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User and Maintenance Manual



Clutches MINI CL-CL/F

Model CL2

Model CL3

Model CL4

Model CL4-AC

Model CL5

Model CL5-HT



Model CL2/F

Model CL3/F

Model CL4/F

Model CL4/F-AC

Model CL5/F

Model CL5/F-HT



ISO 9001 - Certificate N°0238

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	User and Maintenance Manual <i>Clutches MINI CL-CL/F</i>		Model CL2 & CL2/F Model CL3 & CL3/F Model CL4 & CL4/F Model CL4-AC & CL4/F-AC Model CL5 & CL5/F Model CL5-HT & CL5/F-HT
	Date: 2013/07/01	Revision: 1	www.coremo.it

TABLE OF CONTENTS

1.	Introduction.....	3
2.	Manufacturer.....	3
3.	General information	3
4.	Warnings.....	4
5.	Technical data.....	5
5.1.	Product performance	5
5.2.	Brake lining wear	6
5.3.	Special note	6
6.	Transport and storage	6
7.	Installation.....	7
7.1.	Installation of CL2 – CL3 – CL4 – CL4-AC – CL5 – CL5-HT clutches	7
7.2.	Installation of CL2/F – CL3/F – CL4/F – CL4/F-AC – CL5/F – CL5/F-HT clutches	7
8.	Operation.....	8
8.1.	Power supply of the product	8
8.2.	Improper use	8
9.	Maintenance and cleaning	9
9.1.	Replacement of the lining discs and central discs.....	9
9.2.	Changing the seal rings and the springs (CL2 – CL3 – CL2/F – CL3/F)	10
9.3.	Changing the diaphragm (CL4 – CL5 – CL4-AC – CL5-HT – CL4/F – CL5/F– CL4/F-AC – CL5/F-HT).....	10
9.4.	Changing the carbon graphite seal or the bearing.....	11
9.5.	Cleaning the friction surfaces	11
9.6.	Replacement of the bearings of the self-supporting unit (CL2/F – CL3/F – CL4/F – CL5/F – CL4/F-AC – CL5/F-HT).....	11
9.7.	Periodic maintenance.....	12
10.	Spare parts list	12

	User and Maintenance Manual <i>Clutches MINI CL-CL/F</i>		Model CL2 & CL2/F Model CL3 & CL3/F Model CL4 & CL4/F Model CL4-AC & CL4/F-AC Model CL5 & CL5/F Model CL5-HT & CL5/F-HT
	Date: 2013/07/01	Revision: 1	www.coremo.it

1. Introduction

The purpose of this manual is to provide the user with all the information necessary to use the product properly, independently and safely.

This manual constitutes an integral part of the safety features and must be read in its entirety before installation and use of the product. It must therefore be kept in a safe place should future reference be necessary before proceeding with any kind of work.

The user is strongly advised to read it carefully and to follow the rules and procedures contained in it as these provide important information concerning safe use and maintenance.

If any doubt should arise concerning the correct interpretation of the instructions, contact our technical department for the necessary clarification.

It is prohibited for anyone to disclose or modify the content of this manual or to use it for personal purposes.

2. Manufacturer

COREMO OCMEA S.P.A.

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3. General information

Correct use of the product: In compliance with Italian Legislative Decree 17/2010 and DIRECTIVE 2006/42/EC the operating limits for ideal and safe use of the product are stated in this manual.

Design parameters: The MINI Clutches of COREMO OCMEA has been designed to operate in compliance with the performance and conditions stated in the catalogue and Chapter 5.1 of this manual. It is advisable not to exceed these limitations.

Model selection: Selection of the correct model for a given application is of basic importance. The technical department of COREMO OCMEA can provide you with information, suggestions and assistance regarding correct application and use.

	User and Maintenance Manual <i>Clutches MINI CL-CL/F</i>		Model CL2 & CL2/F Model CL3 & CL3/F Model CL4 & CL4/F Model CL4-AC & CL4/F-AC Model CL5 & CL5/F Model CL5-HT & CL5/F-HT
	Date: 2013/07/01	Revision: 1	www.coremo.it

Use: Compliance with the assembly and maintenance instructions prevents not only costly down time but also accidents due to incomplete knowledge of the product.

Rotating parts: The clutches are coupled mainly with rotating parts. In this case the moving parts must be protected in conformity with the requirements of DIRECTIVE 2006/42/EC and Italian Legislative Decree 17/2010 or equivalent legislation in force in the countries in which they are used.

