



WHEEL LOADER

**LW50B
LW80B**

**SERVICE
MANUAL**

60367191NA

Issued 01Aug06



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CHAPTER 01 - GENERAL

FOREWORD

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This **Technical Handbook (THB)** has been written with **the servicing mechanic** in mind and contains important information required to carry out repair and servicing procedures.

Read through the **Technical Handbook**, but also the **Operating Instructions** for the **Wheel Loader** before commencing any servicing or repair work. The **Technical Handbook**, as well as the **Operating Instructions** and **Spare Parts List** should be used as a source of reference and assistance - even when the user is well acquainted with the range of the Wheel Loaders.

Using the Technical Handbook allows the experienced mechanic to carry out repair work in a correct manner.

Using the Technical Handbook

The Technical Handbook is divided into main and sub-groups that deal with the machine as actually delivered. Any auxiliary attachments or optional upgrading introduced later are not described.

The main table of contents allows to find the required information quickly.

For the sake of clarity, the illustrations have been simplified and can therefore differ slightly from the actual appearance of the machine.

Servicing and repair

Servicing and repair work should be carried out as soon as possible. This keeps overall servicing & repair costs to a minimum and increases the availability of the Wheel Loader.

During servicing and repair work, always follow the instructions contained in the Technical Handbook and Operating instructions.

The **After Sales Service** is always available for assistance and advice.

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FUNDAMENTAL SAFETY INSTRUCTIONS

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Warnings and symbols

The following signs are used in the manual to designate instructions of particular importance:

	Precautionary rules and measures designed to protect the machine operator and other persons from life-threatening danger or injuries and to prevent extensive damage.
	Information and precautionary measures designed to prevent damage to the machine or other property.

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Danger in the event of nonobservance of the safety instructions



This wheel loader has been built in accordance with state-of-the-art standards and the recognized safety rules.

However, operating the machine if a fault is suspected or has occurred, or carrying out repair work inexpertly may

- endanger the lives of persons in contact with it
- damage the machine and other property.

The wheel loader must be stopped immediately on any damage being suspected or occurring to ensure that the safety of the operator, of other persons at the place of use or of other material property is not compromised.

All components are carefully co-ordinated. Trouble-free operation and a long service life can only be achieved with original spare parts.

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Organizational measures

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The operating instructions must always be at hand at the place of use of the machine, e.g. by stowing them in the tool compartment or tool-box provided for such purpose.

In addition to the operating instructions, observe and instruct the user in all other generally applicable legal and other mandatory regulations relevant to accident prevention and environmental protection.

These compulsory regulations may also deal with the handling of hazardous substances, issuing and/or wearing of personal protective equipment or traffic regulations.

The operating instructions must be supplemented by instructions covering the duties involved in supervising and notifying special organizational features, such as job organization, working sequences or the personnel entrusted with the work.

Personnel entrusted with work on the machine must have read the operating instructions and in particular the chapter on safety before beginning work. Reading the instructions after work has begun is too late. This applies especially to persons working only occasionally on the machine, e.g. during setting up or maintenance.

Check - at least from time to time - whether the personnel is carrying out the work in compliance with the operating instructions and paying attention to risks and safety factors.

For reasons of security, long hair must be tied back or otherwise secured, garments must be close-fitting and no jewellery, such as rings, may be worn. Injury may result from being caught up in the machinery or from rings catching on moving parts.

Use protective equipment wherever required by the circumstances or by law.

Observe all safety instructions and warnings attached to the machine.

See to it that safety instructions and warnings attached to the machine are always complete and perfectly legible.

In the event of safety-relevant modifications or changes in the behaviour of the machine during operation, stop the machine immediately and report the malfunction to the competent authority/person.

Never make any modifications, additions or conversions which might affect safety without the supplier's approval. This also applies to the installation and adjustment of safety devices and valves as well as to welding work on load-bearing elements.

Spare parts must comply with the technical requirements specified by the manufacturer. Spare parts from original equipment manufacturers can be relied to do so.

Replace hydraulic hoses within stipulated and appropriate intervals, even if no safety-relevant defects have been detected.

Adhere to prescribed intervals or those specified in the operating instructions for routine checks and inspections.

For the execution of maintenance work, tools and workshop equipment adapted to the task on hand are absolutely indispensable.

The personnel must be familiar with the location and operation of fire extinguishers.

Observe all fire-warning and fire-fighting procedures.

Selection and qualification of personnel

Any work on and with the machine must be executed by reliable personnel only. Statutory minimum age limits must be observed.

Employ only trained or instructed staff and set out clearly the individual responsibilities of the personnel for operation, set-up, maintenance and repair.

Make sure that only authorized personnel works on or with the machine.

Define the machine operator's responsibilities - also with regard to observing traffic regulations - giving the operator the authority to refuse instructions by third parties that are contrary to safety.

Do not allow persons to be trained or instructed or persons taking part in a general training course to work on or with the machine without being permanently supervised by an experienced person.

Work on the electrical system and equipment of the machine must be carried out only by a skilled electrician or by instructed persons under the supervision and guidance of a skilled electrician and in accordance with electrical engineering rules and regulations.

Work on chassis, brake and steering systems must be performed by skilled personnel only, which has been specially trained for such work.

Work on the hydraulic system must be carried out only by personnel with special knowledge and experience of hydraulic equipment.

OPERATING, SAFETY INSTRUCTIONS

Standard operation

Avoid any operational mode that might be prejudicial to safety.

