DRAWBARS
USE AND MAINTENANCE MANUAL

GENERAL INDEX

MANUFACTURER'S DECLARATION
Concerning drawbar to be incorporated into a machine, according to directive 2006/42/EC.

RIMA S.p.A.
Via Sigalina a Mattina, 32 – 25018 MONTICHIARI (BS) ITALIA,
in the person of its pro tempore Legal Representative, Mr. Giorgio Zonta,

DECLARES

under its responsibility, in accordance with directive 2006/42/EC, that no drawbars manufactured by RIMA S.P.A. may be used if not incorporated into the machine they are intended for and until the same machine is declared to conform to directive 2006/42/EC and successive additions by the manufacturer, importer or installer of the machine.

AND FURTHER DECLARES THAT:

- all the drawbars are designed and manufactured applying the safety rules stated in directive 2006/42/EC.
- all the drawbars must operate at a temperature range suitable to the material used (see point 3, component features)
- if not otherwise indicated, all the drawbars with hydraulic cylinder must not be used at a pressure higher than 210 Bar;

RIMA S.P.A. DECLINES ALL RESPONSIBILITY FOR IMPROPER USE OF DRAWBARS

Any arising dispute shall be governed by the court of Brescia.

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1 INTRODUCTION

Introduction

This manual has been prepared by **RIMA S.p.A.** to provide the users of its drawbars with information about the safety standards connected to using, maintaining and overhauling the drawbars.
With the purpose of ensuring maximum operating reliability of its drawbars **RIMA S.P.A.** has carefully selected the materials and components used to manufacture the drawbars. All the components have been designed and manufactured to safely resist any stresses foreseen in their use.

Drawbar users

Trained person = a technician who knows about the equipment and rules relevant to the drawbars and to the machine on which they are fitted.
Informed person = operator who knows about his duties and who has basic information relevant to the specific risks and right use of the drawbars.
Final user = synonym of informed person

Symbols used in the manual

This symbol indicates behaviour that is important also as far as safety is concerned. In case users do not respect these rules, any kind of manufacturer's liability will automatically cease.

This symbol indicates that all the possible operations have been made on the drawbar to eliminate or reduce risks, but that there are residual risks which users must be aware of.

Residual risks and information about drawbars

Drawbars must not be used or worked on before carefully reading and completely understanding all parts of this manual.

- The safety standards established for the machines or the equipment the drawbars are installed in are also valid for the drawbars.
- The machine operator is responsible for the correct use of the machine and the equipment. He must therefore know and apply the instructions for drawbar use described here.
- Only use the drawbar when it is fitted on a machine or equipment according to the rules provided for in this manual. When using the drawbar the utmost attention must be paid in the following cases:

- As far as hydraulic drawbars are concerned, sudden starts can be dangerous to people or objects, please make sure that the plant controlling the cylinder on the drawbar works well and is appropriate to use.
- In order to avoid injuries, do not pull up or grab any parts of the drawbar while it is working.
- Never overcharge the drawbar beyond the charge allowed.
- Do not use the drawbar as a support or as a grip to get into the machine or to rest objects on.
- Make the drawbar width of movement suitable to the work it is going to do.

