Working Group on Vehicle Maintenance Service
Final Report

INTRODUCTION

This report summarises the work of the Working Group on Vehicle Maintenance Service for the past year and proposes a number of recommendations on how to improve the standard of the vehicle maintenance trade with a view to reducing vehicle emissions and enhancing road safety in Hong Kong.

BACKGROUND

2. In tackling the problem of smoky vehicles and reducing roadside emissions, ensuring proper maintenance of vehicle engine is identified as one of the measures that could help address the problem. Proper vehicle maintenance is also essential to the safety of the vehicles travelling on the road. To explore ways to improve the service standard of the trade, a Working Group on Vehicle Maintenance Services ("the Working Group") was set up in December 1999.

3. The Working Group comprised representatives from the vehicle maintenance trade as well as representatives from relevant Government bureaux and departments. The membership list and the terms of reference of the Working Group are at **Annexes A and B** respectively.

OVERVIEW OF THE VEHICLE MAINTENANCE TRADE

4. To allow a better understanding of the vehicle maintenance trade, the Working Group commissioned the Hong Kong Productivity Council (HKPC) in March 2000 to conduct a survey on the operation of the local vehicle maintenance companies/workshops. The survey report is at **Annex C**.

5. The survey consisted of two parts, namely -

(a) an extensive questionnaire survey of all vehicle maintenance companies/workshops in Hong Kong; and

(b) an intensive survey by personal interviews of about 10% of the companies/workshops selected from the extensive survey database[1].

[1] Except that all members of the Services Managers Association were selected because they represent those

6. A total of 2,684 vehicle maintenance companies/workshops were identified, among which 1,563 were classified as motor repairing and maintenance companies/workshops, while the other 1,121 were involved in the sale or dismantling of vehicles or vehicle parts. As the core business of the latter group was not related to vehicle maintenance, only the former group was chosen as the targets of this survey.

7. A questionnaire was sent to all 1,563 motor repairing and maintenance companies/workshops for their completion. Feedback was received from 1,183 companies/workshops (75.7%). A breakdown of the services being provided by these companies/workshops are shown in the following table –

Types of vehicle repair service provided	*No. of companies/ Workshops **	*% of respondents*
Mechanical service/repair	995	84%
Body repair	674	57%
Electrical repair	641	54%
Body painting	341	29%
Specialty shop – Air-conditioning repair	29	2%
Specialty shop – Lubrication services	12	1%
Specialty shop – Tyre repair and replacement	10	1%
Others	42	4%

** Each company/workshop may provide more than one type of repair services*

8. In terms of the types of vehicles serviced, the respondents can be classified as follows –

Types of vehicle serviced	*No. of companies/ Workshops**	*% of respondents*
Light petrol vehicles	939	79%
Light diesel vehicles	583	50%
Heavy commercial diesel vehicles	198	17%
Light buses	189	16%
Taxis	160	14%
Non-franchised/franchised buses	36	3%
Others	18	2%

** Each company/workshop may service more than one type of vehicle*

large vehicle maintenance garages many of which are the local distributors of imported vehicles.

9. The survey has revealed the following characteristics of the vehicle maintenance trade –

(a) the majority of the vehicle maintenance workshops (about 80%) are small backstreet workshop type with less than five employees. On the other hand, about 4% of the vehicle maintenance workshops are very large workshops with more than 100 employees. These large workshops are associated with vehicle manufacturers or their agents in Hong Kong;

(b) less than 8% of the workshops operate in purpose-built buildings in Hong Kong. More than 30% of the workshops operate on the ground floor of residential buildings. Another 30% operate at open yards while about 25% operate in multi-storey industrial buildings;

(c) the average area of the premises of vehicle maintenance workshops is only 420 square metres;

(d) only about one-third of the mechanical services/repair workshops are equipped with vehicle emissions monitoring equipment, namely, smoke meters and four-gas analysers;

(e) over 65% of the vehicle mechanics do not possess any technical qualification. Most of them receive the apprenticeship type of training. Among those who do not possess any qualification, more than 90% have over ten years of experience in vehicle maintenance;

(f) about 30% of the vehicle mechanics receive only basic training in vehicle maintenance and obtain a craft certificate; and

(g) less than 5% of the vehicle mechanics receive structured training offered by the Vocational Training Council or equivalent training institution.

AREAS IDENTIFIED FOR IMPROVEMENTS

10. With the advancement in vehicle technology, the introduction of LPG vehicles, and the tightening of legislation relating to vehicle emissions, the vehicle maintenance trade has to face many new challenges.

11. The trade now needs to –

(a) constantly upgrade their skills to cater for the advancement in vehicle engineering technologies;

(b) familiarise themselves with the latest legislative requirements concerning environmental protection and vehicle construction and safety; and

(c) keep themselves up-to-date on vehicle maintenance information and data in order to facilitate them to carry out proper maintenance works.

12. The vehicle maintenance trade also notes that at present, the community does not have a very positive perception of the trade in terms of prospect and professionalism. With the absence of a structured regulatory framework and recognition mechanism, some members of the trade are of the view that there are difficulties in ensuring the service standard and attracting talented young people to join the trade.

13. Separately, the Working Group also noted that vehicle owners in general did not attach much importance to proper maintenance of their vehicles. Transport statistics showed that in 1999, there were 13 fatal and 80 serious accidents in Hong Kong due to defective vehicle parts. The Working Group considered that there was a need to educate motorists to conduct regular safety checks and to ensure that their vehicles were properly maintained.

IMPROVEMENT MEASURES IMPLEMENTED

14. Having regard to the characteristics of the vehicle maintenance trade and the difficulties faced by the trade, the Working Group recommended the following measures to improve the trade's service standards -

(a) to provide sufficient and relevant training for vehicle mechanics/technicians on the latest vehicle maintenance skills and technologies;

(b) to organise workshops explaining the prevailing legislative requirements of environmental and safety standards of vehicles and disseminate information on preventing pollution arising from the trade's operation;

(c) to establish a database of vehicle maintenance information and technical data and make it accessible to the trade;

(d) to promote awareness among vehicle owners of the importance of proper maintenance of their vehicles; and

(e) to explore the feasibility of establishing a regulatory framework which could help enhance the standard of vehicle maintenance service.

Details of implementing the above recommendations are set out in paragraphs 15 to 26 below.

Further training for vehicle mechanics

15. At present, the Automobile Industry Training Centre and the Hong Kong Institute of Vocational Education (HKIVE) provide training programmes for both new and in-service vehicle mechanics and technicians. In response to the introduction of LPG taxis and the tightening up of the vehicle emission standards in Hong Kong, the Training Centre has introduced new training programmes for vehicle mechanics/technicians. New training courses on LPG vehicle servicing were introduced in 1998. In addition, new courses on the diagnosis and repair of smoky diesel vehicles, and the use of dynamometer for emission tests have been introduced since March 2000. These courses aim to help the trade practitioners upgrade their skills and knowledge in servicing LPG vehicles and emission testing.

16. Up to the end of 2000, 680 mechanics/technicians have completed the LPG vehicle servicing courses while 282 have completed the courses on emission testing.

17. In the 2001-02 academic year, the Training Centre will continue to operate these courses, and plans to offer 17 new evening courses. These include petrol engine fault diagnosis and tuning, diesel engine fault diagnosis and tuning, and chassis measurement etc.

18. The Administration will continue to look into the training needs of the vehicle maintenance trade and liaise closely with relevant parties on means to further strengthen the training programmes. Also, the Administration would encourage vehicle distributors to organise workshops for vehicle mechanics/technicians on proper maintenance of the vehicles distributed by them. The first forum of this kind was conducted in January 2000 by one of the vehicle suppliers and was well received by the trade.

Workshops on Legislative Requirements concerning Environmental Protection and Vehicle Construction and Safety

19. Since late 1999, the Environmental Protection Department (EPD) has organised jointly with the transport and vehicle maintenance trades a total of 14 seminars to enhance their knowledge on engine maintenance and the use of chassis dynamometer for testing smoky vehicles. Over 1,000 trade practitioners had participated in these fora. To promote the use of chassis dynamometer for testing smoky vehicles and to explain the relevant legislative requirements, EPD also provided from September 1999 to May 2000 on-site instruction and demonstration in its emission testing centres on the correct ways to tune engines. EPD also arranged for vehicle owners to take their vehicles to designated centres on a voluntary basis for smoke emission check.

20. Separately, EPD has organized seminars for the vehicle maintenance trade explaining the legislative requirements relating to pollution arising from the trade's operation. They are also working closely with the trade to promote their environmental awareness and compliance with environmental requirements.

21. These training programmes and briefing sessions have proved to be very successful both in helping the trade to meet the new vehicle emission standards and in contributing to the improvement in air quality. With their combined effects with those of other motor vehicle emission control measures, the Environmental Protection Department's spotters are now catching about 50% less smoky vehicles than a year ago.

Provision of vehicle maintenance data

22. The vehicle maintenance trade expressed that they did not have easy access to comprehensive vehicle maintenance information and data which might hinder their work. In response to the trades' request, the Working Group had secured the agreement of the Motor Traders Association (MTA) / Service Managers Association (SMA) in 2000 to release information on the emission systems of pre-Euro diesel vehicles, which were regarded as one of the major sources of roadside emission.

23. In late 2000, the HKIVE, with the support of the Working Group, established an Automotive Engineering Database Centre providing a central database for all vehicle maintenance information. The information provided by MTA/SMA is kept by the Centre. In addition, technical data for other diesel and petrol vehicles are kept by the Centre and can be used for training

purposes as well as for general reference of the vehicle maintenance trade in their daily operation. There are technical staff stationed at the Centre to handle enquiries and to provide assistance to members of the trade and the general public. The Centre will be further expanded with a view to providing comprehensive technical support to the trade.

24. Separately, the Administration has also identified third-party publishers that provide comprehensive vehicle maintenance data on almost all types of petrol and diesel motor vehicles currently in the market, which are available for sale to both the maintenance trade and members of the public.

Enhancing Vehicle Owners' Awareness of the Need for Proper Vehicle Maintenance

25. To promote "green" driving in order to reduce waste of energy and vehicle emissions, EPD, HKPC, the Hong Kong School of Motoring and SMA have organised a number of workshops on eco-driving for motorists. So far, 9 workshops have been organized which were attended by over 1,000 motorists.

26. To promote the importance of proper vehicle maintenance among motorists, the Transport Department has worked with the Hong Kong School of Motoring to arrange courses on defensive driving/safe driving for motorists and members of automobile associations such as the Hong Kong Automobile Association and the Hong Kong Institute of Advanced Motorists. In addition, courses on safety checks and basic vehicle maintenance techniques are provided by automobile associations on a regular basis. The Transport Department will work with the Road Safety Council to promote the importance of proper vehicle maintenance with a view to enhancing road safety.

NEED FOR A REGULATORY FRAMEWORK

27. In the local survey conducted by the HKPC, some members of the vehicle maintenance trade considered that there was a need for establishing a regulatory framework to control the standard of vehicle maintenance service. Out of the 1183 garages surveyed, 79% supported the setting up of mandatory licensing/registration of mechanics. In this regard, the Working Group set up a Special Task Group on Licensing System of Vehicle Maintenance (the "Task Group") in March 2000 to examine the issue in detail.

28. The Task Group's objectives were -

(a) to review overseas systems on licensing/registration of the vehicle

maintenance trade (including the vehicle maintenance companies, vehicle mechanics/technicians and workshops);

(b) to review local systems on licensing/registration of technical services trades such as electrical workers, gas installers; and

(c) to analyse information on (a) and (b) and identify possible options for licensing/registration of the vehicle maintenance trade in Hong Kong.

29. The composition of the Task Group was largely the same as that of the Working Group. The membership list and the final report are at **Annexes D and E** respectively.

Results of the overseas survey

30. The Task Group commissioned the HKPC to conduct an overseas survey on the practices of other countries/places in regulating the vehicle maintenance trade in 2000. Letters were issued to relevant authorities of some 40 major countries/places in the world. The survey report is at **Annex F**

31. With the assistance of the Consulates and trade representatives in Hong Kong, feedback from about 10 countries/places was received. Separately, HKPC conducted an extensive research on information available on the Internet as well as other resource centres in Hong Kong.

32. The study reveals that mandatory registration/licensing schemes for vehicle maintenance mechanics/technicians exist in Germany, the United Kingdom (for commercial fleet operators only), the Netherlands, Spain, California and Michigan of the USA, Alberta of Canada, China (including Taiwan), New South Wales of Australia, and Japan.

33. To implement such schemes, these countries/places have relevant legislation to control the service standard and requirements. In general, these schemes require a vehicle mechanic to complete relevant training programmes (ranging from 1 to 4 years) and pass a trade examination, which usually includes written and sometimes practical tests, as well as to accumulate sufficient work experience before they can qualify and be registered. The validity of the registration varies from one year to lifelong. Under these schemes, it is uncommon to grant exemption to in-service mechanics from fulfilling the registration requirements. There are also penalties for mechanics who cannot comply with the registration requirements.

34. The study also finds that voluntary registration/licensing schemes exist in some states of the USA and Canada, the United Kingdom and New Zealand. These voluntary schemes are mostly organised and administered by institutions and unions widely accepted by the trade, e.g. the National Institute for Automotive Service Excellence in the USA and Canada, and the Institute of Motor Industry in the UK.

35. Though voluntary in nature, these schemes are rather elaborate and well-developed. For instance, the Institute of Motor Industry in the United Kingdom provides detailed guidelines on professional competence, qualifications of mechanics and requirements on vehicle repairers, and also codes of conduct. They are similar to the mandatory schemes in that they also specify formal training programmes, trade test (written and sometimes practical), relevant experience requirement, and validity period of registration.

36. Apart from registration/licensing of mechanics/technicians, the survey also reveals that mandatory registration/licensing for vehicle maintenance companies/workshops also exist in Florida, Georgia and Michigan of the USA, the Netherlands, Spain, New South Wales of Australia, China (including Taiwan), Japan and the UK. All of these known registration/licensing schemes are mandatory in nature and most of them are governed by a clear legislative framework. There are usually explicit requirements on the classes of vehicles a workshop can service, the types of equipment it must have, the number of qualified personnel it must employ, and the necessary documents it must keep. Violation of such requirements may lead to penalties such as fine or licence suspension/revocation, or even imprisonment in Michigan of the USA.

Local experience of regulation/licensing schemes

37. Apart from the survey on overseas experience, the Task Group also examined relevant local registration/licensing systems so that reference could be made if there was a need to establish a similar system for the vehicle maintenance trade.

38. The Task Force noted that registration/licensing systems for electrical workers and gas workers are in place in Hong Kong. The two trades are regulated by the Electricity (Registration) Regulations (Cap. 406 sub. leg.) and the Gas Safety (Registration of Gas Installers and Gas Contractors) Regulations (Cap. 51 sub. leg.) respectively. These schemes have the following common features –

(a) both the workers and the contractors are required to be registered;

(b) adequate vocational training and/or experience are required for registration of worker;

(c) the entry requirements are relaxed during the initial grace period to cater for in-service workers;

(d) a contractor must employ not less than a certain percentage of registered workers; and

(e) there are performance monitoring systems for both the contractors and the workers to assure satisfactory performance levels. Disciplinary actions could result in the revocation of registration/licences.

39. In addition, very extensive consultations both within and outside the Government were conducted to solicit views on the establishment of the licensing/registration system. Some people had concerns over the workers' interests and job security once the registration system was implemented.

Views of the trade representatives

40. Representatives of the vehicle maintenance trade in the Task Group supported a mandatory registration/licensing scheme to improve the standard of the vehicle maintenance trade. They also considered that a mandatory registration/licensing scheme would help create a professional image of the trade and boost public's confidence in them.

41. If a mandatory registration/licensing scheme is implemented in Hong Kong, the trade considered that in-service mechanics and technicians who have not passed the trade test should be subject to oral tests in order to qualify for registration. They should, however, be exempted from written tests.

Issues to be considered

42. In considering whether to implement some form of licensing/registration system for the vehicle maintenance trade, the following issues would need to be carefully examined –

(a) what the scope of control should be;

(b) whether exemptions should be given to certain categories of in-service vehicle mechanics/technicians;

(c) whether a mandatory or self-regulatory system should be pursued; and

(d) whether the vehicle maintenance trade is prepared for the change in the rules of the game.

Scope of Control

43. In designing a regulatory framework for the vehicle maintenance trade, there are three areas that should be subject to control –

(a) the qualification of vehicle mechanics/technicians;

(b) the vehicle maintenance companies; and

(c) the premises for conducting the business of vehicle maintenance.

44. As the objective of establishing a regulatory framework is to improve the vehicle maintenance standard, the control of vehicle mechanics/technicians, vehicle companies and the premises of workshops would need to go hand in hand. A registration system for vehicle mechanics/technicians alone would provide no guarantee that the maintenance service could be upgraded if the companies concerned do not employ these qualified mechanics/technicians or have the necessary or adequate equipment. Control over the premises for such business is also essential to ensure safety of the mechanics/technicians and the nearby residents. Properly controlled premises will also enhance the image of the vehicle maintenance trade in Hong Kong.

45. In the overseas survey, almost all countries/places adopting a registration or licensing system for vehicle mechanics/technicians would at the same time adopt a registration system for the vehicle companies and workshops. In exploring the development of a regulatory framework for the vehicle maintenance trade in Hong Kong, it is considered that a similar approach should be adopted.

Exemptions for in-service vehicle mechanics/technicians

46. The overseas survey reveals that exemptions for in-service vehicle mechanics/technicians are uncommon in countries/places with mandatory registration/licensing schemes. However, proponents for granting exemption argue that such transitional arrangement would make the registration system more acceptable to existing members of the trade.

47. In considering whether exemptions should be granted, consideration will need to be given to the following areas –

(a) will the proposal be able to achieve the overall objective of improving the vehicle maintenance standard if majority of the trade is to be exempted?

(b) will such an approach be perceived as a kind of discrimination against new entrants to the trade? and

(c) with vehicle technology advancing all the time, will the experience in vehicle maintenance accumulated in the past be applicable in the present environment?

Mandatory vs Voluntary Scheme

48. In establishing a regulatory framework, there could be two approaches –

(a) a mandatory scheme; and

(b) a self-regulatory or voluntary scheme.

49. Implementing a mandatory scheme would require the establishment of a legal framework specifying the registration requirements for vehicle mechanics/technicians (both new and in-service) and vehicle maintenance companies and workshops, and the requirements for premises operating such business. The legislation would also need to spell out the penalty provisions, such as revocation of registration and levels of fines of operating such business without complying with the legal requirements.

50. Under the mandatory scheme, those vehicle mechanics/technicians and workshops who do not qualify for registration would need to cease operation. The operating cost of vehicle maintenance service could also increase and consumers would need to be prepared to pay more for vehicle maintenance. There is hence a need to carefully assess the impact on the existing trade and consumers if we were to pursue this route.

51. As regards the establishment of a self-regulatory or voluntary system, there is a need to have an organisation which is accepted by the vehicle maintenance trade to act as the authority to give recognition to the qualification of vehicle mechanics/technicians as well as the standard of vehicle maintenance workshops.

52. Representatives of the vehicle maintenance trade in the Task Group were generally of the view that a voluntary registration/licensing scheme might not work in Hong Kong due to the absence of a reputable trade organisation like the Institute of Motor Industry in the UK. Also, they considered that since vehicle mechanics or technicians could not be forced to attend training courses under a voluntary registration scheme, most of the mechanics or technicians would not attend such courses.

53. An alternative that warrants closer examination may be a collaboration between the vehicle maintenance trade and the Vocational Training Council to set up a body which could take up this role.

54. Given the potential impacts on the vehicle maintenance trade and consumers, there is a need to adopt a prudent approach in taking the matter forward. Extensive consultation of all parties affected by the proposal will be a necessary first step.

CONCLUSIONS

55. The vehicle maintenance trade is a rather fragmented trade and the standard of vehicle maintenance service offered by the trade varies. To cope with the changing environment in vehicle technology and requirements on vehicle emissions and vehicle safety, the Working Group concludes that the following should be pursued to help the trade to meet the challenges ahead –

(a) having regard to the needs of the vehicle maintenance trade, the Administration, the VTC and other recognized training institutes should continue to provide suitable education and training to the trade to help them comply with the tightened environmental and safety requirements in respect of vehicle maintenance;

(b) the HKIVE should continue to expand and develop its Automotive Engineering Database Centre while the Government and other parties should continue to explore other practical measures, with a view to providing more comprehensive assistance to the trade and helping them to upgrade their technical standard;

(c) the Administration and relevant bodies should make more effort to promote vehicle owners' awareness of the responsibility for proper maintenance of their vehicles in order to contribute to reducing vehicle emissions and enhancing road safety; and

(d) the Administration should, as soon as possible, study the practicability of setting up appropriate mechanism to regulate the vehicle maintenance trade.

Working Group on Vehicle Maintenance Service
September 2001

Annex A

Working Group on Vehicle Maintenance Service

Membership List

Environment and Food Bureau (Chairman)
Transport Bureau (Co-Chairman)
Transport Department
Electrical and Mechanical Services Department
Environmental Protection Department
Vocational Training Council
Institute of the Motor Industry Hong Kong
Motor Traders Association / Service Managers Association
Hong Kong Institution of Engineers
Hong Kong Vehicle Repair Merchants Association
Environmental Vehicle Repairers Association

Annex B

Terms of Reference

(A) To study ways to raise the standard of service of the vehicle maintenance trade

(B) To recommend practical improvement measures in the interim

(C) To study the need for regulating the services provided by the vehicle maintenance trade and to recommend ways to develop an appropriate regulatory mechanism

FINAL REPORT ON SURVEY ON VEHICLE (LPG, PETROL & DIESEL) MAINTENANCE GARAGES AND MECHANICS

(Project No.: 01013836)

Environmental Management Division
Hong Kong Productivity Council

7th June 2001

CONTENT

1. BACKGROUND

1.1 The recent deterioration of the air quality in Hong Kong has caused a lot of public concerns. The government has been trying hard to formulate both short-term and long-term strategies to tackle the problem hopefully to alleviate the situation quickly. Among the many sources of air pollution, vehicle emissions are the ones that are in general considered to contribute significantly to air pollution.

1.2 High levels of respirable suspended particulates and nitrogen dioxides are causing Hong Kong air pollution problems. According to EPD's estimates, motor vehicles account for about 80% of the nitrogen oxides and 75% of the respirable suspended particulates in the urban areas. It is therefore natural for the Government to target at improving vehicle emissions as one of the priorities.

1.3 In the past several years, the Government has been tightening up emission standards for newly imported vehicles, giving tax incentive to introduce ultra-low sulphur fuel, direct subsidy to taxi owners to switch to LPG taxis, direct subsidy to diesel vehicle owners to retrofit particulate traps and catalytic converters to remove particulate matters and nitrogen oxides, etc. All these initiatives should be applauded as this shows the commitment of the Government in tackling air pollution seriously.

1.4 In parallel with all these initiatives, there is an opinion in the society that the government should not overlook the importance of proper vehicle maintenance. If the existing hundred thousands of on-road vehicles are not properly maintained, all the Government's initiatives in improving the air quality could easily be rotten away. However, when one turns to look at the vehicle maintenance trade, one could finds that the trade is facing a number of difficulties.

Difficulties Faced by the Vehicle Maintenance Trade

Varied quality of mechanics from one to another

1.5 Except those franchised public transportation companies and Government's fleet operators who have their in-house vehicle maintenance shops to take care of their fleet, all the other on-road vehicles are being maintained by private vehicle maintenance garages. Over the past decades, it is a tradition in the vehicle

maintenance trade that vehicle maintenance mechanics do not undergo a formal training, let alone being certified as qualified mechanics. If anyone wishes, he can join the trade to work as a mechanic under the supervision of an experienced mechanic, who himself may not be formally trained either. Normally, this loose apprenticeship training lasts for several years before the apprentice can claim himself as a skilled mechanic.

1.6 Without a consistent set of objective criteria to gauge the standard of the trained mechanics, it is only to be expected that the standard varies from one mechanic to another and this directly affects their quality of maintenance work delivered to the customers.

Varied quality of vehicle maintenance garages from one to another

1.7 On the other hand, not only mechanics are not required to be registered with the Government, vehicle maintenance garages are not required to be registered either except business registration. As such, there is no regulation on the quality of the garages in delivering vehicle maintenance work and it varies from one garage to another.

1.8 At present, more than 80% of the about 1500 vehicle maintenance garages are small ones employing less than 5 workers. These garages are usually opened by mechanics who have been practising in the field for several years. In order to survive, these small garages must either compete on quality or price or both. Unfortunately, many of the low quality garages (they are called the backyard garages in the trade) can only opt to compete on price at the expense of quality.

1.9 Without the proper licensing system to regulate the quality services of the garages, the silent majority customers could only choose to accept the poor quality of work by the backyard garages, or else they have to try their luck with another garage.

Lack of knowledge to comply with environmental protection requirements

1.10 Under the current informal apprenticeship training of mechanics, there is no regular training opportunities provided to the mechanics to constantly upgrade their knowledge and skills in vehicle maintenance to comply with the ever-tightened environmental protection requirements. In fact, there are no requirements on the continuous professional development of mechanics in order

to keep up with technological advancement in vehicle engineering either.

Unavailability of vehicle maintenance manuals and technical data

1.11 Many small garages advocate that the local agents of vehicle manufacturers are withholding the release of vehicle maintenance manuals and technical data and this affects their work in vehicle repair. As claimed by these garages, without the maintenance manual and data, their mechanics could only rely on their experience to repair the vehicles or consult their peers who have experience in repairing the same brand and model of the vehicles. This substantially affects their quality of work. To improve the situation, the small garages strongly advocate that the Government should set up legislation demanding the release of vehicle maintenance manuals and technical data.

Request from the Vehicle Maintenance Trade and the Government's Response

1.12 It is against this background that many of the representative vehicle maintenance trade associations[1] have been lobbying the Government in the past several years to devote resources in helping the trade to upgrade the trade standards. They specifically request the following:-

(a) establishing mandatory registration of vehicle maintenance mechanics (and possibly on registration of vehicle maintenance garages as well)
(b) providing training on vehicle maintenance for the mechanics to upgrade their skills and knowledge in environmental protection.
(c) setting up legislation to require the release of vehicle maintenance manuals and technical data.

1.13 The Government responded in setting up The Working Group on Vehicle Maintenance Service (WGVMS) comprising representatives from relevant government bureaus/departments and the vehicle maintenance trade in early 2000. The function of the WGVMS is to explore ways to upgrade the standard of the trade in order to meet the tightened environmental and safety requirements on vehicle maintenance. A Special Task Group on Licensing System for

[1] These include:
(a) The Institute of the Motor Industry Hong Kong
(b) Service Managers Association
(c) Hong Kong Vehicle Repair Merchants Association
(d) Environmental Vehicle Repairers Association
(e) and others

Vehicle Maintenance was formed under WGVMS to specifically investigate whether registration/licensing of vehicle maintenance mechanics are recommendable to upgrade the trade standard and if so the options available.

1.14 Under the funding support of the Electrical & Mechanical Services Department (EMSD) and the Environment and Conservation Fund (ECF), Hong Kong Productivity Council (HKPC) was commissioned to conduct an overseas survey on the registration/licensing of vehicle maintenance garages and mechanics in order to benchmark the overseas practices in regulating the vehicle maintenance trade. In addition, a local survey was also conducted to solicit the opinion of the trade on registration/licensing of vehicle maintenance mechanics and the training needs as well as facility upgrading needs to cope with the tightened environmental and safety requirements. The findings of the overseas survey are presented to the Special Task Group whereas the findings of the overseas and local survey are presented to the WGVMS for consideration in selecting ways to upgrade the standard of the vehicle maintenance trade.

1.15 The overseas survey was started in April 2000 and completed in mid August, while the local survey was started in May and completed also mid August. The draft final report summarizing the findings of the overseas and local surveys was first submitted to the WGVMS on 5th September 2000. Subsequently, the revised draft report was submitted to the WGVMS on 22nd September 2000 to incorporate the comment from the Government representative in the WGVMS. That revised draft report was discussed in the WGVMS on 13th October 2000 with comments raised by the members of the WGVMS. The comments were incorporated in this Final Report.

2. OBJECTIVES OF THE SURVEY

2.1 The objectives of the overseas survey are:-

(a) to collect information on those countries that are currently implementing mandatory or voluntary schemes of registration/licensing of vehicle maintenance mechanics;
(b) to collect information on those countries with licensing of vehicle maintenance garages.

2.2 The objectives of the local survey are:-

(a) to collect information about the needs of vehicle maintenance garages in facilities upgrading and training of mechanics, and the difficulties encountered when repairing vehicles in order to comply with the tightened environmental and safety requirements;
(b) to solicit their views on setting up mandatory scheme to register/license vehicle mechanics.

3. METHODOLOGY

Overseas Survey

3.1 HKPC conducted the overseas survey through the following means:-

(a) We contacted through correspondences and/or email all major countries in the world to collect information about registration/licensing of vehicle maintenance garages and mechanics in these countries. Assistance from the Consulates and/or trade representatives of these countries in Hong Kong was solicited wherever possible.

(b) At the same time we also conducted extensive search of such information through the internet. This is proved to be the most effective means to collect relevant information especially when the registration/licensing schemes are known to us.

(c) We also search technical reference in HKPC's technical reference library, on-line connection to the International Information Retrieval System, university libraries in Hong Kong for relevant information. However, no relevant information on registration/licensing schemes was collected.

Local Survey

3.2 The local survey consists of two parts, namely:

(a) the extensive survey through fax to all vehicle maintenance garages in Hong Kong; and
(b) the intensive survey by personal interviews to about 10% of the garages selected from the extensive survey database.

Extensive Survey

3.3 HKPC constructed the survey subject database by reference to the White Page and Yellow Page telephone directories of the then Cable & Wireless HKT under the category of Motor Industry, the member lists as supplied by the Services Managers Association (SMA), the company names supplied by Hong Kong Vehicle Repair Merchants Association (HKVRMA), and the company names supplied by Environmental Vehicle Repairers Association (EVRA). After

consolidation, a total of 2,684 companies were included in the database among which 1,563 were specifically classified as motor repairing and maintenance companies while the other 1,121 companies were those involved in car sales/retailers, car-parts retailers or car-dismantling, etc. Those 1,563 motor repairing and maintenance companies were the main survey targets.

3.4 Standardized questionnaire was prepared for the purpose of the extensive survey. A copy of the extensive survey questionnaire is enclosed in Annex A. The questionnaires were designed to collect the following information:-

(i) Basic company information including types of vehicle repair offered by the survey subject.
(ii) Personnel information of the company including the qualifications, training and experience of the technicians and mechanics.
(iii) Opinions on ways to improve the standard of the vehicle maintenance trade including the views on setting up schemes to register/license mechanics[2].
(iv) Difficulties encountered when repairing vehicles in order to comply with tightened environmental and safety requirements.

3.5 The questionnaires were prepared in English and Chinese versions and were submitted to the Special Task Group on Licensing System for Vehicle Maintenance for approval before being sent out to the recipients.

3.6 Only Chinese version of the questionnaires was sent out by fax to the recipients because all the recipients are Chinese.

3.7 HKPC followed up with telephone calls to all the recipients should they not reply within two days or we needed to clarify the information provided in the returned questionnaires. About 80% of the surveyed targets were called up to follow up their responses. During the follow-up telephone calls, HKPC explained further the purpose of the survey and that the registration/licensing scheme as mentioned in the questionnaire was referring to a mandatory scheme operated by the Government. There was no ambiguity expressed by the recipients that the

[2] Regarding the questions on setting up schemes to register/license mechanics, the questionnaire was designed in such a way as to allow respondents to limit their feedbacks on whether they would agree to set up registration, either mandatory or voluntary, system in principle. There was no firm proposal on monitoring and disciplinary actions of a mandatory registration system to tell the respondents and so they might reply the questionnaire without considering the implications of the mandatory system fully.

registration/licensing scheme was interpreted the other way. HKPC also clarified that the respondents were asked whether they agreed in principle to the setting up of a mandatory registration scheme for mechanics as a way to improve the trade standard although the details of the registration scheme was not yet decided. Furthermore, the respondents were also asked about their further comments, if any, on the registration scheme.

3.8 The information provided in the feedback from the surveyed subjects was summarized in a database and analyzed subsequently.

Intensive survey

3.9 In parallel with the extensive survey, about 10% of the surveyed subjects, i.e. about 260 garages, were selected for the follow-up intensive survey through personal interview. The interviewees were selected in such a way that all the members of SMA (43 garages) were selected, while the remaining were selected randomly from the sources of HKPC's database, HKVRMA's list and EVRA's list as summarized below:-

	HKPC	HKVRMA	EVRA	SMA
Size of database	2,579	260[(i)]	490[(i)]	43
Involved in maintenance work	1,563	260	490	43
No. of Garages Selected for Interview	143	26	48	43
Sample proportion	9.1%	10%	9.8%	100%

Note: (i) These are the respective numbers of mechanics interviewed in the surveys by HKVRMA and EVRA.

