D E A R D R I V E R,

This Manual should acquaint you with the correct operation and routine maintenance of your new vehicle AVIA.

It also provides the important safety information.

We recommend you to read it thoroughly and to follow instructions and warnings mentioned.

We would be pleased if you manage to make a full use of its advantages and possibilities.

We believe that the vehicle AVIA will serve you many years to your complete satisfaction.

Avia Ashok Leyland Motors s.r.o.
Beranových 14
Praha - Letňany
Czech Republic

Vehicle documentation

Operation Manual

To get acquainted with the vehicle properly, it is necessary to read through the "Operation Manual" and all manuals, which were delivered together with your vehicle (e.g. operating instructions for the use of auto radio, tachograph, battery warranty card, etc.).

Service Booklet

The vehicle documentation also contains the "Service Booklet", in which you can find:

- **n** vehicle identification data
- **n** guarantee conditions
- **n** warranty card and data on the owner
- **n** records on regular service inspections
- **n** service jobs and maintenance intervals
- **n** body condition records
- **n** special servicing and maintenance
- **n** directory of authorized service stations

Information

The vehicle equipment parts marked with * have been factory installed on certain models or are delivered as option only.

Warning!

n The texts in frames named "Warning!" must be unconditionally observed.

If you sell your vehicle, remember to overhand the complete vehicle documentation to a new owner.

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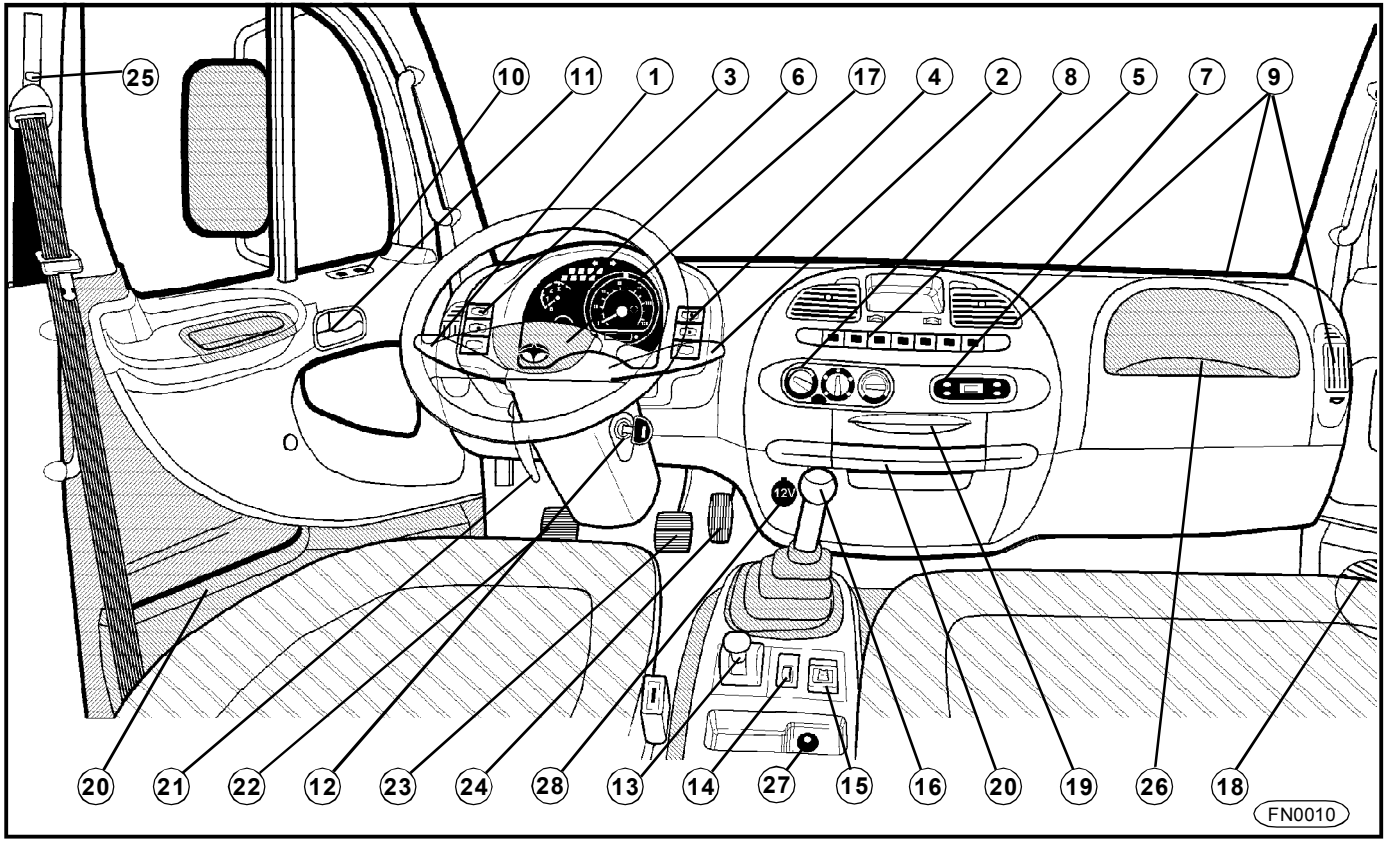
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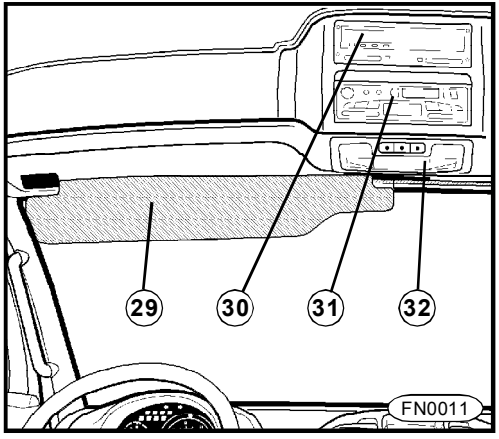
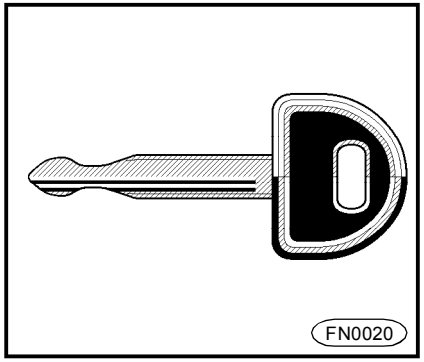


Keys

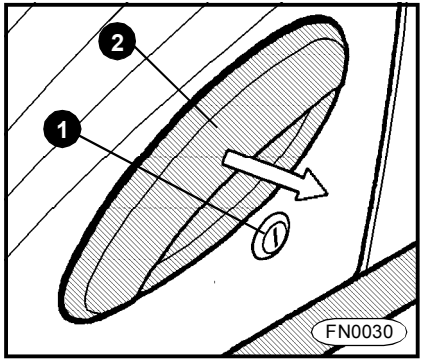


n Your vehicle is delivered with two keys - you should keep one in a safe place outside the vehicle as a spare one.

n Keys are provided with a label, on which the key number is stamped. You should keep the label in a safe place outside the vehicle and put down the number somewhere.

n If the vehicle is fitted with the analogue tachograph, the key to open it is delivered with the vehicle.

Doors

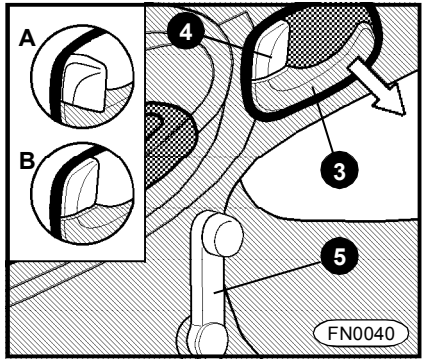


From outside

Both doors can be unlocked and locked from outside by the key which you insert and turn in the lock (item 1). Grasp the handle grip (item 2) and pull it toward you to open the door.

Unlocking - insert the key, give it 90° turn towards the face of the vehicle and back into the initial position when you can remove it.

Locking - insert the key, gently turn it towards the rear of the vehicle and back into the initial position.



From inside

n (item 4)

A - door unlocked

B - door locked (when the door is locked in that manner, it cannot be opened neither from the outside, nor from the inside).

n Pull the lever (item 3) to open the door.

n Turn the handle (item 5) to open or to shut the window.

Electrically actuated windows*

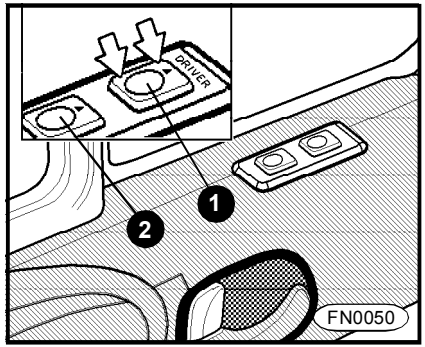
Central door locking*

Use the central door locking to lock or to unlock both doors simultaneously from the driver´s side.

Warning!

n Remember always to remove the key from the ignition switch before leaving the vehicle.

n Take care that the tailgate and side door of the box body are locked properly. It is not allowed to transport the loads which do not allow a safe closing of the door. Should the box body be damaged due to the tailgate or side door closed wrong, the manufacturer does not provide any guarantee for it.



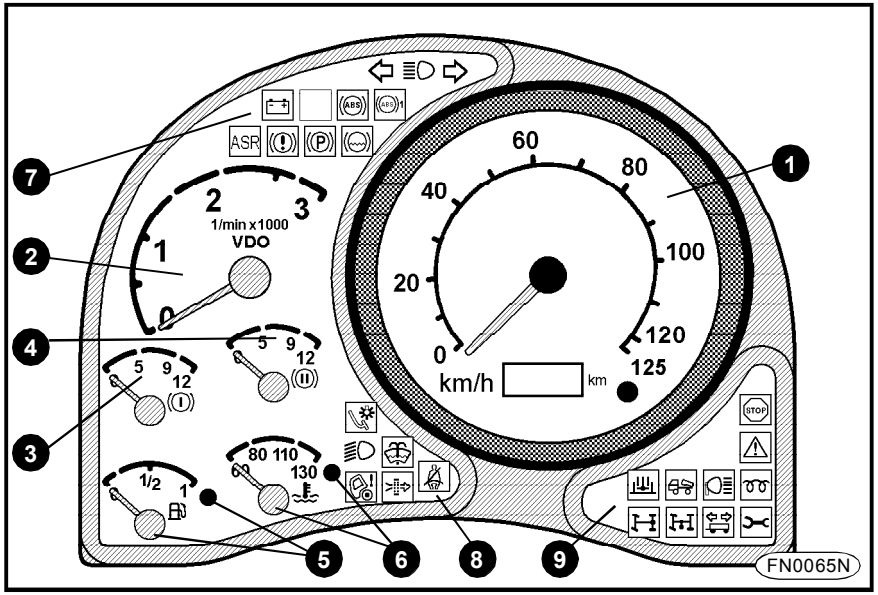
n The windows can be lowered when the ignition is in position **"ON"** only.
n The windows lowering is active only when the button is hold depressed.
n The control buttons are situated on the top of the door.
n Both side windows can be controlled from the driver´s place.
n Only the window on the RH side can be controlled from the co-driver´s side.
n The control button (item 1) - for the window on the driver´s side.
n The control button (item 2) - for the window on the co-driver´s side.

n Push the front part of the rocker switch to open the windows, push the other half of the rocker switch to shut the windows.

Warning!

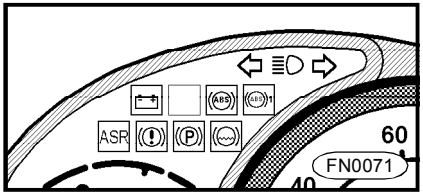
Do not leave your fingers on the window glass when closing it - the mechanism can develop the force, which may cause injury.

Instrument board - gauges



1 Tachometer
2 Engine speed - indicator
3 Air pressure gauge of 1st brake circuit
4 Air pressure gauge of 2nd brake circuit
5 Fuel gauge, indicator light
6 Coolant thermometer, indicator light
7 Group of indicator lights I
8 Group of indicator lights II
9 Group of indicator lights III

Indicator lights



Turn signals

n The left or the right indicator light flashes when you operate the turn signal lever.
n A short interval of flashing indicates a defective bulb in the turn signal light (replace it immediately).

High beam

It lights with the high beam on.

Batteries charging

n It lights when the ignition is turned **"ON"** and it must go out after starting the engine.

n If it does not go out after starting or it lights up during driving, move the vehicle a safe distance off the road, shut the engine off and proceed per Chapter **Troubleshooting.**

ABS (vehicle)

ABS (trailer)

n It lights when the ignition is turned **"ON"** (to check the function), it must go out after a short while.
n If it does not go out after a short while or lights up on the move, it is necessary to stop and proceed per Chapter **Troubleshooting.**

Warning!

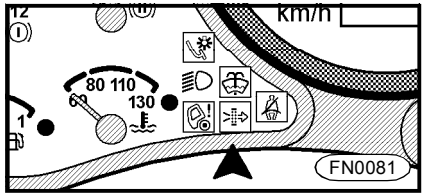
The indicator light may flash with a reduced brightness on the move at irregular intervals. This flashing does not indicate a failure but it is caused by its continuous check performed by the ABS control unit.

Brake system malfunction or brake pads wear

n It lights when the ignition is turned **"ON"** (to check the function) and it must go out after a short while.
n If it does not go out after a short while or lights up on the move, it is necessary to stop and proceed per Chapter **Troubleshooting.**

Parking brake

n It comes on when the parking brake is applied and at low air pressure.
n If it lights, do not move off or if it lights up on the move, stop and proceed per Chapter **Troubleshooting.**



Stop light

n It comes on with a defective bulb of the stop light.
n Replace the faulty bulb immediately.

Low beam

It lights with the low beam turned on.

Cabin tilting

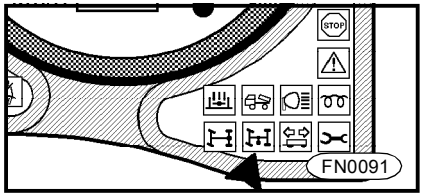
It lights when the cabin does not rest properly in its rear location (correct it immediately).

Air filter (polluted)

n It lights when the filter cartridge has been clogged.
n It is necessary to replace the filter cartridge.

Seat belt*

It reminds you of not buckling by the seat belt.



Differential lock

It lights when the differential lock is ON.

PTO*

Power - take off drive (PTO). It lights when the PTO is on.

Reverse light

It lights when the reverse speed is engaged.

Trailer turn signals*

n They light when the turn signals are switched on and a trailer is coupled.
n A short flashing interval indicates a faulty bulb in the turn signal light (replace the faulty bulb immediately).

Engine - stop

n It lights when the ignition is turned **"ON"** (to check the function), it must go out after a short while.
n It lights at a serious defect of the engine.
n If it does not go out after a short while or if it lights up on the move, move a safe distance off the road, stop the engine and proceed per Chapter **Troubleshooting.**

Engine - warning light

n It lights when the ignition is turned **"ON"** (to check the function), it must go out after a short while.
n It lights when a malfunction or defect on the engine component occurs.

n If it does not go out after a short while or if it lights up on the move, move a safe distance off the road, stop the engine and proceed per Chapter **Troubleshooting.**

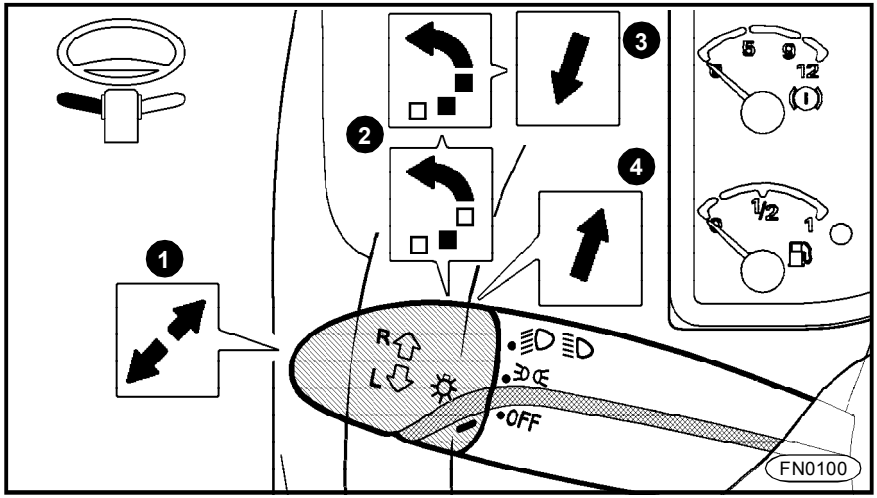
Glowing

It lights when the ignition is turned **"ON"**. You can start the engine after it goes out.

Engine maintenance

n It lights when the ignition is turned **"ON"** (to check the function), it must go out after a short while.
n It lights when some servicing is necessary (oil change, cleaning of water separator in fuel, etc.) and with the engine at standstill, it will go out after starting.
n If it does not go out after a short while or it flashes, proceed per Chapter **Troubleshooting.**

Combined lever switch



1 Turn signals

Turn signals are active when the ignition is in the position **"ON"**. Move the lever perpedicularly towards the steering wheel axis to switch the turn signals on.

R ⇧ right turn signal - lever up
L ⇩ left turn signal - lever down

2 Side marker lights and low beam

Turn the rotary end of the lever to switch them on.

The lights, whose symbol is against the mark, are on:

OFF lights off
side marker lights on
low beam (and/or high beam) on

n The audible signalling is active when the lights are on and the door is open.

3 Low / high beam changing

n To turn on the high beam, push the lever away from the steering wheel (the indicator light will come on to indicate the high beam function).

n Pull the lever to the initial position to change over to the low beam.

4 Headlight flasher

n Move the lever slightly toward the steering wheel (the high beam indicator light will come on).

n Headlights are on until you release the lever.

5 Windshield washer

n Windshield wipers and washer are active when the ignition is turned "ON".

n Push the switch at the end of the control lever to turn on the washer. The washer pump will operate until you release the switch.

6 Windshield wipers

Turn the rotary end of the lever to switch the wipers on:

OFF wipers off

INT intermittent wiping (you can select any wiping interval by the rotary ring in steps - item 7)

LO low speed and continuous wiping

HI high speed and continuous wiping

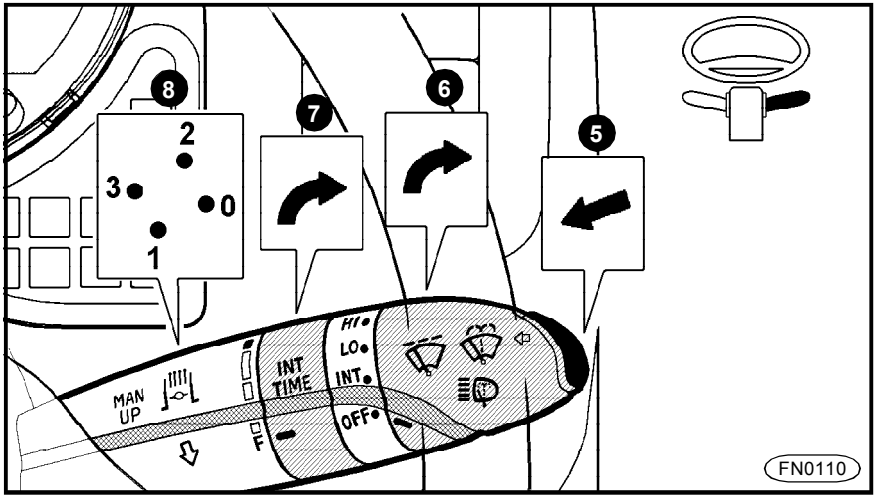
7 Intermittent wiping interval control

The wiping interval is the shortest in the position F, increase it by turning the ring.

8 Engine brake

Position 0 - move the controller away from you and down - the engine brake is off.

Position 1 - move the controller toward you and down - the engine brake is activated when the service brake is applied.



Position 2 - move the controller away from you and up - the engine brake works when the accelerator pedal is released (in the speed zone above the idle run).

Position 3 - move the controller towards you and up - combined function.

We recommend you to switch the engine brake on / off once a week at least. Hereby the service life will be increased.

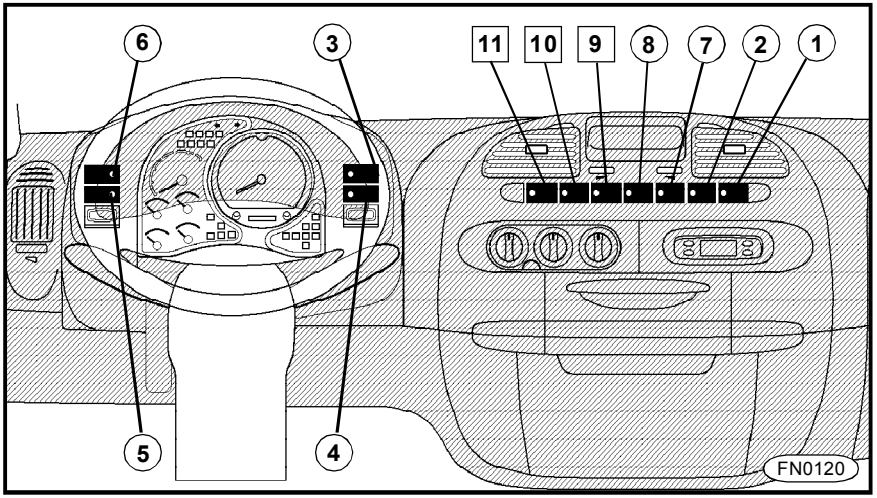
Warning!

n Depress the accelerator pedal to put the engine brake automatically out of function.

n The engine brake function is indicated by the red indicator light on the instrument board.

n The indicator light signalling depends on the engine brake function, not on the position of the control lever.

Controllers



1 Power take-off drive *

n It can be engaged on vehicle at standstill and after the engine speed drops - after about 6 s.

n When the engine is running, depress the clutch pedal to engage the PTO.

n The indicator light comes on to indicate the PTO engagement.

2 Differential lock on /off

n It can be engaged on vehicle at standstill and after the engine speed drops - after about 6 s.

n Use it only for the necessarily needed time to overcome the hard driving conditions.

n The indicator light comes on to indicate the differential lock engagement.

Warning!

Positions 1 and 2 can be engaged when the air pressure exceeds 0.55 MPa - otherwise the engagement cannot be guaranteed.

