Italy Headquarters

Installation, use
and maintenance
manual

dinamic oil

Manuale Installazione Uso e Manutenzione riduttori carcassa rotante serie WD/RW/EH

Installation, use and maintenance manual Gearboxes with rotating housing in series WD/RW/EH

Installations, -Gebrauchs- und Wartungshandbuch Getriebe mit drehbarem Gehäuse in den Serien WD/RW/EH

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1 GENERAL INFORMATION

The instructions contained in this manual are an integral part of the planetary gearboxes range for winches.

All required information for purchasers and engineers is included on the dimensional drawings and data sheets provided in the proposal. In the absence of such information, the data provided in the catalogue should be considered correct.

In addition to adhering to rules of best practice in construction, this information should be carefully read and stringently applied. If in any doubt, contact the DINAMIC OIL S.p.A. technical assistance service.

These installation instructions have been designed for the safety of all persons carrying out assembly, transport, handling, installation, start-up and support on planetary gearboxes, however any other technical or specific documentation from the order must also be followed.

There may be attachments to this manual.

The manual is relevant to the following units:

- Gearboxes with rotating housing.

To comply with their “intended use”, they must be operated as described in this manual, and in accordance with the other technical documents (data sheets, catalogues, etc.).

The manufacturer has designed these units for industrial uses. Any use, application and/or installation beyond those described in this manual and other technical documents (data sheets, catalogues etc.) must be agreed/approved by the DINAMIC OIL S.p.A. technical assistance service.

For the purposes of Directive 2006/42/EC on machinery, the gearbox is considered partly completed machinery which will be fitted onto other machines and/or installations. The gearbox must not be incorporated into them and used until all safety issues have been resolved, and it is not permitted to start up the final product (for its intended use) until it has been verified as compliant with Directive 2006/42/EC on machinery.

The customer must accept responsibility for compliance with the Directive 2006/42/EC on machinery and any other community directive relating to safety of machinery.

Planetary gearboxes can pose hazards to persons, animals and material goods. For this reason, all handling, transport, fitting, installation, start-up and support operations must only be carried out by personnel who are trained, qualified and authorised to carry out the task, and who are aware of the potential hazards.

Personnel must have the required qualifications for the task to be carried out, and have attested experience in handling, transporting, fitting, installing, starting up and supporting planetary gearboxes. (see chapter 2, “Safety information”).

1.1 TERMS AND SYMBOLS

Warning
Precautionary measures to be followed to ensure the safety of the operator and persons present in the working area, animals and objects.

Specialist, authorised personnel
Operations which must only be performed by specialist, authorised personnel.

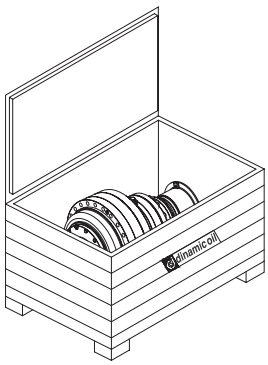
Information
Important information or procedures.

Customer = Manufacturer of final machinery
Manufacturer of final machinery = Person fitting the “partly completed machinery” (gearbox) onto the final machinery
Manufacturer/Constructor = DINAMIC OIL S.p.A.

Oil fill *Oil level* *Oil drain*

1.2 SUPPLY

Upon receipt of the gearbox, check that it has not been damaged and that the item supplied matches the one ordered. If any of these conditions is not fulfilled, contact the DINAMIC OIL S.p.A. sales technical assistance service immediately.



DINAMIC OIL S.p.A. gearboxes are delivered in cases, pallets, carton pallets or simple cardboard boxes, which are carefully organised to prevent movement.
The packaging material should be disposed of according to the national and international environmental standards in force.

Take the utmost care when unpacking.

The gearboxes are supplied as follows:

- Arranged for installation in the assembly position stated when the order was placed.
- **Without lubrication oil, unless otherwise provided for by contractual arrangement.**
- Painted externally with a red, water-based, anti-oxidising undercoat, unless otherwise provided for by contract. This protective coating is suitable for normal industrial environments, even outdoors, and allows further finishing coats of synthetic paint to be applied.
- The external machined parts of the gearbox, such as the outside of the shafts, the resting surfaces and centring units, as well as the internal kinematic mechanisms, require protection with anti-oxidising oil.

2 SAFETY INFORMATION

Follow the simple instructions given in the relevant parts of the manual to reduce or eliminate risk situations.

