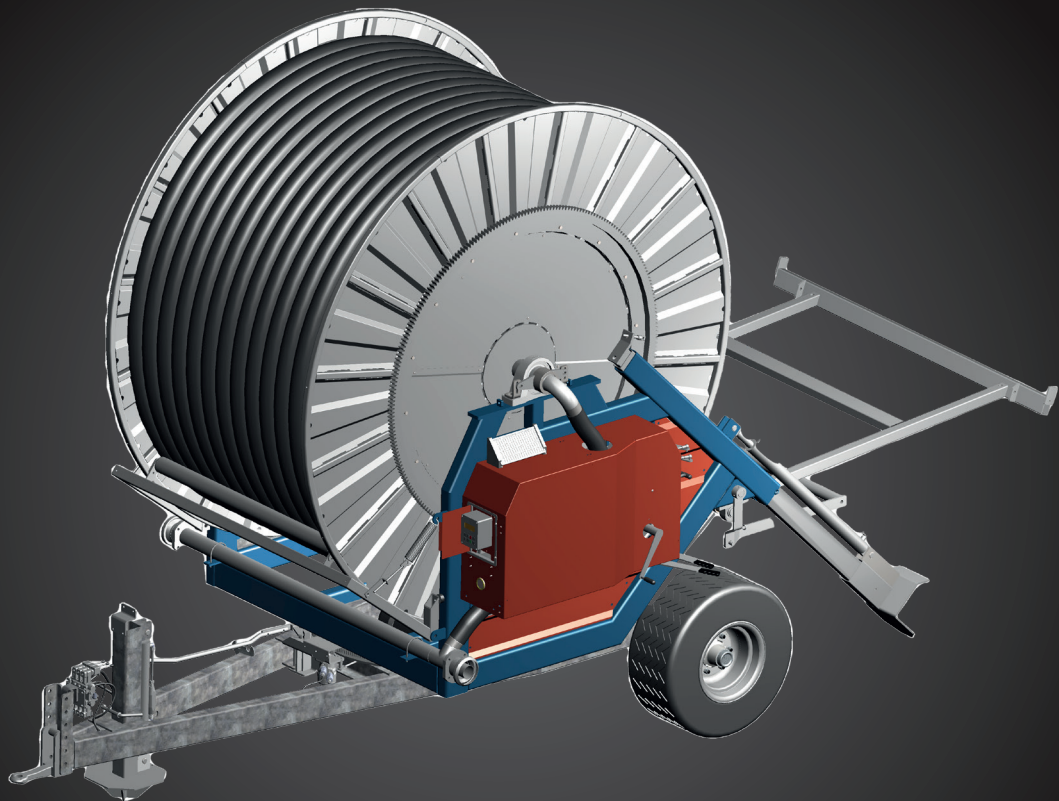


**User Manual &  
Spare Parts Catalogue**

(EN) 11-11-2024



# Irrigator GT5



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## EF - Overensstemmelseserklæring

EEC Declaration of conformity

Fabrikant (navn og adresse):  
Manufacture (name and address):

**Fasterholt Maskinfabrik A/S**

Adresse: Ejstrupvej 22,  
Fasterholt  
By: DK-7330 Brande  
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CVR: 58 83 28 12  
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E-mail: [mail@fasterholt.dk](mailto:mail@fasterholt.dk)

Erklærer hermed, at følgende produkt:  
Hereby is certified that the following product:

Benævnelse, mærke, type:  
Description, ID/mark, type:

Vandingsmaskine GT5

Evt. serienr.:  
Serial No. if any:

Evt. bemyndigede organ og nr.  
Notified body if any:

Evt. EF- typeattest:  
EEC-type certificate if any:

Evt. Harmoniserede standarder:  
Harmonised standards if any:

EN 908:1999+A1:2009.  
DS/EN/ISO 12100:2011.  
DS/EN/ISO 14120:2015.

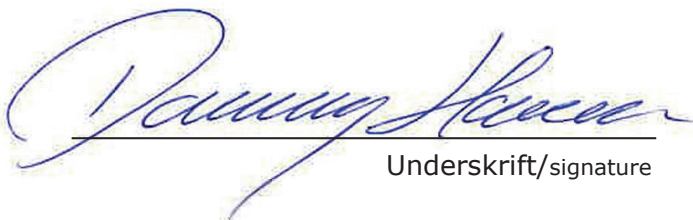
Er fremstillet i overensstemmelse med bekendtgørelse nr. 693 af 10. juni 2013, der gennemfører EUROPA-PARLAMENTETS OG RÅDETS DIREKTIV 2006/42/EF om maskiner med senere ændringer.

Is made according to the announcement no.693 of 10. Jun 2013 that implements the DIRECTIV 2006/42/EC.

Navn, titel og underskrift af fabrikanten:  
Name, title and signature of manufacture:

\_\_\_\_\_

Dato/date

  
Underskrift/signature

## IMPORTANT!

**Read this manual carefully before using your irrigator!**

### Operating Instructions & Information

Your new Fasterholt irrigator is a high quality, Danish built machine, but even the best machines only deliver top results when they are properly handled and maintained.

To ensure that the machine complies with the EU Machinery Directive, only original spare parts may be used. Otherwise, compliance will be lost and safety will be entirely at your own risk.

The irrigator is only suitable for irrigation with clean water from a drilled well or a watercourse.

We must point out that any damage caused by incorrect operation and/or negligence is not covered by the warranty. Fasterholt Maskinfabrik A/S only guarantees new machines sold through an authorised Fasterholt dealer. Any modifications made to the design of the irrigator shall exclude Fasterholt Maskinfabrik A/S of any liability and shall void the warranty.

The Fasterholt FM GT12 is a stationary type irrigator with a hose drum (rewind machine). The hose drum is mounted on a turntable and equipped with a gun trailer lift, so the unwind direction can be changed without having to move the machine. A turbine is used to power the machine and rewind stops automatically when the gun trailer reaches the machine.

The machine is available with an underpressure stop or an overpressure stop. With the overpressure stop function, make sure that the pump is either switched off via a pressostat or can dispose of water by other means when the machine stops irrigation. With the underpressure stop function, the pump must be stopped via a pressostat.

The machine must be supplied with a maximum pump pressure of 12 bar. The recommended pressure is 7-9 bar.

For extended periods of inactivity, both the - and + battery terminals should be disconnected.

### Safety instructions/warnings

If the machine is to be moved via public roads, it must first be drained of water.

As this machine is used for field irrigation involving high water pressure, there is a risk of injury if the machine is used inappropriately. The warnings and safety instructions given here must therefore be respected and followed precisely.

- It is forbidden to stand on the machine during irrigation and transport (**risk of fatal injury**).
- The guards are fitted for your own safety - please leave them in place
- Remember to tighten the wheel bolts
- During transport on uneven roads/fields, move VERY carefully according to the conditions.
- **DANGER!** Avoid welding in the paint layer! Before welding, remove all paint from the welding area
- Only one person (the operator) should be in the vicinity of the machine during transport, setup and dismantling

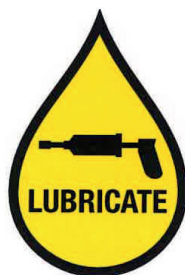
**WARNING: If the machine is stopped during rewind, the hose is in tension and the drum may run backwards when the clutch lever is released.**

Symbols used in this product

The following symbols are used in this product and the following documentation.



**WARNING** Indicates a potentially dangerous situation which, if not prevented, could result in death or serious injury.



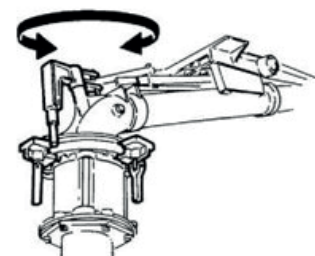
**LUBRICATION** Indicates lubrication is required as per the service description.



**SERVICE WARNING** Indicates a service hazard

Nelson SR 150 is factory-adjusted to Danish conditions and ready to use after the following three steps:

1. Select and install the nozzle size that best suits your application. Performance data for the different sizes are shown in the table below.
2. Adjust the stop on the part circle to obtain the desired irrigation angle.
3. There are grease nipples which should be checked once a week for refilling.



## ADJUSTMENT

The only thing you can adjust is the counterweight on the drive arm. By moving the counterweight forward, the gun will slowly irrigate from side to side. If you move the counterweight back, the gun will irrigate quickly. If it does not irrigate quickly enough, you can remove the brake springs (no. 778474) in pairs (contact the service department).

**WARNING: DO NOT ADJUST WHEN THE GUN IS IRRIGATING!! DANGER: HIGH WATER PRESSURE – STAY CLEAR!!**

**TABLE FOR NELSON SR 150**

### Dysetabel for Nelson SR150 kanon, 21°- Plastdyser.

Tryk (Bar)	18mm		19mm		20mm		21mm		22mm		23mm		24mm	
	m <sup>3</sup> /h	Rad.(m)	m <sup>3</sup> /h	Rad.(m)	m <sup>3</sup> /h	Rad.(m)	m <sup>3</sup> /h	Rad.(m)	m <sup>3</sup> /h	Rad.(m)	m <sup>3</sup> /h	Rad.(m)	m <sup>3</sup> /h	Rad.(m)
3,5	20,2	32,5	22,7	33,5	25,4	34,5	28,0	36,0	30,9	36,5	34,1	37,5	37,5	38,8
4,0	21,6	33,5	24,3	34,5	27,1	35,7	29,9	36,5	33,0	37,8	36,4	38,8	40,1	40,0
4,5	22,9	34,5	25,7	35,7	28,7	36,5	31,7	37,8	35,0	39,2	38,6	40,5	42,5	41,4
5,0	24,2	35,2	27,1	36,5	30,3	37,8	33,4	39,2	36,9	40,5	40,7	41,4	44,8	42,7
5,5	25,3	36,5	28,5	37,8	31,7	38,7	35,1	40,0	38,7	41,4	42,6	42,7	47,0	44,0
6,0	26,5	37,4	29,8	38,7	33,1	40,0	36,6	41,4	40,4	42,7	44,5	44,0	49,0	45,3

Tryk (Bar)	25mm		26mm		27mm		28mm		29mm		30mm		31mm	
	m <sup>3</sup> /h	Rad.(m)	m <sup>3</sup> /h	Rad.(m)	m <sup>3</sup> /h	Rad.(m)	m <sup>3</sup> /h	Rad.(m)	m <sup>3</sup> /h	Rad.(m)	m <sup>3</sup> /h	Rad.(m)	m <sup>3</sup> /h	Rad.(m)
3,5	41,0	39,6	44,8	40,5	49,0	41,8	53,3	42,7	57,9	44,0	62,8	44,8	67,8	45,8
4,0	43,8	40,9	47,8	42,2	52,3	43,1	57,0	44,5	61,9	45,8	67,1	46,6	72,5	47,5
4,5	46,5	42,7	50,7	43,6	55,5	44,5	60,5	45,8	65,7	47,0	71,2	48,0	76,9	49,3
5,0	49,0	44,0	53,5	44,5	58,5	46,2	63,8	47,5	69,2	48,4	75,1	49,7	81,1	50,6
5,5	51,4	44,5	56,1	46,2	61,4	47,5	66,9	48,8	72,6	50,2	78,7	51,0	85,0	52,4
6,0	53,7	46,2	58,6	47,5	64,1	48,8	69,9	49,7	75,8	51,0	82,2	52,4	88,8	53,7

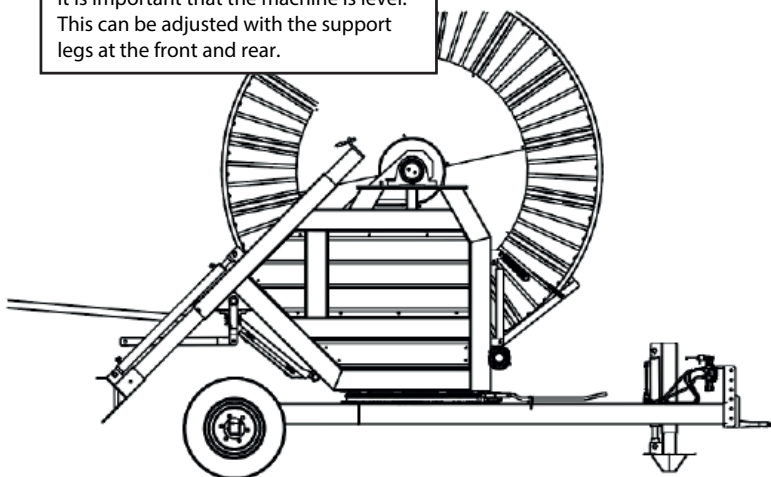
Tryk (Bar)	32mm		33mm		34mm	
	m <sup>3</sup> /h	Rad.(m)	m <sup>3</sup> /h	Rad.(m)	m <sup>3</sup> /h	Rad.(m)
3,5	73,1	46,6	78,7	47,5	84,5	48,4
4,0	78,1	48,4	84,2	49,3	90,3	50,2
4,5	82,9	50,2	89,3	51,0	95,8	51,9
5,0	87,4	51,9	94,1	52,8	101,0	53,2
5,5	91,6	53,2	97,8	54,1	105,9	55,0
6,0	95,7	54,6	103,0	55,4	110,6	56,3



## Starting the GT5

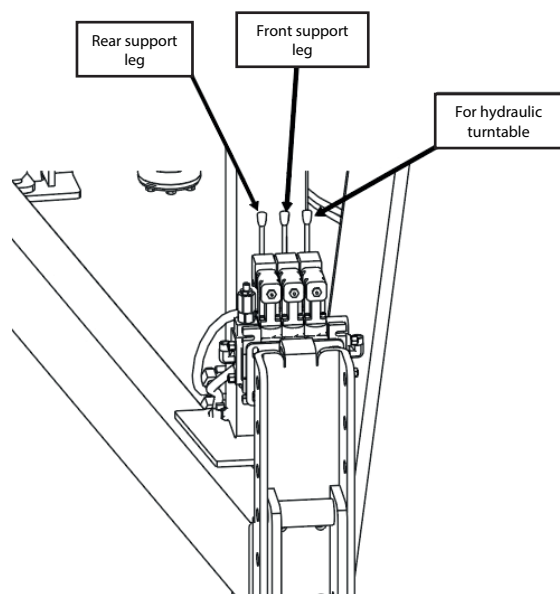
1. Position the machine horizontally in line with the unwind direction.

It is important that the machine is level. This can be adjusted with the support legs at the front and rear.



2. The ground must be level for the first 10 m of the unwind direction.

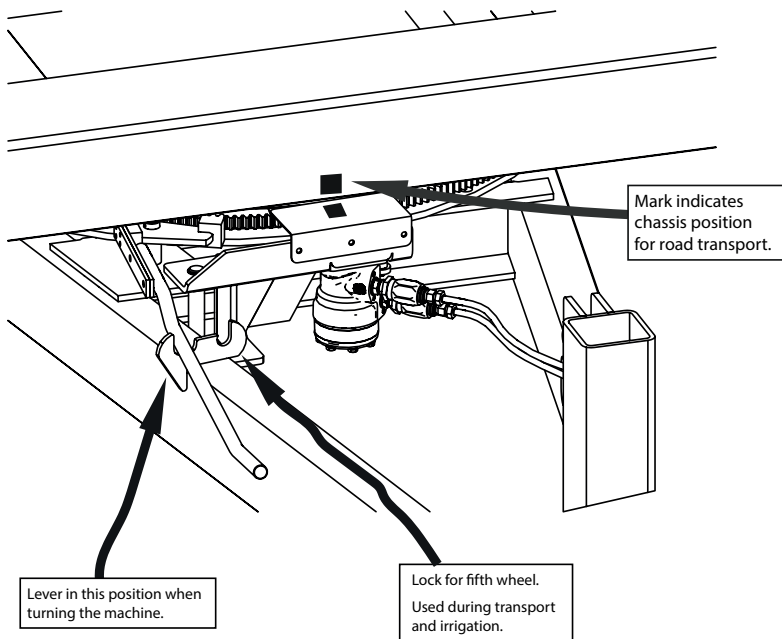
3. Connect the two hydraulic hoses to the tractor.



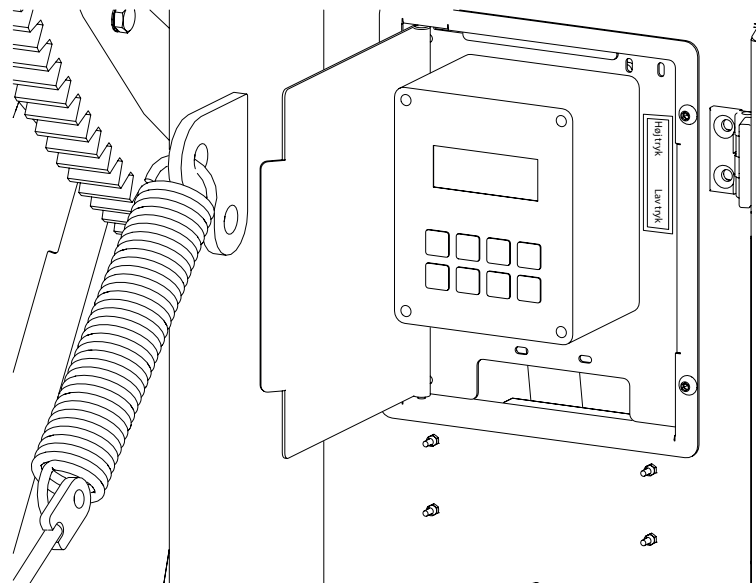
4. Rotate the drum in the desired direction.

5. Lower the two hydraulic support legs to the ground so they are firmly engaged. If the ground is very hard, it may be necessary to move them up and down a few times. **(Warning!! The support legs must not raise the wheels of the machine from the ground.)**

6. The gun trailer lowers automatically when the support legs are lowered.

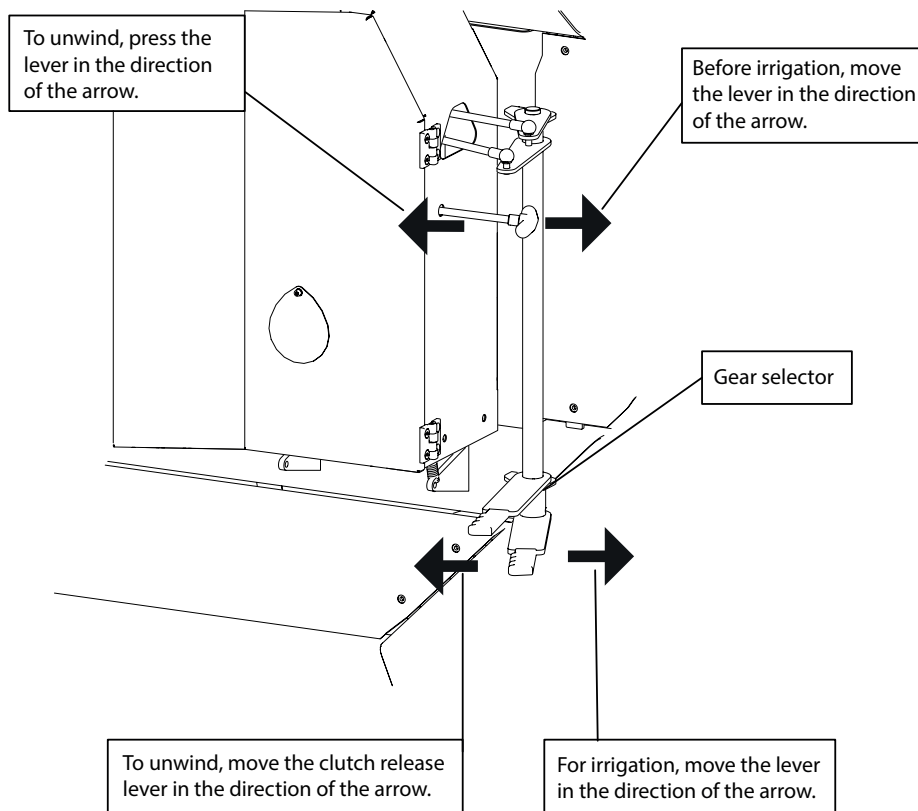


7. If the machine is equipped with a high pressure/low pressure function, ALWAYS REMEMBER to press start before flicking the toggle switch to the desired stop function.





Move the lever on the left hand side to unwind. See the photo below.  
 Open the slide valve on the gun trailer to allow the water to flow freely from the hose during unwinding.  
 It is important that the feed hose is not connected to the machine until the hose is fully unwound.



## Setting up the Gun trailer

**REMEMBER** when unwinding the hose to ensure that the gun trailer lift is adjusted correctly. Remember to make sure the machine is standing on firm ground, otherwise damage may occur to the gun trailer lift and machine.

Connect the gun trailer to the tractor and start unwinding the hose. The unwinding speed must not exceed 3 km/h.

If the water has not started to flow out of the machine after about 10 metres, it may be beneficial to stop unwinding for a moment and start again.

It is important that the gun trailer is unwound in line with the machine for the first 10 metres of unwinding, as excessive movements may prevent the gun trailer from entering the gun trailer lift.

**WARNING: Never unwind the hose too far – always ensure that there are at least 2 hose turns left on the drum, otherwise the hose coupling will be damaged when the hose is rewound. Driving on hilly terrain may therefore require an assistant or a warning lamp, which can be purchased separately.**

**WARNING: If the hose temperature exceeds 30 degrees, e.g. due to the machine being in sunlight, cool it by flushing water through the hose before unwinding it, to avoid damage to the hose. Unwind the machine 2-5 metres to activate the end stop sensor. This to stop water from passing through.**

When unwinding the hose, it is important to avoid suddenly braking/stopping the tractor, as the hose may tangle on the drum. Instead, slow down gently and stop.

If the hose becomes loose on the drum during unwinding, adjust the drum brake. If the hose is loose on the drum when fully unwound, tighten it with the PTO crank handle. **REMEMBER** to remove the PTO crank handle after tightening. Never place the crank handle on the machine's PTO input during unwinding or operation. Never release/put the clutch lever in neutral position when the crank handle is on the machine's PTO input and the hose is in tension.

When the hose is fully unwound, close the slide valve of the gun trailer again.

1. Enter the rewind speed on the computer using the arrow keys.
2. Select the gear according to the table below. (Table is also in the machine cabinet)

Gear	Speed	m/h
1	7	20
2	15	45
3	25	65
4	40	200

1. For pre-irrigation, press "PRE" (highlighted in display). For post-irrigation, press "POST" (highlighted in display).
2. Connect the feed hose.
3. Press "START".
4. Open the hydrant and start the water supply pump. The water must not be fed too quickly into the machine to prevent air in the machine, hose and pipe. This can cause pressure surge and kickback in the system.

**WARNING:**

- **If the hose is in tension when uncoupling, the drum can run back with great force.**
- **All other adjustments to the machine, gun trailer and gun should only be made when the machine is not in operation.**

**Automatic and manual stop**

Rewind stops automatically when the gun trailer is wound back into the machine, thereby affecting the stop bracket. The machine stops due to either overpressure or underpressure. The machine can also be stopped either at the pump or by pressing "STOP" on the computer.

**Emergency stop and safety stop**

The safety cable ensures that the machine will stop in case of computer failure.

The machine is equipped with a rewind error bracket that stops rewind if the hose guide should come out of alignment, causing the hose to tangle. The rewind error bracket will activate the stop bracket when the reel comes off the edge of the drum.

**REMEMBER** when starting for the first time, to check that the rewind error bracket and cable are adjusted correctly.

**Gun trailer and hose guide**

The gun trailer can be adjusted with different track widths. This is done by loosening the locking bolts on the chassis and extending the legs to the desired track width.

If the gun trailer does not follow the same track during rewind as during unwind, loosen the centre bolt on the steering wheel and move the wheel shaft back and forth on one side by turning the steering wheel.

The hose guide ensures that the hose is wound properly on the drum. If the hose does not wind properly on the drum, the hose guide should be adjusted. The hose must be unwound until there are two to three turns left on the drum. Remove the hose guide chains and adjust the hose guide so the hose passing through the hose guide is against the hose already on the drum. (Contact the service department at Fasterholt Maskinfabrik A/S)

## Maintenance

After winding for the first time, you should:

1. Retighten the machine.

### Weekly:

1. Lubricate the sliding bushing on the drum inlet pipe. Stop lubricating the sliding bushing in the inlet bend of the hose drum when there is a slight increase in pressure in the grease gun.
2. Lubricate the main bearing on the drum.
3. Lubricate the slide for the hose guide. The shaft must never be dry.
4. Lubricate the floor reel for the hose guide.
5. Lubricate the wheels on the gun trailer.
6. Lubricate the turntable.
7. Grease the gear wheel on the drum.

