



INSTRUCTION MANUAL

FOR INSTALLATION,
OPERATING,
AND
MAINTENANCE.



Dosing pump
PRIMEROYAL[®]
Diaphragm liquid end

This manual should be made available to the person responsible for installation,
operating and maintenance.

CONTENTS

HOW TO USE THIS MANUAL ?

I - DESCRIPTION

- I - 1. Unpacking and storage
- I - 2. Description
- I - 3. Operating principle of the mechanical assembly
- I - 4. Operating principle of the liquid end
- I - 5. Safety and health instructions

II - INSTALLATION

- II - 1. Hydraulic installation
- II - 2. Drip collection
- II - 3. Handling
- II - 4. Setting up
- II - 5. Electrical installation

III - START UP

- III - 1. Procedures before start up
- III - 2. Start up
- III - 3. Failures on start up
- III - 4. Operation - Schedule of checks and maintenance operations

IV - ROUTINE MAINTENANCE

- IV - 1. Oil change
- IV - 2. Other maintenance operations
- IV - 3. Tracing causes of failure
- IV - 4. Ordering spare parts

V - PREVENTIVE MAINTENANCE

VI - SERVICING THE MECHANICAL ASSEMBLY

VII - SERVICING THE LIQUID END

GUARANTEE

LIST OF « TECHNICAL ASSISTANCE » AND « SPARE PARTS » DEPARTMENTS

PART I – DESCRIPTION

I - 1. UNPACKING AND STORAGE

UNPACKING

The packaging must be carefully examined on receipt in order to ensure that the contents have not sustained any obvious damage. Precautions must be taken when opening the packaging in order to avoid damaging accessories which may be secured inside the packaging. Examine the contents and check them off against the delivery note.

STORAGE PRECAUTIONS

- Storage for less than six months

Equipment shall preferably be stored in its original packaging and protected from adverse weather conditions.

- Storage for more than six months

- Grease all visible unpainted sections. Rubber parts (such as semi-flexible couplings) must be protected from sunlight and sudden temperature changes.
- Store the pump in its original packaging. In addition, packaging in heat-sealing plastic cover and dessicant bags must be provided for. The quantity of dessicant bags should be adapted to the storage period and to the packaging volume.
- Store protected from adverse weather conditions.

I - 2. DESCRIPTION

The PRIMEROYAL Pump is a compact electro-mechanical metering pump, oil-lubricated with a sealed housing, allowing adjustment of its capacity when stopped or in operation.

It is designed for industrial operation in continuous mode.

It is made up of the following items :

- a driving device consisting of a motor ,
- a mechanical assembly ,
- a liquid end .

Capacity adjustment is controlled either manually (by a graduated hand-knob).

I - 3. OPERATING PRINCIPLE OF THE MECHANICAL ASSEMBLY

Drawing 1066085010

The movement of rotation of the motor is transmitted by the worm [052B] to the tangent wheel [052A], herself connected to the eccentric [016] by the finger [037H].

The system of rod and eccentric transforms the rotative movement in a linear movement. The crosshead connected to the connecting rod moves with an adjusting linear stroke. The stroke of the crosshead [010] depends on the position of the eccentric female [016A] in relation to the eccentric male [016].

I - 4. OPERATING PRINCIPLE OF THE MECHANICAL ASSEMBLY

Refer to chapter VII « Servicing the liquid end »

1 - 5. SAFETY AND HEALTH INSTRUCTIONS

The personnel responsible for installing, operating and maintaining this equipment must become acquainted with, assimilate and comply with the contents of this manual in order to:

- avoid any possible risk to themselves or to third parties,
- ensure the reliability of the equipment,
- avoid any error or pollution due to incorrect operation.

Any servicing on this equipment must be carried out when it is stopped. Any accidental start-up must be prevented (either by locking the switch or removing the fuse on the power supply line).

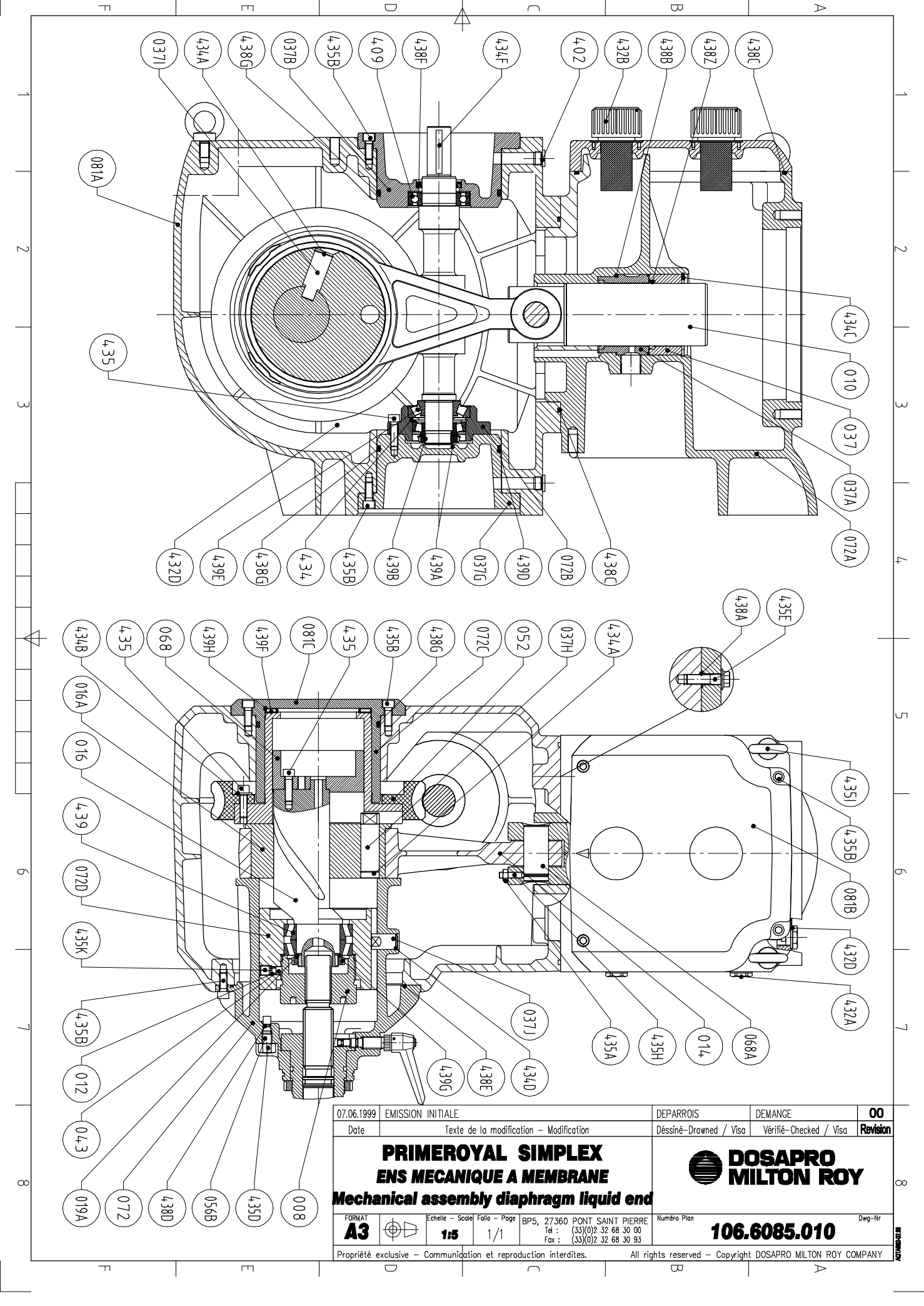
A notice must be attached to the location of the switch to warn that servicing is being carried out on the equipment.

During oil changing operations, the waste oil must be collected in a suitable receptacle. Any overflow of oil which may result must be removed using a degreasing agent suitable for the operating conditions.

Soiled cleaning cloths must be stored in suitable receptacles. The oil, degreasing agent and cleaning cloths must be stored in accordance with the rules on pollution.

Switch off the power supply as soon as any fault is detected during operation: abnormal heating or unusual noise.

Special care has to be taken for chemicals used in the process (acids, bases, oxidizing/reducing solutions, ...).



07.06.1999	EMISSION INITIALE	DEPARROIS	DEMANGE	00
Date	Texte de la modification - Modification	Déssiné-Drawn / Viso	Vérifié-Checked / Viso	Revision

PRIMEROYAL SIMPLEX
ENS MECANIQUE A MEMBRANE
Mechanical assembly diaphragm liquid end



FORMAT A3	Echelle - Scale 1:5	Folio - Page 1/1	BP5, 27360 PONT SAINT PIERRE Tel : (33)(0)2 32 68 30 00 Fax : (33)(0)2 32 68 30 93	Numéro Plan 106.6085.010	Dwg-Nr
---------------------	-------------------------------	----------------------------	--	------------------------------------	--------

Propriété exclusive - Communication et reproduction interdites. All rights reserved - Copyright DOSAPRO MILTON ROY COMPANY

PART II - INSTALLATION

II - 1. HYDRAULIC INSTALLATION

All the information concerning the hydraulic installation of a metering pump is detailed in a volume, « Generalities about dosing pumps installation ». You should consult that manual to define the installation required for your application. However the main items are describe hereafter.

