repaired by Kaltek. In particular, Kaltek complained about the letter sent by Sun to a number of its customers threatening to invalidate their warranty unless they contracted with Sun to carry out calibration. In this context Sun reiterated its arguments, denying that the letter could be interpreted as a threat, saying it quite properly warned that warranty might be invalidated by unauthorized repair. Sun also said that the letter could not be interpreted as casting doubt on the ability of independent calibrators to calibrate its instruments. Sun also told us that the letter had been in part prompted by the practice of some of its former employees among Kaltek's engineers calling on existing Sun customers using their Sun business card inscribed with the name 'Kaltek' and their new telephone number.

8.37. Sun also denied Kaltek's allegations that some warranties had been suspended or that it kept a 'blacklist' of Kaltek's customers. Sun suggested that this referred to the computer database it maintained of all equipment it had supplied. From this Sun said that it could identify those instruments not maintained by Sun whose history was incomplete.

8.38. On its letter to customers warning about the use of non-approved parts, Sun said that it was drawing users' attention to the potential danger of using such parts. It was a requirement of the OIML laboratory that the label quoting the EGA's pattern approval number be placed on the instrument under the implicit assumption that it was maintained in its 'as approved' condition. Any modification caused it to be downgraded from Class I to Class II which could require increased calibration frequency under the VI's requirements.

8.39. Sun said that Kaltek's allegation that it was developing a 'lock-out' facility was correct. This was designed to prevent tampering with its EGAs as this had been required by law in the USA for a number of years and would shortly be required in Germany and Switzerland for which markets Sun manufactured in the UK. Sun said that passwords also constituted a type of lock-out; but in a large population of EGAs the degree of secrecy maintained was obviously a factor in controlling the degree of tampering possible. Every additional person who knew the password added to the potential for tampering. (Sun had recently discovered that some MGA 1200 machines that it did not calibrate or service had affixed a label showing the password.) Accordingly, Sun disclosed the password to its employees strictly on a 'need-to-know' basis. The spread of knowledge of the password could be effectively restricted by changing it frequently. This was technically possible and was a route which Sun told us it intended to pursue.

8.40. Finally, on Kaltek's complaint about publication of SIRA's list of NAMAS-approved calibrating companies in the February 1992 edition of the *Motor Retailer*, Sun described the suggestion that it had been able to influence the manner in which the list was published as 'fanciful'.

8.41. Sun did not accept the complaint from HFL that it had ceased placing filter orders with that company because HFL had supplied Kaltek and Prosol with filters for Sun EGAs. Sun told us that it commenced buying filters from HFL in 1986 in substitution for its existing supplier for the replacement market and for EGAs supplied to Switzerland. By the end of 1988 it was purchasing two types of filter from HFL. Shortly thereafter HFL sought to supply replacement filters to Sun's sister companies in Germany and the Netherlands; and upon doing so Sun's UK Marketing Manager discovered that HFL was supplying to those companies at a lower price than to Sun in the UK. He requested that HFL supply to him at the same lower price, and when HFL refused he ceased all further purchases of HFL filters for the replacement market. Sun told us that it continued to buy HFL's filters for the Swiss market and when its MGA model was developed and submitted for type approval it was fitted with an HFL filter. Subsequently HFL's filter system was assessed as marginally inferior to that of Sun's traditional supplier. HFL's quoted price was also higher and it refused to supply on an exclusive supply arrangement. Accordingly the other supplier's quotation was accepted and Sun's purchases from HFL ceased.

8.42. Responding to the complaint by Prosol that EGA manufacturers were attempting to prevent the supply of filters by third parties by implying that they were of inferior quality, Sun said that it had never claimed, and could not claim, that no alternative filters were suitable. Identical filters might well be made available to the market by Sun's own supplier. But Sun maintained that only filters it had approved and submitted to a type approval laboratory as fitted to an EGA were those bearing Sun's

part number. Filters obtained elsewhere might be identical, but might equally not be; and the use of a different filter was liable to prejudice the measurement accuracy of the EGA. Sun also pointed out that its filter prices were now considerably lower than those of Prosol (see paragraph 8.31).

8.43. On the more general complaints made against it and other EGA suppliers, Sun commented as follows:

- (a) *Refusal to release information and manuals to independents.* Sun reiterated that no independent calibrator had ever requested Sun to supply manuals. However, for the reasons previously set out (paragraphs 8.3 to 8.10) Sun would not wish to supply manuals to third parties and had registered concern that independent calibrators appeared to have obtained copies of its calibration and service manuals and access to its software passwords without the company's consent.
- (b) *Little or no choice of calibrator.* Sun accepted that this was factually correct and was, Sun understood, one of the reasons for the reference being made. However, Sun refuted the suggestion that the consequence of that was that the customer was required to pay a higher price for calibration than would be the case if there were greater competition in the supply of calibration services. Sun drew the MMC's attention to its previous comments on its calibration charges (paragraph 8.12).

8.44. Finally Sun commented on the apparent absence of any complaints to the MMC from its EGA customers.

## **FKI Crypton Limited, FKI Transervice Limited and FKI plc**

### *The reference services*

8.45. FKI told us that it was opposed to the release of its intellectual property to third parties to assist them in achieving NAMAS approval to calibrate its EGAs. Accordingly FKI did not release its calibration manuals to third parties and, it told us, had turned down the one approach it had so far had.

8.46. FKI said that it did not actively obstruct any competitor wishing to calibrate its EGAs; but to assist in their approval by NAMAS would enable competitors to exploit at low cost to themselves a product in which FKI had made a considerable investment to develop and establish a market share.

8.47. FKI also considered that as calibration had to be carried out after any major repair, an engineer had to be fully competent on the repair as well as the calibration of the product. FKI believed it to be in the best interests of the customer that this was carried out by the manufacturer's service agent who was factory trained and up to date with any equipment modifications. FKI said that prior to the introduction of emissions testing into the MOT scheme, repair and calibration were carried out almost exclusively by the manufacturer. This was despite the fact that there was no requirement for engineers to meet any particular standard.

8.48. FKI believed that, if it gave assistance to third party service companies to achieve NAMAS approval, they would offer their services in the areas of highest density, leaving FKI with the responsibility of supporting customers in the remainder of the UK, so forcing costs up in the rural MOT stations. The resulting fall in revenue would also cause fragmentation and reduction in the quality of FKI's after-sales support which the company considered to be significantly against the interests of its UK customers.

8.49. FKI was not aware of any EGAs being calibrated by FKI Transervice that were being maintained by independent service companies. FKI told us that there were some of its EGAs suitable for MOT use which were not under any FKI Transervice contract or service cover. It assumed that third parties or the users themselves were maintaining the units which could not be used in MOT tests as the engineers were not approved. FKI was unable to estimate the number of EGAs suitable for MOT tests being maintained in this way by third parties but believed it was a small percentage. FKI

considered that its reputation had suffered from the involvement of such independents as users always came back to FKI if any problems arose.

8.50. FKI considered that calibration of EGAs carried out to a traceable standard set by NAMAS could be the correct way to control the accuracy of the instruments in use for the MOT test. FKI had 72 engineers NAMAS-approved through SIRA, so as to be able to provide a national service. FKI told us that its engineers were approved in line with the original NAMAS requirement. They had an electrical engineering background with at least four months' experience of the products and were able to prove their competence by carrying out a calibration to the satisfaction of SIRA. The engineers approved through SIRA were randomly assessed and audited by NAMAS.

8.51. In FKI's view the original outline EGA calibration scheme presented to the GEA was considered acceptable if properly controlled. FKI considered that subsequently, the issues associated with the control and qualification of engineers had become diluted. As an example of this FKI told us of the case of one of its former employees, a mechanical engineer, whom it had made redundant at the time the calibration scheme was introduced because it considered that he did not have the relevant experience. This employee was subsequently recruited by another company and approved by NAMAS.

8.52. FKI also expressed concern at the procedure for the pattern approval of EGAs used in this country. Once this had been secured by submitting the instrument to one of the NAMAS-approved laboratories no follow-up action was taken to check that the manufactured models conformed precisely to the approved pattern. FKI told us that this contrasted strongly with the procedure in a number of European countries where the state set the pattern approval standard and approval tests were carried out in a state-controlled laboratory. The manufacturer was required to exercise control to ensure that the approved standard was maintained and this, for example, required that only manufacturer-approved spare parts, conforming to the original approval standard, could be fitted. In FKI's view the VI's less stringent approach weakened the integrity of its exhaust emission testing arrangements compared with these other countries.

### *Calibration and servicing charges*

8.53. FKI told us that it charged a standard contract price throughout the UK. This was to ensure that customers in rural districts were not penalized as the MOT test fee was also standard nationwide. Any change in this pricing structure could, in FKI's view, force rural MOT stations with a low throughput of vehicles to withdraw from the scheme to the detriment of all parties concerned. FKI did not consider that greater competition from third parties would benefit customers or manufacturers by cutting response times in some areas and reducing engineers' travelling time. FKI said that because of the number of trained and approved engineers at its disposal travelling time on average was less than an hour between jobs and, in its view, the competence and experience of its engineers ensured a high 'first fix' rate and minimized their time on site.

### *The complex monopoly situation*

8.54. In its response to our issues letter FKI did not dispute the existence of a complex monopoly situation as defined in section 7 of the Fair Trading Act 1973, in respect of the reference services. But FKI believed that the definition of the service referred to the MMC by the Director General of Fair Trading was too narrow to identify correctly the key competitive forces which determined the price and quality of the reference services. In FKI's view the nature of the market and the way in which it operated could only be understood by looking at both the supply of EGA equipment and the supply of the service of calibration and servicing. FKI considered that in reality the supply of the equipment and the provision of after-sales service and calibration together made up one market. FKI also considered the market to be extremely competitive to an extent that manufacturers were prevented from offering uncompetitive service, calibration and repair charges. FKI also believed that low-cost suppliers of these services had made only a limited penetration of the market because of their uncertain service support so highlighting the importance of the EGA manufacturer's service capability as part of the original purchase decision.

8.55. FKI further argued that it had always been the case in the UK (both before and after the introduction of the VI scheme) that the reference services were predominantly provided by manufacturers of the equipment. The complexity of the equipment and the quality of service provided by the manufacturer in what was a relatively small market had predicated this situation. This pattern was repeated in most of the major markets in mainland Europe; indeed in a number of other European countries this was a statutory requirement, in that strict pattern approval standards existed in respect of both the equipment and the provision of servicing and calibration.

8.56. In response to the four practices listed in the issues letter, FKI told us that it engaged in only one, restricting access by third parties to the calibration manuals and software needed to calibrate its equipment.

### *Restrictions on access to manuals training and software*

8.57. FKI considered that restricting access to calibration and service manuals, training and software did not restrict competition by limiting those able to enter the market for the reference services. FKI believed that the existing market structure ensured a competitive framework for the supply, servicing and calibration of EGAs between the manufacturers which resulted in the high levels of customer satisfaction recorded in the MMC survey (Appendix 3.4). If independent providers of services were given access to FKI's intellectual property this was likely, in the company's view, to lead to a reduction in the number of its engineers. As a result FKI said that it might not be able to maintain the current uniform and consistent level of cover nation-wide; average travel times would be extended and costs increased. FKI said that it had invested in what it saw as the highest quality of service support to differentiate its product in the market-place. It considered that the increased involvement of independent servicers and the inevitable contraction of its own operations would have a serious adverse effect on the company's reputation. Furthermore, FKI argued, a fragmented market was likely to leave areas of the country with only independent coverage, where manufacturers had had to withdraw, and this could give rise to opportunities for excessive price increases.

8.58. FKI also pointed out that the compilation of calibration manuals, the training and approval of engineers and the development of products and software represented a substantial investment by FKI in the market amounting, the company told us, to an expenditure averaging over £1 million in each of the past five years. This expenditure represented a very significant part of FKI's intellectual property and asset base. FKI believed that to make it available to third parties would allow them to exploit these assets without having made the initial investment. Any modest price gain for end users would in FKI's view be transient as the service to end users was bound to deteriorate without further investment.

8.59. FKI also considered that there was in practice nothing to prevent any third party service organization or independent service engineer from compiling their own calibration manual, or from developing the technical information which would allow them to gain approval and compete in the market-place. FKI told us that it would be possible for a skilled engineer to 'reverse engineer' FKI equipment especially as, unlike its two major competitors, FKI did not make use of passwords or software locks to prevent third party access. Such an investment by a third party in compiling the necessary information through a process of reverse engineering would, in the company's view, at least represent some equivalent investment to that it had made.

8.60. FKI told us it considered that restrictions on access by third parties to its manuals and software did not result in higher prices for the reference services than would otherwise be the case. FKI believed that the prices for the reference services provided by the major companies, while showing some variation, did not reflect any exploitation. This, in its view, was due to the highly competitive nature of the market for equipment. FKI pointed out that currently the customer had a wide choice between approximately 23 suppliers of EGAs in the UK. Nor, in FKI's view, was there any evidence of excess levels in those parts of its profits associated with the reference services. FKI said that overall it had for a long time been a profitable company. This had been achieved by the scale of operations and investment made by FKI in equipment, training and information technology. FKI also pointed out that the calibration services operated on relatively low margins and this too, FKI believed, was due to the fierce competition it faced in the sale of new EGA equipment.

8.61. FKI also told us that it had always run its business on the basis of service contracts with payments in advance. We pointed out from data provided by FKI in response to the MMC's questionnaire that as at 31 March 1993 payments in advance for the reference services were 57 per cent of the EGA sales figures compared with 18 per cent of sales for the company's business as a whole. FKI said that the 18 per cent referred to total sales including direct spares sales, inter-company trading and parking meter maintenance and that the 57 per cent figure for the reference services was relatively low and the company expected it to increase. There was no pressure exerted on EGA users to take out service contracts and it was normal, FKI told us, for two-thirds of the company's field service income from garage equipment to be contracted.

### ***Restrictions on warranties***

8.62. FKI said that it did not impose conditions in warranties that had the effect of requiring calibration and/or servicing to be carried out by its employees or appointed agents or the use of FKI-supplied parts. In its view its terms did not restrict competition or consumer choice, though FKI accepted that, at present, no one other than the company's employees were NAMAS-approved to calibrate its instruments. FKI confirmed, however, that its warranty would not be voided if an instrument were calibrated by a NAMAS-approved engineer but the result of repairing damage arising from any third party interference with the equipment would necessarily be chargeable.

8.63. FKI also maintained that it was in the best interests of its customers that they use engineers that were accountable and parts that could be guaranteed to conform to pattern approval. FKI believed that only in this way could there be any guarantee of conforming to design and specification for the machine in its warranty period. FKI also noted that the accountability of the manufacturer for the ongoing performance of its products in the field arose from the competitive market for the supply of EGAs. In the absence of what in its view was strict pattern approval FKI believed the VI depended on this support by the manufacturer to maintain the integrity of the EGA calibration scheme.

### ***Restrictions on the supply of proprietary spare parts***

8.64. FKI told us that it had never refused to supply proprietary spare parts to customers or to third parties. Nor did FKI actively discourage the sourcing of spare parts from third parties. The company said that it operated a third party spares sales service at its Bridgwater base and parts were made available to third party service organizations and end users with acceptable credit accounts or who were willing to pay cash.

8.65. At the same time FKI pointed out that it was impossible for the company to guarantee the performance of spare parts supplied by any third party. This was particularly the case in the context of pattern approvals of equipment. FKI said that it could only guarantee the parts sourced and supplied by its own procurement, specification and quality control organization. The company told us that there had, for example, been cases of filter failure resulting in damage to the EGA's infra-red gas bench. FKI provided evidence of this in an analysis of 75 SIRA Incident Report Forms. Of these 38 were related to filter problems and 18 were due either to incorrect filter specification, filter failure or repair or modification of the unit by a third party.

### ***Restrictions in contracts of employment***

8.66. FKI said that its contracts included a confidentiality agreement but it did not include conditions in contracts with employees which restricted their ability to provide the reference services after termination of their employment.



## ***Complaints***

8.67. We asked FKI for its comments on a number of specific complaints made against it by Rosary Garage (paragraph 6.32) and Mr Derek Whittaker (paragraphs 5.24 to 5.26) as well as on a number of general complaints received by the MMC directed at EGA suppliers.

8.68. On the complaints by Rosary Garage, FKI commented that the garage had had a free calibration contract covering the first four EGA calibrations. The customer was able to choose between a range of calibration contracts and was not obliged to enter into an annual contract. FKI also denied the claim by Rosary Garage that no calibration took more than 20 minutes. Its service reports suggested that calibrations at the garage were taking between 45 and 90 minutes depending on the experience of FKI's engineer. FKI's contract costs were based on visits taking one hour; anything over this was the company's liability. Finally FKI said that the requirement for calibration and service was known to Rosary Garage before it purchased its FKI EGA.

8.69. Mr Whittaker, FKI told us, was recruited by the company prior to the introduction of the EGA calibration scheme to ensure that he would qualify as a calibrator, under NAMAS guidelines, by the November 1991 deadline. FKI said that he was made redundant in September 1992 following the uneven pattern of EGA sales in that year and the reduced workload in Mr Whittaker's area. Under the rules of the calibration scheme NAMAS approval and the relevant documentation belonged to the company and had to be withdrawn when an engineer left the company. FKI considered Mr Whittaker's comments on an alliance between the company, NAMAS and SIRA to be unwarranted. The requirements were imposed, in FKI's view, by the VI and not by the company.

8.70. On the more general complaints made against it and other EGA suppliers, FKI commented as follows:

- (a) *Little or no choice of calibrator.* FKI reiterated that it was not willing to license use of its intellectual property to third parties to enable them to calibrate its EGAs, for the reasons previously set out (paragraphs 8.46 to 8.48).
- (b) *Discouraging use of filters supplied by third parties.* FKI said that it could only guarantee its EGAs if its own filters were used. Manufacturers had frequently found unsuitable, incorrectly sized or substandard filters fitted to their EGAs. FKI also doubted the claim, by Prosol UK (paragraph 6.79), that 90 per cent of the filters market was taken up by manufacturers' supplies. In FKI's case, it told us, its annual sales for the MOT emission test amounted to about 5,000 units. It had estimated its annual filter sales in 1992 as 24,000 units assuming that 3,000 of its EGAs were in use. Its actual sales in 1992 had been 8,000 units and FKI was unable to assess the respective parts played in the shortfall by cheap substandard filters, quality filters from other suppliers or end users not changing filters as frequently as was advisable.

## **V L Churchill Ltd**

### ***The reference services***

8.71. Churchill told us that it did not make its calibration manuals available to third parties as it considered this to be its intellectual property. The company's reaction to someone seeking to offer an independent calibration service for its EGAs would be to enquire whether they had already or were in the process of obtaining NAMAS approval, would be prepared to pay a reasonable royalty for the use of Churchill's intellectual property and whether they had a firm financial base and were prepared to offer a nation-wide service rather than concentrate on the more profitable conurbations. However, Churchill believed it was unable to license third parties in this way because of NAMAS/SIRA regulations (but see paragraphs 8.86 and 8.87).

8.72. Churchill told us that the Autogas 4 was an OIML Class I EGA with the calibration procedure operated by plugging in a special software cartridge. It was required by the VI to be calibrated four times a year. The company was under the impression that most Class I machines were required

to be calibrated four times a year although it was aware of one for which calibration was required only twice a year. The company told us that in its view there was some confusion as to where responsibility for initiating changes in the frequency of calibration lay. Churchill had understood that this was a matter for the VI which would keep the situation under review on the basis of calibration data provided by the manufacturers. Only recently, Churchill said, had it become clear that the VI expected manufacturers to take the initiative and approach it with supporting data if they wished to seek to change the calibration frequency of their machines.

8.73. Churchill told us that it had entered the UK EGA market with a mass-produced product, the Autogas 4, for the first time in 1991. It had decided, unlike most of its competitors, that it would be easier and simpler, for such a delicate instrument, for servicing to be carried out at the company's manufacturing plant. Churchill said that when a service was required the user was provided with a calibrated EGA on loan so that the MOT test business should not be interrupted. Churchill also told us that the Autogas 4 had been designed for the UK market and might not meet the specifications required in other countries.

8.74. Churchill considered the pattern approval requirements for the EGA for use in MOT test stations to be among the most severe in the world. It involved manufacturers in considerable time and expense to meet the required standard.

8.75. We asked Churchill about the suggestion made to us (paragraph 8.52) that the UK pattern approval rules were less stringent than in other countries because no checks were made on manufacturers to ensure that they were maintaining the approved standard. Churchill commented that this had developed since the original scheme was established. It had been Churchill's understanding that such rules applied in the UK. When the filter system on the Autogas 4 was changed the company had re-submitted it for OIML approval to the test house. The company said that it subsequently discovered that it was probably alone in carrying out this level of OIML approval. Churchill also agreed that it would have been preferable for the UK to set its own standard for EGA pattern approval but pointed out that there was insufficient time for this when the scheme was first introduced. This, Churchill understood, was because the VI was under political pressure to introduce the scheme by a certain date and, as a result, it was very late in the day before the VI finally approved the calibration process.

