OPERATOR and SERVICE MANUAL
FOR
VAMMAS PS4200 PLOW
HAGIE MANUFACTURING COMPANY

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MANUAL FOR MODEL YEAR 2007

04-08 A010408EN

VAMMAS Plow Sweeper PS 4200

Operator and Service Manual

1. TO THE OWNER

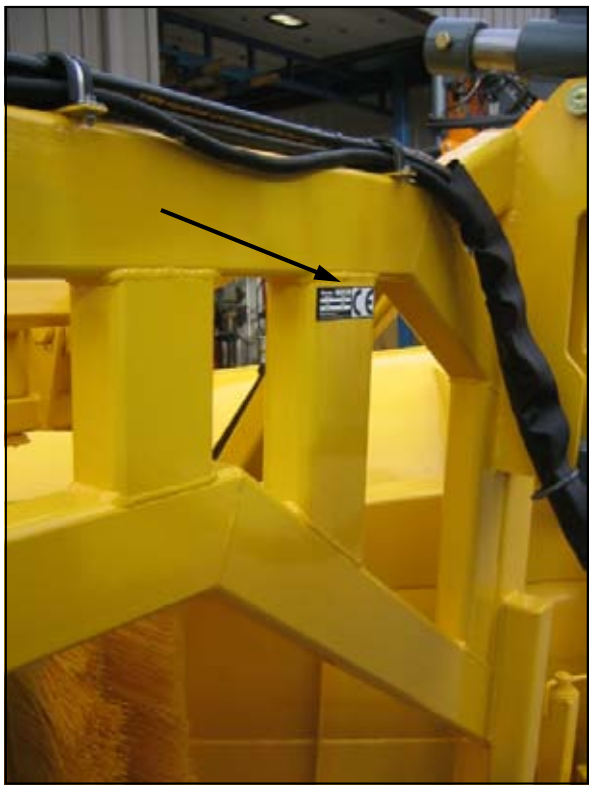
FOR THE OPERATOR

Thank you for choosing Vammas by Hagie PS 4200 plow!

This operator's manual is intended for both beginners and experienced operators. It is recommended that, before starting to operate the machine, the operator read this operator's manual to master the efficient and economic use of the machine, even if the operator has worked with an equivalent machine previously.

The principles introduced in this manual apply to the use of this machine only. The persons responsible for airfield maintenance are also responsible for properly adapting these principles for practical use.

The information contained in this manual is based on the facts available at the time of its compilation. This manual is intended for operators of Vammas by Haige equipment only. Reproducing the manual in any form without prior authorization from Patria Vammas by Hagie is strictly prohibited.



Identification plate

The machine's identification plate is located in the frame, on the right side of the machine, as indicated in the figure.

2. OPERATOR RESPONSIILITIES

NOTICE

Before starting to use the machine, familiarize yourself with the contents of this manual, paying special attention to the SAFETY section, regardless of whether or not you have previously operated similar equipment.

The operator of the driving machine bears the primary responsibility for the maintenance and safe use of the equipment. To ensure proper and effective functioning of the machine, the instructions provided in this manual must be followed carefully. This is also required for the guarantee to be valid.

The safety instructions contain a summary of the instructions and rules that must be followed whenever working with the machine. However, these instructions do not replace the various statutory occupational and traffic safety requirements that may be in force on different sites.

Everything possible has been done to ensure that the information contained in this manual is correct and that the manual contains all necessary warnings. Vammas by Hagie does not assume any direct or indirect liability for damages caused by the information contained in this manual or lack of any warnings issued therein.

Neither Vammas by Hagie nor its representatives are liable for any form of damage caused by the use of their tools or components.

Due to constant product development, Vammas by Hagie reserves the right to alter any machine function or structure after the publication of this manual.

3. SAFETY

3.1. Warning symbols

The following warning symbols are used in this manual to emphasize points of great importance, which are to be noted.

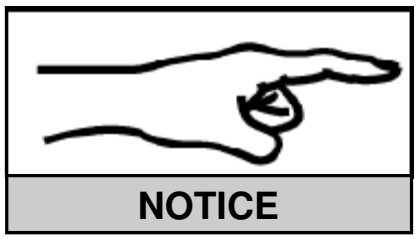
Injury risk

Neglecting the safety measures may cause serious injury or death.

Equipment damage or environmental risk

Incorrect operation or servicing of the machine may cause damage to the environment or to the machine itself.

Note



Pay attention to specific instructions.

References

Consideration for the environment when using the machine.

3. SAFETY

3.2. Safety instructions

Read and familiarize yourself with all warnings and safety instructions specified in this manual.

The machine may not be operated, repaired or serviced by a person, who is unqualified, tired, ill or intoxicated.

The operator of the machine is always responsible for safety. The operator must have adequate training on the machine and its operation.

Keep a first-aid kit at hand at all times. Check the contents of the first-aid kit regularly and update the contents if necessary.

When moving, the machine may cause personal injury in the operating area. During operation, no person is to stay in the operating area, on top of, or on the steps or platforms of the machine.

Do not step between the coupling and the wheel loader when connecting.

Check that there are no persons under the equipment when lowering it.

Danger of clamping!

- Space between the coupling and the wheel loader
- Brushes
- Opening wedge part and its opening mechanism

Never service or repair the machine alone.

When working under the machine, make sure that it is securely and safely supported. Danger of clamping!

3. SAFETY

DANGER

Do not allow unauthorized persons inside the loader cabin when you are servicing the machine.

WARNING

When making adjustments to the machine, adhere to the given instructions and settings. Appropriate use of the machine increases its service life.

NOTICE

Always use original spare parts and components.

DANGER

Keep in mind the following facts and hazards associated with high pressure hydraulics:

- Use protective clothing and goggles when servicing the hydraulic system.
- The hydraulic system is under high pressure.
- Escaping high-pressure oil may penetrate the skin and cause severe injuries and accidents. The oil spray can be very difficult to detect.
- Oil operating temperature can be very high.
- The hydraulic system must be depressurized before it can be opened.
- Before servicing, ensure that the machine has been lowered and that the cylinder is in a static state.
- Clean all connections and components, and store the system free of impurities.
- Check the tightness of hose connections. Replace worn or damaged hoses. New hoses must meet the requirements set by Vammas by Hagie.
- Do not discard oil into the environment!

DANGER

If welding is necessary, take the following precautions:

- Remove the battery cables of the loader before welding.
- Always use a welding mask and protective clothing.
- Be careful not to become part of the welding electrical circuit.
- Always keep fire-extinguishing equipment close at hand.
- Welding gases are hazardous to health; do not breath in the gases.

3. SAFETY

3.3. Risk factors

Personal injury risks

- Insufficient training on correct use of the machine
- Unauthorized persons in the operating area
- Negligence of occupational safety regulations

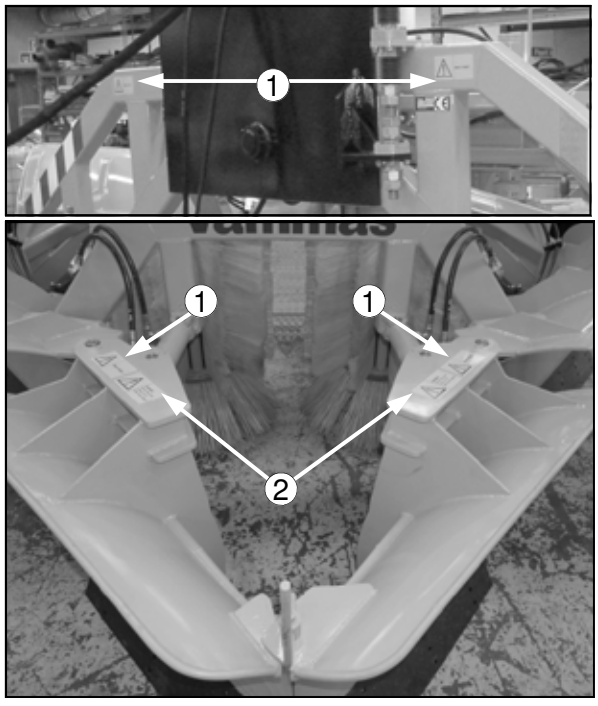
Equipment damage risks

- Negligence of operating and service instructions
- Incorrect operation of the machine

3.4. Danger zones

Minimum safety distance from the machine during operation is 5 meters (17 ft) !

3.5. Warning symbols



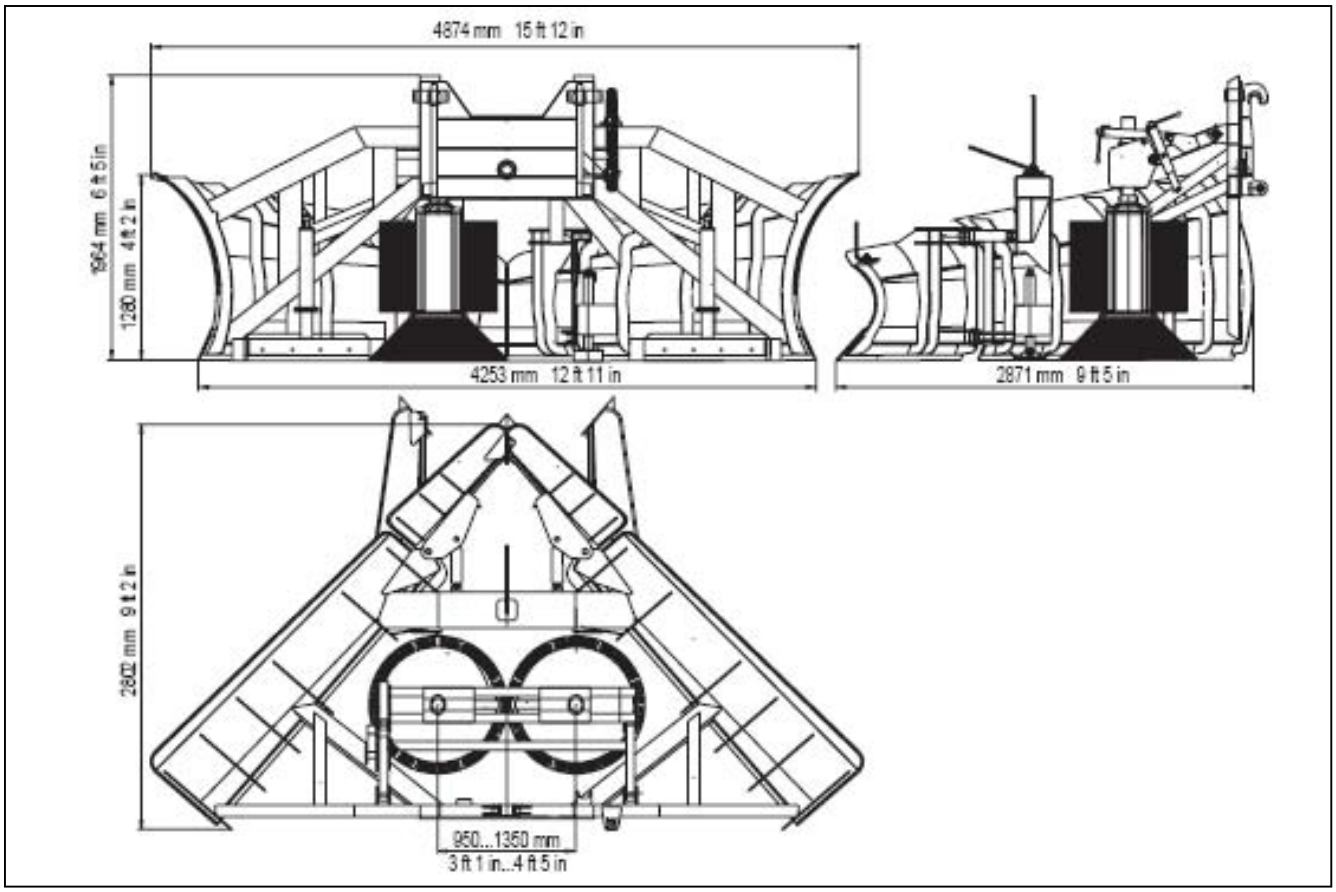
The adjacent figure shows the location of the warning symbols with arrows. The upper arrows indicate the location of the symbols; the symbols are located on the coupling side.

Clean dirty warning symbols, replace them when necessary.

4. INTRODUCTION

The plow sweeper is designed for plowing and cleaning airport lights located on the ground. The plow opens at the wedge. When approaching the light, the wedge is opened using a hydraulic cylinder and the brushes behind the wedge clean the light. Once the light is cleaned, the wedge is closed. The distance between the lights is plowed normally with the plow wedge closed.

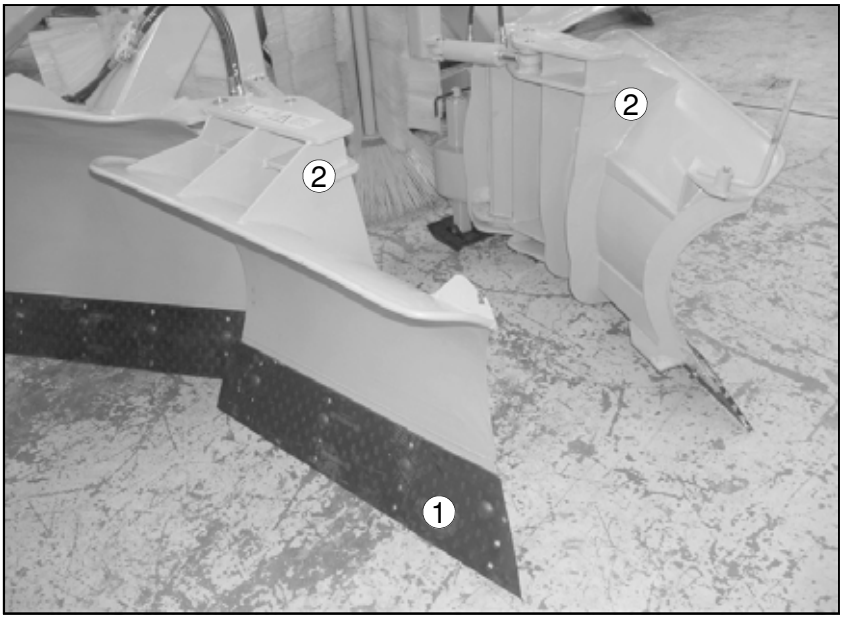
4.1. External dimensions



* note that some of the drawings and pictures may not depict the plow as it is used by Hagie Manufacturing*

4. INTRODUCTION

4.2. Plow



The plow is a conventional wedge plow by construction, except for the opening wedge part.

Wings

Replaceable blades have been attached to the bottom edge of the plow wings (1) . The blades enable snow and slush to be removed efficiently. At the same time, the blades protect the plow wings from wearing.

Wedge part

The wedge part (2) is constructed from two wings. The wings are articulated so that they can be spread into an open position. The wedge part is also equipped with replaceable blades.

Coupling

The plow is equipped with a quick coupling. The coupling is attached to the frame, slightly to the side of the machine's centerline, so that the wedge part of the plow is visible from the loader cabin.

