

Operating Instructions

Mounted Reversible Plough Opal 080 E



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Item no . 17512540 00/11.18

LEMKEN India Agro Equipment Pvt Ltd.

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Dear customer,

Thank you for the trust you have placed in us by purchasing this device. The device can only be used to its full advantage when operated and used properly. When the device was delivered, you will already have been instructed in operation, adjustment and maintenance by your dealer. However, this brief instruction is not a substitute for thorough study of the operating instructions.

These operating instructions will help to familiarise you with the LEMKEN India Agro Equipment Pvt Ltd.device and the options available for using it.

The operating instructions contain important information about how to operate the device safely, properly and efficiently. Following the instructions will help to prevent hazards, faults and down times and will increase reliability and service life. Read the operating instructions carefully and attentively before commissioning.

Make sure that the operating instructions are always available at the location where the device is used.

The operating instructions must be read and followed by anyone who is involved in carrying out the following work:

- Coupling and uncoupling
- Adjustments
- Operation
- Maintenance and repairs
- Troubleshooting, and
- Final shutdown and disposal.

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Spare parts ordering

This device is supplied with a specification listing all assemblies that are relevant for the product. The spare parts list valid for your device includes both those assemblies relevant to you and those that are not intended for your device. Make sure that you only order spare parts that belong to the assemblies that can be found on your specification or the enclosed print out. When ordering spare parts, state the type designation and serial number of the device. This information can be found on the type plate. Enter this data in the fields below so that it is always to hand.

Type designation:	
Serial number:	

Remember that you should only use genuine LEMKEN spare parts. Reproduction parts have a negative influence on the function of the device, have a shorter service life and present risks and hazards that cannot be estimated by LEMKEN India Agro Equipment Pvt Ltd. They also increase the maintenance costs.

Service and spare parts

Information on service and spare parts is available from your local dealer or our website at www.lemken.com.

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1 ALLGEMEINES

1.1 Copyright

These operating instructions represent a document in terms of the law on unfair competition.

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LEMKEN GmbH & Co. KG

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D-46519 Alpen, Germany

These operating instructions are intended to be used by the user of the implement. They contain texts and drawings which must not be

- reproduced,
- divulged or
- communicated in any other way in whole or in part without the express permission of the manufacturer.

Infringements will result in a claim for damages.

1.2 Optional accessories

LEMKEN implements may be equipped with various accessories. The operating instructions below describe both series components and optional accessories.

Please note: These accessories will vary depending on the type of equipment.



2 SYMBOLS USED IN THE OPERATING INSTRUCTIONS

2.1 Hazard classes

The following symbols are used in the Operating Instructions for particularly important information:

DANGER



Denotes an imminent hazard with high risk, which will result in death or severe physical injury, if not avoided.

WARNING



Denotes a possible hazard with medium risk, which could result in death or severe physical injury, if not avoided.

CAUTION



Denotes a low-risk hazard, which could cause light or medium physical injury or property damage, if not avoided.

2.2 Information



Denotes special user tips and other particularly useful or important information for operation and efficient utilisation.

2.3 Environmental protection



Indication of special recycling and environmental protection measures.



2.4 Indication of passages

The following symbols are used for particular passages in the operating instructions:

- Indicates work steps
- Indicates enumerations

3 SAFETY MEASURES AND PRECAUTIONS

General safety instructions for the operator are specified in the chapter entitled «Safety measures and precautions». At the start of some main chapters the safety instructions, which refer to all work to be carried out in this chapter, are listed together. Each safety-relevant work step includes other safety instructions specific to the work step.

3.1 Target group

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These operating instructions are restricted exclusively to the use of the device by trained technicians and instructed persons.

3.2 Intended use

The device is manufactured in accordance with state-of-the-art standards and the recognised safety rules. However, the use of the device may result in a risk to life and limb of the user or third parties, or cause damage to the device and other material property. The device may be operated in a technically perfect condition only, in accordance with its designated use and by safety-conscious persons in compliance with the operating instructions.

Intended use also includes:

- compliance with the operating instructions and implementation of the work steps indicated in the operating instructions,
- compliance with the safety and warning signs on the device,
- observance of the power limits of the tractor and device,
- observance of all maintenance specifications and additional checks,
- the use of original spare parts,
- the use of the listed auxiliary and operating materials as well as their environmentally friendly disposal.

Safe operation is not guaranteed unless all instructions, settings and power limits applicable to the device are observed.

The machine is only suitable for the usual agricultural use.

