

TRANSFLUID

drive with us

TRANSFLUID®

industrial & marine

ISO 9001 Certified Company since 1997

INSTALLATION AND MAINTENANCE

BEFORE ASSEMBLING AND OPERATING THE FLUID COUPLING, CAREFULLY READ ALL THE SAFETY AND OPERATING INSTRUCTIONS REPORTED IN THIS MANUAL.

ALWAYS FOLLOW ALL THE INSTRUCTIONS AND ASSURE THAT ALL THE OPERATORS STANDING BY THE MACHINERY ARE WEARING ALL THE PROTECTIVE EQUIPMENT NECESSARY FOR THE JOB TYPE AND APPLICATION BEING PERFORMED.

DO NOT USE THE MACHINERY IF YOU DO NOT UNDERSTAND THESE INSTRUCTIONS, AND IMMEDIATELY REFER TO THE MANUFACTURER OR THE CUSTOMER SERVICE DESK FOR ASSISTANCE.

THE COUPLING MUST BE PROTECTED BY A CONVENIENT COVER GUARD TO AVOID PERSONAL INJURY TO PEOPLE. AXIAL AND RADIAL VENTILATION OPENINGS SHOULD BE INCORPORATED IN THE GUARD FOR HEAT EXCHANGE.

IF THE COUPLING IS FITTED WITH FUSIBLE PLUGS, THE SAID OPENINGS SHOULD NOT BE DIRECTED TOWARDS OPERATORS OR ANY HOT OR ELECTRICAL INSTALLATION.

FLUID COUPLINGS
...KR..., ...KS..., EK

TF6646 - rev. 3

DECLARATION OF THE MANUFACTURER

Declaration of Incorporation (Article 13 of Directive 2006/42/CE)

The Manufacturer: TRANSFLUID S.p.A.
Via Guido Rossa, 4
21013 Gallarate (VA) - Italy

hereby declares that, as per Attachment II, part 1, section B of directive 2006/42/CE, the products described below:

Description: Constant fill fluid coupling and relevant accessories
Model: KR, KS, EK
Size: 7, 8, 9, 11, 12, 13, 15, 17, 19, 21, 24, 27, 29, 34, D34, 46, D46
Function: transmission of power - rotating parts
Specification number: according to shipping documents

- should not be put into service before the machinery in which it will be incorporated is declared to comply with the provisions of directive 2006/42/EC, and with the regulations transposing it into national law;
- should not be put into service before the provided "installation and maintenance" manual has been read and completely understood by the user;
- comply with the requirements of the directive 2006/42/CE (which has replaced directive 98/37/EEC).

Each modification of the product, not approved in written form by TRANSFLUID S.p.A., voids this declaration.

As per Attachment VII, part B, of Directive 2006/42/CE, the technical file of the product is available by the seat of the TRANSFLUID.

Issued at: Gallarate (VA), Italy
On: 28/03/2019

Name of signatory: Ing. Ugo Pavesi Managing Director

Firma / Signature



PRESCRIZIONI GENERALI (TF6737A - rev. 4)

1. - PREFACE

1.1 General information

This manual will support the user in using the product in a safe and correct way.

If the information contained into this manual will be observed, it will be possible:

- to increase the reliability and lifetime of the product and its installation
- to avoid risks,
- to reduce repairs and downtimes

This manual must:

- **always be available at the machine site**
- **be read, understood and used by every person who works on the product.**

The product is manufactured to the state of the art and according to current safety regulations.

Nevertheless, in case of improper handling or use:

- user's or third parties's life may be endangered
- the product or other materials could be damaged.

Spare parts

TRANSFLUID is not liable for injuries, damages, losses of any type, lack of performances resulting from use of non-original spare parts.

Use only appropriate workshop equipment for repair. Professional maintenance or repair can only be guaranteed by the manufacturer or an authorized specialist workshop.

In case further information are requested, please contact:

TRANSFLUID S.p.A.

Via Guido Rossa, 4 - 21013 Gallarate (VA) ITALIA

Tel. +39 0331 28421 / Fax +39 0331 2842911 / technical@transfluid.eu / www.transfluid.eu

TRANSFLUID reserves the rights for any modification of this manual.

1.2 Proper use

The product is provided for the use described in this manual.

The use, application values either then what stated in this manual or sales technical literature, or failure to comply with recommended inspection and maintenance interval indicated in this operator's manual is deemed as an infringement to the existing regulation.

All damages due to improper use will be borne solely by the user.

1.3 Remaining risks






Improper use or mishandling may cause death, severe injuries or minor injuries to the personnel , as well as property and/or environment damages.

Only persons who are qualified, trained and authorized are allowed to work on or with the product. Please pay attention to the warnings and safety information!

2. - SAFETY

2.1 Notes and symbols

The safety notes and symbols included in this manual are particularly marked with symbols according to DIN 4844-2.

DAMAGE o HARM to per...	SIGNAL	DEFINITION	CONSEQUENCES	SYMBOL
Persons	DANGER!	Imminent danger	Fatal or most serious injuries	
Persons	WARNING!	Danger situation possible	Fatal or most serious injuries possible	
Persons	CAUTION!	Less dangerous situation	Slight or minor injuries possible	
Persons Property	DANGER!	Burning of combustible materials	Fire hazard	
Persons	DANGER!	Use goggles	Risk of sight loss Risk of blindness	
Persons	DANGER!	Use ear protection	Hearing damage	
Property	ATTENTION!	Harmful situation possible	Damage possible to: - the product - the environment	

2.2 Staff qualification

DANGER:

personnel not qualified is exposed to danger or it is dangerous for third parties. Possible consequences can be death, serious or minor injuries to the personnel, damage to properties and/or to the environment.



DANGER:

if the content of this manual, even in part, is not clear or if some doubts remain on how to proceed even after reading, don't perform any actions on the product and contact TRANSFLUID immediately.



Only properly trained, instructed and authorized persons can work on or with the product!

Keep unauthorized people away!

Qualified people only are allowed to carry out maintenance and inspection works, trouble shooting and/or remedial actions.

Staff in charge of any work to be done on the product must:

- be trained properly for the work
- have the legal minimum age
- trained and authorized with regard to the specific work to be done

2.3 Product observation

In compliance with the legal obligation to observe our products, even after shipment, we ask you to submit us useful information as:

- change in operating data
- experience gained with the unit
- recurring problems
- problems experienced with this installation and operating manual..

2.4 General information

For all works performed on the product, please observe the local regulations for prevention of accidents!

DANGER:

before installation of the product, stop all driving and driven rotating parts, taking moreover all necessary precautions to prevent their accidental operation.

DANGER:

prior to operate on the hydraulic circuit personnel must wear relevant eyes protection devices.

ATTENTION:

the use of unsuitable working means and methods may cause damage to the product.

ATTENTION:

if irregularities are found during operation, immediately switch off the driving unit!

DANGER:

the product generates noise during operation.

If the equivalent sound pressure level exceeds 80 dB(A) this can cause hearing damage!

DANGER:

exposed rotating parts, if any, need to be protected against contact by proper guards.

Never operate the product without these guards!

DANGER:

ensure suitable, working space, light and ventilation when working on the product.

DANGER:

if the product is equipped with fusible plug (fluid coupling), in case of thermal overload of the product, fusible plugs will operate. The high temperature operating fluid inside the product (fluid coupling) is therefore sprayed out through these fusible plugs. Be sure that the exiting operating fluid:

- cannot get into contact with hot machine parts, heaters, electricals, sparks or open flames! There is a risk of fire!
- be not dangerous for personnel.

DANGER:

energized terminals, electric lines and components may cause serious or even fatal injuries!

In the event of a fault, even assemblies operationally not energized may instead be energized.

DANGER:

during the installation, operation and maintenance of the product, do not modify electrical and hydraulic circuits.

This could cause malfunctions or unforeseen behaviours of the product with potential serious consequences for the product itself and for the safety of personnel.

3. - HANDLING

DANGER:

improper slinging and lifting of the product may cause personal injuries.

ATTENTION:

improper slinging and lifting of the product may cause damage of property.

Pay attention to the product weight.

All lifting appliances, slings, slinging points must be:

- checked and approved
- sufficiently dimensioned and in the best condition
- operated only by authorized and trained personnel.

4. - STORAGE, PACKING, PRESERVATION

ATTENTION:

- dispose of the packaging in accordance with the provisions of the local regulations

- storage area must be dry, and without dust

- for storage periods longer than 3 months, ask TRANSFLUID document relevant to prescriptions for conservation of the product.



1 - INSTALLATION

..KR...KSD series

Couplings series ..KRG and ..KRM are not approved for operation at temperature below -20°C. Check our catalogue to select types ..KCG or ..KDM special version for low temperature.

- 1.1 For KRG model, remove half coupling G (29) FIG. 4);
- 1.2 For KRD model, disassemble shaft D (31) FIG. 1b). In case the fluid coupling is still filled with oil, drain it or, to avoid possible losses, position it vertically with the shaft D upwards; after disassembling the shaft D, block the bearing carrier (14) with at least 2 nuts and washers (11) and (12).
- 1.3 Check that the threaded hole at the end of the motor or gearbox shaft complies with DIN 332 (TAB. A1-A2 and FIG. 4).

a) without taper bushing

- 1.4.a Fit the coupling on the motor shaft by using a threaded bar with S dia. (TAB. A1 and A2) as shown in FIG.1a, and using 2 wrenches (hold a to avoid shaft rotation, and turn b to draw the coupling on to the motor shaft).

- 1.5.a For a correct assembly, lubricate the connecting surfaces with oil or antiseizing paste. For hot mounting (not recommended), do not exceed a temperature of 90°C, which causes irreparable damages to oil seals.

- 1.7 For KRG series, fit half coupling (29) FIG.4) on driven shaft, taking care that the shaft end does not protrude beyond face X. Fit the fixing screw and the washer (25) and (26) for KR models; (26) and (27) for KSD models) holding the motor or the gearbox shaft still; lock the fixing screw with a torque wrench, respecting the torque reported in TAB. A1 and A2.

Only for 13÷19 ..KR../..KS.. couplings, the taper bushing must be fitted into the shaft by tightening the socket screw with the torque wrench a (Fig. 3), following the torque values reported in Tab. A2. During this operation the electric motor's shaft (or the gearbox one) must be blocked using the wrench b on shaft's end C.

- N.B. For a correct assembling, when the coupling is equipped with the taper bushing, the locking torque must be as close as possible to the recommended values.

- 1.8 For KRG models, lock and peg the driven machine, positioning the motor as far as the gap k (FIG. 4.1) between the half couplings reaches the indicated values listed in TAB. B. The error on radius must be checked with a gauge (FIG.4); the angular gap with a feeler, by rotating the coupling at 4 points 90°apart: the errors should not exceed those listed in TAB. B.

- 1.9 For type KRD, reassemble the shaft D (31) – Fig. 1b) clamping the nuts and washers (11) and (12) – Fig. 1b) to the prescribed tightening torque (Tab. K – p. 11).

b) with taper bushing

- 1.4.b In case the bushing is not provided with keyway (68) FIG.1b), remove the key from motor or gearbox shaft (reverse mounting).

- 1.5.b Carefully clean all surfaces contacting the bushing by oil, grease, etc., possibly using solvent, whether they belong to motor, gearbox or fluid coupling.

- 1.6.b Fit the bushing on the motor or gearbox shaft, introducing a screwdriver into the axial cut to make mounting easier; assure that bushing goes as far as the shaft shoulder.

