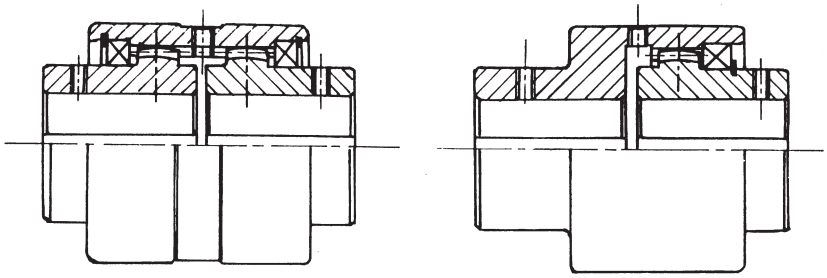
"GIFLEX®" GFA-GFAS COUPLINGS with STEEL SLEEVE

DUAL CURVATURE, FLEXIBLE TOOTHED COUPLINGS



GFA GFAS

PRESENTATION

The "GIFLEX" GFA - GFAS range of flexible couplings represent couplings designed with a compact structure for industrial applications, torsionally rigid and capable of compensating angular, parallel and combined misalignments.

The special configuration with the single-piece sleeve and the seals at the two ends renders the couplings suitable for use in aggressive environments and in particularly demanding operating conditions. The performance complies with the characteristics of a dual articulation, constant-velocity coupling intended to be used both for general and specific applications and with the possibility of also being mounted on shafts with a large free gap.

The operating limits defined by the maximum torque, by the rotating speed and the permitted angular misalignment are the result of a design based on a targeted choice of materials, the heat treatment and the toothing geometry.

The reliability of the stated operating limits has been confirmed by testing the fatigue limits both at the surface pressure (Hertzian pressure) and at bending and to destructive wear in accordance with calculation schemes based on the most authoritative international standards.

The CHIARAVALLI Trasmissioni Technical Department is available however, to examine problems that relate to the choice, application and maintenance of couplings in collaboration with users.

On specific request, special couplings by

their shape, execution and performance can be offered and produced, as an alternative to the normal execution couplings. For example:

- **Couplings designed for high angular and parallel misalignments.**
- **Couplings manufactured using high resistance steel and with surface hardening heat treatment.**
- **Couplings with case hardened and hardened hubs and toothing finished by machine tools after heat treatment (skiving using a hard metal tool).**
- **Special couplings manufactured to a drawing.**

STRUCTURAL CHARACTERISTICS

The **GFA** range of compact couplings, comprise two toothed hubs and an external connecting single-piece sleeve.

The lubricant seal inside the coupling is ensured by two ring gaskets, arranged at the two ends of the sleeve and held in position by spring washers (Seeger washers).

Two threaded dowels arranged radially on the sleeve in a counter-position allow a solid lubricant to be adopted.

The toothing adopted for the two hubs is profile corrected and has a progressive dual curvature achieved by machine the toothing on a fully Numerically Controlled gear cutting machine.

The sleeve's profile corrected toothing, which has a parallel generatrix, is obtained using a shaping tool.

The toothing is produced to category 7 precision, in compliance with DIN 3972 and has a degree of finish with a surface roughness of not more than Ra = 1.4 micrometres, thanks to the machining technology adopted.

Both the hubs and the sleeve are manufactured using hardened and tempered carbon steel with a tensile stress resistance of 800 N/mm. The couplings are subjected to a surface hardening thermo-chemical treatment at the end of the machining stage, which ensures a high resistance to wear and seizure and also confers a high resistance to corrosion caused by atmospheric agents.

The perfect seal achieved by the gaskets ensures the required lubricant containment and prevents penetration of contaminating elements from outside, thereby contributing to increase the average useful working life of the coupling, even if operating in an aggressive environment.