3.3 Safety features of the device

To protect the operator and the device, the device is equipped with special safety features in accordance with country specific requirements.

- Always keep all safety devices in working order.
- 3.4 Safety and warning signs
- 3.4.1 General information

The implement features all equipment which ensures safe operation. If hazardous areas could not be completely secured with respect to operational safety, warning signs are affixed which indicate these residual risks. Damaged, lost or illegible warning signs must be replaced immediately.





3.4.2 Position of warning stickers





3.4.3 Meaning of warning signs

 Please familiarise yourself with the meaning of the warning signs.

The following explanations provide detailed information.



Please read and observe the operating instructions and safety instructions before starting up the implement for the first time.



Before carrying out maintenance or repair work, switch off the engine and remove key.



Do not remain in the operating and swivel area of the implement.



Keep well clear of the turning and swinging area of the implement.





When the three-point power lift is activated, stay outside of the lifting range of the three-point suspension.

3.5 Special safety instructions



• During work nobody must accompany the device.

Risk of injury when freeing casualties

When rescuing people trapped or injured by the device, there is a risk of additional serious injury to the casualty if the hydraulic connections were not connected according to their colour coding as described in the section entitled "Required hydraulic equipment". As a result, functions may run in the opposite direction or may be inverted.

WARNING



 Before actuating the hydraulics, check that the hydraulic connections of the device are connected to the tractor according to the colour coding.

If there is no identification on the tractor and on the device or if the connections are not connected to the tractor according to their identification, it may not be possible to free the person safely.

If in doubt, leave casualties to be freed by specially trained rescue personnel.

WARNING

Risk of injury on parked implement



The implement is not a toy!

Climbing onto the parked implement can result in severe injuries, e.g. due to slipping or tripping.

Do not climb onto the parked implement.



WARNING

3.5.1 Danger areas during implement operation

Moving danger area

The danger area around the implement moves with the implement during operation. The danger area includes the area extending across the entire width (a) of the implement in the direction of travel. Allow an additional 2 m safety distance from the implement on each side.

- Pay attention to the entire danger area while the implement is moving in the field. Stop if necessary.
- Never get off the tractor while it is moving.
- Never allow anyone else to get on or off the tractor while it is moving.



3.6 Residual risks

Residual risks are particular hazards which occur when handling the device and which cannot be eliminated despite a design in accordance with safety requirements.

Residual risks are not usually obvious and may be the source of a potential injury or health hazard.

3.6.1 Hazard caused by mechanical systems

There is a risk of accidents due to crushing, cutting and striking body parts

- on abruptly moving machine parts,
- on moving machine parts caused by stored mechanical energy in elastic parts, such as springs,
- on an inadequately stable device,
- on the general shape or mounting location of components.

3.6.2 Hazard caused by hydraulic systems

There is a risk of injury to body parts, in particular the face, eyes and unprotected areas of skin, caused by burns and contamination with hydraulic fluid

- due to hot/pressurised hydraulic fluid spraying out of leaking joints or lines,
- due to bursting, pressurised lines or components.

3.7 Applicable rules and regulations

The applicable rules which must be observed during operation of the device are listed below:

- Observe the currently valid national highway code!
- Observe the currently valid national laws and regulations for occupational safety.
- Observe the currently valid national laws and regulations for operational safety.



3.8 Operation on public highways

3.8.1 Lighting system and identification

A proper lighting system, identification and equipment must be on the device if it is to be transported on public roads. Further information can be requested from the appropriate authorities.

3.8.2 Requirements of the tractor

 Ensure that the tractor with mounted device always reaches the stipulated braking deceleration.

Observe the permitted axle loads, gross weights and transportation dimensions, see also section entitled "Axle loads"!

Observe the permitted power limit of the tractor!





3.8.3 Axle loads



The following data are required for the calculation:

- from the tractor operating instructions,
- from the implement operating instructions,
- which are to be documented through remeasuring.





Data from tractor operating instructions

- Take the following data from your tractor's operating instructions:

Abbreviation		Data
TL	Tractor kerb weight (kg)	kg
T _V	Front axle load (kg) of empty tractor	kg
Τ _Η	Rear axle load (kg) of empty tractor	kg

Data from implement operating instructions

 Take the following data from these operating instructions or from the documents for the front weight or rear weight:

Abbreviation		Data
G _н	Gross weight (kg) for rear mounting implement or rear weight	kg
Gv	Gross weight (kg) for front mounting implement or front weight	kg
d	Distance (m) between centre of lower control link ball and centre of gravity for rear mounting imple- ment or rear weight	m

Data to be determined through remeasuring are

- Determine the following data through remeasuring:

Abbreviation		Data
а	Distance (m) between centre of gravity for front mounting implement or front weight and centre of front axle	m
b	Tractor wheelbase (m)	m



С	Distance (m) between centre of rear axle and centre	
	of lower control link	m

Calculation of minimum ballasting value at front $G_{V min}$ for rear mounting implement

 $G_{V \min} = \frac{G_{H} x (c + d) - T_{V} x b + (0.2 x T_{L} x b)}{a + b}$

 Enter the calculated minimum ballasting value, as required at the front of the tractor, into the table.

