

Operating Instructions

C 9.92 H



Foreword

We congratulate you on having bought a product from HOLDER. We would like you to be able to work safely with your tractor and without malfunctions, and therefore we recommend you follow the instructions in this manual. You will also ensure getting full value from your tractor, save yourself trouble and maintain your warranty. These operating instructions provide you with the required information. These operating instructions also apply to tractors with the designation 9.92 H.

Continual development

Due to the continual development of our tractor in design and equipment, there may be deviations between these operating instructions and your tractor.

Despite taking all the care possible in the creation of this manual, we can not fully exclude mistakes. Please note that the technical data, illustrations and descriptions are not binding and no legal claims can be made on the basis thereof.

These operating and maintenance instructions are supplied with each tractor. Keep these in a safe place where they are available for the driver and owner at any time. If they should get lost, the owner must get a replacement from the manufacturer.

The personnel entrusted with the operation and maintenance of the tractors must be made familiar with the operating and maintenance instructions. The owner must ensure that every operator has received, read and understood these instructions.

We thank you for reading and observing these instructions. In case you still have any questions, suggestions for improvements or discovered mistakes, please contact our customer service.

General notes on service

Detach the warranty card, have it filled in by your dealer and return the signed card to us.

Have the scheduled services carried out at the proper intervals and have them confirmed with the dealer's stamp and signature in these instructions. Please note that warranty can only be claimed if the regular services have been carried out as scheduled.

Foreword

In case of questions regarding your tractor, please state the following data:

Tractor model eg S 990
Engine serial number eg 10668874
Chassis serial number eg 53400101
Date of sale,
date of complaint, if necessary eg 15.07.2009
Service hours eg 500 service hours

Date of issue and version of instructions

September 2009

We wish you safe driving and troublefree working with your HOLDER.

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Explanation of the cautions used:



DANGER

Indicates procedures which must be observed exactly to prevent danger to the life and limbs of persons.



CAUTION

Indicates procedures which must be observed exactly to prevent personal injuries.



ATTENTION

Indicates procedures which must be observed exactly to prevent damage to and/or destruction of objects and equipment.



NOTE

For technical exigencies requiring particular attention.

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Information on the tractor

This tractor has received the type approval acc. to 74/150/EEC after a safety inspection. The tractor conforms to the EMC (Electromagnetic Compatibility) requirements of directive 89/336/EEC. The regulations for exhaust gas identification and noise emissions are observed. The tractor must be registered and the licence plates must be attached at the front and rear.

Intended use

The tractor can be used for towing trailers and for the operation of various attachments. The maximum trailer load, which must not be exceeded, is stated on the identification plate.

The transport of persons is not allowed.

The tractor is designed solely for the customary type of operation in farming and forestry, the upkeep of municipal facilities, including operation in winter. The tractor may only be used as intended and described in these operating instructions.

Included in the intended use is also the performance of the specified maintenance and repairs.

The tractor, together with its attachments, may only be used, serviced and repaired by persons familiar with this equipment and who have been warned of possible risks. The applicable safety regulations and any other valid safety, industrial medicine and traffic rules must be observed.

Site of operation

The tractor must be used in the open. Its operation on public roads is allowed. When using the tractor on public roads, observe the regulations in your country.

Unintended use

Any use which is not intended as described above is not allowed. HOLDER can not be held responsible for any hazards which may result from any unintended use. The manufacturer will not be responsible for any damage which may result therefrom. The damage shall solely be borne by the user. The tractor may not be used for any other purposes than those described in these instructions. The transport of persons on the loading area or attachment is not allowed.

Information on the tractor

Residual hazards and risks

Despite careful working and conformance with standards and regulations, hazards arising from handling the tractor can not be excluded.

The tractor and all other system components conform to currently applicable safety regulations. A residual risk, however, can not be excluded even if the tractor is used as intended and all the safety notices given are observed.

For this reason, persons standing in the area of the tractor and attachments must exercise particular caution in order to be able to react immediately in case of a malfunction, incident, failure, etc.



CAUTION

All persons standing in the area of the tractor and attachments must be advised of the risks which can result from their operation. Also read and observe the other safety rules and regulations contained in these operating instructions.

The hazards can include:

- Unexpected movements the attachments and of the tractor.
- Escape of fuel, fluids and lubricants due to leaks, broken lines and containers, etc.
- Risk of accidents when driving, steering and braking due to unfavourable ground conditions such as slopes, icy roads, unevenness or poor visibility, etc.
- Falling, stumbling, etc when moving on the tractor, particularly if it is wet.
- Risk of fires and explosions due to the battery and electric voltages.
- Danger of poisoning through diesel exhaust fumes.
- Risk of fire through diesel fuel and oils.
- Human misconduct through the non-observance of safety rules.

Disposal instructions

Your tractor is made of different materials. Each material should be disposed of/treated/recycled according to different regional/national regulations. We recommend contacting a salvage company.

Operating instructions

Driver's licence

For the driving of this tractor you require a **driver's licence** depending on the maximum ground speed and the permissible total weight of the tractor and combinations. See the tables below.

Driver's licence classes

Tractors for farming and forestry (also with attachments)

Top speed (design-dependent)	Maximum total weight	Driver's licence class (minimum requirement)	Previous driver's licence class
Up to 32 km/h	No limitation	B, L, T	1, 1a, 1b, 2, 3, 4, 5
Over 32 km/h	Up to 3.5 t	B T: up to 60 km/h, under 18 years only up to 40 km/h	2, 3
	Over 3.5 t to 7.5 t	C1 T: up to 60 km/h, under 18 years only up to 40 km/h	2, 3

Operating instructions

Single-axle trailers or two-axle trailers with axle base of up to 1 metre maximum

Maximum total weight	Driver's licence class (minimum requirement)	Previous driver's licence class
Trailer weight up to 750 kg	B, C1, C, T L: $\textcircled{25}$ only with additional sign and type-dependent maximum tractor ground speed of 25 km/h	1, 1a, 1b, 2, 3, 4, 5
Trailer weight over 750 kg	BE, C1E, CE, T B, C1, C: only up to 3.5 t of max. total combined weight and max. total trailer weight \leq curb weight of tractor; otherwise: $\textcircled{25}$ C1E: only up to 12 t max. total combined weight and max. total trailer weight \leq curb weight of tractor; otherwise: $\textcircled{25}$ L: $\textcircled{25}$	1, 1a, 1b, 2, 3, 4, 5

Operating instructions

Multiple-axle trailers and two-axle trailers with an axle base over 1 metre

Maximum total weight	Driver's licence class (minimum requirement)	Previous driver's licence class
Trailer weight up to 750 kg	B, C1, C, T L: $\textcircled{25}$ only with additional sign and type-dependent maximum tractor ground speed of 25 km/h	2, 3
Trailer weight over 750 kg	BE, C1E, CE, T	2, 3
Up to 3.5 t max. total weight	B, C1, C: only up to 3.5 t of max. total combined weight and max. total trailer weight \leq curb weight of tractor; otherwise: $\textcircled{25}$	1, 1a, 1b, 4, 5: each $\textcircled{25}$
Up to 12 t max. total weight	C1E: only up to 12 t max. total combined weight and max. total trailer weight \leq curb weight of tractor; otherwise: $\textcircled{25}$ L: $\textcircled{25}$	

Operating instructions

Two trailers behind tractors for farming and forestry

Maximum total weight	Driver's licence class (minimum requirement)	Previous driver's licence class
Up to 3.5 t max. total weight	BE, C1E, CE, T B, C1, C: only up to 3.5 t of max. total weight of the combination and max. total weight of the trailer \leq curb weight of tractor; otherwise: 25	2, 3 1, 1a, 1b, 4, 5, 25
Up to 12 t max. total weight	C1E: only up to 12 t max. total weight of the combination and max. total weight of the trailer \leq curb weight of tractor; otherwise: 25 L: 25	

Safety

General notes on safety

- Observe your national regulations for safety and health protection.
- Do not allow children under 16 to use the tractor.
- When using the public highway, respect the highway code.
- Do not allow anyone to stand around where they might get hurt.
- Do not run the engine in enclosed spaces.
- Exercise extreme caution when handling fuels. There is a high risk of fire.
- Exercise extreme caution when handling fuel, fluids and lubricants. These can be poisonous and corrosive.
- To prevent the danger of fire, keep the tractor and attachments clean.
- Observe the warning notices and symbols on your tractor.
- **Emergency stop** When the inching pedal or traction hydraulics is defective, the tractor can only be brought to a halt by setting the ignition to 0 and using the service brake.

Working clothes

- Only wear snugly fitting clothing when working with the tractor.
- If necessary, wear suitable headwear to keep loose hairs and pigtails from being caught in rotating parts.
- Do not wear jewellery and similar objects, eg rings, when working with the tractor.

Safety notes for retrofits

The tractor has electronic components whose proper functioning can be influenced by electromagnetic emissions from other equipment. These influences can endanger persons if the following notes on safety are not observed.

- Have the equipment installed by your service centre only.
- Before the installation of electric or electronic equipment connected to the tractor's electrical system, check if these installations can interfere with the tractor's electronic system or other system components.

Operating instructions

- The installed equipment must conform to the applicable EMC directive 89/336/EU and carry the CE symbol.
- If you must install a mobile communications system (or have it installed) (eg radio, mobile telephone), the following requirements must be met:
 - Only approved equipment (eg with type approval) may be installed.
 - The equipment must be installed permanently,
 - The operation of portable or mobile equipment inside the tractor is only allowed if connected to a permanently installed external antenna,
 - The transmitting section must be installed away from the tractor's electronic system.
 - When installing the antenna, install it properly and with a good connection to tractor ground.
 - Do not exceed the maximum permissible current rating of the wiring according to the installation instructions of the equipment manufacturer.
 - Before doing electric welding, disconnect all plugs from the electronics.

Safety instructions for handling fuel, fluids and lubricants

Gear oil, engine oil, diesel fuel



Do not eat, drink or smoke when handling these fuel, fluids and lubricants. Prolonged intensive contact may cause degreasing and irritation of the skin. Wash the skin with water and soap; use a skin care cream. If necessary, wear personal protective gear. Change soaked clothes and shoes immediately. If vapour or mist was inhaled, breathe fresh air. Consult a doctor if the complaint persists. After contact with the eyes, rinse the eyes thoroughly with water (at least 10 minutes), then consult an eye doctor. If swallowed, do not force to vomit, but consult a doctor. Danger of slipping on the spilled product, particularly in connection with water.

Oils can contaminate water. Always keep them in approved containers. Avoid spilling fluids. Remove spilled fluids immediately with an oil binding agent and discard in accordance with laws and regulations. Discard old fluids as specified.

Operating instructions

Observe applicable laws and regulations. Oils are inflammable. Do not let them come in contact with hot engine parts as fire can result.

Hydraulic oil, brake fluid

During tractor operation, these fluids are pressurized and pose a health hazard. Do not spill these fluids. Remove any spilled fluids immediately with an oil binding agent and discard them as specified. Discard the old fluid as specified. Observe applicable laws and regulations. Do not allow them to come in contact with hot engine parts. Danger of fire!

Avoid contact with the skin. Avoid the inhalation of spray fog. The penetration of pressurized fluids into the skin is particularly dangerous if these fluids are under high pressure and escape from the hydraulic system through leaks. Seek medical aid at once in case of such injuries.

If injuries can not be excluded, use a suitable personal protector (for example, protective gloves, glasses and skin protection and skin care creams).

Battery acid

Battery acid contains dissolved sulphuric acid. This acid is poisonous and caustic. When working with battery acid, always wear protective clothing and eye protectors. Do not allow acid to contact the clothing, skin or eyes; in case of contact wash immediately with ample clean water. In case of personal injuries, consult a doctor at once. Neutralize spilled battery acid immediately. Discard old fluids as specified. Observe applicable laws and regulations.

Emissions**Exhaust Gases**

During operation, the engine emits exhaust gas into the environment. The exhaust gas mainly consists of water vapour, carbon dioxide (CO₂), carbon monoxide (CO), carbon hydride (CH), nitrogen oxide (NO_x) and soot. The components CO, CH and NO_x are poisonous or hazardous to health and should not be inhaled in high concentrations. Soot is a carcinogenic material.

Operating instructions

Particularly the particulates contained in the exhaust gas can cause cancer. For this reason the engine should not be operated in enclosed spaces.

Heat



The exhaust gases are very hot and can ignite inflammable material. Therefore keep the exhaust pipe away from inflammable materials.

Battery

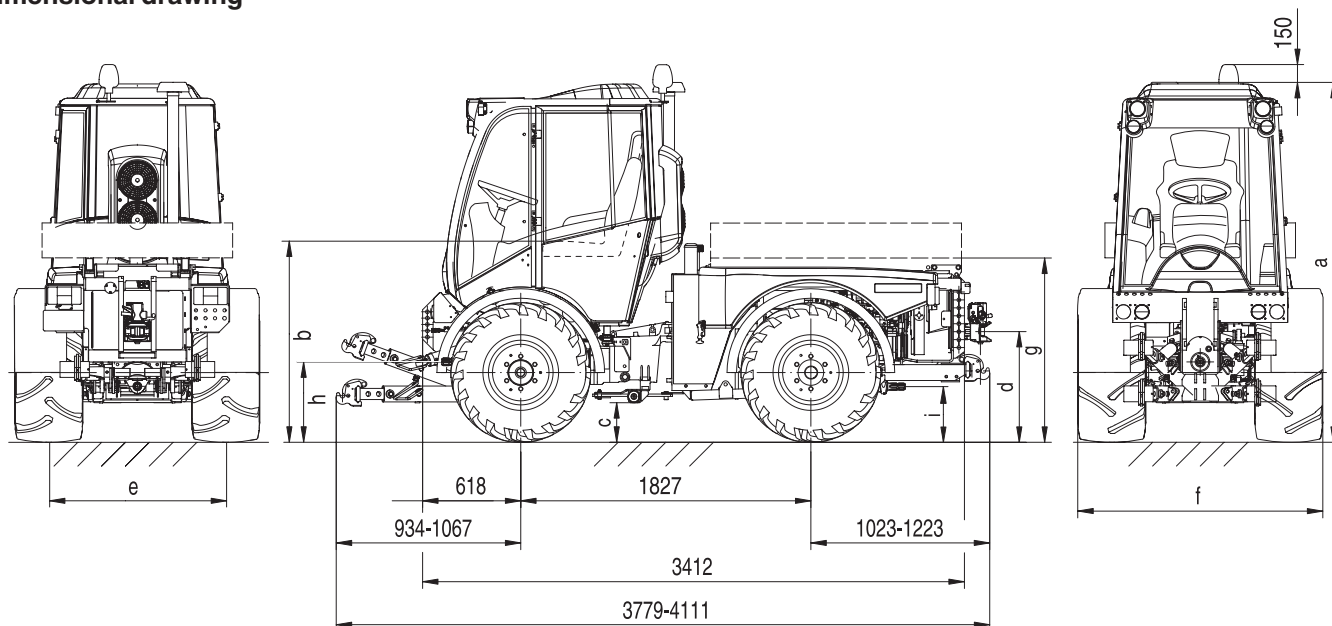


During charging the battery emits a mix of oxygen and hydrogen (detonating gas). This gas mix is explosive and must not be ignited. The danger of explosion can be avoided with suitable ventilation and the keeping naked fires away. Observe the safety rules when handling the battery.

Technical data

Tractor dimensions

Dimensional drawing



Technical data

Table of dimensions for S 990

Tires	Type	Profile	Total height	Avg. seat height	Ground clearance	Tow coupling		Dump body height	PTO height	
						Lowest position	Highest position		h	i
			a mm	b mm	c mm	d mm	d mm	g mm	mm	mm
280/80 R18 280/80 R18 S	532-31-08 532-31-09	XMCL	2243	1265	227	572	972	1136	481	327
36x13.50-15	524-31-8	Multi Trac	2236	1258	220	565	965	1129	474	320
10.5-18 MPT 10.5-18 MPT S	524-31-1 524-31-6	AT 603	2233	1255	217	562	962	1126	471	317
425/55 R17	532-31-02	AC 70G	2227	1249	211	556	956	1120	465	311
425/55 R17	532-31-01	All – Ground	2221	1243	205	550	950	1114	459	305
400/60-15.5	524-31-5	404	2212	1234	196	541	941	1105	450	296
33x12.50-R15	524-31-7	Discoverer LT	2209	1231	193	538	938	1102	447	293
33/18LL-16.1	524-31-9	Turf Special	2209	1231	193	538	938	1102	447	293
33x12.50-15	524-31-4	413 TL	2194	1216	178	523	923	1087	432	278
33x15.50-15	524-31-3	412 TL	2193	1215	177	522	922	1086	431	277
31x15.50-15	524-31-2	Xtra Trac	2181	1203	165	510	910	1074	419	265

Distance between centreline of tires

Tires	Small turning radius to DIN 7020 at min. track width (measured at outermost point of truck)	Normal track width (flange size 1034)				With hub spacers							
						Type 5234-80 = 45 mm				Type 526-34-70 = 80 mm			
		Track width e		Overall width f		Track width e		Overall width f		Track width e		Overall width f	
		Min.-mm	Max.-mm	Min.-mm	Max.-mm	Min.-mm	Max.-mm	Min.-mm	Max.-mm	Min.-mm	Max.-mm	Min.-mm	Max.-mm
10.5-18 MPT S	7.12 m	960	1124	1234	1398	1050	1214	1324	1488	1120	1284	1394	1558
33x12.50-15	7.19 m	1000	1084	1310	1394	1090	1174	1400	1484	1160	1244	1470	1554
10.5-18 MPT	7.19 m	1034	1052	1308	1326	1124	1142	1398	1416	1194	1212	1468	1486
280/80 R18	7.21 m	1034	1052	1324	1342	1124	1142	1414	1432	1194	1212	1484	1502
33x12.50R15	7.30 m	-	1084	-	1427	1090	1174	1433	1517	1160	1244	1503	1587
36x13.50-15	7.35 m	-	1084	-	1465	1090	1174	1471	1555	1160	1244	1541	1625
400/60-15.5	7.38 m	-	1104	-	1504	-	1194	-	1594	1142	1264	1542	1664
425/55 R17	7.42 m	-	1114	-	1545	-	1204	-	1635	-	1274	-	1705
280/80 R18 S	7.30 m	-	1124	-	1414	1050	1214	1340	1504	1120	1284	1410	1574
31x15.50-15	7.39 m	-	1124	-	1518	-	1214	-	1608	1122	1284	1516	1678
33x15.50-15	7.39 m	-	1124	-	1519	-	1214	-	1609	1122	1284	1517	1679
33/18LL-16.1	7.51 m	-	1164	-	1639	-	1254	-	1729	-	-	-	-

Technical data

Weights

	Weight in kg	Auxiliary assemblies	Total	Front	Rear
Max. curb weight	4500 kg	Inching speed	13 kg	10 kg	3 kg
Max. front axle load	*2660 kg - 2700 kg	Rear lift	77 kg	-25 kg	102 kg
Max. rear axle load	*2660 kg - 2700 kg	Dump body	75 kg	0 kg	75 kg
Max. tongue weight on tow coupling	800 kg				

* With 33X12.50 R15 tires

Tires	33x12,50-15	33x12,50R15	31x15,50-15 33x15.50-15	10,5-18MPT 36x13.50-15	400/60-15.5	33/18LL-16.1	280/80 R18	425/55 R17
Curb weight S 990 (with driver 75 kg)								
Total: kg	2638	2648	2668	2696	2718	2734	2766	2790
Front kg	1220	1225	1235	1249	1260	1268	1284	1296
Rear kg	1418	1423	1433	1447	1458	1466	1482	1494

Tires

The pressure can deviate, depending upon the make and use of the tires. Observe the instructions of the tire manufacturer.

Type of tyre	Capacity	Profile	Tube	Inflation pressure (in bar)			Wheel ballast weights	
				Curb weight	Max. loading		Type	Weight
					Front	Rear		
280/80 R18	132A8	XMCL	No	1.6	2.5	2.5	524-34-1	ca. 45 kg
36x13.50-15	114B / 4PR	Multi Trac	No	1.0	1.2	1.4	524-34-1	ca. 45 kg
10.5-18 MPT	10	AT 603	Yes	2.2	2.2	2.2	524-34-1	ca. 45 kg
425/55 R17	134G	AC 70G	No	0.8	1.6	1.6	524-34-1	ca. 45 kg
425/55 R17	134G	All - Ground	No	0.8	1.6	1.6	524-34-1	ca. 45 kg
400/60-15.5	132A8	404	Yes	1.8	1.8	2.0	524-34-1	ca. 45 kg
33x12.50-15	6PR	413 TL	No	1.4	1.9	2.0	524-34-1	ca. 45 kg
33x12.50 R15	108Q	Discoverer LT	No	1.6	2.5	2.5	524-34-1	ca. 45 kg
33x15.50-15	6PR	412 TL	No	1.0	1.6	1.6	524-34-1	ca. 45 kg
33/18LL-16.1	10PR	Turf Special	No	1.2	1.8	2.0	-	-
31x15.50-15	115B	Xtra Trac	No	2.0	3.2	3.2	524-34-1	ca. 45 kg

Note: Observe the max. tire inflation pressure (max. loading) for the max. axle load and for road travel. Adjust the inflation pressure acc. to the data of the tire manufacturer for max. tractive force for off road travel and to reduce the ground pressure.

Technical data

Engine specifications

	S 990
Manufacturer	Deutz AG
Model designation	TD2011 L04w
Engine type	4-stroke diesel
No. of cylinders	4
Cubic capacity	3619 cm ³
Specific fuel consumption	216 g/kWh
Rated speed	2600 rpm
Upper idle speed	2600 rpm +200 rpm
Lower idle speed	900-950 rpm
Power to 97/68 EC n=2600 rpm	68.0 kW (92 HP)

Theoretical ground speeds

Transmission			Hydrostatic drive	Dual Drive 30 km/h	Dual Drive 40 km/h
Engine output 68 kW					
Engine speed 2600 RPM					
Tires	Type	Unit			
280/80 R18	532-31-08/09	km/h	31.3	32.3	39.1
36x13.50-15	524-31-8	km/h	31.1	32.1	38.8
10.5-18MPT	524-31-1/-6	km/h	30.8	31.7	38.4
425/55 R17	532-31-01/-02	km/h	29.8	30.7	37.2
400/60-15.5	524-31-5	km/h	29.7	30.7	37.1
33x12.50-15	524-31-4	km/h	29.4	30.3	36.7
33x12.50R15	524-31-7	km/h	29.2	30.1	36.4
33x15.50-15	524-31-3	km/h	28.8	29.7	35.9
33/18LL-16.1	524-31-9	km/h	28.8	29.7	35.9
31x15.50-15	524-31-2	km/h	26.5	27.3	33.0

Technical data

Technical data /filling quantities

Assembly	Additional information	Description
Hydrostatic drive		Infinitely variable ground speed, 2 mechanical speed ranges
PTO shafts		2 PTOs (front and rear), sense of rotation: clockwise when looking on shaft end
- RPM at front		540 RPM at 2200 engine RPM, 1000 RPM at 2390 engine RPM
- RPM at rear		1000 RPM at 2360 engine RPM
- Spline profile		1 3/8" (6) DIN 9611
PTO clutch		Wet multi-disc clutch, electro-hydraulically operated
Differential lock		Simultaneous front and rear operation, electro-hydraulically operated
Fuel system		
Fuel tank	Diesel fuel	82 litres

Assembly	Additional information	Description
Steering		
- Type		Hydrostatic with 2 double-acting steer cylinders
- Steering valve		Orbitrol OSPC 125 LS (single-stage) or OSPD 125/205 (two-stage)
Brakes		
- Service brake		Multi-disc brake, wet, acting on all 4 wheels
- Actuator		Hydraulic
- Parking brake		Multi-disc brake, wet, acting on all 4 wheels
- Operation		Electrically-operated
Tow coupling		
- Type		Cramer, height-adjustable
Front lift		
- Type		3-point, upper link adjustable
- Attachment		Category I and II
- Lifting power		2700 N (measured at attachment points)
- Cylinder		2 cylinders, double-acting

Technical data

Assembly	Additional information	Description
Rear lift		
- Type		HOLDER standard 3-point
- Attachment		Category I and II
- Lifting power		15700 N (measured at attachment points)
- Cylinder		2 cylinders, double-acting
Dump body		
- Dimensions	L X W X H	1530 x 1140 x 215 mm
- Load capacity		1300 kg
Traction hydraulics		
Variable pump		Hydromatik
- Type		A4 VG 40 EP
- Output		160 litres/min
- Operating pressure		380 bar (430 bar maximum)
Variable motor		Hydromatik
- Type		A6 VM 55 EP
- Displacement		26.1 - 55 cm ³ /rev
Hydraulic oil tank		45 L (common oil tank for traction and working hydraulics)

Assembly	Additional information	Description
Working hydraulics (with steering)		
Pump		Sauer-Sundstrand
- Type		-
- Output		17 cm ³ /rev (42.5 L/min at 2500 engine RPM)
- Operating pressure		180-190 bar
Hydraulic oil tank		45 L (common oil tank for traction and working hydraulics)
Electrical system		
- Operating voltage		12 VDC
- Battery		12 V / 100 Ah
- Alternator		12 V / 95 A
- Starter motor		12 V / 2.4 kW
General tractor		
- Operating range		- 30°C to + 50°C

Technical data

Noise level

The tractor emits the following noise level (measured at the driver's ear) according to EU Standard 77/311/EEC; measurement according to Appendix II.

Table of noise levels and absorption rating

Model	Type of engine	Engine output	Noise level dB(A)				Absorption value
			Cabin open*		Cabin closed		
			Left	Right	Left	Right	
S 990	TD2011 L04w	68.0 kW (92 HP)	85	85	84	84	1.3

*Roof hatch and side window open

Exhaust gas identification

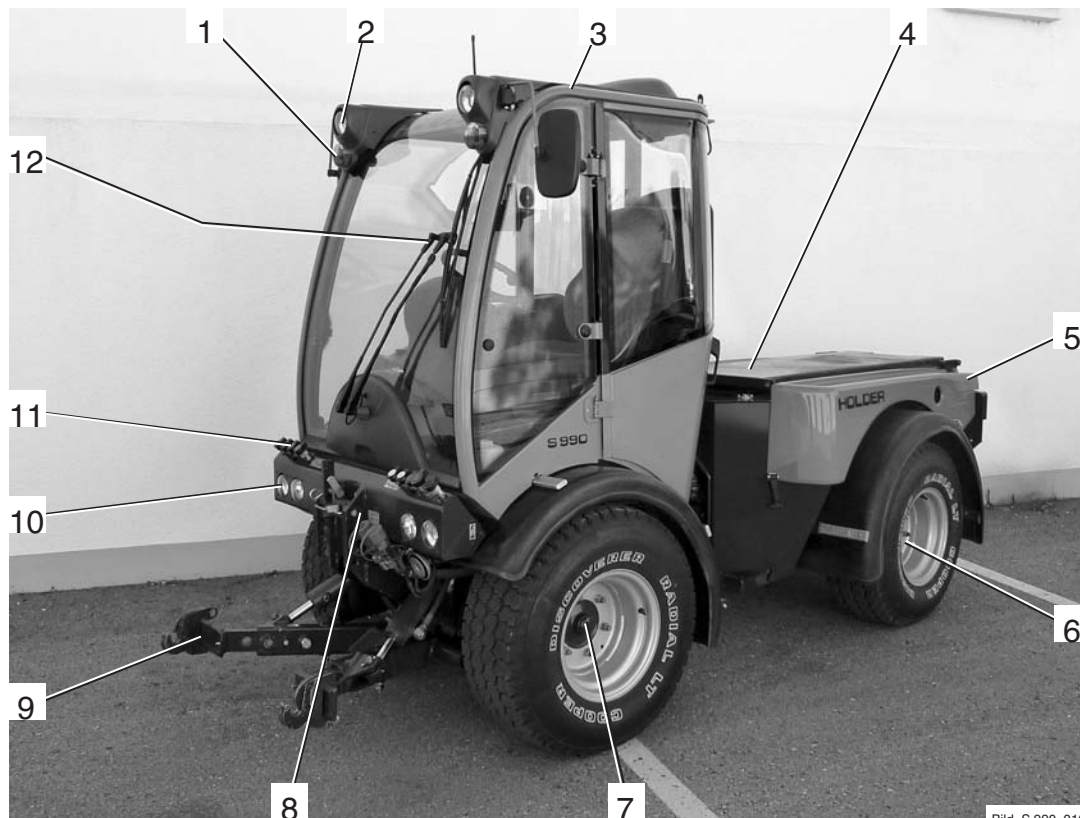
The absorption rating is stated on the type plate.

