1. General

Dimensioning, actual operating conditions and regular maintenance are of major importance for the efficient operation and the life of spindle gears with (trapezoidal) threaded spindles which in general have a relatively low efficiency factor and are thus susceptible to wear.

First off all it is important to know the actual operating conditions already during planning in order to take them into account for dimensioning.

2. Recommendations for mounting

2.1. Prior to mounting it is recommended to check the mounting surface of the bracket for evenness and sufficient rigidity when mounting the spindle gears on the floor.

2.2. Please take care that there are no distortions between spindle and spindle gear due to improper alignment between the guides of your machine and the spindles of the spindle gears neither when the spindle (basic type) is extended nor when it is run-in and/or in the respective end positions of the spindle nut (travelling nut type). Uncontrolled transverse forces which occur in case of such improper alignment result in overload and as a rule in demolition of the spindle gear. Therefore, accurate alignment or cardanic suspension of the spindle gear are required (special information on request).

2.3. It is advisable to switch off the spindle gears before they reach their end positions in order to avoid following damages:

- Basic type (GO/GU): spindle moves towards stop - gear is overstrained and damaged and/or extends from nut (worm wheel) - the last threads are overstrained and damaged.
- Travelling nut type (LO/LU): nut reaches stop - gear is overstrained and damaged and/or the nut overshoots the spindle - the last threads are overstrained and damaged as well.

2.4. In case of excessive dust accumulation and/or hostile environment, it is advisable to protect the spindle in a special way and/or to chose the respective resistant materials. Please take the advice of ALBERT.

2.5. Please pay attention to, that the spindle (in basic performance) is only allowed to be proceed by twisting of the worm shaft.

2.6. In standard models (GO/GU) with a backlash-adjustable trapezoidal thread drive, or with a load locking nut, do not drive the spindle out of the worm gear or out of the nut.

2.7. In running nut models (LO/LU) with backlash-adjustable trapezoidal thread drive, or with a load locking nut, do not drive the spindle out of the load lock nut or out of the running nut.

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3. Putting into operation

Prior to the actual startup, please perform an almost no-load test run and pay attention to following things:

3.1. Does lubrication function properly?

3.2. Is the direction of motion the right one?

3.3. For systems equipped with several forcibly synchronized gears, level spindle noses (basic type) and/or travelling nuts (travelling nut type) properly. Jams will result in an increased demand for energy and thus to premature wear.

4. Lubrication and maintenance of the spindle gears

The rating plate of the spindle gears includes following designations of lubricants:

4.1. For grease lubrication

This symbols have the following meaning:

-in accordance with DIN 51502

Declaration of the abbreviations:

KP: Greases for antifriction bearing, plain bearing and sliding surfaces for high pressure load
DIN 51825 had been taken as basis

2: NLGI-class according to DIN 51818
Worked penetration according to DIN 51804 part 1 approx. 280 (x 0,1 mm)

K: characteristics towards water (DIN 51807 part 1)
No change and/or only a minor change
Working temperature: - 20°C up to + 120°C

4.2. For oil lubrication:

According to DIN 51502, the kinematic viscosity is 220 mm^2/s (cst) at 40°C.

In case these recommendations are not included in the rating plate, please contact ALBERT immediately and/or precise lubricating instructions are included in the tender documents and/or in the confirmation of order of your order.

Up to now following lubricant types for spindle gears were used:

Grease:	Spheerol EPL 2	Castrol
	Mobilux EP2	Mobil
	Texando FO 20	Texaco
Oil:	Castrol Alpha SP 220	Castrol
Mounting spray:	Klueber Lubrication - Unimoly C 220 - Spray (MO2-antiseize enamel)	

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Additional lubrication for spindle gears:

- Lubrication nipple and/or oil filler screw at gearbox case.

5. Lubrication and maintenance fo trapezoidal threaded spindle

Only in exceptional cases, which are mentioned specially in the tender documents, the threaded spindle both for basic type and for travelling nut type is operated via special additional lubricating facilities such as lubrication nipples and central lubrication systems.

Normally, the respective lubricant (comparable grease types as mentioned above for the gear) is applied manually by means of a suitable tool to the spindle prior to startup and lubricated 1 - 4 times a month, depending on the operating conditions.

6. Lubrication and maintenance fo additional equipment

Following items can serve as additional equipment:

- Anti-twisting safety device by means of rectangular protective tube
- Swivelling bracket
- Cardan bracket
- Articulated heads
- Cardan shafts
- Motors
- Power divider or attachment gear

In case the spindle gears are supplied together with the above or similar additional equipment of ALBERT, we recommend to check if the respective instructions for lubrication and maintenance are included in the confirmation of order and/or we recommend to request these instructions from ALBERT.

