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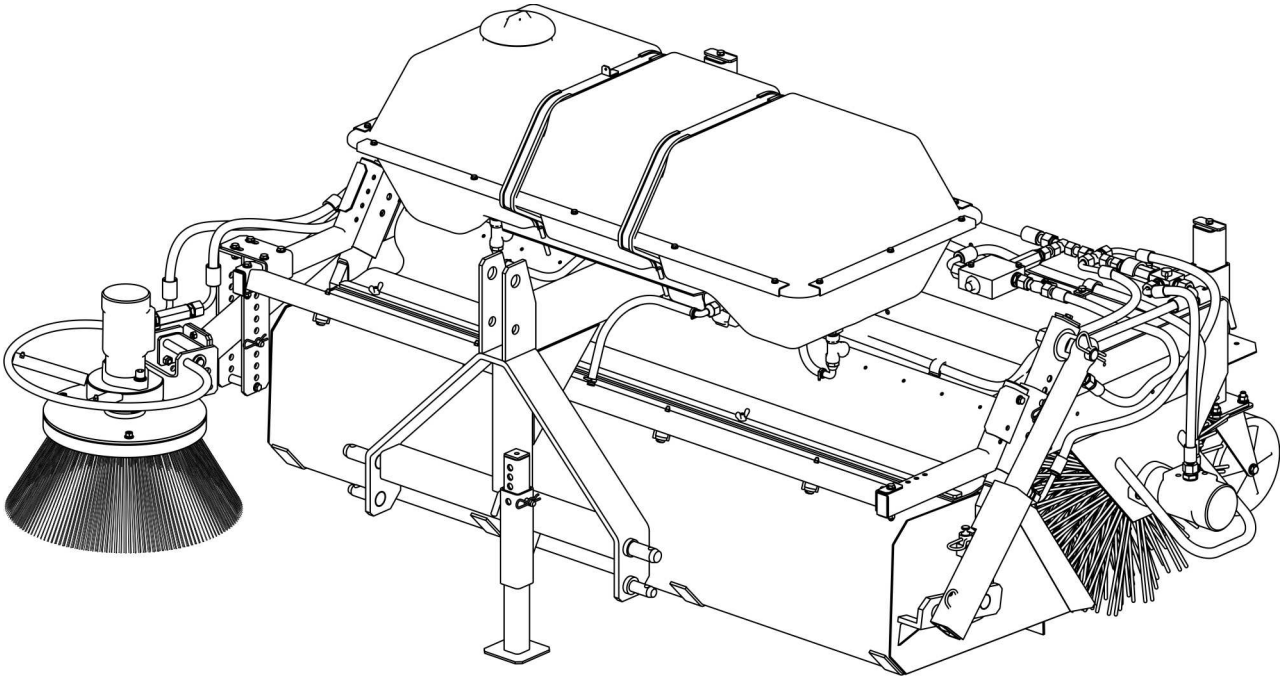
OPERATOR'S MANUAL

MOUNTED SWEEPER

PRONAR „Agata”

ZM-1600 ZM-1600-01 ZM-1600-02
ZM-1600-03 ZM-1600-04 ZM-1600-05

TRANSLATION OF THE ORIGINAL COPY OF THE MANUAL



ISSUE 9B-01-2010 PUBLICATION NO 12N-00000000-UM

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MOUNTED SWEEPER

PRONAR „Agata”

ZM-1600 ZM-1600-01 ZM-1600-02

ZM-1600-03 ZM-1600-04 ZM-1600-05

MACHINE IDENTIFICATION

TYPE:

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 malfunction 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 sweeper. If the information contained 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:

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CONTACT TELEPHONES

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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:

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.

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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:	**Tractor attached sweeper**					
Type:	**ZM-1600**	**ZM-1600-01**	**ZM-1600-02**	**ZM-1600-03**	**ZM-1600-04**	**ZM-1600-05**
Model:	–	–	–	–	–	–
Serial number:						
Commercial name:	**Tractor attached sweeper PRONAR Agata ZM-1600** **Tractor attached sweeper PRONAR Agata ZM-1600-01** **Tractor attached sweeper PRONAR Agata ZM-1600-02** **Tractor attached sweeper PRONAR Agata ZM-1600-03** **Tractor attached sweeper PRONAR Agata ZM-1600-04** **Tractor attached sweeper PRONAR Agata ZM-1600-05**					

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.

Z-CA DYREKTORA
d/s technicznych
członek zarządu
Roman Omelianiuk

Narew, the 2010 -04- 07

Place and date

Full name of the empowered person position, signature

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1 BASIC INFORMATION

IDENTIFICATION DATA
PROPER USE
EQUIPMENT
WARRANTY TERMS
TRANSPORT
ENVIRONMENTAL HAZARDS
WITHDRAWAL FROM USE

1.1 IDENTIFICATION DATA

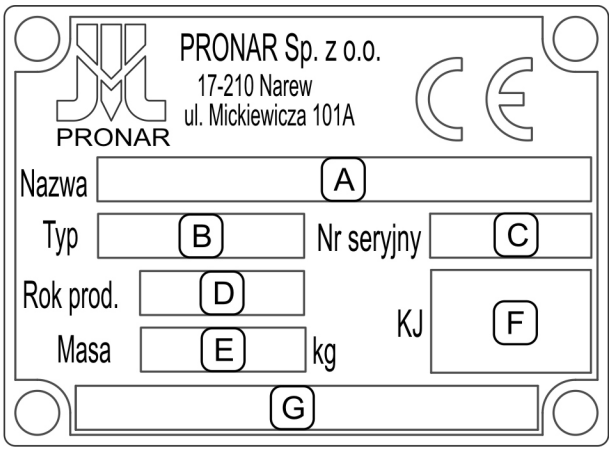


FIG. 1.1A Data plate

Meaning of data plate items:

A – machine name (e.g. "MOUNTED SWEEPER AGATA")

B – type (ie. ZM-1600-01)

C – serial number

D – year of manufacture

E – machine tare weight

F – Quality Control stamp

G – Unfilled box or extension of name (box A)

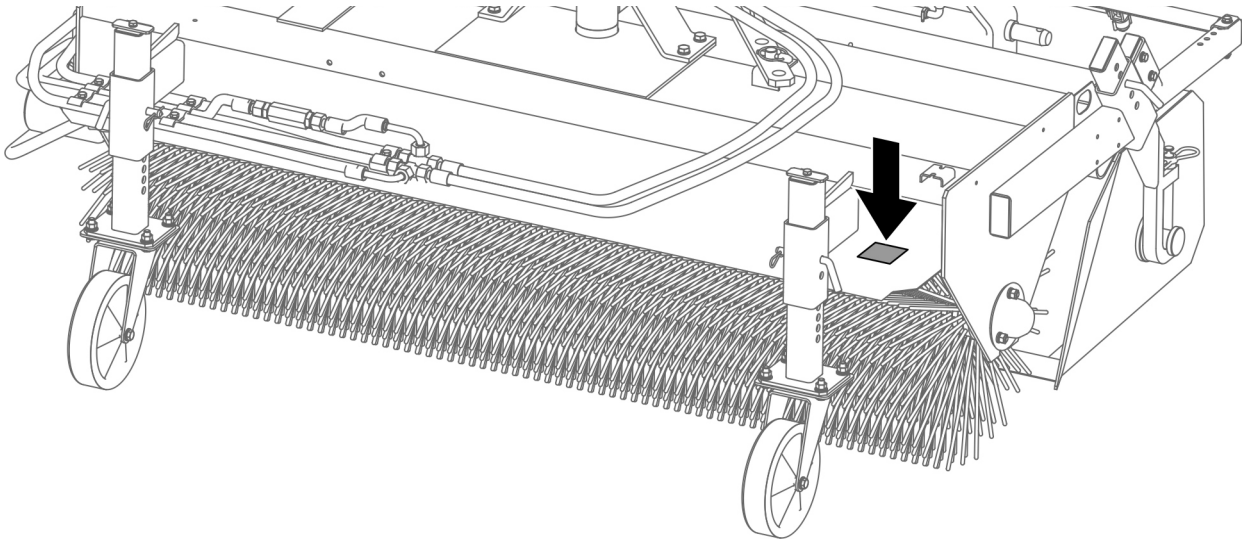


FIG. 1.2A Location of the data plate

Serial number is stamped on the data plate. The data plate is located at the rear, on the frame, near the right bracket of the jockey wheel. When buying the machine, check that the serial number corresponds with that indicated in the *WARRANTY BOOK*, in the sales documents and in the *OPERATOR'S MANUAL*.

1.2 PROPER USE

The sweeper is designed for operation with agricultural tractors and is used for maintaining the cleanness of access roads, squares, parking spaces, extensive warehouse areas, external surroundings of buildings with paved surfaces such as asphalt, concrete paving blocks, paving, concrete. The sweeper is ideal for agriculture, forestry and municipal establishments.

Use for other purposes is not in accord with design. 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.

IMPORTANT!

The sweeper must not be used for purposes other than those for which it is intended, in particular:

- **for transporting people and animals**
- **for transporting whatever materials**

TAB. 1.1 AGRICULTURAL TRACTOR'S REQUIREMENTS

	UNIT	REQUIREMENTS
Linkage		
Front or rear three point linkage	-	I (I narrow) or II cat. according to ISO 730-1, with a "floating" position
Hydraulic system		
Nominal pressure	MPa	16 - 20*
Hydraulic oil	-	HL32
Hydraulic sockets	-	2 sockets type 12,5-ISO 7241-1-serie-A of one section with the possibility of changing the direction of oil circulation
System efficiency	dm^3/min	13 - 25*
Electrical system		
Lighting system socket	-	7 polar compliant with ISO 1724
Electrical system voltage	V	12
Other requirements		
Minimum power	kW / Horsepower	25.7 / 35
Beacon light	-	orange light

** - optimum values are given; declared performance and durability of the machine are not guaranteed for other values*

1.3 EQUIPMENT

The sweeper equipment includes:

- Operator's Manual
- Warranty Book

1.4 WARRANTY TERMS

PRONAR Sp. z o.o. Narew guarantees reliable operation of the machine 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 guarantee does not apply to those parts and sub-assemblies of the machine, which are subject to wear in normal usage conditions, regardless of the warranty period. Consumables include, among others, the following parts/sub-assemblies:

- working elements of the roller brush and side brush;
- bearings;
- filters,
- bulbs,

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, caused by road accidents,
- by inappropriate use, adjustment or maintenance, use of the machine for purposes other than those for which it is intended,
- use of damaged machine,
- repairs carried out by unauthorised persons, improperly carried out repairs,
- arbitrary and wilful adjustments to the machine's structure,

the user may lose the right to warranty service.

The user is obliged to report immediately on noticing any wear in the paint coating or traces of corrosion, and to have the faults rectified whether they are covered by the guarantee or not. Detailed guarantee regulations are contained in the Warranty Book attached to each machine.

ATTENTION!

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

1.5 TRANSPORT

The machine is prepared for sale completely assembled and does not require packing. Packing is only required for the machine's technical documentation.

Delivery is either by transport on a vehicle or independently, after being attached to a tractor. Transport of the sweeper connected to tractor is permitted on the condition that the tractor driver is familiar with the Operator's Manual and, in particular, with information concerning safety and principles of machine connection and transport on public roads. During transport on public roads, the sweeper should be equipped with additional lights (available as an option), if the sweeper obscures carrying vehicle's lights.

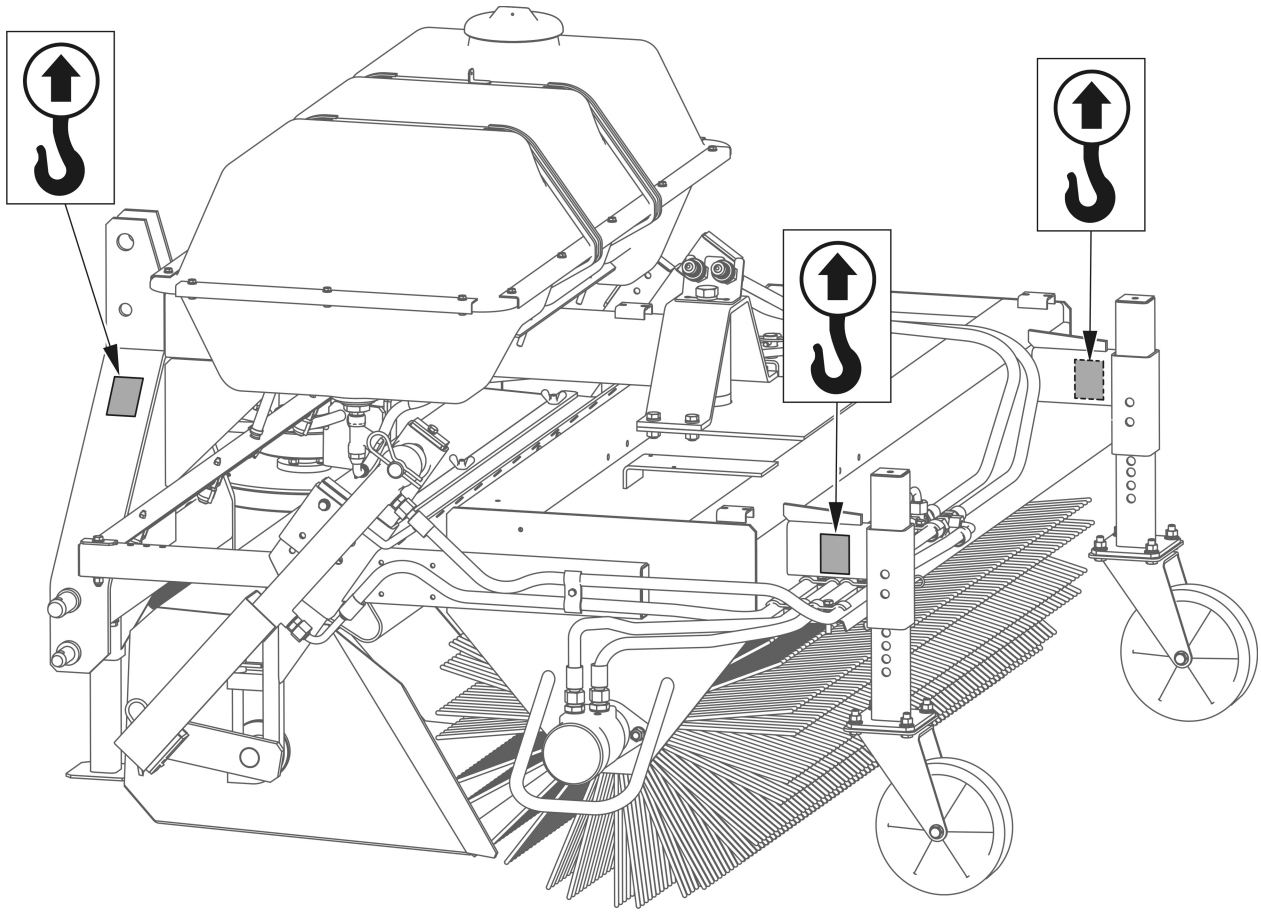


FIG. 1.3A transport lugs

Suspension points are identified with information decals. When lifting the machine take particular care due to the possibility of tipping over the machine and the risk of injuries from protruding parts. To keep lifted machine in the correct direction it is recommended to apply additional guy cables. During the loading work particular care should be taken not to damage paint coating.

The machine should be attached to lifting equipment in places specially designed for this purpose (FIG. 1.3A) i.e., using the three-point linkage frame bracket and each of the jockey wheel brackets.

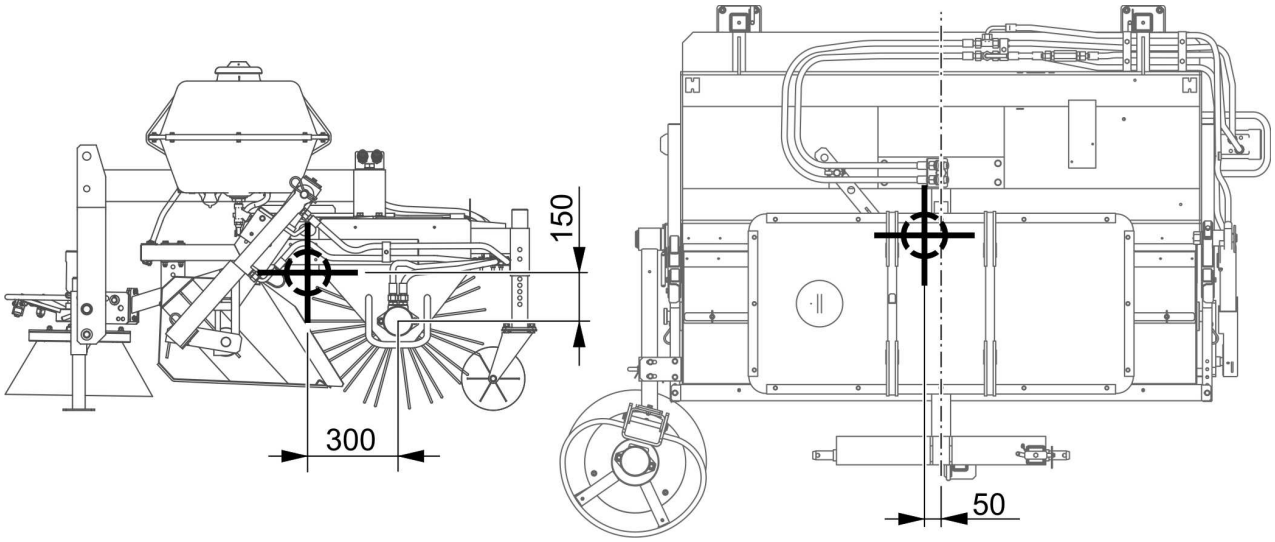


FIG. 1.4A Centre of gravity

All dimensions given in millimetres [mm]

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. During road transport the machine should be secured on the carrier platform by certified belts or chains fitted with a pulley.

ATTENTION!

Centre of gravity, depending on the machine version (e.g. ZM-1600/-01…05), varies in the range of ± 75 mm.

DANGER

When transporting independently, the user must carefully read this Operator's Manual and observe all recommendations. When being transported on a motor vehicle the machine must be mounted on the vehicle's platform in accordance with the transport safety requirements. The driver of the vehicle should take particular care while transporting the machine. This is due to the vehicle's centre of gravity shifting upwards when loaded with the machine.

ATTENTION!

Do not attach any slings or fastening elements to cylinder or hydraulic motor.

1.6 ENVIRONMENTAL HAZARDS

A hydraulic oil leak constitutes a direct threat to the natural environment owing to limited biodegradability of oil. Maintenance and repair works which involve the risk of an oil leak should be performed in the rooms with oil resistant floor. 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. Collected oil should be kept in sealed and clearly marked containers away from heat sources and food. Oil waste should be taken to the appropriate facility dealing with the re-use of this type of waste.

It is recommended to store used oil in its original packaging.

1.7 WITHDRAWAL FROM USE

Before proceeding to dismantle equipment oil shall be completely removed from hydraulic system.

DANGER

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.

Worn metal parts remaining after repairs and unsuited for regeneration shall be scrapped. Waste oil and also rubber and plastic elements should be taken to establishments undertaking the utilisation of such materials.

SECTION

2 SAFETY ADVICE

BASIC SAFETY RULES
DRIVING ON PUBLIC ROADS
DESCRIPTION OF MINIMAL RISK
INFORMATION AND WARNING DECALS

2.1 BASIC SAFETY RULES

- Before using the machine, the user must carefully read this operator's manual. When operating the machine, the operator must comply with all the recommendations included in the operator's manual.
- If the information contained in the Operator's Manual is difficult to understand, contact a seller, who runs an authorised technical service on behalf of the manufacturer, or contact the manufacturer directly.
- The machine must never be used by persons, who are not authorised to drive agricultural tractors, including children and people under the influence of alcohol or other drugs.
- The machine must not be used for purposes other than those for which it is intended. Anyone who uses the machine other than the way intended takes full responsibility for himself for any consequences of this use.
- Any modification to the machine made by the user frees PRONAR from any responsibility for damage or detriment to health which may arise as a result
- In the event of any fault or damage whatsoever, do not use the machine until the fault has been corrected.
- Before hitching the machine to tractor, always check technical condition of the hitching system and connection elements of the tractor and the machine.
- Be especially careful when hitching the machine to tractor.
- When hitching, there must be nobody between the machine and the tractor.
- The machine should be hitched to tractor by means of the three point linkage. After mounting the machine, check the safeguards.
- To mount machine on tractor use only genuine pins and safeguard cotter pins.
- When connecting the hydraulic lines, make sure that the hydraulic system is not under pressure.
- Regularly check technical condition and correct mounting of safety guards, protective aprons and protective elements. Do not operate the machine without safety guards installed.

