

Quick Coupling Systems



LIEBHERR

Areas of application

No matter whether in road construction, dismantling operations or in pipe-laying and sewer construction, a competent well-established team is an important prerequisite for economical and prompt implementation of challenging projects. Another requirement is the use of efficient multi-purpose construction machinery and the appropriate working tools.

Dismantling

The application of more stringent legislation in respect of dismantling operations has led to increased demands on the tools implemented in this sector. Aside from traditional hydraulic hammers, depending on the type of dismantling job, demolition and sorter grabs, hydraulic cutters, demolition pincers, shears and pulverisers are also used. Targeted tool deployment thus permits economical and safe demolition of existing buildings and appropriate material sorting.

Pipe-laying and sewer construction

In the course of sewer construction drivers must repeatedly master various tasks in quick succession with their hydraulic excavators: excavation, foundation work, pipe-laying, sand back-filling, filling, lining and compacting. The use of a hydraulic excavator with a quick coupling system is essential for executing pipe-laying and sewer construction projects economically and competitively.

With its quick coupling systems and working tools Liebherr offers practical economical solutions for virtually all construction and dismantling operations. For increased productivity, efficiency and safety on the building site.





Mechanical quick coupling system

- manual opening and closing of the **quick coupling system**
- manual connecting and disconnecting of **hydraulic lines**

Liebherr's mechanic quick coupling system is the perfect solution when aiming to increase the flexibility and productivity of machinery while keeping investment costs to a minimum. The sturdy construction, proven over many years, impresses with its straightforward, safe and reliable mechanical design. After releasing the screw fastening pin, the two locking pins with internal double threading are manually retracted from one side and then inserted following tool attachment.

A safety latch on the load hook of the quick coupling system affords additional safety as it prevents unintentional unhooking of the load. The safety latches on the load hook of the Liebherr quick coupling system offer additional safety. They can bear 100 % of the maximum permissible hook load (basic safety) - and thus considerably more than the 10% required by EN 474.

Features and customer benefits

- straightforward sturdy design for a long service life and low maintenance costs
- increased machine utilization due to faster tool changing at a low investment cost
- high standard of safety with additional screw fastening pins
- locking pins with double threading for fast manual releasing and locking from one side
- load hook equipped as standard with heavy-duty safety latches for increased safety when lifting loads

Areas of application

- for infrequent tool changes
- for deployment in the toughest conditions (e.g. tunnel construction)



Hydraulic quick coupling system

- opening and closing of the **quick coupling system** at the touch of a button
- manual connecting and disconnecting of **hydraulic lines**

Mechanical working tools can be changed effortlessly from the operator's cabin at the touch of a button with the Liebherr hydraulic quick coupling system. During tool change two-handed operation, the electronic position sensors and visual control by the operator from the driver's cabin of the left locking pin guarantees maximum safety - ensuring that quick coupling system and working tool remain reliably connected.

Improved safety thanks to the sturdy heavy-duty safety latches on the load hook: they bear 100 % of the maximum permissible hook load (basic safety) - and thus considerably more than the 10% required by EN 474.

Features and customer benefits

- faster safer changing of mechanical working tools from the operator's cabin
- optimum transmission of digging forces like those of directly attached tools
- unique level of safety when changing tools afforded by position monitoring of the locking pin by electronic position sensor instead of pressure monitoring of the locking cylinder
- straightforward reliable visual locking control from the operator's cabin with a clear view of the left locking pin
- optical and acoustic warning when the quick coupling system is open
- load hook equipped with heavy-duty safety latches as standard for increased safety when lifting loads

Areas of application

- for frequent tool changes (of predominantly mechanical working tools)



LIKUFIX

- opening and closing of the **quick coupling system** at the touch of a button
- automatic connecting and disconnecting of the **hydraulic lines** during coupling

