

Precautions against Heat Stroke at Vehicle Maintenance Workshops and Coronavirus Disease 2019 (COVID-19)



查詢
For enquiries



2808 3545
3968 7646

機電工程署
EMSD



Introduction

Vehicle mechanics often need to work outdoors, or at poorly ventilated machine rooms or workshops. In the sultry weather, performing heavy manual work, such as moving mechanical equipment and tools (e.g. electrical and mechanical equipment in machine rooms, tyres and engines at vehicle maintenance workshops, etc.), and having to work near heat-generating equipment, be it indoors or outdoors, may cause heat stroke if appropriate precautions are not taken. Heat stroke is harmful to health and may even lead to severe consequences. In response to the COVID-19 pandemic, we still have to wear masks to reduce the risk of spreading diseases during July and August, even though the weather is hot and seasonal influenza is more common, thus increasing the risk of heat stroke under the summer sun. Employers and employees should take appropriate precautions to prevent heat stroke and avoid working in a hot environment for prolonged periods of time. To prevent heat stroke at workplace, we should first understand its causes and symptoms for formulation of preventive measures. A brief account of the causes and symptoms of heat stroke as well as the occupational safety and health measures to be taken is given below.

Causes

Heat stroke is caused by severe malfunctioning of the body temperature control mechanism (Figure 1) which failed to regulate the body's heat balance. Body temperature will continue to rise if the excessive body heat accumulated is not dissipated through expanded pores and sweating. Heat stroke can have multiple causes including environmental factors, work nature factors and personal factors that will affect the level of risk.

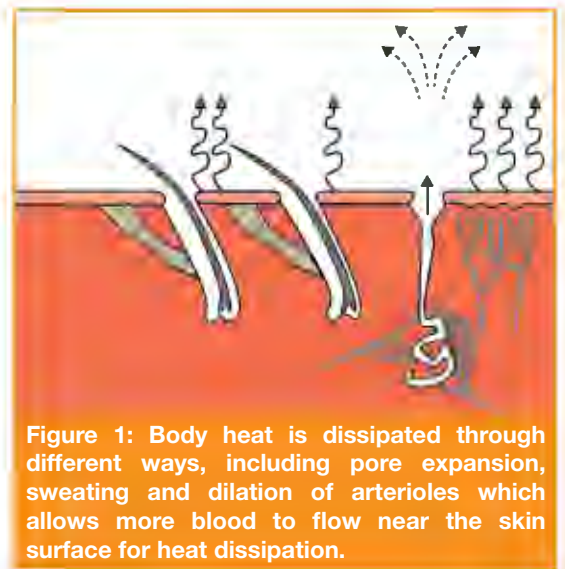


Figure 1: Body heat is dissipated through different ways, including pore expansion, sweating and dilation of arterioles which allows more blood to flow near the skin surface for heat dissipation.

Environmental factors

- * Environments with high temperature, high humidity, stagnant air and other adverse conditions.

Work nature factors

- * Performing large amount of heavy manual work under hot weather will lead to rapid increase in body temperature and severe loss of body fluid and salt.
- * It may also be caused by the lack of rest and the failure to replenish the lost fluids and salts.

Personal factors

- * Employees new to a hot working environment are prone to heat stroke as they have not yet adjusted to the environment.
- * Materials of employees' clothing will affect their heat dissipation.