Description

Views of vehicle

Front left view

- 1 Turn signal and position light
- 2 Top headlight
- 3 Driver's cab
- 4 Dumping subframe (dumping device)
- 5 Rear end of tractor
- 6 Rear axle
- 7 Front axle
- 8 Upper link bracket
- 9 Lower link frame of front lift
- 10 Headlight
- 11 Plug-in hydraulic quick couplings for attachments*
- 12 Wiper/washer



Bild_S 990_010

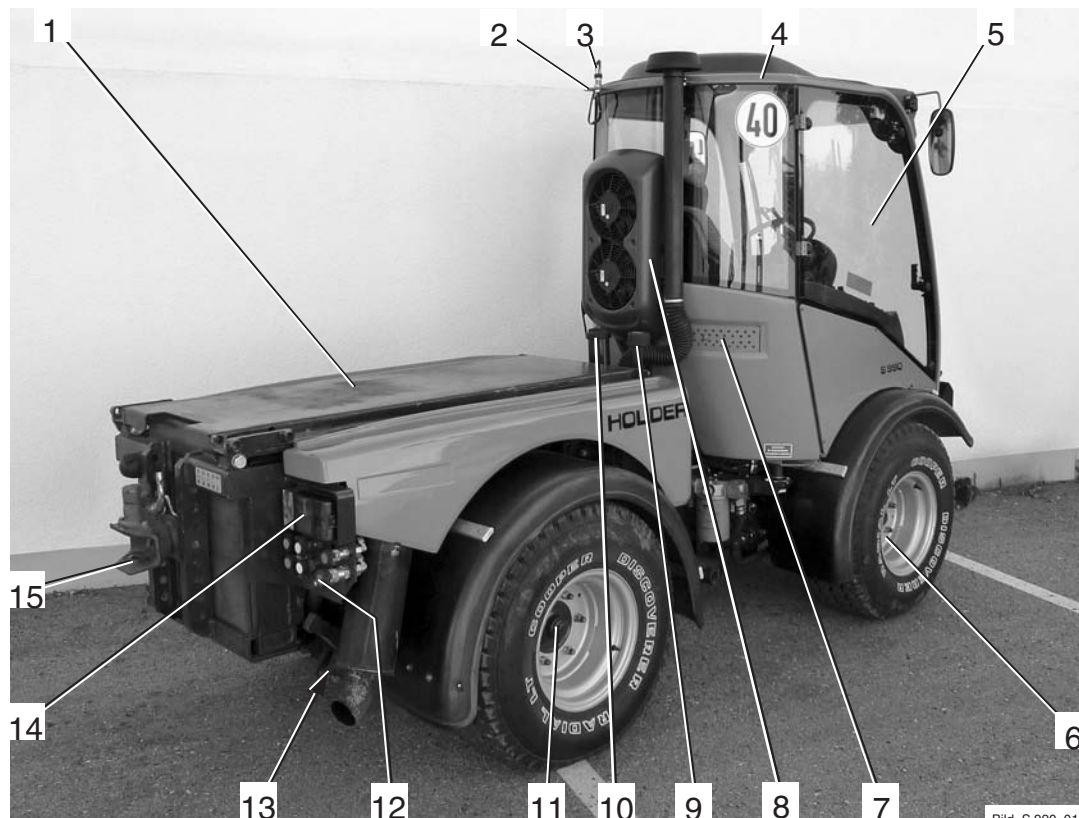
Description

Tractor

Rear right view

- 1 Dumping subframe
- 2 Working light*
- 3 Mount for top strobe warning light*
- 4 Driver's cab
- 5 Front end of tractor
- 6 Front axle
- 7 Intake screen of fresh air fan
- 8 Engine air intake
- 9 Hydraulic oil filler neck
- 10 Fuel filler neck
- 11 Rear axle
- 12 Plug-in hydraulic quick couplings for attachment*
- 13 Lower link frame of rear lift*
- 14 Tail light, left/right
- 15 Trailer coupling

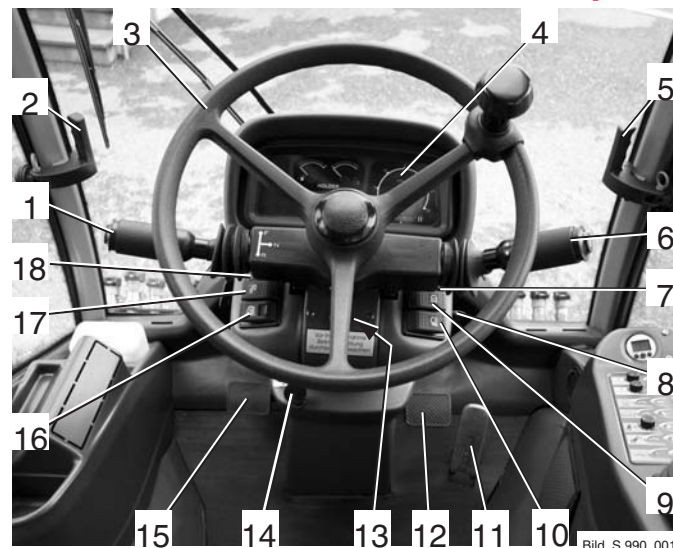
* Option



Bild_S 990_011

Description**Driver's station****Operating controls**

- 1 Direction lever
- 2 Lever for left side window
- 3 Steering wheel
- 4 Multifunctional display
- 5 Lever for right side window
- 6 Turn signal and wiper lever
- 7 Toggle switch for meter
(ground speed in km/h or PTO RPM)
- 8 Ignition lock
- 9 Toggle switch for top headlight
- 10 Light switch
- 11 Accelerator pedal
- 12 Brake pedal
- 13 Preheating indicator
- 14 Speed range selector
- 15 Inching pedal
- 16 Parking brake switch
- 17 Switch for two-stage steering*
- 18 Toggle switch for console or steering column direction switch

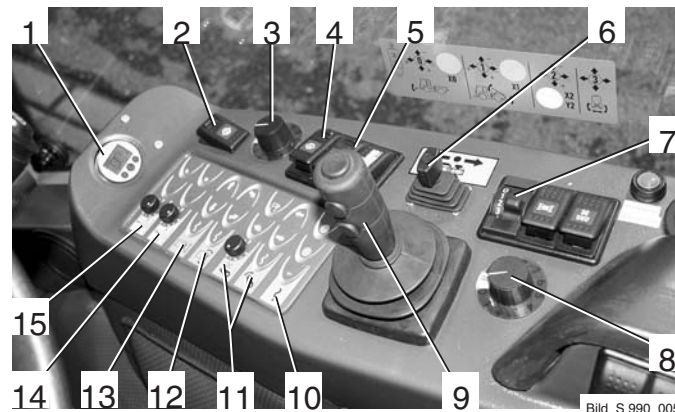


* Option

Description

Controls on right front console

- 1 Pressure gauge for hydraulic accumulator*
- 2 Master switch for working hydraulics
- 3 Fine adjustment knob for attachment variable pump*
- 4 Switch for attachment variable pump*
- 5 Front PTO* switch
- 6 Forward/reverse switch
- 7 Driving program switch
- 8 Fine adjustment knob for ground speed (in ground speed ranges 3 and 4)
- 9 Joystick for working hydraulics
- 10 Float positions for 3 plug-in quick couplings
- 11 Membrane keyboard for front lift
- 12 Membrane keyboard for tilt control
- 13 Membrane keyboard for lateral control*
- 14 Membrane keyboard for 2nd circuit priority flow valve*
- 15 Membrane keyboard for 1st circuit priority flow valve*

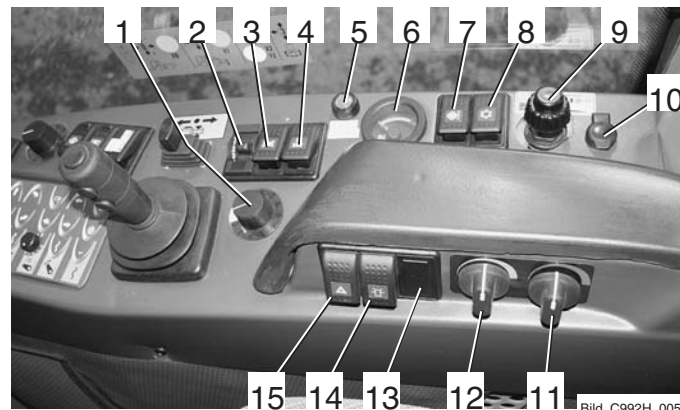


* Option

Description

Controls on right rear console

- 1 Fine adjustment knob for ground speed (in ground speed ranges 3 and 4)
- 2 Driving program selector switch
- 3 Differential lock toggle switch
- 4 Fan toggle switch
- 5 Hydraulic oil level warning light
- 6 Hydraulic oil temperature gauge
- 7 Fan reversing toggle switch*
- 8 Air conditioning toggle switch*
- 9 Throttle control knob
- 10 Power socket
- 11 Heater control
- 12 Air conditioning control*
- 13 Working light switch*
- 14 Top strobe warning light switch
- 15 Hazard warning flasher switch



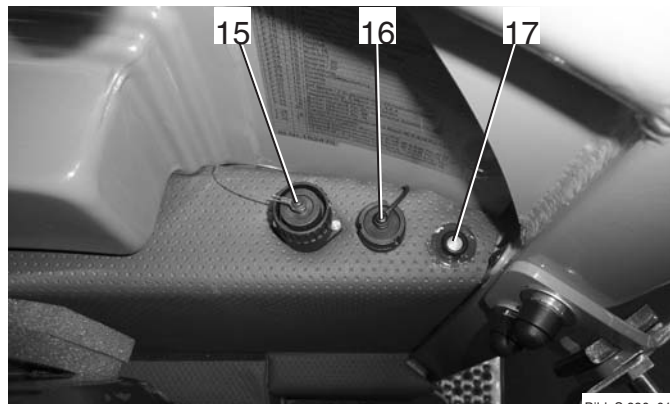
Bild_C992H_005

* Option

Description

Controls on rear console

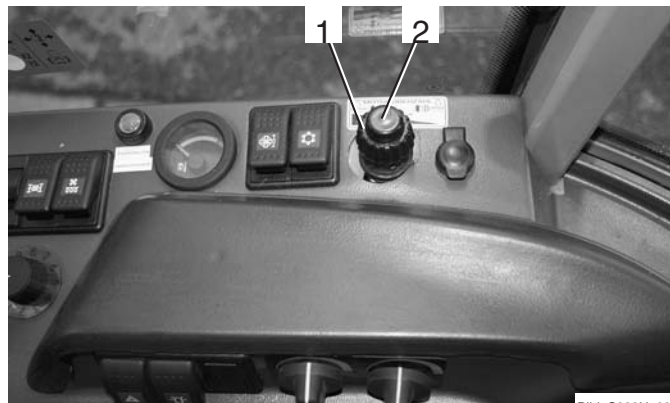
- 15 Diagnostic socket for working hydraulics
- 16 Diagnostic socket for traction hydraulics
- 17 Traction electronics trouble diode



Bild_S 990_012

Hand throttle

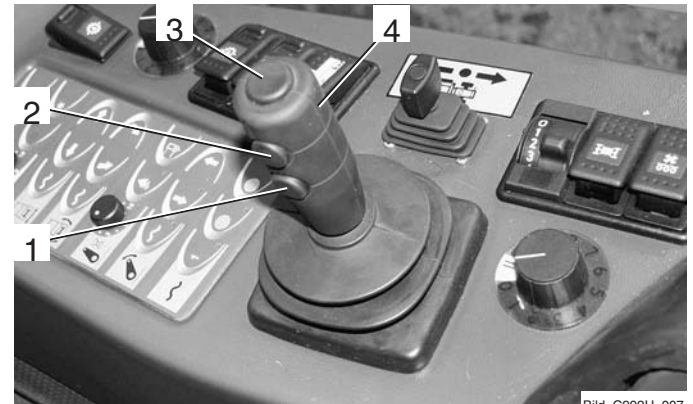
- 1 Outer ring for fine control:
 - Turn clockwise for RPM reduction
 - Turn counter-clockwise for RPM increase
- 2 Inner knob for coarse control
 - Pull up for RPM increase
 - Push down for RPM reduction
 - Push down fast for emergency reset to idle speed



Bild_C992H_006

Description**Joystick**

- 1 Pushbutton 1 for joystick level 1
- 2 Pushbutton 2 for joystick level 2
- 3 Pushbutton 3 for joystick level 3
- 4 Joystick (with no button pressed = joystick level 0)



Bild_C992H_007

Pedals

- 1 Inching pedal
- 2 Brake pedal
- 3 Accelerator pedal

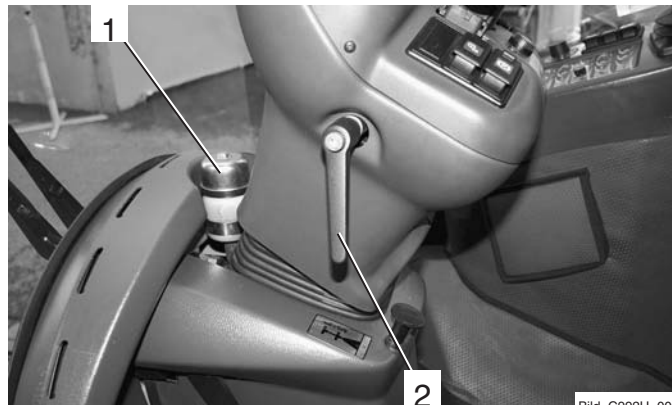


Bild_C992H_008

Description

Steering column adjustment

- 1 Brake fluid reservoir
- 2 Steering column adjustment lever



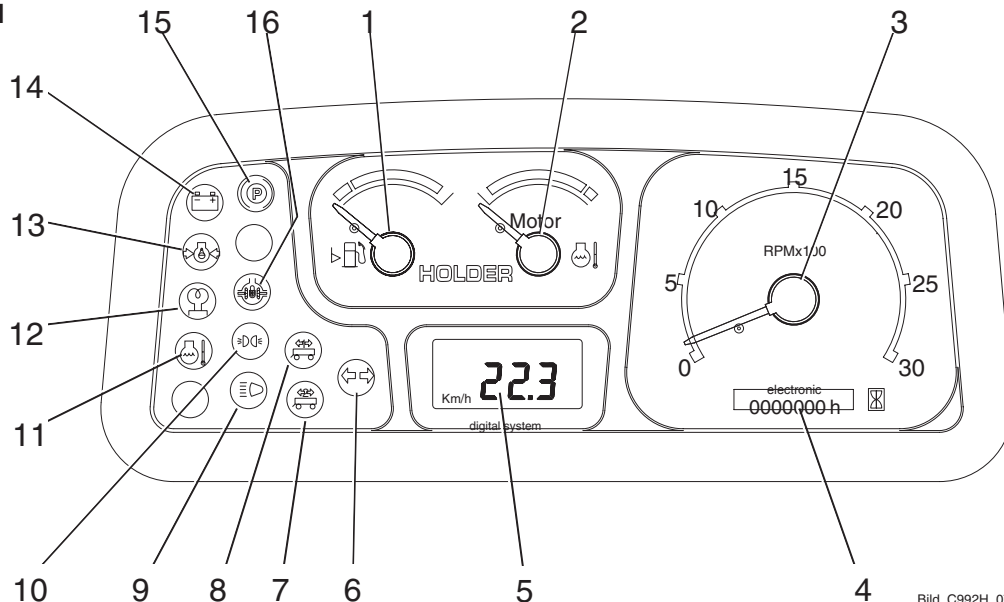
Bild_C992H_009

Description**Multifunctional display, legend**

- 1 Fuel gauge
- 2 Engine oil temperature gauge
- 3 Tachometer with marks for PTO RPM
- 4 Hour meter
- 5 Digital speedometer

Indicator lights:

- 6 Turn signal indicator
- 7 Turn signal indicator for 2nd trailer
- 8 Turn signal indicator for 1st trailer
- 9 High beam
- 10 Low beam
- 11 Engine oil temperature
- 12 Preheating
- 13 Engine oil pressure
- 14 Battery
- 15 Parking brake
- 16 Differential lock

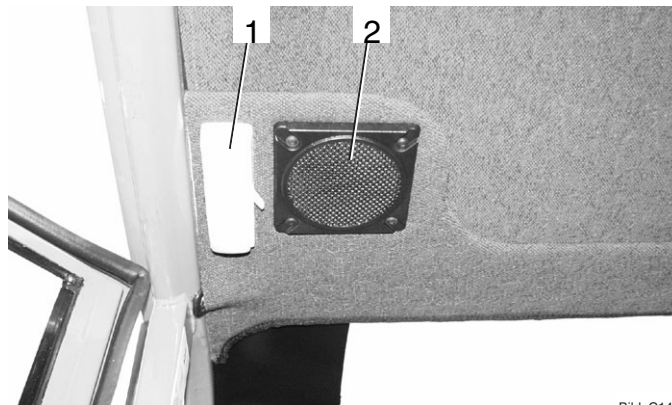


Bild_C992H_071

Description

Controls at front top of cabin

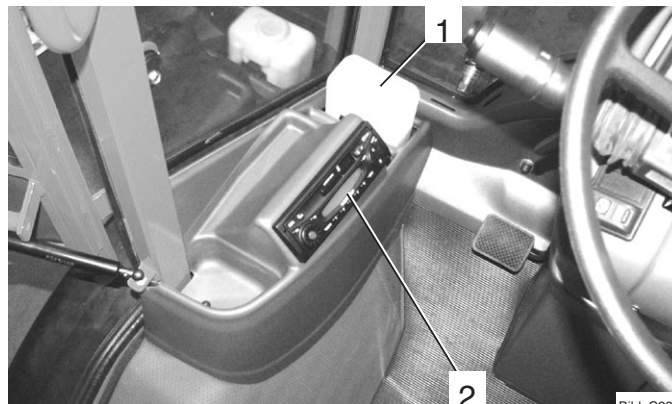
- 1 Dome light
- 2 Loudspeaker



Bild_C149

Controls at front bottom of cabin

- 1 Wiper fluid reservoir
- 2 Radio

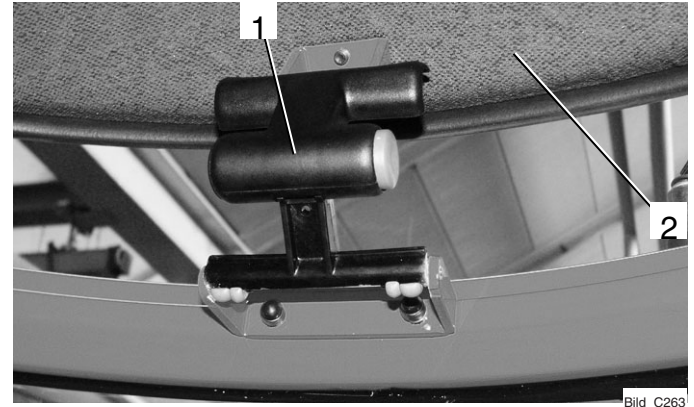


Bild_C282

Description

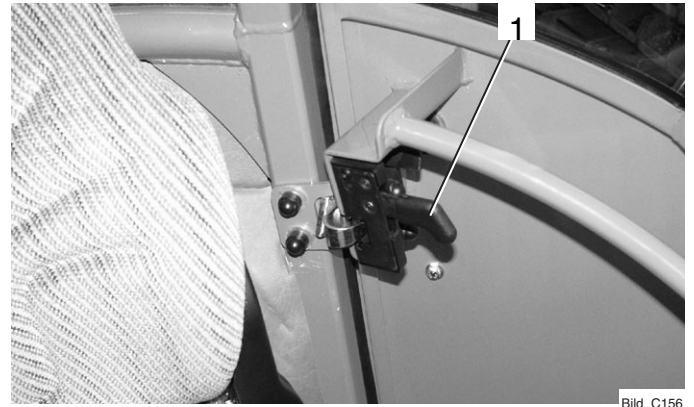
Controls at rear of cabin

- 1 Roof hatch handle
- 2 Roof hatch



Door controls

- 1 Dooropener

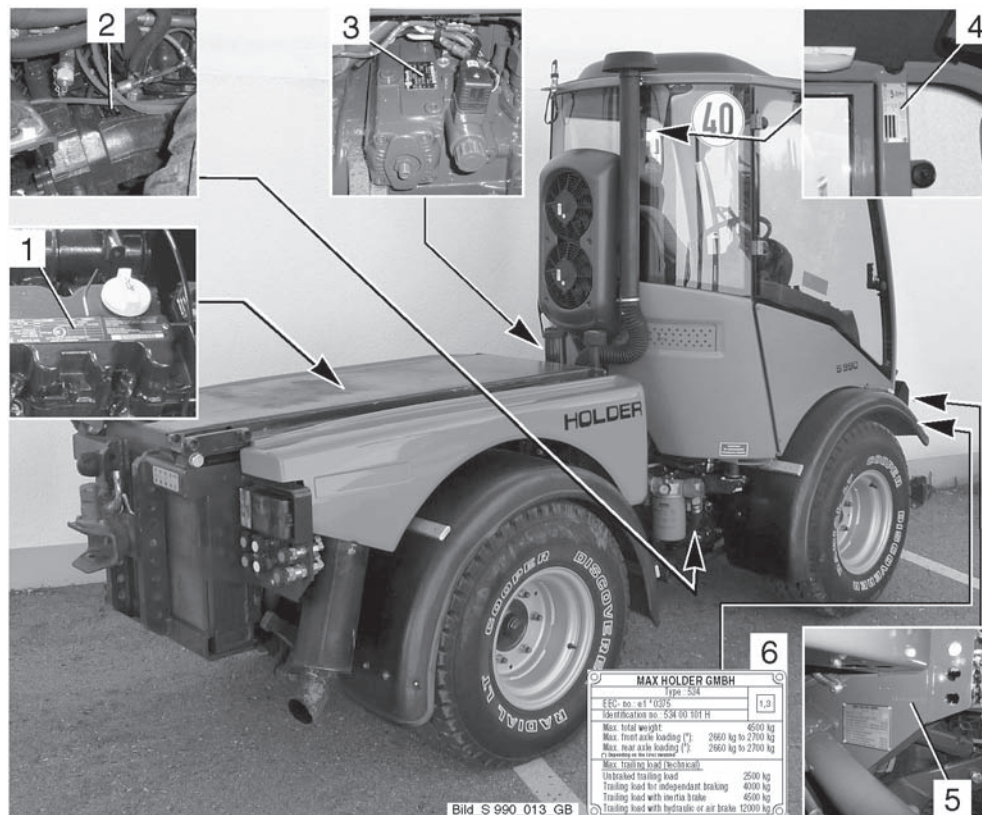


Description

Location of plates and labels

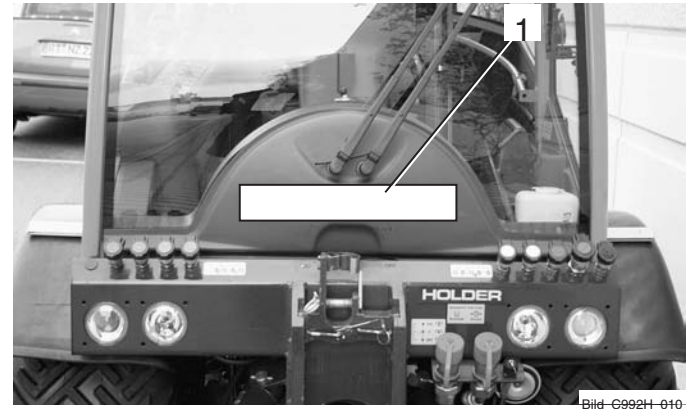
Identification plates

- 1 Engine type plate
- 2 Variable motor type plate
- 3 Variable pump type plate
- 4 Cabin type plate
- 5 Chassis serial number
(on front support on right side)
- 6 Machine type plate
(on front support)



Description**Mounting instructions for licence plate**

- Install the front licence plate (1) on the cover below the windshield wipers.
Remove the cover before installing the licence plate.



- Install the rear licence plate (2) at the rear below the left tail light.



Description

Overview of options and variants (selection)

Assembly	Additional information	Dimension/order no./type
Activated carbon filter	for cabin ventilation	131667
Heating element for oil preheating (engine)	From -20°C (230VAC)	5234-69
Air conditioning		534-34-80
Seat heater		204-34-83
Lap seat belt		204-34-81
Comfort backrest extension		204-34-80
Left armrest		204-34-82
Rear working light		204-34-88
Hydraulic lateral control	For front lift	204-01-01
Rear lift		534-51-04
Mounting	For ball-type hitch	526-51-73
Ball-type hitch		526-51-74
Top strobe warning light		526-34-74

Description

Assembly	Additional information	Dimension/order no./type
Electro-hydraulic accumulator		204-80-19
Circuit 1 priority flow valve		204-80-04
- Hydraulic pump	Series pump	
- Output		17 cm³/rev
- Flow rate		0-25 litres/min
- Maximum pressure		200 bar
Circuit 2 priority flow valve		534-80-25
- Hydraulic pump	Tandem pump	
- Output		14 cm³/rev
- Flow rate		0-25 litres/min
- Maximum pressure		200 bar

Description

Assembly	Additional information	Dimension/order no./type
Attachment variable pump	0-120 litres/min adjustable	534-80-30
- Hydraulic pump	A11VO40EP	
- Output		0-40 cm ³ /rev
- Flow rate		0-120 litres/min
- Maximum pressure		280 bar
Attachment encoding wiring harness	For attachment variable pump	204-80-72
Power hydraulic system	80 litres/min fixed	534-80-35
- Hydraulic pump	Mounted on traction pump	Gear pump
- Output		22 cm ³ /rev
- Flow rate		80 litres/min
- Maximum pressure		210 bar

Accessories

The tractor is delivered with the following accessories:

Operating instructions

Folder

2 ignition keys

2 door keys

2 tank cap keys

2 reducer sleeves for Category I attachments

Upper link with retaining pins

Key folder

Bio pass for proof of filling environment-friendly hydraulic oil

Taking into service

Daily checks and activities prior to taking into service

If damages or defects are found during the following checks, they must be eliminated before taking the tractor into service. Do not operate the tractor before proper repairs are carried out. Safety and protective devices should not be removed or disabled. Do not change fixed specified settings. Before starting work, make yourself truck familiar with all the functions and protective devices of the tractor.

Checking/cleaning the radiator and protection screens

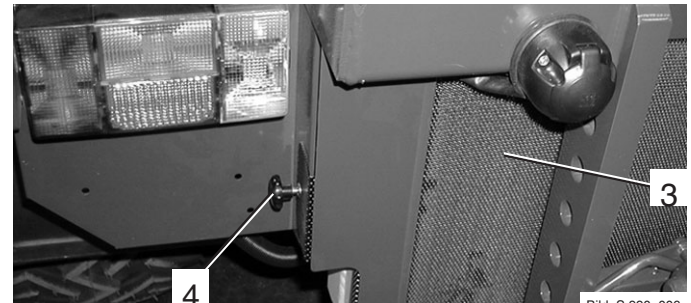


NOTE

- Check that the protection screens (2 and 3) are clean.
- Clean the screens if necessary.
The screen (3) can be pulled off to the left after loosening the bayonet screw (4) and then easily cleaned.
- The air intake of the air filter (1) must be clean.



Bild_C992H_011



Bild_S 990_006

Taking into service

Turning on the battery isolating switch



NOTE

The battery can be switched off fully with the removable key.

- Insert the key (1) into the battery isolating switch and set it to the horizontal position.
The battery circuit is turned on.

Checking the engine oil level



NOTE

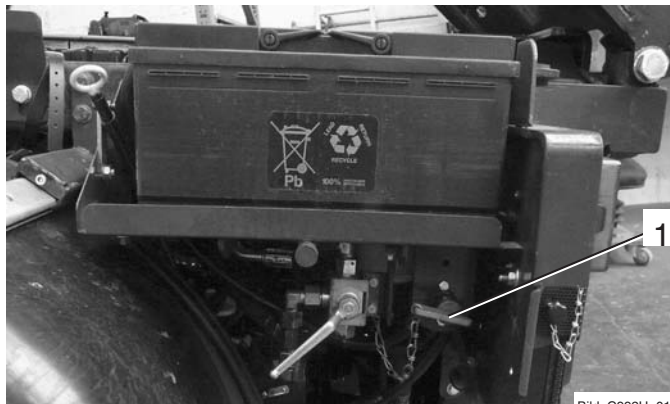
Check the engine oil level only when the vehicle is parked on level ground.

- Let the engine run for approx. 2 minutes.
- Stop the engine and pull out the oil dipstick (1) after approx. 1 minute.
- The oil level must be between the Min and Max marks.
- Top up oil as specified in the maintenance instructions.

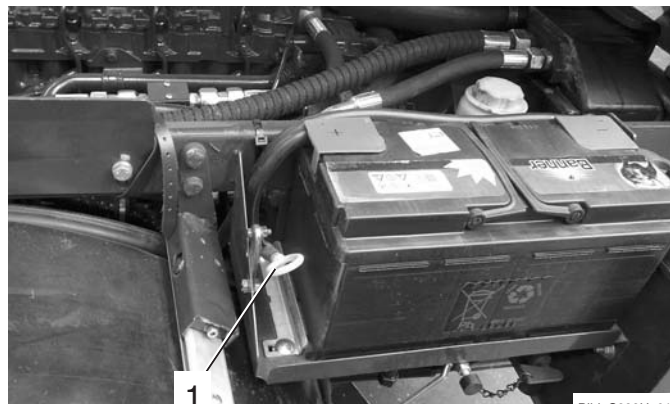


ATTENTION

Do not fill too much oil.



Bild_C992H_014



Bild_C992H_015

Taking into service**Checking the trailer coupling (optional) if necessary**

- Check the trailer coupling for proper condition and operation. Carry out the check according to the instructions in the section „Operating the trailer coupling“.

Checking the tire inflation pressure**NOTE**

Your tractor can be equipped with different types of tyres. The specified inflation pressure for your tires is given in the table entitled „Tires“ in the technical data section.

- Check the inflation pressure on all four tires. All tires must have the same pressure. Low pressure will increase the rolling resistance. This will cause increased fuel consumption and tire wear, and the driving characteristics will become poorer.

**DANGER**

If the inflation pressure is too high, the tires can explode!

- The tires should not be damaged or worn.
- Have damaged tires replaced without delay. Due to the longer braking distance, the risk of an accident will be higher.



Bild_S 990_015

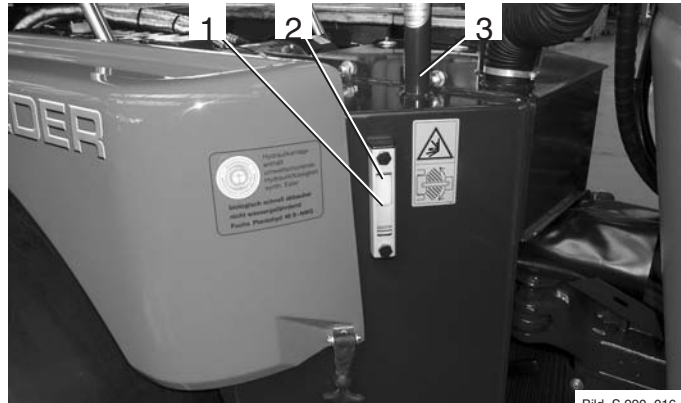


Bild_S 990_014

Taking into service

Checking the hydraulic oil level

- Retract all hydraulic cylinders.
- Check the oil level at the sight glass (2).
- The oil level must be at the centre (1) of the sight glass.
- Top up oil through the filler neck (3) as specified in the maintenance manual.



Bild_S 990_016

Taking into service**Filling fuel**

- If necessary, read the fuel level (1) on the multifunctional display.

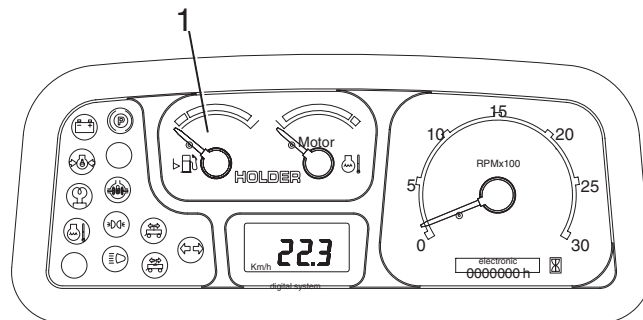
**CAUTION**

Danger of fire when handling fuels. Stop the engine. Do not fill fuel in the vicinity of naked flames, ignition sparks or hot engine parts. Do not smoke when refuelling.

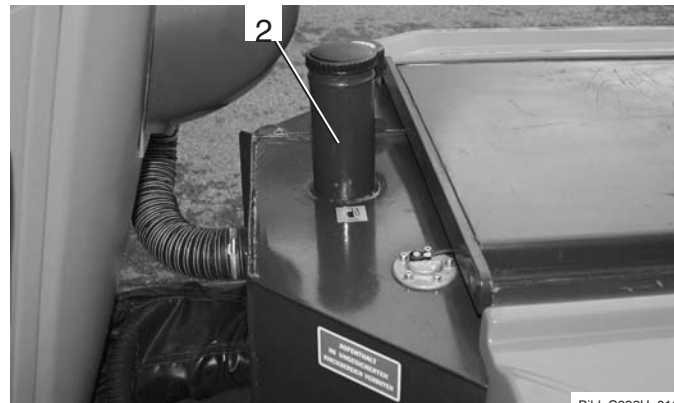
- Remove the fuel tank filler cap (2).
- Top up diesel fuel as recommended in the maintenance instructions.

Filling quantity approx. 82 L

- Refit the filler cap (2).



Bild_C992H_073



Bild_C992H_016

Taking into service

Checking the brake fluid level

- Check the level at the brake fluid reservoir (1).
- The brake fluid level must be between the Min and Max marks on the reservoir.
- Top up brake fluid as specified in the maintenance instructions.

Adjusting the steering wheel



NOTE

The inclination and height of the steering wheel can be set to a comfortable position.



DANGER

Do not adjust the steering wheel while driving.

- Loosen the lever (2).
- Adjust the tilt and height of the steering wheel (3).
- Retighten the lever (2).



Bild_C992H_017



Bild_C992H_018

Taking into service**Adjusting the driver's seat with pneumatic suspension**

- 1 Backrest
- 2 Lumbar support adjustment knob
- 3 Backrest tilt
- 4 Weight adjustment
- 5 Horizontal suspension
- 6 Horizontal adjustment

**DANGER**

Do not adjust the seat while driving. Risk of accident!

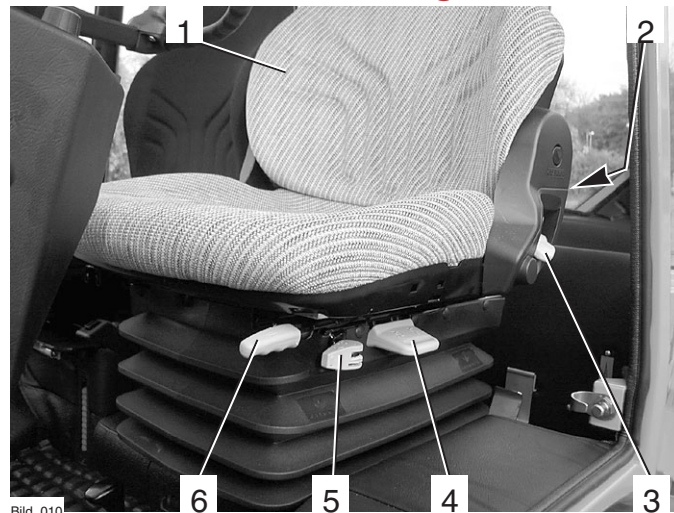
- Adjust the seat so that all the controls can be reached and operated safely.

**NOTE**

If separate operating instructions for the seat are supplied with your tractor, follow these instructions.

Adjusting the lumbar support

- Be seated and lean against the backrest (1).
- Turn the lumbar support adjustment knob (2) until the most comfortable position is reached.

**Adjusting the backrest tilt**

- Pull the tilt lever (3) up.
- Use the back to adjust the backrest tilt.
- Release the tilt lever.

Taking into service

Adjusting the driver's weight

- Be seated.
- Pull the weight adjustment grip (4) up.



NOTE

A noise can be heard. The seat will adjust automatically to the weight of the driver. The noise stops.

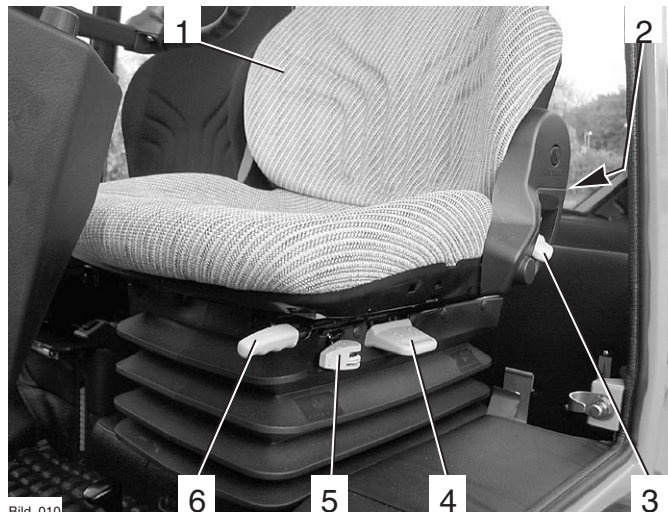
- Release the lever.

Adjusting the horizontal suspension

- Pull the horizontal suspension lever (5) back:
Seat suspension in horizontal direction is released.
- Move the horizontal suspension lever (5) forward.
Seat suspension in the horizontal direction is locked.

Horizontal seat adjustment

- Pull the horizontal seat adjustment lever (6) up.
- Slide the seat horizontally forward or back to the suitable seating position.
- Release the horizontal seat adjustment lever.



Topping up wiper water**NOTE**

The washer water reservoir for the windshield washer system is located at the front left in the footwell of the cabin.

- Open the filler cap (1) and top up washing water in the reservoir (2).

Filling capacity approx. 1.3 L

Checking the lights and rear view mirror

- Check the lights for proper operation. Carry out the check according to the instructions in the section entitled „Lights“.
- Adjust the rear view mirror so that the roadway behind the tractor and the working area can be seen well.

Taking into service

Bild_S 990_017



Bild_S 990_014

Taking into service

Starting the engine

Engine instructions before operation



DANGER

Do not start or run the engine in enclosed spaces. Danger of poisoning through exhaust gases!