2.1 GENERAL SAFETY WARNINGS

- These safety warnings apply to all types of gearbox, wheels and other products made by DINAMIC OIL S.p.A..
- Safety warnings contained in the other chapters of this manual must also be observed.
- The safety warnings must be observed at every stage of the product life cycles described in this manual (transport, handling, packaging, storage, installation/fitting, start-up/operation, servicing, dismantling/disposal).
- Failure to observe safety warnings can result in serious health risks and harm to objects and animals.
- If uncertain about safety warnings, contact the DINAMIC OIL S.p.A. sales technical assistance service.
- The personnel that this manual is addressed to must have attested experience and be authorised to carry out the operations.
- While performing the various operations, personnel must also comply with national and international standards on safety and safe working practices.
- Installing and operating damaged units can pose serious safety risks.
- Serious harm can be caused to persons, animals or objects as a result of:
  - improper use
  - incorrect installation or use
  - unauthorised removal of protection systems
- The following risks arise during and after gearbox operation:
  - overheated parts
  - moving parts
  - parts under pressure

2.2 SAFETY WARNINGS FOR HANDLING WHEN UNPACKING AND TRANSPORTING

See point 4, “Transport, handling and storage”.

2.3 SAFETY WARNINGS FOR USE AND OPERATION

Comply with the information appearing in the data sheet.

2.4 SAFETY WARNINGS FOR INSTALLATION AND ASSEMBLY

Comply with the information appearing in the data sheet.

2.5 SAFETY WARNINGS REGARDING ENVIRONMENTAL IMPACT

Units must be disposed of according to the environmental standards in force.

2.6 SAFETY AND INFORMATION NOTICES

Manufacturers applying the CE mark are responsible for applying safety and information notices.

2.7 MANUFACTURER'S LIABILITY

The manufacturer will not be held liable in the event of:
- Gearbox use contrary to national laws on safety and safe working practices.
- Incorrect installation, inadequate or incorrect observance of the instructions given in this manual.
- Electrical or hydraulic power supply failure (for motor gears).
- Alteration or tampering.
- Operations performed by untrained, unqualified or unauthorised personnel.
- Use, applications or installations which do not comply with the instructions given the data sheets or this manual and have not been approved by DINAMIC OIL S.p.A..

The safety of the gearbox also relies upon strict observance of the instructions given in this manual, and in particular:
- The gearbox must only be operated within its limitations of use (see data sheets, catalogues etc.).
- Diligent routine servicing must always be carried out.
- Operators assigned to inspection and servicing must be sufficiently trained.
- Only original spare parts must be used.
- The configurations shown on the dimensional drawings and their instructions in the catalogue are the only ones permitted.
- Do not attempt to use the gearbox in any other way than indicated by the provided instructions.
- The instructions given in this manual are supplementary to, and do not replace, the obligations of current safety legislation.

2.8 RESIDUAL RISKS

Residual risks are potential hazards which cannot be eliminated or can only be partially eliminated, and which can harm the operator if incorrect methods or working practices are used.

Note	Directive 2006/42/ EC Annex I	Description	Remarks
19	1.3.4	Risks posed by surfaces, edges or angles	Correct and non-hazardous positioning is the responsibility of the customer
22	1.3.7	Risks related to moving parts	Protection of the operator from potential risks related to moving parts is the responsibility of the customer
23	1.3.8	Choice of protection against risks arising from moving parts	Protection of the operator from potential risks related to moving parts is the responsibility of the customer
25	1.4.1	General requirements for guards and protective devices	The choice of requirements for guards and protective devices is the responsibility of the customer
26	1.4.2.1	Fixed guards	Fitting any fixed guards is the responsibility of the customer
28	1.4.2.3	Adjustable guards restricting access	Fitting any adjustable guards restricting access is the responsibility of the customer
29	1.4.3	Special requirements for protective devices	The choice of special requirements for protective devices is the responsibility of the customer

2.9 REASONABLY EXPECTED INCORRECT USES

Incorrect use of the partly completed machinery is defined as a use different from that described in the instructions of this manual and the data sheets, but which is reasonably expected human behaviour:

- Negligence of the operator in following the instructions contained in this manual.
- Instinctive reactions of the operator.
- Lack of concentration or carelessness during installation or servicing.

- Behaviour resulting from the pressure to keep the machine running under any circumstances.

3 TECHNICAL INFORMATION

3.1 GENERAL DESCRIPTION OF THE MACHINE

DINAMIC OIL S.p.A. gearboxes have been designed and built to be incorporated into and powered by an electric or hydraulic motor, in finished devices or systems for use in industrial sectors such as construction, chemical, mechanical, agri-foodstuff, transport, naval, etc., once the manufacturer has resolved all safety-related problems of final regulations in accordance with Directive 2006/42/EC on machinery and other community directives (e.g. ATEX).
For certain applications and to satisfy specific requirements, the gearbox may be supplied in various structural forms and configurations, including a range of accessories and optional modifications. For all the technical and information and descriptions about these, see the relevant sales catalogue.
It is the user's responsibility to use the gearbox in a correct manner, complying with the warnings given in this manual.

