CS78, CS86, CS94 Tractors

Service - Training Manual Sva 7-96911

Table of Contents

	Section	Pub. No.
2 ENGINE		
Workshop Manual post DBD0055001	2007	7-98510
3 FUEL SYSTEM		
How it works - Injection System post DBD0055001	3	7-97340
4 ELECTRICAL		
How it works and Troubelshooting - Combi Instrument	4A	7-95391
How it works - ECCU (Electronic Central Control Unit) from DBD0057135 onwards	4B	7-99220
Circuit Diagram post DBD0057135	4003	7-98691
5 STEERING SYSTEM		
Workshop Manual - Front Axle 20.16 (German/English)	5001	7-70620
6 TRANSMISSION		
Troubleshooting 4-Wheel Drive – Differential lock – Management post DBD 0055001	6003	7-97150
Workshop Manual TW557	6005	7-99240
8 HYDRAULIC SYSTEM		
How it works and Troubleshooting - Electronic Hitch Control EHR-D	8B	7-95350
Functional description and troubleshooting Electronic lifting gear control system (EHR-B) from DBD0057135 onwards	8C	7-99420
Functional description and Troubleshooting - Electronic front hitch control (EFH)	8E	6-50640

PREVIEW - YOUFIXTHIS.COM

CNH Österreich GmbH

Copyright © 2002 CNH Österreich GmbH
Sva 7-96921
June, 2002

Download full manual at youfixthis.com

SAFETY REGULATIONS

The possibility of injury always exists when carrying out maintenance and repair work. Read the following safety regulations and information before starting work.



•) Never start repair work, which you do not fully understand.

•) Make sure that the environment is safe to work in.

•) Make sure the location is clean and in a good state.

•) Never use incorrect or unsuitable tools.

•) Remove all rings, chains and watches before commencing work.

•) Use state of the art safety equipment. For example, wear goggles when using compressed air for cleaning, grinding, hammering or similar work.

•) Use a lifting device for lifting or transporting heavy parts (over 20 kg). Make sure the hooks and chains are in a good condition and sit firmly in place.

•) Never work below an engine hanging from a lifting device or raised by a jack. Always secure with strong support trestles before commencing work.

•) Only use **original Case-Steyr spare parts**.

•) Only start the engine from the cab, using the ignition key.

•) Never start the engine with the protective covers removed.

WARNING: *It is difficult to see the radiator fan when the engine is running! Baggy clothes and long hair can get caught in rotating engine parts!*

•) If the engine is started in a confined space, sufficient ventilation must be provided.

•) Never use auxiliary starting fuels on an aerosol basis whilst the pre-glow starting facility is in operation (explosion hazard).

•) Ear muffs must be worn when testing the engine or working close to the engine.

•) Always switch the engine OFF before carrying out
maintenance or repair work.

•) Avoid touching the exhaust manifold, turbo charger and other hot engine parts.

•) When the engine is hot and the coolant is pressurised, be careful when opening the radiator cap. Coolant and lubrication oil out of the hot engine can cause severe injuries if contact is made with the skin.

•) Naked flames and smoking are not permitted in the vicinity of fuel tanks or batteries. Electric sparks should be avoided. (Particularly when charging the batteries. Explosion hazard!)

•) Disconnect the cable at the negative battery pole before carrying out service or repair work on the electrical system.

•) If the engine gets excessively hot (over 300 °C), for example, if it catches fire, the viton seals (e.g. bottom O-ring on the cylinder liner or the O-ring on the oil pressure valve) release highly caustic HF acid. Never touch viton seals, which have been subjected to unusually high temperatures, with bare hands. Always wear neoprene gloves or thick work gloves and safety goggles when removing these harmful substances. Wash the seals and contaminated surfaces with a 10% hydroxide solution or another alkaline solution. Collect the material in air-tight sealed plastic bags and bring them to an authorised collecting depot.

IMPORTANT: *Viton seals may never be burned!*

•) When checking the injection nozzles, never touch the fuel, which is ejected under high pressure. The jet will penetrate the skin and cause serious poisoning. If contact is made with the skin, consult a doctor without delay!

Fuel, lubrication oil and coolant can cause skin irritations, if contact is made over a longer period.

•) Avoid running the engine in idle unnecessarily.

When carrying out service work, take measures to prevent fuel or other fluids from entering the ground or drains.

•) All seals are asbestos-free.

•) Be careful when washing the engine using a washing facility with a high water pressure. Do not wash, for example, the electrical and fuel systems under high pressure as they can easily be damaged.

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

ENGINE DATA

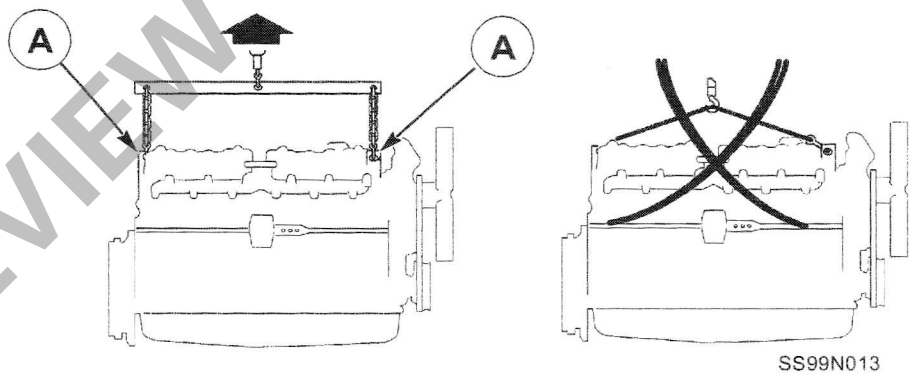
Engine type	320.80	320.82	420.81	420.82	420.83	420.85	620.94	620.92	620.93
Number of cylinders	3		4				6		
Capacity (dm^3)	3,3		4,4				6,6		
Bore (mm)	108								
Stroke (mm)	120								
Delivery start marking of the V-belt pulley (° before UDC)	$15^{\pm 1}$					$14^{\pm 1}$	$15^{\pm 1}$		$13^{\pm 1}$
Compression ratio	16,5 : 1		18,5 : 1			16,5:1	18,5 : 1		16,5:1
Method of combustion	direct injection								
Injection sequence	1 - 2 - 3		1 - 2 - 4 - 3				1 - 5 - 3 - 6 - 2 - 4		
Compression pressure[1] (bar)	24								
Charge-air pressure[2] (bar)	1,10	1,20	1,10	1,20	1,30	1,30	0,70	0,78	1,1
Weight[3] (kg)	280		340				510		
Direction of rotation of the crankshaft	Clockwise								

[1]) Minimum value when idling at operating temperature.
Highest permissible difference between the cylinders is 3 bar.
[2]) measured at full load and nominal engine speed
[3]) Without flywheel and electrical equipment.

Lifting the engine

The engine is lifted safely by means of a lifting device, on which the lifting power acts vertically on the lifting eyes.

A = Engine lifting eyes



SS99N013

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

TECHNICAL DATA

Cylinder block

Guide pin bore holes ..... 13.250 - 13.320 mm
Diameter of the crankshaft bearing base bore hole ..... 91.000 - 91.025 mm
Diameter of the crankshaft bearing base bore hole (bearing 162000010800) ..... 92.000 - 92.025 mm
Bore hole diameter of the cylinder liner:
- top ..... 124.514 - 124.554 mm
- bottom ..... 123.000 - 123.040 mm
Diameter of the camshaft bearing bush (if fitted) ..... 50.010 - 50.070 mm
Construction height of the cylinder block ..... 428.170 - 428.430 mm

Cylinder liners

Liner height above the cylinder block ..... 0.030 - 0.080 mm
Highest permissible height difference between cylinder liners ..... 0.02 mm
Diameter of the cylinder liner bore holes in the engine block:
- top end of liner ..... 124.475 - 124.500 mm
- bottom end of liner ..... 122.961 - 122.986 mm
Cylinder liner bore hole ..... 108.010 - 108.032 mm
Height, cylinder liner flange ..... 9.03 - 9.05 mm
Height, cylinder liner flange, 1st oversize SP NO 162000040713 ..... 9.08 - 9.10 mm
Height, cylinder liner flange, 2nd oversize SP NO 162000040714 ..... 9.13 - 9.15 mm
Height, cylinder liner flange, 3rd oversize SP NO 162000040715 ..... 9.23 - 9.25 mm
Outer diameter of the cylinder liner flange ..... 131.700 - 131.800 mm

