USAGE AND MAINTENANCE MANUAL

ROTOGEAR RE COUPLINGS

ENGLISH ROTOGEAR MANUAL EDIT.2018-10 COD. 24861-EN

WESTCAR s.r.l.

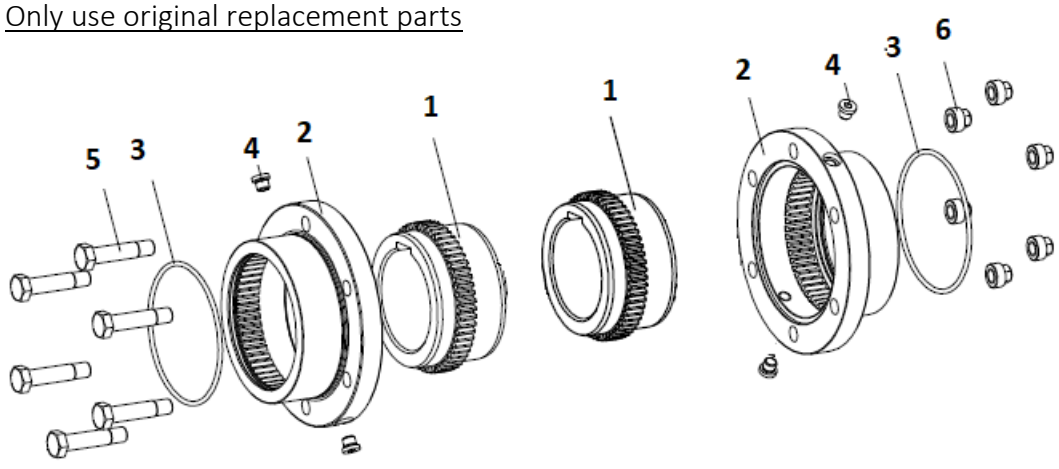
REGISTERED OFFICE
Commercial Offices
Via Monte Rosa 14
20149 Milan – ITALY
Tel. 02-76110319
Fax. 02-76110041

PLANT
Via Venezia 31
21058 Solbiate Olona
Varese – ITALY
Tel. 0331-641294
Fax. 0331-376014

1) Parts of the coupling, construction elements

1. Coupling hubs
2. Bell housings
3. O-ring seals
4. Grease nipples
5. Calibrated screws
6. Self-locking nuts

Only use original replacement parts



2) Coupling installation

- Prior to assembly, clean the surfaces of the holes and the surfaces of the shafts
- Grease the O-rings (3) and insert them into the bell housings (2)
- Position the bell housings (2) on the shafts, taking care not to damage the O-rings (3)
- Position the hubs in the direction of the shafts; for large couplings, use suitable lifting equipment
- Assemble the hubs so that the head of the shafts is aligned with the inner surface of the hub
- Fix the hubs to the shafts by tightening the fixing screws
- Proceed with alignment as directed in section 3
- Lightly grease the teeth and slide the bell housings (2) onto the hubs (1)
- Use Loctite 510 liquid sealant between the flanges of the bell housings (2), fit the screws (5) and the nuts (6), then tighten as indicated in the table

COPPIE DI SERRAGGIO *TIGHTENING TORQUE*		
TIPO *TYPE*	**VITI METRICHE** *BOLTS METRIC*	
	Dimensione mm *Size mm*	**Nm**
40	8x1	20
55	10x1,25	35
70		
85	12x1,25	65
100		
120	16x1,5	145
140		
160		
180	18x1,5	225
200	22x1,5	395
220		
250	24x2	515
280	27x2	660
320		
360	30x2	1200
400		
450		

In potentially explosive areas, a medium threadlocker (e.g. Loctite 222) must be used

Note: In the event of interference between the hole and the shaft, the hubs can be uniformly heated to between 80°C and 100°C; in this case, wear gloves to protect the hands.
N.B. Before heating the hubs, the elastic elements must be removed