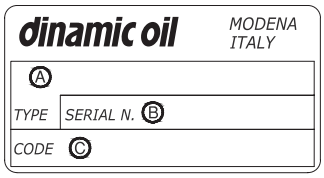
3.2 CONDITIONS AND RESTRICTIONS OF USE

The gearbox may only be installed in the position indicated on the identification plate. Any change to its installation position must be authorised by DINAMIC OIL S.p.A..

The recommended ambient temperature for use of standard gearboxes is: min. -15 °C; max. +40 °C.
Using the gearbox in aggressive environments, in water or other liquids is not permitted unless agreed during the planning stage.
Unless duly marked (ATEX plate), the gearbox may not be used in potentially explosive atmospheres or where explosion-proof equipment is required.

3.3 TECHNICAL DATA

The gearboxes are equipped with identification plates containing the unit's main technical and manufacturing information.
To interpret the product description (A), refer to the sales catalogue.



A) Product description/customer code*
B) Serial number (week, year, identifying number)
C) Product code

*The product description may be replaced by a code supplied by the customer.

Ensure the identification plate is kept clean and clearly visible. If even one item of information on it is no longer legible, request a copy from the manufacturer and replace it.

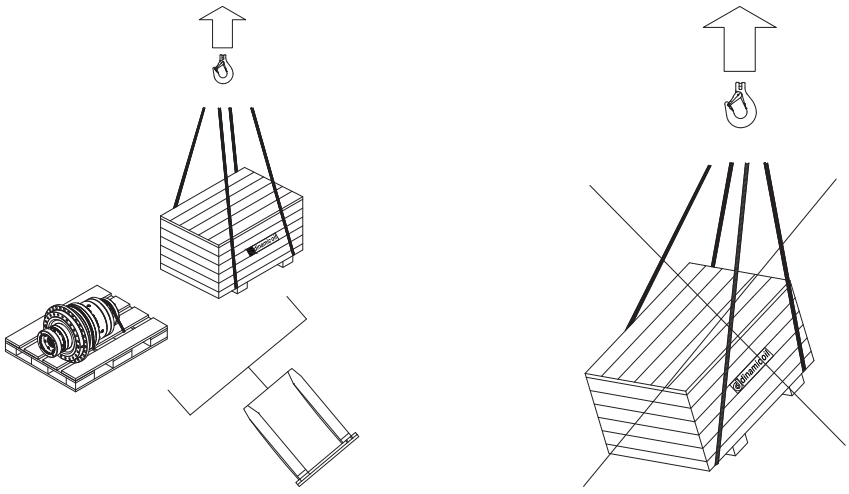
4 TRANSPORT, HANDLING AND STORAGE

Handling personnel must ensure that the required safety conditions are enforced for themselves and for persons in the vicinity.

The cases have a load-bearing structure on the bottom only, while the other sides are for coverage only.
Those structures must therefore not be loaded.

4.1 HANDLING OF THE PACK

Before handling the pack, prepare an appropriate area, marked out and with a flat paved floor for unloading and placing the packs on the ground.
Move the pack using equipment (e.g. forklift trucks, cranes or transpallets) appropriate for the type of pack, in perfect working order, taking into consideration the pack's size, weight and centre of gravity.



Keep packs level to prevent them from tipping over during handling.

Use accessories that comply with the directive on machinery, and which are suitable for the weight to be lifted.

The weight, gripping points and centre of gravity of the package to be handled are shown on the pack.

4.2 HANDLING OF EQUIPMENT

Before taking the gearbox out of its packaging, prepare the relevant lifting accessories (e.g. chains, bands, grills, eyebolts etc.), or handle it using a pallet as a resting platform.

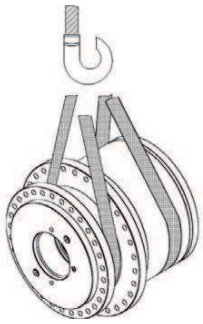
Take the utmost care when unpacking.
Use accessories that comply with the directive on machinery, and which are suitable for the weight to be lifted.

Lift the gearbox, taking care not to unbalance the load while moving.

Refrain from making abrupt movements and perform an initial slow manoeuvre to ensure that the load is balanced.

Move and lay down the gearbox in the area prepared for unloading.

The weight of the equipment to be lifted can be found in **Annex 1**.



4.3 STORAGE

For correct storage of the units, the following steps must be taken:

- For storage for over 2 months, protect the coupling surfaces, such as the flanges, shafts and joints, with a very thin layer of grease and/or protective anti-corrosion fluids.
- Store in a dry place with temperatures of between -5 °C and +30 °C.
- Always place wooden planks or a platform made of other materials between the unit and the floor, to prevent direct contact.
- Do not stack the packages.
- Check the internal gears regularly by rotating the input shaft manually. If the unit is fitted with negative lamellar brakes, release the brake with a hydraulic pump or suchlike.
- Before starting up the unit, we recommend you replace the washers of the static and rotary seals.
- For storage for over 6 months, fill the gearbox with the same type of oil as the oil that is planned to be used when operational, placing the vent cap in the upper part of the gearbox. Before starting up, fill the gearbox with the right amount of oil.