3.10 All members of SMA were selected because they represent those large vehicle maintenance garages many of whom are the local distributors of imported vehicles. For the other databases, they mainly represent small and medium garages and are in large number and so they are selected randomly with about 10% sampling proportion from the respective databases. The following table summarizes the population of the surveyed garages in the intensive survey when categorized into small, medium and large garages:-

	Small	Medium	Large	Total
Criteria	Employment size <5	Employment size from 5 to 100 and not member of SMA	SMA member or employment size >100	
Number	154	56	43	253
% of total	60.9%	22.1%	17.0%	100%

3.11 The selected garages were interviewed by HKPC's interviewers using a standardized questionnaires to collect further information in the following areas:-

(i) Basic company information including types of vehicle repair offered by the survey subject.

(ii) Personnel information of the company including the qualifications, training and experience of the technicians and mechanics.

(iii) Existing facilities in the garages and the facilities upgrading plan in future.

(iv) Opinions on ways to improve the standard of the vehicle maintenance trade including the views on setting up schemes to register/license mechanics[3].

(v) Difficulties encountered when repairing vehicles in order to comply with tightened environmental and safety requirements.

(vi) Other comments from the interviewees.

3.12 The questionnaires, both in English and Chinese, were submitted to the Special Task Group for approval before being used for the survey. A copy of the questionnaire is enclosed in Annex B for reference.

3.13 The interviewees were first sent the Chinese version of the questionnaire before HKPC's interviewers visited them. During the interview HKPC's interviewer explained the purpose of the survey and that the registration/licensing scheme as mentioned in the questionnaire was referring to a mandatory scheme operated by the Government. There was no ambiguity expressed by the recipients that the registration/licensing scheme was interpreted the other way. HKPC also clarified that the respondents were asked whether they agreed in principle to the

[3] Regarding the questions on setting up schemes to register/license mechanics, the questionnaire was designed in such a way as to allow respondents to limit their feedbacks on whether they would agree to set up registration, either mandatory or voluntary, system in principle. There was no firm proposal on monitoring and disciplinary actions of a mandatory registration system to tell the respondents and so they might reply the questionnaire without considering the implications of the mandatory system fully.

setting up of a mandatory registration scheme for mechanics as a way to improve the trade standard although the details of the registration scheme was not yet decided. Furthermore, the respondents were also asked about their further comments, if any, on the registration scheme.

3.14 The information collected in the feedback from the surveyed subjects were summarized in a database and analyzed subsequently.

4. OVERSEAS SURVEY RESULTS

4.1 As the overseas survey results have to be presented separately to the Special Task Group on Licensing System for Vehicle Maintenance, they are compiled in a separate report. The title of the report is "Final Report on Overseas Survey of Vehicle (LPG, Petrol & Diesel) Maintenance Garages and Mechanics" dated 7th June 2001, which forms an integral part of this report. Readers are referred to that separate report for details of the overseas survey.

5. LOCAL SURVEY RESULTS

Responses of the Local Surveys

5.1 The responses of the extensive and intensive surveys are summarized in the following table:-

	Extensive Survey	Intensive Survey
Surveyed Population of Garages	1,563	260
Successfully surveyed and feedback collected	1,183	253[(i)]
% of population surveyed	75.7%	97.3%

Note:: (i) HKPC tried to contact hundreds of garages hoping to achieve the target of visiting 260 garages but failed because all of them declined our request for survey. So, HKPC could only manage to visit 253 garages.

5.2 In view of the high proportion of the population covered (>75%), the survey results are considered representative.

Survey Results

5.3 Summaries of the extensive and intensive survey results are enclosed in Annex C and Annex D respectively for reference.

5.4 The 1,183 surveyed garages are categorized into small, medium and large garages as below:-

	Small	Medium	Large	Total
Criteria	Employment size <5	Employment size from 5 to 100 and not member of SMA	SMA member or employment size >100	
Number	933	205	45	1,183
% of total	78.9%	17.3%	3.8%	100%

5.5 The table shows that about 80% of the garages are small employing less than 5 employees. They are the ones that have the least resources and are suspected to be the most affected if mandatory registration/licensing of vehicle mechanics are introduced. So, their views and concerns on such registration scheme are the most important.

5.6 The following paragraphs list out the results of the survey in terms of facilities

upgrading needs, personnel qualifications, opinions to upgrade trade standard, views on registration/licensing of mechanics, training needs, and difficulties encountered in vehicle repair to comply with tightened environmental and safety requirements.

Garages premises and business involved

5.7 Out of the 1,183 surveyed garages, 84% are mechanical shops, 57% panel beaters, 54% electrical shops and 29% painters. They represent the majority of vehicle repair shops in Hong Kong.

5.8 Many of the garages are housed in multi-storey industrial buildings (25.5%), open yards (26.6%), ground floors of residential buildings (31.3%), while only 7.7% are housed in purpose-built buildings (i.e. the whole building is used for vehicle repair and related activities). This shows that many of the small and medium garages are operating in the heart of the city and are likely to cause environmental problems especially for those locating in residential areas.

Garages facilities and upgrading plan

5.9 The garage facilities and upgrading plan was surveyed in the intensive survey because the extensive survey did not allow such detailed information collection. The table below summarizes the essential facilities that are not commonly available in 50% of the garages.

Type of Garages	Essential Facilities not Available in 50% of the Surveyed Garages (% Garages with such facilities)
Body Repair Workshop	◦ Vehicle transport devices (10.0%) ◦ Air extraction system (37.2%) ◦ TIG/MIG (48.8%)
Paint Shop	◦ Spray booth/enclosed area with ventilation only (43.3%) ◦ Spray gun cleaning machine (45.0%)
Electrical Repair Workshop	◦ Belt tension gauge (32.7%) ◦ Battery charging area with forced ventilation (23.1%) ◦ Oscilloscope (29.9%)
Mechanical Services/Repair Workshop	◦ Safety stands (33.2%) ◦ Smoke meter (38.4%) ◦ Four-gas analyzer (31.0%) ◦ Wheel alignment tester (32.3%) ◦ Wheel balancer (28.8%) ◦ Decelerometer (Tepley meter) (10.9%) ◦ Roller brake tester (14.8%) ◦ Air extraction system (21.4%) ◦ Freon recharging/recycling machine (35.8%)

5.10 The table above shows clearly that only about one-third of the mechanical repair workshops are equipped with vehicle emissions monitoring equipment, i.e. smoke meters and four-gas analyzers. Without such equipment, it would be difficult for these garages to check whether the repaired vehicles comply with the environmental regulations.

5.11 Regarding the facilities upgrading plans in the next two years, a total of 78 out of 253 mechanical repair shops (30.8%) replied they had such plan and their responses are summarized below:

	Facilities to be Purchased or Upgraded (No. of Garages, %)
Mechanical Services/Repair Workshop	◦ Smoke meters and/or four-gas analyzers (25, i.e. 32.1%) ◦ Vehicle diagnosis computer (19, i.e. 24.4%) ◦ Car lift (11, i.e. 14.1%) ◦ LPG vehicle repair facilities (10, i.e. 12.8%)

5.12 The facilities upgrading plan reflects clearly that about one-third of the mechanical repair garages are well aware of the needs to equip with vehicle

emissions monitoring equipment. Also, the upgrading plan to purchase vehicle diagnosis computers (about one-fourth had such upgrading plans) also highlights the problem faced by the mechanics in diagnosing the more sophisticated modern vehicles, which use many electronic control systems.

5.13 Hence, the trade practitioners are preparing to upgrade and better position themselves in meeting the challenge of tightened environmental and safety requirement. However, apart from facilities upgrading, it is also necessary to better prepare the vehicle mechanics for the challenge. In this respect, the extensive and intensive surveys specifically investigate the mechanics' qualification, training and experience to give a snap-short of the current situation in the trade.

Personnel's qualification, training and experiences

5.14 The table below summarizes the qualifications of mechanics (technicians and craftsmen) in the surveyed garages.

		No. of Mechanics (% of Total)
Higher Diploma		24 (0.4%)
Diploma		44 (0.8%)
Higher Certificate		126 (2.3%)
Certificate		69 (1.3%)
Secondary 5		348 (6.4%)
Craft Certificate		1,568 (28.9%)
Secondary 3 and below		1,852 (34.1%)
No qualification but experience only	<5 years	50 (0.9%)
	5 to 10 years	67 (1.2%)
	>10 years	1,286 (23.7%)
Total		5,434 (100%)

5.15 The table shows that about 59.9% of the mechanics (i.e. 3,255 mechanics) are either at secondary 3 level or below or possessing no educational qualifications. Only 33.7% of the mechanics are properly trained in vehicle maintenance by having craft certificate or obtaining Certificate, Higher Certificate level, Diploma or Higher Diploma qualifications.

5.16 The extensive survey also revealed that only 582 mechanics of the surveyed garages have passed the trade test and obtained the trade test certificates issued by Vocational Training Council. This only accounts for less than 20% of the population of those mechanics without educational qualifications. So, if

registration/licensing of mechanics is implemented, there will be a very substantial amount of mechanics without educational or trade qualifications who would be affected.

Opinions on ways to improve standard of the trade

5.17 One of the main objectives of the surveys was to solicit the view of the survey recipients to upgrade the standard of the vehicle repair trade. They were asked whether they agree to the following:

(i) there should be further education and training by the government; and
(ii) setting up scheme for the registration/licensing of mechanics.

5.18 The results are summarized below:-

	Agree	Disagree	No Comment	Total
Further education/training by government	1,047 (88.5%)	110 (9.3%)	26 (2.2%)	1,183 (100%)
Registration/ Licensing of mechanics	928 (78.5%)	231 (19.5%)	24 (2.0%)	1,183 (100%)

5.19 There was overwhelming support on the education/training by government and registration/licensing of mechanics.

5.20 Furthermore, if we analyze the opinion on registration/licensing of mechanics by categorizing the garages into small, medium and large garages, the results are similar as summarized below showing that there is a consensus across the board in the trade that there is a need to implement mandatory registration/licensing of mechanics.

	Registration/Licensing of Mechanics			
	Agree	Disagree	No Comment	Total
Small Garages	715 (76.7%)	197 (21.1%)	21 (2.2%)	933 (100%)
Medium Garages	168 (82.0%)	34 (16.6%)	3 (1.4%)	205 (100%)
Large Garages	45 (100%)	0 (0%)	0 (0%)	45 (100%)
Total	928 (78.5%)	231 (19.5%)	24 (2.0%)	1,183 (100%)

View on setting up mandatory scheme to register/license vehicle mechanics and concerns

5.21 Although there was overwhelming support on setting up mandatory registration/licensing of mechanics as a means to improve the standard of the trade, there was still 19.5% (i.e. 231 garages) against such system. Their views must not be overlooked. Furthermore, those supportive of the registration/licensing schemes raised certain concerns even though they supported the system.

5.22 Among the 231 garages against the mandatory registration/licensing system, 56.3% (i.e. 130 garages) were supportive to set up a voluntary system to register/license mechanics. This showed that they considered there is a need to unify the standard of mechanics in the trade[4].

5.23 The intensive survey provided us the chance to talk to the surveyed garages why they were against the mandatory registration/licensing system. Of the 253 garages interviewed, 36 garages were against such registration/licensing system among which 16 offered their opinions. The major objection reasons are summarized below:-

(i) Many of them considered that there was no need to set up any registration/ licensing system because they are satisfied with the present operation.

(ii) Experience is more important than just a registration status.

(iii) Employer may need to spend extra resources to train up mechanics to the registration standard.

[4] After submission of the draft Final Report in October 2000, HKPC received instruction from EMSD to consult the Hong Kong Automobile Repair Worker Association, which was not included in the survey in the first place. Upon checking, HKPC found that the Association was registered on 29 July 1999 and the first Annual General Meeting of the Association was held in April 2000, which was after the formation of the Working Group. The Association was not a member of the Working Group and when HKPC undertook the survey in February 2000, the existence of this Association was not brought to our notice and this explained why they were not included in the survey. The Association has 32 members as at February 2001 and they are mainly vehicle repair workers. The Association supports the establishment of a voluntary registration scheme although it rejects a mandatory system for fear of losing employment for those elder mechanics without proper educational training. Although they were not included in the survey in the first place, their view would have been included in the survey, which covered many employees of garages. Also, the member size of the Association is about 5% of the trade worker force. Hence, HKPC considers that the opinion of the Association would not in any way affect the conclusion of this local survey.

5.24 On the other hand, there are some concerns expressed by those interviewees who are supportive of registration/licensing of mechanics. 73 out of the 214 supportive interviewees expressed their concerns which are summarized below:-

(a) They consider that educational qualification for registration should be waived if the mechanics possess certain years of working experience. This is understandable in view of the fact that about 60% of the mechanics are at secondary 3 level or below.

(b) Government should set up technical support centre to help the trade to upgrade the standard and require the release of vehicle maintenance manual and technical data.

(c) Training institutes, e.g. Vocational Training Council, should provide more updated course on vehicle repair. The current training courses are a bit not up-to-date.

(d) There should be grace period of say 3 to 5 years to allow practising mechanics to upgrade themselves to the registration level.

Training needs

5.25 As summarized above, 88.5% respondents agree the Government to provide further education and training to mechanics. In the intensive interview, we asked the interviewees about the types of training they needed and the results are summarized below:-

Further Education/Training		% of Respondents
LPG vehicle servicing		94.8%
Diesel engine maintenance		75.4%
Petrol engine maintenance		83.2%
General chassis		50.4%
Transmission		55.6%
Suspension		52.2%
Braking		56.9%
Steering		53.4%
Body repair		50.9%
Body painting		47.8%
Vehicle electrical		62.9%
Vehicle air-conditioner		55.6%
Others	Electronic/computer control	9.5%
	Industrial safety	3.4%
	Good trade practice	3.0%
	Environmental protection knowledge	2.6%

5.26 The table shows that most of the interviewees agree government to provide further training on LPG vehicle servicing, diesel engine maintenance and petrol engine maintenance. This demonstrates the trade practitioners are well aware that they need constant upgrading of their skills in order to meet with the advancement in vehicle engineering to meet the ever tightening environmental and safety requirements.

Difficulties in vehicle repairs to comply with tightened environmental and safety requirements

5.27 The following table summarizes the difficulties faced by the mechanics in repairing vehicles to comply with tightened environmental and safety requirements:-

Difficulty	No. of Respondents (%)
Vehicle service or maintenance manual not readily available	610 (52%)
Lack of vehicle diagnostic equipment	519 (44%)
Lack of skilled or competent technicians	123 (10%)
Lack of skilled or competent craftsmen	143 (12%)
Lack of vehicle emission testing equipment	432 (37%)
Lack of understanding of environmental legislation related to vehicle emissions	265 (22%)
Others, e.g. not suitable premises for vehicle repair, harsh environmental legislation, etc.	50 (4%)

5.28 It is clear from the responses that lack of maintenance manual, diagnostic equipment and vehicle emission testing equipment are the three major difficulties. This is the reason, as discussed before, why the trade association request the Government to set up legislation to require the release of vehicle maintenance manual and technical data. This aspect is currently being considered by the WGVMS and is outside the scope of the current study.

5.29 With regard to diagnostic equipment and vehicle emission testing equipment, this agrees well with the facilities upgrading plan discovered in the intensive survey because many garages are planning to purchase such equipment. Obviously, this is a business decision and if there is a market need, garages will purchase the necessary equipment for their work.

5.30 Another difficulty as expressed by the respondents was the lack of understanding of environmental legislation related to vehicle emissions. This is also

advocated by the trade associations in the WGVMS and so it is a proven common concern in the trade.

5.31 On the other hand, a very interesting phenomenon was observed. Although 78.5% respondents agreed to the mandatory registration/licensing of mechanics, there were only 10% said they faced the difficulty in lacking skilled/competent technicians (and 12% said there was lack of skilled/competent craftsmen). One would expect that if the trade wants to set up mandatory scheme to register/license mechanics, they must consider that there is not sufficient supply of skilled technical/craftsmen. However, this is exactly the opposite, i.e. the trade did not consider there is any lack of skilled technicians/craftsmen.

5.32 This phenomenon can be explained, however, if we analyze the responses by splitting those agreed to the mandatory registration/licensing system from those against it. Such analysis is given in the following table:

	Small Garages	Medium Garages	Large Garages	Total
Agree to Registration/Licensing Scheme	715	168	45	928
Lack of skilled/competent technicians	62 (8.7%)	28 (16.7%)	13 (28.9%)	103 (11.1%)
Lack of skilled/competent craftsmen	75 (10.5%)	27 (16.1%)	14 (31.1%)	116 (12.5%)
Disagree to Registration/Licensing Scheme	197	34	0	231
Lack of skilled/competent technicians	11 (5.6%)	6 (17.6%)	0	17 (7.4%)
Lack of skilled/competent craftsmen	15 (7.6%)	8 (23.5%)	0	23 (10.0%)

5.33 The table shows that there is not much difference between those agreeable to the mandatory registration/licensing scheme and those against it in terms of the opinion on lack of skilled/competent technicians and craftsmen. The same appears in the population of small and medium garages. This analysis reveals that the request of the trade to set up the mandatory registration/licensing of mechanics system is not motivated by the lack of skilled/competent technicians and craftsmen, but by other motives instead. Some of these other motives were revealed when we asked the interviewees to give further comment on the survey as reported in the next paragraph.

Other comments

5.34 The following other comments were expressed by the respondents:-

(i) Mandatory registration/licensing scheme could cast a professional image of the mechanics to the public, enhance professionalism in the trade, improve mechanics' skills and provide better confidence to the public in respect of repair work quality.

(ii) Mandatory registration/licensing of mechanics could be used as employment criteria in future.

(iii) Government support to the trade is not sufficient, especially in helping the trade to comply with environmental legislation.

5.35 From the other comments given by the interviewees, it was noted that some of the surveyed garages viewed mandatory registration/licensing of mechanics as a means to upgrade the professional image of mechanics, raise their social status, and enhance confidence in the public towards their work. These may be the other reasons why there is overwhelming support by the trade towards mandatory registration/licensing of mechanics.

6. FURTHER DISCUSSION ON THE LOCAL SURVEY AND RECOMMENDATIONS

6.1 As discussed in Section 1 of this report, the vehicle maintenance trade is facing the following difficulties:-

(a) Varied quality of mechanics from one to another
(b) Varied quality of vehicle maintenance garages from one to another
(c) Lack of knowledge to comply with environmental protection requirements
(d) Unavailability of vehicle maintenance manuals and technical data.

6.2 The survey found that about 60% of the mechanics are not possessing recognized vehicle repair qualification or certification and are being trained up informally. This non-systematic training of mechanics would result in the varied quality of mechanics from one to another.

6.3 Although the survey did not target at vehicle maintenance garages specifically, it is to be expected that the service quality of vehicle maintenance garages would also vary in view of the varied quality of mechanics.

6.4 The survey also revealed that 22% of the respondents considered that they lack the understanding of environmental protection requirements and this affects their work in vehicle repair.

6.5 Lastly, 52% of the respondent replied that lack of vehicle maintenance manuals is one of the major difficulties in vehicle repair.

6.6 Hence, the local survey basically confirms that the four issues mentioned above are the major difficulties faced by the trade.

6.7 The issue on vehicle maintenance manual is currently being discussed in the WGVMS and is not covered in this study.

6.8 To tackle the other three issues, the trade requests the Government to set up mandatory system to register/license vehicle mechanics and then later on to consider mandatory registration/licensing of vehicle maintenance garages as well.

6.9 This study is aim at investigating whether the silent majority of the trade is agreeable to setting up the mandatory registration/licensing of mechanics scheme and collect information on the facilities upgrading and mechanics' training needs to comply with the tightened environmental and safety requirements. However, the issue on registration/licensing of garages is not covered in this study.

Mandatory Registration/Licensing of Vehicle Mechanics

6.10 As discussed in detail in Section 5, there is overwhelming support from the trade towards setting up a mandatory system to register/license vehicle mechanics. To gauge whether such mandatory system is recommendable, it is necessary to evaluate whether the system can help solve the four major difficulties faced by the trade.

6.11 Once the mandatory registration/licensing system is in operation, every mechanic has to comply with a set of consistent registration/licensing criteria. In addition, under the registration/licensing system, there would be penalty system to penalize mal-practiced mechanics. In this way, there will be greater guarantee of the quality of the work delivered by mechanics in the trade.

6.12 Regarding the varied quality of vehicle maintenance garage, the mandatory registration/licensing of mechanics cannot improve the situation much. The Government must move a little step further to also register/license the garages. The trade has shown indication in the WGVMS that they will support garage registration/licensing in principle.

6.13 It is expected that under the mandatory registration/licensing system, there would be a requirement on continuous professional development. Through attending training courses the registered mechanics can be constantly updated about the trade practices, advancement in skills, as well as environmental protection requirements.

6.14 On the other hand, unless it is an ancillary requirement to release maintenance manual under the registration/licensing scheme, the scheme itself would not solve the problem of unavailability of maintenance manual or technical data.

6.15 In summary, mandatory registration/licensing of mechanics can help solve the

first three difficulties in the trade except the release of maintenance manual and technical data.

6.16 Regarding the release of vehicle maintenance manual and technical data, HKPC was informed the following: "On maintenance information of petrol and Euro diesel vehicles, it was found that third-party publications covering different aspects of almost all running models of vehicles, e.g. ignition system, braking system, carburetor and fuel injection systems, electric and air conditioning systems, are readily available in Hong Kong. There is at least a publisher which offers full sets of vehicle maintenance data for all running models. Similar to practice overseas, the public or the vehicle maintenance trade in Hong Kong could purchase such information from the publishers' local office or through the internet." There seems to have a positive outlet to solve the unavailability of vehicle maintenance manual and technical data.

Recommendations

6.17 Although the survey revealed overwhelming support of mandatory registration/licensing of mechanics, it remains a policy decision by the Government on whether to set up such system. Among other considerations, resource implication and priority of the needs to set up such system should be considered. But anyway, this survey has confirmed that the silent majority of the trade are supportive of the mandatory registration/licensing system.

6.18 Before making decision on whether to set up mandatory schemes to register/license mechanics, members of the WGVMS are suggested to visit overseas countries with mandatory and/or voluntary systems to learn their lessons. As recommended in the Overseas Survey Report, which is separately bounded and attached to this report, members are suggested to visit Australia (NSW and Queensland), USA (Michigan) and New Zealand. NSW operates a mandatory registration/licensing schemes and has set up a dedicated Council to take care of the work, Michigan has been operating stringent control over mechanics and garages with imprisonment penalty, while New Zealand has been operating a voluntary registration/licensing scheme which is run by the New Zealand Qualifications Authority, a government department. The experiences gained in operating the mechanic/garages registration systems in these countries are worth further studying.

6.19 Should the Government decide to implement mandatory registration/licensing of mechanics, it should consult the trade thoroughly before finalizing the details of the scheme. In particular, in view of the large proportion of uncertified skilled mechanics (about 60% of the mechanics are without relevant education qualifications or certification in vehicle repair work), the registration/licensing criteria must be set carefully so that these experienced mechanics would not be screened out from the registration/licensing net and lose their jobs. However, a balance should be made between avoiding creating unemployment of the large proportion of uncertified skilled mechanics and consumer protection against substandard workmanship.

6.20 Besides, the Government should consider providing or arranging to provide further education/training to upgrade mechanics' skills and knowledge in environmental protection requirements, both of which are considered major difficulties faced by the trade. One way to accomplish this is to enrich the training courses currently provided by Vocational Training Council.

6.21 Furthermore, the Government should also consider setting up mandatory registration/licensing system for vehicle maintenance garages in order to ensure the quality of vehicle repair. Further research and consultation with the trade on this issue should be conducted in the near future.

Annex A

Copy of Extensive Survey Questionnaire

QUESTIONNAIRE FOR POSTAL SURVEY ON VEHICLE (LPG, PETROL & DIESEL) MAINTENANCE GARAGES AND MECHANICS' CAPABILITY TO COMPLY WITH TIGHTENED ENVIRONMENTAL AND SAFETY REQUIREMENTS

1. COMPANY INFORMATION

Name of establishment: _____

Address: _____

Telephone: _____

Fax: _____

Responsible person and post: _____

Name and post of person interviewed: _____

Type of premises:
- ☐ Purpose-built building
- ☐ Multi-storey industrial building
- ☐ Open yard
- ☐ Others, please specify below

_____

_____

Area of premises: _____

No. of employees involved in vehicle repair:

Technologists: _____

Technicians: _____

Craftsmen: _____

Operatives: _____

Unskilled workers: _____

Type of Service:

Vehicle repairing:	☐ Major	☐ Minor
Trading of vehicle parts:	☐ Major	☐ Minor
Trading of new/used vehicles:	☐ Major	☐ Minor
Others, please specify below:	☐ Major	☐ Minor

_____

_____

Type of vehicle repair service:
- ☐ Body Repair
- ☐ Body Painting
- ☐ Electrical Repair
- ☐ Mechanical Service/Repair
- ☐ Specialty Shop – Air-conditioning repair
- ☐ Specialty Shop – Tyre Repair & Replacement
- ☐ Specialty Shop – Lubrication Services
- ☐ Others, please specify below

_____

_____

Types of vehicles repaired:
- ☐ Light diesel vehicles
- ☐ Light petrol vehicles
- ☐ Heavy commercial diesel vehicles
- ☐ Light buses
- ☐ Non-Franchised/Franchised buses
- ☐ Taxis
- ☐ Others, please specify below

_____

_____

Interview date: _____

Interview time: _____

Interviewer: _____

2. PERSONNEL

2.1 Qualifications of Existing Vehicle Maintenance Employees

No. of Employees	Qualification							Total
	Higher Diploma	Diploma	Higher Certificate	Certificate	Secondary 5	Craft Certificate	Secondary 3 or below	
Technician Level								
Craftsman Level								
Apprentices (registered under Apprentice Ordinance)	Technician apprentices: _____ Craft apprentices: _____							
Others (no qualification but experience only)	<5 years: _____ 5 to 10 years: _____ >10 years: _____							

2.2 Existing employees who passed the trade tests run by Vocational Training Council

	No. of Existing Employees Passed Trade Tests Run by Vocational Training Council
Technician Level	
Craftsman Level	

2.3 Number of existing employees who completed the LPG vehicle servicing course: _____

3. APPROACHES TO IMPROVE STANDARD OF VEHICLE REPAIR IN ORDER TO COMPLY WITH TIGHTENED ENVIRONMENTAL AND SAFETY REQUIREMENTS

3.1 In order to improve the standard of the vehicle repair in order to comply with tightened environmental and safety requirements, do you agree to take the following measures:

	Yes	No
Further education and training by the government		
Registration/licensing of vehicle repair technicians/craftsmen		
Others, please specify below		

_____

_____

3.1 If in Q3.1 you do not agree to register/license vehicle repair technicians/craftmen, do you agree to set up a vehicle repair council to regulate the vehicle repair industry?

☐ Yes ☐ No

4 DIFFICULTIES FACED BY TECHNICIANS/CRAFTSMEN WHEN REPAIRING VEHICLES TO COMPLY WITH TIGHTENED ENVIRONMENTAL AND SAFETY REQUIREMENTS

4.1 Which of the following difficulties do your workforce face when repairing vehicles to comply with tightened environmental and safety requirements? (You can tick more than 1 box)

- ☐ Vehicle service or maintenance manual not readily available
- ☐ Lack of vehicle diagnostic equipment
- ☐ Lack of skilled or competent technicians
- ☐ Lack of skilled or competent craftsmen
- ☐ Lack of vehicle emissions testing facilities
- ☐ Lack of understanding of environmental legislation related to vehicle emissions
- ☐ Others, please specify below

_____

_____

*** END OF QUESTIONNAIRE ***

Annex B

Copy of Intensive Survey Questionnaire

QUESTIONNAIRE FOR SURVEY ON VEHICLE (LPG, PETROL & DIESEL) MAINTENANCE GARAGES AND MECHANICS' CAPABILITY TO COMPLY WITH TIGHTENED ENVIRONMENTAL AND SAFETY REQUIREMENTS

1. COMPANY INFORMATION

Name of establishment: _____
Address: _____
Telephone: _____
Fax: _____
Responsible person and post: _____
Name and post of person interviewed: _____
Type of premises:
- ☐ Purpose-built building
- ☐ Multi-storey industrial building
- ☐ Open yard
- ☐ Others, please specify below

_____
_____

Area of premises: _____
No. of employees involved in vehicle repair:
- Technologists: _____
- Technicians: _____
- Craftsmen: _____
- Operatives: _____
- Unskilled workers: _____

Type of Service:

Vehicle repairing:	☐ Major	☐ Minor
Trading of vehicle parts:	☐ Major	☐ Minor
Trading of new/used vehicles:	☐ Major	☐ Minor
Others, please specify below:	☐ Major	☐ Minor

_____
_____

Type of vehicle repair service:
- ☐ Body Repair
- ☐ Body Painting
- ☐ Electrical Repair
- ☐ Mechanical Service/Repair
- ☐ Specialty Shop – Air-conditioning repair
- ☐ Specialty Shop – Tyre Repair & Replacement
- ☐ Specialty Shop – Lubrication Services
- ☐ Others, please specify below

_____
_____

Types of vehicles repaired:
- ☐ Light diesel vehicles
- ☐ Light petrol vehicles
- ☐ Heavy commercial diesel vehicles
- ☐ Light buses
- ☐ Non-Franchised/Franchised buses
- ☐ Taxis
- ☐ Others, please specify below

_____
_____

Interview date: _____
Interview time: _____
Interviewer: _____

2. FACILITIES AT MOTOR VEHICLE REPAIR SHOP

2.1 Does your repair workshop have the following facilities?

(a) Body Repair Workshop
- ☐ Car Lift
- ☐ Car hydraulic jack
- ☐ Engine lifting jib crane/block
- ☐ TIG/MIG
- ☐ Welding equipment
- ☐ Oxygen/acetylene gas welding equipment
- ☐ Body Alignment Rig
- ☐ Vehicle transport devices
- ☐ Air extraction system

(b) Paint Shop
- ☐ Spray Booth with heater
- ☐ Spray booth/enclosed area with ventilation only
- ☐ Paint Mixer
- ☐ Heat Lamps
- ☐ Ventilation/air extraction system for dust removal & filtering
- ☐ Spray gun cleaning machine

(c) Electrical Repair Workshop
- ☐ Car Lift
- ☐ Discharge meter
- ☐ Tachometer
- ☐ Belt tension gauge
- ☐ Volt/Amp/Ohm meters
- ☐ Battery Charging Area with forced ventilation
- ☐ Battery chargers
- ☐ Oscilloscope

(d) Mechanical Services/Repair Workshop
- ☐ Car Lift
- ☐ Car Hydraulic Jack
- ☐ Safety Stands
- ☐ Engine Lift
- ☐ Electronic Diagnostic System
- ☐ Smoke Meter
- ☐ Four-gas Analyzer
- ☐ Wheel alignment tester
- ☐ Wheel balancer
- ☐ Torque wrenches
- ☐ Tachometer
- ☐ Decelerometer (Tepley Meter)
- ☐ Roller brake tester
- ☐ Air extraction system
- ☐ Chemical waste collection facilities
- ☐ Freon recharging/recycling machine

2.2 What equipment are you considering to upgrade or purchase in the next two years?

(a) Body Repair Workshop

_____

_____

_____

(b) Paint Shop

_____

_____

_____

(c) Electrical Repair Workshop

_____

_____

_____

(d) Mechanical Services/Repair Workshop

_____

_____

_____

3. PERSONNEL

3.1 Qualifications of Existing Employees

No. of Employees	Qualification							Total
	Higher Diploma	Diploma	Higher Certificate	Certificate	Secondary 5	Craft Certificate	Secondary 3 or below	
Technician Level								
Craftsman Level								
Vehicle Mechanic								
Vehicle Electrician								
Vehicle Body Repairer								
Vehicle Body Builder								
Vehicle Painter								
Vehicle Air-conditioning Mechanic								
Vehicle Upholsterer								
Machinist								
Industrial Vehicle Mechanic								
Apprentices (registered under Apprentice Ordinance)	Technician apprentices: _____ Craft apprentices: _____							
Others (no qualification but experience only)	<5 years: _____ 5 to 10 years: _____ >10 years: _____							

3.2 Existing employees who obtained the Trade Test Certificate issued by Vocational Training Council

	No. of Existing Employees Obtained the Trade Tests Certificate issued by Vocational Training Council
Technician Level	
Craftsman Level	
Vehicle Mechanic	
Vehicle Electrician	
Vehicle Body Repairer	
Vehicle Body Builder	
Vehicle Painter	
Vehicle Air-conditioning Mechanic	
Vehicle Upholsterer	
Machinist	
Industrial Vehicle Mechanic	

3.3 Number of existing employees who completed the LPG vehicle servicing course: _____

4. APPROACHES TO IMPROVE STANDARD OF VEHICLE REPAIR IN ORDER TO COMPLY WITH TIGHTENED ENVIRONMENTAL AND SAFETY REQUIREMENTS

4.1 How do you acquire the tightened environmental and safety requirements as well as other legislative requirements, e.g. industrial safety and fire?

