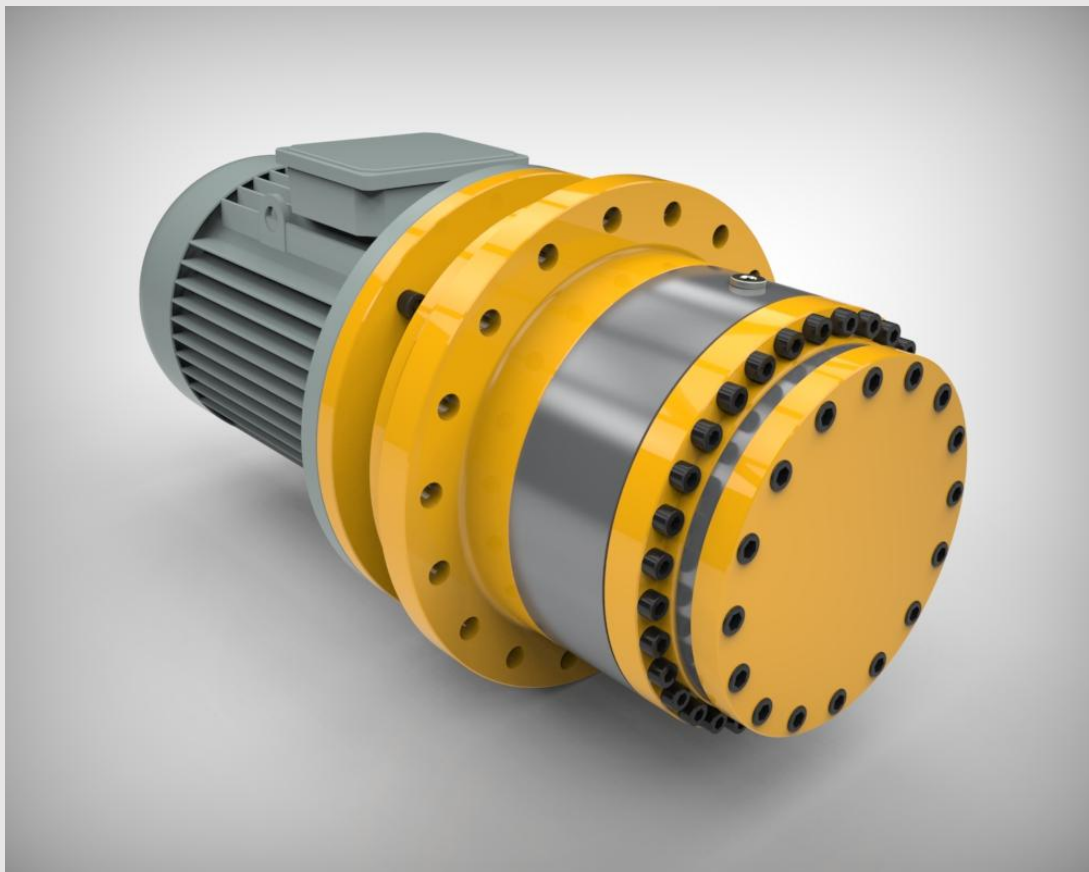


OPERATING INSTRUCTIONS FOR CRANE GEARBOX



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1 OPERATING INSTRUCTIONS

Pay attention to the following safety and warning signs before installation and operation of the crane gearbox.



Mechanical Risk: Do not put your hand on the gearbox while it is running. It cause fatal injuries.



Electrical Risk: Electrical hazard may cause severe or fatal injuries



It may pose a risk: It may cause minor or fatal injuries.



Recommendations and key information for the user


1.1 ORDER INFORMATION FOR GEARBOX

- The crane is delivered without oil filling and with an oil-free label on it.
- Gearboxes labelled as oil-free do not contain any oil. Gearboxes must never be operated without oil. Otherwise, failures that will occur in the gearbox are not covered by the warranty.
- If it is requested to add oil in the gearboxes, our sales representative must be notified at the order stage.
- The operating conditions of the gearbox must be notified to our sales representative at the order stage.
- Important technical information can be found on the gearbox label.
- The mounting position can only be changed after consultation with PDS Planet Redüktör. If changed without any information and approval, the warranty provided will be invalid.
- When the mounting position is changed, the warranty given will be invalid unless PDS Planet Redüktör is informed because the oil quantity of the gearboxes will change.
- The filling amount of the gearbox whose mounting position is to be changed and the position of the air relief valve (air vent) also change.
- Use of the product outside the catalogue values is not covered by the warranty.
- The product will be out of the scope of warranty in case of repair and maintenance or replacement of parts other than PDS Planet Dişli.
- For the devices where the gearboxes will be mounted according to the working place, the instructions in the PDS Planet Redüktör operating manual must also be included in own operating manual.

