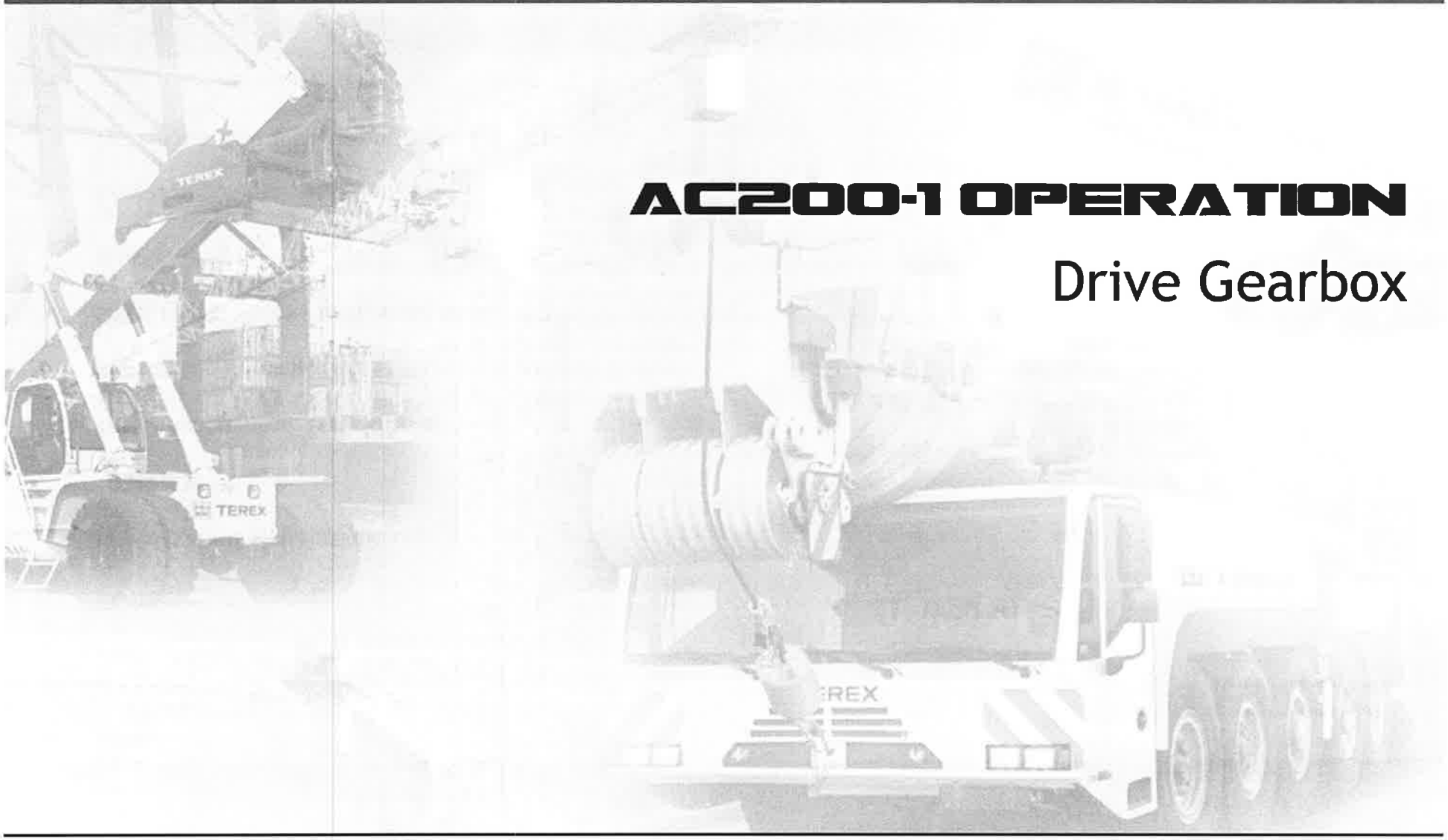
TEREX®

GLOBAL CRANE TRAINING



AC200-1 OPERATION

Drive Gearbox

Drive Gearbox Content

Drive gearbox / distributor gear

The drive gearbox (2) – an automatic transmission ZF–*AS* TRONIC Type 16 AS 2601 (16 forward gears, 2 reverse gears) – is flanged together with the drive motor (1) via a dry clutch. A two stage distributor gear (3) is rear mounted to this combination.

You see here the drive line of the 5–axle model. In the 6–axle model, an additional non–driven axle has been fitted between the third and fourth axles.

Drive gearbox:

Description of the System

The ZF–*AS TRONIC consists of a four speed part, a splitter unit* (GV) and a rear mounted range unit (GP) in planetary design.

The basic gearbox is dog clutched; splitter and planetary units are synchronized.

Thanks to the automatic coupling (no clutch pedal), the driver no longer needs to activate the clutch.

The actual gear switching is done by the electronic transmission system.

The transmission actuator and the clutch actuator are the most important components for completely automating the transmission.

The transmission actuator consists of the electronic gear system, shift valves, shift cylinders and sensors.

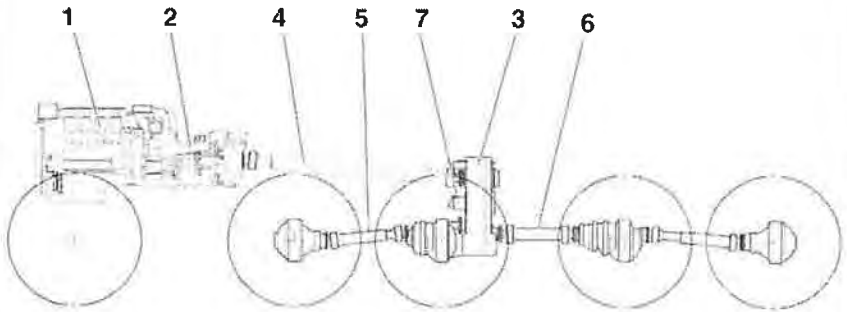
The clutch actuator is an electro pneumatic actuator with path sensors; it takes over the entire transmission actuation.

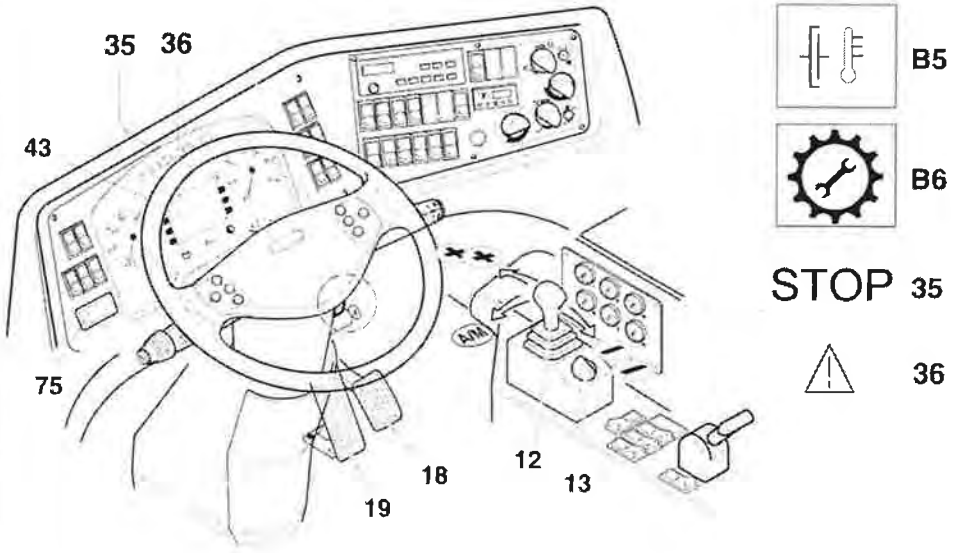
A hydraulic retarder (system "ZF Intarder"), a non–wearing, functioning, hydrodynamic auxiliary brake is integrated in the transmission.