GENERAL

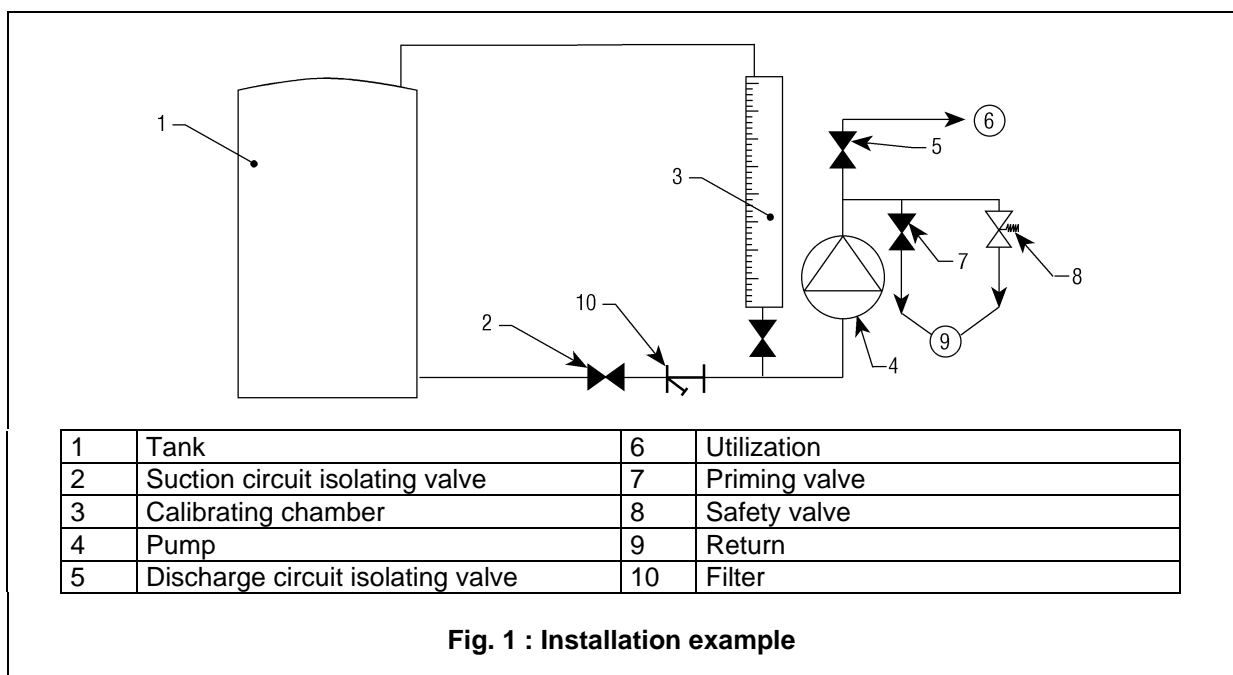
- Piping layout
 - There must be no swan-necks or stagnant volumes which can trap air or gas.
 - Stresses due to incorrect alignment of piping with respect to the centreline of valves must be avoided as far as possible.
- Remove burrs and clean the piping before fitting.
- It is advisable to provide for a calibrating chamber in order to calibrate the pump in service conditions.

PIPING ON THE SUCTION CIRCUIT

- Provide for a filter with suitable mesh size upstream of the pump.
- Check whether the diameter and length of pipe are compatible with the pump's maximum capacity.

PIPING ON THE DISCHARGE CIRCUIT

- Provide for a safety valve on the discharge pipe, designed to protect the installation.
- It is advisable to install a priming valve on the discharge circuit in order to make starting and maintenance of the pump easier.



II - 2. DRIP COLLECTION

It's recommended to install a drain system to collect the leakage and the drip, especially if the liquid pumped is harmful

II - 3. HANDLING

Handling the pump

The lifting equipment must be compatible with the pump weight. (Refer to the pump signaletic plate)

The handling requires the following precautions :

- Fit the sling through the rings on the pump
- Check that the assembly is correctly balanced before starting to move it.
- Fix the pump as soon as it is positioned in correct location (see Chapter II - 4. Setting up).

Handling The Motor

The lifting equipment must be compatible with the motor weight (Refer to the motor signaletic plate).
Fit a sling in each ring on the motor.

Check that the motor is correctly balanced before starting to move it.

II - 4. SETTING UP

Pump Installation

Fix by the fixing holes the pump to an horizontal support correctly dimensioned. Leave enough clear space around the pump to be able to carry out servicing operations and adjustments.

Pumps installed outdoors must be protected by a shelter (according to the climatic conditions).

II - 5. ELECTRICAL INSTALLATION

Connecting The Motor

Check the specifications of the motor and compare them with the voltage available on your installation before making connections. Connect up the motor in accordance to the indications specified in the connecting box.



Do not forget to connect the earth terminal of the motor [PE] to the equipment earth conductor.

The electrical protection for the motor (fuse or thermal protection) must be suitable for the motor's rated current.

PART III - START UP

III - 1. PROCEDURES BEFORE START UP

Special care has to be taken for chemicals product used in the process (acids, bases, oxidizing/reducing solutions, ...).

- Check the pump fixation(Chapter II - 4. Setting Up).
- Remove the filling plug and fill the housing with lubricating oil (Chapter IV-1. Oil Change) supplied up to the middle of the level indicator. Reinstall the filling plug.
Check the opening of all isolating valves installed on the suction and discharge circuits.
Disconnect discharge circuit (caution to the liquid pumped). This procedure is to verify that there is liquid present (pump is installed in flooded suction), or to prime the pump (pump installed in suction lift).
- Check that the pump capacity is set to "0%" (hand-knob).

III - 2. START UP

- Once all the checks and procedures described in the previous section have been carried out, start up the pump.
- Check visually and by listening. (In particular, check that there are no suspicious noises).
- Make sure that the hand-knob is unlocked.

- Adjust the pump capacity gradually from 0 % to 100% and control the liquid output at priming valve.
- As soon as the liquid to be pumped flows out of the priming valve, priming on the process side has been achieved. Close the priming valve or reconnect the discharge pipe, as applicable.
- Once the priming is obtained, adjust the pump to the desired capacity.
- Lock the hand-knob with the locking screw

III - 3. FAILURES ON START UP

The motor runs with difficulty and heats up

- One phase is incorrectly connected.
- The characteristics of the electrical power supply do not match the specifications of the motor.
- The electrical connection used is not suitable.
- The housing does not contain any oil. Fill up with oil (See Chapter III - 1. Procedures Before Start Up).

The flow rate is lower than desired

- The pump capacity is incorrectly adjusted: adjust the capacity to the desired value and lock the hand-knob.
- The suction power is insufficient (pipe cross-section too small or pipe too long): replace the pipe with ones that have a larger cross-section or install the pump in flooded suction.
- The leak-tightness of suction pipe is unsatisfactory.
- The viscosity of the liquid is incompatible with the pump's capabilities.

The capacity is greater than desired

- The stroke adjustment of debit of the pump is incorrect: to adjust the debit to the wanted value
- A syphoning phenom is observed: check if the suction pressure is not superior to the discharge pressure . So necessary, to place a back-pressure valve on the discharge line.

The capacity is variable

- This problem may be due to particles from the piping which interfere with the operation of the valve assemblies: clean the piping and the valve assemblies (by checking the assembly sequence of different components).

III - 4. SCHEDULE FOR CHECKS AND MAINTENANCE OPERATIONS

- The programme of checks and maintenance operations depends on the conditions in which the equipment is used. For this reason, the following frequencies are given as an example only. Individual users should adapt these frequencies to their own specific operating conditions.

When ?	Check	Maintenance	See
After 2000 hours		Change lubricating oil (mechanical and hydraulic oil)	Chapter IV-1
Every month	Check the oil level of the housing and the spacer -if incorrect →	Trace lubricating oil leak	Chapter IV-2
Every 3 months	Check the oil temperature -if incorrect →	Vérify -the date of the last oil change -the oil contamination -the equipement operating conditions	Chapter IV-1
Every 8 000 hours or 1 year		Change lubricating oil (mechanical and hydraulic) Change the filter Complete revision **	Chapter IV Chapter IV
Frequency to be defined according to process	Check comformity of capacity	Check the pump capacity	Chapter IV-2

** Our Technical Assistance Department staff is available for any maintenance matters on site (see DOSAPRO adress at the end of this manual).

A model maintenance sheet is shown hereafter to help you ensure follow-up of your servicing actions (checking or maintenance).

PART IV - ROUTINE MAINTENANCE

IV - 1. OIL CHANGE



To avoid any risk of burning by the hot oil, protective gloves must be used..

- Perform the first oil change after 2000 hours' operation. Subsequent oil changes will be carried out every 8000 hours operation or every 1 year
- Disconnect the pump electrically, check that the equipment cannot be switched on accidentally. Position a notice at the location of the switch.
- Unscrew the plug and drain the oil into a tray. Degrease the plug and screw it into place.



For the diaphragm liquid end drain also the liquid end spacer and the displacement chamber
Replace the filter

- Remove the filling plug and fill up the housing to the middle of the oil level indicator with a mechanical oil suitable for service conditions.



For the diaphragm liquid end fill up the liquid end spacer and the displacement chamber by the safety valve hole with an hydraulic oil

- Remove any overflow of oil immediately with a suitable degreasing agent for the operating conditions.

Oil Quantity

Designation	Quantity (liter)
Mechanical housing	50L
Multiplexing mechanical housing	60L / pump
Liquid end spacer (diaphragm liquid end)	30L

Oil used for mechanical housing

Synthétique oil : Renep Sintonep Part number : 437 0035 000 N

Minimum température : > -22°F(-30°C)

Maximum température : 284°F(140°C)

Equivalencie : ESSO SPARTAN EP150 Synthetic

Oil used for diaphragm liquid end

Hydraulic oil COFRAN Cofraline Extra 32S Partnumber : 437 0013 033N

Minimum temperature: > 23°F(- 5°)

Maximum temperature: 194°F (90°)

From -31°F(-35°C) to 115°F(+46°C) used the Sintofluid oil (FUCHS)

Table of equivalencies:

FUCHS	RENEP 220
B.P	GR XP 220
CASTROL	ALPHA SP 220
ELF	REDUCTELF SP 220
FINA	GIRAN 220

IGOL	DYNAM SP 220
MOBIL OIL	MOBILGEAR 630
SHELL	OMALA 220
TOTAL	CARTER EP 220
ESSO	SPARTAN EP 220

IV - 2. OTHER MAINTENANCE OPERATIONS

TRACING A OIL LEAKAGE

- Check that the drain plug is correctly tightened.
- Check for leakage on the shaft on the motor side. If a leakage is found, change the seals on the worm shaft.
- Check for leakage on the micrometer screw. If a leakage is found, change the seal on the micrometer screw.

CHECKING THE PUMP CAPACITY

This is a question of determining the straight line representing the pump's capacity according to its adjustment. Four measurements are sufficient (adjustment at 100%, 75%, 50% and 25%). There are two possible methods:

If the pump is installed in pressurizing mode

Measure the volume of pumped liquid in a calibrating chamber for a given period of time. It may be necessary to reproduce actual operating conditions (suction pressure).

If the pump is installed in suction mode

Measure the volume of discharged liquid. It may be necessary to reduce actual operating conditions (discharge pressure).

The first method is recommended. In addition, this method avoids placing the operator in contact with the liquid, which is important if the pumped liquid is hazardous.

For a precise check, it may be necessary to use an electromagnetic flowmeter.

IV - 3. TRACING CAUSES OF FAILURE

PROBLEMS WITH MOTOR

The motor does not run :

- The thermal relay has been tripped.
- The motor is defective.
- Wiring is defective.

