

## Technical Product Information No. 1060 EN

### Linear motion lock Series 0055

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## About this Technical Product Information (TPI)

### Who is this TPI directed at?

This TPI is directed at qualified personnel who

- are entrusted with the assembly, commissioning and operation of the product and who
- have obtained the necessary qualifications by reading and understanding the instructions by training or instruction

It is intended for

- Fitters at the manufacturer of the machine / plant
- Maintenance fitters at the machine users.

### What will you find in the TPI?

The TPI provides all the necessary information for the assembly and maintenance of the product described on the title page

### Notes on the symbols used in the text

On the pages which follow, important sections of text are highlighted with the following symbols.



This symbol means:

There is a risk of injury during the activity described or in operational running!



This symbol means:

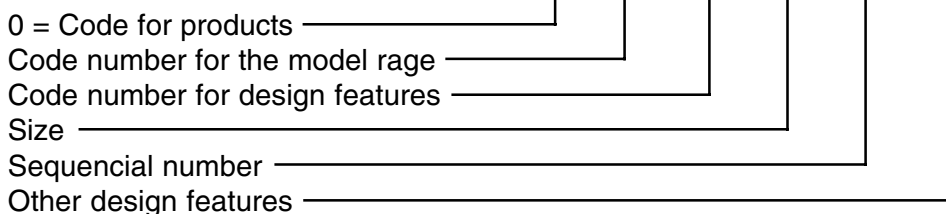
There is a risk of material damage during the activity described or in operational running!



This symbol indicates sections of text to which particular attention must be paid.

### The Ortlinghaus numbering system

**Example:** 0 111 - 222 - 33 - 444 555



Pass this TPI on to your customers ! You can either order further copies of this TPI from us or you are free to make copies, for use by your customers.

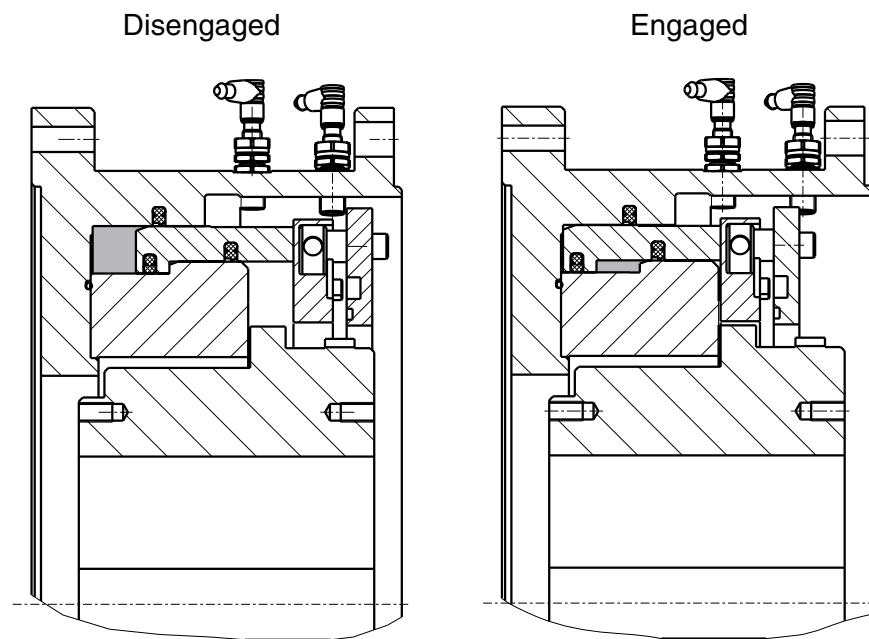
## About the product

### Purpose and mode of functioning of the linear motion lock

The linear motion lock is used to lock a shaft to the fixed housing of a clutch in a positive manner so that the shaft cannot rotate. Being able to lock the shaft in this manner is particularly desirable for presses so that one can be absolutely sure that the press ram will not move in an uncontrolled or unintended manner while servicing and/or maintenance work is being carried out between the halves of the tool.

