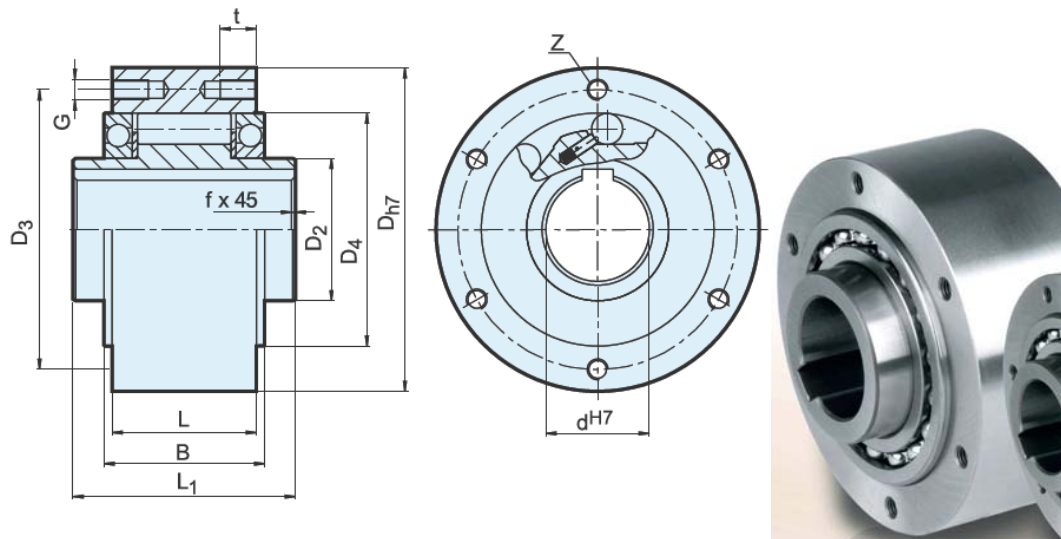


## Installation and Maintenance Instructions Freewheel Type GFR

To avoid premature failure of the freewheel or possible machine malfunction, installation of the freewheel should be carried out by suitably qualified personnel and according to the following instructions.

**STIEBER will not accept liability in cases of non-compliance with these instructions!**



Type	Size	Overrunning speeds										Number						Weight	
		$d_{H7}^{1)}$ [mm]	$T_{KX}^{1)}$ [Nm]	$n_{max}^{2)}$ [min <sup>-1</sup> ]	$n_{max}^{3)}$ [min <sup>-1</sup> ]	$D_{H7}$ [mm]	$D_2$ [mm]	$D_4$ [mm]	$D_3$ [mm]	G [mm]	t [mm]	z	$L_1$ [mm]	L [mm]	B [mm]	$t_1$ [mm]	$b^{10)}$ [mm]		f [mm]
GFR GFRN	12*	55	4000	7200	62	20	42	51	51	5,5	—	3	42	20	27	2,5	4	0,5	0,5
	15	125	3600	6500	68	25	47	56	56	M5	8	3	52	28	32	3	5	0,8	0,8
	20	181	2700	5600	75	30	55	64	64	M5	8	4	57	34	39	3,5	6	0,8	1,0
	25	288	2100	4500	90	40	68	78	78	M6	10	4	60	35	40	4	8	1,0	1,5
	30	500	1700	4100	100	45	75	87	87	M6	10	6	68	43	48	4	8	1,0	2,2
	35	725	1550	3800	110	50	80	96	96	M6	12	6	74	45	51	5	10	1,0	3,0
	40	1025	1150	3400	125	55	90	108	108	M8	14	6	86	53	59	5	12	1,5	4,6
	45	1125	1000	3200	130	60	95	112	112	M8	14	8	86	53	59	5,5	14	1,5	4,7
	50	2125	800	2800	150	70	110	132	132	M8	14	8	94	64	72	5,5	14	1,5	7,2
	55	2625	750	2650	160	75	115	138	138	M10	16	8	104	66	72	6	16	2,0	8,6
	60	3500	650	2450	170	80	125	150	150	M10	16	10	114	78	89	7	18	2,0	10,5
	70	5750	550	2150	190	90	140	165	165	M10	16	10	134	95	108	7,5	20	2,5	13,5
	80	8500	500	1900	210	105	160	185	185	M10	16	10	144	100	108	9	22	2,5	18,2
	90	14500	450	1700	230	120	180	206	206	M12	20	10	158	115	125	9	25	3,0	28,5
	100	20000	350	1450	270	140	210	240	240	M16	24	10	182	120	131	10	28	3,0	42,5
	130	31250	250	1250	310	160	240	278	278	M16	24	12	212	152	168	11	32	3,0	65,0
150	70000	200	980	400	200	310	360	360	M20	32	12	246	180	194	12	36	4,0	138,0	