The motor heats abnormally :

- The quantity of lubricating oil is incorrect: trace the leak (see Chapter IV - 2.)
- The quality of the lubricating oil is incorrect. Check the date of the last oil change and the specifications of the oil used.
- The pump is used in conditions it was not designed for.

PROBLEMS WITH NOISY MECHANICAL PARTS

- The bearings can be worn, replace them if necessary
- The motor coupling can be worn, replace it if necessary

PROBLEMS WITH FLOW RATE

The pump produces no flow

- The pump capacity is adjusted to « 0 % » : Adjust the capacity to the desired value and lock the hand-knob.
- Check the leak-tightness of the piping safety valve.
- The liquid end is unprimed: release the pressure on the discharge pipe and prime the liquid end, or check the leak-tightness of the suction circuit.
- The balls of the valve assemblies are blocked by particles: clean or replace the valve assemblies.
- First, check whether the presence of the particles in the valve assemblies is normal and take corrective action if necessary.
- If the problem is not solved check the mechanical assembly and liquid end functioning.

The pump does not provide the required flow rate



- The pump capacity is incorrectly adjusted: adjust the capacity to the desired value and lock the hand-knob.
- The valve assemblies are blocked by particles: clean or replace the valve assemblies.
- The suction circuit leak-tightness is unsatisfactory.

IV - 4. ORDERING SPARE PARTS

To make it easier to register your order for spare parts and ensure a quick delivery, please provide us the following details:

- Information on the pump: type and contract number. These two items of information are shown on the identification plate mounted on the pump.
- Information on the spare part: reference, description and quantity. These items of information are specified in the spare parts list supplied with the pump.

You will find the phone and fax number of the Spare Parts Department at the end of this document

 DOSAPRO MILTON ROY		PONT ST PIERRE 27360 FRANCE	
TYPE	(1)		
Dmax	(2)	l/h	GPH
Pmax	(3)	bar	PSI
Date	(4)	M (8)	Kg
N°	(5)		
Item	(6)		
N°serie	(7)		

1	Type : Pump code
2	Dmax : maximum capacity
3	Pmax : maximum pressure
4	Date: date of manufacture
5	N° : Contract No
6	Item : your reference
7	N° série.: Dmr internal no

Fig. 3 : Typical identification plate

PART V - PREVENTIVE MAINTENANCE

V-1. GENERALITIES

The preventive maintenance consists in replacing the wear parts included in a "spare parts kit". This kits are available on request at the spare part department (chapter IV-4)

The corresponding action is detailed in the chapter VI : Servicing of the mechanical assembly

V-2. MECHANICAL ASSEMBLY PREVENTIVE MAINTENANCE

Renewal	Frequency* (hours)
Wheel and worm assembly	20 000 h
Bearings	20 000 h
Crosshead axis / fingers [037H],[037I]	20.000 h
Crosshead and his seals	8000 h
Flexible shock absorber of the motor coupling	8000 h
Flexible shock absorber of the pump coupling	8000 h

V-3. LIQUID END ASSEMBLY PREVENTIVE MAINTENANCE

Renewal	Frequency* (hours)
Plunger and plunger connection	20 000 h
Diaphragm (for the diaphragm liquid end))	15 000 h
Plunger packing ring (temperature < 194°F (90°C))	8000 h
Check valves	8000 h

* Approximate hours number when operating under max performances and normal using conditions

VI-SERVICING THE MECHANICAL ASSEMBLY

REMARKS

- By measure of simplification, the described procedures don't mention the washers fitted with fasteners (such as screws and nuts) and the magnet.



Do not to forget to go up them

- Some parts have been bonded during the workshop assembly. Clean the residual glue before a second assembly
- Replace the seal at each servicing

PRECAUTION

Before all servicing perform the following operations :

- Adjust the pump capacity at « 0% »
- Disconnect the electrical power Any accidental start-up must be prevented. position a notice at the switch location to avoid start up.
- Disconnect the hydraulic power if used
- Drains the oil from the housing (refer to chapter V-1 oil change)

TO BE PREPARED BEFORE SERVICING

Handling material compatible to the weight of the equipement	(all chapter)
2 screw M12x 40	(chapter VI.1)
1 lifting ring M12	(chapter VI.2)
1 lifting ring M8	chapter VI.2)
1 shim (thickness 90mm/3.54inch)	(chapter VI.2)
Glue Loctite 638	(chapter VI.2)
Degreasing agent	(all chapter)

VI.1- Assembly / disassembly of the wheel

Drawing 1066085010D01 rev 00

réf : M0000001a

Disassembly

Assembly

Perform the following steps before this operation

- VI-7
- VI-6
- VI-5
- VI-4
- VI-3
- VI-2

Repere

Torque

[435]

20 N.m

[435B]

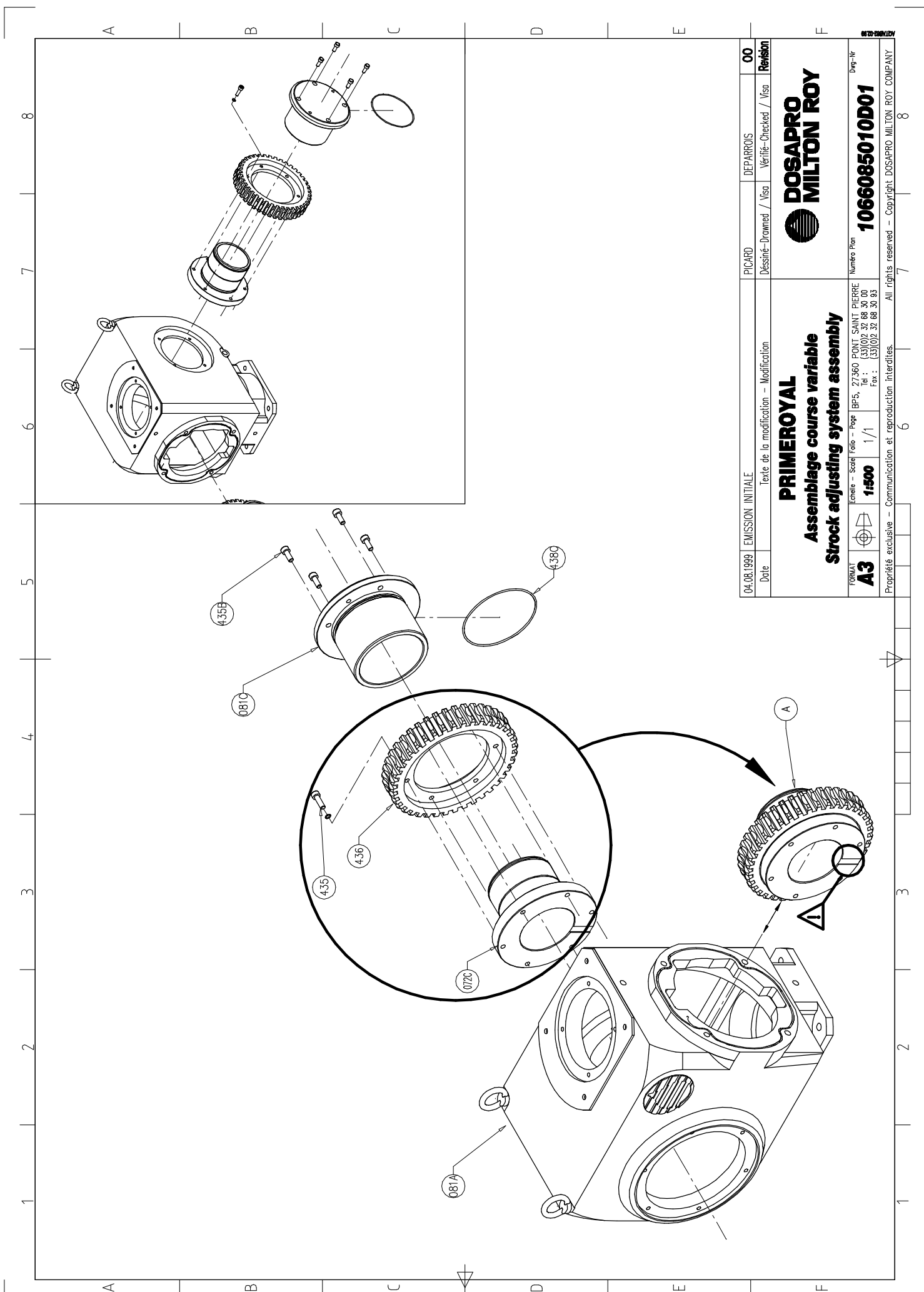
some turns

1. Remove the whole [A].
2. Unscrew the screw [435B]. Remove the part [081C].
3. Unscrew the screw [[435A]. Remove the part [019][431].
4. Unscrew the screw [435]. Remove the part [072C].

1. Fit the parts [438C],[081C].
2. Fit the parts [072C][436][435].
3. Insert the whole [A] in the housing.
4. Fit the part [081C],[081A] Screw the screw [435B].
5. Screw the 2 screw M12x40 on the part [081C]



to the groove position of the whole[A].



04.08.999	EMISSION INITIALE	PICARD	DEPARROIS	00
Date	Texte de la modification - Modification	Dessiné-Drawn / Visa	Vérifié-Checked / Visa	Revision
PRIMEROYAL Assemblage course variable Stroke adjusting system assembly				
		Numéro Plan 1066085010D01		
Echelle - Scale Ratio - Page A3	BP5, 27360 PONT SAINT PIERRE (33)02 32 68 30 00 Tel : (33)02 32 68 30 93 Fax :	1/1	1500	Dwg-Nr 1066085010D01
Propriété exclusive - Communication et reproduction interdites. All rights reserved - Copyright DOSAPRO MILTON ROY COMPANY.				

VI.2 - Assembly / disassembly whole excentric and connecting rod

Drawing 10660850010D02 rev00

réf : M0001001a

Disassembly

Assembly

Perform the following steps before this operation :

- VI-7
- VI-6
- VI-5
- VI-4
- VI-3

Repere

Torque

[435]&[435B]

120N.m

[439G]

mechanical stop

[008]

50N.m & 10N.m

[435K]

60N.m

1. Unscrew the screw [435B]. Screw of 2 turns the screw [435B].
2. Screw the two screws M12 on the plug [081C].
3. Fit a mechanical housing lifting ring to the part [072D].
4. Remove the whole [A].
5. Remove the parts [014],[434A],[037I],[016A],[435A],[068].
6. Remove the parts [056],[008],[439G],[019A],[439A],[435K],[043].