**The linear motion lock is suitable only to take static moments.**

The linear motion lock is matched to and integrated on the dynamic brake or clutch/brake combined unit as required for the particular drive train. It is engaged and disengaged hydraulically. The particular state of the linear motion lock at any time is detected by sensors (proximity switches).



**Fig. 1: Linear motion lock in its disengaged and engaged states**

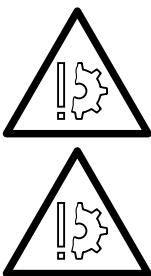
**Engaging:** The pressure oil moves the piston together with the coupling ring to the left-hand stop. The coupling ring engages with the teeth of the rotatable internal driver and prevents the latter rotating.

**Disengaging:** The pressure oil moves the piston with the coupling ring to the right-hand stop. The teeth of the internal driver are now free and the internal driver can rotate.

Danger note: The normal operating pressure is **60 bar**, the max. permissible pressure **65 bar**. Never operate the linear motion lock with a higher pressure since in this case there is the risk of screws shearing

Danger note: The linear motion lock may only be engaged/disengaged when the internal driver is stationary.

The clutch may not be disengaged when the shaft is under load.



**Delivered state**

The linear motion lock is supplied in one of two different forms of execution:

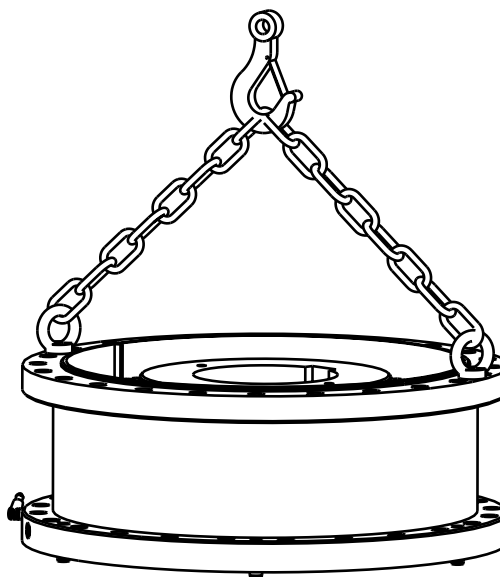
- For fitting on its own or in combination with an original Ortlinghaus hydraulically actuated clutch/brake combined unit. In these cases the linear motion lock is delivered in a preliminarily assembled state. The internal driver is supplied loose. Initial installation is carried out in accordance with sections A and B.
- In combination with an original Ortlinghaus compact drive unit. In this case the linear motion lock is supplied in a ready-for-operation state. The linear motion lock actuation system is installed in accordance with section B of this TPI. Please see TPI 1160 for instructions on the fitting of the compact drive.



The securing screws, pins, feather keys, threaded connections and other auxiliaries do not form part of the scope of delivery. Use only screws of strength class 10.9 or higher.

**Transport**

Ensure that the linear motion lock cannot suffer hard knocks or jars in the course of transportation.



**Fig. 2: Transport aids**

Tapped holes for the reception of screws or eye-bolts are provided on the outside of the clutch housing for transport purposes. Take particular care that the integrated proximity switches cannot be damaged by chains in the course of transport.