The static and rotary seals will begin to deteriorate after 6 months.

5 INSTALLATION AND ASSEMBLY

Gearboxes must be installed carefully and professionally, by suitably suitably trained and technically skilled authorised personnel.

All the installation operations must be performed to ensure maximum safety levels are guaranteed for both workers and third parties and that the gearbox operates correctly and safely.

All the installation operations must be performed to ensure maximum safety levels are guaranteed for both workers and third parties and that the gearbox operates correctly and safely.

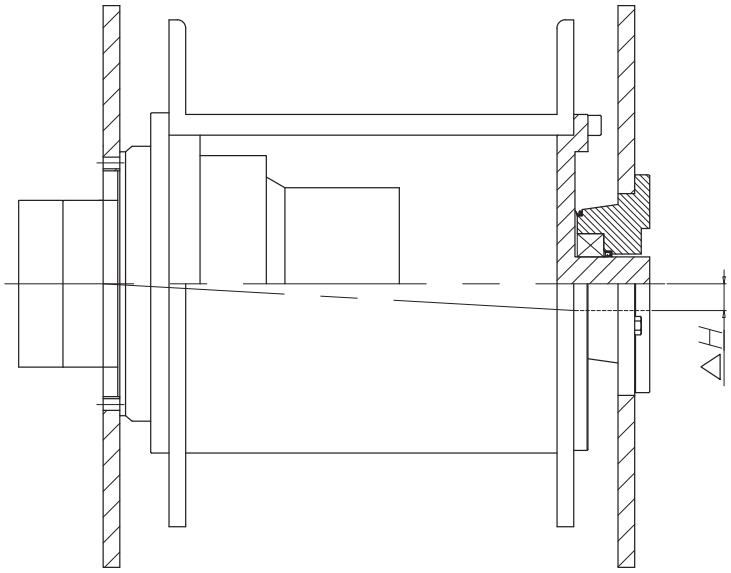
Before installing the gearbox, check that it is in the correct assembly position.

- Tampering with the gearbox and any of the accessories fitted during production is strictly prohibited.
- When any lifting and handling manoeuvres are carried out, care must be taken to ensure the end of the shaft does not hit anything. The relative hoisting straps and/or eyebolts must be used, suitably arranged, and with hoisting means whose capacity is sufficient for the job.
- Welding operations on gearboxes are strictly prohibited without suitable protection.
- Any installation work or servicing must be carried out with the gearbox stationary, therefore it is recommended that you ensure the gearbox cannot be switched on accidentally.
- In the event of connections involving the use of rotary parts such as shafts, joint or pulleys with belts, suitable accident prevention gear must be provided.

General information unless otherwise indicated on the relevant data sheets.

5.1 INSTALLATION OF GEARBOXES IN SERIES WD-RW

Make sure that the gearbox and the rigid structure to which it will be anchored are aligned and at right angles, and that the surfaces to be joined are clean and not dented.
Create slits in the structure aligned with the oil holes and the oil level kit of the gearbox, if present, to ensure that it can be accessed and used.
After completing installation, check that the bending angle “ΔH” does not exceed 0.3 mm.



On the side opposite to the gearbox on the winch structure, there must be an axially free bearing to prevent the winch and the gearbox from being abnormally overloaded.

Anchor the gearbox to the structure with class 12.9 screws, applying the tightening torque shown in **Annex 2**.

Further important operational information is given in the dimensional drawings, data sheets or in any specific documentation for the order.

5.2 INSTALLATION OF GEARBOXES IN SERIES EH

Make sure that the gearbox and the rigid structure to which it will be anchored are aligned and at right angles, and that the surfaces to be joined are clean and not dented.

Anchor the gearbox to the structure of the machine with class 8.8 screws, applying the tightening torque shown in **Annex 2**.

Use class 10.9 or 12.9 screws when the applications will involve strong shocks, frequent stopping and start-up and/or inversion of the direction of motion and when 70 % of maximum admissible torque will be exceeded.

Further important operational information is given in the dimensional drawings, data sheets or in any specific documentation for the order.

5.3 CONNECTION TO BRAKE

In the case of gearboxes prepared for hydraulic motors and complete with brakes, at the time of installation, use an appropriate tube to connect the hydraulic circuit with the command opening on the body of the brake, identifiable by its red cap.

6 START-UP AND TESTING

Improper start-up can damage the gearbox.