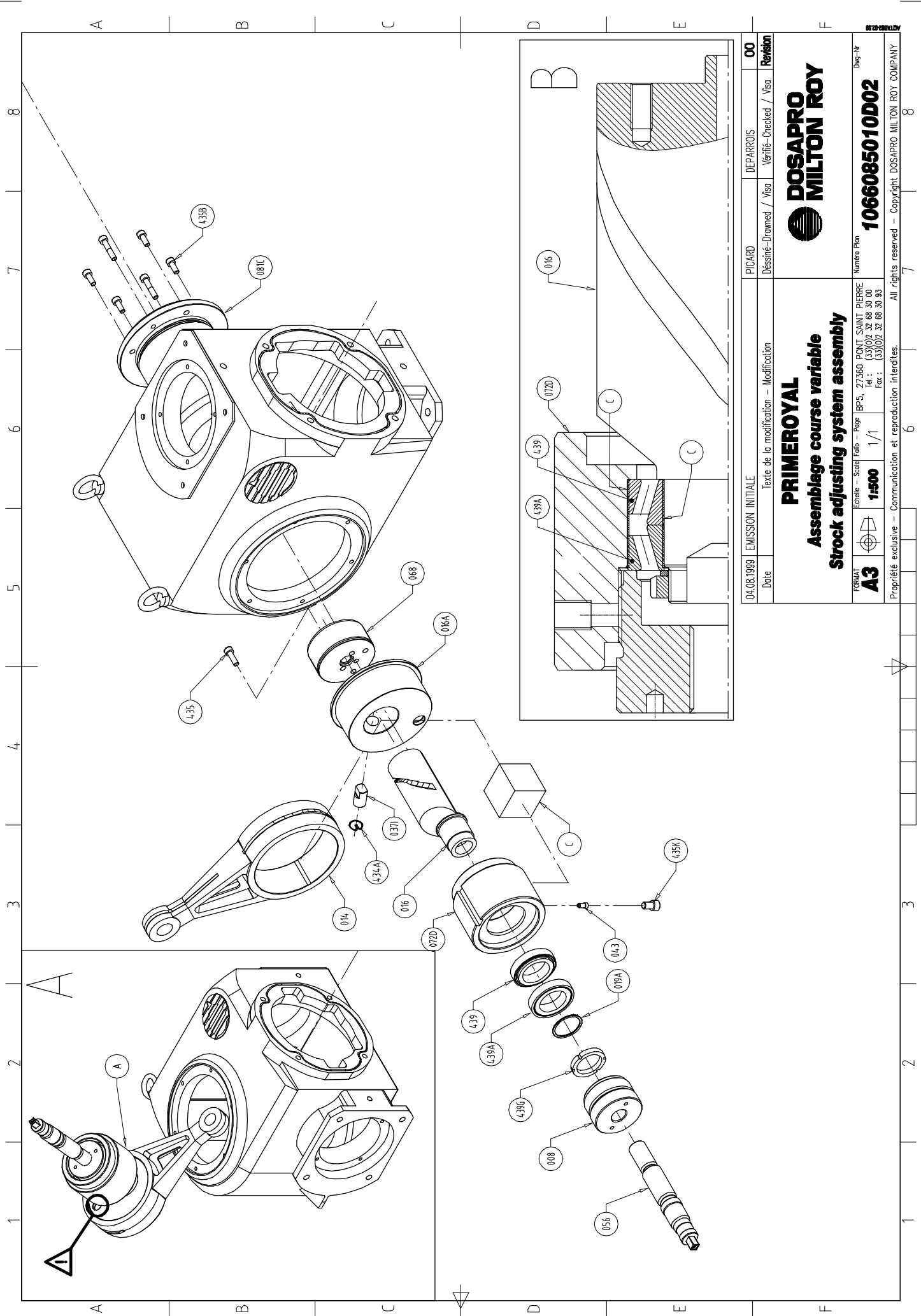
Clean all residual of glue on the parts [439],[439A],[072D],[016].

1. Heat at (40°C/104°F) the part [072D].
2. Fit the external cage of the bearing [439] to the part [072D].
3. Fit the parts [072D],[016].
4. Spread the area [C] of the part [016],[439].
 - The glue drying time is very fast. Avoid any trace of glue on the part [016] spinning.
5. Fit the internal cage of the bearing [439],[439A] to the part [016].
6. Fit the external cage of the bearing [439A] to the part [072D].
7. Fit the part [019A]. Screw the nut [439G].
8. Screw the nut [008] (50N.m). Unscrew the nut [008]. Screw the nut [008](10N.m).
9. Fit on the female excentric [016A] the parts [016],[037I],[434A],[068].Screw the screws[435].
 - The retaining ring [434A] must be placed in the groove of the part [016A].
10. Insert the part [043] in [072D].Screw the screw [435K].
11. Fit the connecting rod [014] to the part [016A].
12. Fit a mechanical housing lifting ring to the part [072D].
13. Insert the shim [C] between the parts [072] and [016A].
14. Screw the screw [056].
15. Insert the whole [A] in the mechanical housing (See section A).



the connecting rod can slide

the position of the part [016A]



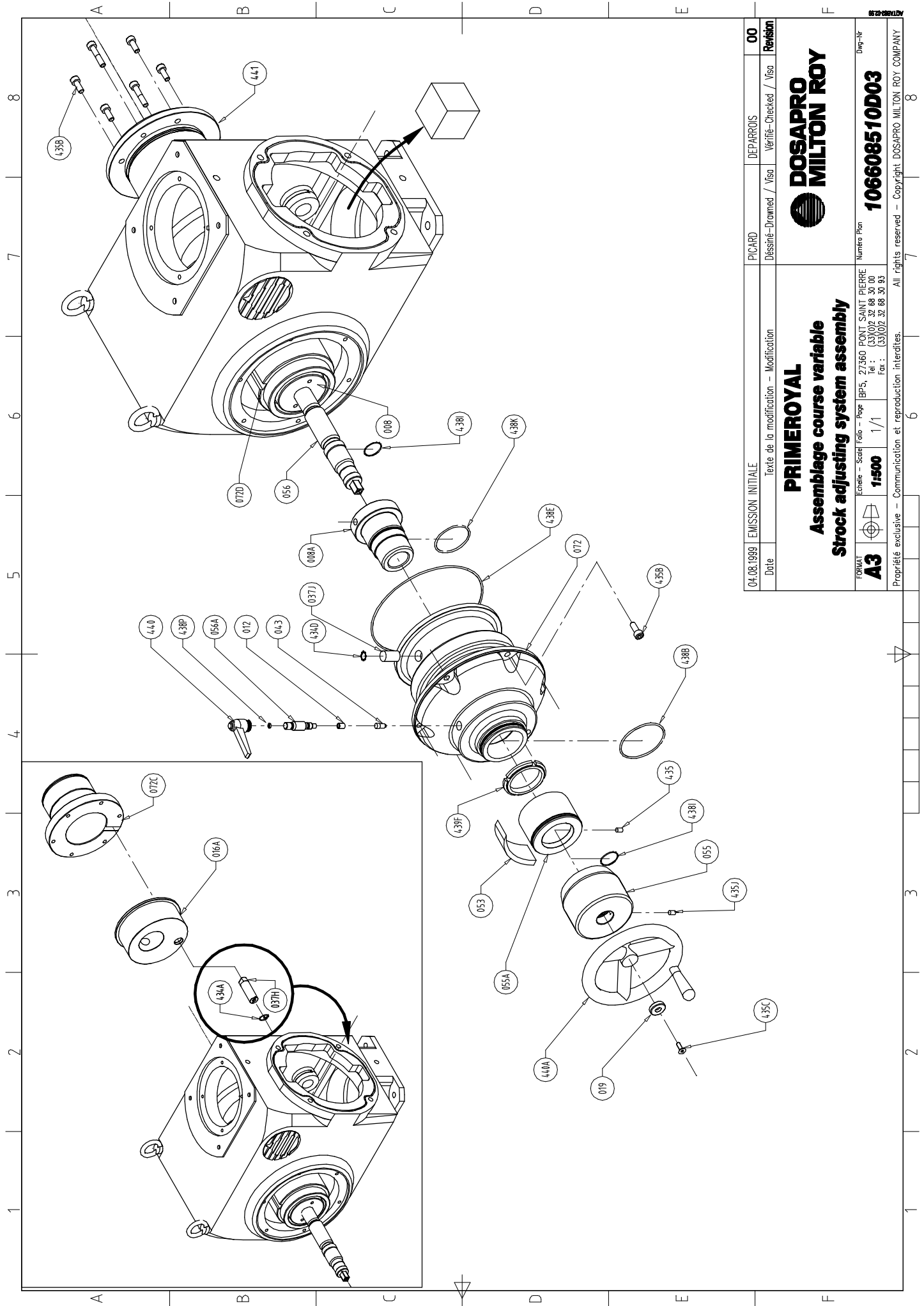
04.08.1989	EMISSIION INITIALE	Texte de la modification - Modification	PICARD	DEPARROIS	00
Date			Dessiné-Drawn / Viso	Vérifié-Checked / Viso	Revision
PRIMEROYAL Assemblee course variable Stroke adjusting system assembly					
FORMA A3	Echelle - Scale 1:500	Folio - Page 1/1	NUMÉRO 1066085010D02 Numéro Part 1066085010D02		
Pont SAINT PIERRE Tel : (33)02 32 68 30 00 Fax : (33)02 32 68 30 93 Propriété exclusive - Communication et reproduction interdites. All rights reserved - Copyright DOSAPRO MILTON ROY COMPANY					

