



## **Mirrorless safety: New assistance functions for MAN trucks**

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**MAN trucks are set to provide drivers with an even greater level of practical safety. An integrated camera system, which is available on order from October onwards, can replace the exterior mirrors entirely, and the new, optional MAN CruiseAssist function can be used to steer, brake and accelerate the MAN TGX and TGS safely in traffic on the motorway. What's more, the new Collision Avoidance Assistant, which takes the danger out of lane changes, and the Lane Change and Turn Assist function can also be ordered for the MAN TGM from October onwards. Moreover, the additional camera systems from MAN Individual improve safety levels further still.**

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- **New MAN Truck Generation soon to be available with fully comprehensive mirror replacement system**
- **New MAN CruiseAssist function facilitates fully assisted driving on motorways for MAN TGX and TGS**
- **New Collision Avoidance Assistant takes the danger out of lane changes and, like the lane change support LCS and turn assist function, can be ordered for the MAN TGM from October onwards**

Just under a year after the successful market launch of the new Truck Generation, MAN has revealed that additional assistance systems will be included in the TGX, TGS, TGM and TGL vehicles, which will make their début in the second half of 2021. Visually the most striking assistance system, which is available to order from October onwards, is the new mirror replacement system, which replaces not only the left and right exterior and wide-angle rear-view mirrors but also the front and kerb mirrors with cameras. In addition to the legally prescribed fields of vision, the integrated system provides views that are specially adapted for different driving situations such as turning, manoeuvring and motorway driving.

MAN Truck & Bus is one of Europe's leading commercial vehicle manufacturers and transport solution providers, with an annual revenue of more than 9,5 billion euros (2020). The company's product portfolio includes vans, trucks, buses/coaches and diesel and gas engines along with services related to passenger and cargo transport. MAN Truck & Bus is a company of TRATON SE and employs more than 37,000 people worldwide.



**Mirrorless for optimum visibility: the new MAN mirror replacement system**

The aim of the development process was to help drivers to gain a swift, visual understanding of what is happening on the road and around the vehicle and to enable them to assess this confidently, thus providing them with optimum support at the wheel. To this end, MAN Optiview's functional principle and display concept have been adapted to meet the specific requirements of natural human perception.

The system consists of five cameras. The exterior rear-view, wide-angle and kerb mirrors have been replaced with a kerb camera and wide-angle camera on each side of the vehicle. The lenses have been integrated into retractable housing arms above the door frames and are heated automatically depending on the ambient temperature. This means that images remain clear even in frosty conditions. Another camera is mounted on the A-pillar, thereby replacing the front mirror. On all cameras, special-purpose filters ensure that glare remains minimal even if the sun is very low on the horizon or headlights from traffic behind are particularly prominent. The special way the airflow is directed around the camera housings protects the cameras against rain and splashing water, thus ensuring that image quality remains high even in adverse weather conditions. The images from the side cameras are shown in HD quality on two large additional screens in the cab, each mounted on the A-pillars at the same height as the driver's line of sight. With its 15-inch diagonal screen size, the one on the co-driver's side is slightly larger than the 12-inch one on the driver's side to compensate for the greater viewing distance. The brightness and contrast of the screens automatically adjust to the ambient brightness. If necessary, it can also be adjusted manually, e.g. when driving at night. This is carried out using a control module in the driver's door and co-driver's door, where you would normally find the control buttons of traditional mirrors.

MAN OptiView can generate three different screen displays from the way the side cameras interact: Standard, zoom and wide-angle view. The view is switched automatically depending on the speed, the steering angle and whether the vehicle is moving forwards or backwards. The driver can specify individual preferences or select the view setting manually at any time using the door control module.

**The default view** is always activated automatically as soon as a door is opened or the ignition is switched on. The fields of vision shown in the standard view are comparable to those of conventional mirrors. A horizontal and vertical dividing line divides the screen into four quadrants that correspond



to fields of vision that are comparable to those of the exterior rear-view mirror, wide-angle mirror and kerb mirror. The fields of vision of the cameras are digitally merged into a coherent image so that the driver can view the areas to the side and to the rear of the vehicle quickly and confidently with a single glance. There are no blind spots in the image that is generated. By removing the conventional mirrors, the driver's immediate field of vision through the side windows is increased.