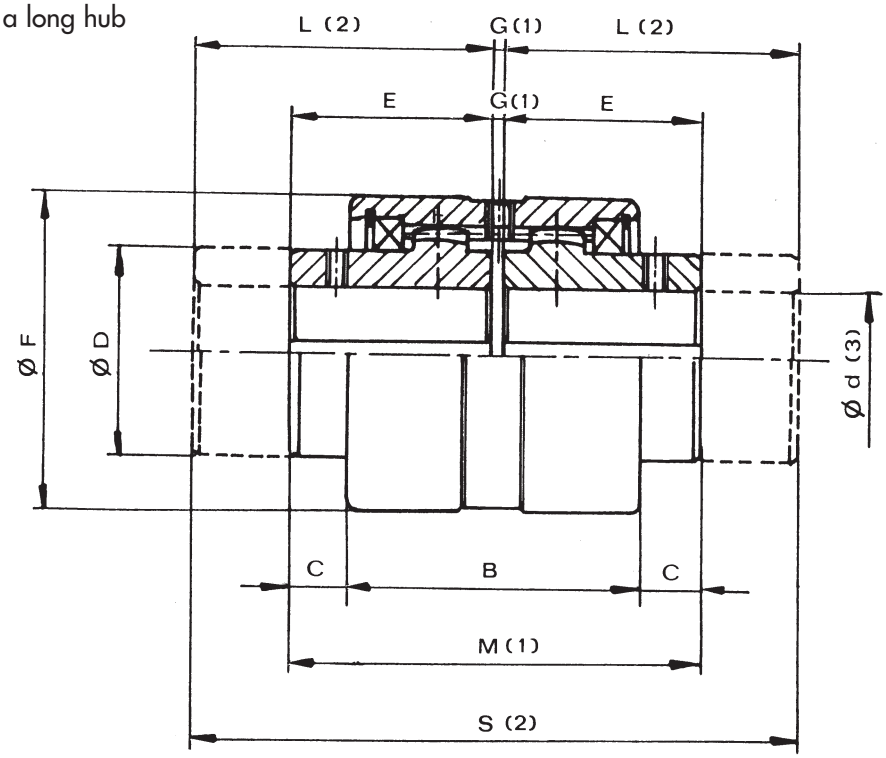
The two toothed hub bands are positioned at the maximum distance permitted by the sleeve length. This arrangement ensures a minimum angular misalignment for a given parallel misalignment and enhances the coupling's constant-velocity features.

Code interpretation

Example:

GFA - 25-NN = with 2 normal hubs
GFA - 25-NL = with one normal hub and a long hub
GFA - 25-LL = with 2 long hubs

DIMENSIONS



The coupling's characteristic size is defined by the maximum bore diameter.

MISURE - PESO

COUPLING TYPE	BORE	Finished bore d (3)		Measurements in mm.									Mass Kg		
				Normal range							Long Range				
		nom.	max.	B	C	ØD	E	ØF	G (1)	M (1)	L (2)	S (2)	Sleeve	Normal Hub	Long Hub
GFA-25	-	25	28	61	12	42	41	68	3	85	60	123	0.72	0.48	0.69
GFA-32	-	32	38	73	13.5	55	48.5	85	3	100	80	163	1.14	0.99	1.58
GFA-40	-	40	48	82	16.5	64	56	95	3	115	80	163	1.68	1.49	2.10
GFA-56	-	56	60	97	21.5	80	68	120	4	140	100	204	2.86	2.96	4.22
GFA-63	-	63	70	108	22.5	100	74.5	140	4	153	119.5	243	3.75	4.90	7.67
GFA-80	-	80	90	125	22.5	125	82.5	175	5	170	140	285	5.58	8.72	14.26
GFA-100	-	100	110	148	34	150	105	198	6	216	174.5	355	6.63	15.76	25.40
(4) GFA-125	40	125	140	214	39	190	140	245	8	288	207.5	423	17.70	32.60	49.50
(4) GFA-155	40	155	175	240	64	240	180	300	10	370	245	498	28.30	65.50	91.40