### Annually:

In addition to the above, the following should be performed annually:

1. Check the oil level in the reduction gear after every 200 hours of operation. If necessary, top up with type 80/90 gear oil or equivalent.
2. Check the air pressure in the wheels.  
On machine: 40 psi (2.7 bar)  
On gun trailer: 45 psi (3.3 bar)

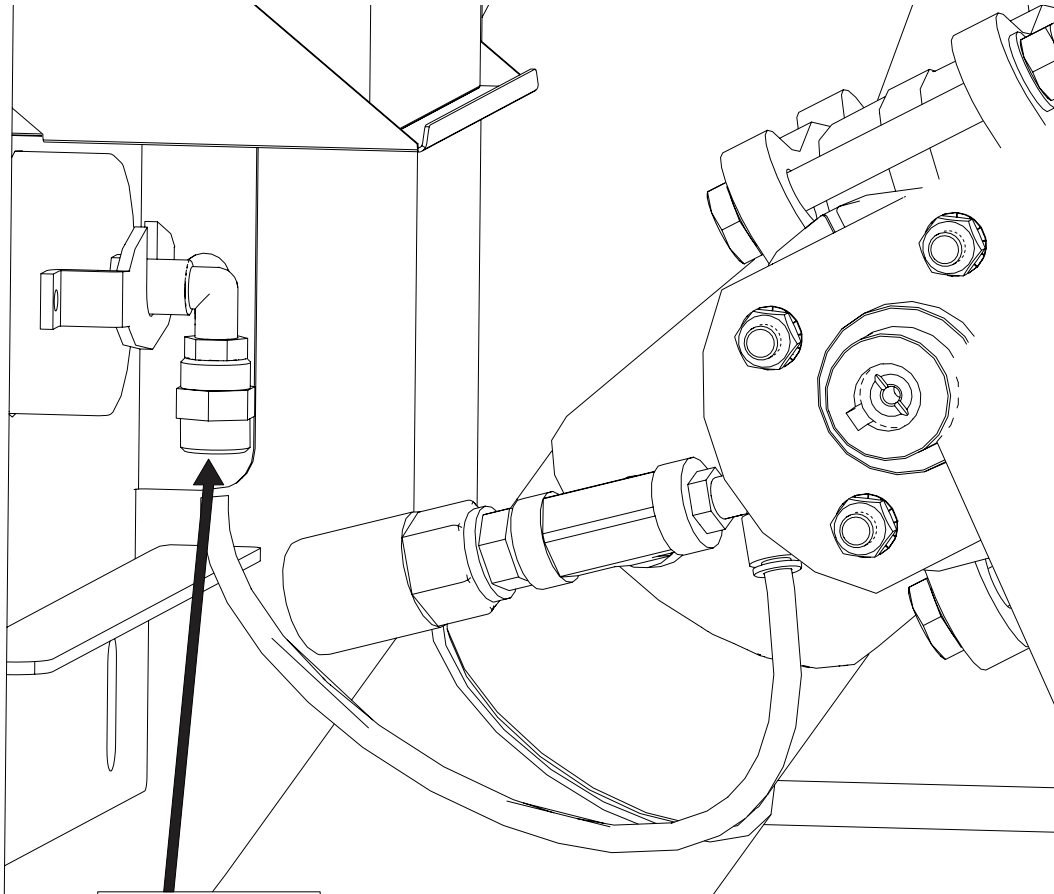
## Preparation for winter

Before the frost sets in, prepare the machine for winter. Contact Fasterholt Maskinfabrik A/S for a winter service inspection. This avoids unnecessary downtime during the season.

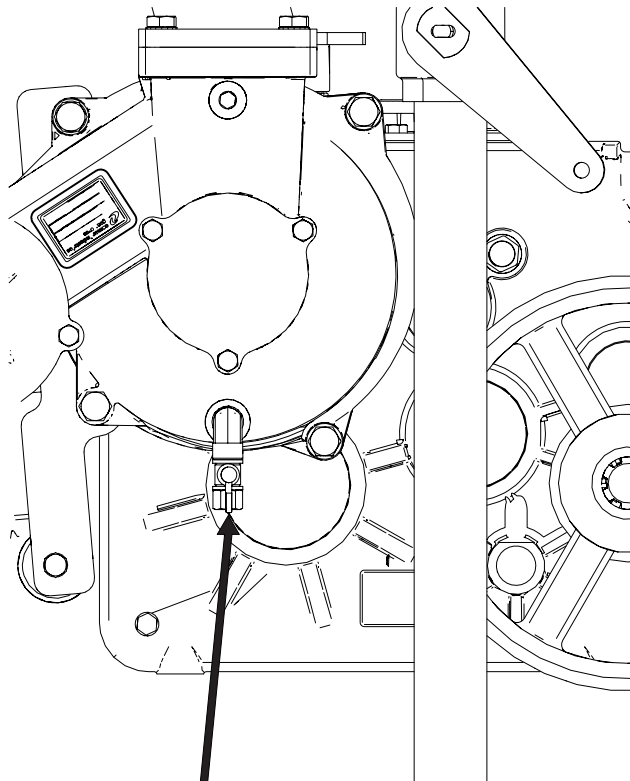
Preparation includes the following points:

1. Drain water from the machine and hose with compressed air. Open the slide valve on the gun trailer. Note: Butterfly valve MUST be open.
2. Grease the slide shafts on the hose guide.
3. Clean the gun and inject acid-free oil.
4. Check the air pressure in the wheels.
5. Lubricate all moving parts with anti-corrosion oil.
6. Remove the battery and store it fully charged in a dry, frost-free environment.

See the photos on the following page for frost protection.



Remove the hose for frost protection.



Open the tap for frost protection.

Hose PEMD 100 mm:  
Capacity up to 75 m<sup>3</sup> - hose length from 350 to 450 m.

**Wheel size:**

Rear wheels: 14.00/65/16»X14 ply - air pressure 34.8 psi / 2.4 bar

**Speed at 35 m<sup>3</sup> and above:**

15-30 metres per hour

**Weight of GT5 standard**

Weight without water 450 m / 100 mm:	2521 kg.
Weight with water 450 m / 100 mm:	4900 kg.
Track width (Standard)	1850 mm
Gun:	Nelson SR 150
Oil in Multigear:	12 litres 80/90 gear oil
Hydraulic oil... :	5 litres STATOIL Hvxa 46
Grease for lubrication:	FUCHS Greaseway CAH 92 or equivalent.
Width	245 cm
Total length	630 cm
Length without gun trailer	530 cm.
Height	340 cm

<b>Oil Replacement</b>	<b>First Use</b>	<b>Routine Maintenance</b>
<b>Change shaft oil</b>	200 T	Season/every 1000 h (1)
<b>Clean magnetic oil drain plug</b>	First oil change	Each oil change
<b>Check and refill oil</b>	100 h	Monthly/every 300 h (1)
<b>Clean oil vent</b>	400 h	Monthly/every 300 h (1)
<b>Lubrication (where necessary)</b>	200 h (2)	Weekly/every 200 h (1)(2)

(1) = Whichever occurs first

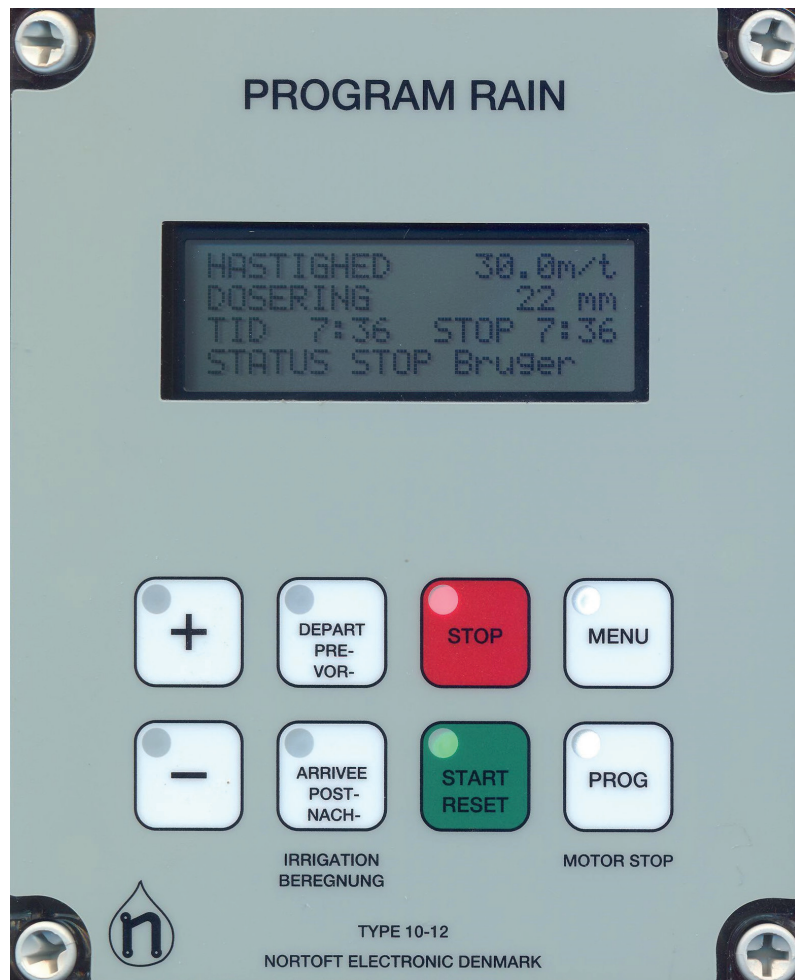
(2) = 50 hours in case of heavy use

h = hours

Contact the Sales Department at Fasterholt Maskinfabrik A/S if you have any questions.

Troubleshooting table

<u>Error</u>	<u>Cause</u>	<u>Solution</u>
<b>Drum stop</b>	Foreign object in turbine	Remove front cover, and clean turbine. Turbine must <u>never</u> be turned forcibly
	Clutch lever not engaged	Engage lever
	Computer failure	Check computer
	3-way valve is stuck	Check 3-way valve
<b>Computer error</b>	Battery flat	Charge or replace
	Stop sensor on stop bracket activated	Adjust or replace
	Fuse in computer	Replace fuse
	Control error	Contact dealer or Fasterholt Maskinfabrik A/S
<b>Rewinding error</b>	Hose guide out of alignment	Adjust the hose guide
	Too much hose on drum	Check hose length
<b>Unwinding error (loose hose)</b>	Brake loose	Adjust brake
	Stops too quickly when unwinding	Reduce speed over a longer distance
<b>Gun does not work</b>	Pressure too low	Increase pressure or switch to smaller nozzle
	Sector guide damaged	Replace/Repair Stop trigger

**Functions:**

Speed control  
 Pre- and post-irrigation  
 4 different speeds on sections of the lane  
 Clock  
 Set start time  
 Display stop time  
 Hose length  
 Current speed  
 Battery voltage  
 Charge regulator

Pressure sensor

Stop sensor

Speed sensor

Motor 1, control motor

Motor 2, stop motor

Gradual start-up of turbine

Gradual closing of inlet

Water volume + spreading width

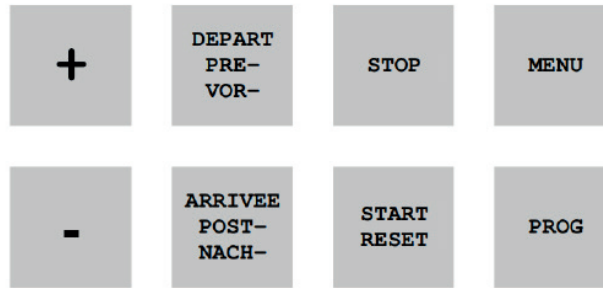
**Optional add-ons:**

GSM, SMS messages for remote control.

Analogue pressure sensor.



Short instructions for use



SPEED 30.0m/h DOSE 22 mm TIME 7:28 STOP 7:28 STATUS STOP Sensor
SPEED 30.0m/h DOSE 22 mm TIME 7:56 STOP 17:16 STATUS STOP Sensor
SPEED 25.0m/h DOSE 26 mm TIME 7:58 STOP 17:58 STATUS STOP Sensor
SPEED 25.0m/h DOSE 26 mm TIME 7:58 STOP 17:58 STATUS STOP Sensor
SPEED 25.0m/h DOSE 26 mm TIME 8:00 STOP 18:38 STATUS Irrigating
SPEED 25.0m/h DOSE 26 mm TIME 8:02 STOP 18:38 STATUS Pre-irrigating
SPEED 25.0m/h DOSE 26 mm TIME 18:20 STOP 18:38 STATUS Post-irrigating
SPEED 25.0m/h DOSE 26 mm TIME 18:38 STOP 18:38 STATUS STOP Sensor

**Move Machine:**

Move machine to a new lane. Display shows start and stop time. Pull hose out to end of the lane (e.g. 250 m).

**Select Speed:**

Display now shows stop after 9h 20m. Press the "+" or "-" key to set the speed. Speed can be adjusted during irrigation.

SPEED has decreased, **DOSE** has increased and **STOP** time is later.

**Start and then select PRE and POST:**

Press START to start. Press **PRE** and **POST** for pre- and post-irrigation respectively. STOP time will be later when PRE and POST irrigation are selected.

**Machine Starts**

The turbine will start when the water pressure increases. After a short period, the regulator finds the correct speed. Irrigation continues until STOP SENSOR is activated at the end of the lane.

**PRE Irrigation:**

If pre-irrigation is selected, the turbine stops immediately after performing a start and pre-irrigation. When the pre-irrigation time has elapsed, the turbine starts and the machine changes status to Irrigating.

**POST Irrigation:**

If post-irrigation is selected, the turbine stops at the end of the lane when the stop sensor is activated. Post-irrigation then starts.

**Stop:**

Stop sensor is activated, turbine and water are shut off. The machine is now ready to be moved to a new lane.

**General instructions for use**

**DISPLAY**

SPEED 30.0m/h DOSE 22 mm TIME 7:28 STOP 07:28 STATUS Irrigating
ZONE 1 30.0m/h DOSE 22 mm TIME 7:56 STOP 17:16 STATUS Irrigating
DISTANCE 123m DOSE 12.8V CHARGING ON 0.231A PRE 0:45 POST 0:45
PRESSURE SENSOR ■ STOP SENSOR ■ SPEED SENSOR ■■ MOT1 0.0 <sub>A</sub> MOT2 1.8A
CURR. SPEED 22m/h START 0:00 STOP 7:43 OPERATING HOURS 123h
0m 30.0m/h 0m 0m 30.0m/h 0m 0m 30.0m/h 0m 0m 30.0m/h 0m
SIGNAL 23 NETWORK HOME A: +45123456 B: +45123456

Standard display

Standard display, ZONE irrigation is selected.

Press the **MENU** key 1 time to display menu 2

Press the **MENU** key 2 times to display menu 3

Press the **MENU** key 3 times to display menu 4

Press the **MENU** key 4 times to display menu 5

Press the **MENU** key 5 times to display menu 6  
(Only if GSM is selected)

When ■ appears in the display, this indicates that the relevant function is ON

**Standard menu:**

SPEED	30.0m/h
DOSE	22 mm
TIME	14:10 STOP 07:28
STATUS	Irrigating

- SPEED** Speed. Can be changed at any time during irrigation using the "+" and "-" keys.
- ZONE** Current zone 1...4, with corresponding speed. The speed cannot be changed. (Zone active)
- DOSE** The dose is calculated from the speed and constants and shows the current number of mm for irrigation. As SPEED increases, DOSE decreases. (Constants 11 and 12)
- TIME** To set the time: Set SPEED to 11.1 m/h and press the **PROG** key 3 + 1 times until the display shows <CONST 1 TIME>. The time can then be set with the "+" and "-" keys. When the battery has been disconnected, the clock will show 0:00 until it is set again.
- STOP** The time that irrigation is completed, incl. pre- and post-irrigation. If the clock is not set and shows 0:00, the total irrigation time is displayed.
- STATUS** Irrigation status, e.g.:
  - < Stop Sensor >
  - < Irrigating >
  - < Pre-irrigating >
  - < Post-irrigating >
  - < LOW pressure >
 See explanation in STATUS chapter.

If the display shows: **LOW BATTERY** instead of SPEED, the battery voltage is below 11.8 V and the battery needs to be charged.

**MENU 2**

DISTANCE	123m
DOSE	12.8V
CHARGING	ON 0.231A
PRE 0:45	POST 0:45

- DISTANCE Length of the unwound hose. The length can be changed immediately after pressing the **PROG** key 3 times, using the "+" and "-" keys.
- BATTERY Battery voltage.
- CHARGER ON Shows when the battery is being charged by a solar cell. The battery is charged when the voltage is below 14.0 volts.
- PRE Shows the pre-irrigation time.
- POST Shows the post-irrigation time.  
The pre- and post-irrigation times can be changed immediately after pressing the **PRE-** or **POST-** keys, using the "+" and "-" keys.

**MENU 3**

PRESSURE	SENSOR	■	
STOP	SENSOR	■	
SPEED	SENSOR	■ ■	
MOT1	0.0 <sub>A</sub>	MOT2	1.8 <sub>A</sub>

**PRESSURE SENSOR**

Shows that the pressure is high when block is lit. **The machine can only move when the pressure is high.** If no pressure sensor is fitted (machine data 14 = 0), the machine will move regardless of pressure status.

The machine can be fitted with analogue pressure sensors. Sensors must be connected according to the diagram. Pressure sensor functions, except for pressure display, are the same as for digital pressure sensors. There are constants for the pressure sensor type. Similarly, set point and hysteresis can be selected for each machine.

PRESSURE	6.2	■	
STOP	SENSOR	■	
SPEED	SENSOR	■ ■	
MOT1	0.0 <sub>A</sub>	MOT2	0.0 <sub>A</sub>

Shows pressure in [BAR] (00.0) or [PSI] (000). Pressure is high when ■ is lit. **The machine can only move when the pressure is high.** If no pressure sensor is fitted (machine data 14 = 0), the machine will operate regardless of pressure status.

PRESSURE		--	
STOP	SENSOR	■	
SPEED	SENSOR	■ ■	
MOT1	0.0 <sub>A</sub>	MOT2	0.0 <sub>A</sub>

**STOP SENSOR**

Shows that the magnet is aligned with the stop sensor when block is lit. **The machine can only start when the magnet is aligned with the stop sensor.** The stop sensor has 3 functions:

1. Reset distance.
2. Post-irrigation.
3. Stop pulses to the regulator motor.

**SPEED SENSOR**

For the speed sensor test, block is only lit when the magnet passes the sensor.

**MOT1, MOT2**

Displays the current motor current. When the current exceeds 4.5 A, the motor stops. **If the current exceeds 4.5 A and the valve is not in the outer position, there may be a blockage in the valve.**

**MENU 4**

CURR. SPEED	22m/h
START	0:00
STOP	7:43
OPERATING HOURS	123h

- CURR. SPEED** Shows the current speed. That is, the speed at which the machine is moving now. This can be used to find how fast the machine can move. The current speed may differ slightly from the set speed, especially at the start. This does not matter, as regulation ensures that the average speed within 10 metres is correct.
- START** Start machine delay. The machine start time can be delayed by up to 24 hours. To set the start time, press the **PROG** key 3 times, then set the time using the "+" and "-" keys.
- STOP** The time that irrigation is completed with a delayed start.
- OPERATING HOURS** Shows how many hours the machine has been running since the electronics started for the first time.

**MENU 5**

0m	30.0m/h	0m
0m	30.0m/h	0m
0m	30.0m/h	0m
0m	30.0m/h	0m

This menu is for irrigation at different speeds in zones of the lane. Press the **PROG** key 3 times to program the zones. See later chapter for details.

**MENU 5**

SIGNAL 23
NETWORK HOME
A: +45123456
B: +45123456

SIGNAL GSM signal strength.  
 NETWORK GSM network.  
 A: First number on "SMS" list.  
 B: Second number on "SMS" list.

See GSM chapter for details.

**START:**

The turbine can only start if the magnet is aligned with the end stop sensor (or end stop sensors). See menu 3 for control of the STOP SENSOR. Press the **START** key to turn on the water. The regulator valve for bypass around the turbine then closes. (Turbine starts). If the end stop sensor is not in place, only the main valve can be opened, which then immediately closes again. Used to relieve pressure before removing charge hose from hydrant.

**DEFERRAL OF START TIME**

First press the **STOP** key to shut off the water. Then press the **MENU** key 3 times and **PROG** 3 times. The start time can be set using the "+" and "-" keys. Finally, select pre- and post-irrigation. To exit, press **MENU**. Info: The clock can only be set forwards.

**STOP:**

When the magnet is removed from the end stop sensor, the turbine stops and the main valve shuts off the water (turns on the water at negative pressure). If post-irrigation is selected, rewinding stops when the magnet is removed from the sensor. When the post-irrigation time has elapsed, the main valve closes. When the **STOP** key is pressed, the turbine stops immediately and the main valve shuts off the water, regardless of whether post-irrigation is selected.

**SUPERVISION:**

Program Rain has a built-in supervision system. The supervision system will be activated if for any reason the machine has water in the same location for longer than a specified time. This time is factory-set to 20 minutes. If the time is set to 0, there is no supervision. (See constants on page 17 for setting the supervision time). If speed supervision less than 50 % of pre-selection is required, select speed supervision together with the above time.

**SPEED:**

The speed is set using the "+" and "-" keys. First count up in steps of 0.1 m/h. After 10 steps, count up in steps of 1 m/h. The speed can be changed at any time during irrigation. If the speed changes during irrigation, the dose and time for the remaining irrigation will be calculated immediately based on the new speed.

**PRE-IRRIGATION:**

If pre-irrigation is required, press the **PRE-** key. The pre-irrigation time is calculated as 8 x the time to move 1 m at the current speed. The constant can be changed individually for pre- and post-irrigation. (See constants). If pre-irrigation is selected, the machine will move forward approx. ½ m, after which the machine will stop and stand still for as long as pre-irrigation is performed. Menu 2 shows the number of minutes remaining of the pre-irrigation time. If you want to cancel pre-irrigation, press the **START** key. This will cancel both pre- and post-irrigation and the turbine will start.

**POST-IRRIGATION:**

If post-irrigation is required, press the **POST-** key. The post-irrigation time is calculated as 8 x the time to move 1 m at the current speed. The constant "8" can be changed individually for pre- and post-irrigation. (See constants on page 17). Post-irrigation starts counting down when the magnet is removed from the stop sensor. When the stop sensor is activated, the turbine stops and post-irrigation starts counting down (see menu 2). When the post-irrigation time has elapsed, the main valve closes. (Opens in installations with negative pressure stops). For machines with mechanical end stops: The turbine stops when the stop sensor is activated. When the post-irrigation time has elapsed, the turbine starts and the machine moves to the mechanical end stop. Press **START** to cancel post-irrigation. If constant "8" (early stop) is selected, the machine will stop when it reaches the selected distance.

**PROGRAMMING 4 DIFFERENT SPEEDS:**

The hose must be unwound before programming, so the computer knows the number of metres in the irrigation lane. The following example assumes that the unwound hose is 400 m. Press the **PROG** key 3 times and the display will show:

400m	30.0m/h	0m
0m	30.0m/h	0m
0m	30.0m/h	0m
0m	30.0m/h	0m

The desired speed can now be selected, in this case 25.0 m/h. Press the **PROG** key and the display will show:

400m	25.0m/h	0m
0m	30.0m/h	0m
0m	30.0m/h	0m
0m	30.0m/h	0m

The desired distance can now be selected, in this case 300 m. Press the **PROG** key and the display will show:

400m	25.0m/h	300m
300m	30.0m/h	0m
0m	30.0m/h	0m
0m	30.0m/h	0m

Now that the first zone is programmed, apply the same procedure to all 4 zones. Zone 4 automatically ends at 0. When zone 4 is programmed, press the **PROG** key again and the display will show:

DELETE	PRESS	MENU
SAVE	PRESS	PROG

If **PROG** is pressed, the program is stored and irrigation will be performed according to this program. If **MENU** is pressed, the program is deleted and the speed is the same for the entire irrigation lane.