- During the damage to the gearbox, the damage must be detected after the machine is stopped.
- If a different condition is encountered in the gearbox during operation, the main motor must be switched off, the cause must be determined and PDS Planet Redüktör must be consulted.

IMPORTANT INFORMATION:

EC Machinery Directive: According to the terms of the European Union Machinery Directive 2006/42/EC, gearboxes are not machine parts that are operated alone, but are components used in machines. In the regions to which this directive applies, it is forbidden to operate the gearbox on the machine on which the gearbox is installed unless the requirements of the directive are fulfilled. This user manual has been prepared by our company in accordance with the European Union Machinery Safety Directive 98/37/EC in order to provide information for the safe transport, storage, assembly, connection, commissioning, maintenance and repair of the gearbox.

 The operating instructions contain key information for the fulfilment of the following purposes:

- Smooth operation
- Fulfilment of warranty conditions

These operating instructions are created for all our gearbox models. For custom-made gearboxes or products revised according to customer request, please consult PDS Planet Redüktör about the validity of this manual. Compliance with the instructions in the user manual is a prerequisite for smooth operation and for warranty coverage in the event of damage. Use contrary to these Operating Instructions poses a risk to human health and safety as well as economic damage.

Therefore, the Operating Instructions must be read carefully before starting up the gearbox!

The operating instructions must be kept close to the operating area of the gearbox and must be accessible when required.

2 TYPE IDENTIFICATION OF GEARBOX

Product Types

1-PW	4-HT-1900	7-HT-1900 VARGELLİ
2-PWF	5-HT-1900 LONG	8-PDTF
3-PWFS	6-HT-1900 SHORT	

Crane Series

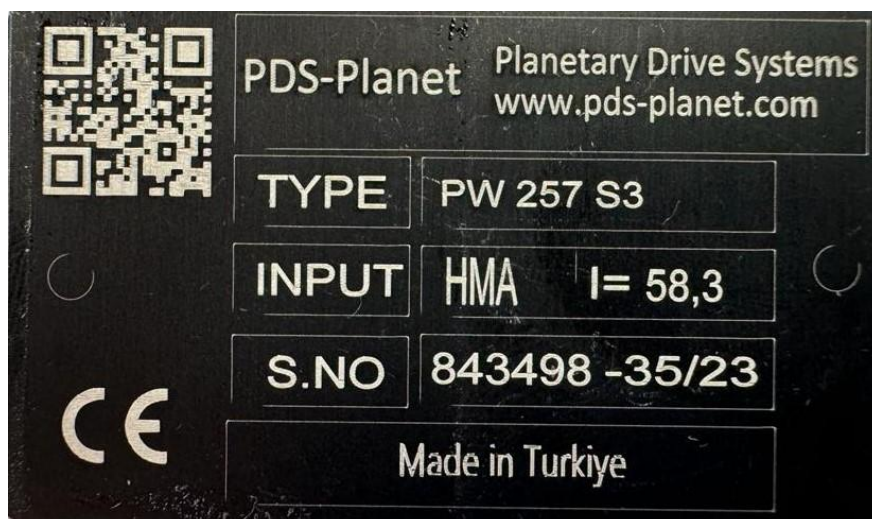
PW SERIES : PW-PWF-PWFS ; 253-257-261-271-273-283

HT SERIES : HT 1900

PDTF SERIES : PDTF 2400-5000-6000-8000

3 LABEL TYPE IDENTIFICATION

Sample label for our gearboxes.



Type: Gearbox Type

Serial number/Date: Gearbox serial number / Week-Year

Input: Motor input adapter

I: Gear Ratio

4 SAFETY

4.1 INTENDED USE

Crane Gearboxes are designed to be used in marine, energy, mobile group, back, construction, crane, industry, mining fields. For maximum permissible torque and speed values, please refer to our product catalogue or our web page.