In potentially explosive areas, consider the ignition risk

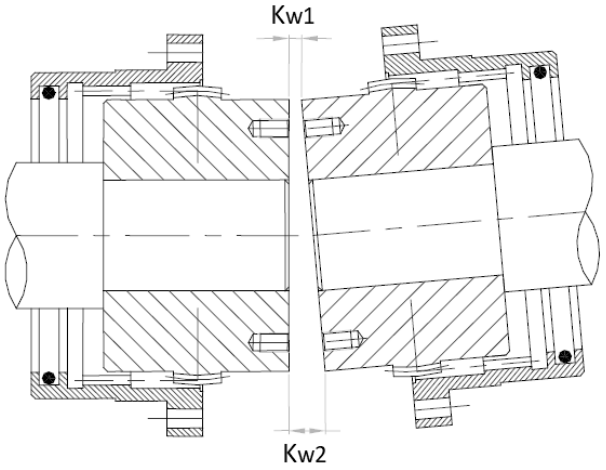
Caution: Before closing the bell housings, ensure that the hubs are at room temperature to protect the O-rings.

- Proceed with greasing: remove the two upper grease nipples and pump grease alternately from the two lower grease nipples until the grease emerges from the opposite side, then replace the grease nipples removed previously.
- Ensure that the coupling is suitably protected.

3) Coupling alignment

In explosive areas, the max values are half of those indicated here

a) Angular Misalignment

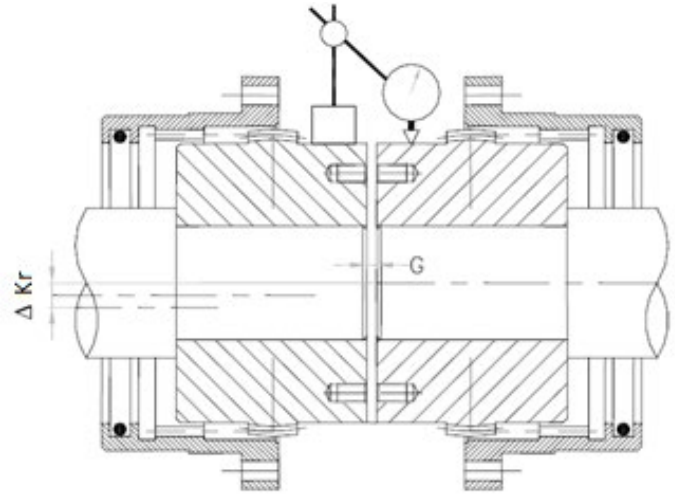


- Rotate the coupling 360°
  to determine the maximum deviation

  between **Kw1** and **Kw2**
- Calculate the angular misalignment

  $\Delta Kw = Kw2 - Kw1$
- Compare the value obtained with the table at the bottom of the page

b) Radial/Parallel Misalignment



- Rotate the coupling 360°
  to determine the maximum deviation

  between **Kr** max and **Kr** min
- Calculate the radial misalignment

  $\Delta Kr = Kr$ max $- Kr$ min
- Compare the value obtained with the table at the bottom of the page

c) Axial Misalignment

Measure the axial gap and compare this

measurement ("G") with the table in the catalogue

***Maximum misalignment values**

Coupling Size	≤ 250 rpm		≤ 500 rpm		≤ 1000 rpm		≤ 2000 rpm		≤ 4000 rpm	
	ΔKw	ΔKr	ΔKw	ΔKr	ΔKw	ΔKr	ΔKw	ΔKr	ΔKw	ΔKr
40–85	0.25mm	0.25mm	0.25mm	0.25mm	0.25mm	0.25mm	0.15mm	0.20mm	0.08mm	0.10mm
100–180	0.50mm	0.60mm	0.50mm	0.60mm	0.25mm	0.35mm	0.15mm	0.20mm	0.08mm	0.10mm
200–250	0.90mm	1.00mm	0.50mm	0.75mm	0.25mm	0.35mm	0.15mm	0.20mm	--	--
280–360	1.00mm	1.10mm	0.60mm	0.85mm	0.30mm	0.40mm	--	--	--	--
400–450	1.00mm	1.20mm	0.60mm	0.90mm	0.30mm	0.50mm	--	--	--	--