- Before using the machine always check its technical condition and if it is complete.
- Before starting the tractor with the coupled sweeper make sure that the external hydraulic system control levers are in off position, otherwise the machine may be started in uncontrolled manner.
- Materials, people or animals must not be transported.
- Before lowering or lifting the machine mounted on the three-point linkage, make sure there are no bystanders near the machine.
- Do NOT travel with raised and working machine.
- Before starting the sweeper make sure that there are no bystanders (especially children) or animals in the danger zone. The machine operator is obliged to ensure proper visibility of the machine and the working area.
- Before starting the sweeper drive, lower the sweeper to working position. It does not refer to the first start, when preparing the sweeper for work.
- Do NOT leave the tractor cab, when the machine drive is engaged.
- Keep a safe distance from rotating machine parts.
- When filling the water tank, the machine should be lowered to working position and the tractor's engine should be turned off .
- Do not exceed the maximum working speed of 6 km/h
- The hydraulic system is under high pressure when operating.
- Reduce pressure prior to disconnecting the hydraulic system.
- Regularly check the technical condition of the connections and the hydraulic lines. There must not be any leaks of hydraulic oil.
- Sweeper disconnected from tractor must be supported on jockey wheels and parking stand.
- Repair and maintenance work should be carried out only with the machine lowered, tractor's engine switched off and the ignition key removed.
- During work use the proper protective clothing and appropriate tools.

- All 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 disinfected and dressed. In the event of more serious injuries, seek a doctor's advice.
- Regularly check the condition of the bolt and nut connections.
- In the event of work requiring the machine to be raised, use proper hydraulic or mechanical lifts for this purpose. After lifting the machine, stable and durable supports must be used. Do NOT carry out work under a machine, which has only been raised with the three point linkage.
- Do NOT modify the hydraulic system under pain of forfeiting the guarantee rights.
- In the event of malfunction of the hydraulic system, the machine should be withdrawn from use until the malfunction is corrected.
- During the warranty period, any repairs may only be carried out by Warranty Service authorised by the manufacturer.
- 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.

2.2 DRIVING ON PUBLIC ROADS

- When driving on public roads, comply with the road traffic regulations.
- The sweeper used on public roads should be equipped with additional lights and a slow-moving vehicle warning sign (if the sweeper obscures the tractor's warning reflective triangle and lights).
- During sweeper operation on public roads, the tractor must be equipped with the orange beacon light.
- Do not leave the tractor with the sweeper on slopes. However, if it is necessary, lower the sweeper, engage 1st gear (in the tractor) and engage the parking brake.
- Do not exceed the maximum speed when travelling. Adjust your speed to the road conditions.
- Do NOT leave tractor driver's seat when the tractor is moving.

2.3 DESCRIPTION OF MINIMAL RISK

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

- using the machine for purposes other than those described in the Operator's Manual,
- being between the tractor and the machine while the engine is working;
- operation of the machine by persons under the influence of alcohol;
- being on the machine during work;
- operating the machine with removed or faulty safety guards;
- cleaning, maintenance and technical checks when engine is running;
- making modifications to the machine without the consent of the Manufacturer;
- bodily injury resulting from contact with moving elements;
- presence of persons or animals in areas invisible from the driver's position;

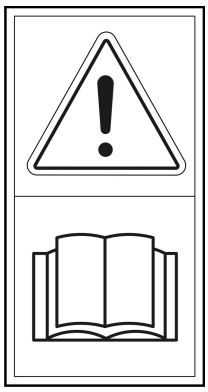
The minimal risk may be kept to a minimum by following the recommendations below:

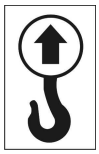
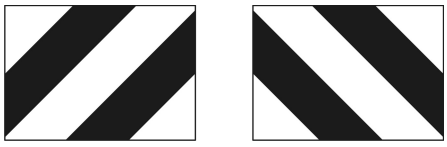
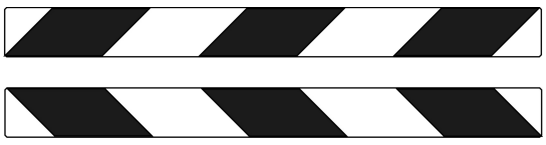
- prudent and unhurried operation of the machine,
- application of the remarks and recommendations contained in the Operator's Manual;
- maintaining safe distance from the danger zone;
- a ban on being on the machine when it is operating;
- carrying out repair and maintenance work in line with operating safety rules;
- using suitable protective clothing;
- ensuring unauthorised persons have no access to the machine, especially children.

2.4 INFORMATION AND WARNING DECALS

All signs should always be legible and clean, visible to the operator and also to persons possibly being 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 AND WARNING DECALS

ITEM	SYMBOL	DESCRIPTION
1		Before starting work, carefully read the Operator's Manual.
2		Pressurised liquid. Keep a safe distance.

ITEM	SYMBOL	DESCRIPTION
3		Risk of injury caused by thrown objects. Keep a safe distance from the operating machine.
4		Do NOT approach and do NOT touch rotating brushes
5		Marking of points of suspension
6	***Agata***	Trade mark
7	***Municipal Series***	Additional marking
8	***ZM 1600 ZM 1600-01 ZM 1600-02 ZM 1600-03 ZM 1600-04 ZM 1600-05***	Sweeper model
9		Rear clearance marking
10		Front clearance marking

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

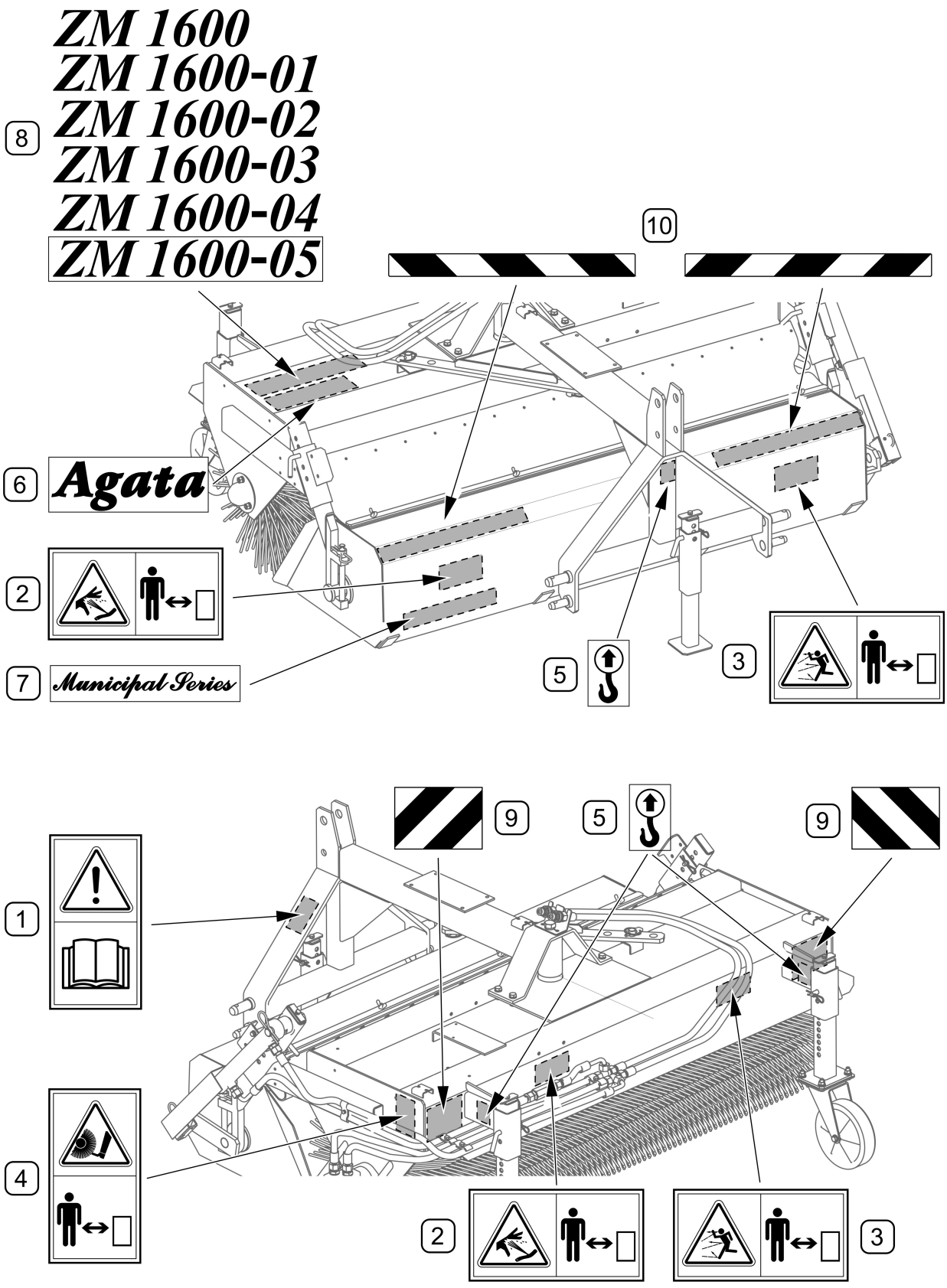


FIG. 2.1A LOCATIONS OF INFORMATION AND WARNING DECALS

Meaning of symbols (TAB. 2.1)

SECTION

3

DESIGN AND OPERATION

TECHNICAL SPECIFICATION
GENERAL DESIGN
HYDRAULIC SYSTEM
SPRINKLER SYSTEM
ELECTRICAL SYSTEM

3.1 TECHNICAL SPECIFICATION

TAB. 5.1 BASIC TECHNICAL DATA OF ZM-1600/-01…05 SWEEPER

	Unit	ZM-1600 ZM-1600-02	ZM-1600-01 ZM-1600-03	ZM-1600-05	ZM-1600-04
Technical specification					
Mounting method		Three point linkage cat. I (I narrow) and II (II narrow) according to PN-ISO 730-1			
Sweeping width	mm	1 600	2 000	2 000	1,600
Sweeping width *(when inclined at 15°)*	mm	1,500	1,900	1,900	1,500
Capacity *	m^2/h	9,500	11,780	11,780	9,500
Recommended sweeping speed	km/h	6			
Quantity and type of brushes	–	1 sweeping roller brush	1 sweeping roller brush + 1 side brush		1 sweeping roller brush
Waste tank capacity	dm^3	~200		–	
Tare weight (without water)	kg	334	375	325	249
Rotation speed: - roller brush - side brush	 RPM RPM	 100 - 200 150 - 300			
Sprinkler system					
Water tank capacity	dm^3	130			–
Quantity of sprinkling nozzles	item	4	6		–
Sprinkler system supply	–	from 12V 7-pole socket			–
System control	–	Switch on the power cord			–
other	–	Pump switches off automatically when there is no water			–