Before beginning work, familiarize yourself with the surroundings and circumstances of the site, such as obstacles in the working and travelling area, the soil bearing capacity and any barriers separating the construction site from public roads.

Take the necessary precautions to ensure that the machine is used only when in a safe and reliable state.

Operate the machine only if all protective and safety-oriented devices, such as removable safety devices, emergency shut-off equipment, sound-proofing elements and exhausters, are in place and fully functional.

Check the machine at least once per working shift for obvious damage and defects. Report any changes (incl. changes in the machine's working behaviour) to the competent organization/person immediately. If necessary, stop the machine immediately and lock it.

In the event of malfunctions, stop the machine immediately and lock it. Have any defects rectified immediately.

Start the machine from the driver's seat only.

During start-up and shut-down procedures always watch the indicators in accordance with the operating instructions.

Before setting the machine in motion, make sure that nobody is at risk.

Before starting work or travelling with the machine, check that the braking, steering, signalling and lighting systems are fully functional.

Before setting the machine in motion always check that the accessories have been safely stowed away.

When travelling on public roads, ways and places always observe the valid traffic regulations and, if necessary, make sure beforehand that the machine is in a condition compatible with these regulations.

In conditions of poor visibility and after dark always switch on the lighting system.

Travel drive assembly

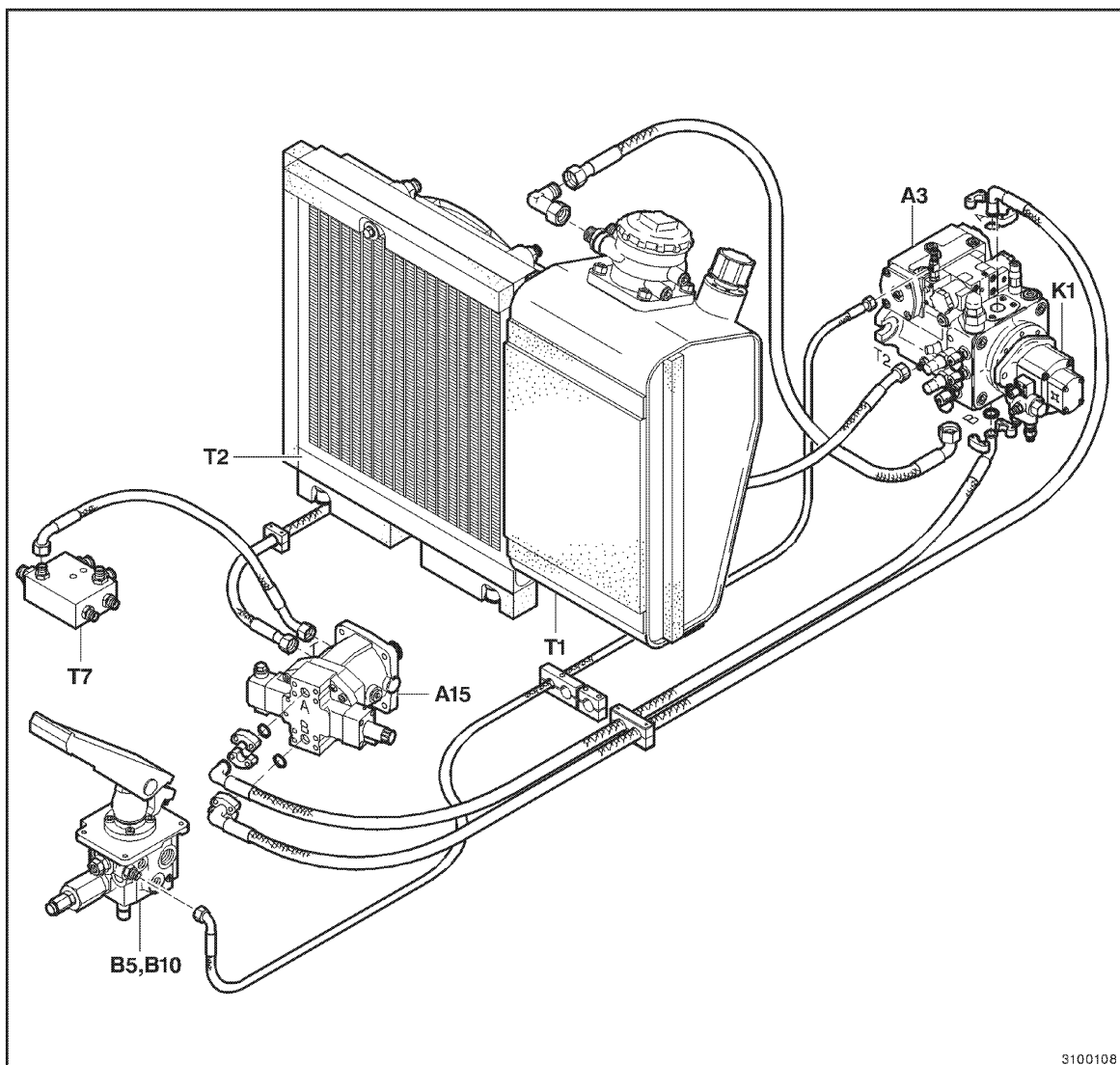


Fig. 6

Items Fig. 6

K1 - Double pump for steering / working hydraulics / brake system / fan drive

B5 - Pedal brake valve

B10 - Inching valve

T1 - Hydraulic reservoir

A3 - Variable displacement axial piston pump

T2 - Combined radiator

A15 - Axial piston oil motor

T7 - Distributor

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Axial-piston pump (A3)