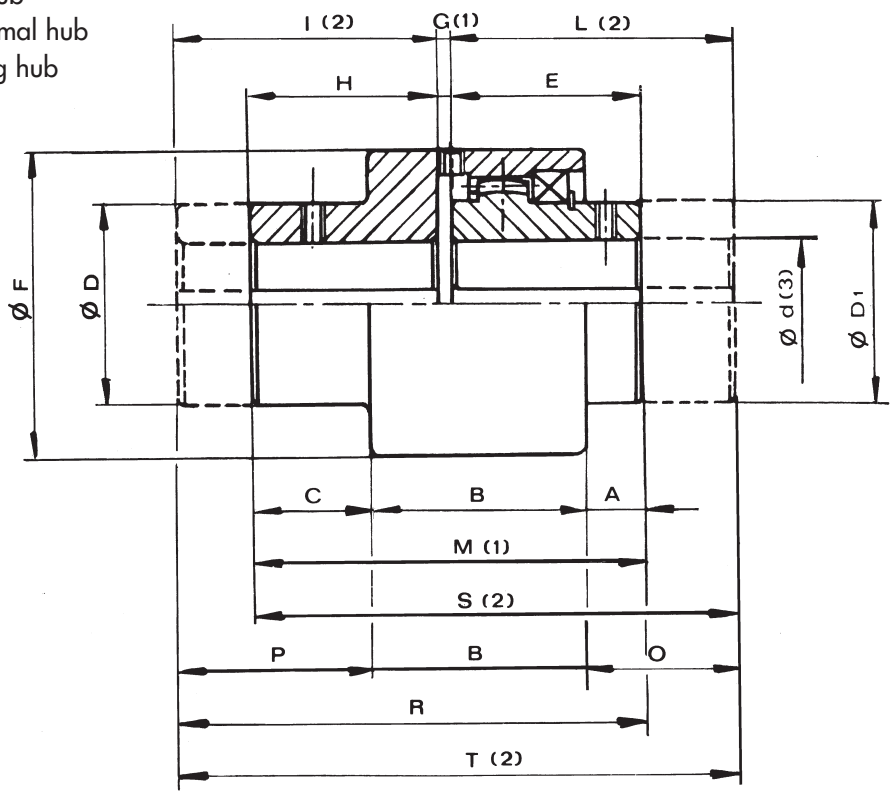
(1) Assembly distances.
(2) Couplings with hub lengths to fully cover normal shafts for the UNEL-MEC range of motors.
(3) **On request:** finished bore in compliance with ISO standards, H7 tolerance, keyway DIN 6885, sheet 1, JS9 tolerance. Dowel bore.
(4) Construction material: hardened and tempered 39NiCrMo3.

Code interpretation

Example:

GFAS - 25-NN = with cone and a normal hub
GFAS - 25-NL = with cone and a long hub
GFAS - 25-LN = with long cone and normal hub
GFAS - 25-LL = with long cone and long hub

DIMENSIONS



The coupling's characteristic size is defined by the maximum bore diameter.

MEASUREMENTS - WEIGHTS

COUPLING TYPE	WITHOUT BORE	Finished bore d (3)		Measurements in mm.																	Mass Kg.			
				Normal range										Long Range (2)										
		nom.	max.	A	B	C	ØD	ØD1	E	ØF	G(1)	H	M(1)	I(2)	L(2)	O	P	R	S(2)	T(2)	Normal cone	Normal Hub	Long Cone	Long Hub
GFAS-25	-	25	28	13	43	29	42	40	41	70	3	41	85	60	60	32	48	104	104	123	1.03	0.48	1.30	0.69
GFAS-32	-	32	38	16	49	35	55	55	48.5	85	3	48.5	100	80	80	47.5	66.5	131.5	131.5	163	1.75	0.99	2.50	1.58
GFAS-40	-	40	48	18.5	54.5	42	64	64	56	95	3	56	115	80	80	42.5	66	139	139	163	2.71	1.49	3.40	2.10
GFAS-56	-	56	60	27	60	45	80	80	68	120	4	60	132	100	100	59	85	172	164	204	4.43	2.96	6.10	4.22
GFAS-63	-	63	75	31	63	46	100	100	74.5	140	4	61.5	140	119.5	119.5	76	104	198	185	243	6.62	4.90	10.20	7.67
GFAS-80	-	80	90	26	76	51	125	125	82.5	175	5	65.5	153	138	140	83.5	123.5	225.5	210.5	283	10.50	8.68	17.90	14.22
GFAS-100	-	100	110	38	92	71	150	150	105	198	6	90	201	162	174.5	107.5	143	273	270.5	342.5	28.20	15.70	38.10	25.30

