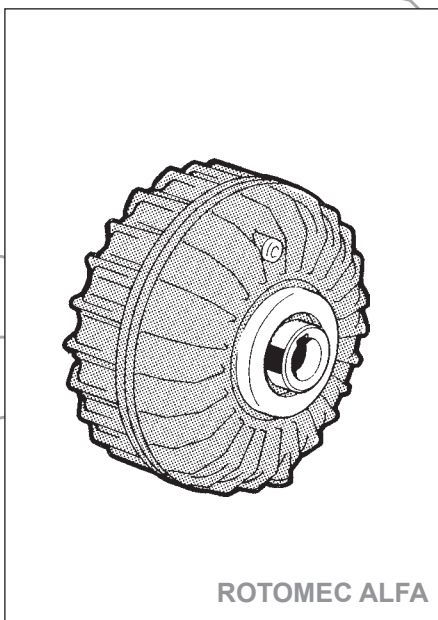


# Constant-fill HYDRO MECHANIC COUPLINGS

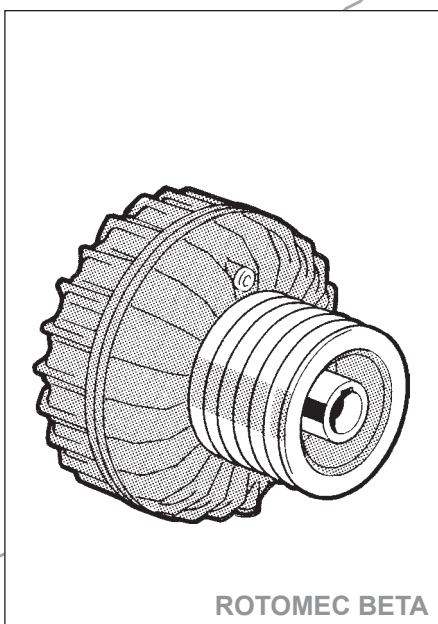


M2021-ENG - ed. 2021-04

# ROTOMECC<sup>®</sup>



ROTOMECC ALFA



ROTOMECC BETA



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# ROTOMECH COUPLINGS

CUSTOMER \_\_\_\_\_

ORDER N. \_\_\_\_\_

## 0.1 TECHNICAL SHEET HYDROMECHANIC COUPLING

TYPE OF MACHINE: \_\_\_\_\_

TYPE OF WORK: \_\_\_\_\_

No-load start-up  Full-load start-up

Start-up n./hour \_\_\_\_\_ Consecutive start-up n. \_\_\_\_\_

Load inertia (PD<sup>2</sup>) \_\_\_\_\_ kgm<sup>2</sup>

N° overloads \_\_\_\_\_ Load start-up \_\_\_\_\_ sec.

Full-load start-up \_\_\_\_\_ sec.

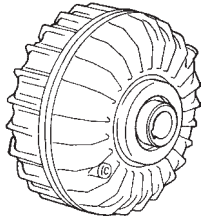
Bore drive end shaft \_\_\_\_\_ mm

Bore of driven end shaft \_\_\_\_\_ mm

Operating area temperature \_\_\_\_\_ °C

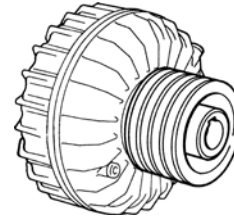
### ROTOMECH ALFA

- ALFA K0
- ALFA K1
- ALFA K2



### ROTOMECH BETA

- BETA H
- BETA J
- BETA X
- BETA Z



Definition: Constant - fill FLUID COUPLING

Type: \_\_\_\_\_

Code: \_\_\_\_\_

Series No \_\_\_\_\_

Year: \_\_\_\_\_

Transmission Fluid: \_\_\_\_\_

Filling:  Standard  Calibration

Actuation on primary wheel:  internal

Rated operating temperature: \_\_\_\_\_ °C

Temperature during start-up: max \_\_\_\_\_ °C

Maximum start-up time: \_\_\_\_\_ S

Expected start-up time: \_\_\_\_\_ S

Lubrication:  constant  self-lubricating

Lubrication:  standard

### SAFETY/TEMPERATURE CONTROL DEVICES SUPPLIED:

- |  |                                |                                |                                |                                |                                   |
|--|--------------------------------|--------------------------------|--------------------------------|--------------------------------|-----------------------------------|
| TF (Fusible Plug)                          | <input type="checkbox"/> 96°C  | <input type="checkbox"/> 120°C | <input type="checkbox"/> 145°C | <input type="checkbox"/> 180°C | <input type="checkbox"/> _____ °C |
| ETP (Expandable Thermal Plug)              | <input type="checkbox"/> 96°C  | <input type="checkbox"/> 120°C | <input type="checkbox"/> 145°C | <input type="checkbox"/> 180°C | <input type="checkbox"/> _____ °C |
| T09 (Plug with Thermostat and RPM counter) | <input type="checkbox"/> 100°C | <input type="checkbox"/> 120°C | <input type="checkbox"/> 145°C | <input type="checkbox"/> 160°C | <input type="checkbox"/> _____ °C |

STANDARD MANUFACTURE

ATEX MANUFACTURE

Ambient: \_\_\_\_\_ Max Temp.: \_\_\_\_\_ °C Ambient: ZONE \_\_\_\_\_ Max Temp.: \_\_\_\_\_ °C

### DRIVE SIDE DATAS:

- Installation:  Horizontal  Vertical
- Type of engine:  Diesel  Petrol \_\_\_\_\_ Rpm
- Electric
- Voltage: \_\_\_\_\_ V \_\_\_\_\_ Hz \_\_\_\_\_ Rpm
- Installed Power: \_\_\_\_\_ kW Power input: \_\_\_\_\_ kW

### DRIVEN SIDE DATAS:

- Installation: Flexible coupling:  YES  NO  Drive - through pulley
- ROTOFLEXI type \_\_\_\_\_ bore Ø \_\_\_\_\_ Primitive diameter: \_\_\_\_\_
- ROTOPIN type \_\_\_\_\_ bore Ø \_\_\_\_\_ Grooves section: \_\_\_\_\_ N° grooves: \_\_\_\_\_
- ROTOGEAR type \_\_\_\_\_ bore Ø \_\_\_\_\_ bore Ø \_\_\_\_\_ bore Ø \_\_\_\_\_
- LAMELLAR type \_\_\_\_\_ bore Ø \_\_\_\_\_

### OPTIONS:

- Brake Disc type \_\_\_\_\_  Brake drum type \_\_\_\_\_

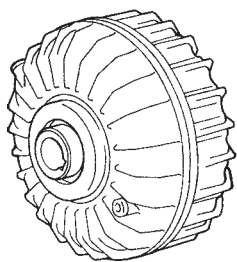


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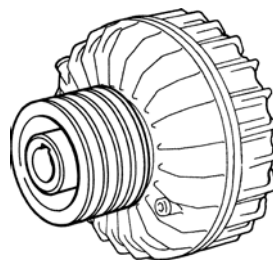
### 0.3 COMPONENTS DEFINITIONS



#### TYPES OF HYDROMECHANIC COUPLINGS

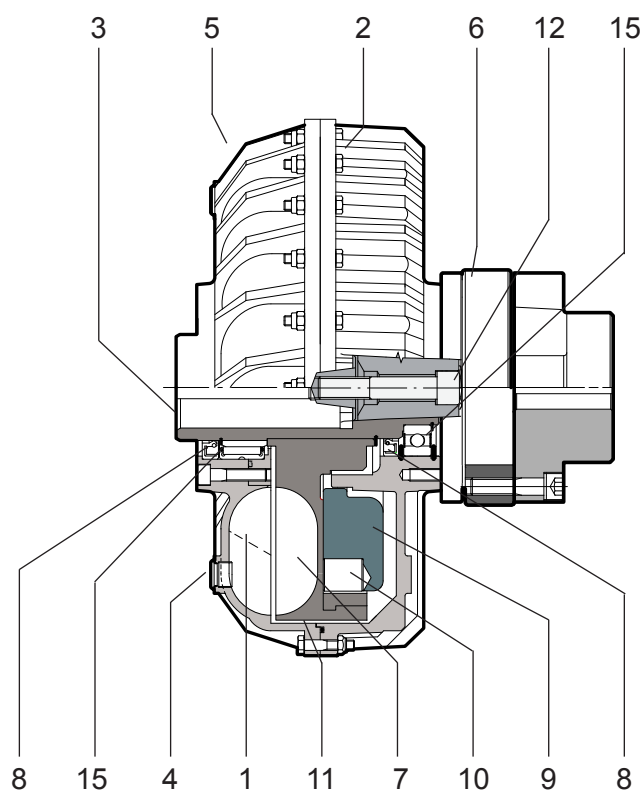


ROTOMECH ALFA



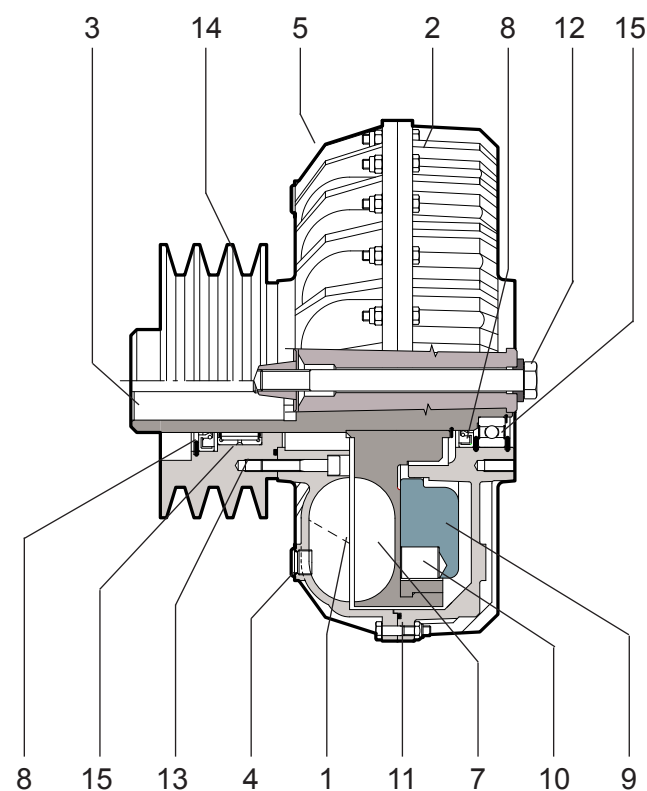
ROTOMECH BETA

#### ROTOMECH ALFA (in-line)



POS.	DEFINITION
1	TRANSMISSION FLUID
2	OUTER SHELLS (external part)
3	HOLLOW SHAFT and INNER PRIMARY WHEEL (internal part)
4	OIL PLUG POSITION (STANDARD)
5	RADIAL PLUG POSITION (OPTIONAL)
6	FLEXIBLE COUPLING
7	PRIMARY WHEEL
8	ROTATING GASKETS

#### ROTOMECH BETA (belt driven)



POS.	DEFINITION
9	CENTRIFUGAL MASSES
10	ROLLERS CENTRIFUGAL COUPLING
11	RADIAL SHELL SEALING
12	HEAD SCREW
13	PULLEY SLEEVE
14	PULLEY
15	RADIAL BEARINGS



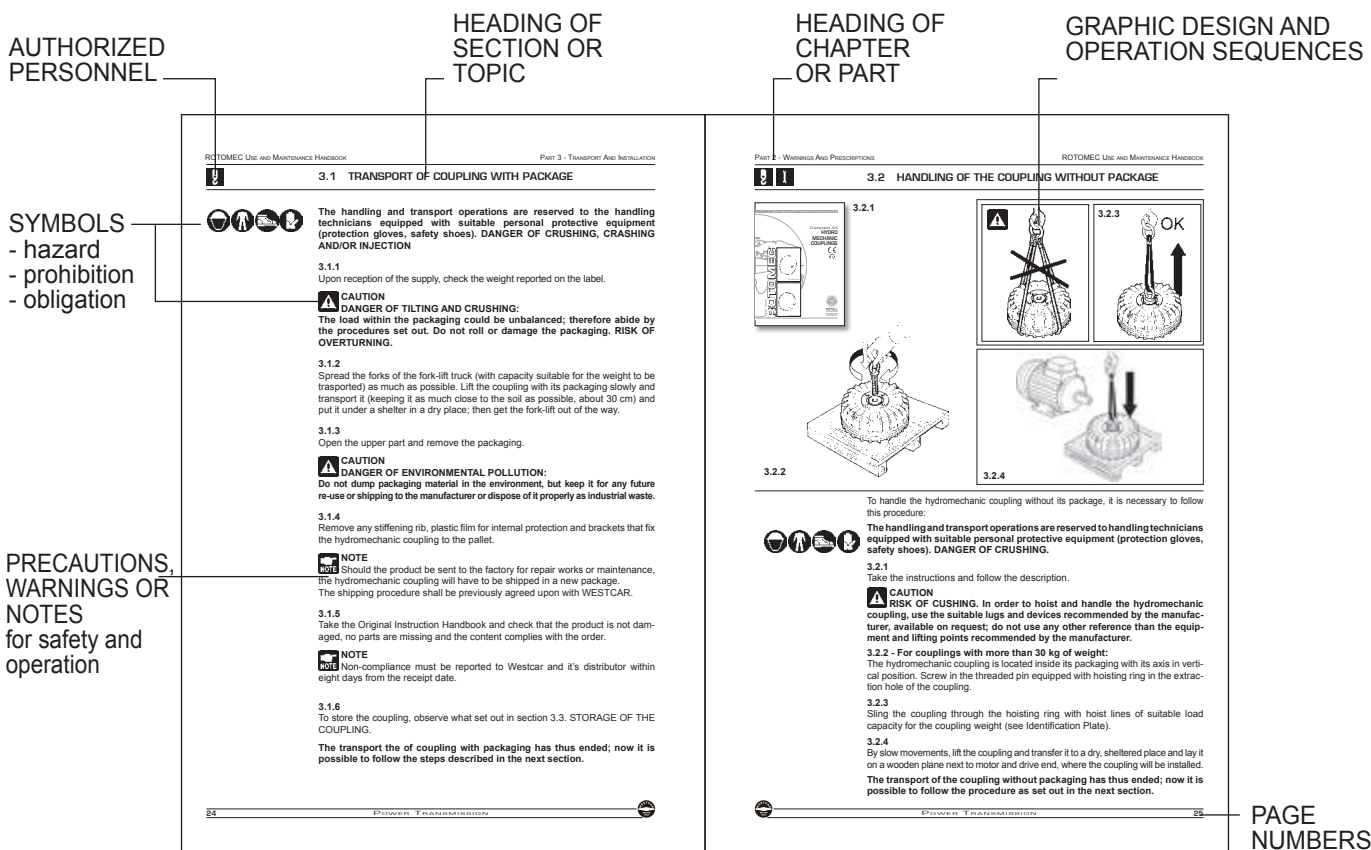


## 0.4 MANUAL LAYOUT AND SYMBOLS

This handbook has been subdivided into topics in order to classify information and operators' activity.

This handbook is composed of several PARTS (chapters) and sections dealing with operational topics to enable correct installation, use and maintenance of the ROTOMECH hydromechanic couplings.

Pages have the following layout and contents:



This document is the property of WESTCAR srl. All copyrights reserved.

This handbook is an integral part to this partly completed machine and it has to be considered as a SAFETY DEVICE; it provides both the purchaser and the personnel (operators and qualified technicians) with the necessary installation, use and maintenance instructions in order to keep the product safe and in good working order for its whole life-cycle. **We recommend to read and to fully understand the content of this manual.** Topics are dealt with in chapters and sections, so that each stage is clearly illustrated in a numbered step-by-step sequence. At the beginning of each section a bar shows the symbols associated with the personnel qualified for the task.

Any operation-related residual risk is highlighted through suitable symbols in the text. In the handbook some symbols are used to highlight and differentiate particular instructions or recommendations, which are of crucial importance for safe operation and/or correct use and maintenance.

These measures allow WESTCAR to draw operators' and qualified technicians' attention to the CAUTIONS, WARNINGS OR NOTES concerning them.

For any further clarification on the content of this handbook, do not hesitate to contact your WESTCAR Customer Support Service.

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web site: [www.westcar.it](http://www.westcar.it)



**SYMBOL CAUTION**



This signal warns the workers that the described task may involve exposure to residual risks with harmful effects on health and it may result in very serious accidents, should they fail to comply with the procedures and safety regulations herein described.

**SYMBOL WARNING**



This signal warns the workers that the described task may damage the partly completed machine and its components; failing to comply with the safety rules may involve consequent risks for the operator and/or the environment.

**SYMBOL NOTE**



It provides information on the task in progress, when it needs to be highlighted due to its great technical significance.

**SYMBOL PRODUCT MANUFACTURED ACCORDING TO THE ATEX STANDARD**



The hydromechanic coupling bearing this mark has been manufactured according to the ATEX standards in compliance with the ATEX Directive 2014/34 EU.

**SYMBOL SYMBOLS OF DANGER**

In combination with the text, they point out the type of residual risk that the task in progress may involve:



Danger of ignition and/or zones with explosive atmosphere



General hazard



Heated areas, danger of burns



Moving components



Danger of explosion



Fire danger



Dangerous voltage and risk of electric shock



Risk of slippery floor and falling

**SYMBOL SYMBOLS OF PROHIBITION**

In combination with the text, they point out the type of prohibition that shall be observed during the described activity:



Do not touch and keep away



Do not remove protections and guards, when machine is operating



Do not lubricate or interfere with moving parts.



## SYMBOL

## SYMBOLS FOR MANDATORY SIGNS

In combination with the text, they point out the type of individual protection that must be used to carry out the described intervention:



It is mandatory to wear protection gloves



It is mandatory to wear protection shoes



It is mandatory to wear protective clothing



It is mandatory to use protection helmets



It is mandatory to disconnect voltage before any task

## SYMBOL

## HANDLING OPERATOR



It identifies the kind of worker, who is qualified for the task in question. The workers, who qualify for this task must have thorough knowledge and understanding of the manufacturer's handbook instructions as well as specific competencies and knowledge of hoisting equipment and systems, slinging and safe handling features.

## SYMBOL

## MACHINE OPERATOR



It identifies the kind of worker, who is qualified for the task in question. This qualification is based on thorough knowledge and understanding of the manufacturer's instruction handbook as well as the required training. Special engineering competencies are required to accomplish mechanical installation and assembly. When this sign is matched with the explosion protection symbol, the technician or operator must have a profound and specific knowledge of the safety rules necessary to work in these environments.

## SYMBOL

## MECHANICAL INSTALLER



It identifies the kind of worker, who is qualified for the intervention in question. This qualification is based on thorough knowledge and understanding of the manufacturer's instruction handbook as well as the completion of the required training. Specific requirements and competencies are required to carry out both mechanical repair and ordinary maintenance. When this sign is matched with the explosion protection symbol, the technician or operator must have a profound and specific knowledge of the safety rules necessary to work in these environments.

## SYMBOL

## EXTRAORDINARY INTERVENTIONS



It identifies the tasks solely and exclusively reserved to technicians of the WESTCAR Customer Support Service.





## 1.1 WESTCAR INSTRUCTION LETTER ON DELIVERY

If equipped with suitable ATEX marking, the hydromechanic coupling of the ROTOMECH series has been designed and manufactured in compliance with the 2006/42/EC Directive (concerned points) and the ATEX 2014/34/EC Directive.

It is not harmful for the operator, if it is used according to the instructions of this handbook and provided that the safety equipment is constantly kept in good working order.

This paper aims at certifying that, on receipt of the hydromechanic coupling:

- the coupling safety equipment is undamaged and efficient;
- the hydromechanic coupling is delivered with this handbook and the user takes the responsibility to read and understand it as well as to follow it step-by-step.

The manual must be kept in good condition and the instructions about maintenance, safety inspections, warnings and prescriptions shall always be kept available on site for the technicians, who are in charge of the installation and final operators.

The manufacturer is not liable for any modification, tampering or any alteration accomplished in violation of what above described and dealt with in this handbook. Any modification not duly authorised in written by Westcar may be dangerous to safety, people's and animals' health or property near the machine. The manufacturing company has committed itself to developing an easily searchable guide aimed at illustrating any function and performance of the fluid coupling as well as the safety-related aspects to fully exploit its potential.

The drawings and any other document delivered with the hydrodynamic coupling are the property of WESTCAR, which reserves all rights and forbids any conveyance to third parties without its written authorization.

**ANY INTEGRAL OR PARTIAL REPRODUCTION THROUGH ANY MEANS OF THIS MANUAL AND ITS CONTENT, TEXT OR PICTURES, IS STRICTLY FORBIDDEN.**





## 1.2 HYDROMECHANIC COUPLING IDENTIFICATION

Each WESTCAR hydromechanic coupling is equipped with a small identification plate which, besides the manufacturing code and serial number, shows important safety information necessary for transport and handling, installation and maintenance as well as for its correct use.

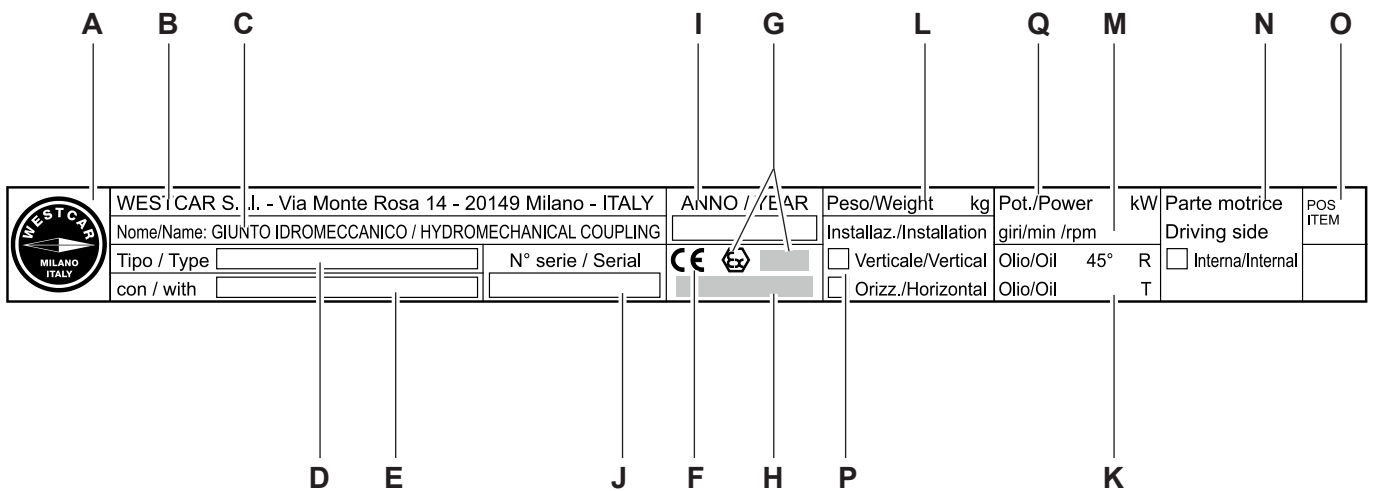


### CAUTION

Any removal and/or alteration of the ID plate and the data reported in it may determine the expiry of the warranty and the loss of compliance with the mentioned directives.

To contact the manufacturer or other Customer Support Service authorized by WESTCAR, always point out the data showed on the identification plate.

Below you can read the content of the fields of the ID plates fixed on the ROTOMECH hydromechanical coupling.



POS.	DESCRIPTION
A	WESTCAR logo
B	Manufacturer's identification data
C	Name of the partly completed machine
D	Coupling identification code abbreviation: type
E	Component or accessory identification code
F	EC Marking
G	ATEX marking and protocol no. (if any)
H	ATEX product protection class (if any)
I	Production year

POS.	DESCRIPTION
J	Product serial number
K	Oil fill data / Calibration
L	Weight of the no-load hydromechanic coupling
M	Maximum admitted rotation speed
N	Connection to the drive end
O	Product code
P	Installation: horizontal / vertical
Q	Drive end: power/rpm





### 1.3 MARKING OF ATEX HYDROMECHANIC COUPLINGS

The ROTOMECH constant-fill hydromechanic coupling is manufactured to fulfil customer's needs according to an explosion protection process, in compliance with the 94/9/EC/ATEX directive.

The couplings are built

- **Category I M2** for mining industry
- **Category II 2 G/D** for surfaces industry

The ATEX marking placed on the hydromechanic coupling defines its design and production characteristics and its anti-explosion protection level as well as the limits of its use.

CE	Ex	I/II	M2/2	G/D	Ex	c	Mb/Gb/Db	IIB/IIC	T3/T4
									Class of temperature: T3=200°C T4=135°C
									Assembly for gas ignition: IIB=Ethylene IIC=Hydrogen acetylene
									EPL Protection Level: - Mb = Mining Protection valid for ordinary functioning and foreseeable malfunction - Gb Db = Surface Protection valid for ordinary function and foreseeable malfunction
									Construction Safety Protection Mode
									Ex - International Sign Ex
									G Gas D Dust
									M2 High protection category for mining industry 2 High protection category for surface industries
									I Mining II Surface
									Symbol for ATEX marking (2014/34/UE directive)
									European Compliance





## 1.4 WARRANTY

The ROTOMECH couplings are submitted to the following controls:

- dimensioning test of single parts,
- concentricity and perpendicularity control of all assembled parts with respect to the rotation axis,
- balancing in G6.3 ISO grade of single components,
- inspection of seals on the whole surface and gaskets with 4 bar internal pressure.

Should abnormalities occur, please call your WESTCAR CUSTOMER SUPPORT SERVICE, which will help you as early as possible.

Please always point out what follows:

- A - Full client's address,
- B - Hydromechanic coupling type and serial number, as shown on the identification plate
- C - Description of the defector abnormality found.

THE ROTOMECH CONSTANT-FILL COUPLING IS COVERED BY THE FOLLOWING WARRANTY:

### 1 Warranty Conditions

The WESTCAR guarantee term is 12 months (barring different forms of contract) for all defective mechanical parts with exemption of all worn parts. The guarantee term starts from the machine delivery date as shown in the delivery note.

### 2 Defect Report

The purchaser shall notify in written to WESTCAR within 8 days the defect found.

### 3 Defective Materials

WESTCAR may solve any problem due to material, machining or design defects, under the terms set out in point 1 of the warranty.

### 4 Warranty Extension

In case of repair or replacement of hydromechanic coupling parts, this warranty will not be extended. Our six-month warranty only covers the parts replaced in our workshops.

Our technician's travelling and maintenance expenses as well as the shipping expenses borne for the removal of any defect will be fully charged.

### 5 Reserved Evaluation

The defective parts shall be returned to WESTCAR, which reserves the right to check them in its own workshops in order to identify the real defects or the external reasons which may have caused the damage. If no defect can be found in the product parts, WESTCAR reserves the right to debit the full cost of the parts previously replaced and covered by this warranty.

TO BE COVERED BY THE BUYER:

### 1 Transport of Materials

Costs and risks of transport of the defective, repaired parts as well as of the parts supplied for replacement, inclusive of any custom duties, are to be borne by the purchaser.

### 2 Obligations from Warranty

Repair or replacement of the defective parts amount to full satisfaction of the obligations stemming from this warranty.

### 3 Direct and Consequential Damages

This warranty shall NOT include any consequential damage and specifically any machine standstill or production downtime.

### 4 Wear-and-Tear of Materials

The warranty does not cover the usual wear-and-tear of any material.

### 5 Exclusion from Warranty

Any damage resulting from improper or negligent use, wrong maintenance of the part, transport or any circumstance other than operating or manufacture defects is not included in this warranty.

### 6 Disclaimer of responsibility

Warranty cover expires in case of improper use, wrong application and disregard of the instructions of this handbook.

**All WESTCAR products are covered worldwide by this "Product Liability Insurance"**



## 1.5 GENERAL NOTES ON DELIVERY

Upon delivery, please check that the number of packages matches what reported in the delivery note:

- ROTOMECH hydromechanical coupling
- Use and maintenance handbook (Original Instructions)
- Warning plate kit
- Over heating control devices (TF,TE,PM+T09)
- Accessories (if any)

Please also check what follows:

- 1- the parcel is intact,
- 2- shipping data (consignee's address, number of parcels, order no.) matches the order and the goods delivery note.
- 3- the delivered objects are not damaged.

Should any of the parts be damaged or missing, please inform immediately (within 8 days from receipt) the manufacturer or the local distributors or agents, the forwarding agent and/or the insurance company providing details (photographs, if needed).

**The operator in charge of the maintenance must conveniently store the supplied materials under shelter, in a dry and safe place, not accessible to unauthorized personnel.**



## 1.6 HYDROMECHANICAL COUPLING DESCRIPTION

The ROTOMECH constant filling hydromechanical coupling consists of two impellers opposite to each other, one connected to the motor shaft or motor part, called pump, and the other connected to the machine or driven part, called turbine.

The pump and the turbine are not connected to each other and the transmission of motion and the torque in absence of usury, through a suitable transmission fluid, with which the hydromechanical coupling is filled.

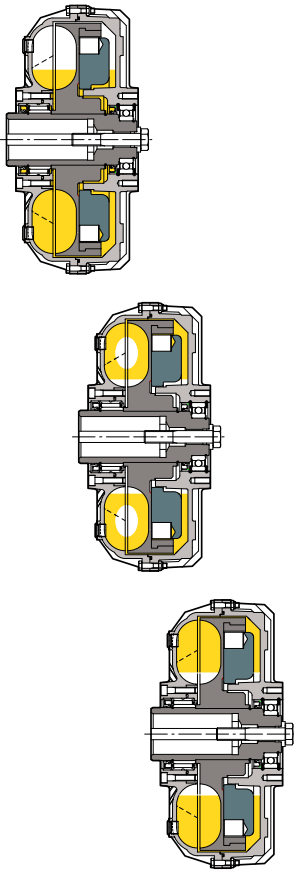
The mechanical power supplied by the motor or motor part, to which the coupling pump is connected, is transformed into hydrodynamical energy of the transmission fluid (inside the coupling) that, in contact with the opposite turbine, it is again converted into mechanical energy, with the progressive transmission of the torque to the driven part.

On the opposite side of the pump (between the pump and the cover) there is a centrifugal coupling, consisting of four centrifugal masses with wear-resistant rollers that grip radially on the external ring of the pump, allowing the residual sliding to be neutralized, giving a power transmission and rotation efficiency of 100%.

The operating principle of the transmission torque of the ROTOMECH coupling provides for a series of important advantages for the mechanical protection of transmission elements: soft starts, a remarkable reduction in power and energy consumption on start-up as well as an important protection against overload at full capacity.



## 1.7 WORKING PRINCIPLE



To operate, the mechanical status of the hydromechanic coupling and the transmission fluid it contains must undergo three main changes:

### Step 1: DRIVE END STOP

The stopping of the motor or the drive end, which the pump is connected to, determines a state of hydrostatic equilibrium of the filling fluid inside the hydromechanic coupling and the lack of motion and torque transmission.

### Step 2: START-UP

By starting the motor or drive end, the pump starts speeding up the transmission fluid by progressively creating a hydrodynamic dragging force in the hydraulic circuit of the coupling, which imparts motion and transmits the torque to the turbine (or driven end). This step results in a higher slip of the transmission fluid and the subsequent conversion of the force into thermal energy or heat. During the start-up phase, the torque is transmitted by the characteristic flow pattern of the fluid in the hydraulic circuit of the coupling and by the type and level of transmission fluid.

During the transmission phase, takes place the gradual connection of the internal centrifugal coupling to hydromechanics coupling pump.

### Step 3: OPERATION AT FULL CAPACITY

Once operation at full capacity is reached, the hydromechanic coupling transmits 100% of torque and speed to the driven machine. The full capacity operation of the ROTOMECH coupling occurs in the absence of sliding of the input revolution compared to the output ones, thanks to the combination of the hydromechanic circuit state and the internal centrifugal coupling.



## 1.8 INTENDED USE AND SAFETY DEVICES

### INTENDED USE

The ROTOMECH constant-fill hydromechanic couplings have been designed and built to transmit the torque (or torsional moment) from the motor (or drive end) to the driven machine through a suitable internal transmission fluid, so to obtain a gradual start-up without resorting to any starting equipment (delta-star start-up, inverter, static starter) and full transmission of 100% of the torque and the number of the revolution (without sliding).