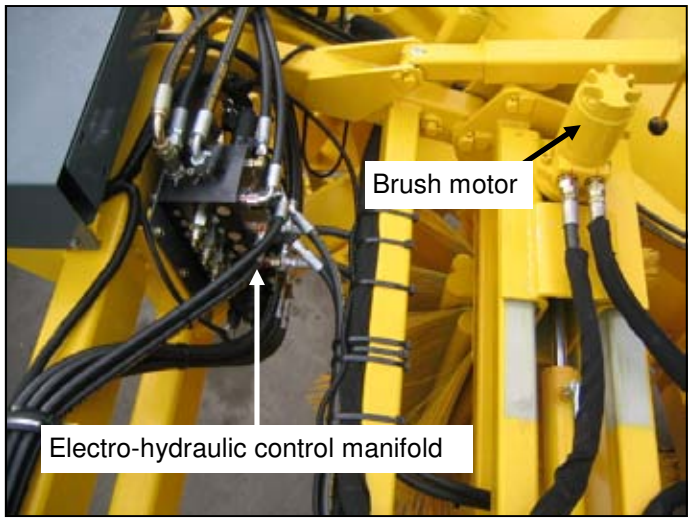
4.3. Brushes

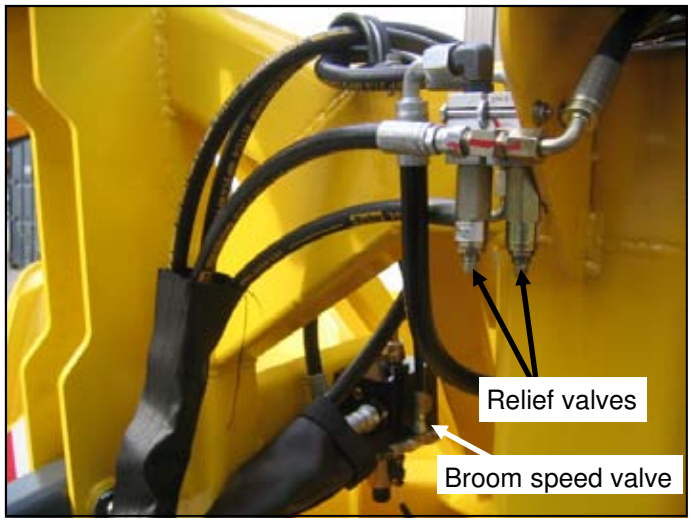
There are two brushes attached to the plow frame, inside the wings. The brushes can be adjusted vertically and horizontally, and they can also be tilted. This is necessary in order to ensure efficient brushing as the brushes wear down. Exhausted brushes can be replaced.

4. INTRODUCTION

4.4. Hydraulic system

The plow sweeper hydraulic system is based on the hydraulics of the tractor. When connecting the plow, the pressure and tank hoses are connected. These hoses are equipped with quick couplings.





Operating principle

The plow sweeper is operated using the hydraulics of the machine. The oil flow generated by the machine is operated proportionately with on/off and speed controls manipulated by the operator.

The electro-hydraulic control valve is used for controlling the wedge and the brush distances when directing the oil for use in the cylinders. The system allows the brushes to operate during opening of the wedge, and operation can continue without stopping.

The flow control valve (broom speed valve) is used for operating the hydraulic motors for brush operation. The motors are connected in a series so that they rotate in opposite directions.

The relief valves on the lift cylinders are set at 1500-1800psi.

All plow functions are electronically controlled by the operator from inside the cab.

5. OPERATING THE MACHINE

5.1. Connecting the plow to the tractor

Hagie GST20
Attachment Change-over Instructions

Boom to Edge Light Plow

1. Set the machines parking brake
2. Fold the booms out half way*
3. Lower the boom to a height accessible from the ground*
4. Lower the boom support stands*
5. Disconnect the solution hose to the boom*
6. Cap and plug the hose and connection *
7. Pull the quick connect pins and lock them open*
8. Lower the booms to the ground and continue lowering the booms until the lift arms are free from the machine*
9. Shut machine off*
10. Disconnect the hydraulic connection*
11. Disconnect electrical connection*
12. Start machine*
    -3 warnings will sound for “modules off line” (Accept the warnings)-
13. Release parking brake*
14. Back away from the booms slowly*

Hydraulic connection

Electrical connection

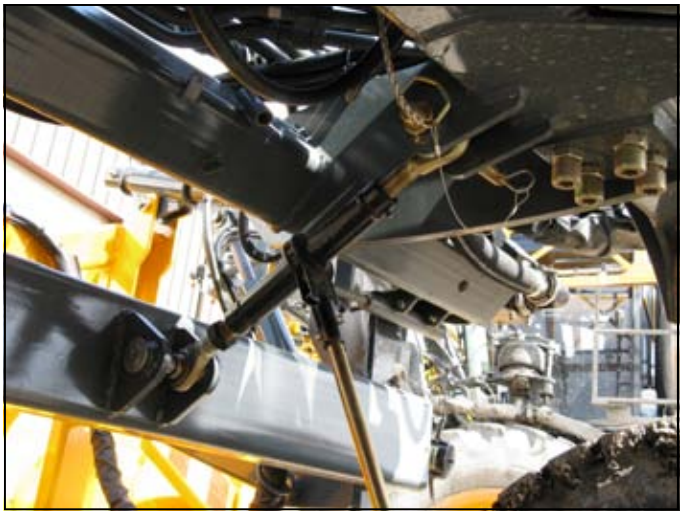
*see the GST 20 Operator Manual for more detailed instructions

5. OPERATING THE MACHINE

15. Line up to the plow and approach until the lift assembly begins to engage the machine
16. Set the parking brake
17. Shut machine off
18. Connect the hydraulic connection
19. Connect the electrical connection
20. Start machine
    -3 warnings will sound for “module off line” (Accept the warning)
21. Raise the plow making sure the hooks on the lift assembly engage the tractor completely
22. Release the quick connect pins (make sure they fully engage)
23. Connect the support ratchets to the machine
24. Check that all functions are working properly

Raise the plow

Make sure the hooks are fully engaged



Connect the support ratchets

5. OPERATING THE MACHINE

5.2. Disconnecting the plow from the tractor

Hagie GST20
Attachment Change-over Instructions

Edge Light Plow to Boom

1. Set the machines parking brake
2. Disconnect the lower support ratchets from the machine
3. Pull the quick connect pins and lock them open
4. Lower the plow to the ground and continue lowering until the lift arms are free from the machine
5. Shut machine off
6. Disconnect the hydraulic connection
7. Disconnect electrical connection
8. Start machine
   *3 warnings will sound for “modules off line” (Accept the warnings)
9. Release parking brake
10. Back away from the plow slowly
11. Line up to the boom and approach unit the list assembly begins to engage the machine*
12. Set the parking brake*
13. Shut machine off*
14. Connect the hydraulic connection*
15. Connect the electrical connection*
16. Start machine*
17. Raise the boom making sure the hooks on the lift assembly engage the machine completely*
18. Release the quick connect pins (make sure they fully engage)*
19. Connect the solution hose to the boom*
20. Raise the boom support stands*
21. Check that all functions are working properly

*see the GST 20 Operator Manual for more detailed instructions

5. OPERATING THE MACHINE

5.3. Daily inspections

The following checks must always be carried out before operating the machine. These checks should also be repeated at the end of the working day. This way any fluid leaks and damages can be detected more quickly and service and repair procedures can be planned well in advance.

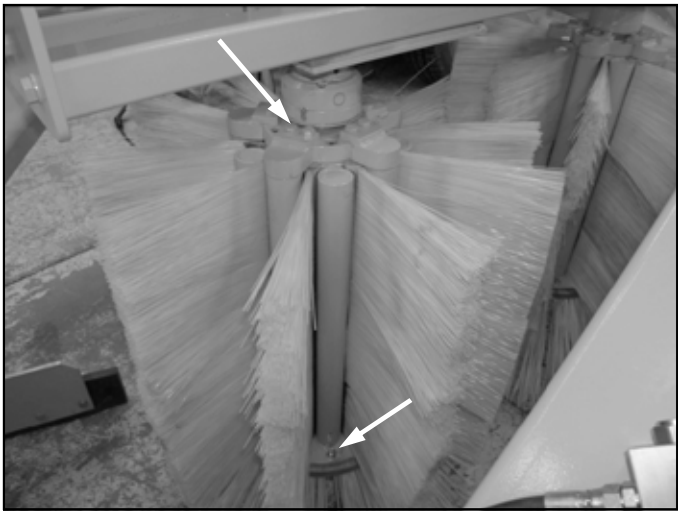
1. Check the condition of the structures

Check the following:

- Welded seams
- Tightness of bolts and nuts
- Possible wear
- Corrosion damage
- General structure of the machine

2. Check the wear of the brush bristles

The bristles are made of a plastic compound and they wear down. Operating efficiency and results suffer if an over worn brush is used. Replace the brush cassettes when they are worn and the length of the bristles is at least 4 inches.



Replacement

• Lift the plow sweeper up and place a support under the plow.

• Lift the brushes up and turn them to the rear position.

• Open the retaining bolts located in the middle of the bristles.

• Replace the brush cassettes and check the operation of the brushes.

5. OPERATING THE MACHINE

3. Check the adjustments

The plow sweeper must be adjusted before use. With appropriate adjustments, the quality of work is improved and unnecessary damage caused by wear is prevented.

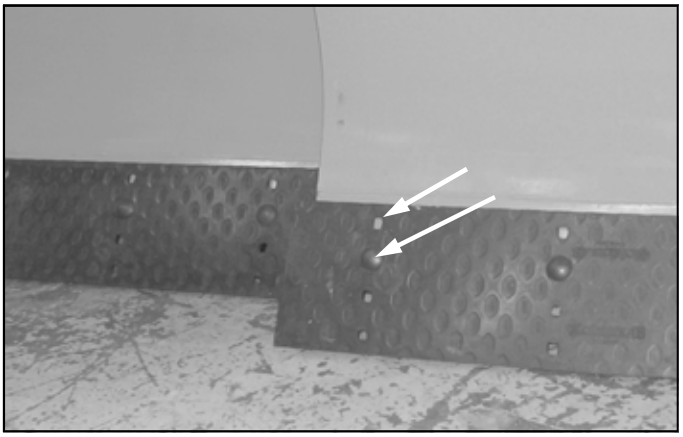
Adjustments:

- Plow floating.
- Wing blades.
- Plow height.
- Brush height.
- Brush tilt.
- Brush distances.

Plow floating

Test the plow and its floating. The plow is "floating" when the FLOAT switch has been activated. It simply means that the plow is in an automatic operational status and will make minor correctional adjustments on its own. Although the plow is being operated automatically, you may still make corrections manually.

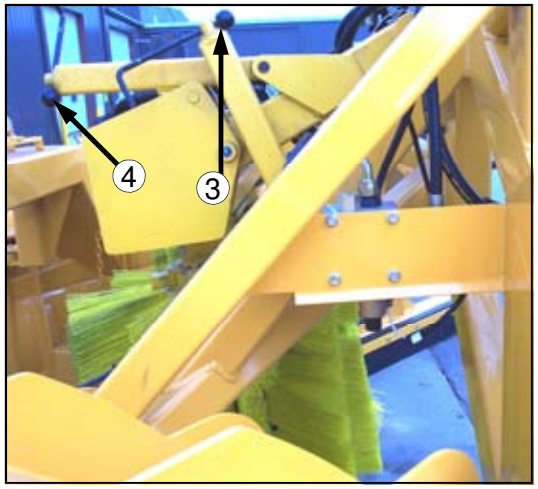
The plow can be adjusted horizontally from the cab using the lift and level functions.



Wing blades

The wing blades are made from wear resistant steel. However, the blades wear in time. Lower the blades by adjusting the location of the mounting holes .

5. OPERATING THE MACHINE



Plow height

It is possible to adjust the plow sweeper's height from the ground. The height is adjusted according to the desired plowing precision. The runners (4pcs) must be adjusted so that they support the plow slightly above the surface of the ground. This way the plow does not grind against small irregularities on the ground, and plowing does not excessively wear the wing blades.

Adjustment is done manually by turning the trapezoid screws (1&2) of the adjustment runners, located on the inside of the plow wings and the inside rear corners of the stationary blade. Adjustment should be made when the plow is slightly off the ground, which makes it easier to turn the screws.

Brush height

The ground clearance of the brush is adjusted by turning the trapezoid screw (3). The right clearance is best found by testing, but it is good to remember that the brush should not be set too low. This wears down the bristles quickly and strains the hydraulic motors.

Brush tilt

The brush tilt (4) is adjusted in the same way as the brush height. These adjustments should be made at the same time, and tested. The brush should be tilted forward as this gives the best results

Brush distances

The brush distances (below) are adjusted to the desired setting hydraulically from inside the cab. The brush distances are also adjusted as the bristles wear. The brushes must not be set too close to each other as this results in excessive wear and may also damage the motor bearings. Neither should they be set too far apart as they wear down when they hit the inner edge of the plow wings.

WARNING

Incorrectly adjusted brushes load the hydraulic motors and wear down the brush.

5. OPERATING THE MACHINE

4. Check the sight bars

With the help of the sight bars, plowing can be performed in a straight line and the wedge part can be accurately directed at the lights.

The plow coupling is located slightly to the left of the centerline so as to allow the operator to better see the plow's wedge part. Due to the location of the coupling, the sight bars can also be adjusted. The rear sight bar can be moved sideways to the desired location. The sight bars are adjusted after which they can be used for accurately defining the driving direction.

5. Check the hydraulic system

The hydraulic system must be checked. Leaks can result in inaccuracies in the controlling of the system. It is also advisable to check the condition of the electric valve control cable and the cleanliness of the connections.

Inspect:

• Hydraulic hoses and connections.

• Hydraulic valves.

• Hydraulic motors.

