



**Document ID**

**Order number:** .....dfY]a ]bUfmj Yfg]cb  
**Issued:** 2014-10  
**Version:** preliminary version  
**Author:** LBH / Technical Documentation Department

**Product ID**

**Manufacturer:** Liebherr Machinery (DaLian) Co. Ltd.  
**Valid for:** L 580-1412  
**Contact** Liebherr Machinery (DaLian) Co. Ltd.  
No.30, Wanli Street  
Dalian -



## Notes for the user

This service handbook is designed for trained specialists of the Liebherr organisation and their dealers.

This service handbook contains special knowledge for repairing Liebherr construction machines. Basic specialist knowledge on electronics, hydraulics, mechanics and engine technology is not contained in this service handbook. Therefore specialized training and qualifications are necessary. Liebherr recommends participation in the Liebherr training program for construction machines.

In this service handbook you will find information on:


- Special tools
- Technical data
- Maintenance intervals and maintenance tasks
- Testing and adjustment tasks
- Structure and function descriptions
- Removal and installation tasks
- Circuit diagrams, hydraulic plans and technical drawings

You will find information on controls and operation in the operating instructions. Information on spare parts are in the spare parts catalogue. Please observe the local accident prevention laws.

This document may only be duplicated, even in part, with the permission of Liebherr.



Technical changes are reserved.


## Warning symbols

	This is the warning symbol. It warns you of potential injuries. To prevent injury or death, carry out all the measures identified by this warning symbol.
---	---

The warning symbol always appears together with the signal words

**DANGER**  
**WARNING**  
**CAUTION**

	<b>DANGER</b>	Indicates a hazardous situation that will immediately lead to serious or fatal injury if it is not avoided.
	<b>WARNING</b>	Indicates a hazardous situation that may lead to serious or fatal injury if it is not avoided.

	<b>CAUTION</b>	Indicates a hazardous situation that may lead to minor or moderate injury if it is not avoided.
	<b>ATTENTION</b>	Indicates a hazardous situation that may lead to damage if it is not avoided.

## Structure of warnings

Warnings in this document are structured as follows:







### **WARNING**

Here you will find information about the type and source of danger. Here you will be informed about possible consequences of not paying attention to the warning.

▶ Here you will be called on to take measures to avoid the dangerous situation.

## Other designations

Symbol	Meaning
	<b>Note</b> Indicates useful tips and information.
	This symbol means: Carry out a task.
	This symbol means: Requirements must be fulfilled.
	This symbol means: Results of a task.
-	This symbol indicates a list.

*Symbols*

# Contents

<b>010</b>	<b>Introduction</b>	010-1
010.1	Safety instructions	010-3
010.1.1	General safety instructions	010-3
010.1.2	Instructions on preventing crushing injuries and burns	010-4
010.1.3	Instructions on preventing fires and explosions	010-4
010.1.4	Safety instructions for start-up	010-5
010.1.5	Safety precautions during start-up	010-5
010.1.6	Instructions for safe working	010-6
010.1.7	Safety instructions for driving on slopes	010-7
010.1.8	Parking safely	010-7
010.1.9	Transporting the machine safely	010-7
010.1.10	Towing the machine safely	010-8
010.1.11	Measures for ensuring safe maintenance	010-8
010.1.12	Safety instructions for maintenance work on machines with hydro accumulators	010-11
010.1.13	Safety instructions for welding work on the machine	010-11
010.1.14	Instructions for working safely on the working attachment	010-11
010.1.15	Safety instructions for transporting the machine by crane	010-12
010.1.16	Safe maintenance of hydraulic hoses and hose lines	010-12
010.1.17	Roll-over protection structure (ROPS) and falling object protection structure (FOPS)	010-13
010.1.17.1	Preventing accidents	010-13
010.1.17.2	Preventing injuries	010-13
010.1.18	Attachments and accessories	010-14
010.1.19	Protection against vibrations	010-14
010.1.20	See and be seen	010-15
010.1.20.1	Field of view	010-15
010.1.20.2	Measures before and during operation	010-15
010.2	Special tools for maintenance and repair work	010-16
010.2.1	Special tools in general	010-16