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Axial-piston pump for LW50.B

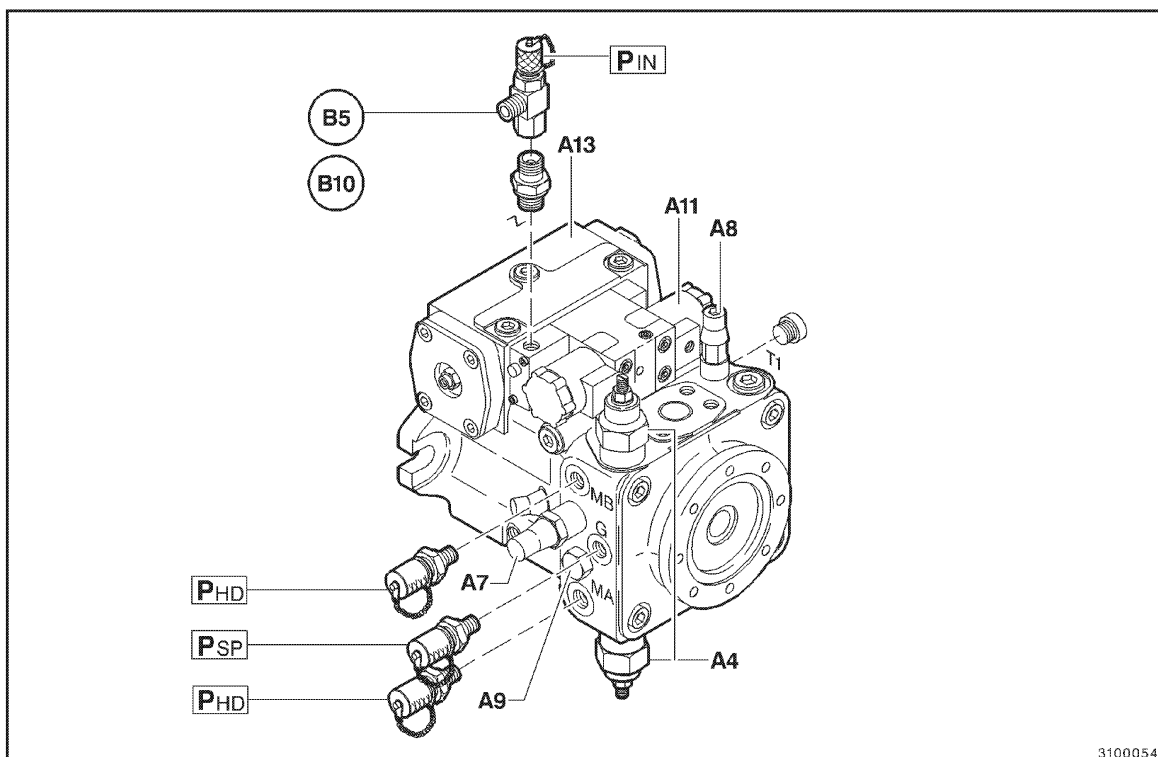


Fig. 7

Items Fig. 7

- A4** - Hydraulic pressure relief valves, unlockable
- A7** - Regulating valve
- A8** - Pressure cut-off
- A9** - Supply pressure relief valve
- A11** - Electromagnetically activated switching valve for forward and reverse travel
- A13** - Adjusting cylinder forward/reverse/neutral
- B5** - Pedal-operated brake valve
- B10** - Inching valve

Pressure measuring ports

- P_{SP}** - Supply pressure
- P_{HD}** - Travelling high pressure
- P_{In}** - Inching pressure