8.76. Churchill considered that approval of calibration engineers to a high standard as stipulated by NAMAS would ensure a similarly high standard of field calibration work for MOT stations. But in the company's view the cost of this approval was extremely high both in terms of the initial investment and the ongoing maintenance of approval.

8.77. Churchill said that it had 29 NAMAS-approved calibration engineers, sufficient to provide a nation-wide service under the system it operated of carrying out all servicing at its Daventry plant. As its EGA had been a new product it had recruited a completely new team of calibration engineers solely for the purpose of providing calibration support for the product in the field.

8.78. On the relationship between calibration and servicing, Churchill said that the latter required diagnostic and test capabilities whereas calibration was a more routine procedure and could be carried out by less qualified engineers. If a Churchill EGA was serviced by a third party the calibration seals would be broken and it would have to be recalibrated by a Churchill NAMAS-approved engineer. The company told us that as far as it was aware none of its Autogas 4 EGAs were currently being serviced by third parties. The company also told us that a small proportion—possibly 200 out of some 2,500—of the Autogas 4 EGAs sold were not being calibrated or serviced by the company. It assumed that they were being used in garages that were not MOT stations.

### **Calibration and servicing charges**

8.79. Churchill said that it charged the same price for calibration throughout the UK. The additional cost of supporting remote locations was absorbed in the cost of running its calibration business. Churchill told us that it had adopted this policy so as to be in line with the MOT test fee which was also set by the DOT at a national flat rate. Churchill doubted that greater participation by

third parties in the reference services would make an alternative charging system feasible. In its view there was a scarcity of suitably qualified engineers in the more remote areas. Churchill offered two types of calibration contract for the Autogas 4: either an annual contract payable in advance or payment per calibration. A combined calibration/service contract for the Autogas 4 had been offered for the first time in 1993.

### *The complex monopoly situation*

8.80. Churchill did not accept as justified the MMC's provisional finding that the company was part of a complex monopoly situation in relation to the supply of the reference services. The company said that section 7(2) of the Fair Trading Act 1973 applied to persons who, whether voluntarily or not and whether by agreement or not, so conducted their respective affairs as to prevent, restrict or distort competition in connection with the supply of services. Churchill pointed out that it had 'conducted its affairs' in this matter so as to follow the requirements laid down by the VI, NAMAS and SIRA. In this context Churchill also recalled that it was a requirement of the VI that EGA calibrations should be carried out only by NAMAS-approved technicians.

8.81. Churchill also pointed out that in the results of the MMC's survey of MOT test stations only 2 per cent had complained about the requirement that calibration had to be carried out by a specified company. Churchill, in this context, reiterated the practical difficulty referred to earlier of separating servicing and calibration so as to have them carried out by different companies because servicing—in which the calibration seals were broken—required immediate recalibration if the EGA was to be used in MOT testing.

8.82. In response to the four practices (Appendix 8.1) listed in the issues letter Churchill told us that it engaged in only one: restricting access by third parties to the calibration manuals and software needed to calibrate its equipment.

### *Restrictions on access to manuals, training and software*

8.83. Churchill did not consider that the practice of restricting access to calibration and service manuals, training and software necessarily led to an effect on competition in the reference service markets as, in its view, fierce competition existed at the point of purchase of EGAs. Churchill argued that although where the purchase is of high value and a one-off type (as, for example, with the motor car itself) this might not be a valid argument, it believed it to be valid in the case of the EGA. This was because customers for EGA equipment typically could be expected to purchase other equipment from the same supplier on a regular basis. This, the company considered, was quite different to a major consumer purchase such as buying a car.

8.84. Churchill also considered cost to be a relevant factor. The company pointed out that the majority of MOT stations responding to the MMC's survey (Appendix 3.4) stated that it was the price of the equipment rather than servicing which influenced them most in their choice of EGA. Churchill said that the cost of a stand-alone Autogas 4 EGA was between £1,800 and £2,000. The MMC's survey of MOT stations showed that some garages had more than one EGA and over three-quarters of them used other diagnostic equipment in their garage. A further 69 per cent of garages said that their experience of calibration and servicing would affect their decision to purchase other equipment from the same manufacturer, 45 per cent of them to a significant degree. Accordingly Churchill submitted that consumer choice which existed at the point of purchase of the equipment inhibited any restriction of competition which might exist in the reference service markets.

8.85. Churchill told us that it had had three formal requests from companies, mostly distributors of its equipment, seeking to calibrate its EGAs. This was in the early stages of the VI's formulation of its calibration requirements, and Churchill said that it had turned down the requests because the VI's requirements were not yet clear, but the company had been given to understand that the manufacturers would be responsible for arranging suitable calibration facilities for their customers.

8.86. Apart from the reasons already given for refusing access to manuals and software to third parties (paragraph 8.71), Churchill told us that it was also under the impression that under its arrangement with SIRA for preparation of the calibration procedure for the Autogas 4 from the company's manual, that procedure document was SIRA's copyright and could not be made available to third parties. We pointed out to the company that from enquiries the MMC had made of SIRA (paragraph 7.61) this did not seem to be the position. We understood that, although SIRA owned the copyright, the procedure document could be released to third parties with the consent of the manufacturer under whose contract SIRA had drawn it up.

8.87. We enquired of Churchill in the light of this clarification from SIRA whether the company would be willing to consider licensing third parties to make use of its manuals and software subject to the conditions it had previously indicated (paragraph 8.71). The company said that it would probably be willing to do so subject to SIRA's position being confirmed.

8.88. Churchill also raised another possible obstacle to access by third parties: the possibility that the manufacturers of the infra-red gas bench used in the Autogas 4, the US company Andros, might object to licensing. But Churchill said that it had not sought Andros's views on the matter and agreed that logically such an objection appeared unlikely.

### ***Restrictions on warranties***

8.89. Churchill told us that it imposed no conditions on its standard warranty which had the effect of requiring calibration or servicing to be carried out by its own employees. Nor, Churchill said, did any spare parts fitted during warranty have to be obtained from the company or its agents. It was also open to users to have calibration carried out by a third party without affecting the warranty. On this last point Churchill accepted that it was of limited value at present as no one other than the company's employees was accredited to calibrate its instruments.

8.90. Accordingly Churchill did not believe that the warranty terms it offered restricted competition and consumer choice in the provision of the reference services. Churchill told us that it was not its policy to prevent the customer from obtaining service elsewhere. But Churchill made the point that in the event that the supplier of alternative services were to cause damage or to insert a part which itself caused damage, then the warranty would not apply.

### ***Restrictions on the supply of proprietary spare parts***

8.91. Churchill told us that it did not refuse to supply proprietary spare parts to third parties or end users. Nor did Churchill seek to discourage the sourcing of spare parts from third parties. Churchill also told us that it did not operate a policy of restricting access to spare parts, nor did it prevent the acquisition of spare parts from third parties.

8.92. On filters, Churchill said that its supplier was free to supply to other parties the same filters it supplied to Churchill and was under no restraint whatsoever from the company.

### ***Restrictions in contracts of employment***

8.93. Churchill said that there were no restrictions in its employment conditions which constrained the freedom of employees to provide the reference services after the termination of their employment.

### ***Complaints***

8.94. We asked Churchill for its comments on one specific complaint made against it by the St Cleer Motor Company (paragraphs 6.33 and 6.34) as well as on a number of general complaints directed at EGA suppliers received by the MMC.

8.95. Commenting on the four points raised by the St Cleer Motor Company, Churchill said that the advertising mailshot referred to was, in its view, in no way misleading. The mailshot referred to a mandatory requirement for a calibration contract and explained that the VI had made it mandatory for all MOT stations using EGAs to have a written contract for calibration. This was set out in the 1992 edition of the MOT Instruction Manual, Appendix D(ii). Accordingly, in Churchill's view, the statement in the mailshot was correct.

8.96. On the allegation that Churchill refused to replace or give a refund for unmerchantable goods, the company said that this related to the need it had found to seek an alternative source of supply for the filtration system on the Autogas 4. But the company said that it had at all times provided the St Cleer Motor Company with a loan unit for which it was not charged. Nor, Churchill said, was St Cleer charged for any calibrations of the loan units that fell due during the period of the loan.

8.97. The charges for two calibrations which St Cleer alleged were not carried out related, the company told us, to calibrations that fell due for the St Cleer unit at times it was being serviced at Churchill's Daventry plant in February and May 1992. Churchill justified this on the grounds that no charge had been made to St Cleer for calibrations carried out on the loan units provided in lieu of St Cleer's EGA. Churchill told us that it was the company's policy to charge for calibrations that fell due on machines while they were undergoing services at its Daventry plant. The company said that it did not charge for recalibration after servicing but only for a calibration that otherwise fell due at the expiry of the usual three-month interval.

8.98. Finally on St Cleer's allegation of Churchill extorting payment for the two calibrations that were in dispute Churchill argued that the payments were due. Churchill said that if the calibrations had not been carried out at Daventry its engineer would have had to make a calibration visit to St Cleer before the EGA could be used for MOT tests.

8.99. On the more general complaints made against EGA suppliers, Churchill commented as follows:

- (a) *Choice of calibrator and charges.* Churchill said that it had invested considerable sums in arranging for its engineers to become NAMAS approved. Despite this the company claimed that it tried to offer a calibration service at costs comparable to calibration service on other equipment not subject to stringent requirements laid down by the Government for the EGA used in MOT tests. Churchill also told us that it was operating at a loss on its calibration service.
- (b) *Self-calibrating instruments.* Churchill said that the Autogas 4 was self-calibrating and was sold as such shortly after the MOT exhaust gas tests started. It was only later, the company told us, that the VI's requirements became known and these overrode what Churchill saw as this inherent advantage of its EGA.
- (c) *Supply of filters.* Churchill said that it did not discourage purchase of filters from third parties but its guarantee did not extend to parts other than its own.

## **H Young (Operations) Limited (trading as Kamasa Tools) and Lucas Service UK Ltd**

### ***The reference services***

8.100. Kamasa told us that it was the sole UK importer of the Protech Flux 2000 EGA manufactured in Italy and approved for use in the MOT test. Kamasa said that it acted as importer and distributor only and did not participate in the calibration or servicing of the Protech EGA; this it subcontracted to Lucas. Kamasa also told us that it sold the Protech only to its distributors Lucas and Brown Brothers (Dana) Ltd which were totally independent and with which Kamasa had no supply agreements. Lucas was the only company authorized by Kamasa to calibrate and service the instrument.

8.101. Kamasa said that it did not support calibration of EGAs by independents and would only do so if this were to be required by legislation. Kamasa considered it preferable that as few service companies as possible participated in the reference services market so that the calibration services and service warranty offered to end users could be properly managed and controlled.

8.102. Kamasa considered the current requirements of the calibration scheme to be sensible and Lucas said that, in its view, NAMAS's requirements appeared to ensure continuing quality and consistency.

8.103. Lucas told us that in agreement with Kamasa it had secured NAMAS approval for the Protech EGA for 26 of its engineers. These were based at the company's various branches throughout the UK. Customers were offered calibration service from their nearest approved engineer. Lucas said that this service was provided completely separately from the sale of the EGA and customers might have purchased their instruments from either Lucas or from Brown Brothers (Dana) Ltd.

8.104. Lucas said that it did not offer a combined service/calibration package with the purchase of the EGA. Lucas also said that it did not offer formal calibration contracts and branches invoiced their customers locally. Nor did it currently offer service contracts. Lucas also told us that it currently calibrated and serviced only the Protech EGA and that warranty terms and conditions were set by Kamasa.

8.105. On the relationship between calibration and servicing Kamasa considered that the two functions could be carried out separately. But in the company's view this was, in effect, impractical as the EGA often needed to be recalibrated after servicing and this had to be done by an approved engineer; to call out another person for this purpose would not, the company believed, be efficient or cost-effective.

### *Calibration and servicing charges*

8.106. Lucas told us that with 26 locally-based engineers it found little variation in travelling times in carrying out the reference services provided it organized its workload so as to cover several jobs on each journey by one of its engineers. Accordingly Lucas said that it did not vary its charges in line with geographical location although the situation in the Shetland Isles was currently under review. Kamasa said it did not consider that a system of variable costs according to location was workable and suggested that it was not practised in other industries, eg for telephone line installation charges.

### *The complex monopoly situation*

8.107. Neither Kamasa nor Lucas commented directly in their replies to the MMC's issues letter on our provisional finding of a complex monopoly situation in the reference services. Both implied in the comments they did make that their respective policies were in almost all respects not anti-competitive and that there was strong competition in the market.

8.108. Kamasa said that there were sufficient players in the market to ensure keen competition. The company also pointed out that the four major players in the market identified by the MMC in their provisional finding were in direct competition with one another. In Kamasa's view a garage owner took account of such factors as the cost of the EGA, the back-up services offered, his own particular requirements and the cost of calibration and servicing in making his choice. If any one of the factors compared unfavourably with what was on offer elsewhere, Kamasa believed that the garage owner would be influenced against the machine. It was therefore essential for the EGA supplier to keep down his charges for the reference services. Nevertheless Kamasa did not consider that EGA calibration costs were a considerable item of revenue expenditure for the average garage.

8.109. Lucas told us that its charges were carefully calculated to cover its training, equipment investment, continuing engineer approval fees, equipment calibration fees, travelling costs, vehicle costs, consumables such as calibration gas, certificates, central administration and computerized follow-up procedure, the actual time taken to calibrate and a fair profit margin. In the company's

view, if the same MOT test requirements were maintained, it had no reason to believe anyone could provide the same level of service more cheaply. Lucas also pointed out that it had a much wider business relationship with many of its customers for EGA calibration. The ability of these customers to take their business elsewhere was, in Lucas's view, a sufficiently powerful incentive to deter it from risking any monopolistic practices.

### ***Restrictions on access to manuals, training and software***

8.110. Kamasa said that the difference between the EGA and other MOT test instruments was that although it could put a car off the road there was no way in which the consumer could check whether or not the EGA's decision was correct. In other aspects of the MOT test the consumer could 'feel' or see that something was wrong. It was for this reason in Kamasa's view that the EGAs had to be maintained in the highest possible conditions by calibration and servicing and this was the objective of the VI and NAMAS approval requirements. In addition to achieving these objectives it was, in Kamasa's view, eminently reasonable that the manufacturer should have some control over the calibration and servicing activity in order to preserve his good name.

### ***Restrictions on warranties***

8.111. Kamasa told us that its warranty required that the EGA should be calibrated and serviced by Lucas employees only (as the company's agents). Kamasa said that this restriction was necessary, in its view, to ensure that the end user was provided with good service and to assist with the management of the engineers carrying out the reference services. Kamasa also told us that these warranty conditions were made clear to the customer as, in effect, a condition of the purchase of its EGA. The company took the view that most guarantee/warranty documents required inspection, servicing and repair by the manufacturer or his agent and the use of 'genuine parts'.

### ***Restrictions on the supply of proprietary spare parts***

8.112. Kamasa considered it important to distinguish between spare parts and consumables. In its view a spare part was something that was not routinely replaced. A consumable was regularly replaced and Kamasa considered that this could be done by the user who could also obtain them from any source he chose. Kamasa also suggested that any consumable supplied by a non-manufacturer should be tested and proven by the supplier to be compatible with the range of machines for which it was intended and should be so certified before its use was allowed.

8.113. Kamasa told us that it required proprietary spare parts for the Protech to be bought only from the company. It was the only source of the parts designed, manufactured, tested and distributed by the manufacturer. Kamasa said that the use of non-manufacturer spare parts might affect the performance of the instrument. Kamasa accepted that this restriction on the supply of proprietary spare parts would in turn restrict competition but the company believed this would guarantee that the EGA worked to its original specification. Kamasa said it would be happy for another company to supply spare parts for any of its machines provided each spare part were tested in accordance with the strict guidelines laid down by such bodies as the OIML and the VI.

### ***Restrictions in contracts of employment***

8.114. Lucas provided the MMC with a copy of its 'Employee Handbook' which, it pointed out, made no reference to EGAs. Nor did it appear to place any restrictions in the way of any employee who left the company and wished to continue or engage in provision of the reference services. Lucas also pointed to the NAMAS requirement that an engineer approved by NAMAS for Protech calibration lost that approval on leaving the company's employment. Lucas commented that had that stipulation not been in place the company might well have questioned the wisdom of entering a field where its employees could have been presented with the possibility of starting their own business at the company's expense and with its customers.

8.115. Finally both Kamasa and Lucas commented on the results of the MMC's survey of MOT stations. Kamasa said it suggested that the vast majority of EGA users were happy and had no real complaint and that if the system were working well it was best left alone. Lucas considered that there was a danger of over-reacting to what it considered to be a handful of complaints.

### **Richard Oliver Limited and the Garage Equipment Maintenance Co Ltd**

8.116. Oliver told us that it had developed its EGA (the Gas Check 2000—an OIML Class II instrument) from its many years' experience as a manufacturer of gas analysis equipment used in research and development in all types of engines and in education. Oliver said that it was not previously involved in the garage equipment market in the UK and was not able to support or even to sell its machines in the field. It was for that reason that it had reached agreement with GEMCO, a company with a service organization and already in the garage equipment market, for the distribution and provision of the reference services for the Gas Check 2000. Oliver also told us that it had given GEMCO sole distribution rights for its EGA and that the agreement between the two companies gave GEMCO complete discretion in the arrangements it made for the provision of the reference services. The agreement also allowed GEMCO to distribute, calibrate and service other EGAs if it wished.

#### *The reference services*

8.117. Oliver said that it was not opposed to the calibration and servicing of its EGA by third parties, subject to their meeting the required standards through GEMCO, nor to the release of its manual to them. The company had had a few approaches from third parties wishing to calibrate and service its EGA but had referred them all to GEMCO.

8.118. GEMCO told us that it was willing to assist third parties to acquire NAMAS approval to calibrate the Gas Check 2000 by providing training, including release to them of the Oliver manual. No royalty was charged for the Oliver manual but GEMCO made a charge of around £250 for the 40 hours of training required. Two third party firms, ATE (Neil Jeffery) and Everquip, had already secured NAMAS approval. GEMCO said that it had also had approaches from a number of other companies but none had been pursued. If they had been GEMCO said that it would wish to establish through references that they had an established business and were commercially sound. Without these precautions GEMCO feared that a third party might secure NAMAS approval for its engineers with GEMCO's assistance and if it then went out of business the end user would look to GEMCO to remedy the situation and incur the costs of doing so.

8.119. On its relationship with the two third parties providing the reference services for the Gas Check 2000 GEMCO told us that they were totally independent and not under contract to GEMCO. They were totally free to provide the reference services in any area, including those covered by GEMCO's engineers, and to charge their own fees. GEMCO said that the third parties were also free to calibrate other makes of EGA if they so wished.

8.120. On its own services GEMCO told us that it had trained its engineers in its own training school to calibrate the Gas Check 2000 in accordance with the required procedures. It had secured NAMAS approval for 50 of them through SIRA. It operated a national service at uniform charges and offered calibration either on annual contract or on demand. GEMCO said that it did not currently offer service contracts apart from a small number of its EGAs, estimated at about 100, sold on all-encompassing lease agreements. Of these, about half had calibration and maintenance contracts.

8.121. GEMCO said that it had adopted its uniform charging system so as to be in line with the terms covering the range of other garage equipment it serviced and to comply with the demands of its national account customers. GEMCO also told us that the cost of acquiring NAMAS approval for its engineers was much greater than it had anticipated so that in the first year of the calibration scheme it had underpriced its charges by some £50 per calibration. GEMCO said that it had had to increase its 1993 charges accordingly and had received a number of complaints as a result. Overall GEMCO believed its calibration charges were much the same as those of its competitors. In response



to a suggestion that increased competition from third parties might reduce its costs by taking over responsibility for some of the more remote MOT stations, GEMCO said that this was unlikely in its case because of the proportion of its business represented by contracts with major garage groups located throughout the UK.

8.122. On the relationship between calibration and servicing, Oliver told us that it was possible to carry out these operations separately apart from the economics of so doing. GEMCO said that it was very difficult to see how the two operations could be economically carried out by different companies because servicing involved breaking the calibration seals requiring immediate recalibration.

8.123. Both Oliver and GEMCO considered the approval procedures satisfactory though GEMCO thought them to be expensive. On the other hand GEMCO believed that using only engineers approved by NAMAS ensured that the appropriate standard of engineering skills was maintained across the market-place.