All essential system information, e.g. neutral, gear step, clutch overload, fault and diagnosis information are display to the driver in the "Transmission information" display (75).

Moreover, other special indicator lights are shown in the "Driver information system" display (43) for:

- Clutch overload (B5) and
- transmission malfunction (B6) together with "caution" (36) or
- serious transmission malfunction (B6) together with "STOP" (35)





System Design

The transmission system consists of the transmission (2) and components, that are required for the automation of the system.

The transmission actuator (2.1) and clutch actuator (2.2) components are integrated into the transmission.

The driving switch (2.3), display (2.4) and e-module (2.5) periphery components are installed in the driver's cab.

Vehicle components such as display (75), accelerator pedal (18) and brake pedal (19), engine electronic system, electronic braking system with wheel speed sensors also belong to the system.

Legend:

2 Transmission

2.1 Transmission actuator with electronic transmission control system

2.2 Clutch actuator

2.3 Driving switch

2.4 "Transmission information" display (75)

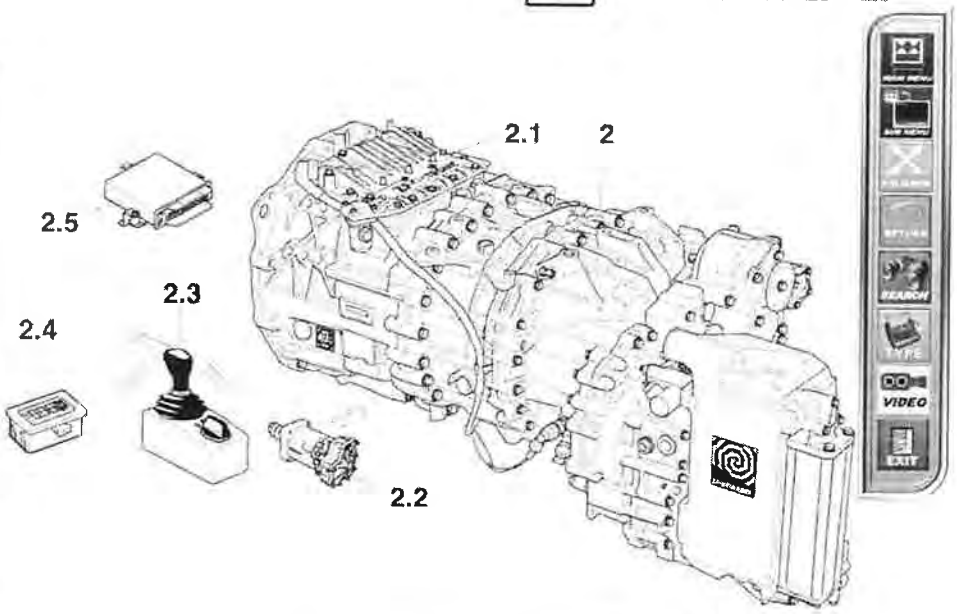
2.5 E-module

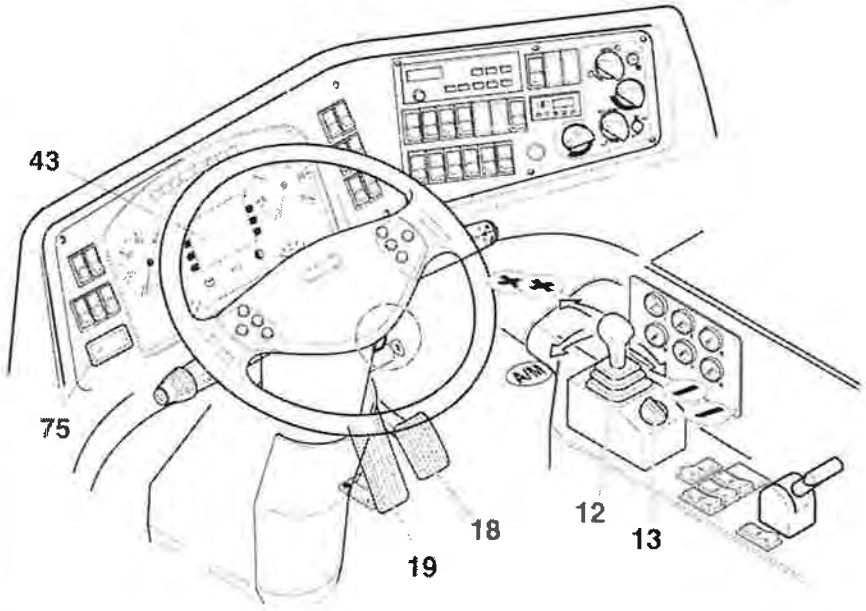
Vehicle components:

18 Accelerator pedal

19 Brake pedal

43 "Driver information system" display





Shifting Gears

Driving switch

The driving switch consists of the switch lever (12) and the rotary switch (13). It is the operating element for

- Selecting the driving range
- Selecting the gear
- Activating / deactivating the automatic mode
- Calling up the error display

Air pressure of min. 6.2 bar (90 psi) is needed to shift gears. It is not possible to shift gears below this mark. Unsuccessful gear shifts are saved as errors by the electronic system.

Risk of accidents!

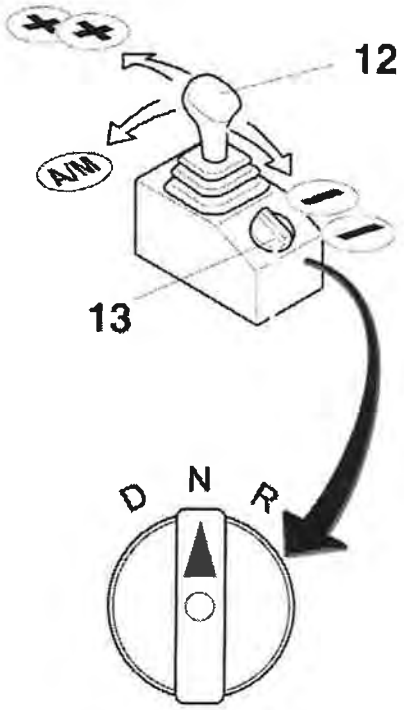
If you shift when the air pressure is too low, the transmission can remain in neutral, with the result that no through drive and no engine braking effect are available.

Rotary switch

The rotary switch has three positions:

- "D" – Drive
- "N" – Neutral (no gear is engaged in the transmission)
- "R" – Reverse

If the rotary switch is in the "N" position, then the switch lever won't work.



Switch lever (12)

The switch lever is used to switch gears and change the transmission mode (manual / automatic).

The switch lever springs back into its initial position after every actuation.

By tapping the switch lever several time, you can shift up / down over several gear steps.

+ Shift up by **one gear**

+ + Shift up by **two gears**

− Shift down by **one gear**

− − Shift down by **two gears**

Change transmission mode:

Manual / automatic and vice versa: press switch lever quickly to the left.

Automatic transmission mode

Rotary switch (13) in position "D": The shifting system automatically selects the third gear as a fixed programmed driving gear. Rotary switch (13) in position "R": The switching system automatically selects the "rapid" reverse motion as a fixed programmed driving gear.

The shifting system automatically shifts up and down while driving.

You can change the transmission mode from automatic to manual at any time.

Manual transmission mode

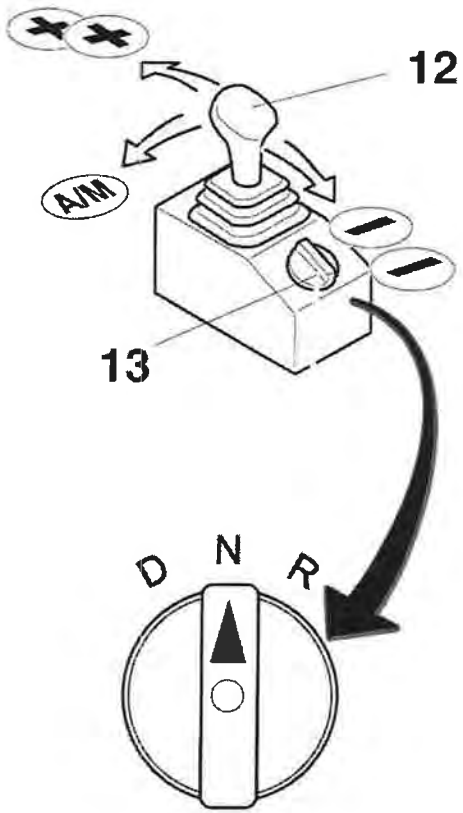
Rotary switch (13) in position "D" or "R": If the gear shift lever is tilted to the left, the switching system switches to the operating mode "Manual".