010.2.2	Special tools for the diesel engine	010-16
010.2.3	Special tools for the electrical system	010-17
010.2.4	Special tools for the air conditioning system	010-18
010.2.5	Special tools for cab glazing	010-18
010.2.6	Special tools for the central lubrication system (Beka Max)	010-19
010.3	Standards and regulations	010-20
010.3.1	Prestressing forces and tightening torques for bolts with metric standard and fine threads	010-20
010.3.2	Assembly instructions for the piston and piston nut of the hydraulic cylinder (WN 4121)	010-24
010.3.2.1	Range of application and purpose	010-24
010.3.2.2	Requirements and description	010-24
010.3.2.3	Amendments	010-29
010.3.2.4	Other applicable documents	010-29
010.3.2.5	Maximum permissible adapter operating pressure	010-34
010.4	Preservation guidelines	010-35
010.4.1	General information	010-35
010.4.2	Putting the machine out of service – unknown duration	010-35
010.4.3	Putting the machine out of service	010-36
010.4.3.1	Out of service for up to 2 months	010-36
010.4.3.2	Out of service for up to 12 months	010-37
010.4.3.3	Out of service for longer than 12 months	010-38
010.4.4	Putting back into service	010-38
010.4.4.1	After being out of service for 2 months	010-38
010.4.4.2	After being out of service for 12 months	010-39
010.4.4.3	After being out of service for longer than 12 months	010-39
<b>020</b>	<b>Technical data</b>	<b>020-1</b>
020.1	Drive group	020-3
020.1.1	Engine <i>L580-1412/28181-;</i>	020-3
020.1.2	Fuel tank <i>L580-1412/28181-;</i>	020-4
020.1.3	Fuel level sensor <i>L580-1412/28181-;</i>	020-4
020.1.4	Fuel pre-filter (separator filter) <i>L580-1412/28181-;</i>	020-4

020.1.5	Air filter vacuum switch <i>L580-1412/28181-;</i>	020-4
020.1.6	Clutch <i>L580-1412/28181-;</i>	020-5
020.1.7	Splitter box <i>L580-1412/28181-;</i>	020-5
020.2	Electrical system	020-6
020.2.1	Central control unit (Master 4) <i>L580-1412/28181-;</i>	020-6
020.2.2	Output module <i>L580-1412/28181-;</i>	020-6
020.2.3	Battery <i>L580-1412/28181-;</i>	020-6
020.3	Transmission	020-8
020.3.1	Transmission <i>L580-1412/28181-;</i>	020-8
020.3.2	Gear shifting solenoid valves <i>L580-1412/28181-;</i>	020-8
020.3.3	Speed sensors <i>L580-1412/28181-;</i>	020-8
020.3.4	Transmission gear pump <i>L580-1412/28181-;</i>	020-9
020.4	Steel components of the basic machine	020-10
020.4.1	Ballast weight <i>L580-1412/28181-;</i>	020-10
020.5	Cab, heating and air conditioning	020-11
020.5.1	Heating, air conditioning <i>L580-1412/28181-;</i>	020-11
020.5.2.1	Air conditioning	020-11
020.5.3.1	Air conditioning compressor	020-11
020.5.4	Condenser <i>L580-1412/28181-;</i>	020-11
020.5.5	Dryer <i>L580-1412/28181-;</i>	020-12
020.5.6	Air conditioning pressure switch <i>L580-1412/28181-;</i>	020-12
020.6	Lubrication system	020-13
020.6.1	Central lubrication system (Liebherr) <i>L580-1412/28181-;</i>	020-13
020.6.1.1	Central lubrication pump	020-13
020.6.1.2	Progressive distributor	020-13