### *Warranties*

8.124. GEMCO said that it was not a condition of its warranty that its EGA should be calibrated and/or serviced by the company or that only its spare parts be used. On the other hand, if there were evidence that the instrument had been tampered with the repairs might not be carried out free of charge and the matter would be taken up with the customer.

### *Spare parts*

8.125. Oliver told us that it did not itself manufacture many spare parts but some were made to its specification and design and it would not be happy to make these generally available through third parties. Other standard parts for the Oliver EGA were, we were told, generally available in the market-place. All Oliver's spare parts were supplied in bulk to GEMCO.

8.126. On the more specific issues of filter elements and the probe, Oliver said that there was a wide variety of filter elements available for use with EGAs. Oliver used a particular brand of filter element for removing water droplets etc and another for removing particulate matter. It used these types after carrying out lengthy and expensive tests on the sample handling of its equipment. Oliver said that it did not claim that another brand or type of filter element would not perform satisfactorily; it simply did not know. Oliver emphasized that users sometimes did not realize that the filters were there to protect the most expensive part of the analyser, the optical bench, and so had to be treated with the utmost caution. Oliver also pointed out that the probe on its analyser was designed specifically to meet the required performance of the sample handling side of the EGA and to meet the requirements of the OIML specification. The design of the probe was Oliver's but it could be produced to Oliver's drawings by several concerns and there were no supply problems.

8.127. GEMCO told us that, in its view, spares were an integral part of the EGA market and that, with a few exceptions, a free market existed. On filters, it was GEMCO's policy to change the filters at every calibration and it had put this into its calibration procedure.

### *Contracts of employment*

8.128. GEMCO told us that its contract of employment contained the standard terms to safeguard confidentiality and to provide for retention of documents etc when an employee left the company. GEMCO said that there were no other restrictions on the employee's future employment.

### *Complaints*

8.129. We put to GEMCO the specific complaints by Neil Jeffery (paragraphs 5.20 and 5.21) and AVS (paragraph 6.17) and to Oliver and GEMCO some of the more general complaints received by the MMC directed at EGA suppliers. Commenting on the points raised by Mr Jeffery, GEMCO said

that he had referred to his contract with GEMCO but it was unaware of any formal or informal contract with Mr Jeffery for calibration. On Mr Jeffery's complaint that he had to buy spare parts from GEMCO rather than direct from Oliver, GEMCO pointed out that the supply of spare parts had been contracted out to it by Oliver as that company had no distribution channels of its own. GEMCO also denied Mr Jeffery's allegation that it had spoilt his tender to BT by stipulating that he could not hire other engineers. GEMCO reiterated that it was willing to assist third parties to acquire NAMAS approval subject to the criteria it had laid down (paragraph 8.118). GEMCO had, it said, told BT that there were two alternative calibrators for the Gas Check 2000.

8.130. Oliver denied the allegation by Prosol (paragraph 6.79) that manufacturers discouraged purchase of filters from third parties by suggesting that they were of inferior quality. Oliver reiterated the importance of using the correct filter for its EGA (paragraph 8.126) and said that if a third party secured its supplies from Oliver's filter supplier under the same part number then there would be no problem. If a third party offered an alternative filter for use in its EGA, Oliver said that it would be prepared to test it at the supplier's expense but pointed out that such testing was expensive and lengthy. Oliver also said that if end users of its EGAs accepted alternative filters for the Gas Check 2000 without its approval it would require them to pay for repairs caused by filtration problems.

### **Tecalemit Garage Equipment Co Ltd**

8.131. Tecalemit told us that it was a major supplier of garage equipment in the UK and that the EGA it supplied, an OIML Class II instrument, was purchased from Omitec Instrumentation Limited. Tecalemit said that it had received NAMAS laboratory accreditation for the approval of engineers to calibrate its EGA and it offered servicing and calibration through its Service Division. Tecalemit had received only one approach from an unknown person seeking to calibrate and service its EGAs and this had been refused. The company said that its policy on such approaches was to consider them on the basis of its assessment of the party's abilities, resources and the degree of customer support that could be given.

8.132. We put to Tecalemit the complaints made by Renault (paragraphs 6.67 and 6.68). On the lack of choice of calibrators for its EGA, Tecalemit pointed out that some 200 out of the 900 EGAs it had sold were not calibrated by the company. On Renault's complaint about Tecalemit's refusal to release its calibration manual, the company pointed out that ownership of the copyright rested with Omitec but it also maintained that the calibration scheme as originally put forward to EGA manufacturers and other interested parties in June 1991 had provided for nomination as an approved calibrator to be endorsed by the manufacturer.

### **Souriau (UK) Ltd**

8.133. Souriau, which is a wholly-owned subsidiary of its French parent company, Souriau Diagnostic Electronique SA France, told us that it sold gas analysers and other automotive workshop equipment. Souriau said that the UK company had been responsible for the repair, maintenance and calibration of the company's products but that agreement had recently been reached to transfer responsibility for this, including the EGAs, to Tecalemit. Souriau had also employed three other companies as subcontractors to calibrate and service its EGAs but had not, as yet, been approached by any others. It had been prepared to consider such approaches provided that the company concerned was able to maintain the standards required and provide the appropriate levels of customer service.

8.134. We asked Souriau about the complaint about increased charges made by Pratt and Gelsthorpe (paragraph 6.31). Souriau told us that its initial calibration fee of £65 was set in February 1991 to meet a request from the RMIF for information for its members. This was before the details of the calibration scheme were available. Souriau said that it held the fee for 12 months but then had to raise it to £85 for calibrations under prepaid contract or £110 without a contract, in order fully cover its costs.

## Hermann Electronics (UK) Ltd

8.135. Hermann told us that in association with Autocraft Equipment Limited it imported, sold, serviced and calibrated garage equipment including EGAs. Hermann said that it had acquired NAMAS laboratory accreditation in order to service its customer base. Hermann had received no approaches from third parties seeking to service and calibrate its EGAs but it had contracted two other companies, Celtech and Celtech UK, to provide these services. Hermann also said that it would be willing to consider further approaches from other parties provided that they were willing to seek NAMAS approval through Hermann's accredited laboratory and to work strictly to the company's procedures and quality manual.

8.136. We raised with Hermann the complaints made by Addtronics (paragraphs 5.6 and 5.7). Hermann told us that its past relationship with that company was *sub judice* but said that it had supplied Addtronics with an OPUS EGA in May 1992 on cash-on-delivery terms. The invoice had not been paid but Hermann said that it had continued to calibrate the instrument. Hermann also told us that a number of NAMAS-approved engineers carried out calibrations on its behalf but were not directly employed by the company. Mr Addison of Addtronics was one of these and had assisted Hermann to achieve NAMAS accreditation, but Hermann said that it reserved the right to decide who to retain in this role. Finally Hermann considered that the faulty OPUS 4 machine referred to by Addtronics was still capable of use for the MOT test and replacement of the faulty oxygen sensor was in Hermann's view Addtronics' responsibility.

## Other EGA suppliers

8.137. In addition to the above eight EGA suppliers, which account for over 75 per cent of both EGAs at MOT stations (Table 3.4) and of calibration services (Table 3.10), replies to our questionnaire were received from a further nine suppliers (listed in Appendix 8.2). From the evidence provided by these suppliers it appeared that the provisional finding of the existence of a complex monopoly situation did not apply to them. Specifically all the companies said in their replies:

- (a) *Access to manuals, training and software.* The companies, many of which indicated that they had not been approached for the use of their manuals, all told us (with varying degrees of enthusiasm) that they would be willing to consider their release to third parties subject, in some cases, to conditions such as payment of a royalty plus evidence of an established business reputation and a sound financial position. Some had already agreed to third party calibration of their EGAs and released their manuals accordingly.
- (b) *Restrictions in warranties.* A number of these other suppliers imposed restrictions requiring that repairs were carried out by the manufacturer using 'genuine' spare parts during the warranty period. None had conditions which invalidated the warranty if calibration was carried out by a third party NAMAS-approved engineer.
- (c) *Spare parts.* None refused to supply spare parts.

# 9 Conclusions

## Contents

	<i>Paragraph</i>
Introduction .....	9.1
Background to the inquiry .....	9.3
The market for calibration and servicing .....	9.6
The monopoly situation .....	9.12
Competition in the market .....	9.21
Identification of relevant market .....	9.24
Extent of competition in the market for EGAs .....	9.32
Practices and their effects	
Calibration .....	9.51
Servicing .....	9.71
Consumables .....	9.77
The public interest .....	9.81
Conclusions .....	9.88

## Introduction

9.1. Our terms of reference require us to investigate and report on whether a monopoly situation exists in relation to the supply in the UK of the service of calibrating and servicing gas analysing equipment. For the purpose of the reference 'gas analysing equipment' means equipment used to analyse exhaust gas emissions from motor vehicles in connection with tests carried out pursuant to the Motor Vehicle (Tests) Regulations 1981. We refer to such tests as MOT tests and to the gas analysing equipment as exhaust gas analysers (EGAs).

9.2. Vehicle testing in Northern Ireland is governed by different legislation from the rest of the UK. Since tests are not carried out pursuant to the Motor Vehicle (Tests) Regulations 1981, the calibration and servicing of EGAs used in Northern Ireland fall outside our terms of reference. The discussion in the remainder of this chapter relates only to the situation in Great Britain.

## Background to the inquiry

9.3. The MOT test first included exhaust gas emission tests in November 1991. They were introduced in order to reduce pollution of the atmosphere as a result of badly-adjusted engines and were therefore a departure from past practice where the MOT test had been concerned solely with road safety.

9.4. Each MOT station is now required to have an EGA of a type approved by the Vehicle Inspectorate (VI) and to have it calibrated regularly in order to ensure that it continues to give accurate readings. Calibration is normally required every three months and it must be carried out by an engineer approved by the National Measurement Accreditation Service (NAMAS), a part of the National Physical Laboratory which is itself an executive agency of the Department of Trade and Industry.

9.5. A number of the leading suppliers of EGAs have followed practices which make it difficult for engineers other than their own employees or agents to gain approval to calibrate their EGAs. These practices are the main focus of this inquiry.

### The market for calibration and servicing

9.6. In its most basic form an EGA consists of a metal box about the size of a large briefcase to which a hose is attached. The hose ends in a metal probe which is inserted into the exhaust pipe of the vehicle. An electric pump draws the vehicle's exhaust gases into the EGA where their composition is analysed. The results are then displayed in numeric form on the front of the machine. An EGA may also form part of a much larger engine diagnostic unit which a garage would use to diagnose faults in a number of components and to tune the vehicle's engine. These functions are not part of the MOT test and so most EGAs used for MOT purposes are of the 'stand-alone' variety.

9.7. There are around 17,750 MOT stations that are approved for the testing of petrol-engined vehicles and therefore need an EGA.<sup>1</sup> There is a wide choice of models. Some 35 models of 25 makes are currently shown as approved on the VI list and are available for installation in MOT stations. In addition 59 other models were accepted provided they were installed prior to the start of emissions testing in November 1991. We estimate that some 19,400 EGAs were installed for MOT purposes at the end of 1992 and, as shown in Table 3.4, the shares of the largest suppliers were:

	%
Sun Electric UK Limited (Sun)	24
FKI Crypton Limited (FKI Crypton)	16
V L Churchill Ltd (Churchill)	14
Richard Oliver Limited (Oliver)	9
H Young (Operations) Limited, trading as Kamasa Tools (Kamasa)	5

9.8. Our inquiry concerns the calibration and servicing of these 19,400 machines. In general the suppliers of the EGAs also offer calibration and servicing. In the case of FKI Crypton these functions are carried out by a sister company, FKI Transervice Limited. Kamasa has appointed Lucas Service UK Ltd (Lucas) as its agent for calibration and servicing. Oliver has appointed the Garage Equipment Maintenance Co Ltd (GEMCO) as its agent for distribution, calibration and servicing. These main suppliers of calibration/servicing deal only with EGAs of one make and so are not competing with each other for the calibration of every installed EGA. However, they do face competition in some cases from independent firms. Kaltek UK and its associates (Kaltek) calibrate about 10 per cent of the Sun machines and a small number of Oliver machines are calibrated by two agents with the co-operation of GEMCO. The calibration arrangements for all the significant makes of EGA are shown in Table 3.9. It will be seen from this table that Kaltek is the only firm that is operating completely independently of the main suppliers. Sun provides no documentation and no assistance with maintaining NAMAS approval for Kaltek's engineers.

9.9. After an EGA has been calibrated the engineer attaches a seal which will be broken if the cover of the machine is opened. Some routine maintenance, including the replacement of external filters and damaged hoses or probes, can be carried out without opening the cover. Any other repair will involve breaking the seal, resulting in the need for the machine to be recalibrated before it can be brought back into use. This has the consequence that the vast majority of repairs are in practice carried out by engineers who have NAMAS approval to calibrate the particular model. Thus entry to the servicing market is feasible for the supply of filters, hoses and probes but the fitting, repair or adjustment of other parts is generally confined to suppliers of calibration services for that model of EGA.

9.10. Calibration engineers operate in conjunction with a NAMAS-accredited calibration laboratory for which they act as 'approved signatories' of EGA calibration certificates. Sun and two smaller EGA suppliers have their own accredited laboratories from which their own employees operate. Sira Test

---

<sup>1</sup>The exhaust emissions from diesel-engined vehicles are subject to a different test for which an MOT station must have a smoke meter.

& Certification Limited (SIRA) is an independent testing and calibration laboratory which provides facilities for EGA calibrators from other companies. It is not an EGA supplier and does not itself calibrate EGAs in MOT stations. It enters into contracts with other companies under which they calibrate EGAs in SIRA's name using engineers whom SIRA has tested and recommended to NAMAS as approved signatories. SIRA is remunerated by fees and by the charges it makes for calibration certificates and seals issued in its name.

9.11. We estimate that the market for the calibration and servicing of EGAs, including the supply of consumable items such as filters, is worth about £8 million to £10 million a year.

## **The monopoly situation**

9.12. Under the terms of the reference made by the Director General of Fair Trading on 4 February 1993 we are required to investigate and report on whether a monopoly situation exists in relation to the supply in the UK of the service of calibrating and servicing EGAs used in connection with MOT tests and, if so, by virtue of which provisions of sections 6 to 8 of the Fair Trading Act 1973 (the Act) the monopoly situation is to be taken to exist and in whose favour it exists.

9.13. We are required to limit our consideration to agreements or practices which restrict owners or users of EGAs as to the persons from whom they may acquire the reference services, whereby persons conduct their affairs as mentioned in section 7(2) of the Act. The effect of this reference to section 7(2) is that we are concerned only with the case where at least one-quarter of the calibration and servicing of EGAs is supplied by a group of separate suppliers who follow practices (whether by agreement or not) which prevent, restrict or distort competition in connection with the supply of those services. Thus we are concerned only with whether a 'complex monopoly situation' exists and not with questions of a scale monopoly (where a quarter of supply is by, or for, one firm or a group of interconnected companies). Furthermore we are concerned only with practices which restrict owners or users in their choice of supplier.

9.14. From the evidence recorded in Chapters 5 and 6 and the replies of the EGA suppliers to our questionnaire we provisionally found that six leading suppliers of EGAs and/or their calibration and servicing each engaged in one or more of the following practices:

- (a) restricting access by users and third parties to calibration/servicing manuals, training and software needed to calibrate or service their EGAs;
- (b) imposing conditions in warranties which have the effect of requiring calibration and/or servicing to be carried out:
  - (i) by their employees or appointed agents; and/or
  - (ii) using parts supplied by the EGA supplier or its appointed agents;
- (c) refusing to supply proprietary spare parts to end users or to third parties other than appointed agents; and
- (d) including conditions in contracts with employees which restrict their ability to provide the reference services after cessation of their employment.

We informed these suppliers of our provisional finding that a complex monopoly situation existed in that they were members of a group which engaged in some or all of these practices which prevent, restrict or distort competition. The suppliers concerned were Sun Electric UK Limited, V L Churchill Ltd, FKI Crypton Limited, together with its sole agent for calibration/servicing FKI Transervice Limited and H Young (Operations) Limited (trading as Kamasa Tools), together with its sole agent for calibration/servicing Lucas Service UK Ltd. They were invited to respond to our provisional findings and to give their views on the issues listed in Appendix 9.1 which arise from them.

9.15. All these suppliers replied in writing and most attended hearings. Three main contrary arguments were advanced: first, that the supplier concerned did not engage in some or all of the practices, second that the practices did not prevent, restrict or distort competition, and third, that the practices did not have effects which were against the public interest.

9.16. After considering the arguments of the suppliers (as set out in Chapter 8) and the evidence of other parties in relation to the practices, we conclude that all six of the suppliers engage at least in the practice of restricting access by users and third parties to calibration/servicing manuals. Together these companies supply over 60 per cent of the calibration and servicing of EGAs used in MOT stations and so satisfy the 25 per cent test (see Table 3.10 and paragraph 3.74).

9.17. The withholding of manuals prevents, restricts or distorts competition in that it prevents would-be entrants to the calibration market from obtaining NAMAS approval and providing competition in the calibration and servicing of EGAs. Thus the provisions of section 7(1)(c) and (2) of the Act are satisfied. Furthermore, the practice restricts owners or users of EGAs as to the persons from whom they may acquire the service of calibrating and servicing EGAs and so satisfies the limitation in our terms of reference. We therefore conclude that a complex monopoly situation exists in relation to the supply in the UK of the service of calibrating and servicing gas analysing equipment as defined in our terms of reference. This finding carries no implication that the conduct operates against the public interest.

9.18. We consider that the complex monopoly situation exists in favour of the same six companies.

9.19. Having concluded that a complex monopoly situation exists because the companies withhold access to calibration manuals, we do not need to consider the other practices listed in paragraph 9.14 for the purpose of establishing the existence of the monopoly situation.

9.20. Because a monopoly situation exists we are now required by our terms of reference to consider whether any steps (by way of uncompetitive practices or otherwise) are being taken by any of the persons in whose favour the complex monopoly situation exists, for the purposes of exploiting or maintaining that situation, and whether any action or omission on the part of those persons is attributable to the existence of that situation. These questions are considered below (paragraphs 9.51 to 9.80) in relation to the practices in various segments of the market. Finally we are required to consider whether any facts found in pursuance of our investigation operate, or may be expected to operate, against the public interest. This is discussed in paragraphs 9.81 to 9.87.

## **Competition in the market**

9.21. Calibration, servicing and the supply of consumables and spares for EGAs are 'secondary products' because demands for them arise only after the purchase of an EGA (the 'primary product'). It is often difficult in such cases to determine whether the provision of the secondary product in relation to a particular brand of primary product is a separate market in itself or whether it forms part of a wider product market. These concepts are discussed more fully in paragraphs 3.85 to 3.90.

9.22. The suppliers have suggested to us that all brands of EGA together with their calibration and servicing constitute a single market. They argue that customers base their choice of EGA not only on the price and quality of the machine but also on the costs and quality of after-sales service in the form of calibration, servicing and consumable spare parts. The suppliers go on to argue that the market for EGAs is highly competitive, so that a monopoly supplier of calibration or servicing for a particular brand of EGA will not be able to exploit his monopoly position. Any attempt to do so would lead to a loss of sales of EGAs. Therefore, the arrangements they make for calibration/servicing, including any practices that we may identify as steps taken for the purpose of maintaining a monopoly situation, can have no adverse effect on the public interest.

9.23. An alternative view is that in the absence of the restrictions which limit the ability of third parties to provide calibration/servicing, there would be two markets: one for the supply of EGAs of all brands and the other consisting of the calibration/servicing of all brands of EGA. Competition between calibration/service companies, even if they were each suppliers of a particular brand of EGA,

would ensure that these services were supplied at minimum cost and at prices which reflected the costs of supplying different customers and possible efficiency gains. For example, where the costs of supplying the service differ significantly, as they are likely to do where travelling time represents a substantial portion of total costs, a system of flat rate charging means that some customers are subsidizing others. This process of averaging costs is likely to discourage innovative arrangements to achieve more cost-effective supply of calibration/servicing in the remote areas. The present arrangements may also hinder the achievement of efficiency gains by precluding the conduct of calibration/servicing across different items of equipment in the same garage and the calibration/servicing of equipment in nearby garages. Under this view the restrictions imposed by suppliers of EGAs may lead to effects adverse to the public interest.

### *Identification of relevant market*

9.24. In deciding which of these alternative market definitions is appropriate we need to examine whether a sole supplier of calibration/servicing for a particular brand of EGAs is constrained from engaging in uncompetitive behaviour such as raising prices significantly above costs. The single market definition will be appropriate where such a constraint is provided by competition for the sale of new EGAs: for example, if high prices for calibration of a particular brand would dissuade MOT stations from purchasing that brand of EGA. Although MOT stations which already have an EGA may have no choice of calibrator, they may nevertheless be protected by the continuing need for the EGA supplier to demonstrate to prospective purchasers of a new EGA that his calibration/servicing costs will be competitive.

