SERVICE MANUAL

F106.6 / F106.6A
F156.6 / F156.6A

Grader

Print No. 87726937A

CONSTRUCTION

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Grader

Print No. 87726937A

CONSTRUCTION

1 BASIC SAFETY INFORMATION

1.1 Warning notes and symbols

The following symbols are used in the operating instructions to indicate particularly important information:

CAUTION: *Safety rules and procedures, designed to protect the driver and others from mortal dangers or injuries, and to prevent serious damage to property.*

NOTE: *Notes and precautions to avoid damage to machinery and property.*

1.2 Correct use

This machine is constructed according to the recognized mechanical safety regulations, and using state-of-the-art technology. Nevertheless, when in operation, situations can occur that present serious or mortal dangers to the operator and third parties, or which could cause damage to the machine and other property.

The machine should be used only if it is in proper operating condition, and only by operators who are aware of the dangers, know the safety procedures, and have read the operating instructions! The important notes are placed at the start of this section. Immediately repair any faults (or have them repaired) if these could have a prejudicial effect on safety.

This Grader is principally designed for:

- Creating a double course
- Clearing top soils
- Scarifying old road surfaces and hard ground
- Cutting embankments
- Clearing ice and snow
- Placing, spreading, mixing, and compressing materials.

The Grader can also be used in conjunction with other operating equipment for special applications. The Technical Data provide clear information on this subject.

Proper use of the machine also means following the operating instructions and applying the inspection and maintenance conditions.

Using the grader for any other purpose, for example:

- transporting personnel,
- as a working platform,
- towing or carrying loads without attaching the proper working attachments, is considered improper use.

Improper use of the machine can pose mortal danger to operating personnel or other persons, or may result in physical injuries, or may cause damage to property.

The manufacturer, supplier will not be liable for any damage resulting from improper use. In this case, the user alone will be responsible.

Noise emission data as stated in statutory order 3 pursuant to the mechanical safety law of 18/01/1991 or EC machinery guideline 89/392/EWG.

Using the earth-moving equipment properly, with ISO 7096 standard driver seats, will ensure that the measured vibration frequencies (measured as described in ISO 2631 Part 1) meet the requirements regarding protection from whole-body vibrations.

CAUTION: *Read the warning signs and instruction plates on the machine.*

Keep these signs and plates clean and legible.

Replace these plates immediately if they are no longer legible.

New warning signs and instruction plates can be obtained from the spare parts department. When ordering, part numbers can be found on the replacement parts lists for the machine.

Legend for left side

1. Do not start up the machine before you have read and understood the operating instructions.
2. At this point, the equipment can be secured against accidental start-up.
3. Inspect wheel nuts regularly - see the operating instructions.
4. **Risk of injury** from hot or rotating parts in the engine compartment. Only open the engine compartment cover when the engine has stopped.
7. **Risk of injury** due to unauthorized starting of the machine. Before working on the machine, switch off the engine and remove the key.
9. This plate indicates the maximum speed permitted on public roads.
10. Lashing ropes or chains must be attached here if the machine is to be transported.
11. **Risk of injury** due to hot or pressurized hydraulic fluid. Follow the operating instructions.
12. **Risk of injury** by crushing. Do not start up the machine if anyone is near the articulated joint.
Risk of injury by crushing. Do not start up the machine if anyone is standing between the machine and an adjoining barrier.
14. The CE symbol certifies that this machine has been constructed according to the European regulations on mechanical safety. L_{WA} indicates the level of noise emissions in dB_A, as stated in EC standard 2000/14/EG).
15. **Driving on public roads.** This plate indicates the steps to be taken before driving on public roads.

3.5 Towing /recovery

Tow the machine with the tow bar or tow rope only.

The tow bar / tow rope should not be damaged. It must be designed so that the calculated load at rupture is three times the tractive force of the towing machine.

The towing vehicle must have sufficient tractive force. Drive slowly and carefully.

No one should be standing near the tow bar/rope.

Only tow the machine if the brakes and steering are functional and the machine cannot be transported any other way.

If these are not functional, only tow the machine as far as is necessary to recover the machine from danger areas.

After recovery, the machine must be secured to prevent it rolling, and prevent unauthorized start-up.

Before transporting over long distances, either repair the machine or load it onto a transport vehicle.

Towing speed should not go above 10 km/h.

Tow the machine out of the danger area only, otherwise tow it on a low-bed trailer.

Towing any further can cause damage to the transmission.

3.5.1 Towing devices

The towing devices should not be used for towing trailers.

3.5.2 Transport

Only load up and transport the machine if all the requirements of the safety regulations are met.

Arrange the loading and transport with a company that is experienced in the transport of abnormal loads.

Responsibility for the loading and transport is borne by the transport company or their authorised representative.

To reduce the risk of slipping, clean the drive-on ramps and loading area on the transport vehicle, and the wheels of the machine, to remove oil, grease, soil, mud, snow, ice and other matter.

Use anchoring equipment with sufficient load-holding capacity (for the weight specifications of the machine, see the ‘Technical Data’ section).

3.5.3 Crane loading

If loading with a crane, lock the articulated joint.

4.4 Power shift transmission

Read and pay attention to: ‘Inspection and maintenance - General information’.

Since the torque converter of the power shift transmission can drain into the transmission when the engine is off, the oil must be checked with the engine running.

It is therefore essential to apply the safety measures listed in the next sections.

4.5 Hydraulic system

RISK OF INJURY

From hydraulic fluid at high pressure.

From hot hydraulic fluid or hot engine parts.

Before working on the hydraulic system, ensure that the system is depressurized, and that residual pressure has also been released (see section ‘Hydraulic system’).

Switch off the engine and allow the machine to cool down.

Secure the machine as described in the section ‘Securing the machine’.

Do not allow the skin to come into contact with hydraulic fluid. Hydraulic fluid can be harmful if it comes into contact with the skin.

Wear gloves and close-fitting work clothes.

Read and pay attention to: ‘Inspection and maintenance - General information’.

6 VACUUM PUMP

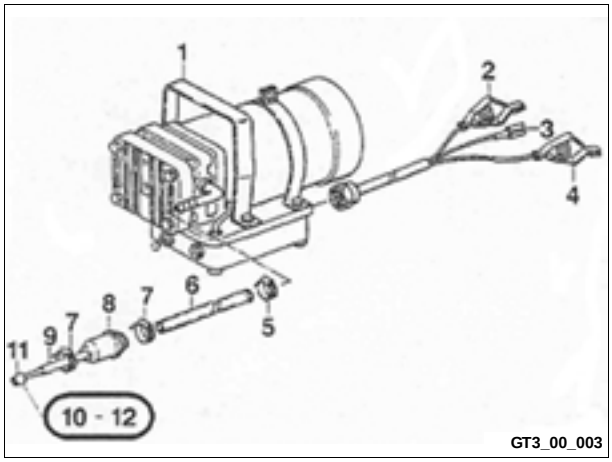
NOTE: *The images below are intended only to illustrate the above steps, and may not show your particular model.*

6.1 General information

When disassembling hydraulic pipes and pumps, fluid will flow from the hydraulic tank. In this case, a vacuum pump can be supplied for the machine as special equipment; when correctly installed, this pump will prevent the hydraulic tank from draining out.

For longer repair operations, a case with a complete assortment of environmental protection plugs and stoppers can be ordered. These can be used, for example, to seal off disconnected pipes.

6.2 Package content

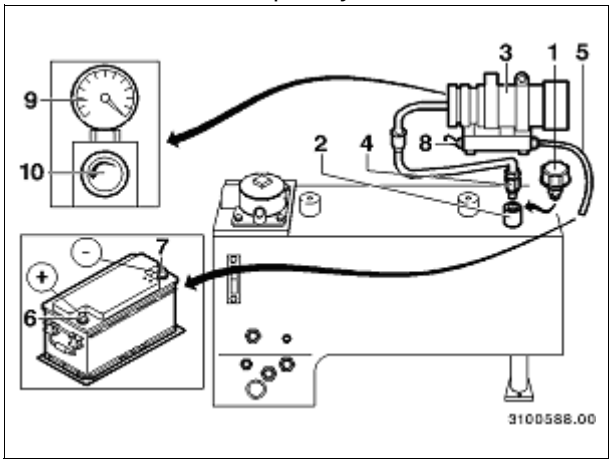


1 Vacuum pump complete
2 Positive terminal
3 Cable lug
4 Negative terminal
5 Hose clamp
6 Hose, length 1.1 m
7 Hose clamp
8 Filter
9 Hose, length 0.13 m
10 Pipe
11 Buffer
12 Pipe

6.3 Vacuum pump connection

The vacuum pump is connected to the vehicle batteries. Therefore, the pump should be operated only briefly, for example while changing hoses or when inserting plugs and stoppers.

- Depressurise the hydraulic tank.
  To do this, turn the vent valve (1) by about one 1/2 turn. After the air has been released (hydraulic tank is now depressurized), remove the vent valve completely.



- Place the vacuum pump (3) on the hydraulic tank. The vacuum pump must be at a higher level than the fluid in the hydraulic tank.
- Press hose fitting (4) carefully into opening (2).
- Run the cable (5) to the battery.
  Connect the positive lead (6) to the positive terminal first, then the negative lead (7) to the negative terminal.
- Switch on vacuum pump (3) at switch (8). The hydraulic system fluid is first pumped up into the hydraulic tank. Air is then drawn continuously into the hydraulic tank by the fluid, causing bubbling at the surface. The resulting vacuum prevents fluid from flowing out of the tank. The pressure on the pressure gauge must be 0.2 bar. If this is not the case, use the rotary switch (10) to adjust to the correct pressure.

To carry out the work required, for example changing hydraulic pipes, seal off all openings immediately with environmental stop plugs. When doing this, do not stop the vacuum pump.

NOTE: *When the work is completed, switch off the pump again. Disconnect cable (5) from the battery. First the negative terminal, then the positive terminal. Perform the above steps in the reverse order.*

5 TYRE

5.1 Tyre types and pressures

5.1.1 F106.6 / F106.6A

Tyre	Tread	Brand	Pressure	
			Front	Rear
405/70 R20 EM	SPT9	Dunlop	3.00	3.25
420/75 R20	XMCL	Michelin	2.00	2.00
455/70 R20 EM	SPT9	Dunlop	2.50	2.50
22-20 SS	E7GRIB	Continental	1.90	2.10

5.1.2 F156.6 / F156.6A

Tyre	Tread	Brand	Pressure	
			Front	Rear
13.00-24 TG	SGG 2A	Good Year	2.75	3.00
14.00-24 TG	SGG 2A	Good Year	2.00	2.50
17.5-25 EM	SGL	Good Year	2.00	2.00
17.5 R25	VKT	Bridgestone	2.25	2.25
17.5 R25 EM	XHA	Michelin	2.0	2.1
17.5 R25 EM	XTLA	Michelin	2.00	2.10
17.5 R25	RM94	Pirelli	2.20	2.20

5.1.3 Wheel nut torques

	F106.6 / F106.6A	F156.6F / 156.6A
With lock washer	450 Nm	550
With pressure plate	500 Nm	600

6 REAR AXLE

Grader rear axle with automatic no-spin differential.
Tandem axles in swing arrangement with power transmission through high-performance roller chains.

	F106.6 / F106.6A	F156.6F / 156.6A
Differential	31 l	36 l
Tandem axle	2 x 60 l	2 x 64 l

7 FRONT AXLE

Swing axle with double-pivot steering and hydraulic wheel camber adjustment.

	F106.6 / F106.6A	F156.6F / 156.6A
Axle swing	±15°	±14° / ±15°
Camber adjustment left / right	±17° / ±22°	±17° / ±21°
Ground clearance	485 / 504 mm	614 / 646 mm

15 OPERATING FLUIDS AND LUBRICANTS

15.1 Fill quantities and specifications for F106.6 and F106.6A

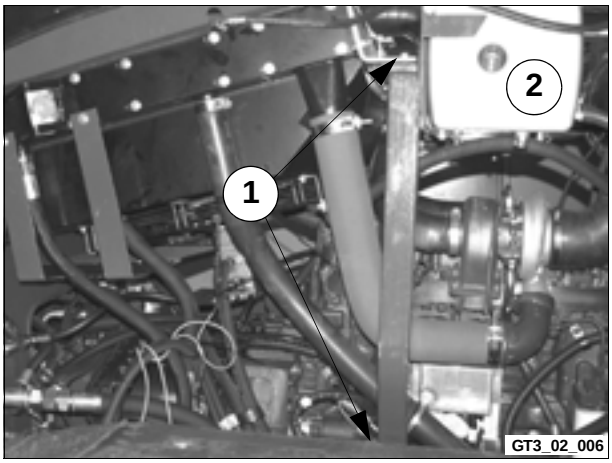
Component			Fill quantity litres	Fluid or lubricant	International specifications	Manufacturer's specifications	Viscosity	Ambient temperature
Engine oil			12.5	AMBRA MASTERGOLD HSP *)	API CH4 ACEA E5	NH 330 H	SAE 15W - 40	-10 to 50 °C
Engine cooling system			37	AMBRA AGRIFLU **)		NH 900 A		-35 to 50 °C
Power shift transmission	Initial filling		27	AMBRA SUPER GOLD 15W - 40	API CF4	NH 330 G	SAE 15W - 40	-10 to 50 °C
	At oil change		21					
Tandem axle	Axle drive		31	AMBRA HYPOID 90	API GL5 MIL-L-2105D	NH 520A	SAE 80W - 90	-25 to 40 °C
	Chain case		2 x 60					
Hydraulics	Initial filling F106.6		170	AMBRA HYDROSYSTEM 46 BIO_S	MIL-H-24459 DIN 51524 T2 FZG test ≥ 10	NH 646 BS	ISO VG 46	-25 to 40 °C
	Initial filling F106.6A		185					
	At oil change		70					
Fuel tank			278	DIESEL OIL	EN 590			
Blade turntable			2.0	AMBRA HYPOID 90	API GL5 MIL-L-2105D	NH 520 A	SAE 80W - 90	-25 to 40 °C
Turntable assembly			-	AMBRA GR 75 MD	NLGI 2	NH 720 A		-40 to 50 °C
Lubrication nipple			-	AMBRA GR 75 MD	NLGI 2	NH 720 A		-40 to 50 °C
A/C system			1.75	R134a				
Windshield washer			1.50	TUTELA PROFESSIONAL SC35				
Rear window washer			1.50					

*) oil change interval: 500 hours

**) water with 50% antifreeze

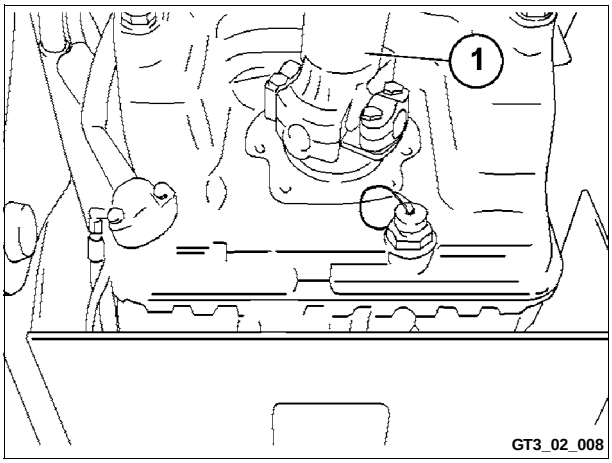
STEP 8

Loosen the bolts (**1**) and take out the bracket together with coolant expansion reservoir (**2**).



STEP 9

Loosen the power transmission shaft (**1**) on the transmission side between tandem axle and transmission.

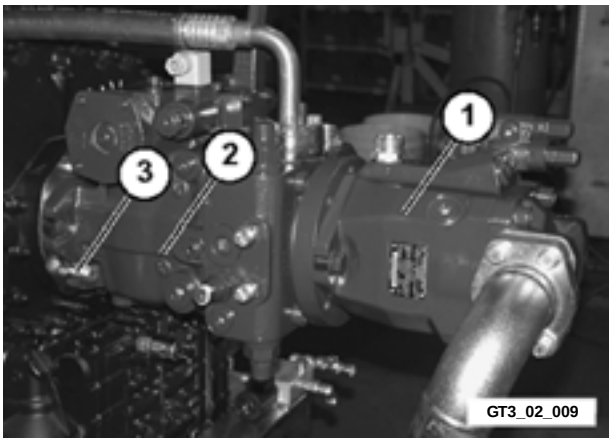


STEP 10

Attach equipment pump (**1**) and front axle drive pump (**2**) to the lifting gear.

NOTE: *In versions F106.6A and F156.6A, the front axle pump is located between transmission and equipment pump.*

Loosen bolts (**3**) and set the pumps down on the frame so that they do not obstruct removal of the engine and transmission.

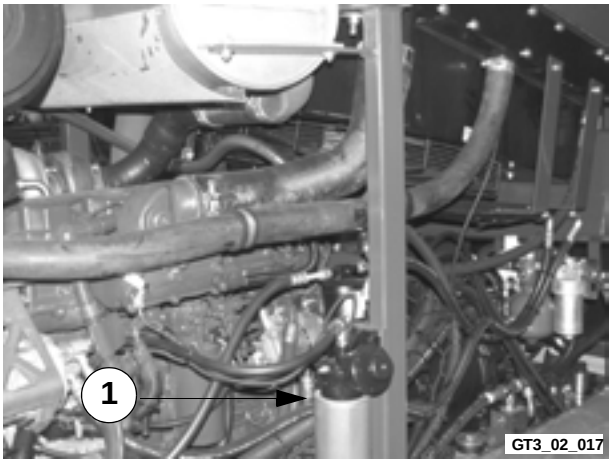


STEP 11

Disconnect all electrical connections from the engine.

Disconnect and seal off the fuel lines at the engine.

Remove fuel pre-filter (**1**) with water separator from the bracket.



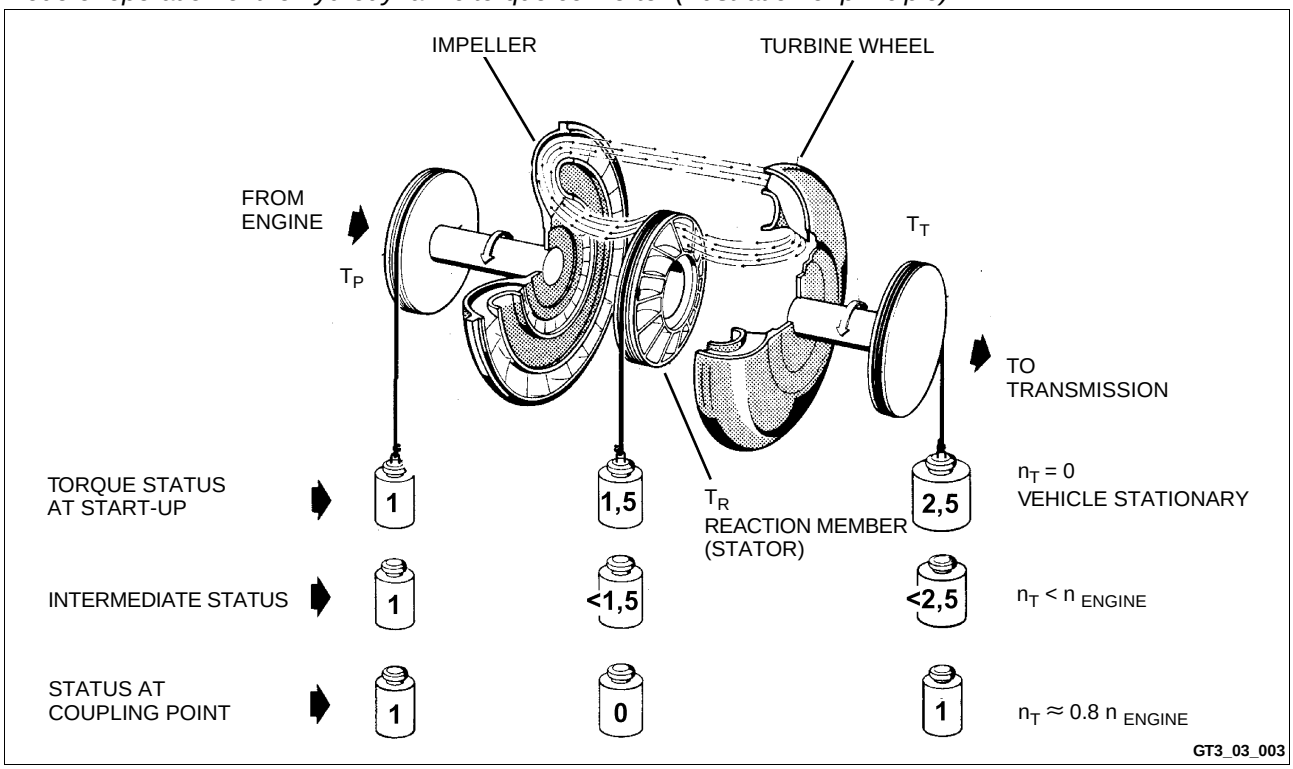
PARAGRAPH 3

LIST OF CONTENTS

2 VERSION

2.1 Torque converter

Mode of operation of the hydrodynamic torque converter (illustration of principle).



T_P = Impeller torque

T_P = Turbine wheel torque

T_R = Torque at reaction member wheel (stator)

The converter uses the Trilok system, i.e. at high turbine rotational speeds, it takes on the characteristics and efficiency advantages of a fluid coupling.

This depends on the engine power output, so that the most favourable operating conditions are produced in each installation case.

The torque converter is made up of three main components:

Impeller - turbine wheel - stator (reaction member)

These three wheels are in a ring, so that the fluid flows through the different parts of the circuit in the required order.

Pressure oil from the transmission pump flows continuously through the converter. This allows it to perform its function of multiplying the engine torque, while at the same time dissipating the heat from the converter through the flowing oil.

The oil driven by the impeller enters the turbine wheel where it is turned to the direction of flow. Depending on the degree of deflection, a greater or lesser reaction torque is applied to the turbine wheel (and therefore the output shaft).

The function of the stator (reaction member) placed after the turbine wheel is to divert the oil from the turbine again, into a direction suitable for delivery to the impeller.

Deflection of the flow causes a reaction torque to be applied to the stator.

The ratio of turbine torque to impeller torque is defined as torque conversion. This becomes greater in proportion to the difference between the impeller and turbine wheel rotational speeds.

The maximum conversion therefore occurs when the turbine wheel is stopped.

As operating rpm increases, torque conversion decreases. The torque converter adapts the working rpm is adapted continuously and independently to the specific torque output requirement.

