PRONAR Sp. z o.o.

17-210 NAREW, UL. MICKIEWICZA 101A, PODLASKIE PROVINCE

phone:	+48 085 681 63 29	+48 085 681 64 29
	+48 085 681 63 81	+48 085 681 63 82
fax:	+48 085 681 63 83	+48 085 682 71 10

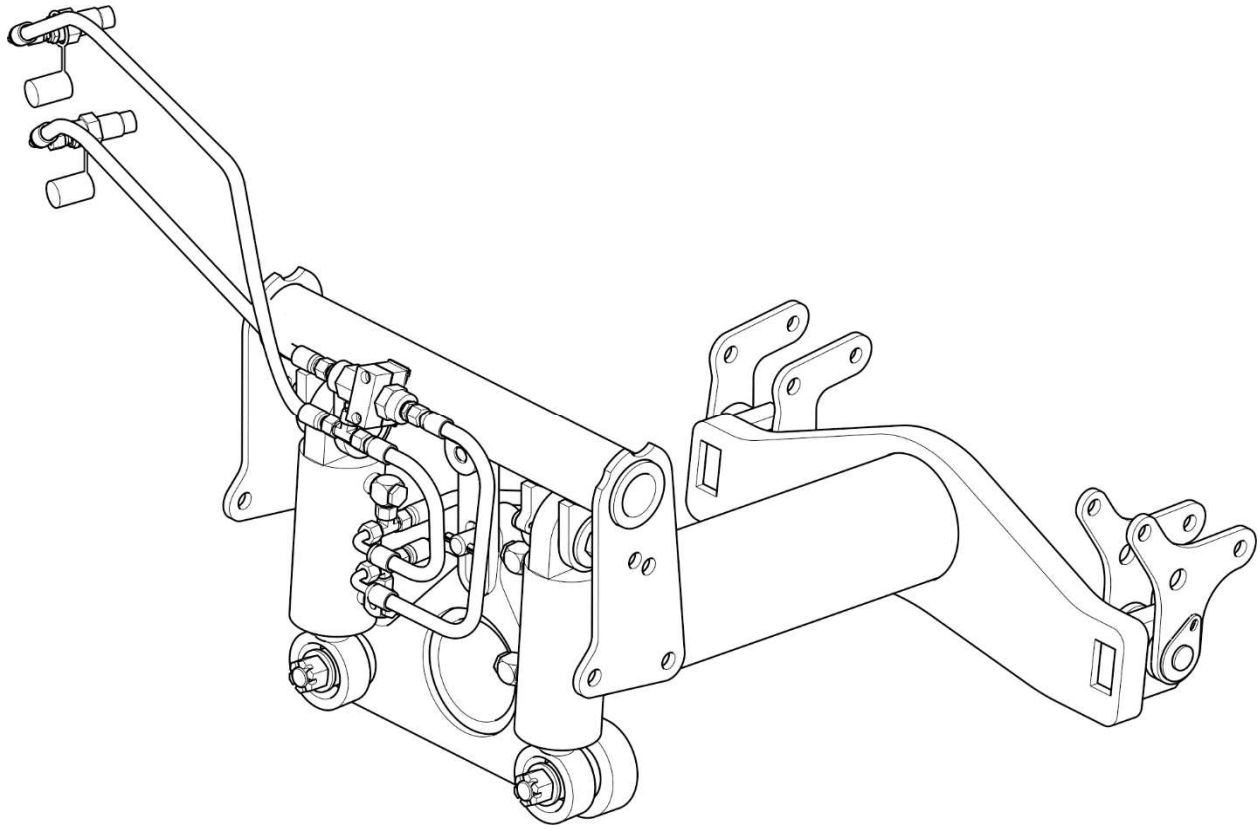
www.pronar.pl

OPERATOR`S MANUAL

TURNING FRAME

R-MU4

TRANSLATION OF THE ORIGINAL COPY OF THE MANUAL



EDITION 1A-11-2012

PUBLICATION NO 376N-00000000-UM

EN

TURNING FRAME

R-MU4

MACHINE IDENTIFICATION

TYPE: R-MU4

SERIAL NUMBER:

INTRODUCTION

Information contained herein is current at date of publication. As a result of improvements, some numerical values and illustrations contained in this publication may not correspond to the factual specification of the machine supplied to the user. The manufacturer reserves the right to introduce design changes in machines produced that facilitate operation and improve the quality of their work, without making minor amendments to this Operator's Manual.

This Operator's Manual is an integral part of the machine's documentation. Before using the machine, the user must carefully read this Operator's Manual and observe all recommendations. This guarantees safe operation and ensures failure-free work of the machine. The machine is designed to meet obligatory standards, documents and legal regulations currently in force.

The manual describes the basic safety rules and operation of the implement. If the information stated in the Operator's Manual needs clarification then the user should refer for assistance to the sale point where the machine was purchased or to the Manufacturer.

MANUFACTURER'S ADDRESS:

PRONAR Sp. z o.o.
ul. Mickiewicza 101A
17-210 Narew

CONTACT TELEPHONES

+48 085 681 63 29 *+48 085 681 64 29*
+48 085 681 63 81 *+48 085 681 63 82*

SYMBOLS APPEARING IN THIS OPERATOR'S MANUAL

Information, descriptions of danger and precautions and also recommendations and prohibitions associated with user safety instructions are marked:

and also preceded by the word **"DANGER”.** Failure to observe the instructions may endanger the machine operator's or other person's health or life.

Particularly important information and instructions, the observance of which is essential, are distinguished in the text by the sign:

and also preceded by the word **"ATTENTION".** Failure to observe the instructions may lead to damage to the machine as a result of improper operation, adjustment or use.

In order to focus the user's attention on the need to perform maintenance, the relevant section of the Operator's Manual is marked with the pictogram:

Additional tips and advice for machine operation are marked with the sign:

and also preceded by the word **"TIP".**

DIRECTIONS USED IN THIS OPERATOR'S MANUAL

Left side – side to the left hand of the operator facing in the direction of machine's forward travel.
Right side – side to the right hand of the operator facing in the direction of machine's forward travel.

PRONAR Sp. z o.o.
ul. Mickiewicza 101 A
17-210 Narew, Polska
tel./fax (+48 85) 681 63 29, 681 63 81, 681 63 82,
681 63 84, 681 64 29
fax (+48 85) 681 63 83
http://www.pronar.pl
e-mail: pronar@pronar.pl

EC DECLARATION OF CONFORMITY OF THE MACHINERY

PRONAR Sp. z o.o. declares with full responsibility, that the machine:

Description and identification of the machinery	
Generic denomination and function:	**Torsion frame**
Type:	**R-MU4**
Model:	–
Serial number:	
Commercial name:	**Torsion frame PRONAR R-MU4**

to which this declaration relates, fulfills all the relevant provisions of the Directive **2006/42/EC** of The European Parliament and of The Council of 17 May 2006 on machinery, and amending Directive 95/16/EC (Official Journal of the EU, L 157/24 of 09.06.2006).

The person authorized to compile the technical file is the Head of Research and Development Department at PRONAR Sp. z o.o., 17-210 Narew, ul. Mickiewicza 101A, Poland.

This declaration relates exclusively to the machinery in the state in which it was placed on the market, and excludes components which are added and/or operations carried out subsequently by the final user.

„PRONAR" Spółka z o.o.
17-210 Narew, ul. Mickiewicza 101 A
tel. (085) 681 6329, 681 6429
fax. (085) 681 6383

Z-CA DYREKTORA d/s technicznych członek zarządu
Roman [illegible]

Narew, the 2017-08-28

Place and date

Full name of the empowered person position, signature

TABLE OF CONTENTS

SECTION

1

BASIC INFORMATION

1.1 IDENTIFICATION

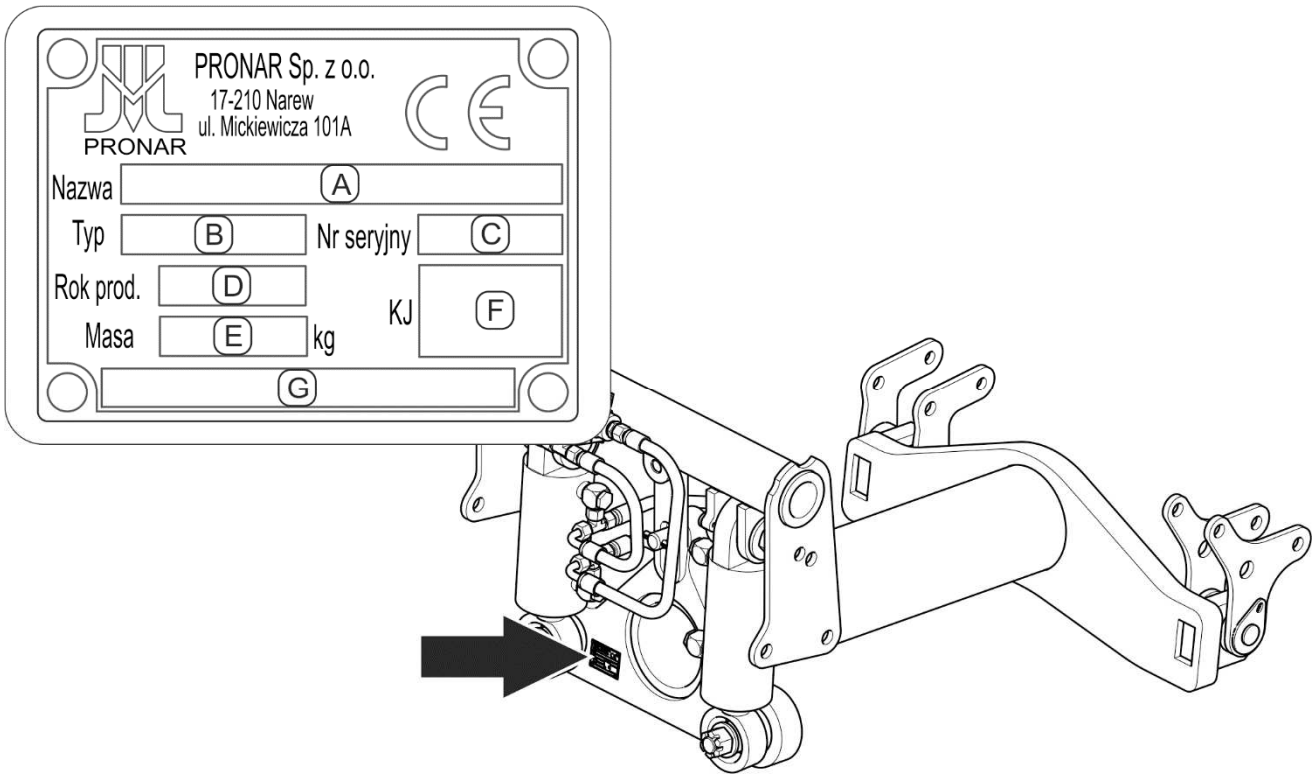


FIG. 1.1 Location of the data plate

Meaning of data plate items (FIG. 1.1):

A - machine name

B – type

C – serial number

D – year of manufacture

E – machine tare weight [kg]

F – Quality Control stamp

G – basic technical parameters

Serial number is stamped on the data plate. The data plate is located on the left side of the lever of the three-point linkage arms (FIG. 1.1)

1.2 PROPER USE

The turning frame is used for blocking the tilt of the carrying vehicle's front axle caused by nonsymmetrical lateral vertical loads occurring during operation of the carrying vehicle with such machines and devices as an outrigger mower.

R-MU4 bearing frame is an additional equipment of the carrying vehicle and can be mounted on UNIMOG vehicles that meet the requirements set out in table 1.1.

Using it as intended also involves all actions connected with the safe and proper operation and maintenance of the machine. Due to the above, the user is obliged to:

- carefully read the *OPERATOR'S MANUAL* and comply with its recommendations,
- understand the machine's operating principle and how to operate it safely and correctly,
- comply with general safety regulations while working,
- prevent accidents,
- comply with road traffic regulations.

The machine may only be used by persons, who:

- are familiar with the contents of this publication and with the contents of the Operator's Manual of the carrying vehicle,
- have been trained in machine operation and safe working Conditions of,
- have the required authorisation to drive the vehicle and are familiar with the road traffic regulations and transport regulations.

ATTENTION

The machine must not be used for purposes other than those for which it is intended.

The turning frame components (e.g. cylinders, main frame) must not be used as a towing hitch.

TAB. 1.1 Carrying vehicle requirements

	UNIT	REQUIREMENTS
Type of carrying vehicle	-	Mercedes - Benz UNIMOG U300, UNIMOG U400, UNIMOG U500
Hydraulic system		
Nominal pressure in the system	bar / MPa	200 /20
Number of hydraulic sockets	-	2 socket of one section with the possibility of changing the direction of oil circulation
Oil demand:	l	2.5

1.3 EQUIPMENT

The equipment of the machine includes:

- The Operator's Manual;
- Warranty Book

1.4 WARRANTY TERMS

PRONAR Sp. z o.o. Narew guarantees reliable operation of the implement when it is used according to its intended purpose as described in the *OPERATOR'S MANUAL*. Defects discovered during the warranty period will be removed by the Warranty Service. The repair period is specified in the *WARRANTY BOOK*.

The warranty does not cover those parts and sub-assemblies of the machine which are subject to wear in normal usage conditions, regardless of the warranty period.

The warranty service only applies to such cases as: mechanical damage which is not the user's fault, factory defects of parts, etc.

In the event of damage arising from:

- mechanical damage which is the user's fault, road accidents,
- inappropriate use, adjustment or maintenance, use of the machine for purposes other than those for which it is intended,

- use of damaged or malfunctioning machine,
- repairs carried out by unauthorised persons, repairs carried out improperly,
- making unauthorised alterations to machine design,

the user will lose the right to warranty service.

TIP

Demand that the seller carefully and precisely fills out the *WARRANTY BOOK* and warranty repair coupons. A missing date of purchase or sale point stamp may make the user ineligible for any warranty repair or refund.

For detailed Terms & Conditions of Warranty, please refer to the *WARRANTY BOOK* attached to each newly purchased machine.

Modification of the implement without the written consent of the Manufacturer is forbidden. In particular, do NOT weld, drill holes in, cut or heat the main structural elements, which have a direct impact on the implement operation safety.

1.5 TRANSPORT

The machine is ready for sale in disassembled condition. The machine may be supplied to the user by any means of transport, which comply with safety conditions during transport. When loading and unloading the machine, comply with the general principles of workplace health and safety for reloading work. Persons operating reloading equipment must have the qualifications required to operate these machines.

1.6 ENVIRONMENTAL HAZARDS

A hydraulic oil leak constitutes a direct threat to the natural environment owing to its limited biodegradability. Maintenance and repair work which involves the risk of an oil leak should be performed in the rooms with oil resistant surface. In the event of oil leaking into the environment, first of all contain the source of the leak, and then collect the leaked oil using available means. Remaining oil should be collected using sorbents, or by mixing the oil with sand, sawdust or other absorbent materials. The oil contaminations, once gathered up, should be kept in a sealed, marked, hydrocarbon resistant container, and then passed on to

the appropriate oil waste recycling centre. The container should be kept away from heat sources, flammable materials and food.

Oil, which has been used up or is unsuitable for further use owing to loss of its properties should be stored in its original packaging in the conditions described above.

1.7 WITHDRAWAL FROM USE

ATTENTION

During dismantling, personal protection equipment shall be used i.e. protective clothing, boots, gloves and protective goggles etc.

Avoid contact of skin with oil. Do not allow used oil to spill.

In the event of decision by the user to withdraw the machine from use, comply with the regulations in force in the given country concerning withdrawal from use and recycling of machines withdrawn from use.

Before proceeding to dismantle machine, oil shall be completely removed from hydraulic system. When spare parts are changed, worn out or damaged parts should be taken to a collection point for recyclable raw materials. Used oil and also rubber and plastic elements should be taken to the appropriate facilities dealing with the recycling of this type of waste.