Hydraulic connections

- MA** - Measuring port, reverse travel
- MB** - Measuring port, forward travel

Axial-piston pump for LW80.B

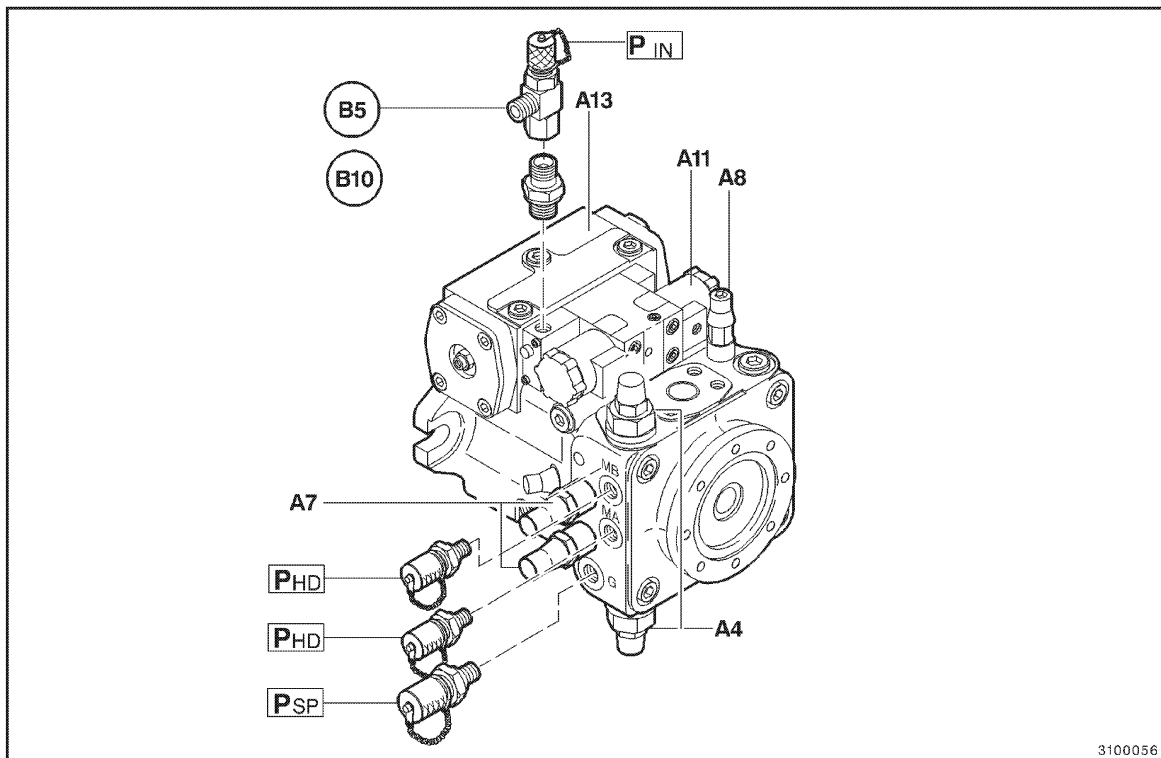


Fig. 8

Items Fig. 8

- A4** - Hydraulic pressure relief valves, unlockable
- A7** - Regulating valve
- A8** - Pressure cut-off
- A9** - Supply pressure relief valve
- A11** - Electromagnetically activated switching valve for forward and reverse travel
- A13** - Adjusting cylinder forward/reverse/neutral
- B5** - Pedal-operated brake valve
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Pressure measuring ports

- P_{SP}** - Supply pressure
- P_{HD}** - Travelling high pressure
- P_{IN}** - Inching pressure

Hydraulic connections

- MA** - Measuring port, reverse travel
- MB** - Measuring port, forward travel

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Distributor (T7)

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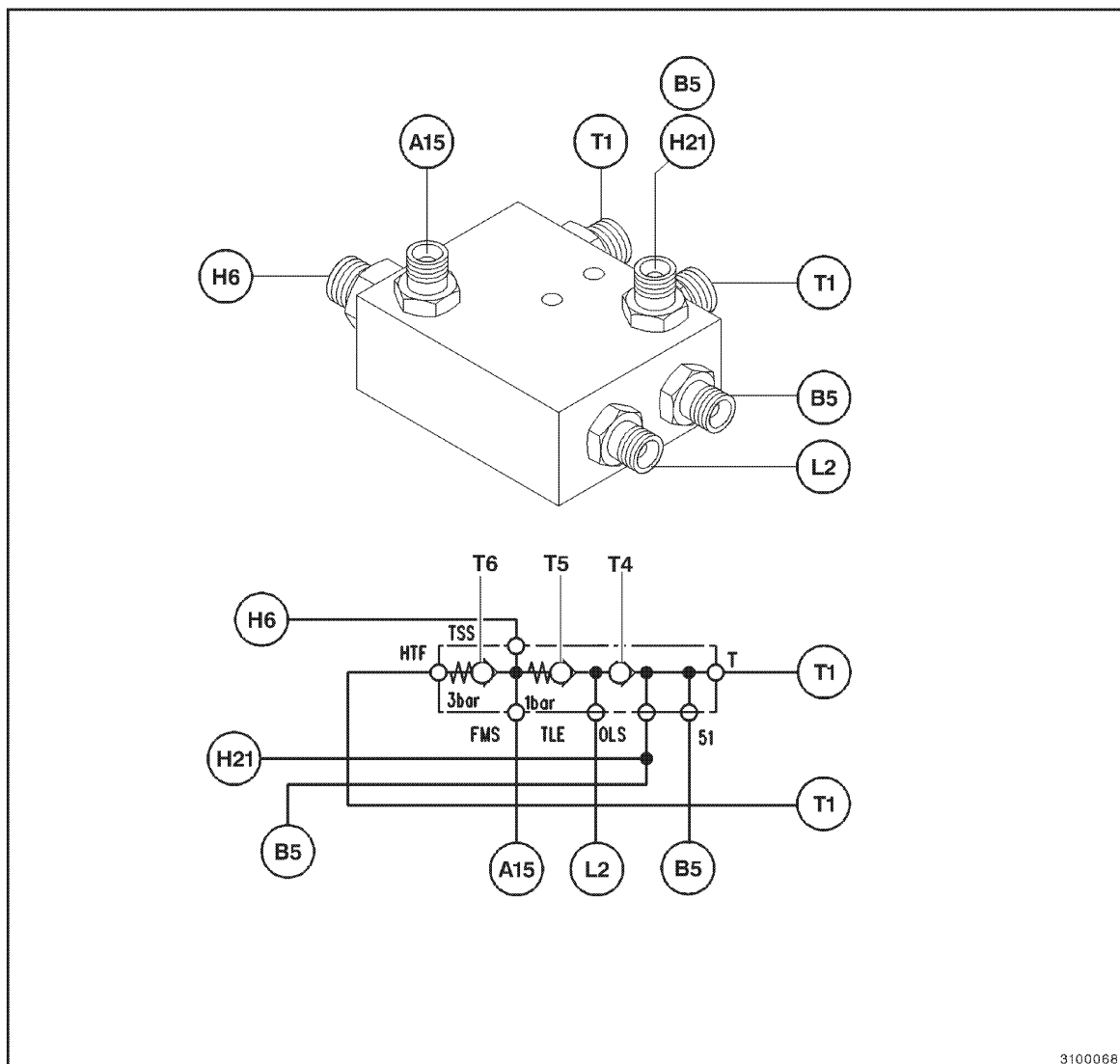