- ☐ From the booklet issued by the Government Departments, e.g. Environmental Protection Department, Labour Department, etc.
- ☐ From industrial trade associations
- ☐ From government gazette
- ☐ From newspaper
- ☐ Others, please specify below

_____

4.2 In order to improve the standard of the vehicle repair in order to comply with tightened environmental and safety requirements, do you agree to take the following measures:

	Yes	No
Further education and training by the government		
Registration/licensing of vehicle repair technicians/craftsmen		
Others, please specify below		

_____

_____

4.3 If in Q4.2 you agree to register/license vehicle repair technicians/craftsmen, what level and types of works do you think shall be registered/licensed?

	To be Registered/Licensed (please tick)
Technician Level	
Craftsman Level	
Vehicle Mechanic	
Vehicle Electrician	
Vehicle Body Repairer	
Vehicle Body Builder	
Vehicle Painter	
Vehicle Air-conditioning Mechanic	
Vehicle Upholsterer	
Machinist	
Industrial Vehicle Mechanic	

4.4 If in Q4.2 you **DO NOT** agree to register/license vehicle repair technicians/craftmen, do you agree to set up a vehicle repair council to regulate the vehicle repair industry?

☐ Yes ☐ No

4.5 If in Q4.2 you agree to "Further education and training supported by the government", please specify what training is needed. (You may tick more than one box)

- ☐ LPG vehicle servicing
- ☐ Diesel engine maintenance
- ☐ Petrol engine maintenance
- ☐ General chassis
- ☐ Transmission
- ☐ Suspension
- ☐ Braking
- ☐ Steering
- ☐ Body repair
- ☐ Body painting
- ☐ Vehicle electrical
- ☐ Vehicle air-conditioner
- ☐ Others, please specify below

_____

4.6 In order to comply with the tightened environmental and safety requirements, do you consider it appropriate to require technicians/craftsmen to pass a trade test before employment?

	Need to pass Trade Test before employment (Please tick if you agree)
Technician Level	
Craftsman Level	
Vehicle Mechanic	
Vehicle Electrician	
Vehicle Body Repairer	
Vehicle Body Builder	
Vehicle Painter	
Vehicle Air-conditioning Mechanic	
Vehicle Upholsterer	
Machinist	
Industrial Vehicle Mechanic	

5. DIFFICULTIES FACED BY TECHNICIANS/CRAFTSMEN WHEN REPAIRING VEHICLES TO COMPLY WITH TIGHTENED ENVIRONMENTAL AND SAFETY REQUIREMENTS

Which of the following difficulties do your workforce face when repairing vehicles to comply with tightened environmental and safety requirements? (You can tick more than 1 box)

- ☐ Vehicle service or maintenance manual not readily available
- ☐ Lack of vehicle diagnostic equipment
- ☐ Lack of skilled or competent technicians
- ☐ Lack of skilled or competent craftsmen
- ☐ Lack of vehicle emissions testing facilities
- ☐ Lack of understanding of environmental legislation related to vehicle emissions
- ☐ Others, please specify below

_____

_____

6. OTHER COMMENTS

_____

_____

*** END OF QUESTIONNAIRE ***

Annex C

Summary of Extensive Survey Results

QUESTIONNAIRE FOR POSTAL SURVEY ON VEHICLE (LPG, PETROL & DIESEL) MAINTENANCE GARAGES AND MECHANICS' CAPABILITY TO COMPLY WITH TIGHTENED ENVIRONMENTAL AND SAFETY REQUIREMENTS

1. COMPANY INFORMATION

Name of establishment: 1183 establishments
Address: _____
Telephone: _____
Fax: _____
Responsible person and post: _____
Name and post of person interviewed: _____

Type of premises:

☐	Purpose-built building	91 (7.7%)
☐	Multi-storey industrial building	302 (25.5%)
☐	Open yard	315 (26.6%)
☐	Others, please specify below	475 (40.2%)

Residential G/F 370 Street Side 32 Residential/Commercial 26

Others Include Commercial Building, Carpark, Covered Workshops, Industrial/Commercial Buildings, Cottage, Villages & Short-Term Waiver Land

Area of premises: Average 4430 Sqft

No. of employees involved in vehicle repair:

Technologists:	183 (2.9%)
Technicians:	385 (6.0%)
Craftsmen:	5049 (78.5%)
Operatives:	130 (2.0%)
Unskilled workers:	682 (10.6%)

Type of Service:

Vehicle repairing:	☐ Major 1183	☐ Minor 0
Trading of vehicle parts:	☐ Major 39	☐ Minor 46
Trading of new/used vehicles:	☐ Major 23	☐ Minor 78
Others, please specify below:	☐ Major 17	☐ Minor

Type of vehicle repair service:

☐	Body Repair	674 (57%)
☐	Body Painting	341 (29%)
☐	Electrical Repair	641 (54%)
☐	Mechanical Service/Repair	995 (84%)
☐	Specialty Shop – Air-conditioning repair	29 (2%)
☐	Specialty Shop – Tyre Repair & Replacement	10 (1%)
☐	Specialty Shop – Lubrication Services	12 (1%)
☐	Others, please specify below	42 (4%)

Types of vehicles repaired:

☐	Light diesel vehicles	583 (50%)
☐	Light petrol vehicles	939 (79%)
☐	Heavy commercial diesel vehicles	198 (17%)
☐	Light buses	189 (16%)
☐	Non-Franchised/Franchised buses	36 (3%)
☐	Taxis	160 (14%)
☐	Others, please specify below	18 (2%)

2. PERSONNEL

2.1 Qualifications of Existing Vehicle Maintenance Employees

No. of Employees	Qualification							Total
	Higher Diploma	Diploma	Higher Certificate	Certificate	Secondary 5	Craft Certificate	Secondary 3 or below	
Technician Level	24	44	126	69	122			385
Craftsman Level					226	1568	1852	3646
Apprentices (registered under Apprentice Ordinance)	Technician apprentices: 53 Craft apprentices: 394							442
Others (no qualification but experience only)	<5 years: 50 5 to 10 years: 67 >10 years: 1286							1403

2.2 Existing employees who passed the trade tests run by Vocational Training Council

	No. of Existing Employees Passed Trade Tests Run by Vocational Training Council
Technician Level	
Craftsman Level	582

2.3 Number of existing employees who completed the LPG vehicle servicing course: 221

3. APPROACHES TO IMPROVE STANDARD OF VEHICLE REPAIR IN ORDER TO COMPLY WITH TIGHTENED ENVIRONMENTAL AND SAFETY REQUIREMENTS

3.1 In order to improve the standard of the vehicle repair in order to comply with tightened environmental and safety requirements, do you agree to take the following measures:

	Yes	No	No Comment
Further education and training by the government	1047 (88.5%)	110 (9.3%)	26 (2.2%)
Registration/licensing of vehicle repair technicians/craftsmen	928 (78.5%)	231 (19.5%)	24 (2.0%)
Others, please specify below			

3.1 If in Q3.1 you do not agree to register/license vehicle repair technicians/craftmen, do you agree to set up a vehicle repair council to regulate the vehicle repair industry?

☐ Yes 130 (56.3%) ☐ No 69 (29.9%) ☐ No Comment 32 (13.8%)

4 DIFFICULTIES FACED BY TECHNICIANS/CRAFTSMEN WHEN REPAIRING VEHICLES TO COMPLY WITH TIGHTENED ENVIRONMENTAL AND SAFETY REQUIREMENTS

4.1 Which of the following difficulties do your workforce face when repairing vehicles to comply with tightened environmental and safety requirements? (You can tick more than 1 box)

☐ Vehicle service or maintenance manual not readily available	610 (52%)
☐ Lack of vehicle diagnostic equipment	519 (44%)
☐ Lack of skilled or competent technicians	123 (10%)
☐ Lack of skilled or competent craftsmen	143 (12%)
☐ Lack of vehicle emissions testing facilities	432 (37%)
☐ Lack of understanding of environmental legislation related to vehicle emissions	265 (22%)
☐ Others, please specify below	50 (4%)

_____

_____

*** END OF QUESTIONNAIRE ***

Annex D

Summary of Intensive Survey Results

QUESTIONNAIRE FOR SURVEY ON VEHICLE (LPG, PETROL & DIESEL) MAINTENANCE GARAGES AND MECHANICS' CAPABILITY TO COMPLY WITH TIGHTENED ENVIRONMENTAL AND SAFETY REQUIREMENTS

1. COMPANY INFORMATION

Name of establishment: 253 establishments
Address: _____
Telephone: _____
Fax: _____
Responsible person and post: _____
Name and post of person interviewed: _____

Type of premises:

☐ Purpose-built building	15 (5.9%)
☐ Multi-storey industrial building	83 (32.8%)
☐ Open yard	17 (6.7%)
☐ Others, please specify below	138 (54.6%)

Resident G/F 109 Commercial G/F 22 Godown/Industrial Shop 1
Covered Shop 1 Industrial/Commercial 2 Industrial & Open Area 1
Bus Maintenance Shop 1 Container Truck Carpark 1

Area of premises: 8143.7 Sqft

No. of employees involved in vehicle repair:

Technologists:	163 (4.8%)
Technicians:	245 (7.2%)
Craftsmen:	2298 (67.3%)
Operatives:	112 (3.3%)
Unskilled workers:	599 (17.5%)

Type of Service:

Vehicle repairing:	☐ Major 252	☐ Minor 1
Trading of vehicle parts:	☐ Major 21	☐ Minor 20
Trading of new/used vehicles:	☐ Major 11	☐ Minor 33
Others, please specify below:	☐ Major 6	☐ Minor 2

Major : Car Inspection 2 Delivery 1 Taxi Charge Meter Repair 1 Paint Spraying 1
Minor : Audio Equipment 1

Type of vehicle repair service:

☐ Body Repair	129 (51%)
☐ Body Painting	60 (24%)
☐ Electrical Repair	147 (58%)
☐ Mechanical Service/Repair	229 (91%)
☐ Specialty Shop – Air-conditioning repair	0
☐ Specialty Shop – Tyre Repair & Replacement	1
☐ Specialty Shop – Lubrication Services	0
☐ Others, please specify below	55 (22%)

Wheel Maintenance/Change 18 Lubricant 26 Vehicle Inspection 3
Air Conditioner Repair 29 New Car Decoration 5 Car Care 1
Battery 1 Car Modification 1 Upholstery 1
Taxi Charge Meter & Electronic Device Maintenance 1 Brake Checking 1

Types of vehicles repaired:

☐ Light diesel vehicles	133 (53%)
☐ Light petrol vehicles	223 (88%)
☐ Heavy commercial diesel vehicles	37 (15%)
☐ Light buses	30 (12%)
☐ Non-Franchised/Franchised buses	17 (7%)
☐ Taxis	57 (23%)
☐ Others, please specify below	8 (3%)

Special Car (LPG, Shovel, Hanger) 1 LPG Car/Minbus 4
Industrial Car 1 Motor Cycle 1 Airport Truck 1

2. FACILITIES AT MOTOR VEHICLE REPAIR SHOP

2.1 Does your repair workshop have the following facilities?

(a) Body Repair Workshop

☐ Car Lift	68
☐ Car hydraulic jack	119
☐ Engine lifting jib crane/block	70
☐ TIG/MIG	63
☐ Welding equipment	93
☐ Oxygen/acetylene gas welding equipment	93
☐ Body Alignment Rig	69
☐ Vehicle transport devices	13
☐ Air extraction system	48

(b) Paint Shop

☐ Spray Booth with heater	37
☐ Spray booth/enclosed area with ventilation only	26
☐ Paint Mixer	34
☐ Heat Lamps	42
☐ Ventilation/air extraction system for dust removal & filtering	37
☐ Spray gun cleaning machine	27

(c) Electrical Repair Workshop

☐ Car Lift	72
☐ Discharge meter	85
☐ Tachometer	74
☐ Belt tension gauge	48
☐ Volt/Amp/Ohm meters	127
☐ Battery Charging Area with forced ventilation	34
☐ Battery chargers	126
☐ Oscilloscope	44

(d) Mechanical Services/Repair Workshop

☐ Car Lift	214
☐ Car Hydraulic Jack	205
☐ Safety Stands	76
☐ Engine Lift	167
☐ Electronic Diagnostic System	191
☐ Smoke Meter	88
☐ Four-gas Analyzer	71
☐ Wheel alignment tester	74
☐ Wheel balancer	65
☐ Torque wrenches	170
☐ Tachometer	120
☐ Decelerometer (Tepley Meter)	25
☐ Roller brake tester	34
☐ Air extraction system	49
☐ Chemical waste collection facilities	182
☐ Freon recharging/recycling machine	82

2.2 What equipment are you considering to upgrade or purchase in the next two years?

(a) Body Repair Workshop

Car Lift 1 Low Temperature Welding Machine 1 Body Alignment Rig 4
Body Alignment 1 TIG/MIG 1

(b) Paint Shop

Heated Spray Booth/Oven 2 Spray Booth/Oven 4 Spray Gun Cleaning Machine 1

(c) Electrical Repair Workshop

Heavy Vehicle Battery Charger 1 Battery Charger 1 Discharge Meter 1
Computer Kits for Vehicle Maintenance 2

(d) Mechanical Services/Repair Workshop

Electronic Diagnostic System 18 Hand Held Computer Diagnostic System 1 Four Gas Analyzer 18
Four Gas Analyzer/Smoke Meter 7 Car Lift 11 LPG Vehicle Repair Tools 10 Set Up LPG Repair Workshop 2
Freon Recharging/Recycling Machine 5 Computer Facilities 5 Wheel Balancer 4
Wheel Alignment Tester 4 Brake Tester 3 Engine Lift 3 Tachometer 2
Tyre Changer 2 Safety Stands 1 Power Meter 1 Chassis Testing Tool 1

3. PERSONNEL

3.1 Qualifications of Existing Employees

No. of Employees	Qualification							Total
	Higher Diploma	Diploma	Higher Certificate	Certificate	Secondary 5	Craft Certificate	Secondary 3 or below	
Technician Level	19	38	115	22	51			245
Craftsman Level								
Vehicle Mechanic					101	77	382	1258
Vehicle Electrician					19	109	54	182
Vehicle Body Repairer					18	155	135	308
Vehicle Body Builder					0	2	0	2
Vehicle Painter					12	172	133	317
Vehicle Air-conditioning Mechanic					2	31	16	49
Vehicle Upholsterer					2	2	0	4
Machinist					0	0	0	0
Industrial Vehicle Mechanic					2	1	1	4
Apprentices (registered under Apprentice Ordinance)	Technician apprentices: 49 Craft apprentices: 249							298
Others (no qualification but experience only)	<5 years: 11 5 to 10 years: 6 >10 years: 156							173

3.2 Existing employees who obtained the Trade Test Certificate issued by Vocational Training Council

	No. of Existing Employees Obtained the Trade Tests Certificate issued by Vocational Training Council
Technician Level	Nil
Craftsman Level	
Vehicle Mechanic	143
Vehicle Electrician	24
Vehicle Body Repairer	36
Vehicle Body Builder	5
Vehicle Painter	29
Vehicle Air-conditioning Mechanic	3
Vehicle Upholsterer	0
Machinist	0
Industrial Vehicle Mechanic	0

3.3 Number of existing employees who completed the LPG vehicle servicing course: 116

4. APPROACHES TO IMPROVE STANDARD OF VEHICLE REPAIR IN ORDER TO COMPLY WITH TIGHTENED ENVIRONMENTAL AND SAFETY REQUIREMENTS

4.1 How do you acquire the tightened environmental and safety requirements as well as other legislative requirements, e.g. industrial safety and fire?

- ☐ From the booklet issued by the Government Departments, e.g. Environmental Protection Department, Labour Department, etc. 194 (76.7%)
- ☐ From industrial trade associations 59 (23.3%)
- ☐ From government gazette 56 (22.1%)
- ☐ From newspaper 167 (66.0%)
- ☐ Others, please specify below 36 (14.2%)

Radio 13 TV 11 Peers 9 Consultancy Report 5 Government Department Inspection 2
Company Information Collection Group 2 SMA Meeting 1 Company Directive 1
Paint Suppliers' Directive 1 KMB 1

4.2 In order to improve the standard of the vehicle repair in order to comply with tightened environmental and safety requirements, do you agree to take the following measures:

	Yes	No	No Comment
Further education and training by the government	232 (91.7%)	12 (4.7%)	9 (3.6%)
Registration/licensing of vehicle repair technicians/craftsmen	214 (84.6%)	36 (14.2%)	3 (1.2%)
Others, please specify below			

Vehicle Maintenance Garages/Shop/Field Registration 17 (6.7%)

4.3 If in Q4.2 you agree to register/license vehicle repair technicians/craftsmen, what level and types of works do you think shall be registered/licensed?

	To be Registered/Licensed (please tick)
Technician Level	183
Craftsman Level	
Vehicle Mechanic	197
Vehicle Electrician	183
Vehicle Body Repairer	162
Vehicle Body Builder	131
Vehicle Painter	143
Vehicle Air-conditioning Mechanic	146
Vehicle Upholsterer	98
Machinist	118
Industrial Vehicle Mechanic	115

4.4 If in Q4.2 you **DO NOT** agree to register/license vehicle repair technicians/craftmen, do you agree to set up a vehicle repair council to regulate the vehicle repair industry?

☐ Yes 22 (61.1%) ☐ No 13 (36.1%) ☐ No Comment 1 (2.8%)

4.5 If in Q4.2 you agree to "Further education and training supported by the government", please specify what training is needed. (You may tick more than one box)

☐ LPG vehicle servicing	220
☐ Diesel engine maintenance	175
☐ Petrol engine maintenance	193
☐ General chassis	117
☐ Transmission	129
☐ Suspension	121
☐ Braking	132
☐ Steering	124
☐ Body repair	118
☐ Body painting	111
☐ Vehicle electrical	146
☐ Vehicle air-conditioner	129
☐ Others, please specify below	30

Electronic Technology/ Control System 12 Computer Software Control 10
Industrial Safety/Safety Knowledge 8 Professional Code of Practice 6 Environmental Protection 6
Electric Car Repair 3 Vehicle Emission Testing 1 Vehicle Maintenance 1
Provide Latest Vehicle Information & Technical Support 1

4.6 In order to comply with the tightened environmental and safety requirements, do you consider it appropriate to require technicians/craftsmen to pass a trade test before employment?

	Need to pass Trade Test before employment (Please tick if you agree)
Technician Level	Nil
Craftsman Level	
Vehicle Mechanic	118
Vehicle Electrician	101
Vehicle Body Repairer	88
Vehicle Body Builder	71
Vehicle Painter	79
Vehicle Air-conditioning Mechanic	87
Vehicle Upholsterer	54
Machinist	52
Industrial Vehicle Mechanic	62

5. DIFFICULTIES FACED BY TECHNICIANS/CRAFTSMEN WHEN REPAIRING VEHICLES TO COMPLY WITH TIGHTENED ENVIRONMENTAL AND SAFETY REQUIREMENTS

Which of the following difficulties do your workforce face when repairing vehicles to comply with tightened environmental and safety requirements? (You can tick more than 1 box)

- ☐ Vehicle service or maintenance manual not readily available 167 (66.0%)
- ☐ Lack of vehicle diagnostic equipment 143 (56.5%)
- ☐ Lack of skilled or competent technicians 89 (35.2%)
- ☐ Lack of skilled or competent craftsmen 93 (36.8%)
- ☐ Lack of vehicle emissions testing facilities 90 (35.6%)
- ☐ Lack of understanding of environmental legislation related to vehicle emissions 88 (34.8%)
- ☐ Others, please specify below 24 (9.5%)

Lack of Money to Buy Equipment/Company Financial Problem 7

Lack of Data/Service Agents Refused to Provide Information 5

Vehicle Technology Advances Quickly, But Local Techniques Fail to Cope With the Change/Lack of New Technology Support 4

Harsh Environmental Legislation/Non-Uniform Standard, Government Always Changes the Rules & They Could Not Adapt to the Change 3

Lack of Electronic Equipment 2 Limitation of Garage Space 2

Can't Employ Mechanics to Repair Heavy Truck 1

6. OTHER COMMENTS

*** END OF QUESTIONNAIRE ***

Annex D

Special Task Group
on Licensing System for Vehicle Maintenance

Membership List

Electrical and Mechanical Services Department (Chairman)
Environment and Food Bureau
Transport Bureau
Environmental Protection Department
Transport Department
Vocational Training Council
Hong Kong Institution of Engineers
Hong Kong Vehicle Repair Merchants Association
Motor Traders Association/Service Managers Association
Institute of the Motor Industry Hong Kong
Environmental Vehicle Repairers Association

Final Report
of
Special Task Group
on
Licensing System for Vehicle Maintenance

Special Task Group
on Licensing System
for Vehicle Maintenance

9 October, 2000

Contents

Appendices

Final Report of Special Task Group on Licensing System for Vehicle Maintenance

1. Background

The LegCo Joint Panels on Transport and Environmental Affairs resolved on 16 December 1999 to establish a Working Group on Vehicle Maintenance Services (WGVMS), comprising representatives from the vehicle maintenance trade and relevant parties, to consider ways to raise the standards of vehicle maintenance. One of the main issues to be considered was the introduction of a licensing/registration scheme for the maintenance trade. The Working Group had a number of meetings and resolved to conduct a local survey on the Vehicle Service Industry with an objective to obtain an across the board knowledge of the present situation, the training needs and resources requirement that will assist to improve the service standards. It has also appointed a Special Task Group chaired by EMSD to survey on overseas regulatory requirements and to put forward various options on licensing/registration of vehicle mechanics/technicians and possibly also the garages.

2. Methodology

The Special Task Group is composed of representatives from various sectors of motor vehicle maintenance trade in Hong Kong including professional and vocational training institutions, small and medium garages, franchised importers, and Governmental bureaux and departments. They are:

- Electrical & Mechanical Services Department
- Environment & Food Bureau
- Transport Bureau
- Environmental Protection Department
- Transport Department
- Vocational Training Council
- Hong Kong Institution of Engineers
- Hong Kong Vehicle Repair Merchants Association
- Service Managers Association/ Motor Traders Association
- Institute of Motor Industry Hong Kong
- Environmental Vehicle (Taxi) Repairers Association

Its Terms of Reference are as follows:

I. To review overseas systems on licensing/registration of vehicle maintenance trade.

II. To review local systems on licensing/registration of technical services trades such as electrical workers, gas workers.

III. To analyze information on (I) and (II) and identify possible options on licensing/registration of vehicle maintenance trade in Hong Kong.

Hong Kong Productivity Council (HKPC) was commissioned as the consultant to conduct overseas regulatory survey on the vehicle maintenance trade. Information concerning regulation of vehicle mechanics and repairers (garages) were gathered by HKPC and subsequently reviewed by the Special Task Group for compilation of the survey report for reference.

The overseas survey started in April and completed in end August. Results of the survey are attached in (Appendix 1).

The Special Task Group also assisted in reviewing questionnaires of local surveys on the vehicle maintenance trade also by HKPC. The objective of the local surveys was to have an across the board knowledge regarding the business and employee profiles, training and equipment requirements, and views on a regulatory system in Hong Kong if vehicle repair standards were to improve. HKPC shall submit its report to the WGVMS direct.

The Special Task Group has studied two local registration systems for technical trades of (i) electrical and (ii) gas workers for drawing any relevant references.

The Special Task Group has held 6 meetings since its establishment in March 2000. There were intensive discussions concerning various options of a regulatory system for the trade, making references to the overseas and local survey results. The views are summarized in the following sections.

3. Results

3.1 Overseas references

3.11 HKPC reported that from the overseas regulatory survey, 10 countries/places were identified to have regulatory systems regarding vehicle maintenance mechanics and/or repairers (garages). They are:

- **In Europe** – Germany, UK (for commercial fleet operators), the Netherlands, and Spain.

- **In North America** – Michigan, Florida, Georgia, California and Federal Level of USA, Alberta of Canada.

- **In Asia and Australia** – Mainland China, Taiwan, Australia (New South Wales) and Japan.

3.12 There are also 5 voluntary systems identified: in USA and Canada (offered by National Institute for Automotive Service Excellence), in the UK (offered separately by the Institute of Motor Industry and Institute of Road Transport Engineers), and in New Zealand (offered by New Zealand Qualification Authority).

Details of these systems are as shown in HKPC's final report (Appendix 1).

3.2 Local References

The Special Task Group has studied local systems on licensing/registration of technical service trades of (i) electrical workers, (ii) gas workers. These trades were regulated respectively under the Electricity (Registration) Regulations, (Cap. 406) in 1992 and the Gas Safety (Registration of Gas Installers and Gas Contractors) Regulations, (Cap.51) in 1990.

There are similarities in these Regulations in that

- both the workers and the contractors are required to be registered,
- workers are registered into different classes according to the different categories of technical know-how requirements,
- adequate vocational training and/or experience are required for registration of workers,
- there were certain relaxed entrance requirements during the initial grace period,
- a contractor will be permitted to undertake the categories of work according to the categories of registered workers employed.
- a contractor must employ not less than a certain percentage of registered workers,
- there are performance monitoring systems for both the contractors and the workers to assure satisfactory performance levels. Disciplinary actions are up to revoking of registration/licences,
- there are appeal boards formed up of trade sectors.

3.3 Identification of Problems

The Special Task Group was in consensus that in order to improve vehicle maintenance standard, the following problems would have to be resolved:

- **Skill of mechanics varies significantly**. There is no recognized benchmarking of skill requirement. Anybody is allowed to repair vehicles irrespective of his skill level, thus the safety of road-users and repair workers may be jeopardized. Poor maintenance standard also aggravates the air pollution problem.

- **Facilities and practice of garages vary significantly**. There is no recognized trade practice/code of conduct for the trade. Consumers are difficult to find suitable references regarding reliable services and fair deals.

- **There is no recognized foundation to trace responsibility of poor performance and mal-practices**. Mechanics/technicians may lack the drive to take responsibility of his work.

- **Mechanics/technicians lack the drive or incentive to update their technical know-how and skill to meet technology advancement.** The trade is in general lacking highly skilled mechanics that would keep themselves up-to-date.

Transport Department's vehicle examination statistics of 1999 shows that the failure rate varies from about 5% to 17% depending on vehicle types (Appendix 2). A failure

means a vehicle is not roadworthy, and is not suitable to run on the road. The statistics indicates that there are rooms for improvement in maintenance of vehicles and mechanic's service standard in Hong Kong. It is necessary to rectify the problems.

3.4 Mandatory Registration System to Solve the Problems

The Special Task Group was in the opinion that a mandatory registration system regulating the vehicle repair trade could provide a solid foundation to solve the above problems, thus improving vehicle maintenance standard.

With reference to existing local registration systems and overseas survey results, the Group considered appropriate that vehicle mechanics and repairers (garages) shall both be regulated. In this aspect, the Trade was also in consensus that both mechanics and repairers should be registered and be considered in parallel.

3.5 Alternatives to Solve the Problems

The Special Task Group has discussed alternative measures to solve the problems:

(i) Voluntary or Self-regulatory system,
(ii) Training.

The consensus was that the results of these measures would be limited and insufficient to solve the problems as explained below.

3.6 Self-Regulation as an Alternative Measure

3.61 The Special Task Group discussed the possibility of setting up a voluntary system as an alternative measure to address the problems.

3.62 There are 5 known self-regulatory systems identified by the overseas survey report. Overseas references reveal that it is necessary to have a prestigious, long-existing, and widely accepted institution of the trade (such as National Institute for Automotive Service Excellence in USA and Canada, Institute of Motor Industry or Institute of Road Transport Engineers in the UK) in order to establish an effective self-regulation system.

3.63 The consensus of the Special Task Group was that there was no such trade body in Hong Kong, and therefore self-regulation was not preferred.

3.64 However, the Special Task Group noted that the Vocational Training Council has been implementing a voluntary trade testing for vehicle trade, which was considered not so widely participated. The Group was in the opinion that without the back up of a mandatory system, the effectiveness of trade testing would be limited. In this connection, the participation rate of electrical workers in trade testing for electrical trade was the highest, notably due to the fact that the registration system of the electrical trade was in force.

3.65 The Special Task Group has also discussed on the pros and cons of a mandatory

system and a self-regulatory system as tabulated below:

Mandatory System	
Pros	**Cons**
To the Public 1. Improving environmental protection 2. Improving road safety effectively 3. Improving consumer protection in vehicle maintenance effectively 4. Bench marking local vehicle maintenance standard against overseas standards 5. Enabling traceability of responsibility 6. Increasing public's confidence in the trade. **To the trade** 1. Improving quality of Trade people regarding skill and practice 2. Improving social status of the trade 3. Better protection against unhealthy competitions 4. Government support of training, educational and administrative resources. 5. Encouraging self-improvement and self-perfection of the trade	**To the Public** 1. Imposing more restriction on outsiders to participate in the trade 2. Restriction on choice of repairers. **To the trade** 1. More regulatory requirements thus reducing freedom of business operation 2. Higher capital and operating costs 3. Fear of failure in admission application 4. Fear of affecting livelihood.

Self-Regulatory System	
Pros	**Cons**
1. Quick to be established 2. Can enjoy freedom of self-regulation without Government's interference 3. Less fear of failure in admission application 4. Quick to respond to environmental changes and the Public's aspiration 5. Lower operational and running costs 6. Higher operational flexibility 7. Anyone can join the trade if interested thus providing more choices to the Public	1. Recognition by the Public is doubtful 2. Acceptance of the system by all Trade sectors is doubtful 3. Lacking authority and difficult to exercise power of regulation 4. Difficult to set and enforce maintenance standards 5. Difficult to help improve environmental protection and road safety 6. Difficult to improve trade practice and service quality 7. Unfair competition would continue to exist 8. Lacking resources to organize and enhance training

3.7 Training as an Alternative Measure

3.71 The Special Task Group recognized the necessity and importance of training and continuous development, and discussed the possibility of solving the identified problems through enhancing training and education.

3.72 HKPC's local survey revealed that 88.5% of the respondents considered that Government should provide further training and education to the trade in order to improve vehicle maintenance standards thus enhancing environmental protection and road safety.

3.73 The need for training for the trade was clear. However, the Special Task Group noted that if a training system is not backed up by a regulatory system, participation rate could be low particularly on the part of continuous education.

3.74 Furthermore, the Special Task Group noted that training alone would not solve the problem of lacking traceability of responsibility.

3.75 In the short to medium term, Government may need to organize or administer relevant training courses for workers in the trade, because a significant portion (about 25%) of the trade workers had no formal training or recognized qualifications, but relevant working experience of over 10 years, according to HKPC's local survey results.

3.76 In the long term, depending on how the regulatory system will be formed up if it is to proceed, existing vocational training for the vehicle Trade may need to be reviewed, restructured and updated to compliment the establishment of the registration system.

3.77 In future, there may also be the need of a continuous development and education program, and thus a reassessment program in periodic registration for the trade in order to keep trade workers up with technological improvement and environmental requirements.

3.8 Penalties for Poor Workmanship

In order that the proposed mandatory system would be effective, the trade was in consensus that penalty measures should be fairly established to deter poor workmanship and mal-practices.

3.9 Mandatory Registration System for Repairers (Garages)

3.91 Furthermore, the trade was in consensus that registration of mechanics and repairers (garages) should be considered in parallel, in order that the mandatory system would be effectively.

3.92 This is to ensure the right skills and the right tools/facilities are both available to allow repair work being performed in the proper manner and up to standards.

3.93 A repairer shall be allowed to perform repair work of those classes provided it employs mechanics registered to the same classes. A repairer's registration certificate shall be issued on location basis.

3.94 The equipment and facilities that are essential in ascertaining repair standards shall be mandatory. Outsourcing shall be allowed for certain expensive equipment.

3.95 Besides, repairers shall need to keep proper records of vehicle receiving, diagnosis, repair estimates, repair tasks performed and critical performance/data achieved, service parts replaced, invoices and payment receipts. Repairers shall guarantee their repair services against defective materials (if supplied by repairers) and inferior workmanship for a certain period of time after completion of repair and delivery of vehicles.