Power source for clutches: Use air not contaminated with oil or water and a 25 micron filter with automatic condensation discharge.


Friction material: All COREMO OCMEA MINI clutches are fitted with friction material which is absolutely free of asbestos and is declared as NON toxic/harmful in full observance of health and environment regulations and laws. In any case it is better not to inhale dust produced by them and to wash hands thoroughly before eating or drinking.

Oils, greases, lubricating components: These are used in extremely limited quantities. Personnel suffering from allergies to these substances are advised to wear gloves or use protective cream which must be washed off thoroughly before eating or drinking.

Product markings: All the data on the plates must always be kept legible. Use the data shown on the plates when contacting the manufacturer for spare parts, information or assistance for example.

Disposal: Worn brake lining pads and other materials of which brakes are made are classified as special NON toxic/harmful products and therefore must be disposed of in accordance with the laws in force in the countries in which they are used.


4. Warnings

	<p>Failure to follow the instructions in this manual and on any plates attached to the product exposes persons to risks and may cause damage to other equipment and machinery.</p>
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The product must not be used at an ambient temperature lower than -20 °C.

The technical department of COREMO OCMEA can provide additional information in order to ensure correct application and use of the product

Dangers caused by a power failure: A power failure will cause the clutches to fail. It is therefore necessary to provide an uninterrupted power supply or, if the case requires, use suitable power failure warning systems as a clutch failure may cause personal injury and damage to property.

	User and Maintenance Manual <i>Clutches MINI CL-CL/F</i>		Model CL2 & CL2/F Model CL3 & CL3/F Model CL4 & CL4/F Model CL4-AC & CL4/F-AC Model CL5 & CL5/F Model CL5-HT & CL5/F-HT
	Date: 2013/07/01	Revision: 1	www.coremo.it

Danger of breakage during operation: To reduce the risk of breakage during operation carry out the periodic inspections shown in this manual.

Risks connected with changes in operating conditions: The product is designed for the purposes stated in this user and maintenance manual therefore the power supply pressure required for the brake to work safely and reliably is indicated.


Residual risk: Residual risk can be attributed to the operator not following all the procedures stated in the user and maintenance manual and not giving due consideration to the warnings.

5. Technical data

5.1. Product performance

The MINI clutches are removable mechanical transmission devices for transmitting power between a self-propelled machinery/shaft and a recipient machinery/shaft.

MINI type “CL” and “CL/F” clutches are required for starting up with high inertia or cyclic start-ups.


	<p>Use of the product for any purpose other than those indicated may represent a risk to any aspect of safety therefore contact the technical department of COREMO OCMEA for all information and suggestions for correct application and use of the product.</p>
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CL and CL/F type MINI clutches differ basically in dimensions, torque values, maximum speed and thermal capacity. These characteristics are therefore shown in Table 1 below.

TYPE	Torque at 6 bar [Nm]		Max speed [min ⁻¹]	Max thermal capacity [kJ]	Continuous thermal cap.
	ST 10	ST 11			
CL2 CL2/F	17	28	3000	2.5	0.1
CL3 CL3/F	34	56	3000	5	0.15
CL4 CL4/F	51	84	2000	7	0.2
CL4-AC CL4/F-AC	30	-	2000	7	0.2
CL5 CL5/F	102	168	2000	14	0.3
CL5-HT CL5/F-HT	-	275	2000	14	0.3

Table 1

Warning: The value of the friction coefficient is purely theoretical as it depends on environmental conditions and on how the product is used.

	User and Maintenance Manual <i>Clutches MINI CL-CL/F</i>		Model CL2 & CL2/F Model CL3 & CL3/F Model CL4 & CL4/F Model CL4-AC & CL4/F-AC Model CL5 & CL5/F Model CL5-HT & CL5/F-HT
	Date: 2013/07/01	Revision: 1	www.coremo.it



Erroneous consideration of the product characteristics jeopardizes aspects of safety. The technical department of COREMO OCMEA can provide information, suggestions and assistance for correct application and use of the product.

5.2. Brake lining wear



A maximum overall brake lining wear is allowed that guarantees a play of no more than 2 mm between the discs of clutches types CL and CL/F series 2 and 4 and a play of no more than 4.5 mm for clutches types CL and CL/F series 3 and 5. Failure to respect these values will jeopardize aspects of safety.

5.3. Special note

During engaging, kinetic energy is converted into heat caused by friction between the surfaces of the discs and the linings. It is therefore fundamentally important to consider the amount of heat that can be dissipated




Ignoring the heat produced during engaging affects lining wear and may jeopardize the safety of the operators and the reliability of the product. Since the unit can be used for many applications, it is advisable to contact the technical department of COREMO OCMEA for further explanation in this regard.