At the factory the gearbox's seals are checked for leaks and a vacuum test is performed.
Check the following before start-up:

- That the machinery incorporating the gearbox is compliant with Directive 2006/42/EC on machinery and any other applicable safety standards in force.
- That all rotating parts are sufficiently protected in compliance with Directive 2006/42/EC on machinery.
- That any risks to the safety of persons, animals or objects are resolved.
- That the assembly position is the same as the one shown and required on the identification plate.
- That the oil level is correct (see point 7.4).
- That there is no leakage of lubricant from the caps or washers.
- That, when the gearbox is installed, the anchorage screws are correctly housed and preloaded according to the table (**Annex 2**).
- That appropriate supply systems are used and that they are in good working order.
- That accessories are correctly fitted.
- That the direction of drum rotation is correct in the presence of a brake with a free wheel.

Further important operational information is given in the dimensional drawings, data sheets or in any specific documentation for the order.

Before start-up, the machinery must undergo a functional, documented test, checking the following:
Temperature, noise, any abnormal events, braking torque, working order of accessories.

DINAMIC OIL S.p.A. will not be held liable for damage caused to persons, animals or objects if these tests are not carried out.

7 LUBRICATION

All DINAMIC OIL S.p.A. gearboxes are supplied without lubricating oil.
The user is required to ensure the units are filled with the correct lubricants before putting the machine to use.

7.1 TYPE OF LUBRICATION

The gearboxes are oil bath lubricated. They must be filled with oil before the gearbox is started, visually checking that the right oil level has been reached. This operation requires special care and must be repeated after a few minutes of operation to make sure that the level is correct.

7.2 SELECTING AN OIL

Any mechanical transmission oil with EP additives in viscosity classes ISO VG220 to ISO VG320 under ISO 3448 can be used. In special cases oils with different viscosities may be used. In this case, contact the DINAMIC OIL S.p.A.
technical assistance service. The oil viscosity must be chosen to suit the room temperature and the gearbox's real operating temperature. If the gearboxes must operate at very high ambient temperatures or with very large temperature excursions, synthetic oil is recommended.

Lubricants are potentially harmful/toxic substances to health: always refer to the manufacturer's safety data sheets.

Do not release used oil into the environment. Collect it and send it to authorised bodies for disposal in accordance with legislative provisions in force.

Recommended viscosity

ISO VG 3448	OPERATING TEMPERATURE [C°] / AMBIENT TEMPERATURE [C°]												
	-20°	-10°	0	10°	20°	30°	40°	50°	60°	70°	80°	90	100°
220													
320													

Lubricants for general use:

Manufacturer	Mineral oil	Synthetic oil	
		Polyalphaolefins (PAO)	Polyglycols (PG)
AGIP	Blasia	Blasia SX	Blasia S
ARAL	Degol BG		Degol GS
BP	Energol GR-XP	Enersyn EPX	Enersyn HTX
CASTROL	Alpha SP	Alphasyn EP	Alphasyn PG
CHEVRON	Ultra Gear	Tegra Synthetic	HiPerSYN
DEA	Falcon CLP		
ELF	Reductelf	Elf Syntherma	Elf Syntherma
ESSO	Spartan EP	Spartan S EP	Glycolube
FINA	Giran		
IP	Mellana		Telesia Oil
KLÜBER	Kluberoil GEM 1	Klubersynt EG4	Klubersynt GH6
MOBIL	Mobilgear XMP	Mobilgear SHC	Glygoile
OPTIMOL	Ultra		
Q8	Goya	El Greco	El Greco
SHELL	Omala S2 G	Omala S4 GX	Omala S4 WE
TOTAL	Carter EP	Carter SH	Carter SY

Lubricants for the food industry:

Manufacturer	Gear oil
AGIP	Rocol Foodlube Hi-Torque
ESSO	Gear Oil FM
KLÜBER	Klüberoil 4 HU1 N
MOBIL	DTE FM
SHELL	Cassida Fluid GL

7.3 OIL FILLING AND LEVEL CHECKING

Each gearbox has oil level, filling and drainage caps. Cap configuration may be seen in the dimensional drawing.

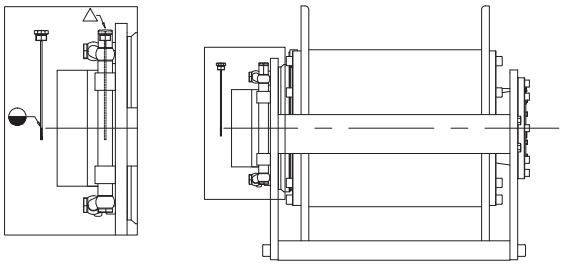
7.4 FILLING PROCEDURE

When being filled, the gearbox must be in the exact position that it will be in when operating.

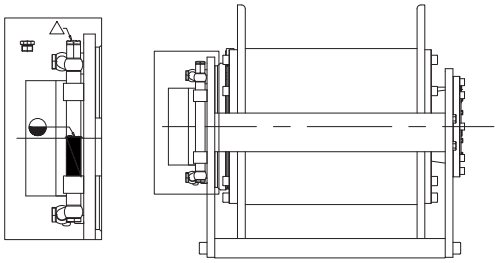
Ensure the power supply is disconnected when filling.