3.10 Trade Consultations

3.101 The Special Task Group has consulted various trade sectors regarding their opinions toward the establishment of a regulatory system to improve vehicle maintenance standards thus enhancing environmental protection and road safety. Their responses are as follows:

- **Environmental Vehicle (Taxi) Repairers Association** received 260 responses from its members and peers. 219 (84%) of them agreed with a mandatory system for the registration of mechanics.
- **Hong Kong Vehicle Repair Merchants Association** had also conducted a similar survey within its sector of about 800 members. Over 70% of them responded they were supportive toward a mandatory registration system.
- **Service Managers Association/ Motor Traders Association** had consulted all its members and was supportive toward a mandatory system of registration for both the mechanics and the repairer (garages) as well in order to ensure promotion of environmental protection and road safety.

3.102 HKPC reported that it had surveyed totally 1,182 repairers out of a total of about 1,500 in the trade by post and telephone on the establishment of a regulatory system. 78.5% of them were supportive toward a mandatory registration system for the mechanics/technicians).

3.103 VTC had also consulted its Automobile Industry Training Board on the issue. It was also supportive toward a mandatory system.

3.104 IMIHK representative expressed that IMIHK was very supportive toward a mandatory system for the vehicle maintenance trade.

3.105 HKIE representative stressed that the regulatory system would create a solid foundation for future initiatives aim at environmental protection and corrective measures particularly on air quality improvement. It would also act as a source of data collection for use in formulating future HKSAR policies.

3.11 Entrance Requirements during the Transitional Period

Although many of the respondents have over 10 years working experience, a significant portion of the trade worker had no relevant vocational qualifications. It may be necessary to provide, for a certain period of time, a set of relaxed academic entrance

requirements, in order that the livelihood of these workers will not be affected. The trade's consensus is that certain kind of exemption or relaxed entrance requirements shall exist in the grace period. Details shall be worked out in due course.

3.12 Preliminary Regulatory Framework for Discussion

At the request of the Special Task Group, a preliminary regulatory framework on the issue has been worked out by EMSD in consultation with Trade sectors, and had been intensively discussed among group members in the meetings. The 2nd draft is attached for information (Appendix 3).

4. Conclusions

4.1 The trade is in general supportive toward a mandatory system for registration of motor vehicle repair trade, and provision of training by the Government for the purpose of improving environmental protection and road safety.

4.2 Trade representatives are supportive toward both registration of vehicle mechanics and repairers as outlined in the preliminary regulatory framework (Appendix 3), and agree that they shall be considered in parallel.

4.3 Trade representatives conclude that requirements should be set for registration of mechanics and repairers, and in particular that a repairer should employ a certain percentage of registered mechanics out of all employees. However, during the initial grace period, relaxed requirements shall be allowed.

4.4 Trade representatives are in agreement that punitive measures shall be fairly constructed to help regulate the trade.

4.5 The trade in general considers that a self-regulatory system is not a preferred option in Hong Kong, because of the lack of a prestigious, long-existing, and widely accepted trade body responsible for administering such a system.

4.6 Trade representatives recognize the importance and necessity of training and continuous development, but have reservation that training alone shall solve the problems of continuous development and traceability of responsibility.

5. The Way Forward

Subject to acceptance of the above conclusions by the Working Group of Vehicle Maintenance Services and the outcome of subsequent discussions in the LegCo panel, relevant Government departments shall pursue the relevant regulatory matters, in conjunction with Trade bodies, including those raised in the draft regulatory framework for consultation purpose so that a regulatory system can be drawn up.

End

Appendix 1

Table 1A: Summary of Overseas Regulation/Licensing Schemes of Vehicle Mechanics (Mandatory)

Country (Scheme)	Level/ Grade	No. of Categories[1]	Education/ Training Requirement[2]	Experience (years)[3]	Examination[4]		Function[5]	Validity[6]	Exemption[7]	Liability[8]			Remark	Refer to Table
					Written	Practical				Fine	Impris-onment	Suspend/ Revoke Licence		
Australia – NSW (Tradesperson's Certificate)	Tradesperson's Certificate	13	Complete Australian Apprenticeship in the trade with satisfactory completion of TAFE trade course (4 years)	No	✓	N/A	To allow a person to practise as vehicle repair mechanic	Life	Authority can authorize a person to work as mechanic under specified conditions	✓	No	✓	◦ Motor Vehicle Repairs Act ◦ Industrial and Commercial Training Act	2A(1)
	Provisional Tradesperson's Certificate	13	No specific requirement but subject to Authority's discretion	As required by Authority	No	No	To allow a person with qualifications acceptable to the Authority to practise as a mechanic for a specified period	Specified period	No	✓	No	✓	As above	As above
Canada – Alberta (Journeyman Certificate)	Journeyman Certificate	4	Complete Alberta Apprenticeship Training programm (4 years)	No	✓	✓	To allow a person to practise as vehicle repair mechanic	Life	N/A	✓	No	N/A	◦ Alberta Apprenticeship and Industry Training Act	2A(2)
Canada – Alberta (Qualification Certificate)	Qualification Certificate	4	No	4.5 to 6	✓	✓	As above	Life	N/A	✓	No	N/A	As above	2A(3)
Germany	Craft Mechanic	3	Complete a 3-year apprenticeship and pass the examination	Nil	✓	✓	N/A	N/A	N/A	N/A	N/A	N/A	A mechanic would be difficult to find employment with major vehicle maintenance companies if not certified	2A(4)
	Master Mechanic	N/A	(a) Being a certified craft mechanic and working for 5 years, and (b) Complete a 1-year full time training course on management	5	✓	✓	Only a certified master mechanic can set up his own business to repair vehicle	N/A	N/A	N/A	N/A	N/A		As above
Japan (自動車整備士技能檢定)	三級整備士	4	(a) 中學畢業; or (b) 職訓畢業生	(a) 1 (b) 0.5	✓	✓	N/A	N/A	N/A	N/A	N/A	N/A	道路運輸車輛法	2A(5)

[1] Different category refers to different type of vehicle repair work in the same level/grade of the registration/licensing scheme.
[2] Education requirements means the formal education qualification that the mechanic must possess before he could be registered/licensed under the scheme.
[3] Experience refers to those experience after completion of the education/training requirement.
[4] Examination refers to those examination that must be passed for registration/licensing purpose. This include the examination taken to demonstrate successful completion of the education/training requirement; and the specific examination that the mechanic must undertaken for registration/licensing purpose, e.g. trade test.

[5] Function means the purpose of the registration/licensing scheme, e.g. to enable a person to practise as a vehicle repair mechanic.
[6] Validity refers to the validity of the registration/licensing status.
[7] Exemption means any exemption by law to allow a person to practice in the trade of vehicle repair even though he is not registered/licensed under the registration/licensing scheme.
[8] Liability means legal liability if a person, otherwise than those exempted by law, does not comply with the registration/licensing requirement.

Country (Scheme)	Level/ Grade	No. of Categories[1]	Education/ Training Requirement[2]	Experience (years)[3]	Examination[4]		Function[5]	Validity[6]	Exemption[7]	Liability[8]			Remark	Refer to Table
					Written	Practical				Fine	Impris-onment	Suspend/ Revoke Licence		
	二級整備士	3	(a) 中學畢業及三級整備士資格; or (b) 職訓畢業生及三級整備士資格	(a) 3; (b) 1	✓	✓	N/A	N/A	N/A	N/A	N/A	N/A	As above	As above
	一級整備士	3	二級整備士資格	3	✓	✓	N/A	N/A	N/A	N/A	N/A	N/A	As above	As above
	特殊整備士	3	(a) 中學畢業; or (b) 職訓畢業生	(a) 3 (b) 2	✓	✓	N/A	N/A	N/A	N/A	N/A	N/A	As above	As above
USA (Section 609 Certified Technicians)	Certified Technician	1	Pass USEPA- approved Section 609 program or Section 608 Type II program	No	✓	No	To allow a person to repair or service motor vehicle air conditioners	Life	N/A	✓	No	No	Title VI of the Clean Air Act (Section 609: Servicing of Motor Vehicle Air Conditioners)	2A(6)
USA – California (Smog Check Program)	Intern Technician	1	(a) Complete Bureau of Automotive Repair's (BAR's) Basic or Advance Clean Air Course.; or (b) By experience only	(a) No (b) 1 year	✓	N/A	To allow a person, under the direction of a licenced supervising technician, to perform repairs or adjustments to emission control systems on vehicles	2 years	N/A	✓	No	N/A	Auto Body Repair Shop Regulations	2A(7)
	Basic Area Technician	1	(a) Holder of certificate from the National Institute for Automotive Service Excellence in the categories of Electrical/Electronic System and Engine Performance; or (b) Complete training course approved by BAR; or (c) By experience only	(a) No (b) No (c) 4	✓	N/A	To allow a person to inspect, diagnose, adjust, repair and certify the emission control systems on vehicle subject to the Basic Area Smog Check Program	2 years	N/A	✓	No	N/A	As above	As above

Country (Scheme)	Level/ Grade	No. of Categories[1]	Education/ Training Requirement[2]	Experience (years)[3]	Examination[4]		Function[5]	Validity[6]	Exemption[7]	Liability[8]			Remark	Refer to Table
					Written	Practical				Fine	Impris-onment	Suspend/ Revoke Licence		
	Advanced Emission Specialist Technician	1	(a) Holder of certificate from the National Institute for Automotive Service Excellence in the categories of Electrical/Electronic System, Engine Performance and Advanced Engineer Performance Specialist; or (b) Complete training course approved by BAR; or (c) By experience only	(a) No (b) No (c) 4	✓	N/A	To allow a person to inspect, diagnose, adjust, repair and certify the emission control systems on vehicle subject to the Enhanced Area Smog Check Program	2 years	N/A	✓	No	N/A	As above	As above
USA – Michigan	Mechanic Trainee	19	Must work under the supervision of a specialty mechanic or a master mechanic	No	No	No	To allow a person to practice as a specialty or master mechanic	2 years	No	✓	✓	✓	Motor Vehicle Service and Repair Act	2A(8)
	Specialty Mechanic	19	Pass a test of a repair category	No	✓	N/A	To allow a person to perform vehicle repair of a specific category	1 year	No	✓	✓	✓	As above	As above
	Master Automobile Mechanic	1	Pass all of the first 8 categories of the Automobile and light truck repair	No	✓	N/A	To allow a person to perform vehicle repair of all of the specific repair categories	1 year	No	✓	✓	✓	As above	As above
	Master Heavy-Duty Truck Mechanic	1	Pass all of the first 6 categories of heavy-duty truck repair	No	✓	N/A	As above	1 year	No	✓	✓	✓	As above	As above
中華人民共和國 - 廣東省深圳市 (汽車維修工人等級及持証上崗規定)	初級技工	23	(a) 單憑經驗; or (b) 正規初級工培訓	(a) 2 to 3 (b) No	✓	✓	持上崗証不同級別的技工從事不同技術要求的維修工作	Life	No	✓	N/A	N/A	<<汽車維修行業管理暫行辦法>>	2A(9)
	中級技工	23	(a) 單憑經驗; or (b) 取得初級<技術等級証書>; or (c) 取得初級<技術等級証書>並經正規中級工培訓; or (d) 專業學校畢業并從事所學專業工作	(a) 5 (b) 2 (c) No (d) No	✓	✓	As above	Life	No	✓	N/A	N/A	As above	As above

Country (Scheme)	Level/ Grade	No. of Categories[1]	Education/ Training Requirement[2]	Experience (years)[3]	Examination[4]		Function[5]	Validity[6]	Exemption[7]	Liability[8]			Remark	Refer to Table
					Written	Practical				Fine	Impris-onment	Suspend/ Revoke Licence		
	高級技工	23	(a) 單憑經驗; or (e) 取得中級<技術等級証書>; or (b) 取得中級<技術等級証書>並經正規高級工培訓	(a) 8 (b) 3 (c) No	✓	✓	As above	Life	No	✓	N/A	N/A	As above	As above
台灣	丙級汽車修護技術士	1	中學畢業	No	✓	✓	初級技能檢定	Life	N/A	N/A	N/A	N/A	技術士技能檢定及發證辦法	2A(10)
	乙級汽車修護技術士	1	(a) 取得丙級技術士; or (b) 職業訓練八百小時; or (c) 事業機構技術生訓練二年; or (d) 高級中等學校畢業 (e) 單憑經驗	(a) 3 (b) 4 (c) 2 (d) 2 (e) 6	✓	✓	受檢人士可受僱汽車修理廠爲技術士	Life	汽車修理廠必須僱用乙級汽車修護技術士或汽車修護技工	N/A	N/A	N/A	As above	As above
	甲級汽車修護技術士	1	(a) 取得乙級技術士; or (b) 大學院校畢業; or (c) 單憑多年經驗並取得乙級技術士	(a) 5 (b) 4 (c) 10	✓	✓	As above	Life	N/A	N/A	N/A	N/A	As above	As above
	汽車修護技工	1	(a) 取得丙級以上技術士; or (b) 高中之汽車或機械科畢業; or (c) 高中立非汽車或機械科畢業; or (d) 汽車修護訓練一千六百小柴;or (e) 單憑經驗	(a) No (b) No (c) 1 (d) 1 (e) 4	✓	✓	技工執照乃修護汽車之執業憑證	Life	汽車修理廠必須僱用乙級汽車修護技術士或汽車修護技工	N/A	N/A	N/A	汽車駕駛人與技工執照登記及考驗	As above
	汽車撿驗員	3	(a) 高中之汽車或機械科畢業; or (b) 高中立非汽車或機械科畢業,並領有汽車修護技工執照或丙級以上汽車修護技術士證 (c) 領有汽車修護技工執照或乙級以上汽車修護技術士證一年以上	No	✓	✓	受檢人士可受僱汽車修理廠爲汽車檢驗員	Life	汽車修理廠必須僱用汽車檢驗員	N/A	N/A	✓		As above

N/A – information not available

Table 1B: Summary of Overseas Regulation/Licensing Schemes of Vehicle Mechanics (Voluntary)

Country (Scheme)	Level/ Grade	No. of Categories[9]	Education/ Training Requirement[10]	Experience (years)[11]	Examination[12]		Validity[13]	Remark	Refer to Table
					Written	Practical			
Canada (ASE – Certified Technician)	ASE-Certified Technician	8	(a) Holder of a provincially established trade certificate; or (b) Experience only (Note: Pass any 1 test in any category will entitled registration in that category)	(a) No (b) 2	✓	N/A	5 years	(a) The eight categories are Automobile Technicians (A1 to A8), Medium/Heavy Truck Technicians (T1 to T8), Truck Equipment Technicians (E1 to E3), Collision Repair and Refinishing Technicians (B2 to B5), Engine Machinists (M1G to M3G and M1D to M3D), School Bus Technicians (S1 to S7), Alternative Fuel (F1); and Parts Specialists (P1-P4). (b) Three full years of training, either in automobile/truck/school bus repair or in collision repair, refinishing may be substituted for one year of work experience. (c) Two full years of post-high school training i a public or private trade school, technical institute, community or four-year college , or in an apprenticeship program may be counted as one year of experience.	2B(1)
	ASE-Specialists Classification – Specialty Technician	1	(a) Pass the test of X1; and (b) Being certified in ASE Automobile Technician tests of A4 and A5	2	✓	N/A	As above	(a) The category is "Exhaust System (X1)"	
	ASE-Certified Technician (Advanced Level)	1	(a) Pass the test of L1 and being certified in ASE Automotive Technician test of A8; or (b) Pass the test of L2 and being certified in ASE tests Diesel Engine (T2) and Preventive Maintenance Inspection (T6) (or school bus version S2 and S6)	2	✓	N/A	As above	(a) The category include "Automotive Advanced Engine Performance Specialist (L1)" and "Medium/Heavy Vehicle Electronic Diesel Engine Diagnosis Specialists (L2)"	
New Zealand (National Certificate in Motor Industry	National Certificate	30	(a) By experience only although some would pass through apprenticeship training	Not specified	✓	✓	Not specified	(a) Achievement of the standard is assessed through test by accredited organizations. Accreditation of organizations is done by the New Zealand Qualifications Authority (NZQA), which is a government department under the Minister of Education of New Zealand (b) The National Certificate is awarded by NZQA.	2B(2)
United Kingdom (IMI Certification)	Certificated Automotive Engineer (CAE)	1	Require one of the vocational programs	3	✓	N/A	5 years	(a) Produce evidence of education and training updating before a further 5 year period is granted. (b) The scheme is run by the Institute of Motor Industry (IMI)	2B(3)
	Licentiate Automotive Engineer(LAE)	1	(a) Require one of the vocational programs; and (b) Require a supervisory qualification, a training & lead body qualification – D32 Assessor in the Workplace, have normally been a CAE for 2 years, or have at least 5 years relevant experience	2 to 5	✓	N/A	5 years	As above	

[9] Different category refers to different type of vehicle repair work in the same level/grade of the registration/licensing scheme.
[10] Education requirements means the formal education qualification that the mechanic must possess before he could be registered/licensed under the scheme.
[11] Experience refers to those experience after completion of the education/training requirement.
[12] Examination refers to those examination that must be passed for registration/licensing purpose. This include the examination taken to demonstrate successful completion of the education/training requirement; and the specific examination that the mechanic must undertaken for registration/licensing purpose, e.g. trade test.
[13] Validity refers to the validity of the registration/licensing status.

Country (Scheme)	Level/ Grade	No. of Categories[9]	Education/ Training Requirement[10]	Experience (years)[11]	Examination[12]		Validity[13]	Remark	Refer to Table
					Written	Practical			
USA (ASE – Blue Seal of Excellence)	ASE-Certified Technicians/ Machinists	6	(a) Experience only (Note: Pass any one test in any category will entitle registration in that category)	2	✓	N/A	5 years	(a) The six categories are Automobile Technicians (A1 to A8), Medium/Heavy Truck Technicians (T1 to T8), Truck Equipment Technicians (E1 to E3), Collision Repair and Refinishing Technicians (B2 to B5), Engine Machinists (M1G to M3G and M1D to M3D), and School Bus Technicians (S1 to S7). (b) Three full years of training, either in automobile/truck/school bus repair or in collision repair or refinishing OR two full years of post-high school training in a public or private trade school, technical institute, community or four-year college, or in an apprenticeship program may be counted as one year of work experience.	2B(4)
	ASE-Certified Master Technicians/ Machinists	6	(a) Pass all the tests of A1-A8; or (b) Pass T1/T2 and T3 to T8 test of item 2; or (c) Pass all the tests of E1-E3; or (d) Pass all the tests of B2-B5; or (e) Pass all the tests of M1G-M3G or M1D-M3D; or (f) Pass all the test of S1-S6	No	✓	N/A	As above	(a) The six categories are the same as above	
	ASE-Specialists Classification – Undercar Specialist	1	(a) Pass the test of X1; and (b) Being certified in ASE Automobile Technician tests of A4 and A5	No	✓	N/A	As above	(a) The category is "Exhaust System (X1)"	
	ASE-Certified Technician (Advanced Level)	1	(a) Pass the test of L1 and being certified in ASE Automotive Technician test of A8; or (b) Pass the test of L2 and being certified in ASE tests Diesel Engine (T2) and Preventive Maintenance Inspection (T6) (or school bus version S2 and S6)	No	✓	N/A	As above	(a) The category include "Automotive Advanced Engine Performance Specialist (L1)" and "Medium/Heavy Vehicle Electronic Diesel Engine Diagnosis Specialists (L2)"	
	ASE-Certified Technicians (Alternative Fuel)	1	Pass the test of F1	2	✓	N/A	As above	(a) The category is "Light Vehicle Compressed Natural Gas (F1)" (b) Substitution of work experience same as item (b) of ASE-Certified Technicians	
	ASE-Certified Parts Specialist	1	(a) Pass any one of the tests of P1-P4	2	✓	N/A	As above	(a) The category include P1 to P4	
UK (IRTE Certification)	IRTEC Certification of Competence of Personnel in the Maintenance Repair and Inspection of Road Vehicles (Bus and Coach)	5	(a) A minimum entry requirement of an S/NVQ at level II (or equivalent) in the same sector that the candidate is seeking assessment.		✓	✓	5 years	(a) The five categories are (1) transmission systems, (2) braking systems, (3) suspension, (4) steering, (5) inspection and public safety	2B(5)

N/A – information not available

Table 1C: Summary of Overseas Registration of Garages (Mandatory)

Country	Registration Requirements							Penalty			Remark	Further Information Table
	Classes	Size	Equipment	Qualified Personnel	Document keeping	Warranty	Others	Fine	Imprison -ment	Suspend/ revoke licence		
Australia – NSW (Motor Vehicle Repairers Licence)	✓	N/A	✓	✓	✓	N/A	✓	✓	N/A	✓	◦ Motor Vehicle Repairs Act ◦ Motor Vehicle Repairs Regulation	2C(1)
Netherland	✓	N/A	✓	✓	✓	N/A	✓	N/A	N/A	N/A	◦ Road Traffic Act ◦ Motor Vehicle Liability Insurance Act	2C(2)
Spain	✓	N/A	✓	✓	✓	✓	N/A	✓	✓	✓	Servicio Postventa Talleres De Reparacion	2C(3)
USA – Florida	✓	N/A	N/A	✓	✓	N/A	N/A	✓	N/A	✓	Florida Motor Vehicle Repair Act	2C(4)
USA – Georgia	✓	N/A	N/A	✓	✓	N/A	N/A	✓	N/A	✓	Georgia Motor Vehicle Repair Act	2C(5)
USA - Michigan	✓	N/A	✓	✓	✓	N/A	✓	✓	✓	✓	Motor Vehicle Service and Rapair Act	2C(6)
中華人民共和國 - 廣東省深圳市 (汽車維修業戶註冊)	✓	✓	✓	✓	✓	✓	✓	✓	N/A	✓	<<汽車維修行業管理暫行辦法>>	2C(7)
台灣	✓	✓	✓	✓	✓	N/A	✓	N/A	N/A	N/A	<汽車修理業管理辦法>	2C(8)
Japan	✓	✓	✓	✓	N/A	N/A	N/A	N/A	N/A	N/A	<道路運送車兩法第 78 条>	2C(9)
U.K. (Note (a))	N/A	N/A	N/A	✓	N/A	N/A	N/A	N/A	N/A	N/A	Goods Vehicles (Licensing of Operators) Act	2C(10)

Note: (a) This is a requirement on goods vehicle operators to employ a Transport Manager who should take care of and be responsible for the maintenance of the vehicle fleet of the fleet operators.

(b) N/A – information not available

Appendix 2

Transport Department Vehicle Inspection Failure Rate (1999)

	Private car (Note 1)	NT taxi	Urban taxi	Goods vehicle <=1.9 tonnes (Note 1)	Goods vehicle >1.9-5.5 tonnes (Note 2)	Goods vehicle >5.5-16 tonnes (Note 2)	Goods vehicle >16 tonnes	Private light bus	Public light bus	Private bus	Public bus (non-franchised)	Public bus (franchised) (Note 3)	Trailer (Note 2)
Passed first	108,329	2,634	14,659	2,777	67,998	27,082	9,735	1,821	4,149	404	5,290	6,296	17,775
Failed first	11,751	201	739	420	5,950	3,259	1,999	198	307	23	389	40	1,816
Total first	120,080	2,835	15,398	3,197	73,948	30,341	11,734	2,019	4,456	427	5,679	6,336	19,591
Failure	0.10	0.07	0.05	0.13	0.08	0.11	0.17	0.10	0.07	0.05	0.07	0.01	0.09

Note : Inspection of vehicles except private cars, goods vehicles and trailers included the pre-registration inspection.
Note 1 : Vehicles are inspected by 23 designated Car Testing Centres
Note 2 : Vehicles are inspected at government vehicle examination centre operated by contractor
Note 3 : Franchised buses are inspected at bus companies' depots by vehicle examiners of Transport Department

Appendix 2

Local Regulatory Framework for Vehicle Maintenance Trade (2nd DRAFT) –for discussion

Item	Proposal	Reasons	Requirements	Exemption	Others
Title	**Motor Vehicle Repairs Ordinance**				
Purposes	Through licensing of Motor Vehicle repair business and registration of trade mechanics, the service standard shall be improved and restored to manufacturer standard, thus improving environmental protection and road safety and enhancing fair trading	A well-maintained vehicle shall be fuel efficient, safe and meet the specific emission standard. The manufacturer standard is adopted because it has been type approved. Also the manufacturer shall be liable for the design and its subsequent updating.			
Registration of Mechanics	All vehicle mechanics whose work that would affect environmental protection and road safety shall be registered according to the mechanism stated below to ensure an acceptable standard of workmanship. These include:			Allow a 3-year grace period for the existing craftsmen in the trade to register into the system under interim requirements (stated below)	
Class 2	a). Lubrication service workmen	To avoid tempering of engines and inappropriate disposal of waste oil by unqualified people.	• have successfully attended a prescribed course offered by VTC • passed the subsequent written exam.	• Written exam. can be exempted by 2-yr experience (option)	
	b). Tyre workmen	Tyre work is a specialty and a safety concern, but the requirement of a tyreman is much lower than that of a normal vehicle mechanic.	(as above)	(as above)	
	c). Air-conditioning installer / workmen	Air-conditioning work is a specialty and an environmental concern. Incompetent people could adversely temper the engine. The requirement is lower than that of a normal vehicle mechanic	(as above)	(as above)	Appendix 3

lass 1	**a)** Light Vehicle Mechanics for repair of vehicles of GVW below 5.5 T, excluding the engine unit. **Remarks** 1. A parenthetical code (M/C) is used to restrict scope of repair within motorcycles only, i.e., **Class 1 (M/C).** 2. Types of engine repair is indicated by further parenthetical codes of : • **(P)** for petrol fuel engines • **(D)** for diesel fuel engines • **(L)** for LPG fuel engines • **(A)** for alternative fuel engines E.g. **Class (1a)/ (P)+(D)** means registration of mechanics to the class of competence of repairing light vehicles of GVW just below 5.5 T fitted with petrol or diesel engines.	Light vehicles and heavy vehicles are two very different categories with different technologies and workmanship requirement. There is however an overlapping from 3.5 T to just below 5.5 T to allow flexibility within light and heavy vehicle sub-classes. Engine repair is regulated because engines of different fuels use different technologies; competency in one engine type does not mean competency in another type. **Remarks**: The employer has to provide apprenticeship training satisfying requirements of chassis and engine types approval.	• completed the specific apprenticeship with further 2-year relevant experience • obtained craftsman certificate or above • accepted by an interview board for experience assessment. **OR** • min. 7-year relevant experience • passed the specific Trade Test recognized by the Authority. **Remark** Trade Tests of chassis and engine shall be composed of optional modules for choice: • **either** heavy **or** light vehicle **or** motor-cycle • petrol **and/or** diesel **and/ or** LPG etc.	**During grace period,** • Matured (age 30 or above) applicant with over 10 years relevant experience. • successfully completed a prescribed course offered by VTC and passed technology assessment within (written or oral) • accepted by an interview board for experience assessment. **Remark** Technology and experience assessments of chassis and engine shall be composed of optional modules for choice: • **either** heavy **or** light vehicle **or** motor-cycle • petrol **and/or** diesel **and/ or** LPG etc	
	b) Heavy Vehicle Mechanics for repair of vehicles of GVW 3.5 T and above. **Remarks** Types of engine repair are indicated by further parenthetical codes as above.	(as above)	(as above)	(as above)	
Other Classes	• Body Repair mechanics, • Body Building mechanics • Body Painters, • Vehicle Electricians • Motor Vehicle technician, technologist, engineers, etc.	To a lesser degree and less direct: Body structural repair and body building can be safety concerns, Body painting can be environmental concerns, Vehicle electrical work can be both environmental and safety concerns. Motor Vehicle technicians, technologist and engineers will have indirect but more wide-spreading effect.	Reserved for future discussion.	Reserved for future discussion.	

Registration of Repairers	All vehicle repair business entities shall be licensed according to mechanism stated below to ensure right standard of services shall be rendered.	Licensing of repairers and registration of mechanics shall be complementary with each other in order to achieve the stated purposes of this ordinance. While registration of mechanics shall ensure the right skill is available, licensing of repairers shall ensure the right facilities and equipment are available, and that repair /servicing activities are carried out in the right manner.	Repair work licence is given on location basis		
Scope	A repairer is authorized to carry out vehicle repair of classes specified in the licence provided 1. mechanic(s) of the specified class(es) and quantities are available and, 2. the right facilities and equipment for the work of specific classes are available				
Manpower	1. at least 1 registered mechanic shall be employed for the class of work to be performed, 2. at least 50% of direct workers shall be registered mechanics of the required classes 3. work done by workers not in the appropriate classes shall be supervised by registered mechanics of the required classes employed by the repairer	Ensure that at least one expert is physically available in the entity who shall be able to give advice and instruction for works of specific classes. Ensure that sufficient manpower of acceptable qualification is available.		Class 1 covers Class 2.	
Facilities and equipment	To ensure the right equipment and tools are available to do the right job.	Equipment and tools specified are mostly for measuring purposes to ensure the manufacturer standards can be achieved and recorded.	Specified tools / equipment and facilities must physically exist in the licensed location, except for out-source items		
Class 2	**a**). Lubrication service		• Vehicle lift or pit • Lubrication tools • waste oil container • torque wrenches	vehicle lifts/pits can be exempted by sufficient no. of vehicle jacks and stands giving sufficient under-chassis access	

	b). Tyre work		• tyre balancer (dynamic) • tyre pressure gauges • depth gauges • compressed air	static tyre balancer can be provisionally accepted for 3 years	
	c). A/C installation/ service work		• refrigerant leakage detector • tachometer • pressure gauges • air thermometer • refrigerant recovery /charging machine		
Class 1	a) Light vehicles below 5.5 T chassis repairs (excluding engines)		• torque wrenches • feeler gauges • pressure gauges • calipers • micrometers • tension gauges • wheel-alignment tester • wheel balancer (can be out-sourced) • decelerometer (Tapley meter) or roller brake tester (can be out-sourced)		
	b) Heavy vehicles (GVW 3.5 T or above) chassis repairs (excluding engines)		(as above)		
Engine Repair	(P) Petrol engine repairs		• torque wrenches • feeler gauges • pressure gauges • vacuum gauges • calipers • micrometers • tension gauges • 4-gas analyzer • engine compression gauges • tachometer • chassis dynamometer (can be out-sourced) • voltmeter/ampere meter /ohmmeter		

	(D) Diesel engine repairs		• as above, but replace 4-gas analyzer with smoke-meter • injection nozzle tester • injection pump calibration machine (can be out-sourced)		
	(L) LPG engine repairs		• Tools/ equipment of Petrol Engine repair code (P) • LPG leakage detector/ alarm and ventilation provisions as required by Cap. 51.		
	(A) Alternative fuel engine repairs		• To be determined		
Records	Appropriate records shall be kept for at least 3 years (optional) for inspection showing correctness of working items and satisfactory service standard achieved.	To ensure that works done are traceable and verifiable.	• Receiving Order - showing service items requested and client's signature • Diagnosis report (when required) - showing ailments and recommendations with the registered mechanic's signature. • Repair records - showing actual work done, parts replaced/installed, standard achieved (such as critical torques, readings measured, etc.) signed by registered mechanics. • Invoices and payment receipts. • Tools and equipment calibration records/ log books.		

Offences	A list of offences and penalties shall be clearly defined. A tentative list is attached below for discussion.				
Disciplinary Actions	Disciplinary measures up to revoking of license and registration to ensure concerned bodies shall abide by the law.		• disciplinary actions to be taken by the Authority according to a performance monitoring point system • Industry council/ tribunal board to take severe actions such as revoking /suspension of licenses.		
Registry	A registry of licensed repairers and registered mechanics shall be kept and be available for inspection				
Enforce-ment	The Authority shall enforce the Law.		Power of entry to repairers' locations and power of examination of concerned documents and related objects shall be delegated to the Law enforcement agent.		
Council Board	Industry Council Board shall be established: 1. to promote the implementation of industry service standards 2. to conduct hearing of severe offences and give verdicts 3. to conduct hearing of appeals against decision of interview boards and the Law enforcement agent and give verdict	Representatives from various sectors relating to the Industry and the Authority shall constitute this Council Board to gain the widest acceptance.	Constituting members : • Chairman appointed by SEF/S for T • 3 representatives from HKIE/ IMI(HK) • 3 representatives from MTA/ SMA • 3 representatives from HKVRMA/ EVTRA • 3 representatives from the list of registered mechanics/ licensed repairers • 3 representatives from the public/ Consumer Council/ Insurance Industry • 3 representatives from VTC and tertiary educational institutions		

Relicense/ Re-registration	The licences and registration certificates shall be valid for 3 years. Relicensing of repairers and re-registration of mechanics shall be required on recurrent basis.	Nominal fees for processing applications and subsequent issue of certificates shall be required.			
Tentative list of Offences	**(A) For Mechanics** 1. Repair/ service a vehicle (other than his/her own at own premises) in the above context (Class 1 - 3 etc.) not within the location of a licensed repairer capable of performing the work, except for emergencies. 2. Repair a vehicle (in the above context) for others without the appropriate registration certificate unless he/ she is supervised by an appropriate registered mechanic. 3. Provide false or misleading information to the Authority in issues relating to registration application, on demand by the Authority for Law enforcement, or in any proceeding of the Industry Council Board concerning disciplinary action and dispute settlement. 4. Fail to update/ present any essential records concerning any repair/ service work done. 5. Proved to have delivered sub-standard workmanship or used faulty materials with environmental or safety concern. **(B) For Repairers** 1. Allow any person who is not an appropriate registered mechanic to repair a vehicle without the supervision of a registered mechanic within the location of his business in respect of the issue of a license. 2. Conduct repair business outside the location in respect of the issue of a license. 3. Fail to employ at least 1 registered mechanic of the appropriate classes in respect the license is issued.				

