

# Nurturing Talents for the Automotive Engineering Trade

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## 2-3. Nurturing Talents for the Automotive Engineering Trade

According to the statistics of the Transport Department, there are over 880 000 registered vehicles in Hong Kong as at end May 2020. If we assume that every family consists of three people, it would imply that about one-fourth of the families in Hong Kong own a vehicle. Taking into consideration the land area of Hong Kong, the vehicle density of our city is not low. As the automotive trade continues to grow, the demand for automotive engineering is also on the rise, and nurturing talent has become an important issue for the automotive engineering trade.

When it comes to automotive engineering, people would often imagine a vehicle mechanic holding a wrench and performing repair work underneath a vehicle or refilling engine oil. As society developed, the training mode of the automotive engineering trade also evolved from the mentorship system with skills passed down from generation to generation through words and practices, to an apprenticeship system for cultivating talents in a comprehensive manner. Since the 1980s, the Vocational Training Council (VTC) has been offering programmes related to the automotive trade, covering the basics and advanced skills and equipping trainees with the necessary knowledge and skills for entering the automotive engineering trade. Ever since the launch of such programmes, the trade could, apart from recruiting apprentices on their own, employ graduates from the VTC and other professional training institutions and provide them with training on top of what they had learned.

Moreover, with our city's free trade policy, imported vehicles from across the globe are commonly seen in Hong Kong. To keep up with the advanced international standards on relevant skills and enhance the capability of our personnel, it is a common practice for the trade to send trainees overseas for technical exchange and introduce to us the new techniques they acquired. Since language proficiency is crucial in technical exchange, the trade would look for more than just technical skills during the recruitment process.

New energy vehicles and application of 5G technology will be our focuses in the future. In line with this trend, the automotive engineering trade will recruit new talent with a bachelor's degree or above in relevant disciplines, such as science, mathematics, computer communications and diagnostic analysis, following the development directions of the trade.

To pass on the torch, we should learn from past experience and forge ahead the future by seizing the opportunities at hand. In the face of the chances and momentum brought by rapid technological development, we should nurture new talent, and set out clear development directions for the trade as a whole.

Mr Alvin Lee, President  
Service Managers Association

## 4-5. Proper Maintenance of New Diesel Commercial Vehicles

Currently, emission of motor vehicles is one of the major causes of roadside air pollution in Hong Kong. Diesel commercial vehicles, such as trucks, buses and light buses, that emit a large amount of particulates and nitrogen oxides (NO<sub>x</sub>) are the major pollution sources. Since 1995, the Government has been tightening the emission standards for first-registered vehicles. The most recent revision, involving the implementation of the Euro VI emission standards, was made in 2020. Compared to pre-Euro diesel vehicles manufactured before 1995, Euro VI heavy duty diesel vehicles emit about 99% less particulates and 96% less NO<sub>x</sub>. Depending on the servicing time, mechanical wear and tear will occur in the vehicles, which will affect their working order and engine performance. To ensure that the vehicles are running in the best working order and emission performance, proper vehicle maintenance is of utmost importance.

### Adopting Different Solutions for Compliance with the Latest Emission Standards

New diesel commercial vehicles adopt electronic engine control system. During operation, diesel engines will produce and emit NO<sub>x</sub> to the atmosphere. Since the new Euro emission standards are more stringent, new diesel commercial vehicles will adopt the following solutions to reduce emissions for compliance with the latest standards.

Euro VI Emission Standards - Diesel Commercial Vehicles			
Emission		Diesel engine	Technical solution(s)
Oxides of Nitrogen	No <sub>x</sub> (mg/kWh)	✓	Exhaust Gas Recirculation (EGR) system and Selective Catalytic Reduction (SCR) system
Particulate Matter	PM (mg/kWh)	✓	Diesel Particulate Filter (DPF) and Diesel Oxidation Catalyst (DOC)
Particle Number	PN (#kWh)	✓	DPF
Ammonia	NH <sub>3</sub> (ppm)	✓	Ammonia Slip Catalyst (ASC)
Carbon Monoxide	CO (mg/kWh)	✓	DOC
Total Hydrocarbons	THC (mg/kWh)	✓	-
Non-Methane Hydrocarbons	NMHC (mg/kWh)	-	-