The driver can also select another driving gear as the programmed driving gear.

Over revving the engine must be avoided by the driver by shifting gears at the right time.

If you use the accelerator pedal in too high a gear, you might stall the engine.

You must avoid slow driving which puts stress on the clutch by possibly driving slowly or by driving in a lower gear than is fixed and programmed.

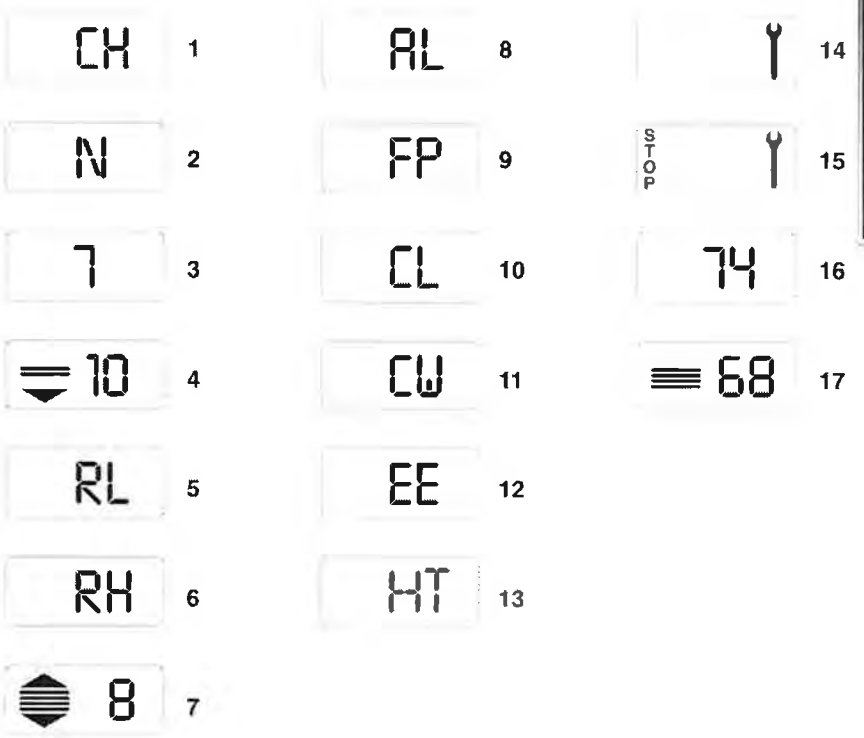


(75) "Transmission information" display
All operating indicators (performed or preselected functions), warning information and malfunctions / errors are shown on the "Transmission information" display (75) with numbers and symbols.
Malfunctions, see error code table at the end of the section.

Operating indicators
1 Self-check of the system
(during ignition, on)
2 Transmission in neutral
3 Engaged gear
4 Manual driving mode
engaged gear, possibility to shift back (two gears)
5 "Slow" reverse gear engaged
6 "Fast" reverse gear engaged
7 Automatic driving mode
is shown in the display by four bar with two arrows
(the eighth gear is engaged in the transmission)

Warning information
8 Insufficient air pressure (airless)
9 Take foot from the accelerator pedal
10 Clutch is overloaded. Select a lower gear (clutch)
11 Clutch is worn out (clutch wear)
12 Communication error to the display (electronic error)
13 Transmission temperature too high

System error
14 System malfunction. Continued operation is possible, though limited.
15 Serious system malfunction. Continued operation is not permitted.
16 Example: Error no. 74
17 Example: Error no. 168
Four bars are shown in addition to the number: Error no. + 100 (only for two digit display)



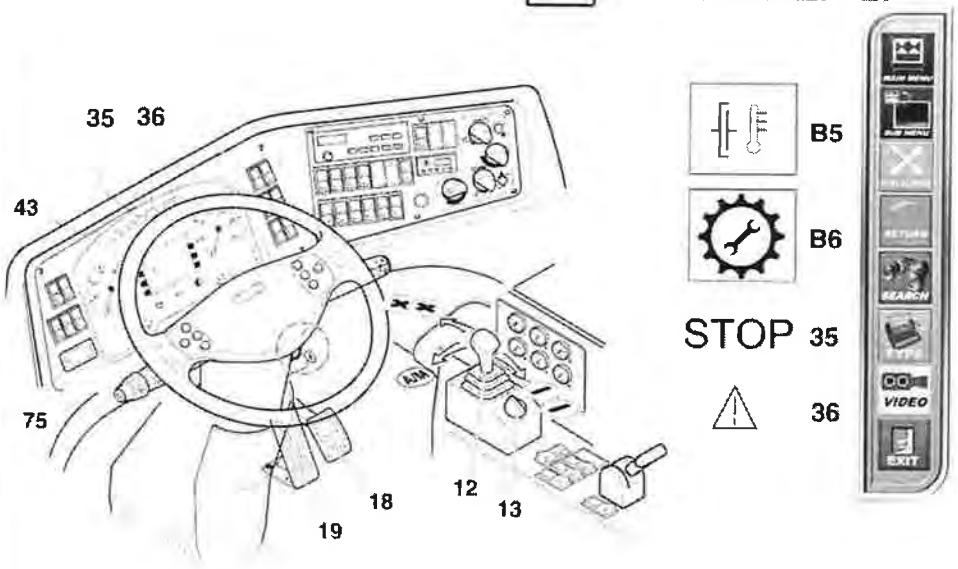
(43) "Driver information system" display

Regardless of what is shown on the "Transmission information" display (75), various malfunctions are also shown on the "Driver information system" display (43) with the use of indicator lights.

- Indicator light (B5) = clutch overload

The clutch temperature is too high. Change travelling operation (do not drive with dragging clutch).

- Indicator light (B6) + "caution" (36) = malfunction in the drive gearbox Stop vehicle, read off fault code, rectify fault. Continued operation is possible, though limited.
- Indicator light (B6) + "STOP" (35) = serious malfunction in the drive gearbox Stop vehicle, read off fault code, rectify fault. Continued operation is not permitted.



Driving and Shifting Gears

You are not allowed to leave the vehicle if is the engine is running or a gear is engaged.

Starting the Engine

1. Apply the parking brake.
2. Rotary switch to "N" (transmission in neutral)
3. Switch on the ignition. (Ignition starter switch, position "2")

At "Ignition on", a self test of the shifting system is done.

After the control signal: "CH" display.

4. Starting the Engine

"N" display; Transmission is in "neutral".

It is not possible to switch gears when the engine is at standstill.

Driving, Driving Forwards

Starting position:

Apply parking brake, engine running, transmission in "neutral".

1. Turn rotary switch from "N" to "D".

Automatic drive mode is activated.

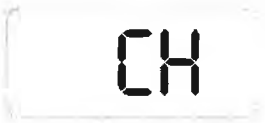
The display (75) shows the driving gear engaged.

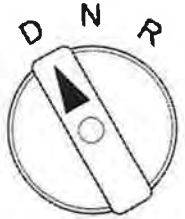
The shifting system automatically selects the third gear as a fixed programmed driving gear.

2. Push the accelerator pedal (18) and at the same time, release the parking brake.

The vehicle can roll away without pushing the accelerator pedal (18).

3. The vehicle starts to drive (clutch engages automatically).





Correcting the programmed driving gear

At road inclines or declines, you can drive with a lower or higher gear.