	4. Fail to employ registered mechanics of the appropriate classes by not less than 50% of its total direct staff. 5. Fail to produce/ displays the licence of a repairer at the location in respect the license is issued on demand by the Authority. 6. Fail to produce any concerned records as required by the Ordinance. 7. Fail to keep a full set of equipment as required by this Ordinance in respect that the license is issued. 8. Fail to upkeep the required tools, equipment and facilities in a reasonably good working condition. 9. Provide false or misleading information to the Authority in issues relating to license application, on demand by the Authority, or in any proceeding of the Industry Council Board concerning disciplinary action and dispute settlement. 10. Make false or misleading claim to make any person or the public to believe that the repairer is capable of repairing any work in the above context that the license does not cover. **11.** Repair work done is proved to be below usual trade standards, e.g. its mechanics have committed (A) 5 above.				
Revoking / Suspension of Cert. / Licenses	**Registration Certificates** • When points has been accumulated to a certain level within a certain duration of time **Repairer Licenses** • When points has been accumulated to a certain level within a certain duration of time • when the licence holder is bankrupted				

Definitions

Vehicle Mechanic	A person who repairs a vehicle which is registered with Transport Department to run on the public road.
Repair	Includes examine, detect faults in, adjust, carry out maintenance on, overhaul, replace, alter and optionally paint.
Mechanic	means a Vehicle Mechanic
Repairers	Any persons or legal entities carrying on the business of motor vehicle repair in the context
GVW	Gross Vehicle Weight
Emission Standard	The requirements for vehicle effluents to comply with as set by Transport Department or Environmental Protection Department when the vehicle is being operated on the public road.
Manufacturer Standard	The requirements as set by the manufacturer of a vehicle for it to be operating efficiently and meet local safety and environmental standards.
Lubrication service	Means replacement and replenishment of 1. vehicle lubricants and filters of engine, transmission, differential/ transaxle, 2. Greases for joints, 3. Engine coolants.
Tyre work	Includes tyre casings and tubes repair and replacement, tyre/wheel balancing, removal and refitting of tyres
Air-conditioning work	Includes repair, replacement and installation of vehicle air-conditioning system components, charging and replacement of refrigerant.
Trade Tests	Practical and theory tests of a trade skill up to a certain level as required by the Authority
LPG	Liquefied Petroleum Gases
Employ	Act of full time employment according to Labour Ordinance

Special Task Group on
Licensing of Vehicle Maintenance Trade
June 2000 (2nd Draft)

FINAL REPORT ON OVERSEAS SURVEY OF VEHICLE (LPG, PETROL & DIESEL) MAINTENANCE GARAGE AND MECHANICS

(Project No.: 01013836)

Environmental Management Division
Hong Kong Productivity Council

7th June 2001

CONTENT

1. BACKGROUND

1.1 The Working Group on Vehicle Maintenance Service (WGVMS) comprising representatives from relevant government bureaus/departments and the vehicle maintenance trade was formed in early 2000 to explore ways to upgrade the standard of the trade in order to meet the tightened environmental and safety requirements on vehicle maintenance. A Special Task Group on Licensing System for Vehicle Maintenance was formed under WGVMS to specifically investigate whether registration/licensing of vehicle maintenance mechanics are recommendable to upgrade the trade standard and if so the options available.

1.2 Under the funding support of the Electrical & Mechanical Services Department (EMSD) and the Environment and Conservation Fund (ECF), Hong Kong Productivity Council (HKPC) was commissioned to conduct an overseas survey on the registration/licensing of vehicle maintenance garages and mechanics in order to benchmark the overseas practices in regulating the vehicle maintenance trade. In addition, a local survey was also conducted to solicit the opinion of the trade on registration/licensing of vehicle maintenance mechanics and the training needs as well as facility upgrading needs to cope with the tightened environmental and safety requirements. The findings of the overseas survey are presented to the Special Task Group whereas the findings of the overseas and local survey are presented to the WGVMS for consideration in selecting ways to upgrade the standard of the vehicle maintenance trade.

1.3 The overseas survey was started in April 2000 and completed in mid August, while the local survey was started in May and completed also mid August. The draft final report was submitted to the Special Task Group on 1st September 2000. This revised draft final report is prepared to incorporate the comments of the Special Task Group.

2. OBJECTIVES

2.1 The objectives of the overseas survey on registration/licensing schemes of vehicle maintenance garages and mechanics are:-

(a) to collect information on those countries that are currently implementing mandatory or voluntary schemes of registration/licensing of vehicle maintenance mechanics;

(b) to collect information on those countries with licensing of vehicle maintenance garages.

In the survey, we also studied whether there is any assistance provided for mechanics by the government in those overseas countries and whether there is any mandatory requirement of releasing vehicle maintenance manual to trade practitioner.

3. METHODOLOGY

3.1 HKPC conducted the overseas survey through the following means:-

(a) We contacted through correspondences and/or email all major countries in the world to collect information about registration/licensing of vehicle maintenance garages and mechanics in these countries. Assistance from the Consulates and/or trade representatives of these countries in Hong Kong was solicited wherever possible. Samples of enquiry letters to these overseas countries are attached in Appendix A.

(b) At the same time we also conducted extensive search of such information through the internet. This is proved to be the most effective means to collect relevant information especially when the registration/licensing schemes are known to us.

(c) We also search technical reference in HKPC's technical reference library, on-line connection to the International Information Retrieval System, university libraries in Hong Kong for relevant information. However, no relevant information on registration/licensing schemes was collected.

4. OVERSEAS SURVEY FINDINGS

Summary of Responses

4.1 The responses from overseas countries were very poor. But quite a substantial amount of relevant information was collected from the internet. The table below summarizes the responses and information collected:

Country/ Place	No responses or relevant information collected	No mechanics registration/ licensing scheme in pace	Mechanics [1]registration/ Licensing		Garages registration/ licensing scheme
			Mandatory	Voluntary	
Australia (NSW)			✓ (since 1980)		✓ (since 1980)
Australia (Queensland)		✓			
Australia (Tasmania)		✓			
Austria	✓				
Belgium	✓				
Canada (All areas)				✓	
Canada (Alberta)			✓ (since 1992)		
Canada (Quebec)		✓			
Czech Republic	✓				
Denmark	✓				
Finland	✓				
France	There is a scheme of certification of mechanics under the Collection Agreement in the trade of motor vehicle maintenance but not much information collected.				
Germany			✓ (since 1989)		
Greece	✓				
India	✓				
Ireland	✓				
Israel	✓				
Italy	✓				
Japan			✓ (since 1951)		✓
Korea	✓				
Luxembourg	✓				

[1] During the survey, it was found that the terms "mechanics" and "technicians" are not defined absolutely. Although "technician" should refer to persons with higher skills and working in supervisory capacity, this is not usually the case as reflected in many countries in which "technicians" are also working as craftsmen, e.g. all are referred to as technicians in the ASE Certified Technician Scheme (see later). Hence, in this report the two terms are not defined absolutely and used to refer to persons involved in the vehicle maintenance either as a craftsman or as a supervisor. The two terms are sometimes used interchangeably.

Country/ Place	No responses or relevant information collected	No mechanics registration/ licensing scheme in pace	Mechanics 'registration/ Licensing		Garages registration/ licensing scheme
			Mandatory	Voluntary	
Malaysia	✓				
Mexico	✓				
Morocco	✓				
Netherlands					✓
New Zealand				✓	
Norway	✓				
Peru	✓				
Philippines	✓				
Poland	✓				
Portugal	✓				
Mainland China			✓ (since 1986)		✓ (since 1986)
Taiwan			✓ (since 1977)		✓ (since 1977)
Russia	✓				
Singapore		✓			
South Africa	✓				
Spain					✓ (since 1986)
Sri Lanka	✓				
Sweden	✓				
Switzerland	✓				
Thailand	✓				
Turkey	✓				
United Kingdom				✓ (2 schemes)	✓ (Note) (since 1995)
USA (Federal Level)			✓ (since 1990)	✓	
USA (California)			✓ (since 1997)		
USA (Florida)					✓ (since 1997)
USA (Georgia)					✓ (since 1997)
USA (Michigan)			✓ (since 1975)		✓ (since 1975)

Note: This is the legislative requirement on goods vehicle operators to employ a Transport Manager who should take care of and be responsible for the maintenance of the vehicle fleet.

4.2 As can be seen above, a total of 9 countries/places are known to require mandatory registration/licensing or certification of vehicle maintenance mechanics. These include:-

- In Northern America – USA (Federal level, California and Michigan), Canada (Alberta)
- In Europe – Germany
- In Asia – Australia (New South Wales), Japan, Mainland China and Taiwan.

In these countries, the government do not directly provide training to the mechanics. Some countries, e.g. Australia, sets up specific vehicle repair council to take care of training for mechanics while others leave them to non-government organizations to provide the training.

4.3 There are 4 countries/places known to have voluntary scheme to register/license vehicle maintenance mechanics including:-

- In Northern America – USA, Canada
- In Europe – United Kingdom (2 schemes)
- In Asia-Pacific – New Zealand

4.4 There are 10 countries/places known to require mandatory registration/licensing of vehicle maintenance garages including:-

- In Northern America – USA (Florida, Georgia and Michigan)
- In Europe – Netherland, Spain, United Kingdom[2]
- In Asia-Pacific – Australia (New South Wales), Mainland China and Taiwan, Japan.

4.5 HKPC tried to contact the relevant registration/licensing authorities in these countries to ask the purpose of the registration/licensing scheme as well as the effectiveness of these schemes in improving the vehicle maintenance trade standard, road safety and environmental protection. Unfortunately, there is no such research data available. This is to be expected because apart from vehicle maintenance, there are many other factors that contribute towards environmental protection and road safety.

[2] In United Kingdom, goods vehicle operators (i.e. commercial fleet operators) are required by law to employ a Transport Manager who should take care of and be responsible for the maintenance of the vehicle fleet of the fleet operators.

Mandatory Registration/Licensing of Vehicle Maintenance Mechanics

4.6 Table 1A summarizes the various schemes of mandatory registration/licensing of vehicle maintenance mechanics. There were 10 schemes identified in 9 countries/places as summarized below. Fine and suspension/revocation of licences are the common penalty for infringement of licensing conditions. However, in USA (Michigan), there are provisions of imprisonment penalties for serious misconduct by the mechanics.

Australia (NSW)

4.7 In New South Wales, a person cannot carry out vehicle maintenance work unless he holds the trade certificate or is a registered apprenticeship working under the supervision of a trade certificate holder. The Tradesperson's Certificate and Provisional Tradesperson's Certificate are the recognized trade certificate for this purpose. Table 2A(1) gives further details of the Tradesperson's Certificate and Provisional Tradesperson's Certificate.

4.8 The Tradesperson's Certificate is awarded to vehicle maintenance mechanics who successfully completes the four-year Australian Apprenticeship training and passed an examination.

4.9 The Provisional Tradesperson's Certificate is awarded to a person who satisfies the Authority that he has acquired that skill as required under the Tradesperson's Certificate. The Provisional Tradesperson's Certificate is valid for a specified period as authorized by the Authority.

4.10 Mechanics are certified in 13 different categories and the certified mechanics can only practice in the category of vehicle repair that he is certified.

Canada (Alberta)

4.11 In Alberta similar system exists which prohibit a person to practice as a vehicle mechanic unless he holds a trade certificate, is a registered apprentice or is authorized to perform one or more specific tasks of vehicle repair. There are a number of recognized trade certificates among which the Journeyman Certificate is the one that offers to a mechanic undergone proper training while the Qualifications Certificate is offered to a mechanic with experience only. Table 2A(2) and Table 2A(3) give further information about the Journeyman Certificate and Qualifications Certificate systems respectively.

4.12 To be certified under the Journeyman Certificate, the mechanic must undergo the four-year Alberta Apprenticeship Training Program.

4.13 Mechanics without proper training but possess 4.5 to 6 years of relevant experience in the vehicle maintenance trade can apply for the Qualifications Certificate by passing the written examination. Once certified, his status is the same as that possessing the Journeyman Certificate.

Germany

4.14 In Germany only a master mechanic can open a vehicle maintenance garage. To be certified as a master mechanic, a person must have completed a three-year craft mechanics training course and passed an examination to get the craft certificate. Then, he needs to practise as a vehicle mechanic for five years before he attends the one-year full time training in management and passed the examination of the course.

4.15 It should be noted that although only a master mechanic can open a vehicle maintenance garage and this makes the master mechanic certification system a mandatory one, there is no such mandatory certification system for craft mechanic. In other word, a person can still be employed to repair/service vehicles even though he is not properly trained or awarded the craft mechanic certificate. Table 2A(4) gives further details of the master mechanic certification system.

Japan

4.16 In Japan, vehicle mechanics are certified in four categories, namely:

(a) Third class vehicle mechanics
(b) Second class vehicle mechanics
(c) First class vehicle mechanics
(d) Special vehicle mechanics

4.17 To be certified as a third class vehicle mechanics, a person needs to be a secondary school graduate or vocational training school graduate with one-year experience in the vehicle maintenance trade.

4.18 After being a third class vehicle mechanics and working for another 3 years in the vehicle maintenance trade, a person can register as the second class vehicle mechanic.

4.19 To be a first class vehicle mechanic, a person must have at least 3 years of experience after certified as a second class vehicle mechanic.

4.20 For specialty vehicle mechanic registration, the requirement is 3 years after secondary school graduation.

4.21 Table 2A(5) gives further information about the different grades of certification.

USA (Federal Level)

4.22 The Section 609 Certified Technician scheme is to certify vehicle mechanics in the repair of vehicle air-conditioning system all across USA. Only a certified technician under this scheme can repair vehicle air-conditioning system or purchase freons for the repair. Table 2A(6) gives further information about the certification scheme.

4.23 To be certified as a Section 609 Certified Technician, a person must pass the US Environmental Protection Department (USEPA) approved Section 609 Program or Section 608 Type II Program, both of which are related to the maintenance of air-conditioning systems. The examination of the Program can be taken in the internet and assessed instantly on the web. Once passed the examination, the person will become a certified technician.

USA (California)

4.24 In California, the Smog Check Technician Licensing Scheme is implemented to control the licensing of vehicle mechanics for the repair of vehicle. Three levels of licensing are in place, namely:-

(a) Intern Technician
(b) Basic Area Technician
(c) Advanced Level Technician

4.25 A person can become a licensed Intern Technician if he has completed the Bureau of Automotive Repair's Clean Air Car Course. The licensee can then

work under a licensed supervising Basic Areas Technicians to perform vehicle repair. A person cannot be an Intern Technician for more than 2 years.

4.26 To qualify for the Basic Areas Technician license, a person must possess four years of verifiable experience in the vehicle engine performance areas or possession of an Intern Technician Licence with one year of verifiable experience in the vehicle engine performance area. The licence allows the mechanic to inspect, diagnose, adjust, repair and certify the emissions control systems on vehicles in restricted (attainment) areas of the State.

4.27 The licensing requirements for the Advanced Emission Specialist Technician are similar to that for the Basic Area Technician licence. The licence allows the mechanic to inspect, diagnose, adjust, repair and certify the emissions control systems on vehicles in all areas of the State.

4.28 Table 2A(7) gives further information about the Smog Check Technician Licensing Scheme.

USA (Michigan)

4.29 In Michigan, a person cannot carry out vehicle maintenance work unless he is a licensed mechanics in the following grade:-

(a) Mechanic trainee
(b) Specialty mechanic
(c) Master automobile mechanic
(d) Master heavy-duty truck mechanic

4.30 Vehicle repair is categorized into 19 categories for the purpose of licensing specialty mechanics. These categories fall into the following areas:-

(a) Automobile and light truck repair
(b) Heavy-duty truck repair
(c) Repair category for other on-road vehicles, i.e. motorcycle and recreational trailer

4.31 Table 2A(8) gives further information of the licensing system.

4.32 There is no education or experience requirement for a person to be licensed as a mechanic trainee. However, the trainee must work under the direct supervision of a certified specialty or master mechanic. The licence is valid for 2 years only.

4.33 To become a licensed specialty mechanic, a person must pass a test in any one of the 19 repair categories. The specialty licence allows the mechanics to perform vehicle repair in the category he is licensed.

4.34 When a mechanic passes all the 8 categories of "Automobile and light truck repair" he will become a master automobile mechanic which enables him to perform vehicle repair of any category.

4.35 When a mechanic passes all the 6 categories of "heavy-duty truck repair" he will become a master heavy-duty truck mechanic which enables him to perform vehicle repair of any category.

4.36 A master mechanic can perform vehicle repair in any repair categories.

Mainland China

4.37 In the mainland China, like other craftsmen category, vehicle mechanics are classified into the following grades:-

(a) Junior grade
(b) Middle grade
(c) Senior grade

4.38 To qualify as a junior grade mechanic, a person must have two to three years of experience in vehicle repair or has attained formal vehicle repair training.

4.39 To qualify as a middle grade mechanic, a person needs five years experience or completes formal training for the middle grade vehicle repair.

4.40 To qualify as a senior grade mechanic, a person needs eight years experience or completes formal training for the senior grade vehicle repair.

4.41 By law, vehicle maintenance garages must employ a specified number of

qualified vehicle mechanics for the vehicle repair.

4.42 All mechanics must be graded before they can seek employment. The grading was done through examination. Table 2A(9) gives further information about the certification scheme.

4.43 Before employment, the mechanics also need to get an employment certificate from the Authority. In Shenzhen such Authority is the Transport Department. To qualify for the employment certificate, the mechanics need to attend the employment training course and pass the examination.

4.44 Similar employment certificate system applies to middle grade and advanced grade vehicle mechanics.

Taiwan

4.45 In Taiwan, there are several certification grades of vehicle mechanics, namely:-

(a) Grade C vehicle technician
(b) Grade B vehicle technician
(c) Grade A vehicle technician
(d) Vehicle Mechanic
(e) Vehicle Inspector

4.46 By law, vehicle maintenance garages must employ a specified amount of Grade B vehicle technicians or Vehicle Mechanics as well as Vehicle Inspectors. Table 2A(10) givers further information of the certification scheme.

4.47 When a secondary school graduate passes the test for elementary vehicle repair standard, he would be certified as a Grade C vehicle technician.

4.48 An additional 3 years after certified as Grade C technician will enable the mechanic to be certified as Grade B technician. Vocational training for 800 hours together with 4 years experience or singly relying on 6 years experience will also enable a mechanic to get the Grade B technician status.

4.49 To be certified as Grade A technician, a mechanic must have 5 years experience after being certified as Grade B technician. Alternatively, 10 years experience

can enable a mechanic to be certified as Grade A technician.

4.50 Vehicle Mechanic is another certification that runs parallel to the Grade A to Grade C technician system. To be certified as Vehicle Mechanic, a person needs to be at least a Grade B technician or has 4 years experience.

4.51 The Vehicle Inspector certification allows the inspector to inspect vehicles after repair in order to ensure the quality of the repair. To qualify as a Vehicle Inspector, a person must have Grade B technician certificate or Vehicle Mechanic certificate for at least one year.

4.52 All the above certifications require written and practical examinations.

Voluntary Registration/Licensing of Vehicle Maintenance Mechanics

4.53 Table 1B summarizes the various schemes of voluntary registration/licensing of vehicle maintenance mechanics. There were 5 schemes identified in 4 countries/places as summarized below.

Canada (ASE-Certified Technician)

4.54 The scheme is run by the National Institute for Automotive Service Excellence (ASE), a nonprofit corporation based in the United States. This scheme is available to all mechanics in the whole Canada. Similar scheme is running in the United States of America as well.

4.55 Under this voluntary certification scheme, a mechanic can be certified in the following grade:-

(a) ASE-Certified Technician in specific category of vehicle repair
(b) ASE-Specialty Technician in Exhaust System
(c) ASE-Certified Technician (Advanced Level)

4.56 To certify as an ASE-certified technician, a person needs to have 2 years experience and passes an examination run by ASE in one of the tests in any 8 categories of vehicle repair. A detailed listing of these tests and categories are attached to Table 2B(1). Further information about the certification system is

also given in Table 2B(1).

4.57 Similarly, a technician needs to have 2 years experience and pass specific tests in relevant categories before he can be certified as a specialty technician or Advanced Level technician.

4.58 It should be noted that it is not mandatory to be certified under the ASE certification scheme before seeking employment. It is purely on voluntary basis. However, through this certification the technician can demonstrate his competence in diagnosing and repairing vehicle problems.

New Zealand (National Certificate in Motor Industry)

4.59 This is a certification scheme run by the New Zealand Qualifications Authority (NZQA). A mechanic, having accumulated certain years of experience or have attended training course in vehicle repair, can apply for certification under this national certification scheme by attending an examination. If passed, he will be awarded the National Certificate in the vehicle repair category that he is examined. There are 30 vehicle repair categories that are offered with National Certificates. Table 2B(2) gives further information about the certification scheme.

4.60 It should be noted that although the register of those certified mechanics are kept by the NZQA, the actual training and examination works are not performed by NZQA. Instead, NZQA accredits a number of organizations to run the training and certification works. The accreditation is to ensure consistence in the quality of the training and examination organizations.

4.61 Certification under this scheme is purely on voluntary basis. A mechanic can still perform vehicle maintenance work even he is not certified under this scheme.

4.62 However, although the scheme is voluntary, it is run by a government department, the NZQA, and so its creditworthiness is high.

U.K. (Institute of Motor Industry Certification Scheme)

4.63 Two levels of certification of vehicle mechanics are in place under this voluntary scheme run by the Institute of Motor Industry in U.K. They are:-

(a) Certificated Automotive Engineer (CAE)
(b) Licentiate Automotive Engineer (LAE).

4.64 Table 2B(3) gives further information about the certification scheme.

4.65 To qualify for CAE, a mechanic must complete one of the approved vocational training programs. The full list of the approved programs is attached to Table 2B(3). Besides, 3 years working experience is needed for certification.

4.66 LAE is a higher grade of certification and is the qualified motor industry master technician. For certification, a mechanic is required to have either an additional 2 years experience after CAE certification or a total of 5 years experience. In addition, the mechanic should have a Supervisory Qualification and a Training & Development Lead Body qualification – D32 Assessor in the Workplace.

4.67 Again, these certification schemes are voluntary and it is not mandatory for a mechanic to be certified before employment. HKPC was informed that up to July 1996, about 20.4% of the some 23,800 corporate members of IMI have either the CAE or LAE qualification.

USA (ASE – Blue Seal of Excellence)

4.68 This scheme is similar to the ASE Certification Scheme in Canada and is indeed run by the same organization, i.e. ASE. Table 2B(4) gives further details of the scheme.

4.69 Under this voluntary certification scheme, a mechanic can be certified in the following grade:-

(d) ASE-Certified Technician in specific category of vehicle repair
(e) ASE-Certified Master Technician
(f) ASE-Specialist Classification – Undercar Specialist
(g) ASE-Certified Technician (Advanced Level)

4.70 To certify as an ASE-certified technician, a person needs to have 2 years experience and passes an examination run by ASE in one of the tests in any 8

categories of vehicle repair, alternative fuel, or parts specialists. A detailed listing of these tests and categories are attached to Table 2B(4). Further information about the certification system is also given in Table 2B(4).

4.71 Similarly, a technician needs to have 2 years experience and pass specific tests in relevant categories before he can certify as a specialty technician or Advanced Level technician.

4.72 To certify as a master mechanic in a particular category, a mechanic has to pass all or most of the tests in that category.

4.73 It should be noted that it is not mandatory to be certified under the ASE certification scheme before seeking employment. It is purely on voluntary basis. However, through this certification the technician can demonstrate his competence in diagnosing and repairing vehicle problems.

U.K. (Institute of Road Transport Engineers Certification Scheme)

4.74 This scheme is run by the Institute of Road Transport Engineers to certify the competence of personnel in the maintenance reapir and inspection of road vehicles (bus and coach). There are currently five certification categories, namely:-

(a) Transmission systems
(b) Braking systems
(c) Suspension
(d) Steering
(e) Inspection and public safety.

4.75 Table 2B(5) gives further information about the certification scheme.

4.76 To qualify for certification, a mechanic must possess a minimum entry requirement of an Scotish/National Vocation Qualification at level 2 (or equivalent) in the same sector in which he is seeking assessment.

4.77 These certification schemes are voluntary and it is not mandatory for a mechanic to be certified before employment.

Mandatory Registration/Licensing of Garages

4.78 Table 1C summarizes the various schemes of mandatory registration/licensing of vehicle maintenance garages. There were 10 schemes identified in 10 countries/places as summarized below.

4.79 Most of countries register/license the garages in different classes as shown in the following table:-

Country	Garage Classes	Further Details
Australia (NSW)	(a) Brake mechanic (b) Exhaust repairer (c) Front end specialist (d) Transmission specialist (e) Motor cycle mechanic (f) LPG mechanic (g) Air-conditioning (h) Automotive electrician (i) Motor mechanic (j) Panel beater (k) Painter tradesman (l) Body maker	Table 2C(1)
Netherland	(a) Maintenance of a commercial stock (b) installation of tachographs (c) installation of speed limiters.	Table 2C(2)
Spain	(a) Mechanic repair (b) Electricity repair (c) Painting (d) Motorcycles repair (e) Specialty – repair of tyres (f) Specialty – repair of radiators.	Table 2C(3)
USA (Florida)	Not classified	Table 2C(4)
USA (Georgia)	Not classified	Table 2C(5)
USA (Michigan)	Not classified	Table 2C(6)
Mainland China	(a) Type 1 garage (b) Type 2 garage (c) Type 3 garage	Table 2C(7)
Taiwan	(a) Maintenance shop (b) Type B maintenance garage (c) Type A maintenance garage	Table 2C(8)
Japan	(a) Large general automobile (b) Medium geneal/special automobile (c) Small general automobile (d) Small four-wheel and three-wheel automobile (e) Small two-wheel automobile	Table 2C(9)

Country	Garage Classes	Further Details
	(f) Light automobile	
U.K.	Goods Vehicle Operator	Table 2C(10)

4.80 In general, there will be various licensing requirements in these garages registration schemes. These include

(a) Size – specify the minimum areas of the garages. Only Mainland China, Taiwan and Japan have such requirement.
(b) Equipment – specify the type of equipment that should be available at the garages. All except USA (Florida) and USA (Georgia) have such requirement.
(c) Qualified personnel – specify the requirement of employment qualified persons for the repair work. All have such requirements.
(d) Document keeping – specify the requirement on keeping certain documents for record purpose. All except Japan and UK have such requirement.
(e) Warranty – specify the minimum guaranteed mileage or days of running after the vehicles are repaired. This is to ensure the quality of the repair work. Only Spain and Mainland China have such requirement.

4.81 Fine and suspension/revocation of licences are the common penalty for infringement of licensing conditions. However, in USA (Michigan), there are provisions of imprisonment penalties for serious misconduct by the garages.

Release of Vehicle Maintenance Manuals

4.82 During the survey, HKPC tried to collect information on whether vehicle maintenance manuals are required by law in overseas countries to be made available to the vehicle maintenance trade practitioners. However, we could not source any relevant information from literature nor the surveyed overseas government web sites.

4.83 HKPC did receive, however, three written responses from three countries, namely, Australia (Queensland), Mainland China and Singapore, which confirmed that there is no regulation to require the release of vehicle maintenance manuals although vehicle manufacturers or agents in these countries are willing to make the technical information available.

4.84 In summary, HKPC did not discover evidence to show the legislative requirement in other countries that require the release of vehicle maintenance manuals to the trade practitioners.

5. SUMMARY AND RECOMMENDATIONS

5.1 HKPC conducted extensive survey of registration/licensing of vehicle maintenance mechanics and garages in several tens of overseas countries/places. Through Consulates of these countries in Hong Kong, and internet access to relevant web sites of overseas governments and those registration/licensing organizations known to HKPC, we collected a large amount of relevant information. It was found that:-

(a) 9 countries/places have implemented 10 mandatory schemes to register/license vehicle mechanics including
  (1) In North America – USA (Federal level, California and Michigan), Canada (Alberta)
  (2) In Europe – Germany
  (3) In Asia-Pacific – Australia (NSW), Japan, Mainland China and Taiwan

(b) 4 countries/places have implemented 5 voluntary schemes including
  (1) In North America – USA and Canada
  (2) In Europe – United Kingdom
  (3) In Asia-Pacific – New Zealand

(c) 10 countries/places have implemented 10 garages licensing schemes including
  (1) In North America – USA (Florida, Georgia and Michigan)
  (2) In Europe – Netherland, Spain, United Kingdom
  (3) In Asia-Pacific – Australia (NSW), Japan, Mainland China and Taiwan

5.2 HKPC observed that many countries/places that have mandatory registration/licensing of mechanics would also require mandatory registration/licensing of garages although there are exceptions. Apparently those countries with both mandatory registration/licensing of mechanics and garages consider it necessary to regulate both the mechanics and garages.

5.3 HKPC also tried to contact those mandatory registration/licensing schemes implementation organizations/governments to ask for the original legal intention to set up such schemes. However, no response has yet been received. It is suspected that no government will be willing to respond to this question.

5.4 Furthermore, HKPC also asked the relevant governments about the effectiveness of those mandatory registration/licensing schemes in upgrading the vehicle maintenance trade standard, environmental improvement as well as road safety improvement. However, no affirmative response has yet been received. This is not surprising because apart from proper vehicle maintenance, there are other factors that would affect environmental and road safety improvement, e.g. driving habit, vehicle design, fuel quality, etc.

5.5 The presence of these vehicle maintenance mechanics and garages registration/licensing schemes in these countries/places, many of which are developed countries, and the fact that these systems have been in place for more than twenty years demonstrated the need of regulating the vehicle maintenance trade. But whether Hong Kong should regulate the trade needs to be studied by the Working Group and the Special Task Group in detail.

5.6 HKPC recommends members of the Special Task Group to visit the following countries to discuss with the relevant organizations about the registration/licensing schemes before making decision:-

(a) For mandatory registration/licensing of mechanics and/or garages, members are suggested to visit the following places:-

(1) Australia (NSW and Queensland) – As NSW has been implementing the mechanics and garages registration/licensing system since 1980, they have accumulated a lot of experience in regulating the vehicle repair trade. The members are also suggested to visit Queensland to understand the difficulties they faced when considering to set up mandatory registration/licensing schemes.

(2) USA (Michigan) – Michigan is the only places that impose imprisonment penalties to registered mechanics and garages for mal-practice in delivering vehicle repair services. The experience accumulated and the reason for such stringent penalty system are worth further studying.

(b) For voluntary registration/licensing of mechanics, members are suggested to visit New Zealand. Their National Certification scheme is a very special scheme in that it is operated by the New Zealand Qualifications Authority,

which is a government department. Hong Kong has a somewhat similar system, the Trade Test Certificate to certify mechanics who has successfully passed the trade tests. However, the Certificate is not that well received by the trade. HKPC considers that there is a possibility that the Trade Test Certificate, can be extended to become a system similar to the New Zealand National Certification System.