\* Calibrations of the engine and the after-treatment control system are crucial to the emission performance

# Maintenance of DPF System

The DPF collects the emission produced in the course of burning diesel fuel and filters particulates. After collecting a certain amount of particulates, the ECU will activate the “filter regeneration” process to burn the particulates stored in the DPF to carbon dioxide for emission to cleanse the DPF and maintain its filtering function. The particulate burning process is not an on-going process. “Filter regeneration” will only be activated by the ECU when the differential pressure sensor detects that the emission storage has reached its full capacity. The working temperature of the engine will be increased, burning the particulates in the DPF with the high temperature exhaust of about 600 °C to 650 °C. However, when the engine load is low, e.g. during traffic congestion, the temperature of the exhaust may not be sufficient to burn the particulates in the DPF to carbon dioxide for emission. As a result, the particulates will accumulate in the DPF, which may cause accumulation of ashes and lead to congestion in the DPF as well as engine issues such as lowered fuel efficiency and fire. In such cases, warning signals may be shown on the dashboard. Most new diesel commercial vehicles are equipped with a two-tier warning system. When the amber warning signal is shown, the vehicle owner should select “manual filter regeneration” to burn the particulates in the DPF. Upon completion of the “manual filter regeneration” process, the amber warning signal will be off. If the red warning signal is shown, the vehicle owner will need to arrange vehicle maintenance at a vehicle workshop.

Furthermore, using unsuitable fuel will lead to early congestion of DPF. Accumulation of ashes in the DPF will increase the emission resistance and fuel consumption. Frequent “filter regeneration” due to extensive accumulation of particulates may also lead to damage of the DPF.

## Use Suitable Fuel

New diesel commercial vehicles are highly durable. With suitable vehicle consumables such as engine oil, coolant and urea solution, the service lives of the engine and emission handling device can be extended. Engine oil and coolant suitable for relevant vehicle models, as well as their engines, are detailed in the vehicle maintenance manuals. Users should follow the manufacturers’ recommendations on parts replacement time and pay attention to the maintenance and replacement time for air filter, engine oil filter and diesel filter.

Consumables		Common specifications
Engine oil	Standard	ACEA: C3, C2, E9, E7, E6, E4
		API: CJ-4, CI-4 PLUS< CI-5, CH-4, CK-4, FA-4
		JASO: DH-2
	Manufacturer’s standard	Individual manufacturers may specify suitable engine oil of particular manufacturers for their engines. The trade should follow the manufacturers’ instructions.
Urea solution AdBlue	Standard	DIN70070 / ISO 22241 (Urea - 32.5%)
Diesel	Standard	Ultra low sulphur diesel (sulphur content at 10 ppm or below)

For specific requirements on consumables for individual vehicle models, please follow the manufacturers’ instructions.

Ir WONG Chi-hang, Kenny  
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Hong Kong Institute of Vocational Education (Tsing Yi)

# 6. Sharing on Vehicle Engineering

## Low-entry Refuse Collection Vehicles

As one of the most densely populated cities in the world, Hong Kong requires refuse collection services with high efficiency. However, gigantic refuse collection vehicles face high risks as they operate and drive through the busy streets in the urban areas. In view of the above, the Food and Environmental Hygiene Department (FEHD) and the EMSD had begun the feasibility study on introducing low-entry refuse collection vehicles to Hong Kong since 2017 with a plan to replace a number of refuse collection vehicles with the new vehicles in a progressive manner.



The major difference between the chassis of a traditional truck and that of a truck with low-entry is the design of the driving cab. The two major benefits of a low-entry design are as follows:

The first batch of low-entry refuse collection vehicles procured by the FEHD in 2019 (with the Econic chassis of Mercedes-Benz and refuse hopper of FAUN Variopress)

(1) With the substantially lowered height above ground of the entry to the driving cab, for example, about 85 cm for the Econic chassis procured by the Government, the driver and other personnel can enter the driving cab with just two steps. Compared to the traditional designs which require three or four steps, the low-entry design allows the relevant personnel to enter and exit the driving cab more safely and easily. Most vehicle models with low-entry design are also equipped with a compressed air suspension system, which can further lower the height of the driving cab and enhance the safety level of the vehicle.