Cylinder head

Construction height of the cylinder head ..... 104.800 - 105.000 mm
Minimum height of the cylinder head after surface grinding ..... 104.000 mm
Inner diameter of the valve guide (when not fitted) ..... 9.000 - 9.015 mm
Outer diameter of the valve guide ..... 16.028 - 16.039 mm
Diameter of the bore hole for the valve guide in the cylinder head ..... 16.000 - 16.018 mm
Projection of the valve guide over the cylinder head face ..... 21 mm
Depth, valve head below cylinder head surface:
- Inlet valve ..... 0.7 ± 0.05 mm (max. 1.70 mm)
- Outlet valve ..... 0.6 ± 0.05 mm (max. 1.60 mm)
Valve seat angle:
- Inlet valve ..... $35^{\circ +20'}$
- Outlet valve ..... $45^{\circ +20'}$
Valve seat width:
- Inlet valve ..... 2.9 - 3.7 mm
- Outlet valve ..... 1.3 - 2.3 mm

Diameter, outlet valve seat insert SP NO 162000040718 ..... 44.070 - 44.132 mm
Bore hole in cylinder head for outlet valve seat insert ..... 44.000 - 44.025 mm

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

Tightening torques

Cylinder head nuts and bolts ..... 80 Nm+90°+90° (+60° after 15 - 20 min. warming up time)
Cylinder head bolts in the cylinder block ..... 30 Nm
Crankshaft bearing bolts ..... 200 Nm
Con-rod nuts ..... 40 Nm + 90°
Nut on the crankshaft (face):
- 320/420 ..... 600 Nm
- 620 ..... 1000 Nm
Counterweight of the crankshaft (320) ..... 160 Nm
Belt pulley bolts ..... 30 Nm
Securing bolts for flywheel ..... 140 Nm
Securing bolts for flywheel casing:
- internal M12 bolts ..... 110 Nm
- external M10 bolts ..... 60 Nm
Retaining screws for intermediate gear wheel (with friction bearing):
- M10 ..... 60 Nm
- M14 ..... 200 Nm
Bolts for balancing unit (420) ..... 60 Nm
Piston cooling nozzles (620.93) ..... 30 Nm
Nut for lubrication oil pump gear wheel ..... 60 Nm
Retaining screws for lubrication oil pump ..... 60 Nm
Connecting pipe for lubrication oil cooler ..... 60 Nm
Nut for belt pulley on coolant pump ..... 120 Nm
Fan bolts ..... 30 Nm
Nuts/bolts for exhaust manifold ..... 50 Nm
Bolts for air intake duct ..... 30 Nm
Nut for injection pump gear wheel ..... 90 Nm
Retaining nuts for injection nozzles (for bolts) ..... 15 Nm
Injection nozzle union nut ..... 60 Nm
Injection line union nut ..... 25 Nm

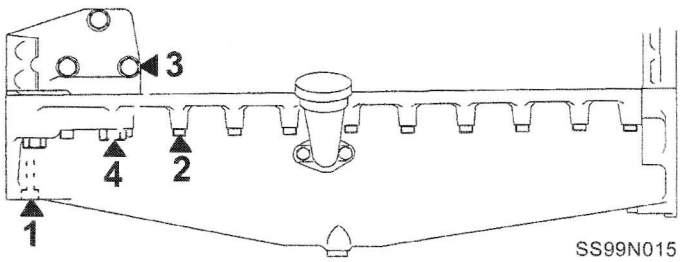
NOTE: *Use washers for aluminium parts.*

If no particular tightening torques are specified,
always use the values specified in the table below.

	M8	M10
Cast iron	$35^{\pm 5}$ Nm	$70^{\pm 5}$ Nm
Aluminium	$25^{\pm 5}$ Nm	$50^{\pm 5}$ Nm

Bolts for the self-supporting oil sump

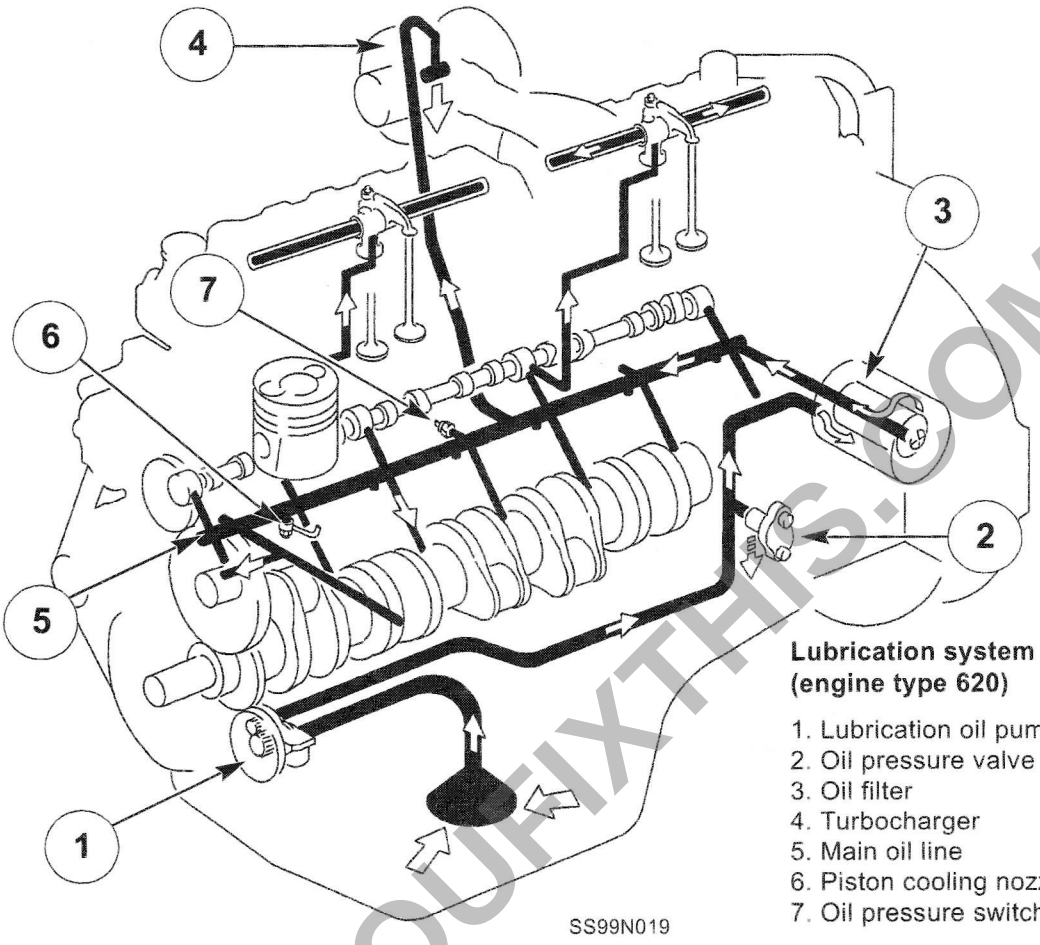
1	M8	25 Nm
2	M10	90 Nm
3	M14	160 Nm
4	M20	600 Nm



SS99N015

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com



Lubrication system (engine type 620)

1. Lubrication oil pump
2. Oil pressure valve
3. Oil filter
4. Turbocharger
5. Main oil line
6. Piston cooling nozzles
7. Oil pressure switch

Lubrication system

The engine is equipped with a pressure lubrication system, in which the oil pump (gear pump) is fixed to the lower part of the cylinder block. The pump sucks the oil in via an intake basket. After the pump, the oil is fed through an oil line to the oil pressure valve and oil filter. The oil is then fed through the main oil line, from which other oil lines branch off. The oil flows through the oil lines to the crankshaft bearings and through the crankshaft to the con-rod bearings.

The main oil line then feeds the oil to the turbo charger, to the balancing unit (420) and to a pneumatic compressor, if fitted. In addition, the intermediate gear wheel bush, the camshaft bearing points and the valve mechanism are lubricated via the main oil line.

In the 620,93 engine, the piston heads are sprayed with oil from below and cooled as long as the lubrication oil pressure is higher than 3 bar.

