

## 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!**

### 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	6	8,5	M5	4,5
25 - 30	M6	10	14	M6	7
40 - 50	M8	25	34	M8	18
55 - 80	M10	48	68	M10	33
90	M12	84	118	M12	63
100 - 130	M16	200	290	M16	150
150	M20	400	570	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.

If grease lubrication is to be used please consult your STIEBER stockist. Excessive grease may lead to malfunction of the freewheel!

If grease lubrication is required drain existing oil first. Only 30 to 40% of the free space between the races should be grease filled.

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>	NUTTO H10 SINESSO 10	NUTTO H22 SPINESSO 22	NUTTO H46 TERESSO 46	NUTTO 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	MOBILUX2
<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

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.**