2.5 Electrical system

Wiring diagram

Item	Description
A9	Electro-hydraulic control unit
A11	Electronic control unit TCU EST-37
A100	Main electronic system
B1	Engine rpm sensor n
B3	Gear chain rpm sensor n
B4	Transmission output rpm sensor n
B5	Turbine rpm sensor n
B12	Driving switch
F14	Fuse 7.5 A
F22	Fuse 7.5 A
S16.1	Driving switch, parking brake
S17.9	Oil filter pressure switch
S26.4	Transmission neutralisation
S87.8	Automatic / manual switch
X33	Connector open
XA5	Diagnosis connector
XCAN	CAN interface (connector)
XCAN.1	CAN interface (connector)

3.3 Diagnosis

NOTE: *For error codes (4000 to 4352) see Section 10 'Electrical', paragraph 4.3 'Transmission error codes'.*

3.4 Diagnosis - inspection

Requirements for error correction

- Oil level and specifications must be as indicated on ZF lubricants list (TE-ML 03) for the new WG power shift transmissions.
- Transmission temperature 80 to 100 °C.
- Follow the specified work instructions (for connecting all lines correctly).
- Use only ZF recommended testing equipment for the function test on the electrical system!
- Fuses 'F14' and 'F22' (8A; see wiring diagram) OK.
- Before doing work on the vehicle (for example, welding) or on the electronics (for example, connecting a tester), switch off the ignition, remove the electronics connector or disconnect all battery terminals.

Data sheet 6 WG 160

Data for the 3 inductive sensors of the engine, turbine and centre gear chain:

⇒ Resistance: 1,050 Ohm (±10%) at 20 °C
⇒ Temperature range: -40 °C > +150 °C
⇒ Tightening torque: M**max** = 30 Nm

Data for the output Hall sensor:

⇒ Temperature range: -40 °C > +150 °C
⇒ Working range: 2 Hz > 5 Hz
⇒ Supply voltage: 24 V

Data for the proportional valves:

⇒ Resistance: 19 Ohm (±10%) at 20 °C ± 0.5 Ohm variation allowed relative to each other
⇒ Current: 100 > 500 mA
⇒ Pressure range: 0.8 bar > 8.3 bar

5.3 Tightening torques for bolts

TIGHTENING TORQUES FOR BOLTS (IN Nm) AS PER ZF STANDARD 148

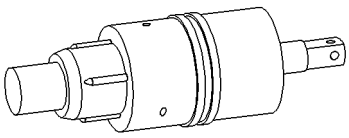
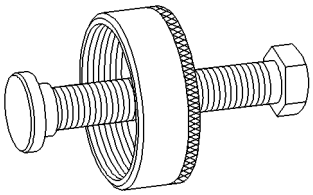
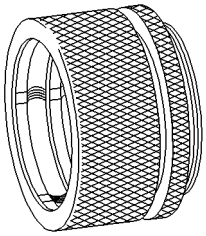
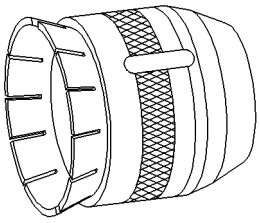
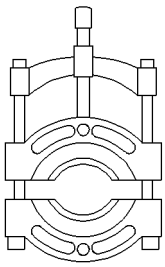
Friction value: μ ges.= 0.12 for nuts and bolts with no readjustment, and for phosphated nuts.
Tighten by hand!
If not otherwise stated, tightening torques can be taken from the following list:

ISO metric coarse-pitch thread DIN 13, Sheet 13

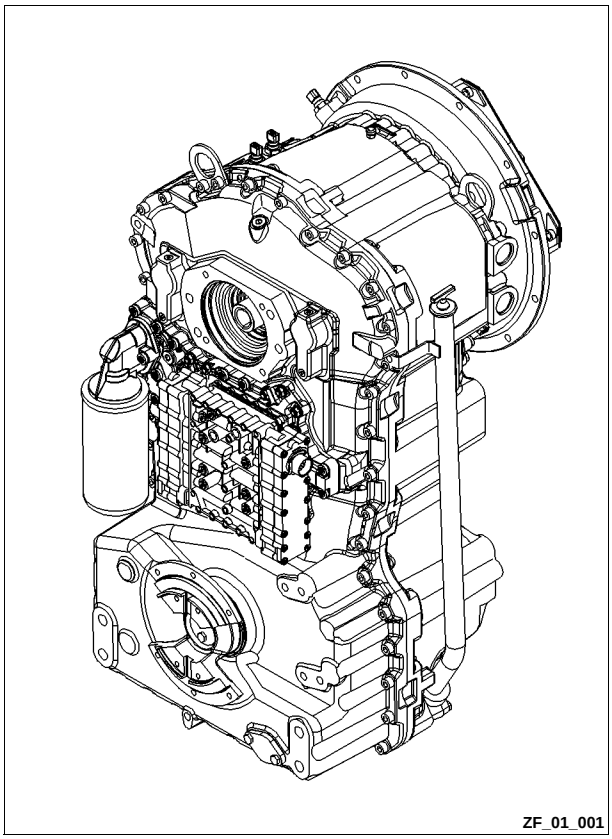
Dimensions	8.8		10.9		12.9
M4	2.8		4.1		4.8
M5	5.5		8.1		9.5
M6	9.5		14		16.5
M7	15		23		28
M8	23		34		40
M10	46		68		79
M12	79		115		135
M14	125		185		215
M16	195		280		330
M18	280		390		460
M20	390		560		650
M22	530		750		880
M24	670		960		1100
M27	1000		1400		1650
M30	1350		1900		2250
M33	1850		2600		3000
M36	2350		3300		3900
M39	3000		4300		5100

ISO metric fine-pitch thread DIN 13, Sheet 13

Dimensions	8.8		10.9		12.9
M 8 x 1	24		36		43
M 9 x 1	36		53		62
M 10 x 1	52		76		89
M 10 x 1.25	49		72		84
M 12 x 1.25	87		125		150
M 12 x 1.5	83		120		145
M 14 x 1.5	135		200		235
M 16 x 1.5	205		300		360
M 18 x 1.5	310		440		520
M 18 x 2	290		420		490
M 20 x 1.5	430		620		720
M 22 x 1.5	580		820		960
M 24 x 1.5	760		1100		1250
M 24 x 2	730		1050		1200
M 27 x 1.5	1100		1600		1850
M 27 x 2	1050		1500		1800
M 30 x 1.5	1550		2200		2550
M 30 x 2	1500		2100		2500
M33 x 1.5	2050		2900		3400
M 33 x 2	2000		2800		3300
M 36 x 1.5	2700		3800		4450
M 36 x 3	2500		3500		4100
M 39 x 1.5	3450		4900		5700
M 39 x 3	3200		4600		5300

Serial No.	Illustration	Designation Order number	Qty.	Section/ illustration
17		**Rolling tool** **5870 600 003**	1	7/8 10/1
18		**Puller insert** **5870 026 100**	1	8.1/3 _ 8.5/7 8.1/10 _ 8.6/2 8.2/2 _ 8.6/8 8.2/9 8.3/2 8.3/8 8.4/2 8.4/8 8.5/2
19		**Gripper** **5873 001 057**	1	8.1/3 _ 8.5/7 8.1/10 _ 8.6/2 8.2/2 _ 8.6/8 8.2/9 8.3/2 8.3/8 8.4/2 8.4/8 8.5/2
20		**Quick gripper** **5873 011 011**	1	8.1/3 _ 8.5/7 8.1/10 _ 8.6/2 8.2/2 _ 8.6/8 8.2/9 _ 8.7/3 8.3/2 8.3/8 8.4/2 8.4/8 8.5/2
21		**Separator** **5870 300 028**	1	8.1/6 8.2/5 8.3/11

7 DISASSEMBLY OF ELECTRO-HYDRAULIC CONTROL UNIT AND ZF FINE FILTER (EXPENDABLE FILTER)


ZF_01_001

STEP 1

Attach transmission to maintenance unit.

(S) Maintenance unit.....5870 350 000
(S) Fillet.....5870 350 063
(S) Angular support.....5870 350 090

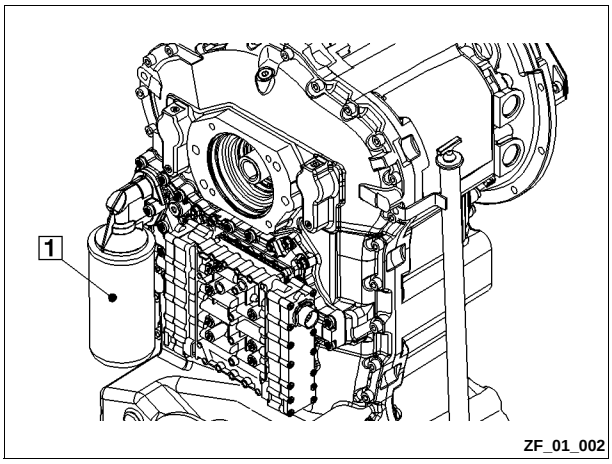
NOTE: *Before starting the disassembly work, drain the oil!*

STEP 2

Remove ZF fine filter

Disconnect ZF fine filter (1) from filter head using a strap wrench.

(S) Strap wrench 5870 105 005



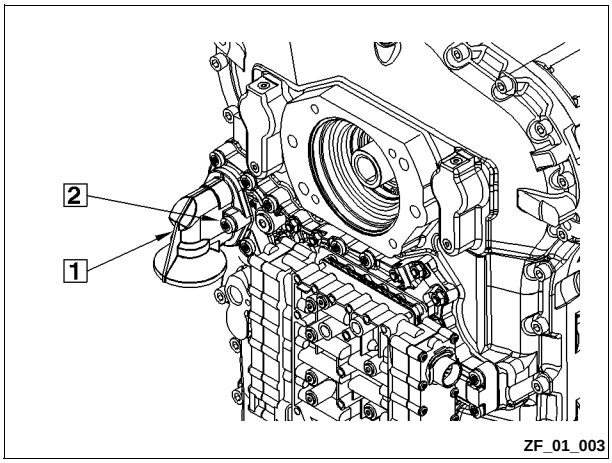
ZF_01_002

STEP 3

Loosen Torx screws (2) and separate filter head (1) from transmission housing.

NOTE: *Remove O-rings.*

(S) Socket wrench TX 40 .....5873 042 004

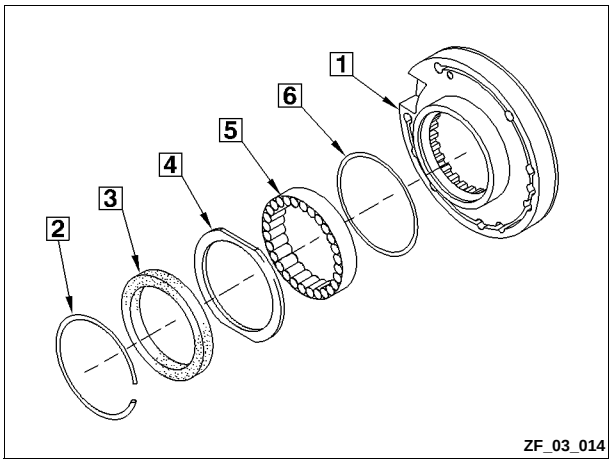


ZF_01_003

STEP 5

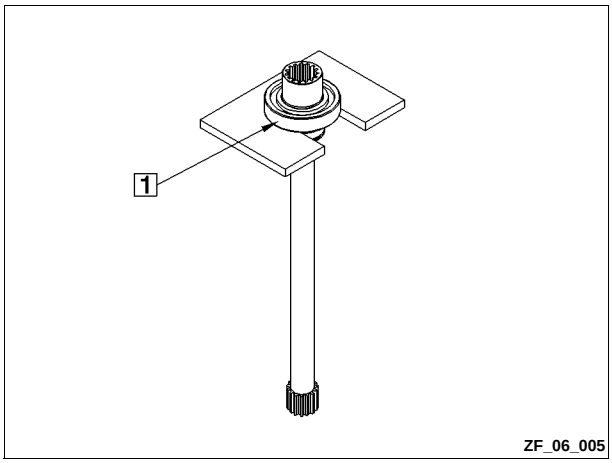
Pry off snap ring (1) and remove the individual components:

1 = Pump housing with rotor
2 = Snap ring
3 = Shaft seal
4 = Support disk
5 = Needle bearing
6 = Ring



STEP 5

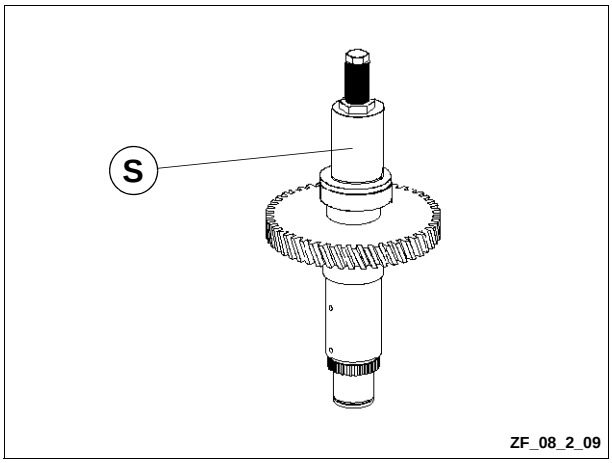
Press ball bearing (1) away from pump shaft.



STEP 9

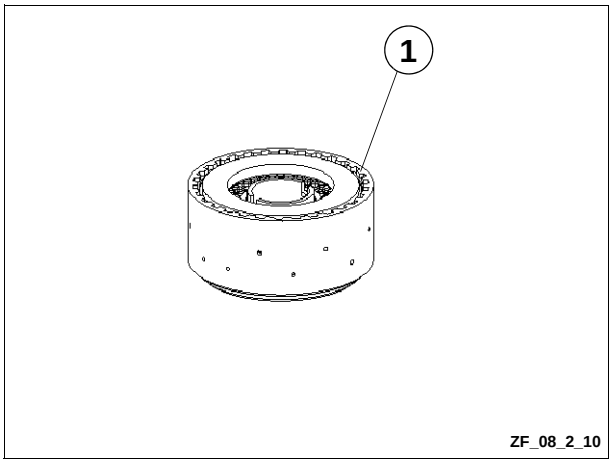
Pull tapered roller bearing (inner race) away from shaft.

(S) Puller insert 5870 026 100
(S) Gripper 5873 001 057
or
(S) Quick gripper 5873 011 011



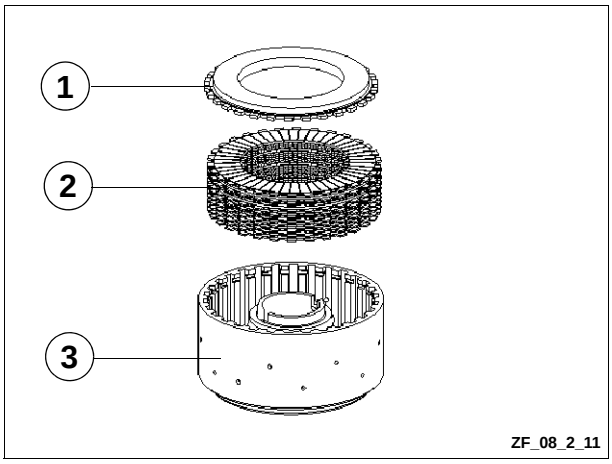
STEP 10

Pry off snap ring (1).



STEP 11

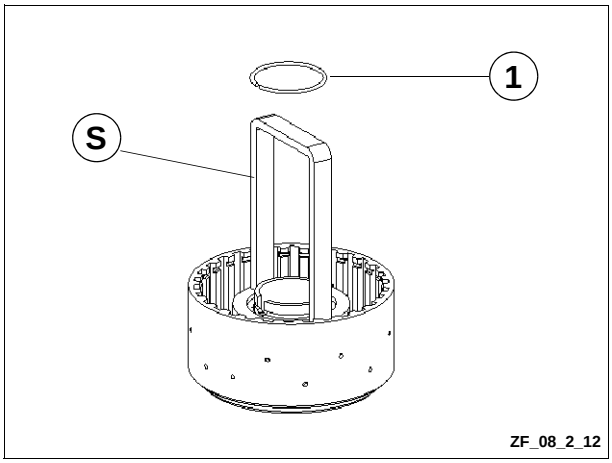
Remove end plate (1) and disk pack (2) from plate support (3).



STEP 12

Pre-tension the push spring and pry off snap ring (1).

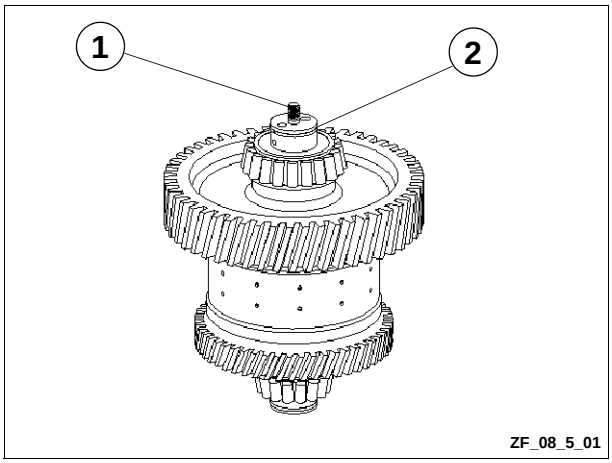
(S) Assembling aid 5870 345 088



14.5 Coupling K3

STEP 1

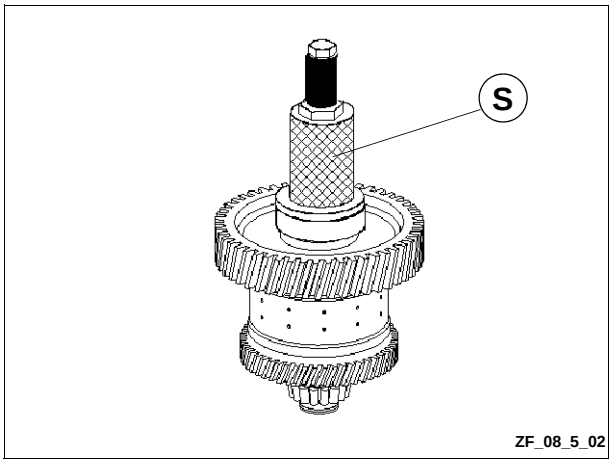
Remove stud bolt (1) and pry off piston ring (2).



STEP 2

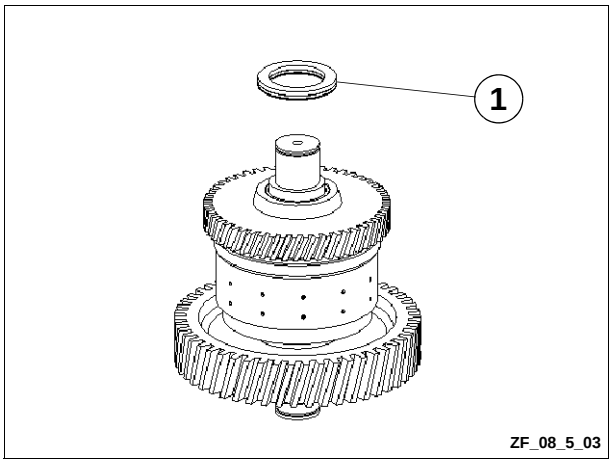
Pull tapered roller bearing (inner race) away from shaft.

(S) Puller insert 5870 026 100
(S) Gripper 5873 001 057
or
(S) Quick gripper.....5873 011 011



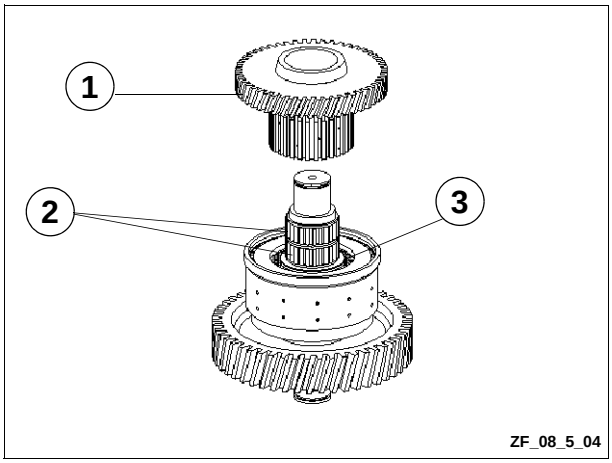
STEP 3

Thrust bearing (1) with support ring.



STEP 4

Take out idler gear (1), remove needle cage (2) and thrust bearing (3).



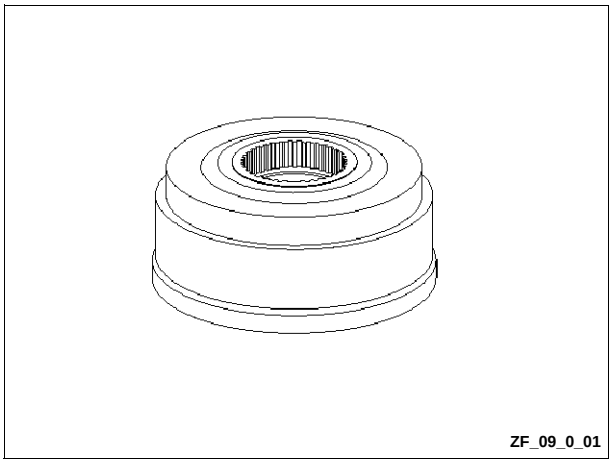
15 ASSEMBLY OF COUPLINGS KV/KR/K1/K2/K3/K4, DRIVE SHAFT AND OUTPUT SHAFT

General notes on couplings

Due to further design developments, the coupling (FLOW coupling), which could previously only be replaced in full, now allows the individual components to be replaced separately.

'Old' coupling (FLOW coupling)

NOTE: *This coupling can only be replaced Or supplied in full.*

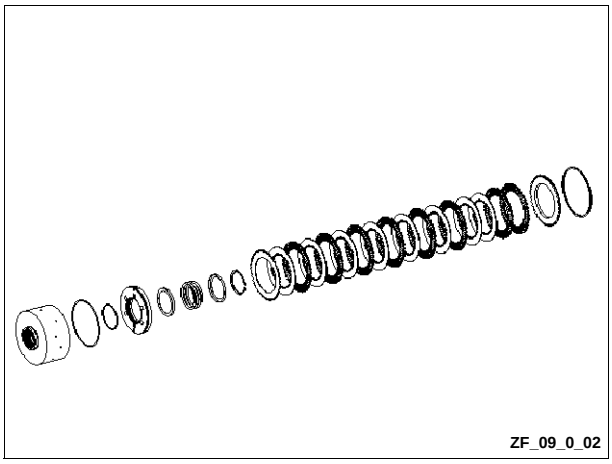


'New' coupling

If damaged, this coupling also allows individual components to be replaced separately.

