

Gear Units, K Series

Edition 01/2005
OIKCE 0101/0105

Operating Instructions



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1 -How To Use This Manual

Take attention to the following safety and warning signs for proper understanding and quick reference.



Electric Hazard; Can cause severe or fatal injuries.



Mechanical Hazard; Can cause severe or fatal injuries.



Likely to be Hazardous; Can cause minor or fatal injuries



Damage Risk; Can damage the drive or environment



Important Information



EC Machinery Directive:

Within terms of the EC machinery directive 98/37/EC, the gear reducer is not considered an autonomous machine, but as a component to install in machines.

Operation is prohibited within the area of validity of the EC directive, until it has been determined that the machine, in which this product is installed, corresponds to the regulations within this directive.

The operating instructions contain important information to ensure;

- Trouble-free operation
- Fulfilment of any rights to claim under guarantee

The operating instruction must be kept close to the gearbox and must be available in case it is needed.

This operating instruction is written for K series gear units and is applicable only for K series. If any different type of gearbox is used please ask YILMAZ REDUKTOR for the operating instructions of that type.

This instruction can be used only for standard type geared units of YILMAZ REDUKTOR. For special application and modified gear units ask YILMAZ REDUKTOR for validity.

This manual does not cover 94/9/EC compatible gearboxes. For 94/9/EC contact YILMAZ REDUKTOR.



2 -Unit Designation

2.1- Detailed unit designation



Detailed KR series gear units designation for ordering

(This Designation is different from the short nameplate designation)

3,0kW - 29rpm - 48,86 - KR373 . 00 . 100L/4b - L02

Power (kW)	Output Speed(rpm)	Ratio (i)	Type	Specification	Motor Size	Brake
			KR-With Motor KT-With input shaft KV- With Motor and IEC Flange KN-Without Motor			L - 220 V With fan P - 24 V With fan S - 220 V Without fan Z - 24 V Without fan
<div> <div> 00 - Standart hollow shaft mounting 01 - With output shaft 02 - With flange and output shaft 03 - With flange and hollow shaft 04 - With double output shaft 05 - With double flansch and double output shaft 06 - Double flange hollow output shaft X0 - Special gearbox Standart hollow shaft mounting X1 - Special gearbox with output shaft X2 - Special gearbox with flange and output shaft X3 - Special gearbox with flange and hollow shaft X4 - Special gearbox with double output shaft X5 - Special gearbox with flansch and double output shaft X6 - Special Double flange hollow output shaft </div> <div> 01 - 10 Nm 02 - 25 Nm 04 - 40 Nm 05 - 50 Nm 10 - 100 Nm 20 - 200 Nm 30 - 300 Nm 40 - 400 Nm </div> </div>						

Example

0,75-24-58,09-KV373.01-B08

0.75 kW (1500 rpm) geared motor with 80 type B14 flange and output shaft, gearbox type: KR373

10,15-KN373.01-B08

KN373 i=10,15 geared unit with 80 type B14 flange and output shaft

10,15-KT373.01

KT373 i=10,15 geared unit with input shaft and output shaft



2.2- Nameplate, unit designation



Nameplate unit designation is a short abbreviation from the detailed designation

A sample name plate for K Series

YILMAZ REDÜKTÖR			
San-Bir Blv. 1.Blg. 3. Cd. No:18			
34900 B.Cekmece / Istanbul / TURKEY			
Type	:	KR373-90L/4	
Power	:	1,5	kW
Speed	:	16 rpm.	Ratio : 87.62
Serial N.	:	04/25520	
Oil Qty	:	1,3 lt.	M. Pos. : B3
OIL FILLED (MINERAL VG220)			

Abbreviations:

Serial N. : Serial Number

M.Pos. : Mounting Position

Type Designation;

<u>KR373</u>	-	<u>90L/4</u>
Type		Motor Size
<hr/>		
KR-With Motor		
KT-With input shaft		
KV- With Motor and IEC Flange		
KN-Without Motor and IEC Flange		

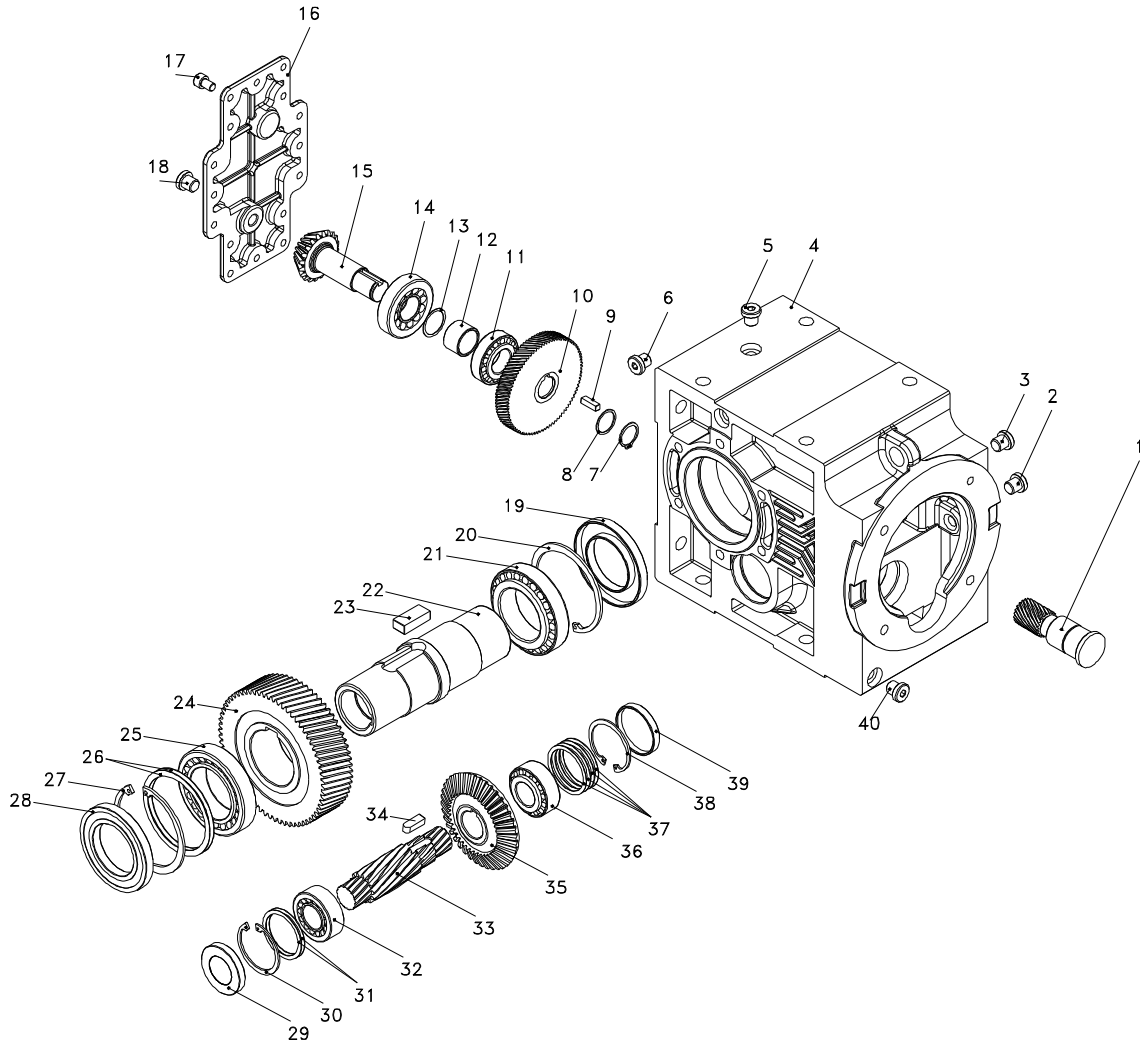
Serial Number Designation;

<u>04</u>	/	<u>25520</u>
Year of manufacturing		Order Number



3- Part List of Standard Type Gear Units

3.1- K...00... Types



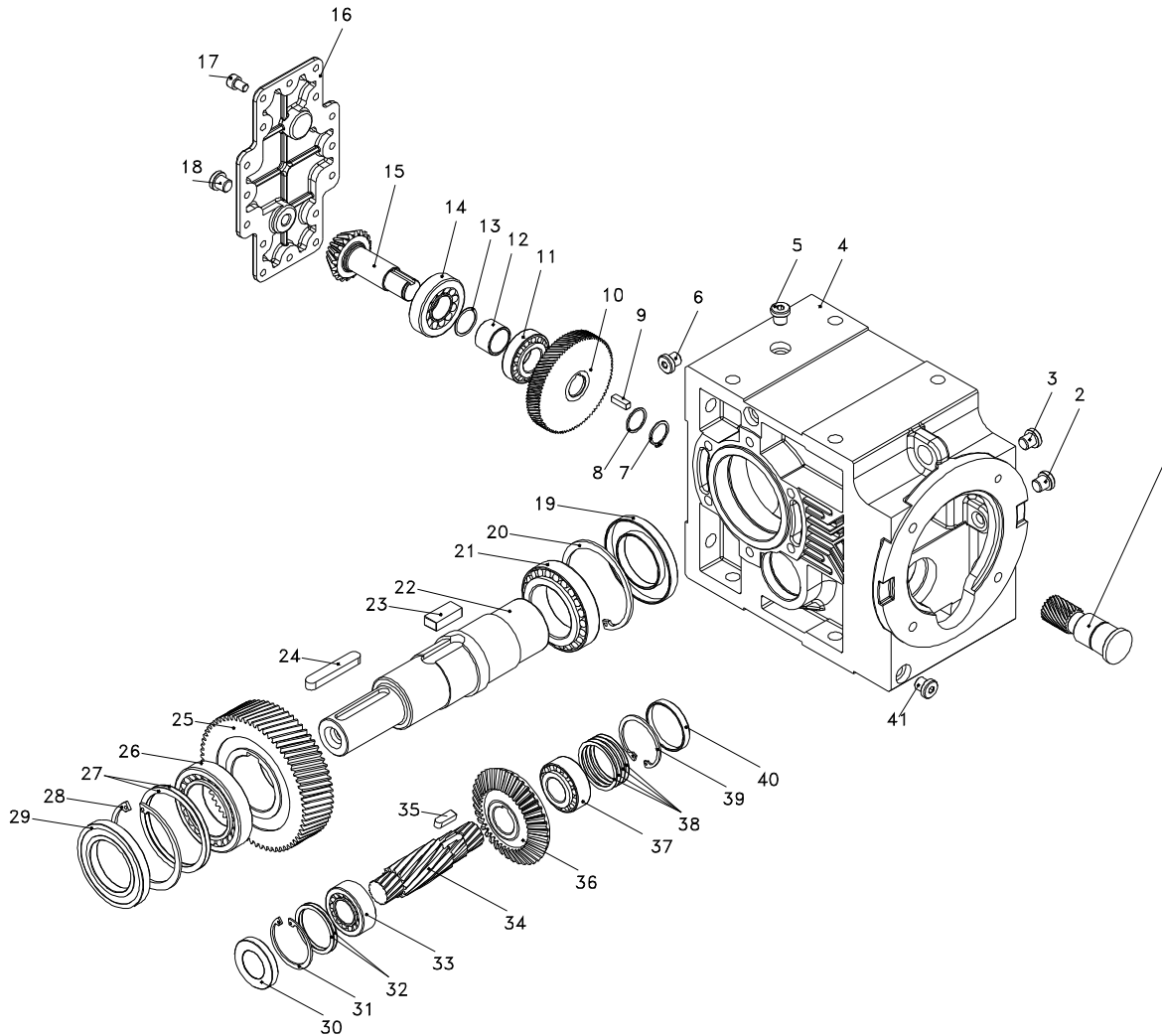
Standard KR...00... type basic part diagram. Parts may differ for special applications.

