STANDARD STARTING PROCEDURE

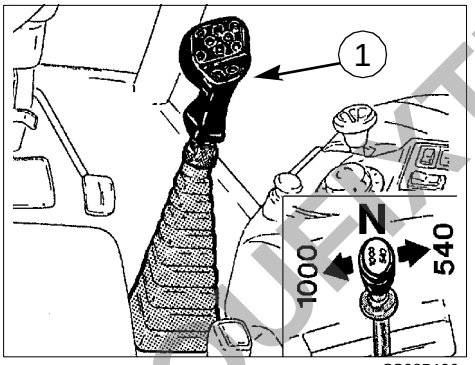
WARNING: *Operate the controls from the driver's seat only.*

IMPORTANT: *Let the engine idle for a few minutes to make sure that enough oil can get to the turbo charger bearings and other engine parts before operating the engine at nominal speed.*

STEP 1

Switch the battery master switch ON (if fitted).

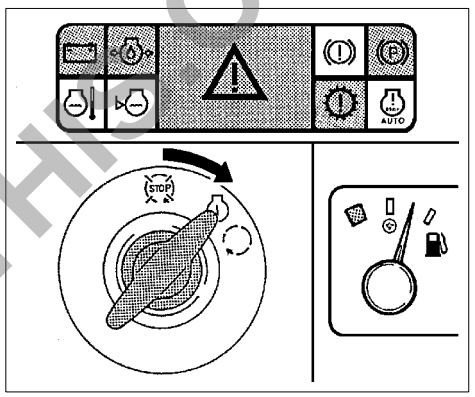
STEP 2



SS98B196

Shift the gear lever (1) and PTO shaft shift lever into their neutral positions.

STEP 3



SS98B197

Turn the ignition start switch to the ON position.Charging, oil pressure indicator and transmission lubrication and the parking brake applied indicator lamps light up and the large WARNING symbol flashes simultaneously on the centralised warning system. On the power shift transmission display, a column lights up for the power shift group (slow) and the letter N for neutral. The fuel level can be read off the combination instrument at any time.

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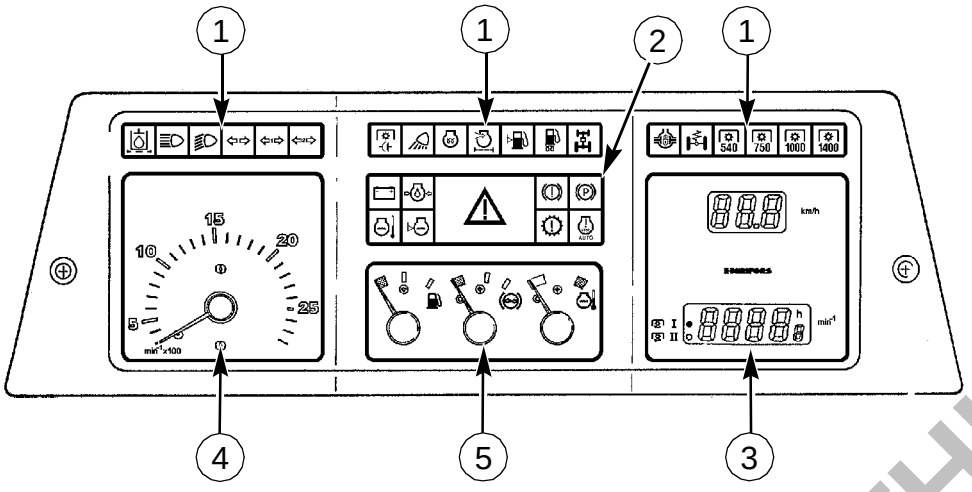
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Instrument panel



SS99B013

1. CONTROL LAMPS – These light up to show the driver that an operational condition requires his/her attention or that the pre-selected function is in operation. For details and complete instructions see under control lamps on page 28 of this manual.

2. CENTRALISED WARNING SYSTEM

3. DIGITAL TRACTOR METER

4. ANALOGUE – TACHOMETER

5. COMBINATION INSTRUMENT – Consists of fuel gauge, cooling water temperature gauge and if fitted, the air pressure gauge.