The maximum permissible value can be obtained from our catalogue based on the gearbox code on the product label. Other detailed information is available in our product catalogue. Use of the product outside the maximum values specified in our catalogue will invalidate the product warranty and CE manufacturer's declaration. The manufacturer responsibilities of PDS PLANET REDÜKTÖR on the product will be relieved.

Gearboxes are intended for use in industrial machinery and our product must only be used in accordance with the conditions specified in the catalogue and this manual. The products are manufactured according to the machinery directive 2006/42/EC. The product must be operated and

maintained as specified in this manual. The products can only be assembled with machines and/or parts conforming to the 2006/42/EC standard.

The motor attached or to be attached to the gearbox can only be operated at frequency values that will give the label or catalogue speeds of the gearbox. The planetary gearbox label contains only one fixed speed and is only allowed to operate at this speed.

Different input speed, different motor power, high input/output radial loads other than catalogue or label values etc. are not permissible.

The ambient temperature must be -20~+40 °C and the interaction of abrasive material with felts and paint must be prevented. Consult PDS PLANET REDÜKTÖR for different operating conditions.

Maintenance of the gearbox (oil change and check) must be carried out according to this manual.

Improper use and any use outside of the above-mentioned limits and outside of the label/catalogue values (especially use at high torque and different speeds) is considered by PDS PLANET REDÜKTÖR as misuse and responsibilities of PDS PLANET REDÜKTÖR for the product will be relieved.

We do not recommend the use of a planetary gearbox under the following conditions;

- ✓ Installation/commissioning other than specified in these operating instructions
- ✓ If the gearbox is excessively dirty and poorly maintained
- ✓ Use without oil
- ✓ Use outside the product catalogue / label values

4.2 GENERAL SAFETY INSTRUCTIONS

- ✓ Irregular and uncontrolled work can cause injuries. Make sure that the gearbox is assembled, disassembled and maintained by trained technicians.
- ✓ Foreign objects in the air or in the surroundings can cause serious injuries. Before starting the gearbox, make sure that there are no foreign objects or tools around it.
- ✓ Hot surfaces can cause burns. If the operating temperature is high, do not touch the surface of the gearbox or use suitable gloves.
- ✓ Rotating elements may cause injuries. There is a risk of swinging or pinching. Stand at a sufficient distance from the rotating elements and cover them all safely. Please refer to the relevant norms EN349 + A1 and EN13857.
- ✓ Unintentional (accidental) operation during gearbox maintenance can cause serious accidents. Before maintenance, make sure that no one can operate the gearbox by means of **lockout and tagout** equipment (see **LOTO applications**) to ensure that the gearbox does not start.
- ✓ Hot oil, which is heated by the operation of the gearbox, may cause burns in contact with the skin. Before changing the oil, make sure that the gearbox is not running and the oil has cooled down.

- ✓ Unless the environmental conditions are specified differently on the label, standard gearboxes are suitable for operation at temperatures between -20 °C and +40 °C. Using the gearbox outside these limits may damage the gearbox.
- ✓ Above temperatures of +40°C, the gearbox surface temperature may cause burns when touched.
- ✓ Intensive contact with oil may cause skin irritation. Thus, oil must be changed with nitrile gloves or suitable gloves that will prevent oil contact with your skin. Avoid contact of the oil with the skin.

4.3 DESCRIPTION OF FIRST AID MEASURES IN CASE OF OIL INHALATION - INGESTION - SKIN CONTACT - EYE CONTACT

- ✓ **Inhalation;** Take the victim out to fresh air immediately. Rinse the nose and mouth with water. Seek medical advice if discomfort persists.
- ✓ **Ingestion;** Never give anything orally to a person who is unconscious. Do not try to induce vomiting. Rinse the mouth thoroughly with water. Seek medical advice if discomfort persists.
- ✓ **Skin contact;** Take the victim away from the source of contamination. Remove contaminated clothing. Wash the skin thoroughly with soap and water. Seek medical advice if discomfort persists.
- ✓ **Eye contact;** If contact lenses are used, remove them and open the eyelids well. Continue washing for at least 15 minutes. Continue washing for at least 15 minutes. If discomfort persists, seek medical advice.

