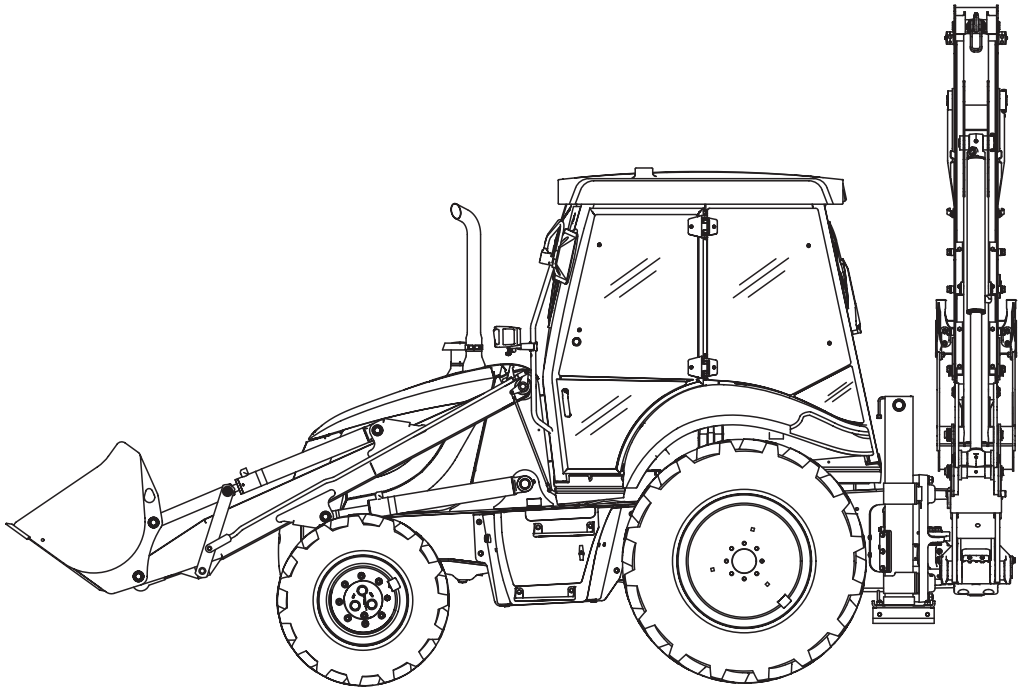
ORIGINAL INSTRUCTIONS - *according to Directives 2006/42/EC, Annex I 1.7.4.1*

# OPERATOR'S MANUAL

## B90B
## B90BLR
## B100B
## B100BLR
## B110B
## B115B



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Ist edition

English 01/10

NEW HOLLAND CONSTRUCTION

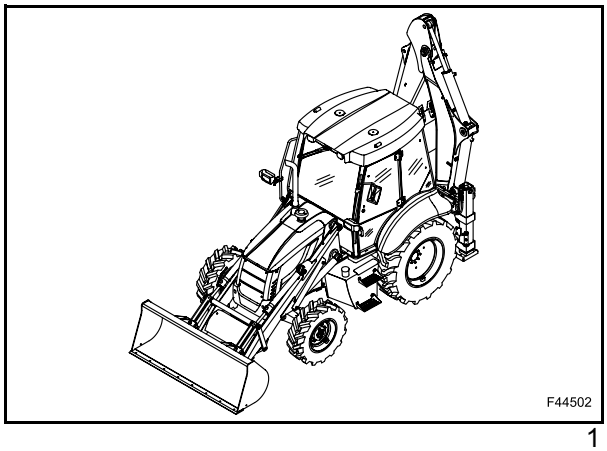
# SECTION 1
# INTRODUCTION, SAFETY, PLATES AND DECALS

## FOREWORD

The loader backhoes B90B - B90BLR - B100B - B100BLR - B110B - B115B have been designed to perform most earth-moving operations.

If you use this machine for duties involving the use of attachments, accessories, or special tools, consult your Dealer to make sure that the adaptations or modifications carried out are in conformity with the machine's technical specifications and with current regulations on safety.

Any modifications or adaptations which are not approved by the Manufacturer may invalidate the machine's original conformity with safety requirements.



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### DESIGNATED USE

The machine has been built in accordance with state-of-the-art standards and the recognized safety rules.

The machine must be used in accordance with its designated use, by observing the safety and precautionary rules and by strictly following the operating instructions. Any functional disorders, especially those affecting the safety of the machine, should therefore be rectified immediately.

**⚠ DANGER ⚠**

A different use of the excavator or of its working equipment:

- for lifting or transporting persons;
- as a working platform;
- for lifting loads without the attachment being approved for this purpose;
- for pulling slung loads;

is considered contrary to the designated use.

Improper use may cause injury or life-threatening risks for the operator and for other persons.

The manufacturer/supplier cannot be held responsible for any damage resulting from other than the designated use. The risk involved in such misuse lies entirely with the user.

**⚠ DANGER ⚠**

For clarity purposes, some figures in this Manual show the machine with protection panels or covers removed. Never operate the machine with any protection panels or covers removed.

**⚠ DANGER ⚠**

It is absolutely forbidden to tamper and/or change the setting of any of the hydraulic system valves to avoid damaging machine components with consequent risks to personal safety.

The current Operator's Manual is the user's guide for correct run-in, use and maintenance of the machine.

Carefully read this Operator's Manual and store it in the cab for quick location and reference.

Instructions concerning safety, operation and maintenance have been developed to permit safe service and operation of this machine.

In the event of queries or suggestions relevant to your machine do not hesitate to address to your Dealer. Dealers have qualified and trained personnel at disposal as well as Original Spares, means and equipment suitable to carry out all necessary maintenance operations.

If your machine comes into contact with electric lines:

- do not leave the machine;
- drive the machine out of the hazard area;
- warn others against approaching and touching the machine;
- have the live wire de-energized;
- do not leave the machine until the damaged line has been safely de-energized.

Make sure you know the location of pipes and cables before starting work. Electrical cables, gas pipes, water pipes or other underground installations can cause serious physical injury.

Do not allow anyone to stand in the machine working area. If the operator carries out a wrong manoeuvre, this could cause an accident. Stop all movement until the person has moved away.

Before moving the stabilizers make sure that no person is within the working range of the stabilizers.

When moving the machine onto a trailer, place the gearshift lever in first gear. Keep the loader bucket 20 cm from the ground.

Load lifting must be carried out in accordance with the instructions shown in this manual and in accordance with current regulations.

Before using the backhoe attachment make sure that the machine is clear of the ground by means of the stabilizers and the loader attachment.

Any uncontrolled movement of the machine can cause an accident. Before turning the operator's seat to the backhoe attachment working position, it is essential to place the direction-of-travel control lever and the gearshift lever in neutral position and to immobilize the machine by means of the parking brake lever.

If you are using the backhoe attachment or if you are carrying out maintenance operations, use the engine accelerator knob/lever. The use of the knob/lever for any other operation can cause accidents.

In case of any operational problem or damage, lower the loader attachment and the backhoe attachment to the ground, stop the engine, remove the starter switch key and raise the parking brake lever. Find the cause of the defect or inform responsible personnel. Take measures to prevent the use of the machine.

When the machine is being lifted, nobody must be allowed to remain in the area surrounding the machine.

**"GLIDE RIDE" SYSTEM (Optional)**

Never operate the "glide ride" lever when the loader arms and the loader bucket are maintaining the machine in a raised position. The machine could fall to the ground and cause serious or fatal injury.

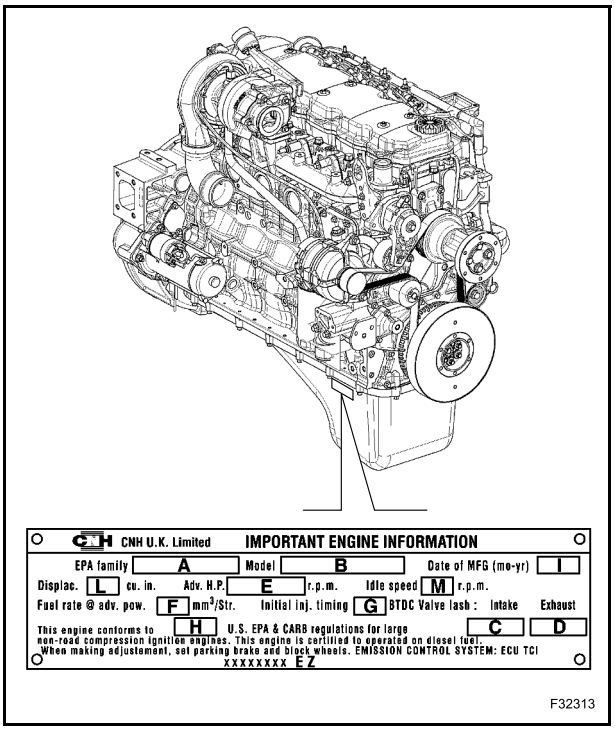
If the "glide ride" lever is operated when the starter switch key is in the ON position, the loader arms may rise or lower slightly due to the effect of the hydraulic accumulator.

Never use the "glide ride" system during precise levelling operations or when using the backhoe attachment.

**ENGINE 82 kW**

Type / Model ..... F4HE9484 for B110B and B115B

Serial number

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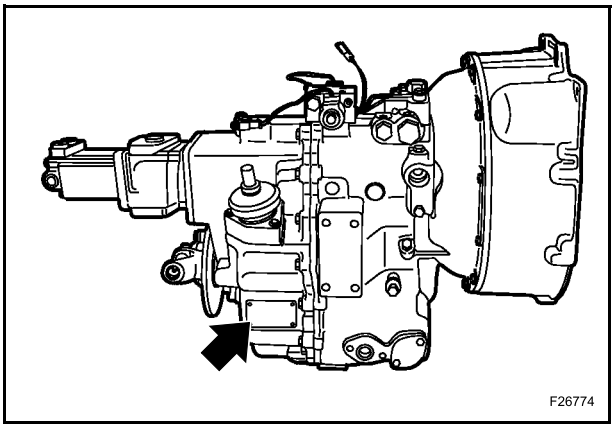
**TRANSMISSION - 4x4 POWERSHUTTLE**

Model

Serial number

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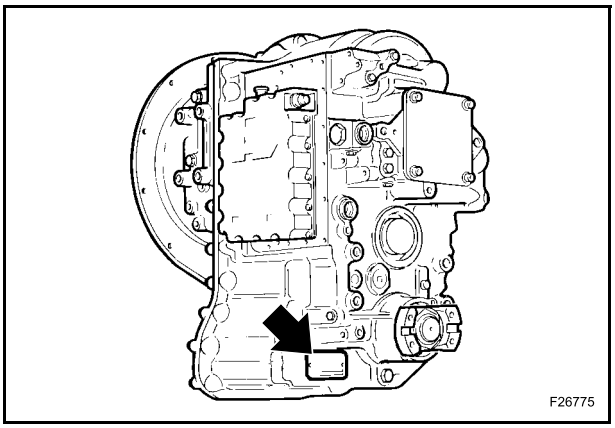
**TRANSMISSION - 4x2 POWERSHIFT**

Model

Serial number

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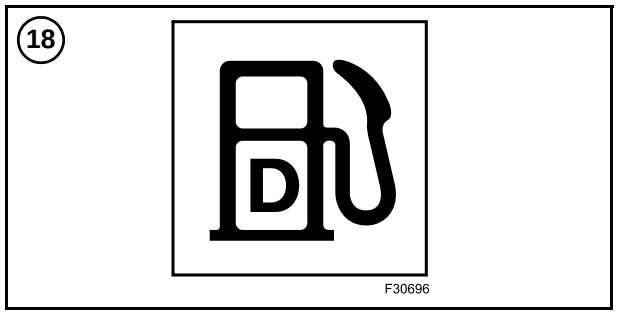
**Fuel tank**

Make sure that the tank bearing this decal contains fuel only. See Section 4 “Supply and maintenance”.

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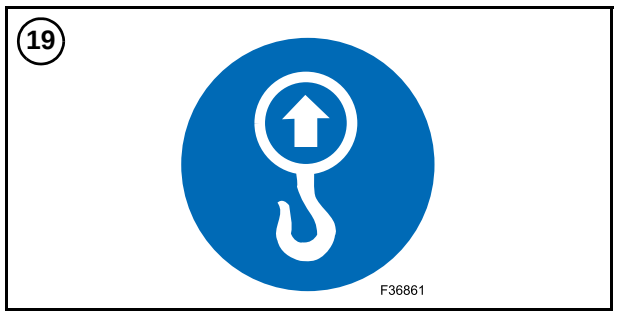
**Slinging points**

This decal shows the slinging points to be used when lifting the machine. Never use any other slinging points than those shown on this decal.

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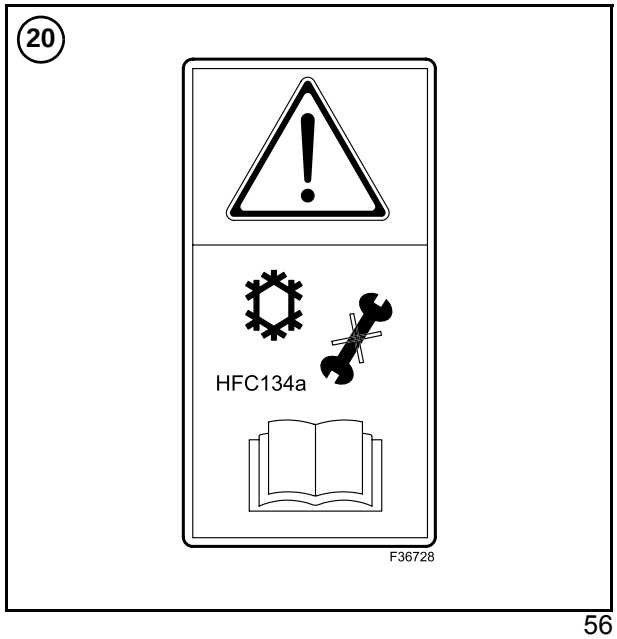
**Air conditioning (Optional)**

This decal indicates that an air conditioning system is installed in the machine. The maintenance operations must be performed by qualified personnel.

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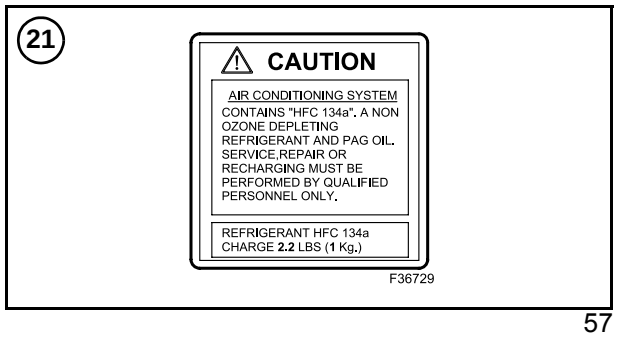
**Air conditioning (Optional)**

This decal indicates that an air conditioning system is installed in the machine. The maintenance operations must be performed by qualified personnel.