* – *for recommended sweeping speed without 15° deflection*

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

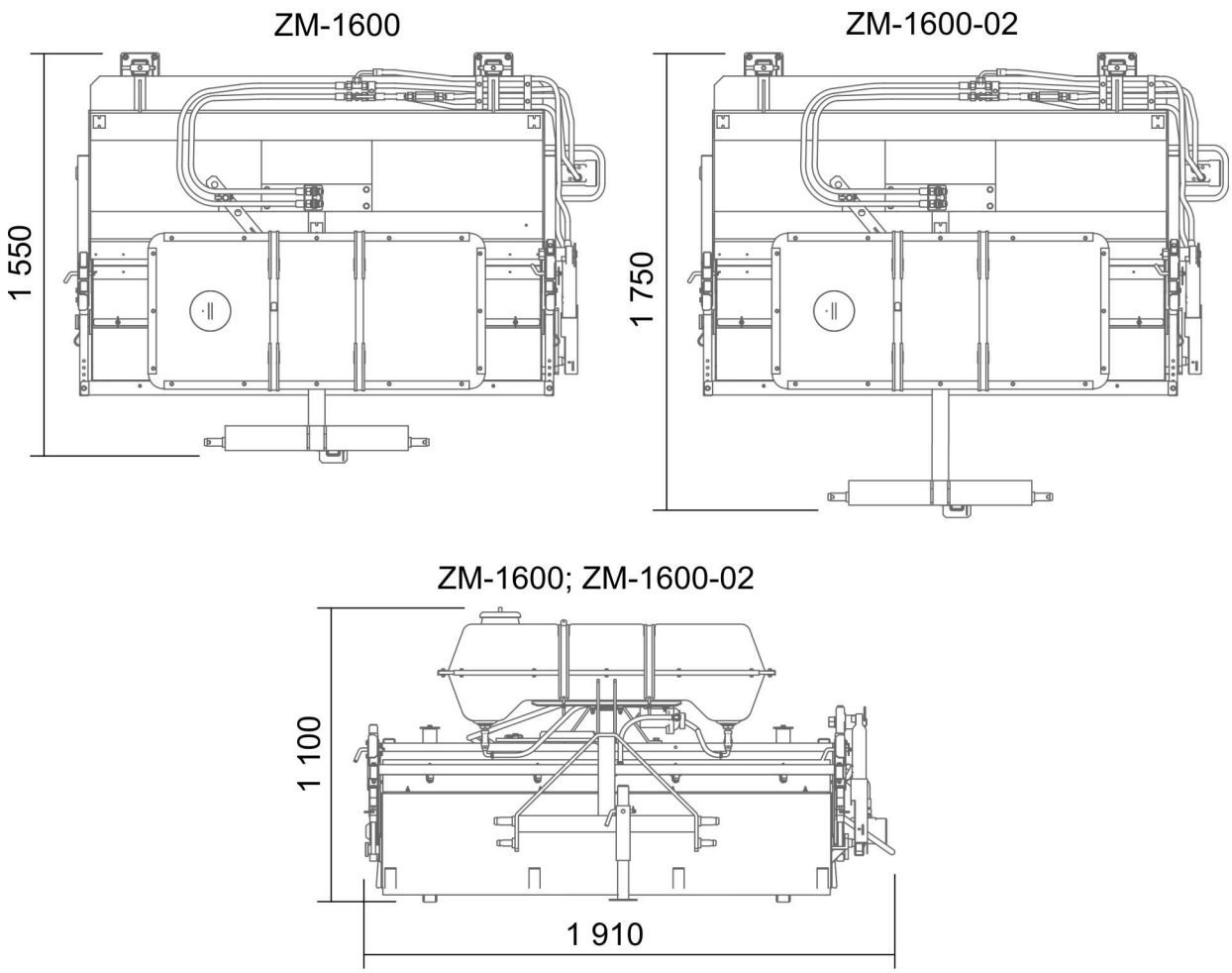


FIG. 3.1A External dimensions of ZM-1600; ZM-1600-02 sweepers

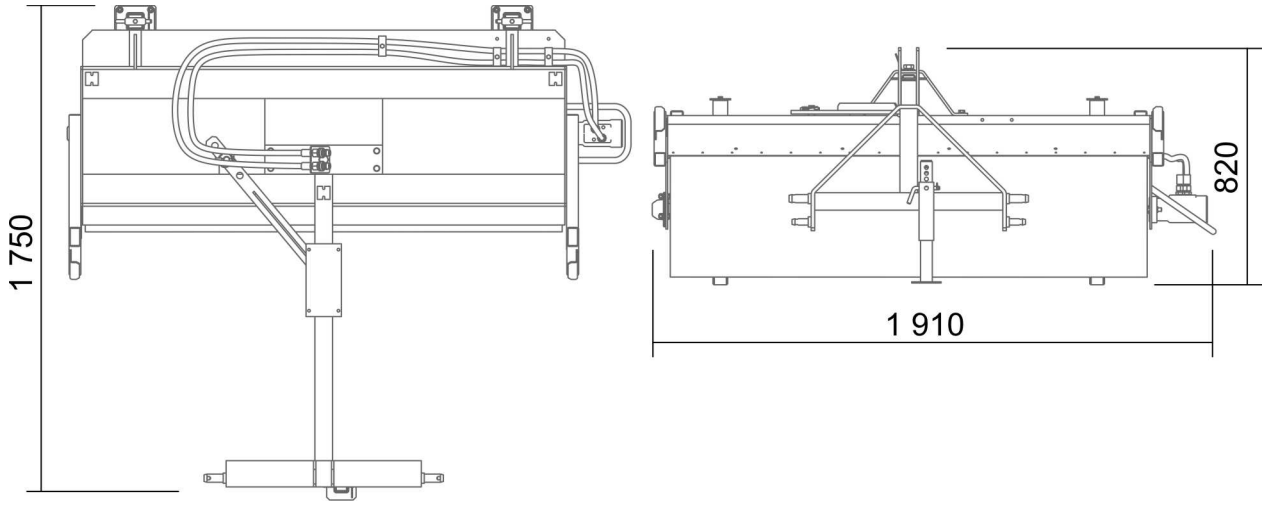


FIG. 3.2A External dimensions of ZM-1600-04 sweeper

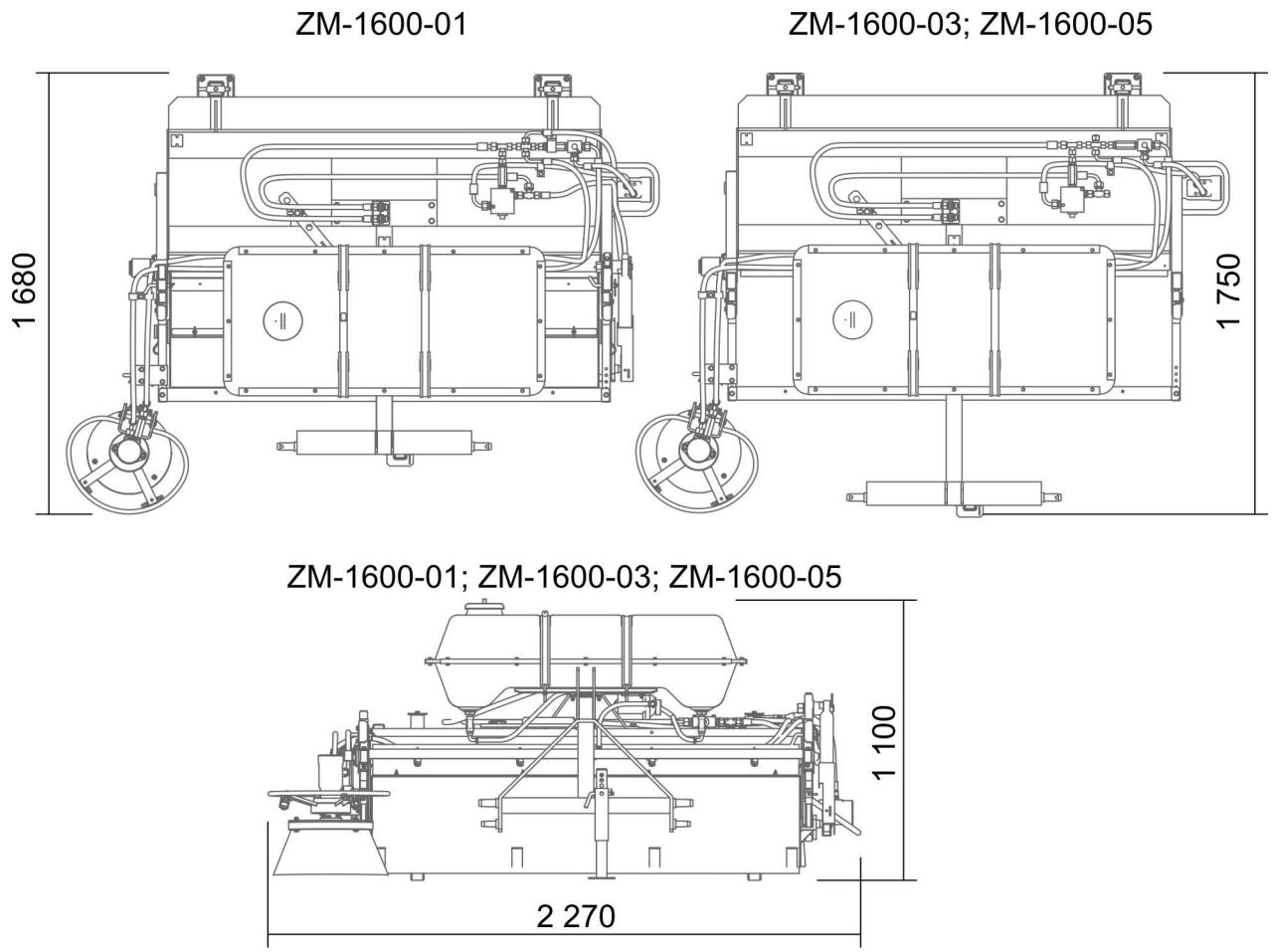


FIG. 3.3A External dimensions of ZM-1600-01; ZM-1600-03; ZM-1600-05

3.2 GENERAL DESIGN

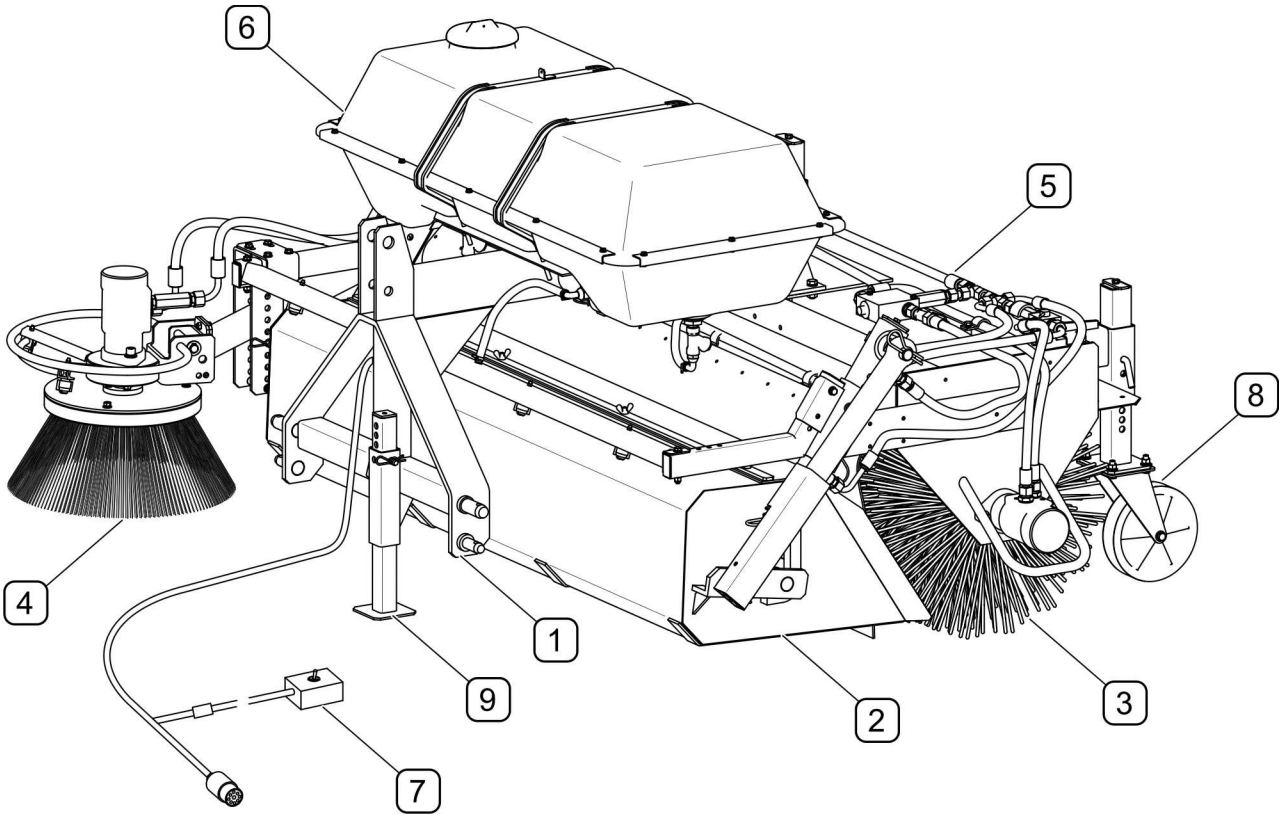


FIG. 3.4A General design of the sweeper

(1)- linkage; (2)- waste tank; (3)- sweeping roller brush; (4)- side brush; (5)- hydraulic system; (6)- sprinkler system; (7)- electrical system; (8)- jockey wheel; (9)- parking stand.

The sweeper's linkage (1) mounted on the frame by means of a pivot allows rotation and operation in front of the carrying vehicle and also operation at an angle. Sweeping roller brush (3) driven by hydraulic motor directs dirt to waste tank (2), which can be emptied from the operator's seat using the hydraulic system (5). ZM-1600-01, ZM-1600-03 and ZM-1600-05 sweepers are additionally equipped with side brush *(4)* to allow sweeping close to walls or curbs. The sprinkler system (6) (*does not apply to ZM-1600-04* sweeper) is controlled by means of the electrical system (7). Self-adjusting jockey wheels (8) support the machine on the ground during operation, while the sweeper detached from the carrying vehicle rests on its parking stand (9).

3.3 HYDRAULIC SYSTEM

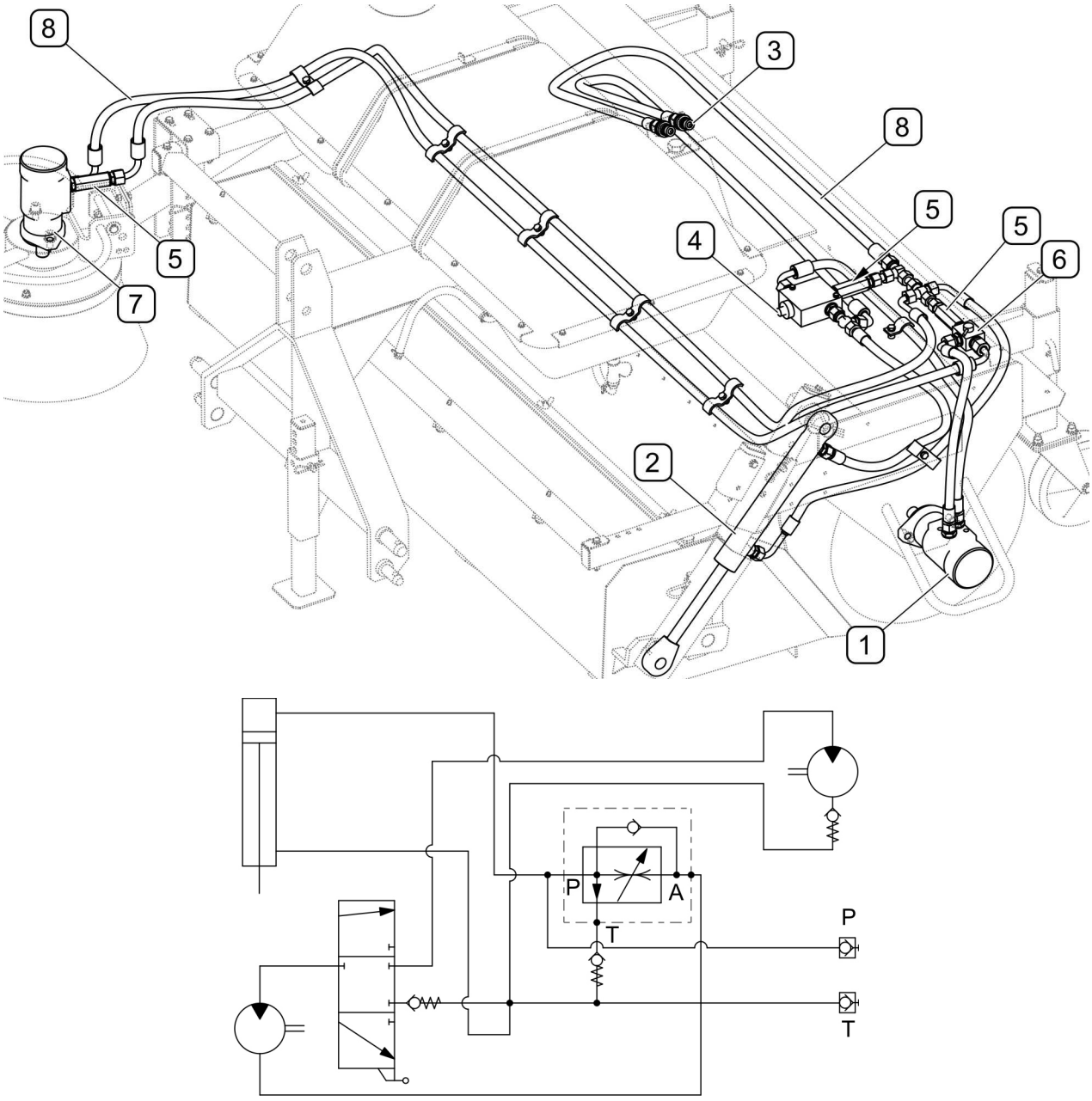


FIG. 3.5A Design of hydraulic system of ZM-1600-01 and ZM-1600-03 sweepers

(1)- hydraulic motor of sweeping roller brush drive; (2)- waste tank hydraulic tipping cylinder; (3)- hydraulic quick couplers; (4)- flow regulator; (5)- check valve; (6)- side brush drive selective control valve; (7)- hydraulic motor of side brush drive; (8)- hydraulic lines

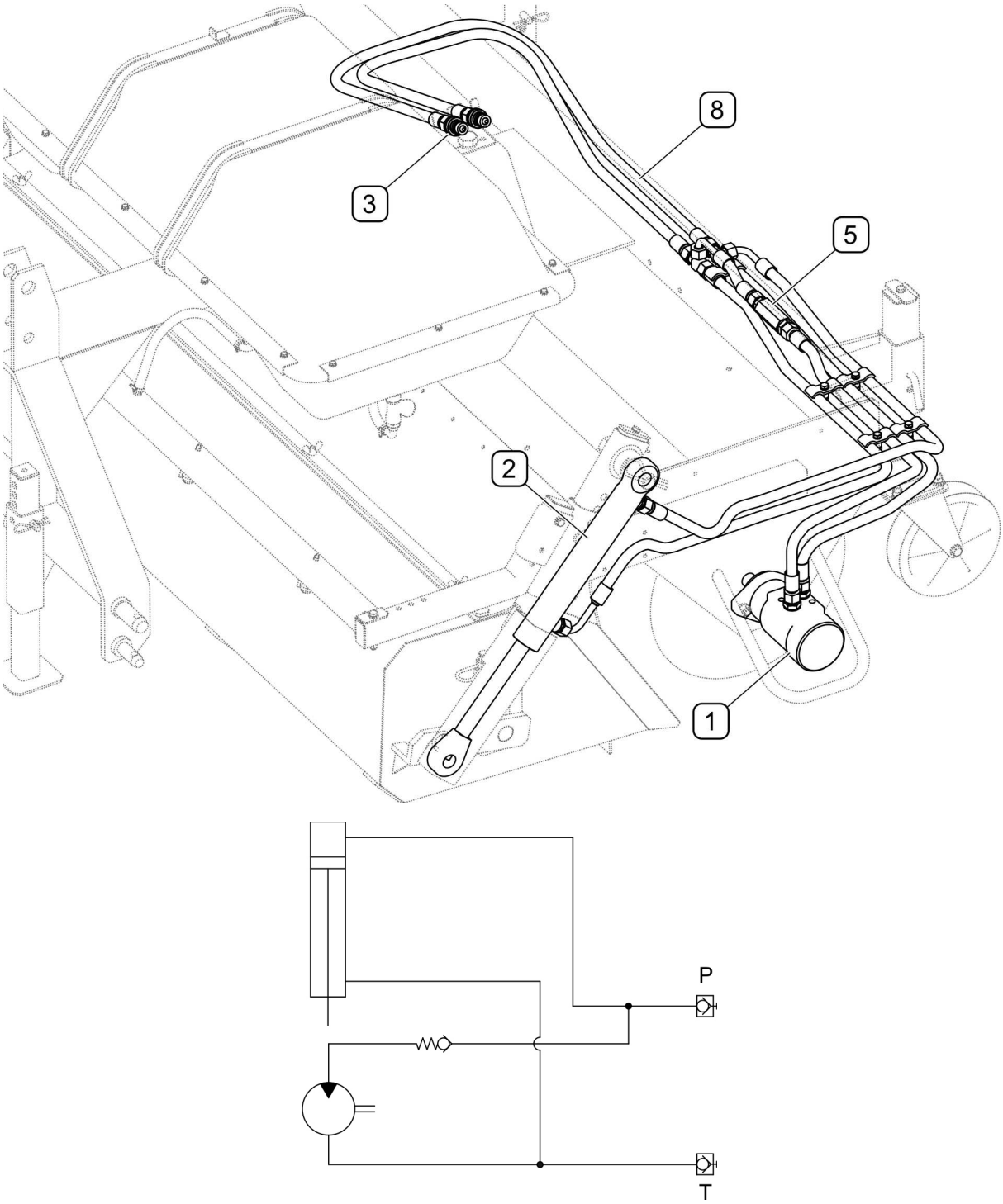


FIG. 3.6A Design of hydraulic system of ZM-1600 and ZM-1600-02 sweepers

(1)- hydraulic motor of sweeping roller brush drive; (2)- waste tank hydraulic tipping cylinder; (3)- hydraulic quick couplers; (5)- check valve; (8)- hydraulic lines

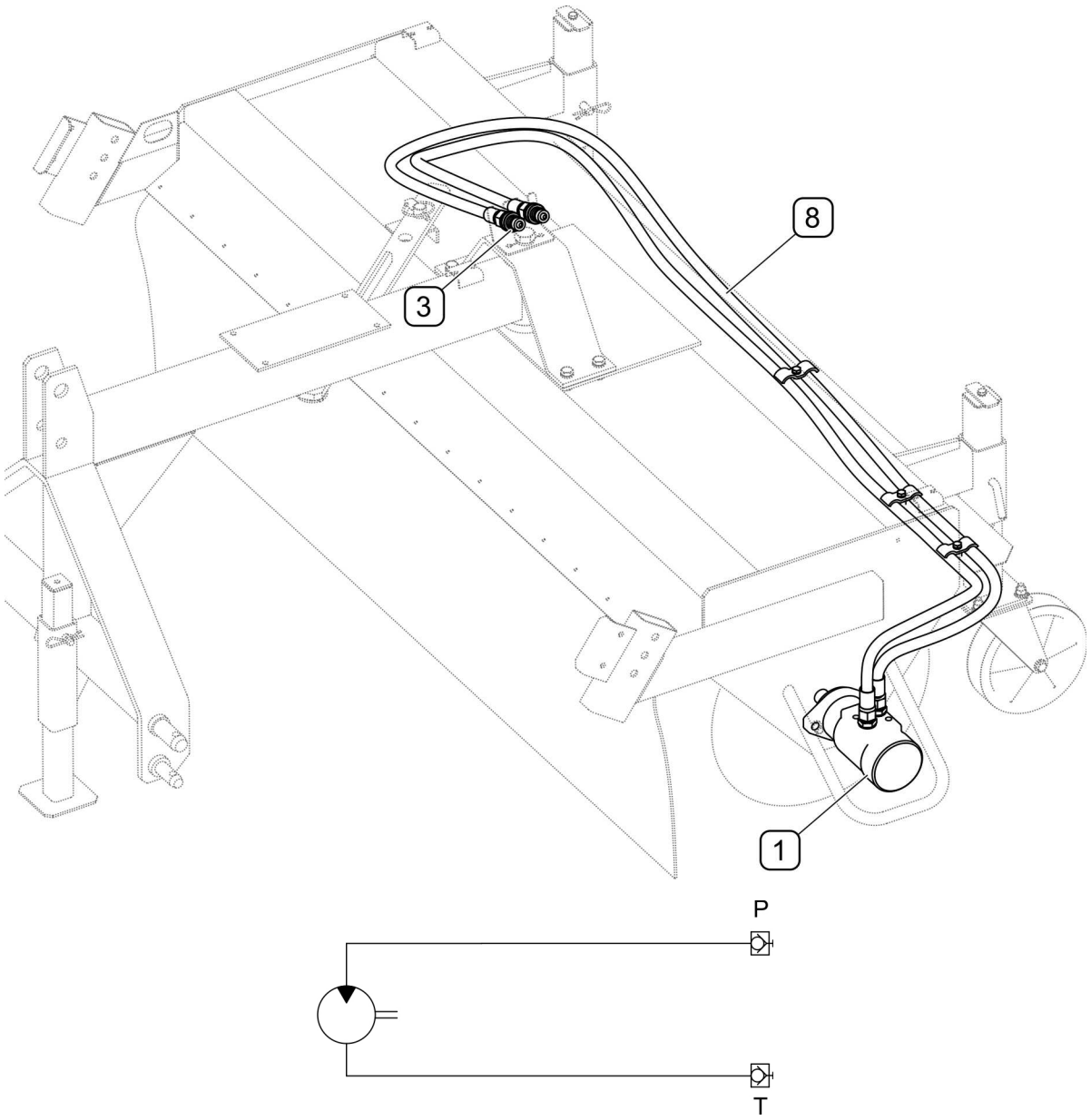


FIG. 3.7A Design of hydraulic system of ZM-1600-04 sweeper

(1) - hydraulic motor of sweeping roller brush drive; (3) - hydraulic quick couplers; (8)- hydraulic lines

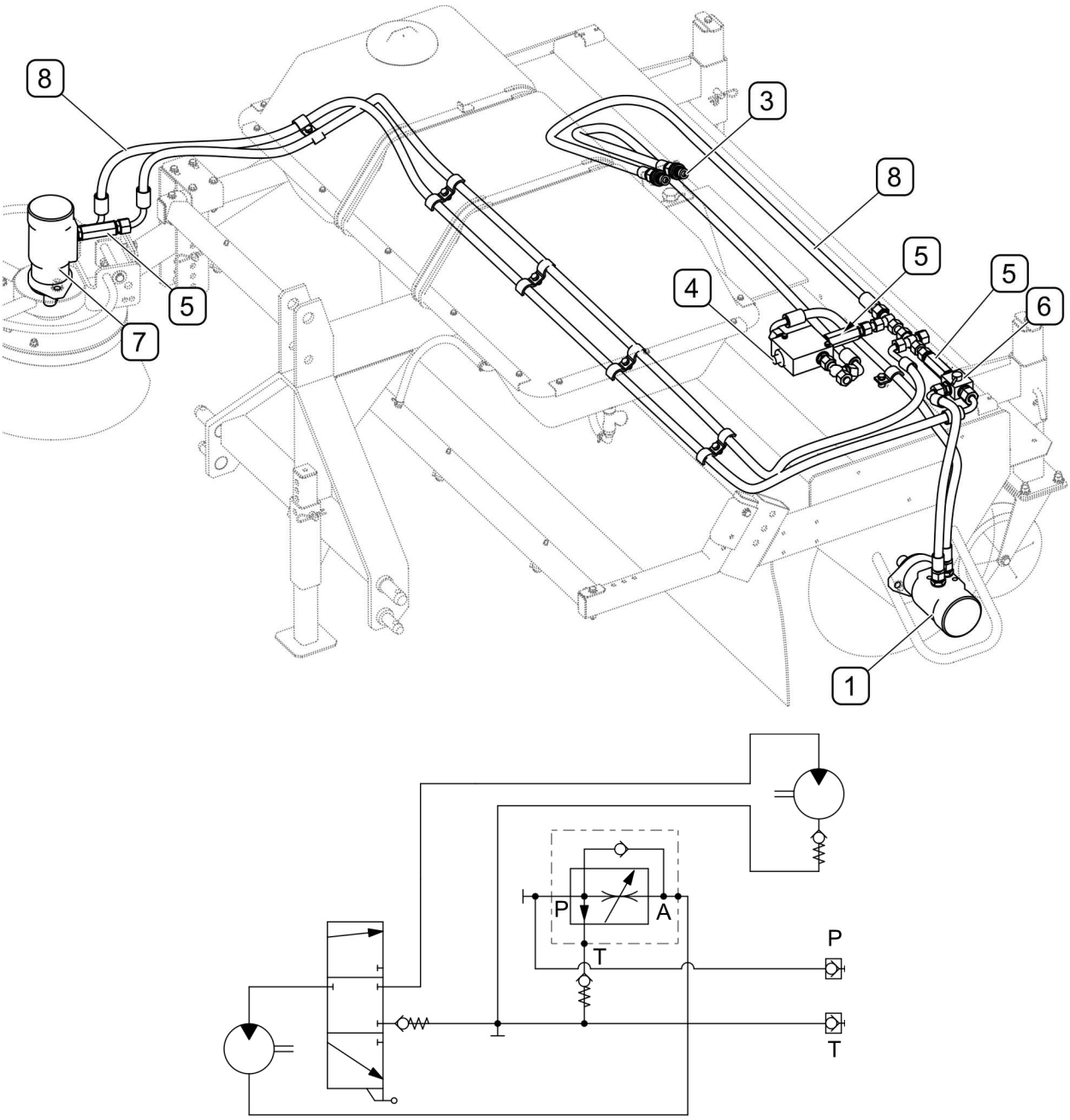


FIG. 3.8A Design of hydraulic system of ZM-1600-05 sweeper

(1) - hydraulic motor of sweeping roller brush drive; (3) - hydraulic quick couplers; (4)- flow regulator; (5)- check valve; (6)- selective control valve; (7)- hydraulic motor of side brush drive; (8)- hydraulic lines

