PULLEY SHOE BRAKES

Installation Manual - Rev. 8.2

PIZZAMIGLIO S.r.L.

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MANUFACTURERS OF LIFTING DEVICE COMPONENTS

Our company

The Pizzamiglio Srl company has been founded recently from the ashes of the former Elettromeccanica F.lli Pizzamiglio Renato e Ivo Snc, established in 1982 by the brothers Renato and Ivo. Their twenty-year experience in the field of lifting gears started with the birth of their own business which dealt with elctro-mechanical maintenance focusing particularly on bridge cranes.

Thanks to the constant growth of customers' needs, the company starts the production of switchboards, the installation of industrial and home electrical systems and the manufacturing of structural works in the lifting field.

In order to offer a more complete range of products, in 1994 the company starts to produce trolleys and accessories for the lifting and handling of power supply cables for bridge cranes and the company to increase its turnover and expand its market.

The workshop equipment gradually increases with the introduction of work vehicles needed to the manufacturing of maintenance mechanical components. Indeed, the maintenance activity was growing more and more also thanks to the European Directive on occupational safety practices.

In 1996 the company starts manufacturing hydraulic brakes in accordance with the DIN 15435 (DIN System), and other crane components such as buffers and load limiting devices. Consequently, the company creates a wider range of bridge crane accessories and expands its commercial possibilities.

At the same time, the assistance activity to other companies increases and becomes one of the significant company activities and the company members' direct experience in this specific filed allows to develop and improve continually bridge crane accessories.

In 1997 the company moves to a new building in a small business area to meet the productive organization and the staff growth needs.

In 1998, the company starts the production and direct marketing of its "AQ Trolley" electric feeder systems with copper conductors for mobile applications.

In 2001 the company Elettromeccanica F.lli Pizzamiglio Snc obtains the certification of the Quality System in accordance with the ISO9002.

In 2002 the company divides and devotes itself to the manufacturing of bridge crane components. Nowadays, based on their installation experience, our technicians can meet the needs of the most demanding manufacturers and maintenance firms.

Our company is specialized in the production of :

- "Olivares" cable trolleys for bridge cranes, jib cranes and many other uses;
- "Olivares Feston" cable trolleys for dock and steelworks cranes;
- **Electro-hydraulic failsafe shoe brakes in accordance with the DIN15435, and broadband brakes;**
- **Brake band and engine couplings for shoe brakes;**
- Spare asbestos-free flexible coupling and brake shoes in accordance with the DIN System requirements;
- Electro-hydraulic failsafe disc brakes;
- Load limiting devices for bridge cranes;
- Telescopic control stops for bridge cranes;
- High energy absorption metal buffers;
- Rubber buffers;
- AQ Trolley busbar trucking systems for bridge cranes, with PVC section and one not expensive and reliable copper bar easy to install.

Index

Chapter

1

Introduction

This manual has been created for the installation and maintenance of shoe brakes (failsafe opposite shoe brakes on a pulley controlled by an electro-hydraulic brake booster) by Pizzamiglio srl, and includes instructions for a correct system setting-up and functioning through time and for the safe use by the end user.

This documentation and its possible enclosures must be read carefully by the personnel working at any level before starting the installation, maintenance or adjustment of the brake. Any intervention must be carried out with the help and in accordance with this manual. The employer must verify the training and qualification of the personnel before giving the authorization to make any intervention on the lifting gears.

Chapter

2

Constructor and Product Identification Data

Constructor Data:

PIZZAMIGLIO SRL

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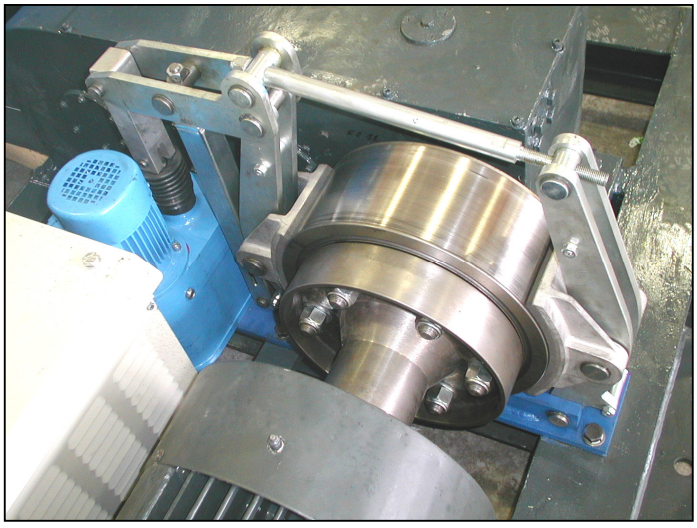


Data Sheet:

Product name:

PULLEY SHOE BRAKE

Chapter

3

Product Description

Pizzamiglio srl failsafe shoe brakes are built in accordance with the DIN15435 requirements. Two opposite shoes with friction coating act on a cast iron pulley (brake band semi-coupling) driven by a spring. In **failsafe brakes** the brake opens thanks to an electro-hydraulic brake booster that opposes to the power of a spring. In this way, the shoes slow the pulley without the use of electric power.

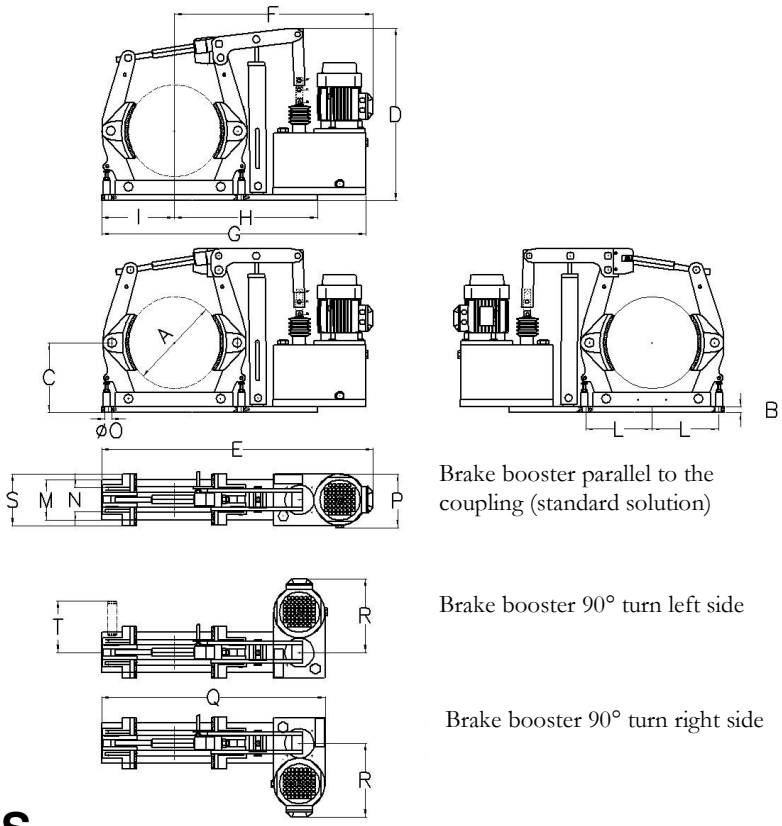
The shoe brakes are largely used in the construction of winches for any kind of crane, lifting gears and in general for the slowing of any rotating device supporting a load or a translation system. Our standard products include brakes for a wide range of purposes and suitable for brake bands with a diameter between mm 160 and 500 and a max braking moment at 3000 Nm.

Our quality check system involves a constant checking at any level of production from the procurement of materials to the final test. For each brake used, an EC Declaration of Conformity guarantees the compliance with the rules, both technical and imposed by our company.

The Working Area - Base, supporting, levers and spring box are completely galvanized.Our standard pins are made in a special steel and guarantee a perfect functioning in close working areas, whereas for open-air employment it is advisable to use our stainless steel pins. Since 2008, our standard brakes (size 200-250-315-400) are assebled using stainless steel pins and self lubricating bushes for majors articulations. The IP55 protection degree of our brake booster electric motors makes them suitable for open-air employment. Nevertheless, it is advisable to add a protection cover for the pulley brake band and shoe brake to prevent the increase the friction coefficient on linings.

Incorrect uses: Never install the brake in an explosive area. Do not install the brake in an area accessible to non-expert staff without placing the necessary safety guards to prevent accidents due to possible contact with mechanical parts, brake band or brake shoes, which reach high temperatures during braking cycles.