The correct intended use of the constant-fill hydromechanic coupling is determined by an installation, which complies with the following requirements:

- correct dimensions of the coupling (size),
- quantity and type of transmission fluid (transmission oil) for the type of requested start-up,
- maximum number of consecutive start-up procedures / start-up procedures per hour
- suitable safety and temperature control devices
- correct use of both the standard and ATEX version of the coupling designed for hazardous areas.
- correct connection of the driving end to the external or internal side of the fluid coupling.

Each hydromechanic coupling is thus designed for a specific industrial application, that shall be subsequently respected.

**COUPLING DIMENSIONING**

The coupling dimensioning (hydromechanic coupling size) and filling are defined as a function of the power and rpm of the driving end and the torque required by the driven machine (see identification plate).

**START-UP TYPE**

The configuration of the hydromechanic WESTCAR coupling is determined by the quantity of transmission fluid in the coupling, this pattern defines the ratio between the STARTING TORQUE (ca) and the RATED TORQUE (cn), thus showing a typical transmission curve on start-up.

**MAXIMUM NUMBER OF START-UP PROCEDURES**

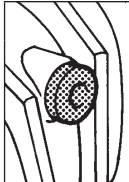
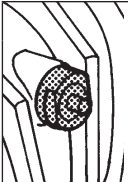
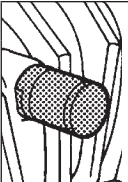
In the event of difficult start-up of the coupling (on load or due to frequent machine start-up), when temperature increases too much if compared to normal operating conditions, it is necessary not to exceed the MAXIMUM NUMBER OF START-UP PROCEDURES/HOUR AND/OR THE MAXIMUM NUMBER OF CONSECUTIVE START-UP PROCEDURES, which shall comply with the results obtained from the formulas reported in the WESTCAR catalogue.

**SAFETY AND TEMPERATURE CONTROL DEVICES**

The constant-fill hydromechanic coupling is configured according to the specific customer's needs and equipped with one or more safety and/or overheating control devices (TF = Fusible plug, TE = Expandable Trip Plug or PM+T09 = plug with thermocouple and rpm controller, SCD = device for overload control). These devices become an integral part of the coupling configuration and further define the field of application and the boundaries of its intended use (see chapter PART 5). They perform an important safety function against overheating phenomena, that may be originated by overloads on the driven end or abnormal conditions.

**IDENTIFICATION OF THE INTERVENTION TEMPERATURES OF THE DEVICES**

The overheating control devices TF, TE and PM are identified through special stamping and suitable colours, that make easier to recognize the special features of each device:

	TF	TE	PM
	BLUE 96°C WHITE 120°C RED 145°C GREEN 180°C	 BLUE 96°C WHITE 120°C RED 145°C GREEN 180°C	 BLUE 100°C WHITE 120°C RED 140°C GREEN 160°C

**CAUTION**  
 It is not allowed to change colour or replace the pad of fusible material in the safety and overheating control devices. DANGER OF OVERHEATING OF THE COUPLING DUE TO THE TAMPERING

**DRIVE END CONNECTION TO THE COUPLING**

When assembling, the drive part (motor) must always be connected

**WARNING**  
 It is forbidden the installation of ROTOMECH hydromechanic coupling with motor side connected to the external part.



## 1.9 IMPROPER AND FORBIDDEN USE OF STANDARD AND ATEX COUPLINGS



### CAUTION

Any deviation from the use previously explained in these Original Instructions has to be considered as misuse and it is not allowed by WESTCAR.

It is especially forbidden to use the ROTOMECH constant-fill hydromechanic coupling for the following applications:

- as revolution limiter,
- when the drive end is mounted on the external side (indicated on the hydro-mechanical coupling)
- when it is mounted in unsuitable locations or in locations, where temperature is higher or lower than expected,
- when torque transmitted is higher than the value requested by the coupling,
- when rotation speed is higher than permitted (see plate),
- when the coupling is filled with a too large or too small amount of transmission fluid in comparison with the quantity reported by the manufacturer,
- when transmission fluids are not appropriate or do not match the fluids recommended by the manufacturer,
- when the start-up time is higher than the maximum time expected,
- when start-up cycles occur in close sequence or exceed the number recommended by the manufacturer,
- in default of safety and temperature control devices or if devices have been tampered with, deteriorated or are different from what reported on coupling configuration (see Technical Data Sheet),
- in case the motor is lacking of an automatic shutdown device, which may block it in the event of transmission fluid leakage (TF) or triggering of maximum temperature devices (TE or PM),
- when there are no suitable protections and/or fluid containment elements for couplings equipped with TF,
- if a suitable ventilation air intake is not available,
- when it is mounted next to intense heating radiation sources, hot air streams,
- next to strong vibration or percussion sources,
- in case of tampering, removal, insertion, deformation due to shocks or fire, which may bring about unbalance,
- in case of both axial or orthogonal installation misalignments, which generate unbalance or vibrations,
- when couplings without ATEX marking are used in potentially explosive atmospheres,
- if checks and maintenance have not been planned as recommended by the manufacturer.

### ONLY FOR ATEX FLUID COUPLINGS



### CAUTION

**Do not install or use hydromechanic couplings without ATEX marking:**

- when the coupling falls into an ATEX protection or temperature category, which is not suitable for the hazardous location where it operates,
- in environments, where methane concentration is or may temporarily be equal or higher than 1%,
- when the hydromechanic coupling is lacking of a suitable earthing system and equipotential bonding.





## 1.10 REQUIREMENTS FOR STANDARD e/o ATEX INSTALLATION

The hydromechanic coupling is a partly completed machine exclusively designed for use in industrial environments and its installation must be in compliance with the following requirements:

- indoor use in a protected location/room,
- ambient temperature between  $-20^{\circ}\text{C}$  and  $+60^{\circ}\text{C}$  (suitable types of oil must be used),
- atmosphere of the operating zone void of corrosive or acid mists
- plant including a coupling equipped with a safety device TF (Fusible Plug) and provided with both protection guards and fluid collection containers, should the fluid leak due to overheating,
- mandatory use of appropriate biologic mineral oil to safeguard the environment
- installation room provided with interlocked protections, which prevent any access when voltage is supplied,
- suitable room layout to prevent objects from falling or any access to the coupling during operation,
- installation location far from intense vibration sources,
- installation location far from heat irradiation, hot air streams or electrostatically charged air,
- easily accessible location for safe maintenance works,
- installation in potentially explosive atmospheres, where methane concentration is lower than 1%.
- correct identification of
  - environment: I mining / II surfaces ind.
  - category: M2 mining / 2 surfaces ind.
  - Epl Protection Level Mb mining: Gb/Db surface industries
  - Gas Group Ignition: IIB /IIC



### CAUTION

**This handbook must be forwarded to the final user of the machine or partly completed machine, where the hydromechanic coupling will be incorporated, because it provides information for its safe use and correct maintenance schedule.**

The installation of the ROTOMECH constant-fill hydromechanic coupling must be compliant with the data reported on the identification plate, the manufacturer's instructions in the TECHNICAL DATA SHEET and in this Use, Maintenance and Installation Handbook. For use in environment with characteristics different from what pointed out above, please call the WESTCAR Technical Department.



### CAUTION

**Should oil leak after intervention of the fusible plug (TF), it is mandatory to stop the motor as soon as possible; RISK OF OVERHEATING of non lubricated bearings and gasket seals.**

- **When using a coupling in over see machines, it is required to stop the motor within 3 min.**
- **When using a coupling in machines without operator, it is required to install an automatic shutdown device to immediately stop the engine.**



## 2.1 GENERAL SAFETY RULES

### 2.1.1

Before installation, the customer has to make sure that the safety requirements for installation are observed (see section 1.10 REQUIREMENTS FOR STANDARD AND ATEX INSTALLATION). The temperature in the installation location must respect the operating characteristics of each hydromechanic coupling (see TECHNICAL DATA SHEET OF THE FLUID COUPLING).

### 2.1.2

Handling (hoisting and unloading) of the hydromechanic coupling must be effected with lifting equipment of suitable load capacity recommended by the manufacturer.



**Do not use any equipment and hoisting point not expressly recommended by the manufacturer; the hydromechanic coupling centre of gravity is irregular: RISK OF OVERTURNING AND/OR LOAD LOSS.**

### 2.1.3

The installation of the hydromechanic coupling must respect all instructions reported in the identification plate and the TECHNICAL DATA SHEET OF THE HYDROMECHANIC COUPLING. **The installation of the coupling, which is not in compliance with the data reported on the identification plate and the TECHNICAL DATA SHEET, is prohibited.**

### 2.1.4

The hydromechanic coupling must be connected and held tightly in place at the drive end through an integral clamping system using appropriate devices as foreseen by the manufacturer (central clamping screw, see section 2.3).



**Any installation of the hydromechanic coupling not integral to the plant or accomplished through devices, which are not included in the manufacturer's recommended parts list, is not allowed. RISK OF UNBALANCE AND/OR DYNAMIC FAILURE.**

### 2.1.5



The installation room must have suitable air intakes for heat dissipation. **Hydromechanic coupling installation with no or insufficient air flow is not allowed. DANGER OF OVERHEATING.**

### 2.1.6



The hydromechanic coupling should never be exposed to heat sources, which may rise its temperature; installation in hot rooms needs a suitable forced ventilation system for heat dissipation.

**Do not install the hydromechanic coupling next to heat sources, if no forced ventilation is available. DANGER OF OVERHEATING.**

### 2.1.7



The installation room of the hydromechanic coupling must be equipped with interlocked protections and suitable safety switch in order to prevent access during component rotation and/ or when voltage is applied to the drive end.

**No admittance to the hydromechanic coupling is permitted during component rotation and/or when voltage is applied to the drive end. DANGER OF DEATH.**

### 2.1.8

In plants where the noise level is higher than 80 dB, suitable soundabsorbing devices are required.

**2.1.9**

The hydromechanic coupling equipped with fusible plug TF must have suitable protections for hot oil containment and collection in case of overheating.



**Do not install the hydromechanic coupling equipped with fusible plug TF if no suitable protection is available to contain and collect hot oil. DANGER OF SCALDING AND/OR SLIPPERY FLOOR.**

**2.1.10**

Under abnormal operating conditions or when the hydromechanic coupling is equipped with fusible plug TF, hot oil leakage may occur.



**The hydromechanic coupling cannot be installed near cables or electric equipment, which are accessible or not protected against high temperature. DANGER OF SHORT CIRCUIT AND/OR FIRE.**

**2.1.11**

The hydromechanic coupling is equipped with one or more safety and temperature control devices, whose triggering causes the driving end to automatically stop.



**The drive end and the hydromechanic coupling must be prevented from operating after the release of the safety and temperature control devices, which the coupling is equipped with. In particular, the FP triggering causes the transmission and bearing lubrication oil to leak.**

**DANGER OF OVERHEATING, SEIZURE AND/OR FIRE.**

**2.1.12**

The hydromechanic coupling is equipped with one or more safety devices for overheating control. **Do not tamper with, remove and/or disable the installed safety device.**



**After triggering, it is necessary to restore and/or replace the device with an original spare part having identical triggering characteristics and to reset it before restarting the drive end.**

**DANGER OF OVERHEATING, SEIZURE AND/OR FIRE.**

**2.1.13**

The installation of the hydromechanic coupling must be effected by observing the axial levelling and planarity between the driving and the driven end (see enclosed instructions PART 5). **Incorrect installation or higher tolerance values axial levelling and/or planarity between the drive and the driven end than pointed out by the manufacturer cannot be authorized.**



**RISK OF DYNAMIC UNBALANCE AND VIBRATIONS.**

**2.1.14**

All the components of the hydromechanic coupling undergo balancing in order to avoid dangerous vibrations. **Do not apply any unbalanced mass to the coupling and/or remove flaps or external parts of it.**



**DANGER OF VIBRATIONS AND/ OR STRUCTURAL FAILURE.**

**2.1.15**

The assembly and/or disassembly of the hydromechanic coupling must be effected with the suitable tools recommended by the manufacturer.

**Do not hit, bore and/or bang on the external shells and the seats of the coupling; do not use flames for assembling or disassembling it.**



**DANGER OF DEFORMATION, IRREVERSABLE IMBALANCE AND/OR STRUCTURAL FAILURE.**

**2.1.16**

Upon request the hydromechanic coupling may be manufactured with anodized shells and for installation in environments with aggressive agents or they may be painted (max 200µm) with a suitable high-temperature resistant paint. **Do not paint the coupling with paints, which are inadequate and/or flammable and/or do not apply a thicker coat. DANGER OF FIRE AND/OR BAD HEAT DISSIPATION.**

**2.1.17**

The hydromechanic coupling must be filled with transmission fluid suitable for the relevant start-up characteristics and the environment, where it is mounted. **Do not use transmission fluids and/or oils not recommended by the manufacturer (see SECTION 6.1 TRANSMISSION OIL TECHNICAL CHARACTERISTICS). DANGER OF DAMAGED SEALS AND/OR SEIZURE OF THE BEARINGS.**

**2.1.18**

The hydromechanic coupling must be filled up in compliance with the type of start-up. **Do not operate the hydromechanic coupling without transmission fluid or with an insufficient quantity of fluid. DANGER OF OVERHEATING, DAMAGED SEALS, SEIZURE OF THE BEARING AND/OR FIRE IGNITION. Do not use the hydromechanic coupling with too much transmission fluid. DANGER OF OIL LEAKAGE DUE TO INTERNAL OVERPRESSURE AND/OR STRUCTURAL FAILURE.**

**2.1.19**

The hydromechanic coupling has been designed for a maximum amount of start-up/hour (see WESTCAR Technical Catalogue). **Never exceed the maximum amount of start-up procedures/hour and/ or never start-up for a longer time than allowed by the manufacturer. DANGER OF OVERHEATING.**

**2.1.20**

The standard hydromechanic coupling is designed for continuous operation (uninterrupted rotation) for periods not exceeding 4 or 5 subsequent full days. **For long-lasting uninterrupted running, use more lubricating transmission oils and/or for higher performance, ask for the special coupling with self-lubricating bearings.**

**2.1.21**

When the hydromechanic coupling and the drive end are stopped, the driven end is free to rotate; the hydromechanic coupling cannot block the driven end nor can it guarantee its motion irreversibility. Suspended or sloping loads require a brake installed on the driven end.

**2.1.22**

Before gaining access to the hydromechanic coupling and/or before carrying out any cleaning, maintenance, regulation or fluid make up work, perform the following steps:

- stop the drive end and wait for the moving parts to stop,
- disconnect the supply voltage and apply a suitable safety padlock,
- wait for the surfaces of the hydromechanic coupling to cool down (max 40°C) before starting the activity,
- use suitable protection gloves, safety devices and protection garments.



**2.1.23**

Before admittance to the room, where the hydromechanic coupling is installed, check for oil leakage; as an alternative, fully remove and dry out the coupling.



**DANGER OF SLIPPING.**

**2.1.24**

Should the transmission oil and/or parts of the hydromechanic coupling (gaskets and seals) catch fire, please follow these steps:

- cut out power supply upstream,
- use suitable powder fire extinguishers (see long-range nozzle) loaded with A, B or C powders or carbon dioxide fire extinguishers.

**2.1.25**

To clean the hydromechanic coupling, use disposable cloths made of cellulose dampened with neutral detergents.

**Do not use inflammable solvents, liquid agents or dry synthetic cloths, which may become electrostatically charged.**



**FIRE DANGER.**

**2.1.26**

Regulation and/or maintenance shall be carried out by trained and authorized Technicians.

**Do not tamper and/or alter the state-of-the-art technology of the fluid coupling.**

**2.1.27**

Worn parts or triggered protections must be replaced by original spare parts only; each hydromechanic coupling component has been expressly designed to perform both an operational and a safety task.

**FAILING TO OBSERVE WHAT ABOVE MAY RESULT IN DANGERS FOR THE OPERATORS, TECHNICIANS, PEOPLE OR THE MACHINE, WHERE THE COUPLING IS MOUNTED, WHICH THE MANUFACTURER MAY NOT BE HELD LIABLE FOR.**





## 2.2 SAFETY RULES FOR POTENTIALLY EXPLOSIVE ATMOSPHERES

In addition to the general rules set out in section 2.1 “GENERAL SAFETY RULES”, the coupling installation in a zone with hazardous atmosphere shall comply with the following supplementary requirements:

### 2.2.1

The ATEX hydromechanic coupling are manufactured in different protection classes, which are characterised by a suitable marking on the identification plate. **Do not use couplings without ATEX marking or whose protection category is unsuitable and/or lower than the category required for the location, where they are used. FIRE DANGER.**



### 2.2.2

The hydromechanic coupling equipotential protection is implemented through the metal bonding of the mechanic connection with the drive end shaft and the driven end, by checking the resistance and the dispersion values of the installed coupling. **Do not connect the fluid coupling with elements, which generate bad conductivity with both the driving and the driven end (e.g. paints, oxide). DANGER OF LOSS OF EQUIPOTENTIAL INSULATION AND/OR IGNITION.**



### 2.2.3

The ATEX hydromechanic coupling must be used with suitable transmission oils and selected among different temperature classes (T3, T4, T5 and T6). **Do not use the coupling in a hazardous environment with unsuitable oil or oil, whose temperature class is inadequate or not in compliance with both the coupling manufacture and the environment classification. FIRE DANGER.**



### 2.2.4

Do not expose the external surfaces of the hydromechanic coupling to hot air streams and/or sources or accumulators of electrostatic currents (synthetic or plastic material, etc.). **IGNITION AND FIRE DANGER.**



### 2.2.5

To clean the surfaces of the hydromechanic coupling, use disposable cellulose cloths dampened with neutral detergent. **Do not use inflammable solvents or agents or dry synthetic cloths, which may become electrostatically charged. IGNITION AND FIRE DANGER.**



### 2.2.6

Service and repair operations may only be carried out by trained and skilled technicians, who qualify for work in locations with hazardous atmospheres. The maintenance and repair work carried out, must be entered in a proper book (see section 7.5 INTERVENTION RECORD). **FIRE DANGER.**



### 2.2.7

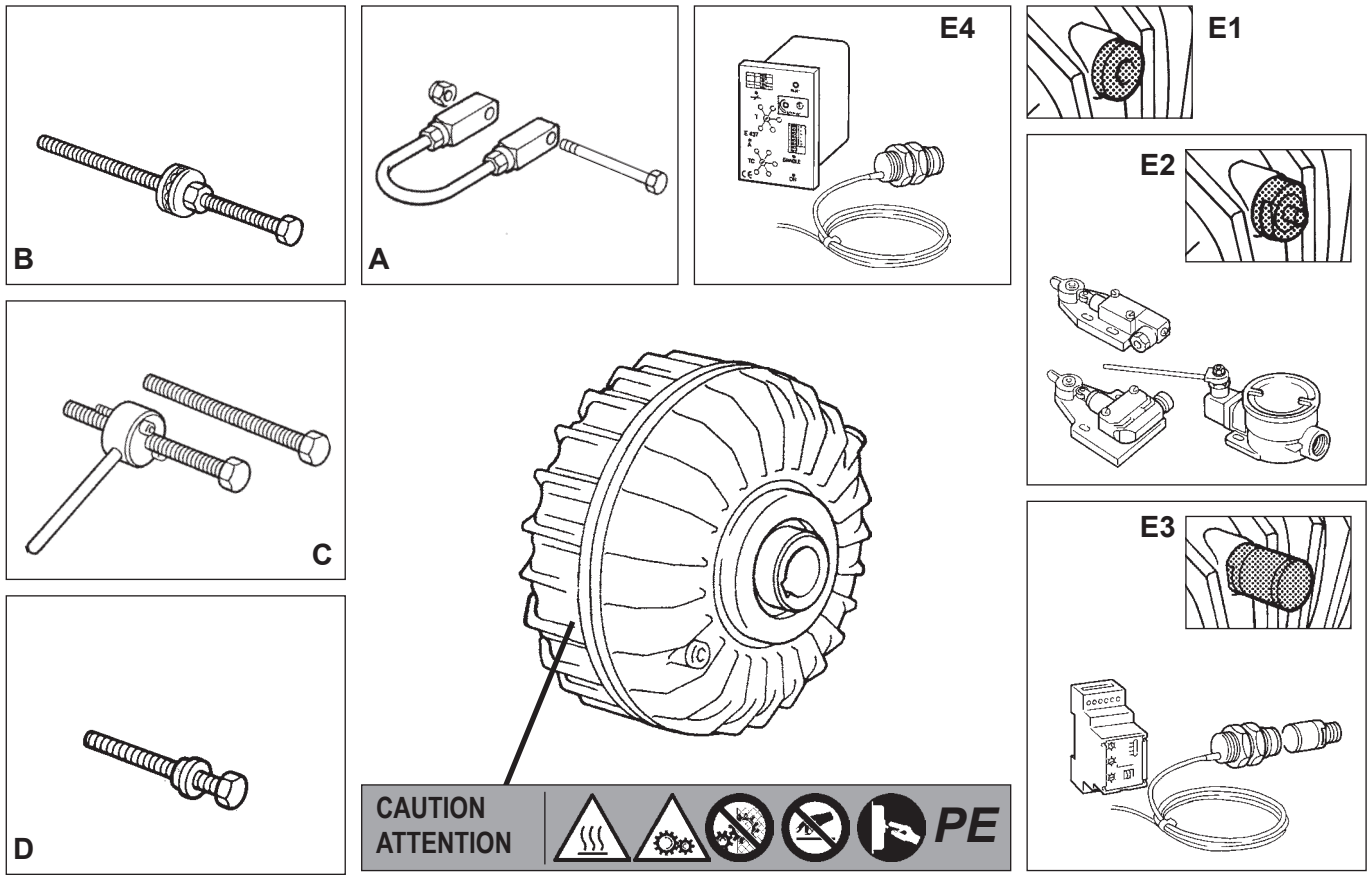
The worn parts or triggered protections of the ATEX couplings must be exclusively replaced by original spare parts. **FAILING TO OBSERVE WHAT ABOVE MAY RESULT IN DANGER FOR THE OPERATORS, TECHNICIANS, PEOPLE OR THE MACHINE, WHERE THE COUPLING IS MOUNTED, WHICH THE MANUFACTURER MAY NOT BE HELD LIABLE FOR.**







### 2.3 SAFETY DEVICES AND SIGNALLING PLATES



**CAUTION** Before commissioning and operating the ROTOMECH hydromechanics coupling, make sure that signalling plates and all safety and temperature control devices are correctly installed, used and are efficient; if not, restore good working conditions before going on with installation and use.

POS.	DESCRIPTION
<b>A</b>	<b>SLINGING DEVICES FOR LIFTING:</b> They enable lifting through grip and slinging points and safe handling of the hydromechanic coupling.
<b>B</b>	<b>DM ASSEMBLY DEVICE:</b> It enables the safe fitting of the hydromechanic coupling fitting on the drive end shaft.
<b>C</b>	<b>DISASSEMBLY DEVICE “VE” or “SE”:</b> It enables the safe, removal of the hydromechanic coupling from the driving shaft.
<b>D</b>	<b>DEVICES FOR COUPLING CLAMPING ON “TT” DRIVE SHAFT:</b> They enable to safely fix the hydromechanic coupling
<b>E<sub>1</sub></b>	<b>FUSIBLE PLUG “TF”:</b> It detects any leakage of transmission fluid from the hydromechanic coupling and any drive failure at the driven machine, when the maximum temperature of the fitted TF is exceeded.
<b>E<sub>2</sub></b>	<b>EXPANDABLE TRIP PLUG “TE”:</b> It permits to detect the overheating value as set up in the fitted TE through release of the signalling stud by a suitable microswitch, which shall be of “ET” type for standard and “ETA” type for ATEX manufacture.
<b>E<sub>3</sub></b>	<b>PLUG WITH thermocouple AND RPM CONTROLLER “PM” with “T09”:</b> It permits to detect the maximum temperature of the fitted PM plug and to transmit an electromagnetic pulse signal, which is detected by suitable sensor and sent to the electronic control unit, which in turn compares the rpm with the threshold setpoint.
<b>E<sub>4</sub></b>	<b>DEVICE FOR OVERLOAD CONTROL “SCD”:</b> It detects the output rotation speed of the coupling. This SCD device is composed of an rpm controller, which receives a pulse train through a sensor and generates a signal for alerting and stopping the system in case of extreme speed reduction.







## 2.4 SAFETY INSPECTIONS

### BEFORE INSTALLING AND/OR INTERFERING WITH THE HYDROMECHANIC COUPLING:

#### 2.4.1

Verify that are fulfilled all the requirements for installation as provided for in section 1.10 REQUIREMENTS FOR STANDARD and/or ATEX INSTALLATION

#### 2.4.2

Make sure that the ATEX marking complies with the zone classification for installation in hazardous atmospheres.

#### 2.4.3

Make sure that no alarm conditions have arisen and/or no signals have been released as a consequence of the activation of a safety and overheating control device.

#### 2.4.4

Verify that the drive part and the moving components are stopped.

#### 2.4.5

Make sure that power supply at the drive end is disconnected and the relevant switch is blocked with an adequate safety padlock and report the event under way.

#### 2.4.6

Wait for cooling - max 40°C - before starting any operation.

#### 2.4.7

Make sure that no oil overflow or leakage have occurred. If so:

- promptly remove and dry up the coupling, before handling it,
- detect the origin of the transmission oil leakage and make the necessary arrangements before going on using the hydromechanic coupling.

#### 2.4.8

Check up on integrity of the safety and overheating control devices and the correct positioning of the electric detectors (microswitch for TE or a sensor for T09); in case the device has triggered or has been damaged, replace it with an original spare part calibrated for the same trigger temperature.

#### 2.4.9

If necessary, verify the filling of the fluid coupling based on the operation and/or any traces or transmission oil leakage (see section 7.2 OIL LEVEL CHECK AND TOP-UP).

### BEFORE RESTARTING THE HYDROMECHANIC COUPLING:

#### 2.4.10

Make sure that in the installation room or on the coupling there are no tools, foreign bodies or cloths and if so, remove them.

#### 2.4.11

Close in safety position the guards in the room, where the hydromechanic coupling is installed.



## 3.1 TRANSPORT OF COUPLING WITH PACKAGE



The handling and transport operations are reserved to the handling technicians equipped with suitable personal protective equipment (protection gloves, safety shoes). **DANGER OF CRUSHING, CRASHING AND/OR INJECTION**

### 3.1.1

Upon reception of the supply, check the weight reported on the label.



#### CAUTION

##### DANGER OF TILTING AND CRUSHING:

The load within the packaging could be unbalanced; therefore abide by the procedures set out. Do not roll or damage the packaging. **RISK OF OVERTURNING.**

### 3.1.2

Spread the forks of the fork-lift truck (with capacity suitable for the weight to be transported) as much as possible. Lift the coupling with its packaging slowly and transport it (keeping it as much close to the soil as possible, about 30 cm) and put it under a shelter in a dry place; then get the fork-lift out of the way.

### 3.1.3

Open the upper part and remove the packaging.



#### CAUTION

##### DANGER OF ENVIRONMENTAL POLLUTION:

Do not dump packaging material in the environment, but keep it for any future re-use or shipping to the manufacturer or dispose of it properly as industrial waste.

### 3.1.4

Remove any stiffening rib, plastic film for internal protection and brackets that fix the hydromechanic coupling to the pallet.



#### NOTE

Should the product be sent to the factory for repair works or maintenance, the hydromechanic coupling will have to be shipped in a new package. The shipping procedure shall be previously agreed upon with WESTCAR.

### 3.1.5

Take the Original Instruction Handbook and check that the product is not damaged, no parts are missing and the content complies with the order.



#### NOTE

Non-compliance must be reported to Westcar and its distributor within eight days from the receipt date.

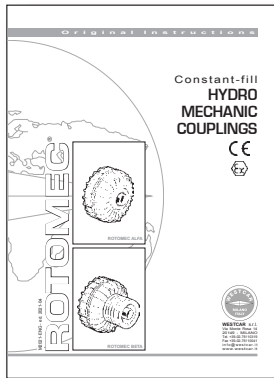
### 3.1.6

To store the coupling, observe what set out in section 3.3. STORAGE OF THE COUPLING.

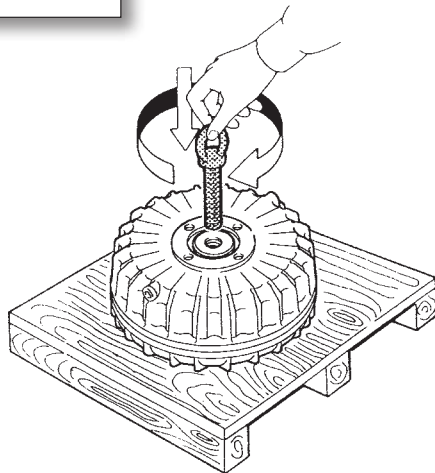
**The transport of the coupling with packaging has thus ended; now it is possible to follow the steps described in the next section.**



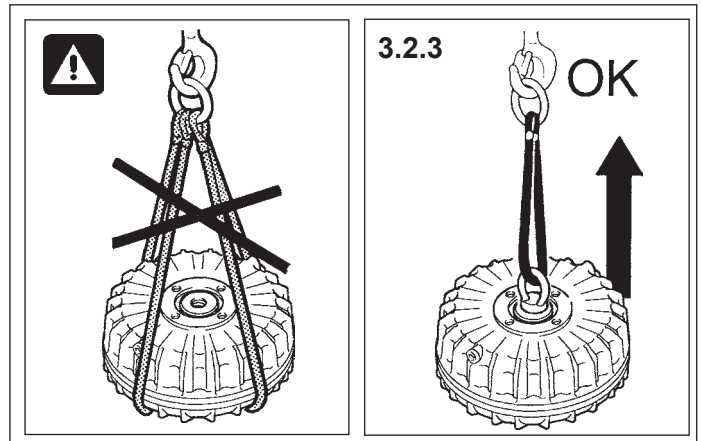
## 3.2 HANDLING OF THE COUPLING WITHOUT PACKAGE



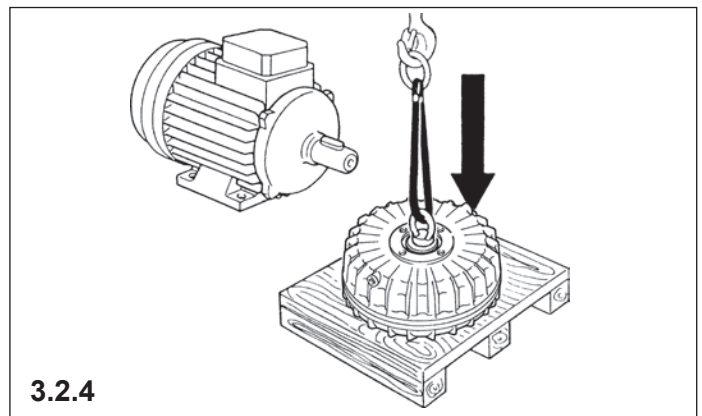
### 3.2.1



### 3.2.2



### 3.2.3



### 3.2.4

To handle the hydromechanic coupling without its package, it is necessary to follow this procedure:



**The handling and transport operations are reserved to handling technicians equipped with suitable personal protective equipment (protection gloves, safety shoes). DANGER OF CRUSHING.**

### 3.2.1

Take the instructions and follow the description.

**CAUTION**  
**RISK OF CUSHING.** In order to hoist and handle the hydromechanic coupling, use the suitable lugs and devices recommended by the manufacturer, available on request; do not use any other reference than the equipment and lifting points recommended by the manufacturer.

### 3.2.2 - For couplings with more than 30 kg of weight:

The hydromechanic coupling is located inside its packaging with its axis in vertical position. Screw in the threaded pin equipped with hoisting ring in the extraction hole of the coupling.

### 3.2.3

Sling the coupling through the hoisting ring with hoist lines of suitable load capacity for the coupling weight (see Identification Plate).

### 3.2.4

By slow movements, lift the coupling and transfer it to a dry, sheltered place and lay it on a wooden plane next to motor and drive end, where the coupling will be installed.