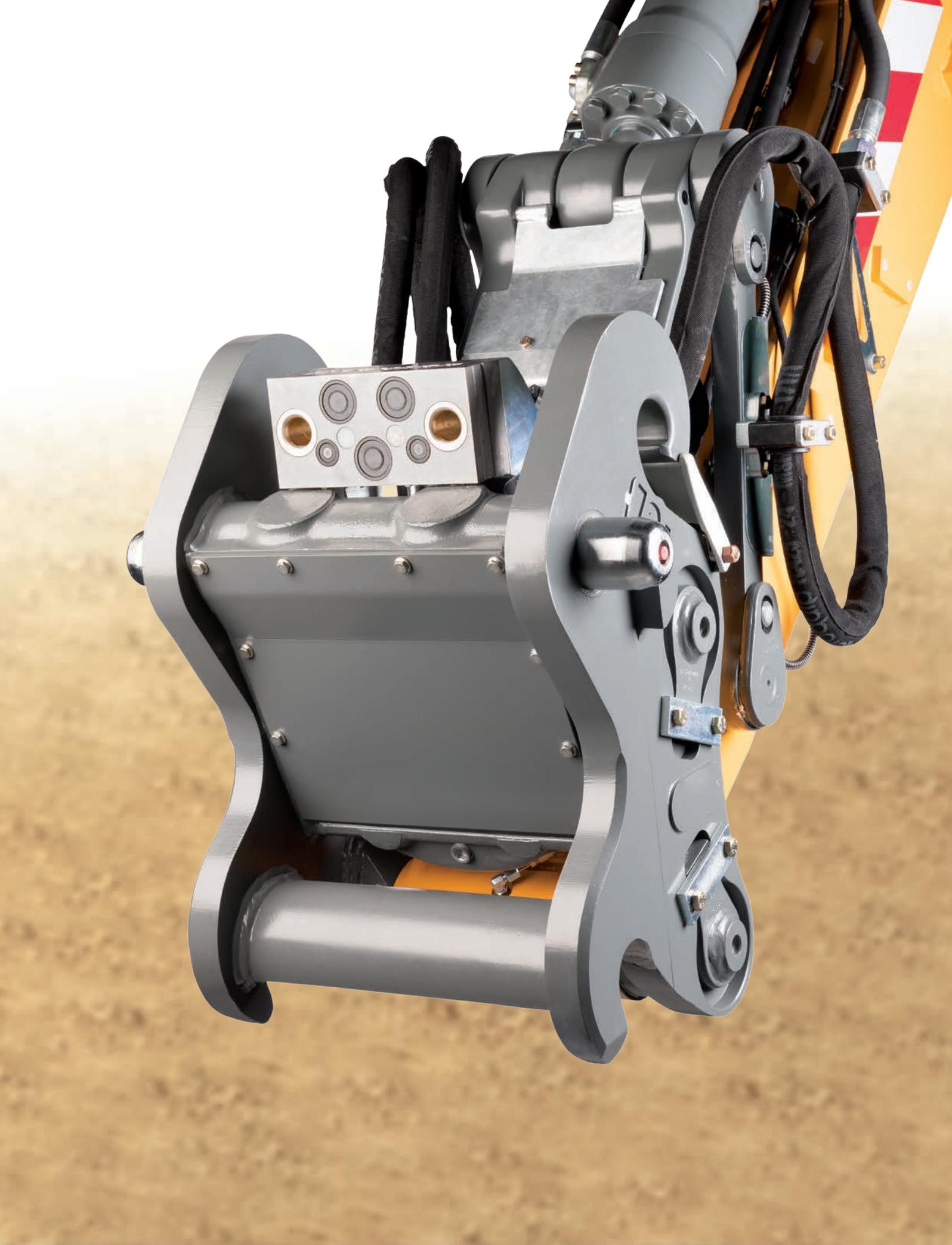
LIKUFIX is the name of the Liebherr fully automatic quick coupling system. The combination of a hydraulic Liebherr quick coupling system with the LIKUFIX coupling block permits fast safe changing of mechanical and hydraulic working tools from the operator's cabin. The deployment options of a hydraulic excavator and machine productivity can thus be increased by up to 30%. A worthwhile investment for over 25 years.