FIG. 1a

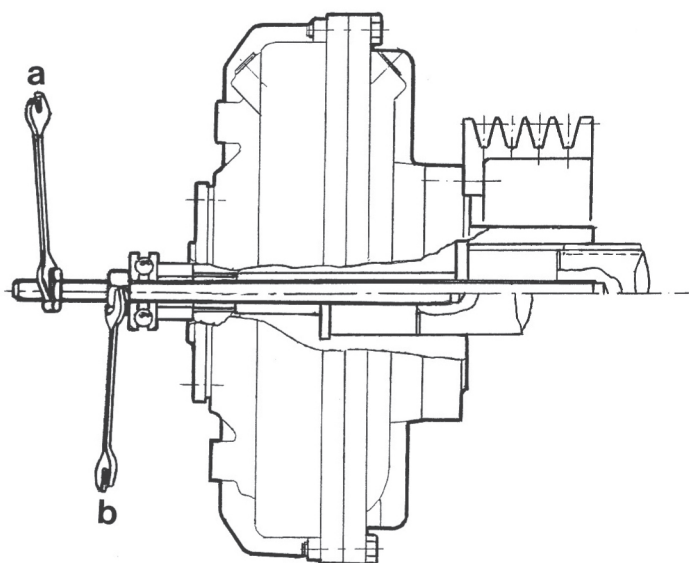


FIG. 2a (KSD)

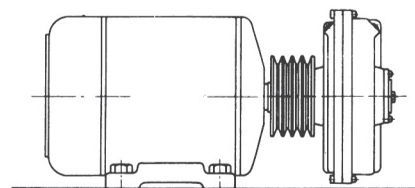


FIG. 2b (KRG)

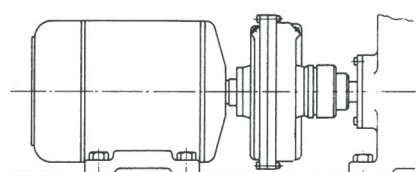
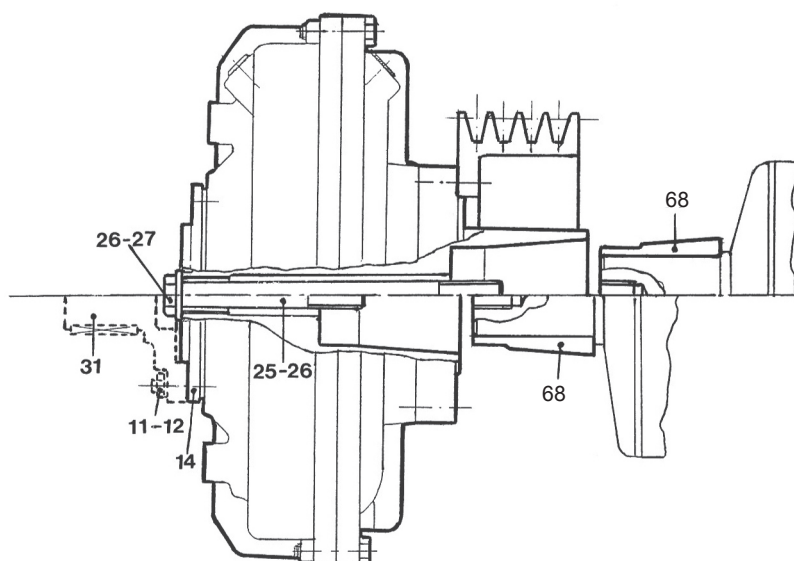
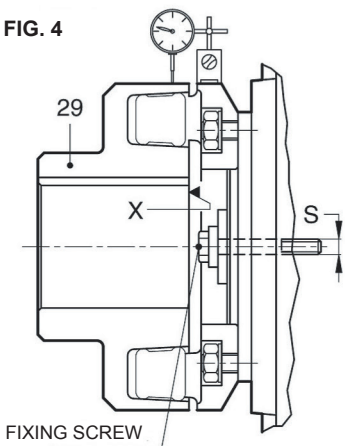
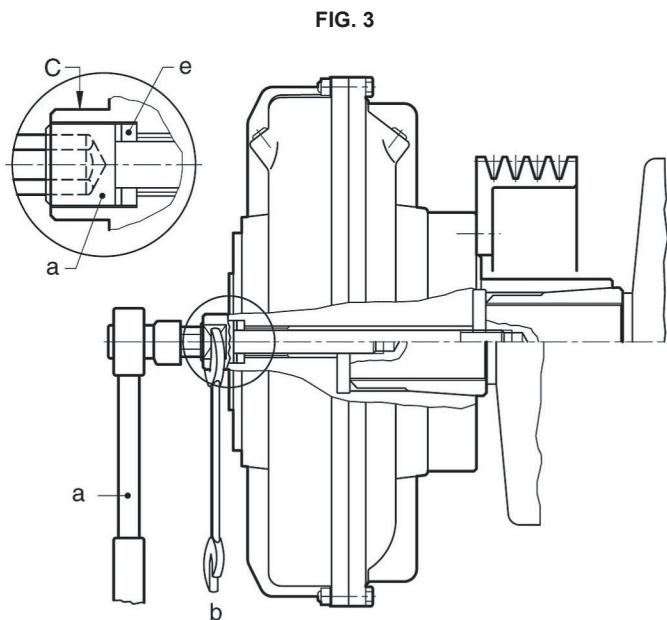
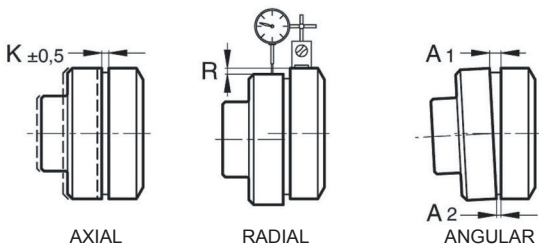


FIG. 1b





MISALIGNMENT



TAB. A1 (without bushing)

K... CK../CCK..	FIX SCREW	Steel spec.	Torque (Nm)
	S		
7 - 8	M6	8.8	10
	M8		24
	M10		50
9 - 11 - 12	M12		85
	M16		205
13 - 15	M20		400
17 - 19			
21 - 24			
27 - 29			
34	*M24		690
46	*M36		1500

* Only for max bore

TAB. A2 (with taper bushing)

K... CK../CCK..	FIX SCREW S	Steel spec.	Torque (Nm)
7 - 8	M6	10.9	15
	M8		35
	M10		50
9 - 11 - 12	M10	10.9	70
	M12		85
	M16		205
13 - 15	M20	8.8	400
	M16		205
17 - 19	M20	8.8	400
	M16		205

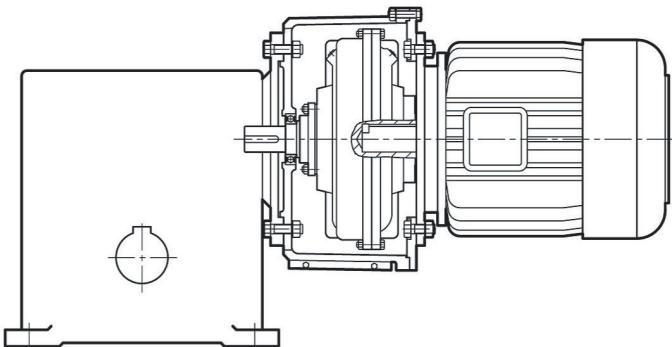
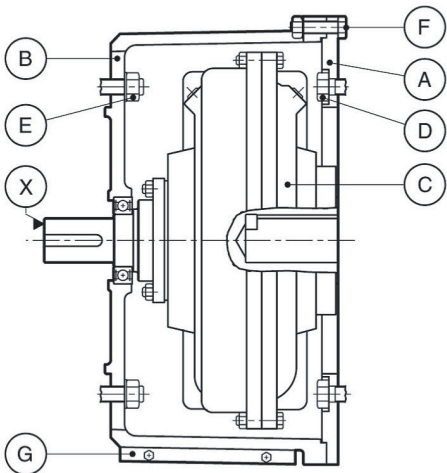
TAB. B

..KRG	Elastic coupling	Dimensions in mm		
		k	R _{max}	A1-A2 _{max}
7 - 8	BT	2	0.3	0.4
9 - 11 - 12			0.35	
13		3	0.4	0.6
15			0.5	
17 - 19				
21 - 24		4	0.6	0.8
27 - 29				
34		5		

- 1.10 Assemble the flange A on the corresponding one of the motor and tighten bolts D.
- 1.11 fit bell housing B into the gearbox flange and tighten bolts E.
- 1.12 Fit the fluid coupling C on the motor shaft, hitting with a soft hammer on the shaft end X, as far as it reaches the limit of the stroke.

EK series (FIG. 5)

- 1.13 For a correct fitting is important to lubricate surfaces with antiseizing paste
- 1.14 Fit the coupling / motor assembly into the gearbox hollow shaft as far as the flange A is connected to the bell housing B, then fix the bolts F.
- 1.15 Fit the safe guard G



..KRM series (Fig. 4a,4a1)

- 1.16 Assemble fluid coupling as reported in par. 1.1 to 1.7
- 1.17 Fit the hub (29a) on the driven shaft, lock and peg the driven machine. Position the motor as far as dimension **K** between hub (29a) and flange (27a) is within the values reported in TAB. C1.
- 1.18 Check dimensions **A1 - A2** with convenient gauge and **R** with comparator, by rolling the coupling and reading values at 90°. Errors must not overcome the values reported in TAB. C1.
- 1.19 Fit the elastic element (28a) with the screws (59), according to the locking torque reported in TAB. C1.

TAB. C1

..KRM	ELASTIC COUPLING MCF..F	Alignment tolerances (mm)				screw item 59	Locking torque Nm
		k	A1 - A2	α°	R		
9 - 11 - 12	53	75 ± 1	1.5	0.75	0.6	M6	10
13	55			0.5			
15	56			0.4			
17 - 19	58	116 ± 1.5	2.0	0.5	1.0	M10	49
21 - 24	65			0.4			
27	66			0.3			
29	68						
34	610						

FIG. 4a

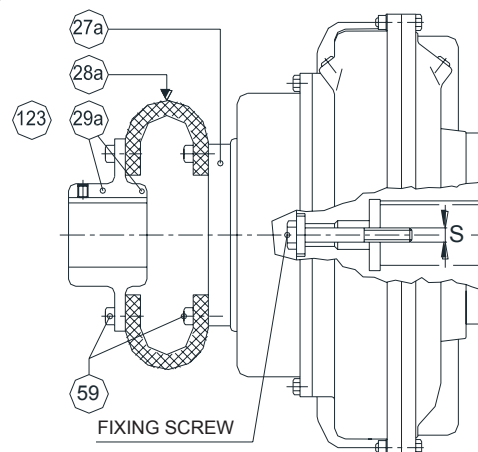
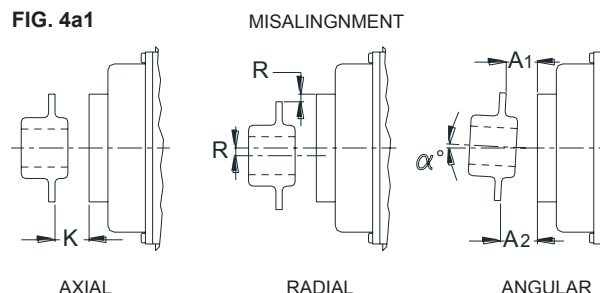