6. Transport and storage



Personnel assigned to this work must wear suitable PPE such as gloves, safety footwear and take any other precautions necessary before proceeding with transport, handling and storage of the unit.

1. **Transport:** When handling it is important to bear in mind the dimensions and weight of each single type of product as shown in the product drawing enclosed with this manual.
2. **Storage:** When storing the unit it is important to bear in mind that a considerable weight is concentrated in a small space. Personnel assigned to this work must wear suitable PPE (safety footwear, gloves, etc.) in order to avoid the risk of injury.

	User and Maintenance Manual <i>Clutches MINI CL-CL/F</i>		Model CL2 & CL2/F Model CL3 & CL3/F Model CL4 & CL4/F Model CL4-AC & CL4/F-AC Model CL5 & CL5/F Model CL5-HT & CL5/F-HT
	Date: 2013/07/01	Revision: 1	www.coremo.it

7. Installation



THE UNIT MUST BE INSTALLED WITH THE MACHINE OFF.


Personnel assigned to this work must wear suitable PPE such as gloves, safety footwear and take any other appropriate precautions to ensure adequate protection and avoid the risk of injury.

7.1. Installation of CL2 – CL3 – CL4 – CL4-AC – CL5 – CL5-HT clutches

1. Fit the hub, which will have been machined for mounting on the shaft of the machine, and lock it axially to prevent it from sliding along the shaft
2. Check that any misalignment between the shaft and the centering of the clutch does not exceed 0.05 mm.
3. Insert the clutch on the hub and flange it to the shoulder of the machine which will have a centering $\varnothing 70$ g6 x 1.5 mm for CL2 and CL3 or $\varnothing 110$ g6 x 1.5 mm for CL4, CL4-AC, CL5 and CL5-HT.
4. Lock the clutch to the shoulder of the machine using 4 Allen screws (M6) c with a tightening torque of 9.5 Nm and suitable length.
5. Connect the clutch to the compressed air line using a tube with a 1/8" gas fitting.
6. The control pressure must not exceed 6 bar or drop below 0.2 bar. The compressed air must not be contaminated with impurities therefore a 25 micron filter with automatic condensate discharge must be fitted.
7. **BEDDING-IN:** The initial braking torque may be from 30% to 50% less than the rated value until the brake lining adjusts to the disc

7.2. Installation of CL2/ F – CL3/ F – CL4/ F – CL4/ F-AC – CL5/ F – CL5/ F-HT clutches

1. Separate the clutch from the self-supporting unit (bearing flange + hub) by removing the 4 M6 Allen screws (C61394 for CL2/F and CL3/F, C61389 for CL4/F – CL5/F – CL5/F-HT, C61390 for CL4/F-AC).
2. Only in the case that machining the hole in the hub is not the responsibility of COREMO, without removing the bearing flange from the hub, carry out the machining of the hole and groove milling of the hole of the key making sure not to damage the teeth of the hub when mounting the unit on the machine.
3. Insert the self-supporting unit (bearing flange + hub) on the shaft of the machine; lock the hub axially to prevent sliding along the shaft.

	User and Maintenance Manual <i>Clutches MINI CL-CL/F</i>		Model CL2 & CL2/F Model CL3 & CL3/F Model CL4 & CL4/F Model CL4-AC & CL4/F-AC Model CL5 & CL5/F Model CL5-HT & CL5/F-HT
	Date: 2013/07/01	Revision: 1	www.coremo.it

4. Put back the clutch on the self-supporting unit using the 4 M6 Allen screws (C61394 for CL2/F and CL3/F, C61389 for CL4/F – CL5/F – CL5/F-HT, C61390 for CL4/F-AC) and tightening torque of 9.5 Nm.
5. Connect the clutch to the compressed air line using a tube with a 1/8" gas fitting.
6. The control pressure must not exceed 6 bar or drop below 0.2 bar. The compressed air must not be contaminated with impurities therefore a 25 micron filter with automatic condensate discharge must be fitted.
7. **BEDDING-IN:** The initial braking torque may be from 30% to 50% less than the rated value until the brake lining adjusts to the disc.

8. Operation

8.1. Power supply of the product


The torque produced by each single type of brake, if powered at 6 bar, and all the other characteristics of the MINI CL and CL/F type clutches are shown in Chapter 5.1. The control pressure of clutches must not be more than 6 bar.