Standard Part List

1- Pinion	9- Key	17- Bolt	25- Bearing	33- Pinion Shaft
2- Plug	10- Gear	18- Plug	26- Shim Ring	34- Key
3- Plug	11- Bearing	19- Oil Seal	27- Circlip	35- Gear
4- Housing	12- Spacer	20- Circlip	28- Oil Seal	36- Bearing
5- Plug	13- Shim Ring	21- Bearing	29- Closing Cap	37- Shim Ring
6- Plug	14- Bearing	22- Output Shaft	30- Circlip	38- Circlip
7- Circlip	15- Pinion Shaft	23- Key	31- Shim Ring	39- Closing Cap
8- Shim Ring	16- Cover Plate	24- Gear	32- Bearing	40- Plug



3.2- K...01... Types



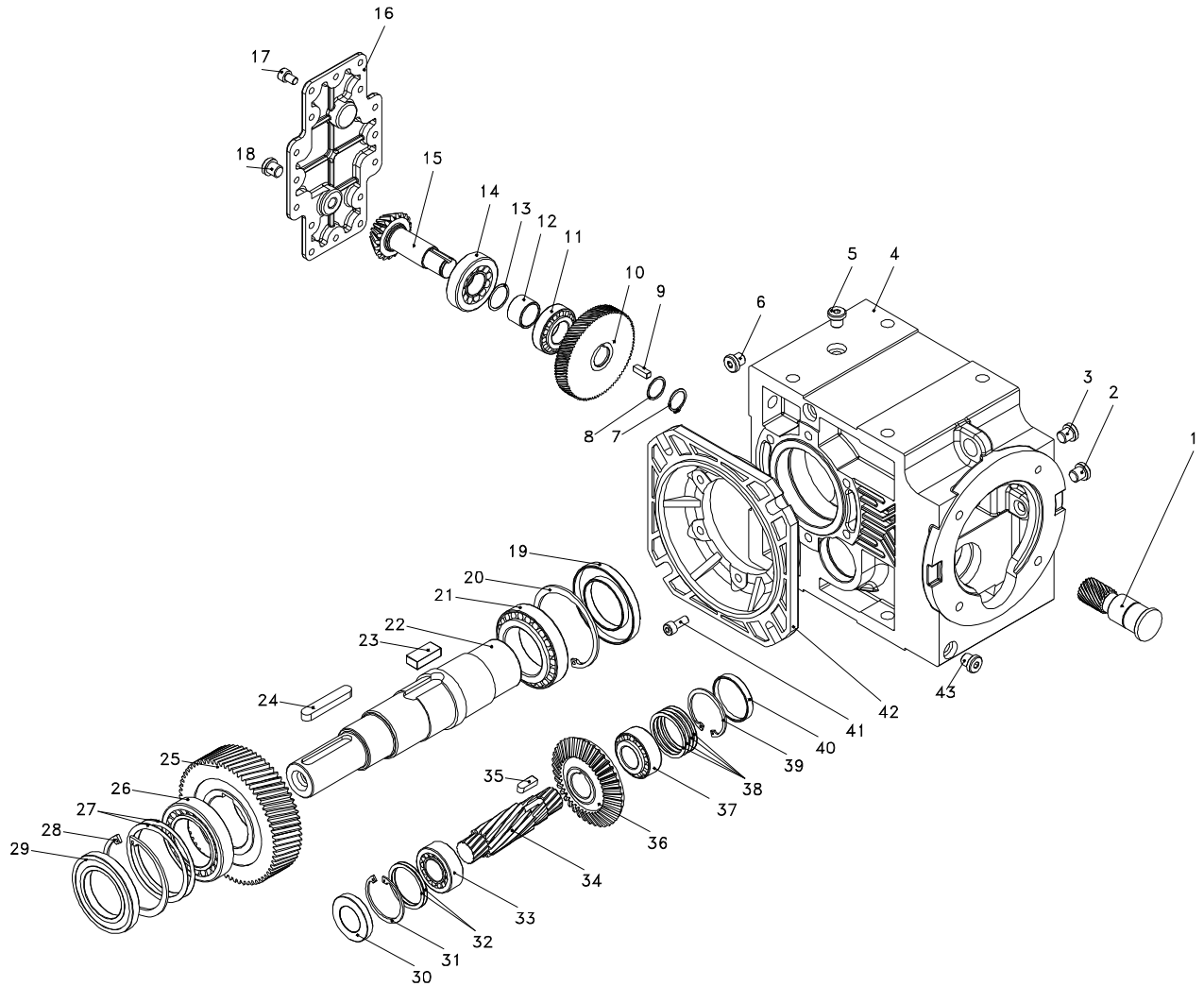
Standard KR...01... type basic part diagram. Parts may differ for special applications.

Standard Part List

1- Pinion	9- Key	17- Bolt	25- Gear	33- Bearing
2- Plug	10- Gear	18- Plug	26- Bearing	34- Pinion Shaft
3- Plug	11- Bearing	19- Oil Seal	27- Shim Ring	35- Key
4- Housing	12- Spacer	20- Circlip	28- Circlip	36- Gear
5- Plug	13- Shim Ring	21- Bearing	29- Oil Seal	37- Bearing
6- Plug	14- Bearing	22- Output Shaft	30- Closing Cap	38- Shim Ring
7- Circlip	15- Pinion Shaft	23- Key	31- Circlip	39- Circlip
8- Shim Ring	16- Cover Plate	24- Key	32- Shim Ring	40- Closing Cap



3.3- K...02... Types



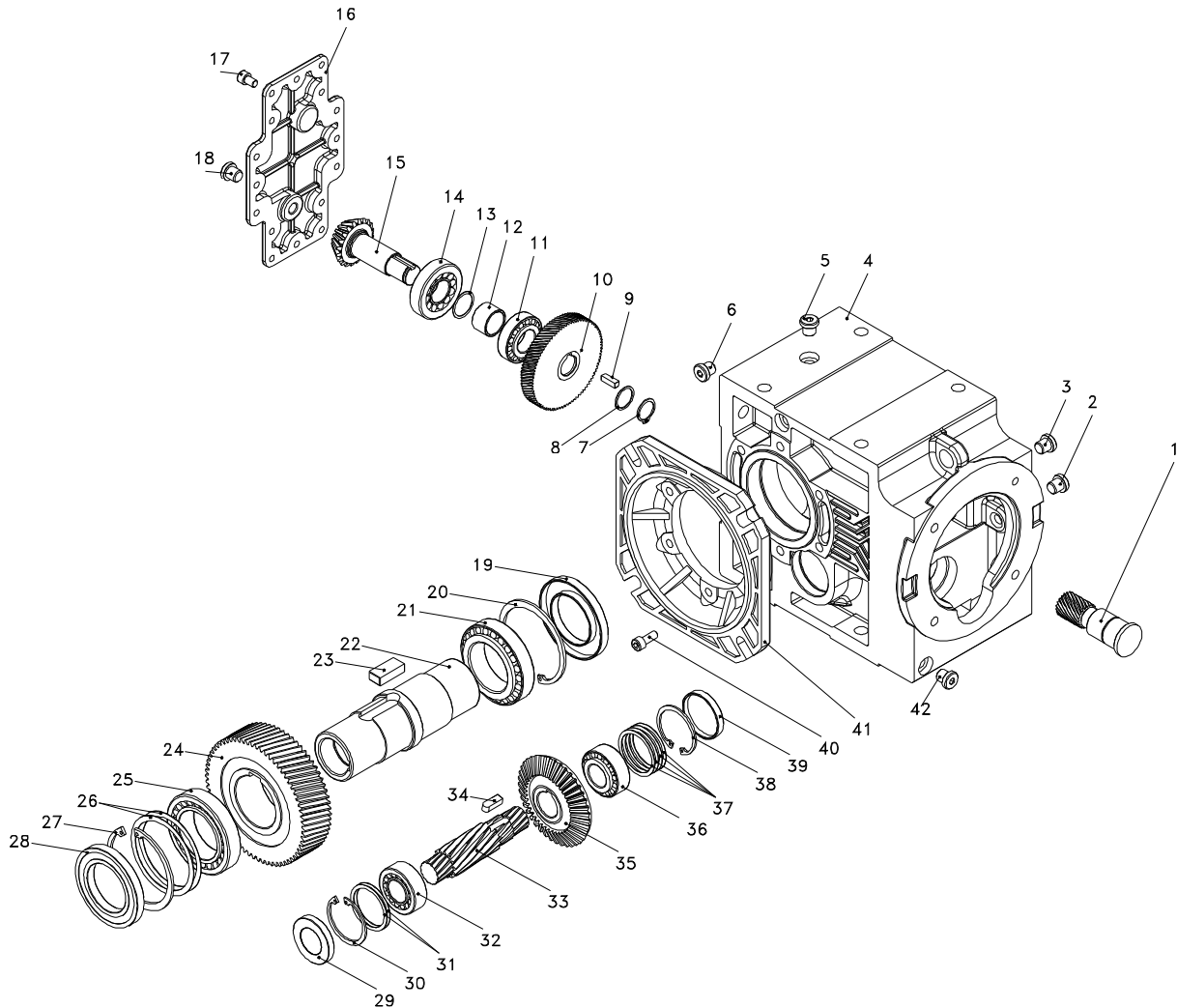
Standard KR...02... type basic part diagram. Parts may differ for special applications.

Standard Part List

1- Pinion	10- Gear	19- Oil Sealing	28- Circlip	37- Bearing
2- Plug	11- Bearing	20- Circlip	29- Oil Seal	38- Shim Ring
3- Plug	12- Spacer	21- Bearing	30- Closing Cap	39- Circlip
4- Housing	13- Shim Ring	22- Output Shaft	31- Circlip	40- Closing Cap
5- Plug	14- Bearing	23- Key	32- Bearing	41- Bolt
6- Plug	15- Pinion Shaft	24- Key	33- Bearing	42- Output Flange
7- Circlip	16- Cover Plate	25- Gear	34- Pinion Shaft	43- Plug
8- Shim Ring	17- Bolt	26- Bearing	35- Key	
9- Key	18- Plug	27- Shim Ring	36- Gear	



3.4- K...03... Types



Standard KR...03... type basic part diagram. Parts may differ for special applications.

Standard Part List

1- Pinion	10- Gear	19- Oil Sealing	28- Oil Seal	37- Shim Ring
2- Plug	11- Bearing	20- Circlip	29- Closing Cap	38- Circlip
3- Plug	12- Spacer	21- Bearing	30- Circlip	39- Closing Cap
4- Housing	13- Shim Ring	22- Output Shaft	31- Bearing	40- Bolt
5- Plug	14- Bearing	23- Key	32- Bearing	41- Output Flange
6- Plug	15- Pinion Shaft	24- Gear	33- Pinion Shaft	42- Plug
7- Circlip	16- Cover Plate	25- Bearing	34- Key	
8- Shim Ring	17- Bolt	26- Shim Ring	35- Gear	
9- Key	18- Plug	27- Circlip	36- Bearing	



4- Safety

4.1- Intended Use

The gear reducer is designed for use in industrial machines. Please refer to our catalogue or our web page for the maximum permitted torques and speeds. The most important maximum permitted values are indicated on the nameplate of the product. But the whole data can be found on our product catalogues. Using the product out of the product catalogue/ nameplate's permitted ranges will cancel the warranty/manufacturer declaration and YILMAZ will not take any responsibility.

The gear units are intended for industrial machines and may only be used in accordance with the information provided in this manual the product catalogue and the nameplate of the gearbox. They comply with the applicable standards and regulations and meet the requirements of the directive 98/37/EC. The gearbox must be started up, maintained and operated according this manual. The gearbox must be incorporated with 98/37/EC confirming parts/machines.



A motor connected to the gear unit is only allowed to be operated in the frequency entries so that the data provided on nameplate/catalogue of the gear unit is not exceeded and is accordance with the nameplate/catalogue. The speed range will be provided on the name plate if YILMAZ REDUKTOR is informed that the gear unit will be used with frequency inverter. If not informed the nameplate will have a single fixed speed and only this speed is allowed. The electric motor and frequency inverter must be in accordance with 98/37/EC



If the gear units input is used with variable speed gear unit, this must be informed to YILMAZ REDUKTOR before ordering and on the nameplate the allowed maximum and minimum speeds (speed range) will be provided. If not mentioned by ordering the gear units speed will be a fixed single input speed and only this speed is allowed.



If the gear unit will be driven by belt / coupling / chain drive etc. the gear unit is only allowed to be used according the nameplate/catalogue entries. Different speed, higher motor power, higher radial/axial loads etc. than nameplate/catalogue is not allowed.



The ambient temperature must be between +5 , +40 celsius and no abrasive media must attack the paint and seals. If different working conditions this must be informed to YILMAZ before ordering.



The gearbox maintenance (oil change / check) must be done according this manual

4.2- Improper Use

Every usage which exceeds the limits stated above, the nameplate and catalogue of the product (especially highest torques and speeds) is not compliant with the regulations, and thus prohibited.

The operation of the gear reducer is prohibited if;

- It was not mounted/installed according to regulations and this manual
- The gear reducer is very soiled
- It is operated without lubricant
- It is operated out of the permitted values provided on catalogues and/or nameplate.



4.3- Safety Instructions

4.3.1- General Safety Instructions

4.3.1.1- Working on the gear reducer



- Inappropriately executed work can lead to injury or damage.

Make sure that the gear reducer is only installed, maintained and dismantled by trained technicians.



- Foreign bodies spinning through the air can cause grave injury.

Before putting the gear reducer into operation, check that there are no foreign bodies or tools near the gear reducer

4.3.1.2- Operation



- Touching hot surfaces can lead to burns.

Do not touch the gear reducer if their operation temperatures are too high, or use suitable safety equipment like gloves.



-Rotating machinery can lead to injuries. There is danger of being trapped or pulled in!

Keep a sufficient distance and make safeguarding to rotating machinery. See relevant norms EN349, EN294.

4.3.1.3- Maintenance



-An unintentional start of the machine during maintenance work can lead to serious accidents.

Make sure no one can start the machine while you are working on it.



- Even a brief running of the machine during maintenance work can lead to accidents if the safety devices are not operating.

Make sure that all safety devices are mounted and active.

4.3.1.4- Lubricant



- Extended, intensive contact with oils can lead to skin irritations.

Avoid extended contact with oil, and clean oil off skin thoroughly.



- Hot oil can cause scalding.

When changing oil, protect yourself against contacting hot oil.

4.3.1.5- Ambient Conditions



- Standart gearboxes are allowed to work in ambient temperatures between +5 to +40 celsius unless differently specified on the nameplate. Using the gear unit out of this range can cause damage to the gear unit or environment. Over +40 celsius ambient conditions the gear unit surface temp could be so high causing burns when touched.



-If the gear unit will be used in outdoor applications the gear unit must be prevented from rain snow and dust. Entering substances inside the gear unit from seals can damage the gear unit. Observe the safety instructions for outdoor use EN292-1, EN292-2, EN 1050.



4.4- Tightening Torques

All screwed connections for which a tightening torque is specified, must on principle be tightened with a calibrated torque wrench and checked. Use the following torques for the threaded bores over the gear unit housing. For connecting elements refer to the mechanical installation part.

Bolt Size	Class	Tightening Torque [Nm]
M8	8.8	15
M10	8.8	20
M12	8.8	20
M16	8.8	40
M20	8.8	80
M24	8.8	200

4.5- Case of Fire

The gear reducer itself is not combustible. However, it usually contains a synthetic or mineral gear oil. Please observe the following if the gear reducer is situated in a burning environment

4.5.1- Suitable extinguishing agents, Protective equipment

Always keep suitable extinguishing, protective equipment like carbon dioxide, powder, foam, fog easily accessible around the gear unit.