Table 1A: Summary of Overseas Regulation/Licensing Schemes of Vehicle Mechanics (Mandatory)

Country (Scheme)	Level/ Grade	No. of Categories[1]	Education/ Training Requirement[2]	Experience (years)[3]	Examination[4]		Function[5]	Validity[6]	Exemption[7]	Liability[8]			Remark	Refer to Table
					Written	Practical				Fine	Impris-onment	Suspend/ Revoke Licence		
Australia – NSW (Tradesperson's Certificate)	Tradesperson's Certificate	13	Complete Australian Apprenticeship in the trade with satisfactory completion of TAFE trade course (4 years)	No	✓	N/A	To allow a person to practise as vehicle repair mechanic	Life	Authority can authorize a person to work as mechanic under specified conditions	✓	No	✓	• Motor Vehicle Repairs Act • Industrial and Commercial Training Act	2A(1)
	Provisional Tradesperson's Certificate	13	No specific requirement but subject to Authority's discretion	As required by Authority	No	No	To allow a person with qualifications acceptable to the Authority to practise as a mechanic for a specified period	Specified period	No	✓	No	✓	As above	As above
Canada – Alberta (Journeyman Certificate)	Journeyman Certificate	4	Complete Alberta Apprenticeship Training programm (4 years)	No	✓	✓	To allow a person to practise as vehicle repair mechanic	Life	N/A	✓	No	N/A	• Alberta Apprenticeship and Industry Training Act	2A(2)
Canada – Alberta (Qualification Certificate)	Qualification Certificate	4	No	4.5 to 6	✓	✓	As above	Life	N/A	✓	No	N/A	As above	2A(3)
Germany	Craft Mechanic	3	Complete a 3-year apprenticeship and pass the examination	Nil	✓	✓	N/A	N/A	N/A	N/A	N/A	N/A	A mechanic would be difficult to find employment with major vehicle maintenance companies if not certified	2A(4)
	Master Mechanic	N/A	(a) Being a certified craft mechanic and working for 5 years, and (b) Complete a 1-year full time training course on management	5	✓	✓	Only a certified master mechanic can set up his own business to repair vehicle	N/A	N/A	N/A	N/A	N/A		As above
Japan (自動車整備士技能檢定)	三級整備士	4	(a) 中學畢業; or (b) 職訓畢業生	(a) 1 (b) 0.5	✓	✓	N/A	N/A	N/A	N/A	N/A	N/A	道路運輸車輛法	2A(5)

[1] Different category refers to different type of vehicle repair work in the same level/grade of the registration/licensing scheme
[2] Education requirements means the formal education qualification that the mechanic must possess before he could be registered/licensed under the scheme
[3] Experience refers to those experience after completion of the education/training requirement
[4] Examination refers to those examination that must be passed for registration/licensing purpose This include the examination taken to demonstrate successful completion of the education/training requirement, and the specific examination that the mechanic must undertaken for registration/licensing purpose, e g trade test
[5] Function means the purpose of the registration/licensing scheme, e.g. to enable a person to practise as a vehicle repair mechanic
[6] Validity refers to the validity of the registration/licensing status.
[7] Exemption means any exemption by law to allow a person to practice in the trade of vehicle repair even though he is not registered/licensed under the registration/licensing scheme
[8] Liability means legal liability if a person, otherwise than those exempted by law, does not comply with the registration/licensing requirement

Country (Scheme)	Level/ Grade	No. of Categories[1]	Education/ Training Requirement[2]	Experience (years)[3]	Examination[4]		Function[5]	Validity[6]	Exemption[7]	Liability[8]			Remark	Refer to Table
					Written	Practical				Fine	Impris-onment	Suspend/ Revoke Licence		
	二級整備士	3	(a) 中學畢業及三級整備士資格; or (b) 職訓畢業生及三級整備士資格	(a) 3; (b) 1	✓	✓	N/A	N/A	N/A	N/A	N/A	N/A	As above	As above
	一級整備士	3	二級整備士資格	3	✓	✓	N/A	N/A	N/A	N/A	N/A	N/A	As above	As above
	特殊整備士	3	(a) 中學畢業; or (b) 職訓畢業生	(a) 3 (b) 2	✓	✓	N/A	N/A	N/A	N/A	N/A	N/A	As above	As above
USA (Section 609 Certified Technicians)	Certified Technician	1	Pass USEPA- approved Section 609 program or Section 608 Type II program	No	✓	No	To allow a person to repair or service motor vehicle air conditioners	Life	N/A	✓	No	No	Title VI of the Clean Air Act (Section 609: Servicing of Motor Vehicle Air Conditioners)	2A(6)
USA – California (Smog Check Program)	Intern Technician	1	(a) Complete Bureau of Automotive Repair's (BAR's) Basic or Advance Clean Air Course.; or (b) By experience only	(a) No (b) 1 year	✓	N/A	To allow a person, under the direction of a licenced supervising technician, to perform repairs or adjustments to emission control systems on vehicles	2 years	N/A	✓	No	N/A	Auto Body Repair Shop Regulations	2A(7)
	Basic Area Technician	1	(a) Holder of certificate from the National Institute for Automotive Service Excellence in the categories of Electrical/Electronic System and Engine Performance; or (b) Complete training course approved by BAR; or (c) By experience only	(a) No (b) No (c) 4	✓	N/A	To allow a person to inspect, diagnose, adjust, repair and certify the emission control systems on vehicle subject to the Basic Area Smog Check Program	2 years	N/A	✓	No	N/A	As above	As above

Table 1B: Summary of Overseas Regulation/Licensing Schemes of Vehicle Mechanics (Voluntary)

Country (Scheme)	Level/ Grade	No. of Categories[1]	Education/ Training Requirement[2]	Experience (years)[3]	Examination[4]		Validity[5]	Remark	Refer to Table
					Written	Practical			
Canada (ASE – Certified Technician)	ASE-Certified Technician	8	(a) Holder of a provincially established trade certificate; or (b) Experience only (Note: Pass any 1 test in any category will entitled registration in that category)	(a) No (b) 2	✓	N/A	5 years	(a) The eight categories are Automobile Technicians (A1 to A8), Medium/Heavy Truck Technicians (T1 to T8), Truck Equipment Technicians (E1 to E3), Collision Repair and Refinishing Technicians (B2 to B5), Engine Machinists (M1G to M3G and M1D to M3D), School Bus Technicians (S1 to S7), Alternative Fuel (F1); and Parts Specialists (P1-P4). (b) Three full years of training, either in automobile/truck/school bus repair or in collision repair, refinishing may be substituted for one year of work experience. (c) Two full years of post-high school training i a public or private trade school, technical institute, community or four-year college , or in an apprenticeship program may be counted as one year of experience.	2B(1)
	ASE-Specialists Classification – Specialty Technician	1	(a) Pass the test of X1; and (b) Being certified in ASE Automobile Technician tests of A4 and A5	2	✓	N/A	As above	(a) The category is "Exhaust System (X1)"	
	ASE-Certified Technician (Advanced Level)	1	(a) Pass the test of L1 and being certified in ASE Automotive Technician test of A8; or (b) Pass the test of L2 and being certified in ASE tests Diesel Engine (T2) and Preventive Maintenance Inspection (T6) (or school bus version S2 and S6)	2	✓	N/A	As above	(a) The category include "Automotive Advanced Engine Performance Specialist (L1)" and "Medium/Heavy Vehicle Electronic Diesel Engine Diagnosis Specialists (L2)"	
New Zealand (National Certificate in Motor Industry	National Certificate	30	(a) By experience only although some would pass through apprenticeship training	Not specified	✓	✓	Not specified	(a) Achievement of the standard is assessed through test by accredited organizations. Accreditation of organizations is done by the New Zealand Qualifications Authority (NZQA), which is a government department under the Minister of Education of New Zealand (b) The National Certificate is awarded by NZQA.	2B(2)
United Kingdom (IMI Certification)	Certificated Automotive Engineer (CAE)	1	Require one of the vocational programs	3	✓	N/A	5 years	(a) Produce evidence of education and training updating before a further 5 year period is granted. (b) The scheme is run by the Institute of Motor Industry (IMI)	2B(3)
	Licentiate Automotive Engineer(LAE)	1	(a) Require one of the vocational programs; and (b) Require a supervisory qualification, a training & lead body qualification – D32 Assessor in the Workplace, have normally been a CAE for 2 years, or have at least 5 years relevant experience	2 to 5	✓	N/A	5 years	As above	

[1] Different categnry refers to different type of vehicle repair work in the same level/grade of the registration/licensing scheme
[2] Education requirements means the formal education qualification that the mechanic must possess before he could be registered/licensed under the scheme
[3] Experience refers to those experience after completion of the education/training requirement
[4] Examination refers to those examination that must be passed for registration/licensing purpose This include the examination taken to demonstrate successful completion of the education/training requirement; and the specific examination that the mechanic must undertaken for registration/licensing purpose, e g. trade test.
[5] Validity refers to the velidity of the registration/licensing status.

Country (Scheme)	Level/ Grade	No. of Categories[1]	Education/ Training Requirement[2]	Experience (years)[3]	Examination[4]		Validity[5]	Remark	Refer to Table
					Written	Practical			
USA (ASE – Blue Seal of Excellence)	ASE-Certified Technicians/ Machinists	6	(a) Experience only (Note: Pass any one test in any category will entitle registration in that category)	2	✓	N/A	5 years	(a) The six categories are Automobile Technicians (A1 to A8), Medium/Heavy Truck Technicians (T1 to T8), Truck Equipment Technicians (E1 to E3), Collision Repair and Refinishing Technicians (B2 to B5), Engine Machinists (M1G to M3G and M1D to M3D), and School Bus Technicians (S1 to S7). (b) Three full years of training, either in automobile/truck/school bus repair or in collision repair or refinishing OR two full years of post-high school training in a public or private trade school, technical institute, community or four-year college, or in an apprenticeship program may be counted as one year of work experience.	2B(4)
	ASE-Certified Master Technicians/ Machinists	6	(a) Pass all the tests of A1-A8; or (b) Pass T1/T2 and T3 to T8 test of item 2; or (c) Pass all the tests of E1-E3; or (d) Pass all the tests of B2-B5; or (e) Pass all the tests of M1G-M3G or M1D-M3D; or (f) Pass all the test of S1-S6	No	✓	N/A	As above	(a) The six categories are the same as above	
	ASE-Specialists Classification – Undercar Specialist	1	(a) Pass the test of X1; and (b) Being certified in ASE Automobile Technician tests of A4 and A5	No	✓	N/A	As above	(a) The category is "Exhaust System (X1)"	
	ASE-Certified Technician (Advanced Level)	1	(a) Pass the test of L1 and being certified in ASE Automotive Technician test of A8; or (b) Pass the test of L2 and being certified in ASE tests Diesel Engine (T2) and Preventive Maintenance Inspection (T6) (or school bus version S2 and S6)	No	✓	N/A	As above	(a) The category include "Automotive Advanced Engine Performance Specialist (L1)" and "Medium/Heavy Vehicle Electronic Diesel Engine Diagnosis Specialists (L2)"	
	ASE-Certified Technicians (Alternative Fuel)	1	Pass the test of F1	2	✓	N/A	As above	(a) The category is "Light Vehicle Compressed Natural Gas (F1)" (b) Substitution of work experience same as item (b) of ASE-Certified Technicians	
	ASE-Certified Parts Specialist	1	(a) Pass any one of the tests of P1-P4	2	✓	N/A	As above	(a) The category include P1 to P4	
UK (IRTE Certification)	IRTEC Certification of Competence of Personnel in the Maintenance Repair and Inspection of Road Vehicles (Bus and Coach)	5	(a) A minimum entry requirement of an S/NVQ at level II (or equivalent) in the same sector that the candidate is seeking assessment.	N/A	✓	✓	5 years	(a) The five categories are (1) transmission systems, (2) braking systems, (3) suspension, (4) steering, (5) inspection and public safety	2B(5)

N/A – information not available

Country (Scheme)	Level/ Grade	No. of Categories[1]	Education/ Training Requirement[2]	Experience (years)[3]	Examination[4]		Function[5]	Validity[6]	Exemption[7]	Liability[8]			Remark	Ref. to Table
					Written	Practical				Fine	Impris-onment	Suspend/ Revoke Licence		
	Advanced Emission Specialist Technician	1	(a) Holder of certificate from the National Institute for Automotive Service Excellence in the categories of Electrical/Electronic System, Engine Performance and Advanced Engineer Performance Specialist; or (b) Complete training course approved by BAR; or (c) By experience only	(a) No (b) No (c) 4	✓	N/A	To allow a person to inspect, diagnose, adjust, repair and certify the emission control systems on vehicle subject to the Enhanced Area Smog Check Program	2 years	N/A	✓	No	N/A	As above	As above
USA – Michigan	Mechanic Trainee	19	Must work under the supervision of a specialty mechanic or a master mechanic	No	No	No	To allow a person to practice as a specialty or master mechanic	2 years	No	✓	✓	✓	Motor Vehicle Service and Repair Act	2A(8)
	Specialty Mechanic	19	Pass a test of a repair category	No	✓	N/A	To allow a person to perform vehicle repair of a specific category	1 year	No	✓	✓	✓	As above	As above
	Master Automobile Mechanic	1	Pass all of the first 8 categories of the Automobile and light truck repair	No	✓	N/A	To allow a person to perform vehicle repair of all of the specific repair categories	1 year	No	✓	✓	✓	As above	As above
	Master Heavy-Duty Truck Mechanic	1	Pass all of the first 6 categories of heavy-duty truck repair	No	✓	N/A	As above	1 year	No	✓	✓	✓	As above	As above
中華人民共和國 - 廣東省深圳市 (汽車維修工人等級及持証上崗規定)	初級技工	23	(a) 單憑經驗; or (b) 正規初級工培訓	(a) 2 to 3 (b) No	✓	✓	持上崗証不同級別的技工從事不同技術要求的維修工作	Life	No	✓	N/A	N/A	<<汽車維修行業管理暫行辦法>>	2A(9)
	中級技工	23	(a) 單憑經驗; or (b) 取得初級<技術等級証書>; or (c) 取得初級<技術等級証書>並經正規中級工培訓; or (d) 專業學校畢業并從事所學專業工作	(a) 5 (b) 2 (c) No (d) No	✓	✓	As above	Life	No	✓	N/A	N/A	As above	As above

Country (Scheme)	Level/ Grade	No. of Categories[1]	Education/ Training Requirement[2]	Experience (years)[3]	Examination[4]		Function[5]	Validity[6]	Exemption[7]	Liability[8]			Remark	Refer to Table
					Written	Practical				Fine	Impris-onment	Suspend/ Revoke Licence		
	高級技工	23	(a) 單憑經驗; or (e) 取得中級<技術等級証書>; or (b) 取得中級<技術等級証書>並經正規高級工培訓	(a) 8 (b) 3 (c) No	✓	✓	As above	Life	No	✓	N/A	N/A	As above	As above
台灣	丙級汽車修護技術士	1	中學畢業	No	✓	✓	初級技能檢定	Life	N/A	N/A	N/A	N/A	技術士技能檢定及發證辦法	2A(10)
	乙級汽車修護技術士	1	(a) 取得丙級技術士; or (b) 職業訓練八百小時; or (c) 事業機構技術生訓練二年; or (d) 高級中等學校畢業 (e) 單憑經驗	(a) 3 (b) 4 (c) 2 (d) 2 (e) 6	✓	✓	受檢人士可受僱汽車修理廠為技術士	Life	汽車修理廠必須僱用乙級汽車修護技術士或汽車修護技工	N/A	N/A	N/A	As above	As above
	甲級汽車修護技術士	1	(a) 取得乙級技術士; or (b) 大學院校畢業; or (c) 單憑多年經驗並取得乙級技術士	(a) 5 (b) 4 (c) 10	✓	✓	As above	Life	N/A	N/A	N/A	N/A	As above	As above
	汽車修護技工	1	(a) 取得丙級以上技術士; or (b) 高中之汽車或機械科畢業; or (c) 高中立非汽車或機械科畢業; or (d) 汽車修護訓練一千六百小柴;or (e) 單憑經驗	(a) No (b) No (c) 1 (d) 1 (e) 4	✓	✓	技工執照乃修護汽車之執業憑證	Life	汽車修理廠必須僱用乙級汽車修護技術士或汽車修護技工	N/A	N/A	N/A	汽車駕駛人與技工執照登記及考驗	As above
	汽車檢驗員	3	(a) 高中之汽車或機械科畢業; or (b) 高中立非汽車或機械科畢業,並領有汽車修護技工執照或丙級以上汽車修護技術士證 (c) 領有汽車修護技工執照或乙級以上汽車修護技術士證一年以上	No	✓	✓	受檢人士可受僱汽車修理廠為汽車檢驗員	Life	汽車修理廠必須僱用汽車檢驗員	N/A	N/A	✓		As above

N/A – information not available

Table 1C: Summary of Overseas Registration of Garages (Mandatory)

Country	Registration Requirements							Penalty			Remark	Further Information Table
	Classes	Size	Equipment	Qualified Personnel	Document keeping	Warranty	Others	Fine	Imprison -ment	Suspend/ revoke licence		
Australia – NSW (Motor Vehicle Repairers Licence)	✓	N/A	✓	✓	✓	N/A	✓	✓	N/A	✓	◦ Motor Vehicle Repairs Act ◦ Motor Vehicle Repairs Regulation	2C(1)
Netherland	✓	N/A	✓	✓	✓	N/A	✓	N/A	N/A	N/A	◦ Road Traffic Act ◦ Motor Vehicle Liability Insurance Act	2C(2)
Spain	✓	N/A	✓	✓	✓	✓	N/A	✓	N/A	✓	Servicio Postventa Talleres De Reparacion	2C(3)
USA – Florida	✓	N/A	N/A	✓	✓	N/A	N/A	✓	N/A	✓	Florida Motor Vehicle Repair Act	2C(4)
USA – Georgia	✓	N/A	N/A	✓	✓	N/A	N/A	✓	N/A	✓	Georgia Motor Vehicle Repair Act	2C(5)
USA – Michigan	✓	N/A	✓	✓	✓	N/A (Note c)	✓	✓	✓	✓	Motor Vehicle Service and Rapair Act	2C(6)
中華人民共和國 - 廣東省深圳市 (汽車維修業戶註冊)	✓	✓	✓	✓	✓	✓	✓	✓	N/A	✓	<<汽車維修行業管理暫行辦法>>	2C(7)
台灣	✓	✓	✓	✓	✓	N/A	✓	N/A	N/A	N/A	<汽車修理業管理辦法>	2C(8)
Japan	✓	✓	✓	✓	N/A	N/A	N/A	N/A	N/A	N/A	<道路運送車兩法第 78 条>	2C(9)
U.K. (Note (a))	N/A	N/A	N/A	✓	N/A	N/A	N/A	N/A	N/A	N/A	Goods Vehicles (Licensing of Operators) Act	2C(10)

Note: (a) This is a requirement on goods vehicle operators to employ a Transport Manager who should take care of and be responsible for the maintenance of the vehicle fleet of the fleet operators.

(b) N/A – information not available

(c) There is a penalty if a garage refuses to honour the warranty

Table 2A(1): Further Information on NSW Tradesperson's Certificate (Mandatory)

Country: Australia

Certification Body: Motor Vehicle Repair Industry Council

Relevant Legislation: (a) Motor Vehicle Repairs Act 1980

Penalty:
(a) A person shall not do any vehicle repair work unless he holds a tradesperson's certificate in respect of a class of repair work that includes that repair work. Otherwise, he will be guilty of an offence liable to a fine of 20 penalty units (i.e.A$2,200)
(b) A person shall not hold himself out as a holder of tradesperson's certificate if not so qualified. Otherwise, he is guilty of an offence liable to a fine of 2 penalty units (i.e. A$220)
(c) If holder of the tradesperson's certificate is convicted of an offence in the Act, he may be cautioned or reprimanded, or his certificate may be suspended or revoked

Reference: Ref. 2A(1)-a to Ref. 2A(1)-i

Level/Grade	Certification Category (✓ if related to emissions)	Education/ Training Requirement	Equivalent Local Education/ Training Levels	Experience Requirement	Remark[1]
Tradesperson's certificate	Automotive electrician	(a) Completion of an Australian Apprenticeship in the trade (usually 4 years) and satisfactory completion of the TAFE trade course; or (b) ◦ Craft certificate; or ◦ Australian Recognized Trade Certificate; or ◦ Institute of Automotive Mechanical Engineers (I.A.M.E.) Associate Grade, together with 6 years experience in the trade	Certificate level	No experience requirement for Apprenticeship but 6 years if through the I.A.M.E. route	Further detail in Ref. 2A(1)-b and 2A(1)-h
	Body maker	As above except that there is no I.A.M.E route	As above	As above	As above
	Brake mechanic	Same as that for automotive electrician	As above	As above	As above
	Exhaust repairer (✓)	(a) Completion of an Australian Apprenticeship in the trade (usually 4 years) and satisfactory completion of the TAFE trade course; or (b) ◦ Completion of two years experience in the appropriate class of work including successful completion of a formal traineeship; or ◦ Completion of three years experience in the appropriate class of work. Reference from employers attesting to the applicants skill and knowledge are required.	As above	As above	As above
	Front end specialist	(a) Completion of an Australian Apprenticeship in the trade (usually 4 years) and satisfactory completion of the TAFE trade course; or (b) I.A.M.E. Associate Grade, together with 5 years experience in the trade	As above	As above but 5 years if through the I.A.M.E. route	As above

Table 2A(1): Further Information on NSW Tradesperson's Certificate (Mandatory) (Cont'd)					
Level/Grade	Certification Category (✓ if related to emissions)	Education/ Training Requirement	Equivalent Local Education/ Training Levels	Experience Requirement	Remark[1]
Tradesperson's certificate (Cont'd)	Motor cycle mechanic (✓)	Same as that for automotive electrician	Certificate level	As automotive electrician	As above
	Painter tradesperson	Same as that for automotive electrician except that Australian Recognized Trade Certificate route	As above	As automotive electrician	As above
	Panelbeater	Same as that for automotive electrician	As above	As automotive electrician	As above
	Radiator repairer	Same as that for exhaust repairer	As above	As exhaust repairer	As above
	Transmission specialist	Same as front end specialist	As above	As front end specialist	As above
	Liquefied petroleum gas mechanic (✓)	Completion of an Australian Apprenticeship in the trade (usually 4 years) and satisfactory completion of the TAFE trade course	No equivalent level	No experience requirement after completing apprenticeship	Further detail in Ref. 2A(1)-b
	Natural gas mechanic (✓)	As above	As above	As above	As above
	Prescriber tradesperson	As above	As above	As above	As above
Provisional Tradesperson's Certificate	Similar to Tradesperson's certificate	No specific requirement but subject to Authority's discretion	As above	As required by Authority	Further detail in Ref. 2A(1)-i

Note 1:

- The function of the Act is to allow a person to practice as vehicle repair mechanic.
- Validity of the certificate is Life except for Provisional Certificate which lasts for a period specified by the Authority.

Table 2A(2): Further Information on Alberta Journeyman Certificate (Mandatory)

Country: Canada

Certification Body: Alberta Apprenticeship and Industry Training Board

Relevant Legislation: (a) Alberta Apprenticeship and Industry Training Act (Chapter A-42.3)
(b) Alberta Apprenticeship Program and Certification Regulation (Regulation 1/92)

Penalty: A person shall not work in the trade unless certified or authorized by the Authority, otherwise, he and his employer will be guilty of offence and be liable to a fine of not more than C$15,000

Reference: Ref. 2A(2)-a to Ref. 2A(2)-h

Level/Grade	Certification Category (✓ if related to emissions)	Education/ Training Requirement	Equivalent Local Education/ Training Levels	Experience Requirement	Remark[1]
Automotive service technician	Automotive service technician (✓)	Complete Alberta Apprenticeship Training Program. Details of the Program as below:- *Entrance requirement:* ◦ complete grade 12; or ◦ pass an entrance examination; or ◦ take part in the Registered Apprentice Program while still in high school, earning an income and credit toward the apprenticeship and the high school diploma *Training requirement:-* ◦ A total of four periods each requires 1500 hours including work experience, attendance and passing of technical training	Certificate level	No additional working experience after completing the apprenticeship training	Further detail in Ref. 2A(2)-e
Recreation vehicle service technician	Recreation vehicle service technician (✓)	Similar to that for automotive service technician except that there are only three periods of training and each period requires 1600 hours	As above	As above	Further detail in Ref. 2A(2)-f
Autobody technician	◦ Collision ◦ Refinishing ◦ Collision and refinishing	Similar to that for recreation vehicle service technician except that:- *For collision and refinishing* ◦ Third period: 1500 hours ◦ Fourth period: 1700 hours *For Collision* ◦ Third and fourth periods: 1500 hours each *For Refinishing* ◦ Third period: 1700 hours, and no fourth period	As above	As above	Further detail in Ref. 2A(2)-g
Motorcycle Mechanic	Motorcycle Mechanic (✓)	Similar to that for automotive service technician except that all four periods of training require 1600 hours	As above	As above	Further detail in Ref. 2A(2)-h

Note 1:

- The function of the Act is to allow a person to practice as vehicle repair mechanic.
- Validity of the certificate is Life.

Table 2A(3): Further Information on Alberta Qualification Certificate (Mandatory)					
Country:	Canada				
Certification Body:	Alberta Apprenticeship and Industry Training Board				
Relevant Legislation:	(a) Alberta Apprenticeship and Industry Training Act (Chapter A-42.3) (b) Alberta Apprenticeship Program and Certification Regulation (Regulation 1/92)				
Penalty:	A person shall not work in the trade unless certified or authorized by the Authority, otherwise, he and his employer will be guilty of offence and be liable to a fine of not more than C$15,000				
Reference:	Ref. 2A(3)-a to Ref. 2A(3)-c				
Level/Grade	Certification Category (✓ if related to emissions)	Education/ Training Requirement	Equivalent Local Education/ Training Levels	Experience Requirement	Remark[1]
Automotive service technician	Automotive service technician (✓)	No formal training requirement.	Trade test	9000 hours (6 years)	Further detail in Ref. 2A(3)-c
Recreation vehicle service technician	Recreation vehicle service technician (✓)	As above	As above	7200 hours (4.5 years)	Further detail in Ref. 2A(3)-c
Autobody technician	◦ Collision ◦ Refinishing ◦ Collision and refinishing	As above	As above	*Collision and refinishing* ◦ 9600 hours (6 years) *Collision* ◦ 9300 hours (6 years) *Refinishing* ◦ 7350 hours (4.5 years)	Further detail in Ref. 2A(3)-c
Motorcycle Mechanic	Motorcycle Mechanic (✓)	As above	As above	8340 hours (6 years)	Further detail in Ref. 2A(3)-c

Note 1:

- The function of the Act is to allow a person to practice as vehicle repair mechanic.
- Validity of the certificate is Life.

Table 2A(4): Further Information on Certification of Vehicle Maintenance Mechanic (Mandatory)					
Country:	Germany				
Certification Body:	N/A				
Relevant Legislation:	(a) Bekanntmachung der Neufassung der Handwerksordnung (b) Verordnung uber die Berufsausbildung zum Kraffahrzeugmechaniker/zur Kraftfahrzeugmechanikerin (Kraftfahrzeugmechanicker-Ausbildungsverordnung – KfzMAusbV) (c) Verordnung uber das Berufsbild und uber die Prufungsanforderungen im praktischen und im fachtheoretischen Teil der Meisterprufung fur das Kraftfahrzeugmechanniker –Handwerk (Kraftfahrzeugmechanikermeisterverordnung – KfzMechMstrV)				
Penalty:	N/A				
Reference:	Ref. 2A(4)-a to Ref. 2A(4)-d				
Level/Grade	Certification Category (✓ if related to emissions)	Education/ Training Requirement	Equivalent Local Education/ Training Levels	Experience Requirement	Remark[1]
Craft Mechanic	(a) Passenger car (✓) (b) Commercial motor vehicle (✓) (c) Motor cycle (✓)	3 year professional training	No equivalent level	N/A	
Master Mechanic	Master mechanic (✓)	(a) Being a certified craft mechanic and working as a mechanic for five years, and (b) Attend a 1-year full time training course on management	N/A	5 years	Only a certified master mechanic can set up his own vehicle maintenance business

N/A – information not available

Table 2A(5): Further Information on 自動車整備士 (Mandatory)

Country: Japan

Certification Body: 運輸省

Relevant Legislation: 道路運送車輛法

Penalty: Information not available

Reference: Ref. 2A(5)-a

Level/Grade	Certification Category (✓ if related to emissions)	Education/ Training Requirement	Equivalent Local Education/ Training Levels	Experience Requirement	Remark
三級整備士	(a) 汽車底盤 (✓) (b) 電油引擎 (✓) (c) 柴油引擎 (✓) (d) 電單車 (✓)	實務經驗者 - 中學畢業生 - 高中畢業生 - 大學畢業生	No equivalent level	一年以上有關經驗	年齡 15 歲以上.
		職訓畢業生 - 舊有公共職業訓練校或職業訓練校、職業能力開發大學校修畢自動車整科、自動車整備工、內燃機關整備工、自動車科、產業機械工學科	As above	無	
二級整備士	(a) 電油車 (✓) (b) 柴油車 (✓) (c) 電單車 (✓)	實務經驗者 - 中學畢業生 - 高中畢業生 - 大學畢業生	As above	三級合格後 3 年	
		職業訓練畢業生 - 自動車整備科、自動車科 - 自動車整備工 - 產業機械工學科 - 自動車整備科、自動車整備工、內燃機械整備工	As above	三級合格後 1 年	

Table 2A(5): Further Information on 自動車整備士 (Mandatory) (Cont'd)					
Level/Grade	Certification Category (✓ if related to emissions)	Education/ Training Requirement	Equivalent Local Education/ Training Levels	Experience Requirement	Remark
特殊整備士	(a) 車輪 (b) 車體 (c) 電氣裝置	實務經驗者 - 中學畢業生 - 高中畢業生 - 大學畢業生	No equivalent level	3 年	
		職業訓練畢業生 - 自動車整備科、自動車科 - 自動車整備工 - 產業機械工學科	As above	2 年	
一級整備士	大型自動車 (✓)	普通自動車 - 車輛總重量 8 噸以上 - 最大積載量超過 2 噸 - 載客 11 人以上	As above	二級合格後 3 年	
	小型自動車 (✓)	普通自動車 - 車輛總重量 8 噸以上 - 最大積載量超過 2 噸 - 載客 11 人以上 四輪小型自動車 三輪小型自動車 四輪輕型自動車 四輪輕型自動車	As above	As above	
	二輪自動車 (✓)	二輪小型自動車 二輪輕型自動車	As above	As above	

Table 2A(6): Further Information on USA Section 609 Certified Technician (Mandatory)					
Country:	USA (Federal)				
Certification Body:	"United States Environmental Protection Agency (USEPA)" approved Certifying Agents (e.g. Automotive Service Excellence (ASE))				
Relevant Legislation:	Title VI of the Clean Air Act (Section 609: Servicing of Motor Vehicle Air Conditioners)				
Penalty:	Each time a motor vehicle air conditioner is serviced without properly using approved refrigerant recycling equipment or is serviced by an uncertified technician, each container of refrigerant containing less than 20 pounds is sold to a person who is not a certified technician or who does not certify to the retail establishment that the container was purchased for resale, and each time a technician is certified by a technician training program which has not been approved by the USEPA Administrator constitutes a separate violation. Section 113 of the Clean Air Act allows USEPA to seek penalties of up to US$25,000 per day per violation.				
Reference:	Ref. 2A(6)-a to Ref.2A(6)-d				
Level/Grade	Certification Category (✓ if related to emissions)	Education/ Training Requirement	Equivalent Local Education/ Training Levels	Experience Requirement	Remark
Section 609 Certified Technicians	Section 609 Certified Technicians	Pass USEPA-approved Section 609 program or Section 608 Type II program *Section 609 program:-* ◦ the certification is required for those working on motor vehicle air conditioning systems *Section 608 Type II program:-* ◦ the certification is required for those working on hermetically sealed refrigeration systems used on motor vehicles for refrigerated cargo, or the air conditioning systems on passenger buses which use HCFC-22 refrigerant	No equivalent	No additional working experience required	

Table 2A(7): Further Information on Smog Check Technician Licence (Mandatory)					
Country:	USA (California)				
Certification Body:	Bureau of Automotive Repair (BAR) – Licensing Division				
Relevant Legislation:	Auto Body Repair Shop Regulations				
Penalty:	(i) Minimum – Revocation of Automotive Repair Dealer & Station licence, stayed, 30 day suspension of Station licence- 2 year probation. (ii) Maximum - Revocation of Automotive Repair Dealer & Station licence				
Reference:	Ref. 2A(7)-a to Ref. 2A(7)-b				
Level/Grade	Certification Category (✓ if related to emissions)	Education/ Training Requirement	Equivalent Local Education/ Training Levels	Experience Requirement	Remark
Intern technician	Nil (✓)	Provide proof of successful completion of BAR's Basic or Advanced Clean Air Course. To qualify for the Clean Air Car Course, the applicant must have one of the following:- *Training requirement:-* ◦ completion of 9 semester units, or 13 quarter units, or 180 hrs of engine performance related automotive training course from a state accredited or recognized college, public school or trade school; or ◦ six months of automotive experience in the engine performance area and 5 semester units or 7 quarter units or 90 hrs of engine performance related automotive training course from a state accredited or recognized college, public school or trade school; or ◦ possession of an Associate of Arts or Associate of Science degree in Automotive Technology from a state accredited or recognized college, public school or trade school; or ◦ possession of a certificate in Automotive Technology from a state accredited or recognized college, public school or trade school. Coursework must be a minimum of 360 hrs in the engine performance area.	No equivalent	One year of automotive experience in the engine performance area or those shown in the Education/ Training Requirement	◦ The function of the Act is to allow a person, under the direction of a licenced supervising technician, to perform repairs or adjustments to emission control systems on vehicles ◦ Validity of the licence is 2 years

Table 2A(7): Further Information on Smog Check Technician Licence (Mandatory) (Cont'd)

Level/Grade	Certification Category (✓ if related to emissions)	Education/ Training Requirement	Equivalent Local Education/ Training Levels	Experience Requirement	Remark
Basic area technician	Nil (✓)	The applicant must provide proof of one of the following certificate:- ◦ certificate (or a passing score) from the National Institute for Automotive Service Excellence in the certification categories of Electrical/Electronic System (A6) and Engine Performance (A8); or ◦ completion of training course(s) approved by BAR. Beginning February 1, 2000, an applicant for an initial or renewal Basic licence must provide proof of successful completion of BAR-certified update training course. Update training courses provide training on new automotive technology that affects emission tests an/or repairs. Update training course may be up to 20 hours. To qualify to take the examination, the applicant must provide proof of one of the following requirements:- ◦ possession of an Intern Technician licence and one year of verifiable experience in the vehicle engine performance area after obtaining the Intern Technician licence; or ◦ possession of an Associate of Arts or Associate of Science degree in Automotive Technology from a state accredited or recognized college, public school or trade school and successful completion of BAR's Basic or Advanced Clean Car Course; or ◦ possession of a certificate in Automotive Technology from a state accredited or recognized college, public school or trade school. Coursework must be a minimum of 360 hrs in the engine performance area and successful completion of BAR's Basic or Advanced Clean Car Course; or ◦ possession of a valid Smog Check Technician's licence other than an Intern Technician licence.	No equivalent	To qualify to take the examination, four years of verifiable experience in the vehicle engine performance area or those shown in the Education/ Training Requirements	◦ The function of the Act is to allow a person to inspect, repair and certify the emission control systems on vehicles subject to the Basic Area Smog Check Program ◦ Validity of the licence is 2 years

Table 2A(7): Further Information on Smog Check Technician Licence (Mandatory) (Cont'd)					
Level/Grade	Certification Category (✓ if related to emissions)	Education/ Training Requirement	Equivalent Local Education/ Training Levels	Experience Requirement	Remark
Advanced emission specialist technician	Nil (✓)	The applicant must provide proof of one of the following certificate:- ◦ certificate (or a passing score) from the National Institute for Automotive Service Excellence in the certification categories of Electrical/Electronic System (A6) and Engine Performance (A8) and Advanced Engine Performance Specialist (L1); or ◦ completion of training course(s) approved by BAR. An applicant for an initial or renewal licence must provide proof of successful completion of BAR-certified update training course. Update training courses provide training on new automotive technology that affects emission tests an/or repairs. Update training course may be up to 20 hours. To qualify to take the examination, the applicant must provide proof of one of the following requirements:- ◦ successful completion of BAR's Advanced Clean Car Course, possession of a current Intern Technician licence and one year of verifiable experience in the vehicle engine performance area completed after obtaining the Intern Technician licence; or ◦ successful completion of BAR's Advanced Clean Car Course and possession of an Associate of Arts or Associate of Science degree in Automotive Technology from a state accredited or recognized college, public school or trade school; or ◦ successful completion of BAR's Advanced Clean Car Course and possession of a certificate in Automotive Technology from a state accredited or recognized college, public school or trade school. Coursework must be a minimum of 360 hrs in the engine performance area; or ◦ possession of a valid Smog Check Technician's licence other than an Intern Technician licence.	No equivalent	To qualify to take the examination, four years of verifiable experience in the vehicle engine performance area or those shown in the Education/ Training Requirements	◦ The function of the Act is to allow a person to inspect, repair and certify the emission control systems on vehicles subject to the Enhanced Area Smog Check Program ◦ Validity of the licence is 2 years

Table 2A(8): Further Information on Mechanic Trainee and Specialty Mechanic Licences (Mandatory)

Country: USA (Michigan)

Certification Body: Department of States

Relevant Legislation: Motor Vehicle Service and Repair Act (Act 300 of 1974) – Bureau of Automotive Regulation

Penalty: Any person, agent, or employee of a registrant under this act who knowingly violates this act is guilty of a misdemeanor, punishable by imprisonment for not more than 90 days or a fine of not more than US$1,000, or both, for the first conviction under this act and not more than 1 year or a fine of not more than US$5,000, or both, for any subsequent conviction.