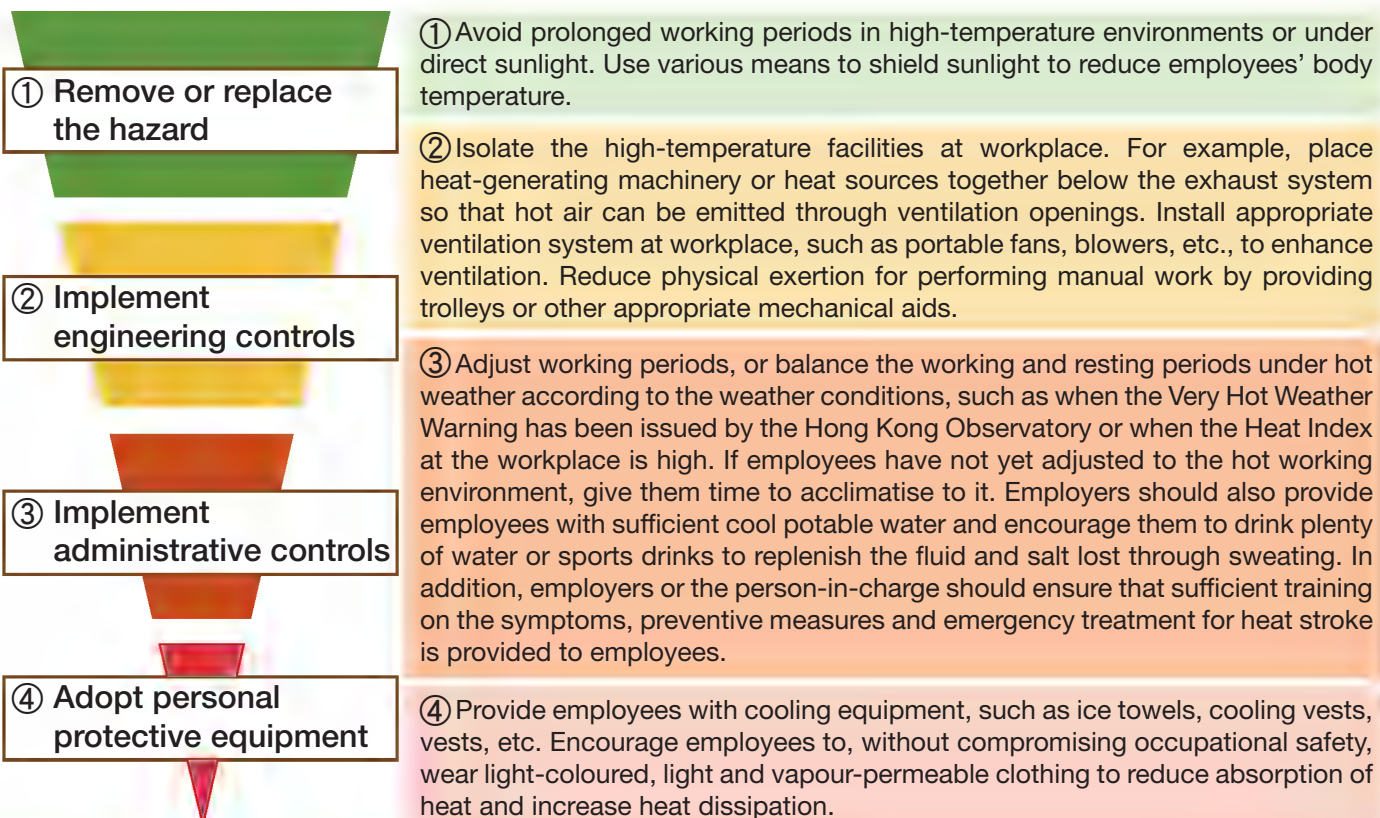
Types and symptoms

Normal human body temperature ranges from 36°C to 38°C. If it rises above 38°C, the body will naturally cool down through heat dissipation. However, if heat dissipation fails to keep up with the rise of body temperature, various degrees of heat strokes, as listed below, may occur. We must always pay attention to our health conditions and prevent negative health outcomes which are harmful and may be life-threatening.

Type of heat stroke	Causes	Symptoms
Heat Syncopy	Under high temperature, the blood vessels near the skin surface dilate, reducing the blood supply to the brain and other parts of the body and resulting in dizziness.	<ul style="list-style-type: none"> • Dizziness. • Wet and cold skin. • Weak pulse.
Heat Cramps	Heavy sweating during performance of manual work also leads to loss of salt. If only water is replenished, heat cramps may occur.	<ul style="list-style-type: none"> • Muscle cramps and pain lasting one to three minutes.
Heat Exhaustion	The severe loss of body fluid and salt due to heavy sweating and dehydration affects heart and cardio-respiratory function.	<ul style="list-style-type: none"> • Extreme thirst, fatigue and generalised weakness. • Nausea and headache. • Dizziness or temporary mental confusion. • Wet, cold and pale skin. • Fast and weak pulse.
Heat Stroke	Prolonged exposure to a hot environment will cause body heat to accumulate, resulting in malfunctioning of the body temperature control mechanism in the central nervous system.	<ul style="list-style-type: none"> • Different from other types of heat stroke, sweating in patient will gradually decrease or even stop. Skin becomes dry and hot. • Fast and weak pulse with breathing becoming rapid. • Dizziness, mental confusion or even unconsciousness. • Convulsion may occur. • Body temperature may rise to 41°C.

