

Report on collision involving a truck-mounted crane and a pedestrian bridge on the FV 5210 road in Bergen 31 July 2023

Road traffic report 2024/06

The accident on the FV 5210 road in Bergen on 31 July 2023 occurred when a truck with a raised crane arm struck a pedestrian bridge. The crane arm was 6,3 m high and the bridge was approximately 4,8 m above the roadway. The concrete element fell on the truck's cab and the driver died.

The investigation has revealed several weaknesses when it comes to trucks with cranes and barriers to prevent accidentally driving with a raised crane arm. It has also revealed weaknesses in the management of vulnerable bridges that could pose a risk in the event of a collision.



The accident site on the FV 5210 road in Bergen 31 July 2023. Photo: NPRA

This is one of two fatal accidents in 2023 where a truck with a crane has driven into an overhead road structure. The other fatal accident occurred in Stavanger in March when a truck crane hit the roof of a culvert. Part of the crane detached and hit an oncoming car where the driver died. There have also been incidents leading to material damage, including a collision with a

pedestrian bridge, which fell onto the E16 road at Sollihøgda in February 2023.

Due to limitations in the available data, the NSIA has been unable to determine how and why the driver of the truck in Bergen managed to retract the support legs and drive with the crane arm raised. This should have been impossible based on how the crane's safety system should have been set up. It is either the result of a technical fault, use of an emergency system or that the crane's safety system did not comply with the standard.

The requirement in the Norwegian standard NS-EN 12999 Loader cranes is that the driver is alerted if the crane arm is not in the safe transport position before driving. The truck in Bergen did not have a separate warning for a raised crane arm. The warning was indirect in the form of a warning that was given if the support legs were not retracted, and it was not meant to be possible to retract the support legs without the crane arm having been lowered. This is an approved solution used for trucks with older Effer cranes.

The investigation has shown that using warning systems as a barrier is vulnerable, and that accidents and incidents occur involving both old and new trucks from different crane manufacturers that drive with a raised crane arm. Both the crane in Bergen and the crane in Stavanger, had undergone an annual inspection by an enterprise of competence, yet the crane's warning system had nonetheless not worked as intended.

Regardless of what causes deviations in the warning circuit, the likelihood of an accident can be reduced by introducing more and stronger barriers. This could be done by introducing a speed limitation device as a physical barrier to driving with a raised crane arm, as the industry also proposes, more uniform and extensive annual inspections by an enterprise of competence, as well as random inspections of the warning systems for crane trucks. The NSIA makes five safety recommendations related to this investigation.

The NSIA also refers to the Directorate of Public Roads' letter to road owners on conducting an assessment of bridges that are vulnerable to collisions. This must also be followed up with measures that reduce the likelihood of a collision or the consequence of such a collision. Vestland County Council and the City of Bergen have initiated work in this area and the NSIA expects other road owners to also follow this up.

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Safety recommendation

Safety recommendation ROAD No 2024/15T

The accident on the FV 5210 road in Bergen on 31 July 2023 occurred when a truck with a raised crane arm struck a pedestrian bridge. The bridge fell on the truck's cab and the driver died. This is one of two fatal accidents in 2023 where a truck with a crane has driven into an overhead road

structure. In addition, there have been incidents leading to material damage.

The requirement in Norwegian standard NS-EN 12999 Loader cranes is that the driver is alerted if the crane is not in a safe position before driving. However, the investigation has shown that incidents occur with both old and new trucks, and that using warning systems as a barrier has vulnerabilities. The warning system can be manipulated in order to use the crane effectively as work equipment, or technical faults may occur. The Norwegian Safety Investigation Authority is of the view that a form of speed limiter as an additional barrier may help improve safety.

The Norwegian Safety Investigation Authority recommends that the crane importer Hiab Norway AS initiate work through its crane manufacturers to improve NS-EN 12999 Loader Cranes, by adding requirements for speed limitation as a physical barrier to driving with a raised crane arm.

