Assembly, Maintenance and Lubrication Instructions for GTS-Gearboxes

1. General instructions

1.1 All gears are given a thorough test run with a corrosion inhibiting oil in our factory before delivery.

1.2 The gears units are generally shipped unpacked – if necessary, they are bolted to wooden pallets.

1.3 To avoid transport difficulties the gears are delivered without oil filling.

1.4 Protection of external an internal part is provided for normal transport conditions, unless otherwise agreed. The protection against corrosion lasts for about six months provided that the gears are properly mounted (dry non-acidic atmospheres etc.).

1.5 The outside coating of RAL 7030, stone grey, is resistant to weak acids and alkalis; oils and solvents, seawater, and tropical conditions as well as temperatures up to + 140°C.

1.6 When used in a potentially-explosive environment, the supplementary ATEX Operating Instructions must be observed.

2. Transport

2.1 Hemp rope loops put around the integrally cast lugs on the lower part of the flange joint may be used when lifting the complete gear unit.

2.2 Special care is required when transporting a gear unit fitted with oil pump and piping.

3. Installation

3.1 Couplings, sprocket wheels etc. must be drawn on carefully. In drawing on no hammer blows or use of force are admissible. Axial thrust during operation e. g. due couplings is not admissible unless otherwise agreed.

3.2 The gears must be installed on a torsion-free bed or together with the engine on the same baseplate. Before the connection bolts are secured check that the machined gear foot surfaces are perfectly positioned.

3.3 In the case of gears sent complete the drive and driven shafts must be aligned so that they lie precisely horizontal or vertical in each case unless another position has been agreed on. From a unit weight of about 10 tons upwards alignment as a function of tooth system is necessary.

3.4 When installing the gears ensure that the oil drain point is accessible and if necessary appropriate drainage arrangements must be provided.

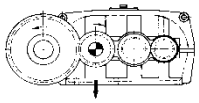
3.5 If units are subject to external forces, then pins or stoppers should be used to prevent shifting.

3.6 If gears are mounted on a bed the gear must be aligned first. Sealing can only be carried out if drive and driven machines are also aligned with the gear. Outer housing components except for housing base must nor come into contact with the compound.

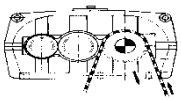
3.7 In case of slip-on gears a safe taking of the reaction moment acting at the housing is to be guaranteed (bear-up elastically). The clearance of the holding bolts mentioned in the data sheet is to be maintained absolutely.

3.8 A gear declination is only allowable if this requirement was known when placing the order.
Gears with drive via spur pinions, chain pinions etc. should be arranged in such a way, if possible, that the gear housing is pressed on the foundation.

Install model



output via a pair of spur wheels



output via chain drive

3.9 Gears with drive via spur pinions, chain pinions etc. should be arranged in such a way, if possible, that the gear housing is pressed on the foundation.

3.10 If the gears are installed in unfavourable conditions, e.g., subject to spray water etc. they must be appro-privately protected, in particular the drive and driven shafts. Adequate air circulation must however be ensured.

3.11 To conform to statutory rules rotating parts must be protected, e.g., by cover grids, conforming to the law of technical working of 24 June 1968. (Such protective components are not generally supplied by GTS with the gears).

4. Other accessories

4.1 For gear units equipped with special accessories (e.g., backstop device, spring brake, multiple disc clutch, etc.) attention is drawn to the instructions for these parts, as they may require special maintenance, e.g. adjustment of clutch.

4.2 Gear units with backstop can operate in one direction only. To avoid any damage, please make sure that motor and gear unit have the same rotational direction.

5. Oil pumps, monitoring

5.1 If separate oil pumps are planned then the position must normally be that indicated in the dimensional drawing for the gear. If pipes are to be installed by the customer in the building these must be properly cleaned (acid cleaning etc.).

5.2 A locking system is essential which prevents gear operation without oil pump running, e.g. by electrical control via pressure and/or flow monitors.

5.3 Observe pump manufacturer’s operating instructions in bringing the pumps into operation.

6. Oil coolers, cooling spirals

6.1 In the case of gears with built-in cooling spirals or separate oil coolers the plant operator must provide the necessary water supply connections.