**Sizes of the tapped holes for transportation:**

Size	86	90							
Thread	M16	M16							

## Initial assembly and commissioning

### Section A - initial installation

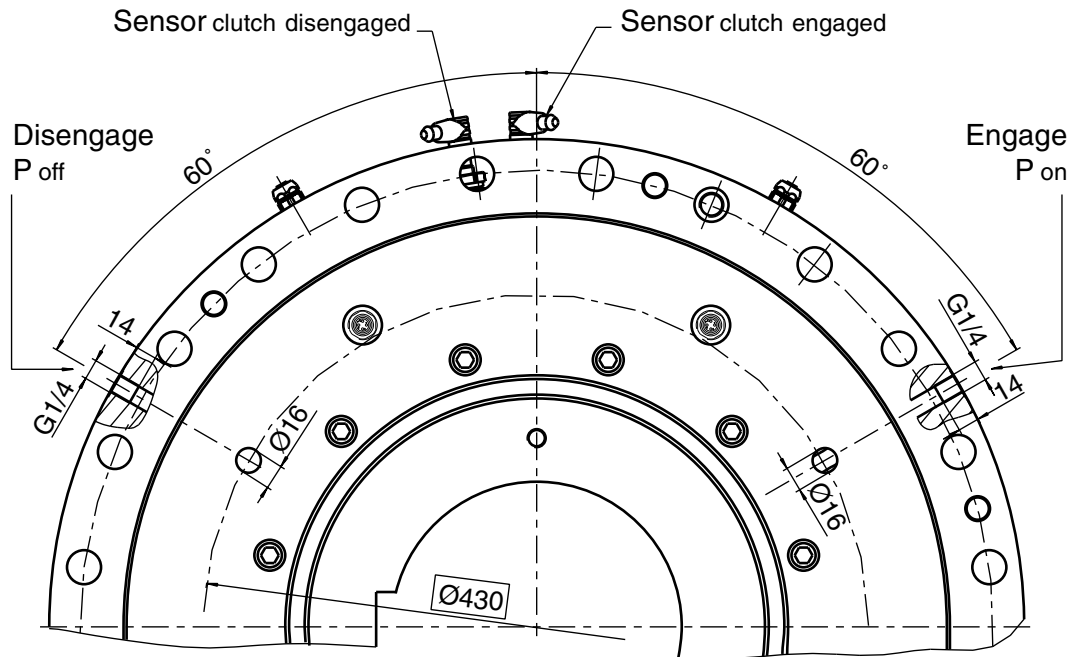
The linear motion lock is supplied in a preliminarily assembled state in a housing with a flange connection. The latter is centred on and secured to the machine frame.

We cannot go here into special fitting variants for particular designs of machine.

After the housing has been mounted, the internal driver with the feather key is mounted on the shaft and secured in respect of its axial position (apply a thin layer of a copper-based friction-reducing paste - do not use a paste containing graphite).

### Section B - connecting the clutch hydraulically and electrically

The linear motion lock has one connection for engaging and one for disengaging.

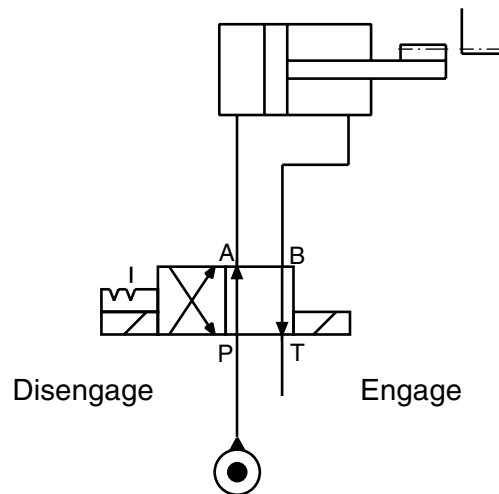


**Fig. 3: Front with relative positions of the connections**

### Sizes of the threaded connections:

Size	86	90							
Thread	G1/4	G1/4							

The connections to the hydraulic unit are to be made in accordance with the circuit diagram below.



**Fig. 4: hydraulic scheme**

On safety grounds we recommend an impulse valve with detent, with no auxiliary manual actuation. As a result of this the engaged state of the linear motion lock will be maintained even if the power supply fails. Unintentional manual disengagement will not be possible. Actuation must come from the safety-oriented section of the press controller.

If pressure accumulators are required in the hydraulic system for some other reason, these must not lead to any unintentional movements at the linear motion lock. This applies especially if there is a failure of the supply or control power.

For mutual securing of machine functions and actuation of the linear motion lock, additional pressure switches can be fitted in the control lines to the linear motion lock.



