

en

Service Manual

Wheel Loader

L544 - L574



LIEBHERR

en

Service Manual

Wheel Loader

L544 - L574

Address

Address: LIEBHERR-WERK BISCHOFSHOFEN GmbH

Dr. Hans Liebherr - Straße 4
A - 5500 BISCHOFSHOFEN

Product identification

Manufacturer:	LIEBHERR-WERK BISCHOFSHOFEN GmbH			
Product group:	Wheel loader			
Type:	L544	L554	L564	L574
Construction number:	442	452	462	472
Serial number:	from 0101	from 0101	from 0101	from 0101

Document identification

Order number: 8450616
Author: LBH/Dept. - TIP
Document version: 01
Manual number:
Owner:

LBH01//08.99/en

Foreword

Target group	This Service Manual has been written for those whose job it is to make sure that the machines remain operational on a daily basis. This specifically includes the mechanics and workshop specialists at Liebherr dealers and Liebherr branch offices.
Contents	<p>In the first chapter you will find information about safety regulations as well as specifications of the special tools needed for maintenance and repair. Chapter 2 provides an overview of all important technical data for the entire machine and the individual assemblies.</p> <p>The next chapter "Maintenance" contains the maintenance and inspection schedule, lubrication schedules and filling quantity tables, a description of maintenance procedures, and specifications for prescribed lubricants and fuels. The description of maintenance procedures is arranged according to maintenance intervals. Adjustment of the hydraulic system is part of the maintenance and inspection schedule and is therefore described as a maintenance procedure.</p> <p>The technical description of the machine in the following chapters is divided into 15 functional groups. The design, function, and technical data for each group, components and parts will be explained.</p> <p>This manual does not contain repair instructions. Repair manuals for individual components are available upon request.</p>
Operating information	<p>This manual describes a variety of types and finished forms. In general, this information applies to the types and serial number groups specified in the footnotes. One exception is that specific type and serial number data are indicated at the beginning of each section (e.g., the technical specifications of the components).</p> <p>Whenever possible, parts and components are supplemented by indication of the identification number in the heading.</p> <p>This manual is available in German, English and French.</p>
Working instructions	<p>It is imperative that safety regulations be observed with all tasks done on the machine. You will find details on this in the Chapter "General Information".</p> <p>A complete set of tools in perfect condition is required for work on the machine, along with any special tools that might be needed. Absolute cleanliness must be observed with all tasks!</p> <p>Sealing material such as O-rings, surface seals, etc. should be replaced whenever repairs are carried out.</p>
CD edition	We would particularly like to draw your attention to the fact that this book is available not only in printed form, but also as an electronic document on CD.

General information	1
Technical data	2
Maintenance	3
Diesel engine, Pump distributor gear	4
Cooling system	5
Travel hydraulics	6
Working hydraulics	7
Steering system	8
Brake system	9
Electrical system	10
Transfer gear	11
Axles, Tyres	12
Vehicle frame, Ballast weight	13
Central lubrication system	14
Covering, Cab access	15
Cab, Heating, Air conditioning system	16
Lift arm, Quick change device	17
Attachments, Accessories	18

1 General information

Chapter contents

1	<u>General information</u>	1.0 - 1
1.1	<u>Safety regulations</u>	1.1 - 1
1.1.1	<u>Introduction</u>	1.1 - 1
1.1.2	<u>Safety instructions and regulations</u>	1.1 - 1
1.2	<u>Special tools for maintenance and repair work</u>	1.2 - 1
1.2.1	<u>Special tools, general</u>	1.2 - 1
1.2.2	<u>Special tools for the electrics</u>	1.2 - 1
1.2.3	<u>Special tools for Liebherr diesel engines</u>	1.2 - 2
1.2.4	<u>Special tools for the hydraulic cylinders</u>	1.2 - 2
1.2.5	<u>Special tools for ZF axles</u>	1.2 - 3

1.1 Safety regulations

Working on the machine involves possible risk to life and limb of the operator, driver or maintenance technician. You can considerably reduce the risk of accidents by always measurement and following the various safety instructions carefully.

This is especially important for specialists who only occasionally work on the machine, for example, carrying out rigging or maintenance work.

The safety regulations listed below, if conscientiously followed, will ensure your own safety and that of others, and will prevent the machine from being damaged.

Whenever tasks are described in this manual which could cause danger for specialists or damage to the machine, the necessary safety precautions are explained.

These are indicated by the headings – **Danger Warning** or **Caution** –.

1.1.1 Introduction

1. The symbols below have the following significance:



"Danger"

Warning that without appropriate precautions, certain operational procedures could result in fatal accidents.



"Warning"

Warning that without appropriate precautions, certain operational procedures could result in severe physical injuries.