3.4 SPRINKLER SYSTEM

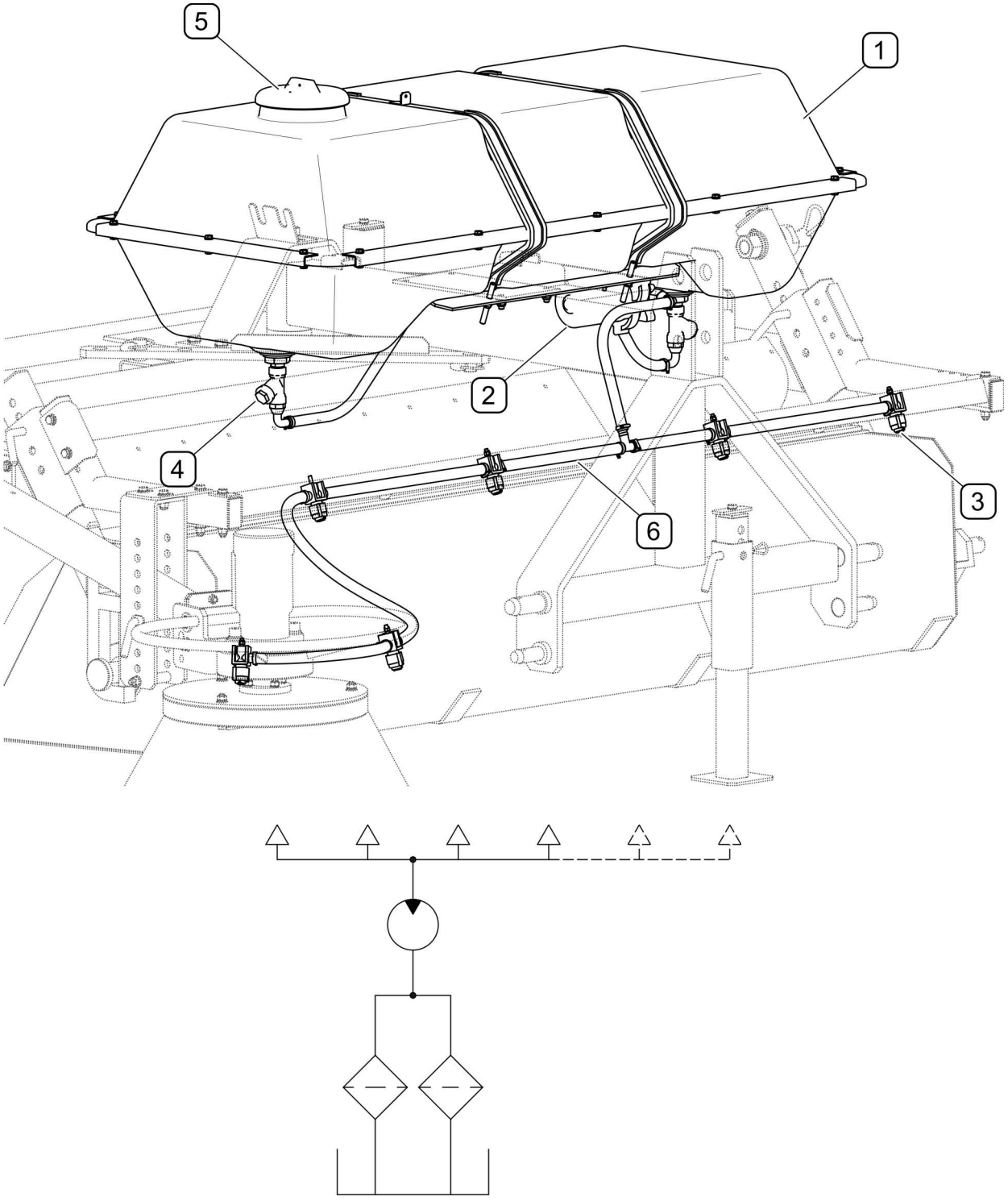


FIG. 3.9A Sprinkler system design

(1)- water tank; (2)- water pump; (3)- sprinkling nozzles; (4)- water filter; (5)- filler plug; (6)- lines;

Water tank (1) and water pump (2) are the main elements of the sprinkler system. Sprinkling nozzles (3) placed in front of the sweeping roller brush and side brush (*does not apply to ZM-1600-04*) effectively prevent excessive dusting during sweeper operation. The system is controlled via a switch located on the power supply cord connected to the 7-pole socket on the tractor.

3.5 ELECTRICAL SYSTEM

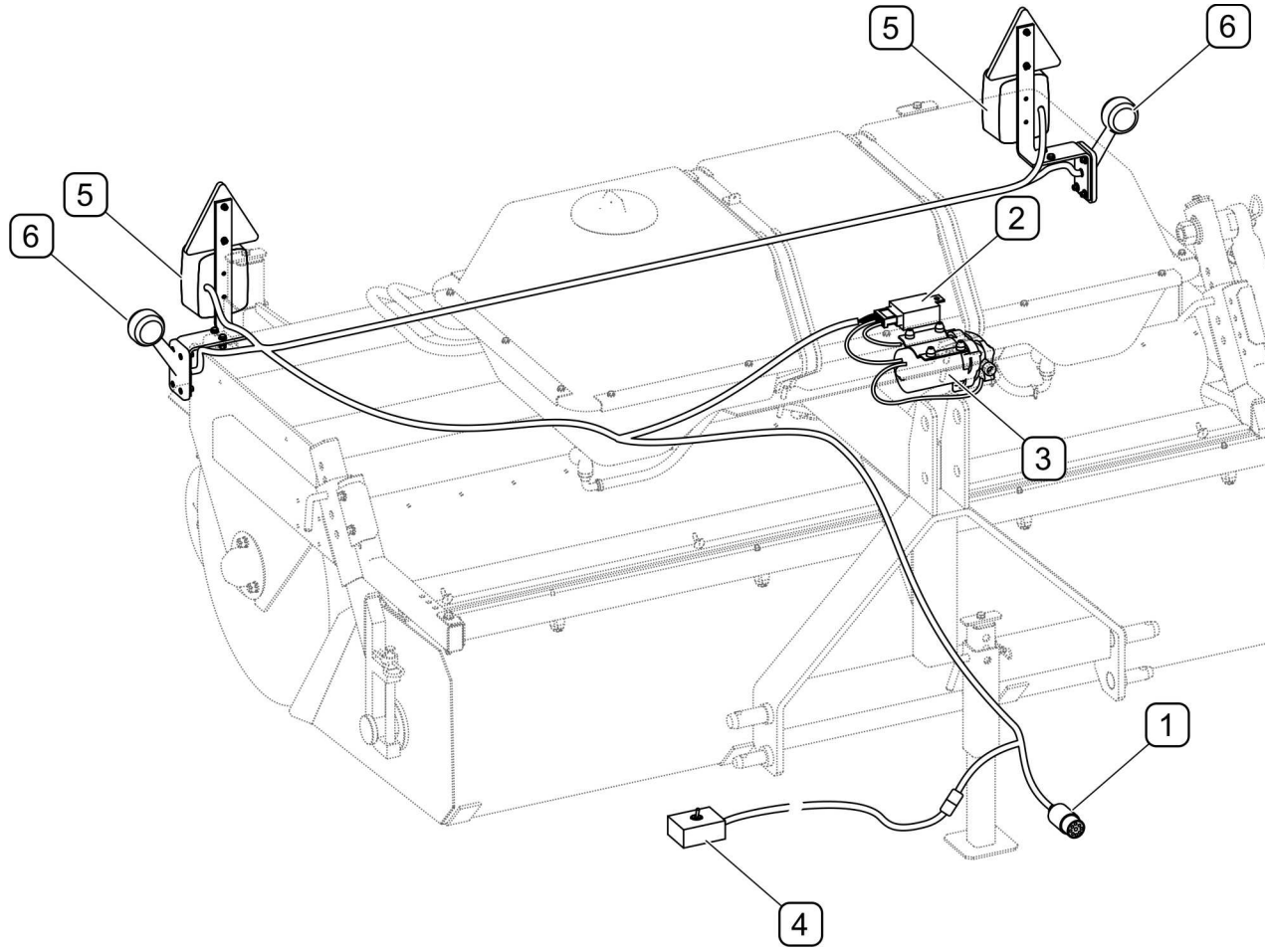


FIG. 3.10A Electrical system design

(1)- 7-pole connector; (2)- pump controller; (3)- water pump: (4)- sprinkler system switch; (5)- rear lamp assembly (option); (6)- clearance lights (option)

The electrical system powers and controls the sprinkler system water pump. Water pump *(3)* located under the tank is connected with controller *(2)* and is powered through connector *(1)* from the 12V 7-pole socket in the tractor. Optionally, the sweeper can be equipped with sprinkler and lighting electrical system consisting of additional lamp assemblies (5) and clearance lamps (6) located in the rear of the machine.

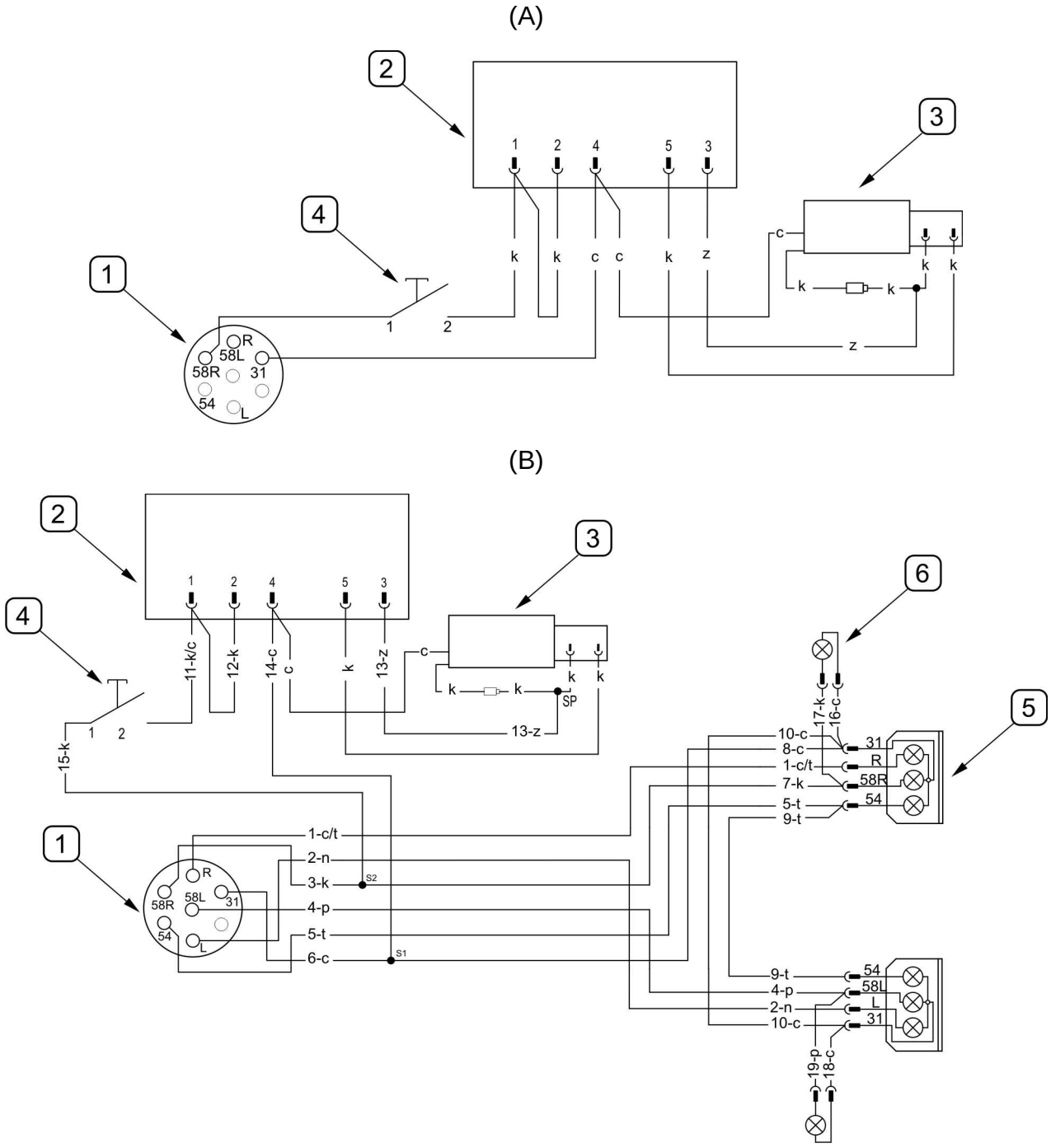


FIG. 3.11A Concept diagram of the sprinkler electrical system

(A)- sprinkler electrical system; (B)- sprinkler and lighting electrical system; (1)- 7-pole connector; (2)- pump controller; (3)- water pump; (4)- sprinkler system switch; (5)- lamp assembly; (6)- clearance lights

Colour designations on electrical diagrams: **b**-white; **c**-black; **f**-violet; **k**-red; **l**-lazurite; **n**-blue; **o**-brown; **p**-orange; **r**-pink; **s**-grey; **t**-green; **z**-yellow;

SECTION

4

CORRECT USE

PREPARING FOR WORK
CHECKING TECHNICAL CONDITION
HITCHING TO TRACTOR
SWEEPER OPERATION
DRIVING ON PUBLIC ROADS
DISCONNECTING FROM TRACTOR

4.1 PREPARING FOR WORK

The manufacturer guarantees that the machine 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 machine's condition after delivery and before first use. The machine is delivered to the user completely assembled.

Before connecting to tractor, machine operator must check the technical condition of the machine and prepare it for test start-up. 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,
- inspect machine's individual components for mechanical damage resulting from incorrect transport (dents, piercing, bent or broken components),
- check all the lubrication points, lubricate the machine as needed according to recommendations provided in section 5 "*MAINTENANCE"',*
- check technical condition of the hydraulic system;
- check technical condition of hitching system pins and locking cotter pins,
- check technical condition of protective shields and check if they are correctly installed,

ATTENTION!

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

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

DANGER

Before starting the tractor with attached sweeper make sure the external hydraulic system control levers are in off position, otherwise it may lead to uncontrolled operation of the machine.

If all the above checks have been performed and there is no doubt as to the machine's good technical condition, it can be connected to tractor. Start the tractor's engine, check all systems and perform a test run before beginning work. In order to inspect:

- connect the sweeper to the tractor linkage *(see „Hitching to tractor")*
- Connect electrical wiring and hydraulic system lines.
- start the machine (see *Sweeper operation*)
- check the hydraulic system operation,
- test the sprinkler system.

ATTENTION!

It is recommended to first run the sweeper in the raised position, because oil circulation in the wrong direction can cause waste tank to tip and damage the machine.

Engage sweeper's drive for 3 minutes and check the following:

- that there is no knocking or noise in the drive system arising from scraping or grinding of metal elements,
- there are no leaks in sprinkler and hydraulic system,
- operation of all sprinkler nozzles,
- correct rotation of sweeping roller brush,

In the event of incorrect operation, immediately disconnect machine drive and identify a fault. If a fault cannot be rectified or the repair could void the guarantee, please contact the Manufacturer for additional clarifications.

4.2 CHECKING TECHNICAL CONDITION

When preparing the sweeper for normal use, check individual elements according to the schedule (TAB. 4.1)

TAB. 4.1 TECHNICAL INSPECTION SCHEDULE

DESCRIPTION	SERVICE OPERATION	FREQUENCY
Condition of safety guards	check the technical condition of safety guards, if complete and correctly mounted.	Before beginning work
Correct mounting of sweeping roller brush and side brush	check if correctly installed	
The technical condition of the sweeping roller brush and side brush *(if any)*	Visually inspect and if necessary replace *(see "Replacing the sweeping roller brush", "Replacing the side brush")*	
Check of all main nut and bolt connections are properly tightened	Torque values should be according to table (*5.5*)	Every six months
Lubrication	Lubricate elements according to table „*LUBRICATION*”.	According to table (*5.4*)

ATTENTION!

Do NOT use out of order sweeper.

4.3 HITCHING TO TRACTOR

The sweeper may be mounted on a tractor fulfilling the requirements contained in table „*1.1 AGRICULTURAL TRACTOR'S REQUIREMENTS”*.

ATTENTION!

Before hitching the sweeper to tractor, read the tractor operator's manual.

DANGER

Exercise caution when hitching the machine.

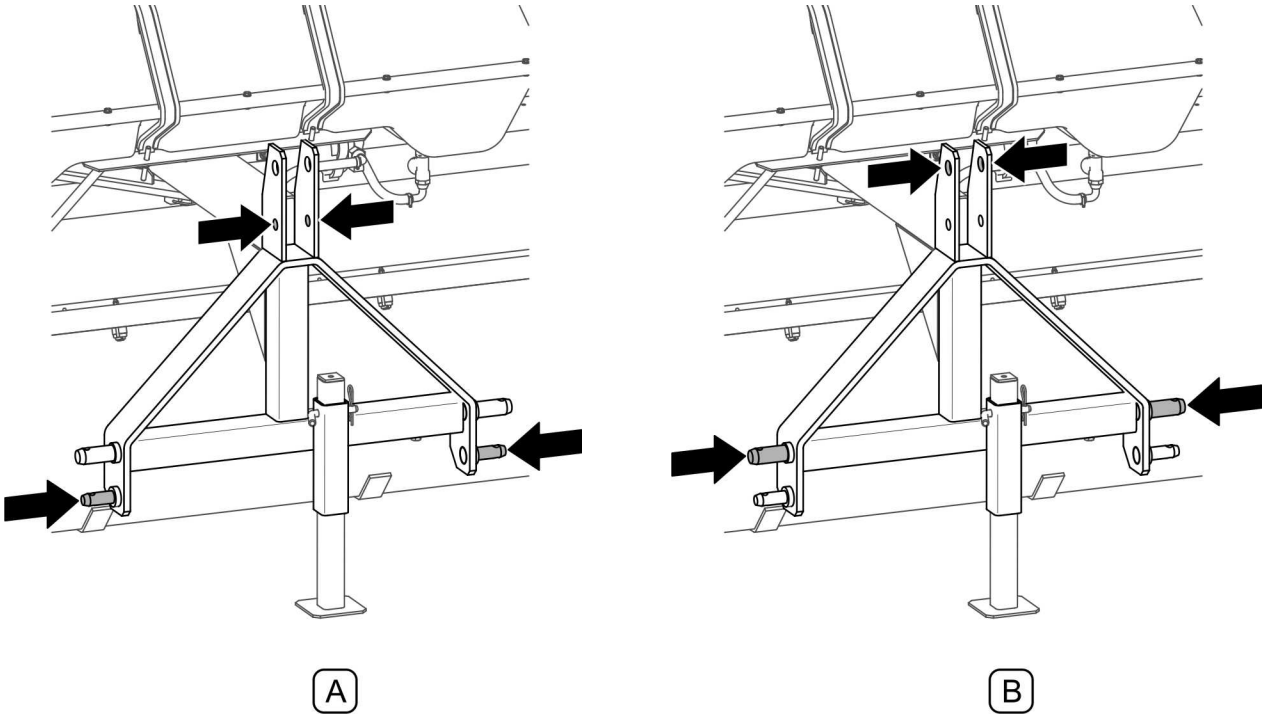


FIG. 4.1A ATTACHMENT POINTS ACCORDING TO CATEGORIES

(A)- category I attachment points; (B)- category II attachment points;

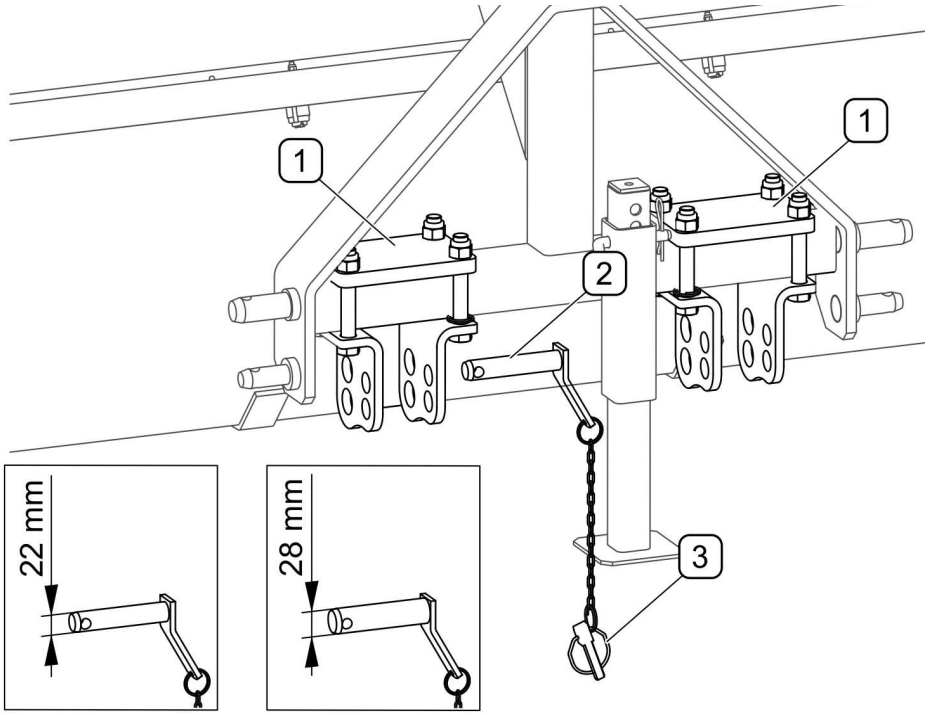


FIG. 4.2A Narrow category I attachment points using pivot pins (option)

(1)- pivot pins; (2)- pin; (3)- securing cotter pin

Optionally, pivot pins (1) and pins can be installed on the sweeper linkage frame(FIG. 4.2A). For the pivot pins, use pins suitable for the hole in the tractor three-point linkage links.