6.2 The coolers supplied are, unless otherwise agreed, designed only for fresh water, i. e. for pure spring or mains water. Since different industrial waste waters have a locally varying composition and thus varying aggressivity cooling water analysis must be carried out before the plant is operated.

6.3 In case of cooling spirals the flow direction is to your liking related to the water; in case of oil coolers this is indicated in any case.
6.4 Water pressure must not exceed a maximum of 6 bar. Maintain the water quantity mentioned in the data sheet.
6.5 The cooling should be switched on when the oil temperature has reached 30°C to 35°C.
6.6 The manufacturer's operating instructions must be observed.

7. Oil filters

7.1 The filter should be cleaned during initial bringing into operation. Otherwise clean filter packet per 1.000 h with petroleum ether.
7.2 The manufacturer's operating instructions must be observed.

8. Cleaning the air filter

If gear units are equipped with an air filter (breather), the filter should be cleaned as soon as a layer of dust is noticed, at least, however, every 3 months. For this purpose, the filter must be taken off and flushed with petroleum ether or a similar cleaning agent, and it should be dried or blow off by compressed air.

9. Bringing into operation

9.1 While stationary the gearbox must be filled with clean oil that complies with the lubrication instructions until the oil level reaches the marking on the sight glass or dip stick. The quantity of oil required is given on the gearbox type plate – it is important that this quantity is used. Make sure that no dirt or other contaminant enters the gearbox with the oil.
9.2 The oil sight-glass resp. dipstick fitted to the gear have one or two marks depending on gear size. In the case of one mark the oil level at standstill must be kept at the level of this mark without fail. If there are two marks the oil level must be kept between them. It is advisable to keep closer to the upper mark. In the case of round sight-glasses the oil level must be kept in the middle.
9.3 If there is an oil pump, after filling with oil the lubricating system of the gear must be checked by switching on the pump. After the pump has been switched off the oil level is corrected if necessary (see section 9.2).
9.4 When the gear unit is started up for the first time it should, if possible, run unloaded for several hours. If no irregularities are noticed, the load may be gradually increased up to full load within a reasonable period of time with the gear unit under continuous observation.
9.5 As the load increases the temperature of the gear unit will rise but should not exceed 80°C in the case of units with rolling bearings and 60°C for gear units with slide bearings. Short time peak temperatures of oil and gear unit up to max. 100°C are quite normal and satisfactory and will not affect the perfect operation of gear units with rolling bearings. Higher temperatures can be permissible in certain cases, providing special lubricants are used.
9.6 Other conditions prevail in cases where very high ambient temperatures or other external heat sources are involved. Please consult us, particularly concerning the lubricant to be used.
9.7 Gear units out of operation for a long period of time should, if possible, be operating, loaded or unloaded for a short time every 3 weeks. If short time operation is impracticable at these time intervals the gear units must be protected against corrosion.

9.8 If a gear unit is inactive for an axtended period after installation and trial run and the short-time operation acc. to 9.7 is not possible, the unit must again be treated with a rust inhibitor.

9.9 During the winter months the starring temperature of the oil must not be below 10°C. It is advisable in case of gears with separate pump to keep the oil pump in operation during the winter when the unit stands still in order to avoid a great temperature loss of the oil.

10. Lubricating instructions

10.1 Grease lubrication

10.1.1 Some gears are equipped, with antifriction bearings filled with grease. These anti-friction bearings are already filled with grease when the gears are delivered. Normally it is possible to relubricate e.g., by means of a forcefeed grease gun.

10.1.2 After about 5.000 operating hours these bearings should be lubricated. Quantity of lubricant indicated on plate on gear.

10.1.3 Only high-quality anti-friction bearing greases from reputable manufacturers must be used for topping up or refilling.

10.2 Oil lubrication

10.2.1 To lubricate gears supplied by us the oil types listed in the table of lubricants or types of equivalent quality must be used. We cannot guarantee the absolute suitability of the oil types listed.