"Caution"

Warning that without appropriate precautions, certain operational procedures could result in less severe physical injuries or damage to the machine.

2. **Observance of these instructions does not relieve you of the responsibility for following any additional rules and guidelines that may apply!**

The following should also be observed:

- the safety rules in force at the operating site,
- legally enforceable "traffic regulations",
- guidelines issued by the employers' liability assurance associations.

1.1.2 Safety instructions and regulations

1. A detailed description of these is included in the relevant section of the **Operator's manual** – "Safety regulations" section.
2. The following sections are described in the **Operator's manual**.

Overview of safety regulations:

- 1 General safety precautions
- 2 Proper use
- 3 Signs on the machine
- 4 Instructions for avoiding crushing injuries and burns
- 5 Instructions for avoiding the risk of fire and explosions
- 6 Instructions for starting up safely
- 7 Safety precautions at start-up
- 8 Instructions for working safely
- 9 Safety instructions for driving on slopes
- 10 Parking safely
- 11 Transporting the machine safely
- 12 Towing the machine safely
- 13 Measures for ensuring safe maintenance
- 14 Safety instructions for welding work on the machine
- 15 Instructions for working safely on machine attachments
- 16 Safety regulations when transporting the machine by crane
- 17 Safe maintenance of hydraulic hoses and hose lines
- 18 Attachments and accessories

1.2 Special tools for maintenance and repair work

1.2.1 Special tools, general

Name	Identno.	Use	Notes
Digital-second thermometer	7020372	All wheel loaders	For taking temperature measurements during adjustment work
DCA 4 coolant test kit	5608459	All wheel loaders	For testing DCA 4 and antifreeze levels
24 Volt vacuum pump	7408148	All wheel loaders	For preventing oil loss
Charging and testing device with case	8145359	All wheel loaders	For testing the hydro accumulators
0-40 bar pressure gauge	7361288	All wheel loaders	For testing hydraulic pressures
0-250 bar pressure gauge	5002932	All wheel loaders	For testing hydraulic pressures
0-600 bar pressure gauge	5002866	All wheel loaders	For testing hydraulic pressures
Pressure gauge connection	7002436	All wheel loaders	Connection for pressure gauge
1500 mm high-pressure tube	7002475	All wheel loaders	High-pressure tube for pressure gauge
4000 mm high-pressure tube	7009134	All wheel loaders	High-pressure tube for pressure gauge
Screw coupling M 10 x 1	5005180	All wheel loaders	For testing hydraulic pressures
Oil drain hose	7005660	All wheel loaders	For draining oil via an outlet valve
Outlet piece	7402657	All wheel loaders	For the oil drain hose
Safety cap SW 10	7009315	All wheel loaders	For securing the valves on the variable displacement motor
Safety cap SW 13	7615515	All wheel loaders	For securing the valves on the pumps
Safety cap SW 17	7615589	All wheel loaders	For securing the valves on the pumps
Safety cap SW 19	7009317	All wheel loaders	For securing the valves on the pumps
Safety cap SW 17	7622068	All wheel loaders	For securing the valves on the control valve block

1.2.2 Special tools for the electricians

Name	Identno.	Use	Notes
Digital multimeter	8502956	All wheel loaders	For measuring electrical voltage, current, resistance and number of cycles
Solenoid tester	8145743	All wheel loaders	For checking solenoid valves
Manual crimping tool	8145434	All wheel loaders	For MATE-N-LOCK connectors
Insertion tool	8145432	All wheel loaders	For MATE-N-LOCK connectors
Extraction tool	8145433	All wheel loaders	For MATE-N-LOCK connectors
Manual crimping tool	7367086	All wheel loaders	For DEUTSCH connectors
Removal tool for pin and bushing	8145674	All wheel loaders	For DEUTSCH connectors

1.2.3 Special tools for Liebherr diesel engines

Name	Identno.	Use	Notes
Compression tester	8008782	924 D and 926 D	For testing compression levels
Injection nozzle tester	7361236	924 D and 926 D	For testing injection nozzles
Adapter for compression tester	0524044	924 D and 926 D	In place of the injection nozzle
High pressure hand pump with accessories	7009318	924 D and 926 D	For testing the delivery begin of the injection pump
Extracting device for injection nozzles	0524072	924 D and 926 D	For removing injection nozzles
Adapter for extracting device	0524029	924 D and 926 D	For use with extracting device
Torque angle indicator	0524062	924 D and 926 D	For cylinder head, main-, and connection lug bearing screws
Krikrit 2 V-belt gauge	8042829	924 D and 926 D	For testing the V-belt tension
Fly cranking device for wheel	0524045	924 D and 926 D	For turning the engine flywheel

