

# USE AND MAINTENANCE MANUAL

IN ORDER TO PREVENT PERSONAL INJURIES AND MATERIAL DAMAGES,  
THIS USE AND MAINTENANCE MANUAL MUST BE READ BY ALL STAFF  
INVOLVED IN THE HANDLING OF THE MACHINE



**PNEUMATIC PISTON  
MOTOR**

**MPL-22/007**

**MANUFACTURING YEAR:**

**SERIAL NUMBER:**

## INDEX

- 1.-GENERAL OVERVIEW
- 2.-SAFETY RULES
- 3.-DESCRIPTION OF THE MACHINE
- 4.-TECHNICAL DATA AND DIMENSIONS
- 5.-OPERATING INSTRUCTIONS
- 6.-MAINTENANCE AND REPAIR, ASSEMBLY AND DISASSEMBLY
- 7.-PARTS LIST
- 8.-GUIDEBOOK FOR TROUBLESHOOTING

**NEUMAC**

## **1.- GENERAL OVERVIEW**

This instruction manual refers to the pneumatic piston motor type MPL-22/007 and is meant to provide the operator with the appropriate knowledge regarding the above-mentioned machine, its composition and the job it's intended to.

The manual also includes indications about:

- ❑ General safety rules.
- ❑ Operating instructions.
- ❑ Maintenance and repair instructions.

The observance of these instructions will help to prevent possible breakages from occurring and will diminish repair costs, increasing the machine's reliability and service life.

As well as the indications contained in this manual, it is essential to observe all applicable legal resolutions regarding Safety and Hygiene at Work.

This instructions manual must always be available near to the place of operation of the machine, and must be read and followed by every person related to its work, particularly those working with it and the persons in charge of its maintenance.

**This machine has not been designed to operate in explosive atmospheres.**

The manufacturer will not be liable for the mechanical failures or the injuries caused by the machine if its use or maintenance do not correspond to the indications of this manual, as well as if it's been used for inappropriate duties that do not match its purpose.

The present instructions has the followings remarks corresponding to important information:

**NOTE: Important information, useful for a correct use of the equipment.**

**WARNING: Important information, mandatory and prohibitive warnings aiming to avoid damage to the machine.**

**DANGER: Important information, mandatory and prohibitive warnings aiming to avoid personal injuries.**

## 2.- SAFETY RULES

### 2.1 GENERAL RULES

The pneumatic motor type MPL-22/007 is manufactured according to standard requirements in order to provide the operator with an efficient and safe machine.

However, the pneumatic motors can be the cause of danger to the operator or nearby persons and/or property if, in any way:

- They are used without compliance with the instructions and safety rules.
- They are modified or altered in some essential aspects.
- They are used for tasks that do not correspond from the intended purpose.
- They are operated by unduly qualified or under proper age staff.

For this reason, it is necessary to read carefully the instructions manual, especially the **safety rules** before starting up the motor.

It is necessary to always observe the following safety procedures:

- Keep the work area clean of oils and trashes.
- Do not use the motor near flammable liquids or gas.
- Wear proper clothing and personal protective equipment.
- Do not allow children or unnecessary persons on the working area.
- Keep your hands away from the moving parts of the machine.
- This machine has not been built to operate in explosive environments.

**NOTE: Although the motor is operated by compressed air, its use in classified explosive atmospheres is subject to official authorization.**

- All legal requirements regarding Safety and Hygiene at work, as well as locally operative safety instructions in matter of working conditions, operator's clothing and personal protective equipment must be observed.
- This instructions manual must always be available near to the place of operation of the machine.

The lack of respect to any of the instructions outlined in the present manual, as well as alterations in the machine, omissions and the use of non-authorized spares free the manufacturer from any kind of responsibility regarding the good use, correct operation and safety of people and things.

## **2.2 SAFETY RULES FOR THE NORMAL USE**

The pneumatic motors are devices that are always used as motor unit integrated into other machines.

Although the pneumatic piston motors type MPL-22/007 may be used in the industry in general, they are especially designed to be mounted on drilling equipment.

The motor MPL-22/007 has two opposed holes on the sides of the front housing in order to mount it on the machine, allowing an oscillating movement.

## **2.3 SAFETY RULES FOR THE STARTING**

It is necessary to read carefully this manual of instructions before working for the first time with the motor.

On the following pages are pointed out the motor's characteristics and the conditions for binding it to pipes and equipments. Follow these instructions in order to ensure the absence of problems within the motor's service life.

## **2.4 SAFETY RULES FOR MAINTENANCE AND REPAIR**

Follow carefully all maintenance instructions. Inspect and repair periodically the machine as outlined in the content of this manual, in order to maintain the initial safety conditions of the machine.

Maintenance and repair work should only be performed by qualified personnel. Always use original spare parts.

Do not work with the motor if any of its parts are somehow damaged.

## **2.5 SAFETY RULES FOR THE CARRIAGE**

On transport vehicles the motor has to be secured against rolling off, slipping or tipping over.

### 3.- DESCRIPTION OF THE MACHINE

NEUMAC manufactures the motor MPL-22/007 for its use on drilling machines, and for the rotation of the pneumatic hammer.

