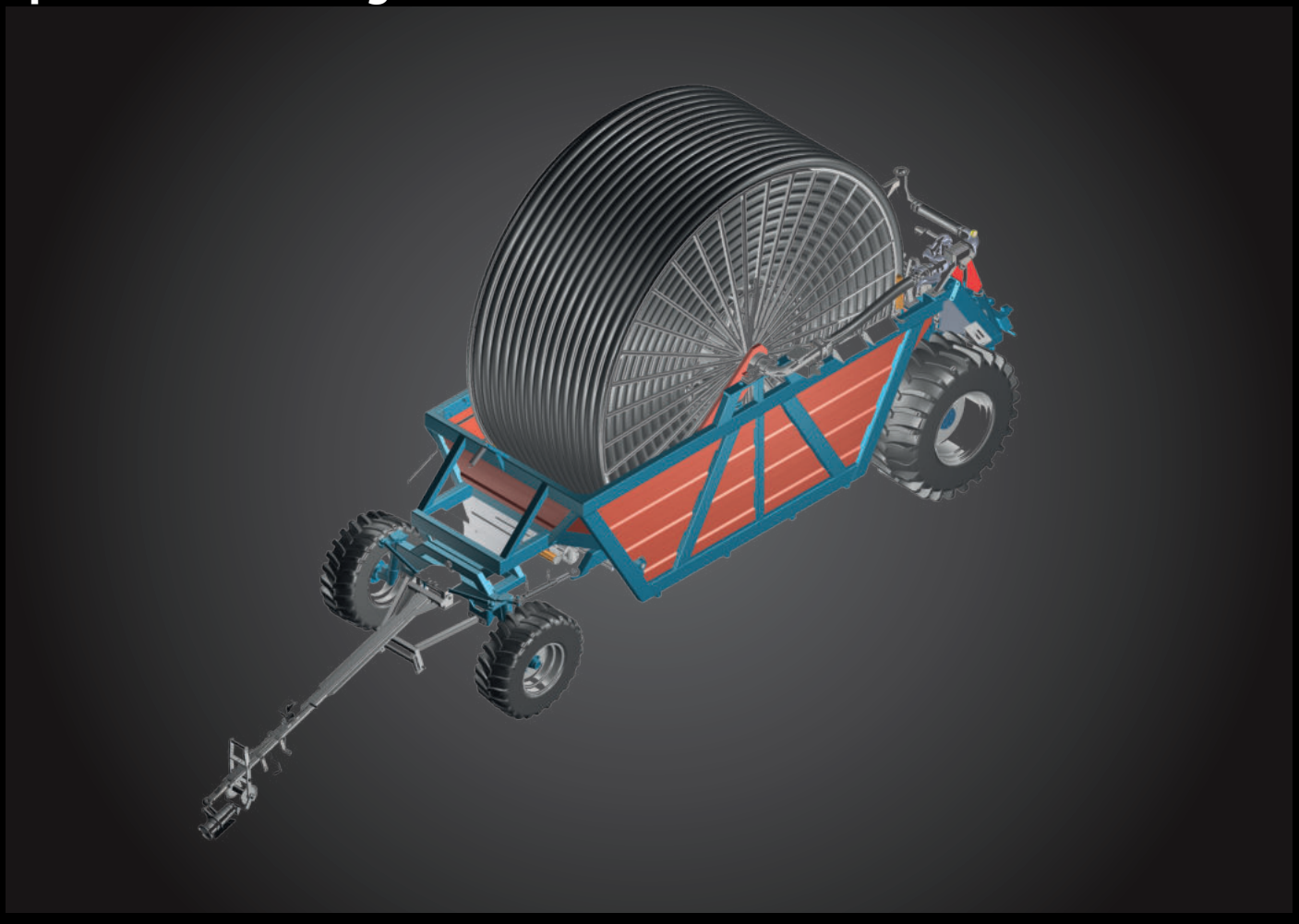
User manual &
Spare Parts Catalogue

(EN) 30-11-2021



Irrigator
FM5500H

CE

Fasterholt Maskinfabrik A/S
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Denmark

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Contents

EEC Declaration of conformity

Manufacture (name and address):

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Hereby is certified that the following product:

Description, ID/mark, type: Irrigator FM 5500H

Serial No. if any:

Notified body if any:

EEC-type certificate if any:

Harmonised standards if any: EN 908:1999+A1:2009.
DS/EN/ISO 12100:2011.
DS/EN/ISO 14120:2015.

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

Name, title and signature of manufacture:

Date

Signature

!!! Important!!!
READ THIS MANUAL BEFORE USING YOUR IRRIGATOR!!

Operating instructions
for Fasterholt FM 5500H

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

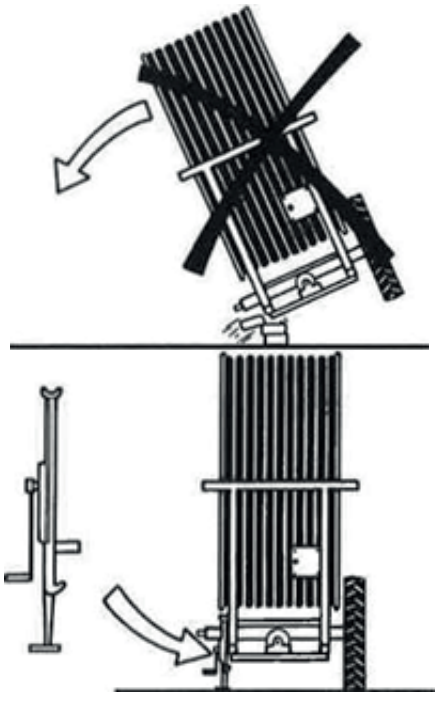
To ensure that the machine complies with the EU Machinery Directive, only original spare parts may be used. Otherwise, compliance will be lost and safety will be entirely at your own risk.

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

1. Safety instructions/warnings!!

- 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.
- When starting the machine on falling ground, you must be **VERY** careful not to disconnect the tractor from the machine until the machine has been put into gear, otherwise the machine may run away.
- If a rear wheel is removed, THE MACHINE MUST BE JACKED UP AND VERY STABLE, because if it overturns, it will fall completely on its side.

WARNING!!



- To perform an EMERGENCY STOP, pull the cable for the miswinding bar or press STOP on the COMPUTER.
- V-belts may only be fitted after the machine has been unwound for the first time. (only the first time the machine is used for irrigation.)
- The gun must face out to the side when unwinding the machine.
- **STAND ASIDE** when the gun is operating.
- **WARNING** against contact with overhead power lines with the machine or water jet. Avoid irrigation on or near power lines.
- During transport on uneven roads/fields, move VERY carefully according to the conditions.
- Max. transport speed with water in the hose is 15 km/h.
- When parking the machine, use the wheel chocks mounted by the rear wheels.
- **DANGER!!** Avoid welding in the paint layer! Before welding, remove all paint from the welding area
- Avoid inhalation of grinding dust.
- Hydraulic oil can be harmful to health:
- Skin contact may cause allergies.
- Inhalation of oil mist may cause lung disease.
- Leakage of oil under high pressure is dangerous, an oil jet can enter the skin, eyes, etc.
- If a hydraulic system leak is found, stop the system immediately and rectify the fault.
- Note that due to operation, the oil may be 70 degrees Celsius or even hotter. This can lead to a risk of scalding during separation.

- **IMPORTANT** Maximum battery charging power is 2 amps. Charging more than 2 amps may cause the battery to crack. The battery must be charged at a temperature between 0 °C and +40 °C. NEVER place the battery in a sealed container while charging. During winter, the battery must be removed and stored in a dry place indoors in a fully charged state.
- Avoid sparks and flames on and around the battery.
- Do not short circuit the battery.
- Never disassemble the battery.
- If you come into contact with the battery's sulphuric acid, wash immediately with water. If acid comes into contact with eyes, rinse thoroughly with water and seek medical attention immediately.
- Pay attention to the battery compartment. If there are cracks, deformities, electrolyte leakage, etc., replace the battery immediately.
- If the battery is dirty, clean it as soon as possible.
- Disposal of oil spills:
- If oil spills are found, they should be cleaned up immediately with rags or oil absorbent powder.
- Spilled products, as well as rags and powder used for oil spills, must be stored in sealed metal containers and delivered to the municipal collection site.

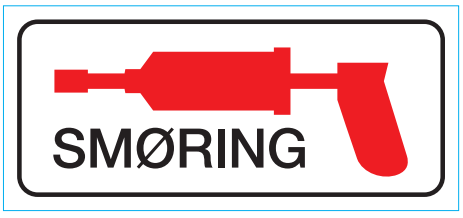
- Batteries, hoses, tyres and other parts of the irrigation machine must be disposed of at an approved recycling site.

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

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.



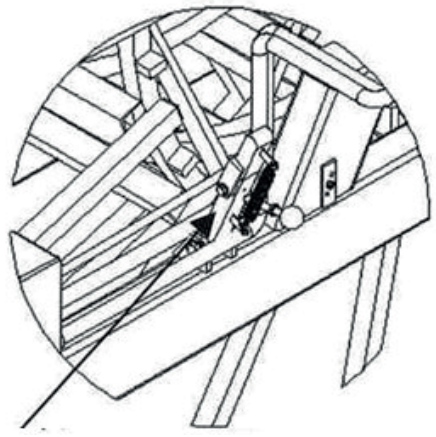
LUBRICATION Indicates lubrication is required as per the service description.

SERVICE WARNING Indicates a service hazard

Starting the FM5500H

Move the machine to the field in the transport position. When the machine is at the crop to be irrigated, disconnect the tractor from the front drawbar. Connect the tractor to the rear drawbar. Insert the electric brake connector in the female connector for the tractor lights. The machine then winds up in the crop and stops.

Disengage the stop pawl at the hose drum.



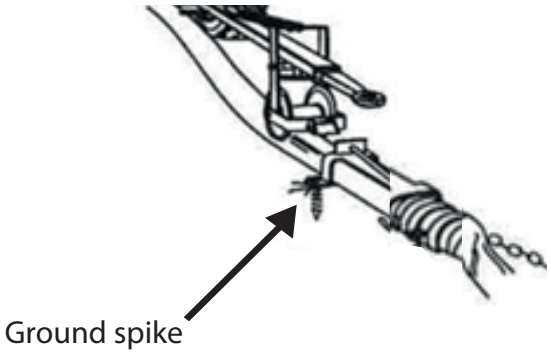
The stop pawl at the hose reel is disengaged when laying the hose.

Remember!! When starting the machine on falling ground, you must be VERY careful not to disconnect the tractor from the machine until the machine has been put into gear, otherwise the machine may run away.

Safety stop

During irrigation

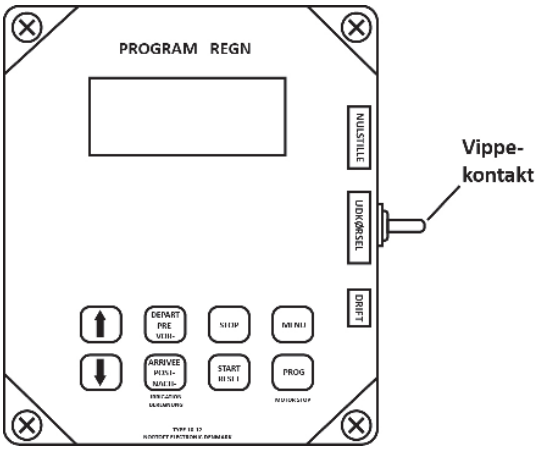
During transport



Secure the drawbar with the long ground spikes. Lower the drawbar over the hose and release the safety stop so the hose reel runs on the hose.

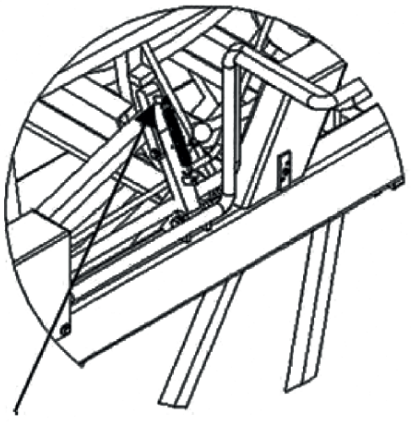
Unwind the machine at **max. 5 km/h** to keep the hose tight on the drum at all times with the electric brake. If you do not lay the hose straight out be **very careful** to ensure that the hose is always tightened on the hose drum.

The machine should be unwound completely at least every 3rd time.
Before starting to unwind the machine, reset PROGRAM RAIN. To do this, press the TOGGLE SWITCH located on the side of the electric box upwards (reset).
When unwinding the machine, the TOGGLE SWITCH must
be in the centre (unwind) so it cannot reset on the way out.
After unwinding, press the TOGGLE SWITCH down (operation).

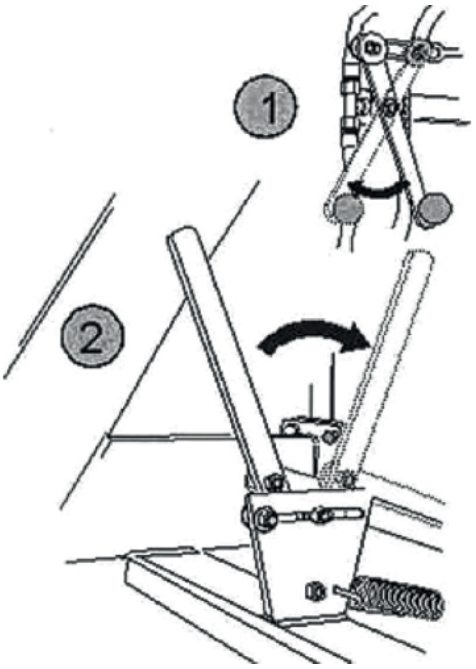


ALWAYS REMEMBER that the TOGGLE SWITCH must be pressed down during operation, otherwise the machine will not move.

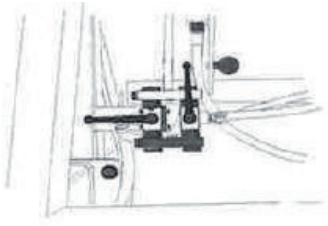
Preparing the machine for irrigation



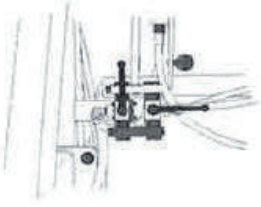
Disengage the stop pawl at the hose to enable operation.
Also remember to release the electric brake and disconnect the electric brake connector from the tractor.



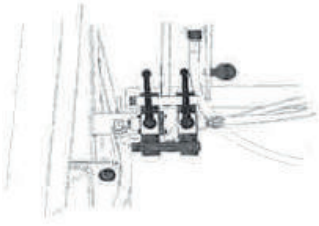
Remember to close the decoupling valve **(Lever "1" must be pulled out)** and to engage with the coupling lever.
(Lever "2" pulled out)
Attach the charge hose to the hydrant. Then open the hydrant, start the pump and irrigation can begin.
When starting irrigation, see the operating instructions for PROGRAM RAIN.
Put the machine in gear. (Remember to select the right gear for the speed you want to drive at.) (Refer to table below or on the machine for electrical control.)



1.GEAR
20-30 meter
pr. time



2.GEAR
30-45 meter
pr. time



3.GEAR
45-90 meter
pr. time

Preparing the machine after irrigation

After each irrigation, open the bypass valve **(Lever "1" must be pushed in)** to get the gearbox out of gear **(Lever "2" pulled out).** If there is tension in the rear axle assembly, use a fork wrench to turn the input shaft to release the coupling.

ALWAYS REMEMBER THE COUPLING MUST BE RELEASED (COUPLING LEVER PULLED BACK) WHEN THE MACHINE IS NOT MOVING BY ITSELF

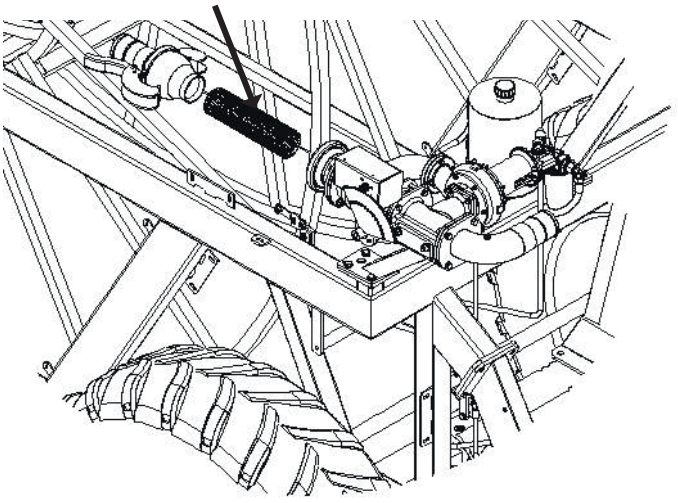
Maintenance

1x per week:
Check that no water is entering the oil on the rear axle assembly and hydraulic system.
Lubricate the steering, roller chain for hose guides, roller chain for forward traction, cross track shaft for hose guide with water-repellent grease.
Check tyre pressure:
Rear wheel air pressure: FM 5500H: 2.4 bar (Tractor pattern)
FM5500H: 2.4 bar (Grass pattern)

Front wheel air pressure: FM5500H: 2.7 bar

Check that front and rear drawbars line up.

Clean the filter at the turbine outlet if required



Check that the hose is positioned neatly on the hose drum.
Remember to check the guide pins in the hose guides regularly.

Remember to tighten the wheel bolts regularly.
Tighten rear wheel bolts to: 450 Nm
Tighten front wheel bolts to: 330 Nm

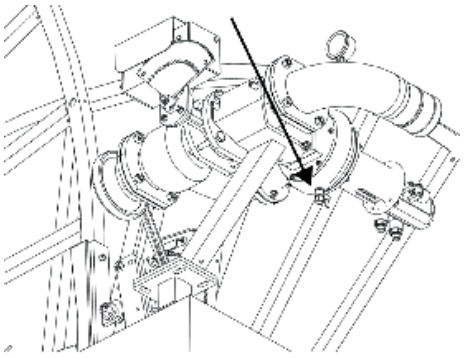
NOTE:
The battery should be charged once a month during the season to maintain full power and extend its useful life.

Preparation for winter

Drain water from the machine:
Water can only be drained from the machine with air.
Use the special compressor for draining.

REMEMBER!!
Open the filter coupling.

Open the valve in the base of the turbine



On machines with high pressure stops START to open the main valve and allow the water to flow out freely. (Disconnect battery lead so stop valve does not close again.)

Remove the battery and do not install it until the next time you use the machine.

Lubrication of:
Front wheel hubs, front spindle, hose guides, bearings on hose guides, wheels.

Check for water in the oil in the rear axle assembly and hydraulic tank. Oil in the rear axle assembly / flat gear should be changed every 1,000 hours. Hydraulic oil and filter should also be replaced every two years.

Lubricate the steering, roller chain for hose guides, roller chain for forward traction, cross track shaft for hose guide with water-repellent grease.

Check tyre pressure:

Guide pins should be replaced every year.

Faults on the Irrigator

Check the following before calling a technician:

1. If the machine is irrigating, but not moving:
   a. Check that machine is in gear.
   B. Check if it is performing pre-irrigation or post-irrigation. (can be seen on the display under menu 3.)
   c. Check if pressure drop valve is closed.
   d. Check that end stop sensor is in place. (can be seen on the display under menu 2.)
   e. Check that toggle switch is in operation position.
   f. Check that decoupling valve is closed (for hydraulic motor)
   g. Check that filter at turbine outlet is not blocked.
   h. Check that turbine can turn easily.

2. If the machine does not wind up the hose properly, it may be that:
   a. The hose guide needs to be adjusted: To adjust the guide, remove the chain from the hose guide to the cross track shaft. Then turn the cross track shaft until the hose guide fits the hose again. Then fit the chain.
   b. The guide pin is worn and needs to be replaced.
   c. There is not enough pressure on the drum winder. (call a technician).

3. Front and rear forced steering are not aligned and forced steering is sprung on impact:
   a. There is a leak at the coupling or assemblies, so the oil has drained out, leaving air in the system.
   b. The system must be vented. (call a technician).

Data for FM5500H with dual pump

Hose PEL 125 mm:
Capacity up to 100m^3 - hose length from 650 to 1000 m.

Wheel size:

Rear wheels: 600/65x28" x 16 ply (tractor pattern):	2.4 bar
600/55x26.5" x 16 ply (grass pattern):	2.4 bar

Front wheels: 500/50x22.5" x 16 ply - air pressure: 2.7 bar

Speed at 55 m3 and above:
20 - 45 m per hour

Weight of FM5500H:

Weight without water with 1000 m 125 mm hose:	7,940 kg.
Weight with water with 1000 m 125 mm hose:	16,590 kg.

Track width (rear wheels):	2050 mm
Gun:	Nelson SR 150

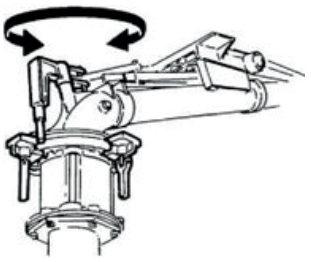
Oil and lubrication:

Oil in rear axle assembly:	27 litres 80/90 gear oil
Oil in flat gear:	1.5 litres 80/90 gear oil
Oil in oil motor gear:	3.5 litres 80/90 gear oil (every 2 years)
Hydraulic oil (Tank):	14 litres STATOIL Hydraway HVXA 46
Grease for lubrication:	STATOIL Moly Way EP2 or equivalent.

Width (rear wheels):	265 cm
Length without drawbar:	825 cm
Length with drawbar:	1060 cm
Height:	434 cm

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 show
2. Adjust the stop on the part circle to obtain the desired irrigation angle.
3. There is a 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	
	m³/h	Rad.(m)	m³/h	Rad.(m)	m³/h	Rad.(m)	m³/h	Rad.(m)	m³/h	Rad.(m)	m³/h	Rad.(m)	m³/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	
	m³/h	Rad.(m)	m³/h	Rad.(m)	m³/h	Rad.(m)	m³/h	Rad.(m)	m³/h	Rad.(m)	m³/h	Rad.(m)	m³/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	
	m³/h	Rad.(m)	m³/h	Rad.(m)	m³/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

NELSON

Functions:

Speed regulator

Pre- and Post-irrigation

4 different speeds on sections of the lane

Clock

Setting the start time

Stop time is shown on the display

Length of hose

Current speed

Battery volts

Charge regulator

Pressure sensor

Stop sensor

Speed sensor

Motor 1, regulating motor

Motor 2, stop motor

Slow start of turbine

Slow closing of inlet

Water volume + spreading width

Accessories:

GSM, SMS messages for remote control.

Analogue pressure sensor.

Short instructions for use

Place machine:

```
SPEED          30.0m/h
DOSE             22 mm
TIME  7:28 STOP 7:28
STATUS STOP Sensor
```

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:

```
SPEED          30.0m/h
DOSE             22 mm
TIME  7:56 STOP17:16
STATUS STOP Sensor
```

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

```
SPEED          25.0m/h
DOSE             26 mm
TIME  7:58 STOP17:58
STATUS STOP Sensor
```

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

Start Irrigate, Select PRE- and POST Irrigation.

```
SPEED          25.0m/h
DOSE             26 mm
TIME  7:58 STOP17:58
STATUS STOP Sensor
```

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.

Starting:

```
SPEED          25.0m/h
DOSE             26 mm
TIME  8:00 STOP18:38
STATUS Running
```

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

```
SPEED          25.0m/h
DOSE             26 mm
TIME  8:02 STOP18:38
STATUS PRE Irrigate
```

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

```
SPEED          25.0m/h
DOSE             26 mm
TIME  18:20 STOP18:38
STATUS POST Irri.
```

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:

```
SPEED          25.0m/h
DOSE             26 mm
TIME 18:38 STOP18:38
STATUS STOP Sensor
```

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

MENU's

```
SPEED          30.0m/h
DOSE             22 mm
TIME 14:10 STOP 7:43
STATUS Running
```

Standard display

```
ZONE       1   30.0m/h
DOSE             22 mm
TIME 14:10 STOP 7:43
STATUS Running
```

Standard display, ZONE irrigation is selected.

```
DISTANCE          123m
BATTERY         12.8V
CHARGE ON      0.231A
PRE.   0:45 POST 0:45
```

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

```
PRESS SENSOR        ■
STOP  SENSOR        ■
SPEED SENSOR      ■ ■
MOT1 0.0A MOT2  1.8A
```

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

```
ACTUAL SPEED    22m/h
START            0:00
STOP             7:45
WORKING HOURS    123h
```

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

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

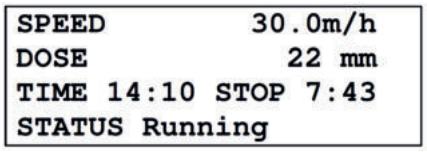
Press the **MENU** key 4 times to display menu 5

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

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:



Standard display

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.