Starting instructions



CAUTION

Before starting, make sure no-one is in the vicinity of the tractor.



ATTENTION

Do not use a starting aid such as a start pilot or similar means. Turn off the traction drive or any driven attachments.



CAUTION

Start the engine only from the driver's station.

Taking into service**Starting the engine**

- Set the direction switch (1) to the neutral position (centre).
- Fully depress the inching pedal (2).

**NOTE**

The engine can only be started if the inching pedal is fully depressed (starting safety switch).

- Set the hand throttle (4) to idle (push in fully).
- Insert the ignition key and turn the preheat/starter switch (3) to position 1.



Taking into service



NOTE

The battery charging indicator (6), the engine oil pressure indicator (7), parking brake indicator (8) (if parking brake is engaged) come on.

- Turn the ignition key to position 2.
The engine will be preheated. The preheating indicator (5) will come on.



NOTE

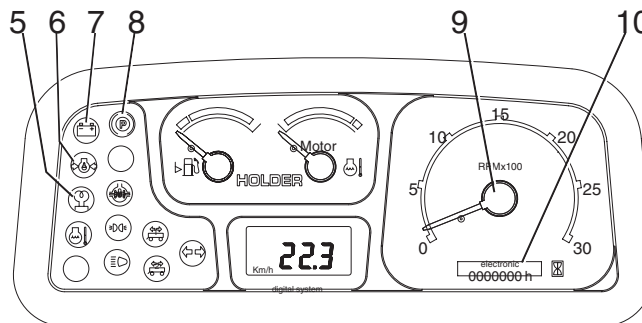
When starting at low temperatures, hold the ignition key longer (approx. 1 minute) in position 2.

- When the preheating indicator extinguishes, turn the ignition key to position 3 to start the engine.



ATTENTION

Operate the starter only for a maximum of 20 seconds. Wait one minute, then repeat the starting procedure. Repeat the starting procedure only twice at most. In case the engine does not start, carry out a troubleshooting according to the section entitled „Malfunctions, causes, remedy“.



Bild_C992H_074

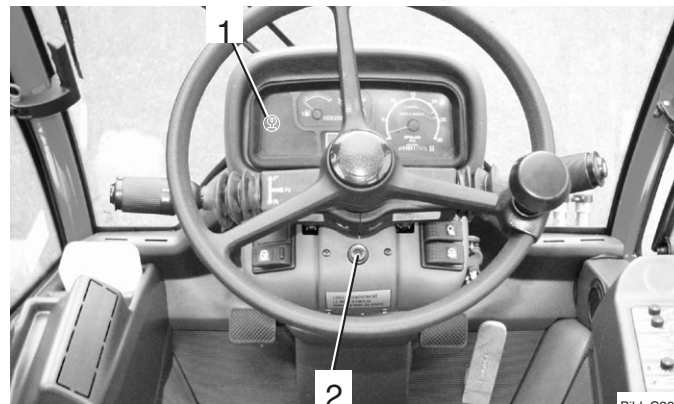
- Release the ignition key after the engine has started. The battery charging indicator (7) and the engine oil pressure indicator (6) should extinguish.
- Set the engine speed with the hand throttle or accelerator pedal to the desired RPM (9).
- The hour meter (10) is activated.

Taking into service**Starting the engine with automatic preheating****Starting procedure**

- Turn the ignition key to position 1.
- The engine will be preheated. At temperatures below +10°C the yellow lamp (2) and the preheating indicator light (1) will come on.
- When the yellow lamp (2) goes out, turn the ignition key to position 3 to start the engine.
- The automatic preheating will turn off some time after starting and the preheating indicator light (1) will go out.

**NOTE**

If the engine is not started, the preheating procedure will cease approx. 10 s after the yellow lamp (2) has gone out.

**Checking the brakes and steering for proper function**

- Make a short trial run and check the steering and brakes for proper operation.

**DANGER**

Do not drive a vehicle with a defective steering and/or braking system.

Operation

Before starting to drive

When driving on public roads, observe the traffic regulations.



Driving safety rules

- Drive the tractor only from the driver's station with the cab doors closed.
- Always adjust your speed to the driving conditions and the load carried.
- Before driving, check that no-one is standing in the immediate vicinity of the tractor.
- The driving behaviour of the tractor is strongly affected by the weight and swing range of the attachments, trailers and, if fitted, ballasting. Therefore drive slowly with heavy equipment and take the longer braking distance into consideration.
- When following a curve with a trailer or other attachments, do not forget to take the added length and drag into consideration.



DANGER

Any parts of the attachments posing a traffic hazard must be covered or identified with warning signs before driving off.

- Switch off the differential lock when travelling in a curve.
- When driving on slopes, always drive downhill if possible; if you have to turn, only make a turn uphill.
- On steep slopes you can improve traction by activating the differential lock.
- Drive across slopes only in accordance with the instructions at the end of this section.

Operation

Driving

Driving with hydrostatic drive

- Start the engine.
- Preselect the direction of travel with the direction switch (1).
- Pull up the direction switch (1) and move it forward or backwards (forward or reverse).



NOTE

After the start of the engine, the direction switch must be operated once if it was in the forward or reverse position when starting. This feature is to prevent accidental movement of the vehicle when starting the engine.



NOTE

You can also reverse the direction of travel while driving at reduced speed.

CAUTION

The tractor will brake strongly and speed up again in the opposite direction.

- Set the speed range knob (2) (at the steering column) to the desired ground speed range:



ATTENTION

The tractor must be stationary for switching.



Bild_C165



Bild_C992H_075

Table of ground speed ranges

Position	Marking	Function	Ground speed*	Use
Lower position	S	Fast range	0 – 30 / 36 km/h	Lower tractive force, eg for road travel
Centre position	0	Drive off		Towing
Lower position	L	Slow range	0 – 11.5 km/h	High tractive force, eg for working or pulling trailers on gradients

- Select the desired driving program with the driving program switch (2). The set position is illuminated:

You can choose between 4 programs:

Range 1 and 2	eg road travel
Range 3 and 4	eg work applications



Bild_S 990_004

Operation

Table of driving programs•

Position	Marking	Function	Use
Range 0	STOP	Traction drive off	
Range 1	Hare symbol	Maximum ground speed	eg on roads
Range 2••	Turtle symbol	Maximum ground speed	eg on roads
Range 3	PTO symbol	The ground speed, which can be set with the fine adjustment knob, is adjusted automatically in case of a high power demand of the attachment.	eg when mowing.
Range 4	Snow blower symbol	The ground speed, which can be set with the fine adjustment knob, is adjusted automatically in case of high power demand of the attachment.	eg especially adjusted to the snow blower

- The driving programs can be optimized by your service centre for special applications, eg controlled constant speed.
- SDS* Driving Comfort functions only in driving range "L".
With SDS* Driving Comfort the driving speed is controlled with the accelerator pedal.

* Option

Operation**Selecting road travel (transport speed)**

The tractor is stationary.

- Set the program switch (2) to speed range 1 or 2.

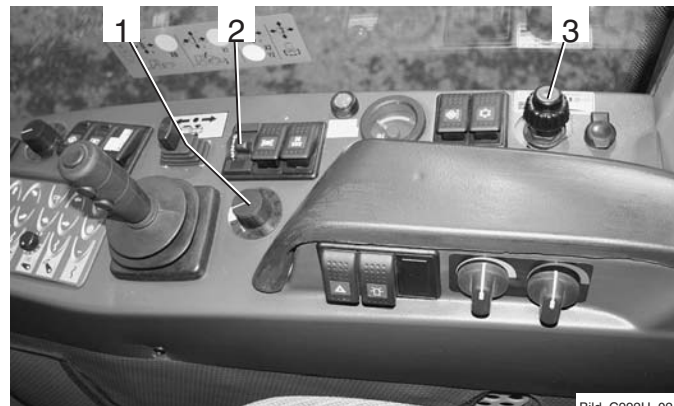
**NOTE**

You can also change the speed range while driving at reduced speed.

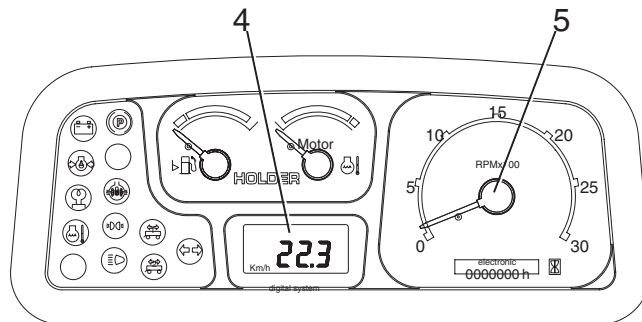
- Release the parking brake.
- Depress the accelerator for the desired ground speed. The tractor will start off and can be driven up to the maximum ground speed of the selected speed range.
- You can read the engine RPM (5) and ground speed (4) on the multifunctional display.

Setting the operating speed of programs 3 and 4**NOTE**

With programs 3 and 4 you can set the ground speed independently of the PTO RPM.



Bild_C992H_024



Bild_C992H_076

Operation

The tractor is stationary.

- Set the fine adjustment knob (1) to 0.
- Set the program switch (2) to speed range 3 or 4.
- Adjust the PTO RPM with the hand throttle (3).



NOTE

The engine speed must be at least 1500 RPM as the control only begins to function at this RPM.



NOTE

You can also change the ground speed ranges while driving.

The speed ranges 3 and 4 will set a speed controlled by the power requirement of the PTO. This means, for example, that when the snow blower needs more power when meeting with higher resistance, the tractor will drive more slowly. When resistance decreases, the tractor will speed up to the preset speed. Range 4 is especially trimmed to particular applications.

- Release the parking brake.
- The ground speed is controlled with the fine adjustment knob (1).



Bild_C992H_024

Operation**Adjusting the fine adjustment knob****NOTE**

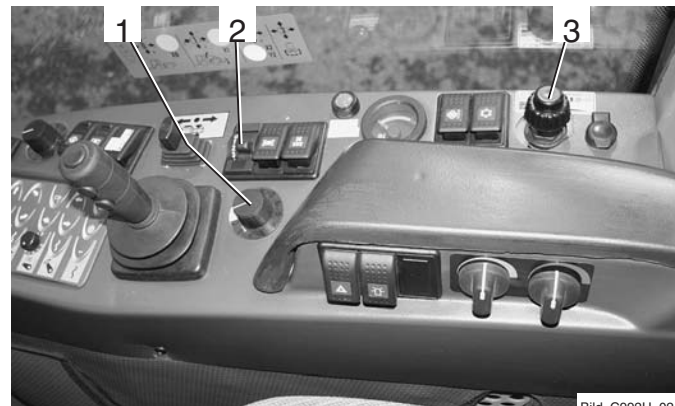
You can adjust the fine adjustment knob (1) any time while driving for a fine and stepless control of the ground speed.

- In position 0 the tractor is stationary. When the knob is turned clockwise, the tractor will start off and in end position 11 of the scale the maximum speed of the range will be reached.
- You can read the engine RPM and ground speed on the multifunctional display.

**NOTE**

In this operating mode the tractor will drive automatically and will only need to be steered.

This mode is ideal for the operation of an attachment as you can concentrate fully on controlling the attachment.



Bild_C992H_024

Operation

Driving with SDS (Special Drive System)*

For the selection of the programs 1, 3 and 4 at the program switch (2) refer to the section on driving on pages 63 and 64.

Driving program 2 (SDS)

- Set the speed range knob (5) to range L.



ATTENTION

The tractor must be stationary for switching.

- Set the program switch (2) to range 2.

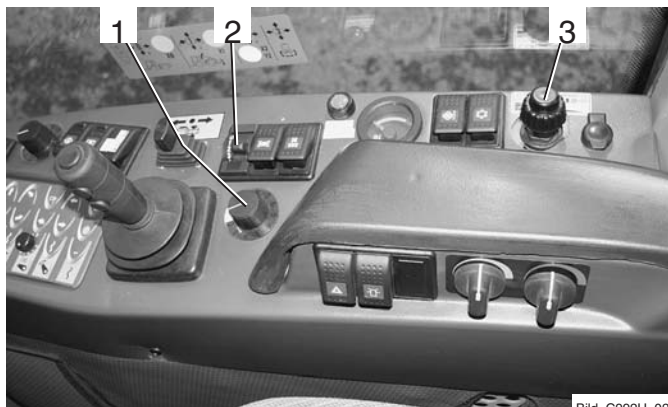


NOTE

In this range, the fine adjustment knob (1) is not operational. The control is assumed by the pedal (4).

- Set the engine RPM with the hand throttle (3).
- You can now control the ground speed steplessly with the pedal (4) (accelerator).

* Option



Operation

Operating the inching pedal

- 7 Inching pedal
- 8 Accelerator

This function is effective in all driving programs.



NOTE

If you must reduce speed temporarily, you can do it with the inching pedal.



ATTENTION

*If the inching pedal is floored, for example, for an **EMERGENCY STOP**, the tractor will brake strongly.*

- Operate the inching pedal (7). The tractor will decelerate and come to a complete stop.
- After passing the obstacle, release the inching pedal. The tractor will drive again at the preset speed.

Changing the direction of travel

- Preselect the new direction of travel with the direction switch (9).
- The tractor will come to a standstill and accelerate in the new direction of travel.



Bild_C992H_026



Bild_C170

Operation

Driving with hydrostatic DUAL drive

- Set the speed range selector (1) to „S“.
The DUAL Drive will only work in this range.



Bild_S 990_003

Table of ground speed ranges with DUAL Drive

Position	Marking	Function	Hydrostatic ground speed*	Ground speed* with Dual Drive	Use
Lower position	S	Fast range	0 - 30 / 36 km/h	0 - 30 / 42 km/h	Low tractive force, eg for road travel
Centre position	0	Drive off			For towing
Upper position	L	Slow range	0 - 11.5 km/h / 14.5 km/h	–	High tractive force, eg for working or pulling trailers on gradients

* Depending on model

Operation

- Set the program switch (2) to range 2.

**ATTENTION**

Drive the tractor warm for approx. 10-12 min. at range 2.

- Set the program switch to range 1.

**NOTE**

*The functions of the travel drive are identical except it does not lock the differential:
When the ground speed* exceeds 25 km/h, the transmission automatically switches from the hydrostatic drive to the mechanical gear. When the speed drops again, the transmission goes back to the hydrostatic drive.*



* Depending on model

Operation

Switching the differential lock on



NOTE

With the differential lock you can improve traction on soft, slippery ground. The lock is engaged when the engine speed is over 1000 RPM. You can engage the differential lock only briefly by pressing the button momentarily.



ATTENTION

The differential lock may only be used when driving straight ahead.

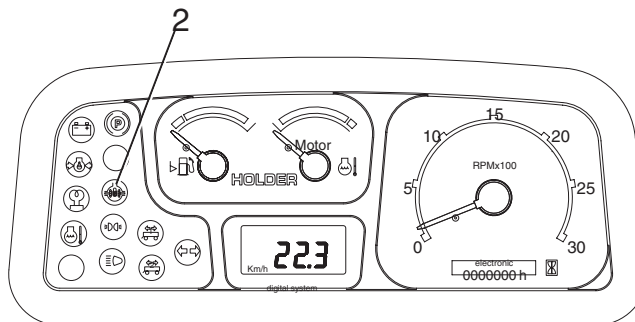
- Depress the differential lock switch (1) at the rear and hold it.
The indicator (2) in the multifunctional display will light up red. An intermittent acoustic warning signal will sound at the same time.
The differential lock acts on both axles.

Switching the differential lock off

- Release the differential lock switch (1).
The indicator light (2) will extinguish and the acoustic warning signal in the multifunctional display cease.



Bild_C992H_027



Bild_C992H_077

Operation**Steering**

The tractor has an hydraulically-actuated articulated steering. The wheels also stay in track in curves so that attachments are guided without any lateral offset.

Steering

- Turn the steering wheel (1) in the desired direction.

The possible turning radii depend on the tires and track width of your tractor. For exact information refer to the track width table in the section „Technical data“.



Bild_C992H_028

Two-stage steering*

The tractor can be driven with two steering speeds.

- Indirect steering (travelling on roads - slow steering speed.)
- Direct steering (on the job - fast steering speed.)
- Depress the toggle switch (2) to the left. The indicator light in the toggle switch will come on and steering for working is turned on.

**NOTE**

*With direct steering the steering angle is about twice as great as with indirect steering for the same steering movement.
(Ratio is approx. 1:2)*

**ATTENTION**

When driving on roads, the two-stage steering must be set to indirect steering (indicator light off) (risk of accidents).

* Option

Operation

Brakes

The service brake is a wet disc brake in the front axle. It is hydraulically actuated and acts on all four wheels. The parking brake is operated by an electric cylinder controlled with the parking brake switch.

Operating the service brake

- Depress the brake pedal (1).

Applying the parking brake



ATTENTION

The parking brake is not intended to be used for braking while driving.

- Release the lock on the parking brake switch (2) and depress the switch to the left.

The parking brake will be engaged, the indicator light in the switch and the parking brake indicator (3) in the multifunctional display will come on.

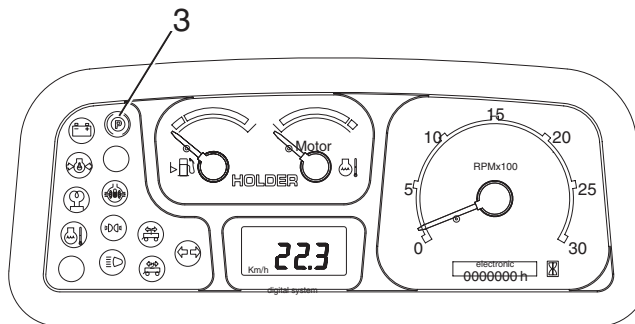


ATTENTION

Operate the parking brake only with the ignition turned on. On tractors with chassis numbers up to 53400105H the ignition must stay on for 10 sec.



Bild_C992H_029



Bild_C992H_078

Operation**Releasing the parking brake**

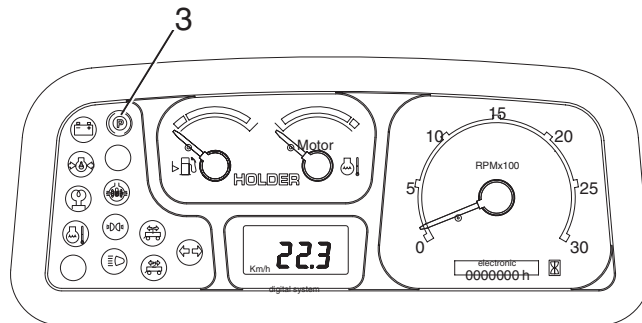
- Turn off the parking brake switch (2).
The parking brake will be released, the indicator light in the switch and parking brake indicator (3) will extinguish.

**ATTENTION**

When driving with the parking brake actuated, an acoustic warning signal will sound.



Bild_C992H_029



Bild_C992H_078

Operation

Driving on slopes



DANGER

Driving on slopes is dangerous as the tractor can tip over if the centre of gravity exceeds the tip-over limit on an extreme slope.

The following factors will reduce the hazard:

- small or no load
- low ground speed
- low gradient
- low tire inflation pressure

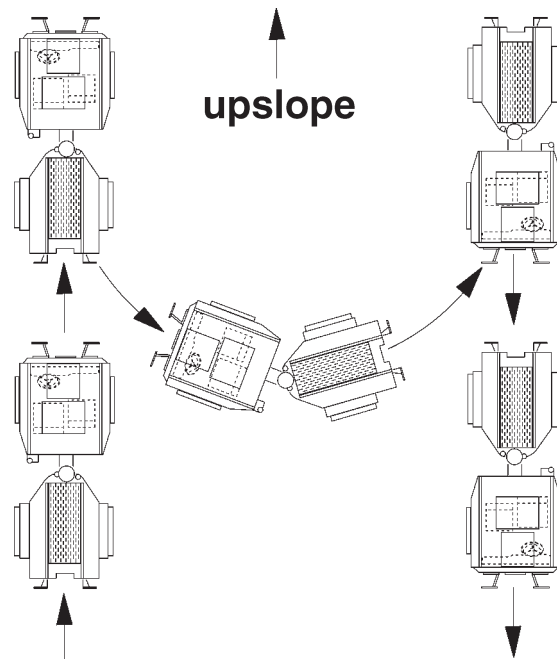


NOTE

The driving comfort and the traction of the tractor can be improved by reducing the inflation pressure.

- large track widths
- level, non-bumpy terrain.

For turning on slopes we recommend proceeding as shown in the drawing on the right.



Special operating instructions

Stationary operation

The tractor can be used for stationary operation, for example, to drive a water pump via the PTO shaft.



ATTENTION

Park the tractor on level ground in both directions.

- Attach the stationary equipment to the PTO shaft (1) at the front or rear.
- Set the program switch to 0.
- Apply the parking brake.



DANGER

Before switching on the PTO, make sure no-one is standing in the vicinity of the tractor and the rotating PTO shaft.



Bild_C992H_030

Hydraulic oil for stationary operation

During stationary operation hydraulic oil can be tapped, for example, for the operation of a hydraulic dump body.

Max. oil quantity 22 L



ATTENTION

Before starting to drive after stationary operation, first check that the hydrostatic steering is operational. Turn the steering wheel fully to the right and left several times to release air from the steering system.

Special operating instructions

Adjusting the track width

You can widen the track width of the tractor by adding spacers.
You have a choice of 3 different spacers.



DANGER

Observe the safety notes on safe parking and jacking up for the wheel change in the maintenance instructions.

- Remove the wheels. Turn the wheels inside out or install the selected spacers.



ATTENTION

Identical spacers must be installed on all four wheels.



NOTE

The arrows on the tires must show in the forward direction of rotation.

- Tighten the wheel nuts to the specified torque.

Torque to 340 Nm

Operating the emergency gear release (hydrostatic DUAL drive only)



NOTE

If the engine was stalled and can not be restarted, the emergency gear release must be operated before a new start.

- Fully depress the inching pedal.
- Operate the starter briefly.
- Pull the emergency gear release grip (1) to the rear.
- Restart the engine.

Special operating instructions



Bild_S 990_023

Special operating instructions

Operation in winter

Oil preheating*

Before starting the engine at temperatures below - 20 °C, turn on the heating element* to preheat the oil.

- Connect the preheating system plug to a 230 VAC outlet.

Observe the operating instructions of the manufacturer.

Winter diesel fuel

Whenever temperatures fall below 0°C, use winter diesel or super diesel fuel or additives recommended in the maintenance instructions.

Engine oil for winter operation

Fill engine oil with a suitable SAE class as recommended in the maintenance instructions.

The cold start capability of the engine can be reduced if the temperature limits are underrun occasionally, but this will not damage the engine.

Hydraulic system

The hydraulic functions are sluggish and slower during cold temperatures. Bring the hydraulic system to operating temperature with some movements without a load.

* Option

Putting on snow chains

Snow chains can be mounted on the tires to improve grip. In the following table you will find the order numbers for RUD chains which fit on the listed tires. You can also fit snow chains from other manufacturers if these have the proper dimensions.

Type of tire	Snow chain type (RUD Order No.)
10.5-18 MPT	24 553 and 24 553
400/60-15.5	22 177
33x12.50 R 15/33x12.5-15	22 167
33x15.50-15	22 174
31x15.50-15 Terra	22 548
36x13.5-15	24 178

Ballasting

The weight of the machine can be increased with ballast weights. The ballast weights must be applied parallel with the same weight on each axle and side.

Operating the attachments

We have tested and approved a large number of possible attachments for use with this tractor. Only attachments with the CE mark may be used. We recommend contacting our customer service before the installation of special equipment.

Possible attachments

For example:
implements for orcharding
implements for soil cultivation
mowers
snow removal equipment
and other municipal equipment.

Safety instructions for handling attachments

The tractor must be parked safely before the installation of attachments.

It must be secured against rolling, for example, with the parking brake or, if required, with chocks.



DANGER

Be careful to avoid injuries due to crushing and cutting when coupling attachments.



DANGER

Never let anyone stand between the tractor and an attachment or implement if the tractor is not secured against rolling.

For driving on roads, the attachments must be lifted and secured against lowering.

Observe the applicable safety regulations for your attachment. Observe the operating instructions and the safety rules for your attachment.



DANGER

During work breaks, the attachment must always be lowered to the ground in order to relieve the hydraulic cylinders. Accidents can occur if lowering occurs in an uncontrolled way, for example, due to damage or accidental movement of the control levers.



DANGER

Any parts of the attachments posing a traffic hazard must be covered or identified with warning signs before driving.

Operating the attachments

Additional information for attachments



When installing attachments on the front and rear lift arms, do not exceed the permissible total weight, the maximum allowable axle loads and tire carrying capacities of the tractor. The front axle of the tractor must always be loaded with at least 20 % of the tractor's curb weight. Before purchasing any equipment, make sure these conditions are met by performing the following calculations or by weighing the tractor-equipment combinations.

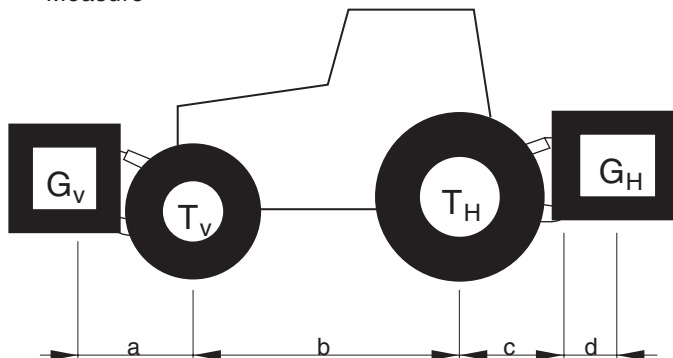
Determination of the total weight, axle loads and tire load capacity including minimum ballasting

For the calculation you need the following data:

T_L (kg)	Curb weight of the tractor ¹⁾
T_V (kg)	Front axle load of the empty tractor ¹⁾
T_H (kg)	Rear axle load of the empty tractor ¹⁾
G_H (kg)	Total weight of rear attachment/rear ballast ²⁾
G_V (kg)	Total weight of front attachment/front ballast ²⁾

- a (m) Clearance between centre of gravity of front attachment/front ballast and centre of front axle^{2) 3)}
- b (m) Wheelbase of the tractor^{1) 3)}
- c (m) Distance between centre of rear axle and centre of lower link ball^{1) 3)}
- d (m) Distance between centre lower link ball and centre of gravity of rear attachment/rear ballast²⁾

- 1) See the technical data in the operating instructions
- 2) See the price list and/or operating instructions of the attachment
- 3) Measure



Operating the attachments

Rear attachment or front/rear combinations

1) Calculation of the minimum front ballasting $G_{V \min}$

$$G_{V \min} = \frac{G_H \cdot (c+d) - T_V \cdot b + 0.2 \cdot T_L \cdot b}{a+b}$$

Enter the calculated minimum ballasting required for the front of the tractor in the table.

Front attachment

2) Calculation of the minimum rear ballasting $G_{H \min}$

$$G_{H \min} = \frac{G_V \cdot a - T_H \cdot b + X \cdot T_L \cdot b}{b+c+d}$$

Enter the calculated minimum ballasting required for the rear of the tractor in the table.

(Value X for Holder tractor 0.25 4-wheel)

3) Calculation of the actual front axle load $T_{V \text{tat}}$

(If the minimum front ballasting ($G_{V \min}$) is not obtained with the front attachment (G_V), the weight of the front attachment must be increased to the weight of the minimum front ballasting.)

$$T_{V \text{tat}} = \frac{G_V \cdot (a+b) + T_V \cdot b - G_H \cdot (c+d)}{b}$$

Enter the calculated actual and the maximum allowable front axle load specified in the operating manual of the tractor in the table.

4) Calculation of the actual total weight G_{tat}

(If the required minimum rear ballasting ($G_{H \min}$) is not obtained with the rear attachment ($G_{H \min}$), the weight of the rear attachment must be increased to the weight of the minimum rear ballasting.)

$$G_{\text{tat}} = G_V + T_L + G_H$$

Enter the calculated actual and the permissible total weight specified in the operating manual of the tractor in the table.

5) Calculation of the actual rear axle load $T_{H \text{tat}}$

$$T_{H \text{tat}} = G_{\text{tat}} - T_{V \text{tat}}$$

Enter the calculated actual and the maximum allowable rear axle load specified in the tractor operating manual in the table.

Operating the attachments

6) Tire load capacity

Enter the double value (two tires) of the permissible tire load capacity (eg see tire manufacturer's documentation) in the table.

	Calculated value		Maximum permissible value (acc. to operating manual)		Double permissible tyre capacity (two tyres)
Minimum ballast front/rear	<div>/ kg</div>		-		-
Total weight	<div>kg</div>	≤	<div>kg</div>		-
Front axle	<div>kg</div>	≤	<div>kg</div>	≤	<div>kg</div>
Rear axle	<div>kg</div>	≤	<div>kg</div>	≤	<div>kg</div>

The minimum ballast must be applied as implemented device or ballast-weight at the tractor!
The calculated values must be less than or equal to (≤) the max. permissible values!

Operating the attachments

Installation of attachments

The various attachments are attached to the front lift or rear lift*.

There are 2 different coupling categories:

Category I Pin diameter 22 mm

Category (II) Pin diameter 28 mm

The tractor is adjustable to both categories. For this adjustment the catch hook bars must be adjusted and the catch hooks equipped with reducer sleeves or not.



DANGER

Only use the following specified devices for the installation of your attachment.

Secure the attachment against shifting or rolling.

* Option

Operating the attachments

Adjusting the catch hooks

The catch hooks can be adjusted laterally and in length.

- Measure the distance between the pins on your attachment.
- Release the clamping screws (8) on both sides.
- Slide the catch hook (7) laterally until the required distance is reached.
- Retighten the clamping screws.
- Attachments of Category II can be picked up directly with the catch hooks (7).
- For attachments of Category I install the reducer sleeves (6) on the left and right hook.

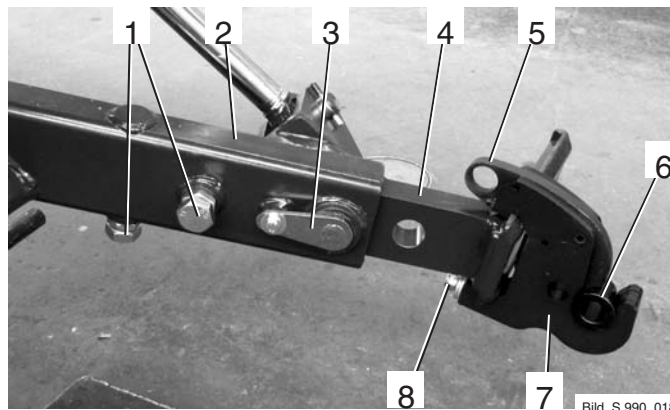
Adjusting the hitch insert length

- Loosen the lock nuts and clamping screws (1) at the lower link (2).
- Loosen the screw at the pin (3) and pull the pin out.
- You can adjust the hitch inserts (4) to one of 3 positions.
- Insert the pin (3) into the hole and secure with the screw.
- Retighten the locknut and clamping screws (1).



DANGER

Never let anyone stand between the tractor and an attachment or implement.



Bild_S 990_018

- Drive the tractor to the attachment to be picked up.

Hole	Position	Used for
1st hole	Front	Category I and II
2nd hole	Centre	Category I
3rd hole	Rear	Special attachments

- Steer the catch hooks (7) below the pick-up pins of the attachment.
- Raise the front lift, until the quick detach coupling (5) closes and engages.

Operating the attachments**Adjusting the upper link slide and upper link**

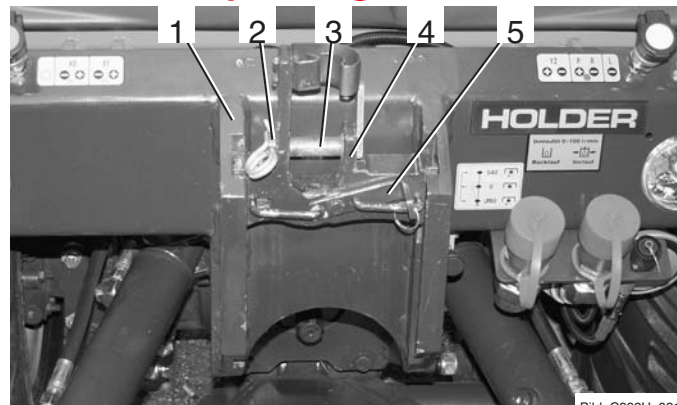
The upper link slides are height-adjustable. The required height depends on your attachment.

- 1 Upper link bracket
 - 2 Locking pin
 - 3 Upper link pin
 - 4 Upper link slide
 - 5 Height adjustment lever
- Raise the height adjustment lever (5).
 - Slide the upper link slide (4) into one of the 4 possible positions.
 - Release the height adjustment lever to engage the upper link bracket.
 - Pull the spring cotter (2) from the pin (3) and pull the pin out to the side.
 - Adjust the upper link arm (8) to a suitable length (by screwing the sleeve in or out) and secure the top link with the locking lever (7).