Reference: Ref. 2A(8)-a

Level/Grade	Certification Category (✓ if related to emissions)	Education/ Training Requirement	Equivalent Local Education/ Training Levels	Experience Requirement	Remark
Mechanic trainee	<u>Automobile and light truck repair categories</u> 1. Engine repair (✓) 2. Engine tune-up/performance (✓) 3. Front end, suspension & steering systems 4. Brakes & braking systems 5. Automatic transmission 6. Manual transmission and rear axles 7. Electrical systems 8. Heating and air conditioning 9. Collision-related mechanical repair 10. Unitized body structural repair <u>Heavy-duty truck repair categories</u> 1. Engine repair – gasoline (✓) 2. Engine repair – diesel (✓) 3. Drive train 4. Brakes & braking systems 5. Suspension & steering systems 6. Electrical systems 7. Collision-related mechanical repair <u>Repair categories for other on-road vehicles</u> 1. Motorcycle (✓) 2. Recreational trailer (✓)	Nil	No equivalent level	Nil	◦ The function of the Act is to allow a person who desires to become a motor vehicle mechanic, a specialty mechanic, or a master mechanic and receives a permit from the administrator ◦ Validity of the permit is 2 years ◦ Must work under the direct supervision of a certified specialty or master mechanic

Table 2A(8): Further Information on Mechanic Trainee and Specialty Mechanic Licences (Mandatory) (Cont'd)					
Level/Grade	Certification Category (✓ if related to emissions)	Education/ Training Requirement	Equivalent Local Education/ Training Levels	Experience Requirement	Remark
Specialty mechanic	<u>Automobile and light truck repair categories</u> 1. Engine repair (✓) 2. Engine tune-up/performance (✓) 3. Front end, suspension & steering systems 4. Brakes & braking systems 5. Automatic transmission 6. Manual transmission and rear axles 7. Electrical systems 8. Heating and air conditioning 9. Collision-related mechanical repair 10. Unitized body structural repair <u>Heavy-duty truck repair categories</u> 1. Engine repair – gasoline (✓) 2. Engine repair – diesel (✓) 3. Drive train 4. Brakes & braking systems 5. Suspension & steering systems 6. Electrical systems 7. Collision-related mechanical repair <u>Repair categories for other on-road vehicles</u> 1. Motorcycle (✓) 2. Recreational trailer (✓)	Must pass a test for the repair category in which you want certification	No equivalent level	Nil	◦ The function of the Act is to allow a person to perform vehicle repair of a specific category
Master automobile mechanic	Master automobile mechanic (✓)	Pass all of the first 8 categories of "Automobile and light truck repair"	Trade test	Nil	◦ The function of the Act is to allow a person to perform vehicle repair of all of the specific repair categories
Master heavy-duty truck mechanic	Master heavy-duty truck mechanic (✓)	Pass all of the first 6 categories of "heavy-duty truck repair"	As above	Nil	

Table 2A(9): Further Information on 廣東省深圳市汽車維修工人等級及持証上崗規定 (Mandatory)					
Country:	中華人民共和国				
Certification Body:	工人等級考核 - 勞動部 持証上崗 - 深圳市運輸局				
Relevant Legislation:	(a) 交通部, 國家經委, 國家工商行政管理局關於<<汽車維修行業管理暫行辦法>>的聯合通知 ((86) 交公路字 956 号) (b) <<深圳經濟特區汽車摩托車維修行業管理暫行規定>> (c) <中華人民共和國工人技術等級標準> - 交通行業工人技術等級標准, 公路運輸與公路養护汽車維修工 (JT/T 27.18-93 到 JT/T27.40-93) (d) <<深圳市汽車維修從業人員崗位培訓與考核工作管理暫行規定>> (e) <<深圳市汽車維修業開業技术條件審查辦法(試行)>> (f) 關于實施<<深圳市汽車維修業開業技术條件審查辦法(試行)>> 的補充通知 (g) 中華人民共和国國家標准 - 汽車維修業開業條件 (GB/T 16739.1~16739.3-1997)				
Penalty:	維修業戶僱用未經審核的技术工人, 處以 2000 元以下罰款				
Reference:	Ref. 2A(9)-a to Ref. 2A(9)-f				
Level/Grade	Certification Category (✓ if related to emissions)	Education/ Training Requirement	Equivalent Local Education/ Training Levels	Experience Requirement	Remark
初級技工	汽車維修工 (✓)	熟悉汽車一般構造、總成修理標准和工藝規程; 看懂簡單零件圖; 能使用机具、儀表; 獨立完成一、二級維护和一般小修作業; 排除一般故障 (a) 單憑經驗; or (b) 正規初級工培訓 各級技工需經深圳市運輸局委托之汽車維修業從業人員崗位培訓機構訓練及考核(理論試及實操試), 考試及格取得<<崗位証書>>,持証上崗	Trade test	技術要求如左列 (a) 2 to 3 (b) No	參考<中華人民共和國工人技術等級標準> - 交通行業工人技術等級標准, 公路運輸與公路養护汽車維修工 (JT/T 27.18-93)
	汽車發動機維修工	初、中、高級技工技術要求詳列於中華人民共和國工人技術等級標准 JT/T 27.19-93 技工持証上崗及學歷要求同上	同上	同上	

Table 2A(9): Further Information on 廣東省深圳市汽車維修工人等級及持証上崗規定 (Mandatory) (Cont'd)					
Level/Grade	Certification Category (✓ if related to emissions)	Education/ Training Requirement	Equivalent Local Education/ Training Levels	Experience Requirement	Remark
初級技工(續)	汽車底盤機維修工 (✓)	初、中、高級技工技術要求詳列於中華人民共和國工人技術等級標准 JT/T 27.20-93 技工持証上崗及學歷要求同上	同上	同上	
	汽車維修檢驗工 (✓)	初、中、高級技工技術要求詳列於中華人民共和國工人技術等級標准 JT/T 27.21-93 技工持証上崗及學歷要求同上	同上	同上	
	汽車維修電工	初、中、高級技工技術要求詳列於中華人民共和國工人技術等級標准 JT/T 27.22-93 技工持証上崗及學歷要求同上	同上	同上	
	汽車維修漆工	初、中、高級技工技術要求詳列於中華人民共和國工人技術等級標准 JT/T 27.23-93 技工持証上崗及學歷要求同上	同上	同上	
	汽車維修輪胎工	初、中、高級技工技術要求詳列於中華人民共和國工人技術等級標准 JT/T 27.24-93 技工持証上崗及學歷要求同上	同上	同上	
	汽車維修鈑金工	初、中、高級技工技術要求詳列於中華人民共和國工人技術等級標准 JT/T 27.25-93 技工持証上崗及學歷要求同上	同上	同上	
	汽車維修鐵工	初、中、高級技工技術要求詳列於中華人民共和國工人技術等級標准 JT/T 27.26-93 技工持証上崗及學歷要求同上	同上	同上	

Table 2A(9): Further Information on 廣東省深圳市汽車維修工人等級及持証上崗規定 (Mandatory) (Cont'd)					
Level/Grade	Certification Category (✓ if related to emissions)	Education/ Training Requirement	Equivalent Local Education/ Training Levels	Experience Requirement	Remark
初級技工(續)	汽車維修焊工	初、中、高級技工技術要求詳列於中華人民共和國工人技術等級標准 JT/T 27.27-93 技工持証上崗及學歷要求同上	同上	同上	
	汽車維修鉗工	初、中、高級技工技術要求詳列於中華人民共和國工人技術等級標准 JT/T 27.28-93 技工持証上崗及學歷要求同上	同上	同上	
	汽車維修散熱器工	初、中、高級技工技術要求詳列於中華人民共和國工人技術等級標准 JT/T 27.29-93 技工持証上崗及學歷要求同上	同上	同上	
	汽車噴油泵調試工	初、中、高級技工技術要求詳列於中華人民共和國工人技術等級標准 JT/T 27.30-93 技工持証上崗及學歷要求同上	同上	同上	
	汽車液壓裝置維修工	初、中、高級技工技術要求詳列於中華人民共和國工人技術等級標准 JT/T 27.31-93 技工持証上崗及學歷要求同上	同上	同上	
	汽車維修鏜磨工	初、中、高級技工技術要求詳列於中華人民共和國工人技術等級標准 JT/T 27.32-93 技工持証上崗及學歷要求同上	同上	同上	
	汽車維修木工	初、中、高級技工技術要求詳列於中華人民共和國工人技術等級標准 JT/T 27.33-93 技工持証上崗及學歷要求同上	同上	同上	

Table 2A(9): Further Information on 廣東省深圳市汽車維修工人等級及持証上崗規定 (Mandatory) (Cont'd)					
Level/Grade	Certification Category (✓ if related to emissions)	Education/ Training Requirement	Equivalent Local Education/ Training Levels	Experience Requirement	Remark
初級技工(續)	汽車空調維修工 (✓)	初、中、高級技工技術要求詳列於中華人民共和國工人技術等級標准 JT/T 27.34-93 技工持証上崗及學歷要求同上	同上	同上	
	汽車蓄電池維修工	初、中、高級技工技術要求詳列於中華人民共和國工人技術等級標准 JT/T 27.35-93 技工持証上崗及學歷要求同上	同上	同上	
	汽車維修縫工	初、中、高級技工技術要求詳列於中華人民共和國工人技術等級標准 JT/T 27.36-93 技工持証上崗及學歷要求同上	同上	同上	
	汽車維修粘接工	初、中、高級技工技術要求詳列於中華人民共和國工人技術等級標准 JT/T 27.37-93 技工持証上崗及學歷要求同上	同上	同上	
	汽車維修材料工	初、中、高級技工技術要求詳列於中華人民共和國工人技術等級標准 JT/T 27.38-93 技工持証上崗及學歷要求同上	同上	同上	
	汽車零件清洗工	初、中、高級技工技術要求詳列於中華人民共和國工人技術等級標准 JT/T 27.39-93 技工持証上崗及學歷要求同上	同上	同上	
	汽車檢測工	初、中、高級技工技術要求詳列於中華人民共和國工人技術等級標准 JT/T 27.40-93 技工持証上崗及學歷要求同上	同上	同上	

Table 2A(9): Further Information on 廣東省深圳市汽車維修工人等級及持証上崗規定 (Mandatory) (Cont'd)					
Level/Grade	Certification Category (✓ if related to emissions)	Education/ Training Requirement	Equivalent Local Education/ Training Levels	Experience Requirement	Remark
中級技工	如初級技工分類	掌握汽車構造和工作原理；熟悉汽車大修標准、工藝規程和一般零件的修復方法，繪制簡單零件圖；能勝任汽車大修、基礎零件檢測，排除較復雜的故障 (a) 單憑經驗; or (b) 取得初級<技術等級証書>; or (c) 取得初級<技術等級証書>並經正規中級工培訓; or (d) 專業學校畢業并從事所學專業工作 各級技工需經深圳市運輸局委托之汽車維修業從業人員崗位培訓機構訓練及考核(理論試及實操試)，考試及格取得<<崗位証書>>,持証上崗	Trade test	技術要求如左列 (a) 5 (b) 2 (c) No (d) No	參考<中華人民共和國工人技術等級標準> - 交通行業工人技術等級標准，公路運輸與公路養 汽車維修工 (JT/T 27.18-93 至 JT/T 27.40-93)
高級技工	如初級技工分類	掌握新型汽車構造和工作原理及用五輪儀進行道路試驗的方法；能勝任兩種以上車型大修，零件的改制代用，解 汽車修理中技術難題；指導初、中級工的技術培訓 (a) 單憑經驗; or (b) 取得中級<技術等級証書>; or (c) 取得中級<技術等級証書>並經正規高級工培訓 各級技工需經深圳市運輸局委托之汽車維修業從業人員崗位培訓機構訓練及考核(理論試及實操試)，考試及格取得<<崗位証書>>,持証上崗	同上	技術要求如左列 (a) 8 (b) 3 (c) No	參考<中華人民共和國工人技術等級標準> - 交通行業工人技術等級標准，公路運輸與公路養 汽車維修工 (JT/T 27.18-93 至 JT/T 27.40-93)

Table 2A(10): Further information on 台灣道路交通安全規則 (Mandatory)					
Territory: 台灣					
Certification Body: 交通部					
Relevant Legislation: 汽車修理業管理辦法					
Penalty: 汽車檢驗員若從事檢驗工作不依規定辦理等，可被停止工作三個月至十二個月，情節較重考可被檢控，吊消檢驗員資格					
Reference: Ref. 2A(10)-a to Ref.2A(10)-d					
Level/Grade	Certification Category (✓ if related to emissions)	Education/ Training Requirement	Equivalent Local Education/ Training Levels	Experience Requirement	Remark
丙級汽車修護技術士	丙級汽車修護技術士 (✓)	- 年滿十五歲或國民中學畢業者，得參加丙級技術士技能檢定 - 參加有危險性職業技能檢定者，須年滿十八歲	無	無	
乙級汽車修護技術士	乙級汽車修護技術士 (✓)	1. 取得應檢職類丙級技術士證 2. 取得應檢職類丙級技術士證後，接受職業訓練時數累計四百小時以上 3. 接受職業訓練時數累計八百小時以上 4. 接受職業訓練時數累計一千六百小時以上 5. 接受公共職業訓練機構養成訓練三千二百小時以上 6. 接受事業機構技術生訓練二年 7. 高級中學校畢業或在校最高級，並取得應檢職類丙級技術士證 8. 高級中學校畢業後，接受職業訓練時數累計一千六百小時以上 9. 五年制專科三年級以上學生、二年制及三年制專科、技術學院或大學之在校學生，並取得應檢職類丙級技術士證 10. 專科、技術學院或大學畢業或在校最高年級者 11. 單憑經驗	無	1. 從事應檢職類相關工作三年以上者 2. 從事應檢職類相關工作二年以上者 3. 從事應檢職類相關工作四年以上者 4. 從事應檢職類相關工作三年以上者 5. 無 6. 從事應檢職類相關工作二年以上者 7. 無 8. 從事應檢職類相關工作二年以上者 9. 無 10. 無 11. 從事應檢職類相關工作六年以上者	

Table 2A(10): Further information on 台灣道路交通安全規則 (Mandatory) (Cont'd)					
Level/Grade	Certification Category (✓ if related to emissions)	Education/ Training Requirement	Equivalent Local Education/ Training Levels	Experience Requirement	Remark
甲級汽車修護技術士	甲級汽車修護技術士 (✓)	1. 取得應檢職類乙級技術士證 2. 取得應檢職類乙級技術士證後，接受職業訓練時數累計一百二十小時以上 3. 高級中學校畢業，取得應檢職類乙級技術士證 4. 專科、技術學院或大學畢業，取得應檢職類乙級技術士證 5. 專科學校畢業 6. 大學院校畢業 7. 技術學院畢業 8. 單憑經驗，取得應檢職類乙級技術士證	無	1. 從事應檢職類相關工作五年以上者 2. 從事應檢職類相關工作四年以上者 3. 從事應檢職類相關工作四年以上者 4. 從事應檢職類相關工作二年以上者 5. 從事應檢職類相關工作六年以上者 6. 從事應檢職類相關工作四年以上者 7. 從事應檢職類相關工作三年以上者 8. 從事應檢職類相關工作十年以上者	
汽車修護技工	汽車修護技工 (✓)	1. 高中(職) 或相當高中(職) 之軍事以上學校之汽車、農机、重機械或機械科畢業者 2. 高中(職) 或相當高中(職) 之軍事以上學校非前目所列之科孚畢業 3. 領有丙級以上汽車修護技術士證 4. 接受政府立案之訓練機構辦理之汽車訓練累計一千六百小時以上 5. 單憑經驗	無	1. 無 2. 從事應檢職類相關工作一年以上者 3. 無 4. 從事應檢職類相關工作一年以上者 5. 從事應檢職類相關工作四年以上者	年滿十八歲

Table 2A(10): Further information on 台灣道路交通安全規則 (Mandatory) (Cont'd)					
Level/Grade	Certification Category (✓ if related to emissions)	Education/ Training Requirement	Equivalent Local Education/ Training Levels	Experience Requirement	Remark
汽車檢驗員	大型車	1. 高中(職) 或相當高中(職) 之軍事以上學校之汽車、農机、重機械或機械科畢業者 2. 高中(職) 或相當高中(職) 之軍事以上學校非前目所列之科學畢業, 並領有汽車修護技工執照或丙級以上汽車修護技術士證者 3. 領有汽車修護技工執照或丙級以上汽車修護技術士證一年以上者 4. 現(曾) 任公路監理机關委任或相當委任級以上之技術人員	無	無	年滿二十歲
	小型車	同上	同上	同上	
	機器腳踏車	同上	同上	同上	

Table 2B(1): Further Information on Canada – ASE Certified Technician (Voluntary)					
Country: Canada Certification Body: National Institute for Automotive Service Excellence Reference: Ref. 2B(1)-a to Ref. 2B(1)-b					
Level/Grade	Certification Category (✓ if related to emissions)	Education/ Training Requirement	Equivalent Local Education/ Training Levels	Experience Requirement	Remark
ASE-Certified Technician/ Machinist	1. Automobile /Light truck technicians (✓) 2. Medium/Heavy truck technicians (✓) 3. Medium/Heavy truck equipment technicians (✓) 4. Collision repair and refinishing technicians 5. Engine machinists 6. School bus technicians (✓) 7. Alternative fuels (✓) 8. Parts specialist	(a) hold a provincially established trade certification (b) by experience only (Note: passing any one test in any category will entitle registration in that category)	No equivalent level	(a) No (b) At least two years of hands-on relevant experience	Certificate valid for 5 years
ASE-Specialists Classification – Specialty Technician	Specialty Technician (✓)	(a) Pass the test of X1; and (b) Being certified in ASE Automobile Technician tests of A4 and A5	As above	2	As above
ASE-Certified Technician (Advanced Level)	Certified Technician (Advanced Level) (✓)	(a) Pass the test of L1 and being certified in ASE Automotive Technician test of A8; or (b) Pass the test of L2 and being certified in ASE tests Diesel Engine (T2) and Preventive Maintenance Inspection (T6) (or school bus version S2 and S6)	As above	2	As above

*List of Category (Supplement to Table 2B(1))

1. automobile/light truck technicians
   - (A1) engine repair
   - (A2) automatic transmission/transaxle
   - (A3) manual drive train and axles
   - (A4) suspension and steering
   - (A5) brakes
   - (A6) electrical/electronic systems
   - (A7) heating and air conditioning
   - (A8) engine performance
2. medium/heavy truck technicians
   - (T1) gasoline engines
   - (T2) diesel engines
   - (T3) drive train
   - (T4) brake
   - (T5) suspension & steering
   - (T6) electrical/electronic system
   - (T7) heating, ventilation, & A/C
   - (T8) preventive maintenance insp.
3. Medium/heavy truck equipment technicians
   - (E1) truck equip. installation and repair
   - (E2) electrical/electronic systems
   - (E3) auxiliary power systems installation and repair
4. collision repair and refinishing technicians
   - (B2) painting and refinishing
   - (B3) non-structural analysis & damage repair
   - (B4) structural analysis & damage repair
   - (B5) mechanical & electrical components
   - (B6) damage analysis and estimating
5. engine machinists
   - (M1G) cylinder head specialist (gasoline)
   - (M1D) cylinder head specialist (diesel)
   - (M2G) cylinder block specialist (gasoline)
   - (M2D) cylinder block specialist (diesel)
   - (M3G) assembly specialist (gasoline)
   - (M3D) assembly specialist (diesel)
6. school bus technicians
   - (S1) body system
   - (S2) diesel engines
   - (S3) drive train
   - (S4) brakes
   - (S5) suspension & steering
   - (S6) electrical/electronic systems
   - (S7) A/C systems and controls
7. alternative fuels
   - (F1) light vehicle compressed natural gas
8. specialty
   - (X1) exhaust systems
9. advanced level;
   - (L1) advanced auto engine performance
   - (L2) advanced truck elec. Diesel Eng. Diag.
10. parts specialist
    - (P1) medium/heavy truck dealership parts specialist
    - (P2) automobile parts specialist
    - (P3) medium/heavy truck aftermarket parts specialist
    - (P4) General motors parts consultant

Table 2B(2): Further Information on New Zealand –National Qualifications Framework (Voluntary)

Country: New Zealand

Certification Body: New Zealand Qualifications Authority

Reference: Ref. 2B(2)-a to Ref. 2B(2)-c

Level/Grade	Certification Category (✓ if related to emissions)	Education/ Training Requirement	Equivalent Local Education/ Training Levels	Experience Requirement	Remark
National Certificate in Motor Industry:	1. Automotive air conditioning 2. Automotive dismantling and recycling 3. Automotive electrical engineering 4. Automotive engineering (✓) 5. Automotive heavy engineering (✓) 6. Automotive machining 7. Automotive parts and accessories merchandising 8. Automotive radiator repair 9. Automotive refinishing 10. Automotive service reception 11. Automotive servicing 12. Automotive steering, suspension, and alignment 13. Automotive technical supervisionBrake service engineering 14. Diesel fuel injection engineering (✓) 15. Entry to automotive trades 16. Entry to motor body trades 17. Exhaust servicing (✓) 18. Motor trimming 19. Motor vehicle assembly 20. Motorcycle engineering (✓) 21. Outdoor power equipment servicing 22. Panelbeating 23. Service station sales 24. Trailer boat systems engineering (Level 3) (✓) 25. Trailer boat systems engineering (Level 4) (✓) 26. Tyre servicing 27. Vehicle grooming 28. Vehicle sales	1. Open 2. A car or a heavy vehicle driver licence and unit standard 6400 (manage first aid) 3. Open 4. Open 5. Open 6. Open 7. Open 8. Open 9. Open 10. Open 11. Open 12. Open 13. Any motor industry NZ trade certificate, or level 3 or above national certificate in Motor industry 14. Open 15. Open 16. Open 17. Open 18. Open 19. Open 20. Open 21. Open 22. Open 23. Open 24. Open 25. Open 26. National certificate in motor industry trailer boat systems engineering (Level 3) 27. Open 28. Open 29. Open	No equivalent level	No specified	

Table 2B(3): Further Information on British Engineering Qualification in Motor Industry (Voluntary)					
Country: UK Certification Body: Institute of Motor Industry Reference: Ref. 2B(3)-a to Ref. 2B(3)-b					
Level/Grade	Certification Category (✓ if related to emissions)	Education/ Training Requirement	Equivalent Local Education/ Training Levels	Experience Requirement	Remark
Certificated Automotive Engineer	Certificated Automotive Engineer (✓)	▫ require one of the vocational programs[1]	No equivalent level	3	Valid for 5 yrs. Produce evidence of education and training updating before a further five year period is granted
Licentiate Automotive Engineer	Licentiate Automotive Engineer (✓)	▫ require a supervisory qualification, a training & lead body qualification – D32 Assessor in the Workplace, have normally been a CAE for two yrs, or have at least 5 yrs's relevant experience, and require one of the vocational programs[2]	As above	2 to 5	Valid for 5 yrs. Produce evidence of education and training updating before a further five year period is granted

(1) LIST OF PROGRAMS

(Supplement to Table 2B(3))

UK-Light & Heavy Vehicles

- An appropriate NVQ/SVQ level 3, or
- The national craft certificate (NJC), or
- City & guild 381 part II (or previous equivalent city & guilds courses) or BTEC national certificate or SCOTVEXC equivalent qualification; plus success in approved skill assessments or joint certificated manufacturers programmes, or
- City & guides 383 level III; plus confirmation of competence within industry, or
- RAF no.4 school of technical training – MT technician, or

UK-Motor Cycle

- An appropriate NVQ Level 3, or
- The national craft certificate (NJC), or
- City & guild 389.1 (or previous equivalent city & guilds courses) or BTEC national certificate or SCOTVEXC equivalent qualification; plus success in approved skill assessments or joint certificated manufacturers programmes, or
- City & guides 389-7 level III; plus confirmation of competence within industry, or

UK-Body Repair, Body Building, Painting & Trimming

- An appropriate NVQ Level 3, or
- The national craft certificate (NJC), or
- City & guild 385 part II (or previous equivalent city & guilds courses) or BTEC national certificate or SCOTVEXC equivalent qualification; plus success in approved skill assessments or joint certificated manufacturers programmes or
- City & guides 398 level III; plus confirmation of competence within industry, or

Ireland-Light & Heavy Vehicles

- The national craft certificate (NJC), or
- The junior & senior department of education group trade certificate in motor engineering, or
- Cork regional technical college diploma in automobile engineering, or

Canada-Light & heavy Vehicles

- The Alberta province motor mechanical apprentice & trade certificate

(2) LIST OF PROGRAMS (CONT'D) (Supplement to Table 2B(3))

UK-Light & Heavy Vehicles

- The qualifications required for a city & guilds full tech cert (FTC) or licentiateship (LCGI) in motor vehicle. With some form of recognized technician training (this could be an institute joint certificated manufacturers' programme, or
- BTEC higher national certificate (HNC) or diploma (HND) in motor vehicle, plus some form of recognized technician training (this could be an institute joint certificated manufacturers' programme, or
- SCOTVEXC higher national certificate (HNC) or diploma (HND) in motor vehicle, plus some form of recognized technician training (this could be an institute joint certificated manufacturers' programme, or
- The institute programme, or

UK-Motor Cycle

- The qualifications required for a city & guilds full tech cert (FTC) or licentiateship (LCGI) in motor cycle. With some form of recognized technician training (this could be an institute joint certificated manufacturers' programme, or
- BTEC higher national certificate (HNC) or diploma (HND) in motor cycle, plus some form of recognized technician training (this could be an institute joint certificated manufacturers' programme, or
- SCOTVEXC higher national certificate (HNC) or diploma (HND) in motor cycle, plus some form of recognized technician training (this could be an institute joint certificated manufacturers' programme, or

UK-Body Repair, Body Building, Painting & Trimming

- The qualifications required for a city & guilds full tech cert (FTC) or licentiateship (LCGI) in motor body. With some form of recognized technician training (this could be an institute joint certificated manufacturers' programme, or
- BTEC higher national certificate (HNC) or diploma (HND) in motor body, plus some form of recognized technician training (this could be an institute joint certificated manufacturers' programme, or
- SCOTVEXC higher national certificate (HNC) or diploma (HND) in motor body, plus some form of recognized technician training (this could be an institute joint certificated manufacturers' programme, or

Ireland-Light & Heavy Vehicles

- Intermediate and advanced department of education technological certificate in motor engineering, or
- *Dublin college of technology diploma in motor vehicle*

Table 2B(4): Further Information on Blue Seal of Excellence (Voluntary)					
Country: USA (Federal) Certification Body: National Institute for Automotive Service Excellence Reference: Ref. 2B(4)-a to Ref. 2B(4)-b					
Level/Grade	Certification Category (✓ if related to emissions)	Education/ Training Requirement	Equivalent Local Education/ Training Levels	Experience Requirement	Remark
ASE-certified technician/machinist	1. Automobile/Light truck technicians (✓) 2. Medium/Heavy truck technicians (✓) 3. Medium/Heavy truck equipment technician 4. Collision repair and refinishing technicians 5. Engine machinists 6. School bus technicians (✓)	(a) by experience only (Note: passing any one test in any category will entitle registration in that category)	No equivalent level	At least 2 year s of hands-on relevant experience	Certificate valid for 5 years
ASE-certified master technician/machinist	Same as above	◦ pass all the tests of item 1 (i.e. A1-A8); or ◦ pass T1/T2 and T3 to T8 tests of item 2; or ◦ pass all the tests of item 3 (i.e. E1-E3); or ◦ pass all the tests of item 4 (i.e. B2-B5); or ◦ pass all the tests of item 5 (i.e. M1G-M3G or M1D-M3D); or ◦ pass all the tests of item 6 (i.e. S1-S6)	As above	No	As above
ASE specialist classification – undercar specialist	Specialty in exhaust system (✓)	◦ pass the test of exhaust system (X1); and ◦ being certified in ASE automobile technician tests of A4 and A5	As above	As above	As above
ASE-certified technician (Advanced Level)	ASE-certified technician (Advanced Level) (✓)	◦ pass the test of automobile advanced engine performance specialist (L1) and being certified in ASE automotive technician test of A8; or ◦ pass the test of med/hvy vehicle electronic diesel engine diagnosis specialist (L2) and being certified in ASE tests of T2 & T6 (or S2 & S6)	As above	As above	As above