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LUBRICATION / MAINTENANCE PLAN

Operating hours	250	500	750	1000	1250	1500	1750	2000	2250	2500	2750	3000	3250	3500	3750	4000
ENGINE																
Engine oil change (at least 1 x year)	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Oil filter change (at least 1 x year)	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Drain water from the fuel filter/pre-filter	weekly or every 50 operating hours															
Clean the fuel filter and pre-filter	■															
Fuel filter – replace cartridge(s)		■		■		■		■				■		■		■
Drain the water separator	weekly or every 50 operating hours															
Replace the water separator (at least once a year)		■		■		■		■		■		■		■		■
Check the hose connections and dirt level indicator of the dry air filter	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Check the valve play, adjust as necessary								■				■				■
Replace the dry filter cartridge (at least 1 x year)				■				■				■				■
Replace the safety cartridge in the dry air filter	after cleaning the main cartridge 5x or every 2 years															
Check and readjust injection nozzle pressure	every 2000 operating hours															
Check the oscillation absorber				■				■				■				■
Check coolant fill level (top-up)	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Clean the radiator grill, radiator and oil cooler	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Check the condition and tension of all drive/fan belts	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Front PTO shaft – Oil change (after approx. 20 PTO shaft operating hours, every 100 hours of operation thereafter or at least once a year																
DRIVING GEAR																
Check transmission fluid level, refill if necessary (inspection glass)	■		■		■		■		■		■		■		■	
Transmission: Change filter cartridge		■		■				■				■				■
Transmission oil change (at least 1 x per year)		■		■				■				■				■
Change planetary gear oil	■			■				■				■				■
Check oil level in the planetary gear			■		■		■		■		■		■		■	
HYDRAULICS SYSTEM																
Change suction filter (CC system)		■				■				■				■		
Change pressure filter (CC system)	■		■		■		■		■		■		■		■	
Change suction filter (OC system)		■		■				■				■				■

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Error code – General

In case of a fault, only the fault code with the highest fault number is shown on the display (depending upon the driving programme). At the same time, the ”SPANNER” error symbol lights up on the display.

WARNING: *The acoustic and visual indications (warning signal, continuous warning signal, “N” lights up)* ***must always*** *be observed! Safety-related driving situations could occur by not paying attention to these warning indicators!*

Independent of this, faults detected are stored in the “EEPROM”.

An acoustic warning is given for:

– a – Reversing direction at a speed of >12.5 km/h

– b – After an incorrect operation when reversing direction, if the speed is still > 12.5 km/h and the direction can not be selected from NEUTRAL. (in both cases,continual beeping)

By placing the gearbox in NEUTRAL and reducing the speed < 12.5 km/h, the continual beeping will stop.

The control automatically switches to another driving programme, dependent upon the severity of the fault.

NOTE: *When switched to NEUTRAL, the vehicle will roll without power flow to the engine!*

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ENGINE

General information

Four stroke diesel engine with fuel injection and exhaust turbo-charger

Type	CS110	WD 420.85 – 4 cylinder
	CS120	WD 620.94 – 6 cylinder
	CS130	WD 620.92 – 6 cylinder
	CS150	WD 620.93 – 6 cylinder
Ignition sequence	CS110	1-2-4-3
	CS120, CS130, CS150	1-5-3-6-2-4
Cylinder diameter		108 mm
Stroke		120 mm
Working volume	CS110	4400 cm^3
	CS120, CS130, CS150	6596 cm^3
Compression ratio	CS110, CS150	16.5 : 1
	CS120, CS130	18.5 : 1
Engine power rating	CS110	77 kW (105 PS)
	CS120	85 kW (115 HP)
	CS120	92 kW (125 HP)
	CS150	107 kW (145 HP)
	At nominal engine speed	2300 rpm
Maximum engine power	CS110	81 kW (110 HP)
	CS120	85 kW (120 HP)
	CS130	9 kW (130 HP)
	CS150	107 kW (150 HP)
	at engine speed	2100 rpm
Nominal engine speed		2300 rpm
Idling speed		750 rpm
Maximum torque	CS110	421 Nm (42.9 kpm)
	CS120	456 Nm (44.7 kpm)
	CS130	497 Nm (50.7 kpm)
	at engine speed	1400 rpm
	CS150	577 Nm (58.8 kpm)
	at engine speed	1500 rpm
Valve play, cold (Exhaust)		0.35 mm
	Intake valve	0.35 mm

IMPORTANT: *Adjustment of valve play must be carried out with the engine stopped.*

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OPERATING THE TRANSMISSION

The tractor is fitted with a synchronised transmission and a power shift transmission.