Precautions

Employers or the person-in-charge should conduct risk assessment on heat stress and formulate safety measures to be taken under hot weather based on the priority of the risk assessment listed below. General precautions against heat stroke are as follows:



Emergency treatment

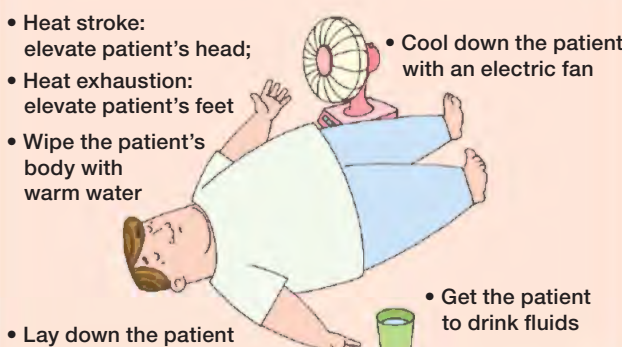
Dos:

- ✓ Move the patient to a cool place.
- ✓ If the patient's level of consciousness decreases, lay him down on his side to maintain his airway and dial 999 for an ambulance.
- ✓ Cool him down with the following means as soon as possible:
 - Wipe the patient's body with cool water.
 - Fan the patient to keep him cool.
 - Put ice on the patient's sides of neck, armpits and groins to cool him down.
- ✓ Stop cooling down the patient if he has chills.
- ✓ Take the patient to hospital for treatment as soon as possible.

Don'ts

- ✗ Do not wipe the patient's body with alcohol to cool him down.
- ✗ Do not offer the patient foods or drinks before he regains full consciousness.

Treatment for heat exhaustion and heat stroke

- Heat stroke: elevate patient's head;
 - Heat exhaustion: elevate patient's feet
 - Wipe the patient's body with warm water
 - Lay down the patient
 - Cool down the patient with an electric fan
 - Get the patient to drink fluids
- 

Conclusion

Whether working indoors or outdoors, practitioners of the vehicle maintenance trade may have increased risk of heat stroke due to their exposure to hot environments for performance of duties, especially during summer. We should not overlook this occupational hazard. Employers should work together with employees to implement engineering and administrative controls and provide them with appropriate personal protective equipment. Employees should be aware of the symptoms due to high temperature and replenishment of water and salt when necessary. With the concerted efforts of both parties, we can create a safe workplace even in a hot environment.

The main mode of transmission of COVID-19 is through respiratory droplets. The virus can also be transmitted through contact. There is no vaccine for this infectious disease at the moment. To maintain at all times strict personal and environmental hygiene is key to personal protection against infection and prevention of the spread of the disease in the community. Tips for prevention of COVID-19 in the workplace are as follows:

1. Maintain environmental hygiene and indoor ventilation in the workplace.
2. Take heed of personal hygiene and always wash hands.
3. Keep restaurant toilets clean and add water to drain outlets regularly.
4. Enhance disinfection work for any suspected/confirmed cases of COVID-19.

For more information: Occupational Health and Safety Council's webpage on heat stroke prevention <https://bit.ly/3dqMe35>

Prevention of Heat Stroke at Work in a Hot Environment (HS)

The purpose of this course is to provide participants with training on prevention of heat stroke at work as well as control measures to minimise the occupational hazards in a hot environment. <https://bit.ly/37wIBIG>

Heat Stress Assessor Training Course (HSA)

The purpose of this course is to provide training to the participants on prevention of heat stroke at work; operation of heat stress monitor; risk assessment on heat stress; the occupational hazards in a hot environment and relevant control measures.

