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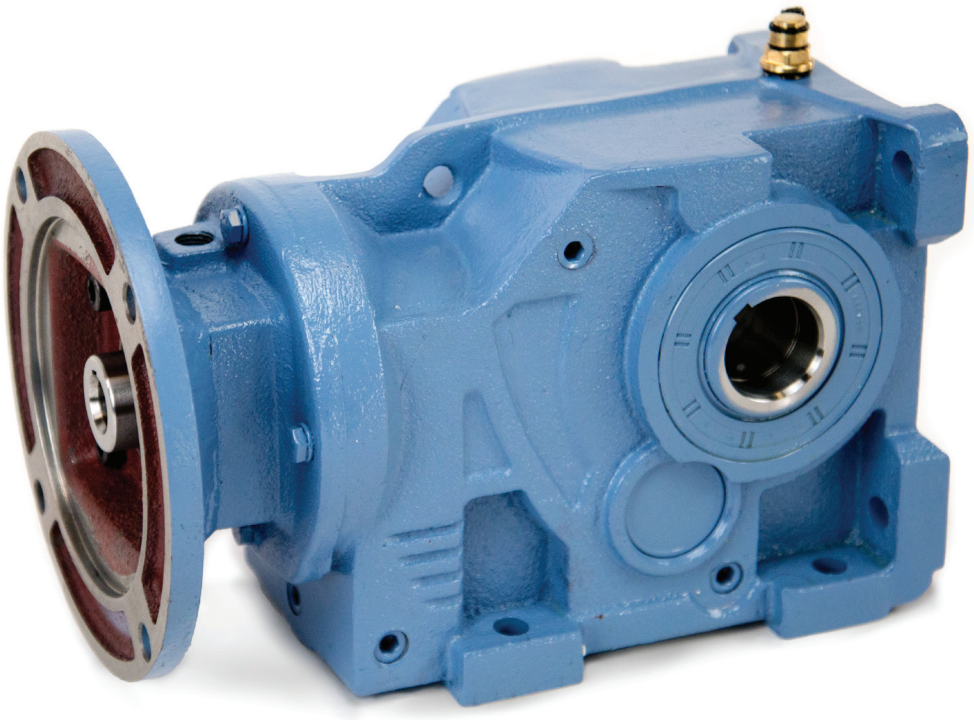
LUBRICATION SPECIFICATION

KHN SERIES
HELICAL & BEVEL SPEED REDUCER



OIL FILL SPECIFICATIONS AND REQUIREMENTS

WARNING: Always check the gear unit for proper oil fill before operation. Failure to do so may result in unit failure and will void the warranty.

Manual: GD-LS-KHN0418.R01 Released April. 2018

Filler / Oil Gauge / Drain Plug Locations

Each (KHN series) helical & bevel speed reducer, regardless of the box size, comes with ten (10) filler / oil gauge / drain plugs. The ten plugs are located in different locations depending on the actual box size selected. As an example of the fill/oil gauge/drain plug locations, please see the figures 1 – 5 below. Each drain port plug is shown with a circle in the figure. Units are shipped from warehouse stock configured for an M1 mounting position (See Figure 6 - Foot Mounting Positions).

Figure 6 - Foot Mounting Positions, shows the recommended location of the filler, oil gauge and drain plug locations for each different mounting position. If the mounting position is changed, the oil drain plug should always be moved to the lowest position.

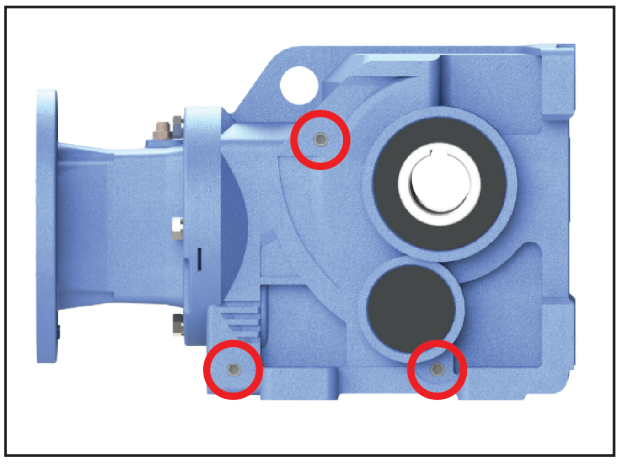
When filling units for a new mounting position, the oil gauge plug will be located somewhere in the middle position of the unit as specified in Figure 6 – Foot Mounting Positions. The table shown under the heading "Recommended Lubricant by Box Size and Mounting Position" (see page 4) shows how much oil the customer should place in the unit when changing mounting positions or replacing the oil. The measuring unit for the oil filling amount is listed in liters.