VI.3 - Assembly / Desassembly of the adjusting stroke system

Drawing 1066085010D03 rev00

réf : M0022001a

Disassembly	Assembly	
<p>Perform the following steps before this operation</p> <ul style="list-style-type: none"> - VI-7 - VI-6 - VI-5 - VI-4 	Repere	Torque
	[435B]	120N.m
	[439F]	mechanical stop
	[435J]	mechanical stop –1/2 turn
	[435C]	mechanical stop
<ol style="list-style-type: none"> 1. Unscrew the screws [435C],[435J]. 2. Remove the parts [019],[440A],[055],[435],[055A]. 3. Unscrew the nut [439F]. 4. Fit 2 lifting ring M12 to the part [072]. 5. Unscrew the screw [435B]. 6. Remove the part [072] ,[008A]. 7. Remove the parts [440],[438P],[056A],[012],[043]. 9. Remove the parts [434D],[037J],[438B],[438K],[438E]. 	<ol style="list-style-type: none"> 1. Insert the part [037H] into the parts [016A],[072C]. 2. Fit the retaining ring [434A]. 3. Fit the seal [438K] to the part [008A]. 4. Fit the parts [438],[056]. 5. Screw the screw [056] on the nut [008] until to reach the side of the last net of [056]. 6. Screw the nut [008A] on the screw [056] until to reach the side of the last net of [056]. 8. Maintain the spacer [008A]. Turn the screw [056] of ¼ anti-clokwise turn. 10. Take a position mark between the parts [008A] and [056]. 11. Maintain the spacer [008A]. Turn the screw [056] of 10 klokwise turns. 12. Fit to the part[072] the greased seal [438E] and 2 lifting ring M12. 13. Fit the bell [072] to the part [008A] (Turn the nut [439F]). <div style="margin-bottom: 10px;"> <p style="margin-left: 20px;">The drilling of the part [008A] must received the part [043]. The groove of the part [072D] must received the part [037J].</p> </div> <ol style="list-style-type: none"> 14. Screw the screw [435B]. 15. Fit the parts [037J],[434D]. <div style="margin-bottom: 10px;"> <p style="margin-left: 20px;">To insert the part [434D] push on the internal diamter.</p> </div> <ol style="list-style-type: none"> 16. Fit the parts [043],[012],[056A],[438P],[440]. 17. Screw one lifting ring M8 on the nut [056]. Pull the whole to extract the shim [C1]. 18. Unscrew the screw M12x40 of the part[081C].Screw the screw [435B]. 19. Screw the nut [439F]. 20. Fit the parts [055A],[438],[053],[435],[055],[435J],[440A],[019]. <div style="margin-bottom: 10px;"> <p style="margin-left: 20px;">The groove of the part [055A] must received the screw [435J].</p> </div> <ol style="list-style-type: none"> 21. Screw the locking [440]. Screw the screw [435C]. 	



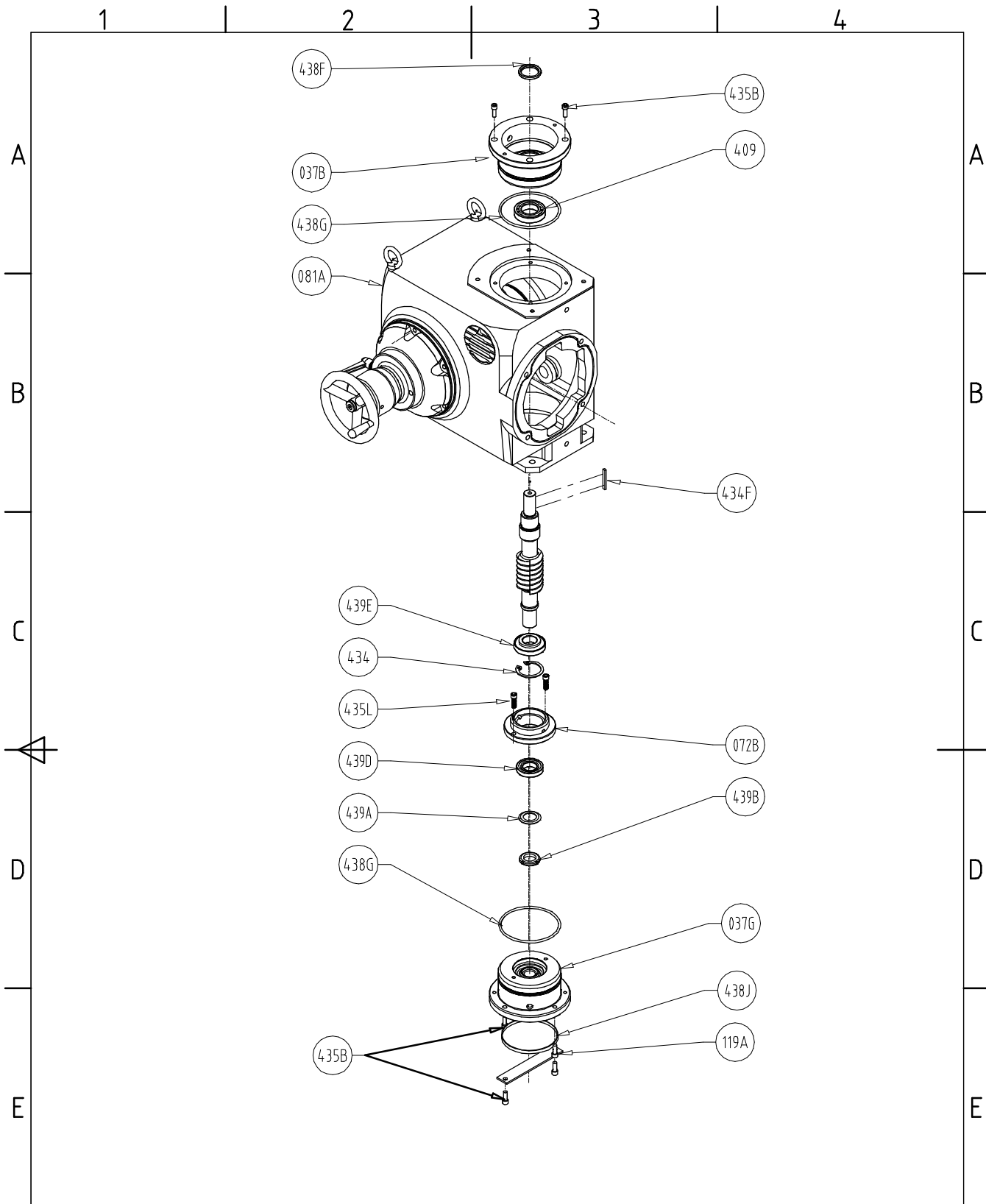
04-08-1989	EMISSIION INITIALE	Texte de la modification - Modification	PICARD	DEPARROIS	00
Date			Dessiné-Drawn / Viso	Vérifié-Checked / Viso	Revision
PRIMEROYAL Assemblage course variable Stroke adjusting system assembly					
FORMULA	Echelle - Scale	Folio - Page	BPS- 27360 PONT SAINT PIERRE Tel : (33)02 32 68 30 00 Fax : (33)02 32 68 30 93		
A3	1:500	1/1	Numéro Plan 106608510D03 Dwg-Nr		
Propriété exclusive - Communication et reproduction interdites. All rights reserved - Copyright DOSAPRO MILTON ROY COMPANY					


VI.4 - Assembly / Disassembly of the worn and gear

Drawing 1066085010D04 rev00

réf : M0028001a

Disassembly	Assembly	
<p>Perform the following steps before this operation</p> <p>- VI-7 - VI-6 - VI-5</p>	Repere	Torque
	[439B]	60N.m / 5N.m
	[435L]	mechanical stop
	[435B]	120N.m
<ol style="list-style-type: none"> 1. Remove the key wheel [434F]. 2. Unscrew the screw [435B]. 3. Remove the parts [037B],[438G],[438F],[409]. 4. Unscrew the screw [435L]. 5. Remove the worn 6. Unscrew the nut [439B]. Remove the parts [439A], [439D],[072D],[434],[439E]. 7. If necessary : Unscrew the screw [435B]. Remove the parts[037G],[438G],[119A],[049]. 	<ol style="list-style-type: none"> 1. Fit the retaining ring [434] to the part [072B]. 2. Heat at (70°C/158°F) the part[072B] and the internal cage of the bearing [439E] and [439D]. 3. Insert the external cage of the bearing [439D] in the part [072B] (full home on the retaining ring [434]). 4. Fit the external cage of the bearing [439E] full home to the part [072B]. 5. Fit the internal cage of the bearing [439E] full home to the worm. 6. Fit to the worm the parts [439E] [072B] [439D]. 7. Fit the internal cage of the bearing [439D] to the worm. 8. Screw the nut [439B].Unscrew the nut [439B]. 9. Fit the washer [439F]. 10. Screw the nut [439B]. Pull down the washer [439A]. 11. Fit the parts [438G] [037G]. 12. Fit the parts [072B],[037G] Screw the screw [435L]. 13. Fit the parts [037G],[081A]. 14. Insert the worm in the part [081A] 15. Screw the screw [435B] <div style="margin-top: 10px;"> Check if the worm is correctly coupled to the wheel </div> <ol style="list-style-type: none"> 16. Fit the parts [037B],[001],[409],[438G],[438B] 17. Fit the parts [037B],[081A]. Screw the screw [435B] 18. Fit the key wheel [434F] to the worm 19. Fit the part [438J],[119A].Screw the screws [435B] 	



04.2000	EMISSION INITIALE	PICARD	TAMPERE	00
Date	Texte de la modification - Modification	Déssiné-Drawned / Visa	Vérifié-Checked / Visa	Revision
PRIMEROYAL MULTIPLEX Mecanique Memee Mechanical Assembly				
FORMAT A4	Echelle - Scale 1:500	Folio - Page 1/1	BP5, 27360 PONT SAINT PIERRE Tel : (33)(0)2 32 68 30 00 Fax : (33)(0)2 32 68 30 93	Numéro Plan 1066085010D04 Dwg-Nr
Propriété exclusive - Communication et reproduction interdites.		All rights reserved - Copyright DOSAPRO MILTON ROY COMPANY		

VI.5- Assembly / Disassembly of the crosshead

Plan 1066085010D05 rev 00

réf : M0003001a

Disassembly

Assembly

Perform the following step before this operation

Repere

Torque

- VI-7
- VI-6

[435H]