SECTION

2

SAFETY ADVICE

2.1 BASIC SAFETY RULES

2.1.1 USE OF MACHINE

- Before using the implement, the user must carefully read this Operator's Manual and the *WARRANTY BOOK*. When operating the machine, the operator must comply with all recommendations contained in the Operator's Manual.
- The implement may only be used and operated by persons qualified to drive carrying vehicles and trained in the use of the implement.
- If the information in this Operator's Manual is difficult to understand, contact the dealer, who runs an manufacturer authorised service, or contact the manufacturer directly.
- Be aware of the residual risk. Use caution when operating this machine and apply all relevant safety principles.
- The implement must never be used by persons, who are not authorised to drive carrying vehicle, including children and people under the influence of alcohol or other drugs.
- Non-compliance with the safety rules of this Operator’s Manual can be dangerous to the health and life of the operator and others.
- The implement must not be used for purposes other than those for which it is intended. Anyone who uses the implement other than the way intended takes full responsibility for himself for any consequences of this use. Use of the implement for purposes other than those for which it is intended by the Manufacturer may invalidate the warranty.
- The machine may only be used when all the protective elements (i.e. safety guards, bolts, cotter pins) are technically sound and correctly positioned. In the event of loss or destruction of the safety guards, they must be replaced with new ones.

2.1.2 HYDRAULIC SYSTEM

- The hydraulic system is under high pressure when operating.
- Regularly check the technical condition of the connections and the hydraulic conduits. Damaged or worn conduits should be replaced. There must be no oil leaks.
- In the event of the hydraulic system malfunction, discontinue using the implement until the malfunction is corrected.
- When connecting or disconnecting the hydraulic conduits, make sure that the hydraulic system of the carrying vehicle and the implement is not under pressure. If necessary, reduce residual pressure in the system.
- In the event of injuries being caused by pressurised hydraulic oil, contact a doctor immediately. Hydraulic oil may find its way under the skin and cause infections. In the event of contact of oil with eye, rinse with large quantity of water and in the event of the occurrence of irritation consult a doctor. In the event of contact of oil with skin wash the area of contact with water and soap. Do NOT apply organic solvents (petrol, kerosene).
- Used oil or oil which has lost its properties should be stored in original containers or replacement containers resistant to action of hydrocarbons. Replacement containers must be clearly marked and appropriately stored.
- Release hydraulic pressure before starting work on the hydraulic system.
- Do not store hydraulic oil in packaging designed for storing food or foodstuffs.
- Rubber hydraulic conduits must be replaced every 4 years regardless of their technical condition.
- Repairs and replacements of hydraulic system elements should be carried out by the appropriately qualified persons.

2.1.3 TRANSPORTING THE MACHINE

- When driving on public roads, comply with the road traffic regulations in force in the country in which the implement is used.

- Do not exceed the permitted speed arising from road conditions and design limitations. Adjust travel speed to the prevailing road conditions and other limitations arising from road traffic regulations limits.
- During transport, the turning frame should be unlocked (cylinders in floating position).
- Before using the implement always check its technical condition, especially in terms of safety. In particular, check the technical condition of the hydraulic system components.
- Reckless driving and excessive speed may cause accidents.

2.1.4 MAINTENANCE

- During the warranty period, any repairs may only be carried out by Warranty Service authorised by the manufacturer. It is recommended that necessary repairs to machine should be undertaken by specialised workshops.
- In the event of any fault or damage, do not use the implement until the fault has been fixed.
- During work on the turning frame, use the proper, close-fitting protective clothing, gloves and appropriate tools. When working on hydraulic systems it is recommended to use oil resistant gloves and protective goggles.
- Any modification to the turning frame frees PRONAR from any responsibility for damage or detriment to health, which may arise as a result.
- Regularly check the technical condition of the safety devices and correct tightening of bolt connections.
- Regularly perform service inspections of the implement as recommended by the Manufacturer.
- Before beginning work on hydraulic systems, reduce oil pressure.
- Servicing and repair work should be carried out in line with the general principles of workplace health and safety. In the event of injury, the wound must be immediately cleaned and disinfected. In the event of more serious injuries, seek a doctor's advice.

- Repair, maintenance and cleaning work should be carried out with the carrying vehicle engine turned off and the ignition key removed. Immobilise the carrying vehicle with parking brake. Ensure that unauthorised persons do not have access to the vehicle cab.
- Should it be necessary to change individual parts, use only original parts. Non-adherence to these requirements may put the user and other people's health and life at risk, and also damage the machine and invalidate the warranty.
- Do NOT weld, drill holes in, cut or heat the main structural elements, which have a direct impact on the machine operation safety.
- After completed lubrication, remove excess of grease.
- Clean and wash the carrying vehicle with the implement only in the designated places and adhere to the environment protection regulations.
- Use only cleaning agents with neutral pH. Acidic and basic cleaning agents must not be used.
- When washing the machine with a pressure washer, do not direct a water jet directly at joints, labels and flexible conduits.
- In order to reduce the danger of fire the implement must be kept in a clean condition.

2.1.5 WORKING WITH THE TURNING FRAME

- Before starting the carrying vehicle with the turning frame installed, make sure that the external hydraulic circuit for controlling the frame is not activated. Otherwise, the vehicle linkage may move in an uncontrolled manner.
- During implement operation do not occupy a different position than that of the operator in the vehicle's cab. Do NOT leave the operator cab when the machine or working tool is in operation.

2.2 RESIDUAL RISK

Pronar Sp. z o. o. in Narew has made every effort to eliminate the risk of accidents. There is, however, a certain residual risk, which could lead to an accident, and this is connected mainly with the actions described below:

- using the implement for purposes other than those for which it is intended,
- being between the carrying vehicle and the machine while the machine is being attached,
- being on the machine while the engine is running,
- not maintaining a safe distance from the danger zone or being within the zones while the implement is operating,
- operation of the machine by persons under the influence of alcohol,
- cleaning, maintenance and technical checks when carrying vehicle is connected and engine is running

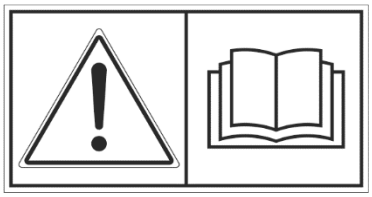
The minimal risk may be kept to a minimum by following the recommendations below:

- prudent and unhurried operation of the implement,
- sensible application of the remarks and recommendations contained in the Operator's Manual,
- carry out repairs and maintenance work in line with operating safety rules,
- repair and maintenance work should be carried out by persons trained to do so,
- use close fitting protective clothing,
- ensure unauthorised persons have no access to the machine, especially children,
- maintain a safe distance from forbidden or dangerous places
- do not climb on the implement when it is operating.

2.3 INFORMATION DECALS

All signs should always be legible and clean, visible to the operator and also to persons in the vicinity of working machine. If any safety sign is lost or illegible, it should be replaced with a new one. All elements having safety signs replaced during repairs should be affixed with these signs. Safety signs and decals may be purchased from the Manufacturer or the Seller.

TAB. 2.1 Information decals

ITEM	SYMBOL	DESCRIPTION
1		Company logo
2		Before starting work, carefully read the Operator's Manual

Numbers in the item column correspond to decals (FIG. 2.1)

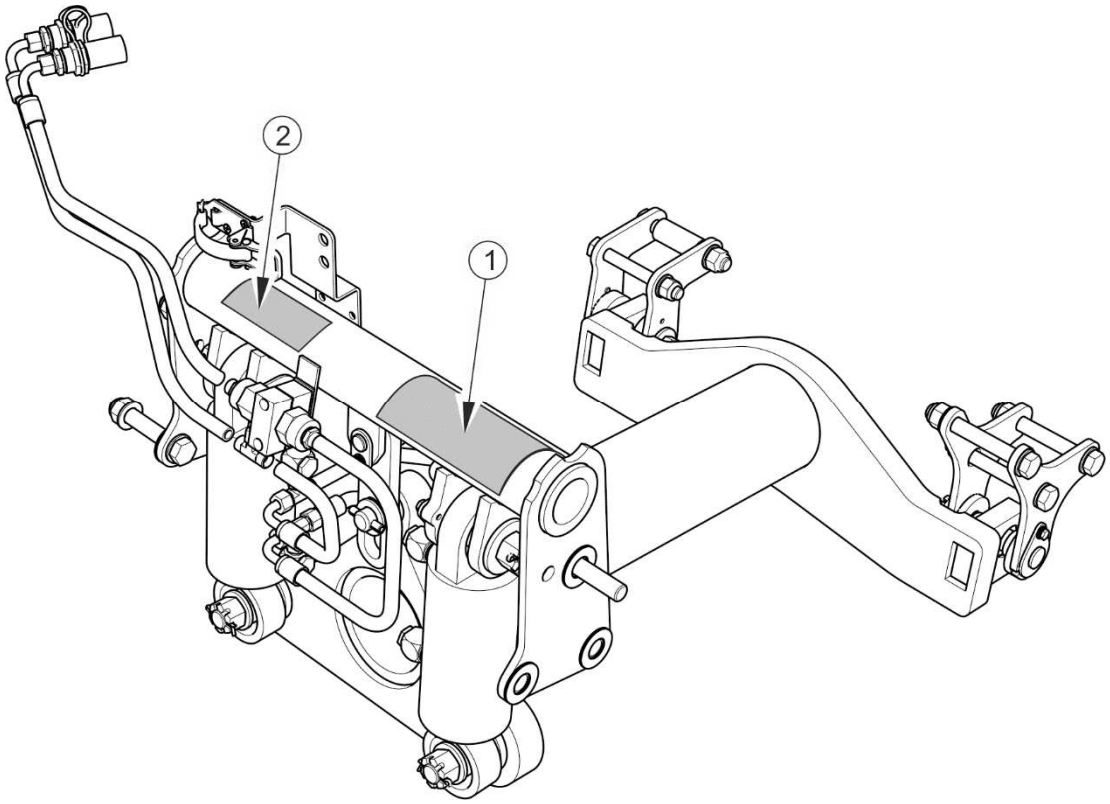


FIG. 2.1 Locations of information decals

Meaning of symbols (TAB. 2.1)

SECTION

3

DESIGN AND OPERATION

3.1 TECHNICAL SPECIFICATION

TAB. 3.1 BASIC TECHNICAL DATA

	Unit	
Type	–	R-MU4
Mounting method	–	front mounted to the carrying vehicle's frame
Power supply and control	–	external hydraulic system of the carrying vehicle
Nominal pressure	bar	200
Weight	kg	150

Level of noise emitted by machine does not exceed 70 dB(A)

3.2 GENERAL DESIGN

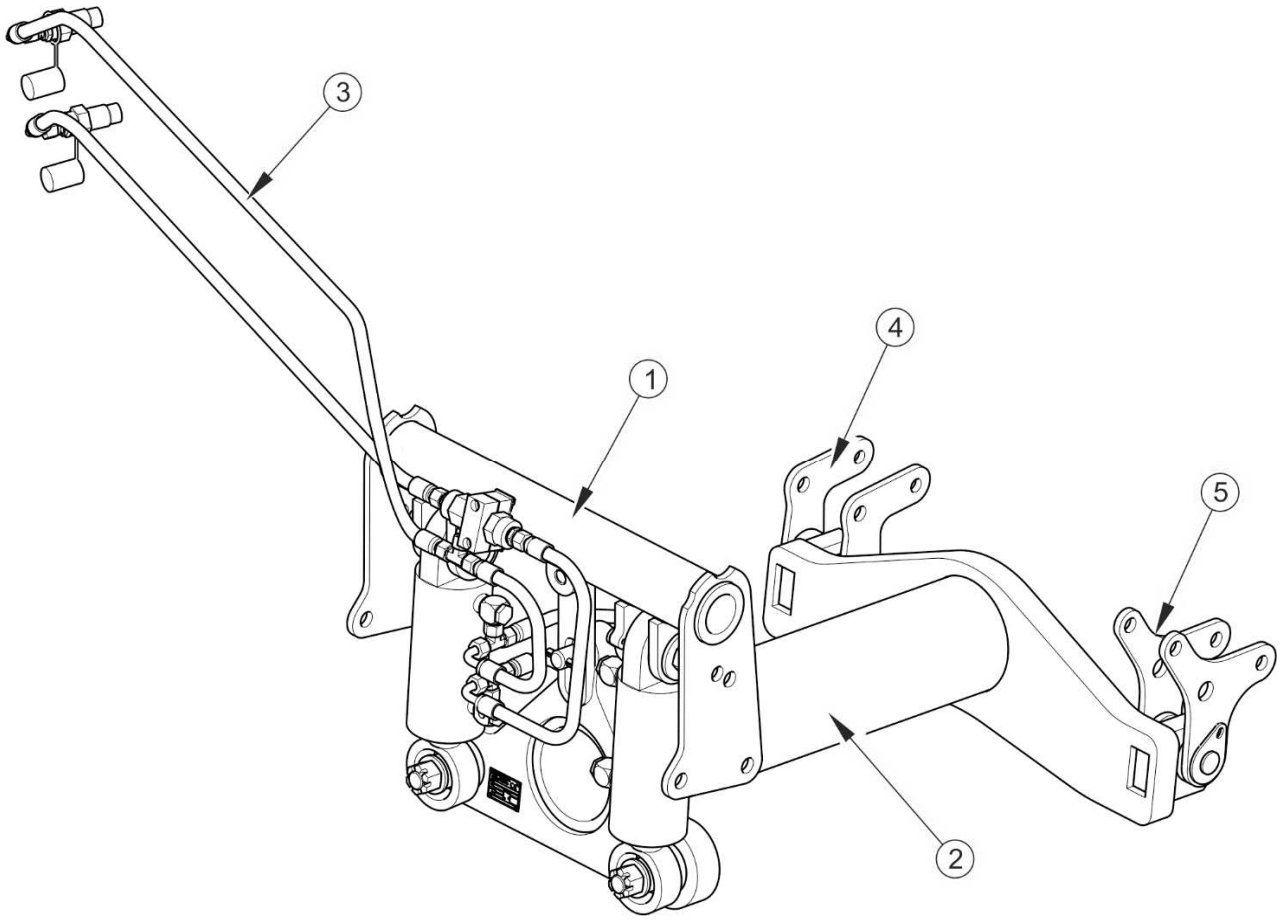


FIG. 3.1 General design

(1) – upper beam; (2) – lower frame; (3) - hydraulic system; (4) – frame plate, right; (5) – frame plate, left