020.6.2	Progressive distributor <i>L580-1412/28181-;</i>	020-14
020.6.2.1	MX-F	020-14
020.6.2.2	MX-F 25	020-14
020.6.2.3	MX-F 45	020-15
020.6.2.4	MX-F 75	020-15
020.6.2.5	MX-F105	020-15
<b>030</b>	<b>Maintenance</b>	030-1
030.1	Maintenance and inspection schedule	030-9
030.2	Filling quantities and lubrication chart	030-13
030.2.1	Recommended lubricants <i>L580-1412/28181-;</i>	030-13
030.2.2	Recommended operating fluids <i>L580-1412/28181-;</i>	030-14
030.3	Lubricants and fuels	030-15
030.3.1	General information on changing lubricants and fuels	030-15
030.3.2	Converting the hydraulic system from mineral oils to environmentally harmless hydraulic fluids	030-15
030.3.3	Diesel fuels <i>L580-1412/28181-;</i>	030-16
030.3.3.1	Specification	030-16
030.3.3.2	High sulphur content in the diesel fuel	030-16
030.3.3.3	Diesel fuel at low temperatures (winter operation)	030-17
030.3.4	Lubricating oils for diesel engines <i>L580-1412/28181-;</i>	030-17
030.3.4.1	Lubricating oil quality	030-17
030.3.4.2	Lubricating oil viscosity	030-17
030.3.4.3	Lubricating oil change intervals	030-18
030.3.5	Coolants for diesel engines <i>L580-1412/28181-;</i>	030-19
030.3.5.1	General recommendations	030-19
030.3.5.2	Water (fresh water)	030-19
030.3.5.3	Coolant - Mixing ration	030-20
030.3.5.4	Permissible antifreeze and corrosion inhibitors	030-20
030.3.5.5	Corrosion inhibitors without antifreeze	030-20
030.3.6	Hydraulic oil <i>L580-1412/28181-;</i>	030-21
030.3.6.1	Liebherr hydraulic oil	030-21



	030.3.6.2	Using engine oil as hydraulic oil	030-22
	030.3.6.3	Warming up	030-22
	030.3.6.4	Biodegradable hydraulic oils	030-23
	030.3.6.5	Changing the oil, analysing the oil, changing filters	030-23
030.3.7	Lubricating oils for splitter boxes <i>L580-1412/28181-;</i>		030-25
030.3.8	Lubricating oils for transmissions <i>L580-1412/28181-;</i>		030-25
030.3.9	Lubricating oils for axles <i>L580-1412/28181-;</i>		030-26
030.3.10	Lubrication grease and other lubricants <i>L580-1412/28181-;</i>		030-27
	030.3.10.1	Minimum quality requirements	030-27
	030.3.10.2	Liebherr lubrication grease	030-27
030.4	Maintenance tasks		030-29
030.4.1	Safety precautions <i>L580-1412/28181-;</i>		030-29
030.4.2	Preparatory tasks for maintenance		030-30
	030.4.2.1	Maintenance positions <i>L580-1412/28181-;</i>	030-30
	030.4.2.2	Opening the service accesses <i>L580-1412/28181-;</i>	030-31
	030.4.2.3	Turning off the battery main switch <i>L580-1412/28181-;</i>	030-34
030.4.3	Overall machine		030-34
	030.4.3.1	Checking the machine for external damage <i>L580-1412/28181-;</i>	030-34
	030.4.3.2	Removing loose parts, dirt, ice and snow from the machine <i>L580-1412/28181-;</i>	030-34
	030.4.3.3	Cleaning the machine <i>L580-1412/28181-;</i>	030-35
	030.4.3.4	Shutting down the machine for a lengthy period <i>L580-1412;</i>	030-36
	030.4.3.5	Checking the machine for leaks <i>L580-1412/28181-;</i>	030-37
	030.4.3.6	Making sure the bolted connections are tight <i>L580-1412/28181-;</i>	030-37
	030.4.3.7	Corrosion protection on machines that work with salt and artificial fertilisers and exchanging VCI capsules <i>L580-1412/28181-;</i>	030-37
	030.4.3.8	Oil analyses <i>L580-1412/28181-;</i>	030-37