***** CAUTION: the reference values indicated are maximums with the other values at zero.

See "Combination alignment" below

d) Combination Misalignment

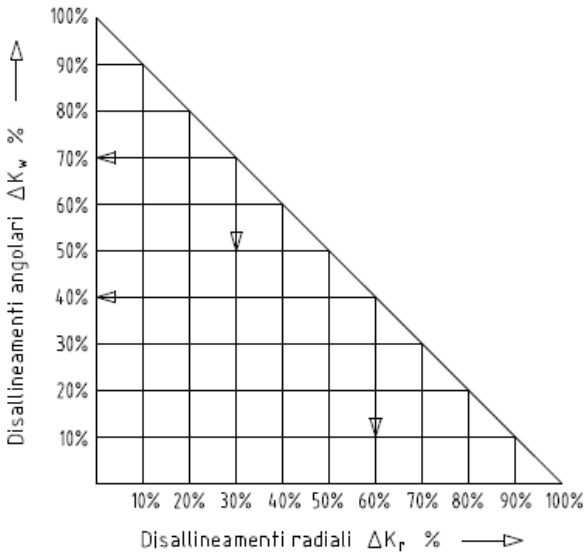
Examples of combination misalignment, sum of several misalignments:
Example 1:

ΔKw = 30%
ΔKr = 70%

Example 2:

ΔKw = 40%
ΔKr = 60%

ΔKtotal = ΔKw + ΔKr ≤ 100%



4) Coupling maintenance and storage

The ROTOGEAR coupling requires simple maintenance, the duration of which is determined by the operating parameters.
During routine checks in the plant, it is recommended that you:

- Remove the screws (5) and move aside the bell housings (2)
- Check the condition of the teeth and remove used-up grease
- Check the condition of the O-rings
- Check the alignment (see point 3)
- Move the bell housings (2) back into place and re-tighten the screws as directed in point 2
- Protect the coupling with a protective film
- Do not allow the O-ring seals to come into contact with acidic substances or corrosive oils; keep them away from direct sunlight

5) Inspection frequency

Once the coupling has been put into service, the torsional backlash and the condition of the teeth must be checked for the first time after 2,000 hours of operation (after 4 months at the latest).
If little or no deterioration is found during this first inspection, provided the same operating parameters apply, further inspections can be carried out after 4,000 hours of operation (after 12 months at the latest).
If the teeth are found to be worn during an inspection, replace the coupling.

In explosive areas, the max values are half of those indicated here

6) Malfunctions: causes and solutions

MALFUNCTIONS	CAUSES	RISK IN EXPLOSIVE AREAS	SOLUTIONS
Onset of abnormal noises and/or vibrations	Misalignment	Risk of ignition due to hot surfaces and sparking	1) Stop the motor/put the coupling out of operation. 2) Eliminate the cause of the misalignment, e.g. loose engine fixing bolts, structural failure of the crankcase, thermal expansion. 3) Assess the wear. 4) Restore the correct alignment.
	Lack of lubricating grease		1) Stop the motor/put the coupling out of operation. 2) Assess the wear. 3) Replace the grease. 4) Check the O-rings for wear and replace them if necessary.
	Loose axial fixing screws on hub		1) Stop the motor/put the coupling out of operation. 2) Check the alignment. 3) Assess the wear. 4) Tighten the hub fixing screws and secure them to prevent further loosening.
Excessive wear of teeth	Engine vibrations		1) Stop the motor/put the coupling out of operation. 2) Disassemble the coupling and remove wear residue. 3) Inspect the components of the coupling and replace any worn parts. 4) Find and eliminate the cause of the vibrations. 5) Re-assemble the coupling. 6) Align if necessary and fill with lubricating grease.
	Excessive misalignment		1) Stop the motor/put the coupling out of operation. 2) Eliminate the cause of the misalignment, e.g. loose engine fixing bolts, structural failure of the crankcase, thermal expansion. 3) Assess the wear. 4) Restore the correct alignment.
	Lack of lubricating grease		1) Stop the motor/put the coupling out of operation. 2) Assess the wear. 3) Replace the grease. 4) Check the O-rings for wear and replace them if necessary.
Loss/leakage of lubricating grease	Worn O-rings		1) Stop the motor/put the coupling out of operation. 2) Check the alignment. 3) Drain the remaining grease. 4) Replace the O-rings. 5) Fill the coupling with new grease.
	O-rings damaged due to incorrect storage or damaged during assembly		1) Stop the motor/put the coupling out of operation. 2) Check the alignment. 3) Drain the remaining grease. 4) Replace the O-rings. 5) Ensure that the O-rings are stored and/or installed correctly. 6) Fill the coupling with new grease.
	O-rings damaged due to contact with aggressive liquids and oils, contact with ozone, or exposure to high temperatures.		1) Stop the motor/put the coupling out of operation. 2) Check the alignment. 3) Drain the remaining grease. 4) Eliminate the cause of the contamination of the O-rings. 5) Replace the O-rings. 6) Fill the coupling with new grease.