The programmed driving gear (gear 3) can be corrected as follows:

Press the switch lever (12) in the direction " – " or " + "; the engaged driving gear is shown on the display (75).

Change transmission mode: Manual / automatic

The transmission mode can be changed at any time, even while driving.

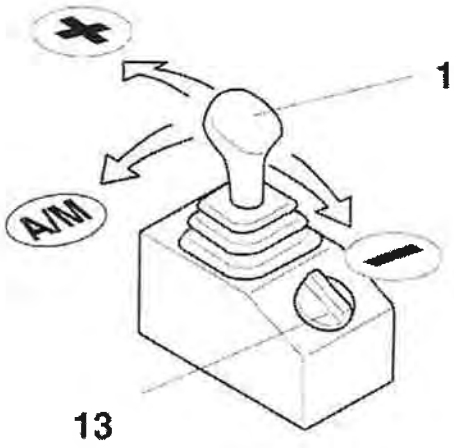
Changing the transmission mode from manual to automatic:

Push the switch lever (12) to the left.

Changing the transmission mode from automatic to manual:

– Push the switch lever (12) to the left or

– in the direction " + " or " – ".



Changing Gears

A gear can be switched automatically while driving by the automatic driving program, or manually by the driver.

You can shift from any gear into "neutral" using the rotary switch (13). This gear switch has priority.

The position of the accelerator pedal (18) must not be changed while switching gears, because the engine is automatically controlled.

A gear switch command is not executed when the max. permissible engine speed was exceeded by the gearshift mechanism.

Risk of accidents!

Shifting to "neutral" is also possible while driving. If you shift to "neutral", the drive train is interrupted

The engine braking effect no longer exists.

At the latest by an engine speed of 2350 U/min (rpm), the crane is to be braked until the speed is reached at which the automatic transmission shifts down to the next gear (possible gear range change).

Shifting gears in the automatic transmission mode

All up shifting and downshifting is done automatically.

Shifting gears depends on various factors such as axle load, acceleration pedal position, speed, engine speed or shift profile.

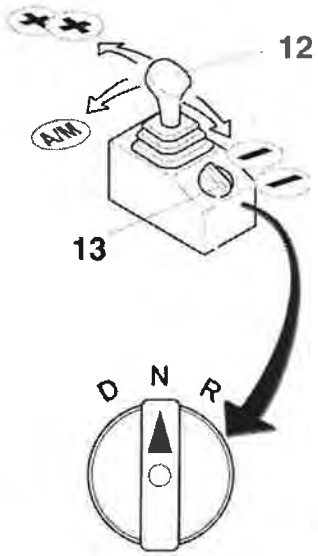
Up shifting:

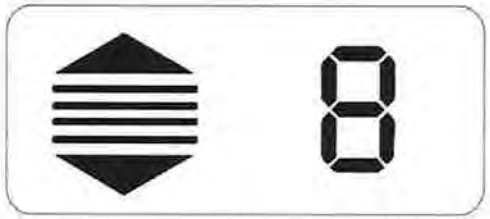
When accelerating, as soon as the required speed is reached to shift up a gear, the transmission automatically shifts into the next higher gear.

Downshifting:

When decelerating, as soon as the required speed is reached to shift down a gear, the transmission automatically shifts into the next lower gear.

The gear display is shown as digits in the display (75) while driving.





Shifting gears in the manual transmission mode

Press the switch lever in the direction " + " or " − "; the engaged gear is shown on the display (75).

When you shift gears manually, the shifting system leaves the automatic transmission mode.

If you press the switch lever (12) to the left, the automatic transmission mode is activated again.

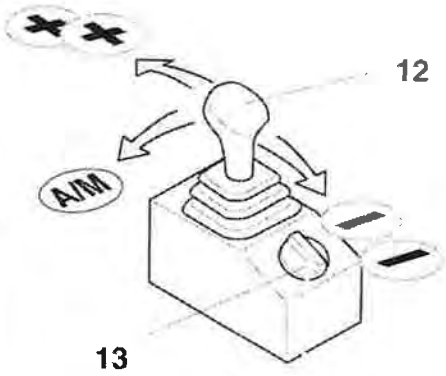
Skipping gears

Skipping a gear:

Press the switch lever (12) twice quickly into the desired direction.

Skipping two gears:

Press the switch lever (12) three times quickly into the desired direction.



13

Reverse driving / changing the driving direction

You can only shift gear in another driving direction is the wheels are at a standstill. Engine at idle speed!

If the vehicle is rolling, it will not shift into the reverse gear; the transmission shifts into "neutral".

Engage reverse gear:

1. Stop vehicle; wait for standstill; Apply the parking brake.
2. Turn the rotary switch (13) over "N" to "R".

"RH" appears in the display (75)

(clutch remains disconnected)

The switching system automatically selects the "rapid" reverse motion as a fixed programmed driving gear.

3. Push the accelerator pedal (18) and at the same time, release the parking brake.

(clutch engages automatically)

4. The vehicle drive in reverse.

As soon as the rotary switch (13) is set in the "R" position, the reverse gear warning signal sounds.

Correcting the programmed driving gear

At road inclines or declines, you can drive with a lower or higher gear.

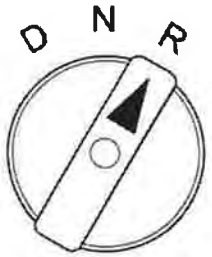
The programmed driving gear ("rapid" reverse motion (display "RH")) can be corrected as follows:

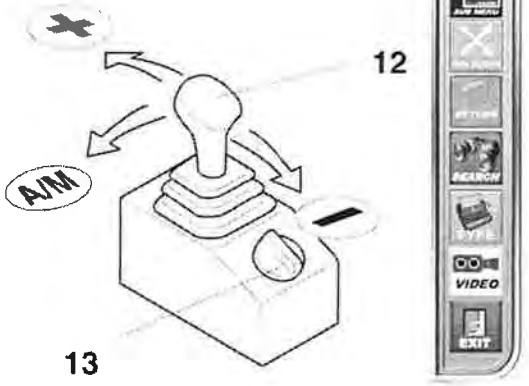
Press gear shift lever (12) in direction " − ". The transmission switches to the "slow" reverse motion (display "RL").

Changing the driving direction

Turn the rotary switch (13) from "R" over "N" to "D" or reversed from "D" over "N" to "R".

Remain in position "N" so that the gearshift is completed.





Stopping

The vehicle can be braked in any gear to the point of standstill.

If the accelerator pedal is not actuated, the vehicle will decelerate with the service brake to the point of standstill. Apply the parking brake.

The clutch opens automatically before the vehicle comes to a standstill, so that "stalling" the engine is avoided.

When engine is not in action, it is recommended to put the transmission in neutral, because after the device has been in standstill for a long time, the emergency pressure supply (6.2 bar (90 psi)) level required for shifting gears could have sunk to a point where it is no longer possible to shift into neutral.

Risk of accidents!

If the vehicle is standing with a running engine and an engaged gear, it is enough to actuate the accelerator pedal (18) in order to bring the vehicle into motion.

Before leaving the vehicle with the engine running, the transmission must be in "neutral" and the parking brake must be applied.

Applying the parking brake while driving on a smooth surface can bring the engine to a standstill.

The hydraulic steering support is no longer available in its previous form. A considerable amount of power is needed for the steering wheel and the steering reacts more slowly.

