Installation and Maintenance Instructions Freewheel Type AL..F, ALM..F

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 AL / ALM are designed primarily for oil lubrication, and may be used as either overrunning clutches or backstops.

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

The basic units (AL or ALM) may be fitted with flanges F2, F4, F5, cover plates D2, D3 or flexible couplings of type KEE or KMS.

The units may be installed so that either the inner or outer race overruns. The maximum permissible overrunning speeds quoted in table 2 must not be exceeded.

Prior to Installation:

The freewheels should be unpacked and installed in a clean 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 inner race should be fitted to a shaft of h6 or j6 tolerance. The mounting register for the outer race should be of H7 tolerance.
- When using the freewheel as a backstop, using cover plate F5, the torque reaction pin must be centralised in the oblong slot of the cover. The pin should protrude through the slot to make the keyface accessible.
- 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. The bolts are of 10.9 quality. Secure them with Loctite 243 or equivalent.
- 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 onto 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 screws used for flange plates F2, F4 and F5 should be of 8.8 quality. Tighten to the torque specified in table 1.
- Secure the screws with Loctite 243 or equivalent

Table 1:

Size	Bolt	Tightening Torque [Nm] ± 7%		Oil Plugs	
		8.8	10.9	Size	Tightening Torque [Nm]
12-25	M5	6	8,5	M5	4,5
30-35	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
100-120	M16	200	290	M16	150
150	M20	400	570	M20	300
200	M24	710	1000		
250	M30	1450	2000		

Table 2: (Based on oil lubrication)

Type	Size	max. Torque [Nm]	Overrunning Speed	
			Inner Race	Outer Race
			[rpm]	[rpm]
AL	12	110	4000	7200
	15	250	3600	6500
	20	362	2700	5600
	25	576	2100	4500
	28	1000	1700	4100
	30	1000	1700	4100
	35	1450	1550	3800
	40	2050	1150	3400
	45	2250	1000	3200
	50	4250	800	2800
	55	5250	750	2650
	60	7000	650	2450
	70	11500	550	2150
	80	17000	500	1900
	90	29000	450	1700
	100	40000	350	1450
	120	62500	250	1250
	150	140000	200	980
	200	350000	150	750
	250	575000	120	620
ALM	25	776	2100	2800
	30	1176	1700	2500
	35	1676	1550	2400

After Installation:

After Installation ensure the unit freewheels in the required direction.

Prior to use, check that the unit contains oil 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.

Lubrication and Maintenance:

Freewheels supplied with covers fitted (except cover D3) 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 D2 and D3 have 2 oil bores at the circumference positioned at 12 and 4 o'clock.

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

- Remove top and lateral oil plug. Top up until oil seeps from the lateral hole.
- Re-fit and tighten all plugs to the torque specified in the table 1 above.
- For oil change remove all oil plugs and position holes at 6 and 10 (or 2) o'clock.
- 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.

For indexing applications, oil types with a kinematic viscosity of about 10mm2/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.

SLIP ADDITIVES SUCH AS MOLYCOTE AND GRAPHITE MAY INHIBIT OPERATION OF THE UNIT!

Recommended Lubricants

	Ambient temperature				
	-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				Grease
ISO - VG DIN 51519	10	22	46	100	
ARAL	SUMOROL CM10	SUMOROL CM22	MOTANOL HK46	DEGOL CL100T	ARALUB HL2
BP	ENERGOL CS10	ENERGOL CS22	ENERGOL CS46	ENERGOL RC100	ENERGREASE LS2
DEA	ASTRON HL10	ASTRON HL22	ASTRON HL46	ASTRON HL100	GLISSANDO 20
ESSO	NUTTO H10 SINESSO 10	NUTTO H22 SPINESSO 22	NUTTO H46 TERESSO 46	NUTTO H100	BEACON 2
FUCHS	RENOLIN MR3	RENOLIN DTA22	RENOLIN DTA46	RENOLIN MR30	RENOLIT LZR2
KLÜBER	CRUCOLAN 10	CRUCOLAN 22	CRUCOLAN 46	CRUCOLAN 100	POLYLUB WH2
MOBIL	VELOCITE No6	VELOCITE No10	VACTRA MEDIUM VG46	VACTRA HEAVY VG100	MOBILUX2
SHELL	MORLINA 10	MORLINA 22	MORLINA 46	MORLINA 100	ALVANIA G2
TOTAL	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.