9.25. There is clear evidence that competition for the supply of EGAs was very strong in 1991 and such competition would undoubtedly generate information for MOT stations on the cost and quality of calibration/servicing as suppliers fought to make sales on the basis of their competitive strength in this area. Although there are comparatively few sales of EGAs at present, because the market is saturated, many of the leading EGA suppliers are also suppliers of other garage equipment. Our survey of MOT stations (see Appendix 3.4) shows that the reputation of a supplier across the whole field of garage equipment is a factor in purchasing decisions. Hence any uncompetitive behaviour in the calibration/servicing of EGAs is likely to be constrained by the supplier's desire to preserve his reputation for garage equipment generally. Further evidence for a single market is provided by the fact that in gearing up to meet the introduction of emission tests the manufacturers clearly recognized the need to ensure that there was adequate servicing and calibration available, whether or not they themselves were intending to provide it. We were told that since that time manufacturers, including Sun, Churchill and FKI Crypton/Transervice, have chosen to provide repairs free of charge under warranty even where they could have avoided any obligation because the need for the repairs resulted from damage caused by independent repairers or the use of inappropriate consumables. It is unlikely that the companies would have taken these steps unless they recognized that their behaviour in the after-sales market would affect their future sales of EGAs and other garage equipment.

9.26. The costs and quality of calibration/servicing are, however, only likely to influence purchases of the EGA itself if they are a high proportion of the whole-life costs of owning an EGA. Evidence so far (see paragraph 4.23) indicates that these costs are likely to be up to 50 per cent of the discounted whole-life costs of the equipment. This appears to us to be a high enough proportion to influence consumers' choice.

9.27. Whatever the costs, behaviour in the after-sales market will only be constrained by competition for the supply of EGAs if those costs are known and that knowledge influences the purchaser's decision. We accept the argument that most MOT stations are knowledgeable and well-informed customers. They are used to paying for the servicing of garage equipment and although any one MOT station may deal only with one supplier informal contact between stations is likely to convey information about the behaviour of suppliers. Information is also conveyed by evaluations by trade associations (eg the recommendation of a particular EGA by the Retail Motor Industry Federation Limited (RMIF)) and by articles in the trade press. We note, moreover, that it is not necessary for each and every MOT station to have a high level of price awareness and the propensity to shop around. All that is necessary for competition in the supply of EGAs to constrain pricing and quality



in the supply of calibration/servicing is that a significant number of customers do have sufficient knowledge and the ability to act on it. We are satisfied that this is the case.

9.28. It was pointed out to us that at the time when most MOT stations made their purchases of EGAs in 1991 the requirements for calibration were not clear because they were not made known by the VI until comparatively close to the November deadline. There was, therefore, no experience of the charges which manufacturers would make since the requirement for calibrating EGAs was a new one and in such circumstances purchasing decisions could not have been based on whole-life costings. This may be true but now that purchasers have gained experience in using these services we believe that they are likely to be aware of the whole-life costs of owning an EGA and the reputations for reliability of the various suppliers of the reference services. They will therefore be able to make more, rather than less, informed decisions at the time when they purchase their next EGA or other item of garage equipment. This knowledge will constrain EGA suppliers from attempting to exploit what could be regarded as captive customers.

9.29. While most MOT stations own only one EGA, and are therefore not frequent purchasers in the EGA market, the efficient functioning of the EGA is essential to the MOT testing function and so any failure in after-sales service could put the station temporarily out of the testing business and is therefore particularly likely to influence the choice of future equipment.

9.30. Experience of EGA users so far is consistent with the view that a single market is in operation. Despite the fact that there is no competition for the calibration and servicing of several of the leading brands, our survey of MOT stations showed that user satisfaction is nevertheless high and we have received few complaints from users. A number of the complaints we did receive have been from MOT stations in dispute with their EGA supplier and frustrated by the absence of choice of calibrator and so unable to show their displeasure by ceasing to deal with the supplier in the short term. It is clear from their correspondence that such complainants will be most unlikely to return to the supplier in question for future purchases of garage equipment. Also suggestive of the constraints on suppliers of EGAs which prevent the exploitation of customers is the fact that prices are not excessive in relation to other comparable services and that excessive profits are not being made by the suppliers of calibration/servicing even though many of them are sole suppliers for their brand of equipment (see paragraphs 4.15, 4.19 and 4.23 to 4.25). However, we note that the provision of free servicing during the warranty period (which will have ended only recently for the majority of machines) will have depressed revenue during the last financial year. An alternative reason why companies might charge low prices for calibration and servicing and provide repairs free of charge when not legally obliged to do so is that they are acting in a predatory fashion with the aim of driving potential competitors from the market. We have received no complaints nor seen any evidence that this is the case.

9.31. On the basis of the preceding analysis it seems to us that as currently organized the calibration/servicing of EGAs is part of a single market with the supply of the original machines. We therefore conclude that this is the appropriate market in which to consider the practices of the suppliers of calibration/servicing.

### *Extent of competition in the market for EGAs*

9.32. In a single market the behaviour of companies as suppliers of calibration and servicing will be influenced by the level of competition between the companies as suppliers of EGAs.

9.33. The four largest suppliers (Sun, FKI Crypton, Churchill and GEMCO) have a market share of some 63 per cent, although no single supplier has a market share of more than 25 per cent (see Table 3.4). This level of concentration might indicate a lack of competition but there are other features of the structure which have to be taken into account.

9.34. First, the user has a wide choice of EGA supplier other than the main four. There are another seven suppliers of EGAs with a market share of 3 per cent or more, including a number of significant suppliers such as Kamasa, Tecalemit Garage Equipment Co Ltd (Tecalemit) and Robert Bosch Limited (Bosch). The main companies supplying EGAs prior to 1991 have subsequently sold

more EGAs but lost market share (see Table 3.5). This suggests that companies in the leading positions in the market can be challenged.

9.35. Second, the evidence suggests that market entry and exit are relatively easy. Market entry has been considerable in the last two years. Some 15 suppliers entered the market in 1991. Most new entrants were already established suppliers in the garage equipment industry. Some entered as manufacturers of EGAs (eg Churchill), some as exclusive suppliers/distributors of EGAs manufactured by others either in the UK or overseas (eg GEMCO, Kamasa/Lucas). There is a large choice of manufacturers and the production of EGAs takes place in many countries, some 27 per cent of the installed base of EGAs in 1992 being imports.

9.36. Entrants in 1991 will have known that the level of demand would not be sustained in later years. This suggests that the costs of exit are not high.

9.37. Third, most of the suppliers do not rely solely on the EGA market for their survival. Sales of EGAs account for less than 10 per cent of the total annual sales of most suppliers. In particular, the large suppliers/distributors appear better able to survive in the longer term than a single manufacturer. They have established distribution and service networks, have their financial risks spread over products other than EGAs, and have a choice of EGA manufacturers.

9.38. Other evidence also suggests that the market for EGAs is competitive.

9.39. Evidence on prices suggests that competition to supply EGAs is strong. In 1991 there was fierce discounting of prices as the November deadline for sales approached (paragraphs 3.56 to 3.58).

9.40. As shown in Table 4.4, the profits earned by the four main suppliers from the supply of stand-alone EGAs have not been excessive, the weighted average operating margin being 11.2 per cent. As regards calibration and servicing, with the exception of two results, the suppliers have incurred losses at the operating profit level in each year (Table 4.1).

9.41. The level of customer satisfaction with calibration and servicing, as expressed by garages interviewed in the survey of MOT stations, is very high. Some 90 per cent of those interviewed were satisfied or very satisfied with the price and quality of calibration and servicing.

9.42. Thus the evidence of the operation of the market over the last two years suggests that the market for the supply of EGAs and their calibration and servicing is currently competitive.

9.43. Ideally conclusions should be drawn from evidence of the operation of a market over several years. This is clearly not possible in this case, but attention needs to be given to the way in which the market might develop over the next few years.

9.44. After the initial surge in sales in 1991, there is now a lower demand for EGAs. The level of demand might increase slightly as a replacement market develops, ie as older machines reach the end of their lives. Moreover up to 55 per cent of machines currently in use are not expected to meet the requirement for greater accuracy which will accompany the more stringent emission test expected to be introduced in 1996. This comprises the 25 per cent of machines which do not meet the Organisation Internationale de Métrologie Légale (OIML) standard, and were only approved if installed before November 1991, and the 30 per cent which are OIML Class II machines (see Table 3.1). Before 1996 many of the older non-OIML machines are likely to have been replaced by OIML Class I EGAs, with the Class II machines remaining in place until close to the 1996 deadline. Hence, demand for the next two years is likely to be low and even as the 1996 deadline approaches the surge in demand is unlikely to be as high as in 1991, when over 15,000 machines were bought.

9.45. Faced with lower demand and the loss of VI approval for any non-OIML models some suppliers may well cease to sell EGAs in the UK market and will make alternative arrangements for the calibration and servicing of machines already installed. Those supplying OIML Class II EGAs may be particularly vulnerable given that these models are likely to become obsolete in 1996. The resulting increase in market concentration might simultaneously increase the market power of the main suppliers and provide the opportunity for them to make a sustainable increase in prices of calibration

and servicing. Given the static nature of the demand, smaller suppliers may be tempted to follow any price rises initiated by the main suppliers.

9.46. However, there are a number of factors which might be expected to constrain the behaviour of the main suppliers.

9.47. First, market entry remains a threat to existing suppliers of EGAs. For instance, a garage equipment supplier with an established name and distribution network would readily be able to enter the market for EGAs and their calibration and servicing, should it be profitable to do so.

9.48. Second, EGAs represent a relatively small part of the turnover of the main suppliers. Most of their business is the supply of other garage equipment. Any adverse reputation they achieve in the sales, calibration or servicing of EGAs is likely to affect other parts of their business.

9.49. Third, as OIML Class I EGAs replace Class II EGAs a six-month calibration interval should become more common which will reduce the annual calibration fee faced by the user. Suppliers that are currently offering only OIML Class II EGAs should be able either to develop their own Class I EGA, or to buy in a suitable model from another manufacturer.

9.50. In the light of the preceding discussion we conclude that the market for the supply of EGAs is currently competitive. We now consider the practices which influence competition in the supply of calibration and servicing.

## **Practices and their effects**

### ***Calibration***

#### ***Withholding access to manuals, software and training***

9.51. In order to calibrate a particular model of EGA an engineer needs to be approved by NAMAS. Such approval is granted only to those who offer a satisfactory manual setting out the calibration procedure, who have demonstrated their technical competence to NAMAS or to a NAMAS-accredited laboratory and who have established a satisfactory quality control system. It is therefore necessary for would-be calibrators to have access to information about how to carry out calibration, eg which keys to press or switches to operate and how to interpret the readings on the EGA's display.

9.52. Such information can be obtained in a variety of ways, eg by acquiring and studying a calibration manual prepared by or with the assistance of the manufacturer; by being trained by the manufacturer; or, if the party has sufficient engineering expertise, by acquiring a machine and studying the way it is built and operates (known as 'reverse engineering').

9.53. All these methods, except the last, normally require the co-operation of the manufacturer. Acquiring the manufacturer's calibration manual is the simplest route since the other methods leave the would-be calibrator with the task of preparing his own manual. We found from complaints and from the evidence of the suppliers themselves that the six listed in paragraph 9.14 either had refused to make manuals available or said that they were unwilling or unable to make them freely available. Some other suppliers who said that they would be willing to do so had never been asked and so had had no opportunity to demonstrate their willingness. Some suppliers said that they would be willing in certain circumstances, for example if they were satisfied that the recipient was competent, financially viable and willing to make appropriate payments for use of the manufacturer's intellectual property.

9.54. Independent calibrators might obtain training from manufacturers either by attending training courses offered to independent businesses or if they had previously worked for the manufacturer or his calibration agent. Some of the suppliers (eg Bosch and GEMCO) offered training to independent businesses which calibrated their EGAs with their approval—indeed, Bosch relied on such agents to calibrate all its machines. Others (eg Sun and FKI) indicated clearly that they would not provide such training. The issues associated with former employees are discussed in paragraph 9.57 to 9.60.

9.55. Obtaining information by reverse engineering requires a degree of engineering competence beyond that required simply to calibrate an EGA after training. Two manufacturers followed practices which (whether intentionally or not) had the effect of making it impossible to follow this route. In the case of Sun, access to the parts of the software which calibrate the machine can only be gained by keying in a password and in the case of Churchill a special cartridge containing the calibration software needs to be plugged into the machine in place of the normal operating cartridge. Sun does not make its password available to independent calibrators and Churchill is unwilling to make its calibration cartridge available.

9.56. We conclude that all of these practices are steps taken for the purpose of maintaining the monopoly situation.

#### *Contracts with employees and distributors*

9.57. A complaint that a manufacturer's contract of employment contained a clause restraining ex-employees from competing in the market for calibration led us to examine the employment contracts of all the leading manufacturers. We found that only Sun had such a clause. It required the employee to undertake that:

For a period of 12 months after the date of termination of my employment I will not, either on my own, or with others or as an employee of any agency or organisation whatsoever calibrate any Sun Electric Equipment for which I require NAMAS accreditation.

9.58. Such a clause could prevent engineers who had acquired the skills necessary to calibrate and service a particular brand of EGA from entering the market in competition with their former employer. We consider that this is a step taken by Sun for the purpose of maintaining the monopoly situation which we have found to exist.

9.59. However, we note that the prohibition on calibrating a Sun EGA lasts for only one year and that the clause also serves the purpose of protecting Sun from the possibility that its ex-employees might make use of commercially confidential information about Sun's customers which they had gained in the course of their employment. In any event, an ex-employee would be free to use his general knowledge of EGA engineering to calibrate/service other brands of EGA if he could gain access to the information discussed in paragraphs 9.51 to 9.54. This will be relatively easy for those brands where calibration does not require access to a password or special software cartridge.

9.60. We understand that if any employer sought to impose unreasonable restraints on its ex-employees they would not be enforceable in the Courts.

9.61. We also examined a number of contracts between manufacturers and their distributors and agents. We found no evidence of clauses restricting distributors/agents or their employees from entering the market for calibration/servicing. Sun has a direct sales force and does not use distributors.

#### *Warranty restrictions*

9.62. Among the EGA suppliers only Sun and FKI Crypton make it a condition of their warranty that calibration is carried out only by the manufacturer or his appointed agent. Other suppliers have less explicit requirements which could have the same effect, for example a condition requiring that no 'adjustment' or 'tampering' is carried out by unauthorized engineers. Others have a condition which excludes from the warranty any *failure resulting from* unauthorized calibration, adjustment, etc. This last condition is unobjectionable.

9.63. Conditions that invalidate the whole warranty in the event of calibration by an unapproved engineer, whether or not the fault results from that calibration, could be intended to tie in calibration to the supply of the EGA. Sun took the process a stage further and informed all those MOT stations

which had purchased a Sun EGA but did not have a calibration contract that their warranty had been withdrawn but could be reinstated if they entered into a contract with Sun (see paragraph 8.29). We believe that this was done with the intention of taking customers from independent calibrators. We therefore conclude that it was done for the purpose of maintaining the monopoly situation.

9.64. As far as the other conditions are concerned, we are satisfied that they are included in the warranty in order to protect the supplier from the possibility that he will have to bear the cost of repairing damage caused by others. We consider this a reasonable precaution by a supplier who chooses to offer a warranty and therefore conclude that the practice is not related to the existence of the monopoly situation. In forming this view we have taken account of the fact that (Sun apart) the EGA warranties last only for 12 months. Our conclusion might have been different if the conditions were combined with a much longer warranty period.

### *Prices*

9.65. The prices charged by the EGA suppliers and their appointed agents are generally in the range of £60 to £80 per calibration (see Table 3.12) with discounts available in some cases for large customers or for annual contracts. There is virtually no price competition for the calibration of a particular brand of EGA, except in the case of Sun equipment where Kaltek offers an independent service at prices slightly lower than Sun's.

9.66. We discuss the profitability of the larger suppliers in Chapter 4 and also record the costs they have incurred to develop calibration software and manuals and to maintain a team of trained and NAMAS-approved calibration engineers. The profitability of the companies is not excessive, indeed many make losses on their calibration and servicing of EGAs, and servicing charges are comparable to those for other electrical equipment. This is consistent with our finding earlier in this chapter that competition in the supply of EGAs will constrain suppliers' actions in respect of calibration and servicing. There is no evidence that low prices are being set in a predatory way to drive competitors from the market or to prevent the entry of new competitors. We therefore conclude that prices are not set at a level which exploits the monopoly situation.

9.67. We have also considered whether the suppliers' practice of charging a uniform fee across the whole country is attributable to the existence of the monopoly situation. Since the cost of carrying out the calibration of an EGA will vary according to the time the engineer takes to travel to the MOT station, which will generally be greater in sparsely populated areas, a system of uniform fees must involve some cross-subsidy from customers in low-cost areas to customers in high-cost areas. In a market where there was competition to calibrate a particular model of EGA it would appear possible to enter the market in the low-cost areas with charges which were lower than the nation-wide uniform fee. Since this would make the uniform fee unsustainable we must conclude that the action of charging such a fee is attributable to the existence of the monopoly situation.

### *Restrictions on competition by agents*

9.68. Although it appears from the VI's list of approved calibrators that many EGA models offer a choice of calibrator, we have found in our inquiry that most of the alternative calibrators operate as agents of the main supplier of calibration services rather than as competitors. The companies which we have identified as the persons in whose favour the monopoly situation exists do not use agents. We therefore conclude that any restrictions on competition by agents are not for the purpose of exploiting or maintaining the monopoly situation. We note, moreover, that where suppliers do have such restrictions, their effect on the market is the same as if the main supplier served the whole market himself rather than using agents to reach some customers.

### *Frequency of calibration*

9.69. Evidence from the manufacturers, the VI, NAMAS and SIRA indicates that no steps are taken to establish whether the required frequency of calibration could be reduced for a particular

model of EGA unless the manufacturer requests a review by the VI. Theoretically this could lead to MOT stations paying for calibrations which were not needed to preserve the integrity of the MOT test. Those who derive income from calibration (which includes NAMAS and SIRA) may have no incentive to seek a review. On the other hand, manufacturers may recognize that a less frequent requirement for calibration would make their models more attractive to customers and that the benefit from increased sales will outweigh any loss of calibration revenues.

9.70. We examined data from SIRA showing the readings recorded on calibration certificates for various models since the requirement was introduced in November 1991. The data, derived from some 58,800 calibrations, showed that the models differed very widely in the degree to which they had drifted out of calibration between one calibration visit and the next. The most stable models (including one of the market leaders) had between 4 and 10 per cent of readings outside the  $\pm 3$  per cent tolerance which is permitted at calibration while other models had more than 50 per cent of readings outside that tolerance. In general the Class I models were most stable. We conclude from this examination that there is no clear evidence that those involved in the supply of calibration services are seeking to maintain an unnecessarily frequent calibration requirement. Nevertheless, in view of the very wide differences in performance between models requiring quarterly calibration, there may be scope to vary the frequency for some of them. We believe that the VI should keep the position under review and we discuss the calibration requirements more fully in Chapter 10.

### *Servicing*

9.71. Some calibration suppliers (eg Sun) make it a condition of their calibration contracts that any maintenance or repairs are carried out by them. This limits the market opportunity for service engineers who are not NAMAS-approved calibration engineers. However, there are factors which make it likely that the two services will normally be provided by the same firm irrespective of any formal tying of servicing to calibration.

9.72. First, any servicing which requires the cover of the EGA to be opened will involve breaking the seals which are attached by the calibration engineer. Thus servicing or repair necessitates a re-calibration and MOT stations would expect to find that it is cheaper to pay for one engineer to carry out both operations.

9.73. Second, since most MOT stations have only one EGA approved for MOT use they will want to begin using the machine again as soon as it is repaired. This can be achieved most easily if the repair is carried out by an engineer who can calibrate the machine immediately it is repaired.

9.74. For these reasons we do not consider that conditions in the calibration contract relating to servicing constitute steps taken for the purpose of exploiting or maintaining the monopoly situation or that they are attributable to its existence.

9.75. A number of EGA suppliers make it a condition of their warranty that the customer has all servicing and repairs carried out by the supplier or his appointed agent during the warranty period. These conditions are similar to those restricting the supply of calibration services during warranty (see paragraphs 9.62 to 9.64) and we conclude for the same reasons that they are not related to the existence of the monopoly situation.