The oil pressure valve is located below the oil filter on the left-hand side of the engine. The valve regulates the lubrication oil pressure so that a constant value is maintained independent of the engine speed. Depending upon the grade of oil, the engine speed and temperature, the oil pressure is **aprox. 2.5 - 4 bar**.
The oil pressure is **at least 1.0 bar** at idling speed.

The oil filter is a one-way main stream filter, which is fitted on the left-hand side of the engine. An overflow valve, on the underside of the filter, ensures reliable cold starting and sufficient lubrication in the event of a filter blockage. In addition, there is a non-return valve which prevents the filter being completely drained of oil.
The oil pressure switch opens at a pressure of 0.5 bar.

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

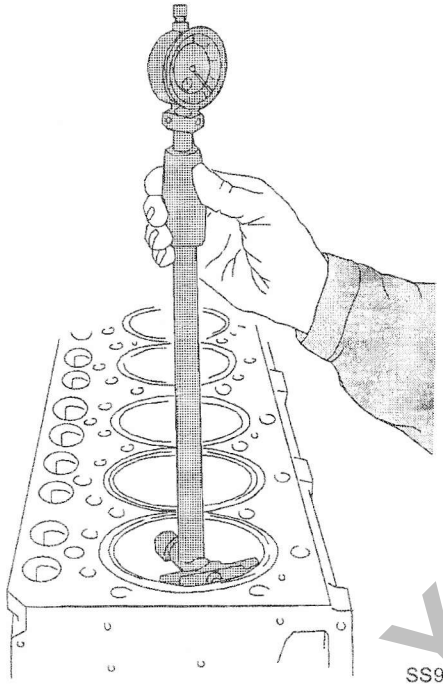
JOB INSTRUCTIONS

1. CYLINDER BLOCK

A. Measuring the cylinder liner wear

1. Set the dial test indicator to zero by means of a micrometer screw or using a new cylinder liner (initial dimension **108.00 mm**).

2. Thoroughly clean the inner surface of the cylinder liner before the measurement.



SS99N036

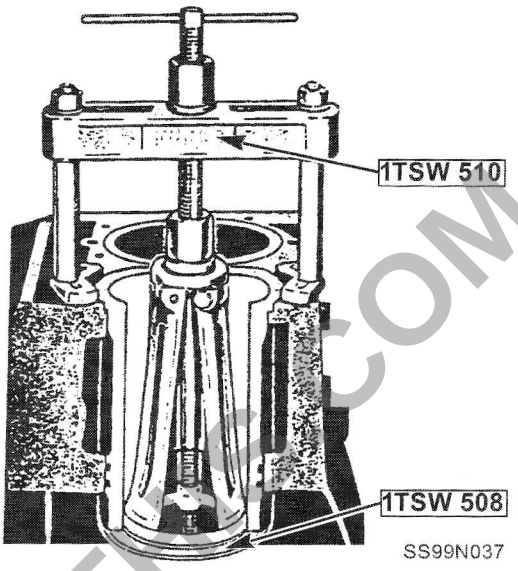
3. Measure cross-wise at the top end, bottom end and in the middle of the cylinder liner.

4. Check the displayed value for max. wear and ovality (compare with nominal values).

B. Removing the cylinder liner

1. If the cylinder liners are to be re-used, they must be marked so they can be re-fitted in the same positions.

2. Remove the cylinder liners using the 1TSW 508 and 1TSW 510 extraction tools.



SS99N037

C. Checking the cylinder block

1. Clean the cylinder block and all oil lines.

2. Check the cooling channels and remove scale and dirt deposits in order to ensure correct engine cooling.

3. Check the tightness of the shell plugs and screw plugs in the cylinder block and make sure the cylinder block and sealing surfaces are in good condition.

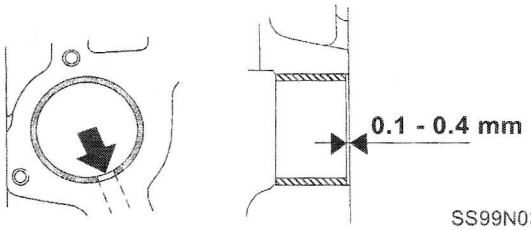
4. Measure the wear on the camshaft bearing points (compare with nominal values).

NOTE: *If the surface of the cylinder block has to be re-ground, the pistons must be shortened by a corresponding amount. Pay attention to the valve head clearances at the top surface of the piston.*

D. Replacing the camshaft bush

1. Pull the bush out using an internal extractor. After removing the rear camshaft end support piece, the bush can be driven out using a long drift.

2. Clean the bush seating.



SS99N038

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

TEST VALUES

1. Frequency to check display of rear PTO shaft speed:

Pick-up cog: 10 teeth

Speed PTO shaft	Frequency
430 min^{-1}	72 Hz
540 min^{-1}	90 Hz
540E min^{-1}	90 Hz
1000 min^{-1}	167 Hz

To carry out a check, the frequency can be calculated:

$$f = \frac{n * z}{60}$$

f .....frequency
n .....speed
z .....no. of teeth

Example: $f = \frac{1000\ min^{-1} * 10}{60} = 167\ Hz$

2. Frequencies of speed signal of rear PTO shaft:

at A12 X12/3 pin 3 to Steyr Veh. No. 04517, Case DBD0010601
at A12 X10/3 pin 8 from DBD 0055001 onwards
at signal plug socket X29 pin 3

Speed PTO shaft	Frequency	Speed PTO shaft	Frequency
430 min^{-1}	288 Hz	540E min^{-1}	360 Hz
540min^{-1}	360 Hz	1000 min^{-1}	667 Hz

3. Frequency to check front PTO shaft speed signal:

Speed Front PTO Shaft	Frequency	
1000 min^{-1}	483 Hz	9000 Series (sensor at front PTO shaft) Pick-up cog with 29 teeth
1000 min^{-1}	541 Hz	M9078 - M9094, up to Veh. No. 04517 CS78 - CS94 up to DBD0010601
1000 min^{-1}	639 Hz	M9078 - M9094 and CS78 - CS94 from DBD0055001 onwards

4. Frequency to check analogue speed display:

Engine speed	permissible deviation	Pointer angle	Frequency from alternator pin "W"
MWM – engine			
1000 min^{-1}	± 100 min^{-1}	67°	254 Hz
2000 min^{-1}	± 65 min^{-1}	163°	508 Hz
SISU – engine from DBD0055001 onwards			
1000 min^{-1}	± 100 min^{-1}	67°	300 Hz
2000 min^{-1}	± 65 min^{-1}	163°	600 Hz

If the voltage at contact "W" is to be measured, then half of the control voltage, approx. a 7 V DC voltage, is displayed irrelevant of engine speed.
Engine gearing: dynamo (6 pole pairs)
i = 1 : 2.54 MWM – engine
i = 1 : 3 SISU – engine

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

Index for Circuit Diagram

M9078 - M9094
CS78 - CS94

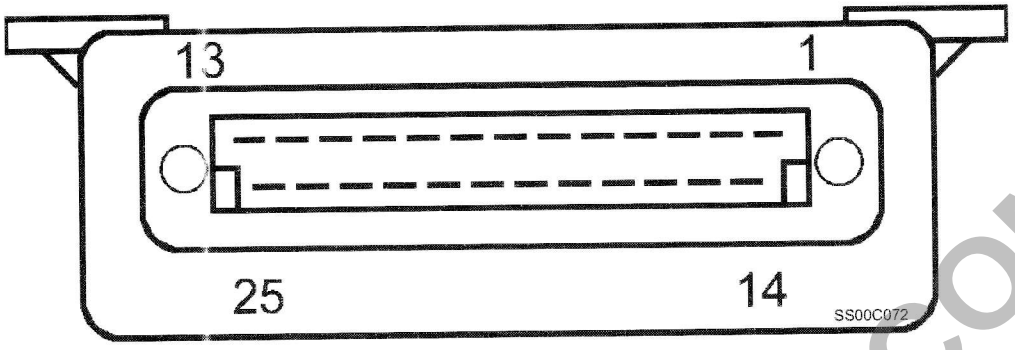
Title	Page (e.g. Page 1) Section (e.g. A)
1st auxiliary control unit, double-action with freedom of movement/ shut-off valve ECCU	28A
1st auxiliary control unit, front-end lifting gear, external buttons	28D
1st auxiliary control unit, joystick operated	28B
1st auxiliary control unit, lever switch operated	28E
1st auxiliary control unit, multi-controller operated	28C
2nd auxiliary control unit, double-action with freedom of movement/shut-off valve ECCU	29A
2nd auxiliary control unit, lever switch operated	29C
2nd auxiliary control unit, multi-controller operated	29B
4-WD	6B#
4-wheel drive management, Opti-Stop	5B#
Air-conditioning system, high-top	20A#
Air-sprung seat	27D
Auxiliary headlight, high-top	10B#
Auxiliary headlight, low-top	11B#
Blower motor, high-top	21A#
Brake light	6A#
Brake light, with management	5A#
Central print ground	22D
Cigarette lighter	27B
Differential lock management, rear	5C#
Differential lock, rear	6C#
Digital clock, high-top	15C#
Dipped/Main beam switchover	10D/11D
ECCU supply	7C
EHR diagnostics display	32A
EHR external push button	31D
EHR internally operated external pushbuttons	31C
EHR lift / pressure changeover	34C#
EHR lift limiting	32F
EHR lifting/control on the multi-controller	33A#
EHR lifting/control per rocker switch	34A#
EHR lighting, front panel	32J
EHR lowering speed	32D
EHR mixed control	32E
EHR over-lift (hitch)	31C