(1) Assembly distances.
(2) Couplings with hub lengths to fully cover normal shafts for the UNEL-MEC range of motors.
(3) **On request:** finished bore in compliance with ISO standards, H7 tolerance, keyway DIN 6885, sheet 1, JS9 tolerance. Dowel bore.

COUPLING SELECTION AND SIZING CRITERIA

The satisfactory operation and the useful working life of flexible toothed couplings depends on the correct selection of the couplings, as well as on the compatibility of the operating conditions with the performance provided by the coupling.
It is essential therefore, to highlight the limiting performance of the couplings and to clarify the actions of the external loads that are exerted on the corresponding couplings.
The basic design ensures that all the couplings are capable of compensating a static angular or assembly misalignment equal to 1 degree and this is ensured by the minimum construction tolerance between the teeth.
The dynamic angular or operating misalignment must never be greater than 0.5 degrees, even if the recommended values should not be greater than 0.25 degrees.
The declared nominal torque values and the maximum rotating speeds indicated refer to an angular or composite misalignment that does not exceed 1/12 of a degree (5 prime divisions).
The 'exceptional' torque values that can be supported as a transient and during the acceleration phases must not be exerted for more than 10-15 seconds and must not occur for more than 5 events/hour.
Fatigue durations are calculated for a conventional limit of 50 million cycles, considering two load cycles for each revolution of the coupling.
Misalignments exceeding 1/8 degrees (7.5 prime divisions) penalise by decreasing the nominal torque and the maximum rotating speed declared for the individual couplings.
The performance of the coupling in terms of torque, limiting speed and useful working life will decrease or increase compared with the declared values in the case of operating conditions that differ from the conditions specified above or for "fixed-term" durations.
The design data has been tested for the purpose of ensuring a reasonable safety margin. The declared performance therefore, is to be understood as valid for a Service Factor equal to 1.
Use of the prescribed lubricants and compliance with the recommended restore time intervals represent the preconditions to achieve the performance as described in the catalogue.
The CHIARAVALLI Trasmissioni Technical Department is available to advise users in selecting the type of coupling most appropriate for the actual operating conditions and to make recommendations in relation to special operating conditions.

TECHNICAL DATA

COUPLING TYPE	POWER FACTOR KW r.p.m.		TORQUE Nm		POWER TRANSMITTED IN KW AT R.P.M.				Max. R.P.M.	R.P.M. Recommended limit	Max. radial misalignment mm.	Mass Kg.	J Kg cm²
	norm.	except.	norm.	except.	**750** norm.	1000 norm.	1500 norm.	3000 norm.					
GFA-25	0.061	0.157	600	1524	45	61	91	183	6000	5000	0.20	1.36	8.68
GFAS-25											-	1.35	7.31
GFA-32	0.103	0.259	1000	2520	77	103	154	309	5000	4000	0.26	2.51	25.10
GFAS-32											-	2.43	19.15
GFA-40	0.128	0.322	1250	3125	96	128	192	384	4200	3000	0.32	3.55	44.82
GFAS-40											-	3.64	34.13
GFA-56	0.257	0.639	2500	6200	192	257	385		3500	2200	0.37	6.15	132.60
GFAS-56											-	6.07	96.56
GFA-63	0.412	0.985	4000	9260	309	412	618		3000	1600	0.40	9.91	278.20
GFAS-63											-	10.00	207.32
GFA-80	0.773	1.855	7500	18000	579	773			2600	1200	0.48	16.20	558.6
GFAS-80											-	19.18	492.6
GFA-100	1.236	2.937	12000	28500	927				1400	700	0.65	23.00	1044.50
GFAS-100											-	28.00	1064.00
GFA-125	2.431	5.795	23600	56250	1823				950	460	0.70	49.15	3650
GFA-155	4.121	9.273	40000	90000	3090				700	350	0.80	91.30	9982