<b>STATUS</b>	Status line in display
<b>**IRRIGATING**</b>	The machine has not started, but speed signals are being received and it is attempting to maintain the selected speed.
<b>IRRIGATING:</b>	The machine is irrigating and functions as intended.
<b>LOW PRESSURE:</b>	Water pressure is low. Individual action according to constants and machine data.
<b>STARTING:</b>	User has pressed the <b>START</b> key and start sequence is being performed.
<b>START TELE:</b>	The machine is starting after receiving an <b>SMS</b>
<b>START TIMER:</b>	The machine is waiting for start delay. (See Menu 4).
<b>START PRESS:</b>	The machine is performing a start after pressure rise. The machine uses the pressure level to start a second machine on the ground line.
<b>START REJECTED:</b>	User is pressing the <b>STOP</b> key to block <b>PRESSURE</b> and <b>SMS</b> start.
<b>STOP USER:</b>	User has pressed <b>STOP</b> and the machine has stopped.
<b>STOP TELE:</b>	The machine has received an <b>SMS</b> with <b>STOP</b> and has stopped.
<b>STOP SENSOR:</b>	The machine has reached the end and is stopped by <b>STOP SENSOR</b> .
<b>STOP DIST:</b>	The machine has reached the stopping distance. (See constant for early stop)
<b>STOP DELAY:</b>	The machine has reached the end, but waiting xx seconds to perform the stop sequence.
<b>STOP REJECTED:</b>	User is pressing the <b>START</b> key to block <b>SMS</b> stop.
<b>STOP SUPERVISION:</b>	Supervision has stopped the machine. The machine has not moved for xx minutes. (See constant for supervision).
<b>CREATE PRESSURE DROP:</b>	The machine is creating a pressure drop to stop the main pump. After 2 minutes, the valve closes to prevent draining the ground line.
<b>PRE-IRRIGATING:</b>	The machine is performing pre-irrigation.
<b>POST-IRRIGATING:</b>	The machine is performing post-irrigation.



**There are a variety of constants that can be modified by the user.**

These constants will be stored for many years, even if the battery is removed.

**Programming procedure:**

Adjust the speed to 11.1 m/h to access the constants.

Press the **PROG** key 3 times in quick succession to access and change the constants.

Press the **PROG** key again to count forward to the constant you wish to change.

Press "+" and "-" to adjust the value of the constant.

Press the **MENU** key to save the change and the display will return to normal.

If the **MENU** key is not pressed, the display will return to normal after 1 minute and the change will not be saved.

**CONSTANTS**

Const. no.	Note	Factory setting	Min. Value	Max. Value	Description
0		100	-	-	Select 111 to access machine data
1		00:00	00:00	23:59	Clock set
2		8	1	15	Pre-irrigation
3		8	1	15	Post-irrigation
4		20	0	99	Supervision time [minutes] (0 = no supervision)
5		1	1	15	1 English. 2 Danish. 3 German. 4 French. 5 Dutch. 6 Swedish. 7 Spanish. 8 Italian. 9 Polish. 10 Japanese. 11 Hungarian.
6		0	0	2	0 = Stop for high pressure. Slow closure 1 = Stop for low pressure. Valve opens and closes again after 3 minutes 2 = Stop motor interrupted
7		-	0	1000	Hose length [m], if the length has been deleted.
8		0	0	1000	Early stop [m] (* This function is only active with post-irrigation *)
9		0	0	1000	Post-irrigation before stopping [m]
10		0	0	1000	Alarm distance [m] (0 = no alarm)
11		40	5	120	Water volume [m <sup>3</sup> /h]
12		60	5	100	Distance between lanes [m]

Set Constant no. 0 to 111 to set the machine data.

Then press **PROG** to display the machine data.

Machine data Flashing number		Possible setting	Data for 100 mm
0	Hose length	0 - 1000 m	Not used
1	Hose diameter	40 - 200 mm	100
2	Hose drum inside Diameter	500 - 3000 mm	1500
3	Number of hose turns per layer	5.00 - 30.00	14.30
4	Large gear on hose drum	50 - 1000	198
5	Small gear on gearbox	5 - 40	12
6	Number of magnets	1 - 20	4
7	Ovality compared to 100 %	0.70 - 1.00	0.97
8	Length of first pulse to stop valve	0 - 45 sec.	3
9	Length of subsequent short pulses to stop valve	0 - 300 m/sec.	160
10	Time between short pulses to stop valve	1 - 5 sec.	2
11	Number of short pulses to stop valve	0 - 250	100
12	Mechanical stop (with only 1 motor) Electrical stop (closed low pressure) even if the pressostat registers low pressure	0 1	1
13	Length of pulse to regulator motor at start-up (Oil pump Motor 1)	26.1 - 0.9 sec.	24V: 5.1 12V: 3.1
14	Pressostat not connected Pressostat connected (to start/stop) or Radio start Pressostat installed: (can be used (for start only) for 2 machines on the same system, Autostart with special pressostat.)	0 1 2	1
15	Length machine moves per pulse: 0 = Moves according to formula GT5 (4 magnets)  62.5 = When moving with roller Ø80 [mm] 0 = Moves according to formula (mach. data numbers 0 to 7)	0 - 160.0 mm	0 - 160.0 mm
16	Speed sensor 0 = Round sensor for roller 1 = Double sensor		1
17	Opening of inlet valve 0 = Quick opening 1 = Slow opening	0 1	0
18	Pressostat 0 = Inlet remains open at low pressure 1 = Inlet closes at low pressure	0 1	0
19	Delay from stop sensor to turbine stopping (sec)	0	0

Const. no.	Note	Factory setting	Min. Value	Max. Value	Description
40		0	0	2	Analogue Pressostat 0 = Digital Pressostat 1 = Analogue Pressostat- Display unit [BAR] 2 = Analogue Pressostat- Display unit [PSI]
41		0.50	0.10	5	Voltage Offset [V]
42		0.20	0.05	5	Voltage Gain [V]
43		3.5	0.0	25.0	Pressure Setpoint 0.0 - 25.0 [BAR] Press for Off - On
44		0.2	0.2	25.0	Pressure Hysteresis 0.2 - 25.0 [BAR] * Setpoint - 0.5 * hysteresis for Off Setpoint + 0.5 * hysteresis for On Factory Setting 0.2 • 3.4 BAR = Off • 3.6 BAR = On

**Program Rain can be set to 2 different types of sensors.**

See machine data no. 16 Sensor

One is a round sensor with 4 built-in sensors and can only be used for rollers with 1 magnet. When the battery is connected, the display shows the following for 2 seconds: **VERSION n.n0.**

The other is a rectangular sensor with 2 built-in sensors (double sensor). This is used for scanning on rollers with more than 1 magnet and for discs with from 1 to 20 magnets. When the battery is connected, the display shows the following for 2 seconds: **VERSION n.n1.**

**Cable connection**

**Double sensor**

**Round sensor**

Program Rain 10 version n.n1 = double sensor Cable connection				Program Rain 10 version n.n0 = round sensor Cable connection			
1	+ Battery	Brown	12V	1	+ Battery	Brown	12V
2	- Battery	Blue		2	- Battery	Blue	
3	+ Solar Panel	Brown		3	+ Solar Panel	Brown	
4	- Solar Panel	Blue		4	- Solar Panel	Blue	
5	Motor 1	Speed control		5	Motor 1	Speed control	
6	Motor 1	Speed control		6	Motor 1	Speed control	
7	Speed sensor 1	Blue	*	7	Speed sensor 1	Blue	*
8	Speed sensor 1	Black	*	8	Speed sensor 1	Black	*
9	Speed sensor 2	Yellow/Green	*	9	Speed sensor 2	Yellow/Green	*
10	Speed sensor 2	Brown		10	Speed sensor 2	Brown	
11	Stop sensor	Blue or Brown		11	Stop sensor	Blue or Brown	
12	Stop sensor	Blue or Brown		12	Stop sensor	Blue or Brown	
13	Motor 2	Stop motor		13	Motor 2	Stop motor	
14	Motor 2	Stop motor		14	Motor 2	Stop motor	
15	Pressostat	Blue or Brown		15	Pressostat	Blue or Brown	
16	Pressostat	Blue or Brown		16	Pressostat	Blue or Brown	
17	BIP -			17	BIP -		
	Motor 3	Brown	Sprinkler		Motor 3	Brown	Sprinkler
18	BIP +			18	BIP +		
	Motor 3	Blue	Sprinkler		Motor 3	Blue	Sprinkler
* If the distance counts in the wrong direction, reverse the speed sensor or swap sensor 1-1 with sensor 2-2				* If the distance counts in the wrong direction, swap the wires to terminals 8 and 9			

Program Rain 10	6-Pin Connector		
19 + GSM	Brown	+12 V	
20 - GSM	Blue (Green)		
21			
22			
23 + Pressure	Brown	12 V	
24 Pressure Signal	White	0-5 V	

**Technical data**

Dimensions (h*w*d)	170*140*100 [mm]
Voltage	10-15V DC
Current	6 mA (Rest) 30 mA (with GSM) 80 mA (with light) 5A motor max current
Fuse	5A Fixed

**Troubleshooting:**

?

The turbine does not start when the **START** key is pressed.

Answer:

The magnet at the stop sensor is not in position or the sensor or sensor cable is damaged.

Stop sensor: The mark ■ must be on when the magnet is in position and off when the magnet is removed. See Menu 3.

A damaged cable can be assembled in an epoxy moulded assembly or with shrinkable tubing and glue.

However, since the sensors are more sensitive than telephone cables in the ground, cable assembly must be seen as an emergency solution.

If a pressostat is installed, the water must be pressurized. The mark ■ must be on when there is pressure.

?

No numbers in the display.

Answer:

Battery disconnected. Fuse inside the box may have blown. The fuse will blow if the battery is wrongly connected.

An additional fuse is available from the factory on a single fuse terminal on the circuit board.

Fuse 5A. Battery voltage 12V. See Menu 2.

?

Clock is set to 00:00

Answer:

If the power is interrupted, the clock is reset. The end time is then the number of hours and minutes until irrigation is complete.

See page 15 for setting the clock.

?

The number of metres is not counted correctly and the speed is not correct.

Answer:

If the speed is measured with a roller running on the hose, check whether the roller is running smoothly or if it is not installed properly on the hose. You will also need to check that the roller sensor with cable is functioning properly.

See Menu 3 Speed sensor.

The 2 marks ■ ■ must light up in the following order from the right during unwinding: The first one turns on, then the second one turns on, the first one turns off, then the second one turns off. During rewind, this happens in reverse order.

?

Only half or perhaps 2/3 of the actual length has been counted.

Answer:

The stop bracket with magnet for the stop sensor may have jumped, so the magnet has been removed temporarily from the stop sensor.

This will reset the counter. Or a hose turn has been so loose that it has impacted the miswinding bracket.

This is usually the same as the impact on the stop bracket and has the same result.

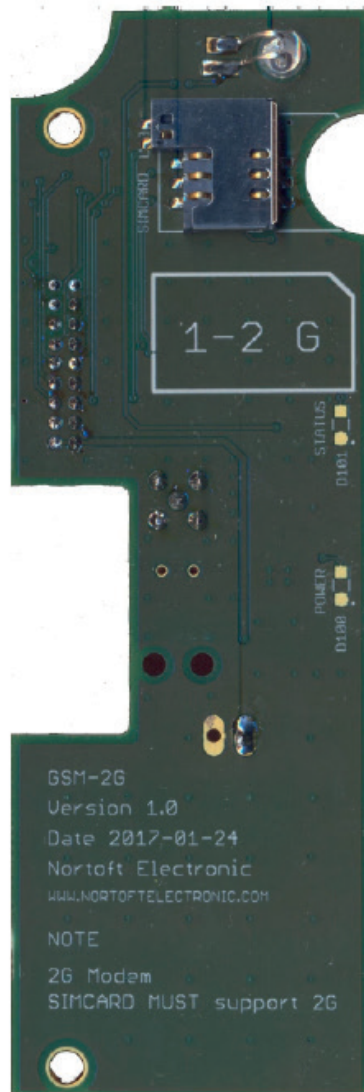
Even if the metres are not saved in the memory, irrigation will still continue at the selected speed and the machine will stop as normal.

However, there will be deviations if the speed is measured on a gear disc and the calculation is based on formulas entered in MACHINE

DATA. This is because the electronics do not know which hose layer the machine is running on. Finally, the metres can be entered manually.



## GSM-2G



### Functions

Easy installation on PR10-12  
 Low power consumption  
 Total 10 mA consumption, PR10-12 and GSM-2G  
 Visible status LED

Supplied with antenna with 2 metre cable  
 Mounting accessories

### Modem

- Dual band 850/900/1800/1900 MHz
- GPRS multi slot class 12/10
- GPRS mobile station class B
- Compliant to GSM phase 2/2+
  - Class 4 (2 W @850/900MHz)
  - Class 1 (1 W @1800/1900 MHz)
- Temperature range: -40 °C ~ 85 °C

**GSM**

GSM-2G is a GSM modem made for PR10-12.

The machine can be started, stopped or queried about status by sending an SMS.

**Commands**

- Start** Starts the machine.
- Stop** Stops the machine
- Speed ##** Set desired speed 3,400 m/h
- Status** Returns the current machine status.

SMS can be written in small, large or mixed characters.

If you call the modem from a GSM phone, you will receive an SMS with **Status**.

**Status**

HASTIGHED	30.0m/h
DOSE	22 mm
TIME	14:10 STOP 18:16
STATUS IRRIGATING	
DISTANCE	123m
BATTERY	12.8V
CHARGER ON	0.231A

SMS sent from machine contains miscellaneous information.

**SMS** is sent at:

- LOW PRESSURE:** The machine has stopped due to a lack of water pressure.
- STOP SENSOR:** The machine has reached the end and is ready for a new lane.
- STOP TELE:** Machine is stopped via an **SMS**
- STOP DIST:** The machine has reached the stopping distance. (Constant 8)
- STOP SUPERVISION:** Supervision has stopped the machine. The machine has not moved for xx minutes. (See constant for supervision).



**How to start the system:**

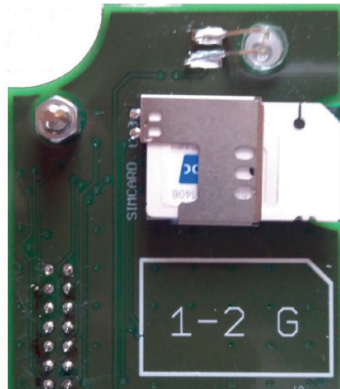
Disconnect the battery from the electronics.

Insert the SIM card in a regular mobile phone and change the pin code to **1111**.  
 Try sending and receiving an SMS to see whether the SIM and account work as intended.

**Note that SIM card MUST support 2G.** Some operators do not support 2G.

Install the modem using the supplied threaded rods.

Insert the SIM card in the modem device.



Connect the battery and set machine data #30

- = 0 No GSM
- = 1 Use GSM, all numbers can be used, no speed setting
- = 2 Use GSM, only the numbers created in the SMS list can be used.

```
SPEED 11.1m/h
DOSE 22 mm
TIME 14:10 Stop 7:43
M.DATA 30 1
```

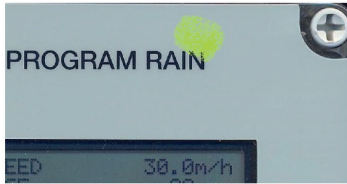
See chapter for setting up data.

After approx. 30-45 seconds, the modem should be connected to the GSM network.

```
SIGNAL 23
NETWORK HOME
A: +45123456
B: +45234567
```

Signal strength 0 - 31 and the network is then displayed in menu #6  
 Signal strength of 10 or above is a stable connection.  
 Signal strength of 99 indicates no signal.  
 - Missing antenna  
 - Very poor signal

**Modem has LED to indicate status.**



**Green**

Switched off

- Searching the network
- No SIM card in modem
- Incorrect PIN code
- No GSM network available

**LED**

Off

Flashes quickly

STANDBY  
(Registered on network)

Flashes slowly

Connection (TALKING)

On

When an SMS is received, the display shows:

**Receiver SMS**  
#: +45123456  
**Status**

Receiving an SMS, sender's phone number and 40 characters of message are displayed. All SMS can be received, but only known commands are accepted.

When an SMS is sent, the display shows:

**Sender SMS**  
#: +45123456  
**Status Irrigating**

Sending an SMS, receiver's phone number and machine status.

## Warranty and complaints

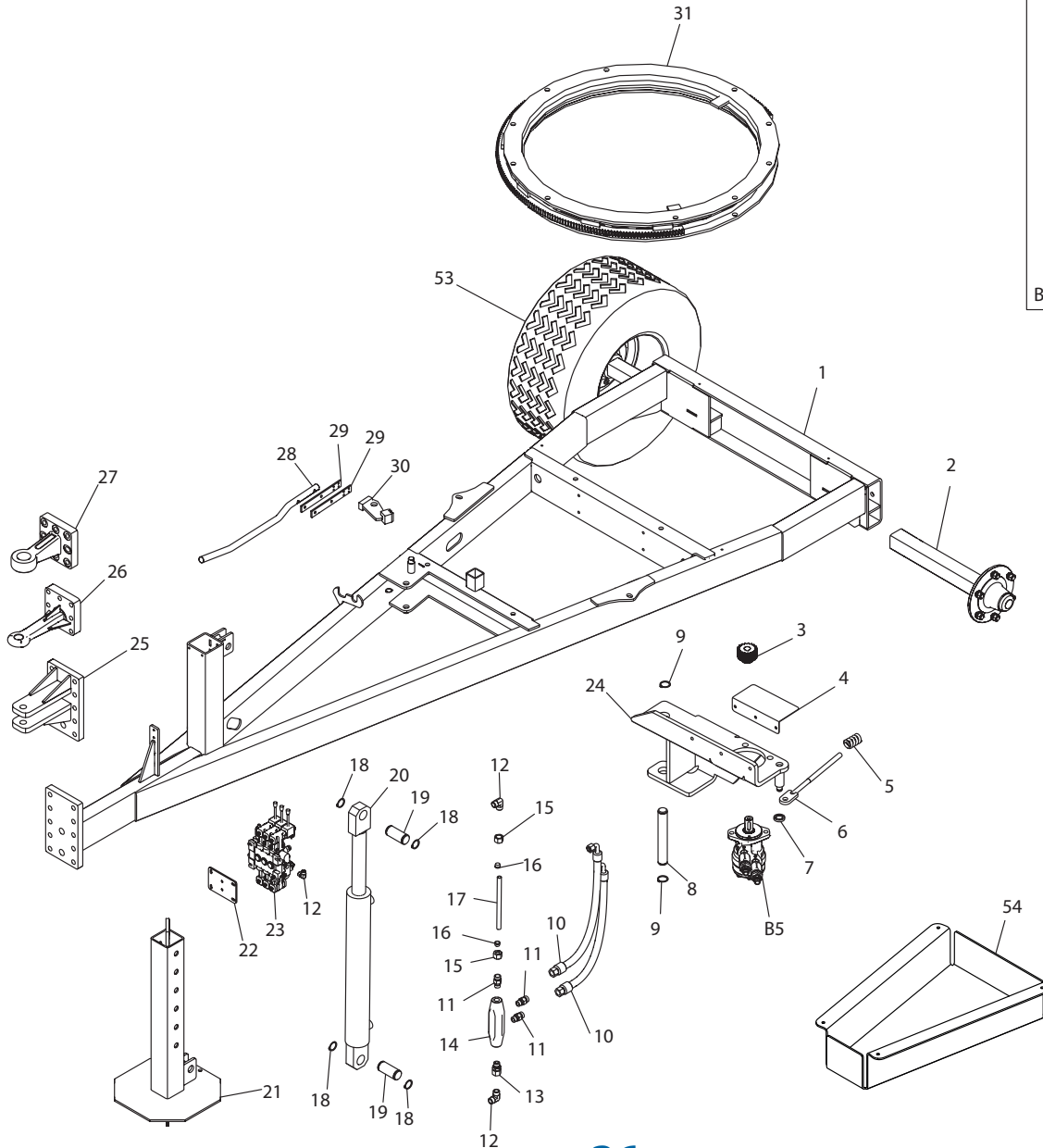
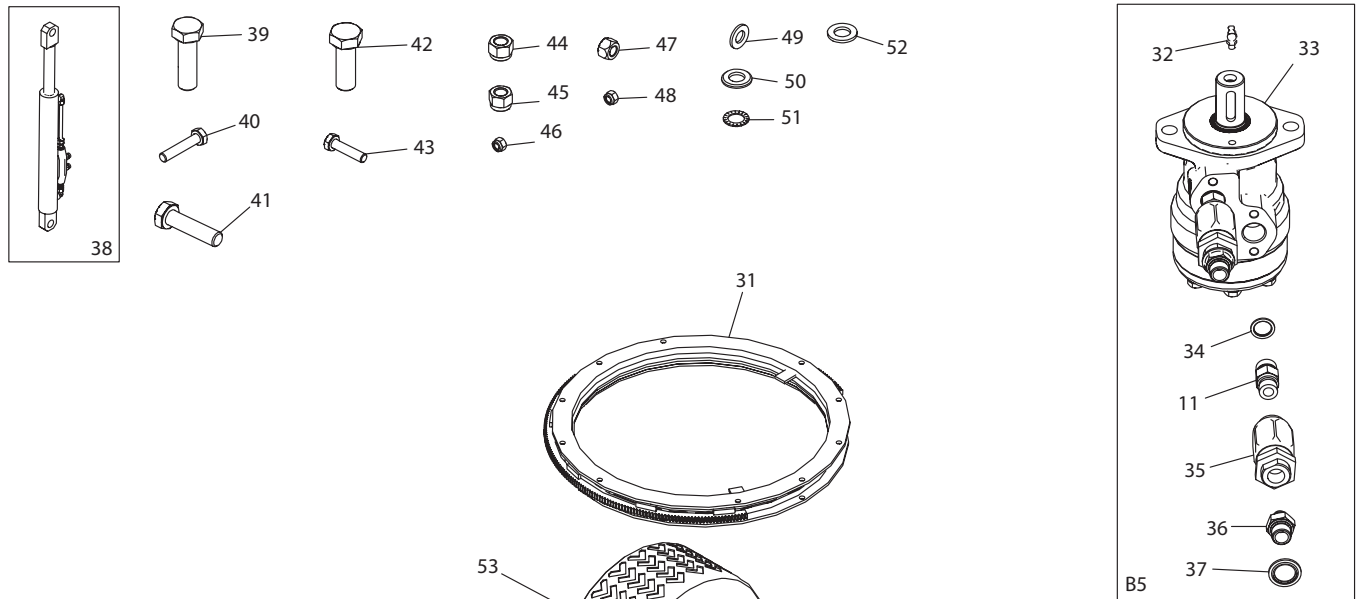
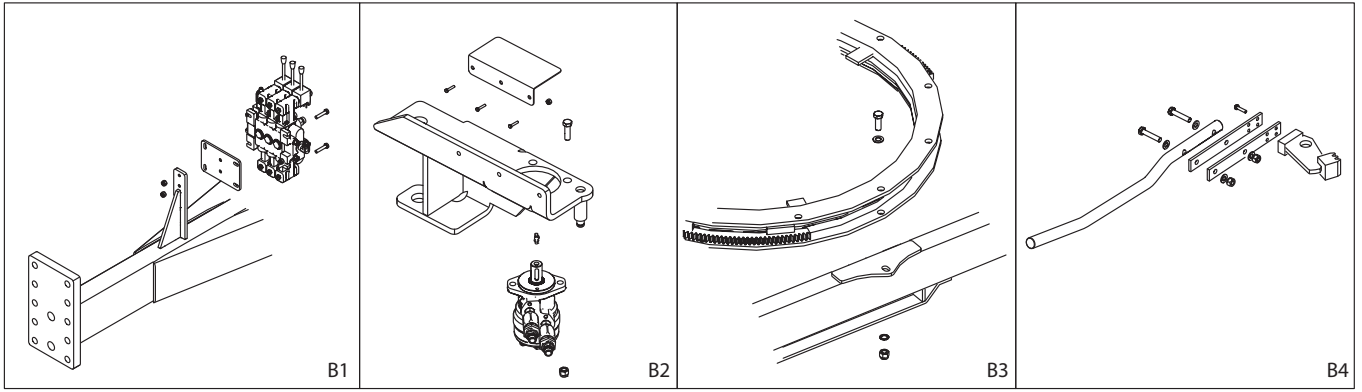
For all products manufactured by FASTERHOLT Maskinfabrik A/S, FASTERHOLT Maskinfabrik A/S provides a warranty for 24 months from the delivery date as regards errors in the processing and materials that are not due to ordinary wear and tear. The warranty only applies provided that the product has been correctly installed, that only original spare parts have been used, and that such use is in accordance with FASTERHOLT Maskinfabrik's instructions and generally known practice.

As regards third-party goods that are part of the delivery, e.g. electronic equipment, the same warranty is provided as the one provided to FASTERHOLT Maskinfabrik A/S by the sub-supplier.