**The transport of the coupling without packaging has thus ended; now it is possible to follow the procedure as set out in the next section.**



### 3.3 COUPLING STORAGE AND CONSERVATION

#### STORAGE IN THE SUPPLY DELIVERY PACKAGE

When delivered, the hydromechanical coupling steel surfaces are protected by suitable lubricant, wrapped in a solid polyethylene bag.

Externally the packaging for couplings up to 40 kg is made of carton; the carton box is delivered on pallet if the coupling is heavier or in crates, if it is shipped by sea or if the client expressly requests it.

Inside the external packaging a bag contains the coupling protected with suitable shock-proof material.

The packaged coupling may be stored for 6 months in dry, clean and protected marine environment and for 12 months in dry, clean and protected land environment.

#### 3.3.1 MEASURES FOR THE FUTURE STORAGE OF THE COUPLING



##### NOTE

The couplings with delay chamber must be positioned inside the packaging with delay chamber pointing upwards; the coupling filling oil will thus guarantee sealing lubrication.

##### 3.3.1a

The coupling must be filled with transmission oil before storage; if not, the shaft sealing must be protected with suitable grease (AGIP 33FD, SHELL Alvania R3 or equivalent).

##### 3.3.1b

Clean the external surfaces of the coupling and protect them with suitable protection lubricant (type CRC 3.36 or equivalent).



##### CAUTION

**The hydromechanic coupling and any flexible coupling with rubber elements must be stored inside a suitable packaging, to protect it from sunlight and dust, solvents and corrosive agents.**

##### 3.3.1c

Put the coupling in a suitable package inside an appropriate protective bag and close it tightly.



##### NOTE

The packaging including a polyethylene bag can last 6 months in protected, dry marine environment and 12 months in dry and protected land environment. Long-lasting storage may be achieved by using a package consisting of a hot-sealed, composite bag (aluminium and plastic) lasting 12 months in dry and protected marine environment and 24 months in dry and protected land environment.

##### 3.3.1c

On expiry of the storage time, it is necessary to inspect and replace the package.

**3.3.2 FIRST ASSEMBLY OF COUPLING, UNUSED UP TO 6 MONTHS**

Apply protective coating CRC 6.66 Marine or equivalent, that guarantees 3 months protection in marine environment, or protection agent CRC Protective Marine that guarantees up to 6 months protection-to the component steel parts. This product can be removed with diluent CRC Marine Elmec Clean.

If the coupling is not filled with oil, spray 0,25 litres (8,79 imp fl oz) of TECTYL 930 SAE 30 oil inside and re-assemble the plug so to ensure the air-tight sealing of the coupling. The rotating seals must be greased.

**3.3.3 ALREADY OPERATED COUPLING, UNUSED UP TO 6 MONTHS**

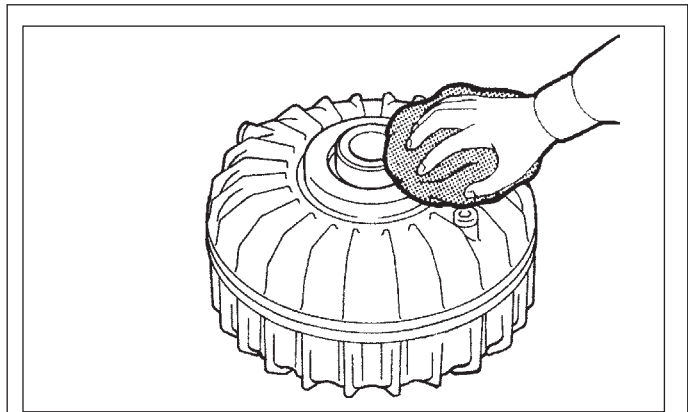
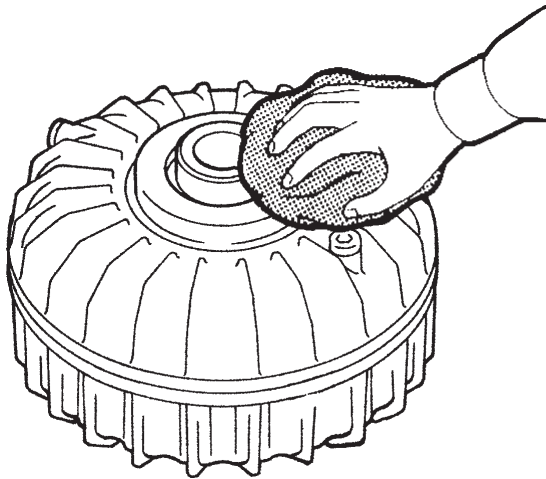
In this case it is necessary that on shutdown the procedures as per point 3.3.2 are observed.

**3.3.4 AFTER COUPLING INSTALLATION, UNUSED OVER 6 MONTH**

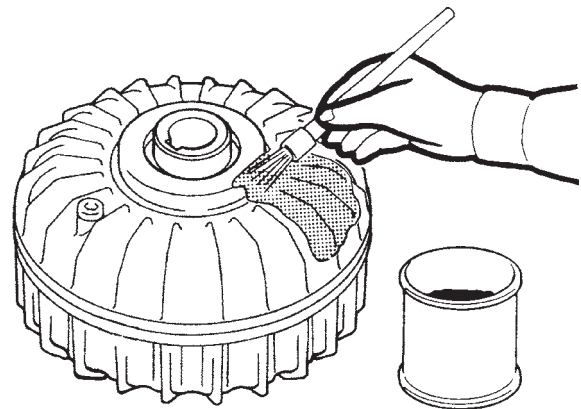
Follow what described in point 3.3.2 and carry out the prescribed operations every 6 months, removing the old protection each time before the new one is applied. Manually turn the coupling one or more times. This ensures that the filling oil lubricates the rotating seals and the internal bearings.



### 3.4 COUPLING PRE-ASSEMBLY



3.4.2



3.4.1

The pre-assembly steps vary according to the location where the coupling list shall operate; to prepare it for assembly, observe what follows:

#### 3.4.1 CLEANING AND REMOVAL OF PROTECTIVE LAYERS

Before shipment, the coupling metal parts are duly protected with fluid ore 3.36. Before coupling installation, remove.

#### 3.4.2 AGGRESSIVE AND / OR CORROSIVE ENVIRONMENTS

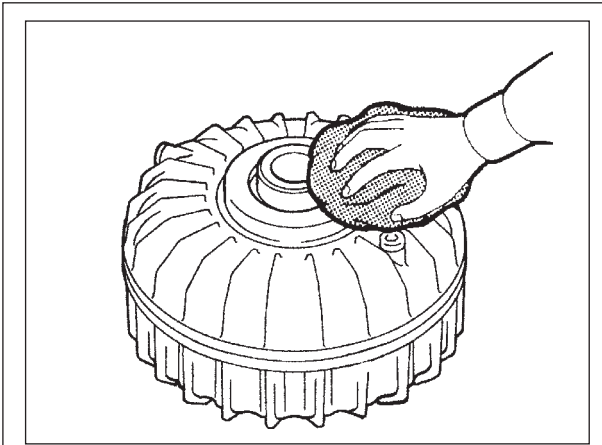
Before a coupling is installed in an environment filled with aggressive or corrosive atmosphere (marine environment, atmospheres with corrosive acids), it is appropriate to use specially manufactured hydromechanic couplings, i.e. with anodized surfaces or it is necessary to coat the aluminium shells as follows:

- Degrease the coupling surfaces with a suitable solvent protecting the shaft sealing.
- Spray the external surfaces with a suitable high-temperature resistant paint (see coupling maximum temperature).

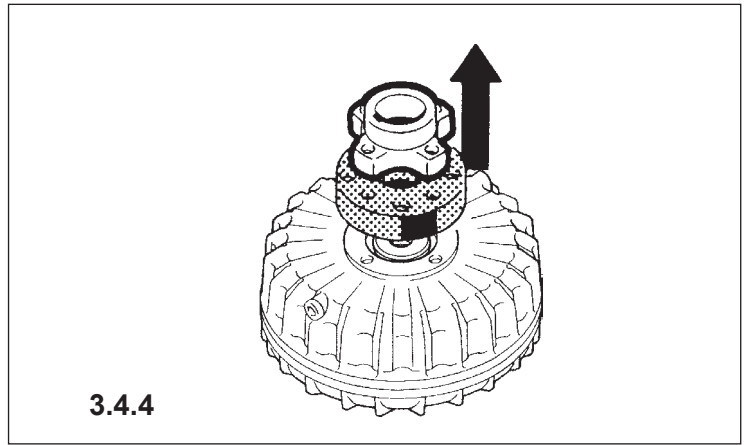
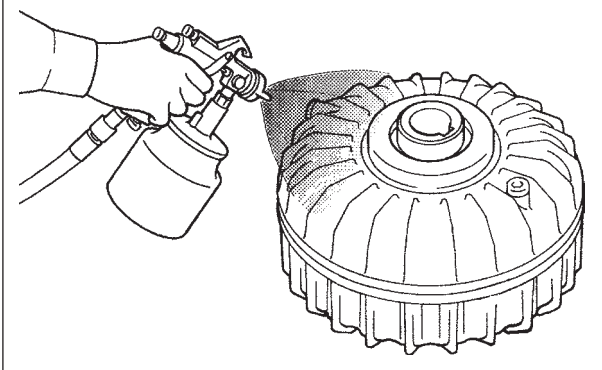


**NOTE** The layer of paint must not exceed 200 µm in order to avoid bad heat dissipation.



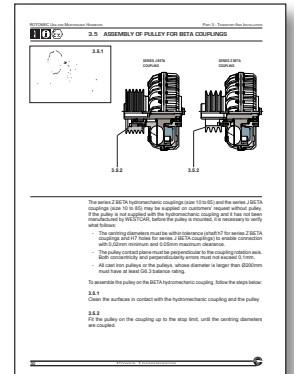
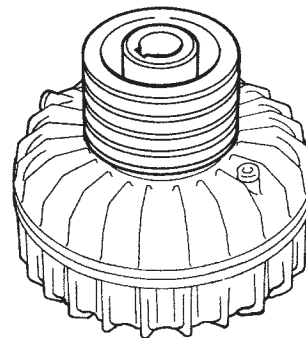


3.4.3



3.4.4

3.4.5



**3.4.3 POTENTIALLY EXPLOSIVE ATMOSPHERES**

If the painting exceeds 200 µm, it is required to use antistatic paint.

**3.4.4 PRE-ASSEMBLY FOR “ALFA” IN-LINE COUPLINGS**

The “ALFA” in-line coupling equipped with accessories (rubber element and hub) must be prepared, disassembling the accessories to gain access to the rear part during its installation on the machine.

**3.4.5 PRE-ASSEMBLY FOR BELT-DRIVEN “BETA” COUPLINGS**

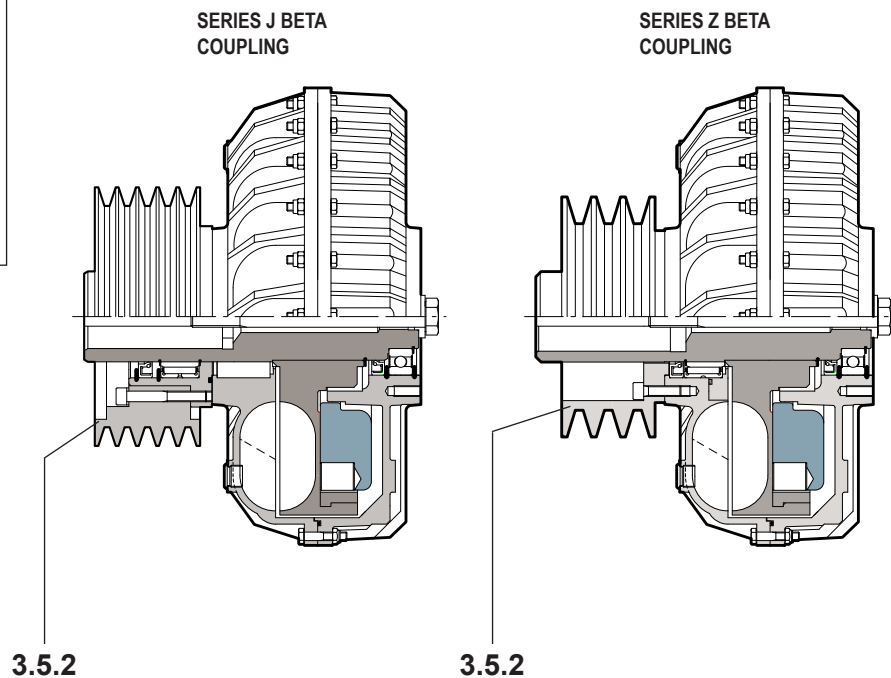
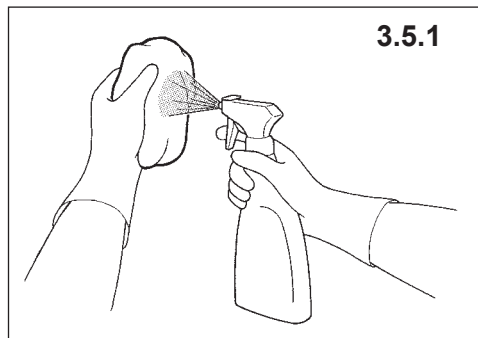
The “BETA” coupling must be prepared for the fitting of the driving pulley, if not yet mounted, by following what described in section 3.5 ASSEMBLY OF THE PULLEY.

**The pre-assembly works for the hydromechanic coupling have been completed and it is now possible to install it as described in the next chapter.**





### 3.5 ASSEMBLY OF PULLEY FOR BETA COUPLINGS



The series Z BETA hydromechanic couplings (size 10 to 65) and the series J BETA couplings (size 10 to 85) may be supplied on customers' request without pulley. If the pulley is not supplied with the hydromechanic coupling and it has not been manufactured by WESTCAR, before the pulley is mounted, it is necessary to verify what follows:

- The centring diameters must be within tolerance (shaft h7 for series Z BETA couplings and H7 holes for series J BETA couplings) to enable connection with 0,02mm minimum and 0.05mm maximum clearance.
- The pulley contact plane must be perpendicular to the coupling rotation axis. Both concentricity and perpendicularity errors must not exceed 0,1mm.
- All cast iron pulleys or the pulleys, whose diameter is larger than  $\varnothing 200\text{mm}$  must have at least G6.3 balance rating.

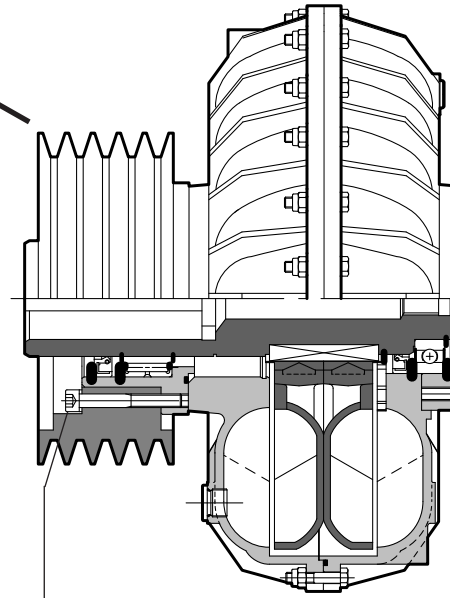
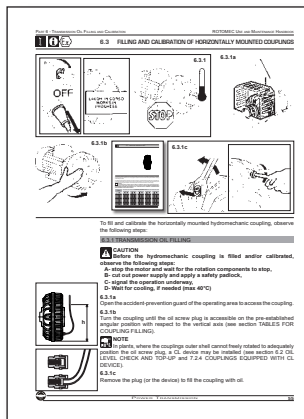
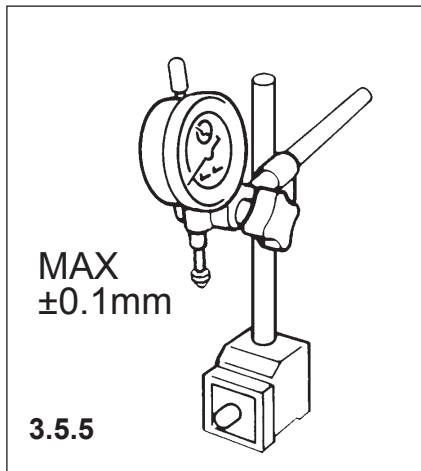
To assemble the pulley on the BETA hydromechanic coupling, follow the steps below:

#### 3.5.1

Clean the surfaces in contact with the hydromechanic coupling and the pulley

#### 3.5.2

Fit the pulley on the coupling up to the stop limit, until the centring diameters are coupled.



**WARNING**

The screw to fix the pulley to the coupling must hold deep in the aluminium threaded holes for one and a half times their diameter, in order to guarantee the resistance of the prescribed tightening torque.

The pulley fixing screws must be in material grade 8.8 or higher. **RISK OF LOSS OF THREADING IN THE SEATS OR SCREW BREAKAGE.**

**3.5.3**

Insert the screws of suitable material and length inside the holes.

**3.5.4**

Tighten all the clamping screws of the pulley to the coupling according to the torques as pointed out in section 4.9 SCREW TIGHTENING TORQUES FOR COUPLING AND ACCESSORIES.

Tighten them stepwise and in a crosswise sequence.

**3.5.5**

Upon completion of the assembly, check eccentricity and perpendicularity of the pulley, by touching with the comparator tip inside the first and last groove as shown in the picture. The maximum eccentricity error must be within ±0.1mm.

**If the assembly of the pulley on the BETA coupling has been successful, carry out the installation as described in PART 4.**



## 4.1 SPECIFIC RULES ON THE USE OF ROTOMECH COUPLINGS IN ATEX ATMOSPHERES

The ROTOMECH hydromechanic coupling is intended to be installed on a machine that must comply with the ATEX Directive 2014/34 / EU.

### 4.1.1

The body of the hydromechanic coupling must be connected either the motor or of the driven machine; this can also be achieved by mechanical connection to the motor or the driven part, in which case the continuity of the connection shall be checked by the user but before the first start-up.

### 4.1.2

The wear parts and the oil of the hydromechanic coupling can be only replaced with original spare parts WESTCAR.

### 4.1.3

Do not overload the device beyond the operating limits as shown in the relevant diagrams and in the TECHNICAL DATA SHEET, that have to be filled out and signed by client.

### 4.1.4

Do not perform consecutive start-up procedures

### 4.1.5

Do not exceed the number of starts/hour pointed out in the TECHNICAL DATA SHEET

### 4.1.6

The WESTCAR couplings are always equipped with protection devices, such as fusible plugs TF or expandable trip plugs ET coupled with the limit switch ET-A (Ex). **Should oil leak due to the fusible plug TF triggering, it is required to stop the motor as soon as possible. RISK of overheating of bearings and gasket seals.**

### 4.1.7

Couplings with fusible plug TF may be only used , if the machinery is monitored; if oil leaks from the fusible leaks from the fusible plugs, it is required to stop the motor within 3 minutes.

### 4.1.8


When using a coupling in machines without operator, it is required to install an automatic shutdown device to immediately stop the motor (to be performed by the Customer or by WESTCAR)

### 4.1.9

Is forbidden to tampering or improperly replacing the fusible plugs TF.

### 4.1.10

The devices included in this risk evaluation and relevant technical dossier according to EN ISO/IEC 80079-36, bear the following markings:

 I M2 c Mb T4

 II 2GD c Gb Db IIB /IIC

where c means the protection mode "construction safety" (which is optional in the marking).

## SAFETY EQUIPMENT AGAINST OVERHEATING AND MOTOR SHUTDOWN

**4.1.11  
FUSIBLE PLUG “TF”**

The standard WESTCAR joint is equipped with a TF fusible plug. The TF plug works by coupling a hot-melt calibrated thermal pad in accordance with the temperature class of the ATEX zone indicated by the customer. In the event of overheating of the coupling due to a malfunction, the hot-melt pad melts, thus causing the transmission oil to leak from the coupling and the driven machine shutdown. Under these conditions, with stopped machine and rotating motor, the bearings and sealing without lubrication overheat, thus giving rise to the RISK OF FIRE IGNITION. The motor should be stopped within the shortest time (maximum 3 minutes after the oil leakage). When the fusible plug TF melts, it is necessary to replace it with original WESTCAR spare parts (See chapter 5.1 of this manual).

**4.1.12  
NON- CONTACT PLUG PM +T09**

The non- contact PM plug is equipped with a thermostat set at a temperature of 100/120°C incorporated in the body of the PM plug and mounted on the hydromechanic coupling. The PM cap is coupled to the Ex sensor connected to the T09 control unit located in a safe area with interposition of the ZENER barrier.

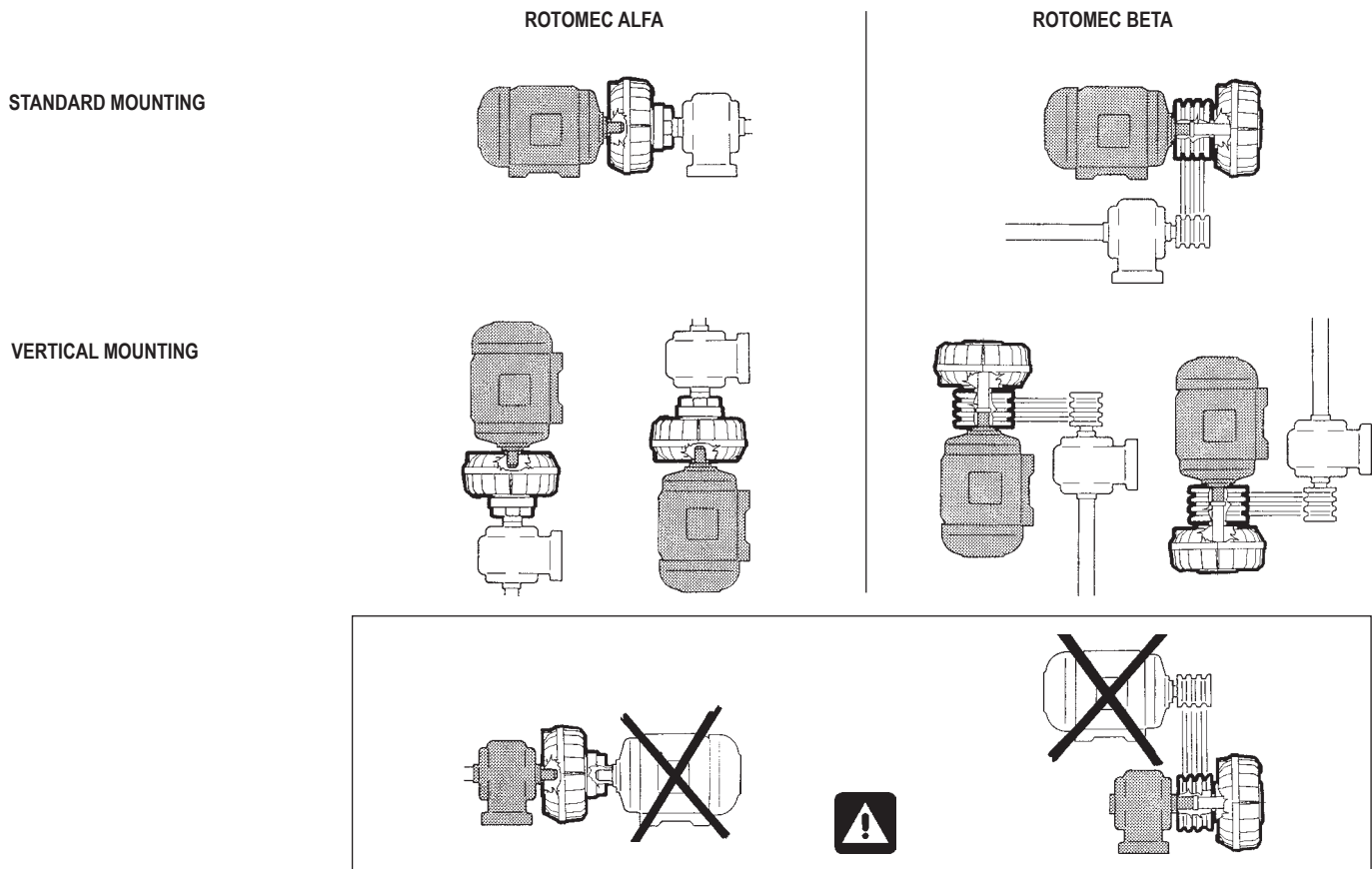
The PM plug works by transmitting (without contact) a signal to the Ex sensor placed at 2/5mm from the PM cap. When the temperature of the coupling exceeds the temperature of 100/120°C, the Ex sensor no longer receives the signal and alarms the central unit T09 to allow the motor to stop.

During the ordinary operation of the coupling, the T09 control unit continuously receives the signal that the PM cap transmits to the Ex sensor. In this way it is possible to control the speed revolution of the coupling, when the external output of the coupling is connected to the driven part, as this help establish a pre-alarm threshold before the motor stop.

After the PM plug triggering, a plug replacement is not required; it is sufficient to allow the coupling to cool down for about 30 minutes and then restart the machine. (See chapter 5.3 of this manual).



## 4.2 FITTING OR ROTOMECH COUPLING ON DRIVE SHAFT



The standard ROTOMECH coupling (standard production) is delivered with hollow shaft and key seat according to DIN6885 standard for UNELMECH motors. The keying of the coupling (hollow shaft side) can be carried out on the motor (electric or endothermic) as well as on the machine driven end, according to the specific instructions reported on both the Identification Plate and the TECHNICAL DATA SHEET OF THE HYDROMECHANIC COUPLING.

### STANDARD ASSEMBLY

Motor connected to the hollow shaft of the coupling (inner part)

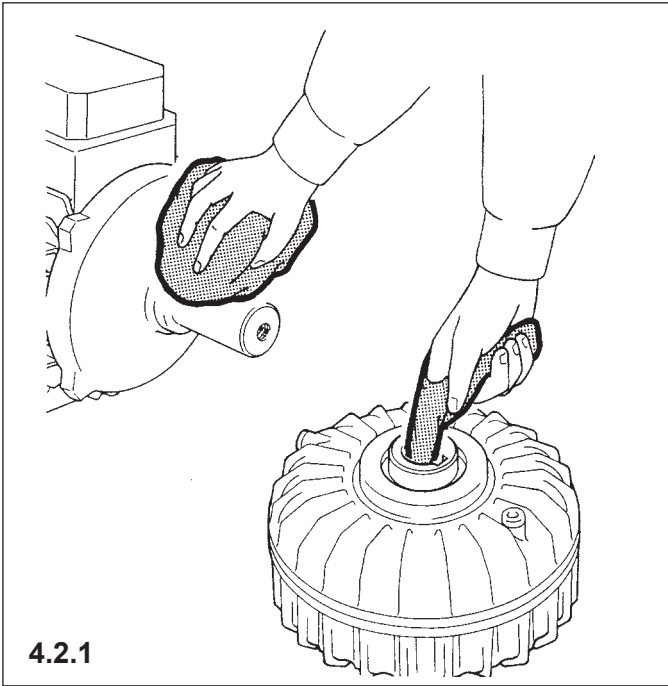
### VERTICAL ASSEMBLY

The hydromechanic coupling produced with "C" manufacture is designed for vertical installation, in order to ease both the filling and the oil level calibration (see Identification Plate).

### CAUTION

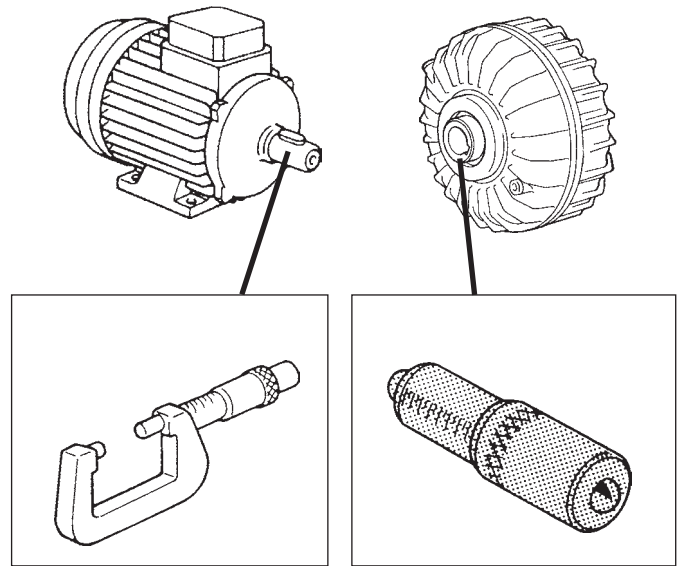
**It is forbidden to install the hydromechanical coupling with the motor or the drive part connected to the outer shells of the coupling itself.**

Following you can read by way of example the instructions for the coupling keying (hollow shaft side) on the motor and/or machine.



4.2.1

4.2.2



MOTOR	BACKLASH ON DIAMETER /HOLE/ SHAFT FOR ROTOMECH COUPLING																	
	14 <sup>H7</sup>	19 <sup>H7</sup>	24 <sup>H7</sup>	28 <sup>H7</sup>	38 <sup>G7</sup>	42 <sup>G7</sup>	48 <sup>G7</sup>	55 <sup>G7</sup>	60 <sup>G7</sup>	65 <sup>G7</sup>	70 <sup>G7</sup>	75 <sup>G7</sup>	80 <sup>G7</sup>	90 <sup>G7</sup>	100 <sup>G7</sup>	110 <sup>G7</sup>	125 <sup>G7</sup>	140 <sup>G7</sup>
UP TO 1500 rpm MAX BACKLASH (hundredths)	1.5	1.5	2	2	2	2.5	2.5	3	3	3	3	3	3	4	4	4	4	4
OVER 1500 rpm MAX BACKLASH (hundredths)	1	1	1	1	1.5	1.5	1.5	2	2	2	2	2	2	3	3	3	3	3

**CAUTION** Motor keying must be effected at the bench with coupling axis placed horizontally. Before fitting the hydromechanical coupling on the machine, it is necessary to observe the following steps:

- Stop the motor and wait for the rotating components to stop.
- Cut out the power supply and apply a safety padlock.
- Wait for the cooling, if needed (max 40°C).

4.2.1

Accurately clean the motor shaft surfaces and the seat of the hydromechanical coupling

**NOTE** The seats of the coupling are manufactured with tolerance H7 or G7, that may result in an interference fit connection. A good connection between shaft and seat must not show any interferences or too much backlash. Comply with the values reported in the table.