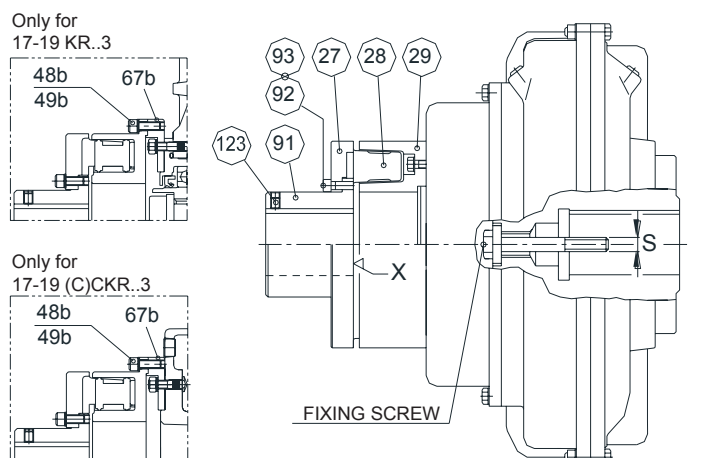
FIG. 4a1



..KRG3 series (Fig. 4b,4b1)

- 1.20 Remove half-coupling (27) and hub (91), then proceed as explained in par. 1.3 to 1.6
- 1.21 Install half-coupling (27) and hub (91) onto driven machine's shaft, making sure that its end doesn't protrude out surface **X**. In addition to this, by means of a torque wrench, tighten the fixing screw and the washer (25)-(26), applying the torque values reported in Tab. A1 e A2. During this operation the electric motor's shaft (or the gearbox one) must be blocked.
- 1.22 Lock and peg the driven machine, positioning the motor as far as the gap **k** (item 4c) between the two half-couplings reaches the values indicated in TAB. C2. The radial error **R** must be checked with a comparator; the angular gap **A1-A2** with a thickness gauge turning the coupling of 360° making reading every 90°. The errors should not exceed values indicated in TAB. C2. (For locking torques see Tab. C3)

FIG. 4b Only for 21-24-27-29(C)(C)KR...3



TAB. C2

...KRG3	ELASTIC COUPLING B3T	Alignment tolerances (mm)		
		k	R (max)	A1 - A2 (max)
17 - 19	50	3	0.5	0.6
21 - 24	60			0.8
27 - 29	80	4	0.6	
34	90	5		
46	100	7	0.8	1.1

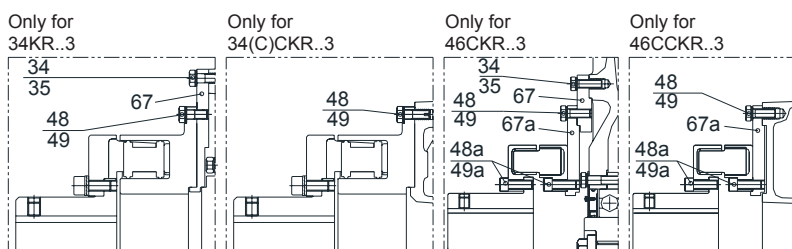
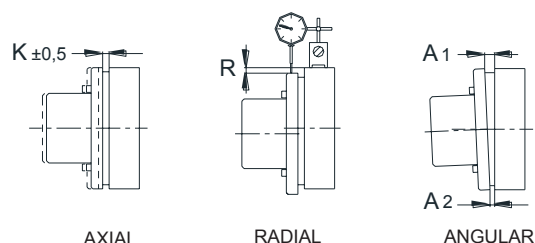


FIG. 4b1 MISALIGNMENT

TAB. C3

...KRG3	Locking torque							
	Pos. 48		Pos. 48a		Pos. 48b		Pos. 92	
	screw	Nm	screw	Nm	screw	Nm	screw	Nm
17 - 19	-	-	-	-	M10	84.6	M14	228
21 - 24	-	-	-	-	-	-	M10	84.6
27 - 29	-	-	-	-	-	-	M14	228
34	M16	285	-	-	-	-	M24	1170
46	M20	410	M20	410	-	-	-	-



INSTALLATION AND MAINTENANCE

2 - FLUID COUPLINGS FILLING INSTRUCTIONS

KR... - KSD - EK SERIES

Transfluid fluid couplings are not supplied with oil.

Therefore it is necessary to perform the following procedures:

- 2.1** Position the coupling axis horizontally (FIG. 6), turn it until the X mark gets at the top vertical (maximum fill), so that the oil plug (13) is inclined as shown in the picture.
- 2.2** Fill with oil until it overflows out of the filler hole. While filling, gently rotate the coupling on its axis to make sure all air excess is vented out of the circuit, or, if possible, remove also the cap located in correspondence on the other rotor. The quantities to be introduced are those reported in TAB. D1.
- 2.3** Fix the cap (or both caps) at the prescribed torque (TAB.E) and make sure no leakages occur; otherwise use thread sealant on filler plug threads.
- 2.4** The fillings marked X-1-2-3-4 may be chosen by the operators to meet the best performance in terms of start-up and steady running operation. With the maximum fill X a condition of minimum slip and maximum performance is achieved: the starting torque / nominal torque ratio gets higher (values generally fall within 1.8 and 2.0); decreasing the oil quantity inside the coupling (fill 1-2-3-4), the opposite result is obtained.
- 2.5** High slip causes overheating of oil contained in the working circuit, with a consequent decrease in overall performance.
- 2.6** Refer to Tab. D for the recommended oils. When used at a temperature of -20°C or less use ISO HV 32 oil for low temperatures
- 2.7** For vertical mounted applications, the couplings recommended oil fills are reported in TAB. D1.

* For ATEX environments see attachments TF6408A and TF6408D

TAB. D

RECOMMENDED OIL: ISO HM 32 (SAE 10W) CLASSIFICATION					
Agip	OSO 32	Chevron	RYKON OILS AW-32	Mobil	DTE 24
Aral	VITAM GF 32			Shell	TELLUS 52M32
BP	ENERGOL HLP 32	Esso	NUTO H 32	Texaco	RANDO HD 32
Castrol	HYSPIN AWS 32			Total	AZOLLA ZS 32

RECOMMENDED OIL: ISO HV 32 CLASSIFICATION FOR LOW TEMPERATURES -20°C -40°C	
AGIP	ARNICA 32
CHEVRON	RYKON OILS AW 32
MOBIL	DTE 10 EXCEL 32
SHELL	TELLUS S2V 32

N.B. For temperatures ≤ -20° C please contact Transfluid

TAB. D1

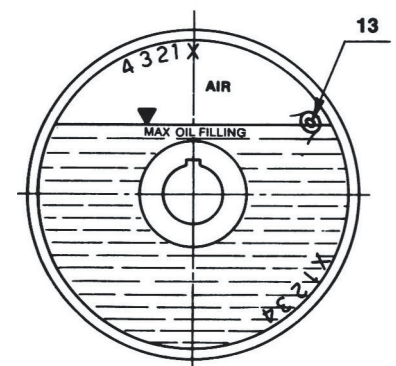
OIL QUANTITY (l)					
K...	X	1	2	3	4
7	0.920	0.860	0.800	0.730	0.650
8	1.510	1.405	1.295	1.190	1.080
9	1.950	1.820	1.690	1.550	1.400
11	2.750	2.550	2.350	2.100	1.850
12	4.100	3.875	3.575	3.250	2.900
13	5.200	4.850	4.450	4.050	3.600
15	7.650	7.150	6.600	6.000	5.400
17	11.70	10.90	10.00	9.100	8.200
19	14.20	13.30	12.30	11.20	10.00
21	19.20	17.80	16.40	15.00	13.50
24	28.40	26.50	24.60	22.60	20.50
27	42.00	39.00	36.00	33.50	31.50
29	55.00	51.00	47.00	44.00	41.50
34	82.50	76.60	70.60	66.20	62.50
46	183	170	158	148	135

TAB. D2

OIL QUANTITY (l)			
CK...	2	3	4
11	3.350	3.050	2.750
12	4.800	4.200	3.600
13	5.800	5.200	4.700
15	8.600	7.700	6.400
17	13.60	12.80	11.70
19	16.50	15.20	14.00
21	23.00	21.30	19.30
24	31.20	28.60	26.00
27	50.00	46.50	43.00
29	63.00	59.00	54.00
34	92.50	88.50	83.50

TAB. D3

OIL QUANTITY (l)		
CCK...	3	4
15	9.30	8.00
17	16.36	14.86
19	18.76	16.86
21	27.30	24.30
24	35.43	31.63
27	59.35	55.15
29	70.60	65.20
34	96.70	86.40
46	215	200

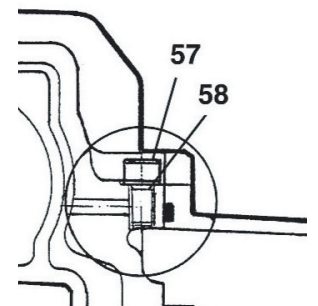


TAB. E

DIM.	Taper plugs POS. 13 and fusible plugs pos. 13a			
	Taper plug GUN7012	*Fusible standard 140° C plug GUN7018...	D nom. BSPT	Locking torque Nm
7 - 8 - 9	AB	BB	1/4"	23
11 - 12				
13 - 15	AC	CB	3/8"	29
17 - 19				
21 - 24				
27 - 29	AE	DB	1/2"	44
34				
46	AL	EB	1"	69

TAB. E1

DIM.	Valve pos. 57 Dia	Torque (Nm)	Part. numb.	
15	M8	7	GA105153 D10	Ø (1.0)
17 - 19			GA105153 D125	Ø (1.25)
			GA105153 D15	Ø (1.5)
21 - 24	M12	20	GA104785 D10	Ø (1.0)
27 - 29			GA104785 D15	Ø (1.5)
			GA104785 D20	Ø (2.0)
34			GA104785 D30	Ø (3.0)
46	M16	45	GA106690 D10	Ø (1.0)
			GA106690 D15	Ø (1.5)
			GA106690 D20	Ø (2.0)
			GA106690 D30	Ø (3.0)



* For temperatures ≠ 140° C see Tab. H at pag. 11

3 - OPERATION AND MAINTENANCE

- 3.1** During fluid coupling's normal activity, temperature and steadiness must be kept under control. Since all of the seals are in Viton, the oil temperature shall not exceed 90° C. A high temperature value could be caused by any of the conditions listed in Tab. F, in which causes and solutions to the most frequent issues are reported.
TRANSFLUID can provide, upon request, all of the functioning data.
- 3.2** After the first 20 days operation or 100 hrs replace the oil and check the tightening of the screws and the alignment of the motor and the driven machine.
- 3.3** Repeat the above checks every 6 months - For the KRG models, check the gap **k** (TAB. B) of the elastic coupling. If the torsional gap is excessive (about 2°), replace the rubber elements.
- 3.4** Transfluid couplings, except for special fluid nes, are normally supplied with the fusible plug set for 140°C (120°C and 198°C settings are available upon request) as shown in Fig. 14. If the fusible plug melts frequently during normal service, then check for the possible causes, listed in Tab. F.
- 3.5** In case the switching pin or the electronic overload controller are mounted, make sure that the distances shown in Fig. 9 and 11 are always respected.
- 3.6** It is advisable to replace the fluid every 4000 working hours.