(2) Moreover, the field of vision of the driver can be largely enhanced. The low driving seat of the low-entry vehicle, combined with the large windscreen and side windows, can significantly reduce the blind spots of those in the front part of the vehicle and those at the side of the driving cab. This design can reduce accidents due to poor field of vision of the driver, for example, collision between the vehicle and pedestrians of short stature near the front part of the vehicle or cyclists at the sides of the vehicle. Therefore, low-entry vehicles are suitable to be used in town centre areas where population density is high.

However, there are also limits to low-entry designs. In general, the driving cab of a low-entry vehicle is longer than that of a traditional vehicle and the manufacturing cost is also higher. With a driving cab located closer to the front of the vehicle, a more sophisticated design is needed to ensure the safety of the driving cab in the event of a head-on collision. While the low-entry design may not be adopted by trucks used for long-distance driving, it is suitable for refuse collection vehicles which navigate through the urban areas.

## 7. Latest Updates of Vehicle Maintenance Registration Unit

### Voluntary Registration Scheme for Vehicle Maintenance Promotional Video Competition

#### Competition Content

Participants are required to produce a creative and compelling video (no longer than one minute) to introduce and promote the Voluntary Registration Scheme for Vehicle Mechanics or the Voluntary Registration Scheme for Vehicle Maintenance Workshops. The video may introduce the two schemes, their objectives and the benefits to the trade and the public. Slogan(s), chant(s) or song(s) may also be added to the video to further deliver the message.

#### Eligibility

Participants must be Hong Kong permanent residents and may enter the competition as an individual or a team of two to five members. Each participant or team may submit only one entry. Participants who submit multiple or incomplete entries will be disqualified, and all of their other submissions will be rendered void.

#### Prizes

<u>Open Division</u> Champion: cash coupons of HK\$5,000 1st runner-up: cash coupons of HK\$3,500 2nd runner-up: cash coupons of HK\$2,000 3 Merit Awards: cash coupons of HK\$1,000
<u>School Division</u> Champion: cash coupons of HK\$5,000 1st runner-up: cash coupons of HK\$3,500 2nd runner-up: cash coupons of HK\$2,000 3 Merit Awards: book coupons of HK\$1,000
<u>Most Supportive School Award</u> Book coupons of HK\$3,500 and a trophy

- \* Each winner will be awarded a merit certificate
- \* Open division includes vehicle maintenance personnel and tertiary students
- \* School division includes secondary and primary students

#### Details and Submission of Entries

Please refer to the website of Electrical and Mechanical Services Department:

[https://www.emsd.gov.hk/en/supporting\\_government\\_initiatives/registration\\_scheme\\_for\\_vehicle\\_maintenance/index.html](https://www.emsd.gov.hk/en/supporting_government_initiatives/registration_scheme_for_vehicle_maintenance/index.html)

- \* Results will be announced on the EMSD website in December 2021.
- \* Participants who, upon submission of entries, upload the submitted video on their personal social media platforms (e.g. Facebook, Instagram, etc.) may make an appointment with the VMRU of the EMSD at 2808 3545 to redeem a souvenir during office hours (from 9:00 am to 4:30 pm on Mondays to Fridays, except public holidays) on or before 30 November 2021. Participants will be required to present the information on their personal social media platforms for confirmation.

#### Submission Deadline



29 October 2021 (Friday)

## 8. Latest Updates of Vehicle Maintenance Registration Unit

### Guide to Translation of Vehicle Maintenance Webpages

Nowadays, with advancements in technologies and popularisation of information, vehicle mechanics can obtain and study the latest information about vehicle maintenance through the Internet. However, most of the websites providing vehicle maintenance information are foreign language websites, which may cause inconvenience to users. In order to promote continuing education via on – line self-learning for vehicle mechanics, the methods for translating foreign languages on information websites through mobile phones and the Google Chrome application are provided as follows for reference.

Apple IOS version/Android version Google Chrome browsers :

1. Click "More Options" on the right side of the webpage  (as shown by the red arrow).
2. Click "Translate".
3. In general, foreign language articles will then be translated into Chinese automatically. If not successful, please refer to the following steps:
4. Click the "Google Translate" logo  (as shown by the green arrow) on the left side of the website address bar.
5. Click "Traditional/Simplified Chinese" to translate the article into Chinese.



