Workshop Service Manual

FENDT 700 Vario S4

FENDT 714 Vario S4
738 .. 01001-

FENDT 716 Vario S4
739 .. 01001-

FENDT 718 Vario S4
740 .. 01001-

FENDT 720 Vario S4
741 .. 01001-

FENDT 722 Vario S4
742 .. 01001-

FENDT 724 Vario S4
743 .. 01001-

Marktoberdorf
AGCO GmbH - Johann-Georg-Fendt-Str. 4 - D-87616 Marktoberdorf
FENDT is a worldwide brand of AGCO

August 2017
X990.005.538.013
5204
English

Position: Left and right at the front axle

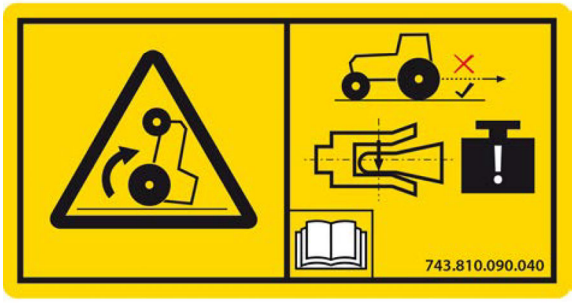
743.500.410.040

DANGER:
Danger of body parts being crushed. Switch the engine off and remove the ignition key before maintenance and repair work.

Position: Left / right rear left mudguard, rear

743.810.090.040

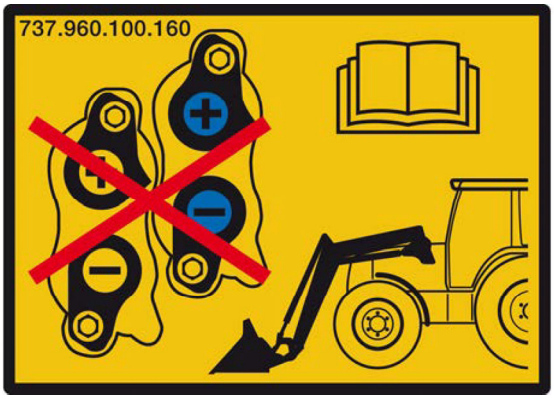
WARNING:
Serious injury or death caused by the vehicle tipping over
Exceeding the maximum permissible hitch load on the towing hitch can result in critical driving conditions through the front wheels being raised. In the worst case, the vehicle can tip over. This can cause serious injury and even death.
Always respect the maximum hitch load indicated on the sign plate of your vehicle.



Position: Above the hydraulic couplers at rear and on right side of tractor, next to hydraulic couplers in the centre

737.960.100.160

NOTE:
Do not use the hydraulic connectors simultaneously. Do not use the hydraulic valves for the front loader with the hydraulic couplers in the rear when a front loader is attached.



Technical data: Dimensions and weights							
Tractor type		**714 Vario**	**716 Vario**	**718 Vario**	**720 Vario**	**722 Vario**	**724 Vario**
Chassis number		**738/../**	**739/../**	**740/../**	**741/../**	**742/../**	**743/../**
Front bolt pitch-circle diameter	mm	335					
Front axle bolt and thread	-	10 units M20x1.5					
Rear bolt pitch-circle diameter	mm	275		335			
Rear axle bolt and thread	-	8 units M22x1.5		10 units M22x1.5			
Rear axle ratio	i	34.29		35.96			
Front axle ratio	i	13.6					
Tightening torques							
Front wheel nut	Nm	450					
Rear wheel nuts	Nm	450		580			
Wheel weight: M16, 8.8, yellow zinc-plated bolts	Nm	190					
Wheel weight: M16, 10.9, black bolts	Nm	295					
Wheel weight: M16, 10.9, silver-gray bolts	Nm	250					

1.2.2 Transmission

Tractor type		714 Vario	716 Vario	718 Vario	720 Vario	722 Vario	724 Vario
Chassis no.:		**738/../**	**739/../**	**740/../**	**741/../**	**742/../**	**743/../**
Transmission oil (Vario transmission)							
Oil grade	-	FENDT Extra Trans 10W-40 or STOU SAE 10W-40 STOU SAE 15W-40					
Transmission, initial fill	l	approx. 58					
Transmission, subsequent fills	l	approx. 47					
Oil quantity between Min. and Max. marks	l	approx. 3					
Oil change interval	Op. hrs / years	2000 / 2					

Tractor type		714	716	718	720	722	724
Chassis number		738/../	739/../	740/../	741/../	742/../	743/../
Overload slip clutch.	-	Wet multiple disc clutch					
Minimum dynamic slip torque	Nm	3000 ± 10%					
Roll resistance of the pinion shaft bearing (measured without seals)	Nm (Ncm)	2.5 ... 5.5 (250 to 550)					

Tractor type		714	716	718	720	722	724
Chassis number		738/../	739/../	740/../	741/../	742/../	743/../
Swing arm	-	Longitudinal oscillation					
Spring travel	mm	± 50					
Oscillation angle	degrees	8 ± 1					
Suspension cylinder diameter	mm	60					
Suspension piston rod diameter	mm	50					
Volumes of suspension accumulators	l	1 x 1.4 + 1 x 0.75					
Nitrogen fill pressure of suspension accumulators	bar	60					
Volume of anti-bounce accumulator	l	1 x 0.75					
Nitrogen fill pressure of anti-bounce accumulators	bar	120					
Pressure limiting (raise)	bar	250					
Min. axle load (suspension)	kg	Approx. 1600					
Max. axle load (suspension)	kg	Approx. 7000					

Fault code	DIN brief description	Cause	Consequences and remedy Service
01.1.3F	**A050** - Basic control unit ECU (EXT) **A077** - Immobilizer ECU	A050 equipment features do not match	Speed governor and 4WD engage when braking New activation Carry out EOL programming
01.1.6E	**A099** - Engine control unit ECU (EDC 17) **B102** - AdBlue® temperature/fill level sensor	AdBlue (DEF) tank sensor fault or message for AdBlue tank level was not received	AdBlue (DEF) tank display goes to zero (flashing bar).
01.1.7A	**A100** - Multifunction armrest (MFA)	Electrical fault (cruise control button MIN)	TMS is switched off
01.1.7B	**A100** - Multifunction armrest (MFA)	Electrical fault (cruise control button MAX)	TMS is switched off
01.1.7C	**A100** - Multifunction armrest (MFA)	Electrical fault (TMS button)	TMS is switched off
01.1.7E	**A100** - Multifunction armrest (MFA)	Electrical fault (potentiometer; hand throttle)	
01.1.8A	**A099** - Engine control unit ECU (EDC 17)	Time-out of "engine temperature" message from EDC	Engine diagnostics
01.1.8B	**A099** - Engine control unit ECU (EDC 17)	Time-out of "charge air temperature" message from EDC	
01.1.9A	**A100** - Multifunction armrest (MFA)	Communication fault with cruise control button MIN	TMS is switched off
01.1.9B	**A100** - Multifunction armrest (MFA)	Communication fault with cruise control button MAX	TMS is switched off
01.1.9C	**A100** - Multifunction armrest (MFA)	Communication fault with TMS key	TMS is switched off
01.1.9E	**A100** - Multifunction armrest (MFA)	Communication fault with Hand throttle potentiometer	

Fault code	DIN brief description	Cause	Consequences and remedy Service
04.1.F0	**A050** - Basic control unit ECU (EXT)	Checksum for gearbox calibration parameters incorrect	Gearbox cannot be calibrated Carry out EOL programming
04.1.F1	**A050** - Basic control unit ECU (EXT)	Checksum for stationary control parameters incorrect	Emergency mode Carry out EOL programming
04.1.F2	**A050** - Basic control unit ECU (EXT)	Transmission values outside the permissible range	Perform transmission calibration
04.1.F3	**A050** - Basic control unit ECU (EXT)	Error in transmission ratio restriction checksum	Emergency mode, gearbox Carry out EOL programming
04.1.F4	**A050** - Basic control unit ECU (EXT)	EXT memory could not be reserved	Continuation in emergency mode possible Carry out EOL programming
04.1.F5	**A050** - Basic control unit ECU (EXT)	Checksum error, "instance for selecting the optimum speed source" parameter	Default values Carry out EOL programming
04.2.40	**B016** - Travel range detection sensor	Transmission travel speed range is not recognized correctly	Calibration code "4003"
04.2.41	**A050** - Basic control unit ECU (EXT) **B009** - Discharge temperature sensor	Condition for switching switch level not fulfilled.	
04.2.51	**B009** - Discharge temperature sensor	Gearbox oil temperature >95°C	Switching from travel speed range 2 to travel speed range 1
04.2.52	**B009** - Discharge temperature sensor	Gearbox oil temperature >105°C	**Transmission damage** if operation is continued!

Fault code	DIN brief description	Cause	Consequences and remedy Service
08.1.33	**B031** - Right-hand draft sensing pin	Warning: right draft sensing pin overloaded	warning message only
08.1.34	**B032** - Left-hand draft sensing pin	Warning: left draft sensing pin overloaded	warning message only
08.1.40	**S029** - Left external rear power lift raise button	Faulty button, Signal fault	Button inoperable until next trouble-free cold start Power lift can be operated internally after short ignition OFF/ON
08.1.41	**S030** - Left external rear power lift lower button	Faulty button, Signal fault	Button inoperable until next trouble-free cold start Power lift can be operated internally after short ignition OFF/ON
08.1.42	**S027** - Right external rear power lift raise button	Faulty button, Signal fault	Button inoperable until next trouble-free cold start Power lift can be operated internally after short ignition OFF/ON
08.1.43	**S028** - Right external rear power lift lower button	Faulty button, Signal fault	Button inoperable until next trouble-free cold start Power lift can be operated internally after short ignition OFF/ON
08.1.44	**A100** - Multifunction armrest (MFA)	Rear power lift STOP button faulty. Signal fault	Button inoperable until next trouble-free cold start Power lift can be operated internally after short ignition OFF/ON

Fault code	DIN brief description	Cause	Consequences and remedy Service
0A.1.4E	**Y179** - Position 4 spool valve (green)	RAM or FLASH test fault	Valve moves to neutral and locks
0A.1.4F	**Y179** - Position 4 spool valve (green)	- No setpoint message No configuration message Setpoint message not plausible configuration message not plausible Potentiometer/PW error	Valve moves to neutral and locks
0A.1.50	**Y180** - Position 5 spool valve (brown)	Valve 5 does not report to CAN BUS	Valve moves to neutral and locks
0A.1.51	**Y180** - Position 5 spool valve (brown)	EEPROM inconsistent	Valve moves to neutral and locks
0A.1.52	**Y180** - Position 5 spool valve (brown)	Undervoltage (where U < 8V)	Valve moves to neutral and locks
0A.1.53	**Y180** - Position 5 spool valve (brown)	Overvoltage, safe (where U > 18 V)	Valve moves to neutral and locks
0A.1.54	**Y180** - Position 5 spool valve (brown)	Valve spool stops short (frequent cause: control pressure dips briefly or oil too viscous at very low temperatures)	Valve moves to neutral and locks
0A.1.55	**Y180** - Position 5 spool valve (brown)	High overvoltage (> 45V)	Valve moves to neutral and locks
0A.1.56	**Y180** - Position 5 spool valve (brown)	Final stage error (pilot control solenoid valve)	Valve moves to neutral and locks
0A.1.57	**Y180** - Position 5 spool valve (brown)	Position pickup sensor error	Valve moves to neutral and locks

Fault code	DIN brief description	Cause	Consequences and remedy Service
0B.1.B4	**A050** - Basic control unit ECU (EXT)	Configuration wizard: error with writing or reading settings and parameters on tractor start-up/end or formula management	
0B.1.B5	**A050** - Basic control unit ECU (EXT)	Configuration wizard: Equipment of the saved formula no longer matches the current equipment of the tractor	Save formula again and restart the tractor
0B.2.00	**A050** - Basic control unit ECU (EXT)	Warning message when engine speed < 400 for sequence start in implement control unit	
0B.2.01	**A050** - Basic control unit ECU (EXT)	Warning message on cancel as seat switch is no longer being pressed	
0B.2.02	**A050** - Basic control unit ECU (EXT)	Warning message if speed is too high at the start of a sequence	
0B.2.03	**A050** - Basic control unit ECU (EXT)	Warning message if speed is too low at the start of a sequence	Valve moves to neutral and locks
0B.2.44	**A050** - Basic control unit ECU (EXT)	Internal error for TeachIn	
0B.2.51	**A050** - Basic control unit ECU (EXT) **A100** - Multifunction armrest (MFA)	"STOP" was pressed. TeachIn execution was interrupted	
0B.2.66	**A050** - Basic control unit ECU (EXT)	Save configuration changes for pop-ups	
0B.2.67	**A050** - Basic control unit ECU (EXT)	Save edit changes for pop-ups	
0B.2.6A	**A050** - Basic control unit ECU (EXT)	Invalid edit settings for pop-ups	

Fault code	DIN brief description	Cause	Consequences and remedy Service
14.1.15	**A139** - Front loader profi ECU **B213** - Tractor tilt sensor	Calibration values invalid or calibration not performed	Calibrate tilt Calibration code "8022"
14.1.16	**B210** - Sensor for raising lift cylinder	Break in wiring Short circuit to earth or supply voltage Supply voltage faulty	Scales pre-selection inactive
14.1.17	**B211** - Sensor for lowering lift cylinder	Break in wiring Short circuit to earth or supply voltage Supply voltage faulty	Scales pre-selection inactive
14.1.18	**A139** - Front loader profi ECU	Calibration values invalid or calibration not performed If calibration "8020–8022" is performed, the fork hysteresis is reset and this fault code is displayed	Calibrate hysteresis Calibration code "8023"
14.1.19	**A139** - Front loader profi ECU	EEPROM fault SRC4/5 Parameters could not be read or parameters invalid	Scales pre-selection inactive
14.1.1A	**A050** - Basic control unit ECU (EXT) **A139** - Front loader profi ECU	EEPROM fault, Profi front loader EXT Parameters could not be read	Tool lock inactive Operating space limitation inactive Limit position damping inactive Profi functions inactive Scales pre-selection inactive

Fault code	DIN brief description	Cause	Consequences and remedy Service
1D.1.72	**A099** - Engine control unit ECU (EDC 17) **B086** - Rail pressure sensor	Rail pressure release valve has tripped	Read the engine-specific error code using engine diagnostics
1D.1.75	**Y091** - Dispensing unit	Rail pressure control error	Read the engine-specific error code using engine diagnostics
1D.1.76	**A099** - Engine control unit ECU (EDC 17) **Y095** - Injector 1 **Y096** - Injector 2 **Y097** - Injector 3 **Y098** - Injector 4 **Y100** - Injector 5 **Y101** - Injector 6	Fault in one or more injectors	Read the engine-specific error code using engine diagnostics
1D.1.79	**B217** - Temperature downstream of venturi sensor	Electrical fault	Read the engine-specific error code using engine diagnostics
1D.1.7A	**B194** - Pressure sensor, downstream of diesel particulate filter	Plausibility error	Read the engine-specific error code using engine diagnostics
1D.1.7C	**B092** - Charge air pressure/temperature sensor	Boost pressure too high	Read the engine-specific error code using engine diagnostics
1D.1.A2	***** - General cross-component system error	Oil temperature	Read the engine-specific error code using engine diagnostics
1D.1.A5	**B089** - Coolant temperature sensor	Coolant temperature too high	Read the engine-specific error code using engine diagnostics
1D.1.AA	**A099** - Engine control unit ECU (EDC 17)	SCR monitoring, crystallization, Standstill requested	Read the engine-specific error code using engine diagnostics

Fault code for calibration code 4007

Fault code	Cause	DIN short description
F02	**A009** actuator unit reporting a fault Frequent cause of fault: During previous fault-generated calibration exit, no "Key reset (ignition OFF/ON)" was carried out	**A050** basic control unit ECU
F03	**A009** actuator unit fails to control the specified value exactly. Check that the transmission adjustment is smooth.	
F04	Transmission ratio adjustment not effected within 8 sec. Check that the transmission adjustment is smooth.	
F05	Step 1 = **A009** actuator unit does not find neutral point 0 in forwards direction. Step 2 = **A009** actuator unit does not find neutral point 0 in reverse direction. Check connection of **A009** actuator unit to actuator shaft.	
F06	See under error message F05	
F07	Step 2: The neutral points of the transmission control system for forwards and reverse travel are too far apart, more than 8°. Check connection of **A009** actuator unit to actuator shaft.	
F08	Step 3: Max. transmission ratio forward point not found. Target value min. 155°, max. 187° Step 4: Max. transmission ratio reverse point not found. Target value min. 136°, max. 165°. Check connection of **A009** actuator unit to actuator shaft.	
F09	Step 3: Forward actuator shaft adjustment greater than 155°. but transmission rotation reacts less than 155° Step 4: Reverse actuator shaft adjustment greater than 135°. but transmission adjustment reacts below 135° Check connection of **A009** actuator unit to actuator shaft.	
F10	Transmission ratio characteristic illogical e.g. shifted forward and reverse detected. Repeat calibration. See also error message F 2. Check rotational direction signal from **B014** collecting shaft sensor	

B019 - Compressed air supply sensor, circuit 2

Right side of transmission.

Remove right rear wheel and panel

NOTE:
Installed up to chassis number: ../../2500

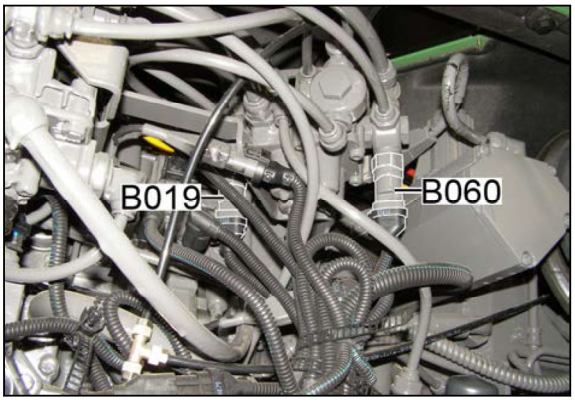


Fig. 61

B020 rear PTO (stub shaft) speed sensor

Rear of trailer, on PTO stub shaft

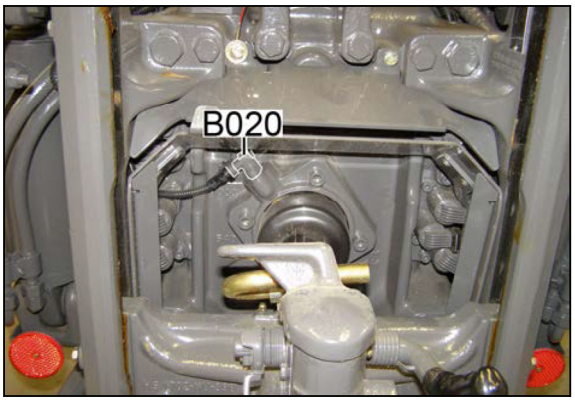


Fig. 62

B021 rear PTO (clutch) speed sensor

Rear of tractor, on the left side of the rear axle cover

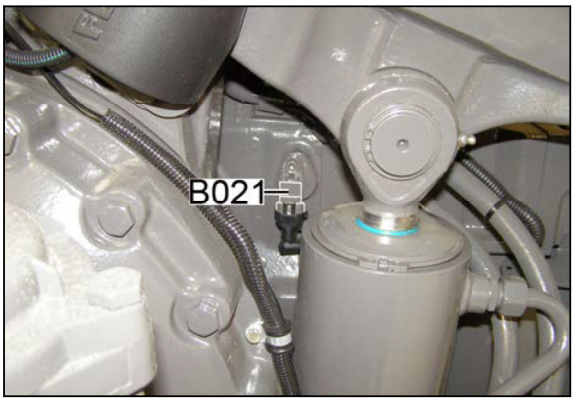


Fig. 63

B031 right-hand draft sensing pin

B032 left-hand draft sensing pin

Lower link bearing (right and left)

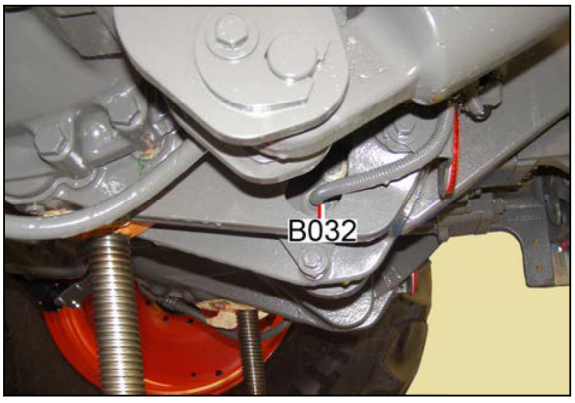


Fig. 64

E215 rear right LED direction indicator

Fig. 124

E216 AdBlue suction and return line heater

E217 AdBlue pressure line heater

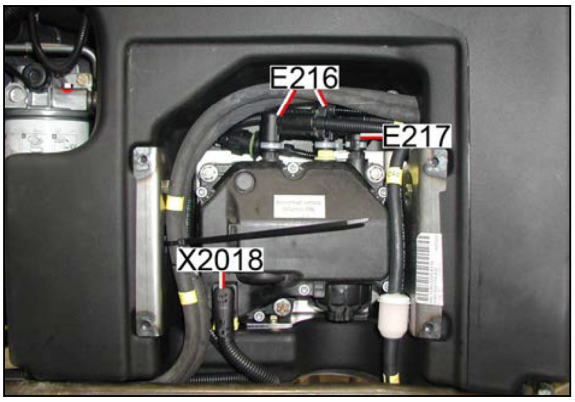


Fig. 125

E219 fuel pre-filter heater

Fig. 126

E220 right-hand rotary beacon

E221 left-hand rotary beacon

Fig. 127

S105 right-hand brake switch

S106 left-hand brake switch

In cab, steering column right.

Detach panel

Fig. 182

S119 hydraulic oil filter contamination switch

Right side of tractor, on the hydraulic oil tank

Fig. 183

S125 battery isolator switch

Cab, right mudguard

Fig. 184

S132 SA/DA comfort front power lift switch

Left side of tractor, on the frame in the front axle area

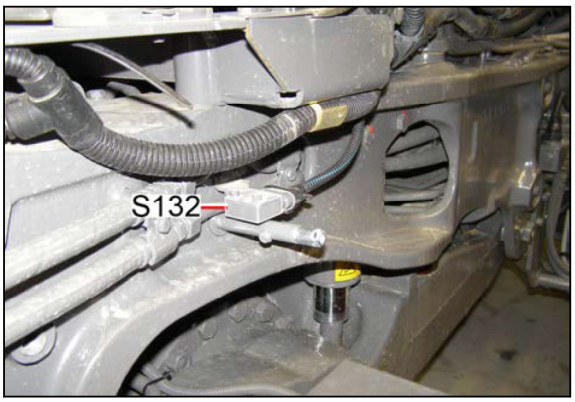


Fig. 185

X4014 - Engine-cover cable coupling

In the engine cover

Open engine cover.

Fig. 243

X4027 - Operator platform/cab cable coupling

Cab, right mudguard, top

Detach panel

Fig. 244

X4028 - Air flow distribution cable coupling

Cab, on left of steering column

Detach panel

Fig. 245

X4034 - Wiper cable coupling

Cab, top front

Fig. 246

X4199 - Injectors 1, 2 and 3: "high" connector

X4200 - Injectors 4, 5 and 6: "high" connector

Left side of tractor, next to the fuel tank

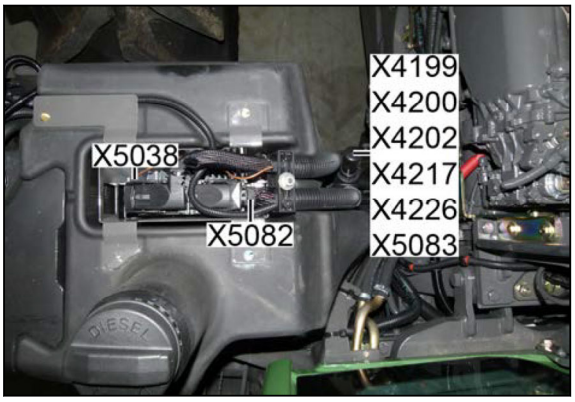


Fig. 305

X4201 - M bus connector

Top of engine compartment

Open engine cover.

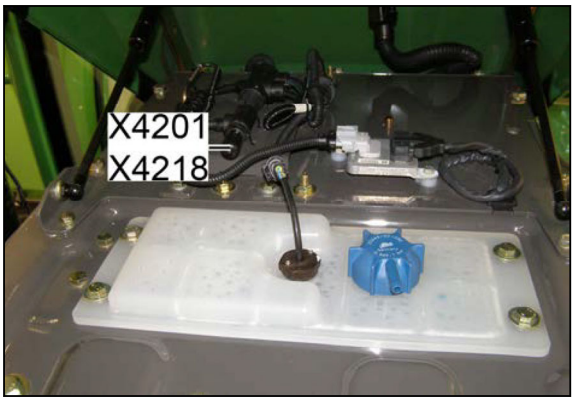


Fig. 306

X4202 - Sensor system earth connector

Left side of tractor, next to the fuel tank

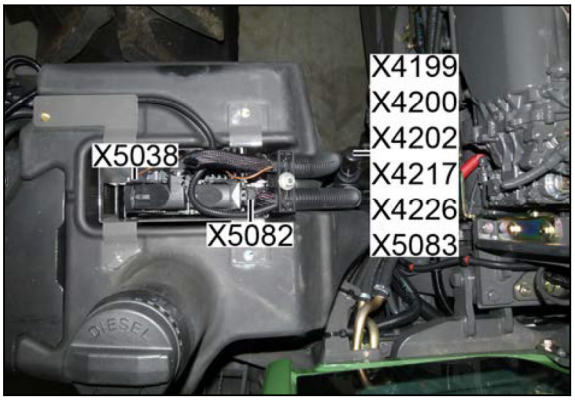


Fig. 307

X4206 - UB 15 connector (NOx)

Middle of the tractor, on the engine bulkhead

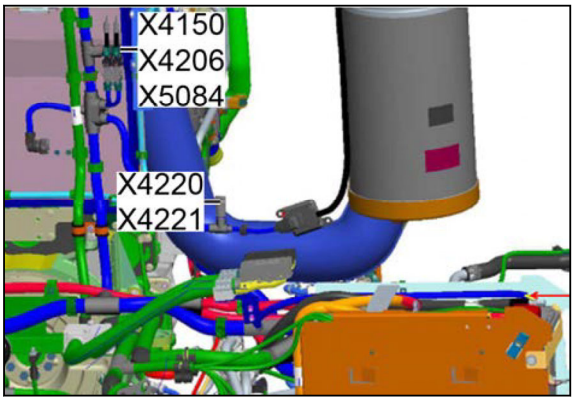


Fig. 308

Y010 differential lock solenoid valve

Left rear axle cover

Fig. 367

Y011 front PTO (clutch) solenoid valve

Front of tractor, before radiator assembly

Open engine cover.

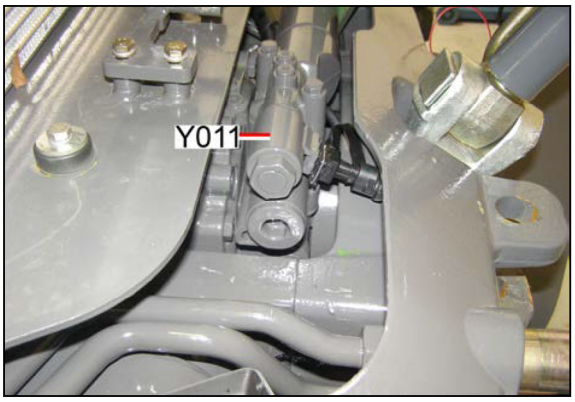


Fig. 368

Y012 suspension loading/oil preheating solenoid valve

Y013 lower suspension solenoid valve

Y014 raise suspension solenoid valve

Right side of tractor, on central control block.