7. Lubricant quantities

7.1. Spindle gears:

New spindle gears are filled with the respective quantity and quality of lubricant at the manufacturer's.

For grease filling quantities for the respective gear types see below.

SGT	5	20	30	50	150	200	300	350	500	1000
kg	0,1	0,2	0,2	0,3	0,5	0,7	1	1,8	2	4

For oil-lubricated spindle gears, the lubricant quantity depends on the fitting position specified in the offer and/or confirmation of order. When the spindle gear is in its actual fitting position, oil is filled up to the oil-level gauge and/or checking screw (for types SGT 5, 20 and 30).

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7.2. Other lubrication points:

Spindles, nuts and additional facilities.
The maintenance personnel is able to detect without problems the quantities required for putting into operation and/or additional lubrication. If necessary, we recommend to contact ALBERT.

8. Lubrication intervals

8.1. For grease lubrication:

Considering the relatively low efficiency factor of spindle gears with trapezoidal threaded spindles we recommend to change the lubricant every 500 operating hours or after 18 months at the latest.

8.2. For oil lubrication:

By new worm drive the surface structure of the tooth profils changes by smoothing. Thus lubricant gets polluted. To reach an optimal life of the worm drive we recommend to change oil maximum after 100 operating hours and/or after 3 months at least, to remove the abrasion accumulated during running in. After this, oil has to be changed all 500 operating hours and/or after 18 months at least.

For grease lubrication as well as oil lubrication it is necessary to dismantle the gears, to remove lubricant residues by washing them out thoroughly, to check the condition of bearings, seals, worm gear and thread gear. If necessary, replace individual parts and/or both the worm and the worm wheel and mount them again in a workmanlike way.

After a 25 % wear of the thread which normally takes place in the nut, at least the nut (travelling nut type) and the worm wheel (basic type) should be replaced.

The intervals for additional lubrication - as already mentioned above - for threaded spindle - nut and/or threaded spindle - worm wheel have to be determined empirically, since these intervals depend very much on the operating conditions and an automatic additional lubrication of these sliding points is not performed.

When lubricating the threaded spindle, attention has to be paid that the whole spindle is lubricated. During additional lubrication of the basic type it is necessary to extend the threaded spindle from the gear by the height of the gear; when lubricating the travelling nut type, the travelling nut has to be moved by the height of the travelling nut on the threaded spindle.

General: Do not mix different lubricants!

Under operating conditions where the thread gear is extremely subjected to wear, an antiseize enamel coating of the threaded spindle showed considerable effects as to reducing wear. Please contact ALBERT for further information.

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Antiseize enamel coating of lifting spindle threads

Product: Gleitmo 940 is a selected combination of solid lubricants, organic vehicles and solvents. Gleitmo 940 forms an adherent, oil and solvent resistant dry lubrication film after setting with high-pressure resistance, good corrosion protection and a wide temperature range. Gleitmo 940 is extremly suited to aid an oil or a grease lubrication in the area of dry and mixed friction.

Applications: Thoroughly degrease the parts to be covered. The surfaces must be dry when applying the lacquer. To increase adherence, and hence longevity, we recommend a surface treatment with sand blasting.
An even film formation and a shorter drying time is achieved by preheating the surface to approx. 100 °C.
Recommended film thickness: 10 µm - 20 µm

Advantages: Improvement of break-in, protection against surface damage and wear, in particular with high pressures and low speeds. At time for longevity lubrication. Gleitmo 940 is applied especially when dry lubrication is required together with corrosion protection.
Serves as replacement for cadmium plating.

Technical data:

Temperature °C	-180 to +300
Color	grey-black
Vehicle	organic
Flash point of fluid °C	25
Corrosion protection (DIN 50021) h	100

Long longevity and the above advantages are achieved only if the following points are observed:

1. Additional lubrication with the lubricants prescribed for each operating condition
2. Protection against contamination of the combination lubricating lacquer and lubricant.
3. Sufficient relubrication.