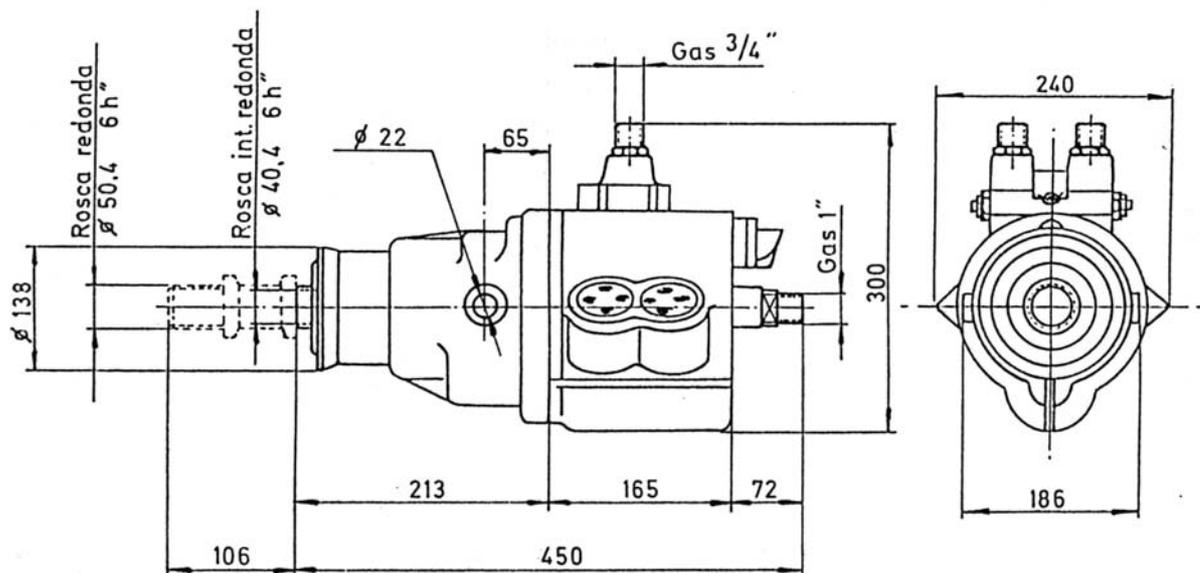
The motor has hollow shaft, with 40 mm DIN 405 female round thread.

The motor has, also, a rear racord threaded 1" Gas to connect the compressed air going to the hammer, through the hollow shaft and the drills pipes.

The motor has three main sections:

- A cover with the reverse elements and the motor controls.
- The central body (motor housing) with the crankshaft and air distribution.
- A gear box housing with the output shaft.

### 4.- TECHNICAL DATA AND DIMENSIONS



Type	Power (H.P.)	R.P.M.	Air consumption (l/min)	Working pressure (bar)	Weight Kg
MPL-22/005	2,2	60	2000	6	30.5

## **5.- OPERATING INSTRUCTIONS**

The incoming air must be clean and lubricated.

The dirt made by the water and oil getting out of the compressor, together with rubber particles decomposed of the air hoses creates a paste that might come to block the motors.

It is very important to place a filter and a lubricator on the air hose, before the motors. If there is a control valve on the circuit, it has to be placed close to the motor as well.

All the air treatment elements must be of the appropriate size and type to fit the motors air consumption (2000 l/min). The air filter pore size must be 64 microns or less. The lubricator must be tuned to release from 4 to 6 drops of oil per minute on the air stream.

We recommend quality oils with a viscosity from 32 to 68 at 40° (cSt).

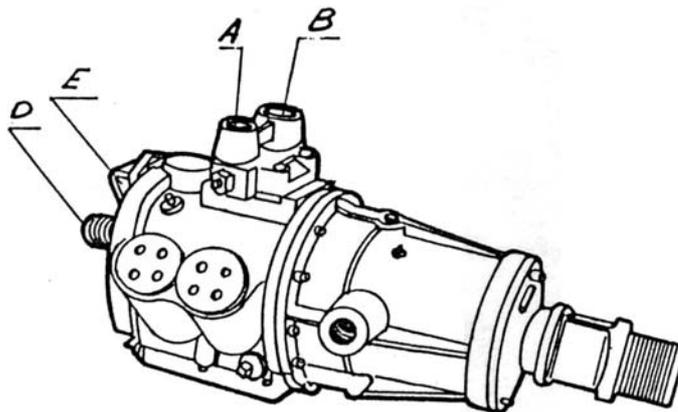
The motors max working pressure is 7 bars.

### **5.1- STARTING UP**

The air inlets A and B are located on the upper cover of the motor. When the air comes in through the A inlet, the motor will rotate in one sense. When the air comes in through the B inlet, it will turn in the other sense. The air exhaust is through E.

On the MPL-22/007 motor, there is, also the D plug for the air operating the hammer.

Every day before starting up the motor, we recommend to let the compressed air from the hoses run away to the atmosphere in order to clean the hoses, and then to release a few drops of oil through the air inlets of the motor.



**6.- MAINTENANCE AND REPAIR****GREASING.**

Every day, before starting to work:

- Remove the greasing screw 49 from the upper cover 50 and put two or three drops of oil.
- Put grease through the caps and grease neaples located on the motor housing and the gear box housing of the motor.

We remind you that the oil must be good quality, with a viscosity form 32 to 68 at 40°.

The grease used in the motor is: "SHELL ALVANIA EP 2".

The grease surplus is expelled by the motor during its operation through the air exhaust E.