NOTE: *However, the coupling can also be supplied or replaced in full.*

NOTE: *The part numbers required can be found on the corresponding replacement parts list.*



Assembly instructions in the event of repairs

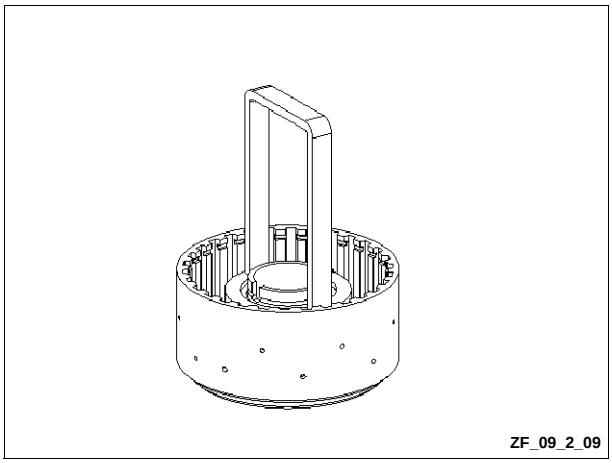
NOTE: *Change to the 'NEW' coupling starts from transmission No. 842654*

NOTE: *In case of damage, please note the following. The 'old' coupling (FLOW coupling) and 'new' coupling are identical in design. In the event of repairs, the 'old' coupling must be replaced by the 'new' one.*

STEP 9

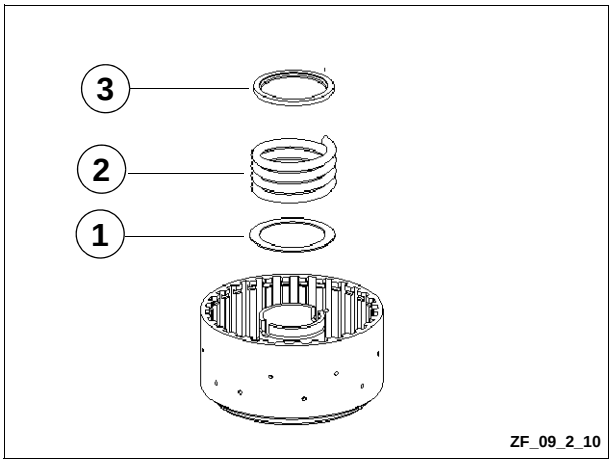
Using the assembling aid, insert the piston into the plate support with a hand-press.

(S) Assembling aid.....5870 345 088



STEP 10

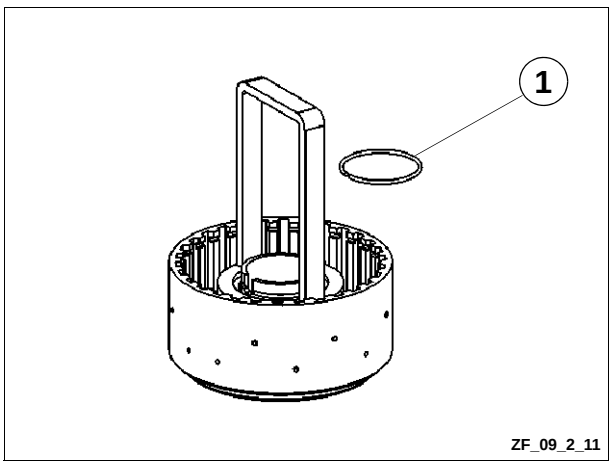
Mount the washer (1), push spring (2) and guide ring (3).



STEP 11

Pre-tension the push spring with the assembling aid and push snap ring 64 x 3.2 (1) into the radial groove.

(S) Assembling aid.....5870 345 088



NOTE: *Depending on the parts list version, different couplings (different disk coatings with the corresponding disk play) can be installed.*

NOTE: *The particular coupling or disk coating required can be found on the corresponding replacement parts list.*

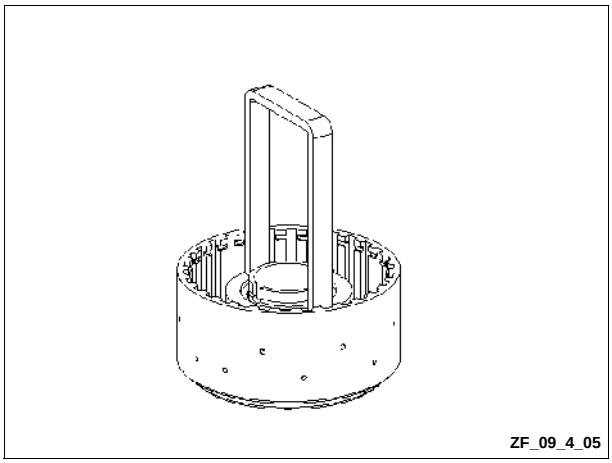
NOTE: *Steps 12 and 13 show the different disk coatings.*

NOTE: *See the replacement parts list for the part required.*

STEP 5

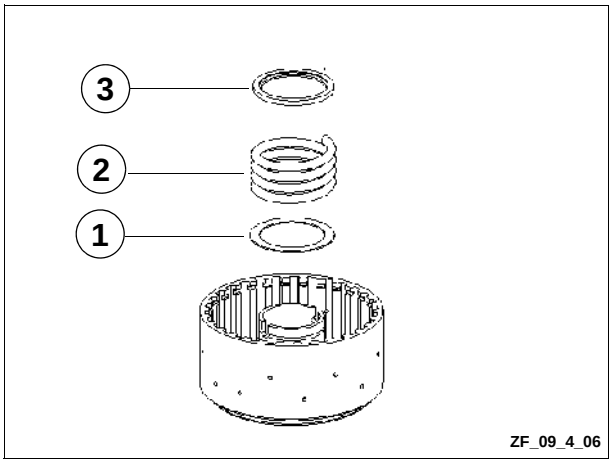
Using the assembling aid, insert the piston into the plate support with a hand-press.

(S) Assembling aid 5870 345 088



STEP 6

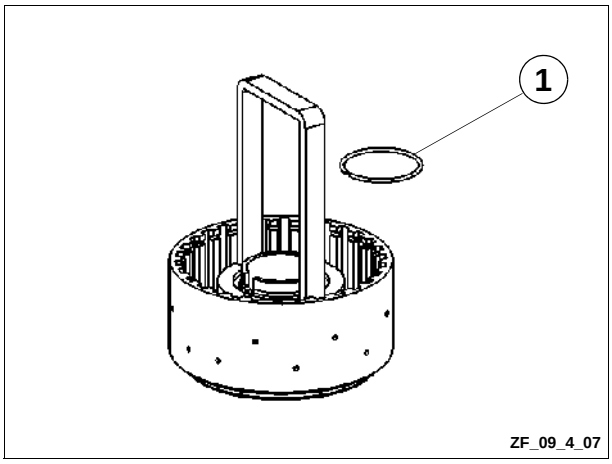
Mount the washer (1), push spring (2) and guide ring (3).



STEP 7

Pre-tension the push spring with the assembling aid and push snap ring 64 x 3.2 (1) into the radial groove.

(S) Assembling aid 5870 345 088



STEP 8

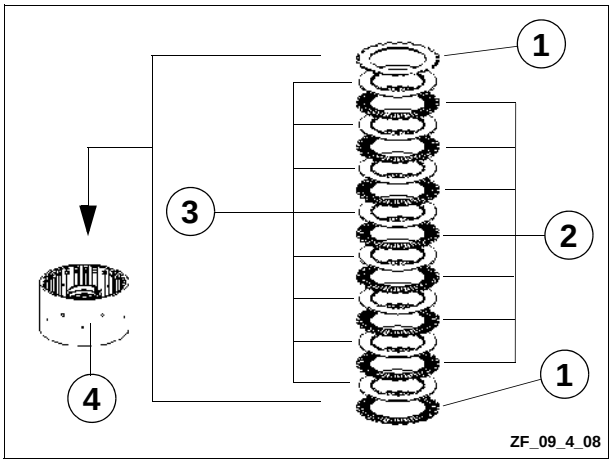
Mount the externally and internally toothed plates alternately in the plate support (4), as shown in the illustration opposite.

1 = 2 pcs. Friction plates - coated on one side -

2 = 7 pcs. Externally toothed plates

3 = 9 pcs. Internally toothed plates

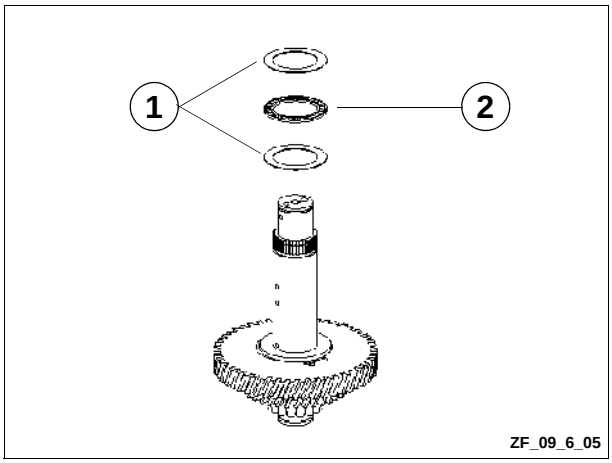
NOTE: *The friction plate (1) must be mounted with the uncoated (bare) side facing towards the piston or end plate.*
Number of friction surfaces is 16.



STEP 5

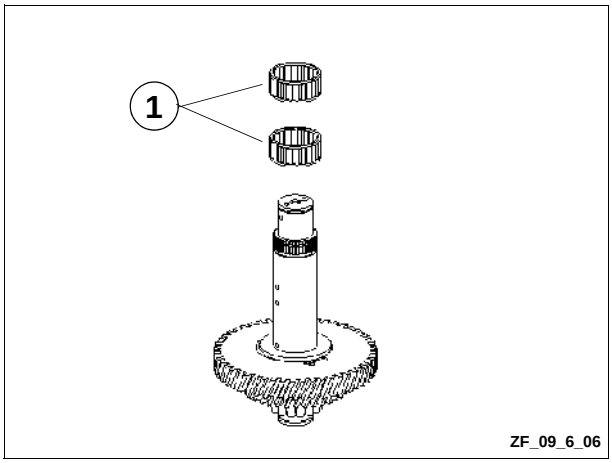
Mount the lower axial disk (1), axial needle cage (2) and upper axial disk (1).

NOTE: *The upper and lower axial disks are identical (50 x 70 x 1).*



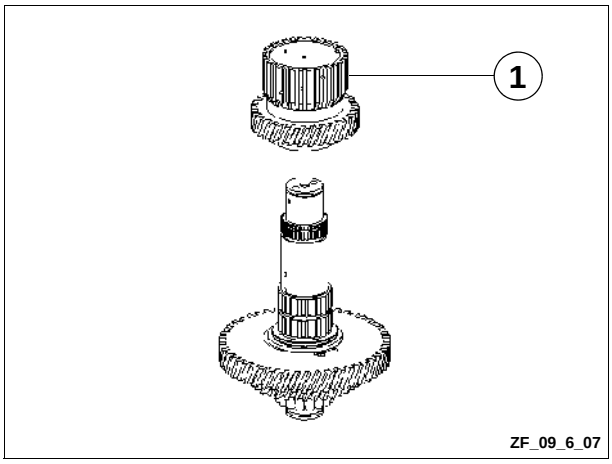
STEP 6

Mount the two needle bearings.



STEP 7

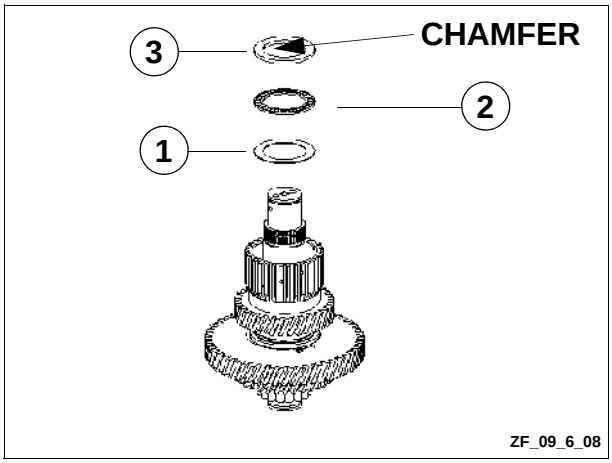
Mount idler gear (1).



STEP 8

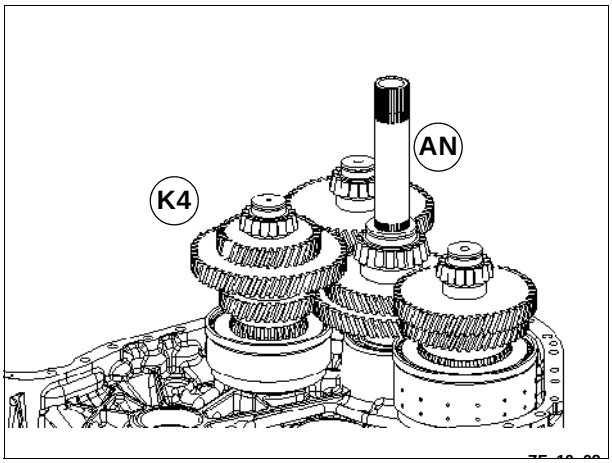
Mount axial disk (1), needle cage (2) and washer disk (3).

NOTE: *Mount the washer disk (3) with chamfered side facing toward the needle cage.*

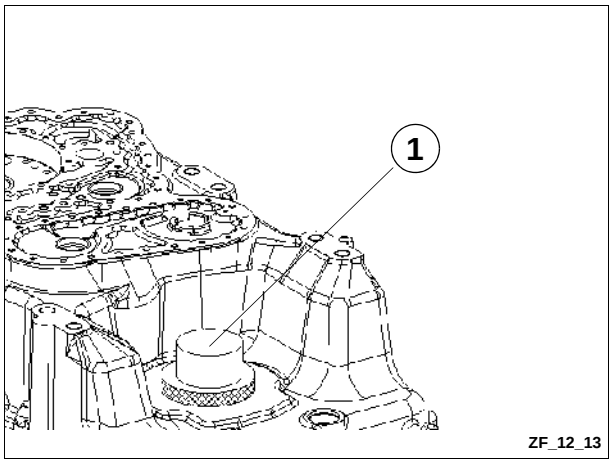


STEP 8

Lift the drive gear slightly and bring coupling K4 into position.



18.3 Output flange converter side (without axle shut-off)



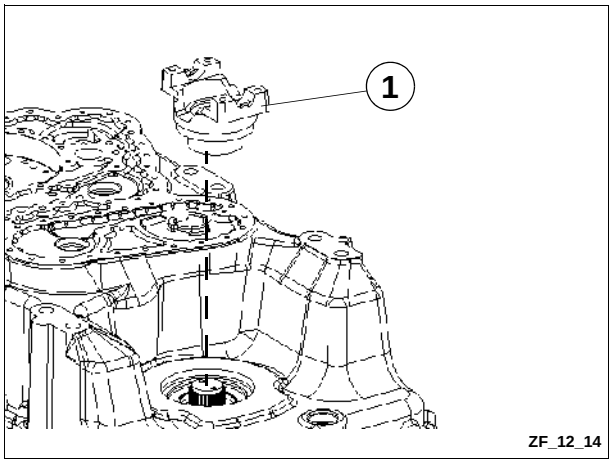
STEP 1

Mount the shaft seal using installer tool (S), with the sealing lip facing towards the oil gallery.

(S) Installer tool 5870 048 057

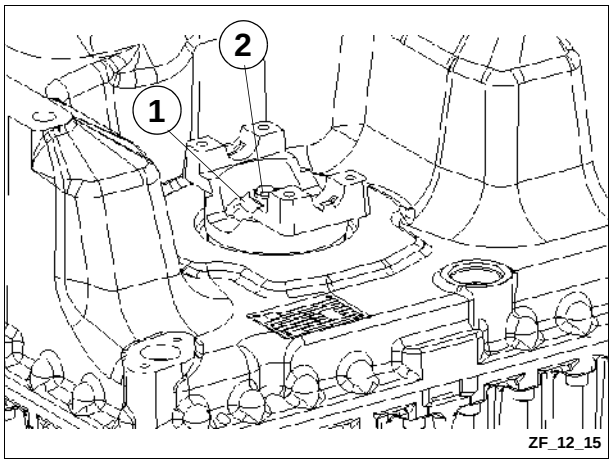
NOTE: *To obtain the exact installation position, use the specified installer tool (S).*

NOTE: *Fill the space between sealing lip and dust lip with grease. Wipe the external diameter (rubberised) with methylated spirit.*



STEP 2

Push drive flange (1) into position.

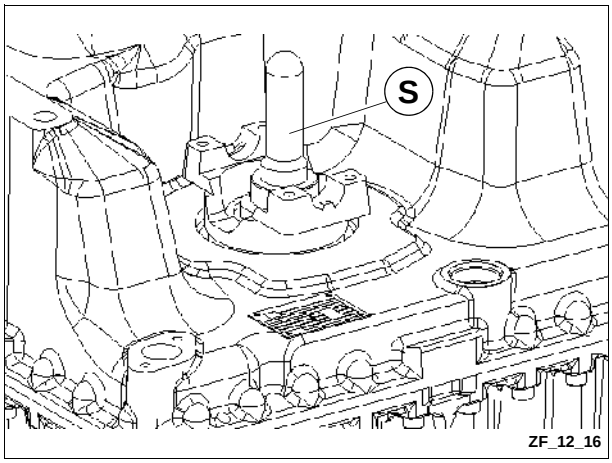


STEP 3

Insert O-ring 38 x 4 into the space between output flange and shaft.

Fasten output flange with disk (1) and hexagon head bolt (2).

Tightening torque (M8/10.9x25) ..... 34 Nm



STEP 4

Fasten the locking plate with installer tool (S).

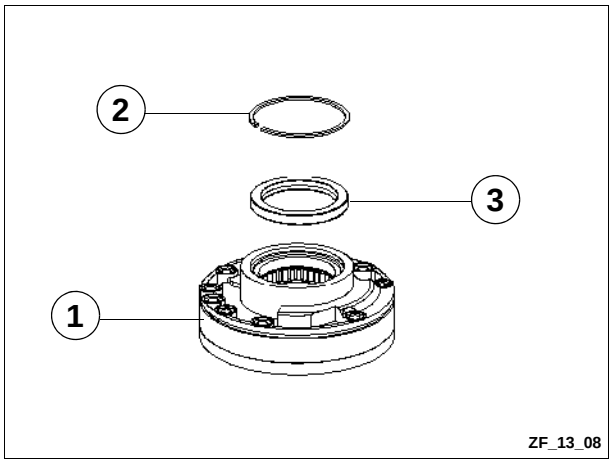
(S) Installer tool 5870 057 011
(S) Handle 5870 260 002

STEP 8

Insert shaft seal (3) carefully in position in the pump housing (1) with the sealing lip facing downward, and fix with snap ring (2).

NOTE: *Wipe the external diameter of the shaft seal with methylated spirit.*

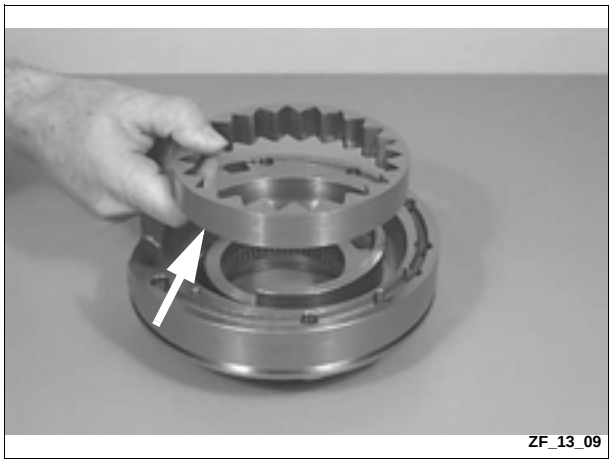
(S) Installer tool.....5870 055 070
(S) Handle.....5870 260 002



STEP 9

Mount the external rotor.

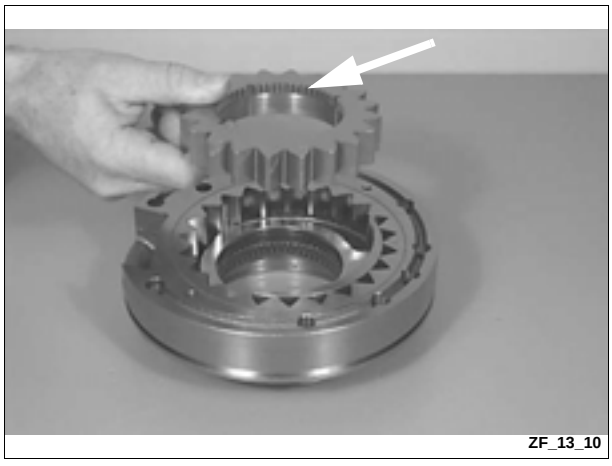
Chamfered side (arrowed) faces down.



STEP 10

Mount the internal rotor.

Toothed side (arrowed) faces up.

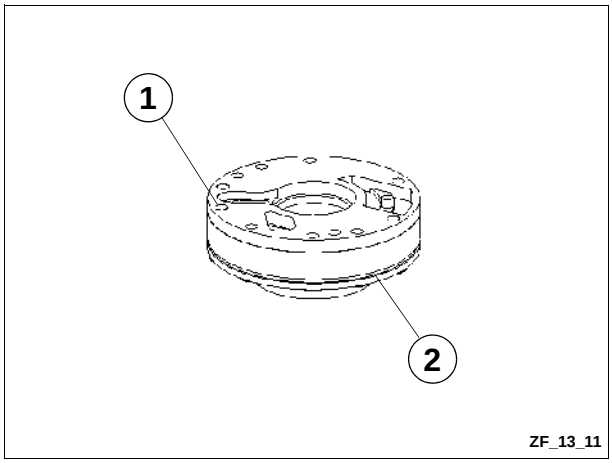


STEP 11

Place control disk and fix radially with two cap bolts (19).

NOTE: *Do not tighten the cap bolts - screw in until disk is in position, then turn back by about one 1/2 turn.*
Note the installation position of the control disk - see picture.