Detach panel

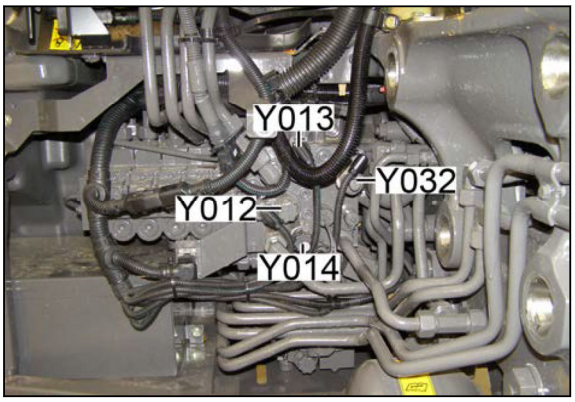


Fig. 369

Y024 magnetic clutch for air conditioning compressor

On left side of engine

Open engine cover.

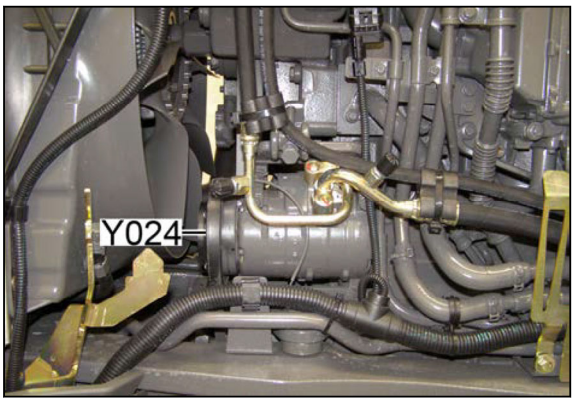


Fig. 370

LE - Steering unit

Under the cab

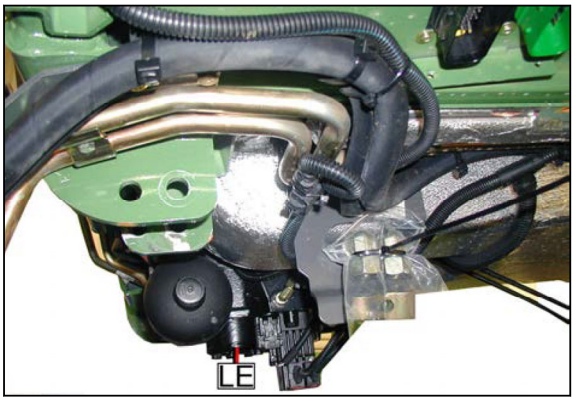


Fig. 428

LS EX - Load Sensing connection

Rear of tractor

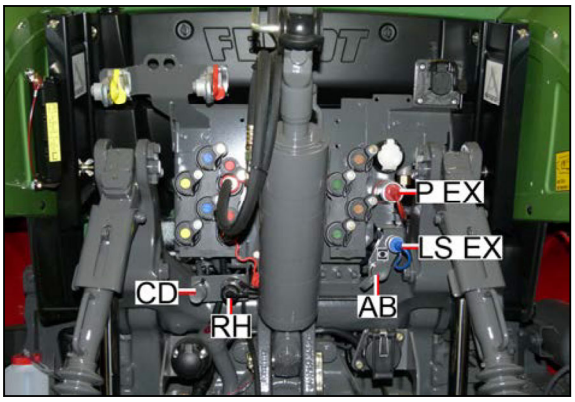


Fig. 429

M1 - Measuring point for emergency steering pump

M2 - Measuring point for auxiliary pump

M3 - Measuring point for variable pump

M4 - Measuring point for Load Sensing pressure

M5 - Measuring point for control pressure

Right side of tractor, central control block, front

Detach panel

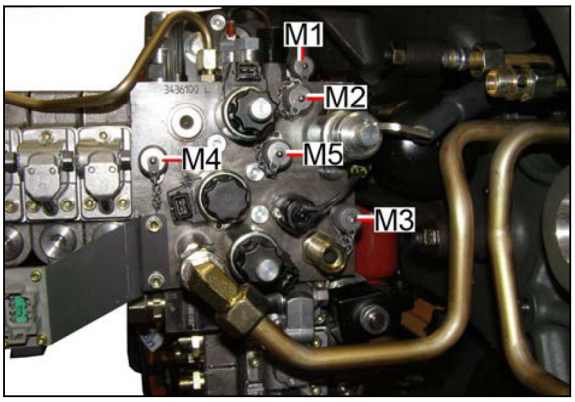


Fig. 430

M6 - Measuring point for side return-flow reference pressure

Right side of tractor, in the side of the end plate

Detach panel

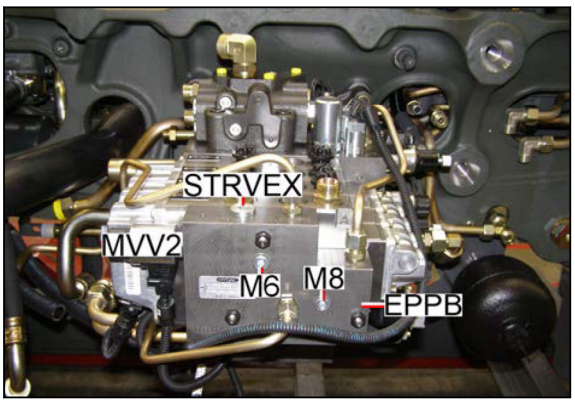


Fig. 431

The rear power lift menu level appears on the multi-display.

Press one of the buttons repeatedly until the symbol (A) flashes

Press "Return" to confirm

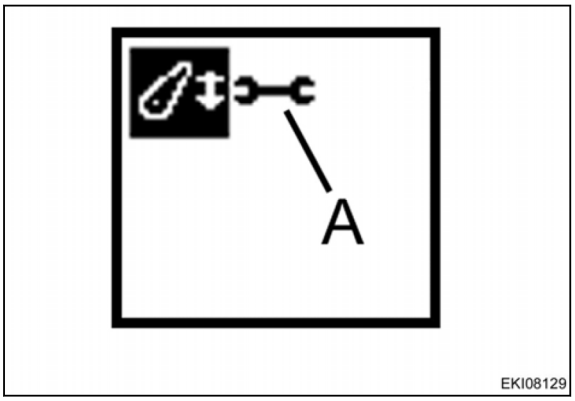


Fig. 480

Input code **8002**

Press one of the buttons until desired number is displayed

Press "Return" to confirm

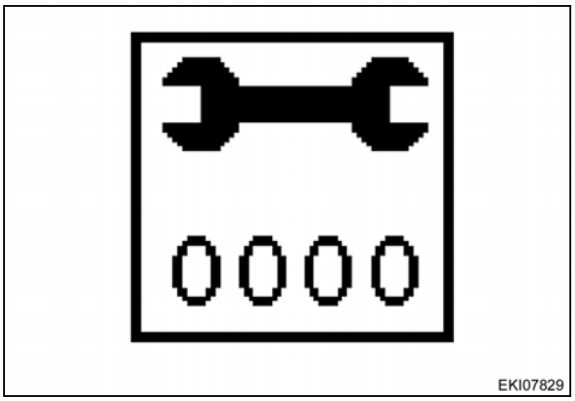


Fig. 481

Turn quick lift switch to "raise". The linkage moves upwards and remains in the top position

Press "Return" to confirm

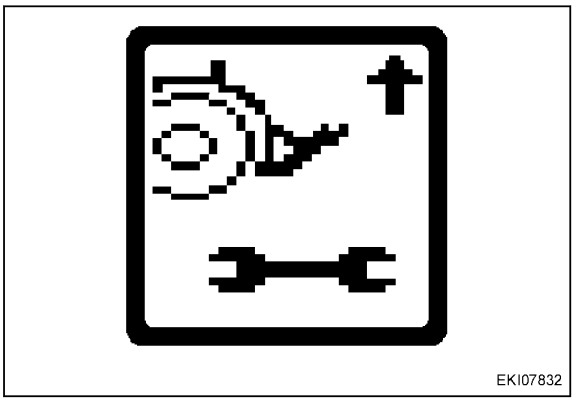


Fig. 482

Set quick lift switch to "lower". The linkage moves downwards and remains in the bottom position

Press "Return" to confirm

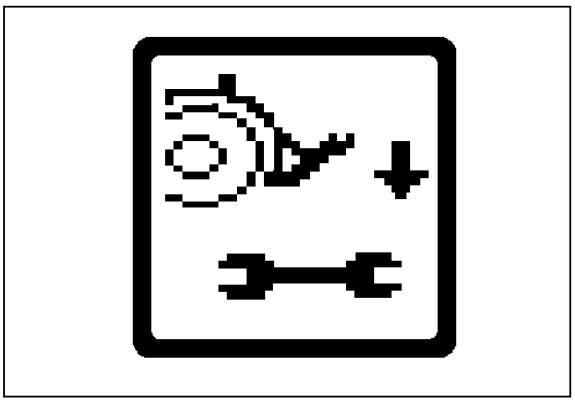


Fig. 483

NOTE:
See also:
"Fault code for calibration code 1003"
"Fault code for calibration code 1004"
"Fault code for calibration code 1005"
"Fault code for calibration code 1006"

1.5.6 Calibration code 7666 (front axle suspension)

8. Calibrating the front axle suspension (7666)

WARNING:
Once the input code has been confirmed, the tractor will raise and lower automatically!

Important: The following preparatory steps must be carried out.

- Position the tractor on a flat, level surface
- Hand brake applied
- Start engine.
- If fault messages are displayed, the faults must be confirmed one by one.

Press "ESC" to confirm the warning and fault messages displayed on the A007 instrument panel.

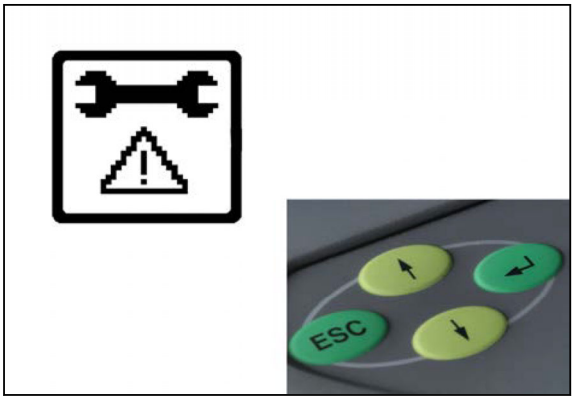
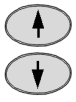


Fig. 540

Press "Return." The first main menu level appears on the multiple display.



Press one of the buttons repeatedly until the symbol (A) flashes.

Press "Return". The second main menu level appears on the multiple display.

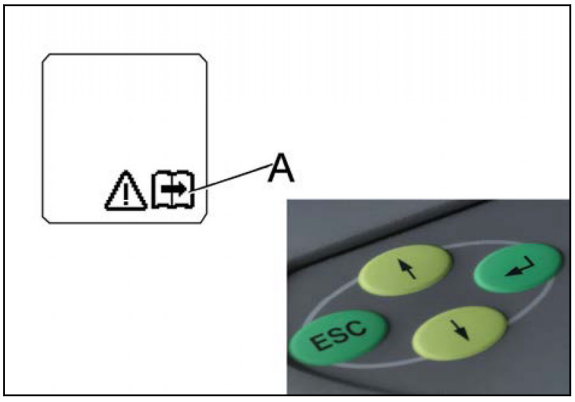


Fig. 541

ESC

Press "ESC" to confirm the warning and fault messages displayed on the A007 instrument panel

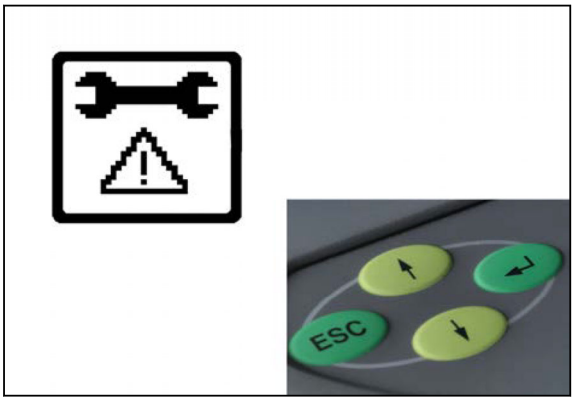


Fig. 580

Press "Return" and the first main menu appears in the multiple display

Press one of the buttons repeatedly until the symbol (A) flashes

Press "Return", the second main menu appears in the multiple display

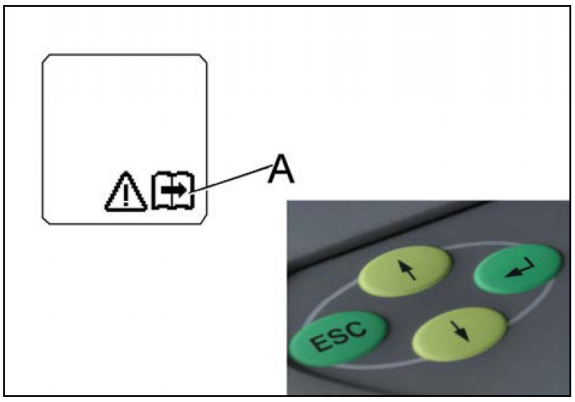


Fig. 581

The second main menu appears in the multiple display

Press one of the buttons repeatedly until the symbol (A) flashes

Press "Return" to confirm

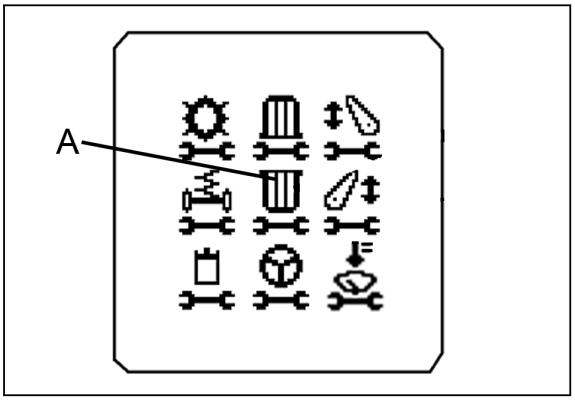


Fig. 582

The rear PTO menu appears on the multiple display

Press one of the buttons repeatedly until the symbol (A) flashes

Press "Return" to confirm

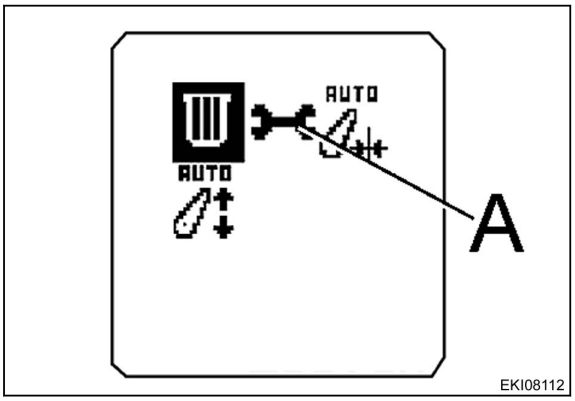


Fig. 583

"Transmission in neutral" display

ESC

Press "ESC" to confirm

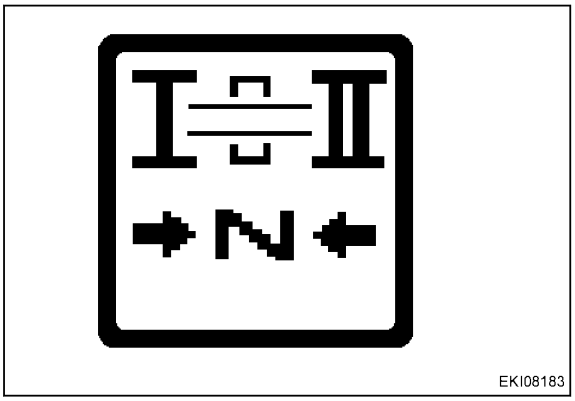


Fig. 636

Press "Return." The first main menu level appears on the multiple display

Press one of the buttons repeatedly until the symbol (A) flashes

Press "Return". The second main menu appears in the multiple display

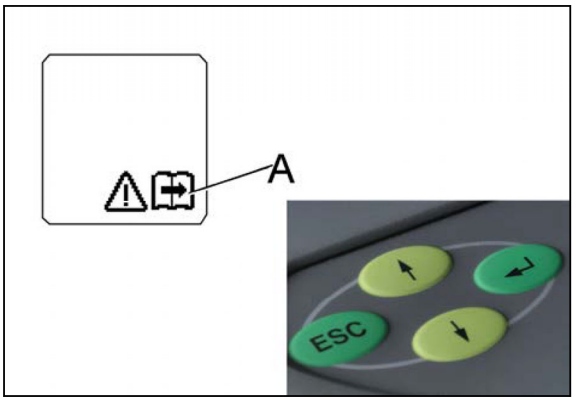


Fig. 637

The second main menu appears in the multiple display

Press one of the buttons repeatedly until the symbol (A) flashes

Press "Return" to confirm

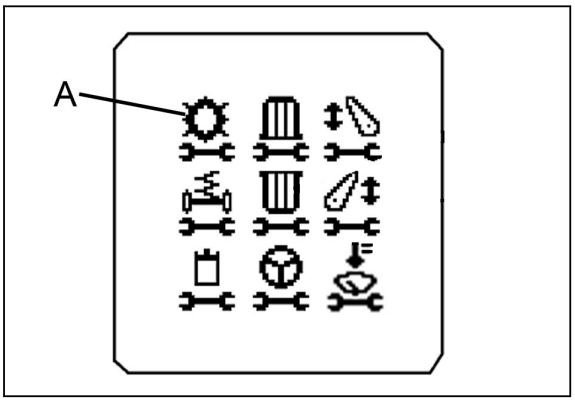


Fig. 638

The transmission menu appears in the multiple display

Press one of the buttons repeatedly until the symbol (A) flashes

Press "Return" to confirm

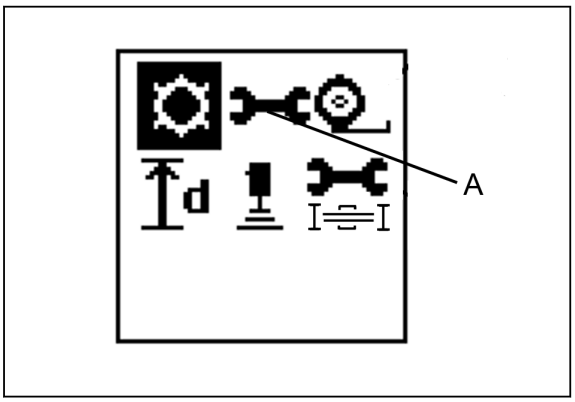


Fig. 639

Fault code for calibration code 4001

Fault code	Cause	DIN short description
F01	User terminated calibration with "ESC"	**A050** basic control unit ECU **B017** clutch pedal sensor
F02	Pedal in rest position: Signal greater than allowed (22 mA_{DC})	
F03	Pedal in rest position: Signal smaller than allowed (2 mA_{DC})	
F04	Pedal fully depressed: Signal greater than allowed (22 mA_{DC})	
F05	Pedal fully depressed: Signal smaller than allowed (2 mA_{DC})	
F06	Calibrated min. and max. values are too close together Minimum difference of 10 mA_{DC} necessary	
F07	Calibration taking too long (more than 30 seconds)	
F08	Transmission in "Active standstill" (Remedy: Put transmission into neutral)	

Fault code for calibration code 4002

Fault code	Cause	DIN short description
F02	Calibrated values are faulty	**A050** basic control unit ECU **A100** MFA, multifunction armrest hand throttle
F03	**A100** MFA, multifunction armrest not responding	
F08	Calibration taking too long (more than 30 seconds)	
F09	User terminated calibration with "ESC"	

Fault code for calibration code 4003

Fault code	Cause	DIN short description
F01	User terminated calibration with "ESC"	**A050** basic control unit ECU
F02	Speed above 0,1 Km/h	
F03	Engine speed below 600 rpm	
F04	Engine speed above 900 rpm	
F05	Transmission not in neutral	
F06	Clutch not depressed	
F07	- **B015** bevel pinion sensor faulty	
F08	- **B014** collecting shaft sensor faulty	

Operating status: Driving in reverse at average speed

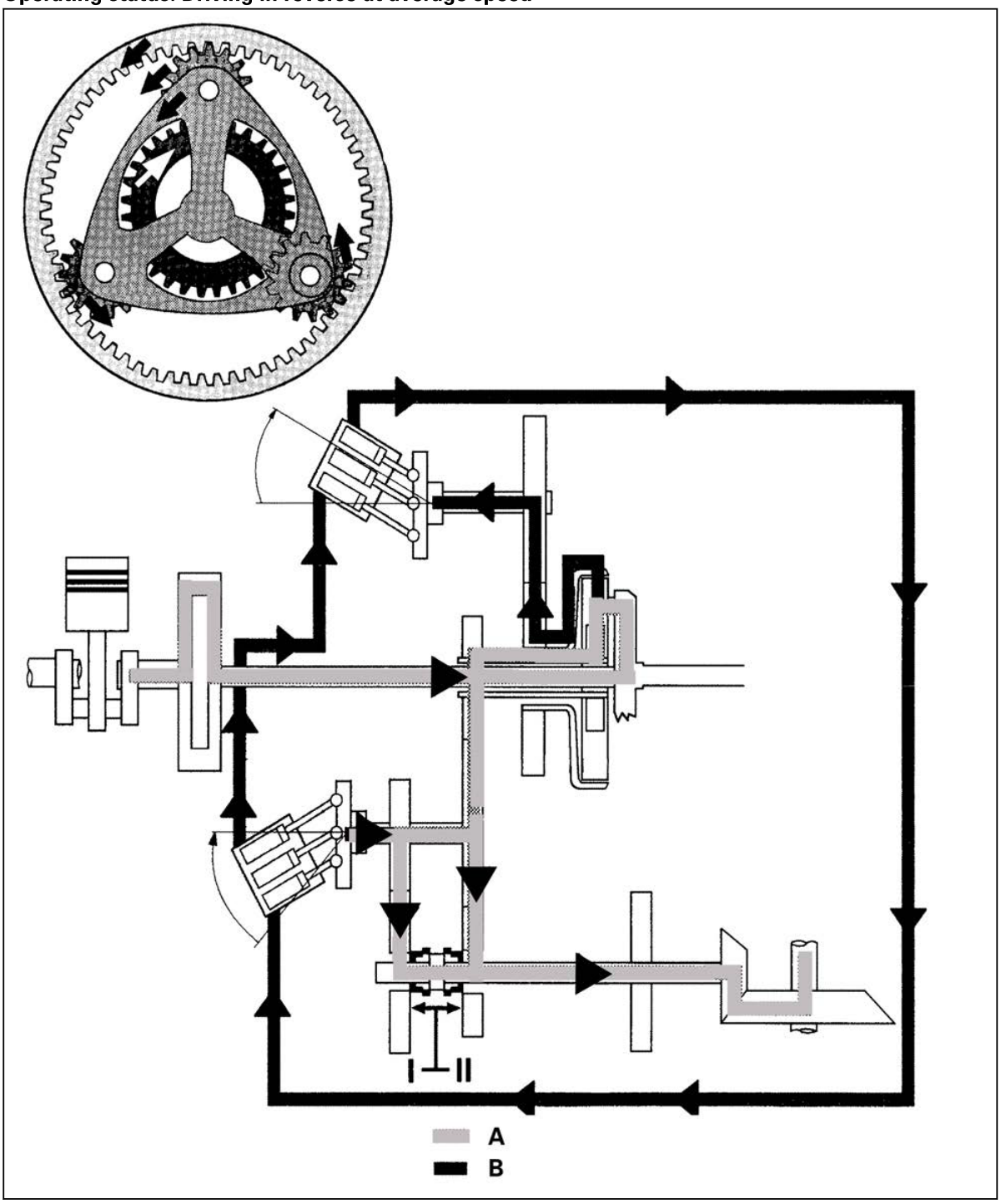


Fig. 7

Power transmission: 100% hydrostatic

Ring gear rotates faster than the comBUStion engine

(A) Mechanical power flow

(B) Hydrostatic power flow

3Z1 - actuator shaft

On vario insert

Dismantle cab and housing cover

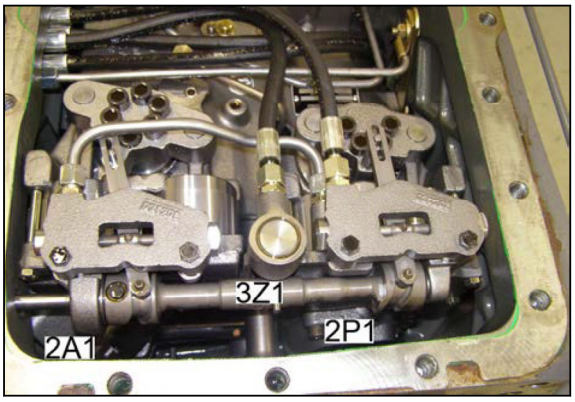


Fig. 40

M1 - cooler feed (KV)

M2 - lubrication pressure (SM)

M3 - discharge pressure (AS)

M4 - feed pressure (ES)

M5 - Servo pump pressure (PU)

Right side of transmission.

Right rear wheel and panel

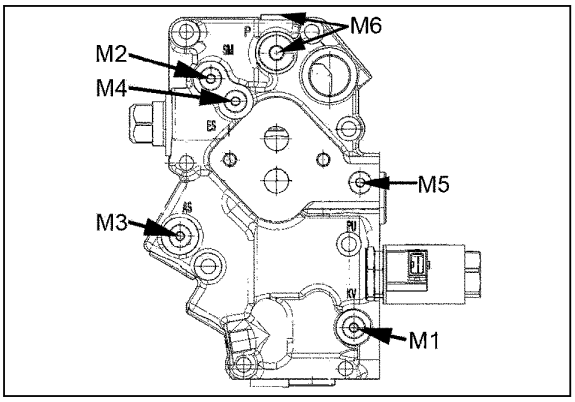


Fig. 41

M2 - lubrication pressure (SM)

M3 - discharge pressure (AS)

M4 - feed pressure (ES)

M5 - Servo pump pressure (PU)

Lower right side of transmission

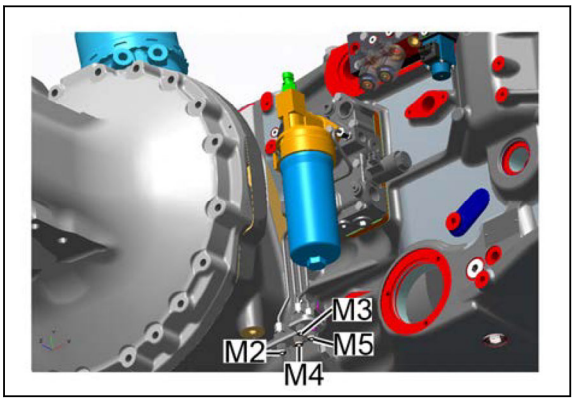


Fig. 42

M6 - transmission gearbox system pressure (P)

M7 - travel range switching pressure I

M8 - travel range switching pressure II

M9 - high pressure (PH)

Right side of transmission.