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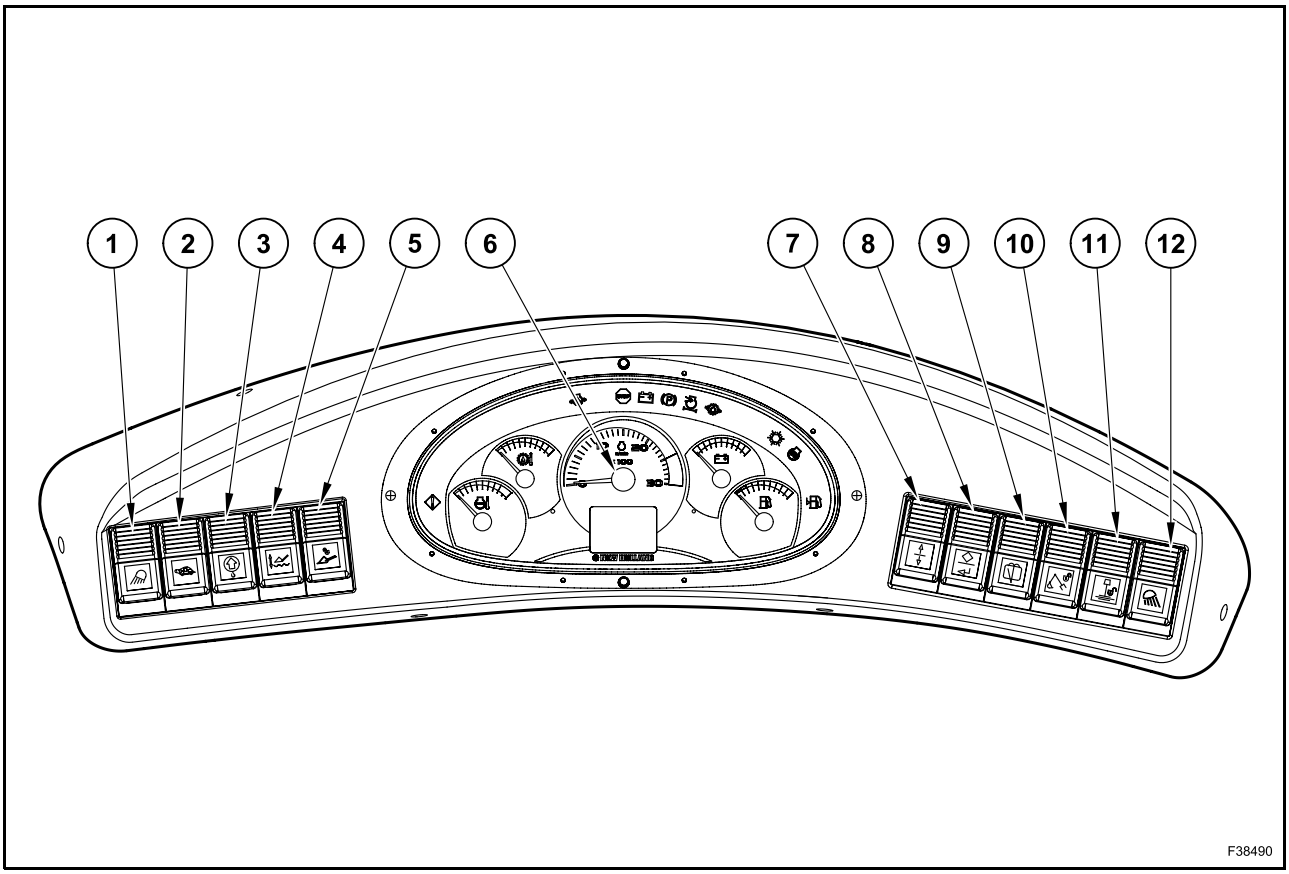
## SIDE INSTRUMENT CLUSTER PANEL (B100B - B110B - B115B)

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1. FRONT WORK LIGHT SWITCH
   This switch has three positions:
   - The first position is OFF.
   - Second position, the two front external work lights turn on.
   - Third position, the two front internal work lights turn on.
     The light switch turns on only in the second and third position.
2. HYDRAULIC SPEED CONTROL SWITCH (If fitted)
   This switch enables an increase in the moving speed of the loader and backhoe attachment.
3. ROLL-OVER PROTECTION SWITCH (Optional)
   This switch is used to engage or disengage the roll-over protection device. When the operator is about to start working with the backhoe attachment in conditions which could cause the machine to roll over, he/she must activate the roll-over protection device by pressing the switch (ON position and lamp turned on).
   In this condition, the audible alarm will sound by means of the buzzer when the pressure switch, installed on the backhoe attachment boom cylinder, detects a pressure exceeding the following values:
   2WS = 116 bar (17 psi)
   4WS = 126.5 bar (18 psi)

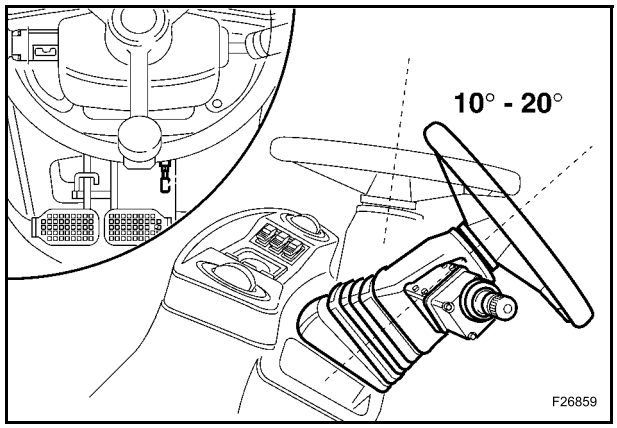
**ADJUSTABLE STEERING COLUMN (Optional)**

The angle of the steering column can be varied through an approximate range of 10° to 20°.

Adjustment is by release of the foot pedal at the base of the column. Apply a light pressure to this pedal and position the steering column to suit your needs.

With the column in the desired position release the foot pedal which will lock the column in position.

***IMPORTANT:*** *it is essential that the machine be brought to a complete stop before attempting to adjust the steering column tilt position. If this instruction is not observed an accident may occur.*

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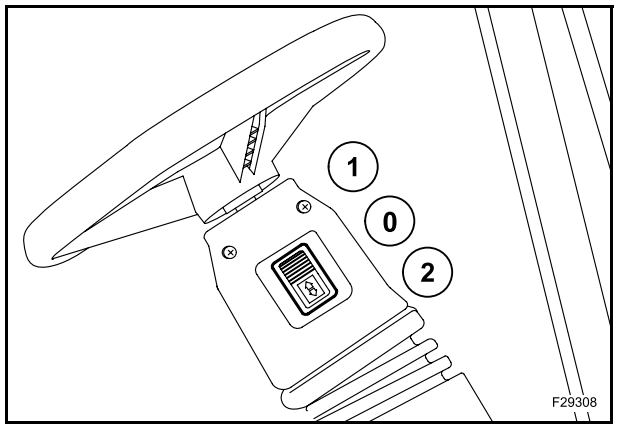
## DIRECTION INDICATOR SWITCH (B90B ROPS)

Located on the right of the steering wheel, this switch has three positions:

Position (0): neutral. No direction indicators will flash.

Position (1): the left-hand direction indicators will flash.

Position (2): the right-hand direction indicators will flash.

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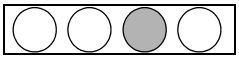
**Powershift lever display by means of LEDs**

**LEDs - Numbered 1 to 4:** they indicate the travel direction by means of the colour of the LED.

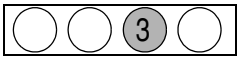
Forward = Green

Neutral = Red

Reverse = Orange



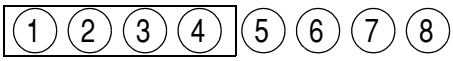
and they also indicate the selected gear.



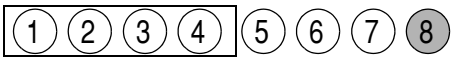

STEADILY ILLUMINATED LED: it indicates the transmission gear selected by the lever.

FLASHING LED: it indicates the actual transmission gear engaged (if different from that selected by the lever).

**LEDs - Numbered 1 to 8:** used in test modes.




**LED - Number 8:** it illuminates in green when the machine is at a standstill (in normal mode).




**LED - Letter T = Self-diagnostic mode:** (T)

Used in self-diagnostic test mode and will illuminate during self test.

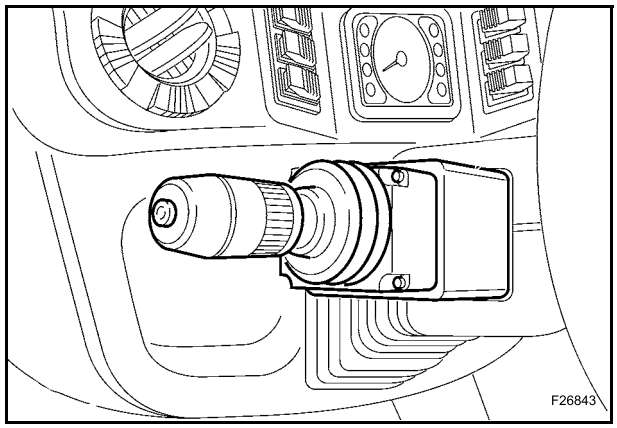
***NOTE:*** *in the event of a fault, (the LED will flash), contact your Authorised Dealer for assistance.*

**LED - Letter N indicates Neutral:** it illuminates when the transmission is shifted to neutral.

**Powershift gearshift lever and microprocessor functions**

The microprocessor controls the transmission and self checks its own memory continuously to ensure that gear selection and range changes are always performed in a safe manner.

Should a fault occur in the transmission or the microprocessor, the microprocessor will default to the reset mode.

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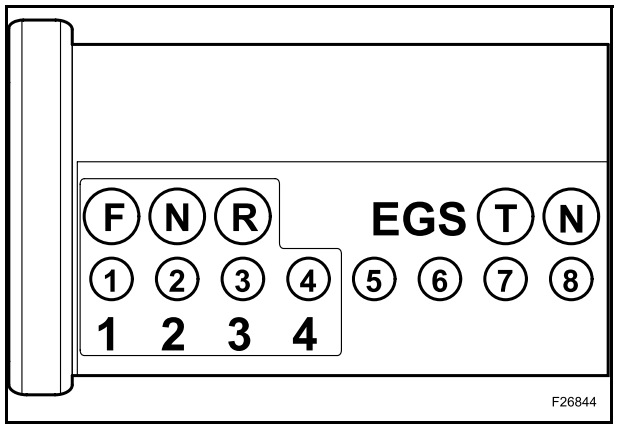


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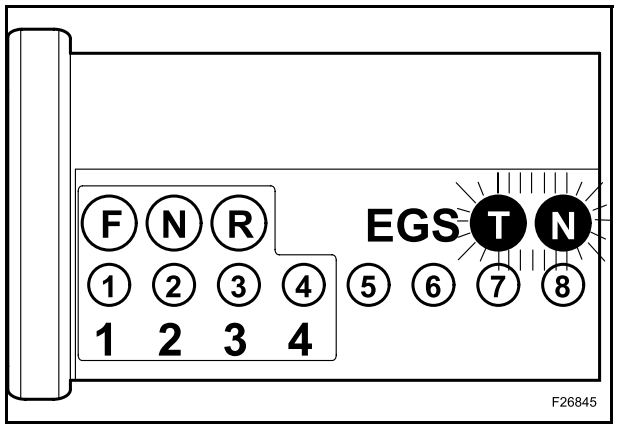


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## ENGINE ACCELERATOR CONTROLS

### ENGINE ACCELERATOR PEDAL

Located under the steering wheel, this pedal (1) enables the engine speed to be increased or decreased.

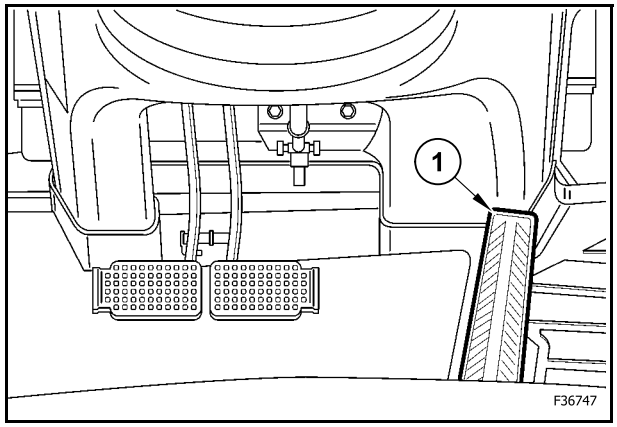
Deeply press the pedal to increase the engine speed.

Release the pedal to reduce the engine speed.

This pedal is used for travel and for operating the loader attachment.

***NOTE:*** *this pedal is coupled with the engine accelerator knob/lever. Before using the pedal, make sure that the manual accelerator is in the minimum speed position.*

***IMPORTANT:*** *never use this pedal when working with the backhoe attachment.*

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### ENGINE ACCELERATOR LEVER (B90B)

The lever (1) enables the engine speed to be increased or decreased.

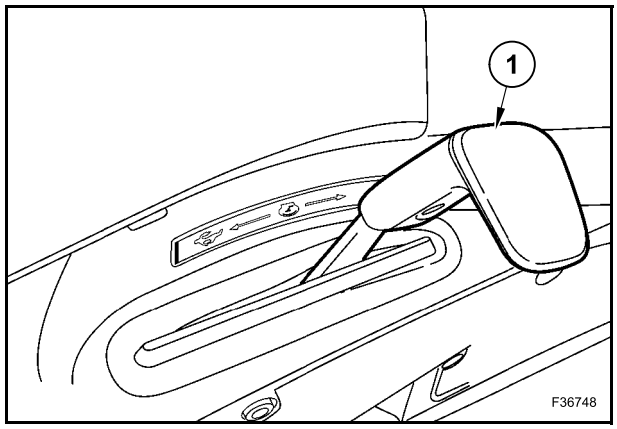
Slide forwards: to increase the speed.

Slide backwards: to decrease the speed.

***IMPORTANT:*** *never use the lever during travel on public highways.*

**⚠ WARNING ⚠**

If you use the backhoe attachment or if you are carrying out maintenance operations, use the engine accelerator lever. The use of the lever for any other operation can cause accidents.