-High temperature produce irritating steam.

Use a protective breathing apparatuses.



4.5.2- Unsuitable extinguishing agents

Do not spray with water!



5 -Thinks to Check Before the Gear Unit or Geared Motor is Installed



If gearedmotors are used, please also refer to the manual of the motor manufacturer.

Before you install the gearbox you have to be sure that the gearbox is arrived with the all necessary equipment and without damage. Thinks to take into consideration before you start to install the unit;

- You have received the correct operation manual of the your product.
- The gearbox and all its parts are transported without damage.
- The gearbox is stored correctly according the instructions in this manual
- You have the latest product catalogue or you have acces to our web page

5.1- Transportation

When the goods arrive, first check for any damage. If some damage observed, immediately contact the transport company and inform about the damage. Contact YILMAZ for the damage and do not start to install the unit until it is agreed that the damage has no affect of operation.



Use the supplied eyebolts or lifting holes for lifting up the gear unit. The eyebolts are capable to carry the weight of gearboxes only. Do not hang additional loads. Use suitable hoisting equipment which is capable to hold the gear units weight. Refer to the catalogue for various types weights. See drawing bellow for hoisting point.

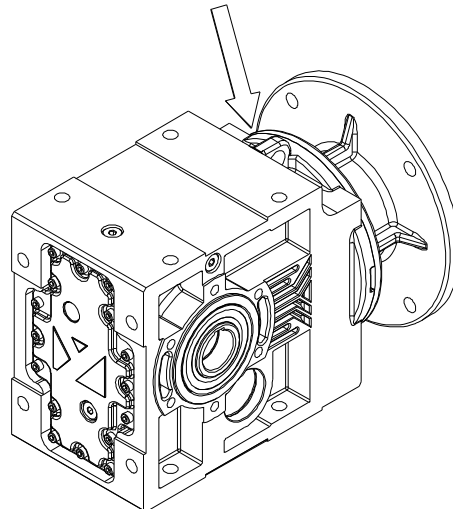


Do not stay beneath / under the lifting/hoisting equipment which may cause serious injuries by falling down objects, accidental movements, unexpected accidents.



Falling or hard placement can damage the gear unit.

Only use hoisting and securing equipment which is permitted for the size / weigt of your gear unit. Ensure that the load is slowly and carefully handled and placed.





5.2- Storage

If the geared unit or gearedmotor will be stored up to 3 years refer to the following instructions;

With Packing;

-Use corrosion protection oil for the output shaft and connection surfaces like flange surface or foot assembling surface. Seal the unit in a plastic wrap and pack it in container. A moisture indicator should be placed around the container to observe the moisture. Relative atmospheric humidity should not exceed 50%. The container should be kept under roof which protects from snow and rain. Under this condition the gear unit can be stored up to 3 year with regular check. The ambient temperature should be between -5 to 60 Celsius degrees

Without Packing;

-Use protection oil for the output shaft and connection surfaces like flange surface or foot assembling surface. If no packing is used and the gearbox is stored without packing, the ambient temperature should be between 5 to 60 Celsius degrees. The gearbox must be kept under enclosed roof with constant temperature and constant humidity not exceeding 50%. The storage should be free of dust and dirt and ventilated with filter. If the gearbox is stored without packing it is recommended not to store more than 2 years and regular check during this time is recommended.

If stored in open protect against insect damage.



6- Installing The Gear Unit

6.1- Before you start;

- Observe the gear unit for damages of storage or transportation. If any damage please contact YILMAZ REDUKTOR.
- Be sure that you have all the equipment necessary for installing like; Spanners, torque wrench, shims and distance rings, fixing devices for input and output elements, lubricant, bolt adhesive etc.



- This manual is not for 94/9/EC (ATEX) conforming gear units. For 94/9/EC conforming gear units refer to the ATEX range manual. ATEX conforming gear units have name plates indicating the zone and the temperature class and are different from standard type geared units. Therefore Standard units can not be installed on Potentially explosive atmospheres.

6.2- Check the shaft dimensions to fit;

Type	Hollow Shaft Diameter	Hollow Shaft Tolerance (H8)	Output Shaft Diameter	Output Shaft Tolerance (DIN748) Up to 50mm k6 Over 50mm m6	Flange Centering Shoulder Diameter	Centering Shoulder Tolerance (g6)
K...37...	40	+0.04 0	40	+0.02 0	180	-0.02 -0.04
K...47...	50	+0.04 0	50	+0.02 0	230	-0.02 -0.05
K...57...	60	+0.05 0	60	+0.03 +0.01	250	-0.02 -0.05
K...67...	70	+0.05 0	70	+0.03 +0.01	300	-0.02 -0.05
K...77...	90	+0.06 0	90	+0.04 +0.02	350	-0.02 -0.06
K...87...	110	+0.06 0	110	+0.04 +0.02	450	-0.02 -0.06

6.3- Check the ambient temperature;

The ambient temperature must be between +5 celsius to +40 celsius for standart type gear units. If different contact YILMAZ REDUKTOR for special solutions.

6.4- Check the voltage supply;

The standard gearedmotors are supplied with 230/400 V 50/60Hz. up to 3kW including 3kW and 400/690 V 50/60 Hz. over 3kW and is indicated on the motors name plate unless it is differently ordered. In case of only gear unit is supplied from YILMAZ please observe the name plate of the electric motor and the instructions of the supplier. Check the basic electric connection diagrams below. Use experienced electric technician.



Using wrong connection or voltage can damage the electric motor or environment.



The following wiring diagram is for standart 230/400 V 50Hz AC electric motors. For different voltages please contact YILMAZ REDUKTOR. For gear units suplied without motor, refer to the motor manufacturers user manuel

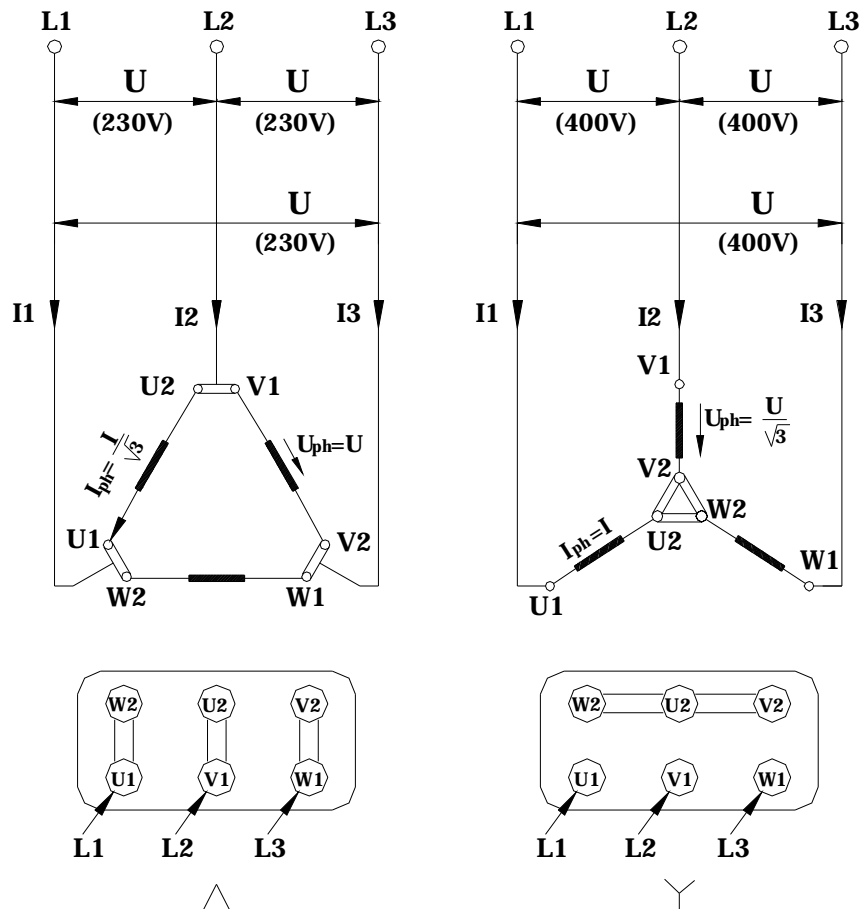


The electric connection must be done by experienced electric technician.

The gearbox, the motor and the brake must be grounded to prewent potential differences of earth and gearbox/motor.

Pole Number	Nominal Powers at 400V, 50Hz	
	230V (D) / 400 V (Y)	400V (D)
2 or 4	* 3 kW	/ 4 kW
6	* 2,2 kW	/ 3 kW
8	* 1,5 kW	/ 2,2 kW
Starting Principle	Direct	Direct or Y/D

Basic motor connection wiring diagram



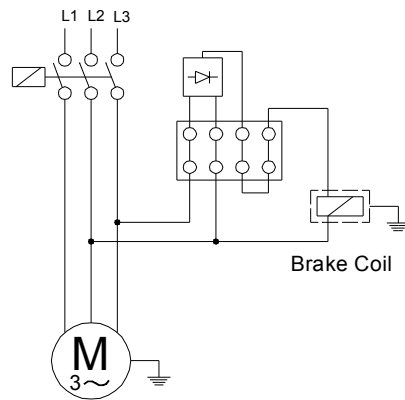


Standard type brakes basic wiring diagram

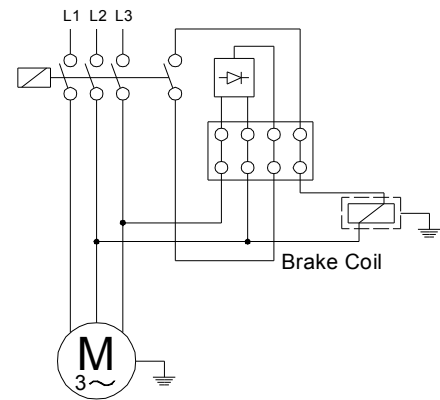
The electric connection must be done by experienced electric technician.

The gearbox and the motor must be grounded to prevent potential differences of earth and gearbox/motor.

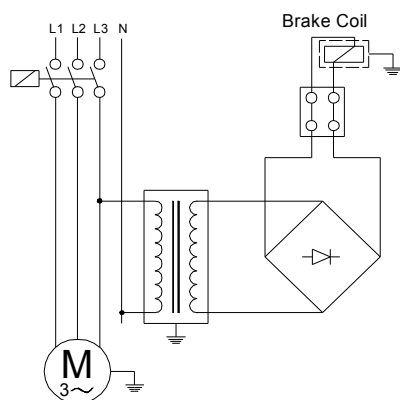
Delayed Running Brake (400 V)



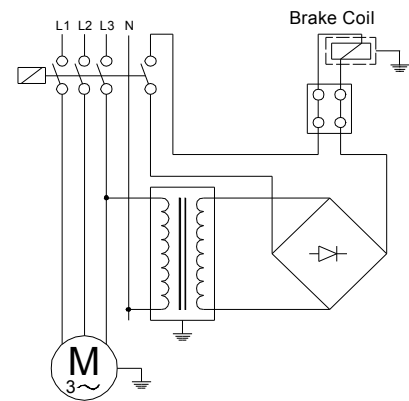
Sudden Brake (400 V)



Delayed Running Brake 4 (24 V)



Sudden Brake (24 V)





6.5- Check the mounting position;

The mounting position must be in accordance with the mounting position mentioned on the name plate. If different please contact YILMAZ REDUKTOR for possibilities of using in a different mounting position. Refer to the mounting positions and oil quantities on this manual and adjust the oil level accordingly with the recommended oil types given on this manual.



Do not mix synthetic oils with mineral oils which can cause serious damage on the gear unit.

6.6- Use of breather plug;

Breather plugs are not needed for K series under normal ambient and working conditions (Up to 30 degree Celsius ambient temperature and up to 8 hours per day) . If heavy ambient conditions and long time working hours then breather plug are recommended by YILMAZ REDUKTOR and delivered with the gearbox together. Replace the breather plug with the most top plug according to your mounting position.



Some plug positions are not machined according mounting position. If no mounting position is mentioned by ordering the standard B3 position plugs are machined.

6.7- Check the oil level ;

On the mounting position tables the oil level plug is shown. Please refer to those tables and be sure that the oil level is correct according the mounting position by screwing half way out the level plug and see if oil comes out from that plug. If oil comes out tighten the plug again. If no oil comes out take out the filling plug and add oil until oil comes out from the level plug and tighten both plugs after finish. Be sure you are using the correct oil mentioned on the oil tables on this manual.



Do not mix synthetic oils with mineral which can cause serious damage on the gear unit.

6.8- Check shaft ends and mounting faces;

Before you start to installing be sure that all the connection elements are free of oil and dust. The output shaft may be protected by anti-corrosion oil. Please remove this using available solvents on your market. By using this do not touch sealing lips or painting of the housing.

6.9- Cover abrasive ambient;

If the gear unit will be placed on a abrasive ambient be sure that the output seals are covered so that no abrasive material, chemicals or water touches the seals. Any pressure coming from outside over the seals can cause that the out staying substances to enter the gearbox and cause serious damage to the gear unit. If pressure or abrasive material can not be prevented from coming over the sealing, contact YILMAZ for solutions.



Abrasive material, chemicals, water; positive or negative pressure exceeding 0,2 bar can affect or damage the sealing lip or output shaft. Inside entering substances from the seals can cause serious damage to the gear unit.



6.10- Check accessibility to filling, breather and drain plugs;

The filling, breather and drain plugs must be freely accessible for further checking and service.

7- Mechanical Installation

The gear unit can only be installed using the supplied connection points like foot and flange assembling points.