**Danger note:** The linear motion lock may only be engaged/disengaged when the internal driver is stationary.

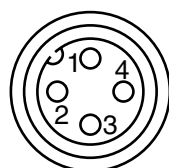
The clutch may not be disengaged when the shaft is under load.

Suitable security measures such as speed monitoring or ram weight compensation are to be carried out.

**Electrical connections**

The integrated proximity switches are to be connected with a M 12x1 sensor plug.

Loading of the plug pins:



- 1 Supply voltage, 24V DC, residual ripple 15%
- 2 n.c.
- 3 Ground
- 4 PNP switching output

**Fig. 5: Position sensor**



Danger note:

The sensors (proximity switches) serve to monitor the state of the clutch, i.e. whether it is engaged or disengaged. For this purpose the fact that the clutch has reached its engaged limit position or its disengaged limit position is captured and passed on to the relevant switching output. If a new unambiguous combination of signals is not being received, the clutch is not functioning in a proper manner. In this case further operating of the system or the taking up of a position beneath the load representing the danger is not permitted.



The monitoring and analysis of the sensor signals is to be undertaken in accordance with EN 954 Category IV in the safety-oriented section of the press controller.

	Clutch function	
	Engaged	Disengaged
Clutch engaged sensor signal	On	Off
Clutch disengaged sensor signal	Off	On

## Commissioning

After the linear motion lock has been installed and connected, the fact that it is functioning properly must be confirmed at least once.

### Clutch engaged

- "Clutch engaged" sensor signal must be being received and there must be no signal from the "Clutch disengaged" sensor.

### Clutch disengaged

- "Clutch disengaged" sensor signal must be being received and there must be no signal from the "Clutch engaged" sensor.
- The clutch is operational.

The control pressure for the linear motion lock should also be applied after reaching the end positions. This will prevent an uncontrolled change of the switched state due to machine vibrations or oscillations.

If with the linear motion lock engaged, the dynamic brake is released, the function of this can cause deflection of the drive shaft. The angle of rotation varies with the model size and is about 3.6 °.

Danger note: The linear motion lock may only be engaged/disengaged when the internal driver is stationary.

The clutch may not be disengaged when the shaft is under load.

Suitable security measures such as speed monitoring or ram weight compensation are to be carried out.



## Maintenance

To a very large extent the linear motion lock is not subject to wear and does not require maintenance.

The proper functioning of the clutch (engaging/disengaging) should be checked about every quarter as described in the "Commissioning" section.

## Fault finding

Fault	Reason	Remedy
Clutch does not engage or does not disengage	Oil pressure too low	Increase operating pressure to 60 bar
	Fault in the hydraulic system (dirt, leaks ...)	Repair hydraulic system
	Reason cannot be established <b>machine-damage</b>	Obtain technical service
Clutch engages and disengages but no signal is given	Sensor defective	Check sensor (function, fitting)
	Cabling defective	Check cables to the sensors
	Reason cannot be established <b>machine-damage</b>	Obtain technical service



If the reason for a malfunction cannot be established, operating of the machine must be ceased immediately since safe operating is no longer guaranteed. Request customer service visit.

## Repairs

### Danger Note.



Before any dismantling work takes place on the in-line clutch brake combination or the linear motion lock, it is necessary to move the press ram to bottom dead centre and to secure it.



### Replacement of the proximity switches

For reasons of safety the sensors may only be replaced when the machine is stationary. No work may be carried out beneath the load for which the linear motion lock provides the safeguard while work is being carried out on the sensors.

The sensors are inserted in immersion sleeves and are secured with a union nut. The immersion sleeves may not be dismantled.

To remove a sensor, disconnect its cable.

Undo the union nut, preventing the immersion sleeve from turning if necessary.

Draw the sensor out of the immersion sleeve and insert a new one until it reaches the stop at the end of the immersion sleeve.

Tighten up the union nut hand-tight and connect the cable to the sensor.

Ensure that the sensor remains in its position against the stop.

Check that the sensor switches properly.

#### Note:

The gap between the sensor and the surface being damped is 0 to 1.5 mm. This distance is set in our works with the aid of the immersion sleeve.