<https://bit.ly/30GFXOa>




1. Background

In the light of the impact of COVID-19 pandemic, the transport industry in Hong Kong did not begin full recovery until June, resulting in the huge backlog of maintenance work for vehicle fleets of large companies. As the Transport Department has also accumulated piles of documents relating to licence renewal, the renewal progress has been slowed down. Due to their failure to renew licences in time, vehicle fleets are stranded at maintenance depots pending vehicle examination and licence renewal.

2. Maintenance Services

In view of the above, goods vehicle maintenance companies offer express vehicle examination arrangements to vehicle fleets of various large companies. Their services may be broadly classified into the following categories:

Government Vehicle Examination and Annual Examination Work

Special Purpose Vehicles	Express Oil Change Service	Maintenance of machinery, braking system	Cargo compartment	Six safety installations for tailboard of goods vehicle
Examination and maintenance for compliance with fire services regulations and statutory guidelines of the EMSD	Cleaning of hydraulic circuit, inspection of exhaust system	Shock absorber system, turning of tyres	Firmly welded to the vehicle chassis	1. Two-hand control device
	Meeting the normal target for smoke emission	Transmission and gearbox, air-conditioning and electric appliances	Outside of cargo compartment is intact	2. Tailboard flashing lamp
Class 1 to 9 Dangerous Goods Vehicles				3. Buzzer
Class 1 –Explosive substances and goods				4. Electrical or mechanical foot protector
Class 2 –Flammable or inflammable gases				5. Tailboard locking device
Class 3 –Flammable liquids				6. Infra-red sensor
Class 4 –Flammable solids				
Class 5 –Organic peroxides				
Class 6 –Toxic and infectious substances				
Class 7 –Radioactive substances				
Class 8 –Corrosive substances				
Class 9 –Other dangerous goods class				

Final inspection before installation of cargo compartment

3. Rental Services

The average time needed for vehicle maintenance and appointment of vehicle examination is about three weeks. For the clients with vehicles that requires maintenance and annual examination, some maintenance companies will rent vehicles of similar type from a legal and reputable vehicle rental company for their clients, until the maintenance work is complete and the licence successfully renewed upon passing the Government's annual examination. Rented vehicles enable clients to maintain daily business operations. For goods vehicles used for conveyance of category 2 and 5 liquefied petroleum gas (LPG), since the annual examination involves a large number of high-level fire services insulation works and comprehensive safety inspection is required for all machinery and electric appliances on the vehicle, the average time needed for licence renewal is about four weeks. However, there are limited large-scale companies on the market that offer legal rental services of dangerous goods vehicles as substitution to LPG companies for sustaining daily operations and timely completion of customer orders.



Vehicles used for conveyance of category 2 and 5 dangerous goods



Final quality check before delivery

Mr LEUNG Chun, 6th Chairman of the Hong Kong Trucks Merchants Association

Cooling Mechanism of Electric Vehicles

The air-conditioning and cooling system of general electric vehicles are similar to those of petrol-driven vehicles. The cooling system of petrol-driven vehicles is used to cool down the heat generated by the engine. Powered by an electric water pump, the coolant of the cooling system of electric vehicles flows from the radiator through the cooling pipes to parts that require cooling, including the motor controller, the DC-to-DC converter and the electric motor (Figure 4). After absorbing the heat, the coolant will flow through the cooling pipes to the radiator for heat dissipation, followed by another cycle. As for traction battery bank, the coolant from a separate electric water pump is used to cool down the high voltage battery bank.