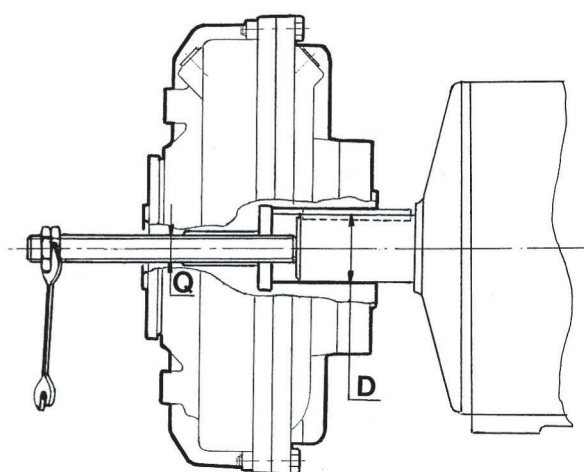
TAB. G

K../CK..	D	Q	
		without bushing	with bushing
7 - 8	19	M12	M12
	24		
	28	M14	
	38		
9 - 11 - 12	38	M16	M20
	42	M20	
	48		
13 - 15	48	M27	M27
	55		
	60		
	65		
17 - 19	65	M27	-
	75		
	80		
21 - 24	80	M36	
	90		
	100		
27 - 29	100	M45	
	120		
	135		
34	150	M52	
46	180		

4 - DISASSEMBLY

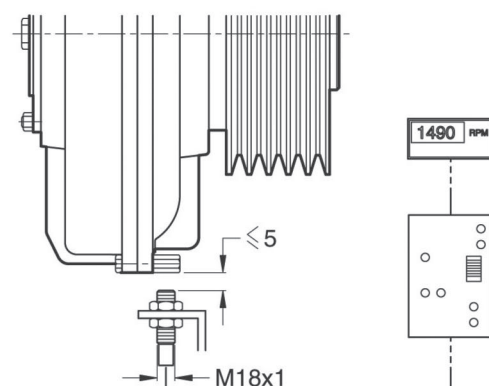
- 4.1** Loosen the fixing screw (25) for ..KR..; (26) for ..KS.. (Fig. 1b) (Pag. 4).
- 4.2** By means of the extraction hole, using an appropriate threaded bar (dimension **Q** reported in Tab. G), take the coupling apart from the motor, as shown in Fig. 8, pushing with the bar against its shaft end.
- 4.3** For the couplings assembled with a taper bush, a very small displacement is sufficient to disengage the coupling from its seat. In case the taper bushing is to be removed too, a screw-driver may be used to push into the keyway cut. Do not force the taper bushing to avoid damaging the contact surfaces which may compromise the correct reassembly of the part.

FIG. 8



TAB. F

SYMPTOM	CAUSE	REMEDY
TOO HIGH TEMPERATURE FUSIBLE PLUG INTERVENTION	POOR OIL LEVEL	Check level and, if necessary, refill (Tab. D1, D2 e D3)
	TOO MANY CONSECUTIVE START-UPS	Wait for cooling before restart or reduce the number of start-ups
	ABSORBED POWER HIGHER THAN RATED	Remove causes and/or review motor/coupling selection
	HIGH AMBIENT TEMPERATURE	Improve coupling ventilation
	JAMMED OR OVERLOADED DRIVEN MACHINE	Remove the causes
	TOO NEAR HEAT SOURCE	Move the heat source away or interpose a shield
	PROTECTION COVER NOT AIRED ENOUGH	Create appropriate vents to improve heat exchange
PERFORMANCE DECREASE	OIL LEVEL	Check level and, if necessary, refill (Tab. D1, D2 e D3)
	OIL TYPE	Replace if necessary (tab. D)
		Verify if the oil fulfills the recommended oil specifications
LOW OPERATING SPEED AND/OR EXCESSIVE SLIP	LOW AMBIENT TEMPERATURE	Use a proper oil type (see par. 2.6)
	FAULTY MOTOR	Check motor's rpm (if electric, check connections)
	START/DELTA INSERTION TIME	If required time is too long, reduce it to 3 s max
NOISE AND VIBRATION	JAMMED OR BRAKED DRIVEN MACHINE	Remove the causes
	BAD ALIGNMENT	Verify alignment (par. 1.8)
	FAULTY BEARINGS	Disassemble, check, replace bearings (and relative seals)
HISSINGS	WORN ELASTIC COUPLINGS ELEMENTS	Replace worn elements
	PROTECTION COVER	Remove small openings



N.B. Before connecting to the electrical power supply, always verify the voltage.

The electrical connections must be made according to the schematic shown in the detailed instructions of the same electronic device, setting and/or adjusting all the functions on the control panel, as shown in FIG. 12.

- Blind timer for starting **TC**, with a screw regulation up to 120s, avoiding the intervention of the alarm during the starting phase.
- Speed range **DS**, by means of a Dip-Switch to be programmed on 5 and 8 positions, setting relay condition, proximity type, reset system, acceleration or deceleration.
- Speed threshold **SV** to be screw regulated from 1 to 10. The value 10 corresponds to full range set with dip-switch.
- Reset **R**, locally executable with a manual switch or remote connections.
- Delay time **T** setting screw regulation up to 30 s. This function delays possible alarms caused by sudden torque variations.

The function of the timers respect to the state of the relays is diagrammed in FIG. 13.

Leds (FIG. 12) permitting to keep some vital functions under control are also present on the panel:

- Speed level overtaken **SS** with a red light switching on as soon as the set threshold is overcome.
- Red alarm **A** lighting up when the internal relay switches on.
- Green supply len **ON** pointing out that the device is electrically supplied.
- Yellow supply led **ENABLE**, signalling that the device is ready to operate.

N.B.: For further details concerning electronic features and connections, refer to the specific instructions supplied with the device.

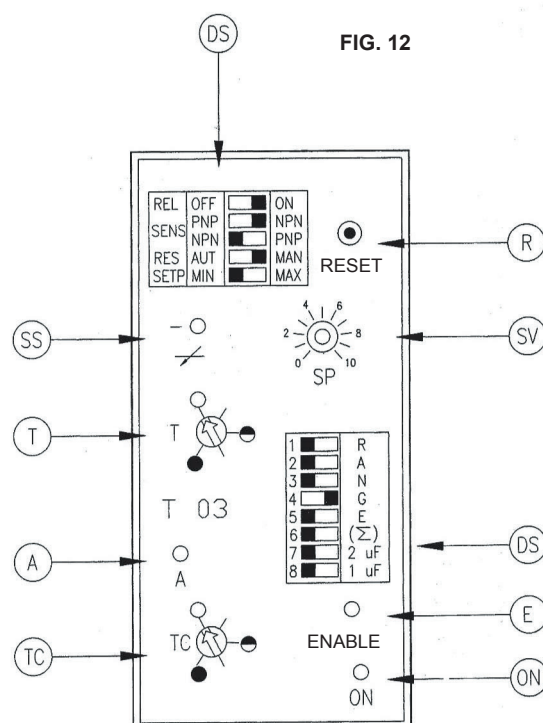


FIG. 12

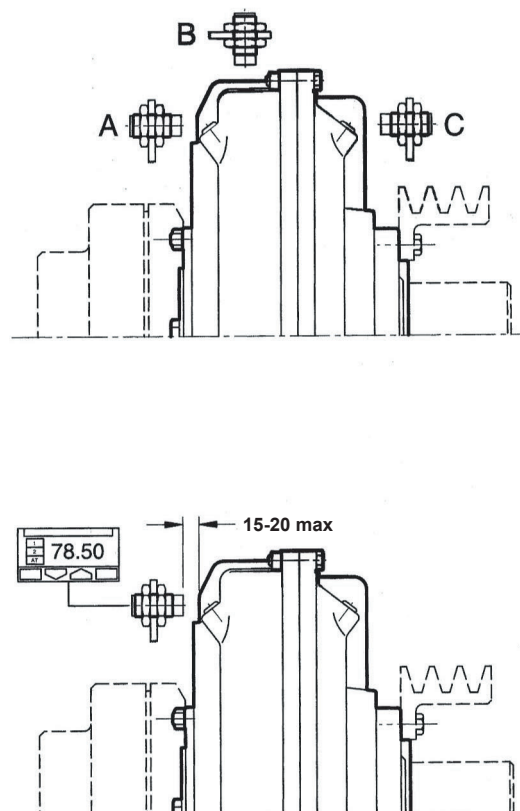


FIG. 13

5.4 INFRARED CONTROLLER (Fig. 13)

The infrared controller is used to detect the working temperature. A system is available equipped with infrared sensors that, when positioned in proximity to the fluid coupling, allows for extremely precise measurement without contact.

The temperature is shown on the display that also allows for 2 alarm levels to be fixed (logical alarm on the first, relay alarm on the second). The sensor must be positioned in proximity of the outer impeller or of the cover of the fluid coupling, choosing for example the possibility illustrated in Fig. 13.

The distance between the sensor and the fluid coupling must be approximately 15-20 mm (the cooling fins do not disturb the correct functioning of the sensor).

To prevent the glossy surface of the fluid coupling from creating reflections that can distort a correct reading of the temperature, the surface of the coupling directly exposed to the sensor must be painted in opaque black (a band of 6-7 cm is sufficient). The sensor cable has a standard length of 90 cm. If required this can be extended using only and exclusively with a braided and shielded cable for "K" type thermocouples.

NB: for further details regarding the electronic functions and connections consult the specific instructions provided.

INSTALLATION AND MAINTENANCE

6 - RECOMMENDED SPARE PARTS (FIG.16-17-18-19)

N.B. When ordering spare parts, always specify model and spec.nr. marked on external impeller in the positions shown in FIG.15 or in the opposite side (cover) 27K, 29K and 34K and 46K have got a plate reporting serial nr. too. (With painted couplings the bom number is stamped on the bearing carrier).

6.1 Seal kit for ...KR / ...KSD items 4-5 (5a for C.../CC... versions)-6-15-20-41 (41) only for 27÷46, (58) only for 15÷46, (90) only for 46...KR)

6.2 Fusible plug item 13a

6.3 Rubber element (for ...KRG only) pos. 28

N.B. Code numbers for possible orders are shown on TAB. H

7 - O-RINGS AND SEALS REPLACEMENT

(pag. 12÷17)

N.B. To operate on the below mentioned surfaces, always make use of a Teflon mallet, do not use the iron hammer.

7.1 Drain the oil by removing plugs (13) on cover and delay chamber, plus the fusible plug on the external impeller.

7.2 If the coupling is provided with delay chamber (33), disassemble it by loosening screws (34).
Only for 7K... ÷ 34..K..

7.3 Remove nuts (11), then insert two screwdriver in the gap between the bearing carrier (14/14a) and the cover (3/3a), prying the first one to take it apart together with seal (15).

7.4 Only for..KS.., remove pulley (29) (if flanged). For 27..KS.. take the snap ring (82) apart, disassemble the seal-carrier (19), together with seals (20) e (41), and remove snap ring (23).

7.5 Unscrew bolts (8)-(10) and disassemble cover (3/3a), hitting softly with the mallet, then take apart bearing carrier (16) and shield (47).

7.6 Remove snap rings (18) and inner impeller (1).

7.7 Take apart screws (9) and shield (17). Hit softly on surface B of the shaft (24/24a) for ..KR.. and (25/25a) for ..KS.., to take away the bearing carrier (23) with its seals (20) and (6).

7.8 Only for 27..K.. ÷ 34..K.. disassemble the outer impeller (2) removing screws (9), the disassembled impeller group includes: seal carrier (19), seals (20) and (41), plate (40), screws and washers (60), (61), then proceed as per par. 7.14 and the next ones.

Only for 46..K..

7.9 Remove two screws (7) 180° apart and all bolts (8)-(10), then disassemble cover (3/3a) with an adequate puller, using the two holes previously occupied by the screws. The taken apart cover group includes: seal carrier (74/74a), seals (15) and (41a), disc (17/17a), screws and washers (70) and (71).

7.10 Take apart bearing (16) and bearing carrier (14/14a) with a puller.

7.11 Remove the inner impeller (1), together with hub (75), disc (76), screws and washers (72) and (73), and clamping device (77), loosening screws (78).