If for any reason you have to dismount the motor, follow the instructions of assembly and disassembly.

**MOTOR MPL-22/007. DISASSEMBLY. (See page 19)**

First of all, if there are any pieces screwed to the shaft, remove them.

Then, unscrew the air exhaust nut (part 28) and put the motor in the vise of the bench, holding it vertically gripping by the record 74, in order to facilitate the following operations.

Remove the external Allen screws 40 from the cover 65 and take the cover out, using two screws on the two threaded holes, made in the cover for the extraction.

Remove the screws 40 from the gear box housing 55. Hit with a plastic mallet on this housing managing to remove it upwards. Always hit **softly**. The housing comes out with the shaft mounted on the bearings and with the planet carrier 73. Then, remove the planets gear 14, and the needle bearing 56.

**DANGER.** When take the housing out, managing it carefully. The set including the gear wheels 18 and 19 and the toothed shaft 16, is free.

In order to separate the wheels, if possible on a press, lean on the bigger one and push on the toothed shaft 16.

To dismount the shaft 66 out of the gear box housing, remove the screws 72 and the nut 70 hitting it with a pointer in the holes no threaded of the nut.

On the press, you have to lean on the outer part of the gear box housing, the part of the biggest diameter, and push down the shaft until the inner track of the bearing 57 more external, comes loose. Take out this track and its roller cage.

That way, the shaft comes out with the inner track of the other bearing and with the planet carrier.

To disassembly the other inner track and the planet carrier from the shaft, put two parts between the planet carrier and the inner track and lean its on the press, pushing on the ends of the shaft. When pushing on the bigger end of the shaft, the inner track of the bearing will be free, and when pushing on the other end of the shaft, the planet carrier will be out of the shaft. Then, you can disassembly the planet pivots, also on the press. (See page 19)

To dismantle the ring gear 15, remove the screw 54. Then, hit on the gear ring with an aluminium bar to prevent damage it. Hit on opposed points of the ring gear until it go out. Same operation is necessary to remove the outer tracks of the bearings.

If needed, take the bearing 33 and the bushing 47 out, removing the screws 68 and pushing through the holes with a pointer.

Take the rest of the motor out from the vise of the bench.

In order to dismantle the motor unit, first remove the four screws that bind the upper cover 50 to the motor housing 1. Once done, take the reverse gear 22.

To dismantly the reverse piston 22, remove one of the upper records 2, without disassembling neither the adjusting rod 24 nor the lock nut 25.

Release the nut 69 and take out the fork 43, in order to remove the distributor 20 and the distributor sleeve 21.

The distributor has to carry, mounted on the side opposed to the teeth, one of the axial bearing 34 tracks. The other track must be removed pushing from the rear of the motor housing. Check that the axial bearing cage and balls come out as well.

The supplement sleeve 46 is shrink fitted to the motor housing and must not be disassembled, unless it is damaged. In such case first remove the screw 53.

In order to dismantle the crankshaft, it is necessary to fasten the motor housing 1 to a bench vise with its lower cover 2 upwards.

First of all, this cover is removed taking out the screws 40, that bind it to the motor housing.

On the crankshaft, open the circlips 8, withdraw the half rings 38, and extract the half needle bearings 7, from inside the connecting rod 6.

Next, the crankshaft is removed with the connecting rods, the pistons and the bearings 32 out of the motor housing 1.

Dismantle the bearings 32 from the crankshaft in order to remove the circlips 8 and then the connecting rods with the pistons. On removing the piston pin 5, the piston 4 will be set free.

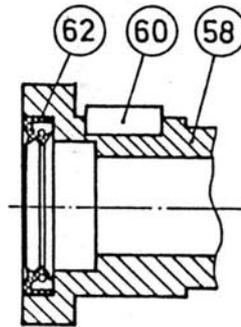
In order to remove the cylinders 9, you have to unscrew the cylinder plugs 10 and remove the setscrews 41, pushing from the outside part of the motor into the inside.

The cylinders are as fragile as hard. For this reason you must be very careful hitting them, so that they don't break up. In order to remove them from their place, you have to use a cylindrical tool with an external diameter slightly smaller than the internal diameter of the cylinders.

Unscrew the part 59. Hit on the rear part of the bushing 58 in order to remove it from the motor housing. Before that you'll have removed the part 63.

## MOTOR MPL-22/007. ASSEMBLY. (See pages 18 and 19)

If the supplement sleeve 46 has been removed, we recommend to heat previously the motor housing a little bit before mounting the supplement sleeve back on it. Be careful to mount it correctly (Check that the openings in this sleeve match with those in the motor housing). After that, you have to drill and thread it at M6X100 from the upper side of the motor housing, where the screw 53 was. Screw up that screw. Check that once tightened, it do not comes out from the inside of the sleeve. Check also, that the distributor sleeve 21 turns easily.