2 USE AND PRESERVATION OF THE "USE AND MAINTENANCE MANUAL"

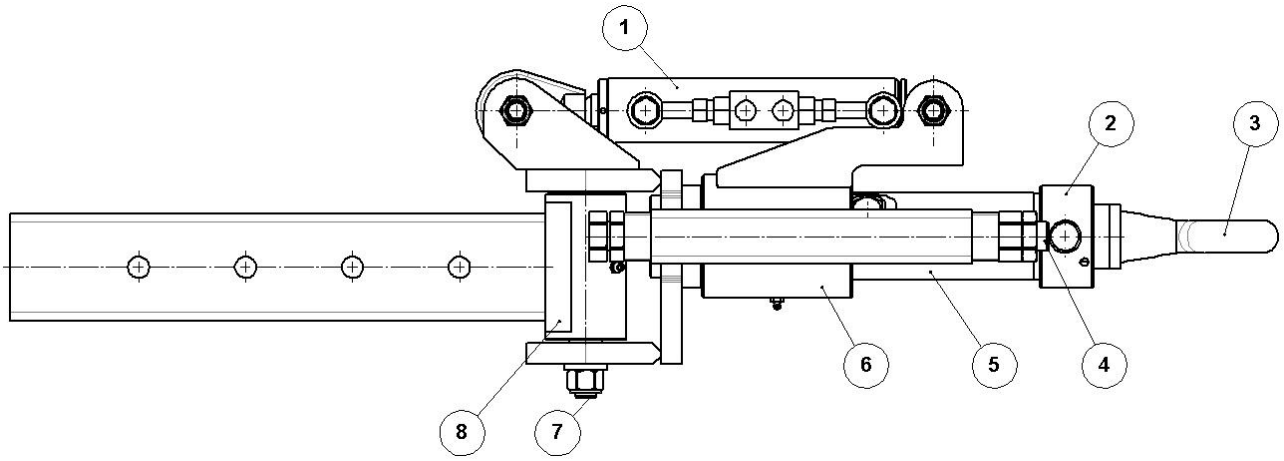
This use and maintenance manual is intended for **RIMA S.P.A.** customers and in particular for the people in charge of: installation, maintenance, overhauling, repair and for all persons concerned with drawbar operation.
The parts of the manual to concentrate on most concern the operations with the highest degree of risk. These operations are disciplined by labour safety laws.
The information contained in this manual is useful to indicate correct drawbar use according to the established design and construction purposes.
Moreover, information is supplied about handling, installation, maintenance, overhauling and problem solving, all respecting the limits established by the manufacturer detailed in this manual.
The use and maintenance manual is an integral part of the drawbar and must be kept until such is disposed of.
It must be kept in a safe place, always close to the equipment so that it is ready for consultation at any time.
If the manual is damaged, the user must request a copy from the manufacturer who is obliged to supply one.
The Rima S.p.A. customer is strictly responsible for following and keeping the instructions in this manual and passing them to the final user.

Circumstances that release the manufacturer from any liability

- Improper use of drawbar or use by persons not trained professionally
- Use contrary to the specific national standards
- Incorrect installation
- Serious failure to carry out the prescribed maintenance
- Unauthorised changes or interventions
- Use of non original spare parts or ones not specific to the model
- Total or partial failure to comply with these instructions
- Lack of documentation concerning possible maintenance and repair done
- Exceptional events (e.g floods, earthquakes, fire, car accidents or such like)

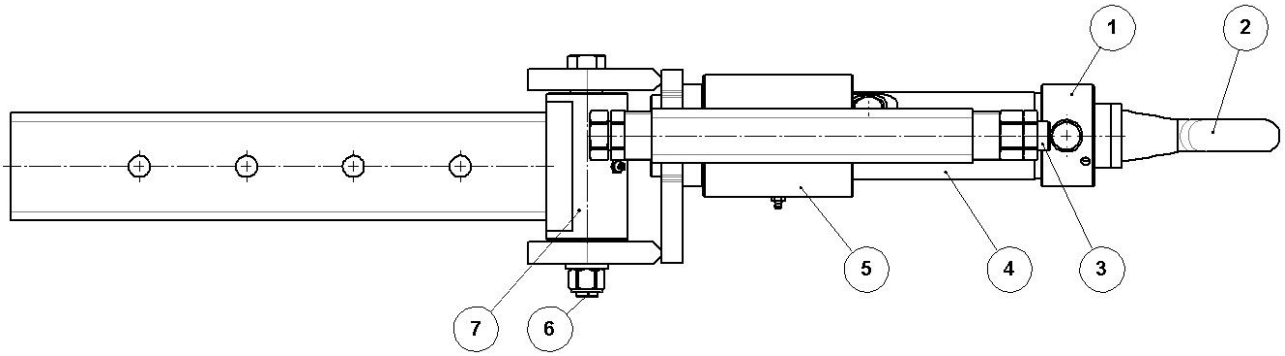
3 DRAWBAR COMPONENTS IN THE BASIC VERSION