5 POINTS TO BE CONSIDERED BEFORE MOUNTING THE GEARBOX

If motor gearboxes are used, please also refer to the motor manufacturer's manual. Before mounting the gearbox, make sure that the gearbox has arrived complete and undamaged. Points to be considered before mounting the gearbox;

You must have the correct instruction manual for the product.

Please read our product commissioning instructions.

Ensure that the gearbox is stored and transported under the storage and transport conditions specified in this manual.

If you do not have the current catalogue of the product, you can access our catalogue at www.pds-planet.com/katalog.

5.1 SHIPMENT

When you receive the shipped goods, first check for any damage. If any damage is detected on the gearbox, please call our company and provide information about the damage. You must not start the gearbox until you have received confirmation from our company that the damage has no effect on the operation of the gearbox.

5.2 HANDLING

Use rope or lifting hooks for lifting and handling gearboxes. If you cannot find a picture suitable for handling your gearbox on pages 10 and 11 of the user manual, please contact PDS PLANET REDÜKTÖR. Do not hang additional loads on the gearbox hooks during lifting and handling of the gearbox. Use lifting equipment (rope or lifting hook) suitable for the weight of the gearbox. Please get information from our company for the weights of different product types.

Pay attention to the centre of gravity when attaching the gearboxes with a rope or lifting hook. Handle the gearbox in accordance with the "**Regulation on Health and Safety Requirements for the Use of Work Equipment**".

Dropping or hitting the gearbox on the ground causes damage to it. Use a crane or lifting system capable of lifting the gearbox. Make sure that the gearbox is handled and put down with slow movements. Avoid sudden movements and sudden lifting load speeds in all handling operations.

6 MOUNTING THE GEARBOX

6.1 BEFORE YOU START

Check whether the gearbox has been damaged during storage or handling. If there is any damage, please call PDS PLANET REDÜKTÖR and the shipping company. Make sure that you have the necessary equipment for assembly (spanners, torque wrench, shims, liners, input and output shaft fasteners, oil, thread lockers, etc.).

6.2 MOUNTING POSITION

The mounting position must be the same as the mounting position indicated on the green label of the gearbox. Please inform our sales representative about the mounting position at the order stage. If the planetary gearbox will be mounted in a different mounting position than the mounting position indicated on the green coloured label, please consult our company. Since the amount of oil to be put into the gearbox changes in case of mounting position differences, make sure to put oil according to the mounting position specified in the user manual.

6.3 USE OF VENT PLUG

Under normal operating conditions (temperature between +2°C - +30°C and operating time between 0-8 hours) there is no need for a vent plug. In cases where the thermal power affecting the oil temperature of the gearbox is high and at high ambient temperatures, it is necessary to use a vent plug (air relief valve) since the pressure will increase due to the expansion of the oil inside the gearbox. It is shipped mounted on the gearbox by PDS Planet Redüktör according to the mounting position of the gearbox. In case of change of mounting position, the blind plug at the top of the horizontal positions must be removed and replaced with the vent plug.

7 MOUNTING POSITIONS

7.1 OIL LEVEL CONTROL

The mounting positions table shows the locations of the oil level plugs. Check whether oil is coming from the plug place by opening the filler plug number 2 (oil level plug), which you have located according to the installation method by looking at these tables. If oil is coming out, tighten this plug back into place and secure it. If oil does not come out, fill the appropriate oil given in the oil tables by using the oil filler plug number 4 until the oil comes out of the level plug and tighten both plugs. Make sure to use the appropriate oil given in the tables.

7.2 CORROSIVE ENVIRONMENTAL CONDITIONS

If the Planetary Gearbox is to be installed in an environment where abrasive materials or water are present, protect the seals to prevent water, abrasives or chemicals from getting on the seals. Any excess pressure that may come from outside the gearbox and liquids, and substances that may enter the gearbox may cause serious damage to the gearbox. If pressure or abrasive materials cannot be avoided on the seals, please contact PDS PLANET REDÜKTÖR for specific solutions. Abrasive materials, chemicals, water, plus or minus pressures exceeding 0.2 bar can damage seals or exposed shafts.

8 LUBRICATION







If the operating temperature of the Planetary Gearboxes is continuously between -°15 °C / +10 °C, it is recommended to use ISO VG 220 viscosity, if between +°10 °C / +60 °C, it is recommended to use ISO VG 320 viscosity and mineral oil with EP additive.