030.4.4	Drive group	030-44
030.4.4.1	Checking the engine oil level <i>L580-1412/28181-;</i>	030-44
030.4.4.2	Changing the engine oil <i>L580-1412/28181-;</i>	030-45
030.4.4.3	Changing the engine oil filter <i>L580-1412/28181-;</i>	030-46
030.4.4.4	Checking the V-ribbed belt on the engine <i>L580-1412/28181-;</i>	030-47
030.4.4.5	Changing the V-ribbed belt on the engine <i>L580-1412/28181-;</i>	030-49
030.4.4.6	Checking the engine valve clearance <i>L580-1412/28181-;</i>	030-49
030.4.4.7	Checking the bleeder filter of the crankcase <i>L580-1412/28181-;</i>	030-52
030.4.4.8	Checking the crankshaft torsional vibration damper <i>L580-1412/28181-;</i>	030-53
030.4.4.9	Changing the crankshaft torsional vibration damper <i>L580-1412/28181-;</i>	030-55
030.4.4.10	Draining off condensate and sediment from the fuel tank <i>L580-1412/28181-;</i>	030-57
030.4.4.11	Draining off condensate from the Separ fuel pre-filter <i>L580-1412/28181-;</i>	030-58
030.4.4.12	Draining off condensate from the fuel pre-filter <i>L580-1412/28181-;</i>	030-58
030.4.4.13	Changing the Separ fuel pre-filter insert <i>L580-1412/28181-;</i>	030-59
030.4.4.14	Changing the fuel pre-filter <i>L580-1412/28181-;</i>	030-61
030.4.4.15	Changing the fuel fine filter <i>L580-1412/28181-;</i>	030-62
030.4.4.16	Bleeding the fuel system <i>L580-1412/28181-;</i>	030-63
030.4.4.17	Cleaning the air filter service cover and dust discharge valve <i>L580-1412/28181-;</i>	030-63
030.4.4.18	Checking the air suction hoses for leaks and tight fitting <i>L580-1412/28181-;</i>	030-64
030.4.4.19	Changing the air filter main element <i>L580-1412/28181-;</i>	030-65
030.4.4.20	Changing the air filter safety element <i>L580-1412/28181-;</i>	030-66

030.4.4.21	Checking the oil level in the splitter box <i>L580-1412/28181-;</i>	030-67
030.4.4.22	Changing the splitter box oil <i>L580-1412/28181-;</i>	030-67
030.4.4.23	Checking the exhaust system for leaks and tight fitting <i>L580-1412/28181-;</i>	030-68
030.4.5	Cooling system	030-69
030.4.5.1	Checking the coolant level <i>L580-1412/28181-;</i>	030-69
030.4.5.2	Checking the coolant antifreeze and corrosion inhibitor concentration <i>L580-1412/28181-;</i>	030-70
030.4.5.3	Cleaning the cooling system <i>L580-1412/28181-;</i>	030-75
030.4.5.4	Changing the coolant <i>L580-1412/28181-;</i>	030-76
030.4.6	Working hydraulics	030-78
030.4.6.1	Checking the oil level in the hydraulic tank <i>L580-1412/28181-;</i>	030-78
030.4.6.2	Checking and cleaning the magnetic rod on the hydraulic tank <i>L580-1412/28181-;</i>	030-80
030.4.6.3	Draining off condensate and sediment from the hydraulic tank <i>L580-1412/28181-;</i>	030-81
030.4.6.4	Changing the hydraulic tank return suction filter <i>L580-1412/28181-;</i>	030-82
030.4.6.5	Changing the hydraulic tank breather filter <i>L580-1412/28181-;</i>	030-83
030.4.6.6	Hydraulic tank - changing the oil in the hydraulic system <i>L580-1412/28181-;</i>	030-83
030.4.6.7	Lubricating the solenoids, universal joints and tappets on the pilot control unit <i>L580-1412/28181-;</i>	030-85
030.4.7	Steering system	030-85
030.4.7.1	Testing the steering <i>L580-1412/28181-;</i>	030-85
030.4.7.2	Lubricating the bearing points on the steering cylinders <i>L580-1412/28181-;</i>	030-86
030.4.8	Brake system	030-86
030.4.8.1	Testing the service brake and parking brake <i>L580-1412/28181-;</i>	030-86