Calculation of minimum ballasting value at rear $G_{H min}$ for front mounting implement

 $G_{H \min} = \frac{G_V x a - T_H x b + (0.45 x T_L x b)}{b + c + d}$

 Enter the calculated minimum ballasting value, as required at the rear of the tractor, into the table.

Calculation of actual gross weight G_{tat}

 $G_{tat} = G_V + T_L + G_H$

 Enter the value for the calculated actual gross weight and the permissible gross weight as given in the tractor's operating instructions into the table.

Calculation of actual front axle load $T_{V\,tat}$

$$\Gamma_{V \text{ tat}} = \frac{G_V x (a + b) + T_V x b - G_H x (c + d)}{b}$$

 Enter the value for the calculated actual front axle load and the permissible front axle load as given in the tractor's operating instructions into the table.



Calculation of actual rear axle load $T_{H tat}$

 $T_{H \text{ tat}} = G_{\text{tat}} - T_{V \text{ tat}}$

 Enter the value for the calculated actual rear axle load and the permissible rear axle load as given in the tractor's operating instructions into the table.

Tyre load-carrying capacity

 Enter double the value (for two tyres) for the permissible tyre load-carrying capacity (see, e.g. tyre manufacturer's documentation) into the table.

Table	Actua cordin	al value ac- g to calcula- tion		Permissible value according to tractor operating instructions			Double permissible tyre load-carrying capacity [two tyres]		
Minimum ballas- ting, front	$G_{V \min}$	kg	3	-			-		
Minimum ballas- ting, rear	G _{H min}	kg	3				-		
Gross weight	G _{tat}	kg	<	TL	kg		-		
Front axle load	T _{V tat}	kg	v	Tv	kg	<u><</u>	kg		
Rear axle load	T _{H tat}	kg	<	Т _н	kg	<u><</u>	≤ kg		

3.8.4 Check before departure

- Before driving with the implement raised, lock the control lever of the control unit; otherwise it may drop and the implement may be unintentionally lowered.
- Mount and check the transport equipment such as the lighting system, warning signs and protective devices.

The actuating cables for the quick-release couplings of the tractor must hang loose and must not actuate themselves in any position.

- Before starting up and operating the implement, check the immediate vicinity around it. No-one must be standing in this area!
- Ensure that visibility is adequate.

Observe permitted axle loads, total weights and transportation dimensions.

3.8.5 Correct behaviour in road traffic

 When driving on public highways, observe the relevant statutory national regulations.

Driving behaviour, steering and braking performance are influenced by ballast weights.

- Ensure that the tractor has adequate steering and braking performance.
- When driving around corners, take into account the wide radius and the inertia of the device.
- It is prohibited to transport people on the device.

3.9 Obligation of the operator

- Before switching on the device, read the operating instructions.
- Follow the safety instructions!
- Wear appropriate protective clothing when carrying out any work on the device.
 Protective clothing must be tight-fitting!
- Observe generally accepted and other obligatory regulations for the prevention of accidents and protection of the environment and add them to the operating instructions!

The operating instructions are an important component of the device.

- Ensure that the operating instructions are always ready available at the installation location of the device and are kept for the entire service life of the device.
- If the device is sold or the operating company changes, pass on the operating instructions with the device!

- Keep all safety instructions and danger warnings on the device in a completely legible state. The affixed safety and warning signs provide important information on safe operation. Comply with them to ensure your safety!
- Do not alter, retrofit or modify the device, potentially impairing safety, without the approval of the manufacturer. The manufacturer is not liable for any damage resulting from arbitrary modifications to the device!
- Operate the device only in compliance with all connection and default values provided by the manufacturer!
- Use original spare parts only!

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3.10 Safe use of the implement

3.10.1 General

- Before starting work, familiarise yourself with all the equipment and controls and how they work.
- Do not operate the implement unless all the safety guards are in place and correctly positioned. For field work: remove safety guards that are designed for transport only.
- Always attach the implement correctly and only attach it to the equipment provided for that purpose.
- Always take great care when attaching the implement to and detaching it from the tractor.

