



Systemic Safety Alert **Inflation of Tyres of Heavy Mechanical Vehicles**

Major systemic safety problems

Tyres inflation for heavy mechanical vehicles is a common process. However, improper inflation and handling of tyres may cause explosion and blowout of wheel components, and workers staying on the trajectory of the flying fragments or air blast could be seriously injured or killed. The following major systemic safety problems had attributed to the majority of serious/ fatal accidents that involved inflation of tyres in the past:-

- failure to conduct task-specific risk assessments;
- failure to formulate appropriate and adequate risk control measures;
- lack of proper design layouts and safety installations in workplaces;
- failure to strictly adhere to the vehicle manufacturers' service and safety manuals;
- slack control and monitoring to ensure that risk control measures stay effective;
- and
- failure to provide workers with adequate safety information, instruction, training and supervision.

Measures of preventing hit by the burst of wheel components/ blast of air¹

Registered Safety Officers ("RSOs") should advise their employers/ clients to:

- (i) appoint a competent person to (a) conduct task-specific risk assessment(s) associated with the inflation of tyres of heavy mechanical vehicles to identify any foreseeable risks, taking into account the working environment, job sequence, use of equipment, traffic conditions and possible entry of other persons into the work area, etc.; and (b) devise appropriate and adequate safe work methods and procedures to eliminate the hazards;

¹ For details, please refer to the "Guidance Notes on Safety at Work for Demounting, Mounting and Inflation of Tyres of Heavy Mechanical Vehicles" issued by the Occupational Safety and Health Branch of the Labour Department.



- (ii) make reference to the manufacturers' specifications of tyres, rim components and any other equipment to be used when formulating safe work methods/ procedures, so as to understand the practice recommended by the manufacturers for inflation of tyres. The following control measures, among others, should be strictly adhered to:

Safe work procedures

- check all the wheels and tyres for signs of damage before inflating; and do not inflate a tyre where there is apparent or suspected damage to the wheel components, such as a tyre having been run flat or being well below its recommended operating pressure;
- ensure that both tyre and rim components are compatible, serviceable and correctly assembled prior to inflation of tyres;
- inflate the tyre with recommended pressure and never inflate it to a pressure exceeding that recommended by the manufacturers of the tyre and vehicle; and
- do not use air lines without a pressure gauge or pressure control device functioning properly.

Prevention of explosion and blowout of wheel components

- take adequate and effective steps to ensure that all workers stand clear of the trajectory danger zone during tyre inflation;
- use a clip-on air chuck with an in-line valve and a pressure gauge equipped with a pressure regulator for type inflation;
- use safety restraining devices, such as safety cages and frames of adequate strength and proper size, to absorb the explosion forces and restrain wheel components from popping up in the event of failures; and
- mount the wheel to the wheel hub before inflating the tyre of specific heavy mechanical vehicles, and tighten the nuts and clamps by using a torque wrench which is set at the value recommended by the manufacturer of the vehicle before inflation.



Preventive maintenance and periodic inspections

- formulate and implement preventive maintenance programmes with reference to the tyre manual as well as the manufacturer's manual of the heavy mechanical vehicle to ensure the sustainability of the safe condition of wheel components. A logbook system should be in place to record all maintenance details and hours of service of the respective wheel components; and
 - carry out periodic inspections to identify any damage of the wheel components. Damaged or worn parts must be replaced at once upon discovery.
- (iii) implement effective proactive safety inspection programmes and arrange stringent on-site supervision to:
- ensure that workers adopt the safe work methods/ procedures. A competent person with adequate safety knowledge and work experience should be appointed as a supervisor to oversee the conduct of work;
 - carry out tyres inflation work by competent workers with sufficient experience and knowledge; and
 - monitor the conduct of the work to ensure that the risk control measures for inflation of tyres of heavy mechanical vehicles are fully implemented. The safe work methods/ procedures should be regularly reviewed so as to improve the effectiveness of the system.
- (iv) provide all workers involved in tyre inflation work with necessary safety information, instruction and training to ensure that they are familiar with the safe work methods/ procedures, safety precautions/ measures and emergency procedures. Before they perform the duty, workers should also fully understand the type and the structure of the wheel components as well as their roles and responsibilities.
- (v) review the system of work periodically to ensure its workability and effectiveness, especially when there is a significant change in work method, team composition, use of equipment, working environment, etc.



Registered Safety Auditors (RSAs) should take into account these systemic safety problems and accident prevention measures in executing safety audit functions.

DISCLAIMER

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