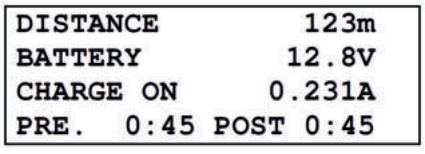
STATUS — Irrigation status, e.g.:

< 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 — 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.

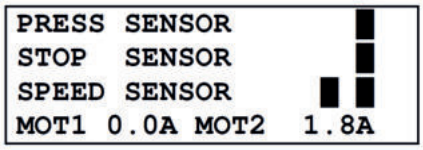
CHARGER ON — Shows when the battery is being charged by a solar cell. The battery is charged when the voltage is below 14.0 volts.

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.

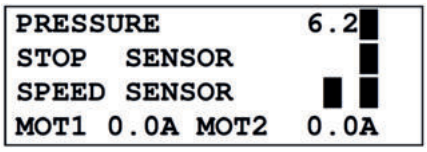
MENU 3



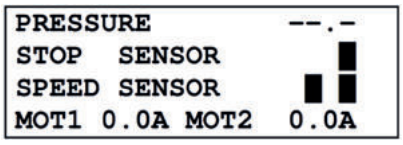
PRESSURE SENSOR

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 operate 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.



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.



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.

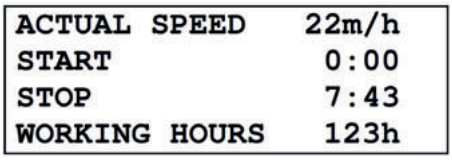
SPEED SENSOR

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

MOT1, MOT2

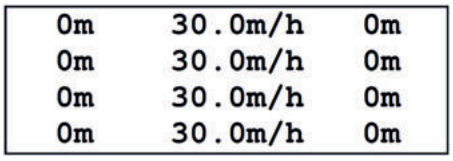
Displays the current motor current. When the current exceeds 4.5 A, the motor stops.
If the current exceeds 4.5 A and the valve is not in the outer position, there may be a blockage in the valve.

MENU 4



CURR. SPEED	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.

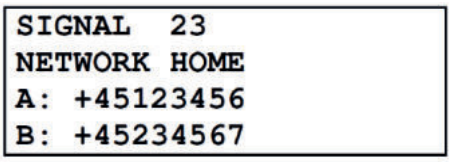
MENU 5



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 6



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 supply. 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.

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

Cons no.	Note	Fact. Adj.	Min. Value	Max. Value	Description
0		100	-	-	Enter 111 to reach machine data
1		00:00	00:00	23:59	Time in line 2 is set
2		8	1	15	Pre irrigation
3		8	1	15	Pre irrigation
4		20	0	99	Supervision time [minutes]
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 shutdown 1 = Stop for low pressure. valve opens and close again after 3 minutes 2 = Motor for stop disconnected
7		-	0	1000	Actual distance, can be set by the keyboard [m]
8		0	0	1000	Early stop [m] (* Is only performed when Post Irrigation is selected *)
9		0	0	1000	Post irrigation before stop [m]
10		0	0	1000	Distance for alarm [m] (* Disabled if Machine data 22. Sprinkler, is selected *)
11		40	5	120	Water flow [m3/h]
12		60	5	100	Spacing between irrigation lanes [m]

Set Constant no. 0 to 111 to set the machine data.
Then press **PROG** to display the machine data.

MACHINE DATA

Machine data Number Flashing digit		Possible setting	Factory setting
0	Hose length	0 - 1000 m	Not used
1	Hose diameter	40 - 200 mm	110
2	Hose drum int. Diameter	500 - 3000 mm	Not used
3	Number of hose turns per layer	5.00 - 30.00	15
4	Large gear on hose drum	50 - 1000	Not used
5	Small gear on gearbox	5 - 40	Not used
6	Number of magnets	1 - 20	Not used
7	Ovality compared to 100 %	0.70 - 1.00	0.85
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.	4.5
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 FM4300 & FM4300H = 73.5 mm (2 magnets) FM4300 & FM4300H = 38.8 mm (4 magnets) FM4400 & FM4400H = 46.2 mm (4 magnets) Old Rear axle assembly FM4400 & FM4400H = 46.0 mm (4 magnets) New Rear axle assembly FM4500 & FM4500H = 85.0 mm (2 magnets) FM4500 & FM4500H = 42.5 mm (4 magnets) FM4550 & FM4550H = 46.2 mm (4 magnets) Old Rear axle assembly FM4550 & FM4550H = 46.0 mm (4 magnets) New Rear axle assembly FM4800H = 43.3 mm (4 magnets) Old Rear axle assembly FM4800H = 46.0 mm (4 magnets) New Rear axle assembly FM4900H = 103.0 mm (2 magnets) FM4900H = 51.5 mm (4 magnets) FM4900H = 46.8 mm (4 magnets) New Rear axle assembly FM5500H = 47.0 mm (4 magnets) FM5500H = 47.0 mm (4 magnets) New Rear axle assembly 62.5 = When moving with roller Ø80 [mm] 0 = Moves according to formula (with data number 0 to 7)	0 - 160.0 mm	
16	Speed sensor 0 = Round sensor for roller 1 = Double sensor	0 1	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

40		0	0	2	Analog Pressure gauge 0 = Digital switch 1 = Analog pressure gauge – Display units [BAR] 2 = Analog pressure gauge – Display units [PSI]
41		0.50	0,10	5.00	Voltage Offset [V]
42		0.20	0,05	5.00	Voltage gain [V]
43		3.5	0,0	25.0	Pressure setpoint 0.0 –25.0 [BAR] Pressure level 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 Default settings 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.

Program Rain 10	18 Pol Connector	
Cable connection	Version n.n1	Double sensor
1 + Battery	Brown	12 V
2 - Battery	Blue	
3 + Solar Panel	Brown	
4 - Solar Panel	Blue	
5 Motor 1	Speed Regulation	
6 Motor 1	Speed regulation	
7 Speed Sensor 1 *	Blue	
8 Speed Sensor 1 *	Black	
9 Speed Sensor 2 *	Yellow/green	
10 Speed Sensor 2 *	Brown	
11 Stop Sensor	Blue or Brown	
12 Stop Sensor	Blue or Brown	
13 Motor 2		Stop Motor
14 Motor 2		Stop Motor
15 Pressure	Blue or Brown	
16 Pressure	Blue or Brown	
17 - BIP Motor 3	Brown	Sprinkler
18 + BIP Motor 3	Blue	Sprinkler

* If the distance counter count the wrong way, the speed sensor should be turned.

Round sensor

Program Rain 10		
Cable connection	Version n.n0	Round sensor
1 + Battery	Brown	12 V
2 - Battery	Blue	
3 + Solar Panel	Brown	
4 - Solar Panel	Blue	
5 Motor 1	Speed Regulation	
6 Motor 1	Speed regulation	
7 Speed Sensor	Blue	
8 Speed Sensor *	Black	
9 Speed Sensor *	Yellow/green (Red)	
10 Speed Sensor	Brown	
11 Stop Sensor	Blue or Brown	
12 Stop Sensor	Blue or Brown	
13 Motor 2		Stop Motor
14 Motor 2		Stop Motor
15 Pressure	Blue or Brown	
16 Pressure	Blue or Brown	
17 BIP – Motor 3	Brown	Sprinkler
18 BIP + Motor 3	Blue	Sprinkler

* If the distance counter count the wrong way, the cable on terminal 8 and 9 must be interchange.

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

Technical data

Dimension (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.
See page 21. CONSTANT no. 7

Combining the various constants:

The machine will always be able to run with the factory-set constants. However, there will be different conditions from farm to farm and from machine to machine. Many requests can be met by changing the constants.

1. Slow start-up of turbine. Set machine data no. 13 initially to approx. 2-4.
This causes the speed regulator valve to close only about halfway, after which continued closing is performed in steps until the rewind speed reaches the set speed. The valve can then be fine-tuned to close first to the point where the turbine starts running and then to close in steps until the set speed is achieved.

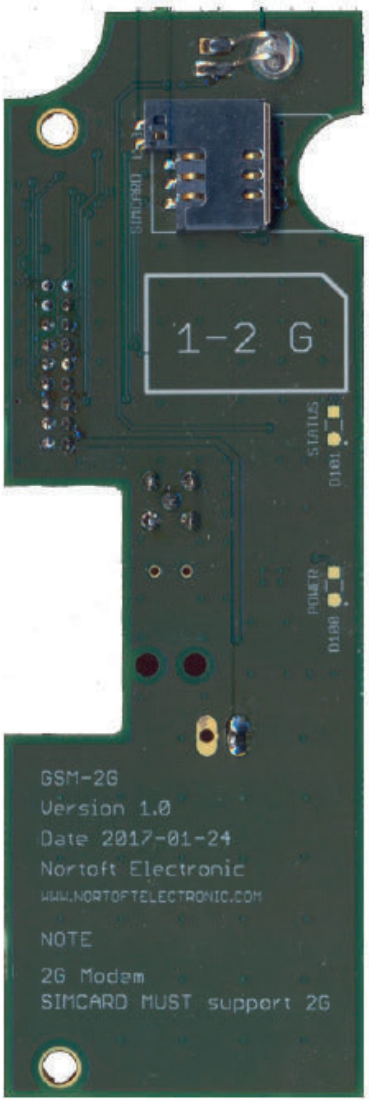
2. Slow opening of inlet. Set machine data no. 17 to 1.
Opening for the water is then performed in steps.

3. Only one motor for speed regulation, set machine data no. 12 to 0.
Post-irrigation starts once the turbine stops, when the magnet at the stop sensor is affected. After the post-irrigation time has elapsed, the machine will restart and move to the mechanical stop.

4. Start up no. 2 machine when no. 1 stops. Set machine data no. 12 to 0.
With a pressostat installed on both machines, set the pressostats between the machine's operating pressure and the pump pressostat's stop pressure. For example, the operating pressure may be 6 bar and the pump stop 9 bar. Set the pressostats on the machines to 7.5 bar. No. 2 machine will then start up when the slow closing of the first machine reaches the point where the pressure in the ground line reaches 7.5 bar. Be aware that if the height difference of the fields is too great, the required pressure differentials that the pressostat must be set to may be too great.

5. The machine should stop due to low pressure and with a pressostat installed.
Set constant no. 6 to 1 and set machine data no. 12 to 2.
This means that the stop valve opens instead of closing if the line connection to the stop valve is the same.
After 2 minutes, close it again, otherwise you will not be able to obtain pressure at start-up. When machine data 12 is set to 2, the valve can only be opened with the stop sensor, stop button and monitoring. But not when the pressostat is switched off.

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 @850/900 MHz)
- 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 the desired speed 3 to 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

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

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 MONITOR:	Monitoring has stopped the machine. The machine has not moved for xx minutes. (See constant for monitoring).

How to start the system:

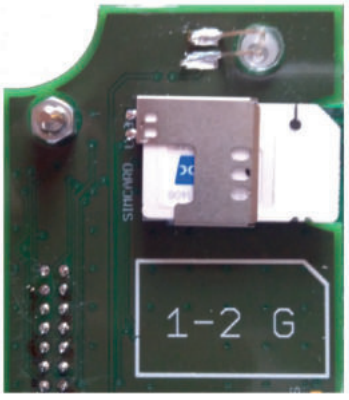
Disconnect the battery from the electronics.

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 tele numbers can be used, no speed setting
= 2 Use GSM, only the numbers created in the SMS list can be used.

See chapter for setting up data.

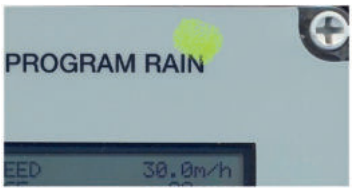
```
SPEED      11.1m/h
DOSE       22 mm
TIME       14:10   Stop 7:43
M.DATA      30              1
```

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	LED
Switched off	Off
- Searching the network - No SIM card in modem - Incorrect PIN code - No GSM network available	Flashes quickly
STANDBY (Registered on network)	Flashes slowly
Connection (TALKING)	On

When an SMS is received, the display shows:

```
Receiving SMS
#: +45123456
Status
```

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

When an SMS is sent, the display shows:

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Sending SMS
#: +45123456

Status Running
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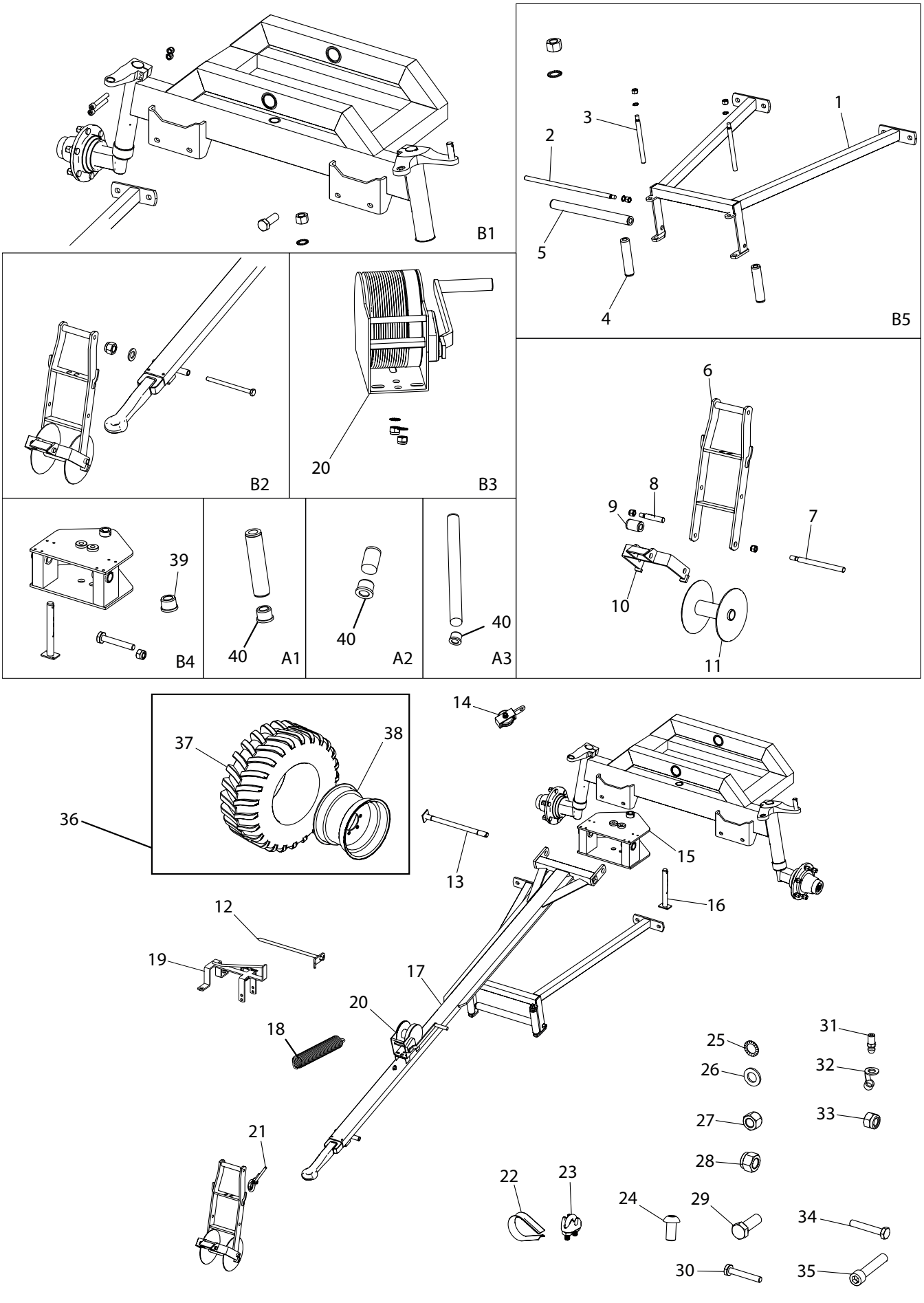
Sending an SMS, receiver's phone number and machine status.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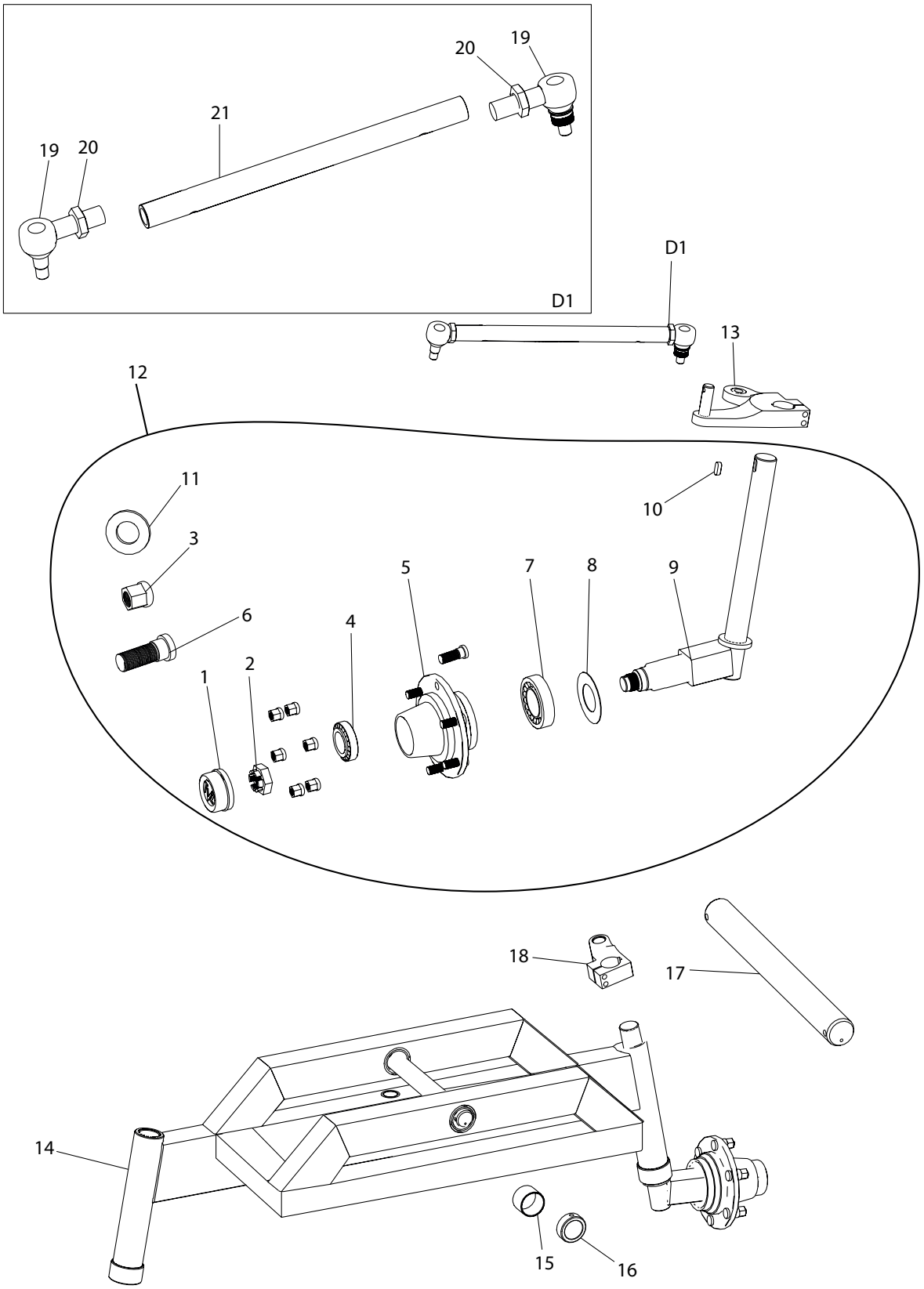
Item No.	Part No.	Qty	Description	Comments
1	2001545	1	Front hose guide	
2	1761026	1	Shaft Ø20 x 550	
3	1013094	2	Shaft Ø20 x 255	
4	761023	2	Support roller 5/4 170 mm	A1
5	1761024	1	Support roller 5/4 170 mm	A3
6	1010110	1	Bar for hose reel	
7	1010103	1	Shaft Ø20 x 290	
8	761273	1	Shaft Ø20 x 115	
9	761272	1	Support roller with bearings	A2
10	1010105	1	Safety stop	
11	1010100	1	Nose wheel	
12	1001255	2	Ground spike	
13	1008222	1	Horizontal split pin	
14	761015-10	1	Wire roller complete	
15	2001942	1	Drawbar bracket	
16	2000612	1	Vertical split pin	
17	2003348	1	Front drawbar	
18	761274	1	Spring	
19	1010118	1	Wheel chock	
20	505500	1	Winch for gun trailer	
20	762036	1	Hoisting set	
21	1013113	1	Wire from miswinding bar	
22	761012-1	1	Cable thimble	
23	761013-1	3	Cable lock	
24	095010020	2	M10 x 20 Int. hex	B3
25	763916	8	M16 Riplock	B1 & B5 & B2
26	050316	4	M16 plain washer	B1
27	040416	7	M16 Steel nut	B1 & B5 & B2
28	044012	4	M12 Lock nut	B1
29	022216045	4	M16 x 45 Set bolt	B1
30	021010065	1	M10 x 65 Steel bolt	B4
31	761286	1	Lubrication nipple	
32	761286-2	1	Cap for lubrication nipple	
33	044010	3	M10 Lock nut	B3
34	021016230	1	M16 x 230 Steel bolt	B2
35	030512085	4	M12 x 85 Int. hex	B1
36	1014105	1	Left front wheel complete	
36	1014104	1	Right front wheel complete	
37	1014106		Tyres	
38	1014107	2	Rim	
39	1008226	2	Collar bushing	
40	761271	6	Nylon bearing	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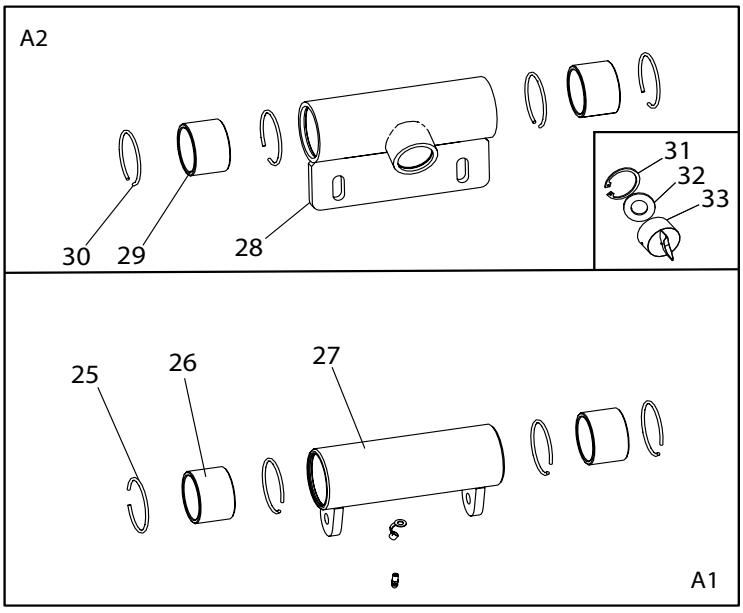
Item No.	Part No.	Qty	Description	Comments
1	1009181-6	2	Hub cap	
2	1009181-5	2	Crown nut	
3	1009181-4	12	Hub nut M18	
4	750032210	2	Tapered roller bearing	
5	1009181	2	Hub	
6	1009181-3	12	Hub bolt M18	
7	750032213	2	Tapered roller bearing	
8	1009181-7	2	Sealing washer	
9	1009185	2	Spindle arm	
10	1009188	2	Feather key	
11	1008198	5	Spacer washer for Shaft	
12	1009183	2	Spindle comp with Hub	
13	1009191	1	Spindle arm	
14	1009178	1	Front axle	
15	1008101	3	Bushing	
16	1008195	2	Stop ring for front axle	
17	2000113	1	Shaft for front axle	
18	1009192	1	Spindle arm Right	
19	1008155	4	Tie rod end	
20	1008157	4	Counter nut	
21	1009196	2	Control arm	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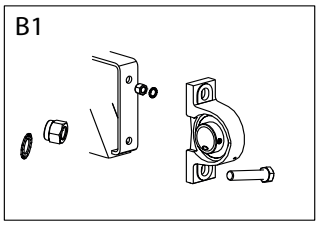
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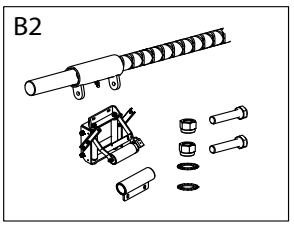
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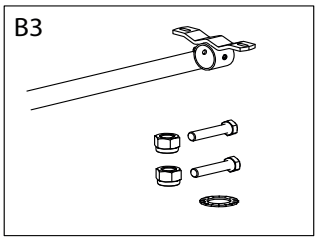
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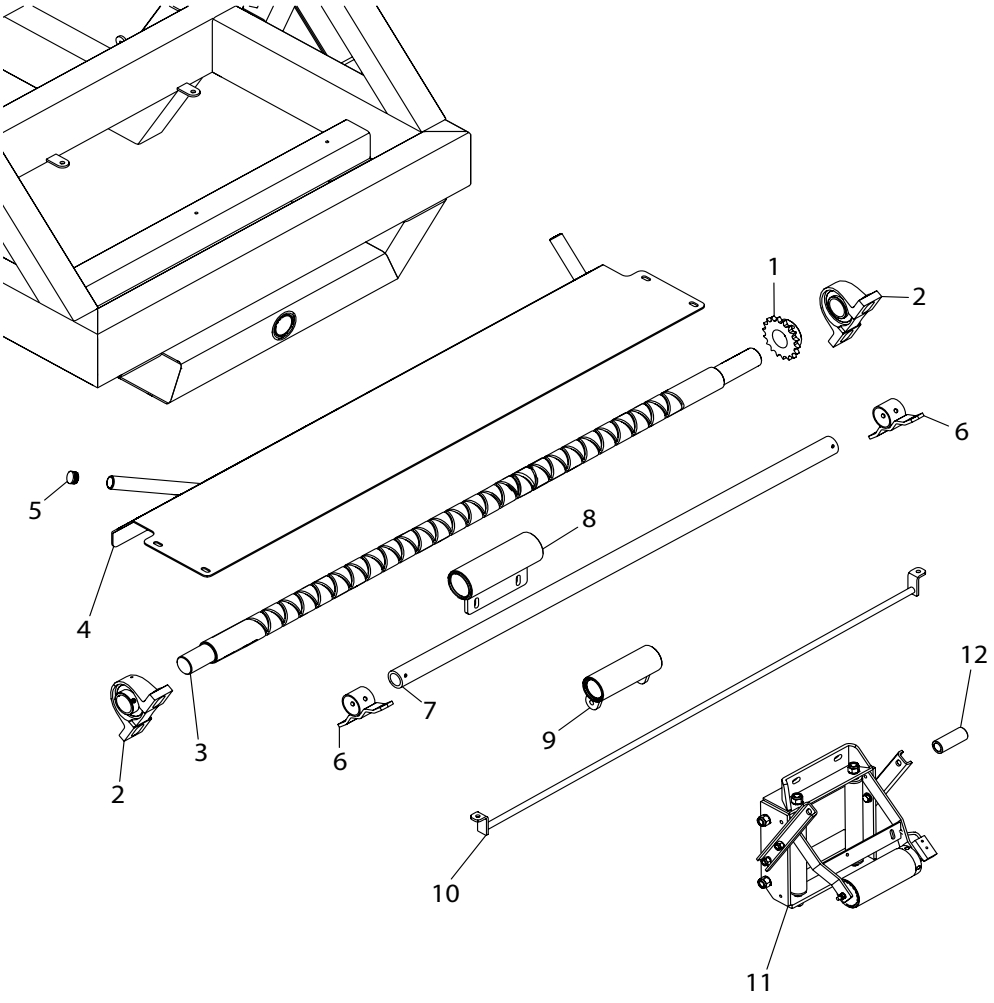
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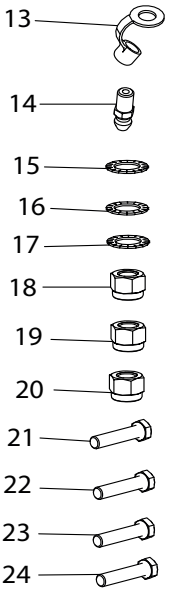
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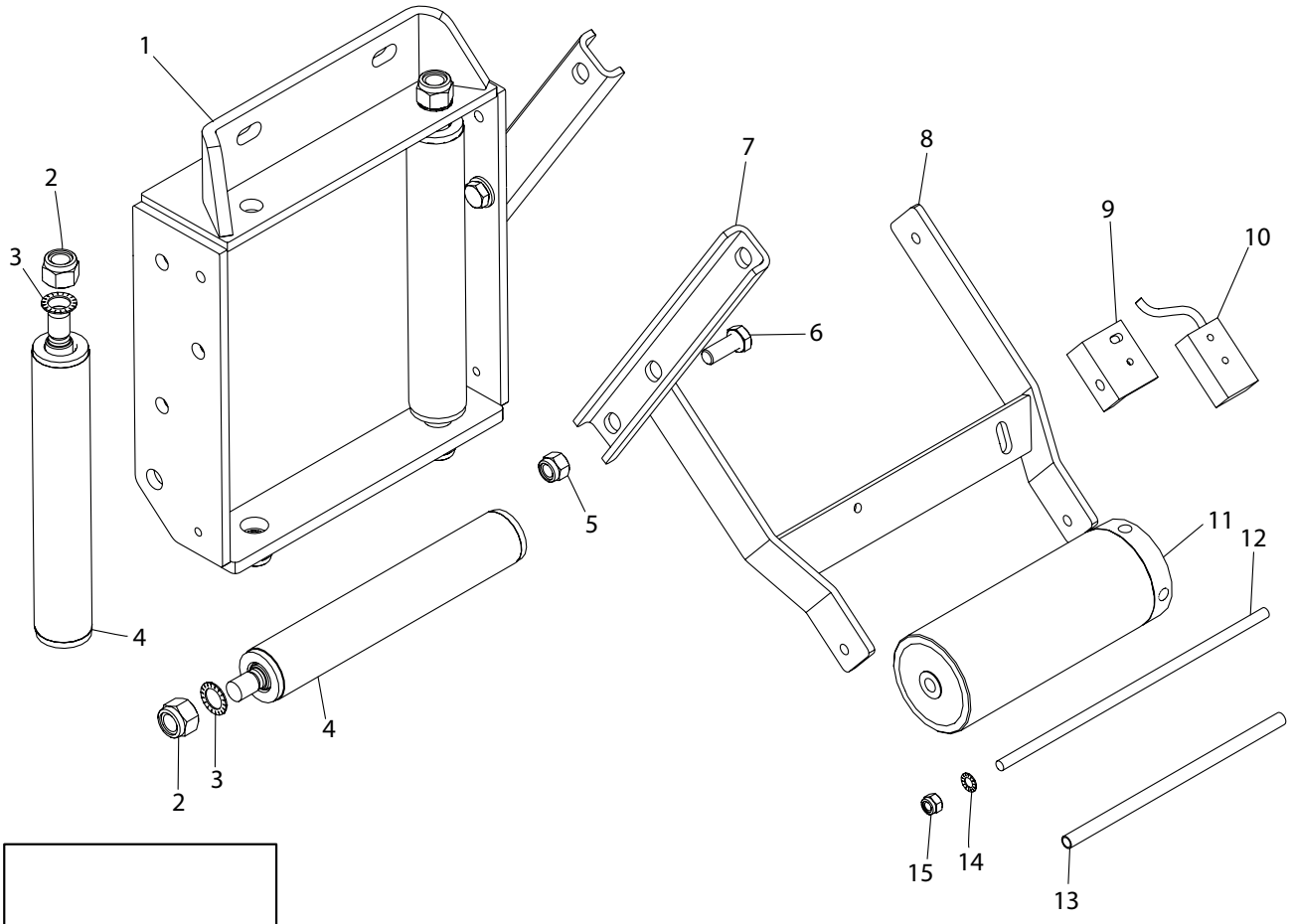
Item No.	Part No.	Qty	Description	Comments
1	1001290	1	Sprocket 3/4 18 teeth	
2	761289	2	Pillow block	
3	1013080	1	Cross track shaft	
4	2006659	1	Guard plate	
5	894955	2	Plug for guard plate	
6	1008485	2	Holder for support pipe	
7	1013075	1	Support pipe for hose guide	
8	See A1	1		
9	1009875-5	1	Comp guide sleeve	
10	1013071	1	Holder for roller sensor cable	
11	Page 38	1		
12	1010092	2	Spacer bushing	
13	761286-2	1	Cap for lubrication nipple	
14	761286	1	Lubrication nipple	
15	050316	4	M16 Plain washer	B1
16	763916	8	M16 Riplock	B1
17	763912	4	M12 Riplock	B2 & B1 & B3
18	044010	1	M10 Lock nut	B3
19	044012	8	M12 Lock nut	B2 & B1 & B3
20	040416	6	M16 Steel nut	B1
21	021010075	2	M10 x 75 Steel bolt	B3
22	022216050	4	M16 x 50 Set bolt	B1
23	022212030	4	M12 x 30 Set bolt	B3
24	022212055	2	M12 x 55 Set bolt	B2
25	761329	4	Retaining ring Ø60	
26	761293	2	Bushing	
27	1008475	1	Sleeve for carriage	New sleeve 326 mm long 2011874
28	1009875	1	Guide sleeve	
29	34000009	2	Bearing bushing for carriage	
30	1115100070-1	4	Spring ring	
31	701042	1	Retaining ring int. Ø42	
32	761284	1	Plain washer	
33	761283	1	Guide shaft (Pin)	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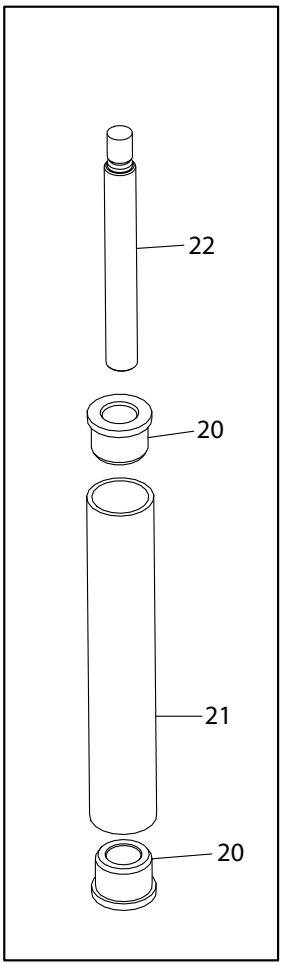
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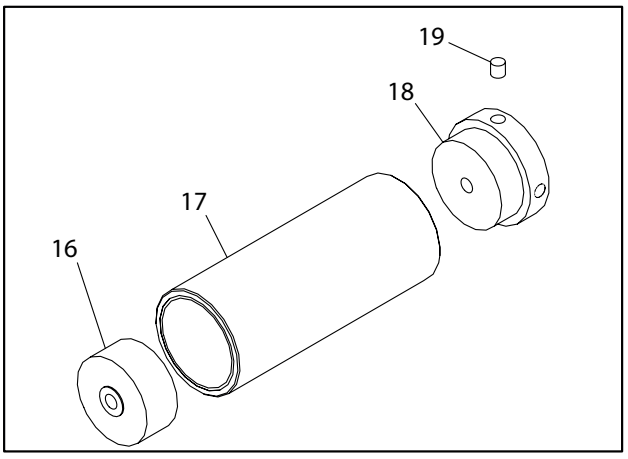
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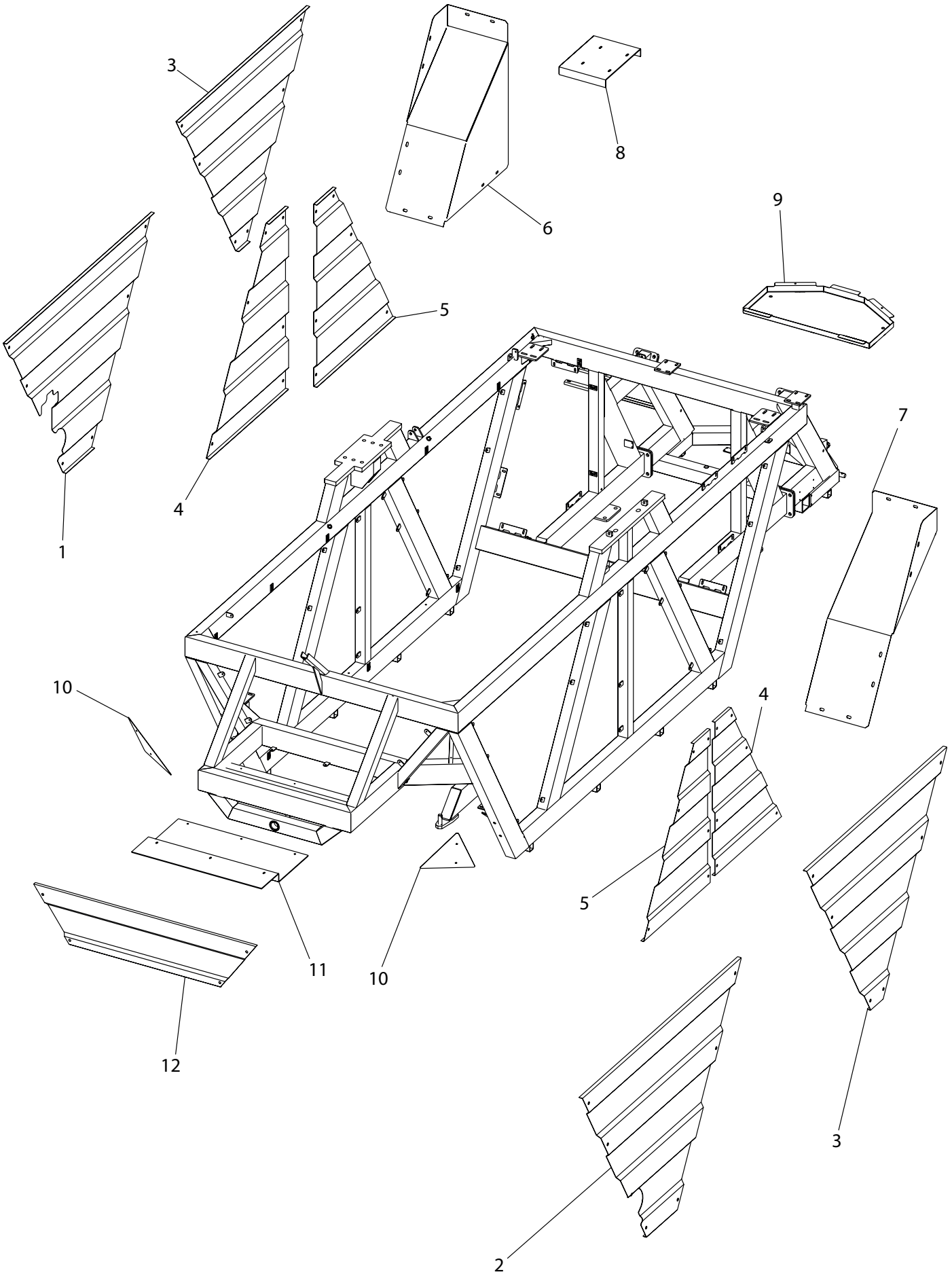
Item No.	Part No.	Qty	Description	Comments
1	1010090	1	Frame for carriage hose guides	
2	044016	4	M16 Lock nut	
3	763916	4	M16 Riplock	
4	1010096	4	Support roller	
5	044012	4	M12 Lock nut	
6	022212030	4	M12 x 30 Set bolt	
7	1008490	2	Brace for support pipe carriage	
8	1013070	1	Bracket for measuring roller	
9	14000056	1	Angle bracket	
10	1007561	1	Dual sensor	
11	1013065	1	Measuring roller with magnets	
12	037808	1	Threaded rod	
13	1013065-2	1	Bushing for measuring roller	
14	763908	1	M8 Riplock	
15	044008	1	M8 Lock nut	
16	34000037	1	End plug for measuring roller	
17	1013065-1	1	Measuring roller without ends	
18	34000062	1	End plug for magnets	
19	1007570	4	Magnet	
20	761271	8	Nylon bearing	
21	1010096-1	4	Pipe for hose reel	
22	761025	4	Shaft	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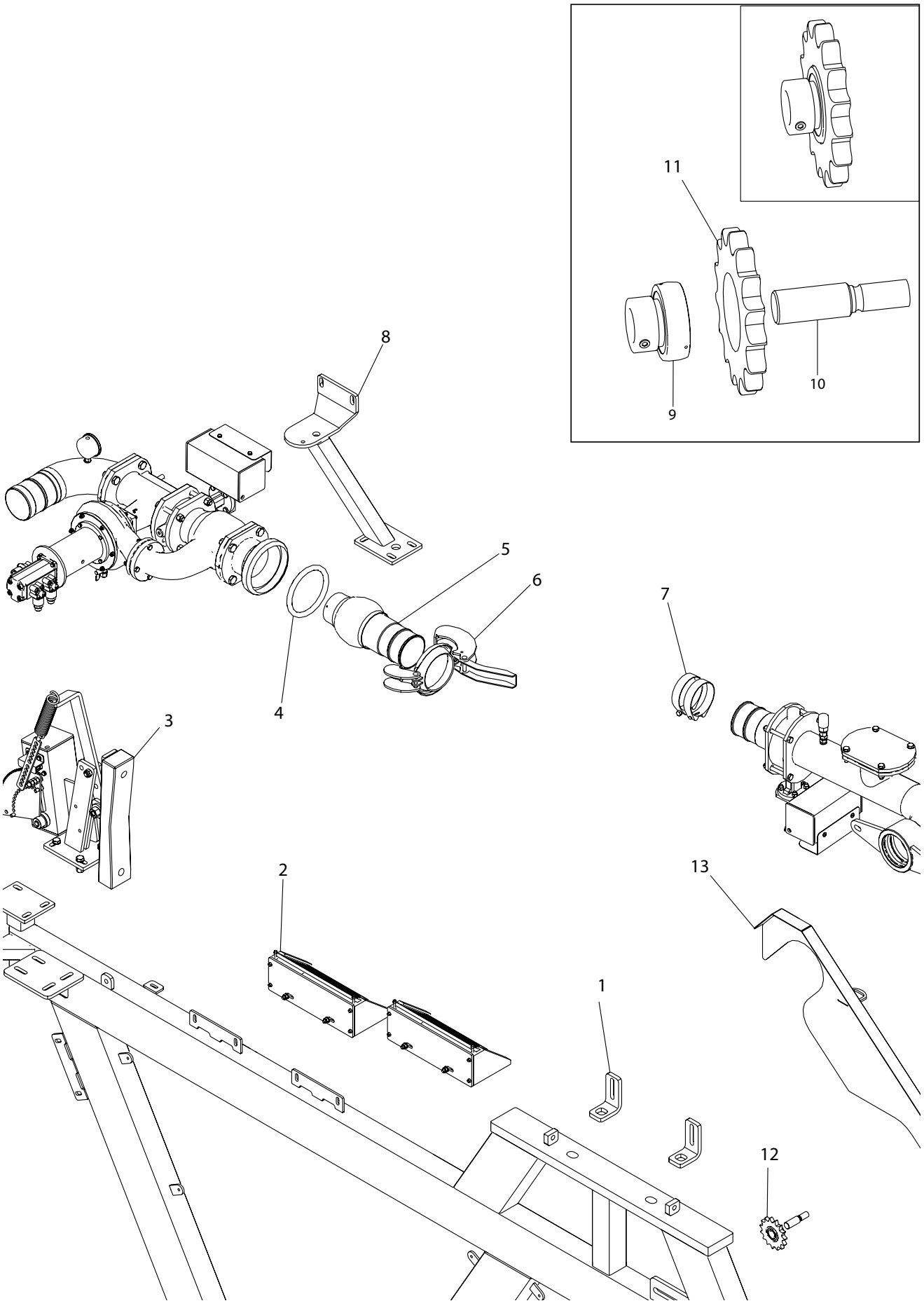
Item No.	Part No.	Qty	Description	Comments
1	1013054	1	Large side guard right	
2	1013053	1	Large side guard left	
3	1013050	2	Large rear side guard R/L	
4	1013051	2	Small side guard right	
5	1013052	2	Small side guard left	
6	1013058	1	Inner guard right	
7	1013059	1	Inner guard left	
8	1010525	1	Top plate	
9	2001754	1	Base plate for tool box	
10	1013057	2	Small front corner guard	
11	1009342	1	Toolbox	
12	1013056	1	Name plate	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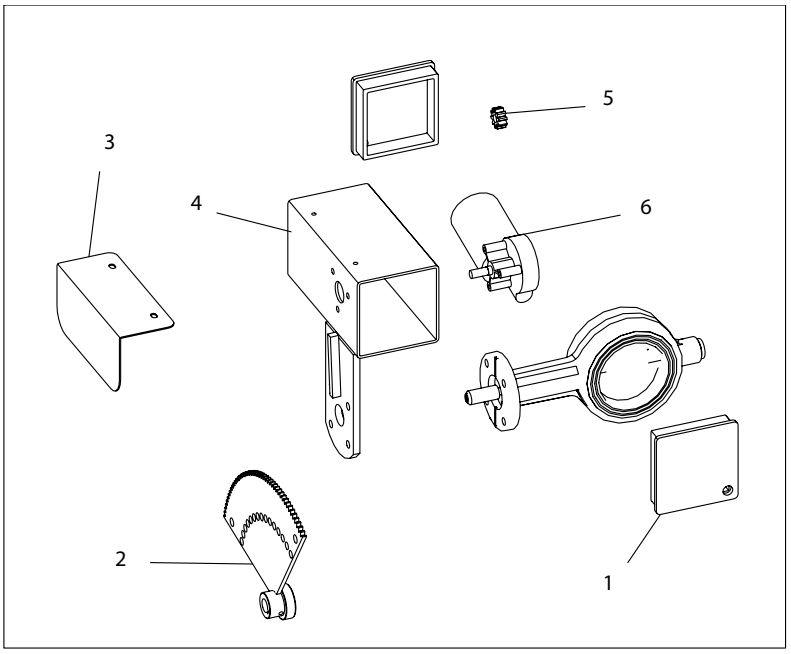
Item No.	Part No.	Qty	Description	Comments
1	2001491	2	Angle bracket	
2	762080	2	Solar panel set	
3	E1096	1	Electric brake comp	
4	14050043	1	Rubber ring HK 108	
5	1013034	1	HK 108 Ball	
6	14050013	1	HK 108 Locking ring	
7	16200726	4	Hose clamp	
8	1009120	1	Suspension for turbine	
9	761276	1	Bearing	
10	761275	1	Shaft	
11	311215	1	Sprocket	
12	2351278	1	Sprocket comp	
13	1007695	1	Chain guard	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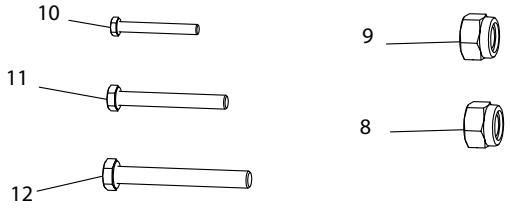
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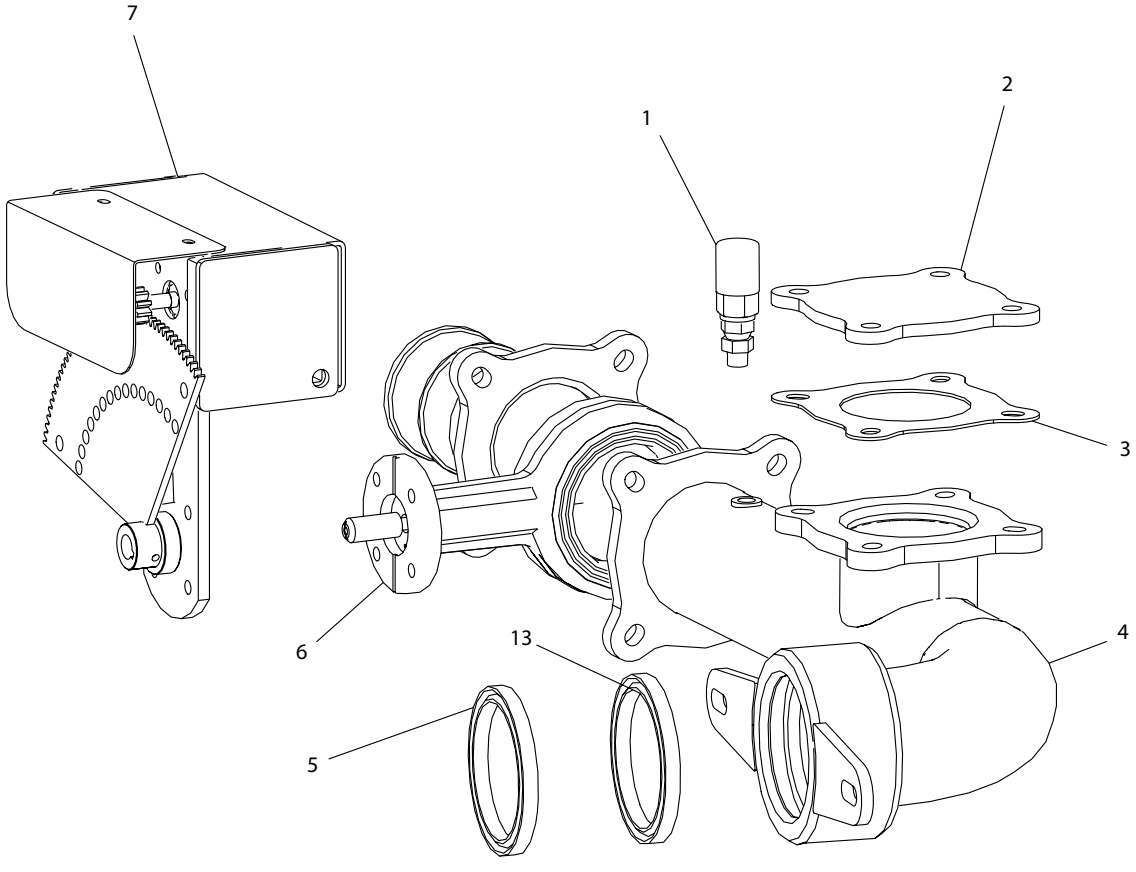
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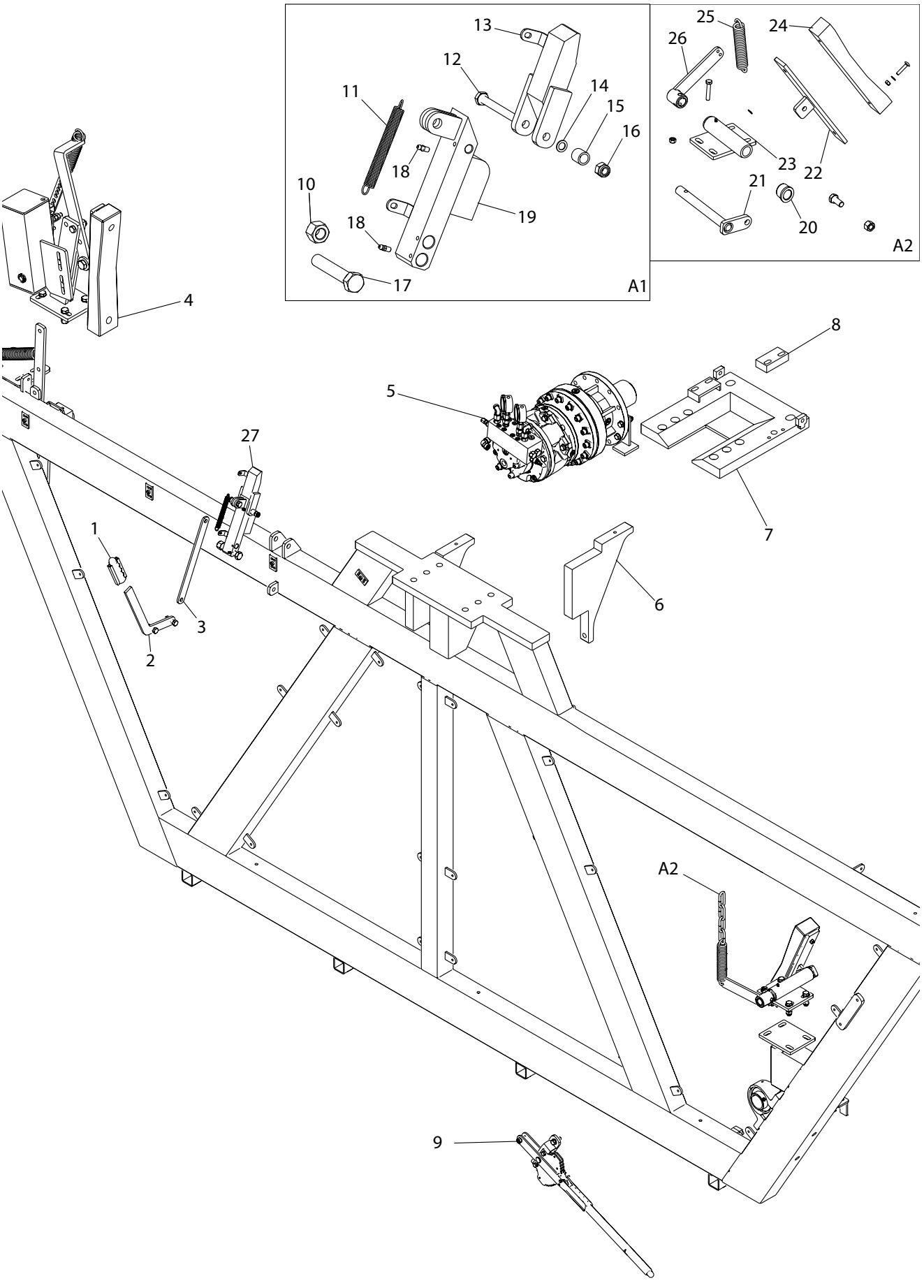
Item No.	Part No.	Qty	Description	Comments
1	1007545	1	Pressostat	
2	1007098	1	Blind flange	
3	631112	1	Flange gasket	
4	1009295	1	Head with pipe and flange	
5	1001095	1	Sealing ring	
6	1007250	1	Butterfly valve	
7	1007230	1	Comp motor valve	
8	044008	4	M8 Lock nut	
9	044010	8	M10 Lock nut	
10	021008035	4	M8 x 35 Steel bolt	
11	022210040	4	M10 x 40 Steel set bolt	
12	021010085	4	M10 x 85 Steel bolt	
13	1102138	1	Sealing ring	