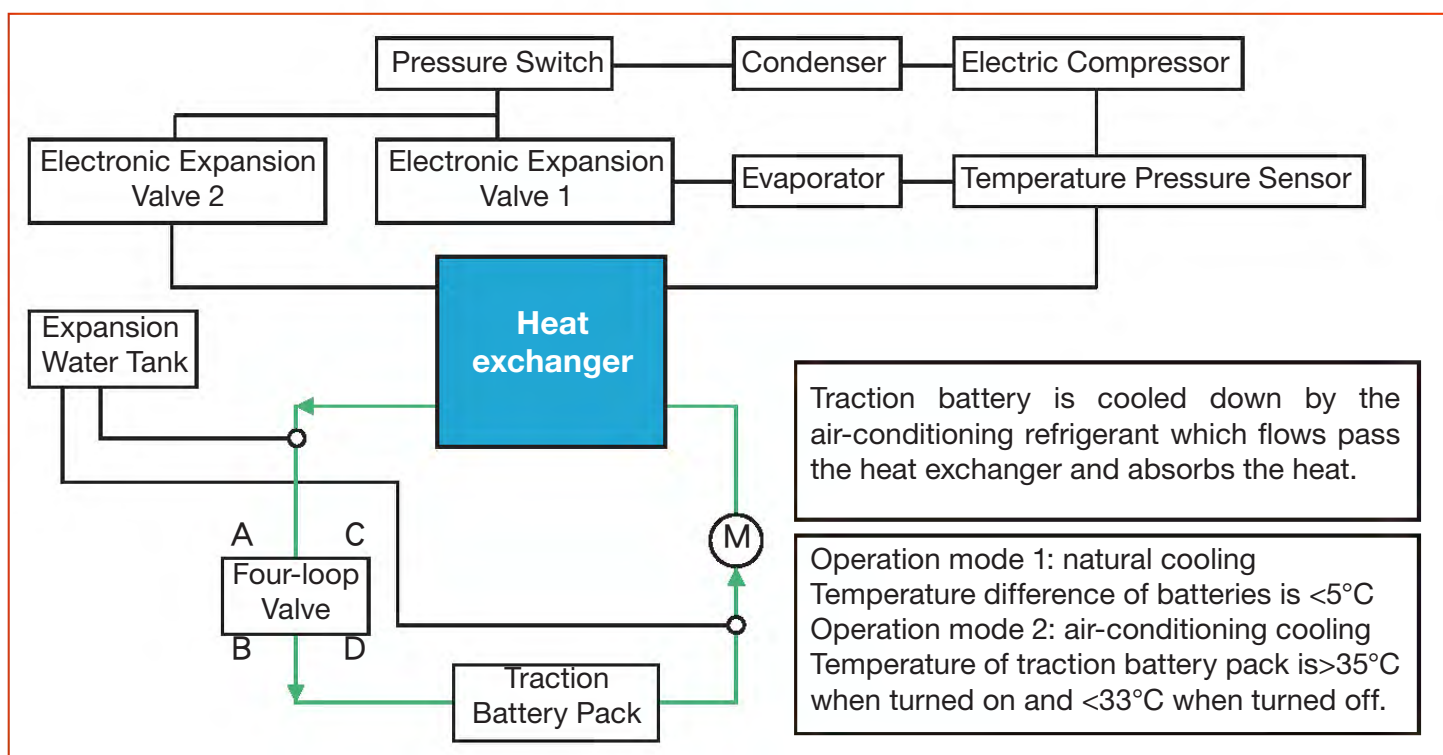
Some electric vehicle suppliers use the refrigerant of the air-conditioning system with a heat exchanger to cool down the coolant that flowed pass the traction battery bank (Figure 2).

An electronic expansion valve, a heat exchanger and a four-loop valve can be installed additionally at the basic air-conditioning system. An additional electric water pump can be installed at the basic cooling system to enable the coolant to flow from the heat exchanger to the traction battery bank.