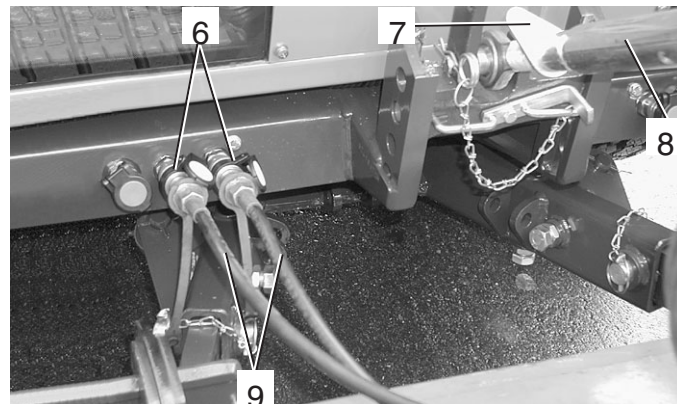
**ATTENTION**

Both threads must be screwed in equally far.

- Install the eye of the upper link arm on the pin and secure the pin again with the spring cotter.



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Operating the attachments

Coupling the hydraulic hoses



ATTENTION

The hydraulic couplings on the truck must be depressurized before their connection. The couplings on the tractor and the hydraulic hoses must be clean.



NOTE

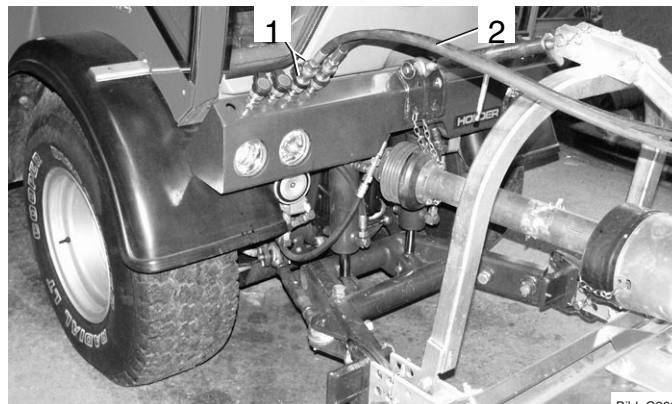
Each attachment has different functions and hydraulic hoses to the control unit. Observe the operating instructions supplied with your attachment and make yourself familiar with the functions and colour codes.

- Open the protective caps on the hydraulic couplings (1).
- Attach the colour-coded hydraulic hoses (2) of the attachment to the hydraulic couplings of the same colour on the tractor.



ATTENTION

The hydraulic male couplings fit on each coupling and can therefore be connected incorrectly. With the connection you decide which function/movement of the attachment is actually to be performed with the control lever assigned to the coupling.



DANGER

If you are not sure about the functions, determine them by testing in a safe place.

Operating the attachments**Installing the articulated shafts**

Only use shafts suitable and intended for the attachment. These shafts are supplied with the attachment. The length of the articulated shaft must be adjusted before the first installation. In case of doubt please contact our customer service. Observe the installation instructions for the articulated shaft when installing it.

***DANGER***

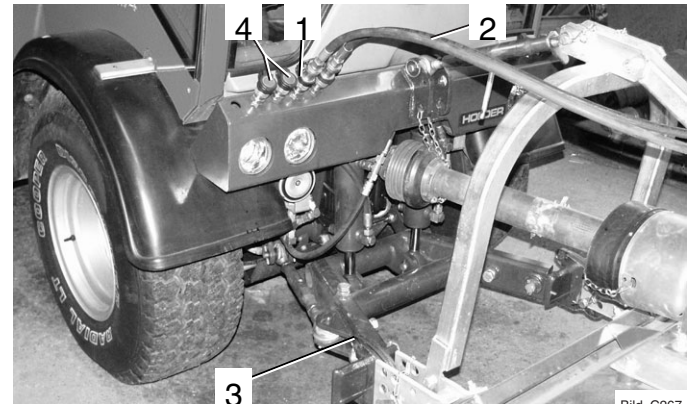
Shut off the engine before the installation. Fit the protective devices as specified after the installation!

Removing attachments

- Drive the attachment to its storage place and lower it with the front lift.
- Stop the engine, but do not turn off the ignition.
- Operate all control levers for the front lift several times in all directions. This will relieve the pressure in the hydraulic system.
- Slide the outer ring of the hydraulic couplings (1) back and disconnect the hydraulic hoses (2).
- Close the protective caps on the hydraulic couplings (as for item 4).
- Remove the upper link from the pin of the upper link bracket.
- Pull the quick detach couplings (3) up to release the attachment pins.
- Lower the front lift and back away carefully.



Bild_C992H_032



Bild_C267

Operating the attachments

Operating the joystick

- 1 Pushbutton 1 for joystick level 1
- 2 Pushbutton 2 for joystick level 2
- 3 Pushbutton 3 for joystick level 3
- 4 Joystick (joystick level 0 without pushbutton operation)
- 5 Master switch for working hydraulics



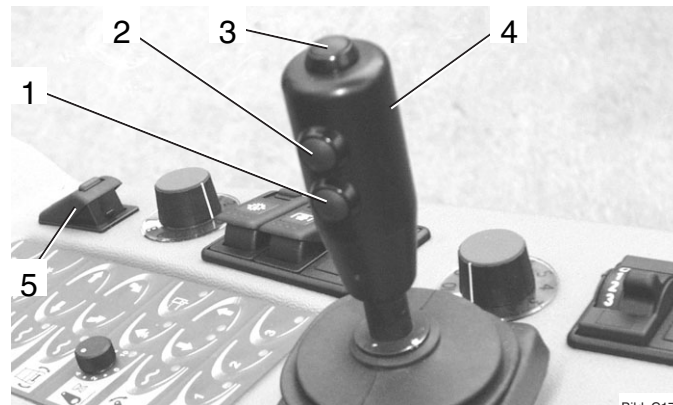
NOTE

The joystick controls those functions of the attachments which are connected directly or to the front or rear hydraulic couplings. The couplings and labels for the joystick are colour coded, ie the colours match to the function.



DANGER

Due to the variety of attachments and connections, however, we recommend a trial run of the movement at a safe place without danger to persons or risk of material damage before starting operation.



Bild_C176

The joystick function can only be performed when the master switch (5) is switched on.



NOTE

The joystick can be moved forward and back as well as to the right and left: The functions are shown on the label.

Operating the attachments

Joystick operation

(proportional for sensitive operation)

	Direction of joystick	
	Forward/back	Left /right
Joystick level 0 (without button)	Front lift Y0 Fwd.: lowering Back: lifting Float position on membrane keyboard	Front right quick coupler X0 Float position X0 on membrane keyboard 2
Joystick level 1 (with button 1 pressed)	Dumping device / rear Lift * Y1 Fwd.: lowering Back: lifting Float position Y1 on membrane keyboard 1	Front right quick coupler X1 Float position Y1 on membrane keyboard 3
Joystick level 2 (with button 2 pressed)	Front left quick coupler Y2 No float position intended	Rear left quick coupler X2 No float position intended
Joystick level 3 (with button 3 pressed)	Front lift tilt control Y3 (included in front lift) Fwd.: tilt right Back: tilt left	Lateral control of the front lift X3 Alternatively: Quick coupler Left: pivot left Right: pivot right

* Selectable with 3-way cock

Operating the attachments

Operating the front lift

The following movements are possible:

Turn on the master switch (5) for working hydraulics.

- Push the joystick (4) forward.
 - The front lift (attachment) will be lowered.

You can stop the movement by releasing the joystick.

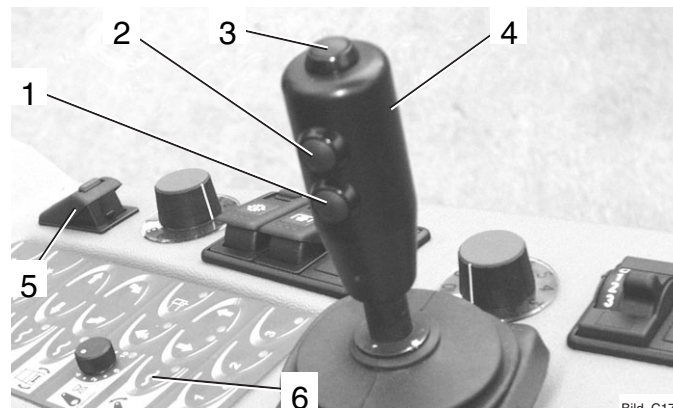
- Pull the joystick (4) back.
 - The front lift (attachment) will be raised.

The float position is turned on with the membrane keyboard.

- To turn on, press key (6). The red LED indicator will come on.
 - The float position the front lift will be turned on, ie the attachment can be moved by the application of an external force.
- To turn off, press key (6). The red LED indicator will extinguish.

Front lift tilt control

- Keep key (3) depressed and push the joystick (4) forward.
 - The front lift will tilt to the right.



- Keep key (3) depressed and pull the joystick (4) back.
 - The front lift will tilt to the left.

Lateral control of the front lift

- Keep key (3) depressed and push the joystick (4) to the right.
 - The front lift will pivot to the right.
- Keep key (3) depressed and push the joystick (4) to the left.
 - The front lift will pivot to the left.

Operating the attachments**Operating the front lift with the membrane keyboard**

The following movements are possible:

Turn on the master switch (3) for working hydraulics.

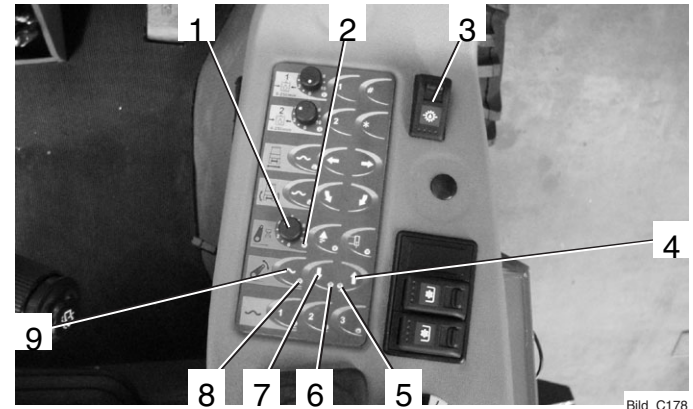
- Keep key (4) depressed for approx. 1 second. The red LED indicator (5 and 2) will come on for approx. 5 seconds.
 - The front lift (attachment) will be lifted until the LED indicator extinguishes.

You can stop the movement by pressing key (4,7) or by moving the joystick.

- For lowering, press key (7) for approx. 1 second. The red LED indicator (6 and 2) will come on.
 - The front lift (attachment) will be lowered until the LED indicator extinguishes.

The lifting and lowering speed can be controlled by turning the adjustment knob (1).

- Turn the rotary knob (1) to the left - slower.
- Turn the rotary knob (1) to the right - faster.



You can also turn on the float position:

- To do so, press key (9) for approx. 1 second. The red LED indicator (8) will come on.
 - The float position of the front lift is turned on, ie the attachment can be moved by the application of an external force.
- To turn it off, press key (9,7 or 4) or move the joystick. The red LED indicator (8) will extinguish.

Operating the attachments

Switching the front lift to double-acting

The front lift can be switched from single-acting to double-acting.

- To select double-acting, press key (5). The red LED indicator (6) will extinguish.
- To select single-acting, press key (5). The red LED indicator (6) will come on.



NOTE:

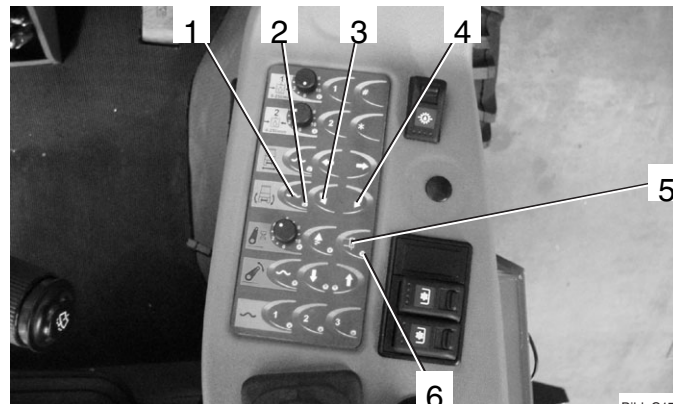
When the truck is started again or when turning on the master switch for working hydraulics, the front lift is always activated in the single-acting mode.

Adjusting the tilt with membrane keyboard

- Keep key (4) depressed.
 - The front lift will tilt to the right.

You can stop the movement by releasing the key.

- Keep key (3) depressed.
 - The front lift will tilt to the left.
- Press key (1). The red LED indicator (2) will come on.

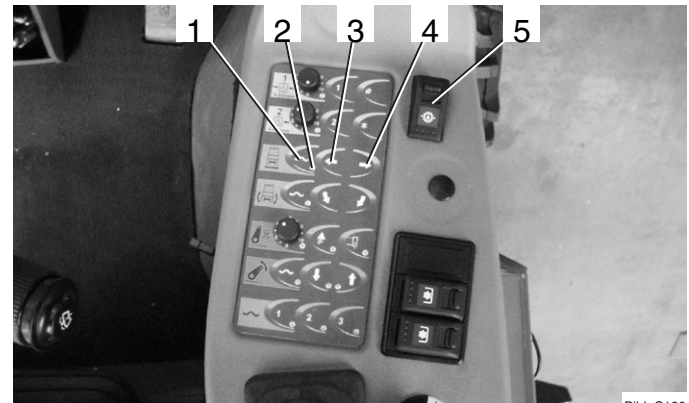


Bild_C179

- The float position of the tilt control is turned on, ie the attachment can be moved by the application of an external force.
- To turn it off, press key (1, 3 or 4) or move the joystick. The red LED indicator (2) will extinguish.

Operating the attachments**Lateral control with the membrane keyboard**

- Keep key (4) depressed.
 - The front lift will shift to the right.
- You can stop the movement by releasing the key.
- Keep key (3) depressed.
 - The front lift will pivot to the left.
 - Press key (1) for approx. 1 second. The red LED indicator (2) will come on.
 - The lateral control float position is turned on, ie the attachment can be moved by the application of an external force.
 - To turn it off, press key (1, 3 or 4) or move the joystick. The red LED indicator (2) will extinguish.



Bild_C180

**NOTE**

*If the joystick function is locked, you can prevent any unintended movement of the attachment through accidental contact with the joystick or the membrane keyboard.
Transport lock for road travel.*

Transport safety

The joystick and membrane keyboard can be locked with the master switch (5):

- Master switch off – joystick and membrane keyboard disabled
- Master switch on – joystick and membrane keyboard enabled

Operating the attachments

External operation of the front lift

You can operate the front lift from outside the cabin.



ATTENTION

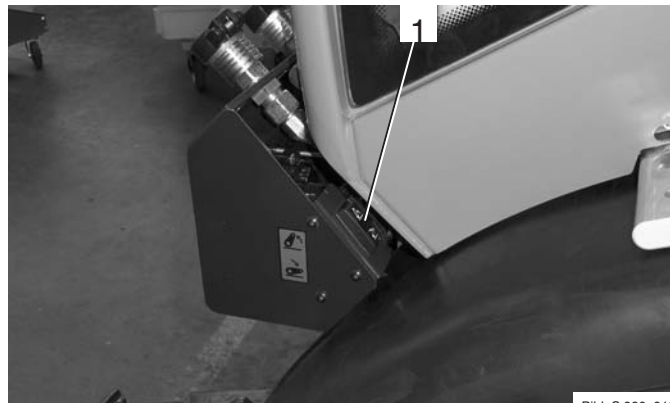
When you leave the cabin, set the direction switch to neutral and apply the parking brake to prevent the tractor from rolling.

- To raise the front lift, press the top pushbutton (1).

The front lift will be raised as long as the pushbutton is pressed.

- To lower the front lift, press the bottom pushbutton (1).

The front lift will be lowered as long as the pushbutton is pressed.



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Operating the attachments**Flow rate limiting for joystick**

- 1 Key for individual flow rate limiting for each individual joystick function

- Turn on the master switch for the working hydraulics.

With the flow rate limiting you can save the lifting or lowering speed individually.

- Operated the joystick (4) until the desired speed at the cylinder is reached, then press key (1).

This value will be stored as the maximum value and will apply for the entire joystick stroke.

If the full volume flow is required again, proceed as follows:

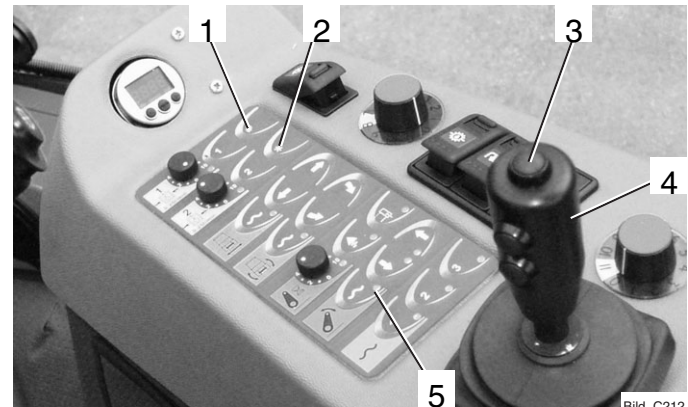
- Move the joystick (4) as far as possible and press key (1).

The full volume flow will be enabled again for the full joystick stroke.

Setting key for float position button

- 2 Key for setting the joystick button (3) to „float position of front lift“

- Press key (2).



Bild_C212

The button (3) will now also be activated as float position button for the front lift.

Two flashing LED indicators show the operating state.

**NOTE**

You can also activate and de-activate the float position with the button (3).

The LED indicator (5) shows the operating state.

- To reverse the selection, press key (2) again.

Operating the attachments

Operating the rear lift

The following movements are possible:

Turn on the working hydraulics master switch.

- Set the changeover lever (1) at the rear down to the „rear lift“ position.
- To raise the rear lift, press key (2) and pull the joystick (3) back.
 - The rear lift (attachment) will be raised.

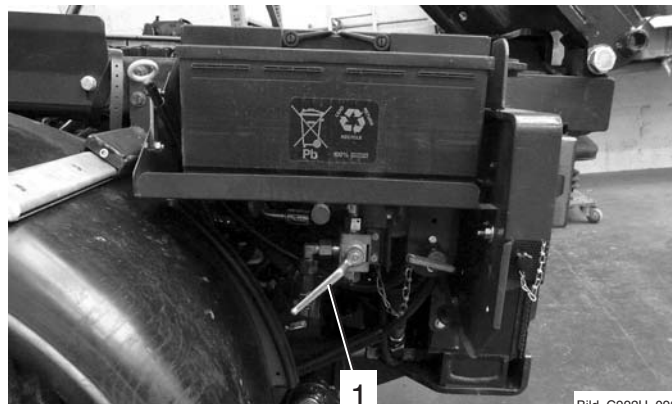
You can stop the movement by releasing the joystick.

- Press key (2) and push the joystick (3) forward.
 - The rear lift (attachment) will be lowered.

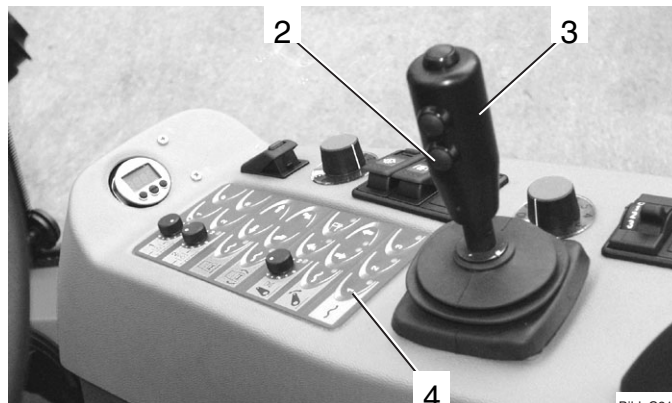
The float position is turned on with the membrane keyboard.

- To turn on, press key (4). The red LED indicator will come on.
 - The float position of the rear lift is turned on, ie the attachment can be moved by the application of an external force.
- To turn off, press key (4). The red LED indicator will extinguish.

* Option



Bild_C992H_092



Bild_C213

Operating the attachments

External operation of the rear lift*

The rear lift can be operated from outside the cabin.



ATTENTION

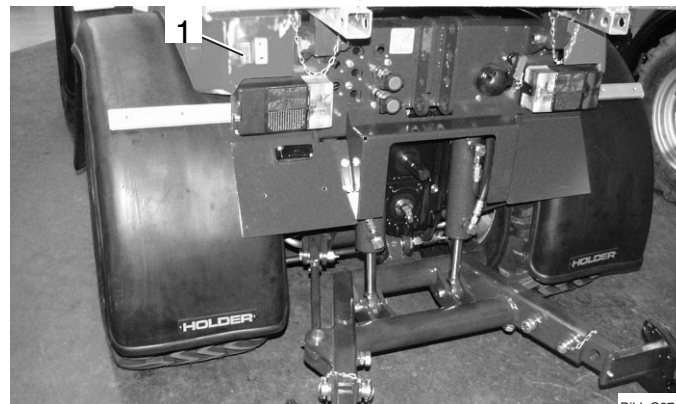
When you leave the cabin, set the direction switch to neutral and apply the parking brake to prevent the tractor from rolling.

- To raise the rear lift, press the top pushbutton (1).

The rear lift will be raised as long as the pushbutton is pressed.

- To lower the rear lift, press the bottom pushbutton (1).

The rear lift will be lowered as long as the pushbutton is pressed.



Bild_C271

* Option

Operating the attachments

Operating the hydraulic couplings

- 1 Pushbutton 1 for joystick level 1
- 2 Pushbutton 2 for joystick level 2
- 3 Pushbutton 3 for joystick level 3
- 4 Joystick (joystick level 0 without pushbutton operation)
- 5 Master switch for working hydraulics



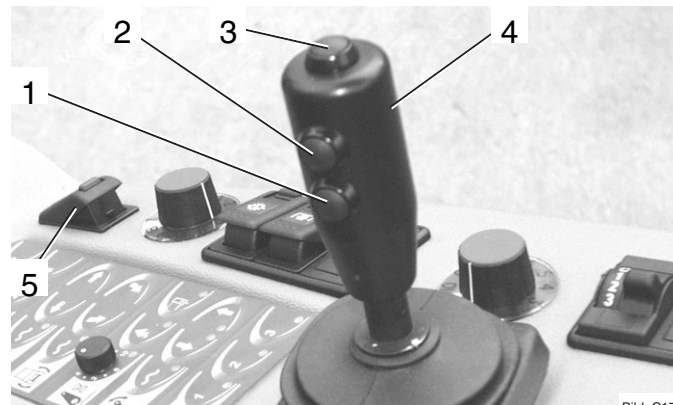
NOTE

The joystick controls those functions of the attachments which are connected directly or to the front or rear hydraulic couplings. The couplings and labels for the joystick are colour coded, ie the colours match to the function.



DANGER

Due to the variety of attachments and connections, however, we recommend a trial run of the movement at a safe place without danger to persons or risk of material damage before starting operation.



Bild_C176

The joystick function can only be performed are when the master switch (5) is switched on.



NOTE

The joystick can be moved forward and rearward as well as to the right and left. The functions are shown on the label.

Operating the attachments**Operating the green hydraulic couplings***

- Move the joystick (4) to the left or right.
 - The green hydraulic couplings front right will be supplied with pressure.

You can stop the movement by releasing the joystick.

The float position is turned on with the membrane keyboard.

- To turn on, press key (7). The red LED indicator will come on.
 - The float position of the green hydraulic couplings is turned on, i.e. the attachment can be moved by the application of an external force.
- To turn off, press key (7). The red LED indicator will extinguish.

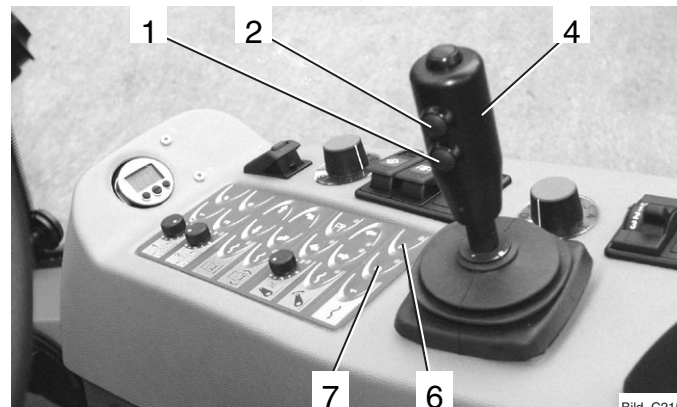
Operating the blue hydraulic couplings*

- Press key (1) and push the joystick (4) to the left or right.
 - The blue hydraulic couplings at the front right will be supplied with pressure.

You can stop the movement by releasing the joystick.

The float position is turned on with the membrane keyboard.

- To turn on, press key (6). The red LED indicator will come on.
- To turn off, press key (6). The red LED indicator will extinguish.



Bild_C215

Operating the yellow and white hydraulic couplings*

- Press key (2) and push the joystick (4) to the left or right.
 - The yellow hydraulic couplings at the rear left will be supplied with pressure.
- Press key (2) and move the joystick (4) forward or back.
 - The white hydraulic couplings at the front left will be supplied with pressure.

**NOTE**

The yellow and white hydraulic couplings do not have a float position.

* Option

Operating the attachments

Turning on the front PTO



DANGER

The PTO switch (1) must be switched off.

- Start the engine.
- Select the required PTO SPM with the PTO push-pull rod (3).



NOTE

The push-pull rod (3) is located at the front right at the front bracket.



DANGER

Before turning the PTO on, make sure that no-one is standing close enough to the tractor and the driven attachment to be hurt.

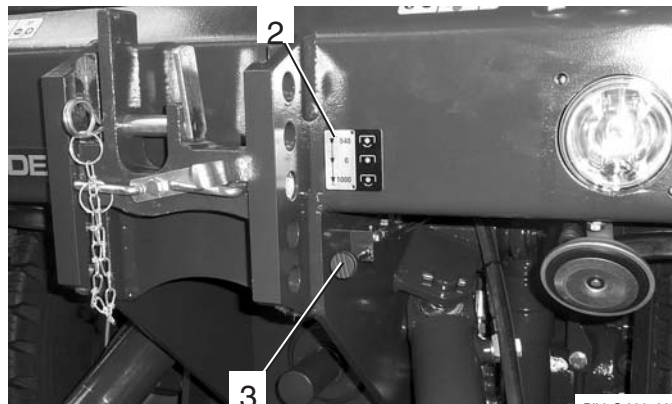
The PTO gear has 3 positions.

The possible positions are shown on the instruction plate (2).

- Set the push-pull rod to the centre position.
The PTO gear will be switched off.
- Pull the push-pull rod out.
The PTO speed will be 540 RPM at an engine speed of 2200 RPM.



Bild_C992H_093



Bild_S 990_007

Operating the attachments

- Push the push-pull rod in.
The PTO speed will be 1000 RPM at an engine speed of 2390 RPM.

**ATTENTION**

Never turn the PTO on with the engine off!

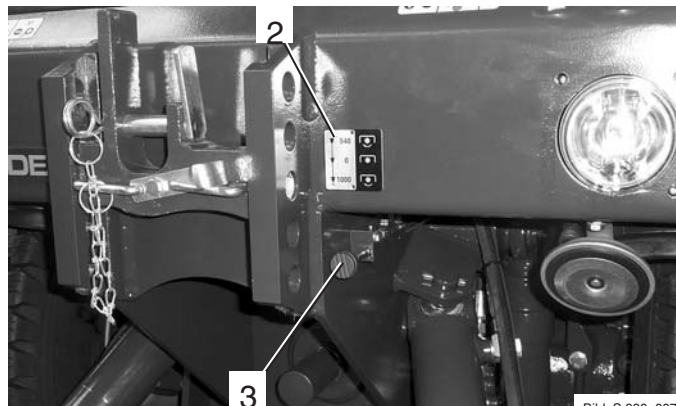
- Increase the engine speed to 1500-1800 RPM.
- Release the lock at the safety switch (1) and depress the switch. The front PTO is now turned on.
- To turn the PTO off, press the safety switch (1) up.
- If the PTO is no longer required, put the push-pull rod (3) back to the neutral position.

**DANGER**

After the PTO is turned off, the installed attachment could continue to run. Wait until the attachment is stationary before working on it again.



Bild_C992H_093



Bild_S 990_007

Operating the attachments

Turning on the rear PTO



NOTE

The rear PTO can be turned on with the control lever (3) in the area of the articulated joint. The control positions are shown on the instruction plate (2).

- The safety switch (1) must be switched off.
- Pull the control lever (3) up to turn on the rear PTO.



DANGER

Before turning the PTO on, make sure that no-one is standing close enough to the tractor and the driven attachment to be hurt.

- Release the lock at the safety switch (1) and depress the switch. The rear PTO is turned on.
- To turn the PTO off, press the safety switch (1) up.
- Push the control lever (3) down again.

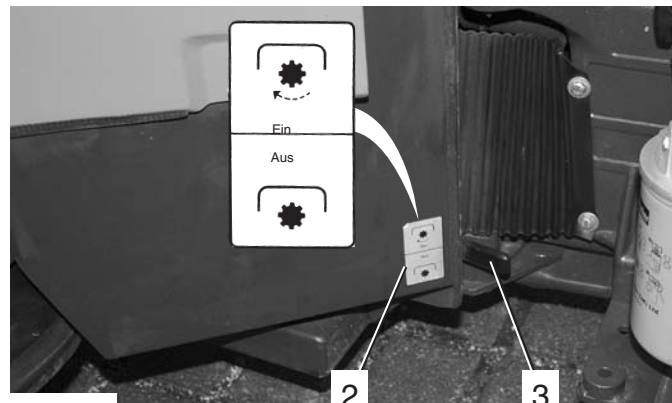


DANGER

After the PTO is turned off, the installed attachment could continue to run. Wait until the attachment is stationary before working on it again.



Bild_C992H_093



Bild_S 990_008

Operating the attachments**Operating the hydraulic accumulator* (front lift)**

The hydraulic accumulator allows the ground pressure of the attachment to be decreased steplessly and the front axle load to be increased. This improves the climbing ability.

- Press key (5). The LED indicator (7) will come on.

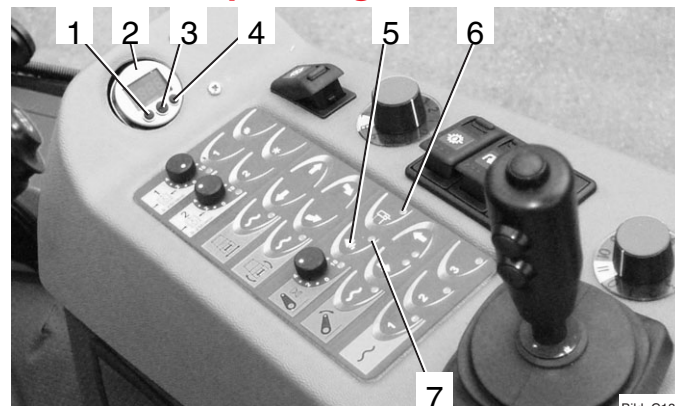
The electronic pressure sensor (2) with a digital display always shows the current pressure of the front lift with the float position turned off.

- Press the „MODE“ key (3).
- S.P.1 will appear in the display. After 2 seconds the current setting will flash.
- If you want to change the setting, press key (1) to reduce the value or key (4) to increase the value until the ground pressure of the machine is changed as desired.
- The value S.P.1 must be less than the pressure with a lifted attachment.

**NOTE**

After 3 seconds without key activation the display will revert and the settings will be stored.

* Option



Bild_C188

Adjusting control sensitivity (hysteresis)

- Press the „MODE“ key (3) twice within 3 seconds.
- HYS.1 will appear in the display. After 2 seconds the current setting will flash.
- Press key (1) to reduce the value or key (4) to increase the value if you want to change the setting. The value should be between 5 and 10 bar.

**NOTE**

The gas pressure in the diaphragm accumulator is 30 bar.

Operating the attachments



NOTE

An hydraulic accumulator pressure under 30 bar (light equipment) will require too many control operations as the accumulator can not function yet.

Applications with hydraulic accumulator



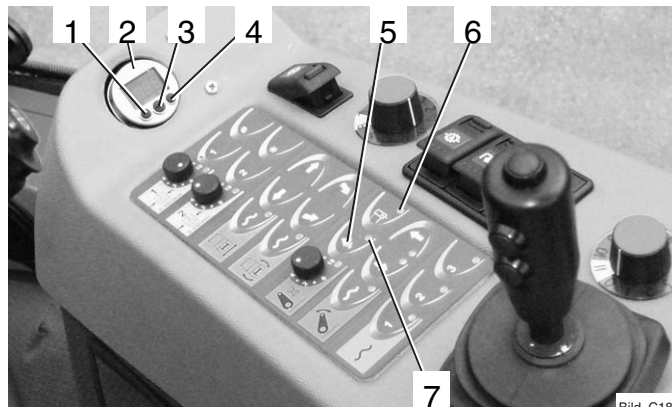
NOTE

If the attachment adjusts to ground unevenness with a delay, reduce the relief pressure or HYS. 1.

- For light attachments (eg rotary mower) turn the hydraulic accumulator off.

Switching the hydraulic accumulator off

- Press key (5), select float position or operate the joystick. The LED indicator (7) will extinguish.