There is a risk of injury due to crush and shear points in the area around the three-point linkage.

- Before attaching or detaching the implement to/from the three-point linkage, move the control device to the position where the implement cannot be raised or lowered accidentally.
- Do not stand between the tractor and implement when operating the external controls for the three-point linkage.

Do not stand in the danger area around the implement or climb onto the implement during operation.

There is a risk of injury in the wider operating area around the implement, e.g. from flying stones.

- Before operating the hydraulic equipment, ensure that nobody is standing in the danger area. There is a risk of crushing and shearing from power-operated components.
- Do not stand between the tractor and the implement. This is only permitted when the tractor is secured by the parking brake and wheel chocks to prevent it from rolling away.
- Always keep the implement clean to avoid the risk of fire.
- Lower the implement onto the ground before leaving the tractor.
- Switch off the engine.
- Remove the ignition key.

3.10.2 Personnel selection and qualifications

- The tractor driver must have the appropriate driving licence.
- All work on the implement must be carried out by properly trained and instructed personnel. The personnel must not be under the influence of drugs, alcohol or medication.
- All maintenance and servicing work must be carried out by trained technicians or persons who have received appropriate instruction.
- All work on electrical components must be carried out by an electrician in accordance with the electrical safety regulations.

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3.10.3 Hydraulic system

- The hydraulic system is under high pressure.
- When connecting hydraulic cylinders and motors, ensure that the specified hydraulic hose connection is used.
- When connecting the hydraulic hoses to the tractor hydraulics, make sure that the hydraulic system is depressurised on both the tractor and the implement.
- If there are hydraulic functional connections between the tractor and the implement, coupling sleeves and plugs must be identified to prevent operating errors.
 If the connections are reversed, the function is reversed (e.g. raising/lowering) Risk of accident.
- Check hydraulic hose lines regularly and replace if damaged or showing signs of aging. The replacement hose lines must meet the technical requirements stipulated by the implement manufacturer.
- When searching for leaks, use appropriate equipment because of the risk of injury.
- Fluid (hydraulic fluid) which escapes under high pressure can penetrate the skin and cause severe injuries. If injuries occur, call a doctor immediately. Risk of infection.
- Before working on the hydraulic system, set down the implement, depressurise the system and shut down the motor.

4 HANDING OVER THE IMPLEMENT

- As soon as the implement is delivered, ensure that it corresponds with the order package.
- Also check the type and completeness of any supplied accessories.

When the device is handed over, your dealer will explain how it works.

As soon as the implement is handed over, familiarise yourself with the implement and its functions.



5 LAYOUT AND DESCRIPTION

5.1 Overview



- 1 Headstock
- 2 Cross shaft
- 3 Stand
- 4 Adjustment centre

- 5 Plough body
- 6 Basic frame
- 7 Turnover device

5.2 Description

5.2.1 Headstock

The headstock with top link pin and cross shaft complies with ISO 730.

Cross shaft L2/Z2 complies with category 2.

The top link pin complies with category 2.

5.2.2 Stand

The stand ensures stability when the footing condition deteriorates.

5.2.3 Plough bodies



5.2.4 Basic frame

The ploughs of the Opal 080 series feature a square profile frame 80 x 80 x 7 mm. The frame height is 70 cm.



5.2.5 Turnover device

The ploughs of the Opal 080 series feature the hydraulic turnover device D60.

6 PREPARATIONS ON TRACTOR

6.1 Tyres

The air pressure must be identical, particularly on the rear tractor tyres. Under difficult conditions, additional wheel weights should be used or the tyres topped up evenly with water. See operating instructions of the tractor manufacturer.

6.2 Lifting rods

The lifting rods should be adjusted so they are as short as possible and of equal length. See operating instructions from the tractor manufacturer.

6.3 Top Link

Where there are alternative fitting positions at the tractor for the top link, fit the top link tractor-sided as hight as possible.

6.4 Chains and stabilisers of the three-way linkage

The chains or stabilisers must be adjusted so that they ensure adequate lateral movement of the lower link of the tractor during work.

• They must be laterally locked if the lower links are raised and are in the transport position.



 Some makes of tractor are equipped with automatic side struts, which must be specially adjusted. If the tractor suddenly pulls to one side or the implement works with different widths on the right and left, this may be caused by the side strut not having been released. The function of the locking device of the automatic side strut should be checked and re-adjusted if necessary. See the operating manual provided by the tractor manufacturer.