To install the gear unit without the supplied connection points can cause serious injuries by loosening or braking the gear unit. Even the gear unit is installed totally correctly according this manuel, be sure that no one will be harmed by accidentally brake downs or loosenings.



The mounting plate must be rigid enough not allowing torsions, flat enough to prevent strains by tightening the bolts and stable enough not allowing vibrations. By using chain drives this becomes much more important because of the polygon effect on chain drives. According to your connection elements the maximal permitted radial and axial load of the gear unit must be in accordance with your application. Check the product catalogue for permitted radial loads and calculation.



If the output or input shaft is overloaded by radial or axial loads it can cause serious damage to the gear unit.

Secure the gear unit using 8.8 or higher quality bolts.



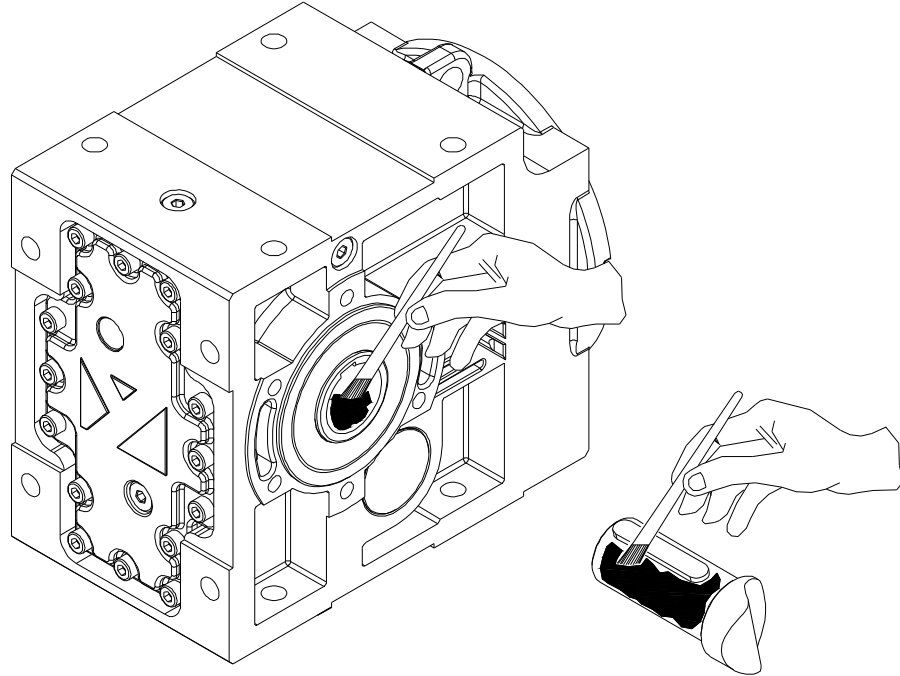
Cover all the turning parts from human entering or touching. Turning parts can cause severe or fatal injuries.

For different kind of basic installations refer to the following illustrations.

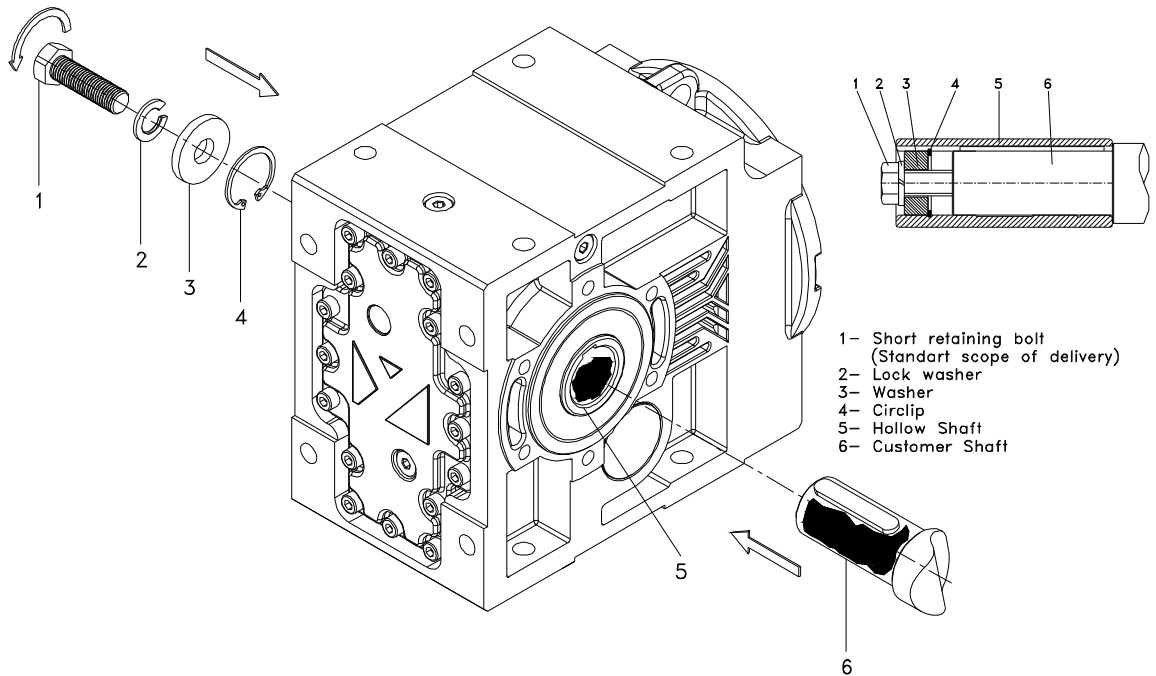


7.1- Installing customer shaft with shoulder

7.1.1- Use anti-seize assembling paste available on your market. Use a brush to apply the paste.



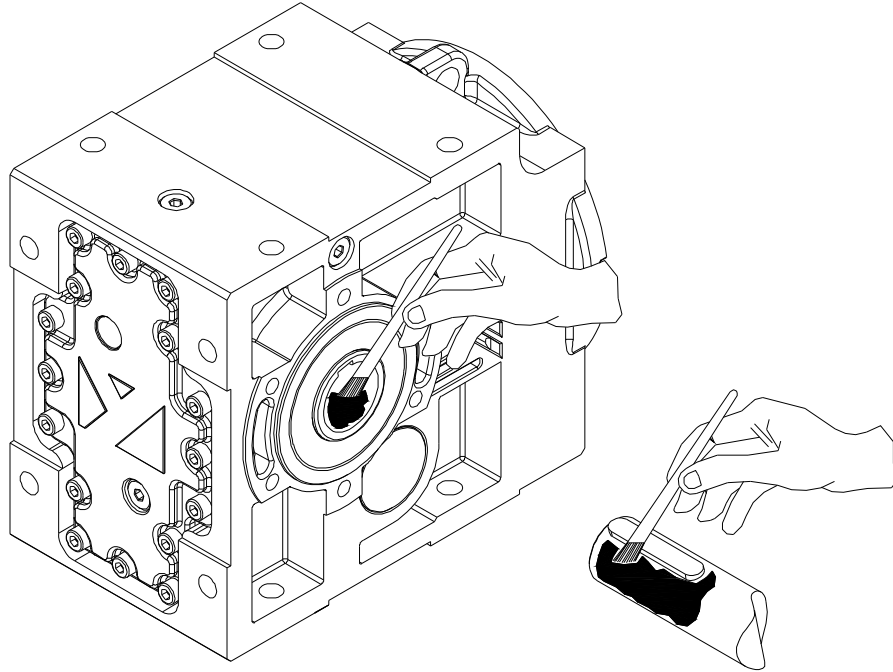
7.1.2 -Fasten the bold as shown below.



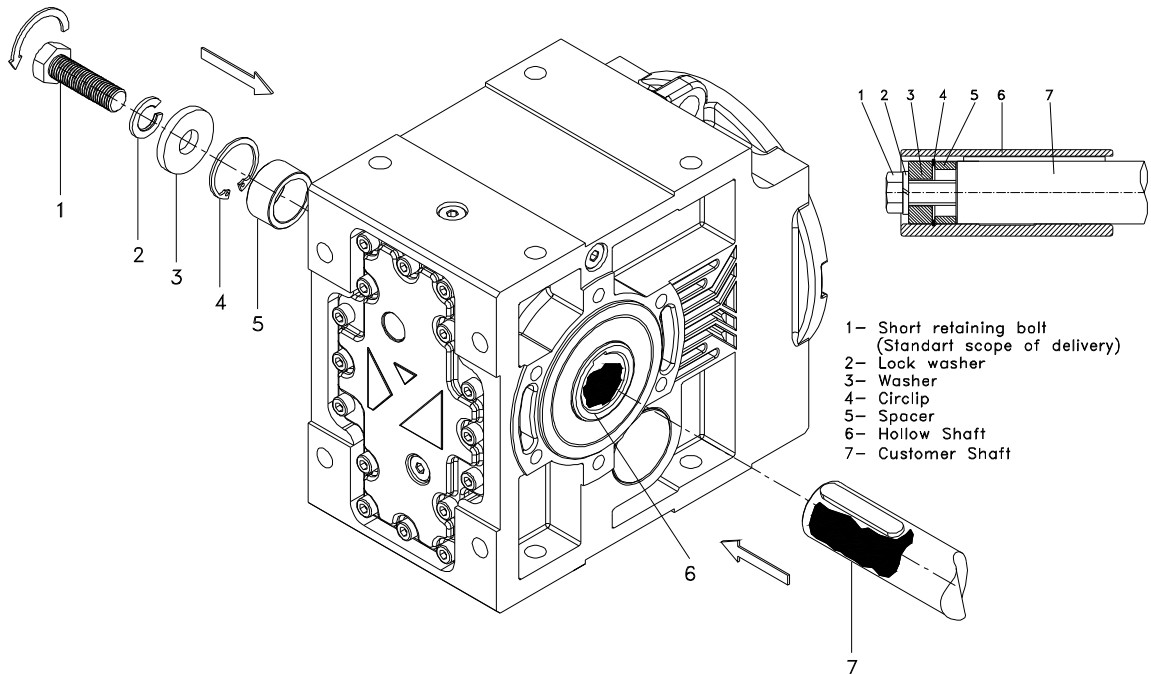


7.2- Installing customer shaft without shoulder

7.2.1- Use anti-seize mounting paste available on your market. Use a brush to apply the paste.



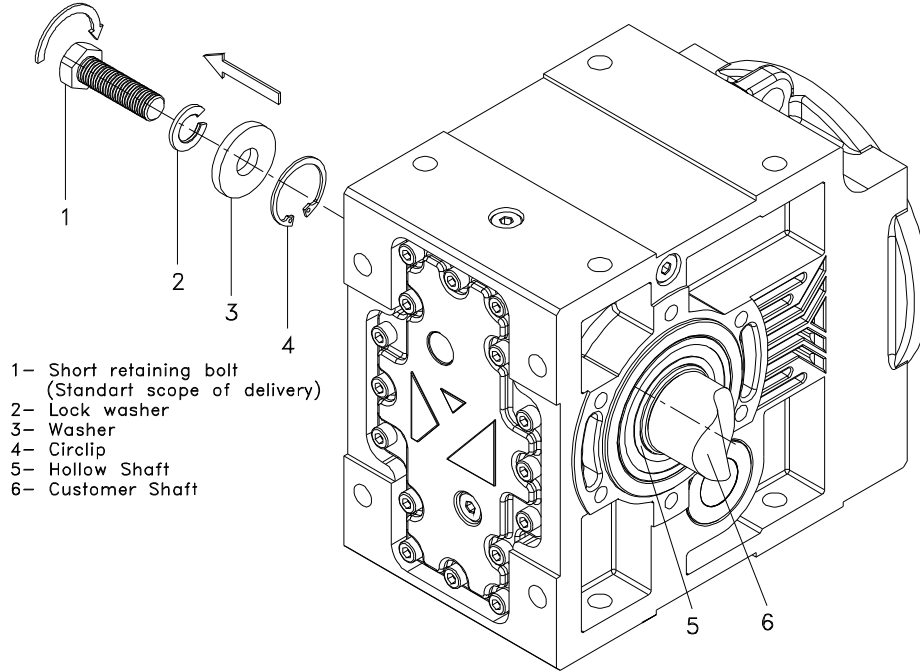
7.2.2 -Fasten the bolt as shown below.