**In zoom view**, the side cameras provide a magnified view. In this case, the quadrant for the exterior rear-view mirror becomes significantly larger on the screen. This view is activated automatically at 60 km/h, but can be selected manually from 50 km/h upwards. With this function, vehicles approaching quickly in the adjacent lane can be spotted at an early stage. The zoom view can also be used as a manoeuvring aid when reversing. Due to the fact that the image is provided by a camera, there is no blind spot on the screen on either the driver's side or the co-driver's side.

The **wide-angle view** is the third possible setting. If this view is selected, only the wide-angle cameras are shown on the screens. This can be particularly useful at lower speeds when driving in town or when reversing. As such, the wide-angle view is activated automatically when reverse gear is selected, but beyond that there are two other selectable modes. If the driver opts for the "city automatic" mode, the wide-angle view is automatically activated up to a speed of 50 km/h. In "automatic curve" mode, the system automatically switches to the wide-angle view as soon as a certain kink angle between the vehicle and the semitrailer or trailer is reached or the turn indicator is selected. This allows the driver to see the vehicle's surroundings without any blind spots and to spot cyclists, pedestrians or obstacles dependably and in good time, even if they are very close by. The close-up area in front of the vehicle, which is almost impossible to see in normal circumstances, is captured by the front camera, which sends the image to the 12-inch screen of the MAN media system in high resolution whenever the vehicle is moving up to a speed of 10 km/h.

In addition to the various screen views, MAN OptiView also features other assistive functions. For example, width and length guides can be superimposed on the views of the side screens, making it easier for the driver to judge distances and dimensions when overtaking or manoeuvring. What's more, with MAN OptiView, the warning indicators for turn assist, lane change support LCS and the lane change collision prevention assistant are also shown on the two side screens. Another useful and safety-enhancing additional function for breaks is the monitoring mode. This mode allows the driver to view the vehicle's surroundings on the side screens using the wide-angle



view and on the media system screen using the front camera image, especially at night when the curtains are closed, and to spot suspicious movements around the truck at an early stage. Monitoring mode can be activated immediately using the control module on the lower couch at any time, even from a sleeping position. If the vehicle is equipped with a rear-view camera in addition to OptiView, the image from this camera is also shown on the media screen in split-screen view. The new mirror replacement system for the latest MAN Truck Generation makes what was already an excellent work place even better.

### **MAN CruiseAssist: Assisted driving for the entire speed range**

MAN CruiseAssist, which can be ordered from July 2021 onwards, is an impressive and useful new addition to the range of driving aids. This long-haul transport assistant controls the driveline, brakes and steering independently over the entire permissible speed range on motorways and on federal roads similar to motorways with structural lane separation. The system moves the truck automatically within the lane, maintains the statutory minimum distance to vehicles in front and, if necessary, decelerates the truck behind a stationary vehicle until it comes to a standstill, e.g. in traffic jams. After brief stops, the system also restarts automatically. This not only takes some of the burden off the driver in stop-and-go situations that require a great deal of concentration, but also makes long journeys involving a high volume of traffic less tiring. The statutory distance between vehicles is maintained, thus lowering the likelihood of rear-end collisions over the long term.

It is a sensor-based system that makes use of the radar and camera combination that is already fitted as standard for the Emergency Brake Assist system and the Lane Departure Warning system LDW, which detect both the traffic ahead and the lane markings. With this information, it controls the movement of the vehicle independently in the longitudinal direction like a typical Adaptive Cruise Control system (ACC), but also the steering movement using the electric power-assisted steering system MAN ComfortSteering so that the vehicle stays in lane. The system does not simply keep the vehicle in the centre the lane, but – as most drivers do – keeps the vehicle slightly to the right of centre with a variable distance of around 20 centimetres to the outer lane marking. If the route takes the vehicle past another vehicle on the hard shoulder or a crash barrier that is close to the lane, the system automatically moves the vehicle further towards the centre of the lane to increase the distance between the vehicle and the obstacle. In traffic jams, the system



moves the vehicle all the way over to the right lane marking when the vehicle is slowing down so that a corridor for emergency vehicle access is formed.

Even though the system takes a lot of the burden off the driver, it does not relieve them of their overriding responsibility for driving the vehicle. To be able to use the assistance function, drivers must, therefore, keep their hands on the steering wheel at all times so that they can intervene whenever necessary. All important information regarding the current driving status, such as the distance to the vehicle in front and its speed, as well as the activation status of MAN CruiseAssist, can be viewed at all times on the instrumentation display. The fact that navigation data needs to be incorporated ensures that the system is only available on motorways and motorway-like roads with structural lane separation. The system is deactivated automatically before the vehicle reaches unsuitable stretches of road, for example curves that are overly sharp.