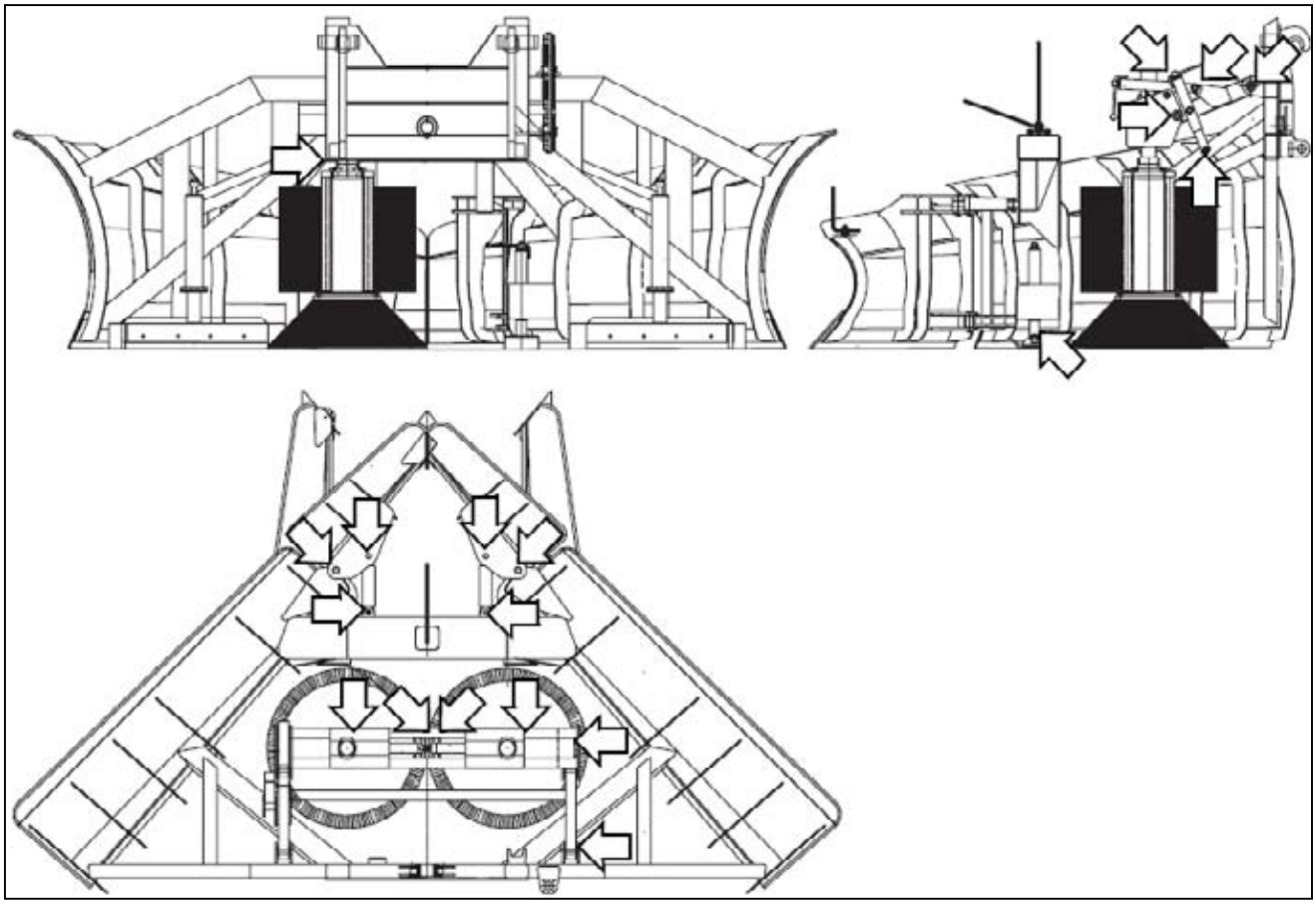
• Cylinders.

5. OPERATING THE MACHINE

6. Perform manual greasing

Apply grease on the grease nipples at least once a week. Greasing prevents wearing of the joints and increases the service life of the components.

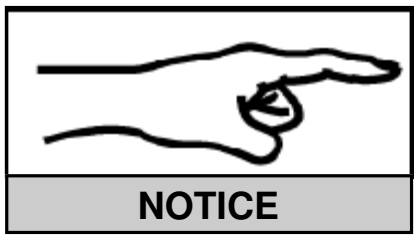
The total number of grease nipples in the machine is 21.



The Hagie lift arm has a grease zerk in each level cylinder shaft. They are located on the right hand side of each shaft.

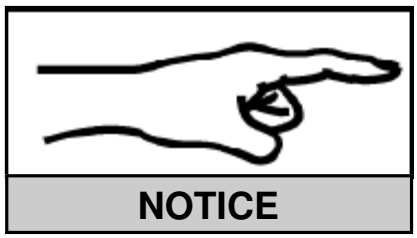
5. OPERATING THE MACHINE

5.4. Operating the plow sweeper



NOTICE

The operator must check that the ground clearance of the loader is greater than the height of the lights to be cleaned.



NOTICE

When operating the machine, all regulations and laws governing airports must be adhered to.

When using the plow sweeper, care must be taken to ensure the plow wings do not damage the items being cleaned. It is advisable to practice operating the machine.

Once the plow sweeper is connected to the machine and the necessary adjustments and lubrications have been made, the machine is ready for operation.

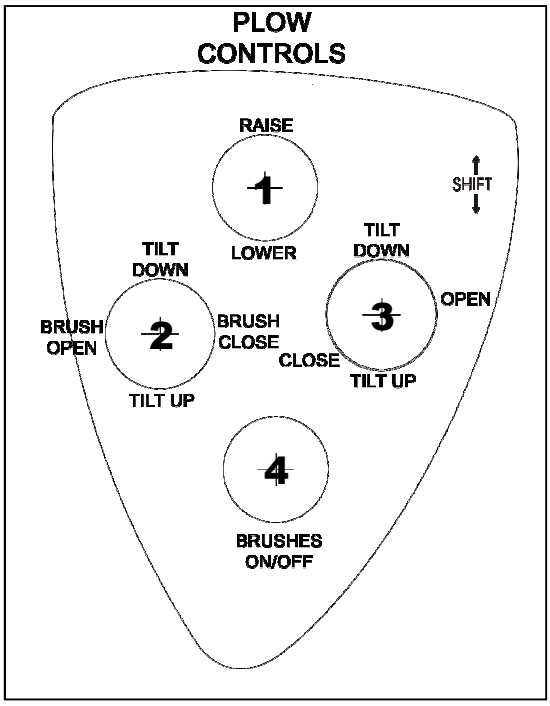
Starting and operating the machine

Once the hydraulics have been connected and the WORK MODE and FLOAT switches have been engaged, the brushes begin to rotate and operation can begin. Adjust the brush speed with the dial on the side of the console. Drive along the direction of the row of lights using the sight bars as guidance. When approaching the first light, use the directional control valve control button to open the wedge. You can drive over the light as usual. The brushes clean the base of the light. When the wedge part of the plow has passed the light and the light is at the brushes, use the control button to close the wedge part. Continue plowing towards the next light and repeat the procedure. It is advisable to stop the rotation of the brushes when plowing between the lights especially if the lights distance is long. This saves the brushes from wear. To shut the brushes off, press the button at the bottom of the control lever.

5. OPERATING THE MACHINE

5.5. Using the plow controls

Hagie GST20 Edge Light Plow Controls



To activate ALL the plow controls you must first have the GST in "work mode" by turning on the WORK MODE switch on the right side console.* The machine must be stopped for any mode change to take effect.

The plows functions are controlled primarily via the hydrostat handle. *

Raise and lower plow:
To raise or lower the plow, rock the switch at the top of the face on the handle. (1) Pushing forward raises the plow, pulling lowers the plow.

Tilt the plow:
To manually tilt the plow forward or backward, rock the round switch on the left or right hand side of the face on the handle up and down. (2 & 3) Pushing forward lowers the front plow tip, pulling back raises the front plow tip.

Adjust brushes:
To increase (open) or decrease (close) the brush width, rock the switch on the left hand side on the face of the handle left or right. (2) Pushing right narrows the brushes, pushing left widens the brushes.

Open and close plow doors:
To open or close the front of the plow, rock the switch on the right side of the face of the handle to the left or right. (3) Pushing right will open the plow, pushing left will close the plow.

Activate the brushes:
To turn the brushes on or off, press the button at the bottom of the face on the handle. (4) The green light in the front center of the headliner will light when the brushes are active. You can adjust the brush speed by turning the speed control knob on the left side of the console next to the hydrostat handle.

To use the plow:
Turn on the FLOAT switch on the side console, make sure WORK MODE switch is on, lower the plow close to, or on the ground, and turn the brushes on by pressing the button on the handle. This activates the float and will lower the plow and allow it to tilt as it rides along the ground. You can manually assist the plow down once the brushes are active. The float is only activated when the brushes are turning and the float switch is on. As you approach a edge light, rock the switch to open the plow and, if needed, adjust the brush width to clear the snow away from the light. Once the light has cleared the plow doors, rock the switch to close the plow again.

6. SPECIFICATIONS

PRINCIPAL DIMENSIONS		
Operating width	12ft 11in	4253mm
Transport width	16ft 2in	4930mm
Length*	9ft 5in	2871mm
Height*	6ft 5in	1964mm
Wing height (at the rear)	4ft 2in	1280mm
Weight*	4740 lbs.	2150 kg
GENERAL		
Coupling	Multifaster Mobile quick coupling	
Plow frame	Welded from steel plates and profiles	
Plow wing blades	4 detachable blades	
Brushes	(2) 2x10 replaceable brushes	
HYDRAULIC SYSTEM		
Oil flow	15.85 g/m max brushes only	60 l/m
Max. pressure	210 bar	
Rotation rate of hydraulic engines	250 rpm	
LUBRICANT AND MEDIUM RECOMMENDATIONS		
Hydraulic oil	Mobil Fluid 424	
Grease lubrication	EP general grease	

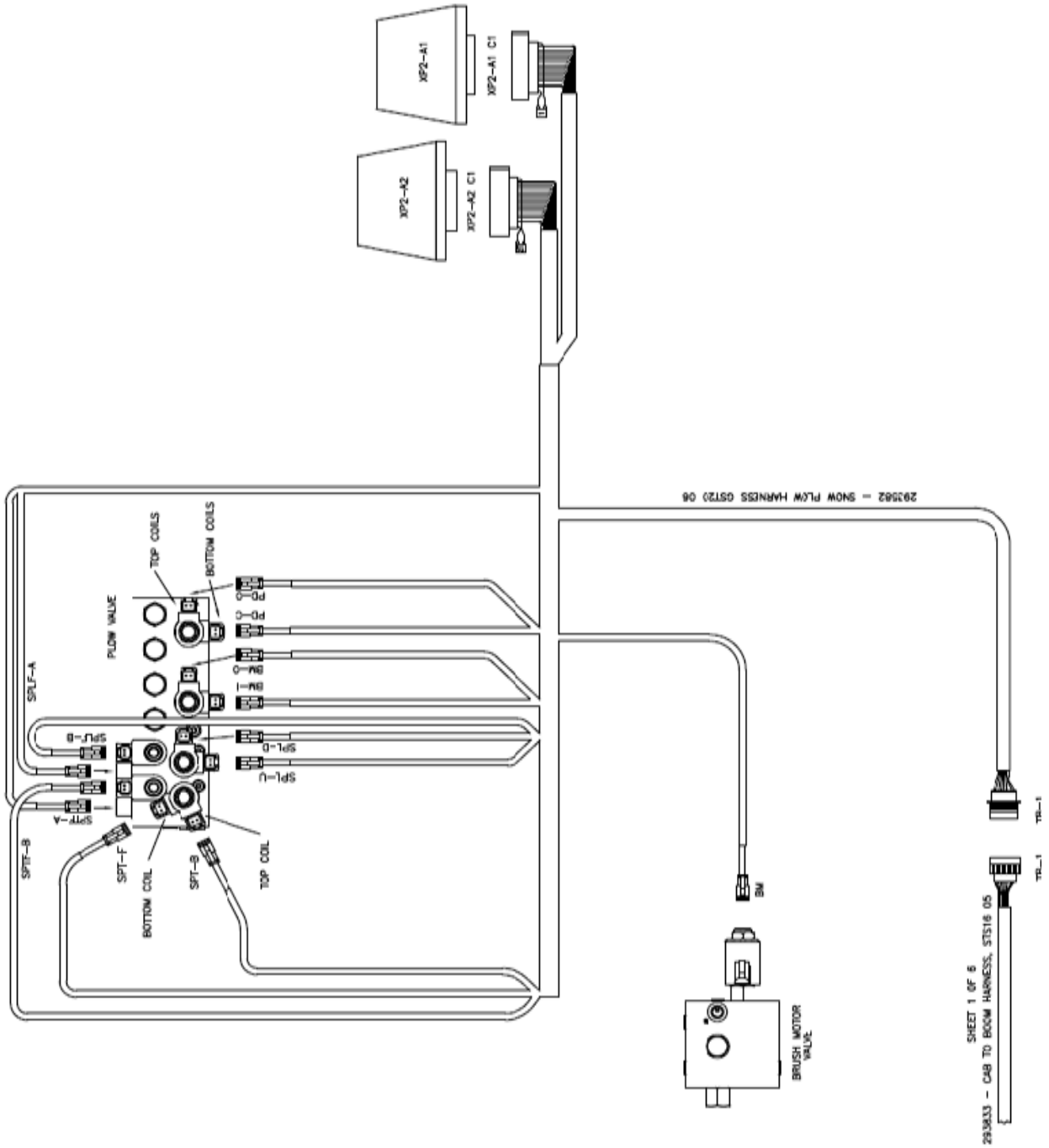
* the measurements are for the plow only, they do not include the lift arm assembly

7. TIGHTENING TORQUES

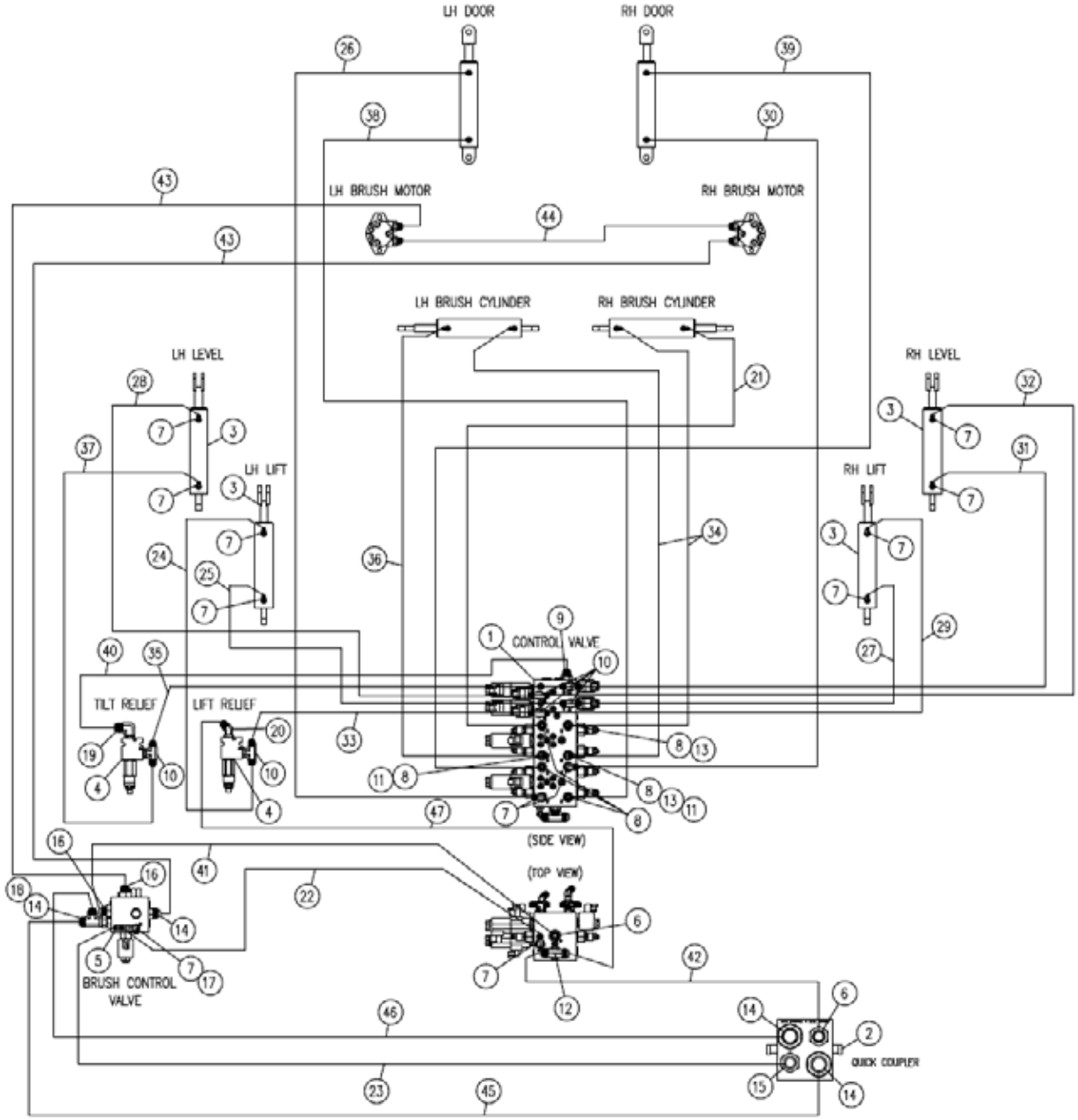
If there are any special requirements related to bolt and screw torques, they are specified in Parts List and Manufacturer's Manuals. The table below shows general torques applicable to all other bolts and screws. Maximum tolerance is ±10% of given torque.