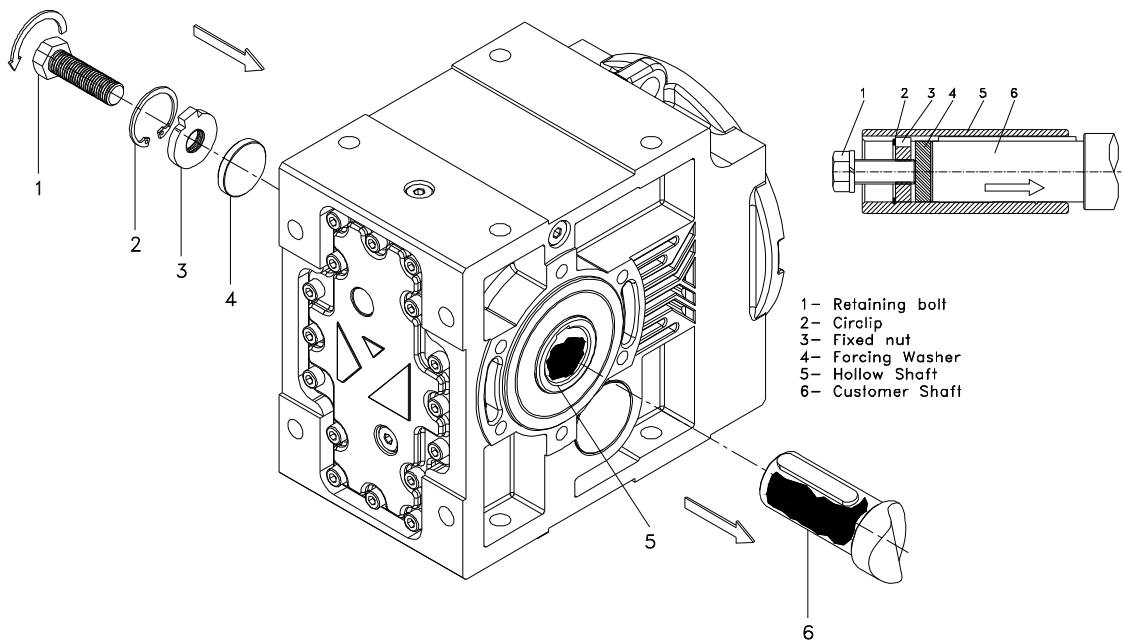


7.3- Disassembling customer shaft with shoulder

7.3.1- Disassemble the bolt and take out the parts as shown



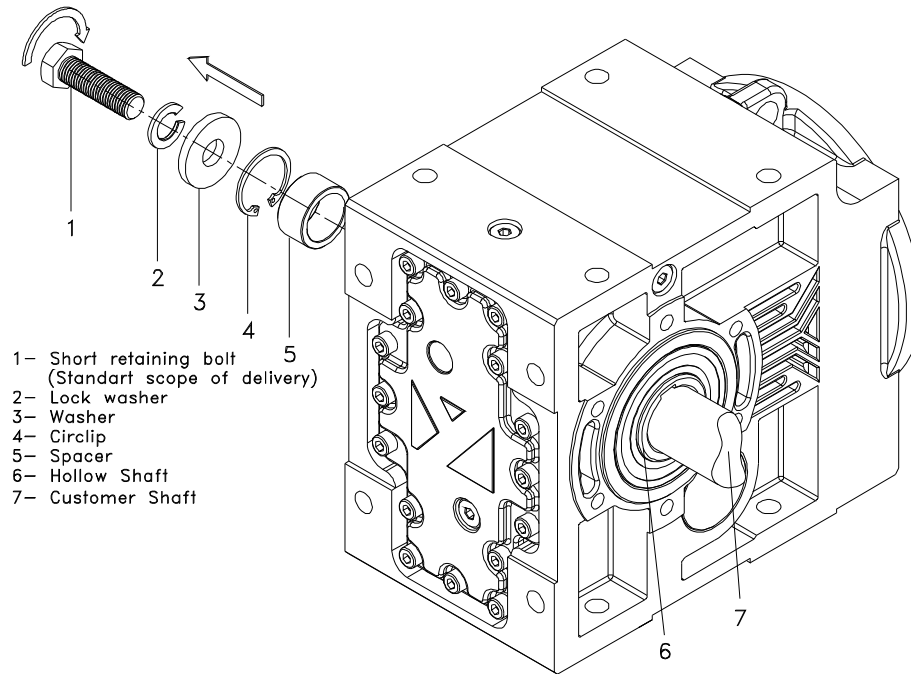
7.3.2 -Use the disassemble set from YILMAZ and fasten the bold as shown bellow to take out the output shaft. For disassemble sets look the following pages.



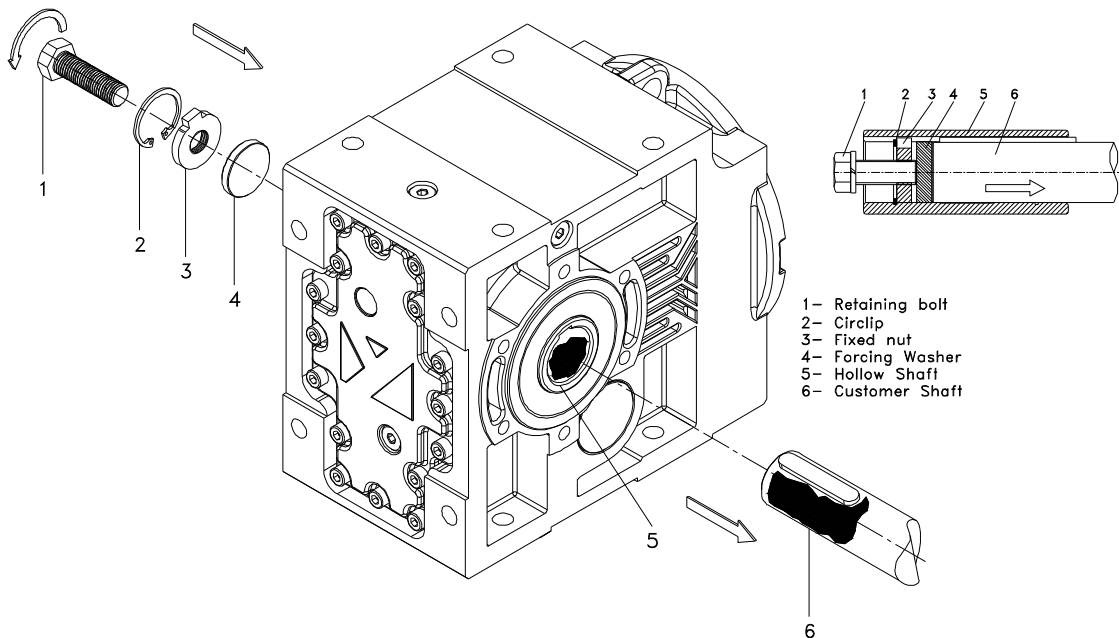


7.4- Disassembling customer shaft without shoulder

7.4.1- Disassembly the bolt and take out the parts as shown



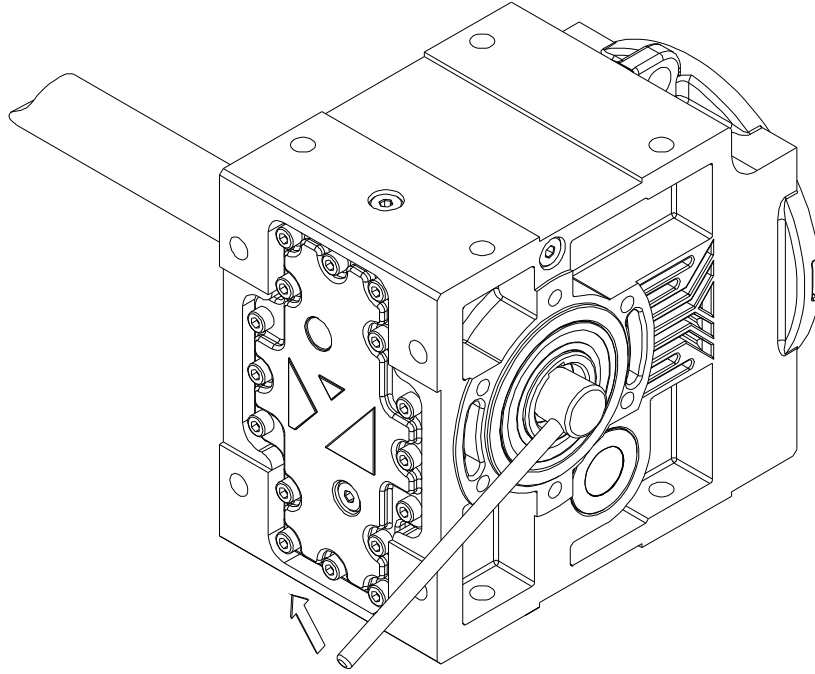
7.4.2 -Use the disassembly set from YILMAZ and fasten the bold as shown bellow to take out the output shaft. For disassembly sets look the following pages.





7.5- Shaft tightening torques

Use the following table for shaft tightening torques.

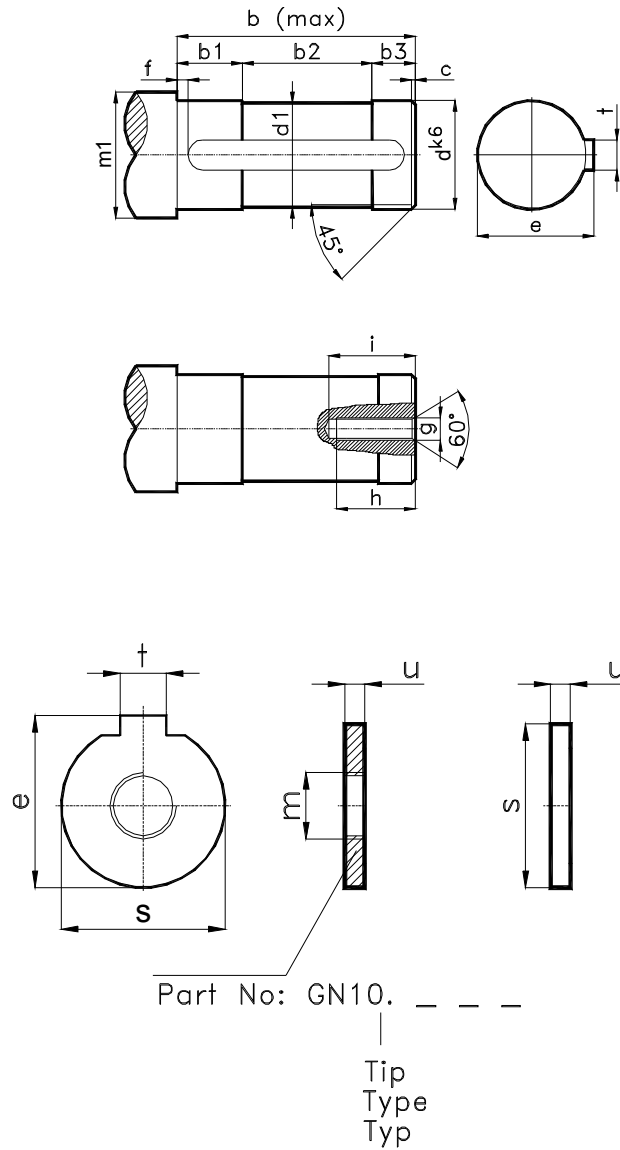


Type	Bolt	Tightening torque [Nm]
K.37...	M16	40
K.47...	M16	40
K.57...	M20	80
K.67...	M20	80
K.77...	M24	200
K.87...	M24	200



7.6- Recommended shaft dimensions and disassembling nut dimensions

Use the following part number for ordering the disassembling nut.



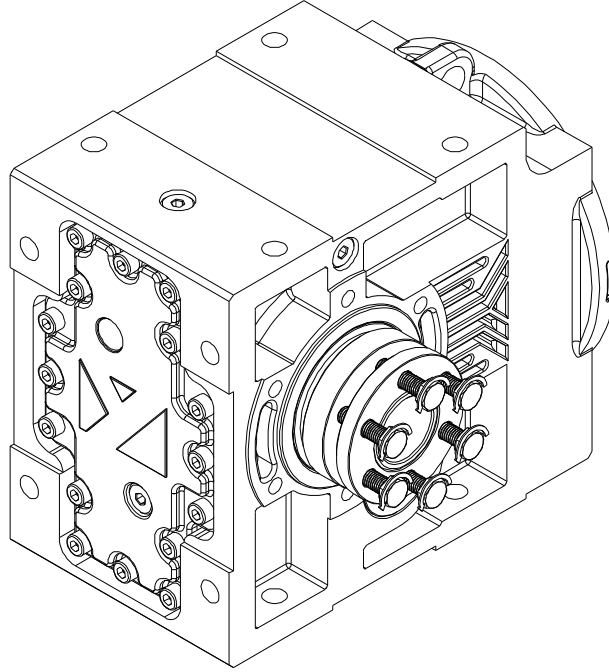
Example: GN10.KR373

Tip	s	m	u	t	e	d	d1	b	b1	b2	b3	c	m1	f	h	i	g
KR373	39,5	M20	6	12	43	40	39	150	40	90	20	2	50	5	38	45	M16
KR473	49,5	M20	6	14	53,5	50	49	180	40	120	20	3	60	5	38	45	M16
KR573	59,5	M24	6	18	64	60	59	206	50	131	25	3	75	5	44	53	M20
KR673	69,5	M24	8	20	74	70	69	260	60	175	25	4	85	5	44	53	M20
KR773	89,5	M26	8	25	95	90	89	300	80	190	30	4	110	5	52	63	M24
KR873	109,5	M26	10	28	116	110	109	360	80	250	30	4	130	5	52	63	M24