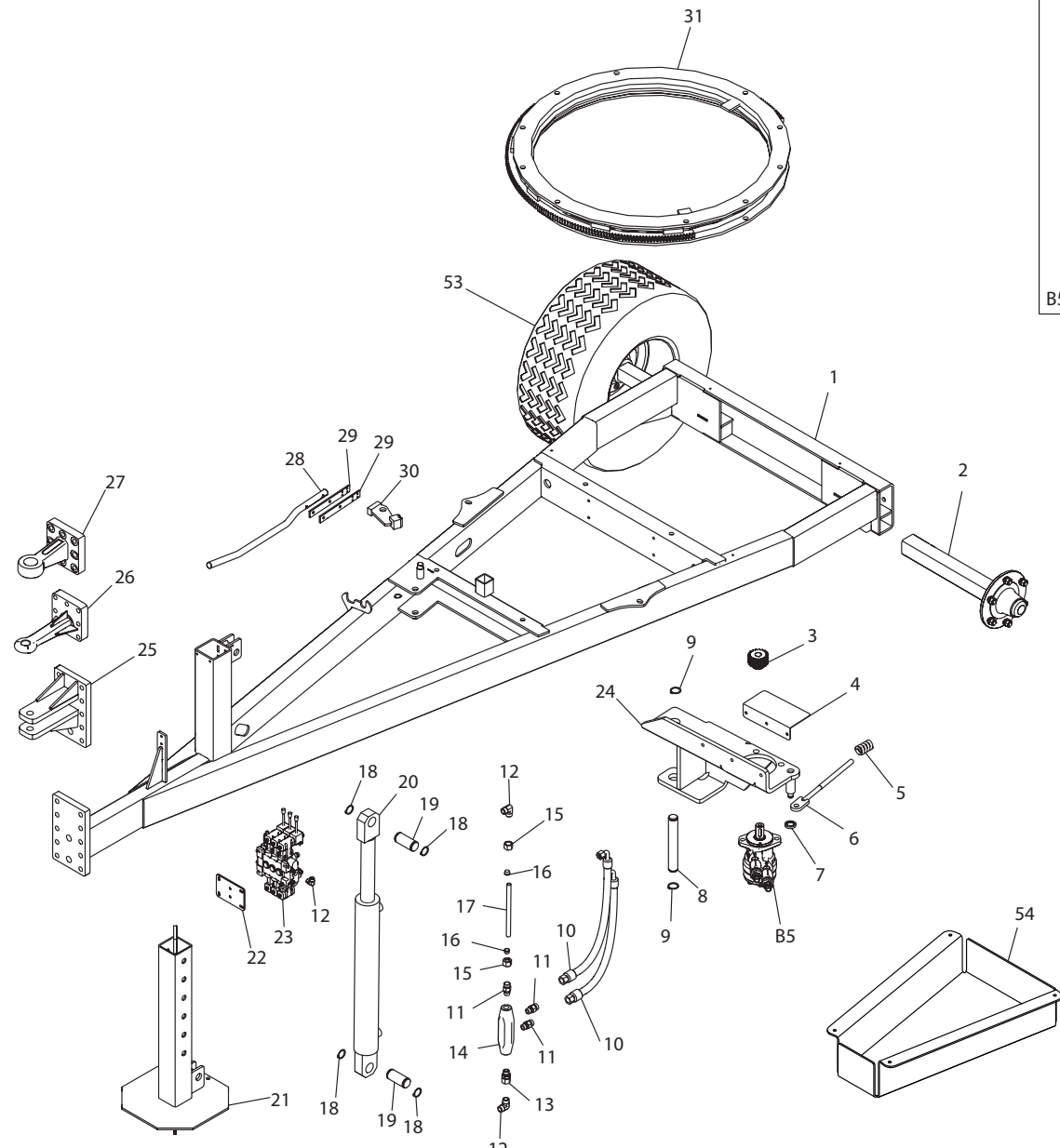
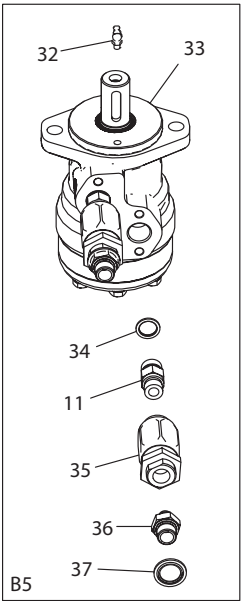
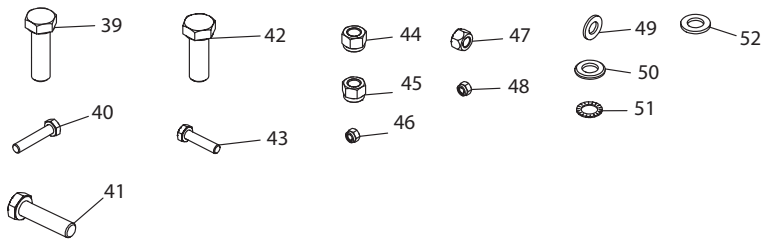
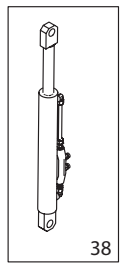
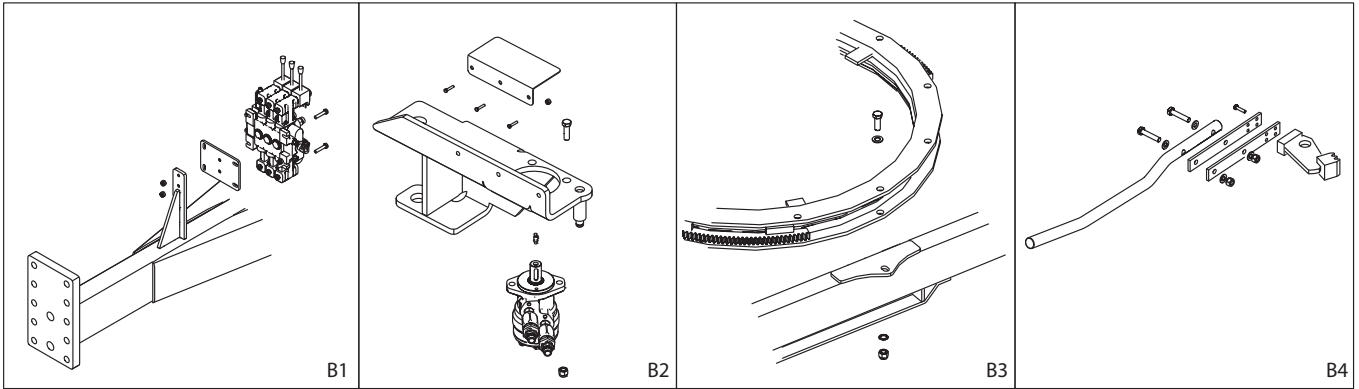
If any errors are demonstrated in our products during the warranty period, FASTERHOLT Maskinfabrik A/S will make cost-free repairs and renewals to the required extent as soon as possible within normal working hours.

If the goods for which a complaint has been made are to be replaced by new goods, such goods are sent including a new invoice. The goods for which a complaint has been made – including documentation outlining the issue and the relevant machine number – must be returned to FASTERHOLT Maskinfabrik A/S at the latest 14 days after the complaint was made for the purpose of crediting. A warranty case will only be created once all necessary material has been received. If the part is too big to send, please contact FASTERHOLT Maskinfabrik to make alternative arrangements. Photographic documentation will always be required in this context.

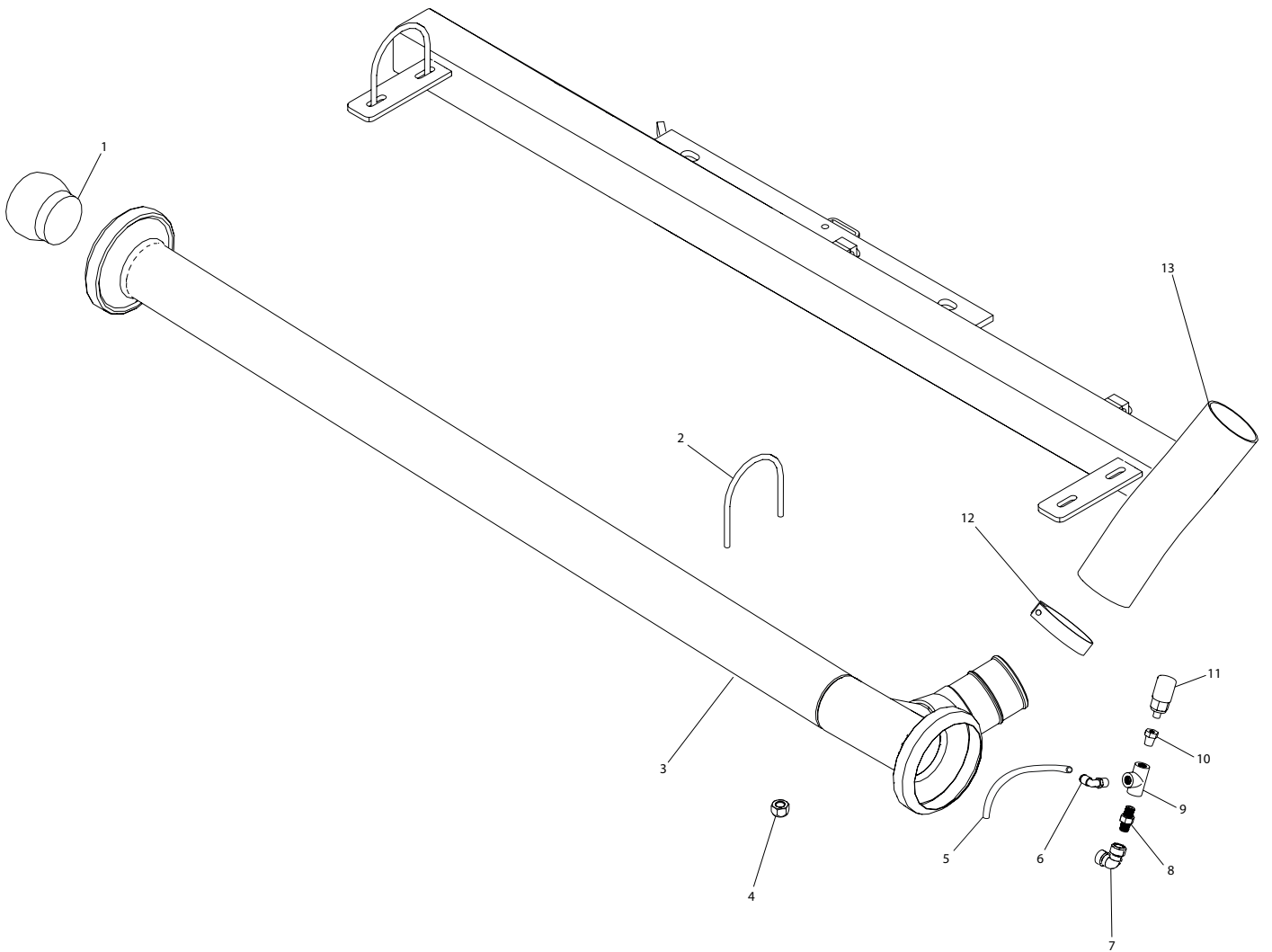
FASTERHOLT Maskinfabrik A/S is not liable for operating losses, loss of time, loss of profits or similar.



Item No.	Part No.	Qty	Description	Comments
1	2012227	1	Chassis GT5	
2	2009045	2	Wheel shaft	
3	31000079	1	Gear	
4	2010192	1	Cover plate for gear	
5	662565	1	Spring	
6	31000050	1	Threaded rod for yaw gear	
7	1007186	1	Clamping ring	
8	31000016	1	Shaft	
9	700025	2	Retaining ring Ø25 Ext.	
10	1008612	2	Hose 3/8	600 mm
11	1007724	5	Nipple	
12	1007544	4	Angle	
13	890414	1	Nipple	
14	551009	1	Throttle valve	
15	1007505	1	12 mm union nut	
16	1007497	2	12 mm Cutting ring	
17	026152098	1	Hydraulic pipe	250 mm
18	700030	4	Retaining ring Ø30 Ext.	
19	04000880	2	Pin for support leg	
20	550002	1	Hyd. Cylinder	
21	11000000	1	Support leg	
22	2009495	1	Clamping plate	
23	551015	1	Manoeuvring valve	
24	2009449	1	Bracket for motor	
25	2012915	1	Fork hitch	
25	11000003	1	Old Fork hitch up to 2020	
26	2011810	1	Drawbar eye hitch	
27	2012617	1	Drawbar eye hitch	
28	31000236	1	Locking lever for turntable	
29	31000218	2	Spring bracket for locking lever	
30	2010134	1	Locking bracket with teeth	
31	2015095	1	Turntable	
32	761286-1	1	Grease nipple	
33	1007440-2	1	Oil motor	
34	552025	2	Gasket	
35	551013	2	Check/Throttle valve	
36	1007538	2	Nipple	
37	552024	2	Gasket	
38	98000245	1	Complete Cylinder	
39	022216045	6	M16 x 45 Set bolt	B3
40	021008040	4	M8 x 40 Steel bolt	B1
41	021010050	2	M10 x 50 Steel bolt	B4

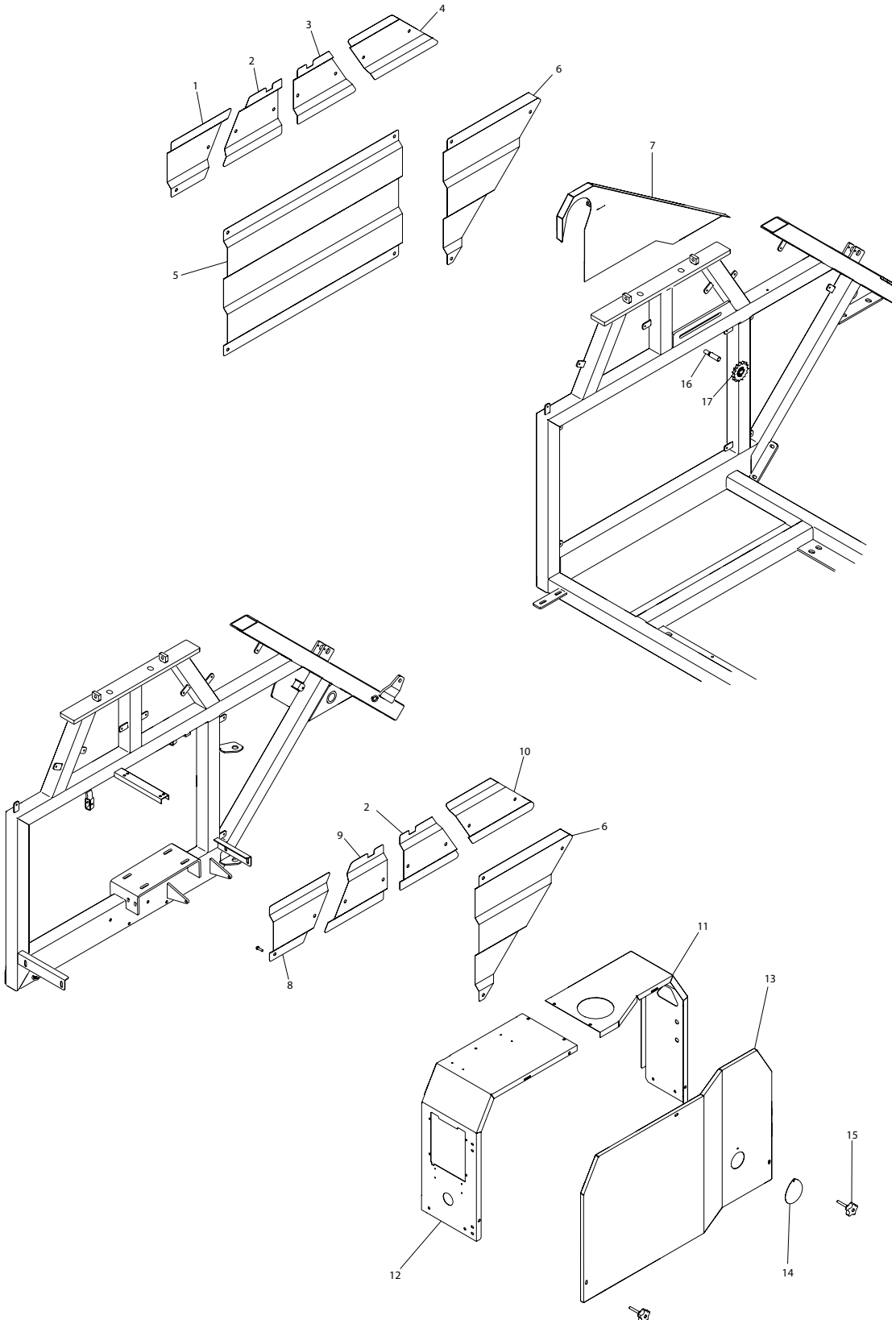
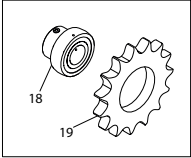
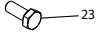
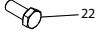


Item No.	Part No.	Qty	Description	Comments
42	022212040	2	M12 x 40 Set bolt	B2
43	022206025	7	M6 x 25 Set bolt	B4 & B2
44	044016	6	M16 Lock nut	B3
45	044008	4	M8 Lock nut	B1
46	040410	2	M10 Steel nut	B4
47	044012	2	M12 Lock nut	B2
48	044006	3	M6 Lock nut	B2
49	050316	6	M16 Plain washer	B3
50	050312	4	M12 Plain washer	B2
51	763916	6	M16 Riplock	B3
52	051010	4	M10 Plain washer	B4
53	833702	2	Complete wheel	
54	2015064	1	Toolbox for GT5	



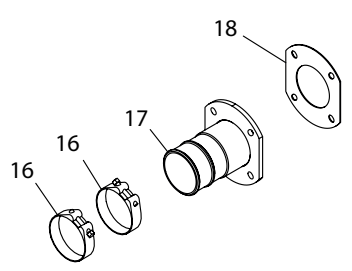


Item No.	Part No.	Qty	Description	Comments
1	921247	1	Blanking plug	
2	1160300089	2	Bracket	
3	2012585	1	Feed pipe	
4	040408	4	M8 Steel nut	
5	1013860	1	Air hose	
6	591197	1	Coupling for air hose	
7	000090402	1	Angle	
8	000280402	1	Collar nipple	
9	000130402	1	Tee	
10	000241420	1	Nipple sleeve	
11	1007545	1	Pressostat 2 bar	
12	16200726	4	Hose clamp	
13	16050210	1	Hose	

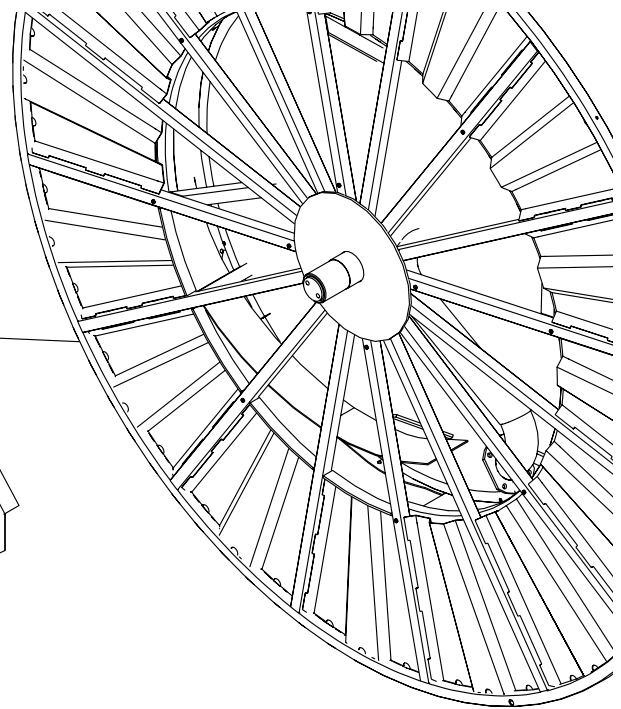


Item No.	Part No.	Qty	Description	Comments
1	2014918	1	Side guard, right	
1	2015376		Side guard, right Year 2023	
2	2012909	2	Side guard, rear right	
2	2015380		Side guard, rear right Year 2023	
3	2014914	1	Side guard, right	
3	2015378	2	Side guard, right Year 2023	
4	2014913	1	Side guard, rear right	
4	2015374		Side guard, rear right Year 2023	
5	2012627	1	Side guard, front right	
6	2012624	2	Side guard	
7	2012825	1	Chain guard	
8	2014915	1	Side guard, front left	
8	2015377		Side guard, front left Year 2023	
9	2012910	1	Side guard, rear left	
10	2014900	1	Side guard, rear left	
10	2015379		Side guard, rear left Year 2023	
11	2011269	1	Side for secured single cover	
12	2011267	1	Side for secured single cover and computer	
13	2011130-1	1	Cover for guard	
14	2008743	1	Cover for gear hole	
15	517542	2	Clamp lever	
16	761275	1	Shaft	
17	2351278	1	Complete gear	
18	761276	1	Bearing	
19	311215	1	Gear	
20	763930	25	M8 Cap nut	
21	050208	25	M8 Plain washer	
22	022208020	25	M8 x 20 Set bolt	
23	030506016	1	M6 x 16 int. hex	

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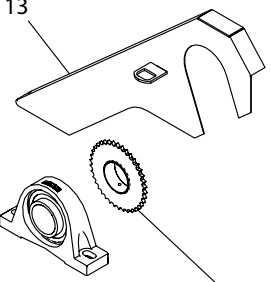


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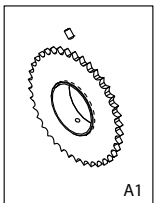