030.4.8.2	Checking the service brake discs for wear <i>L580-1412/28181-;</i>	030-87
030.4.8.3	Checking the gap and wear on the parking brake linings <i>L580-1412/28181-;</i>	030-89
030.4.9	Electrical system	030-92
030.4.9.1	Checking the lights <i>L580-1412/28181-;</i>	030-92
030.4.9.2	Checking the batteries, fluid level and terminals <i>L580-1412/28181-;</i>	030-93
030.4.9.3	Changing the travel direction rocker switch and cap (optional) on the control lever <i>L580-1412/28181-;</i>	030-94
030.4.10	Transmission	030-97
030.4.10.1	Checking the transmission oil level <i>L580-1412/28181-;</i>	030-97
030.4.10.2	Changing the transmission oil <i>L580-1412/28181-;</i>	030-98
030.4.10.3	Changing the transmission oil filter <i>L580-1412/28181-;</i>	030-99
030.4.11	Axles and cardan shafts	030-100
030.4.11.1	Checking the axle oil levels <i>L580-1412/28181-;</i>	030-100
030.4.11.2	Changing the axle oil <i>L580-1412/28181-;</i>	030-100
030.4.11.3	Checking the cardan shafts <i>L580-1412/28181-;</i>	030-102
030.4.11.4	Checking the tyre pressure <i>L580-1412/28181-;</i>	030-102
030.4.11.5	Checking the wheel tightness <i>L580-1412/28181-;</i>	030-103
030.4.12	Steel components of the basic machine	030-103
030.4.12.1	Lubricating the articulated bearing and the rear oscillating bedding <i>L580-1412/28181-;</i>	030-103
030.4.12.2	Covering - lubricating locks and hinges <i>L580-1412/28181-;</i>	030-104
030.4.12.3	Greasing the rear section cover lower hinges <i>L580-1412/28181-;</i>	030-105
030.4.13	Working attachment	030-105
030.4.13.1	Lubricating the lift arms and attachment <i>L580-1412/28181-;</i>	030-105

030.4.13.2	Checking the bucket bearing seals and the bearing bushings on the lift arms <i>L580-1412/28181-;</i>	030-107
030.4.13.3	Checking the lift arm bucket stops <i>L580-1412/28181-;</i>	030-108
030.4.13.4	Lubricating and testing the quick-change device <i>L580-1412/28181-;</i>	030-110
030.4.14	Cab, heating and air conditioning	030-111
030.4.14.1	Lubricating the elongated hole on the accelerator pedal and checking the bearing <i>L580-1412/28181-;</i>	030-111
030.4.14.2	Cleaning the fresh and recirculated air filters <i>L580-1412/28181-;</i>	030-111
030.4.14.3	Changing the fresh and recirculated air filters <i>L580-1412/28181-;</i>	030-113
030.4.14.4	Checking the condition and function of the safety belt <i>L580-1412/28181-;</i>	030-114
030.4.14.5	Checking and topping up the windscreen washer reservoir <i>L580-1412/28181-;</i>	030-114
030.4.14.6	Checking the rubber seals on the driver's cab <i>L580-1412/28181-;</i>	030-115
030.4.14.7	Testing the air conditioning unit <i>L580-1412/28181-;</i>	030-115
030.4.15	Lubrication system	030-117
030.4.15.1	Checking the lubrication system grease reservoir level <i>L580-1412/28181-;</i>	030-117
030.4.15.2	Checking the pipes, hoses and lubrication points of the lubrication system <i>L580-1412/28181-;</i>	030-117
030.4.15.3	Checking whether metered quantities are adequate at the bearing points (grease collars) of the lubrication system <i>L580-1412/28181-;</i>	030-118
030.5	Testing and adjustment checklist <i>L580-1412/28181-;</i>	030-119
030.6	Testing and adjustment tasks	030-124
030.6.1	Safety precautions <i>L580-1412/28181-;</i>	030-124
030.6.2	Overall machine	030-125
030.6.2.1	Preparatory tasks for testing and adjustment <i>L580-1412/28181-;</i>	030-125
030.6.2.2	Bringing the machine up to operating temperature <i>L580-1412/28181-;</i>	030-126