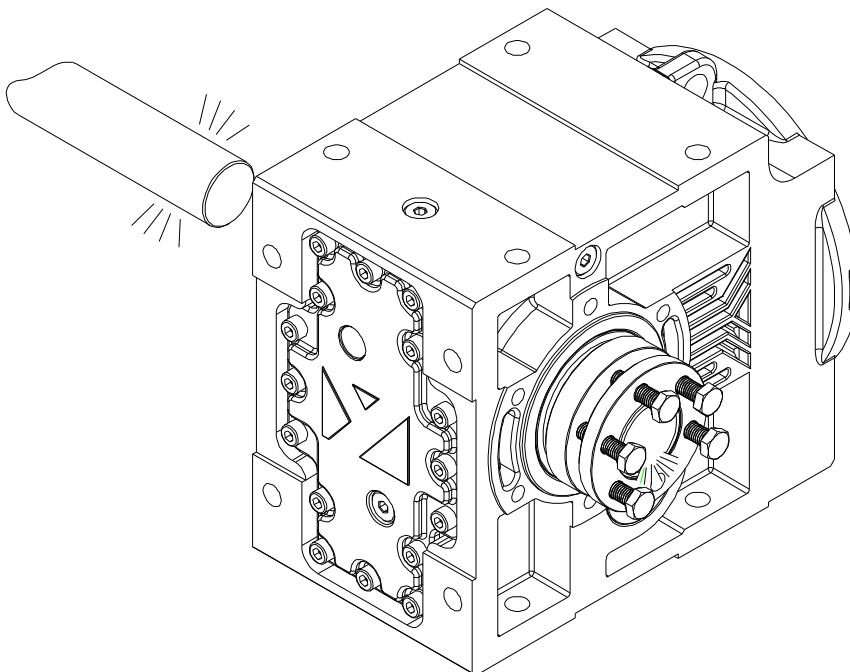


7.7-Assembling customer shaft with shrink disk

7.7.1- Loosen the bolts of the shrink disk

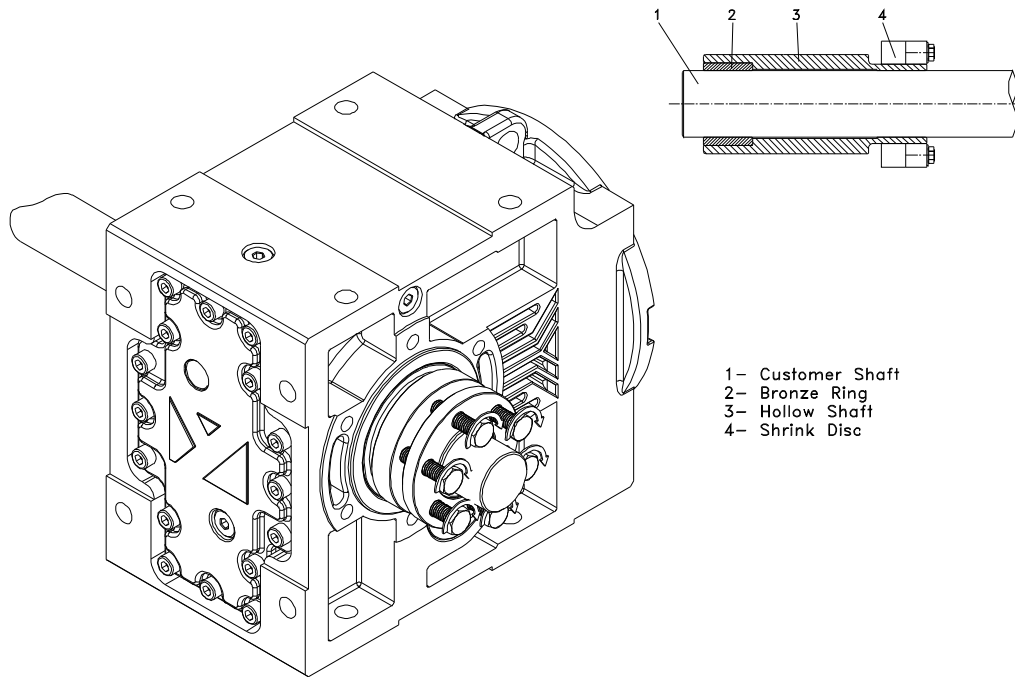


7.7.2-Use a solvent available in your market to clean all the dirt and oil from the shaft and shrink disk hollow. The surfaces must be free from oil or any dirt. The solvent must be removed from the surfaces as well.





7.7.3- Insert the shaft and tighten the bolts as shown. Be sure that there is a clearance between the shrink disk shoulder and the hollow shaft shoulder of the gearbox.

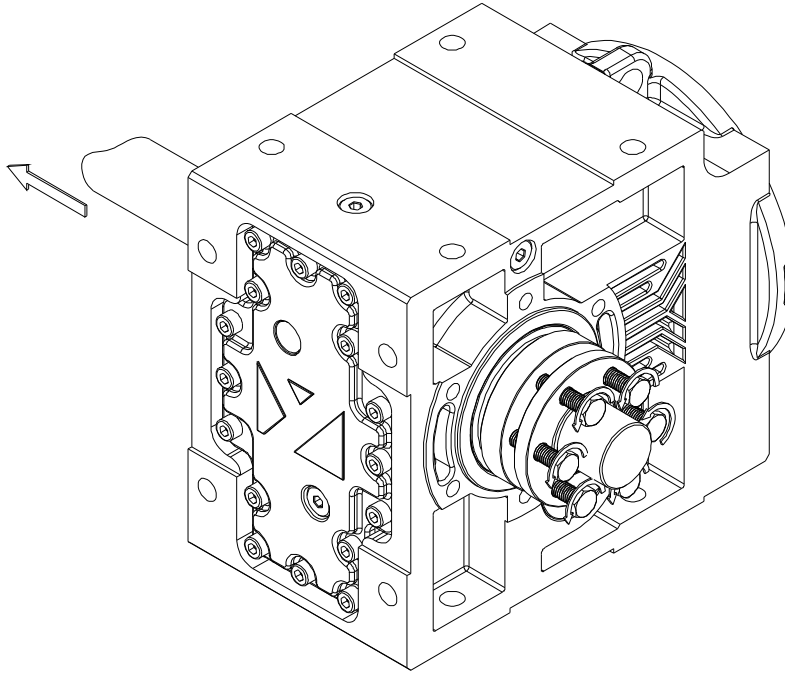


Type	Bolt	Tightening Torque [Nm]
K.37...	M8	30
K.47...	M8	30
K.57...	M10	60
K.67...	M10	60
K.77...	M12	100
K.87...	M14	200



7.8- Disassembling customer shaft with shrink disk

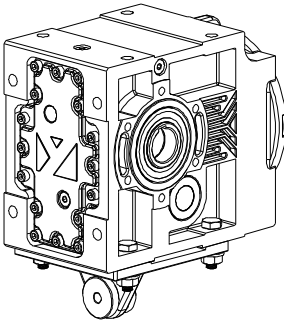
7.8.1- Loosen the bolts of the shrink disk and take out the shaft.



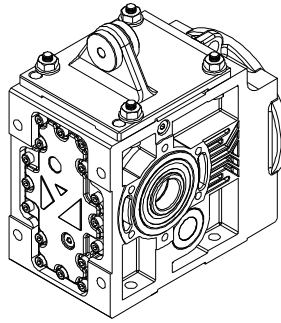


7.9- Assembling Gear Unit with Torque Arm

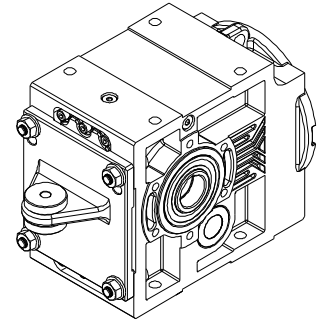
7.9.1- The following connecting possibilities are available. Use one position which is the most suitable.



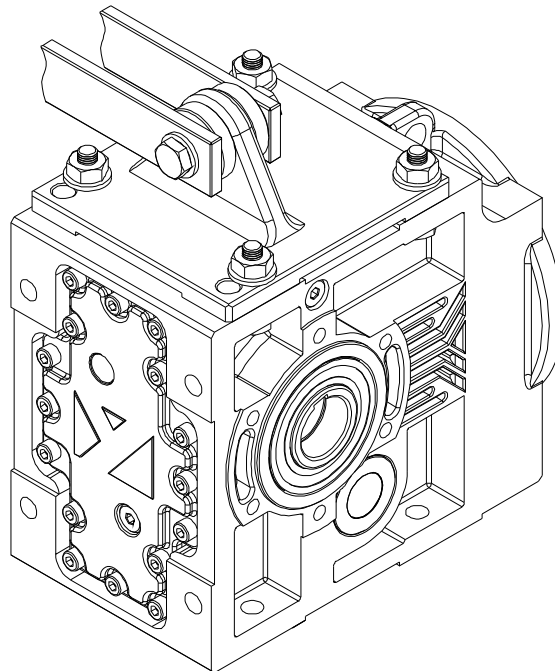
A



B

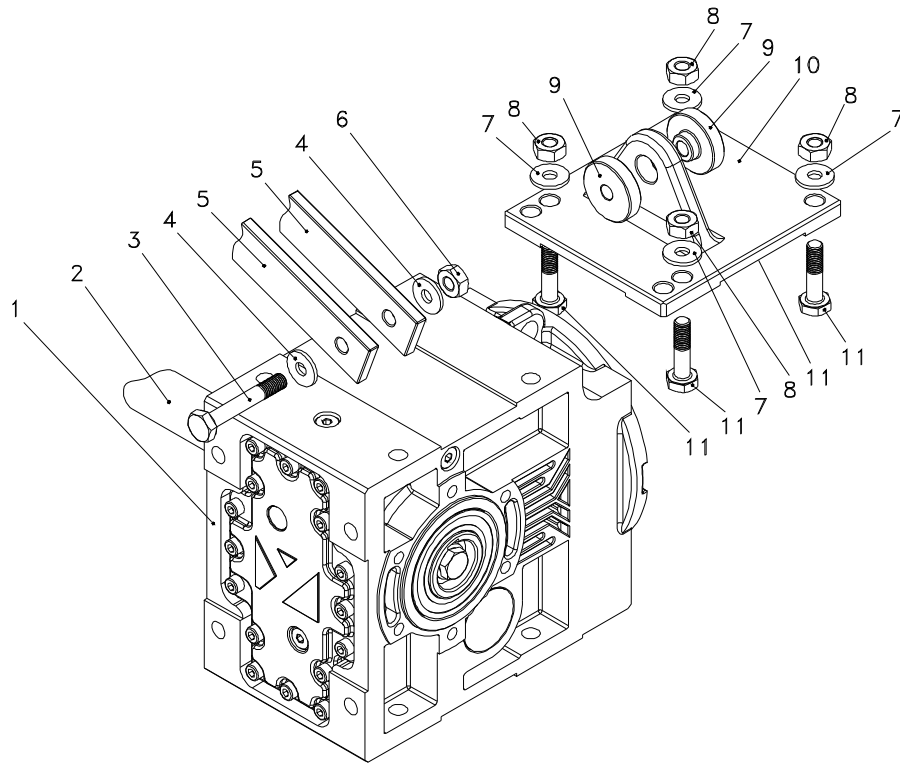


C





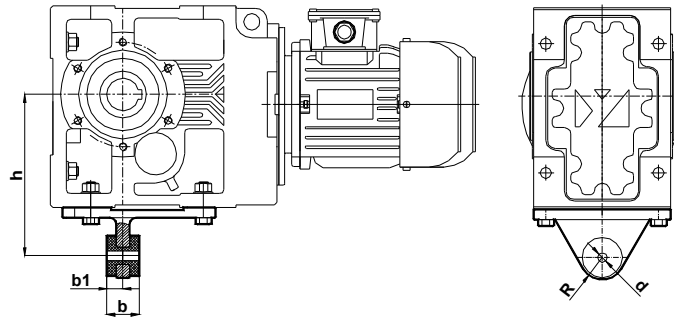
7.9.2-Assemble the parts as shown bellow



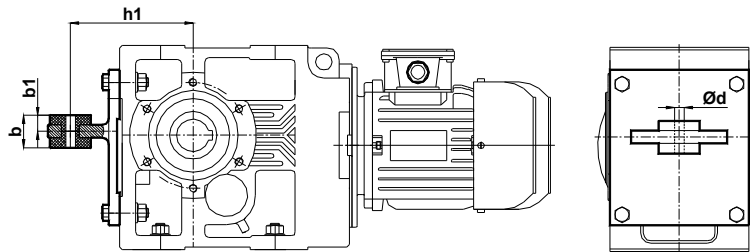
1- Gear Unit	4- Spacer Ring	7- Spacer Ring	10- Torque Arm
2- Assembled Shaft	5- Machine Extension	8- Nut	11- Bolt
3- Bolt	6- Nut	9- Rubber Buffer	



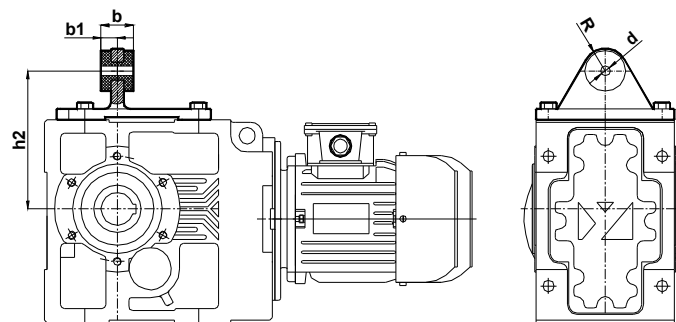
7.9.3-For the fixing bold position refer to the following dimensions



Std.



T1



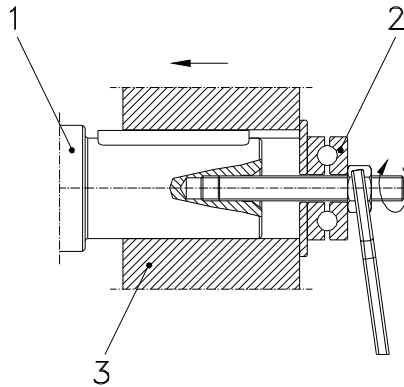
T2

					Std.	T1	T2
Type	b	b1	d	R	h	h1	h2
KR373.10	40	20	12	27,5	200	150	170
KR473.10	50	25	14	27,5	250	182	210
KR573.10	55	27,5	14	27,5	300	220	251
KR673.10	60	30	16	27,5	350	245	260
KR773.10	70	35	26	50	450	335	360
KR873.10	80	40	28	55	550	400	410



7.10- Fitting outputshaft elements

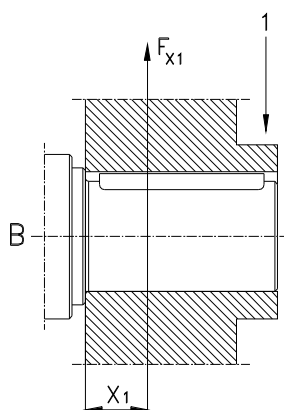
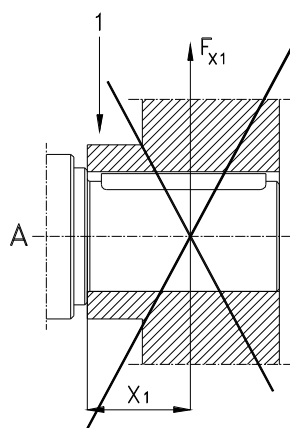
Use the following illustration to assemble output shaft units



- 1) Gear shaft end
- 2) Thrust bearing
- 3) Coupling hub

7.11- Correct position of outputshaft elements

The Output Shaft unit (transmission elements) must be placed as close as possible to the gear unit so that the radial load is as close as possible to the gear unit.