We recommend you to switch the differential lock on / off once a week at least - hereby the service life will increase

3 Emergency flasher

n The bulb in the switch indicates the function.

n It can be turned on even with the ignition off.

4 Rear-view mirrors heating

it is indicated by the bulb in the switch.

Warning!

Operate the heating for the necessarily required time only.

5 Tail fog lamps

n The tail fog lamps can be turned on only when the low beam or front fog lamps are on.

n With regard to a dazzling effect, it can be turned on only in fog, heavy rain or snow.

n The bulb in the switch comes on to indicate the function.

6 Fog headlights

n Fog headlights can be turned on when the side marker lights and low beam and/or high beam are on.

n The bulb in the switch comes on to indicate the function.

7 Loading space lighting*

The bulb in the switch comes on to indicate the function.

8 Air-conditioning *

n The cooling equipment works with the engine running only.

n The air-conditioning does not work when the rotary switch of the fan is off.

n The bulb in the switch indicates its function.

9 Resume / reduce

n It resumes the speed already set on the cruise control.

This can also reduce the engine speed during driving or in the PTO regime.

10 Permanent (main)

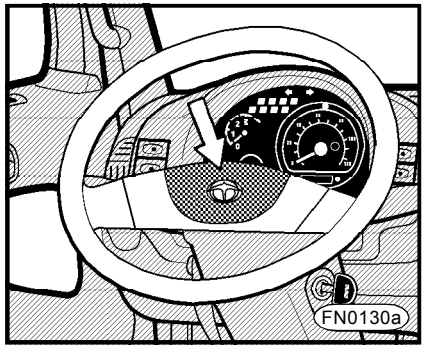
n It activates the cruise control or PTO regime speed setting.

11 Adjust / increase

n It stores the instantaneous speed of the cruise control.

This control switch can also increase the engine speed during driving or in the PTO regime.

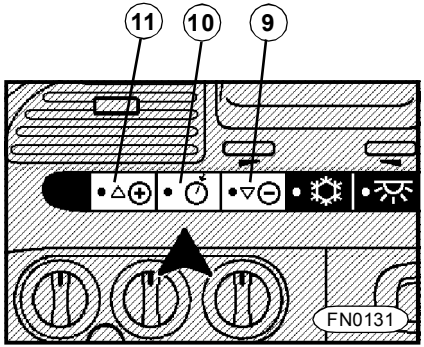
n When the diagnostic test is performed, another malfunction code will enter when pushed.



Horn

The horn switch is situated in the middle of the steering wheel.

Cruise control



n The cruise control allows you to maintain a desired speed (engine speed - both on the move and in the PTO regime) - without actuating the accelerator pedal.

n Use three control buttons located on the central panel of the instrument board to control it.

n The cruise control starts to operate when the speed reaches about 48 km/h and in the PTO regime up to 48 km/h (it can be selected).

Adjustment of cruise control

n Push the button **10** to activate the cruise control.

n When the desired speed has been achieved, push briefly the button **11** "adjust / increase" - now the speed is stored and maintained by the engine without applying the accelerator pedal.

n The speed can be increased by depressing the accelerator pedal - after releasing it, the cruise control function is resumed (however, first the cruise control must be activated).

n All functions will be cancelled by depressing the clutch or brake pedal and/or by switching off the button **10**. The resuming of the cruise control function can be performed when you push briefly the button **9** "resume / reduce", it means that the cruise control need not be set again.

Setting the PTO speed on vehicle at standstill

n Push the button **10** to activate the PTO.

n Push and hold the button **11** "adjust/ increase" depressed (the adjustable speed range 950 ÷ 3,000 rpm) to increase the speed - hold the button depressed to increase the PTO speed gradually - when the button is depressed repeatedly, the PTO speed increases by about 25 rpm steps.

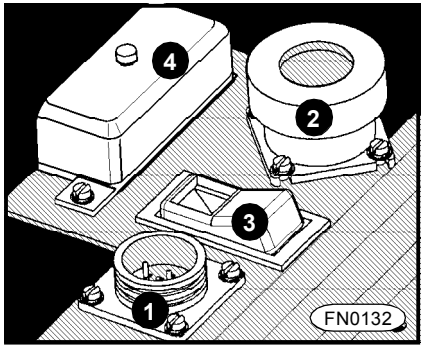
n Push the button **9** "resume / reduce" to activate the speed 1,200 rpm automatically.

Warning!

n When the cruise control is not used, the "permanent (main)" control button 10 must be switched off.

n The vehicle speed can be influenced by driving uphill or by the load weight. For that reason use the cruise control only when driving on level ground or in slight hilly terrain.

Diagnostic sockets

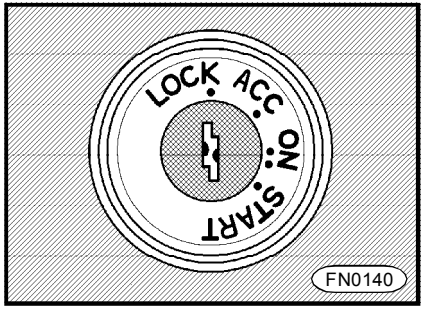


1 Socket for the ABS diagnostics
2 Socket for the engine diagnostics
3 Engine diagnostics switch
4 Fuse box for voltage transformer (fuses: 2x 5 A, 1x 10 A)

n Diagnostic sockets are situated under the storage box in the instrument board.

n They are accessible after removal of the storage box bottom, which is released by turning the two rotary holders (sense of rotation is shown on the cover).

Ignition switch and steering lock



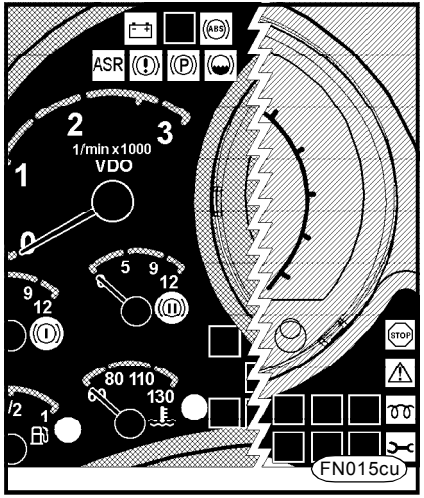
Switch positions

n "LOCK" position

Only in this position the key can be inserted and removed. Only tachograph, electric clock or radio are powered. The steering shaft will be automatically locked in this position.

n "ACC" position

Steering is unlocked, electric circuits connected through the ignition switch are not powered. When turning the ignition from **"ON"** into this position, the engine will be stopped.



n "ON" position

The indicator lights (see the figure) of battery charging, brake system malfunction, parking brake, ASR function, glowing, ABS, coolant temperature and reserve fuel amount, engine - stop, engine- warning, engine - maintenance will come on. After several seconds only charging and/or glowing indicator lights remain on. When the glowing light goes out, the engine is ready to be started.

Electric circuits connected through the ignition switch are powered.

Warning!

If after a moment any indicator light, at which its own test was activated, remains on, proceed per Chapter "Troubleshooting".

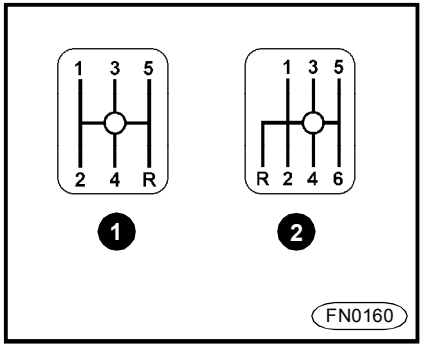
n "START" position
The engine can be started only when no gear speed is shifted.
Do not depress the accelerator pedal while starting.
The position is not arrested. When starting repeatedly, move the key back to position **"ACC"** - this prevents to start the already running engine and avoids damage to starter.

Warning!

n The ignition switch function is secured with the battery circuit breaker on.

n Do not switch off the battery circuit breaker or do not disconnect battery clamps to avoid damage to alternator or some electric consumers.

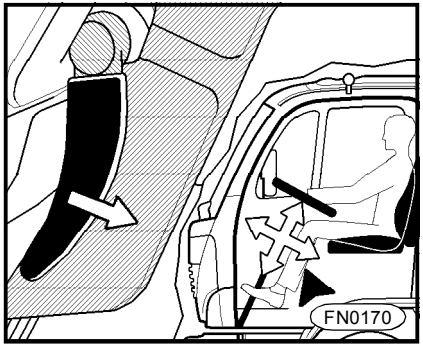
Gearshift lever



Position	Type of gearbox	Number of gear speeds
1	ZF S5-42	5
2	ZF 6 S 850	6

Engage gear speeds mechanically by the gearshift lever with the clutch pedal depressed.

Steering wheel adjustment



n Pull the positioning lever towards you to release the steering wheel and adjust the steering wheel into the desired position.
n After the desired steering wheel position has been achieved, push the positioning lever as far as it goes.

Warning!

It is not permitted to adjust the steering wheel during driving.

Heating and ventilation

n The cabin is heated by the hot-water heating. It can be used also for heating of coolant in the cooling and heating circuits after starting the engine.

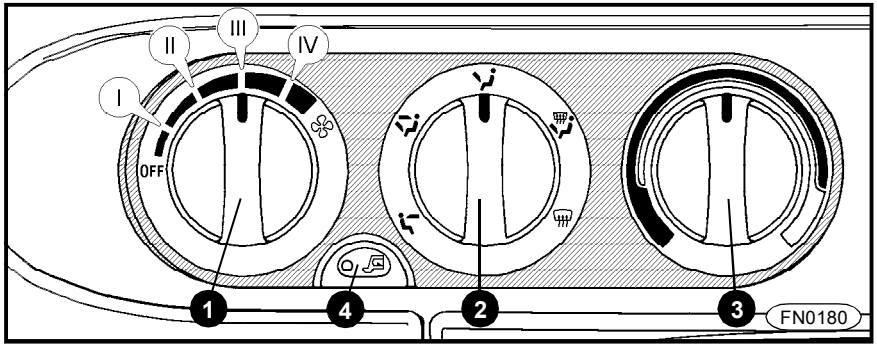
n The heater is controlled by heater control elements on the instrument board.

n Use the heater valve control knob (item 3) to adjust the water volume passing through the heating insert, and thus also the temperature of the drawn airflow (turn the control knob to the red zone to supply the hot air).

n Use the control knob (item 1) to adjust the fan speed and thus the air volume circulating through the system. The airflow speed can be set in four steps.

n The control knob of the airflow direction (item 2) allows you to change the direction of airflow (way of cabin heating).

n Push the button (item 4) to turn on / off the regime of circulating air in the cabin.



n Deflect the fins (item 5) at air vents to change the angle of airflow.

The air volume emitted from individual vents is controlled by thumbwheels (item 6).

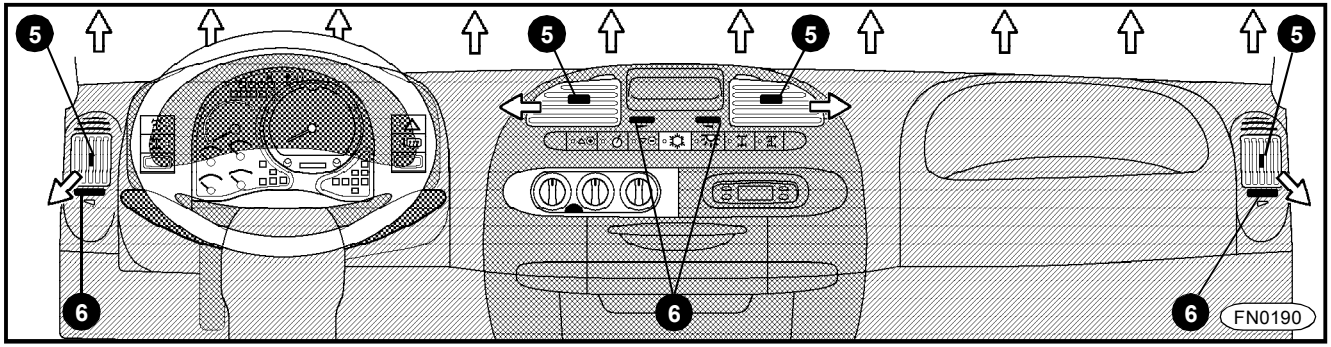
1 Heater fan control

2 Airflow direction control

- to crew heads
- to crew feet and heads
- to crew feet
- to feet , windshield and side windows
- to windshield and side windows

3 Heater valve control - control of the drawn airflow temperature

4 Regime of air circulation



Window defogging
- **n** (item 1) fully to position **IV**
- **n** (item 3) to extreme left
- **n** (item 2) to position
- **n** Close air vents by thumbwheels.

Windshield defrosting
- **n** (item 1) fully to position **IV**
- **n** (item 3) to extreme left
- **n** (item 2) to position
- **n** Switch on the regime of air circulation
- **n** Close air vents by thumbwheels.

Keeping windows being not fogged under increased humidity

When windows are still being fogged (for example in rainy weather), it is necessary:
- **n** (item 1) to position **II** or **III**.
- **n** (item 2) to position
- **n** (item 3) if necessary, turn on heating.

Ventilation
- **n** (item 1) to desired position.
- **n** (item 3) to extreme right.
- **n** (item 2) to position

(or to desired position).

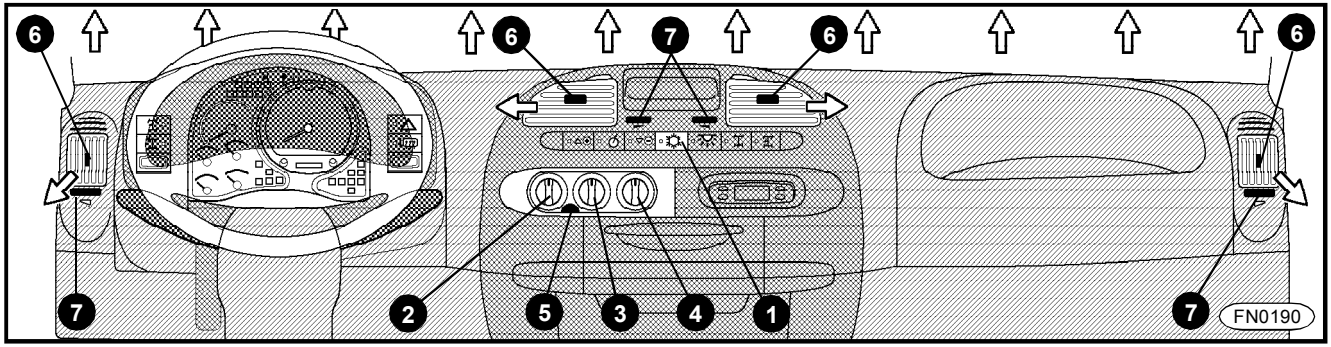
Optimum heating
- **n** (item 1) to position **II** or **III**.
- **n** (item 3) to desired heating output.
- **n** (item 2) to position

Maximum heating
- **n** (item 1) to position **IV**.
- **n** (item 3) to extreme left
- **n** (item 2) to position
- **n** Switch on the regime of air circulation.

Warning!

The heating output depends on the coolant temperature. The maximum heating output can be obtained after the engine has reached the operating temperature.

Air-conditioning*



n The air-conditioning is a combined cooling and heating device.

n The a/c cooling unit cools down the air and dehumidifies it.

n The cooling unit works with the engine running only.

Control elements

n Switch on/off the air-conditioning by means of the switch (item 1) ☼ (signalled by the bulb in the switch).

n The air-conditioning does not work if the fan rotary switch is off.

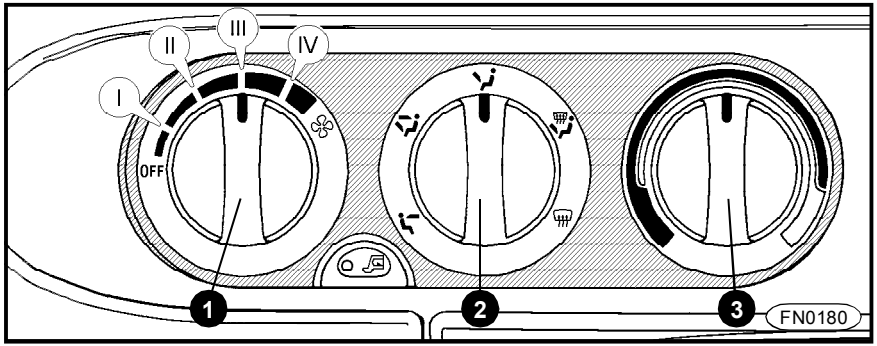
n Depending on the heater valve control knob position (item 4), the temperature of the drawn airflow is controlled (when in the red zone, the hot air is circulated and contrariwise). It can be used even with the air-conditioning on.

n Use the control knob (item 2) to control the fan speed and thus also the air volume circulating through the system. Adjust the air volume by selecting one of four fan speeds.

n The airflow direction control knob (item 2) allows to change the airflow direction (way of cabin heating).

n Push the button (item 5) to switch on/off the regime of circulating air in cabin (signalled by the bulb in the button).

n Deflect the fins (item 6) at air vents to adjust the airflow in desired angle. The air volume is controlled by thumbwheels (item 7).



Optimum cooling

n (item 1) to desired position (position **II** or **III** are optimum)

n (item 3) to extreme right, turn it slightly to left to adjust the temperature if needed

n (item 2) move it to position

n Push the button with symbol ☼ (the bulb comes on in the switch)

n The outside air is being sucked up and cooled in that regime

Maximum cooling

n Close all windows

n (item 1) to position **IV**

n (item 3) to extreme right

n (item 2) turn it to position

n Push the button with symbol ☼ (the bulb comes on in the switch)

n Switch on the regime of air circulation

Warning!

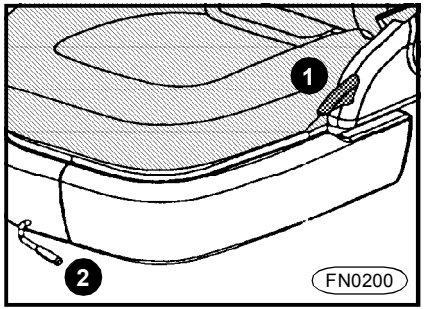
Smoking is not advisable when being in regime of air circulation.

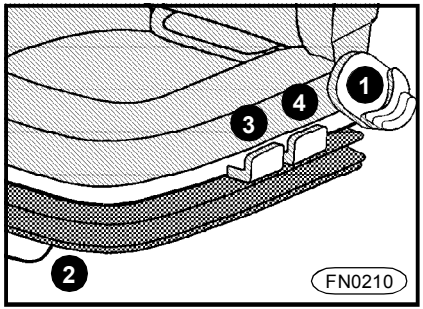
Warning!

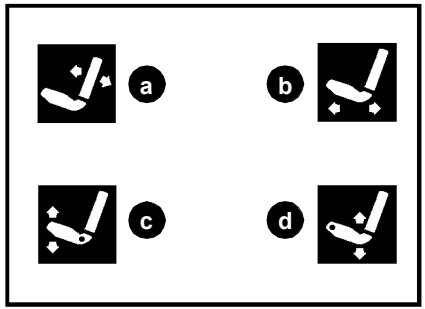
n When the vehicle was parked in the direct sun, remember to open the windows before switching on the air-conditioning.

n It is recommended to switch on the air-conditioning once a week at least (even in the winter months) to prolong the a/c service life.

Seats







Seatback adjustment (a)
Lift the control lever (item 1) with your body weight taken on the seatback to tilt the seatback to the rear. To adjust the seatback to the front, lift the control lever with your body weight taken on the seatback slightly and after that release the seatback, which will tilt automatically forward. Release the lever to lock the seatback in position.

Forward and backward adjustment (b)
n Pull the control lever (item 2) up to release the longitudinal shift and the seat can be adjusted into desired position. Release the lever to lock the seat.

n The seat should be adjusted so that the driver could control the pedals safely.

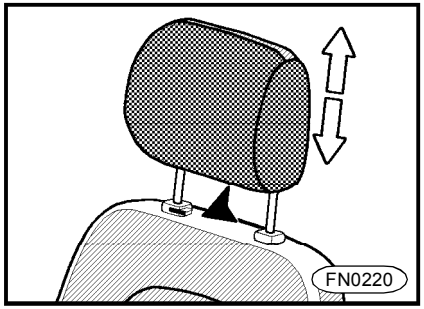
Seat cushion inclination (c) and height (d) adjustment on the pneumatically controlled driver´s seat*
n Raise the lever (item 3) to adjust the front part of the seat cushion.
n Raise the lever (item 4) to adjust the rear part of the seat cushion.
n Take your body weight off to adjust the seat cushion height.

Correct adjustment of seats
n The seatback should be adjusted so that the driver can hold the steering wheel at its top point with hands slightly bent.
n A quick and safe handling the controls required for the drive must be secured.
n Keeping your body at ease for the maximum protection offered by seat belts must be obtained.

Warning!

For reasons of safety the driver´s seat may be adjusted on vehicle at standstill only.

Head restraints

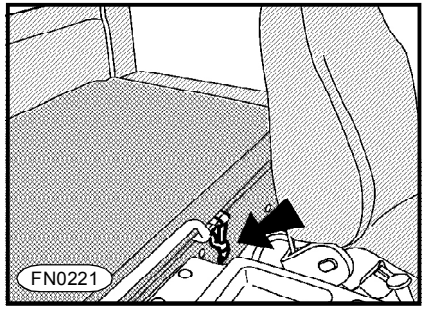


n Head restraints are height adjustable.
n To adjust the head restraint vertically, push the stop toward the rear cab wall.
n Adjust the head restraint so that its position is adapted to fit the seating height of occupant.

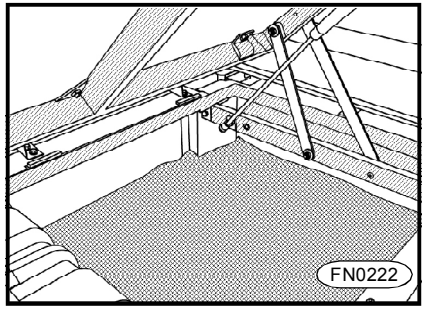
Warning!

n The head restraint being set properly will support the back of the skull when the vehicle is crashed from the rear.
n For reasons of safety the head restraint may be adjusted on vehicle at standstill only.