6.5 Hydraulics

For work the tractor hydraulics must be set to 'Draft' or 'Mixed' Control. See manufacturer's instructions.



6.6 Hydraulic equipment required

The implement is supplied as standard with separate hydraulic couplings for each consumer. The protecting caps on the hydraulic couplings are coloured and the hydraulic couplings themselves are marked alphanumerically.

In order to operate the hydraulic devices, the tractor must be equipped with a double-acting spool valve.

7 PREPARING THE IMPLEMENT

7.1 General

Before using the implement for the first time, we recommend that you set it up as described below while you are still in the yard and familiarise yourself with the implement and its functions. The settings are adjusted with the implement mounted on the tractor.

7.2 Upper control link length

- Lower the plough.
- Turn the upper control link until the plough standing on even ground is 1 to 3 cm higher at the front than at the rear.

If the upper control link is in the slot, it must be turned until the top link pin is at the front of the slot when the plough is lowered and the plough is also 1 to 3 cm higher at the front than at the rear.

7.3 Three-point connection

Loss of the implement

WARNING



The category of the three-point linkage on the tractor and the category of the cross shaft and top link pin must correspond, otherwise the cross shaft and top link pin may slip out of the connection when travelling on uneven ground or as a result of vibration.

 Always ensure that the category of the three-point linkage and the diameter of the cross shaft and top link pin are exactly the same.

The maximum permissible tractor power and dimensions for each category in accordance with ISO 730-1 are set out in the table below.





Tractor	power	Cat.	Diameter of drawbar pivot (mm)	Length of drawbar (shoulder distance) (mm)	Distance, tractor lower links (mm)	Distance between cross shaft and in- tersection point ex- tension of lower links (mm)
kW	hp		Α	В	С	D
22 - 51	30 - 70	2	28	825	435	1800 - 2400

8 ATTACHING THE IMPLEMENT

8.1 Specific safety information

Risk of injury from the parked implement

- Never enter the danger zone between the tractor and implement.
- Read and observe the "Safety measures and precautions" section and the special safety instructions "Risk of injury from the parked implement".

The implement is not a play area.

Climbing on the parked implement may cause serious injuries, e.g. as a result of slipping or tripping.

Do not climb on the parked implement.

8.2 General

WARNING



Attach the plough parked in working position to the tractor as follows:

- Switch the tractor's hydraulic system to position control.
- Connect the lower link to the cross shaft (1).
- Secure the lower link.
- Use the tractor's hydraulic system to lift the implement until the stand is sufficiently raised from the ground.
- Remove the connector pin (2).
- Remove the stand (3).





- Connect the top link. The top link should rise up towards the plough while ploughing.
- Secure the top link pin (4). Only use the top link pin supplied with the plough.
- Switch the tractor's hydraulic system to float position.
- Connect the hydraulic hoses.
- Switch the hydraulic system to draft control or mixed control for work. Also see the operating instructions from the tractor manufacturer.

9 UNCOUPLING THE IMPLEMENT

9.1 Specific safety information

Risk of injury from the parked implement

- Never enter the danger zone between the tractor and implement.
- WARNING



 Read and observe the "Safety measures and precautions" section and the special safety instructions "Risk of injury from the parked implement".

The implement is not a play area.

Climbing on the parked implement may cause serious injuries, e.g. as a result of slipping or tripping.

Do not climb on the parked implement.

9.2 General

Detach the plough from the tractor as follows:

The plough is in rightward turning working position.

The plough is parked on a solid and level ground.

- Rotate the plough frame into working position.
- Switch the tractor's hydraulic system to position control.
- Lower the plough.
- Switch off tractor engine.





- Depressurise the hydraulic hoses. See operating instructions from the tractor manufacturer.
- Remove the top link from the headstock (1).
- Disconnect the hydraulic hoses and the electric cables.
- Install the protecting caps.
- Position the hydraulic hoses with the couplings between the headstock (1) and the adjusting nut (2).



Attach the stand (3) with the connector pin (4).

CAUTION



Risk of injury from falling stand



- Unlock the lower link locking device.
- Remove the lower link from the cross shaft (5).
- Lower the plough fully.
- Check that the lower link is completely detached from the cross shaft.



10 DRIVING ON PUBLIC ROADS

10.1 Laws and regulations

All national laws and regulations relating to transport on public roads must be observed.

11 OPERATION

11.1 Specific safety information

Read and observe the "Safety measures and precautions" sec-CAUTION tion.