**Description:**

Freewheels of type GFR are designed primarily for oil lubrication, and may be used as either backstops or overrunning clutches.

The main components are: Outer race, inner race, ball bearings, drive rollers and spring elements.

The basic GFR unit may be fitted with two covers of types F1 to F7. The GFR can be installed so that either the inner or outer race overruns.

The maximum overrunning speeds quoted in table 2 must not be exceeded.

**Prior to Installation:**

The freewheels should be unpacked and installed in a clean dry working environment.

For units despatched 'dry' the corrosion inhibitor should be removed using flushing oil.

Care must be taken that the ball bearings are not loaded radially or axially during installation.

The shaft should be to h6 or j6 tolerance. The mounting register for the outer race should be to H7 or G7 tolerance.

The freewheeling direction should be checked prior to installation.

To reverse the freewheeling direction of a unit fitted with covers, simply remove the cover-plates, and re-install at opposite ends of the freewheel.

Tighten the bolts to the torque specified in table 1 below. The bolts supplied are of 10.9 quality.

When using the freewheel as a backstop with cover type F3, the torque reaction pin of the cover must have a clearance of 1% to 2% of the pin diameter around its circumference when located in its anchorage slot, and must have axial clearance to avoid axial loads on the freewheel unit.

The outer race must not be moved axially if covers are not installed.

**CAUTION: RISK OF INJURY**

**When cover plates are removed, the freewheel should always be held so that the bore is horizontal, otherwise the inner race and bearings may slip from the outer race.**

**Installation:**

The unit should be installed as an assembly.

- Install the inner race on to the shaft ensuring alignment of the keyways.
- Apply any axial load exclusively to the inner race. The inner race must be retained axially on the shaft - circlips or a retainer plate are suitable.
- The bolts used for cover plates F1 and F7 must be of 10.9 quality; tighten to the torque specified in table 1 below.

**Table 1:**

Bore Ø [mm]	Bolt Size	Tightening Torque [Nm] ± 7%		Oil Plugs	
		8.8	10.9	Size	Tightening Torque [Nm]
12 - 20	M5	5,9	8,3	M5	4,5
25 - 30	M6	9,9	14	M6	7
40 - 50	M8	24	34	M8	18
55 - 80	M10	47	66	M10	33
90	M12	82	115	M12	63
100 - 130	M16	200	280	M16	150
150	M20	390	550	M20	300

**After Installation:**

After installation, ensure the unit freewheels in the required direction.

Prior to use check that the oil is to the correct level.

The drag torque produced when freewheeling is about 1/1000 of the nominal torque.

**Dismantling:**

To remove the unit please follow the installation section in reverse sequence.

**Table 2: (Based on oil lubrication)**

Size	max. Torque [Nm]	Overrunning Speed Inner Race [rpm]		Overrunning Speed Outer Race [rpm]	
		without sealing	with sealing	without sealing	with sealing
12	110	4000	3100	7200	4700
15	250	3600	2800	6500	4400
20	262	2700	2400	5600	4100
25	576	2100	1600	4500	3800
28	1000	1700	1300	4100	2800
30	1000	1700	1300	4100	2800
35	1450	1550	1200	3800	2600
40	2050	1150	850	3400	2300
45	2250	1000	740	3200	2200
50	4250	800	580	2800	1950
55	5250	750	550	2650	1800
60	7000	650	530	2450	1700
70	11500	550	500	2150	1600
80	17000	500	480	1900	1500
90	29000	450	450	1700	1300
100	40000	350	350	1450	1100
130	62500	250	250	1250	900
150	140000	200	200	980	700

### **Lubrication and Maintenance:**

Freewheels supplied with covers fitted (except F4) may be factory filled with oil. The oil used has a viscosity of ISO-VG 32. An oil change may be necessary according to the application details.