Sleep couch

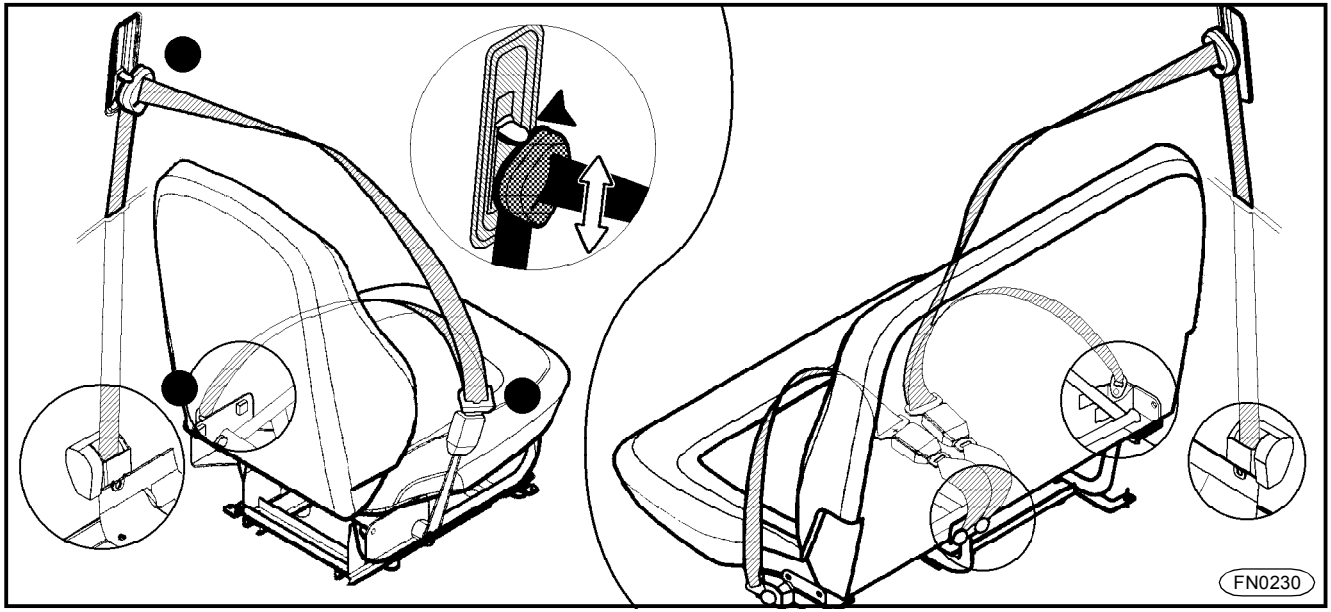


On vehicle versions with a long cab, there is an emergency couch with a storage compartment in the rear part of the cab.



The storage compartment is accessible after unlocking the rubber element and tilting the couch.

Seat belts



n The cabin is equipped with three-point seat belts and retractors on two side seats.

n The middle seat has got the two-point seat belt and mechanical adjusting equipment.

n Seat belts offer a protection for passengers in case of an accident.

n Seat belts have to be buckled whenever you drive the vehicle - even in urban driving.

Use of seat belts

n The respective warning light reminds you of necessity of the use of seat belts *.

n Grasp the belt holding it at tongue and slowly fit it across the chest and pelvis.

n The belt must fit snugly to the centre of arm and to your pelvis.

n If the belt locks when being pulled out, release it, let it rewind and after that pull it out again.

n Insert the belt tongue into a respective seat buckle. The belt is anchored properly when it clicks into a buckle.

n To release the seat belt, press the red marked cap on the buckle.

Seat belts height adjustment*

n Due to the height adjustable belt anchorage, the belt can be adapted to fit the body dimensions.

n To adjust the belt height, push the button downwards, tilt the upper anchorage toward you (up) and adjust it to the desired position.

Warning!

n The belt strap must not be worn over rigid or breakable objects, which are stored in your clothing in pockets.

n Seat belts, which have been subject to an accident or have been damaged, must be unconditionally replaced with new ones.

n Take care that the belt is not twisted and is worn across pelvis and not across soft parts of the body if possible.

n The maximum effect can be reached only with a correct seating position in cabin.

n Do not strap in more than one person with each belt.

n Keep the seat belts clean (dirt impairs the function of the retractor). Use the soap water to clean the seat belts.

n If the seat belt has been damaged, it is necessary to have it replaced.

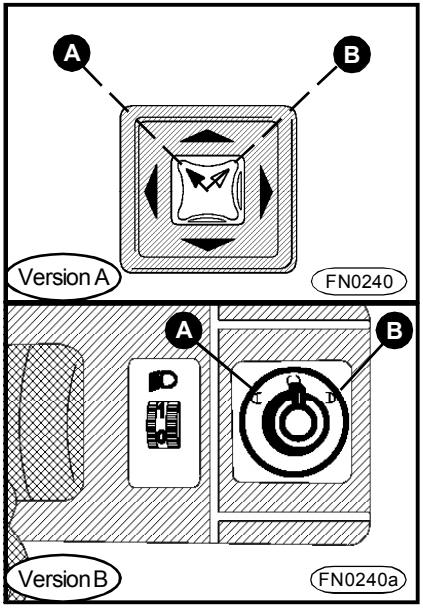
Rear-view mirrors

n Vehicles are equipped with heated rear-view mirrors.
n The heating is controlled by the controller on the instrument board and is indicated by the indicator light situated directly in the controller.
n Use the heating for the necessary time only.

Warning!

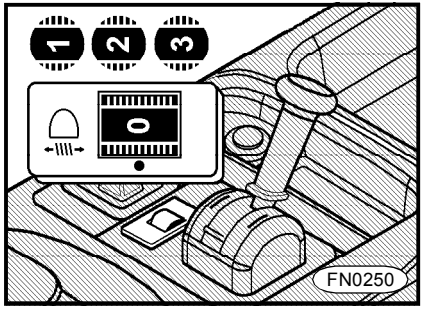
n For reasons of safety the mirrors must be adjusted prior to move off.
n Pay extreme attention when considering the size and distances of cars and other objects when seen in a convex mirror. Always remember that they will look smaller and appear farther away than in reality.

Rear-view mirrors remote control*



n Turn the controller to select adjustment of the left or right mirror.
to left - left mirror - position A
to right - right mirror - position B
n Deflect the four-position controller to obtain the desired position of the mirror.

Headlights levelling device



n Use the thumbwheel to change the headlights beam inclination.

n The basic adjustment of headlamps has been performed on the unloaded vehicle (the control thumbwheel mark is against zero).

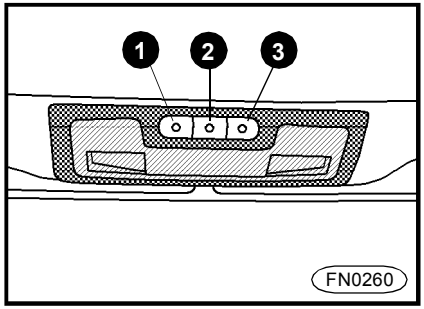
n Payloads for the respective vehicle version are mentioned in table **Weights and axle loads.**

	Vehicle load out of the max. payload			
	30%	50%	70%	100%
N	1		2	3
L		1		2
E		1		2
S			1	2
G			1	2

Warning!

The driver is obliged to adjust the headlamps depending on the instantaneous vehicle load.

Cabin interior lighting

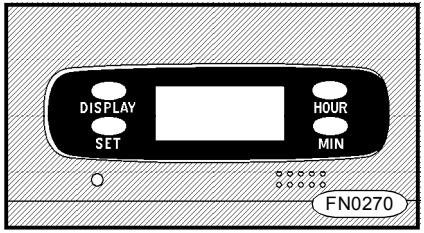


n Bulbs of the dome light are turned on/off by switches situated in the light directly.

n Use the switch (item 1) and (item 2) to turn on/off the light on the driver´s side.

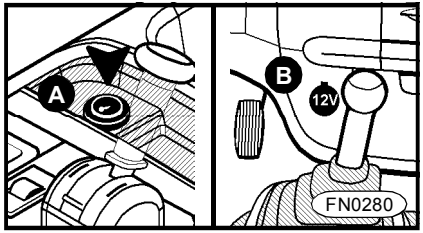
n Use the switch (item 3) to turn on/off the light on the co-driver´s side.

Digital clock*



n Use button "**HOUR**" to set hours.
n Use button "**MIN**" to set minutes.
n Use button "**SET**" to zero minutes to whole hours.
n The button "**DISPLAY**" will show the clock when the ignition is in "**LOCK**" position only. The clock displays only when the button is hold depressed.

Socket / cigarette lighter

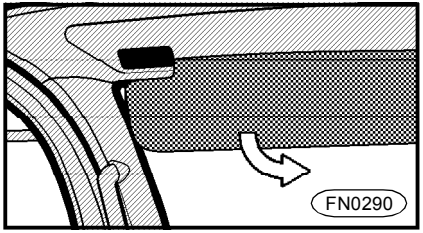


n The socket (item A) can be used to connect the cigarette lighter or auxiliary 24 V electric consumers.
The socket (item B) can be used for 12 V appliances.
n Push the knob in to switch on the cigarette lighter. When the spiral is ready for use, it will spring back. Pull out the lighter and use it immediately (the heating spiral will loose the thermal energy soon).

Warning!

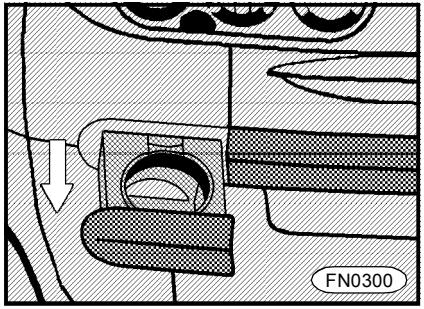
n Pay attention not to burn yourself when handling the cigarette lighter.
n If the lighter does not spring back after about 30 seconds, it must be removed not to burn through.

Sun visors



n Sun visors are situated above the windshield in the cabin ceiling.
n They can be tilted as desired.
n Adjust the sun visors to protect you against sun glare.

Cup holder

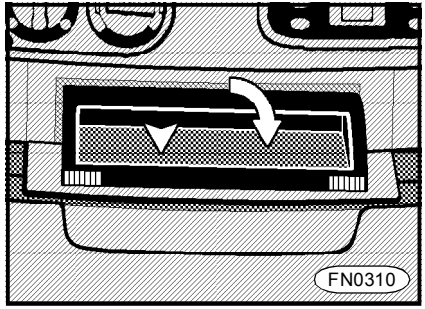


n To slide the holder out, push it and release.
n After use, slide it back.

Warning!

n Do not use the cup holder if the vehicle is in motion.
n Do not use the cup holder to hold other objects.

Ashtray

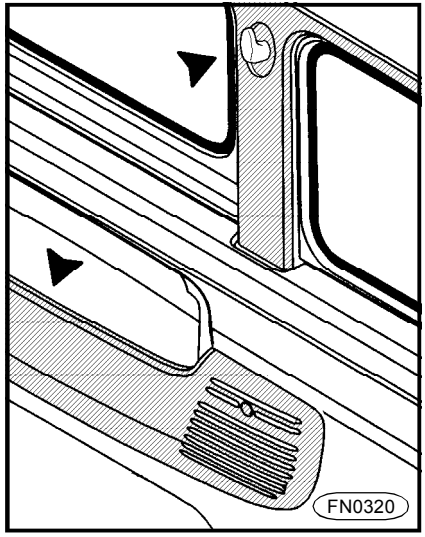


n Pull it to open it.
n To clean it, remove the sheet insert.

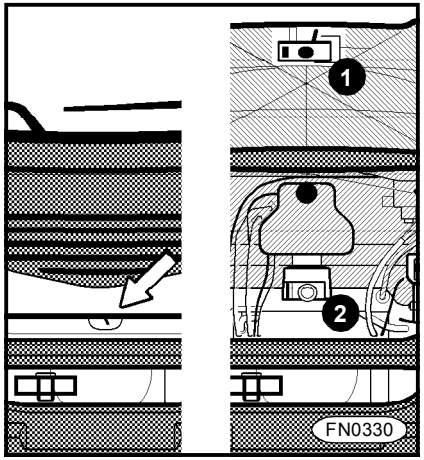
Warning!

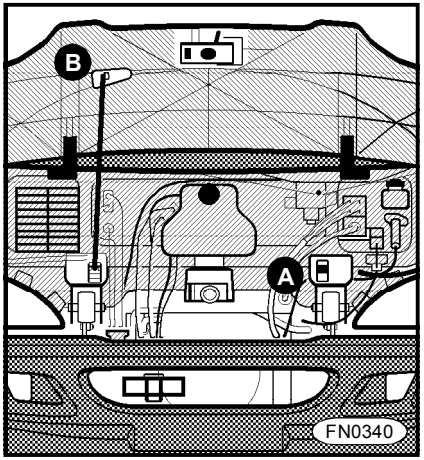
Never put paper and other flammable objects in the ashtray - danger of fire!

Clothes hooks, glove compartment



Bonnet





Warning!

You should check a proper bonnet locking whenever you move off.

Opening the bonnet

n Push the bonnet in its lower part, press the release lever (item 1) to left.

n Raise the bonnet.

n Take strut out of holder (item A) and insert the strut end in hole (item B) to secure the lifted bonnet.

Closing the bonnet

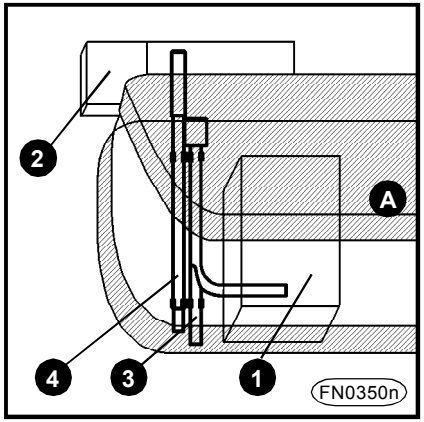
n Raise the bonnet slightly.

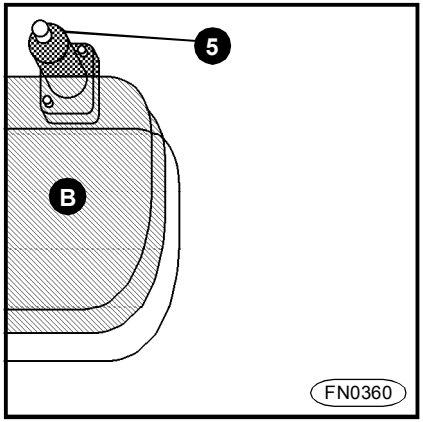
n Unhook strut from hole and put it in holder (item A).

n Tilt the bonnet in the vertical position and push its lower edge until it clicks into lock (item 2).

n When the bonnet snaps in, you can hear it.

Tools and equipment





Wrench 24 x 24	item1
Wrench 30 x 30	
Lever adaptor	
Box with bulbs	
First aid kit	
Warning triangle	item 2
Lug wrench	item 3
Rod for jack and cabin tilting	item 4
Hydraulic jack	item 5

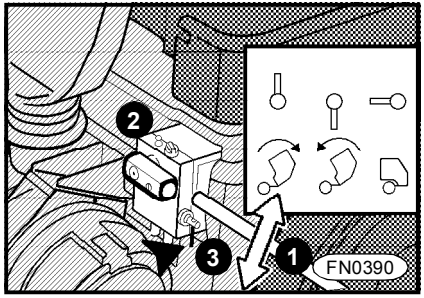
A - co-driver´s seat
B - driver´s seat

n Tools and equipment are placed under the co-driver´s seat and are accessible after tilting the seat cushion.
n The hydraulic jack is attached to the cab floor behind the driver´s seat.
n Tools must be attached firmly.

Warning!

n Tools, which is not stored properly, may cause a personal injury or disturb you by vibrations during driving.
n The jack delivered with the vehicle is determined to be used with this vehicle model only. It must not be used to lift other vehicles or other loads.
n Tools and equipment must be attached properly on the move or during the cabin tilting.

Hydraulic cabin tilting



Cabin tilting

n Move the distributor lever (item 3) into vertical position upwards (see schema on the pump).

n Insert rod (item1) into lever of the hydraulic pump (item 2) and pump. Hydraulic locks of the rear location will open and cabin starts to tilt itself.

n The cabin must be tilted fully to its tilted position - a partial tilting is not allowable for entering beneath the cabin.

n Let the distributor lever be in vertical position with the cabin lifted.

Cabin lowering

n Move the distributor lever (item 3) into vertical position downwards.

n Pump until locks of the rear location are closed (cabin rests down in place and is locked).

n Move the distributor lever (item 3) into horizontal position.

Instructions for cabin tilting

Warning!

n Prior to tilt the cabin, shut the engine off and shift into neutral.

n Secure the objects which are placed inside the cabin and shut the doors properly .

n Open the bonnet before tilting.

n Take an extreme care when tilting.

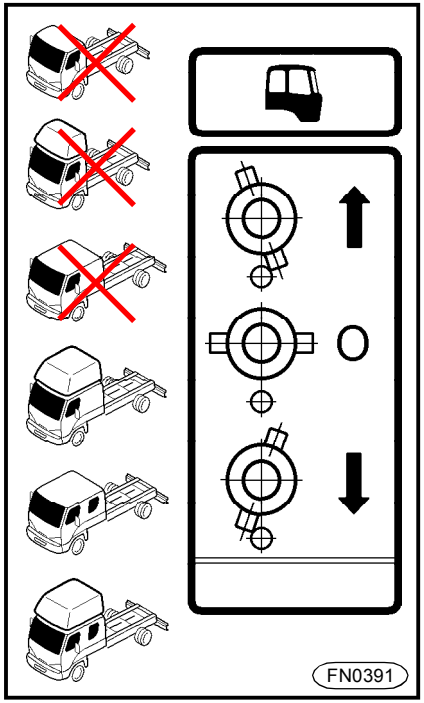
n Be very careful when working beneath the tilted cabin.

n It is not allowed to stay ahead of the cabin tilted.

n It is not allowed to stay beneath the cabin if tilted partially.

n The necessary workshop height to tilt the cab is 3,000 mm and 3,800 mm with the additional superstructure.

Cabin tilting at special versions



Cabin tilting

n Move the distributor into position ⬆.

n Pump until the cabin is tilted completely (cabin will not fall over its zero point).

Note: The cabin starts to raise itself only after several lever strokes.

Cabin lowering

n Move the distributor into position ⬇.

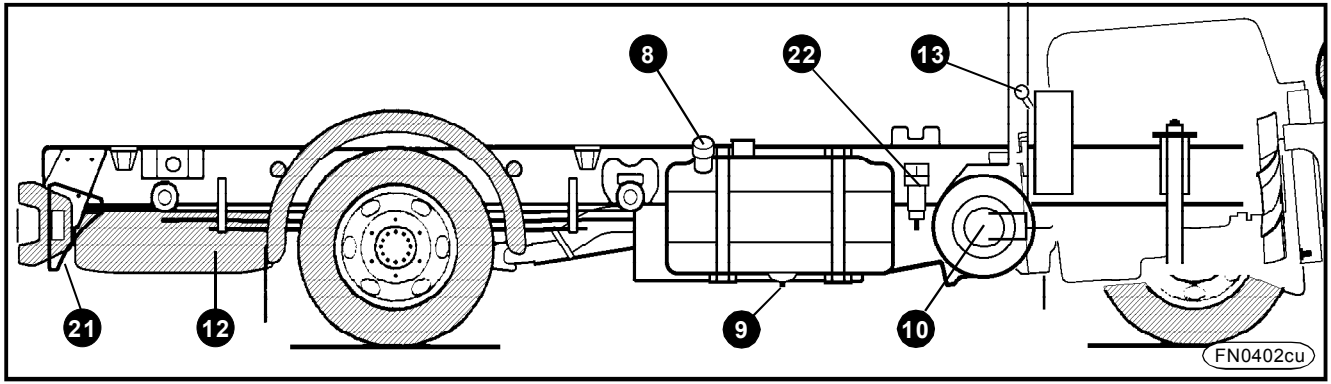
n Continue to pump until the locks click in place and until you feel an increased resistance on the lever.

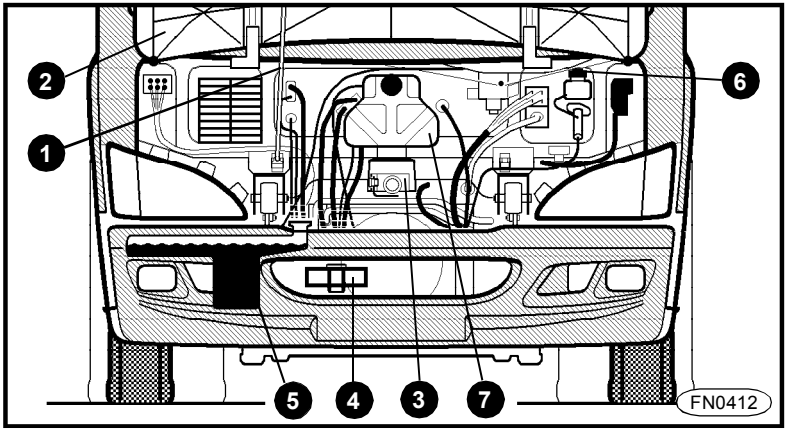
n Move the distributor into position ⬆.

n Go on pumping by about 15 strokes to adjust the position of the cabin pin into a centre of the oval hole in the cylinder eye.