Fig. 9

Items Fig. 9

- A15** - Axial-piston oil motor
- B5** - Brake pedal valve
- H6** - Control block working hydraulics
- H21** - "OLS" valve block with pressure accumulator
- L2** - Steering valve
- T1** - Hydraulic reservoir
- T4** - Check-valve
- T5** - Check-valve
- T6** - Check-valve

Hydraulic connections Fig. 9

- TSS** - Return from control block
- HTF** - Hydraulic reservoir / filter
- T** - Hydraulic reservoir
- FMS** - Travel motor (flushing port)
- TLE** - Return from steering valve
- OLS** - Return from "OLS" and brake valve
- 51** - Return from inching valve in brake pedal

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Adjusting operations on hydrostatic travel drive

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During all checking and adjusting operations performed on the hydrostatic travel drive, the hydraulic oil temperature must be approx. 60 - 70°C.

Mechanical zero position

In normal conditions, the mechanical zero position setting does not change by itself. Checking and/or adjustment is therefore necessary only if:

- the pump had been dismantled and reassembled,
- the driver complains that the loader travels in any of the directions although the travel direction switch is set to neutral. In this case, the functioning of the travel direction switch and of the electromagnetic switching valve (A11) should be checked **beforehand**.

To check the mechanical zero position, install a pressure gauge (range 600 bars) on both measuring ports for travel high pressure (P_{HD}).

Attention:

The machine must now be secured by appropriate measures against moving forwards and backwards. Observe the corresponding safety instructions.

The engine is started and the travel direction selector is in neutral position.

After loosening the retaining nut (9, Fig. 10), the centering spindle (5, Fig. 10) is turned with an 5 mm Allen key until the same pressure value (in this case the feed pressure) is indicated at both ports (P_{HD}).

After the adjustment, the centering spindle (5, Fig. 10) must be secured with the retaining nut (9, Fig. 10).

The mechanical zero position is now adjusted.

Checking and adjusting the travel high pressure

The travel high pressure (P_{HD}) is limited by the high-pressure relief valves (A4) and by the pressure cut-off (A8).

Important:

Maximum high pressure can only be reached, if the displacement volume switch-over function at the hydraulic motor (A15) is deactivated. For this purpose, the regulation start setscrew (2, Fig. 10) is **turned out** by about 3 turns. After this work, the regulation start of the hydraulic motor must be readjusted. During all high pressure measuring operations, speed range 2 (road speed) must be selected at the travel direction selector.

If no readjustment of the travel motor regulation start is desired, the pressure drop caused by slipping wheels can in most cases also be avoided by pulling the handbrake when driving against block and thus by preventing the handbrake switch from cutting out the travel drive.

Adjusting cylinder (A13)