Right rear wheel and panel

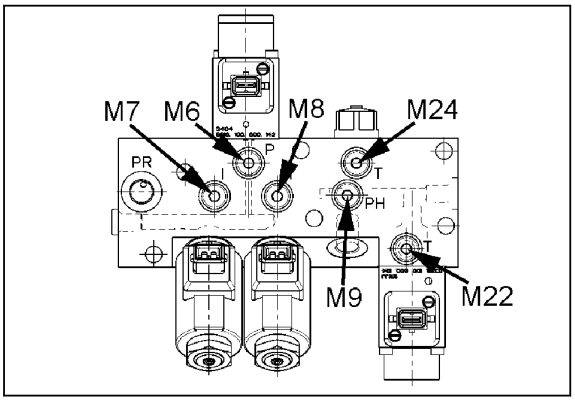


Fig. 43

Remove outer ring of the taper roller bearing

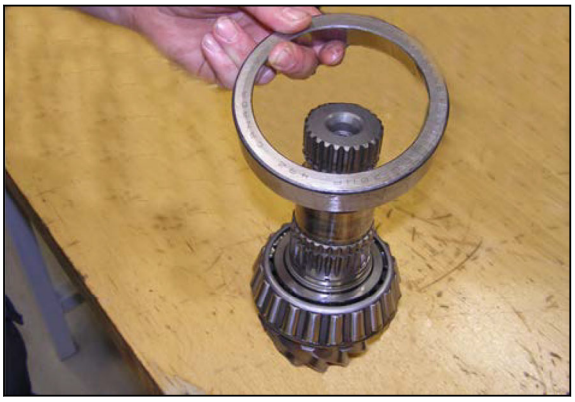


Fig. 74

Remove oil tray

Fig. 75

If necessary: Pry off the circlip

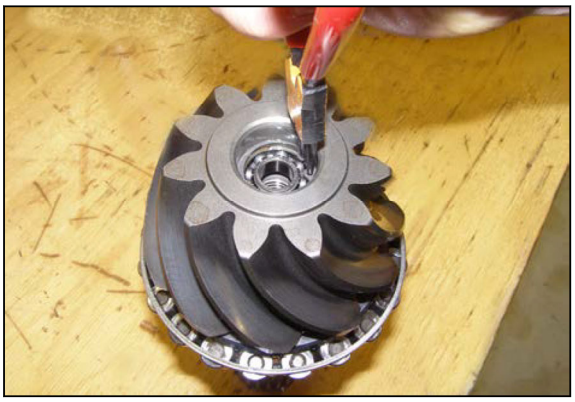


Fig. 76

If necessary: Remove bearing and washers

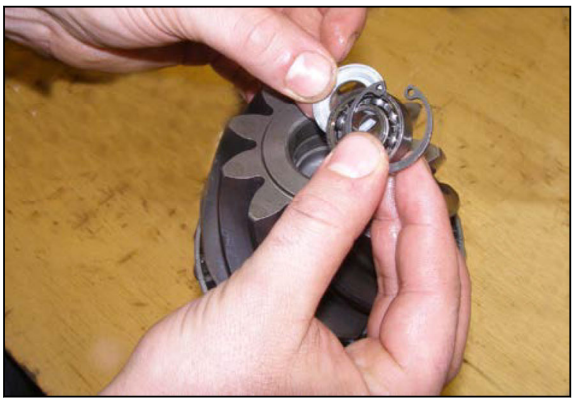


Fig. 77

Remove the axle cross support

Fig. 127

Remove differential pinion with the shaft and the thrust ring

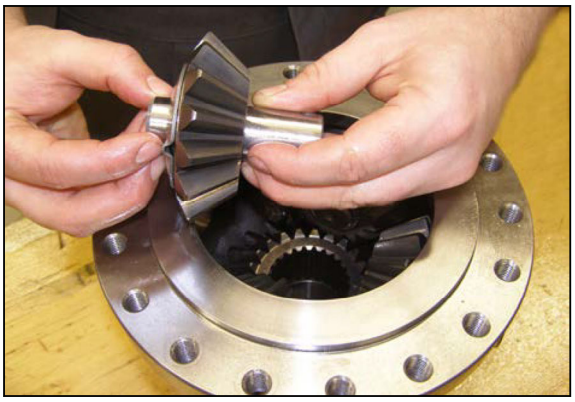


Fig. 128

Remove axle bevel gear

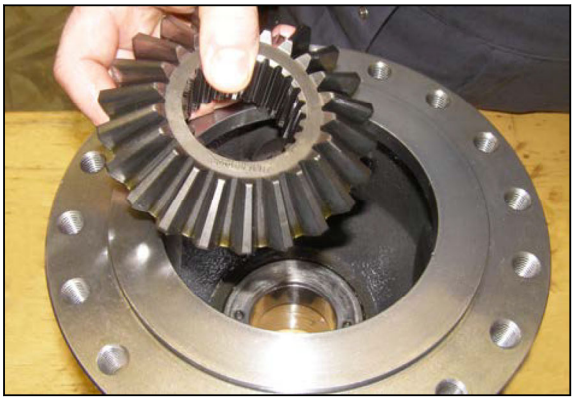


Fig. 129

Remove thrust ring

Fig. 130

Oil inner (32) and outer disks (33). Begin with an internally toothed disk (32)

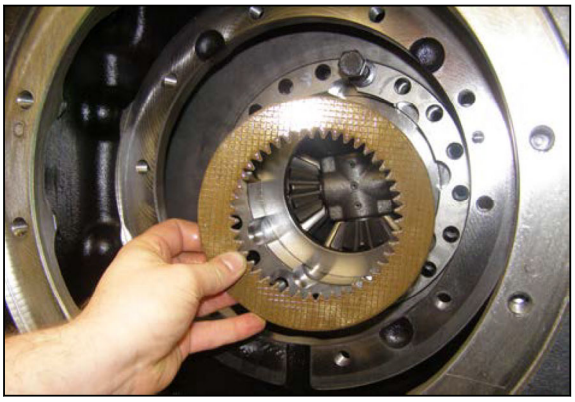


Fig. 179

Mount internally and externally toothed disks alternately

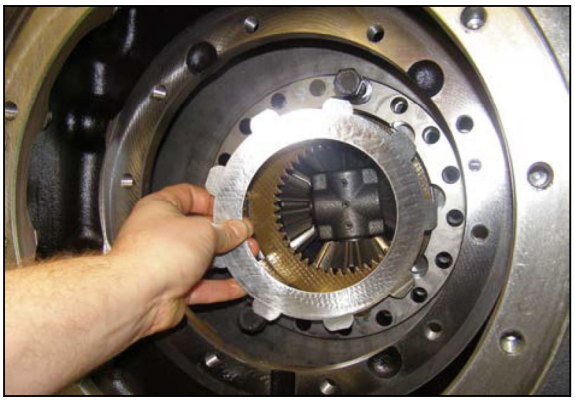


Fig. 180

Align the internally toothed disks (32)

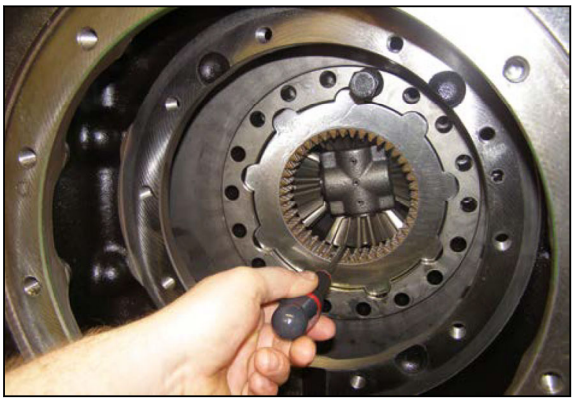


Fig. 181

Mount axle bevel gear (21)

Fig. 182

CAUTION: Risk of burns!

Wear protective gloves

If necessary: Fit the outer rings of the taper roller bearings (18 and 19)

Heat the inner ring of the taper roller bearing (19) to approximately 90°C and insert it into the axle housing (26)

Fig. 230

Fit the shaft seal (20) in the axle housing (26)

Offset: 8 mm

Fig. 231

NOTE:
The next step is only required for bar axles

Fit the bush (21), ring (22) and O-ring (24)

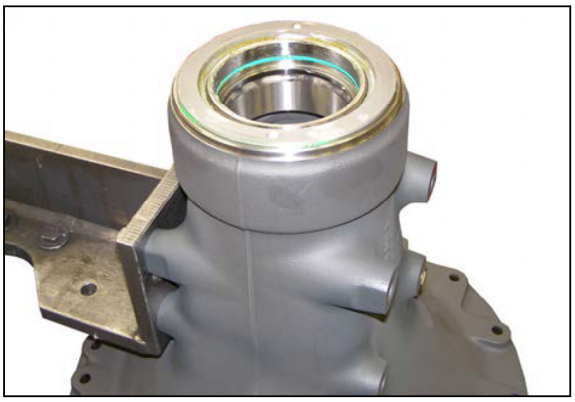


Fig. 232

Fit rear axle shaft (23)

Fig. 233

2.4.2 Install rear wheel brake

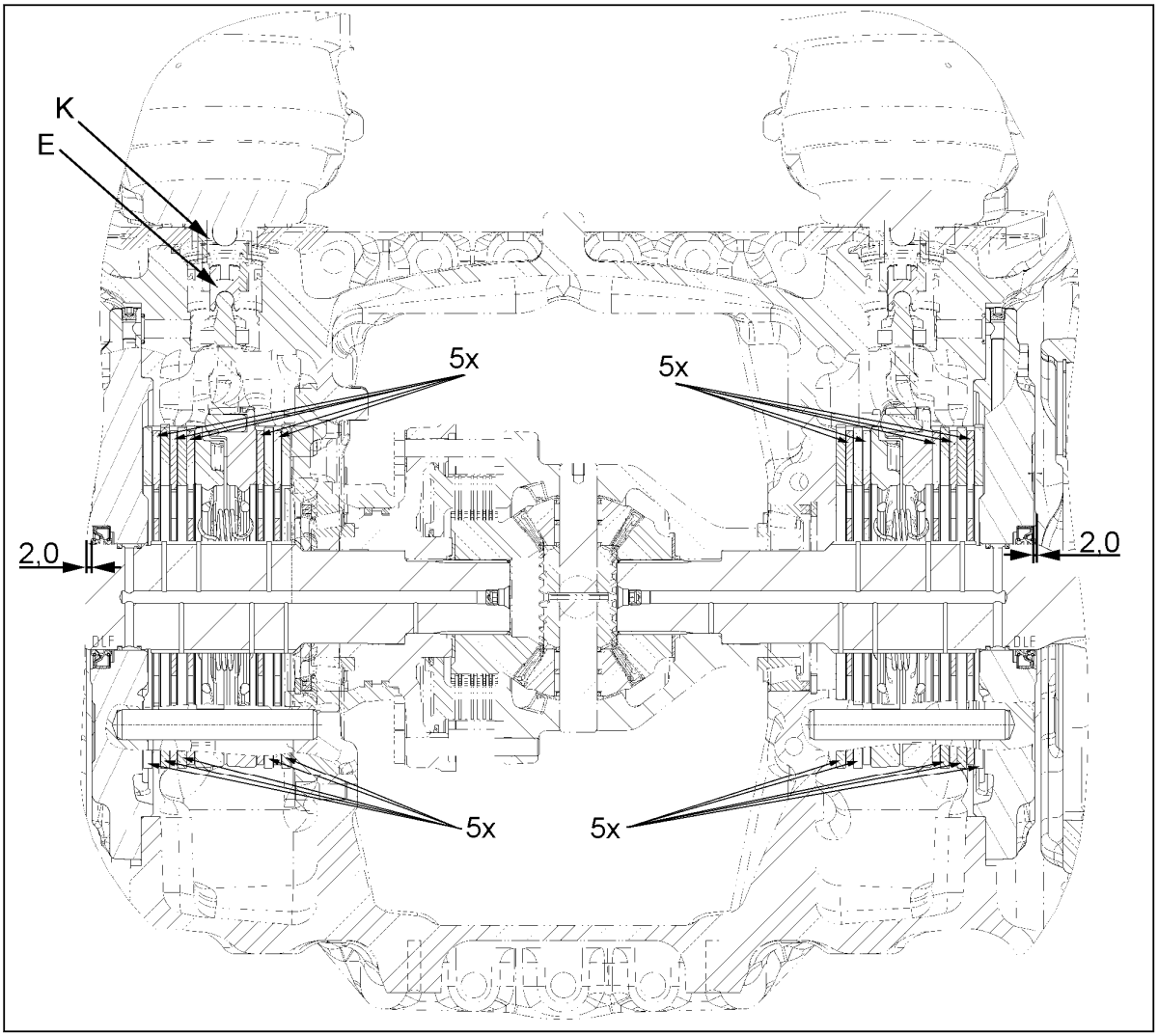


Fig. 284

Disconnect battery and remove from the box

Fig. 338

Remove pipe clamp on battery box

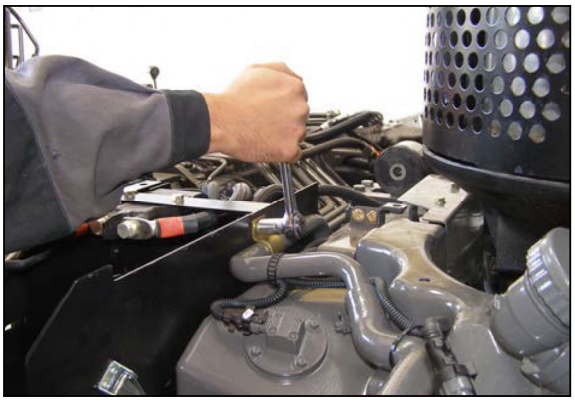


Fig. 339

Remove battery box

Fig. 340

Remove front bracket

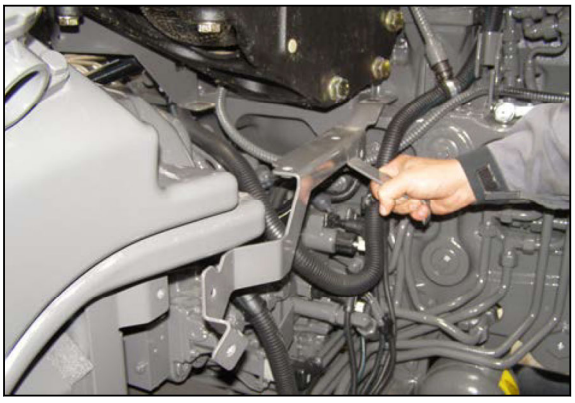


Fig. 341

Screw M12 collet bolt into the transmission block, attach load hooks and gently lift until taut

Screw on slide hammer puller with modified M20 nut (self-produced); remove shafts for the elastic suspension

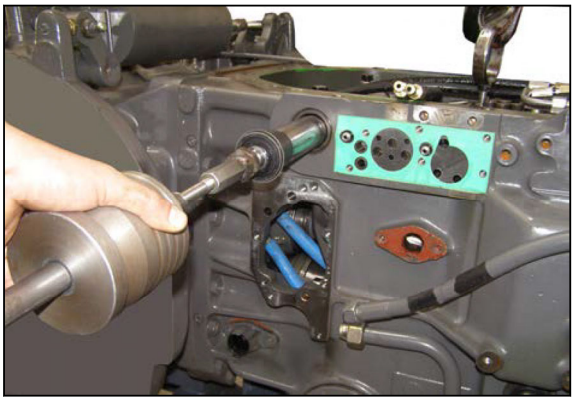


Fig. 401

DANGER: Falling loads can cause injury! Do not walk or stand under suspended loads!

Carefully lift transmission unit out of the transmission housing with lifting gear; ensure clearance of all components!

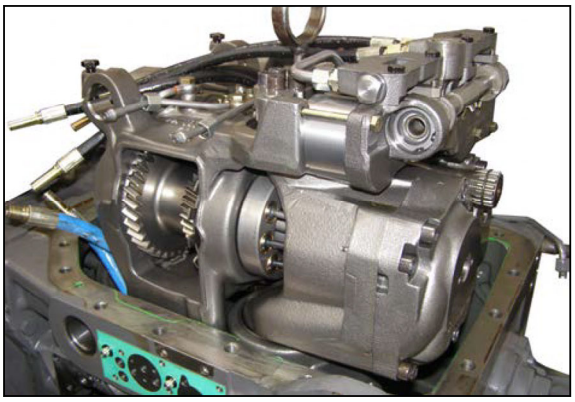


Fig. 402

2.5.2 Fit the Vario insert

NOTE:
The first steps were carried out on a model for greater clarity.

Move range shift lever (see arrows) to a vertical position

Fig. 403

Mount front bracket

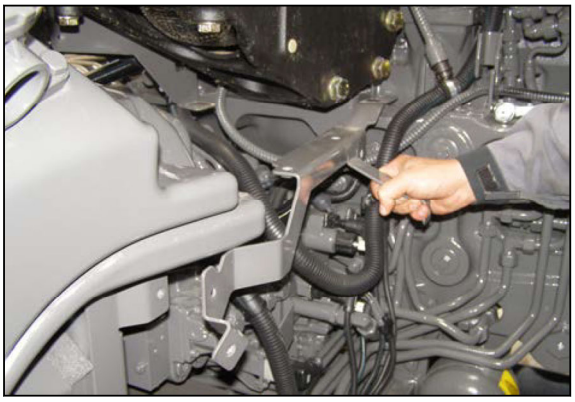


Fig. 463

Fit battery box

Fig. 464

Mount pipe clamp on battery box

Fig. 465

Fit and clamp the battery

Fig. 466

Install the five front internally toothed disks from back to front **in an anti-clockwise direction**, each offset by one tooth

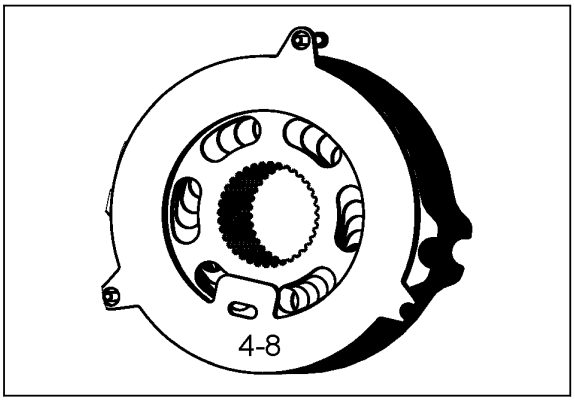


Fig. 507

Position the front PTO horizontally and unscrew the hex screws (11,12).

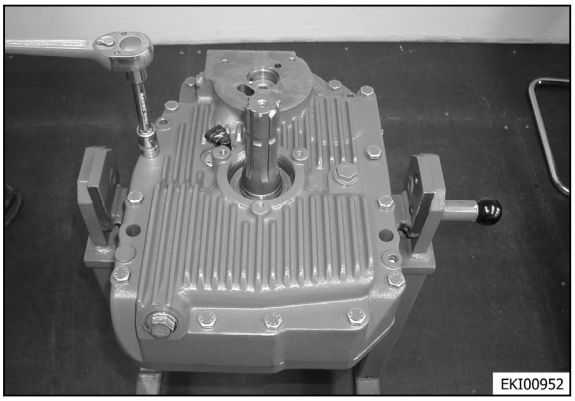


Fig. 548

Press off the housing (5) with 2 M8 jack screws.

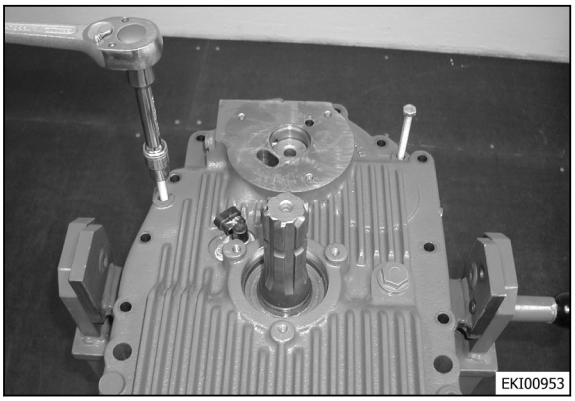


Fig. 549

Using a hoist, take off the housing (5).

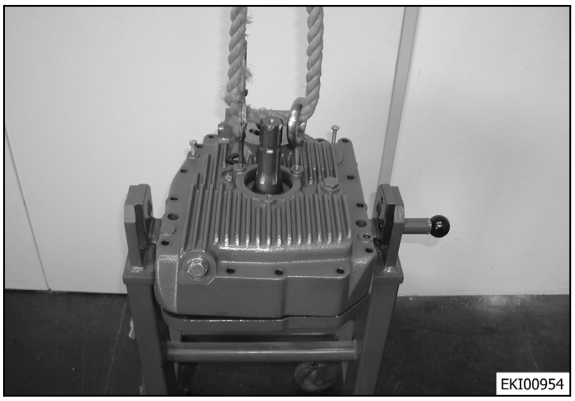


Fig. 550

Remove circlip (12).

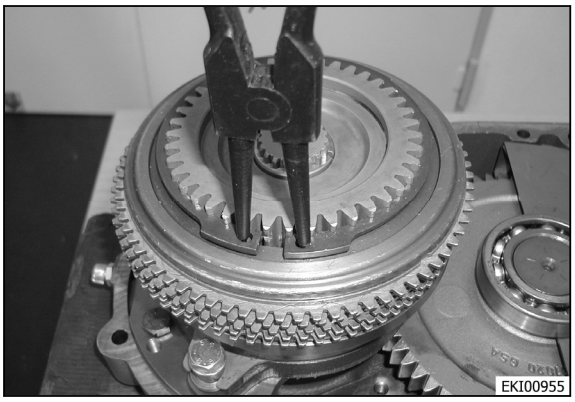


Fig. 551

Unplug the electrical connector of the **B021** - Rear PTO pressure clutch speed sensor and remove the sensor

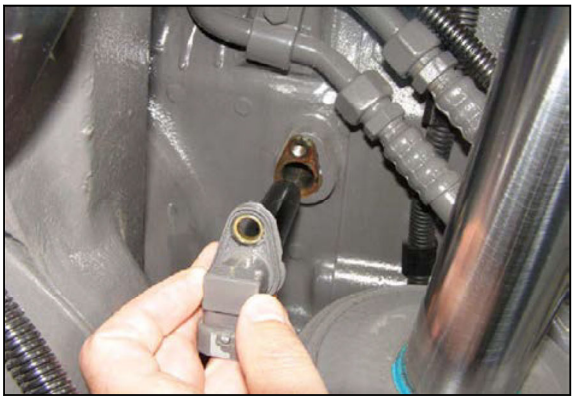


Fig. 598

Loosen all obstructing fixings on the wiring harness

Fig. 599

Carefully support the weight of the rear axle cover

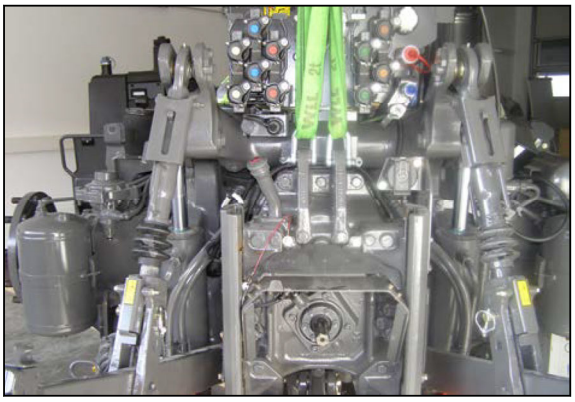


Fig. 600

Remove the flange bolts from the rear-axle cover

NOTE:
Work as shown in the illustration below! Do not undo these screws

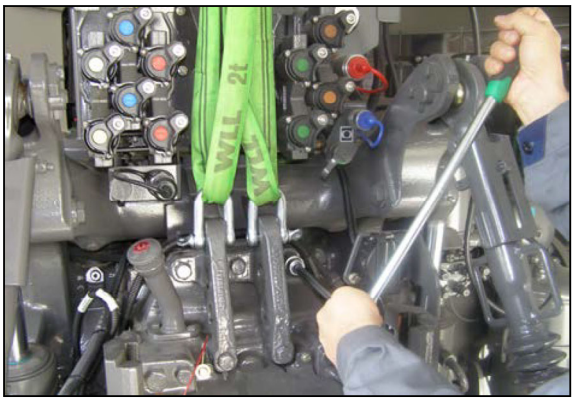


Fig. 601

Pry off the bottom circlip

Fig. 657

Remove the bridge, driving the layshaft (arrow) downwards with gentle taps from a hammer

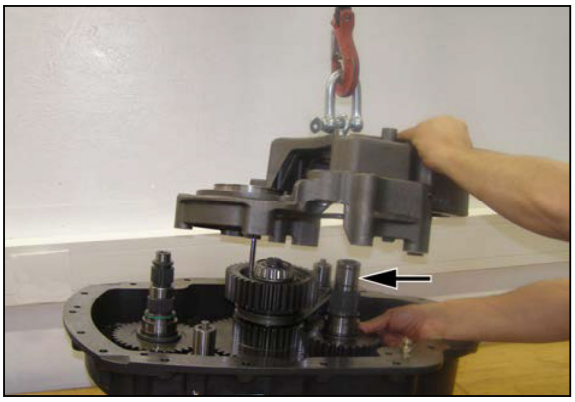


Fig. 658

Disassemble the output shaft

Remove the taper roller bearing from the output shaft

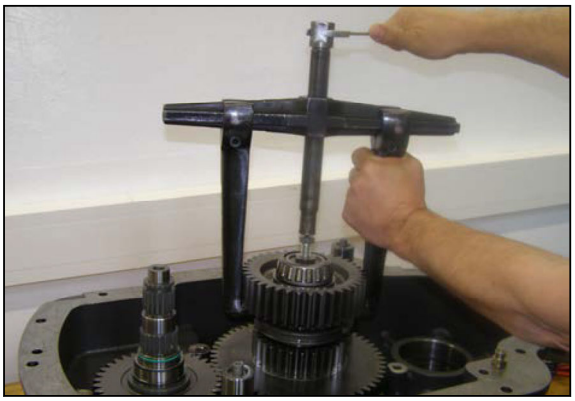


Fig. 659

Snap on circlip (45)

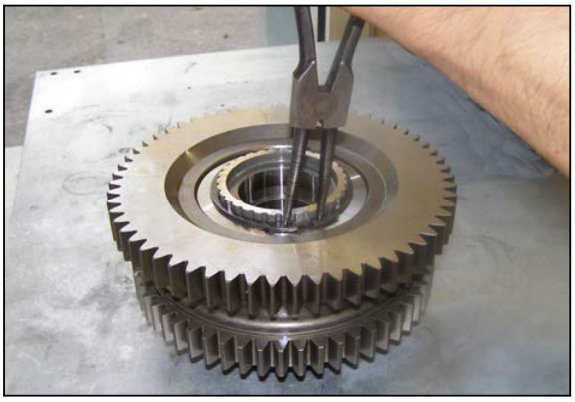


Fig. 710

Install the spur gear (44) on the output shaft (30)

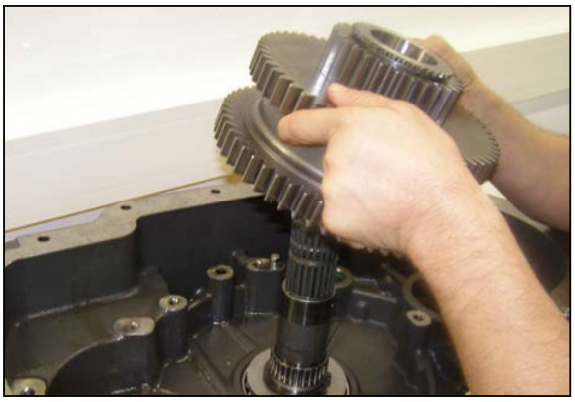


Fig. 711

Install and oil the needle bearing (20)

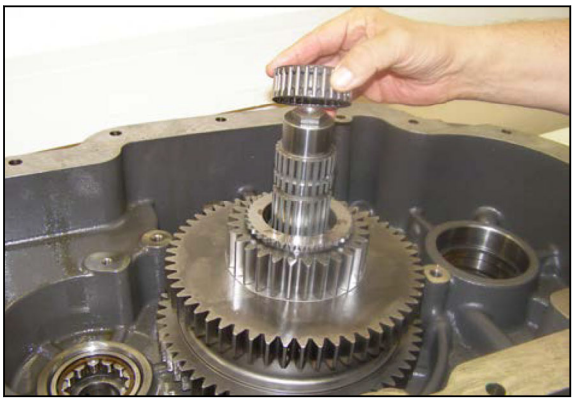


Fig. 712

Fit guide sleeve (40)

Fig. 713

Remove the front wheel drive clutch completely from the housing

Fig. 763

Fit the assembly bracket

Press the Belleville package using a press until the circlip can be moved freely.