(1) Referred to the normal coupling complete with maximum bore without keyway.

N.B. Class G 2.5 dynamic balancing in compliance with ISO 1940 is recommended for actual operating speeds that exceed 3,600 r.p.m.
Couplings can operate with a parallel misalignment value that is double the suggested value and assembly with a misalignment value that is four times greater than the suggested value in exceptional cases.

COUPLING SIZE SELECTION INSTRUCTIONS

The torque, speed and useful working life data declared for the couplings are to be understood as valid referred to a Service Factor SF = 1.
The service factor must be determined therefore, based on the type of load, the load intensity and the range factor that characterises the type of load exerted on the coupling.
The values shown in the following table can be considered as a precautionary measure in the absence of reliable service factor design data.
It is appropriate to multiply the service factor taken from the table by an increasing factor equal to 1.4 in the case of continuously reversible operations under load.

SERVICE FACTORS

LOAD CONDITION	OPERATING CONDITIONS	TYPE OF DRIVE	
		Electric motor	Diesel engine
UNIFORM	Regular operation without impacts or overloads	1.25	1.5
LIGHT	Regular operation with minor and infrequent impacts and overloads	1.50	2.0
MEDIUM	Irregular operation with medium overloads for a short duration and frequent but moderate impacts	2.0	2.5
HEAVY	Markedly irregular operation with very frequent impacts and overloads and of major intensity.	2.5	3.0

TEST BASED ON THE POWER TO BE TRANSMITTED

Use the following formula to calculate the value of the operating torque (Me) expressed in Nm, considering the drive motor power output (P) in kW and the operating speed (n) in r.p.m.

$$Me = \frac{9549 \times P}{n}$$

Establish the nominal torque to be transmitted (Mn) based on the service factor taken from the table.

Mn = Me x Sf

Select the coupling with a nominal torque which is GREATER than the value calculated.

WARNING

The declared nominal torques must be progressively decreased for angular misalignments that exceed 0.125 degrees.

TEST BASED ON THE SHAFT DIAMETER

Check that the largest of the shafts to be connected has a diameter equal to or less than the nominal bore declared for the coupling.

Adopting the maximum permitted diameter for the selected coupling should be limited to UNIFORM or LIGHT load conditions.

TEST BASED ON THE ROTATING SPEED

The maximum rotating speed indicated for each coupling represents an operating limit calculated for an angular misalignment that does not exceed 1/12 of a degree. Both the nominal torque and the permitted rotating speed are reduced for greater angular misalignments. Adopt a coefficient equal to 1.12 to increase the service factor and select the coupling as described previously when both the misalignment and the operating speed are less than the suggested reference values, but are close to these values. Contact our Technical Services for operating conditions with misalignments and operating speeds that exceed the suggested reference values.

TEST BASED ON THE REQUIRED USEFUL WORKING LIFE

Couplings are calculated for a standard operating lifespan under nominal operating conditions (torque, misalignment and rotating speed). Operating lifespans that exceed the standard duration cause the nominal torque to decrease.
The service factor must be multiplied by a lifespan coefficient defined as follows if a given operating lifespan, which exceeds the standard working lifespan, is required.