Table 2B(4): Further Information on Blue Seal of Excellence (Voluntary) (Cont'd)					
Level/Grade	Certification Category (✓ if related to emissions)	Education/ Training Requirement	Equivalent Local Education/ Training Levels	Experience Requirement	Remark
ASE-certified technician (Alternative Fuel)	Certified technician (Alternative Fuel) (✓)	Pass the test of F1	As above	At least 2 year s of hands-on relevant experience	As above
ASE-certified parts specialist	Certified parts specialist	◦ pass the test of med/hvy truck dealership parts specialist (P1); or ◦ pass the test of automobile parts specialist (P2); or ◦ pass the test of med/hvy truck aftermarket parts specialist (P3); or ◦ pass the test of general motor parts consultant (P4)	As above	At least 2 year s of hands-on relevant experience as a parts specialist	Experience as a repair technician or service writer does not satisfy the hands-on requirement for parts specialist certification

* **LIST OF TESTS** (Supplement to Table 2B(4))

1. automobile/light truck technicians
   - (A1) engine repair
   - (A2) automatic transmission/transaxle
   - (A3) manual drive train and axles
   - (A4) suspension and steering
   - (A5) brakes
   - (A6) electrical/electronic systems
   - (A7) heating and air conditioning
   - (A8) engine performance
2. medium/heavy truck technicians
   - (T1) gasoline engines
   - (T2) diesel engines
   - (T3) drive train
   - (T4) brake
   - (T5) suspension & steering
   - (T6) electrical/electronic system
   - (T7) heating, ventilation, & A/C
   - (T8) preventive maintenance insp.
3. Medium/heavy truck equipment technicians
   - (E1) truck equip. installation and repair
   - (E2) electrical/electronic systems
   - (E3) auxiliary power systems installation and repair
4. collision repair and refinishing technicians
   - (B2) painting and refinishing
   - (B3) non-structural analysis & damage repair
   - (B4) structural analysis & damage repair
   - (B5) mechanical & electrical components
   - (B6) damage analysis and estimating
5. engine machinists
   - (M1G) cylinder head specialist (gasoline)
   - (M1D) cylinder head specialist (diesel)
   - (M2G) cylinder block specialist (gasoline)
   - (M2D) cylinder block specialist (diesel)
   - (M3G) assembly specialist (gasoline)
   - (M3D) assembly specialist (diesel)
6. school bus technicians
   - (S1) body system
   - (S2) diesel engines
   - (S3) drive train
   - (S4) brakes
   - (S5) suspension & steering
   - (S6) electrical/electronic systems
   - (S7) A/C systems and controls
7. alternative fuels
   - (F1) light vehicle compressed natural gas
8. specialty
   - (X1) exhaust systems
9. advanced level;
   - (L1) advanced auto engine performance
   - (L2) advanced truck elec. Diesel Eng. Diag.
10. parts specialist
    - (P1) medium/heavy truck dealership parts specialist
    - (P2) automobile parts specialist
    - (P3) medium/heavy truck aftermarket parts specialist
    - (P4) General motors parts consultant

Table 2B(5): Further Information on Institute of Road Transport Engineers Certification Scheme (IRTEC) (Voluntary)					
Country: UK Certification Body: Institute of Road Transport Engineers (IRTE) Reference: Ref. 2B(5)-a					
Level/Grade	Certification Category (✓ if related to emissions)	Education/ Training Requirement	Equivalent Local Education/ Training Levels	Experience Requirement	Remark
Competence of personnel in the Maintenance Repair and Inspection of Road Vehicles (Bus and Coach)	Transmission Systems (✓)	Candidates are required to possess a minimum entry requirement of an S/NVQ at level 2 (or equivalent) in the sector in which the candidate is seeking assessment.	No equivalent	N/A	
	Braking Systems	As above	As above	As above	
	Suspension	As above	As above	As above	
	Steering	As above	As above	As above	
	Inspection and Public Safety	As above	As above	As above	

N/A – information not available

Table 2C(1) – Further Information on NSW Motor Vehicle Repairers Licence (Mandatory)

Country:	Australia
Relevant Legislation:	(a) Motor Vehicle Repairs Act (b) Motor Vehicle Repairs Regulation
Penalty:	(a) A person shall not carry on the business trade of vehicle repair unless he is the holder of a licence in respect of a class of repair work that includes that repair work. Otherwise, he will be guilty of an offence liable to a fine of 20 penalty units (i.e. A$2,200) (b)If a licensed repairer conduct his vehicle repair business below the usual trade standards, etc., he may be cautioned or reprimanded, or his licence may be suspended or revoked
Reference:	Ref. 2C(1)-a to Ref. 2C(1)-e

Registration Requirement							Remark
Classes	Size	Equipment	Qualified Personnel	Document keeping	Warranty	Others	
◦ Brake mechanic ◦ Exhaust repairer ◦ Front end specialist ◦ Transmission specialist ◦ Motor cycle mechanic ◦ LPG mechanic ◦ Air-conditioning ◦ Automotive electrician ◦ Motor mechanic ◦ Panel beater ◦ Painter tradesman ◦ Body maker	Nil	Each class of repairer has its own specific equipment requirement. A full list is attached in Ref. 2C(1)-d.	Vehicle mechanics must hold tradesman's certificate in the class of repair they intend to undertake or be apprentice.	The repairer must complete and keep records of traceable parts in writing or by means of data processing equipment. For details please refer to Ref. 2C(1)-c.	Nil	The repairer should have sufficient materials, manpower and financial resources to carry on business	Further detail in Ref. 2C(1)-a, 2C(1)-c, 2C(1)-d and 2C(1)-e

Table 2C(2) – Further Information on RDW (Ministry of Transport in Netherland) Certification of Vehicle Garages (Mandatory)							
Country:	Netherland						
Relevant Legislation:	N/A						
Penalty:	N/A						
Reference:	Ref. 2C(2)-a						
Registration Requirement							Remark
Classes	Size	Equipment	Qualified Personnel	Document keeping	Warranty	Others	
Certification to fit Liquid Petroleum Gas (LPG) installation	N/A	Exhaust gas testing equipment must be inspected and certified	Diploma level of LPG mechanics	An approved installation must be reported to RDW	N/A	N/A	Certified to install equipment allowing vehicles to run on LPG
Certification permitting maintenance of a commercial stock	N/A	N/A	N/A	N/A	N/A	• Have one or more business premises to keep commercial stock • A suitable secure location to store documents	Certified to maintain a commercial stock, allow to include vehicles in an commercial stock and entitle to issue liability release certificates
Certification for installation of tachographs	N/A	N/A	The operator should have participated in the required course on tachographs installation	An tachograph installation must be report to RDW	N/A	N/A	Certified to install, examine and repair of tachographs
Certification for installation of speed limiters	N/A	N/A	The operator should have participated in the required course on speed limiters installation	A speed limiter installation must be report to RDW	N/A	N/A	Certified to install, examine and repair speed limiters

N/A – information not available

Table 2C(3) – Further Information on Registration of Vehicle Garages in Spain (Mandatory)

Country: Spain

Relevant Legislation: Servicio Postventa Talleres De Reparacion – Reparacion De Automoviles

Penalty:
(a) Slight infraction, up to 500,000 pesetas
(b) Serious infraction, up to 2,500,000 pesetas
(c) Very serious infraction, up to 100,000,000 pesetas and suspension of registration for a maximum term of five years

Reference: Ref. 2C(3)-a

	Registration Requirement						Remark
Classes	Size	Equipment	Qualified Personnel	Document keeping	Warranty	Others	
Mechanic repair	N/A	Equipment requirement is stipulated in Annex I of the regulation	N/A	N/A	Three months or 2,000 kilo meters. But for industrial vehicles, 15 days or 2,000 kilometers	N/A	
Electricity repair	As above	As above	As above	As above	As above	As above	
Bodies repair	As above	As above	As above	As above	As above	As above	
Painting	As above	As above	As above	As above	As above	As above	
Motorcycles repair	As above	As above	As above	As above	As above	As above	
Specialty – repair of tyres	As above	As above	As above	As above	As above	As above	
Specialty – repair of radiators	As above	As above	Aa above	As above	As above	As above	

N/A – information not available

Table 2C(4) – Further Information on Registration of Vehicle Garages in Florida (Mandatory)

Country: USA

Relevant Legislation: Florida Motor Vehicle Repair Act

Penalty:
(a) Imposing an administrative fine not to exceed $1,000 per violation for each act which constitutes a violation of the act.
(b) Revoking or suspending a registration
(c) Placing the registration n probation for a period of time, subject to such conditions as the Authority may specify.

Reference: Ref. 2C(4)-a

Registration Requirement							Remark
Classes	Size	Equipment	Qualified Personnel	Document keeping	Warranty	Others	
No	N/A	N/A	N/A	Repair records which shall include written repair estimates and repair invoices	N/A	N/A	

N/A – information not available

Table 2C(5) – Further Information on Registration of Vehicle Garages in Georgia (Mandatory)							
Country:	USA						
Relevant Legislation:	Motor Vehicle Repair Act						
Penalty:	The administrator may enforce the provisions by imposing administrative fines not to exceed $1,000 per violation or by taking action to suspend or revoke the registration of a motor vehicle repair shop						
Reference:	Ref. 2C(5)-a						
Registration Requirement							Remark
Classes	Size	Equipment	Qualified Personnel	Document keeping	Warranty	Others	
No	N/A	N/A	N/A	Repair records which shall include written repair estimates and repair invoices	N/A	N/A	

N/A – information not available

Table 2C(6) – Further Information on Registration of Vehicle Garages in Michigan (Mandatory)

Country: USA

Relevant Legislation: Motor Vehicle Service and Repair Act

Penalty:

(a) The administrator may deny, suspend, or revoke the registration if the facility infringes the provisions of the Act.

(b) A facility that violates the Act or who, in a course of dealing as set forth in the Act, engages in an unfair or deceptive method, act, or practice, is liable as provided in the Act to a person who suffers damage or injury as a result thereof in an amount equal to the damages plus reasonable attorney fees and costs. If the damage or injury to the person occurs as the result of a wilful and flagrant violation of the Act, the person shall recover double the damages plus reasonable attorney fees and costs.

(c) Any person, agent, or employee of a registrant under the Act who knowingly violates the Act is guilty of a misdemeanor, punishable by imprisonment for not more than 90 days or a fine of not more than $1,000 or both, for the first conviction under the Act and not more than 1 year or a fine of not more than $5,000 or both, for any subsequent conviction.

Reference: Ref. 2C(6)-a

Registration Requirement							Remark
Classes	Size	Equipment	Qualified Personnel	Document keeping	Warranty	Others	
No	N/A	N/A	N/A	◦ A facility shall maintain reasonable records as required by rules for not less than 5 years. ◦ A facility that engages in vehicle body work shall maintain records in a form prescribed by the administrator. The records shall contain the date of purchase or acquisition of each distressed vehicle, a description of the vehicle, and the name and address of the person from whom the vehicle was acquired. If the vehicle is sold, the record shall contain the date of sale and the name and address of the purchaser.	N/A	N/A	

N/A – information not available

Table 2C(7) – Further Information on 廣東省深圳市汽車維修業戶註冊 (Mandatory)

Country: 中華人民共和国

Relevant Legislation:
(a) 交通部, 國家經委, 國家工商行政管理局關於<<汽車維修行業管理暫行辦法>>的聯合通知 ((86) 交公路字 956 号)
(b) <<深圳經濟特區汽車摩托車維修行業管理暫行規定>>
(c) <中華人民共和國工人技術等級標準> - 交通行業工人技術等級標准, 公路運輸與公路養护汽車維修工 (JT/T 27.18-93 到 JT/T27.40-93)
(d) <<深圳市汽車維修從業人員崗位培訓與考核工作管理暫行規定>>
(e) <<深圳市汽車維修業開業技术條件審查辦法(試行)>>
(f) 關于實施<<深圳市汽車維修業開業技术條件審查辦法(試行)>> 的補充通知
(g) 中華人民共和国國家標准 - 汽車維修業開業條件 (GB/T 16739.1~16739.3-1997)

Penalty:
(a) 未取得<技術審查合格証>而經營汽車維修業務, 責令立即停止營業, 并可處以 2000 元以內罰款
(b) 超越維修技術等汲、類別而違章作業的, 每次 500-2000 元以內罰款
(c) 聘用未經立管部門審核的技術人員, 處從 2000 元以下罰款
(d) 不符合技術要求的維修業戶, 吊扣其<技術審查合格証>

Reference: Ref. 2C(7)-a to Ref. 2C(7)-c

Registration Requirement							Remark
Classes	Size	Equipment	Qualified Personnel	Document keeping	Warranty	Others	
一類汽車維修業戶(即汽車大修、總成大修)	使用框架結構正規廠房,面積不少於 1200 平方米,停車場面積不少於 300 平方米,舖水泥地面,要與廢油回收單位簽定回收合同	設備要求詳列中華人民共和国國家標准 - 汽車維修業開業條件 (GB/T 16739.1-1997 第 4 節)	各工種技術人員要求詳列中華人民共和国國家標准 - 汽車維修業開業條件 (GB/T 16739.1-1997 第 6 節)	◦ 進廠檢驗單、過程檢驗單、竣工檢驗單、維修合同文本和出廠合格証等 ◦ 所有登記資料必須保留三年)	1000 公里或 90 天內	◦ 經營地點應盡量選擇現有的工業區或工業開發區. ◦ 經營場斫周邊 300 米內應無學校,醫院,幼兒院,圖書館或其他文化設施,100 米內應無居民住宅.應遠離政府辦公家機關,社會公衆場所和市區主要街道.1000 米內無經營同類項目的業戶 ◦ 設置廢油回收設備及污水處理與吸塵設備配備,汽車排氣污染檢測設備(汽油柴油),員工全部持証上崗.廠長經理須具有執業資格証明.	

Table 2C(7) – Further Information on 廣東省深圳市汽車維修業戶註冊 (Mandatory) (Cont'd)							
Registration Requirement							Remark
Classes	Size	Equipment	Qualified Personnel	Document keeping	Warranty	Others	
二類維修企業 (即汽車維　及小修)	使用框架結構正規廠房,面積不少於 600 平方米,停車面積不少於 300 平方米,舖水泥地面,要與廢油回收單位簽定回收合同.	設備要求詳列中華人民共和　國家標准 - 汽車維修業開業條件 (GB/T 16739.2-1997 第 4 節)	各工種技術人員要求詳列中華人民共和　國家標准 - 汽車維修業開業條件 (GB/T 16739.2-1997 第 6 節)	同上	1000 公里或 3 天內	◦ 經營地點應盡量選擇現有的工業區或工業開發區. ◦ 經營　所周邊 300 米內應無學校,醫院,幼兒院,圖書館或其他文化設施,100 米內應無居民住宅.應遠離政府辦公家機關,社會公　　所和市區主要街道.1000 米內無經營同類項目的業戶. ◦ 設置廢油回收設備及污水處理與吸塵設備配備,汽車排氣污染檢測設備(汽油柴油),員工全部持証上崗.廠長經理須具有執業資格証明.	
三類維修企業(即汽車專項修理,含汽車一級維　)	使用框架結構工業廠房或商業用建築,面積不少於 150 平方米,停車　面積不少於 50 平方米,舖水泥地面	設備要求詳列中華人民共和　國家標准 - 汽車維修業開業條件 (GB/T 16739.3-1997 第 4 節)	各工種技術人員要求詳列中華人民共和　國家標准 - 汽車維修業開業條件 (GB/T 16739.3-1997 第 4 節)	無	200 公里或 1 天內	◦ 經營地點應盡量選擇現有的工業區或工業開發區. ◦ 200 米內應無學校,醫院,幼兒院,圖書館或其他文化設施,100 米內無居民住宅.應遠離政府辦公家機關,社會公　　所和市區主要街道. ◦ 設置廢油回收設備和污水處理與及降噪設施,員工全部持証上崗.廠長經理須具有執業資格証明.	註 1

註 1:

車身清潔維修(汽車美容)

- 經營地點應選擇現有的工業廠房或商業用建築.生產廠房和停車　的結構設施必須滿足修理作業的要求,並符合環境保護,衛生和消防安全等有關規定.
- 經營地點應盡量選擇現有的工業區或工業開發區.
- 1000 米內無經營同類項目的業戶(工業區內此限制距離爲 300 米)
- 設置廢油回收設備和污水處理與及降噪設施,員工全部持証上崗.廠長經理須具有執業資格証明.

汽車四輪定位汽車維修(行業試點項目)

- 經營地點應選擇現有的工業廠房或商業用建築.生產廠房和停車　的結構設施必須滿足修理作業的要求,並符合環境保護,衛生和消防安全等有關規定.
- 經營地點應盡量選擇現有的工業區或工業開發區.
- 特區內經營網點碼限制距離爲 3000 米, 區外爲 2000 米.
- 設置廢油回收設備和污水處理與及降噪設施,員工全部持証上崗.廠長經理須具有執業資格証明.

其他汽車維項修理項目

- 經營地點應選擇現有的工業廠房或商業用建築.生產廠房和停車　的結構設施必須滿足修理作業的要求,並符合環境保護,衛生和消防安全等有關規定.
- 經營地點應盡量選擇現有的工業區或工業開發區.
- 特區內經營網點碼限制距離爲 2000 米, 區外爲 1000 米.
- 設置廢油回收設備和污水處理與及降噪設施,員工全部持証上崗.廠長經理須具有執業資格証明.

Table 2C(8) – Further Information on 台灣汽車修理廠註冊 (Mandatory)

Territory: 台灣

Relevant Legislation: (a) 汽車修理業管理辦法 (經濟部工業局法令規劃)

Penalty: (a) 違反本辦法規定者，由各該主管機關依都市計劃法、區域計劃法、公司法、商業登記法、社會秩序維　法、建築法、消防法、行政執行法、道路交通管理處罰條例、空氣污染防治法、水污染防治法、噪音管制法、廢棄物清理法或其他有關法令處罰，涉及刑事責任者，並移送法辦。

Reference: Ref. 2C(8)-a

Registration Requirement							Remark
Classes	Size	Equipment	Qualified Personnel	Document keeping	Warranty	Others	
汽車保養所	70 平方公尺以上，　括: 1. 檢查位至少兩位，每位面積 32 平方公尺(4 公尺*12 公尺) 以上 2. 工具間至少一間，每間面積 12 平方公尺以上	設備要求詳列<汽車修理業管理辦法>附表	汽車修護技工或乙級以上技術士一人	主要材料及汽車保養紀錄簿，格式由警政機關訂定	無	1. 作業場所之設置應符合都市計劃、區域計劃法令規定 2. 汽車修理業設置基地，其入出口應臨接寬 8 公尺以上道路	
乙種汽車修理廠	144 平方公尺，　括: 1. 修車位至少兩位，每位面積 60 平方公尺(5 公尺*12 公尺) 以上 2. 引擎拆裝及機件加工廠房至少一間，每間面積 24 平方公尺以上	同上	汽車檢驗員一人及汽車修護技工或乙級以上技術士一人	同上	同上	同上	
甲種汽車修理廠	400 平方公尺，　括: 1. 修車位至少兩位，每位面積 60 平方公尺(5 公尺*12 公尺) 以上 2. 引擎拆裝及機件加工廠房至少一間，每間面積 24 平方公尺以上	同上	汽車檢驗員一人及汽車修護技工或乙級以上技術士二人		同上	同上	

Table 2C(9) – Further Information on Certification of Garages (Mandatory)

Territory: 日本

Relevant Legislation: 道路運送両法第 78 条

Penalty: Relevant information not available

Reference: Ref. 2C(9)-a

Registration Requirement							Remark
Classes	Size	Equipment	Qualified Personnel	Document keeping	Warranty	Others	
普通自動車(大型)	如附頁所示	如附頁所示	如附頁所示	N/A	N/A	N/A	
大型特殊/普通自動車(中型)	As above	As above	As above	N/A	N/A	N/A	
普通自動車(小型)	As above	As above	As above	N/A	N/A	N/A	
四輪/三輪小型自動車	As above	As above	As above	N/A	N/A	N/A	
二輪小型自動車	As above	As above	As above	N/A	N/A	N/A	
軽自動車	As above	As above	As above	N/A	N/A	N/A	

N/A – information not available

面積等の基準

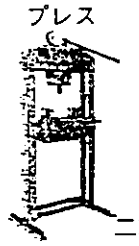
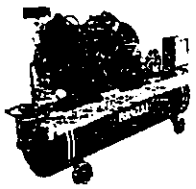
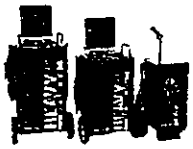
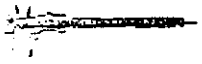
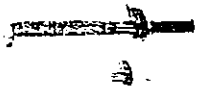
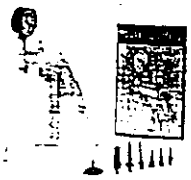
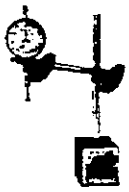
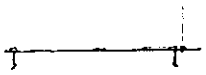
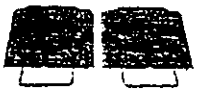
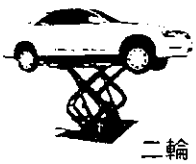
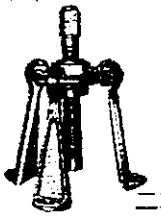
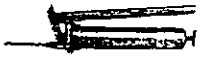
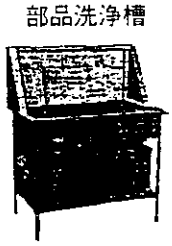
屋内作業場及び車両置場は、整備対象装置ごとに以下のように定められています。
なお、二種類以上の装置の分解整備を行う場合は、該当する種類ごとに定められた基準の全てに適合することが必要です。

事業の種類	分解整備の種類 対象とする自動車の種類	対象とする装置の種類	屋内作業場 車両整備作業場 間口	車両整備作業場 奥行	部品整備作業場	点検作業場 間口	点検作業場 奥行	車両置場	
普通自動車分解整備事業	普通自動車（大型） ・車両総重量8t以上 ・最大積載量5t以上 ・乗車定員30人以上	すべての装置	5m以上	13m以上	12㎡以上	5m以上	13m以上		
		原動機							
		動力伝達装置							
		走行装置							
		操縦装置	5m以上	12m以上	7㎡以上	5m以上	12m以上	3.5m以上	11m以上
		制動装置							
		緩衝装置							
		連結装置	3.5m以上	12.5m以上	7㎡以上	3.5m以上	12.5m以上		
		すべての装置	5m以上	10m以上	12㎡以上	5m以上	10m以上		
	大型特殊／普通自動車（中型） ・最大積載量2t超 ・乗車定員11人以上 ・上欄に掲げるものを除く	原動機							
		動力伝達装置							
		走行装置							
		操縦装置	5m以上	9m以上	7㎡以上	5m以上	9m以上	3.5m以上	8m以上
		制動装置							
		緩衝装置							
		連結装置	3.5m以上	9.5m以上	7㎡以上	3.5m以上	9.5m以上		
		すべての装置	4.5m以上	8m以上	10㎡以上	4.5m以上	8m以上		
	普通自動車（小型） ・貨物の運送に供するもの ・散水自動車 ・広告宣伝用自動車 ・豊旅自動車その他特種用途に供するもの ・二輪に掲げるものを除く	原動機							
		動力伝達装置							
		走行装置							
		操縦装置	4.5m以上	7m以上	6㎡以上	4.5m以上	7m以上	3m以上	6m以上
		制動装置							
		緩衝装置							
		連結装置	3m以上	7.5m以上	6㎡以上	3m以上	7.5m以上		
		すべての装置	4m以上	8m以上	8㎡以上	4m以上	8m以上		
小型自動車分解整備事業	普通自動車 ・上欄に掲げるものを除く 四輪の小型自動車 三輪の小型自動車	原動機							
		動力伝達装置							
		走行装置							
		操縦装置	4m以上	6m以上	5㎡以上	4m以上	6m以上	3m以上	5.5m以上
		制動装置							
		緩衝装置							
		連結装置	2.8m以上	6.5m以上	5㎡以上	2.8m以上	6.5m以上		
		すべての装置							
	二輪の小型自動車	原動機							
		動力伝達装置							
		走行装置	3m以上	3.5m以上	4㎡以上	3m以上	3.5m以上	2m以上	2.5m以上
		操縦装置							
		制動装置							
		緩衝装置							
		連結装置							
		すべての装置	3.5m以上	5m以上	6.5m以上	3.5m以上	5m以上		
軽自動車分解整備事業	軽自動車	原動機							
		動力伝達装置							
		走行装置							
		操縦装置	3.5m以上	4.4m以上	4.5m以上	3.5m以上	4.4m以上	2.5m以上	3.5m以上
		制動装置							
		緩衝装置							
		連結装置	2.5m以上	4.7m以上	4.5m以上	2.5m以上	4.7m以上		

2.設　備

設備の基準（対象とする装置ごとに必要な作業機械等）

原：原動機、動：動力伝達装置、走：走行装置、操：操縦装置、制：制動装置、緩：緩衝装置、連：連結装置の略号です。
○で囲んだ装置が分解整備事業に必要な作業機械となります。

プレス (原)(動)(走)(操)(制)(緩)(連)  二輪	エア・コンプレッサー (原)(動)(走)(操)(制)(緩)(連) 	チェーン・ブロック (原)(動)(走)(操)(制)(緩)(連)  二輪	ジャッキ (原)(動)(走)(操)(制)(緩)(連)  二輪	バイス (原)(動)(走)(操)(制)(緩)(連) 
充電器 (原)(動)(走)(操)(制)(緩)(連) 	ノギス (原)(動)(走)(操)(制)(緩)(連) 	トルク・レンチ (原)(動)(走)(操)(制)(緩)(連) 	サーキット・テスタ (原)(動)(走)(操)(制)(緩)(連) 	比重計 (原)(動)(走)(操)(制)(緩)(連) 
コンプレッション・ゲージ (原)(動)(走)(操)(制)(緩)(連) 	ハンディバキューム・ポンプ (原)(動)(走)(操)(制)(緩)(連) 	エンジン・タコ・テスタ (原)(動)(走)(操)(制)(緩)(連) 	ドエル・テスタ (原)(動)(走)(操)(制)(緩)(連)  ジ限定	タイミング・ライト (原)(動)(走)(操)(制)(緩)(連)  ジ限定
ノズル・テスタ (原)(動)(走)(操)(制)(緩)(連)  ガ限定	シックネス・ゲージ (原)(動)(走)(操)(制)(緩)(連) 	ダイヤル・ゲージ (原)(動)(走)(操)(制)(緩)(連) 	トーイン・ゲージ (原)(動)(走)(操)(制)(緩)(連)  二輪・三輪	キーンバ・キャスタ・ゲージ (原)(動)(走)(操)(制)(緩)(連)  二輪・三輪
ターニングラジアス・ゲージ (原)(動)(走)(操)(制)(緩)(連)  二輪・三輪	タイヤ・ゲージ (原)(動)(走)(操)(制)(緩)(連) 	亀裂点検装置 (原)(動)(走)(操)(制)(緩)(連)  二輪	検車装置 (原)(動)(走)(操)(制)(緩)(連)  二輪	CO・HCテスタ (原)(動)(走)(操)(制)(緩)(連)  二輪・ジ限定
ホィール・プーラ (原)(動)(走)(操)(制)(緩)(連)  二輪	ベアリングレース・プーラ (原)(動)(走)(操)(制)(緩)(連)  二輪	グリース・ガン (原)(動)(走)(操)(制)(緩)(連) 	部品洗浄槽 (原)(動)(走)(操)(制)(緩)(連) 	

注1．全ての装置を認証の対象とする場合には、上記全ての作業機械等が必要となります。
2．二輪：小型二輪のみを対象とする場合には当該作業機械等は必要としません。
3．三輪：小型三輪のみを対象とする場合には当該作業機械等は必要としません。
4．ガ限定：軽油を燃料とする原動機の点検を行わない事業場は当該作業機械等は必要としません。
5．ジ限定：ガソリン及び液化石油ガスを燃料とする原動機の点検を行わない事業場は当該作業機械等は必要としません。

3.要　員

要員に関する基準

整備主任者

☞事業場ごとに整備主任者を届出することが必要となります。
☞整備主任者の資格は次のとおりです。

整備主任者の要件

・自動車整備士の技能検定のうち1級又は2級の技能検定に合格したこと。

従業員

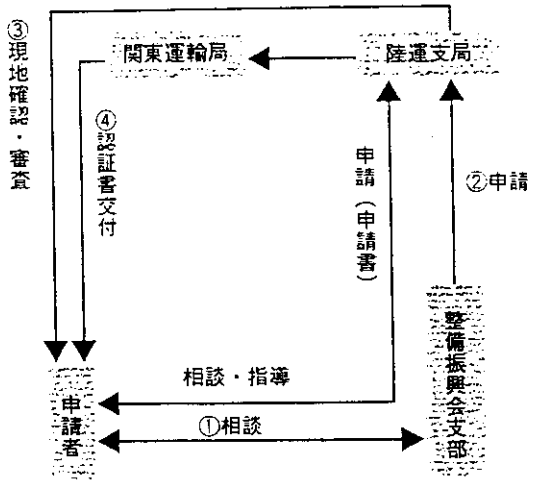
☞従業員の基準は次のとおりです。

・事業場には、2人以上の分解整備に従事する従業員を有すること。
・従業員のうち、少なくても一人の自動車整備士の技能検定に合格した者（1級又は2級）・1級、2級又は3級の自動車整備士の技能検定に合格した者の数が、従業員の数を4で除して得た数（その数に1未満の端数があるときは、これを1とする。）以上であること。

■認証の申請

1.認証の申請書類は、各陸運支局を経由して関東運輸局長に提出されます。
2.書類等は各地区の自動車整備振興会にありますのでご相談下さい。

申請の手順



■提出書類

1.自動車分解整備事業認証申請書（事業の種類、事業の範囲、作業場の面積、工員数、整備主任者届出、宣誓書等）
2.役員名簿（法人）
~~3.事業場の全景の写真等~~
~~4.車両整備・点検作業場／部品整備作業場の写真等~~
~~5.車両置場／事務所の写真等~~
~~6.認証基準で定める作業用機械工具類等の写真等~~
7.従業員名簿
8.整備士合格書（写）
9.登記簿謄本（法人）／戸籍謄本または住民票（個人）
10.その他、特に必要と認められる書類

Table 2C(10) – Further Information on Goods Vehicle (Licensing of Operators) (Mandatory)							
Territory:	U.K.						
Relevant Legislation:	Goods Vehicle (Licensing of Operators) Act						
Penalty:	A person who uses a goods vehicle on a road without an operator's licence for the carriage of goods for hire or reward, or for or in connection with any trade or business carried on by him is guilty of an offence and is liable on summary conviction to a fine not exceeding level 4 on the standard scale.						
Reference:	Ref. 2C(10)-a to Ref. 2C(10)-c						
Registration Requirement							Remark
Classes	Size	Equipment	Qualified Personnel	Document keeping	Warranty	Others	
Goods Vehicle Operator	N/A	N/A	The operator must employ a professionally competent Transport Manager who is responsible for the maintenance of the goods vehicles.[1]	N/A	N/A	N/A	

N/A – Relevant information not available.

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[1] The Transport Manager is professionally competent if and only if

(a) he has demonstrated that he possesses the requisite skills by passing a written examination organized by an approved body and is the holder of a certificate to that effect issued by that body; or

(b) he is the holder of any other certificate of competence, diploma or other qualification recognized for the purpose of the Act by the Secretary of State.

Note: There are three ways in which professional competence can be proven:

1. Practical experience – Up to December 1979, practical experience was accepted (this is known as Grandfather Rights)
2. Designated qualifications – Holder of the following qualifications are exempt from taking an exam:
   (i) For both national and international operations:
   - Fellow or Member of the Chartered Institute of Transport (road transport sector)
   - Member or Associate Member of the Institute of Traffic Administration (road transport sector)
   - Member or Associate Member of the Institute of Road Transport Engineers
   - Fellow or Associate of the Institute of the Furniture, Warehousing and Removals Industry

   (ii) For national operations only:
   - Licentiate of the Chartered Institute of Transport (road haulage sector)
   - Associate of the Institute of Road Transport Engineers by examination
   - Graduate or Associate of the Institute of Traffic Administration (road transport sector)
   - The General Certificate in Removals and Management issued by the Institute of the Furniture, Warehousing and Removals

   (iii) FSA Exam – A person who entered the industry in a position of responsibility after 1 January 1975 but before 1 January 1978 was regarded as being professiona. competent, until December 1979. All new entrants must now pass the examination.