1.2.4 Special tools for the hydraulic cylinders

Name	Identno.	Use	Notes
80 mm installation sleeve	9227165	Steering cylinder L544, L554	For installation of the seals
90 mm installation sleeve	9227161	Steering cylinder L564, L574	For installation of the seals
130 mm installation sleeve	9998624	Lift cylinder L544, L554	For installation of the seals
150 mm installation sleeve	9998622	Tilt cylinder L544, L554 Lift cylinder L564, L574	For installation of the seals
170 mm installation sleeve	9107931	Tilt cylinder L564, L574	For installation of the seals
80 mm expansion tube	9227166	Steering cylinder L544, L554	For installation of the seals
90 mm expansion tube	9227162	Steering cylinder L564, L574	For installation of the seals
130 mm expansion tube	9110408	Lift cylinder L544, L554	For installation of the seals
150 mm expansion tube	9110410	Tilt cylinder L544, L554 Lift cylinder L564, L574	For installation of the seals
170 mm expansion tube	9110412	Tilt cylinder L564, L574	For installation of the seals
Assembly wrench - bearing head 70/8 mm	9210219	Steering cylinder L544, L554	For installation of the bearing head
Assembly wrench - bearing head 75/12 mm	9239572	Steering cylinder L564, L574	For installation of the bearing head
Assembly wrench - piston 88/12 mm	8007365	Steering cylinder L544, L554	For installation of the piston
Assembly wrench - piston 100/14 mm	8007366	Steering cylinder L564, L574	For installation of the piston

1.2.5 Special tools for ZF axles

Name	Identno.	Use	Notes
Hand pump	8145835	AP 409, AP 411, AP 415, AP 417	For testing the disc brake seals
Clamping pliers	7009536	AP 409, AP 411, AP 415, AP 417	For locking or releasing the snap ring
Spring hook	8145767	AP 409, AP 411, AP 415, AP 417	For locking or releasing the return springs
260 mm slip bushing	7017559	AP 409, AP 411	Installation aid for brake piston
315 mm slip bushing	7017556	AP 415, AP 417	Installation aid for brake piston
Slip bushing M 90 x 1.5 mm	7017558	AP 409	Installation aid for ring gear carrier
Slip bushing M 110 x 1.5 mm	7017557	AP 411, AP 415	Installation aid for ring gear carrier
Slip bushing M 130 x 1.5 mm	7017555	AP 417	Installation aid for ring gear carrier
Handle	7017566	AP 409, AP 411, AP 415, AP 417	Handle with mounting tool
Mounting tool	7017563	AP 409	For installation of grooved nuts
Mounting tool	7017560	AP 411, AP 415, AP 417	Installation aid for sealing ring cartridge
Centering shackle	7013775	AP 409, AP 411, AP 415, AP 417	For grooved nut spanner
111 mm grooved nut spanner	7009537	AP 409	For installation of grooved nuts
140 mm grooved nut spanner	7011251	AP 411, AP 415	For installation of grooved nuts
169 mm grooved nut spanner	7013774	AP 417	For installation of grooved nuts
M 16 x 1.5 micrometer gauge	7019556	AP 409, AP 411, AP 415	For measuring wear on the brake discs
M 16 x 1.5 micrometer gauge	8145771	AP 417	For measuring wear on the brake discs
Clamping fork	7011522	AP 409, AP 411, AP 415, AP 417	For installation of the drive flange
Mounting tool	7013922	AP 409, AP 411, AP 415, AP 417	Installation aid for shaft sealing ring
71 mm grooved nut spanner	7013773	AP 409, AP 411, AP 415, AP 417	For installation of grooved nuts on the axle drive