3.3 HYDRAULIC SYSTEM

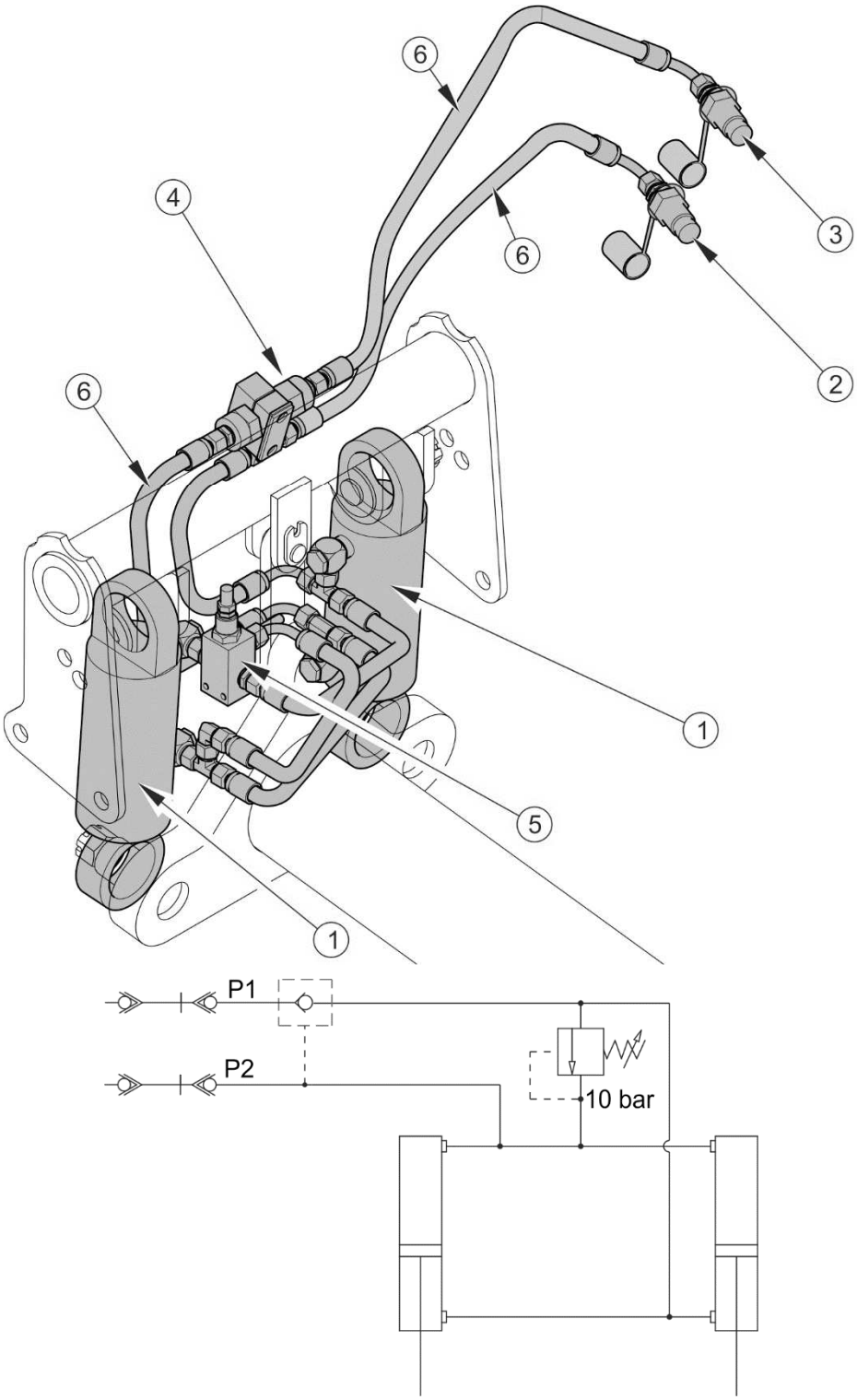


FIG. 3.2 Hydraulic system design

(1) - hydraulic cylinder; (2) - quick coupler of oil return from cylinders; (3) - quick coupler of cylinder supply; (4) – controlled check valve; (5) – overflow valve; (6) - hydraulic conduits

SECTION

4

CORRECT USE

4.1 MOUNTING THE TURNING FRAME ON THE CARRYING VEHICLE

Before mounting the frame, check completeness of its components. The mounting process should be performed by a person with appropriate qualifications. During mounting process, ensure that all threads of bolt and nut connections are free from contaminations and paint and that they are not mechanically damaged. Ensure that the bolt and nut connections fixing the turning frame are tightened using proper tightening torques according to table (5.2).

In order to mount the turning frame on U300/U400/U500 vehicles, first dismount the front vehicle body plate (1) using a crane – figure *(4.1).*

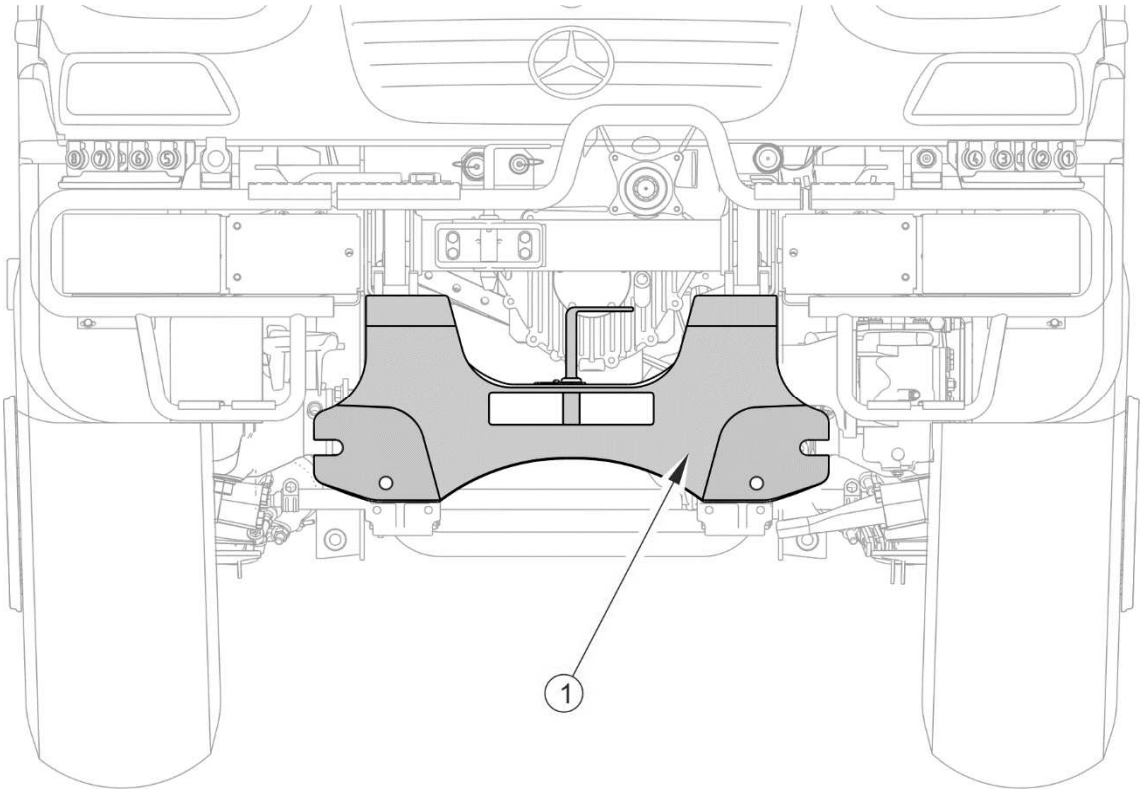


FIG. 4.1 Dismounting the vehicle body plate

(1) – front vehicle body plate

Next, remove the front protective shield (1) and two side shields (2) together with holders - figure *(4.2)*.

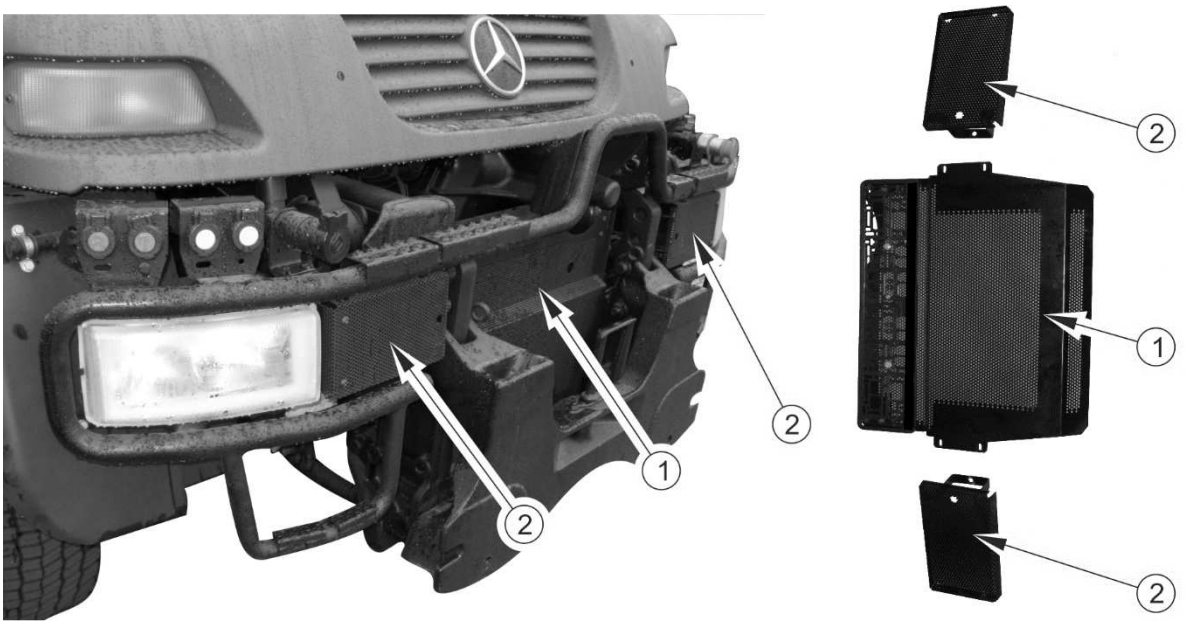


FIG. 4.2 Disassembly of protective shields

(1) – front shield, (2) – side shield

If U300/U400/U500 vehicles are equipped with a valve supporting bracket, dismount the bracket and replace it with bracket (1) - figure *(4.3)* which is delivered together with R-MU4 turning frame. The bracket should be mounted in the vehicle as shown in figure (*4.3).*

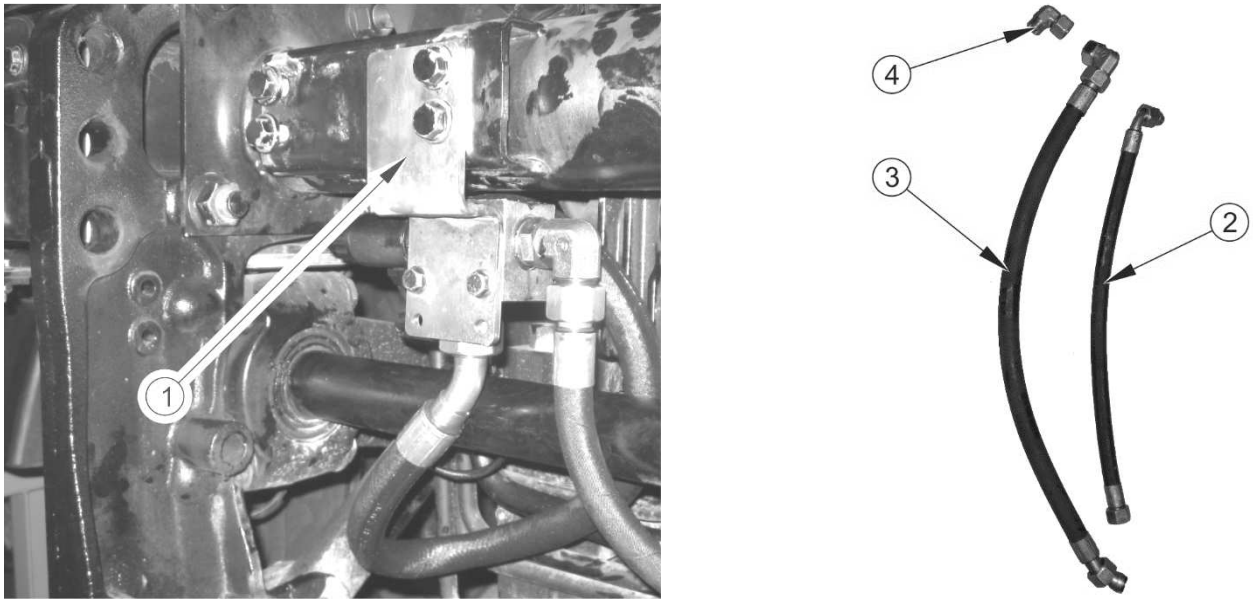


FIG. 4.3 Mounting the bracket and conduits

(1)– valve bracket, (2)– conduit I (12/02H1716S0600H0216S) (3)– conduit II (19/01H1122L0800H0222L), (4) – elbow (EW22LOMDCF)

U300/U400/U500 vehicles with a manufacturing date starting from March 2001 are equipped with two hydraulic pipes for connecting the valve. The pipes should be dismounted and replaced with hydraulic conduits *(2)* and *(3)* which are delivered together with R-MU4 turning frame - figure *(4.3)*.

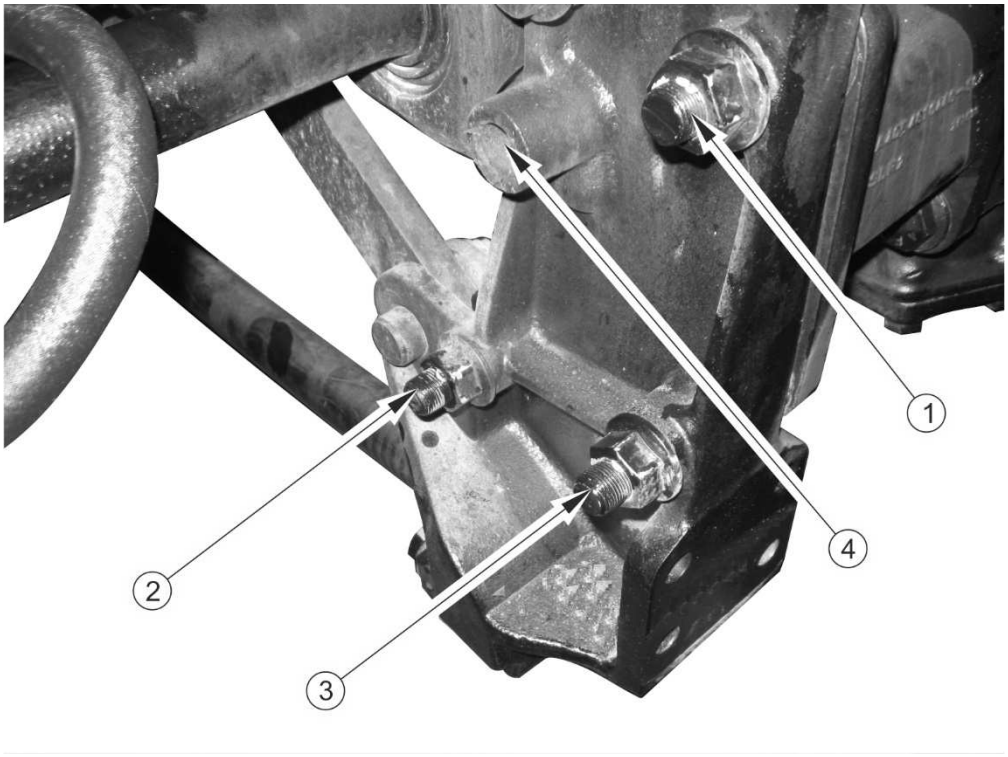


FIG. 4.4 Mounting the upper beam

(1) – original bolt I, (2) – original bolt II (3) – original bolt III, (4) – threaded hole

Next, on the left side of the vehicle (the side to the left hand of the operator facing in the direction of machine's forward travel) dismount and turn the original bolt *(1)* – figure *(4.4)* by 180^0. Remove nuts of bolts *(2)* and *(3)* and position the bolts in such a manner as to enable the installation of the upper beam of the turning frame.

TIP

The original nuts securing the steering gear should be replaced with new flange nuts M20x1.5, 5-10 type D - EN 14218

Next, clean the thread *(4)* in which M20x1.5x80 bolt is mounted. Remove contaminations and remaining paint from all bolts and thread the bolts again, if necessary, using a M20x1.5 threading die.

TIP

Tighten bolts (1), (2) and (3) securing the vehicle's steering gear using the tightening torque of 520 Nm. Tighten the remaining bolt and nut connections using proper tightening torques according to table (4.1).