- This implement should always be used, operated and repaired by persons who are familiar with it and aware of the risks.
- Before carrying out any adjustment or repair work or rectifying any malfunctions, always ensure that the driveline is switched off and the engine is stationary. Remove the ignition key.

Risk of accidents during adjustment work

DANGER



During all adjustment work there is a risk of crushing, cutting, trapping or knocking the hands, feet or body on heavy parts which may be under spring pressure and/or have sharp edges.

Adjustment work must always be carried out by trained personnel.

- Always wear appropriate protective clothing.
- Always follow the safety and accident prevention rules.

11.2 Turning the plough frame







The turnover device has a double-acting turnover ram (1) with automatic locking and switchover for connection to a doubleacting spool valve.

- Lift the plough completely before turning it.
- Apply pressure to the hydraulic hose connected to the tractor, marked "P1".
 The plough frame turns through 90°.
- In central position (90° plough turning) apply pressure to the hydraulic hose connected to the tractor with the mark "T1".

The plough frame turns to 180°.

- After turning, switch the control lever to "N" (neutral).

A new turning operation can then be initiated.

11.3 Adjusting front furrow width

11.3.1 General information

The front furrow width must be set to correspond to the working width of the following plough base.

11.3.2 Front furrow width



Use the inner screw (1) to adjust the front furrow width.

If the front furrow is too narrow:

- Turn the screw (1) shorter.

If the front furrow is too wide:

- Turn the screw (1) longer.

11.4 Angle

11.4.1 General information

When ploughing, the base blade should be almost vertical to the ground as seen from the direction of travel. The correct angle is set when the ploughing pattern is uniform.

If this is not the case, then the angular adjustment must be altered as described below.

11.4.2 Angular adjustment (double acting)



- Lift the plough 5 to 10 cm.
- Briefly apply pressure to the hydraulic hose that leads to hose terminal P of the turnover ram (1).
- The stop arm (2) rotates a few centimetres away from the stop.
- Adjust the inclination as required using adjusting nut (3).
- Move the lever of the tractor spool valve to the opposite pressure position.
- The stop arm (2) rotates a few centimetres towards the stop.
- Lower the plough again.
- Check whether the adjustment is good enough.
- If not, repeat the adjustment as described above.

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11.5 Working depth

The working depth is set using the tractor hydraulic system. For information on adjusting the hydraulic system, see the operating instructions from the relevant tractor manufacturer.

- Always switch the hydraulic system to draft control or mixed control.

11.6 DURAL plough body

11.6.1 Angle



The distance (A) between the points and the plough frame should be identical at all bodies. The dimension (D) should be approx. 1.5 cm. Required adjustments are carried out using the adjusting screw (1).

- Loosen wing body screws (2).



The bodies are fitted at a centre pitch angle relative to the ground. Change the pitch angle using the adjusting screw (1).

- Adjust the adjusting screw (1).
 - Larger pitch angle
 => improved penetration
 - Smaller pitch angle
 - => improved depth control
- Retighten all screws.
- See "Tightening torques, page 54".

11.6.2 Working width for each body



The working width for each body is changed using wedges (1) that are screwed between the leg (2) and the frog (3). Three working widths are possible for each body.

 Narrow side of the wedge (1) points forwards

=> less working width for each body

- Without wedges
 => medium working width for each body
- Wide side of the wedge (1) points forwards

=> more working width for each body



11.6.3 Tail Pieces



The tail pieces (2) being positioned at the end of the mouldboards (1) help to turn the furrow slice.

- Adjust all tail pieces uniformly.

Set too deeply, they can cause soil to fall back into the furrow.



11.6.4 Sword Coulter



Fit the sword coulter (1) in front of the landslide (2) of the plough body.

11.7 Shearing protection



Each plough body is equipped with shearing protection (1) to safeguard against overloading.

If an excess load is applied to a plough body, the shear bolt (1) shears off. The plough body swivels to the rear.

Risk of being crushed and injured due to moving components

WARNING



When a shear bolt shears off, the plough body is movable. There is a risk of being crushed and injured in the turning range of the plough body.

When repairing the plough body:

- Always stand behind the plough body in the direction of travel when carrying out work.
- Pay particular attention during repair work.



After a shear bolt has broken:

- Leave the implement in the ground.

Carry out the following work on the implement behind the plough body in the direction of travel:

Remove the remains of the shear bolt (1).

WARNING: Risk of cuts due to sharp edges at the shear bolt

• Keep hands and fingers away from the area of the stalk and leg bracket.