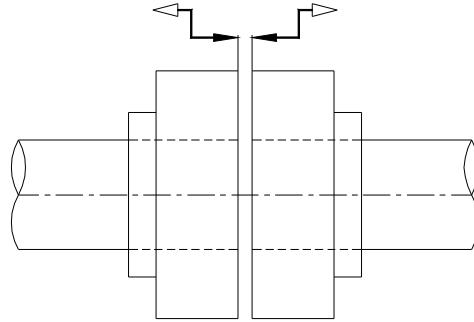


- 1) Hub

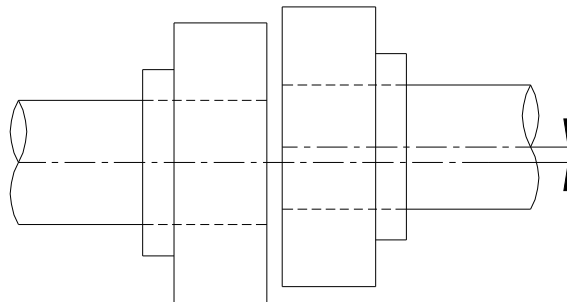


7.12- Fitting Couplings

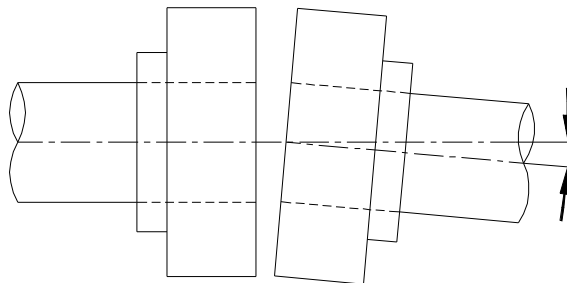
7.12.1-By fitting couplings be sure that there is some clearance between the two elements



7.12.2-By fitting couplings be sure that there is no exantricity between the two shafts.



7.12.3-By fitting couplings be sure that the two shafts are not angular miss-aligned.

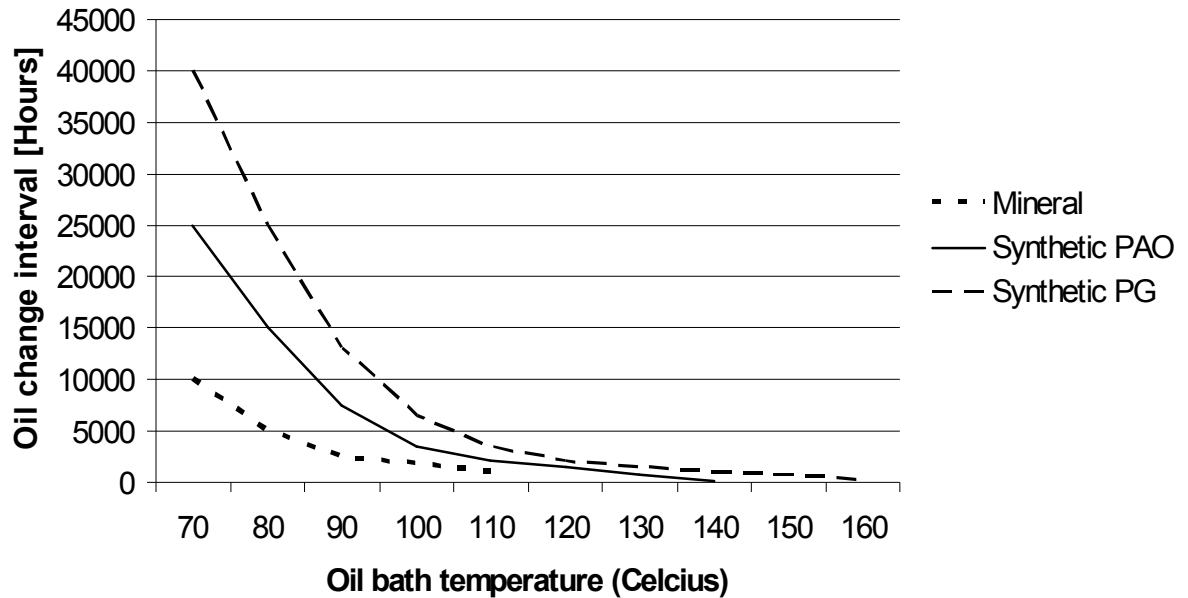




8- Maintanance and Inspections

Under normal ambient and working conditions the gear unit should be checked according the follow-
ing intervals. (For definition of normal working conditions refer to the product catalogue: “Selecting
Gearbox” section);

Item to check / replace	Every 3,000 working hours or every 6 months	Every 4,000 working hours	Every 10,000 working hours or every 3 years	Every 25,000 working hours
Check for oil leakage	x			
Check for oil level	x			
Check oil leakage from seal	x			
Check Rubber buffer	x (Change if necessary)			
Check Bearings Noise		x (Change if necessary)		
Change Mineral Oil			x (See Below for details)	
Change Synthetic-PAO Oil				x (See Below for details)
Change Sealing				x
Change Bearing Grease				x
Change Bearings				x
Check for noise Changes				x



*For normal ambient conditions 70 degrees celsius oil bath temp. should be taken as
reference*

* For K series Mineral oil is used unless it is differently ordered. For oil type and quantities
refer to the following tables.



9- Lubrication

9.1- Oil Types

Lubricant	Usage Temperature	ISO Viscosity Class	ARAL	bp	esso	KLOBER	Mobil	Shell	Castrol
Mineral Oil	0 ... +100	ISO VG 680	Degol BG 680	Energol GR-XP680	Spartan EP 680		Mobilgear 636	Omala 680	Alpha SP 680
	0 ... +100	ISO VG 460	Degol BG 460	Energol GR-XP460	Spartan EP 460	GEM 1 680	Mobilgear 634	Omala 460	Alpha SP 460
	0 ... +100	ISO VG 320	Degol BG 320	Energol GR-XP320	Spartan EP 320	GEM 1 460 GEM 1 320	Mobilgear 632	Omala 320	Alpha SP 320
	-5 ... +100	ISO VG 220	Degol BG 220	Energol GR-XP220	Spartan EP 220	GEM 1 220	Mobilgear 630	Omala 220	Alpha SP 220
	-5...+100	ISO VG 150	Degol BG 150	Energol GR-XP150	Spartan EP 150	GEM 1 150 GEM 1 100	Mobilgear 629	Omala 150	Alpha SP 150
	-5...+100	ISO VG 100	Degol BG100	Energol GR-XP100	Spartan EP 100		Mobilgear 627	Omala 100	Alpha SP 100
Synthetic Oil	-20 ... +140	ISO VG 680	Degol GS 680	Energol SG-XP680		Syntheso D 680 EP	Gylgoyle HE 680		
	-20 ... +140	ISO VG 460	Degol GS 460	Energol SG-XP460	Glycolube 460	Syntheso D 460 EP	Gylgoyle HE 460	Tivela SD	Alphasyn PG 460
	-25 ... +140	ISO VG 320	Degol GS 320	Energol SG-XP320	Glycolube 320	Syntheso D 320 EP	Gylgoyle HE 320		Alphasyn PG 320
	-25 ... +140	ISO VG 220	Degol GS 220	Energol SG-XP220		Syntheso D 220 EP	Gylgole HE 220	Tivela WB	Alphasyn PG 220
	-30 ... +140	ISO VG 150	Degol GS 150	Energol SG-XP 150		Syntheso D 150 EP			Alphasyn PG 150
	-30 ... +140	ISO VG 100		Energol SG-XP 100		Syntheso D 150 EP			
Mineral Grease	-20 ... +120		Aralup HL 3	Energol LS 3	Beacon 3	Centoplex 2	Mobilux 2	Alvania R3	Spheerol APT 3
Synthetic Grease	-30 ... +100					ISOFLEX Topas L152	Mobiltemp SHC 100	Cassida RLS 00	

9.2- Changing the oil

Refer to the nameplate to find out the correct oil filled inside the gearbox.



-Do not mix sythetic oils with mineral oils which will cause serious damage to the gear unit. The oil change must be done by using the filling, draining and level plugs according the mounting position illustrated in section 9.4.



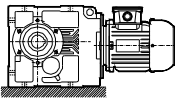



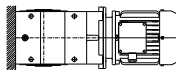
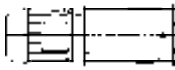
- Extended, intensive contact with oils can lead to skin irritations.
Avoid extended contact with oil, and clean oil off skin thoroughly.

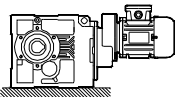



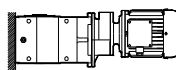
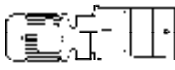


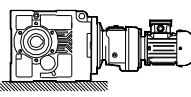



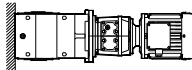
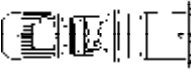
- Hot oil can cause scalding.
When changing oil, protect yourself against contacting hot oil.



9.3- Oil Quantities. (lt)

Type						
	B3	V6	B8	V5	B6	B7
KR373..	1,3	1,5	1,3	3,9	1,3	1,3
KR473..	5,5	5,5	5,5	7,15	5,5	5,5
KR573..	7,7	12	12,8	15,1	12	12
KR673..	10	18,7	19,7	24	19,7	19,7
KR773..	14	24,5	28	36	28	28
KR873..	25	45,5	47	56	44	44

Type						
	B3	V6	B8	V5	B6	B7
KR374..	1,3 / 0,7	1,5 / 0,7	1,3 / 0,7	3,9 / 0,7	1,3 / 0,7	1,3 / 0,7
KR474..	5,5 / 1,5	5,5 / 1,5	5,5 / 1,5	7,15 / 1,5	5,5 / 1,5	5,5 / 1,5
KR574..	6,7 / 1,5	11 / 1,5	11,8 / 1,5	14,1 / 1,5	11 / 1,5	11 / 1,5
KR674..	10 / 4,0	17,7 / 4,0	18,7 / 4,0	23 / 4,0	18,7 / 4,0	18,7 / 4,0
KR774..	13 / 4,0	23,5 / 4,0	27 / 4,0	35 / 4,0	27 / 4,0	27 / 4,0
KR874..	23 / 4,0	44,5 / 4,0	46 / 4,0	55 / 4,0	43 / 4,0	43 / 4,0

Type						
	B3	V6	B8	V5	B6	B7
KR345-376..	13, / 0,85	1,5 / 0,85	13, / 0,85	3,9 / 0,85	1,3 / 0,85	1,3 / 0,85
KR475-476..	5,5 / 1,4	5,5 / 1,4	5,5 / 1,4	7,15 / 1,4	5,5 / 1,4	5,5 / 1,4
KR575-576..	6,7 / 1,95	11 / 1,9	11,8 / 1,95	14,1 / 1,9	11 / 1,95	11 / 1,95
KR675-676..	10 / 3,32	17,7 / 3,1	18,7 / 3,32	23 / 3,1	18,7 / 3,32	18,7 / 3,32
KR775-776..	13 / 3,1	23,5 / 3,1	27 / 3,1	35 / 3,1	27 / 3,1	27 / 3,1
KR875-876..	24 / 3,1	44,5 / 3,1	46 / 3,1	55 / 3,1	43 / 3,1	43 / 3,1



9.4- Mounting Positions

KR373-KR873

KR374-KR874

KR375-KR875 / KR376-KR876

B3			
B6			
B7			
B8			
V5			
V6			

Symbols : ■ : Drain plug ▽ : Vent plug ▼ : Oil level ✱ : Only upon request



10- Troubleshooting Guide



All the operations bellow must be done by othirized and skilled mechanichan/electrician. Inform YILMAZ REDUKTOR before making any change to the gearbox. Only oil change is allowed to change without information. Do not make anythink if you are not sure what you are doing and contact YILMAZ. Any change or operation done without the information of YILMAZ REDUKTOR is in your own risk and responsibility and YILMAZ REDUKTOR does not take any responsibility.

ID	Problem	Observation	Remedy
001	Gearbox Does Not Start Up	You hear no noise and shaft is not turning. You are not using any driver or frequency inverter.	Please Check the voltage supply and frequency of your electric connection. They must be in accordance with the nameplate of the motor. Observe motor manufacturers start up manual. Still does not work go to ID 100
002	Gearbox Does Not Start Up	You hear no noise and shaft is not turning. You are using frequency inverter or driver.	Please observe the frequency incerter/driver manual. Chech the motor by supplying direct voltage to see if the problem is on your driver/frequency inverter. Still does not work go to ID 001.
003	Gearbox Does Not Start Up	You hear some noise but both motor shaft and gearbox shaft is not turning. You are not using any driver /frequency inverter or braked motor.	Please Check the voltage supply and frequency of your electric connection. They must be in accordance with the nameplate of the motor. Observe motor manufacturers start up manual. Still same problem, the load may be too high for the choosen motor. Loosen the gearbox from the load/torque. If it works than the starting torque is insufficient and higher motor power is needed. For monophaze motors, check the starting up condansator and running condansator as well. If notting helps go to ID 100
004	Gearbox Does Not Start Up	You hear some noise but both motor shaft and gearbox shaft is not turning. You are using driver or frequency inverter.	Please observe the frequency inverters or drivers manual. To see if the problem is on your driver or frequency inverter take out the driver/frequency inverter and make direct voltage supply to the motor according the motors nameplate. Still does not work go to ID 100
005	Gearbox Does Not Start Up	You hear some noise but both motor shaft and gearbox shaft is not turning. You are using braked motor	Please Check the voltage supply and frequency of your electric connection. They must be in accordance with the nameplate of the motor. Observe motor manufacturers start up manual. Be sure that the brake is working. Observe the brake manufacturers manuel. If brake is supplied from YILMAZ observe this manuel for correct brake wiring diagram. If still not work supply the brake with voltage according its nameplate directly. For example 198V DC. You will hear a clicking noise explaining that the brake is opening. If you hear no noise the brake or rectifier is defect. If you hear the clicking noise the brake is working. You should this clicking noise by your normal electric connection as well. By supplying direct supply to the brake you hear the clicking noise and at same time you supply the motor with direct voltage according to its name plate and still same problem, the load may be too high for the choosen motor. Goto ID 003.