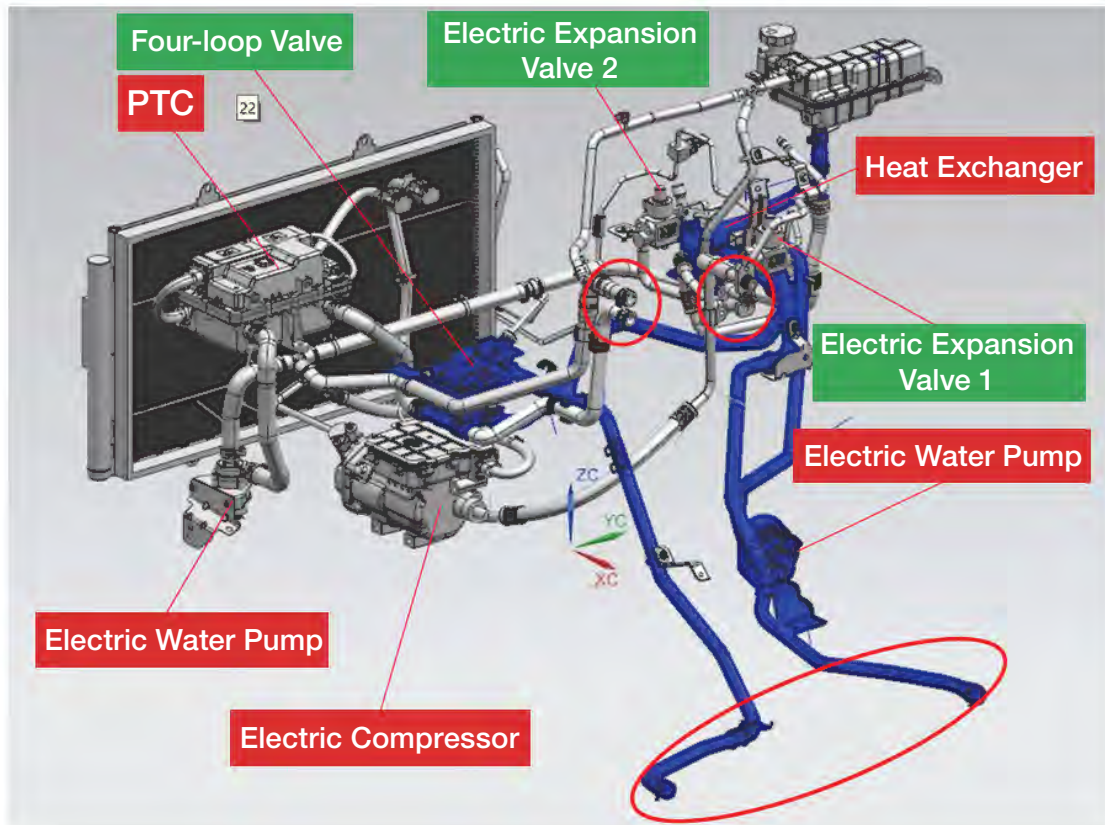
High voltage electric air-conditioning compressor (Figure 1) can be used to provide air-conditioning of the car and reduce the temperature of the traction battery bank.



High voltage electric air-conditioning compressor (Figure 1)



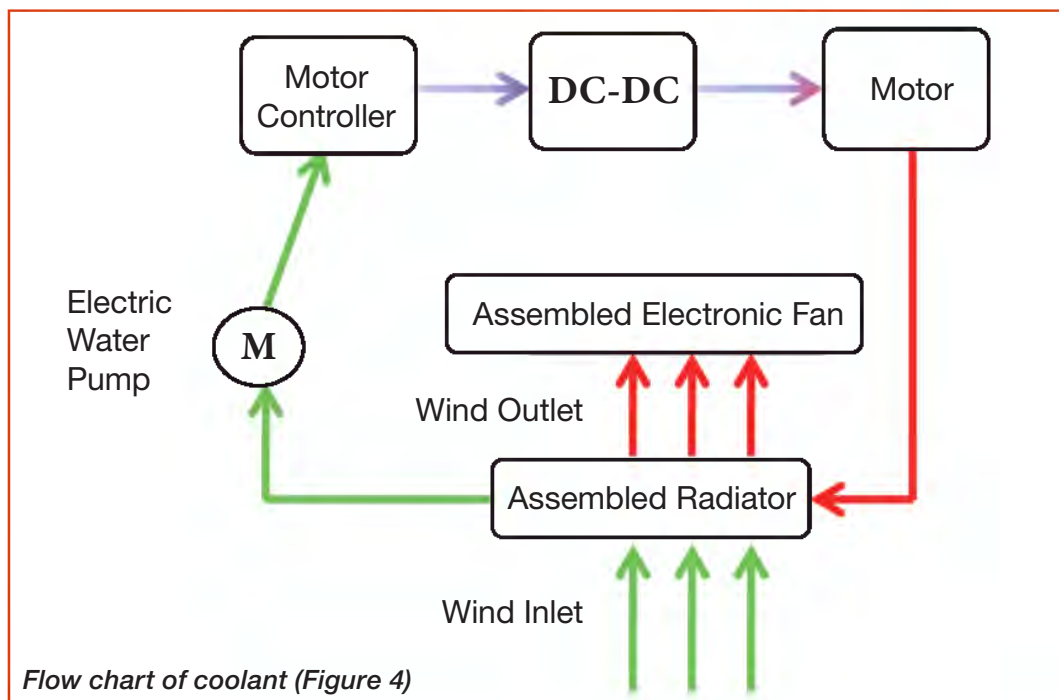
Mechanism of the battery cooling system (Figure 2)