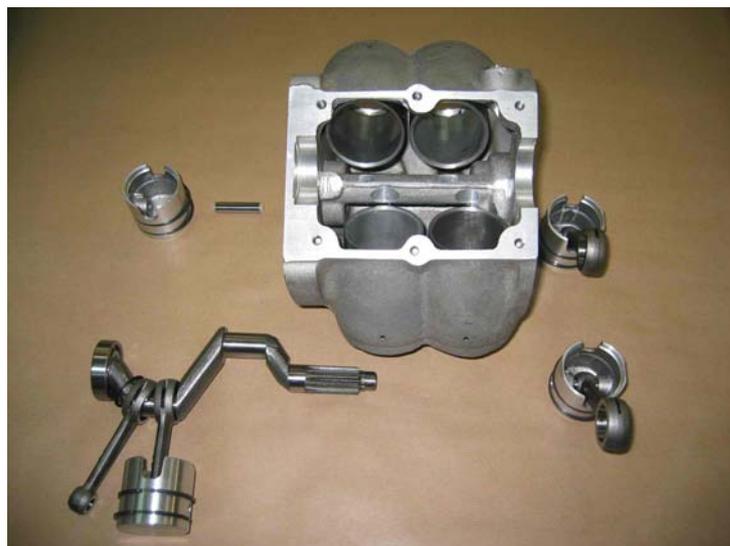


On the motor housing 1, put the guide bushing 58 with the key 60 and mount the shaft seal 62 as shown. Then put the bearing bushing 63 in. On the other side of the guide bushing, put the seal 61 on, and screw the connection 59.

Carry on mounting the cylinders 9 on the aluminum housing. You have to be careful to match the openings in the cylinders with the ones inside the aluminum body. On the outside part of motor housing, and near to the holes of the cylinders, there are threaded holes at M4. Once the cylinders are in their place, you have to introduce a manual drill with a bit of 3.2 mm trough the holes up to touching the cylinders, and drill them between 0.5 and 0.7 mm deep (a little slit is enough).

Afterwards, screw on the four M4x10 Allen screws 41, until they reach the cylinders but **without applying a pressure** on them. To avoid any risk that these screws screw off, it is necessary to apply threadlocker (liquid or paste).

**Crankshaft assembly.** In order to start the crankshaft assembly you have to fasten the motor housing with the four cylinders on a workbench in the position shown below.



First of all, screw the cylinder plugs 10 to the cylinders without tightening and without the joint 11. Drop a 5mm thick washer (diameter less than 50mm) in each cylinder, in order to avoid that, on mounting the pistons, the segments go in the openings of the cylinders.

Mount the eight segments on the four pistons. Put them so that their cuts remain opposed in each piston. Do not open them too much.

Put the piston pins on their holes. Check which of the four pins slides more easily on the piston. Keep this piston and pin for the upper left cylinder.

Put the connecting rods and the pins on the other three pistons, checking that they rotate softly. Keep two of these sets for mounting on the cylinders located on the right side of the motor housing. On the crankshaft, put the other set, the connecting rod that is left, the circlip 8 and the bearing 32 (See picture).

Mount the reserved piston (without pin) on the upper left cylinder of the motor housing. In order to mount the segments, you have to keep a slight pressure on the piston, towards the inside of the cylinder, and, with the help of a thin peaked stick, go putting the opposed parts of each segment on the groove of the piston until it is entirely introduced inside the cylinders.

Rotate the piston so that the pin hole lies parallel to the crankshaft shaft.

Afterwards, put the two pistons of the right side of the motor, with pins and connecting rods. Before putting the segments, remember the position of the piston pin holes compared to the motor shaft. Remember also the position of the segments cuts.

Once the two pistons are mounted, you have to pull those outwards without **taking the segments out**, in order to facilitate the mounting of the crankshaft. Put the holes of the connecting rod at the same height and perpendicularly to the crankshaft.

Take the crankshaft set and pass the end with the teeth through the connecting rods of the right side pistons.

*These manipulations are the most delicate part of the assembly and require a bit of care and attention. Try not to take the segments out of the pistons (It's not a problem if you do but you'll have to put them back in).*

Carry on, putting in the fourth piston. Help yourself moving the set in order to find the convenience of manipulation.

Once the four pistons are in place, you have to take the upper left piston out towards the outside, until you're able to put the reserved pin as well as the connecting rod mounted on the crankshaft. (In this case, in order to be able to put the pin in, you have to take at least one segment out of the cylinder).

Pass the other circlip 8 and the other bearing 32 through the carved end of the crankshaft. To mount this bearing, take the motor housing 1 out of the vise and lean the crankshaft on a plate with a hole that allows the passage of the carved end shaft, but that it retains the bearing, while hitting softly at the other end of the crankshaft until bringing the bearing to the maximum.

Manipulate the set with care.

Place the motor housing back on the vise, in its previous position.

Put the half needle bearings inside their crankshaft seats (two sets in each site), put the half rings 38 and fasten them with the circlip 8. Check that the circlips are in their place.

Remove the cylinder plugs of the cylinders that were not tightened. Keep the 5mm washers away for a next assembly.

Put the joints 11 on the plugs 10 and screw them back on the cylinders. **DO NOT TIGHTEN TOO MUCH.** After tightening them by hand, a little hit on the exterior holes, in the tightening direction, is enough.

**GREASING.** Apply SHELL ALVANIA EP2 grease from the cover side in every corner you can. Leave also a small excess of grease on top of the crankshaft.

The flat surface of the motor housing, where the cover is going to be mounted, must remain clean and dry.

On this clean part, you have to apply a **thin** layer of sealing paste, and, afterwards, to mount the lower cover 2. Before tightening the screws, check that the cover is correctly located regarding the motor housing (the rear part mustn't show gaps or discontinuities between the two pieces).

If the plug 36 is not on the cover, put it on.