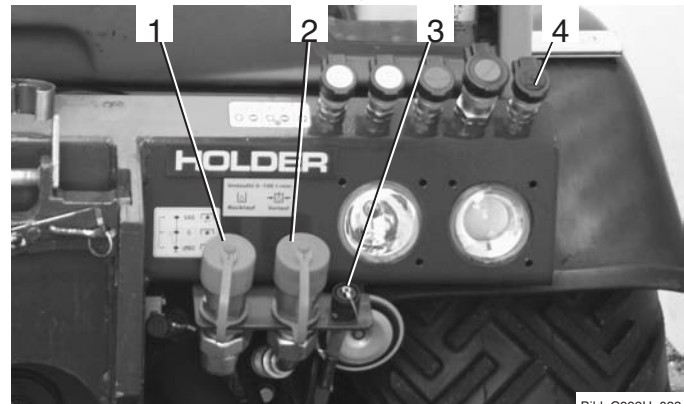


Bild_C188

Operating the attachments**Operating the attachment variable pump* (adjustable to 0-120 L)**

The attachment variable pump is a device for operating attachments with a high hydraulic power requirement, eg a cylinder mower. The pump is operated electrically from the driver's station.

- Connect the hydraulic hoses of the front or rear attachment to the return line (1) and supply line (2) quick couplings and, if necessary, to the black leakage oil coupling (4).
- Plug the coded plug of the attachment into the socket (3) beside the quick couplings.

**NOTE**

Only one coded plug may be plugged in at the front or rear.

**NOTE**

If a new or unknown attachment is to be installed, the cable harness for attachment encoding 204-80-72 must be used. The correct encoding must be determined after consultation with the manufacturer of the attachment and Holder.

* Option

Operating the attachments



ATTENTION

Turn on the safety switch (6) only at low engine speed.

- Turn the rotary knob (5) to 0.
- Release the lock at the safety switch (6) and depress the switch. The indicator in the switch will light.



ATTENTION

After the engine speed was increased, the oil flow may only be increased slowly.

- Turn the rotary knob (5) for setting the oil flow from 0 to 120 litres/min maximum to the desired rating for the attachment.



NOTE

The coded plug of the attachment will determine the maximum oil flow rate for the related attachment (for safety reasons).

The numerical value 11 on the ring corresponds to the maximum oil flow rate determined by the encoding.



Bild_C992H_034

Operating the attachments

**NOTE**

The attachment variable pump will attempt to maintain the oil flow rate specified by the attachment plug and potentiometer, even if the engine RPM drops.

Only when the maximum swash angle of the pump is reached will the oil flow be reduced when the RPM are reduced (refer to diagram).

**ATTENTION**

When the attachment is no longer in use, always turn the pump off with the safety switch so that the hydraulic oil will not heat up unnecessarily.

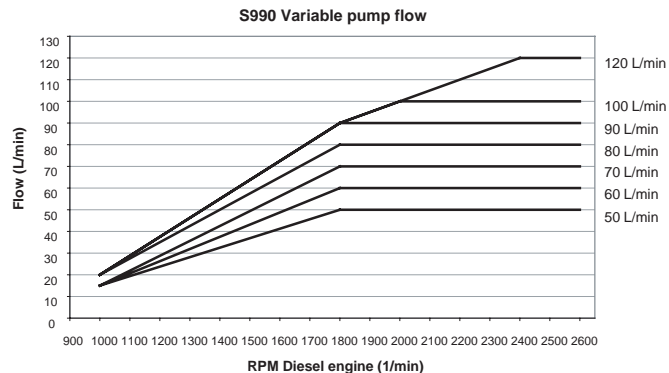
Switching off the attachment variable pump

- Turn the safety switch (6) off. The indicator in the switch will extinguish.

**NOTE**

When you stop the engine without switching off the attachment variable pump, the pump will not start after the engine is started again (for safety reasons).

To start the attachment variable pump, you must set the rotary knob (5) to 0 and then turn the safety switch (6) off and on once.



Bild_C992H_034

Operating the attachments

Operating the hydraulic system* (fixed setting 80 L)

The hydraulic system is a facility for operating attachments with a fixed hydraulic power requirement. The hydraulic system is operated electrically from the driver's station.

- Connect the hydraulic hoses of the attachment to the screw couplings (1) and (2) and the leakage oil coupling (3).



ATTENTION

Turn on the safety switch only at low engine speed.

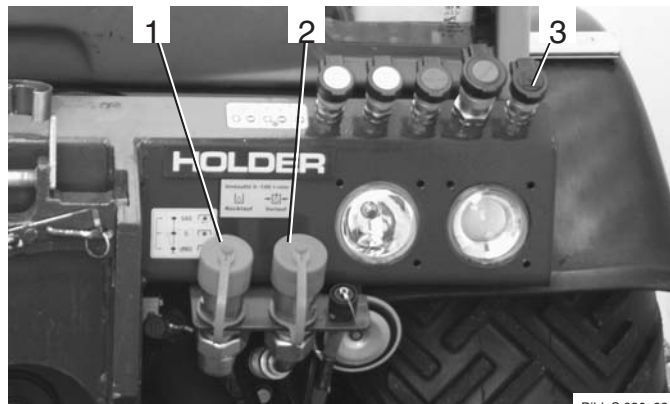
- Release the lock on the safety switch (4) and depress the switch. The indicator in the switch will light.



ATTENTION

Increase the speed of the engine slowly.

- The attachment will be supplied with an oil flow of approx. 80 L/min at the rated RPM.



Bild_S 990_021



Bild_S 990_022

Operating the attachments

**ATTENTION**

The attachment must be set to 80 litres/min, otherwise damage to the attachment or hazards for people standing in the vicinity can result.

**ATTENTION**

When you no longer use the attachment, always turn the pump off with the safety switch so that the hydraulic oil will not heat up unnecessarily.

Never leave the hydraulic system turned on:

- if the engine is running and no load is connected to the couplings
- or it is not in operation.

The resulting overheating can damage the hydraulic system.

Switching off the hydraulic system

- Turn the safety switch (4) off. The indicator in the switch will extinguish.



Bild_S 990_022

Operating the attachments

Operating the hydraulic dumping device

The hydraulic dumping device allows the easy and fast raising of the dumping subframe. The dumping device tips the dump body* to the rear.

- Start the engine.

Changeover lever for the device to be driven:

- Set the changeover lever (1) at the rear forward to the „dumping device“ position.



DANGER

Make sure that no-one is standing in the danger zone at the rear end.

- Press the key (2) and pull the joystick (3) back.
 - The dumping device will be raised. To stop the movement, release the joystick.
- To lower the dumping device, press the key (2) and move the joystick (3) forward.

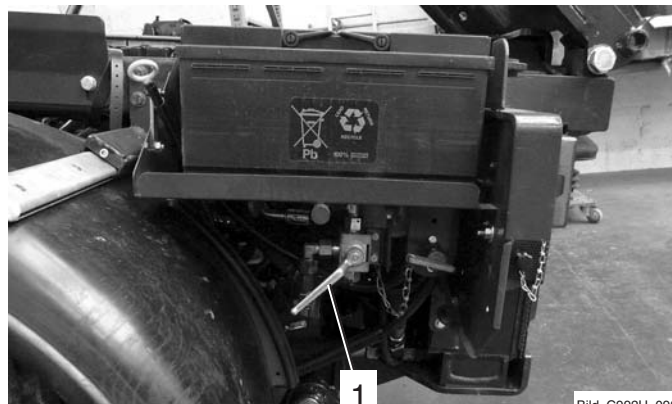


DANGER

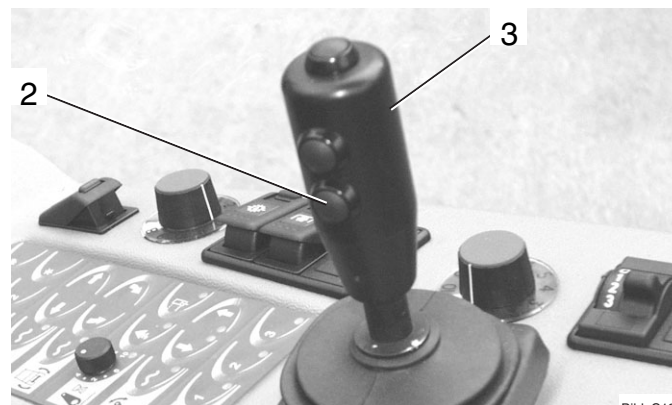
Make sure that no-one is standing in the danger zone at the rear end. Danger or being crushed!

The dumping device will be lowered.

* Option



Bild_C992H_092



Bild_C187

Operating the attachments**Operating priority flow valve I***

Priority flow valve I is used to drive the servo motor in an attachment with a variable hydraulic power demand, for example, salt spreader, hedge cutter, etc. The working speed can be set independently of the tractor engine speed. The priority flow valve is fed by the (standard) working pump and operated from the driver's station.

- Connect the hydraulic hoses of the attachment to the red quick couplings for the drive (1) and return line (2) at the front of the vehicle.
- Turn on the master switch (5) for the working hydraulics.

**ATTENTION**

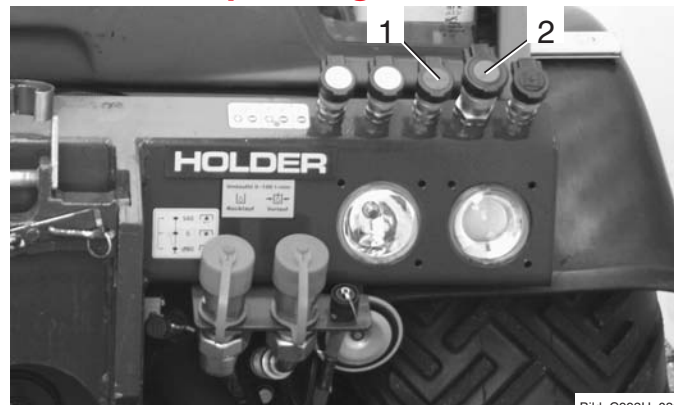
Press button (4) only at low engine speed.

- Press key (4). The red LED will come on.

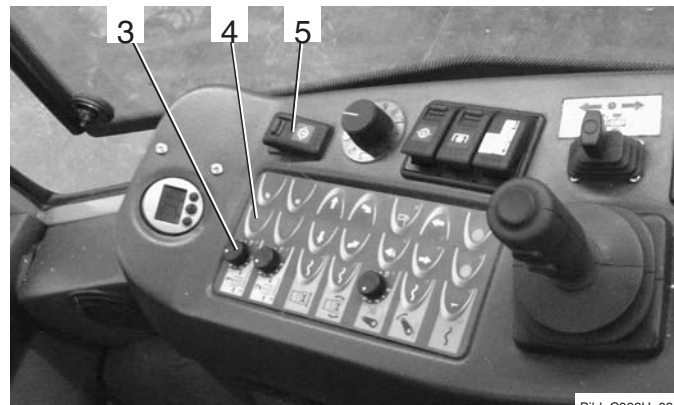
**ATTENTION**

Increase the speed of the engine slowly.

* Option



Bild_C992H_036



Bild_C992H_035

Operating the attachments

- Select the desired engine speed with the hand throttle.
- Set the rotary knob (3) to the operating speed required for the attachment.

Turning clockwise increases the speed, turning anticlockwise lowers it.



ATTENTION

If the flow rate selected is higher than intended for the attachment, the attachment can be damaged or people standing in the vicinity can be injured.

- The servo motor in the attachment is supplied with an oil flow of 0 to 25 litres/min.



ATTENTION

If the attachment is not in use, always turn the priority flow valve off with key (4) to prevent any unnecessary overheating of the hydraulic oil.

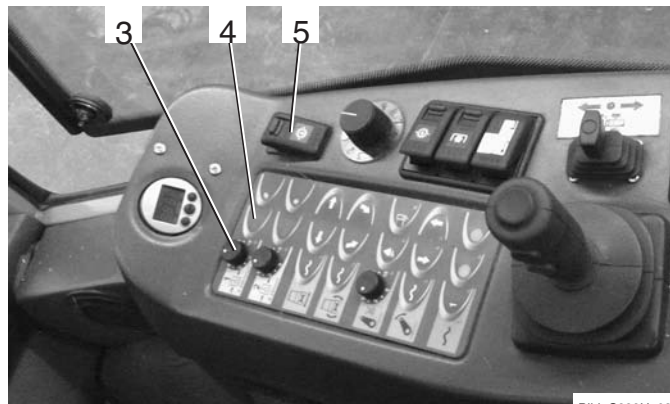
Do not leave the priority flow valve on:

- If the engine is running and no load is connected to the couplings
- or it is not in operation.

The resulting overheating can damage the hydraulic system.

Turning off the priority flow valve

- Press key (4). The red LED will extinguish.



Bild_C992H_035

Operating the attachments**Operating priority flow valve II***

Priority flow valve II is used to drive the servo motor in an attachment with a variable hydraulic power demand, for example, salt spreaders, hedge cutters, etc. The working speed can be set independently of the tractor engine speed. The priority flow valve is fed by the tandem working pump and operated from the driver's station.

- Connect the hydraulic hoses of the attachment to the red quick couplings for the drive (1) and return line (2) at the rear of the tractor.
- Turn on the master switch (5) for working hydraulics.

**ATTENTION**

Press button (4) only at low engine speed.

- Press key (4). The red LED will come on.

**ATTENTION**

Increase the speed of the engine slowly.



* Option

Operating the attachments

- Select the desired engine speed with the hand throttle.
- Set the rotary knob (3) to the operating speed required for the attachment.

Turning clockwise increases the speed, turning anticlockwise lowers it.



ATTENTION

If the flow rate selected is higher than intended for the attachment, the attachment can be damaged or people standing in the vicinity can be injured.

- The servo motor in the attachment is supplied with an oil flow of 0 to 25 litres/min.



ATTENTION

If the attachment is not in use, always turn the priority flow valve off with the button (4) to prevent any unnecessary overheating of the hydraulic oil.

Do not leave the priority flow valve on:

- If the engine is running and no load is connected to the couplings
- or it is not in operation.

The resulting overheating can damage the hydraulic system.

Turning off the priority flow valve

- Press key (4). The red LED will extinguish.



Bild_C992H_037

Operating the attachments

Connecting line for priority flow valves 1 and 2

The oil flow of priority flow valves 1 and 2 can be combined with the connecting line. This will result in a flow rate of 0 to 50 litres/min.

- Set the changeover lever (1) in the area of the articulated joint to the up position.

The priority flow valves 1 and 2 are now connected.

- Set the rotary knob for priority flow valve 2 to the max. position. You can set the desired flow rate with the rotary knob for priority flow valve 1.

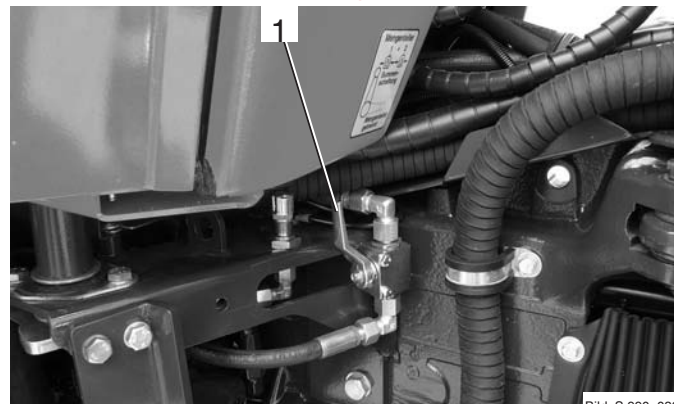


ATTENTION

If the flow rate selected is higher than intended for the attachment, the attachment can be damaged or people standing in the vicinity can be injured.

- Set the changeover lever (1) to the rear position.

The priority flow valves 1 and 2 are now separated.



Bild_S-990_000

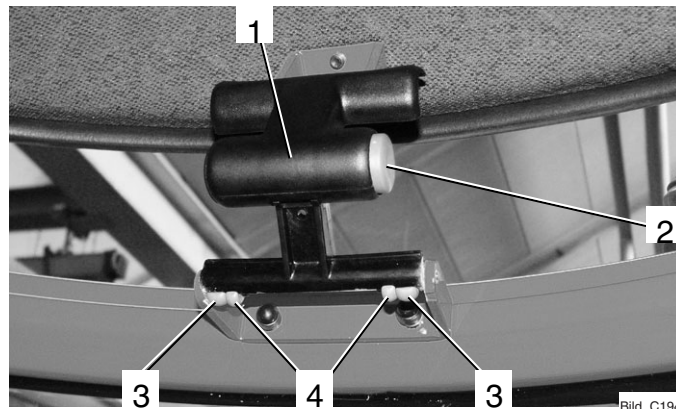
Other operations

Operating the driver's cabin

Operating the roof hatch

Opening the roof hatch

- Press in the knob (2) on the side of the handle.
- Push the handle (1) up. The roof hatch will open to the rear.



Removing the roof hatch



NOTE

The roof hatch can be used as an emergency exit in case of danger.

- Open the roof hatch.
- Press out the inner plastic clip (4) to the back.
- Press the outer plastic clip (3) inward.
- Swing the roof hatch up with the handle (1).

Other operations

Operating the windshield wiper/washer

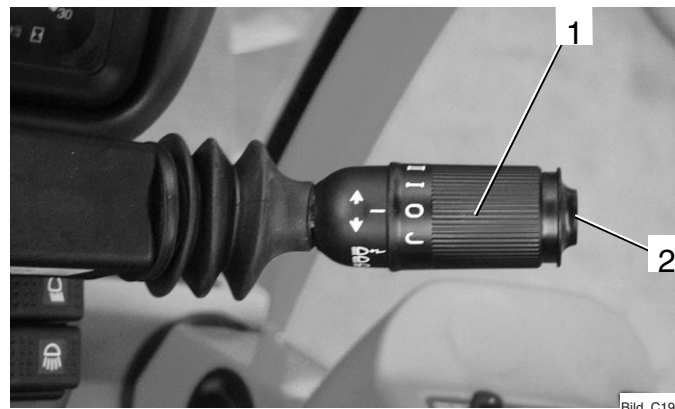


NOTE

The tractor is provided with a front wiper. A washer system is also installed. The washer system draws its water from the washing water reservoir located at the front left in the cabin.

Front windshield wiper/washer

- Turn the rotary switch (1) for the front windshield wiper to stage J.
The front windshield wiper will be switched to intermittent operation.
- Turn the rotary switch (1) to stage I.
The windshield wiper will be set to slow continuous operation.
- Turn the rotary switch (1) to stage II.
The windshield wiper will be set to fast continuous operation.
- Push the button (2).
The front windshield washer will operate and spray only as long as the button is pressed.



Other operations**Lights****Turning on and operating the lights****NOTE**

The preheat/starter switch is set to position 1

- Put the light switch (2) to position 1.
The front position lights (3,6) and the tail lights (10,14) (parking light) will come on.
- The position light indicator (3) in the multifunctional display will come on.
- Put the light switch (2) to position 2.
The front headlights (1, 8) (low beam) will come on.



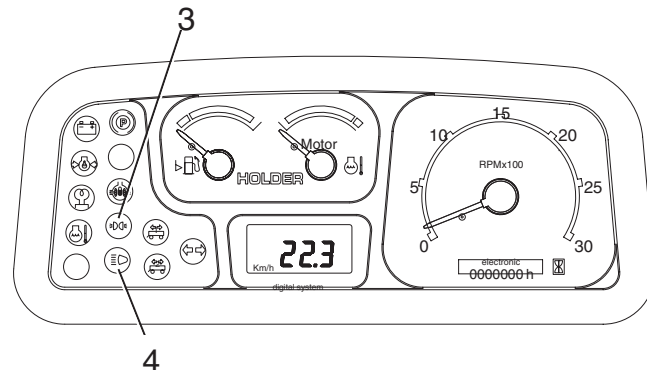
Bild_C196

Turning on high beam

- Put the light switch (2) to position 2.
- Move the turn signal lever (1) down. The headlights (2, 7) will be set to high beam.
- The high beam indicator (4) in the multifunctional display will come on.

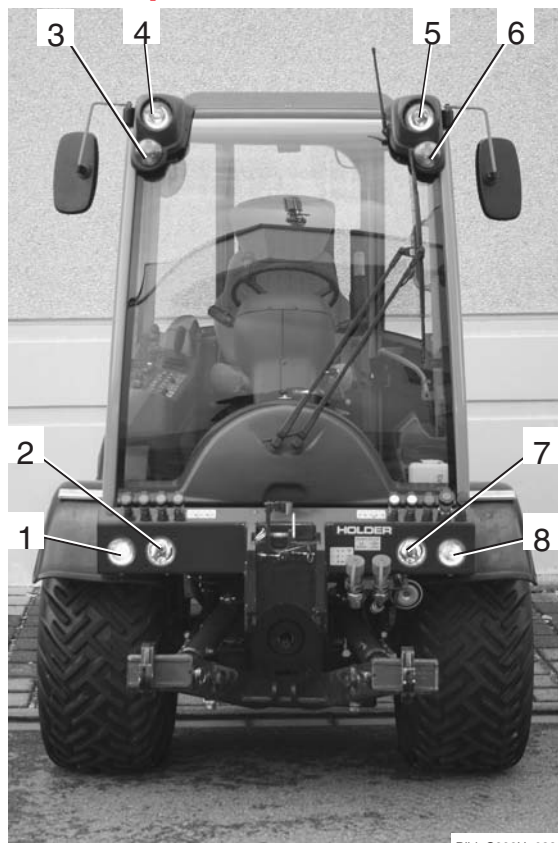
**NOTE**

To flash the headlights, pull the turn signal lever up.



Bild_C992H_099

Other operations



Bild_C992H_038

- 1 Low beam head-light, right
- 2 High beam head-light, right
- 3 Turn signal and position light, right
- 4 Top headlight
- 5 Top headlight
- 6 Turn signal and position light, left
- 7 High beam head-light, left
- 8 Low beam head-light, left
- 9 Brake light
- 10 Tail light
- 11 Turn signal light, left
- 12 Licence plate light
- 13 Top strobe warning light mount/working light*
- 14 Back-up light
- 15 Tail light
- 16 Turn signal light, right
- 17 Brake light

* Option



Bild_C992H_039

Other operations**Turning on the top headlights****NOTE**

If front attachments are installed and the bottom headlights are hidden, you may turn on the top headlights.

- Push the toggle switch for top headlights (2) to turn on the top headlights (5, 6).

**NOTE**

The functions high beam and headlight flashing are only available in the lower headlights.



Bild_C992H_040

Activating the left / right turn signal

- Push the turn signal lever (1) forward to activate the left turn signal lights (7, 9).
- The turn signal indicator in the multifunctional display will come on.
- Push the turn signal lever (1) back to activate the right turn signal lights (4, 8).

Operating the horn

- Push on the end of the direction lever (3) to sound the horn.



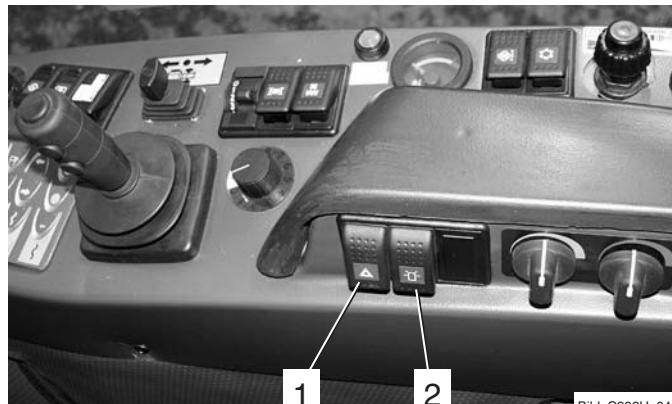
Bild_C992H_041



Other operations

Operating the 4-way hazard flashers

- Push the hazard flasher switch (1) to activate the 4-way flashers.



Bild_C992H_043

Turning on the top strobe warning light*



NOTE

The top strobe warning light may only be turned on if the tractor is used for applications on public roads.

- Push the strobe warning light switch (2) to turn on the top strobe warning light (3).



Bild_C200

* Option

Other operations**Turning on the working lights*****NOTE**

The working light must not be used in public traffic.

- Push the working light switch (1) to turn on the working light (2).



Bild_C201

Dome light**Turning on the dome light****NOTE**

There is an dome light mounted in the cabin roof on the left and right side.

- Flip the switch (1) to turn on.



Bild_C202

* Option

Other operations

Radio* and loudspeaker*

Operating the radio



NOTE

There are a separate operating instructions for the radio.

Please observe these instructions for the operation of the radio.

The loudspeakers are integrated in the cab roof at the front.



Bild_C283

Power socket

Connecting equipment to the power socket

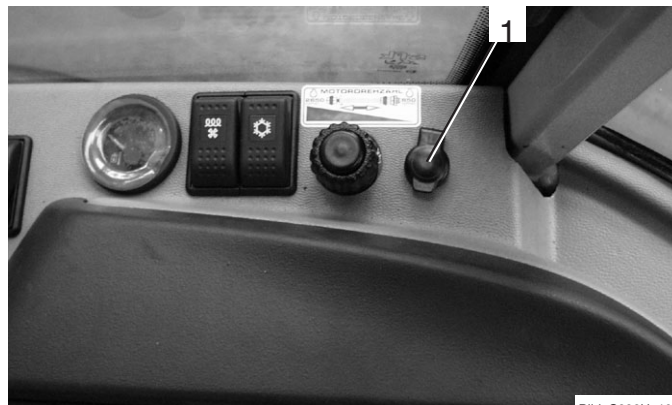
- You can connect 12 VDC equipment with a max. power rating of 15 A to the power socket (1) with a commercial automotive plug.



ATTENTION

Do not let the equipment run unattended. If the engine is not running, the battery can become discharged.

* Option



Bild_C992H_100

Heater

Heating and ventilating

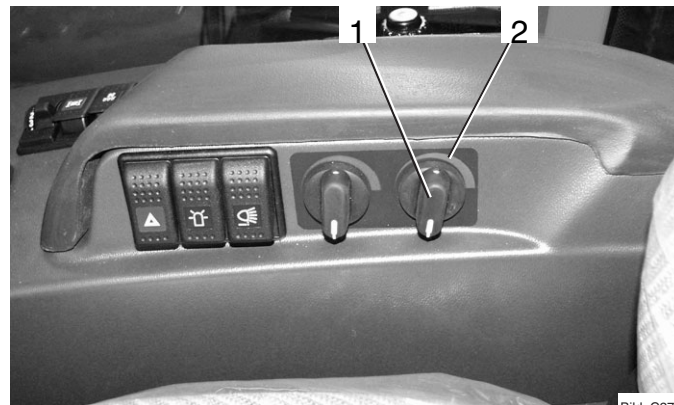
Turning on the heating

**NOTE**

The cabin heater is connected to the engine coolant circuit.

- To heat the cabin, turn rotary knob (1) to the right. You can also select any intermediate positions. Turning to the left will reduce the heat output, turning to the right will increase it. Please note the symbol (2) behind the rotary knob.
- To switch the heater off, turn the rotary knob (1) to the left.

Other operations



Bild_C272

Other operations

Turning on the ventilation

- To heat or ventilate the cabin, push fan switch (1).



NOTE

The ventilation fan has 2 speeds.

- Speed 1 slow
- Speed 2 fast

There are several air outlets (2, 3) provided in the cabin:

- 2 adjustable outlets (2) at the bottom front right in the footwell
- 13 ventilation ducts (3) in the instrument panel for the front and side window panes
- Set the air outlets to the desired direction and to the desired air flow.



Bild_C992H_044

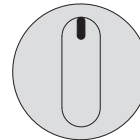
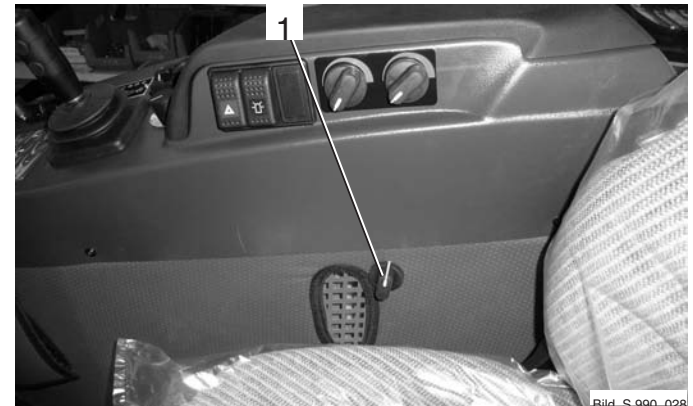


Bild_S 990_027

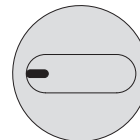
Other operations**Recirculating air operation**

Turning the control knob (1) to the left will select recirculated air operation.

Depending on the position of the control knob, a 3-step mixing of fresh air and recirculated air can be selected.



Fresh air



Recirculated air

Other operations

Air conditioning

Operating the air conditioning*



NOTE

Separate operating instructions are supplied for the air conditioning.

Please observe these instructions for the operation of the air conditioning.

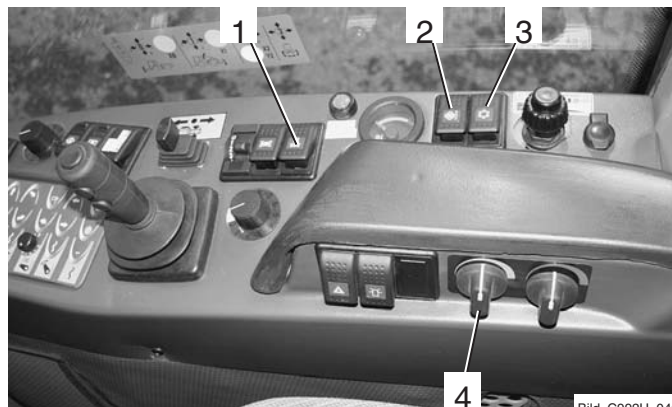
Air conditioning*

- 1 Switch for 2-speed blower
- 2 Fan reversal
- 3 On/off switch
- 4 Temperature regulator
- 5 Ventilation ducts
- 6 Adjustable air outlet

- Set the air outlet to the desired direction and desired air flow.

Cleaning the condenser

- Turn on the ignition (engine off)
- Push the fan reversal switch (2).
- The fans will rotate in the reverse direction and run as long as the switch is pushed.



Bild_C992H_046



Bild_C992H_047

Other operations**Fuses****CAUTION**

Turn off the battery isolating switch before doing any work on the electrical equipment, for example, replacing fuses.

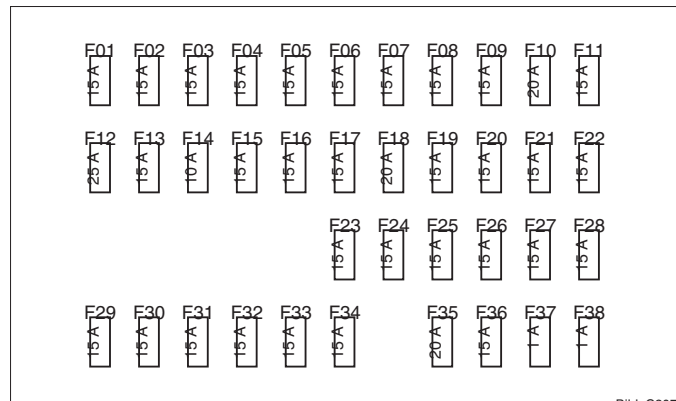
Fuses for the tractor**NOTE**

The fuses for the tractor are installed below the console on the right. Open the cover to gain access.



Bild_C206

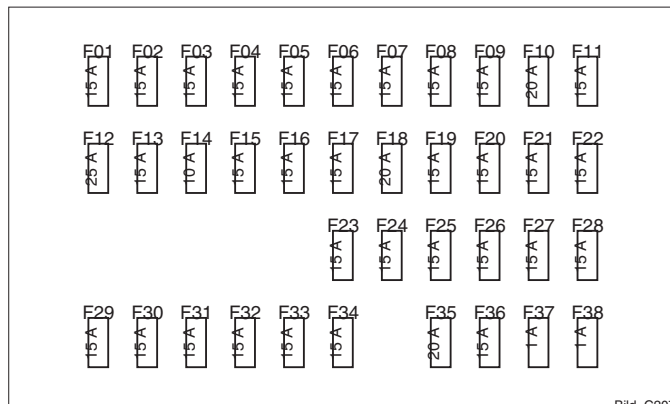
- F01 Multifunctional display/hydraulics remote thermometer
- F02 Spare
- F03 Strobe warning light
- F04 Parking light right 58R
- F05 Multifunctional display/hydr. remote thermometer/
hazard flasher lighting
- F06 Parking light left 58L/rear licence plate light
- High beam/high beam indicator
- F08 Low beam headlight
- F09 Front intermittent wiper
- F10 Hazard warning flasher
- F11 Radio 30/dome light



Bild_C207

Other operations

- F12 Air conditioning
- F13 2-pin socket/electric seat adjuster 15
- F14 Heatable external mirrors
- F15 Brake light
- F16 Flashing headlight/neutral position of wiper washer
- F17 Cigarette lighter/working lights cabin rear
- F18 Deutz shutoff solenoid
- F19 Fan - fresh air/heating/ventilation
- F20 Spare
- F21 Radio 15
- F22 Turn signal light
- F23 Spare/30
- F24 Spare/30
- F25 Seat heater
- F26 Attachment pump encoding
- F27 Spare
- F28 Spare
- F29 Diff. lock/2-stage steering/preheating timer
- F30 Parking brake electric motor, 4.6 A max.
- F31 Solenoid valve for front/rear PTO
- F32 Bucher hydraulics pin 23 / supply switch on/off
- F33 Bucher electronics pin 05
- F34 Bucher electronics pin 34
- F35 Traction control electronics Bosch RC 6-9 /20, item 1 and 27/back-up light
- F36 Horn/air filter maintenance switch



Bild_C207

- F37 Traction control electronics Bosch RC 6-9/20, item 41.42/direction of travel
- F38 Traction control electronics Bosch RC 6-9/20 pos. 10, 11, 12, 23, 34, 37, 48 and 61/diagnosis socket A/ driving program switch/inductive transmitter/ reversing pushbutton switch

Parking the tractor

Leaving the tractor unattended

Stopping the tractor

- Lower the attachment completely.
- Apply the parking brake.
- Push in the hand throttle (2) fully (idle position).
- Put the direction switch to neutral.
- Set the driving program switch (1) to 0.