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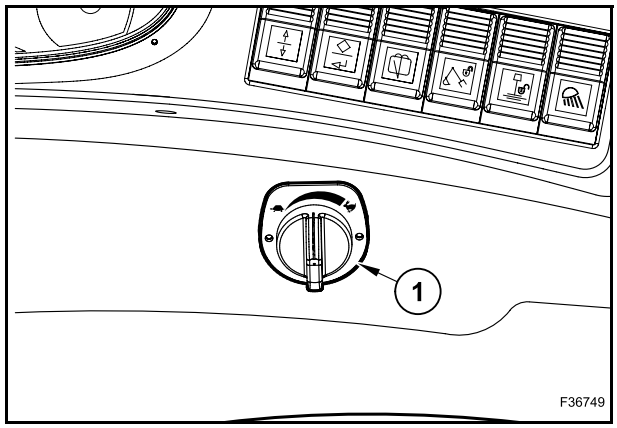
### ENGINE ACCELERATOR KNOB (B100B - B110B - B115B)

The knob (1) enables the engine speed to be increased or decreased.

Turn to to increase the speed.

Turn to to decrease the speed.

***IMPORTANT:*** *never use the knob (1) during travel on public highways.*

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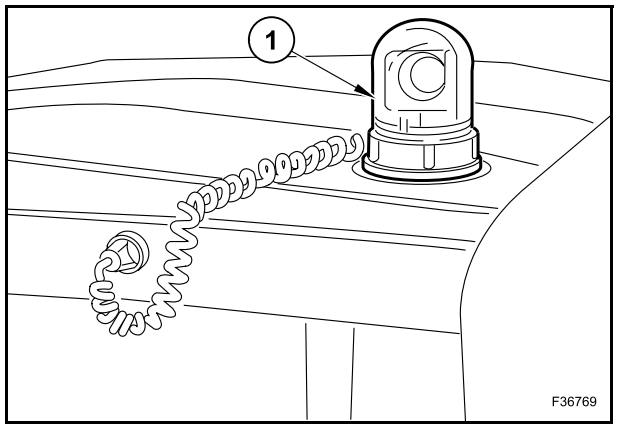
**ROTATING BEACON (Optional)**

The rotating beacon (1) should be placed on the cab roof and the cable connected to one of the 12 V sockets over the door on each side of the machine.

***IMPORTANT:*** *the rotating beacon must be installed and operated when undertaking road travel.*

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**BATTERY MASTER SWITCH**

**⚠ WARNING ⚠**

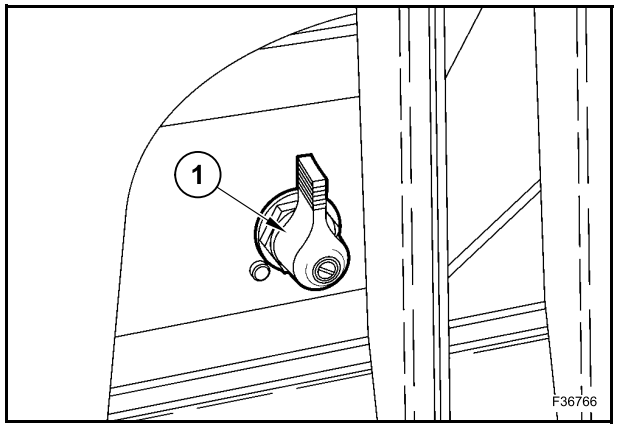
The battery master switch must be switched off at the end of each working day, for machine service or for any operations on the electrical system.
It acts as an anti-theft device when the cab doors and windows are locked.

**B90B**

The battery master switch (1) is located in the battery compartment and is used to completely disconnect the battery from the electrical system.

When the master switch is in vertical position, the circuit is connected.

When the battery master switch is in horizontal position, the circuit is disconnected.

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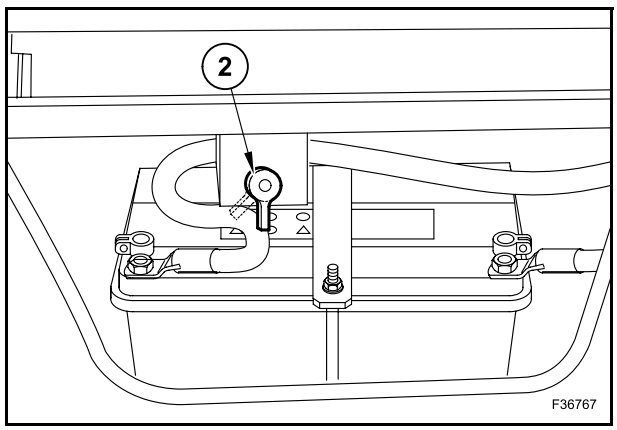
**B100B - B110B - B115B**

The battery master switch (2) is located in the battery compartment and is used to completely disconnect the battery from the electrical system.

When the battery master switch has an inclination of 45°, the circuit is disconnected.

When the master switch is in vertical position, the circuit is connected.

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## BACKHOE ATTACHMENT MECHANICAL CONTROLS VERSION

### STABILIZER MECHANICAL CONTROLS

***IMPORTANT:*** *whenever the backhoe attachment is used, the machine must be resting on the stabilizers.*

**Left-hand stabilizer left-hand control lever**

This lever has three positions:

Position (0): neutral. This position stops the movement of the left-hand stabilizer. As soon as the lever is released, it automatically returns to the neutral position (0) and the left-hand stabilizer stops raising or lowering.

Position (1): the left-hand stabilizer lowers.

Position (2): the left-hand stabilizer rises.

**Right-hand stabilizer right-hand control lever**

This lever has three positions:

Position (0): neutral. This position stops the movement of the right-hand stabilizer. As soon as the lever is released, it automatically returns to the neutral position (0) and the right-hand stabilizer stops raising or lowering.

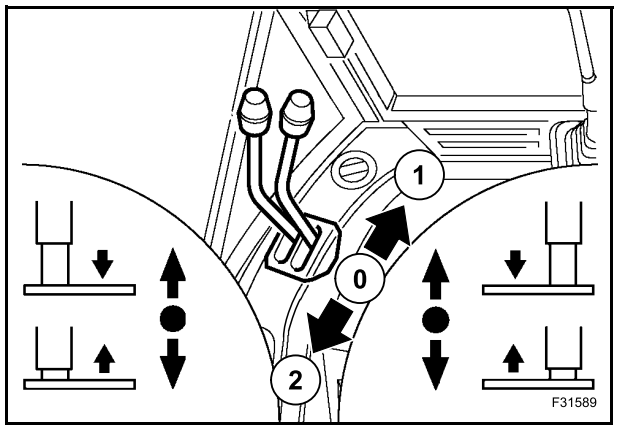
Position (1): the right-hand stabilizer lowers.

Position (2): the right-hand stabilizer rises.

***NOTE:*** *to raise or lower the two stabilizers at the same time, operate the two levers simultaneously.*

***IMPORTANT:*** *before machine travel or before using the loader attachment, make sure the stabilizers are completely raised.*

During road travel, the stabilizers must be completely raised and immobilized by means of the pins provided for that purpose.

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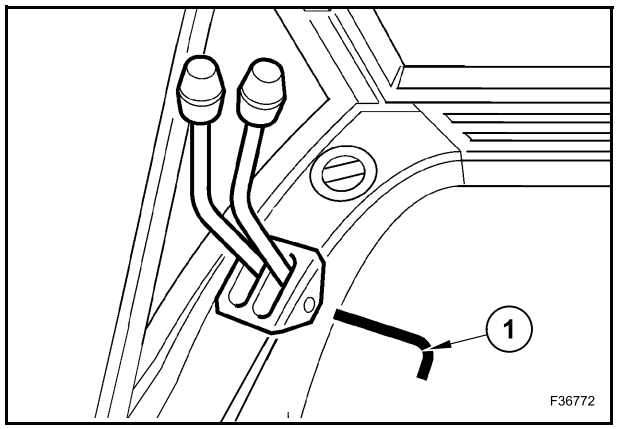
**Locking the stabilizer mechanical controls (specific to certain countries)**

This pin (1), located in front of the stabilizer control levers, is used to lock the stabilizer controls.

To lock the controls, remove the pin from its housing and install it in the specially provided hole in the console.

**⚠ WARNING ⚠**

Before leaving the operator's compartment, undertaking any road travel or working with the backhoe attachment, place the pin in locking position.

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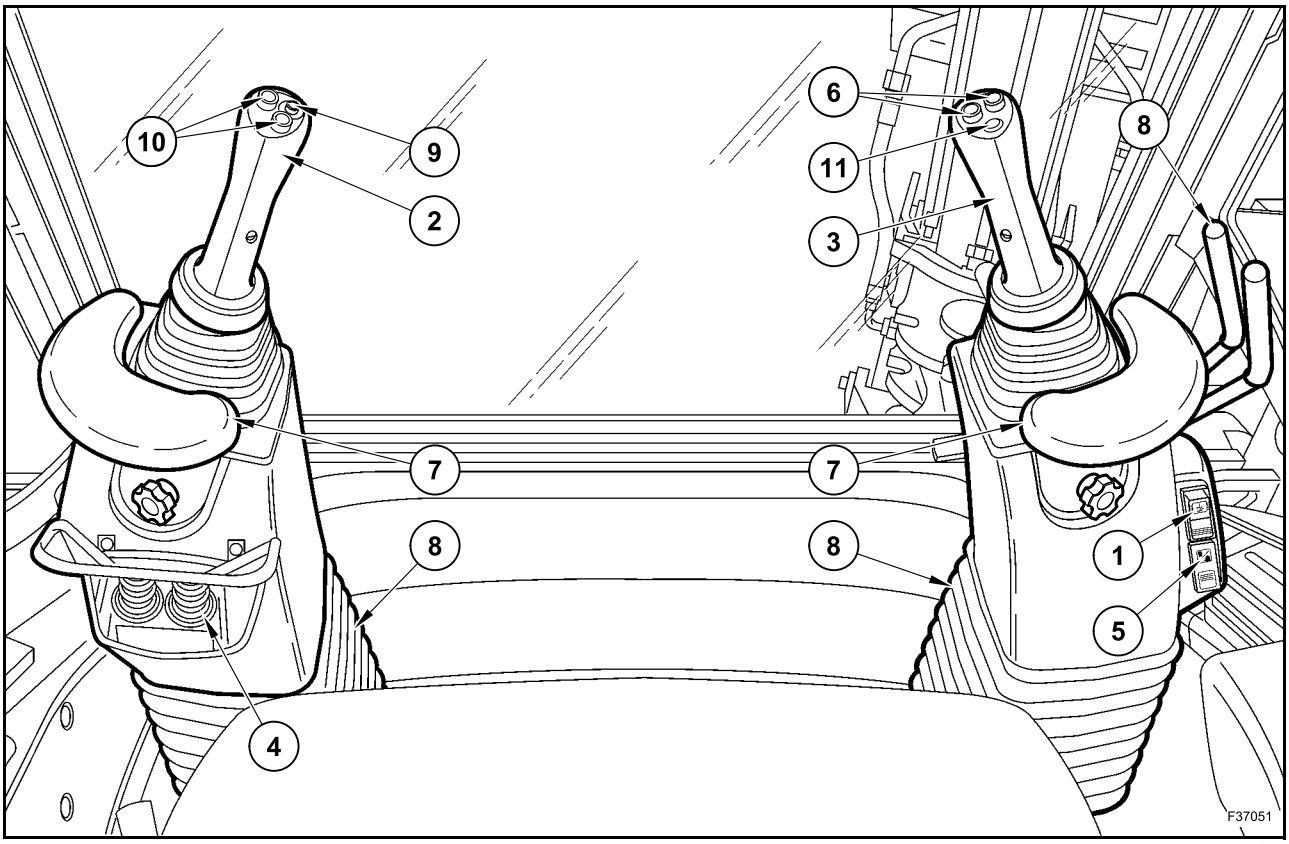
## BACKHOE ATTACHMENT HYDRAULIC CONTROLS

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1. CONTROL ENABLE SWITCH: with this switch in the ON (alight) position, all the backhoe attachment hydraulic controls are functional.
2. LEFT-HAND HYDRAULIC CONTROL LEVER: the left-hand hydraulic control lever controls attachment swing and the boom or the dipper (depending on the control pattern adopted).
3. RIGHT-HAND HYDRAULIC CONTROL LEVER: the right-hand hydraulic control lever controls the bucket and the boom or the dipper (depending on the control pattern adopted).

***NOTE:*** *the operating speed depends on the angle of movement of the control levers. In intermediate position, two movements may be obtained simultaneously.*

4. STABILIZER CONTROLS: the right-hand control is for the right-hand stabilizer and the left-hand control is for the left-hand stabilizer.
5. CONTROL PATTERN CHANGE SWITCH: this switch is used for changing the standard control pattern to the ISO pattern.
6. TELESCOPIC DIPPER CONTROLS: (proportional controls): press the right-hand button to extend the telescopic dipper.
   Press the left-hand button to retract the telescopic dipper.
7. WRIST RESTS: the wrist rests may be adjusted to the required height.
8. HYDRAULIC CONTROL LEVER SUPPORT ANGLE ADJUSTMENT: these controls are used for the fore/aft and left/right adjustment of the arm.
9. HORN BUTTON: press the tip of the left-hand hydraulic control lever to sound the horn (momentary action).
10. CONTROLS OF AUXILIARY BIDIRECTIONAL SECTION (If fitted): proportional buttons for the activation of the additional attachment.
11. DECELERATOR BUTTON: by pressing this button, the engine rpm sets to low idle. During this phase, the accelerator knob and pedal are disabled.
    By pressing the button again, the engine rpm is restored and the accelerator knob and pedal are functional again.

# SECTION 3
# OPERATING THE MACHINE

## GENERAL INSTRUCTIONS

### BEFORE USING THE MACHINE

**⚠ WARNING ⚠**

Read and familiarize yourself with the instructions and warnings shown in this manual before operating the machine.

Before using the machine, some precautions are necessary.

Check the levels (engine oil, hydraulic fluid and coolant fluid) and make sure that the various fluids correspond to the conditions of use.

Carry out the daily maintenance operations.

Walk round the machine, look for any leaks and inspect the hoses. Tighten or replace any items as required.

Before undertaking road travel, unlock the attachments, completely raise the stabilizers and install the safety systems required by the regulations.

Before road travel or night work, check that the lighting and signalling systems are correctly operating and correctly adjusted.

Check the condition of the tyres and the tyre pressure.

Clean the steps and access handles. The presence of oil, mud or ice (winter) can cause accidents. Make sure they are always clean.