Mount three bolts (3) M20x1.5x120 on the opposite side of the beam and secure them using washers (7) and nuts (6). If necessary, up to 15 shims (5) may be installed between the upper frame and the vehicle frame in order to centre the frame - figure *(4.5).*

TAB. 4.1 TIGHTENING TORQUE FOR NUT AND BOLT CONNECTIONS

THREAD DIAMETER [mm]	**10.9**	**10.9 with a flange**
	TIGHTENING TORQUE [Nm]	
M10	53	58
M16 x1.5	230	260
M18x1.5	335	380
M20x1.5	460	520

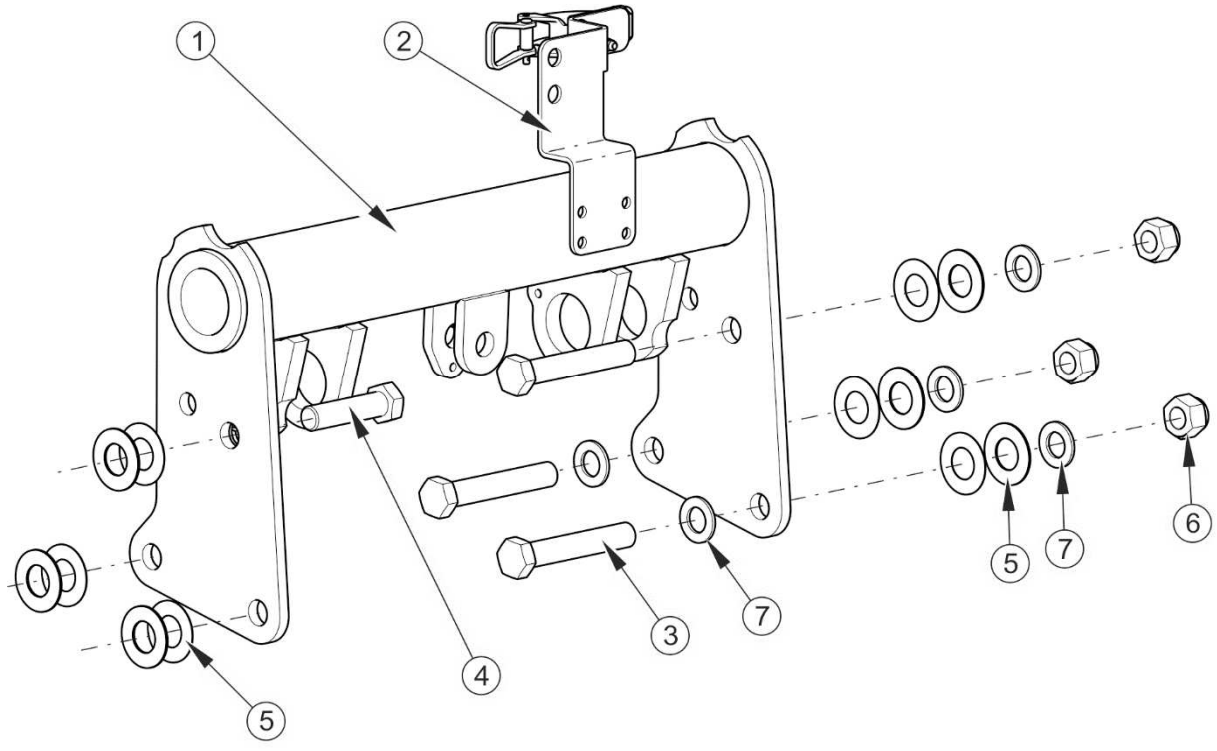


FIG. 4.5 Mounting the upper beam

(1) –upper frame, (2) – valve bracket, (3) – M20x1.5x120 bolt, (4) – M20x1.5x80 bolt, (5) – shim, (6) – M20x1.5 nut, (7) – washer 2

Next, in U300/U400/U500 vehicles, mount the frame plates (1) so that Ø 40 pin hole is located on the outside of the vehicle. Replace the original bolts on the right side with M18x1.5x150 bolt (2) and M20x1.5x150 bolt (4) - figure *(4.6).* Insert delivered sleeve (3) between the plates. In U500 vehicle, the plates having the same shape are mounted on the left side of the vehicle.

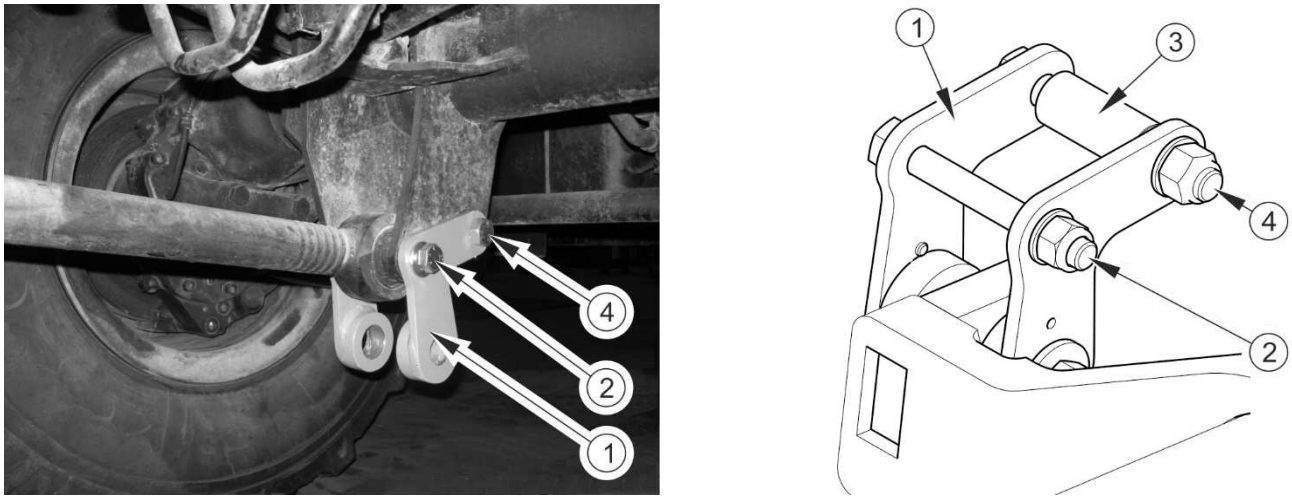


FIG. 4.6 Mounting the frame securing plates on the right side

(1) – frame plate, (2) – M18x1.5x150 bolt, (3) – sleeve, (4) – M20x1.5x150 bolt

In U300/U400 vehicles, dismount the original frame plates on the left side of the vehicle and mount the "banana" plates *(1)* so that Ø 40 pin hole is located on the outside of the vehicle. These plates are delivered together with R-MU4 turning frame – figure *(4.7)*. Mount these plates using three fixing bolts.

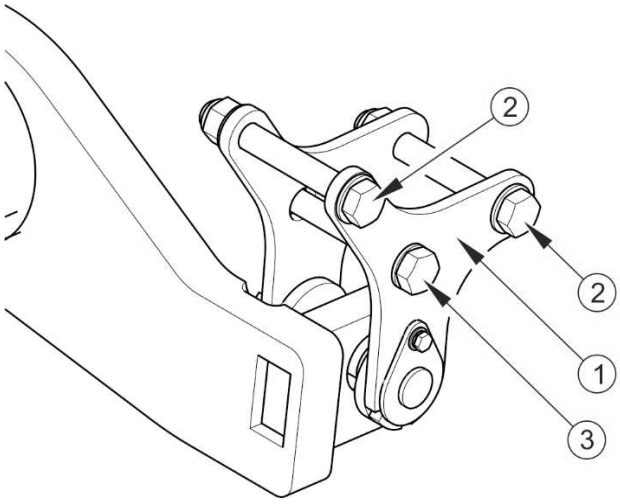


FIG. 4.7 Mounting the plates in U300/U400 vehicle on the left side

(1) – banana plate, (2) – M18x1.5x150 bolt, (3) – M20x1.5x150 bolt

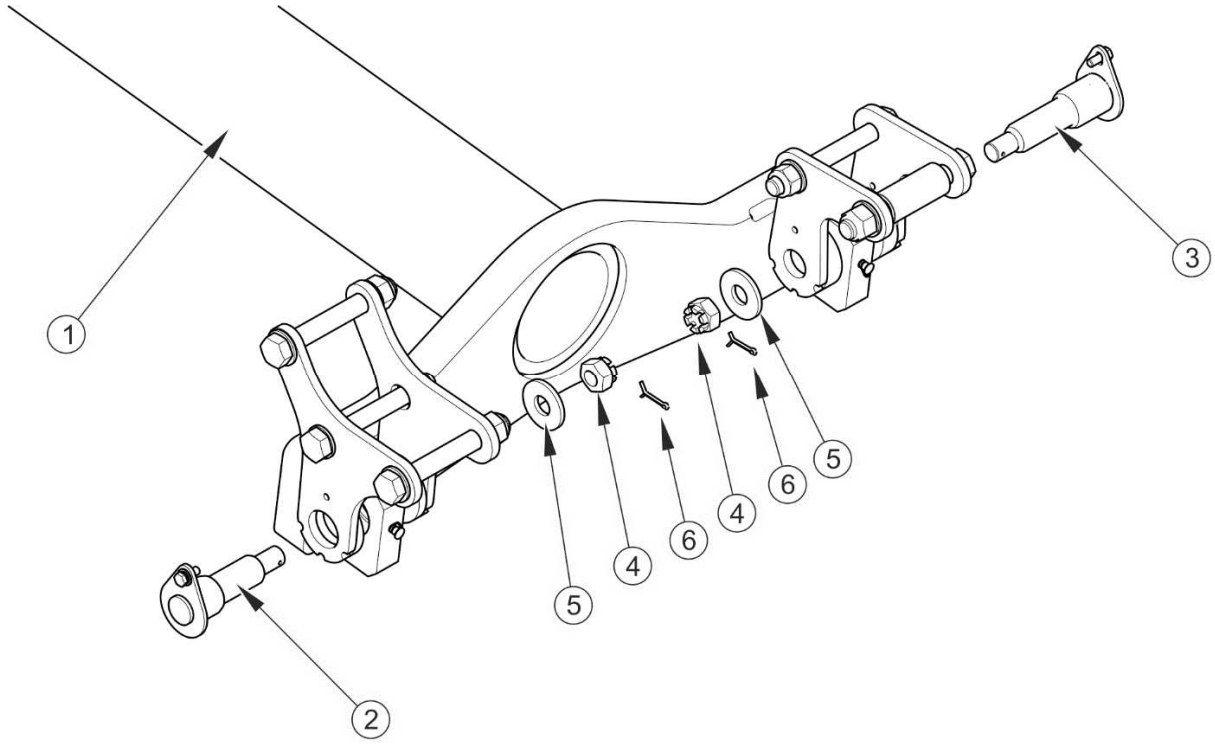


FIG. 4.8 Mounting the lower frame

(1) – lower frame, (2) – pin, (3) – pin, (4) – nut, (5) – washer, (6) – cotter pin

Next, attach the lower frame (1) to the plates - The frame should be suspended on the vehicle using pins (2), (3) and secured.

Next, suspend hydraulic cylinders (1) on the upper beam using pins (2) and secure the pins. Suspend the lower frame on the cylinders and secure using nut (3) and cotter pin (4) - figure *(4.9).*

Install the cylinder tilt interlock (5). On the side of the upper frame, secure the interlock using pin (6), on the side of the lower frame, install washer (7) and secure using spring-type straight pin (8) - figure *(4.9*).

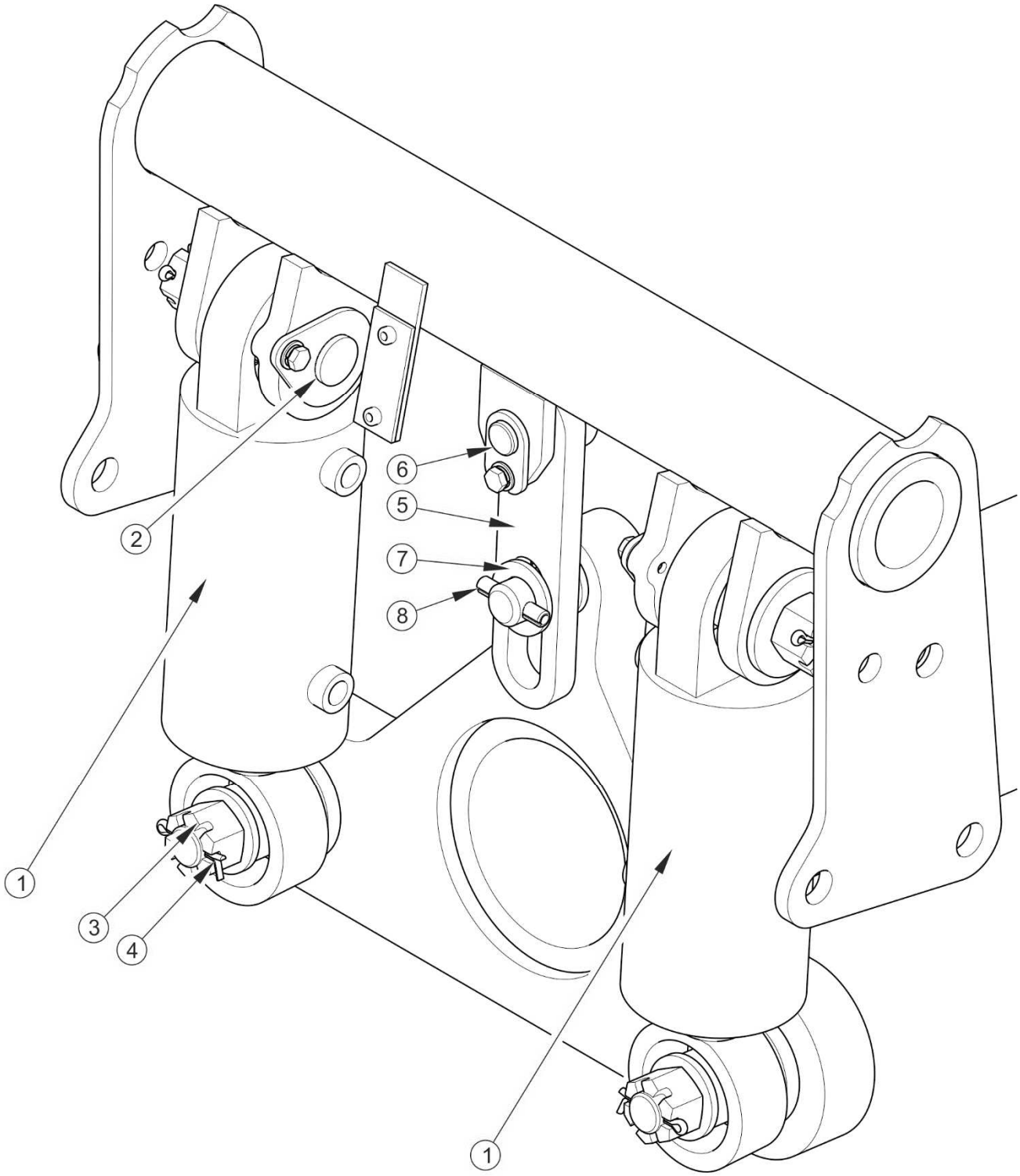


FIG. 4.9 Mounting the cylinders and cylinder tilt interlock

(1) – hydraulic cylinder, (2) – securing pin, (3) – nut, (4) – cotter pin, (5) – interlock, (6) – securing pin, (7) – washer, (8) – spring-type straight pin

4.2 INSTALLATION OF HYDRAULIC SYSTEM

Hydraulic system components should be installed by a person with appropriate qualifications.