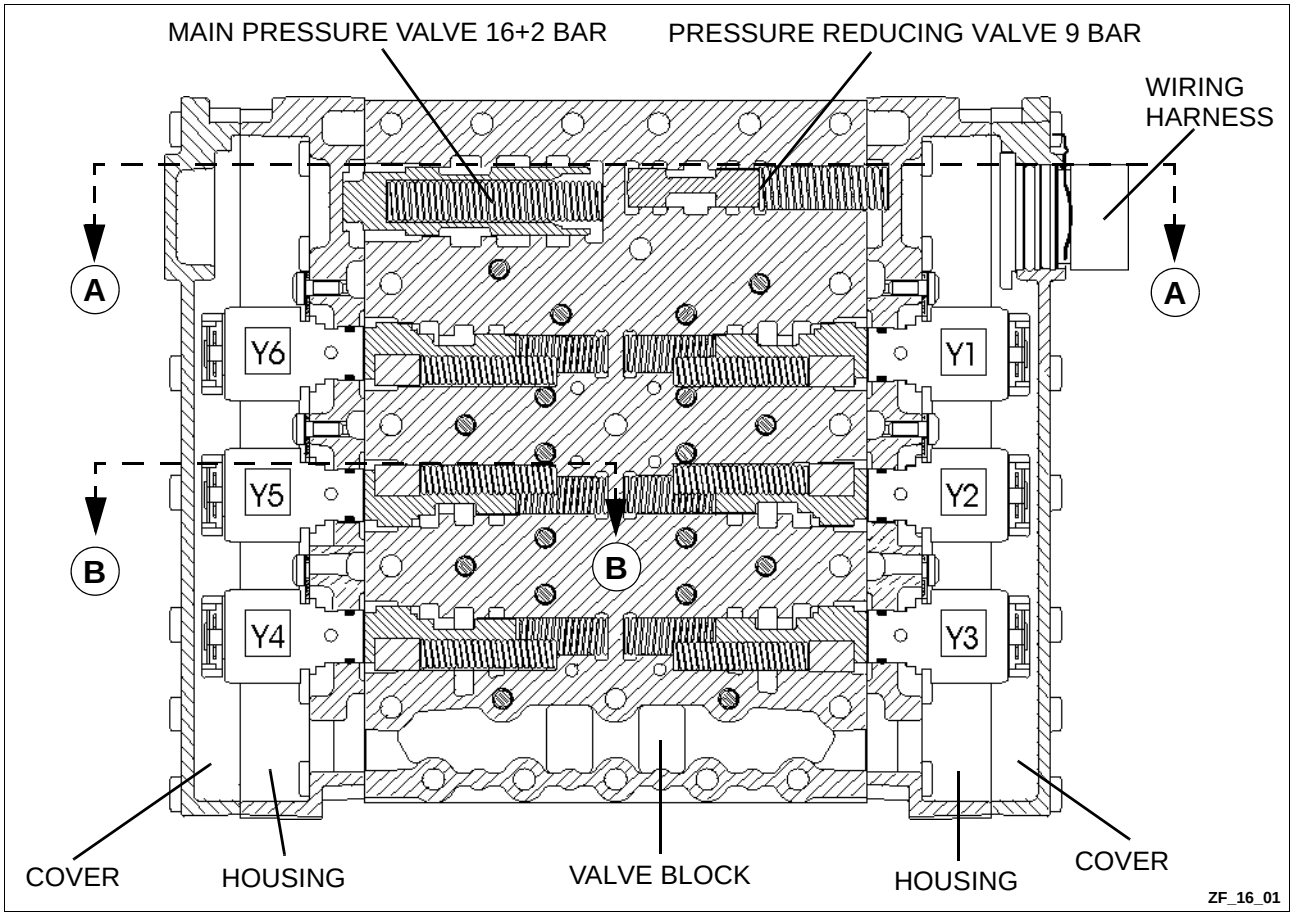
Insert O-ring 182x3 (2) in the radial groove and lubricate it.

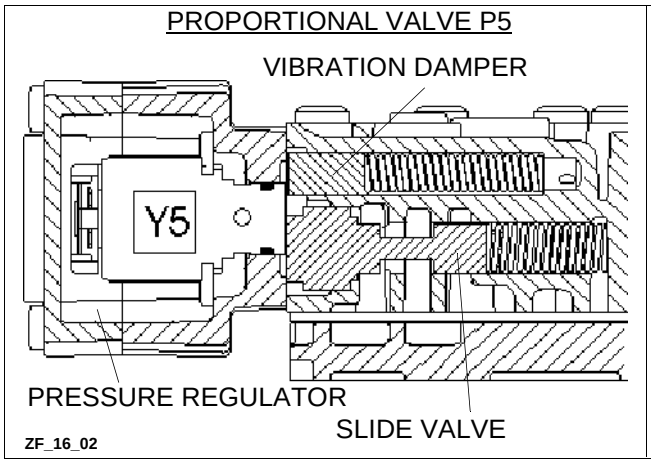


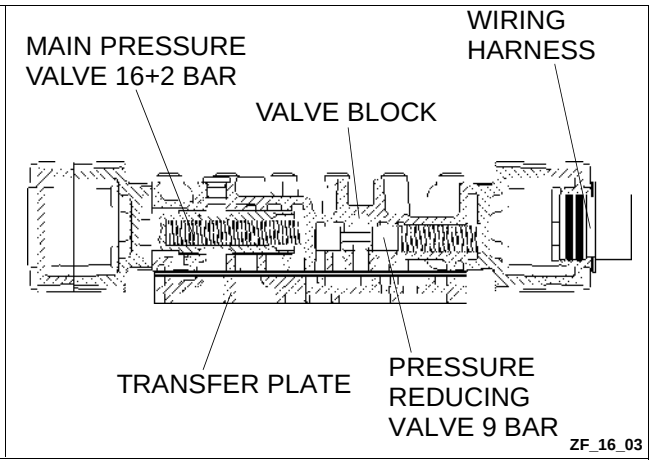
22 ASSEMBLY OF ELECTRO-HYDRAULIC CONTROL UNIT WITH PROPORTIONAL VALVES

NOTE: *Different versions are possible regarding the position of the wiring harness. Refer to the documentation supplied by the vehicle manufacturer!*

The following illustrations show sectional views of the electro-hydraulic control.







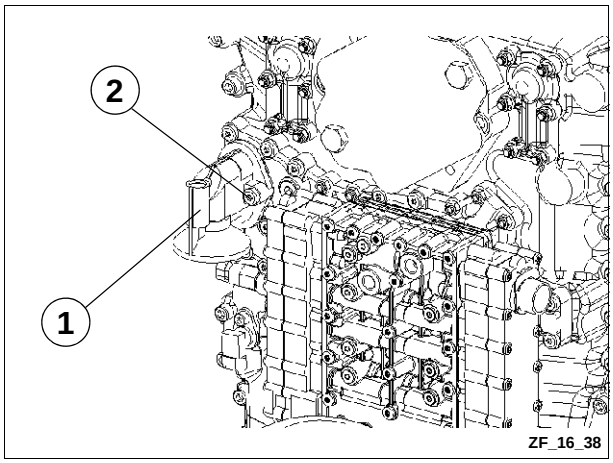
22.3 Mounting ZF fine filter (pressure filter)

STEP 34

Fasten filter head (1) with new O-rings 34.2x3 to the housing rear section using Torx screws (2).

Tightening torque (M8/10.9x60) ..... 34 Nm

(S) Torque wrench.....5870 203 034
(S) Socket wrench TX-40.....5870 042 004

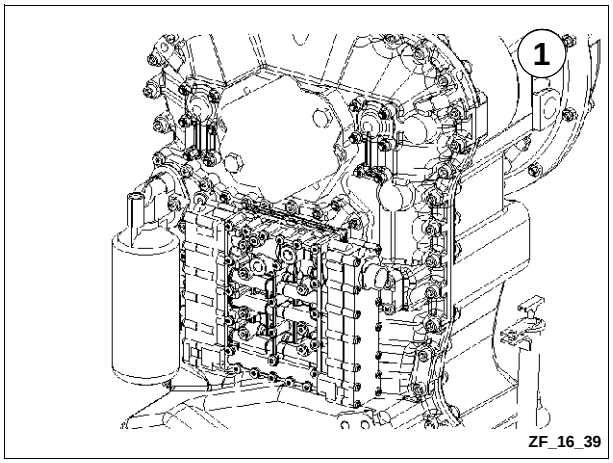


STEP 35

CAUTION: *The filter must be mounted as follows:*

- *Lightly oil the seal*
- *Screw the filter in until it touches the sealing surface. Then give about a 1/3 to 1/2 turn by hand to tighten.*

CAUTION: *Before starting up the transmission, fill with oil as described in the operating instructions (Order No. 5872 153 001).*



8. Check that the permanent magnets still have sufficient magnetic force to hold the new lining carriers.
   If they do not, replace the permanent magnets by prying them out with a suitable screwdriver, and installing new ones.

9. Secure the guide pins with the castle nut and the cotter pin or retaining clip.

10. Screw in the pressure line again and bleed the brake.

NOTE: *If the brake lining carrier has been replaced or repaired, the brake must be set again.*

Sealant

Only use suitable sealants. Check that the surfaces are clean, dry and free of grease.

Oil draining

Before any work is performed on the assembly, drain off the oil.

WARNING: *Dispose of used oil as required by regulations.*

Cleaning

Clean all moving parts (gears, bearings etc.) thoroughly using gasoil or paraffin.

Avoid using petrol or alkaline solvents.

Do not use water or steam, which would leave the surfaces damp.

Dry off all parts with compressed air or a cleaning cloth, to remove any residues that might scratch the surface.

To prevent oxidation, lightly grease all surfaces.

Inspection

Inspect all bearings, all outer rings that may still be in place, and all bolts over which rollers move. Parts that show signs of wear or damage should be replaced.

Inspect all gear teeth for wear or damage. No wear should be visible on the tooth surfaces.

Check that the grooves are not damaged, and that they do not show excessive wear. Replace worn parts with original replacement parts only.

It is recommended to replace the shaft seals after each disassembly operation.

Flange and tool end pieces

When fitting flange and tool end pieces, take care to prevent any deformation that might impair their functional efficiency.

Mounting methods

Use a suitable workbench for working on the assembly.

Use lifting gear when raising the assembly, when disassembling/assembling gear pairs, and for supporting the gear housing.

For an illustration of the disassembly/assembly processes, refer to a drawing of the entire assembly.

Using lubricants

For correct lubrication, and to be able to reach the exact operating temperature of the axles, it is important to use only the recommended lubricants and to keep the oil constantly at the levels described in this manual.

4 DISASSEMBLY/ASSEMBLY PROCEDURES

NOTE: *THIS SECTION NOT YET COMPLETE!*

2 GENERAL PROPERTIES

2.1 Intended use

This axle has been developed and produced for installing on industrial machines. The axles is the part of the machine that transmits power from the engine to the wheels.

It has bee produced to the customer's specifications, and is used to:

- increase tractive force, while at the same time reducing rotational speed;
- balance the speeds of inner and outer wheels while steering.

CAUTION: *Never install this axle in machines other than those specified.*

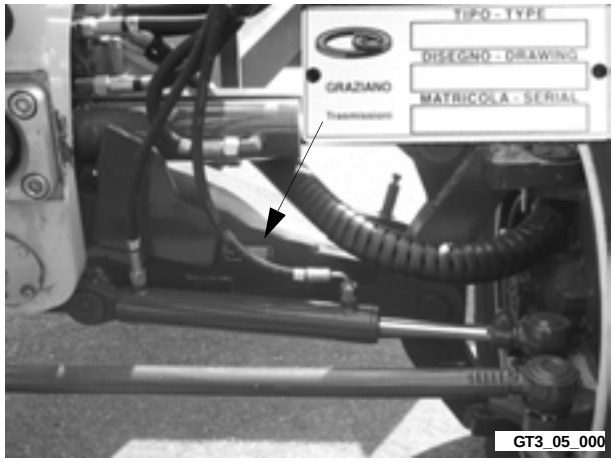
The manufacturer will not be liable for any damage to property or injuries to personnel if the axle is not used according to the specified conditions.

In such cases, the customer alone will be liable.

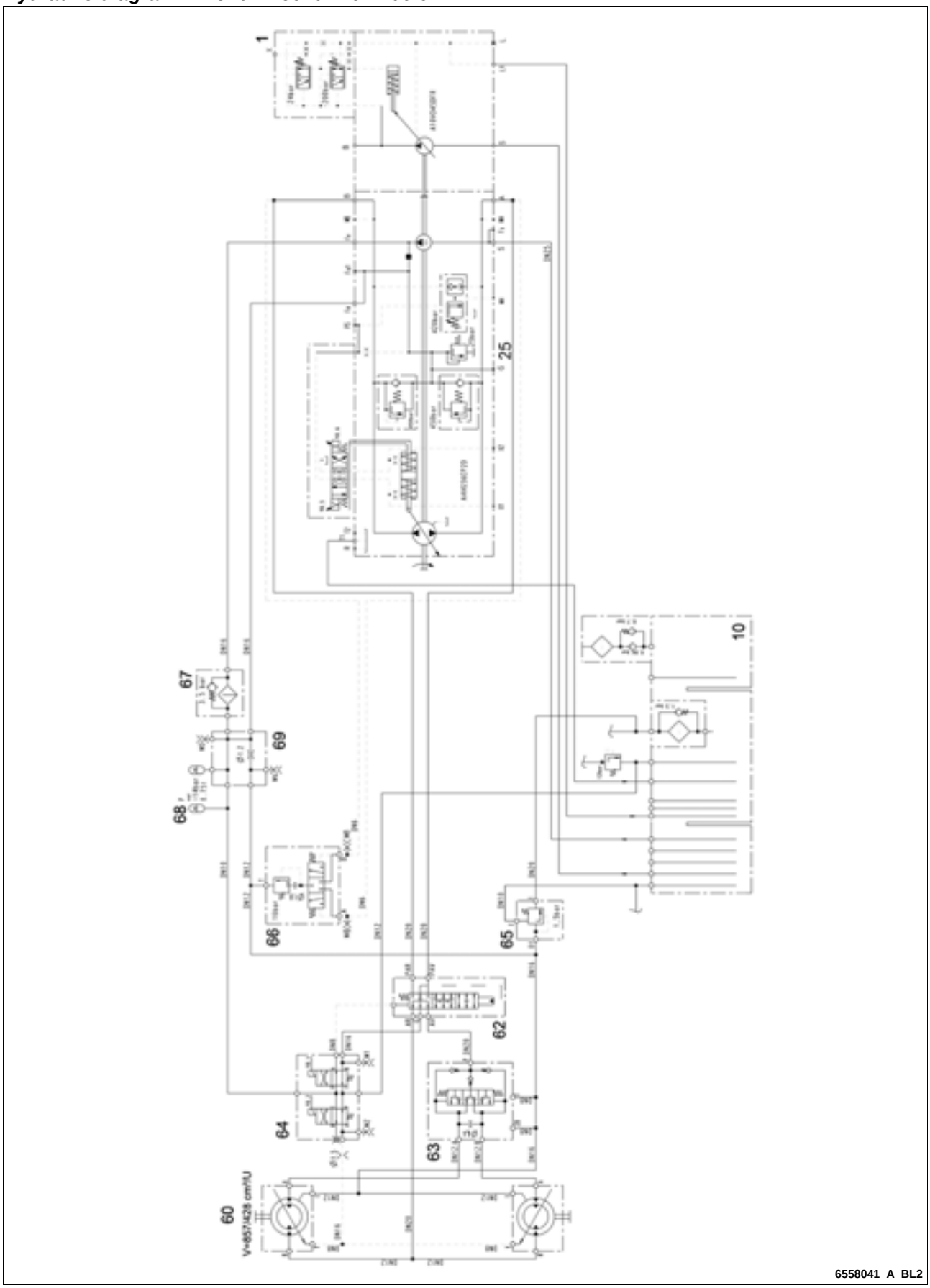
Even when used correctly, the manufacturer's maintenance and repair instructions must be followed in all cases.

2.2 Product identification

Axle identification plate



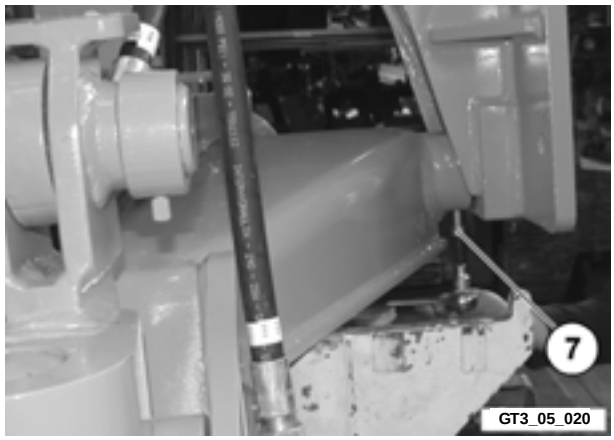
Hydraulic diagram - Front-wheel drive F106.6A



STEP 4

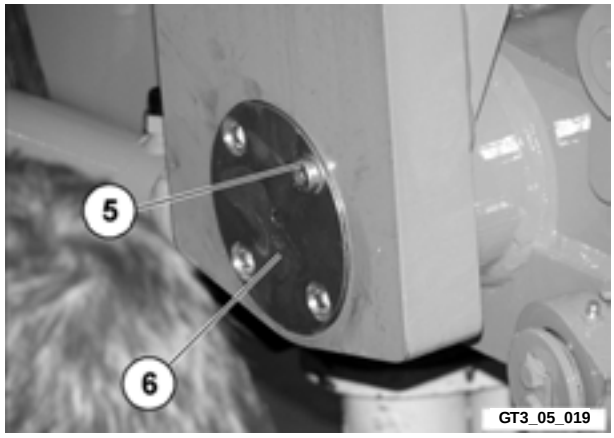
Remove the tool and drive the front frame/front axle connecting pin fully in.

Screw the grub screw into the connecting pin and tighten the counternut (**7**).



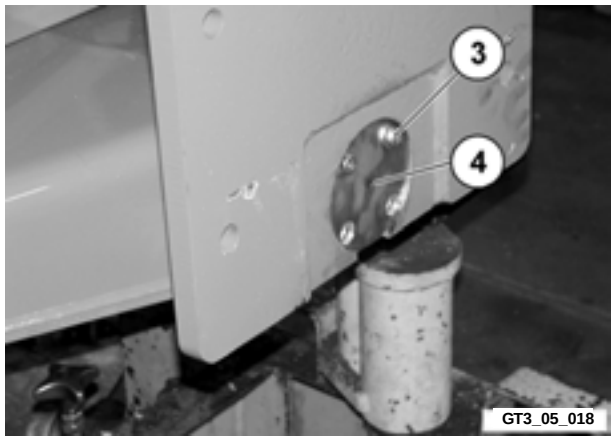
STEP 5

Insert the rear flange (**8**) and tighten the bolts (**5**).



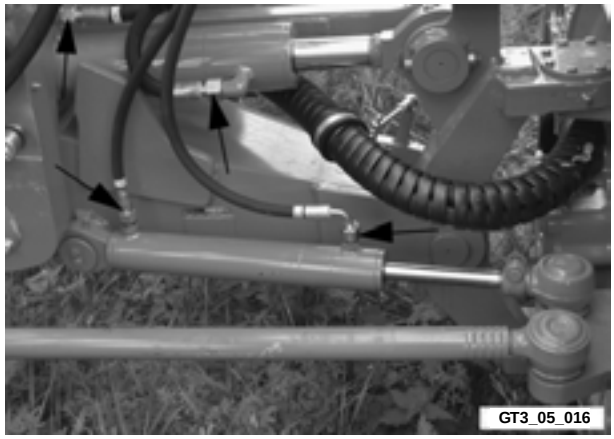
STEP 6

Insert the front flange (**4**) and tighten the bolts.



STEP 7

Connect all hydraulic lines to the steering and wheel camber cylinders.

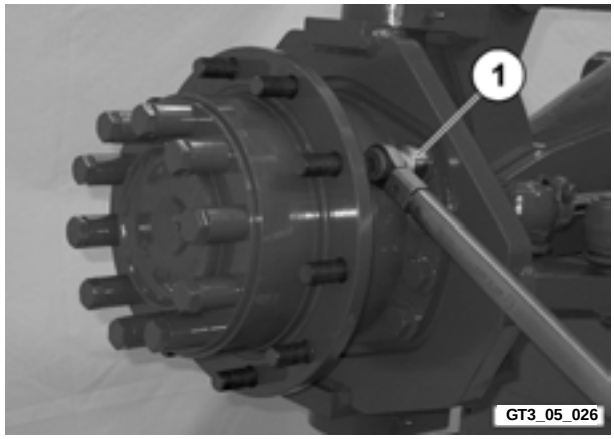


STEP 13

Apply Loctite 242 to the bolts (**1**).

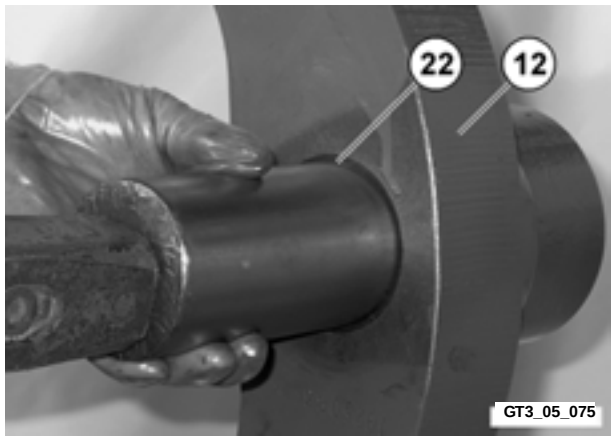
STEP 14

Insert bolts (**1**) and tighten to the specified torque (see 5.2.6).



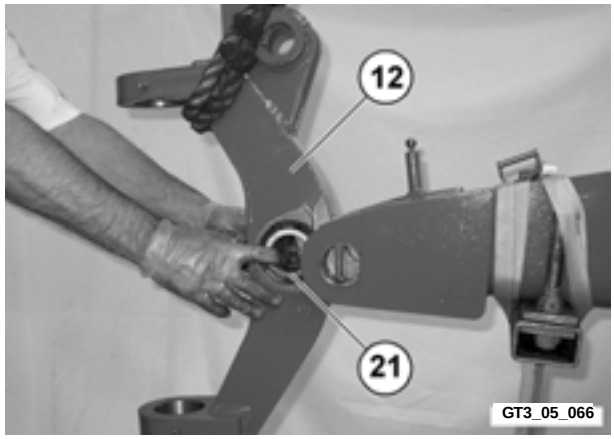
STEP 5

Mount bearing (**22**) on both sides of hub carrier (**12**).



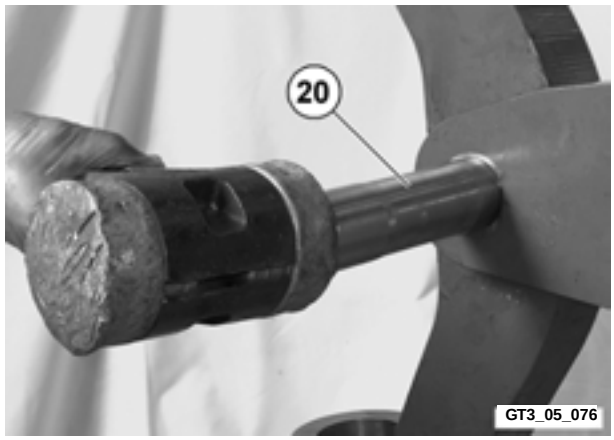
STEP 6

Insert seals (**21**) on both sides of hub carrier (**12**) and mount the hub carrier.