Parts list 1007230

Item No.	Part No.	Qty	Description	Comments
1	1007175	2	End plug	
2	1007195	1	Gear for valve	
3	1007185	1	Guard for motor valve	
4	1007171	1	Motor housing	
5	1007190	1	Gear for motor	
6	1007180	1	Motor	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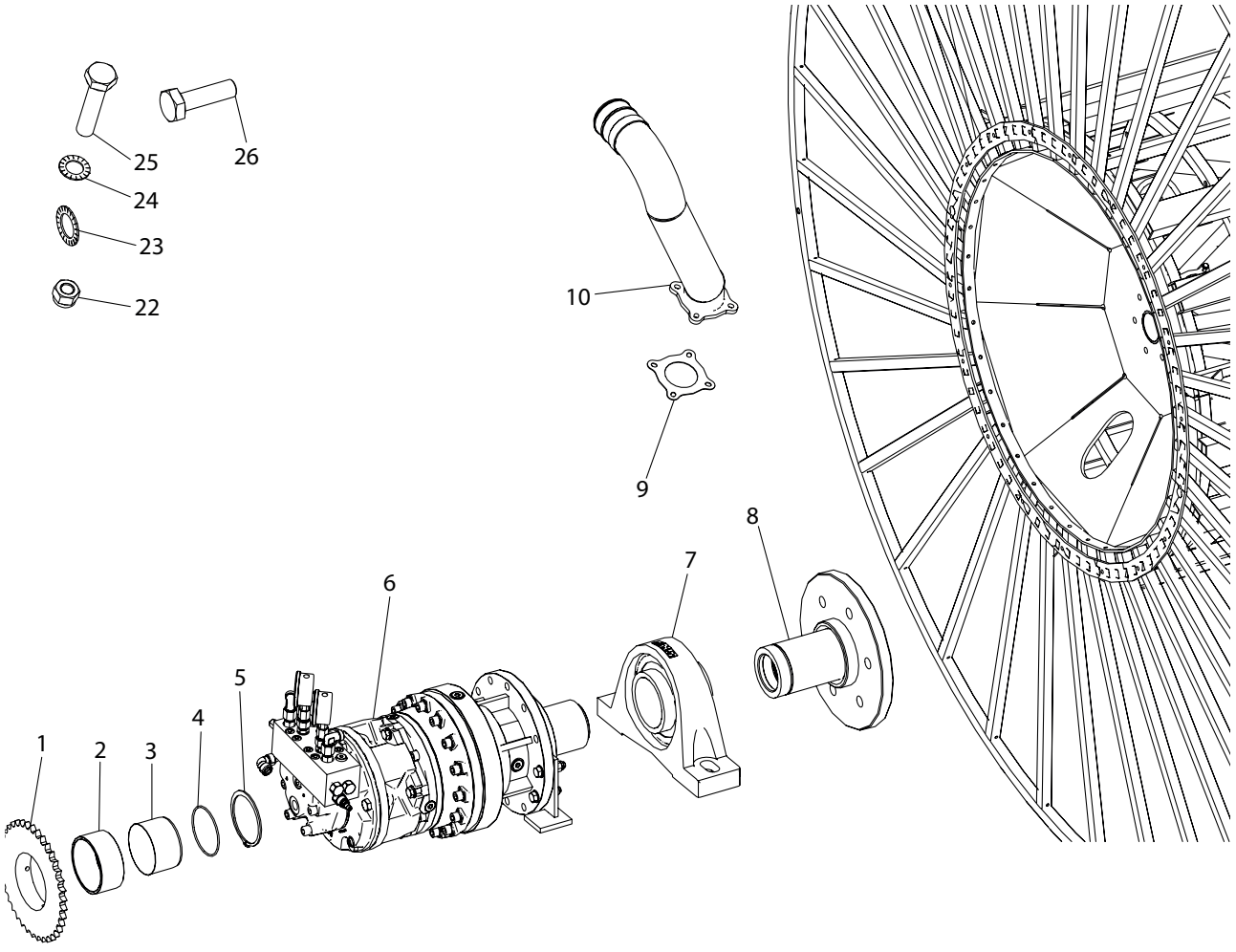
Item No.	Part No.	Qty	Description	Comments
1	680006	1	Rubber grip	
2	2002324-1	1	Locking pawl bracket	
3	2002322-1	1	Locking pawl drawbar	
4	E1095	1	Electric brake	
5	See page 50	1		
6	2003238	2	Reinforcement plate for gear	
7	2002851	1	Top reinforcement plate for gear	
8	2000910	2	Stop block for gear	
9	761113	1	Coupling lever	
10	040416	1	M16 Steel nut	
11	570114	1	Drawbar spring	
12	021010090	1	M10 x 90 Steel bolt	
13	2002680-2	1	Loose part for locking pawl top	
14	763910	2	M10 Riplock	
15	109101	1	Spacer for switch valve	
16	044010	1	M10 Lock nut	
17	021016090	1	M16 x 90 Steel bolt	
18	761286	2	Lubrication nipple	
19	2002680	1	Loose part for locking pawl bottom	
20	1009337	2	Bushing for brake shaft	
21	1008355	1	Shaft for brake	
22	902119	1	Brake shoe	
23	1009335	1	Pipe for brake bushings	
24	902120	1	Brake block	
25	761110	1	Spring	
26	1009275	1	Arm for brake	
27	2013199	1	Locking pawl Comp	A1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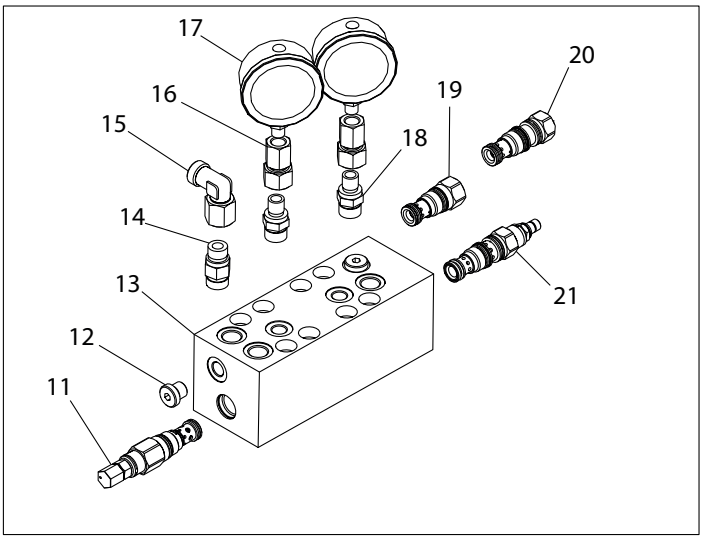
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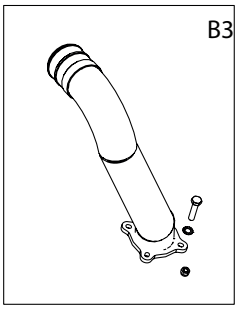
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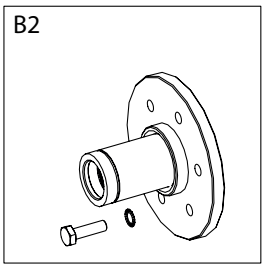
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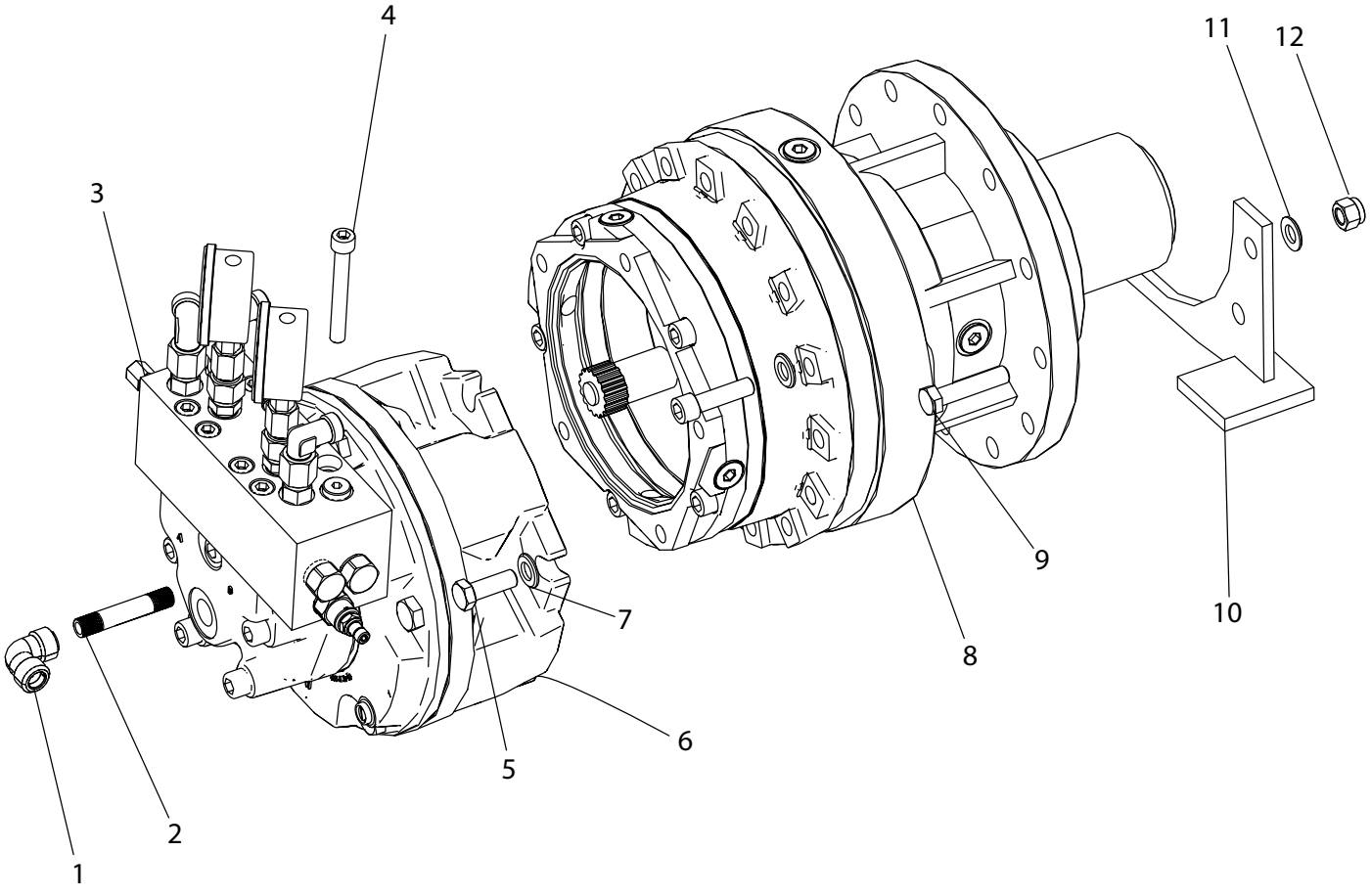
Item No.	Part No.	Qty	Description	Comments
1	1010027	1	Sprocket	
2	1010020-17	1	Bushing for bearing	
3	36000151	1	Stainless bushing	
4	624101	1	O-ring for stainless bushing	
5	1115150100	1	Retaining ring ext. Ø100	
6	1013901	1	Drive set	
7	1010490-2	2	Bearing	
8	2000967	1	Flange with splined shaft bushing	
9	631112	1	Flange gasket	
10	2003600-1	1	Inlet pipe	
11	2012257	1	Pressure relief valve	
12	1010972	1	1/4 Plug ext. Thread	
13	-	-	-	
14	1007724	1	Nipple straight 3/8	
15	1008622	1	Angle Ø12 with fixed mounting	
16	1010979	2	Nipple straight for manometer	
17	761163-4	2	Manometer	
18	1010978	2	Nipple straight 1/4	
19	2012256	1	Check valve	
20	1013948	1	Check valve for drum roller	
21	2012255	1	Valve with pressure control	
22	044010	4	M10 Lock nut	B1
23	763920	8	M20 Riplock	B2
24	763910	8	M10 Riplock	B1
25	022210045	4	M10 x 45 Set bolt	B1
26	021020070	8	M20 x 70 Steel bolt	B2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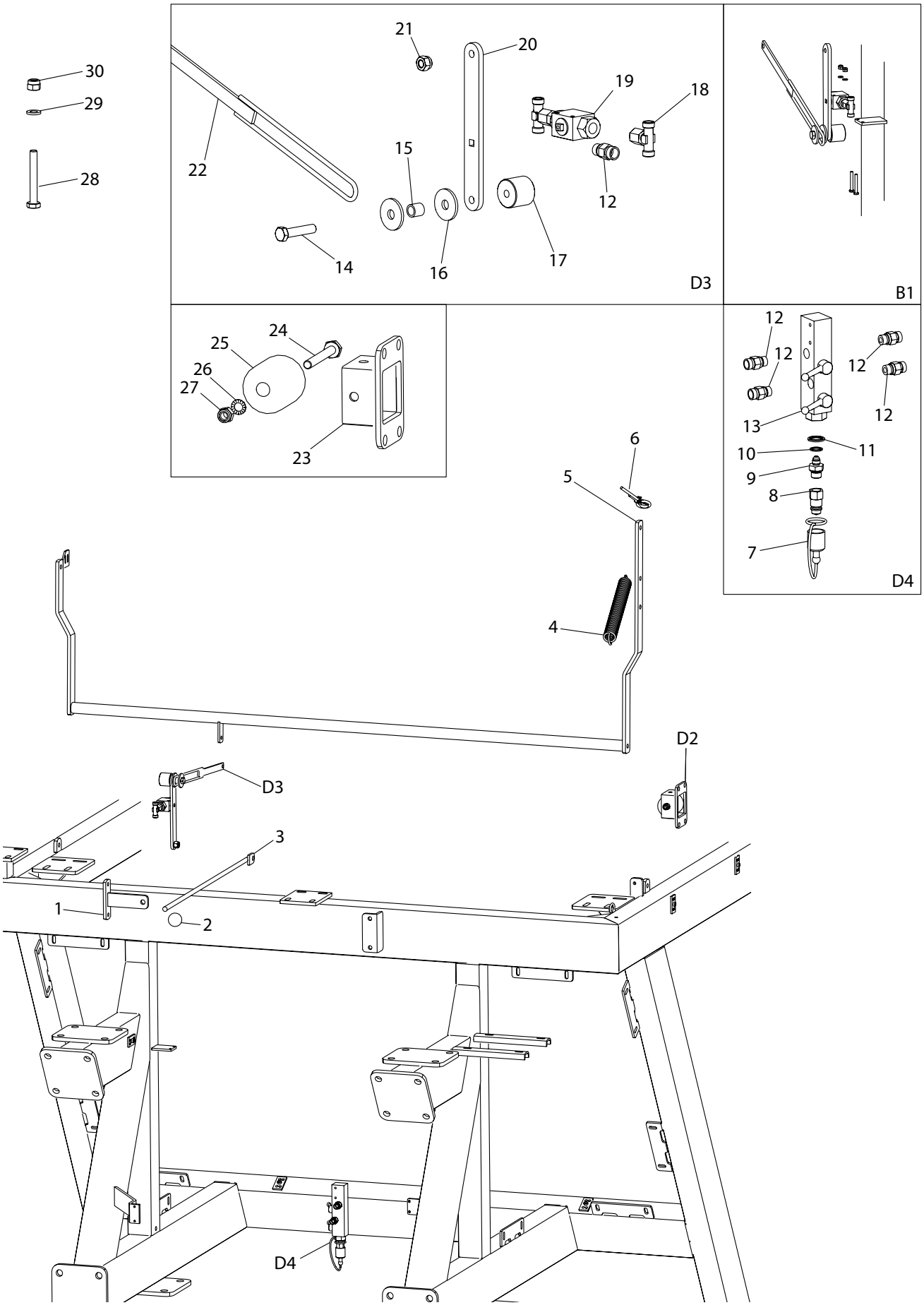
Item No.	Part No.	Qty	Description	Comments
1	000090402	1	Angle 1/4	
2	1013830	1	Nipple pipe 1/4	
3	2013208	1	Aluminium block complete	
4	030010080	8	M10 x 80 round with int. hex	
5	030512130	5	M12 x 130 int. hex	
6	1013930	1	Piston motor	
7	056212	5	Spring washer	
8	1013920	1	Gear for piston motor	
9	021012050	10	M12 x 50 Steel bolt	
10	2001526	1	Support bracket	
11	050312	20	M12 Plain washer	
12	044012	10	M12 Lock nut	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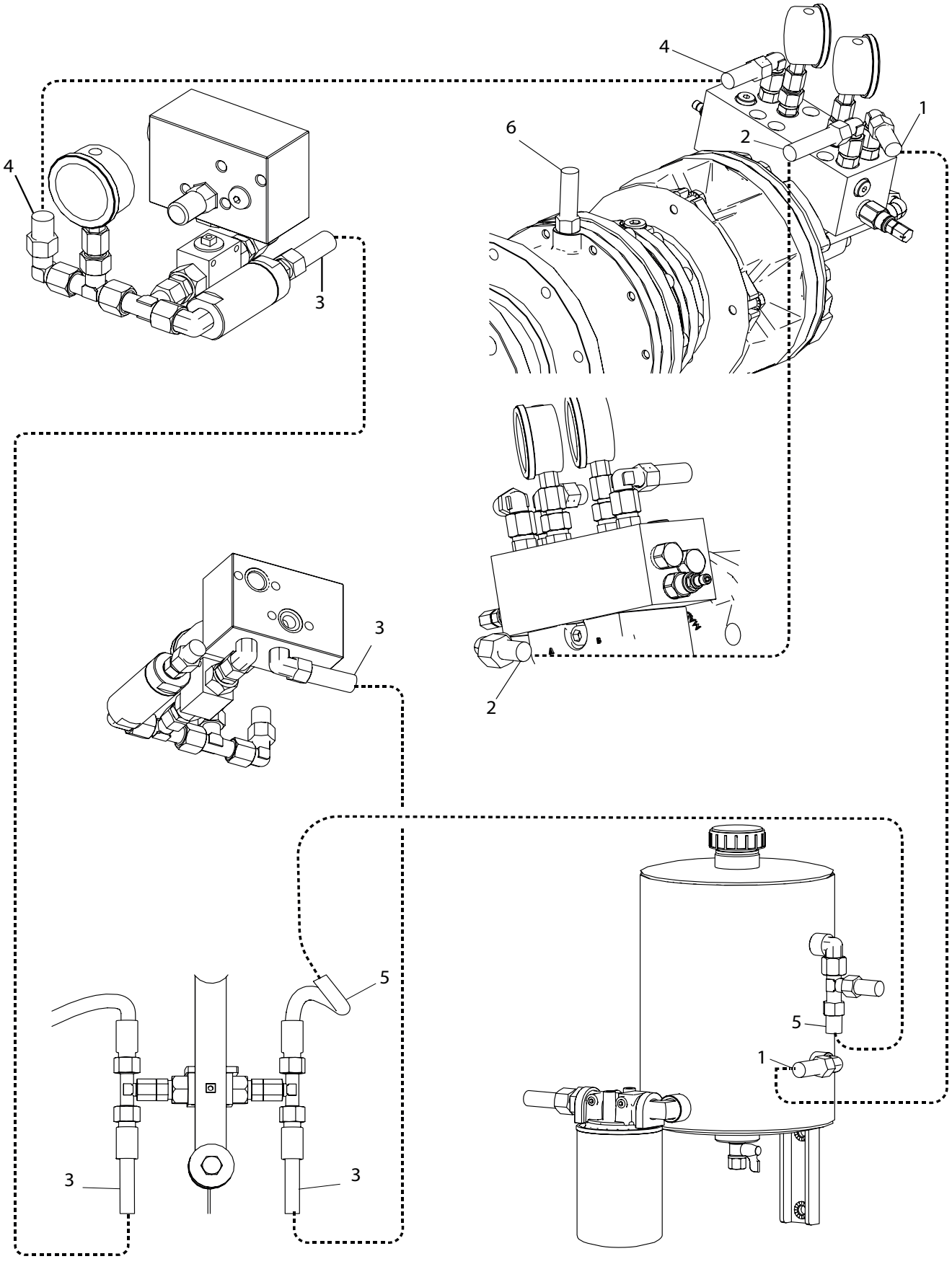
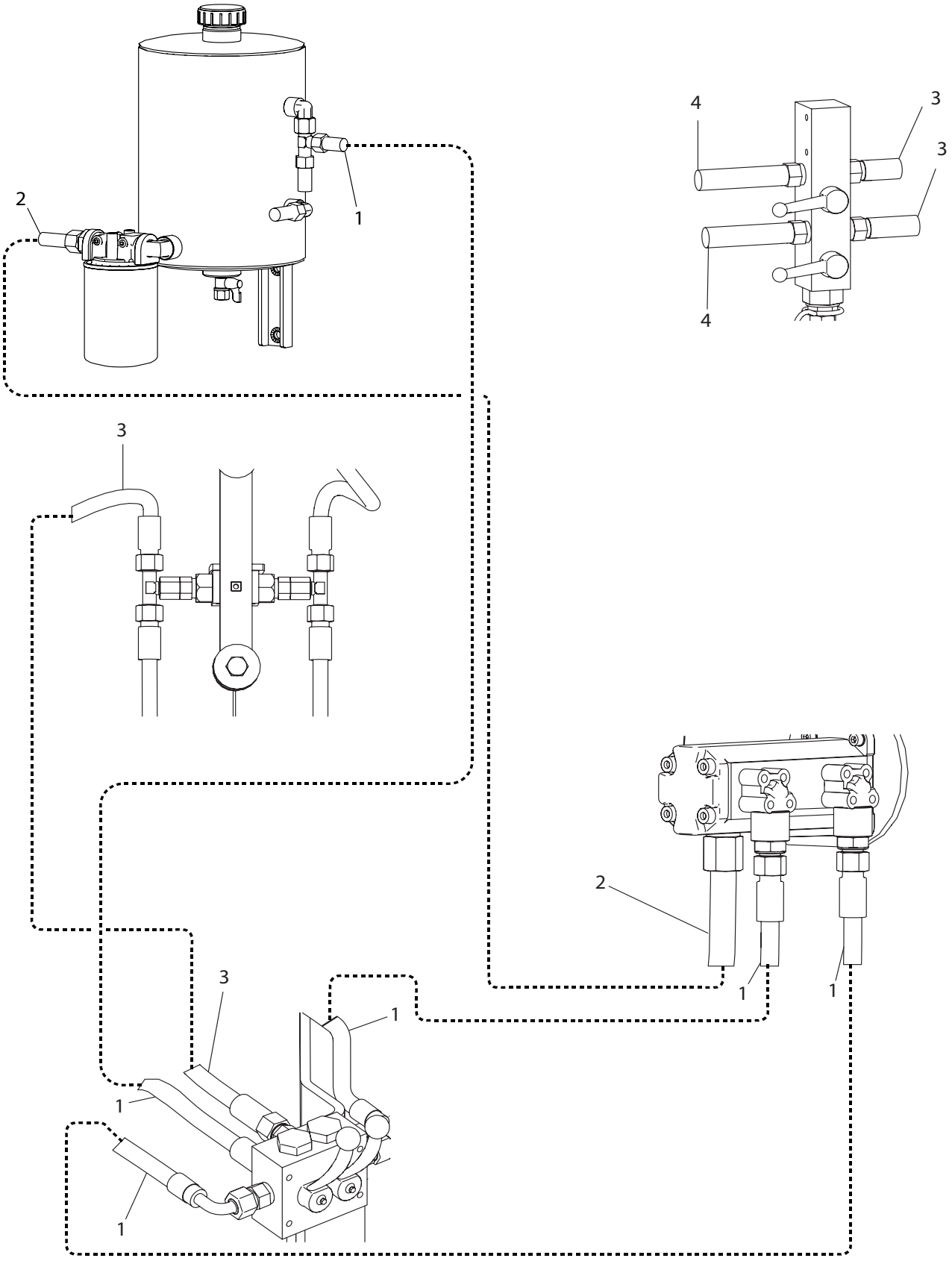
Item No.	Part No.	Qty	Description	Comments
1	1013126	1	Bracket for stop bar lever	
2	763300	1	Ball lever	
3	1013125	1	Lever for stop bar	
4	1011011	1	Drawbar spring	
5	1013120	1	Miswinding bar	
6	1013113	1	Wire from miswinding bar	
7	801711	1	Plastic plug for male coupling	
8	801710	1	Oil coupling	
9	1007538	1	Nipple straight 1/2 x 3/8	
10	552025	1	Sealing ring 3/8	
11	BS20	1	20 mm gasket	
12	1007724	6	Nipple straight 3/8	
13	1010755	1	2-way ball valve	
14	022212055	1	M12x55 Set bolt	
15	109101	1	Spacer for switch valve	
16	050312	2	M12 plain washer	
17	1007511	1	Stop block for ball valve	
18	1007518	2	Tee Ø12 x Ø12	
19	1007510	1	Ball valve 3/8	
20	1008335	1	Lever for ball valve	
21	040412	1	M12 Steel nut	
22	1009260	1	Stop bar	
23	2004241	1	Holder for support roller	
24	021010085	1	M10x85 Steel bolt	
25	2004310	1	Roller	
26	763910	1	M10 Riplock	
27	044010	1	M10 Lock nut	
28	022206045	1	M6x45 Set bolt	B1
29	051006	2	M6 Plain washer	B1
30	044006	2	M6 Lock nut	B1