7.12 Disassemble the outer impeller (2) removing screws (9); the impeller group includes: seal carrier (19), seals (20) and (41), closing plates (40) and (40a), screws and washers (60), (61), (60a) and (61a).

7.13 Take apart snap ring (22) and, only for 46..K.., spacer (83).

7.14 Remove bearing (21), bearing carrier (23) and gasket (6).

7.15 For all fluid couplings, the reassembly must be done following these procedures backwards, replacing the bearings and all of the seals. Apply sealant (type Loctite 518) between disc (17) and impeller (2).

N.B. For locking torques of screws, nuts and plugs refer to Tab. C1, Tab. C3, Tab. E1, Tab. K.

TAB. H

DIM.	GASKET KIT VITON GA2395		FUSIBLE PLUG GUN7018 (°C)				RUBBER BLOCK Item 28			
	K...	CK... CCK...	109	120	140	198	N°	CODE	N°	CODE
7	B	-	-	BA	BB	BC	12	B	-	-
	W*									
8	C									
	X*									
9	D	-	-	BA	BB	BC	12	C	-	-
11	EA							EB		
12KR..	FA							FB		
12KSD	GA							GB		
13	HA	HB	CE	CA	CB	CC	16	C	12	P
15	KA	KB								
17	LA	LB								
19	MA	MB								
21	NA	NB								
24	OA	OB								
27..KR..	PA	PB	DE	DA	DB	DC	16	T	16	T
27..KSD	YA	YB								
29	QA	QB								
34	RA	RB								
46..KR..	ZA	ZB	EE	EA	EB	EC	-	-	40	LU...MMD 4000**

* For versions with taper bushing

** Specify material (SN, SP,)

FIG. 14

FUSIBLE PLUG

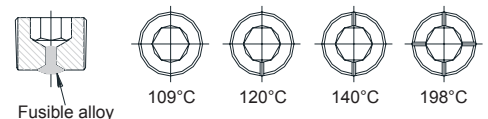
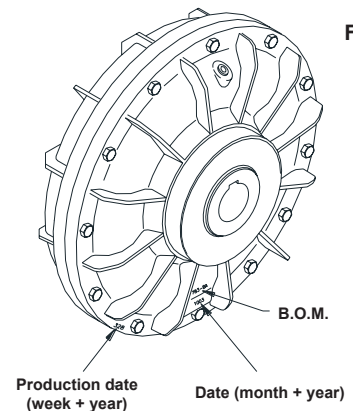
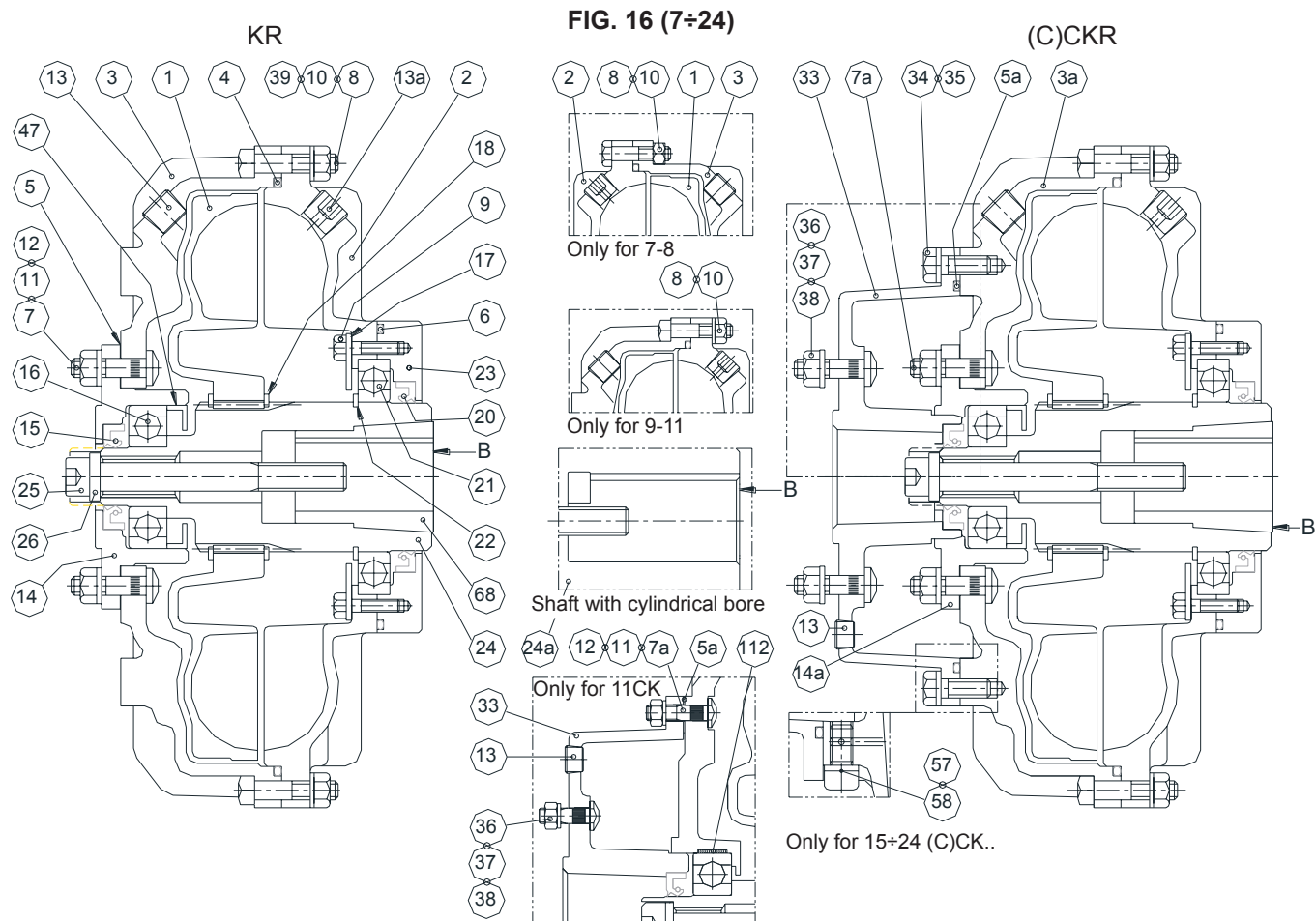


FIG. 15



TAB. K

K... CK.. CCK..	LOCKING TORQUE for pos.																	
	7-7a		9		10		11-37		30		34		60-70-88		72		78	
	screw	Nm	screw	Nm	nut	Nm	screw or nut	Nm	screw	Nm	screw	Nm	screw	Nm	screw	Nm	screw	Nm
7-8	-	-	M6	10	M6	10	M7	13	M6	10	-	-	-	-	-	-	-	-
9-11-12			M8	24	M8	24	M8	24	M8	24	M8	24						
13							M10	50										
15-17-19			M10	50	M10	50	M10	50	M10	50	M10	50						
21			M14	135	M12	85	M14	135	M14	135								
24					M14	115												
27					M16	205	M14	135										
29					M16	205												
34K			M16	205	M20	400	M14	135	-	-	M14	135						
34KRD							M16	205										
34 (C)CK	M16	205																
46	M22	332	M20	400	M20	400	-	-			M18	283			M22	532	M18	410



POS.	NAME	POS.	NAME
1	IMPELLER (INNER)	27	LOCK WASHER
2	IMPELLER (OUTER)	27b	FLANGE
3-3a	COVER	28	RUBBER BLOCK
4	O-RING	29	HALF FEMALE CPLG
5-5a	GASKET OR O-RING	30-30a	BRAKE DRUM-DISC
6	GASKET OR O-RING	31	SHAFT D
7-7a	SCREW	31.1	KEY
8	SCREW	33	D.F. CHAMBER
9	SCREW	34	SCREW
10	NUT	35	LOCK WASHER
11	NUT	36	SCREW
12	LOCK WASHER	37	NUT
13	TAPER PLUG	38	LOCK WASHER
13a	TAPER FUSIBLE PLUG	39	LOCK WASHER
14-14a	BEARING CARRIER	47	SHIELD (only for 13÷24)
15	SEAL	48b	SCREW (see pag.6)
16	BALL BEARING	49b	LOCK WASHER (see pag.6)
17	PLATE	57	VALVE
18	SNAP RING	58	GASKET
20	SEAL	67b	ADAPTER (see pag.6)
21	BALL BEARING	68	TAPER BUSH
22	SNAP RING	91	HUB
23	BEARING CARRIER	92	SCREW
24-24a	SHAFT	93	LOCK WASHER
25	FIXING SCREW	112	RING
26	WASHER	123	SET SCREW (only if expected)

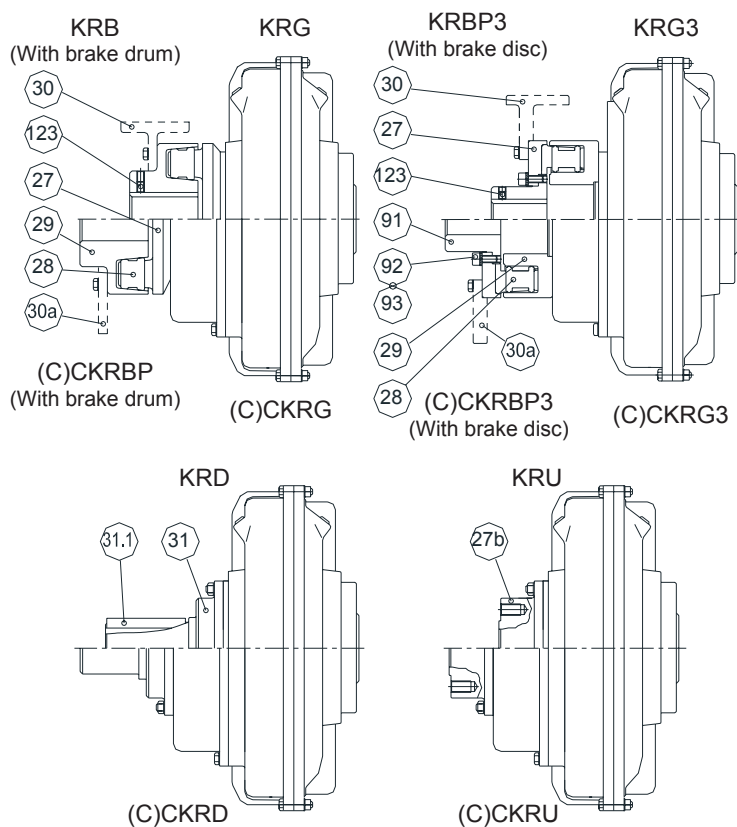


FIG.16a (27-29-34)