Proper lubrication is essential for the efficient operation of the gearbox. The following criteria must therefore be checked during operation.

- Check that all oil plugs are properly installed according to the recommended operating position.
- Oil must be filled up to the level by considering the mounting position diagrams. Before operation, the oil level is checked visually by loosening the level plug.
- In order to fill the oil homogenously in the crane gearboxes, the plug at the top closest to the gearbox outlet must be opened.
- Under cold weather operating conditions, lower viscosity oils must be used in the gearbox.

- Depending on the contact surfaces of the gearboxes in the first operating times, parts of metal may be encountered. Undoubtedly, these metal parts can cause some problems for both gear groups and bearings in the gearbox. To prevent this, the gearbox oil must be changed after the first 100 hours.
- The oil temperature of the gearbox must not exceed 90°C. In operating conditions above 60°C, synthetic oil must be used.
- Synthetic oil and mineral-based oil must never be mixed. This mixture may cause the oil in the gearbox to lose its lubricating properties and may lead to serious damage to the gearbox.

8.1 OIL TABLE

Oil Type	ISO Viscosity Grade	Petrol Ofisi 	Bp 	Esso 	Klubber 	Mobil 	Shell 
Synthetic Oils	ISO VG 680	SP 460	ENERGOL GR-XP460	----	SYNTHESO D680 EP	----	TIVELA S 680
	ISO VG 460	SP 220	ENERGOL GR-XP460	----	SYNTHESO D460 EP	GYLGOLE 80	TIVELA S 460
	ISO VG 320	----	----	----	SYNTHESO D320 EP	GYLGOLE 30	TIVELA S 320
	ISO VG 220	----	----	----	SYNTHESO D220 EP	----	TIVELA S 220
Mineral Oils	ISO VG 680	GRAVİS MP 680	ENERGOL GR-XP680	SPARTAN EP 680	LAMORA 680	MOBİLGEAR 636	OMALA F 680
	ISO VG 460	GRAVİS MP 460	ENERGOL GR-XP460	SPARTAN EP 460	LAMORA 460	MOBİLGEAR 634	OMALA F 460
	ISO VG 320	GRAVİS MP 320	ENERGOL GR-XP320	SPARTAN EP 320	LAMORA 320	MOBİLGEAR 632	OMALA F 320
	ISO VG 220	GRAVİS MP 220	ENERGOL GR-XP220	SPARTAN EP 220	LAMORA 220	MOBİLGEAR 630	OMALA F 220
Greases	----	----	ENERGREASERLS3	BEACON 3	STABURAGS NMU8 EP	MOBİLUX 2	ALVANİA RL3

9 MAINTENANCE

Under normal environmental and operating conditions, the gearbox must be checked at the following intervals. (For the definition of normal operating conditions, refer to the "Gearbox Selection" section of the product catalogue)

Element to be checked / Replaced	Every 3000 working hours or every 6 months	Every 4000 working hours	Every 10000 working hours or every 3 years	Every 25000 working hours
Oil leakage control	X			
Oil level control	X			
Checking oil leakage from the seal	X			
Bearing noise control		X (replace if necessary.)		
Mineral oil change			X (see below for details)	
Synthetic-PAO oil change				X(see below for details)
Seal replacement				X
Bearing grease replacement				X
Bearing replacement				X
Sound change				X

Periodic maintenance of gearboxes is required. Paying attention to the following points during maintenance is key for the life and efficient operation of the gearbox.

Check the oil level and quantity of the gearboxes. Select the type of oil from the oils in the given table. Change the oil completely after 100 hours from the time the gearbox is put into operation. Then change the oil every 2000 hours or once a year, whichever comes first.

Do not use oils other than the recommended oils or mix different types of oils.

Check the vent plugs (air relief valves). The air trapped as a result of the increase in internal pressure due to the expansion of the oil is discharged through the vent plug.

Check the gearbox mounting bolts, tighten any loose ones.

For specific operating conditions, please contact PDS PLANET REDÜKTÖR for technical assistance.