Remove the circlip and release the press carefully

Fig. 764

Remove the spur gear

Fig. 765

Remove the belleville package

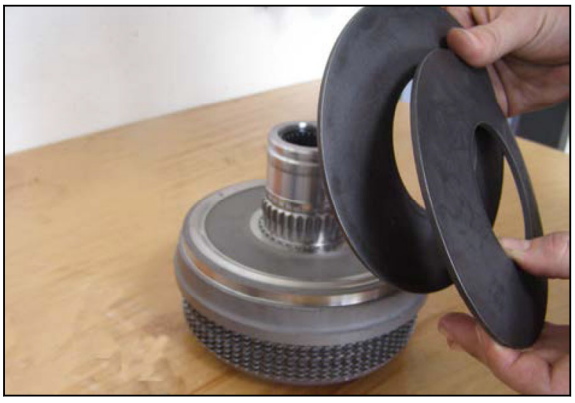


Fig. 766

Insert retainer ring (13) into groove

Fig. 812

Fit seal (8) on transmission side

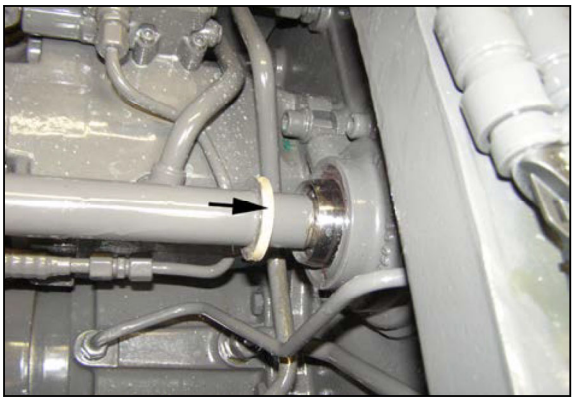


Fig. 813

Fit seal (8) on engine side

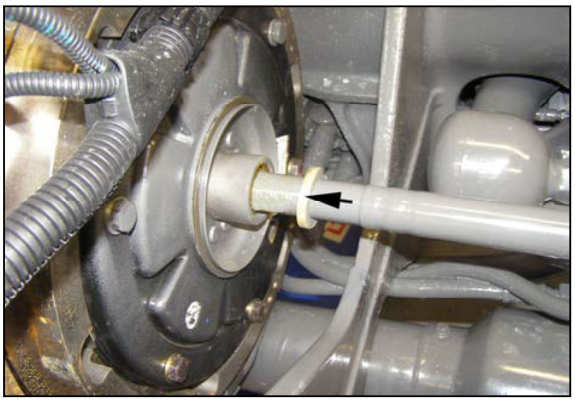


Fig. 814

Fit flywheel cover

Fig. 815

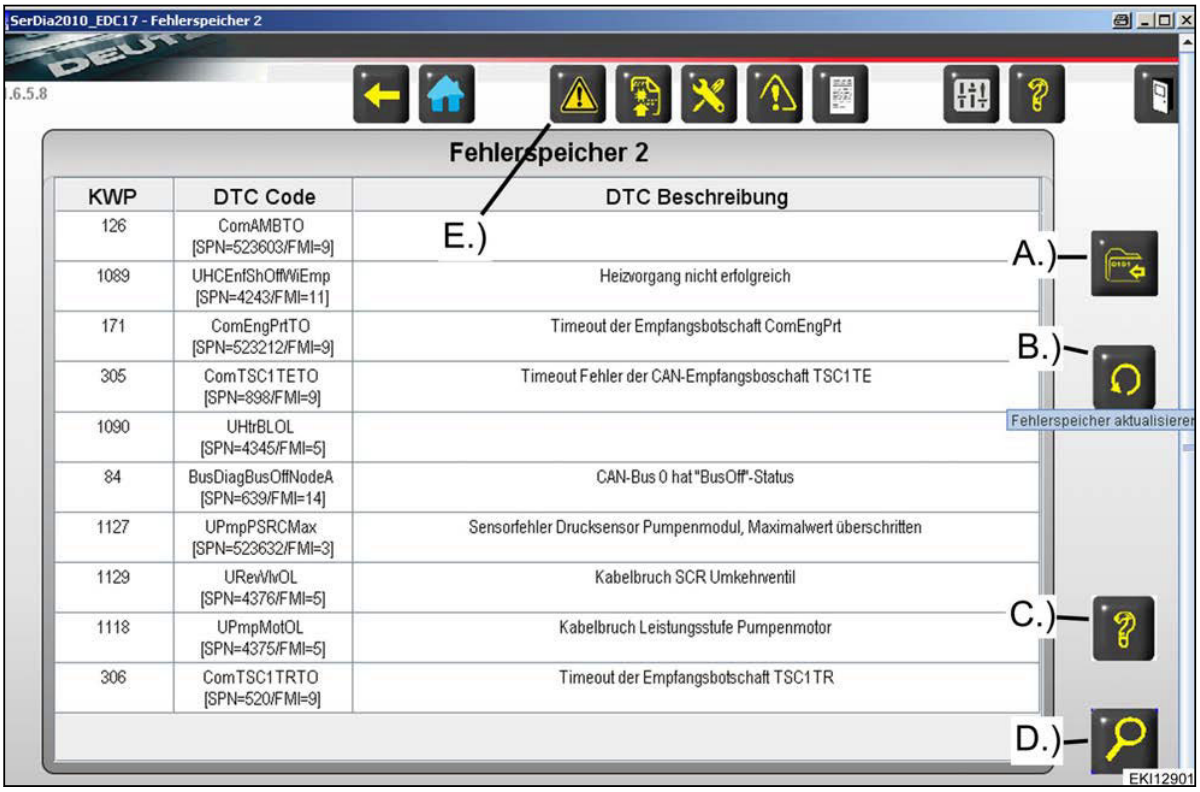


Fig. 19 This opens fault memory 2 (not deletable)

(A) Save fault memory
(B) Update fault memory
(C) Read out fault details
(D) Read out surrounding conditions when fault occurs
(E) Switch to fault memory 1 (deletable)

Lubricating oil and fuel consumption (at least 100 operating hours) — fax template				
Operating hours	**Fuel [liters]**	**Lubricating oil [liters]**	**Date**	**Operator**
Total	**Total**	**Total**	**Specific fuel consumption**	**Specific lubricating oil consumption (actual value) [%]**

3.1.4 Determining engine power - comparison of standards and directives

DIN 70020

Determining engine power at the crankshaft on a test bench. All standard equipment is mounted (water pump, unloaded alternator, fuel delivery pump, fixed fan).

Net power: Power at the crankshaft with fixed fan that is driven.

Gross power: Power at the crankshaft without a fixed fan that is fitted and driven.

ECE - R - 24

Determining engine power at the crankshaft on a test bench. All standard equipment is mounted (water pump, unloaded alternator, fuel delivery pump).

If the fan used can be turned off, or is controllable, the test must be performed with fan turned off or running at maximum slip.

97 / 68 / EC or 80 / 1269 / EEC

Determining engine power at the crankshaft on a test bench. All standard equipment is mounted (water pump, unloaded alternator, fuel delivery pump).

The fan must not be mounted for determining the net power of the engine.

ISO 14396 or ISO 15550

Determining engine power at the crankshaft on a test bench. All standard equipment is mounted (water pump, unloaded alternator, fuel delivery pump).

Net power: If a controlled fan is used, or one that can be switched off, the test must be performed with fan switched off or at max. slip.

Gross power: The fan must not be fitted on the engine.

Application at FENDT

Originally engine power was quoted according to DIN 70020. Power specifications always referred to the engine power output at rated engine speed.

With the introduction of Visco fans, power was quoted according to ECE - R - 24. Here, power specifications also always referred to the engine power output at rated engine speed.

Starting with the introduction of engines with extra power (in 1998), the maximum attainable power had to be entered into the vehicle documents in Germany.

3.1.12 B086 rail pressure sensor

DANGER:
After switching off engine, wait at least 30 seconds before starting any work on the fuel system!

Pin	Function
1	Earth
2	Signal
3	Supply

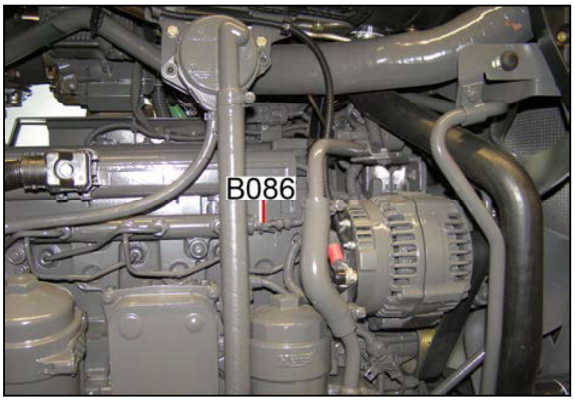


Fig. 30

Item	Designation
1	Separation point
2	Evaluation circuit
3	Steel membrane with expansion resistors
4	Pressure connection
5	Thread
p	Rail pressure (400 bar to approx. 1600 bar in normal operation)

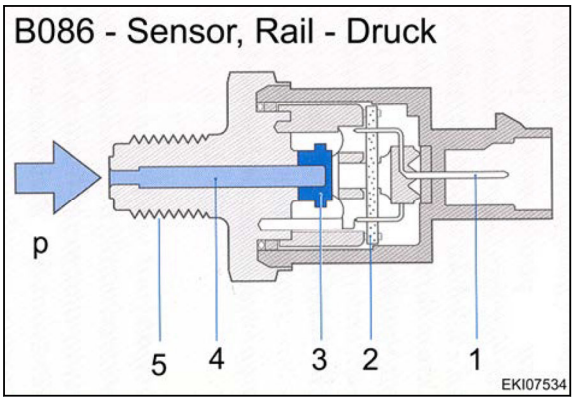


Fig. 31

Design and mode of operation of the B086 rail pressure sensor

The core of the sensor consists of a steel membrane (3) on which expansion resistors have been vapor deposited to form a bridge circuit.

As soon as the pressure to be measured takes effect on the steel membrane (3) via the pressure connection (4), the resistance value of the expansion resistors changes due to the membrane flexion.

The output voltage of 0 to 80 mV generated by the bridge circuit is forwarded to an evaluation circuit (2) via a connecting cable.

The evaluation circuit amplifies the signal to approx. 0.7 VDC at idling speed and approx. 2.7 VDC at maximum pressure, and forwards the signal to the **A099** - Engine control ECU (EDC 17).

With the assistance of the **Y091** fuel dispensing unit, the **A099** - Engine control ECU (EDC 17) controls the fuel high pressure in the rail (pressure accumulator)

NOTE:
<xref href="#T013738"/>
The rail pressure is displayed as a target and actual value in the Deutz "SERDIA" diagnostics program.

The **B086** rail pressure sensor measures the current pressure in the high-pressure circuit and supplies a voltage signal to the **A099** engine control ECU (EDC 17) for further processing.

18. Remove the retainer.

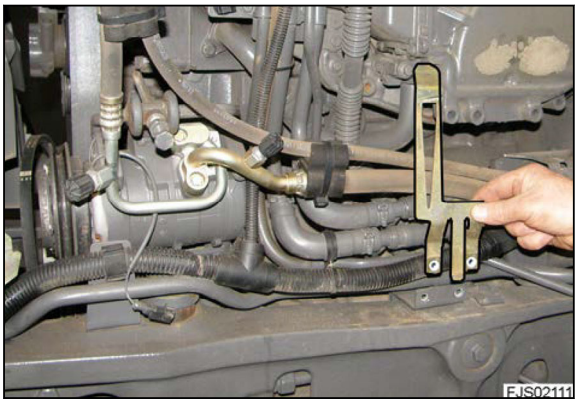


Fig. 63

19. Remove the return spring on the hinge on the air-conditioning condenser.

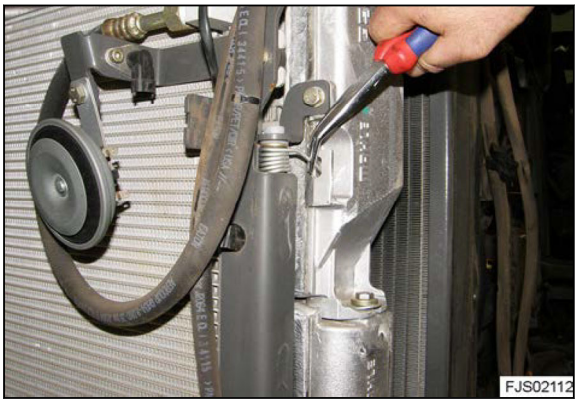


Fig. 64

20. Unscrew the screw (arrowed).

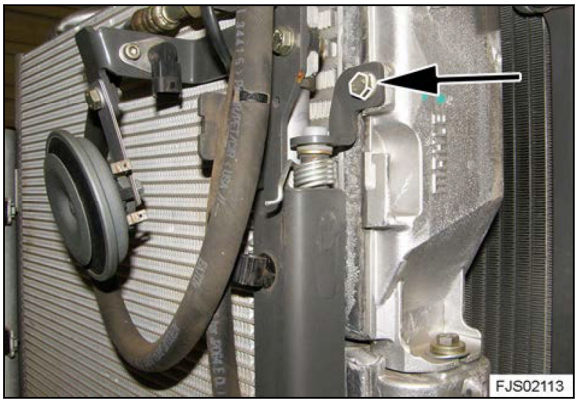


Fig. 65

68. Loosen the cooling water pipe.

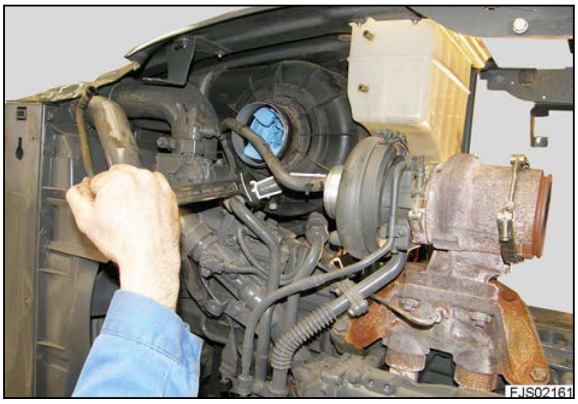


Fig. 110

69. Unscrew all bolts from the retainer. Screw in the eyelet.

Fig. 111

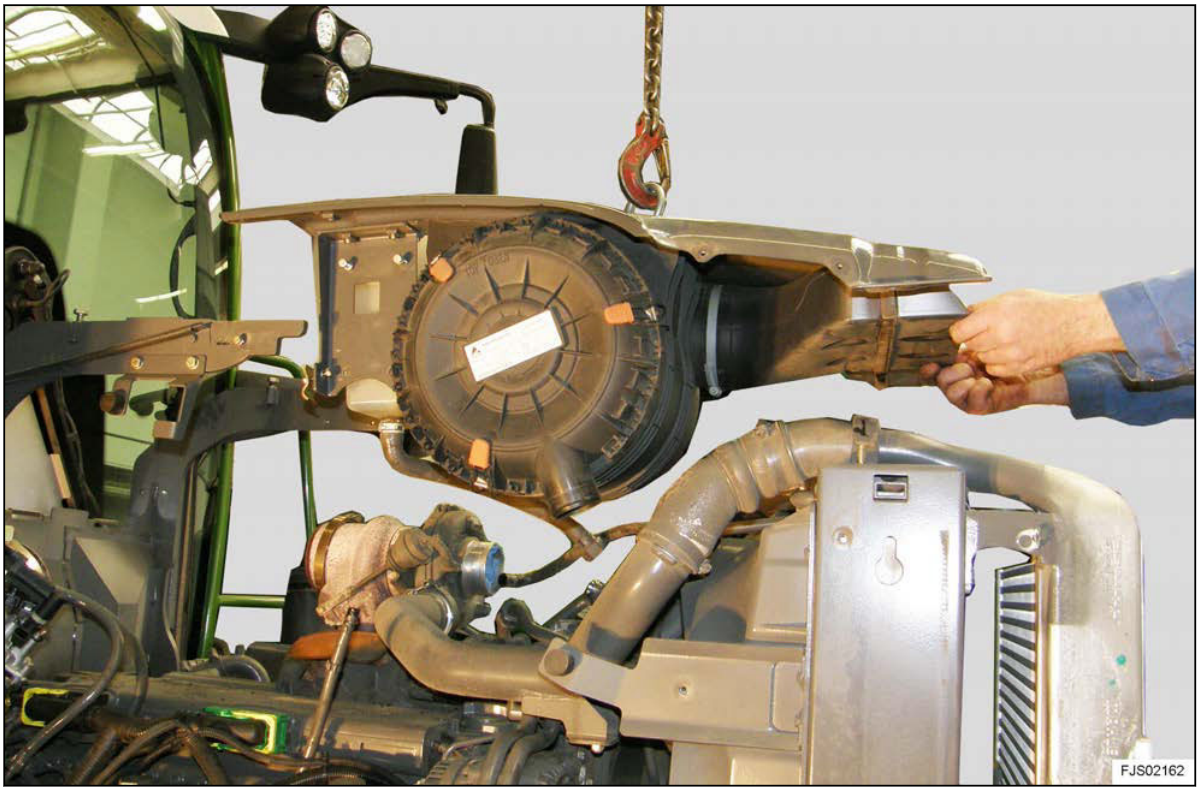


Fig. 112

121. Remove the compressed air hose on the pneumatic spring.

Fig. 158

122. Unscrew the screws on pneumatic spring.

Fig. 159

123. Remove the retainer.

Fig. 160

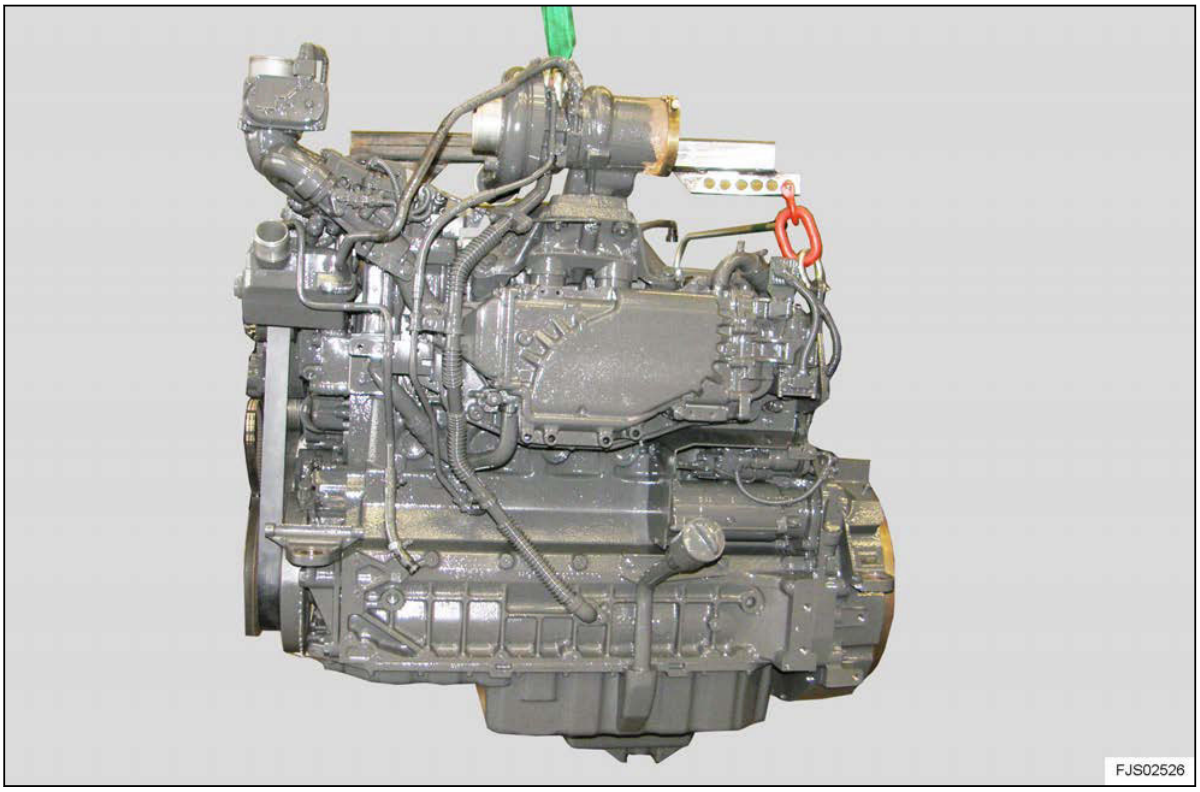


Fig. 201

2. **DANGER: Falling loads can cause injury.**

Risk of injury and death! Material damage is possible.

Do not walk or stand under suspended loads.

Pick up the engine using a hoist.

3. Coat the splines on the gearbox input shaft and the O-ring with long-life grease (X902.002.472.000).

Fig. 202

Fig. 249

54. Fit the piping package.

55. Secure the cooling water hoses using clamps.

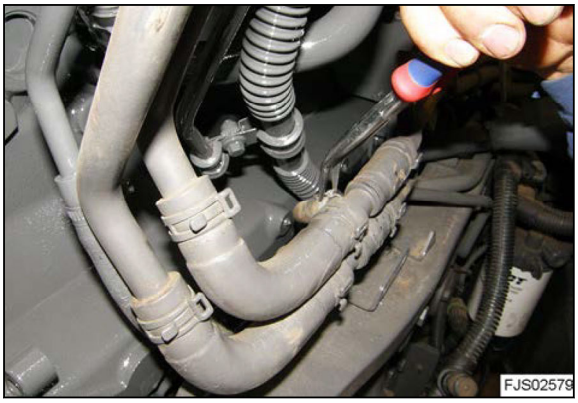


Fig. 250

96. Tighten all pipe clips.

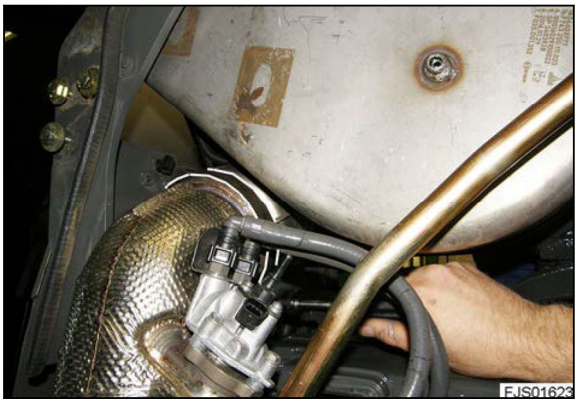


Fig. 291

97. Coat the thread connections on the diesel particulate filter (CSF) with an anti-seize agent.

Fig. 292

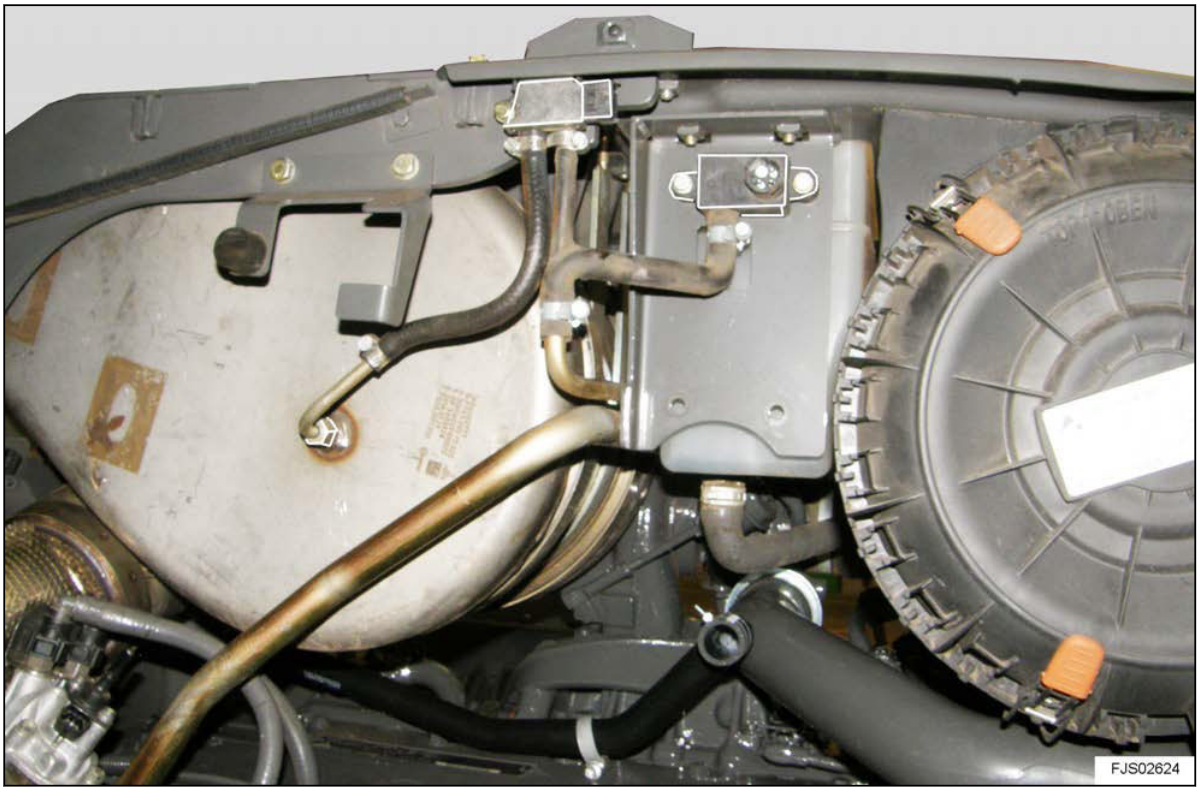


Fig. 293

98. Connect the pressure measurement line to the diesel particulate filter (CSF).

Procedure

1. **Deutz S1 "Anti Seize"**.

   - Prevents screw connections in exhaust lines from seizing (between -180°C and 1200°C)
   - Deutz 0 100 0198 = can, 450 g
   - Deutz 0 134 0198 = can, 400 ml
   - Deutz 0 101 6483 = tube, 10 g

Fig. 334

2. The following product can also be used as an alternative: **Loctite Anti Seize Aluminium 8150**.
   - Prevents screw connections in exhaust lines from seizing (between -30°C and +900°C), can, 500 g
   - AGCO spare part number: **LC 1115 791**. Available to order from the AGCO shop
   - **http://agcoshop.agcoparts.com**

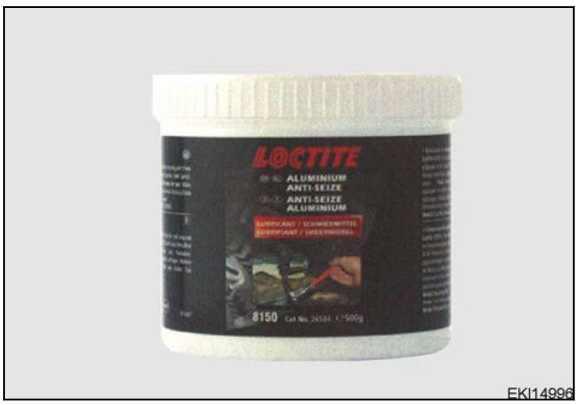


Fig. 335

3. **Deutz AP1908 "Klüber grease soap"**.