若不成功，請參考以下步驟：



## 9. Latest Updates of Vehicle Maintenance Registration Unit

### Paper-based Continuing Professional Development

As some vehicle maintenance mechanics indicate that they would like to take the continuing professional development (CPD) course and answer questions in paper form, the Vehicle Maintenance Registration Unit (VMRU) will hold a paper-based CPD course at the Electrical and Mechanical Services Department (EMSD) Headquarters Building from 5 pm to 8 pm on 6 November 2021 (Saturday). Please note that questions of the paper-based course have all been previously uploaded online (see the table below). For those have completed relevant online courses, it is not necessary to take the paper-based courses again (i.e. participants will not be eligible for earning CPD hours if they take the paper-based course).

Arrangement of the paper-based course is as follows: The VMRU will send the relevant CPD course material and articles to the correspondence address of the participants in advance by mail. Participants should read the course material and the articles in advance and answer the questions to show that they have read the articles and understand the contents of the course. The questions will be distributed to the attendees on the day of the paper-based course at the EMSD. Participants should bring the course material and articles they have read for searching for the relevant information.

There are altogether 10 questions for each CPD course. Participants getting 6 to 9 questions correct will earn one CPD hour, and those who answer all the questions correct will earn two CPD hours.

On-line CPD Course - 2020Q2	Practice Guidelines for Registered Vehicle Maintenance Mechanics
On-line CPD Course - 2020Q3	Voluntary Registration Scheme for Vehicle Mechanics
On-line CPD Course - 2020Q4A	How to Apply for Registration and Renewal of Registration as Vehicle Maintenance Workshops
On-line CPD Course - 2020Q4B	Proper Maintenance of Diesel Commercial Vehicles: An Overview of Emission Tests
On-line CPD Course - 2021Q1A	Operational Development Trend of Vehicle Maintenance Industry
On-line CPD Course - 2021Q1B	NISSAN NV350 Technical Seminars on Diesel Commercial Vehicles
On-line CPD Course - 2021Q1C	ISUZU Technical Seminars on Diesel Commercial Vehicles

If you are interested in taking the paper-based CPD course on November 6, 2021, please fill in the following reply slip and return it to the VMRU via WhatsApp (9016 3185) or fax (3968 7646). Please note that mobile phone number, correspondence address, English name (in full and as shown on ID Card) and Vehicle Mechanic Registration No. should be provided in the reply slip. For those who have not yet become registered vehicle mechanics, please fill in the first English letter and the next four digits of your ID Card (i.e. if your ID number is A123456(7), please enter "A1234"; if it is XY123456(7), "XY1234" should be entered). For enquiries, please contact the VMRU at 2808 3545.

Reply Slip

I am interested in taking the paper-based CPD course.

Date & Time: 6 November 2021 (Saturday) 5pm to 8pm

Place: EMSD Headquarters Building

Mobile Phone No.: \_\_\_\_\_

Correspondence Address: \_\_\_\_\_

English Name: \_\_\_\_\_

Vehicle Mechanic Registration No.: VM \_\_\_\_\_

First English letter and the next four digits of ID Card \*: \_\_\_\_\_

\* For those who have not yet registered

## 10. Latest Developments of the Registration Schemes

1. Registered vehicle mechanics who have switched to work in another vehicle maintenance workshop should notify the VMRU by e-mail (vmru@emsd.gov.hk) or fax (3968 7646) the name, address and telephone number of the new workshop.

2. If there is any change in the information of the vehicle maintenance workshop (such as name of the workshop, registration number of the workshop, address, contact number and business registration certificate, etc.) or alteration in the type of workshop being registered, the person-in-charge of the workshop must, within 14 working days of such change, notify the VMRU of the change in writing, and submit the relevant documents for processing.