Diagram of hydraulic drawbar:



1 HYDRAULIC CYLINDER
2 EYELET LOCKING RING
3 EYELET
4 COMPLETE PIN WITH SPRING
5 INNER BODY
6 MOBILE INNER BODY
7 PIVOT
8 ROTATING BODY

Diagram of mechanical drawbar:



1 EYELET LOCKING RING
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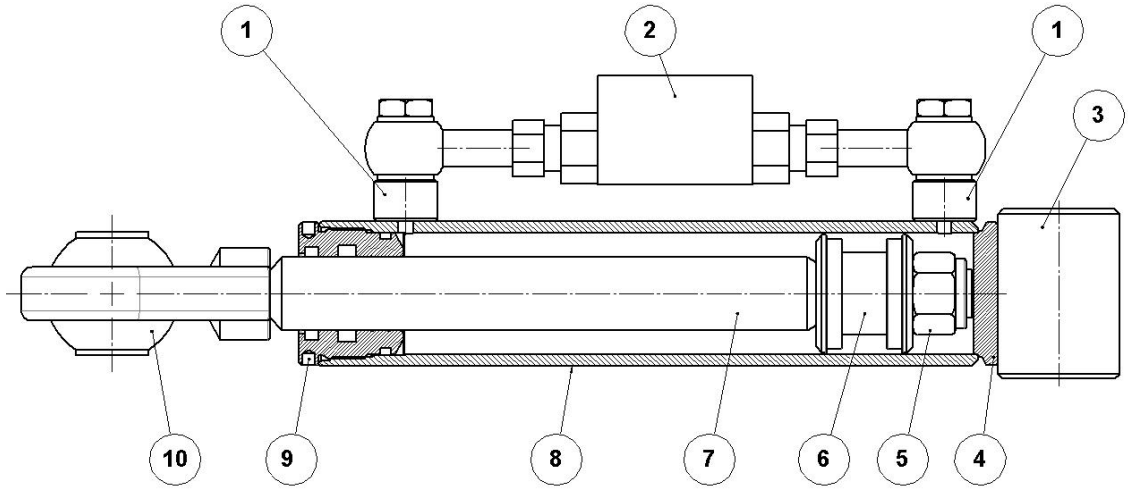
Diagram of hydraulic cylinder for drawbar 12910



1	OIL INLET FITTINGS	6	PISTON
2	DOUBLE-EFFECT CHECK VALVE WITH PIPES	7	ROD
		8	BODY
3	CYLINDER LOCKING BUSHING	9	HEAD
4	FOOTPLATE	10	ARTICULATED JOINT
5	PISTON SELF-LOCKING NUT		

Component features

Materials normally used for the different components:

Inner body: all the details in S235JR UNI EN 10025-1:2005
Rotating body: all the details in S355J2G3 UNI EN 10025-1:2005.
Mobile inner body: all the details in S235JR UNI EN 10025-1:2005.
Pin: 39NiCrMo4 UNI EN 10083-1:2006
Ring: S235JR UNI EN 10025-1:2005.
Eyelet: 35CrMo4 UNI EN 10083-1:2006

Hydraulic cylinder:

Body: bright H9 drawn steel pipe E355 UNI EN 10305-3:2003
Rod: chromed bar made of C45E UNI EN 10083-1:2006
Footplate: S355 UNI EN 10277-2:2000.
Head: cast iron EN GJL-250 UNI EN 1561:1998.
Piston: steel bar 9SMnPb28 (AVP) 10087:2000.
Fittings: cold-drawn bar S235JR UNI EN 10277-2:2000
Coupling bushings: laminated pipe made of S235JR UNI EN 10025-1:2005.
Oil pipes: SS pipe for hydraulic oil circuits S235JR UNI EN 10277-2:2000.