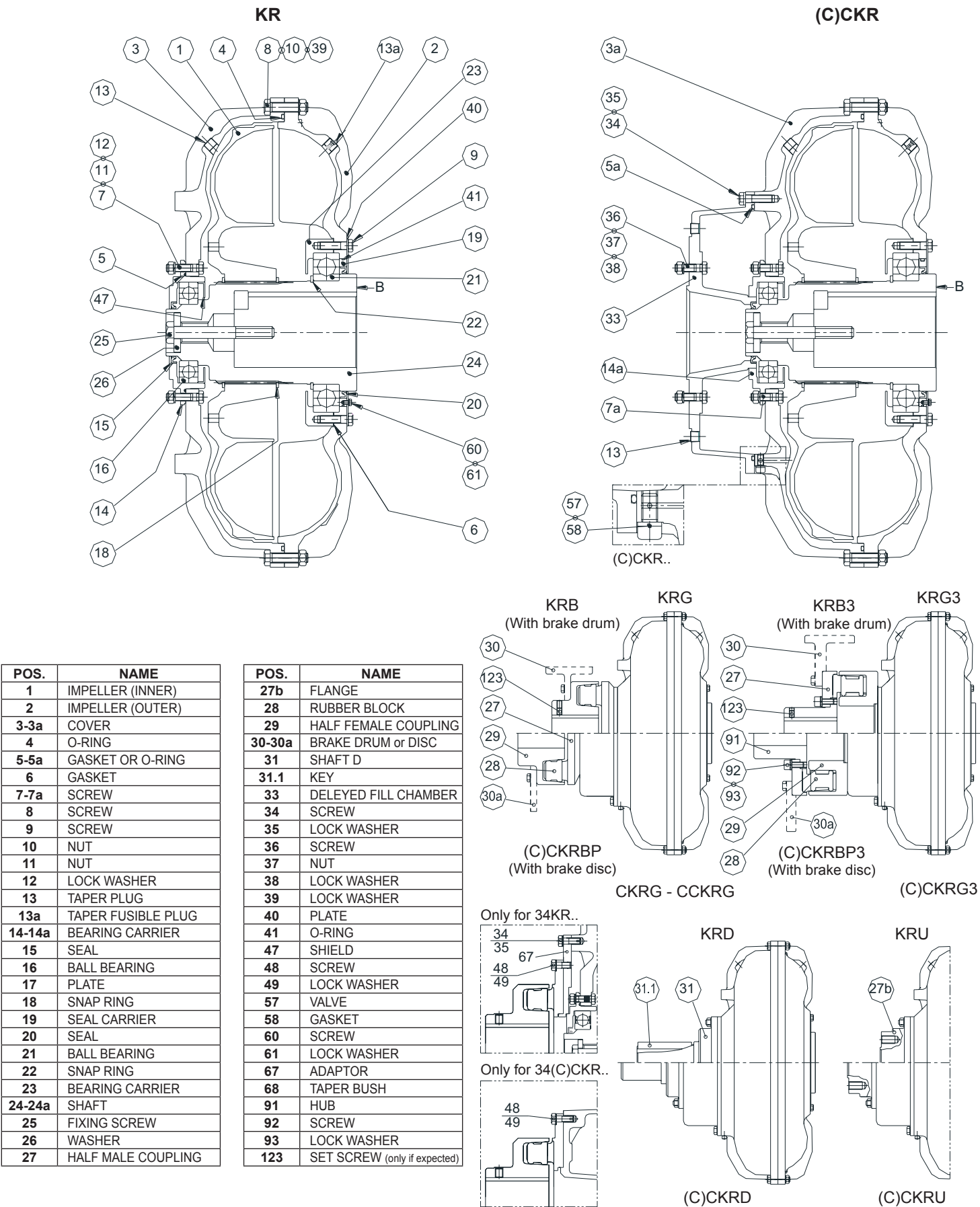
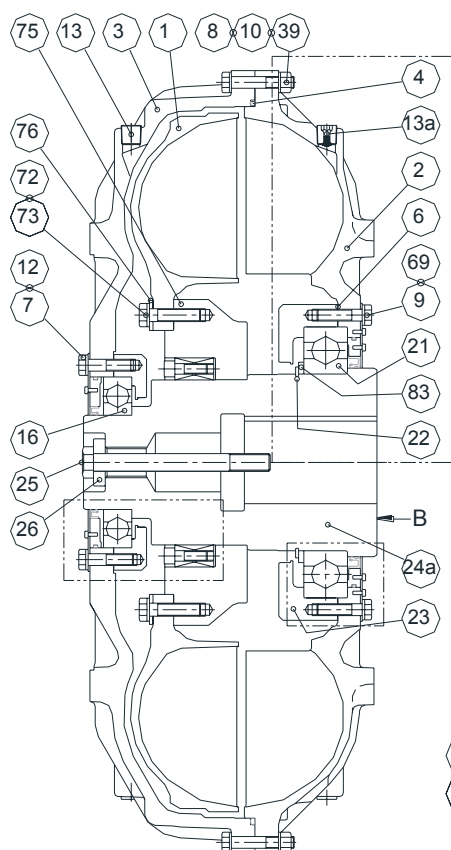
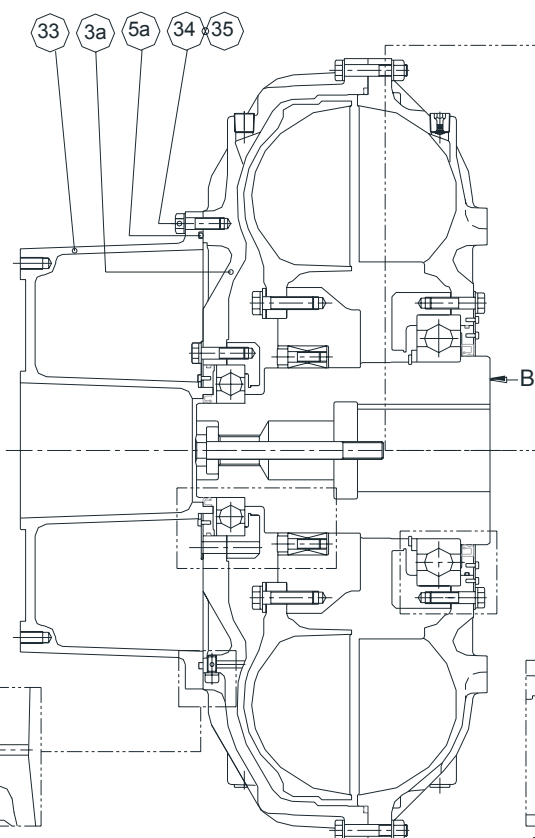


FIG.6b

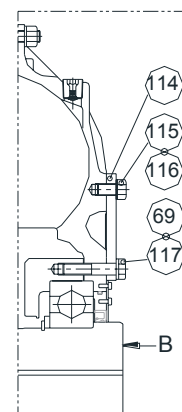
46KR



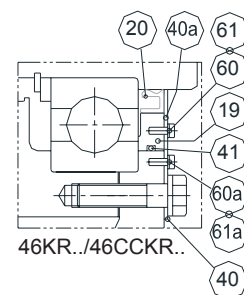
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46(CC)KR..

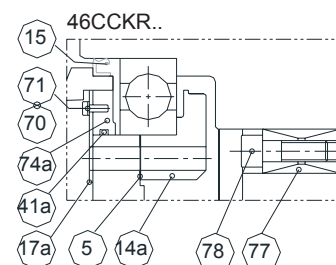
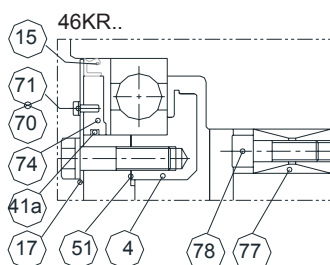


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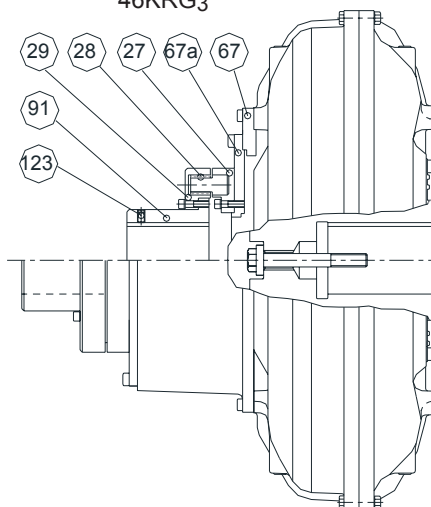


POS.	NAME
1	IMPELLER (INNER)
2	IMPELLER (OUTER)
3-3a	COVER
4	O-RING
5-5a	GASKET OR O-RING
6	GASKET
7	SCREW
8	SCREW
9	SCREW
10	NUT
11	NUT
12	LOCKER WASHER
13	TAPER PLUG
13a	TAPER FUSIBLE PLUG
14-14a	BEARING CARRIER
15	SEAL
16	BALL BEARING
17-17a	PLATE
18	SNAP RING
19	SEALCARRIER
20	SEAL
21	BALL BEARING
22	SNAP RING
23	BEARING CARRIER
24a	SHAFT
25	FIXING
26	WASHER
27	HALF MALE COUPLING
27b	FLANGE
28	RUBBER BLOCK
29	HALF FEMALE COUPLING

POS.	NAME
33	DELAYED FILL CHAMBER
34	SCREW
35	LOCK WASHER
36	SCREW
37	NUT
38	LOCK WASHER
39	LOCK WASHER
40-40a	PLATE
41-41a	O-RING
48-48a	SCREW (see pag.6)
49-49a	LOCK WASHER (see pag.6)
57	VALVE
58	GASKET
60-60a	SCREW
61-61a	LOCK WASHER
67-67a	ADAPTER
69	LOCK WASHER
70	SCREW
71	LOCK WASHER
74-74a	SEAL CARRIER
75	PLATE
76	HB for INNER IMPELLER
77	CLAMPING DEVICE
78	SCREW
91	HUB
92	SCREW
93	LOCK WASHER
114	BACKUP RING
115	SCREW
116	LOCK WASHER
117	SCREW
123	SET SCREW (only if expected)