ATTENTION!

Comply with the recommendations relating to linkage and mounting points.

In order to attach the sweeper to tractor, proceed as follows:

- Reverse the tractor so as to move the lower links of the tractor three-point linkage to the pins of the sweeper linkage.
- Set lower links of the tractor three-point linkage at appropriate height.
- Switch off tractor's engine and prevent it from rolling.
- Connect the sweeper linkage lower links with the tractor lower pins and secure.

- Using a pin, connect top link of the tractor linkage with the top attachment point of the sweeper linkage and secure. Adjust stabilizers (tensioners) of the tractor linkage lower links so as to reduce lateral movement of the machine.
- Connect the hydraulic line connectors to the appropriate sockets on the tractor.
- Connect the sprinkler and lighting system (option) electrical connector to a 7-pole socket on the tractor.
- Lift sweeper using tractor's three point linkage.
- Raise the parking stand and lock it with a pin and securing cotter pin.

It is recommended to set both tractor lower linkage arms at the same height.

DANGER

When hitching, there must be nobody between the sweeper and the tractor.

ATTENTION!

During sweeper operation, the tractor must be equipped with the orange beacon light.

DANGER

Prior to connecting hydraulic system lines the user must carefully read the tractor operator's manual and observe all recommendations of the Manufacturer.

DANGER

During sweeper operation, the tractor three-point linkage must be set to floating position.

DANGER

When connecting the hydraulic lines to the tractor, make sure that the tractor hydraulic system is not under pressure.

DANGER

When connecting the hydraulic lines to the tractor, make sure that the tractor hydraulic system is not under pressure.

Before beginning work using the sweeper, check the oil level in tractor hydraulic system.

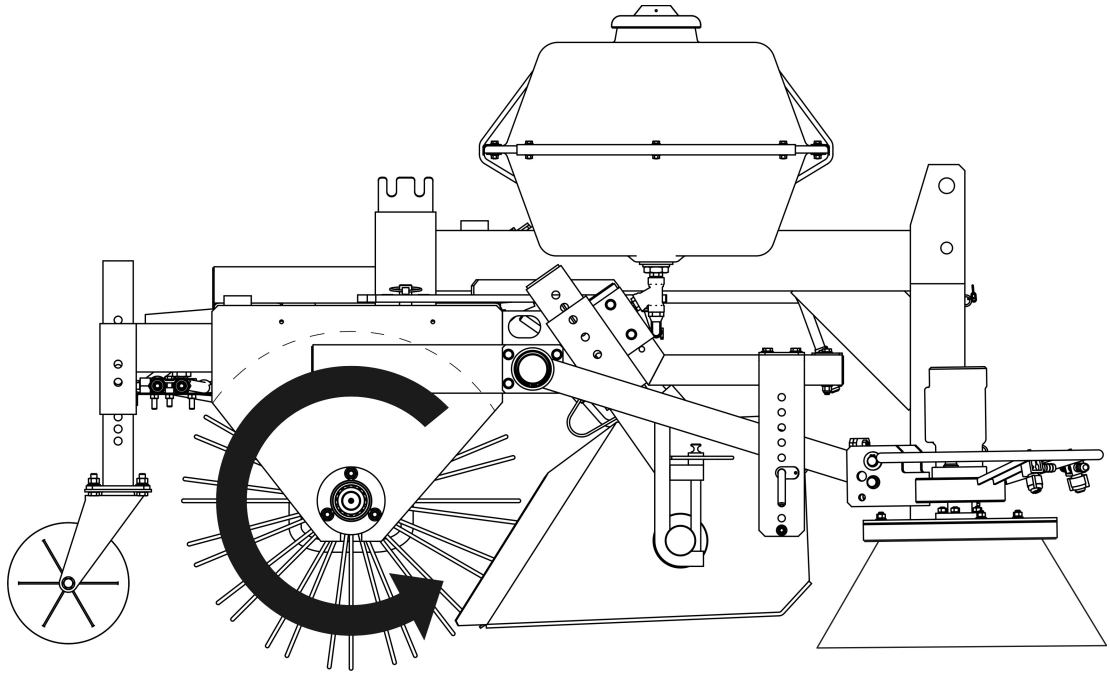


FIG. 4.3A Direction of sweeping roller brush rotation

Sweeping roller brush begins to rotate a moment after actuating the appropriate hydraulic circuit by means of a tractor hydraulic selective control valve lever. If the brush rotates in the wrong direction (FIG. 4.3A) or does not rotate at all, swap the hydraulic connectors.

ATTENTION!

Direction of the sweeping roller brush rotation should be checked when the machine is raised.

4.4 SWEEPER OPERATION

4.4.1 FILLING THE SPRINKLER SYSTEM TANK

Water tank *(1)* is filled through the inlet opening secured with a cap *(2)* (FIG. 4.4A). The tank holds 130 litres of water.

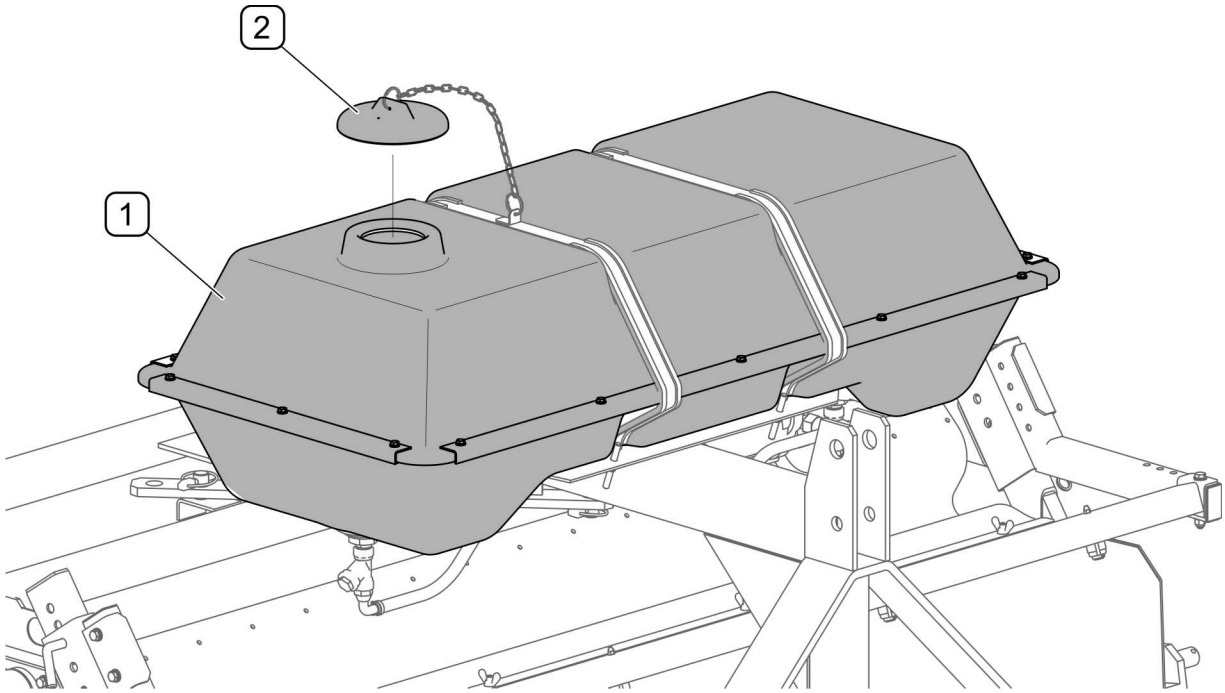


FIG. 4.4A Water tank of sprinkler system

(1)- water tank; (2)- filler plug;

IMPORTANT!

If there is a risk that temperatures drop below 0°C, drain water from the sprinkler system.

4.4.2 SPRINKLER SYSTEM CONTROL

Connect electrical system connector to 12V 7-pole socket on the tractor. Switch the sprinkling system on or off using the switch *(1)* on the power cord (FIG. 4.5A).

Switch *(1)* has two positions:

- "ON" or "I" - sprinkler system turned on;
- "OFF" or "0" - sprinkler system turned off

Install the switch in the operator cab in an easily accessible place.

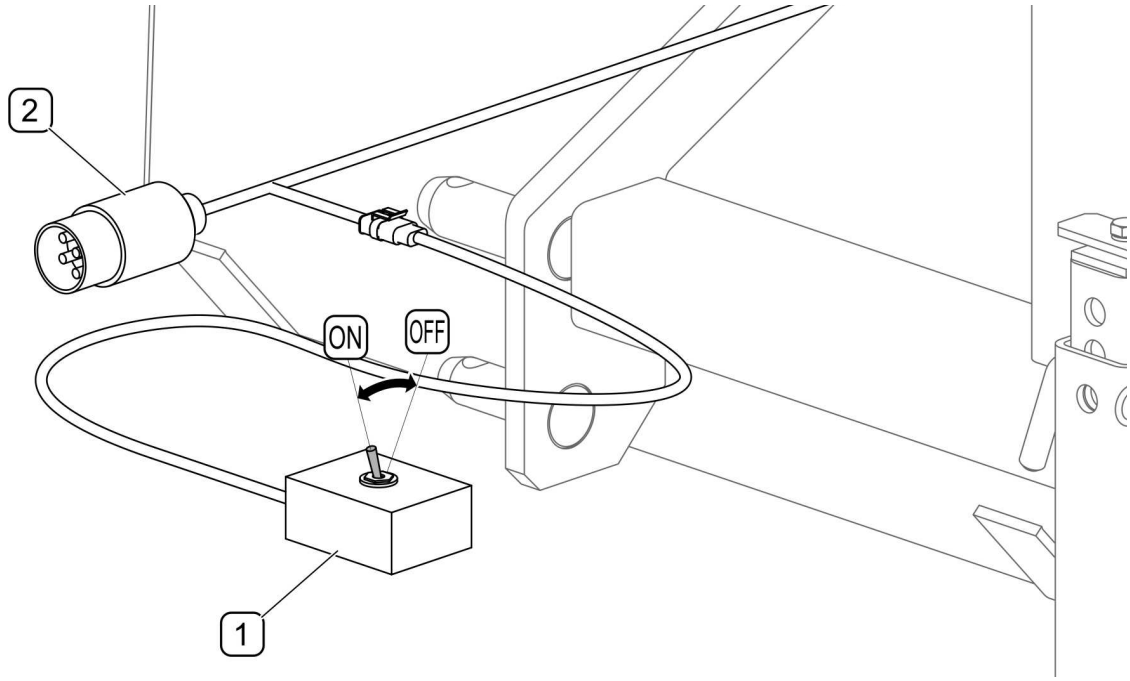


FIG. 4.5A Sprinkler system control

(1)- sprinkler system switch; (2)- 7-pole socket connector; (ON) or (I)- sprinkler system is turned on; (OFF) or (0)- sprinkler system is turned off

IMPORTANT!

If there is no water in the tank, the sprinkler system's pump will switch off automatically.

4.4.3 EMPTYING THE WASTE TANK

Operator can empty the waste tank using a hydraulic selective control valve by reversing the sweeper control circuit, so that the oil return line becomes a supply line. After emptying the tank restore the previous setting of the control circuit.

Waste tank can be opened and closed hydraulically only after lifting the sweeper.

DANGER

Do NOT stand under raised sweeper during machine operation.

4.4.4 OPERATING SWEEPER WITHOUT WASTE TANK

Sweepers equipped with waste tank can be converted to a sweeper operating without the waste tank. To remove the waste tank:

Remove the cotter pins from the hydraulic cylinder mounting points so it can be completely removed (FIG. 4.6A)

Reconnect the hydraulic system according to diagram in figure 3.6A

Unscrew the wing nuts (FIG. 4.6A) of the rubber apron to remove the terminal block. During sweeping without the waste tank, apron hangs down and provides protection against ejected particles.

Take out cotter pins and remove tank suspension locks from the extension arms on the right and left side of the tank and then slide out complete tank from the catches (FIG. 4.7A).

When the above preparations are completed, the machine is ready for sweeping without waste tank.

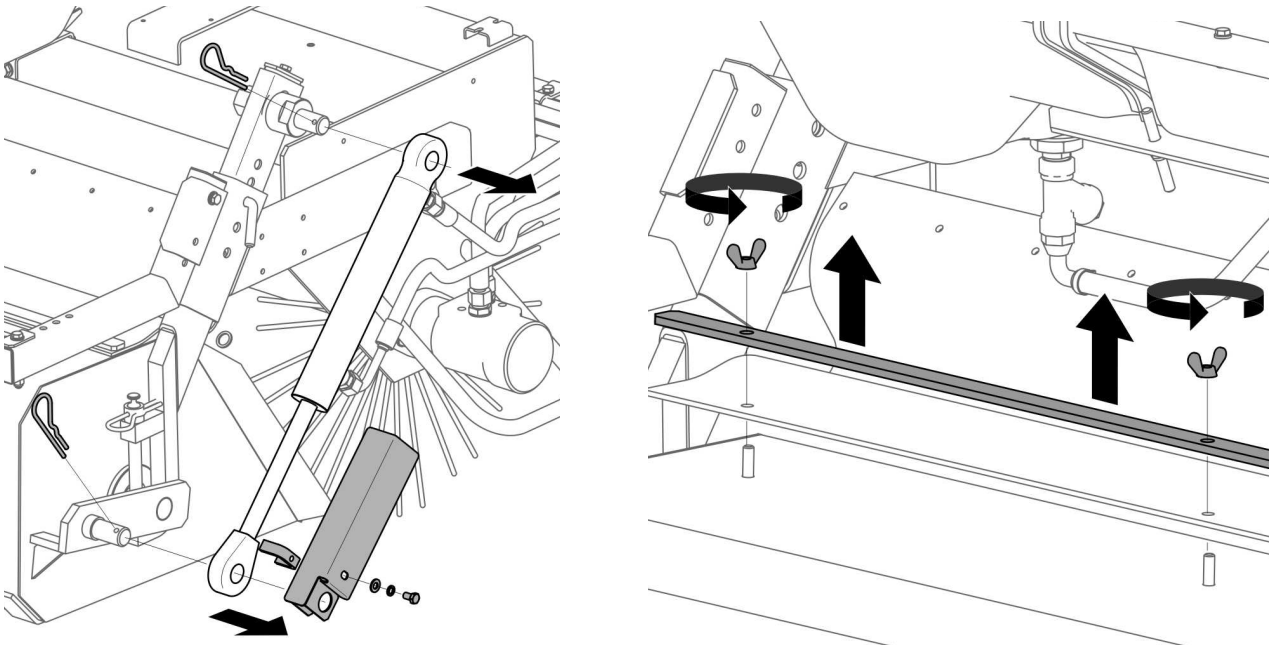


FIG. 4.6A Removing of the hydraulic cylinder and a rubber apron strip

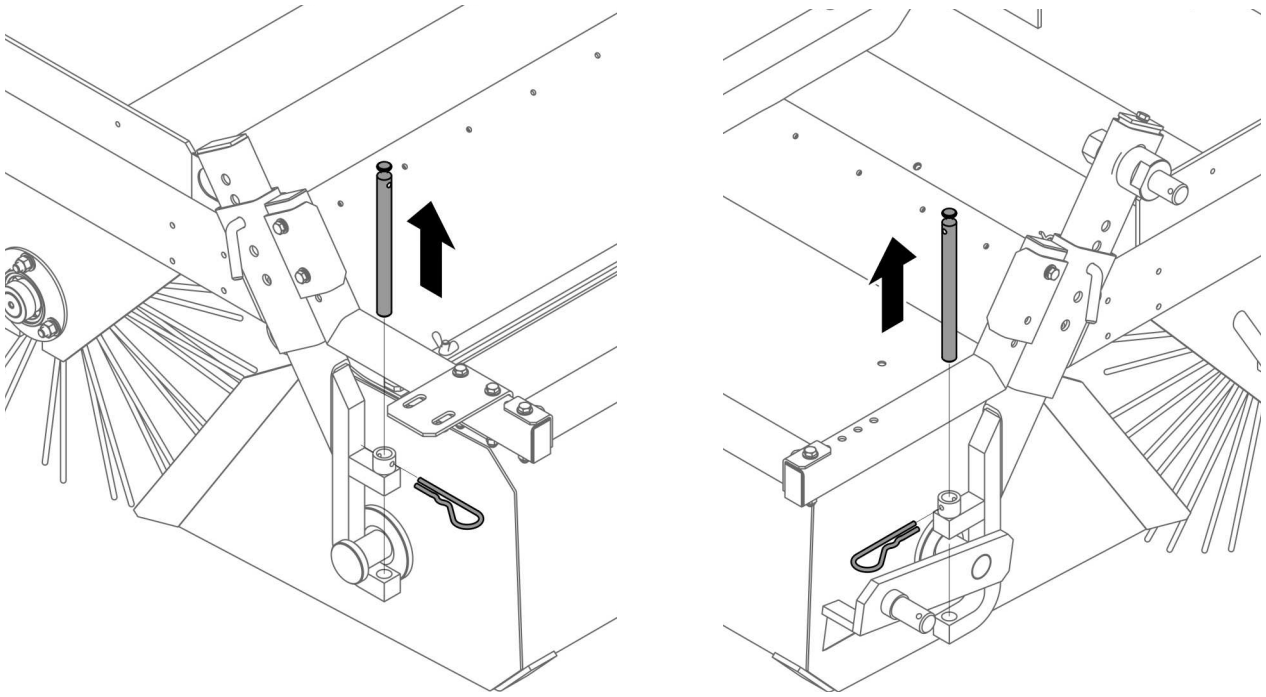


FIG. 4.7A Removing safety locks of waste tank catches

DANGER

The hydraulic system should be reconnected be a specialized facility, the dealer or manufacturer.

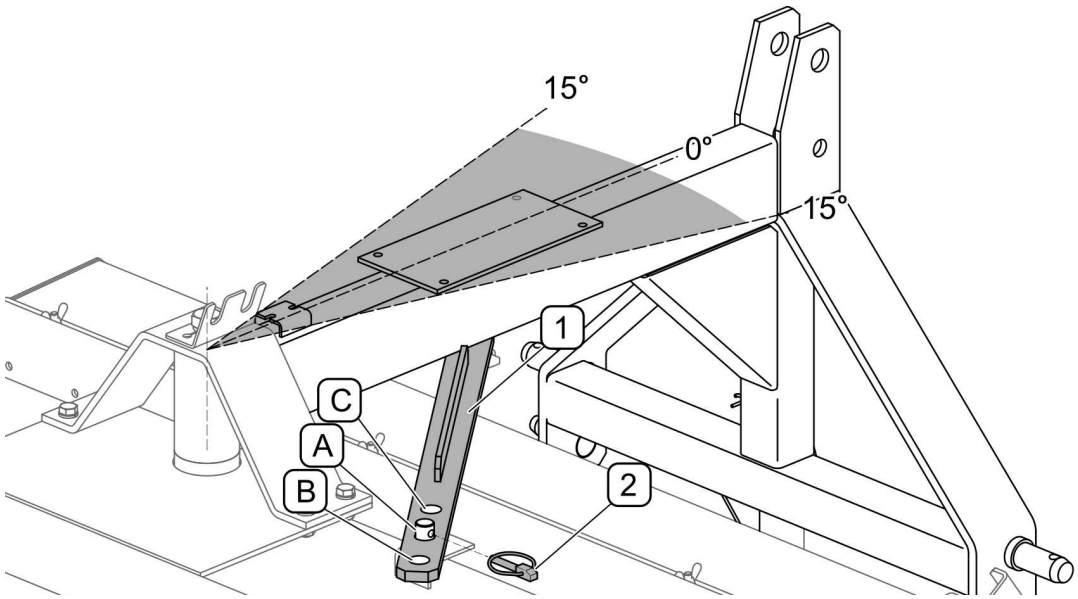


FIG. 4.8A Changing the sweeping roller brush angle of operation

(1)- flat bar; (2)- securing cotter pin; (A)-hole retaining 0 deflection ^{0}; (B)- hole retaining deflection to the right by 15 ^{0}; (C)- hole retaining deflection to the left by 15 ^{0}

To set the working angle of the sweeping roller brush (FIG. 4.8A), change the position of the pin to the appropriate retaining hole *(A), (B), (C)* in the flat bar *(1)*.Fix the pin in hole *(A)* of the flat bar *(1)* to obtain 0^{0} sweeper deflection. Use securing cotter pin *(2)* to lock the desired position. Use holes *(B)* and *(C)* for operating the sweeper with right or left 15^{0} deflection. Use the sweeper deflection setting only during sweeper operation without the waste collecting tank.