Technical Features



Brake booster parallel to the coupling (standard solution)

Brake booster 90° turn left side

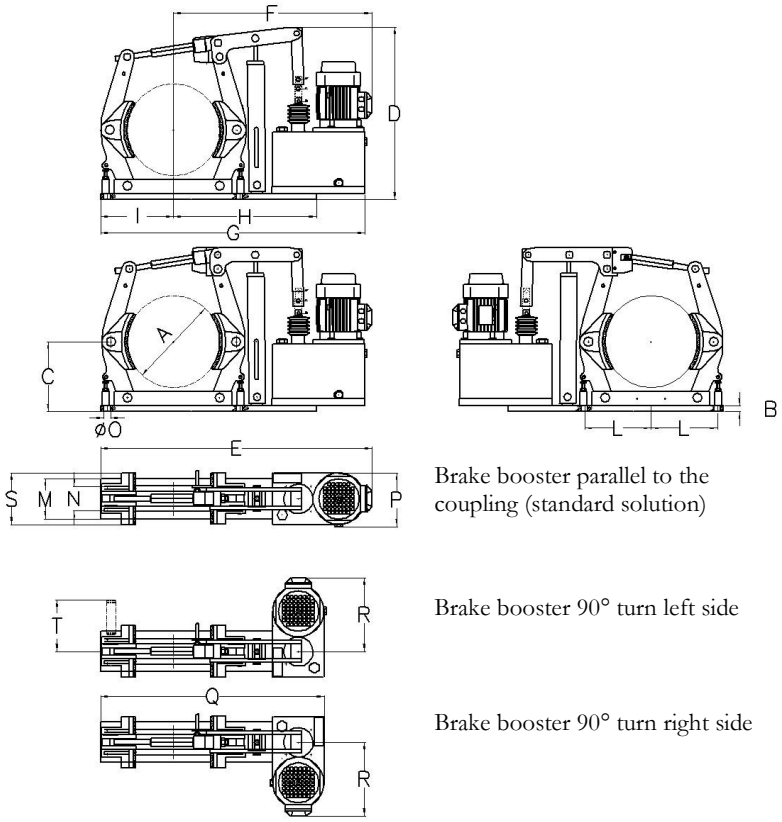
Brake booster 90° turn right side

'DIN' SERIES

Type	Mt [Nm]		A	B	C	D	E	F	G	H	I	L	M	N	O	Q	P	R	S	T	mass [kg]
	min	max																			
160C20	10	109	160	12	125	326	578	443	542	290	135	120	90	55	11	451	127	188	55	89	18
200DINC50	40	377	200	15	160	395	642	482	622	340	160	145	90	55	14	519	140	200	70	111	28
250DINC50	50	472	250	15	190	478	713	516	693	375	197	180	100	65	18	607	140	200	90	134	37
250DINC100	70	968	250	15	190	478	780	580	750	380	197	180	100	65	18	617	160	235	90	134	45
315DINC50	60	583	315	15	230	546	829	587	809	452	242	220	110	80	18	705	140	200	110	159	50
315DINC100	80	1079	315	15	230	546	852	610	832	452	242	220	110	80	18	715	160	235	110	159	58
400DINC100	90	1396	400	20	280	666	959	664	939	515	295	270	140	100	22	828	160	235	140	200	85
400DINTH4	120	1585	400	20	280	666	994	699	980	515	295	270	140	100	22	--	200	250	140	200	88
500DINC100	120	1739	500	20	340	817	817	767	1107	620	360	325	180	130	22	985	160	235	180	244	127
500DINTH4	150	2312	500	20	340	817	817	794	1139	620	360	325	180	130	22	--	200	250	180	244	130

Type TH4 brake booster cannot be rotated

Pizzamiglio srl reserves the right to make changes without notice.



Brake booster parallel to the coupling (standard solution)

Brake booster 90° turn left side

Brake booster 90° turn right side

'AL' SERIES (Broad Band)

Type	Mt [Nm]		A	B	C	D	E	F	G	H	I	L	M	N	O	P	Q	R	S	T	mass [Kg]
	min	max																			
200ALC50	40	377	200	15	160	395	642	482	622	340	160	145	90	55	14	140	519	200	105	28	28,5
250ALC50	50	472	250	15	190	478	713	516	693	375	197	180	100	65	18	140	607	200	135	37	37,5
250ALC100	70	968	250	15	190	478	780	580	750	380	197	180	100	65	18	160	617	235	135	45	45,5
315ALC50	60	583	315	15	230	546	829	587	809	452	242	220	110	80	18	140	705	200	165	50	51,5
315ALC100	80	1079	315	15	230	546	852	610	832	452	242	220	110	80	18	160	715	235	165	58	59,5
400ALC100	90	1396	400	20	280	670	990	675	940	515	295	270	140	100	22	160	828	235	210	85	87
400ALTH4	120	1585	400	20	280	670	1100	770	1000	515	295	270	140	100	22	205	--	270	210	88	90
500ALC100	120	1739	500	20	340	817	817	767	1107	620	360	325	180	130	22	160	985	235	270	127	129
500ALTH4	150	2312	500	20	340	817	817	794	1139	620	360	325	180	130	22	200	--	250	270	244	132

Type TH4 brake booster cannot be rotated

Pizzamiglio srl reserves the right to make changes without notice.

EXTRAS

ADJUSTING DEVICE

Acting on the main pull rod, this mechanism ensure the reduction of the backlash between the shoes and the brake band at any operation and by doing so it balances the thickness reduction of the friction lining.

STAINLESS STEEL PINS

The standard brakes couplings are mounted with steel pins, nevertheless we can use stainless steel on demand. This extra is needed when the brake is installed on cranes intended to work open-air or in places with high humidity.

SELF LUBRICATING BUSHES

To reduce the friction between the brakes couplings more efficiently we can mount self lubricating bushes on demand.

Since 2008, our standard brakes (size 200-250-315-400) are assembled using stainless steel pins and self lubricating bushes for majors couplings.

SIGNALING MICRO-SWITCH FOR OPEN BRAKE

This micro-switch applied to the brake booster and operated by a pin on the levers allows to know from a distance whether the brake is fully open. Micro-switch Features: max 2A, 400V, AC IP67 two coincidentally commutating clean NO/NC contactors (For the exact micro-switch features see data stamped directly on the body of the device by the manufacturer). For a correct functioning of the contactors, an appropriate connection between the device and the crane control panel is required.

SIGNALING SENSOR FOR FRICTION LINING WEAR

The signaling sensor is mounted directly on the shoes and may be exposed due to the friction lining wear, this will close the contact with the mass brake band. To ensure the functioning, the installation must be carried out using appropriate connection circuits to the crane control panel.

SIGNALING MICRO-SWITCH FOR CLOSED OR NEED OF ADJUSTING OF THE SETTING OF THE BRAKE FOR FRICTION LINING WEARING

This micro-switch applied to the brake booster and operated by a pin on the levers allows to know from a distance whether the brake is closed. In brakes without self adjusting device when the lining wears down the piston goes down in a ratio of 1 to12 between the lining thickness and the piston stroke, the switching threshold may be set at a position lower of the usual close position so the commutating of the switch warns need to make the setting of the brake or the replacement of the brake shoes Micro-switch Features: max 2A, 400V, AC IP67 two coincidentally commutating clean NO/NC contactors (For the exact micro-switch features see data stamped directly on the body of the device by the manufacturer). For a correct functioning of the contactors, an appropriate connection between the device and the crane control panel is required.

Chapter 4

PIZZAMIGLIO SRL
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CF P.IVA-Reg.Imp.di VR 03165700232 - REA 314197
Capitale sociale Euro 40.000,00 i.v.

DECLARATION OF THE MANUFACTURER
EUROPEAN STANDARD 2006/42/CE
ENCLOSE II LETTER B

CE

THE **PIZZAMIGLIO SRL** COMPANY
DECLARES, UNDER HIS OWN RESPONSIBILITY TO BE ITSELF
THAT THE MANUFACTURE OF THE FOLLOW "PARTLY COMPLETED MACHINERY".

- **NEGATIVE DRUM BRAKE DIN 15431** , COMPONENT THAT CAN BE USED TO BRAKE THE JOINT PULLEY PLACED BETWEEN MOTOR AND GEARBOX OF A WINCH OR OTHERS MACHINE-MEMBERS HAVING ROTARY MOTION

Type 160/200/250/315/400/500 DIN or AL
SERIAL NUMBER: *XXXXX* YEAR OF MANUFACTURING *XXXXX*

- EQUIPPED WITH **ELECTRO HYDRAULIC SERVO BRAKE (THRUSTER),** COMPONENT UTILIZED TO OPEN NEGATIVE DRUM BRAKES AND NEGATIVE DISK BRAKES PRODUCED BY PIZZAMIGLIO SRL IN OPPOSING TO THE FORCE OF THE MAIN SPRING.