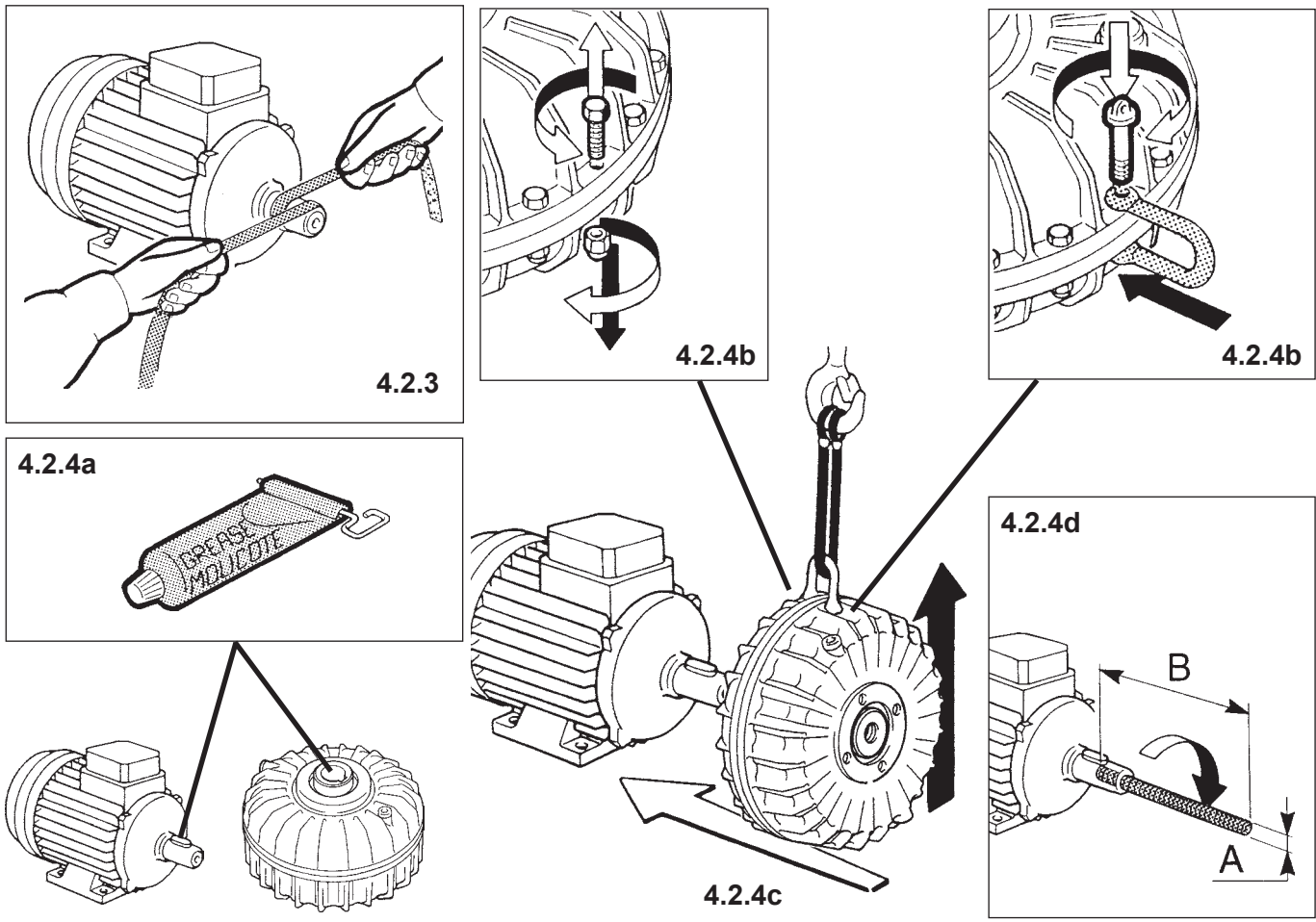
4.2.2

Measure with a suitable micrometric tool the real dimension of the drive shaft or the machine and the hydromechanical coupling.

**CAUTION** The bore-shaft connection of the hydromechanical coupling must not be a force fit and no flames or heaters must be used. DANGER OF SEAL DAMAGING AND/OR IMPOSSIBLE DISASSEMBLING OF THE COUPLING.

4.2.3

In case of interference in the connection, it is necessary to make backlash adjustments all along the drive shaft or machine using an abrasive cloth.



**WARNING**  
 A larger backlash in comparison with the one pointed out in the table may cause unbalancing during rotation with subsequent vibrations.

**4.2.4 SHAFT ASSEMBLY WITH KEYWAY**

In order to mount the coupling on a shaft with key, respect the following steps:  
**4.2.4a** Lubricate the whole surface of the drive shaft and machine and the relevant seat of the hydromechanic coupling.

**NOTE**  
 Use pressure-resistant grease, such as MOLLICOTE or equivalent.

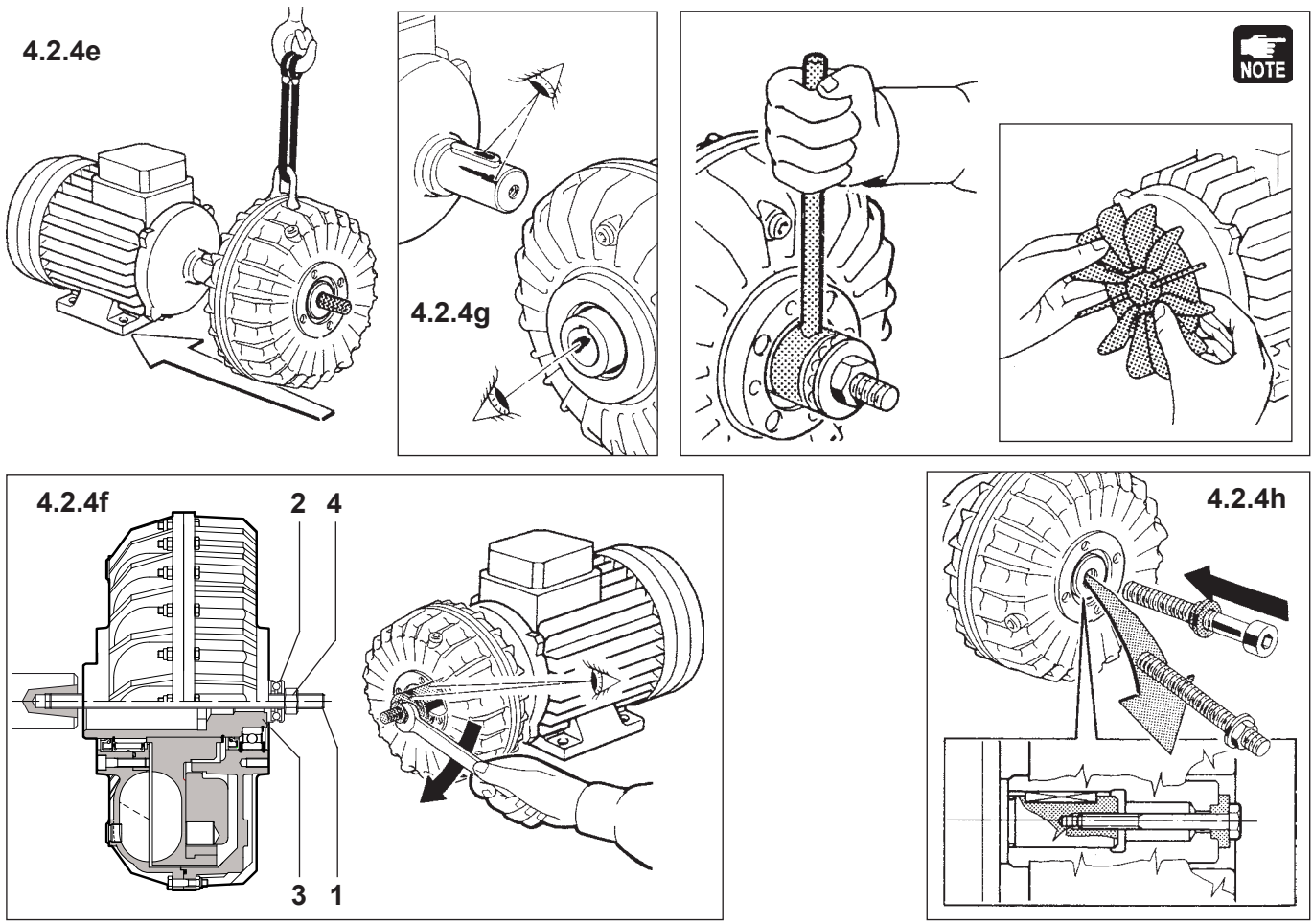
**4.2.4b** For hydromechanic couplings having weight over 30 kg, fully unscrew and remove one of the screws for coupling shell closure and insert a suitable WESTCAR hoisting device (available on request).

**4.2.4c** Sling the hydromechanic coupling on the hoisting device with ropes having load capacity suitable for its weight (see Identification Plate).

**4.2.4d** Place on the hole of the drive shaft a threaded bar, whose length must be suitable for the hydromechanic coupling dimensions (see technical catalogue) without blocking it.

**4.2.4e** Move the coupling at a minimum height above the ground with slow movements and bring it near the installation shaft in horizontal position.



**CAUTION**

Do not hit, bang about or exert any force on the coupling shells. **DANGER OF DAMAGING THE BEARING SEATS, CRACKINGS, VIBRATIONS AND/OR UNBALANCE.**

**4.2.4f**

In case of coupling with delay chamber, insert on the threaded bar (1) the suitable spacing tube (2) and a thrust bearing (3) resting only on the primary shaft (4) of the coupling or on the spacing tube; afterwards screw the nut (5) on the threaded bar and tighten the nut until the coupling fits on the motor shaft.

**NOTE**

This operation must be carried out holding up the motor shaft from the blower side or, in case of couplings provided with extraction holes, using the SE extraction system to block the shaft.

**4.2.4g**

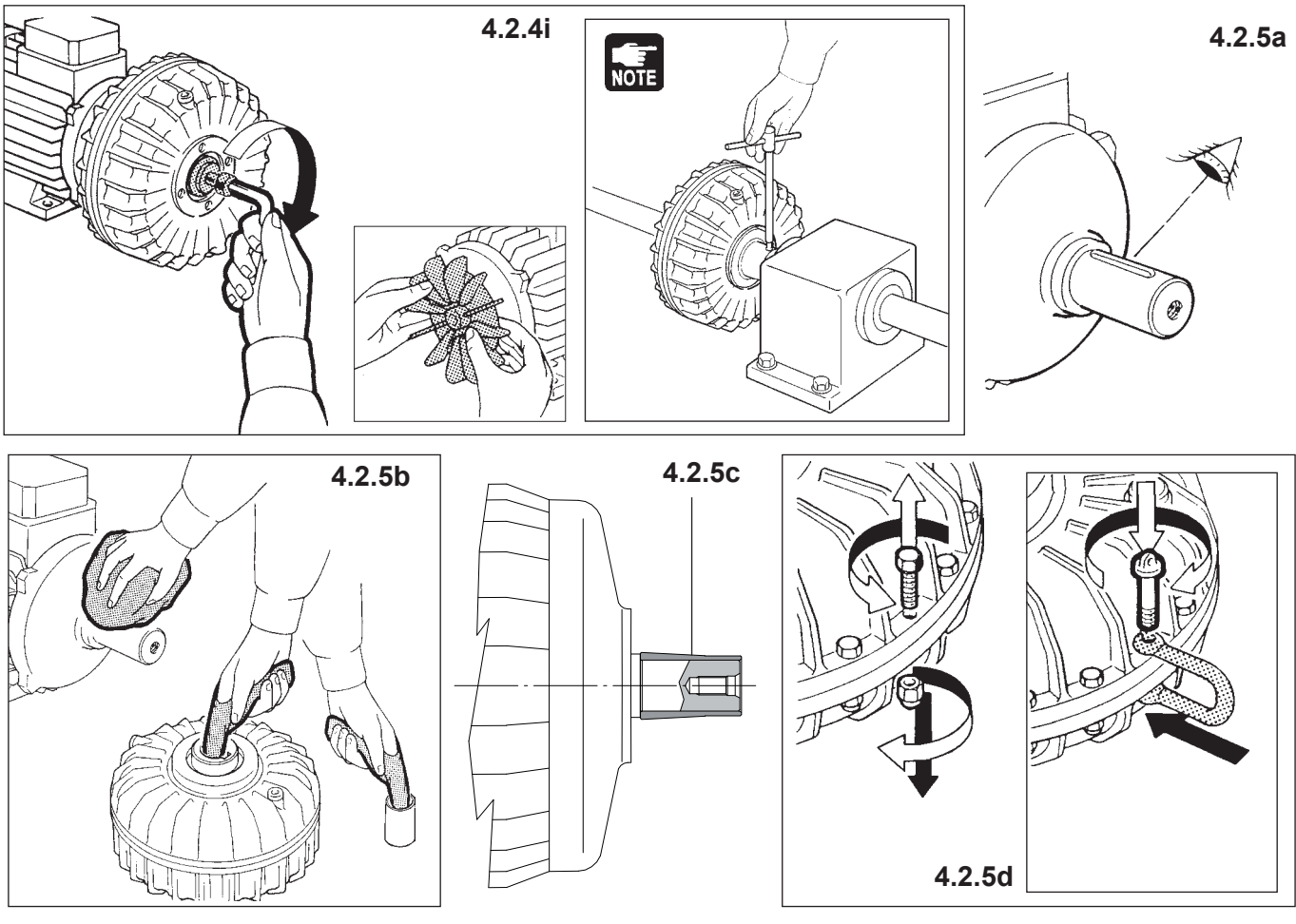
In case the coupling keying turns out to be difficult and subject to strain, disassemble the coupling (see chapter 9.1 DISASSEMBLY OF THE COUPLING) and follow the procedure from step 4 again more accurately.

**CAUTION**

Check the surfaces of the shaft, the keys and its seat. **DANGER OF SEIZURE AND/OR CRACKING OF THE COUPLING.**

**4.2.4h**

After the coupling has been fitted up to the stop limit on the shaft, loose the nut and remove both the threaded bar and the thrust bearing; insert in the head through bolt equipped with the suitable centring washer supplied with the coupling.



**4.2.4i**  
Tighten the head through bolt accurately, holding firmly in place the machine or motor shaft, where it is mounted.

**NOTE**  
The ROTOMECH couplings, whose shafts bore are in inches, will be equipped with grub screw for axial fastening on the shaft, as an alternative to the axial fixing screw.

**4.2.5 - SHAFT ASSEMBLY WITH TAPER SLEEVE**

To fit the coupling on shaft with taper sleeve, proceed as follows:

**4.2.5a** In order to fit hydromechanic couplings with taper sleeves without key-way, remove feather key from drive shaft/reduction gear.

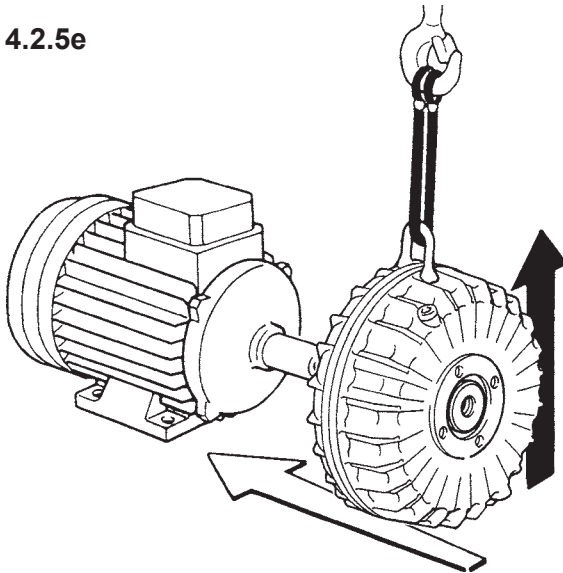
**4.2.5b** Accurately clean with a neutral detergent all the contact surfaces between shaft, sleeve and taper hole.

**4.2.5c** Position the sleeve using a retainer (to be removed after tightening the retaining screw on shaft end).

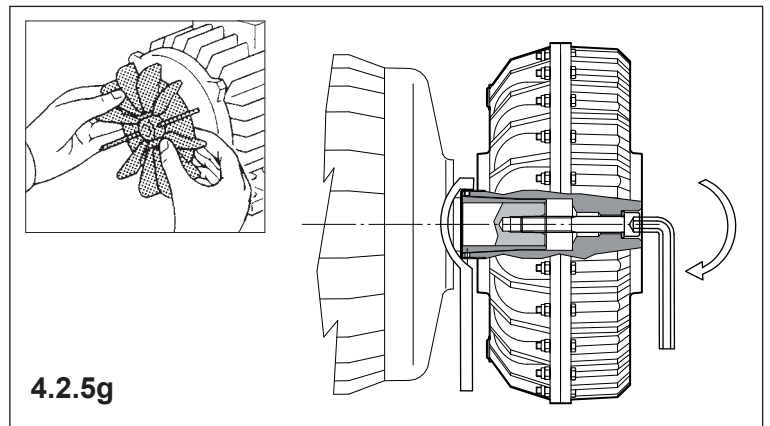
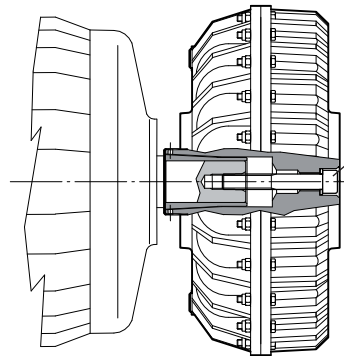
**NOTE**  
The length of the closely fitted shaft must be lower than the taper hole depth and have a threaded bore on the top.

**4.2.5d** For couplings with weight over 30 kg, fully unscrew and remove one of the screws of coupling shell closure and insert a suitable WESTCAR hoisting device (available on request).

4.2.5e



4.2.5f



4.2.5g

4.2.5e

Sling the hydromechanic coupling on the hoisting device with ropes having a load capacity suitable for its weight (see Identification Plate). Lift the coupling to a minimum height, approach it to the installation shaft with slow movements and fit it on the taper sleeve of the motor.



**CAUTION**

**Do not hit, bang about or exert any force on the coupling shells. DANGER OF DAMAGING THE BEARING SEATS, CRACKINGS, VIBRATIONS AND/OR UNBALANCE.**

4.2.5f

Insert the retaining screw on the end of the shaft provided with a suitable washer and screw it on the drive shaft.

4.2.5g

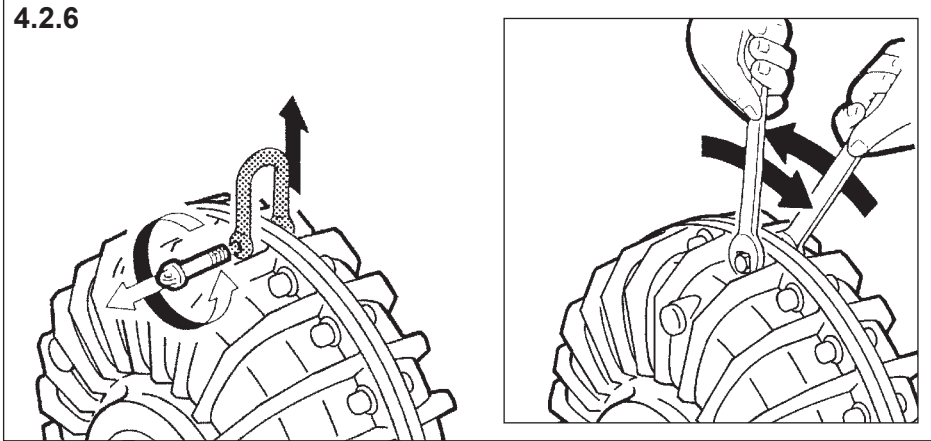
Tighten the central clamping screw, preventing any motion of the machine or motor shaft, where it is mounted. For tightening, respect the torque values as reported in the table.

COUPLING SIZE	TAPER BUSH BC	RETAINING SCREW	CLASS	TORQUE Nm
30 / 30P	3BC 54 D= $\varnothing$ 28	M10	8.8	50
	3BC 54 D= $\varnothing$ 38	M12	8.8	80
	* 3BC 54 D= $\varnothing$ 42+50	M16	8.8	210
40P	4BC 58 D= $\varnothing$ 38+40	M12	8.8	80
	4BC 58 D= $\varnothing$ 40+42	M16	8.8	210
	* 4BC 58 D= $\varnothing$ 48+50	M16	8.8	210
50 / 55	5BC 73 D= $\varnothing$ 38+40	M12	10.9	120
	5BC 73 D= $\varnothing$ 40+50	M16	8.8	210
	* 5BC 73 D= $\varnothing$ 55+65	M20	8.8	230
60 / 65[B]	6BC 79,5 D= $\varnothing$ 40+50	M16	10.9	290
	6BC 79,5 D= $\varnothing$ 55	M20	8.8	410
	* 6BC 79,5 D= $\varnothing$ 60+65	M20	8.8	410

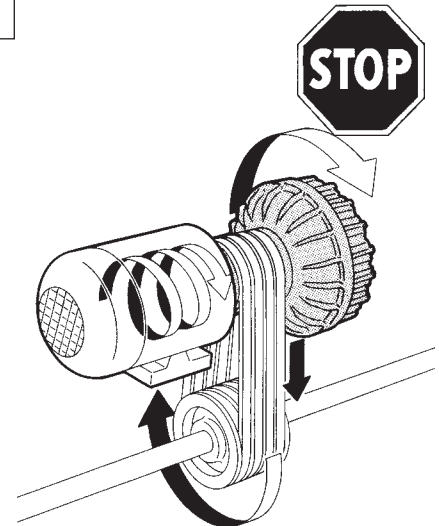
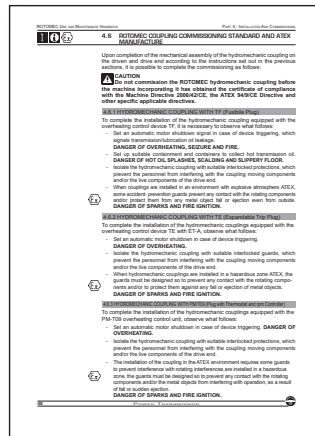
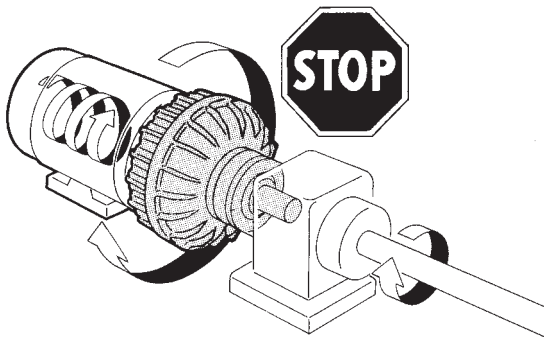
\* Coupling with taper bush without keyways



4.2.6



4.2.7



**NOTE**

The Rotomech couplings with conical bush are provided with keyholes (optionals) for locking the shaft during keying.

4.2.6

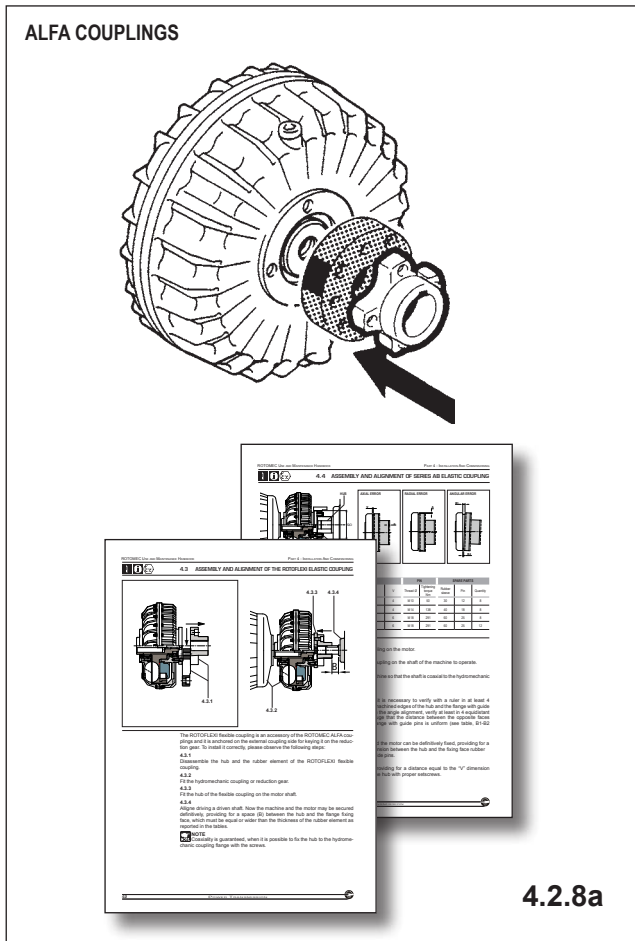
Remove the sling and the hoisting device, then reinsert the screw and the nut previously removed and screw it in tightly.

4.2.7

The transmission oil carries out an important lubrication function inside the hydromechanics coupling; therefore the motor or the drive parts should not be activated, if it is missing. Before starting the motor, complete the operation described in section 4.6 STANDARD AND ATEX FLUID COUPLING COMMISSIONING.

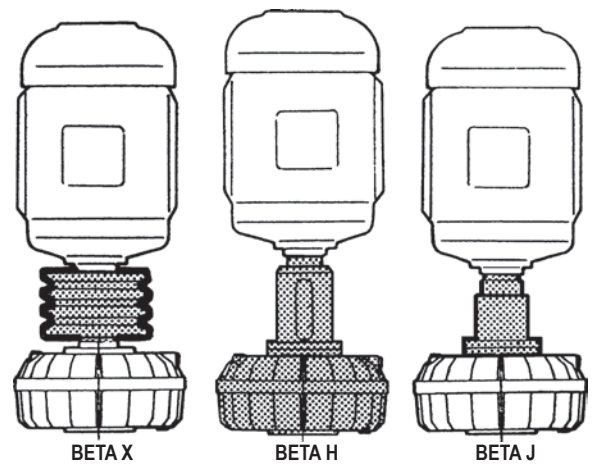
**CAUTION**

Do not start up the motor or the drive part without or with insufficient oil filling. **DANGER OF BEARING SEIZURE, OVERHEATING AND/OR FIRE IGNITION.**



**BETA COUPLINGS**

**4.2.8b**



**4.2.8**

Start to install the hydromechanic coupling ROTOMECH, considering the type of coupling at disposal (ALFA or BETA):

**4.2.8a - ALFA COUPLINGS**

To install the ALFA in-line hydromechanic couplings, it is necessary to assemble the accessories (rubber element, hub, etc.) according to the instructions dealt with in section 4.3 FITTING AND ALIGNMENT OF ROTOFLEXI FLEXIBLE COUPLINGS or 4.4 FITTING AND ALIGNMENT OF AB series FLEXIBLE COUPLINGS.

**4.2.8b - BETA COUPLINGS**

To install BETA hydromechanic couplings for belt drive, it is necessary to assemble and tension the belts according to the instructions of the belt manufacturer.

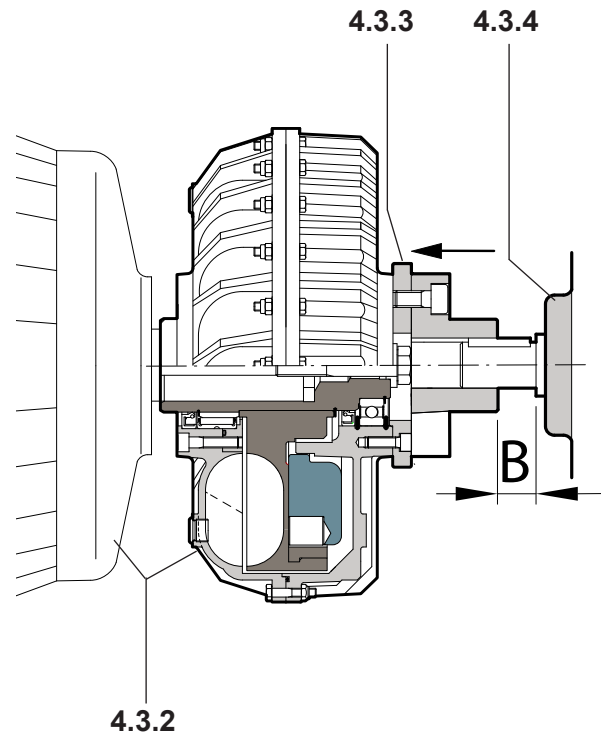
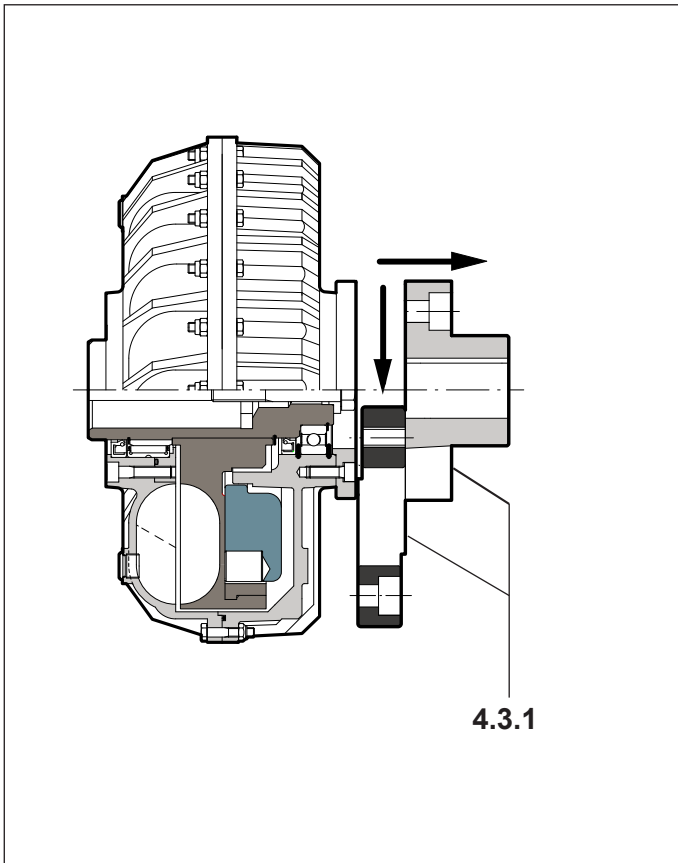
**CAUTION**

Too loose belts may originate vibrations, while too stiff tensioning or wrong alignment may cause excessive axial load and damage the seats of the roller bearings of the coupling, motor or machine.

The assembly of the hydromechanic coupling on the hollow shaft side has thus ended.



### 4.3 ASSEMBLY AND ALIGNMENT OF THE ROTOFLEXI ELASTIC COUPLING



The ROTOFLEXI flexible coupling is an accessory of the ROTOMECH ALFA couplings and it is anchored on the external coupling side for keying it on the reduction gear. To install it correctly, please observe the following steps:

**4.3.1**

Disassemble the hub and the rubber element of the ROTOFLEXI flexible coupling.

**4.3.2**

Fit the hydromechanic coupling or reduction gear.

**4.3.3**

Fit the hub of the flexible coupling on the motor shaft.

**4.3.4**

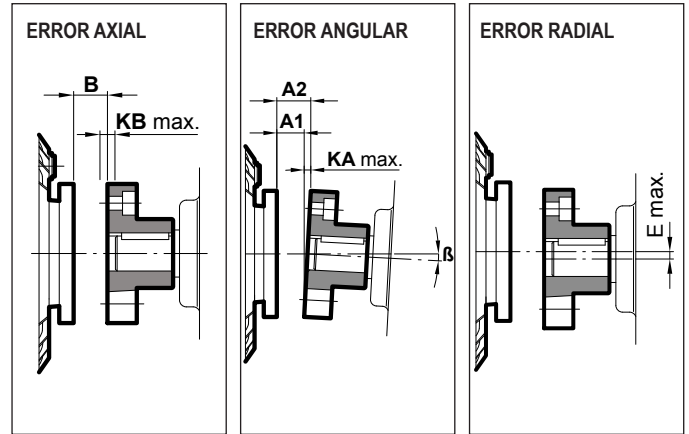
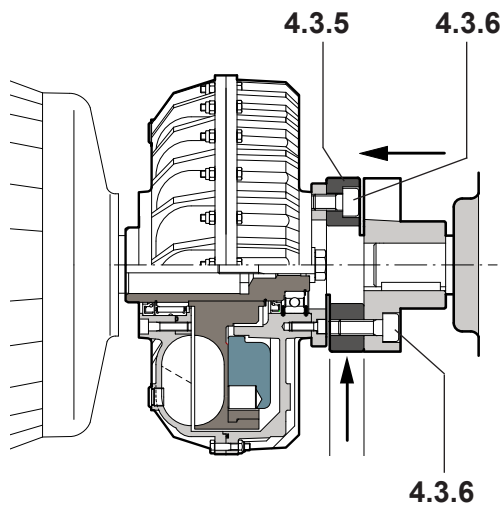
Align driving a driven shaft. Now the machine and the motor may be secured definitively, providing for a space (B) between the hub and the flange fixing face, which must be equal or wider than the thickness of the rubber element as reported in the tables.



**NOTE** Coaxiality is guaranteed, when it is possible to fix the hub to the hydromechanic coupling flange with the screws.