8.2. Improper use

The products considered here must be used exclusively as described in Chapter 5 of this manual. Any other use is to be considered improper. The manufacturer declines all responsibility for damage caused by erroneous or unreasonable use of the product.



Use of the product for purposes other than those stated in this manual may compromise any aspect of safety.

	User and Maintenance Manual <i>Clutches MINI CL-CL/F</i>		Model CL2 & CL2/F Model CL3 & CL3/F Model CL4 & CL4/F Model CL4-AC & CL4/F-AC Model CL5 & CL5/F Model CL5-HT & CL5/F-HT
	Date: 2013/07/01	Revision: 1	www.coremo.it

9. Maintenance and cleaning



ALL TYPES OF WORK ON THE BRAKE MUST BE DONE WITH THE MACHINE OFF.


Staff assigned to this work must wear suitable PPE such as gloves and safety footwear and take any further precautions necessary to ensure adequate protection and prevent injury. Failure to follow the instructions given for maintenance and cleaning of the product may compromise personal safety and cause damage to equipment and machinery.



High temperatures may be produced after engaging on the surfaces of the discs. Personnel must therefore wait for parts subject to overheating to cool down and wear suitable protective gloves and PPE..

9.1. Replacement of the lining discs and central discs

1. For CL2 – CL3 – CL4 – CL4-AC – CL5 – CL5-HT clutches:
Unscrew the 4 screws (M6) locking the clutch to the machine and remove the clutch from the shoulder of the machine but leaving the hub mounted on the shaft.
2. For CL2/F – CL3/F – CL4/F – CL5/F – CL4/F-AC – CL5/F-HT clutches:
Unscrew the 4 screws (M6) (C61394 for CL2/F and CL3/F, C61389 for CL4/F – CL5/F – CL5/F-HT, C61390 for CL4/F-AC) and remove the clutch from the self-supporting unit (bearing flange + hub). Do not remove the self-supporting unit of the shaft of the machine.
3. Unscrew the 4 screws (M6) (C61391 for CL2 – CL3 – CL2/F – CL3/F, C61387 for CL4 – CL5 – CL4/F – CL5/F – CL5-HT – CL5/F-HT, C61388 for CL4-AC and CL4/F-AC) and remove the assembly flange.
4. Pull out the lining discs, central discs and disc thruster unit from the housing.
5. Unscrew the screws of the disc thruster unit and replace the lining. R Remount and tighten the screws to a torque of 1.7 Nm for CL series 2 and 3 or 4 Nm for CL series 4 and 5.
6. Insert the disc thruster unit in the housing and replace the other discs by mounting the central discs and lining discs in alternation.
7. Remount the assembly flange using M6 screws and a tightening torque of 9.5 Nm.
8. Make sure that the lining discs slide freely in the housing.
9. Align the teeth of the central discs to facilitate mounting the clutch on the hub (only for CL3 – CL3/F – CL5 – CL5/F – CL5-HT – CL5/F-HT clutches)
10. For CL2 – CL3 – CL4 – CL5 – CL4-AC – CL5-HT clutches
 - a. Pull out the lining discs, central discs and disc thruster unit from the housing.

	User and Maintenance Manual <i>Clutches MINI CL-CL/F</i>		Model CL2 & CL2/F Model CL3 & CL3/F Model CL4 & CL4/F Model CL4-AC & CL4/F-AC Model CL5 & CL5/F Model CL5-HT & CL5/F-HT
	Date: 2013/07/01	Revision: 1	www.coremo.it

- b. Unscrew the screws of the disc thruster unit and replace the lining. Remount the clutch and tighten the screws with a tightening torque of 1.7 Nm for CL series 2 and 3 or 4 Nm for CL series 4 and 5.

11. For CL2/F – CL3/F – CL4/F – CL5/F – CL4/F-AC – CL5/F-HT clutches:

Remount the clutch on the self-supporting unit using 4 screws (M6) (C61394 for CL2/F and CL3/F, C61389 for CL4/F – CL5/F – CL5/F-HT, C61390 for CL4/F-AC) with a tightening torque of 9.5 Nm.

9.2. Changing the seal rings and the springs (CL2 – CL3 – CL2/ F – CL3/ F)

1. For CL2 – CL3 clutches:

Unscrew the 4 screws (M6) locking the clutch to the machine and remove the clutch from the shoulder of the machine but leaving the hub mounted on the shaft.