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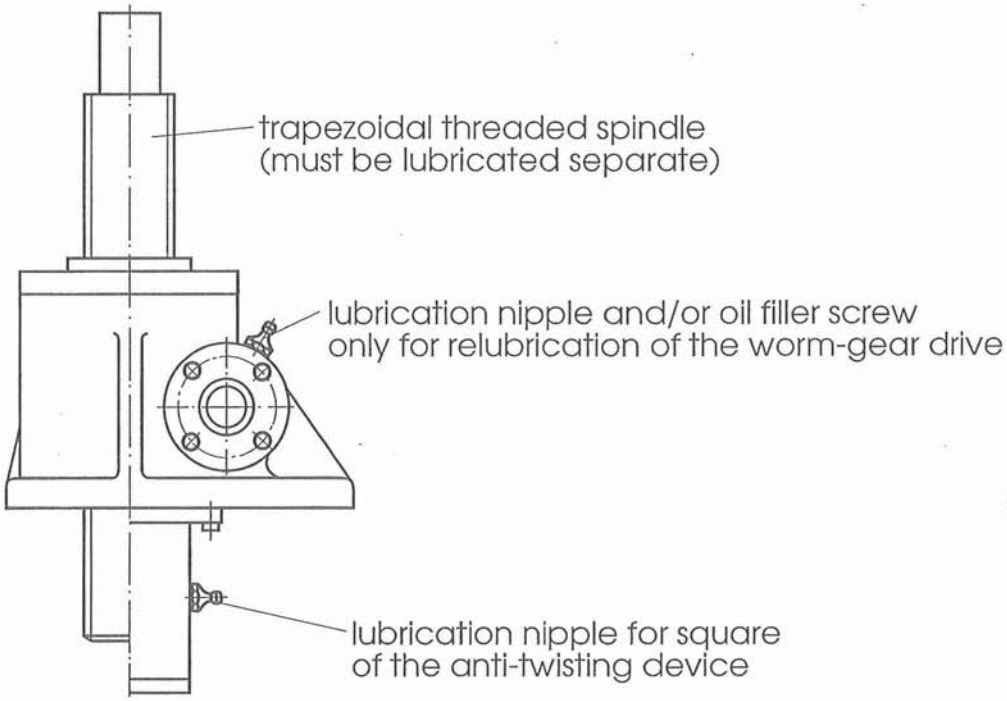
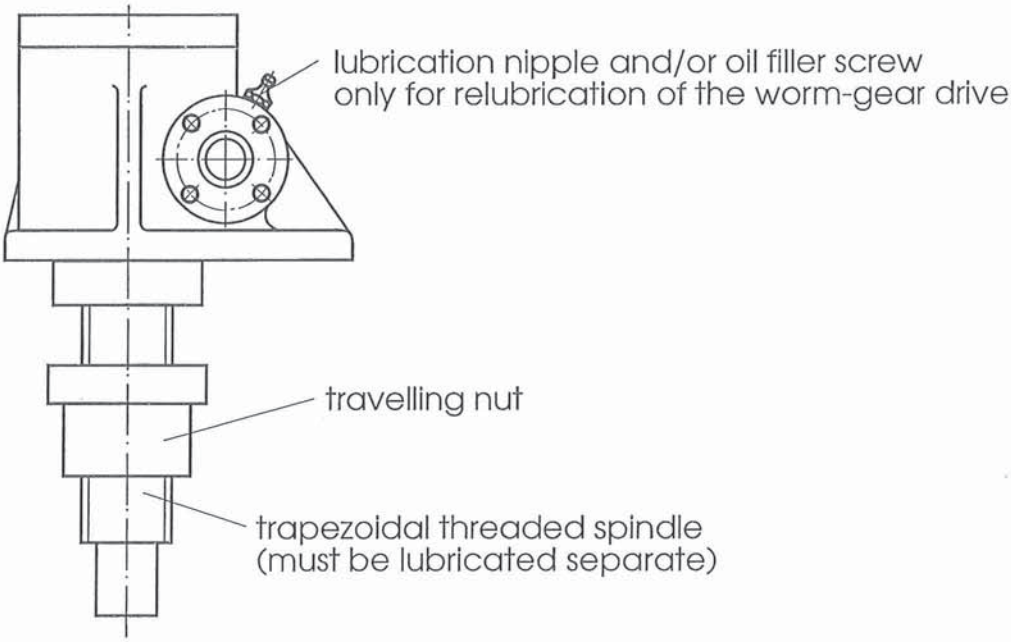
SPINDLE - GEAR

BASIC TYPE



TRAVELLING NUT TYPE



The trapezoidal threaded spindle and worm-gear drive are two separate lubrication points.

standard

sheet:	version:	date/name:	operation and maintenance instructions	
6 of 6	G	17.01.1996	SPINDLE GEARS SGT SGTP	ALBERT
customer:			No.: B9401012	
project number:				

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