Features and customer benefits

- faster and safer changing of mechanical and hydraulic working tools from the operator's cabin
- machine utilization increased to up to 90% thanks to extended deployment options
- productivity increased by an average of 30% (based on practical customer experience)
- maximum flexibility due to add-on options to all hydraulic excavators with operating weights of between 8 and 120 tons
- unique level of safety when changing tools afforded by position monitoring of the locking pin by electronic position sensor instead of pressure monitoring of the locking cylinder
- straightforward reliable visual locking control from the operator's cabin with a clear view of the left locking pin
- optimum fluid flow through hydraulic couplings with large cross-sections for fast tool action and high fuel efficiency
- hydro-mechanical bearing support of the tool coupling block ensuring the long service life of the hydraulic couplings
- optical and acoustic warning when the quick coupling system is open
- load hook equipped as standard with heavy-duty safety latches for increased safety when lifting loads

Mounting on tools and hydraulic excavators of other manufacturers

Practically all hydraulic add-on tools can be fitted with LIKUFIX. Hydraulic excavators from other manufacturers can be easily fitted with a Liebherr quick coupling system or LIKUFIX.



Functions for increased productivity

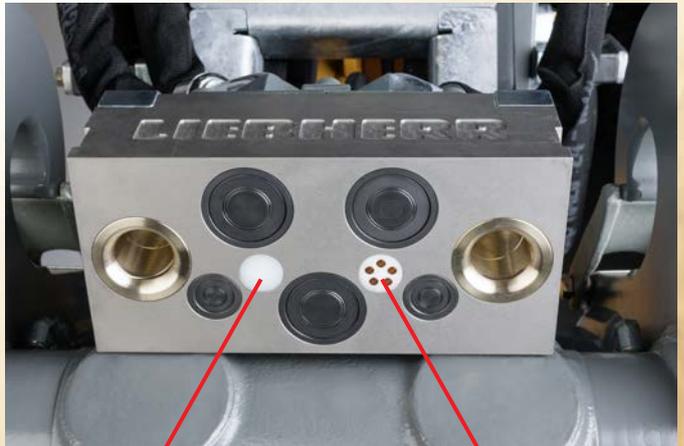
Tool Control

Tool Control is an additional electro-hydraulic function that simplifies work with hydraulic working tools: up to 10 combinations of fluid quantity and pressure can be stored with the tool name, and directly selected via the display unit with touch screen function. With Tool Control the machine operator can easily select the parameters for the required hydraulic tool at the touch of a button – with no complicated re-setting for a tool change. This function is already featured as standard on most hydraulic excavators.



Tool Management (Option)

Tool Management enables automatic tool recognition by the hydraulic excavator. The data stored on the chip in the working tool are read out by the read/write head in the LIKUFIX coupling block on the hydraulic excavator, and transmitted to the operator's control console. The operator acknowledges data at the touch of a button, thus ensuring automatic adjustment of the fluid quantity and pressure. Aside from this technical data, fluid type and the hours worked with this tool are saved on the chip.



Tool management system read/write head (contact-free, protected)