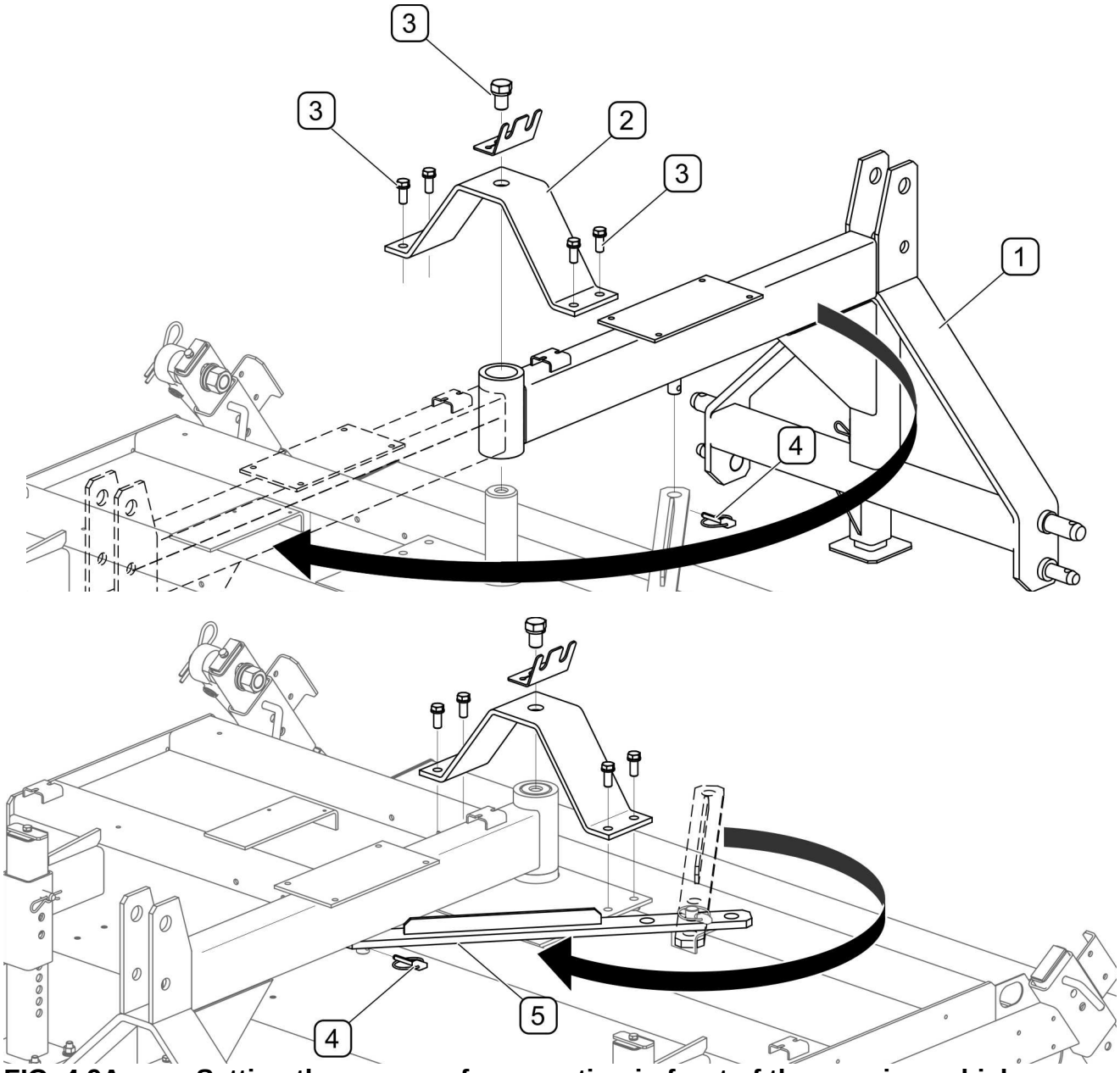


FIG. 4.9A Setting the sweeper for operation in front of the carrying vehicle.

(1)- suspension frame; (2)- main pivot bracket: (3)- bracket mounting bolts; (4)- cotter pin; (5)- flat bar;

To adapt the sweeper for operation in front of the carrying vehicle (FIG. 4.9A) remove cotter pin *(4)* which secures flat bar *(5)*, unscrew 5 bolts *(3)* fixing bracket *(2)* of main pivot and rotate the entire suspension frame *(1)* by 180 ^{0} and screw down bracket *(2)*. Turn the flat bar *(5)*, place on the pivot of the suspension frame lock with cotter pin *(4)*. For the sweepers equipped with the sprinkler system, pay attention to water conduit connecting water pump with sprinklers' flat bar and replace it with a longer one.

4.5 DRIVING ON PUBLIC ROADS

When driving on public roads, respect the road traffic regulations, exercise caution and prudence. If sweeping with the sweeper is done near pavements special attention should be paid to the bystanders likely to be near the working machine. Listed below are the key guidelines for driving the tractor and sweeper combination.

- Before moving off make sure that there are no bystanders, especially children, near the machine or the tractor. Take care that the driver has sufficient visibility.
- Make sure that the sweeper is correctly attached to the tractor and secured.
- The maximum working speed and the maximum speed allowed by road traffic regulations must not be exceeded. The towing speed should be adapted to the current road conditions, load carried by the machine, road surface conditions and other relevant conditions.
- If the sweeper obscures tractor lights then install additional lights (FIG. 4.11A) mounted on the sweeper rear (available as an option).
- If the sweeper obscures the slow-moving vehicle warning sign attached to the back of the tractor, the warning sign must be mounted on a dedicated bracket (FIG. 4.10A) on the sweeper frame (available as an option).
- When driving, comply with all road traffic regulations, indicate an intention to turn using indicator lamps, keep all road lights and indicator lights clean at all times and ensure they are in good condition. Any damaged or lost lamps or indicator lights must be immediately repaired or replaced.
- While operating the sweeper, turn the orange beacon light in the tractor.
- Avoid ruts, depressions, ditches or driving on roadside slopes. Driving across such obstacles could cause the machine or the tractor to suddenly tilt. Driving near

ditches or canals is dangerous as there is a risk of the wheels sliding down the slope or the slope collapsing.

- When driving, avoid sharp turns especially on slopes.
- Speed must be sufficiently reduced before making a turn or driving on an uneven road or a slope.

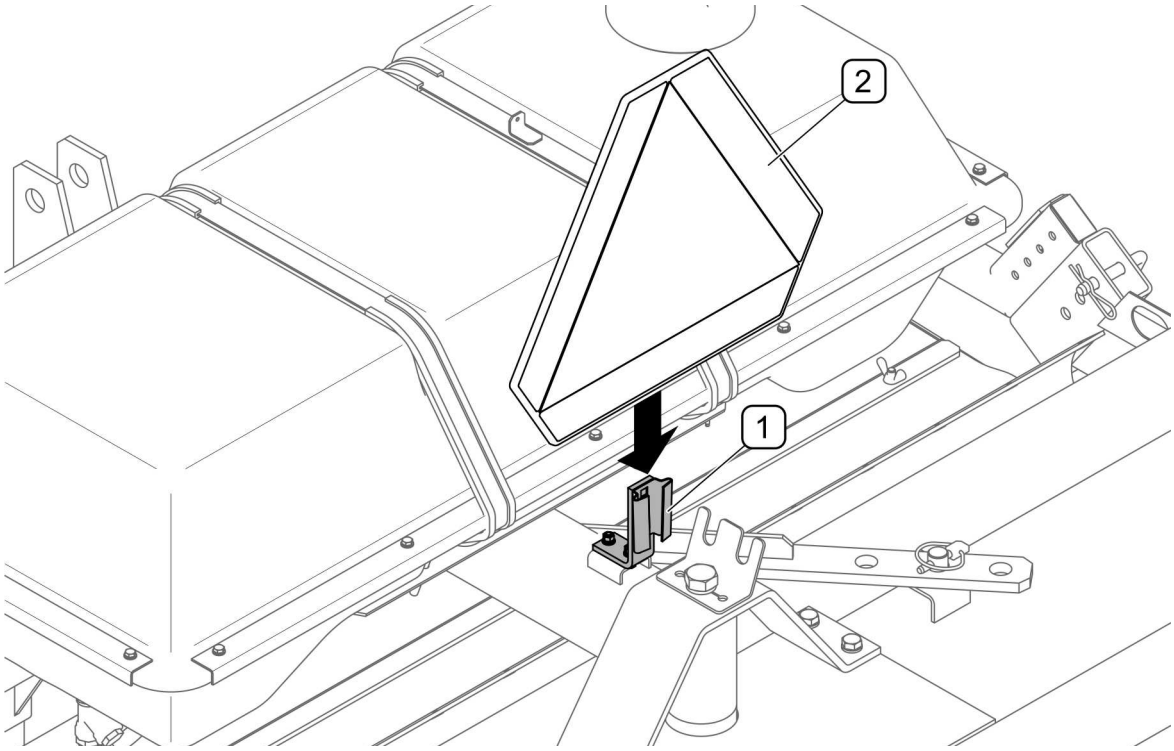


FIG. 4.10A Additional bracket for slow-moving vehicle warning sign

(1)- bracket; (2)- slow-moving vehicle warning sign

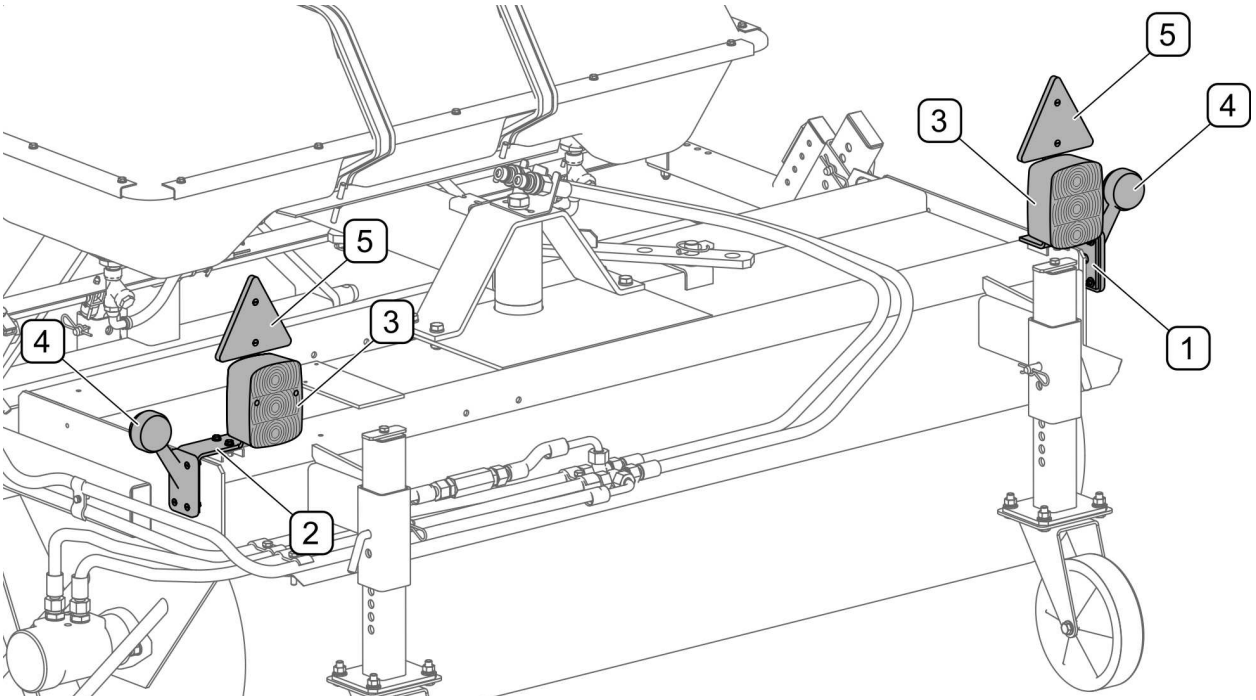


FIG. 4.11A Additional lights installed on the sweeper rear

(1)- right bracket; (2)- left bracket; (3)- lamp assembly; (4)- clearance lamp; (5)- warning reflective triangle

4.6 DISCONNECTING FROM TRACTOR

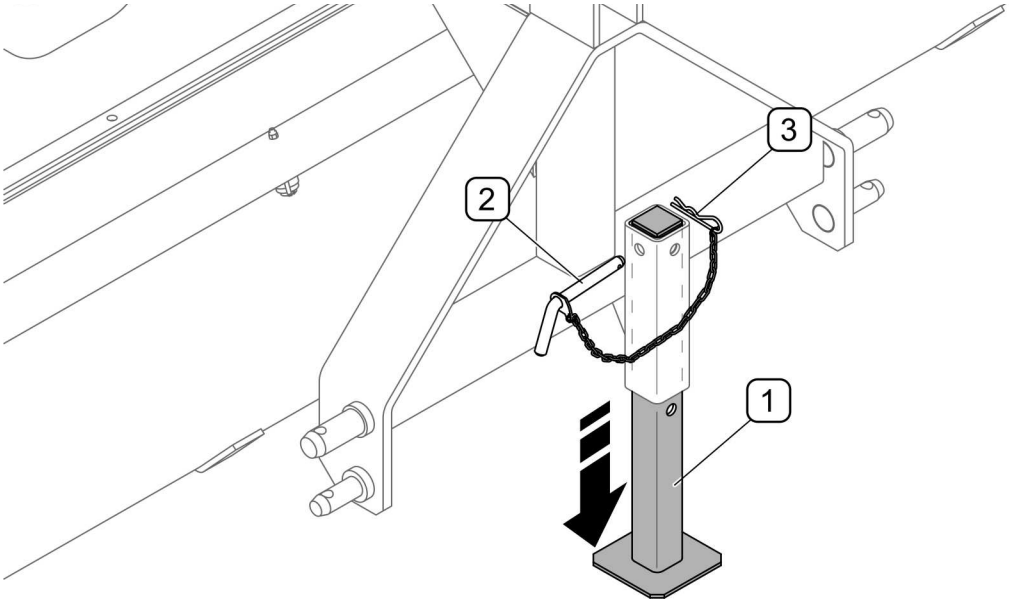


FIG. 4.12A Parking stand

(1)- parking stand; (2)- pin; (3)- securing cotter pin

Sweeper disconnected from the tractor must be supported on the parking stand and the jockey wheels. Otherwise, the weight rests on the sweeping roller brush causing the bristles to deform. Normal sweeping is then impossible.

DANGER

Reduce pressure prior to disconnecting the hydraulic system.

In order to disconnect the sweeper from the tractor, proceed as follows:

- Lower the parking stand (FIG. 4.12A) and set it at the appropriate height
- Lower the sweeper until it fully rests on the ground.
- Reduce residual pressure in the hydraulic system by moving the appropriate control lever of the tractor's hydraulic circuit.
- Disconnect hydraulic system connectors from the tractor, secure with caps and put in a special bracket on the frame (FIG. 4.13A)
- Disconnect top link, dismount lower links from pins and drive tractor away from the machine

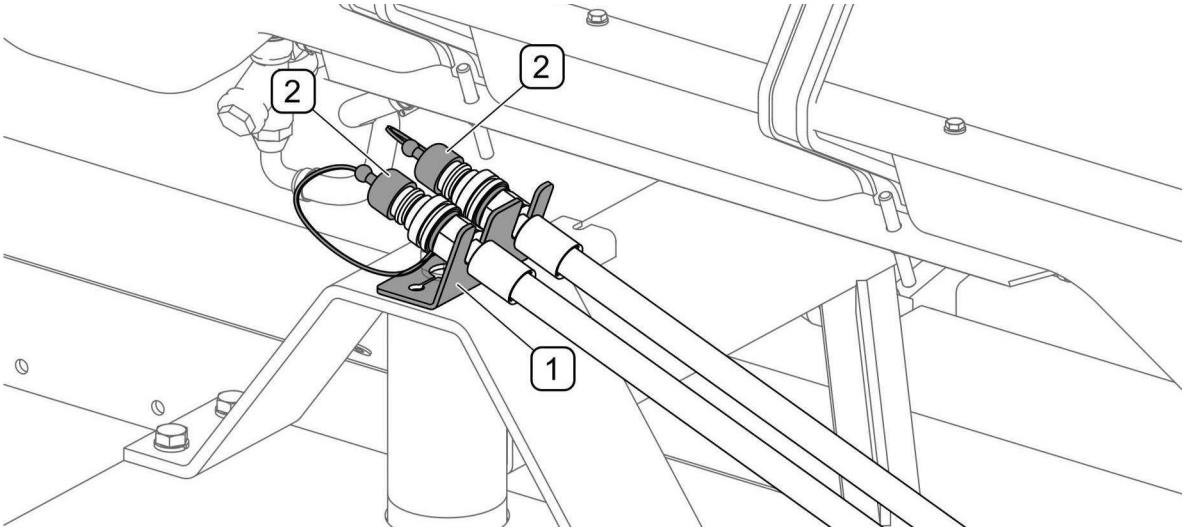


FIG. 4.13A Protecting connectors after disconnecting from the tractor

(1) - line bracket, (2) - hydraulic quick coupler caps

SECTION

5 MAINTENANCE

SWEEPING ROLLER BRUSH ADJUSTMENT
ADJUSTING THE WASTE TANK
ADJUSTING THE SIDE BRUSH
REPLACING THE SWEEPING ROLLER BRUSH
REPLACING THE SIDE BRUSH
SPRINKLER SYSTEM MAINTENANCE
HYDRAULIC SYSTEM OPERATION
ELECTRICAL SYSTEM MAINTENANCE
LUBRICATION
STORAGE
TIGHTENING TORQUE FOR NUT AND BOLT CONNECTIONS
TROUBLESHOOTING

5.1 SWEEPING ROLLER BRUSH ADJUSTMENT

Adjustment of the sweeping roller brush should always be carried out in conjunction with adjustment of the waste tank.

Sweeping roller brush must be adjusted depending on its wear. Sweeping roller brush ground contact surface should be in the range from 60 to 120 mm (FIG. 5.1A). The pressure can be set individually depending on the degree of ground contamination.

Pressure is adjusted by changing the position of jockey wheels (1) in guides (FIG. 5.1A) as follows:

- lift tractor mounted sweeper, turn off the engine and engage the parking brake,
- remove R-clip (3) and cotter pin (2);
- raise or lower wheel (3) in the guide so that the holes are coaxial.
- put cotter pin (2) in the corresponding hole and secure with R-clip (3)
- proceed in the same way to adjust the height of the second wheel

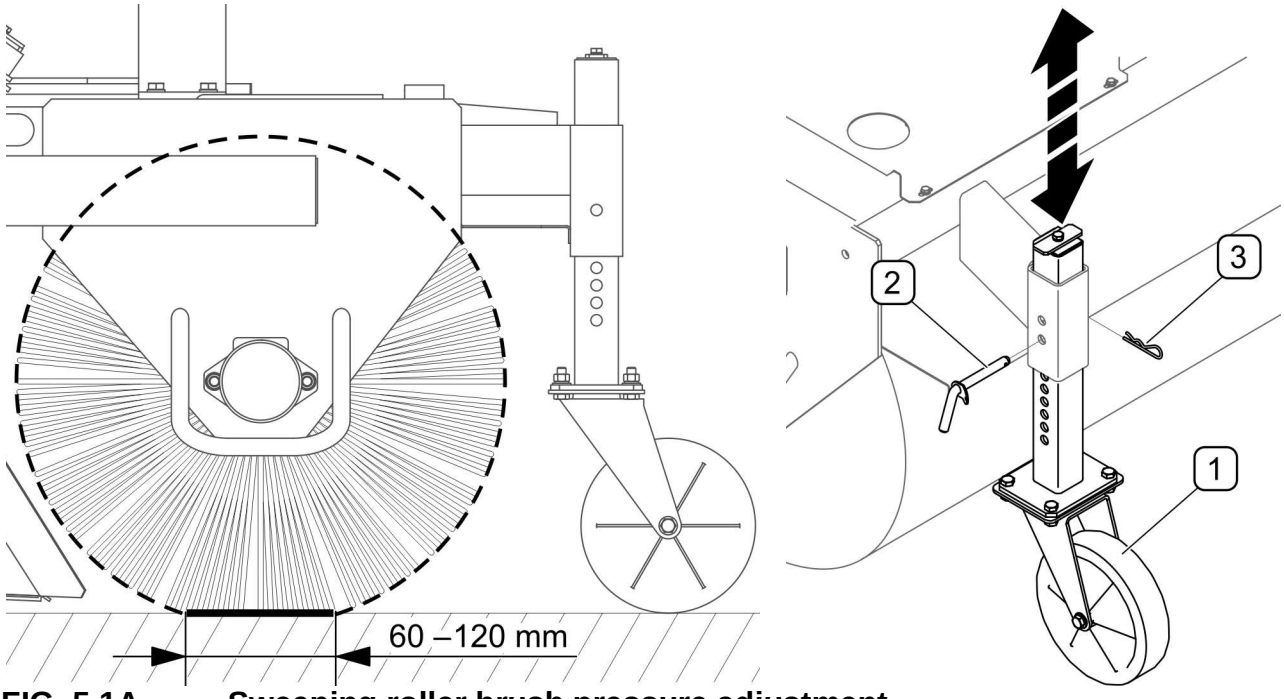


FIG. 5.1A Sweeping roller brush pressure adjustment

(1)- jockey wheel; (2)- cotter pin; (3)- R-clip

After adjustment, lower the sweeper on the jockey wheels and check the width of the roller ground contact surface, adjust again if necessary. Pay attention to levelling of the sweeper by means of the central connector.