Clean or replace safety decals which are no longer legible.

Make sure that the engine guard is closed and latched correctly.

Remove anything which might hinder visibility. Clean the windows and the rearview mirrors.

Make sure that no objects or tools are left on the machine or in the operator's compartment.

Make sure you know how to evacuate the machine (emergency exit via the right-hand door) in case exit through the left-hand door is impossible.

Make sure that the right-hand door is not locked.

Make sure that nobody is under or on the machine. The operator should be the only person on the machine.

Make sure that nobody is within the working range of the machine.

# STOPPING THE ENGINE

Check that the direction-of-travel control lever (1) is in the neutral position.

(Powershuttle) place the gearshift lever (2) in neutral position.

Raise the parking brake lever (3).

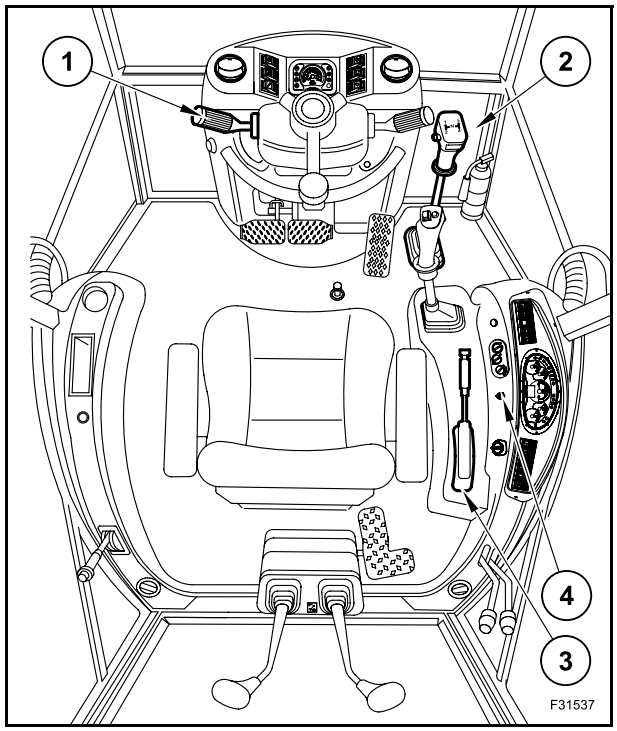
***NOTE:*** *(powershuttle) the audible warning device will sound if the parking brake lever is raised while the direction-of-travel lever is not in the neutral position.*

Allow the engine to run at idle speed for about one minute in order for the turbocharger to be lubricated correctly.

***IMPORTANT:*** *in cold weather, run the engine at low idle speed for three to five minutes.*

Turn the starter switch key (4) to the OFF position, then remove it.

***IMPORTANT:*** *if it is necessary to stop the engine for a long time, place the machine in safety conditions.*




7

5. BACKHOE BUCKET RETAINING: consisting of a retaining belt locking the backhoe bucket to the hook located in the rear side of the frame.
6. BACKHOE ATTACHMENT LOCKING PIN: install the pin in the locking bar.
7. WARNING PANEL: it is fastened to the bucket by means of clips.
8. LICENCE PLATES: before undertaking any road travel, make sure that the licence plates are clean.
9. LOADER ATTACHMENT BOOM TIE-DOWN STRAP: when travelling or transporting the machine on the road, it guarantees that the loader attachment boom is secured to the frame.
10. STABILIZER STRAP: (Sideshift version): fastens the stabilizer pads to the frame columns.
11. TELESCOPIC DIPPER LOCKED PIN (If fitted): place the safety pin to the lock position.

## PRECAUTIONS FOR ROAD TRAVEL

**⚠ WARNING ⚠**

Before travelling on the road, make sure that the load on each axle, depending on the machine configuration, conforms to the road traffic regulations of the country concerned.

**⚠ WARNING ⚠**

Always fasten your seat belt before travelling on the road.

**⚠ WARNING ⚠**

It is essential to lock the attachments and install the safety systems required by regulations before travelling on the road.

**⚠ WARNING ⚠**

Check that the lighting and signalling systems are operating correctly before travelling on the road.

**⚠ WARNING ⚠**

Before undertaking any road travel, make sure that the backhoe attachment is in road travel position and mechanically immobilized.

# OPERATING THE MACHINE IN COLD WEATHER

**FUEL**

Refill the fuel tank after each working day to prevent the formation of condensation and the entry of water into the fuel system.

To prevent the formation of crystals -2 °C (28.4 °F) use a low temperature fuel or mix a protective fluid with your fuel.

**LUBRICATING OIL**

Select oil viscosity (SAE grade) according to ambient temperature before starting engine.

Increase oil change frequency when operating below -10 °C (14° F).

**ENGINE OIL**

The engine oil must have a viscosity corresponding to the ambient temperature.

**COOLANT**

It must have characteristics corresponding to the ambient temperature.

**BATTERY**

Efficient cold starting requires that battery is well-charged.

Warm up the batteries approximately up to +20 °C (68 °F) (disassembly and storage in a warm place) in order to be able to start the engine at a temperature below 4 or 5 °C (39.2 or 41 °F).

## LOADER ATTACHMENT SAFETY STRUT (B115B)

Located on the left-hand side of the loader attachment, this safety strut enables the loader attachment to be locked in the raised position in case of defects in the system.

### LOCKED POSITION

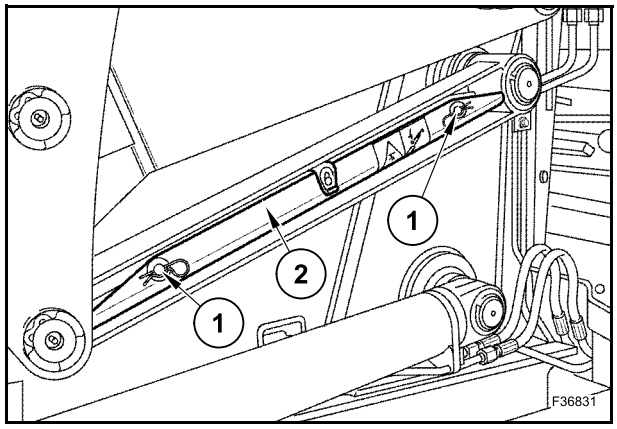
Completely raise the loader attachment. Stop the engine and remove the starter switch key.

Remove the split pins (1) and the safety strut (2) from the arm. Put the split pins back in place.

Place the strut (2) on the cylinder rod and fasten it by means of the fastening flip (3).

**⚠ WARNING ⚠**

It is mandatory to install the safety strut when carrying out any operation requiring the loader attachment to be in the raised position.

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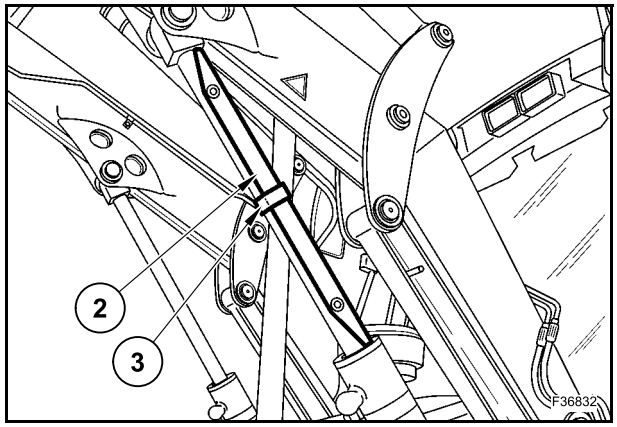
### UNLOCKED POSITION

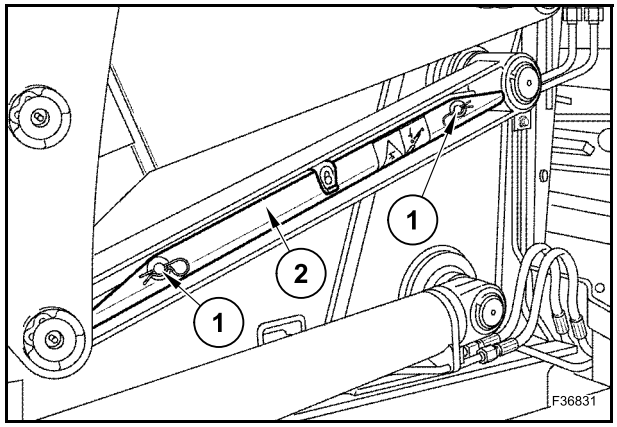
Remove the flip (3) and the strut (2) from the cylinder rod.




69

Install the safety strut (2) on the loader arm by means of the split pins (1).

Start the engine and lower the loader attachment.




70

**Moving the machine forwards when working on flat ground**

It is possible to use the backhoe attachment to move the machine forward at the same time as the excavation.

Make sure that the front wheels are straight.

Set the engine speed to 1000 rpm.

Release the machine's brakes by means of the parking brake.

Raise the boom and retract the dipper, then move the boom so as to place the backhoe bucket teeth on stable ground.

Raise the stabilizers and the loader bucket about 20 cm (7.8 in) from the ground.

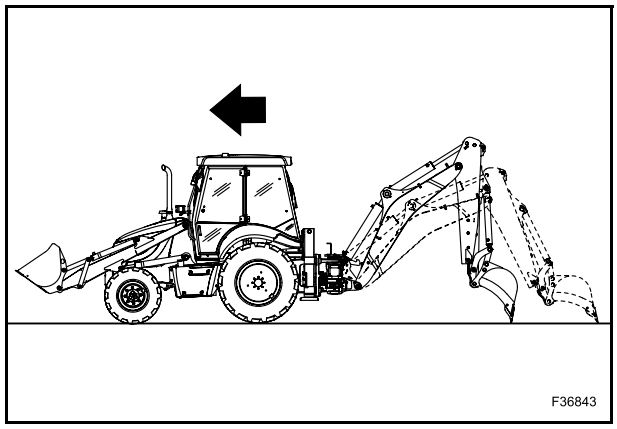
Use the boom and dipper to move the machine.

After moving the machine, lower the stabilizers and place the loader bucket on the ground, then level the machine.

Use the parking brake to brake the machine.

***IMPORTANT:*** *this procedure can only be used on level ground. Never use it on sloping ground. On sloping ground it is mandatory to turn the operator's seat to the loader attachment position to move the machine by the normal procedure.*

The machine can be moved sideways in the same fashion, except that the bucket must be flat to support the weight of the machine. Use the swing control to move the machine sideways to the required position.

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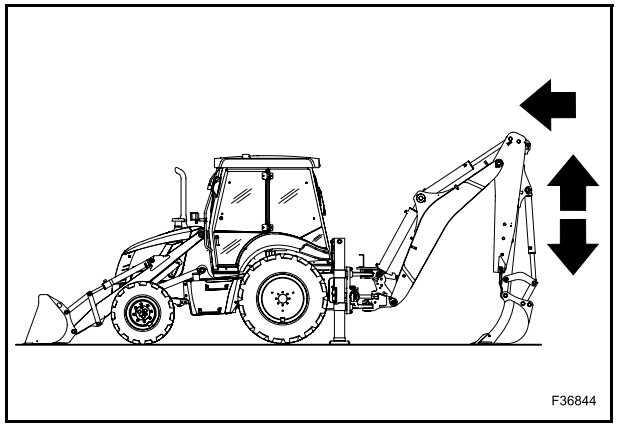
**Telescopic dipper**

To avoid the risk of damage and to extend the overall life of machines fitted with a telescopic dipper the following precautions must be observed.

When the attachment is used for compacting operations, the telescopic dipper must be fully retracted and locked.

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# LIFTING LOADS

## SAFETY INSTRUCTIONS

**⚠ WARNING ⚠**

Suspended loads must be handled in strict compliance with the relevant national regulations and with the safety instructions given in this manual.

**⚠ WARNING ⚠**

The anti-drop valves located on the cylinders of the loader and backhoe attachment, the lifting load table located in the cab and the hook on the link of the bucket linkage are safety devices. The lack of one of them or a damaged item make the machine unfit for use.

**⚠ WARNING ⚠**

Before handling suspended loads, check that the valves do not show clear evidence of damage or anomalous noise. In the event anomalous conditions are found, contact the Dealer; in the meantime, do not use the machine for handling suspended loads.

Check that the lifting devices (hooks, chains, etc.) are in perfect conditions, without any sign of excessive wear. The device can be used exclusively to lift parts not anchored to the ground. Never use it for towing, uprooting or tearing operations.

In any case, comply with the current regulations in force as regards checking these devices (not supplied with the machine).

**⚠ WARNING ⚠**

In order to prevent injuries, do not exceed the nominal load capacity of the machine. If the machine is not on a level surface, the load capacity is reduced. In any case, always proceed with extreme care.

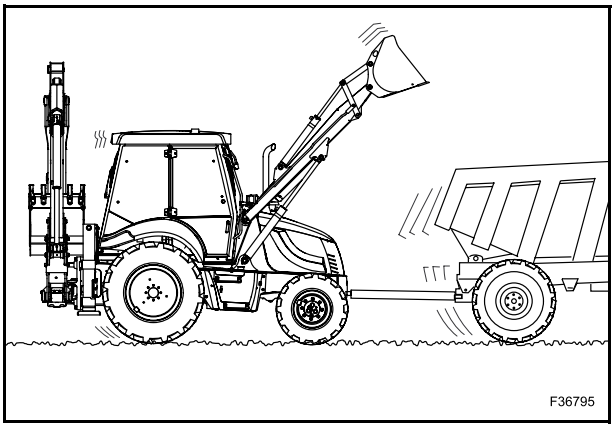
**⚠ WARNING ⚠**

Suspended loads can rotate and swing in all directions; therefore, there is the dangerous possibility that they hit persons or the cab of the machine. In order to limit this danger, it is absolutely required that all bystanders are moved away from the operating range of the machine and that the load is handled slowly.

In the event the load rotates or swings during handling, slow down until the machine stops and lower the load slowly to the ground; then, correct the way it is slung.

Make sure the attachments are raised sufficiently to avoid any interference with the ground or the trailer.

If it is not possible to raise the attachments sufficiently to avoid interference, then they must be removed.

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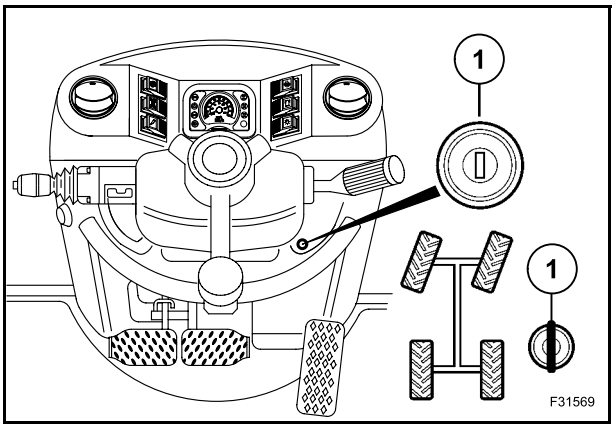
**4WS**

For towing purposes, “Road” (1) type steering must be selected.