To verify that the reducer has enough oil, the customer should remove the oil gauge plug while filling the oil. When the customer sees the oil coming out of the oil gauge plug, then they can stop filling the oil and replace the oil fill plug and the fill plug. The reducer now has enough oil inside.

When changing the oil, it may not be possible to completely remove all existing oil without disconnecting and lifting the unit. If lifting the unit is possible, simply lift the unit with proper lifting equipment, lower the drain plug by tilting the unit sideways, and gently shake the unit until all of the oil contained within is removed

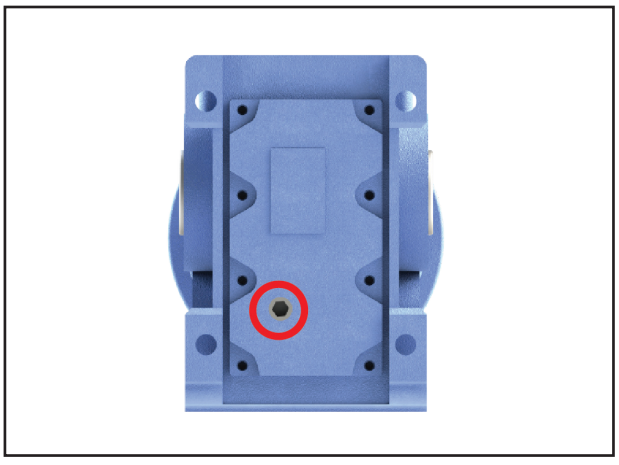
Filler / Oil Gauge / Drain Plug Location Diagrams

Figure 1: Right View



Right side view, three fill / gauge / drain plug ports

Figure 2: Rear View



Rear view, one fill / gauge / drain plug port

Filler / Oil Gauge / Drain Plug Location Diagrams

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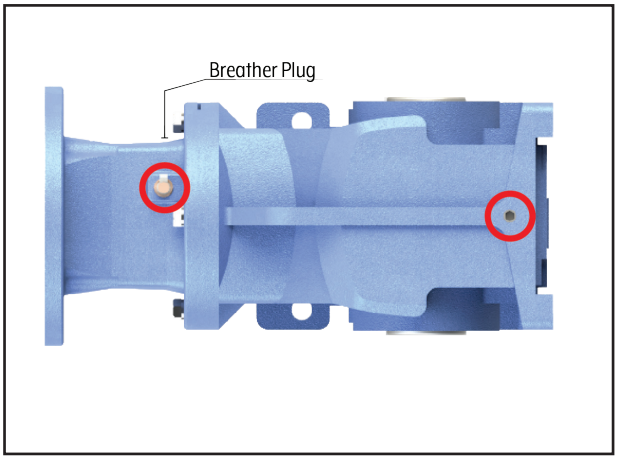
Figure 3: Top View



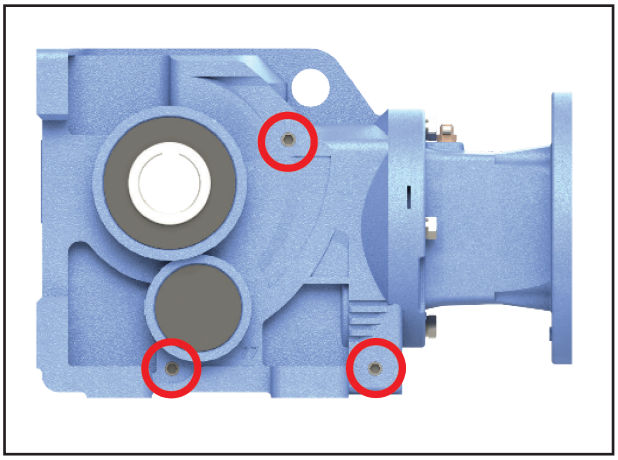
Top view, two fill / gauge / drain plug ports
One with breather plug

The bronze cap with rubber ring shown in Figure 3 (left) is a breather plug located in the top of the reducer as shown in this M1 mounting position. If the reducer is used in another mounting position, this breather plug will need to be moved to the top fill position after the new mounting is completed. **The breather plug must always be in the top most position on the unit.**

Note: The breather plug and oil fill plug share the same location and are always in the top most position. When the customer needs to fill in the oil, they remove the breather plug and fill the oil. After the oil is filled, they re-install the breather plug. To activate the breather plug, the customer must remove the rubber ring that seals the breather plug during shipment.