   - Klüber Lubrication SYNTHESO PROBA 270
   - Fit O-rings in water circuit
   - Deutz 0 101n6105 = tube, 50 g
   - Fendt F119.200.040.090 = tube, 50 g

Fig. 336

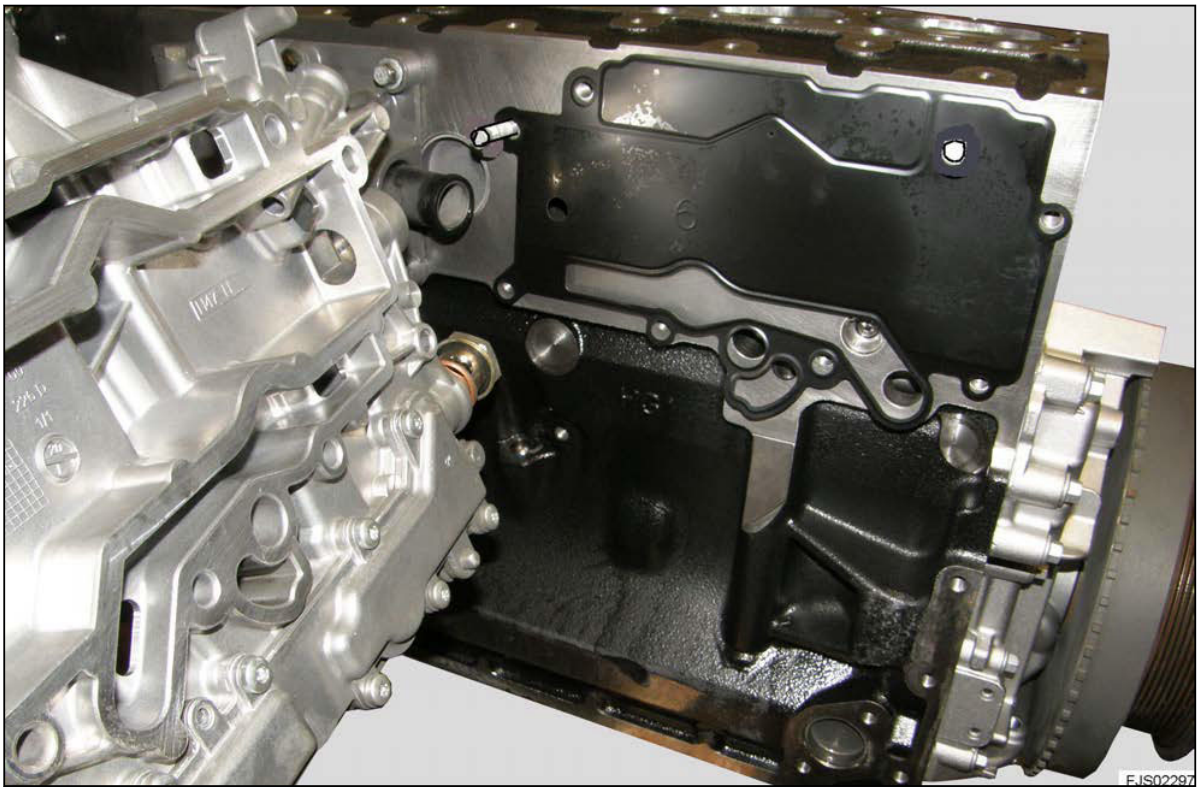


Fig. 381

53. **NOTE:** *Screw in two studs as an aid.*

Carefully clean the flange surface and fit the seal (F842.201.510.170).

54. Fit the lubricating oil cooler housing.

105. Position the seal (F836.200.610.170) and fit the thermostat housing.

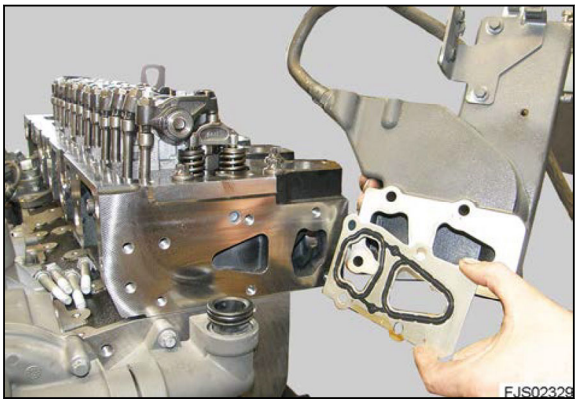


Fig. 421

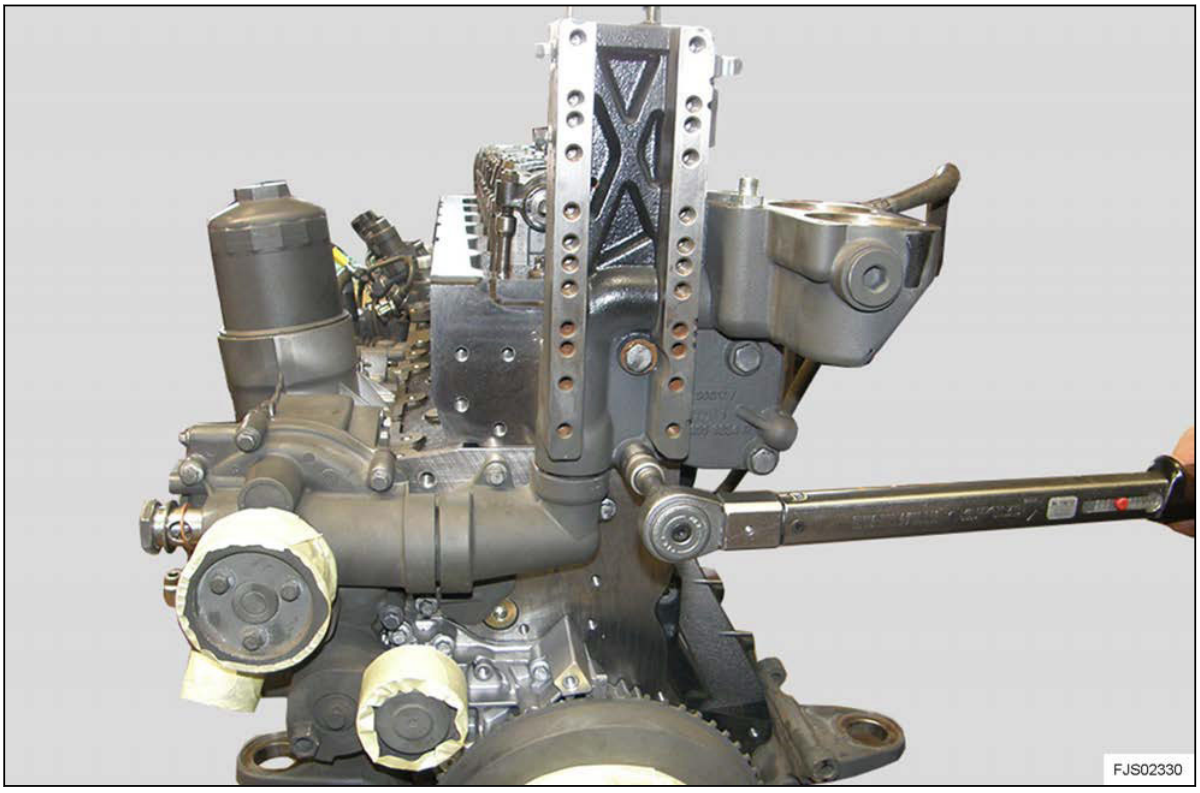


Fig. 422

106. Tighten the hex bolts to **60 Nm**.

157. Position the mixing pipe (fresh air/exhaust) together with a seal (F718.202.180.020).

Fig. 468

158. Tighten the nuts to **30 Nm**.

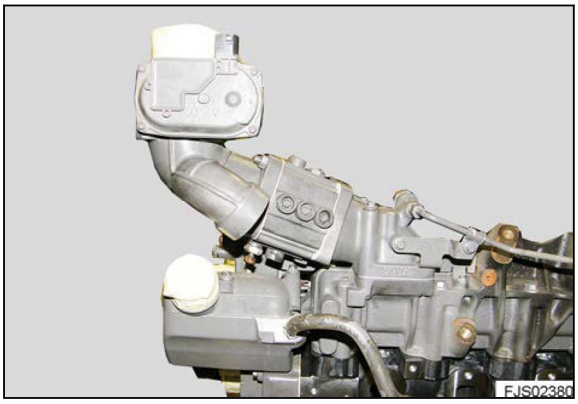


Fig. 469

159. Insert an O-ring into the groove on the cooling water pipe and coat with assembly compound (F119.200.040.090).

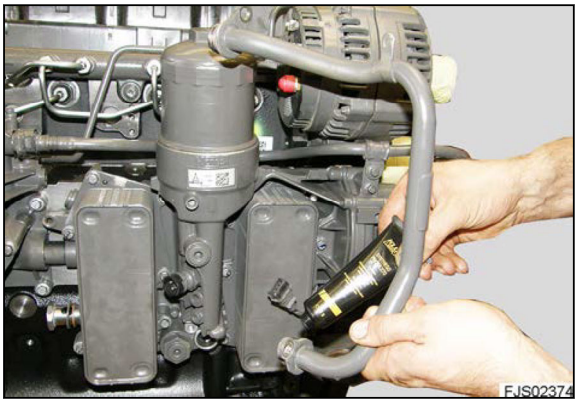


Fig. 470

198. Tighten the bolts to **30 Nm**.

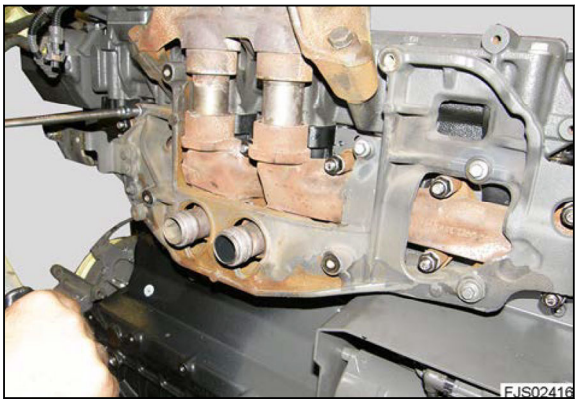


Fig. 509

199. Coat the exhaust connections on the exhaust gas cooler with an anti-seize agent.

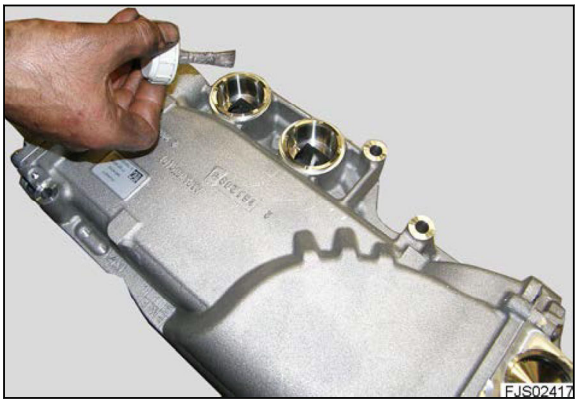


Fig. 510

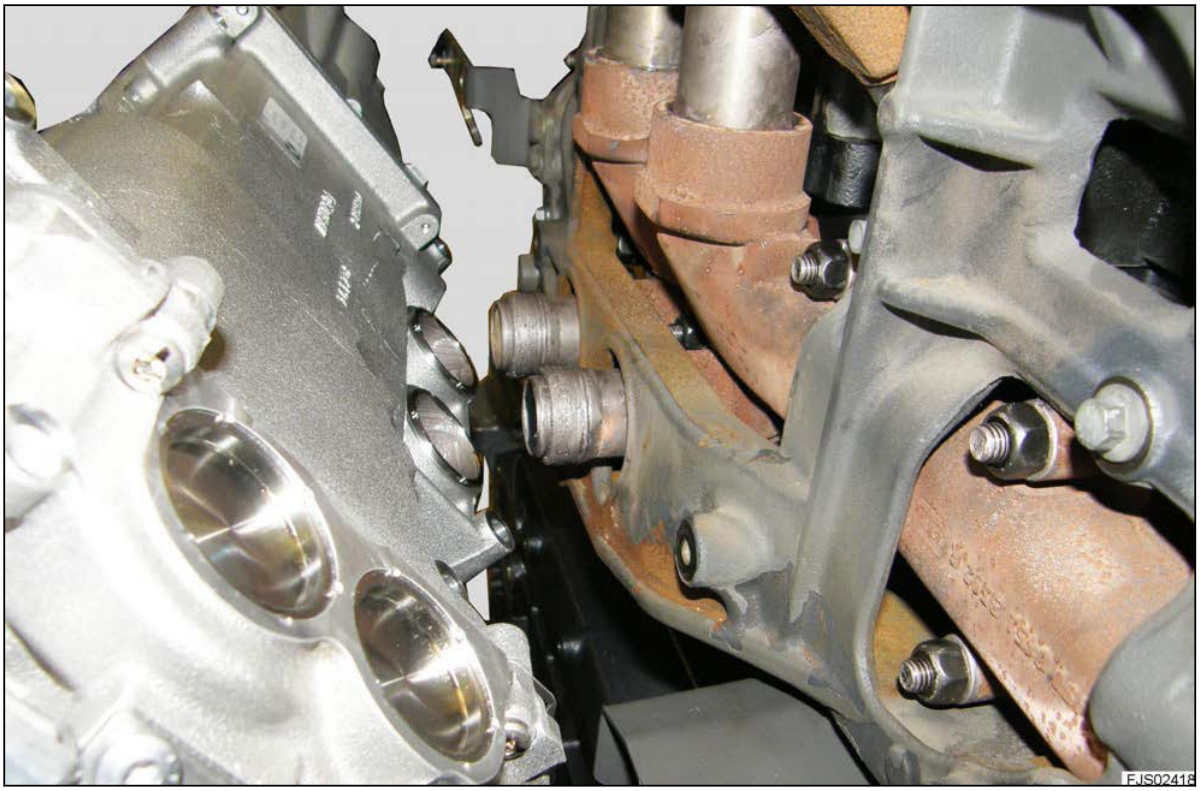


Fig. 511

200. Fit the exhaust gas cooler (AGRex).

Loosen the bolts for the bleed fitting socket and remove the bleed fitting socket

Fig. 550

Mark and disconnect all electrical connectors that go up from the wiring harness

Fig. 551

Disconnect both electrical connectors (X4215 and X4216)

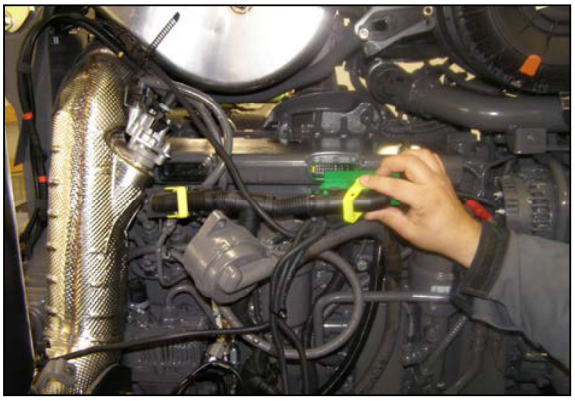


Fig. 552

Remove right cooler cover. This creates more room for disassembly of the air charge pipe.

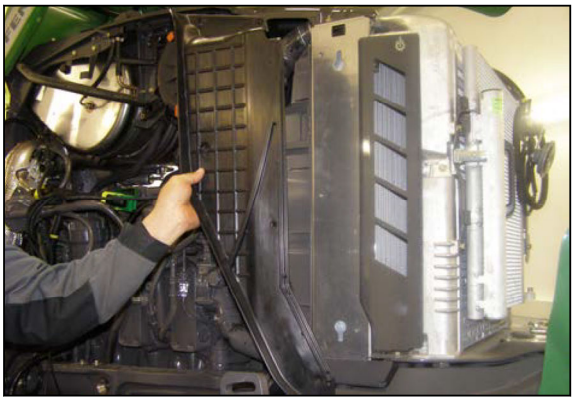


Fig. 553

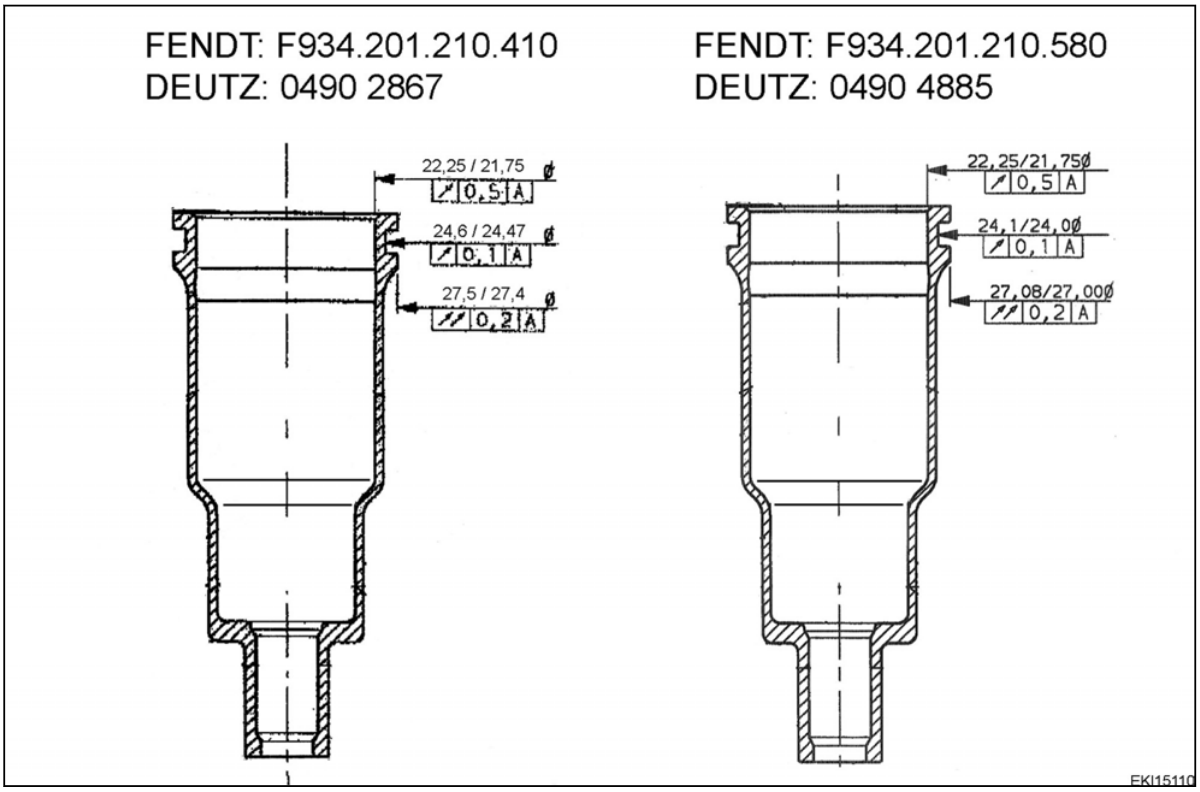


Fig. 594 Injector sleeve dimensions

Remove injector

Remove injector

Remove the valve cover

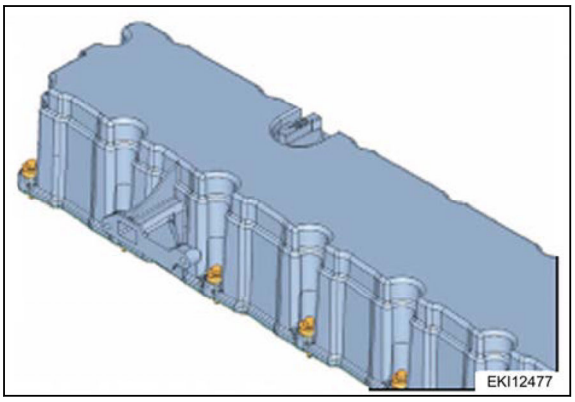


Fig. 595

If required, insert the new O-rings (1) into the groove of the thrust piece and lightly grease

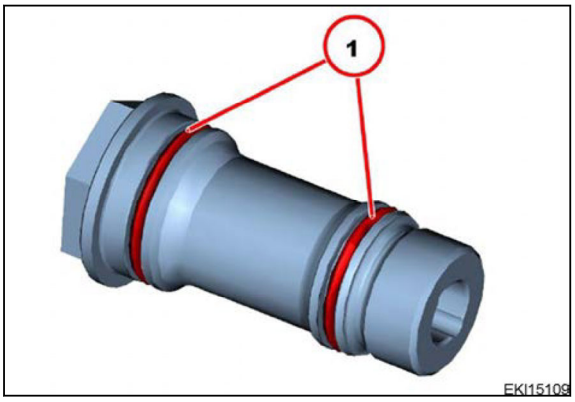


Fig. 637

Screw in the thrust piece (1).

Tighten the thrust piece.

Tightening torque: **80 Nm**

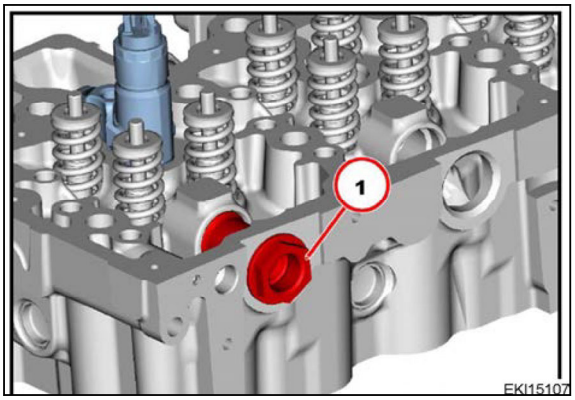


Fig. 638

NOTE:
The pressure pipe coupling must always be renewed.

Lightly oil the O-ring seal.

Position the pressure pipe nozzle and push into the sleeve so that the balls (1) of the anti-twist device sit correctly in the grooves (2) of the sleeve.

Insert pressure pipe nozzle with new O-ring seal into the cylinder head.

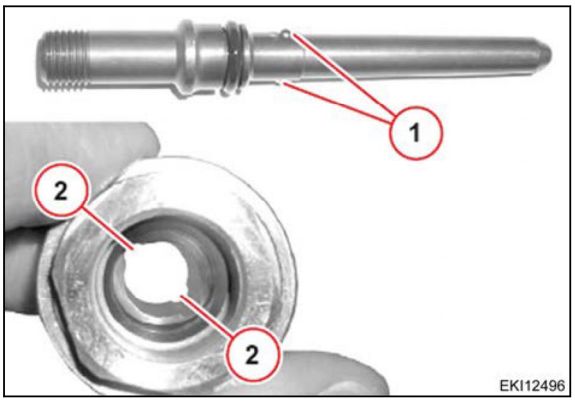


Fig. 639

If the diesel engine is switched off, the pressure relief valve closes after approx. 30 seconds.

If the A099 engine control unit detects a fault in the fuel system, it initiates emergency mode.

Warning: High-pressure relief valve is open. A fault code is logged: FC 1D.1.04 or 1D.1.09

3.4.8 Y095 to Y101 - Injectors 1 to 6

DANGER: After switching the engine off, wait at least 30 seconds before starting any work on the fuel system!

WARNING: Ensure the utmost cleanliness!

See Service Bulletin 14/2007.

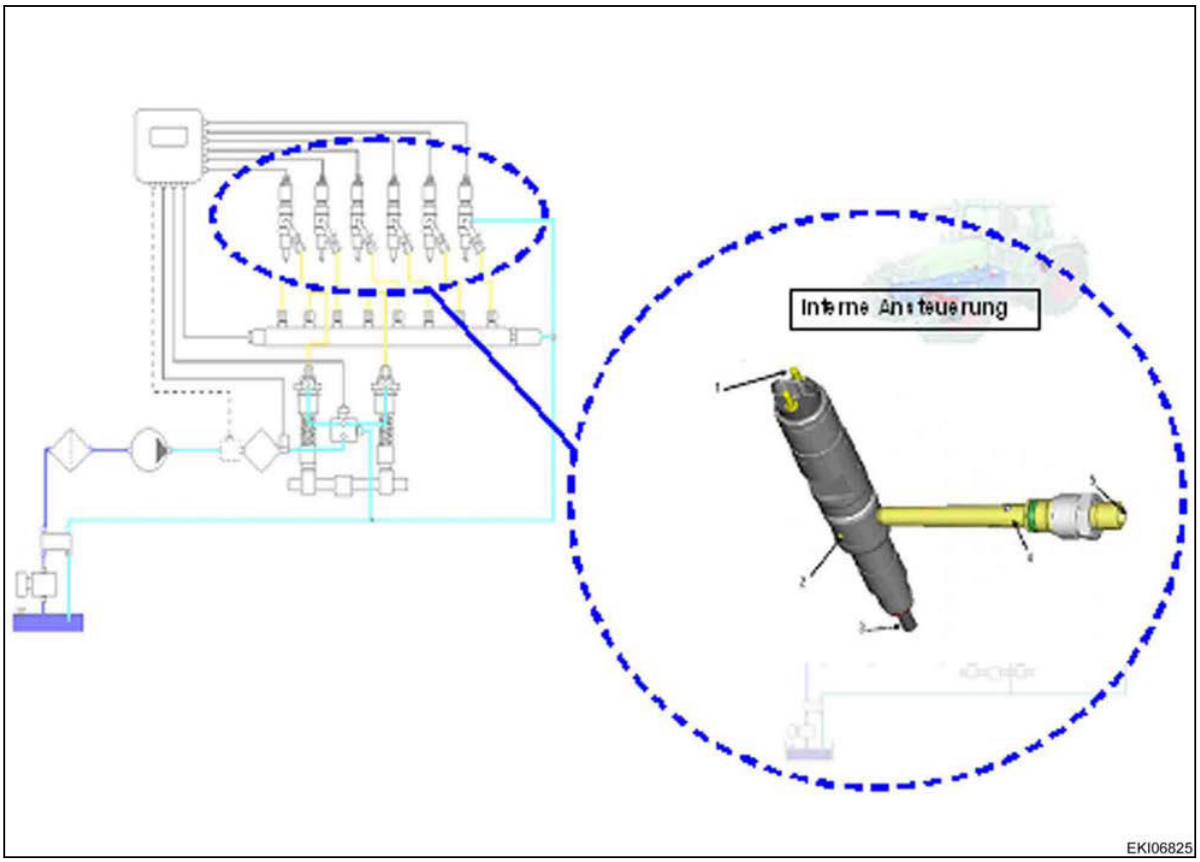


Fig. 657

Item	Designation	Item	Designation
1	Electrical connection	4	External high-pressure connection
2	Return flow	5	High-pressure connection from rail
3	Nozzle		

Check the fuel pressure (low pressure) in front of the Y091 fuel dispensing unit(ZME)

- Screw measuring connection into the fuel filter housing.
- Pressure gage with measurement range 0 bar to 25 bar.
- Target value: ca. 6 bar to 10 bar

Check the fuel pressure (low pressure) after the Y091 fuel dispensing unit (ZME)

- Attach adapter with measuring connection downstream of the Y091 dispensing unit.
- Pressure gage with measuring range 0 bar to 25 bar.
- Specified value: depends on engine load.

Y091 dispensing unit (fuel) fully energized "idle" (dispensing unit almost completely closed): approx. **1 bar**

Y091 dispensing unit (fuel) de-energized "full load" (dispensing unit fully open): approx. **5 bar ... 10 bar**

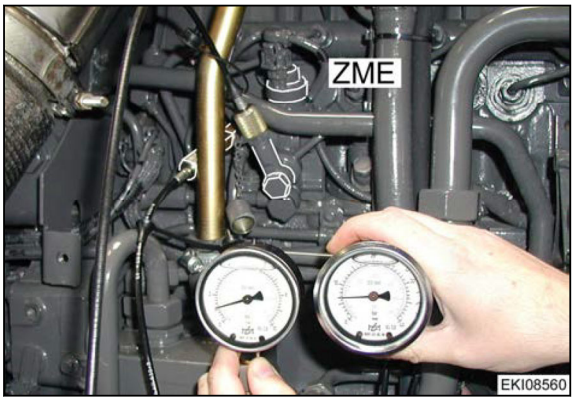


Fig. 677

Note: testing is carried out with diesel engine not under load.		
	Fuel pressure in front of the Y091 fuel dispensing unit	**Fuel pressure after the Y091 fuel dispensing unit**
Diesel engine not under load idling (800 rpm)	approx.6 bar (overflow valve opens)	approx. 1 bar
At no-load engine speed (2200 rpm)	approx. 6 bar (overflow valve opens)	approx. 1 bar
Externally energize Y091 dispensing unit with 12 V_{DC} Y091 - dispensing unit completely closed	approx.6 bar	approx. 0 bar (diesel engine dies)
Y091 dispensing unit de-energized (unplug connector) Y091 - dispensing unit fully open	approx.6 bar	approx.6 bar
Note: In this test, the engine switches to emergency mode (emergency running approx. 5 minutes).		