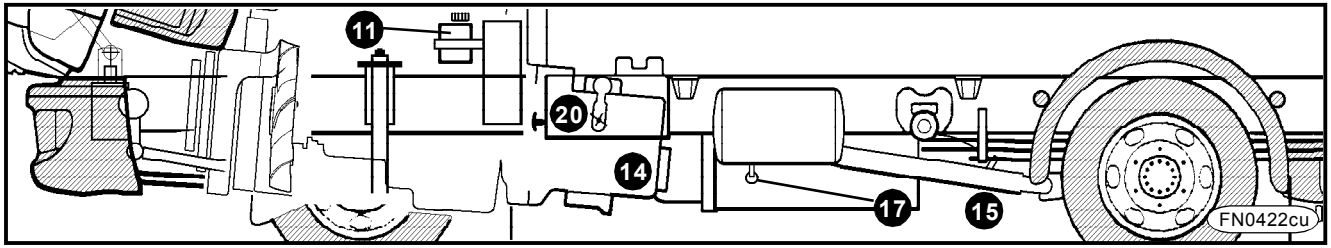
n Move the distributor into position **O.**

Chassis c/w cabin

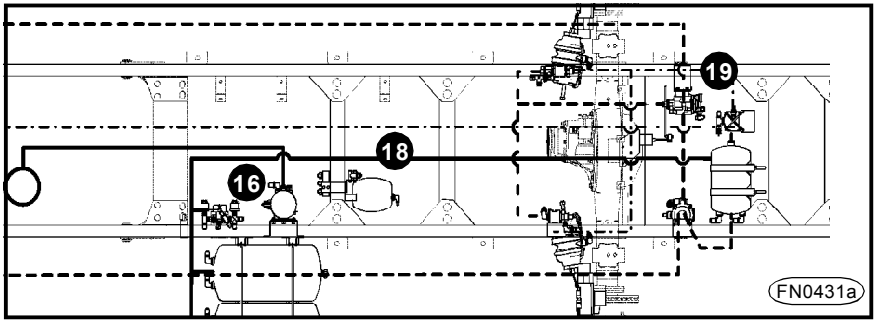




1 Strut
2 Bonnet
3 Bonnet lock
4 Front coupling (for towing)
5 Washer tank
6 Clutch tank
7 Expansion tank
8 Fuel tank filler neck
9 Fuel tank drain plug
10 Air filter
11 Power-steering tank
12 Spare wheel (four positions - vehicle version dependent)



13 Oil dipstick
14 Gearbox
15 Propeller shaft
16 Air pressure regulator c/w air drier
17 Drain valve
18 Regenerating air reservoir 4.5 l
19 Brake pressure regulator
20 Battery case c/w circuit breaker
21 Wheel chock
22 Fuel filter



Check before the drive

n Adjustment of headlamps related to load
n Cabin locking in the rear location
n Cabin securing
n Engine oil level
n Fuel amount in tank
n Coolant level in expansion tank
n Fluid level in clutch circuit
n Oil level in tank of the monoblock hydraulic power steering circuit
n Efficiency of service and parking brakes
n Washer tank fluid level
n Tires pressures and condition
n Function of outer illumination, turn signals and stop lights
n Pollution of the intake system and air filter
n Dewatering of water separator
n Cooling fan and intercooler
n Engine and its ventilation

Vehicle running-in

n The running-in of a new vehicle or vehicle after the general overhaul is terminated after covering 3,000 km (practically, the vehicle engine will reach the maximum possible output after covering several further thousands of kilometres).
n During the running-in period, do not run the engine above 3/4 of its top speed or at maximum fuel delivery under low engine speed.
n Avoid full throttle starts, running the engine at high speed and abrupt stops.
n Do not run the cold engine at high speed.
n Do not let engine labor. Downshift when engine no longer runs smoothly.
n Vehicle must not be loaded extremely.

Warning!

The way of running in the vehicle has a great influence upon its service life.

Maintenance

n To achieve a maximum use value, economic and safe operation and maximum possible service life, it is necessary to carry out all maintenance works at regular intervals as stipulated in the Service Booklet.
n The vehicle maintenance must be carried out by **authorized service stations**, which have been acquainted with the vehicle design, do their work on a professional level, have the necessary equipment and are in direct contact with the manufacturer.

Warning!

n The engine brake should be engaged / disengaged once a week at least. Its service life will be increased.
n The differential lock should be engaged / disengaged once a week at least. Its service life will be increased.

Starting the engine

n Insert the ignition key and turn in **"ON"** position. Indicator and warning lights as shown in the illustration on the next page will come on.

n Starting the engine is possible only with no gear shifted in gearbox. Do not depress the accelerator pedal.

n When the glow plug light has gone out, start the engine by turning the ignition key to **"START"** position and hold it for a while (the engine will crank when holding the key in this position), until the engine starts running, however, for 10 seconds as a maximum. When starting repeatedly, keep the interval of min. 30 s between individual starting attempts.

Warning!

n Should the indicator and warning lights of brake system malfunction, parking brake, engine - stop, engine - warning and engine - maintenance be still on after turning the ignition to "ON" position even after a short while, you must not move off - find out the cause of the defect per Chapter "Troubleshooting".

n When starting the warm engine, wait until the glowing indicator light goes out.

n Use the winterized Diesel fuel and engine oil of the viscosity grade in accordance with climatic conditions in the winter months.

n After starting the engine, release the key, it will automatically return to "ON" position. After a regular engine run has been achieved, the glowing and charging indicator lights must go out. If not, find out the cause of the defect according to chapter **Troubleshooting.**

Warning!

n When the indicator and warning lights of battery charging, parking brake, engine - stop, engine - warning and engine - maintenance do not go out after starting the engine, do not move off .

n The vehicle must not be put in motion in any way unless the battery circuit breaker is on and the ignition key is inserted into ignition switch and turned in position "ON". The steering is unlocked in this position. Before you move off, check whether the steering wheel is free to turn.

n Do not run the cold engine at high speed - it could be damaged.

During driving

n After the vehicle is set in motion, check the efficiency of the service brake. Checking the braking efficiency is important especially in winter, after washing the vehicle or after fording (passing through a deeper pool of water). Brake up the vehicle repeatedly to allow a quick drying out of the brake system.

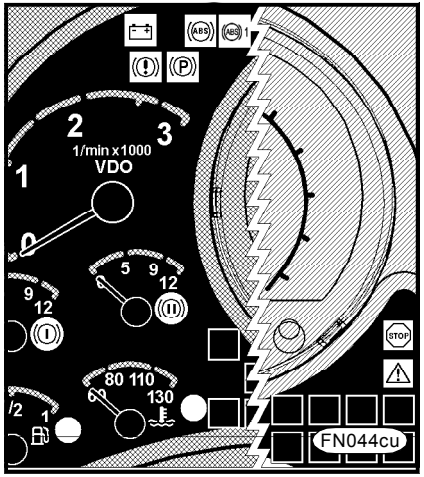
n Do not brake sharply - on one hand the tires and brake system would be worn quickly and too much, on the other hand this way of braking would endanger the other motorists.

n Depress the accelerator pedal gradually.

n Depress the clutch pedal as far as it goes.

n Shift to gears smoothly not to stress the engine extremely. Before engaging the reverse run, put the vehicle to a full stop not to cause damage to gearbox.

n Before shifting to reverse gear at the gearbox model ZF 6 S 850 it is necessary to wait 3 to 5 seconds after depressing the clutch pedal (to allow stopping of shafts in gearbox) and only after that engage the reverse gear.



n It is not allowed to drive without the engine running and the gear shifted.

n Watch the indicator and warning lights on the move from time to time.

n If one of lights shown in the above mentioned figure comes on during driving, it is necessary to stop the vehicle. In addition, if the engine - stop light comes on, it is also necessary to shut the engine off.

Then proceed according to Chapter: **Troubleshooting**.

If the coolant temperature indicator light comes on, it is necessary to reduce the vehicle speed, to downshift, and stop the vehicle as soon as possible and allow cooling down the engine by the enhanced speed (1,200÷1,500 rpm).

Warning!

In any case it is not allowed to shut the engine off when the coolant temperature indicator light comes on.

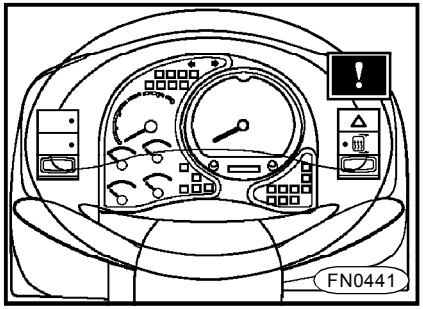
If the fuel reserve indicator light comes on (item 1), it is still about 16 l fuel in the fuel tank.

Stopping the engine

n Turn the ignition key from position **"ON"** to position **"ACC"** to stop the engine.

Warning!

n Turn off the battery circuit breaker only 30 seconds after turning off the ignition (to allow the PC data processing).
n Never shut the engine off by turning off the battery circuit breaker - it may result in damage to wiring cables and alternator.
n The ignition key may be removed from the ignition switch only after full stopping of the vehicle.
n Before stopping the engine after a full load operation, allow it to idle 1 minute at least - see the label on the instrument board.

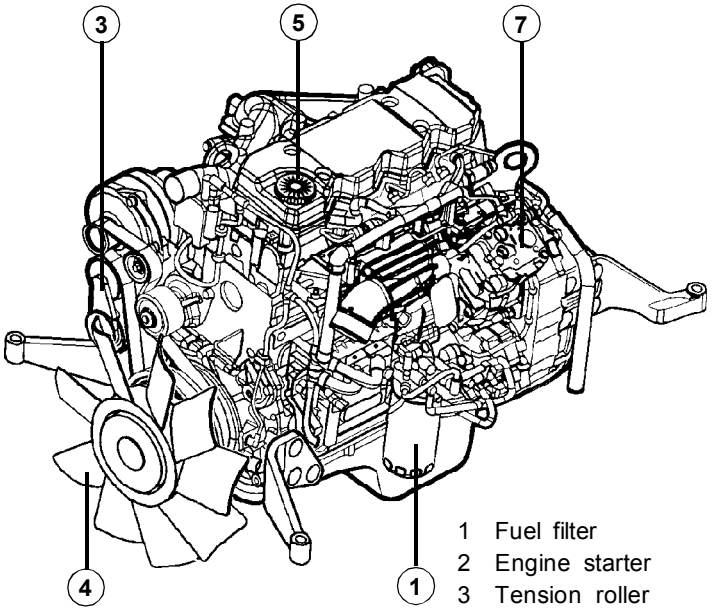


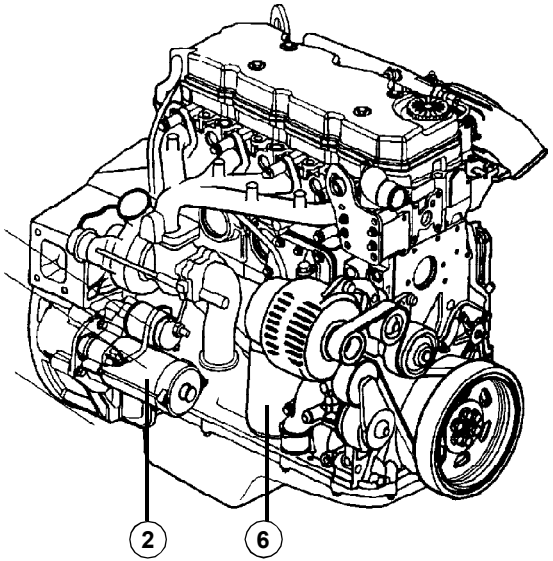
Idle run

Warning!

Do not let the engine run at idle or at speed to 1,000 rpm without load for more than 10 minutes. When the engine is running for a long time in these regimes, the temperature of the combustion space will drop so that the fuel cannot be burned completely. This may result in creation of carbon in the surrounding of holes of injection nozzles and piston rings what may lead to damage the engine. In addition, low temperatures will cause that all oil penetrating from valve gaskets will not burn in exhaust channels. The oil not burned can cause damage to turbocharger.

Engine





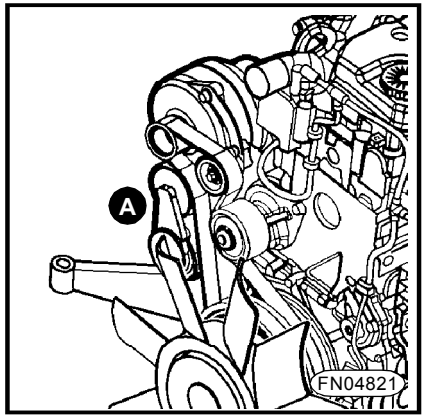
1 Fuel filter
2 Engine starter
3 Tension roller
4 Fan c/w visco-coupling
5 Oil filler neck
6 Oil filter
7 Compressor

FN0482

Belt tensioning

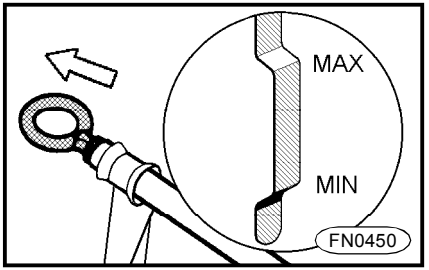
Cummins ISBe 150 30
- Diesel engine
- four-cylinder
- 16 valves
- max. power output 110 kW / 2,500 rpm

Cummins ISBe 170 30
- Diesel engine
- four-cylinder
- 16 valves
- max. power output 125 kW / 2,500 rpm



n The belt is tensioned automatically by the pulley (item A), which cares of the constant tension.
n When the belt has been damaged, it must be replaced immediately.

Lubrication system



Checking the oil level and kind of oil

n It is necessary to check the oil level before each drive (the oil is consumed a little by the vehicle operation).

n The vehicle must stand on level ground to check the oil level.

n Check the oil level before starting the engine when the oil level is stabilized.

n Pull dipstick out, wipe it clean with a rag and push it in a hole all the way.

n Pull dipstick out again. The oil level is correct when it is between marks on the dipstick. It must not be above the **MAX** mark, because the engine will smoke too much in that case.

n Add the oil in time not to allow the oil level to drop below the **MIN** mark.

n Always add the oil of the same quality.

n For the oil change intervals see the **Service Booklet.**

Warning!

n Have the oil changed and oil filter replaced at the authorized service station.

n The insufficient oil level will cause damage to engine.

n Keep the environment clean when handling the oil.

n When it looks that oil quality got worse (presence of water), contact the authorized service station promptly.

n Dispose of used oil in accordance with environmental regulations.

Engine oil specification **A C E A**	**Recommended oil viscosity grade** **S A E**
E5 or E7	10 W - 40 5 W - 40

n The oil class, which was filled in the engine in the manufacturing plant, is mentioned on a sticker on the cap of oil filler hole.

n Always use the approved engine oils only.

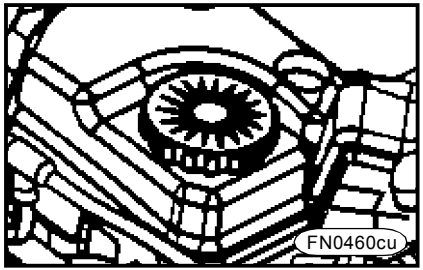
n Use of special oil additives is not recommended, because some additives combined with brand name engine oils may result in impairing the function resulting in damage to engine.

Warning!

n The manufacturer is not responsible for damages caused by neglecting the oil economy .

n The manufacturer does not provide any guarantee for engines damaged by use of oil additives.

Turbocharger



Filling the engine with oil

n Unscrew the filler neck cap.

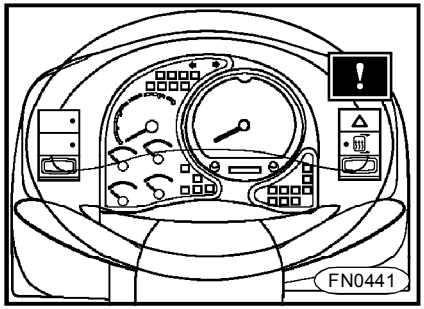
n Keep the environment perfectly clean when adding the oil.

n Do not fill the oil above **MAX** mark.

n When the oil level is correct, mount the cap again.

n Keep the environment clean and avoid mechanical damage to impeller of centrifugal blower by sucking in the mechanical dirt (for example during operation without installed coarse air filter).

n Before stopping the engine from a full load operation, allow it to run at idle for one minute at least (see the label on the instrument board) to secure the cooling down of turbocharger by oil and thus to avoid burning-in of carbon on the turbocharger shaft.

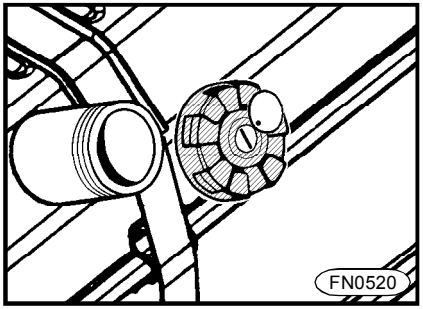


Warning!

n If the turbocharger is defective, have it repaired at the authorized service station.

n To increase the service life of turbocharger, keep the air filter and the whole intake manifold perfectly clean.

Fuel tank



n To prevent air from entering the fuel system, never allow the fuel tank be completely empty.

n The fuel tank capacity is 120 l (160 l*****, 200 l*****).

The float device is installed in the fuel tank. The fuel reserve in tank is checked by the fuel gauge on the instrument board.

n The minimum fuel reserve makes 16 l (20 l*****) as indicated by the signal bulb at the fuel gauge.

n The fuel gauge is operative with ignition turned in **"ON"** position.

n The fuel tank neck is fitted with a lockable cap.

Fuel

n Your Diesel engine has been specifically designed to operate on Diesel fuel per ČSN EN 590 (656506). Prefer using the Diesel fuel with a low sulphur content (0.05% hm), which is available on the market.

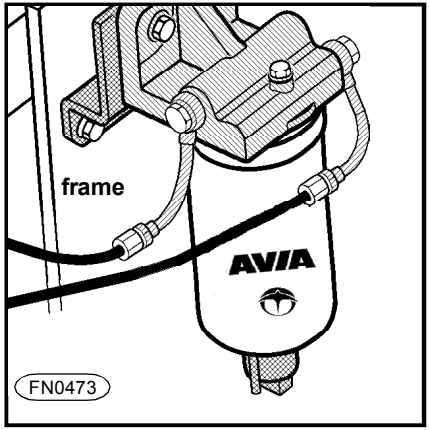
n In the winter months (from November 1 to March 31) you should use the Diesel fuel whose filtering ability (CFPP specification) meets the climatic conditions.

n To assure the operation under low temperatures, you may put additives into Diesel fuel, which improve the filtering ability under low temperatures. Perform the mixing according to manufacturer´s instructions.

Warning!

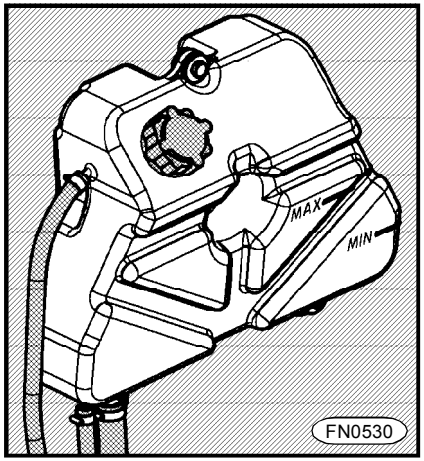
n Do not allow all the fuel be pumped out of the fuel tank.
n The use of bio-Diesel is not permitted.
n It is not allowed to add petrol into Diesel fuel.

Draining the fuel filter



Unscrew drain bolts on the fuel filter bottom to allow draining of water from the fuel filter. When all dirt particles drip out, screw the bolts again.

Cooling system



Checking and adding the coolant

n The label saying which kind of coolant has been filled, is situated on the expansion tank. The cooling system has been filled with the fluid based on ethylene-glycol. The mentioned coolants can be mixed with coolants based on ethylene-glucol (C type).

n Check the coolant level at regular terms.

n The coolant level must be between **MIN** and **MAX** marks when the engine is cold (when the engine is warm, the coolant level may exceed slightly the **MAX** mark). If the coolant level is too low, it is necessary to add it.

n For year round, add antifreeze (specification ASTM 4985) and distilled water in the ratio specified **(see the manufacturer´s instructions on the antifreeze packing).**

n All year-round use of antifreeze protects the cooling and heating system against corrosion and sediments. For that reason do not reduce the concentration of the antifreeze by adding water even during the warm season of the year (always add it in the ratio with antifreeze).

n Take care not to spill the antifreeze on the body paint.

n Before the winter season comes, check the antifreeze in the cooling system for condition and concentration.

n Before the summer season comes and anytime when the face body area has been polluted, clean the radiator with compressed air or stream of hot water from the engine side.

Check the expansion tank cap.

Warning!

n Have the coolant changed at the authorized service station.

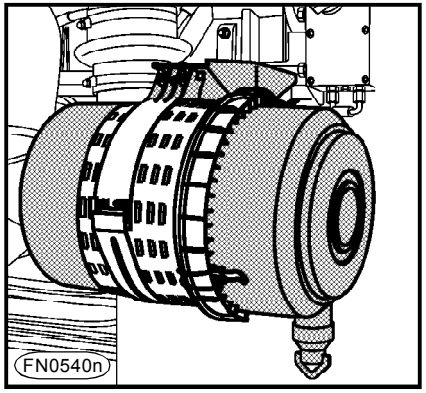
n Do not open the cap of coolant reservoir when the engine is hot - danger of scalding!

n Never run the engine with the thermostat removed.

n The expansion reservoir prevents the bleeding of the cooling and heating circuit. Remember to check the coolant level.

n When the engine overheats or the coolant leaks, have it corrected by the authorized service station.

Air filter

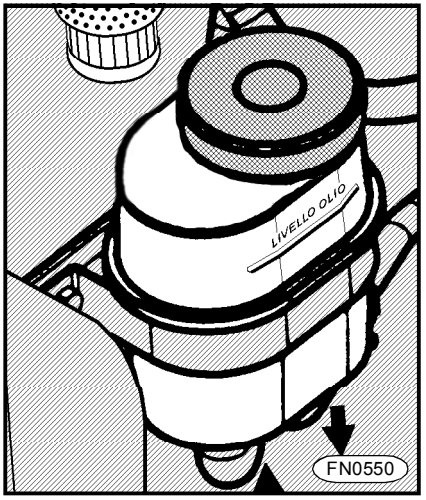


n The air filter cartridge replacement interval is stated in the Service Booklet.
n The clogged filter cartridge is indicated by the indicator light. When it comes on, you should visit the authorized repair shop immediately.
n Without regard to the pollution signalling, keep the replacement interval as mentioned in the Service Booklet.
n The condition of the air filter and intake manifold have a great influence upon the service life of turbocharger.

Warning!

n Have the air filter cartridge replaced at the authorized service station.
n When the vehicle is operated in very dusty conditions, reduce the replacement intervals accordingly.

Steering



Checking and adding the steering oil

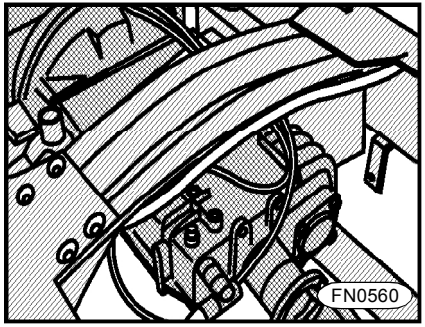
n Check the oil level regularly.
n The oil level in the tank must reach the **"LIVELLO OLIO"** mark. If it drops below this mark, it is necessary to add the oil of the **ATF D II** specification into circuit.
n If the steering play was found out, it is necessary to have it adjusted and/or repaired at the authorized service station.