9.76. A refusal on the part of EGA manufacturers to supply proprietary spare parts to third parties other than their appointed agents would restrict the ability of such third parties to enter the market for the servicing of EGAs. Competition in the supply of spare parts would be inhibited if dealers were required to supply only spare parts obtained from the manufacturer. We found no evidence of either of these practices.

### *Consumables*

9.77. We found no evidence that suppliers of calibration/servicing were making it a condition of their contracts that a customer procured his consumables (eg external filters and hoses) only from

them. Nor did it appear that manufacturers were placing restrictions on the consumables that their dealers supplied.

9.78. As with calibration and servicing, a number of EGA suppliers required that only 'genuine' spare parts (including consumables) were used during the warranty period. We accept that the use of inappropriate filters can cause damage to the most expensive component in an EGA (the gas bench) and that it is therefore reasonable for suppliers to include such conditions in their warranties.

9.79. We also received some representations about the prices charged for filters: both that they were too high and that Sun might be engaging in predatory pricing. On the basis of the survey of MOT stations, which showed that 44 per cent of EGA users were aware of competitive sources of supply, and the evidence we heard from the filter suppliers themselves (see paragraphs 6.75 to 6.80) we conclude that there is a competitive market for the supply of filters. The lower prices now charged by Sun are a result of competition in the market and its greater buying power than independent calibrators.

9.80. We therefore conclude that there are no steps, actions or omissions in connection with the supply of consumables which relate to the existence of the monopoly situation.

### **The public interest**

9.81. The discussion in paragraphs 9.51 to 9.80 has identified a number of practices which affect competition in the supply of calibration and servicing. We have concluded in paragraphs 9.56, 9.58, 9.63 and 9.67 that some of them are steps being taken for the purpose of maintaining the monopoly situation or are actions attributable to its existence. We list these in Appendix 9.2. We are now required to consider whether any of the facts operate, or may be expected to operate, against the public interest.

9.82. We consider that the service of calibrating and servicing EGAs, as it is currently organized, forms part of a single market with the supply of the original machines. We have concluded that that market is competitive at present with a variety of company policies offering diversity of practice and hence of choice to consumers. In such a single market the behaviour of suppliers of the secondary product (calibration and servicing) is constrained by competition to supply the primary product (EGAs). This leads us to conclude that although practices such as the withholding of manuals, etc, make it difficult for would-be calibrators/servicers to enter the market they do not have adverse consequences for users. This is borne out by the lack of any significant evidence of disbenefits in terms of high prices, excessive profits or customer dissatisfaction with the quality of service. We accept the suppliers' argument that their reputations for quality and price in the after-market are a significant factor in the vigorous competition for the sale not only of EGAs but of garage equipment generally. Users are protected by competition in that primary market.

9.83. The EGA suppliers argued that their reputations would be damaged by poorer quality entrants servicing and calibrating their equipment. In fact independent firms already carry out this work successfully for some brands of EGA—either with the help and support of a main supplier (as with the agents appointed by Bosch or GEMCO) or despite the opposition of the main supplier (as with Kaltek's calibration of Sun equipment). We saw no evidence that these independent companies were incapable of carrying out the work to a high standard and we would not expect this to be the case given the requirements to demonstrate competence before being approved by NAMAS for calibration and the ongoing quality audits which NAMAS and its accredited laboratories have in place. Furthermore, if they had access to the manufacturers' manuals and training and were notified of updates to them, independent calibration engineers should be no less competent than those employed by the manufacturers.

9.84. It was also argued that opening the market to independent calibrators would be against the public interest because the integrity of the MOT test would be damaged and the full benefits of reduced atmospheric pollution would not be realized. This was based partly on the premise that new entrants will be less competent, which we have dealt with in paragraph 9.83, and partly on concern that the calibration procedures and software will get into the hands of unscrupulous MOT stations which will misuse them to reset their EGAs between calibrations. They might have an incentive to

do this in order to pass vehicles which should fail the MOT test or, on the other hand, they might have an incentive to adjust their EGAs so that vehicles fail the test when they should pass thus increasing the amount of profitable repair work generated by the garages' MOT activities. We do not believe it is for EGA suppliers to take on the mantle of guardians of the anti-pollution legislation. If the Government is satisfied with the controls it has in place—and the VI has told us it favours competition in the calibration/servicing of EGAs—we do not see a legitimate role for EGA suppliers in imposing tighter controls.

9.85. The final public interest argument put to us in favour of the suppliers' practices was that the information needed to calibrate and service the various models of EGA is the intellectual property of the respective manufacturers from which they are entitled to enjoy the full benefits. We recognize the force of this argument. The manufacturers have invested significant effort in developing the software and operational procedures which are used during calibration and servicing. Good reasons would need to exist for interfering with the way they choose to exploit their intellectual property rights if innovation, with its pro-competitive benefits, is not to be discouraged. An adverse public interest finding could provide such a reason but, given our findings on the competitive nature of the EGA market, we do not consider that the manufacturers have chosen to exploit their intellectual property rights in a way which operates against the public interest.

9.86. It has been suggested to us that alternative arrangements for the supply of calibration/servicing could bring benefits to customers (see paragraph 9.23). We note that some independent calibrators are operating successfully, including in the remoter areas of Scotland, and we would not wish to discourage further developments in this direction. Our task, however, is not to establish some ideal organization of the market. Our task is to consider whether any of the facts found during our investigation operate, or may be expected to operate, against the public interest. We conclude that they do not.

9.87. We have based these conclusions on the evidence before us about the structure of the market for calibration and servicing of EGAs. We recognize, however, that the market is not yet mature. It may therefore develop in a way which allows the practices we have considered to have adverse effects. In those circumstances it would be open to the Director General of Fair Trading to exercise his powers under the Act or the Competition Act 1980 if there is evidence of such effects.

## Conclusions

9.88. In summary, our conclusions are that:

- (a) a complex monopoly situation exists by virtue of sections 7(1)(c) and (2) of the Act in relation to the supply in the UK of the service of calibrating and servicing gas analysing equipment as defined in our terms of reference;
- (b) the monopoly situation exists in favour of V L Churchill Ltd, FKI Crypton Limited, FKI Transervice Limited, Lucas Service UK Ltd, Sun Electric UK Limited and H Young (Operations) Limited;
- (c) the steps listed in Appendix 9.2 are being taken by the respective persons listed in that appendix for the purposes of exploiting or maintaining the monopoly situation;
- (d) the actions or omissions on the part of the respective persons listed in Appendix 9.2 are attributable to the existence of the monopoly situation; and
- (e) none of the facts found by the MMC in pursuance of their investigations operate, or may be expected to operate, against the public interest.

9.89. During the course of our inquiry we received a number of criticisms and comments about the arrangements for pattern approval of EGAs and about the calibration requirements. We consider these in Chapter 10 and propose some changes which the relevant government agencies should consider in any review of the arrangements. We believe that if they were adopted these changes would enhance competition in the supply of calibration and servicing.



# 10 Pattern approval and calibration arrangements

10.1. When the Office of Fair Trading announced that this reference had been made to the MMC its press release said that the reference would enable the MMC to investigate related issues which may bear upon the working of competition in this market such as the technical and procedural requirements for the present, and any possible future, system of servicing and calibration. We became aware of a number of such issues during the course of our investigations.

## Pattern approval arrangements

10.2. Some of the companies supplying EGAs criticized the arrangements for pattern approval in the UK. They considered that the OIML standards against which approval is granted are not the most appropriate and that it would be better if a national standard were developed. We do not believe it is within our terms of reference to comment on this aspect since it does not relate to calibration or servicing.

10.3. However, criticisms that the arrangements do not ensure that a machine is kept to the approved standard are relevant because manufacturers argue that this places the onus on them to ensure that servicing is carried out only by them and that only original parts and manufacturer-approved consumables are used throughout the machine's life.

10.4. Pattern approval is obtained by submitting specimens of the machine to a testing laboratory accredited by NAMAS (or its overseas equivalent) for this purpose. There are two such laboratories in the UK: SIRA and GEC Avionics Ltd. If the laboratory certifies that a machine meets the appropriate OIML standard the VI will normally add it to the approved list. According to the manufacturers no steps are taken to see that production models remain identical to the specimens submitted for testing nor that a machine is not modified during servicing so that it no longer conforms to the standard. They argue that the VI implicitly relies on them to perform these functions. The manufacturers contrast this with arrangements in the USA and some European countries where production models are regularly checked at the factory and the manufacturer is required to see that every machine continues to meet the standard throughout its life. He is able to do this by arrangements which ensure that no one else opens the cover of the machine, that the machine 'locks-out' so that it cannot be used if it moves out of calibration and that only the manufacturer has access to the password necessary to release the lock-out and recalibrate the machine.

10.5. We understand from the VI and NAMAS that they are satisfied that a machine is continuing to function correctly if it can be properly calibrated against a specimen gas at the required intervals (normally three months). It does not matter if different spare parts, which may not have been tested to the OIML standard, are used so long as the machine calibrates correctly. We are not convinced that this is a sufficiently rigorous arrangement to ensure that EGAs continue to function in accordance with the standard. Calibration is required only at intervals of three months (or longer in a few cases) and it is possible to envisage circumstances in which a machine calibrates correctly but then, because it incorporates inappropriate spare parts or consumables, quickly drifts out of calibration so that for much of the period between calibrations it is not taking accurate measurements.

10.6. While this situation could be remedied by giving the manufacturers more control over servicing and use of the machine we do not believe that this is the only or best way.

10.7. One way of detecting machines which are failing to read accurately is to examine the extent to which they have drifted out of calibration between one routine calibration and the next. This information is recorded at the time of calibration on the calibration certificate, of which a copy is retained by the calibrating engineer's company, and, in the case of engineers operating under the auspices of SIRA, a further copy is returned to SIRA and entered on a computer database. It should be possible to analyse this information on a regular basis to identify any particular machine where the drift between calibrations is consistently worse than the average for a particular model. The VI could then require the machine to be taken out of service until it had been checked and adjusted by the manufacturer to bring it back into specification. In this way the integrity of the machines could be ensured without inhibiting competition in calibration and servicing.

10.8. As far as consumables are concerned the same object could be achieved by requiring manufacturers of EGAs to publish the functional specification of the relevant parts (eg filter elements) used in the models submitted for testing. Competing filter manufacturers and suppliers could then have samples of their filters tested against the specification in an accredited laboratory and so demonstrate to users that their filters, while not necessarily the original equipment, were nevertheless of the same specification.

10.9. We believe that the VI should consider the practicability of these proposals with a view to implementing them when an opportunity to change the regulations next arises. The proposals should also be considered in relation to smoke meters and any other equipment which might be required for MOT tests in the future.

10.10. Early decisions on future changes in requirements, for example those expected to be introduced in 1996, are important in ensuring that competition in the market for EGAs and their calibration/servicing is as effective as possible. If manufacturers do not know the requirements until shortly before introduction they cannot readily develop or adapt equipment to meet the need and they cannot develop appropriate servicing and calibration information with the result that they will not be able to provide information to the market on the after-sales services they will offer and the prices they will charge for them. Purchasers of equipment will then be less able to make informed choices which take account of the whole-life costs and competing suppliers of after-sales services will not be able to develop and advertise their offerings. We recognize that the VI itself had very little time in which to organize the introduction of emission tests in 1991. We recommend that on future occasions this situation be avoided.

## Calibration arrangements

10.11. The organization of calibration arrangements for EGAs involves three parties—the VI, which is the government agency responsible for laying down the requirements and policing the way MOT stations adhere to them; NAMAS, which is the government agency responsible for accrediting and monitoring laboratories which test equipment for pattern approval purposes and carry out the calibration of measuring instruments (including EGAs); and SIRA, which is one of the organizations accredited by NAMAS to carry out calibration services and which does so largely for those EGA suppliers which do not have their own NAMAS-accredited laboratories.

10.12. Some EGA suppliers said that they believed these and other functions concerned with vehicle testing should be carried out by a government agency on a monopoly basis or, in the case of calibration, by themselves under close government supervision—as is the case in a number of other countries. However, in the UK the Government has adopted the policy of putting as much of this work as possible in the private sector and allowing it to be carried out on a competitive basis. In our view, where government imposes requirements on commercial organizations, such as the possession and regular calibration of an approved EGA, there is an onus on it to ensure that the system it designs will minimize costs and provide the customer with good value for money. This can be achieved either by competition or by economic regulation. Competition is generally to be preferred where it is practicable but its efficient operation depends on the VI designing systems which promote *effective* competition.

10.13. In the case of EGAs, competition could be enhanced if the VI published information about those suppliers that are willing to release the information necessary for independent calibrators to enter the market. Purchasers who regarded a choice of calibrator as important would then be able to make a more informed choice at the time of the original purchase. The VI publishes such information for smoke meters and we believe that there would be benefits in doing the same for EGAs and for any future equipment which requires regular calibration.

10.14. Competition is not feasible in relation to the activities of NAMAS, a government organization whose costs are borne by the industry. In such cases there is an onus on the Government both to provide such services as efficiently as possible and to ensure that the requirements laid down by the VI are not more onerous than are necessary. For example, we are concerned that the VI has not reviewed its requirements for quarterly calibration (see paragraph 7.13) unless asked to do so for its own model by a particular manufacturer. We consider that the VI should regularly examine the available data in order to avoid a situation where the responsibility for seeking a review lies with one of those parties which gains revenue from calibration (which includes NAMAS and SIRA) and therefore may not have an incentive to reduce the frequency where this could safely be done. In any change to the arrangements the VI might also consider the possibility of linking calibration frequency to the number of MOT tests carried out so that those MOT stations which did not carry out many tests would have to pay less per annum for calibration services than those which used the machine more intensively. A combined arrangement, such as every 400 tests or every 12 months (whichever occurred first), might meet the VI's requirements and relate the costs borne by the MOT station more closely to its revenues from tests.

10.15. Competition could be enhanced if more information on the performance of the various models of EGA were available to purchasers. One source of such information is the calibration data discussed in the previous paragraph and we suggest that the VI considers whether some comparative analysis might be published.

10.16. We note also that SIRA gains work and revenue from every calibration which is carried out other than by an employee of one of the other three NAMAS-accredited laboratories (Sun, Tecalemit and Hermann Electronics (UK) Ltd). In practice 244 out of the current total of 304 calibration engineers are issuing certificates in SIRA's name. This represents some 80 per cent of the market. However, we saw no evidence that there were barriers to becoming an accredited laboratory and so if SIRA were to be perceived to be exploiting its position we would expect competition to emerge, for example from one of the other companies manufacturing EGAs in the UK. However, if circumstances had existed where entry was restricted this would be another example of the need for the VI to consider the structure of the market in devising its requirements.

## **Proposals**

10.17. In the light of these considerations we propose that in any review of the arrangements for the use of EGAs in connection with MOT tests the relevant government agencies should consider the practicability of:

- (a) establishing regular analyses of calibration data to monitor the performance of individual models, having regard to usage levels and other factors, so as to identify the scope to vary the required frequency of calibration if appropriate and to identify any machines that appear not to be remaining within specification;
- (b) requiring suppliers of EGAs submitted for pattern approval to publish the specification for consumable items such as external filters so that competing suppliers of consumables can have their products tested against the specification;
- (c) publishing new or changed requirements as far in advance of the implementation date as possible so that competitive supply can be allowed to develop and purchasers have better information at the time of initial purchase;

- (d) publishing information about those EGA suppliers which are willing to provide information needed by competing suppliers of calibration services and about the performance of different models of EGA; and
- (e) designing any system which imposes compulsory costs on businesses in a way which will foster competition or otherwise ensure that those costs are kept to a minimum.

We believe that these considerations may also apply to other equipment which may be introduced for the purpose of the MOT test in future.

**B C OWENS** (*Chairman*)

**J EVANS**

**J F PICKERING**

**J K ROE**

**S N BURBRIDGE** (*Secretary*)

31 August 1993

## Glossary

In this report the expressions and abbreviations listed have the meanings given below: in other contexts they may have different meanings.

<b>Calibration</b>	Adjusting the EGA against a standard gas mixture of known composition according to a procedure specified by the VI.
<b>Catalytic converter</b>	A device fitted to the exhaust system of vehicles to reduce emissions harmful to the environment.
<b>CO</b>	Carbon monoxide.
<b>CO<sub>2</sub></b>	Carbon dioxide.
<b>Consumables</b>	EGA parts requiring regular replacement (eg filters, hoses) not necessarily as part of the calibration procedure.
<b>DOT</b>	Department of Transport.
<b>EGA</b>	Exhaust gas analyser.
<b>Filters</b>	Glass fibre filters fitted externally to the EGA to remove water and particulate matter from the exhaust gas sample.
<b>Gas bench</b>	Optical infra-red gas analysis unit; the EGA component that measures the respective concentrations of carbon monoxide and hydrocarbons in the exhaust gas sample.
<b>GEA</b>	Garage Equipment Association.
<b>GEMCO</b>	Garage Equipment Maintenance Co Ltd.
<b>HC</b>	Hydrocarbons.
<b>Hoses</b>	Flexible gas connections within the EGA and between the EGA and the vehicle exhaust pipe (see also Probe).
<b>Lambda</b>	A measurement corresponding to the air:fuel ratio in the engine which influences the carbon monoxide and hydrocarbon content of the exhaust gases. Lambda measures the excess air so that for chemically complete combustion (the 'stoichiometric mixture') lambda = 1. For fuel-rich mixtures lambda is <1 and for lean mixtures >1.
<b>NACCB</b>	National Accreditation Council for Certification Bodies. A sister organization to NAMAS that accredits certification bodies as opposed to laboratories.
<b>NAMAS</b>	National Measurement Accreditation Service. A service of the National Physical Laboratory, an executive agency of the Department of Trade and Industry. Responsible for the accreditation of laboratories for the pattern approval of EGAs and for the assessment of engineers seeking NAMAS approval as EGA calibrators.
<b>O<sub>2</sub></b>	Oxygen.

<b>OIML</b>	Organisation Internationale de Métrologie Légale. A Paris-based international organization that sets standard specifications for measuring and testing instruments.
<b>Probe</b>	Tube inserted into the exhaust tail pipe of a vehicle to take a sample of the exhaust gases.
<b>RMIF</b>	Retail Motor Industry Federation Limited.
<b>Service</b>	Regular maintenance or periodic overhaul or repair of an EGA.
<b>SIRA</b>	SIRA Test & Certification Limited.
<b>SMMT</b>	Society of Motor Manufacturers and Traders.
<b>Smoke meter</b>	An instrument used in emission tests on diesel-engined vehicles to measure the opacity of the exhaust fumes.
<b>Standard gas mix</b>	A stable gas mixture of known concentration used for periodic calibration of the EGA.
<b>TRL</b>	Transport Research Laboratory, an executive agency of the DOT.
<b>VI</b>	Vehicle Inspectorate, an executive agency of the DOT, responsible for management of the MOT scheme of statutory vehicle tests.

APPENDIX 1.1  
(referred to in paragraph 1.1)

**Conduct of the inquiry**

1. On 4 February 1993 the Director General of Fair Trading sent the MMC the following reference:

The Director General of Fair Trading, in exercise of his powers under sections 47(1) and (2), 49(1) and 50(1) of the Fair Trading Act 1973 ('the Act'), hereby refers to the Monopolies And Mergers Commission the matter of the existence or possible existence of a monopoly situation in relation to the supply in the United Kingdom of the service of calibrating and servicing gas analysing equipment ('reference services').

The Commission shall investigate and report on the questions whether a monopoly situation exists in relation to such supply and, if so:

- (a) by virtue of which provisions of sections 6 to 8 of the Act that monopoly situation is to be taken to exist;
- (b) in favour of what person or persons that monopoly situation exists;
- (c) whether any steps (by way of uncompetitive practices or otherwise) are being taken by that person or those persons for the purpose of exploiting or maintaining the monopoly situation and, if so, by what uncompetitive practices or in what other way;
- (d) whether any action or omission on the part of that person or those persons is attributable to the existence of the monopoly situation and, if so, what action or omission and in what way it is so attributable; and
- (e) whether any facts found by the Commission in pursuance of their investigations under the preceding provisions of this paragraph operate, or may be expected to operate, against the public interest.

The Commission shall for the purpose of this reference limit consideration to agreements or practices which restrict owners or users of gas analysing equipment as to the persons from whom they may acquire reference services, whereby persons conduct their affairs as mentioned in section 7(2) of the Act.

In this reference:

'gas analysing equipment' means equipment used to analyse exhaust gas emissions from motor vehicles in connection with tests carried out pursuant to the Motor Vehicle (Tests) Regulations 1981.

The Commission shall report by 3 September 1993.