While adjusting sweeping roller brush pressure make sure the contact surface is uniform along on the entire length of the roller. Different settings for left and right cause uneven wear of the sweeping roller brush. Check the suspended waste tank and, if necessary, adjust after each adjustment of the jockey wheels.

5.2 ADJUSTING THE WASTE TANK

Adjust the waste tank (FIG. 5.2A) after adjusting the pressure of the sweeping roller brush (FIG. 5.1A) and adjusting the waste tank inclination angle. Adjust the height of the waste tank as follows:

- lower the sweeper on the jockey wheels, level the central linkage,
- remove R-clip (1) from safety pin (2) and remove the bolt from the guide hole on the right side of the sweeper,
- sliding the bar (3) set the tank at a height from 10 to 40 mm from the ground,
- insert safety pin (2) into the matching through hole in the guide

Proceed the same way to adjust the height of the tank on the left side of the sweeper. The sweeper roller brush distance from the ground on the left and right side of the tank must be the same.

To adjust the waste tank inclination angle (FIG. 5.2) move the upper fixing point of the waste tank tipping cylinder on the left side of the sweeper. The adjustment should be performed as follows:

- loosen nut (4) fastening the cylinder pin,
- screw in or unscrew the adjustment bolt (5) to set the inclination angle of the waste tank so that angle "A" between the bottom of the tank and the ground is positive (the more uneven the surface, the greater the angle "A" should be),
- tighten nut (4) of the cylinder pin and tighten bolt (5).

Perform the adjustment with waste tank tipping cylinder maximally extended.

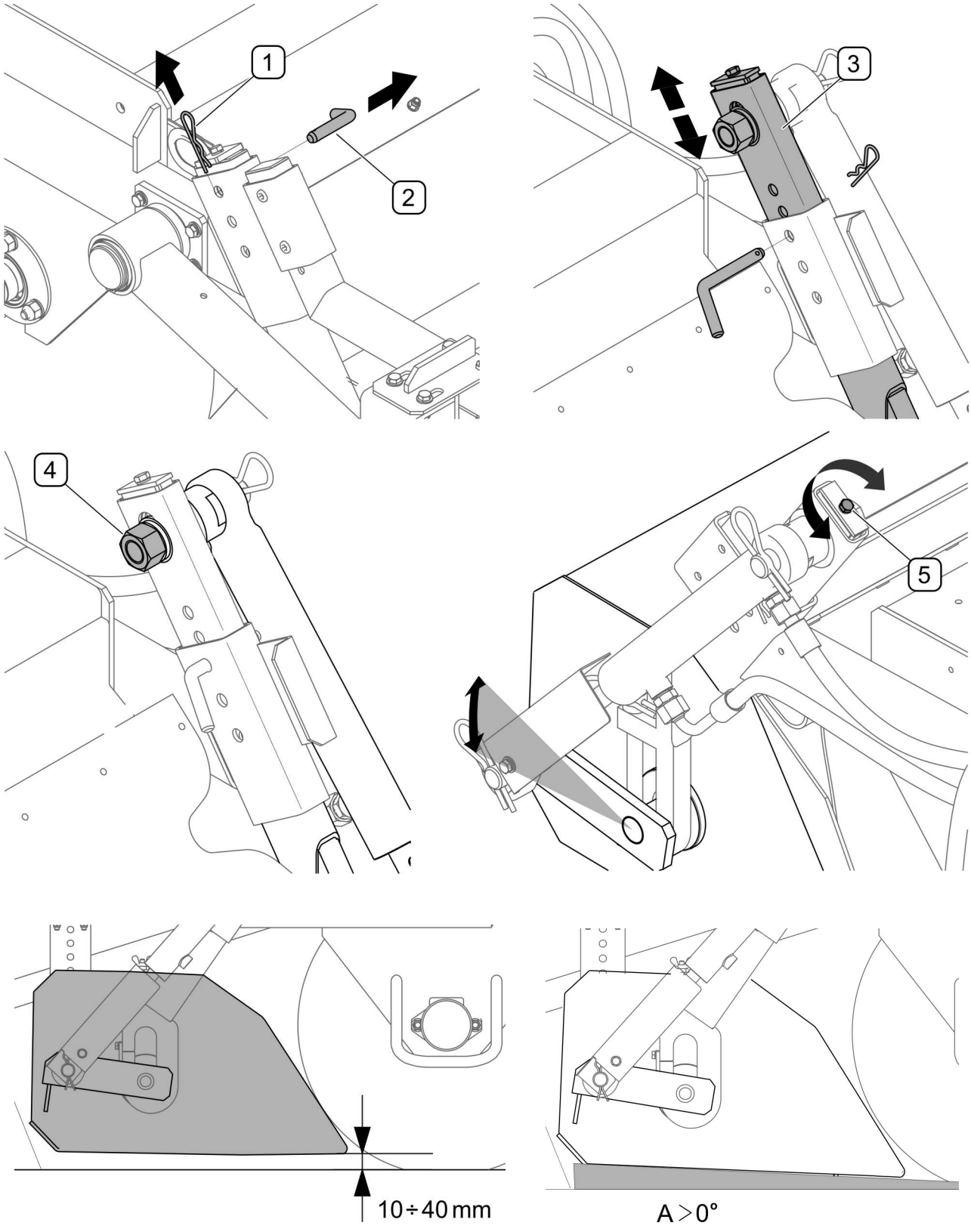


FIG. 5.2A Adjusting the waste tank

(1)- securing R-clip; (2)- pin; (3)- bar; (4)- counter nut; (5)- adjustment bolt nut;

After adjusting the waste tank, check that all fixing bolts and securing elements are properly fitted. As sweeping roller brush wears, monitor the setting of the waste tank.

5.3 ADJUSTING THE SIDE BRUSH

All adjustments of the side brush head are performed after adjusting sweeping roller brush and waste tank, depending on the amount of dirt on the surface being swept and head wear. 1/3 of circumference of a properly adjusted head should touch the ground (FIG. 5.3A)

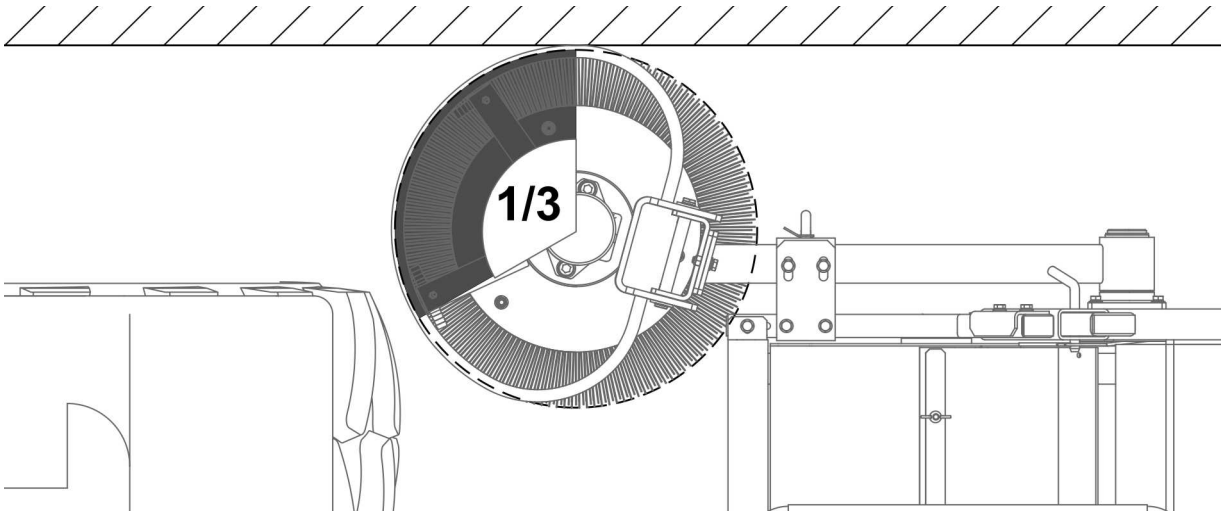


FIG. 5.3A Correct setting of the side brush

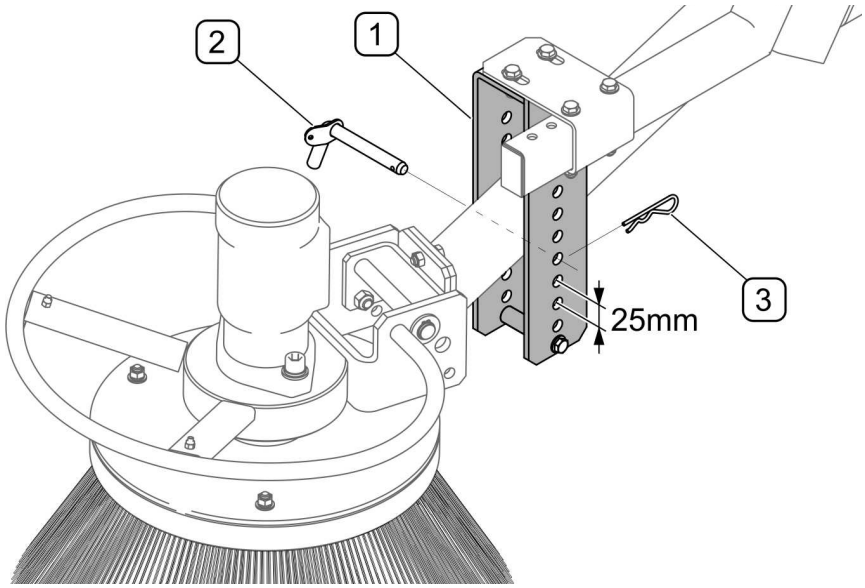


FIG. 5.4A Adjusting side brush pressure

(1)- brush arm guide; (2)- pin; (3)- securing R-clip

To set the brush pressure (FIG. 5.4A), remove R-clip (3) and change the pin (2) mounting hole in the bracket (1) and secure with R-clip (3).

Longitudinal tilting of the head can be set in three positions. This involves changing the position of retaining bolt (1) in head bracket holes (2).

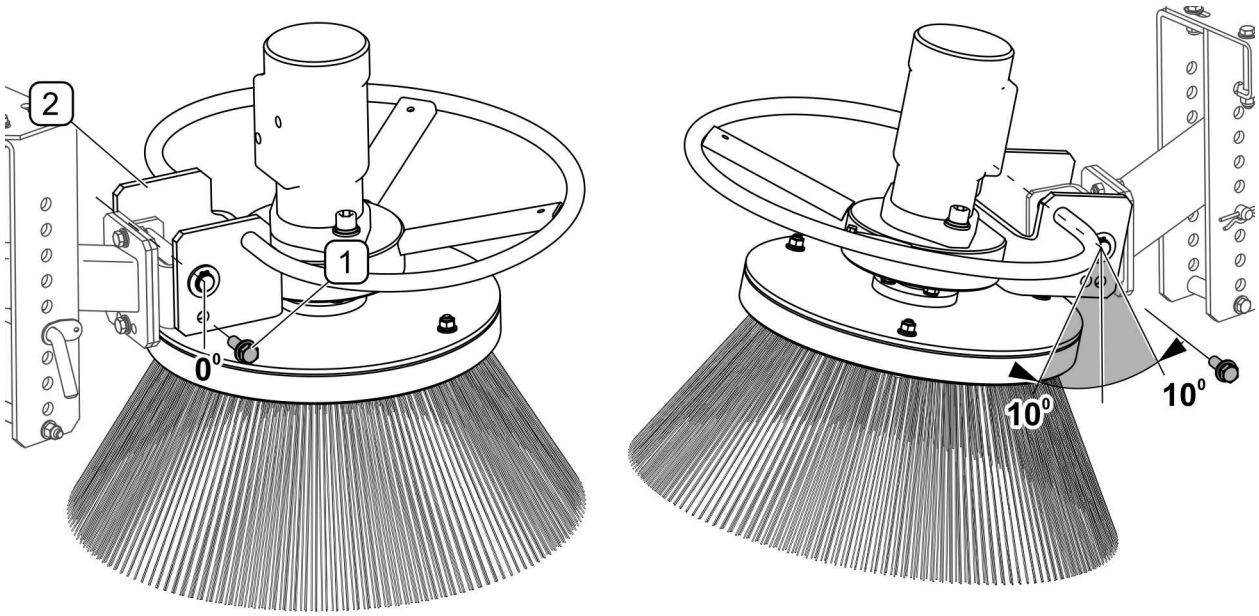


FIG. 5.5A Adjusting longitudinal tilt

(1) - longitudinal tilt retaining bolt, (2) - brush head bracket

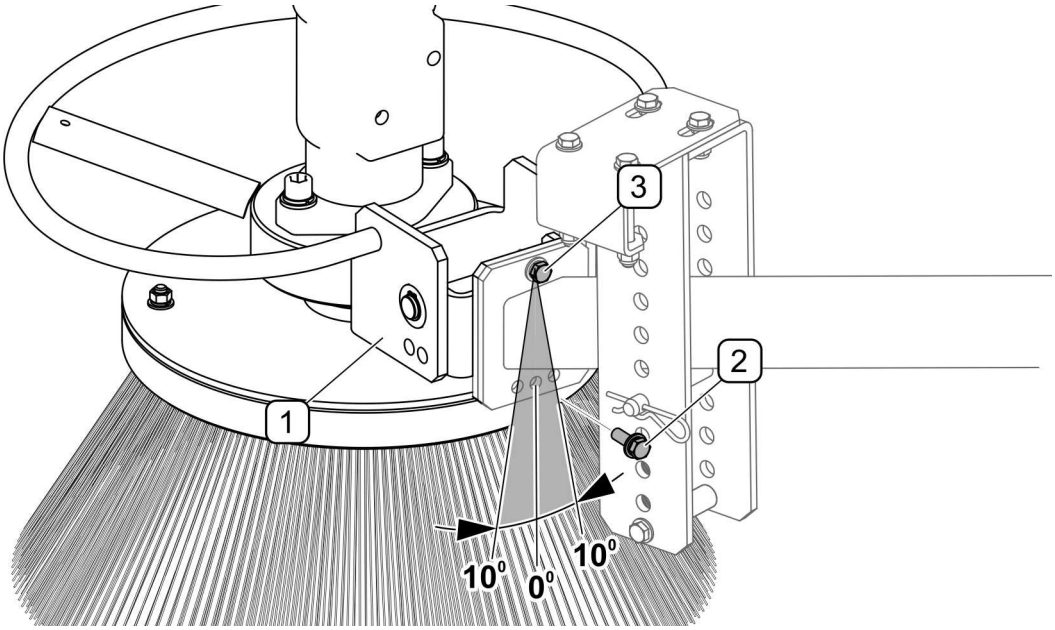


FIG. 5.6A Adjusting lateral tilt

(1)-brush head bracket; (2)- lateral tilt retaining bolt; (3)- bolt

To change the lateral tilt angle, unscrew retaining bolt (2), loosen bolt (3) and turn bracket (1) to the right or left side so as to place bolt (2) in the corresponding hole. Tighten bolt (3).

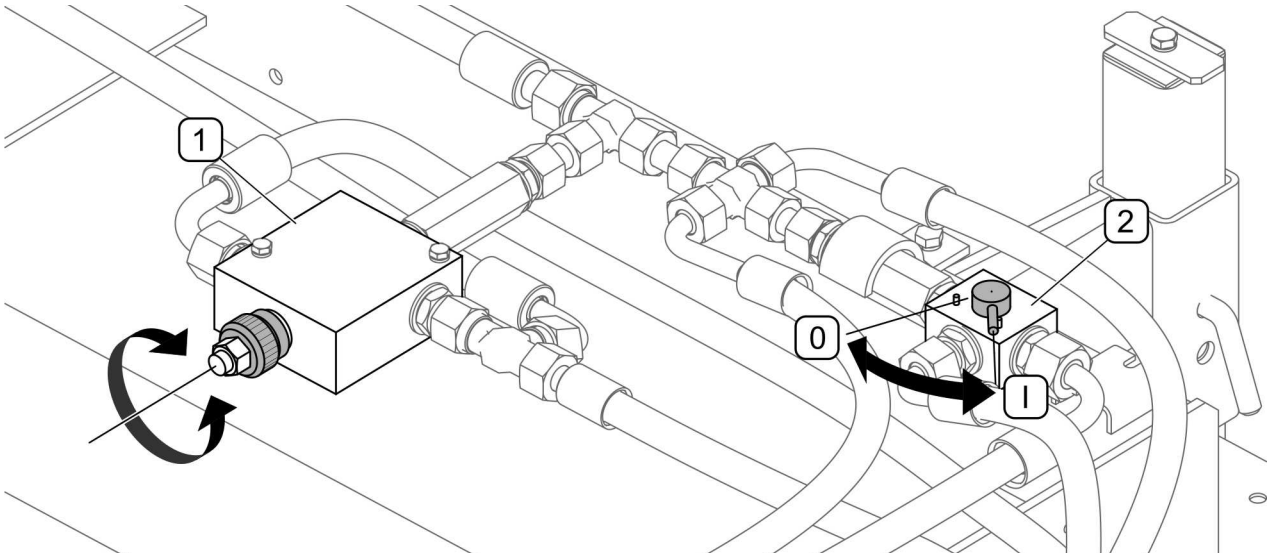


FIG. 5.7A Side brush drive flow regulator selective control valve

(1)- oil flow regulator; (2)- side brush drive selective control valve; (I)- side brush drive selective control valve; (0)- brush drive off

The sweepers with side brush are equipped with oil flow regulator (1) (FIG. 5.7) for smooth side brush speed control in relation to the sweeping roller brush. Speed is controlled using a knob.

Use a selective control valve (2) to turn off the side brush drive by setting the lever to position "0".

5.4 REPLACING THE SWEEPING ROLLER BRUSH

Before changing the sweeping roller brush make sure that the sweeper is disconnected from the tractor hydraulic system, and that the residual pressure in the hydraulic system is reduced.

The sweeping roller is composed of two equal segments, so-called roller brushes. Each of the segments is 800 mm long.

Depending on customer needs four types of roller brushes differing in hardness are available.