### **Distributor assembly.**

Remove the motor housing from the bench vise and lean it on its rear side, with the end of the crankshaft facing upwards.

You have to put the rear track of the axial bearing 34, through the hole of the supplement sleeve 46 down to its place. In order not to confuse the two tracks of this bearing, check that the track that goes in the housing, has its inner diameter 1 mm bigger than the track that goes in the distributor.

Before carrying on with the assembly, check that the distributor sleeve 21, made of bronze, rotates smoothly inside the supplement sleeve 46, and also that the distributor 20 rotates the same way inside the bronze sleeve.

Once the bearing 34 track is in its place on the motor housing, you have to put the bearing cage. Before putting it and so that it sticks to the track, apply a little grease on it. Check that the cage is in its place.

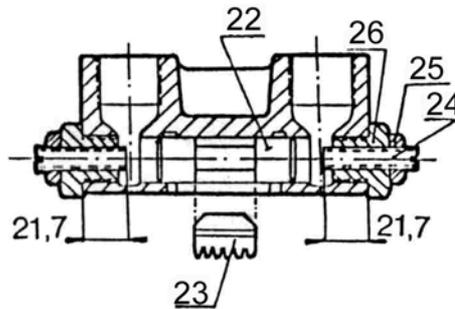
Afterwards, mount the other track of the bearing on the distributor, then put it in the bronze sleeve and put both inside the supplement sleeve. The distributor and the distributor sleeve must be at the same level of the motor housing.

Put the fork 43 on the Allen screw 44 and inside the cut of the distributor sleeve 21. When tightening the nylon insert lock nut, check that the sleeve rotates in both ways until reaching the fork, and that the distributor does not get blocked.

**GREASING.** Put grease through the visible holes of the motor housing and cylinders.

Fasten the motor on the vise bench by the cover 2 in order to mount the upper cover.

## Upper cover assembly.



To finish this part of the motor, mount the upper cover that contains the reverse unit. This is done by screwing together the parts 24, 25 and 26 setting the distance of 21.7 mm. shown on the drawing.

These sets are screwed after mounting the reverse piston 22.

In order to mount the reverse gear 23, you have to place the distributor sleeve 21 so that its carved part remains centered along the motor housing groove. The reverse gear is also centrally adapted in this position.

Before mounting the cover, you have to apply a layer of sealing paste between the motor housing and the upper cover.

Place the cover so that the reverse gear remains placed between the heads of the piston 22.

The motor assembly is completed by placing the binding screws.

## Assembly of the housing.

First of all you have to put the outer track of the conical bearing 57 located beside the ring gear, on the gear box housing 55. Then, put the ring gear 15 in the housing 55.

The ring gear is mounting heating the gear box housing, until to get a dilatation that allows the ring gear, to fall in its place, by its own weight. Then, you can rotate the ring gear to positioning its hole correctly with the hole of the housing. Hit on the ring gear teeth with an intermediate stick made of soft material to rotate the ring gear easily.

You can heat the housing, using an oxyacetylene blowtorch for about five minutes, trying to heat uniformly by the inside and the outside of the housing on the part where the ring gear goes. While heating, the housing becomes bluish. Never heat the housing until it becomes red.

Once the ring is placed, put the screw 54. **WARNING:** The screw is tightened on the housing, NEVER on the ring gear.

After the housing is cold, put on it, the outer crack of the second conical bearing 57. Put also, the greaser 27, the washer 47, the bearing 33 and the two screws 68. Apply a little grease on the rollers of the bearing 33, so that they stick on the wall of the outer track of the bearing and facilitate that way the entry of the crankshaft point.

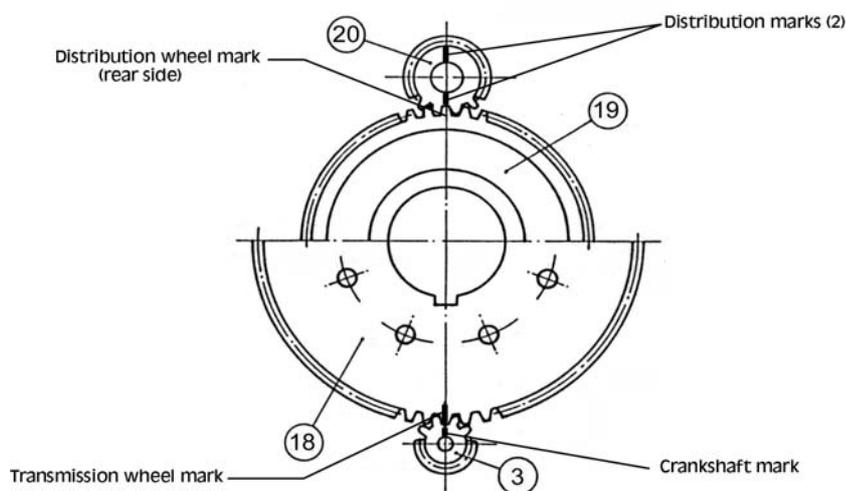
Separately, you have to mount the key 17 on the toothed shaft 16 and, on top of it, the transmission and distribution wheels (18 and 19).

**IMPORTANT:** There is only one mounting position of the wheels on the toothed shaft 16. See the next drawing.

On this drawing it is shown the assembly of the transmission and distribution wheels on the toothed shaft with regard to the distributor and the crankshaft.