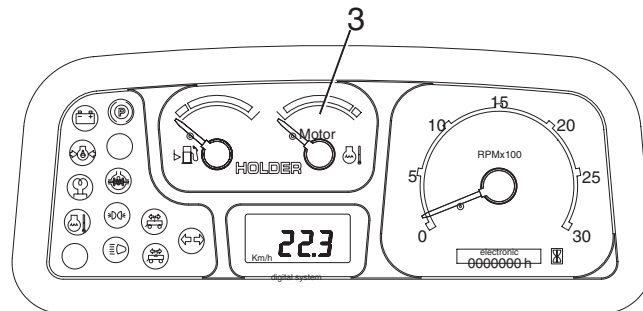


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ATTENTION

If the engine is overheated (engine temperature gauge (3) in the red field), let the engine run without a load until the temperature has dropped to the green area. Do not let the engine run unattended!



Bild_C992H_101

Parking the tractor

Parking



ATTENTION

When parking the tractor on slopes, secured it against rolling with chocks.

- If the tractor is equipped with a hydrostatic drive, also put chocks behind the wheels.
- Turn the ignition key (1) back to 0 to stop the engine.
- Remove the ignition key and take it along.



CAUTION

Do not leave the cabin without taking the ignition key with you.

- Turn off the battery isolating switch (2).



Emergency stop

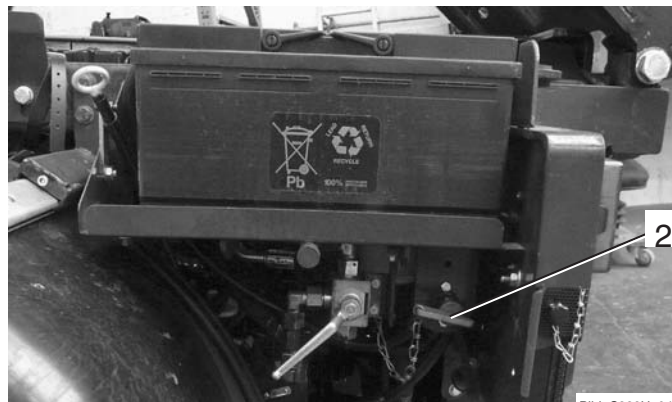
When the inching pedal or traction hydraulics is defective, the tractor can only be brought to a halt by setting the ignition to 0 and using the service brake.

Leaving the tractor unattended

- Lock the cab door with the key.
- If necessary, secure the tractor against rolling with chocks.



Bild_C992H_102



Bild_C992H_049

Trailers, towing

Your tractor can tow the following trailers:

Table of trailers

Type of trailer	Max. total weight	Brake system
Single axle trailers	2.5 t	without brake system
Single and multiple axle trailers	Up to 4 t	With own brake system if the trailer brake lever can be mounted easily accessible beside the driver's seat
Single axle trailers	Up to 4.5 t	With overrunning brakes
Multiple axle trailers	Up to 4.5 t	With service brake system and parking and rapid emergency brake system
Trailers	Up to 12 t	With hydraulic or pneumatic brake system

The following trailer combinations are allowed:

- 1 Tractor with single-axle trailer with brakes or without brakes.
- 2 Tractor plus single-axle trailer with brake or without brake plus 2-axle trailer with override brake.
- 3 Tractor plus two-axle trailer with brake plus 2-axle trailer with override brake.
- 4 Tractor plus two trailers with override brakes, one single-axle trailer plus one 2-axle trailer, or one 2-axle trailer plus one single-axle trailer.



NOTE

The total length of the tractor-trailer train must not exceed 18 m.

Trailers, towing

Operating the trailer coupling, attaching trailers

- Adjust the height of the trailer coupling (2) at the adjustment rail (1) so that the trailer tiller can be attached horizontally.
- To adjust the height, pull the lever (6) up.

Tongue weight



ATTENTION

The tongue weight must be at least 25 kg (4 % of the trailing load), while the maximum tongue weight must not exceed 800 kg. If the tongue weight is less or exceeded when unloading the trailer, the load must be shifted so that the tongue weight returns to the permissible range.

- Drive the tractor in front of the trailer to be attached.



DANGER

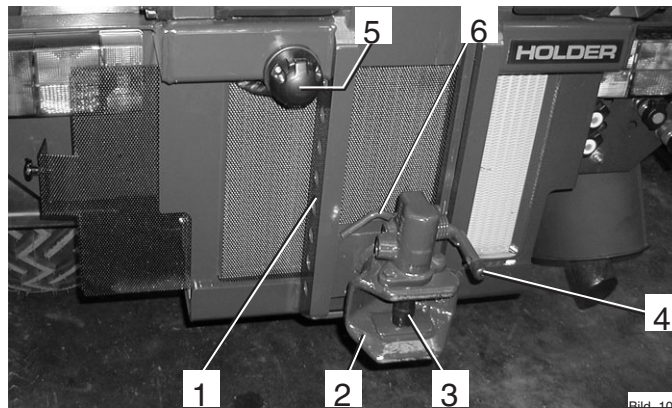
The trailer must be secured against unintentional movement (rolling).

- Pull the release lever (4) up until the tow pin (3) releases the coupling jaw.



DANGER

Never allow anyone to stand between the tractor and trailer.



Bild_105

- Reverse the tractor until the trailer tongue is in the coupling jaw. The coupling will close upon contact and the tow pin (3) will go through the eye in the trailer tongue.



DANGER

The trailer coupling must close fully.

- Connect the trailer lighting to the socket (5).
- Remove the wheel chocks from the trailer.

Trailers, towing**Driving with a trailer**

- Turn the speed range knob (1) to position S or L. The tractive force is greatest in position L.
- Drive the tractor as described in the section entitled „Driving“.

**DANGER**

If a trailer not requiring a permit is attached, the ground speed is limited to 25 km/h. The trailer must be identified with a 25 km/h sign.



Bild_S 990_003

Transport, hoisting, towing

Transport instructions

- Drive the tractor onto the means of transport.
- Park the tractor as described in the section entitled „Leaving the tractor unattended“.
- Secure the tractor against rolling with chocks behind the wheels and, if needed, with wood blocks at the sides to prevent it from sliding.
- Lash the tractor at the front to the upper link bracket (1), at the rear to the towing device (2).

Hoisting instructions

**DANGER**

When hoisting the tractor, only use lifting equipment and a crane with a sufficient load capacity.

- The hoisted load must not exceed the permissible total weight:

The hoisting weight is given on the tractor identification plate and in the tables of weights in the technical data.

- Hoist the tractor only with the lifting equipment attached to all 4 wheels.



Bild_S 990_024

**DANGER**

*Do not step or stand under a suspended load.
Danger to life!*

Transport, hoisting, towing

Towing instructions

If your tractor can not drive on its own power because of damage, it can be towed. Use the trailer coupling or the front upper link bracket on the cabin for towing.



DANGER

The towing tractor must have sufficient tractive and braking force for the towed load without brakes.

- The towed load must not exceed the allowed maximum total weight.
The total weight of the tractor is given on the identification plate and in the tables of weights in the technical data.
- Attach the towing device (only a rigid tow bar in case of a brake malfunction) to the trailer coupling (1).
- Turn on the ignition.
- Turn off the parking brake switch.
- Set the direction switch to the centre position (no direction of travel selected).
- Turn the speed range knob to the zero position (centre position).
- Let the engine run so that the power steering is in operation.



Bild_S 990_025



CAUTION

If the engine is not running during towing or if the hydraulic system has failed, steering will be difficult. Increased steering effort will be required in this case.

- Tow the tractor at 10 km/h maximum to the nearest service centre.
- Park the tractor and secure it against rolling.

Transport, hoisting, towing**ATTENTION**

If the parking brake can not be released due to a loss of electrical power or an electrical failure, the electric cylinder must be relieved before the tractor can be towed.

**DANGER**

Secure the tractor against rolling with chocks.

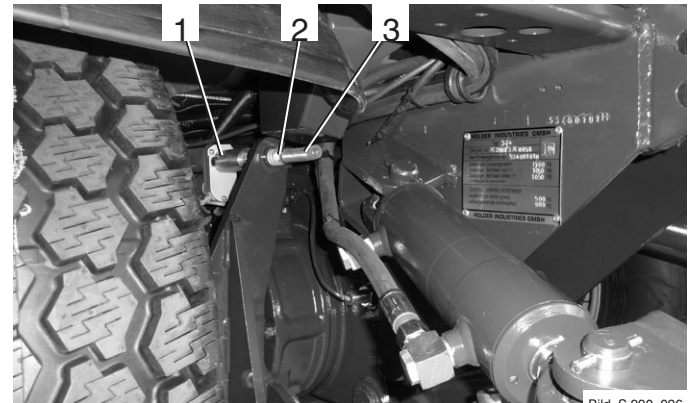
- Pull off the protective hose (3) toward the front.
- Remove the lock nut (2) with a 17mm Allen key until the electric cylinder (1) is relieved.

The parking brake is now released and the tractor can be towed.

Have the parking brake repaired only by your service centre.

- Fully extend the electric cylinder.
- Screw a new lock nut (2) on until the lock nut contacts the compression spring.
- Refit the protective hose (3).

Check the parking brake.



Bild_S 990_026

Indicators, adjustments

Adjusting the speedometer

The adjustment of the speedometer in the multifunctional display is required when changing from larger to smaller tires and vice versa.

Please refer to the maintenance instructions for the adjustment of the speedometer.

Indication of special operating conditions

The built-in horn also warns the driver of the following condition:

- clogged air filter.

The acoustic warning signal warns the driver of the following conditions (only with the engine running):

- turn signal lights
- Hazard warning flasher
- Differential lock
- Coolant temperature > 110°C
- Low engine oil pressure
- Parking brake applied - only when driving

The LED behind the seat indicates a defect in the traction electronics.

Malfunctions, causes, remedy

The following tables list malfunctions and their possible causes. If you can not carry out the remedial measure yourself, please contact a service centre or our customer service.

The optional test and control box BB3 or the Bodem PC software is available for further troubleshooting/diagnosis/traction electronics calibration.

Engine and exhaust gas turbocharger malfunctions

Please observe the notes in the operating instructions for the engine.

Traction electronics and traction hydraulics malfunctions

Malfunction	Cause	Remedy
Traction electronics in general	<p>Traction electronics defective The warning light is illuminated or flashes if the following conditions are fulfilled:</p> <ul style="list-style-type: none">• Ignition on• Driving program switch at 1, 2, 3 or 4• Direction switch in neutral position	<p>Read out fault history with BB3 or Bodem Eliminate the fault Clear the fault in the error memory</p>

Malfunctions, causes, remedy

Malfunction	Cause	Remedy
Tractive force too low	Fault in the feed pressure or high pressure system	Check the feed pressure of hydraulic system
		Check the high pressure hydraulic system
		Check for leakage at variable pump and variable motor
		Check the variable pump controls and proportional solenoids
		Check the maximum current at proportional solenoids
		Eliminate determined faults
No forward and reverse travel	Direction switch in neutral position	Put the direction switch to the desired direction of travel
	Machine was started with direction of travel preselected	Put direction switch in neutral position and preselect desired direction of travel
	Electronics without electrical power	Check the fuses Check the electrical connection
	Traction electronics defective	Read out fault with BB3 or Bodem and eliminate fault
	Electrical connection to the variable pump is interrupted	Make a connection

Malfunctions, causes, remedy

Malfunction	Cause	Remedy
No forward and reverse travel	Electrical connection of diesel engine speed sensor interrupted, possibly oxidized	Make a connection
	Speed range knob in neutral position	Select the working or transport range
	Direction switch defective or bad contact	Renew the direction switch, make contact
	Driving program switch at 0	Select the desired driving program Check the feed pressure of hydraulic system
	Fault in the feed pressure or high pressure system	Check the high pressure hydraulic system Check the variable pump controls and proportional solenoids Eliminate determined faults
No maximum speed	Diesel engine does not attain maximum RPM	Check the accelerator linkage Check the diesel engine
	Inch pedal not at maximum speed	Adjust, calibrate the inch potentiometer
	Variable pump or variable motor does not swash fully to end position	Check the maximum current,
	Inductive transmitter on variable motor defective, possibly electrical connection adjustment	Check the proportional solenoid Check the inductive transmitter, renew if necessary. Check the electrical connection

Malfunctions, causes, remedy

Malfunction	Cause	Remedy
Does not stop when inch pedal is fully depressed	Incorrect position of inch pedal, possibly foreign objects in actuator Inch potentiometer not correctly adjusted	Adjust correctly, remove any foreign objects Adjust, calibrate the inch potentiometer
Inch pedal is not functioning (fault warning light flashing)	Inch potentiometer defective or without contact	Replace inch potentiometer, calibrate Repair cable connection
Tractor does not stop in driving program 1 or 2 without operation of accelerator	Engine idle speed is too high Calibration is incorrect	Check engine, adjust idle speed, check actuator Perform calibration
Differential lock does not operate	Fuse defective or bad contact Switch defective Hydraulic valve for diff. lock defective or no pressure applied No power supply	Check the fuse, make a connection Make a connection Check / renew the switch Check the hydraulic system and hydraulic valve Check and repair electrical connections, cables
Parking brake can not be released	Switch defective	Check – renew the switch

Malfunctions, causes, remedy**Hydraulic and steering system malfunctions****NOTE**

These notes only apply for valve arrangements conforming to our circuit diagrams or approved by Bucher Hydraulics.

Malfunction	Cause	Remedy
Power lift or hydraulic cylinder is not lifting. No build-up of pressure discernible (steering working normally).	Slide valve in input plate jammed due to foreign particles	Remove and clean slide valve in input plate LU8SSCS-OM22/04! Do not change the pressure setting!
Power lift is lifting too little.	Pressure setting too low Oil level too low	Reset the pressure with a pressure gauge (190 bar). Add the specified oil type.
Operating pressure is only achieved at high RPM.	Pump defective	Replace the pump
Power lift is not lifting Insufficient power, drops after operation.	Lift cylinder leaking Valve leaking	Clean / renew

Malfunctions, causes, remedy

Malfunction	Cause	Remedy
Hydraulic oil overheats quickly, system working against excess pressure. (engine under load)	Cylinder at limit stop	Move joystick to neutral position (free circulation)
	Attachment is not connected, but joystick is in work position (quick coupler)	Move joystick to neutral position (free circulation)
Oil is foaming	Leak in the suction area	Inspect all line fittings and tighten, if necessary
Hydraulic system is working too slowly, whistling noise	Hydraulic oil level too low	Add oil as specified
	Temperatures too low	Fill proper oil type according to maintenance instructions
Steering is not working	Priority valve contaminated	Clean priority valve (mounted on the frame at the right)
	Relief valve in power steering not closing	Remove and clean (service centre)
Lost steering motion when steering direction is changed fast	Leak in the steering return line	Inspect the hose connections

Malfunctions, causes, remedy**Working hydraulics malfunctions**

The optional OPUS test unit or a PC software is available for further troubleshooting/diagnosis/working hydraulics electronics calibration.

**NOTE**

These notes only apply for valve arrangements conforming to our circuit diagrams or approved by Bucher Hydraulics.

Malfunction	Cause	Remedy
All hydraulic functions not active	Controller unit (box) without power Plug or cable harness defective Controller unit defective, Observe flashing code of the LED on the box	Turn on master switch (toggle switch) Repair or replace plug, cable Replace controller unit
Individual functions not active	Function is locked Plug or cable damaged Solenoid or valve defective	Release with Opus or PC software, also refer to Bucher operating instructions. Repair or replace Repair or replace

Malfunctions, causes, remedy

Malfunction	Cause	Remedy
Joystick inoperative	Joystick locked Buttons defective	Release with Opus or PC software Determine fault with Opus, submit the joystick for repair, or replace it
Membrane keyboard inoperative	Mechanically or electrically defective	Determine fault with Opus or PC software, replace membrane keyboard and/or related printed circuit board
Simultaneous failure of many joystick and membrane keyboard functions	Power supply interrupted (3 separate positive cables, pin 05, 23, 34)	Determine and eliminate the defect (cable breakage, contact problems in the plug) Attention: Although voltage is applied in the quiescent state, power failure can result during operation
Functions operate too slowly or too fast	Flow rate limiting out of adjustment Current value for a certain channel too low	Readjust with hash (#) key and joystick or Opus or PC software Adjust from 800 to 1900 mA in "Channels" area with Opus or PC software
4th control level on joystick "malfunctioning"	Special function activated with asterisk (*) key	Push the asterisk (*) key again
Joystick or membrane keyboard not functioning	Bus cable is defective (Opus does not indicate a connection)	Make a connection or replace the cable

Malfunctions, causes, remedy

Malfunction	Cause	Remedy
Many malfunctions	Some parameters out of adjustment	Upload "standard values" with Opus or PC software
Keys respond too slowly	Set to "slow"	Can be set to "fast" with Opus or PC software
Keys "stay put" instead of "returning"	Out of adjustment	Adjust with Opus or PC software
Hydraulic accumulator inoperative	Switched off	Turn on with membrane keyboard
	Electronic pressure sensor defective	Replace
	Desired value too low	Change at electronic pressure sensor
	Function switched to rear lift	Change to "front" with Opus
Hydraulic accumulator pulsating strongly	Desired pressure value and hysteresis (sluggishness) too low or too high	Change values at electronic pressure sensor
	Weight of attachment is too low	Switch the hydraulic accumulator off
	Hydraulic accumulator defective, no resilience determinable	Renew the hydraulic accumulator
Way valve leaking	Foreign particles in the seat valve	Remove, clean or replace the valve cartridge

Malfunctions, causes, remedy

Malfunction	Cause	Remedy
No build-up of pressure	Slide valve in input plate is stuck (foreign particles)	Remove, clean or plate replace the slide valve
Strong flow rate fluctuation or too little flow of priority flow valve I	Low oil flow	Increase RPM, reduce consumption of 2nd load

Troubleshooting also with Opus (Order No. 204-80-70) or PC software in the menu

- Keyboard check: keys of the membrane keyboard.
- Output functions: functions XO...Y3, check if box provides current for valves.
- Hydraulic accumulator: functions of the hydraulic accumulator.
- Specified value channel.
- FCE1: Joystick functions.
- Diagnosis of master inputs.
- Diagnosis of BKN nodes.

General remarks on maintenance

In order to always keep your tractor operational, we ask you to read these maintenance instructions carefully. This section contains all the information required for careful maintenance and care of your tractor. Take particular care to have your tractor serviced at the intervals stated in the maintenance schedule.

Service

Please have all services (acc. to the maintenance schedule) and repairs on your tractor done regularly by your dealer (service centre) and confirmed with a stamp and signature in the service book.

Detach the double guarantee card, have it filled in by the dealer and send it with the customer's signature directly to:

Max Holder GmbH
P. O. Box 15 55
72545 Metzingen/Wuertt.

Warranty and product liability can only be claimed if the maintenance services and inspections have been carried out punctually and regularly.

Qualification of service personnel

The tractor, including the attachments, may only be serviced and repaired by persons who are familiar with it and who have been instructed in the hazards involved.

The qualified personnel entrusted with the work must have the required tools.

The applicable safety regulations and rules must be observed.

How to value the tractor?

As you know, a car is judged by its age together with the number of kilometres driven. Tractors are best assessed according to service hours and age, whereby the following guidelines can be assumed:

Service hours	Kilometres driven
1	50
10	500
150	7500
300	15000
600	30000
1500	75000

General remarks on maintenance

Handling fuel, fluids and lubricants

- Fuels, fluids and lubricants must always be handled properly and as specified by the manufacturer.
- Fuels, fluids and lubricants may only be stored in approved containers at specified places of storage. They can be inflammable, therefore do not allow them to come in contact with hot objects or with naked flames.
- Exercise caution when handling fuels. Increased danger of fire! Do not fill fuels in the vicinity of naked flames, ignition sparks or hot engine parts. No smoking when refuelling!
- Before refuelling, shut off the engine and remove the ignition key. Do not refuel in enclosed spaces. Do not spill fuels! (Use suitable filling aids).
- Exercise caution when handling brake fluid and battery acid (poisonous and corrosive).
- Only use clean vessels when filling fuel, fluids and lubricants.
- When using fuels, fluids, lubricants and cleaners, follow the safety and disposal instructions of the manufacturer.
- Always avoid spilling of the product. Eliminate spilled brake fluid immediately with a suitable binding agent and discard as specified by regulations.

- Oils, fuels, batteries, brake fluid and filters must be disposed of separately and as specified by regulations.
- Before beginning lubrication, changing filters or opening the hydraulic system, clean the area surrounding the affected part carefully.
- Replaced parts must be discarded in a way friendly to the environment.
- Observe all local and national laws and regulations.



CAUTION

The penetration of hydraulic oil under pressure into the skin, eg due to leaks, is dangerous. If such injuries occur, seek medical aid at once.

Safety notes for maintenance

Observe the notes in these maintenance instructions and the general applicable safety and accident prevention rules!

- Do not allow anyone to stand around where they might get hurt!
- When starting the engine, the traction and attachment drives must be shut off!
- Start the engine only from the driver's station. Do not start the engine by short circuiting the starter terminals, as the machine could start moving immediately.

- Do not run the engine in enclosed spaces! Danger of poisoning!
- To prevent the danger of fire, always keep the tractor and attachments clean!
- When leaving the tractor unattended, secure it against rolling and unauthorized use (parking brake, chocks), stop the engine, remove the ignition key and lock the cabin, if necessary!
- Never leave the tractor unattended if the engine is still running!
- If external electric power loads are connected (eg equipment with solenoid valves), protect them with diodes against back currents. If not, the traction electronics could be affected.
- Operate the equipment only if all guards are installed and in position.
- Install and remove the articulated shaft only with the engine stationary.
- When working with the PTO, no-one should be standing in the area of the rotating PTO and articulated shaft.
- The guards for the articulated shaft and the PTOs must be installed as specified.
- When the articulated shaft is removed, refit the protective cap on the PTO.

General remarks on maintenance

- Do not do any welding, cutting and grinding on supporting parts and other safety-relevant parts such as the tractor frame, axles, trailer coupling, etc.
- Before doing electric welding, disconnect all connectors from the electronic system.
- The mounting of tires requires sufficient knowledge and specified mounting tools.
- Only use genuine HOLDER replacement parts! Use the parts listed in the list of replacement parts in the section entitled „Maintenance data“.
- Always check the tractor and the attachment for road-worthiness and operating safety before taking the tractor into operation and after maintenance or repair services!

General remarks on maintenance

Doing work on the electrical equipment

Before doing work on the electrical equipment, cut off the power with the battery isolating switch (1).

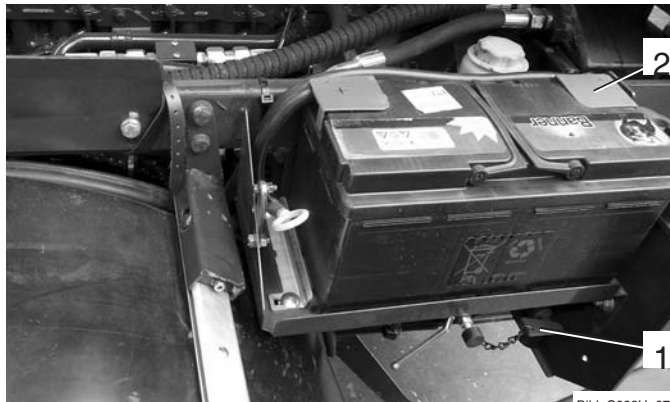
- The switch must be in the vertical position and the toggle removed.



CAUTION

Disconnect the battery ground lead (2).

Do not place any metal parts on the battery terminals. Risk of short circuit!



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General remarks on maintenance**Jack lift points****Jacking up****DANGER**

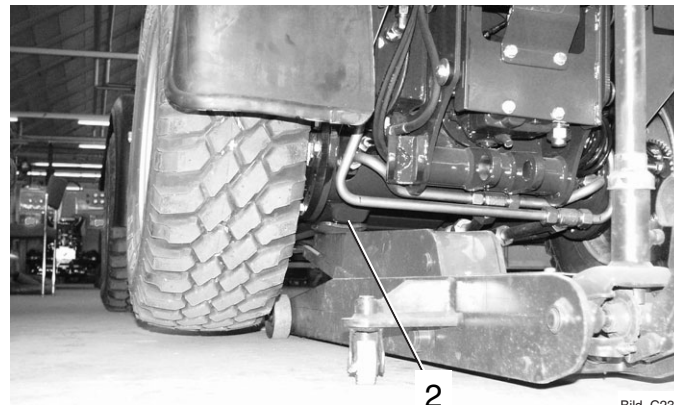
When operating the lift jack, make sure that the tractor is parked securely and prevented from rolling (chock)!

The tractor may only be jacked up at the shown locations (1 and 2).

**DANGER**

The weight to be lifted should not exceed the maximum load capacity of the jack.

When doing repairs, the raised tractor must also be secured against lowering with assembly stands. Place the stands under the axles on both sides.

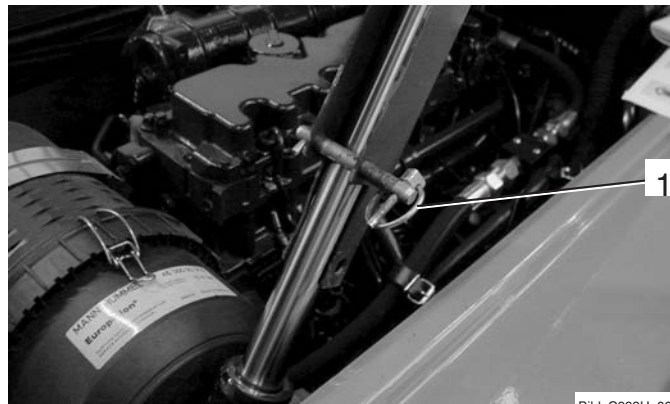


General remarks on maintenance

Securing the dumping subframe (dump body)*

The dumping subframe (dump body*) must be secured against accidental lowering during all services for which it must be raised.

- Place the U-channel on the cylinder and secure it with a locking pin (1).



Bild_C992H_062

* Option

General remarks on maintenance**Tilting the cabin**

The cabin can be tilted for repair and maintenance services.

**ATTENTION**

Raise the cabin carefully.

- Remove the nuts (1) and holding plate at the back of the cabin.
- Attach an M14 eyebolt* (2) to the cabin frame at the top.
- Attach a hook or rope and slowly lift the cabin with a hoist.
- Take the prop rod (3) out of the mounting, insert it on the tractor frame and secure it with a securing pin (4).

**DANGER**

Working under the cabin is only allowed with the prop rod in place.



Bild_S 990_032



Bild_C992H_103

* Option (commercial good)

Maintenance schedule

Maintenance during the initial period of operation

Interval	Service and inspection	See page
Maintenance after the first 50 service hours	Check the engine for leaks	167
	Check the air tubes and air hoses for leaks	167
	Check the heating hoses for damage and tightness	169
	Check the coolant level, top up if necessary	168
	Check the V-belt for tension and condition, tighten or replace belt if necessary	195
	Cleaning the strainer in the fuel pump, replace if necessary	169
	Check the hydraulic lines and hoses for damage and tightness	170
	Check the hydraulic oil level	48
	Replace the working hydraulics pressure filter	171
	Replace the traction hydraulics pressure filter	172
	Change the front and rear gearbox oil	173
	Check the service brake	
	Check the parking brake for proper operation	
	Tighten the wheel nuts (340 Nm)	
	Tighten nuts and bolts according to the torque table	

Maintenance schedule

Interval	Service and inspection	See page
Maintenance after the first 500 service hours	Clean the working hydraulics suction filter, replace if necessary	181
	Clean the suction filter for the traction hydraulics/attachment variable pump, replace if necessary	181
	Replace the working hydraulics pressure filter	171
	Replace the traction hydraulics pressure filter	172
	Change the hydraulic oil	180
	Checking the engine valve clearances	

The services and inspections specified below must be carried out when the stated number of service hours is reached. The services and inspections of the lower intervals must be carried out at the same time.

Example:

At 1000 hours of operation, the services and inspections for 500 and 250 service hours must also be carried out.

Regular maintenance

Interval	Service and inspection
Maintenance as required	<ul style="list-style-type: none">Adjust the speedometerCheck the air cleaner system, clean if necessaryReplace the hydraulic return filter for attachment variable pumpReplace the hydraulic return filter for hydraulic systemCheck the radiator, clean if necessaryCheck the air conditioner condenser for free flow of air, clean if necessaryClean the fresh air filter and filter mat, replace if necessaryGrease the tractor (except universal joints)Check the frost protection of the windshield washer water

Maintenance schedule**Periodic maintenance**

Interval	Service and inspection
Maintenance every 250 service hours	Check the engine for leaks Check the engine oil level Check the air tubes and air hoses for leaks Check the heating hoses for damage and tightness Check the radiator, clean if necessary Check the coolant concentration, add antifreeze if necessary Check the coolant level, top up if necessary Check the V-belt for tension and condition, tighten or replace if necessary Check the fuel lines for condition and tightness Check the cable connections Check the hydraulic lines and hoses for damage and tightness Check the steering cylinder for leaks and mechanical damages Check the hydraulic oil level Check the front and rear gearbox for leaks Check the front and rear gearbox oil level Checking the speed range selector for ease of shifting Check the brake fluid level Check the service brake Check the parking brake for proper operation Check the heating system for proper operation Check the air conditioner for proper operation Check the sight glass of the air conditioner for the formation of bubbles Check the condenser for the free flow of air, clean if necessary Check the seat of the compressor Check the V-belt of the compressor for proper tension and condition

Maintenance schedule

Periodic maintenance

Interval	Service and inspection
Maintenance every 250 service hours	<ul style="list-style-type: none">Check the condensate water drainVisual inspection of air conditioner for leaksCheck the air conditioner hoses and wiring for damageClean the fresh air filter and filter mat in the fan box, replace if necessaryCheck the electrical system for proper operationCheck the lightsCheck the preheating systemLubricate the tractor (except universal joints)Check the accelerator for ease of movement, clean and grease if necessaryCheck the windshield washer water level, top up if necessaryCheck the frost protection of the windshield washer waterCheck the windscreen wiper, renew if necessaryTighten the wheel nuts (340 Nm)Tighten nuts and bolts according to the torque tableCheck the tyre inflation pressure
Maintenance every 500 service hours	<ul style="list-style-type: none">Change the engine oil incl. oil filter (at least once a year)
Maintenance every 1000 service hours	<ul style="list-style-type: none">Check the engine valve clearancesCheck the glow plugsReplace the fuel filter elementClean the strainer in the fuel pump, replace if necessaryLubricate the universal joints (at least once a year)

Maintenance schedule**Periodic maintenance**

Interval	Service and inspection
Maintenance every 1500 service hours	Hydraulic oil change of HE oils (at least every 2 years) Hydraulic oil change of mineral oils (at least every 2 years) Clean the suction filter of the traction and working hydraulics, replace if necessary (at least every 2 years) Clean the suction filter for the traction hydraulics/attachment variable pump, replace if necessary (at least every 2 years) Replace the working hydraulics pressure filter (at least every 2 years) Replace the traction hydraulics pressure filter (at least every 2 years) Replace the return filter of the attachment variable pump or power hydraulic system Change the front and rear gearbox oil
Maintenance every 3000 service hours	Change the toothed belt (at least every 5 years) Replace the injection nozzles
Annual maintenance	Change the engine oil incl. oil filter cartridge Change the air filter element Change the brake fluid Change the fresh air filter Check the battery, coat the terminals with grease Lubricate the universal joints

Maintenance schedule

Periodic maintenance

Interval	Service and inspection
Maintenance every 2 years	<ul style="list-style-type: none">Change the coolantReplace the V-beltChecking the glow plugsHydraulic oil change of HE oils (or at 1500 hours)Hydraulic oil change of mineral oils (or at 1500 hours)Clean the suction filter of the working hydraulics, replace if necessary (or at least every 1500 hours)Clean the suction filter for the traction hydraulics/attachment variable pump, replace if necessary (or at 1500 hours)Replace the working hydraulics pressure filter (or at 1500 hours)Replace the traction hydraulics pressure filter (or at 1500 hours)Replace the alternator and the water pump V-beltReplace the air conditioner V-belt
Maintenance every 5 years	<ul style="list-style-type: none">Change the toothed belt (or at 3000 hours)

Maintenance during the initial period of operation

The following services and inspections are due during the initial period of operation:

Maintenance after the first 50 service hours

Maintenance after the first 500 service hours

Maintenance after the first 50 service hours

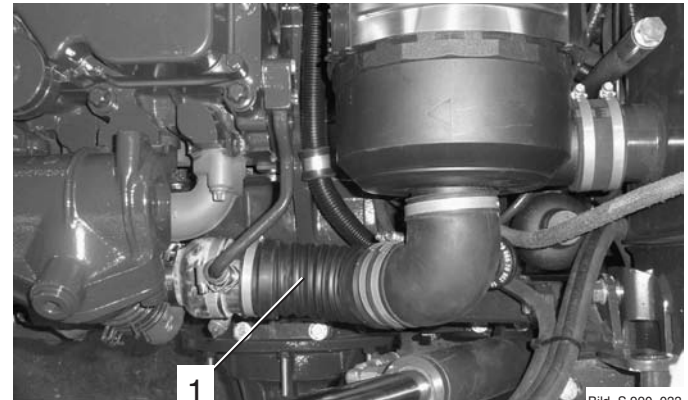
Checking the engine for leaks

- Raise the dumping subframe (dump body*) and secure it against accidental lowering.
- Check the engine and attachments for leaks.