Side 1-2

Item No.	Part No.	Qty	Description	Comments
1	1010988	1	Hose 3/8 x 3600 mm	
2	1008612	1	Hose 3/8 x 600 mm	
3	1008601	2	Hose 3/8 x 1600 mm	
4	1008614	1	Hose 3/8 x 4900 mm	
5	1008609	1	Hose 3/8 x 1200 mm	
6	1010981	1	Hose 1/4 x 1230 mm	



Side 2-2

Item No.	Part No.	Qty	Description	Comments
1	1008601	3	Hose 3/8 x 1600 mm	
2	1008605	1	Hose 1/2 x 750 mm	
3	1008600	3	Hose 3/8 x 1050 mm	
4	1013829	2	Hose 3/8 8900 mm	

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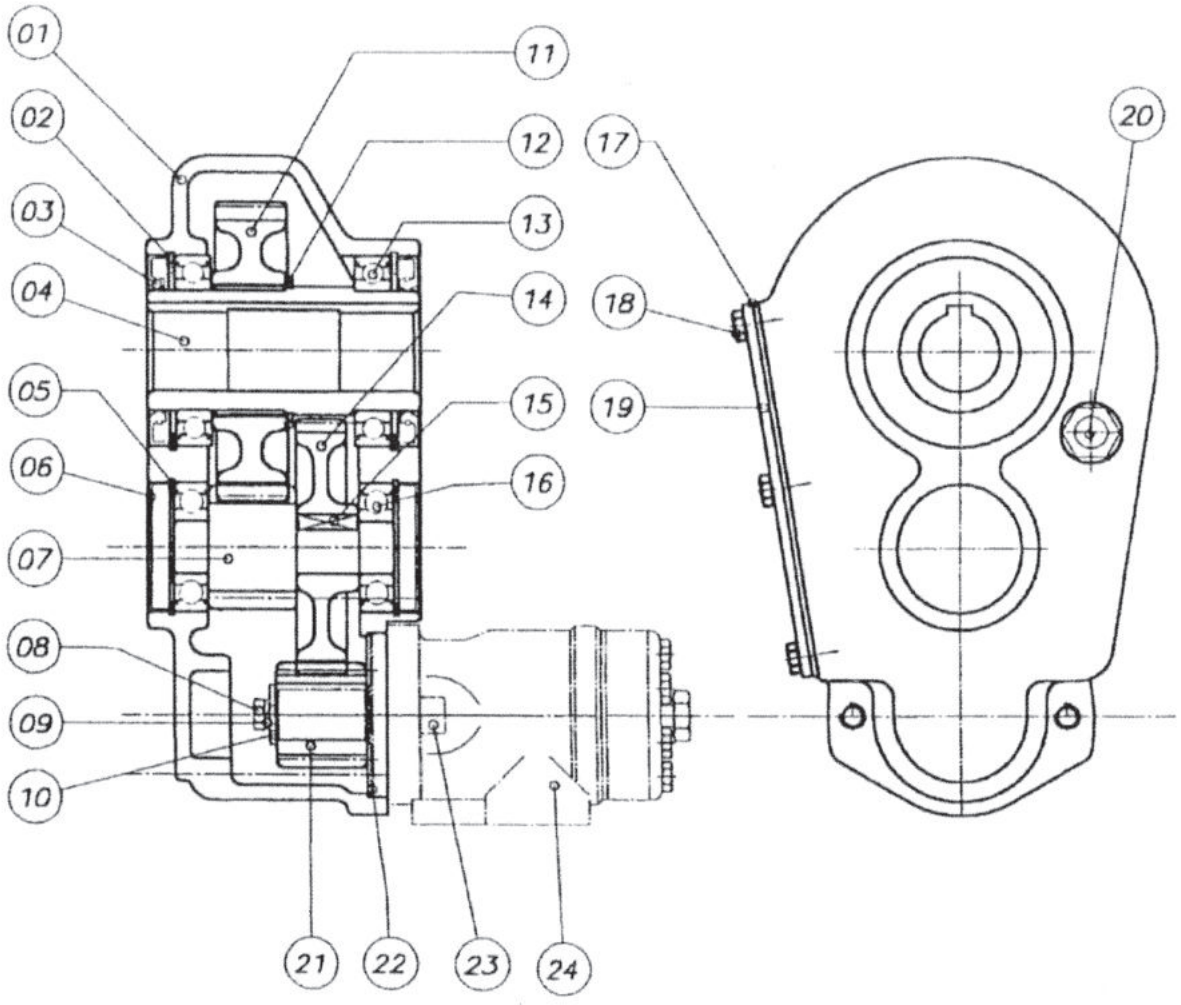
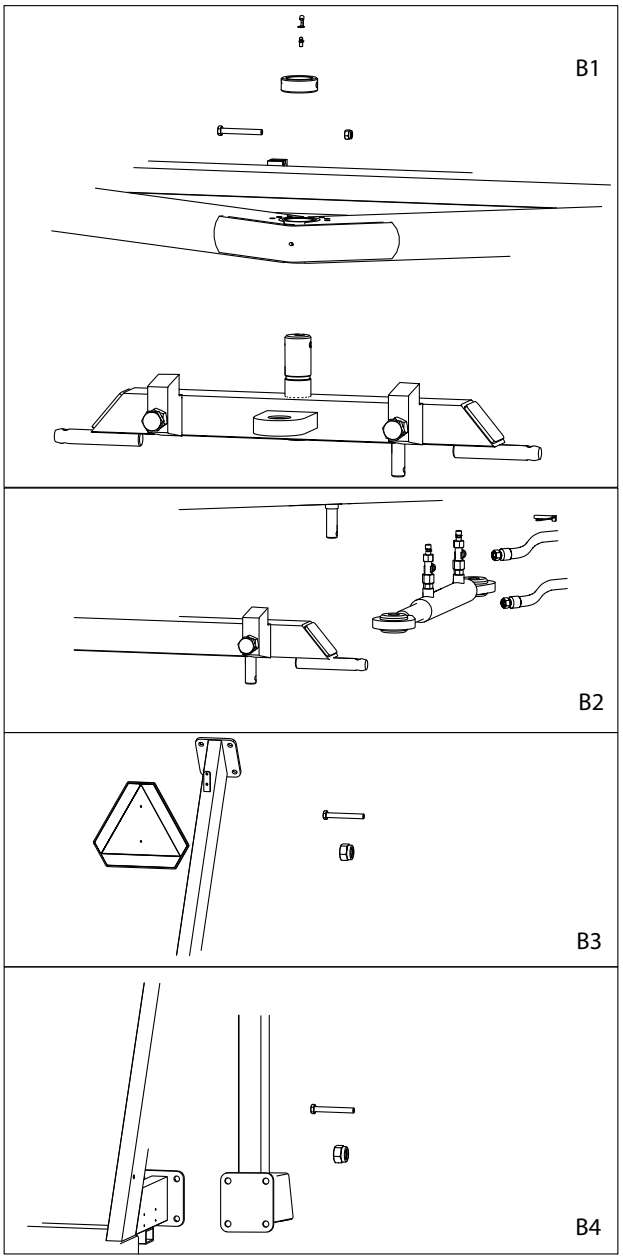


Item No.	Part No.	Qty	Description	Comments
1	1009500	1	Gear comp	
2	1009504	1	Retaining ring 95 mm	
3	1009505	1	Sealing ring Ø60/95x10	
4	1009506	1	Hollow shaft Ø40	
5	1009507	1	Retaining ring 62mm	
6	1009508	1	Cover Ø62	
7	1009509	1	Shaft/Gear	
8	1009510	1	Bolt with int. Hex M8 x 20	
9	1009511	1	Washer	
10	1009512	1	Spring washer	
11	1009513	1	Gear	
12	1009514	1	Retaining ring 65mm	
13	1009515	1	Bearing	
14	1009516	1	Gear	
15	1009517	1	Key	8 x 7 x 30
16	1009518	1	Bearing	6305
17	1009519	1	Flange gasket	
18	1009520	1	M8 x 16 mm	
19	1009521	1	Cover	
20	1009522	1	Sight glass	1/2
21	1009523	1	Gear	
22	1009524	1	Gasket	
23	1009529	1	Int. hex M12 x 35	
24	1007440	1	Oil motor	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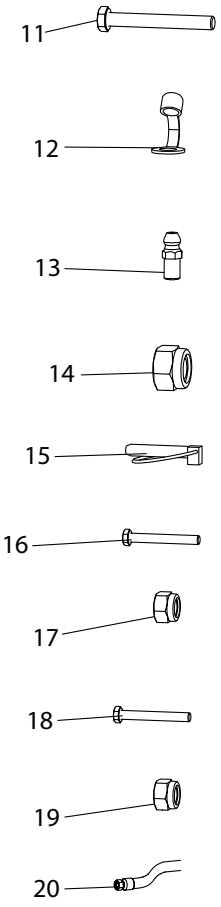
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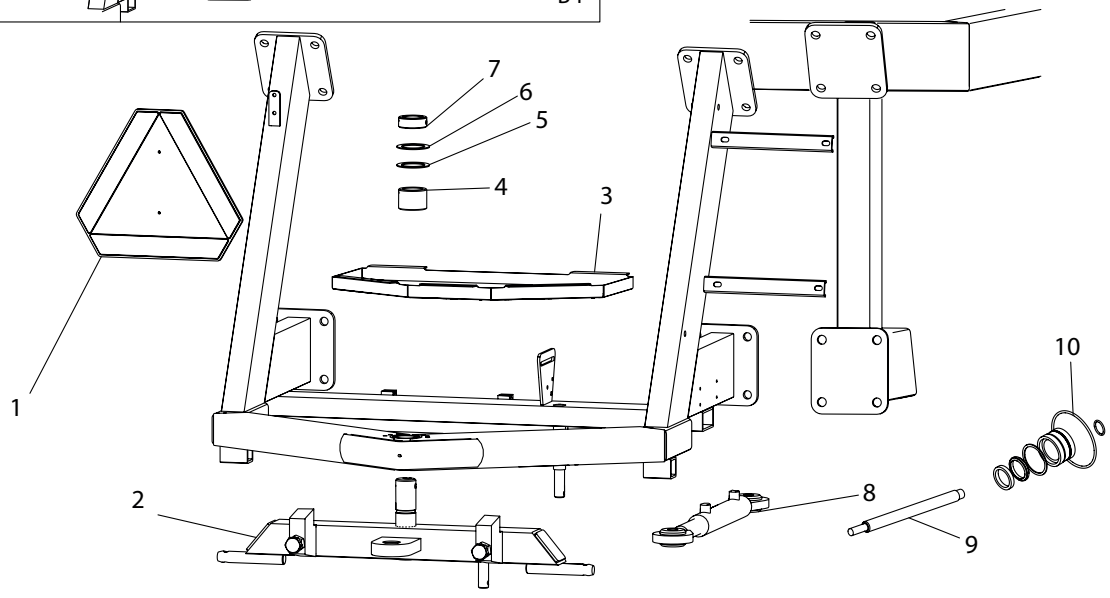
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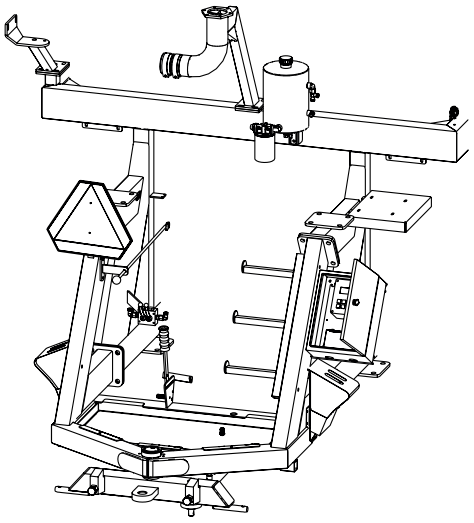
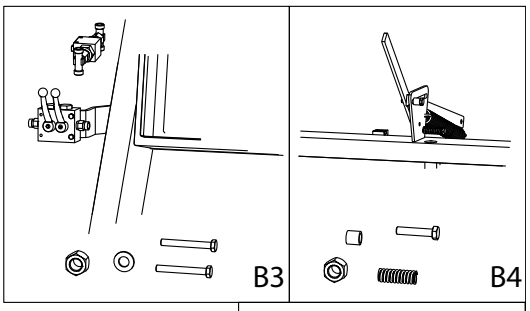
Item No.	Part No.	Qty	Description	Comments
1	1008966	1	Warning triangle	
2	1008250	1	Rear drawbar for forced steering	
3	1010520	1	Base plate for tool box	
4	1008101	3	Bushing	
5	895630	7	Support ring	
6	1008198	7	Spacer washer	
7	2002561	1	Stop ring front axle	
8	1013100	1	Steering cylinder	
9	1013100-1	1	Seal/gasket set	
10	022210080	1	M10 x 80 Set bolt	B1
11	761286-2	1	Cap for lubrication nipple	B1
12	761286	1	Lubrication nipple	B1
13	044010	1	M10 Lock nut	B1
14	763642	1	Tractor split pin	
15	022216045	16	M16 x 45 Set bolt	B4
16	044008	2	M8 Lock nut	B3
17	022208016	2	M8 x 16 Set bolt	B3
18	040416	16	M16 Steel nut	B4
19	1013829	2	Hyd. Hose for forced steering	