Title	Page (e.g. Page 1) Section (e.g. A)
EHR position sensor	30C
EHR power sensor	30B
EHR Raise+Lower solenoid valve	30D
EHR Raise/Lower indicator	32C
EHR setpoint	32G
EHR slip indicator	32B
EHR stop button	32H
EHR transport signal	5E#
EHR-B box ground	31A
EHR-B signal conversion	33B/34B
Electronic front implement load relief, up to DBD 0057986	36A
Electronic front-end lifting gear control, from DBD 0057987 onwards	37 / 38
Engine cut-out	4B#
Floor-level heating	14B
Front differential lock	5D#/6D#
Front screen washer pump	18D/19D
Front searchlight (2) mounted on trafficator/sidelight, high-top	12D#/13D#
Front searchlight, twin-power, built into roof	12C#/13C#
Front sidelight, high-top	8C#
Front sidelight, low-top	9C#
Fuel filter heating	7A
Fuel pump control	3A/4A
Headlights	10C/11C
Heated rear window, high-top	17E
Heated windscreen, high-top	17D
Horn	18A/19A
Indicator lamps, centre	24B
Indicator lamps, left	24A
Indicator lamps, right	24C
Indicators	8A/9A
Instrument panel, centre, fuel/air/ temperature gauges (analogue)	25C
Instrument panel, centre, warning indicator	25B
Instrument panel, left, rev. counter (analogue)	25A
Instrument panel, right (digital)	26A
Interior light, high-top	15E#
Interior light, low-top	16E#
MHR – 50%-switch (transport signal)	6E#
Mirror heating, high-top	17A

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

PIN ASSIGNMENT OF EHR-B BOX A25



Pin	*Cable*	*Function*
1	L533	Permanent ground to box
2	N485	+Pulse width modulation to Y6 RAISE
3	L524	Ground from box to potentiometer, resistor network and external IC for management systems
4	F516	Signal from mixed control potentiometer
5	K198	D+ supply
6	L479	Ground to Y6 and Y7 via box
7	-------	No pin assignment
8	N523	TRANSPORT – CONTROL – FAST RETRACTION signal
9	N526	Signal to driver for H2/1 diagnosis
10	N480	Signal from RAISE external pushbutton
11	-------	No pin assignment
12	H518	+9.5 VDC stab. to potentiometer, resistor network and external IC for management systems, supply to external pushbuttons
13	H482	+9.5 VDC stab. to sensors
14	N444	+Pulse width modulation to Y7 LOWER
15	L489	Ground from box to sensors
16	F522	Signal from Setpoint potentiometer
17	F492	Signal from Power sensor, left B10/1
18	F495	Signal from Power sensor, right B10/2
19	F483	Signal from Position sensor B9/1
20	N443	Signal from LOWER external pushbutton
21	N525	Not used
22	F517	Signal from Upper Limit potentiometer
23	B521	EMERGENCY STOP signal
24	F527	Signal from Lowering Speed potentiometer
25	G445	+15 Supply

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

Construction

The main rotating components are the drive shaft, the transfer pump blades, the distributor rotor and the governor.

The drive shaft engages in the distributor rotor in the hydraulic head. The drive end of the DB4 rotor incorporates four pumping plungers.

The plungers are actuated towards each other simultaneously by an internal cam ring through rollers and shoes which are carried in slots at the drive end of the rotor. The number of cam lobes normally equals the number of cylinders (not with 3 cylinder engines).

The transfer pump at the rear of the rotor is of the positive displacement vane type and is enclosed in the end cap. The end cap also houses the fuel inlet strainer and transfer pump pressure regulator. The face of the regulator assembly is pressed against the liner and the distributor rotor, and forms an end seal for the transfer pump.

The injection pump is designed in such a way, that the end thrusts against the face of the transfer pump pressure regulator.

The distributor rotor incorporates two charging ports and a single axial port (pressure chamber), in which the pressure valve is placed. Behind the delivery valve, there is one discharge port to serve all head outlets leading to the fuel injection pipes.

The hydraulic head contains the bore in which the rotor revolves, the metering valve bore, the charging ports and the connections to the fuel injection pipes.

The pump contains a mechanical governor. The centrifugal force of the weights is transfered to the metering valve via a linkage. The metering valve can be closed electrically with the aid of the solenoid situated in the upper part of the pump housing.

The automatic advance is a hydraulic mechanism which turns the cam ring and advances or retards the commencement of the fuel delivery from the pump.

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

EHR-B DIAGNOSIS

The EHR-B continuously monitors the system for faults. Faults occurring are divided into three categories. The EHR-B reacts differently, according to the fault category.

Serious Faults
- The control system is stopped and latched (disabled)
- The relay is de-energised (output stage protection)
- Indication for the driver: Diagnosis LED issues a fault code.

  The fault code is goes out when control is resumed.
- Resumption of control: ---> Remedy the cause of the fault and operate the ignition switch.

Medium Faults
- The control system is stopped and latched (disabled)

  Indication for the driver: Diagnosis LED issues a fault code.

  The fault code is goes out when control is resumed.
- Resumption of control: ---> Remedy the cause of the fault and unlatch the EHR at the transport switch or button.

Slight Fault
- Control is continued
- Indication for the driver: Diagnosis LED issues a fault code.

  After operating the raise switch, the diagnosis LED goes out, if the fault has been remedied.

  However, a code number output, which has been started, is completed.

The fault code list can be used to localize and determine faults.

If the signal line to the mixer potentiometer is interrupted, for example, fault code 36 is signalled by the following flashing frequency.

Refer to fault code list.

- Long pause – flashes three times – short pause – flashes six times -

When all faults have been remedied, the diagnosis LED goes out.

The disabled status of the EHR-B is indicated by the diagnosis LED lighting continuously. If the EHR-B detects a fault in the system, output of the corresponding blink code has top priority.

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

TROUBLESHOOTING USING THE DIAGNOSTIC SYSTEM

To quickly find errors such as e.g.:

display failure or inaccurate displays on the combination instrument

Using the diagnostic system and the table listed you can quickly and safely locate the error.