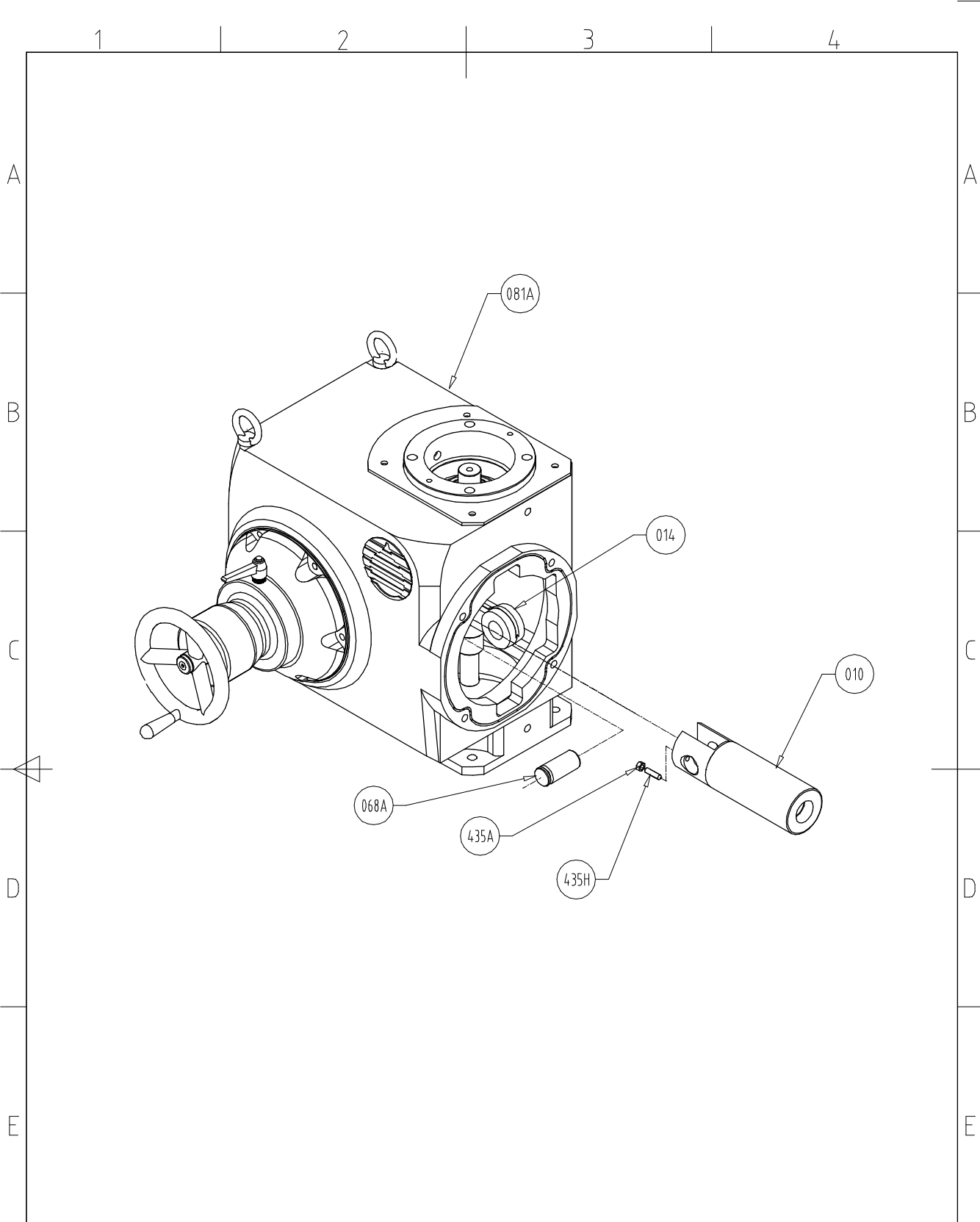
Mechanical stop

[435A]

60 N.m

1. Turn the worm and gear in order to put the connecting rod [014] in front position.
2. Unscrew the nut [435A]. Unscrew the screw [435H].
3. Remove the parts [068A][010].

1. Protect the crosshead [010] with a cloth or with a paper.
2. Turn the worm and gear in order to put the connecting rod [014] in front position.
3. Fit the part [014],[010],[068A],[435A].
4. Screw the screw [435H](in the groove of the part [068A]).
5. Screw the nut [435A].



04.08.1999	EMISSION INITIALE	PICARD	DEPARROIS	00
Date	Texte de la modification - Modification	Déssiné-Drawned / Visa	Vérifié-Checked / Visa	Revision

PRIMEROYAL SIMPLEX
Assemblage du coulisseau
Assembly of the crosshead



FORMAT A4	Echelle - Scale 1:500	Folio - Page 1/1	BP5, 27360 PONT SAINT PIERRE Tel : (33)(0)2 32 68 30 00 Fax : (33)(0)2 32 68 30 93	Numéro Plan 1066085010D05	Dwg-Nr
---------------------	---------------------------------	---------------------	--	-------------------------------------	--------

Propriété exclusive - Communication et reproduction interdites. All rights reserved - Copyright DOSAPRO MILTON ROY COMPANY

A071882-02-89

VI.6- Assembly/Disassembly of spacer liquid end

Drawing 1066085000D07 rev 00

réf : M004001a

Disassembly

Assembly

Perform the following step before this operation:

Repere

Torque

- VI-7

[435E]

200N.m

[435B]

mechanical stop

1. Unscrew the screw [435B]. Remove the part [081B].
2. Remove the retaining ring [434C].
3. Remove the parts [037],[438Z],[037A],[438B].
4. Unscrew the screw [435E]. Remove the parts [072A],[402],[438A],[438Z].
5. Remove if necessary the equipment of the part [072A].

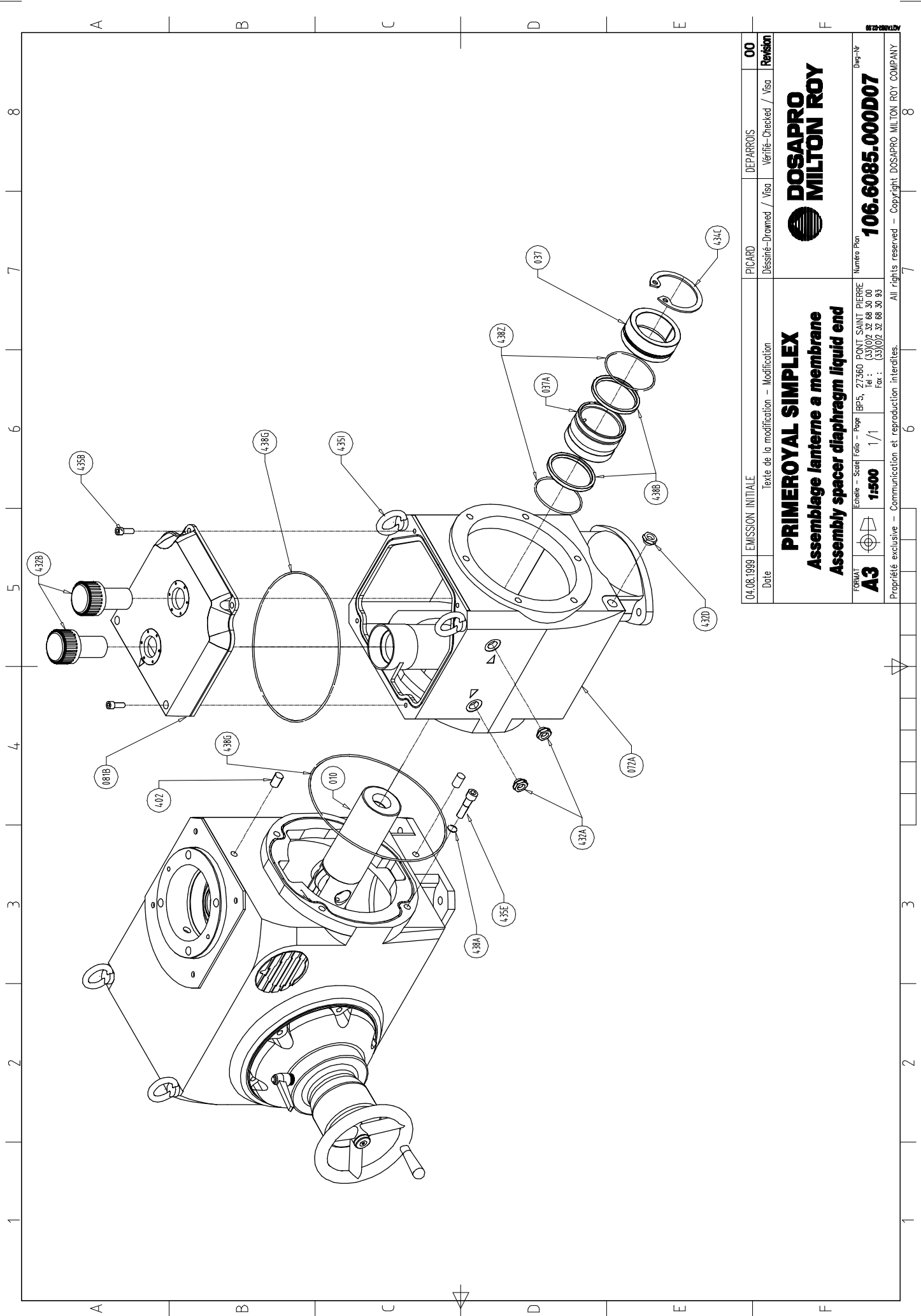
1. Insert the seal [438Z] in the groove of the spacer [072A].
2. Fit to the mechanical housing the parts [402],[438G],[438A],072A].
3. Screw the screw [435E].
4. Insert the part [438B] in the groove of the part [037A].
5. Fit to the crosshead [010] the part [037A] (groove placed to the mechanical housing side).
6. Fit to the seal [438Z] on the chamfer of the part [037A].
7. Insert the part [438B] in the groove of the part [037].
8. Fit to the crosshead [010] the part [037] (part [438B] placed to the part [037A] side).

Fit the retaining ring [434C]



The retaining ring [434C] must be in the groove of the housing [072A].