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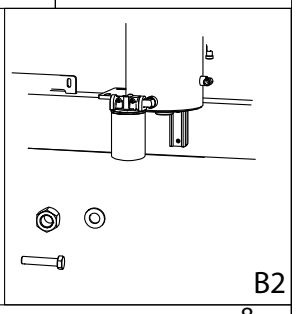
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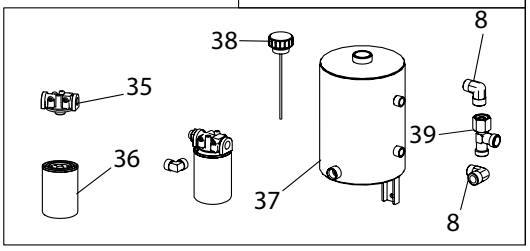
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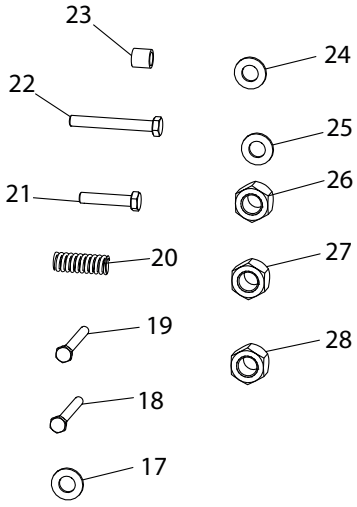
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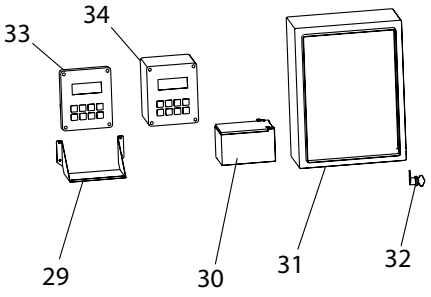
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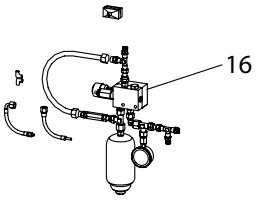
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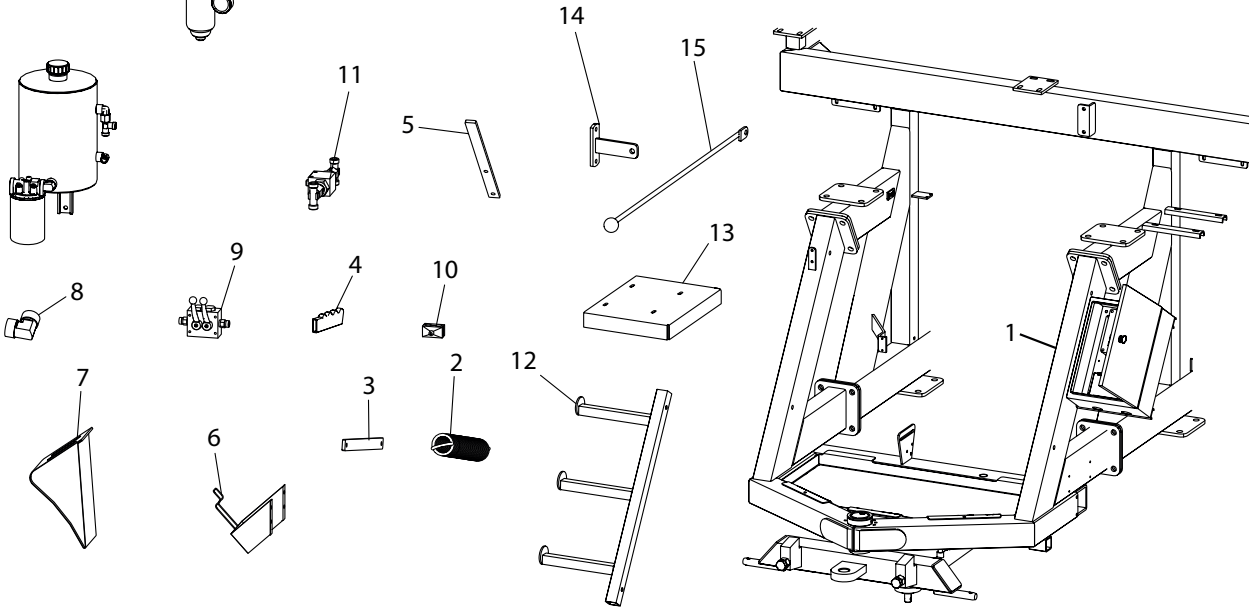
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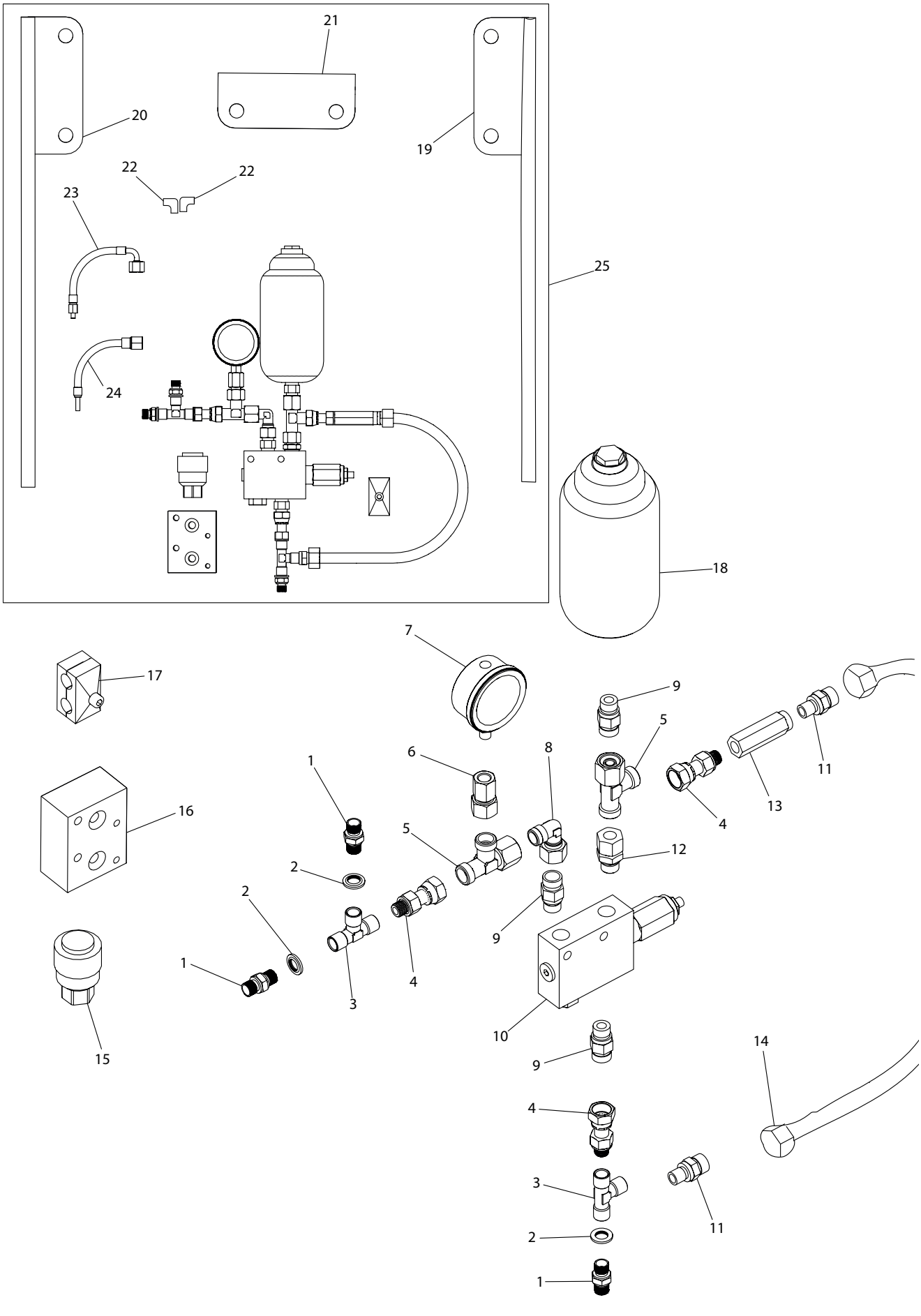
Item No.	Part No.	Qty	Description	Comments
1	2001773	1	Frame for rear drawbar	
2	1011011	1	Drawbar spring	
3	2004055	1	Release arm	
4	680009	1	Lever	
5	1009250	1	Lever for coupling	
6	2004913	2	Holder for stop wedge	
7	2004912	2	Stop wedge	
8	1007540	3	Angle cyl 3/4 x 3/4	
9	1010750	1	3-way ball valve	
10	1007514	2	Hose carrier	
11	1007510	1	Ball valve 3/8	
12	1010530	1	Ladder	
13	1010525	1	Top plate	
14	1013126	1	Bracket for stop bar lever	
15	1013125	1	Comp lever for stop bar	
16	See Page 62	1	Brake set complete	
17	051006	4	M6 Plain washer	B3
18	022206045	2	M6 x 45 Set bolt	B3
19	022210030	2	M10 x 30 Set bolt	B2
20	1009252	1	Compression spring for coupling lever	
21	022210080	1	M10 x 80 Set bolt	B4
22	022206055	2	M6 x 55 Set bolt	B3
23	109101	1	Spacer for switch valve	
24	1008198	2	Spacer washer	
25	763910	4	M10 Riplock	B2
26	044006	4	M6 Lock nut	B3
27	040410	3	M10 Steel nut	B4 & B2
28	040416	2	M16 Steel nut	B1
29	1007590	1	Plate for battery	
30	1005521	1	Battery	
31	1007578	1	Box for Program Rain	
32	1007584	1	Lock for box	
33	1007549-1	1	Exchanger Prog Rain	
34	1007549-7	1	Prog. Rain	
35	1007484	1	Filter housing	
36	1007482	1	Hydraulic filter	
37	1007490	1	Tank	
38	1007500	1	Tank cover	
39	1007526	1	Nipple straight	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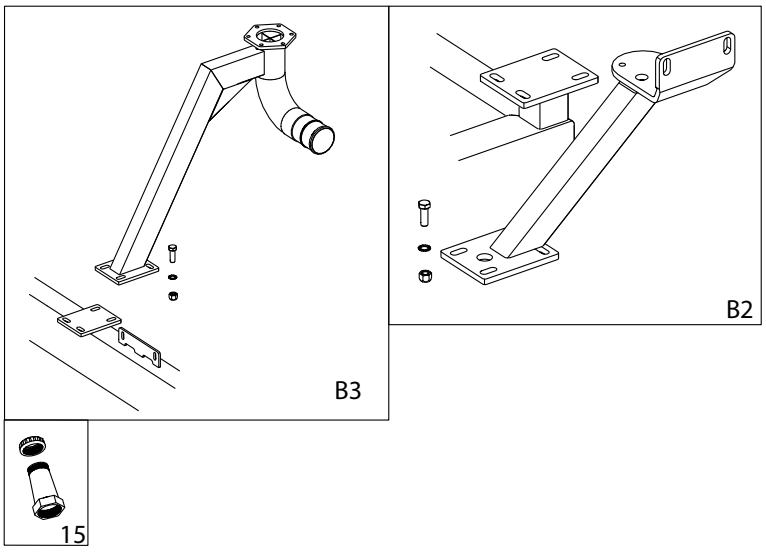
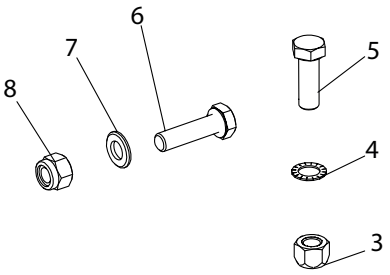
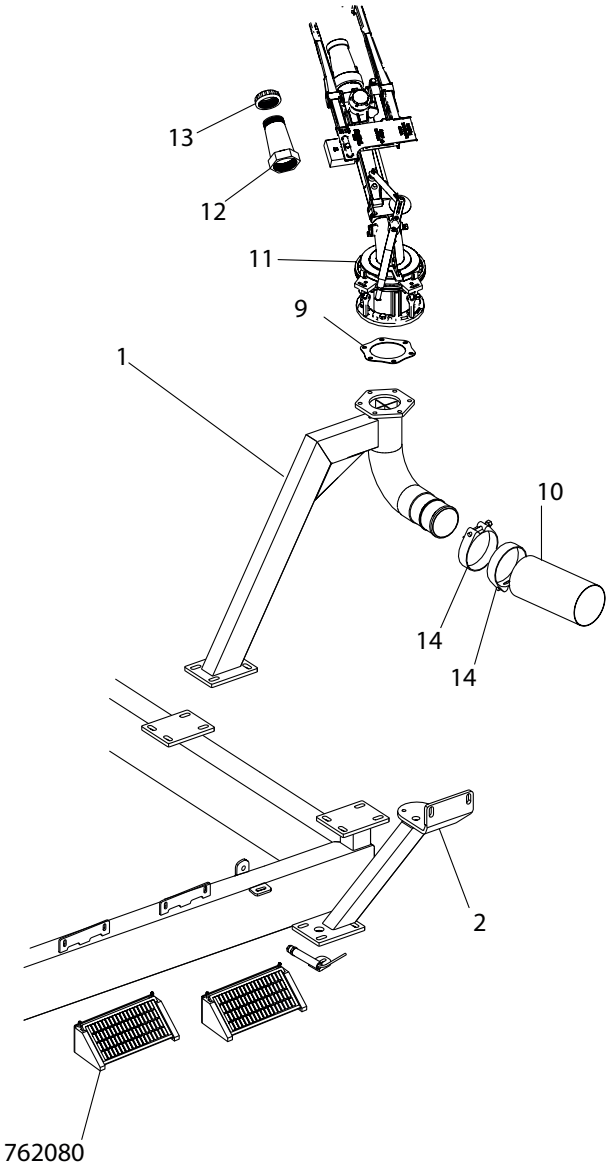
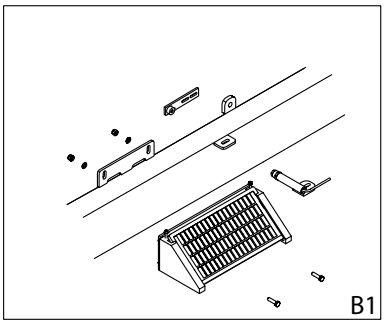
Item No.	Part No.	Qty	Description	Comments
1	121001BP04	3	Nipple	
2	552026	3	Sealing ring 1/4	
3	1013814	2	Tee 1/4 x 1/4 x 1/4 int.	
4	1010976	3	Nipple straight 1/4	
5	1007531	2	Tee Ø12 Fixed bypass X Ø12 x Ø12	
6	1010979	1	Nipple straight for manometer	
7	761163-4	1	Manometer	
8	1220SV12L	1	Adjustable angle Ø12	
9	1007724	3	Nipple straight 3/8	
10	1013835	1	Brake valve	
11	1010978	2	Nipple straight 1/4 x Ø12	
12	890414	1	Nipple straight 3/8 x Ø12 bypass Fixed bypass	
13	1210C055CA07	1	Check valve	
14	1008610	1	Hose 3/8 x 400 mm	
15	1013817	1	Brake Hyd. Coupling 1/2 int. thread	
16	2004448	1	Assembly block	
17	1007514	10	Hose carrier	
18	1013837	1	Accumulator for brakes	
19	2008065	1	Reinforcement for rear end Right	
20	2008066	1	Reinforcement for rear end Left	
21	2008064-1	2	Clamping bracket for reinforcement	
22	1013845	2	Angle screw fitting	
23	1013843	1	Brake hose 3/16 x 500 mm	
24	1013842	1	Brake hose 3/16 x 650mm	
25	2010601	1	Hydraulic brake set	









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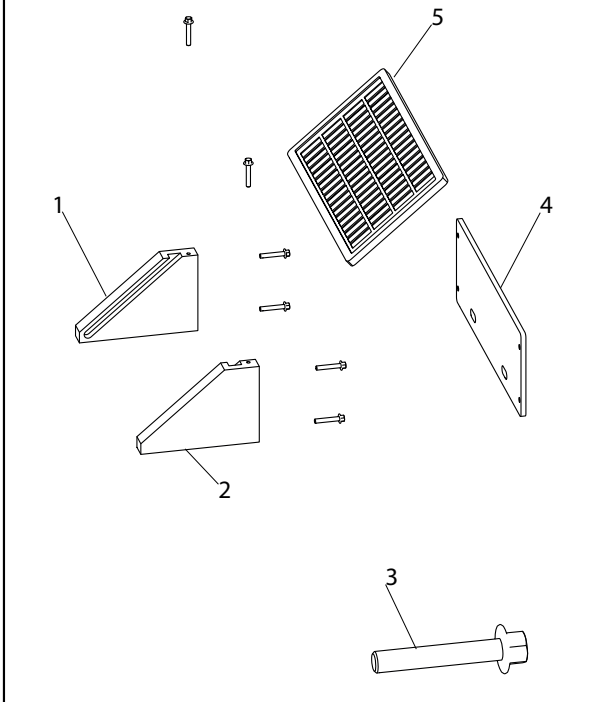
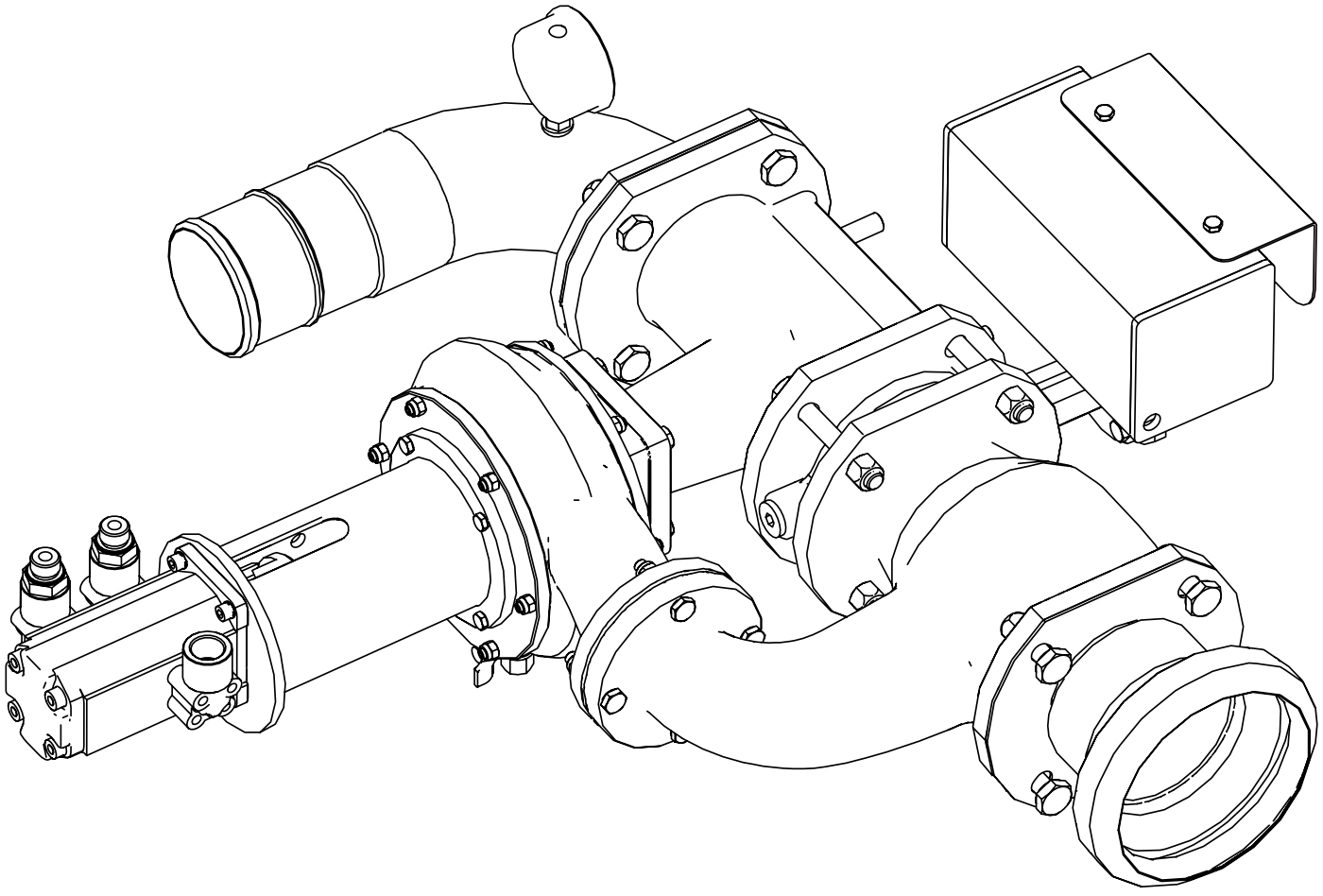


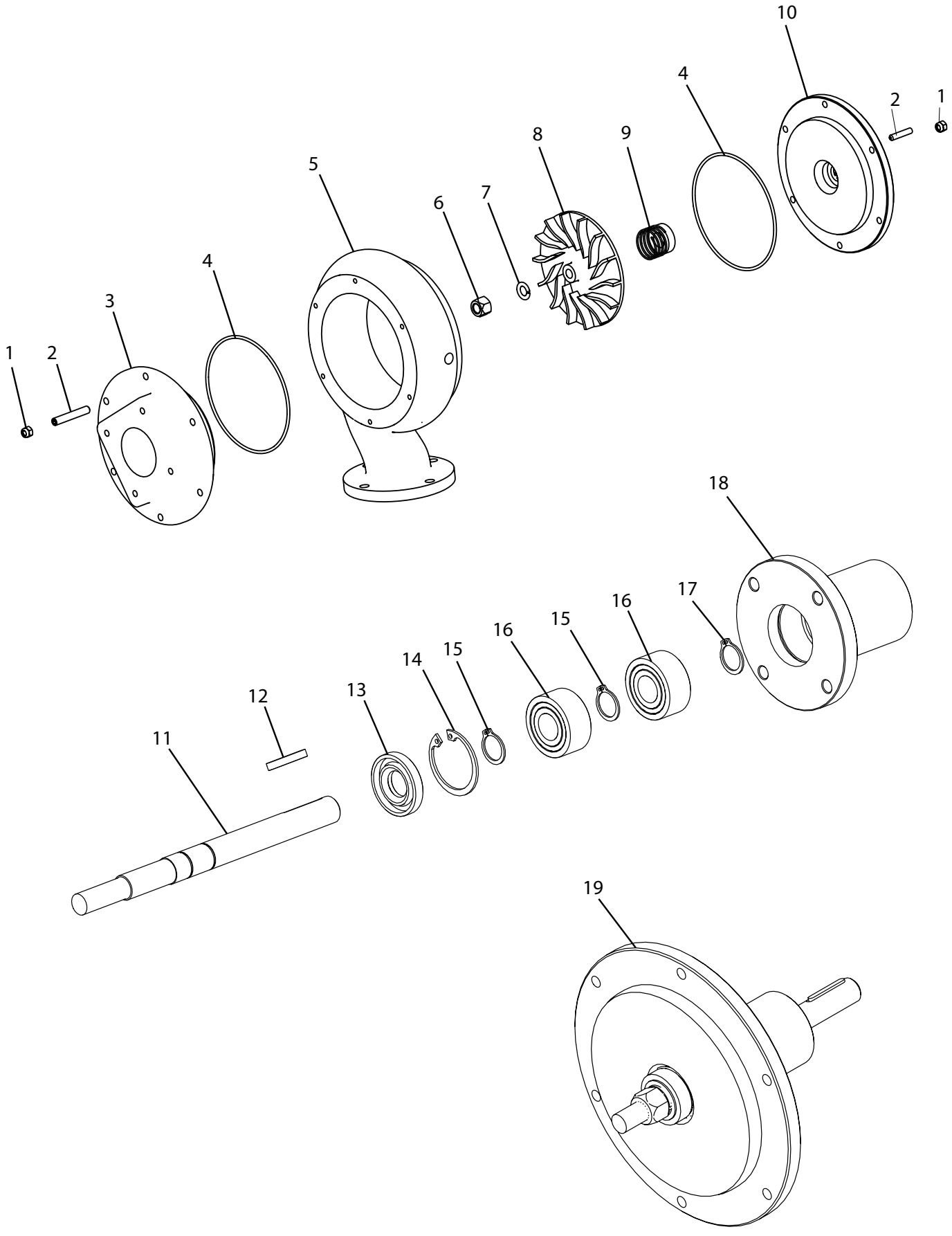
Solpanel sæt 762080 stykliste

Item No.	Part No.	Qty	Description	Comments
1	1013025	1	Gun pipe	
2	1009120	1	Suspension for turbine	
3	040412	8	M12 Steel nut	B3 & B2
4	763912	16	M12 Riplock	B3 & B2
5	022212035	8	M12 x 35 Set bolt	B3 & B2
6	022208030	4	M8 x 30 Set bolt	B1
7	050312	4	M12 Plain washer	B1
8	044008	4	M8 Lock nut	B1
9	761614	1	Flange gasket	
10	1007910	1	Hose Ø90 x 900 mm	
11	770145	1	Gun	
12	7712781	1	150Tr Plastic body	
13	7712467	1	150Tr Plastic cap	
14	16200726	2	Hose clamp	
15	7712701	1	Complete nozzle	

Parts list 762080 Solar panel

Item No.	Part No.	Qty	Description	Comments
1	2001259	1	Holder for solar cell L	
2	2001260	1	Holder for solar cell R	
3	510555	1	Ø4.8 x 32 SuperTEKS 6	
4	2002533	1	Galvanized plate for solar panel	
5	1005523	1	Solar panel for constant	

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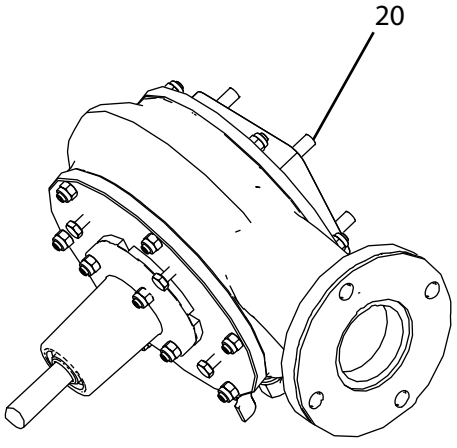
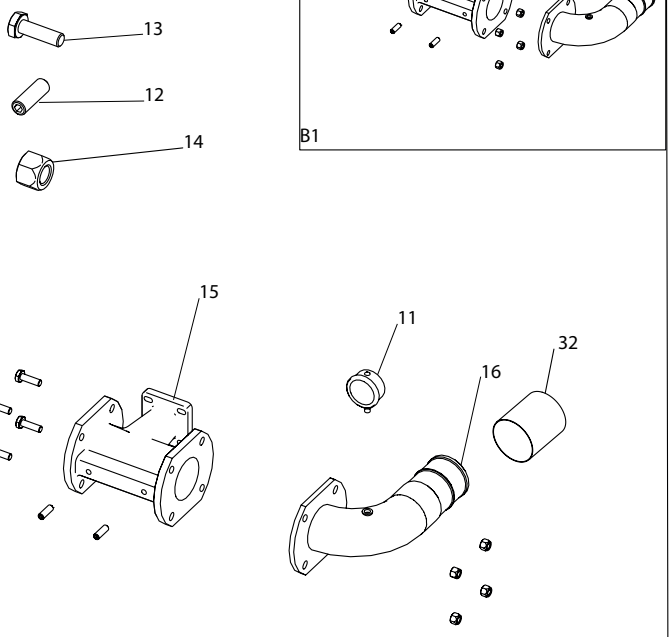
Item No.	Part No.	Qty	Description	Comments
1	095906	16	M6 Lock nut	
2	096506029	16	M6 x 29 Support bolt Pinol	
3	13000086	1	Upper flange turbine for top pipe	
4	195211	2	O-ring Cover seal	
5	195001	1	Turbine housing	
6	096012	1	M12 Nut	
7	096112	1	M12 Spring washer	
8	195031	1	Impeller	
9	P195201	1	Shaft seal for turbine	
10	195018	1	Packing block cover 20/50	
11	195036	1	Shaft	
12	195255	1	Key	4 x 4 29
13	195050	1	Sealing ring	
14	701035	1	Retaining ring Int.	
15	700015	2	Retaining ring Ext.	
16	195220	2	Front bearing	
17	517715	1	Clamping ring	
18	195013	1	Bearing housing	
19	195500	1	Turbine cover complete	
20	195000V	1	Complete turbine.	