ROTOFLEXI	ROTOMECH COUPLING					MISALIGNMENT				SCREWS	
Type	K-RNV	B	K-FRNV	B	Rated Torque. Nm	KB (max)	KA max (A2-A1)	$\beta$ (max.)	E (max.)	Size	Tightening Torque Nm
2	20	22	--	--	75	$\pm 0,5$	0,4	1°	0,4	M8	25
3	25/30	30	20	30	230	$\pm 0,5$	0,4	1°15'	0,4	M10	50
4	40/40M	34	25/30	34	470	$\pm 0,5$	0,4	1°15'	0,4	M12	87
5	55	38	40/40M	38	750	$\pm 0,7$	0,4	1°15'	0,4	M14	138
6	65	42	55	42	1125	$\pm 0,8$	0,5	1°30'	0,5	M14	138
7	--	--	65	48	1100	$\pm 1$	0,6	1°30'	0,6	M16	212
8	--	--	75	56	4000	$\pm 1$	0,6	1°30'	0,6	M18	291

ROTOFLEXI	ROTOMECH COUPLING					MISALIGNMENT				SCREWS	
Type	K-LRV K-LRU	B	K-FRV K-FRU	B	Rated Torque. Nm	KB (max)	KA max (A2-A1)	$\beta$ (max.)	E (max.)	Size	Tightening Torque Nm
2	20	24	--	--	65	$\pm 0,5$	0,4	1°	0,4	M8	25
3	25/30	32	20	30	175	$\pm 0,5$	0,4	1°15'	0,4	M10	50
4	40/40M	36	25/30	34	330	$\pm 0,5$	0,4	1°15'	0,4	M12	87
5	55	40	40/40M	38	440	$\pm 0,8$	0,4	1°15'	0,4	M14	138
6	65	44	55	42	630	$\pm 0,8$	0,6	1°30'	0,6	M14	138
7	75	50	65	48	1160	$\pm 1$	0,6	1°30'	0,6	M16	212
8	--	--	75	56	2000	$\pm 1$	0,6	1°30'	0,6	M18	291

**4.3.5**

Unscrew the screws, remove the hub and insert the rubber element.



**CAUTION**

Insufficient tightening torque values may cause the loosening of the screws during operation, and subsequently destroy the rubber element of the coupling.

**4.3.6**

Block the fixing screws of the hub and rubber element with the torque wrench up to the tightening torque shown in the table. Pay attention to the final tightening in order to avoid the deformation of the rubber element.



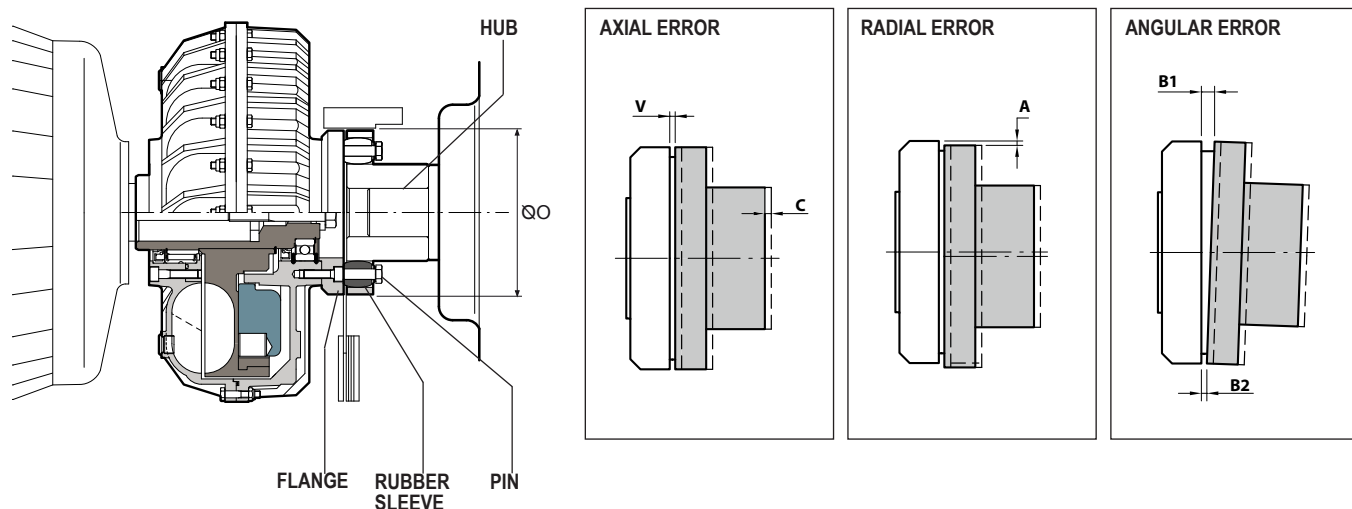
**NOTE**

The screws must be blocked using some MEDIUM-STRENGTH thread sealant.





## 4.4 ASSEMBLY AND ALIGNMENT OF SERIES AB ELASTIC COUPLING



ROTOMECH	ELASTIC COUPLING			SIZE IN MM				PIN		SPARE PARTS		
Size	Type	Ø O	Rated torque Nm	A	B1-B2 max	C	V	Thread Ø	Tightening torque Nm	Rubber sleeve	Pin	Quantity
55	AB-5	186	950	0,18	1	2	4	M10	50	30	12	8
65	AB-6	224	2200	0,22	1,2	2	4	M14	138	40	18	8
75	AB-8/7	330	6500	0,35	1,7	3	6	M18	291	60	25	8
85	AB-8M	400	12000	0,35	2	3	6	M18	291	60	25	12

### 4.4.1

Fit the hydromechanic coupling on the motor.

### 4.4.2

Fit the hub of the flexible coupling on the shaft of the machine to operate.

### 4.4.3

Then position the driven machine so that the shaft is coaxial to the hydromechanic coupling



### NOTE

To confirm coaxiality, it is necessary to verify with a ruler in at least 4 equidistant points, that the machined edges of the hub and the flange with guide pins are levelled. To confirm the angle alignment, verify at least in 4 equidistant points with a thickness gauge that the distance between the opposite faces of both the hub and the flange with guide pins is uniform (see table, B1-B2 dimension).

### 4.4.4

Now the driven machine and the motor can be definitively fixed, providing for a space equal to the "V" dimension between the hub and the fixing face rubber sleeve of the flange with guide pins.

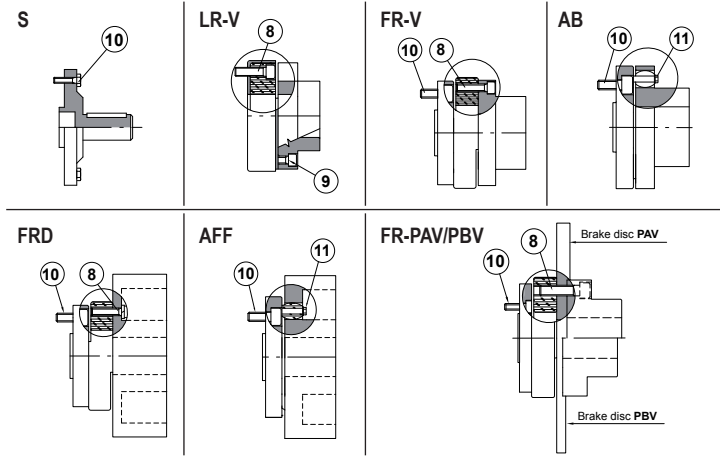
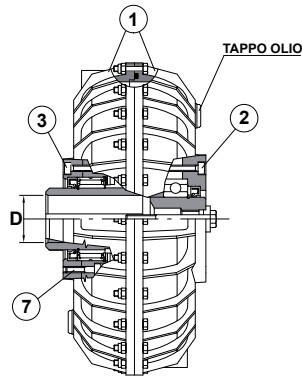
### 4.4.5

in the relevant housings, providing for a distance equal to the "V" dimension shown in the table and fix the hub with proper setscrews.

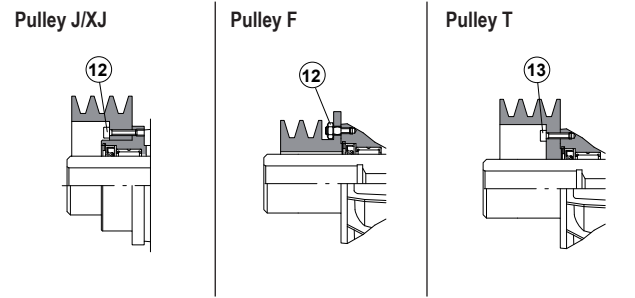
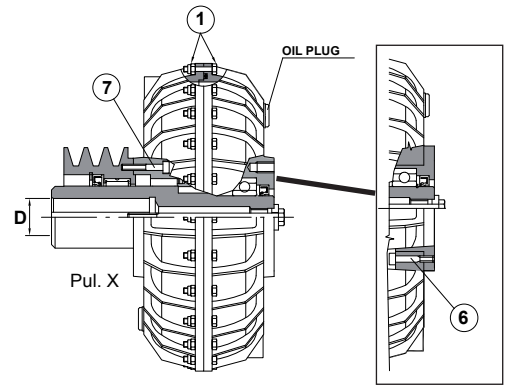


### 4.5 SCREW TIGHTENING TORQUES FOR COUPLINGS AND ACCESSORIES

#### ROTOMECH ALFA



#### ROTOMECH BETA



All tightening torques are expressed in Nm (UNI 3740/ISO 898) and refer to the screws included in the WESTCAR scope of supply, which are produced in material grade 8.8 (8G) or higher (UNI 5931, UNI 5737, UNI 5739, UNI 5932).

**CAUTION** The screws in the aluminium or cast-iron threaded holes must exert a firm grip along a depth equal to 1½ time their diameter, in order to ensure resistance at the prescribed tightening torque. **DANGER OF SEAT THREAD STRIPPING.**

ROTOMECH SIZE	Pos. 1	Pos. 2	Pos. 3	Pos. 6	Pos. 7	Pos. 8	Pos. 9	Pos. 10	Pos. 11	Pos. 12	Pos. 13	OIL PLUG	SCREWS	TORQUE Nm
20	M5	-	-	-	M6	M8	M8	M6	-	M6	M6	1/4"	M5 8.8	6,03
25	M6	-	-	-	M6	M8	M8	M8	-	M6	M6	1/4"	M6 8.8	10,38
30	M8	-	-	-	M8	M10	M10	M8	-	M8	M8	1/4"	M8 8.8	25,16
40/40M	M8	-	-	-	M8	M12	M12	M10	-	M10	M8	1/4"	M10 8.8	50,53
55	M8	M10	-	-	M10	M14	M14	M10	M10	M10	M10	1/2"	M12 8.8	87,08
65	M8	M10	-	-	M10	M14	M14	M10	M14	M10	M10	1/2"	M14 8.8	138,5
75	M10	-	-	M12	M12	M18	M18	M16	M18	M12	M12	1/2"	M16 8.8	212
85	M12	M14	M14	-	-	M18	M18	M18	M18	M14	M14	1/2"	M18 8.8	291

ROTOMECH SIZE	Pos. 1	Pos. 2	Pos. 3	Pos. 6	Pos. 7	Pos. 8	Pos. 9	Pos. 10	Pos. 11	Pos. 12	Pos. 13	OIL PLUG	PLUG	TORQUE Nm
55	M8	M10	-	-	M8	M14	M14	M10	M10	M10	-	1/2"	1/4"	12,75
65	M10	M10	-	-	M10	M14	M14	M10	M14	M10	-	1/2"	3/8"	25,14
75	M10	-	-	M12	M12	M16	M16	M16	M18	M12	-	1/2"	1/2"	43,03
85	M12	M14	M14	-	-	M18	M18	M20	M24	M14	-	1/2"		


DRIVE SHAFT SIZE "D"	14	19	24	28	38	42-48	55-65-75-85
SCREW HEAD	M5	M6	M8	M10	M12	M16	M20
TIGHTENING TORQUE Nm	6,03	10,38	25,16	50,53	87,08	212	413





## 4.6 ROTOMECH COUPLING COMMISSIONING STANDARD AND ATEX MANUFACTURE

Upon completion of the mechanical assembly of the hydromechanic coupling on the driven and drive end according to the instructions set out in the previous sections, it is possible to complete the commissioning as follows:

 **CAUTION**  
**Do not commission the ROTOMECH hydromechanic coupling before the machine incorporating it has obtained the certificate of compliance with the Machine Directive 2006/42/CE, the ATEX 94/9/CE Directive and other specific applicable directives.**

### 4.6.1 HYDROMECHANIC COUPLING WITH TF (Fusible Plug)

To complete the installation of the hydromechanic coupling equipped with the overheating control device TF, it is necessary to observe what follows:

- Set an automatic motor shutdown signal in case of device triggering, which signals transmission/lubrication oil leakage.

**DANGER OF OVERHEATING, SEIZURE AND FIRE.**

- Set up suitable containment and containers to collect hot transmission oil.  
**DANGER OF HOT OIL SPLASHES, SCALDING AND SLIPPERY FLOOR.**
- Isolate the hydromechanic coupling with suitable interlocked protections, which prevent the personnel from interfering with the coupling moving components and/or the live components of the drive end.
- When couplings are installed in an environment with explosive atmosphere ATEX, some accident- prevention guards prevent any contact with the rotating components and/or protect them from any metal object fall or ejection even from outside.  
**DANGER OF SPARKS AND FIRE IGNITION.**



### 4.6.2 HYDROMECHANIC COUPLING WITH TE (Expandable Trip Plug)

To complete the installation of the hydromechanic couplings equipped with the overheating control device TE with ET-A, observe what follows:

- Set an automatic motor shutdown in case of device triggering.

**DANGER OF OVERHEATING.**

- Isolate the hydromechanic coupling with suitable interlocked guards, which prevent the personnel from interfering with the coupling moving components and/or the live components of the drive end.
- When hydromechanic couplings are installed in a hazardous zone ATEX, the guards must be designed so to prevent any contact with the rotating components and/or to protect them against any fall or ejection of metal objects.  
**DANGER OF SPARKS AND FIRE IGNITION.**



### 4.6.3 HYDROMECHANIC COUPLING WITH PM/T09 (Plug with Thermostat and rpm Controller)

To complete the installation of the hydromechanic couplings equipped with the PM-T09 overheating control unit, observe what follows:

- Set an automatic motor shutdown in case of device triggering. **DANGER OF OVERHEATING.**
- Isolate the hydromechanic coupling with suitable interlocked protections, which prevent the personnel from interfering with the coupling moving components and/or the live components of the drive end.

- The installation of the coupling in the ATEX environment requires some guards to prevent interference with rotating interferences are installed in a hazardous zone, the guards must be designed so to prevent any contact with the rotating components and/or the metal objects from interfering with operation, as a result of fall or sudden ejection.

**DANGER OF SPARKS AND FIRE IGNITION.**



**4.6.4 FIRST START-UP AND COMMISSIONING OF THE HYDROMECHANIC COUPLING**

After completion of all operations dealt with in the previous sections, observe the following steps:

**4.6.4a**

For filling and calibration of the transmission oil of the hydromechanic coupling, follow the steps described in section 6.3 FILLING AND CALIBRATION OF HORIZONTALLY MOUNTED COUPLINGS or 6.4 FILLING AND CALIBRATION OF VERTICALLY MOUNTED COUPLINGS.

**4.6.4b**

The ROTOMECH hydromechanic couplings are designed to achieve 4-5 days of continuous running. The vertically installed BETA hydromechanic couplings of the X, J and H type, with pulley in the upper part, must be equipped with permanent lubrication or self-lubricating system (see technical data sheet).

**WARNING**

For heavy-duty applications or in case of continuous running for a longer time than previously mentioned, use transmission oils with a higher lubricating power (see technical data sheet and table B for oils) or hydromechanic couplings equipped with permanent lubrication or self-lubrication system (see COUPLING TECHNICAL DATA SHEET).

**4.6.4c**

To install the ATEX hydromechanic coupling in an environment with explosive atmosphere, it is necessary to use suitable transmission oil with a flash temperature (T max) higher than the maximum safety temperature of the coupling and the overheating control devices it is completed with, as shown on the ATEX marking on the product.

**CAUTION**

**Do not use oil not suitable for ATEX environment with flash temperature (T max) Lower than the safety temperature reported on the ATEX marketing of the hydromechanic coupling.**

**4.6.4d**

Promptly remove any oil dripping or leakage from the coupling or the soil.

**CAUTION**

**Oil leakage may cause dangerous accidents, in particular during the initial start-up phases; therefore it must be carefully wiped out. DANGER OF SLIPPERY FLOOR, CRASH AND FALL.**

**4.6.4e**

Remove tools, cloths and/or foreign bodies from the coupling and the operating area.

**4.6.4f**

Close the guard of the hydromechanic coupling operating area.

**CAUTION**

**During normal operation, the ROTOMECH hydromechanic coupling is not noisy; in case of high noise level and/or vibrations, stop immediately the motor and trace the causes to remove them.**

**4.6.4g**

During inspection and afterwards, during operation, remember never to exceed the maximum number of start-ups/hours prescribed by the manufacturer (see technical catalogue). **DANGER OF OVERHEATING.**

**4.6.4h**

If after evaluation of the start-up results the calibration of the start-up is required, follow what described in section 6.3 FILLING AND CALIBRATION OF HORIZONTALLY MOUNTED COUPLINGS or 6.4 FILLING AND CALIBRATION OF VERTICALLY MOUNTED COUPLINGS.

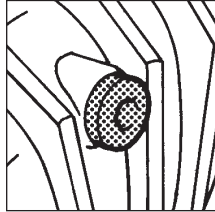
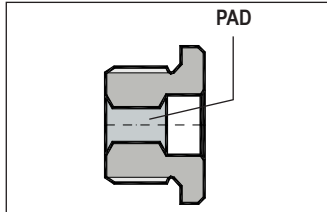
**Commissioning has thus ended.**



## 5.1 TF (Fusible Plug) OPERATION AND REPLACEMENT

### 5.1.1 EXPECTED DEVICE OPERATION

The TF are calibrated for different triggering temperatures, which may be inferred from the marking and they are characterized by different identification colours.



TRIGGERING TEMPERATURES	COLOUR
96°C	BLUE
120°C	WHITE
145°C	RED
180°C	GREEN

The Fusible Plug is a device designed for safeguarding the hydromechanic coupling. It is composed of a bored plug, filled with a pad in hot-melt material, which melts when temperature reaches the threshold

In case of abnormalities, due to an excessive slip and subsequent overheating of the transmission fluid, the melting of the pad and the transmission oil leakage occur, so that the power transmission to the driven machine is cut off

#### CAUTION

The transmission oil leakage prevents the lubrication of the internal bearings; therefore the activation of this device **MUST ALWAYS** be followed by the automatic shutdown of the motor and the drive end.

**DANGER OF OVERHEATING, SEIZURE AND/OR FIRE IGNITION.**

### 5.1.2 TF REPLACEMENT

After this device has triggered causing the shutdown of the machine, where the fusible plug is installed, it is necessary to replace the TF as described below:

- Wait for all moving components to stop.
- Cut out power supply to motor or drive end and apply an appropriate safety padlock.
- Wait for the cooling down of the hydromechanic coupling (max 40°C) before intervening.

#### CAUTION

Remove any oil dripping or leakage from the coupling or the soil. **DANGER OF SLIPPERY FLOOR, CRASH AND/OR FALL.**

- Open the guard to access the hydromechanic coupling.

#### CAUTION

Do not install the TF on **ATEX hydromechanic couplings category 2.** **DANGER OF FIRE IGNITION.**

- Replace the fusible plug with a spare part having the same triggering characteristics and fill the coupling with suitable transmission oil as described in section 6.3 FILLING AND CALIBRATION OF HORIZONTALLY MOUNTED COUPLINGS or 6.4 FILLING AND CALIBRATION OF VERTICALLY MOUNTED COUPLINGS.
- Remove the causes, which have determined the device triggering due to overheating.
- Check the shaft for oil leakage and the condition of the shaft sealing.
- Remove any tools, cloths and/or foreign bodies from the coupling and the working area.
- Close the guard in the hydromechanic coupling operating area.

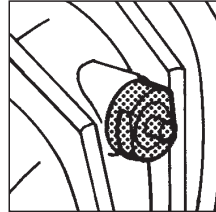
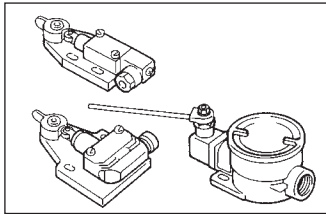
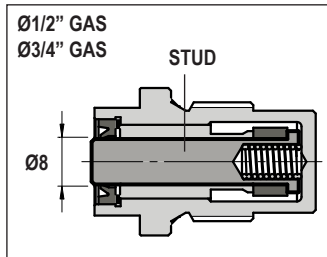
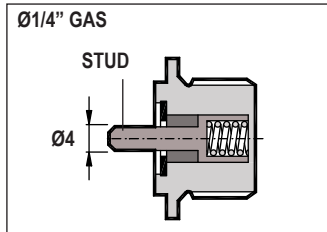
**The replacement of the TF is thus ended.**



## 5.2 TE (Expandable Trip Plug) OPERATION AND REPLACEMENT

### 5.2.1 EXPECTED DEVICE OPERATION

The TE are calibrated for different triggering temperatures, which may be inferred from the marking and they are characterized by different identification colours.



TRIGGERING TEMPERATURES	COLOUR
96°C	BLUE
120°C	WHITE
145°C	RED
180°C	GREEN

TE = Expandable Trip Plug (trigger temperatures 96°C [204.80°F], 120°C [248°F], 145°C [293°F] e 180°C[356°F]).

The Expandable Trip Plug is a detection device, which permits to activate a signal through a suitable microswitch available in both the STANDARD (ET or ET-CE) and the ATEX (ET-A) manufacture. It is a closed plug (which does not permit any leakage of transmission fluid) with an external seat, which houses an actuating piston, retained by a hot-melt spacer.

When the maximum temperature is exceeded, the hot-melt ring is pushed outside, while a suitable microswitch senses this movement. The triggering of this device controls the automatic motor and drive part stop in order to avoid that the maximum temperature is exceeded.

### 5.2.2 TE REPLACEMENT

After this device has triggered causing the shutdown of the machine, where the expandable trip plug is installed, it is necessary to replace the TE as described below:

- Wait for all moving components to stop.
- Cut out power supply to motor or drive end and apply an appropriate safety padlock.
- Wait for the cooling down of the hydromechanic coupling (max 40°C) before intervening.
- Open the guard to access the coupling.
- Check the shaft for oil leakage and the condition of the shaft sealing.
- Turn the coupling until the triggered TE is positioned along its vertical axis.
- Replace the device with an original spare part having the same triggering characteristics.
- Put the level of the microswitch in operating position again.
- Remove the causes, which have determined the device triggering due to over-heating.

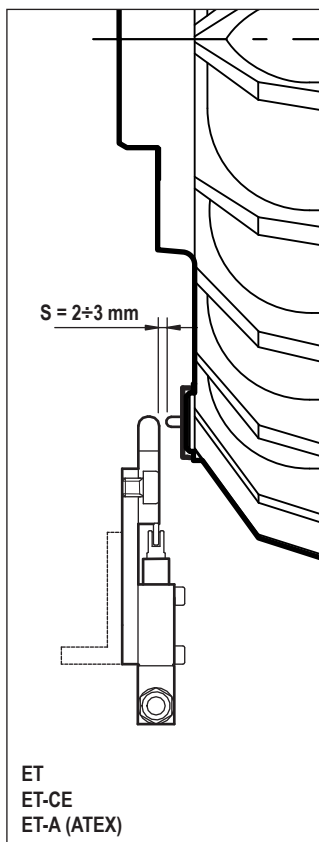


#### CAUTION

**Remove any oil dripping or leakage from the coupling or the soil.  
DANGER OF SLIPPERY FLOOR, CRASH AND/OR FALL.**

- Remove any tools, cloths and/or foreign bodies from the coupling and the working area.
- Close the guard in the hydromechanic coupling operating area.

**The replacement of the TE has thus ended.**



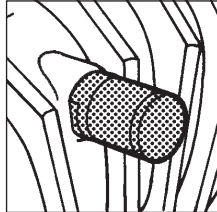
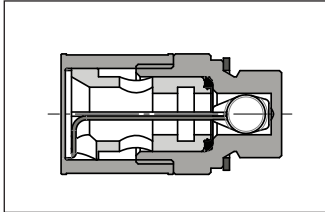




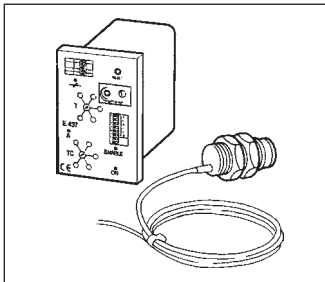
### 5.3 PM-T09 UNIT (Plug with Thermostat and rpm Controller) OPERATION AND RESET

#### 5.3.1 EXPECTED PM-T09 UNIT OPERATION

The PMs are calibrated for different triggering temperatures, which may be inferred from their marking, and they are also characterized by different identification colours.



TRIGGERING TEMPERATURE	COLOUR
100°C	BLUE
120°C	WHITE
140°C	RED
160°C	YELLOW



The plug with thermostat is a device, which transmits a magnetic and detection signal to a suitable electronic central unit by means of sensors. It is a closed plug (which does not permit any leakage of transmission fluid) and it houses externally a temperature probe with a thermostat capable of emitting a pulse signal.

When the hydromechanic couplings are mounted with standard installation (internal drive end), the PM-T09 unit can be used to control both motor revolutions and overtemperature. In the reversed installation of the hydromechanic coupling (external drive end), the PM-T09 unit can only control overheating

#### CAUTION

The use of this PM-T09 unit in an environment with hazardous atmosphere ATEX requires the installation of Zener barriers for an intrinsically safe electric system (see Original Instruction Manual of the PM-T09 unit).

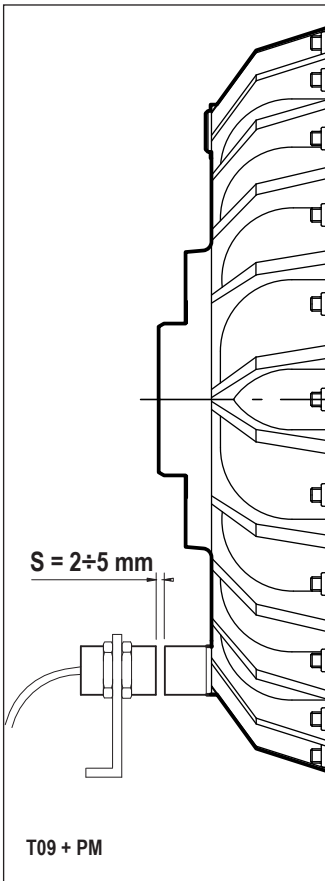
#### 5.3.2 MAXIMUM TEMPERATURE CONTROL

When the maximum temperature of the hydromechanic coupling is exceeded, the sensor detects it and the signal emitted generates an alarm condition and automatically causes the motor or drive side to stop.

#### 5.3.3 REPLACEMENT OF PM-T09 UNIT DUE TO OVERTEMPERATURE

When the maximum temperature is reached, an extended 30 minute's stop is required in order to enable temperature dissipation of both the hydromechanic coupling and the transmission fluid (lowering of 20°C below maximum temperature), which is a necessary requirement to reset the thermostat of the PM-T09 unit.

- Check the shaft for oil leakage and the condition of the shaft sealing.
- Remove the causes, which have determined the device triggering due to overheating.





### 5.3.4 RPM CONTROL

The pulse signal from the T09 device in the PM plug is detected by a sensor and transformed by the electronic central unit into a number of revolutions. The minimum threshold number of revolutions for the driven member is set up in an appropriate regulator included in the electronic central unit, which generates an alarm condition and causes the motor or drive member to shut down when the two following conditions pre-set in suitable integrated timers are met:

- Start-up timer (max 60 seconds): it permits to ignore the signals from the revolution controller for the time set up, during the start-up phase, until the motor reaches stable operating conditions; afterwards the specific Pre-alarm Timer takes over.
- Pre-alarm Timer (max 30 seconds): it permits to generate a pre-alarm condition for the pre-set time. If any rotational slow-down has been detected under normal operating conditions for longer than the set up pre alarm time, an alarm signal is released and the motor or drive member are automatically shut down.
- Remove the causes, which have determined the device triggering due to overheating.

### 5.3.5 T09 RESET DUE TO A REDUCTION IN RPM



The alarm released because of a reduction in the number of revolutions entails no downtime for the reset of this device.

This device is installed upon customer's request in the standard couplings, when overloads of the driven end during operation are likely to occur, which may determine a reduction in the number of revolutions or a start-up overextension beyond the maximum pre-set time, or in order to avoid the TF fusible plug and/ or the TE Expandable Trip Plug reset after overheating of the hydromechanic coupling.



## 6.1 TRANSMISSION OIL TECHNICAL CHARACTERISTIC

The ROTOMECH hydromechanic coupling operates with hydraulic oil as transmission fluid. The applications of the hydromechanic couplings in the natural environment must give priority to biodegradable mineral oils used for environmental protection.

 **CAUTION**  
 **The couplings manufactured according to the ATEX directive and installed in explosive atmospheres shall use oils with higher flash temperature (T max) than pointed out on the marking of the hydromechanic couplings.**


The basic characteristics for a good selection of transmission oils are:

### 6.1.1 VISCOSITY

Good oil viscosity and dynamic fluidity permit the maximum torque transmission. Remember that oil varies its fluidity as a function of temperature (the hotter the temperature, the more fluid the oil).

### 6.1.2 LUBRICATING POWER

High lubricating power ensures the lubrication of the coupling bearings. Basically, oil with viscosity degree among 1,9° and 4° angler may be used.

 **CAUTION**  
**The oil inside the coupling must be fluid enough to transmit the torque. In case of low temperature (below 0°C), the first start-up requires a longer time to transmit the torque until standard operating conditions are reached.**

The recommended oils are listed below according to their technical characteristics and the properties of environment (temperature), where they are used.

**TABLE A OILS FOR TEMPERATURE UP TO -20°C**

These oils are very fluid and their viscosity is between 21 and 22 CST; they are adequate for operating temperatures not below -20°C.

OIL TRADEMARK		BP	CASTROL	ESSO	MOBIL	Q8	SHELL
OIL TYPE		ENERGOL HPL22	HYSPIN AWS22	NUTO H22	DTE 22	VERDI 22	TELLUS OIL 22
VISCOSITY	ISO VG	22	22	22	22	22	22
	CST A 40°C	21	22	21.01	22	22	22
	ENGLER	2.3	2.3	2.3	2.3	2.3	2.3
VISCOSITY INDEX		104	100	104	110	98	90
DENSITY	kg/dm <sup>3</sup>	0.875	0.870	0.864	0,860	863	0.871
POURPOINT	°F	-22	-22	-31	-22	-22	-22
	°C	-30	-30	-35	-30	-30	-30
FLASHPOINT	°F	377.6	410	399.2	392	406	356
	°C	192	210	204	200	208	180



**TABLE B HIGH PERFORMANCE OILS**

The viscosity range of the following oils is 46 – 48 CST. Thanks to their high lubricating power they are suitable for longer periods of continuous running, provided that temperature is not below -20°C.

OIL TRADEMARK		BP	CASTROL	ESSO	MOBIL	Q8	SHELL
OIL TYPE		BARTRAN HW46	HYSPIN AWH46	INVAROL EP46	DTE 15	VERDI 46	TELLUS T46
VISCOSITY	ISO VG	46	46	46	46	46	46
	CST A 40°C	46	46	46	46	46	46
	ENGLER	4	4	4	4	4	4
VISCOSITY INDEX		152	150	167	155	98	185
DENSITY	kg/dm <sup>3</sup>	0.882	0.875	0.867	0.880	877	0.875
POURPOINT	°F	-33	-38	-33	-38	-22	-44
	°C	-36	-39	-36	-39	-30	-42
FLASHPOINT (T max)	°F	431	410	437	374	432	365
	°C	222	210	225	190	222	185

**TABLE C OILS FOR TEMPERATURE UP TO -40°C**

These oils have a high viscosity index (more stable as temperature changes) and they are suitable for longer periods of continuous running, provided that temperature is not below -40°C.