If the engine is not running, the force necessary to turn the steering wheel will be higher.



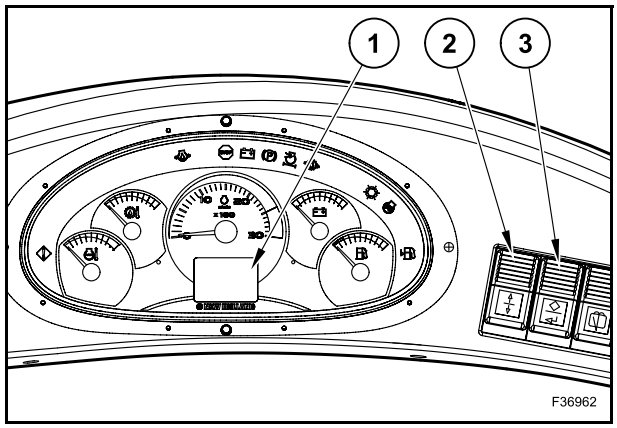

119

**B100B - B110B - B115B**

The hours are shown on the display (1) located in the side instrument.

To display the hours when the machine is off:

- press either switch (2) or (3);
- the hours are displayed for about 15 seconds.

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## INTERVALS

Servicing and inspection intervals are variable.

All operations are scheduled on the following basis:

- every 10 hours or once a day, whichever comes first;
- every 50 hours or once a week, whichever comes first;
- every 250 hours or once every 3 months, whichever comes first;
- every 500 hours or once every 6 months, whichever comes first;
- every 1000 hours or once a year, whichever comes first;
- every 2000 hours or once every 2 years, whichever comes first.

## BRAKE SYSTEM FLUID - LEVEL

Move the machine to a level and firm ground.

Lower the loader attachment to the ground.

Place the backhoe attachment in the road travel position.

Place the direction-of-travel lever and gearshift lever in neutral position.

Immobilize the machine by means of the parking brake.

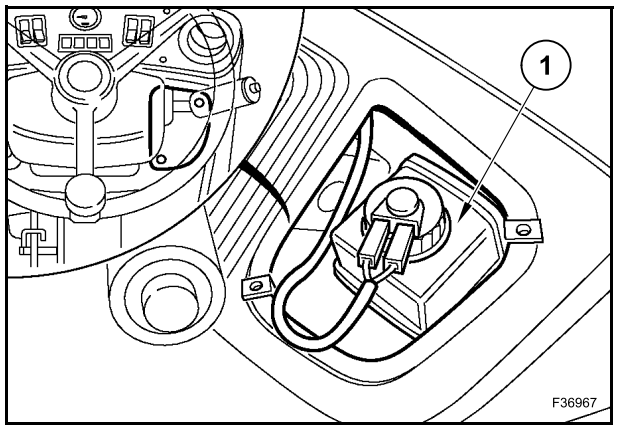
Stop the engine and remove the starter switch key.

Wait for the machine to cool down.

Check the level of fluid in the brake system by directly checking the reservoir (1).

If necessary, top up.

***NOTE:*** *before filling brake fluid into the reservoir, check that it is of the right type. The use of a wrong type of fluid can cause serious damage.*

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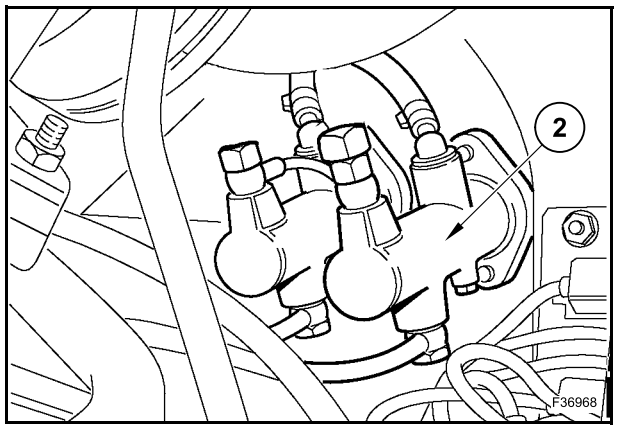
Check the brake pumps (2) for signs or leaks.

**⚠ WARNING ⚠**

Take any local regulation concerning the check of braking systems into consideration. Regularly maintain the brakes to ensure compliance with the law and ensure safety. If in doubt, consult your Dealer.

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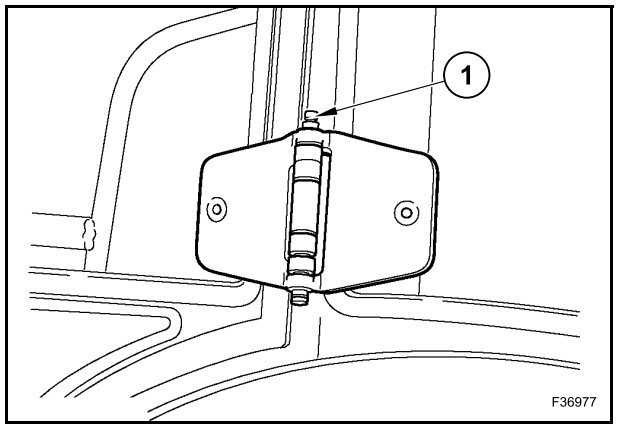
## DOOR HINGES - GREASING

Grease fittings (1): 4

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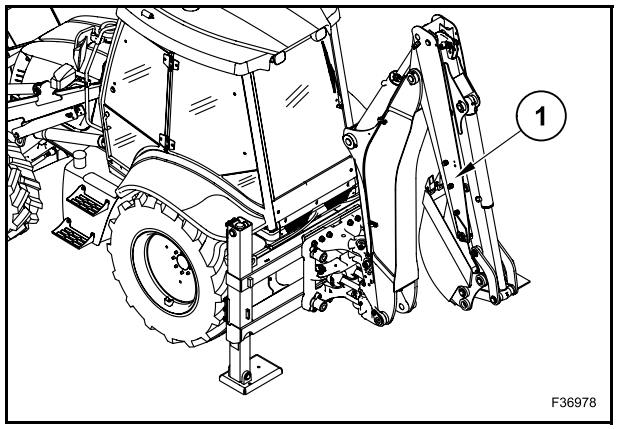
## RAILS - GREASING

***IMPORTANT:*** *before applying new grease on the sliding surfaces, clean and remove all dirt accumulations and foreign bodies.*

### TELESCOPIC DIPPER RAILS

Rails (1): 2

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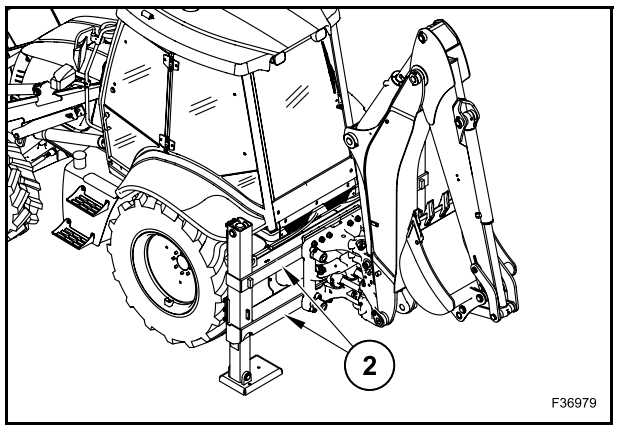
### SIDESHIFT CARRIAGE RAILS (SIDESHIFT)

Rails (2): 2

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## REAR AXLE - OIL LEVEL

Move the machine to a level and firm ground.

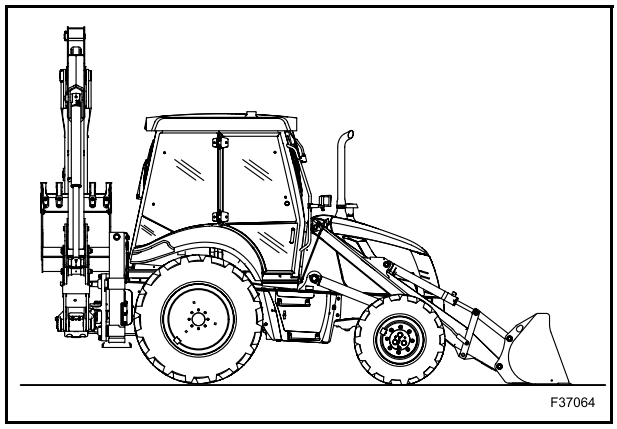
Lower the loader attachment to the ground.

Place the backhoe attachment in the road travel position.

Place the direction-of-travel lever and gearshift lever in neutral position.

Immobilize the machine by means of the parking brake.

Stop the engine and remove the starter switch key.

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**AXLE OIL LEVEL**

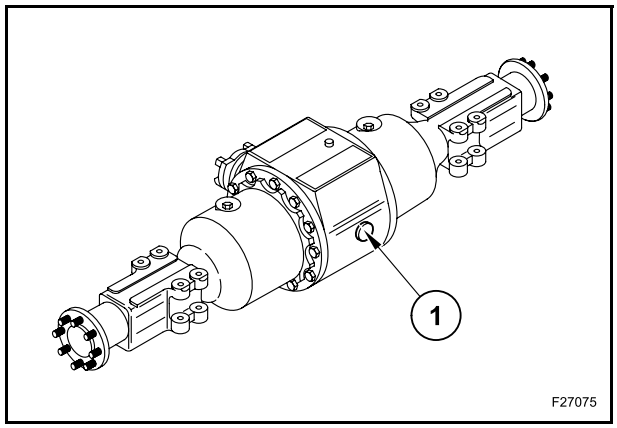
**2WS**

Unscrew and remove the plug (1).

Check the level by checking if the oil reaches the height of the plug hole.

If necessary, top up.

Retighten the plug (1).

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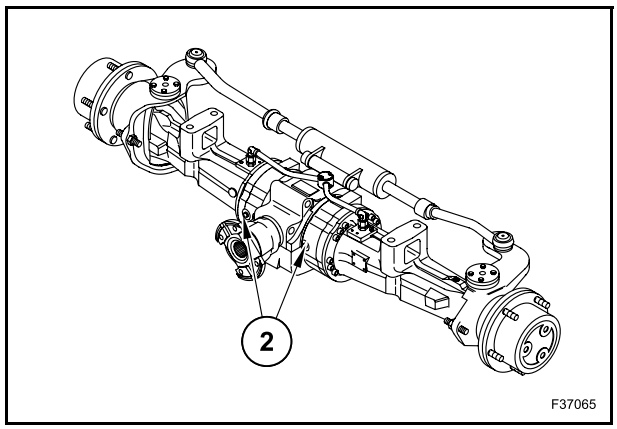
**4WS**

Unscrew and remove the plug(s) (2).

Check the level by checking if the oil reaches the height of the plug hole.

If necessary, top up.

Screw in the plug(s) (2) again.

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## FUEL FILTER - REPLACEMENT (B90B)

Move the machine to a level and firm ground.

Raise the loader attachment and install the safety support strut.

Place the backhoe attachment in the road travel position.

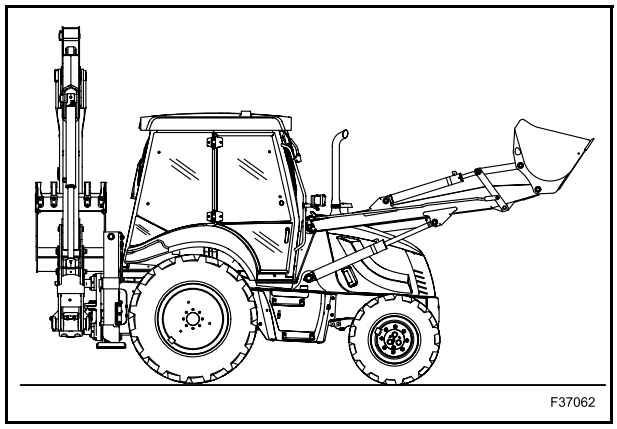
Place the direction-of-travel lever and gearshift lever in neutral position.

Immobilize the machine by means of the parking brake.

Stop the engine and remove the starter switch key.

Open and raise the engine guard and lock it in opened position by means of the safety lock on the left-hand gas spring.

***NOTE:*** *the engine guard has a handle and an opening button only on the left-hand side of the machine.*

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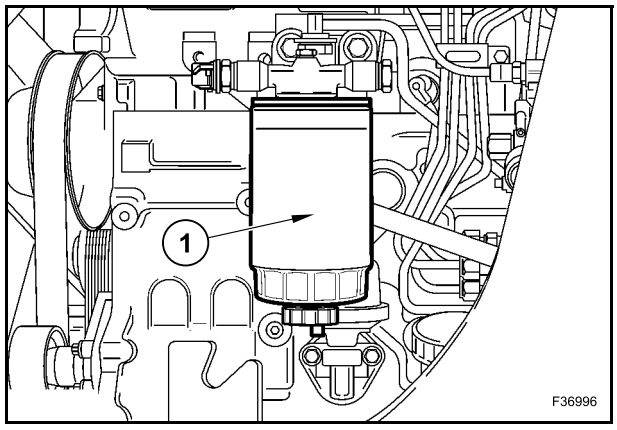
Place a container with suitable capacity under the filter.

Unscrew and remove the cartridge (1) by means of the filter wrench, code 380000670.

Apply a thin layer of clean oil on the seal (2) of the new cartridge.

Assemble the new cartridge (1). Manually screw in the cartridge until the seal touches the filter head. By means of the wrench code 380000670, tighten by 3/4 of a turn.

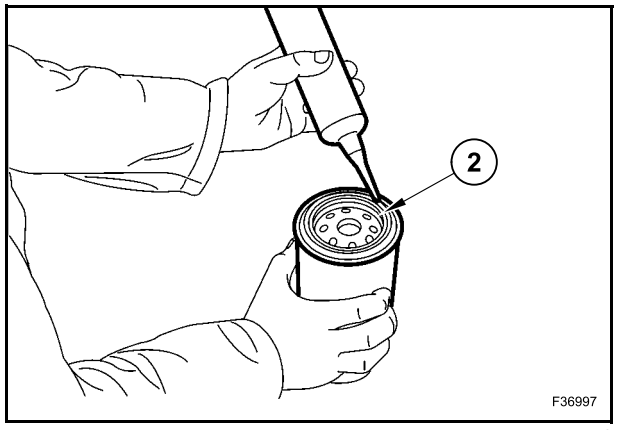
***IMPORTANT:*** *overtightening can damage the filter seal (2).*




70

***NOTE:*** *for this replacement, it is essential that an original spare cartridge is used, as a non-approved part could seriously damage the injection pump.*

Bleed the fuel system.