Gearbox

n If the steering effort increases considerably during the vehicle operation, stop immediately and check the oil level in the tank of monoblock hydraulic power steering and check the hydraulic circuit for condition.

Warning!

n Have the oil changed and oil filter replaced at the authorized service station.
n If the oil needs to be refilled too often, visit the authorized service station.
n Do not run the engine when there is no oil in the power steering hydraulic circuit.
n Keep the environment clean when handling the oil.

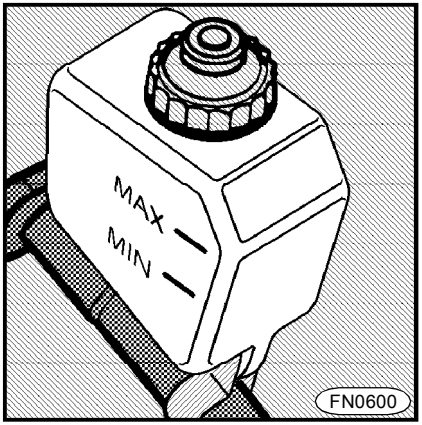


n Check oil level and quality in gearbox during service inspections.
n Check the gearbox for leaks. If you find out leakage, visit the authorized service station.

Warning!

n Have the oil changed at the authorized service station.
n When the vehicle is towed with engine at standstill and no gear shifted, disconnect the propeller shaft (at the rear axle) to avoid damage to gearbox due to insufficient lubrication.
n Do not start the engine when there is no oil in gearbox.

Clutch



n The clutch is actuated hydraulically and completed with the air booster.

n In case that the fluid circuit has been aerated (clutch will disengage poorly), it is necessary to look for the authorized service station.

n When the clutch plate has been worn, the clutch system will be set automatically what is evident by discharging the fluid into tank (the fluid volume increases in the tank).

Checking and adding the fluid

n Check the fluid level in circuit regularly.

n The fluid level must be between **MIN** and **MAX** marks. If it drops below MIN mark, add the fluid of the specification **DOT3, DOT4, DOT4+ or SAE J 1703.**

Warning!

n Have the fluid changed at the authorized service station.

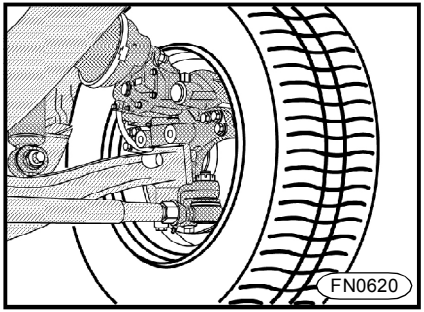
n Keep the environment clean when handling the fluid.

n When the air leaks from the air system (for example during a long-term vehicle storage), the air booster will be put out of function what results in increasing the force even to 500 N needed to depress the clutch pedal.

n If the fluid needs to be added too often, contact the authorized service station.

n The fluid is harmful to health.

Front axle



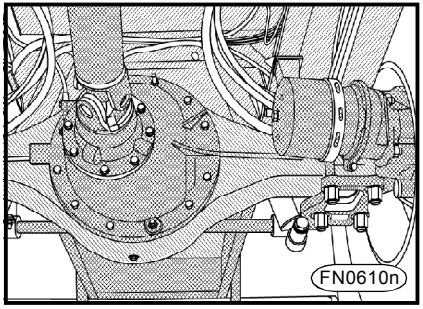
n If you notice that tire treads wear unevenly on the front axle, check and/ or have the front axle geometry adjusted at the authorized service station.

n The life of shock absorbers and their function depend on the way of driving and kind of operation.

Warning!

Entrust some authorized service station to carry out all repairs, refills or adjustments.

Rear axle



n Check the oil level and change the oil in axle final drive housings during service inspections.

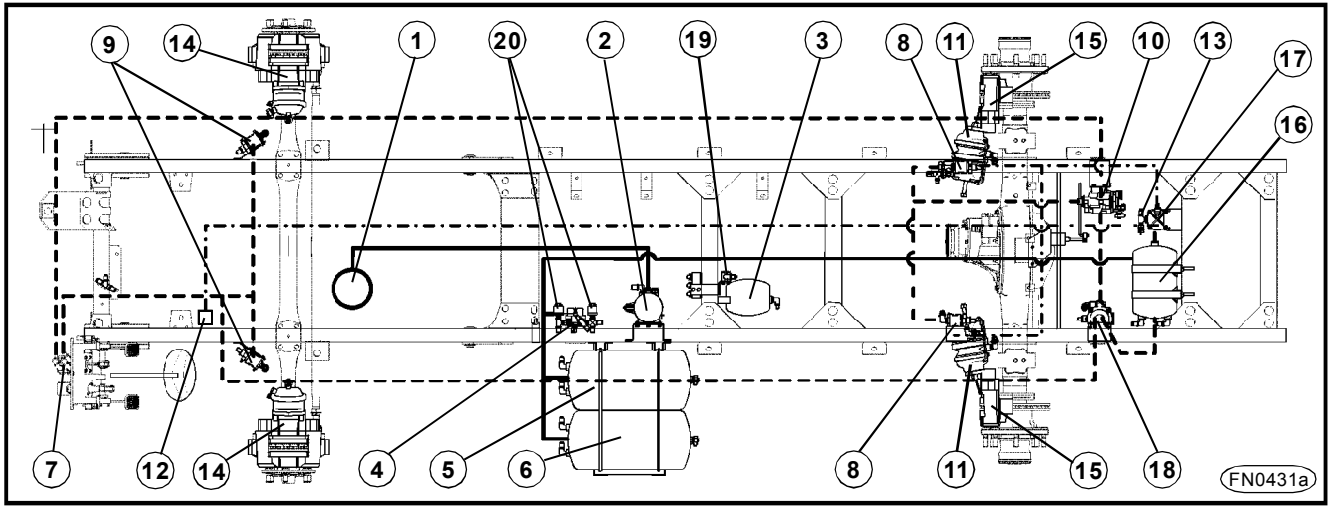
n Visually check the axle final drive housings for leaks only. If you find out leakage, have it repaired at the authorized service station.

Transmission oil specification API	Recommended viscosity grade SAE
GL - 5	85 W - 140 H

Warning!

Have the oil changed at the authorized service station.

Brake system D100/110/120



1 Compressor
2 Air pressure regulator c/w air drier
3 Air reservoir 4.5 l
4 Four-way relief valve
5 Air reservoir 30 l
6 Air reservoir 30 l
7 Master brake valve
8 ABS valve (1st circuit)
9 ABS valve (2nd circuit)
10 Automatic brake pressure regulator
11 Combined brake cylinder
12 Manual brake valve of parking brake
13 Switch of minimum air pressure of spring loaded cylinder
14 Front axle brake system
15 Rear axle brake system
16 Air reservoir of parking brake circuit
17 Valve relay
18 Trailer brake valve
19 ASR valve
20 Minimum air pressure sensor in circuits of service brake

Service brake

n Disc brakes are mounted on both axles.
n The service brake system is dual-circuit, controlled pneumatically.
n Vehicles are standard equipped with ABS, the ASR is installed as option.
n The first circuit of the master brake valve controls the rear brake system.
n The second circuit of the master brake valve controls the front brake system.
n The automatic brake pressure regulator controls the braking force of rear axle wheels in dependence on the vehicle load.

Correct function of the service brake is indicated by:
1. Air pressure gauges picking up the pressures in 1st and 2nd circuits.
2. ABS indicator light.

Air pressure in circuit of service brake
Nominal pressure

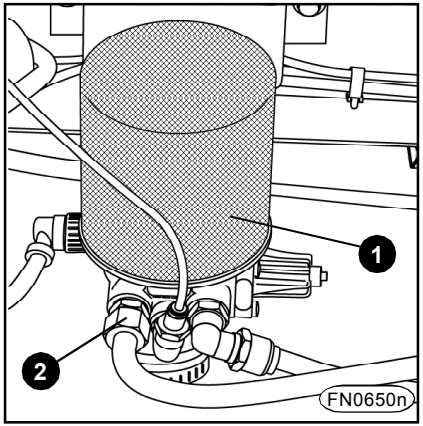
0.85 ± 0.02 MPa (8.5 bar)

Minimum pressure

0.55 MPa (5.5 bar)

Warning!

If it is not possible to reach the minimum level of the air pressure in the brake system, there is a fault in the service brake circuit which must be promptly repaired at the authorized service station. It is not permitted to continue to drive the vehicle until the fault is repaired.



Air pressure regulator c/w air drier
n This serves to clean and dry the air supplied from the compressor and to control the operating pressure in brake circuits.

Air drier filter replacement (item1)

n Replace the air drier filter **always before the winter season**. If you find out water in drain valves, replace it immediately (water can be found in drain valves during regular service inspections).

n No air pressure is allowed in the air drier.

n Prior to start the replacement, clean the surface of the air drier and loosen the union nut to release the pressure (item 2) on the inlet.

n Clean the upper part of the air drier body, gently oil the gasket of a new filter and hand tighten to **15 Nm**.

Warning!

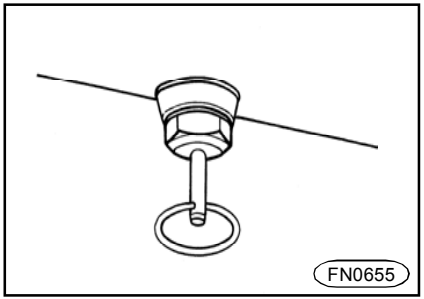
The used filter must be disposed of in accordance with environmental regulations (it may contain oil).

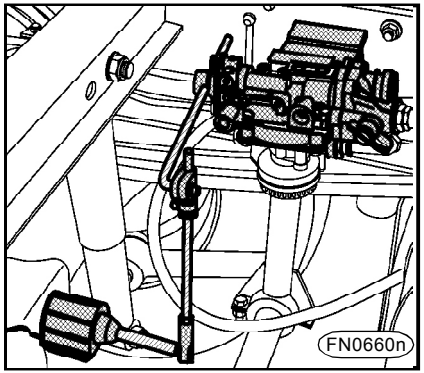
Condensate draining from air reservoirs

n The condensate (condensed water) settles in air reservoirs of the brake system during vehicle operation. The condensate must be drained at regular terms:

- several times a day in winter and humid weather

n The full operating pressure must be in the pressure system during draining. To drain the condensate, deflect control levers of drain valves on bottom of air reservoirs.





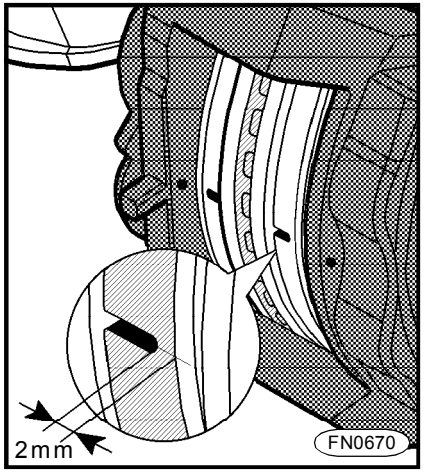
Automatic brake pressure regulator

n The brake pressure regulator serves to control the air pressure entering the combined cylinder of the rear axle.

n All adjustments must be carried out at the authorized service station. During operation, check visually the connection of regulator lever with axle, a free travel of the regulator lever and instrument tightness.

n The vehicle operator only gives the adjusting values of the brake pressure regulator according to vehicle version in case that real values do not respond to ones given on the label in the cabin.

Checking the brake lining



Wheels brake system

n Disc brakes are mounted on both axles.

n Brake pads have been worn if the indicator light on the instrument board and diode on the check module under the glove box of the instrument board come on.

n Brake pads need to be replaced when there is no gap in their centres (see the figure).

n The minimum thickness of the brake pad is:

2 ÷ 9 mm

n Replace the pads with ones of the approved type only.

Warning!

Only the authorized service station may perform the replacement of brake pads.

Brake system inspections

n To assure a correct function of the brake system, it is necessary to check it for a good condition at regular terms.

n **Daily**:

-drain the air reservoirs

n **Once a month**:

-clean the air reservoirs from outside and check whether they have not corroded and if attached properly.Replace the damaged air reservoir immediately.

-check the compressor intake manifold and check whether the air filter has not been polluted.

-check the screwed connections and manifolds of the whole brake system for leaks.

-check the pipes and hoses for a good condition. If damaged, carry out a replacement.

Anti - Blocking - System

The ABS system enhances considerably the active driving safety of the vehicle. Compared with common brake systems, it keeps a good driving maneuverability even at sudden braking on wet roads because the wheels will not block.

However, you cannot expect that the braking distance will be reduced with ABS under all circumstances!

The ABS has been designed not to shorten the braking distance, but to keep the control ability over the vehicle. If the circumferential wheel speed is too low related to the vehicle speed and the wheel tends to slip, the braking pressure of this wheel will be reduced. The braking pressure controls each axle separately. Hereby the braking effect will be balanced and the driving maneuverability is kept as much as possible.

To allow a good function of ABS, the brake pedal must be hold depressed - **never brake up interruptedly!**

Warning!

n When the ignition is on, the ABS indicator light must always come on. If the ABS indicator light does not go out in several seconds after the ignition is on, or when it does not come on at all and/or comes on during driving, the system is defective and the vehicle is braked without ABS. Only the normal brake system is operative on vehicle. Proceed to your nearest authorized service station in that case.

n The enhanced safety which is offered by the ABS must not tempt you to undergo any risking!

n All repairs and interventions in ABS may be performed by the authorized service station only.

ASR

The ASR system facilitates the move-off of the vehicle when the road adhesion is decreased. At the moment when the wheel on the driving axle starts to slip, it will be braked up and hereby the torque on the wheel with better adhesion conditions will be increased.

Warning!

n When the ignition is on, the ASR indicator light must always come on. If the ASR indicator light does not go out in several seconds after the ignition is on, or when it does not come on at all and/or comes on during driving, the system is defective and ASR is probably out of function. Proceed to your nearest authorized service station in that case.

n When ASR is not functional, the normal vehicle operation is not influenced.

n All repairs and interventions in ASR may be performed by the authorized service station only.

Emergency brake

The brake system has been designed so that when one circuit is defective, the emergency braking effect is secured.

A loss of operating braking effect may be caused by:

n Malfunction in the pneumatic part of the service brake due to air loss. The defect is indicated by the decreased pressure in one of two service brake circuits.

n Defect in the pneumatic part ahead of the four-way relief valve.

n Defect in one of four pneumatic circuits behind the four-way relief valve.

n Defect in the electrical part of the brake system - in the ABS system.

n Fault on the trailer connected.

Warning!

The use of emergency brake always means the endangering of the vehicle operation because the emergency braking effect is always much lower than that of the service brake.

Conclusion

n Always prior to set out for the drive, remember to check a good function of the brake system so that you watch the indicator lights of the brake system.

n Check a good function of bulbs of the brake system indicator lights by turning the ignition key from **"ACC"** to **"ON"** position when the indicator lights must come on.

n The indicator lights must go out after several seconds.

n After the indicator lights have gone out, you may move off.

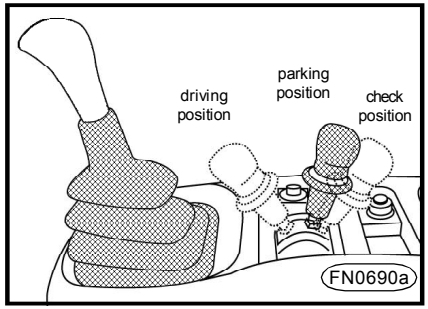
Brake system instruments

The vehicle user is obliged to carry out the continuous inspections of the brake system to check its condition and function. When some defect or suspicion of the defect has been found out, have the diagnostics and possible repair performed by the authorized service station.

Warning!

Any unprofessional intervention into the brake system is not allowed and all repairs and interventions must be entrusted to authorized service stations.

Parking brake



n The parking brake is of spring-loaded type and acts on wheels of the rear axle.

n The energy needful to brake up the vehicle is accumulated in the spring of combined brake cylinder being air compressed.

n The parking brake is controlled by means of the manual brake valve lever, which is located behind the gearshift lever.

Position of the parking brake lever

n Parking position:

To brake up the vehicle, it is necessary to move the manual brake lever rearwards into the parking position (before the parking position is achieved,

you have to overcome a point of pressure resistance and then the lever is automatically secured in the parking position).

n Check position

(it applies to some vehicle versions only)

This position is designed to check if the parking brake system of the towing vehicle is capable to brake up the vehicle combination in a certain gradient in a safe manner. A function of the parking brake of the trailer brake is disengaged after pushing the manual brake lever and its displacing from the parking position rearwards into the check position; hereby the vehicle combination will be braked up by the parking brake of the towing vehicle only (hold the lever in this position during inspection). After releasing, the control lever will automatically return into the parking position.

n Driving position

After releasing, gently raise the lock ring of the manual brake lever and move the lever forwards into a driving position.

Warning!

n The use of parking brake during driving is dangerous - danger of loss of control and skidding. Apply the parking brake only in case of urgent need.

n It is not allowed to drive the vehicle when the indicator light of minimum air pressure in the spring-loaded brake lights - the vehicle is being braked up.

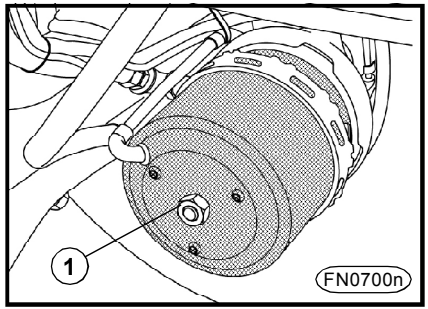
n Pressures in a circuit of the spring-loaded brake:

Nominal pressure

0.85 ± 0.02 MPa (8.5 bar)

Minimum pressure

0.55 MPa (5.5 bar)

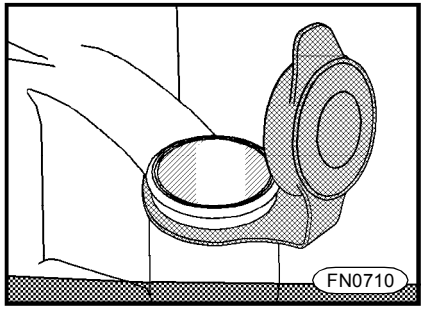


Releasing the combined brake cylinder - for the need of towing only

n Place the wheel chock to secure the vehicle against motion.

n Turn the nut **1** to unscrew the stem out of spring-loaded cylinder.

Windshield washer & wipers



Fluid container

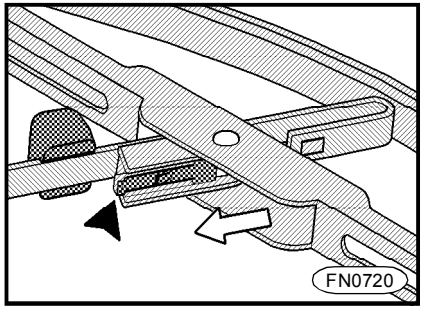
n The windshield washer container is situated in the front bumper.

n The container capacity is 7.5 l.

n The fluid can be added after opening the front bonnet.

n The respective indicator light* indicates the minimum fluid level.

n Use water with glass washer solvent agent (**e.g. Glacidet)** to add the fluid. In winter keep the stipulated ratio not to allow the fluid will freeze up (follow instructions mentioned on the antifreeze package).



Wipers

n For reasons of safety, keep the wiper blades in a perfect condition to assure good visibility.

n To assure good wiping, wash the rubber blades with glass washing agent regularly.

n On the wiper arm there are washer jets.

n The jets can be adjusted with a needle.

n The whole wiper arm body c/w jets can be moved freely along the arm.

Replacement of wiper blade

n Tilt the wiper arm.

n Tilt the wiper blade horizontally.

n Depress the plastic locking spring and remove blade by pulling it from location.

n Installation is a reverse of removal.

Warning!

n Do not use wipers to wipe dry glass - they may scratch it.

n Do not use wipers when there is a layer of snow on the windshield - clean the glass first.

n In the winter months, make sure first whether the wipers have not frozen up to the glass.

Tires and wheels

n Check the tire pressures always before you drive the vehicle. Remember also to check the tires if they are in a good condition (look for the tire repair shop if they have been damaged).
n Tire inflation pressures are mentioned on the plate inside the cabin and in table in Chapter **Technical Data**.
n No cuts, bruises or other damages showing the tire casing cord are allowed on tire treads or sides.
n In case of the uneven wear of tire treads on front axles, check and/or adjust the front axle wheels geometry.
n The depth of tread grooves of tires must be **1.6 mm at least.** If tires treads are marked REGROOVABLE, the treads can be cut through to make them deeper (only a specialist may perform it).
n Only balanced tires may be mounted on front wheels and all wheels must be in a good technical condition.
n Only tires stated for the given type of the vehicle and recommended by the tire manufacturer may be used on the vehicle.
n Protect tires against oils and fuel.
n If the vehicle is put out of operation for a long time, it should be slightly raised to relieve the tires.
n The dismounted wheels (tires) should be stored in a dry and dark place.
n Check the tightening-up of wheel nuts at intervals stipulated in the **Service Booklet**.
n In addition, check the tightening-up of nuts on wheel bolts after covering the first **50 ÷ 100 km** and after every wheel removal to the torque of **485 ± 35 Nm**.