Type C20/C50 / C100
SERIAL NUMBER: *XXXXX* YEAR OF MANUFACTURING *XXXXX*

THIS "PARTLY COMPLETED MACHINERY" IF CORRECTLY INSTALLED AND KEPT MAINTAINED IN CONFORMITY TO THEIR DESTINATION, TO THE INSTRUCTIONS OF THE MANUFACTURER AND TO LAW, THESE GOODS COMPLIES, WHERE APPLICABLE, WITH PROVISIONS OF THE ABOVE INDICATED STANDARDS AND NORMS:

- EUROPEAN DIRECTIVE 2006/42/CE "SAFETY OF MACHINERY"
- DIN 15435 1-2-3 DRUM BRAKES

THESE EQUIPMENTS ARE SUITABLE TO BE UTILIZED IN CRANES CONSTRUCTION.

THESE "PARTLY COMPLETED MACHINERY" ARE BOUND TO BE INCORPORATED IN OTHER MACHINERY. IS FORBIDDEN TO PUT THEM INTO SERVICE BEFORE THAT THE WHOLE MACHINERY OR "PARTLY COMPLETED MACHINERY" HAS BEEN DECLARED ACCORDING TO THE EUROPEAN STANDARD 2006/42/CE.

THE PERSON AUTHORIZED BY PIZZAMIGLIO SRL TO ARRANGE THE TECHNICAL DOCUMENTATION CONCERNING THESE "PARTLY COMPLETED MACHINERY" IS MR. PIZZAMIGLIO CRISTIAN THAT IS THE TECHNICAL MANAGER OF THE COMPANY. FOR THIS PURPOSE HE ELECTS HIS DOMICILE WITH THE REGISTERED OFFICE OF THE PIZZAMIGLIO SRL COMPANY AS INDICATED IN LETTERHEAD.

IN COMPLIANCE WITH THAT IS ESTABLISHED BY THE STANDARD 2006/42/CE – ENCLOSE II – THE COMPANY COMMIT HIMSELF TO TRANSMIT, IN ANSWER TO A JUSTIFIED REQUEST OF THE NATIONAL AUTHORITIES, THE INFORMATION CONCERNING THESE "PARTLY COMPLETED MACHINERY" OBJECT OF THIS DECLARATION. THE TRANSMISSION MAY BE DONE IN THE WAY THAT THE COMPANY PIZZAMIGLIO SRL CONSIDERS MORE SUITABLE BY USING DIGITAL OR FISICAL SUPPORTS OR BY THE INTERNET WEB BY ADOPTING THE CONVENIENT PRECAUTIONS IN ORDER TO PRESERVE THE RIGHTS AND INTELLECTUAL PROPERTIES OF THE MANUFACTURER OF THE "PARTLY COMPLETED MACHINERY"

VALEGGIO SUL MINCIO – ITALY, XX.XX.XXXX

PIZZAMIGLIO SRL
THE TECHNICAL MANAGER
AND CHIEF EXECUTIVE OFFICER
CRISTIAN PIZZAMIGLIO

Chapter

5

Safety Regulation

Installation advice

During the installation, please follow security information by the Risk Prevention and Protection Unit using approved ladders, scaffoldings or platforms and personal protective equipment according to the rules in force.

Code of Conduct: Wear accident-prevention equipment according to the rules in force; use only approved ladders, lifting platforms or other similar devices; handle the devices with the utmost care in order not to create dangerous situations for people or things; dispose of the packaging according to the rules in force in the country where the installation is carried out.

Residual Risk

Despite the solutions adopted during the product design phase, some risks still remain for installation and maintenance staff, mainly due to electricity and to the height at which the crane is installed and the staff has to work:

Electrocution in case the electric connection is carried out without clearing tension to the machine.

Fall from high structures during the installation and maintenance phase in case the staff does not use approved ladders, scaffoldings or platforms and/or personal protective equipment.

Risks due to machinery overheating: During the standard brake functioning, the shoes overheats due to braking. If the brake has been installed in a place easy to access to by the staff, it is advisable to use proper covers for the dangerous overheated parts.

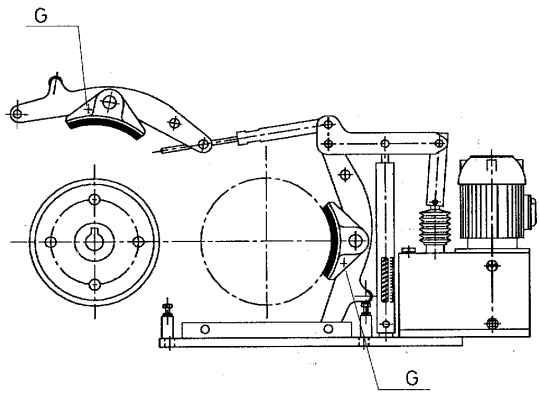
Chapter

6

Installation and Activation

For the installation, please follow the instructions below.

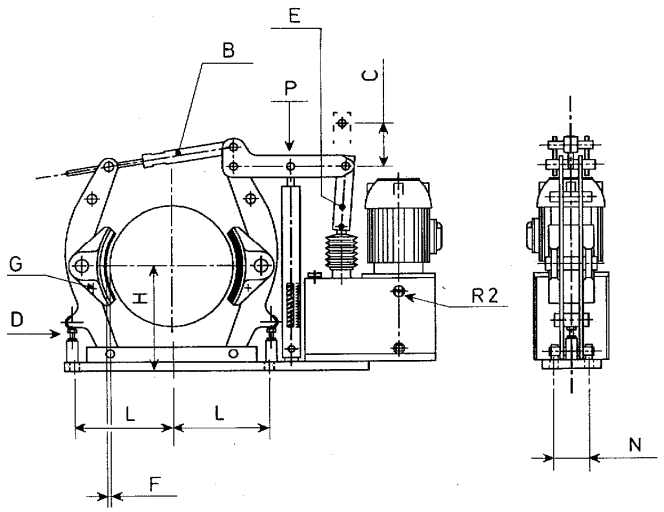
The brake activation must be carried out strictly accordingly to the L and N values and the verticality between the average brake floor and the axis of rotation of the brake pulley. The brake installation can be performed without removing either the pulley nor the main motor. Infact, extracting the pin of the brake block lever opposite to the brake booster, it is possible to turn this lever upwards and make it slide on the brake pulley, while the base slides below. Once the lever is back to the normal position, the shoes set automatically and remain in their normal position thanks to adjust screws.



PERFORMANCE

The brake will perform at its best after a running-in period, which is required for a correct working of the brake band friction gaskets. Both the linings and the brake band must always be perfectly clean.

If the brake is to be installed open-air or in places subject to dust or splashes or to possible sliding of other materials, it is necessary to protect the brake to avoid the insertion of foreign bodies between the linings and the brake band.



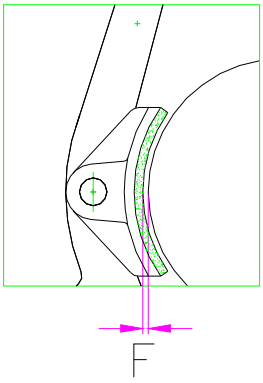
Backlash between the linings and the brake band: The following operations show the value of the backlash (F) that must be present between each shoe lining and the brake band. Backlash values according to the DIN 15435 requirements:

Brake Size	160*	200	250	315	400	500	630
Backlash F [mm]	0,8	1	1	1,2	1,2	1,4	1,8

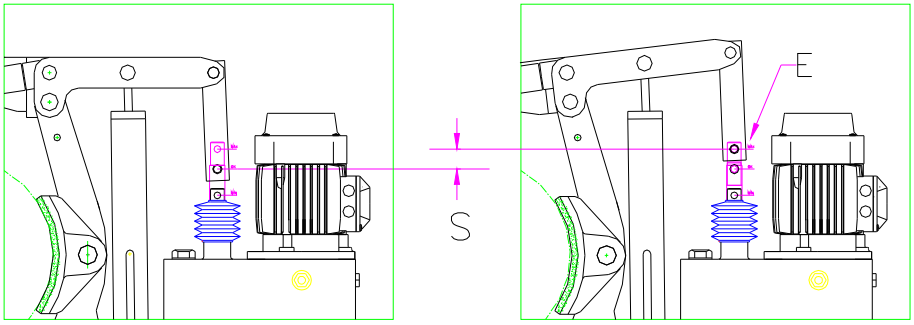
*Size not fixed by the DIN System

Brake Booster Type	C20	C50	C100	C140*	TH4
Opening Stroke S [mm]	25	35	40	50	35
Total Brake Booster Stroke	45	60	70	90	60

*Special production brake booster



During the backlash setting up, verify that the stroke (S) between the homing and open position of the brake correspond to the values specified for each brake. To do so, unloose the nut (B1) and turn the brake pull rod (B).



The backlash setting up must be carried out when the brake is closed. Unloose the nut (B1) and turn the brake pull rod (B) as needed, so that the pin (E) is located in the midpoint of the stroke. The backlash (F) should now correspond to the values shown in the tab. Check the stroke (S) values taking the brake booster piston to the previous stopping point manually without forcing it. Once the setting up is completed, tighten the nut (B1) again.