OIL TRADEMARK		ESSO	MOBIL	ROLOIL
OIL TYPE		INVAROL EP22	SCH 524	SYNTHEST-HP32 BIO
VISCOSITY	ISO VG	22	32	32
	CST A 40°C	20.75	32	32
	ENGLER	2.3	3.3	3,3
VISCOSITY INDEX		167	144	200
DENSITY	kg/dm <sup>3</sup>	0.888	0.855	0,914
POURPOINT	°F	-45.4	-65.2	-81,4
	°C	-43	-54	-63
FLASHPOINT (T max)	°F	302	543.2	446
	°C	150	234	230

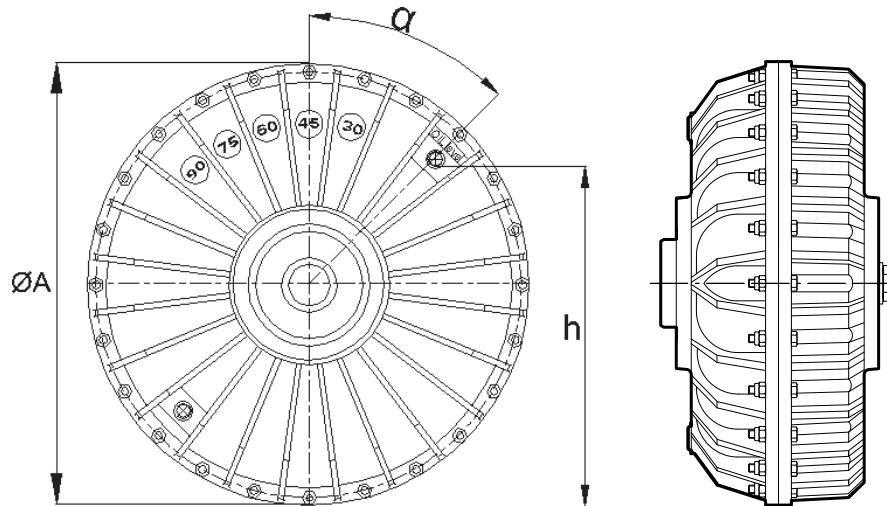
**TABLE D BIODEGRADABLE OILS**

The table below shows the synthetic biodegradable fluids, which are particularly suitable for out door applications.

OIL TRADEMARK		ROLOIL	ROLOIL	ROLOIL
OIL TYPE		SYNTHEST 46 BIO	SYNTHEST HP 32 BIO	SYNTHEST HP 46 BIO
VISCOSITY	ISO VG	45	32	48
	CST A 40°C	45	32	48
	ENGLER	4	3,3	
VISCOSITY INDEX		190	200	190
DENSITY	kg/dm <sup>3</sup>	0,915	0,914	0,914
POURPOINT	°F	45,4	-81,4	-81,4
	°C	-43	-63	-63
FLASHPOINT (T max)	°F	563	446	473
	°C	295	230	245
BIODEGRADABILITY %		> 90	> 80	> 80



## 6.2 TABLES FOR COUPLING FILLING



This section shows the tables with the filling quantity (in litres) for the coupling, according to a specific angular location of the lubricant oil screw plug with respect to the vertical axis of the hydromechanical coupling horizontally mounted.

For different filling angles (reported on the first line above) of hydromechanical coupling size (as pointed out on the first column left) you may read the correct angular position of the horizontally mounted coupling and the height of the plug with respect to the lowest point of the external diameter of the coupling.

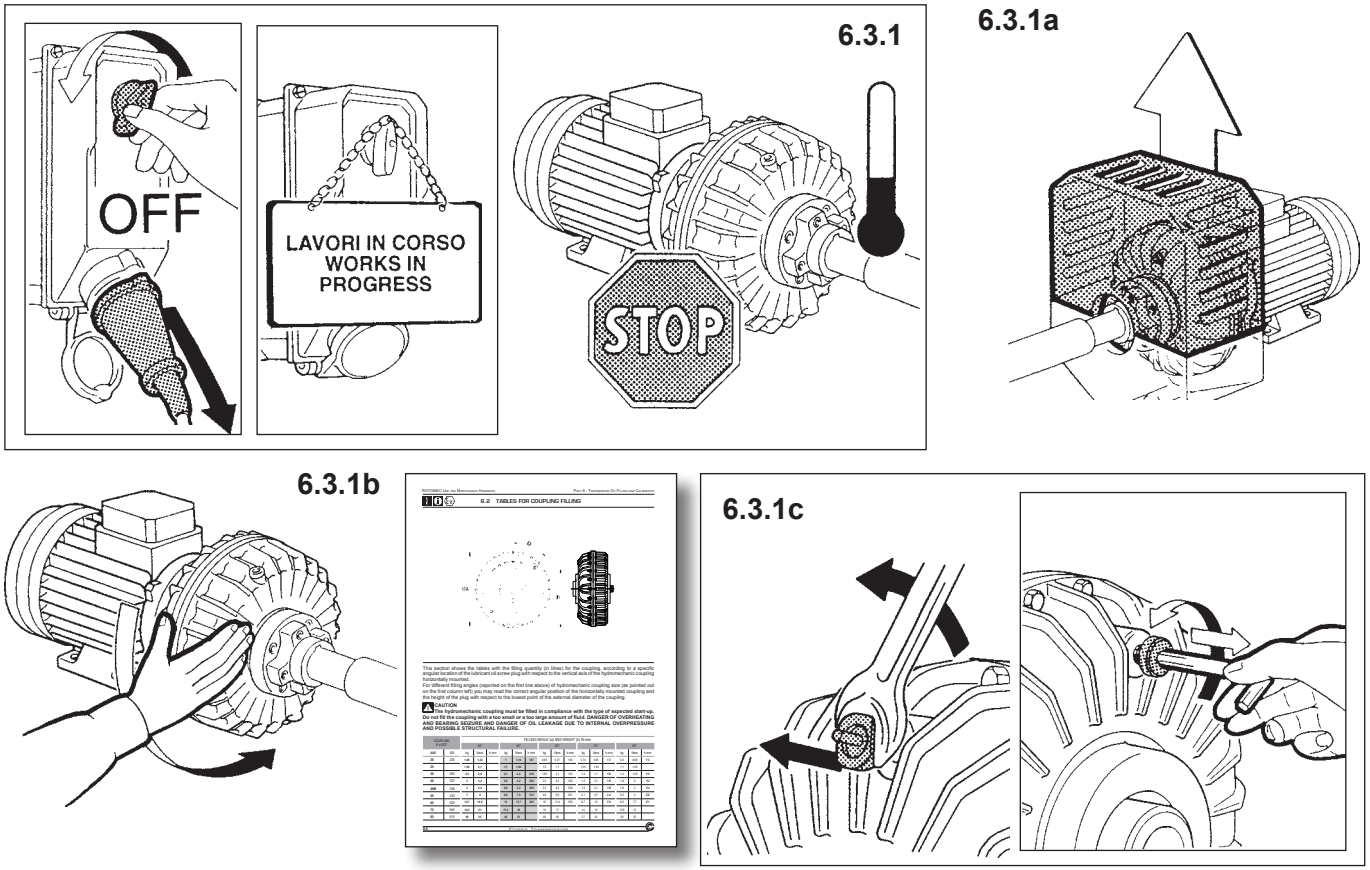
**CAUTION** The hydromechanical coupling must be filled in compliance with the type of expected start-up. Do not fill the coupling with a too small or a too large amount of fluid. DANGER OF OVERHEATING AND BEARING SEIZURE AND DANGER OF OIL LEAKAGE DUE TO INTERNAL OVERPRESSURE AND POSSIBLE STRUCTURAL FAILURE.

COUPLING K e SCF		FILLING ANGLE (α) AND HEIGHT (h) IN mm														
		30°			45°			60°			75°			90°		
SIZE	ØA	kg	liters	h mm	kg	liters	h mm	kg	liters	h mm	kg	liters	h mm	kg	liters	h mm
20	230	1,08	1,23		1	1,14	167	0,85	0,97	150	0,75	0,85	137	0,6	0,68	110
25		1,85	2,1		1,7	1,94		1,5	1,7		1,35	1,54		1,1	1,25	
30	290	2,3	2,6		2,1	2,4	218	1,85	2,1	195	1,5	1,7	168	1,3	1,48	140
40	327	3	3,4		2,8	3,2	256	2,5	2,8	229	1,9	2,1	198	1,8	2	164
40M	338	3	3,4		6,6	3,2	256	2,5	2,8	229	1,9	2,1	198	1,8	2	164
55	430	7	8		6,6	7,5	312	4,8	5,5	281	4,1	4,7	244	3,5	4	206
65	520	12,7	14,5		12	13,7	395	10	11,4	353	8,7	10	304	6,8	7,7	251
75	640	18,3	21		17,4	20		15	17		14	16		10,6	12	
85	810	48	55		45	51		40	46		37	42		28	32	





6.3 FILLING AND CALIBRATION OF HORIZONTALLY MOUNTED COUPLINGS

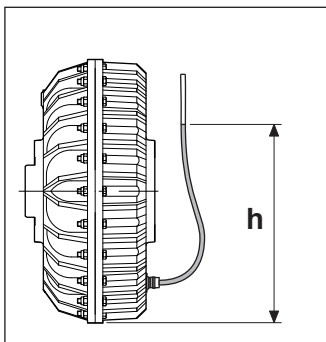


To fill and calibrate the horizontally mounted hydromechanical coupling, observe the following steps:

6.3.1 TRANSMISSION OIL FILLING

**CAUTION** Before the hydromechanical coupling is filled and/or calibrated, observe the following steps:

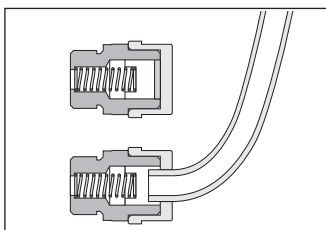
- A- stop the motor and wait for the rotation components to stop,
- B- cut out power supply and apply a safety padlock,
- C- signal the operation underway,
- D- Wait for cooling, if needed (max 40°C)



**6.3.1a** Open the accident-prevention guard of the operating area to access the coupling.

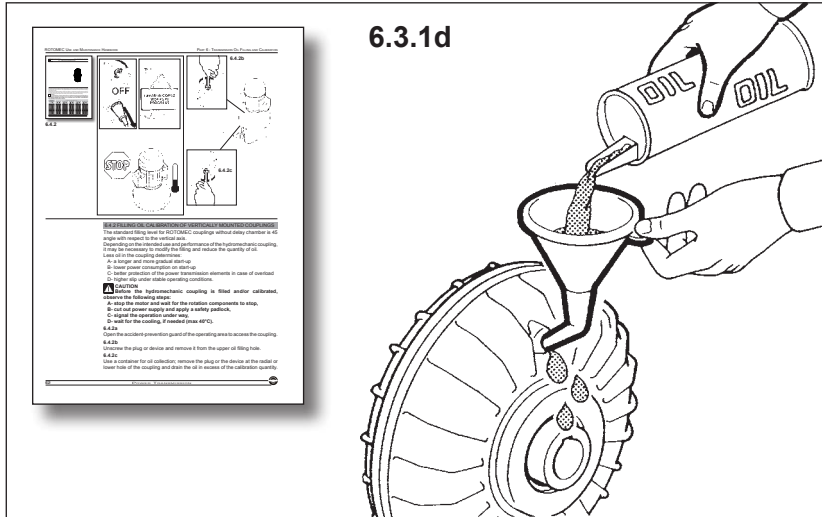
**6.3.1b** Turn the coupling until the oil screw plug is accessible on the pre-established angular position with respect to the vertical axis (see section TABLES FOR COUPLING FILLING).

**NOTE** In plants, where the couplings outer shell cannot freely rotated to adequately position the oil screw plug, a CL device may be installed (see section 6.2 OIL LEVEL CHECK AND TOP-UP and 7.2.4 COUPLINGS EQUIPPED WITH CL DEVICE).

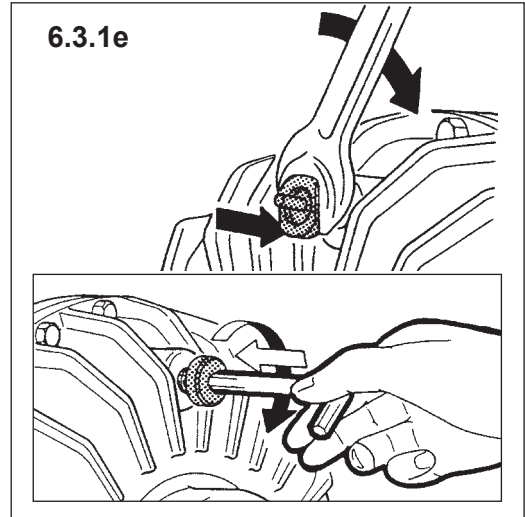


**6.3.1c** Remove the plug (or the device) to fill the coupling with oil.

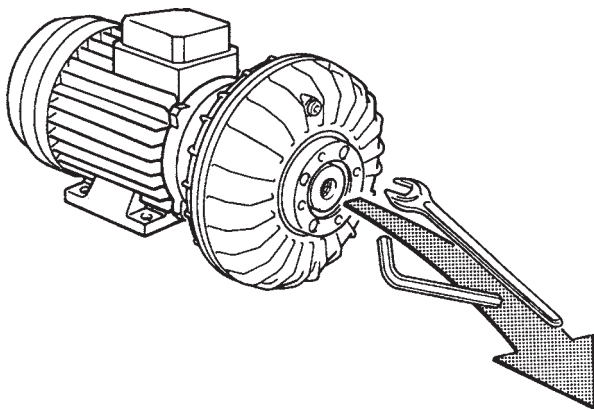




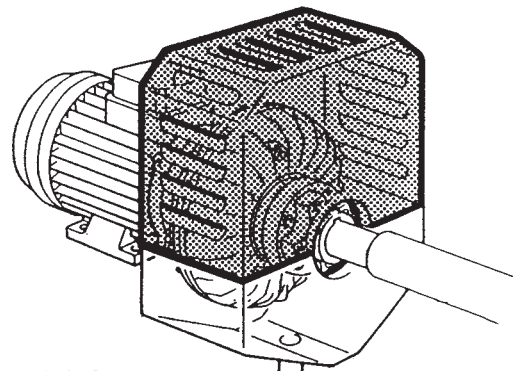
6.3.1d



6.3.1e



6.3.1f



6.3.1g

**6.3.1d**

Fill up the coupling until the fluid overflows from the filling hole, using only the oil recommended by the manufacturer (see section 6.1 TRANSMISSION OIL TECHNICAL CHARACTERISTICS).



**CAUTION**

Promptly remove any oil dripping or leakage from the coupling or the soil. **RISK OF SLIPPERY FLOOR, CRASH AND/OR FALL.**

**6.3.1e**

Position the plug or the device on the filling hole of the coupling again.

**6.3.1f**

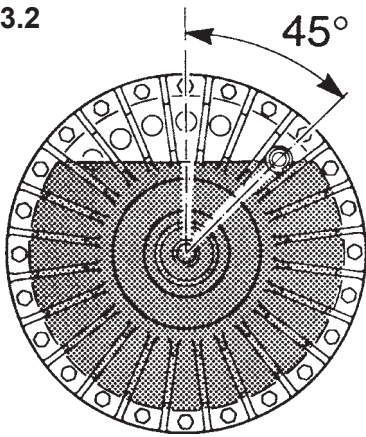
Remove any used key and/or cloth or tool from the coupling and the operating area. **RISK OF PHYSICAL INTERFERENCE**

**6.3.1g**

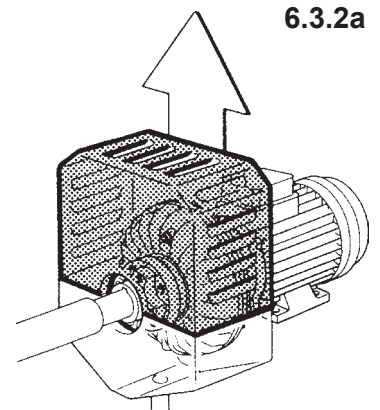
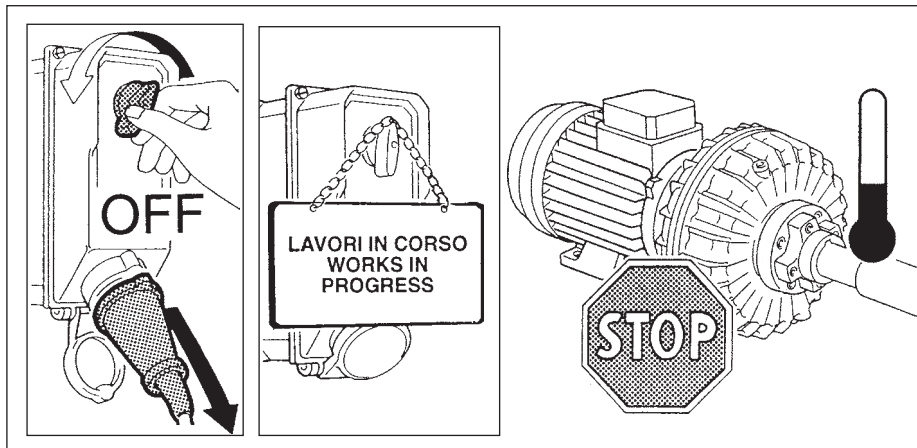
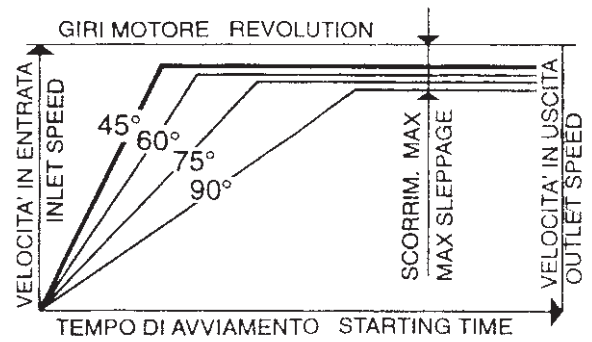
Close the guard protecting the hydromechanic coupling operating area. **The filling up of the horizontally mounted coupling has thus ended.**



6.3.2



6.2 TABLES FOR COUPLING FILLING



6.3.2 FILLING OIL CALIBRATION OF HORIZONTALLY MOUNTED COUPLING

The standard filling level for ROTOMECH couplings without delay chamber is equivalent to a 45° angle respect to the vertical axis. For couplings with delay chamber SCF, DCF and CA, read the tables in section 6.2 TABLES FOR COUPLING FILLING. In view of the hydromechanic coupling use and performance, it may be necessary to modify the filling, reducing the oil quantity. Less oil in the coupling determines

- A- a longer and more gradual start-up,
- B- lower power consumption on start-up,
- C- better protection of the power transmission elements in case of overload,
- D- higher slip under stable operating conditions.

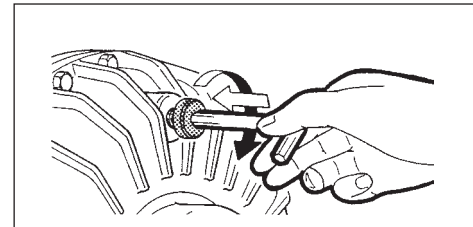
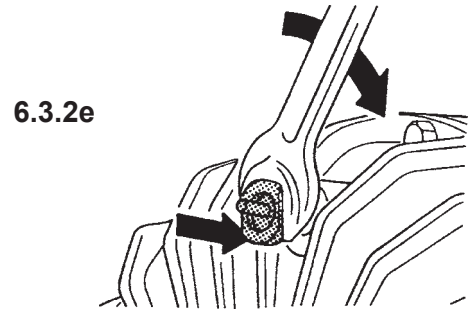
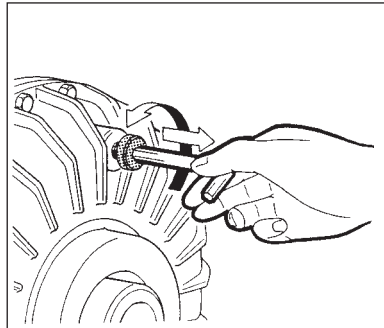
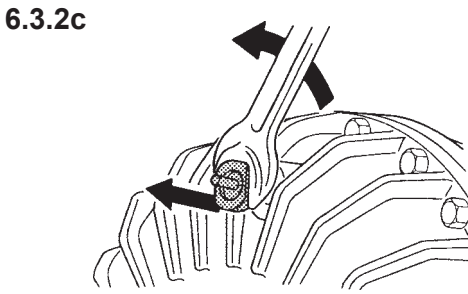
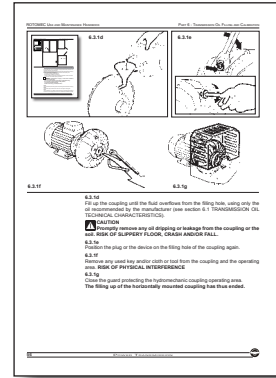
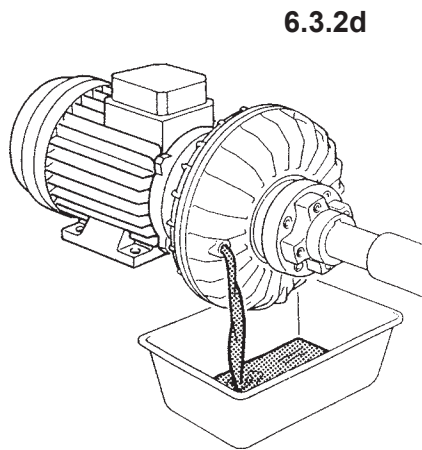
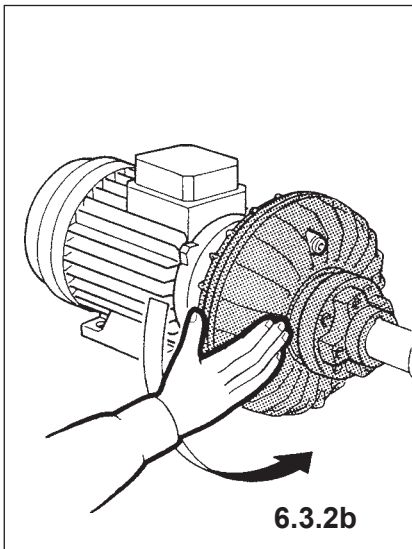
**CAUTION** Before the hydromechanic coupling is calibrated, observe the following steps:

- A- stop the motor and wait for the rotation components to stop
- B- cut out power supply and apply a safety padlock,
- C- signal the operation underway,
- D- wait for the cooling, if needed (max 40°C).

6.3.2a

Open the accident-prevention guard of the operating area to access the coupling.





**6.3.2b**

Manually turn the coupling until the oil filler plug is accessible on the upper part.

**6.3.2c**

Unscrew the plug or device and remove it from the oil filling hole.



**CAUTION**

The hydromechanic coupling must be filled in compliance with the type of expected start-up. Do not fill the coupling with a too small or a too large amount of fluid. **RISK OF OVERHEATING, SEALING DAMAGE, OVER HEATING OF THE BEARINGS AND/OR FIRE IGNITION OR RISK OF OIL LEAKAGE DUE TO OVERPRESSURE AND/OR STRUCTURAL FAILURE.**

**6.3.2d**

In order to decrease the quantity of oil, use a collection bowl and turn the coupling until it reaches the desired filling position on the vertical axis (see section 6.2 TABLES FOR COUPLING FILLING) and wait until the excessive oil flows out.

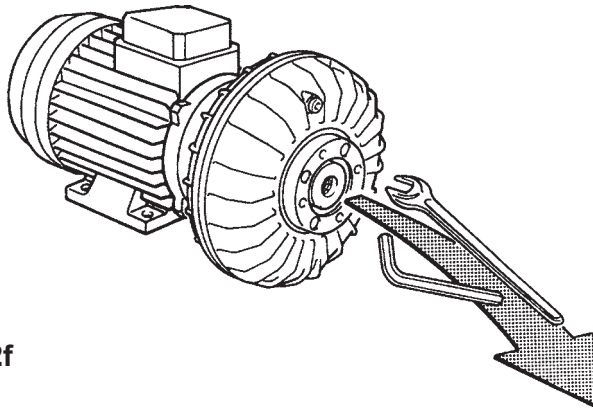


**CAUTION**

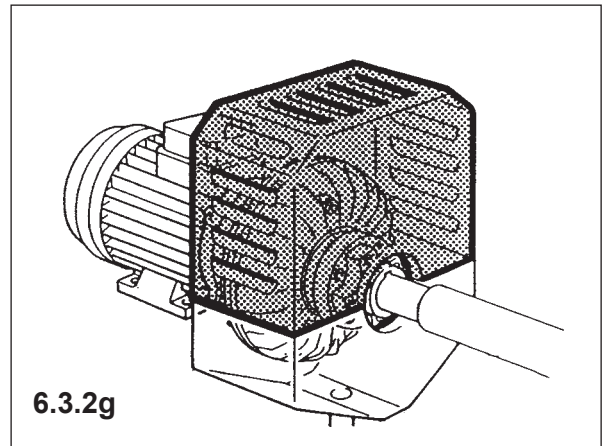
Promptly remove any oil dripping and/or leakage from the coupling or the soil. **RISK OF SLIPPERY FLOOR, CRASH AND/OR FALL.**

**6.3.2e**

Screw the plug or the device on the filling hole of the coupling again and make a reference mark for any future oil top-up and replacement.



6.3.2f



6.3.2g

6.3.2h

The image shows a technical data sheet for ROTOMECH COUPLINGS. It includes various fields for specifications such as 'TYPE OF SPACING', 'TYPE OF WORK', 'DEFINITION', 'SPECIFICATIONS', 'TEMPERATURES', 'MATERIALS', and 'DIMENSIONS'. The form is partially filled out with checkboxes and text.



**CAUTION**

Do not spill oil in the environment, but provide for its collection and storage in appropriate drums and/or have it disposed of by authorised firms. **RISK OF POLLUTION.**

**6.3.2f**

Remove any used key and/or cloth or tool from the coupling and from the operating area. **RISK OF PHYSICAL INTERFERENCE.**

**6.3.2g**

Close the guard protecting the hydromechanic coupling operating area again.

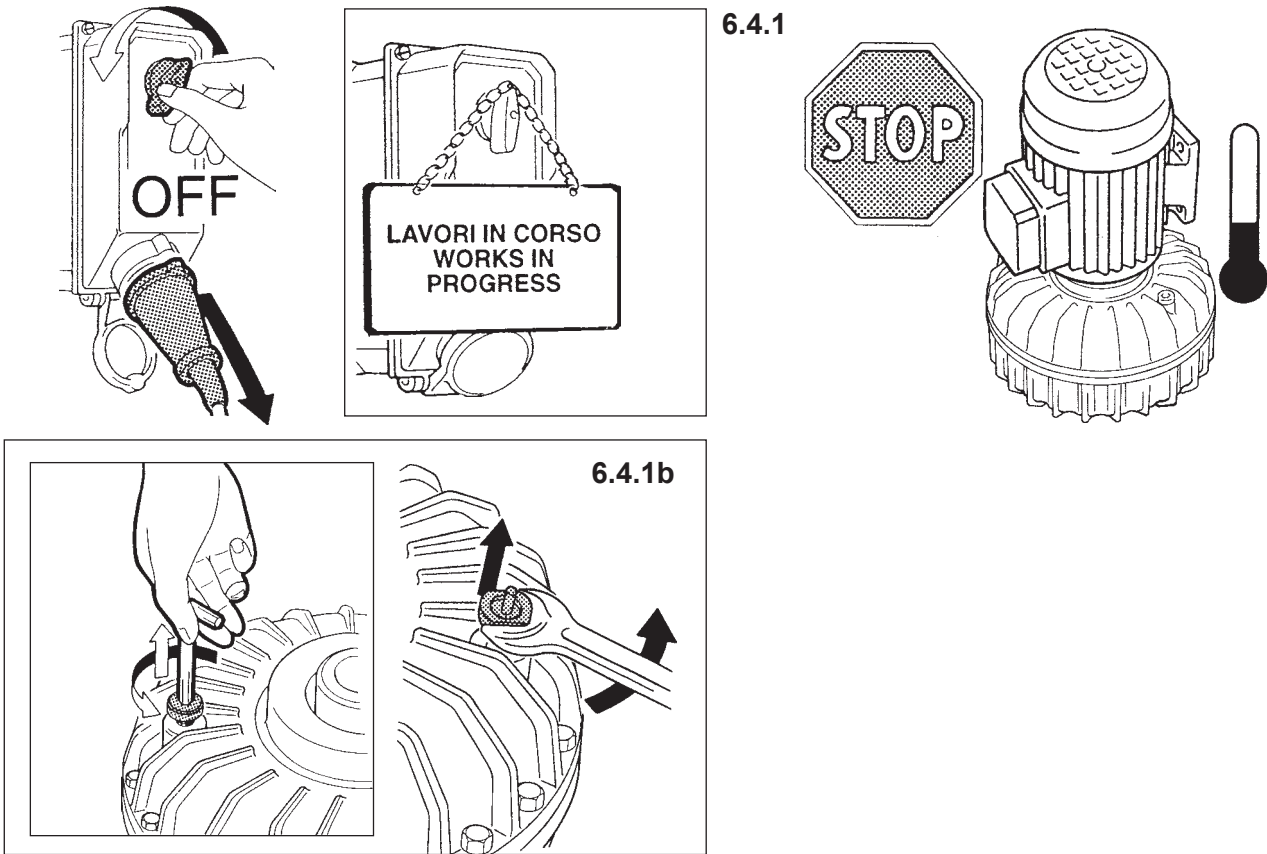
**6.3.2h**

Mark down in the appropriate box of the COUPLING TECHNICAL DATA SHEET the final calibration value (see FILLING DATA SHEET) for future oil replacement or top-up.

**The calibration of the horizontally mounted fluid coupling has thus ended.**



6.4 FILLING AND CALIBRATION OF VERTICALLY MOUNTED COUPLINGS



The first filling of the coupling must be carried out on the bench with the coupling installed on the motor and its axis positioned horizontally (see section 6.3).

To fill and calibrate the vertically mounted hydromechanic coupling, please follow the described procedures:

6.4.1 TRANSMISSION OIL FILLING

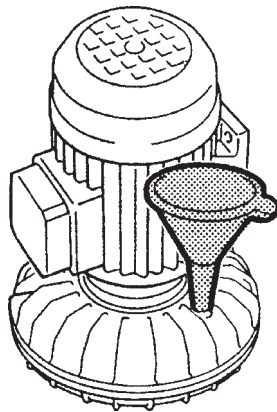
- CAUTION** Before the hydromechanic coupling is filled and/or calibrated, observe the following steps:
- A- stop the motor and wait for the rotation components to stop,
  - B- cut out power supply and apply a safety padlock,
  - C- signal the operation under way,
  - D- wait for the cooling, if needed (max 40°C).

**6.4.1a** Open the accident-prevention guard of the operating area to access the coupling.

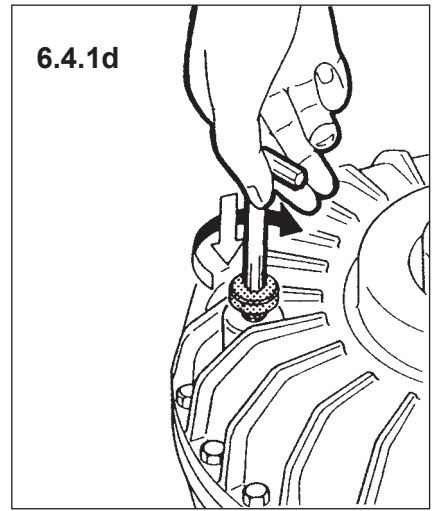
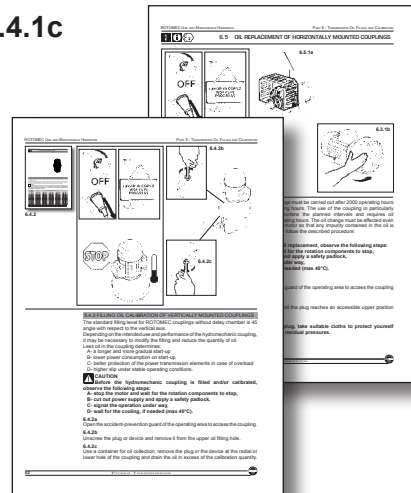
**6.4.1b** Remove the plug or the device, whatever part may be positioned on the upper part of the oil filling hole of the coupling.

- CAUTION** The maximum filling permitted in couplings designed for vertical installation must never exceed the filling equivalent to a 45° angle with respect to the vertical axis, whereas the minimum quantity for start-up must never be lower than the filling equivalent to a 75° angle.





6.4.1c



6.4.1d

**6.4.1c**

Fill up the coupling with oil of suitable grade (see section 6.1 TRANSMISSION OIL TECHNICAL CHARACTERISTICS), observing the predefined quantity pointed out in section 6.2 TABLES FOR COUPLING FILLING.