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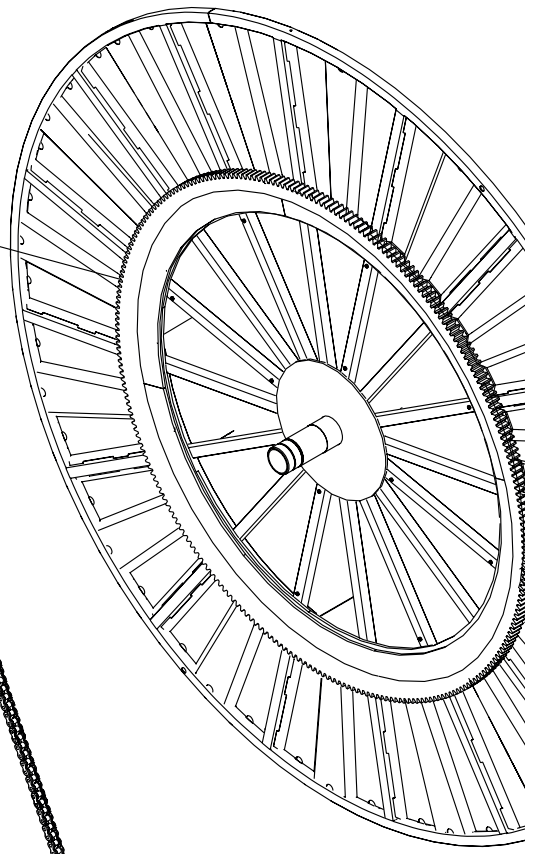
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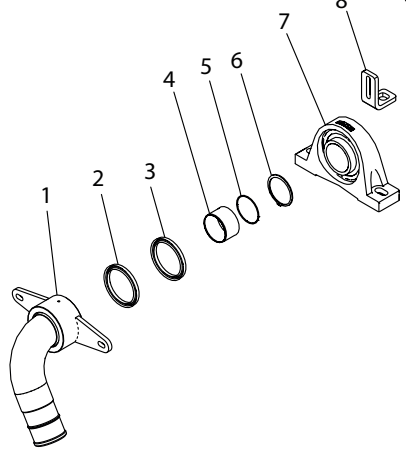
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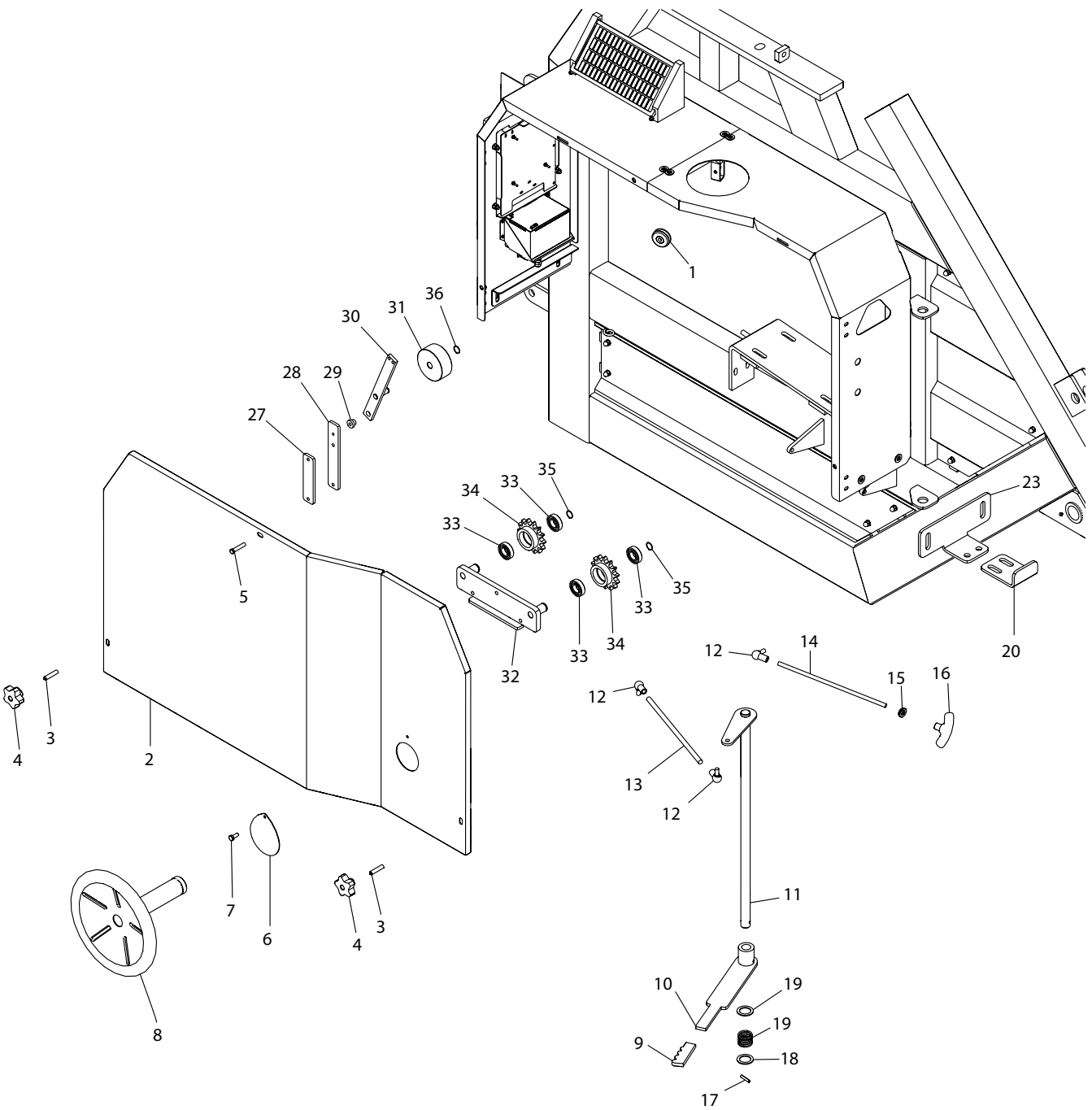
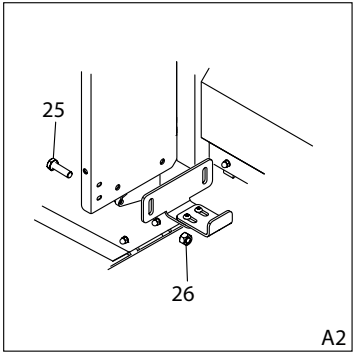
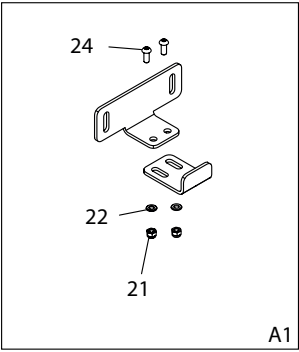
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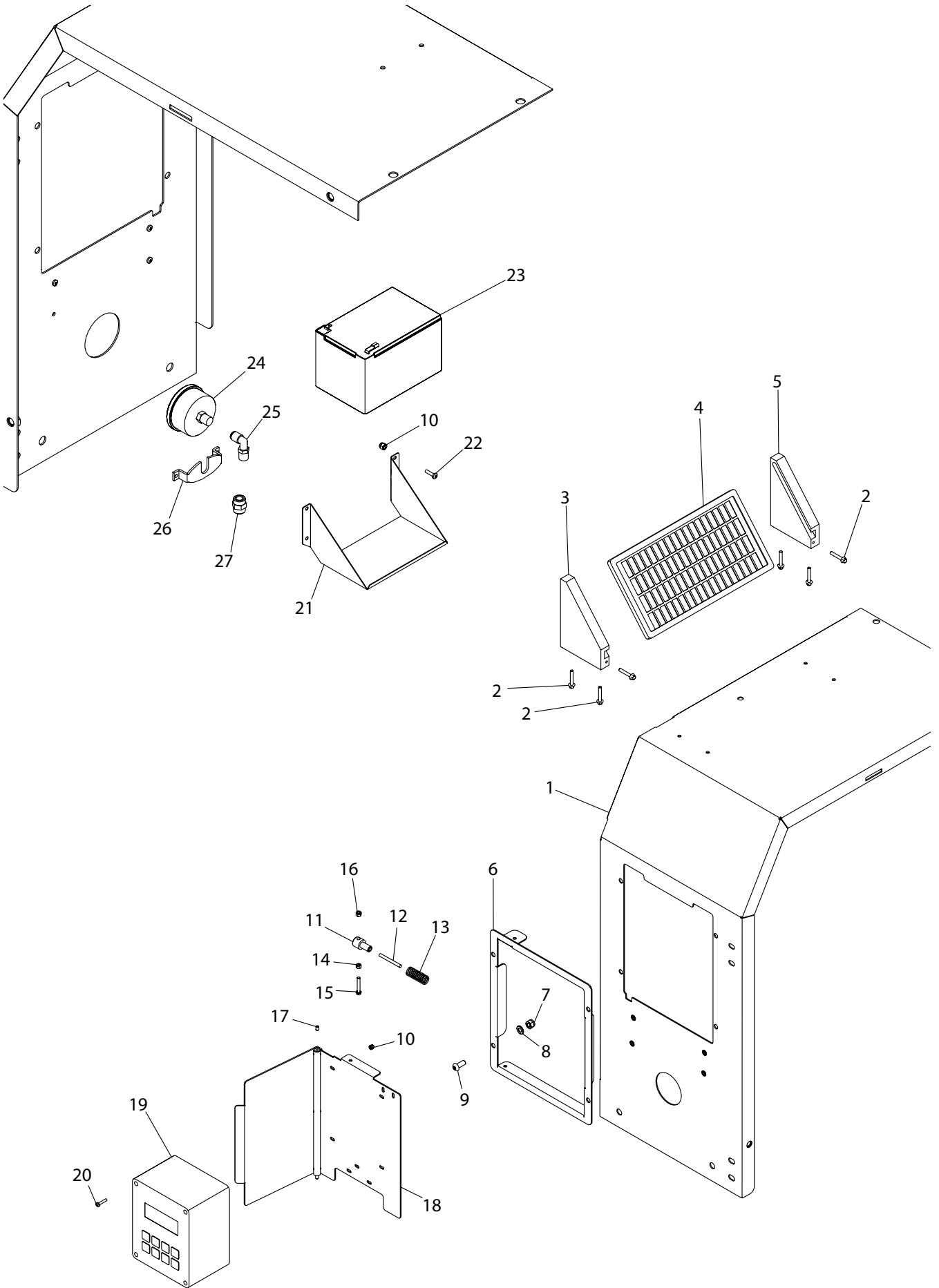
9



Item No.	Part No.	Qty	Description	Comments
1	2012577	1	Bend water inlet	
2	1001095	1	Nut ring Soft	
3	112138	1	Nut ring Hard	
4	1001270	1	Stainless bushing	
5	624099	1	O-ring for stainless bushing	
6	1007930	1	Retaining ring Ext. Ø100	
7	1001098	2	Bearing for 90 mm centre pipe	
8	2001491	2	Bracket for Bend for water inlet	
9	2014876	1	Chain	
10	36000004	1	Chain gear	
11	1001081-20	1	Clamping plate	
12	1001291	1	Gear Ø100 mm hose	
12	1009705	1	Gear Ø90 mm hose	
13	2012825	1	Chain guard	
14	2012531	1	Hose drum	
15	030516030	2	Int. hex 16x30	A1
16	16200335	2	Hose clamp no.130	
16	16200345	2	Hose clamp no.110	
17	15000036	1	Hose connector Ø90 mm with flange	For Ø90 Hose
17	15000120	1	Hose connector Ø100 mm with flange	For Ø1200 hose
18	631109	1	Flange gasket	



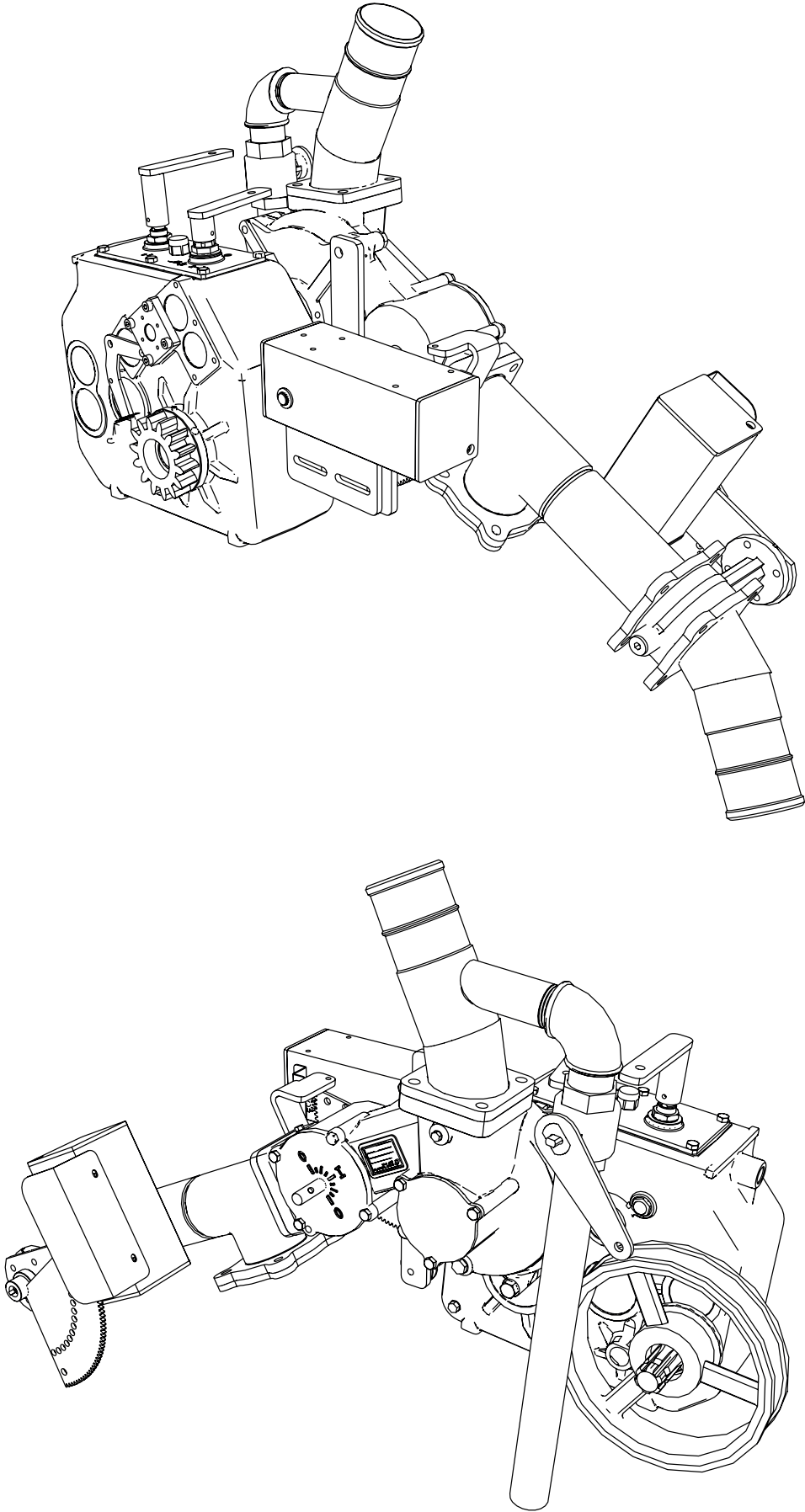
Item No.	Part No.	Qty	Description	Comments
1	761015-15	1	Cable roller Loose	
2	2011130-1	1	Front guard for cabinet	
3	033010050-1	2	M10 x 50 Stop screw	
4	517542	2	Operating lever	
5	072210050	1	M10 x 50 Stainless bolt	
6	2008743	1	Cover plate for gear wheel	
7	030506016	1	M6 x 16 Int. hex	
8	2011698	1	Hand wheel	
9	680006	1	Rubber grip	
10	2008478	1	Lever for decoupling	
11	2008476	1	Decoupling arm	
12	1100151608	3	Angle joint	
13	2008482	1	Threaded rod for decoupling	350 mm
14	2008501	1	Threaded rod for T-grip	400 mm
15	13345	1	Rubber bushing	
16	680001	1	T-Grip for slide valve	
17	1113060030	1	Split pin	
18	895260	2	Washer for compression spring	
19	895250	1	Compression spring	
20	2015316	1	Stop plate	
21	044008	2	M8 Lock nut	
22	050308	2	M8 Plain washer	
23	2015315	1	Base plate for safety stop	
24	095010020	1	M10 x 20 int. hex round head	
25	022212020	2	M12 x 20 set bolt	
26	044012	2	M12 Lock nut	
27	2015143	1	Bracket for chain roller	
28	2015144	1	Bracket	
29	2014852	1	Shaft for tension arm	
30	2013210	1	Tension arm for chain	
31	2014844	1	Roller	
32	2014800	1	Bracket for gear	
33	75006206-2RS	4	Roller bearing	
34	2014795	2	Gear	
35	1115150030	2	Retaining ring	
36	700025	1	Retaining ring	

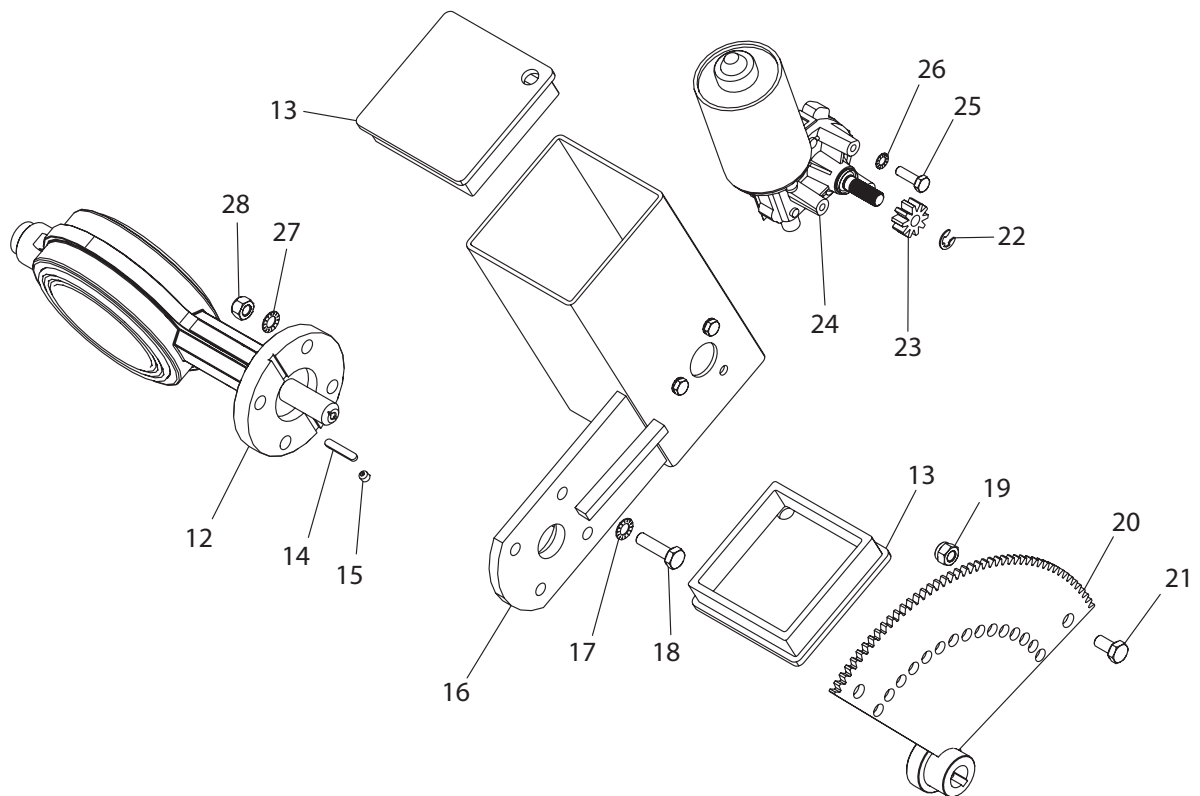
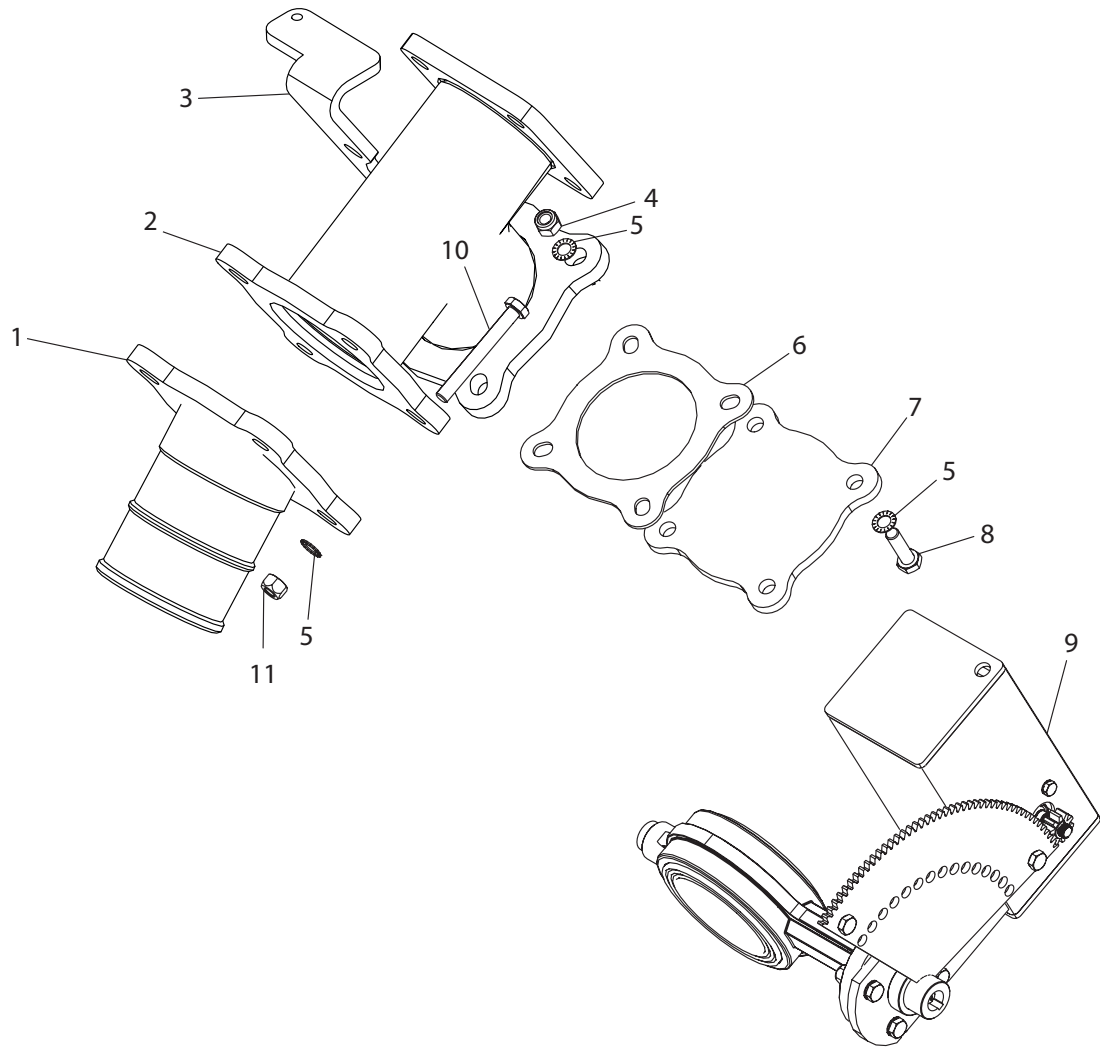




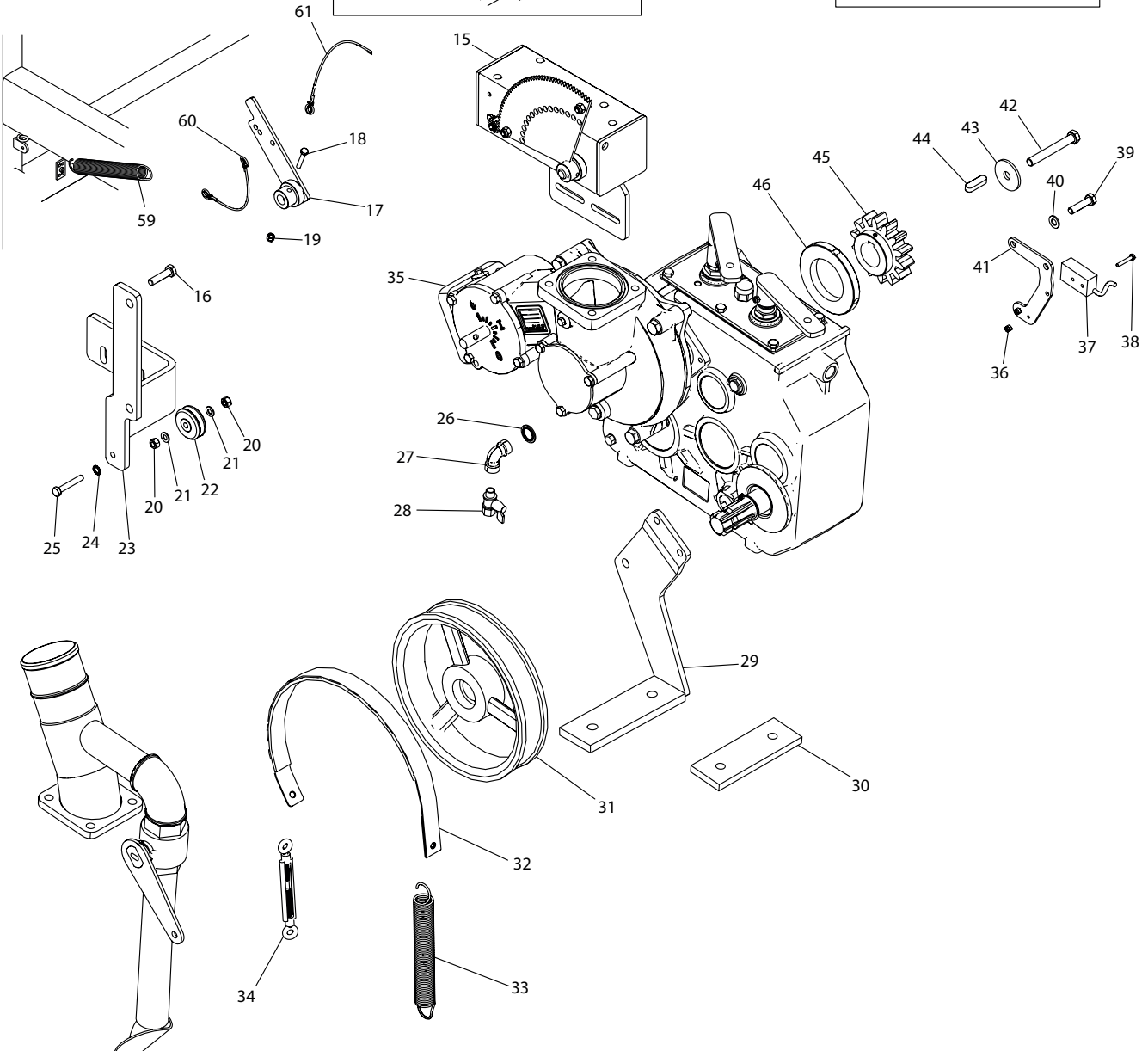
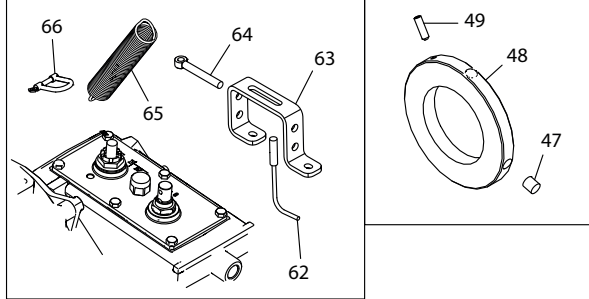
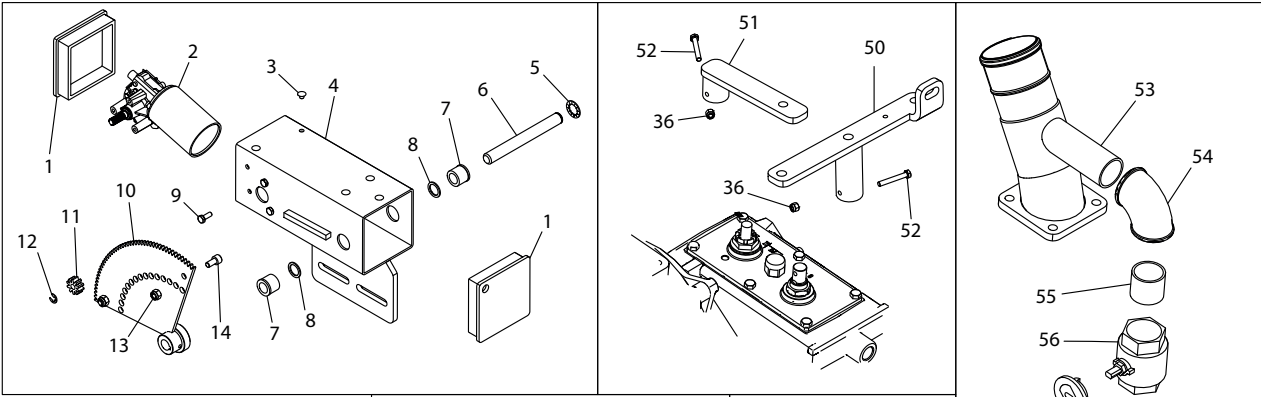
Item No.	Part No.	Qty	Description	Comments
1	2011267	1	Front guard	
2	510555	6	M5 x 30 Self-tapping	
3	2001260	1	Holder for solar cell Left	
4	1005523	1	Solar cell	
5	2001259	1	Holder for solar cell Right	
6	35000361	1	Hinge plate for computer	
7	044008	4	M8 Lock nut	
8	050208	8	M8 Plain washer	
9	095008020	4	M8 x 20 Round head int. hex	
10	044004	8	M4 Lock nut	
11	15000145	2	Holder for spring	
12	15000146	1	Shaft for Holder	
13	662280	1	Spring	
14	040405	2	M5 Steel nut	
15	021005030	2	M5 x 30 Steel bolt	
16	044005	2	M5 Lock nut	
17	033005010	1	5 x 10 Int. hex	
18	2008515	1	Angle cover for computer	
19	1007549-7	1	Prog. Rain Version 12	
20	034604020	4	M4 x 20 Crosshead	
21	1007590	1	Bracket for battery	
22	763510	4	M4 x 16 Crosshead	
23	1005521	1	Battery	
24	949575	1	Manometer	
25	591197	1	Nipple	
26	761163-8	1	Bracket for manometer	
27	1916650202B	1	Sleeve	