As the lining wears due to the brake functioning, the stroke (S) speed increases. When the stroke (S) value will be equal to the total piston stroke, the brake would not be able to work properly any more and the brake pull rod (B) would need to be set up again. When the lining is completely worn, the blocks must be changed and the brake pull rod (B) must be set up again.

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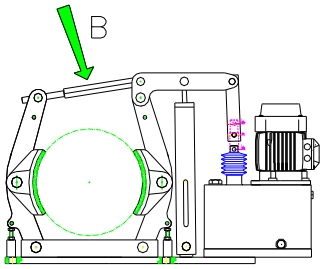
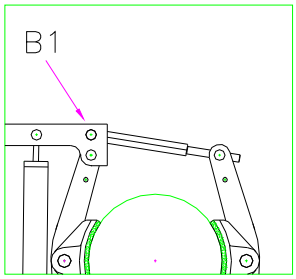
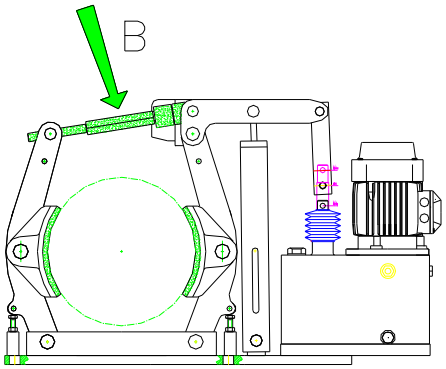


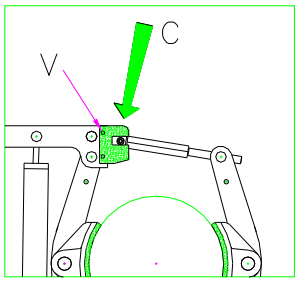


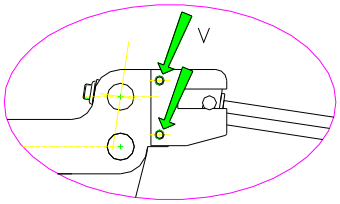
Special Suggestions for BRAKES with SELF ADJUSTING DEVICE

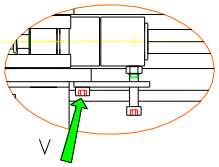
If the brakes are equipped with a self adjusting device, the manual setting can be only approximate to the backlash value shown in the DIN System tab. As the lining wears, the system reaches and keeps the correct backlash through function.

NOTE: If the brake has been tighten too much and you want to increase the value (F), you must remove the plate (C) unscrewing the screws (V), then turn the brake pull rod (B) to untighten it. Once this operation is completed, put the plate (C) back placing the tag in the interior side of the slint.

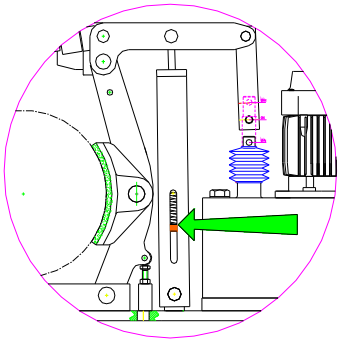


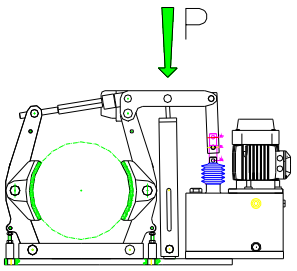


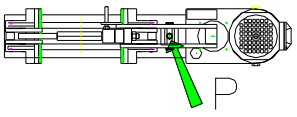




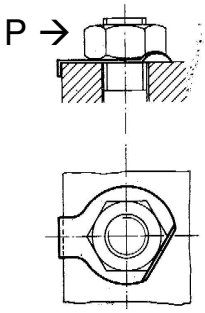
Setting up of the Braking Torque: The brakes spring provided is released, so it is necessary to load it accordingly turning the nut (P) at the end of the brake pull rod clockwise (see the arrow in the right picture). Then, through the slint you will see a metal slider -in the latest products this slider is orange. It is possible to set the braking torque to increase or decrease braking speed. Do not exceed the max level on the graduated line on the spring box or the brake booster won't be able to resist the spring power and open the brake. The max limit is the upper line of the orange slider which acts directly on the spring. The setting up must be carried out when the brake is closed.







Once the setting up is completed, it is necessary to block the nut turning the security washer between the nut and the pin or the nut would turn modifying the braking torque settings.

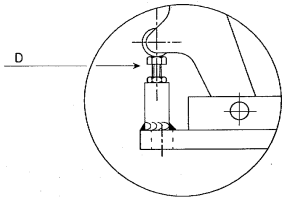


(P)

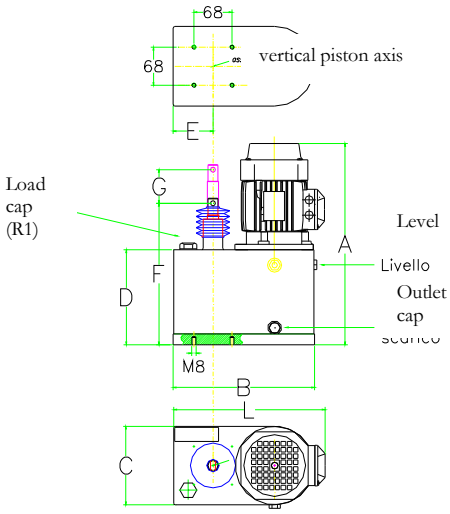
Note:
Do not exceed the MAX spring load level suggested for each brake booster type(C50/C100/TH4) or the gearcase won't have the power needed to resist the spring power and the brake won't be able to open causing serious damages to the main motor.

Brake Setting up: After having loaded the spring, define the brake settings in working position in order to have an equal backlash distribution between the shoes friction linings and the brake band. The brake setting up is carried out tightening or loosening the screws (D).

Also the brakes equipped with a self adjusting device need periodical setting up as it can't be carried out automatically.



BRAKE BOOSTERS/THRUSTERS



The following instructions refer to Pizzamiglio srl **standard** brake booster types: **C20-C50-C100-C140**.

Tank filling: Brake boosters are supplied with empty tank. The filling mast be with one hydraulic fluid ISO32 density as the above indicated:

MOBIL DTE OIL LIGHT
Suitable for temperatures from –10 to +40°C
MOBIL SHC 524
Suitable for temperatures from –20 to +50°C

For brake boosters type **C140** (now out of production replaced with TH4 and TH4/12, see note at next page) due to the high motor power other fluids are required to reach high working temperatures **MOBIL SHC 524**

Different types of oil would modify the spring push and response values.To fill the tank unscrew the cap (R1) and fill with oil up to the cap level. To avoid possible air bubbles in the tank, move downwards or upwards the piston manually, then fill with oil to the top and screw the cap.

NOTE:
Do not exceed the oil level shown in the transparent cap or the oil in excess will be expelled through the piston rod during the functioning.

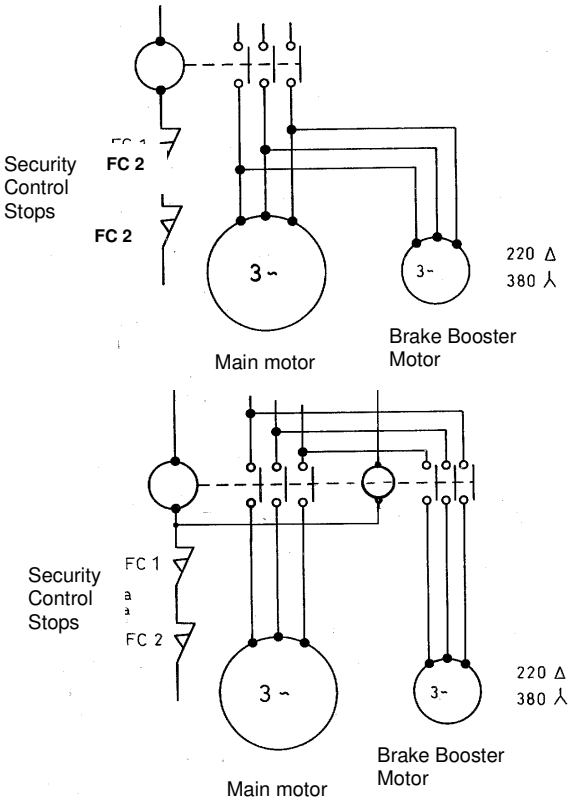
Brake Booster Type	Oil quantity
C20	1.6 kg
C50	3.5 kg
C100	5.0 kg

Electric Connection: The brake boosters motors supplied are intended to be used with three-phase alternate current -if not especially required otherwise- and can be used with the tension/frequency shown in the following tab. In case of special needs, please contact our trade office.