OPERATING LIFESPAN IN HOURS	3.800	4.000	6.000	8.000	12.000	20.000
LIFESPAN COEFFICIENT	1	1.06	1.17	1.26	1.39	1.58

The nominal torque verified for the lifespan must be further decreased in the fairly improbable circumstance in which the actual operating speed is greater than the maximum permitted operating speed for the misalignment conditions of the coupling when in operation.

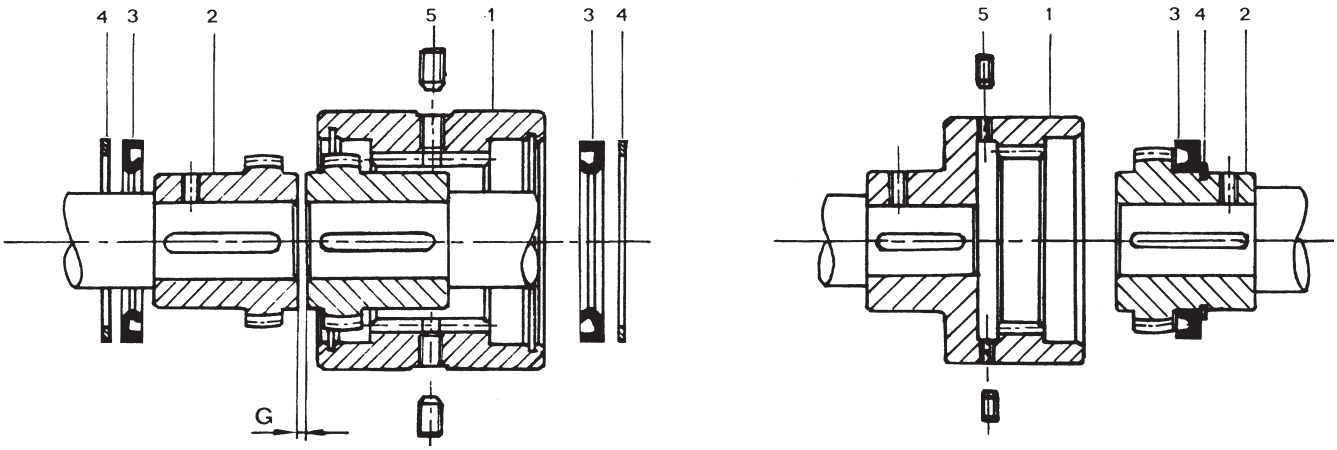
COMPONENT PARTS OF THE "GIFLEX®" GFA COUPLING

COUPLING TYPE	POS. 1		POS. 2		POS. 3		POS. 4		POS. 5			
	Description	No. of pieces	Description	No. of pieces	Seal ring Corteco NBR DIN 3760 A	No. of pieces	Flexible ring for bores DIN 472	No. of pieces	Flat dowel UNI 5923	No. of pieces	Allen wrench	No. of pieces
GFA-25	Sleeve	1	Hub	2	BA 42x56x7	2	56 I	2	M6x8	2	D.3	1
GFA-32	Sleeve	1	Hub	2	BA 55x72x8	2	72 I	2	M6x8	2	D.3	1
GFA-40	Sleeve	1	Hub	2	BA 64x80x8	2	80 I	2	M6x8	2	D.3	1
GFA-56	Sleeve	1	Hub	2	BA 80X100X10	2	100 I	2	M6x8	2	D.3	1
GFA-63	Sleeve	1	Hub	2	BA 100x125x12	2	125 I	2	M6x8	2	D.3	1
GFA-80	Sleeve	1	Hub	2	BA 125x160x12	2	160 I	2	M6x8	2	D.3	1
GFA-100	Sleeve	1	Hub	2	SMIM 150x180x12	2	180 I	2	M6x8	2	D.3	1
GFA-125	Sleeve	1	Hub	2	SM 190x220x15	2	220 I	2	M6x8	2	D.3	1
GFA-155	Sleeve	1	Hub	2	SMIM 240X280X15	2	280 I	2	M6x8	2	D.3	1