Tightening torques for bolts and screws Torque Nm (1Nm ~ 0.1kpm ~ 0.74lb-ft)				
Thread	Strengt			Key span
	8.8	10.9	12.9	
M 6	10.3	14.7	17.6	10
M 8	25.5	35.3	42.1	13
M 10	50.0	70.6	85.3	17
M 12	87.3	122.6	147.1	19
M 14	138.3	194.2	235.4	22
M 16	210.8	299.1	357.9	24
M 18	289.3	411.9	490.3	27
M 20	411.9	578.6	696.3	30
M 22	559.0	784.5	941.4	32
M 24	711.0	1000	1196	36
M 27	1049	1481	1775	41
M 30	1422	2010	2403	46
M 33	1932	2716	3266	50
M 36	2481	3491	4197	55

8. ELECTRICAL DIAGRAM



8. HYDRAULIC DIAGRAM



1	1	606283	PLOW CTRL VALVE, SAUER 07		24	1	616611	06-451TC-06FJX-06FJX-91	H/A
2	1	618803	MULTIFASTER MOBILE		25	1	616612	06-451TC-06FJX-06FJX-109	H/A
3	4	621558	LEVEL CYL, 3.00 X 11.00 STS		26	1	616613	06-451TC-06FJX-06FJX-125	H/A
4	2	606214	RELIEF VALVE ASSY		27	1	616614	06-451TC-06FJX-06FJX-145	H/A
5	1	606253	CTRL VALVE, SOLU PUMP SAUER		28	1	616615	06-451TC-06FJX-06FJX-153	H/A
6	2	611125	3/4MJIC-3/4MOR ADPTR		29	1	616616	06-451TC-06FJX-06FJX-159	H/A
7	12	618119	9/16MJIC-90-9/16MOR LBO		30	1	616617	06-451TC-06FJX-06FJX-168	H/A
8	6	618126	9/16MJIC-9/16MOR ADPTR		31	1	616618	06-451TC-06FJX-06FJX-183	H/A
9	1	618327	3/4MJIC-7/8MOR ADPTR		32	1	616619	06-451TC-06FJX-06FJX-191	H/A
10	6	618629	9/16MOR BRANCH TEE-9/16MJIC		33	1	616620	06-451TC-06FJX-06FJX90-30	H/A
11	2	618634	9/16MJIC-45-9/16FJIC SWIV LBO		34	1	616621	06-451TC-06FJX-06FJX90-37	H/A
12	1	618637	7/8MOR BRANCH TEE-7/8MJIC		35	1	616622	06-451TC-06FJX-06FJX90-42	H/A
13	2	618734	9/16JIC .047 ORIFICE ADPTR		36	1	616623	06-451TC-06FJX-06FJX90-47	H/A
14	4	611127	1 1/16MJIC-1 1/16MOR ADPTR		37	1	616624	06-451TC-06FJX-06FJX90-116	H/A
15	1	618109	9/16MJIC-3/4MOR ADPTR		38	1	616625	06-451TC-06FJX-06FJX90-126	H/A
16	2	618308	1 1/16MJIC-1 5/16MOR ADPTR		39	1	616626	06-451TC-06FJX-06FJX90-175	H/A
17	1	618486	9/16FJIC SW RUN TEE-9/16MJIC		40	1	616627	08-451TC-08FJX-08FJX90-31	H/A
18	1	618487	1 1/16FJ SW RUN TEE-1 1/16MJ		41	1	616628	08-451TC-12FJX-08FJX90-42	H/A
19	1	618249	3/4MJIC-90-9/16MOR LBO		42	1	616629	10-451TC-08FJX-10FJX90-125	H/A
20	1	618425	9/16MJIC-45-9/16MOR LBO		43	2	616630	10-451TC-12FJX-12FJX90-85SL	H/A
21	1	616582	06-451TC-06FJX-06FJX90-51	H/A	44	1	616631	10-451TC-12FJX-12FJX-86 SL	H/A
22	1	616609	04-451TC-06FJX-06FJX-42	H/A	45	1	616632	12-451TC-12FJX-12FJX-84	H/A
23	1	616610	04-451TC-06FJX-06FJX-88	H/A	46	1	616633	12-451TC-12FJX-12FJX-86	H/A
					47	1	616634	08-451TC-06FJX-10FJX-22	H/A

10. DECOMMISSIONING

The end user of the machine is responsible for its decommissioning. If the end user does not have the ability or the resources to disassemble the machine, the work must be performed by someone who does possess the necessary knowledge and skills. In disposing of the waste material from disassembly of the machine, the following matters should be considered:

- The machine body, all the steel constructions, and the copper and aluminum in the electrical wiring are recyclable. The metals can be melted and used as raw material for new products, except for machine parts that have been in contact with substances that are regarded as hazardous waste. The contaminated parts can usually be simply cleaned or rinsed, after which they can be recycled.
- Most plastic parts are recyclable, similarly to the metals. Each plastic part carries information on the material used and a manufacturing date, which can be used for determining whether the part can be recycled.
- Rubber parts are not regarded as hazardous, and they can be disposed of according to normal procedures. Tubes (hydraulics etc.) must be cleaned before they are disposed of. Worn-out tires can be returned to the dealer from whom they were originally bought.
- Windshields and other cabin windows are not accepted for conventional glass recycling, but they can be disposed of via normal waste disposal methods.
- Electrical components that are classified as hazardous waste (accumulators, batteries, circuit boards) and other hazardous waste must be delivered to a licensed waste treatment location or be disposed of according to local regulations.
- Air conditioning units, which contain CFC and HCFC compounds, must always be delivered for treatment to a licensed waste disposal facility.
- For disposal instructions for fluids and lubricants, check your state or federal guidelines.

These instructions are not binding, but they offer suggestions for appropriate waste disposal procedures. Local authorities always have more detailed instructions and recommendations on the disposal of different materials.

When removing a machine from use, you must always follow the relevant authorities' regulations on waste disposal that are in force at the time and location of disassembly.

11. CONTACT INFORMATION

Hagie Manufacturing Company

721 Central Avenue West

PO Box 273

Clarion, Iowa 50525-0273

Phone: 1 (800) 247-4885

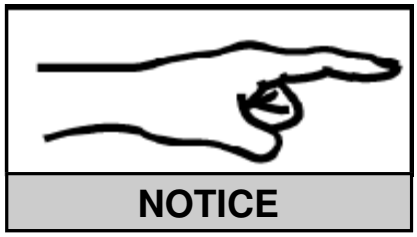
Fax: 1 (515) 532-3553

E-mail: www.hagie.com

Notes:

Notes:

12. SPARE PARTS LIST– VAMMAS



NOTICE

All dimensions given in the drawings are in millimeters unless specified (1”= 25.4mm)

12.1. Instructions for spare part manual readers

The spare part manual is compiled to make ordering of spare parts easier and faster for our customers. The contents of the spare part manual have been compiled to correspond with the structure of the machine delivered. However, continuous product development may cause modifications to the machine and the appropriate spare part manual.

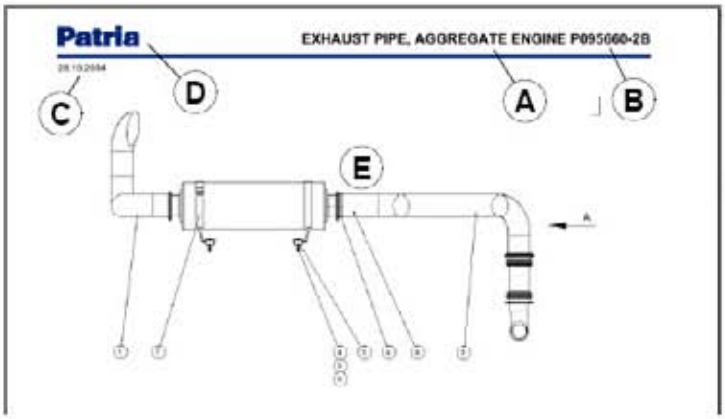
Always include the following data when ordering spare parts:

1. 1.Type and serial number of the machine (e.g., PSB 4500, Serial No. 001). The data can be found in the machine identification plate located on the frame of the machine. If the part to be ordered is, for example, a hydraulic motor gasket, it is advisable to also attach to the order the type plate data from the appropriate motor.
2. Part code (spare part number), name, and required quantity.
3. Date of the spare part manual.
4. Exact shipping address and method of delivery.
5. Name and invoicing address of the orderer.
6. Order number, if used.

In ambiguous cases, consult the dealer for help in selecting the correct part.

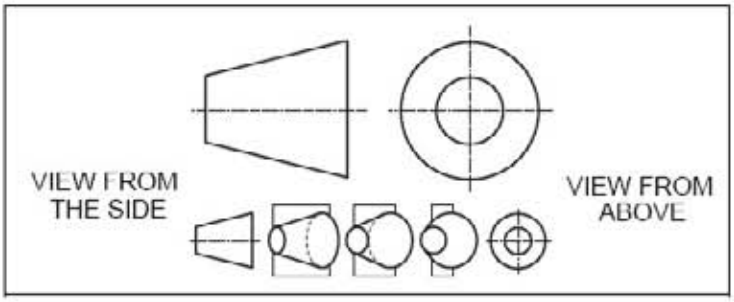
12. SPARE PARTS LIST– VAMMAS

Viewing a spare parts drawing



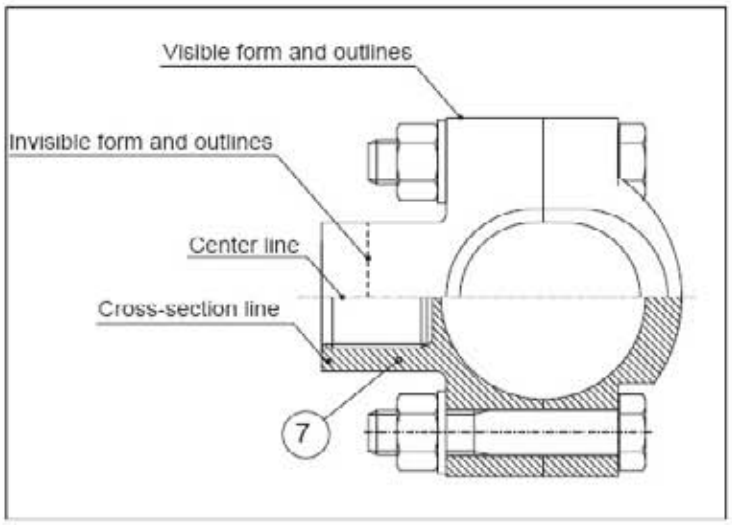
Spare part drawing

- (A) Assembly name.
- (B) Assembly number (code). The letter at the end indicates the version of the drawing.
- (C) Date of compilation of the spare part manual.
- (D) Manufacturer of the machine.
- (E) Drawing with reference numbers.



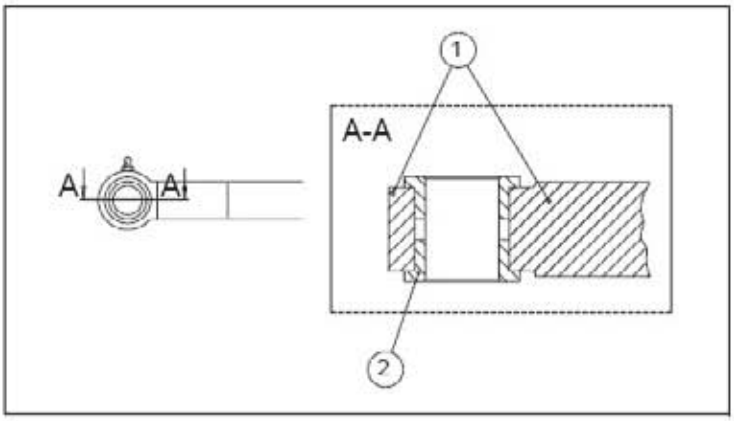
Views and directions

The different views use the so-called one-turn method. This is a European standard (previously the E method).



Line types

- Visible form and outlines.
- Invisible form and outlines.
- Center lines (symmetry lines) and trajectories.
- Cross-section lines.
- Alternate or extreme positions of moving parts (double dotted lines).

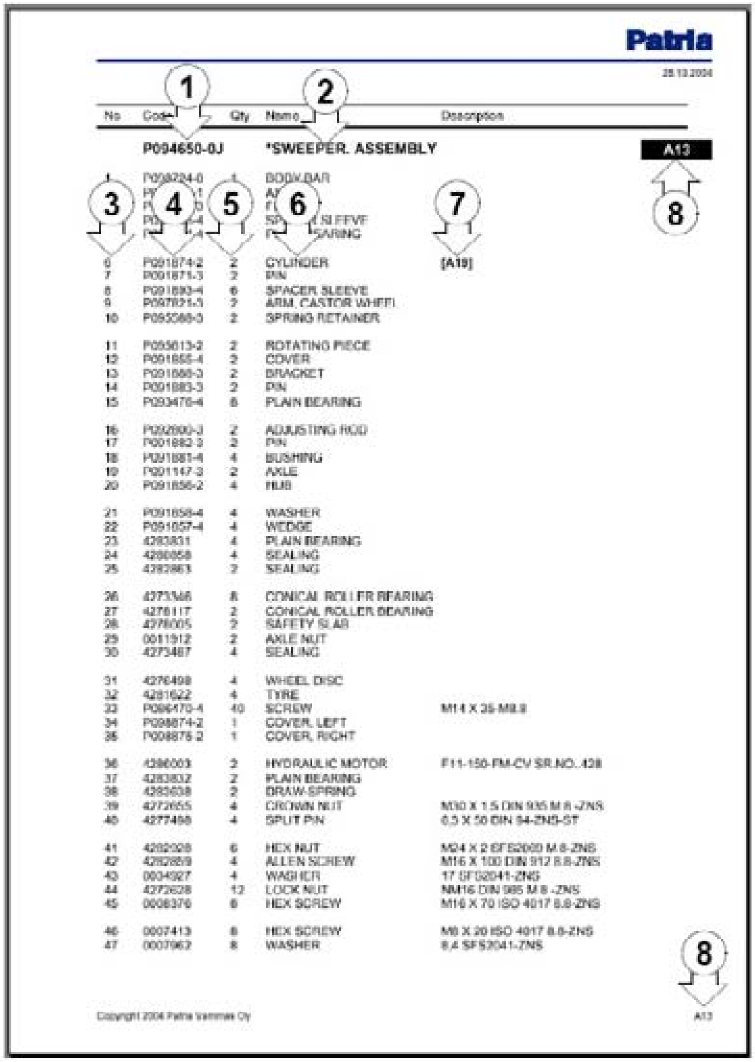


Cross-section views and detail diagrams

In a cross-section view, the components are viewed as having been cut through from a certain location (**A-A**). The viewing direction is indicated by an arrow.