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## AIR FILTER - REPLACING MAIN AND SAFETY FILTER ELEMENTS

Move the machine to a level and firm ground.

Raise the loader attachment and install the safety support strut.

Place the backhoe attachment in the road travel position.

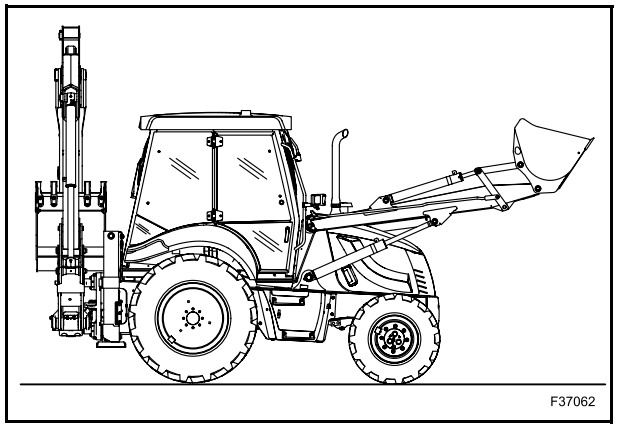
Place the direction-of-travel lever and gearshift lever in neutral position.

Immobilize the machine by means of the parking brake.

Stop the engine and remove the starter switch key.

Open and raise the engine guard and lock it in opened position by means of the safety lock on the left-hand gas spring.

***NOTE:*** *the engine guard has a handle and an opening button only on the left-hand side of the machine.*

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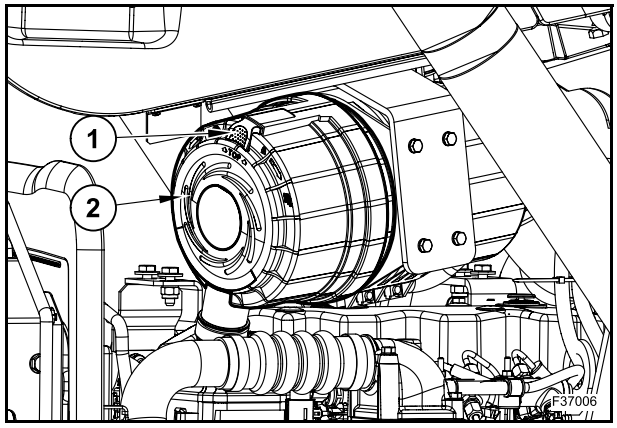
Unhook the clip (1) and remove the filter cover (2).

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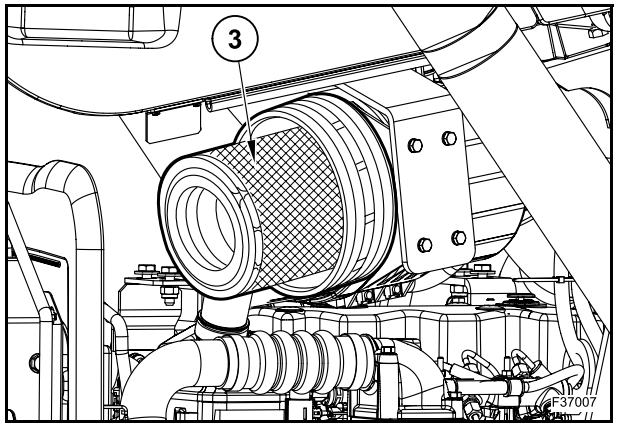
Extract the main filter element (3).




90

**REDUCTION GEAR OIL CHANGE**

**4WS**

***NOTE:*** *reduction gear oil capacity 1.3 x 2 litres (0.30 x 0.50 gal).*

In this case, slightly raise the rear part of the machine by means of the stabilizers, until the rear wheels are no longer in contact with the ground. Place an appropriate support under the rear axle.

Manually position the wheel until the hole of the plug (1) is in the lowest possible position.

Place a container with suitable capacity under the plug (1).

Unscrew and remove the plug (1).

Wait for the oil to come out of the reduction gear through the hole of the plug (1).

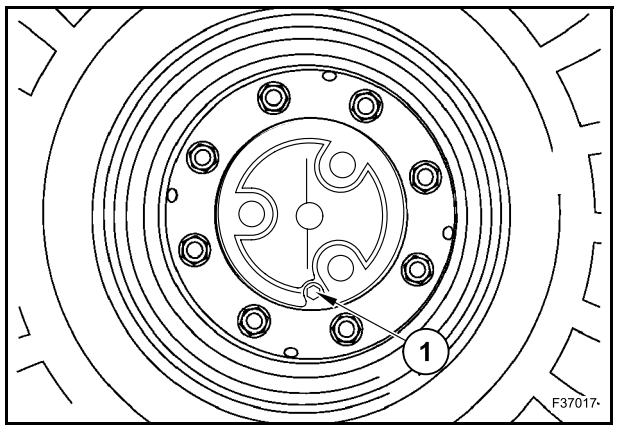
Manually position the wheel until the hole of the plug (1) is in horizontal position.

Fill with clean oil through the hole of the plug (1) until the level reaches the hole.

Retighten the plug (1).

Repeat the same operations, previously described, for the other reduction gear.

Lower the machine to the ground.

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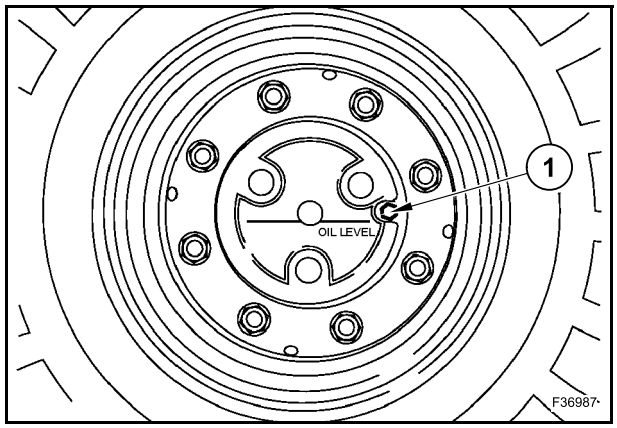


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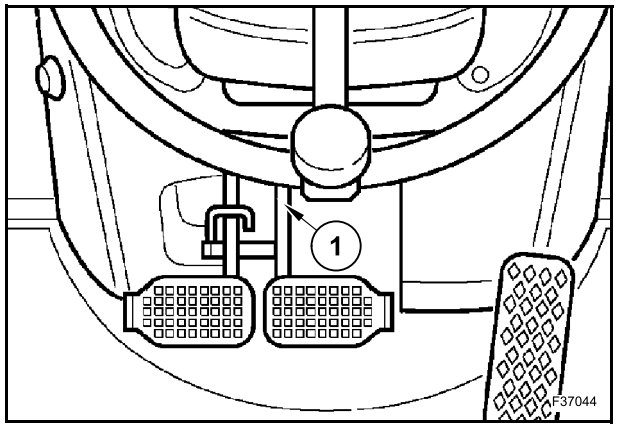
## BRAKE PEDAL LEVER - GREASING

Grease the brake pedal levers (1) by introducing the new clean grease and expelling the exhaust grease until the new grease starts coming out.

Clean all the grease come out by means of a cloth.

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## DRIVE BELT - REPLACEMENT

Move the machine to a level and firm ground.

Raise the loader attachment and install the safety support strut.

Place the backhoe attachment in the road travel position.

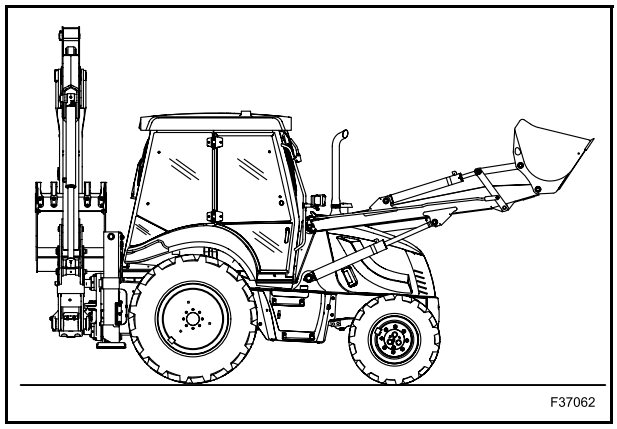
Place the direction-of-travel lever and gearshift lever in neutral position.

Immobilize the machine by means of the parking brake.

Stop the engine and remove the starter switch key.

Open and raise the engine guard and lock it in opened position by means of the safety lock on the left-hand gas spring.

***NOTE:** the engine guard has a handle and an opening button only on the left-hand side of the machine.*



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Visually check the condition of the drive belt (1).

Replace it if it is worn or damaged.

Insert the 1/2” square wrench into the hole of the tensioner roller (2).

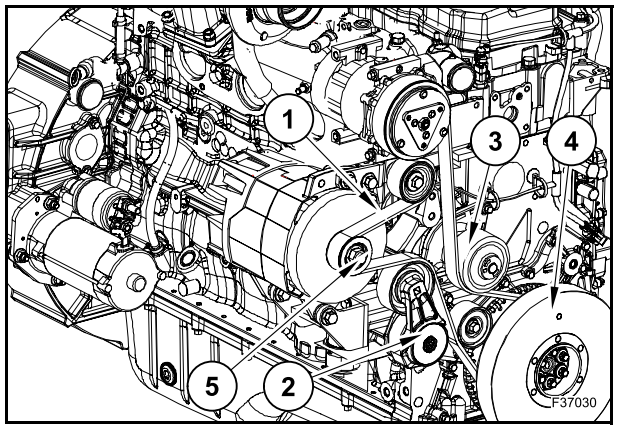
Press the wrench as much as necessary to slacken the belt (1).

Release the belt from the pulley (3) of the water pump, then from the other pulleys.

Install a new belt on the pulley of the water pump and on the pulley (4) of the drive shaft.

Insert the wrench into the hole in the belt tensioner roller (2).

Press the wrench to let the belt pass on the pulley (5) of the alternator.



135

Unlock the safety lock and close the engine guard.

Remove the safety support strut and lower the loader attachment.

## WHEEL/TYRE - REPLACEMENT

Move the machine to a level and firm ground.

Place the direction-of-travel lever and gearshift lever in neutral position.

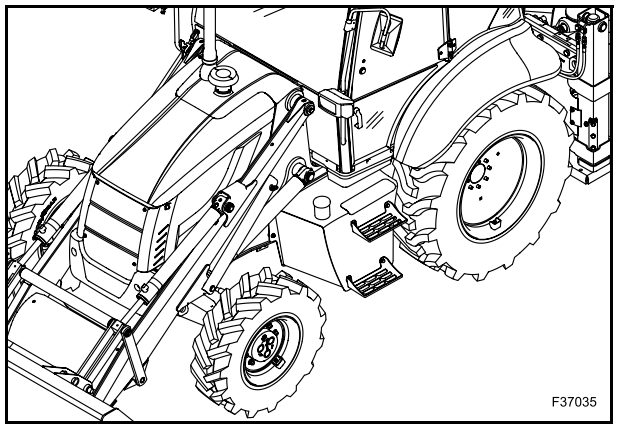
Immobilize the machine by means of the parking brake.

Stop the engine.

Unlock the nuts of the wheel to be disassembled.

Start the engine.

Use the loader attachment or the rear stabilizers to lift the machine until the wheel to be removed is no more in contact with the ground.

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Stop the engine and remove the starter switch key.

Lock the wheels still in contact with the ground and which are not to be removed using wedges.

Correctly support the axle of the wheel to be removed with blocks.

Unscrew and remove the wheel nuts.

Remove the wheel.

Install a new wheel, observing the orientation of the tread pattern.

Reinstall and tighten the nuts to the specified torque:

- front wheel nuts (2WS) = 330 Nm (243 lbf·ft);
- rear wheel nuts (2WS) = 540 Nm (398 lbf·ft);
- front and rear wheel nuts (4WS) = 700 Nm (516 lbf·ft).

Remove the wedges from the wheels.

Lower the machine.

Check the inflating pressure of the tyres. Inflate, if necessary.