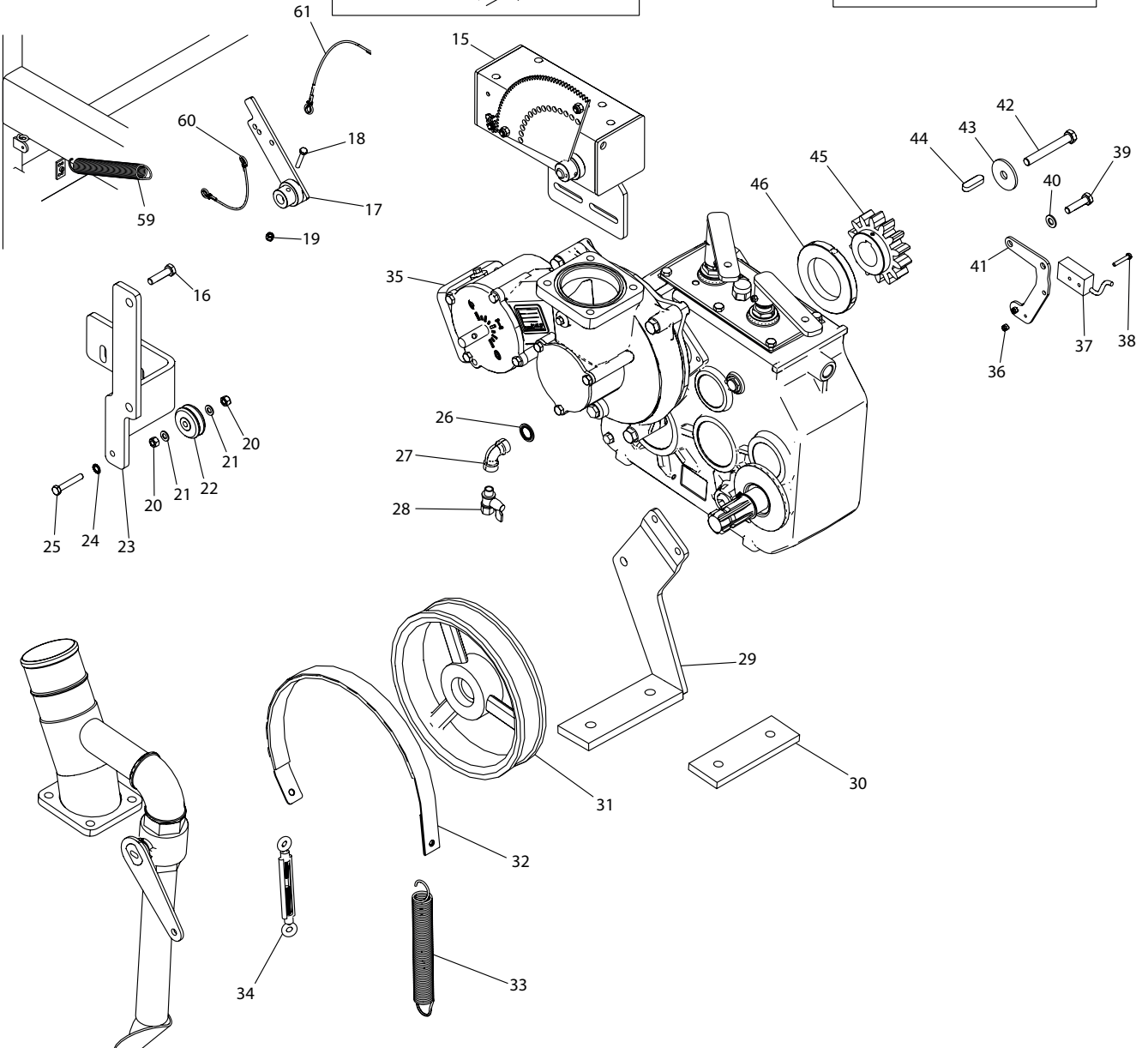
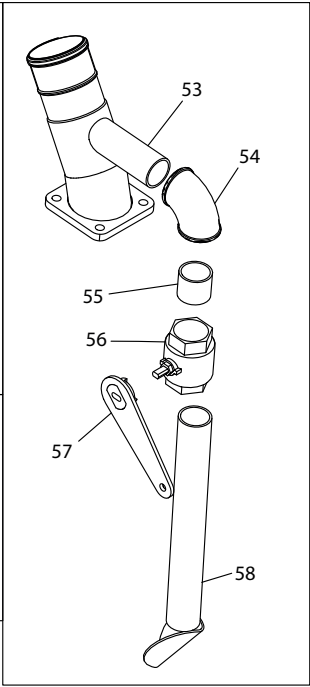
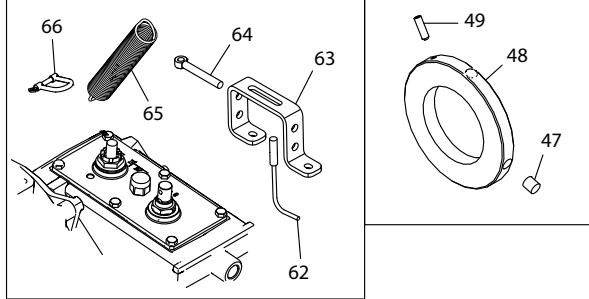
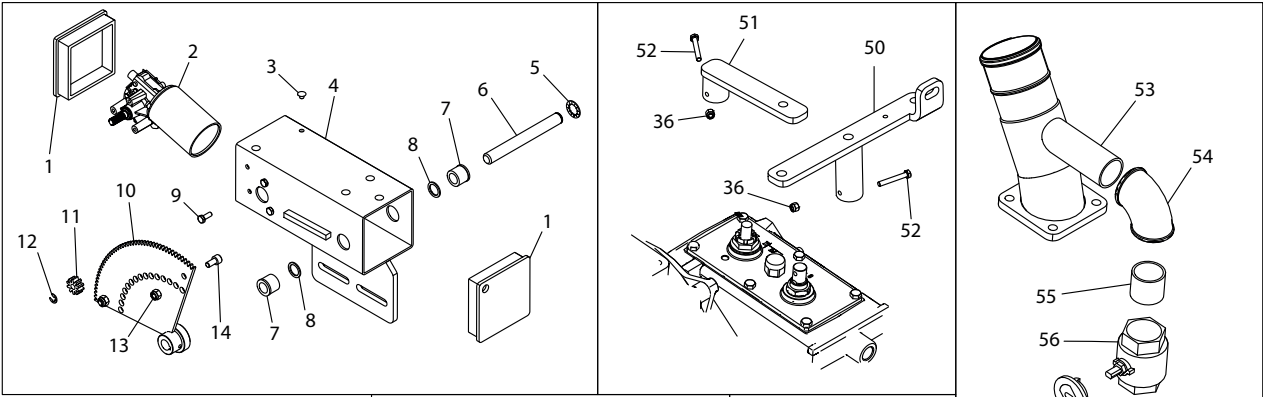




<b>Item No.</b>	<b>Part No.</b>	<b>Qty</b>	<b>Description</b>	<b>Comments</b>
1	2014888	1	Flange with hose connector	
2	2012091	1	Tee with Turbine and valve	
3	2009301	1	Holder for stop turbine	
4	044010	4	M10 Lock nut	
5	763910	16	M10 Riplock	
6	631112	1	Flange gasket	
7	1007098	1	Flange	
8	022210035	4	M10 x 35 Set bolt	
9	1007230	1	Comp. Motor valve	
10	021010085	4	M10 x 85 Steel bolt	
11	040410	4	M10 Steel nut	
12	1007250	1	Butterfly valve	
13	1007175	2	End plug for motor valve	
14	641528	1	Key	
15	033006006	1	M6 x 6 Int. hex stop screw	
16	1007171	1	Housing for motor	
17	763908	4	M8 Riplock	
18	022208030	4	M8 x 30 Set bolt	
19	044008	2	M8 Lock nut	
20	1007195	1	Gear for valve	
21	022208016	2	M8 x 16 Set bolt	
22	1007184-1	1	Horseshoe	
23	1007190	1	Gear	
24	1007180	1	Motor	
25	022206020	3	M6 x 20 Set bolt	
26	763906	3	M6 Riplock	
27	763908	4	M8 Riplock	
28	040408	4	M8 Steel nut	

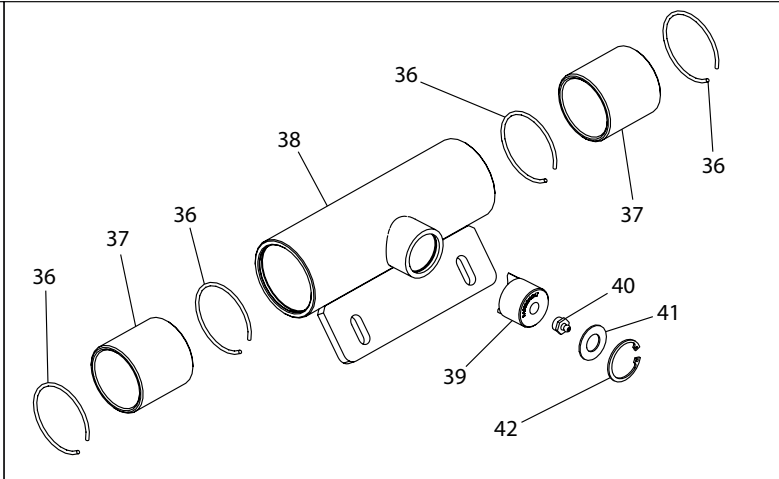
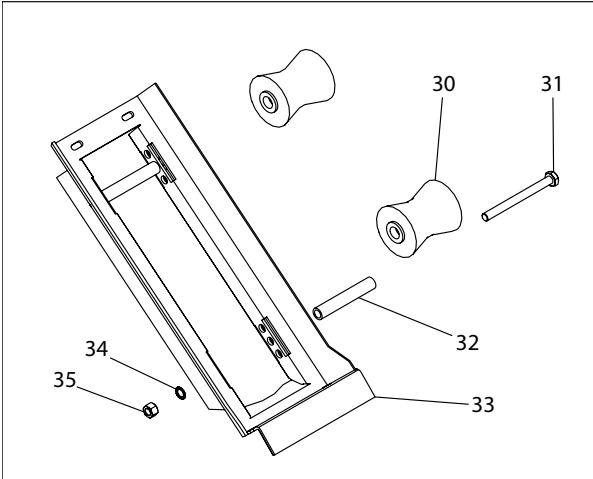
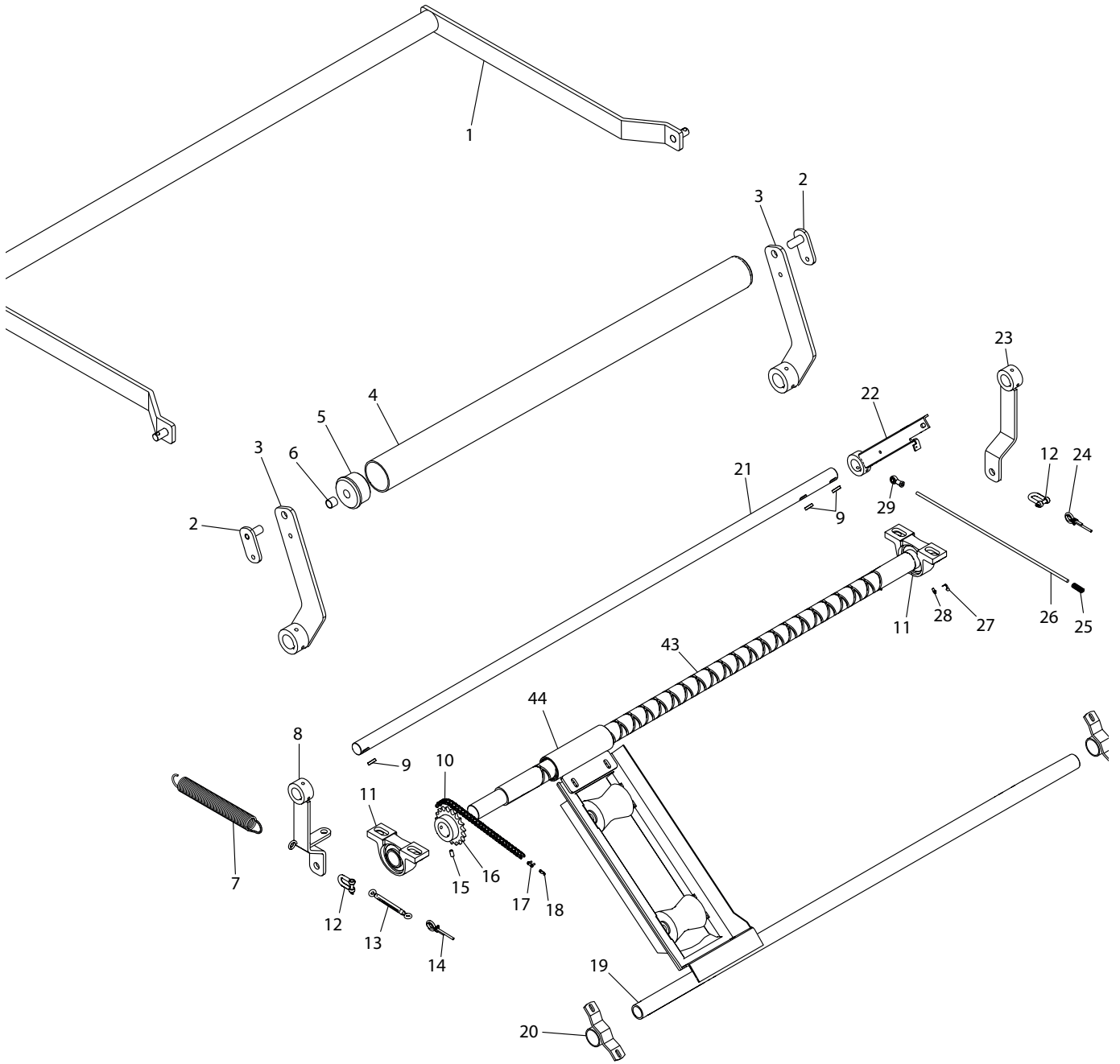


Item No.	Part No.	Qty	Description	Comments
1	1007175	2	End plug for motor valve	
2	1007180	1	Motor	
3	1008918	5	Plug for closing	
4	1008905	1	Housing for motor valve	
5	1008919	1	Lock washer	
6	1008920	1	Shaft	
7	1008921	2	Bushing	
8	1130172315	2	Copper ring	
9	022206016	3	M6 x 16 Set bolt	
10	1007195	1	Gear for valve	
11	1007190	1	Gear	
12	1007184-1	1	Horseshoe	
13	044008	2	M8 Lock nut	
14	030508016	2	M8 x 16 Int. hex Round head	
15	1008906	1	Complete motor housing	
16	022212030	2	M12 x 30 Set bolt	
17	2008358	1	Arm for turbine	
18	022206035	1	M6 x 35 Set bolt	
19	044006	1	M6 Lock nut	
20	040408	2	M8 Steel nut	
21	051008	2	M8 Plain washer	
22	761015-15	1	Cable roller	
23	2008354	1	Bracket for console	
24	763908	1	M8 Riplock	
25	021008050	1	M8 x 50 Steel bolt	
26	BS20	1	Gasket	
27	000092402	1	Angle	
28	195010	1	Ball valve	
29	2013233	1	Bracket for chain tensioner	
30	2008407-1	1	Bracket	
31	2009686-1	1	Brake wheel	
32	18000419	1	Brake strap	
33	2009210	1	Spring	
34	643608	1	Turnbuckle	
35	821305-50	1	Gear	
36	044005	4	M5 Lock nut	
37	1007561	1	Sensor	
38	021005030	2	M5 x 30 Steel bolt	
39	022210040	2	M10 x 40 Set bolt	
40	051010	2	M10 Plain washer	
41	2008787	1	Bracket for sensor	
42	022212090	1	M12 x 90 Set bolt	
43	05401250	1	M12 Round washer	
44	641840	1	Key	





Item No.	Part No.	Qty	Description	Comments
45	2012841	1	Chain gear	
46	2008786	1	Magnet wheel comp	
47	1007570	4	Magnet	
48	2008759	1	Magnetic roller	
49	033006016	1	M6 x 16 Int. hex	
50	2014931	1	Arm for gear short	
51	2008479	1	Arm for gear long	
52	021005035	2	M5 x 35 Set bolt	
53	2012580	1	Output from gear/turbine	
54	000090411	1	Angle G1 1/2	
55	012001411	1	Nipple pipe G1 1/2	
56	540112	1	Ball valve without lever	
57	2008500	1	Lever for ball valve	
58	2011660	1	Relief pipe	
59	661323	1	Spring	
60	2009239	1	Cable for Motor tensioner	
61	2009237-1	1	Cable for stop	
62	1007560	1	Sensor	
63	2014944	1	Bracket for sensor	
64	100193	1	Eyebolt	
65	2003929	1	Spring	
66	643206	1	Shackle	