Electro contacts

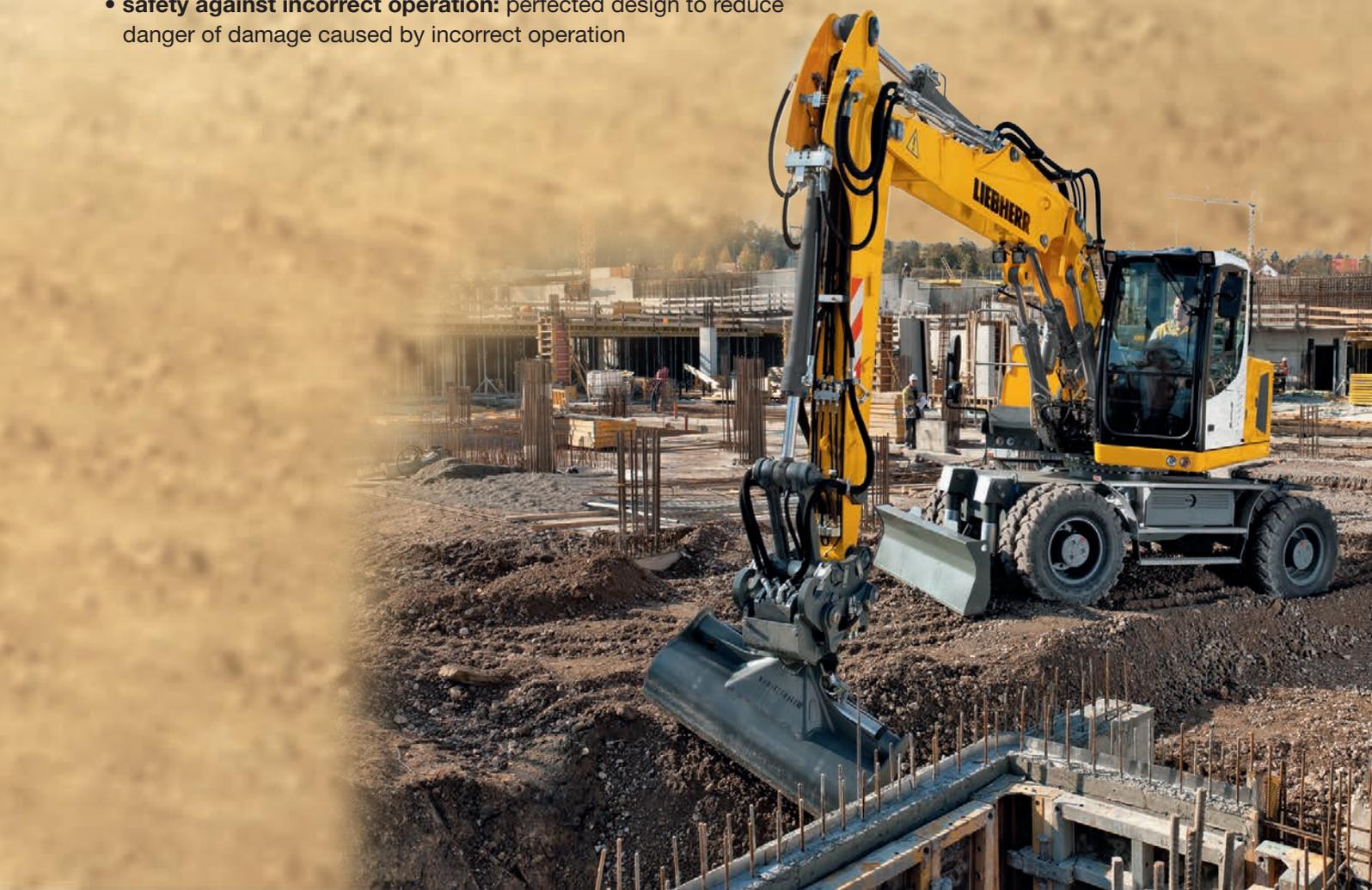
Electro contacts (Option)

Five electro contacts guarantee signal transmission between the hydraulic excavator and the working tool. They enable controlling of electro valves in a working tool for triggering various hydraulic functions and transmitting signals from a position transmitter/GPS receiver to a working tool. The contact pins are spring-mounted and designed for heavy-duty building site implementation.

Productivity with safety

The use of the right tool and optimum utilization of construction machinery contribute to the economical and prompt execution of building projects. Fast and easy tool changing is essential for high machine utilization and productivity, while also achieving a high standard of safety. This is only possible if the operator can see whether the quick change system and working tool are correctly connected following tool change. The Liebherr hydraulic quick coupling system offers this option, and thus guarantees maximum productivity and occupational safety.