STEP 7

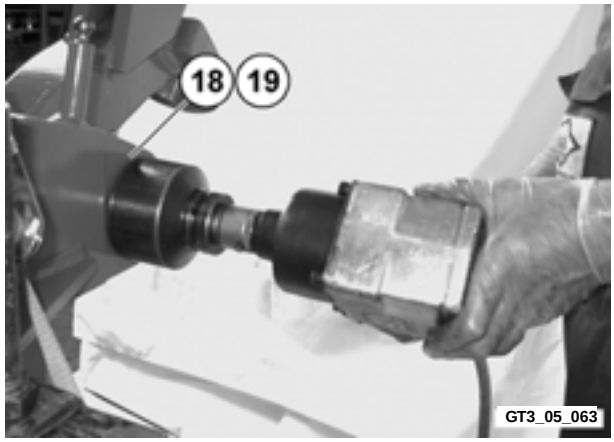
Knock in bolt (**20**) until flush.



STEP 8

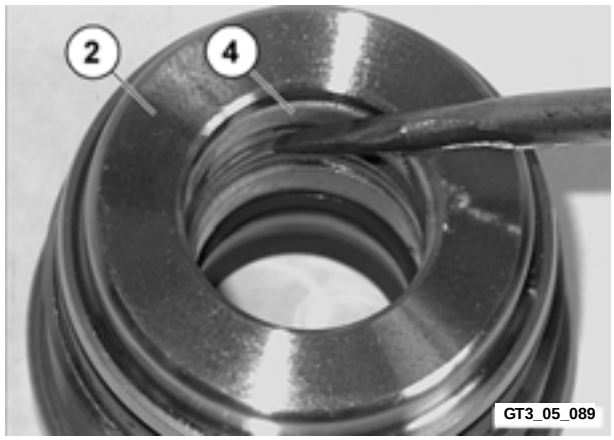
Mount thrust plate (**19**).

Tighten castle nut (**18**).



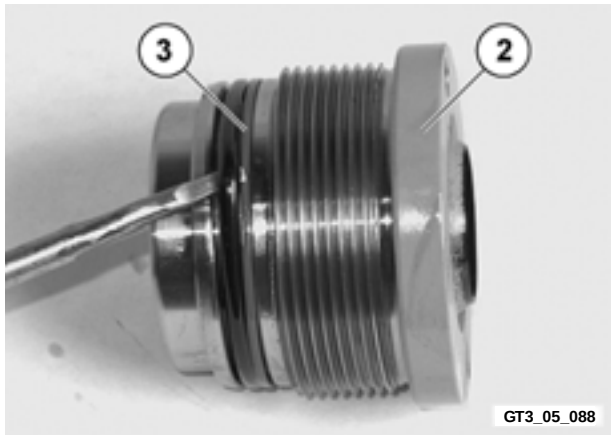
STEP 5

Mount inner seals (**4**) of head (**2**).



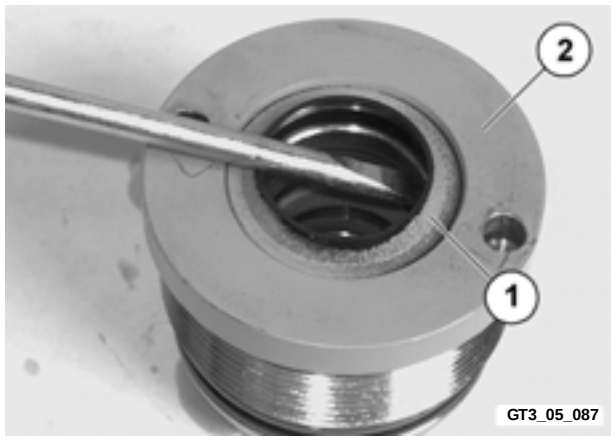
STEP 6

Mount seal (**3**) on head (**2**).



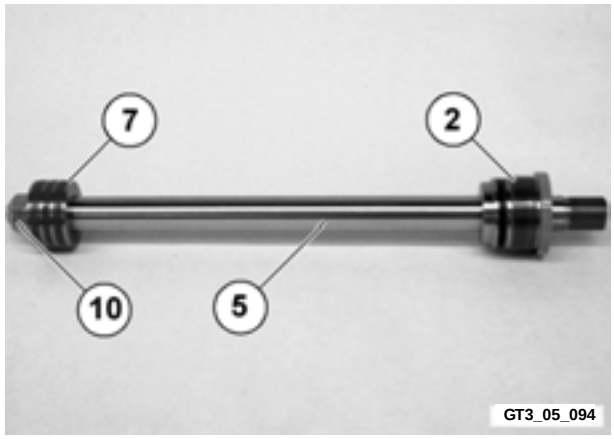
STEP 7

Insert seal ring (**1**) in head (**2**).

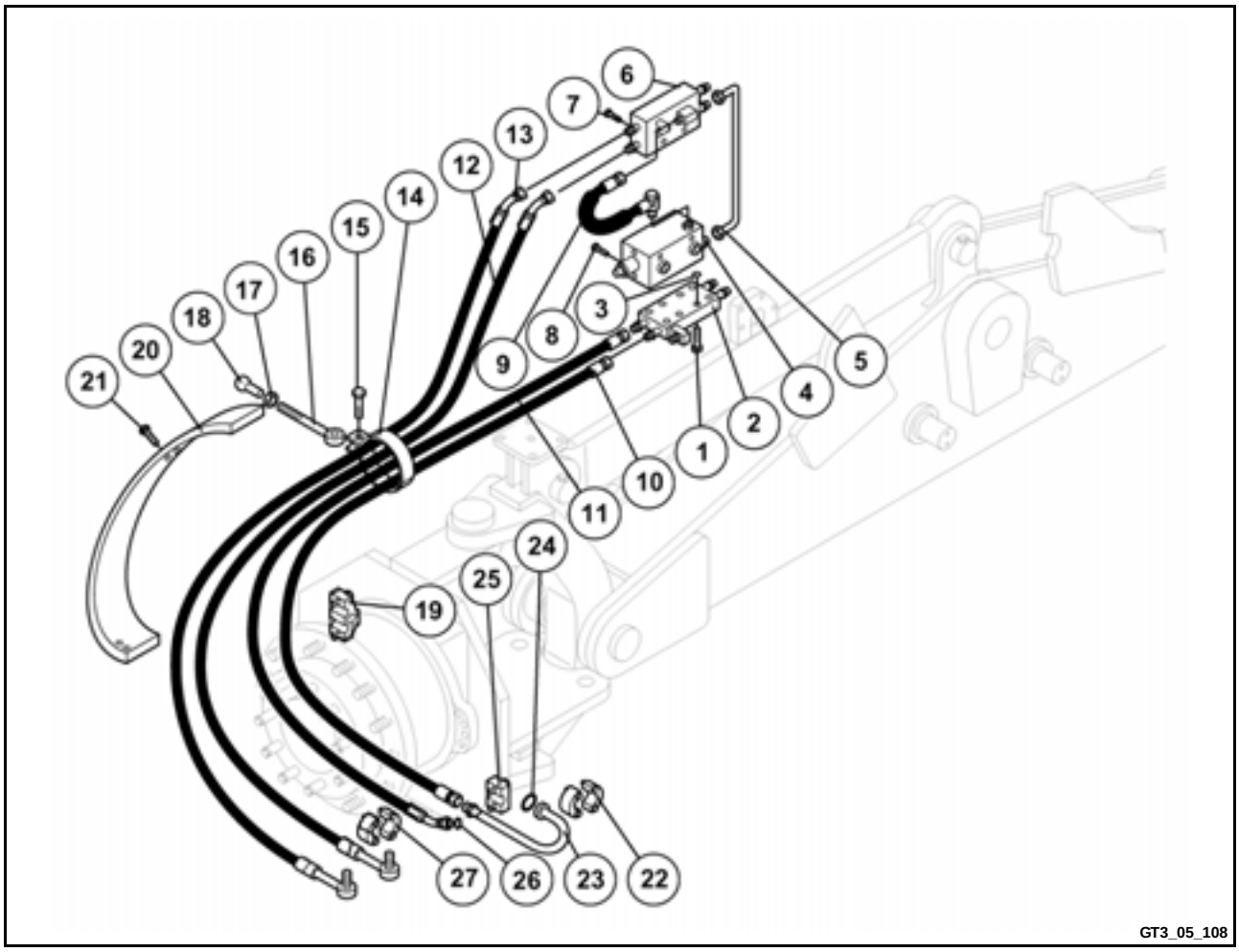


STEP 8

Push the assembled head (**2**) onto stem (**t)** complete with piston (**7**) and nut (**10**).



5.5 Hydraulic system (F106.6A and F156.6A)

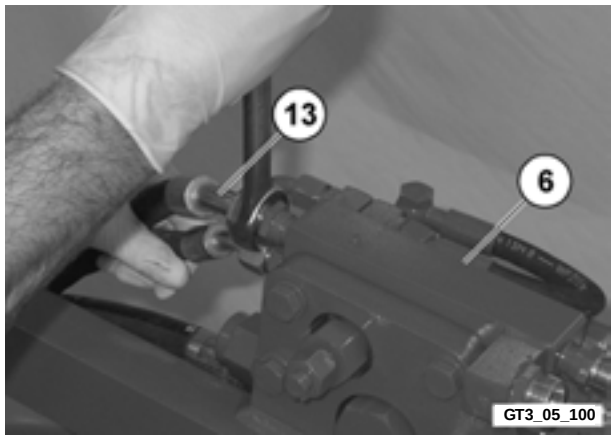


5.5.1 Disassembly

NOTE: *Some of the illustrations may show a different axle. Nevertheless, the procedures are the same.*

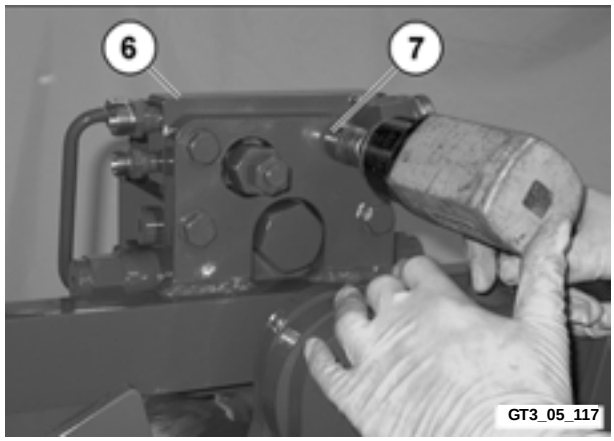
STEP 1

Detach hose (**13**) from valve (**6**).



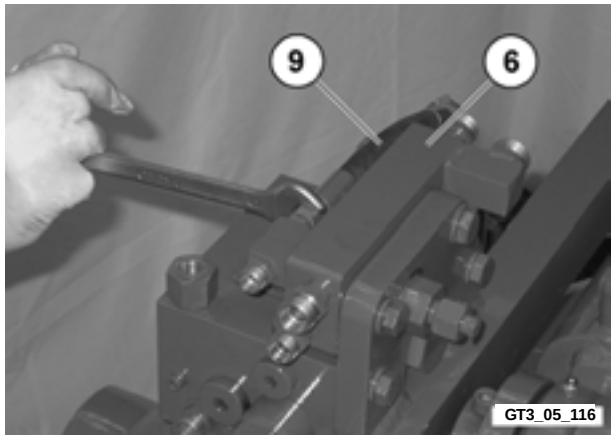
STEP 13

Fasten valve (**6**) to the frame using screws (**7**).



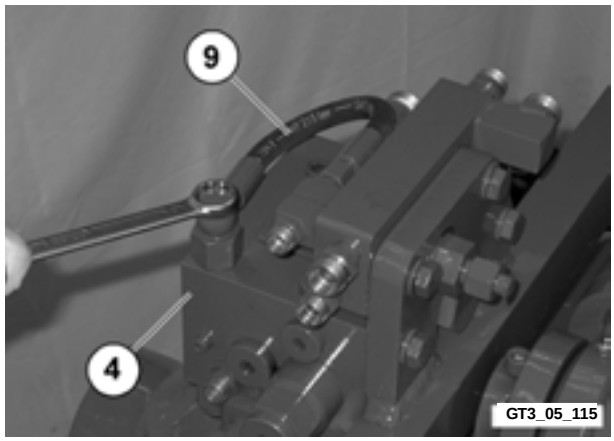
STEP 14

Connect hose (**9**) to valve (**6**).



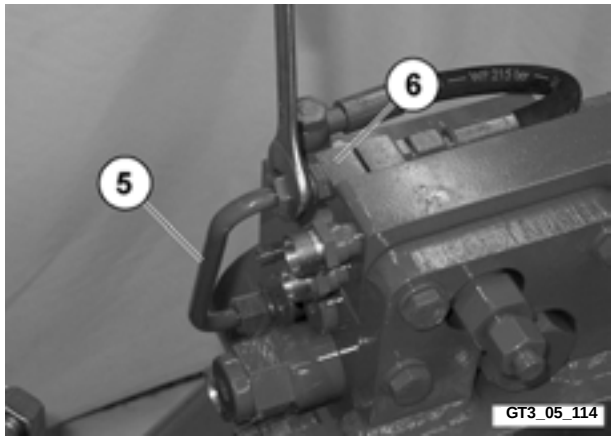
STEP 15

Connect hose (**9**) to block (**4**).



STEP 16

Connect tube (**5**) to valve (**6**).



The pump characteristics in the acceptance report are used to derive the lower (IKV, IKR) or upper (IXV, IXR) current value from the arithmetical average of the corresponding values for the rising/ falling current characteristic (hysteresis). The rising or falling current characteristic is then determined from a line parallel to the ideal characteristic (Imin = 200 mA, Imax = 600 mA), which passes through the actual characteristic.

At the point of intersection of the two parallel lines with the current scale for $\frac{V}{Vmax} = 0$ the maximum (IKVmax, IKRmax) and minimum (IKVmin, IKRmin) lower current values (IKV, IKR) can be read off.

At the point of intersection of the two parallel lines with the current scale for $\frac{V}{Vmax} = 1$ the maximum (IKVmax, IKRmax) and minimum (IKVmin, IKRmin) upper current value (IXV, IXR) can be read off.

The final characteristic current values of the pump are as follows:
Forward:

lower current value: $IKV = \frac{IKVmin + IKVmax}{2}$

upper current value: $IXV = \frac{IXVmin + IXVmax}{2}$

Reverse:

lower current value: $IKR = IKRmin + IKRma\frac{x}{2}$

upper current value: $IXR = \frac{IXRmin + IXRmax}{2}$

The resulting pump characteristic values IKV, IKR, IXV and IXR are to be transferred to the FWD control using the EDS tester.

The setting values should be checked using the procedure described in paragraph 6.6, and corrected if necessary.

If the permitted pressure ranges are exceeded, the corresponding values of IKV, IXV, IKR, and IXR should be reduced in 5mA steps until they are within the allowed pressure range.

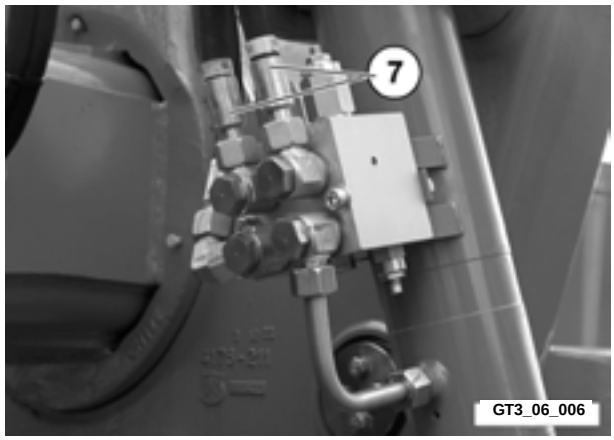
If the values are below the permitted pressure ranges, the corresponding values of IKV, IXV, IKR, and IXR should be raised in 5mA steps until they are within the allowed pressure range.

Fault	Possible cause	Check and remedy
Tractive force too low at front wheels	Value settings IXV, IKV, IXR and IKR	Check the values and adjust if necessary
	8-stage rotary feed switch faulty	Check the signal from the switch; repair or replace it
	Pressure cut-off valve faulty	Check pressure cut-off Replace valve if faulty
	a high-pressure limiting valve is faulty	Check whether high pressure builds up on one side Replace valve if faulty
	Feed pressure too low or absent	Check feed pressure at measuring point (MS), set the feed pressure limiting valve, or replace it
Tractive force too high at front wheels	see under 'tractive force too low'	
	Other possible cause: Wheel motor control faulty	Check chamber pressure at measuring point (2), replace 4/2 way valve
Front wheels lock in normal straight-ahead running	Inductive sensor signal for signal transmission input/output speed faulty	Check the inductive sensors using the related cable connection
	incorrect IXV, IKV, IXR and IKR values programmed	Correct the value settings IXV, IKV, IXR and IKR
	Gear detection incorrect	Test the gear detection on the EDS tester, gearshift unit, and FWD control
Front wheels block when shifting forward gear 3 → 4, or reverse gear 2 → 3	Air in the control line of the chamber switchover valve to the wheel motor	Bleed the control line
	Chamber switchover valve or electr. connection faulty	Check and replace if necessary
	Feed pressure too low or absent	Check that nozzle ∅ 1.8 F106.6A nozzle ∅ 2.0 F156.6A is correctly installed Check feed pressure valve setting and adjust if necessary
	Preloading of reservoir in feed pump circuit too high or too low	Check the reservoir 16 bar preload pressure and adjust if necessary
	Chamber parameter t	Reduce the parameter value on the EDS tester
Front wheels braking in gears 4 and 5	Wheel motor control faulty	Check chamber pressure at measuring point (2) replace 4/2 way valve
	Wheel motor switchover faulty	Check the switchover Replace or repair wheel motors
Front wheels braking when FWD Off and vehicle speed increasing	Pump and wheel motor housing pressure too low. (Rattling noise at wheel motors)	Check pressure at pressure limiting valve Set the feed pressure limiting valve or replace it

STEP 4

Connect the lift cylinder hydraulic lines (**7**).

Repeat steps 3 and 4 for the other lift cylinder.

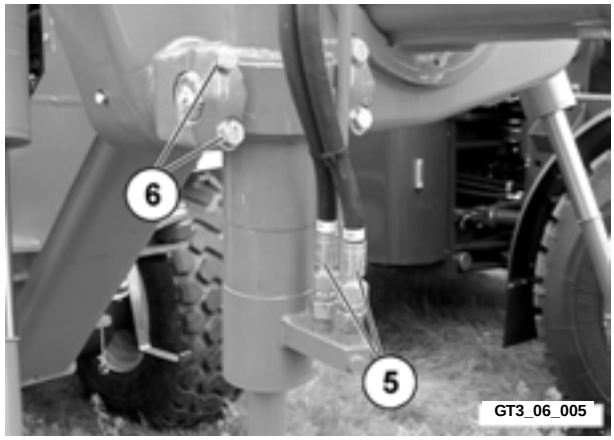


STEP 5

Bring the swing cylinder into position with the lifting gear. Mount the bushings and covers.

Tighten the four mounting bolts.

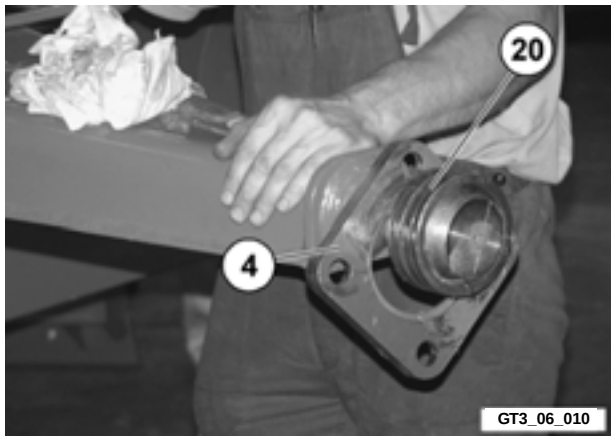
Connect hydraulic lines (**5**) to the swing cylinder.



STEP 6

Lift the centre equipment, blade and scarifier (optional) with lifting gear.

Place mounting plate (**4**) and bushing (**20**) with the two O-rings on the centre equipment ball joint and smear generously with grease.



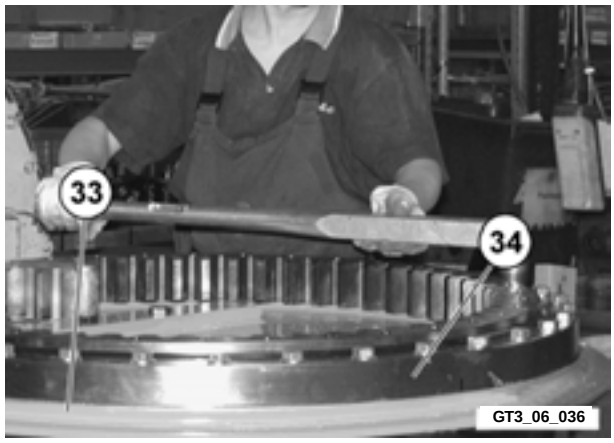
STEP 7

Move the blade and scarifier (optional) with the lifting gear until the ball joint and bushing comes into the seat in the front frame.

STEP 4

Insert and tighten the other bolts that connect turntable (**34**) to the pull rod (**33**).

Tightening torque ..... 250 Nm



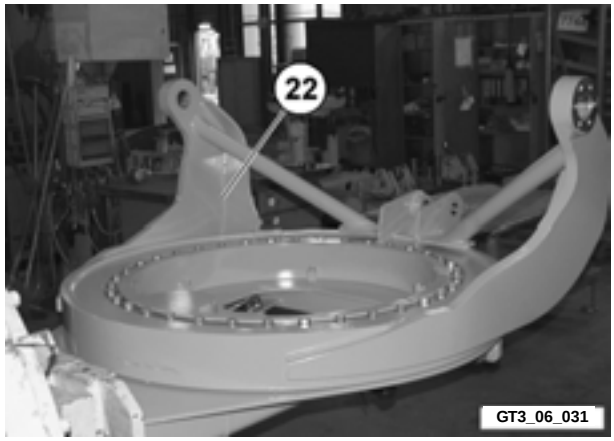
STEP 5

Fasten the rotating ball bearing (**22**) to the turntable.

First, insert and tighten four bolts offset at 90°.

Tightening torque ..... 250 Nm

Tighten the other bolts in the direction of rotation.

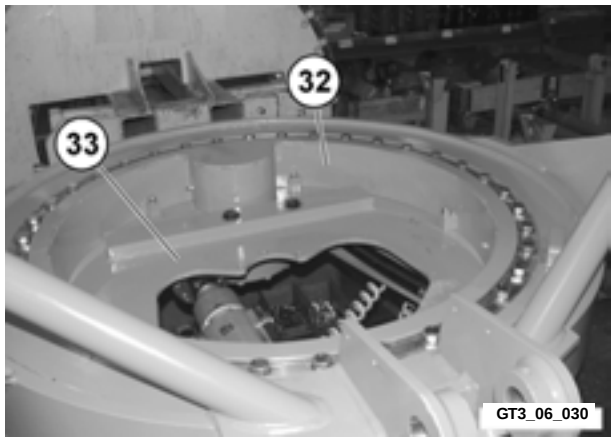


STEP 6

Mount the turntable cover (**32**).