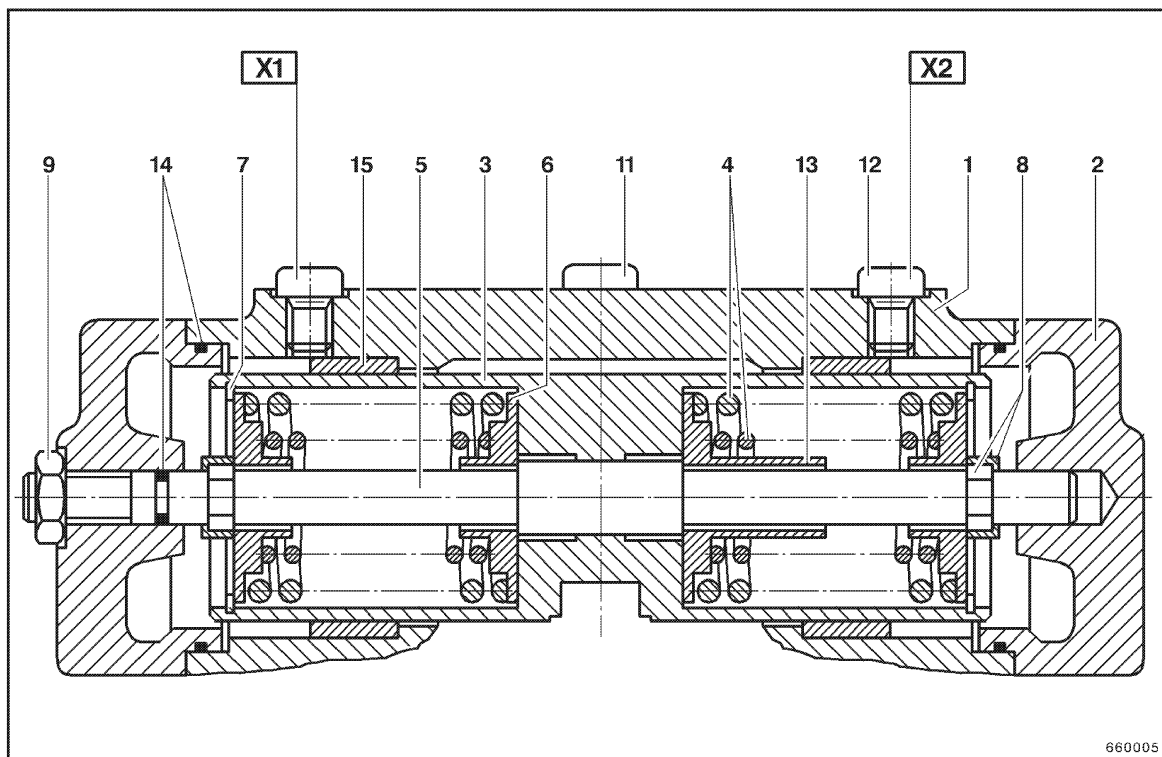


Fig. 10

Items Fig. 10

- 1 - Cylinder bore in pump housing
- 2 - Cover
- 3 - Adjusting piston
- 4 - Compression spring
- 5 - Centering spindle
- 6 - Spring cup
- 7 - Retaining ring
- 8 - Lock-nut / ring and sleeve
- 9 - Retaining nut
- 11 - Vent screw
- 12 - Screw plug for control pressure checking (M 12 x 1,5)
- 13 - Distance sleeve
- 14 - O-ring
- 15 - Bearing bush

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High-pressure relief valve (A4) for LW50.B

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To test the high-pressure relief valve (A4), the adjusting screw of the pressure cut-off (A8, item 1) must first be turned to block position and a pressure gauge (measuring range 600 bars) must be connected to the corresponding measuring port (P_{HD}).

It is advisable first to measure dimension "X" (Fig. 13) at the adjusting screw (A8, item 1) and to make a note of it for later readjustment.

Then drive with the wheel loader in 2nd gear against a wall or a mound of earth, observing the pressure gauge. The maximum attainable pressure is ca. 450 bars, both in forward and in reverse travel.

Unlocking on (A4)

If the wheel loader is to be towed, the hydraulic circuit of the travel motor must be short-circuited (unlocked), as the drive and the wheels are otherwise blocked.

Slacken retaining nut (2, Fig. 11) by 1 1/2 to 2 rotations.

Hold the retaining nut in place with an open-jawed wrench and turn the unlock setscrew (1, Fig. 11) with an Allan key until it is flush with the lock-nut (2, Fig. 11). Tighten the hexagon nut again.

After the towing operation, slacken the retaining nut (2, Fig. 11). Turn the unlock setscrew (1, Fig. 11) counter-clockwise to the limit stop and tighten the retaining nut (2, Fig. 11).

Important:

Travel against the hydraulic pressure relief valves (A4) must not exceed 5 seconds, as they will otherwise be damaged by the high temperature.

It is normally hardly necessary to adjust the hydraulic pressure relief valves (A4).

Should it nevertheless be necessary to adjust the high pressure, the valve must be dismantled and the setscrew (7, Fig. 11) slackened.

The pressure can then be adjusted with the valve spindle (11, Fig. 11).

On completion of adjustment (1 rotation = approximately 44 bars) tighten the setscrew (7, Fig. 11) again and install the valve in the pump housing.

Important:

After installation, the pressure is checked once again.