7.4.1 Filling series WD gearboxes

- Horizontal position and level with rod:
  - Unscrew the cap with the rod in the top part of the level kit.
  - Pour the appropriate amount of oil through the corresponding hole (see point 7.5).
  - Use the cap with the rod to check when the level reaches the mid-point.
  - Replace the cap with the rod, tightening it to the recommended torque (see **Annex 2**).

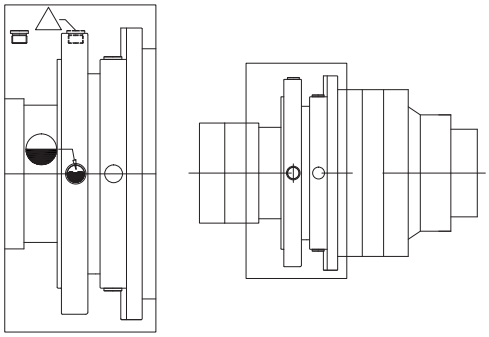


- Horizontal position with visual level:
  - Unscrew the cap in the upper part of the level kit.
  - Pour the appropriate amount of oil through the corresponding hole (see point 7.5).
  - Use the clear tube mounted on this kit to check when the level reaches the mid-point.
  - Replace the cap, tightening it to the recommended torque (see **Annex 2**).



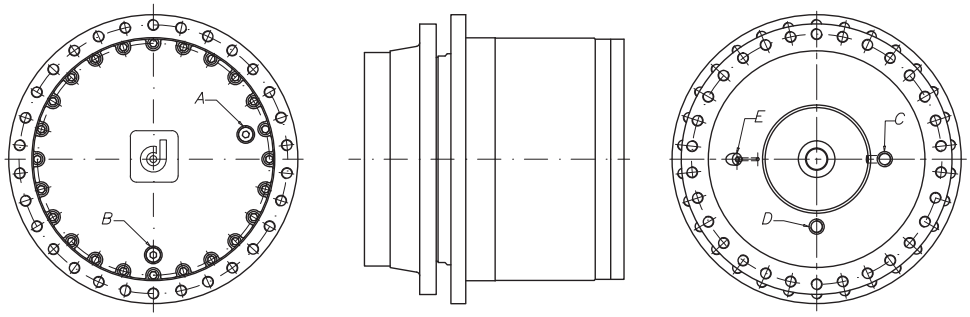
7.4.2 Filling series RW gearboxes

- Horizontal position:
  - Unscrew the cap in the upper part of the flange.
  - Pour the appropriate amount of oil through the corresponding hole (see point 7.5).
  - Use the visual cap to check when the level reaches the mid-point.
  - Replace the cap, tightening it to the recommended torque (see **Annex 2**).



7.4.3 Filling series EH wheel gearboxes

- Horizontal position:
  - Position the gearbox as shown in the figure below:



  - Unscrew caps “A” and “B”.
  - Fill with the appropriate amount of oil through the hole in cap “B” (see point 7.5), adding oil until it comes out of the hole in cap “A”.
  - Tighten the caps again to the recommended torque (see **Annex 2**).

In the case of a cooling system oil enters and exits through caps “C” and “D”, while cap “E” is used to open the brake.

For information on filling in other assembly positions, contact the Dinamic Oil Sales Technical Assistance Service.

7.5 AMOUNT OF OIL

Indicative oil amounts are given in Annex 1 of this manual. These amounts are indicative only. Refer to the level control instruments on the gearbox in order to fill with the correct amount of oil.

7.6 BRAKE LUBRICATION

Negative hydraulic brakes with multiple discs and a lubrication chamber are already lubricated.

7.6.1 FW/FY brakes without a free wheel for series WD gearboxes:

These are dry brakes requiring no lubrication.

7.6.2 FW/FY brakes with free wheel for series WD gearboxes:

Brakes of this type have a lubrication chamber filled with ISO VG 32 hydraulic oil (FX about 0.4 liters, FY about 0.8 liters).

7.6.3 F9 brake with or without free wheel for series RW gearboxes:

This type of brake uses lubricant oil from the gearbox.

7.6.4 F5 brake for series RW gearboxes:

This type of brake has a lubrication chamber filled with ISO VG 32 mineral oil (about 0.1 liters).

7.6.5 Brake for series EH gearbox:

This type of brake is integrated into the gearbox and uses the gearbox's own lubricant oil.

8 SUPPORT AND SERVICING

Servicing must be performed by expert, authorised personnel adhering to the work and environmental safety standards in force.