The service life of tires depends on:

n way of driving and driving habits
n correct tires inflation
n vehicle operating conditions
n geometry of front axle
n proper distribution of load on the load space

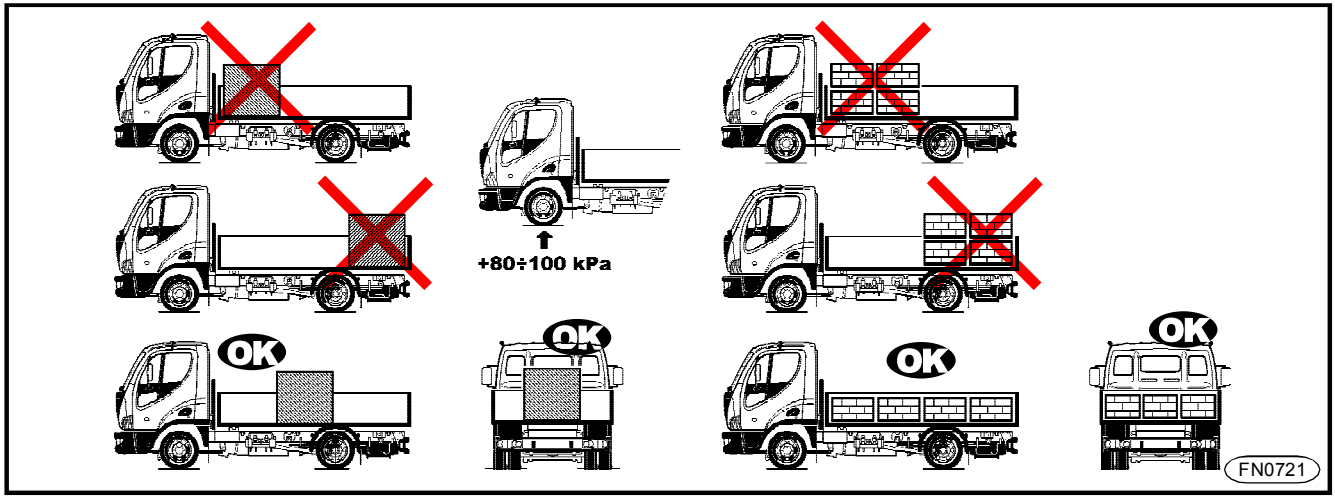
Wheels and wheels data

Wheels of the front axle - 2 balanced ones
Wheels of the rear axle - 4 non-balanced ones

Spare wheel - 1 balanced one

Disc wheel	**17,5 x 6,75**
	19,5 x 6,75
Tires	**245/70R 17,5**
(radial)	**265/70R 17,5**
	245/70R 19,5
	265/70R 19,5
	ALL STEEL TUBELESS

Transport of loads



Especially during the vehicle operation on highways and long-distance transport, follow the below-mentioned instructions:

n Do not exceed the maximum allowable front axle load of

4,000 kg

n Increase the tire inflation of the front axle by 80 to 100 kPa. However, do not exceed the maximum allowable tire inflation pressures stated by the manufacturer.

n Take care that the load is distributed correctly on the load space of the vehicle:

- place the load to the centre of the load space,
- place the load evenly on the whole load space.
- keep a correct distribution of the weight (1/3 to the front axle and 2/3 to the rear axle)

n If the tires should be replaced, it is necessary to prefer:

a) tires of higher capacity

b) tires stated for the highway operation by the manufacturer

Basic rules for the trailer coupling

n Secure the trailer rear wheels with chocks.
n The front trailer axle must remain steering.
n Adjust the trailer draw bar into a height of the trailer hitch.
n When engaging the reverse speed, make sure that nobody is standing between the trailer and vehicle.
n Make sure that the trailer is coupled correctly.
n Attach the brake hoses coupling heads and plug connectors of electric conductors.
n Check the brake system and lights for a correct function.
n Proceed very carefully when towing a trailer and do not exceed the allowable load limits.
n When stopping during uphill or downhill driving, check the manual brake for a good efficiency. It must hold the whole vehicle combination in a gradient on the spot.

Warning!

n The pieces of information mentioned in this chapter are the basic ones only. You should abide mainly by the instructions given in the Operation Manual for the connected vehicle.

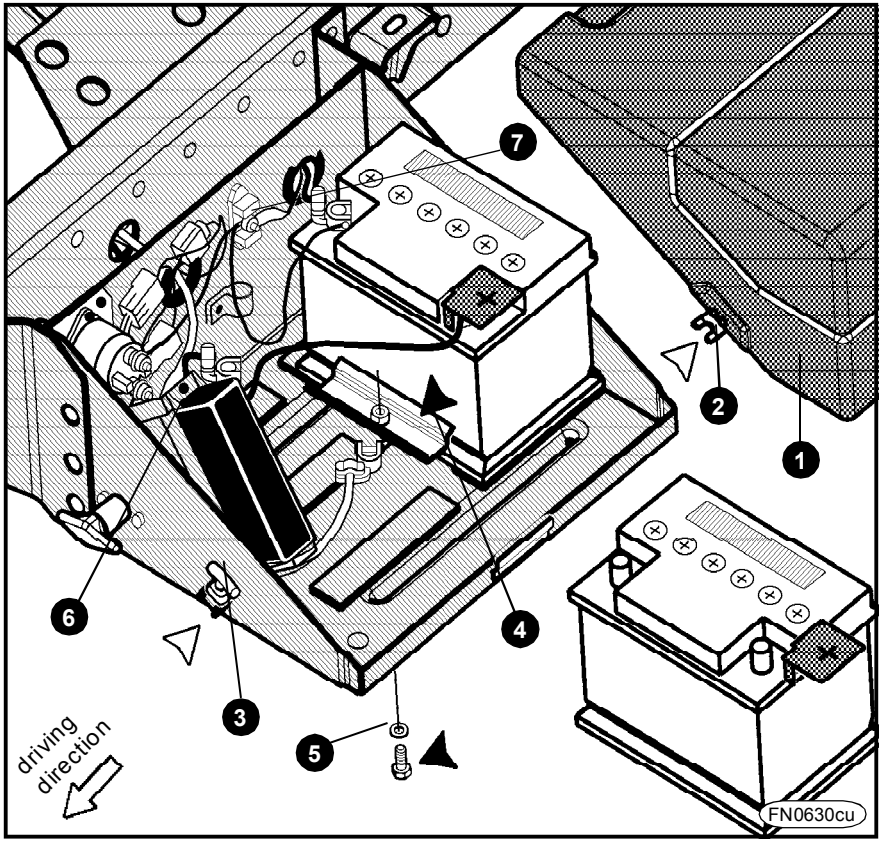
Electrical equipment

n Clamps of all electrical consumers of the vehicle must be connected correctly and their polarity must not be mutually exchanged.
n Always charge the batteries outside the vehicle.
n With the engine running, do not switch off the battery circuit breaker and do not disconnect battery terminals.
n During handling the vehicle when short-circuit could occur, remember to switch off the battery circuit breaker.
n When you wash the vehicle, protect starter, alternator, glowing regulator and battery case against water to avoid short-circuit.
n For reasons of safety, during vehicle standstill (when parking in garage, etc.), when leaving the vehicle or when you find out any fault in the electrical equipment, switch the battery off.
n When the fire could occur, use the battery circuit breaker to disconnect the electrical equipment.

Warning!

n When the engine is not running, the battery is discharged by use of electrical consumers.
n The electric arc welding outside the dealer's network is not allowed - danger of damage to alternator, engine control unit and ABS control unit.

Location of battery



1 Plastic cover
2 Holder clip
3 Rubber holder
4 Profiled battery holder
5 Battery holder screw
6 Fuse box
7 Central ground point

Battery

n Instructions for the operation and maintenance are a part of the warranty card delivered with the vehicle.

n Check the battery condition, electrolyte level and tightening-up of the ground screw (item 7 on the previous page) every six months.

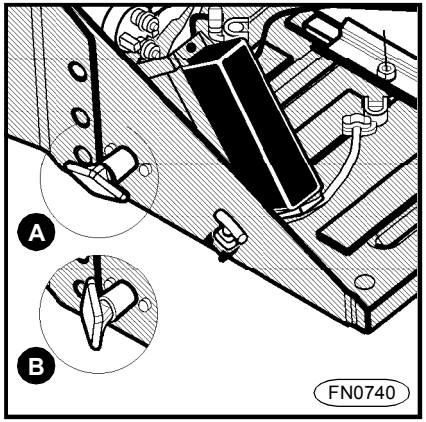
n When disconnecting the battery terminals, be sure to disconnect first the negative ("**–**") terminal. Proceed with care during removal of battery terminals not to cause short-circuit between "**+**" battery terminal and vehicle ground. After cleaning and careful connection of terminals connect the positive terminal ("**+**") to the battery circuit breaker again.

n Replace the discharged battery with a battery of the same capacity, voltage, ampere load and size.

Warning!

n Charge up the battery always outside the vehicle.
n The used battery must be disposed of with regard to environmental regulations.

Battery circuit breaker



A circuit breaker on

B circuit breaker off

Warning!

n Switch off the battery circuit breaker only 30 seconds after switching off the ignition (to allow the PC data processing).
n Never shut the engine off by the battery circuit breaker - this could damage the electrical equipment and alternator.

Alternator

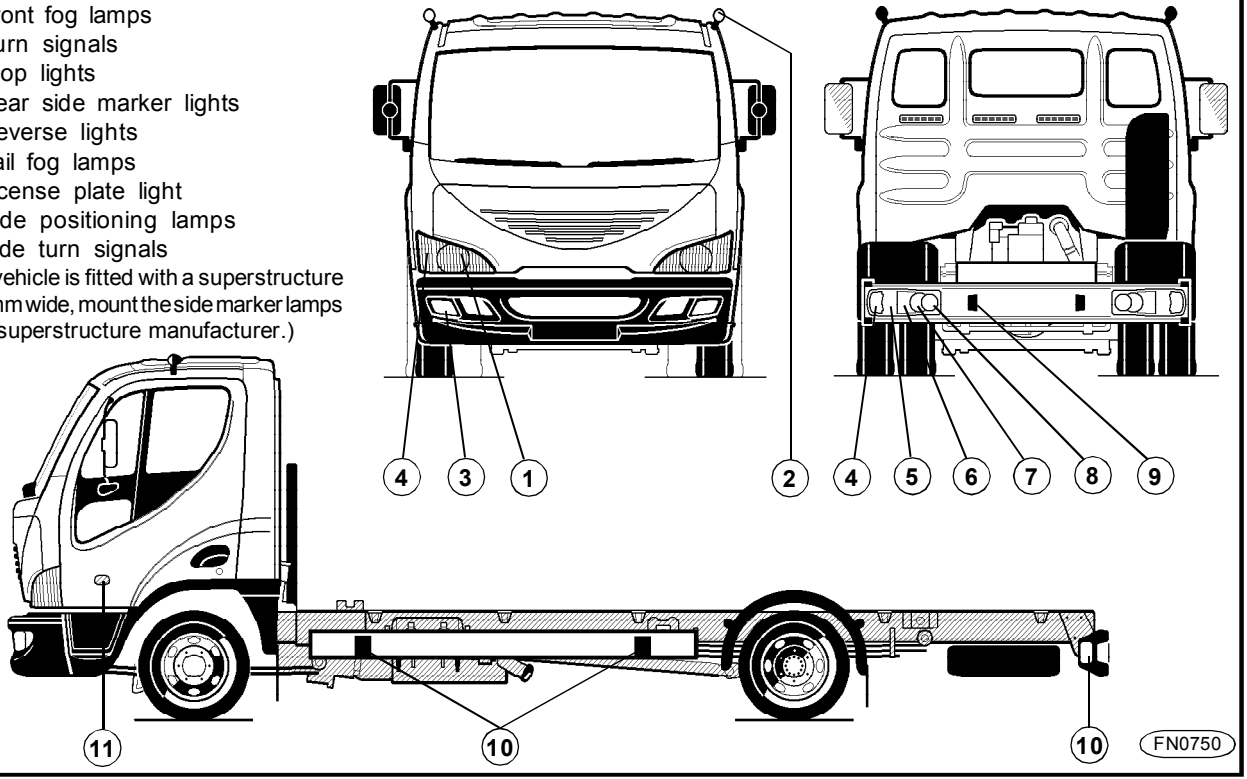
Warning!

With the engine running the alternator terminals must not be disconnected and the battery circuit breaker must not be switched off - the alternator must not run without load.

Headlamps and lights - location

1 Front headlamps
2 Front auxiliary side marker lamps
3 Front fog lamps
4 Turn signals
5 Stop lights
6 Rear side marker lights
7 Reverse lights
8 Tail fog lamps
9 License plate light
10 Side positioning lamps
11 Side turn signals

(If the vehicle is fitted with a superstructure 2,550mm wide, mount the side marker lamps of the superstructure manufacturer.)



Vehicle care

Warning!

In case that the vehicle is fitted with a superstructure and the tailgate covers the rear cluster lamps in a tilted condition, the driver is obliged to place a warning triangle behind the vehicle under decreased visibility with the tailgate tilted and standing on a road. The special label inside the cabin being visible from the driver´s place reminds you of this obligation.

Cleaning agents

n As far as the cleaning agents or other chemical vehicle-care products are concerned, you should follow the manufacturer´s directions when using them both for the vehicle interior or exterior.

n The non-suitable cleaning agents may impair the value of vehicle components.

n You should not use the volatile agents (acetone, diluents, gasoline), cleaning agents (wash powders) and bleaching or other aggressive agents except for those recommended to remove spots from clothes.

n Take care that the ventilation is enough when working in interior (vapours of some agents are harmful to health).

Care of the vehicle interior

It is important to use correct cleaning agents and procedures (see instructions mentioned on cleaning agents). When not observing these instructions, hard removable spots may stay on interior materials after cleaning.

Plastic parts

n Use wet rag to clean the plastic parts.

n After a rough cleaning by wet rag, you can apply the agents recommended.

Seat belts

Clean them with a soap water solution.

Warning!

n The seat belts should be kept clean - dirt would affect the function of retractor.

n Before winding, the seat belts must be perfectly dry.

n The seat belts must not be cleaned chemically.

Doors and windows seals

Apply rubber preserving agents to seals of doors and windows from time to time to increase their life.

Windows

n Use window cleaning agents.

n Use a plastic scraper to remove snow in winter.

Care of the vehicle exterior

n Frequent washing and preserving are a good protection of the vehicle against negative influences of the environment.

n Regular care will contribute to maintain the value of your vehicle.

n It is important to use correct cleaning agents and procedures (see instructions mentioned on packages of cleaning agents). When not observing these instructions, hard removable spots may stay on exterior surface materials after cleaning.

Washing the vehicle

n The best way how to maintain the paint in a good condition is to wash it very often.

n Use the lukewarm or cold water to wash the vehicle.

n Do not use hot water or do not wash the vehicle in direct sunlight.

n First use plenty of water to wash off the dirt thoroughly.

n After washing off the dirt, use a soft sponge to clean the body from the roof down using water and car-wash shampoo in ratio as mentioned on the packing. It is necessary to rinse the sponge often during washing.

n Use plenty of water to rinse the vehicle off after washing (do not allow the agents to dry on the body paint) and dry it out with a chamois.

Warning!

Keep environmental regulations when washing the vehicle.

Waxing and polishing

n When waxing and polishing the vehicle regularly, you will obtain a good shine and easier maintenance during the next washing.

n Apply wax to a clean and dry body.

Warning!

Do not apply polishing and waxing agents to plastic parts.

Damage to the body paint

Correct each damage to paint promptly not to allow a rapid corrosion of the bare metal. Entrust the work to a specialized workshop.

Engine

1. Starter does not crank the engine or cranks slowly

A) Fault: Battery circuit breaker is off
Remedy: Switch the battery circuit breaker on

B) Fault: Engaged gear
Remedy: Move the gearshift lever to the neutral position.

C Fault: Blown fuse
Remedy: Replace the fuse. If the new fuse blows immediately again, have the vehicle checked at the authorized service station

D) Fault: Charged battery
Remedy: Charge the battery according to instructions mentioned in the warranty card delivered with the vehicle

E) Fault: Faulty electric wiring
Remedy:
- Check and clean battery outlets and terminals
- Check and/or clean connections from battery to engine
- Check the cables connection of starter and/or tighten

F) Fault: Faulty neutral switch
Remedy: Contact and have it repaired at the authorized service station

G) Fault: Faulty starter
Remedy: Contact and have it repaired at an authorized service station

2. Starter cranks the engine but the engine cannot be started

A) Fault: No fuel in tank
Remedy: Fill the fuel and bleed the fuel system

3. Engine starts but will not keep running

A) Fault: Too low idle run speed
Remedy: Contact and have it repaired at an authorized service station

B) Fault: Faulty fuel inlet
Remedy: Contact and have it repaired at an authorized service station

Engine

C) Fault: Clogged fuel filter cartridge
Remedy: Contact and have it repaired at an authorized service station

D) Fault: Air penetrates into the fuel system
Remedy: Contact and have it repaired at an authorized service station

4. Engine will not reach the rated output

A) Fault: Fuel filter has been clogged with dirt
Remedy: Contact and have it repaired at an authorized service station

B) Fault: Wrong function of injection system
Remedy: Contact and have it repaired at an authorized service station

5. Engine is knocking

Remedy: Contact and have it repaired at an authorized service station

6. Engine smokes excessively

A) Fault: Faulty or wrong adjusted injection unit or fuel injectors
Remedy: Contact and have it repaired at an authorized service station

B) Fault: Faulty turbocharger
Remedy: Contact and have it repaired at an authorized service station

7. Engine overheats

A) Fault: Insufficient coolant level
Remedy: Check the cooling circuit for leaks, repair the fault and add the fluid

B) Fault: Insufficient function of cooler
Remedy: Clean the cooler surface

C) Fault: Faulty thermostat
Remedy: Contact and have it repaired at an authorized service station

D) Fault: Faulty function of the fan visco-coupling
Remedy: Contact and have it repaired at an authorized service station
CAUTION:
If the cooling indicator light comes on, it is necessary to stop the vehicle as soon as possible and to cool down the engine by enhanced engine speed (1,200 ÷ 1,500 rpm).
In any case do not shut the engine off after the cooling indicator light comes on.

Engine

8. "Engine - stop" indicator light ON

Fault: Serious engine defect (it may be probably the coolant temperature, charge air temperature or oil pressure)
Remedy: Stop the vehicle and shut the engine off. Carry out the diagnostic test (the diagnostic procedure is mentioned on the following page). If the light code lights up during this test, there is a serious defect in the engine and it is necessary to contact the authorized service station. It is strictly prohibited to continue to drive the vehicle. However, when the indicator lights "engine - stop" and "engine - warning" light together permanently during the diagnostic test, you can continue to drive the vehicle.

9. "Engine - warning" indicator light ON

Fault: Fault in the engine system or in the engine component
Remedy: The vehicle can be further operated, however, when you reach the nearest authorized service station, have this fault repaired - this situation is not considered to be an emergency state.

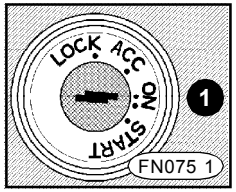
10. "Engine - maintenance" indicator light ON

Fault: It notifies you of the necessary maintenance work
Remedy: If it flashes during the start, it reminds you of the necessary service job such as the engine oil change, etc. After, for example, the oil change has been performed, the re-start of the indication of this indicator light must be carried out - the authorized service station will perform it.

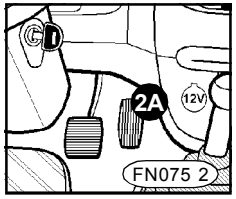
Engine

11. Diagnostic test

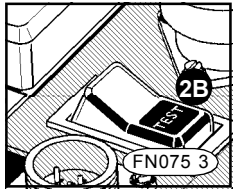
Fault: The indicator lights
"engine - stop" [STOP] "engine - warning" [⚠] are ON



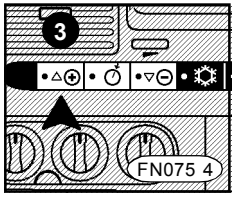
Which of two indicator lamps is on determines the kind of defect (three- to four-digit fault code).

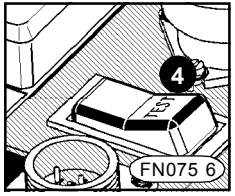


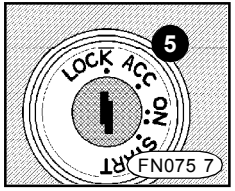
How to start the diagnostic test:
1) The ignition key must be in position **"ON"** (item 1).
2) Depress three times the accelerator pedal and release it (item 2A) -
or
push the engine diagnostics switch (item 2b) situated under the glove box in the instrument board.



3) The orange indicator light "engine - warning" will begin lighting and when it goes out, the red indicator light "engine - stop" will start blinking to show the fault code.







The fault code blinking repeats itself continuously. It is necessary to put down the fault code number. To detect other faults, it is necessary to push the cruise control switch (item 3) marked **"+"** and the procedure of fault code blinking will begin to repeat itself - either the same fault code appears (if there is no other fault code) or another fault code displays (put it down) and by repeated pushing the cruise control switch **"+"** further blinking of the fault code will be activated - go on in that way until the first fault code appears again.
On termination of the diagnostic test, turn the diagnostics switch off (item 4), move the ignition key (item 5) to position **"ACC"** and wait 30 seconds.

Warning!

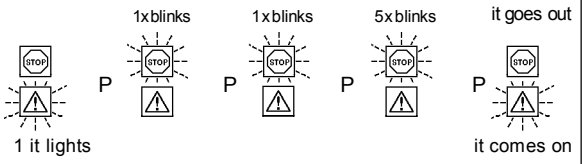
If the blue indicator light "engine - maintenance" comes on, contact the nearest authorized service station.

Engine

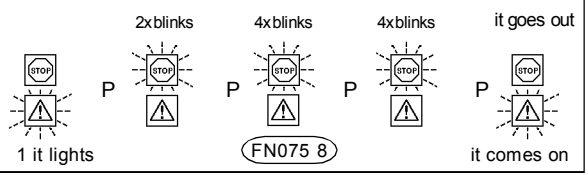
Example of fault codes

P=pause

Fault code 115:



Fault code 244:



The indicator light "engine-stop" displays the fault code number. The example of fault code determination is illustrated.

- after the orange indicator light "engine-warning" goes out
-1x the red light blinks
-pause 1-2 s
-1x the red light blinks
-pause 1-2 s
-5x the red light blinks
-pause 1-2 s
- the orange light come on again (end of fault code lighting)
fault code = 115

Electrical equipment

1. The battery charging indicator light is on

A) Fault: Fault in the charging circuit
Remedy: First check whether all cables of alternator, accumulator batteries and battery circuit breaker are tightened thoroughly and/or connected to respective terminals. Check also whether connections including the battery ground cable have not been corroded.