2. For CL2/F – CL3/F clutches:

Unscrew the 4 screws (M6) C61394 and remove the clutch from the self-supporting unit (bearing flange + hub). Do not remove the self-supporting unit of the shaft of the machine.

3. Unscrew the 4 screws M6 C61391 and remove the cover D70811
4. Remove the springs C60959 and pull out the thruster D70808 from the cover.
5. Replace the O-rings C61797 and C61796. Grease the surfaces where the O-Rings and thruster D70808 slide, then remount the thruster in the cover D70811.
6. Replace ALL the springs C60959, including those which might seem to be intact.
7. Reassemble following points 3 to 1 in reverse order.

9.3. Changing the diaphragm (CL4 – CL5 – CL4-AC – CL5-HT – CL4/ F – CL5/ F – CL4/ F-AC – CL5/ F-HT)


1. For CL4 – CL5 – CL4-AC – CL5-HT clutches:

Unscrew the 4 screws (M6) locking the clutch to the machine and remove the clutch from the shoulder of the machine but leaving the hub mounted on the shaft.

2. For CL4/F – CL5/F – CL4/F-AC – CL5/F-HT clutches:

Unscrew the 4 screws (M6) (C61389 for CL4/F – CL5/F – CL5/F-HT, C61390 for CL4/F-AC) and remove the clutch from the self-supporting unit (bearing flange + hub). Do not remove the self-supporting unit of the shaft of the machine.

3. Unscrew the 4 screws (M6) (C61387 for CL4 – CL5 – CL4/F – CL5/F – CL5-HT – CL5/F-HT, C61388 for CL4-AC and CL4/F-AC) and remove the cover (D70220 for CL4 – CL5 – CL4/F – CL5/F, D70792 for CL4-AC and CL4/F-AC, D70721 for CL5/HT – CL5/F-HT)
4. Replace the diaphragm (C60438 for CL4 – CL5 – CL4/F – CL5/F – CL5-HT – CL5/F-HT, C61798 for CL4-AC and CL4/F-AC).
5. Reassemble following points 3 to 1 in reverse order.

	User and Maintenance Manual <i>Clutches MINI CL-CL/F</i>		Model CL2 & CL2/F Model CL3 & CL3/F Model CL4 & CL4/F Model CL4-AC & CL4/F-AC Model CL5 & CL5/F Model CL5-HT & CL5/F-HT
	Date: 2013/07/01	Revision: 1	www.coremo.it

9.4. Changing the carbon graphite seal or the bearing

1. For CL2 – CL3 – CL4 – CL5 – CL4-AC – CL5-HT clutches:
2. Unscrew the 4 screws (M6) locking the clutch to the machine and remove the clutch from the shoulder of the machine but leaving the hub mounted on the shaft.
3. For CL2/F – CL3/F – CL4/F – CL5/F – CL4/F-AC – CL5/F-HT clutches
Unscrew the 4 screws (M6) (C61394 for CL2/F and CL3/F, C61389 for CL4/F – CL5/F – CL5/F-HT, C61390 for CL4/F-AC) remove the clutch from the self-supporting unit (bearing flange + hub). Do not remove the self-supporting unit of the shaft of the machine.
4. Remove the Seeger C61294.
5. Using a special extractor, remove the remaining components of the group K90085 (rotor/bearing).
6. Replace the rotor C60439, the bearing C61774 and the group K90084 (seal/carbon graphite seal).
7. Reassemble following points 4 to 1 in reverse order.

9.5. Cleaning the friction surfaces

1. For CL2 – CL3 – CL4 – CL4-AC – CL5 – CL5-HT clutches:
Unscrew the 4 screws (M6) locking the clutch to the machine and remove the clutch from the shoulder of the machine but leaving the hub mounted on the shaft.
2. For CL2/F – CL3/F – CL4/F – CL5/F – CL4/F-AC – CL5/F-HT clutches:
Unscrew the 4 screws (M6) (C61394 for CL2/F and CL3/F, C61389 for CL4/F – CL5/F – CL5/F-HT, C61390 for CL4/F-AC) and remove the clutch from the self-supporting unit (bearing flange + hub). Do not remove the self-supporting unit of the shaft of the machine.
3. Unscrew the 4 screws (M6) (C61391 for CL2 – CL3 – CL2/F – CL3/F, C61387 for CL4 – CL5 – CL4/F – CL5/F – CL5-HT – CL5/F-HT, C61388 for CL4-AC and CL4/F-AC) and remove the assembly flange.
4. Pull out the lining discs, central discs and disc thruster unit from the housing.
5. Remove any oil or grease from the surface of the discs using a non-pollutant detergent.
6. If the linings are only dirty superficially clean them with fine emery cloth. In the case of deep contamination of the linings replace them as described in Chapter 9.1.