4 February 1993

*(Signed)* BRYAN CARSBURG  
Director General of Fair Trading

2. Formal answers to the questions in the reference are given in paragraph 9.88 and Appendix 9.2. The questions are answered more fully in the following paragraphs of the report:

whether a complex monopoly situation exists: paragraph 9.17;

(a) paragraph 9.17;

(b) paragraph 9.18;

(c) paragraphs 9.56, 9.58 and 9.63;

(d) paragraph 9.67; and

(e) paragraph 9.86.

3. The composition of the group of members responsible for the inquiry and report is indicated in the list of members in the preface.

4. Notices inviting evidence were placed in:

*Financial Times*  
*Automotive Management*  
*Fleet News*  
*Motor Retailer*  
*Motor Trader.*

5. During the course of our inquiry members and staff of the MMC visited Sira Test & Certification Limited, at Chislehurst. Staff also visited Sun Electric UK Limited at King's Lynn and V L Churchill Ltd at Daventry.

6. Written and oral evidence was provided by independent EGA calibrators and those servicing garage equipment (Chapter 5); MOT stations, fleet operators, car manufacturers, trade and consumer associations, government departments, filter suppliers and other interested parties (Chapter 6); the VI, NAMAS and SIRA (Chapter 7) and EGA suppliers (Chapter 8). In addition a survey was carried out of a sample of the nation's 18,000 MOT stations, a summary of the results of which is shown at Appendix 3.4.

7. In May and June 1993, on the basis of the information made available to us in response to questionnaires, we informed V L Churchill Ltd, FKI Crypton Limited, FKI Transervice Limited, H Young (Operations) Limited (trading as Kamasa Tools), Lucas Service UK Ltd and Sun Electric UK Limited of our provisional finding that a complex monopoly situation, as defined in section 7(1)(c) of the Fair Trading Act 1973, existed in their favour. Each of these companies was advised of the issues which the MMC might have to consider in assessing the effect of the complex monopoly situation on the public interest and was invited to give its views on them. In response we received written submissions from each of them.

8. We invited all these parties to give oral evidence and held hearings with Churchill, FKI and Sun. Hearings were also held with Richard Oliver Limited and the Garage Equipment Maintenance Co Ltd, the RMIF, the SMMT, NAMAS, and with two independent calibrating companies, a distributor and a supplier of filters.

9. Some of the evidence submitted to us during the course of our inquiry was of a commercially confidential nature and our report contains only such information as we consider necessary for a proper understanding of our conclusions.

10. We should like to thank all those who assisted in our inquiry, particularly the companies and organizations principally involved.



APPENDIX 2.1  
(referred to in paragraphs 2.2, 2.3, 2.12 and 3.8)

### Legislative provisions concerning the MOT test

1. MOT tests in Great Britain (but not in Northern Ireland) are carried out under the Road Traffic Act 1988. The detailed requirements are specified in regulations and instructions issued by the Secretary of State for Transport. This appendix describes the provisions that concern the introduction of a check on exhaust emissions requiring the use of an EGA.

2. Section 45 of the Road Traffic Act 1988 makes provision for vehicle tests 'for the purpose of ascertaining whether the prescribed statutory requirements relating to the construction and condition of motor vehicles or their accessories or equipment are complied with'. Sections 45 and 46 empower the Secretary of State to make regulations prescribing, among other things:

- (a) the authorisation of examiners, the imposition of conditions to be complied with by authorised examiners and the withdrawal of authorisations,
- (b) the manner in which, conditions under which and apparatus with which examinations are carried out, the maintenance of that apparatus in an efficient state, and the inspection of premises at which and apparatus with which examinations are being, or are to be, carried out.'

3. The regulations governing these matters are the Motor Vehicle (Tests) Regulations 1981 (SI 1981 No 1694). They have been extensively amended over the years and from 1 November 1991 have required a test of exhaust emissions to be carried out on vehicles of Class IV: motor cars and heavy motor cars other than certain passenger-carrying vehicles, public service vehicles and goods vehicles which fall into other Classes. The regulations introducing the emissions test were the Motor Vehicles (Tests) (Amendment) (No 3) Regulations 1991 (SI 1991 No 1525) which were made on 4 July 1991. Regulation 10 of SI 1991 No 1525 amended Schedule 2 of the 1981 Regulations so that it required the MOT test to include a check that the vehicle complied with Regulation 61 of the Road Vehicles (Construction and Use) Regulations 1986 (SI 1986 No 1078) which laid down the maximum carbon monoxide and hydrocarbon content for the exhaust emissions of petrol-engined cars.

4. Paragraph (10A) of Regulation 61 of SI 1986 No 1078 provides as follows:

(10A) Without prejudice to paragraphs (1) and (7) no person shall use, or cause or permit to be used on a road, a vehicle first used on or after the 1 August 1975 and propelled by a four-stroke spark ignition engine, unless the vehicle is in such a condition that, when the engine is idling—

- (a) the carbon monoxide content of the exhaust emissions from the engine does not exceed—
  - (i) in the case of a vehicle first used on or after 1 August 1983, 4.5%; or
  - (ii) in any other case, 6%;
- (b) the hydrocarbon content of those emissions does not exceed 0.12% of the total exhaust emissions from the engine by volume.

This sets the limits which exhaust gases must meet if the vehicle is to pass the MOT test. Paragraph (10A) was inserted in the Regulations by Regulation 5(5) of the Road Vehicles (Construction and Use) (Amendment) (No 1) Regulations 1991 (SI 1991 No 1526) which were made on 5 July 1991 and came into force on 1 November 1991.

5. The method of carrying out the vehicle tests, including the check on exhaust emissions, is laid down by the VI (acting on behalf of the Secretary of State for Transport) whose powers derive from Regulations 8 and 9 of SI 1981 No 1694. Appendix D of the MOT Inspection Manual, which deals with Test Equipment, is reproduced below. Among other things, it specifies the requirement for the regular calibration of EGAs.

## **Test Equipment**

## **Appendix D**

---

### **1. Introduction**

The MOT Testing Conditions of Appointment stipulate the minimum test bay equipment and other requirements. The MOT List of Acceptable Equipment lists the various makes and models of test equipment that have a measuring capability eg headlamp aim testers, brake testers etc. The suitability of other test equipment is individually assessed at each testing station.

### **2. Equipment Maintenance and Calibration**

All MOT testing equipment must be properly maintained and kept in good order. Measuring equipment must also be calibrated at the appropriate time intervals (see paragraph 3) and in all cases calibration records must be kept, except for tyre tread depth gauges.

### **3. Frequency and Location of Calibration**

#### **a. Exhaust Gas Analysers**

##### **i. Daily (checks by the user)**

Carry out a leak check on the hose and probe. Most machines have an automatic facility for doing this. If not, a physical check of the hose and probe must be carried out to confirm that there are no leaks.

##### **ii. Three monthly;**

An exhaust gas analyser must be calibrated with a certified calibration gas and when the ambient temperature is above 5°C.

**Note:** Gas analysers cannot be properly calibrated if the mains AC voltage is less than 204V or more than 264V.

#### **b. Roller and Plate Brake Testers and Headlamp Aim Testers**

Must be calibrated insitu every 6 months. It is acceptable for calibration certificates to be issued at any time during every sixth month.

#### **c. Decelerometers**

Must be calibrated at intervals not exceeding 2 years. This can only be done by a decelerometer manufacturer or a National Measurement Accreditation Service (NAMAS) accredited test house.

#### **d. Tyre Tread Depth Gauges**

A periodic accuracy check is required. This can be done by placing the base foot onto a flat surface (eg window glass) and checking that the zero datums align.

### **4. Calibration Personnel**

Equipment may be calibrated on site only by the following personnel:

#### **a. Exhaust Gas Analysers**

A technician accredited by NAMAS. The only exception is for testing stations that have OIML Class I equipment with an approved automatic gas calibration facility. These testing stations can carry out every second gas calibration themselves.

#### **b. Roller and Plate Brake Testers and Headlamp Aim Testers**

Either

i. the original manufacturer

or

ii. a firm which has taken over responsibility for equipment support from the manufacturer,

or

iii. a calibration specialist

or

iv. an experienced person from the testing station. The Vehicle Inspectorate will witness a calibration prior to confirmation of this arrangement and may subsequently require periodic demonstration of continuing competence.

### **5. Documentation**

In cases where a Testing Station employs either the manufacturer or a calibration specialist, there must be a written contract and the Test Station must obtain a certificate for each calibration.

### **6. Calibration Certificates**

#### **a. General**

All certificates must contain

i. a certificate serial number

ii. the address of the testing station and its VTS number

iii. details of the equipment, ie make, model and serial number

iv. title and address of calibration company or agency

v. signature of calibrator and date of calibration

#### **b. Exhaust Gas Analysers**

Calibration certificates are normally valid for 3 (or 6) months from the date of issue. However, if the certificate is issued no more than 14 days before the expiry of an existing certificate, then the expiry date may be 3 (or 6) months from the date of expiry of the old certificate.

#### **c. Roller and Plate Brake Testers**

Certificates must include a record of the test load, gauge readings and percentage error. The following limits apply in both forward and reverse operation as applicable.

- i. Equipment for Class III and IV: within  $\pm 3\%$  at gauge readings 100 kg (220 lb), 200 kg (440 lb), 400 kg (900 lb) and 500 kg (1100 lb).
- ii. Equipment for Class VII: within  $\pm 3\%$  at gauge readings 200 kg (440 lb), 400 kg (900 lb), 800 kg (1760 lb), and 1200 kg (2640 lb).

Calibration certificates for brake testers are to contain the following (or similar) statement

'This is to certify that the above brake test equipment has been calibrated and is within the limits specified by the Vehicle Inspectorate'.

#### **d. Headlamp Aim Testers**

Calibration certificates for headlamp aim testers are to contain the following (or similar) statement

'This is to certify that the above headlamp aim testing equipment has been checked and is in correct alignment with the vehicle standing area'.

#### **e. Calibration by Vehicle Test Stations**

Testing Stations calibrating their own equipment must keep a register listing the types of equipment and the information stated in paragraph 6a(ii) and (iii) above. Each calibration entry must contain the signature of the person who performed the calibration, the date, and for brake testers, the readings obtained (see paragraph 6c above).

#### **f. Retention of Records**

Calibration records/certificates must be retained for at least 2 years.

### **7. Independent Calibrators**

Testing stations employing calibration specialists are advised to satisfy themselves of the technical competence and viability of the company concerned.

### **8. Equipment Condition**

Test stations must immediately notify their Vehicle Inspectorate Local District Officer if any of their MOT test equipment is unsuitable for its purpose, eg out of calibration, inoperative, defective, etc.

6. It will be seen that EGAs must be calibrated every three months by 'a technician accredited by NAMAS'. The only exception is that MOT stations that have equipment meeting the OIML Class I standard with an approved automatic gas calibration facility can carry out every second gas calibration themselves. Hence for these machines calibration by a NAMAS-approved engineer is only

required every six months. Paragraph 5 of the Appendix requires that there must be a written contract with the calibrator and that the MOT station must obtain a certificate for each calibration.

## EC provisions

7. The EC harmonised the frequency of vehicle tests and the items to be tested in Council Directive 77/143/EEC of 29 December 1976 (OJ No L 47/47, 18 February 1977). The Directive has been amended over the years and on 22 June 1992 the Council adopted an amending Directive specifying the exhaust emission tests which member States were to incorporate in their national rules for vehicle tests.

8. This Directive, No 92/55/EEC (OJ No L 225/68, 10 August 1992), specified tests for petrol-engined vehicles and diesel-engined vehicles. In the case of petrol-engined vehicles, the tests were to be introduced by 1 January 1994 for vehicles without catalytic converters and by 1 January 1997 for those with catalytic converters.

9. For vehicles with catalytic converters the tests are more stringent than those for conventional vehicles. The requirements as now set out in section 8.2.1(b) of Annex II to Directive 77/143 are:

Where the exhaust emissions are controlled by an advanced emission control system such as a three-way catalytic converter which is lambda-probe controlled.

1. Visual inspection of the exhaust system in order to check that there are no leakages and that all parts are complete.
2. Visual inspection of the emission control system in order to check that the required equipment has been fitted.
3. Determination of the efficiency of the vehicle's emission control system by measuring the lambda value and the CO content of the exhaust gases in accordance with Section 4 or with the procedures proposed by the manufacturers and approved at the time of type-approval. For each of the tests the engine is conditioned in accordance with the vehicle manufacturer's recommendations.

4. Exhaust pipe emission—limit values

— Measurement at engine idling speed:

The maximum permissible CO content in the exhaust gases is that stated by the vehicle manufacturer. Where this information is not available, the maximum CO content must not exceed 0.5 vol%.

— Measurement at high idle speed, engine speed to be at least 2000 rmp:

CO content: maximum 0.3 vol%

Lambda: 1 +/− 0.03 or in accordance with the manufacturer's specifications.

## Required calibration procedure

VI4/07/20/CAL/EM

AUGUST 1991

### VEHICLE INSPECTORATE

#### EXHAUST GAS ANALYSER CALIBRATION REQUIREMENTS

##### 1. INTRODUCTION

The requirements detailed in this document relate to all calibrations of exhaust gas analysers for MOT use which are carried out on or after 1 November 1991. Certificates issued prior to November 1991 will remain valid for, the appropriate period—see paragraph 2 below. The provisions of Note ii of paragraph 2 also apply to certificates issued before November 1991.

##### 2. FREQUENCY

###### A. Equipment approved to OIML Class I with an approved automatic gassing facility:

6 monthly checks by a NAMAS approved operator, and at least one intermediate gas calibration check by the equipment user (ie the unit is gassed at not more than 3 monthly intervals).

###### B. All other equipment:

3 monthly checks by NAMAS approved operator.

##### Notes:

- i) Only NAMAS approved operators can perform statutory calibration checks.
- ii) Calibration certificates are normally valid for 3 (or 6) months from the date of issue. However, if the certificate is issued no more than 14 days before the expiry of an existing certificate, then the expiry date may be entered as 3 (or 6) months from the date of expiry of the old certificate.

##### 3. CALIBRATION LIMITS

Equipment must be calibrated to within 3% rel. of the actual gas bottles values on both CO and HC channels.

Correct calibration of CO<sub>2</sub> or O<sub>2</sub> channels is not a Vehicle Inspectorate requirement.

##### 4. COMPOSITION OF CALIBRATION GAS

Calibration gas is to be of the following nominal composition:

6% Carbon Monoxide  
2400ppm Propane  
15% Carbon Dioxide  
balance Nitrogen

The composition of the gas mixture shall be quoted with an uncertainty of less than +/- 3% of concentration of each component and be traceable to National Standards according to NAMAS requirements.

## 5. ANALYSIS OF RESULTS

The Inspectorate will monitor the results of calibrations to verify the adequacy of the calibration periods. Details of the form of the data to be given to the Inspectorate will be agreed with individual accredited laboratories.

## 6. CALIBRATION PROCEDURE

The items detailed below must be included in the periodic calibration checks of gas analysers used for MOT testing. The order in which they are performed may vary according to the equipment type.

- 1 Measure and record ambient temperature and pressure.
- 2 When the analyser has completed its warm-up phase, present the calibration gas to the instrument via the calibration port. Check the calibration of the instrument and record the results.
- 3 Check that
  - a) the exhaust probe can be inserted into an exhaust pipe,
  - b) the holes at the end of the probe are clear,
  - c) the sample hose is of the correct material,
  - d) the sample hose is not chafed to the extent that failure is imminent,
  - e) the sample hose is not collapsed or kinked,
  - f) filters are clean,
  - g) filter bowls are correctly seated and undamaged and 'o' rings are in place,
  - h) internal pipes are secure and not damaged or deteriorated to the extent that collapse or leakage is imminent,
  - i) the pump draws gas through the complete sample system at the rate specified by the manufacturer,
  - j) the input voltage to the gas bench is within the tolerance stated by the manufacturer,
  - k) visual displays are readable and function correctly,
  - l) the casing is complete and there is electrical continuity between the earth on the input socket and all parts of the case,
- 4 Perform a 'self-test' check (where applicable).

- 5 **Perform a gas calibration and adjust the instrument to bring it within calibration requirements.**  
**Note: It is important that the gas bottle values are corrected for ambient pressure.**
- 6 **Repeat the self-test check (where applicable).**
- 7 **Complete and affix calibration seals.**
- 8 **Complete and issue a calibration certificate of a type approved for the purpose by NAMAS and the Vehicle Inspectorate.**



**APPENDIX 3.1**  
(referred to in paragraphs 3.6, 3.73 and 7.39)

**NAMAS charges**

NAMAS charges (£) for accreditation of:

1. Pattern approval laboratory to:		<i>SIRA</i>		<i>GEC Avionics</i>	
Applicant fee			See Note 1		
Initial assessment fee		1,480		1,480	
Annual subscription:	1991	2,880		1,920	} See Note 2
	1992	3,040		2,120	
2. Pattern approval laboratory to:		<i>British Oxygen</i>		<i>Gas &amp; Equipment Ltd (Aberdeen)</i>	
Applicant fee		400		400	
Initial assessment fee		1,980		1,730	
Annual subscription:	1991	1,780		-	
	1992	1,820		1,420	
3. Calibration laboratory to:		<i>Hermann</i>	<i>SIRA</i>	<i>Sun</i>	<i>Tecalemit</i>
Applicant fee		400	(Note 3)	400	400
Initial assessment fee		1,580	10,670	4,740	3,560
Annual subscription:	1991	1,420	9,050	3,550	2,840
	1992	1,500	9,550	3,750	3,000

Source: NAMAS.

**Notes:**

1. Assessments of SIRA and GEC Avionics for pattern approval were extensions to existing testing scopes—no applicant fee payable.
2. The subscriptions quoted are for an accreditation covering a much wider range of testing. It is estimated that approximately £550 of the quoted subscriptions covers the technical surveillance of the pattern approval work. Overall quality system surveillance is included in the remainder of the subscription.
3. Assessment of SIRA for EGA calibration was an extension to an existing calibration scope—no applicant fee payable.
4. All charges exclude VAT.

APPENDIX 3.2  
(referred to in paragraphs 3.7, 3.39 and 7.7)

**VI list of approved equipment**

**Section G: Exhaust Gas Analysers**

<i>Item</i>	<i>Name</i>	<i>Models acceptable</i>	<i>Models only acceptable if installed before November 1991</i>
1	Allen	50-01Y	42-100 DEA, 62-130 SEA, 53-370, 53-700
2	Bear	40-100* 40-101* 40-200* 40-201* 40-200-20* 40-400* 42-400*	40-900 ACE, 40-960 DACE, 40-550 BACE (comprising 40-903 and 40-504)
3	Bosch	ETT 8.21 to 8.24† ETT 8.31 to 8.34† ETT 8.36†	ETT 8.11, 8.12, ETT 8.19, 8.20
4	BVW		Series 90
5	Crypton	282, 283, 284, 285 283/285P, POR, PORT, 290 Hi-spec	267 series, 270 series, 260 (with 440-12 Cruisemate or 450 Automate)
6	Environment		AG3M
7	GMI	VEGA 4	
8	Gunson	3037A, 9940	
9	Hamilton		VTS 850
10	Hermann	MHC 222	EHC 220, MHC 220, MHC 221
11	Hofmann	Quadro Gas 4000	
12	Horiba		MEXA 544 GE, MEXA 554 GE, MEXA 574 GE
13	Junkalor		Infralyt 4000
14	Lucas Hartridge	904	
15	Motorbranch	581A, 583A, 588A	581, 588
16	Motortest		9060-3, 9065-2
17	Omitec	OM2000	
18	Opus	Opus 4	
19	Peerless		630, 631, 650
20	Protech	FLUX 2000-200-2 FLUX 2000-200-4	FLUX 2000, FLUX 2000-2, FLUX 2000-4, FLUX 4000
21	Richard Oliver	GASCHECK 2000	
22	Riken		RX-777
23	Rogen	US699A	

<i>Item</i>	<i>Name</i>	<i>Models acceptable</i>	<i>Models only acceptable if installed before November 1991</i>
24	Sagem	AGM 1500A AGM 1500C	
25	Servitron	190A, 173A, 176A	173, 176, 190
26	Souriau	2672 Class 2	2670, 2672
27	Sun	MGA 1200‡ MEA 1500 SL	2014, MEA 1500, MGA 1200, MCS 2000, MCA 3000, SGA 9000 (Ser No 20.000.00 on) OCS TECH 80 INTERROGATOR 1805Z-9
28	Sykes-Pickavant	300760, 300481A, 300488A	300481, 300488, 300600 MK II
29	Tecalemit	TD 2044	
30	Tecnotest	488A, 481A, 483A	481, 483, 487, 488
31	Tecnomotor		G320
32	TEN		TEN 3, TEN 4
33	Triton	KAL OM 2000	
34	VL Churchill	Autogas 4	
35	Cartec	CET 2000	

\*Denotes equipment with an 'on board' self gassing facility requiring monthly calibration checks by the testing station, and annual 'NAMAS' calibration.