Conditions	Function	Test
Calculated catalytic converter temperature above 200 °C B236 sensor	**The diaphragm pump in the A084 AdBlue module (feed module) is speed-regulated.** Pressure in the A084 AdBlue module builds up to approx. 9 bar. System is now ready for dispensing	FENDIAS- Diagnostics SERDIA Engine diagnostics: SCR overview
AdBlue temperature in tank above -5 °C B102 - "level sensor" **If the outside temperature is below 0 °C** B076 - sensor (F800/900) the **heating progress of the AdBlue™ lines must be OK.** E216, E217 - tube heating A084 - AdBlue filter heater **Calculated catalytic converter temperature between 250 °C and 700 °C** B236 sensor **Coolant temperature below approx. 65 °C** B089 - sensor **=>** **A082 NOx sensor upstream of the catalytic converter** not yet detecting NOx values **A083 NOx sensor downstream of the catalytic converter** not yet detecting NOx values **A099 engine control unit (F800/900) detects:** • The engine load (calculated) • The catalytic converter temperature (calculated) Using these values, the A099 engine control unit calculates the optimal AdBlue injection volume.	The A099 engine control unit is then controlled by a mapping field when regulating • **AdBlue pressure** • **AdBlue flow rate** (adjustable speed of diaphragm pump — A084 AdBlue module) • **AdBlue injection volume** (timed energizing of Y120 flow valve)	FENDIAS- Diagnostics SERDIA engine diagnostics SCR overview

Fig. 731

Select the Deutz engine software (BSW).

Use the engine number (see engine sign plate) to download the relevant operating software (BSW) for the engine.

The engine operating software is saved at:

C / MDT_Data / chassis number (954.....) / Engine / BSW / software version (P.....) / Motornummer.hex

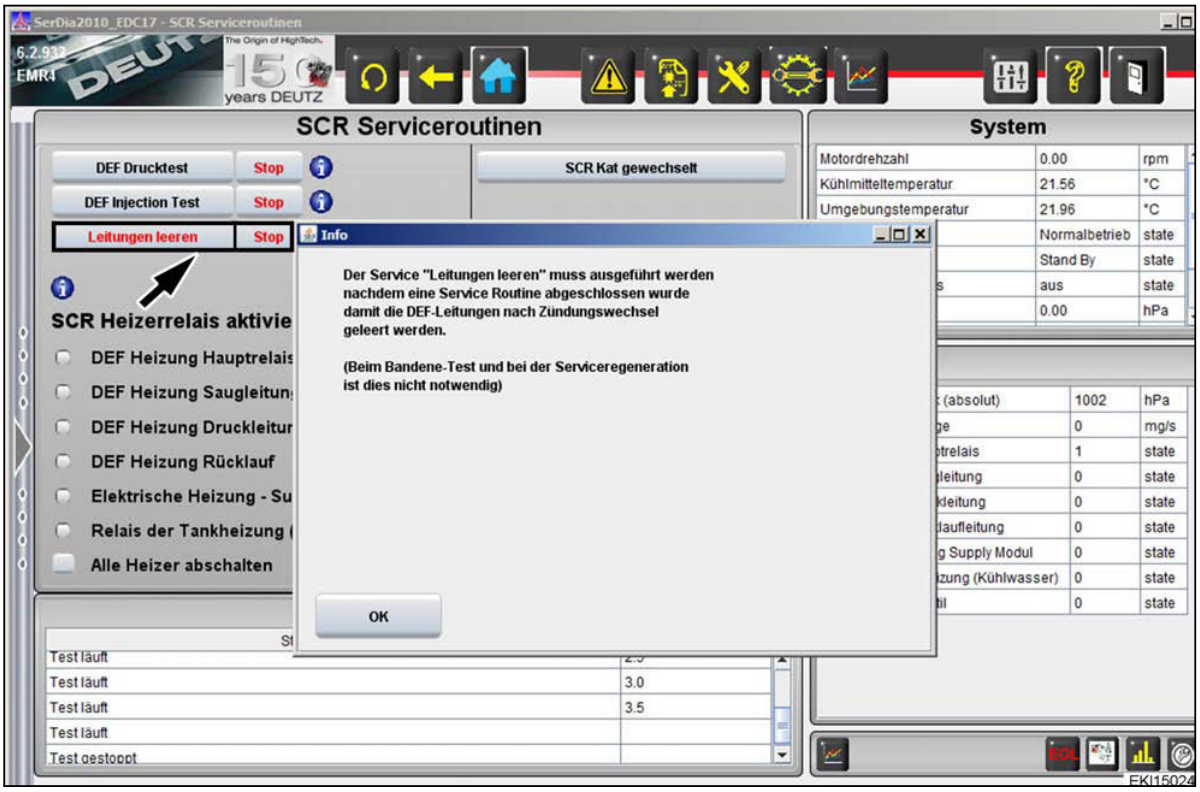


Fig. 753

Start the "Empty line" process in the Serdia diagnostics system (version b = tier 4 engine)

Engine diagnostics / Use Cases / Exhaust gas treatment / SCR service routines

AdBlue will be extracted from the hoses.

NOTE:
"Empty line" must be performed if a pressure test or injection test was performed, otherwise the hoses may crystallize or burst in cold weather.

Connect the adapter cable to the diagnostics X810 socket. Disconnect the comfort BUS. Confirm with "OK" button. Confirm the language selection with OK

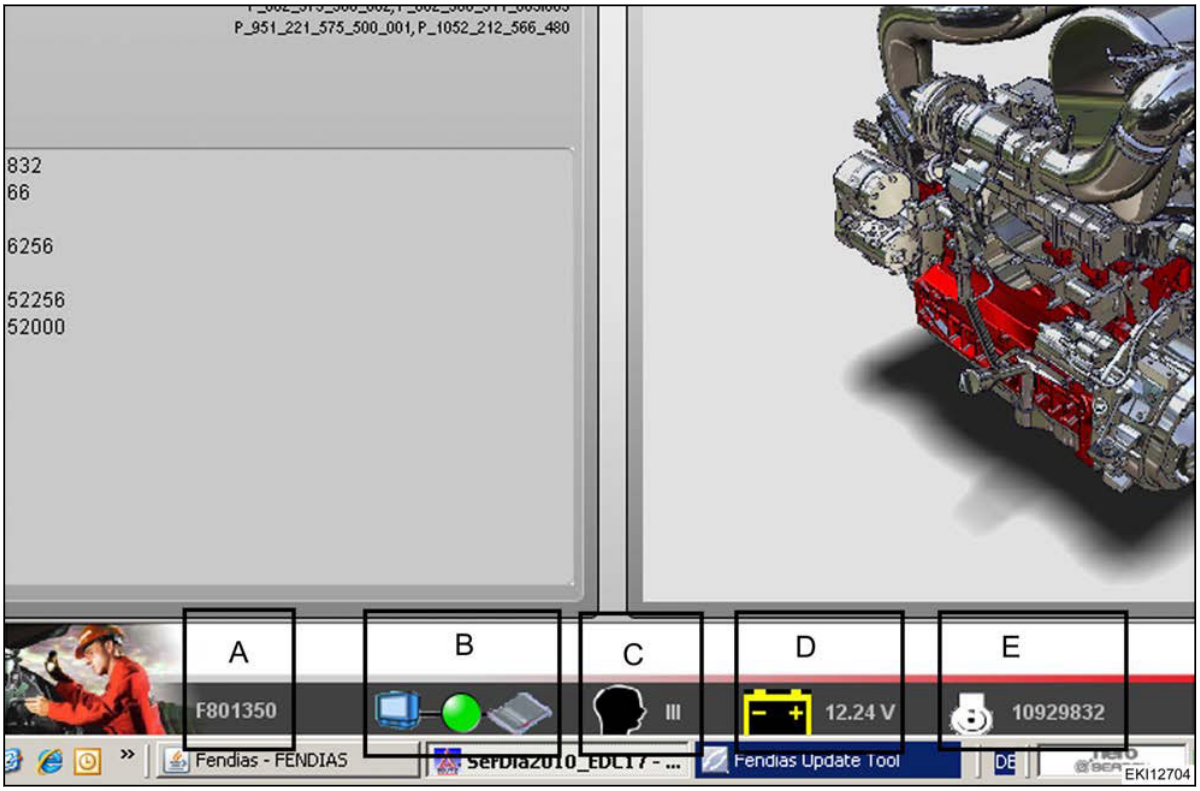


Fig. 779

(A) Serial number of the CAN USB adapter (X899.980.206.218)
(B) Engine control unit connection OK (green point)
(C) Access level (Level III here)
(D) G001 battery voltage
(E) Engine serial number

This opens the DEUTZ-Serdia engine diagnostics.

FENDT 800/900 SCR/T4

K083 AdBlue relay

K090 AdBlue module heater relay

K091 AdBlue heating relay for suction and return line

K092 AdBlue heating relay for pressure line

Cab, right mudguard at bottom

Detach panel

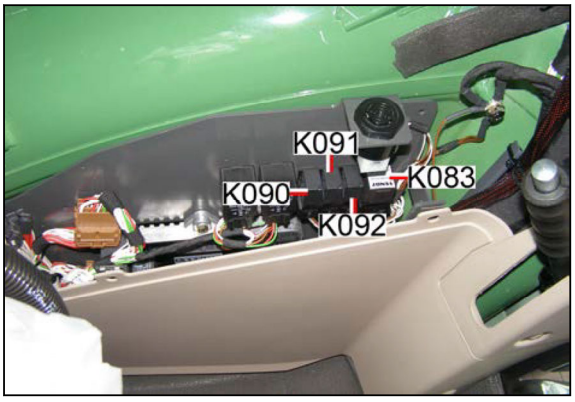


Fig. 797

3.5.7 AdBlue dosing system: AdBlue consumption and fuel consumption

Fig. 798

Determine the fuel and AdBlue consumption of a tractor using the dynamometer

4.2.2 Technical drawing: Suspension cylinder

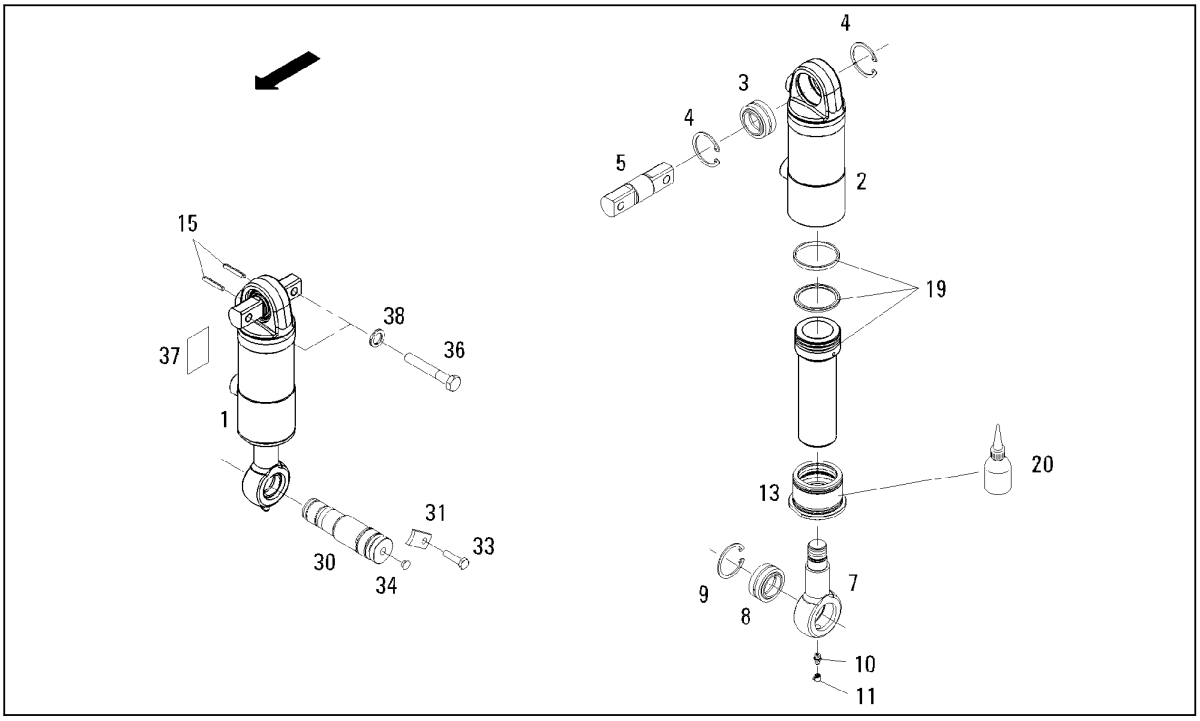


Fig. 8

(1) Hydraulic cylinders
(2) Cylinder barrel
(3) Swivel bearing
(4) Circlip
(5)5 Pin
(7)6 Plate
(8) Swivel bearing
(9) Circlip
(10) Conical grease nipple
(11) Protective cap
(13) Guide BUSh
(15) Roll pin
(19) Piston rod
(20) Threadlock compound
(30) Pin
(31) Plate
(33) Hex bolt
(34) Plug
(36) Hex bolt
(37) Plate
(38) Spring washer

	S025	S134	S075
Note:	Emergency steering pump (PNL) faulty Switch faulty		
Result:	Slide travel is reduced to 5 l/min on each installed valve		

Fit the cab panel bolt

Fig. 46

Fit the rubber mat

Fig. 47

Fit the seat

Fig. 48

Fit the nuts to the seat bracket

Fig. 49

Tighten both hydraulic lines on the left side

Fig. 41

Fit clamp and tighten bolt

Fig. 42

Fit cab mounting bolts to the front left and right and tighten

Tightening torque: **206 Nm**

Fig. 43

Fit shock absorber and cab suspension bolts to the front and tighten

Tightening torque: **85 Nm**

Fig. 44

Remove the cable from the roof lining at the back.

Fig. 101

Feed the socket cover through the roof lining.

Take roof lining out of the cab

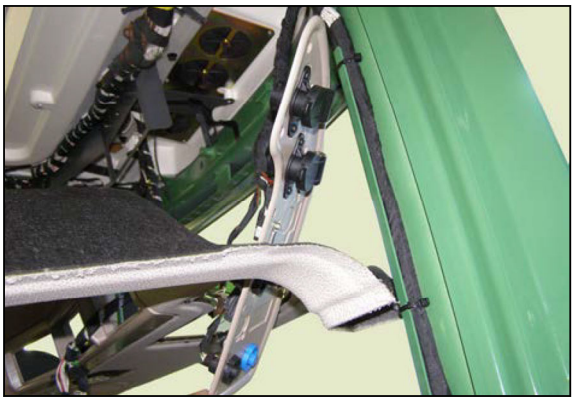


Fig. 102

Cab roof

Unplug electrical connectors on the right-hand mudguard.

Remove any cable ties that are in the way.

Fig. 103

(4) Hand rail clamp
(5)5 Outer hinge base plate
(6) Inner hinge base plate
(7)6 Washer
(8) Rubber washer
(9) Washer
(10) Washer
(11) Plate
(12) Lock cover
(13) Socket head cap screw
(14) Handle trim
(15) Front support
(16) Lock
(18) Oval-head screw
(19) Oval-head screw
(20) Oval-head screw
(21) Nut
(22) Countersunk screw
(23) Handle
(24) Oval-head screw
(25) Bolt
(26) External handle
(27) Washer
(28) Washer
(29) Nut

Remove

Remove the screws from the top and bottom of the lock cover (12)

Fig. 151

Remove the screw and handle trim (14)

Fig. 152

Item	Designation	Note
A013 - PCB microfuse **(Microfuse no. 13 = B032 - draft sensing pin, left)** **(Microfuse no. 14 = B031 - draft sensing pin, right)**		
X200	Separation point on A013 PCB_microfuse	
Pin 17	+ supply for the A013 PCB microfuse (8.5 V_{DC})	Switch on ignition.
Pin 6	+ supply for B031 - draft sensing pin (8.5 V_{DC})	Switch on ignition.
Pin 5	+ supply for B032 - draft sensing pin (8.5 V_{DC})	Switch on ignition.
A050 - basic control unit ECU		
X1402	Separation point on the A050 basic control ECU	
X1403	Separation point on the A050 basic control ECU	
Pin 32 (to X1402)	+ supply for the A013 PCB microfuse (8.5 V_{DC})	Switch on ignition.
Pin 17 (at X1403)	B031 signal	
Pin 16 (to X1403)	B032 signal	
Pin 46 (at X1403)	Sensor system earth	
Pins 22 and 23 (to X1403)	Electronics earth	
B031 - draft sensing pin, right		
X179	Separation point on the B031 - draft sensing pin	
Pin 1	Earth	
Pin 2	Signal	
Pin 3	Supply (8.5 V_{DC})	Switch on ignition.
B032 - draft sensing pin, left		
X180	Separation point on the B032 - draft sensing pin	
Pin 1	Earth	
Pin 2	Signal	
Pin 3	Supply (8.5 V_{DC})	Switch on ignition.
X553 - earth point		

1B1 - air receiver, circuit 1 (10 l)	**3M1** - supply pressure, circuit 3 (red single-line coupling)
1P1 - compressor	**3M2** - brake pressure, circuit 3 (yellow single-line coupling)
1P2 - air dryer with pressure controller	**3M3** - spring-loaded pressure release hand brake
1P3 - regeneration reservoir (5 l)	**3V1** - hand brake valve
1M1 - supply pressure, circuit 1	**3V2** - non-return valve
1M2 - brake pressure, circuit 1	**3V3** - hydraulic trailer brake shuttle valve
1V1 - 4-circuit safety valve	**3V4** - trailer control valve
1V2 - foot brake valve, circuit 1 (rear axle)	**3V5** - trailer control valve for single-line brake
1Z1 - rear right Tristop cylinder	**3V6** - hand brake rapid bleed valve
1Z2 - rear left Tristop cylinder	**4** - auxiliary consumer
2B1 - air receiver, circuit 2 (10 l)	**4V2** - hydraulic trailer brake release valve [Y088]
2M1 - supply pressure, circuit 2	**A050** - Basic control unit ECU (EXT)
2M2 - brake pressure, circuit 2	**AB** - Hydraulic trailer brake
2Z1 - Cardan brake	**ABVF** - Trailer brake (French version)
3B1 - air receiver, circuit 3 (15 l)	

Earth layout of the A050 - Basic control unit ECU (EXT)

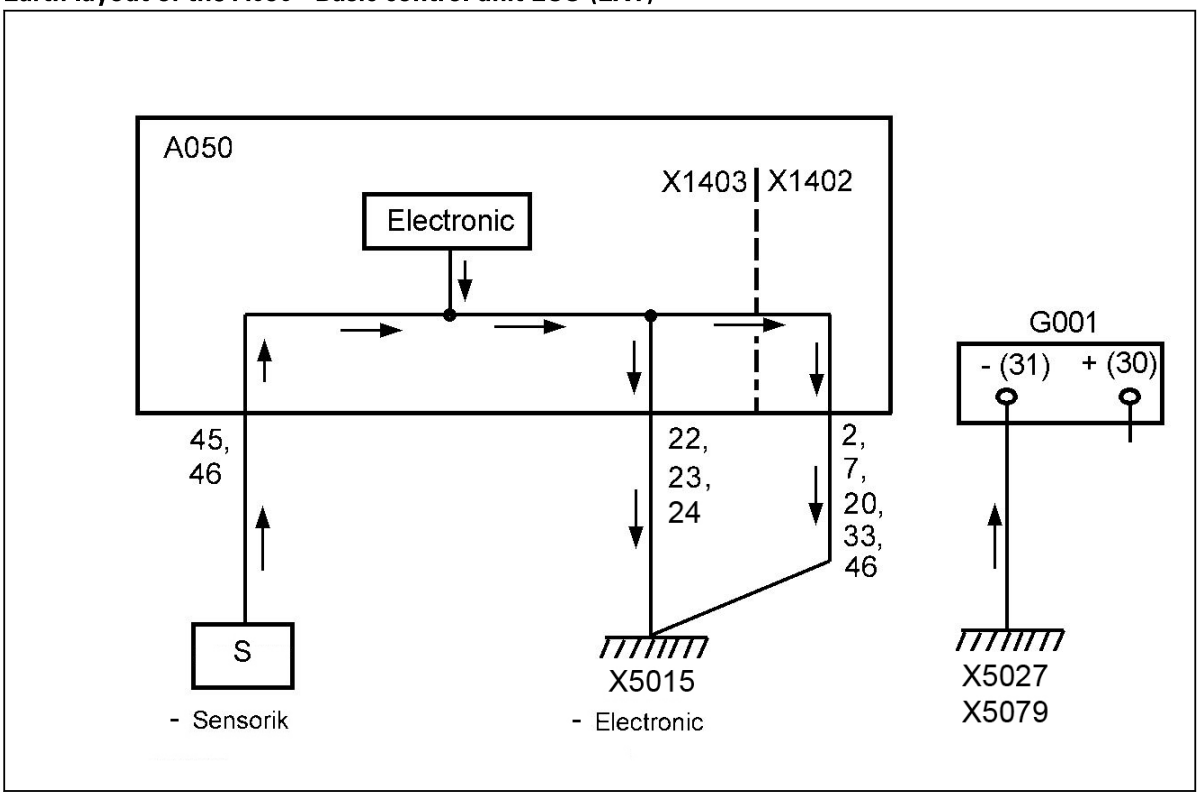


Fig. 4

A050 - Basic control unit ECU (EXT)

G001 - Battery 1

X101 - separation point (yellow)					
				Wire interrupted	
Pin	**Description**	**condition**	**Signal Specified value**	**Signal from ECU**	**Signal from component**
		Ignition ON, engine running	14 VDC	0 VDC	14 VDC
10	**58**				
		Light OFF	0 VDC	0 VDC	0 VDC
		Light ON	12 VDC	12 VDC	0 VDC
11	**Body earth**				
12	**Digital earth (electronics earth)**	-	-	-	-
13	**+ UB 12 VDC (sensor system)**				
		Ignition OFF	0 VDC	0 VDC	0 VDC
		Ignition ON	12 VDC	12 VDC	0 VDC
14…19	Not assigned				
20	**Analog earth (sensor system earth)**	-	-	-	-
21	**B007 fuel level sensor**				
		Fuel gage "Empty" (1 bar flashing) (resistance = 20 ohms)	10.2 VDC	9.6 VDC (ignition ON) or 11.6 VDC (engine running)	0 VDC
		Fuel gage "1/2" (6 bars) (resistance = 260 ohms)	2.45 VDC		
		Fuel gage "1/1" (12 bars) (resistance = 500 ohms)	4.8 VDC		
22	Not assigned				
23	Not assigned				

Fuses (X200 separation point) "area A"			
Vehicle earth			
Pin	**Fuse**	**Specified value**	**Component**
A1	-	12 VDC	+ UB 30 (fuse F6)
A2	-	approx. 2.5 VDC	Control bus_Low
A3	-	approx. 2.6 VDC	Control bus_High
Ignition off, A2 and A3 Measure	-	approx. 60 ohms	2x 120 ohms parallel Terminating resistance: 120 ohms **A007** instrument panel 120 ohms **A013** microfuses PCB
A4	S 15	8.5 VDC	**B145** rear power lift position sensor
A5	S 14	8.5 VDC	**B031** right-hand draft sensing pin
A6	S 13	8.5 VDC	**B032** left-hand draft sensing pin
A7	S 12	8.5 VDC	**B040** front power lift position sensor
A8	-	-	-
A9	-	-	-
A10	S 8	8.5 VDC	**B015** bevel pinion sensor
A11	S 7	8.5 VDC	**B014** collecting shaft sensor
A12	S 6	8.5 VDC	**B016** travel range detection sensor
A13	S 5	8.5 VDC	**B017** clutch pedal sensor
A14	-	-	-
A15	-	-	-
A16	-	-	-
A17	-	8.5 VDC	+UB 8.5 VDC from the A050 basic control ECU
A18	-	-	-

10.2.13 A083 nitrogen oxide NOx sensor 2, downstream of SCR

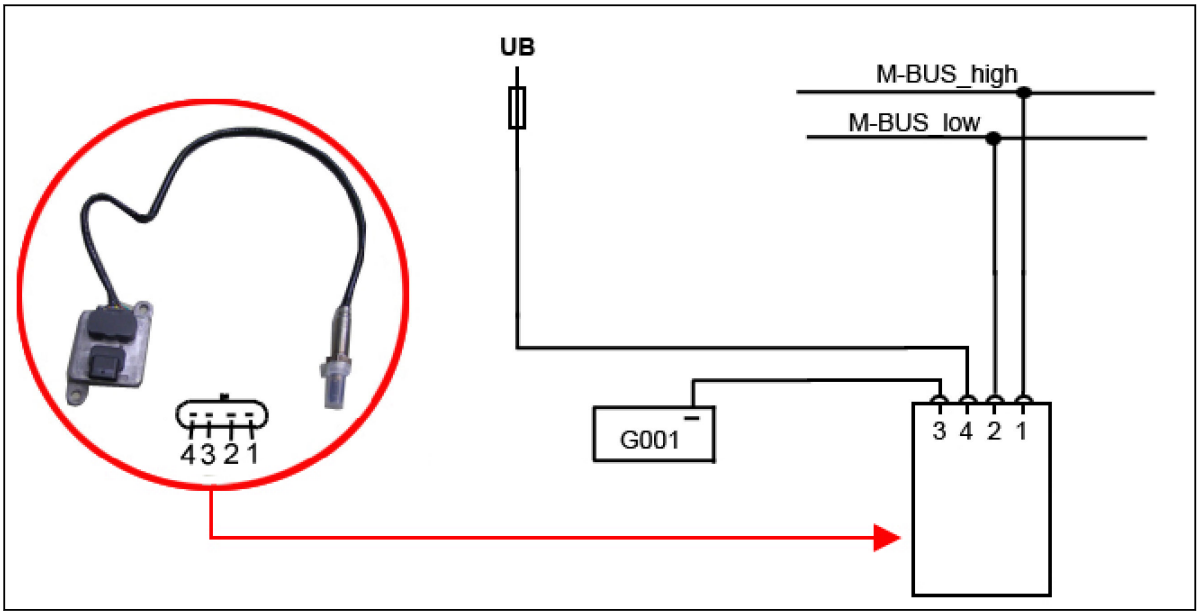


Fig. 52

Pin assignment	A083 nitrogen oxide NOx sensor 2, downstream of SCR	A099 engine control unit ECU (EDC 17)
M BUS_High	# 1 (X2015)	# B 77 (X2187)
M BUS_Low	# 2 (X2015)	# B 98 (X2187)
Earth	# 3 (X2015)	Battery earth
+UB	# 4 (X2015)	Fuse 60 (X2246) **A111** central electrical system ECU

Measurement at component - separation point (X2015)

Test	Pin	Specified value	condition	Note
+UB	# 4	12 V_{DC}	Ignition **ON**	Fuse 60 (X2246) or wiring faulty.
Earth	# 3			
M BUS_High	# 1	60 ohms	Ignition **OFF** (min. 2 minutes)	2x 120 ohms parallel: **R006** terminating resistor (bridge connector) **R007** terminating resistor (bridge connector)
M BUS_Low	# 2			

Recommended tools

- Diagnostic PC with current FENDIAS software

				Wire interrupted	
Pin	**Description**	**Signal type/condition**	**Signal**	**Signal from ECU**	**Signal from component**
E106 right-hand exterior mirror (adjustment/heater)					
11	Actuation of horizontal (right & left) adjustment	Adjust mirror horizontally (right & left)	12 VDC	12 VDC (F45)	0 VDC
		Using a multimeter (ammeter) Open and measure pin Mirror, horizontal adjustment	approx. 0.15 to 0.30 ADC	-	-
9	Sensor system earth for horizontal adjustment				
E106 right-hand exterior mirror (adjustment/heater)					
13	Actuation of vertical (up & down) adjustment	Adjust mirror vertically (up & down)	12 VDC	12 VDC (F45)	0 VDC
		Using a multimeter (ammeter) Open and measure pin Mirror, vertical adjustment	approx. 0.15 to 0.30 ADC	-	-
10	Sensor system earth for vertical adjustment				
E107 left-hand exterior mirror (adjustment/heater)					
12	Actuation of horizontal (right & left) adjustment	Adjust mirror horizontally (right & left)	12 VDC	12 VDC (F45)	0 VDC
		Using a multimeter (ammeter) Open and measure pin Mirror, horizontal adjustment	approx. 0.15 to 0.30 ADC	-	-
9	Sensor system earth for horizontal adjustment				
E107 left-hand exterior mirror (adjustment/heater)					

Do not damage the contact plugs (arrowed) for the electric rear-view mirror adjustment switch.