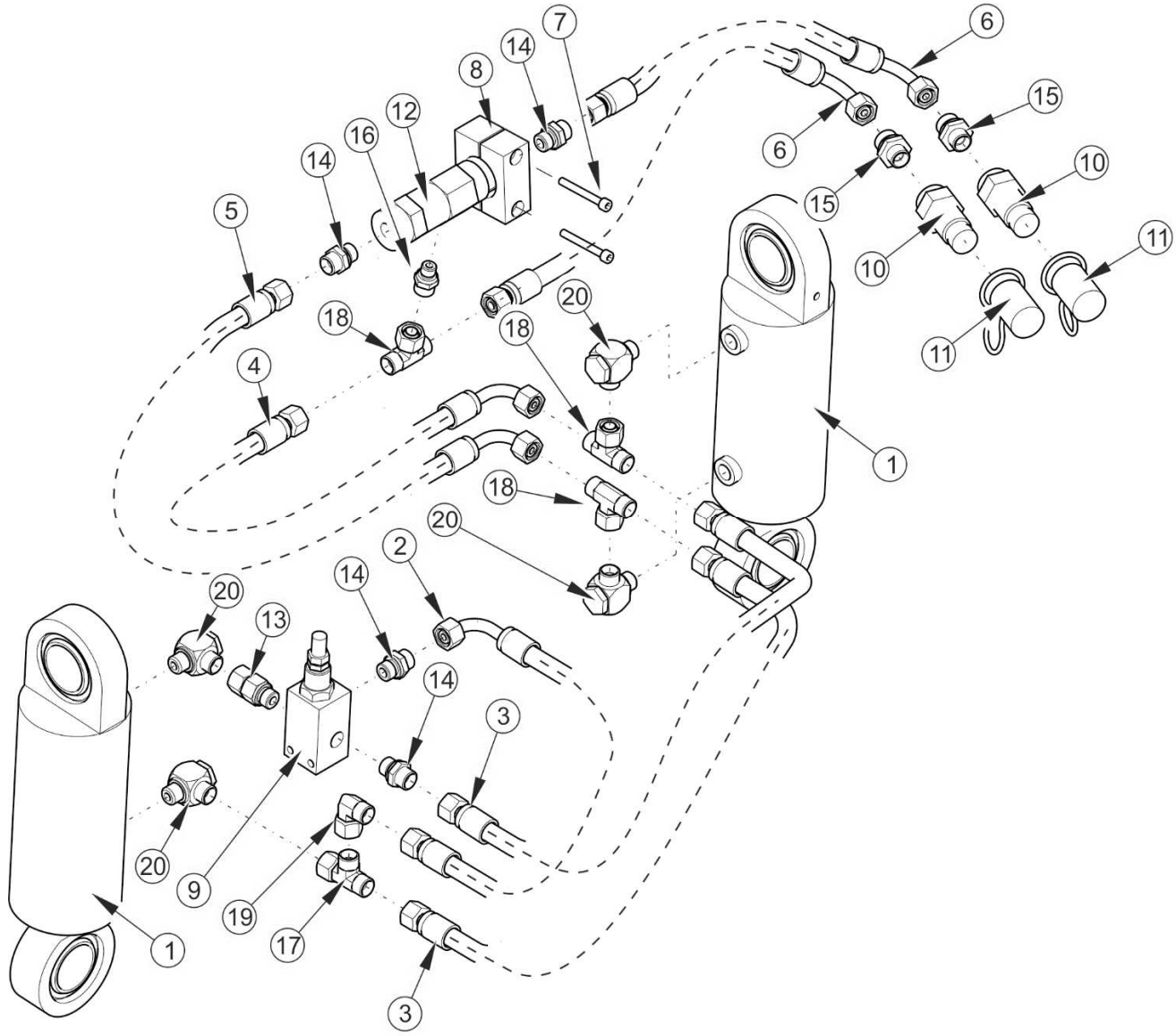


FIG. 4.10 Installation of hydraulic system

Markings according to table 4.2 "Specification of components for hydraulic system installation"

TAB. 4.2 Specification of components for hydraulic system installation

ITEM	PART NAME	PART NUMBER	QUANTITY
1	CYLINDER	106N-07110000	2
2	CONDUIT	10/02H1712L00350HO212L	1
3	CONDUIT	10/02H0212L00500HO212L	2
4	CONDUIT	10/02H1712L00500HO212L	1
5	CONDUIT	10/02H1712L00600HO212L	1
6	CONDUIT	10/02H1712L01200HO212L	2
7	M6x40-8.8-A2J BOLT	PN-EN ISO 4762	2
8	CLAMPING RING INSERT 38	A5 38 C	1
9	OVERFLOW VALVE	VMP-V0700-3/8"	1
10	1/2" MALE PLUG	HQ12-M-08G	2
11	PLUG STOPPER	HQ12-M-08-CAP	2
12	CONTROLLED CHECK VALVE	V0202-3/8"	1
13	CONNECTOR BODY	EGE12LREDCF	1
14	CONNECTOR BODY	GE12LREDOMDCF	4
15	CONNECTOR BODY	GE12LR1/2EDOMDCF	2
16	CONNECTOR BODY	GE12LR1/4EDOMDCF	1
17	ASYMMETRICAL TEE FITTING	EL12LOMDCF	1
18	TEE FITTING	ET12LOMDCF	3
19	ELBOW	EW12LOMDCF	1
20	BANJO	WH12LRKDSOMDCF	4

4.3 CONNECTING TO CARRYING VEHICLE

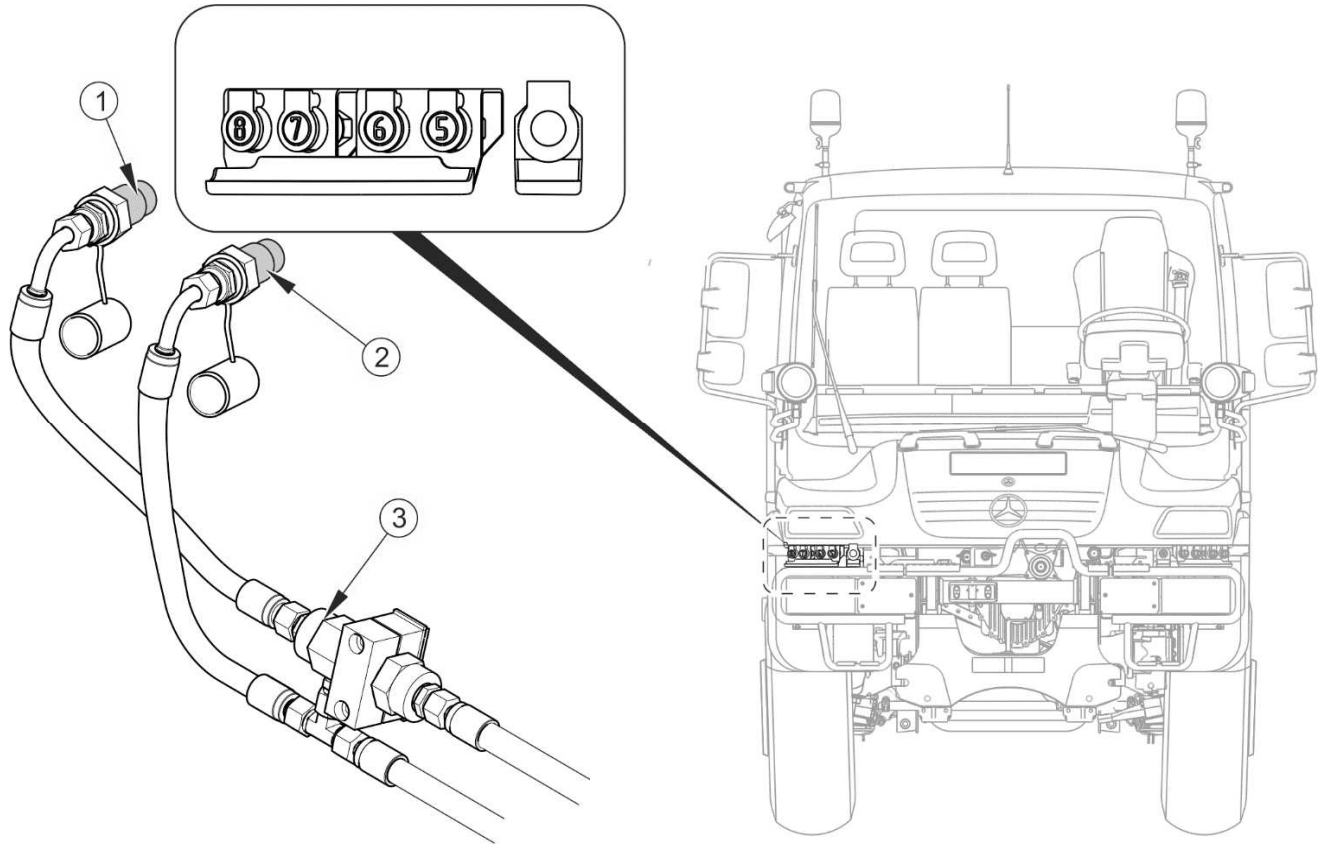


FIG. 4.11 Connecting the hydraulic system

(1) – oil supply quick coupler plug; (2) – oil return quick coupler plug; (3) – controlled check valve

In order to control the turning frame, connect the hydraulic system to the front connections of the carrying vehicle's external hydraulic system. Connect oil supply quick coupler (1) plug with controlled check valve (3) to yellow connection No. 5 in the carrying vehicle; connect oil return plug (2) to yellow connection No. 6. Alternatively, the frame's hydraulic system can be connected to connections No. 7 and No. 8.

DANGER

Keep the system clean when connecting and disconnecting. Contaminations in the hydraulic system can cause damage or malfunctioning of the system.

DANGER

The turning frame may be connected and disconnected only when the vehicle's engine is turned off and the vehicle is protected against rolling away by means of parking brake. Accidental motions of working elements are prevented in this way.

Perform carefully the test run of connected turning frame in order to check if it works correctly.

Release hydraulic pressure before starting work on the hydraulic system.

TIP

When connecting the implement to the carrying vehicle's external hydraulic system, remember that the tools at the front and at the rear must not be connected to the same section (colour) at the same time.

4.4 PREPARING FOR WORK

DANGER

Before using the implement, the user must carefully read this Operator's Manual and the operator's manual of the carrying vehicle.

The turning frame must never be used by persons who are not authorised to drive carrying vehicles, including children and people under the influence of alcohol or other drugs.

Non-compliance with the safety rules of this Operator's Manual can be dangerous to the health and life of the operator and others.

The manufacturer guarantees that the turning frame is fully operational and has been checked according to quality control procedures and is ready for normal use. This does not release the user from an obligation to check the implement's condition before the first use. In order to do this:

- the user must carefully read this Operator's Manual and observe all recommendations, understand the design and the principle of machine operation
- check the condition of protective paint coat,
- visually inspect individual components,

- check all the lubrication points, lubricate the machine as needed according to recommendations provided in section 5,
- check technical condition of the hydraulic system,
- check technical condition of pins and securing cotter pins.

ATTENTION

Non-adherence to the recommendations contained in the Operator's Manual or improper use may cause damage to the turning frame.

The technical condition before starting the machine must be no cause for concern.

In the event of a disruption in the operation of the machine immediately discontinue its use, find and remove the fault. If a fault cannot be rectified or the repair could void the guarantee, please contact the Manufacturer for additional clarifications.

ATTENTION

Before using the turning frame always check its technical condition. In particular, check the technical condition of the hydraulic system.

4.5 TECHNICAL INSPECTION

When preparing the implement for normal use, check individual components according to the guidelines presented in table *(4.1).*

TAB. 4.3 TECHNICAL INSPECTION SCHEDULE

DESCRIPTION	MAINTENANCE ACTIVITIES	FREQUENCY
Technical condition of working elements	Visually inspect technical condition of frame, pins and securing elements	Before starting work
Technical condition of the hydraulic system.	Visually inspect the technical condition	
Check if all main nut and bolt connections are properly tightened	Tightening torque values should be according to table *5.2*	Once a week
Lubrication	Lubricate the components according to section "*LUBRICATION*".	According to table (*5.1*)

ATTENTION

The turning frame must not be used when not in working order.

4.6 WORKING WITH THE TURNING FRAME

The turning frame is controlled electrohydraulically from the operator's position using the joystick located in the operator's cab. The frame locking function is activated when the oil pressure is applied (cylinders are shortened). The frame is unlocked when the oil pressure is not applied (cylinders are in floating position).

ATTENTION

The maximum travelling speed of the carrying vehicle with activated turning frame (cylinders in locked position) must not exceed 10 km/h.

4.7 TRANSPORTING THE MACHINE

ATTENTION

During transport, the turning frame should be unlocked (cylinders in floating position).

When driving on public roads, respect the road traffic regulations, exercise caution and prudence. Before moving off make sure that there are no bystanders, especially children, near the machine or the tractor. Ensure that the driver has sufficient visibility. Make sure that the turning frame is correctly attached to the carrying vehicle. Travelling speed should be adjusted to existing road conditions, pavement condition and other conditions. When driving on uneven terrain, reduce speed due to dynamic loads and the risk of damage to the machine.

If the machine is working in public places, special attention should be paid to the bystanders likely to be near the working machine.

4.8 UNHITCHING THE MACHINE FROM THE CARRYING VEHICLE

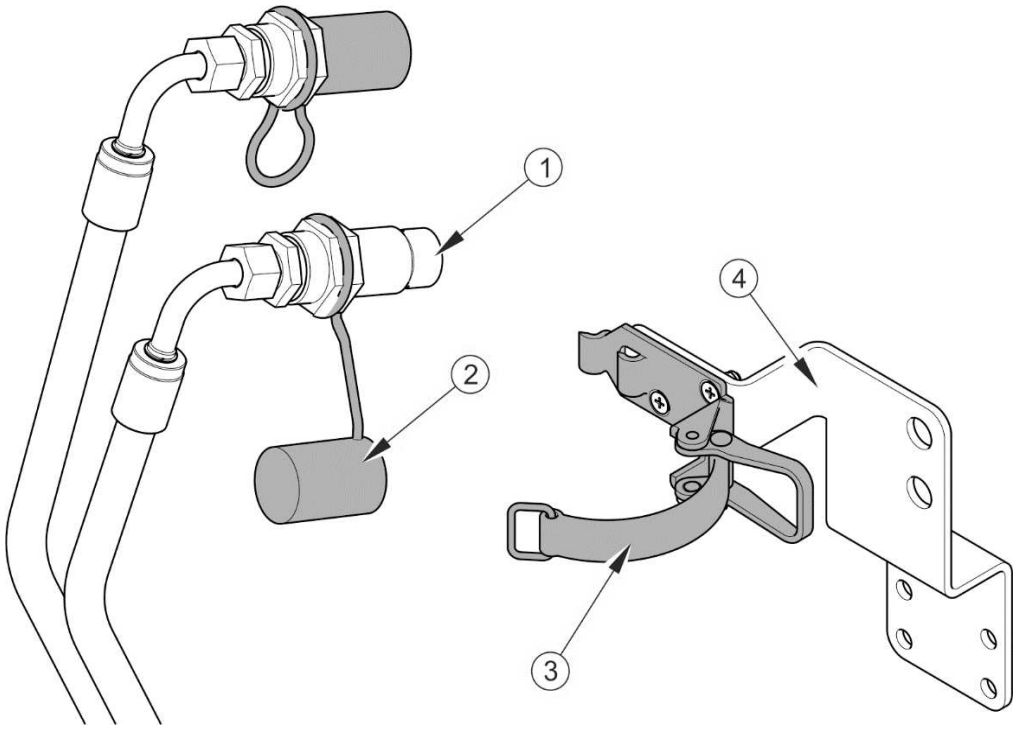


FIG. 4.12 Disconnecting the hydraulic system

(1) - hydraulic conduit connector; (2) - protective stopper; (3) - conduit holder; (4) – valve bracket

DANGER

Reduce pressure prior to disconnecting the hydraulic system.

After disconnecting the turning frame's hydraulic system - figure *(4.12)* secure the hydraulic conduit connectors (1) with stoppers (2). Secure disconnected conduits in holder (3) which is mounted on bracket (4).

SECTION

5

MAINTENANCE

5.1 HYDRAULIC SYSTEM MAINTENANCE

The duties of the operator connected with the hydraulic system include:

- checking tightness of cylinders hydraulic connections,
- checking technical condition of hydraulic conduits and quick couplers;

DANGER

Do not repair hydraulic system on your own. All hydraulic system repairs must be performed only by suitably qualified personnel.

ATTENTION

Before starting work, visually inspect the hydraulic system components.

Because of its composition, the oil is not classified as a dangerous substance, however long-term action on the skin or eyes may cause irritation. In the event of contact of oil with skin wash the place of contact with water and soap. Do NOT apply organic solvents (petrol, kerosene). Contaminated clothing should be changed to prevent access of oil to skin. In the event of contact of oil with eye, rinse with large quantity of water and in the event of the occurrence of irritation consult a doctor. Hydraulic oil in normal conditions is not harmful to the respiratory tract. A hazard only occurs when oil is strongly atomised (oil vapour), or in the case of fire during which toxic compounds may be released.

DANGER

Oil fires should be quenched with carbon dioxide (CO_2), foam or extinguisher steam. Do NOT use water for fire extinguishing!

Spilt oil should be immediately collected and placed in a marked tight container. Used oil should be taken to the appropriate facility dealing with recycling or regeneration of oils.

The hydraulic system should be completely tight sealed. Minimum leaks are permissible with symptoms of "sweating", however in the event of noticing leaks in the form of "droplets" stop using the machine until faults are remedied.

The hydraulic system is vented automatically during machine operation.

The condition of hydraulic system should be inspected regularly while using the implement.