Test conditions:


Start button switched off

Start button switched on (in position 1)


Engine must be running

X.. Plug

Pin Pin on specified plug


Plug is connected

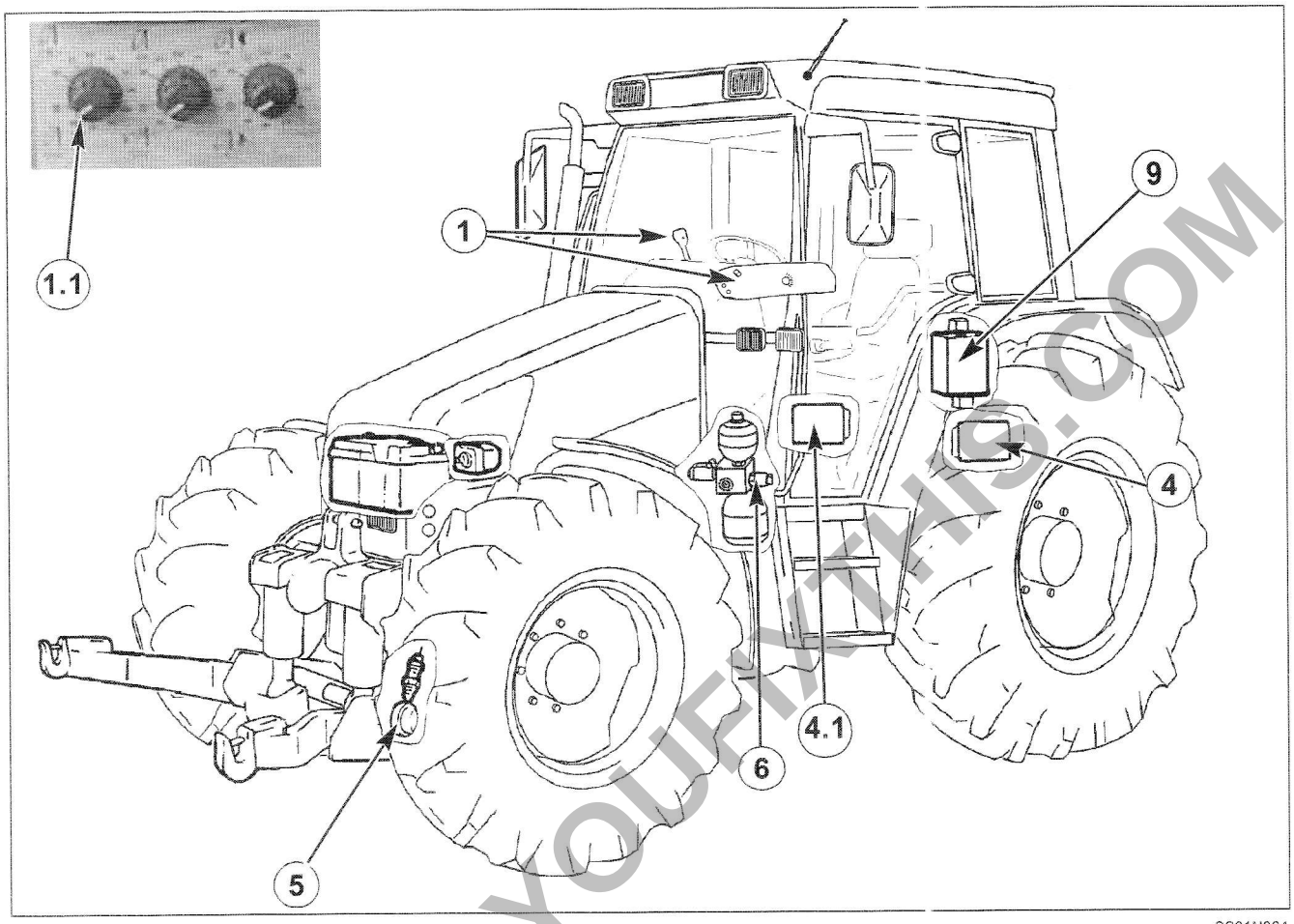

Plug is not connected


Connect a bulb of the specified wattage as a load

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

PRESSURE CONTROL FUNCTION



SS01N064

Example of a control function sequence:

- Turn the mixed control potentiometer (item 1.1) to basic setting, position 0 = 100 % pressure control (also corresponds to max. control sensitivity). If required, the control sensitivity can be varied between switch positions 0 to 5. If this setting is not sufficient, e.g. very bumpy ground, position control can be added in setting range 5 - 9 until the control operates in a steady state.
- Use the setpoint rotary switch (item 1), switch position 1 - 10, to adjust the pressure relief (downward pressure), dependent on the implement fitted, the desired driving speed and the composition of the soil.
- The setpoint values are forwarded to the electronics box (item 4/4.1).
- The actual values are simultaneously acquired by the sensors (item 5/6) and passed on to the electronics box.
- The electronics box (item 4/4.1) continually compares the setpoint values to the actual values.
- If necessary, the electronics box (item 4/4.1) operates one of the two control valve (item 9) magnets until the actual values correspond with the setpoint values (closed-loop control circuit). This ensures a constant ground contact pressure of the implement.

NOTE: *Both hydro-reservoirs are connected in the pressure control operating mode*

IMPORTANT: *In order to get a perfect control function, the front hydraulics must be recalibrated every time the implement is changed, with the implement at working height (but raised above the ground).*

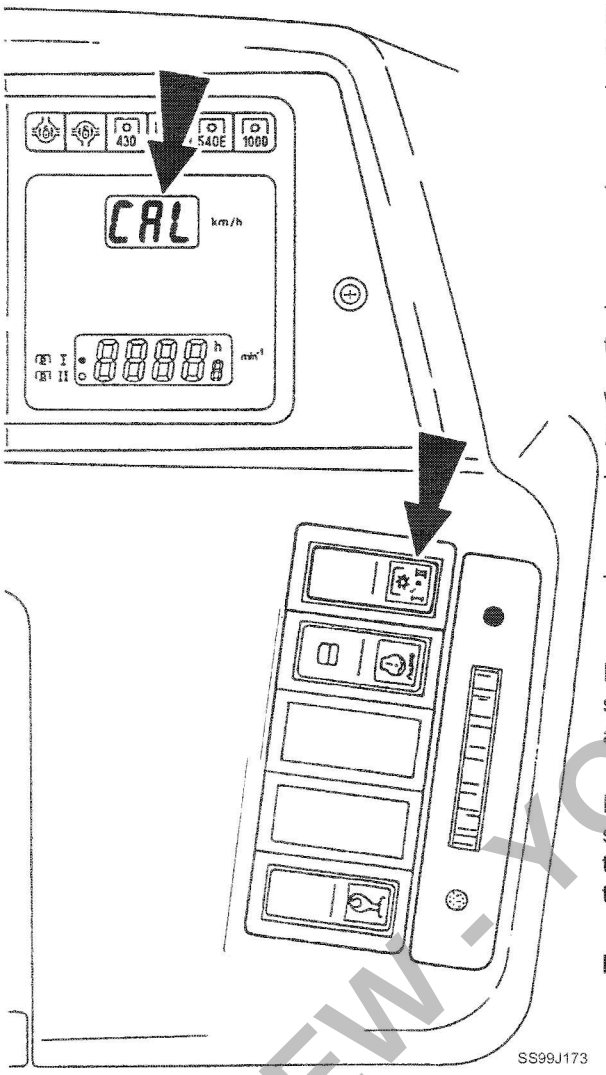
The current cylinder pressure (load pressure of the implement) is stored in the system during this procedure.

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

CALIBRATING THE DRIVING SPEED

Re-calibration is required after replacing tyres or when 3 bars appear on the km/h display.



Measure out a distance of exactly 100 m and mark both ends clearly.

- Press the switchover button (front PTO shaft/rear PTO shaft/operating hours) for at least 10 seconds, until CAL appears in the km/h display.
- Drive vehicle froward and when the tractor's front axle passes the 0 mark, press the button briefly. The display shows COU.

The impulses will be counted to 9999 on the bottom part of the display, ---- will appear above this, pay no attention to this.

WARNING: *Minimum speed within the 100 m markings = 2 km/h – it is possible to drive faster.*

- When the front axle is in line with the 100 m mark, press the pushbutton briefly once again – the letters **PRO** appear on the display.
- Then press the switchover button once again – the re-calibration values are stored.

If the driving speed is not displayed, the tractor must be stopped and the engine must be stopped and then started again.

If a fault occurs during calibration (delay in pressing the switch etc.), simply switch the ignition OFF before pressing the switch for the last time – the programming sequence will thus not be accepted and the old values remain in effect.

Repeat the procedure.