Shutting off the engine and vehicle

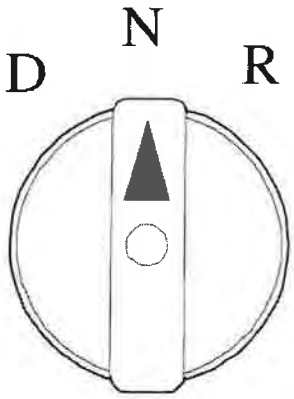
1. Stop vehicle; wait for standstill; Apply the parking brake.
2. Turn rotary switch (13) to “N” (neutral).
3. Shut off the engine (ignition–starter switch (15), position “1”)
4. Place wheel chocks underneath (e.g. on inclines)

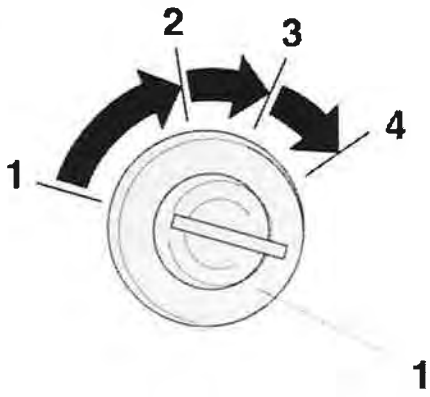
After “Ignition off”, the system automatically shifts into neutral. If no brake is actuated, the vehicle can roll away.

“Ignition off”, special case

If the ignition is switched off while driving, it is not possible to shift into neutral. The engaged gear remains engaged, the clutch remains engaged.

When the driving speed goes below a certain limit, the clutch and the transmission shifts into neutral.





Maneuvering (Distance < 1m / 3.3 ft)

When moving slowly and carefully (e.g. hooking up / detaching a dolly), a maneuvering operation is provided in the first driving gear and in the first reverse gear. The transmission remains in this gear; it does not up shift.

The maneuvering operation is not effective in other gear. If it is selected in another gear, the shift will not be executed (transmission remains in the first gear).

In the maneuvering operation, the clutch is switched from "Driving mode" to "Maneuvering mode" with the switch (90). The clutch control is different to that for the normal "Driving mode" (now: dragging clutch).

In this way, the vehicle can be positioned slowly and carefully forward or backwards using the accelerator pedal (18).

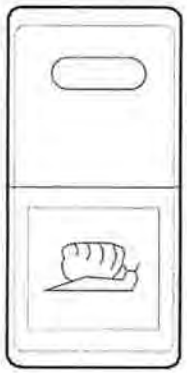
During maneuvering, the distributor gear should always be shifted into "Off-road gear" – because of the more favorable transmission ratio. This prevents damage to the clutch.

The maneuvering operation is associated with heat development and increased clutch wear and can lead to overloading the clutch.

The "CL" display (43) and the "Clutch overload" (B5) is shown in the display (75) if the clutch is overloaded (regardless of accelerator pedal position and driving speed). The driver has to change the travelling operation now (vehicle / stop) to prevent damage to the clutch.

In "Maneuvering mode", the vehicle can only be moved slightly. The driving time is about three minutes; only a short distance (< 1 m / 3.3 ft) can be covered until the "CL" and B5 warning displays light up as a result of heat development.

The system needs another 15 minutes or so – with stationary vehicle and running engine – to cool off the clutch.



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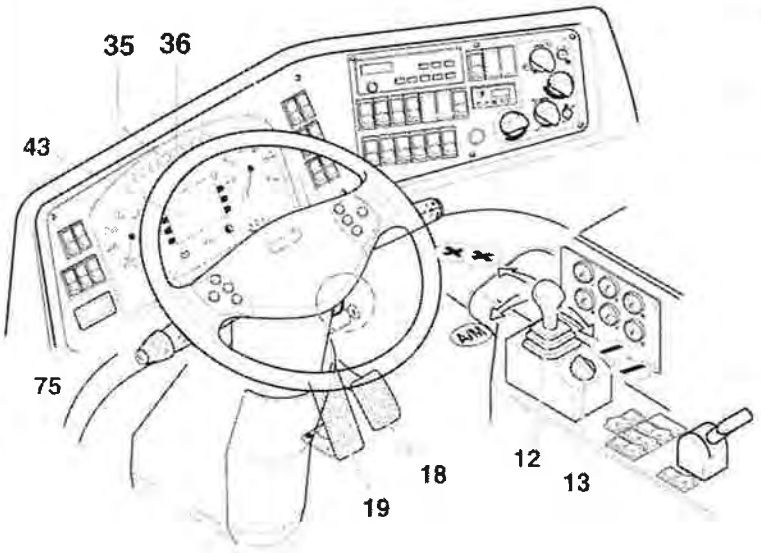
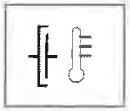




B5

Towing away

The towing operation is described in detail in Sect. 14.

Observe the procedures defined there exactly.

Towing start

It is not possible to start the engine by towing it along.

Starting aid with external batteries, see Sect. 5.

Rolling down a downhill slope

Prerequisite for this procedure: Running engine

Risk of accidents!

When the vehicle is rolling without an engaged gear – rotary switch (13) is on "N" – there is no engine braking effect.

Do not let the vehicle roll in the opposite direction of the engaged gear.

If the vehicle rolls forward – when the transmission is in neutral – after releasing the brakes and you shift from "N" to "D", then the system selects the gear that fits to the speed. The drive train is "closed" (positively tied). (Example with third gear)

Exhaust brake

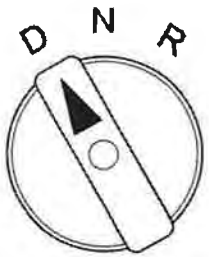
The engine braking effect is interrupted when switching gears. The vehicle can accelerate when travelling downhill.

Manual driving mode

The exhaust brake is deactivated by the system when shifting. After shifting successfully, the exhaust brake is automatically switched on again.

Automatic driving mode

When actuating the exhaust brake, the system shifts back to the gear where the highest brake performance was available.



Clutch protection

Despite the automated clutch, the driver has great influence on the service life of the clutch lining. To cut down on wear and tear, it is recommended to always select the lowest possible gear when driving.

See "Driving and Shifting" in this section under "Correction of the programmed driving gear".

To prevent damage to the mechanical parts of the clutch control, shift the transmission to neutral for longer stops (more than 1–2 minutes, e.g. traffic jam, train crossing). In doing so, the clutch is engaged and the clutch controller is released.

If the clutch is in danger of overloading, e.g. due to several short, consecutive startup procedures or crawling with dragging clutch, the " CL " display will appear on the display (75) and the indicator light (B5) on the display (43).

Put the vehicle into an operating mode where the clutch is not overloaded; for example:

- when accelerating (to apply the clutch)
- when stopping
- when driving at a low gear
- when driving at speeds below the walking speed: switch distributor gear to terrain driving.

If the driver ignores the warning signal, the clutch engages when the accelerator pedal (18) is pushed.

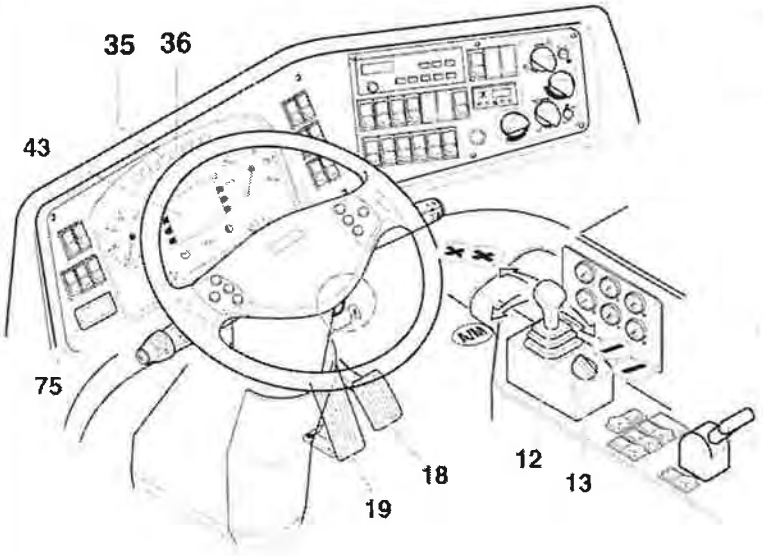
In this way, further strain on the clutch is avoided.

This can lead to the "stalling" of the engine, in which case the vehicle may roll back if on an incline.