WARNING: Risk of being crushed by moving components.

- Loosen the screw (2) on the leg.
 - Keep hands and fingers away from the area of the stalk and leg bracket.
- Lift up the implement until the plough body swivels into its working position.
- Have a new shear bolt M12x55 10.9 ready.

ATTENTION: Only use the aforesaid shear bolt. Only this bolt guarantees effective protection against damage.

 If the swivelled out plough body is not yet in the working position when the implement is raised:

Swivel the plough body all the way back into its working position by hand.

 Perform a visual inspection whether the holes for the shear bolt are in alignment.







- Install the new shear bolt (1) M12x55 10.9.
- Carefully tighten the shear bolt (1) and the screw (2). See "Tightening torques, page 54".



12 PUT THE IMPLEMENT OUT OF OPERATION

12.1 Shutting down the implement in an emergency

- In an emergency shut down the implement via the tractor.
- Switch the tractor engine off.
- Remove the ignition key.

	Damage caused by improper storage of the implement			
CAUTION	If incorrectly or improperly stored, the implement may be dam- aged, e.g. by humidity and dirt.			
	The implement should be deposited on a flat and adequately sta- ble base only.			
	 Clean the implement prior to storage. 			
	 Lubricate the implement according to "Lubrication diagram". 			

12.2 Disposal

Metal and plastic components must be recycled.



 When disposing of the implement, ensure that the individual components as well as the auxiliary and operating materials are disposed of in an environmentally friendly manner.



13 MAINTENANCE AND REPAIRS

13.1 Special safety instructions

13.1.1 General

	Risk of injury when carrying out maintenance and repair work
WARNING	There is always the risk of injury when carrying out maintenance and repair work.
	 Use suitable tools, suitable climbing aids, platforms and support elements.
	 Always wear protective clothing.
	 Carry out maintenance and repair work only on an extended and deposited device or on a device secured by suitable sup- port elements to prevent it from extending or dropping.

13.1.2 Working under the raised device



13.1.3 Immobilise the implement for maintenance and repairs

	Risk of accidents when tractor starts up
WARNING	 Injuries may occur if the tractor starts moving during maintenance and repair work. Switch off the tractor engine before carrying out any work on the implement.
	 Secure the tractor against unintentional starting.
	 Remove the ignition key.
	 Affix a warning sign in front of the implement and in front of the tractor to advise outsiders of maintenance work.
	 Secure the tractor against rolling away using wheel chocks.

13.1.4 Working on the hydraulics

WARNING Risk of accident from spurting hydraulic fluid WARNING Fluid (hydraulic fluid) which escapes under high pressure may penetrate your skin and cause severe injuries. If injuries occur, call a doctor immediately. Always depressurise the hydraulic system before working on it. – Always wear appropriate protective clothing before working on the hydraulic system.

13.1.5 Personnel qualifications





13.1.6 Protective equipment



Risk of accident due to working without protective equipment There is always an increased risk of accidents when carrying out maintenance work and repairs.

Always wear appropriate protective equipment.

13.1.7 Utilised tool

WARNING Risk of accident due to use of unsuitable tool



If working with an unsuitable or defective tool, there is a risk of accidents and injuries.

 Perform all work on the device with a suitable and functional tool only. This applies in particular to the use of lifting gear.

Risk of back injuries

WARNING



cumbersome components, you may suffer back injuries which require long convalescence.

If your posture is not correct when installing or fixing heavy or

Installation and maintenance work may be carried out by trained and instructed personnel only.

 Perform all work on the device with a suitable and functional tool only. This applies in particular to the use of lifting gear.

Risk of accident due to tool slipping off

WARNING

If applying a large force, e.g. when loosening bolts, the tool may slip off. This may result in hand injuries on sharp-edged parts.



 Avoid applying a large force by using suitable auxiliary equipment (e.g. extensions).

Check nuts and bolt heads, etc. for wear and, if required, consult an expert.

13.2 Environmental protection

- Ensure that all materials and operating supplies used to maintain and care for the device are disposed of in line with environmental regulations.
 - All recyclable components should be recycled.
 - Observe the national regulations applicable in your country.

13.3 Maintenance intervals

13.3.1 After initial commissioning (after no more than 2 hours)

Check	What needs to be done?
Bolted connections	 Tighten all the bolts and nuts on the implement to the appropriate tightening torque, see «Tightening tor- ques, page 54».