12. SPARE PARTS LIST– VAMMAS

List of spare parts



No	Code	Qty	Name	Description
	P094650-0J		*SWEEPER. ASSEMBLY	A13
1	P098724-0	1	BODY BAR	
[illegible]	[illegible]	[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]	[illegible] SLEEVE	
[illegible]	[illegible]	[illegible]	[illegible] BEARING	
6	P091874-2	2	CYLINDER	[A19]
7	P091871-3	2	PIN	
8	P091893-4	6	SPACER SLEEVE	
9	P097821-3	2	ARM, CASTOR WHEEL	
10	P093088-3	2	SPRING RETAINER	
11	P093613-2	2	ROTATING PIECE	
12	P091855-4	2	COVER	
13	P091880-3	2	BRACKET	
14	P091883-3	2	PIN	
15	P093470-4	8	PLAIN BEARING	
16	P092900-3	2	ADJUSTING ROD	
17	P091882-3	2	PIN	
18	P091881-4	4	BUSHING	
19	P091147-3	2	AXLE	
20	P091856-2	4	HUB	
21	P091858-4	4	WASHER	
22	P091857-4	4	WEDGE	
23	4283831	4	PLAIN BEARING	
24	4280858	4	SEALING	
25	4282863	2	SEALING	
26	4273346	8	CONICAL ROLLER BEARING	
27	4278117	2	CONICAL ROLLER BEARING	
28	4278005	2	SAFETY SLAB	
29	0011912	2	AXLE NUT	
30	4273487	4	SEALING	
31	4276498	4	WHEEL DISC	
32	4281622	4	TYRE	
33	P086470-4	40	SCREW	M14 X 35-M8.8
34	P098874-2	1	COVER, LEFT	
35	P098875-2	1	COVER, RIGHT	
36	4286003	2	HYDRAULIC MOTOR	F11-150-FM-CV SR.NO. 428
37	4283832	2	PLAIN BEARING	
38	4283638	2	DRAW-SPRING	
39	4272655	4	CROWN NUT	M30 X 1.5 DIN 935 M 8 -ZNS
40	4277498	4	SPLIT PIN	6.3 X 50 DIN 94-ZNS-ST
41	4282028	6	HEX NUT	M24 X 2 SFS2000 M 8-ZNS
42	4282859	4	ALLEN SCREW	M16 X 100 DIN 912 8.8-ZNS
43	0034927	4	WASHER	17 SFS2041-ZNS
44	4272628	12	LOCK NUT	NM16 DIN 985 M 8 -ZNS
45	0008376	8	HEX SCREW	M16 X 70 ISO 4017 8.8-ZNS
46	0007413	8	HEX SCREW	M8 X 20 ISO 4017 8.8-ZNS
47	0007962	8	WASHER	8.4 SFS2041-ZNS

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A13

(1) Assembly number (code). The letter at the end of the code (if shown) indicates the version of the part list.

(2) Assembly name.

(3) Reference number.

(4) Spare part code.

(5) Quantity or length in meters (0.9 m).

(6) Part name.

(7) Part description / identifier. Indicates the identifier of a standard part. The part description column may include marking **[A19]**. This means that the part has a separate spare part drawing and list in a place indicated by the marking.

(8) Page code.

12. SPARE PART LIST– VAMMAS

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12. SPARE PART LIST– VAMMAS

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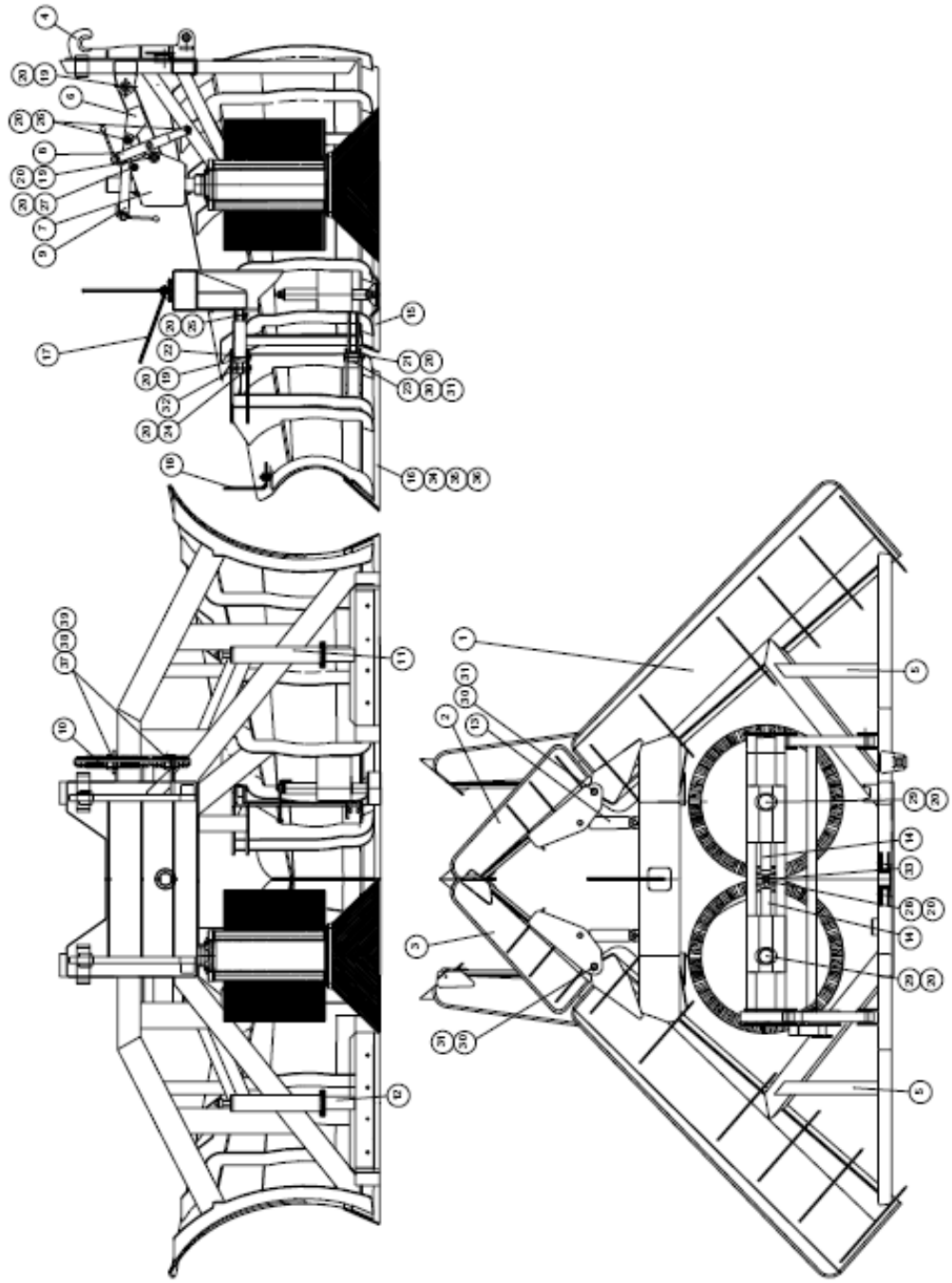
SPARE PART LIST A

12. SPARE PART LIST– VAMMAS

Patria

PLOW SWEEPER P099122-1

11.11.2005



12. SPARE PART LIST– VAMMAS

Patria

11.11.2005

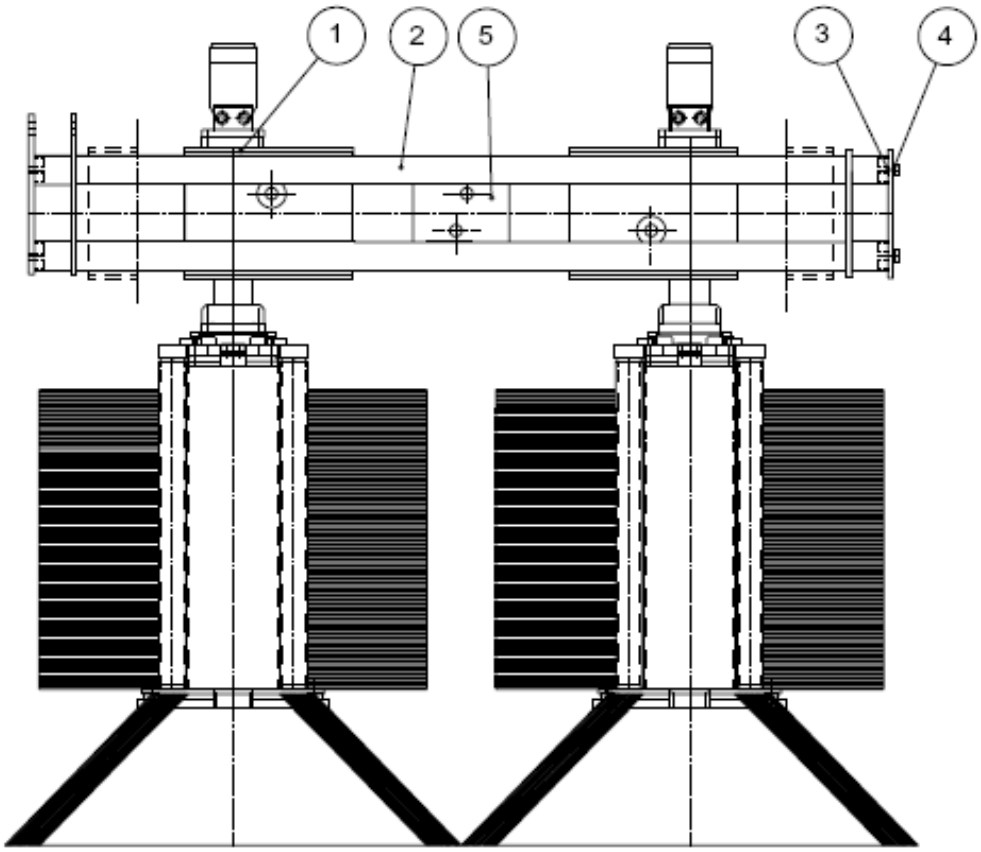
No	Code	Qty	Name	Description
	P099122-1		**PLOW SWEEPER**	**A3**
1	P099248-2	1	FRAME	
2	P099283-3	1	RIGHT POINT	
3	P099282-3	1	LEFT POINT	
4	P099211-2	1	QUICK COUPLING PLATE	
5	P099307-	2	SUPPORT	
6	P099212-2	1	VERTICAL LEVER	
7	P099232-2	1	GUIDE BAR	[A5]
8	P099246-2	1	REGULATING UNIT, VERTICAL LEVER	[A9]
9	P094965-2	1	REGULATING UNIT, HORIZONTAL LEVER	[A11]
10	P099215-2	1	SUSPENSION	[A13]
11	P099291-1	1	EXTRA PLOW (EXTRA)	[A15]
12	P099291-1	1	EXTRA PLOW (EXTRA)	[A15]
13	4286246	2	CYLINDER	[A17]
14	4286245	2	CYLINDER	[A19]
15	P099259-4	2	GRADER BLADE	
16	P099260-4	2	GRADER BLADE	
17	P094962-2	1	SIGHT	
18	P094963-3	1	SIGHT	
19	P099297-3	2	PIN, UPPER	
20	4276401	16	SPLIT PIN	6,3 X 63 DIN 94-ZNS-ST
21	P099304-3	2	PIN, LOWER	
22	P099288-4	2	BUSHING	
23	P099254-4	2	BUSHING	
24	P099305-3	2	PIN	
25	P099306-3	2	PIN	
26	P095156-4	2	PIN	
27	P095155-4	1	PIN	
28	P099233-4	2	PIN	
29	P099236-4	2	PIN	
30		8	THRUST PLATE	GLACIER WC40DU
31		8	BEARING BUSHING	GLACIER MB 4030DU
32	P099289-4	4	BUSHING	
33	P099235-4	4	BUSHING	
34	4284680	22	LOCK SCREW	M16 X 40 SFS 2458 8.8-ZNS
35	4284496	22	LOCK NUT	
36	0034927	22	WASHER	17 SFS2041-ZNS
37	4272425	8	HEX SCREW	M12 X 70 ISO 4017 8.8-ZNS
38	0035052	8	NUT	M12 SFS2067 M 8-ZNS
39	0010875	8	WASHER	13 SFS2041
40	0012178	15	GREASE FITTING	KR 1/8