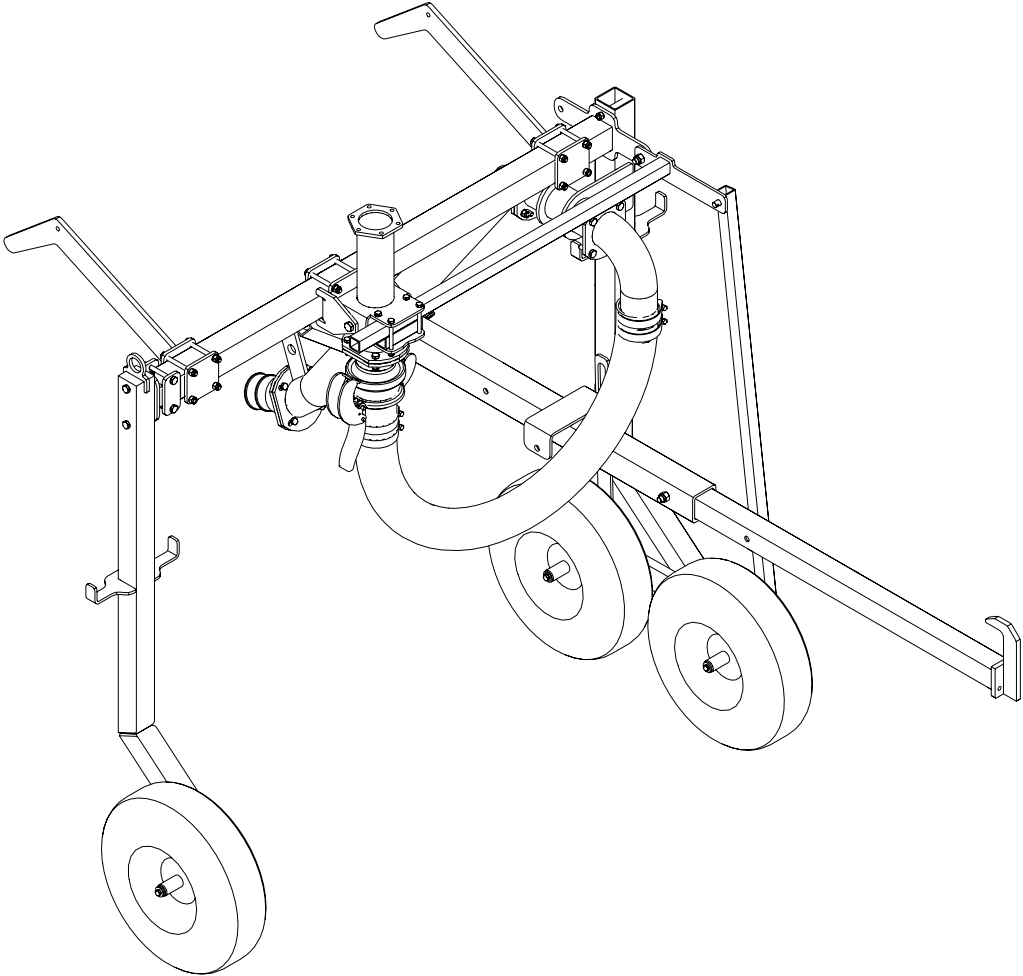


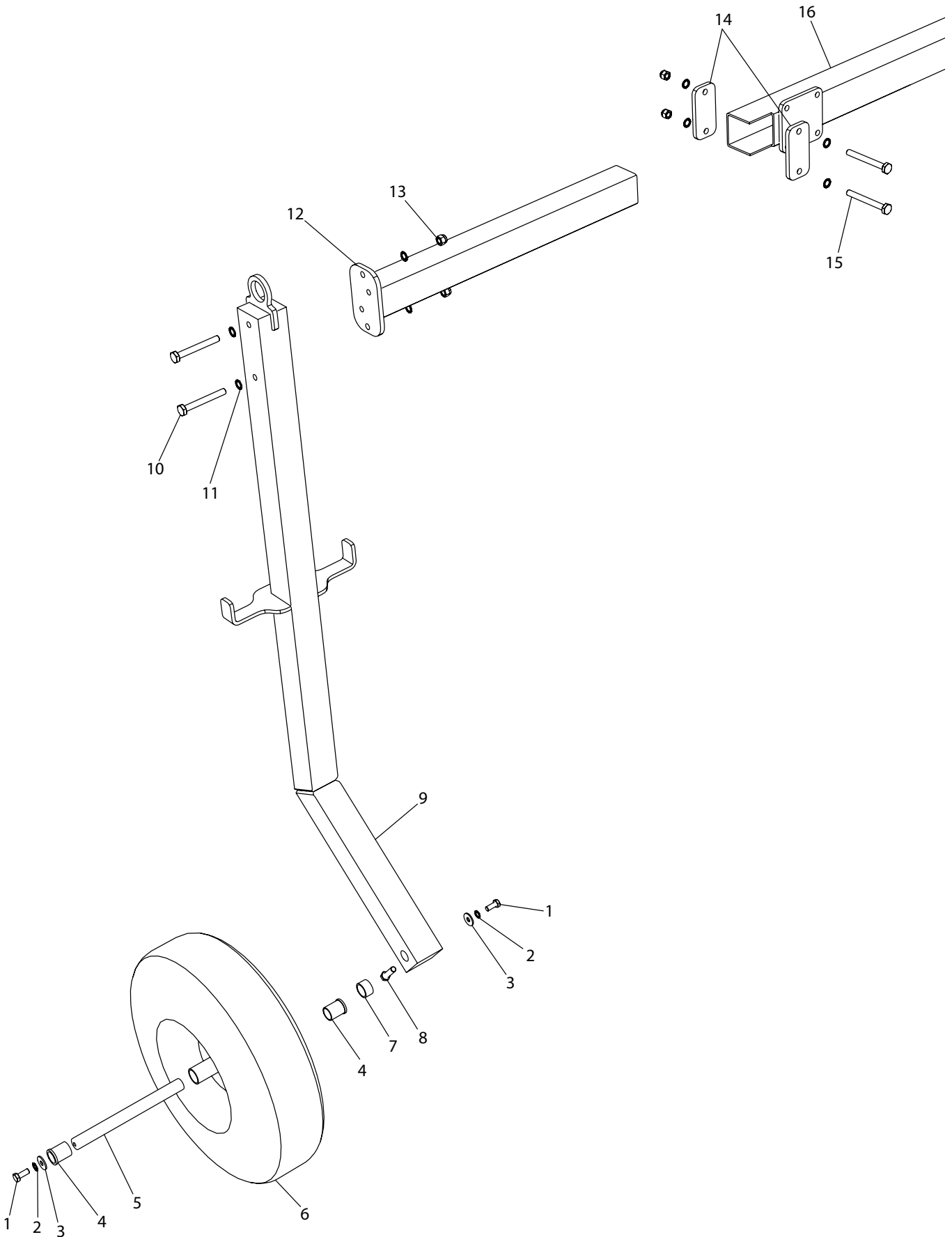
Item No.	Part No.	Qty	Description	Comments
1	2012690	1	Stop bracket	
2	15000106	2	Pin for roller	
3	2014881	2	Bracket for roller	
4	2014771	1	Pipe	
5	35000207	2	Bushing for roller	
6	538119	2	Bushing	
7	661323	1	Spring	
8	2009542	1	Stop arm complete R	
9	641830	3	Key	
10	2015388	1	Chain	
11	761289-1	2	Pillow block	
12	643210	2	Shackle	
13	643608	1	Turnbuckle	
14				
15	033010020	2	M10 x 20 Int. hex	
16	1001290	1	Gear	Ø100mm
16	1001290-1	1	Gear	Ø90mm
17	761056	1	Split link	
18	761058	1	Split link offset	
19	2012591	1	Support pipe for carriage	
20	1008485	2	Holder for support pipe	
21	2012687	1	Shaft for stop bracket arms	
22	2008897	1	Arm for stop arm and magnet	
23	2009540	1	Stop arm complete L	
24	2009237-1	1	Cable for stop	
25	1009252	1	Spring	
26	2014934	1	Rod for gearing	
27	761286-2	1	Cap for lubrication nipple	
28	761286	2	Grease nipple	
29	7500SIKAC10M	1	Rod end	
30	34000055	2	Floor roller	
31	021016180	2	M16 x 180 Steel bolt	
32	34000047	1	Bushing for support roller	
33	2009592	2	Main plate	
34	763916	2	M16 Riplock	
35	040416	4	M16 Steel nut	
36	1115100070-1	2	Retaining ring Int. Ø60	
37	34000009	1	Bushing	
38	1009875	1	Guide sleeve without bushings	
39	761283	1	Guide shaft (pin)	
41	2008560	1	Grease nipple	
41	761284	1	Plain washer	
42	761285	1	Retaining ring Int. Ø40	
43	2012594	1	Cross track shaft	
44	1009875-5	1	Complete guide sleeve	



Item No.	Part No.	Qty	Description	Comments
1	15000039	1	Lift	
2	35000082-1	1	Hinge right	
3	15000004	1	Foot for support leg Left	
4	15000005	1	Foot for support leg Right	
5	35000052	2	Long support leg	
6	15000034	2	Bracket for support leg	
7	15000033	4	Pin for hydraulic cylinder	
8	1007544	4	Angle 3/8	
9	1007497	8	Cutting ring	
10	1007505	8	12 mm union nut	
11	026152098	4	Hydraulic pipe Same part no. Just different lengths	2 lengths 1050 mm 392 mm
12	890625	4	Angle	
13	550001	2	Cylinder	
14	2009229	2	Hydraulic hose	
15	552037	2	Double pipe holder Ø18xØ18	
16	1007514	2	Hose clamp Ø16x16	
17	155004170	2	2.5 m x 2 Chain for lift	
18	643210	4	Shackle	
19	35000082-2	2	Hinge left	
20	2012813	1	Cover plate for cross track shaft	
21	661545	2	Spring	
22	40000870	2	Tension spindle	
23	15000032	2	Telescope for long support legs	

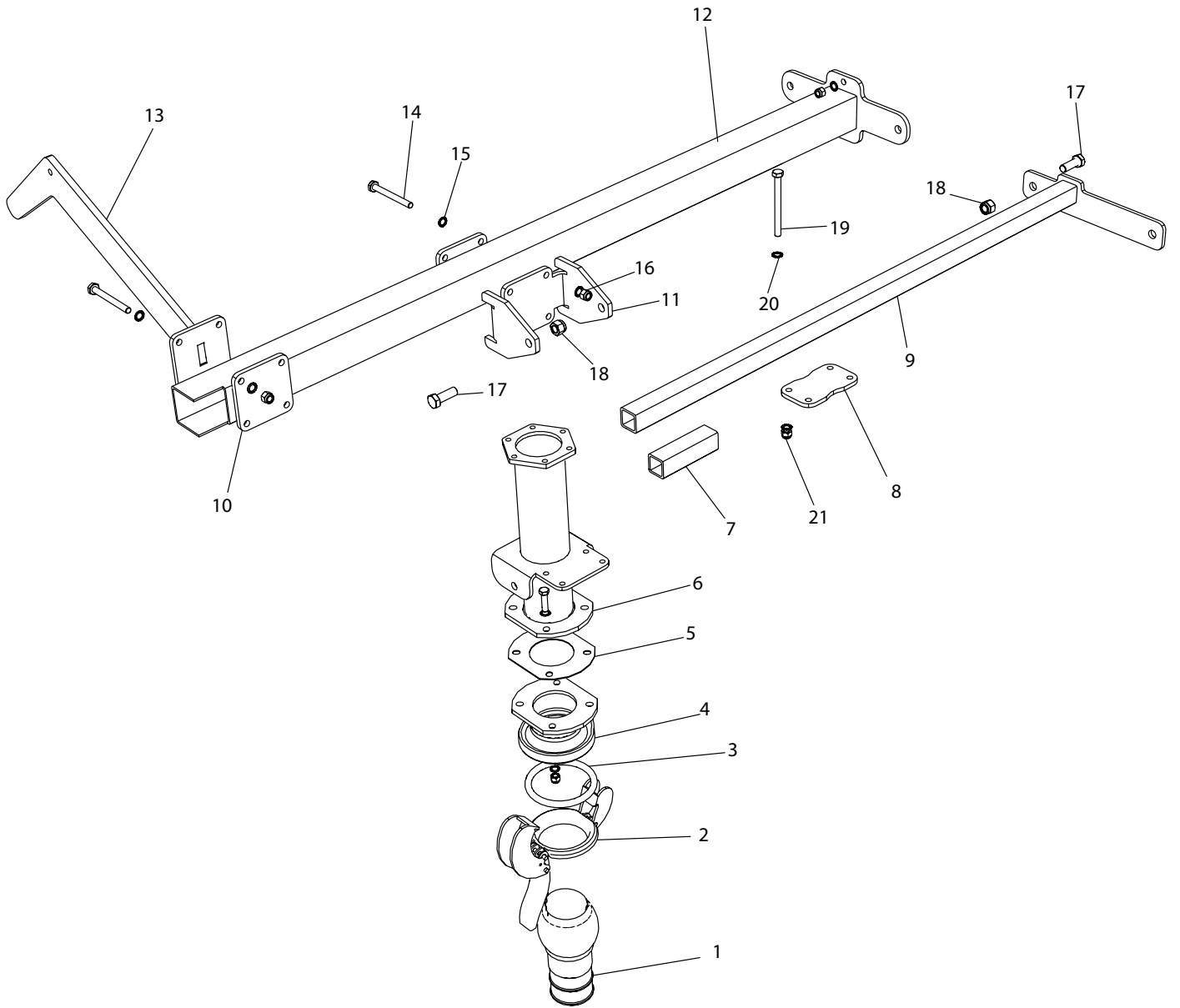




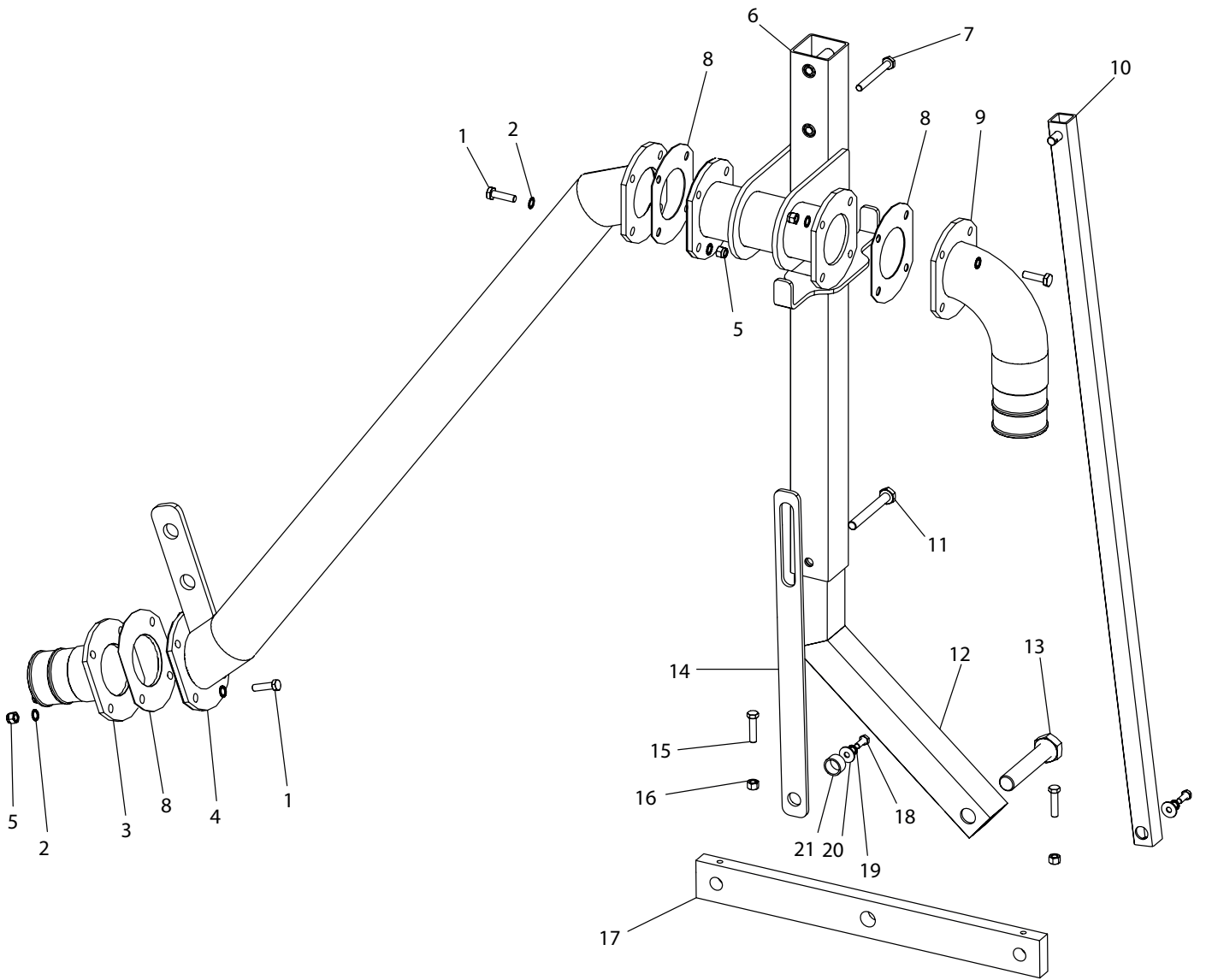




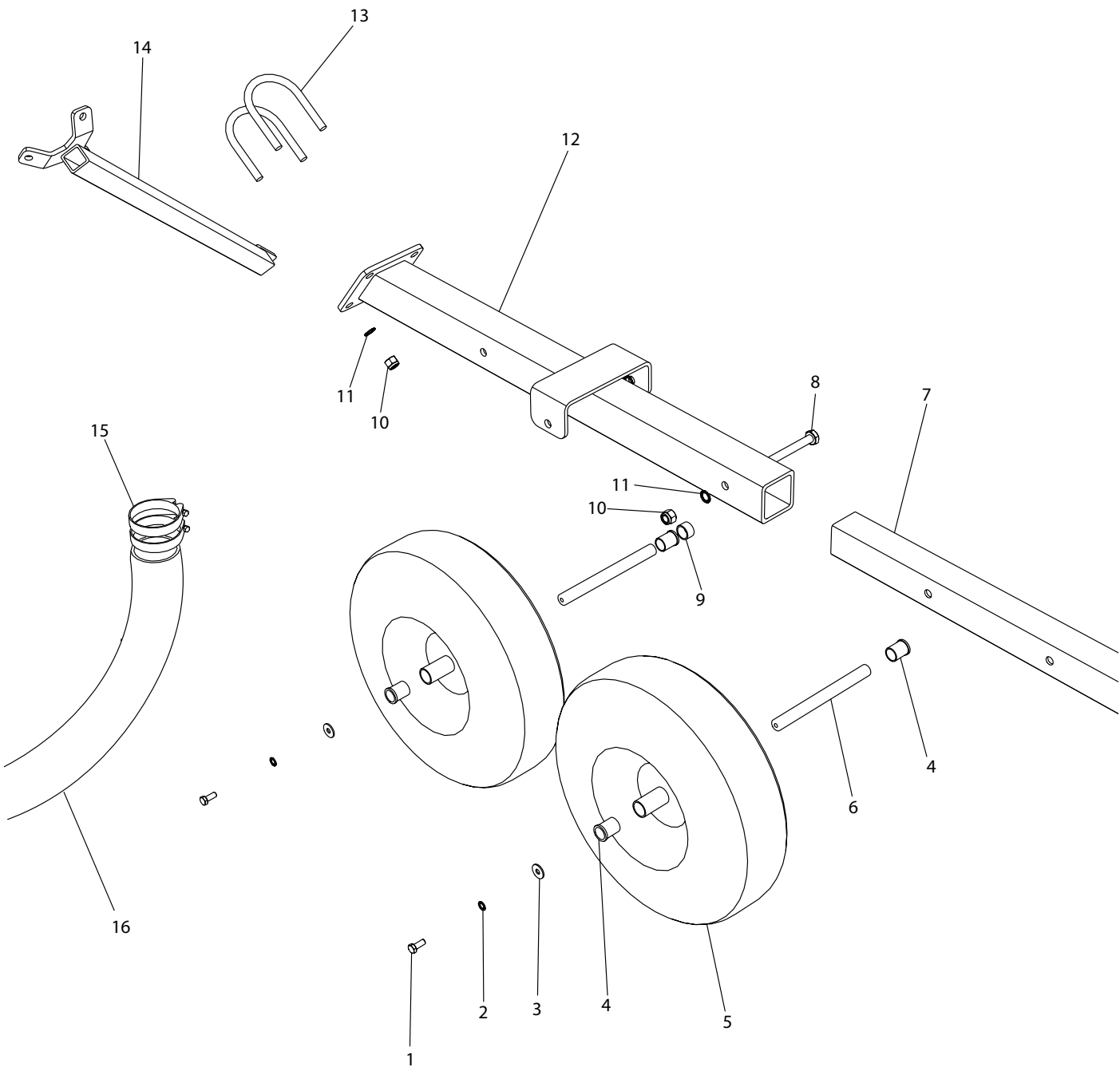
Item No.	Part No.	Qty	Description	Comments
1	022210025	2	M10x25 Steel set bolt	
2	763910	2	M10 Riplock	
3	051010	2	M10 Plain washer	
4	37000100	2	Bushing Gun trailer	
5	2010417	1	Wheel shaft for gun trailer	
6	830600	1	Wheel	
7	37000066	1	Bushing Front wheel	
8	022212050	1	M12x50 Steel set bolt	
9	2010217	1	Single-wheel leg Gun trailer	
10	021012100	2	M12x100 Steel bolt	
11	763912	8	M12 Riplock	
12	2010220	1	Unwinding bar	
13	044012	4	M12 Lock nut	
14	2010438	2	Clamping bracket for gun trailer	
15	021012110	2	M12x110 Steel bolt	
16	2010222	1	Cross bar	



Item No.	Part No.	Qty	Description	Comments
1	14050386	1	HK 108 Ball with hose connector	
2	14050013	1	Galv. Locking ring	
3	14050043	1	Rubber ring	
4	1009328	1	Flange with HK Cup	
5	631109	1	Gasket	
6	2010257	1	Holder for gun pipe	
7	2011381	1	Spacer profile	
8	2010264	1	Clamping plate for profile gun trailer	
9	2010267	1	Adjustment tube	
10	2011124	2	Clamping plate gun trailer	
11	2010250	1	Clamping plate for gun	
12	2010222	1	Cross bar	
13	2010282	2	Support arm	
14	021012120	4	M12x120 Steel bolt	
15	763912	8	M12 Riplock	
16	044012	4	M12 Lock nut	
17	022216045	4	M16x45 Steel set bolt	
18	044016	4	M16 Lock nut	
19	021010110	12	M10x110 Steel bolt	
20	763910	24	M10 Riplock	
21	044010	12	M10 Lock nut	



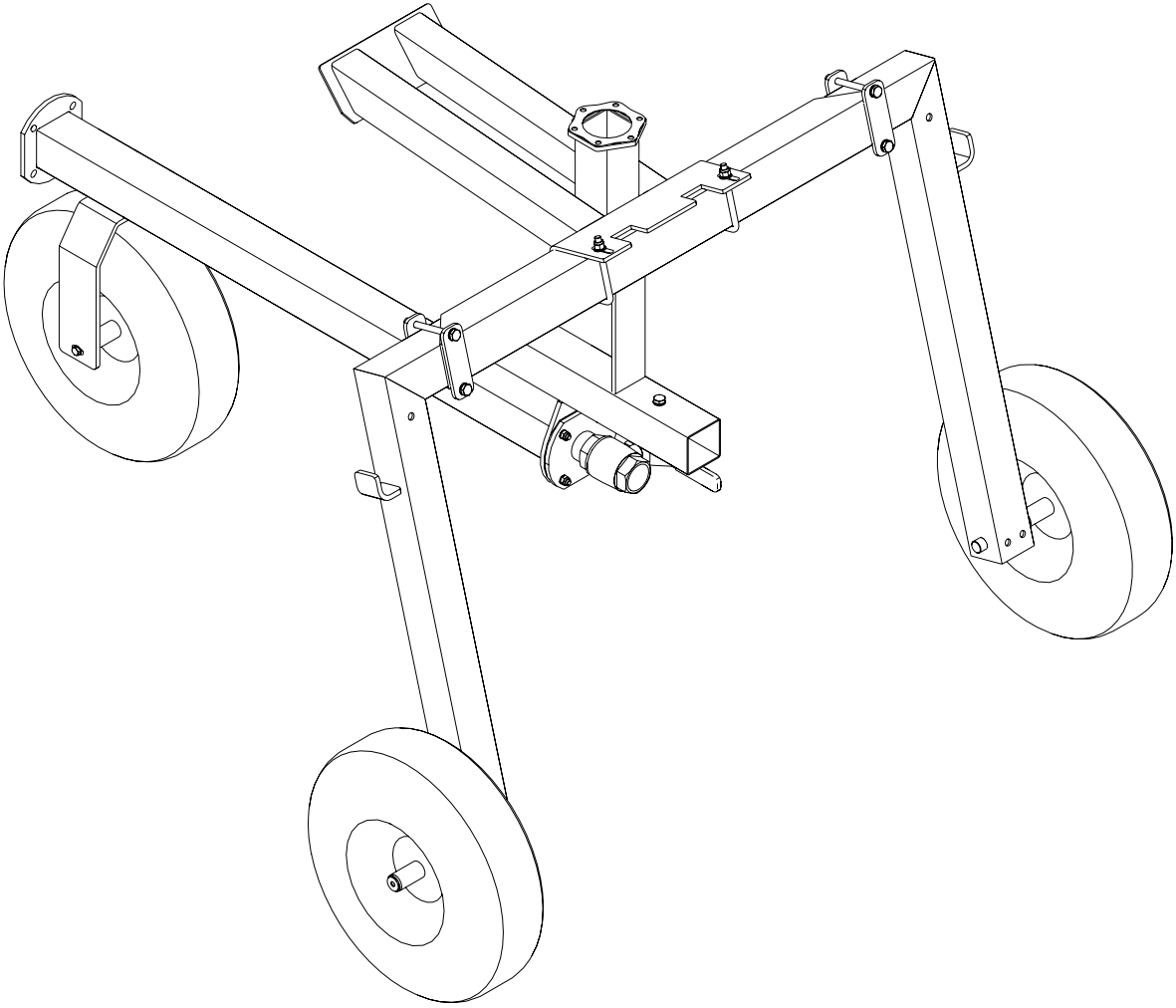
Item No.	Part No.	Qty	Description	Comments
1	021012045	12	M12x45 Steel bolt	
2	763912	24	M12 Riplock	
3	15000127	1	Hose connector with flange	Ø125 mm
3	15000121	1	Hose connector with flange	Ø110 mm
4	2010242	1	Feed pipe	
5	044012	12	M12 Lock nut	
6	2010226	1	Stand Gun trailer	
7	021012110	2	M12x110 Steel bolt	
8	631109	3	Gasket	
9	2010248	1	Bend Gun trailer	
10	2010374	1	Control arm	
11	021016130	1	M16x130 Steel bolt	
12	2010231	1	Stand Gun trailer	
13	021030160	1	M30x160 Steel bolt	
14	2010277	1	Control bracket	
15	022212050	2	M12x50 Steel set bolt	
16	040412	2	M12 Steel nut	
17	2010888	1	Bogie for right wheel	
18	022210025	2	M10x25 Steel set bolt	
19	763910	2	M10 Riplock	
20	051010	2	M10 Plain washer	
21	37000066	1	Bushing Front wheel	