2. The battery charging indicator light does not come ON when the ignition is ON

Remedy: Contact and have it repaired at an authorized service station

Monoblock hydraulic power steering

1. Oil leaks from the hydraulic circuit

Fault: Leaky connections
Remedy: Tighten the loose connections, check the oil level and/or add the oil and visit the authorized service station

2. Faults of individual instruments

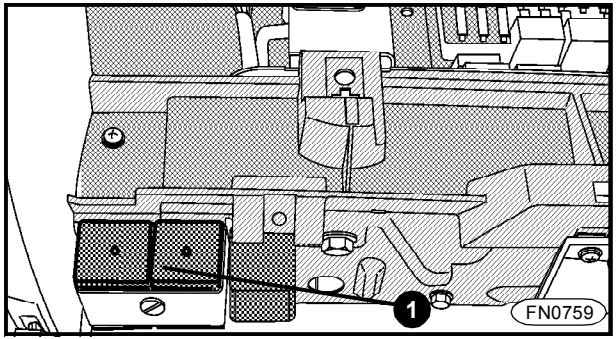
Remedy: Contact and have it repaired at an authorized service station

Brakes

1. The indicator light - brake system malfunction - is on

Fault: Low pressure in 1st or 2nd circuit of service brake or worn brake pads

Remedy: Check the pressure in the pneumatic system on gauges on the instrument board. If the air pressure is too low, release the spring-loaded cylinders (see Chapter Parking brake) and have the vehicle towed to the authorized service station. In case that the pressure is sufficient in the pneumatic system, dismount the glove box in the instrument board and inspect the module (1) for checking the brake pads wear - see the figure. If the red diode lights on some module, the brake pads have been worn. Adapt the driving to the situation and visit the authorized service station.



2. The parking brake has been blocked, the air pressure gauge of brake system indicates the pressure below the minimum value, the vehicle cannot be put in motion

Remedy: Release the spring-loaded cylinders (see Chapter Parking brake) and have the vehicle towed to the authorized service station.

3. The ABS indicator light is on

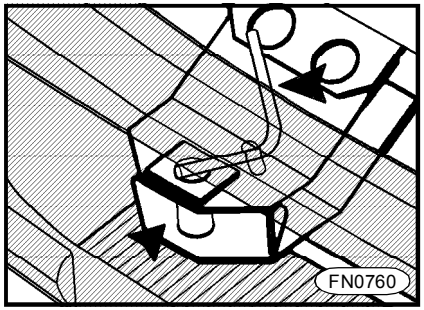
Remedy: The equipment is not OK, the vehicle is braked without ABS function. Only the normal brake system is functioning on the vehicle. In that case it is promptly necessary to visit the authorized service station. Adapt the driving to the situation.

4. The ASR indicator light is on

Remedy: The equipment is not OK, the ASR system is not working. It is necessary to visit the authorized service station.

Note: When the ASR system is out of function, the common vehicle operation is not influenced.

Towing



n Use the pin to attach the towing bar in the middle part of the front bumper.
n When towing the vehicle with the engine at standstill and no gear speed shifted in gearbox, disconnect the propeller shaft not to damage the gearbox due to insufficient lubrication and release the spring-loaded cylinder in accordance with Chapter "Parking brake".
n The ratio of the towed and towing vehicles weights must be **1.4:1** at least.

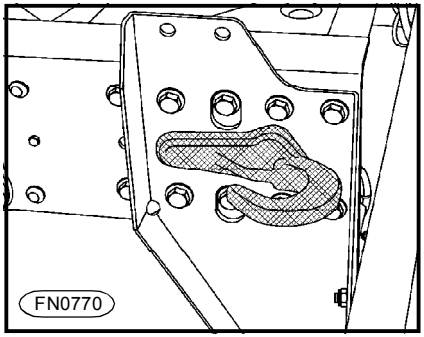
Warning!

n With the engine off, the power steering and brake booster are out of function.
n Use only the tow bar to tow the vehicle; other connection is not permitted.

Disconnecting the propeller shaft

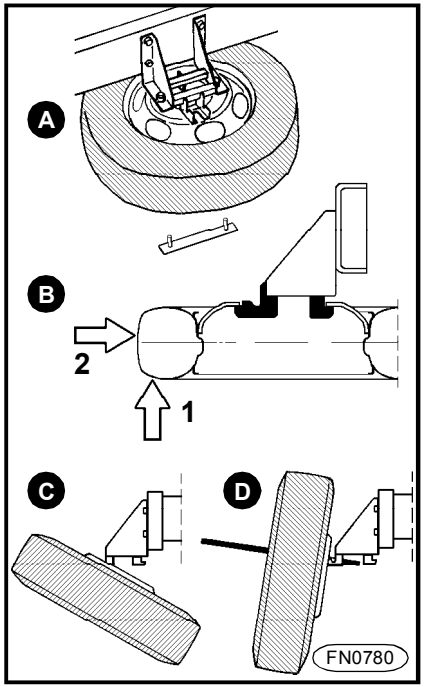
n Secure the vehicle against motion.
n Dismount bolts fixing the propeller shaft to the axle final drive housing flange.
n Attach the propeller shaft to the vehicle frame in a suitable manner.
n After the vehicle towing and repair have been accomplished, remount the propeller shaft to the axle final drive housing flange again; tighten the self-locking nuts to $\mathbf{M_k = 60 \pm 10}$ **Nm.**

Vehicle recovery



A special hook to hold the rope for the vehicle recovery is welded to the frame.

Spare wheel holder (L, E, S, G)



Removal of spare wheel

n Dismount the spring split pin and two nuts to loosen the thrust plate (Fig. A).

n Raise the wheel while holding the tire (Fig. B) in point **1** and with the wheel lifted, push in point **2** towards the centre of the vehicle (the wheel will swing - see Fig.C - danger of injury).

n Remove the wheel from holder.

Installation of spare wheel

n Use the assembling bar for the cabin lifting to raise the wheel so that it remains hanging in grooves of front holder brackets (Fig.D).

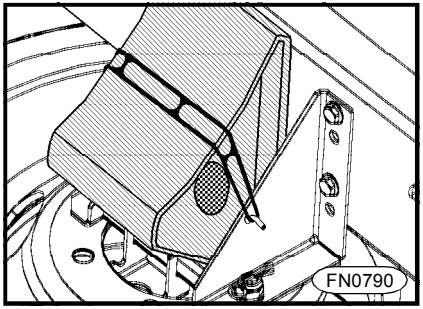
n Swing the wheel into the horizontal position towards you so that it rests on the contact surface of the rear bracket and simultaneously on contact surfaces of front brackets ahead of stop lugs.

n Tighten the thrust plate from below by two nuts and secure with the wire clip at one of two bolts.

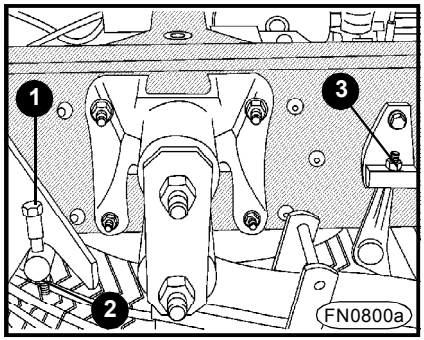
Warning!

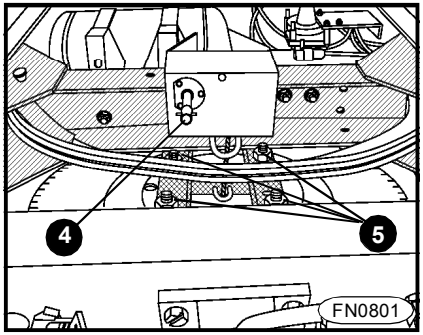
Proceed with extreme care with regard to the wheel weight.

Wheel chock (L, E, S, G)



Spare wheel holder (N)





Removal of spare wheel

n Dismount bolt **1** c/w nut **2** and nut **3** on the LH and RH side of the spare wheel hanger.

n Put the handle out of the vehicle equipment onto a winch **4** and turn the handle to lower the spare wheel c/w hanger on ground.

n Dismount four bolts c/w nuts **5** and remove the wheel from hanger.

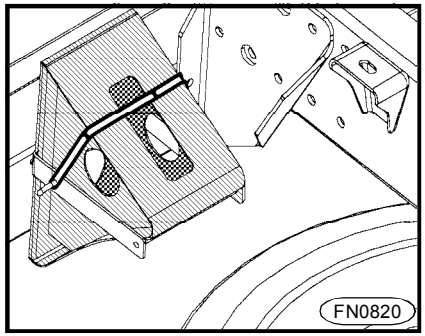
Installation of spare wheel

n During installation first attach the spare wheel by four bolts c/w nuts to the hanger, use the winch to attract the hanger c/w spare wheel to the frame and secure the hanger with bolt **1** c/w nut **2** and nut **3** on each side.

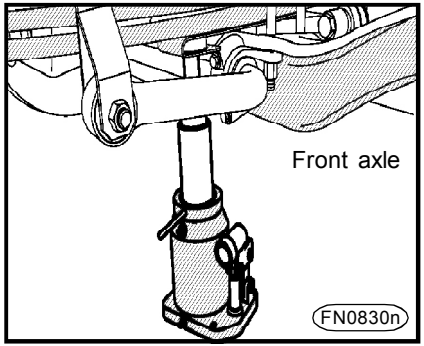
Warning!

Proceed with extreme care with regard to the wheel weight.

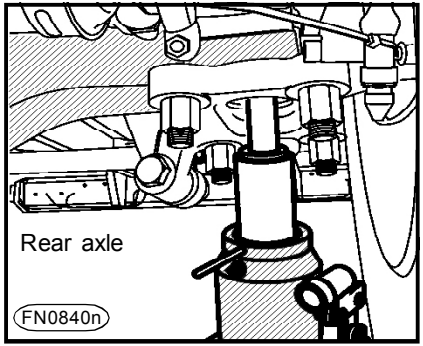
Wheel chock (N)



Changing the wheel



n When changing a wheel, the vehicle must stand on level ground if possible.
n Secure the vehicle with the wheel chock and set the parking brake.
n Remove the spare wheel from holder.
n Loosen the wheel nuts by a lug wrench (from the vehicle equipment) by 1/2 turn.
n Location of jack:
- on the front axle, place the jack with its head into a hole in the metal sheet guide situated under the leaf spring ahead of the axle (see the figure).
- on the rear axle, place the jack with its head into a recess of the clamping plate of the leaf spring shackle.



Warning!

The jack must stand firmly on the firm subgrade.

n Raise the wheel by several centimetres above the ground by moving the lever (with the valve closed).
n Unscrew the wheel nuts, remove the wheel and fit the spare wheel in place.
n The contact surfaces of disc and wheel hub must be clean.
n Tighten the wheel nuts partially and evenly.

Warning!

With the vehicle lifted, never start the engine.

n Open the jack valve slowly and carefully lower the vehicle on ground.
n Tighten the wheel nuts completely to 485 ± 35 Nm.
n Retighten the wheel nuts after covering 50 ÷ 100 km.

Replacing bulbs

n Prior to the bulb replacement, switch off the respective light.

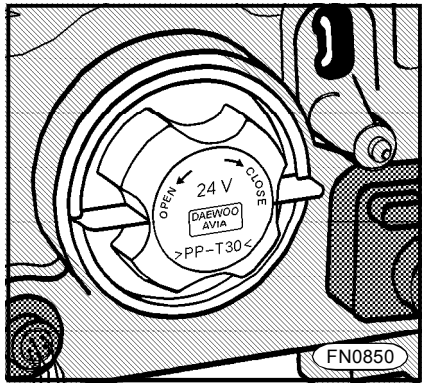
n Replace the defective bulbs with bulbs of the same parametres (designation and parametres are mentioned on the bulb).

n Do not touch the halogen bulb glass with bare fingers - it would loose its efficiency after switching on.

Warning!

n Only the authorized service station may adjust the main headlamps.

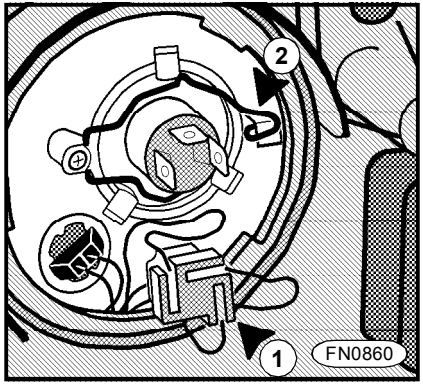
n A new bulb must correspond to the specified bulb by its type and output.



Main headlamp

n Tilt the cabin to replace the bulb.

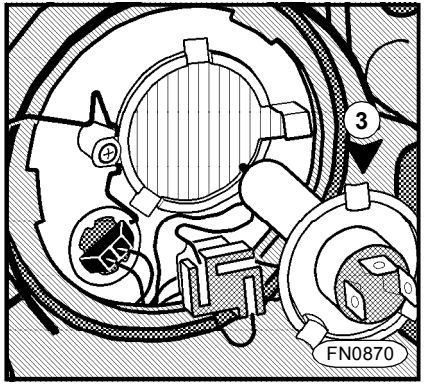
n Slightly turn the cover plastic lid of the headlamp counterclockwise and remove.



Low and high beam

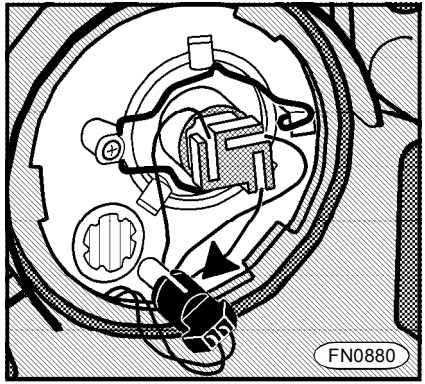
n Unplug the connector (item 1) from the bulb.

n Unhook and fold the flexible wire holder (item 2).



n Remove the faulty bulb and fit a new bulb - lugs (item 3) on the bulb base must engage into recesses of the headlamp.

n Installation is reverse of removal.



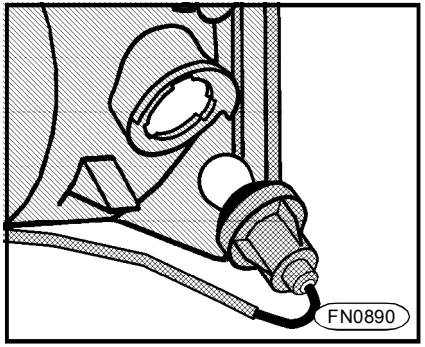
Front side marker lights

n Remove the socket out of the headlamp.

n Take the bulb out of socket.

n Insert a new bulb and proceed in a reverse manner.

Front part	H4	24 V	70/75 W	2	headlamp - low and high beam
		24 V	5 W	2	side marker light



Front turn signals

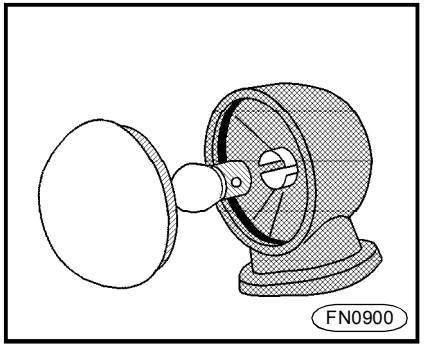
n To make a faulty bulb better accessible, open the cabin door.

n Turn the plastic socket of the bulb counterclockwise and pull it out of the light housing.

n Push the faulty bulb into socket, twist counterclockwise and remove.

n Fit a new bulb, push it and turn clockwise.

n Install the bulb socket into a light housing and turn clockwise as far as it goes.



Front auxiliary side positioning lights

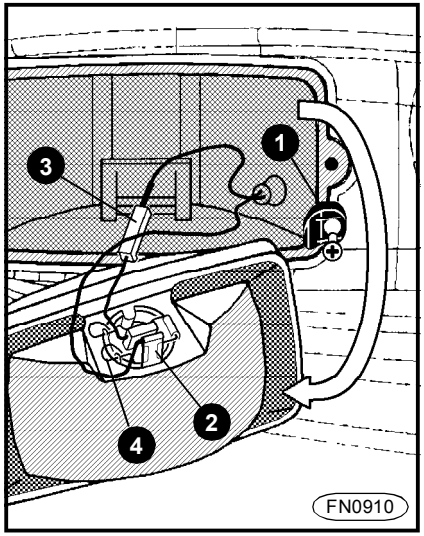
n Use a screwdriver to remove cover from the light housing.

n Push the faulty bulb into socket, twist counterclockwise and remove.

n Fit a new bulb, push it and turn clockwise.

n Install cover and push it in place.

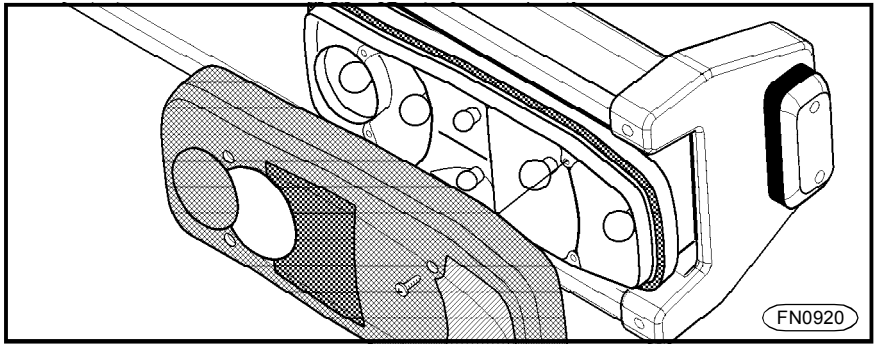
Front		24 V	21 W	2	turn signals
part		24 V	5 W	2	auxiliary side positioning lights

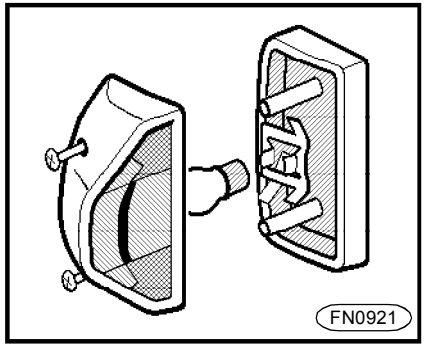


Front fog lamps

n Unscrew plastic clips (item 1) from the fog lamp housing.
n Remove the housing.
n Bend the ground connector perpendicularly (item 2).
n Disconnect the cable (item 3) by pulling it out.
n Unhook and fold the flexible wire holder (item 4).
n Remove the defective bulb and insert a new one (slots on the bulb socket must engage into lugs in the fog lamp housing).
n To reinstall, reverse the above procedure (do not forget to bend the ground connector back into the initial position).
n The designation **TOP** must be directed up.
n Have the headlamps adjusted at the authorized service station.

Front part	H3	24 V	70 W	2	fog lamps





Rear cluster lamps

n Unscrew the lamp cover.

n Push the defective bulb into socket, twist counterclockwise and remove.

n Fit a new bulb, push it and turn clockwise.

n Install and screw the cover. Tighten the cover carefully as this may crack.

License plate light

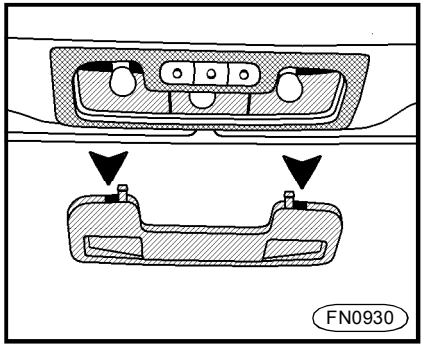
n Unscrew the lamp cover.

n Push the defective bulb into socket, twist counterclockwise and remove.

n Fit a new bulb, push it and turn clockwise.

n Install and screw the cover. Tighten the cover carefully as this may crack.

Rear part		24 V	10 W	2	red side marker light
		24 V	21 W	2	red stop light
		24 V	21 W	2	orange turn signal
		24 V	21 W	2	red fog lamp
		24 V	21 W	2	white reverse light
		24 V	10 W	2	license plate lights



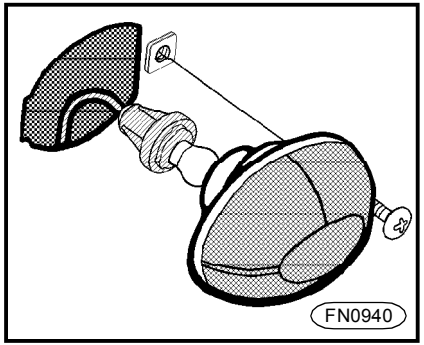
Dome light

n Use a small screwdriver to pull cover out of the light housing (you can see two slots to insert the screwdriver in the cover).

n Push the faulty bulb into socket, twist counterclockwise and remove.

n Fit a new bulb, push it and turn clockwise.

n Carefully install cover and push it in place.



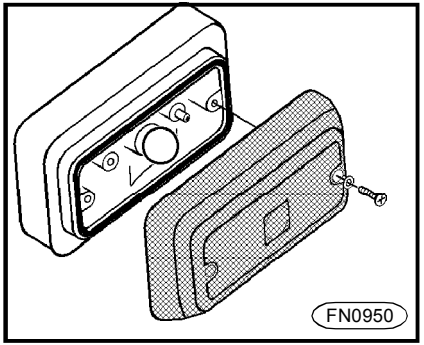
Side turn signals

n Unscrew the lamp.

n Push the faulty bulb into socket, twist counterclockwise and remove.

n Fit a new bulb, push it and turn clockwise.

n Install the lamp spring clip in the front part and screw. Tighten it carefully as this may crack.



Side positioning lights

n Unscrew the light cover.

n Push the defective bulb into socket, twist counterclockwise and remove.

n Fit a new bulb, push it and turn clockwise.

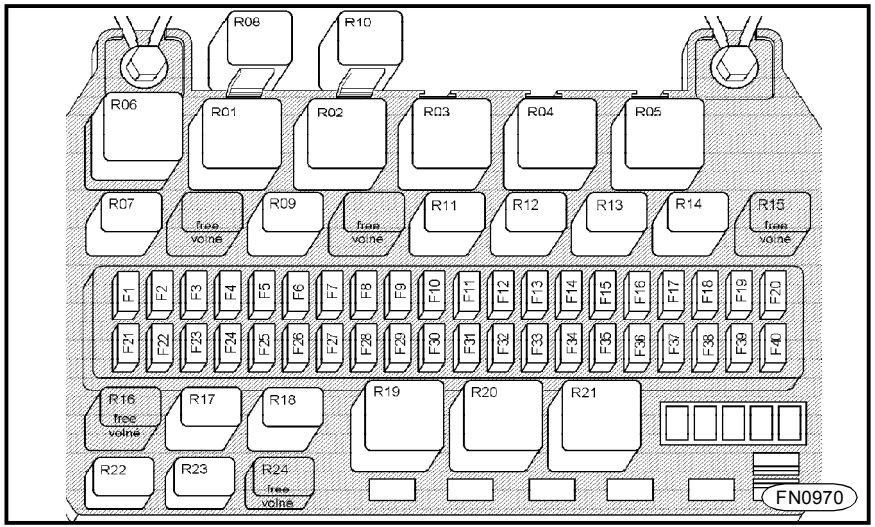
n Install and screw the cover. Tighten the cover carefully as this may crack.