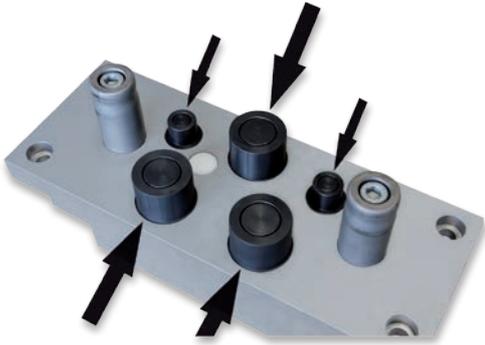
- **visual control:** straightforward reliable visual locking control from the operator's cabin with a clear view of the left locking pin
- **position monitoring:** unique level of safety when changing tools afforded by position monitoring of the locking pin and the quick coupling system by electronic position sensors instead of pressure monitoring of the locking cylinder
- **alarm signalling:** optical and acoustic warning when the quick coupling system is open or not locked correctly
- **safety in the event of pressure loss:** reliable connection even in the event of pressure loss in the locking cylinder hydraulic line thanks to form-fit coupling
- **safety during load lifting:** sturdy heavy-duty safety latches on the load hooks bear 100 % of the maximum permissible hook load (basic safety) for a high standard of safety when transporting heavy loads
- **safety against damage:** hydraulic couplings are recessed or integrated into solid metal plates
- **safety against incorrect operation:** perfected design to reduce danger of damage caused by incorrect operation



Easy maintenance, long service life

Quick and easy: changing sealing washers on the working tool

The condition of the sealing washers can be checked by pressing down the sealing discs. If replacement is necessary, the sealing washer can be quickly replaced with the help of a screwdriver and a sharp tool.



Working tool hydraulic couplings with sealing washers



Press down sealing disc on the coupling plug with a screwdriver and remove the top sealing washer (red) with a sharp tool.



Press together new sealing washer and place on the sealing disc with the open end facing downwards.



Press sealing disc down as far as the groove, position the screwdriver in the centre of the sealing washer and remove hand.



Allow the sealing washer to jump into the groove.



Remove screwdriver.

- Hydraulic excavator: couplings with maintenance-free metallic washers
- hydraulic working tools: couplings with sealing washers

Reconditioning

Thanks to replaceable wearing parts Liebherr quick change systems can be reconditioned at little cost within the shortest of times to restore them to their “as new” state. Hydraulic couplings on the working tool and hydraulic excavator can be easily replaced on the building site by the machine operator.

		Operating weight kg	SW 22	SW 33	SW 48	SW 66	SW 77	SW 92
Quick coupling systems	QC M echanical		•	•	•	•	•	
	QC H ydraulic			•	•	•	•	•
	L IKUFIX			•	•	•	•	
Liebherr hydraulic excavator models	Competition machines	8,000 - 10,000	M	M/H/L				
	A 910 Compact (A 309)	11,600 - 12,800	M	M/H/L				
	A 912 Compact (A 311)	12,700 - 14,100	M	M/H/L				
	A 914 Compact (A 312)	14,700 - 16,600		M/H/L	M/H/L			
	A 914 (A 314)	15,200 - 17,500		M/H/L	M/H/L			
	R 914 Compact (R 313)	15,100 - 17,500		M/H/L	M/H/L			
	A 916 (A 316)	16,800 - 19,000		M/H/L	M/H/L			
	A 918 Compact	17,500 - 19,500		M/H/L	M/H/L			
	A 918 (A 900)	17,700 - 19,900		M/H/L	M/H/L			
	R 918 (R 317)	18,150 - 21,750		M/H/L	M/H/L			
	A 920 (A 904)	18,900 - 21,700			M/H/L			
	R 920 (R 900)	20,200 - 23,500			M/H/L			
	R 922 (R 906 Advanced - Classic)	21,350 - 23,600			M/H/L			
	A 924	21,400 - 26,500			M/H/L			
	R 924 (R 916 Advanced - Classic)	23,500 - 27,600			M/H/L			
	R 924 Compact	25,150 - 29,050			M/H/L			
	R 926 (R 926 Advanced - Classic)	25,700 - 28,950			M/H/L			
	A 928 (A 924 Plus)	26,500 - 27,600			M/H/L			
	R 936 (R 934)	30,550 - 33,850				M/H/L		
	R 946 (R 944)	38,050 - 41,600				M/H/L		
	R 950 SME	42,950 - 44,800				M*/H/L*		
	R 956 (R 954)	49,600 - 57,100					M/H/L	
R 960 SME	58,980 - 60,600					M*/H/L*		
R 966 (R 964)	66,000 - 76,300						H	
R 970 SME	76,800 - 78,600						H	
R 976 (R 974)	85,300 - 95,500						H	
R 980 SME	93,900 - 97,800						H	