10.2.2 The critical factor for the choice of oil is its viscosity, which is marked on the gearbox and given in the dimension sheet. The quantity of oil, which is also given, must be checked based on Section 9.2.

10.2.3 The indicated oil viscosity is related to normal operating conditions with ambient temperatures between 0°C and + 30°C. In case of ambient temperatures between 30°C and 50°C choose one higher stage of oil viscosity tan mentioned. (e.g. from VG –220 to VG –320). In case the ambient temperatures are below 0°C or above 50°C please discuss – if not already mentioned in the order – as a change of viscosity resp. special steps may be necessary.

10.3 Oil change

10.3.1 After about 300 to 600 operating hours the oil must be changed for the first time. Drain the oil soon after stopping the gear unit while the oil is still warm.

10.3.2 Subsequent oil changes must be made after every 1.500 to 5.000 operating hours, depending on working conditions. The oil change intervals should, however, not exceed 18 months.

10.3.3 When the old oil has been drained off, clean the gear with fresh oil (never use Diesel oil or cleaning agents). Fill with oil as when first bringing into operation.

Lubricant selection table

Schmier-stoffe Lubricant Lubrifiant	Viskosität Viscosity Viscosité ISO VG DIN 51519 mm²/s (cSt)	Kennzeich-nung nach DIN 51502	ARAL	bp	KLÜBER	ExxonMobil	Shell	TEXACO
Getriebeöl Gear oil Huile de réducteur	VG 680	CLP 680	Aral Degol BG 680	BP Energol GR-XP 680	Klüberoil GEM 1-680	Mobilgear 600 XP 680	Shell Omala 680	Meropa 680
	VG 460	CLP 460	Aral Degol BG 460	BP Energol GR-XP 460	Klüberoil GEM 1-460	Mobilgear 600 XP 460	Shell Omala 460	Meropa 460
	VG 320	CLP 320	Aral Degol BG 320	BP Energol GR-XP 320	Klüberoil GEM 1-320	Mobilgear 600 XP 320	Shell Omala 320	Meropa 320
	VG 220	CLP 220	Aral Degol BG 220	BP Energol GR-XP 220	Klüberoil GEM 1-220	Mobilgear 600 XP 220	Shell Omala 220	Meropa 220
	VG 150	CLP 150	Aral Degol BG 150	BP Energol GR-XP 150	Klüberoil GEM 1-150	Mobilgear 600 XP 150	Shell Omala 150	Meropa 150
	VG 100	CLP 100	Aral Degol BG 100	BP Energol GR-XP 100	Klüberoil GEM 1-100	Mobilgear 600 XP 100	Shell Omala 100	Meropa 100
	VG 68	CLP 68	Aral Degol BG 68	BP Energol GR-XP 68	Klüberoil GEM 1-68	Mobilgear 600 XP 68	Shell Omala 68	Meropa 68
	VG 46	CLP 46	Aral Degol BG 46	BP Bartran 46	Klüberoil GEM 1-46	Mobil DTE 25 Ultra	Shell Tellus S 46	Anubia EP 46
	VG 32		Aral Degol BG 32	BP Bartran 32	LAMORA HLP 32	Mobil DTE 24 Ultra	Shell Tellus S 32	Anubia EP 32
Getriebefett Gear grease Graisse de réducteur		G 00 H-20	Aral FDP 00 (Na-verseift) Aralub MFL 00 (Li-verseift)	BP Energrease PR-EP 00	MICROLUBE GB 00	Mobilux EP 004	Shell Alvania GL 00 (Li-verseift)	Marfak 00
Wälzlagerfett Bearing grease Graisse de roulement		K 3 K-20 (Li-verseift)	Aralub HL 3	BP Energrease LS 3	CENTOPLEX 3	Unirex N 3	Shell Alvania R 3 Alvania G 3	Multifak Premium 3

Do not mix greases of different saponification bases.

GTS-Antriebstechnik GmbH • Breitlerstraße 70 • 55566 Bad Sobernheim • Germany
Tel: (+49) 06751 9314 0 • Fax: (+49) 06751 9314 24
mailto: gts-antriebstechnik@t-online.de • http://www.gts-antriebstechnik.de