Checking air tubes and air hoses for leaks

- Check the air tubes and air hoses (1) for damage and leaks.

* Option



Bild_S 990_033

Maintenance after the first 50 service hours

Checking the coolant level, topping up if necessary

- Park the tractor on a level surface.
- Raise the dumping subframe and secure it against accidental lowering.
- Turn off the engine and allow it to cool.

The coolant level should be between the min. and max. marks on the expansion reservoir (4) when the engine is cool.

Add coolant if the coolant level is below the min. mark.



ATTENTION

Do not remove the cap when the engine is hot. Danger of scalding!

- Remove the cap (3) on the expansion reservoir (4) and add coolant.

Observe the mixing ratio of anti-freeze/cooling water.

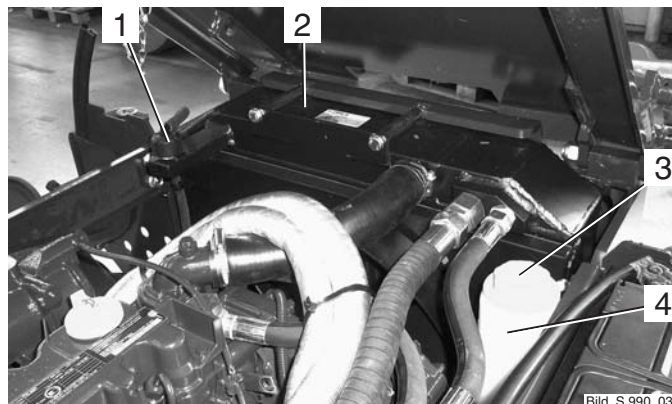
- Refit the cap (3).

If there is no more coolant in the expansion reservoir, the radiator (2) must first be filled fully with coolant.



ATTENTION

Do not remove the cap when the engine is hot. Danger of scalding!



- Remove the cap (1) and top up the radiator (2) with coolant.
- Refit the cap (1).
- Remove the cap (3) of the expansion reservoir (4) and fill coolant up to the max. mark.
- Refit the cap (3).
- Check the coolant level again, adding coolant if necessary.
- Lower the dumping subframe.

Maintenance after the first 50 service hours**Checking the heating hoses for damage and tightness**

- Check the heating hoses for leaks and damage.

Checking engine V-belt tension and condition

Please also refer to the operating instructions of the engine manufacturer.

**CAUTION**

Adjust V-belt tension only when the engine is shut off.

- Inspect V-belts for cracks and tears over their entire length.
- Replace damaged V-belts.
- Using thumb pressure, check that belt deflection is not over 10 - 15 mm.
- To tighten the V-belt: Loosen the fastening screws on the idler pulley mounting and push the pulley outwards until the proper V-belt tension is obtained.
- Tighten the fastening screws on the idler pulley mounting.

Cleaning the strainer in the fuel pump, replacing if necessary

- Clean the strainer and, if necessary, replace it according to the procedure in the engine operating instructions.

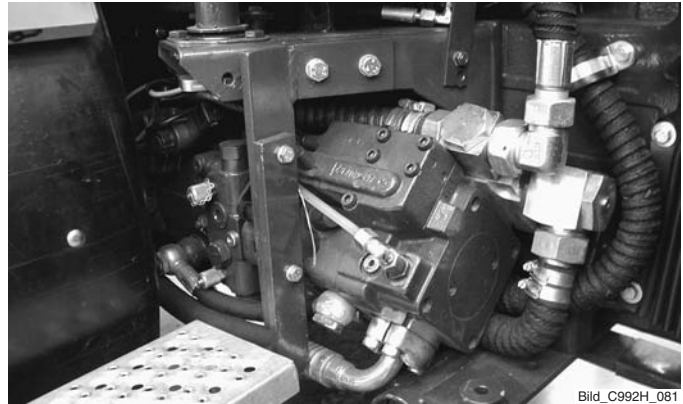
Maintenance after the first 50 service hours

Checking the hydraulic lines and hoses for leaks and damage

- Check all hydraulic lines and hoses for leaks and damage.

Checking the hydraulic oil level

- Check the hydraulic oil level (see page 48).



Bild_C992H_081

Maintenance after the first 50 service hours

Replacing the working hydraulics pressure filter

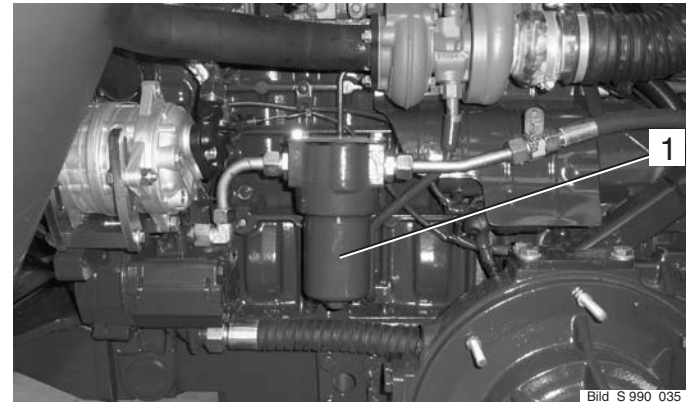
- Depressurize the hydraulic system by operating the joystick.
- Remove the air filter housing (1) with a 24mm wrench.



ATTENTION

Observe the instructions for handling fuel, fluids and lubricants!

- Clean the mating surface of the filter mount.
- Withdraw the pressure filter from the housing.
- Clean the housing.
- Coat the new gasket with oil.
- Insert the new pressure filter in the air filter housing.
- Using a new gasket, screw the air filter housing into the filter mount.
- Check for leaks.
- Check the hydraulic oil level.



Maintenance after the first 50 service hours

Replacing the traction hydraulics pressure filter

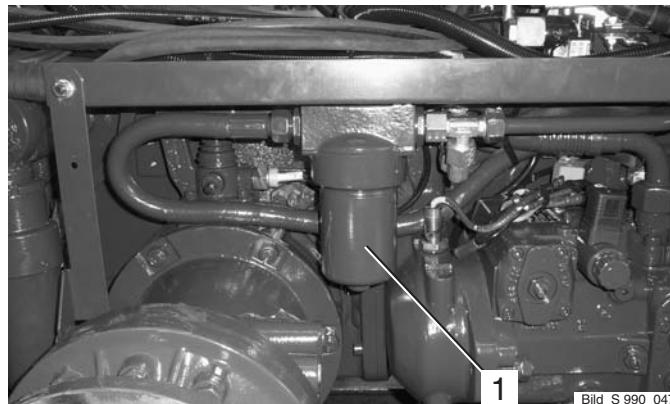
- Remove the air filter housing (1) with a 24mm wrench.



ATTENTION

Observe the instructions for handling fuel, fluids and lubricants!

- Clean the mating surface of the filter mount.
- Withdraw the pressure filter from the housing.
- Clean the housing.
- Coat the new gasket with oil.
- Insert the new pressure filter in the air filter housing.
- Using a new gasket, screw the air filter housing in the filter mount.
- Check for leaks.
- Check the hydraulic oil level.



Maintenance after the first 50 service hours

Changing the front and rear gearbox oil

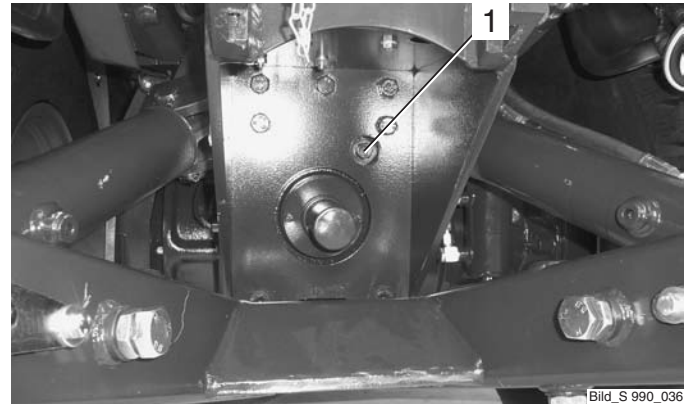
Changing the front gearbox oil (including axle)



NOTE

Change the gear oil only when at operating temperature.

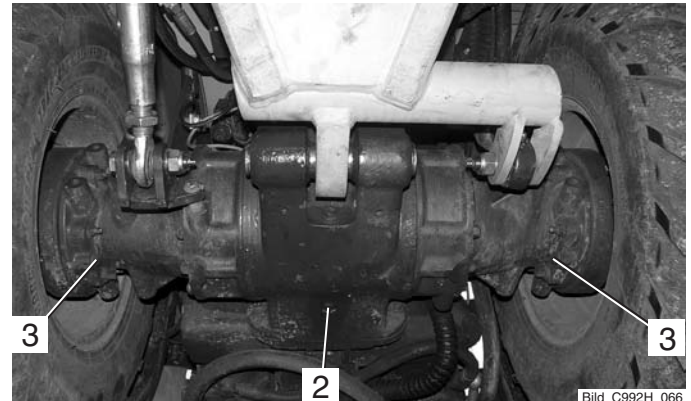
- Park the tractor on a level surface.
- Remove the filler plug (1) at the front gearbox and clean it with diesel oil.
- Place a suitable catch pan beneath the gearbox and axles.



CAUTION

Danger of scalding when draining hot gear oil.

- Remove the oil drain plug (2) at the front gearbox and wash it with diesel oil.
- Remove the drain plugs (3) and clean them with diesel oil.
- Allow the oil to drain completely.
- Refit the oil drain plugs with new sealing rings. Make sure that the plugs are tight.



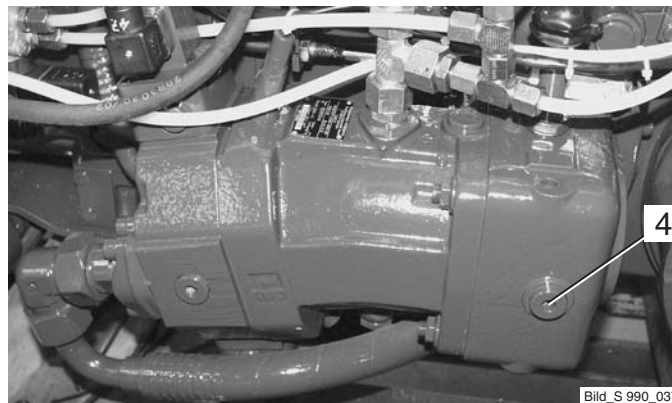
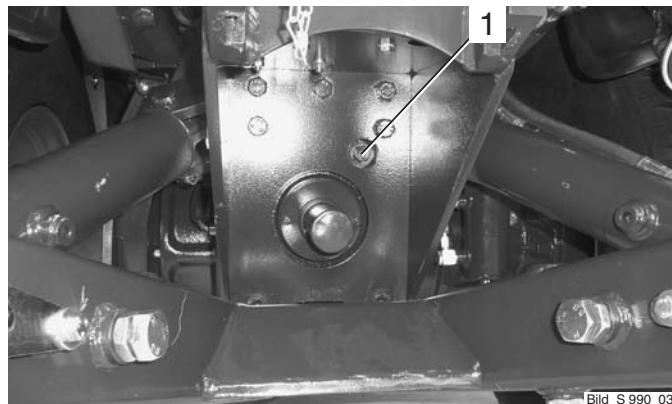
Maintenance after the first 50 service hours

Filling oil

- Remove the oil level plug (4).
- Fill recommended gear oil through the filler plug hole (1) until oil flows out of the level plug hole (4).

Filling quantity approx. 10.9 L

- Refit and tighten the oil level plug with a new sealing ring. Make sure that the plug is tight.



Maintenance after the first 50 service hours

Changing the gear oil of the rear gearbox (including offset axles)



NOTE

Change the gear oil only when at operating temperature.

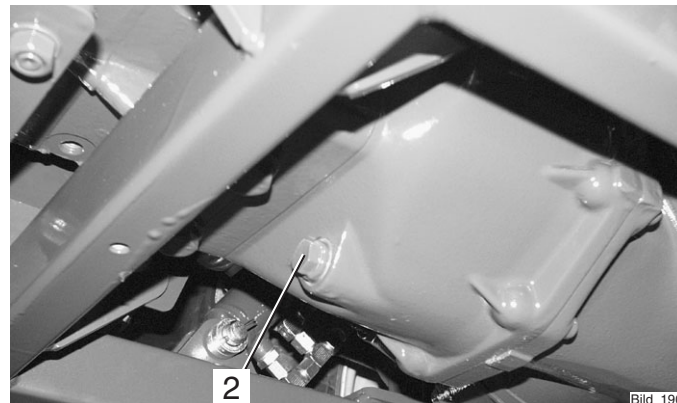
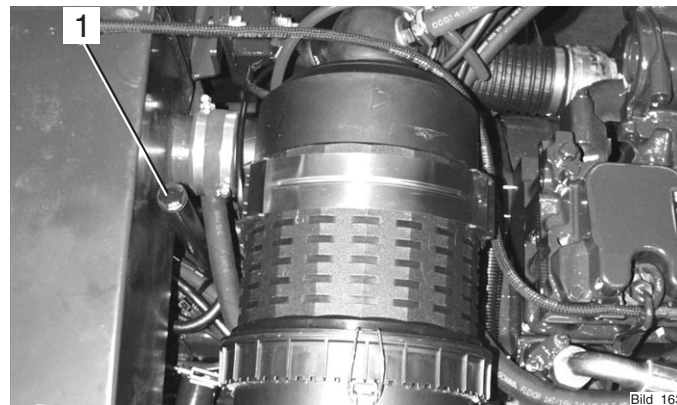
- Park the tractor on a level surface.
- Unscrew the filler plug (1) at the rear gearbox and wash it with diesel oil.
- Place a suitable catch pan under the gearbox.



CAUTION

Danger of scalding when draining hot gear oil.

- Remove the oil drain plug (2) at the rear gearbox and clean it with diesel oil.
- Allow the oil to drain completely.

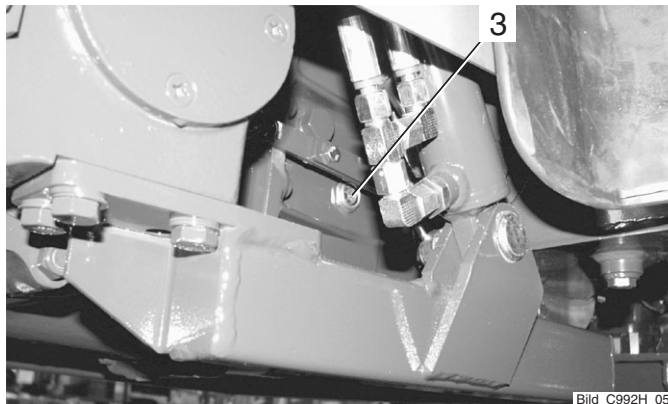


Maintenance after the first 50 service hours

- Refit the drain plug with a new sealing ring. Make sure that the plug is tight.
- Fill recommended gear oil through the filler plug hole.

Filling quantity approx. 17.75 L

- Check the oil level at the sight glass (3).
- The oil level must be visible in the sight glass.
- Then fill another 3 litres of gear oil.



Bild_C992H_056

Maintenance after the first 50 service hours

Checking the parking brake for proper operation



DANGER

Do not operate the tractor with a defective braking system!

- Operate the parking brake (2).
- Select driving speed range 1 or 2 and start off slowly. A noticeable resistance should be discernible when starting off and an acoustic warning signal should sound.



Check the service brake



CAUTION

Operating the service brake pedal (1) will brake the tractor strongly.

- Depress the brake pedal (1) while driving slowly. The tractor should brake strongly.



DANGER

In case of irregularities with the braking system, stop the tractor immediately and have it checked by your service centre.

Maintenance after the first 50 service hours

Tightening the wheel nuts

- Tighten all wheel nuts at the front and rear wheels (1 and 2).

Torque 340 Nm

- Have any damaged parts replaced by your service centre.

Tightening nuts and bolts according to the torque table

- Tighten the nuts and bolts at the variable pumps, axles and engine.
- Tighten the nuts and bolts to the specified torque according to tables in the maintenance data.



Maintenance after the first 500 service hours

Replacing the working hydraulics pressure filter

- Refer to page 171 of maintenance after the first 50 service hours.

Replacing the traction hydraulics pressure filter

- Refer to page 172 of maintenance after the first 50 service hours.

Maintenance after the first 500 service hours

Replacing the hydraulic oil of the traction and working hydraulic system



ATTENTION

When using mineral hydraulic oils, the oil must be changed for summer and winter operation. Refer to the coolant, fuel and lubricant specifications on page 219.



NOTE

Change the hydraulic oil only at operating temperature.

- Park the tractor on a level surface. Raise the dumping subframe.



CAUTION

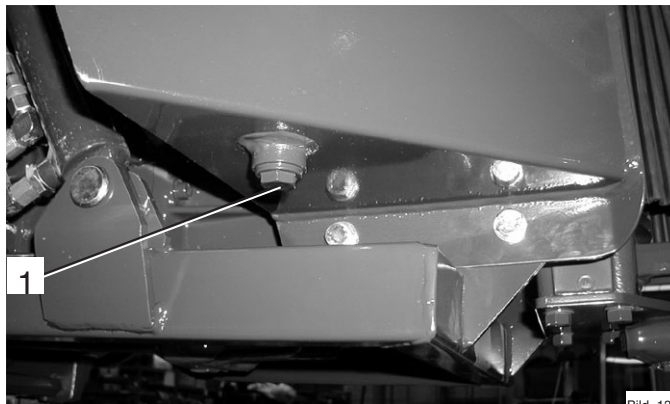
Secure the dumping subframe (dump body) against accidental lowering.*

- Place a suitable catch container beneath the hydraulic oil tank.
- Depressurize the hydraulic system by operating the joystick.
- Retract all hydraulic cylinders.



CAUTION

Danger of scalding when draining hot hydraulic oil.



- Unscrew the oil drain plug (1).
- Drain the oil.



Dispose of the oil in an environment-friendly way.

- If necessary, flush the hydraulic oil tank with clean hydraulic oil.

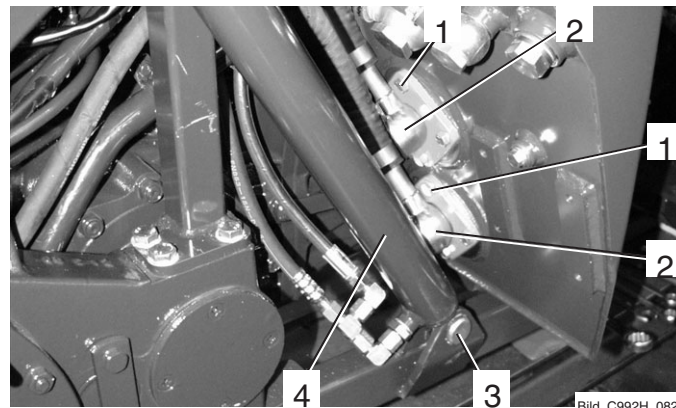
* Option

Maintenance after the first 500 service hours**Cleaning the suction filters of the traction and working hydraulics, replacing if necessary**

- Remove the pin (3) of the hydraulic cylinder (4).
- Remove the banjo bolts (2).
- Remove the filter cover fastening screws (1).
- Pull out the filter housings with the star filter.

**ATTENTION**

Observe the instructions for handling fuel, fluids and lubricants!



Bild_C992H_082

Cleaning:

- Wash the star filters with clean diesel oil and blow out with compressed air.

Replacement:

- Unscrew the star filters from the filter housing with a 46mm open-ended wrench.
- Screw new filters on the filter housing, using new rubber toric rings.

Installation is in the reverse order of removal.

Maintenance after the first 500 service hours

- Refit the drain plug with a new sealing ring. Make sure that the plug is tight.
- Fill recommended hydraulic oil through the filler neck (2).

Filling quantity approx. 45 L

- Check the oil level at the sight glass (3).
- Refit the filler neck cap.
- Start the engine. Operate the working hydraulic and steering systems.



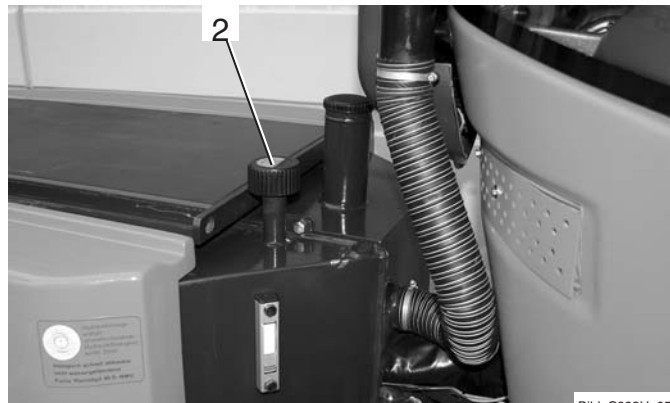
NOTE

The hydraulic system is vented automatically.

- Shut off the engine and depressurize the hydraulic system.
- Check for leaks.
- Check the oil level at the sight glass (3). Add hydraulic oil if necessary.

Checking the engine valve clearances

- See page 203 of maintenance every 1000 service hours.



Bild_C992H_059



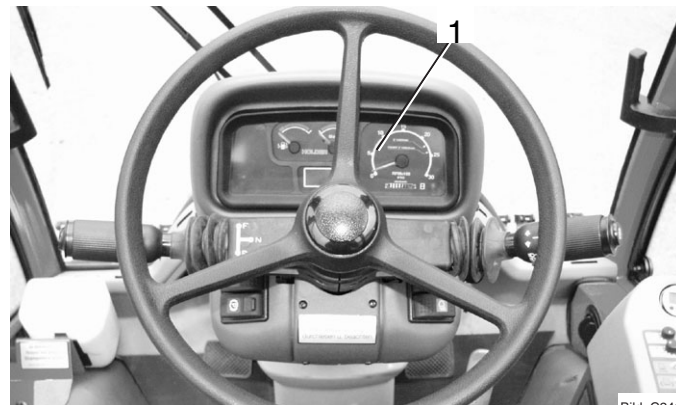
Bild_C992H_060

Maintenance as required

Adjusting the speedometer

The adjustment of the speedometer in the multifunctional display is required when changing from larger to smaller tires and vice versa.

- Carefully pull the multifunctional display (1) out at the left and right side and rotate it.
- Remove the cover from the DIP switch (2) on the back.
- Set the 6 of 8 toggle switches to the positions shown in the table as required for the size of your tires.



Bild_C241



Bild_C299

Maintenance as required

Tire size	Type	Switch settings							
		Combination							
		1	2	3	4	5	6	7	8
280/80 R18	532-31-08/-09	1	1	1	0	1	0	-	-
36x13.50-15	524-31-8	1	1	1	0	1	0	-	-
10.5-18 MPT	524-31-1/-6	1	1	1	0	1	0	-	-
425/55 R17	532-31-01/-02	1	0	0	1	1	0	-	-
400/60-15.5	524-31-5	1	0	0	1	1	0	-	-
33x12.50-15	524-31-4	1	0	0	1	1	0	-	-
33x12.50 R15	524-31-7	0	1	0	1	1	0	-	-
33x15.5-15	524-31-3	0	1	0	1	1	0	-	-
33/18LL-16.1	524-31-9	0	1	0	1	1	0	-	-
31x15.5-15	524-31-2	0	1	1	1	1	0	-	-

- Switches 7 and 8 are inoperative.
- Refit the multifunctional display.

Maintenance as required**Checking the air cleaner system, cleaning if necessary**

The filter cartridge must be serviced when the flow resistance of the filter is at maximum due to the restriction of the element. This is indicated by the sounding of the horn.

- Stop the engine.
- Raise the dumping subframe (dump body*) and secure it against accidental lowering.
- Loosen the hose clamp (1).
- Remove the tensioning band (2) from the air cleaner housing and rotate the air cleaner housing upwards.
- Open the clips on the air cleaner cover.
- Pull off the housing cover and clean the dust ejection valve (3).
- Pull the air filter cartridge (4) out of the housing by rotating it slightly.

Cleaning:

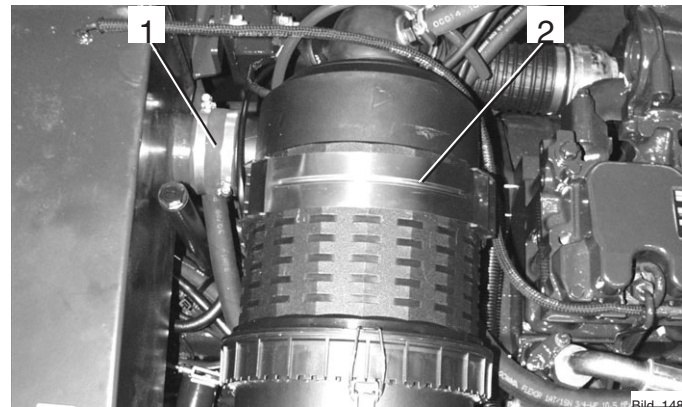
- Blow out the air filter cartridge from the inside with compressed air having a pressure of 5 bar maximum.

Replacement:

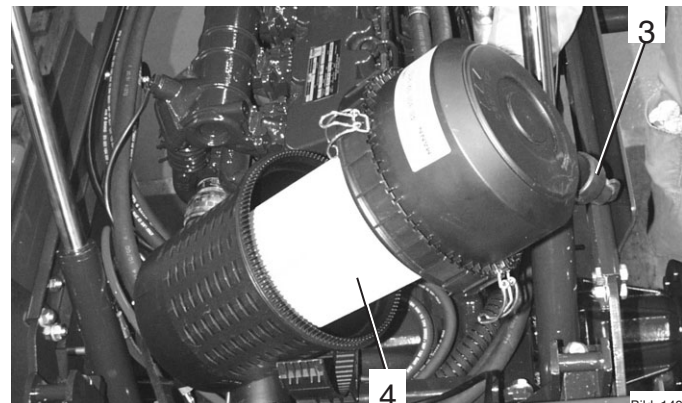
- Install the new air filter cartridge.

Clean the air filter housing with a moist cloth before installation. The installation of the air filter cartridge is performed in the reverse order of removal.

* Option



Bild_148



Bild_149

Maintenance as required

Replacing the hydraulic return filter for the attachment variable pump*

The hydraulic return filter with service indicator is located at the rear right side under the cabin.



ATTENTION

The hydraulic return filter must be replaced when the pressure at the service indicator (1) reaches 3 bar with an attachment (eg cylinder mower) fitted and the engine at idle speed.

- Depressurize the hydraulic system by turning off the attachment.
- Remove the hydraulic return filter (2) with a filter wrench.

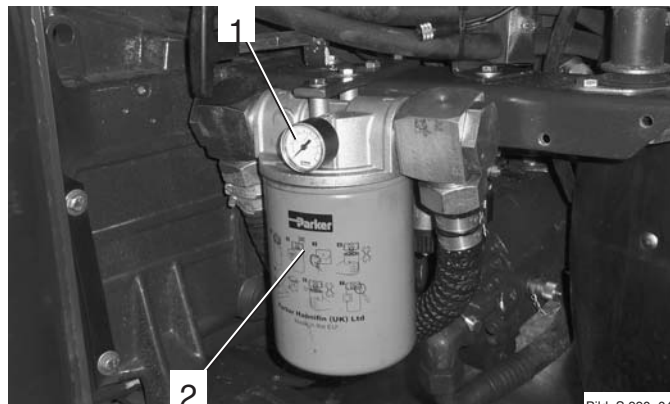


ATTENTION

Observe the instructions for handling fuel, fluids and lubricants.

- Clean the mating surface of the filter mount.
- Coat the new gasket with oil.

* Option



Bild_S 990_046

- Install and hand tighten the new filter cartridge with the new seal in the filter mount.
- Make a trial run and check for leaks.
- Check the hydraulic oil level.

Maintenance as required**Replacing the hydraulic return filter for hydraulic system***

The hydraulic return filter with the service indicator is located at the rear right below the cabin.

**ATTENTION**

When the pressure at the service indicator (1) rises to 3 bar with an attachment (eg cylinder mower) fitted and the engine at idle speed, the hydraulic return filter must be replaced.

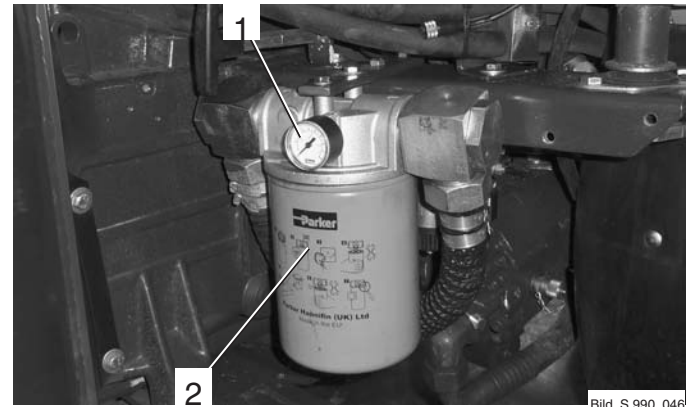
- Depressurize the hydraulic system by turning off the attachment.
- Remove the hydraulic return filter (2) with the filter wrench.

**ATTENTION**

Observe the instructions for handling fuel, fluids and lubricants.

- Clean the mating surface of the filter mount.
- Coat the new gasket with oil.

* Option



Bild_S 990_046

- Install and hand tighten the new filter cartridge with the new seal in the filter mount.
- Make a trial run and check for leaks.
- Check the hydraulic oil level.

Maintenance as required



ATTENTION

Carry out the services and inspections only with the engine turned off.

Checking the radiator, cleaning if necessary

- Inspect the cooling fins and oil cooler for the accumulation of dirt.

Cleaning with compressed air

- Raise the platform* and secure it against accidental lowering.
- Blow out any dirt from the engine compartment to the outside.

Cleaning with cold cleaner or water jet



ATTENTION

Maximum spray pressure 60 bar, maximum steam temperature 60 °C

- Raise the dumping subframe (dump body*) and secure it against accidental lowering.
- Spray the oil cooler and engine with a cold cleaner and allow it to soak in for 10 minutes.
- Clean the oil cooler and engine with a strong water jet.



Bild_C992H_063



ATTENTION

Do not aim the water jet directly at sensitive parts such as the alternator, covering them if necessary.

- Run the engine warm to prevent the formation of rust.

Maintenance as required**Cleaning the condenser**

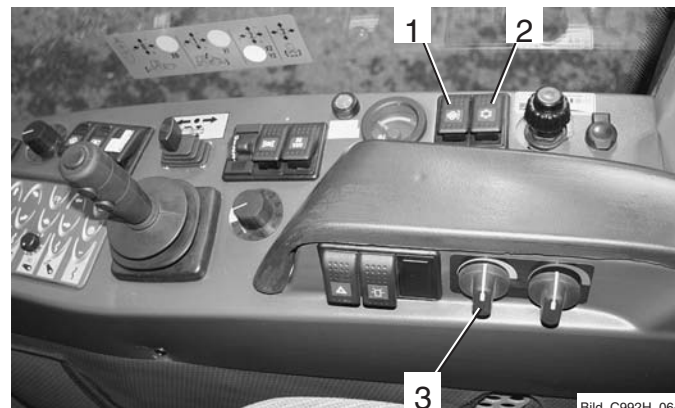
- Turn on the ignition (engine off).
- Operate the fan reversal switch (1).
- The fans will rotate in the reverse direction and run as long as the switch is pushed.

**NOTE**

With this function it is easy to remove any collected grass from the air conditioner.

Checking the condenser for the free flow of air, cleaning if necessary

- Inspect the ribs for accumulation of dirt.
- If little dirt has accumulated, blow out the ribs with compressed air opposite to the normal direction of air flow.
- In case of a heavy accumulation of dirt or a greasy coating, first clean with a soap solution or an appropriate cleaning solution (not aggressive for copper or aluminium) and followed by cleaning with compressed air or a jet of water.



Maintenance as required

Cleaning the fresh air filter and filter mat, replacing if necessary

- Remove the fastening screws (1).
- Remove the filter cover (2) and take out the filter element.
- Clean the filter element or replace it.



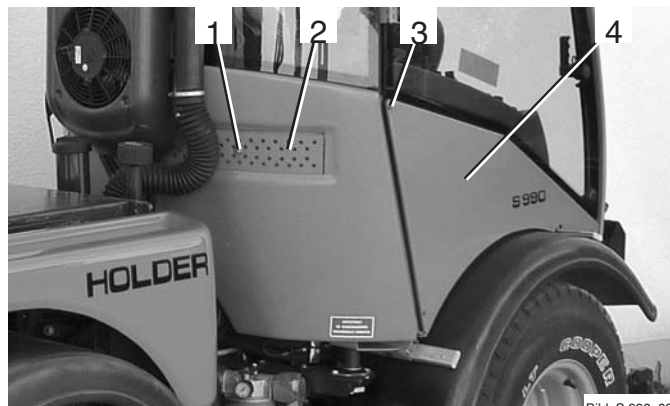
NOTE

An activated carbon filter is available for use with spray chemicals, etc.*

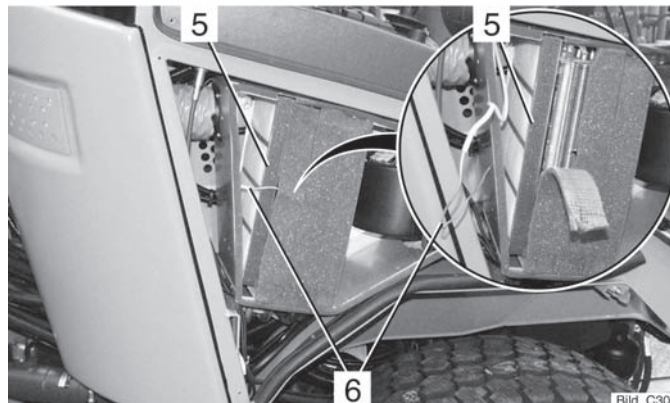
- Refit the filter element and filter cover.
- Remove the fastening screws (3).
- Remove the panel (4).
- If an air conditioner is installed, pull off the sealing tape and remove the capillary tube (6) from the evaporator.
- Remove the filter (5).
- Clean the filter mat or replace it with a new one.