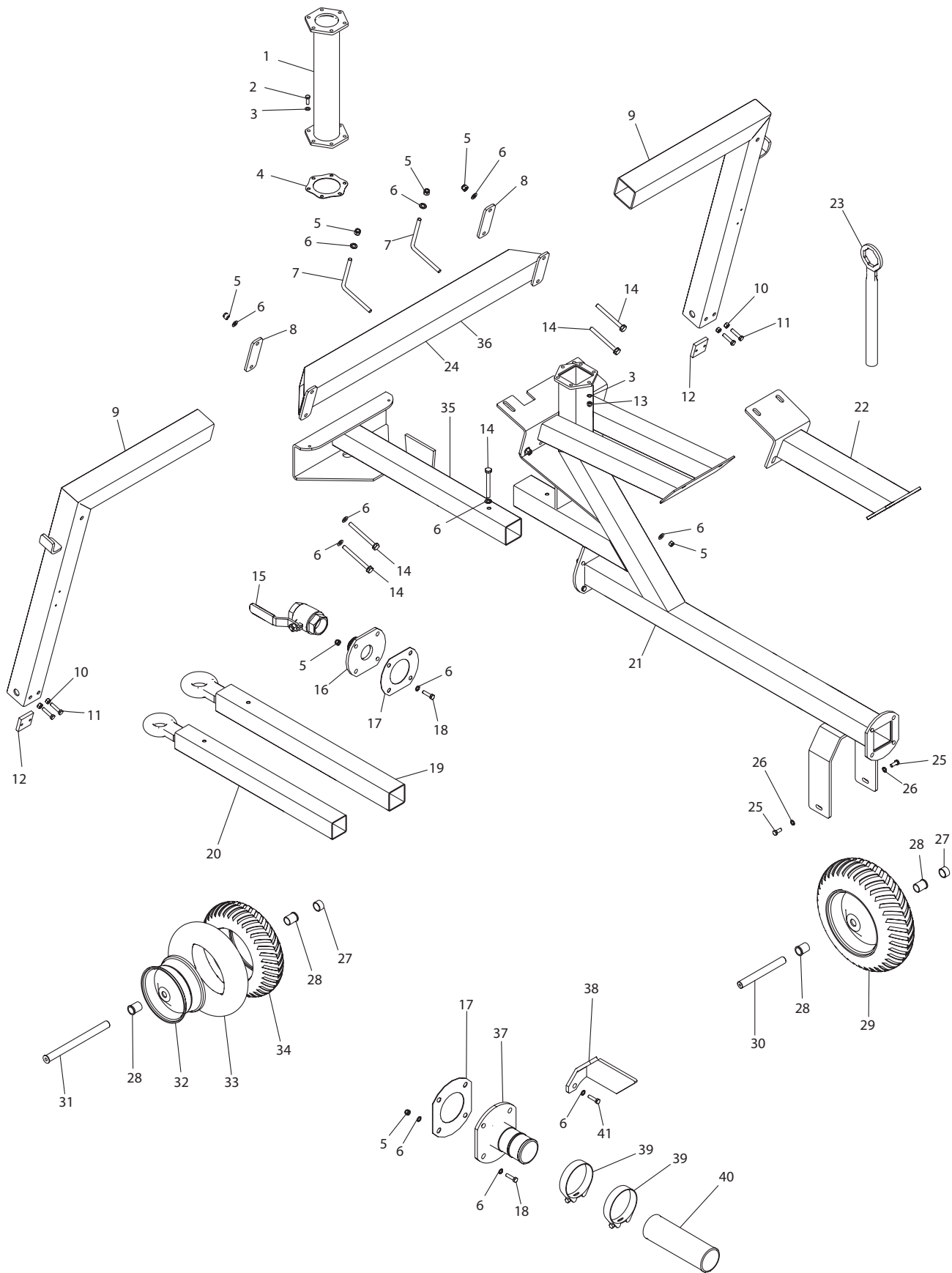


Item No.	Part No.	Qty	Description	Comments
1	022210025	2	M10x25 Steel set bolt	
2	763910	2	M10 Riplock	
3	051010	2	M10 Plain washer	
4	37000100	4	Bushing Gun trailer	
5	830600	2	Wheel	
6	2010417	2	Wheel shaft	
7	2010053	1	Hitch hook	
8	021016120	2	M16x120 Steel bolt	
9	37000066	1	Bushing Front wheel	
10	044016	6	M16 Lock nut	
11	763916	6	M16 Riplock	
12	2010271	1	Drawbar profile	
13	2003693	2	U-bar	
14	2010281	1	Brace	
15	16200350	4	Hose clamp	
16	SL509102	1.65	Lightflex Hose 165 cm	

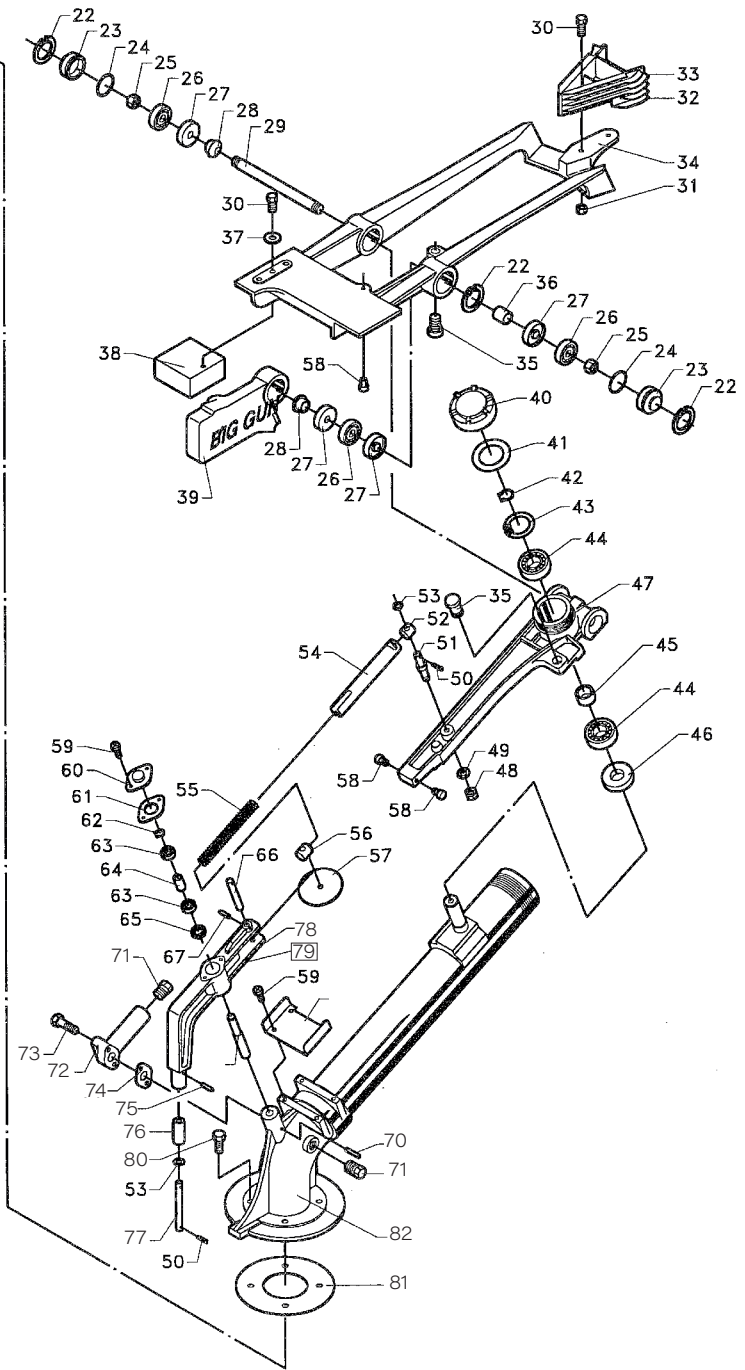
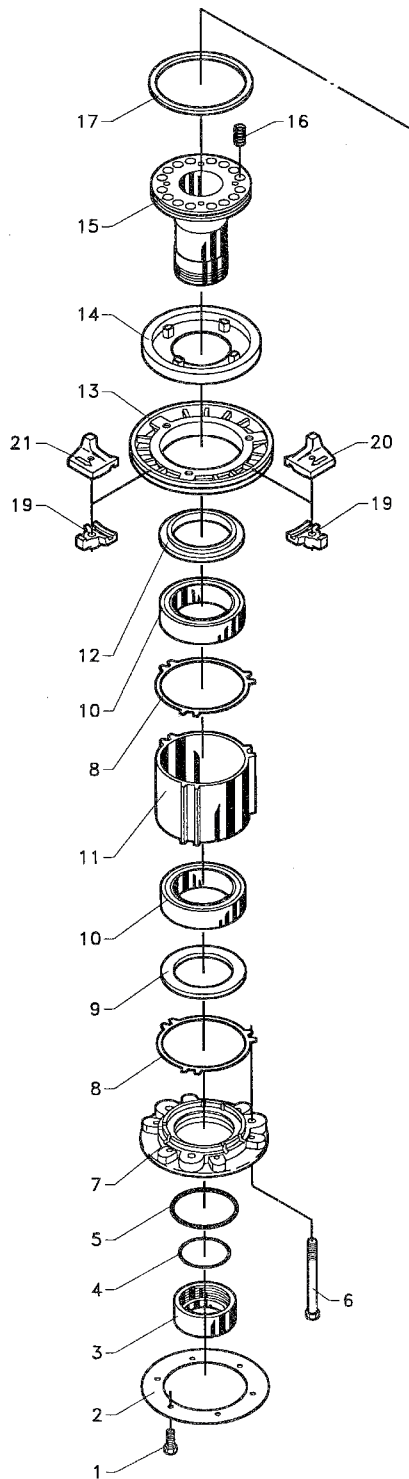




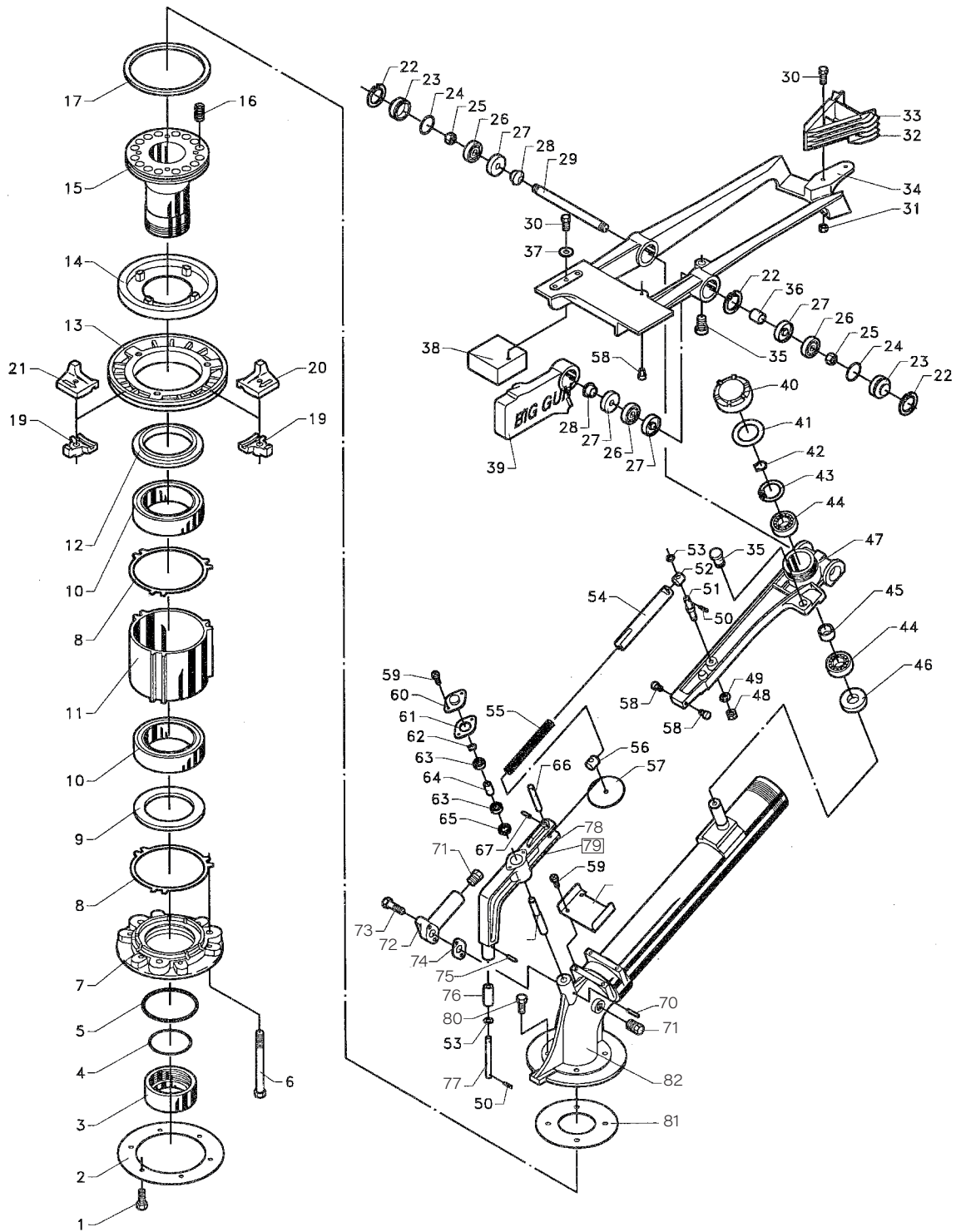




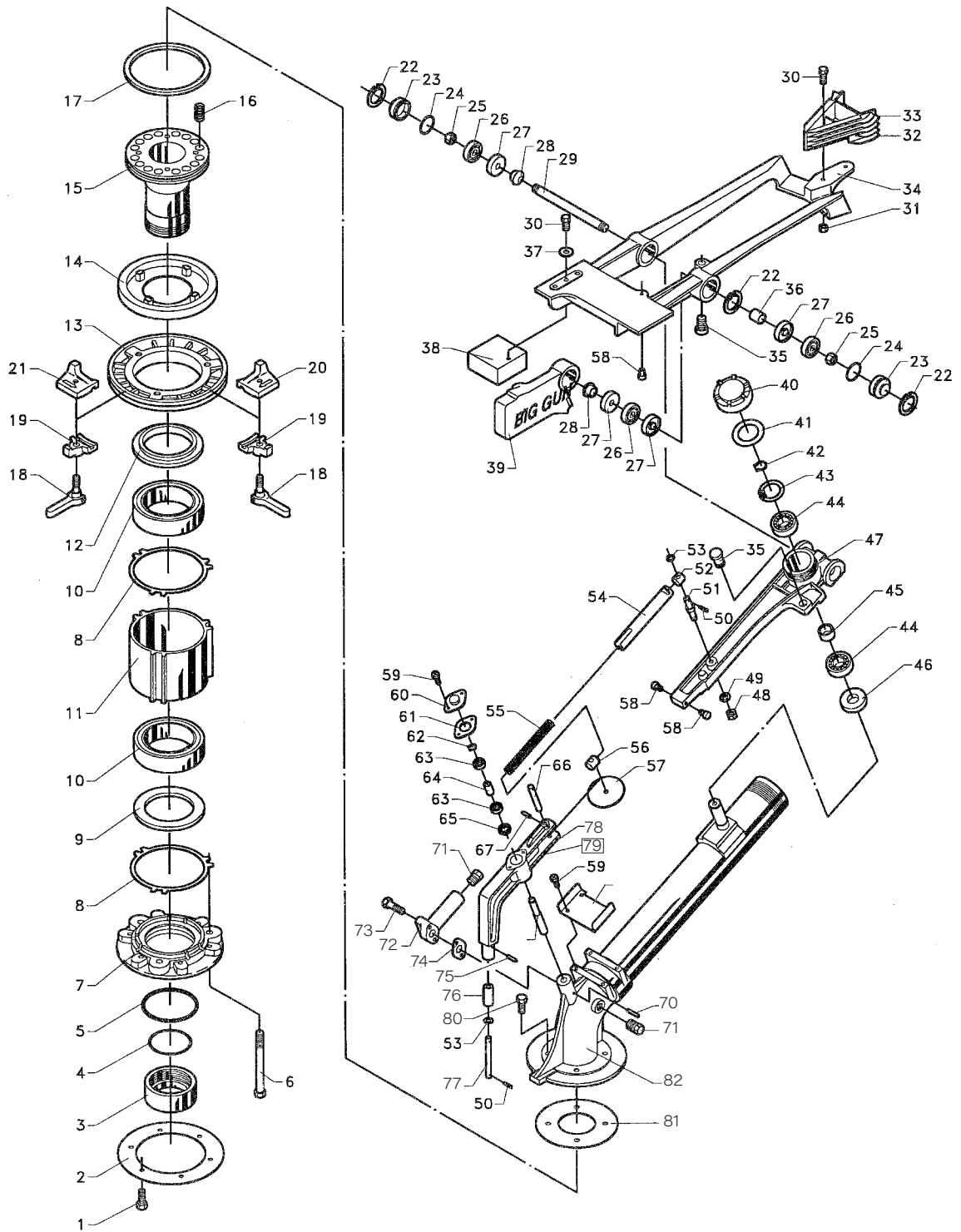
Item No.	Part No.	Qty	Description	Comments
1	762006	1	Height extender pipe for gun	500 mm
1	762005	1	Height extender pipe for gun	250 mm
2	021010040	6	M10 x 40 Steel bolt	
3	050310	12	M10 Plain washer	
4	761614	1	Flange gasket	
5	044012	16	M12 Lock nut	
6	050312	32	M12 Plain washer	
7	37000064	4	Tension bar	
8	37000062-3	2	Clamping plate for gun trailer	
9	17000017	2	Leg for gun trailer	
10	040410	4	M10 Steel nut	
11	022210035	4	M10 x 35 Set bolt	
12	37000036	2	Thread plate for wheel leg	
13	044010	6	M10 Lock nut	
14	021012120	5	M12 x 120 Steel bolt	
15	540116	1	Ball valve	
16	2007223	1	Flange for ball valve	
17	631109	2	Gasket	
18	021012045	4	M12 x 45 Steel bolt	
19	17000043	1	Unwinding hook Ø50 Drawbar eye	
20	17000039	1	Unwinding hook Ø40 Drawbar eye	
21	2009243	1	Gun trailer body	
22	17000024	1	Additional lifting arm	For wide model
23	761295	1	Nozzle key	
24	17000037	1	Overhanging 3m width	
24	17000037-1	1	Overhanging 2m width	
25	022210020	2	M10 x 20 Set bolt	
26	050320	2	M20 Plain washer	
27	37000066	2	Bushing Front wheel	
28	37000100	2	Bushing gun trailer	
29	830600	3	Comp wheel	
30	37000065	1	Wheel shaft	
31	17000019	2	Wheel shaft	
32	830602	3	Rim	
33	830604	3	Hose	
34	830606	3	Wheel	
35	17000020	1	Unwinding hook	
36	17000018	1	Overhanging for gun trailer	
36	2014095	1	Overhanging for gun trailer wide model	Drives wheel/wheels
37	15000037 15000120 15000127	1	Hose connector Ø100 Hose connector Ø110 Hose connector Ø125	
38	2014853	1	Stop buffer	
39	16200730 16200732 16200735	2	Hose clamp Ø100 Hose clamp Ø110 Hose clamp Ø125	
40			Hose	
41	021012065	1	M12 x 65 Steel bolt	



<b>Item No.</b>	<b>Part No.</b>	<b>Qty</b>	<b>Description</b>	<b>Comments</b>
1	022208025	1	Bolt	
2	761614	1	Flange gasket for gun	
3	778402	1	Lock nut	
4	776548	1	O-ring	
5	778475	1	O-ring	
6	778462	3	Bolt	
7	778401	1	Base piece	
8	778461	2	Gasket	
9	778373	1	Sealing ring	
10	776253	2	Ball bearing	
11	778405	1	Bearing housing	
12	778372	1	Sealing ring	
13	778400	1	Brake disc	
14	778371	1	Brake lining	
15	778459	1	Bearing pipe	
16	778474	12	Spring	
17	778473	1	Sealing ring	
18	776849	2	Bolt	
19	776371	2	Bracket	
20	778432	1	Wheel chock Left	
21	778431	1	Wheel chock Right	
22	776565	3	Retaining ring	
23	776602	2	End cover	
24	776563	2	O-ring	
25	776603	2	Nut	
26	776598	3	Ball bearing	
27	776600	4	Sealing ring	
28	776607	2	Spacer pipe	
29	778465	1	Shaft	
30	776818	2	Bolt	
31	776060	2	Nut	
32	778354	1	Drive blade	
34	778364	1	Drive arm	
35	778139	2	Rubber stop	
36	778327	1	Spacer pipe	
37	776070	1	Flat washer	
38	778433	1	Weight block	
39	778366	1	Counterweight	
40	778233	1	Cover	
41	778272	1	Gasket	



Item No.	Part No.	Qty	Description	Comments
42	778323-017	1	Retaining ring	
43	776045	1	Retaining ring	
44	776054	2	Ball bearing	
45	778326	1	Spacer pipe	
46	776048	1	Oil seal ring	
47	778394	1	Switch lever	
48	776064	1	Nut	
49	777029	1	Washer	
50	776714	2	Split pin	
51	778197	1	Bolt	
52	778282	1	Shaft	
53	778409	2	Flat washer	
54	778446	1	Pipe	
55	778470	1	Spring	
56	778417	1	Shaft	
57	778336	1	Washer	
58	776580	3	Stop pin	
59	778311	4	Screw	
60	778263	1	Cover	
61	778265	1	Gasket	
62	778323-004	1	Retaining ring	
63	778321	2	Bearing	
64	778281	1	Spacer pipe	
65	778317	1	Seal	
66	778193	1	Pin	
67	778320	1	Split pin	
68	778448	1	Plate	
69	778274	1	Shaft	
70	776931	1	Locking pin	
71	776089	2	Plug	
72	778497	1	Nozzle pipe	
73	776059	2	Bolt	
74	778511	1	Gasket	
75	778322	1	Split pin	
76	778277	1	Roller	
77	778276	1	Shaft	
78	778410	1	Arm trip lever	
79	778451	1	Complete switch	
80	778408	4	Bolt	
81	778460	1	Gasket	
82	778587	1	Jet pipe	

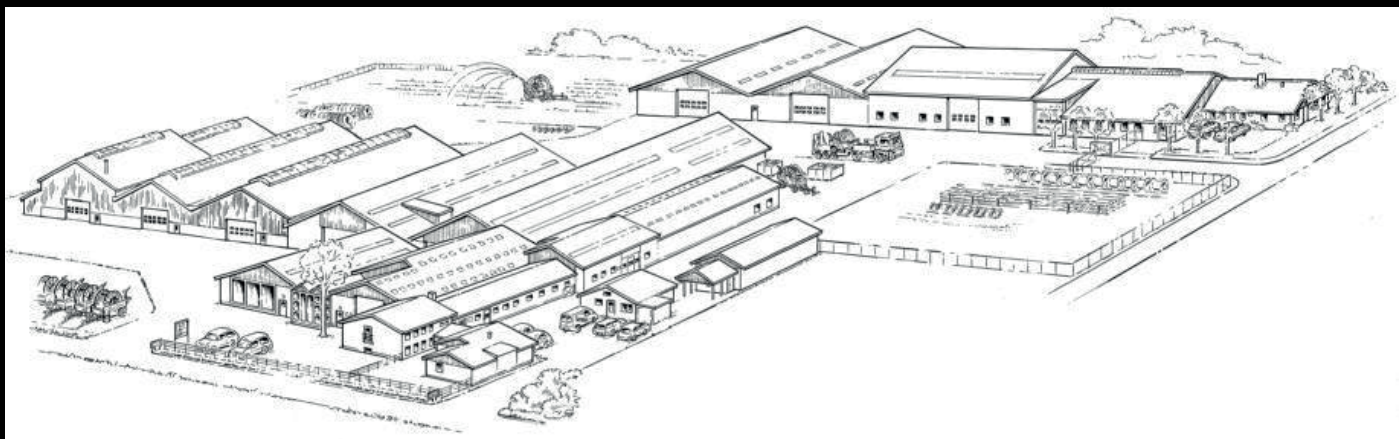




Item No.	Part No.	Qty	Description	Comments
83	770145	1	Gun	
84	7712781	1	150Tr Plastic body	
85	7712785	1	O-ring	
86	7712467	1	150Tr Plastic cap	
87	7712468-018	1	18 mm 150 tr plastic nozzle	
87	7712468-019	1	19 mm 150 tr plastic nozzle	
87	7712468-020	1	20 mm 150 tr plastic nozzle	
87	7712468-021	1	21 mm 150 tr plastic nozzle	
87	7712468-022	1	22 mm 150 tr plastic nozzle	
87	7712468-023	1	23 mm 150 tr plastic nozzle	
87	7712468-024	1	24 mm 150 tr plastic nozzle	
87	7712468-025	1	25 mm 150 tr plastic nozzle	
87	7712468-026	1	26 mm 150 tr plastic nozzle	
87	7712468-027	1	27 mm 150 tr plastic nozzle	
87	7712468-028	1	28 mm 150 tr plastic nozzle	
87	7712468-029	1	29 mm 150 tr plastic nozzle	
87	7712468-030	1	30 mm 150 tr plastic nozzle	
87	7712468-031	1	31 mm 150 tr plastic nozzle	
87	7712468-032	1	32 mm 150 tr plastic nozzle	
87	7712468-033	1	33 mm 150 tr plastic nozzle	
87	7712468-034	1	34 mm 150 tr plastic nozzle	
88	7712701	1	Complete nozzle	







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