DANGER

Before commencing whatever work on hydraulic system reduce the residual pressure in the system.

DANGER

During work on hydraulic system, use the appropriate personal protection equipment i.e. protective clothing, footwear, gloves and eye protection. Avoid contact of skin with oil.

5.2 LUBRICATION

DANGER

Lubrication may only be performed when the turning frame is not blocked and the carrying vehicle's engine is turned off.

TAB. 5.1 LUBRICATION POINTS AND LUBRICATION FREQUENCY

ITEM	NAME	NUMBER OF LUBRICATION POINTS	TYPE OF GREASE	LUBRICATION FREQUENCY
A	Hydraulic cylinder eye	2	grease	every 40 hours of work
B	Cylinder rod eye	2		
C	Lever securing pin	2		

Marking description in Item column (TAB. 5.1) conforms with numbering shown (FIG. 5.1)

Before commencing lubrication insofar as is possible remove old grease and other contamination. Remove and wipe off excess oil or grease The following grease is recommended for lubrication: ŁT-43-PN/C-96134.

When using the turning frame, the user is obliged to observe lubrication instructions according to attached schedule. Excess lubrication substance causes depositing additional contaminants in places requiring lubrication, therefore it is essential to keep individual machine elements clean.

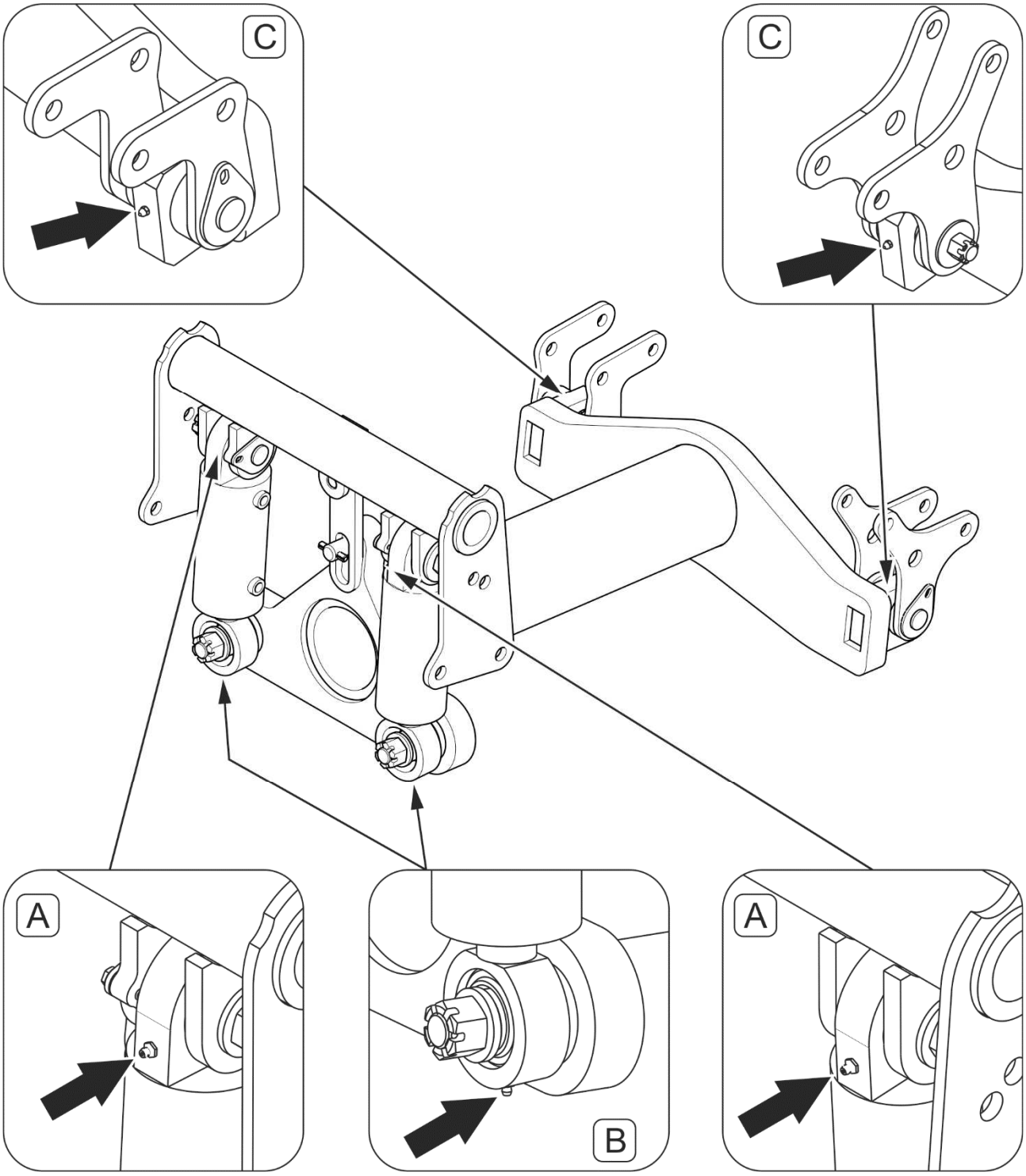


FIG. 5.1 Lubrication points

Lubrication points are described in table 5.1

5.3 STORAGE

After completed work, the turning frame should be carefully cleaned and washed with a water jet. While washing, do not direct a strong water or steam jet at decals, hydraulic conduits and grease nipples. Nozzle of pressure or steam washer should be kept at a distance of not less than 30 cm from cleaned surface.

After cleaning, inspect the turning frame, check technical condition of its individual components. Used or damaged elements should be repaired or replaced.

In the event of damage to the paint coat, clean rust and dust from damaged area, degrease and then paint with undercoat and after it is dry paint with surface coat paint retaining colour uniformity and even thickness of protective coating. Until the time of touch-up painting, the damaged place may be covered with a thin layer of grease or anticorrosion preparation.

Lubricate the turning frame according to the instructions provided. In the event of a prolonged work stoppage, it is essential to lubricate all components regardless of the date of the last lubrication.

5.4 TIGHTENING TORQUE FOR NUT AND BOLT CONNECTIONS

During maintenance and repairs use appropriate torque for bolt connections (unless other is specified for a particular connection). Recommended torque values apply to non-greased steel bolts (02).

ATTENTION!

Should it be necessary to change individual parts, use only original parts or those indicated by the Manufacturer. Non-adherence to these requirements may put the user and other people's health and life at risk, and also damage the machine.

TAB. 5.2 TIGHTENING TORQUE FOR NUT AND BOLT CONNECTIONS

THREAD DIAMETER [mm]	**8.8**	**10.9**	**12.9**
	TIGHTENING TORQUE [Nm]		
M8	25	36	43
M10	49	72	84
M12	85	125	145
M14	135	200	235
M16	210	310	365
M20	425	610	710
M20x1.5	480	680	1350
M22	580	820	960
M24x2	730	1 050	1200

5.5 TROUBLESHOOTING

TAB. 5.3 TROUBLESHOOTING

TYPE OF FAULT	**CAUSE**	**REMEDY**
Turning frame control system does not work	The carrying vehicle's engine is turned off	Start the engine
	The carrying vehicle's hydraulic system (e.g. pump, distributor) is out of order or switched off	Check the carrying vehicle's hydraulic system
	Quick-couplers or hydraulic conduits are damaged or not connected	Check the connection, repair damaged components at an authorised service point
The turning frame's hydraulic system is malfunctioning	The external hydraulic system couplers are incorrectly connected	Connect the hydraulic quick couplers of the turning frame to the external hydraulic system of the carrying vehicle according to the operator's manual
	Incorrect oil flow direction	Swap the quick coupler plugs.

ANNEX

A

SPARE PARTS LIST

INTRODUCTION

The sequence of presentation of the individual items of the spare parts list does not constitute assembly/disassembly sequence.

The manufacturer reserves the right to introduce design changes in machines produced that facilitate operation and improve the quality of their work.

The spare parts list is valid on the day it is issued.

If in doubt, please contact your Dealer or the Manufacturer directly.

Manufacturer's address:

PRONAR Sp. z o.o.

ul. Mickiewicza 101A

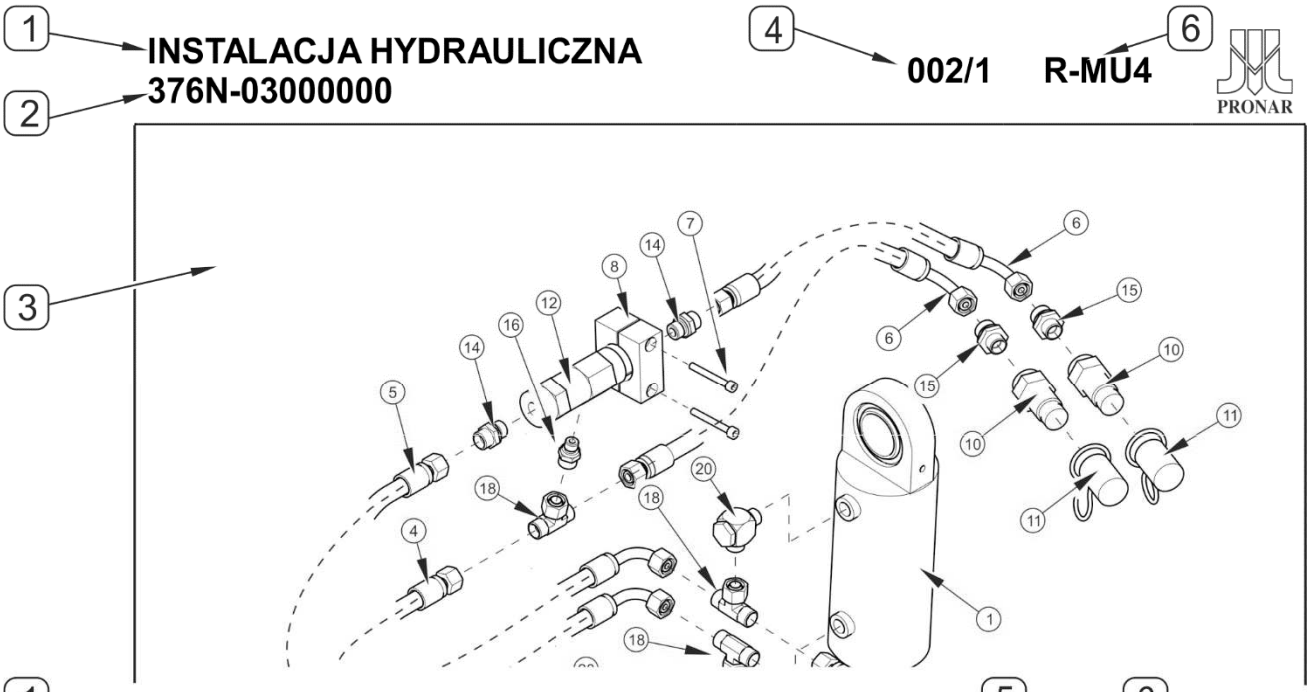
17-210 Narew

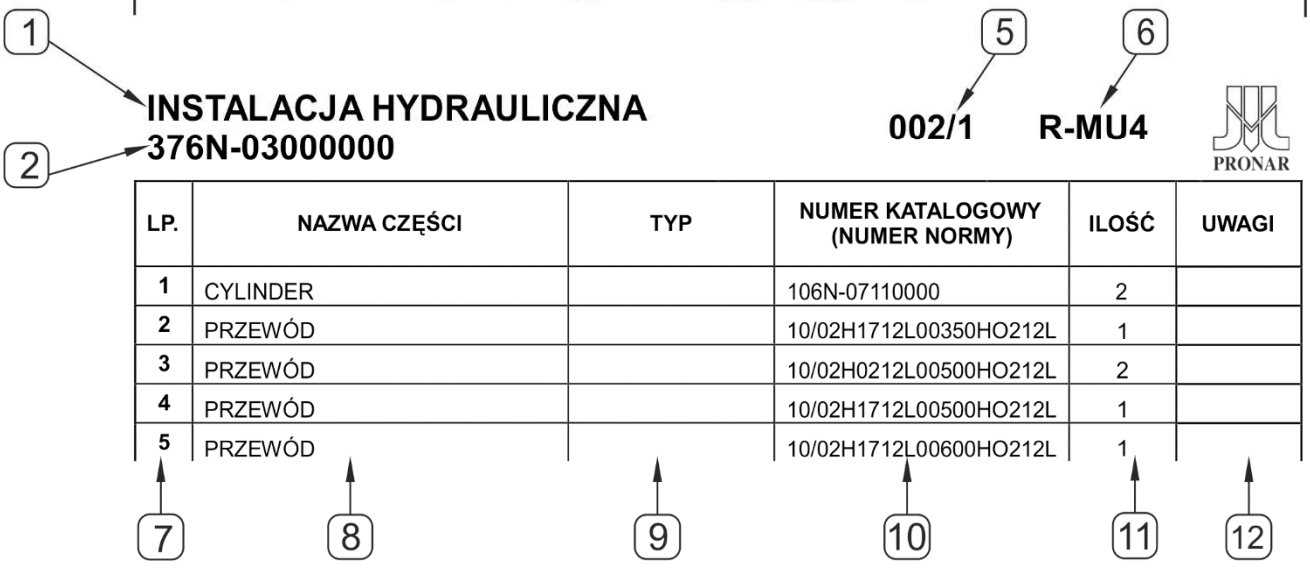
Contact telephones

+48 085 681 63 29 +48 085 681 64 29

+48 085 681 63 81 +48 085 681 63 82

HOW TO USE THIS SPARE PARTS LIST?





LP.	NAZWA CZĘŚCI	TYP	NUMER KATALOGOWY (NUMER NORMY)	ILOŚĆ	UWAGI
1	CYLINDER		106N-07110000	2	
2	PRZEWÓD		10/02H1712L00350HO212L	1	
3	PRZEWÓD		10/02H0212L00500HO212L	2	
4	PRZEWÓD		10/02H1712L00500HO212L	1	
5	PRZEWÓD		10/02H1712L00600HO212L	1	

7 8 9 10 11 12

(1) Name of assembly (2) Complete assembly number (3) Assembly drawing

(4) Drawing number (5) Drawing callouts(6) Machine type

(7) Item number (8) Part name (9) Part type

(10) Part number (11) Number of parts in a set (12) Notes concerning a part

In this spare parts list all assembly drawings are presented along the left side of the page and the associated parts list is presented along the right side of the page.

Each assembly drawing and a table listing the spare parts are described by *name of assembly (1)* and *complete assembly number (2)* – if available. Due to complexity of some assemblies, they can be divided into subassemblies and presented on several assembly drawings. The first segment of a *drawing number (4)*, denotes a group of drawings presenting the entire assembly, while the second segment of *drawing number (4)* denotes a specific drawing in a given group. For example, if a given complete assembly is presented on three drawings, each of these will be numbered as follows 001/1, 001/2 and 001/3. Field (5) in the tables listing spare parts for a group of drawings will indicate a number as follows: 001/1 – 001/3.

Item number (7) listed in the table refers to a part number called out on the assembly drawing.