9.6. Replacement of the bearings of the self-supporting unit (CL2/ F – CL3/ F – CL4/ F – CL5/ F – CL4/ F-AC – CL5/ F-HT)

1. Unscrew the 4 screws (M6) (C61394 for CL2/F and CL3/F, C61389 for CL4/F – CL5/F – CL5/F-HT, C61390 for CL4/F-AC) and remove the clutch from the self-supporting unit (bearing flange + hub).
2. Remove the self-supporting unit from the shaft of the machine.

	User and Maintenance Manual <i>Clutches MINI CL-CL/F</i>		Model CL2 & CL2/F Model CL3 & CL3/F Model CL4 & CL4/F Model CL4-AC & CL4/F-AC Model CL5 & CL5/F Model CL5-HT & CL5/F-HT
	Date: 2013/07/01	Revision: 1	www.coremo.it

3. Remove the Seeger from the hub.
4. Pull out the hub from the bearing flange.
5. Using a special extractor remove the two ball bearings and replace them.
6. Reassemble following points 1 to 4 in reverse order.

9.7. Periodic maintenance



All inspections must be done with the machine switched off.

Although the intervals between these inspections depend on the frequency of use of the clutch, they should be done every 3 months in any case so as not to compromise all aspects of safety.


1. Check that the total play between the discs does not exceed 2 mm for CL and CL/F series 2 and 4 or 4.5 mm for CL and CL/F series 3 and 5. When the values indicated are exceeded replace the discs as described in Chapter 9.1.
2. Check that the surfaces of the linings and the central disc are not contaminated with grease, oil or similar substances as these prevent the brake from working effectively.
 3. Check that the anchoring screws of the clutch are correctly tightened.
4. Check the condition of the flexible hoses.
5. Apply the clutch a number of times to check the integrity of the diaphragms (for CL and CL/F series 4 and 5) the integrity of the seal gaskets and that the springs are working properly (for CL e CL/F series 2 and 3).

10. Spare parts list

To avoid costly down time we recommend keeping a stock of spare parts adequate for the number of clutches as listed below:

Clutches CL2 and CL3

Lining pad:	C61785 (ST10) - C61786 (ST11)
Disc thruster linings:	C61788 (ST10) - C61789 (ST11)
Central discs:	C60995
Seal rings:	C61796 and C61797
Springs:	C60959

	User and Maintenance Manual <i>Clutches MINI CL-CL/F</i>		Model CL2 & CL2/F Model CL3 & CL3/F Model CL4 & CL4/F Model CL4-AC & CL4/F-AC Model CL5 & CL5/F Model CL5-HT & CL5/F-HT
	Date: 2013/07/01	Revision: 1	www.coremo.it

Clutches CL2/F and CL3/F

Lining pad:	C61785 (ST10) - C61786 (ST11)
Disc thruster linings:	C61788 (ST10) - C61789 (ST11)
Central discs:	C60995
Seal rings:	C61796 and C61797
Springs:	C60959
Bearings:	C61799

Clutches CL4 and CL5

Lining pad (CL4 – CL5 – CL4-AC):	C61778 (ST10) - C61779 (ST11)
Lining pad (CL5-HT):	C61779 (ST11)
Disc thruster linings (CL4 – CL5 – CL4-AC):	C61763 (ST10) - C61764 (ST11)
Disc thruster linings (CL5-HT):	C61764 (ST11)
Central discs:	C61775
Diaphragm (CL4-AC):	C60798
Diaphragm (CL4 – CL5 – CL5-HT):	C60438

Clutches CL4/F and CL5/F

Lining pad (CL4/F – CL5/F – CL4/F-AC):	C61778 (ST10) - C61779 (ST11)
Lining pad (CL5/F-HT):	C61779 (ST11)
Disc thruster linings (CL4/F – CL5/F – CL4/F-AC):	C61763 (ST10) - C61764 (ST11)
Disc thruster linings (CL5/F-HT):	C61764 (ST11)
Central discs:	C61775
Diaphragm (CL4/F-AC):	C60798
Diaphragm (CL4/F – CL5/F – CL5/F-HT):	C60438
Bearings:	C61781
Kit rotor/bearings (all series):	K90085
Kit seal/carbon graphite seal (all series):	K90084

These spare parts must be kept in a place that is preferably dark, cool and far from substances that could reduce their functionality.