Brake Booster Type	Power	Standard Tension	Current	Other Electric Data
C20	0,12 kW	50Hz 380-420V 60Hz 440-480V	0,45 A	IP55 - Ins.Class F cosφ = 0,64
C50	0,25 kW	50Hz 380-420V 60Hz 440-480V	0,72 A	IP55 - Ins.Class F cosφ = 0,76
C100	0,37 kW	50Hz 380-420V 60Hz 440-480V	0,94 A	IP55 - Ins.Class F cosφ = 0,81

Data subject to variation without previous notice. Before ordering, please check these data with our office and compare them with your needs.

In lifting gears, the brake booster motor can be shunt directly from the main motor, as shown in the right picture. In this case, it can happen that the brake response is considerably delayed, especially in installations with a powerful main motor. In fact, the main motor magnetic retentivity and the enduring movement of the rotor itself could generate currents which may act on the brake booster motor with the effects described above. This problem can be solved installing a different brake booster control switch as shown in the second picture. To improve further the performance and extend the brake booster life, power the brake separately without the phases exchange while going up and down to avoid the brake booster motor to invert its rotation wise. By doing so, the mechanical stress on the rotor and other mechanical parts is reduced considerably.



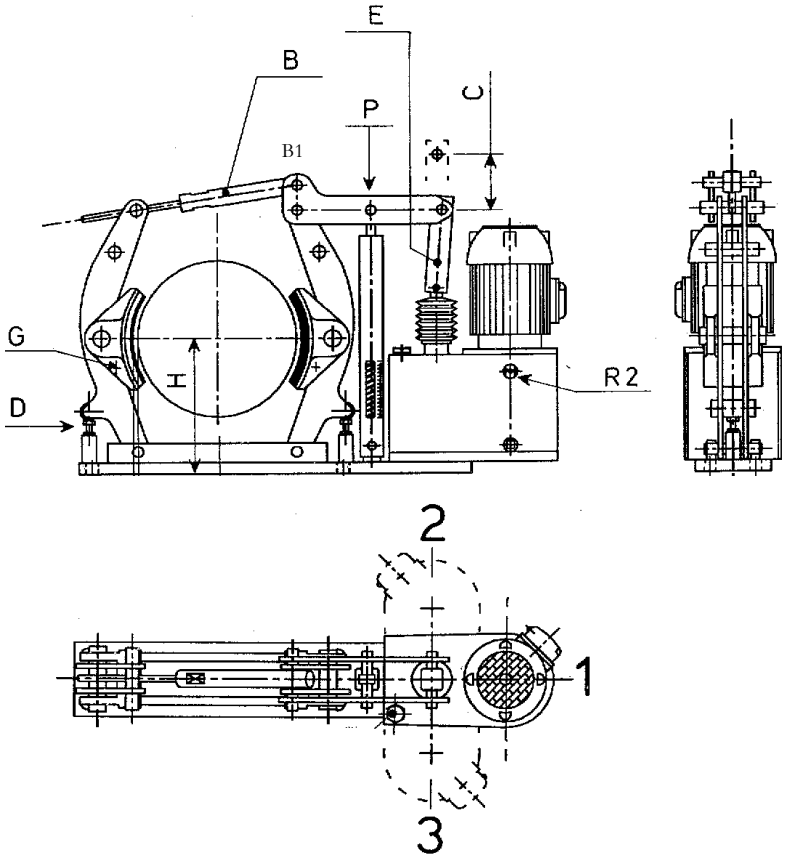
Protect the brake booster with an electro thermal circuit breaker. It is advisable to install a system that prevents the starting up of the main motor in case the brake does not open due to the magneto thermal device, brake booster motor failure or any other problem that may cause damages to the main motor.

Note: Brake booster are supplied with empty tank!

Use one of the suggested hydraulic fluid types.

Instruction for use and maintenance of thruster type TH4 e TH4/12 please make reference to the specific handbook drawn up by the manufacturer

Brake Positioning: According to size needs, it is possible to change the position of the brake booster on the brake at any moment, orienting it perpendicular to its standard position with a ± 90° rotation on the level surface. The repositiong can be carried out easily changing the 4 brake booster fixing screws at the bottom surface of the brake base.



*Rotation in the positions 2 and 3 is not possible for brakes equipped with BRAKE BOOSTER C20.

If the brake is to be **installed open-air** or in places subject to dust or splashing or to possible sliding of other materials, it is necessary to protect the brake to avoid the insertion of foreign bodies between the linings and the brake band. When ordering, please ask for stainless steel pins.

For particular exigencies such us ambient temperature >50°C or thrust force >100daN or plunger stroke >70mm our brakes are equipped with thruster made by others companies; for each information about use and maintenance of them please make reference to the specific handbook drown up by the manufacturer.

Chapter

7

Maintenance

For best brake performances, it is necessary to check periodically its functioning with a frequency that may vary according to environment conditions and to how crucial the service is. In standard conditions the check up can be carried out every 150 working hours. Please carry out these checks with the utmost care:

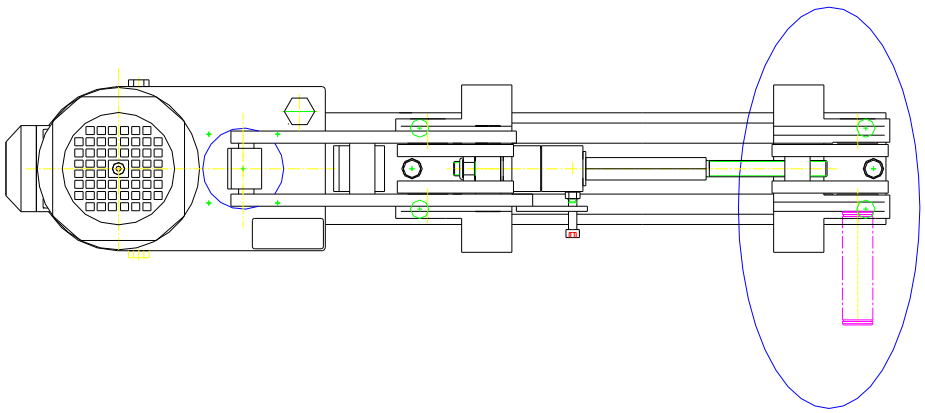
Adjust the backlash between the linings and the brake band (Linings wear).

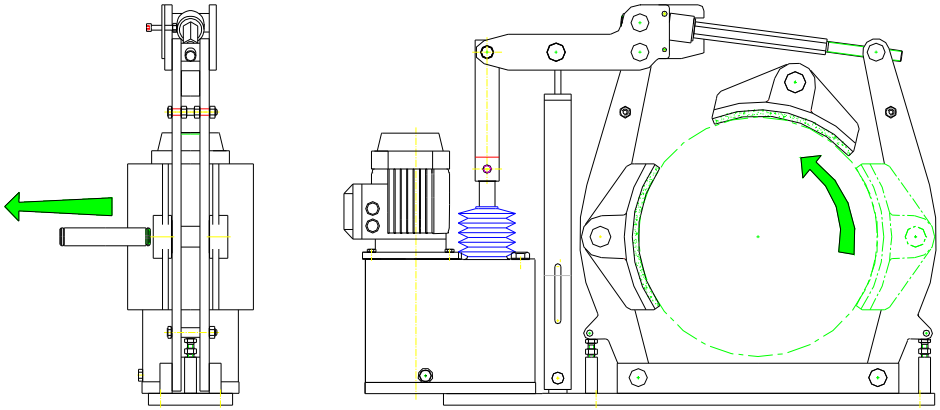
For brakes not equipped with a self adjusting device, it is necessary to check that the backlash between the linings and the brake band correspond to the suggested values, so that the braking time and moment values are the same than those shown. To change these values, unscrew the nut (B1) and adjust the brake pull rod (B). After every brake pull rod (B) adjustment, adjust also both locators (D).

Replacement of wear shoe linings.

Friction linings are stuck on shoes with thermo-setting binder, so when they are wear, it is necessary to change the whole shoe.

Both the DIN (standard DIN 15435/2) and the AL (broad band) shoes can be changed easily without removing the brake; just remove the snap rings and the pin and turn the shoe upwards making it slide on the brake band as shown in the next page.