By releasing the accelerator pedal (18), the clutch opens again.

Further information can be found under "Maneuvering" in this section.

B5



Over speed protection

To protect the entire drive train from too high a speed, the system allows only gearshifts that are within a certain range.

Shifting and protective measures are in conjunction with the permissible engine speed, that can be controlled at the revolution counter (50) in the instrument panel.

If the engine speed exceeds 2350 U/min (rpm) (excessive engine speed), the LED (50.1) lights up and the warning buzzer sounds as long as the engine speed is excessive.

Be sure that the engine does not exceed the permissible speed range. especially when driving downhill.

At an engine speed of 2300 U/min (rpm), the exhaust brake is deactivated to protect the engine mechanic against damage.

Manual transmission mode

If the vehicle accelerates when going downhill, the automatic transmission will not shift into a higher gear.

The engine can be damaged, if the vehicle accelerates when going downhill and the engine comes in to the over speed range.

The – accordingly low – gear range in which the crane can be maintained at a constant speed must be selected before the crane is driven downhill.

Automatic transmission mode

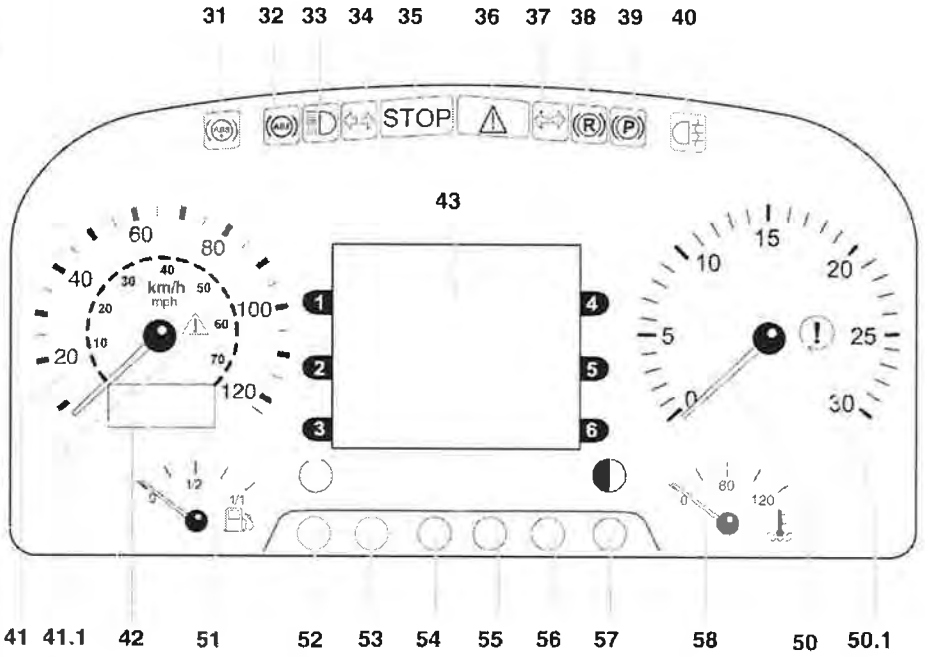
Caution when driving downhill!

At the latest by an engine speed of 2300 U/min (rpm), the vehicle is to be braked until the speed is reached at which the automatic transmission shifts down to the next gear.

Risk of accidents!

The vehicle can accelerate when travelling downhill.

To protect the engine during excessive engine speed, the system up shifts.



Roller dynamometer

After driving onto a roller dynamometer (brake dynamometer), shift the transmission into "neutral".

When rolling, the system recognizes the function "Driving vehicle". If a gear is engaged, the clutch engages.

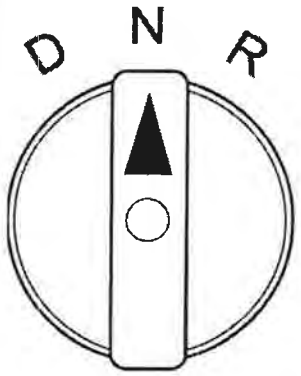
Risk of accidents!

The vehicle can drive off the roller even without the accelerator pedal being pressed (18).

When rolling, it is not possible to shift into reverse gear.

Hydraulic Retarder (system "ZF Intarder")

A hydraulic retarder (system "ZF Intarder") is integrated in the transmission.



System malfunctions / error diagnosis

Fault messages

The drive gearbox has a self-diagnosis system.

If the system recognizes faults / errors, this will be shown to the driver on the (75) "Transmission information" display.

The faults are divided into fault classes 1 to 3 and entered into the fault memory of the transmission after the ignition has been switched off. Up to ten different errors can be stored. If the fault memory is full, a non-active error will be overwritten.

Error class 1

Errors that even after occurring several time do not lead to a reduced availability of the system.

Display: None

Unlimited driving mode possible.

Error class 2

If there are two or more occurring errors from error class 2, the system reacts as under error class 3.

Display: "Spanner" symbol

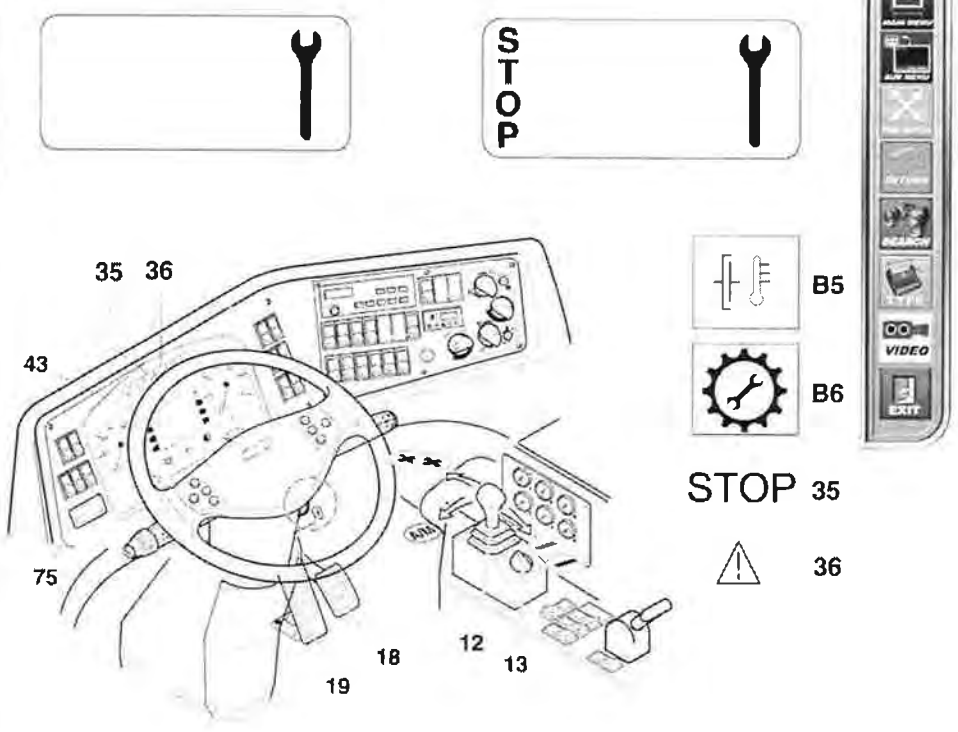
If the "Spanner" symbol appears on the display, there is **system malfunction. It may be that the driving mode is only possible in** limited form, e.g. only in manual.

Error class 3

Display: "Spanner" symbol plus "STOP"

If the "Spanner" symbol plus "STOP" appears in the display, there is **a serious system malfunction. Continued operation is not** permitted. It is necessary to bring the vehicle to the workshop.

Regardless of what is shown on the "Transmission information" display (75), various malfunctions are also shown on the "Driver information system" display (43) with the use of indicator lights.



Reset

It is possible to delete the fault message and the resulting error reaction when the vehicle is at standstill using "Ignition OFF"; wait until the display goes out.