10 TROUBLESHOOTING GUIDELINES

NO	PROBLEMS	OBSERVATION	SOLUTION
1	The gearbox is not working.	You hear a sound, but neither the gearbox shaft nor the motor shaft rotates.	Motor labelling and supply values must match. Check the operating instructions of the motor manufacturer. If it does not work despite all attempts, the load may be too much for the selected motor. Disconnect the output shaft of the gearbox from the load. If it runs in this state, the motor power may not be sufficient. If the problem persists, refer to No. 21.
2	The gearbox is not working.	Ambient temperatures drop below -5 degrees Celsius.	The gearbox oil is not suitable for the operating environment. Use oils with a lower viscosity. Check the operating instructions for the appropriate oil. Working at higher ambient temperatures is another solution. If the same problem persists, it may be necessary to increase the motor power. If the problem persists, refer to No. 21.
3	The gearbox is not working.	A constant humming sound is heard.	Check your moving machine elements. Disconnect the gearbox from the machine and run without load. If you hear similar sounds again, there may be some foreign substances in the oil. Change the oil and check the substances in the waste oil. If metal parts are visible, the gearbox may be damaged. If the problem persists, refer to No. 21.
4	The gearbox won't start after long periods of standstill or in the morning.	Ambient temperatures drop below -5 degrees Celsius.	The gearbox oil is not suitable for the operating environment. Use oils with a lower viscosity. Check the operating instructions for the appropriate oil. Working at higher ambient temperatures is another solution. If the same problem persists, it may be necessary to increase the motor power. If the problem persists, refer to No. 21.
5	The gearbox is noisy.	Regular knocking sound is heard.	Check your moving parts. Disconnect the gearbox from the machine and run without load. If you hear similar sounds again, the gearbox may be damaged. If the problem persists, refer to No. 21.
6	The gearbox is getting very hot.	The ambient temperature is above +40 degrees.	Standard gearboxes are designed to operate at max +90 degrees. Special gearboxes are required at ambient temperatures above +90 degrees. If the problem persists, refer to No. 21.

7	The gearbox is noisy.	Regular knocking sound is heard.	Check your moving parts. Disconnect the gearbox from the machine and run without load. If you hear similar sounds again, the gearbox may be damaged. If the problem persists, refer to No. 21.
8	The gearbox is noisy.	Regular fading in and out of the sound.	Check the runout of the fasteners connected to the output shaft. Disconnect the element connected to the output shaft and run without load. If the problem persists, refer to No. 21.
9	There is an oil leak.	There is an oil leak from the seal.	If the ambient temperature is above +40 degrees Celsius and there is continuous operation for more than 16 hours, remove the top plug according to the mounting position and use a vent plug. If this is not the case, the seal may be damaged. If the problem persists, refer to No. 21.
10	There is an oil leak.	The oil is leaking through the plug.	If you are using a vent plug, make sure it is in the correct position. The correct position is the uppermost plug in relation to the mounting position of the gearbox. The gearbox plug may not be tightened enough. Clean the seating surface of the gearbox plug and the plug. Tighten it back into place. If the problem persists, refer to No. 21.
11	There is an oil leak.	The oil is coming from the housing.	Observe exactly where the gearbox oil is coming from. Oil may be leaking from the plug or seal and flowing onto the housing. If this is the case, please refer to no 13, 14 and 16. If you are sure that the oil is coming from the housing, there may be micro cracks or fractures in the housing. If the problem persists, refer to No. 21.
12	There is an oil leak.	The oil is coming from the cover.	The O-ring under the cover is torn or not functioning. Remove the cover. Clean underneath and install a new o-ring. If the problem persists, refer to No. 21.
13	The motor is getting too hot.	The motor operates above the rated amperage; The environment is clean.	Motor power is insufficient or overloaded. The motor may have a failure. If the problem persists, refer to No. 21.