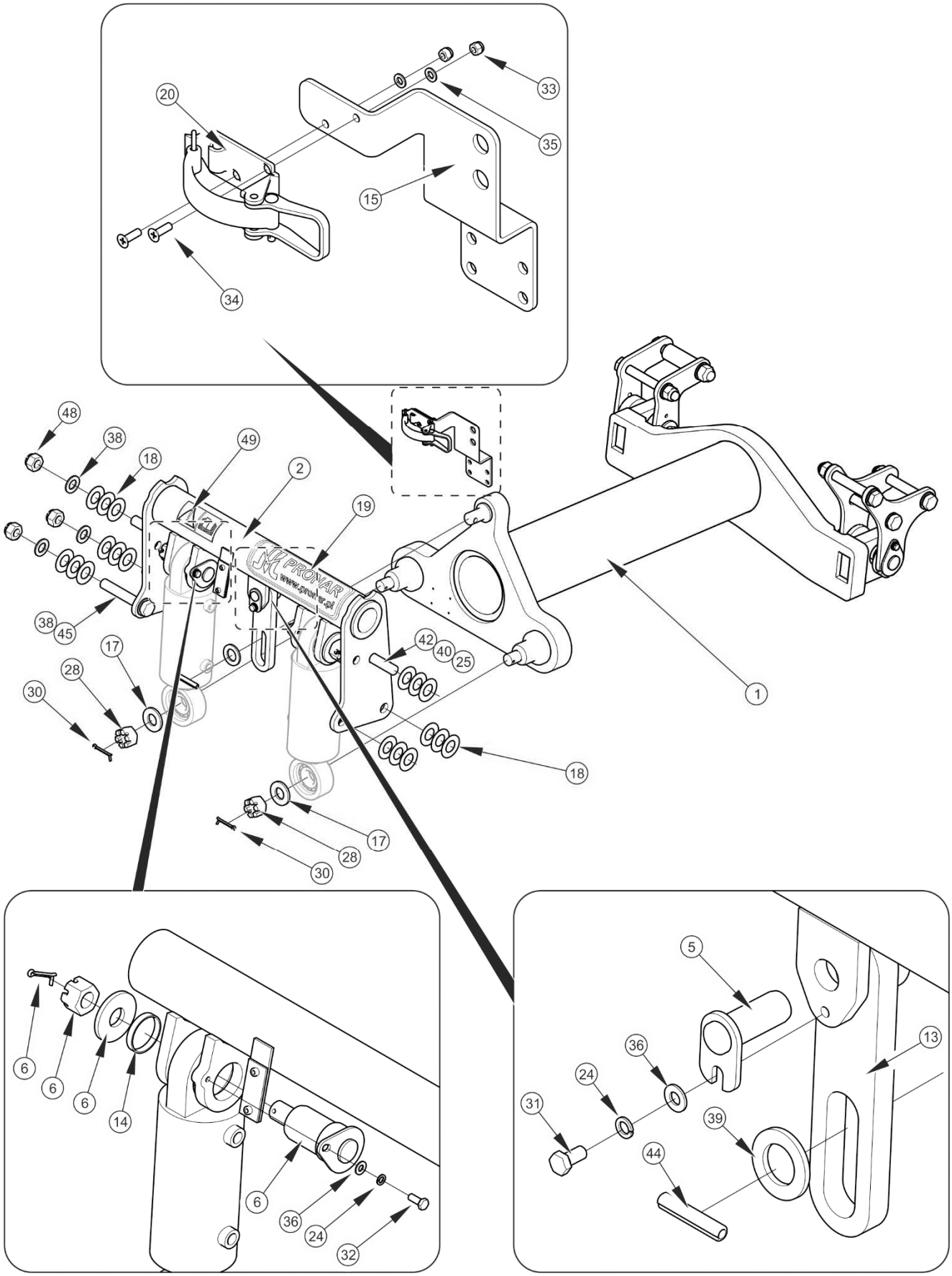
ORDERING SPARE PARTS

Each spare parts order must indicate the following information:

- Part name
- Part type
- Part number
- Number of parts on order
- Machine type and its serial number

A complete order must also indicate contact information of the ordering party and the delivery address.

SPARE PARTS LIST

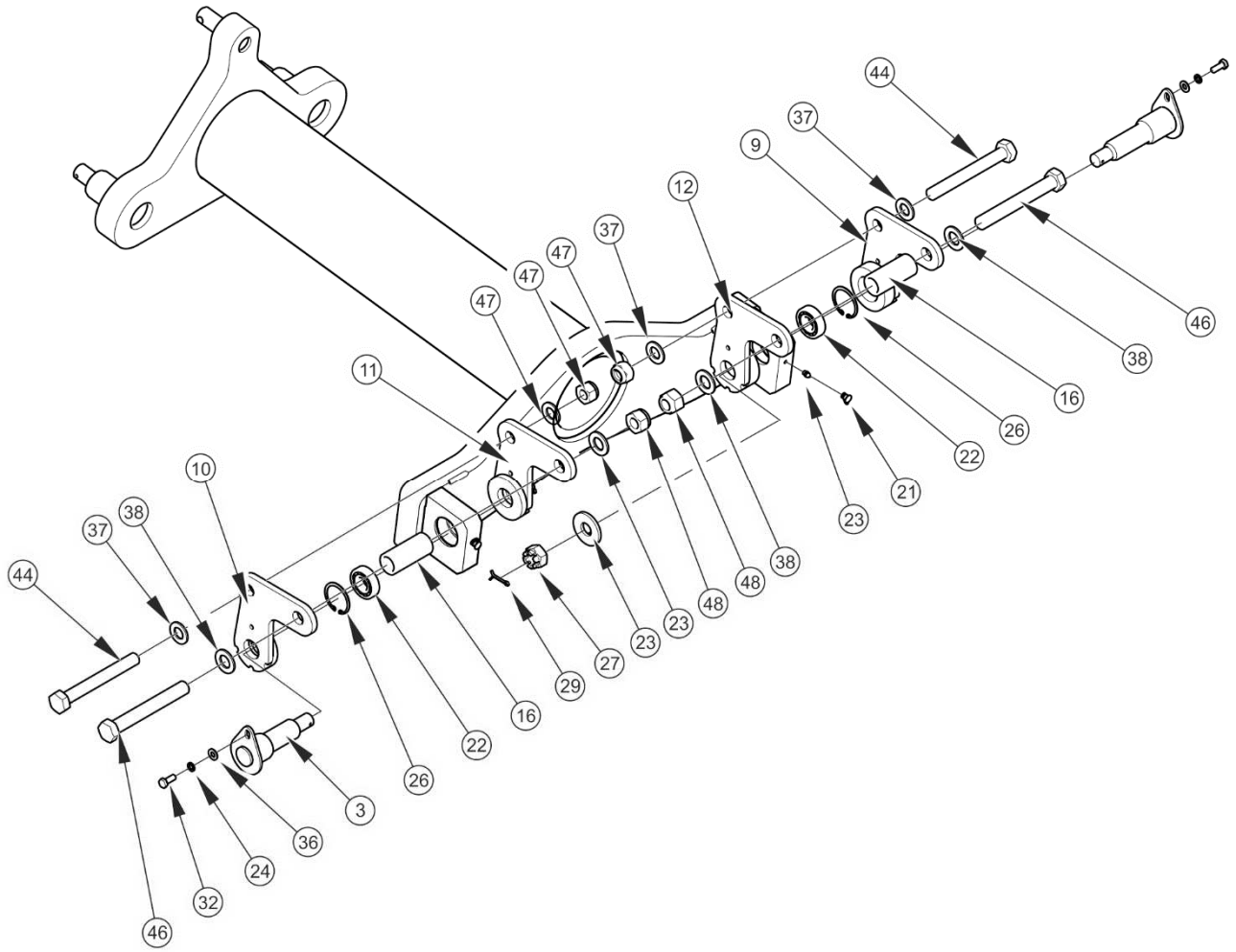

20
33
35
15
34
48
38
18
49
2
19
38
45
17
28
30
42
40
25
1
18
17
28
30
6
6
6
14
6
36
24
32
5
36
24
31
39
44
13

TURNING FRAME

001/1-001/3 R-MU4

PRONAR

Item	PART NAME	TYPE	PART NUMBER (STANDARD NUMBER)	QUANTITY U300/400	QUANTITY U500	NOTES
1	LOWER FRAME		376N-01000000	1	1	
2	UPPER BEAM		376N-02000000	1	1	
3	FRAME PIN		376N-04000000	2	2	
4	FRAME PIN		376N-04000000-01	-	1	
5	INTERLOCK PIN		376N-05000000	1	1	
6	CYLINDER PIN		376N-06000000	2	2	
7	FRAME PLATE		376N-07000000	-	1	
8	FRAME PLATE		376N-07000000-01	-	1	
9	FRAME PLATE		376N-08000000	1	1	
10	FRAME PLATE		376N-08000000-01	1	-	
11	FRAME PLATE		376N-09000000	1	-	
12	FRAME PLATE		376N-09000000-01	1	1	
13	LOCK		376N-00000001	1	1	
14	SPACER		376N-00000002	2	2	
15	VALVE BRACKET		376N-00000003	1	1	
16	SLEEVE		376N-00000004	2	?	
17	WASHER		359N-01000014	2	2	
18	SHIM		228N-08012300	18	18	
19	DECAL V		142N-16000005	1	1	
20	SECURING HOLDER		215131718	1	1	
21	PROTECTIVE CAP	SN65	65 2912R	2	2	
22	SLIDE BEARING		GE30ES	2	2	
23	GREASE NIPPLE	M6	PN-76/M-86002	2	2	
24	SPRING WASHER	Z 8.2-Fe//Zn9//A	PN-M-82008	5	5	
25	SPRING WASHER	Z 20.5-Fe//Zn9//A	PN-77/M-82008	1	1	
26	SEATING RING	W47	PN-81/M-85111	2	2	
27	CASTELLATED NUT	Z M20X1,5-8-B- A2J	PN-86/M-82148	2	2	
28	CASTELLATED NUT	Z M24X2-8-B-A2J	PN-86/M-82148	4	4	
29	COTTER PIN	4X32-St-Fe//Zn8//A	PN-EN ISO 1234	2	2	
30	COTTER PIN	5x28-St-Fe//Zn8//A	PN-EN ISO 1234	4	4	
31	BOLT	M8x16-8.8-A2J	PN-EN ISO 4017	1	1	
32	BOLT		PN-EN ISO 4017	4	4	
33	NUT	M5-8-A2J	PN-EN ISO 7040	2	2	
34	CONE HEADED BOLT	M5x16-4.8-H-A2J	PN-EN ISO 7046-1	2	2	
35	WASHER	5-100HV-Fe//Zn6//A	PN-EN ISO 7091	2	2	
36	WASHER	8-100HV-Fe//Zn6//A	PN-EN ISO 7091	5	5	
37	WASHER	18-100HV-Fe//Zn6//A	PN-EN ISO 7091	4	4	
38	WASHER	20-200HV-Fe//Zn6//A	PN-EN ISO 7091	11	13	
39	WASHER	24-100HV-Fe//Zn6//A	PN-EN ISO 7091	1	1	
40	WASHER	20-100HV-Fe//Zn6//A	PN-EN ISO 7093	2	2	
41	WASHER	24-100HV-Fe//Zn6//A	PN-EN ISO 7093	2	2	
42	BOLT	M20x1.5x80-10.9-A2J	PN-EN ISO 8676	1	1	
43	SPRING PIN	10X50-C	PN-EN ISO 8752	1	1	
44	BOLT	M18x1.5x150-10.9-A2J	PN-EN ISO 8765	2	2	
45	BOLT	M20x1.5x120-10.9-A2J	PN-EN ISO 8765	3	3	
46	BOLT	M20x1.5x150-10.9-A2J	PN-EN ISO 8765	2	3	
47	NUT	M18x1.5-8-A2J	PN-EN ISO 10512	2	2	
48	NUT	M20x1.5-8-A2J	PN-EN ISO 10512	5	6	
49	WARNING DECAL		185N-00000001	1	1	

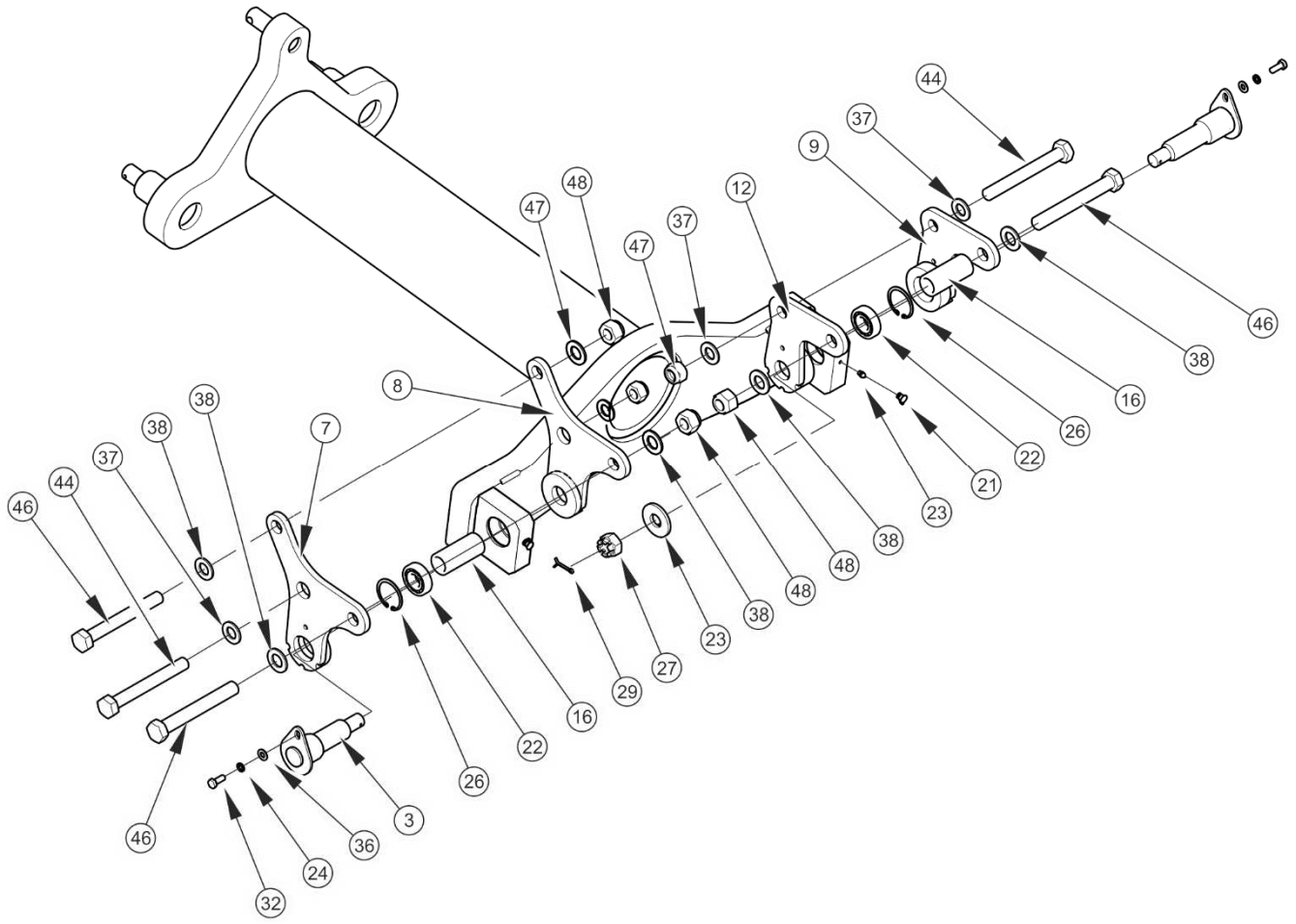

44
37
9
12
37
47
47
47
11
10
37
38
44
46
38
16
26
22
21
23
48
38
23
23
27
29
16
22
26
3
36
24
32
46