030.6.3	Drive group	030-127
030.6.3.1	Calibrating the pedals <i>L580-1412/28181-;</i>	030-127
030.6.3.2	Checking the engine speed <i>L580-1412/28181-;</i>	030-127
030.6.4	Cooling system	030-128
030.6.4.1	Pressure relief and proportional valve of fan gear motor <i>L580-1412/28181-;</i>	030-128
030.6.5	Working hydraulics	030-130
030.6.5.1	Working hydraulics pump, flow regulator (standby pressure) <i>L580-1412/28181-;</i>	030-130
030.6.5.2	Working hydraulics pump, flow regulator (differential pressure) <i>L580-1412/28181-;</i>	030-131
030.6.5.3	Working hydraulics pump, power regulator <i>L580-1412/28181-;</i>	030-133
030.6.5.4	Z-bar kinematics control block for secondary pressure relief valves <i>L580-1412/28181-;</i>	030-134
030.6.5.5	Industrial lift arm control block, secondary pressure relief valves <i>L580-1412/28181-;</i>	030-136
030.6.5.6	Z-bar kinematics control block, primary pressure relief valve <i>L580-1412/28181-;</i>	030-138
030.6.5.7	Industrial lift arm control block, primary pressure relief valve <i>L580-1412/28181-;</i>	030-139
030.6.5.8	Z-bar kinematics control block, LS-pressure cut-off <i>L580-1412/28181-;</i>	030-141
030.6.5.9	Industrial lift arm control block, LS-pressure cut-off <i>L580-1412/28181-;</i>	030-142
030.6.5.10	Stabilisation module (optional), cut-off function <i>L580-1412/28181-;</i>	030-143
030.6.5.11	Ride control hydro accumulator (optional), nitrogen filling <i>L580-1412/28181-;</i>	030-143
030.6.5.12	Testing the control valve block for leakages <i>L580-1412/28181-;</i>	030-146
030.6.6	Travel hydraulics	030-149
030.6.6.1	Travel pump replenishing pressure relief valve <i>L580-1412/28181-;</i>	030-149
030.6.6.2	Travel pump high-pressure relief valves <i>L580-1412/28181-;</i>	030-150

030.6.6.3	Travel pump pressure cut-off <i>L580-1412/28181-;</i>	030-152
030.6.6.4	Travel pump, high pressure sensor <i>L580-1412/28181-;</i>	030-154
030.6.6.5	Travel pump block curve calibration <i>L580-1412/28181-;</i>	030-155
030.6.6.6	Travel motors, automatic calibration <i>L580-1412/28181-;</i>	030-156
030.6.6.7	Hydro accumulator supply, nitrogen filling <i>L580-1412/28181-;</i>	030-157
030.6.6.8	Engine output <i>L580-1412/28181-;</i>	030-159
030.6.7	Steering system	030-159
030.6.7.1	Steering pump, LS pressure cut-off <i>L580-1412/28181-;</i>	030-159
030.6.7.2	Steering pump, flow regulator (standby pressure) <i>L580-1412/28181-;</i>	030-160
030.6.7.3	Steering pump, flow regulator (differential pressure) <i>L580-1412/28181-;</i>	030-162
030.6.8	Brake system	030-163
030.6.8.1	Compact brake valve, hydro accumulator charging function <i>L580-1412/28181-;</i>	030-163
030.6.8.2	Service brake pressure <i>L580-1412/28181-;</i>	030-164
030.6.8.3	Service brake hydro accumulator capacity <i>L580-1412/28181-;</i>	030-165
030.6.8.4	Accumulator charge pressure switch shift pressure <i>L580-1412/28181-;</i>	030-166
030.6.9	Electrical system	030-167
030.6.9.1	Setting the IP addresses of the central control unit (Master4) <i>L580-1412/28181-;</i>	030-167
030.6.9.2	Central control unit (Master4) - Performing a reset <i>L580-1412/28181-;</i>	030-170
030.6.9.3	Testing the CAN line <i>L580-1412/28181-;</i>	030-171
030.6.9.4	Addressing the CAN module and checking the system information <i>L580-1412/28181-;</i>	030-175
030.6.10	Transmission	030-178
030.6.10.1	Control valve block shift pressure <i>L580-1412/28181-;</i>	030-178
030.6.10.2	Nitrogen filling of transmission hydro accumulator <i>L580-1412/28181-;</i>	030-178