Information on the Voluntary Registration Scheme for Vehicle Mechanics:	
Total number of vehicle mechanics	10 303 <sup>Note1</sup>
Number of registered vehicle mechanics (as at end-July 2021)	8 116
Information on the Voluntary Registration Scheme for Vehicle Maintenance Workshops:	
Total number of vehicle maintenance workshops	2 783 <sup>Note 2</sup>
Number of registered workshops (as at end-July 2021)	2 052

Note1: 2019 Manpower Survey Report (updated on 13 January 2020) by the VTC and the Automobile Training Board

Note2: Database of the VMRU (updated in July 2019)

If you wish to help protect our environment by receiving the electronic version of RVM Newsletters and leaflets, please send us the completed reply slip by e-mail: vmru@emsd.gov.hk or WhatsApp: 9016 3185. We will contact you by means of e-mail or mobile communication as far as possible.

### Reply Slip

I/My company would like to receive the RVM Newsletters and other information leaflets by  
e-mail / WhatsApp

Please provide the relevant contact details for the above selected means of communication:

E-mail address: \_\_\_\_\_ WhatsApp: \_\_\_\_\_

The electronic version of the RVM Newsletter is also available on the EMSD website:

[https://www.emsd.gov.hk/en/supporting\\_government\\_initiatives/registration\\_scheme\\_for\\_vehicle\\_maintenance/publications\\_and\\_circulars/rvm\\_newsletter/index.html](https://www.emsd.gov.hk/en/supporting_government_initiatives/registration_scheme_for_vehicle_maintenance/publications_and_circulars/rvm_newsletter/index.html)



**\* Please note that starting from 15 July 2018, new application for registration as Type Four workshop (i.e. a workshop situated at a residential building or a composite building with domestic part) is no longer accepted. Furthermore, requests for conversion from a registered Type One, Type Two or Type Three workshop to a Type Four workshop will not be entertained.**

## New Online Self-learning Continuing Professional Development Platform

New training materials has been released via the Online Self-learning Continuing Professional Development Platform since 1 August. By reading training materials and answering questions, vehicle mechanics can earn continuing professional development (CPD) hours online for registration or renewal purposes. The theme for this quarter is occupational safety and the training is available to vehicle mechanics, regardless of whether the registration is valid, expired or not yet completed. The quizzes for this quarter will close on 31 October.

Mechanics can visit the following website or scan the QR code to access the CPD platform  
<https://sites.google.com/view/vmru-cpd>



# Prize Quiz Issue No.34

Q1. When did the VTC begin to offer programmes related to the automotive trade?

- A. Since the 1960s
- B. Since the 1970s
- C. Since the 1980s
- D. Since the 1990s

Q2. Since 1995, the Government has been tightening the emission standards for first-registered vehicles. When was the most recent revision conducted? What was the Euro emission standards implemented?

- A. 2018, involving the implementation of the Euro I emission standards
- B. 2020, involving the implementation of the Euro II emission standards
- C. 2020, involving the implementation of the Euro VI emission standards
- D. 2021, involving the implementation of the Euro VII emission standards

Q3. New diesel commercial vehicles are highly durable. What are the suitable vehicle consumables that can extend the service lives of the engine and emission handling device if used in accordance with the manufacturers' instructions?

- A. Engine oil
- B. Coolant
- C. Urea solution
- D. All of the above

Q4. When did the FEHD and the EMSD begin the feasibility study on introducing low-entry refuse collection vehicles to Hong Kong with a plan to replace a number of refuse collection vehicles with the new vehicles in a progressive manner?

- A. 2017
- B. 2018
- C. 2019
- D. 2020

Q5. Which of the following is not the benefit of a truck chassis with low-entry design?

- A. Relevant personnel can enter and exit the driving cab more safely and easily
- B. The manufacturing cost is higher
- C. The field of vision of the driver can be largely enhanced
- D. Most vehicle models with low-entry design are also equipped with a compressed air suspension system, which can further lower the height of the driving cab and enhance the safety level of the vehicle

## How to participate (Issue No.34)

Please scan the QR code and submit the answers directly on the following website <https://forms.gle/XkvY86CGAor2UkYs6>. Vehicle mechanics may also complete the form below, circle the correct answers, and send it to the VMRU by fax (3968 7646) or e-mail (vmru@emsd.gov.hk).

Deadline: 31 October 2021

Question	Answer			
1	A.	B.	C.	D.
2	A.	B.	C.	D.
3	A.	B.	C.	D.
4	A.	B.	C.	D.
5	A.	B.	C.	D.