9. Fit to the spacer [072A] the parts [438G] [081B],[435B],[432B],[432A],[432D],[435I].



04.08.1999	EMISSIION INITIALE		PICARD	DEPARROIS	00
Date	Texte de la modification - Modification		Dessiné-Drawn / Viso	Vérifié-Checked / Viso	Revision
PRIMEROYAL SIMPLEX Assemblage lanterne a membrane Assembly spacer diaphragm liquid end					
FORMA A3	Echelle - Scale / Folio - Page 1:500 / 1/1	BP-5, 27360 PONT SAINT PIERRE Tel : (33)02 32 68 30 00 Fax : (33)02 32 68 30 93	Numéro Part 106.6085.000D07		
Propriété exclusive - Communication et reproduction interdites. All rights reserved - Copyright DOSAPRO MILTON ROY COMPANY					




ACT 20 02 93

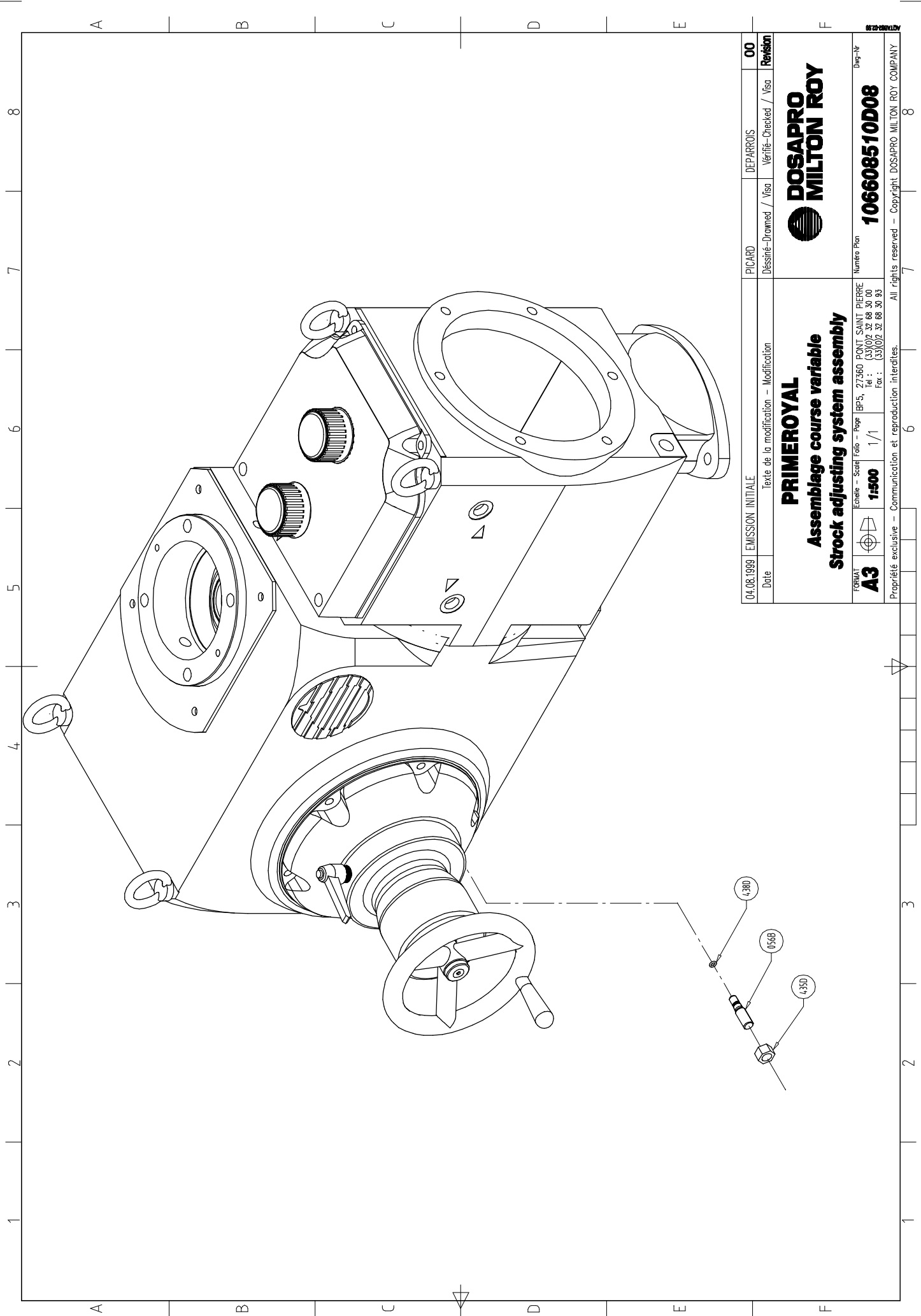
1 2 3 4 5 6 7 8


VI.7- Assembly/Desassembly of the 100% mechanical stop

Drawing 1066085010D08 rev 00

réf : M0005001a

Disassembly	Assembly	
<p>Perform the following step before this operation</p>	Repere	Torque
	[056B]	mechanical stop
	[435D]	mechanical stop
<ol style="list-style-type: none"> 1. Set the setting to 100%. 2. Unscrew the nut [435D]. Unscrew the screw [056B]. 3. Remove the part [438D]. 	<ol style="list-style-type: none"> 1. Set the setting to 90%. 2. Fit the parts [056B],[438D]. 3. Screw the screw [056B] (mechanical stop). <p> The screw [056B] must be in mechanical stop.</p> <ol style="list-style-type: none"> 4. Screw the nut [435D]. 	



04/08/1999	EMISSIION INITIALE	Texte de la modification - Modification	PICARD	DEPARROIS	00
Date			Dessiné-Drawn / Viso	Vérifié-Checked / Viso	Revision
PRIMEROYAL Assemblage course variable Stock adjusting system assembly			 DOSAPRO MILTON ROY		
FORMA A3	Echelle - Scale 1:500	Folio - Page 1/1	NUMÉRO Pont SAINT PIERRE (33)02 32 68 30 00 Tel : (33)02 32 68 30 93 Fax :		Dwg-Nr 106608510D08
Propriété exclusive - Communication et reproduction interdites. All rights reserved - Copyright DOSAPRO MILTON ROY COMPANY					