SYNCHRONIZED TRANSMISSION – gears must be changed by operating the clutch.

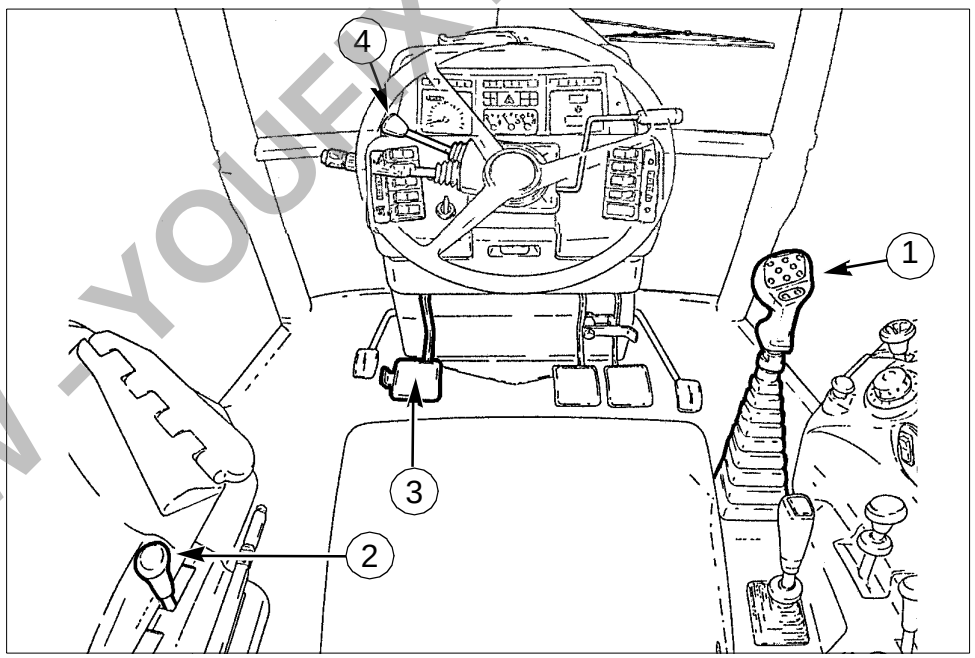
POWER SHIFT TRANSMISSION – is changed electro-hydraulically using the multi-controller with the tractor at a standstill or in motion.

REVERSING THE DRIVING DIRECTION – is carried out without operating the clutch.

CRAWLER GEAR GROUP – Only change when tractor is standing still.
Depress the clutch pedal fully.

IMPORTANT: *At outside temperatures below -10 °C it is possible, that when automatically moving off after a cold start, the transmission shifts to neutral. In this case, the first moving off procedures must be carried out using the clutch, until the engine has reached operating temperature.*

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1. MULTI-FUNCTION LEVER
2. SUPER CRAWLER GEAR (If fitted)
3. CLUTCH PEDAL
4. REVERSE DIRECTION LEVER (shuttle lever)

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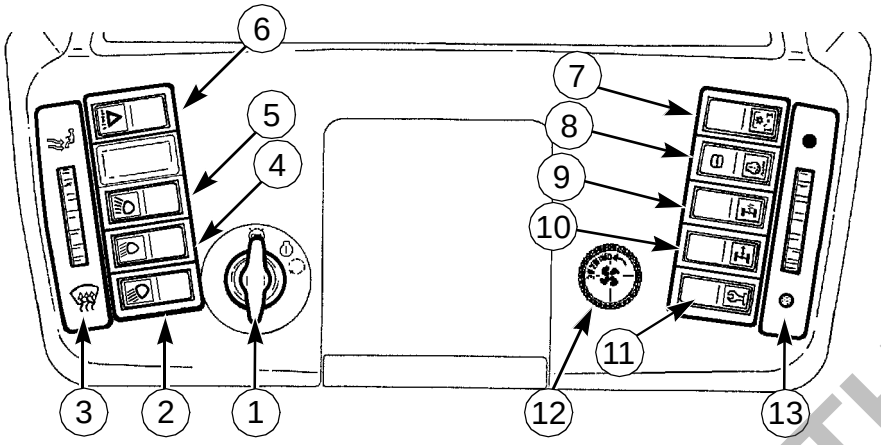
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OPERATING CONTROLS

Instrument panel



SS98B192

1. IGNITION SWITCH – The ignition switch has the following positions:

OFF position – The ignition key is vertical. Everything is switched OFF and the ignition key can be removed. The parking light and hazard warning lights can be switched ON without the key.