†Denotes equipment requiring 6-monthly 'NAMAS' calibration, with no intermediate checks.

‡Self gassing facility optional.

APPENDIX 3.3  
(referred to in paragraphs 3.10 and 7.59)

**SIRA vehicle exhaust gas analyser calibration service**

<i>Calibration companies</i>	<i>Number of NAMAS approved signatories</i>
ADE Systems	1
Almac Sales & Service	1
Analyze (UK)	7
Angstrom Electronic Services	1
Automotive Test Equipment (also known as Neil Jeffery)	1
Bear Automotive (UK)	10
Celtech Engineering Services (CES)	1
Celtech UK Electronics	2
Celtech UK Southern	1
Electrons Services	1
Euro-tec Equipment Service	2
Everquip	1
FKI Transervice	68
Gabriel Corry Garage Equipment	1
Garage Equipment Maintenance Co (GEMCO)	51
Gas Measurement Industries	9
General Diagnostic	2
Globeaid	1
Gunson	2
Horiba	2
Kaltek UK	7
Lucas Service UK	24
Motoplat UK	2
Multiquip	1
Q-Tech	1
Robert Bosch	1
Servtec	3
Souriau UK	9
Sykes-Pickavant	8
TAE	1
Transtec	2
V L Churchill	29

*Source: SIRA.*

---

## APPENDIX 3.4

(referred to in paragraphs 3.15, 3.19, 6.1, 8.57, 8.84, 9.25 and Appendix 1.1, paragraph 6)

### Survey of MOT stations

#### Methodology

1. The survey of MOT stations was carried out for the MMC in April 1993 by MIL Motoring Research (MIL).

2. The VI provided the MMC with the complete list of MOT stations. MIL's telephone research unit carried out a telephone survey of 801 of them using a quota random sample design, arranged to ensure that representation by region broadly matched population within each region.

#### Types of MOT stations

3. The respondents varied considerably in size from small outlets specializing in offering MOT tests to large motor dealers, some within major groups, whose main business is the sale of new cars as a franchised dealer for one of the car manufacturers. The following table gives a breakdown:

##### Franchised v independent by type of grouping

Type of grouping	Type of outlet		
	Franchised dealer	Independent	Total
Single operator	142	497	639
Group member	<u>102</u>	<u>60</u>	<u>162</u>
All	244	557	801

---

#### Volume of MOT business

4. The average number of MOT tests carried out by survey respondents in 1992 was 1,277. The volume of testing ranged as follows:

##### Number of MOT tests conducted in 1992

	No of MOT stations
Less than 200	81
201-500	148
501-1,000	206
1,001-2,000	240
2,001-3,000	80
3,001-4,000	19
4,001-5,000	13
5,001-7,500	10
Over 7,500	<u>4</u>
All	801

---

#### Numbers of EGAs installed for MOT use

5. Seven hundred and forty respondents (92 per cent) had only one EGA installed at their outlet, 49 (6 per cent) had two EGAs and the remainder three or more. Half of the respondents with more

than one EGA said that their second machine was the same make and model as the first. Information was obtained by MIL about each one separately, amounting to about 880 EGAs across the 801 MOT stations, allowing analysis of survey results both by unit and by outlet. Unless otherwise noted, findings are shown below based on the primary EGA installed. For most of the questions in the survey, the pattern of replies was similar, irrespective of classification by region, type of garage, type of contract, etc. Within the three major suppliers, Sun, FKI Crypton and Churchill, there were similar patterns found for the preponderance of contract types, warranty terms etc, but with a diversity of terms reported similar to that in the overall market.

6. Sixty-five different models of EGA were reported on in the survey. The three larger suppliers were represented as follows:

	<i>MOT stations</i>	<i>EGAs</i>
Sun	218	222
FKI Crypton	141	143
Churchill	129	137

7. Respondents were asked when they had acquired their EGA. Five hundred and forty-six (68 per cent) had acquired it in 1991, the majority in the fourth quarter. The responses were:

**Dates of acquiring EGA used for MOT tests**

Before 1991	105	
1991 Q1	21	} 546
Q2	32	
Q3	87	
Q4	325	
NK	81	
1992	124	
1993	7	
NK	19	
	<u>801</u>	

**Financing of EGAs**

8. Six hundred and eighty-seven respondents (86 per cent) said that their EGA had been purchased outright, 99 (12 per cent) that it was leased and 3 that it was rented. The remaining 12 did not know.

**Warranty**

9. The most common warranty duration range was from six months up to one year, as quoted by 85 per cent of respondents who were able to provide this information. A further 13 per cent had longer warranties.

**Need for calibration/provision of free calibrations**

10. Over half of the respondents (423) said that they had been offered one or more free calibrations when they purchased or rented their EGA. Two hundred and six said that the offer covered just one calibration, while 109 were allowed four free calibrations, and 69 two calibrations. The main suppliers, Churchill, Sun and FKI Crypton, were represented in each of these groups, but while 48 per cent of the FKI Crypton users quoted four free calibrations, similar terms applied only to 26 per cent of Churchill users and to 14 per cent of Sun users.

11. Six hundred and eighty-eight respondents (86 per cent) said that they had been aware of the requirement for regular quarterly calibration when they acquired their EGA.

## Types of contract for calibration

12. Respondents were asked about the type of calibration contract they had. Paragraph 3.64 and Table 3.11 report the replies.

## Charges for calibration or calibration/servicing

13. Respondents were also asked what price they were charged for a 'calibration' or for calibration and servicing combined. As expected, where the functions were combined charges tended to be higher. Just over half of all respondents were unable to supply details of costs on a per calibration basis. Replies were as follows:

	<i>Type of calibration contract</i>	
	<i>Calibration only</i>	<i>Calibration and servicing</i>
Nil	3	5
Under £20	1	4
£20-£39	4	5
£40-£59	29	36
£60-£79	111	92
£80-£99	19	25
£100+	9	13
Total reporting charge	176	180
Others	132	313
Total	308	493

Expressed in terms of annual cost range, more respondents were able to be specific about costs and their replies were as follows:

	<i>Type of calibration contract</i>	
	<i>Calibration only</i>	<i>Calibration and servicing</i>
Up to £100	10	8
£100-£199	41	38
£200-£299	120	106
£300-£399	23	29
£400-£499	4	27
£500+	1	16
Total reporting charge	199	224

In terms of regional charging patterns, there were no particular correlations, with all regions showing the range £200 to £299 as the most common, as follows:

	<i>Annual charge</i>					
	<i>Up to £100</i>	<i>£100-£199</i>	<i>£200-£299</i>	<i>£300-£399</i>	<i>£400-£499</i>	<i>£500+</i>
Scotland	-	4	19	3	2	3
North	-	5	25	2	1	-
North-West	2	10	29	9	8	-
Yorks	-	5	20	6	2	1
East Midlands	-	4	23	7	4	-
West Midlands	2	4	17	7	2	3
East Anglia	1	6	6	1	2	-
South-East	10	25	58	11	8	7
South-West	2	10	19	1	1	-
Wales	1	6	10	5	1	3

## **Price changes**

14. In most cases (78 per cent) charges for calibrations had been unchanged since installation of the EGA. Among the 22 per cent who had had charges raised, 31 per cent said that the increase had been 5 per cent or less, 25 per cent said that the increase had been between 6 and 10 per cent, 19 per cent said that the rise was between 11 and 15 per cent, and the remaining 18 per cent more than 20 per cent. In a small number of cases charges had been reduced, generally by up to 10 per cent of the original charge.

## **Customer satisfaction with price and quality of calibration service**

15. When asked to rate their degree of satisfaction or dissatisfaction with calibration arrangements as to price, quality and overall (using a four-point scale), the markings were generally high. Two-thirds said that overall they were satisfied with their calibration service and a further 24 per cent expressed themselves very satisfied. Independents were more likely to record dissatisfaction on price (34 per cent) than franchised dealers (24 per cent), which might be expected given the generally smaller size of the former.

16. An invitation to comment on aspects that had particularly satisfied or dissatisfied respondents provides some qualitative support to the results in the previous paragraph. Positive comments were received from 18 per cent, for example with respect to promptness of response, and proficiency of engineers, with all the main suppliers receiving commendations in one aspect or more of service. Negative comments were received from 23 per cent, a somewhat higher proportion than were recorded as dissatisfied or very dissatisfied with price or service, but implying that overall service levels tended to compensate for particular deficiencies for some of the 23 per cent. The main negative comments related to cost (11 per cent), and the imposition of frequent/unnecessary calibrations (8 per cent). Eighteen respondents (2 per cent) complained that calibration had to be carried out by a specified company, imposing a monopoly.

## **Choice of calibrator**

17. Three hundred and seventy-three respondents (47 per cent) said that they had a choice of calibrator. Churchill and FKI Crypton users were less likely to say that they had a choice at 36 per cent and 43 per cent respectively, while 57 per cent of Sun users said that they had a choice. 54 per cent of franchised dealers said that they had a choice compared with only 43 per cent of independent outlets. Of 163 within the 373 who had details of the choices available to them, 50 said that they could choose between four or more calibrators, and 64 had three to choose from. There were respondents in all regions of the country who said that they had a choice.

18. The 428 respondents who said that their choice was limited were asked to explain what the limitations were. One hundred and ninety (44 per cent) of these said that they were restricted by the terms under which they had purchased their EGA. One hundred and twenty-eight (30 per cent) said that there was a lack of alternative calibrators. A number of other points were mentioned such as location considerations, company policy, satisfaction with current service etc.

## **Service/maintenance of EGAs**

19. 95 per cent of respondents said that the company which supplied their calibration service also maintained their EGA. 55 per cent had an annual service contract and 40 per cent had no service contract.

20. Respondents were asked about servicing costs in 1992, excluding calibration charges. Besides 51 (6 per cent) who had had servicing done at no charge under warranty, or as part of a total service contract, a further 192 (24 per cent) provided information on service charges during 1992. Within the 192 the median charge was about £150. The distribution of charges reported was as follows:



## Distribution of servicing/repair costs during 1992

Costs	% MOT stations
Under £50	15.6
£51-£100	24.5
£101-£150	10.9
£151-£200	8.3
£201-£250	5.7
£251-£300	8.9
£301-£350	3.1
£351-£400	4.2
£401-£500	6.8
£500 and over	<u>10.4</u>
Total reported	100.0

---

## Satisfaction with service arrangements

21. As with calibration arrangements, respondents were generally satisfied with servicing, both as to price and quality. Overall 74 per cent said that they were satisfied with service arrangements, and a further 18 per cent said that they were very satisfied.

## Choice of service company

22. Just over half (51 per cent) of all respondents in the survey said that they had a choice of service company. Only 37 per cent of the 76 respondents located in Scotland said that they had a choice, while in Wales the figure was 40 per cent of the 42 respondents. Reasons given for having no choice included: (a) warranty requirement (25 per cent of those restricted); (b) other condition of supply (18 per cent); (c) unavailability of other servicers (20 per cent); and (d) advantage of combining calibration/servicing of work as calibration is required after service (15 per cent).

## Consumables

23. Asked whether they were obliged to obtain spare parts such as filters and replacement hoses from their EGA supplier under the terms of supply of the EGA or the calibration/service contract, 578 (72 per cent) said that they were not. Sun EGA users were less likely to say that they had to use their EGA supplier's spare parts, with only 18 per cent saying that they were so obliged. Three hundred and fifty-one out of the total of 801 respondents (44 per cent) said that identical parts were available at lower prices elsewhere, but 41 per cent said that they did not know about prices elsewhere.

## Use of other equipment

24. 83 per cent of franchised dealers and 61 per cent of independent outlets in the survey said that they used other diagnostic equipment in their workshop (eg engine diagnostic equipment other than the EGAs used for MOT purposes). 23 per cent of all respondents said that they had other equipment calibrated/serviced at the same time as their EGA. Asked whether it was usual to have equipment calibrated/serviced by the equipment supplier, 72 per cent of all respondents said that it was.

25. Respondents were also asked whether their experience of calibration and servicing of a piece of equipment affects their decision to purchase other equipment from the same manufacturer; just under half of the respondents (45 per cent) said that it did so greatly, 24 per cent a little, and the remaining 31 per cent not at all.

## Factors affecting choice of EGA

26. Respondents were asked about factors affecting the choice of their installed EGAs. As the table below shows, price was of importance for nearly half of the MOT stations in the survey. A smaller number had considered calibration and servicing arrangements to be an important factor at that stage. Nearly half said that calibration arrangements had not influenced their decision.

*per cent of cases*

*Effect on choice of EGA*

	<i>Greatly</i>	<i>A little</i>	<i>Not at all</i>
Price	44	29	27
Servicing arrangements	34	29	37
Calibration arrangements	24	28	48
Experience of other diagnostic or garage equipment	31	27	42
Recommendation of trade association or motor car franchise	21	19	60

On the last factor, recommendation from a trade association or car franchise, users of Churchill EGAs were twice as likely as the average user to reply that their decision was greatly affected by this.

27. In confirmation of the relatively low levels of dissatisfaction with their EGA equipment and calibration and servicing arrangements, only 14 per cent of respondents said that they were unlikely to make their next purchase of an EGA from their current supplier. 61 per cent said that they were likely to do so, and the remaining 25 per cent were neutral on the question.

28. Asked a similar question about possible future purchase of non-EGA equipment made by their EGA manufacturer, a considerable degree of loyalty was shown, as follows:

**When you make your next purchase of equipment other than EGA, how likely is it that you will purchase equipment made by the manufacturer of your current EGA?**

	<i>MOT stations</i>	<i>%</i>
Likely	360	45
Neither likely nor unlikely	230	29
Unlikely	163	20
Not applicable (EGA manufacturer not supplying other relevant equipment)	48	6
	801	100

APPENDIX 5.1  
(referred to in paragraphs 5.1 and 7.8)

**VI list of approved calibrators**

**APPROVED EXHAUST GAS ANALYSER CALIBRATORS**

Calibration of exhaust gas analysers can be carried out only by NAMAS approved personnel. We have been advised that the following companies are, or should soon be, approved to calibrate the models of gas analyser shown.

<b>MAKES AND MODELS COVERED</b>	<b>CALIBRATION COMPANY (Tel No)</b>	
Allen (all models)	VL Churchill	(0327 704461)
Bear (all models)	Bear Automotive	(0223 68666)
Bosch (all models)	Bosch	(0895 838354)
	ADE Systems	(0257 278641)
	Angstrom	(0292 312939)
	CES	(0831 811656)
	Celtech UK	(061 788 0267)
	General Diag.	(0455 617888)
	Hermann	(0935 881848)
	TAE	(0823 289111)
	Hermann	(0935 881848)
BVW Series 90	VL Churchill	(0327 704461)
Churchill Autogas4	FKI Transervice	(0422 882383)
Crypton (all models)	GMI	(041 812 3211)
GMI (all models)	Motoplat	(0322 222343)
Hamilton VTS 850	Hermann	(0935 881848)
Hermann (all)	Horiba	(0604 765171)
Horiba (all models)	Sykes-Pickavant	(0253 714023)
Motortest (all models)	Servtec	(0276 79889)
Omitec OM 2000	Peerless	(0254 391792)
Peerless (all models)	Brown Brothers	(0793 513315)
Protech (all models)	Lucas Service	(021 733 2363)
	GEMCO	(0604 22773)
Richard Oliver Gascheck 2000	Globe Aid	(0702 295599)
Sagem (all models)	Hermann	(0935 881848)
	Analize (UK)	(081 984 9006)
Servitron 173, 176, 190	Souriau	(06285 24981)
Souriau (all models)	Sun Electric	(0553 692422)
Sun (all models)	Celtec UK	(061 788 0267)
Sun 2014, MCA3000, MCS2000, )	CES	(0831 811656)
MEA1500, MGA1200, )	Kaltec UK	(0553 675369)
SGA9000, TECH80. )	Sykes-Pickavant	(0253 714023)
Sykes (all models)	Tecalemit	(0752 701212)
Tecalemit TD 2044	Servtec	(0276 79889)
	Motoplat	(0322 222343)
Tecnomotor G320	Sykes-Pickavant	(0253 714023)
Tecnotest 481, 483, 487, 488	Kaltec UK	(0553 675369)
TEN (all models)	Servtec	(0276 79889)
Triton KAL OM 2000		

*Note:* NAMAS approved engineers have a NAMAS identification card carrying their name and photograph. If in doubt, ask to see it.

APPENDIX 7.1  
(referred to in paragraph 7.64)

**SIRA price list: valid from 1 November 1992**

**Stationery**

Gas analyser certificates	£ 2.40 each
(Data supplied to ST&C on Disk)	£ 1.70 each

Each pad of 50 supplied with a full set of labels free of charge

4 sheets of calibrated  
1 sheet of uncalibrated  
3 sheets of void if broken

Smoke detector certificates	£ 2.40 each
(Data supplied to ST&C on Disk)	£ 1.70 each

Each pad of 25 supplied with a full set of labels free of charge

2 sheets of calibrated  
1 sheet of uncalibrated  
1 sheet of void if broken

Dummy gas certificate pads	£ 4.00 per book
----------------------------	-----------------

Incident report pads	£ 4.00 per book
----------------------	-----------------

**Additional labels**

'For calibration contact ...'	Free
-------------------------------	------

White 'Calibrated'	50p per sheet
--------------------	---------------

Red 'Uncalibrated'	50p per sheet
--------------------	---------------

Green 'Void if broken'	£1 per sheet
------------------------	--------------

**Calibrations (Issued with a NAMAS calibration certificate)**

Item	1 to 9	10 plus
Barometer	£ 59 each	£ 39 each
Multimeters	From £ 60 each	On request

Although not Mandatory for calibrating the Gas analyser, a multimeter with a NAMAS calibration certificate may be required if you use it to calibrate other equipment in garages with BS 5750 accreditation.

Optical filters	On request	On request
-----------------	------------	------------

### Calibrations (Issued with an in house ST&C calibration certificate)

<b>Item</b>	<b>1</b>	<b>2 or more</b>
Multimeters	£ 35	£ 20
Insulation meter	£ 30	£ 15
Flowmeter	£ 35	£ 15
Thermometer	£ 30	£ 15
Optical filters	On request	On request

All equipment should be delivered in good working order. Any additional costs eg batteries will be levied.

The prices quoted are for small batches and a typical turn-round of 3 days. A same day service for small batches is usually available at an additional premium. Ring for details.

### Equipment Purchases

<b>Item</b>	<b>1</b>	<b>10 or more each</b>
Barometers	£ 205	£ 155
(calibration not included in the purchase price)		
Gas bag kit	£ 25	£ 20

All orders are subject to postage and packing. Prices quoted are all exclusive of VAT.

*Source: SIRA.*

---

**APPENDIX 8.1**  
*(referred to in paragraphs 8.1, 8.14 and 8.82)*

**Practices referred to in the issues letter**

- (a)** restricting access by users and third parties to calibration/servicing manuals, training and software needed to calibrate or service their EGAs;
- (b)** imposing conditions in warranties which have the effect of requiring calibration and/or servicing to be carried out: (i) by their employees or appointed agents; and/or (ii) using parts supplied by the EGA supplier or his appointed agents;
- (c)** refusing to supply proprietary spare parts to end users or to third parties other than appointed agents; and
- (d)** including conditions in contracts with employees which restrict their ability to provide the reference services after termination of their employment.