12. SPARE PART LIST– VAMMAS

Patria

GUIDE BAR P099232-2

11.11.2005



12. SPARE PART LIST– VAMMAS

Patria

11.11.2005

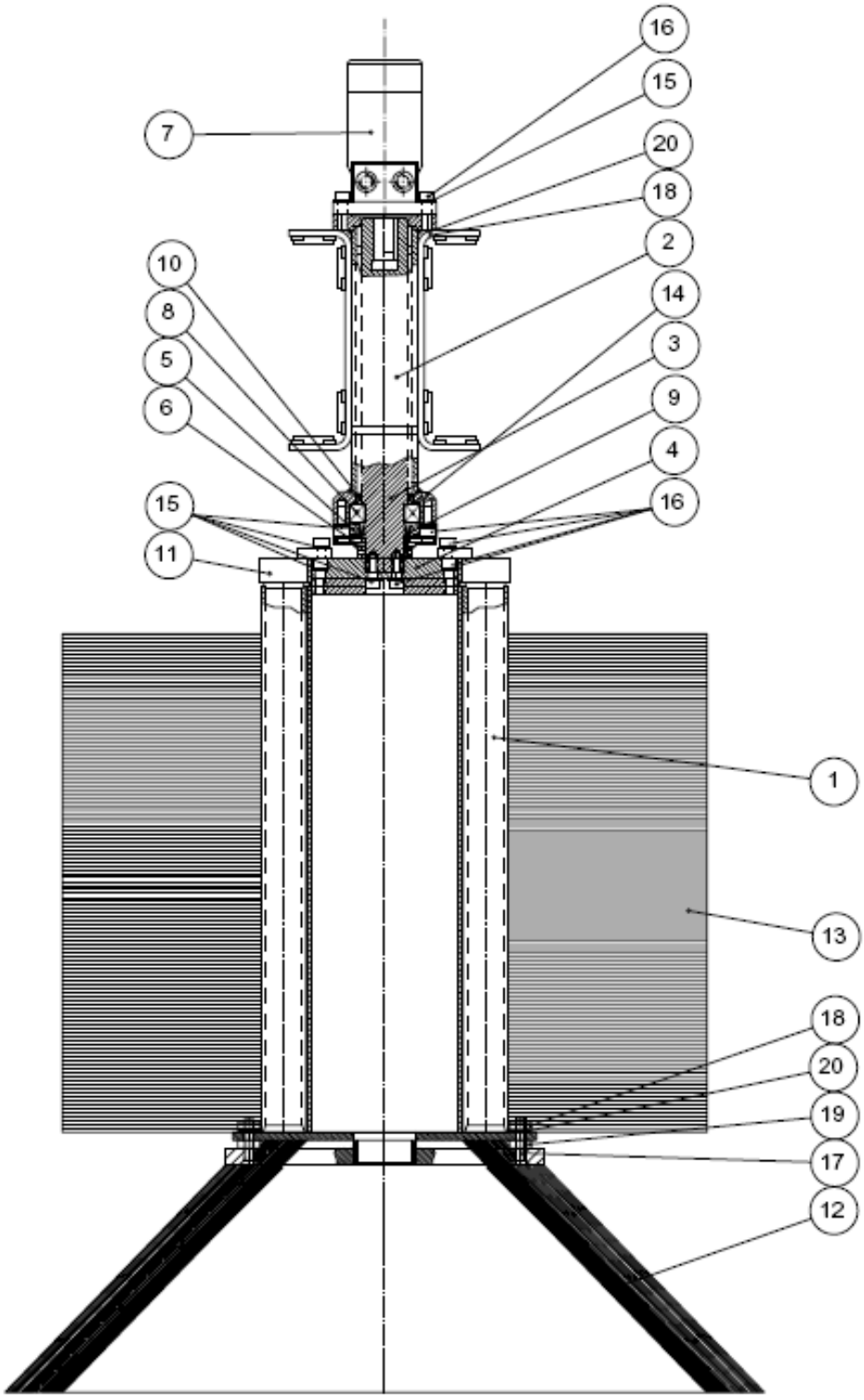
No	Code	Qty	Name	Description	
	P099232-2		*GUIDE BAR		A5
1	P099122-2	2	BRUSH	[A7]	
2	P099220-3	1	BARS		
3		4	HEXAGON HEAD SCREW	M16 X 30 SFS 2064	
4		4	NORD LOCK	NL16 SS	
5	P099127-3	1	MOUNTING PLATE		

12. SPARE PART LIST– VAMMAS

Patria

BRUSH P099122-2

11.11.2005



12. SPARE PART LIST– VAMMAS

Patria

11.11.2005

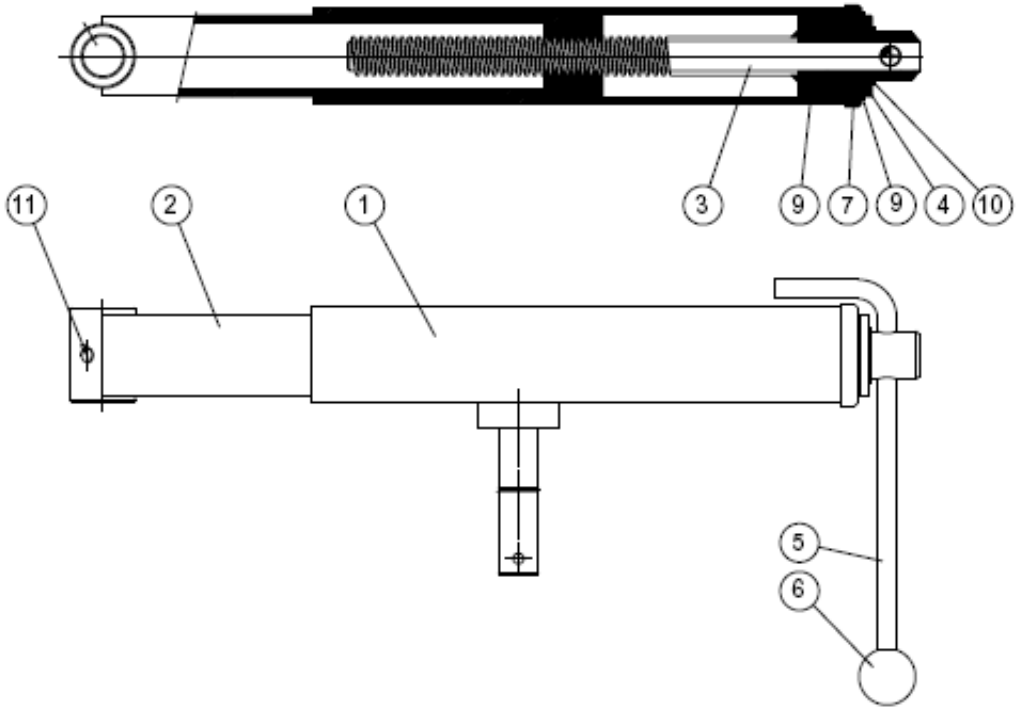
No	Code	Qty	Name	Description	
	P099122-2		****BRUSH**		**A7**
1	P099129-3	1	LOWER PIPE		
2	P099126-3	1	MOVING FRMAE		
3	P099123-3	1	AXLE		
4	P099130-3	1	FLANGE		
5	P099132-3	1	SPACER PLATE		
6	P099131-3	1	PLASTIC PART		
7		1	HYDRAULIC MOTOR	RG 230 270 320 A18 12	
8		1	ROLLER BEARING	22210E, SKF	
9		1	SEALING	50X65X10 RST/CC/BASL	
10		1	SEALING	58X72X10 RST/CC/BASL	
11	P099138-4	5	FASTENER		
12		1	BRUSH UNIT	05013409501350	
13		1	BRUSH UNIT	01011025011227	
14		1	GREASE NIPPLE	M6	
15		25	NORD LOCK	NL12 SS	
16		25	ALLEN SCREW	M12 X 30 SFS 2219	
17		5	ALLEN SCREW	M12 X 50 DIN 7991	
18		5	LOCK NUT	NM12	
19		5	NUT	M12 DIN 934	
20		7	WASHER	13 DIN 433	

12. SPARE PART LIST– VAMMAS

Patria

REGULATING UNIT, VERTICAL LEVER P099246-2

11.11.2005



12. SPARE PART LIST– VAMMAS

Patria

11.11.2005

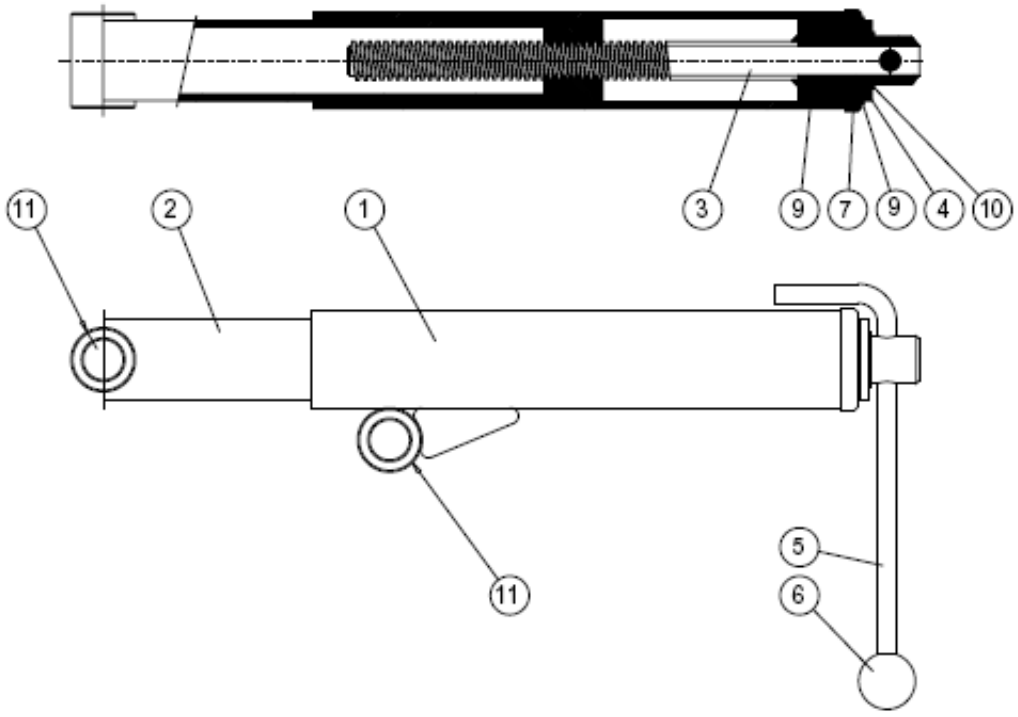
No	Code	Qty	Name	Description	
	P099246-2		*REGULATING UNIT, VERTICAL LEVER		A9
1	P099242-3	1	OUTER PIPE		
2	P095133-3	1	INNER PIPE		
3	P095134-3	1	TRAPEZOID THREAD AXLE		
4	P095135-4	1	BUSHING	Ø50/Ø30	
5	P095037-3	1	LEVER	Ø12	
6	4284677	1	BALL KNOB	P35 M12	
7	4284681	1	BEARING BUSHING	MB 3030 DU	
9	P095136-4	2	THRUST BEARING		
10	0008407	1	SAFETY RING	30 X 1,5 DIN 471	
11	0012178	1	GREASE FITTING	KR 1/8	

12. SPARE PART LIST– VAMMAS

Patria

REGULATING UNIT, HORIZONTAL LEVER P094965-2

11.11.2005



12. SPARE PART LIST-VAMMAS

Patria

11.11.2005

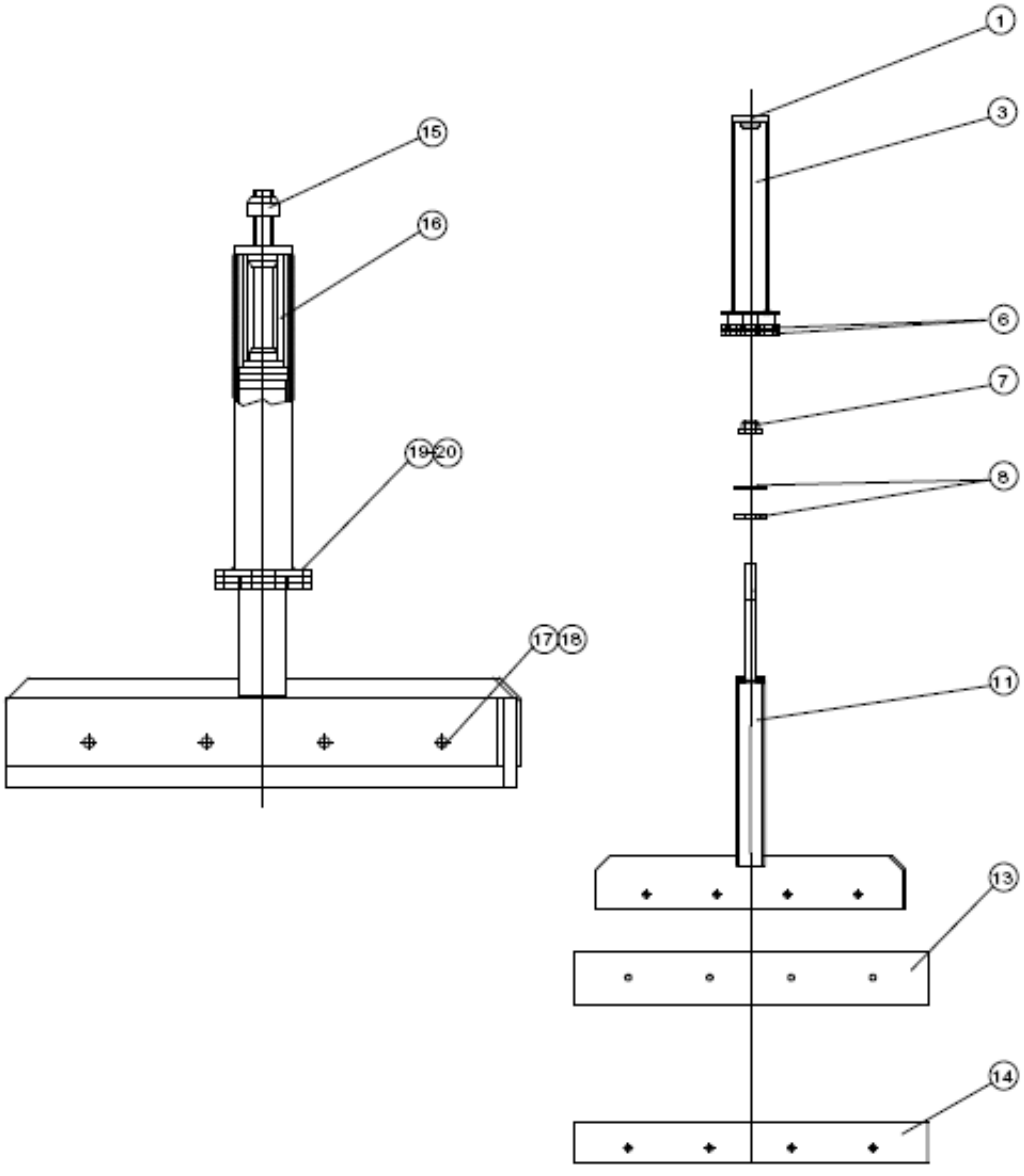
No	Code	Qty	Name	Description	
	P094965-2		*REGULATING UNIT, HORIZONTAL LEVER		A11
1	P095137-3	1	OUTER PIPE		
2	P095133-3	1	INNER PIPE		
3	P095134-3	1	TRAPEZOID THREAD AXLE		
4	P095135-4	1	BUSHING	Ø50/Ø30	
5	P095037-3	1	LEVER	Ø12	
6	4284677	1	BALL KNOB	P35 M12	
7	4284681	1	BEARING BUSHING	MB 3030 DU	
9	P095136-4	2	THRUST BEARING		
10	0008407	1	SAFETY RING	30 X 1,5 DIN 471	
11	0012178	2	GREASE FITTING	KR 1/8	