ID	Problem	Observation	Remedy
006	Gearbox Does Not Work in Low Speeds/frequencies.	You are using frequency inverter.	For very low speeds the frequency inverters frequency is lowering down. For very low frequencies the inverter parameter and motor parameter must be optimized. Also for low speeds the efficiency of the gearbox may vary too much. Specially for worm-gearboxes. The recommended frequency range is 20-70 Hz for worm-gearboxes and 10-70 Hz for Helical Gear Boxes. Use Higher motor power and Frequency inverter or change ratio of gearbox to work inside the recommended range.
007	Gearbox Does Not Start Mornings or After Long Time Stop.	Ambient Temperature is below +5 Celsius	The oil is not in accordance with your working conditions. Change to lower viscosity oils. Observe this manual for using the correct oil. Working in higher ambient temperatures is an other solution if possible. If still same problem you need higher motor power.
008	Gearbox is Heating Up too Much	You are using Worm Gear Box and ambient temp is lower than +40 Celsius	Measure the surface temp. using a temperature measuring device under full load. If the temp is under +80 Celsius this will make no harm to the gearbox and is normal. All ATEX conforming gearboxes and standart worm gearboxes are designed to work under max. +120 Celsius. <u>If higher than +120 Celsius and using ATEX conforming gear box immediately stop the system and contact YILMAZ REDUKTOR.</u> Go to ID 100. If not ATEX confirming check the oil type and oil quantity/level according your mounting position and check the nameplate mounting position. If nameplate mounting position does not fit the actual position goto ID 100.
009	Gearbox is Heating Up too Much	You are using Helical Gear Box. Ambient temp is lower than +40 Celsius	Measure the surface temp. using a temperature measuring device under full load. If the temp is under +80 Celsius this will make no harm to the gearbox and is normal. All ATEX conforming gearboxes are designed to work under max. +120 Celsius. <u>If higher than +120 Celsius and using ATEX conforming gear box immediately stop the system and contact YILMAZ REDUKTOR.</u> If not ATEX gearbox the gearbox is designed to work under max. +80 Celsius. If higher than +80 Celsius check the oil type and oil quantity/level according your mounting position and check the nameplate mounting position. If nameplate mounting position does not fit the actual position goto ID 100
010	Gearbox is Heating Up too Much	Ambient Temp is over +40 Celsius	Standart Gearboxes are designed to work under +40 Celsius. ambient temperature. If ambient temp is higher than +40 Celsius special solutions/gearboxes are required. Please contact YILMAZ
011	Gearbox is noisy	Nois is regular continious	Check Your moving parts for noise. Disassemble the gearbox and run without load. If you still hear the noise motor bearings or gearbox bearings are defect. Change bearings. Goto ID 100
012	Gearbox is noisy	Nois is random	Check Your moving parts for noise. Disassemble the gearbox and run without load. If you hear still the noise the oil may has some particles inside. Change the oil and look for small particles. If metal particles are found the gearbox may have some damage. Goto ID 100



ID	Problem	Observation	Remedy
013	Gearbox is noisy	Regular knocking noise	Check Your moving parts for noise. Disassemble the gearbox and run without load. If you still hear the noise one of the gears inside is defect. Goto ID 100
014	Gearbox is noisy	Regular up and down noise	Check the output-shaft connection elements for runout. Take out the output shaft element and run without load. If you still hear the noise one of the gears has runout problem. Goto ID 100
015	Gearbox is noisy	Gearbox is with braked motor and noise is coming from the brake side randomly.	Low randomly clicking noise may come from the brake disk which is normal. If noise level is disturbing the brake may be defect or brake clearance is not adjusted. Goto ID 100
016	Gearbox is noisy	You are using frequency inverter and the noise level is changing according your speed.	The frequency inverter parameters are not optimized for the frequency range or motor you are using. Observe the frequency inverters manual. If still same problem change the ratio of gearbox. Goto ID 100
017	Oil is Leaking	Oil Leakage from Seal	If ambient Temp is over +40 Celsius or none stop work over 16 hours please change the top plug with a breather plug. Observe this manual for using breather plug. If this is not your case the seal could be damaged. Goto ID 100
018	Oil is Leaking	Oil Leakage from Plug	If you are using breather plug be sure it is in the correct place. This is the most top plug position according your mounting position. The plug may be not tight enough. There are some particles under the plug rubber surface. Clean and tighten the plug. If still same problem goto ID 100
019	Oil is Leaking	Oil Leakage from Housing	Observe exactly where the oil is coming out. It could be seal or plug point where it comes out and leaks over the housing. If this is your case goto ID 018/019. If you are sure oil comes out from housing than housing has some micro split / crack. Goto ID 100
020	Oil is Leaking	Oil Leakage from Cover	The sealing liquid under cover is split/defect. Disassemble the cover and put new sealing liquid. Assemble the cover and tighten the bolts. If still same problem goto ID 100
021	Gearbox is moving regularly on its mounting point	You are using Torque Arm	The movement of gear box is because of the runout of the shaft which you assemble the gearbox. This has no bad affect or harm to the gearbox and is normal unless you are using torque arm.
022	Gearbox is moving randomly on its mounting point	You are using Torque Arm	The movement of gear box is because of the runout and clearance of the shaft which you assemble the gearbox. Check the clearance of the assembling shaft and the clearances on your machine. This has no bad affect or harm to the gearbox unless you are using torque arm.
023	Motor is heating up	Motor is running over its nominal current	The motor power is not enough or some overload to the motor is possible. The motor may be defect. Goto ID 100
023	Motor is heating up	Ambient is dusty	Check the motor Fan Hub and ribs. They must be free of dust. If you are using forced external fan, check if it is working. If you are using frequency inverter in low speeds and you do not have forced external fan, you may need forced external fan. Goto ID 100



ID	Problem	Observation	Remedy
024	Motor is running but Gearbox shaft does not turn	Scratchinh noise comes out	Some part (key, gear) may be defect inside gearbox. Goto ID 10
025	Gearbox Housing is Defect	You are using chain drive or pinion gear	The radial load or poligon effect of the chain may have caused the damage. Check also if the assembly bolts are loosened or the plate you assemble the gearbox is rigit enough. Check if you are using the correct diameter of chain drive and you are not exceeding max. allowed radial load. Check the position of your output element and re-calculate your radyal load and check if this fit to the maximum allowed radial load. Goto ID 100
026	Output Shaft is Defect	You are using chain drive or pinion gear	The radial load or poligon effect of the chain may have caused the damage. Check also if the assembly bolts are loosened or the plate you assemble the gearbox is rigit enough. Check if you are using the correct diameter of chain drive and you are not exceeding max. allowed radial load. Check the position of your output element and re-calculate your radyal load and check if this fit to the maximum allowed radial load. Goto ID 100
027	Gearbox is stopping too late	You are using braked motor	Please check the wiring diagram of the brake. There are two different kind of brake wiring diagram. The standart gearbox delivered from our factory is set to delayed braking. For sudden braking check the wiring diagram.
028	Gearbox is starting too late	You are using braked motor	For fast opening of big brakes (over 100Nm), you may need shock transformers which is supplied by YILMAZ. Goto ID 100
100	Service Required	No self solution found	Please contact YILMAZ REDUKTOR Service point. See on the back side of this manual. Changing mechanical parts of gearbox can only be done by YILMAZ REDUKTOR or with information of YILMAZ REDUKTOR. Any change without informing YILMAZ REDUKTOR will cancel the waranty, manufacturer decleration and YILMAZ REDUKTOR will take no responsibility.

11- Disposal

If your product is no longer of use and you wish to dispose of it, refer to the instructions here. If you have any questions regarding ecological disposal methods, please consult our service points given on the backside of this manuel.

11.1- Disposal of Oil

-Lubricants (oil and greases) are hazardous substances, which can contaminate soil and water. Collect drained lubricant into suitable receptacles and dispose of it according to the valid national guidlines.

11.2- Disposal of Sealings

Remove the sealing rings from the gear reducer, and clean them of oil and grease resudies. Dispose of the sealings as composite material (metal/plastic)

11.3-Disposal of Metal

Divide up the remainder of the gear reducer into iron, aluminium, non-ferrous havy metal if possible. Dispose of it according to the valid national guidlines.

Appendix

Manufacturer's Declaration in accordance with the EC Machinery Directive 98/37/EC, Annex IIB

We **YILMAZ REDUKTOR Sanayi ve Ticaret A.S.**
Beylikduzu San-Bir. Bulvari 1.Bolge 3.Cadde No:18
Buyukcekmece/Istanbul-TURKEY

herewith declare, on our own responsibility, that the following products

Model : K Series Geared Units
Type: KN...,KT...,KV*...,KR*..

which this declaration refers to, is to be incorporated into machinery or assembled with other machinery to constitute machinery covered by the Machinery Directive is in conformity with the following standards

EN 292-1, 1991
EN 292-2, 1991
EN 1050, 1996

* This declaration is valid only for the gear unit part and does not cover the motor

The product this declaration refers to must not be put into service until the machinery into which it is to be incorporated has been declared in conformity with the provisions of the relevant European Directives.

TURKEY / Istanbul
Date : 01.01.2005

Authorized Person
Metin YILMAZ,
Re-Search Manager



Warranty Conditions:

1. The geared motors and gear units are warranted for two year except the electric motor. For motor warranty please refer to the manual of the electric motor manufacturer or the warranty document of the motor manufacturer. This warranty is valid only if the gearbox is assembled and started up according our operating instructions and is used under the allowed conditions for the appropriate gearbox type in our catalogue.
2. The warranty time starts from the start up time written on the warranty document and last for two years. If the start-up time is more then three months after the billing time, the total warranty time is limited to 27 months starting from billing time. If the warranty document is not send to our company after start-up, the total warranty time will be limited to 24 months after the billing time.
3. Any time during the warranty for maintenance, repair or change will be added to the warranty time. This time starts from the date which the company or representative was made aware of the problem and ends on the date of the re-start-up.
4. If the product fails to operate because of a manufacturing or assembly failure during the warranty time, the product will be repaired free of charge.
5. If the product fails to operate because of a manufacturing or assembly failure during the warranty time and it is not possible to repair it, the product will be changed with a new one according to the report from our service department mentioning that the hazard can not be repaired.
6. Costumers must inform the manufacturer if there are some problems after the service and repair of the failed product.
7. The extra costs like stopped plant, physical or mental injuries etc. by the costumer side are not covered by this warranty except the product itself.

YILMAZ REDUKTOR San. ve Tic. A.S.

Head Office: Maltepe Gumussuyu Cad. Bestekar Medeni Aziz Efendi Sok. No:54

P.K.34020 Topkapi/Istanbul-TURKEY

Phone: +90 (0) 212 567 93 82/83 , Fax: +90 (0) 212 567 99 75

Factory : Beylikduzu San-Bir Bulv. 1.Bolge 3.Cad. No:18

Buyukcekmece/Istanbul- TURKEY

Phone: +90 (0) 212 886 90 00 - PBX 10lines , Fax: +90 (0) 212 886 54 57

Warranty Decleration

YILMAZ REDUKTOR products are **warranted for 2 (Two) years** covering all parts and materials used in products and their production errors unless they are started-up and used according our service manual and is not modified or disassembled without an acknowledgement from our company.

The warranty covers all costs like repair, service, spare parts etc. and no charge will be asked under any name. The time for repair, service will be added to the warranty time.

For detailed warranty conditions please refer the back side of this page.

Serial No:

Type:

Manufacturer:

Company : YILMAZ REDUKTOR Sanayi ve Ticaret A.S.

Address : Gumussuyu Cad. Bes.Medeni Aziz Efendi Sok. No:54

Topkapi / Maltepe / Istanbul - TURKEY

Phone : +90 (0) 212 567 93 82 / 83 - +90 (0) 212 886 50 43/44

Fax : +90 (0) 212 567 99 75 - +90 (0) 212 886 54 57

Stamp and Signature

Supplier / End User:

With signing this part and sending this back to our company your warranty period will be started and you are accepting that you have received the operating instruction of the product.

Name:

Billing Date/ Bill No.:

Start-Up Place / Date:

Address:

Phone - Fax:

Supplier/ End User Stamp and Signature

Service Contact Points:

Main Service Point:

YILMAZ REDUKTOR A.S.

Beylikduzu San-Bir Bulv. 1. Bolg. 3. Cad. No: 18

PK 34900

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+90(0) 212 886 52 82

Fax: +90 (0) 212 886 54 57

e-mail: yilmaz@yr.com.tr

web: www.yr.com.tr

Outside Turkey:

Please contact the main service point mentioned above. You will be directed to our nearest service point to your location