**APPENDIX 8.2**  
*(referred to in paragraph 8.137)*

**Other EGA suppliers**

<i>Supplier</i>	<i>Model (brand)</i>
<b>Analyze (UK)</b>	<b>Servitron</b>
<b>Bear Automotive (UK) Limited</b>	<b>Bear</b>
<b>Robert Bosch Limited</b>	<b>Bosch</b>
<b>Europe Automotive Products (Real Auto Limited)</b>	<b>Ten</b>
<b>Globeaid Limited</b>	<b>Sagem</b>
<b>Horiba Instruments Limited</b>	<b>Horiba (MEXA)</b>
<b>Omitec Instrumentation Limited</b>	<b>Camic Tecalemit CAL</b>
<b>Snap-on Tools Limited</b>	<b>Snap-on Horiba (MEXA)</b>
<b>Sykes-Pickavant Ltd</b>	<b>Sykes-Pickavant Motortest Tecnotest</b>

APPENDIX 9.1  
(referred to in paragraph 9.14)

**Issues put to the main suppliers**

**List of issues**

- (a) whether the practice of restricting access to calibration and service manuals, training and software (including any necessary passwords) restricts or may be expected to restrict competition by limiting those able to enter the market for the reference services and so to reduce consumer choice;
- (b) whether the practices listed in paragraph 3 of the covering letter<sup>1</sup> result or may be expected to result in higher prices for the reference services than would otherwise be the case;
- (c) whether these practices deprive or may be expected to deprive users acquiring more than one brand of EGA, and/or purchasing other garage equipment used in MOT tests, of potential economies arising from the use of a single calibrator or service engineer;
- (d) whether the practices result or may be expected to result in excessive levels of profits for companies providing the reference services;
- (e) whether the provision of national calibration/service coverage at a uniform fee is justified given that the price charged does not reflect the cost of providing the service so that some customers subsidize others;
- (f) to what extent it may be reasonable for an EGA supplier to exert some control or influence over those calibrating and servicing its EGAs in order to preserve the integrity of the instruments and the company's reputation as a manufacturer of quality goods;
- (g) whether the warranty terms offered by your company restrict or may be expected to restrict competition and consumer choice in the provision of the reference services;
- (h) whether your company's practices discourage the sourcing of spare parts for its EGAs from third parties and hence restrict or may be expected to restrict competition and consumer choice;
- (j) whether the practice of supplying proprietary spare parts only to employees or appointed agents may also restrict or be expected to restrict competition and consumer choice in the reference services; and
- (k) what distinctions (if any) there are between EGAs and other equipment which justify practices which restrict or may be expected to restrict competition in servicing and calibration of the equipment.

---

<sup>1</sup>See Appendix 8.1.



APPENDIX 9.2  
(referred to in paragraphs 9.81 and 9.88)

**Steps, actions or omissions relating to the existence  
of the monopoly situation**

1. Steps taken for the purpose of exploiting the monopoly situation.

None.

2. Steps taken for the purpose of maintaining the monopoly situation.

<i>Action</i>	<i>Companies</i>
(a) Withholding access to the calibration manual (paragraph 9.56)	V L Churchill Ltd FKI Crypton Limited FKI Transervice Limited Lucas Service UK Ltd Sun Electric UK Limited H Young (Operations) Limited
(b) Withholding training in calibration procedures (paragraph 9.56)	V L Churchill Ltd FKI Crypton Limited FKI Transervice Limited Lucas Service UK Ltd Sun Electric UK Limited H Young (Operations) Limited
(c) Keeping confidential from independent calibrators the password which gives access to the calibration software (paragraph 9.56)	Sun Electric UK Limited
(d) Withholding access to the cartridge containing calibration software (paragraph 9.56)	V L Churchill Ltd
(e) Including in the company's contracts of employment a clause restraining ex-employees from calibrating EGAs manufactured by the company (paragraph 9.58)	Sun Electric UK Limited
(f) Informing purchasers of EGAs that their warranty is withdrawn because they do not have a calibration contract with the manufacturer (paragraph 9.63)	Sun Electric UK Limited

3. Action attributable to the existence of the monopoly situation.

<i>Action</i>	<i>Companies</i>
Charging a uniform national fee for calibration (paragraph 9.67)	V L Churchill Ltd FKI Transervice Limited Lucas Service UK Ltd Sun Electric UK Limited

4. Omissions attributable to the existence of the monopoly situation.

None.

## Index

- Accreditation
  - of laboratories 7.32
  - for calibration of exhaust gas analysers 2.8, 3.10, 7.34-7.37
  - for pattern approval of exhaust gas analysers 2.6, 3.6, 7.33
  - for supply of calibration gas 7.38
- Addtronics
  - views 5.2-5.7
  - NAMAS response 7.50
- Analyze (UK)
  - calibration arrangements Table 3.9
  - calibration prices 3.66
  - imports 3.45, Table 3.7
  - market share 3.40-3.41, Tables 3.4, 3.5, 3.6
  - market share of calibration services 3.64
- Anglian Vehicle Services
  - views 6.17-6.18
  - response by GEMCO and Oliver 8.129
- Approval of calibration engineers 2.9-2.11
  - costs 4.29
- Automobile Association, views 6.59
- Automotive Aftermarket Association, views 6.37
- Automotive Test Equipment (ATE)—*see* Jeffery, Mr Neil
  
- BDK Motor Services, views 6.19-6.20
- Bear Automotive (UK) Ltd 3.30
  - calibration arrangements Table 3.9
  - calibration prices 3.66
  - imports 3.45, Table 3.7
  - market share 3.40-3.41, Tables 3.4, 3.5, 3.6
  - market share of calibration services 3.64
- Bosch, Robert, Ltd 3.30
  - calibration arrangements Table 3.9
  - calibration prices 3.66
  - imports 3.45, Table 3.7
  - market share 3.40-3.41, Tables 3.4, 3.5, 3.6
  - market share of calibration services 3.64
- Brover & Co Ltd, views 5.27-5.29
  
- Calibration
  - frequency 2.8, 3.9, 6.45-6.46, 9.69-9.70, 10.14
  - views of SIRA 7.62-7.63
  - views of Vehicle Inspectorate 7.13-7.14
  - procedure 3.12-3.13
  - Vehicle Inspectorate requirements 2.7-2.8, 3.9, 3.13, 7.34, App 2.1, App 2.2
- Calibration companies
  - approved by Vehicle Inspectorate 5.1, 7.8, App 5.1
  - market shares 3.64
  - views 5.1-5.33
- Calibration services
  - advance payments 4.31
  - barriers to entry 3.71-3.73
  - charge-out rates 4.24-4.25
  - contracts 3.65
  - market definition 3.85-3.91
  - market shares 3.64
  - prices 3.66-3.70, 6.42, 9.65-9.67, App 3.4
  - views of suppliers 8.12, 8.53, 8.79, 8.106, 8.121, 8.134
- Calibration services, prices—*contd*
  - views of Vehicle Inspectorate 7.25
  - profitability 4.14-4.18
  - supplier arrangements 3.60-3.63, Table 3.9
- Car fleet operators, views 6.70-6.74
- Car manufacturers, views 6.61-6.69
- Catalytic converters 3.8, 7.10-7.12
- Churchill, V L, Ltd 3.28, 6.33-6.34
  - calibration arrangements Table 3.9
  - calibration prices 3.66
  - financial performance 4.10-4.12
  - imports 3.45, Table 3.7
  - market share 3.40-3.41, Tables 3.4, 3.5, 3.6
  - market share of calibration services 3.64
  - views 8.71-8.99
- Competition 1.4, 1.6-1.7, 3.56-3.58, 6.53, 10.13-10.16
  - conclusions 9.21-9.50
  - views of suppliers 8.17-8.18, 8.54, 8.108
- Complex monopoly situation 1.3, 8.1, 8.137, 9.12-9.20, 9.88, App 9.2
  - views of suppliers 8.13-8.14, 8.54-8.56, 8.80-8.82, 8.107-8.109
- Consumables 3.17, 9.77-9.80, 10.8, App 3.4
  - (*see also* Spare parts)
- Contracts
  - calibration services 3.65
  - of employment 9.57-9.61
  - views of suppliers 8.32-8.33, 8.66, 8.93, 8.114-8.115, 8.128
- Cornish Ford, views 6.21
- Cowie, T, PLC, views 6.5
  
- Discounts
  - equipment servicing 4.28
  - price of calibration 3.66-3.67
  - price of exhaust gas analysers 3.55-3.58
  
- Edmondson, R C, (Spalding) Ltd, views 6.22
- Emission limits 2.3
- Emission test 1.2, 2.2-2.6, 3.4-3.5, 9.3, App 2.1
  - alterations in 1996 3.8, 3.38, 6.46, 7.10-7.12, 9.44-9.45, 10.10
- Employment contracts 9.57-9.61
- Engineers
  - hours worked 4.26-4.27
  - NAMAS approval 2.9-2.11, 3.11, App 3.3
  - NAMAS approval
    - costs 4.29
    - views of NAMAS 7.40-7.51
  - training 9.51-9.56
- Esso, views 6.81
- Exhaust gas analysers
  - approved models 3.7, 3.39, 7.7, App 3.2
  - description 9.6
  - distribution 3.46-3.48
  - function 3.1-3.4
  - number in use 3.32-3.34, 9.7, App 3.4
  - prices 3.54-3.58
  - sales 3.35-3.38
- Exhaust gas emission test—*see* Emission test
  
- Filter suppliers, views 6.75-6.80

- Filters 3.17, 3.52, 9.77-9.80, 10.8
  - views of EGA suppliers 8.31, 8.41, 8.65, 8.92, 8.126
- FKI Crypton Limited 3.27, 6.32
  - calibration arrangements 3.61, Table 3.9
  - imports 3.45, Table 3.7
  - market share 3.40-3.41, Tables 3.4, 3.5, 3.6
  - views 8.45-8.70
- FKI Transervice Limited 3.61, 6.32, 9.8
  - financial performance 4.6-4.7
  - market share 3.64
  - prices 3.66
  - views 8.45-8.70
- Ford Motor Company Limited, views 6.63
- Garage Equipment Association (GEA) 2.7, 7.43
  - views 6.47-6.57
- Garage Equipment Maintenance Co Ltd (GEMCO) 3.29, 5.20-5.21, 6.17, 9.8
  - calibration arrangements 3.61-3.62, Table 3.9
  - financial results 4.13
  - market share 3.64
  - prices 3.66-3.67
  - views 8.116-8.129
- Garage equipment other than EGAs, servicing 3.80-3.84, 4.19
- Garages—*see* MOT stations
- Gas bench 3.1, 3.3
- GEC Avionics Ltd 2.6, 3.6
- Hartnoll Motors, views 6.23-6.27
- Headline Filters Ltd
  - views 6.75-6.78
  - response by Sun Electric 8.41
- Henlys' Limited, views 6.6
- Hermann Electronics (UK) Ltd 2.8, 3.10, 5.2-5.7
  - views 8.135-8.136
- Hickley Valtone, views 6.82-6.84
- Honda (UK), views 6.62
- Imports 3.45, Table 3.7
- Inchcape Motors Retail, views 6.7-6.10
- Issues 9.14, App 8.1, App 9.1
- Jeffery, Mr Neil
  - views 5.19-5.23
  - response by GEMCO and Oliver 8.129
- Kaltek UK 3.63, 9.8
  - market share 3.64
  - prices 3.66
  - views 5.8-5.11
  - response by Sun Electric 8.34-8.40
- Kamasa Tools 3.31
  - calibration arrangements 3.61, Table 3.9
  - imports 3.45, Table 3.7
  - market share 3.40-3.41, Tables 3.4, 3.5, 3.6
  - views 8.100-8.115
- Laboratories
  - accreditation 7.32
  - for calibration services 2.8, 3.10, 7.34-7.37
  - for pattern approval of exhaust gas analysers 2.6, 3.6, 7.33
  - for supply of calibration gas 7.38
- Lambda ratio 3.2, 3.8, 3.38
- Lex Retail Group Limited, views 6.11-6.13
- Life-cycle costs 4.23
- Lou's Tyres and Exhausts, views 6.28
- Lucas Service UK Ltd 3.48, 9.8
  - market share 3.64
  - prices 3.66
  - views 8.100-8.115
- Manuals 3.11
  - access withheld 1.5, 3.71, 5.19-5.21, 6.49, 6.68, 9.14, 9.16-9.17, 9.51-9.53
  - views of NAMAS 7.49
  - views of suppliers 8.3-8.10, 8.14-8.26, 8.43, 8.45-8.48, 8.56-8.61, 8.71, 8.82-8.88, 8.110, 8.118, 8.132, 8.137
  - views of Vehicle Inspectorate 7.20-7.28
  - development costs 4.30
- Market definition 1.6-1.7, 3.85-3.91, 9.21-9.31
- Market entry 9.35-9.36
- Market shares
  - calibration companies 3.64
  - suppliers 3.40-3.43, 9.7, 9.33-9.34
- Meteor Group plc, views 6.71-6.74
- Midway Motors, views 6.29
- MIL motoring research, survey for MMC 3.19-3.24, App 3.4
- Monopolies and Mergers Commission
  - conclusions 9.88-9.89
  - public interest findings 9.81-9.87
  - report *Indirect electrostatic photocopiers* 8.16-8.21
  - terms of reference 1.1, 9.1-9.2, App 1.1
- MOT stations 3.18-3.24
  - calibration contracts 3.65
  - advance payments 4.31
  - factors influencing choice of exhaust gas analyser 3.24, App 3.4
  - MMC survey 3.19-3.24, App 3.4
  - service contracts 3.77-3.78
  - views 6.4-6.35
- MOT test 1.2, 2.12, 6.43-6.44, App 2.1
- MOT test
  - alterations in 1996 3.8, 3.38, 6.46, 7.10-7.12, 9.44-9.45, 10.10
  - fee 3.23, 7.4-7.5
  - number carried out 3.20, App 3.4
- Motor Vehicle (Test) Regulations 1981 App 2.1
- NAMAS—*see* National Measurement Accreditation Service
- National Economic Research Associates (NERA) 8.15
- National Measurement Accreditation Service (NAMAS) 1.2, 7.31, 10.11
  - accreditation of laboratories 7.32
  - for calibration services 2.8, 3.10, 7.34-7.37
  - for pattern approval of exhaust gas analysers 2.6, 3.6, 7.33, 10.4
  - for supply of calibration gas 7.38
  - approval of calibration engineers 2.9-2.11, 3.11
  - costs 4.29
  - charges 7.39, App 3.1
  - views 7.29-7.51
- Northern Ireland Office, views 6.2
- OIML—*see* Organisation Internationale de Métrologie Légale

- Oliver, Richard, Limited 3.29  
 imports 3.45, Table 3.7  
 market share 3.40-3.41, Tables 3.4, 3.5, 3.6  
 views 8.116-8.129
- Organisation Internationale de Métrologie Légale (OIML) 2.5, 3.5-3.7, 7.33
- Passwords 3.72, 9.55  
 views of suppliers 8.4, 8.39
- Pattern approval 2.5-2.6, 3.5-3.6, 10.2-10.10  
 views of suppliers 8.52, 8.74-8.75
- Peach's Garage, views 6.30
- Perry Group plc, views 6.14-6.15
- Pratt & Gelsthorpe  
 views 6.31  
 response by Souriau 8.134
- Prices  
 calibration services 3.66-3.70, 9.65-9.67, App 3.4  
 exhaust gas analysers 3.54-3.58  
 (see also Uniform pricing)
- Prosol UK  
 views 6.79-6.80  
 response by Oliver 8.130  
 response by Sun Electric 8.42
- Public interest findings 1.7, 9.81-9.87
- Renault UK Limited, views 6.64-6.69  
 response by Tecalemit 8.132
- Retail Motor Industry Federation Limited (RMIF) 3.22, 3.58, 6.38-6.46
- Road Traffic Act 1988 App 2.1
- Rosary Garage  
 views 6.32  
 response by FKI 8.68
- Royal Automobile Club (RAC), views 6.60
- St Cleer Motor Company  
 views 6.33-6.34  
 response by Churchill 8.94-8.98
- Scottish Motor Trade Association (SMTA), views 6.38-6.46
- Scottish Office, views 6.3
- Servicing  
 of exhaust gas analysers 3.14-3.16, 3.74-3.84, 9.9, 9.71-9.76, App 3.4  
 of exhaust gas analysers  
 barriers to entry 9.9  
 charge-out rates 4.24-4.25  
 market definition 3.85-3.91  
 profitability 4.14-4.18  
 of other garage equipment 3.80-3.84, 4.19
- Servtec Limited  
 market share 3.64  
 views 5.12-5.18
- SIRA Test & Certification Limited 2.6, 3.6, 3.10, 9.10, 10.11, 10.16  
 charges 7.64, App 7.1  
 scheme for site calibration of exhaust gas analysers 2.9-2.10, 7.35, 7.56-7.60  
 views 7.52-7.64
- Smoke meters 3.80, 6.46, 7.21-7.23, 10.9
- Society of Motor Manufacturers and Traders (SMMT), views 6.47-6.57
- Software  
 access withheld 1.5, 3.72, 9.55
- Software—*contd*  
 views of NAMAS 7.49  
 views of suppliers 8.4-8.10, 8.14-8.26, 8.57-8.61, 8.82-8.88, 8.110, 8.137  
 development costs 4.30
- Souriau (UK) Ltd 5.19, 6.31  
 calibration arrangements Table 3.9  
 calibration prices 3.66  
 imports 3.45, Table 3.7  
 market share 3.40-3.41 Tables 3.4, 3.5, 3.6  
 market share of calibration services 3.64  
 views 8.133-8.134
- Spare parts 3.53, 3.79, 9.76-9.80, 10.5-10.7  
 views of NAMAS 7.46-7.47  
 views of SIRA 7.54-7.55  
 views of suppliers 8.30-8.31, 8.64-8.65, 8.91-8.92, 8.112-8.113, 8.125-8.127, 8.137  
 views of Vehicle Inspectorate 7.16-7.19
- SPX United Kingdom Limited 4.8-4.9
- Sun Electric UK Limited 2.8, 3.10, 3.26, 5.8-5.11, 6.62, 6.73, 6.75-6.79  
 calibration arrangements Table 3.9  
 calibration prices 3.66  
 financial performance 4.2-4.5  
 imports 3.45, Table 3.7  
 market share 3.40-3.41, Tables 3.4, 3.5, 3.6  
 market share of calibration services 3.64  
 views 8.3-8.44
- Suppliers 3.25-3.31, App 8.2  
 calibration arrangements 3.60-3.63, Table 3.9  
 market shares 3.40-3.43, 9.7, 9.33-9.34  
 profitability 4.20  
 views 8.1-8.137
- Sykes-Pickavant Ltd  
 calibration arrangements Table 3.9  
 calibration prices 3.66  
 imports 3.45, Table 3.7  
 market share 3.40-3.41, Tables 3.4, 3.5, 3.6  
 market share of calibration services 3.64
- Tecalemit Garage Equipment Co Ltd 2.8, 3.10  
 calibration arrangements Table 3.9  
 calibration prices 3.66  
 imports 3.45 Table 3.7  
 market share 3.40-3.41, Tables 3.4, 3.5, 3.6  
 market share of calibration services 3.64  
 views 8.131-8.132
- Trade associations, views 6.36-6.57
- Training  
 access withheld 1.5, 9.14  
 views of suppliers 8.3-8.10, 8.14-8.26, 8.45-8.48, 8.56-8.61, 8.71, 8.82-8.88, 8.110, 8.118, 8.132, 8.137
- Tune & General Garage Equipment Limited, views 5.30-5.31
- Uniform pricing 3.68-3.70, 4.21-4.22, 7.27, 9.67  
 views of suppliers 8.12, 8.53, 8.79, 8.106, 8.121
- Vauxhall Welch Limited, views 6.35
- Vehicle emission limits 2.3
- Vehicle emission test (see Emission test)
- Vehicle emissions 3.2
- Vehicle Inspectorate 1.2, 2.4, 7.1, 10.11  
 approved calibrators 5.1, 7.8, App 5.1

**Vehicle Inspectorate—*contd***

approved models of exhaust gas analyser 3.7, 3.39,  
7.7, App 3.2  
calibration requirements 2.7-2.8, 3.9, 3.13, App 2.2  
views 7.2-7.28

**Warranty restrictions 3.50-3.53, 9.62-9.64, 9.75**  
views of suppliers 8.27-8.29, 8.62-8.63, 8.89-8.90,  
8.111, 8.124, 8.137  
views of Vehicle Inspectorate 7.19

**Warranty restrictions—*contd***

**Warranty work, costs 4.17**  
**Whittaker, Mr Derek**  
views 5.24-5.26  
FKI response 8.69  
NAMAS response 7.51  
**Wincanton Limited, views 6.85**

**Young, H, (Operations) Ltd—*see* Kamasa Tools**







HMSO publications are available from:

**HMSO Publications Centre**

(Mail, fax and telephone orders only)

PO Box 276, London, SW8 5DT

Telephone orders 071-873 9090

General enquiries 071-873 0011

(queuing system in operation for both numbers)

Fax orders 071-873 8200

**HMSO Bookshops**

49 High Holborn, London, WC1V 6HB

(counter service only)

071-873 0011 Fax 071-873 8200

258 Broad Street, Birmingham, B1 2HE

021-643 3740 Fax 021-643 6510

33 Wine Street, Bristol, BS1 2BQ

0272 264306 Fax 0272 294515

9-21 Princess Street, Manchester, M60 8AS

061-834 7201 Fax 061-833 0634

16 Arthur Street, Belfast, BT1 4GD

0232 238451 Fax 0232 235401

71 Lothian Road, Edinburgh, EH3 9AZ

031-228 4181 Fax 031-229 2734

**HMSO's Accredited Agents**

(see Yellow Pages)

*and through good booksellers*

ISBN 0-10-123862-2



9 780101 238625