030.6.11	Cab, heating and air conditioning	030-180
030.6.11.1	Calibrating the display unit <i>L580-1412/28181-;</i>	030-180
030.6.11.2	Formatting the display unit and reinstalling the software <i>L580-1412/28181-;</i>	030-181
<b>040</b>	<b>Drive group</b>	<b>040-1</b>
040.1	Engine	040-2
040.1.1	Diesel engine overview <i>L580-1412/28181-;</i>	040-2
040.1.2	Fuel system	040-8
040.1.2.1	Overview of the fuel system <i>L580-1412/28181-;</i>	040-9
040.1.2.2	Fuel level sensor <i>L580-1412/28181-;</i>	040-11
040.1.2.3	Fuel pre-filter <i>L580-1412/28181-;</i>	040-12
040.1.2.4	Fuel fine filter <i>L580-1412/28181-;</i>	040-13
040.1.3	Air filter system	040-14
040.1.3.1	Overview of the air filter unit <i>L580-1412/28181-;</i>	040-14
040.1.3.2	Air filter <i>L580-1412/28181-;</i>	040-15
040.1.3.3	Air filter vacuum switch <i>L580-1412/28181-;</i>	040-16
040.1.4	Exhaust system	040-16
040.1.4.1	Overview of the exhaust system <i>L580-1412/28181-;</i>	040-17
040.2	Coupling <i>L580-1412/28181-;</i>	040-18
040.3	Splitter box <i>L580-1412/28181-;</i>	040-20
<b>050</b>	<b>Cooling system</b>	<b>050-1</b>
050.1	Electronic control unit	050-2
050.1.1	Hydraulic oil temperature sensor <i>L580-1412/28181-;</i>	050-2
<b>060</b>	<b>Working hydraulics</b>	<b>060-1</b>
060.1	Working hydraulics - Overview <i>L580-1412/28181-;</i>	060-2



060.2	Pilot control	060-5
060.2.1	Pilot control unit <i>L580-1412/28181-;</i>	060-5
060.2.2	Pilot control hydro accumulator <i>L580-1412/28181-;</i>	060-10
060.3	Ride control	060-11
060.3.1	Stabilisation module <i>L580-1412/28181-;</i>	060-11
<b>070</b>	<b>Travel hydraulics</b>	070-1
070.1	Travel hydraulics overview <i>L580-1412/28181-;</i>	070-2
<b>080</b>	<b>Hydraulic components</b>	080-1
080.1	Hydraulic tank	080-2
080.1.1	Overview of the hydraulic tank <i>L580-1412/28181-;</i>	080-2
080.1.2	Breather filter <i>L580-1412/28181-;</i>	080-3
<b>090</b>	<b>Steering system</b>	090-1
090.1	Steering system overview <i>L580-1412/28181-33962;</i>	090-2
090.2	Steering system overview <i>L580-1412/33963-;</i>	090-4
090.3	Emergency steering	090-6
090.3.1	Electronic control unit	090-6
090.3.1.1	Emergency steering pressure switch <i>L580-1412/28181-;</i>	090-6
090.3.1.2	Emergency steering check pressure switch <i>L580-1412/28181-;</i>	090-7
090.3.2	Valve block <i>L580-1412/28181-;</i>	090-8
<b>100</b>	<b>Brake system</b>	100-1
100.1	Overview of the brake system <i>L580-1412/28181-;</i>	100-2
100.2	Parking and service brake	100-5
100.2.1	Compact brake valve <i>L580-1412/28181-;</i>	100-5
100.3	Service brake	100-12