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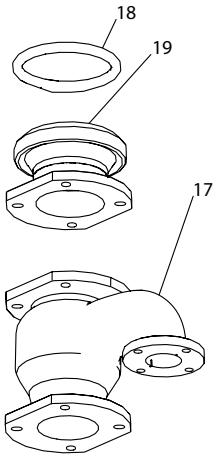
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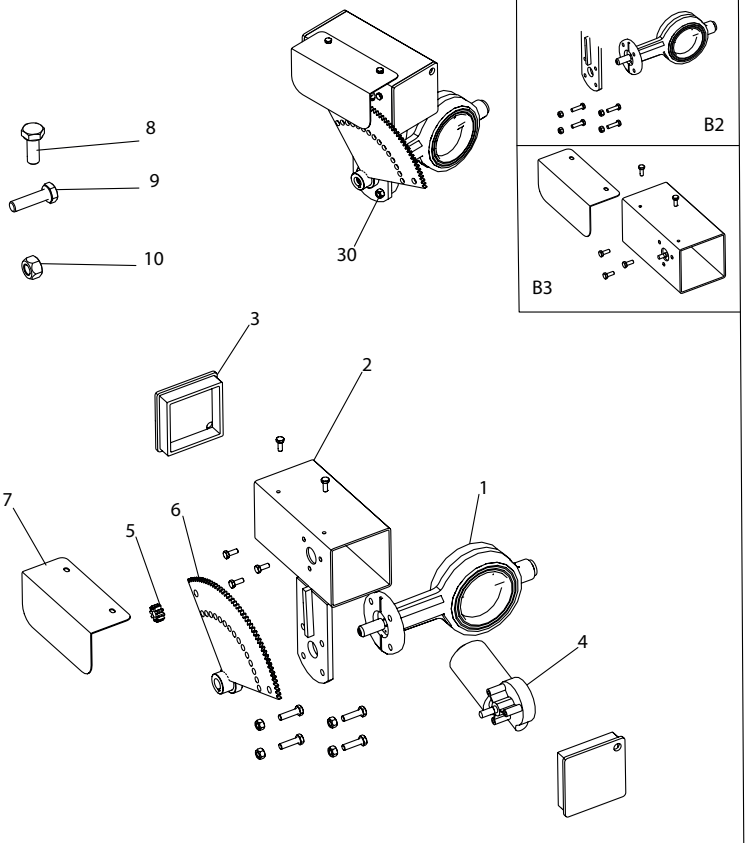
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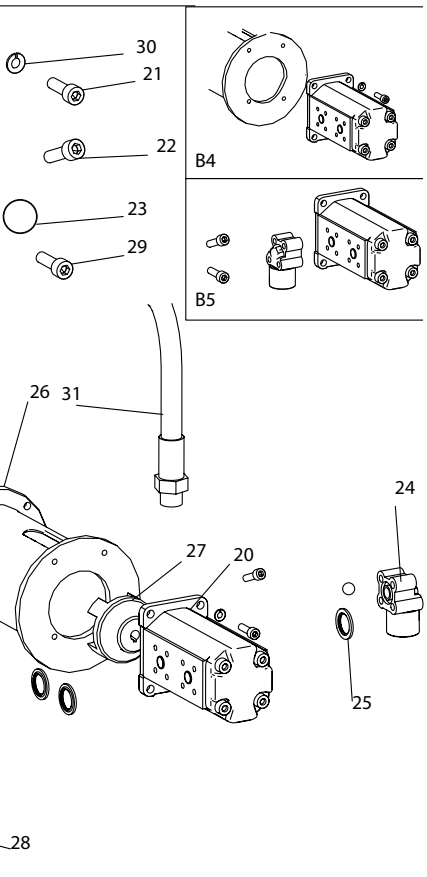
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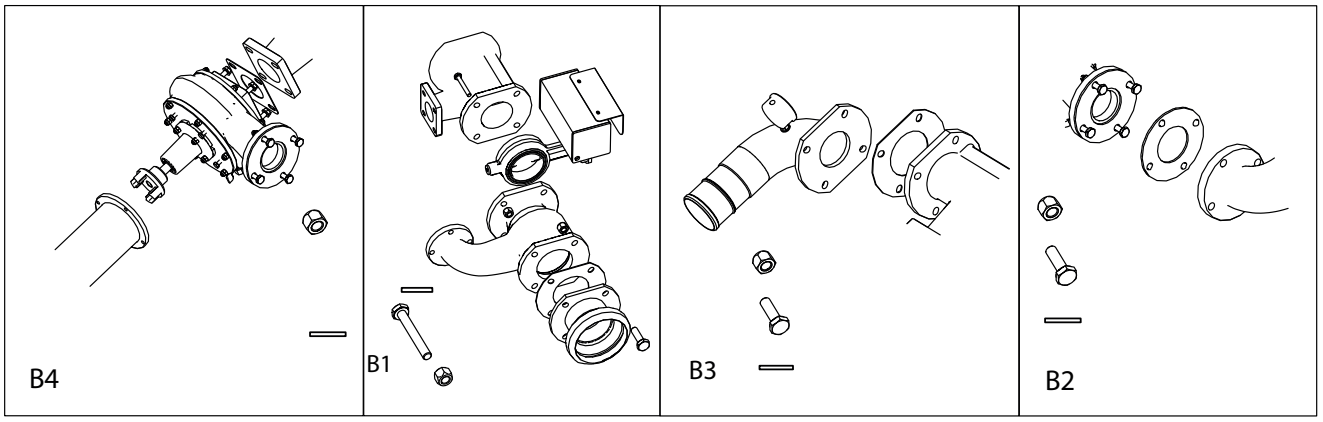
Item No.	Part No.	Qty	Description	Comments
1	1007250	1	Butterfly valve	
2	1007171	1	Motor housing for motor valve	
3	1007175	2	End plug for motor valve	
4	1007180	1	Motor for valve	
5	1007190	1	Gear for electric motor	
6	1007195	1	Gear for valve	
7	1007185	1	Guard for motor valve	
8	022206016	5	M6 x 16 Steel set bolt	B3
9	022208030	4	M8 x 30 Steel set bolt	B2
10	040408	4	M8 Steel nut	B2
11	1001163	1	Manometer glycerine	
12	763764	2	M12 x 50 Int. hex	B1
13	021012040	4	M12 x 40 Int. hex	B1
14	040412	4	M12 Steel nut	B1
15	33000227	1	Outlet pipe for turbine	
16	1009324	1	Flange with bend	
17	33000226	1	Base pipe for turbine	
18	14050043	1	Rubber ring	
19	1009328	1	Flange with HK cup	
20	1007415	1	Dual pump	
21	030506040	6	M6 x 40 Int. hex	B5
22	030506030	6	M6 x 30 Int. hex	B5
23	2.62 x 15.08	3	O-ring	
24	1007420	3	Flange for oil pump	
25	552024	3	Sealing ring 1/2	
26	1007110	1	Flange for pump	
27	1007450	1	Coupling part	
28	1007726	2	Nipple 1/2	
29	030506020	4	M6 x 20 Int. hex	B4
30	056206	4	M6 Spring washer	B4
31	1008605	1	Hydraulic hose 1/2	
32	16050210	1	Soft hose no. per running metre	530 mm
33	1007230	1	Comp Motor valve	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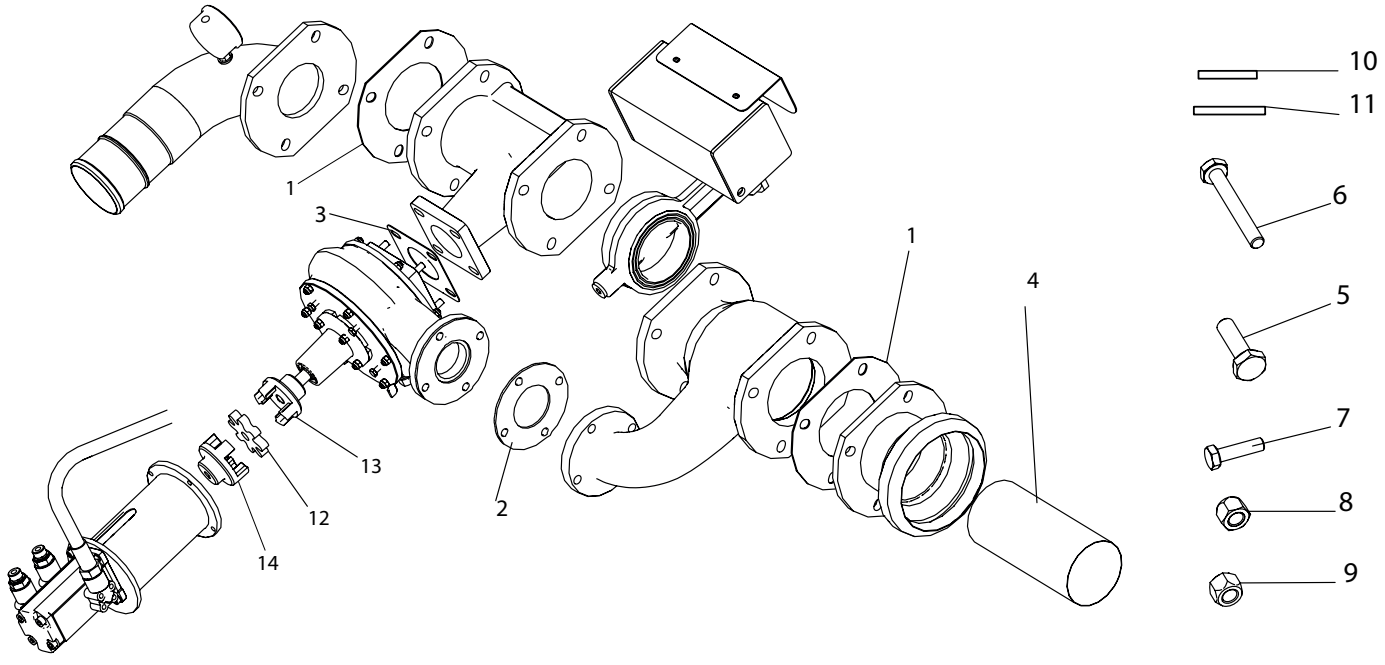
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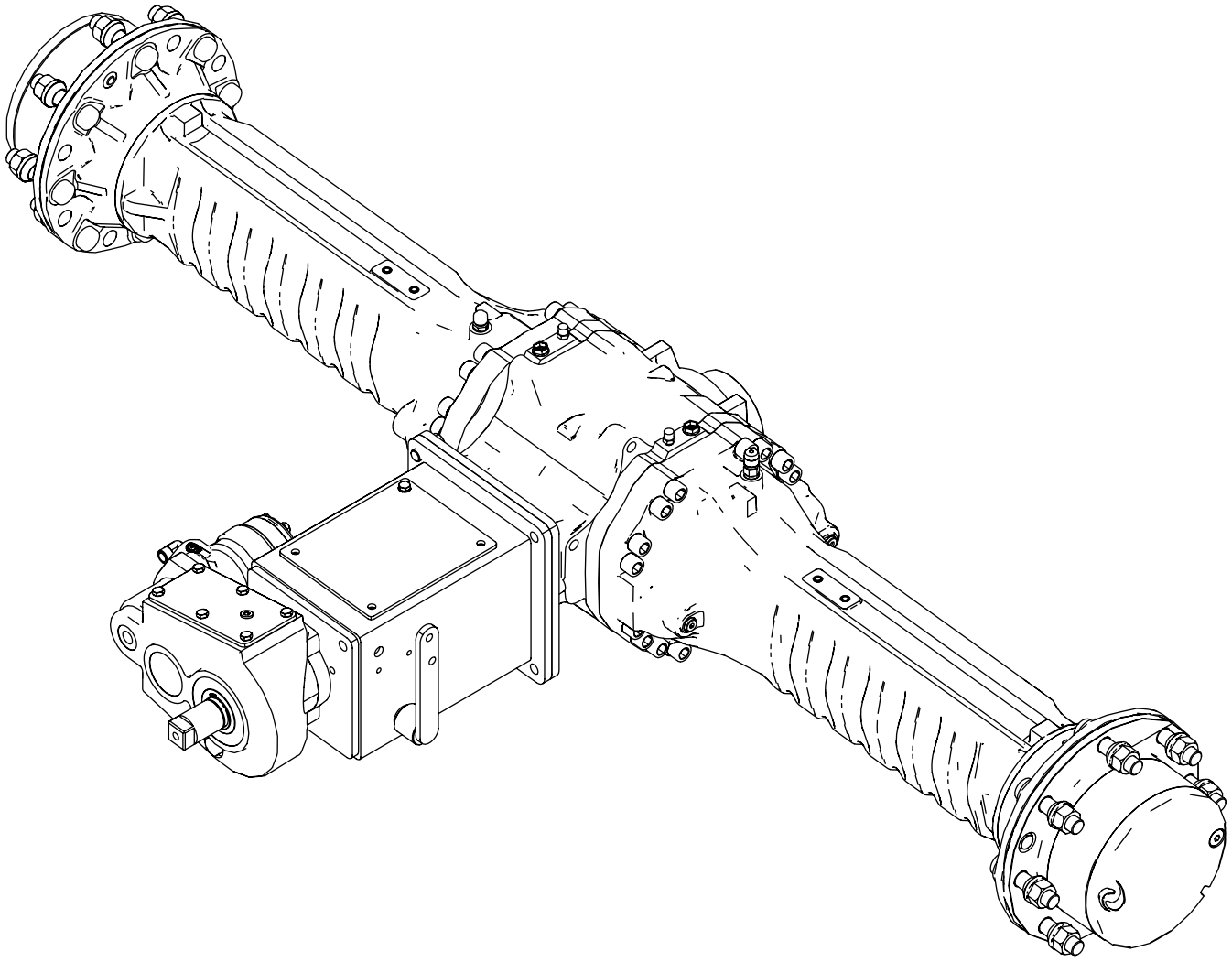
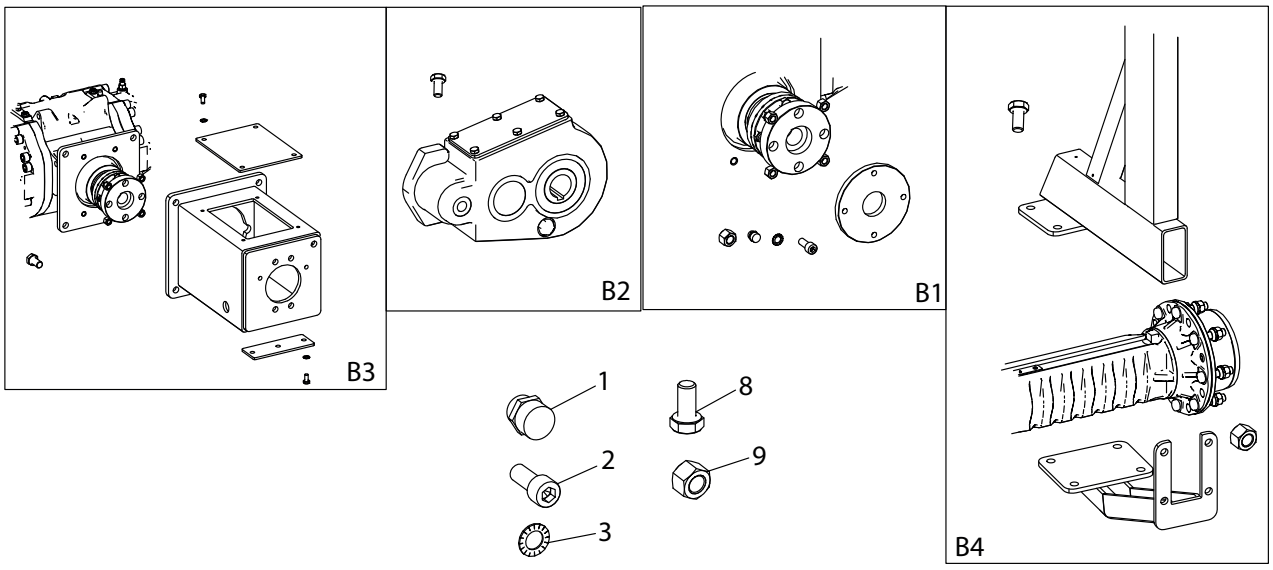
Item No.	Part No.	Qty	Description	Comments
1	631109	2	Flange gasket	
2	522085	1	Flange gasket	
3	631955	1	Flange gasket	
4	1005753	1	Filter	
5	021008045	4	M8 x 45 Steel bolt	B2
6	021010095	4	M10 x 95 Steel bolt	B1
7	022210040	8	M10 x 40 Steel set bolt	B1 & B3
8	040408	12	M8 Steel nut	B2 & B4
9	040410	12	M10 Steel nut	B3 & B1
10	763908	16	M8 Riplock	B2 & B4
11	763910	24	M10 Riplock	B3 & B1
12	1007470	1	Rubber for coupling	
13	1007450	1	Claw coupling Turbine	
14	1007460	1	Claw coupling Oil motor	

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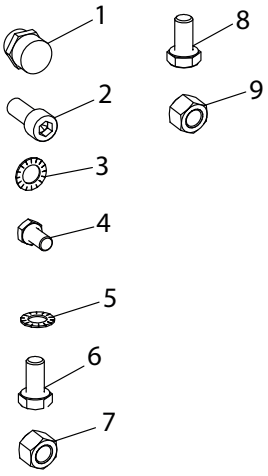
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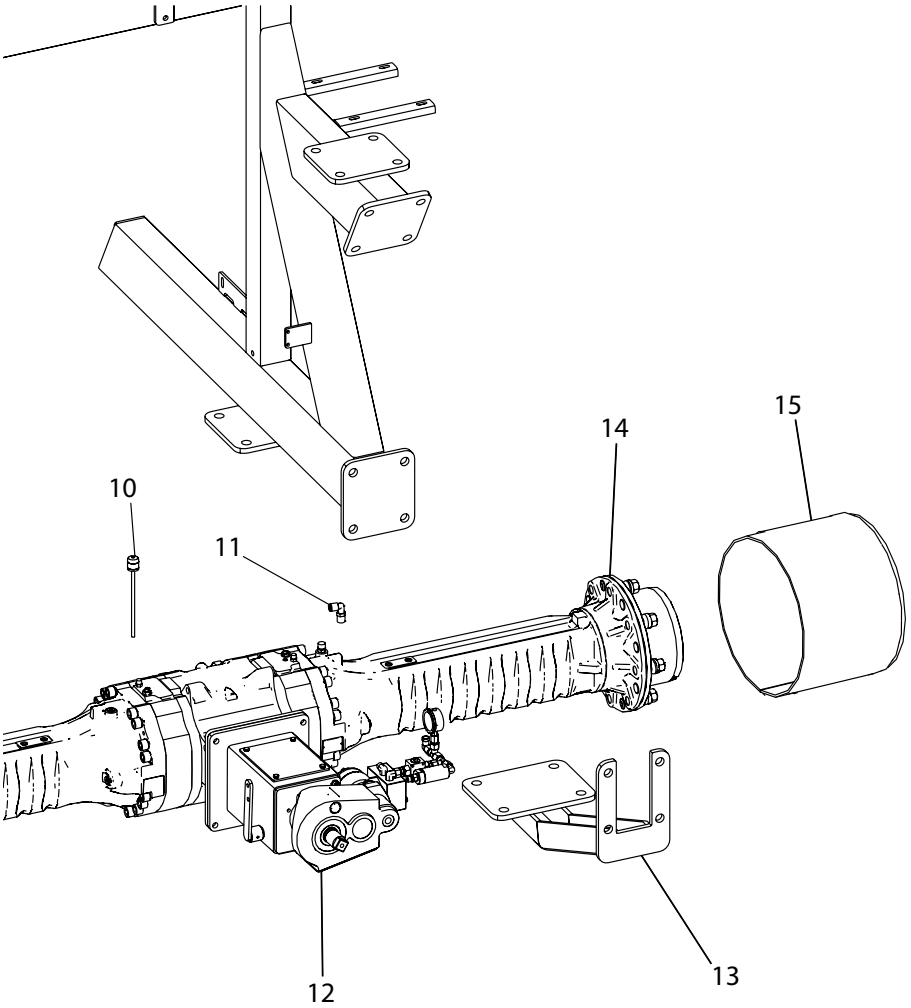
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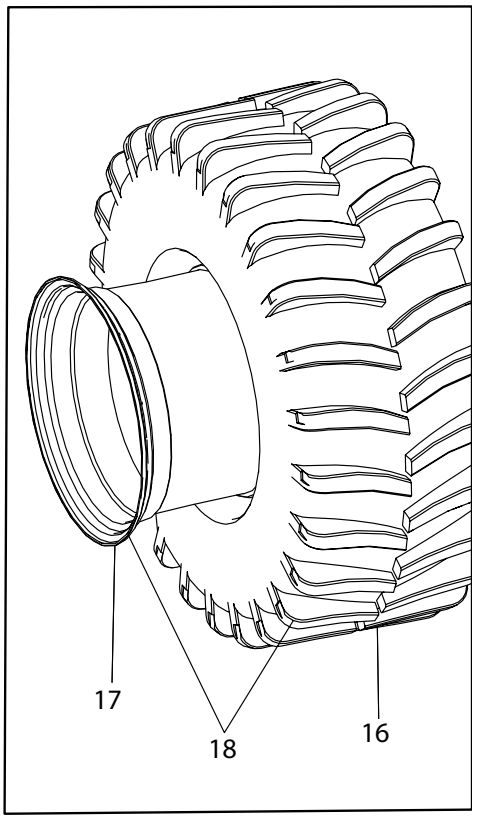
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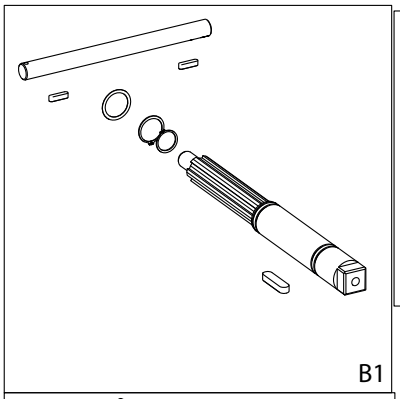
Item No.	Part No.	Qty	Description	Comments
1	1007571	4	Magnet embedded	B1
2	763770	4	M10 x 22 Unbraco bolt	B1
3	763908	6	M8 Riplock	B3
4	022208016	12	M8 x 16 Set bolt	B3 & B2
5	763910	4	M10 Riplock	B1
6	021020220	8	M20 x 220 Steel bolt	B4
7	044020	8	M20 Lock nut	B4
8	022216030	4	M16 x 30 Set bolt	B3
9	044010	4	M10 Lock nut	B1
10	2002813	1	Dipstick	
11	591197	1	Swivel angle	
12	See page 80	1		
13	2009078	2	Reinforcement for rear axle assembly	
14	1009498	1	Rear axle assembly	
15	1009285	2	Tube	
16	1014116	2	Rear tyre	
17	1014120	2	Rim	
18	1014125	1	Comp left rear wheel	1014125-2 Comp right rear wheel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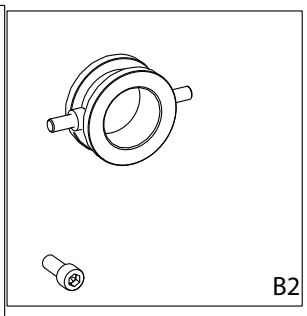
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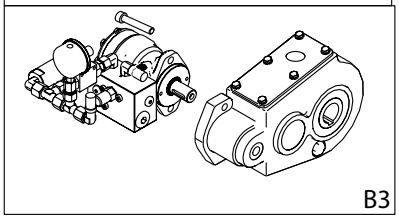
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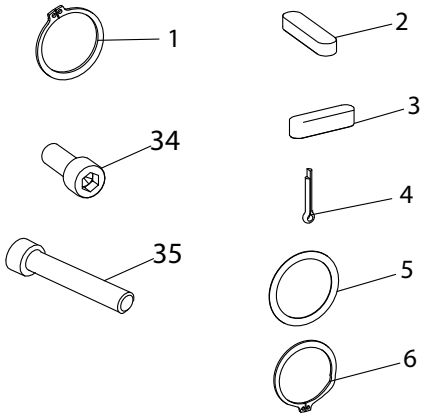
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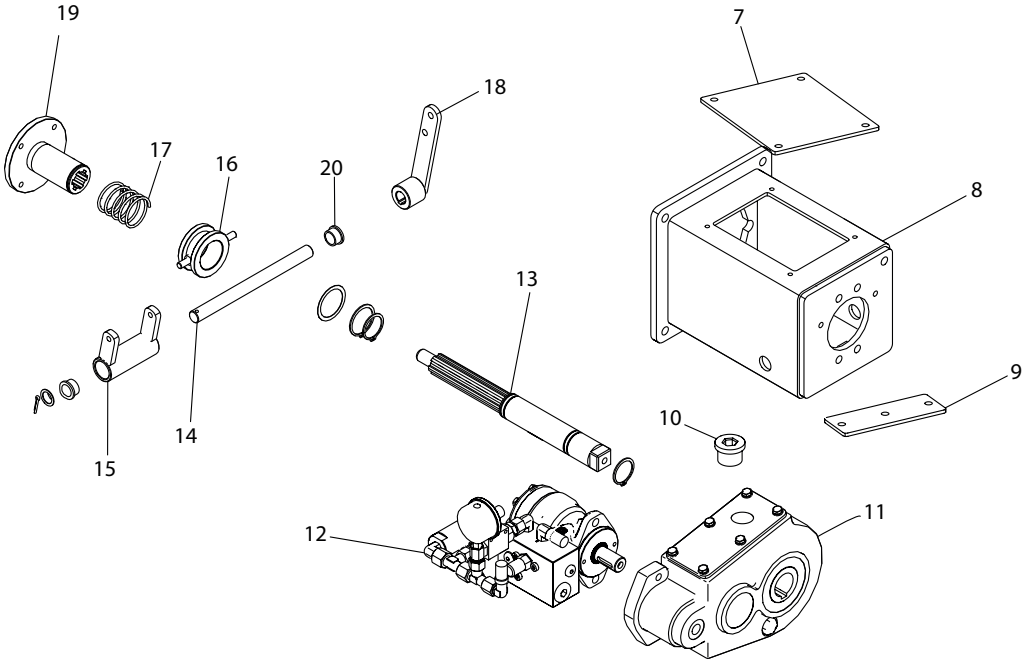
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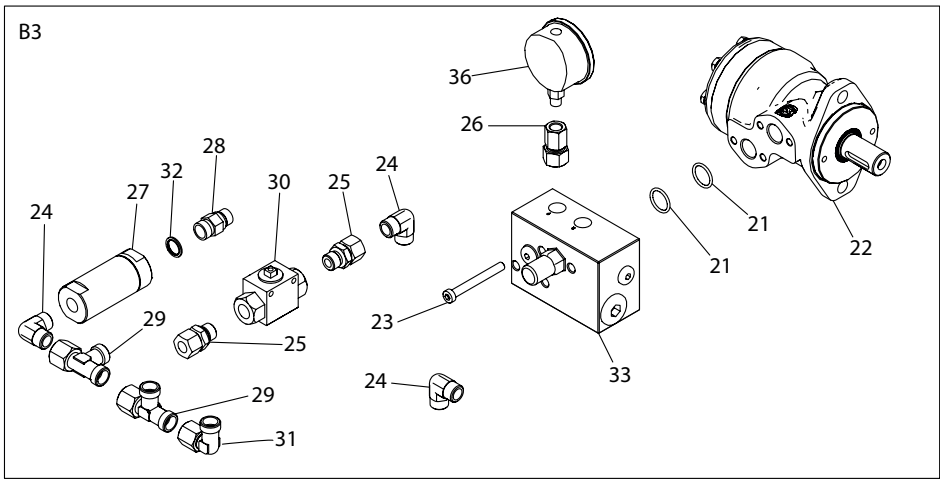
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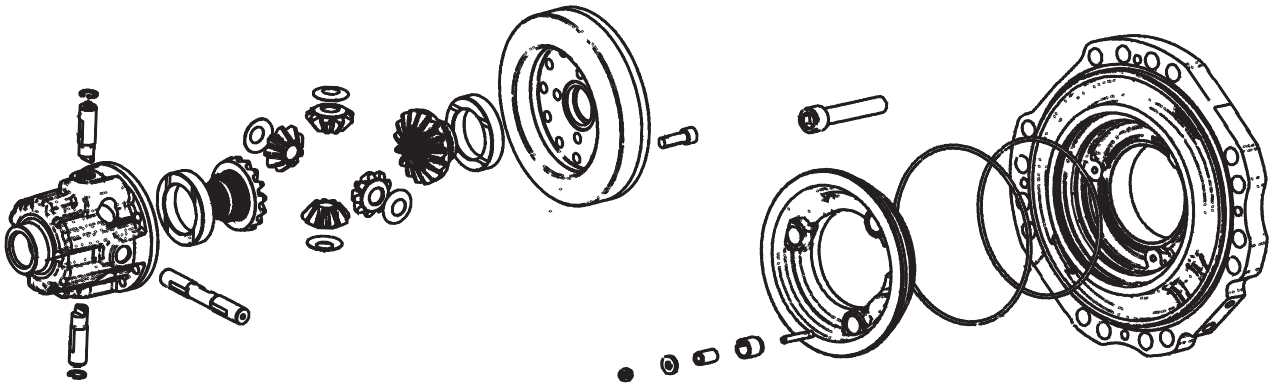
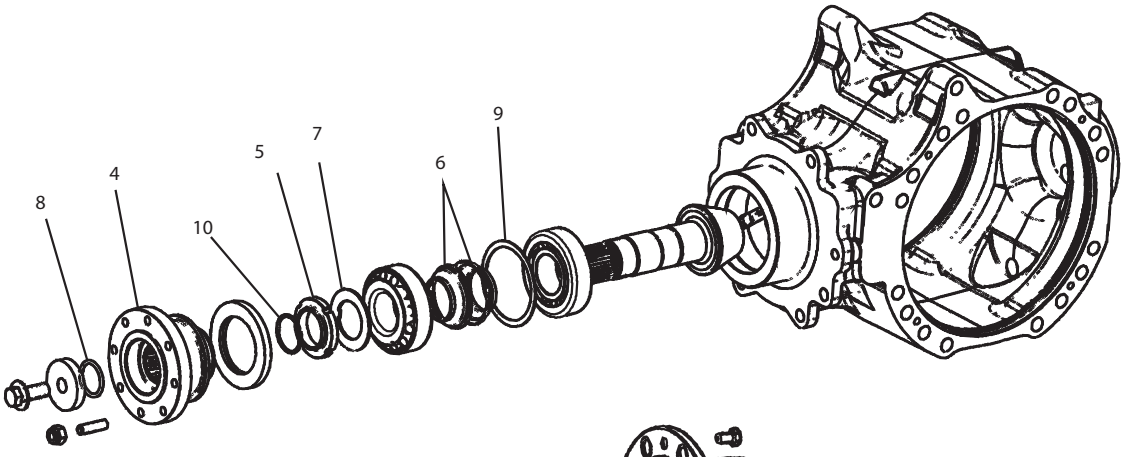
Item No.	Part No.	Qty	Description	Comments
1	700040	2	Retaining ring	B1
2	641625	2	Key	B1
3	641850	1	Key	B1
4	761010	1	Split pin	
5	1009222	1	Shim ring	B1
6	1009221	1	Retaining ring	B1
7	1009205	1	Cover	
8	2002057	1	Coupling housing	
9	1009207	1	Base cover	
10	1007728-5	1	Plug for flat gear	
11	1009500	1	Flat gear	
12	B3			
13	1009230	1	Shaft for coupling	
14	1009235	1	Shaft	
15	1009240	1	Shift fork	
16	1009225	1	Shift sleeve	
17	1009227	1	Compression spring	
18	1009245	1	Shift arm	
19	1009220	1	Coupling hub	
20	1009203	2	Bushing shaft	
21				
22	1007443	1	Oil motor	
23				
24	1007544	3	Angle	
25	890414	2	Nipple straight	
26	1010979	1	Nipple straight	
27	1010970	1	Filter	
28	1007724	1	Nipple straight	
29	1007531	2	Tee	
30	1007510	1	Ball valve	
31	1008622	1	Angle	
32	552025	1	Sealing ring	
33	1013950	1	Valve block	
34	763770	2	M10 x 22 Unbraco bolt	B2
35	763572	2	M12 x 45 Unbraco bolt	B3
36	761163-4	1	Manometer	