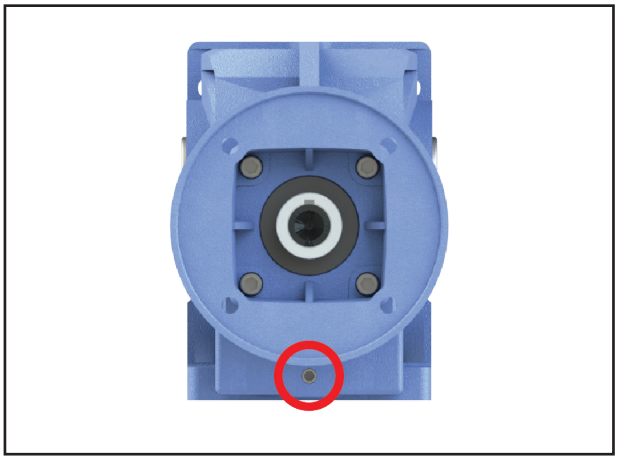
WARNING: Remove the rubber ring to activate the breather plug (figure 3). Failure to do so will prevent the reducer from breathing to atmosphere, leading to reducer overheating, and may potentially cause premature and catastrophic seal failure.

Figure 4: Left View



Left side view, three fill / gauge / drain plug ports

Figure 5: Front Input Quill View



Front view, one fill / gauge / drain plug port

Lubricant Selection

STANDARD LOAD, 1750 RPM INPUT				
Temperature (Deg C)	CPC	ISO VG	Mobil	Shell
-30 to -15	HD 100	VG 100	Mobilgear 627	Omala 100
-15 to -3	HD 150	VG 150	Mobilgear 629	Omala 150
-3 to 23	HD 220	VG 220	Mobilgear 630	Omala 220
23 to 40	HD 320	VG 320	Mobilgear 632	Omala 320
40 to 80	HD 460	VG 460	Mobilgear 634	Omala 460

HEAVY LOAD, 1750 RPM INPUT				
Temperature (Deg C)	CPC	ISO VG	Mobil	Shell
-30 to -15	HD 150	VG 150	Mobilgear 629	Omala 150
-15 to -3	HD 220	VG 220	Mobilgear 630	Omala 220
-3 to 23	HD 320	VG 320	Mobilgear 632	Omala 320
23 to 40	HD 460	VG 460	Mobilgear 634	Omala 460
40 to 80	HD 680	VG 680	Mobilgear 636	Omala 680

NOTE: On **Standard Loads** with output speeds > 100 RPM, please use CPC HD-220 E.P. lubricant or equivalent. On **Heavy Loads** with output speeds < 100 RPM, please use CPC HD-320 E.P. lubricant or equivalent.

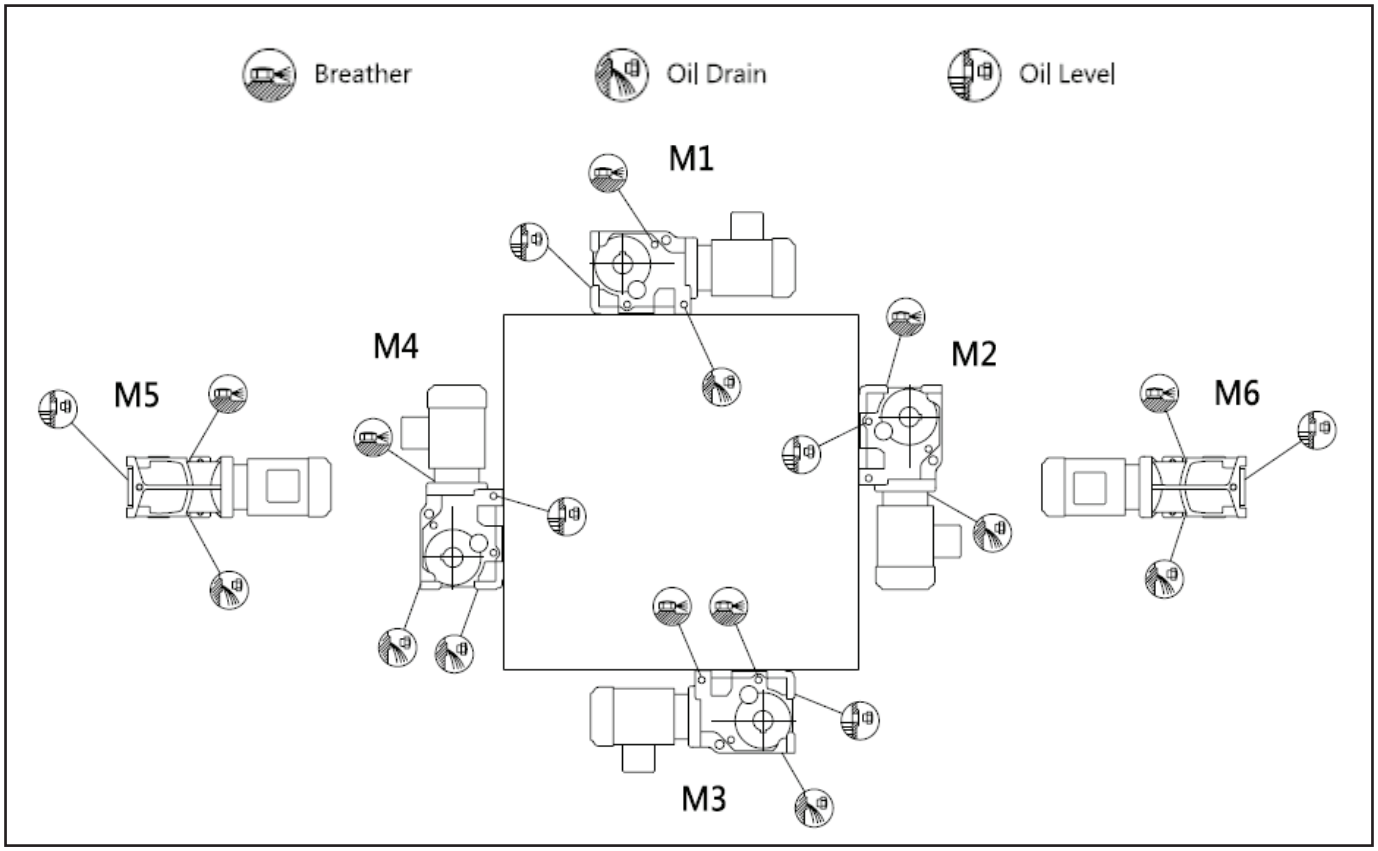
Lubricant Volume by Box Size and Mounting Position