Installation is in the reverse order of removal.

* Option



Bild_S_990_039



Bild_C302

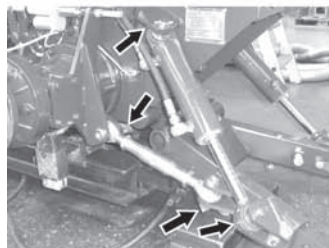
Maintenance as required

Greasing the tractor (except universal joints)

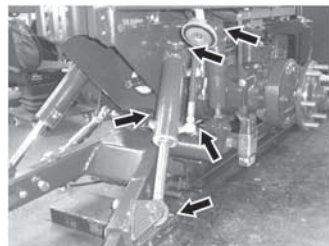
- Grease all moving parts lightly.
- Lubricate the grease nipples (1 and 2) according to the lubrication chart. Only use recommended grease.

**ATTENTION**

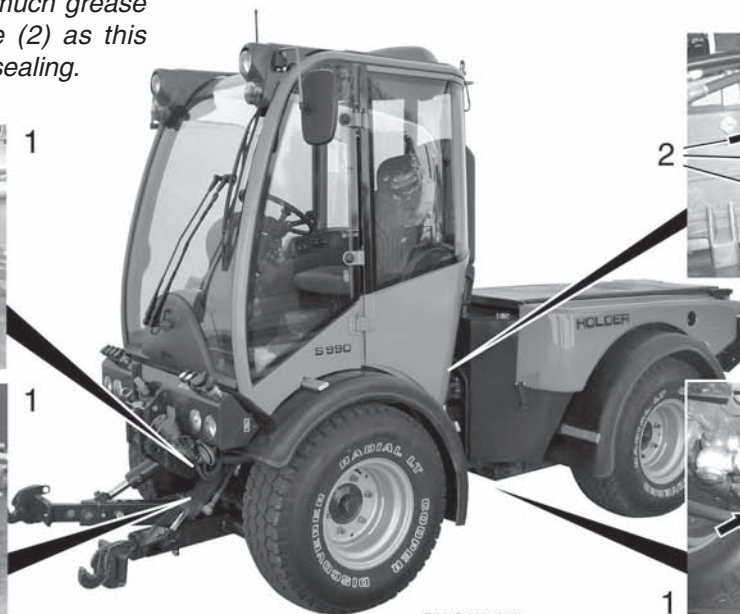
Do not press too much grease into grease nipple (2) as this could damage the sealing.



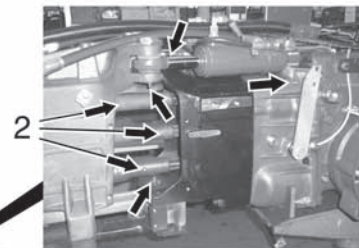
1



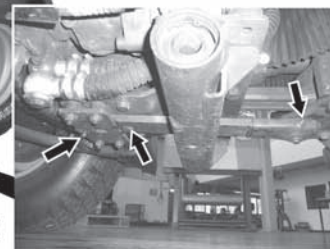
1



Bild_S 990_040



2



1

Maintenance as required

Checking the frost protection of the windshield washer water

- Remove the filler cap (1) from the windshield washer fluid reservoir (2).
- Add a mixture of antifreeze and clear water.



NOTE

The percentage of antifreeze depends on the frost protection used and the temperature to be expected.

- Refit the filler cap (1).



Bild_C992H_019

Maintenance every 250 service hours

Checking the engine for leaks

- Refer to page 167 of maintenance after the first 50 service hours.

Checking the radiator, cleaning if necessary

- Refer to page 188 of maintenance as required.

Checking the engine oil level

- Refer to page 46.

Checking the air tubes and air hoses for leaks

- Refer to page 167 of maintenance after the first 50 service hours.

Checking the heating hoses for damage and tightness

- Refer to page 169 of maintenance after the first 50 service hours.

Maintenance every 250 service hours

Checking the coolant, adding if necessary

- Remove the cap (1) of the coolant expansion reservoir.
- Take a sample of the coolant and check its concentration according to the engine operating instructions. Add coolant if necessary.

Checking the coolant level, topping up if necessary

- Refer to page 168 of maintenance after the first 50 service hours.



Bild_C992H_080

Maintenance every 250 service hours

Checking the V-belt for tension and condition, tightening or replacing if necessary

Please also refer to the operating instructions of the engine manufacturer.



CAUTION

Adjust V-belt tension only when the engine is shut off.

- Inspect V-belts for cracks and tears over their entire length.
- Replace any damaged V-belts.
- Using thumb pressure, check that belt deflection is not over 10 - 15 mm.
- To tighten the V-belt: Loosen the idler pulley mounting screws and push the pulley outwards until the proper V-belt tension is reached.
- Tighten the fastening screws of the idler pulley mounting.

Maintenance every 250 service hours

Checking the fuel lines for condition and tightness

- Check the fuel lines in the engine compartment for leaks.

Checking the cable connections

- Check the cables and plugs for security and damage.

Checking the hydraulic lines and hoses for damage and tightness

- Refer to page 170 of maintenance after the first 50 service hours.

Checking the steering cylinder for leaks and mechanical damage

- Check the steering cylinder for leaks and mechanical damage.
- Have damaged or leaking parts replaced by your service centre.

Checking the hydraulic oil level

- Refer to page 48.

Checking the front and rear gearbox for leaks

- Check the front and rear gearboxes and axles for leaks.

Checking the front and rear gearbox oil level

- Refer to page 173 and 175 of maintenance after the first 50 service hours.

Checking the speed range selector for ease of shifting

- Check the slow/fast speed range selector for ease of shifting, cleaning and greasing the mechanism if necessary.

Checking the brake fluid level

- Refer to page 50.

Checking the service brake

- Refer to page 177 of maintenance after the first 50 service hours.

Checking the parking brake for proper operation

- Refer to page 177 of maintenance after the first 50 service hours.

Maintenance every 250 service hours

Checking the heating system for proper operation

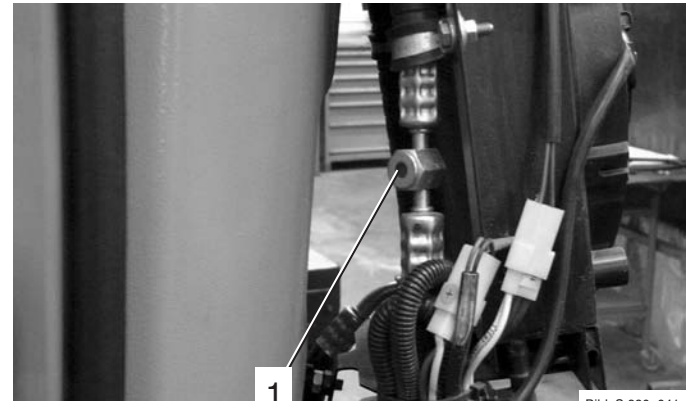
- Refer to page 125.

Checking the air conditioner for proper operation

- Refer to the operating instructions for the air conditioner.

Checking the sight glass of the air conditioner for the formation of bubbles

- Refer to the operating instructions for the air conditioner.
- Check the air conditioner for proper operation.
- Observe the sight glass (1) during operation. In case of formation of bubbles, an air conditioning expert must bleed the unit.



Bild_S 990_041

Maintenance every 250 service hours

Checking the condenser for the free flow of air, cleaning if necessary

- Refer to page 189 of maintenance as required.

Checking the seat of the compressor

- Check the compressor (1) for security and damage.

Checking the V-belt of the compressor for proper tension and condition

- Check the V-belt (2) for tension and condition.

Checking the condensate water drain

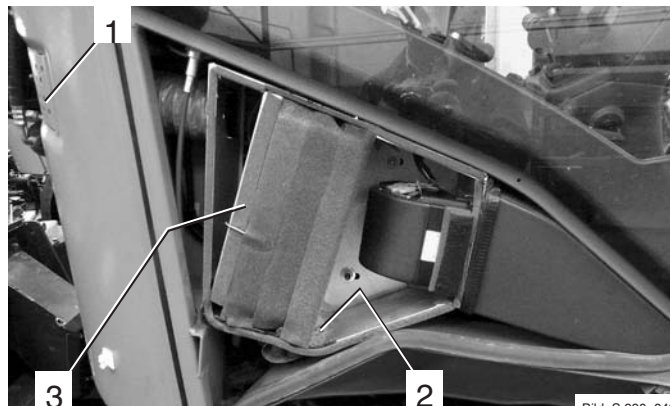
- Check the drain (2) of the condensate water, cleaning the drain hose if necessary.

Visual inspection of air conditioner for leaks

- Make a visual inspection of the air conditioner and hoses for leaks.

Checking the air conditioner hoses and wiring for damage

- Check all hoses, pipes and wiring of the air conditioner for damage or chafing.



Cleaning the fresh air filter and filter mat in the fan box, replacing if necessary

- Clean the fresh air filter (1) and filter mat (3) in the fan box, replacing them if necessary.

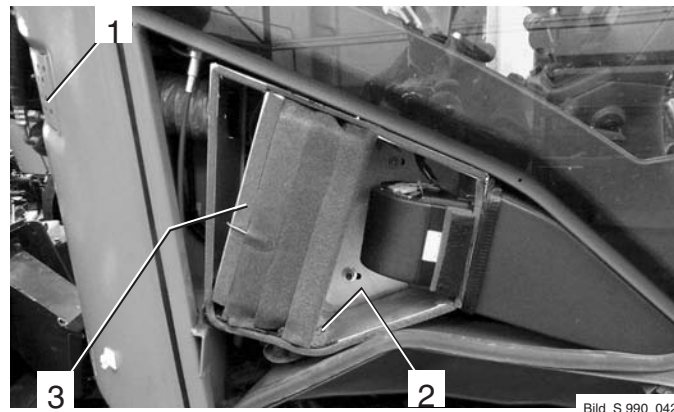
Checking the electrical system for proper operation, check the lighting

- To check the electrical installation, turn on the lighting (refer to page 119).

Checking the preheating system

- To check the preheating system, start the engine (refer to page 54).

Maintenance every 250 service hours



Lubricate the machine (except universal joints)

- Refer to page 191 of maintenance as required.

Maintenance every 250 service hours

Checking the accelerator for ease of movement, clean and grease if necessary

- Check the accelerator (1) for ease of movement, clean and grease the mechanical parts if necessary

Checking the windshield washer water level, topping up if necessary

- Check the level in the reservoir (2) and add water, if necessary.

Checking the frost protection of the windshield washer water

- Refer to page 192 of maintenance as required.

Checking the windscreen wiper, renewing if necessary

- Check the wiper blades, renewing them if necessary.

Tighten the wheel nuts

- Refer to page 178 of maintenance after the first 50 service hours.



Bild_C992H_089

Tightening nuts and bolts according to the torque table

- Refer to page 178 of maintenance after the first 50 service hours.

Checking the tire inflation pressure

- Refer to page 47.

Maintenance every 500 service hours

Changing the engine oil (at least once a year)

- Run the engine to operating temperature.
- Park the tractor on a level surface and switch off the engine.
- Place a suitable catch pan under the engine.

**CAUTION**

Danger of scalding when draining hot engine oil.

- Unscrew the oil drain plug (1).
- Allow the oil to drain completely.

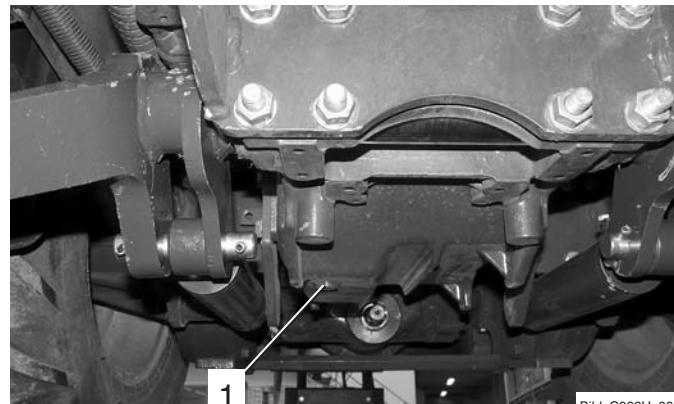
**ATTENTION**

Observe the instructions for handling fuel, fluids and lubricants.

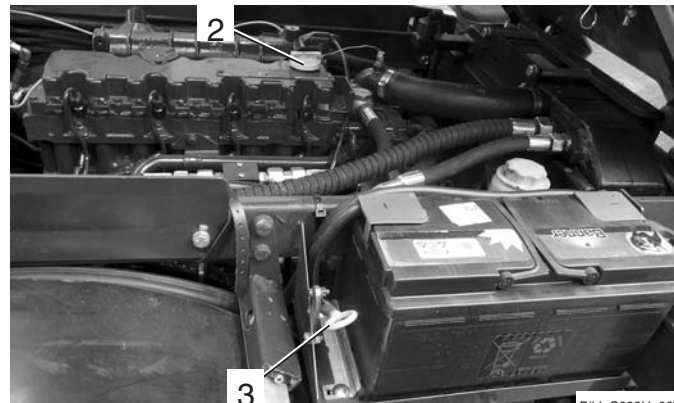
- Screw the oil drain plug in again with a new sealing ring and tighten to a torque of 55 Nm.
- Fill new engine oil through the filler neck (2). Only use recommended engine oil.

Filling quantity with filter 10.5 L

- Let the engine idle for a short time.
- After approx. 1 minute, check the oil level with the dipstick (3).



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Bild_C992H_067

Maintenance every 500 service hours

Changing the engine oil filter

Refer the operating instructions of the engine manufacturer.

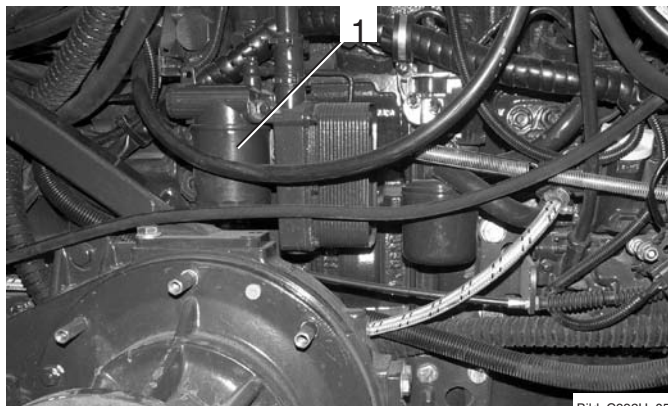
- Remove the left rear wheel and fender.
- Drain the engine oil.
- Unscrew the air filter cartridge (1) with a filter wrench.



ATTENTION

Observe the instructions for handling fuel, fluids and lubricants.

- Clean the mating surface of the filter mount.
- Screw a new air filter cartridge with a new gasket in the filter mount until the seal makes contact.
- Tighten the air filter cartridge half a turn.
- Top up with engine oil and check the oil level.
- Install the fender and rear wheel.



Bild_C992H_058

Maintenance every 1000 service hours

Checking the engine valve clearances

- Check the valve clearances of the engine with reference to the operating instructions of the engine manufacturer. Special knowledge and special tools are required for this service.
Entrust your authorized dealer with this service.

Checking the glow plugs

- Refer the operating instructions of the engine manufacturer.

Replacing the fuel filter element

- Replace the fuel filter element according to the operating instructions of the engine manufacturer.

Cleaning the strainer in the fuel pump, replacing if necessary

- Clean the strainer and, if necessary, replace it according to the procedure in the engine operating instructions.

Maintenance every 1000 service hours

Lubricating the universal joints (at least once a year)

- Turn the steering wheel right or left until the steering stop is met.



CAUTION

Carry out services in the articulated joint area only with the engine shut off.

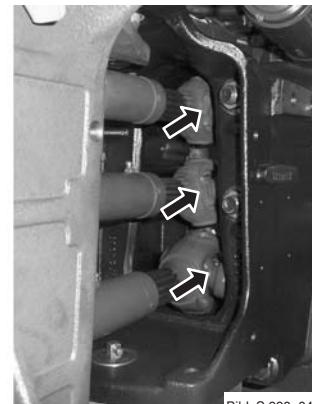
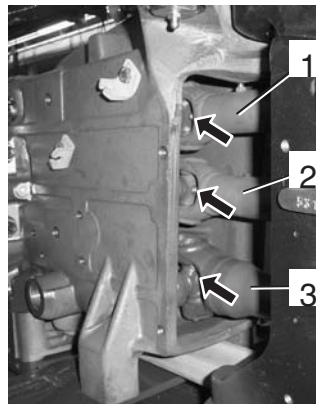
- Remove the rubber protector.
- Adjust the top articulated shaft (1) by hand until the grease nipples are easily accessible.
- Grease the top articulated shaft.
- Move centre articulated shaft (2) with starter until grease nipples are easily accessible.



CAUTION

Never let anyone stand in the area of the articulated joint when the starter is being operated.

- Grease the middle articulated shaft.
- Adjust the lower articulated shaft (3) by moving the tractor forward or back until grease the nipples are easily accessible.
- Grease the lower articulated shaft.
- Refit the rubber protector at the articulated joint.



Bild_S-990_043



ATTENTION

Do not press in too much grease when lubricating the universal joints as this could damage the sealing.

Maintenance every 1500 service hours

Changing the hydraulic oil (at least every 2 years)

- Refer to page 180 of maintenance after the first 500 service hours.

Cleaning the suction filter of the traction and working hydraulics, replacing if necessary (at least every 2 years)

- Refer to page 181 of maintenance after the first 500 service hours.

Replacing the working hydraulics pressure filter (at least every 2 years)

- Refer to page 171 of maintenance after the first 50 service hours.

Replacing the traction hydraulics pressure filter (at least every 2 years)

- Refer to page 172 of maintenance after the first 50 service hours.

Changing the front and rear gearbox oil

- Refer to page 173 of maintenance after the first 50 service hours.

Maintenance every 3000 service hours

Changing the toothed belt

Change interval every 3000 service hours or every 5 years maximum.

Refer to the maintenance instructions of the engine manufacturer.



ATTENTION

This work may only be carried out by your service centre.

Replacing the injection nozzles

(Refer to the maintenance instructions of the engine manufacturer)



ATTENTION

This work may only be carried out by your service centre.

Annual maintenance

Changing the engine oil and oil filter cartridge (every 500 hours minimum)

- Refer to page 201 of maintenance every 500 service hours.

Changing the air filter element

- Refer to page 185 of maintenance as required.

Changing the brake fluid



ATTENTION

Special knowledge and special tools are required for this service.

Entrust your authorized dealer with this service.

Changing the fresh air filter

- Refer to page 190 of maintenance as required.

Annual maintenance

Checking the battery, coating the terminals with grease



CAUTION

Observe the following instructions for safety reasons.

The battery contains dissolved sulphuric acid, which is poisonous and caustic.

When handling battery acid, wear personal protective equipment (protective apron, protective gloves) and eye protectors. If your clothing, skin or eyes have nevertheless come in contact with battery acid, the affected parts must be rinsed at once with water. If the eyes are affected, seek medical aid immediately. Neutralize spilled battery acid immediately.

Gases are released when batteries are charged. To prevent an explosion, keep sparks and naked fires away. Rooms in which batteries are charged or stored must be ventilated accordingly.



NOTE

The charging, servicing and care of the battery must always be according to the maintenance instructions of the battery manufacturer.

Annual maintenance

Before doing work on the electrical equipment, cut off the power with the battery isolating switch (3).

- The switch must be in the vertical position and the toggle removed.
- Disconnect the battery ground lead (2).
- Disconnect the battery positive lead (1).



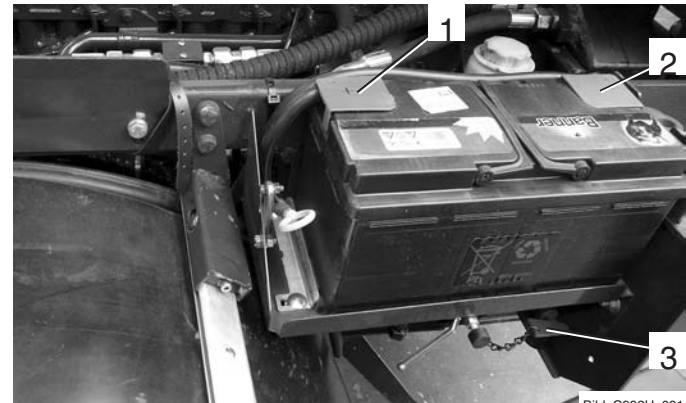
CAUTION

Do not place any metal parts on the battery poles. Risk of short circuit!

- Coat the battery poles and battery terminals lightly with pole grease.
- Charge the battery and top up the electrolyte with distilled water.

Lubricating the universal joints

- Refer to page 204 of maintenance every 1000 service hours.



Bild_C992H_091

Maintenance every 2 years

Changing the coolant

- Refer to the operating instructions of the engine manufacturer.
- Fill coolant with reference to page 168.

Replacing the V-belt

- Replace the V-belt according to the operating instructions of the engine manufacturer.

Checking the glow plugs

- Refer to the operating instructions of the engine.

Changing the hydraulic oil (or at 1500 hours)

- Refer to page 180 of maintenance after the first 500 service hours.

Replacing the suction filter of the traction and working hydraulics (or at 1500 hours)

- Refer to page 181 of maintenance after the first 500 service hours.

Replacing the working hydraulics pressure filter (or at 1500 hours)

- Refer to page 171 of maintenance after the first 50 service hours.

Replacing the traction hydraulics pressure filter (or at 1500 hours)

- Refer to page 172 of maintenance after the first 50 service hours.

Replacing the alternator and the water pump V-belt

- Refer to the operating instructions of the engine manufacturer.

Maintenance every 2 years

Replacing the air conditioner V-belt

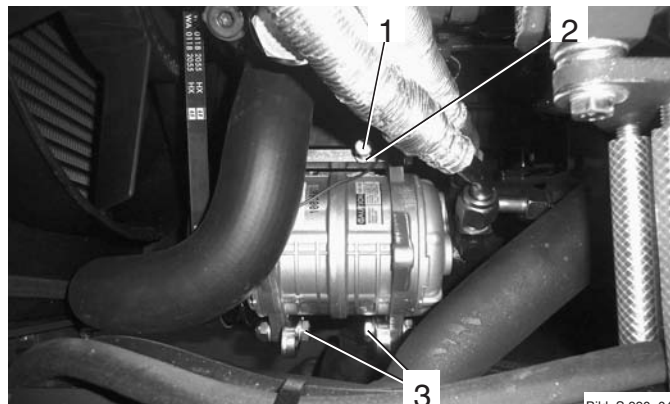
- Remove the rear frame, radiator and annular fan.
- Loosen the screws (3).
- Loosen the locknut (2) and tensioning screw (1).
- Remove the V-belt (4) and install a new V-belt.
- Screw in the tensioning screw (1) until the correct belt tension is reached.
- Retighten the locknut (2) and screws (3).
- Refit the annular fan.



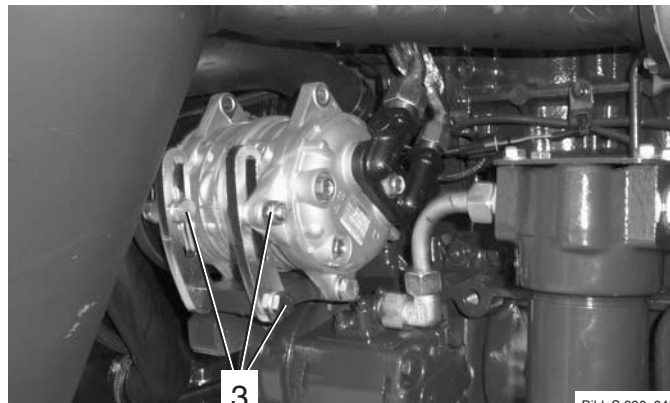
ATTENTION

Secure the annular fan screws with Loctite 243.

- Refit the rear frame and radiator.



Bild_S 990_044



Bild_S 990_045

Maintenance every 5 years

Changing the toothed belt (or at 3000 hours)

- Refer to page 207 of maintenance every 3000 service hours.

Taking the tractor out of operation

If the tractor is not going to be in service for over 2 months, for example for operational reasons, it must be placed in a well-ventilated, clean and dry room and the following measures must be carried out.

- Clean the tractor thoroughly.
- Check the hydraulic oil levels, top up oil if necessary
- Cover all blank mechanical components with a thin film of oil or grease.
- Grease the tractor.
- Check the condition and acid density of the battery; cover the battery terminals with non-acidic grease. (Observe the instructions of the battery manufacturer.)
- Remove the battery and store in a frost-free, dry room.

Engine preservation

- Clean the engine.
- Run the engine warm.
- Drain the engine oil and refill with anti-corrosion oil.
- Drain the fuel and fill up the fuel tank with a mixture of diesel oil and anti-corrosion oil. Relation of diesel oil 90 %, anti-corrosion oil 10 %.
- Run the engine for 10 minutes.

- Stop the engine.
- Crank the engine several times by hand.
- Block up the intake opening and exhaust outlet.



ATTENTION

The tractor must be blocked up so that all wheels are off the ground. This measure will prevent a permanent deformation of the tires.



NOTE

Do not use plastic foil to cover the tractor as this will enhance the formation and collection of condensate water.

Putting tractor back in service after taking out of operation

If the tractor was taken out of service for over six months, it must be inspected carefully before being put back into service. Similar to the safety inspection, this inspection should also cover all safety relevant components of the tractor.

- Clean the tractor thoroughly.
- Grease the tractor.
- Check the condition and acid density of the battery, recharging it if necessary.

Taking the tractor out of operation

Removing the engine preservation

- Unblock the intake opening and exhaust outlet.
- Drain the anti-corrosion oil and rinse the oil sump with engine oil.



ATTENTION

Observe the instructions for handling fuel, fluids and lubricants.

See the section „Changing the engine oil“ on how to proceed further.

- Check the hydraulic oil for condensation water, change the oil if necessary.
- Perform the services and inspections as for before taking into service.
- Fill the fuel tank.
- Renew the brake fluid.
- Take the tractor into operation.

When taking into the tractor into service, particularly check:

- Gearboxes and axles for leaks.
- Traction hydraulics, gearshift, steering.
- Brakes (service brake, parking brake)
- Working hydraulics, functions and work movements.

If the tractor is to be laid up for a longer period, please contact your HOLDER Service for further measures.

Coolant, fuel and lubricant specifications

Use	Fluids and lubricants	Specification		Season
Engine (Refer to Deutz operating instructions)	Multi-purpose engine oil	SAE 5W-40		All-season
		ACEA E3-96/E5-02; E4-99/E6-04		
		API CH-4/CG-4; DHD-1		
Hydraulic oil tank (traction and working hydraulics)	Hydraulic oil	HE oils (hydraulic ester)	VG 46	All-season
		Mineral hydraulic oil HLP to DIN 51524	VG 46	Winter
			VG 68	Summer
Fuel tank (Refer to Deutz operating instructions)	Diesel fuel	Commercial diesel fuels with a sulphur content under 0.5 % DIN EN 590		All-season
Brake system	Brake fluid	DOT 4		All-season
Air conditioner	Refrigerant	R 134 a		All-season
Hydrostatic transmission (front)	UTTO special oil	SAE 10W-30		All-season
		API GL4		
Transmission (rear)	UTTO special oil	SAE 10W-30		All-season
		API GL4		
Grease nipples	Multipurpose grease	Penetration number from 260 to 290		All-season

Maintenance data

Filling quantities	S 990
Engine oil	8.5 litres
Incl. filter 0.5 litre	
Cooling system with heater	approx. 13 litres
Hydraulic oil tank for working and traction hydraulics, hydraulic oil*	approx. 45-50 litres
Initial filling (depending on equipment)	approx. 50-55 litres
Front hydrostatic transmission with axles, gear oil	10.9 litres
Initial filling	12.7 litres
Rear transmission with axles, gear oil	17.75 litres
Reduction gearbox	0.2 litre SAE 80
Brake fluid for hydr. footbrake	0.4 litre
Fuel tank, diesel fuel	82 litres
Windshield washer fluid reservoir	approx. 2.5 litres



* NOTE

In order to ensure the biological degradability of the hydraulic oil, all attachments connected to the tractor hydraulic system must also be operated with HE oil.

Residual quantities of mineral oils reduce the biological degradability, but they do not influence operation.

Maintenance data

Tightening torques

Hexagon head and set screws	M8	M10	M12	M14	M16
Screw grade 8.8	25 Nm	49 Nm	86 Nm	135 Nm	210 Nm
Screw grade 10.9	35 Nm	69 Nm	120 Nm	190 Nm	295 Nm

Transmission, axles, wheels	Torque
M10 hex head screws (orbitrol to steering column)	40 Nm
Clamping screws for hydraulic control valves	16 Nm
Axle spindle to transmission case	86 Nm
Axle spindle cover M10 (planetary gear)	69 Nm
Spherical bearing M12	86 Nm
Lock bar M16	210 Nm
Coupling jaw attachment bar M14	135 Nm
Wheel fastener (incl. hub spacer)	340 Nm

Engine	Torque
Cylinder head cover	8.5 Nm
Rocker arm adjustment screw	21 Nm
Intake manifold	8.5 Nm
Air intake pipe (TORX)	21 Nm
Exhaust manifold (TORX)	22 Nm
Oil drain plug	55 Nm
Oil sump (cast)	31 Nm
Injection line fastener	30 Nm
Injection valve fastener (TORX)	21 Nm
Plugs and connecting screws for heating hoses	65 ± 5 Nm

List of replacement parts

Designation	Order number
Sealing ring for oil drain plug	010 395
Engine oil filter	797 135
Fuel filter	782 971
Cylinder head cover gasket	798 097
Air filter element	029 760
V-belt for KHD fan	798 095 (10x1250)
Toothed belt repair kit	797 499
Hydraulic suction filter (working and traction hydraulics)	029 541 (2 items)
O-ring 64X3	014 696 (2 items)
Hydraulic pressure filter (working and traction hydraulics)	132 897 (2 items)
O-ring 63.17X2.62 for hydraulic pressure filter	028 109 (2 items)
Replacement cartridge for power hydraulic system return filter	029 088
Replacement cartridge for attachment variable pump return filter	143 991
Filter element (cabin fresh air filter)	131 666
Ventilation filter with activated charcoal (cabin fresh air filter)	131 667
Spray paint can, black grey RAL 7021	029 000
Spray paint can, orange RAL 2004	020 656
Spray paint can, silver RAL 9006	031 053

Maintenance data

Bulbs 12 V

Use	Power	Use	Rating
Low beam headlight H7	55 W	Front top working light H7	55 W
High beam headlight H7	55 W	Rear working light H3	55 W
Front turn signal light	21 W	Indicator lights in switches	1.2 W
Rear turn signal light	21 W	Yellow indicator light	2 W
Tail light	10 W	Position lights	5 W
Licence plate light	5 W	Dome light	5 W
Brake light	21 W	Top strobe warning light H1	55 W
Back-up light	21 W	Multifunctional display incandescent lamps DIN 72601/W5/12 V	1.2 / 3.0 W

Technical data of the engine

	S 990
Manufacturer	Deutz AG
Model designation	TD2011 L04w EU Tier IIIA
Design	Vertical in-line
Type	4-stroke diesel
Cooling	Water cooling
Method of injection	Direct fuel injection
No. of cylinders	4
Cylinder bore	Ø 96
Stroke	125
Cubic capacity	3619 cm ³
Compression ratio	1:18
Max. charge pressure	1.4 bar
Valve clearances when cold	Intake valve 0.3 mm Exhaust valve 0.5 mm
Specific fuel consumption	216 g/kWh
Air filter	Mann & Hummel dry filter with acoustic warning system
Lubricating system	Forced-feed lubrication
Lubricating oil consumption	0.5% maximum of fuel consumption
Oil filter	replacement cartridge in the main stream
Oil pressure at n=2600 RPM	1.5 bar
Rated speed	2600 RPM
Upper idle speed	2600 RPM +200 RPM
Lower idle speed	900-950 RPM
Max. torque to 97/68 EC	280 Nm at 1600 RPM
Power to 97/68 EC at n=2600 RPM	68.0 kW (92 HP)

Maintenance data

Fuel system

	S 990
Injection pump	Motorpal single plug-in pump
Governor	Governor integrated in the front cover
Injection nozzle/opening pressure	Multi-hole nozzle/180 bar + 10 bar
Start of injection	2°+/-0.5° after TDC
Traction pump	Hydrostatic drive Axial piston pump, type 11 VG50 EP Rated pressure 300 bar Maximum pressure 350 bar A4 VG40 EP Rated pressure 380 bar Maximum pressure 430 bar
Traction motor	Axial piston motor / type AG KM 55

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