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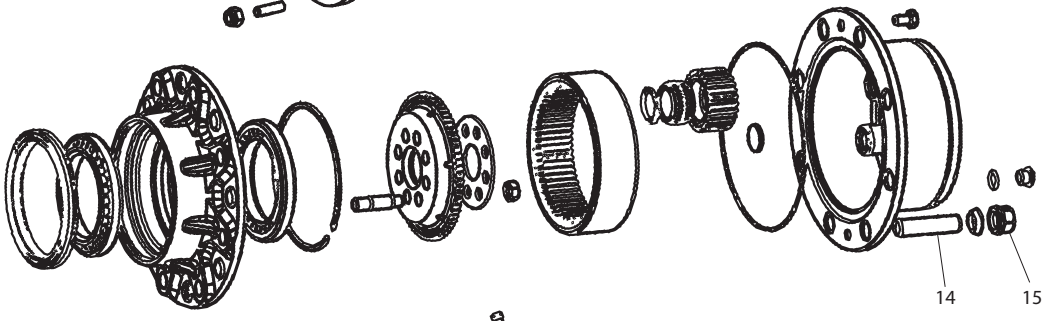
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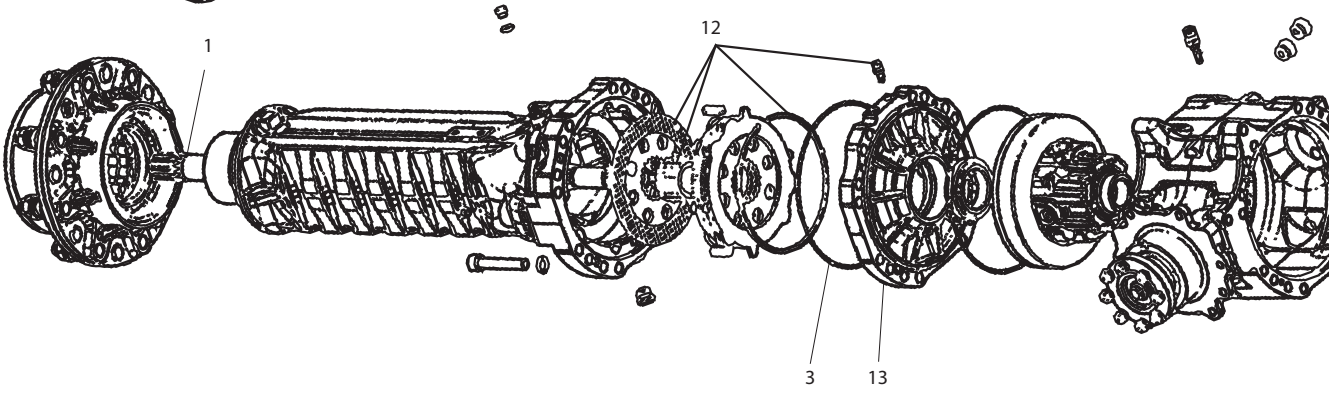
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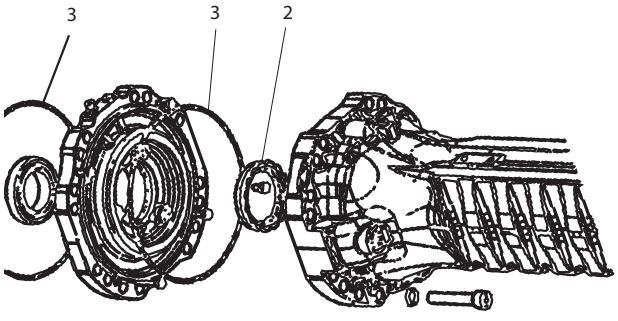
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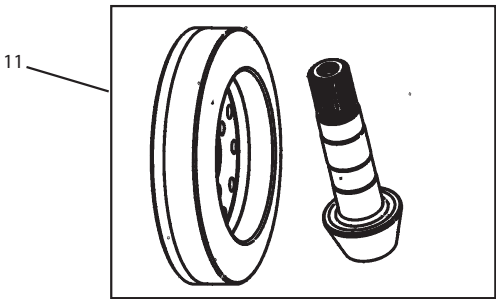
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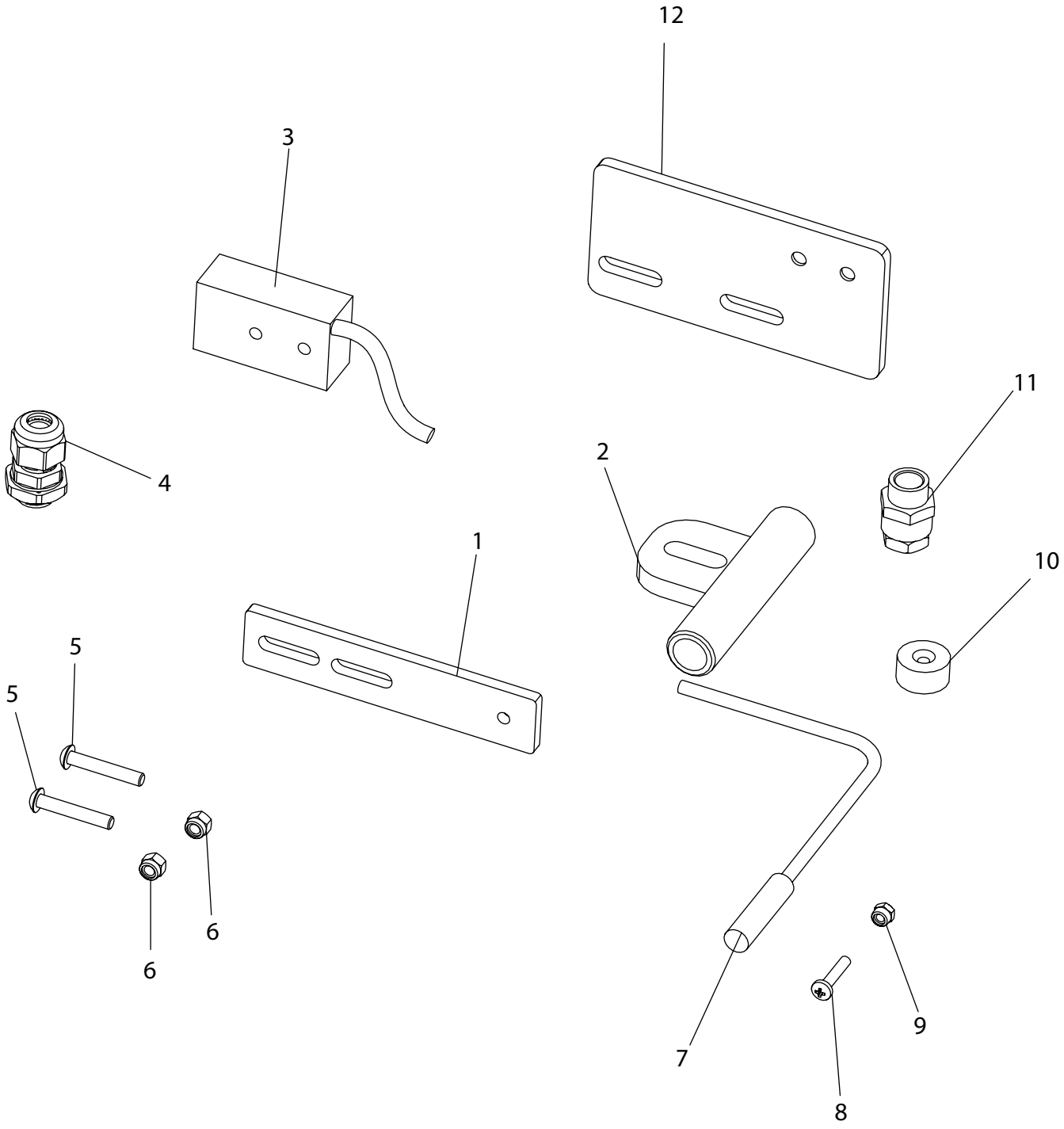
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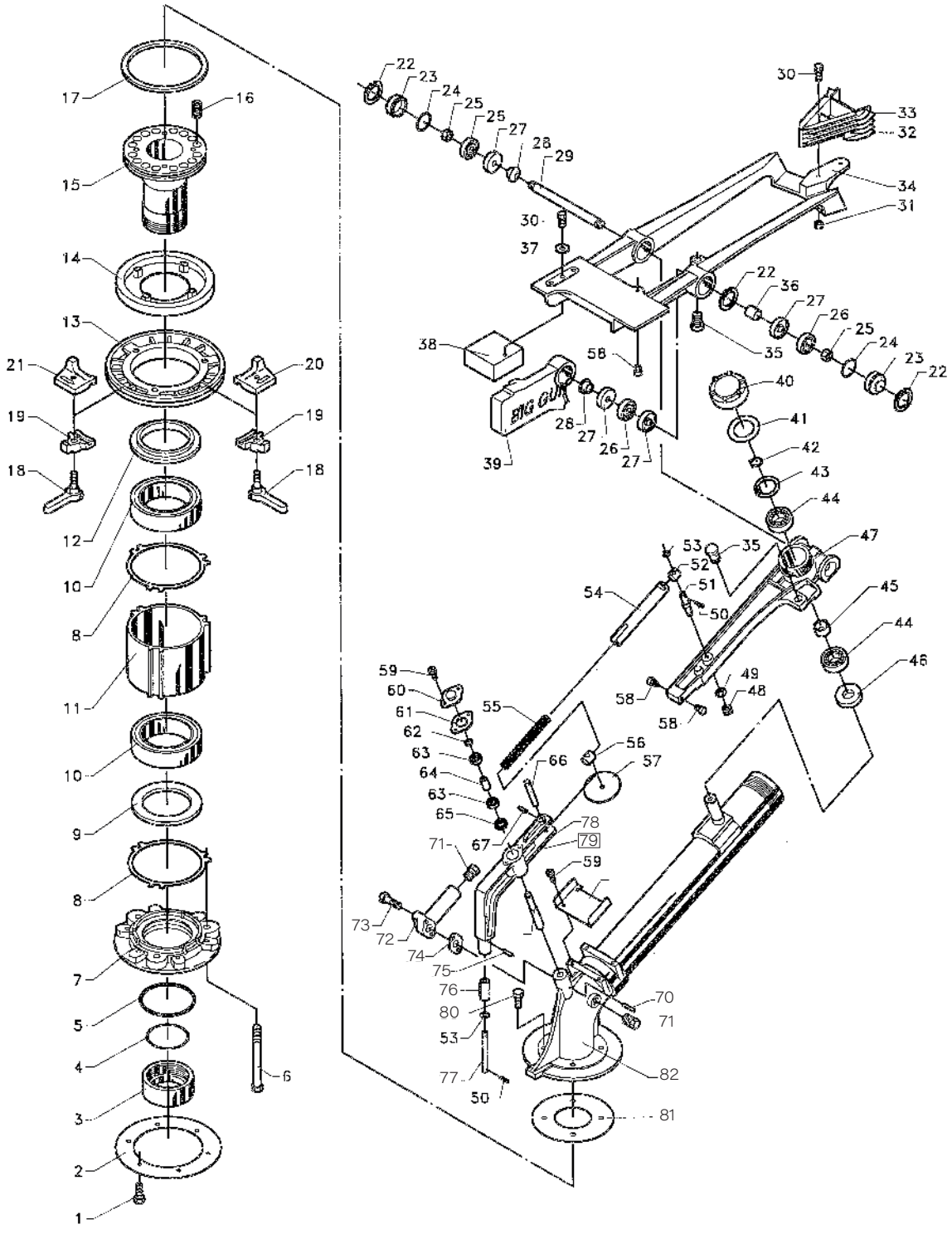
Item No.	Part No.	Qty	Description	Comments
1	1009347	1	Bracket for sensor magnet	
2	1008265	1	Pipe for end stop sensor	
3	1007561	1	Dual sensor	
4	1005535-1	1	Cable coupling Rear axle assembly	
5	763782	2	M5 x 30 Int. hex	
6	044005	1	M5 Lock nut	
7	1007560	1	Sensor	
8	034604020	1	M4 x 20 Machine screw	
9	044004	1	M4 Lock nut	
10	1005530	1	Magnet	
11	1005535	1	Cable coupling Sensor	
12	1009255	1	Bracket for coupling housing sensor	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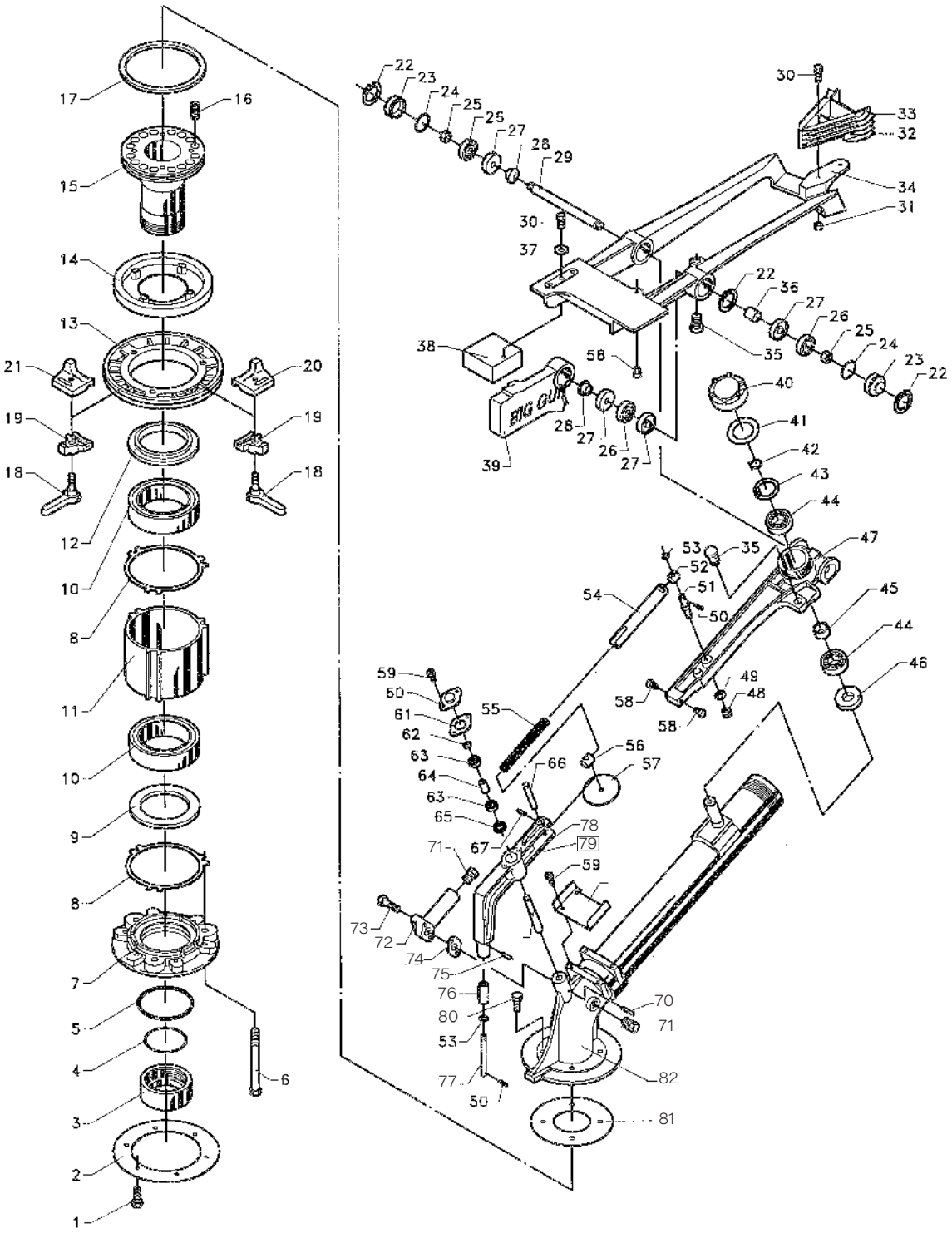
Item No.	Part No.	Qty	Description	Comments
1	776849	1	Bolt	
2	761614	1	Flange gasket for gun	
3	778402	1	Lock nut	
4	776548	1	O-ring	
5	778475	1	O-ring	
6	778462	3	Bolt	
7	778401	1	Base piece	
8	778461	2	Gasket	
9	778373	1	Sealing ring	
10	776253	2	Ball bearing	
11	778405	1	Bearing housing	
12	778372	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	
33	779229	1	Drive blade Topspeed	
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	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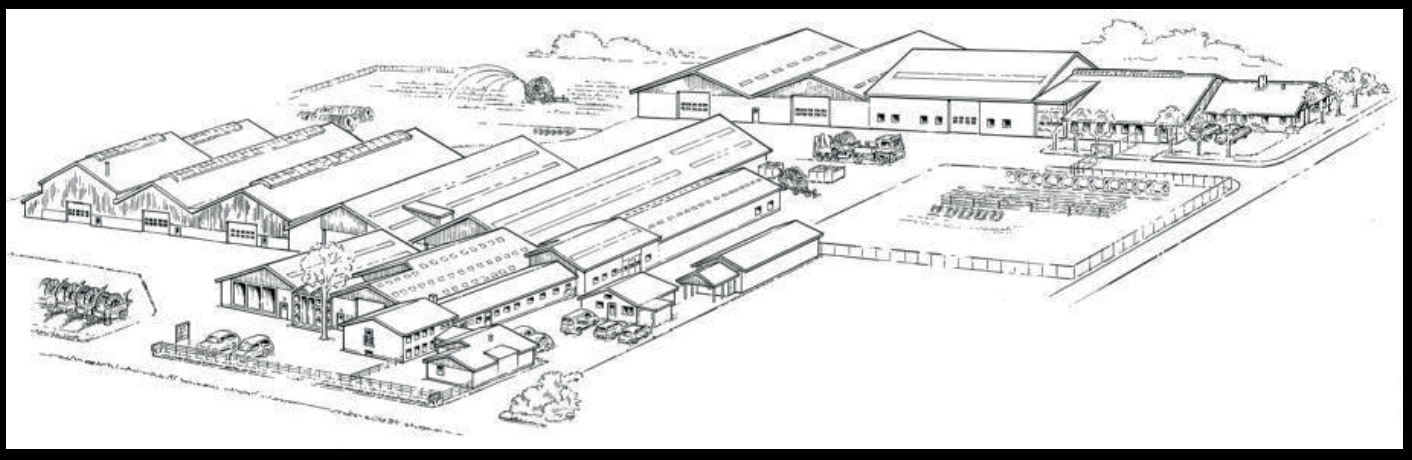
Item No.	Part No.	Qty	Description	Comments
42	778323-017	1	Retaining ring	
43	776045	1	Retaining ring	
44	776054	2	Ball bearing	
45	778326	1	Spacer pipe	
46	776048	1	Oil seal ring	
47	778394	1	Switch lever	
48	776064	1	Nut	
49	777029	1	Washer	
50	776714	2	Split pin	
51	778197	1	Bolt	
52	778282	1	Shaft	
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	2	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	



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