Hydraulic pressure relief valve (A4), unlockable for LW50.B

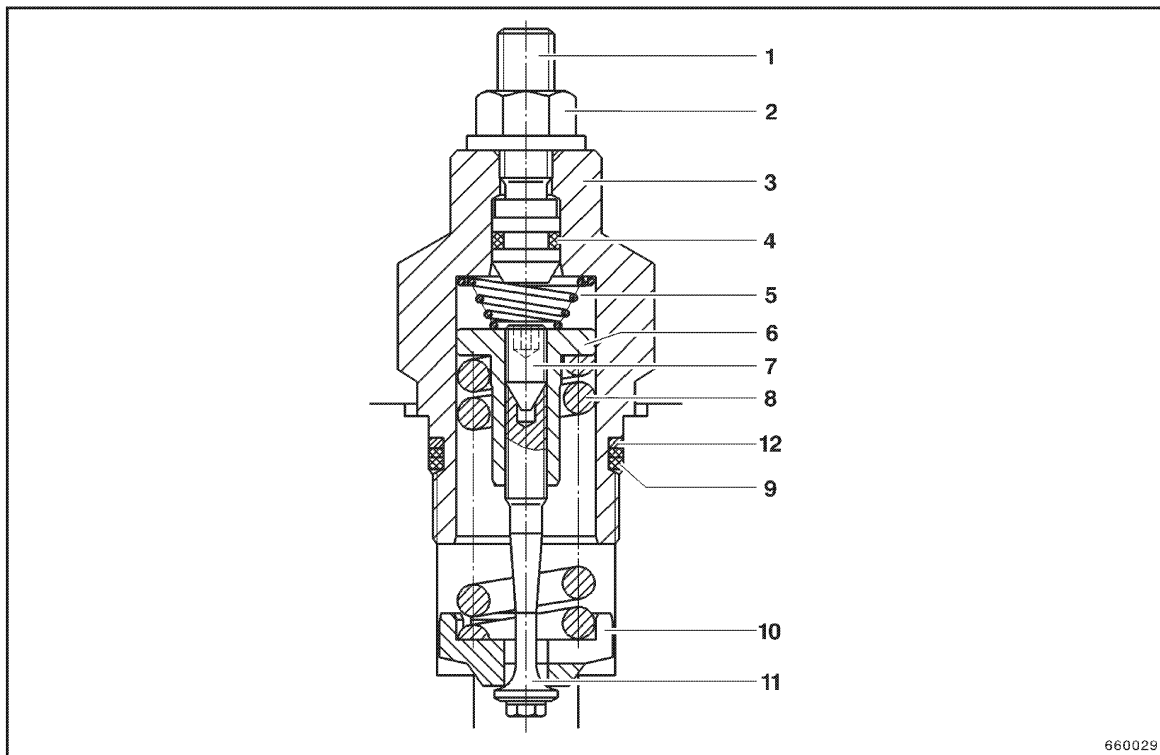


Fig. 11

Items Fig. 11

- 1 - Unlock unlock setscrew / Adjusting screw
for bypass
- 2 - Retaining nut
- 3 - Screw plug
- 4 - Sealing ring
- 5 - Spring
- 6 - Spring tensioner
- 7 - Setscrew
- 8 - Spring
- 9 - O-ring
- 10 - Valve plate
- 11 - Valve spindle
- 12 - Support ring

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High-pressure relief valve (A4) for LW80.B

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To test the high-pressure relief valve (A4), the adjusting screw of the pressure cut-off (A8, item 1) must first be turned to block position and a pressure gauge (measuring range 600 bars) must be connected to the corresponding measuring port (P_{HD}).

It is advisable first to measure dimension "X" (Fig. 13) at the adjusting screw (A8, item 1) and to make a note of it for later readjustment.

Then drive with the wheeled loader in 2nd gear against a wall or a mound of earth, observing the pressure gauge. The maximum attainable pressure is ca. 450 bars, both in forward and in reverse travel.

Important:

Travel against the hydraulic pressure relief valves (A4) must not exceed 5 seconds, as they will otherwise be damaged by the high temperature.

It is normally hardly necessary to adjust the hydraulic pressure relief valves (A4).

Should it nevertheless be necessary to adjust the high pressure, the cap (2, Fig. 12) is removed and the lock-nut (3, Fig. 12) slackened.

The pressure can then be adjusted with the setscrew (1, Fig. 12).

On completion of adjustment, the retaining nut (3, Fig. 12) is retightened and the cap (2, Fig. 12) refitted.

Important:

After tightening of the retaining screw (3, Fig. 12), the pressure is checked once again. The high pressure setting position must be secured after the work by means of a lead seal.