The distribution wheel 19 has a marked tooth. The distributor 20, has two marks. On mounting, the marked tooth of the distribution wheel, must fit in one of the marks of the distributor .

The transmission wheel 18 has also two opposed marks on its flat surface and the teeth of the crankshaft 3, has one mark. On mounting, the transmission wheel mark, nearer to its key seat , must fit in the mark of the crankshaft. The other transmission wheel mark, helps to place the distribution wheel.



**IMPORTANT:** The correct location of the marks of the wheels in the assembly is absolutely necessary for the correct operation of the motor.

On the planet carrier 73, put the planet pivots 13 (see page 18).

Afterwards, put the inner track of the conical ball bearing on the shaft 66 up to its end.

Fit the keys 64 on the shaft and put the planet carrier 73.

With the motor housing 1 tightened by the connection 59 on the bench vise, put the needle bearing 56 on the central hole of the body with a little grease.

Mount the shaft set with the wheels on the motor body.

For that you have to get the shaft, place the three planet gears 14 on the planet pivots 13, and the wheels block on the shaft.

With all these pieces in hand, aim the end of the shaft on the needle bearing 56 and match the marks of the carved pieces according to the previous indications. Check that they are in their place and let the shaft down with care in order not to damage the shaft seal 62

GREASING. Apply grease on the wheels.

Clean the surface of the housing and apply a thin layer of sealing paste on one of the the surfaces in contact. Place the positioning pin 31 on the motor housing. Put the gear box housing 2 hitting slowly until bringing the housing to its place. Put the screws and tighten them.

Place the inner track of the other ball bearing on the shaft. Once it has reached its position, screw the fixing nut 70 and tighten it against the bearing as much as you can, hitting with a pointer on the unthreaded holes of the nut. Tighten the safety screws 72 well.

On the cover 65, put the shaft seal 71 and apply sealing paste on the housing before mounting the cover. Put the screws 40.

Remove the motor from the vise bench and, from the rear part, screw the exhaust pieces unit (Parts 28, 29, 30, and 42)

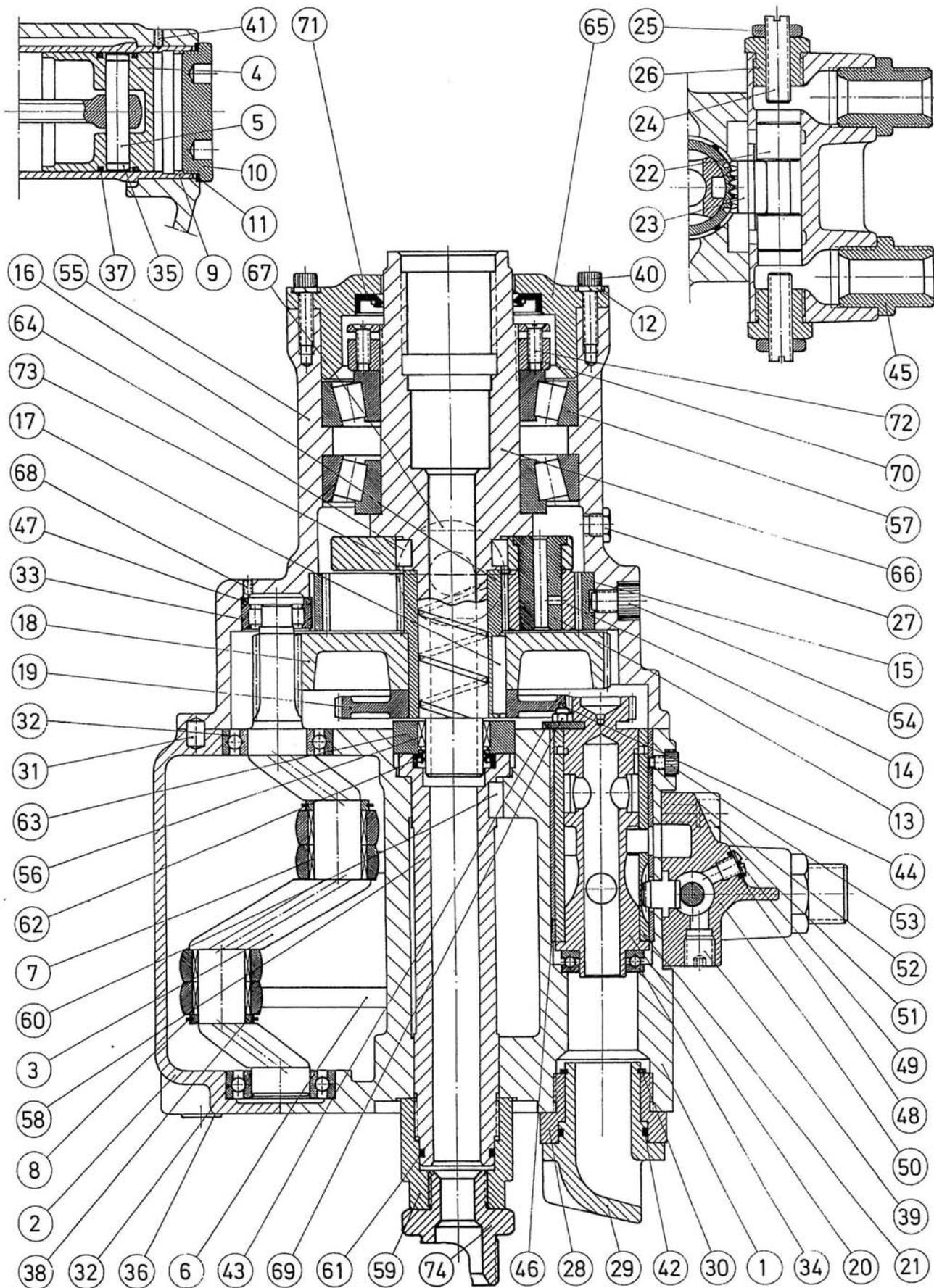
Once finished the assembly, it is advisable to run the motor in for 15 minutes and to add grease through the lubricators of the body and the housing.