Tighten the bolts on pull rod (**33**).

Fill with grease.



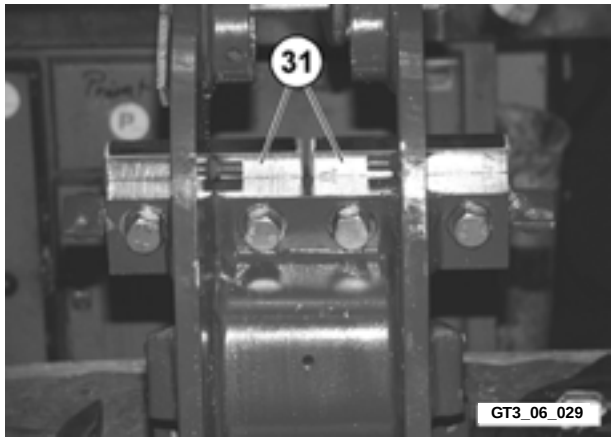
STEP 7

Fasten the blade bearing to a support frame.

Fasten the two blade guide plates (**31**). Tighten the bolts.

Tightening torque ..... 250 Nm

Attach the cover.



2.2 Disassembly and assembly

2.2.1 Disassembly

CAUTION: *Heavy parts should be lifted and handled using lifting gear with sufficient load capacity.*

Individual parts and assemblies should be secured and held with a firm harness and suitable hooks.

No one should be standing near the load being lifted.

STEP 1

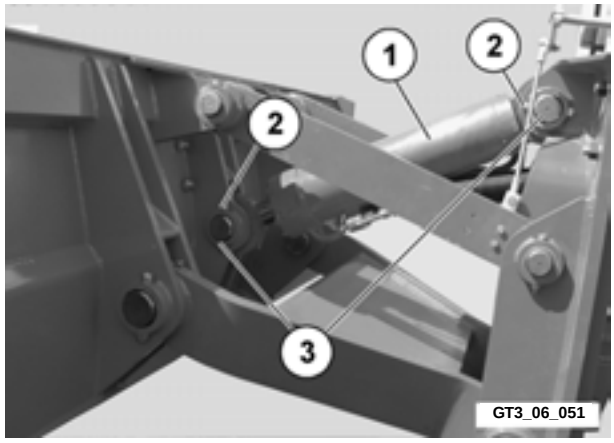
Fasten the front equipment to a support frame and set the blade or scarifier on the ground.

Loosen the four mounting bolts and remove the front pulling gear.

Secure the front equipment lift cylinder (**1**) with the lifting gear. Loosen safety bolt (**2**) and take out pin (**3**).

Remove the lift cylinder.

IMPORTANT: *Use suitable drift punches for driving out bolts.*

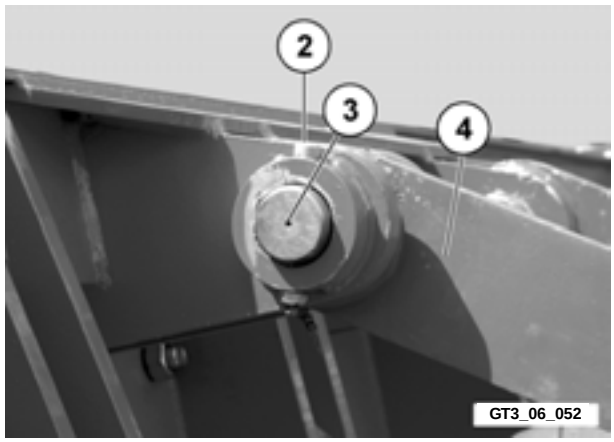


STEP 2

Secure the scraper blade (or front scarifier) with lifting gear.

Loosen safety bolt (**2**), take out pin (**3**) and remove upper rod (**4**).

Remove the bushings.

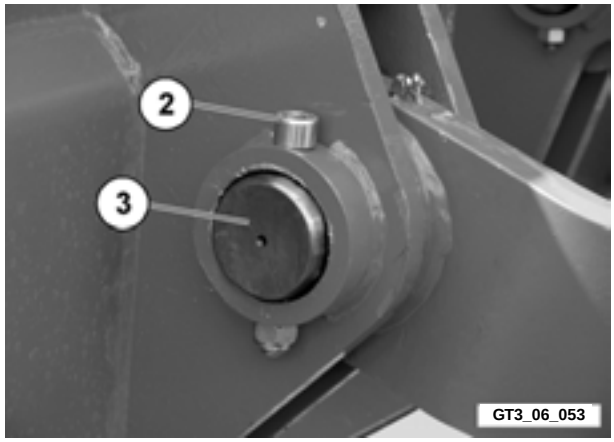


STEP 3

Loosen safety bolt (**2**) and take out pin (**3**).

Remove the scraper blade (or scarifier).

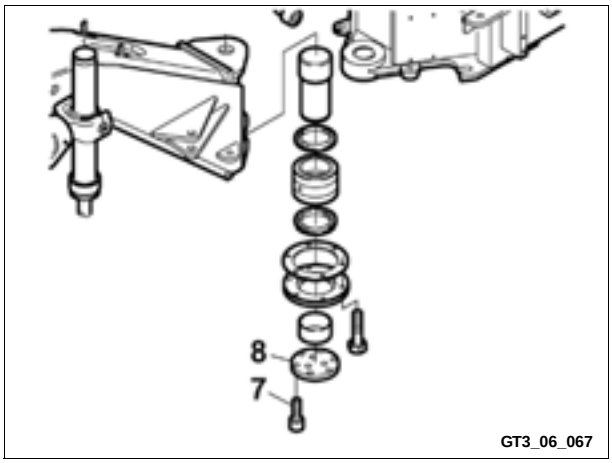
Remove spacers and seals.



STEP 4

Insert safety flange (**8**) of lower frame connecting pin (**7**) and tighten the bolts.

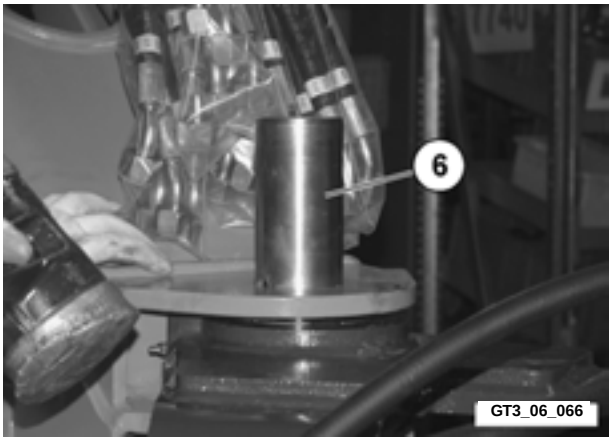
Tightening torque ..... 170 Nm



STEP 5

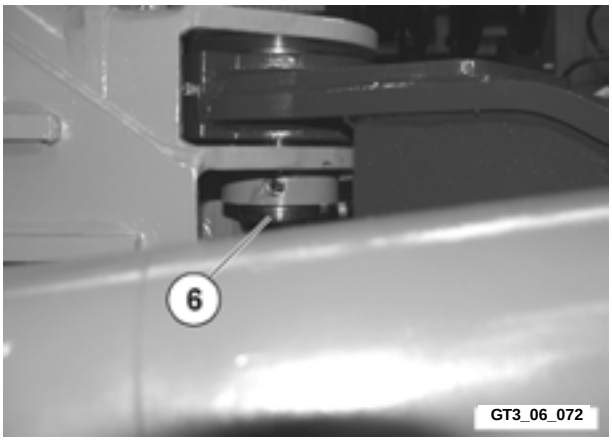
IMPORTANT: *Use a suitable drift punch for driving bolts.*

Insert upper frame connecting pin (**6**).



STEP 6

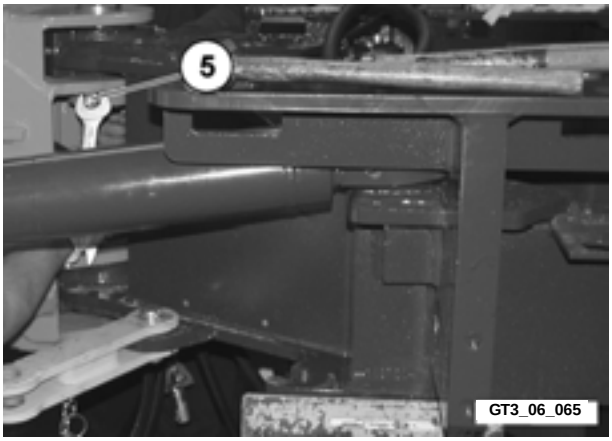
CAUTION: *Do not align the holes using the fingers.*
After inserting the upper frame connecting pin (**6**), align with the hole in the front frame.

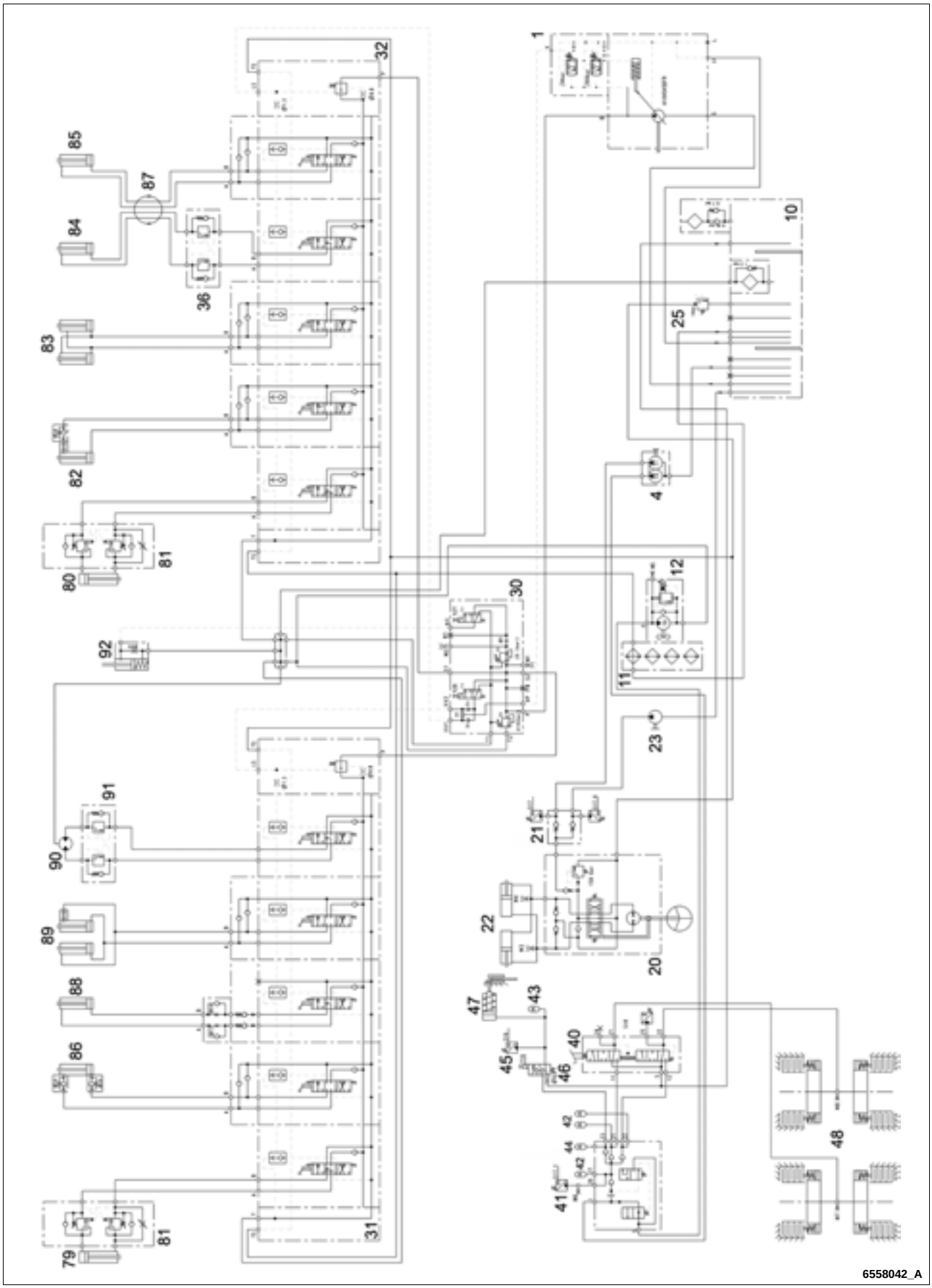


STEP 7

Insert the safety bolts and tighten nut (**5**).

Tightening torque ..... 250 Nm

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3 MAIN FUNCTIONS

3.1 General

The hydraulic system is divided into the following areas:

- Working hydraulics
- All-wheel drive (F106.6A and F156.6A)
- Brakes / steering
- Oil cooling

3.2 Working equipment

The working equipment is adjusted hydraulically by the hydraulic cylinders, which are controlled by the operator through the control blocks.

3.3 All-wheel drive (F106.6A and F156.6A)

On Graders F106.6A and F156.6°, a front wheel drive can be engaged in addition to the rear axle drive.

3.4 Brake / steering

Please see Section 8 for the brake and Section 9 for the steering.

3.5 Oil cooling

The fan drive oil circuit consists of the following components:

- Double gear pump,
- Shutoff valve,
- Fan motor,
- Hydraulic fluid tank.

The fan drive oil circuit is part of the brake and fan circuit. Oil is supplied at stage 1 of the double gear pump (Vgh = 23 cm3). This delivers oil to the shutoff valve, which supplies the fan motor according to the oil requirement of the brake system.

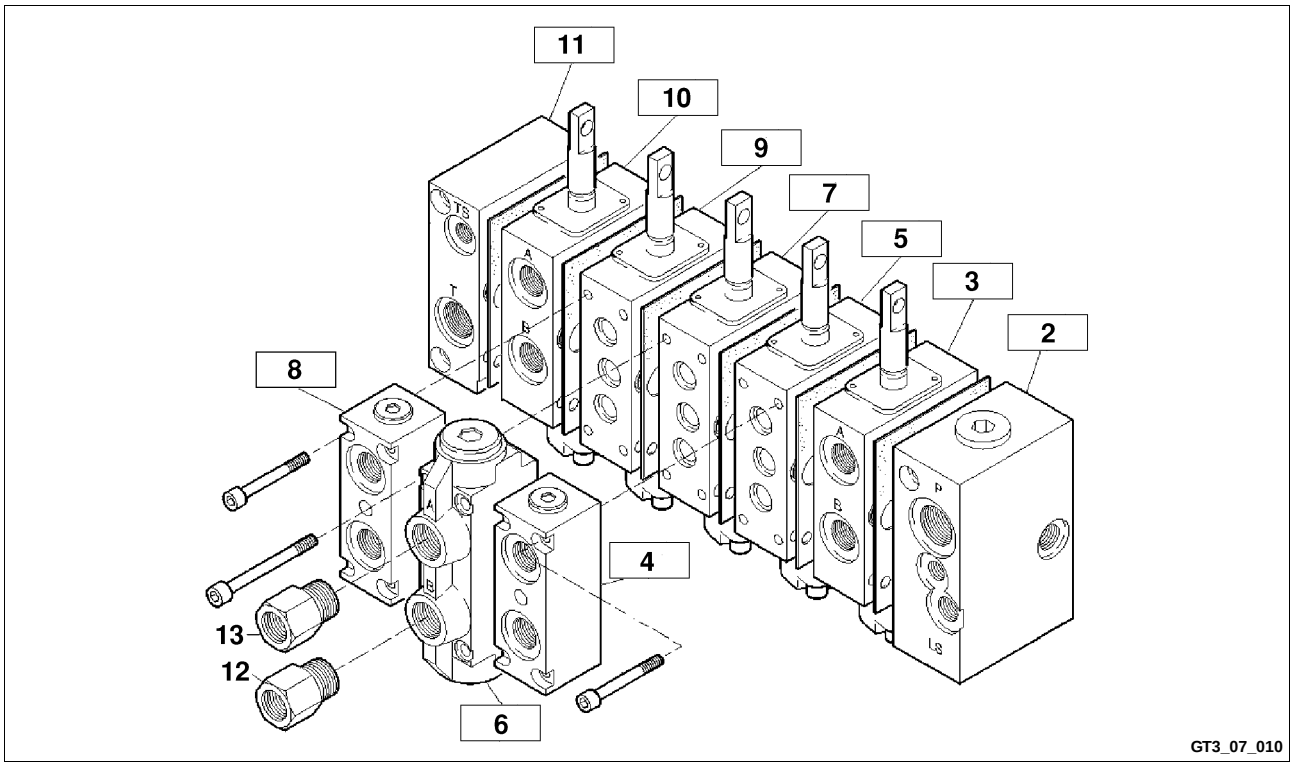
The fan motor consists of a fixed-displacement motor with specific direction of rotation (left-hand). It is equipped with a pressure limiting valve cartridge.

The **DBV** (pressure limiting valve) sets the maximum pressure in the fan motor, The opening pressure is adjusted according to the required cooling output.

Fan motor	Stator	Increased cooling output
WM9A1 - 23	110 ±5 bar	130 ±5 bar

If there is insufficient oil supply through the motor's **P** channel, an integrated replenishing valve allows oil intake from the hydraulic fluid tank.

A measurement coupling is provided on the motor housing for monitoring the prevalent pressure level. The oil return from the fan motor passes directly through a hose to the tank.

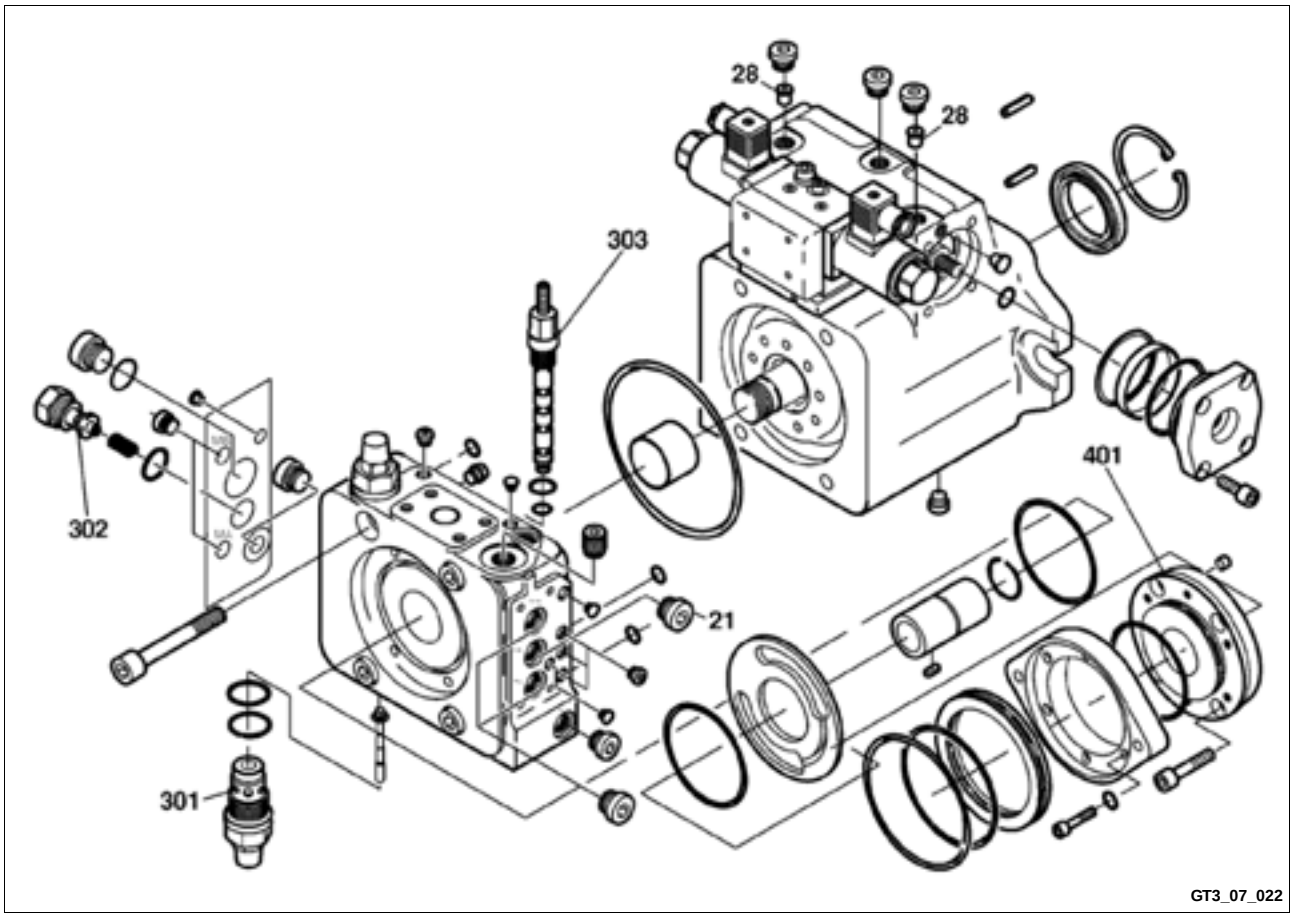


Item	Description	Function
2	Inlet element	P; LS; TS - connection
3	Control valve element with load holding valve	Turn blade
4	Replenishing valve	
5	Control valve element with load holding valve	Rear scarifier
6	Twin check valve	Tilt angle adjustment (blade)
7	Control valve element A/B/T connection	Wheel camber
8	Replenishing valve	
9	Control valve element with load holding valve	Swivel blade
10	Control valve element with load holding valve	Blade lift, right
11	Outlet element	T; TS - outlet
12	Restrictor	
13	Restrictor	

All-wheel pump (F106.6A and F156.6A)

The front drive is supplied by all-wheel pump A4VG, which has an axial piston/swash plate design.
In the movable range, the pump can be set at pressures up to 315 bar. The geometric flow volume can be continuously adjusted by changing the position of the swash plate.