Fig. 94

Carefully remove the protective film.

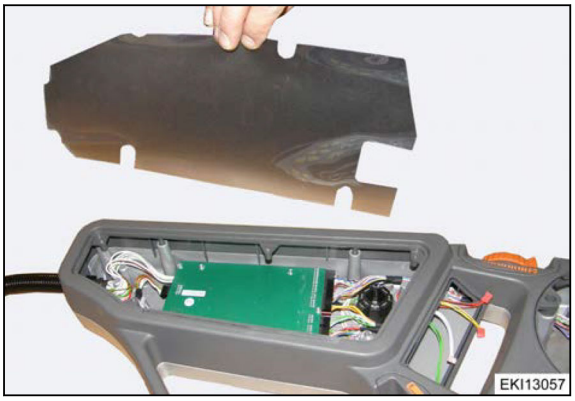


Fig. 95

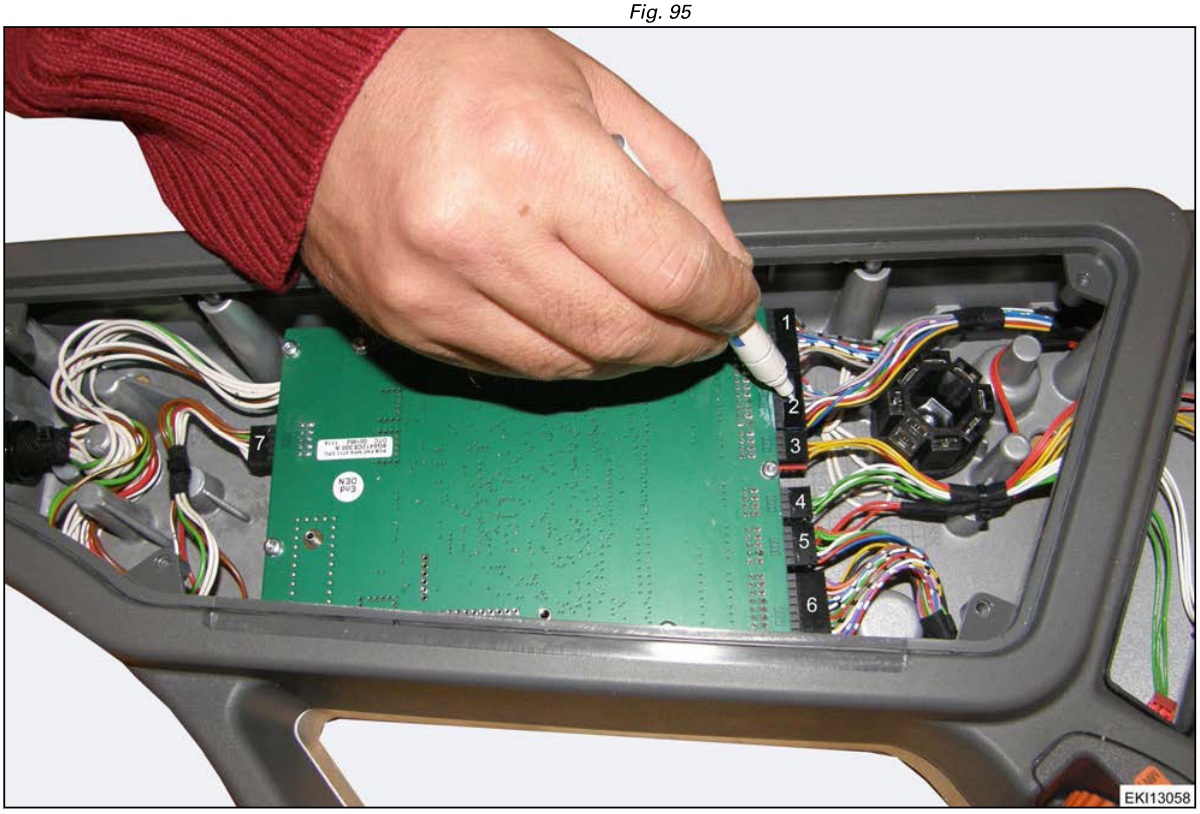


Fig. 96

Remove the circuit board

Mark the separation points on the circuit board.

Connect the crossgate lever separation point (arrowed).

Make sure the lug (arrowed) is in the correct position.

Fig. 138

Connect the joystick separation points.

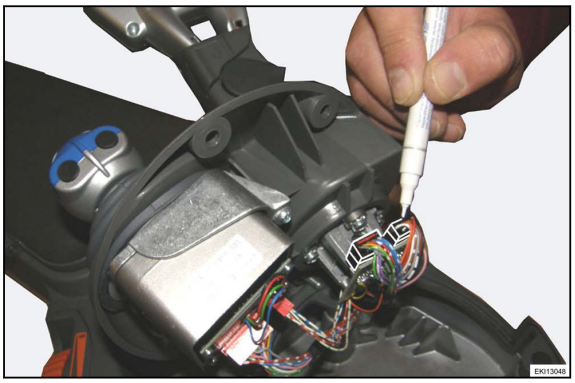


Fig. 139

Attach the A100 multi-function armrest (MFA) to the operator's seat.

Fig. 140

Put the armrest to one side.

Keep the Bowden cables (arrowed) tensioned so that they do not hang onto the armrest adjuster.

Tighten hex bolts.

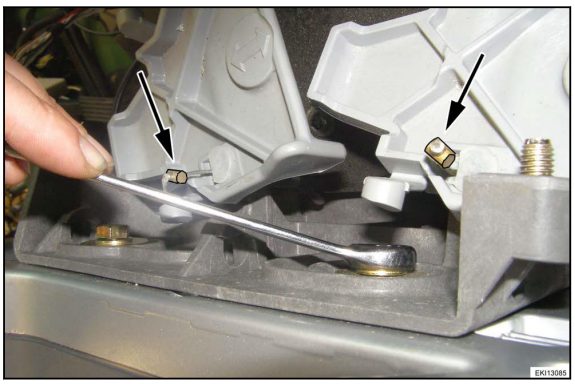


Fig. 141

				Wire interrupted	
Pin	**Description**	**Signal type/condition**	**Signal**	**Signal from A111**	**Signal from component**
D6 (X2243)	**Signal** **Left brake light**	Foot brake not applied	0 V_{DC}	12 V_{DC} not loadable	0 V_{DC}
		Foot brake applied	12 V_{DC}	12 V_{DC}	0 V_{DC}
Activation of: E206 left LED brake light					
D2 (X2243)	**Signal** **Right brake light**	Foot brake not applied	4.6 V_{DC} not loadable	4.6 V_{DC} not loadable	0 V_{DC}
		Foot brake applied	12 V_{DC}	12 V_{DC}	0 V_{DC}
Operation of: **E207** right LED brake light					
D6 (X2243)	**Signal** **Right brake light**	Foot brake not applied	4.6 V_{DC} not loadable	4.6 V_{DC} not loadable	0 V_{DC}
		Foot brake applied	12 V_{DC}	12 V_{DC}	0 V_{DC}
Operation of: **E208** left tail lamp					
F3 (X2245)	**Signal** **Left tail lamp**	Parking light **OFF**	0 V_{DC}	12 V_{DC} not loadable	0 V_{DC}
		Parking light **ON**	12 V_{DC}	12 V_{DC}	0 V_{DC}
Operation of: **E209** right tail lamp					
F6 (X2245)	**Signal** **Right tail lamp**	Parking light **OFF**	0 V_{DC}	12 V_{DC} not loadable	0 V_{DC}
		Parking light **ON**	12 V_{DC}	12 V_{DC}	0 V_{DC}
Operation of: **E210** left LED tail lamp					
F3 (X2245)	**Signal** **Left tail lamp**	Parking light **OFF**	4.6 V_{DC} not loadable	4.6 V_{DC} not loadable	0 V_{DC}
		Parking light **ON**	12 V_{DC}	12 V_{DC}	0 V_{DC}
Operation of: **E211** right LED tail lamp					

				Wire interrupted	
Pin	**Description**	**Signal type/condition**	**Signal**	**Signal from A111**	**Signal from component**
D18 (X2243)	**Signal**	Screen washer pump **OFF**	0 V_{DC}	0 V_{DC}	0 V_{DC}
		Screen washer pump **ON**	12 V_{DC}	12 V_{DC}	0 V_{DC}
Supply to: M004 rear wiper motor					
C12 (X2242)	**supply (53) to:** **M004** rear wiper motor	Wiper motor **OFF**	0 V_{DC}	12 V_{DC} not loadable	0 V_{DC}
		Wiper motor **ON**	12 V_{DC}	12 V_{DC}	0 V_{DC}
B9 (X2241)	**Control line (31b)** from **M004** rear wiper motor to **A111** central electrical system ECU				
	Ignition **ON**	Wiper motor **OFF**	0 V_{DC}	Approx. 4 V_{DC}	0 V_{DC}
		Wiper motor **ON**	Approx. 4 V_{DC}		
NOTE: ***If the control line (31b) is interrupted:*** *The **A111** central electrical system ECU does not detect the part position and the **M004** rear wiper motor does not switch off.*					
Activation of: M005 rear screen washer pump					
E12 (X2244)	**Signal**	Screen washer pump **OFF**	0 V_{DC}	0 V_{DC}	0 V_{DC}
		Screen washer pump **ON**	12 V_{DC}	12 V_{DC}	0 V_{DC}
Detection of: S157 forward - reverse shuttle switch					
B20 (X2241)	**Front washer system**	M003 - front screen washer pump **OFF**	1.7 V_{DC} not loadable	1.7 V_{DC} not loadable	0 V_{DC}
		M003 - front screen washer pump **ON**	12 V_{DC}	1.7 V_{DC} not loadable	12 V_{DC}
B2 (X2241)	**Front wiper motor "Setting 1"**	M002/M055 - front wiper motor **OFF**	1.7 V_{DC} not loadable	1.7 V_{DC} not loadable	0 V_{DC}

Pin assignment	A112 climate control ECU (X2254)	
-	# B12 (X2254)	
-	# B13 (X2254)	
-	# B14 (X2254)	
-	# B15 (X2254)	
Fan diagnostics	# B16 (X2254)	# B1 (X2426 — A129)

10.2.33 A128 control panel for right/left dashboard

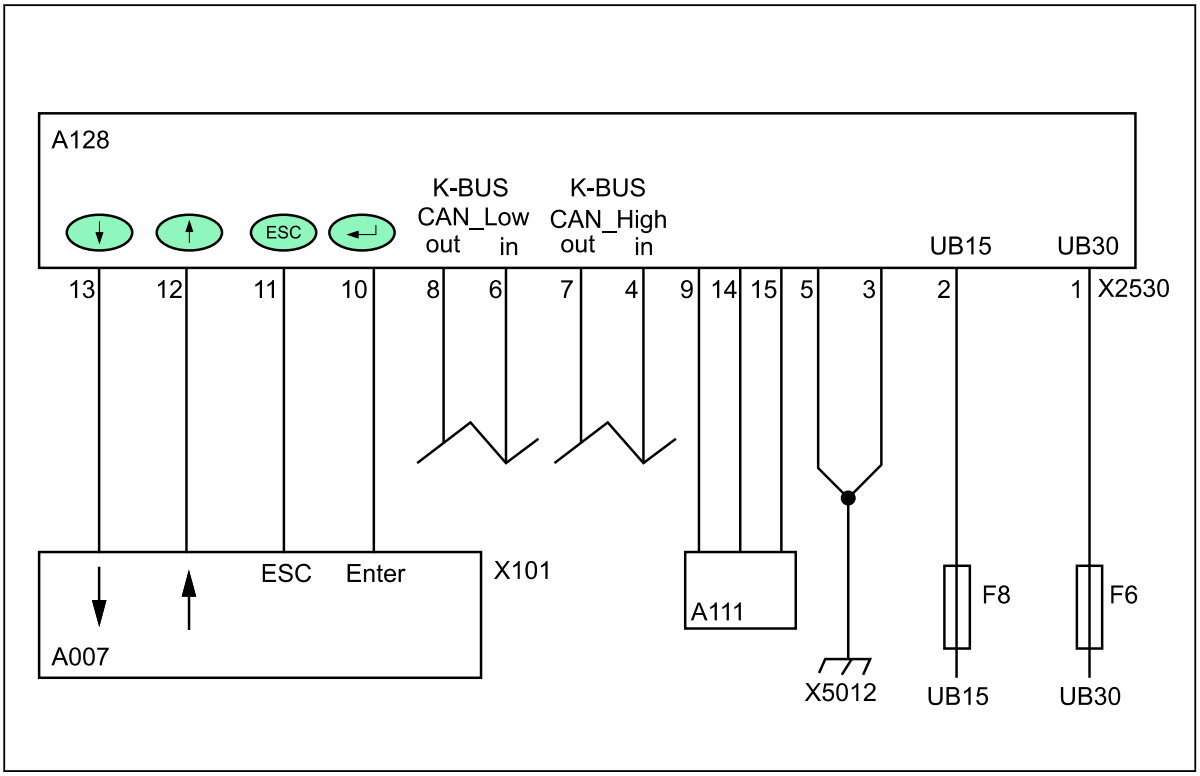


Fig. 181 Circuit diagram: A128 control panel for right/left dashboard

A007 instrument panel
A111 central electrical system ECU
A128 control panel for right/left dashboard
X101 - Separation point on A007
X2530 - Separation point on A128
X5012 - Right-hand operator platform earth point

Display on A007 instrument panel	Signal	Total resistance
5 bars	2.10 ... 2.44 VDC	220 ... 259 ohms
16 bars	2.45 ... 2.79 VDC	260 ... 299 ohms
7 bars	2.80 ... 3.19 VDC	300 ... 339 ohms
8 bars	3.20 ... 3.59 VDC	340 ... 379 ohms
9 bars	3.60 ... 3.99 VDC	380 ... 419 ohms
10 bars	4.00 ... 4.33 VDC	420 ... 459 ohms
11 bars	4.34 ... 4.69 VDC	460 ... 499 ohms
12 bars "full"	4.70 ... 5.0 VDC	500 ohms

Recommended tools

- Diagnostic PC with current FENDIAS software
- X899.980.246.205 adapter cable - connection to sensor
- Adapter box X899.980.208.100
- Adapter cable X899.980.208.204
- Resistance decade X899.980.224.000

10.3.6 B008 - High pressure sensor 1

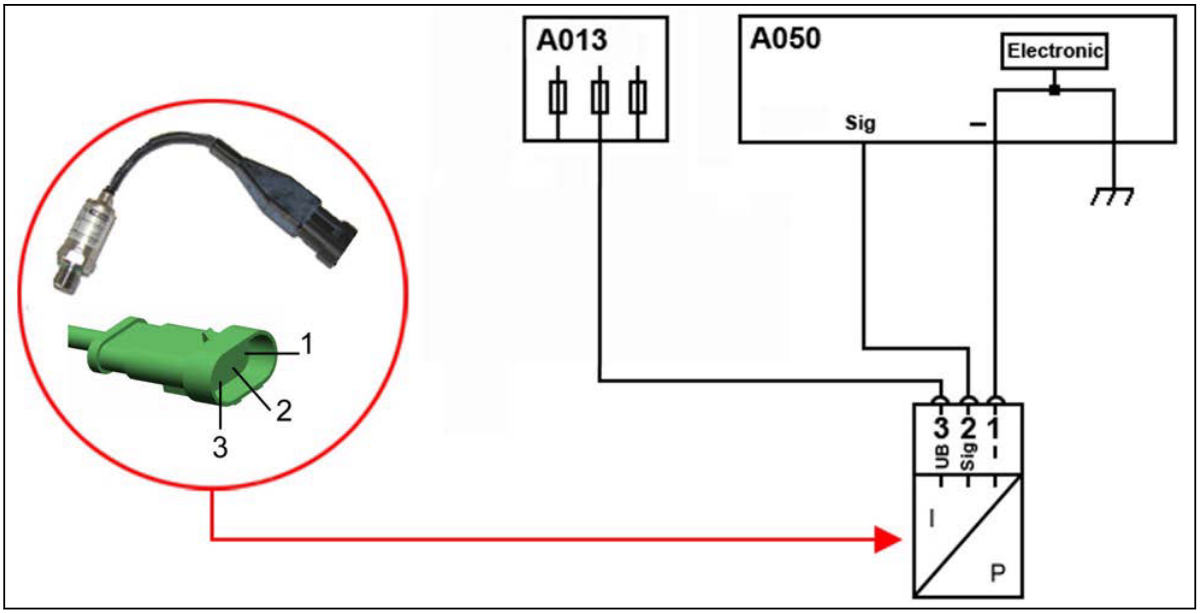


Fig. 195

Pin assignment	B008 - High pressure sensor 1	A050 - Basic control unit ECU (EXT)
Earth	#1 (X157	#A46 (X1403)
Signal	#2 (X157)	#A67 (X1403)
+UB	#3 (X157)	-

Resistance	Display
Ohms	Bar
77	7
86	8
96	9
104	+10
112	11
113	12

10.3.15 B020 rear PTO (stub shaft) speed sensor

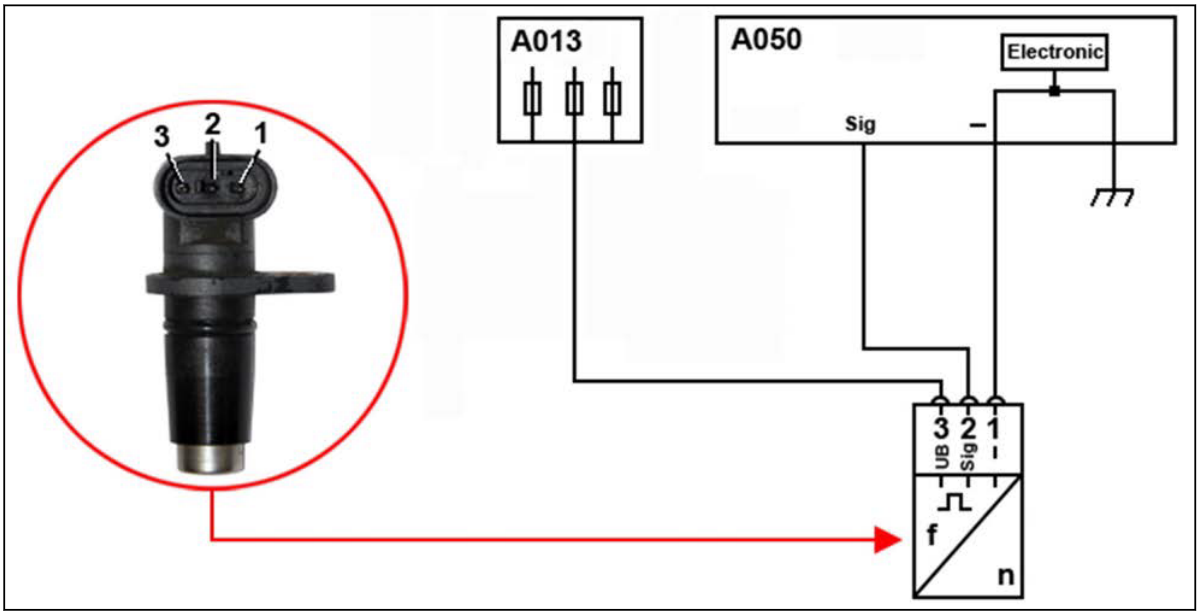


Fig. 212

Pin assignment	B020 - rear PTO (stub shaft) speed sensor	A050 - basic control unit ECU (EXT)
Earth	# 1 (X169)	# A46 (X1403)
Signal	# 2 (X169)	# A10 (X1403)
+UB	# 3 (X169)	-

Measurement at component separation point (X169)

Test	Pin	Specified value	condition	Note
+UB	# 3	12 to 14 V_{DC}	Ignition **ON**	Microfuse (S35) in A013 or wiring set faulty.
Earth	# 1			

Checking display (compressed air supply) on the A007 - Instrument panel instrument panel.

Connect adapter cable X899.980.246.205 to component separation point X1410.

Connect X899.980.224 resistance decade and select corresponding resistance (see table).

Switch ignition ON.

Compressed air supply is displayed on the instrument panel.

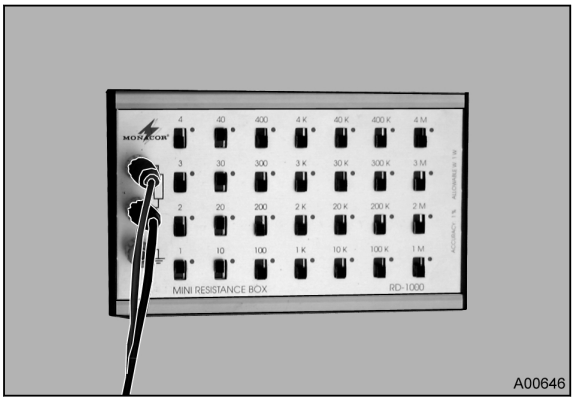


Fig. 227

Resistance	Display
Ohms	Bar
20	1 flashes
25	1
32	2
41	3
50	4
59	5
68	6
77	7
86	8
96	9
104	10
112	11
113	12

10.3.25 B076 - exterior temperature sensor

NOTE:
Only for "Profi - ProfiPlus Variants"

Pin assignment	B088 crankshaft speed sensor	A099 engine control ECU (EDC 17)
Signal	# 1	# B102 (X2187)
Earth	# 2	# B101 (X2187)
Shielding against interference	# 3	# B75 (X2187)

- Connect adapter cable X899.980.246.202 to the sensor only
- Ignition off

Test	Pin	Specified value	condition	Possible cause of fault
Signal	1	approx. 900 ohms	Ignition **OFF**	Reading infinity: component fault.
Earth	2			

Measuring the internal resistance

Checking permanent magnet of the inductive sensor

Hold inductive sensor against a metal plate.

The inductive sensor must "stick" to the metal plate

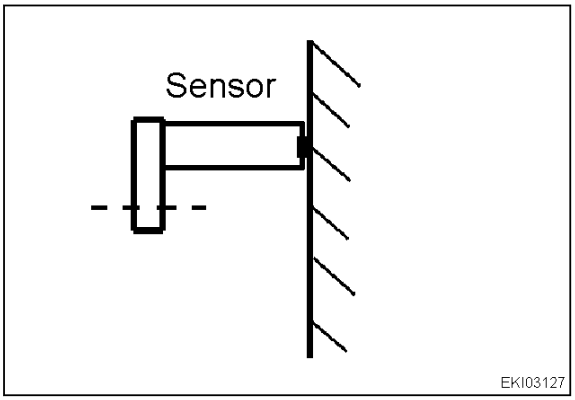


Fig. 249

Measuring induction voltage and frequency

IN = Inductive sensor

Ua = Induced voltage

Measurement of inductive sensors

The inductive sensor receives pulses directly from a pulse generator (gearwheel or disk).

Where the magnetic field of the inductive sensor is intersected by measuring points, an induction voltage is generated.

The A099 engine control unit calculates the speed from the number of voltage pulses (frequency).

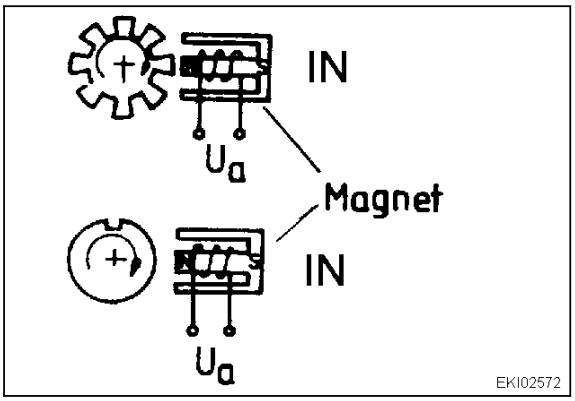


Fig. 250

Measurement at component - separation point (X2221)

Test	Pin	Specified value	condition	Note
+UB	# 2	8.5 V_{DC}	Ignition **ON**	Microfuse (S15) in A013 or wiring faulty.
Earth	# 1			
Signal	# 3	3.8 V_{DC}	Rear power lift raised	
		0.9 V_{DC}	Rear power lift lowered	
Earth	# 1			

Measurement on A050 - basic control unit ECU (EXT) — separation point (X1403)

NOTE:
*Remove bridge at pin **68** on adapter box.*

Test	Pin	Specified value	condition	Note
Signal	# A68	20 mA_{DC}	Rear power lift raised	Remove bridge at pin 68 on adapter box
		4 mA_{DC}	Rear power lift lowered	

Recommended tools

- Diagnostic PC with current FENDIAS software
- X899.980.246.205 adapter cable - connection to sensor
- Adapter box X899.980.304.000
- Adapter cable X899.980.304.201 - connection to adapter box

Pin assignment	B217 temperature downstream of venturi sensor	A099 engine control ECU (EDC 17)
Sensor system earth	# 1	# B76 (X2187)
Signal	# 2	# B8 (X2187)

Test characteristic curve from the B217 temperature downstream of venturi sensor

1. Connect adapter cable X899.980.??? to the B217 sensor.
2. Measure resistance using multimeter (ohmmeter).
3. Warm up the B217 sensor

   (For resistance values, see table).

Exhaust temperature	Resistance (ohms)	Voltage (V_{DC})
0°C	200	0.84
25°C	220	0.9
50°C	240	0.96
100°C	275	1.1
200°C	350	1.3
300°C	420	1.5

Test temperature display in Serdia

Connect adapter cable X899.980.259.104 to the separation point on the engine cable loom (connection to B217 remains separated)

Connect the X899.980.224.000 resistance decade.

Switch on ignition.

Select the corresponding resistance (see table) and read the temperature off in Serdia

NOTE:
Allow preconditioning time.