Recommended lubricants are specified in the table below.

#### **To check oil level**

The cover plates F2, F4 and F6 have 3 oil bores at the circumference.

To check the oil level, the oil bores should be at 12 o'clock 6 o'clock and 8 (or 4) o'clock.

- Remove top and lateral oil plug. Top up until oil seeps from the lateral hole.
- Tighten all plugs to the torque specified in the table 1 above.
- For oil change remove all oil plugs to drain oil.
- Refill as described above.

The lubricating oil should be changed after approximately 10 hours operation. Further oil changes should be made after every 2000 hours.

In arduous applications change oil every 1000 operating hours.

With ambient temperatures above 80°C, check lubrication regularly.

For operating temperatures below -20°C and above 100°C contact the technical department of your lubricant suppliers.

**Lubricants with slip additives such as graphite, Molykote or similar agents should be avoided!**

For indexing applications, oil types with a kinematic viscosity of about 10mm<sup>2</sup>/s at the normal operating temperature are recommended.

#### **Grease Lubrication**

If grease lubrication is to be used please consult your STIEBER stockist.

Drain existing oil first. 30 to 40% of the free space between the races should be grease filled, the bearings have to be lubricated too.

Excessive grease may lead to malfunction of the freewheel!

Every two years the grease has to be changed and the freewheel to be inspected.

With grease lubrication the overrunning speed must not exceed 50% of the speeds specified in table 2.

## Recommended Lubricants

	Ambient temperature				Grease
	-40°C to -15°C	-15°C to +15°C	+15°C to +30°C	+30°C to +50°C	
	Operating temperature				
	-20°C to +20°C	+10°C to +50°C	+40°C to +70°C	+50°C to +85°C	
	Oil				
<b>ISO - VG DIN 51519</b>	10	22	46	100	
<b>ARAL</b>	SUMOROL CM10	SUMOROL CM22	MOTANOL HK46	DEGOL CL100T	ARALUB HL2
<b>BP</b>	ENERGOL CS10	ENERGOL CS22	ENERGOL CS46	ENERGOL RC100	ENERGREASE LS2
<b>DEA</b>	ASTRON HL10	ASTRON HL22	ASTRON HL46	ASTRON HL100	GLISSANDO 20
<b>ESSO</b>	NUTO H10 SPINESSO 10	NUTO H22 SPINESSO 22	NUTO H46 TERESSO 46	NUTO H100	BEACON 2
<b>FUCHS</b>	RENOLIN MR3	RENOLIN DTA22	RENOLIN DTA46	RENOLIN MR30	RENOLIT LZR2
<b>KLÜBER</b>	CRUCOLAN 10	CRUCOLAN 22	CRUCOLAN 46	CRUCOLAN 100	POLYLUB WH2
<b>MOBIL</b>	VELOCITE No6	VELOCITE No10	VACTRA MEDIUM VG46	VACTRA HEAVY VG100	MOBILUX 2
<b>SHELL</b>	MORLINA 10	MORLINA 22	MORLINA 46	MORLINA 100	ALVANIA G2
<b>TOTAL</b>	AZZOLA ZS10	AZZOLA ZS22	AZZOLA ZS46	AZZOLA ZS100	MULTIS 2

Alternatively we strongly recommend the use of multigrade oils SAE 10W-40 at working temperature between 0° and +80 ° C.

The ambient temperature is to be taken as a guide line. The operating temperature is determinant for the choice of the viscosity.

Corrosion inhibitor: Rivolta KSP

Time of protection: 6 to 12 months

Recommendation: Prior to use, remove corrosion inhibitor using flushing oil.

**The maximum overrunning speeds given in our literature apply to oil lubricated units. For grease lubrication the quoted speeds must be halved. Please refer to the 'Lubrication & Maintenance' section in our main catalogue.**