ON position – Turn in a clockwise direction from the OFF position. The indicator lamps for low oil pressure, battery charging control and applied parking brake light up on the instrument panel. At the same time the large ATTENTION symbol in the centralised warning system blinks. In addition, the combination instrument indicates the correct value. The indicator lamp remains lit until the engine is started.

START position – Turn further in a clockwise direction from the ON position. Turn the ignition key to the START position. As soon as the engine starts, release the key. It automatically returns to the ON position.
Stop the engine by turning the ignition key from the ON position to the OFF position.

2. SWITCH FOR SEARCHLIGHTS ON THE REAR MUDGUARDS (if fitted) – Double action rocker switch for switching the searchlights ON and OFF.
The rear searchlights must not be used on public highways.

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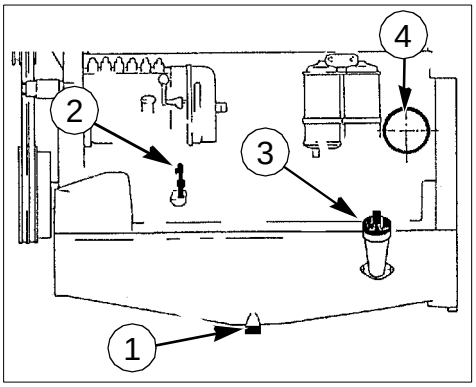
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ENGINE MAINTENANCE

Maintenance points



SS98C014

1 = Drain plug

2 = Oil dip stick

3 = Oil filler aperture

4 = Engine oil filter

Engine oil and filter change

To check the engine oil level, park the tractor on level ground and switch the engine OFF.

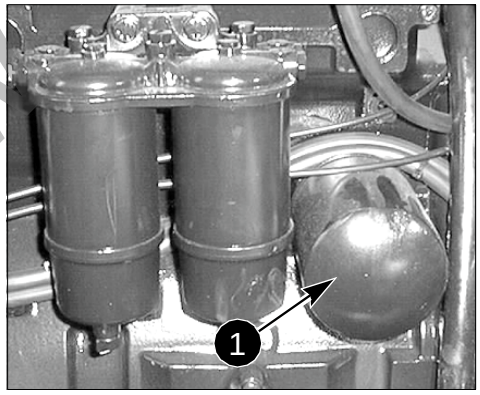
NOTE: *Drain the engine oil only when engine is warm.*

WARNING: *Avoid contact with hot oil. Do not change the filter while it is hot since you can burn the skin on your hands. Wait until the temperature drops below 50 °C.*

M528

IMPORTANT: *Dispose of old oil and filters in compliance with local regulations. Do not drain old oil onto the ground or into drains. Do not drain old oil into leaking containers. Be aware of environmental protection.*

Filter change



SD98E031

Screw the filter cartridge (1) off and replace.

Oil the sealing ring on a new filter before inserting.

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Driving programmes

Normal driving

Fault code 10 – 20

Insignificant fault, the tractor carries on functioning normally. Moving off/reversing direction delayed or jerky.
Remedy fault during next visit to a workshop and erase the fault memory!

Fault code 22

Transmission oil temperature too high.

Reduce loading on the tractor until the fault code is erased.

If the fault can not be cured in this manner, consult a specialist workshop!

Driving restricted

Fault code 27 – 41

Power shift is blocked.

Further operation is possible. It is however recommended to consult a workshop as soon as possible!

Reserve driving program

Fault code 47 – 58

Power shift is blocked.

Conditions for moving off and reversing direction:

– Gearbox at least 1 second in neutral with the tractor at a standstill

> ⚠ ***WARNING:*** *If the driving speed RPM transmitter is defective (fault code 47,48,49) it is possible to reverse direction at speeds in excess of 12.5 km/h. ACCIDENT HAZARD!*

Finish the work in hand and then consult a specialist workshop!

