Scania Opticruise and Scania Retarder
– for maximum uptime and productivity

The latest version of Scania Opticruise, fully automated or with a clutch pedal, is designed to give the driver the best possible support, while making the most of every drop of fuel. The legendary Scania Retarder provides safe and economical downhill cruising and leaves the wheel brakes intact for other tasks. A new version has improved low-speed performance and boosts maximum braking torque by 20 percent. With intuitive control and integrated functionality, these systems, as well as the traction control panel, further contribute to uptime and productivity.

Scania Opticruise offers customers a choice of a fully automatic version or one with a clutch pedal, depending on preference. Scania Opticruise is designed to give the driver the best possible help with gearchanging to provide an optimum combination of performance and fuel economy. Customers interested in further fuel savings can have kickdown and Power mode disconnected by a Scania service workshop.

A new version of the Scania Retarder, tailored for tough construction applications, boosts braking torque by 20 percent and provides better low-speed performance.

Typical for Scania, the ergonomics of these systems have been designed for logical and intuitive control. A single lever on the steering column offers the driver full control of all gearchanging and retarder functions.

The Traction panel is another new feature that supports the driver by causing minimum distraction in demanding driving situations. All functions related to grip and traction are logically grouped in one location on the dashboard.
SCANIA OPTICRUISE – AUTOMATED GEARCHANGING EXCELLENCE

When introduced in 1996, Scania Opticruise was one of the first automated gearchanging systems in the market and it took driver comfort and driver support to new levels. Continually refined ever since, the latest version introduced in 2009, features all-new software and refined functionality, e.g. with integrated manoeuvring mode and automatic rocking mode, as well as power mode and kickdown.

Customers can choose according to preference between the fully automated version and the one with a clutch pedal. The automatic clutch is electro-hydraulically operated, providing exceptional precision and smoothness.

New off-road mode
A new driving mode adapted to rough terrain and driving on soft surfaces complements Normal mode and Power mode. Off-road mode is standard on vehicles specified for off-road driving and for driving on soft or loose ground with high rolling resistance.

- In off-road mode the system strives to keep the clutch engaged as much as possible to avoid interruptions in power delivery and, hence, in traction. The number of gearchanges is minimised by allowing the engine speed to vary over a wider rev band. Gearchanges are made faster without prioritising comfort. The gearchanging strategy is the same for Opticruise with a clutch pedal.

- Power mode is intended for runs where transport time is at a premium. Hill performance is adapted to aim for engine revs where maximum power is delivered. There is some sacrifice in fuel, but hill-climbing is faster and with slightly quicker gearchanges than in normal mode.

- Normal mode is optimised for maximum fuel economy, while still delivering good hill performance. The system strives to run at engine revs where maximum torque is delivered.

All driving modes are controlled by toggling the ring switch on the Opticruise lever and the mode engaged is indicated in the central instrument:

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<td>AP/MP</td>
<td>Power mode (automatic/manual)</td>
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<td>AO/MO</td>
<td>Off-road mode (automatic/manual)</td>
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Manoeuvring mode is engaged by pressing the Opticruise lever away from the steering wheel for a few seconds. Manoeuvring mode is available in all driving modes and is shown as a lower case ‘m’ after the gear indication.

Rocking mode is integrated in the system and becomes available automatically as soon as the system senses that the drive wheels are spinning faster than the front wheels. In rocking mode, the clutch is disengaged as soon as the accelerator is released. This means that the driver can easily press and release the accelerator repeatedly to get the vehicle ‘rocking’ and get moving again.

The floor switch on the left in the footwell triggers downchanging for maximum engine and exhaust braking without engaging the retarder.

SCANIA RETARDER – BENCHMARK DOWNHILL PERFORMANCE

For nearly 20 years, the legendary Scania Retarder has been the industry benchmark in auxiliary braking. The system reduces the use of the wheel brakes by 75 percent in highway driving and provides fast and safe travel in undulating terrain.

A new high-performance version is now being added as an option. The existing version remains the most economical choice for most types of long-haulage operations. The new version is aimed at customers in search of greater low-speed power or higher overall performance, for example in construction and off-road applications.
The new more powerful Scania Retarder (R4100) is technically identical to the existing version (R3500) in all major respects. This includes multiple functional integration of the braking, speed control, gearchanging and cooling systems.

Overall braking performance is up from 3,500 Nm to a healthy 4,100 Nm. The internal gear ratio has been raised from 3.04 to 3.26, providing a 17 percent boost in peak braking torque. At low road speeds, the actual increase is 20-25 percent, depending on the rear axle ratio of the vehicle.

The new gear ratio causes some additional drag at high road speed. The new retarder is therefore most suitable for applications that mainly run at road speeds below 70 km/h. The difference in fuel consumption is then insignificant.

**Performance analysis**

The diagram below shows braking torque as a function of the rotational speed of the output shaft in the gearbox for the two retarders. The main benefit is at rotational speeds from slightly below 600 r/min up to around 1,050 r/min, as delimited by the two orange vertical bars (useful speed range).

The dashed lines show the difference in drag loss, which is insignificant at low speed and rises with increasing rotational speed. At high speed, there is a marked increase in drag, but no bonus in terms of increased braking performance.

The lines below the graph indicate the road speed for different rear axle ratios:

- With typical gearing for a road-going construction vehicle (top line), extra braking power is available in top gear from below 20 up to 55 km/h.
- In heavy construction such as mining (middle line), the boost in braking power in top gear comes between around 10 and 35 km/h.
- For typical long-haulage gearing (bottom line), cruising around 1,200 r/min, the added torque is noticeable below about 85 km/h, but there is no significant increase at cruising speed in top gear and a slight increase in drag, which may be unwanted if fuel consumption is a top priority.
Useful speed range

TRACTION PANEL

Differential lock and traction control are fitted to most Scania trucks. All controls related to traction – differential lock, traction control and weight transfer – are grouped in one intuitive module on the dashboard, close to the gearchanging hand.

Adjacent to the rotary switch are controls for lifting the tag axle or transferring weight between bogie axles.

Rotary difflock switch

In the centre of the panel module is the rotary switch for the differential locks that engages all locks on the vehicle in the right sequence to provide increasing traction, while maintaining as much steerability as possible.

Progress is indicated in the central instrument with pictograms displaying the status of each axle:
Traction control – normal or off-road mode
The traction control function on vehicles with electronic brakes (EBS) has the following features:

- The rotary difflock switch is pushed to engage off-road mode. This is discreetly indicated in the instrument cluster.
- Controllable slip. To enable experienced drivers to search for maximum traction, the slip level is now dependent on the throttle position, i.e. more throttle results in higher slip.
- More precise engine torque reduction. This ensures that the turbo pressure is maintained to avoid unwanted downchanges when driving uphill in slippery conditions.

For other press material and pictures, please visit the “Global engine range” pressroom at www.scania.com/media.

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