Name: \_\_\_\_\_

Vehicle Mechanic Registration No.: VM \_\_\_\_\_

E-mail Address: \_\_\_\_\_








Contact Tel. No.: \_\_\_\_\_

- Participants who answer all the questions correctly will earn one CPD hour and be notified by the VMRU individually.
- Only registered vehicle mechanics with valid registration may participate, each not more than once in each quiz.
- If there are duplicate submissions, only the last answers submitted before the deadline will be accepted.
- The decision of the VMRU on the quiz will be final.
- The correct answers will be announced in the next issue of the RVM Newsletter.

The answers for RVM Newsletter Issue No. 33 are as follows:

Question	1.	2.	3.	4.	5.
Answer	D	B	C	A	C

## 12. Training Institutes Providing Continuing Professional Development Courses for Vehicle Mechanics (in random order)

Name of Training Institute	Website/Contents	Enquiry Tel. No.	QR Code
Traffic Services Employees Association	<a href="http://www.facebook.com/tseahk">http://www.facebook.com/tseahk</a>	2575 5544	
Pro-Act Training and Development Centre (Automobile)	<a href="http://www.proact.edu.hk/automobile">http://www.proact.edu.hk/automobile</a> Certificate in Vehicle Mechanical Repair#, a programme run by the Pro-Act Training and Development Centre (Automobile) may serve as another means for qualifying as registered vehicle mechanics. Mechanics who are interested in enrolling in the above programme may visit the website of the Centre. # For details and latest developments of the programme, the information issued by the Pro-Act Training and Development Centre shall prevail.	2449 1310	
The Institute of the Motor Industry Hong Kong	<a href="http://www.hkimi.org.hk">http://www.hkimi.org.hk</a> The Institute of the Motor Industry Hong Kong (IMIHK), formerly known as the Institute of the Motor Industry (IMI) - Hong Kong Branch, brings the mission and vision of the IMI to the Hong Kong automobile industry. After the reunification in 1997, the IMI - Hong Kong Branch applied to be renamed the IMIHK in Hong Kong. Eligible members of the trade are welcome to join the IMIHK or enroll in its courses or talks.	2625 5903	
Hong Kong Vehicle Repair Merchants Association Limited	<a href="https://www.facebook.com/HKVRMA/">https://www.facebook.com/HKVRMA/</a>	2399 7977	
Hong Kong Vehicle Repairing Industry Employee General Union	<a href="http://www.vrunion.hk">http://www.vrunion.hk</a>	2393 9955	
Occupational Safety and Health Council	<a href="http://www.oshc.org.hk">http://www.oshc.org.hk</a> The course of Safe Handling of Chemicals aims to provide employees with basic knowledge of the safe handling of chemicals. The course content includes hazards of chemicals, labelling of chemicals, safety precautions, personal protective equipment, emergency procedures, etc. For more course details, please contact the Occupational Safety and Health Training Centre.	2311 3322	
The Society of Operations Engineers (Hong Kong Region)	<a href="http://www.soe.org.hk">http://www.soe.org.hk</a>	2617 0311	



## Gentle Reminder

The contents in each issue help you catch up on the development of the registration schemes and enhance the quality of service. Please stay tuned! Each issue is available for downloading on the EMSD website:

[http://www.emsd.gov.hk/en/supporting\\_government\\_initiatives/registration\\_scheme\\_for\\_vehicle\\_maintenance/publications\\_and\\_circulars/rvm\\_newsletter/index.html](http://www.emsd.gov.hk/en/supporting_government_initiatives/registration_scheme_for_vehicle_maintenance/publications_and_circulars/rvm_newsletter/index.html)



For enquiries on the contents of the RVM Newsletter, please contact the VMRU of the EMSD.

Fax No.: 3968 7646

E-mail Address: [vmru@emsd.gov.hk](mailto:vmru@emsd.gov.hk)

Tel. No.: 2808 3545

### Members of the Editorial Working Group:

Mr YIP Sui-pong (Chief Editor), Mr YIP Lai-hing, Ms SHAR Wing-suen, Mr WONG Lik-kuen, Mr CHEUNG Kam-hung, Mr CHEUNG Kam-fai, Mr WONG Koon-wai, Mr SHUM Cheuk-hung and the Vehicle Maintenance Registration Unit