During the filling, the external part of the coupling must be turned to release any air bubbles.

**CAUTION**  
 Promptly remove any oil dripping and/or leakage from the coupling or the soil. **RISK OF SLIPPERY FLOOR, CRASH AND/OR FALL.**

**6.4.1d**

Position the plug or the device on the oil filling hole of the coupling.

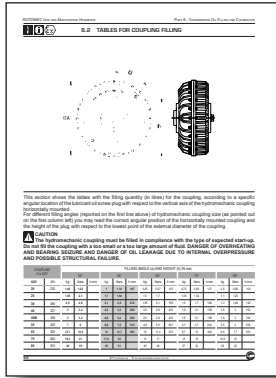
**6.4.1e**

Remove any used key and/or cloth or tool from the coupling and the operating area. **RISK OF PHYSICAL INTERFERENCE.**

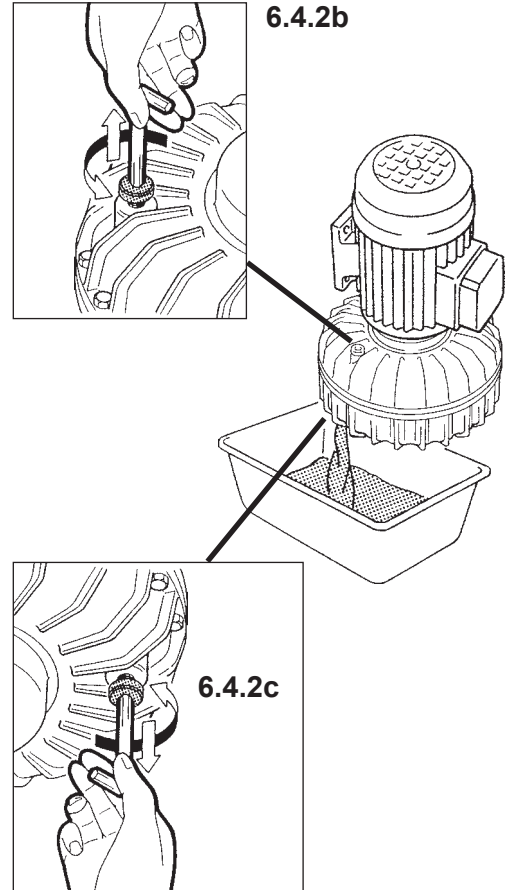
**6.4.1f**

Close the guard of coupling operating area.

**The filling of the vertically mounted hydromechanic coupling has thus ended.**



6.4.2



**6.4.2 FILLING OIL CALIBRATION OF VERTICALLY MOUNTED COUPLINGS**

The standard filling level for ROTOMECH couplings without delay chamber is 45 angle with respect to the vertical axis.

Depending on the intended use and performance of the hydromechanic coupling, it may be necessary to modify the filling and reduce the quantity of oil.

Less oil in the coupling determines:

- A- a longer and more gradual start-up
- B- lower power consumption on start-up
- C- better protection of the power transmission elements in case of overload
- D- higher slip under stable operating conditions.

**CAUTION**

Before the hydromechanic coupling is filled and/or calibrated, observe the following steps:

- A- stop the motor and wait for the rotation components to stop,
- B- cut out power supply and apply a safety padlock,
- C- signal the operation under way,
- D- wait for the cooling, if needed (max 40°C).

**6.4.2a**

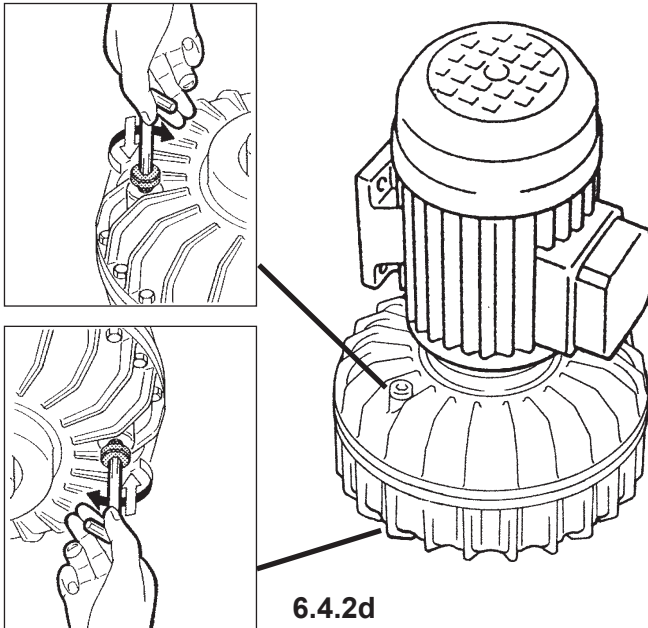
Open the accident-prevention guard of the operating area to access the coupling.

**6.4.2b**

Unscrew the plug or device and remove it from the upper oil filling hole.

**6.4.2c**

Use a container for oil collection; remove the plug or the device at the radial or lower hole of the coupling and drain the oil in excess of the calibration quantity.



6.4.2d

6.4.2h

ROTOMECH COUPLINGS		ROTOMECH	
<b>D-1 TECHNICAL SHEET HYDROMECHANIC COUPLING</b>			
TYPE OF MACHINE: <input type="checkbox"/> Full load start-up <input type="checkbox"/> Non-load start-up Load inertia (J): <input type="checkbox"/> Full load start-up <input type="checkbox"/> Non-load start-up Full-load start-up: <input type="checkbox"/> Yes <input type="checkbox"/> No Non-load start-up: <input type="checkbox"/> Yes <input type="checkbox"/> No Date of start-up start: <input type="checkbox"/> Yes <input type="checkbox"/> No		TYPE OF ROTEC: <input type="checkbox"/> Convective start-up <input type="checkbox"/> Load start-up Max. start-up speed: <input type="checkbox"/> Yes <input type="checkbox"/> No Max. start-up torque: <input type="checkbox"/> Yes <input type="checkbox"/> No Operating area temperature: <input type="checkbox"/> Yes <input type="checkbox"/> No	
<b>HYDROMECHANICAL</b> <input type="checkbox"/> ALFAKO <input type="checkbox"/> ALFAKI <input type="checkbox"/> ALFAKZ		<b>ROTOMECH DATA</b> <input type="checkbox"/> ROTEX <input type="checkbox"/> ROTEX2 <input type="checkbox"/> ROTEX3 <input type="checkbox"/> ROTEX4	
Oil/coolant: <input type="checkbox"/> Hydraulic oil <input type="checkbox"/> Water			
Type: <input type="checkbox"/> Horizontal <input type="checkbox"/> Vertical Series No.: <input type="checkbox"/> Standard <input type="checkbox"/> Special Transmission Fluid: <input type="checkbox"/> Mineral <input type="checkbox"/> Synthetic Available as primary start: <input type="checkbox"/> Yes <input type="checkbox"/> No Secondary start-up time: <input type="checkbox"/> Yes <input type="checkbox"/> No Expected start-up time: <input type="checkbox"/> Yes <input type="checkbox"/> No Lubrication: <input type="checkbox"/> Manual <input type="checkbox"/> Automatic		Code: <input type="checkbox"/> Standard <input type="checkbox"/> Special Start-up: <input type="checkbox"/> Standard <input type="checkbox"/> Special Calibration: <input type="checkbox"/> Standard <input type="checkbox"/> Special Max. start-up temperature: <input type="checkbox"/> Yes <input type="checkbox"/> No Max. start-up torque: <input type="checkbox"/> Yes <input type="checkbox"/> No Self-lubricating: <input type="checkbox"/> Yes <input type="checkbox"/> No	
<b>START-UP PARAMETERS - CONVECTIVE COUPLING</b>			
T1 (Joule Plug): <input type="checkbox"/> 20°C <input type="checkbox"/> 30°C <input type="checkbox"/> 40°C <input type="checkbox"/> 50°C T2 (Automatic Thermal Plug): <input type="checkbox"/> 20°C <input type="checkbox"/> 30°C <input type="checkbox"/> 40°C <input type="checkbox"/> 50°C T3 (Plug with Thermal and RPM sensor): <input type="checkbox"/> 20°C <input type="checkbox"/> 30°C <input type="checkbox"/> 40°C <input type="checkbox"/> 50°C		Ambient: <input type="checkbox"/> 20°C <input type="checkbox"/> 30°C <input type="checkbox"/> 40°C <input type="checkbox"/> 50°C Max. Temp.: <input type="checkbox"/> Ambient <input type="checkbox"/> Zone Max. Temp.: <input type="checkbox"/> Ambient <input type="checkbox"/> Zone	
<b>OPERATING CONDITIONS</b>			
Installation: <input type="checkbox"/> Horizontal <input type="checkbox"/> Vertical Type of engine: <input type="checkbox"/> Diesel <input type="checkbox"/> Gas Electrical: <input type="checkbox"/> 230V <input type="checkbox"/> 400V		Control: <input type="checkbox"/> Manual <input type="checkbox"/> Automatic Voltage: <input type="checkbox"/> V <input type="checkbox"/> Hz Power: <input type="checkbox"/> kW	
<b>OPERATING DATA</b>			
Installation: <input type="checkbox"/> Flexible coupling <input type="checkbox"/> Rigid through-shaft ROTEX/EX2: type <input type="checkbox"/> base D <input type="checkbox"/> Flexible diameter <input type="checkbox"/> N° grooves ROTEX/EX3: type <input type="checkbox"/> base D <input type="checkbox"/> Groove width <input type="checkbox"/> base D ROTEX/EX4: type <input type="checkbox"/> base D <input type="checkbox"/> base D		Labeling: <input type="checkbox"/> Yes <input type="checkbox"/> No Drive: <input type="checkbox"/> Drive drum <input type="checkbox"/> No	

**CAUTION**  
 The hydromechanic coupling must be filled in compliance with the expected start-up. Do not fill the coupling with a too small or a too large amount of fluid. **DANGER OF OVERHEATING, SEALING DAMAGE, SEIZURE OF THE BEARINGS AND/OR FIRE IGNITION OR DANGER OF OIL LEAKAGE DUE TO OVERPRESSURE AND/OR STRUCTURAL FAILURE.**

**6.4.2d**  
 Screw the lower and the upper plug again.

**CAUTION**  
 Promptly remove any oil dripping and/or leakage from the coupling or the soil. **DANGER OF SLIPPERY FLOOR, CRASH AND/OR FALL.**

**6.4.2e**  
 Remove any used key and/or cloth or tool from the coupling and the operating area. **DANGER OF PHYSICAL INTERFERENCE.**

**CAUTION**  
 Do not spill oil in the environment but provide for its collection and storage in appropriate drums and/or have it disposed of by authorized firms. **DANGER OF POLLUTION.**

**6.4.2f**  
 Close the guard of the hydromechanic coupling operating area.

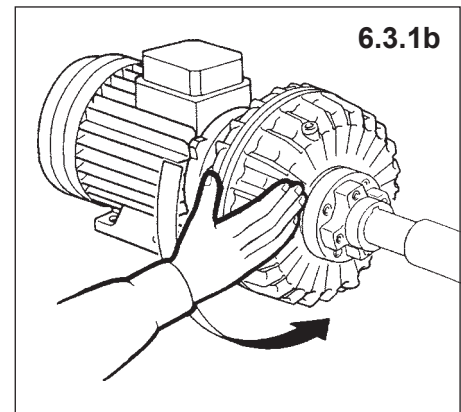
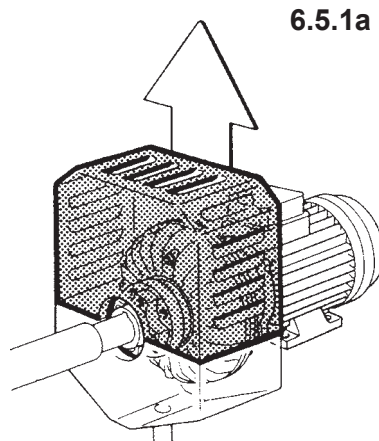
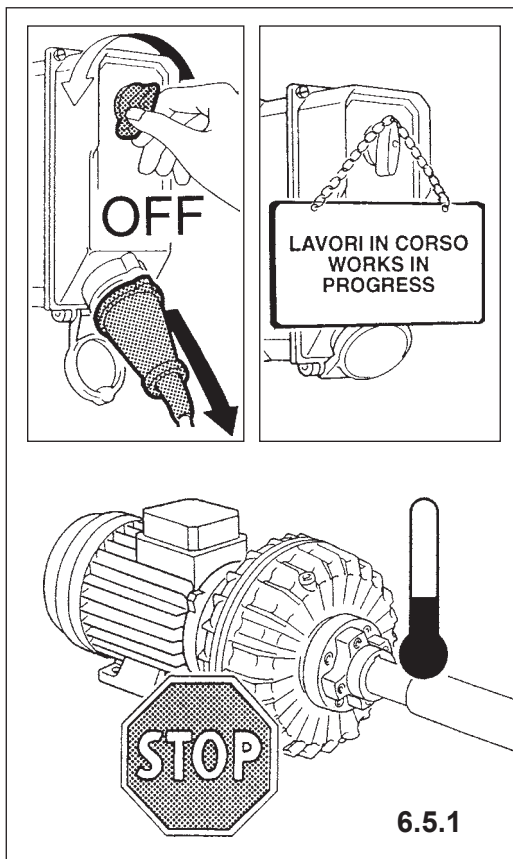
**6.4.2g**  
 Mark down in the appropriate box of the COUPLING TECHNICAL DATA SHEET the final calibration (see FILLING DATA SHEET) for future oil replacement or top-up.

**The calibration of the vertically mounted hydromechanic coupling has thus ended.**





## 6.5 OIL REPLACEMENT OF HORIZONTALLY MOUNTED COUPLINGS



The first transmission oil change must be carried out after 2000 operating hours and later every 4000 operating hours. The use of the coupling in particularly dusty environments also shortens the planned intervals and requires oil replacement every 1000 operating hours. The oil change must be effected even after a partial start-up of the motor so that any impurity contained in the oil is suspended. After that, please follow the described procedure:

**CAUTION**

Before transmission oil replacement, observe the following steps:

- A- stop the motor and wait for the rotation components to stop,
- B- cut out power supply and apply a safety padlock,
- C- signal the operation under way,
- D- wait for the cooling, if needed (max 40°C).

### 6.5.1

Open the accident-prevention guard of the operating area to access the coupling

### 6.5.2

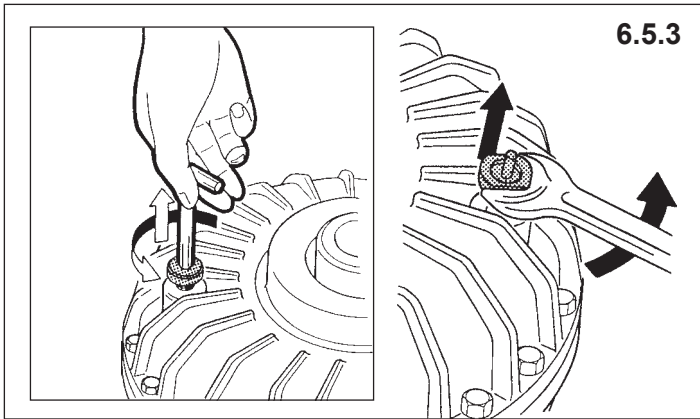
Manually turn the coupling until the plug reaches an accessible upper position near its vertical axis.

**CAUTION**

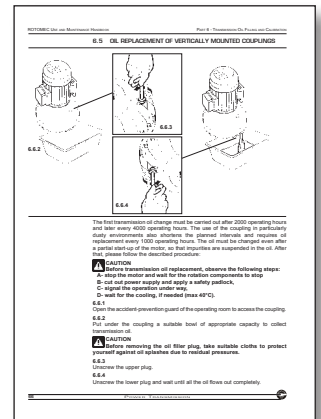
Before removing the plug, take suitable cloths to protect yourself against oil splashes due to residual pressures.



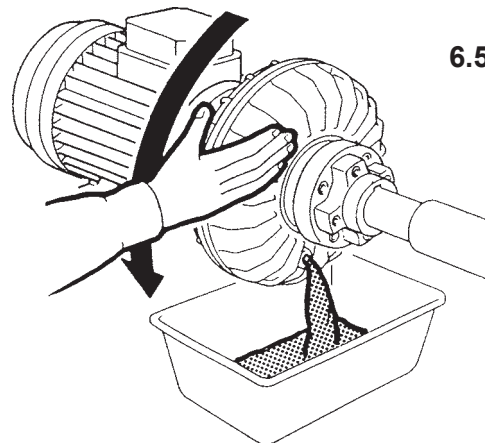




6.5.3



6.5.5



6.5.4

**6.5.3**

Remove the plug or the accessible device completely.



**CAUTION**

**Promptly remove any oil dripping and/or leakage from the coupling or the soil. RISK OF SLIPPERY FLOOR, CRASH AND/OR FALL.**

**6.5.4**

Position under the coupling a suitably sized container to collect the oil.

Turn the coupling until the oil discharge hole is in the lowest position and wait for the oil to flow out.



**CAUTION**

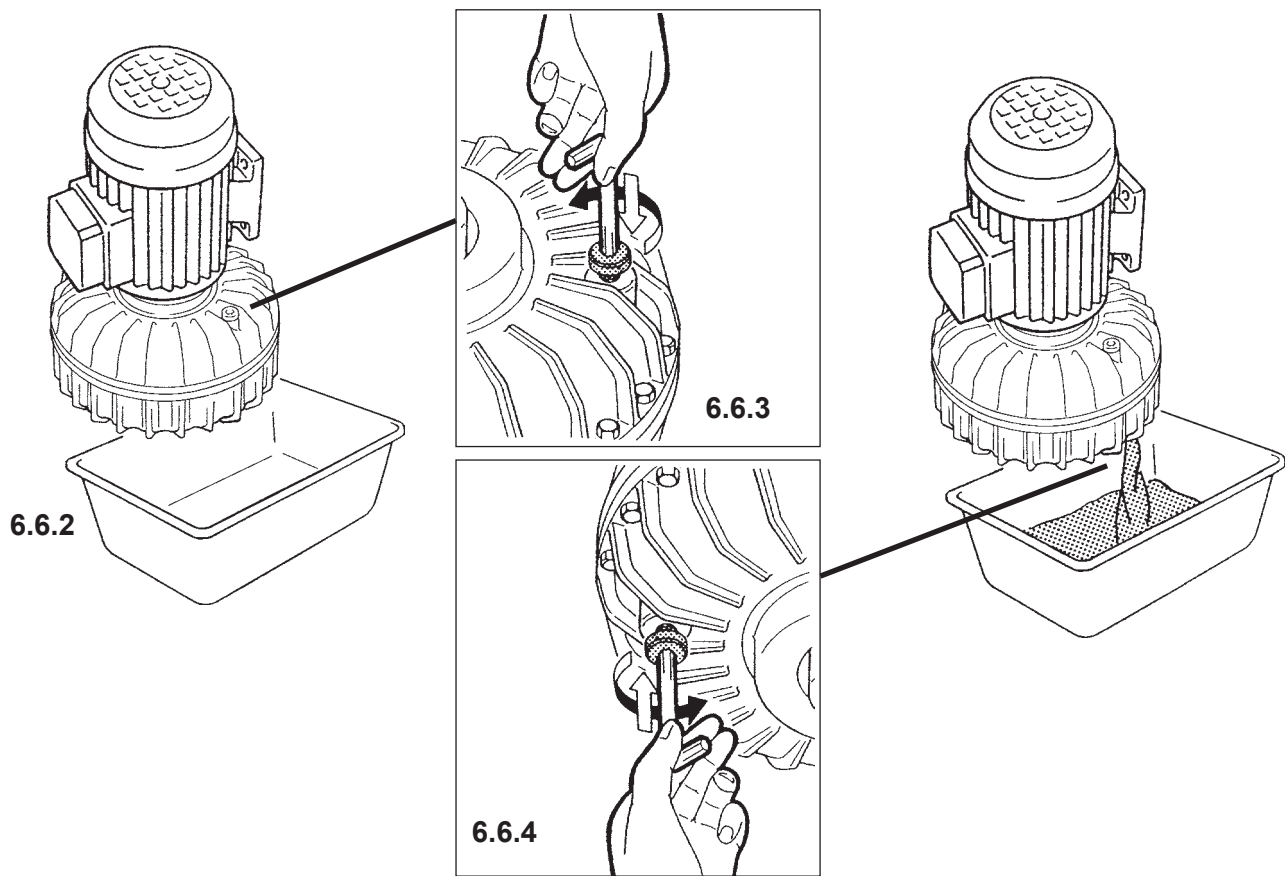
**Do not spill exhausted oil in the environment, but provide for its collection and storage in appropriate drums and/or have it disposed of by authorised waste disposal companies. RISK OF POLLUTION.**

**6.5.5**

Effect the oil filling and/or coupling calibration as described in section 6.3 FILLING AND CALIBRATION OF HORIZONTALLY MOUNTED COUPLING

**Upon completion of these operations, the oil change in horizontally mounted couplings has ended.**

### 6.5 OIL REPLACEMENT OF VERTICALLY MOUNTED COUPLINGS



The first transmission oil change must be carried out after 2000 operating hours and later every 4000 operating hours. The use of the coupling in particularly dusty environments also shortens the planned intervals and requires oil replacement every 1000 operating hours. The oil must be changed even after a partial start-up of the motor, so that impurities are suspended in the oil. After that, please follow the described procedure:

- ⚠ CAUTION** Before transmission oil replacement, observe the following steps:
  - A- stop the motor and wait for the rotation components to stop
  - B- cut out power supply and apply a safety padlock,
  - C- signal the operation under way,
  - D- wait for the cooling, if needed (max 40°C).

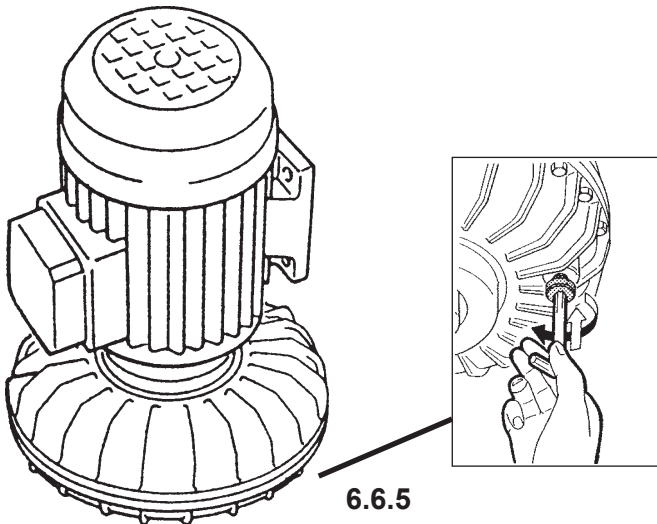
**6.6.1**  
Open the accident-prevention guard of the operating room to access the coupling.

**6.6.2**  
Put under the coupling a suitable bowl of appropriate capacity to collect transmission oil.

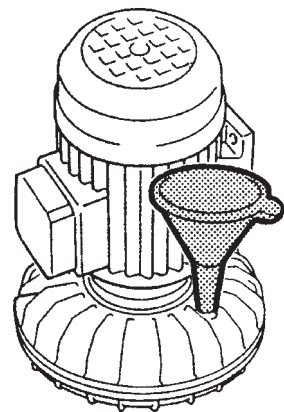
- ⚠ CAUTION** Before removing the oil filler plug, take suitable cloths to protect yourself against oil splashes due to residual pressures.

**6.6.3**  
Unscrew the upper plug.

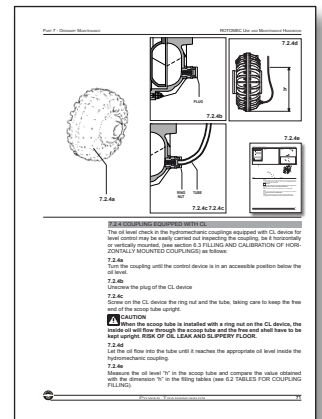
**6.6.4**  
Unscrew the lower plug and wait until all the oil flows out completely.



6.6.5



6.6.6



**CAUTION**  
 Promptly remove any oil dripping and/or leakage from the coupling or the soil. **RISK OF SLIPPERY FLOOR, CRASH AND/OR FALL.**

**CAUTION**  
 Do not spill exhausted oil in the environment, but provide for its collection and storage in appropriate drums and/or call authorised waste disposal companies. **RISK OF POLLUTION.**

**6.6.5**  
 Screw the plug or the device in the filling hole of the coupling again.

**6.6.6**  
 Effect the oil filling and/or coupling calibration as described in section 6.4 FILLING AND CALIBRATION OF VERTICALLY MOUNTED COUPLINGS.

**NOTE**  
 The oil inside the coupling does not flow out completely, because a very small quantity remains in the interstices; this has to be taken into account during the filling of the coupling (see section 6.7 TABLE FOR RESIDUAL OIL DEPLETION IN VERTICALLY MOUNTED COUPLINGS).

**Once these operations have been completed, the oil change in vertically mounted couplings has ended.**



### 6.7 TABLE FOR RESIDUAL OIL DEPLETION VERTICALLY MOUNTED COUPLINGS

The following table shows how much residual oil remains after depleting the coupling already prepared for vertical installation (C manufacture). This quantity must be taken into account and subtracted from the filling quantities described in section 6.2 TABLES FOR COUPLING FILLING.

SIZE	Q.TY	MOTOR BELOW COUPLING	SIZE	Q.TY	MOTOR ABOVE COUPLING
20 K1 (ø28)	Lt. 0,1		10 K1 (ø24)	Lt. 0,125	
30 K1 (ø42)	Lt. 0,1		30 K1 (ø42)	Lt. 0,400	
30P K1 (ø42)	Lt. 0,1		30P K1 (ø42)	Lt. 0,950	
40P K1 (ø55)	Lt. 0,1		40P K1 (ø55)	Lt. 0,850	
20 K3 (ø38)	Lt. 0,230		10 K3 (ø28)	Lt. 0,1	
25 K2 (ø42)	Lt. 0,230		20 K3 (ø38)	Lt. 0,1	
30 K3 (ø48)	Lt. 0,400		30 K3 (ø48)	Lt. 0,1	
40P K2 (60)	Lt. 0,850		40P K2 (ø60)	Lt. 0,1	
55 K2 (ø65) 55 K3 (ø75)	Lt. 1,8 Lt. 1,8		55 K2 (ø65) 55 K3 (ø75)	Lt. 1,8 Lt. 1,8	
65 K2 (ø80)	Lt. 3,6		65 K2 (ø80)	Lt. 3,6	
75P K2 (ø90) 75P K3 (ø100)	Lt. 5,0 Lt. 5,0		75P K2 (ø90) 75P K3 (ø100)	Lt. 5,0 Lt. 5,0	
85 K2 (ø125)	Lt. 12,5		85P K2 (ø110)	Lt. 12,5	





## 7.1 OIL LEAKAGE CHECK

This check must be effected after one week since the first installation and later after any operation abnormality or overload, in order to make sure that no abnormal oil leakage occurs due to wear of the hydromechanic coupling sealing. The leakage of transmission oil may cause excessive overheating, unnecessary triggering of the overheat protection devices and troubles in the transmission of the required torque/speed. To perform the check, please follow the described procedure:



### CAUTION

**Before transmission oil replacement, observe the following steps:**

- A- stop the motor and wait for the rotation components to stop,**
- B - cut out power supply and apply a safety padlock,**
- C- signal the operation under way,**
- D- wait for the cooling, if needed (max 40°C).**

#### 7.1.1

Open the accident-prevention guard of the operating area to access the coupling.

#### 7.1.2

Inspect the hydromechanic coupling and the installation space and check for oil leakage.



### CAUTION

**Promptly remove any oil dripping and/or leakage from the coupling or the soil. DANGER OF SLIPPERY FLOOR, CRASH AND/OR FALL.**

#### 7.1.3

Carefully inspect, where possible, the condition of the sealing of the coupling shaft in order to establish if it is necessary to substitute it.

#### 7.1.4

In section 7.5 SERVICE RECORDS register the result of the operation and, if necessary, replace the sealing, as described in section PART 9 EXTRAORDINARY MAINTENANCE.



### CAUTION

**Do not use the hydromechanic coupling when the sealing is worn out or damaged due to excessive overheating. DANGER OF HOT OIL LEAKAGE AND COUPLING OVERHEATING.**

#### 7.1.5

Remove any used key and/or cloth or tool from the coupling and from the operating area. **DANGER OF PHYSICAL INTERFERENCE.**

#### 7.1.6

Close the guard of the hydromechanic coupling operating area again.

**The check for oil leakage has thus ended.**



## 7.2 OIL LEVEL CHECK AND TOP-UP

The oil level check must be performed periodically every 2000 operating hours, after the onset of any start-up abnormalities or in consequence of overheating of the hydromechanic coupling and if an oil leakage from the hydromechanic coupling is detected. To carry out this check, please follow the described procedure:



### CAUTION

**Before transmission oil replacement, observe the following steps:**

- A- stop the motor and wait for the rotation components to stop,**
- B- cut out power supply and apply a safety padlock,**
- C- signal the operation under way,**
- D- wait for the cooling, if needed (max 40°C).**

### 7.2.1

Open the accident-prevention guard of the operating area to access the coupling.

### 7.2.2 HORIZONTALLY MOUNTED COUPLINGS

Check the oil level in the coupling (see identification plate and TECHNICAL DATA SHEET OF THE COUPLING).

#### 7.2.2a

Manually turn the coupling until the oil screw plug reaches the angle inclination determined through the pre-established calibration.



### NOTE

In case the couplings are equipped with plug and level indicator, it is sufficient to position the coupling in the pre-established filling position and check the oil level.

#### 7.2.2b

Remove the plug or the device mounted in the oil filling hole and check the oil level; as an alternative, it is necessary to make up the oil as described in section 6.3 FILLING AND CALIBRATION OF HORIZONTALLY MOUNTED COUPLINGS.

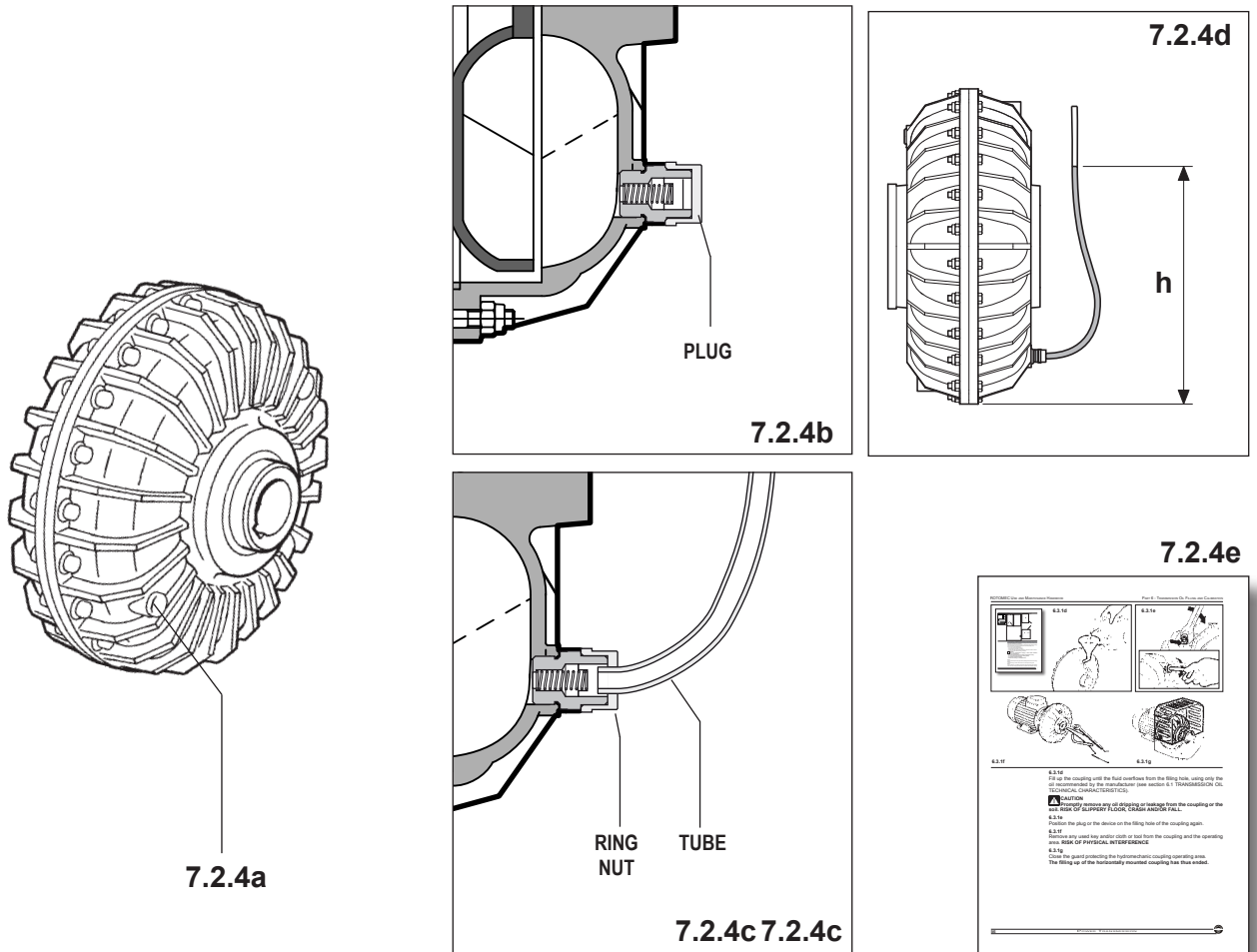
### 7.2.3 VERTICALLY MOUNTED COUPLINGS

The couplings designed for vertical installation (C manufacture) are not equipped with level check points; therefore this control must be carried out depleting and filling the coupling again according to the final calibration values as pointed out in the TECHNICAL DATA SHEET OF THE COUPLING.