MALFUNCTIONS	CAUSES	RISK IN EXPLOSIVE AREAS	SOLUTIONS
Teeth breakage	Teeth breakage due to overload	Risk of ignition due to hot surfaces and sparking	1) Stop the motor/put the coupling out of operation. 2) Disassemble the coupling and remove any debris from the breakage. 3) Find the cause of the overload. 4) Replace the damaged parts of the coupling. 5) Re-assemble the coupling. 6) Align if necessary and fill with lubricating grease.
	The usage parameters are not suitable for the installed coupling		1) Stop the motor/put the coupling out of operation. 2) Disassemble the coupling and remove any debris from the breakage. 3) Review the selection parameters and install a larger coupling if possible. 4) Replace the damaged parts of the coupling. 5) Re-assemble the coupling. 6) Align if necessary and fill with lubricating grease.
	Lack of lubricating grease		1) Stop the motor/put the coupling out of operation. 2) Disassemble the coupling and remove any debris from the breakage. 3) Check the O-rings for wear and replace them if necessary. 4) Replace the damaged parts of the coupling. 5) Align if necessary and fill with lubricating grease.
	Excessive misalignment		1) Stop the motor/put the coupling out of operation. 2) Disassemble the coupling and remove any debris from the breakage. 3) Check the O-rings for wear and replace them if necessary. 4) Eliminate the cause of the misalignment, e.g. loose engine fixing bolts, failures. 5) Replace the damaged parts of the coupling. 6) Re-assemble the coupling. 7) Align if necessary and fill with lubricating grease.
Electrostatic buildup	Electrostatic buildup on metal parts	Possible sparking	The metal parts have a coefficient of friction (R<100 Ohm) in compliance with the provisions of the ATEX directive.
	Electrostatic buildup on painted parts		If painting is required, anti-static paints or thicknesses of less than 200 µm are used.

7) Disposal

It is recommended that you dispose of the coupling in compliance with the regulations in force in the respective areas.

8) Liability

This item must be used only for the functions for which it was designed, in accordance with the standard safety parameters and taking into account the parameters for selection, use, assembly, alignment, inspection and maintenance as indicated in the corresponding technical catalogue and in these assembly and maintenance instructions. Otherwise, WESTCAR shall not be held liable under any circumstances.

9) Specific indications for potentially explosive environments

a. The ROTOGEAR coupling is suitable and confirmed for use in potentially explosive areas. When using the coupling in these areas, follow the special instructions and provisions listed in the catalogue and in these rules.
b. ROTOGEAR couplings with attached parts capable of generating heat, sparks and electrostatic buildup and discharge (e.g. in combination with brake drums/discs, overload systems such as friction couplings, rotors, etc.) are NOT permitted in explosive areas; a separate inspection is required.
c. In explosive areas, fixing screws and/or fixing pins for mounting taper bushes must be secured against self-loosening, e.g. by bonding with medium-strength Loctite.
d. If using taper bushes without a key, self-locking hubs and/or similar, without a keyway these are NOT to be permitted in explosive areas.
e. The more precisely the coupling is aligned, the longer it will last.
   When used in potentially explosive atmospheres falling under group IIC (identifier II 2GD c IIC T), the maximum permitted misalignment values are halved (point 3).
f. If the couplings are used in areas at risk of dust explosions and in mining companies, it must be ensured that dust does not build up in dangerous quantities between the coupling and the protection.
   The coupling should not be operated in a dust buildup.

g. When using the couplings as equipment in equipment category II, light metals should not be used as protective covers (stainless steel if possible). The use of aluminium is permitted only if the proportion of Mg is less than 7.5%. This protection must leave a space of at least 10mm from the coupling and provide adequate ventilation holes.
h. If the couplings are used in mining companies (equipment categories I M2), the cover must not be made of light metal and must also be capable of withstanding greater mechanical stresses than the equipment in equipment category II.
i. If coated couplings (coated with primer, paint, etc.) are used in potentially explosive areas, conductivity and layer thickness requirements must be followed. Electrostatic buildup is not anticipated for coatings applied with a thickness of up to 200 µm. Multiple applications with thicknesses greater than 200 µm are NOT permissible for explosion group IIC.