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

INDEX

INDEX 2
SPECIAL TOOLS 5
FOR THE USER 7
Engine serial number 7
SAFETY REGULATIONS 8
ENGINE DATA 9
Lifting the engine 9
TECHNICAL DATA 10
Cylinder block 10
Cylinder liners 10
Cylinder head 10
Valves, rocker arms and push rods 11
Camshaft 12
Crankshaft 12
Flywheel 13
crankshaft inertia weight (engine type 420) 13
Camshaft drive 13
Con-rods 14
Pistons, piston rings and piston pins 14
Lubrication system 15
Lubrication oil pump (320, 420) 15
Lubrication oil pump (620) 15
Thermostat 15
Coolant temperature switch
Coolant temperature transmitter 15
Cooling water pump (320, 420) 16
Cooling water pump (620) 16
Turbo charger 16
Tightening torques 17
CONSTRUCTION 18
General information 18
Cylinder block 18
Flywheel casing 18
Cylinder head 19
Valve mechanism 19
Crankshaft drive 19
Timing gears 20
Lubrication system 21
Cooling system 22
Intake / exhaust system 23

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

Title	Page (e.g. Page 1) Section (e.g. A)
Mudguard mounted searchlights (left + right)	10A#
Mudguard mounted searchlights, as reversing lights (left + right)	11A#
Number plate lighting, high-top	17C
Parallel front windscreen wiper	18C
Power shift	7B
Power socket	22C
Power socket 40A	22C
Power supply with main switch	2A#
Power supply without main switch	1A#
Pre-glowing	1C/2C
Radio preparation, high-top	15A#
Radio preparation, low-top	16A#
Rear (inner) searchlight (2+2), high-top	12B#
Rear (outer) searchlight (2), high-top	13A#
Rear (outer) searchlight (2+2), high-top	12A#
Rear PTO shaft	35A
Rear screen washer pump	18E/19E
Rear screen wiper (sector), low-top	19G#
Rear sidelights	8D/9D
Reserve roof print (high-top)	23C
Reserves print, EHR operating console	23C
Reserves print, EHR, left	30E
Reserves – central print	7E
Reversing facility	23B
Rotating beacon, high-top	15D#
Rotating beacon, low-top	16D#
Safety switch	27C
Screen washer pump, front	18D/19D
Screen washer pump, rear	18E/19E
Searchlight on rear axle	7D
Spotlight, high-top	17B
Standard front wiper, high-top	18F#
Standard front wiper, low-top	19F#
Standard rear screen wiper, high-top	18G#
Standard rear wiper, high-top	18G#
Standard rear wiper, low-top	19G#

Title	Page (e.g. Page 1) Section (e.g. A)
Standard signal socket for EHR	31B
Standard signal socket for MHR or on-board computer preparation	22B
Standard signal socket, EHR fitted	31B
Standard signal socket, MHR fitted	22B
Standard windscreen wiper, high-top	18F#
Standard windscreen wiper, low-top	19F#
Starter	1B/2B
Starting with electrical PTO shaft	1D#
Starting with mechanical PTO shaft	2D#
Starting, with front PTO shaft	2D#
Stationary operation cut-out	3B#
Steering column switch	18B/19B
Step/interior lighting, high-top	15E#
Supply 58, sundry lighting	27E
Supply potential 15, high-top	15B#
Supply potential 15, low-top	16B#
Supply potential 58L, instrument	14A
Supply potential 58R, instrument	14C
Supply, EHR operating console	27A
Supply, EHR-B box	30A
Supply, on-board computer	22B
Supply, potential 31, central print	22D
Supply, potential 31, EHR-B box	31A
Trafficator, high-top	8B#
Trafficator, low-top	9B#
Trailer brake valve, Italy	23A
Trailer socket	22A
Trailer socket	22A
Windscreen wiper (parallel)	18C#

EHR = Electronic Lift Control

MHR = Mechanical Lift Control

ECCU = Electronic Central Control Unit

PTO = Power Take Off shaft

EGE = Electronic front implement load relief

EFH = Electronic front-end lifting gear control

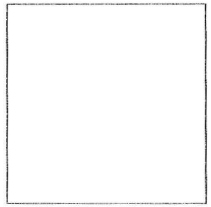
..... = only applies for the reversing facility

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

Electrical equipment

A12	Central print
A15	Print, EHR, left
A25	Control unit EHR-B
S2/15/5	Switch, internally operated external pushbuttons
S14/1	External pushbutton, Lower, left
S14/2	External pushbutton, Lower, right
S15/1	External pushbutton, Raise, left
S15/2	External pushbutton, Raise, right
X2/1	Plug-in connection, potential 15 socket
X6/8	Plug-in connection, signal socket
X6/15	Plug-in connection, cable, chassis, left, print left
X6/16	Plug-in connection, front pressure control
X10/6	Plug-in connection, instrument cable chassis, left
X14/1	Plug-in connection, cable, chassis, left
X14/3	Plug-in connection, EHR – distribution print
X14/12	Plug-in connection, instrument cable, chassis, left
X18/5	Plug-in connection, EHR – distribution print
X24/2	Plug-in connection, chassis, right
X24/5	Plug-in connection, chassis, right, operating console
X29	Standard signal socket
X31/1	Plug-in connection, instrument – engine



Grounding points

5	Engine compartment
20	EHR box console

Designation of Sections

A	Supply, EHR box, ground
B	Standard signal socket, for EHR
C	EHR internal actuation external pushbutton or over-lift
D	EHR external pushbutton

Cable colour or coding in accordance with standard 05449

Ident. letter	Colour	Type of use
A	Red	+30 (potential 30) = Cont. current
B	Beige	-- Control line (ground)
C	White	+ Control line (positive)
D	Yellow	+ 15 Si (Potential 15 safety)
E	Grey	Potential 58 Lighting cable
F	Green	Signal cable
G	Violet	+ 15 (potential 15.1 or 15.2) Switched current after the starter switch
H	Orange	VDC, stabilised by the 'E' Box
K	Light blue	D+
L	Brown	Ground via a box
M		Grounding strip
N	Pink	Spare
P	Colourless	Spare
S	Black	Ground, directly to a grounding point

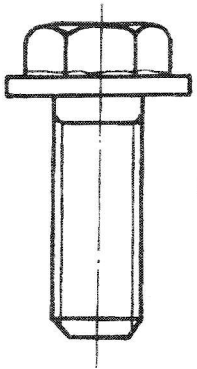
PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

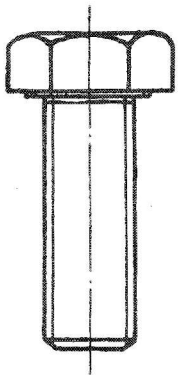
ANZUGSDREHMOMENTE (nach Positionsnummern von Seite B, B1, B2 und B3)

BESCHREIBUNG		Gewinde	Nm
DIFFERENTIAL - ACHSGEHÄUSE			
1 Nutmutter am Triebling		M 35 x 1,5	bis auf richtige Lagervorspannung
2 Achseinsatzbefestigung (Schrauben wahlweise)	*)	M 12 x 33	169
	*)	M 12 x 35	135 + Loctite 270
3 Sicherung bei Einstellmutter für Tellerradlager		M 6 x 12	13
4 Tellerradbefestigung (Loctite 270 verbauen)		M 10 x 75	78
5 Gehäuseentlüftung		M 10 x 1	10
6 Ölfüll- und Niveauschraube		M 24 x 1,5	70
7 Bügel für Tellerradlager am Achseinsatz		M 14 x 75	266
8 Deckel für Differentialsperreschaltung		M 8 x 20	27,6
8a Befestigungsschrauben für Differentialsperre		M 12 x 75	169
9 Fixierschraube für Buchse zur Pendellagerung		M 16	200
ACHSSCHENKELBOLZEN			
10 Befestigung der Achschenkelbolzen		M 12	120
11 Einstellschraube für Lenkeinschlag		M 16	150
12 Kontermutter auf Spurstange		M 18 x 1,5	120
13 Spurstangengelenk		M 18 x 1,5	165
14 Verschraubung Kugelgelenk-Kolbenstange		-	300
15 Befestigungsschrauben für Lenkzylinder		M 12	120
ENDANTRIEBE			
16 Hohlrad - Befestigungsschrauben		M 10	78
17 Radbolzen		M 18	70
18 Befestigungsschrauben für Planetenträger		M 8	25
19 Verschlußschraube		M 30	80
20 Radmuttern (nach 50 Betriebsstunden nachziehen)			300
21 Bremskolbenbefestigung		M 6	10