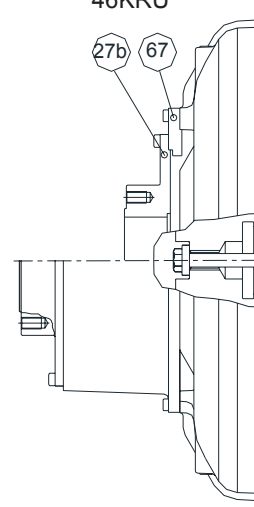


46KRG3



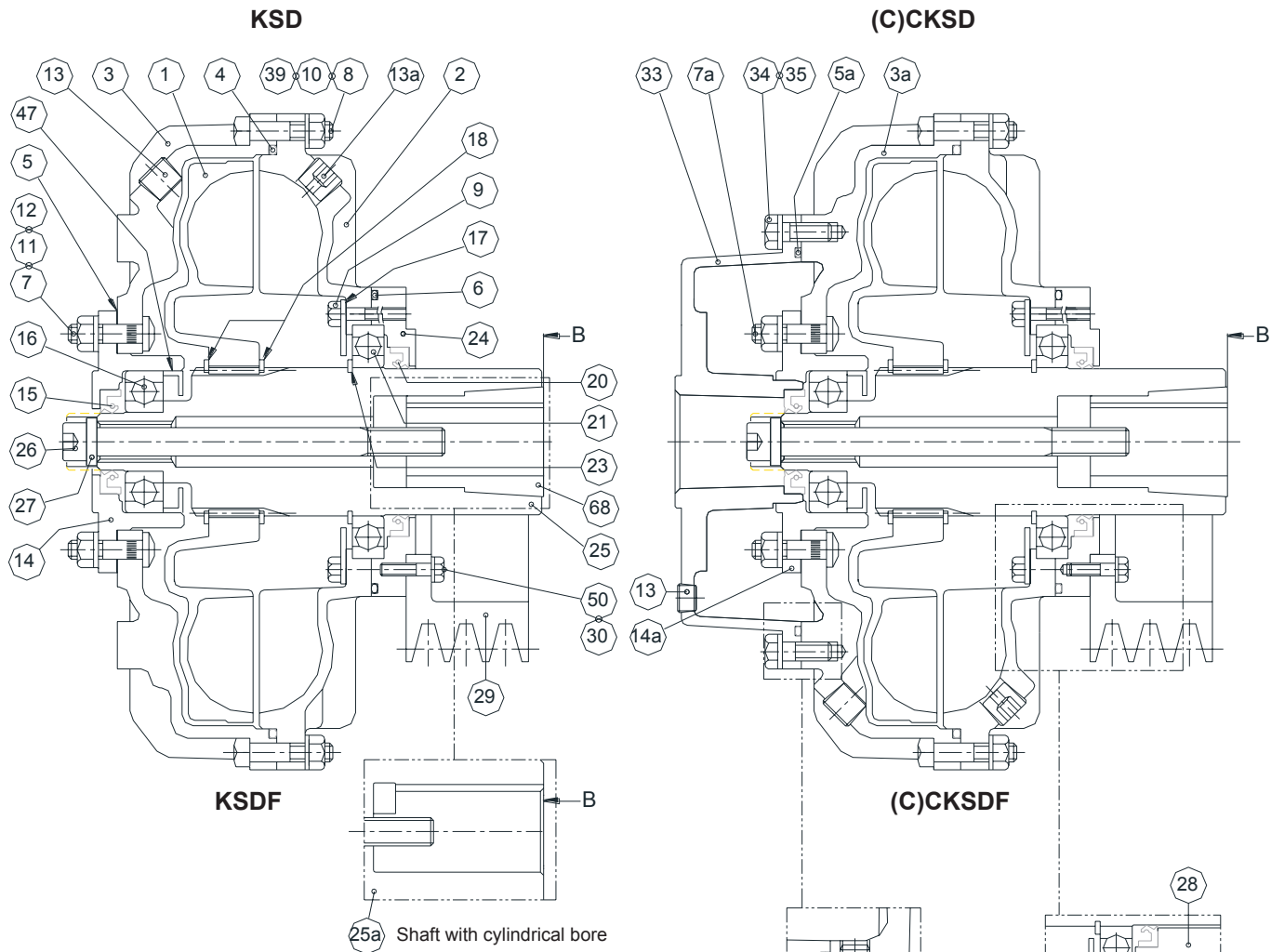
46CCKRG3

46KRU



46CCKRU

FIG. 17 (7÷24)



POS.	NAME
1	IMPELLER (INNER)
2	IMPELLERE (OUTER)
3-3a	COVER
4	O-RING
5-5a	GASKET OR O-RING
6	GASKET OR O-RING
7-7a	SCREW
8	SCREW
9	SCREW
10	NUT
11	NUT
12	LOCKER WASHER
13	TAPER PLUG
13a	FUSIBLE TAPER PLUG
14-14a	BEARING CARRIER
15	SEAL
16	BALL BEARING
17	PLATE
18	SNAP RING
20	SEAL

POS.	NAME
21	BALL BEARING
22	SPACER
23	SNAP RING
24	BEARING CARRIER
25-25a	SHAFT
26	FIXING SCREW
27	WASHER
28	INTEGRAL SHEAVE
29	BOLTED SHEAVE
30	SCREW
33	D.F. CHAMBER
34	SCREW
35	LOCK WASHER
39	LOCK WASHER
47	SHIELD
50	LOCK WASHER
57	VALVE
58	GASKET
68	TAPER BUSH
69	LOCK WASHER

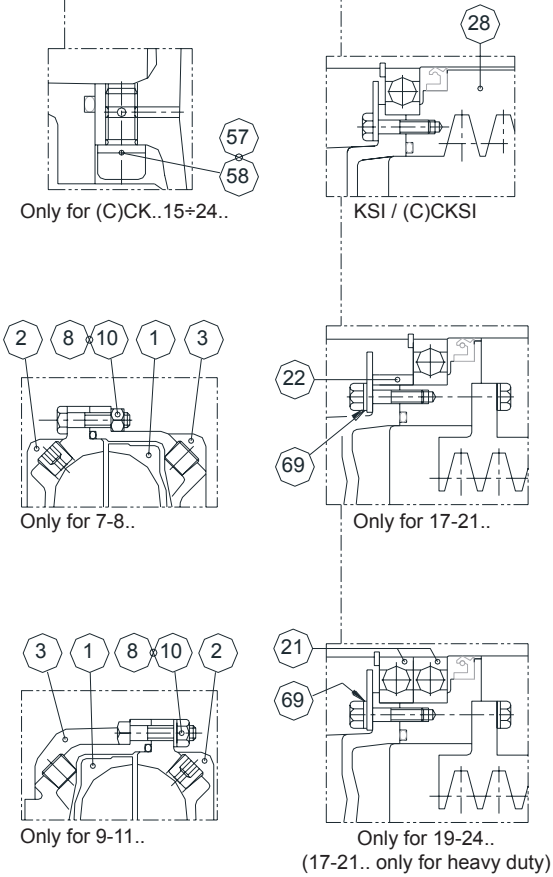
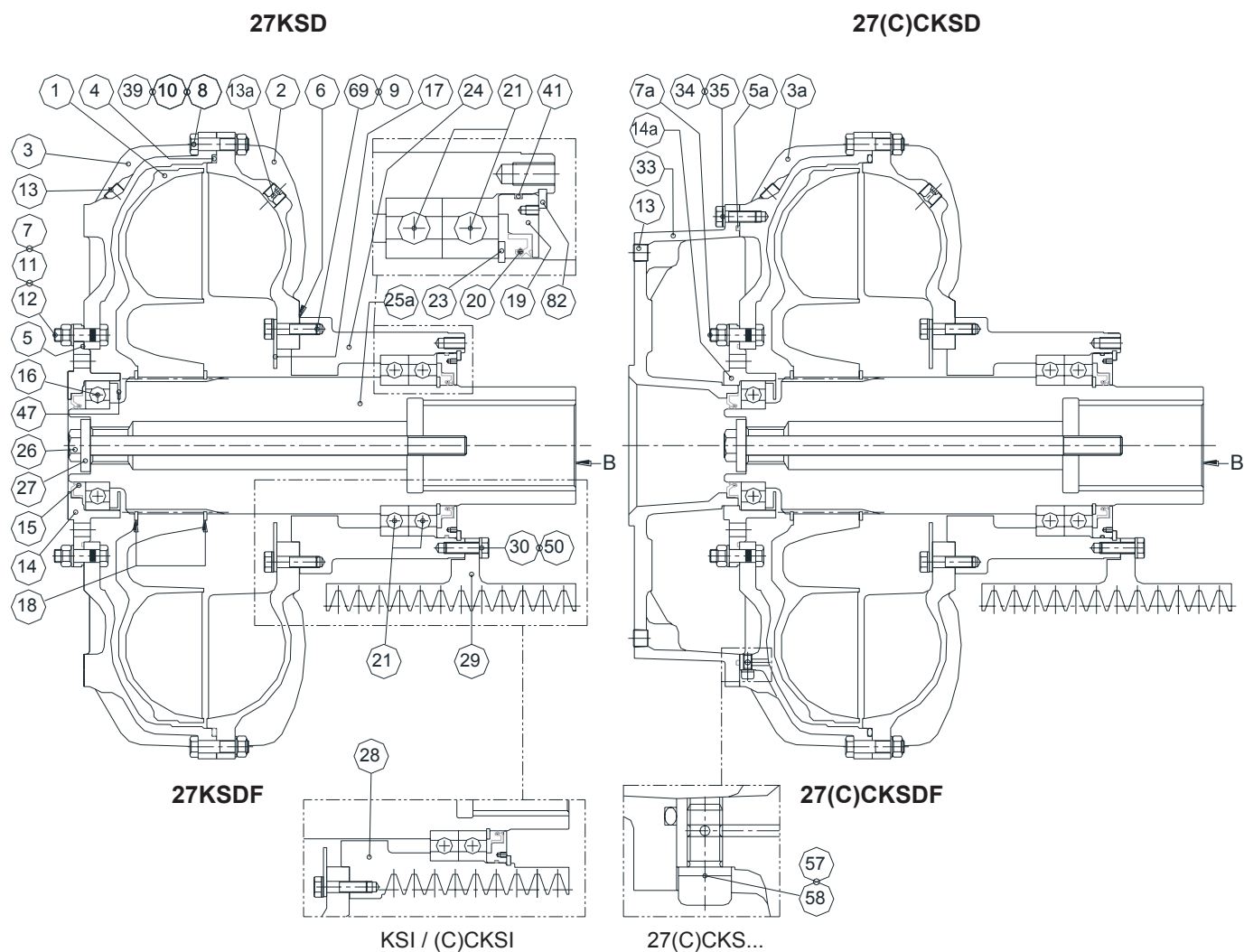


FIG. 17a



POS.	NAME
1	IMPELLER (INNER)
2	IMPELLERE (OUTER)
3-3a	COVER
4	O-RING
5-5a	O-RING
6	GASKET
7-7a	SCREW
8	SCREW
9	SCREW
10	NUT
11	NUT
12	LOCKER WASHER
13	TAPER PLUG
13a	FUSIBLE TAPER PLUG
14-14a	BEARING CARRIER
15	SEAL
16	BALL BEARING
17	PLATE
18	SNAP RING
19	SEAL CARRIER

POS.	NAME
20	SEAL
21	BALL BEARING
23	SNAP RING
24	BEARING CARRIER
25a	SHAFT
26	FIXING SCREW
27	WASHER
28	INTEGRAL SHEAVE
29	BOLTED SHEAVE
30	SCREW
33	D.F. CHAMBER
34	SCREW
35	LOCK WASHER
39	LOCK WASHER
41	O-RING
47	SHIELD
50	LOCK WASHER
57	VALVE
58	GASKET
82	SNAP RING

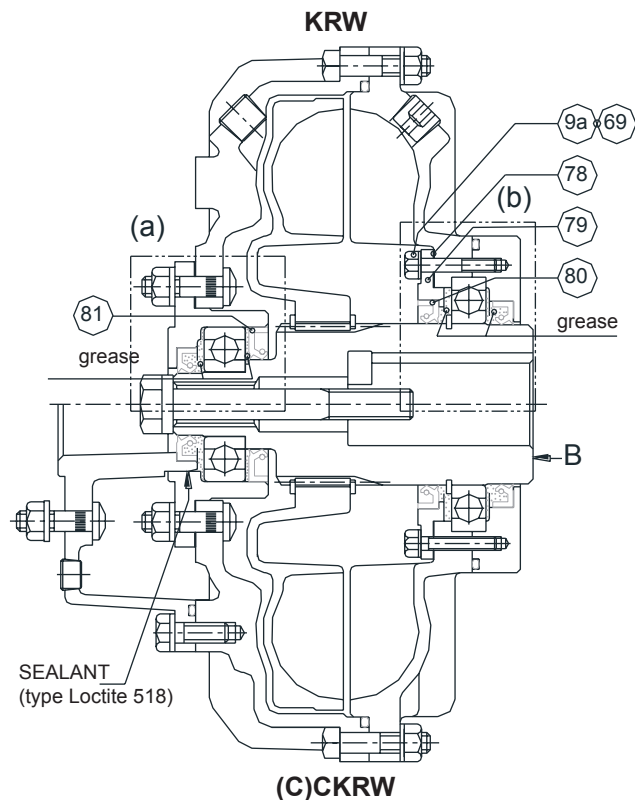
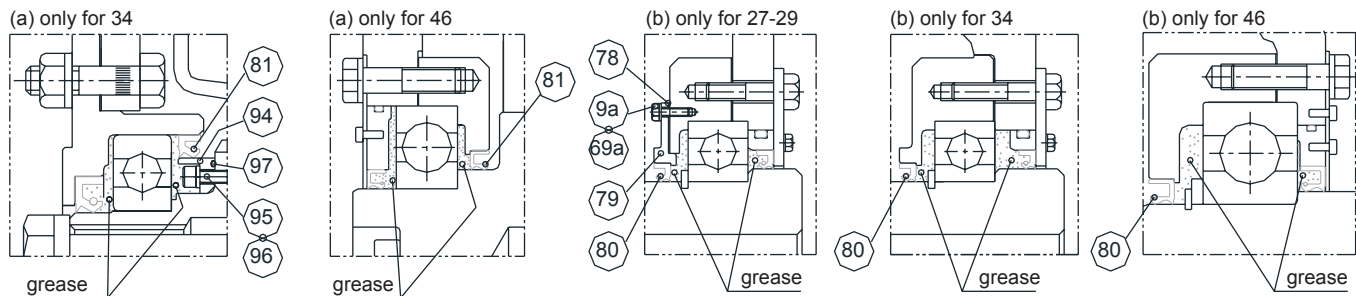
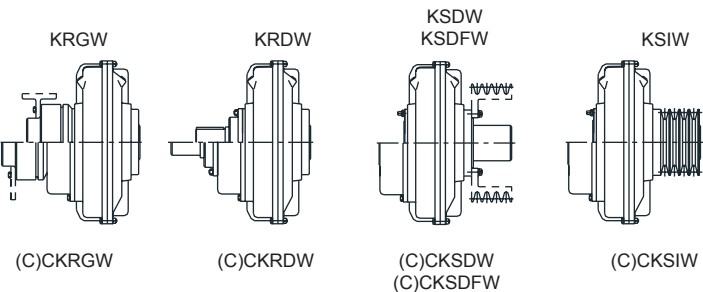