	F106.6 / F106.6A	F156.6 / F156.6A
Pump	A4VG 56EP2	A4VG 71EP2
Displacement	0 to 56 cm^3/ rev	0 to 71 cm^3/ rev
Volume flow	115 l / min	160 l / min
Wheel motor	MS8	MS11
min / max displacement	428 / 857 cm^3	629 / 1,229 cm^3

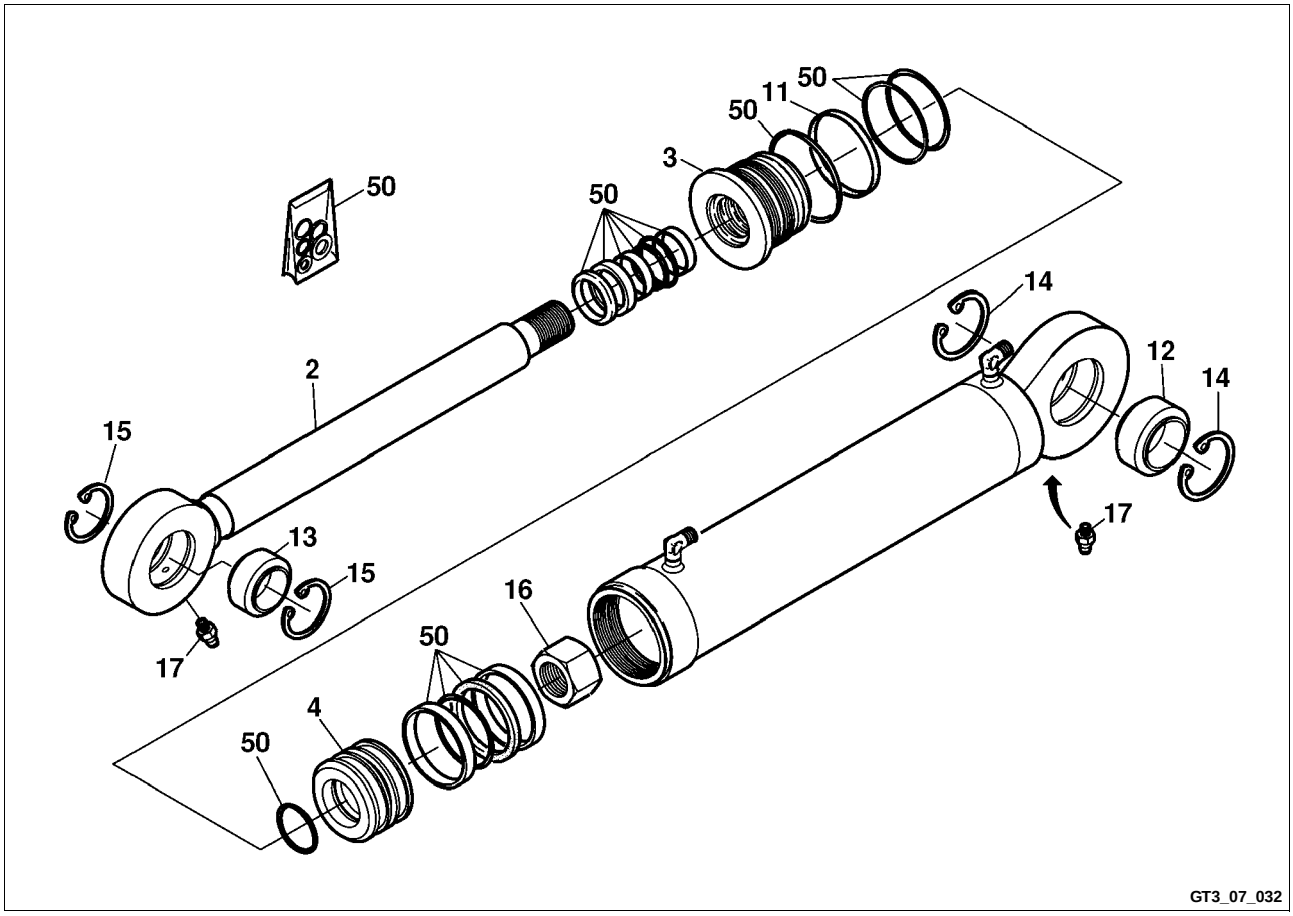


21. Counterweight
28. Nozzle
301. Pressure limiting valve
302. Pressure limiting valve
303. Valve
401. Inner transmission pump

4.11 Joint cylinder

Technical data

Piston Ø .....100 mm
Piston rod Ø .....50 mm
Lift .....367 mm
Min. useful length.....706 mm
Max. useful length.....1,073 mm
Useful lift .....339 mm
Housing side - pin with joint bearing Ø.....60 mm
Piston rod side - pin with joint bearing Ø....50 mm



2. Piston rod
3. Guide
4. Piston
11. Circlip
12. Joint bearing
13. Joint bearing
14. Circlip
15. Circlip
16. Hexagon nut
17. Lubricating nipple
50. Seal set

PARAGRAPH 8

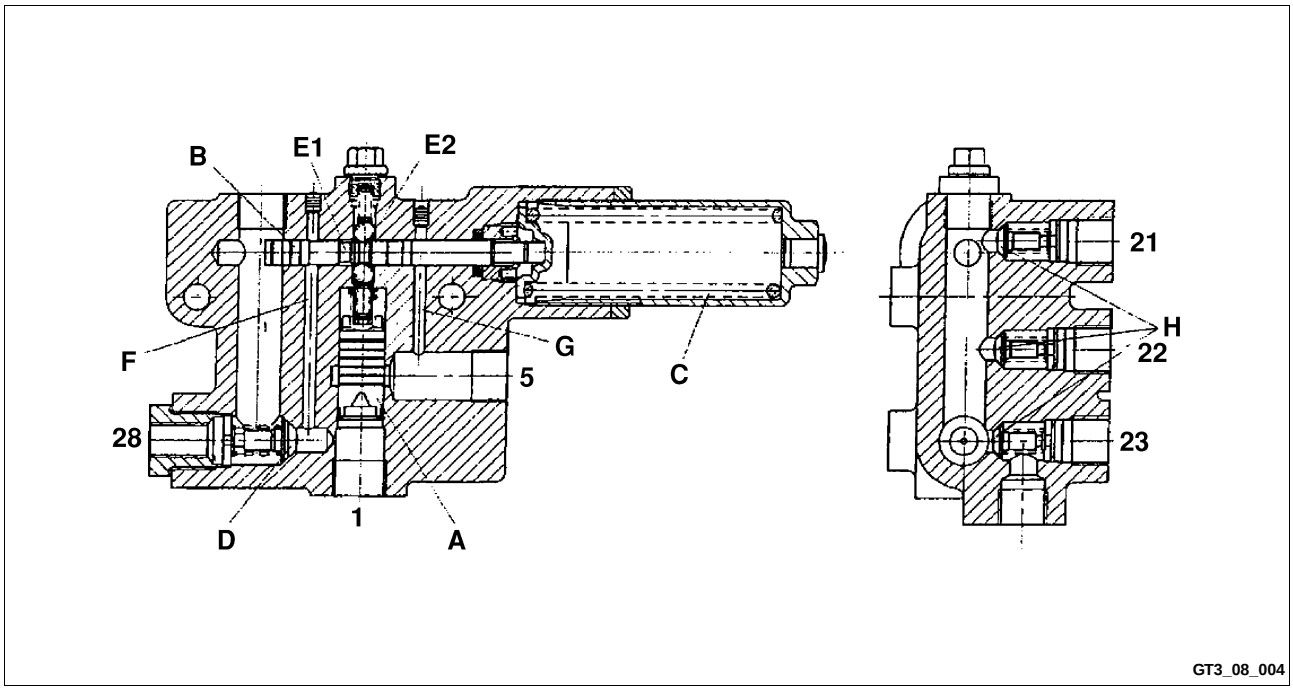
LIST OF CONTENTS

2 BRAKE SYSTEM COMPONENTS - FUNCTION DESCRIPTION

2.1 Reservoir charge valve - shutoff valve

2.1.1 Purpose

The function of the shutoff valve is to regulate the pressure level in the pressure reservoirs.



A. Main slide valve
B. Control valve with 2 locking positions
C. Spring assembly
D. Check valve
E1. Locking positions
E2. Locking positions
F. Connecting hole
G. Hole
H. Check valves to brake valve
1. Energy flow
5. Energy flow
21. Service brake (circuit I)
22. Service brake (circuit II)
23. Service brake (circuit III)
27. Hydraulic pressure reservoir
28. Pressure switch

Section 9

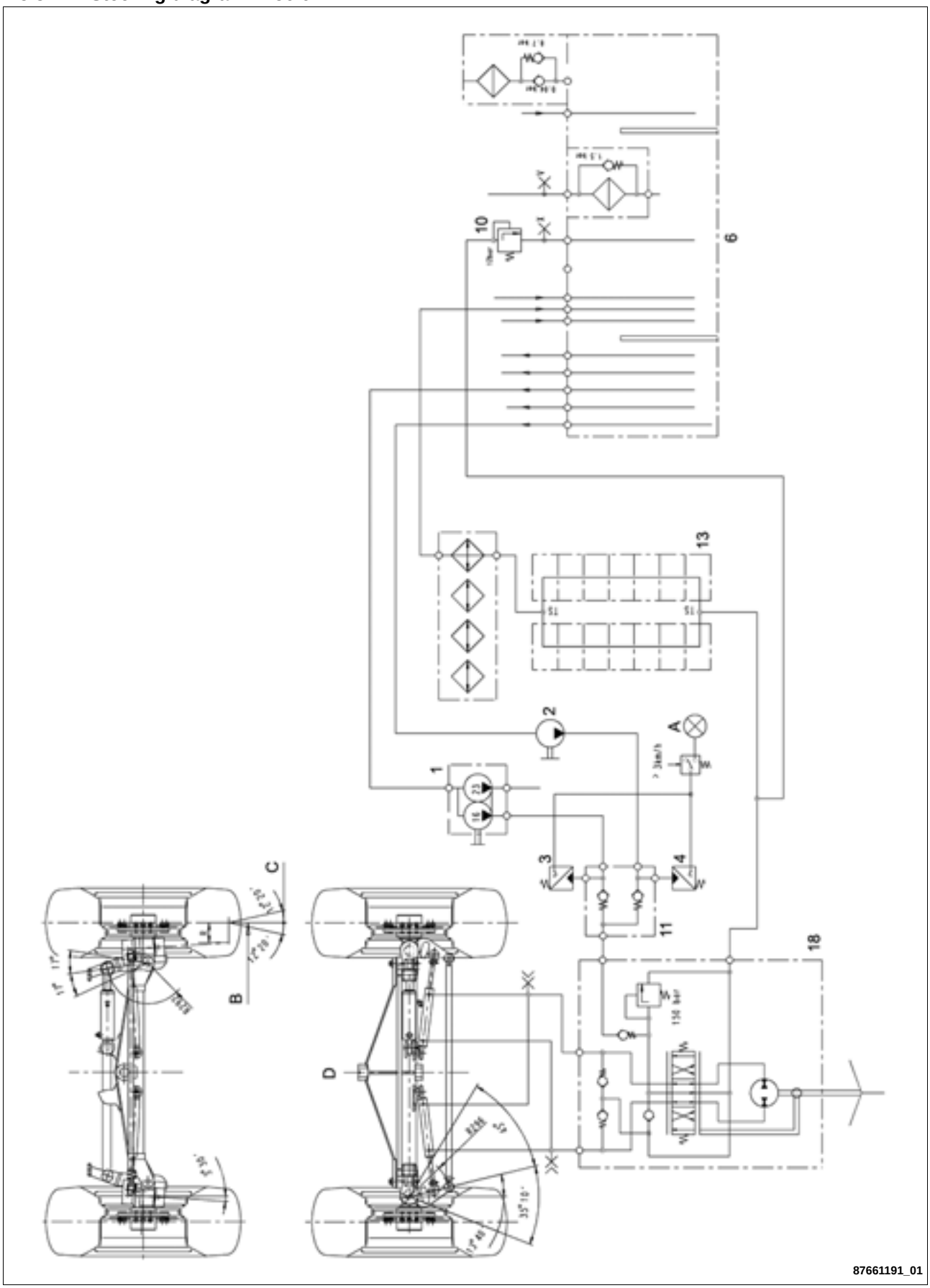
STEERING SYSTEM

CNH Baumaschinen GmbH
Product documentation
13581 Berlin, Staakener Str. 53-63

87726937A

December, 2007

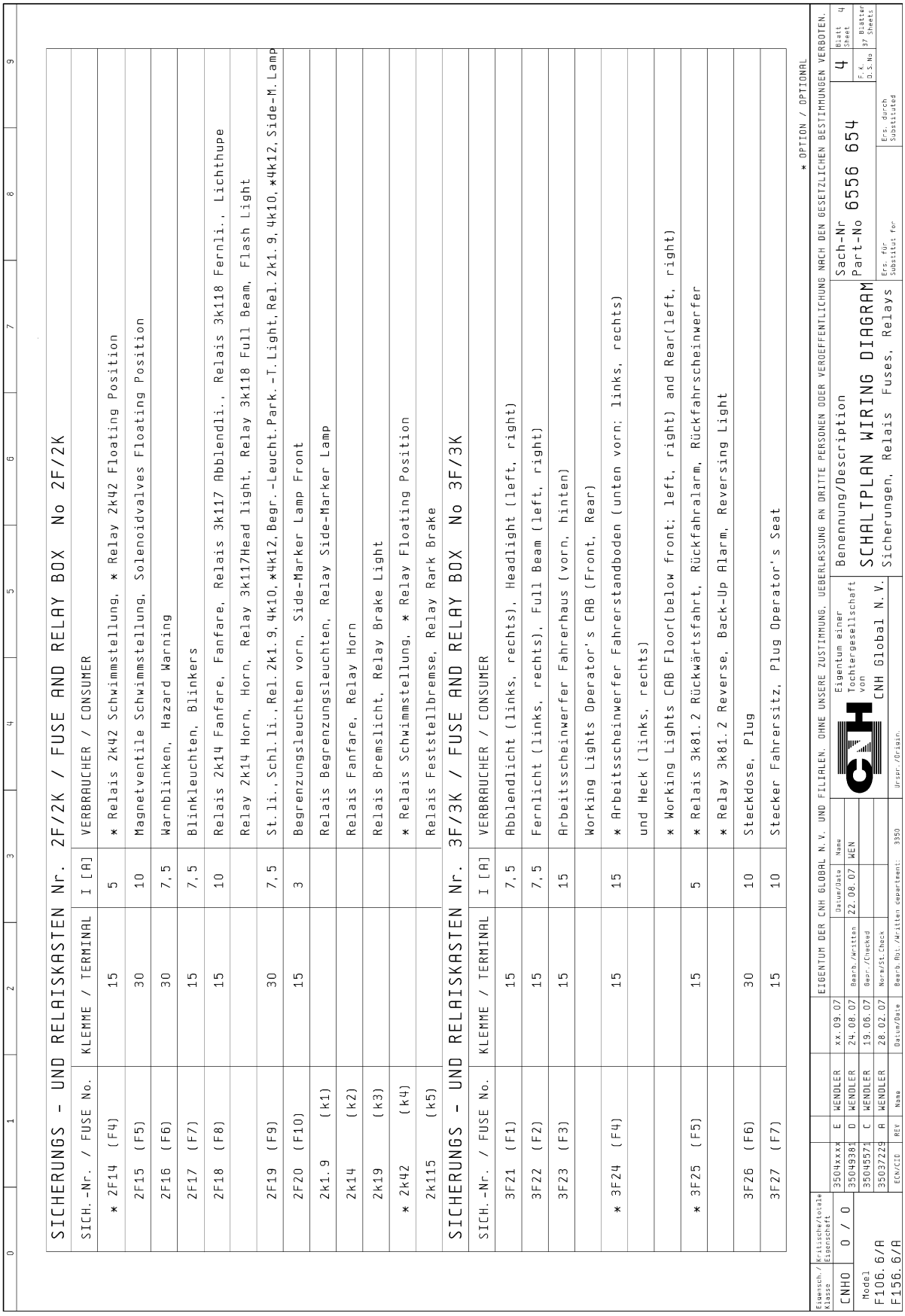
1.5.3 Steering diagram F156.6



PARAGRAPH 10

LIST OF CONTENTS

2.3 Sheet 4 - Fuse and relay box No. 2/3



SICHERUNGS - UND RELAISKASTEN Nr. 2F/2K / FUSE AND RELAY BOX No 2F/2K

SICH.-Nr. / FUSE No.	KLEMME / TERMINAL	I [A]	VERBRAUCHER / CONSUMER
* 2F14 (F4)	15	5	* Relais 2k42 Schwimmstellung, * Relay 2k42 Floating Position
2F15 (F5)	30	10	Magnetventile Schwimmstellung, Solenoidvalves Floating Position
2F16 (F6)	30	7,5	Warnblinken, Hazard Warning
2F17 (F7)	15	7,5	Blinkleuchten, Blinkers
2F18 (F8)	15	10	Relais 2k14 Fanfare, Fanfare, Relais 3k117 Abblendli., Relais 3k118 Fernli., Lichthupe
			Relay 2k14 Horn, Horn, Relay 3k117Head light, Relay 3k118 Full Beam, Flash Light
2F19 (F9)	30	7,5	St.li.,Schl.li.,Rel.2k1.9,4k10,*4k12,Begr.-Leucht.Park.-T.Light,Rel.2k1.9,4k10,*4k12,Side-M.Lamp
2F20 (F10)	15	3	Begrenzungsleuchten vorn, Side-Marker Lamp Front
2k1.9 (k1)			Relais Begrenzungsleuchten, Relay Side-Marker Lamp
2k14 (k2)			Relais Fanfare, Relay Horn
2k19 (k3)			Relais Bremslicht, Relay Brake Light
* 2k42 (k4)			* Relais Schwimmstellung, * Relay Floating Position
2k115 (k5)			Relais Feststellbremse, Relay Rark Brake

SICHERUNGS - UND RELAISKASTEN Nr. 3F/3K / FUSE AND RELAY BOX No 3F/3K

SICH.-Nr. / FUSE No.	KLEMME / TERMINAL	I [A]	VERBRAUCHER / CONSUMER
3F21 (F1)	15	7,5	Abblendlicht (links, rechts), Headlight (left, right)
3F22 (F2)	15	7,5	Fernlicht (links, rechts), Full Beam (left, right)
3F23 (F3)	15	15	Arbeitsscheinwerfer Fahrerhaus (vorn, hinten)
			Working Lights Operator's CAB (Front, Rear)
* 3F24 (F4)	15	15	* Arbeitsscheinwerfer Fahrerstandboden (unten vorn; links, rechts)
			und Heck (links, rechts)
			* Working Lights CAB Floor(below front; left, right) and Rear(left, right)
* 3F25 (F5)	15	5	* Relais 3k81.2 Rückwärtsfahrt, Rückfahralarm, Rückfahrscheinwerfer
			* Relay 3k81.2 Reverse, Back-Up Alarm, Reversing Light
3F26 (F6)	30	10	Steckdose, Plug
3F27 (F7)	15	10	Stecker Fahrersitz, Plug Operator's Seat

* OPTION / OPTIONAL

Eigensch./ Klasse	Kritische/lokale Eigenschaft					
CNHO	0 / 0	3504xxxx	E	WENDLER	xx.09.07	
		35049381	D	WENDLER	24.08.07	
		35045571	C	WENDLER	19.06.07	
		35037229	A	WENDLER	28.02.07	
		ECN/CID	REV	Name	Datum/Date	

Model
F106.6/A
F156.6/A

	Datum/Date	Name
Bearb./written	22.08.07	WEN
Gepr./Checked		
Norm/St.Check		
Bearb.Abt./Written department:	3350	

Eigentum einer Tochtergesellschaft von CNH Global N.V.

Benennung/Description
SCHALTPLAN WIRING DIAGRAM
Sicherungen, Relais Fuses, Relays