14	The gearbox is getting very hot.	You are using a planetary gearbox. The ambient temperature is below +40°C.	Measure the surface temperature of the gearbox with a thermometer under full load. If the measured temperature is below 80°C, this is normal and will not harm the gearbox. All ATEX certified gearboxes are designed to operate at Max +90°C. If the gearbox is above +90°C and ATEX compliant, stop the gearbox operation immediately and inform PDS PLANET REDÜKTÖR. ATEX non-compliant gearboxes are designed to operate at temperatures of max +90°C. If it is above +90°C, check the oil level according to the mounting position. Make sure that the mounting position given on the label is compatible with the mounting position you use. If the problem persists, refer to No. 21.
15	The gearbox oscillates regularly when it is running at the mounting site.	You're using a moment arm.	The cause of oscillation of the gearbox is the clearance between the shaft runout and the shaft/sleeve to which you connect the gearbox. Check your shaft bore tolerance. As long as the moment arm is used, this does not harm the gearbox and is normal for the gearbox. If the problem persists, refer to No. 21.
16	Motor shaft rotates but the gearbox shaft does not.	There is a friction sound or just motor noise.	The gearbox may also be damaged. If the problem persists, refer to No. 21.
17	Motor shaft rotates but the gearbox shaft does not.	There is a friction sound or just motor noise.	The gearbox may also be damaged. If the problem persists, refer to No. 21.
18	The gearbox housing is broken.	You use chain gear or pinion gear on the gearbox output shaft.	The damage may be caused by the polygon effect of the chain gear or radial load. The foot connections of the gearbox may be loose or the plate to which it is attached may not be rigid enough. Make sure you are using the correct chain gear / pinion gear diameter. Check the maximum permissible radial load. Check the position of the fastener connected to the output shaft and recalculate the radial load according to this position. If the problem persists, refer to No. 21.

19	Output shaft is broken.	You are using a chain gear or pinion gear.	The damage may be caused by the polygon effect of the chain gear or radial load. The foot connections of the gearbox may be loose or the plate to which it is attached may not be rigid enough. Make sure you are using the correct chain gear / pinion gear diameter. Check the maximum permissible radial load. Check the position of the fastener connected to the output shaft and recalculate the radial load according to this position. If the problem persists, refer to No. 21.
20	The gearbox stops too late.	You are using a motor with brake.	Check the connection diagram of the brake. There are two types of brake connection. The gearbox is shipped from the factory with delayed braking. Refer to the electrical wiring diagram for sudden braking. If the problem persists, refer to No. 21.
21	Service required.	It's not a problem you can solve yourself.	Please contact PDS PLANET REDÜKTÖR. Company details are given at the back of these operating instructions. Mechanical parts may only be replaced by or with the knowledge of PDS PLANET REDÜKTÖR. Any modification made without the knowledge of PDS PLANET REDÜKTÖR invalidates the warranty and CE manufacturer's declaration of the product and the responsibilities of PDS PLANET REDÜKTÖR for the product are relieved.

11 DISPOSAL

11.1 DISPOSAL OF THE GEARBOX

If the gearbox has become unusable and is to be disposed of, read the instructions here.

11.2 DISPOSAL OF OIL

Lubricants (oils and greases) are harmful substances that can be mixed with soil and water. Dispose of the drained oil in suitable closed containers in accordance with the applicable national laws of your country.

11.3 DISPOSAL OF SEALS

Remove the seals from the gearbox, wipe off the oil and dispose of them in composite materials (metal/plastic) waste treatment centres or bins.

11.4 DISPOSAL OF METAL PARTS

If possible, separate the remaining metals into iron, aluminium, alloys and dispose of them in accordance with the applicable national laws of your country.

As Gearbox Service, the above-mentioned information is enlightening information and we are not responsible for any problems that may arise due to use other than this information.

12 TERMS OF WARRANTY

1. Gearboxes are guaranteed for two years except electric motor and hydromotor. For motor warranty, please refer to the manufacturer's warranty certificate and user manual. This warranty is valid if the gearbox is installed and operated as described in the operating instructions and used within the conditions specified in the product catalogue.
2. The warranty period starts with the invoice date and lasts for two years.
3. During the warranty period, if the product malfunctions or fails to operate due to manufacturing or assembly defects, the product shall be repaired under warranty.
4. During the warranty period, if the product malfunctions or fails to operate in a way that cannot be repaired due to manufacturing or assembly defects, the product shall be replaced with a new one within the scope of the warranty based on the report of the Service Department stating that the product cannot be repaired.
5. Customers must inform the manufacturer of any problems that occur after service or repair.
6. These warranty terms do not cover damages that may occur after stoppage of the machine or plant in which the product is used.
7. Unlabelled products are out of warranty.
8. Gearboxes opened without the knowledge of PDS planet are out of warranty.

13 SALES AND SERVICE POINTS

Sales and Technical Support

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