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Hydrostatic steering

Type ..... Load sensing system
Steering pump ..... Hydrostatic
Steering cylinder ..... Dual action

Transmission

Transmission type Fully synchronised – reversing transmission with 4 power shift levels and 6 gears

Standard Speed levels

40 km/h and 50 km/h ..... 24 forwards and 24 reverse
30 km/h ..... 20 forwards and 20

Crawler gear version (if provided)

40 km/h and 50 km/h ..... 40 forwards and 40 reverse
30 km/h ..... 36 forwards and 36

Gear shifting ..... Single lever operation located to the right of the driver's seat
Forwards/Reverse shifting ..... with multi-controller and shuttle lever
Crawler gear shifting ..... Shift lever located to the left of the seat

Hydraulic system

OC system (Open Centre), open system, closed circuit (if fitted)

Pump ..... Gear pump
Flow rate ..... 78 / 39 l/min
Operating pressure ..... 185 bar

CC system (Closed Centre), closed system, closed circuit (If fitted)

Pump ..... PFC pump with integrated feed pump
Pump flow rate ..... 115 l/min
Operating pressure ..... 205 bar

Hydraulic lifting gear

Operation ..... Electronic power lift control
Lower linkage version ..... Quick action coupling
Linkage version ..... Three point, category III
Maximum lifting capacity at the linkage tow-bar ..... 9,900 kp
Maximum lifting power ..... 7,100 kp

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REAR POWER TAKE OFF (PTO) SHAFT

General information concerning the PTO on your tractor can be found in the Technical Data section of this manual-
When using PTO driven implements in conjunction with the three-point hook up, the lifting bars must be adjusted in accordance with the specifications in the Implement Manufacturer's Operating Instructions.

> ⚠ **WARNING:** *This tractor is fitted with a 4-speed PTO shaft, 540, 540E, 1000 or 1000E RPM. Pay attention to the fact that the implement to be used is capable of running at the tractor's PTO speeds. When using the PTO shaft, fix the adjustable tow-bar (if fitted) in the mid position. Do not use the 540 and 540E PTO shaft for implements which require more than 80 HP (59 kW) from the PTO.*
> *Never fit, maintain or repair PTO driven implements when the motor is running. Wait until the PTO has finally stopped turning.*

Operating the rear PTO shaft

The PTO is switched ON and OFF by means of a spring loaded switch on the right-hand operating console or using the external pushbuttons on the mudguard (if fitted). There are 4 speeds available. These can be selected using the selector levers 1000/540 and ECO/N.

NOTE: *The lift limiter must always be used, when operating the PTO, see page 132.*

IMPORTANT: *The build up of pressure is slower at low oil temperatures, which will lead to a delayed implement run-up. Implements with a high run-up torque must only be switched ON when the gearbox oil is at operating temperature.*

Start the PTO shaft as follows:

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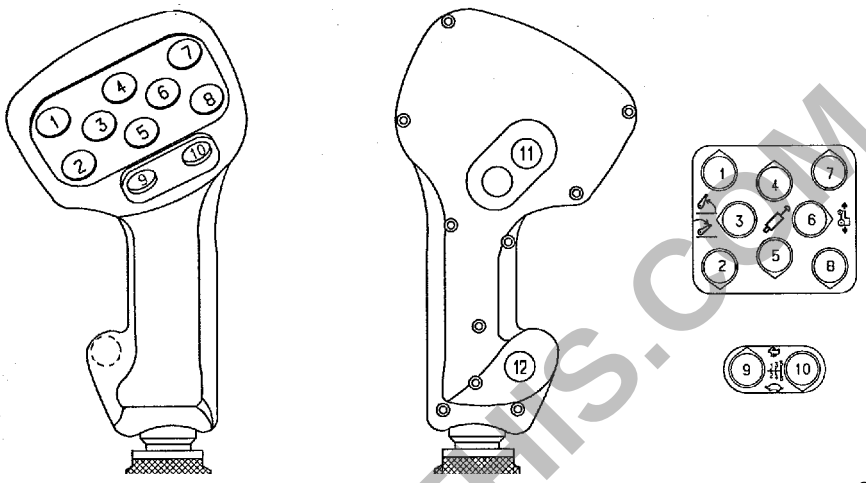
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Multi-Controller



SS98C172

Function of the individual buttons:

1. Black button RAISE lifting gear
2. Black button LOWER lifting gear
3. Yellow button additional control unit RAISE
4. Yellow button additional control unit RAISE
5. Green button additional control unit LOWER
6. Yellow button additional control unit LOWER
7. Black button Drive FORWARDS
8. Black button Drive in REVERSE
9. Black button Power shift level FAST
10. Black button Power shift level SLOW
11. Black button Safety switch
12. Green button Floating position for additional control unit green

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