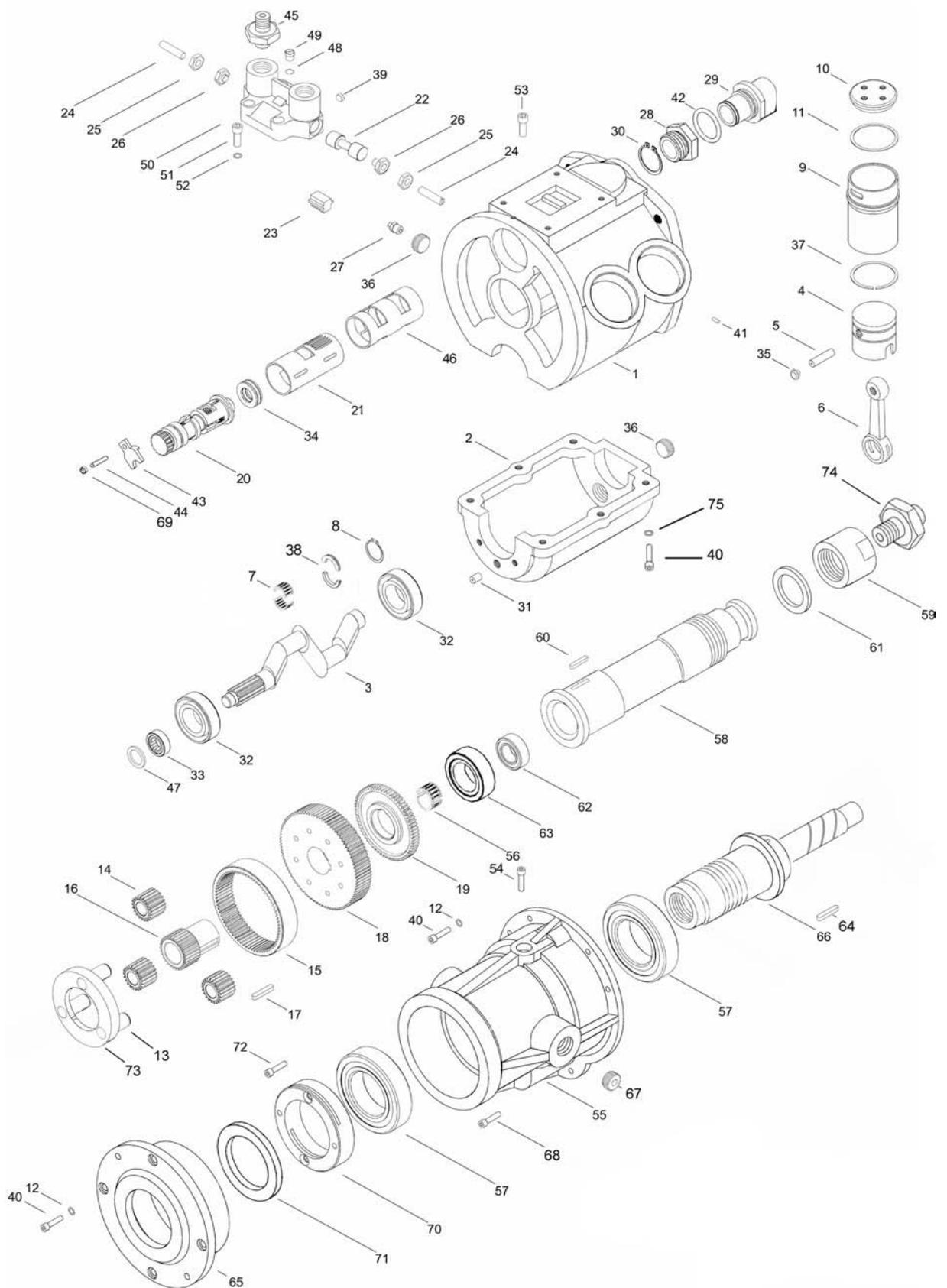
## 7.-PARTS LIST

Part nº	Designation	Quantity	Reference
1	Motor housing	1	37801
2	Lower cover	1	37503
3	Crankshaft	1	37815
4	Piston	4	37805
5	Piston pin	4	37806
6	Connecting rod	4	37507
7	Half needle bearing KF-11476-I	4	95383
8	Circlip E-27	2	93774
9	Cylinder	4	37810
10	Cylinder plug	4	37811
11	Cylinder joint	4	37812
12	Serrated washer 6	14	94742
13	Planet pivot	3	37519
14	Planet gear	3	37520
15	Ring gear	1	37821
16	Toothed shaft	1	37822
17	Key 8x6x35	1	37823
18	Transmisión wheel	1	37816
19	Distribution wheel	1	37525
20	Distributor	1	37827
21	Distributor sleeve	1	37828
22	Reverse piston	1	37829
23	Reverse gear	1	37830
24	Adjusting rod	2	37831
25	Lock nut	2	37832
26	Upper racord	2	37833
27	Greaser	2	93419
28	Air exhaust nut	1	37836
29	Air exhaust mouth	1	37837
30	Circlip WR-32	1	93748
31	Positioning pin	1	37539
32	Ball bearing 6005 AH 02 FA	2	95124
33	Roller bearing RNU F-86072	1	95243
34	Axial bearing 51104	1	95287
35	Stop plug	8	37847
36	Plug ½"	2	93135
37	Segments	8	99001
38	Half ring	4	37850
39	Plug ¼"	1	93134
40	Allen screw M6x20	1	94150
41	Allen screw M4x10	20	93906
42	O-ring 2-123	4	91364
43	Fork	1	37857
44	Allen screw M6x30	1	93932
45	Racord ¾" Gas	2	93103
46	Supplement sleeve	1	37858
47	Bearing bush	1	37817
48	O-ring 2-010	1	91317
49	Greaser screw	1	11428
50	Upper cover	1	37862
51	Allen screw M8x30	4	94161
52	Serrated washer	4	94773

53	Supplement sleeve screw	1	37864
----	-------------------------	---	-------

Part n°	Designation	Quantity	Reference
54	Ring gear screw	1	37865
55	Gear box housing	1	37871
56	Needle bearing KT 253113	1	95440
57	Bearing 30212	2	95265
58	Guide bushing	1	37874
59	Rear racord	1	37876
60	Key 8x7x15	1	93647
61	O-ring 2-120	1	91357
62	Shaft seal special 25x35x5	1	91588
63	Bearing bushing	1	37879
64	Key 8x7x12	2	93653
65	Cover	1	37562
66	Shaft	1	37884
67	Support bushing	1	37887
68	Allen screw M5x8	2	94239
69	Nylon insert nut M6	1	94574
70	Lock nut	1	37886
71	Shaft seal 56x80x8	1	91526
72	Screw M6x15	2	94285
73	Planet carrier	1	37880
74	Racord	1	93269
75	Serrated washer	6	94772