2 Technical data

Chapter contents

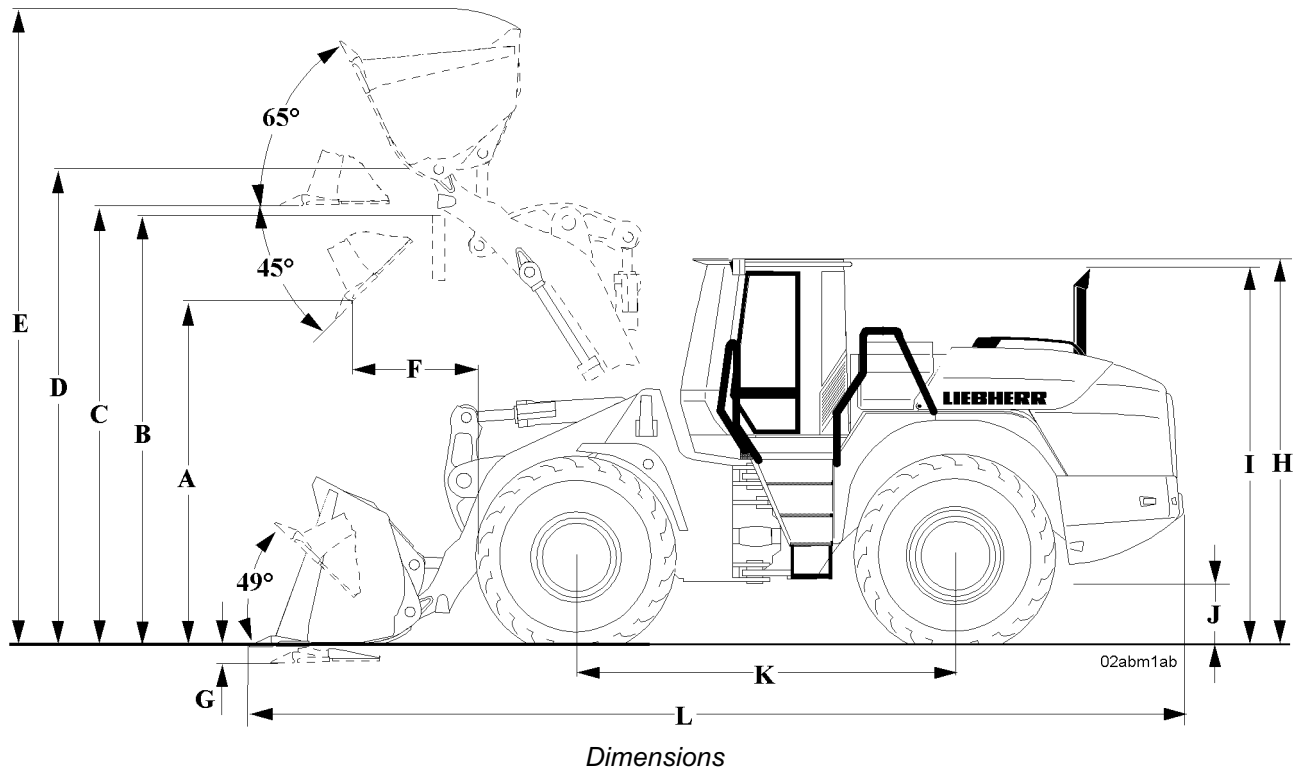
2	Technical data	2.0 - 1
2.1	Technical data	2.1 - 1
2.1.1	Complete machine	2.1 - 1
2.1.2	Diesel engine, Pump distributor gear	2.1 - 7
2.1.3	Cooling system	2.1 - 10
2.1.4	Travel hydraulics	2.1 - 10
2.1.5	Working hydraulics	2.1 - 12
2.1.6	Steering system	2.1 - 14
2.1.7	Brake system	2.1 - 16
2.1.8	Electrical system	2.1 - 16
2.1.9	Transfer gear	2.1 - 17
2.1.10	Axles, Tyres	2.1 - 17
2.1.11	Cab, Heating, Air conditioning system	2.1 - 18
2.1.12	Lift arm, Quick change device	2.1 - 19
2.1.13	Attachments, Accessories	2.1 - 19

2.1 Technical data

2.1.1 Complete machine

Wheel loader L544 Valid for: L544-442/0101-

The specified values apply for a machine with a 2.8 m³ toothed loading bucket and Michelin 23.5 R25 XHA tyres.



Name	Value	Unit
Bucket capacity	2.8	m ³
Bucket width	2700	mm
Specific material weight	1.8	t/m ³
A Dump height with max. lifting height and 45° tilt out angle	2970	mm
B Max. dump height	3500	mm
C Max. height bucket base	3645	mm
D Max. height of bucket pivot point	3915	mm
E Max. height of bucket upper edge	5275	mm
F Reach with max. lifting height and 45° tilt out angle	990	mm
G Digging depth	85	mm
H Height above cab	3355	mm
I Height above exhaust	3265	mm
J Ground clearance	530	mm

Name	Value	Unit
K Wheel base	3150	mm
L Overall length	7715	mm
Turning radius at bucket outer edge	6220	mm
Lifting force (SAE)	170	kN
Breakout force (SAE)	135	kN
Tipping load when straight *	12300	kg
Tipping load, articulated 35° *	11170	kg
Tipping load, articulated 40° *	10840	kg
Articulation angle	40	°
Operating weight	15000	kg
Travel speed – travel range 1, forward and reverse	0–7.0	km/h
Travel speed – travel range 2, forward and reverse	0–16.5	km/h
Travel speed – travel range A2 (Automatic), forward and reverse	0–16.5	km/h
Travel speed – travel range A3 (Automatic), forward and reverse	0–38.0	km/h

* The stated values refer to Michelin 23.5 R25 XHA tyres, inclusive of all lubricants, full fuel tank, ROPS/FOPS cab and driver.