LUBRICANT (unit: liter)							
	Box Size						
Position	37	47	67	77	87	97	107
M1	0.50	0.80	1.10	2.10	3.70	7.00	10.00
M2	1.00	1.30	2.40	4.10	8.20	14.70	20.50
M3	1.00	1.60	2.70	4.60	8.80	15.70	24.00
M4	1.40	2.15	3.70	5.90	11.10	20.00	32.40
M5	1.00	1.60	2.60	4.40	8.00	15.70	24.00
M6	1.00	1.60	2.60	4.40	8.00	15.70	24.00

NOTE: The oil fill volumes shown are recommended values and should not be used exclusively to set the reducer oil level – **ALWAYS** fill the reducer to the correct oil level plug and recheck after one (1) week of use. Units are shipped from the factory prefilled with HD320 mineral oil for an M1 mounting position.

Foot Mounting Positions

Figure 6



Recommended Lubricants: CPC E.P. Lubricant HD

CPC E.P. Lubricants HD are engineered for exceptional metal surface adhesion and are formulated from highly refined base oils and special additives, including EP (extreme pressure) additives, anti-oxidation, anti-rust, anti-foamers, and more. CPC Lubricants also contain sulfur-phosphorus EP additives to form tenacious oil film on metal surfaces that can endure high E.P. and vibration load to prevent gear surface overheating and premature, excessive wear. These oils pass FZG gear test (DIN 51354) with pass load stage 12+.

These oils possess excellent oxidative stability, and effectively prevent gum formation and oil degradation for extended service. Suitable for lubrication of heavily loaded bearings and gears.

CPC E.P. Lubricants are available in three packages:

- Bulk (HD320, HD460, and HD680)
- 200 liter drum
- 19 liter pail (HD150, HD220, HD320 and HD460)

CPC E.P. LUBRICANT HD DATA								
Grade Number	HD32	HD68	HD100	HD150	HD220	HD320	HD460	HD680
Gravity API, 15.6°C	30.4	28.5	27.8	27.1	26.5	25.9	25.3	24.4
Viscosity, Kin. cSt @40°C	31.15	67.2	98.1	143.6	212.2	310.5	440.4	656.2
@100°C	5.26	8.62	11.16	14.38	18.59	23.70	29.80	38.68
Viscosity Index	99	99	99	98	97	96	96	96
Pour Point °C	-18	-18	-18	-18	-18	-18	-18	-12
Flash Point, COC, °C	224	240	256	264	278	290	310	316
Color, D1500	L3.0	3.0	L4.0	4.0	L4.5	4.5	4.5	L5.0
TAN, mgKOH/g	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
Timken EP, OK Load, Lbs	65	65	65	65	65	65	65	70
Carbon Residue, Rams, %	0.25	0.27	0.34	0.40	0.45	0.51	0.56	0.64
Sulfated Ash, %	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Product Number	LA82032	LA82068	LA82100	LA82150	LS82220	LS82320	LS82460	LS82680

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