Schematic diagram of the battery cooling system (Figure 3)

Components of the cooling system: four-loop valve, electric water pump, heat exchanger, water tank, water bottle, electric fan, electric expansion valve 2, electric compressor, etc.

Components of the air-conditioning system: electric compressor, electric expansion valve 1, electric heater, radiator, evaporator, dryer, etc.



Flow chart of coolant (Figure 4)

Mr Raymond KUNG, Hong Kong E-Vehicles Business General Association
Vice President & Financial Secretary

Voluntary Registration Scheme for Vehicle Maintenance Poster Design Competition

To enhance public understanding of the Voluntary Registration Scheme for Vehicle Mechanics and the Voluntary Registration Scheme for Vehicle Maintenance Workshops as well as promote the quality services of registered vehicle maintenance workshops and mechanics, the EMSD jointly organised the Voluntary Registration Scheme for Vehicle Maintenance Poster Design Competition with the Vehicle Maintenance Technical Advisory Committee.

Closed on 30 April 2020, the competition received an enthusiastic response with over 60 highly creative and meaningful poster designs. Upon selection by the judging panel, the winners of the competition are as follows:



Champion: Mr LEUNG Chung-ho



1st runner-up: Ms CHEUNG Cho-shan

2nd runner-up: Ms LEUNG Ka-pik

Subsidy Scheme for the Vehicle Maintenance Workshops under the Anti-epidemic Fund

The EMSD received over 3 000 applications for the Subsidy Scheme for the Vehicle Maintenance Workshops under the Anti-epidemic Fund launched by the Government. Vetting of application is underway. The first batch of subsidies has been disbursed to applicants by cheque at end-July.

The Subsidy Scheme offers assistance to vehicle maintenance workshops by granting a one-off non-accountable subsidy of \$50,000 to each eligible vehicle maintenance workshop. This is to assist vehicle maintenance workshops in coping with the operating pressure under the COVID-19 epidemic. Application for the scheme was closed on 14 August 2020.

- 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** from 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 (Note 1)
Number of registered vehicle mechanics (as at end-July 2020)	8 615

Information on the Voluntary Registration Scheme for Vehicle Maintenance Workshops:

Total number of vehicle maintenance workshops	2 783 (Note 2)
Number of registered workshops (as at end-July 2020)	2 054

Note 1: 2019 Manpower Survey Report (updated on 13 January 2020) by the VTC and the Automobile Training Board.

Note 2: 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 based on the above selected means of communication:

E-mail address: _____ WhatsApp: _____

The electronic version of RVM Newsletters is also available at the EMSD website:

https://www.emsd.gov.hk/en/supporting_government_initiatives/registration_scheme_for_vehicle_maintenance/publications_and_circulars/rvm_newsletter/index.html



Online Continuing Education

To further promote online self-learning, the VMRU has been releasing more online reading materials. Participants who answer 5 questions correctly will earn one hour of continuing professional development (CPD). Participants answering all questions correctly will earn two CPD hours. Vehicle mechanics who have not registered or whose registration has expired can also participate to obtain CPD hours for registration purpose.