## **8 . GUIDEBOOK FOR TROUBLESHOOTING**

### 1° The motor rotates slowly

- Insufficient air pressure
- Obstruction of the inlet pipe
- Wear of the pistons or sleeves
- Excessive weight on the hammer
- Jammed

### 2° The motor rotates slowly in one sense and fast in the other

- Wrong positioning of the gears during the assembly (see page 14)
- Bad setting of the adjusting rods (see page 13)

### 3° The motor rotates only in one sense

- The reverse piston is blocked
- The distributor sleeve is blocked

### 4° The motor does not rotate

- Obstruction of the inlet pipe
- The motor is blocked
- Jammed
- Wrong position of the gears (see page 14)



**NEUMAC, S.A.**

Polígono de Malpica, A. 16  
50016 Zaragoza  
España (Spain)

NIF (VAT Registr. No.):  
ES A50003706

Teléfono (34) 976 57 10 01  
Fax (34) 976 57 38 98  
e-mail: neumac@neumac.es  
www.neumac.es

## “EC” DECLARATION OF CONFORMITY



**NEUMAC, S.A.**, as the manufacturer, declares that the component described below:

### PNEUMATIC PISTON MOTOR

Type: **MPL-22/007**

Serial No.:

- Is intended to be incorporated in a machine.
- As a component it is forbidden to put it into service until the machine to which it is incorporated, or that it belongs to, is fully in conformity with the applicable Directives.
- As a machine component, the product meets the requirements of the following applicable Directives:

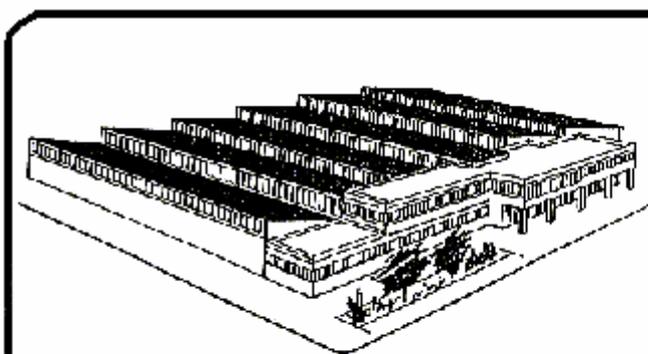
### Directive 98/37 CEE

and conforms with the following harmonized Standards:

STANDARD	DESCRIPTION
EN-ISO 12100-1:2003	<i>Safety of machinery. Basic concepts, general principles for design. Part 1: Basic terminology, methodology</i>
EN-ISO 12100-2:2003	<i>Safety of machinery. Basic concepts, general principles for design. Part 2: Technical principles</i>
EN 1050:1996	<i>Safety of machinery. Principles for risk assessment</i>

NEUMAC, S.A.  
Polígono de Malpica, A, 16  
E-50016 ZARAGOZA

Signed: J. Miguel Lostal  
Technical Manager



## **NEUMAC**, S.A.

Poligono de Malpica, A, 16  
50016 ZARAGOZA  
ESPAÑA (SPAIN)

TEL: (34) 976 57 10 01  
FAX: (34) 976 57 38 98