Rima S.p.A reserves the right to change the above listed materials without notice, assuring the same correct functioning. Unless otherwise requested by the customer, the drawbars are constructed using structural steel that can be normally used from -10/+80°C, but that are guaranteed from +20/+80°C as JR type.
If the customer needs a warranty for a lower temperature, he must request the appropriate materials.

4 IDENTIFICATION OF THE DRAWBAR AND MANUFACTURING DATE

Each cylinder has an internal code, the name of the company, the manufacturing month and year printed on the outside of the body.
As an alternative, this information can be written on a non-removable adhesive label.
Example of hydraulic cylinder stamping: RIMA001ABC01/11

5 PRELIMINARY PRECAUTIONS ON ASSEMBLING

Do not use the drawbars before reading all the instructions in this manual.
The **RIMA S.P.A.** company forbids its drawbars to be put into service until the machine into which they are incorporated conforms to the directive 2006/42/EC; consequently **RIMA S.P.A.** declines all responsibility for the improper use of its drawbars.
Changing or transforming the drawbar or its components without specific authorisation from **RIMA S.P.A.** is forbidden.
Before being fitted to machines or equipment, the drawbars must be painted or galvanized to protect them against aggressive agents and rust. During the paint preparation process, make sure to cover the drawbar parts that are not to be covered with paint (machine fitting holes, grease nipples, the oil incoming holes in case of hydraulic drawbar). For hydraulic drawbars during the painting process the temperature must not be greater than 70°C. If the temperature should exceed this value, the cylinder inner seals could be damaged.
The supports and the movement devices of the machine and of the equipment to which the drawbars are connected as well as the accessible parts of the frames in which the drawbars are positioned must not have any sharp edges or burrs so that no injuries are caused when fitting or removing drawbars.
The drawbar opening and closing movement must never be stopped by fixed or movable parts of the machine on which it is fitted; those parts could interfere with the movement of the drawbar or damage the oil connecting pipes.
To operate the hydraulic drawbar only use appropriate oil for hydraulic control that comply with the following specifications: ISO 11158 type HM - DIN 51524 part 2nd class HLP

6 TRANSPORT OR HANDLING INSTRUCTIONS

RIMA's standard packaging can be handled with standard lifting devices.
On receipt of the goods is essential to open the package and keep it in a protected area (not subject to weather conditions)

If the drawbar is so heavy that it cannot be safely moved by hand, it must be lifted with means suitable for its mass. As a lifting sling, it is necessary to use at least two fabric belts which comply with directive 2006/42/EC, having the same length, hung around both ends of the drawbar correctly and safely (do not use steel cables or chains in contact with the drawbar because the surfaces could be damaged).

It is necessary to make sure that the lifting operation is performed safely by checking that both the means of lifting and the sling belts are capable of lifting the weight of the drawbar in safety.

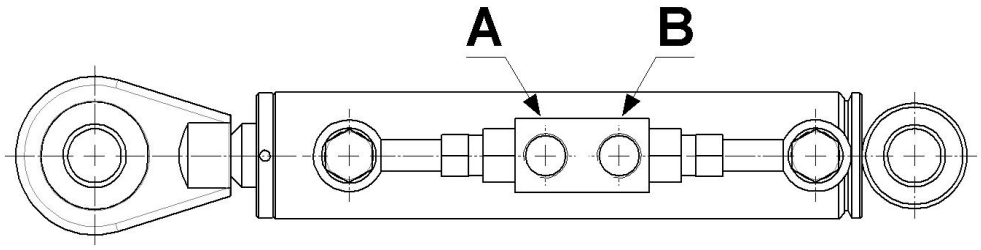
7 INSTRUCTIONS FOR FITTING THE DRAWBARS ON MACHINES AND/OR EQUIPMENT

The operations for installing the drawbars on machines and equipment must be performed by qualified personnel who have read and understood this instruction manual in all its parts.