#### **LCCPA: Lane change collision prevention assistant**

Whether you are moving into a turning lane, overtaking another vehicle or avoiding an obstacle – changing lanes in heavy traffic is always a challenge that requires a lot of attention to ensure that you do not overlook vehicles approaching from behind. The new lane change collision prevention assistant LCCPA actively assists drivers in these situations by constantly monitoring the lateral areas to the left and right of the lane that the vehicle is in. To this end, two radar sensors on each side of the vehicle measure the distance to detected objects and the difference in speed between the object and the driver's own vehicle. The monitored area covers up to eight metres to the front and 80 metres to the rear of the vehicle. Using these values and further information such as turn indicator activation or steering and vehicle movements, a control unit determines the driving situation given what is happening on the road. If the system detects an imminently dangerous situation if the driver were to change lanes, it warns the driver in good time either via LED light strips in the A-pillars or, if equipped with MAN OptiView, via the screen of the mirror replacement system. On the co-driver side, which is harder to see, a warning is issued as soon as a vehicle approaches from behind. On the driver's side, the visual warning is issued as soon as the turn indicator is switched on before a lane change. If the driver steers in the direction of the impending collision despite the warning, the LCCPA actively moves the vehicle back into its own lane using corrective steering torque in order to prevent the accident. The new lane change collision prevention assistant will lead to a reliable increase in safety for all road users and take a lot of the



burden off drivers, especially in heavy traffic. Depending on the vehicle configuration, the system can be ordered for the MAN TGX and TGS from July 2021 and for the MAN TGM from October.

**Turn assist and lane change support LCS also available for the MAN TGM**

The lane change and turn assist systems are also new additions to the range of functions of the MAN TGM. Previously only available for the MAN TGX and TGS, these two systems, which are also available in combination, are very useful electronic co-drivers, especially for distribution transport.

The turn assist system uses radar sensors to monitor the area next to the vehicle on the co-driver's side which is difficult to see, at speeds of up to 30 km/h. A three-section LED strip on the A-pillar or, if MAN OptiView is available, an indicator on the screen of the mirror replacement system provides a gradual warning in critical situations. The warning level depends on how far away from the vehicle other detected road users are and whether an accident is imminent when the motion paths are calculated in advance. If the system detects a critical situation, the highest visual warning level appears and an additional signal tone sounds. This enables the driver to intervene in good time and remedy the situation.

Lane change support LCS also uses radar sensors and monitors the side areas to the left and right of the lane that the truck is in from speeds of 50 km/h. If the sensors detect a hazardous situation caused by a vehicle approaching from behind during a lane change, they provide an early visual warning in the same way as the turn assist system.

**Additional camera systems from MAN Individual offer even greater safety**

The second half of 2021 will also see new developments in the video and camera systems from MAN Individual, which are available both ex works and as retrofits. At present, these systems are particularly useful in city traffic and provide even better all-round visibility around the truck. As an extension of the SCS side camera system that was available previously to assist with turning manoeuvres, the new Video Turn Assist function (VTA) provides an acoustic warning in addition to the visual indicator on one of the monitors installed on the co-driver's A-pillar. If there are other road users in an area of 2.5 by 6 metres to the right of the vehicle, an acoustic warning signal sounds over the on-board loudspeakers. The camera with GPS sensor and intelligent

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image processing software distinguishes between people on foot, on bicycles or stationary objects such as traffic lights or lamp posts. This keeps the number of false alarms to a minimum and makes the system a reliable safety companion on every delivery tour.

The new assistance systems, which can be ordered from the second half of 2021 onwards, together with proven MAN safety equipment such as the Emergency Brake Assist EBA, which cannot be switched off as standard, the Lane Departure Warning system LDW, the Lane Return Assist LRA or the ACC Stop&Go, provide the new MAN Truck Generation with a unique level of safety and operational orientation. With these systems, MAN is substantiating its intention to focus specifically on drivers and its goal of making their important and challenging job as easy and as safe as possible with trucks that are optimally designed for this purpose. True to MAN's guiding principle: Simplifying Business.