Vehicle mechanics may read the Voluntary Registration Scheme for Vehicle Mechanics, and then log on to the following website (<https://forms.gle/eAz8Ce68ucY3MiwQ8>) via the QR code, answer the questions to obtain CPD hours by means of online self-learning.

- Participants who answer 5 to 9 questions correctly can earn one CPD hour.
- Participants who answer all the questions correctly can earn two CPD hours.
- The VMRU will notify successful participants by e-mail within 1 month after the end of the quiz.
- Only registered vehicle maintenance mechanics or relevant working personnel in vehicle maintenance industry may participate, each not more than once.
- If there are duplicate submissions, only the last submitted before the end of the quiz will be accepted.
- The decision of the VMRU on the quiz will be final.

The event will end on 31 October 2020.

The Voluntary Registration Scheme for Vehicle Mechanics is available at the following website:

https://www.emsd.gov.hk/filemanager/en/content_648/Promotional_Leaflet.pdf



- Q1** Which of the following is a symptom of heat syncope?
- A** Dizziness **B** Cold clammy skin
C Weak pulse **D** All of the above
- Q2** As mentioned in the article, which of the following is the range of normal human body temperature?
- A** 28°C to 30°C **B** 30°C to 35°C
C 36°C to 38°C **D** 38°C to 41°C
- Q3** As mentioned in the article, which of the following, apart from environmental factors and work nature factors, is the cause of heat stroke?
- A** Negligence **B** Frail physical conditions
C Team spirit **D** Personal factors
- Q4** As mentioned in the article, what is the average time needed for vehicle examination for licence renewal of goods vehicles used for conveyance of category 2 and 5 LPG?
- A** One week **B** Four weeks
C Ten weeks **D** Twenty weeks
- Q5** Regarding the cooling mechanism of electric vehicles as mentioned in the article, which of the following components can be used to provide air-conditioning of the car and reduce the temperature of the traction battery bank?
- A** High voltage electric air-conditioning compressor **B** Water spray motor for wiper
C Brake caliper **D** 3-point seat belt

How to participate (Issue No.30)

Please submit the answers directly at the following website <https://forms.gle/KirB3b43RGRikrAq9> by scanning the QR code. Vehicle mechanics may also complete the form below, circle the correct answers, and send it to the VMRU by fax or e-mail (fax: 3968 7646 or e-mail: vmru@emsd.gov.hk).



Deadline: 31 October 2020

Question	Answer			
Q1	A	B	C	D
Q2	A	B	C	D
Q3	A	B	C	D
Q4	A	B	C	D
Q5	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 submitted answers 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 in RVM Newsletter Issue No. 29 are as follows:

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

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	http://www.facebook.com/tseahk	2575 5544	
Pro-Act Training and Development Centre (Automobile)	http://www.pro-act.edu.hk/automobile The Certificate in Vehicle Mechanical Repair 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 Centre's website. # 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	http://www.hkimi.org.hk 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 handover 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 enrol in its courses or talks.	2625 5903	
Hong Kong Vehicle Repair Merchants Association Limited	https://www.facebook.com/HKVRMA/	2399 7977	
Hong Kong Vehicle Repairing Industry Employee General Union	http://www.vrunion.hk	2393 9955	
Occupational Safety and Health Council	http://www.oshc.org.hk The Safety Handling of Chemicals course 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)	http://www.soe.org.hk/	2617 0311	
Qualifications Framework recognised courses	http://www.hkqr.gov.hk	2836 1700	

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 can be downloaded from the EMSD website at:

https://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: 3521 1565

E-mail: vmru@emsd.gov.hk

Tel.: 2808 3545

Members of the Editorial Working Group:

Mr YIP Sui-pong (Chief Editor), Mr CHAN Ho-man, Mr LIU Keung,
 Ms SHAR Wing-suen, Mr CHAN Kwok-tin, Mr WONG Koon-wai, Mr MOK Chi-fai,
 Mr TAI Kwok-keung and the Vehicle Maintenance Registration Unit