*) Pos. 2



M 12 x 33 12.9
169 Nm

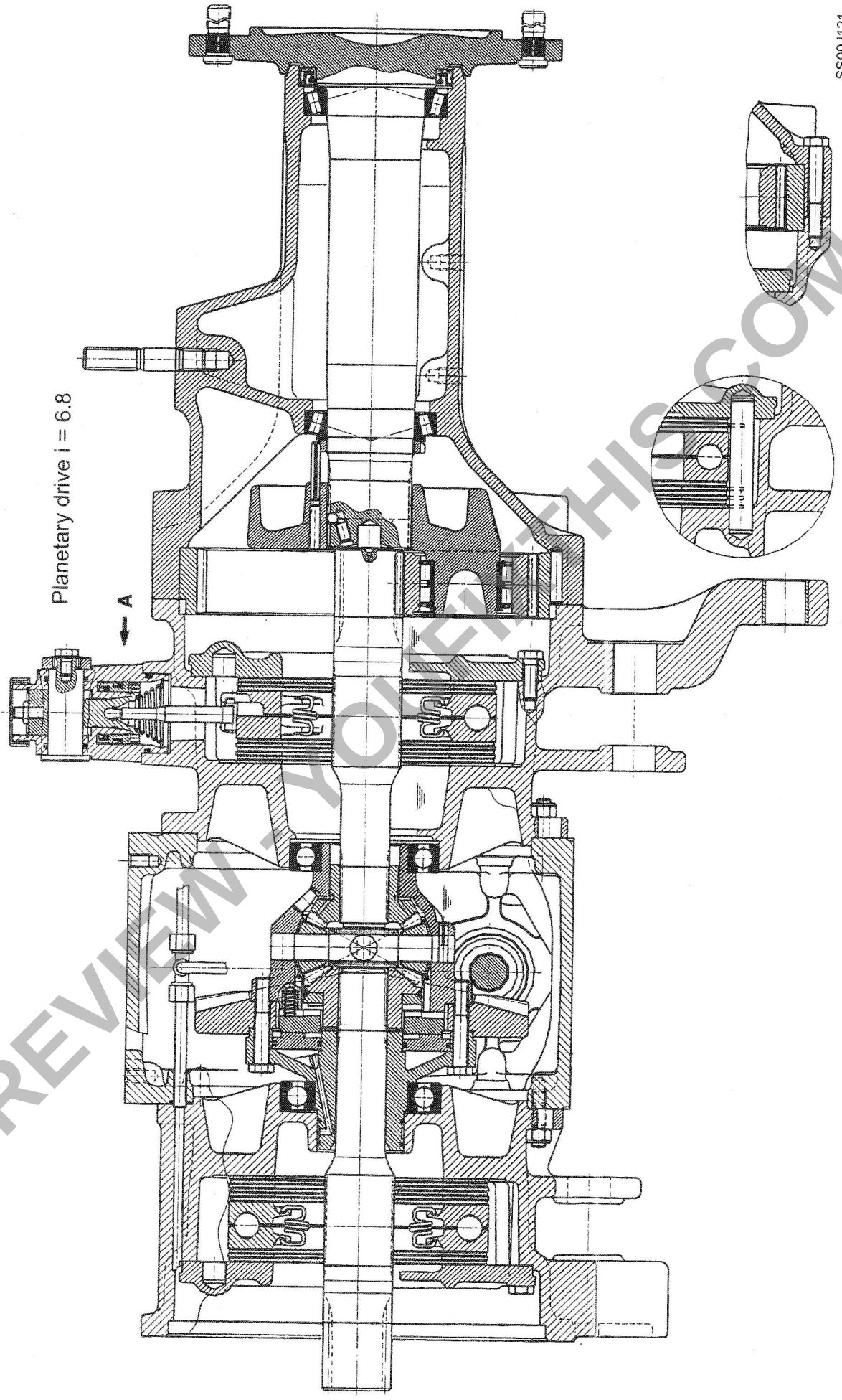


M 12 x 35 10.9
135 Nm + Loctite 270

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

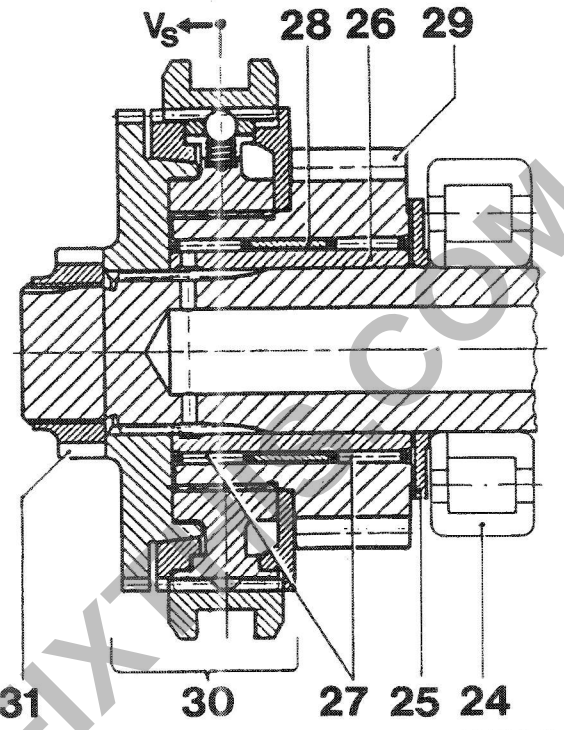
Rear axle with brake and planetary drive i = 6.8



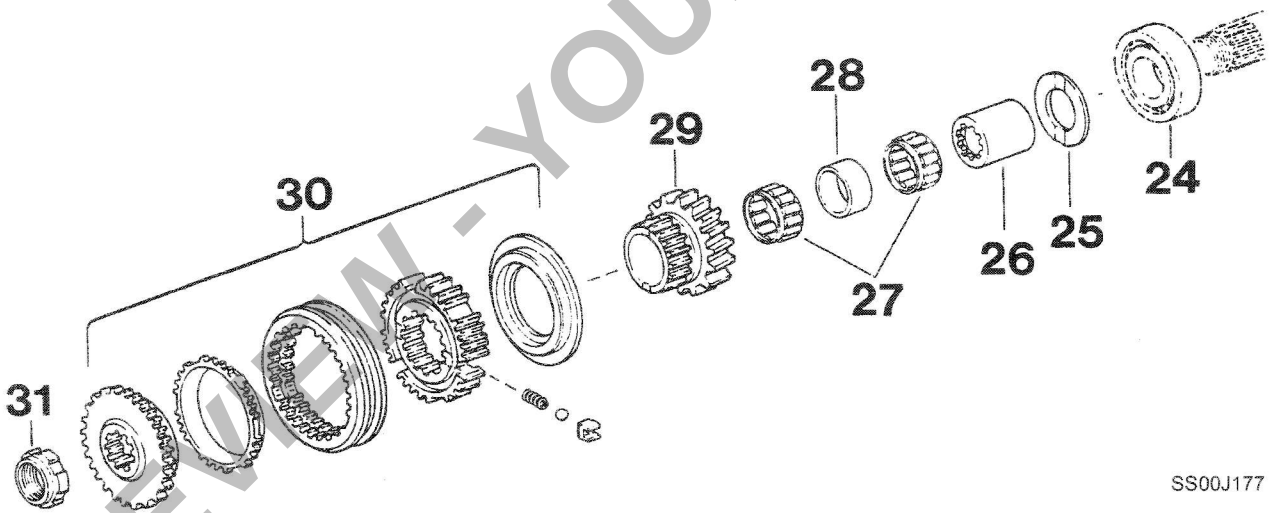
PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

Version with preselection group:
To be assembled before mounting the castellated nut (31)!