13.3.2 Daily checks

Check	What needs to be done?
Hydraulic hoses	 Check the hydraulic hoses for damage and leaks.
	 Replace damaged or faulty hydraulic hoses im- mediately.
	Hydraulic hoses must be replaced within six years from the date of manufacture.
	Always use LEMKEN-approved hydraulic hoses.
Safety equipment	Check that the safety equipment is working pro- perly. See «Safety features of the device, page 11».
Soil working implements	 Check all the soil working implements for dama- ge and wear.
	- Replace damaged or worn components.



13.3.3 Weekly checks

Check	What needs to be done?
Bolted connections	 Tighten all the bolts and nuts on the implement to the appropriate tightening torque. See «Tightening torques, page 54».
	 If necessary, secure the bolted connections with locking compound.

13.4 Tightening torques

13.4.1 General

- Secure self-locking nuts that have been loosened against working themselves loose again by:
 - Replacing them against new self-locking nuts
 - Using lock washers
 - Using locking compounds such as Loctite



The tightening torques set out below refer to screw connections that are not specifically mentioned in these operating instructions. Specific tightening torques to be applied are mentioned in the text.

 Identify the relevant screw connection by means of the spareparts list or the markings on the screw head.

Diameter	Strength category				
Diamotor	8.8 [Nm*]	10.9 [Nm*]	12.9 [Nm*]		
M 6	9,7	13,6	16,3		
M 8	23,4	32,9	39,6		
M 10	46,2	64,8	77,8		
M 12	80,0	113	135		
M 14	127	178	213		
M 16	197	276	333		
M 20	382	538	648		
M 24	659	926	1112		
M 30	1314	1850	2217		

13.4.2 Bolts and nuts made of steel

 $^{*}\mu_{g} = 0,12$

13.5 Check the connections to the tractor

13.5.1 Hydraulic connections

Risk of accidents due to escaping hydraulic fluid



- Hydraulic fluid which is ejected under high pressure (hydraulic oil) can penetrate the skin and cause serious injuries. In the event of injuries, consult a doctor immediately.
 - Due to the risk of injury, always use suitable tools when looking for leaks.
 - Always wear appropriate protective clothing.
- Carry out a visual inspection of the hydraulic couplings.
- Look for leaking hydraulic oil at the hydraulic couplings.
- Connect the hydraulic lines to the tractor.
- Check that the hoses are leak-free when under pressure.

Faulty or leaking couplings must be repaired or replaced immediately by a specialist workshop.



13.5.2 Lubrication schedule

	Every		Before and after	
	10	50	100	a long
	ope	rating ho	urs	break
Slewing gear bea- rings and cylinder adapters		\checkmark		
Bearing tube of the basic frame				
Turnbuckles				
Thread of the angu- lar adjustment				

14 TROUBLESHOOTING

14.1 Plough penetration and depth control, slippage

Fault	Cause	Solution
Plough does not stay in the ground.	Penetration force too low	 Retract the body Reduce the distance between the point and the frame (not more than 2 cm).
Plough does not penetra- te the soil.	 Pitch angle of shares is too small 	 Extend the body Increase the distance between the point and the frame (not more than 2 cm).
	 Top link attached too high on the plough headstock 	 Move top link to a lower position on the plough headstock.
Excessive tractor slippa- ge.	Tractor hydraulic system not adjusted correctly	 Adjust the hydraulic system so that suffi- cient plough weight is transferred to the trac- tor.



14.2 Miscellaneous

Fault	Cause	Remedy
Shear bolt on the base fre-	Incorrect shear bolt fitted.	 Use an original shear bolt.
quently shears off.		



The shear bolt head should always be fitted on the side of the plough that points towards the ploughed land, so that the thread is not in the shearing area.

15 TECHNICAL DATA

15.1 Permissible power range and weight

Designation	Number of furrows	Weight	Tractor power	
		Approx. kg	HP	kW
Opal 080E	2	300	30-47	22-35

15.2 Type plate

The implement carries a type plate.

The type plate can be found at front right on the implement.

The operating instructions may apply to different implement types or variants of the implement.

The operating instructions indicate information which only applies to a specific implement type or a specific variant of the implement.

The type plate will help you to identify the implement type and variant.

Layout of the type plate



Illustration: Example of a type plate

EXEMPTIES

- 1 Series
- 2 Type designation
- 3 Serial number
- 4 Year of manufacture
- 5 Permissible drawbar load [kg]
- 6 Permissible axle load [kg]
- 7 Permissible gross weight [kg]
- 8 Company logo and address
- 9 CE marking (only within the European Union)
- 10 Name of manufacturer
- 11 Type, variant, version
- 12 Type approval date



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