TURNING FRAME

001/1-001/3 R-MU4

PRONAR

Item	PART NAME	TYPE	PART NUMBER (STANDARD NUMBER)	QUANTITY U300/400	QUANTITY U500	NOTES
1	LOWER FRAME		376N-01000000	1	1	
2	UPPER BEAM		376N-02000000	1	1	
3	FRAME PIN		376N-04000000	2	2	
4	FRAME PIN		376N-04000000-01	-	1	
5	INTERLOCK PIN		376N-05000000	1	1	
6	CYLINDER PIN		376N-06000000	2	2	
7	FRAME PLATE		376N-07000000	-	1	
8	FRAME PLATE		376N-07000000-01	-	1	
9	FRAME PLATE		376N-08000000	1	1	
10	FRAME PLATE		376N-08000000-01	1	-	
11	FRAME PLATE		376N-09000000	1	-	
12	FRAME PLATE		376N-09000000-01	1	1	
13	LOCK		376N-00000001	1	1	
14	SPACER		376N-00000002	2	2	
15	VALVE BRACKET		376N-00000003	1	1	
16	SLEEVE		376N-00000004	2	?	
17	WASHER		359N-01000014	2	2	
18	SHIM		228N-08012300	18	18	
19	DECAL V		142N-16000005	1	1	
20	SECURING HOLDER		215131718	1	1	
21	PROTECTIVE CAP	SN65	65 2912R	2	2	
22	SLIDE BEARING		GE30ES	2	2	
23	GREASE NIPPLE	M6	PN-76/M-86002	2	2	
24	SPRING WASHER	Z 8.2-Fe//Zn9//A	PN-M-82008	5	5	
25	SPRING WASHER	Z 20.5-Fe//Zn9//A	PN-77/M-82008	1	1	
26	SEATING RING	W47	PN-81/M-85111	2	2	
27	CASTELLATED NUT	Z M20X1,5-8-B- A2J	PN-86/M-82148	2	2	
28	CASTELLATED NUT	Z M24X2-8-B-A2J	PN-86/M-82148	4	4	
29	COTTER PIN	4X32-St-Fe//Zn8//A	PN-EN ISO 1234	2	2	
30	COTTER PIN	5x28-St-Fe//Zn8//A	PN-EN ISO 1234	4	4	
31	BOLT	M8x16-8.8-A2J	PN-EN ISO 4017	1	1	
32	BOLT		PN-EN ISO 4017	4	4	
33	NUT	M5-8-A2J	PN-EN ISO 7040	2	2	
34	CONE HEADED BOLT	M5x16-4.8-H-A2J	PN-EN ISO 7046-1	2	2	
35	WASHER	5-100HV-Fe//Zn6//A	PN-EN ISO 7091	2	2	
36	WASHER	8-100HV-Fe//Zn6//A	PN-EN ISO 7091	5	5	
37	WASHER	18-100HV-Fe//Zn6//A	PN-EN ISO 7091	4	4	
38	WASHER	20-200HV-Fe//Zn6//A	PN-EN ISO 7091	11	13	
39	WASHER	24-100HV-Fe//Zn6//A	PN-EN ISO 7091	1	1	
40	WASHER	20-100HV-Fe//Zn6//A	PN-EN ISO 7093	2	2	
41	WASHER	24-100HV-Fe//Zn6//A	PN-EN ISO 7093	2	2	
42	BOLT	M20x1.5x80-10.9-A2J	PN-EN ISO 8676	1	1	
43	SPRING PIN	10X50-C	PN-EN ISO 8752	1	1	
44	BOLT	M18x1.5x150-10.9-A2J	PN-EN ISO 8765	2	2	
45	BOLT	M20x1.5x120-10.9-A2J	PN-EN ISO 8765	3	3	
46	BOLT	M20x1.5x150-10.9-A2J	PN-EN ISO 8765	2	3	
47	NUT	M18x1.5-8-A2J	PN-EN ISO 10512	2	2	
48	NUT	M20x1.5-8-A2J	PN-EN ISO 10512	5	6	
49	WARNING DECAL		185N-00000001	1	1	

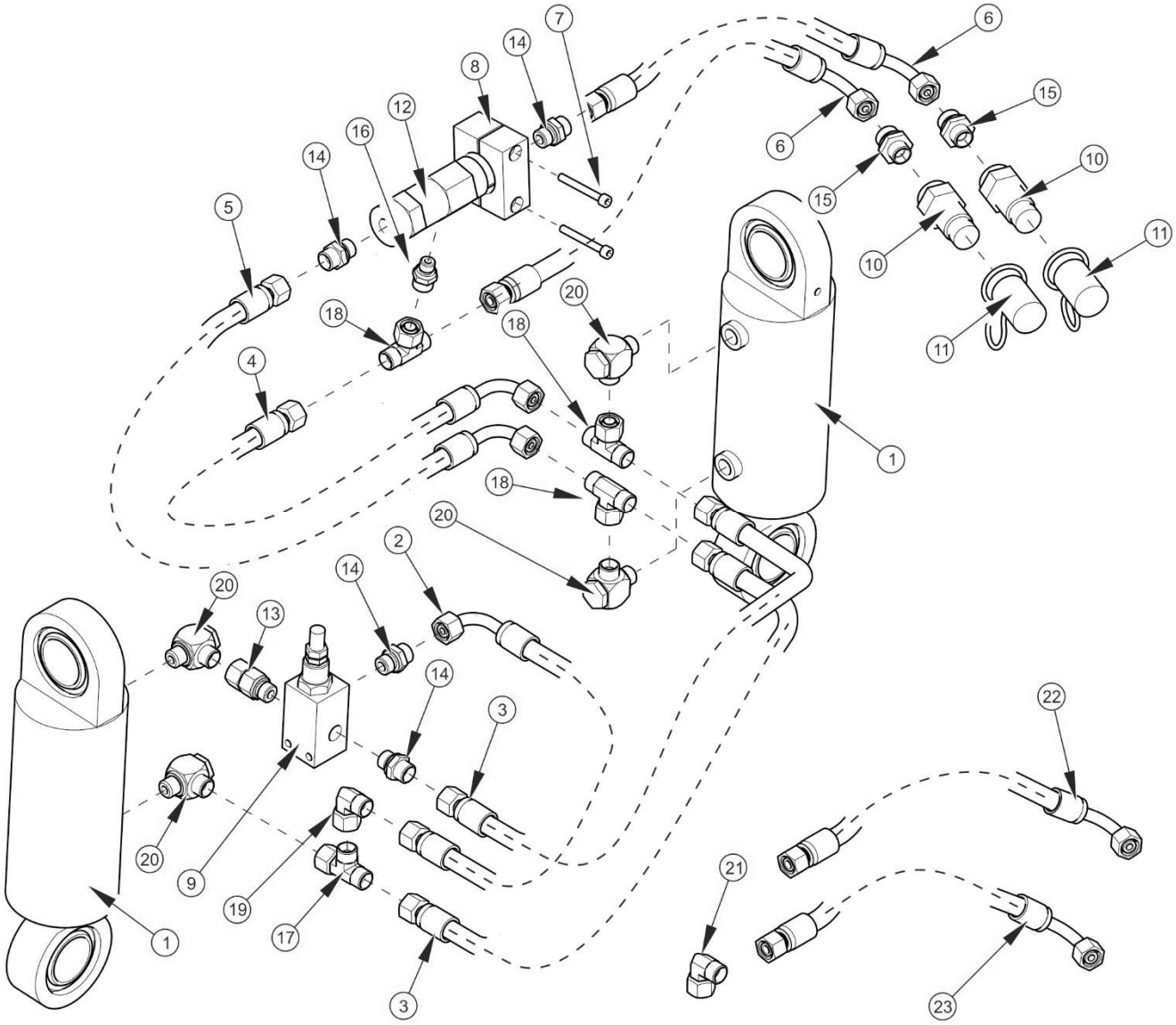

44
37
9
48
47
12
37
47
46
38
16
26
22
21
23
38
48
48
38
23
27
29
16
22
26
3
36
24
32
46
46
44
37
38
38
7
8

TURNING FRAME

001/1-001/3 R-MU4

PRONAR

Item	PART NAME	TYPE	PART NUMBER (STANDARD NUMBER)	QUANTITY U300/400	QUANTITY U500	NOTES
1	LOWER FRAME		376N-01000000	1	1	
2	UPPER BEAM		376N-02000000	1	1	
3	FRAME PIN		376N-04000000	2	2	
4	FRAME PIN		376N-04000000-01	-	1	
5	INTERLOCK PIN		376N-05000000	1	1	
6	CYLINDER PIN		376N-06000000	2	2	
7	FRAME PLATE		376N-07000000	-	1	
8	FRAME PLATE		376N-07000000-01	-	1	
9	FRAME PLATE		376N-08000000	1	1	
10	FRAME PLATE		376N-08000000-01	1	-	
11	FRAME PLATE		376N-09000000	1	-	
12	FRAME PLATE		376N-09000000-01	1	1	
13	LOCK		376N-00000001	1	1	
14	SPACER		376N-00000002	2	2	
15	VALVE BRACKET		376N-00000003	1	1	
16	SLEEVE		376N-00000004	2	?	
17	WASHER		359N-01000014	2	2	
18	SHIM		228N-08012300	18	18	
19	DECAL V		142N-16000005	1	1	
20	SECURING HOLDER		215131718	1	1	
21	PROTECTIVE CAP	SN65	65 2912R	2	2	
22	SLIDE BEARING		GE30ES	2	2	
23	GREASE NIPPLE	M6	PN-76/M-86002	2	2	
24	SPRING WASHER	Z 8.2-Fe//Zn9//A	PN-M-82008	5	5	
25	SPRING WASHER	Z 20.5-Fe//Zn9//A	PN-77/M-82008	1	1	
26	SEATING RING	W47	PN-81/M-85111	2	2	
27	CASTELLATED NUT	Z M20X1,5-8-B- A2J	PN-86/M-82148	2	2	
28	CASTELLATED NUT	Z M24X2-8-B-A2J	PN-86/M-82148	4	4	
29	COTTER PIN	4X32-St-Fe//Zn8//A	PN-EN ISO 1234	2	2	
30	COTTER PIN	5x28-St-Fe//Zn8//A	PN-EN ISO 1234	4	4	
31	BOLT	M8x16-8.8-A2J	PN-EN ISO 4017	1	1	
32	BOLT		PN-EN ISO 4017	4	4	
33	NUT	M5-8-A2J	PN-EN ISO 7040	2	2	
34	CONE HEADED BOLT	M5x16-4.8-H-A2J	PN-EN ISO 7046-1	2	2	
35	WASHER	5-100HV-Fe//Zn6//A	PN-EN ISO 7091	2	2	
36	WASHER	8-100HV-Fe//Zn6//A	PN-EN ISO 7091	5	5	
37	WASHER	18-100HV-Fe//Zn6//A	PN-EN ISO 7091	4	4	
38	WASHER	20-200HV-Fe//Zn6//A	PN-EN ISO 7091	11	13	
39	WASHER	24-100HV-Fe//Zn6//A	PN-EN ISO 7091	1	1	
40	WASHER	20-100HV-Fe//Zn6//A	PN-EN ISO 7093	2	2	
41	WASHER	24-100HV-Fe//Zn6//A	PN-EN ISO 7093	2	2	
42	BOLT	M20x1.5x80-10.9-A2J	PN-EN ISO 8676	1	1	
43	SPRING PIN	10X50-C	PN-EN ISO 8752	1	1	
44	BOLT	M18x1.5x150-10.9-A2J	PN-EN ISO 8765	2	2	
45	BOLT	M20x1.5x120-10.9-A2J	PN-EN ISO 8765	3	3	
46	BOLT	M20x1.5x150-10.9-A2J	PN-EN ISO 8765	2	3	
47	NUT	M18x1.5-8-A2J	PN-EN ISO 10512	2	2	
48	NUT	M20x1.5-8-A2J	PN-EN ISO 10512	5	6	
49	WARNING DECAL		185N-00000001	1	1	


1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23

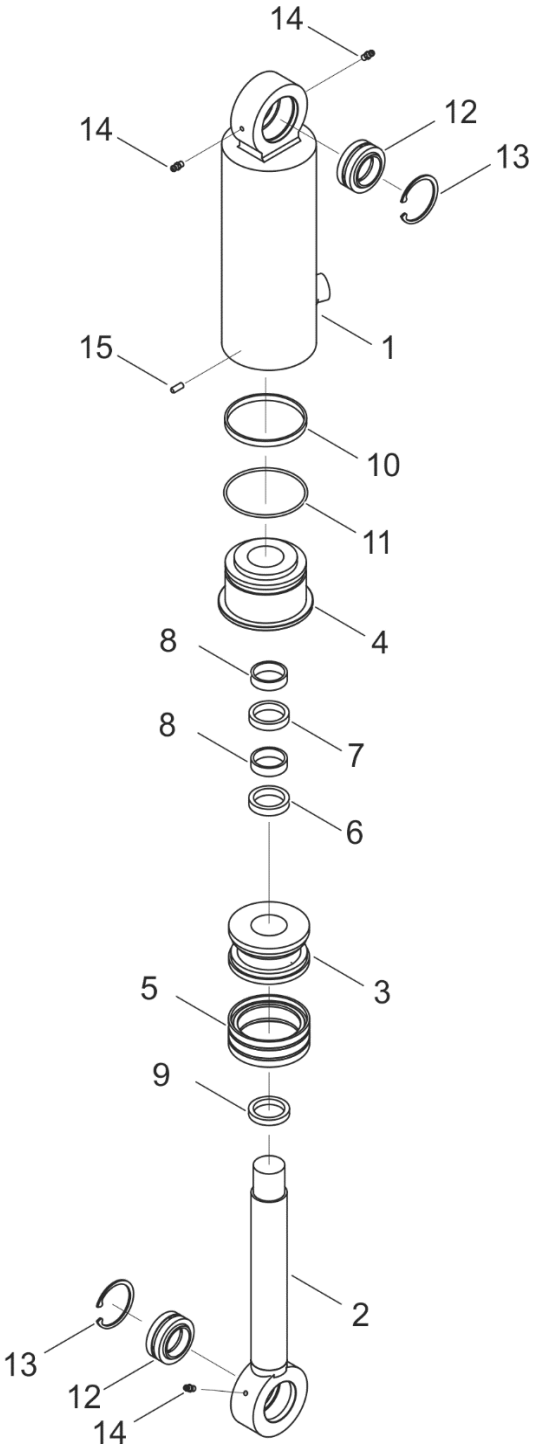
HYDRAULIC SYSTEM
376N-03000000

002/1 R-MU4

PRONAR

ITEM	PART NAME	TYPE	PART NUMBER (STANDARD NUMBER)	QUANTITY	NOTES
1	CYLINDER		106N-07110000	2	
2	CONDUIT		10/02H1712L00350HO212L	1	
3	CONDUIT		10/02H0212L00500HO212L	2	
4	CONDUIT		10/02H1712L00500HO212L	1	
5	CONDUIT		10/02H1712L00600HO212L	1	
6	CONDUIT		10/02H1712L01200HO212L	2	
7	BOLT	M6x40-8.8-A2J	PN-EN ISO 4762	2	
8	CLAMPING RING INSERT	38	A5 38 C	1	
9	OVERFLOW VALVE		VMP-V0700-3/8"	1	
10	MALE PLUG	1/2"	HQ12-M-08G	2	
11	PLUG STOPPER		HQ12-M-08-CAP	2	
12	CONTROLLED CHECK VALVE		V0202-3/8"	1	
13	CONNECTOR BODY		EGE12LREDCF	1	
14	CONNECTOR BODY		GE12LREDOMDCF	4	
15	CONNECTOR BODY		GE12LR1/2EDOMDCF	2	
16	CONNECTOR BODY		GE12LR1/4EDOMDCF	1	
17	ASYMMETRICAL TEE FITTING		EL12LOMDCF	1	
18	TEE FITTING		ET12LOMDCF	3	
19	ELBOW		EW12LOMDCF	1	
20	BANJO		WH12LRKDSOMDCF	4	
21	KNEE		EW22L0MDCF	1	*
22	CONDUIT		12/02H1716S0600H0216S	1	*
23	CONDUIT		19/01H1122L0800H0222L	1	*

* - install conduit 22, conduit 23 and elbow 21 to replace the original metal conduits


14
14
12
13
15
1
10
11
4
8
8
7
6
5
3
9
2
13
12
14

CYLINDER 90sj40A_100g2a20
106N-07110000

003/1 R-MU4

PRONAR

ITEM	PART NAME	TYPE	PART NUMBER (STANDARD NUMBER)	QUANTITY	NOTES
1	CYLINDER BODY		106N-07110100	1	
2	CYLINDER RAM ASSEMBLY		106N-07110300	1	
3	PISTON		106N-07110003	1	
4	GLAND		106N-07110004	1	
5	PISTON KIT		TPM 9034	1	
6	SCRAPING RING		K06-040/2	1	
7	SEALING RING		TTI 1614	1	
8	GUIDE RING		AGI 40/2	2	
9	SEALING RING		DU0000450	1	
10	SEALING RING		DU0100900	1	
11	SEALING RING	O-ring	90x3	1	
12	SLIDE BEARING		GE 45 ES	2	
13	SEATING RING	W68	PN/M-85111	2	
14	GREASE NIPPLE	M6	PN/M-86002	3	
15	SET SCREW	M6x8	PN-EN ISO 4028	2	

NOTES