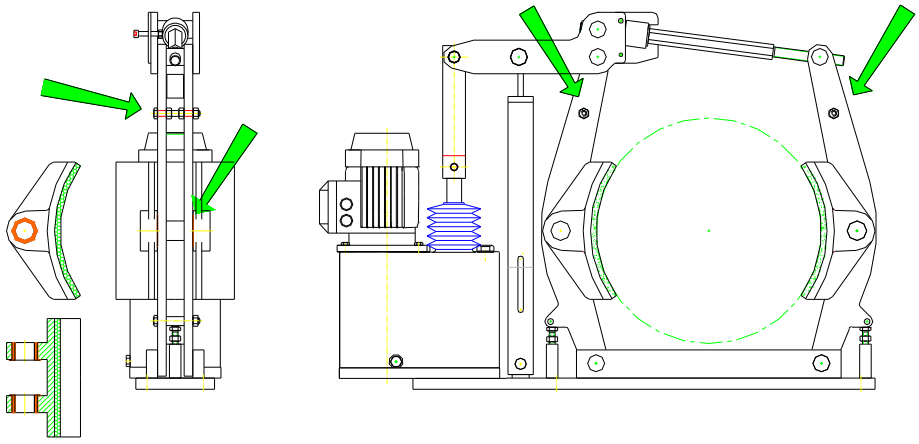




SHOES ANTI-ROTATION SYSTEM: To avoid that, once the brake is open, the shoes could unintentionally turn and lay on the pulley while it is rotating, we have developed different solutions:

At first, we added compensation washers between the shoe and the levers to create friction between these elements. Later we mounted flanged bushes directly on the back of the blocks; this solution simplified maintenance activities and did not constitute a big interference. With our latest improvement, we solved the problem replacing the spacing bushes with a system 'screw-nut-nut-nut' instead as shown below.

Screws and Nuts for Shoe Friction Adjustment



As the shoes (from size 200 to 400) supplied are equipped with flanged bushes, replacement activities may include:

1) **Reassembly of the previous renewed shoes (not replacement) fixed with compensation springs:** During the reassembly it is important to insert the compensation springs as they were before.

2) **Replacement of shoes without flanged bushes with others supplied with flanged bushes:** Replace both the springs and the 2 spacing elements -if present- with the system screw-nut-nut-nut (common screws).

3) **Replacement of shoes with flanged bushes with other of the same type plus a fixed spacing element:** Check the 2 existing spacing elements are thick enough to produce the correct friction, if not, replace them with the system screw-nut-nut-nut.

4) **Replacement of flanged bushes shoes with other of the same type** on brakes equipped with the system screw-nut-nut-nut: Set up the new shoes and adjust the system to restore the light friction. To simplify the shoes replacement, loosen the nut between the levers and screw it again after replacing the shoes.

Note: After replacing the shoes, always carry out the BACKLASH ADJUSTMENT between the shoes and the brake band again. To do so, please see settings at page 14.

To carry out the initial backlash adjustment for brakes equipped with a SELF ADJUSTING DEVICE, do not unscrew the nut (B1), but remove the plate (B2) unscrewing the 2 screws, as explained in detail at page 14.
Do not turn the brake pull rod when the plate is still on or the device will be damaged.

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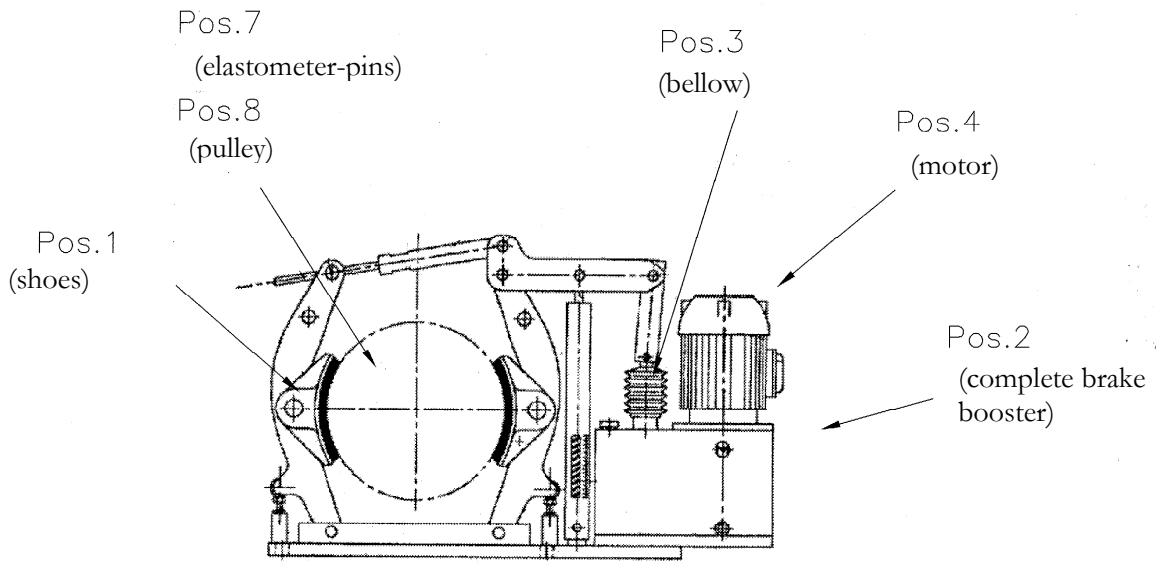
After replacing the shoes it is not necessary to adjust the braking torque again: screw (P)

Spare Parts



POS. 1 SPARE SHOES see chapter 8

POS. 2 BRAKE BOOSTER (ELECTRO-HYDRAULIC GEARCASE)

C20	Complete C20 brake booster with rubber bellow included and without oil.
C50	Complete C50 brake booster with rubber bellow included and without oil.
C100	Complete C100 brake booster with rubber bellow included and without oil.
~~C140~~	~~Complete C140 brake booster with rubber bellow included and without oil~~ (out of production).
TH4	TH4 brake booster with oil (the bellow is not provided).
TH4/12	TH4/12 brake booster with oil (the bellow is not provided).

POS. 3 BELLOW

534/02	Protective black rubber bellow for brake booster piston -suitable for C20-C50-C100-C140 brake boosters.

POS.4 BRAKE BOOSTER ELECTRIC MOTOR

MOTOREC20	Electric motor for C20 gearcase (kW 0.12 – See electric data sheet at page 17)
MOTOREC50	Electric motor for C50 gearcase (kW 0.25 – See electric data sheet at page 17)

MOTOREC100	Electric motor for C100 gearcase (kW 0.37 – See electric data sheet at page 17)
MOTOREC140S	Electric motor for C140 gearcase (kW 2.20 - Ins. Class F – IP55 – V230/400 Hz50 rpm 2840)

POS.5 MICROSWITCHES

OMD4B1111N	'Brake open' alert microswitch (max 2A, 400V, AC IP67 two coincidentally commutating clean NO/NC contactors).

POS.6 BRAKE BOOSTER HYDRAULIC FLUID

MOB01140	Hydraulic fluid MOBIL DTE OIL LIGHT (for C20-C50-C100 brake boosters/Thrusters).
MOBSHC524	Hydraulic fluid MOBIL SHC 524 wide temperature range (for C140 brake boosters/Thrusters)

POS.7 SPARE COUPLINGS PINS

PERNO160-RIC	Spare pin-nuts-washers kit for the 160 coupling, flexible bush not included - one item (Note: the 160 coupling needs 4 pins).
PERNO200/250-RIC	Spare pin-nuts-washers kit for the 200 coupling, flexible bush not included - one item (Note: the 200 needs 4 pins and the 250 couplings needs 6 pins).
PERNO315-RIC	Spare pin-nuts-washers kit for the 315 coupling, flexible bush not included - one item (Note: the 135 coupling needs 6 pins).
PERNO400-RIC	Spare pin-nuts-washers kit for the 400 coupling, flexible bush not included - one item (Note: the 400 coupling needs 6 pins).
PERNO500-RIC	Spare pin-nuts-washers kit for the 500 coupling, flexible bush not included - one item (Note: the 500 couplings need 6 pins)
ELAST160	Rubber flexible bush for the 160 coupling (Note: the 160 coupling needs 4 pins).
ELAST200-250	Rubber flexible bush for the 200 and 250 couplings (Note: the 200 and 250 couplings need 4 pins).
ELAST315	Rubber flexible bush for the 315 coupling (Note: the 315 coupling needs 6 pins).
ELAST400	Rubber flexible bush for the 400 coupling (Note: the 400 coupling needs 6 pins).
ELAST500	Rubber flexible bush for the 500 coupling (Note: the 500 coupling needs 6 pins).