It is necessary to pay attention that the supports and the moving devices of the machines and of the equipment to which the drawbars are connected are in a centred position with respect to the drawbar axis. In this way, there will be no transverse forces on the pipes, thus avoiding the premature wear of all the sliding parts of the drawbar or breaking of the drawbar itself.
The connection of the drawbars to the supports and the moving devices of the machines and equipment, must be performed by welding carried out by specialized personnel according to ISO 3834 standard, or by means of fixing mechanical systems compatible with the fittings set by the design and constructed using material and tolerances suitable for safely supporting the maximum thrust of the drawbars.
In case of hydraulic drawbar, it is strictly forbidden to weld directly on the cylinder because the heat could damage the inner seals and may cause a malfunctioning of the drawbar.
After fitting on the machine, it is necessary to check for correct coupling; the drawbars must be tested to check correct functioning.

8 INSTRUCTIONS FOR USE

Make sure that the position of the machine on which the drawbar is assembled is stable and that the operation of the drawbar does not cause an overbalance or create a danger for people and objects.
To change the position of the mobile inner body, take the central pivot out and then move the mobile inner body onto the new position and block it using the pivot.
In hydraulic drawbars, the cylinder moves the mobile inner body; therefore take the pivot away, then run the cylinder in order to shift the mobile inner body. When it is in the new position, block it again using the pivot.
To open the cylinder, send the oil under pressure into the "B" valve entrance (see diagram hereunder), send oil under pressure into the "A" fitting to close it. Never exceed the cylinder operating pressure limit.



9 INSTRUCTIONS FOR MAINTENANCE AND CHECKING

Read this instruction manual before starting operations of maintenance and checking.
Any operations of maintenance or checking on the drawbars installed on the machines must be performed by properly trained staff using suitable accident prevention equipment. These operations must be performed with the machine at a standstill, set in a stable position.

MAINTENANCE OPERATIONS. (To be performed every 50-drawbar working hours or at least twice a year). This operation consists of cleaning the outside of the drawbars and greasing by means of the appropriate grease guns.
CHECKING OPERATIONS. (To be performed every 50-drawbar working hours or at least twice a year). It is necessary to check that the sliding parts slide easily without any problem or blockage and that there is no leakage of oil (for hydraulic drawbars). Also, check that there are no damaged or deformed parts either in the drawbar, the supports or in the machine moving devices to which the drawbars are connected.

10 DRAWBAR OVERHAULING

All overhauling carried out during the warranty period must be done at Rima S.p.A. or at workshops expressly authorized by Rima S.p.A.
This operation is necessary when difficulties of use or damaged components are discovered after the checks have been made.
In these conditions, the machine or the equipment cannot be used and it is therefore necessary to disassemble the damaged drawbar for overhauling. Trained staff must carry out the operations of removing the drawbar from the machine and overhauling.

Instructions for disassembling the drawbar from the machine or equipment

The operation to disassemble the drawbar from the machine or equipment must be performed with the machine at a standstill, set in a stable position, with the engine switched off and with the key removed.
Before starting to disassemble, use suitable means to securely anchor the parts of the machine or the equipment where the drawbar is connected, so that these parts cannot move during and after drawbar disassembly.

For hydraulic drawbars, before unscrewing the piping connecting the cylinder to the hydraulic system make certain that there is no pressure in the system, or if this is the case, release it.
In order to support the drawbar during disassembly, use the means suitable for its mass. If the drawbar is so heavy that it cannot be handled manually in safety, it is necessary to sling it using fabric bands of a suitable capacity, as described in point 6. This operation must be performed in safe conditions.
Check the type of fixing for the drawbar and go on with disassembly as described depending on the type:

- Drawbars fixed using screws or nuts; remove them using appropriate wrenches or devices.
- Welded drawbars: cut the welding with a grinder taking care not to damage the frame of both the machine and the tubular part of the drawbar.