Interior		24 V	12 W	3	dome light
Side		24 V	21 W	2	side turn signals
part		24 V	4 W	6	side positioning lights

Fuse box - cabin

Fuses

F1	10A	stop lights
F2	10A	cigarette lighter
F3	10A	audible horn
F4	10A	dome light and superstructure light*
F5	10A	radio / clock
F6	25A	24 V / 12V voltage transformer
F7	10A	engine speed sensor / engine brake relay
F8	10A	engine control unit / glowing regulator
F9	10A	differential lock / PTO / clock display
F10	25A	superstructure
F11	10A	hazard warning lights (emergency flasher)
F12	10A	central door locking*
F13	10A	IGN relay control via ignition switch / starter relay control
F14	10A	tail fog lamps
F15	10A	open
F16	10A	windshield wipers
F17	10A	fan electric motor
F18	10A	turn signals
F19	10A	reverse lights / "+" for instruments
F20	10A	brake pads wear
F21	25A	rear-view mirrors
F22	10A	air-conditioning*
F23	25A	windows remote control*
F24	10A	air drier
F25	10A	high beam, LH + indicator light
F26	10A	high beam, RH / R04 tail fog lamp
F27		open
F28	10A	low beam, LH + indicator light
F29	10A	low beam, RH / R04 tail fog lamp
F30	10A	main headlamps levelling device
F31	10A	side marker light, LH / auxiliary side positioning light, RH / instrument board light
F32	10A	side marker light, RH / auxiliary side positioning light, LH
F33	10A	front fog lamps and tail fog lamps control
F34	10A	controllers illumination
F35	10A	front fog lamp, LH*
F36	10A	front fog lamp, RH*
F37		open
F38		open
F39	10A	ABS control unit / diagnostic connector
F40	10A	ABS control unit



Replacing a fuse

n The fuse box is situated under the glove box in the instrument board.

n Fuses are accessible after removal of the glove box bottom which wil be released by turning two rotary holders (sense of turning is illustrated on the cover).

n The individual electric circuits are secured by fuses.

n The blown fuse can be recognized by the burnt metal strip.

n Switch off the battery circuit breaker during the fuse replacement.

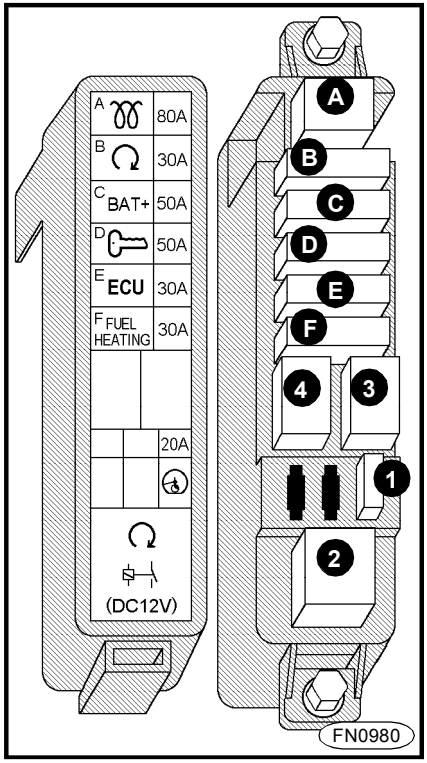
n A new fuse must have the same ampere value.

n It is necessary to keep spare fuses on hand in vehicle.

Relays

R01 rear-view mirrors heating
R02 open
R03 stop lights - check
R04 tail fog lamps control
R05 turn signals
R06 ignition switch
R07 windows control 1
R08 open
R09 windows control 3
R10 open
R11 side marker lights
R12 low beam
R13 high beam
R14 front fog lamps
R15 open
R16 open
R17 wipers
R18 wipers speed relay
R19 wiper interval cycle switch
R20 air-conditioning
R21 emergency flasher 1
R22 emergency flasher 2
R23 stop lights - control
R24 open

Fuse box - under the battery cover



A 80A air heating
B 30A starter electromagnet
C 50A "+" ahead of ignition switch
D 50A "+" behind ignition switch
E 30A "+" permanent for the engine control unit
F 30A fuel heating
1 20A "+" without circuit breaker (permanent current for tachograph, clock, radio)

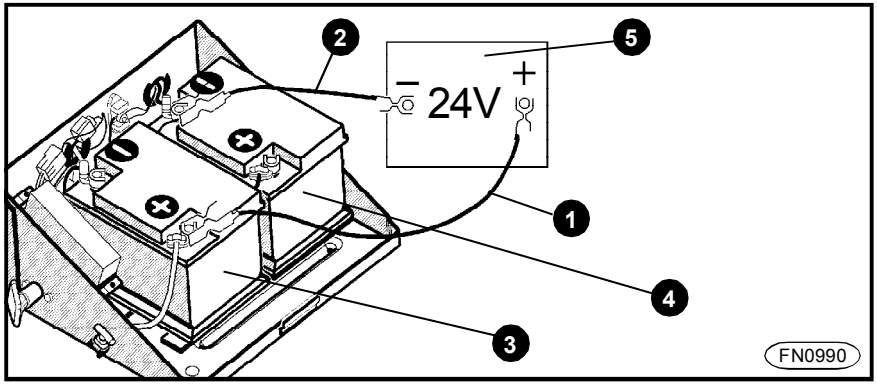
---

2 relay for starter electromagnet
3 fuel heating relay
4 starter relay - auxiliary

Warning!

n Replace the blown fuse with a fuse of the same ampere value. Do not use a fuse of higher amperage because this could cause damage the electrical part or even cause a fire.
n If the fuse blows repeatedly after switching on the respective electrical consumer, it is necessary to contact and have the vehicle repaired at the authorized service station.
n Never repair the blown fuses.
n Do not use a screwdriver or other metal object to remove the fuse.

Use of jumper cables to start the engine



n The vehicle with a discharged battery may be started only by connecting it to the battery of some other vehicle with the same nominal voltage.

Warning!

The battery of the other vehicle must have the nominal voltage of 24V.

n Only approved jumper cables of sufficient cross section may be used.
n Do not use cables with insulated clamps only.

n When starting, the engine of the vehicle, whose battery is used to start, must run.

Connecting procedure

1. Connect one clamp of "+" cable (item 1) to positive terminal of the front discharged battery (item 3).
2. Connect clamp on opposite end of the same cable to positive terminal of 24V booster battery (item 5).
3. Connect clamp of "-" cable (item 2) to negative terminal of 24V booster battery (item 5).
4. Firmly connect clamp on opposite end of the same cable to "-" terminal of the rear discharged battery (item 4).
5. The engine of the vehicle, whose battery is used to start the other vehicle, must run all the time.

Starting the engine

n Start the engine in accordance with Chapter **Starting the engine**.
n After the engine starts to run, remove jumper cables in reverse order.

Warning!

n When using the jumper cables to start the vehicle, the auto radio must be turned off because this may be damaged.
n Non-insulated parts of cable clamps must not touch each other. The jumper cable connected to the positive terminal of the battery must not come in contact with the vehicle ground because this could lead to short circuit.

Engine

n *Diesel with direct injection* ***n*** *turbocharged by one turbocharger* ***n*** *with charge-air cooling* ***n*** *OHV, four-stroke* ***n*** *four-cylinder, in-line* ***n*** *water cooled*

Engine type designation

CUMMINS	**ISBe 150 30**	**ISBe 170 30**
Number of cylinders / valves	4 / 16	4 / 16
Cylinders bore	102 mm	102 mm
Pistons stroke	120 mm	120 mm
Displacement	3,922 cm^3	3,922 cm^3
Compression ratio	17.2	17.2
Maximum output	110 kW / 2,500 rpm	125 kW / 2,500 rpm
Maximum torque	550 Nm / 1,200 ÷ 1,600 rpm	600 Nm / 1,200 ÷ 1,600 rpm
Injection system	CommonRail Bosch; electronic control unit	CommonRail Bosch; electronic control unit

Undercarriage

Engine cooling system
n fluid
n overpressure type with the forced coolant circulation by means of the centrifugal pump
n cooling circuit is fitted with two-flap thermostat and expansion tank

Air filter
dry filter cartridge

Clutch
n dry
n one-disc
n with asbestos-free lining
n with mesh damper
n hydraulically controlled

Gearbox
n mechanical
n with layshaft gear
n with gears in constant mesh
n synchronized
n gearshift lever control on floor
n gearbox allows to mount the power take-off drive with pump, outlet shaft or flange

Propeller shaft
n versions N, L, E with two-shaft arrangement and three cross-shaped joints with one intermediate bearing and sliding splined adaptor
n versions S,G with three-shaft arrangement and four cross-shaped joints with two intermediate bearings and sliding splined adaptor

Rear axle
n driving, banjo-type rigid axle
n axle final drive with single hypoid gearing and bevel differential
n mechanical differential lock
n parabolic spring suspension with stabilizer bar
n fluid shock absorbers with lower stop
n rubber upper stop
n hypoid gears:
3.7 4.10 4.56

Front axle
n rigid, with forged axle casing
n parabolic spring suspension with stabilizer bar, shock absorbers with lower stop

Steering

n monoblock hydraulic power steering
n gear ratio from 14 to 16.6 - changeable during turning the steering wheel between full locks
n split steering shaft c/w longitudinally splined cardan joints

Frame

n ladder-type
n cold riveted
n screwed
n brackets or clips to attach chassis groups or components are riveted or screwed to the frame
n holes for brackets ready to attach superstructures or directly riveted brackets on frame longitudinal beams
n towing hook for the vehicle recovery situated on the rear bumper bracket

Service brake system

n dual circuit
n pneumatic
n with brake pressure control of the rear axle wheels (check data for adjustment of the brake pressure regulator are stated on the plate situated in cabin)
n TT system of brake circuits connection
n Anti-blocking Brake System (ABS) as standard

Brake system

n disc brakes with rigid yoke on both axles
n the brake system completed with the parking brake equipment on the rear axle
n two pressure gauges on the instrument board indicate the air pressures in the brake system

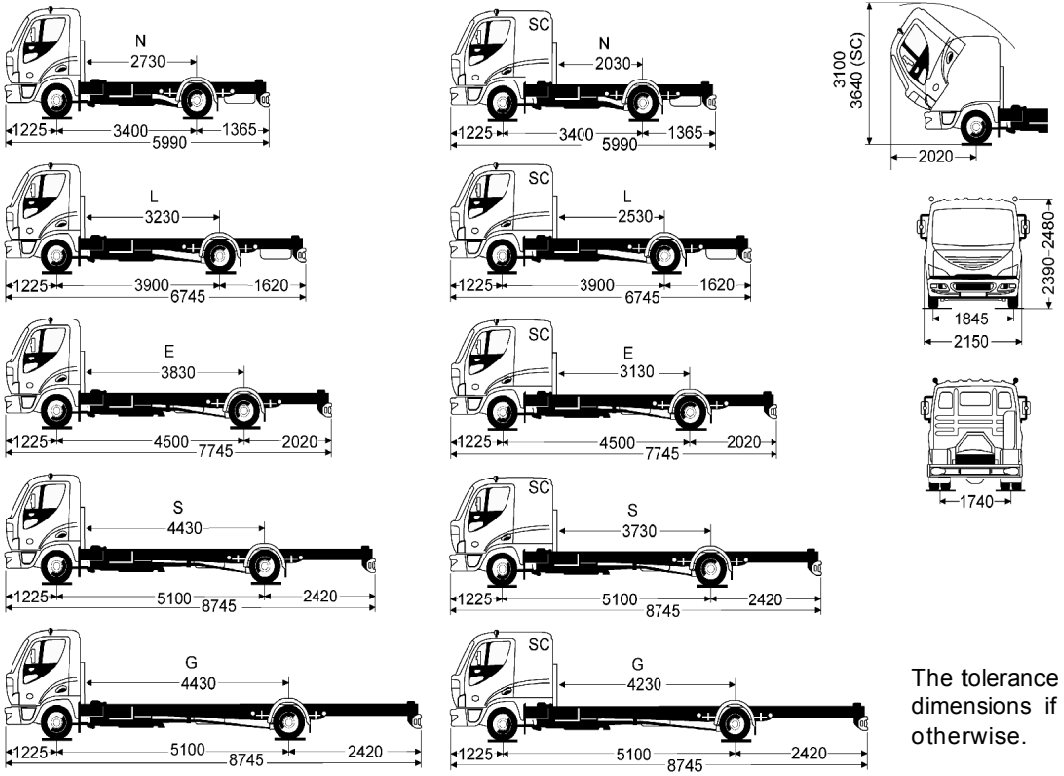
Emergency brake

the emergency braking is secured by one non-defective brake circuit

Parking brake system

n parking braking secured by spring-loaded brake
n controlled by the manual brake valve situated near to driver behind the gear-shift lever
n the air pressure drop in the chamber of spring-loaded cylinders to the value, at which the spring-loaded brake is activated, is indicated to a driver by the respective indicator light.

Dimensions of chassis c/w cabin



The tolerance ± 1 % holds for the dimensions if not stated otherwise.

FN1001

Weights and axle loads

Vehicle type		D 100				
Vehicle version		N	L	E	S	G
		kg				
Curb weight chassis + cabin		3510	3560	3610	3660	3720
Weight distribution:	front axle	2230	2270	2310	2350	2390
	rear axle	1280	1290	1300	1310	1330
Carrying capacity of chassis + cabin (c/w crew)		6490	6440	6390	6340	6280
Max. vehicle overall weight		10000	10000	10000	10000	10000
Max. allowable weight distribution:	front axle	4000	4000	4000	4000	4000
	rear axle	6600	6600	6600	6600	6600
Max. allowable trailer weight:	non-braked	750	750	750	750	750
	braked	3500	3500	3500	3500	3500
Max. allowable vehicle combination weight[1]		13500	13500	13500	13500	13500

[1]The individual maximum allowable weights must not be exceeded
The tolerance ± 3 % holds for the weight data.

Warning!

The distribution of the instanta-neous vehicle weight is allowed in ratio at least 30-35 % to the front axle and 65-70 % to the rear axle.

Weights and axle loads

Vehicle type		D 110				
Vehicle version		**N**	**L**	**E**	**S**	**G**
		kg				
Curb weight chassis + cabin		3510	3560	3610	3660	3720
Weight distribution:	front axle	2230	2270	2310	2350	2390
	rear axle	1280	1290	1300	1310	1330
Carrying capacity of chassis + cabin (c/w crew)		7490	7440	7390	7340	7280
Max. vehicle overall weight		11000	11000	11000	11000	11000
Max. allowable weight distribution:	front axle	4000	4000	4000	4000	4000
	rear axle	7400	7400	7400	7400	7400
Max. allowable trailer weight:	non-braked	750	750	750	750	750
	braked	3500	3500	3500	3500	3500
Max. allowable vehicle combination weight[1]		14500	14500	14500	14500	14500

[1]The individual maximum allowable weights must not be exceeded

The tolerance ± 3 % holds for the weight data.

Warning!

The distribution of the instanta-neous vehicle weight is allowed in ratio at least 30-35 % to the front axle and 65-70 % to the rear axle.

Weights and axle loads

Vehicle type		D 120				
Vehicle version		**N**	**L**	**E**	**S**	**G**
		kg				
Curb weight chassis + cabin		3510	3560	3610	3660	3719
Weight distribution:	front axle	2232	2272	2312	2352	2391
	rear axle	1278	1288	1298	1308	1328
Carrying capacity of chassis + cabin (c/w crew)		8480	8430	8380	8330	8271
Max. vehicle overall weight		11990	11990	11990	11990	11990
Max. allowable weight distribution:	front axle	4056	4086	4079	4082	4115
	rear axle	7934	7904	7911	7908	7875
Max. allowable trailer weight:	non-braked	750	750	750	750	750
	braked	6000	6000	6000	6000	6000
Max. allowable vehicle combination weight[1]		18000	18000	18000	18000	18000

[1]The individual maximum allowable weights must not be exceeded

The tolerance ± 3 % holds for the weight data.

Warning!

The distribution of the instanta-neous vehicle weight is allowed in ratio at least 30-35 % to the front axle and 65-70 % to the rear axle.

Tires inflation pressures

Tire size	Front axle	Rear axle	Spare wheel
	Air pressure (kPa)		
245/70 R 17,5 245/70 R 19,5	750	800	800
265/70 R 17,5 265/70 R 19,5	650	675	675

The plate with the tire inflation pressures is situated in the door space on the driver´s side.

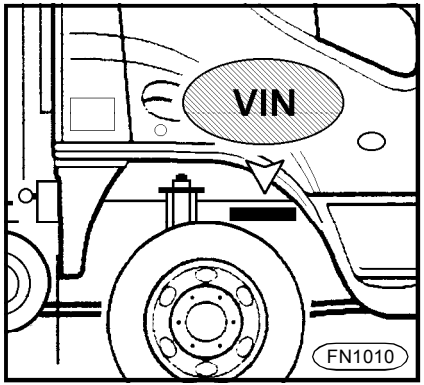
Maximum speeds and climbing abilities

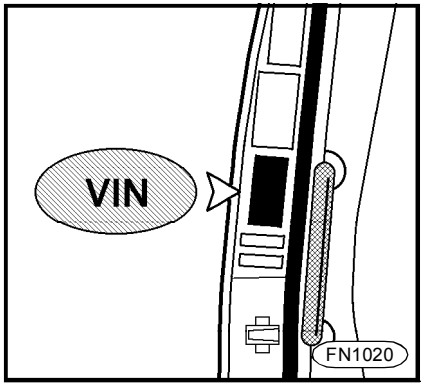
Engine	Gearbox	Disc dimension	Rear axle ratio	Maximum theoretical speed (km/h)	Maximum theoretical climbing ability (%)
ISBe 150 30	ZF 6 S 850	17,5x6,75	4,10	110	32
			4,56	99	36,2
		19,5x6,75	4,56	107	33,1
	ZF S5-42	17,5x6,75	4,56	103	30,1
ISBe 170 30	ZF 6 S 850	17,5x6,75	3,73	121	32,1
			4,10	110	35,9
			4,56	99	40,6
		19,5x6,75	4,10	119	32,9
			4,56	107	37,1
	ZF S5-42	17,5x6,75	4,10	115	29,8
			4,56	103	33,6
		19,5x6,75	4,56	111	30,8

Operation fillings

Engine oil	13 l
Cooling circuit c/w heater circuit	19 l
Gearbox ZF S5-42	3.2 l
Gearbox ZF 6 S 850	7.5 l (with PTO 8 l)
Fuel tank capacity	120 l
Mnimum fuel reserve	16 l
Rear axle - 5.14 differential	4 l
wheel body	0,25 l
Rear axle - 8.20 differential	8 l
wheel body	0,25 l
Monoblock power steering	1.7 l
Windshield washer tank	7.5 l
Hydraulic circuit for clutch release	0.5 l
Hydraulic circuit for cabin tilting	0.65 l

Vehicle Identification Number



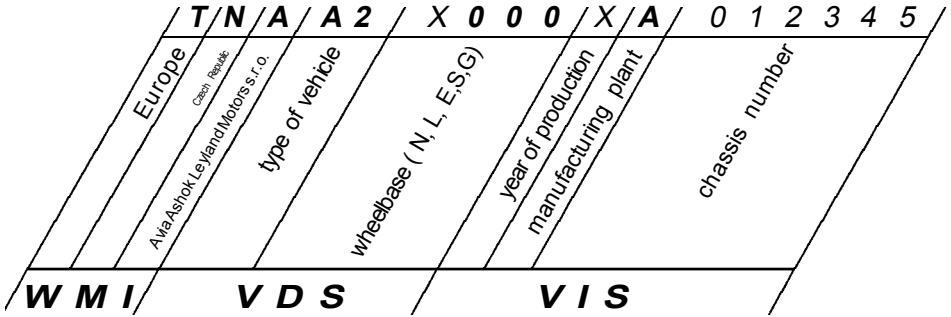


VIN
(Vehicle Identification Number)

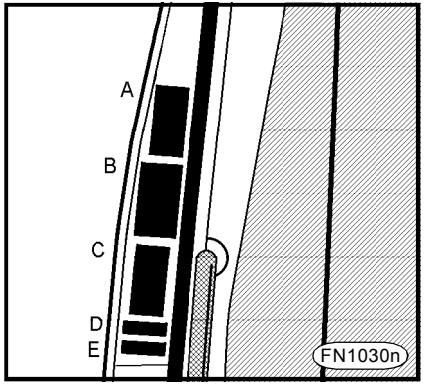
n The vehicle is marked with the VIN number in accordance with the unified international vehicle marking.

n The VIN number is stamped on the web plate of the right frame longitudinal beam ahead of the shock absorber holder.

The manufacturer´s plate VIN is situated also on the right door jamb above the door lock.

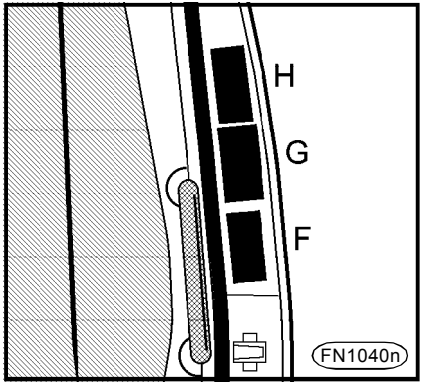


Vehicle labels



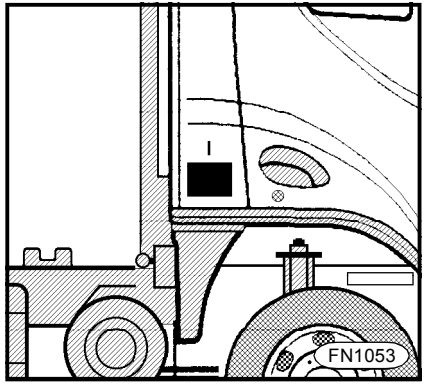
On the right door jamb above the door lock

- **n** homologation **(A)**
- **n** automatic brake pressure control **(B)**
- **n** VIN **(C)**
- **n** headlamps adjustment **(D)**
- **n** cabin **(E)**



On the left door jamb above the door lock

- **n** tires inflation pressures **(F)**
- **n** warning - information about alternator **(G)**
- **n** notice of air-conditioning **(H)**



On the cabin right side in the rear information about cabin tilting **(I)**.

I N D E X

* version 4a / 1/ 2007
D100 / 110 / 120