FIG. 18 (13÷46)

EXAMPLE:



8 - COUPLINGS WITH SPECIAL FLUID

The fluid coupling ..KR..W series differ from traditional coupling as they are completely isolated from the fluid and greased using Rocol SAPHIRE AQUA 2 grease or equivalent (OKS 1133 silicon grease must be used for LT couplings).

For the installation and maintenance of the fluid coupling series ..KR..W follow the rules in this instruction manual 150 GB except for Tab. D regarding the working fluid. This fluid is water mixed with special liquid (**AGIP ECOFREEZER or equivalent**) this inhibited polypropylene glycol based liquid is usually used in refrigeration circuits in all types of vehicle with an internal combustion engine presenting the following benefits: **BIODEGRADABLE – ANTIFOAM – NON-FLAMMABLE**. Mixed appropriately (50% water and 50% special liquid) raises the boiling point and lowers the freezing point (see Tab. L).

The hydrodynamic coupling ..KR..W series can also operate, alternatively, with oil for low temperatures.

They are supplied complete with fuse plug calibrated at 109°C.

It is advisable to periodically check the fluid level, and if necessary restore it according to the instructions in paragraph 3.

For the replacement of sealing rings and bearings, follow the instructions in paragraph 7 with the variations of the following paragraphs.

7.5 Remove bearing (16) and sealing ring (81)

7.7 Remove the screws (9a), the sealing ring holder (79), seal and sealing ring (78) and (80)

7.8 To reassemble proceed in reverse order replacing the bearings and all the seals, inserting Rocol SAPHIRE AQUA 2 (or equivalent) **grease between bearings and seals as indicated in Fig. (a) and (b).** (for LT couplings use OKS 1133 silicone grease). See Tab. M and N for the positions and the tightening torques.

Tab. L

Volume %	Boiling point	Freezing point
50	104°C	-33°C
60	106°C	-48°C
80	118°C	-54°C
100	160°C	-60°C

Tab. M

DIM	Locking torque			
	(9a)		(96)	
	Screw	Nm	Screw	Nm
13-15-17-19	M10	50	-	-
21-24	M14	135	-	-
27-29			-	-
34	M16	205	M8	24

Tab. N

POS.	NAME
9a	SCREW
69a	LOCK WASHER
78	GASKET
79	SEAL CARRIER
80	SEAL

POS.	NAME
81	SEAL
94	SEAL CARRIER
95	SCREW
96	LOCK WASHER
97	O-RING

Following prescriptions complete the Product Installation and Maintenance Manual nr. 150

1 - ASSEMBLY

Radial misalignment control (**R**) must be carried out using a dial indicator as shown in Fig. 4, pag.5.

The tolerances indicated in tab. "C" are subject to the following limitations:

radial misalignment (R)	: max 0,2mm
angle misalignment (A1-A2)	: reduce by 50% the indicated values
distance between the half-couplings (k)	: the tolerance is +/- 0,5 mm

All holes must be made exclusively by TRANSFLUID.

2 - FILLING / WORKING FLUID

For areas responding to the ATEX – CAT 2 standard, use fire resistant oil (see Tab. TF6115A).

For areas responding to the ATEX – CAT 3 standard, use standard oil as referred to at par. 2.

3 - EXERCISE

- After the first start check that all the bolts of both the driving and the driven machine are tight, a regular check is recommended.
- Check the alignment again as indicated at point 1.8 of manual no. 150.

It is recommended:

- A robust cover made of non-sparking material with appropriate openings for ventilation, must be used for the fluid coupling. The openings must be smaller in dimension than the bolts used on the coupling (the dimensions of the bolts depend on the size of the coupling), to avoid the escape of metal parts, due to the centrifugal effect of the revolving machine, that could cause sparks.
- All surfaces of the coupling must be thoroughly cleaned each time the machine is put into operation, since all possible deposits of dust and general dirt must be avoided.
- Use of transmission belts for the pulley (if present) suitable for use in potentially explosive atmospheres.
- Periodical control of wear and possible replacement of the rubber blocks of the TRANSFLUID alignment coupling BT / B3T if mounted
- Provision, by means of special devices, for continuous monitoring of the temperature of the alignment coupling surfaces, which must not exceed 90 ° C.
- If brake disc or brake drum configurations are provided, ensure that these devices are used in conjunction with braking systems conforming to the ATEX standards.
- Periodic checks and possible replacement of the complete lamellar pack of alignment coupling (if fitted) if fatigue cracks, deformation, vibration or abnormal noise are detected.

Check every six months:

- The state of wear of seals and VITON seals.
- The state of wear of the rubber elements (if fitted) so that the tensional tolerance is always less than 2 ° (as described in par.3.3).
- No fluid leakage, otherwise immediately arrange for an overhaul of the hydrodynamic coupling.

4 - ELECTRICAL DEVICE

Check the correct functioning of the electrical device every 6 months (if present).

5 - MAINTENANCE

Any repair and/or overhaul to the coupling must be carried out at an authorised TRANSFLUID service centre where official documentation will be issued of the work carried out.

TRANSFLUID SpA declines any responsibility if the user does not observe and does not apply these instructions with scrupulous care.

TF6401 - Rev. 3

1) Preamble

TRANSFLUID guarantees that at the time of shipment, its products comply with the specifications published in its catalogues or technical documents, which were valid at the time of shipment, and that the products are free from defects in material and workmanship. These terms of warranty supersede all other war the course of the services, negotiations or commercial use). Except in the event of serious negligence and fraud, under no circumstances will TRANSFLUID be held liable for direct, indirect, consequential, fortuitous or extra contractual damage based upon claims for compensation by the Buyer for violation of the warranty, contract or objective responsibility.

Under no circumstances can the compensation by TRANSFLUID exceed the amount paid by the Buyer for the product supplied by TRANSFLUID.

2) Duration and limits of the guarantee

- a) The duration of the warranty is equal to eighteen (18) months from the time the product supplied by TRANSFLUID is commissioned, and nonetheless, no more than twenty-four (24) months from the date of shipment of the original product from TRANSFLUID's plant.
- b) Product that are not used and stored for a long period must be kept and handled in keeping with the guidelines, which are available upon request, drawn up by TRANSFLUID according to product type.
- c) The wear or tear of parts, which is particularly due to conditions of use (tension of the belts, environmental conditions, unforeseen knocks and overloading), or to the sensitivity of the operator (use within the approved limits) or to external circumstances (jamming of the machine), is not covered by the warranty if these parts have been used (are not new), unless the Buyer can clearly prove the manufacturing defect, which is ascribable to TRANSFLUID.

Typical parts subject to wear or tear include:

- Filters, seals and gaskets
 - Springs, screws, plugs
 - Switches and fuses
 - Material and friction surfaces
 - Belts and chains
 - Lubricants in general
 - Electric components (motors, instruments, accessoires, sensors,...)
- d) Installation and maintenance of TRANSFLUID products must be carried out following the installation, use and maintenance manual, which is always supplied with each product and using original spare parts.
 - e) With regard to the supply of loose/disassembled parts, the warranty solely and exclusively covers faults of the components themselves, related to the material or mechanical workmanship carried out by TRANSFLUID.
 - f) The warranty is no longer valid when:
 - the product is used exceeding the limits stated in the catalogues or installation manuals, or in applications that are not approved by TRANSFLUID;
 - breakage results from abuse, negligence, omission or inadequate maintenance, failed connection or control of the protection devices or as a result of accidents;
 - the product is modified or disassembled without TRANSFLUID'S written approval.
 - the product is repaired or maintained without using original spare parts.

3) Services included/excluded in the guarantee

- a) In TRANSFLUID'S final decision, products or components, whose faults are covered by the warranty, will be repaired or replaced at no extra cost, with the exception of the subsequent points.

The replaced parts will be covered from the remaining period of the original warranty, which stays in force for the product initially supplied (a new warranty period will therefore not come into effect).

- b) Excluded from the warranty and remaining at the Buyer's expense are the costs resulting from:

- Removal of the TRANSFLUID product from the machinery onto which it is fitted, and recommissioning;
- Suitable packing and charges resulting from the return transport of the material;
- Restoration of lubricants in general, piping, sound proof canopies, guards, etc.
- All other costs not expressly approved in writing by TRANSFLUID.

- c) The Buyer can request the support of a specialised technician to disassemble/re-install/recommission the product by sending a standard purchase order. TRANSFLUID will invoice the work, applying the current ASSIOT rates (Italian Association of Gears and Transmission Elements Manufacturers, a member of EUROTRANS).

- d) TRANSFLUID cannot be held liable for lost or reduced profit, costs for replaced machinery, still machinery, damage to equipment or property caused by failure of its products.

4) Conditions for requesting services under warranty

- a) If the Buyer intends to take advantage of the guarantee, he must inform TRANSFLUID in writing within 7 (seven) days of discovering a fault, stating:

- Product description;
 - Serial number (where foreseen), specification number or article code;
 - Reference to the date and document of purchase or delivery;
 - Reasonable proof that the fault falls within the conditions of warranty, together with a detailed description of the irregularity or failure and where possible, supported by photographs.
- In the event of failure after commissioning the product, the following must also be communicated:
- Type of application;
 - Power and engine rpm (stating also the make and model for endothermic engines);
 - Diameter, type, number of races and position of pulley (if foreseen by the application);
 - Hours of operation.

- b) TRANSFLUID will indicate whether the product must be delivered or sent free port to an authorised centre or directly to its own plant depending on the product concerned, the failure indicated and the urgency of the intervention.

- c) On receiving the product, TRANSFLUID or the authorised distributor will carry out a thorough analysis; if the product is deemed to be covered by the warranty:

- TRANSFLUID will repair or replace the parts needed to restore full and safe working at no cost;

If the product is NOT deemed to be covered by the warranty, TRANSFLUID:

- will send a technical report explaining its decision;
- will draw up an estimate for the repair;
- will carry out the repair upon receipt of the order from the Buyer.

- d) The repaired products will be returned to the Buyer freight collect, by the same means of transport that was used for the arrival (unless stated otherwise).

- e) Should the Buyer decide not to accept the estimate for the repair, he must communicate his decision in writing, explicitly asking for the parts to be scrapped or returned; the parts will be sent in their current state.