12. SPARE PART LIST– VAMMAS

Patria

EXTRA PLOW (EXTRA) P099291-1A

11.11.2005



12. SPARE PART LIST– VAMMAS

Patria

11.11.2005

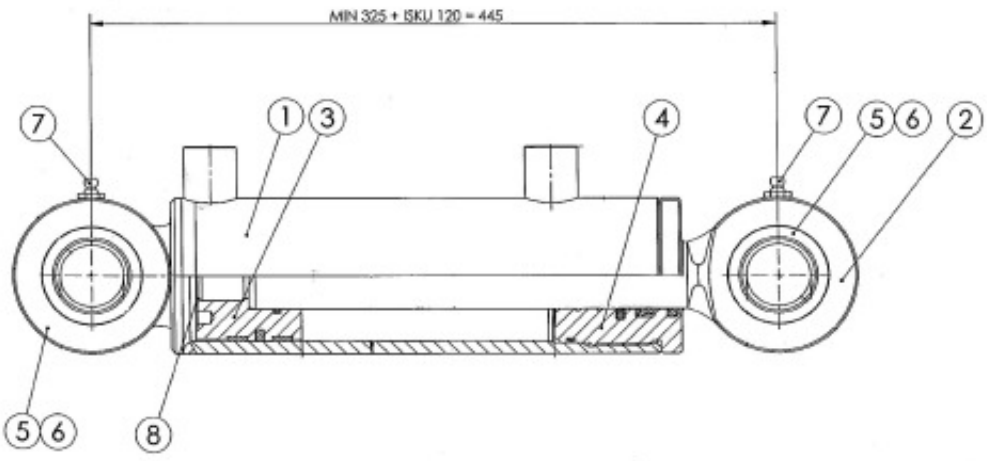
No	Code	Qty	Name	Description	
	P099291-1A		*EXTRA PLOW (EXTRA)		A13
1		1	COVER		
3		1	PIPE		
6		1	PLASTIC PART		
8		1	WASHER		
11		1	PIPE		
13		1	RUBBER PLATE		
14		1	PLATE		
15		1	LOCK NUT	NM30 , 8.8	
16		1	COMPRESSION SPRING	D=50, L=250	
17		4	HEXAGON HEAD SCREW	M10 X 70 ,8.8	
18		4	LOCK NUT	NM10 8.8	
19		8	HEXAGON HEAD SCREW	M10 X 35 ,8.8	
20		8	WASHER	M10 ZNC	

12. SPARE PART LIST– VAMMAS

Patria

CYLINDER 4286246

11.11.2005



12. SPARE PART LIST– VAMMAS

Patria

11.11.2005

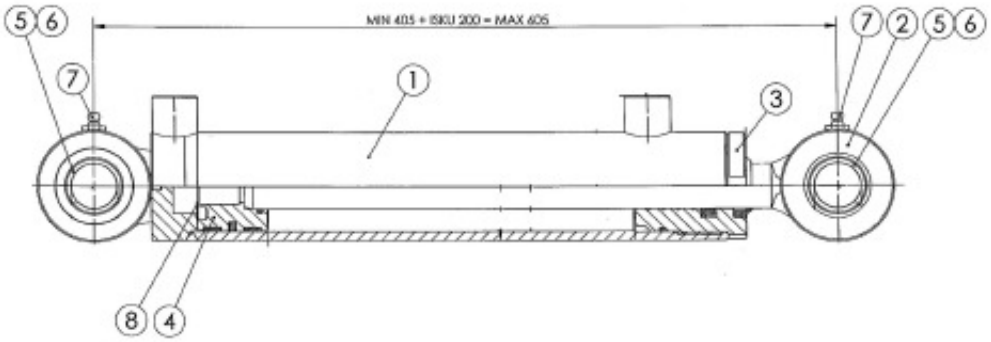
No	Code	Qty	Name	Description	
	4286246		***CYLINDER**		A15
1	P099359-3	1	CYLINDER PIPE	63/75-266	
2	P099360-3	1	PISTON ROD	32-279	
3	P099361-4	1	PISTON	63-50	
4	P099362-3	1	COVER	M68 X 2	
5		1	ROCKER BEARING	GE 30 DO	
6		1	LOCK RING	42 X 1,75 DIN 472	
7		1	GREASE NIPPLE	R1/8 DIN 71412	
8		1	ALLEN SCREW	M8 X 12 DIN 916	
	4286275	1	SEALING SET		

12. SPARE PART LIST– VAMMAS

Patria

CYLINDER 4286245

11.11.2005



12. SPARE PART LIST– VAMMAS

Patria

11.11.2005

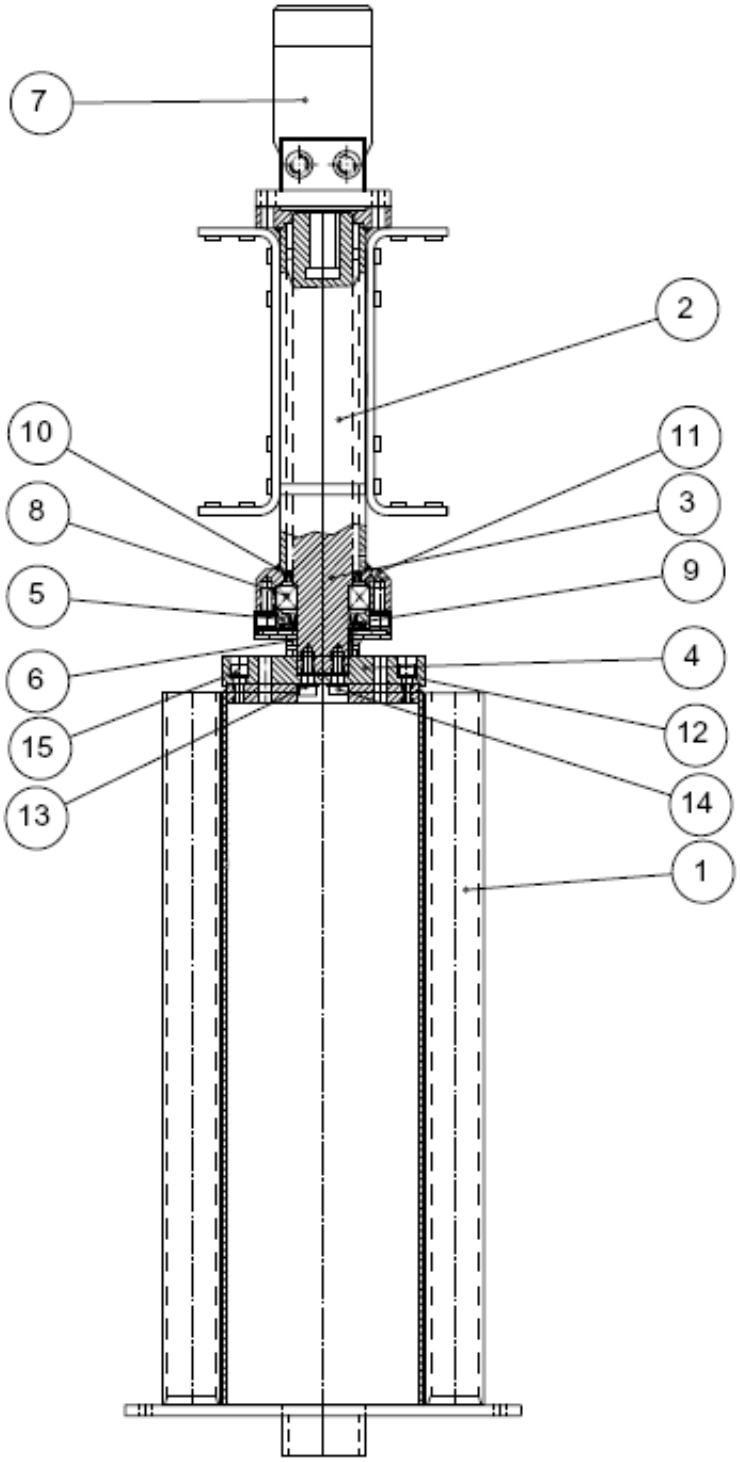
No	Code	Qty	Name	Description	
	4286245		***CYLINDER**		A17
1	P099351-3	1	CYLINDER PIPE	50/50-345	
2	P099352-3	1	PISTON ROD	25-349	
3	P099353-3	1	COVER	M54 X 2	
4	P099354-3	1	PISTON	M20 X 1,5	
5		2	ROCKER BEARING	GE 25 DO	
6		2	LOCK RING	42 X 1,75 DIN 742	
7		2	GREASE NIPPLE	R18 DIN 71412	
8		1	ALLEN SCREW	M8 X 12 DIN 916	
	4286274	1	SEALING SET		

12. SPARE PART LIST– VAMMAS

Patria

SWEEPER AXLE P099133-2

11.11.2005



12. SPARE PART LIST– VAMMAS

Patria

11.11.2005

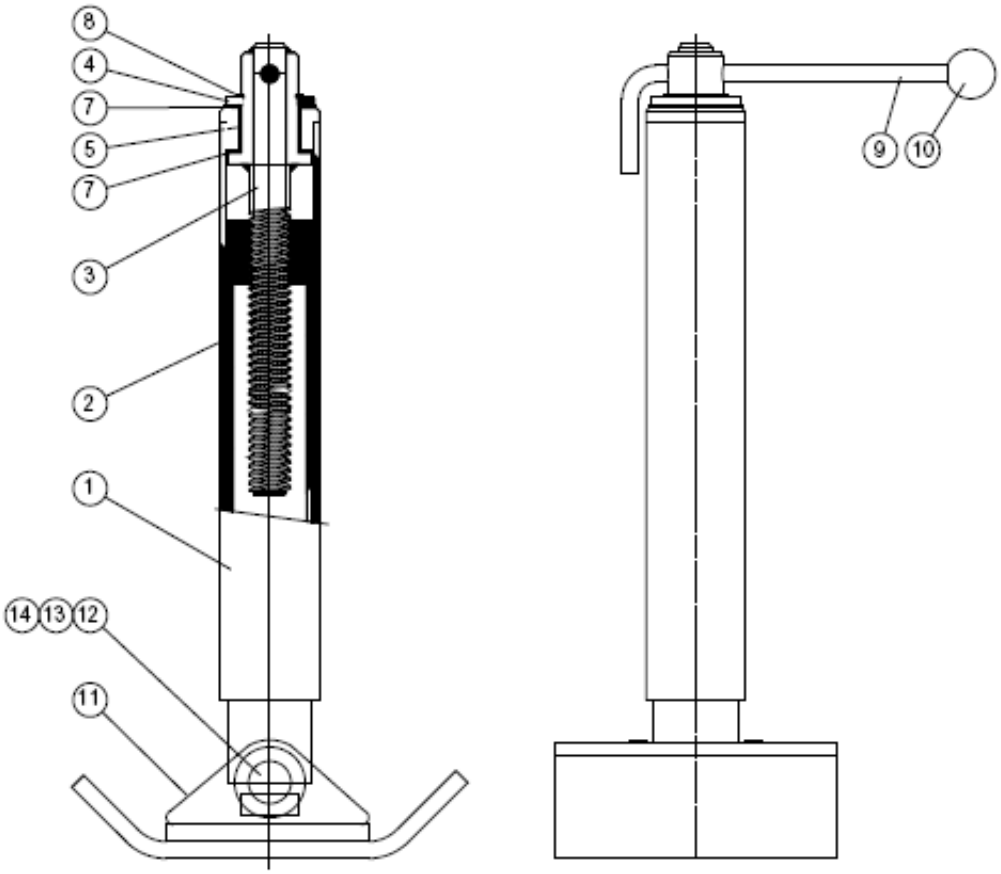
No	Code	Qty	Name	Description	
	P099133-2		**SWEEPER AXLE**		A19
1	P099129-3	1	LOWER PIPE		
2	P099126-3	1	MOVING FRMAE		
3	P099123-3	1	AXLE		
4	P099130-3	1	FLANGE		
5	P099132-3	1	SPACER PLATE		
6	P099131-3	1	PLASTIC PART		
7		1	HYDRAULIC MOTOR	RG 230 270 320 A18 12	
8		1	ROLLER BEARING	22210E, SKF	
9		1	SEALING	50 X 65 X 10	
10		1	SEALING	58 X 72 X 10	
11		1	GREASE NIPPLE	M6	
12		1	NORD LOCK	NL10 SS	
13		1	NORD LOCK	NL12 SS	
14		8	ALLEN SCREW	M12 X 30 SFS 2219	
15		5	ALLEN SCREW	M10 X 25 SFS 2219	

12. SPARE PART LIST– VAMMAS

Patria

SKID ASSEMBLY P099230-1

11.11.2005



12. SPARE PART LIST– VAMMAS

Patria

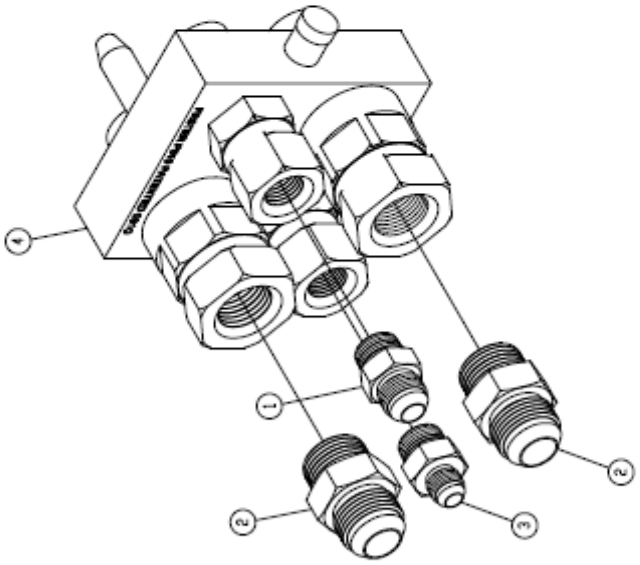
11.11.2005

No	Code	Qty	Name	Description	
	P099230-1		SKID ASSEMBLY		A21
1		1	OUTER SUPPORT		
2		1	INNER SUPPORT		
3		1	TRAPEZOID THREAD SHAFT		
4		1	SLEEVE		
5		1	BEARING SLEEVE		
7		2	THRUST BEARING		
8		1	SAFETY RING		
9		1	LEVER		
10		1	KNOB		
11		1	SKID		
12		1	PIN		
13		1	COTTER PIN		
14		1	GREASE NIPPLE		

13. SPARE PART LIST– HAGIE

SNOW PLOW QUICK COUPLER ASSEMBLY

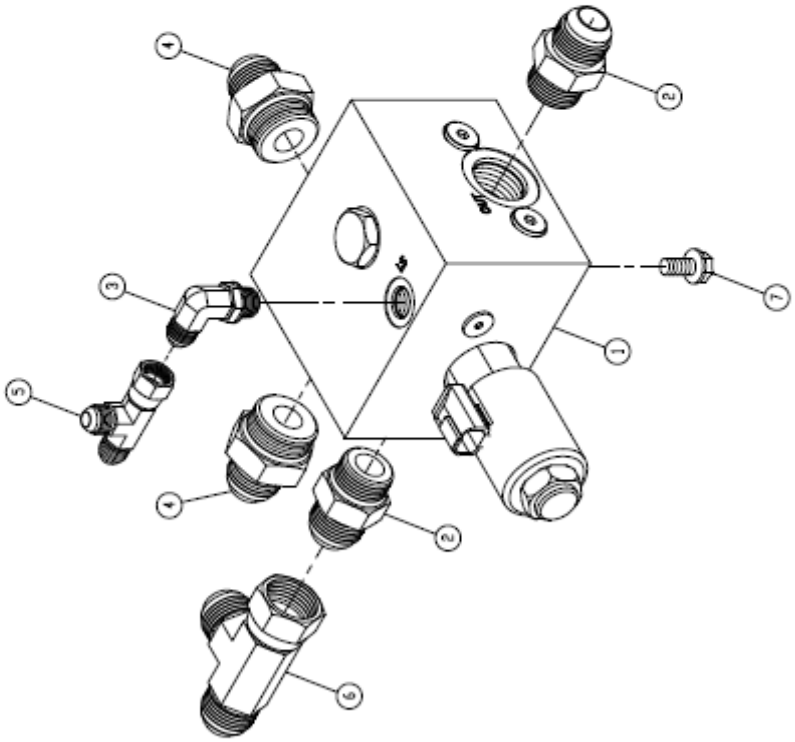
REF.	QTY	PART NO.	DESCRIPTION
1	1	611125	3/4MJIC-3/4MOR ADPTR
2	2	611127	1 1/16MJIC-1 1/16MOR ADPTR
3	1	618109	9/16MJIC-3/4MOR ADPTR
4	1	618803	MULTIFASTER MOBILE