POS.8 BRAKE BAND AND MOTOR BAND SEMI-COUPLING See chapter 8

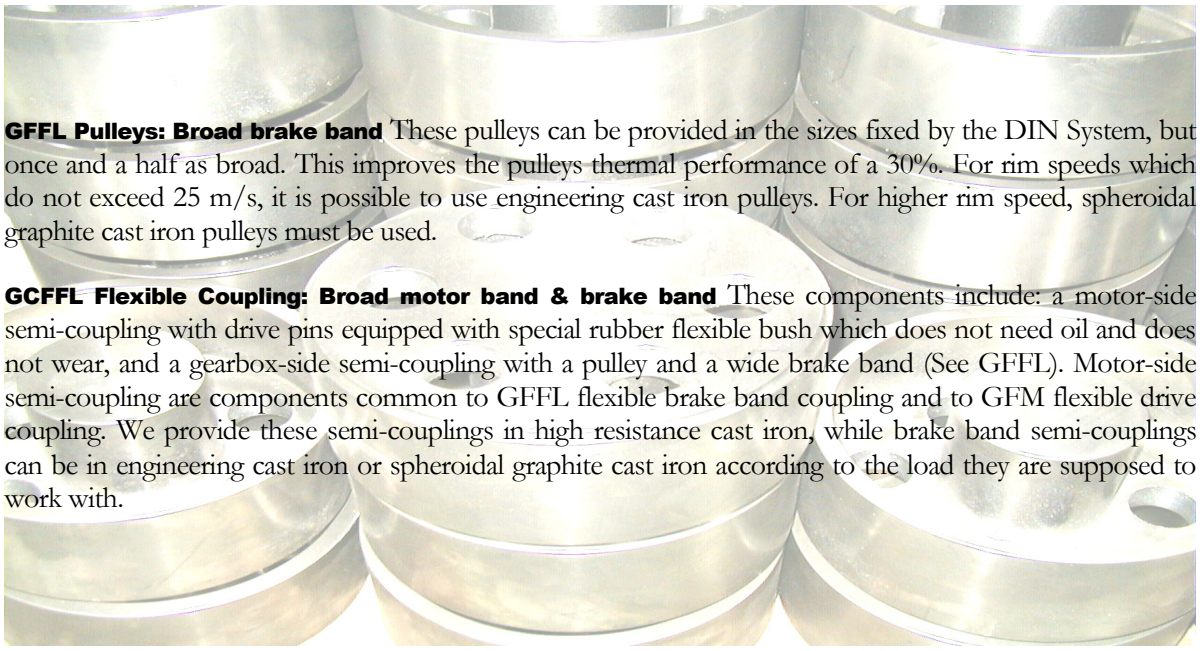
Chapter

8

Flexible coupling (brake pulleys)

GFF Pulley: Brake band in accordance with the DIN15431 These pulleys are designed according to the DIN15431 to be used with shoe brakes as in DIN15435. For rim speed which do not exceed 25m/s, it is possible to use engineering cast iron pulleys. For higher rim speed, spheroidal graphite cast iron pulleys must be used.

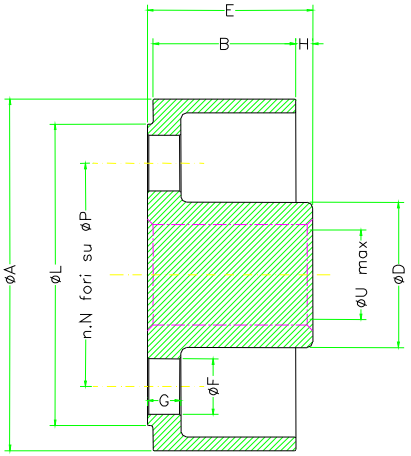
GCFF Flexible Coupling: Motor band & brake band in accordance with the DIN15431 These components include: a motor-side semi-coupling with drive pins equipped with special rubber flexible bush which does not need oil and does not wear, and a gearbox-side semi-coupling with a pulley and a brake band in accordance with the DIN15431. Motor-side semi-couplings are components common to GFF flexible brake band coupling and to GFM flexible drive coupling. We provide these semi-couplings in high resistance cast iron, while brake band semi-couplings can be in engineering cast iron or spheroidal graphite cast iron according to the load they are supposed to work with.



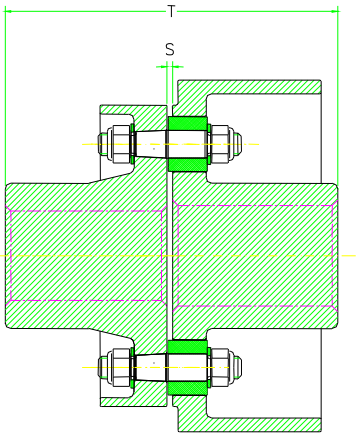
GFFL Pulleys: Broad brake band These pulleys can be provided in the sizes fixed by the DIN System, but once and a half as broad. This improves the pulleys thermal performance of a 30%. For rim speeds which do not exceed 25 m/s, it is possible to use engineering cast iron pulleys. For higher rim speed, spheroidal graphite cast iron pulleys must be used.

GCFFL Flexible Coupling: Broad motor band & brake band These components include: a motor-side semi-coupling with drive pins equipped with special rubber flexible bush which does not need oil and does not wear, and a gearbox-side semi-coupling with a pulley and a wide brake band (See GFFL). Motor-side semi-coupling are components common to GFFL flexible brake band coupling and to GFM flexible drive coupling. We provide these semi-couplings in high resistance cast iron, while brake band semi-couplings can be in engineering cast iron or spheroidal graphite cast iron according to the load they are supposed to work with.

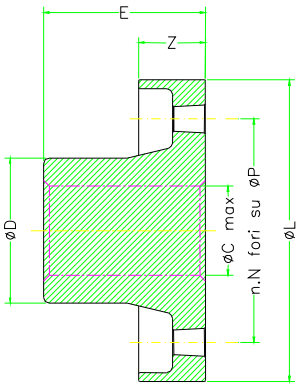
GFF

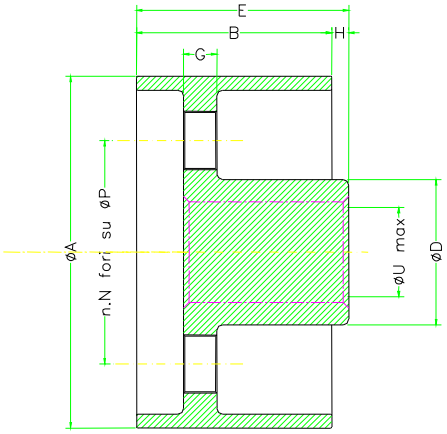


GCFF

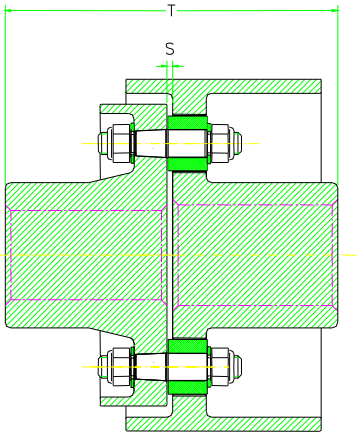


GFM





GFFL

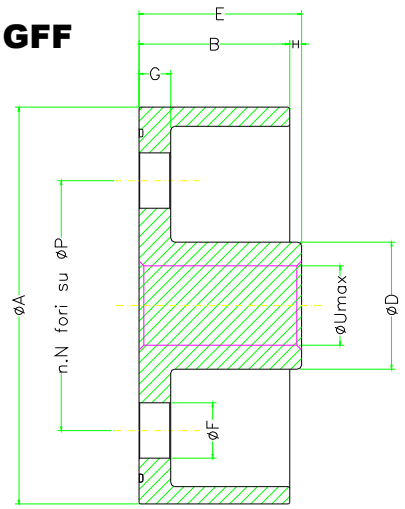


GCFFL

Type	Mass [kg]	Mt [daNm]	PD² [kgm²]	Weight [kg]	Values [mm] A	B	H	E	Z	S	T	C	D	U	L	P	G	F	No [n.]	Elast Type	Pin Type
GFM160	5	12	0,01	4.8	-	-	-	80	40	-	-	38	65	-	150	105	-	-	4	160	160 M12
GFF160	5.5		0,02	5.5	160	63	15	83	-	-	-	-		40	150	105	25	33			
CGFF160	11		0,03	10.6		-	-	-	-	4	167	-		-	-	-	-	-			
GFM200	8	25	0,03	8.2	-	-	-	110	50	-	-	42	80	-	180	125	-	-	4	200 250	200 250 M14
GFF200	10		0,05	10.0	200	80	15	100	-	-	-	-		50	180	125	25	40			
GCFF200	19		0,08	18.2		-	-	-	-	4	214	-		-	-	-	-	-			
GFFL200	11		0,06	11.0		110	15	125	-	-	-	-		50	-	125	25	40			
GCFFL200	20		0,10	19.2		-	-	-	-	4	214	-		-	-	-	-	-			
GFM250	15	50	0,07	15.6	-	-	-	145	50	-	-	60	100	-	220	160	-	-	6		
GFF250	17.5		0,15	18.0	250	100	15	120	-	-	-	-		60	220	160	25	40			
GCFF250	32		0,22	33.6		-	-	-	-	4	269	-		-	-	-	-	-			
GFFL250	20.5		0,19	21.3		140	15	155	-	-	-	-		60	-	160	25	40			
GCFFL250	36.5		0,27	36.9		-	-	-	-	4	269	-		-	-	-	-	-			
GFM315	24	100	0,16	24.1	-	-	-	145	60	-	-	70	130	-	270	200	-	-	6	315	315 M20
GFF315	33		0,39	33.3	315	128	15	148	-	-	-	-		80	270	200	30	50			
GCFF315	61		0,58	57.4		-	-	-	-	5	298	-		-	-	-	-	-			
GFFL315	39		0,49	38.6		175	15	190	-	-	-	-		80	-	200	30	50			
GCFFL315	65		0,68	62.7		-	-	-	-	5	298	-		-	-	-	-	-			

Pizzamiglio srl reserves the right to make changes to the values above for production needs without notice.