High-pressure relief valve (A4), pilot-operated for LW80.B

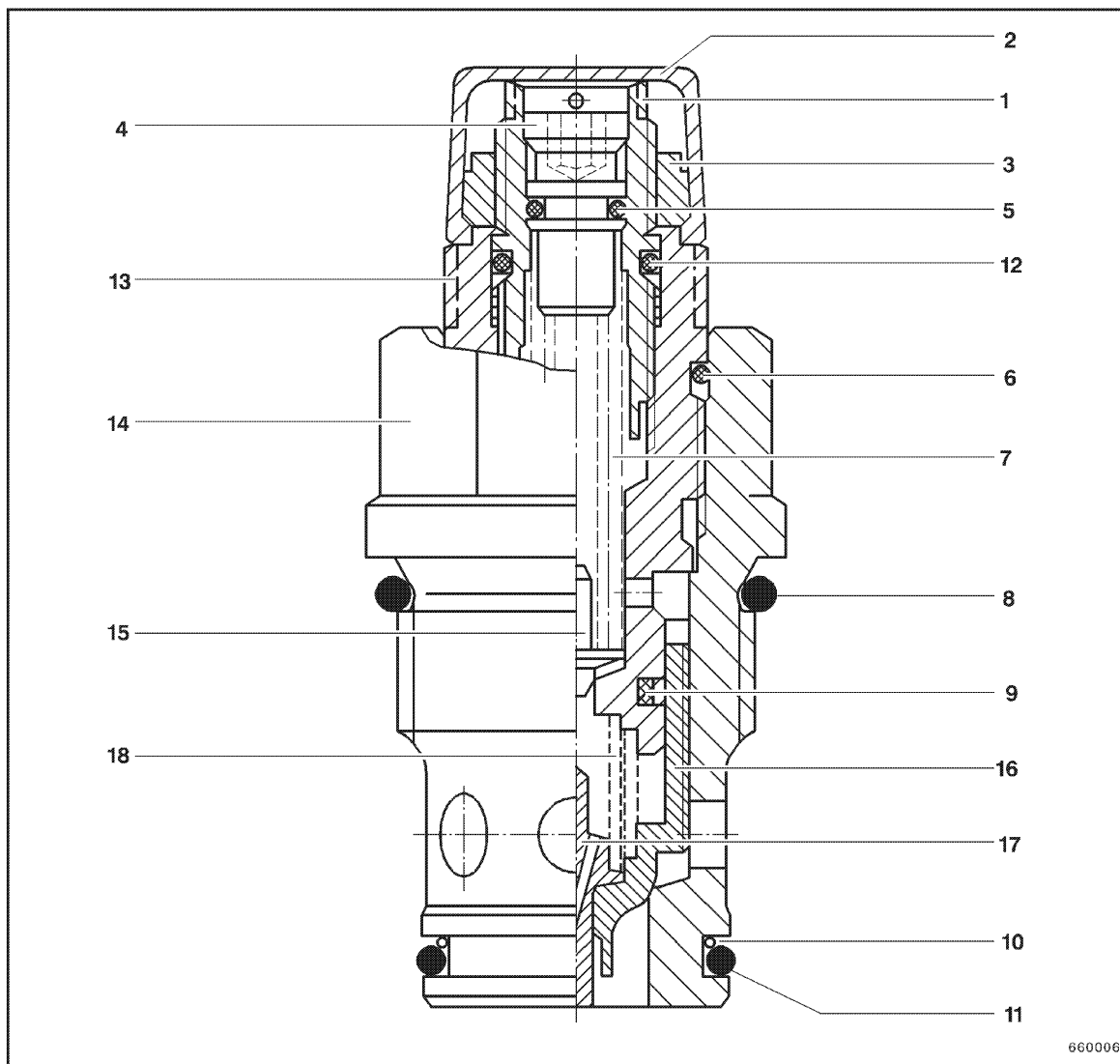


Fig. 12

Items Fig. 12

- | | |
|--|--------------------------------|
| 1 - Setscrew SW 11 | 12 - O-ring |
| 2 - Cap | 13 - Screw plug SW 22 / 100 Nm |
| 3 - Retaining nut SW19 / 20 Nm | 14 - Valve body SW 32 / 150 Nm |
| 4 - Setscrew for bypass - loosen 3 turns max. - SW 4 / 10 Nm | 15 - Pilot piston |
| 5 - O-ring | 16 - Piston |
| 6 - Sealing ring | 17 - Restrictor needle |
| 7 - Spring | 18 - Spring |
| 8 - O-ring | |
| 9 - Piston seal | |
| 10 - Support ring | |
| 11 - O-ring | |

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Suggest:

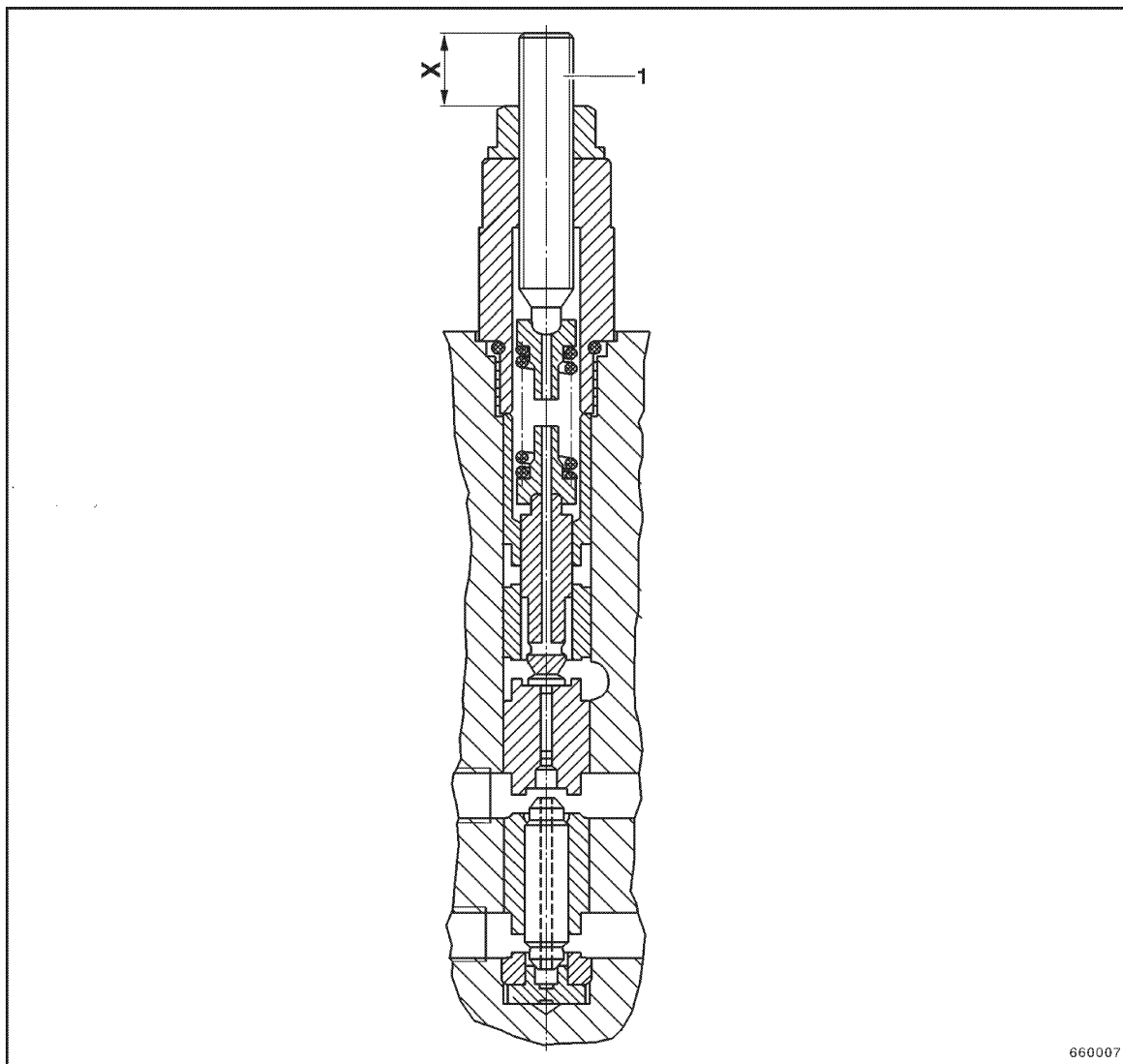
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Pressure cut-off (A8)

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Fig. 13

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