To readjust the linear motion lock, move it into the position corresponding to the sensor. Screw in the immersion sleeve until it touches the coupling ring, then screw the sleeve out again by  $\frac{3}{4}$  - 1 turn. Lock the immersion sleeve with the lock nut. Check the switching function of the sensors.

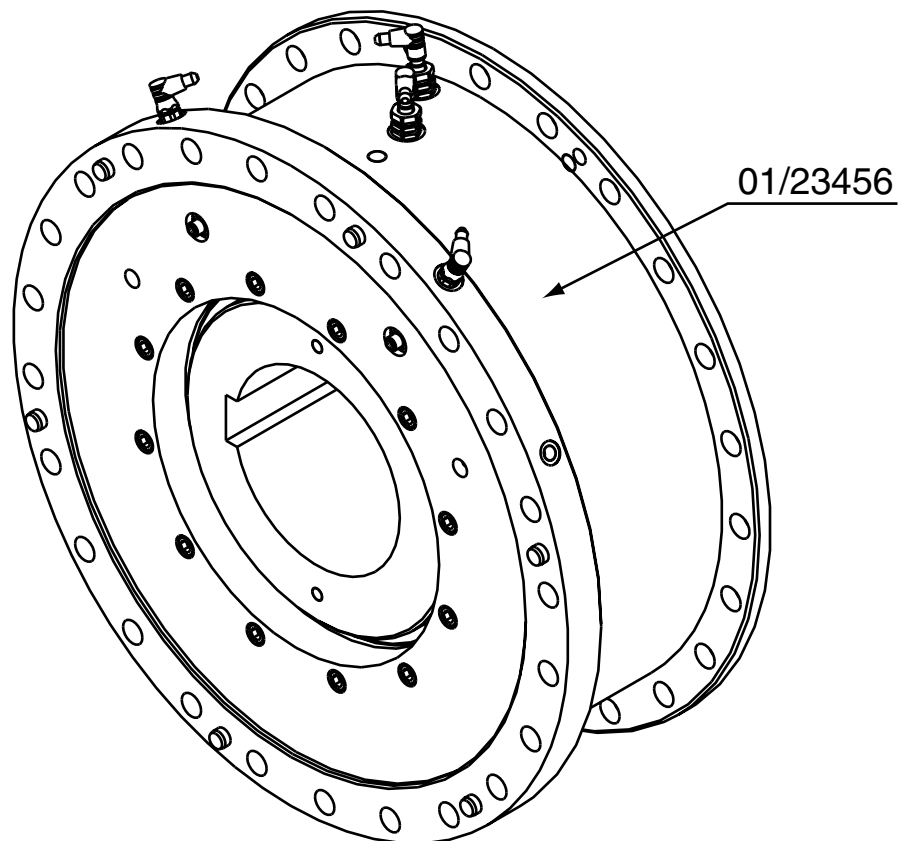
## Spare parts

The guarantee on our products only holds good when you use original spare parts from Messrs Ortlinghaus-Werke. Please order spare parts only in writing.

You will find the production number, under which the linear motion lock was produced, on the outside of the clutch housing.

Please always quote this number when ordering spare parts. It consists of two digits for the year followed by a consecutive number, e.g. 01/23456.

In addition please state if possible the article number of the linear motion lock.



**Fig. 6: Fabrication number**

## List of parts

(see sectional drawing)

Item	Part
1	Hub
2	Housing
3	Piston
4	Pressure disc
5	Sinus ring
6	Bush
7	Pressure pin
8	Cylinder wall
9	Connecting ring
10	Strap
11	Sliding block
13	Pressure spring
15	Proximity switch
16	Sensor pocket
17	Connection line
20	Seal set
21	Seal set
22	Seal set
25	O-ring
26	O-ring
30	Hexagon socket pipe plug
31	Screw
32	Screw
37	Clamping sleeve
38	Threaded dowel
39	Hexagonal screw

**Parts - linear motion lock**