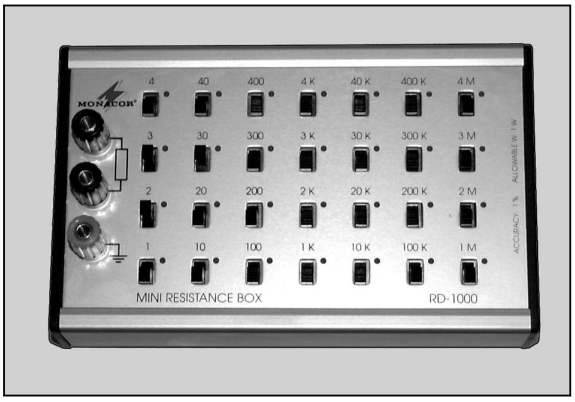


Fig. 282

Recommended tools

- Diagnostic PC with current FENDIAS software
- Adapter cable X899.980.259.104 - connection to sensor
- Resistance decade X899.980.224.000
- Adapter box X899.980.304.000
- Adapter cable X899.980.304.207, 105-pin - connection to adapter box for X2187 (B)

10.4 Measure and test - CAN bus

10.4.1 CAN BUS

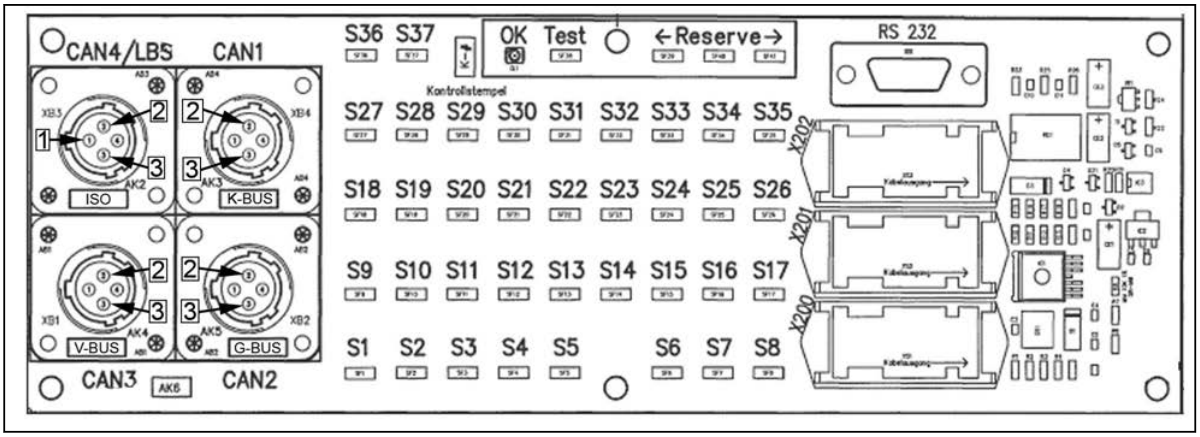


Fig. 305

NOTE:

- *Switch ignition ON.*
- *All readings +/- 10%.*

Check the K bus

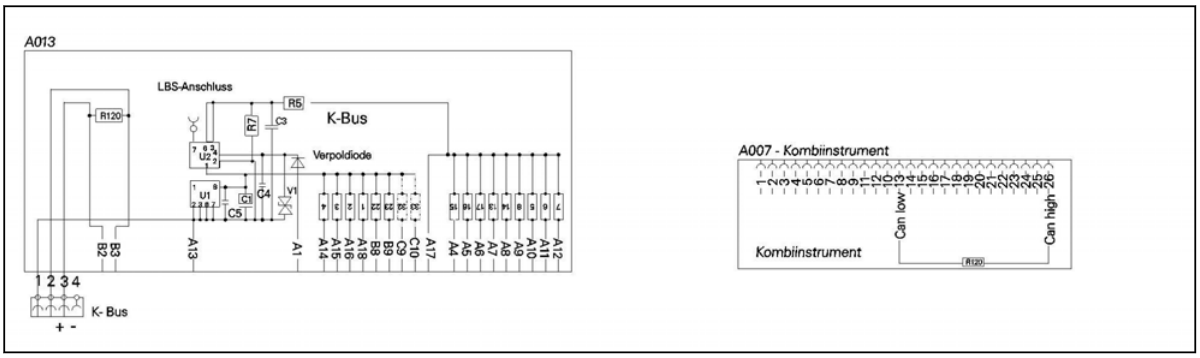


Fig. 306 K bus, 120-ohm terminating resistance in A013 and A007

Test	Pin	Specified value	condition	Note
Comfort BUS	2	60 ohms	Switch off ignition	120 ohms = Break in wiring or defective component
	3			

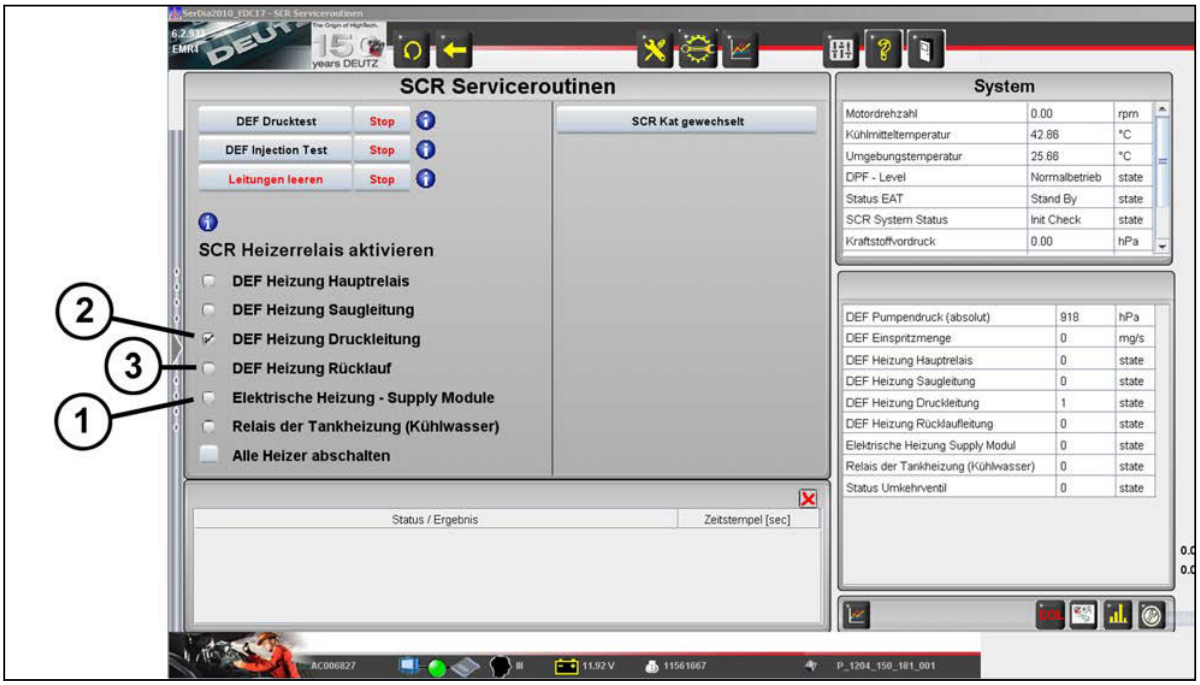


Fig. 325

Recommended tools

- Diagnostics PC with current FENDIAS software
- Adapter box X899.980.304.000
- Adapter cable X899.980.304.207 for connection to the electronics box

10.9 Measure and test - S components

10.9.1 S017 - Filter contamination switch

The resistors (510 ohms and 160 ohms) are switched by means of a read element. The magnet is located in the valve piston of the bypass valve.

Before installing, lubricate the thread on the switch, fit a seal ring and rotate until it lies flush.

Tightening torque: 25 Nm.

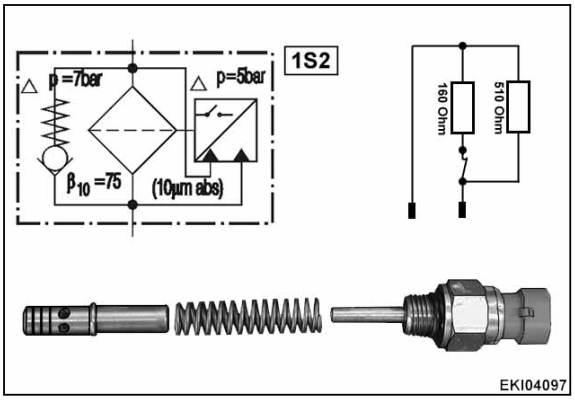


Fig. 338

Pin assignment	S017 - Filter contamination switch	A050 - Basic control unit ECU (EXT)
Signal	# 1 (X228)	# A34 (X1403)
Earth	# 2 (X228)	# A46 (X1403)

Measurement at component

Test	Pin	Specified value	condition	Possible cause of fault
Signal	pin 1	1.8 V_{DC}	Gearbox high pressure filter OK (switch closed)	**Unplug component:** If the measured value is 0 V_{DC}, there is a fault in the wiring or in A050 If measured value is 6.2 V_{DC}: fault in component.
		3.7 V_{DC}	Oil temperature < 0° or contaminated pressure filter (switch open)	
Earth	pin 2			

Checking the S017 - Filter contamination switch

- Connect the X899.980.246.204 adapter cable directly to the S017
- Connect multimeter (ohmmeter) - Target: **121 ohms**
- Unscrew **S017** - Filter contamination switch by 1 4/6 revolutions
- The value must jump to **510 ohms** on the ohmmeter

When the following conditions are met, a warning message (pressure filter clogged) appears on the instrument panel:

1. Engine is running
2. Transmission oil temperature greater than 50 °C (resistance of temperature switch < 150 ohms).
3. Pressure difference before and after the pressure filter > 5 bar

Pin assignment	S074 starter lockout switch/ clutch pedal limit switch	A099 engine control ECU (EDC 17)
+ UB sensors	# 3 (X1429)	# A91 (X2186)
Starter lockout switch	# 4 (X1429)	# A43 (X2186)

Measurement at component - separation point (X1429)

Test	Pin	Specified value	condition	Note
Resistance	# 1	Infinite	Clutch pedal not depressed (switch open)	Reading at 20°C coil resistance
		4.0 ohms	Completely depress clutch pedal (switch closed)	
	# 2			

Test	Pin	Specified value	condition	Note
Voltage	# 1	12 V_{DC}	Clutch pedal not depressed (switch open)	Microfuse (S37) in A013 or wiring set faulty.
		0 V_{DC}	Completely depress clutch pedal (switch closed)	
	# 2			

Test	Pin	Specified value	condition	Note
Resistance	# 3	Infinite	Clutch pedal not depressed (switch open)	Reading at 20°C coil resistance
		4.7 ohms	Completely depress clutch pedal (switch closed)	
	# 4			

10.10.4 X028 - cab ISO socket "Profi - ProfiPlus Variants"

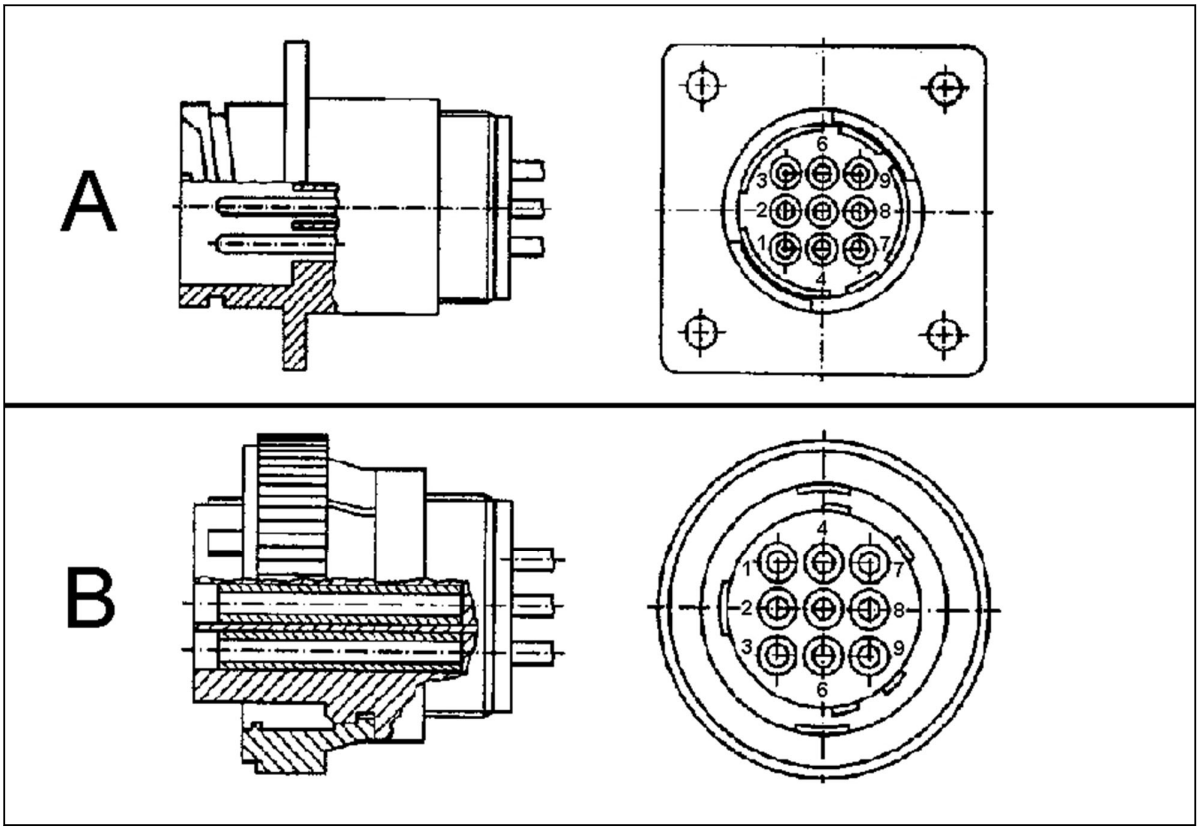


Fig. 367

(A) Socket in the cab.

(B) Connector for ISO terminal.

Pin assignment			
1	**K081** ISOBUS relay	**6**	+ UB 15
2	CAN Low in	**7**	+ UB 30
3	CAN Low out	**8**	Earth
4	CAN High in	**9**	Earth
5	CAN High out		

NOTE:
For details of the ISO BUS wiring, refer to the wiring diagram.

Load the test project (software) onto the A103 NT01/02 terminal

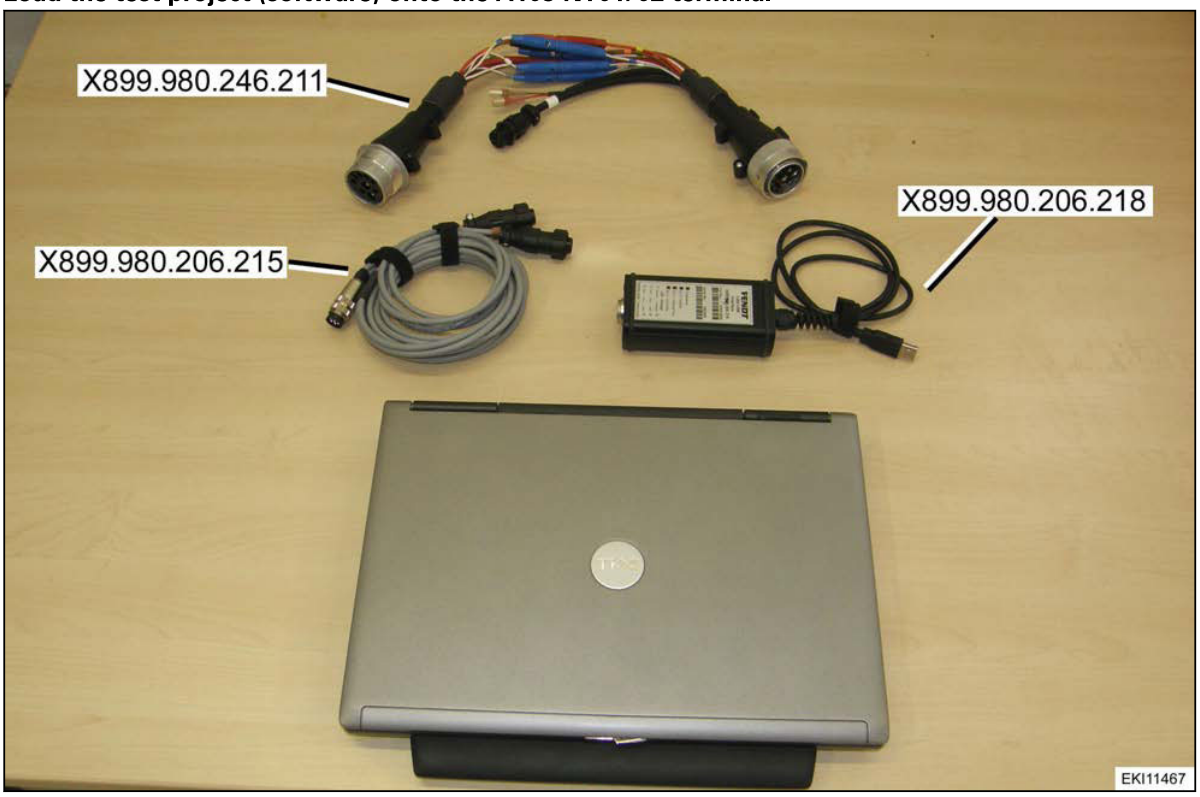


Fig. 392 Required tools

Connect the ISO BUS test cable (X899.980.246.211 or X899.980.364.000) only to the X400 separation point

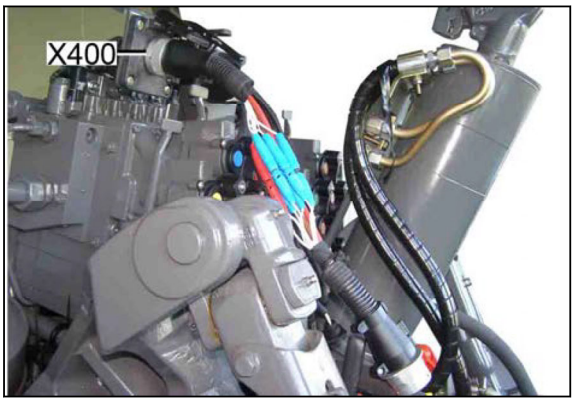


Fig. 393

Connect the CAN 2 to the X10 separation point on the ISO BUS test cable

Fig. 394

Test	Pin	Specified value	condition	Note
Signal	pin 1	14 V_{DC}	4WD switch setting OFF	Start engine.
		0 V_{DC}	4WD switch setting ON	If the foot brake is depressed or the parking brake is applied, the 4WD activates.
Earth	pin 2			

Measurement at electronics box - separation point X1403

NOTE:
Remove bridge at contact #89 on adapter box.

Test	Pin	Specified value	condition	Note
Current	pin 89	0 A_{DC}	Switch position ON	Remove bridge at pin 89 on adapter box
		1.5 A_{DC}	Switch position OFF	

Recommended tools

- Diagnostic PC with current FENDIAS software
- Adapter cable X899.980.246.201 - connection to solenoid valve
- Adapter box X899.980.304.000
- Adapter cable X899.980.304.201 - connection to adapter box

10.11.9 Y010 - Differential lock solenoid valve

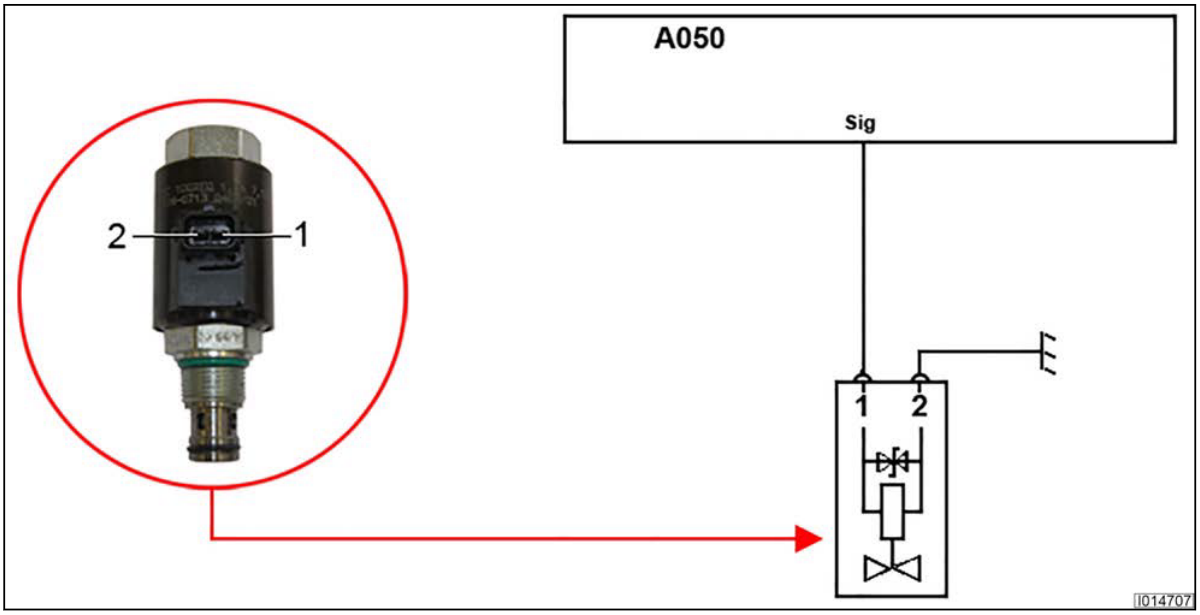


Fig. 409

NOTE:
*The earth on pin #A22, separation point X1403 can also be used for testing the **A050** - Basic control unit ECU (EXT). The actual earth connection of the component is taken from the wiring diagram set.*

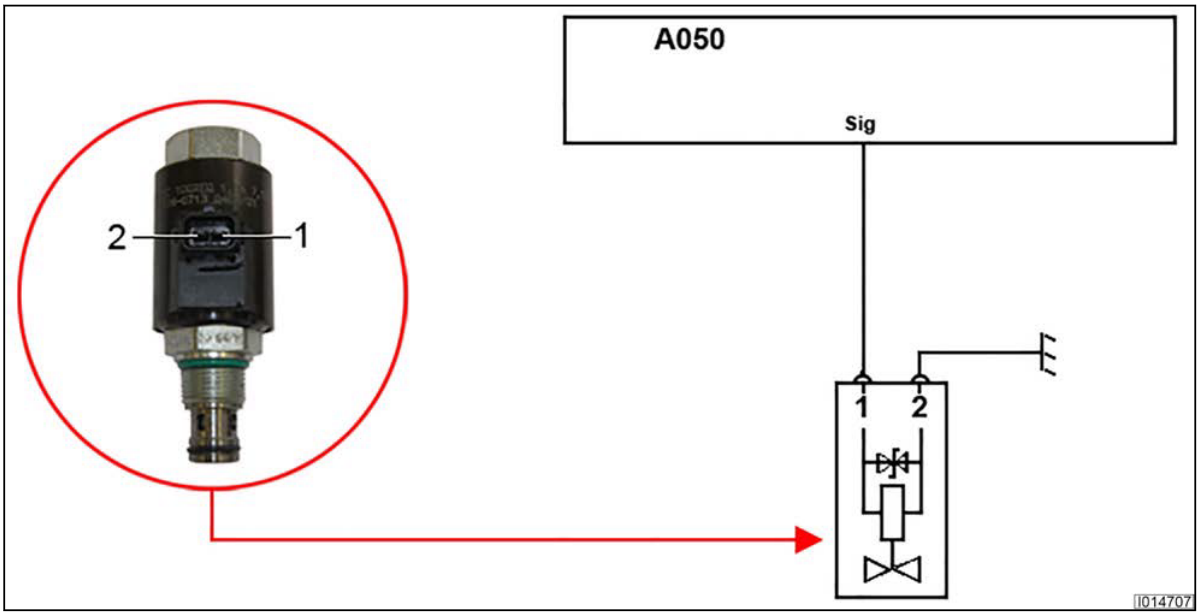


Fig. 422

NOTE:
*The earth on PIN #A22, separation point X1403 can also be used for testing the **A050** - basic control unit ECU (EXT). The actual earth connection of the component is taken from the wiring diagram set.*

Pin assignment	Y055 rear pressure compensator lock valve	A050 - basic control unit ECU (EXT)
Signal	# 1 (X1459)	# A31 (X1403)
Earth	# 2 (X1459)	# A22 (X1403)

Measurement at component - separation point (X1459)

Test	Pin	Specified value	condition	Note
Resistance	# 1	8.7 ohms	Ignition **OFF**	Measured value at 20 °C coil resistance
Earth	# 2			

NOTE:
*The **Y055** rear pressure compensator lock valve is energized if:*

- *The rear power lift is in SA mode and the rear power lift is lowered.*

Signal	# 1	14 V_{DC}	Switch position **ON**	Start engine, Lower rear power lift in SA mode
		0 V_{DC}	Switch position **OFF**	
Earth	# 2			

Measurement on electronics box - separation point X1403

NOTE:
*Remove bridge at pin **31** on adapter box.*

Pin	Description	Signal type / prerequisite	Signal	Break in wiring	
				Signal from ECU	Signal from component
Y120 - AdBlue® metering valve (resistance = 12 ohms)					
#B26 (X2187)	AdBlue®- Flow valve high	Flow valve not active	0 V_{DC}	0 V_{DC}	Approx. 0 V_{DC}
#B47 (X2187)		Flow valve active Calculated SCR catalytic converter temperature above 250 °C Engine temperature greater than 65 °C Diesel engine more than 50% utilization	5.0 V_{DC}	5.0 V_{DC}	
		Flow valve running on Engine off, Ignition off approx. 2 minutes running on from A084 module The AdBlue line system is emptied. The flow valve is energized to equalize pressure.	5.0 V_{DC}	5.0 V_{DC}	Approx. 0 V_{DC}
	AdBlue®- Flow valve low, virtual earth				

Measurement at component - separation point X2019

Test	Pin	Specified value	condition	Note
Signal	pin 1	13 ohms	Ignition OFF	Measured value at 20 °C coil resistance
Earth	pin 2			

NOTE:
The valve is always only briefly energized.

Test	Pin	Specified value	condition	Note
Resistance for regeneration	# 3	??? Ohms	Ignition OFF	Resistance at 20°C
Earth	# 4			

IMPORTANT:
As for tractors with dual-circuit brake systems, regulation is performed based on the lower pressure between circuits 1 and 2, the pressures in both circuits must be checked simultaneously using two pressure gages.
***1M1** - supply pressure, circuit 1*
***2M1** - supply pressure, circuit 2*

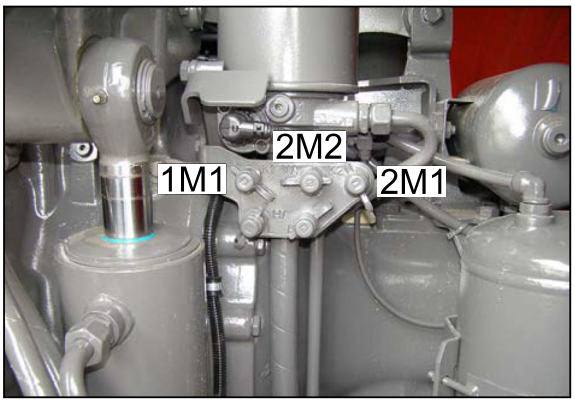


Fig. 447 Measuring points for dual-circuit brake system

Measurement at A111 - Central electrical system (ZE) ECU - separation point X2241

Adapter cable at A111: X899.980.304.203

Adapter box: X899.980.304.000 (160-pin)

Magnetic valve for regeneration (A)				
Test	**Pin**	**Specified value**	**condition**	**Note**
Current	# 4	??? A_{DC}	In case of switch position ON	Remove bridge at pin #4 For switch-on conditions, see "Measurement at component"
		0 A $_{DC}$	In case of switch position OFF	

Measurement at A050 - Basic control unit ECU (EXT) - separation point X1403

Adapter cable on A050: X899.980.304.201

Adapter box: X899.980.304.000 (160-pin)

Magnetic valve for regulation (B)				
Test	**Pin**	**Specified value**	**condition**	**Note**
Current	# A94	??? A_{DC}	In case of switch position ON	Remove bridge at pin # A94 For switch-on conditions, see "Measurement at component"
		0 A $_{DC}$	In case of switch position OFF	

Test of auxiliary pump						
	Test [PH]	**Auxiliary pump (PH) M2 (bar)**	**LS pump (PR) M3 (bar)**	**Load sensing LS pressure M4 (bar)**	**Pilot pressure M5 (bar)**	**Hydraulic oil temperature**
B	Connect the short circuit hose to a spool valve and use the terminal to set the valve to max. flow rate and deflect or – Short circuit hose from pressure connection, external to return line, rear	SETPOINT ACTUAL	SETPOINT ACTUAL	SETPOINT ACTUAL	SETPOINT ACTUAL	
B1	Free steering when stationary (Valves unlocked)	Depending on resistance	Depending on resistance	Depending on resistance	18–24	
B2	Steering at stop to left/right (Valves unlocked)	185–195	Depending on resistance	175–180	18–24	
B3						

Test of wheel-driven steering pump				
	Test	**Emergency steering pump (PNL) M1 (bar)**	**Emergency steering pump (PNL) M1 (bar)**	**Hydraulic oil temperature**
C	**- only when driving forwards**	SETPOINT	ACTUAL	
C1	10 km/h	0.4		
C2	40 km/h	1.5		
C3				