Instructions for disassembling the drawbar

A bench with a vice and a support are indispensable for the drawbar disassembly operation. This support must be adjustable in height and be robust, to support the weight of the drawbar safely. In addition, if the drawbar is so heavy that it cannot be lifted manually, it must be lifted with a sling, as described in point 6 using means suitable for its mass.
To disassemble, proceed in the following way:

- Fix the outer side of the drawbar body in the vice and rest the inner part on a support; put some rags between the drawbar and the vice so as not to damage the paint.
- For hydraulic drawbars, take the cylinder away by unscrewing the nuts and the screws that fix it to the central and mobile body; for mechanical drawbars, go on to the next point.
- Unscrew the nut of the screw that fixes the cylinder rod to the inner part and take out the screw from its seat in order to take the inner part out.
- In order to remove the rotating body, unscrew the nut that blocks the rod, take the rod away and then take the rotating body out taking care not to lose the bearings.

Completely wash all the components of the drawbar, preferably using naphtha, kerosene or another degreasing agent that is not aggressive and blow with compressed air, until the pieces are completely clean.
Scrupulously check all the components to identify if there are any damaged or worn parts. In particular, check the welding of the plate and of inner and outer pipe fittings.
If you find components worn to the extent that they can no longer be used, contact **RIMA S.P.A.** requesting spare parts (do not replace components with pieces that are not original).
You can easily find grease nipples if you have to replace them, because they have standardised sizes and profiles. If you have any problem in finding them, please contact **RIMA S.P.A.**

Instructions for disassembling the cylinder (hydraulic drawbar)

A bench with a vice and a cylinder support are indispensable for the cylinder disassembly operations. This support must be adjustable in height and be robust, to support the weight of the cylinder safely. In addition, if the cylinder is so heavy that it cannot be lifted manually, it must be lifted with a sling, as described in point 6 using means suitable for its mass.
To disassemble, proceed in the following way: fix the rear coupling of the cylinder body in the vice and rest the front part on a support. Unscrew the nuts that connect the valve to the fittings and disconnect it from the cylinder; after that use a spanner to unscrew the head. If this is difficult to unscrew, use a rubber or plastic mallet on the spanner, then proceed to unscrew completely.
Place an oil container under the cylinder so that the oil does not leak onto the ground. Then slide the rod complete with head and piston out.
Next, fix the rod in the vice using some rags or similar material so as not to damage the chromium-plated surface and support it from the piston side with an adjustable support, always taking care to place rags or other material between the support and the rod.
As far as the disassembling of the piston is concerned, it is necessary to check if it is threaded directly onto the rod and fixed with a grub screw or if it is fixed using Loctite glue or with a nut. In the first case, it is necessary to remove the grub screw and then unscrew with a suitable spanner, in the second case it is necessary to warm the thread and unscrew; in the third case it is necessary to unscrew the nut. Then, after removing the piston, slide the head out of the rod.
Proceed to disassemble all the seals, both of the head and the piston, using tools that do not cut.

Completely wash all the components of the cylinder, preferably using naphtha, kerosene or another degreasing agent that is not aggressive and blow with compressed air, until the pieces are completely clean.
Scrupulously check all the components to identify if there are any worn parts. In particular, check the rod surface and the inside of the body to make sure that there are no scores or galling. If you find components worn to the extent that they can no longer be used, contact **RIMA S.P.A.** requesting spare parts (do not replace components with pieces that are not original).
The seals and rod guides, if there are any, must all be replaced with new ones. These are easy to find as they have standardised sizes and profiles. If you experience problems in finding them, please contact **RIMA S.P.A.**

Instructions for reassembling the cylinder (hydraulic drawbar)