* on request

Liebherr Quick coupling system

	direct mounted	mechanic quick coupler	hydraulic quick coupler
			
Application	- for earthmoving	- for rare tool changes - for heavy applications (f. e. tunnel application)	- for frequent tool changes (mainly mechanic tools)
Advantages	- maximum handling performance - best fuel efficiency (tons per litre Diesel)	- simple technology (only mechanic components) - low cost of purchase	- quick change of mechanic tools - no persons in danger zone (change of mechanic tools) - easy retrofitting of LIKUFIX
Disadvantages	- no flexibility - safety hazard at tool change by pins	- reduced lift capacity due to additional weight of quick coupler	- reduced lift capacity due to additional weight of quick coupler - additional components
additional weight (machine) kg	-	SW 33 = approx. 100 SW 48 = approx. 200 SW 66 = approx. 350	SW 33 = approx. 110 SW 48 = approx. 226 SW 66 = approx. 430
opening and closing quick coupler	-	manually	hydraulically (push a button)
connecting and disconnecting hydraulic lines	-	manually	manually
expenditure of time and personal (change of mechanic tool)	approx. 25 min. (2 persons)	approx. 10 min.	< 1 min.
expenditure of time and personal (change of hydraulic tool)	approx. 45 min. (2 persons)	approx. 25 min.	ca. 15 min.

* not for LIKUFIX 33

ms for Earthmoving

<p>hydraulic quick coupler + hydraulic coupling system = LIKUFIX</p> 	<p>Tool Control</p> 	<p>Tool Management (in combination with LIKUFIX*)</p> 	<p>Electrocontacts (in combination with LIKUFIX*)</p> 
<ul style="list-style-type: none"> - for regular tool changes - for canal construction, civil engineering and demolition 	<ul style="list-style-type: none"> - 10 memory slots for tool data (oil pressure and oil flow) in the hydraulic excavator 	<ul style="list-style-type: none"> - automatic tool recognition (transmission of all relevant tool data to the excavator) 	<ul style="list-style-type: none"> - 5 electro-contacts to transmit signals between excavator and working tool
<ul style="list-style-type: none"> - quick change of mechanic and hydraulic tools - no persons in danger zone 	<ul style="list-style-type: none"> - Fast manual setting of the required tool data (oil pressure and oil volume) at the push of a button 	<ul style="list-style-type: none"> - easy analysis and post calculation (tool working hours saved on tool chip) - shelter from accidental misuse 	<ul style="list-style-type: none"> - to control electro-valves of the working tool - to transmit a BUS-signal (f. e. GPS-signal)
<ul style="list-style-type: none"> - reduced lift capacity due to additional weight of quick coupler - additional components 	<ul style="list-style-type: none"> - In case of incorrect operation (selection of incorrect tool data) there will be restricted performance and danger of damage to the tool 	<ul style="list-style-type: none"> - additional components (maintenance) 	<ul style="list-style-type: none"> - additional components (maintenance)
<p>SW 33 = approx. 130 SW 48 = approx. 255 SW 66 = approx. 490</p>	-	-	-
<p>hydraulically (push a button)</p>	-	-	-
<p>automatically</p>	-	-	-
<p>< 1 min.</p>	-	-	-
<p>< 1 min.</p>	-	-	-

