

Anti-Tilt Standard

Background

Within Skanska there has been an increase in the prevalence of wheeled dumpers overturning as a result of their use on gradients which are outside of their safe working parameters, or the actions of less experienced operators.

Objective

It is a Skanska objective to eliminate all overturning incidents as each event represents a significant opportunity to cause harm to both the operator as well as pedestrians in the vicinity of the plant.

Scope

An Anti-Tilt device will be fitted to wheeled Forward Tipping Dumpers (FTD), rigid or articulated dump trucks (ADT) of any size. If a risk assessment identifies that the gradient required for operation does not pose a risk of overturning e.g. only operating within safe parameters on a tarmacadam surface, then Anti-Tilt devices may be omitted. This standard will apply from **1st October 2021**.

In all cases it is required that prior to the fitting of an Anti-Tilt device the following will be undertaken:

- Temporary Works - relating to haul roads and stockpiles, these must be managed in accordance with the OU procedure ([OWOW](#)) and noted in the Temporary Works Register. Gradients and inclines must be considered as part of the Temporary Works Design Brief.
- A site-specific risk assessment of the gradient of any inclines (in both pitch and roll) and compatibility with manufacturers safe operating parameters for the wheeled dumper must be undertaken.
- The wheeled dumper selected for use must be appropriate to the operating environment inclusive of the nature of materials which are to be transported.
- All required maintenance checks must be in place to allow operation in line with manufacturer's instructions.
- All required competence and safety critical medicals must be held by the operator to ensure the plant is used safely.

Specifications for Anti-Tilt Devices

- The device must be capable of measuring gradients in real time in both pitch (side to side) and roll (front to back).
- The device must be pre-programmable, with the safe operating parameters of the dumper, and provide a two-stage warning system at gradients approaching and then at the maximum operating gradient of the plant
- Both audible and visual in cab alarms must be provided
- The device must not be able to be set or changed by the plant operator

Installation Recommendation

- All Anti-Tilt device installations must be verified, including being documented, as fit for purpose, and not impact negatively on the dumper's other functions.

Example Anti Tilt Device Supplier

Emolice Si-2 Slope Indicator

The Emolice Si-2 Slope Indicator is an audio-visual warning device designed to be used on off-highway machines such as mowers, dumpers, excavators and other machines where there is a risk of the machine overturning on gradients.

Comprising an integrated dual axis tilt sensor, the Emolice Si-2 slope indicator measures the operating angle of the machine in real time for both pitch (front to back) and roll (side to side). The Realtime tilt measurement is shown on two high intensity LED screens that are visible in both low light and bright light conditions.

The operator can program a maximum working angle and a warning threshold for the machine. Whilst the machine is in use, the operator will receive a visual (flashing orange LED) warning when the warning threshold is reached. However, it is not intended for the operator to set the working parameters.

When the maximum working angle of the machine is exceeded, the operator receives an audible alarm (buzzer) and visual (flashing red LED) warning. Additionally, the relay and / or telematics outputs are triggered.

For machines where higher acceleration or cornering speeds are present or if remote angle measurement is required, the Emolice Si-2 offers an external sensor option allowing the tilt sensing to be performed remotely from the Slope Indicator.

The device is protected to IP69K allowing for outside use in all weather conditions.



Si-1 Slope Indicator

Safety device designed to reduce accidents caused by machine operators exceeding machinery maximum tilt angles



Optional External Sensor

Can be connected to provide remote tilt measurement e.g. booms, backhoes, tow mowers



Optional Relay Output

can be used to cut the power to any connected attachment upon alarm