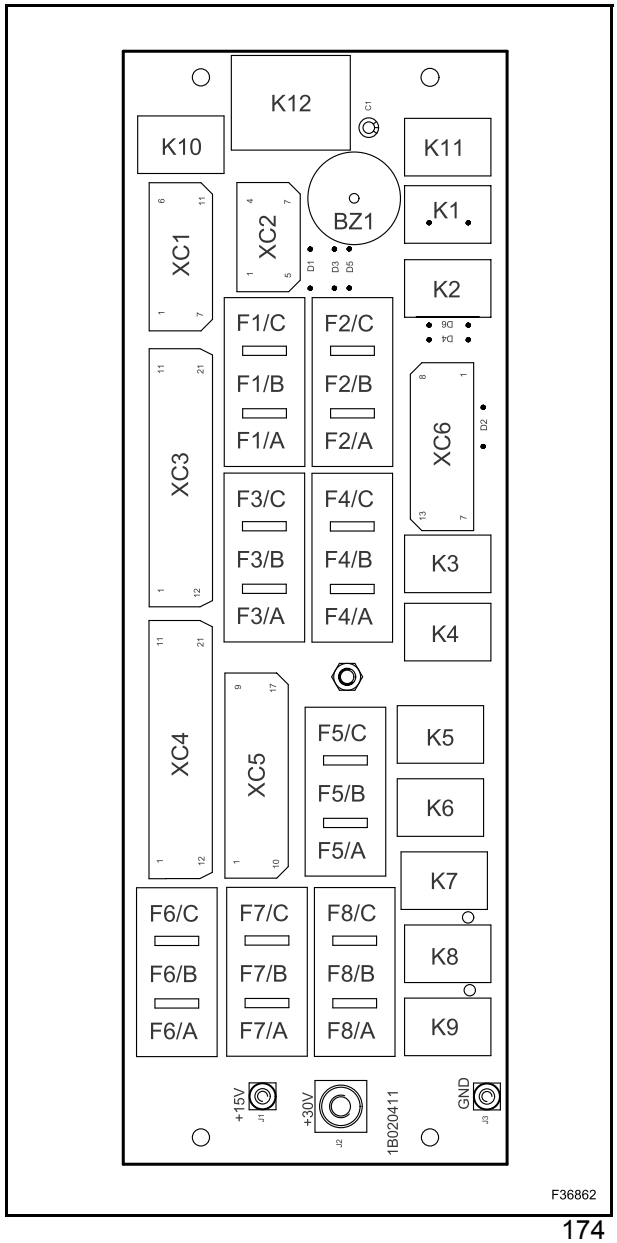
# FUSES AND RELAYS - POWERSHUTTLE CAB (B90B)

## FUSES

| Fuse No. | Rating | Function |
|---|---|---|
| F1A | 15 A | Rear windshield wiper and washer |
| F1B | 7.5 A | Engine stop, (+15) anti-theft device, “grid heater” |
| F1C | 10 A | Stop light switch, 4-wheel braking |
| F2A | 15 A | Instrument power supply, switch lamps, brake fluid level sensor, pneumo-electric seat, buzzer |
| F2B | 15 A | Air conditioning |
| F2C | 15 A | Pilot control |
| F3A | 3 A | Rear right/front left side light, instrument backlighting |
| F3B | 3 A | Rear left/front right side lights, number plate light |
| F3C | 10 A | Front work light switch, ride control, double delivery, 4x1 bucket |
| F4A | 5 A | Reverse travel buzzer, gearshift |
| F4B | 10 A | Rear hammer button, bucket level solenoid valve + sensor, clutch disconnect buttons |
| F4C | 10 A | Backhoe attachment lock, backhoe attachment travel lock, rear work light |
| F5A | 15 A | Inner front work lights |
| F5B | 10 A | Low beams |
| F5C | 15 A | Main beams |
| F6A | 7.5 A | Rotating beacon |
| F6B | 7.5 A | (+15) hazard warning light power supply |
| F6C | 7.5 A | Hand hammer, 4WD |
| F7A | 10 A | (+30) hazard warning lights, horn |
| F7B | 10 A | Electrical socket, radio, roof lamp |
| F7C | 6 A | Front windshield wiper |
| F8A | 15 A | Outer rear work lights |
| F8B | 15 A | Outer front work lights |
| F8C | 15 A | Inner rear work lights |

## RELAYS

| | |
|---|---|
| K1 | Forward-reverse travel gearshift relay |
| K2 | Parking brake engaged relay |
| K3 | Starting relay |
| K4 | Bucket level solenoid valve relay |
| K5 | Low and main beam relay |
| K6 | Inner front work light relay |
| K7 | Inner rear work light relay |
| K8 | Outer front work light relay |
| K9 | Outer rear work light relay |
| K10 | Reverse travel relay |
| K11 | Forward travel relay |
| K12 | Hazard warning lights |



# SECTION 5
# TROUBLESHOOTING

Often failures are due to improper use or to an irregular maintenance of the machine.

In case of failure, it is recommended to read the relevant chapter in the manual.

In case no failure cause can be determined or if you are not able to eliminate the problem, consult the Service Department.

When contacting the Service Department, it is important to describe the failure and all the factors related to it in the most precise way possible. Precise information allows quickly finding and eliminating the cause of the problem.

Never perform any operation if not sufficiently skilled for the job.

These following tables are reported for your guidance only. If any repairs are required beyond routine maintenance, your machine must be returned to your Dealer who has the correct tools, facilities and knowledge to perform repairs to the correct specification and safety standards.

These tables describe the failures already occurred, their possible causes and the remedies to be adopted. In exceptional cases, a failure described may also have another cause.

**PROBLEM**

Here the failure is described as the consequence of a previously performed observation or activity.

Therefore, observe with extreme care.

Carefully examine the problem.

Ask yourself the following questions:

What symptoms preceded the failure?

What repair or maintenance operations have been previously performed?

Had this failure already occurred?

Is this a single failure or are these more contemporary failures?

**POSSIBLE CAUSE**

The possible causes of the detected failure are indicated. They are listed according to probability; the most probable cause is indicated first.

**CORRECTION**

Here it is explained how to detect and eliminate the cause of the problem.

| PROBLEM | POSSIBLE CAUSE | CORRECTION |
|---|---|---|
| Low 4WD clutch pack pressure. | 4WD cylinder seals leaking. | Replace the cylinder seal. |
| | 4WD shaft seal ring leaking. | Replace the seal ring. |
| | Leak from 4WD clutch supply pipe. | Eliminate leaks. |
| | Faulty 4WD solenoid valve. | Replace the solenoid valve. |
| | Blockage or restriction in 4WD clutch supply pipe. | Clean. |
| High 4WD clutch pack pressure. | Pressure relief solenoid valve faulty. | Replace the solenoid valve. |
| Low lubrication pressure. | Blockage or restriction in the oil cooler. | Clean. |
| | Input shaft front seal ring leaking. | Replace the solenoid valve. |
| | Very hot oil. | Let the oil cool down. |

# ELECTRICAL SYSTEM

| PROBLEM | POSSIBLE CAUSE | CORRECTION |
|---|---|---|
| The electrical system is inoperative. | Loose or oxidised battery connections. | Check that the battery voltage with open circuit is at least 12.6 V. |
| | Clean and tighten the connections. Sulphated batteries. | Check the electrolyte level and density. |
| | Battery isolator switch off. | Restore the battery isolator switch. |
| | The main connection fuse of the machine is blown. | Find the reason of the failure and replace the connection fuse. |
| Starter motor speed too low, the engine cranks slowly. | Loose or corroded connections. | Clean and tighten loose connections. |
| | Low battery output voltage. | Check that the battery voltage with open circuit is at least 12.6 V. Check the electrolyte level and density. |
| | Incorrect viscosity of the engine oil. | Use an oil with correct viscosity for the temperature conditions. |
| Starter motor inoperative. | Transmission gearshift lever engaged. | Move gearshift lever to neutral. |
| | Loose or corroded connections. | Clean and tighten loose connections. |
| | Dead batteries. | Charge or replace the batteries. |
| The charge indicator lamp stays on with the engine running. | Low engine idle speed. | Increase idle speed. |
| | Loose belt. | Check belt tension. |
| | Malfunctioning battery. | Check that the battery voltage with open circuit is at least 12.6 V. Check the electrolyte level and density. |
| | Malfunctioning alternator. | Check the alternator and repair, if necessary. |

# SECTION 8
# DATA AND TECHNICAL SPECIFICATIONS

## DIESEL ENGINE

### 72 kW - 97 HP ENGINE (B90B)

Specifications (EEC 88/195) ..... 72 kW - 97 HP @ 2200 rpm
Model ..... F4GE9484C*601
Type ..... diesel, mechanical
No. of cylinders ..... 4
Valves per cylinder ..... 2
Bore ..... 104 mm (4 in)
Stroke ..... 132 mm (5.2 in)
Displacement ..... 4485 $cm^3$ (237.69 $in^3$)
Compression ratio ..... 17.5:1
Maximum torque (EC) ..... 400 Nm (295 lbf·ft) @ 1400 rpm
Low idle speed at no load ..... 1000 ± 50 rpm
High idle speed at no load (engine not installed) ..... 2430 ± 50 rpm
High idle speed at no load (engine not installed on the vehicle) ..... 2380 ± 60 rpm
Maximum speed at full load ..... 2200 rpm
Air intake ..... TAA (turbocharged with aftercooler)

**Supply**

Type ..... direct injection
Injection pump ..... BOSCH ROTARY VE 4/12 F1100L
Injection sequence ..... 1-3-4-2
Cold-start device ..... “grid heater” (optional)

**Cooling**

Pump type ..... $H_2O$ pump
Pump drive ..... belt drive
Temperature switch (opening start) ..... 81 ± 2 °C (177.8 ± 35.6 °F)

## INFLATING PRESSURE AND ALLOWED CARRYING CAPACITY TABLE

The following tables give the approximate carrying capacity of the axle at the indicated tyre pressures.

**FRONT TYRES - 2WS**

| Tyre size | No. of plies | Inflating pressure in bar (psi) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1.5 (22) | 1.7 (25) | 1.9 (28) | 2.1 (30) | 2.2 (32) | 2.4 (35) | 2.6 (38) | 2.8 (41) | 3.0 (44) | 3.3 (48) | 3.6 (52) | 3.9 (57) |
| | | Allowed carrying capacity on axle (kg) (lb) | | | | | | | | | | | |
| 11L-16 | 10 | 1400 (3080) | 1480 (3256) | 1620 (3564) | 1720 (3784) | 1790 (3938) | 1880 (4136) | 2000 (4400) | 2080 (4578) | 2210 (4862) | 2340 (5148) | 2460 (5412) | - |
| 12.5/80-18 | 10 | 1550 (3410) | 1665 (3663) | 1790 (3938) | 1890 (4158) | 1940 (4268) | 2040 (4488) | 2140 (4708) | 2265 (4983) | 2330 (5126) | 2425 (5335) | 2575 (5665) | 2720 (5984) |
| 320/80-R18 | 8 | 1180 (2596) | 1300 (2860) | 1410 (3102) | 1560 (3432) | 1610 (3542) | 1715 (3773) | 1820 (4004) | 1975 (4345) | 2080 (4576) | - | - | - |

**REAR TYRES - 2WS**

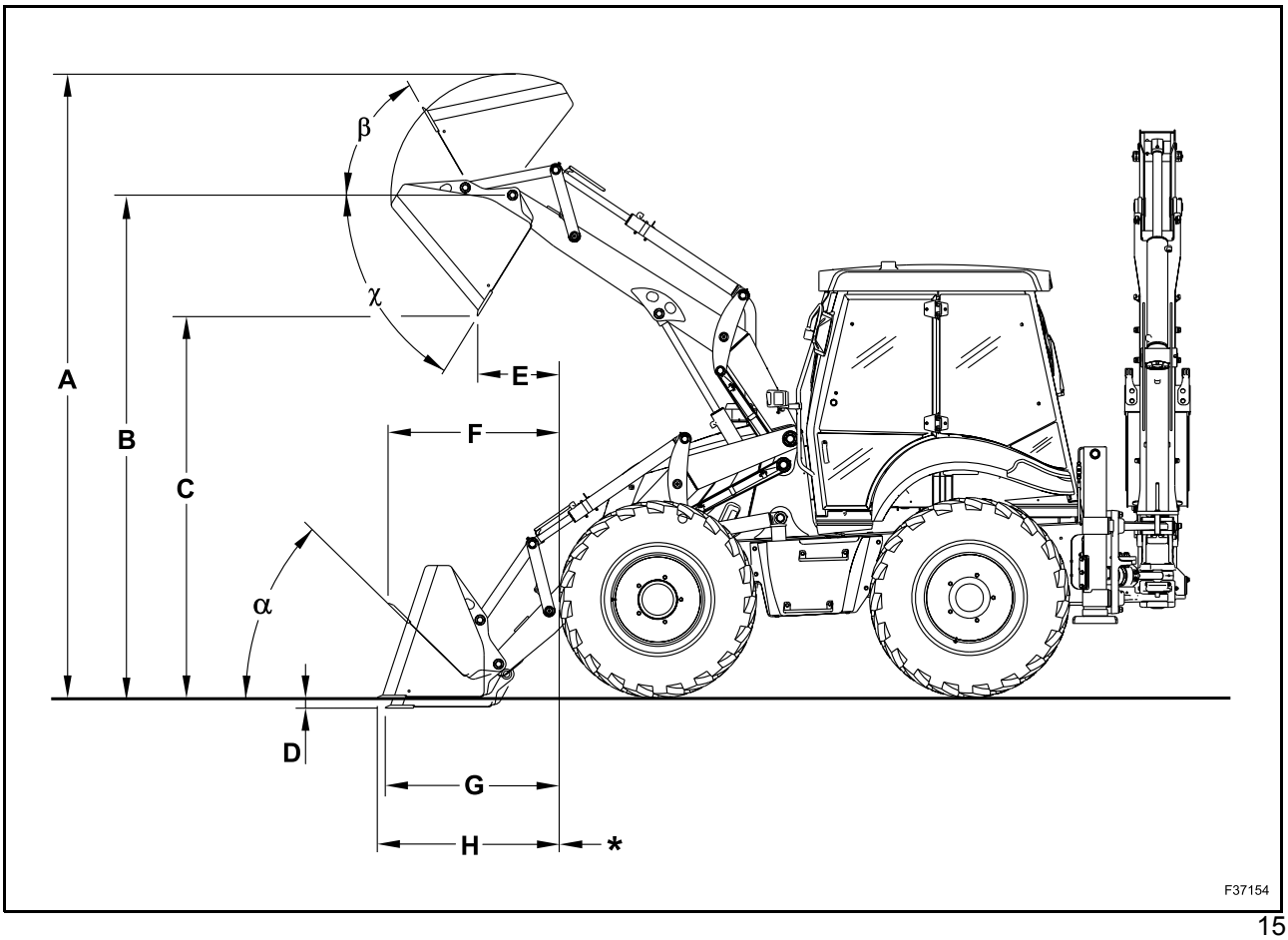
| Tyre size | No. of plies | Inflating pressure in bar (psi) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1.1 (16) | 1.2 (17) | 1.3 (19) | 1.4 (20) | 1.5 (22) | 1.6 (23) | 1.7 (25) | 1.8 (26) | 1.9 (28) | 2.0 (29) | 2.2 (32) | 2.3 (33) | 2.4 (35) | 2.6 (38) |
| | | Allowed carrying capacity on axle (kg) (lb) | | | | | | | | | | | | | |
| 16.9-24 | 10 | 3556 (7823) | 3675 (8085) | 4040 (8888) | 4260 (9378) | 4408 (9698) | 4625 (10175) | 4890 (10758) | 5100 (11220) | 5300 (11660) | 5470 (12034) | 5810 (12782) | - | - | - |
| 16.9-28-R4 | 10 | 3800 (8360) | 4000 (8800) | 4200 (9240) | 4460 (9812) | 4780 (10516) | 4900 (10780) | 5090 (11198) | 5380 (11836) | 5660 (12452) | 5800 (12760) | 6190 (13618) | - | - | - |
| 17.5L-24 | 10 | 3430 (7546) | 3740 (8228) | 3995 (8789) | 4160 (9152) | 4275 (9405) | 4530 (9966) | 4675 (10285) | 4780 (10516) | 4950 (10890) | 5200 (11440) | 5450 (11990) | 5610 (12342) | 5820 (12804) | - |
| 18.4/15-26 | 12 | 4490 (9878) | 4720 (10384) | 4950 (10890) | 5180 (11396) | 5420 (11924) | 5654 (12439) | 5890 (12958) | 6140 (13508) | 6380 (14036) | 6630 (14586) | 7100 (15620) | 7320 (16104) | 7540 (16588) | - |
| 480/80-R26 | 10 | 2090 (4598) | 2205 (4851) | 2330 (5126) | 2455 (5401) | 2565 (5643) | 2680 (5896) | 2795 (6149) | 2910 (6402) | 3055 (6721) | 3200 (7040) | 3485 (7667) | 3585 (7887) | 3690 (8118) | 3900 (8580) |

**FRONT AND REAR TYRES - 4WS**

| Tyre size | Inflating pressure in bar (psi) | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1.0 (15) | 1.1 (16) | 1.3 (19) | 1.4 (20) | 1.5 (22) | 1.7 (25) | 1.8 (26) | 1.9 (28) | 2.0 (29) | 2.1 (30) | 2.2 (32) | 2.3 (33) | 2.4 (35) | 2.5 (36) | 2.6 (38) |
| | Allowed carrying capacity on axle (kg) (lb) | | | | | | | | | | | | | | |
| 16.9-24-R4 | 1650 (3630) | 1775 (3905) | 2020 (4444) | 2130 (4686) | 2240 (4928) | 2445 (5379) | 2550 (5610) | 2650 (5830) | 2735 (6017) | 2820 (6204) | 2905 (6391) | 2990 (6578) | 3080 (6776) | 3165 (6963) | 3250 (7150) |
| 16.9-28-R4 | 1760 (3872) | 1895 (4169) | 2155 (4741) | 2775 (6105) | 2390 (5258) | 2610 (5742) | 2720 (5984) | 2830 (6226) | 2920 (6424) | 3005 (6611) | 3095 (6809) | 3190 (7018) | 3280 (7216) | 3370 (7414) | 3465 (7623) |
| 440/80-R28 | 1770 (2574) | 1975 (4345) | 2089 (4596) | 2205 (4851) | 2225 (4895) | 2580 (5676) | 2680 (5896) | 2720 (5984) | 2910 (6402) | 2995 (6589) | 3120 (6864) | 3080 (6776) | 3275 (7205) | 3250 (7150) | 3590 (7898) |

The tables above are for your guidance only. For detailed information regarding the inflating pressures and the allowed carrying capacities of the tyres in use, contact your Dealer.