If the display does not go out after "Ignition OFF", switch on the ignition again. If the fault message is still showing, it is time to consult out customer service department.

In addition to this optical warning, the warning buzzer sounds in the cab according to the error class.

Reading off the fault code

If there is an error, the error number can be called up on the display (75). If there is a serious system error ("Spanner" symbol plus "STOP"), stop the vehicle and switch off the engine.

Calling up the current error numbers:

1. Switch on the ignition.
2. Turn rotary switch (13) to "N".
3. Push the switch lever (12) to the front and hold.

An error number appears on the display (43). This corresponds to the current error; Example: Error no. 74

Display of three-digit error numbers:

If, in addition to the display number, **four bars are shown, this** means that: **Error no. 100; Example: Error no. 168**

Retrieving the errors stored in the fault memory:

While holding down the brake pedal (19) at the same time, all (saved and active) errors are shown on the display (43) in sequence.

Error list

Error list explanation

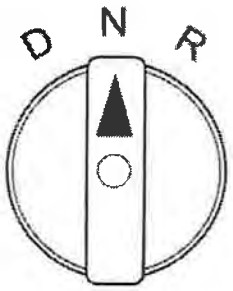
GV = transmission in GV position (splitter unit)

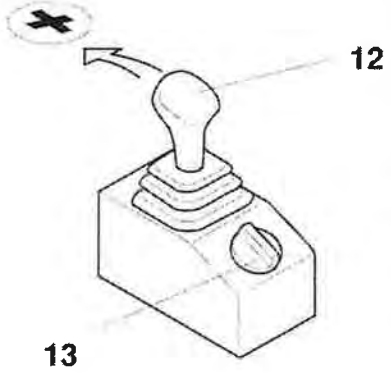
Even and odd gears

GP = transmission in GP position (range unit)

Slow gears (gears 1 to 8)

Fast gears (gears 9 to 16)





Listing / explanation of possible error displays

Error class 3	Effect
02, 03, 04, 05, 06, 07, 08, 09, 22, 34, 35, 36, 37, 38, 39, 40, 41, 54, 61, 62, 66, 67, 68, 69, 70, 71, 72, 73, 77, 78, 82, 83, 84, 85, 90, 101, 105, 117, 132, 136, 140, 144, 169, 170, 177, 179, 180, 181, 188, 189, 190, 191, 193	Driving: gear shifting is locked. Standstill: Automatically shifted into neutral and the gear shifting is locked. Continued operation is not possible. System not available.
Error class 2	**Effect**
10, 42	Driving: gear shifting locked, incl. neutral. Driving gear: Only when lowest gear is engaged for GP high speed. Ignition on: System not available.
17, 18, 19, 20, 21, 49, 50, 51, 52, 53, 97, 98, 99, 107, 120, 121, 122, 123, 124, 164, 165	The following effects may happen: Driving: Reduced comfort when driving, manoeuvring, shifting, increased shifting time. Standstill: Middle driving gear. No manoeuvring operation.
81	Driving: Gear shifting is locked. Standstill: it is possible to engage the driving gear. Driving possible.
110	Driving: gear shifting is locked, including the shifting attempts into neutral. Standstill: Driving gears possible.
118	Driving: Gear shifting is locked. Standstill: Engine stalls, if the clutch does not open.
119	Driving: clutch engages quickly. Gear shifting is locked. Standstill: Automatic shifting into neutral system not available.
Error class 1	**Effect**
11	Warning buzzer permanently active.
12, 44	Activation of the back-up light not possible.
23	Permanent control warning light.
25, 89	Display EE. No system reaction.
26, 27, 28, 30, 31, 32, 33, 91, 92, 93, 94, 96, 113, 171, 173, 182, 183, 184, 192, 197, 199	The following effects may happen: Driving: Reduced comfort when driving, manoeuvring, shifting, increased shifting time Standstill: Middle driving gear. No manoeuvring operation.
43, 75	Cannot control the warning buzzer.
55, 87	Cannot control the warning light.
76	Back-up light permanently switched on.

Error class 3	Effect
86	Display cannot be switched off. Driving switch does not switch off. No restriction of the system availability.
95, 100, 104, 111, 112, 125, 127, 128, 167, 174, 195, 196, 198	Since an isolated error, no effect on the system or on certain calculations e.g. wear on clutch not possible.
102, 163	Driving: gear shifting is locked, including the shifting attempts into neutral. Standstill: Driving gears possible.
108, 175	The following errors may occur: Driving: Gear shifting is locked. Standstill: System not available, driving gear possible.
126	System function not affected. Possible loss of pressure was not displayed. Higher learning time.
129, 130, 131	Driving: gear shifting is locked, shifting out of neutral possible. Standstill: Driving gears possible
133, 134, 135	Driving: Restricted gear selection. Standstill: Restricted driving gear, no reverse gear.
137, 138, 139, 145, 146, 147	Driving: GP shifting locked. Only gears can be engaged in the shifted GP area. Reduced shifting comfort, increased shifting time. Standstill: Driving gears possible.
141, 142, 143, 148, 149, 152	Driving: Automatic gear correction (last GV position) or shift into neutral. Standstill: Driving in last GV position or using driving switch.
150	System not available. Renewed GV shifting attempt possible.
151	Driving: Automatic gear correction or shift into neutral. Standstill: Driving gear can only be selected using driving switch.
153, 155, 156	Driving and standstill: Automatic shift into neutral. Renewed shifting using driving switch.
154	Driving: clutch engages. Next shifting attempt using driving switch. Standstill: Driving max. lower gear, higher GP.
158, 159, 160	Automatic gear correction.
166	Driving: possible to shift while driving. Standstill: System not available.
168	Driving: no system restrictions. Standstill: After reset, driving is possible.

Distributor gear

The distributor gear is rear mounted to the actual drive gearbox.

It forms a unit with the "Lift axle".

An emergency steering pump, that secure the steering ability of the crane in case the engine fails, is located on the intermediate shaft. It is driven from the rolling crane.

There are two gear levels (street / off-road gear).

A = on road gear, B = drive, C = emergency steering pump 1, D = front drive, E = differential lock,

F = off-road gear, G = shift cylinder, H = lubricating oil pump, I = emergency steering pump 2, (not fitted) J = rear drive

Operating the distributor gear

Engage the off-road gear early enough (on level surface and before entering difficult terrain); and not after the crane vehicle has become stuck.

On road gear, off-road gear and the differential lock can only be activated when the vehicle is at a standstill (dog clutching).

On rare occasions, it is not possible to switch from on road gear to off-road gear in one go due to the gear teeth locking.

If the attempt to shift the distributor gear fails (locked teeth), this will be indicated on the display (43) by an indicator light (A8). The distributor gear will then be in neutral; i.e. the drive train is not closed.

To change the position of the teeth in the distributor gear, carry out the following procedure:

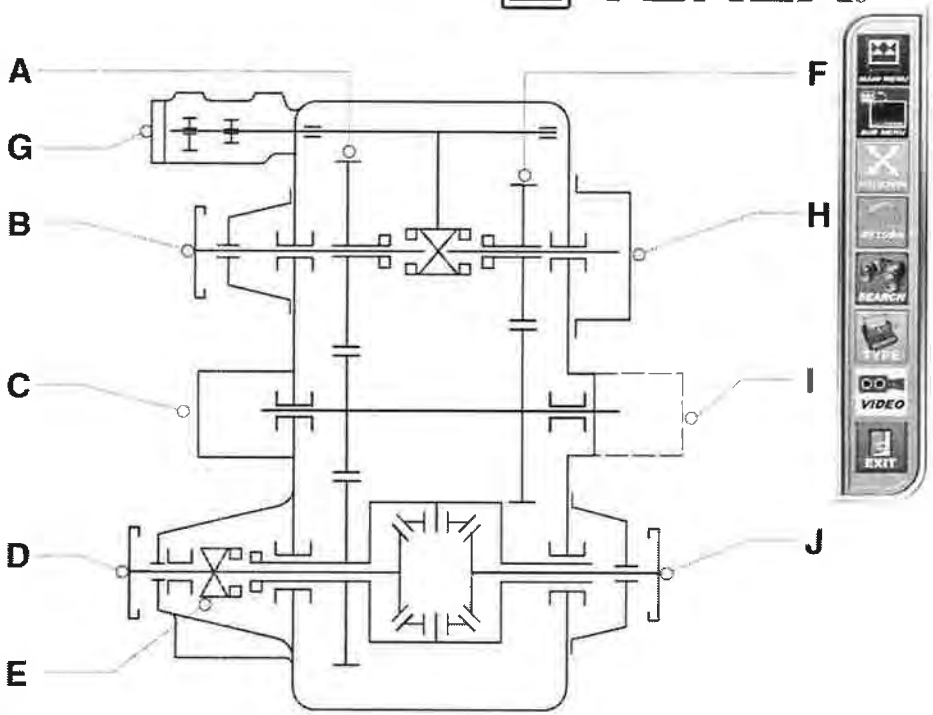
1. Apply the parking brake.
2. Starting position for rotary switch (13): position "N" .
3. Press the dual button (93) and hold it down.
4. Change rotary switch (13) from "N" to "D" and / or "R".

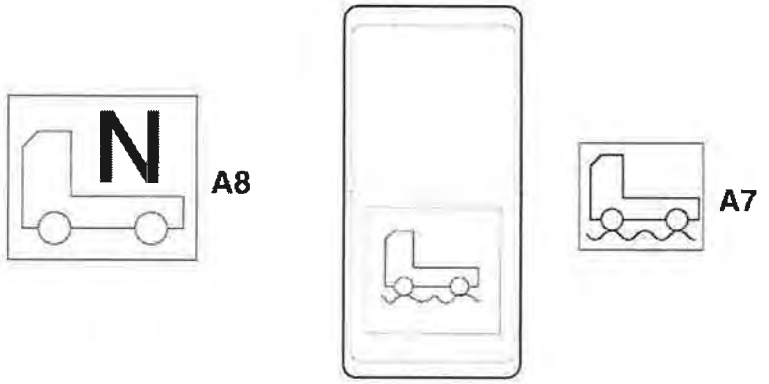
Do not push the accelerator pedal (18) (do not give it any "gas").

5. Observe the display (43)

If the indicator light (A7) is shown, the gear has been successfully shifted. The off-road gear is engaged.

6. Release the dual button (93).

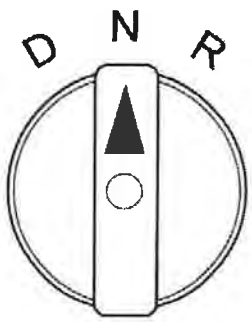


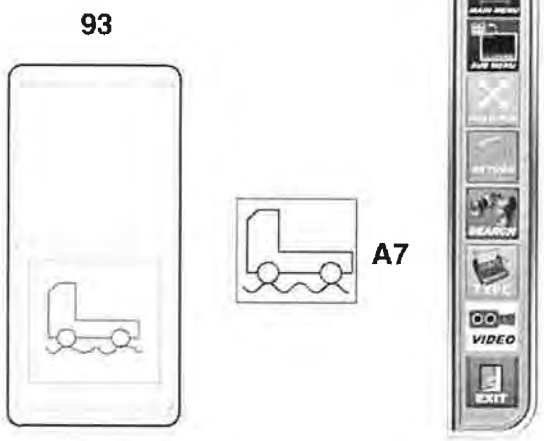


In case the off-road gear – despite carrying out the described procedures – cannot be engaged:
Without the parking brake being engaged, turn the steering wheel as far as it will go in one direction and then and repeat procedures 1–6.
If the accelerator pedal was pushed at point 4 (the clutch closed), the rotary switch (13) must be turned back to the starting position, position "N", before another attempt is made to shift the gear. This will open the clutch again. Another gear shift attempt can be made.

– On/off-road gear

The switch (93) can be used to choose between two different gear steps in the distributor gear:
The transmission ratio in the distributor gear changes when shifting from on road to off-road gear.
When driving below the walking speed or during maneuvering operation you should always switch to the gear "Terrain driving" due to the more favorable transmission ratio. This prevents damage to the clutch.
The gear shifts of the distributor gear operate independently of the driving mode / gear mode of the drive gearbox.
A supply pressure of min. 7.0 bar (101.5 psi) is required for all distributor gear shifts.
– Distributor gear in "on road gear" position:
The on road gear is always engaged under normal circumstances. No indicator light is shown.
– Distributor gear in "off-road gear" position:
Press dual button (93); the indicator light (A7) lights up.
The off-road gear is primarily intended for:
– Driving on a work site
– "Driving when rigged"
– Driving with the lowest speed possible.





– Differential lock

The differential in the distributor gear can be locked if the drive wheels slip in difficult ground conditions.

When locked, there is a rigid connection between forwards output and rear output.

Be sure to follow the instructions and regulations outlined there.

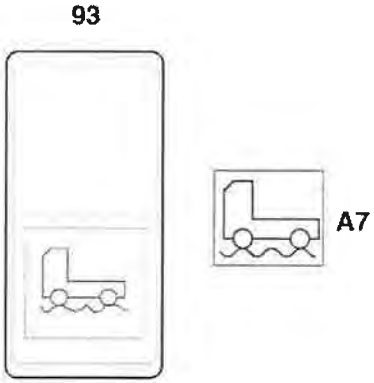
– Neutral position

If towing is required (for certain specific types of damage), the distributor gear can also be put into the neutral position using a manually actuated pneumatic valve.

When towing is finished, on/off-road gear must be reinstated in the distributor gear by pressing dual button (93).

– Driving in reverse

Prolonged driving in reverse should be avoided. (The lubricating oil pump does not operate!)



Driving stuck crane free

If the crane is stuck on difficult terrain, it can be driven "free" by driving forwards and backwards.

Action steps for driving crane free:

1. Engage off-road gear (press dual button (93)).
2. Turn rotary switch (13) to "D".

The driving gear is selected automatically, but can still be changed using the switch lever (12).

3. Apply careful pressure to the accelerator pedal (18).

Move the vehicle as far forwards as possible.

4. Engage the service brake and stop the vehicle.

Engine at idle speed!

5. Wait for standstill.
6. Move rotary switch (13) from "D" to "N" and then to "R").

The driving gear "RH" is automatically selected, however it can still be modified using switching lever (12).

7. Apply careful pressure to the accelerator pedal (18).

Move the vehicle as far backwards as possible.

8. Engage the service brake and stop the vehicle.

Engine at idle speed!

9. Wait for standstill.

Repeat this procedure if the crane is getting a bit further with each change of direction.

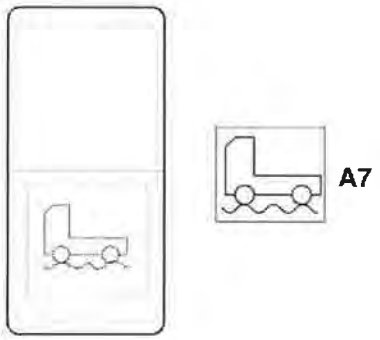
If the wheels are spinning, stop the attempt; the crane will have to be towed free.

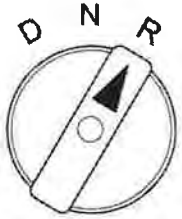
You can only shift gear in another driving direction is the wheels are at a standstill (engine at idle speed).

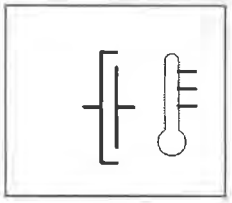
If the vehicle is rolling, it will not shift gears; the transmission shifts into "neutral".

Keep an eye on the clutch temperature.

If the clutch is in danger of overloading, the "CL" display will appear on the display (75) and the indicator light (B5) on the display (43).







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