Servicing on the gearbox must be performed with the power supply disconnected and the gearbox taken “out of service” to prevent it from being switched on accidentally. The oil temperature must be at a safe level so as not to burn the operators.
The instructions given in this paragraph must be followed, ensuring the gearbox is operational and that required levels of safety are met.

Only use original spare parts (refer to the Spare Parts List for the gearbox in question).

- Use lubricants that are recommended by the manufacturer.
- After any servicing work, always replace the seal washers and any lubricating oil.
- Carry out the routine servicing work as set out by the manufacturer.
- Use additional lighting if carrying out servicing work in dimly lit areas, to ensure that it is performed safely.
- Take relevant precautions if carrying out servicing work in enclosed spaces, to ensure that it is performed safely.

DINAMIC OIL S.p.A. will not be held liable for damage caused to persons, animals or objects if non-original spare parts are used.

8.1 ROUTINE SERVICING

Scheduled routine servicing work is carried out on DINAMIC OIL S.p.A. gearboxes by the operator:

Proper servicing improves performance, longevity and safety.

After the first 150 hours of operation:

- Check there are no metal residues of abnormal size in the magnetic caps on the gearboxes.
- Clean the surfaces of the gearbox body and the air ventilation pathways to ensure correct heat dispersal.
- Replace lubricating oil (see point 8.3).

- Check the screws are all tight, and tighten them where required.

After every 500 hours of operation:

- Check the oil levels with the relevant caps.
- Check for any leaks in the seals.
- Check the screws are all tight, and tighten them where required.

After every 2000 hours of operation or at least every 12 months:

- Clean the surfaces of the gearbox body and the air ventilation pathways to ensure correct heat dispersal.
- Check the screws are all tight, and tighten them where required.

It is worth checking for the vibration, noise and temperature of the gearbox while it is in operation.
When repairing, top up the oil to the correct quantity.

8.2 SUPPLEMENTARY SERVICING

If agreed with the customer, DINAMIC OIL S.p.A. can supply suitable servicing procedures on a case by case basis.

DINAMIC OIL S.p.A. prohibits the gearbox from being opened for any operations which are not defined as “routine” servicing.

DINAMIC OIL S.p.A. will accept no liability for harm to objects or persons caused by operations carried out which do not fall within routine servicing and have not been agreed with the customer.

If in need of assistance, contact the DINAMIC OIL S.p.A. technical sales office.

8.3 OIL REPLACEMENT

Replace the lubricating oil according to the schedule set out in the following table, or at least every 2 years.

Average operating duration according to oil type

Operating temperture	Oil type		
	Mineral oil	Synthetic oil	
		Polyalphaolefins (PAO)	Polyglycols (PG)
70° C	7000 hours	15000 hours	16000 hours
80° C	5000 hours	10000 hours	12000 hours
90° C	3000 hours	7500 hours	9000 hours

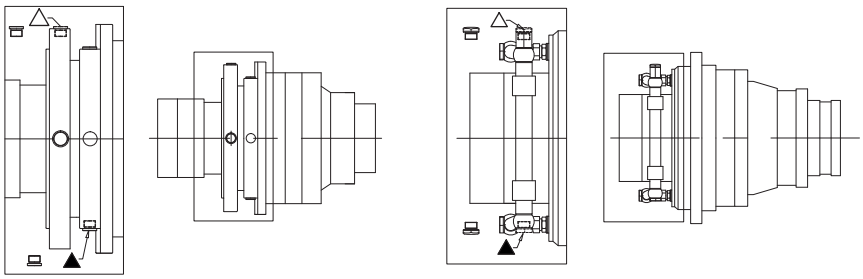
To make it easier to empty the gearbox, it is recommended that oil be changed when the gearbox is warm. Internal parts must be washed with a suitable liquid before filling with new oil. **Oils with different viscosity or different brands of oil should not be mixed. In particular, synthetic and mineral oils must never be mixed together**.
Once the machine is in operation, periodically check lubricant level and top up if necessary.

Do not release used oil into the environment. Collect it and send it to authorised bodies for disposal in accordance with legislative provisions in force.

Empty the oil when the gearbox is warm, but at a temperature not exceeding 40-45 °C to prevent the risk of burns.

8.3.1 Oil replacement procedure for RW/WD

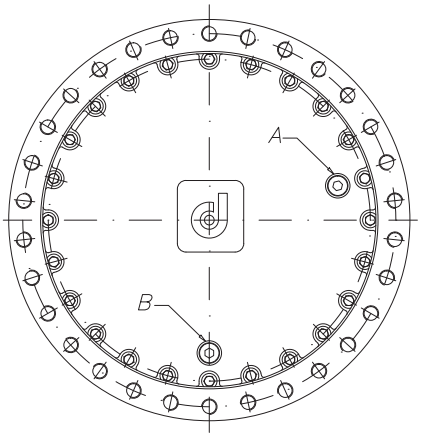
- Place a container of appropriate size under the oil drainage cap.
- Unscrew the gearbox oil filling and drainage caps and let all the oil flow out.