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COUPLING TYPE	POS. 1		POS. 2		POS. 3		POS. 4		POS. 5			
	Description	No. of pieces	Description	No. of pieces	Seal ring Corteco NBR	No. of pieces	Flexible ring for bores DIN 471	No. of pieces	Flat dowel UNI 5923	No. of pieces	Allen wrench	No. of pieces
GFAS-25	Sleeve	1	Hub	1	UM 60X40X10	1	40 E	1	M6x8	2	D.3	1
GFAS-32	Sleeve	1	Hub	1	UM 75x55x10	1	55 E	1	M6x8	2	D.3	1
GFAS-40	Sleeve	1	Hub	1	UM 85x65x10	1	65 E	1	M6x8	2	D.3	1
GFAS-56	Sleeve	1	Hub	1	UM 100x80x10	1	80 E	1	M6x8	2	D.3	1
GFAS-63	Sleeve	1	Hub	1	UM 120x100x10	1	100 E	1	M6x8	2	D.3	1
GFAS-80	Sleeve	1	Hub	1	UM 155x125x15	1	125 E	1	M6x8	2	D.3	1
GFAS-100	Sleeve	1	Hub	1	UM 180x150x15	1	150 E	1	M6x8	2	D.3	1

ASSEMBLY INSTRUCTIONS



— **GFA ASSEMBLY**

A) Insert the stop ring (4) and the seal ring (2) on the shaft.
B) Assemble the hubs (2) on the relative shafts.
C) Sleeve (1) is to be fitted on the longest shaft.
D) Position the shafts close together and check that the distance G corresponds to the value indicated in the table.
E) Align the shafts and check the parallelism then tighten the hubs on the shaft.
F) Fill the toothing and the gap between the hubs with grease.
G) At this stage slide the sleeve (1) down and position the sealing rings (3) in its place and tighten the stop rings (4) in their seat.
H) Proceed as follows for disassembly: remove the stop rings (4) using a pair of pliers, separate the sleeve (1) from the hubs (2) and the GFA coupling is fully disassembled.

MAINTENANCE

Unscrew both plugs (5) then introduce grease using the grease gun through the greasing holes until the grease exits from the other hole positioned at 180°. Replace the plugs. Repeat this operation every 1.000 working hours.

— **GFAS ASSEMBLY**

A) The seal ring (3) and stop ring (4) are already fitted on the extractable hub (2).
B) Assembly in closed cone mode only requires the sleeve (1) to be fixed onto one shaft and the extractable hub (2) to be tightened on the other shaft.
C) Then arrange the shafts to be connected closely together, positioning the hub (2) over the sleeve (1).
D) To disassemble, separate the shafts then extract the hub (2) from the sleeve (1).

Couplings require lubrication with grease, the quantity of grease used should half fill the available gap.

Use of Lithium soap grease with a base mineral oil and consistency index 2 (in compliance with NLGI) is recommended for moderate loads and normal operating conditions.

Use Barium complex soap grease, PAO synthetic base oil and consistency index 2 for heavy-duty operating conditions as regards temperatures and with heavy loads.

Contact the CHIARAVALLI Trasmissioni spa Technical Department for extreme operating conditions.

The lubricant complying with the formulation and with the recommended characteristics can be selected from among the range of products indicated below by consulting the Producer.

Equivalent recommended greases are as follows:

TYPE	PRODUCER
Sovarex L-O	MOBIL OIL
Gulfrown EP-O	GULF OIL
Alesia EP-2	SHELL OIL
Litholine Multi-Purpose	SINCLAIR
PGX-2 API	
Mariax 1	TEXACO
GR MUIEP2	AGIP
SPHEEROL EPL 2 SUPERGREASE 2	CASTROL

N.B. *- The technical characteristics, the dimensions and all other data contained in this catalogue are not binding. CHIARAVALLI Trasmissioni spa reserves the right to change the measurements indicated at any time and without notice.*