TAB. 5.1 TYPES OF ROLLER BRUSHES

ITEM	SPECIFICATION	PART NUMBER
1	Medium brush (plastic 2x3mm)	180730b.000600
2	Soft brush (plastic 1.6 mm)	180730b.000580
3	Hard brush (plastic 1.6mm+wire)	180730b.700580
4	Very hard brush (plastic 2x3mm+wire)	180730b.700600

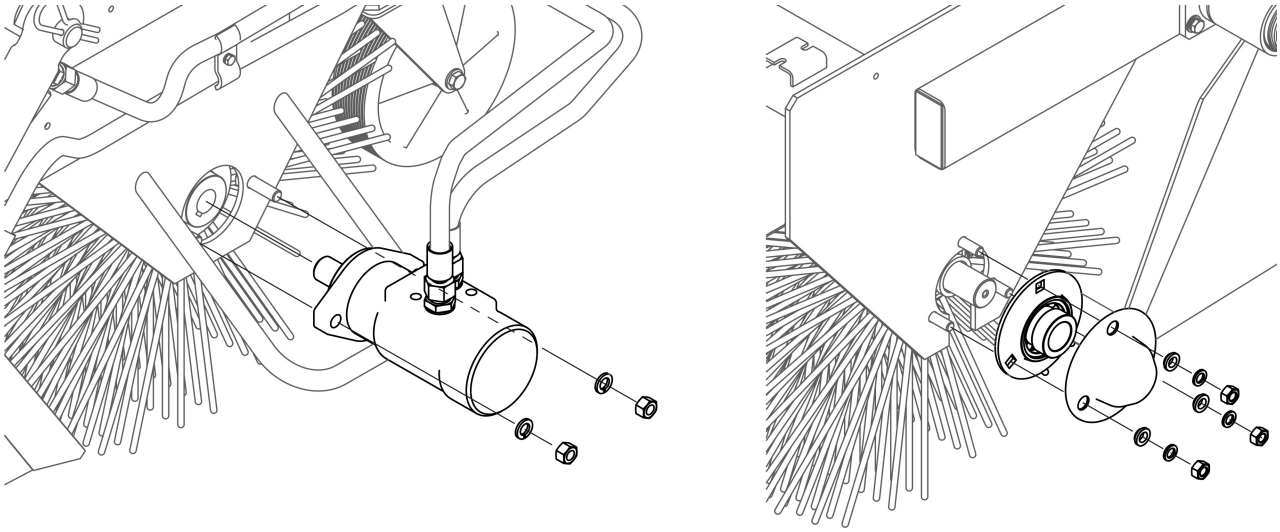


FIG. 5.8A REPLACING THE SWEEPING ROLLER BRUSH

To remove the sweeping roller brush proceed as follows:

- loosen the bolt connection of the hydraulic drive on the left side of the sweeper.
- remove the drive from the shaft of the sweeping roller brush (no need to disconnect the hydraulic lines on the hydraulic drive).
- remove cover, loosen the clamping sleeve bolt of the bearing inner ring on the right side of the sweeper and slide the sleeve off the shaft pivot.
- remove bearing mountings from the shaft.

Sweeper can be raised by the carrying vehicle (e.g. tractor) and additionally secured against falling. Remove the roller, slide the brush segments and replace with new. To mount the sweeping roller perform these steps in reverse order.

5.5 REPLACING THE SIDE BRUSH

Replace the side brush only when the sweeper is disconnected from the tractor and rests on the parking stand and jockey wheels. Brush arm should be raised and locked in the guide in its highest position.

Replace the brush as follows:

- unscrew nuts *(2), r*emove bolts *(3)* with washers;
- replace worn brush *(1)*,
- insert bolts *(3)* and washers and tighten nuts *(2);*

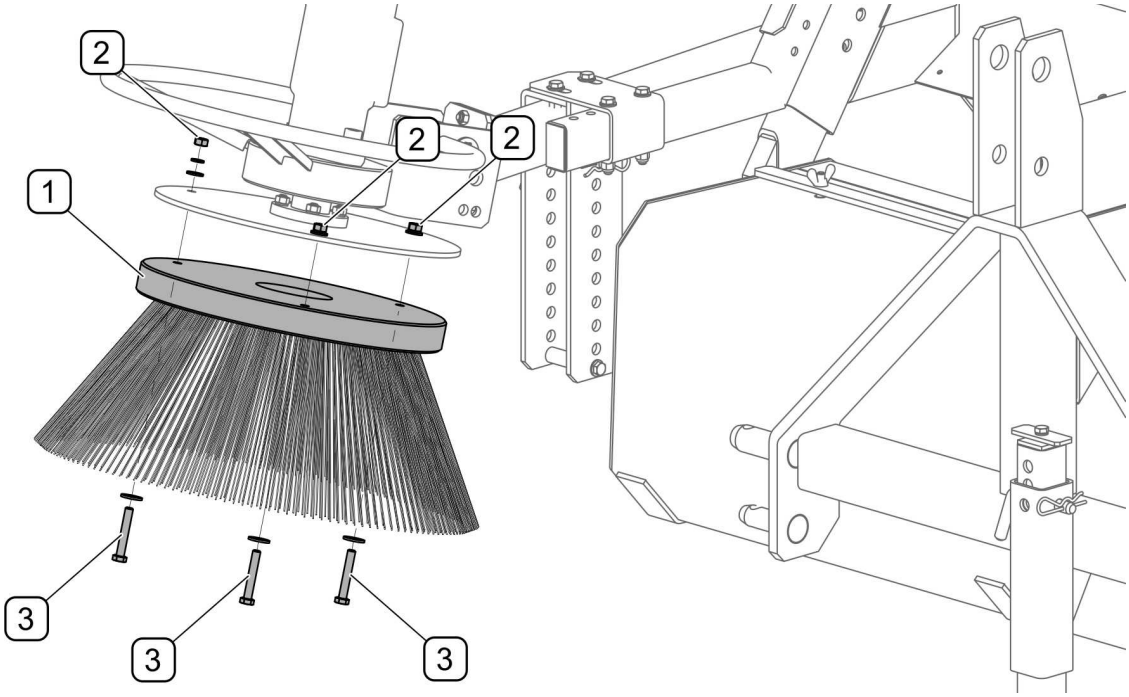


FIG. 5.9A Replacing the side brush

(1)- brush; (2)- nut M8; (3)- bolt M8x50;

TAB. 5.2 THE TYPES OF SIDE BRUSHES

ITEM	SPECIFICATION	PART NUMBER
1	Medium brush (wire + plastic 2x3 mm)	260800.900600
2	Soft brush (plastic 2x3 mm)	260800.000600
3	Hard brush (wire)	260800.900000

5.6 SPRINKLER SYSTEM MAINTENANCE

Maintenance of the sprinkler system consists in periodic inspecting the water system and cleaning (FIG. 5.10A) of water filters (2) and (3).

Before first use, check sprinkler operation, especially the setting of spray nozzles. Nozzles should be positioned so that during sweeper operation water is sprayed through the slit, perpendicularly to the sweeping direction.

Water filters are recommended to be cleaned at least once a year. Frequency of filter cleaning depends on amount and size of water contamination.

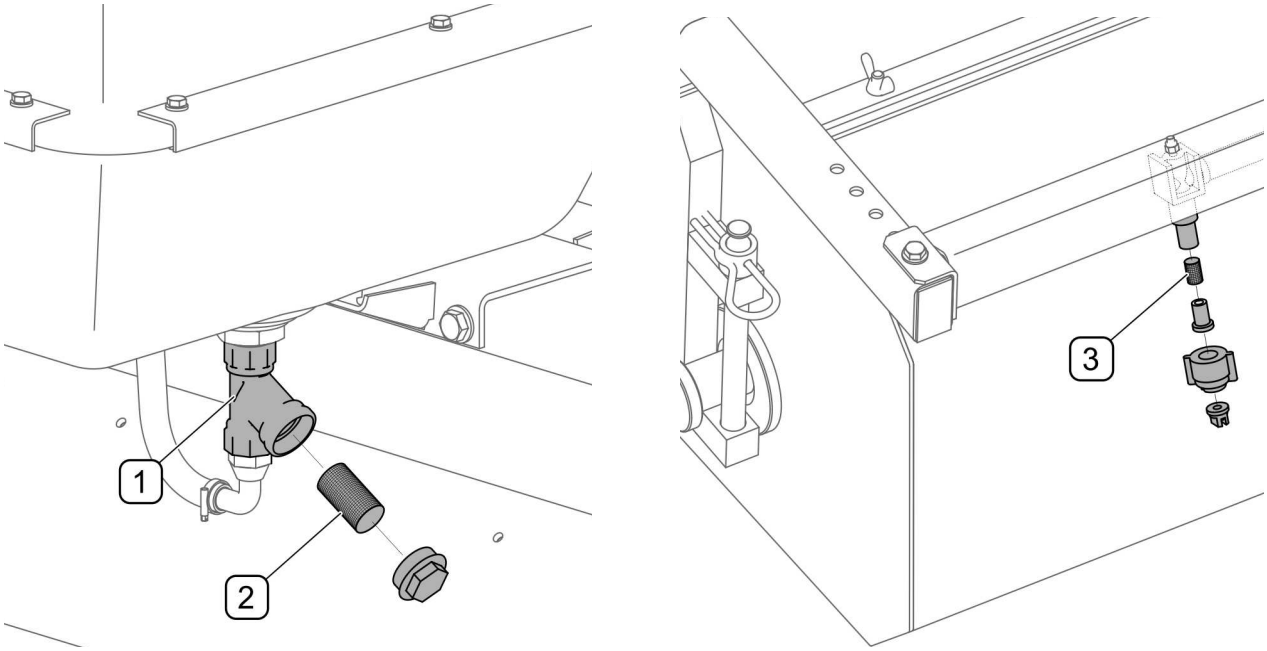


FIG. 5.10A WATER FILTERS IN SPRINKLER SYSTEM

(1)- water filters; (2)- water filter strainer; (3)- sprinkler strainer

In the sprinkler system there are two water filters *(2)* located under the water tank. These filters catch grit. In the sprinkler system there are also strainers *(3)* installed in each sprinkler (FIG. 5.10A). In order to clean filters *(2),* unscrew plug and take out mesh cartridge *(2)* and wash it with water under pressure or clean with compressed air. Install cartridge, tighten plug and check tightness of connection. To clean the sprinkler strainer (3), dismantle the housing and then wash the filter or blow with compressed air. Before installing, make sure the nozzle is not clogged.

5.7 HYDRAULIC SYSTEM OPERATION

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

- checking tightness of cylinder and hydraulic connections,
- checking technical condition of hydraulic lines and quick couplers;

DANGER

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

DANGER

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

DANGER

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

In a new sweeper, the hydraulic system is filled with HL32 hydraulic oil. Because of its composition the oil applied 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 marked tight container. Used oil should be taken to the appropriate facility dealing with the re-use of this type of waste.

TAB. 5.3 HL32 HYDRAULIC OIL CHARACTERISTICS

ITEM	NAME	VALUE
1	ISO 3448VG viscosity classification	32
2	Kinematic viscosity at 40℃	28.8 – 35.2 mm^2/s
3	ISO 6743/99 quality classification	HL
4	DIN 51502 quality classification	HL
5	Flash point, ^0C	Above 210℃
6	Maximum operating temperature, ^0C	80

The hydraulic system should be completely tight sealed. Inspect the seals when hydraulic ram cylinders are completely extended. In the event of confirmation of oil on hydraulic ram cylinder bodies ascertain origin of leak. 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.

ATTENTION!

Before you begin to operate the sweeper, visually inspect the hydraulic system components.

In the event of confirmation of an oil leak on hydraulic line connections, tighten connections, and if this does not remedy faults then change line or connection elements. Change of sub assemblies is equally required in each instance of mechanical damage.

ATTENTION!

The hydraulic system is vented automatically during machine operation.

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

Hydraulic lines should be replaced after 4 years of machine use.

5.8 ELECTRICAL SYSTEM MAINTENANCE

Electrical system maintenance involves periodical checking of the operation of sprinkler system and lighting system (option). After connecting to 7-pole socket on the tractor, check operation of the lighting system. In case of bulb burnout in lamp assembly, unscrew screws (7) that secure lamp lens (5) and replace appropriate bulb (FIG. 5.11A). To replace a bulb in clearance lamp, take out lens (6) from flexible housing.

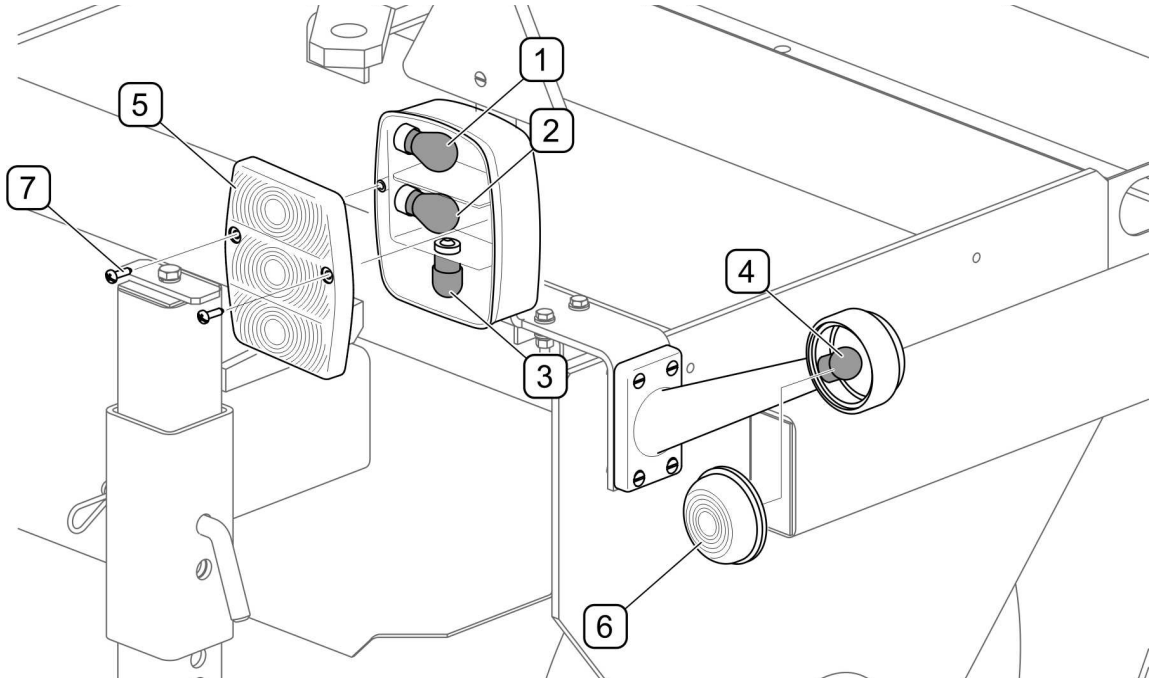


FIG. 5.11A Changing bulbs

(1)- indicator light bulb; (2)- brake light bulb; (3)- parking light bulb; (4)-clearance lamp bulb; (5)- lamp assembly lens; (6)- clearance lamp lens; (7)- screws

TAB. 5.4 LIST OF BULBS

MARKING (FIG. 5.11A)	TYPE OF LIGHT	BULB	LAMP
1	indicator light	P21W	Lamp assembly W-18U
2	brake light	P21W	
3	parking light	R10W	
4	clearance light	R5W	Left clearance lamp 127 022 00 00 Right clearance lamp 127 023 00 00

If electrical system of sprinkler system fails, first check water level in the tank and check whether filters are clean (FIG. 5.10) and confirm correctness of connection of the control cable with the switch and water pump power cable.

DANGER

Do not independently repair electrical system, except items described in chapter ELECTRICAL SYSTEM MAINTENANCE. All electrical system repairs must be performed only by suitably qualified personnel.

5.9 LUBRICATION

Machine lubrication should be performed with the aid of a manually or foot operated grease gun, filled with ŁT-43-PN/C-96134 grease.

After lubricating according to instructions, wipe off excess grease.

When using the machine 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.

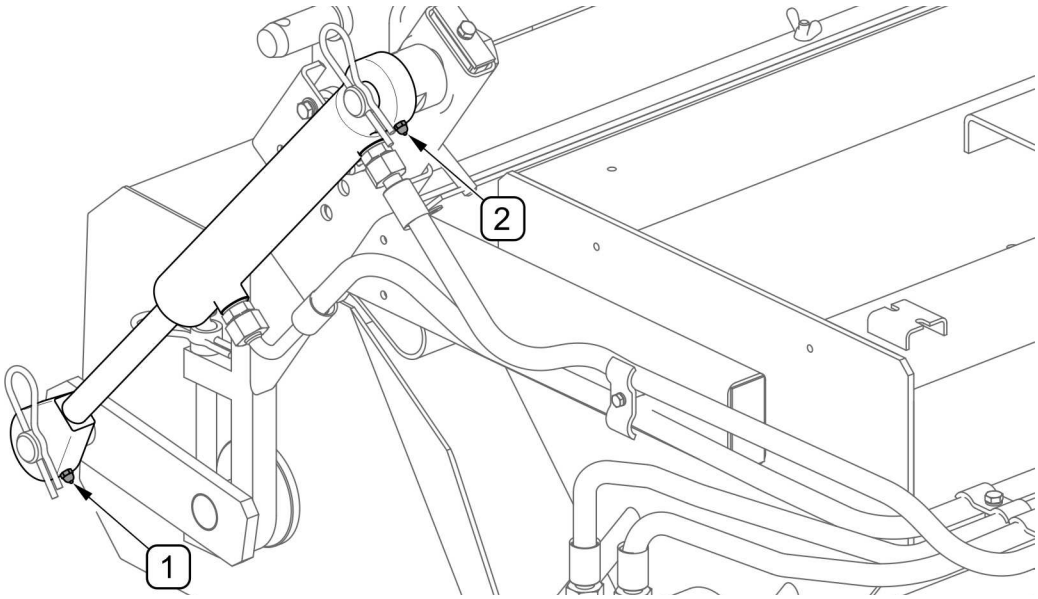


FIG. 5.12A Lubrication points

description- TAB. 5.5

TAB. 5.5 LUBRICATION POINTS AND LUBRICATION FREQUENCY

ITEM	NAME	NUMBER OF LUBRICATION POINTS	TYPE OF GREASE	LUBRICATION FREQUENCY
1	Cylinder rod lug	1	grease	50 hours
2	Cylinder barrel lug	1	grease	50 hours

Marking description in Item column (TAB. 5.5) conforms with numbering shown (FIG. 5.12A)

5.10 STORAGE

After finishing work, machine should be thoroughly cleaned and washed with water jet. While washing do not direct a strong water jet at information and warning decals, hydraulic cylinders, electrical equipment. In the event of damage to the lacquer coating clean those places from rust and dirt, degrease and then paint with paint maintaining uniform colour 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. It is recommended to keep the machine in a closed or roofed building.

If the machine shall not be used for a long period of time, protect it against adverse weather conditions. Lubricate machine according to the instructions provided. In the event of prolonged work stoppage, it is essential to lubricate all elements regardless of the

period of the last lubrication process. Additionally before the winter period apply grease to hitching system pins.

If there is a risk that temperatures drop below 0℃ , drain water from the sprinkler system. If there is excessive amount of water in the tank, loosen band clips next to water filters under the tank and drain water by removing conduits. After installing water conduits, start the system and remove remaining water from conduits.

5.11 TIGHTENING TORQUE FOR NUT AND BOLT CONNECTIONS

Unless other tightening parameters are given, during maintenance repair work apply appropriate torque to tightening nut and bolt connections. Recommended torque values (TAB. 5.6) apply to non-greased steel bolts.

TAB. 5.6 TIGHTENING TORQUE FOR NUT AND BOLT CONNECTIONS

THREAD DIAMETER [mm]	**5.8**	**8.8**	**10.9**
	TIGHTENING TORQUE [Nm]		
M6	8	10	15
M8	18	25	36
M10	37	49	72
M12	64	85	125
M14	100	135	200
M16	160	210	310
M20	300	425	610
M24	530	730	1050
M27	820	1150	1650

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.

5.12 TROUBLESHOOTING

TAB. 5.7 TROUBLESHOOTING

TYPE OF FAULT	CAUSE	REMEDY
Sweeping roller does not rotate or rotates in the wrong direction	Hydraulic system not connected or incorrectly connected	Check connection
	Wrong tractor hydraulic circuit activated or hydraulic circuit not activated	Activate correct hydraulic circuit on the tractor
	Faulty hydraulic system	Notify service point
Side brush does not rotate	Hydraulic system not connected or incorrectly connected	Check connection
	Brush drive turned off	Operate the brush drive selective control valve
	Faulty hydraulic system	Notify service point
Side brush rotates too slowly or too quickly	Sweeper oil flow regulator improperly adjusted	Set brush speed by turning the oil flow regulator knob
Waste tank can not be opened or closed	Hydraulic system not connected or incorrectly connected	Check connection
	Wrong tractor hydraulic circuit activated or hydraulic circuit not activated	Change the direction of oil flow in the hydraulic circuit using selective control valve lever on the tractor
Sprinkler system is not working	Sprinkler system turned off	Set the sprinkler system switch to "on" position
	Water pump electrical power supply not connected	Makes sure that correct connector is plugged in the 7-pole socket on the tractor. Check the connection of the sprinkling system switch
	No water in the tank	Top up water. If there is no water, the system will switch off automatically
	Sprinkler system clogged	Make sure the system is not clogged, clean the filter strainers and water sprinklers
	Faulty water pump	Notify service point
Sweeper does not collect waste precisely	Sweeping roller brush rotational speed too slow	Increase engine RPM
	Improperly set sweeping roller brush pressure	Adjust according to operator's manual
	Waste tank positioned incorrectly	Adjust according to operator's manual
	Side brush incorrectly set	Adjust according to operator's manual
	Driving too fast	Adjust driving speed
	Waste tank is full	Empty the waste tank
	Brushes excessively worn	Replace
Rapid wear of brushes	Improperly set sweeping roller brush pressure. Side brush incorrectly set	Adjust according to operator's manual
Material is ejected from under the sweeper	Brush rotational speed to high. Brush incorrectly set. Incorrect setting on the tractor	Check and adjust according to operator's manual

NOTES