- Wash the inside of the gearbox with a suitable liquid.
- Refill the gearbox with oil (see point 7.4).

8.3.2 Oil changing procedure for EH

- Position the gearbox as shown below:



- Place a container of appropriate size under oil drainage cap “B”.
- Unscrew drainage cap “B” and level cap “A” and let all the oil flow out.
- Wash the inside of the gearbox with a suitable liquid.
- Refill the gearbox with oil (see point 7.4).

9 BREAKDOWNS AND SOLUTIONS

PROBLEM	POSSIBLE CAUSE	SOLUTION
Excessive and/or abnormal noise	Internal problem	Contact the DINAMIC OIL S.p.A. technical assistance service
Excessive vibration	Gearbox not installed correctly	Check the fastening
	Weak coupling structure	Strengthen the structure
	Internal problem	Contact the DINAMIC OIL S.p.A. technical assistance service
Seeping of lubricant from seals	Seals worn or damaged	Contact the DINAMIC OIL S.p.A. technical assistance service
	Seals stiffened after prolonged time in storage	Clean the area and check for seeping after a few hours of operation
	Damaged seats	Restore the seats
Excessive heat	Lack of lubricating oil	Apply lubricating oil
	High thermal power	Contact the DINAMIC OIL S.p.A. technical assistance service
	Insufficient lubrication	Contact the DINAMIC OIL S.p.A. technical assistance service
With the motor switched on, the slow shaft of the gearbox does not turn	Motor not fitted correctly	Check the coupling between the motor and the gearbox
	Jammed brake	Check the hydraulic circuit
	Internal problem	Contact the DINAMIC OIL S.p.A. technical assistance service
Parking brake will not release	Lack of pressure	Check the hydraulic circuit
	Internal problem	Contact the DINAMIC OIL S.p.A. technical assistance service
Parking brake will not apply	Residual pressure in brake	Check the hydraulic circuit
	Worn plate	Contact the DINAMIC OIL S.p.A. technical assistance service

10 DISMANTLING AND DISPOSAL

Before scrapping the gearbox, it needs to be rendered unusable and emptied of lubricant, remembering that used oil has a serious impact on the environment.

The gearbox must be dismantled by expert operators, adhering to the applicable laws on occupational health and safety and environmental protection.
Non-biodegradable products must not be disposed of into the environment under any circumstances.
Disassembled and disused gearboxes produce the following waste: iron, aluminium, cast iron, lubricant, plastic, copper and bronze.
The gearbox parts must be disposed of according to the selective sorting standards in force in the country where the disposal takes place.
For countries in the European Community, with the issue of Commission decision 2000/532/EC, subsequently amended by decisions 2001/118/EC and 2001/19/EC from the Commission and 2001/573/EC from the Council, new community provisions have been introduced regarding waste classification.

Do not attempt to reuse parts or components which may seem to be complete after they have undergone checks and tests and/or replacements by specialist personnel and declared no longer fit for use.

ANNEX 1 - OIL WEIGHTS AND QUANTITIES

WD:	kg	(Liters) OIL ℓ
WD 1023	150	3.5
WD 1523	200	4.5
WD 2003	225	5
WD 2523	275	6
WD 3003	350	8
WD 4803	455	10
WD 8003	660	15
WD16004	1100	30

RW:	kg	(Liters) OIL ℓ
RW 512	75	2
RW 513	85	2.3
RW 612	90	2.3
RW 613	100	2.5
RW 812	130	3
RW 813	140	3.5
RW 1022	145	4
RW 1023	155	4.2
RW 1532	195	5
RW 2522	275	7

EH:	kg	(Liters) OIL ℓ
EH 10000 SC	410	6.5
EH 13000 SC	440	7.5
EH 16000 SC	680	11.5
EH 22000 SC	880	15
EH 26000 SC	980	18
EH 33000 SC	1280	21
EH 33000 W	1280	25
EH 45000 SC	1560	24
EH 60000 SC	3120	50
EH 70000 SC	3120	50

ANNEX 2 - TIGHTENING TORQUE FOR LARGE THREAD SCREWS AND CAPS

Screw thread	Class 8,8	Class 10,9	Class 12,9
	Torque [Nm]	Torque [Nm]	Torque [Nm]
M10	44	62	74
M12	77	108	130
M14	122	172	207
M16	191	269	323
M18	263	370	444
M20	373	525	630
M22	507	714	857
M24	645	908	1090
M27	944	1330	1590
M30	1280	1800	2160
M33	1740	2460	2940
M36	2240	3150	3780
M39	2900	4080	4890
M42	3580	5040	6050

Cap thread	Torque [Nm]
1/8”	5
1/4”	7
3/8”	7
1/2”	14
3/4”	14
1”	25

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