#### 7.2.3 a

To empty and store the coupling, observe what set out in section 6.6. TRANSMISSION OIL REPLACEMENT IN VERTICALLY MOUNTED COUPLING.

**The level check of the hydromechanic coupling has thus ended**



**7.2.4 COUPLING EQUIPPED WITH CL**

The oil level check in the hydromechanic couplings equipped with CL device for level control may be easily carried out inspecting the coupling, be it horizontally or vertically mounted, (see section 6.3 FILLING AND CALIBRATION OF HORIZONTALLY MOUNTED COUPLINGS) as follows:

**7.2.4a**  
Turn the coupling until the control device is in an accessible position below the oil level.

**7.2.4b**  
Unscrew the plug of the CL device

**7.2.4c**  
Screw on the CL device the ring nut and the tube, taking care to keep the free end of the scoop tube upright.

**CAUTION**  
When the scoop tube is installed with a ring nut on the CL device, the inside oil will flow through the scoop tube and the free end shell have to be kept upright. RISK OF OIL LEAK AND SLIPPERY FLOOR.

**7.2.4d**  
Let the oil flow into the tube until it reaches the appropriate oil level inside the hydromechanic coupling.

**7.2.4e**  
Measure the oil level “h” in the scoop tube and compare the value obtained with the dimension “h” in the filling tables (see 6.2 TABLES FOR COUPLING FILLING).







## 7.3 EXTERNAL CLEANING OF THE COUPLING

During operation, dust deposits do not specifically affect the hydromechanic coupling thanks to rotation and ventilation.

However if external surfaces are exposed to humid atmospheres, vapours or oily fluids, the dusts are likely to be retained in the environment, thus generating deposit layers, which may interfere with the dissipation of the heat absorbed by the coupling during operation. **RISK OF OVERHEATING.**

Another factor which may affect operation and produce more dust deposits on the coupling surfaces, are long stops.



This phenomenon plays an even more important role in safety when the ATEX hydromechanic coupling is installed in a potentially explosive atmosphere, where inflammable dust occurs. **RISK OF FIRE.**

The coupling surfaces must be cleaned before starting up the machine after prolonged stops.

The intervals and frequency for the external cleaning of the coupling must be defined taking into account the characteristics of the location, where the coupling is installed and cleaning must be carried out in order to avoid the above described conditions



### CAUTION

**Before you start cleaning outside of the coupling:**

- A- stop the motor and wait for the rotation components to stop,**
- B- cut out power supply and apply a safety padlock,**
- C- signal the operation under way,**
- D- wait for the cooling, if needed (max 40°C).**

### 7.3.1

Open the accident-prevention guard of the operating area to access the coupling.

### 7.3.2

Disposable cloths soaked in neutral detergent may be used to remove the dust and/or any other deposit on the external surfaces of the coupling, the sealing on the shaft and the overheating control devices.



### CAUTION

**Do not use solvents or inflammable agents, especially in places with potentially explosive atmosphere. DANGER OF FIRE AND/OR SEALING DAMAGE.**

### 7.3.3

Remove any deposits or dusts from the operating area.

### 7.3.4

Remove any used key and/or cloth or tool from the coupling and the operating area. **DANGER OF PHYSICAL INTERFERENCE.**

### 7.3.5

Close the accident-prevention guard of the hydromechanic coupling operating area again.

**The cleaning of the external surfaces has thus ended.**



## 7.4 INSPECTION OF OVERHEATING CONTROL DEVICES

These mandatory inspections guarantee the correct operation of the overheating control devices, which are installed on the hydromechanic coupling. They must take place regularly, in connection with the ORDINARY MAINTENANCE activities to monitor the conditions of the devices installed. To perform the inspection, please follow the described procedure:



### CAUTION:

**Before you start checking devices:**

**A- stop the motor and wait for the rotation components to stop,**

**B- cut out power supply and apply a safety padlock,**

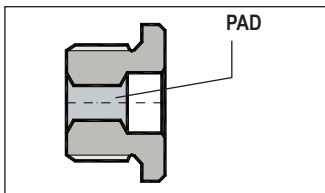
**C- signal the operation under way,**

**D- wait for the cooling, if needed (max 40°C).**

### 7.4.1

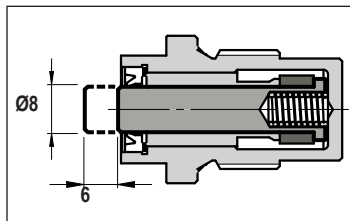
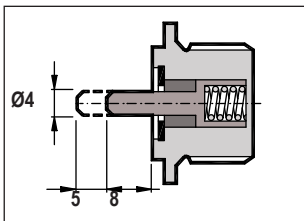
Open the accident-prevention guard of the operating area to access the coupling.

#### 7.4.2 TF DEVICE (Expandable Trip Plug)



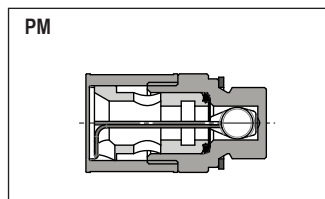
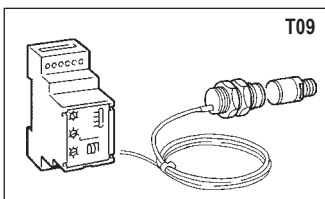
- Unscrew the TF and check the inside pad for deformation and damages.
- Make sure that the TF is in good working order and its outside seat is not obstructed.

#### 7.4.3 TE DEVICE (Expandable Trip Plug)



- Make sure that the TE device is not impaired and the piston is not deformed or blocked and the return spring is in good working order.
- Make sure that device (safety microswitch) has not been tampered with, it is in good working and the distance between the detector and the device is 2 mm.,

#### 7.4.4 PM T09 UNIT



- Make sure that the PM device in the coupling is in good operating conditions it is not damaged.
- Make sure that the sensor of the T09 device has not been tampered with, is in good operating conditions and detecting distance is between 2mm and 5mm (see distance defined during test and inspection).



### NOTE

The correct functioning of the PM-T09 combined unit is signalled by a yellow led, when the PM plug passes in front of the sensor.

### 7.4.5

Note in section 7.5 SERVICE RECORD the results of the operation and/or, if necessary, carry out the replacement or resetting of the overheat protection devices.



### CAUTION

**Do not use fluid couplings without devices or if devices have been tampered with or are inefficient. DANGER OF OVERHEATING AND/OR FIRE IGNITION.**

### 7.4.6

Remove any used key and/or cloth or tool from the coupling and the operating area. **DANGER OF PHYSICAL INTERFERENCE.**

### 7.4.7

Close the accident-prevention guard of the hydromechanic coupling operating area.

**The check of the overheating control devices has thus ended**



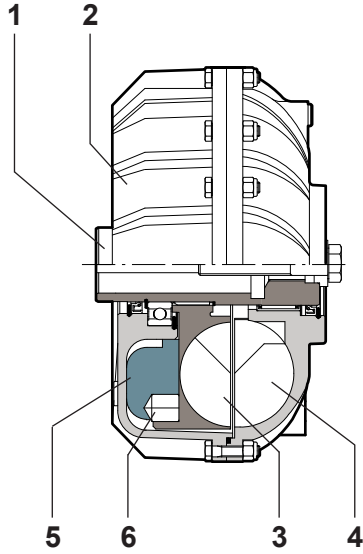






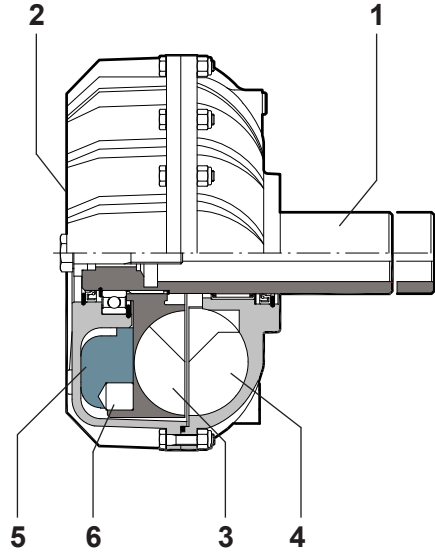
7.6 COUPLING OUTER PROFILE AND MAIN ELEMENTS

ROTOMECH SIZE 20 - 40



ALFA K

- 20 K1
- 30 K1
- 40 K1
- 40M K1



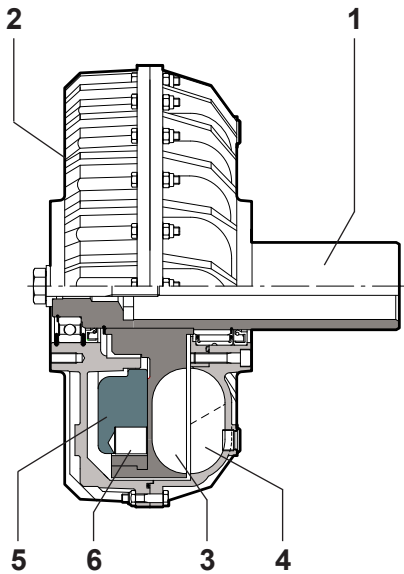
ALFA K2 - K3

- 20 K3
- 25 K2
- 30 K3
- 40 K2

BETA Z - X

- 20 Z-X
- 25 Z-X
- 30 Z-X
- 40 Z-X
- 40M Z-X

ROTOMECH

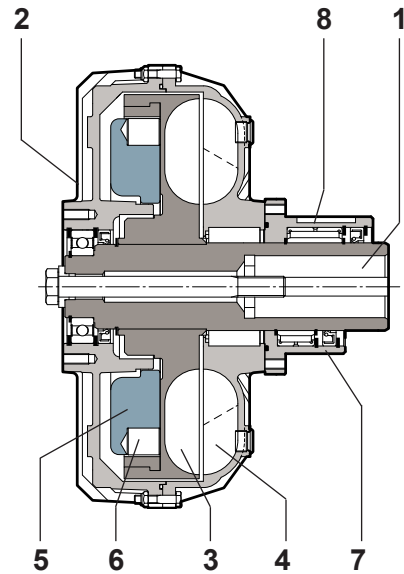


ALFA K

- 55 K2 - K3
- 65 K2
- 75 K2 - K3
- 85 K2

BETA X - Z

- 55 Z-X-J-H
- 65 Z-X-J-H
- 75 Z-X-J-H



BETA J

- 20 J
- 25 J
- 30 J
- 40/40M J
- 55 J
- 65 J
- 75 J

BETA H

- 20 H
- 25 H
- 30 H
- 40/40M H
- 55 H
- 65 H
- 75 H

COUPLING COMPONENTS

1 - Hollow Shaft  
5 - Sectors

2 - Cover  
6 - Rollers

3 - Internal Pump  
7 - Hub J

4 - Female Turbine  
8 - Hub H





## 8 INCONVENIENCES AND REMEDIES

In case of operation abnormalities and/or to remedy any operation faults, take advantage of the instructions included in this chapter to trace the causes.



### CAUTION

**Only skilled and qualified technicians may provide technical support. For any other kind of work or instruction, please feel free to contact the WESTCAR Customer Support Service. You will benefit from a prompt intervention by very experienced staff.**

Below you can find summarized data tables about the faults, which may occur during operation and the first maintenance work to be planned.

<b>FAULT</b>	<b>THE HYDROMECHANIC COUPLING OVERHEATS OR THE EXPANDABLE PLUG IS RELEASED TOO OFTEN</b>
Possibly causes to be checked.	<ol style="list-style-type: none"> <li>1 Cooling is not enough due to missing or unsuitable air intake on the carter or on the guard</li> <li>2 The carter is equipped with a cooling fan, but it is out of order and it turns in opposite direction</li> <li>3 The ambient temperature is still high, or there are sources of heat next to the coupling</li> <li>4 The driven machine is operating with excessive overload</li> <li>5 Not enough transmission oil in the coupling</li> <li>6 Oil is leaking from the hydromechanic coupling</li> <li>7 Too frequent or too long start-up cycles</li> <li>8 The hydromechanic coupling is undersized</li> </ol>
<b>FAULT</b>	<b>THE DRIVEN MACHINE CANNOT REACH FULL SPEED</b>
Possibly causes to be checked	<ol style="list-style-type: none"> <li>1 Not enough transmission oil in the coupling</li> <li>2 Oil leaks from the hydromechanic coupling</li> <li>3 The driven machine is operating with excessive overload</li> <li>4 The motor installed power is not enough</li> <li>5 Too low ambient temperature</li> <li>6 Too thick transmission oil in the coupling</li> <li>7 The motor input speed is not sufficient</li> <li>8 The hydromechanic coupling is undersized</li> </ol>

<b>FAULT</b>	<b>START-UP IS TOO FAST</b>
Possibly causes to be checked	<ol style="list-style-type: none"> <li>1 Excessive quantity of all oil in the hydromechanic coupling</li> <li>2 The hydromechanic coupling is oversized for the required performance</li> </ol>
<b>FAULT</b>	<b>START-UP IS TOO SLOW</b>
Possibly causes to be checked	<ol style="list-style-type: none"> <li>1 Not enough transmission oil in the coupling</li> <li>2 Oil leaks from the hydromechanic coupling</li> <li>3 The driven machine is operating with excessive overload</li> <li>4 Not enough motor installed power</li> <li>5 Too low ambient temperature</li> <li>6 Too thick transmission oil in the coupling</li> <li>7 The hydromechanic coupling is undersized</li> </ol>
<b>FAULT</b>	<b>OIL LEAKS FROM THE HYDROMECHANIC COUPLING</b>
Possibly causes to be checked	<ol style="list-style-type: none"> <li>1 The melting pad in the fusible plug has melted</li> <li>2 The oil plugs were not tightened properly and the gasket is damaged</li> <li>3 The gaskets failed as a consequence of excessive overheating</li> <li>4 The gaskets failed as a consequence of overpressure inside the coupling</li> <li>5 The gaskets are worn out and the sealing is damaged due to foreign bodies under the mim oil seals</li> <li>6 Inadequate gaskets are mounted on the coupling</li> <li>7 The screws on the coupling crown are not correctly tightened</li> <li>8 The coupling shells cracked or broke because of crashes or internal overpressure</li> </ol>
<b>FAULT</b>	<b>THE COUPLING VIBRATES OR IT IS NOISY</b>
Possibly causes to be checked	<ol style="list-style-type: none"> <li>1 The components connected to the coupling are not aligned or rotate off axis</li> <li>2 The central clamping screw of the coupling is loose or it is not properly tightened</li> <li>3 The central clamping screw is tightened off centre line or there is no centering washer.</li> <li>4 The connection between coupling and shaft has got too much backlash</li> <li>5 The drive belts are too loose or too tensioned</li> <li>6 The driven parts or the alignment coupling are unbalanced</li> <li>7 The coupling or the pulley are unbalanced</li> <li>8 Unbalanced masses have been applied to the coupling or have been removed from the parts</li> <li>9 Air eddies form inside the carter</li> <li>10 There is interference among the rotating parts and the fixed parts of the coupling</li> <li>11 The bearing are damaged by lacking or not sufficient lubrication.</li> </ol>







## 9.1 COUPLING DISASSEMBLY FROM MACHINE

Usually the coupling does not require any internal maintenance, unless extraordinary causes (faults or breaks) make it necessary. When for whatever reason it is necessary to replace the pulley, bearings, seals or any other internal components in a BETA "I" or "X" coupling, remove the coupling (hollow shaft side) from the drive shaft or from the machine as described below:



### CAUTION

**Before coupling disassembly from machine, observe the following steps:**

- A- stop the motor and wait for the rotation components to stop,**
- B- cut out power supply and apply a safety padlock,**
- C- signal the operation under way,**
- D- wait for the cooling, if needed (max 40°C).**

#### 9.1.1

Open the accident-prevention guard of the operating area to access the coupling

#### 9.1.2

Deplete the coupling following the steps described in section 6.5 for horizontally mounted coupling or in section 6.6 for vertically mounted couplings.

#### 9.1.3

Remove the components, which connect to the external part of the coupling, belts in case of BETA coupling, or the accessories (flexible elements, hubs etc.) in case of ALFA couplings.

#### 9.1.4

Unscrew the central clamping screw completely, preventing any motion of the machine or motor shaft on the blower side.

#### 9.1.5

Screw in the extractor in the hole of the coupling, keeping into account that the extraction system S.E. can be used, if the couplings are equipped with bored shaft (sizes 70P to 85P). Otherwise use the V.E. extraction system.

#### 9.1.6

Unscrew and remove one of the screws set in the crown of the coupling and insert the suitable hoisting device as foreseen by the manufacturer.

#### 9.1.7

Sling up the coupling with a hoisting device. The load capacity of the hoist lines must be in compliance with its weight (see identification plate).



### CAUTION

**Do not lift the coupling using devices other than the hoisting equipment foreseen by the manufacturer. DANGER OF CRUSHING**

#### 9.1.8

Tension the ropes slightly without stressing the shaft, with a suitable hoisting system.

#### 9.1.9

Screw the extractor screw tightly until the coupling is completely extracted, preventing the machine or motor shaft on the blower side from rotating in case of V.E. extractor, or preventing the shaft rotating in case of S.E. system.

#### 9.1.10

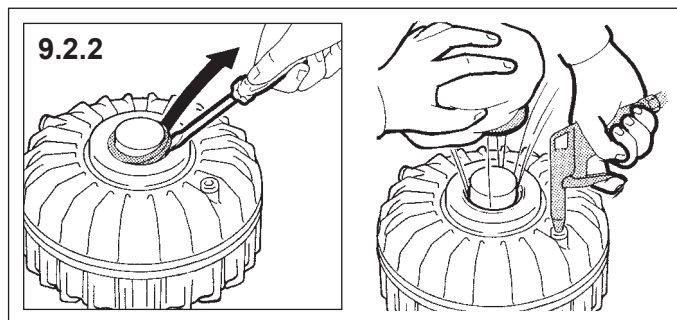
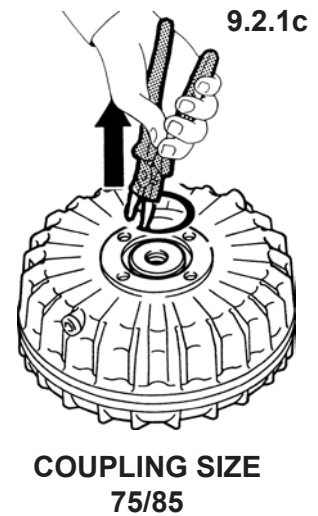
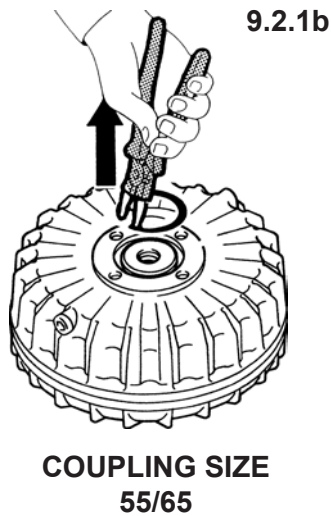
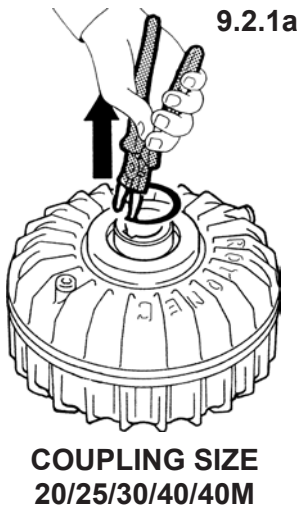
Once removed, handle the coupling with care just above the soil and lay it slowly on a pallet.

**Now the coupling is fully disassembled.**

Should extraordinary maintenance be carried out (bearing, gasket or internal component replacement), ship the coupling to WESTCAR or to the nearest distributor after the conclusion of a shipping agreement.



## 9.2 OPENING OF THE COUPLING AND SPARE PARTS REPLACEMENT



Should the coupling be opened on site, after removing it from the motor or the drive end, take the following steps:

### 9.2.1.

Remove the Seeger ring:

#### 9.2.1a COUPLING SIZE 20/25/30/40/40M

Remove the seeger ring from the mim seal on the coupling side with the ROTOMECH logo.

#### 9.2.1b COUPLING SIZE 55/65

Remove the seeger ring of the shielded bearing placed on the side of the threaded extraction hole of the coupling.

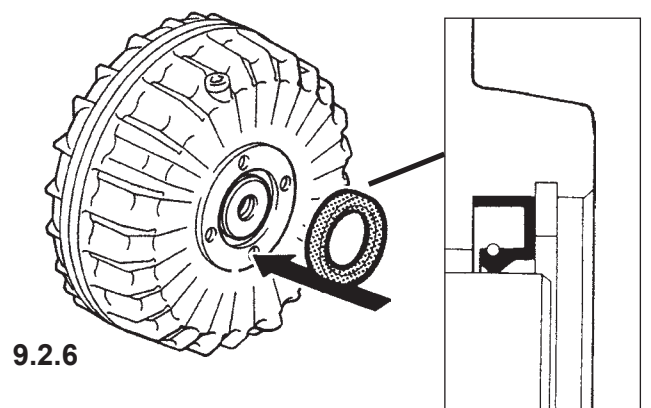
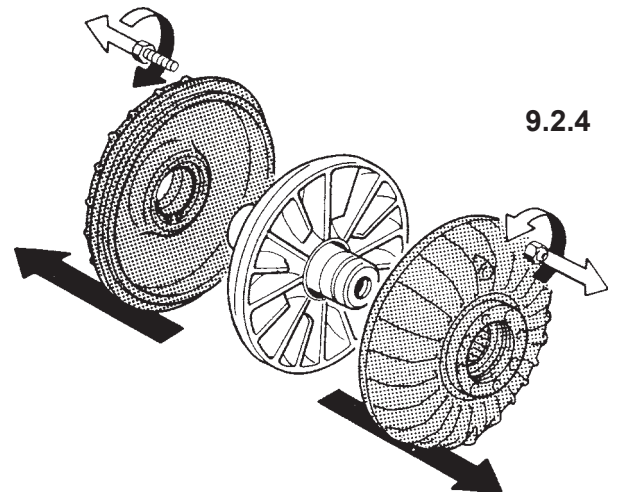
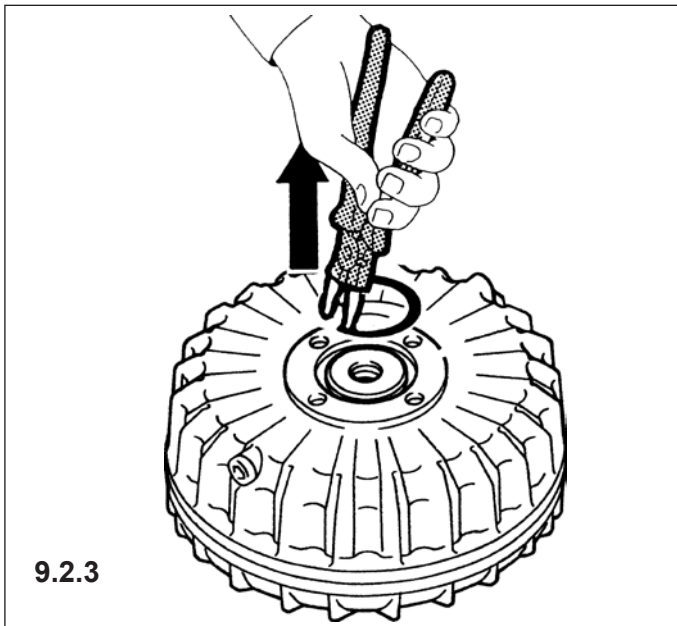
#### 9.2.1c COUPLING SIZE 75/85

Remove the seeger ring from the mim seal placed on the side of the threaded extraction hole.

**CAUTION**  
**RISK OF SPLASHES AND SEAL EJECTION**

### 9.2.2

To remove the mim seal, use a screwdriver or, as an alternative, position a protective cloth on the shaft at the mim seal and let compressed air through the hole of the plug until the gasket is ejected.

**9.2.3**

Remove the second seeger ring placed on the shaft on the same side of the coupling as pointed out in section 9.2.1a and 9.2.1b.

**9.2.4**

Unscrew all the screws placed on the coupling crown and open both hydromechanic coupling shells.

**9.2.5**

After the opening of the coupling, it is possible to clean it inside and/or replace any worn parts with original WESTCAR spare parts.

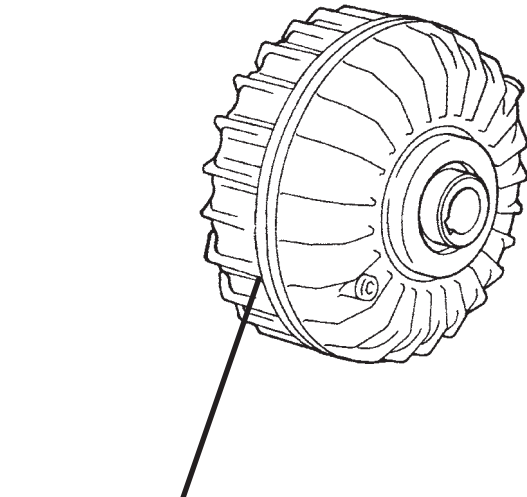
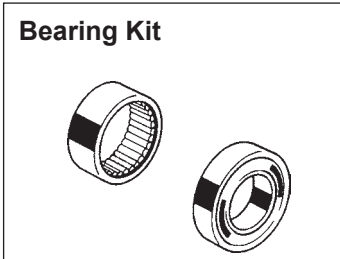
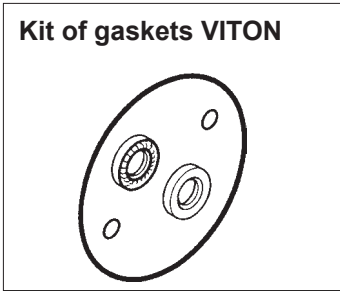
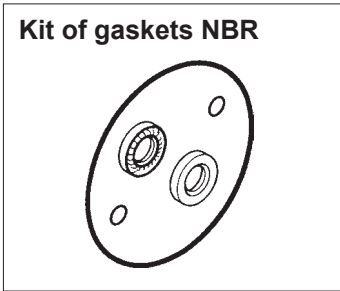
**9.2.6**

To reassemble the coupling, follow the reverse sequence, repositioning the mim seals with their edge inwards without deforming it.

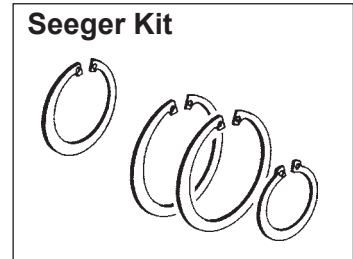
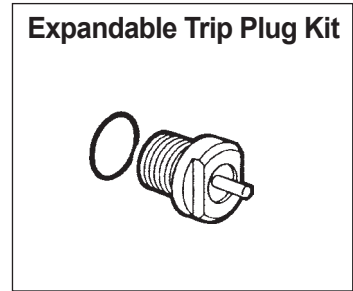
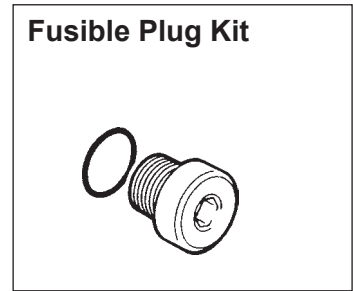
**The opening of the coupling and the spare part replacement have thus ended.**



### 9.3 SPARE PARTS



	WESTCAR S.r.l. - Via Monte Rosa 14 - 20149 Milano - ITALY		ANNO / YEAR	Peso/Weight	kg	Pot./Power	KW	Parte motrice	pos.
	Nome/Name: GEUNTO IDROMECCANICO / HYDROMECHANICAL COUPLING		Installaz./Installation	gir/min /rpm		Driving side		pos. / FEM	
	Tipo / Type		N° serie / Serial	<input type="checkbox"/> Verticale/Vertical	<input type="checkbox"/> Orizz./Horizontal	Olio/Oil	45°	<input type="checkbox"/> Interna/Internal	<input type="checkbox"/> Esterna/External
	con / with			<input type="checkbox"/>	<input type="checkbox"/>	Olio/Oil		<input type="checkbox"/>	<input type="checkbox"/>



To enable the effective and timely extraordinary maintenance of the coupling, it is recommended to keep a small supply of parts available, especially the ones, which are most subject to wear or substitution.

To order the KITS, please report:

- SIZE AND IDENTIFICATION CODE of the coupling, shown on the identification Plate.

To submit a request for FUSIBLE PLUG or EXPANDABLE TRIP PLUG KITS, also specify the triggering temperature.

For any further information on single components of the coupling, you may request the SPARE PART DRAWINGS, specifying the ROTOMECH coupling model.





## 10.1 COUPLING DECOMMISSIONING

The decommissioning of the hydromechanic coupling must be carried out in case of operation abnormalities or downtime for longer periods or extraordinary maintenance works. For the decommissioning, follow the described procedure:

### 10.1.1

Open the accident-prevention guard of the operating area to access the coupling.

### 10.1.2

Disassemble the coupling from the machine, following the description in section 9.1 COUPLING REMOVAL FROM THE MACHINE.

### 10.1.3

To store the coupling, observe what set out in section 3.3 STORAGE AND CONSERVATION OF THE COUPLING.

**The decommissioning of the coupling has thus ended.**



## 10.2 COUPLING DISMANTLING AND DEMOLITION

At the end of the machine life-cycle, the dismantling of the coupling includes separate waste collection and disposal of the materials composing it, as follows:

### 10.2.1

Adopt measures to collect any transmission oil leakage in appropriate airtight containers



#### CAUTION

**Do not spill exhausted oils in the environment, but instruct authorized waste collection companies to dispose of them. DANGER OF ENVIRONMENTAL POLLUTION:**

### 10.2.2

The TF and TEs are to be removed from the coupling and require special handling and disposal procedures.



#### CAUTION

**The TF and TE devices contain a fusible pad in heavy metal, which is dangerous for the environment; therefore it has to be disposed of as special waste. DANGER OF ENVIRONMENTAL POLLUTION**

### 10.2.3

Provide for the separation of the metal components (steel, aluminium, etc).

**Specialised and authorized firms may be charged with the disposal and the scrapping of the materials.**



#### CAUTION

**Dispose of components, small or big parts properly, as they may cause accidents, direct or consequential damages and/or adversely affect the environment pollution.**

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