F	DECLARATION "CE" DE CONFORMITE CONFORME A L'ANNEXE II PARTIE A DE LA REGLEMENTATION, DIRECTIVE "MACHINES", CI-DESSOUS DIRECTIVE DU CONSEIL DU 14 JUIN 1989 (89/392 CEE) MODIFIEE LE 20 JUIN 1991 (91/368 CEE) MODIFIEE LE 14 JUIN 1993 (93/44 CEE) ET LE 22 JUILLET 1993 (93/68 CEE) CONCERNANT LE RAPPROCHEMENT DES LEGISLATIONS DES ETATS MEMBRES RELATIVES AUX MACHINES. Nous, DOSAPRO MILTON ROY 27360 PONT SAINT PIERRE FRANCE déclarons que le matériel désigné ci-après est en conformité avec la directive "machines" sous réserve que l'installation, l'utilisation et la maintenance soient effectuées suivant les règles de l'art et selon les prescriptions définies dans la notice d'instructions.
GB	"EC" DECLARATION OF CONFORMITY CONFORMS WITH APPENDIX II, PART A, OF THE REGULATIONS "MACHINES" DIRECTIVE BELOW DIRECTIVE OF THE COUNCIL OF JUNE 14, 1989 (89/392 EEC) MODIFIED ON JUNE 20, 1991 (91/368 EEC), MODIFIED ON JUNE 14, 1993 (93/44 EEC) AND JULY 22, 1993 (93/68 EEC) CONCERNING THE APPROXIMATION OF THE LAWS OF MEMBER STATES RELATIVE TO MACHINES. We, DOSAPRO MILTON ROY 27360 PONT SAINT PIERRE FRANCE hereby declare that the equipment designated below : conforms with the "machines" directive, on the condition that installation, use and maintenance are performed in keeping with recognized workmanship practices and according to the specifications given in the instruction manual.
D	EG-KONFORMITÄTSEKTLÄRUNG IN KONFORMITÄT MIT ANHANG II, TEIL A DER NACHSTEHENDEN BESTIMMUNGEN EG-MASCHINENRICHTLINIE RICHTLINIE DES RATS VOM 14. JUNI 1989 (89/392 EWG), ABGEÄNDERT AM 20. JUNI 1991 (91/368 EWG), ABGEÄNDERT AM 14. JUNI 1993 (93/44 EWG) UND AM 22. JULI 1993 (93/68 EWG) BEZÜGLICH DER ANNÄHERUNG DER GESETZGEBUNGEN DER MITGLIEDSTAATEN AUF DEM GEBIET DES MASCHINENWESENS. Wir, DOSAPRO MILTON ROY 27360 PONT SAINT PIERRE FRANCE erklären, daß die nachstehend bezeichneten Gerätschaften : der EG-Maschinenrichtlinie konform ist, falls Einbau, Verwendung und Wartung fachgerecht und unter Einhaltung der in der Gebrauchsanleitung enthaltenen Vorschriften erfolgen.
NL	EG FABRIKANTENCONFORMVERKLARING CONFORM BIJLAGE II VAN HET HIERONDER VERMELDE REGLEMENT RICHTLIJN "MACHINES" DOOR DE RAAD VAN DE EUROESE UNIE OP 14 JUNI 1989 UITGEVAARDIGD ALS EEG-RICHTLIJN 89/392 EN OP 14 JUNI 1993 GEWIJZIGD ALS EEG-RICHTLIJN 93/44 VERVOLGENS OPNIEUW GEWIJZIGD OP 22 JULI 1993 ALS EEG-RICHTLIJN 93/68 INZAKE DE HARMONISATIE VAN DE WETGEVING DER LIDSTATEN BETREFFENDE MACHINES. De ondergetekenden, DOSAPRO MILTON ROY 27360 PONT SAINT PIERRE FRANKRIJK verklaren dat het hierna vermelde materiaal overeenstemt met de richtlijn «machines» op voorwaarde dat installatie, gebruik en onderhoud vakkundig en volgens de betreffende handleidingen plaatsvinden.
I	DICHIARAZIONE DI CONFORMITA' "CE" CONFORME ALL'ALLEGATO II PARTE A DELLA NORMATIVA SOTTO DIRETTIVA "MACCHINE" DESCRITTA DIRETTIVA DEL CONSIGLIO DEL 14 GIUGNO 1989 (89/392 CEE) MODIFICATA IL 20 GIUGNO 1991 (91/368 CEE), MODIFICATA IL 14 GIUGNO 1993 (93/44 CEE) E IL 22 LUGLIO 1993 (93/68 CEE) IN SEGUITO ALL'UNIFORMAZIONE DELLE LEGISLAZIONI DEGLI STATI MEMBRI RELATIVE ALLE MACCHINE. La società DOSAPRO MILTON ROY 27360 PONT SAINT PIERRE FRANCIA dichiara che l'apparecchiatura descritta di seguito : è conforme alla direttiva "macchine", con la riserva che l'installazione, l'utilizzazione e la manutenzione vengano effettuate attenendosi alle regole d'arte e rispettando le procedure descritte nel manuale d'istruzioni.
E	DECLARACION "CE" DE CONFORMIDAD CONFORME AL ANEXO II PARTE A DE LA REGLAMENTACION DIRECTIVAS "MAQUINAS" SIGUIENTE DIRECTIVA DEL CONSEJO DEL 14 DE JUNIO DE 1989 (89/392 CEE) MODIFICADA EL 20 DE JUNIO DE 1991 (91/368 CEE) MODIFICADA EL 14 DE JUNIO DE 1993 (93/44 CEE) Y EL 22 DE JULIO DE 1993 (93/68 CEE) RELATIVA AL ACERCAMIENTO DE LAS LEGISLACIONES DE LOS ESTADOS MIEMBROS EN LO QUE RESPECTA A LAS MAQUINAS. Nosotros, DOSAPRO MILTON ROY 27360 PONT SAINT PIERRE FRANCIA Declaramos que el material que a continuación se designa : cumple la directiva "máquinas" siempre y cuando la instalación, el uso y el mantenimiento sean efectuados de conformidad con la normativa profesional y cumpliendo las prescripciones del manual de instrucciones.
P	DECLARAÇÃO "CE" DE CONFORMIDADE CONFORME O ANEXO II DA PARTE A DA REGULAMENTAÇÃO DIRECTIVA "MÁQUINAS" ABAIXO DIRECTIVA DO CONSELHO DO DIA 14 DE JUNHO DE 1989 (89/392 CEE) MODIFICADA NO DIA 20 DE JUNHO DE 1991 (91/368 CEE) MODIFICADA NO DIA 14 DE JUNHO DE 1993 (93/44 CEE) E NO DIA 22 DE JULHO DE 1993 (93/68 CEE) NO QUE SE REFERE À APROXIMAÇÃO DAS LEGISLAÇÕES DOS ESTADOS MEMBROS RELATIVAS AS MÁQUINAS. Nós, DOSAPRO MILTON ROY 27360 PONT SAINT PIERRE FRANCE declaramos que o material designado em seguida : está em conformidade com a directiva "máquinas" sob reserva que a instalação, utilização e manutenção sejam efectuadas seguindo as regras da arte e segundo as prescrições da nota de instruções.
DK	EF-OVERENSSTEMMELSESERKLÆRING I OVERENSSTEMMELSE MED BILAG II AFSNIT A I NEDENSTÅENDE "MASKIN" DIREKTIV BESTEMMELSER RÅDETS DIREKTIV AF 14. JUNI 1989 OM INDBYRDES TILNÆRMELSE AF MEDLEMSSTATERNES LOVGIVNING OM MASKINER (89/392/EØF) OG ÆNDRET DEN 20. JUNI 1991 (91/368/EØF), DEN 14. JUNI 1993 (93/44/EØF) OG DEN 22. JULI 1993 (93/68/EØF). Underskrevne: DOSAPRO MILTON ROY 27360 PONT SAINT PIERRE FRANKRIG erklærer hermed, at nedenstående udstyr : er i overensstemmelse med "maskin" direktivet under forudsætning af, at monteringen, anvendelse og vedligeholdelse foregår i henhold til god faglig praksis og de i vejledningen angivne forskrifter.
SW	"EG"-INTYG OM UPPFYLLANDE I ENLIGHET MED BILAGA 1) DEL A I NEDANSTÅENDE "MASKIN"ÄDIREKTIV BESTÄMMELSE DIREKTIV FRÅN RÅDET, DEN 14 JUNI 1989 (89/392 EEC) MODIFIERAT DEN 20 JUNI 1991 (91/368 EEC) MODIFIERAT DEN 14 JUNI 1993 (93/44 EEC) OCH DEN 22 JULI 1993 (93/68 EEC) RÖRANDE NÄRMANDE AV MEDLEMSSTATERNAS LAGSTIFTNINGAR FÖR MASKINER. Vi, DOSAPRO MILTON ROY 27360 PONT SAINT PIERRE FRANKRIKE intyggar att nedan beskriven utrustning : överensstämmer med "maskin"-direktivet under förutsättning att den installeras, används och underhålls enligt konstens regler och enligt de beskrivningar som ges i användarinstruktionen.
FIN	"EU"-TODISTUS VAATIMUSTEN TAYTTAMISESTA ALLAOLEVAN MÄÄRÄYKSEN LIITTEEN 1) OSAN A MUKAISESTI KONEIDIREKTIIVI NEUVOSTON DIREKTIIVI, 14. KESÄKUUTA 1989 (89/392 EEC), MUUTETTU 20. KESÄKUUTA 1991 (91/368 EEC), MUUTETTU 14. HEINÄKUUTA 1993 (93/44 EEC) JA 22. HEINÄKUUTA 1993 (93/68 EEC) KOSKIEN JÄSENVALTIOIDEN KONEISIIN LIITTYVIEN LAINSÄÄDÄNTÖJEN LÄHENTYMISTÄ. Me, DOSAPRO MILTON ROY 27360 PONT SAINT PIERRE RANSKA todistamme, että seuraavassa selostettu varustus : vastaa koneidirektiiviä edellyttäen, että se asennetaan, sitä käytetään ja huolletaan sääntöjen ja käyttöohjeissa olevien selostusten mukaisesti.
GR	ΔΗΛΩΣΗ ΠΙΣΤΟΤΗΤΑΣ "EK" ΣΥΜΦΩΝΑ ΜΕ ΤΟ ΠΑΡΑΡΤΗΜΑ ΙΙ ΜΕΡΟΣ Α ΤΗΣ ΚΑΤΩΤΕΡΩ ΟΔΗΓΙΑ "ΜΗΧΑΝΗΜΑΤΑ" ΡΥΘΜΙΣΗΣ ΟΔΗΓΙΑ ΤΟΥ ΣΥΜΒΟΥΛΙΟΥ ΤΗΣ 14ης ΙΟΥΝΙΟΥ 1989 (89/392 ΕΟΚ) ΠΟΥ ΤΡΟΠΟΠΟΙΗΘΗΚΕ ΤΗΝ 20η ΙΟΥΝΙΟΥ 1991 (91/368 ΕΟΚ), ΤΗΝ 14η ΙΟΥΝΙΟΥ 1993 (93/44 ΕΟΚ), ΠΟΥ ΑΦΟΡΑ ΤΗΝ ΠΡΟΣΕΙΠΣΗ ΤΩΝ ΝΟΜΟΘΕΣΙΩΝ ΤΩΝ ΚΡΑΤΩΝ ΜΕΛΩΝ ΣΧΕΤΙΚΑ ΜΕ ΤΑ ΜΗΧΑΝΗΜΑΤΑ. Η DOSAPRO MILTON ROY 27360 PONT SAINT PIERRE FRANCE δηλώνουμε ότι το παρακάτω περιγραφόμενο μηχανήμα : είναι σύμφωνο προς την οδηγία "Μηχανήματα" , με την επιφύλαξη ότι η εγκατάσταση, η χρήση και η συντήρηση του θα πραγματοποιούνται σύμφωνα με τους κανόνες της τεχνικής και τις προδιαγραφές που ορίζονται από τις οδηγίες χρήσης.

SERIE SERIEN SARJA	SERIAL SERIEÄ ΣΕΙΡΑΣ	TYPE TIPO ΤΥΠΟΣ	TYP TYYPPI
D		D2 / D4 / D6 / D10 / D17 / D34 / D50 D120 / D170 / D220	
D Pulse		D6 / D10 / D17 / D34 / D50 D120 / D170	
F		F200 / F400 / F600	
G		GA / GC / GB	
G Pulse		GA / GC	
MAXROY		RD / RA / RB	
MROY		A / B	
MILROYAL		B / C / D	
PRIMEROYAL			

Directeur Industriel
Olivier PERRIN



GUARANTEE

The vendor guarantees his products according to the D.M.R. general conditions of sale.

The guarantee for components and sub-assemblies not fabricated by the vendor is limited to that given by the supplier.

The vendor's guarantee only covers the replacement or the repair, at his cost and in his factory, of all parts acknowledged by his technical services as being defective due to an error in conception, of material or of execution.

It is the purchaser's responsibility to prove the said defects. The guarantee does not cover the replacement of wear parts mentioned in part V - Preventive Maintenance.

The vendor reserves the right to modify all or part of his products in order to satisfy the guarantee. The guarantee does not cover charges arising from dismantling, assembly, transport and movements.

The replacement of one or several parts, for whatever reason, does not prolong the period of guarantee.

The guarantee is not applicable notably in the following cases :

- installation not in accordance with standard current practice.

- deterioration or accident resulting from negligence.

- lack of surveillance or maintenance.

- modifications to conditions of use.

- chemical corrosive or erosive attack. The proposed materials of construction are recommendations subject in all cases to verification and acceptance by the client. The recommendations, based on the experience of the vendor and the best available information, do not guarantee against wear or chemical action.

The guarantee ceases :

- if the storage of the material, outwith the vendor's factory, does not conform to his recommendations or to current standard practices.

- in case of work or dismantling of the material by someone who does not respect written recommendations of the instruction manual (when replacing wear parts).

- if parts from another origin are substituted for the original parts supplied by the manufacturer.

The purchaser cannot call on guarantee claims to justify differing payments.

INDUSTRIAL OWNERSHIP

This manual can only be used by the purchaser or the user. It cannot be distributed, published, reproduced (partially or totally) or generally communicated to third parties without the advance, formal written authorisation of the vendor.

Any breach of these rules may result in legal action being taken.



F

FRANCE

ASSISTANCE TECHNIQUE : Tél. 02.32.68.30.02
PIECES DE RECHANGE : Tél. 02.32.68.30.01 télécopie 02.32.68.30.92
ACCUEIL : Tél. 02.32.68.3000 - Télécopie 02.32.68.3093 - Télex 180345
B.P.5,27360 Pont-Saint-Pierre ,France
Internet : www.dosapro.com

E

ESPAÑA

ASISTENCIA TECNICA Y PIEZAS DE REPUESTOS :
C/Embajadores, 100 - 28012 MADRID
Tél.(91) 517 80 00 - Fax. (91) 517 52 38 - Télex 23016

I

ITALIA

ASSISTENZA TECNICA E PARTI DI RICAMBIO :
Centro Direzionale Colleoni - Via Paracelso 16
Palazzo Andromeda - Ingresso 1
20041 AGRATE BRIANZA (MI)
Tel. (39.39) 60.56.891 - Fax. (39.39) 60.56.906 - Télex 330550

GB

UNITED KINGDOM

TECHNICAL ASSISTANCE AND SPARE PARTS :
Oaklands Park, fishponds Road, WOKINGHAM - Berkshire RG 11 2FD
Tel. (0118) 977 10 66 - Fax. (0118) 977 11 98 - Télex 846989

USA

UNITED STATES

TECHNICAL ASSISTANCE AND SPARE PARTS :
201 Ivyland Road, IVYLAND, PA, 18974-0577
Tel. (215) 441.0800- Fax.(215) 441.8620 - Télex 4761 138
Internet : www.miltonroy.com

OTHER COUNTRIES :

Representatives in all countries, contact in FRANCE:
INTERNATIONAL SALES DEPARTMENT
Tel. 33.2.32.68.3004 - Fax. 33.2.32.68.3094 - Télex 180345