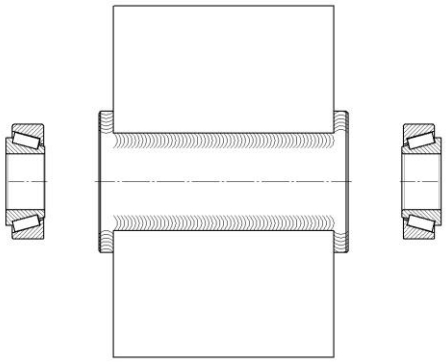
Prepare the new sealing kit, checking that they are the same as the original ones. Check that the seals, the components they are fitted to and the assembly tools are all perfectly clean. The assembly of the sealing parts does not present any particular difficulty, given the good elasticity of the material used.
To fit the head seals, lubricate them with hydraulic oil and insert them into the hollows provided. Work on them uniformly using a non-cutting tool, until fully inserted.
To fit the seals on the piston, lubricate them with hydraulic oil and fit the O-Rings into the specific piston hole seat. The main seal, composed of five parts, must be fitted outside the piston, using a non-cutting tool to fit the rubber part without deforming it and then the other parts can be fitted.
Place the welded coupling part of the rod into the vice and support it on the other side with an adjustable support, taking care to place rags or other material between the support and the rod so as not to damage the rod.
Fit the piston by pressure fitting it onto the turned rod and then tighten the self-locking nut using a manual or automatic tool. Apply the correct tightening torque as set in the standard tables.
For the version with the threaded hole piston, screw it using an appropriate spanner, tighten well and then fit the suitable anti-unscrewing device provided.
Place the welded coupling part of the cylinder body into the vice and support the front part with an adjustable support, in such a way that the cylinder body remains horizontal.
Before sliding in the rod complete with its components, it is necessary to lubricate the seal on the piston and the inside of the cylinder body with hydraulic oil or Teflon grease. Then slide it into the pipe, holding it in axis and keeping the piston seal centred in the first threaded part of the bore until it passes the chamfer of the thread end. Then push on the rod until the piston is fully inserted. If the piston is heavy, for this operation it is advisable to keep it raised using means suitable for its mass, slinging on the centre of the rod with a belt as described in point 6.
Screw the head onto the cylinder body with the appropriate spanner until fully screwed on and hit lightly with a rubber mallet onto the spanner to block the head.
Place the pipes with the valve on the fittings putting the washers between the fitting and the pipe and between the pipe and the drilled screw. Tighten the screw using an appropriate manual or automatic tool by applying the correct tightening torque as set in the standard tables.
Carry out a sliding test to check that the rod slides freely in the bore without sticking.
Warning: if the cylinder is not fitted immediately onto the machine, it is necessary to place special plastic plugs into the threaded holes to prevent any dirt entering.

Instructions for reassembling the drawbar

A bench with a vice and a drawbar support are indispensable for the drawbar reassembly operations. This support must be adjustable in height and be robust, to support the weight of the drawbar safely. In addition, if the drawbar is so heavy that it cannot be lifted manually, it must be lifted with a sling, as described in point 6 using means suitable for its mass.

To reassemble, proceed in the following way:

- Fix the inner body in the vice (place some rags to protect the paint of the drawbar being damaged by the vice) and insert the mobile part by blocking it using the sleeve and the eyelet.
- Fix the rotating body complete with bearings to the inner body by means of the pin and lock it with the self-locking nut applying the correct tightening torque as set in the standard tables. Take care to position the bearings correctly in their housing (see image on right).
- For hydraulic drawbars, assemble the cylinder by using the appropriate screws, so that the side with the articulated joint is locked to the inner body, while the side with the bushing is locked to the mobile part.



Grease the drawbar and check correct functioning before assembling it to the machine.

11 REPAIR AND SPARE PARTS

For any repair operation and/or the replacement of the various spare parts of the drawbar, not due to normal maintenance or overhauling, as indicated in the previous chapters, please contact **RIMA S.P.A.**, who will supply goods or give information on the subject.

12 DISPOSAL

Drawbar disposal must be carried out in conformity with the laws in force; therefore, the parts made of metal should be scrapped while those made of plastic or rubber should be disposed of in appropriate containers. When possible, grease and oil should be recycled and taken to the obligatory Cooperative deposit for used mineral oil. (www.coou.it).