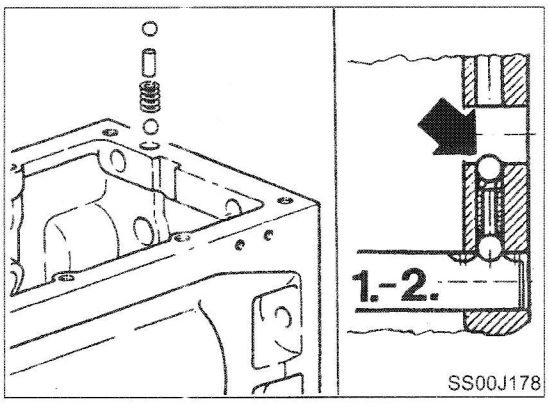


SS00K017



SS00J177

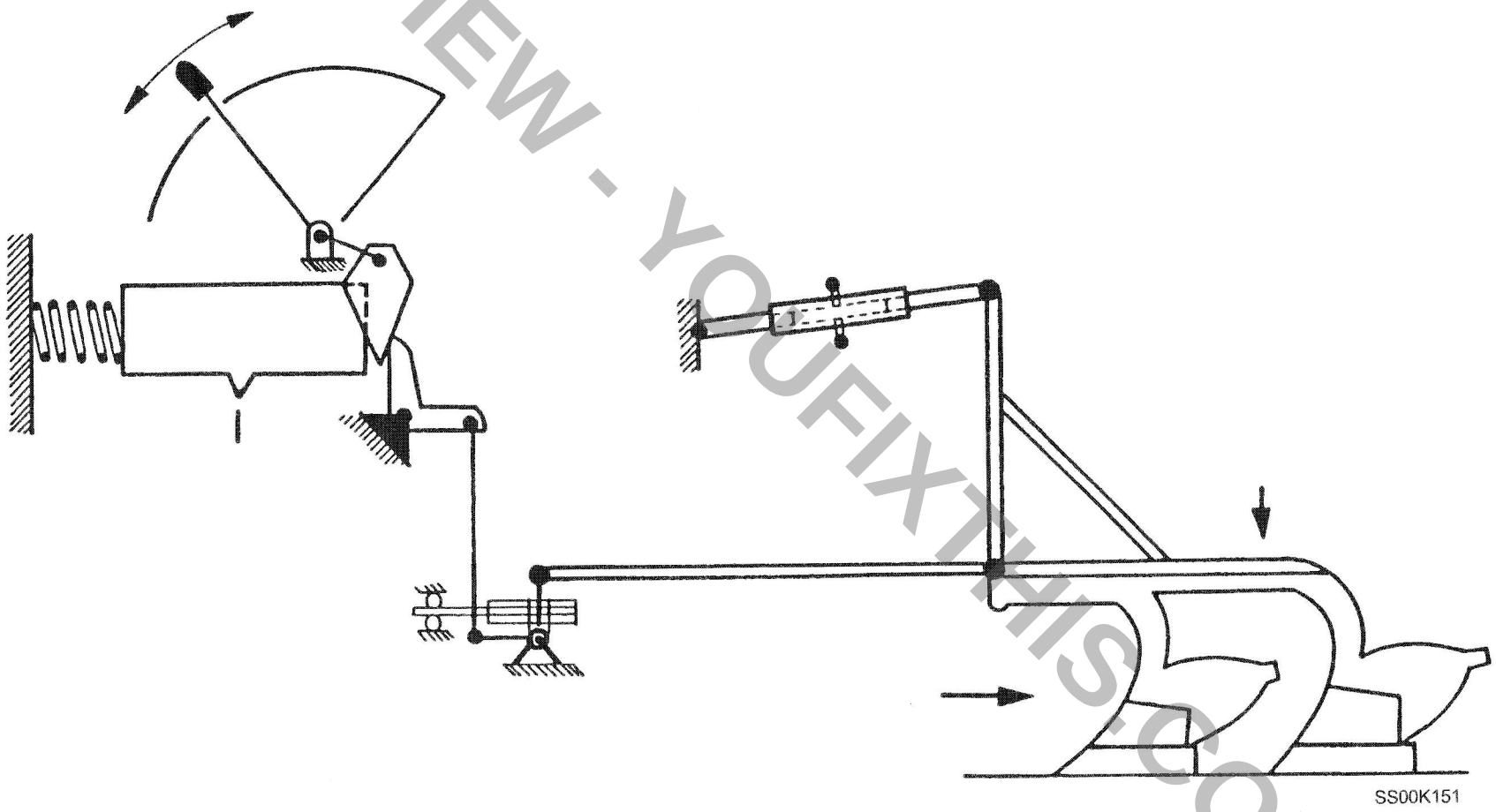
GEAR SHIFT MECHANISM 3rd-4th GEAR - installation.
Mount gear shift lock (balls, springs and barring bolt.)



SS00J178

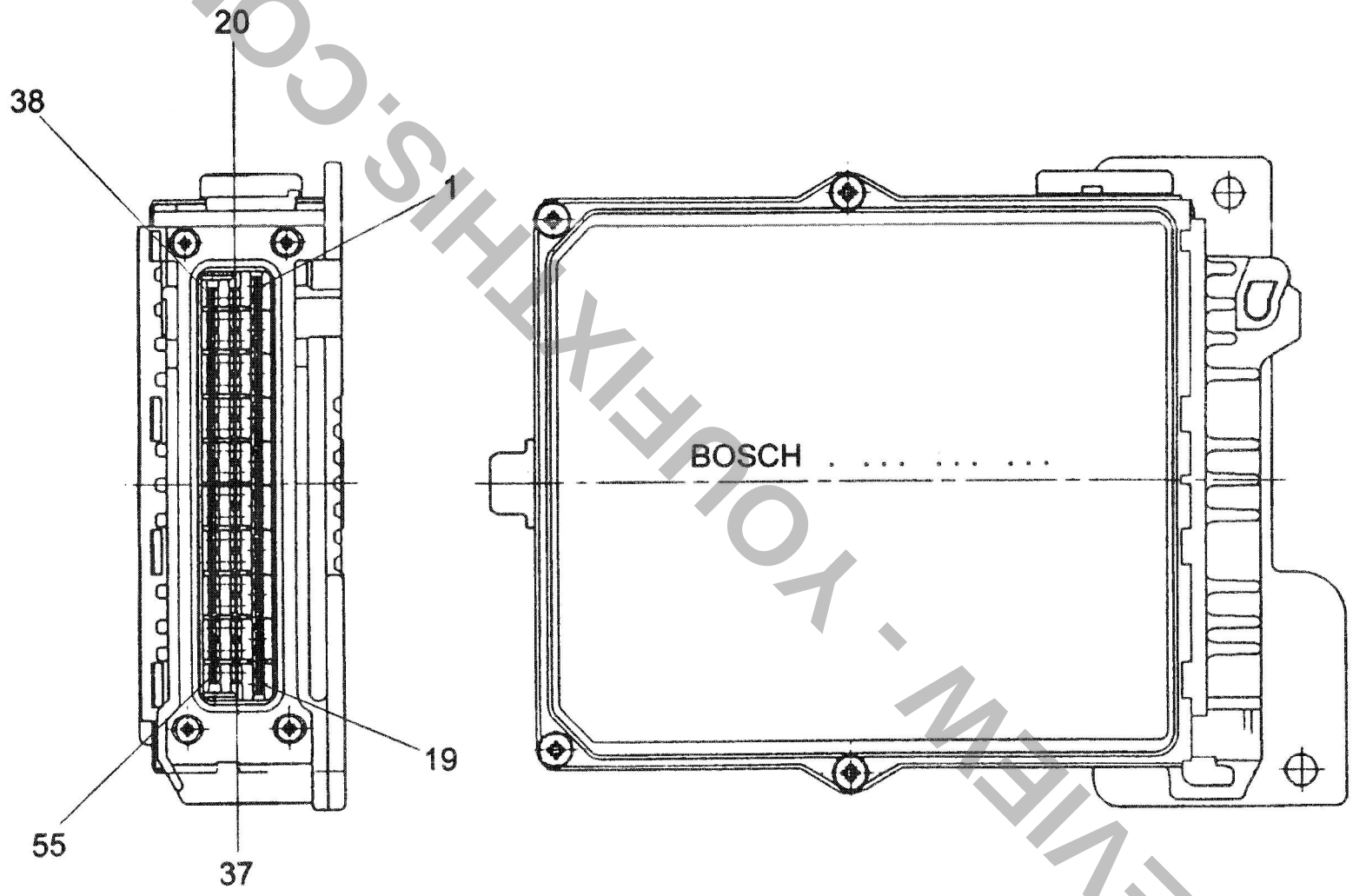
PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com



PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com



SS00K182

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

BLANK PAGE

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

PREVIEW ONLY

You're viewing 24 of 624 pages

The full manual includes:

- All 624 pages, complete
- Searchable PDF (find any keyword)
- No watermarks
- Instant download
- Print-ready quality

GET FULL MANUAL NOW

Case-steyr CS78, CS86, CS94 Service Manual

Scan or click anywhere
youfixthis.com

Click anywhere on this page to get the full manual