GFF



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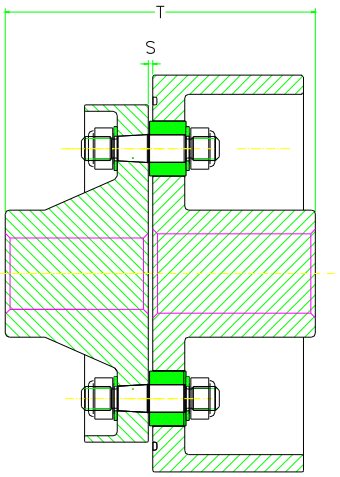
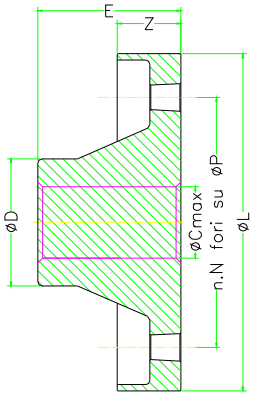
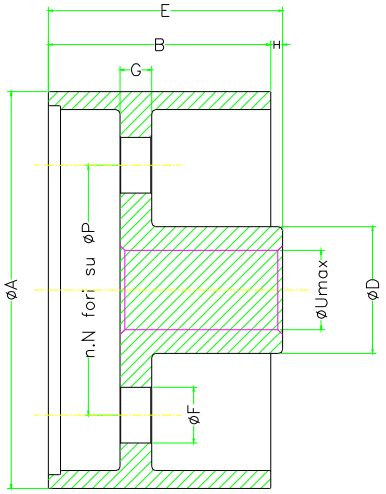
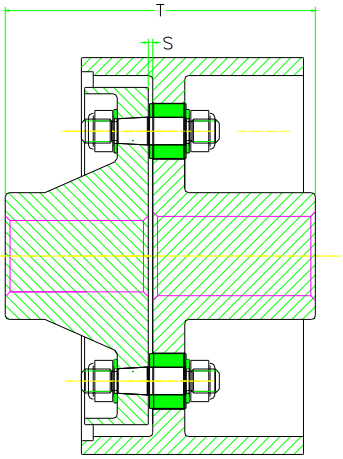


GFM







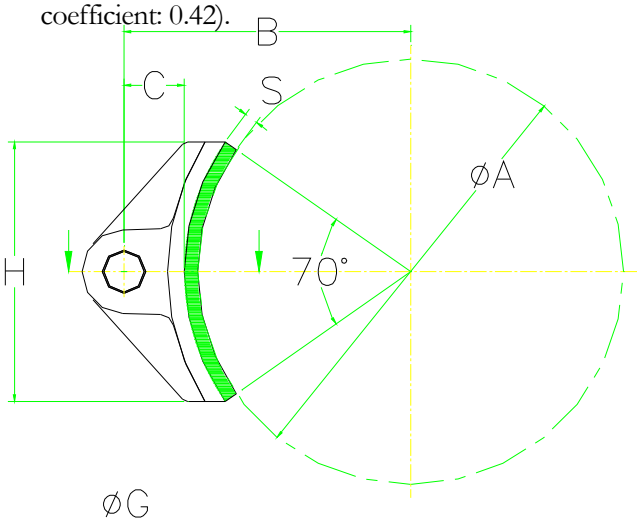
GFFL **GCFFL**

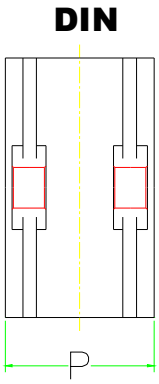
Type	Mass [kg]	Mt [daNm]	PD² [kgm²]	Weight [kg]	Values [mm]														No [n.]	elast. Type	Pin Type
					A	B	H	E	Z	S	T	C	D	U	L	P	G	F			
GFM400	38	200	0,39	38.1	-	-	-	175	70	-	-	80	130	-	335	250	-	-	6	400	400 M24
GFF400	589		1,15	58.9	400	150	15	165	-	-	-	-	150	90	-	250		60			
GCFF400	103		1,62	103		-	-	-	-	5	345	-	-	-	-	-	-	-			
GFFL400	68		1,51	68.3		220	15	235	-	-	-	-	150	90	-	250		60			
GCFFL400	113		1,97	112		-	-	-	-	5	345	-	-	-	-	-	-	-			
GFM500	63	400	0,99	63	-	-	-	180	45	-	-	90	160	-	425	315	-	-	6	500	500 M30
GFF500	110		3,78	109.4	500	190	15	205	-	-	-	-		100	-	315		70			
GCFF500	192		4,97	182.6		-	-	-	-	6	391	-		-	-	-	-	-			
GFFL500	131		5,03	138		280	15	295	-	-	-	-		100	-	315		70			
GCFFL500	213		6,22	211		-	-	-	-	6	391	-		-	-	-	-	-			

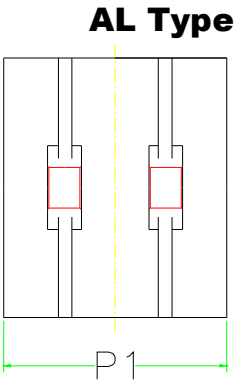
Pizzamiglio srl reserves the right to make changes to the values above for production needs without notice.

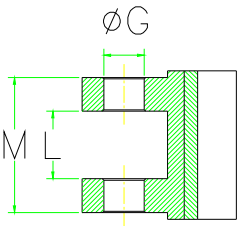
Friction Lining Shoes

These shoes are built according to the DIN15435/2 in the shape A1 and this broad band 'AL' The shoe includes an aluminium body to which a friction lining is stuck with thermo-setting binder (friction coefficient: 0.42).









ASBESTOS-FREE friction lining

Type	Size [mm]										mass
	A	B	C	H	S	G	L*	M	P	P1	[Kg]
SHOE 160	160	115	29	100	6	15	(28)	50	55	-	0.3
SHOE 200DIN	200	140	32	125	8	20	33 (35)	65	70	-	0.6
SHOE 200AL									-	105	0.8
SHOE 250DIN	250	170	37	150	8	25	38 (40)	80	90	-	0.9
SHOE 250AL									-	140	1.2
SHOE 315DIN	315	212	44.5	190	10	30	48 (50)	100	110	-	1.7
SHOE 315AL									-	165	2.4
SHOE 400DIN	400	260	53	240	10	35	60 (62)	125	140	-	3.2
SHOE 400AL									-	210	4.2
SHOE 500DIN	500	320	58	290	12	40	(80)	160	180	-	6.0
SHOE 500AL									-	270	7.8

Pizzamiglio srl reserves the right to make changes to the values above for production needs without notice. The DIN System does not describe the 160 measure, or the AL types. *Actual size. The value in brackets is the value fixed by the DIN15435. Our 200/250/315/400 standard shoes need a flanged bush to avoid the shoes unintentional rotation (See page 20). We also provide shoes without flanged bush which comply with the L value fixed by the DIN15435 (tol. ± 1mm).

Chapter

9

Guarantee Conditions

The constructor guarantees its products for a 12-months period from the delivery date. This warranty covers only the free repair and replacement of those parts that, after a careful examination of the constructor, are found to be faulty. Except for the responsibility for direct or indirect damages, the warranty covers the defective goods and is not valid for elements broken or repaired by other companies than the constructor. The elements subject to wear (shoes, bushes and bellow) are not covered by the warranty. Are also excluded by the guarantee possible damages to things or people caused by negligence, carelessness, bad or improper use of the product, incorrect installation, handling or electric connection. The electric motor must be protected by a magneto thermal switch. It is necessary to install a safety system to avoid the crane main motor staring up when the brake can not open, or the motor would be damaged. In case the safety information provided above are not followed, the warranty will decay and Pizzamiglio srl will not be responsible. The warranty decays also in case the spare parts used are not original. The damaged parts, even if under warranty, must be returned carriage paid. For all the other guarantee conditions, refer to the sale contract.

Warehousing: Store the products in a covered and dry place not subject to whether effects.

Due to the constant improving of its production, Pizzamiglio srl reserves the right to modify its products without notice. For this reason, the description and technical data of this manual do not represent an obligation. Pizzamiglio srl reserves the right to make changes without notice.

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