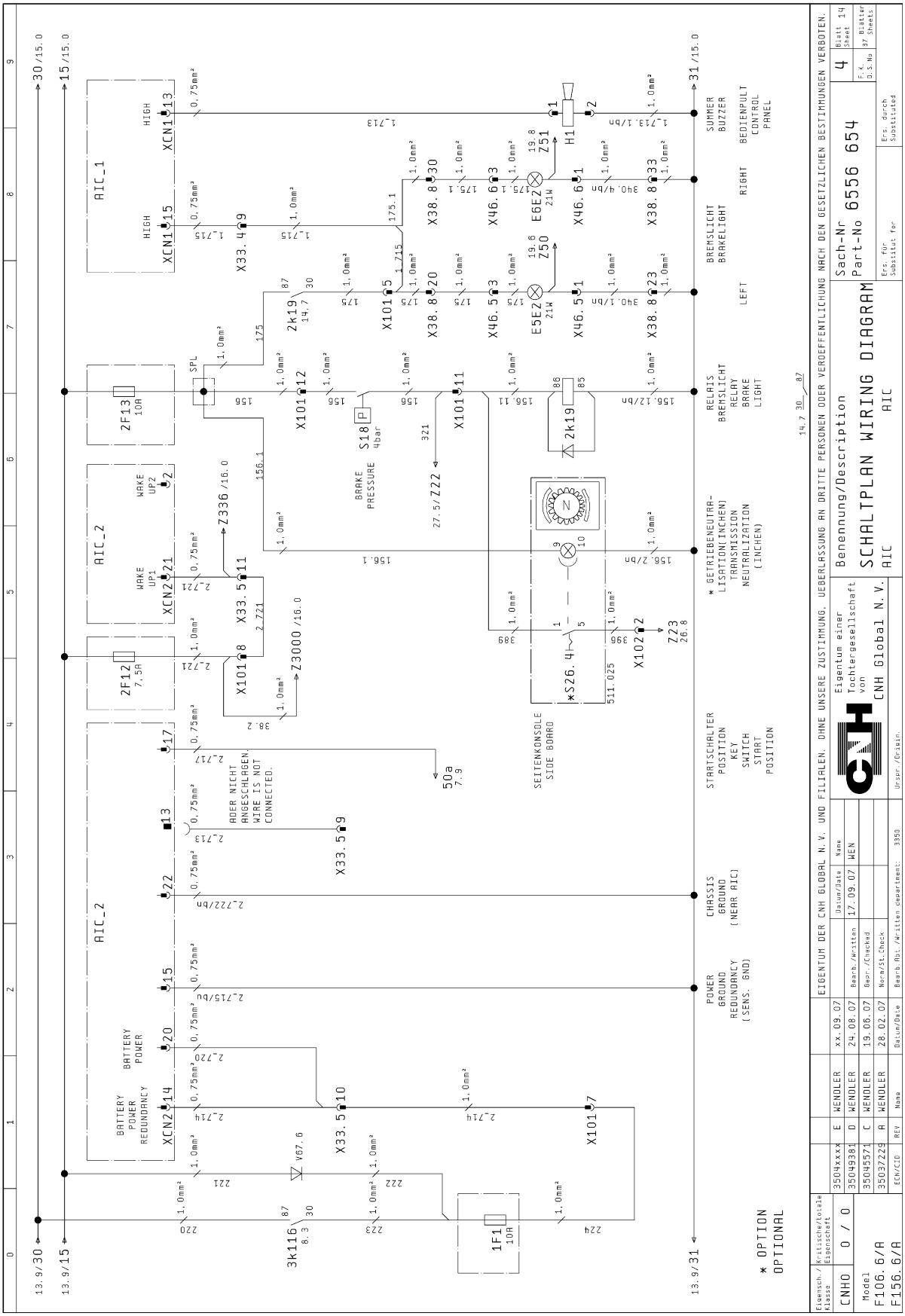
Sach-Nr / Part-No 6556 654

Ers. für / Substitut for

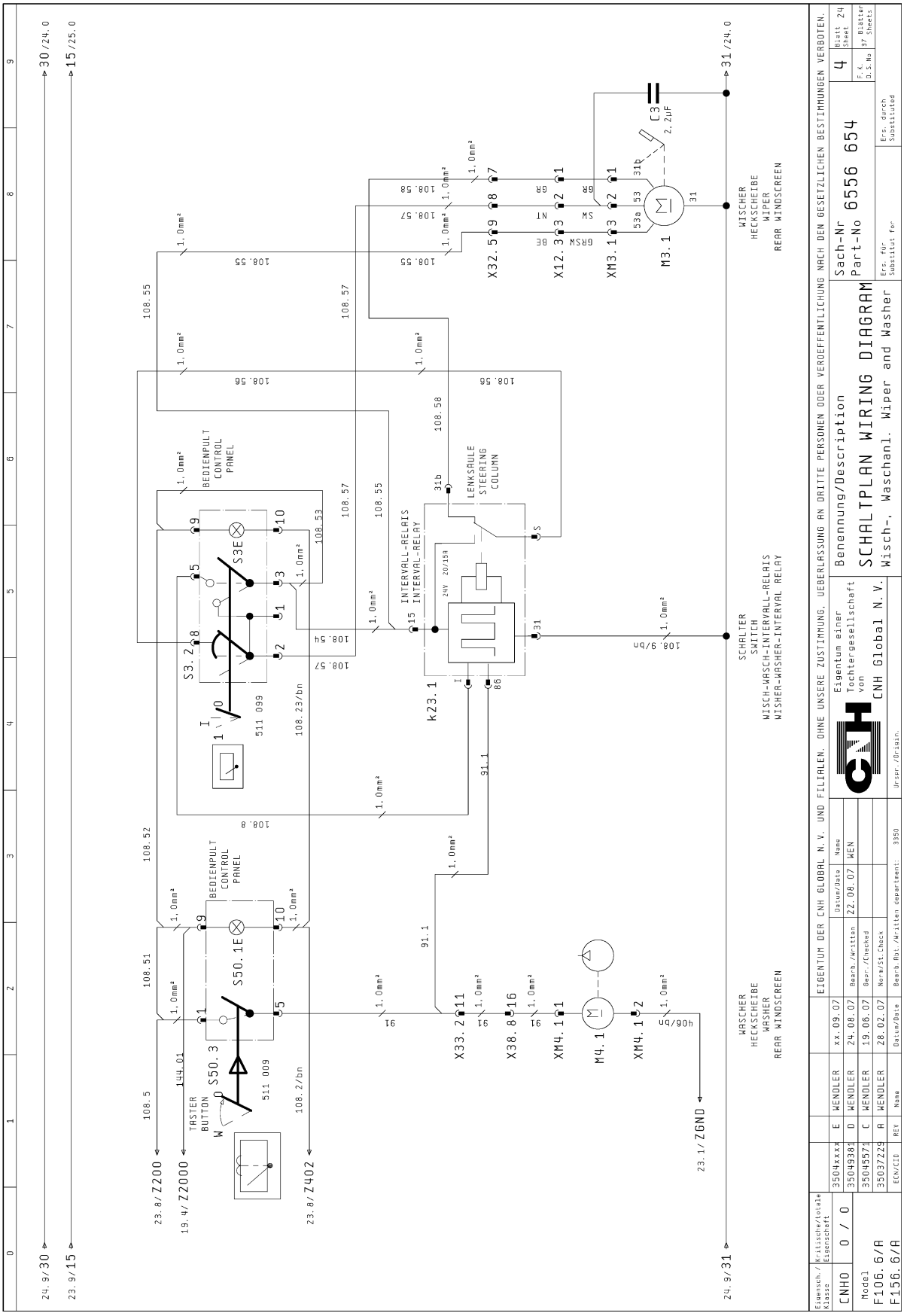
Ers. durch / Substituted

Blatt / Sheet 4
37 Blätter / Sheets
F. K. / D. S. No

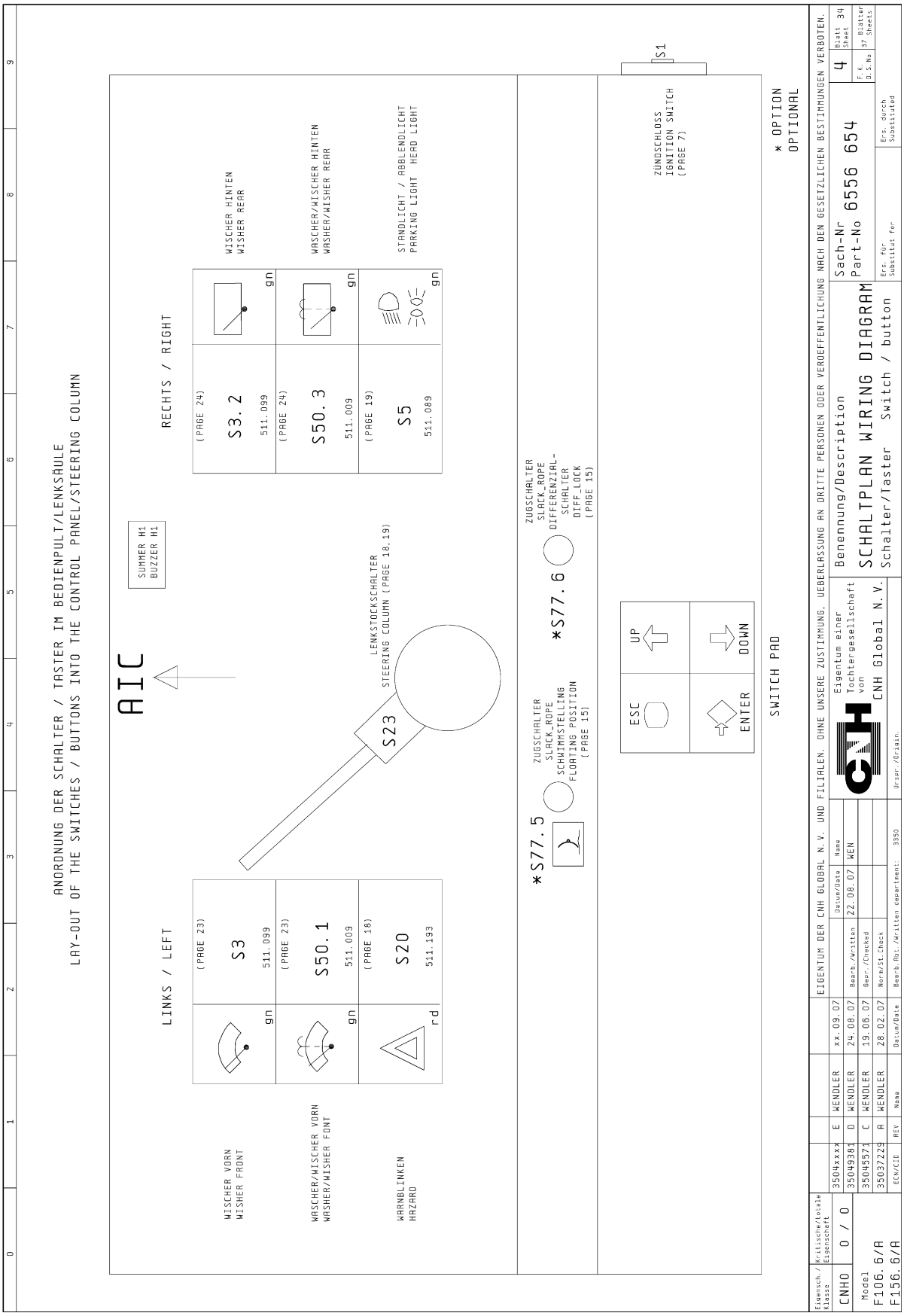
2.13 Sheet 14 - Power supply AIC_2, starter switch, start position, transmission neutralisation, brake light, buzzer



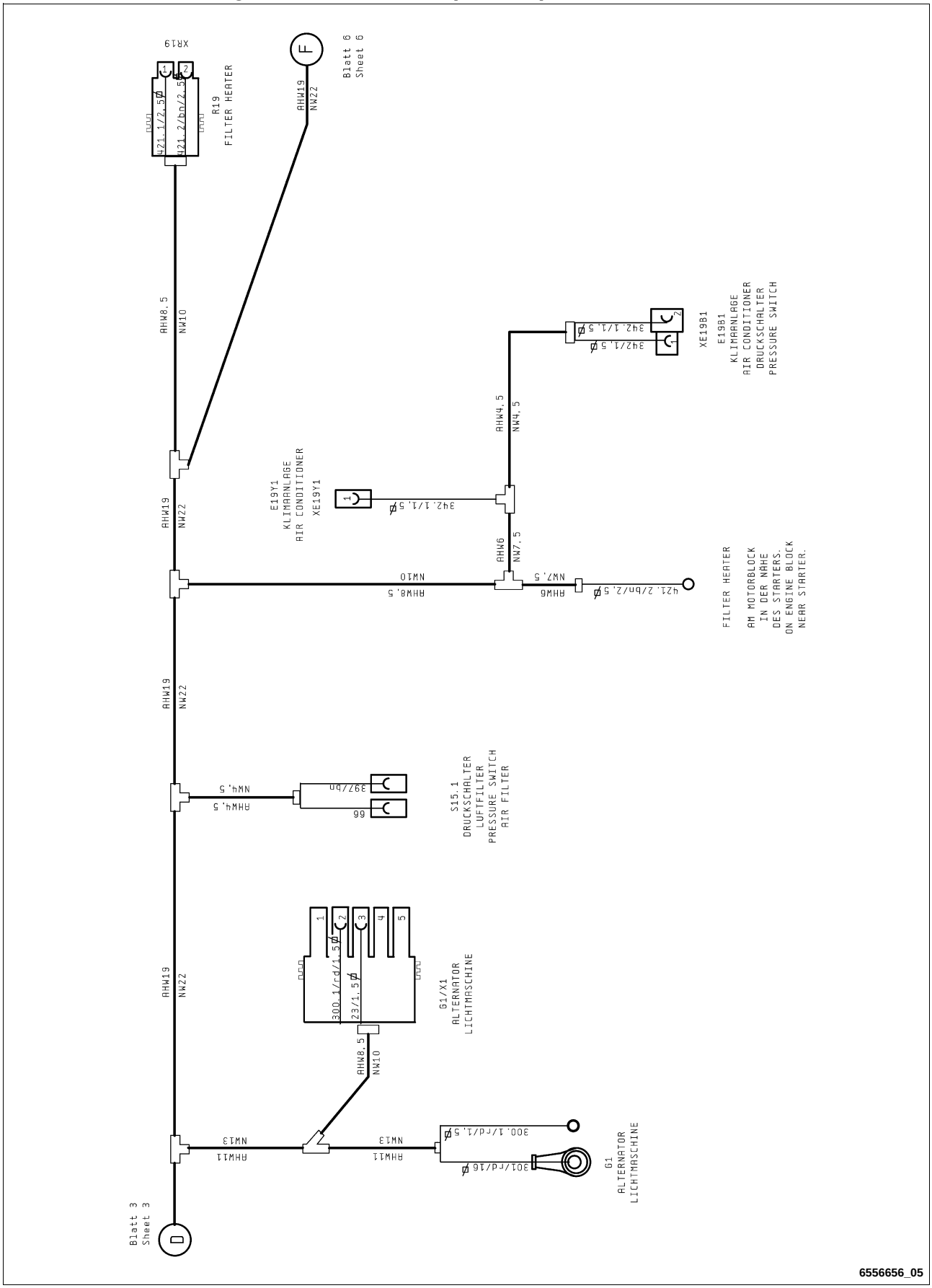
2.23 Sheet 24 - Wiper/washer system (rear)



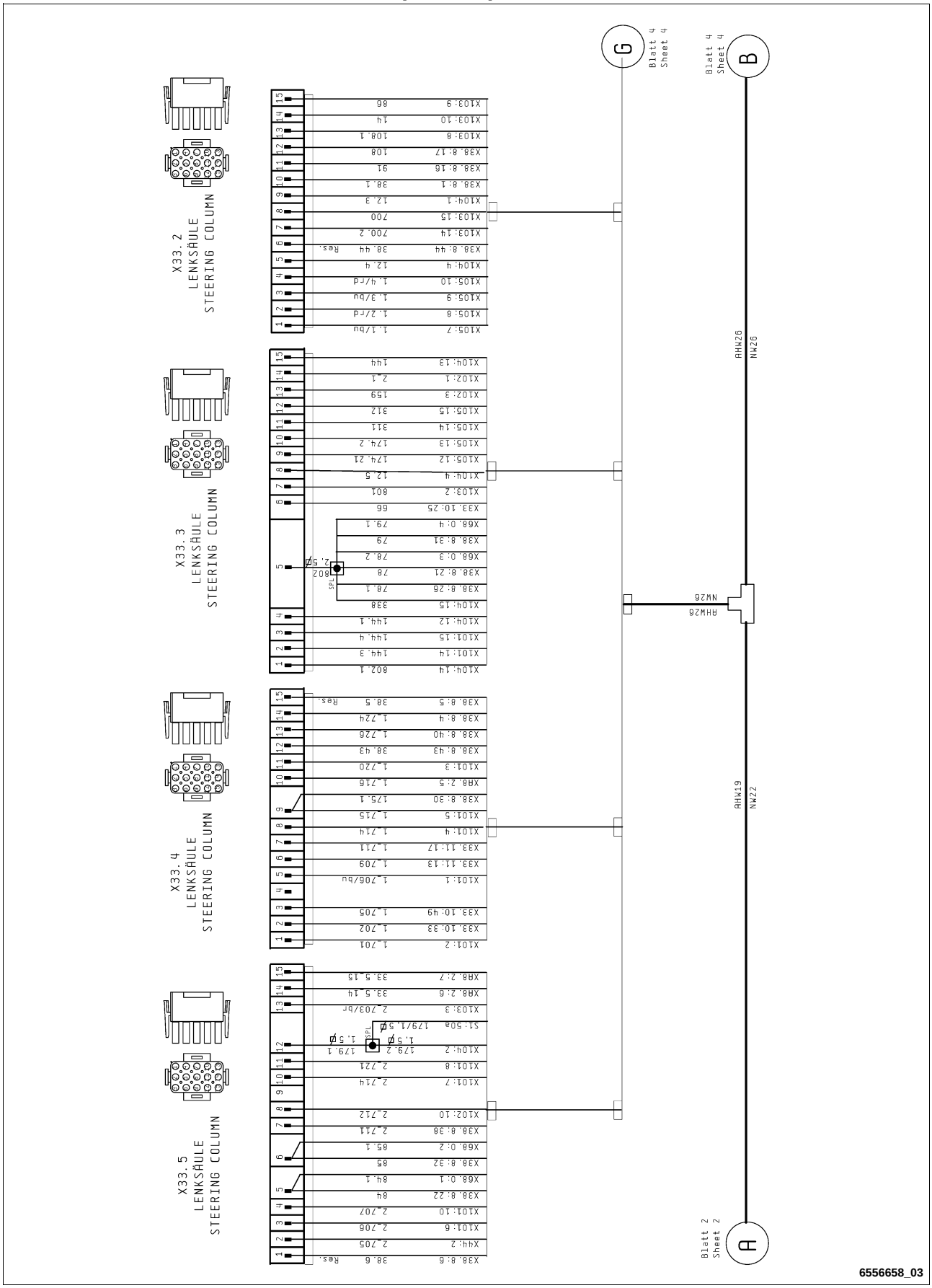
2.33 Sheet 34 - Layout of switches / buttons on control console / steering column



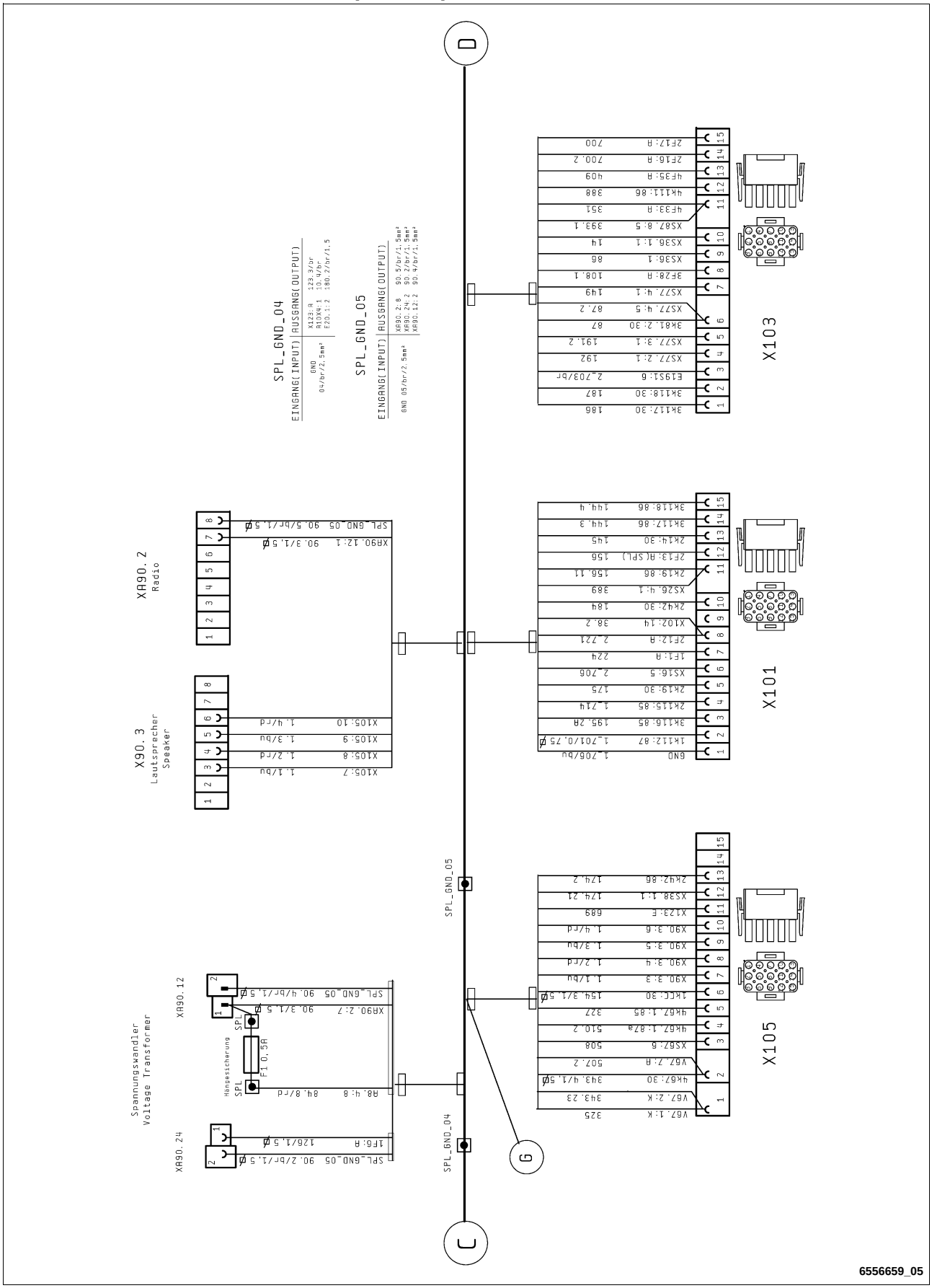
3.7 Cable set, engine - transmission (Sheet 5)



3.17 Cable set, driver's cab floor (Sheet 3)



3.27 Cable set, side console (Sheet 5)



code	Warning level	Meaning	Corrective action
1332	red	Water detected in fuel	Set driving mode, drain the fuel filter (drain the water)
1333	red	Engine speed too high	Set drive mode, check accelerator pedal
1334	red	Intake manifold temperature too high- value critical	Check cooling circuit (thermostat, radiator, lines)
1335	red	Brake pressure too low	1. Set vehicle mode 2. Allow engine to run at current idle speed (800 - 1,100 rpm) 3. Check brake system pressure 4. Check brake system for leaks
1336	yellow	Transmission fluid filter blocked	Replace filter element
1341	yellow	Emergency steering hydraulic fluid pressure too low	Check hydraulic fluid circuit

code	Warning level	Meaning	Corrective action
3249	yellow	TPU monitoring - time deviation between TPU and system not plausible	
3250	red	EDC software version data input error - invalid data set	
3251	yellow	Data input - required variant cannot be entered	
3252	yellow	Controller watchdog - SPI communication error	
3253	yellow	ADC monitoring error status	Call CNH / IVECO Service
3254	yellow	ADC monitoring error status	
3255	yellow	ADC monitoring error status	
3256	yellow	ADC monitoring error status	
3258	yellow	Short circuit at battery on high-pressure side power stage	Short circuit between wiring and external source, or in relay. Check wiring or replace relay
3259	yellow	Short circuit to ground on high-pressure side power stage	Short circuit between wiring and ground, or in relay. Check wiring or replace relay
3260	yellow	Load interruption on low-pressure side power stage	Wiring broken or disconnected or relay faulty. Check wiring or replace relay
3261	yellow	Short circuit at battery or temperature too high in low-pressure side power stage	Short circuit between wiring and external source, or in relay. Check wiring or replace relay
3262	yellow	Short circuit to ground on low-pressure side power stage	Short circuit between wiring and ground, or in relay. Check wiring or replace relay
3265	red	Activation time exceeds overflow monitoring limit	Electronic fault, torque increase required with tester, incorrect application of injection-related parameters, EDC fault. Check injection-related application parameters, if fault cannot be cleared, replace EDC
3266	red	Plausibility error during engine rpm test	Electronic fault, EDC internal fault. If fault continues after re-installation, replace EDC
3278	red	Supply voltage CJ940 upper limit	Power supply too high for a CJ940 component: Battery voltage too high, wiring fault, internal EDC fault. Check battery for correct power supply, check wiring. If fault continues, replace EDC (internal fault)

4.4 FWD control error code (all-wheel control)

code	Warning level	Meaning	Corrective action
5150	yellow	Unknown error	Stop operation
5151	yellow	Short circuit in forward proportional valve	Stop operation
5152	yellow	Open circuit in forward proportional valve	Stop operation
5153	yellow	Short circuit in reverse proportional valve	Stop operation
5154	yellow	Open circuit in reverse proportional valve	Stop operation
5155	yellow	Short circuit in chamber valve	Stop operation
5156	yellow	Open circuit in chamber valve	Stop operation
5157	yellow	Short circuit in all-wheel front axle solenoid valve	Stop operation
5158	yellow	Open circuit in all-wheel front axle solenoid valve	Stop operation

4.5 Internal AIC error code

code	Warning level	Meaning	Corrective action
9128	yellow	CAN timeout during transmission operation	If the fault is permanent or occurs frequently, check the CAN wiring harness and CAN bus circuit connections
9129	yellow	CAN timeout during engine operation	
9130	yellow	CAN timeout during keypad operation	
9132	yellow	CAN timeout during all-wheel drive operation	