13. SPARE PART LIST– HAGIE

BOOM SPEED VALVE ASSEMBLY

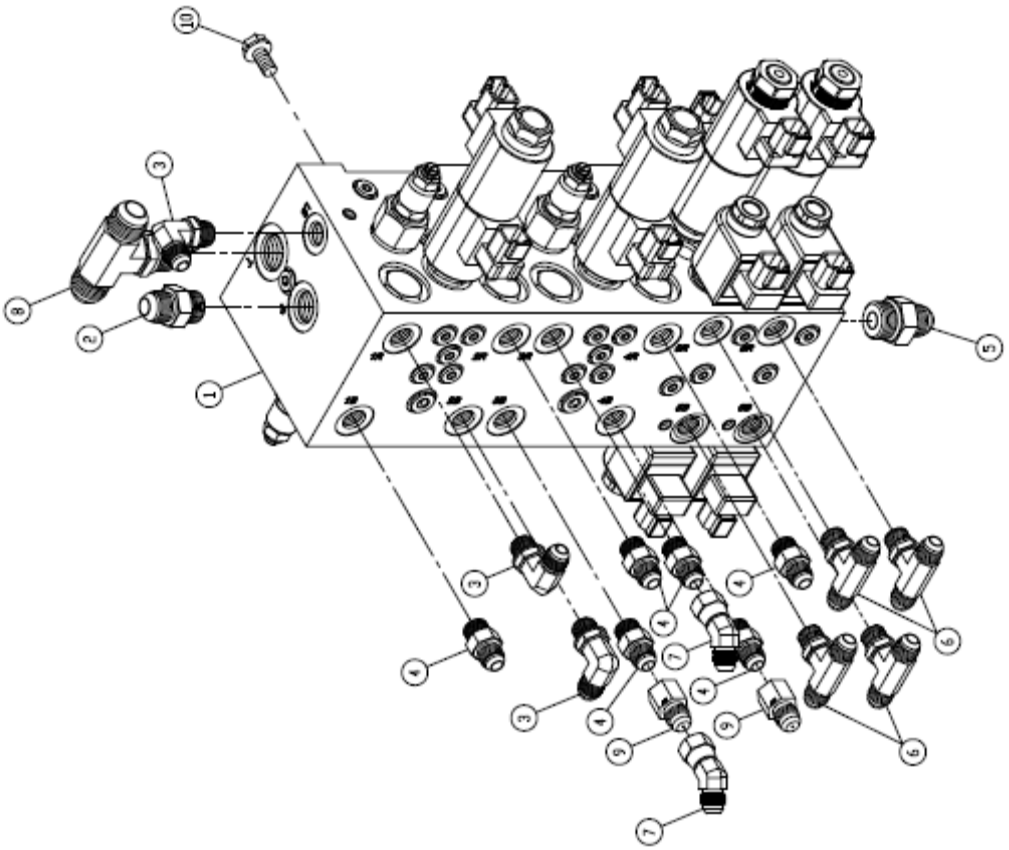
REF.	QTY	PART NO.	DESCRIPTION
1	1	606253	CTRL VALVE,SOLU PUMP SAUER
2	1	611127	1 1/16MJIC-L 1/16MOR AUPTR
3	1	618119	9/16MJIC-90-9/16MOR LBO
4	2	618308	1 1/16MJIC-L 5/16MOR AUPTR
5	1	618486	9/16FJIC SW RUN TEE-9/16MJIC
6	1	618487	1 1/16FJ SW RUN TEE-L 1/16MJ
7	4	900128	3/8UNC X 3/4 HEX BOLT



13. SPARE PART LIST– HAGIE

CONTROL VALVE ASSEMBLY

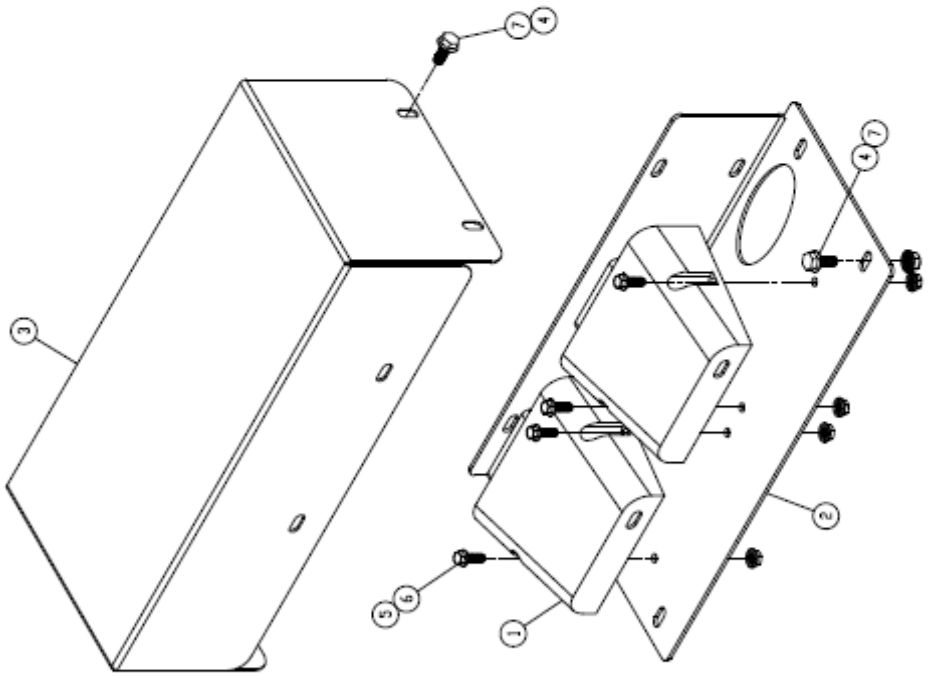
DET.	QTY	PART NO.	DESCRIPTION
1	1	606283	FLOW CTRL VALVE, SAUER
2	1	61125	3/4MJIC-3/4MOR ADPTR
3	3	618119	9/16MJIC-90-9/16MOR LBO
4	6	618126	9/16MJIC-9/16MOR ADPTR
5	1	618327	3/4MJIC-7/8MOR ADPTR
6	4	618629	9/16MOR BRANCH TEE-9/16MJIC
7	2	618634	9/16MJIC-45-9/16FJIC SWIV LBO
8	1	618637	7/8MOR BRANCH TEE-7/8MJIC
9	2	618734	9/16JIC .047 ORIFICE ADPTR
10	4	900128	3/8UNC X 3/4 HEX BOLT



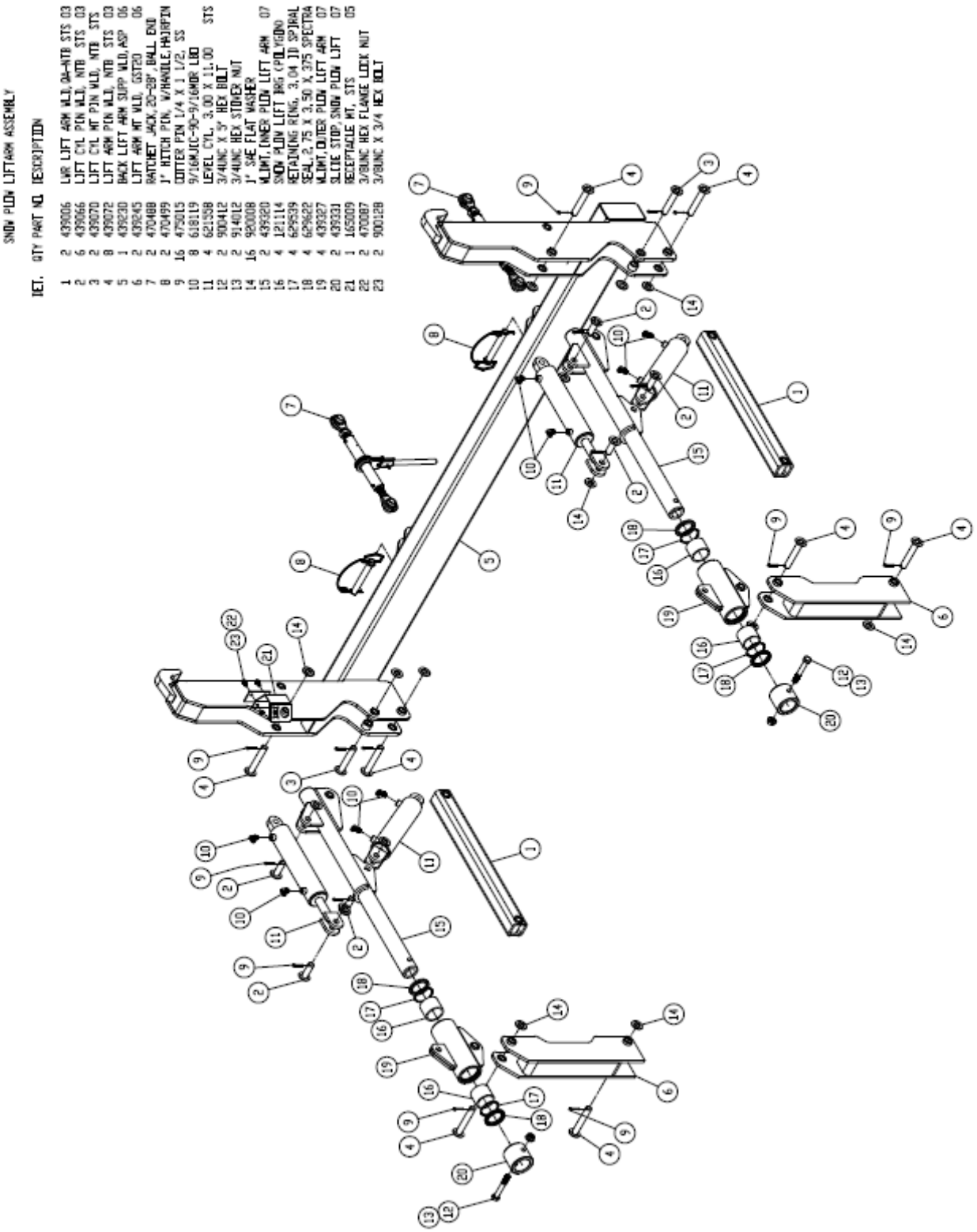
13. SPARE PART LIST– HAGIE

ELECTRIC PANEL ASSEMBLY

REF.	QTY	PART NO.	DESCRIPTION
1	2	293012	CDAN-XP2 POWER MODULE
2	1	439194	ELECT CTRL MT PANEL, NTB 05
3	1	439195	ELECT CTRL BOX COVER, NTB 05
4	8	470113	5/16UNC HEX FLANGE LOCK NUT
5	4	470118	1/4UNC X 3/4 FLANGE HEX BOLT
6	4	470121	1/4UNC HEX FLANGE LOCK NUT
7	8	470233	5/16UNC X 3/4 FLANGE HEX BOLT



13. SPARE PART LIST– HAGIE



SNOW PLOW LIFTARM ASSEMBLY

REF.	QTY	PART NO.	DESCRIPTION
1	2	439006	LWR LIFT ARM WLD,DA-NTB STS 03
2	6	439066	LIFT CYL PIN WLD, NTB STS 03
3	2	439070	LIFT CYL MT PIN WLD, NTB STS
4	8	439072	LIFT ARM PIN WLD, NTB STS 03
5	1	439230	BACK LIFT ARM SUPP WLD,ASP 06
6	2	439245	LIFT ARM MT WLD, GST20 06
7	2	470488	RATCHET JACK,20-28" BALL END
8	2	470499	1" HITCH PIN, W/HANDLE,HAIRPIN
9	16	475015	COTTER PIN 1/4 X 1 1/2, SS
10	8	618119	9/16MJIC-9D-9/16MOR LBD
11	4	621538	LEVEL CYL, 3.00 X 11.00 STS
12	2	900412	3/4UNC X 5" HEX BOLT
13	2	914012	3/4UNC HEX STOVER NUT
14	16	920008	1" SAE FLAT WASHER
15	2	439320	WLDMT,INNER PLOW LIFT ARM 07
16	4	121114	SNOW PLOW LIFT BKG (POLYGON)
17	4	629539	RETAINING RING, 3.04 ID SPIRAL
18	4	629622	SEAL,2.75 X 3.50 X.375 SPECTRA
19	4	439327	WLDMT,OUTER PLOW LIFT ARM 07
20	2	439331	SLIDE STOP,SNOW PLOW LIFT 07
21	1	165009	RECEPTACLE MT, STS 05
22	2	470087	3/8UNC HEX FLANGE LOCK NUT
23	2	900128	3/8UNC X 3/4 HEX BOLT

HAGIE UpFront PARTS ORDER FAX

Fax 24 hours a day 7 days a week*

Ph. 1 (800) 247-4885 Fx. 1 (515) 532-3553 **Photocopy and fax to Hagie Customer Support Department**

ORDERED BY/BILL TO:

Name_____

Co. Name _____

Street_____

City, St, Zip_____

Ph._____ Fx. _____

SHIP TO:

Name _____

Co. Name_____

Street _____

City, St, Zip _____

Ph. _____ Fx. _____

HOW SHIP: ☐ UPS Ground ☐ Next Day ☐ 2 Day ☐ 3 Day ☐ Other _____

If "HOW SHIP" is left blank, parts will be sent UPS ground service. If part is over 150 pounds, an independent motor freight company will be used.

PAYMENT: ☐ Hagie Account #**_____

☐ C.O.D

☐ American Express ☐ Discover ☐ Visa ☐ Master Card

Signature:_____

name as appears on card:_____

card no. _____ exp. date _____

Year and Model No. _____

Serial No. _____

Item Serial No. (if necessary):

Engine (include type) _____

Hydrostatic Pump (s)_____

Torque Hub _____ ☐ LF ☐ RF ☐ LR ☐ RR

Wheel Motor _____ ☐ LF ☐ RF ☐ LR ☐ RR

HAGIE Part No.	Qty.	Description

☐ Check here if you want phone confirmation of parts order.

* Orders received before 3:00 p.m., CST will be processed the same business day.
Regular business hours are Monday through Friday, 7:00 a.m. through 5:00 p.m..

** If you do not have a Hagie account number, contact the Hagie Customer Support Department and you will be issued one.

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