100.3.1	Service brake hydro accumulator <i>L580-1412/28181-;</i>	100-12
100.3.2	Brake light pressure switch <i>L580-1412/28181-;</i>	100-13
100.3.3	Accumulator charge pressure switch <i>L580-1412/28181-;</i>	100-14
100.4	Parking brake	100-15
100.4.1	Parking brake hydro accumulator <i>L580-1412/28181-;</i>	100-15
<b>110</b>	<b>Electrical system</b>	110-1
110.1	Overview of the electrical system <i>L580-1412/28181-;</i>	110-2
110.2	Lighting <i>L580-1412/28181-;</i>	110-6
110.3	Circuit diagrams <i>L580-1412/28181-;</i>	110-8
110.4	Electronic control unit	110-10
110.4.1	Overview of the electronic control system <i>L580-1412/28181-;</i>	110-10
110.4.2	Central control unit (Master4) <i>L580-1412/28181-;</i>	110-12
110.4.3	Modules	110-17
110.4.3.1	Overview of the module <i>L580-1412/31403-;</i>	110-17
110.4.3.2	Input modules <i>L580-1412/28181-;</i>	110-19
110.4.3.3	Output modules <i>L580-1412/28181-;</i>	110-21
110.5	Electrical components in the rear section	110-24
110.5.1	Battery installation <i>L580-1412/28181-;</i>	110-24
<b>120</b>	<b>Transmission</b>	120-1
120.1	Overview of the transmission <i>L580-1412/28181-;</i>	120-2
120.2	Mechanical transmission <i>L580-1412/28181-;</i>	120-3
120.3	Electronic control unit	120-9
120.3.1	Gear shifting solenoid valves <i>L580-1412/28181-;</i>	120-9
120.3.2	Speed sensors <i>L580-1412/28181-;</i>	120-10

120.4	Hydraulic control unit	120-12
120.4.1	Overview of the hydraulic control system <i>L580-1412/28181-;</i>	120-12
120.4.2	Control valve block <i>L580-1412/28181-;</i>	120-16
120.4.3	Transmission gear pump <i>L580-1412/28181-;</i>	120-18
<b>130</b>	<b>Axles and cardan shafts</b>	130-1
130.1	Axles	130-2
130.1.1	Axles <i>L580-1412/28181-;</i>	130-2
130.2	Cardan shafts	130-8
130.2.1	Front cardan shaft <i>L580-1412/28181-;</i>	130-8
130.2.2	Rear cardan shaft <i>L580-1412/28181-;</i>	130-9
<b>140</b>	<b>Steel components of the basic machine</b>	140-1
140.1	Vehicle frame	140-2
140.1.1	Articulation bearing <i>L580-1412/28181-;</i>	140-2
140.1.2	Articulation lock <i>L580-1412/28181-;</i>	140-3
<b>150</b>	<b>Working attachment</b>	150-1
150.1	Lift arms with Z kinematics	150-2
150.1.1	Z kinematics lift arm <i>L580-1412/28181-;</i>	150-2
150.2	Z kinematics quick coupler <i>L580-1412/28181-;</i>	150-3
<b>160</b>	<b>Cab, heating and air conditioning</b>	160-1
160.1	Overview of the cab, heating and air conditioning unit <i>L580-1412/28181-;</i>	160-2
160.2	Display and control elements	160-4
160.2.1	Electrical components in the control panel	160-4
160.2.1.1	Control unit for main functions <i>L580-1412/28181-;</i>	160-4
160.2.1.2	Starter switch <i>L580-1412/28181-;</i>	160-6

160.2.2	Display <i>L580-1412/28181-;</i>	160-7
160.2.3	Touch screen display <i>L580-1412/28181-;</i>	160-9
160.2.4	Control lever <i>L580-1412/28181-;</i>	160-10
160.3	Heating, ventilation, air conditioning	160-12
160.3.1	Heating and air conditioning unit	160-12
160.3.1.1	Blower <i>L580-1412/28181-;</i>	160-12
160.4	Air conditioning	160-13
160.4.1	Condenser <i>L580-1412/28181-;</i>	160-13
160.4.2	Dryer <i>L580-1412/28181-;</i>	160-14
160.4.3	Air conditioning pressure switch <i>L580-1412/28181-;</i>	160-15
160.4.4	Evaporator <i>L580-1412/28181-;</i>	160-17
<b>170</b>	<b>Lubrication system</b>	170-1
170.1	Liebherr automatic central lubrication system	170-2
170.1.1	Overview of Liebherr automatic central lubrication system <i>L580-1412/28181-;</i>	170-2
170.1.2	Liebherr central lubrication pump <i>L580-1412/28181-;</i>	170-6
170.1.3	Progressive distributor MX-F <i>L580-1412/28181-;</i>	170-10
<b>200</b>	<b>Service codes, diagnosis</b>	200-1
200.1	Malfunctions	200-2
200.1.1	Service code indicator in the display	200-2
200.1.2	C service codes displayed in the LCD	200-3
200.2	Troubleshooting	200-5