Safety recommendation ROAD No 2024/16T

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The requirement in Norwegian standard NS-EN 12999 Loader cranes is that the driver is alerted if the crane is not in a safe position before driving. However, the investigation has shown that incidents occur with both old and new trucks, and that using warning systems as a barrier has vulnerabilities. The warning system can be manipulated in order to use the crane effectively as work equipment, or technical faults may occur. The Norwegian Safety Investigation Authority is of the view that a form of speed limiter as an additional barrier may help improve safety.

The Norwegian Safety Investigation Authority recommends that the Labour Inspection Authority, as a market surveillance authority for machinery, assess and report the need for improvement of NS-EN 12999 Loader Cranes.

Safety recommendation ROAD No 2024/17T

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The requirement in Norwegian standard NS-EN 12999 Loader cranes is that the driver is alerted if the crane is not in a safe position before driving. However, the investigation has shown that incidents occur with both old and new trucks, and that using warning systems as a barrier has vulnerabilities. The Norwegian Safety Investigation Authority sees a need for owners of crane

trucks to be informed of the possibilities of installing speed limiters as an additional barrier on their current vehicles, as it will take time for new cranes covered by such safety requirements to be delivered.

The Norwegian Safety Investigation Authority recommends that the Norwegian Truck Owners Association (NFL) advise truckers about the possibilities of reprogramming their crane trucks to integrate speed limitation as a physical barrier to driving with a raised crane arm.

Safety recommendation ROAD No 2024/18T

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The requirement in Norwegian standard NS-EN 12999 Loader cranes is that the driver is alerted if the crane is not in a safe position before driving. However, the investigation has shown that incidents occur with both old and new trucks, and that using warning systems as a barrier has vulnerabilities. The warning system is checked at annual inspections of cranes by an enterprise of competence, but the inspection forms used by the various enterprises of competence vary both in scope and implementation of the warning system check.

The Norwegian Safety Investigation Authority recommends that the Labour Inspection Authority follow up the certification scheme of enterprises of competence to ensure more uniform and extensive inspection of warning systems on loader cranes.

Safety recommendation ROAD No 2024/19T

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The requirement in Norwegian standard NS-EN 12999 Loader cranes is that the driver is alerted if the crane is not in a safe position before driving. However, the investigation has shown that incidents occur with both old and new trucks, and that using warning systems as a barrier has vulnerabilities. The warning system is checked at annual inspections of cranes by an enterprise of competence, but these will not detect any ongoing deviations. The NPRA's roadside inspections can currently determine whether an annual inspection by an enterprise of competence has been carried out. The NSIA is of the view that inspectors should also be able to check the sound and light warning signals for a raised crane arm during random inspections, with the assistance of a driver who has the necessary certificate of competence (G8). To ensure that any deviations are followed up, an arrangement must be established whereby deviations are

communicated to the Labour Inspection Authority.

The Norwegian Safety Investigation Authority recommends that the Norwegian Public Roads Administration's roadside inspections include spot checks of sound and light warning signals for raised crane arms on crane trucks, and that any deficiencies that must be followed up are communicated to the Labour Inspection Authority for post-inspection.

Facts

Location	Fv. 5210, Olsvik, Bergen municipality
Occurrence date	31.07.2023
Accident type	Collision
Road class	County road
County	Vestland
Vehicle type	Lorry, Crane truck
Type of Transportation	Freight transport
Accident category	Ulykke m/ kjøretøy over 7500 kg

NSIA conducts its investigations for the sole purpose of improving transportation safety. The object of a safety investigation is to clarify the sequence of events and root cause factors, study matters of significance for the prevention of transportation accidents and improvement of transportation safety, and to publish a report with eventually safety recommendations. NSIA shall not apportion any blame or liability. Use of information from this investigation for any other purpose than for improvements of transportation safety shall be avoided.