**B115B (WITH STANDARD BUCKET 1.15 $m^3$/40.6 $ft^3$))**

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∗ Front tyres

A. Maximum height/dimensions

B. Maximum height of loader bucket pin/pivot

C. Maximum dumping height

D. Digging depth

E. Loader attachment reach when raised in dumping position

F. Loader attachment reach when lowered with retracted bucket

G. Attachment reach in digging position

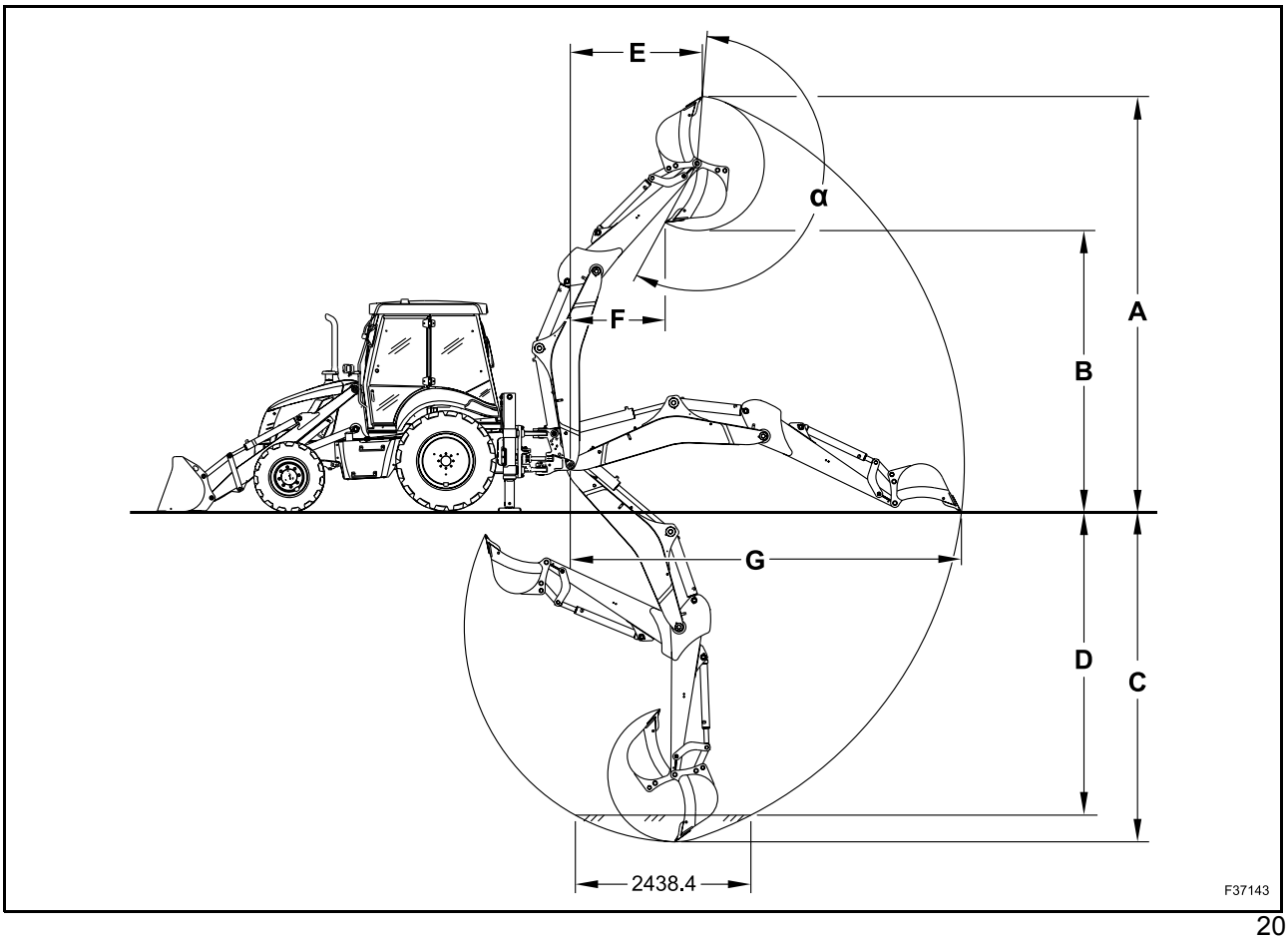
H. Attachment reach when lowered

α. Angle of lowered closed bucket

β. Angle of closed bucket at maximum height

χ. Dumping angle

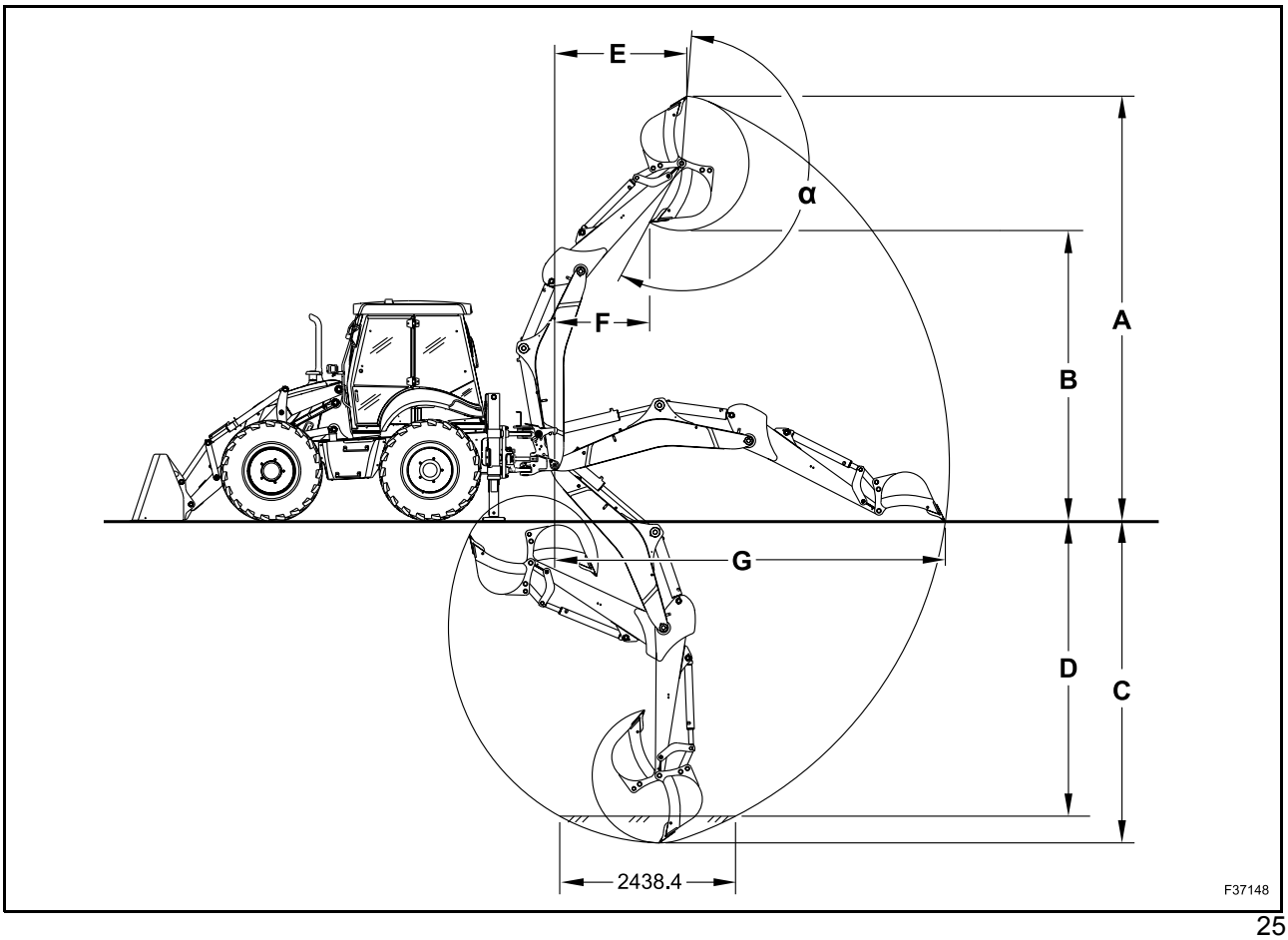
**B100B AND B110B SIDESHIFT (WITH LONG STANDARD DIPPER)**




20

A. Maximum digging height
B. Maximum height at full load
C. Maximum digging depth
D. Digging depth (L = 2438.4 mm (95.99 in))
E. Digging reach at maximum height
F. Maximum reach when loaded
G. Maximum digging reach with lowered bucket
α. Bucket digging angle

**B115B SIDESHIFT (WITH LONG STANDARD DIPPER)**




25

A. Maximum digging height
B. Maximum height at full load
C. Maximum digging depth
D. Digging depth (L = 2438.4 mm (95.99 in))
E. Digging reach at maximum height
F. Maximum reach when loaded
G. Maximum digging reach with lowered bucket
α. Bucket digging angle

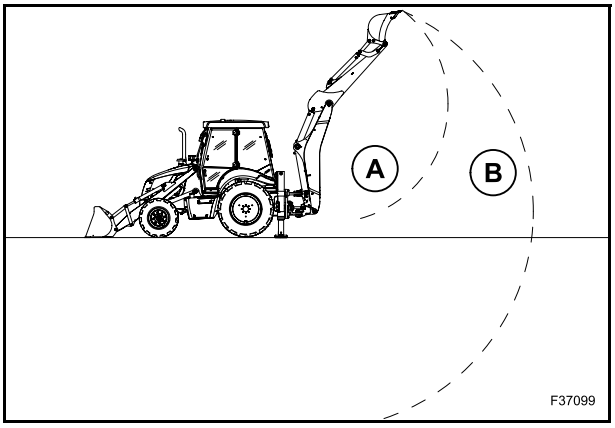
## LIFTING CAPACITY - MODELS B110B (SIDESHIFT)

### Lifting capacity in normal operating mode - SAE rated

The following table reports the lifting capacities of the dipper (A) and the boom (B).

***NOTE:*** *the capacities indicated may slightly vary from one machine to another, according to the accessories mounted, the pressure settings and the market requirements.*

Lifting capacities are given in kg for a standard dipper and a telescopic dipper.




3

| Dipper | | Telescopic dipper (retracted) | | Telescopic dipper (extended) | | Height/Depth |
|---|---|---|---|---|---|---|
| Dipper A | Boom B | Dipper A | Boom B | Dipper A | Boom B | m (ft) |
| | | | | | 600 (1323) | +5.4 (18) |
| | 1165 (2568) | | 1090 (2403) | | 900 (1984) | +4.9 (16) |
| | 1560 (3439) | | 1460 (3219) | 1455 (3208) | 1030 (2271) | +4.3 (14) |
| 1925 (4244) | 1680 (3704) | 1815 (4001) | 1570 (3461) | 1400 (3087) | 1095 (2414) | +3.6 (12) |
| 1865 (4112) | 1700 (3748) | 1755 (3869) | 1585 (3494) | 1380 (3042) | 1125 (2480) | +3.0 (10) |
| 1900 (4189) | 1560 (3439) | 1785 (3935) | 1440 (3175) | 1400 (3087) | 1115 (2458) | +2.4 (8) |
| 2045 (4508) | 1475 (3252) | 1925 (4244) | 1355 (2987) | 1460 (3219) | 1065 (2348) | +1.8 (6) |
| 2480 (5468) | 1425 (3142) | 2345 (5170) | 1300 (2866) | 1585 (3494) | 1035 (2282) | +1.2 (4) |
| 3645 (8036) | 1405 (3098) | 3475 (7661) | 1280 (2822) | 1835 (4046) | 1020 (2249) | +0.6 (2) |
| | 1415 (3120) | | 1285 (2833) | 2615 (5765) | 1020 (2249) | 0 (ground) |
| | 1450 (3197) | | 1320 (2910) | 3625 (7992) | 1035 (2282) | -0.6 (2) |
| | 1525 (3362) | | 1395 (3075) | | 1070 (2359) | -1.2 (4) |
| | 1550 (3417) | | 1395 (3075) | | 1130 (2491) | -1.8 (6) |
| | 1570 (3461) | | 1410 (3109) | | 1150 (2535) | -2.4 (8) |
| | 1645 (3627) | | 1470 (3241) | | 1180 (2602) | -3.0 (10) |
| | 1965 (4332) | | 1755 (3869) | | 1240 (2734) | -3.6 (12) |
| | | | | | 1395 (3075) | -4.2 (14) |
| | | | | | 2055 (4531) | -4.8 (16) |