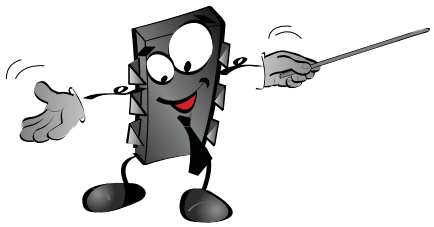
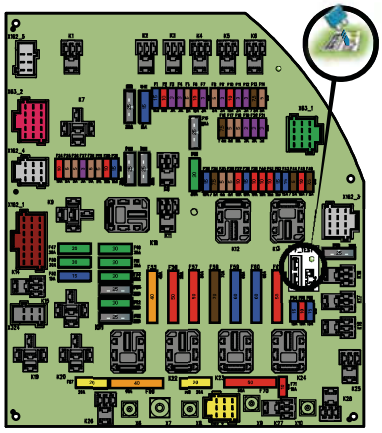
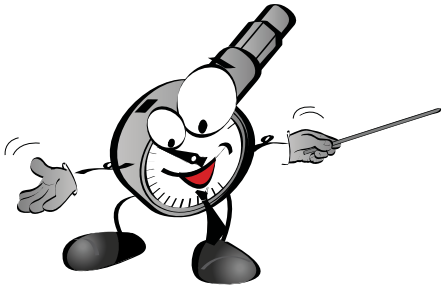
Workshop Service Manual

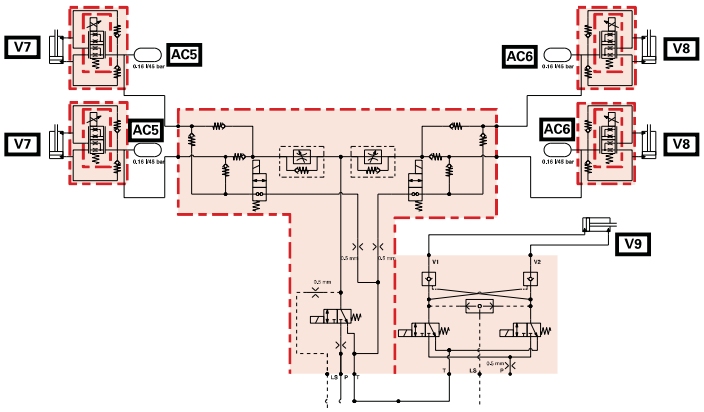
Technician Service Book - 6400 series tractors

Electrical and hydraulics diagrams









AGCO S.A. - Beauvais - France - RC B562 104 539
MASSEY FERGUSON is a worldwide brand of AGCO

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No. 4346420M1
6400
English

4WD front axle and 2WD front axle	
Axle type	Suspended or fixed
Supplier reference - fixed front axle	720/527
Supplier reference - suspended front axle	730/604 (1 accumulator) 730/608 (2 accumulators)
Rotational direction	anti-clockwise
Total loaded weight supported by front axle - 40 km/h (25 mile/h)	3300 kg (7275 lb)
Total loaded weight supported by front axle - 50 km/h (31 mile/h)	-
Recommended oil type (beam and final drive)	SAE 85 W 90 (API GL5)
Total ratio for fixed front axle	18.975
Total ratio for suspended front axle	19.00
Number of teeth on final drive	14 x 27 x 70
Ratio for fixed axle final drive	4.6
Ratio for suspended axle final drive	6
Number of fixed axle pinion/ring gear teeth	8/33
Number of suspended axle pinion/ring gear teeth	12/38
Differential type	Coupler
Number of discs on multidisc differential	-
Maximum steering angle	55°
Oscillation angle	-
Type of oscillation stop	Mechanical
Steering ram diameter	63 mm (2.5 in) x 32 mm (1.3 in)
Steering ram stroke	2 x 125 mm (4.9 in)
Suspension type	Hydraulics
Suspension ram diameter	65 mm (2.6 in) x 60 mm (2.4 in)
Suspension ram stroke	100 mm (3.9 in)
Hydraulic control unit brand	Husco
Hydraulic control unit nominal pressure	200 bar (2901 psi)
Number of accumulators	1 accumulator (730/604) 2 accumulators (730/608)
Accumulator pressure	1 accumulator 1 l (0.3 gal (US)) = 20 bar (290 psi) 2 accumulators: – Left 0,5 l (0.1 gal (US)) = 10 bar (145 psi) – Right 0,75 l (0.2 gal (US)) = 50 bar (725 psi)
Suspension sensor type	Angular potentiometer.
Steering sensor type (with Auto-Guide option)	-
Factor K	Fixed axle = 1.360 Suspended axle = 1.358

3 Model 6460

Engine	
Brand	Sisu
Type	44CTA
Nominal power (ISO TR14396) at 2200 rpm	115 hp
Maximum power (ISO TR14396) at 2000 rpm	125 hp
Maximum torque (ISO TR14396)	538 Nm (397 lbf ft)
Maximum PTO power (OECD) at PTO 1000 rpm	110 hp
Idle speed	850 rpm
Maximum speed	2260 rpm
Engine weight	345 kg (761 lb)
Number of cylinders	4
Engine cubic capacity	4,4 l (1.2 gal (US))
Piston travel	120 mm (4.7 in)
Piston diameter	108 mm (4.3 in)
Compression ratio	17.4:1
Compression pressure	-
Injection pump brand	Bosch
Injection pump type	CP 1H
Firing order	1-2-4-3
Maximum pressure in the high-pressure system	1100 bar (15954 psi)
Injector brand	Bosch
Injector type	CRIN 2
Charge pump type	Electric
Fuel prefilter filtration capacity	30 µ
Main fuel filter filtration capacity	5 µ
Low-pressure system pressure at minimum speed	0,75 bar (11 psi)
Low-pressure system pressure at maximum speed	0,75 bar (11 psi)
Recommended oil:	CI - 4 (ACEA and API)
Maximum operating tilt (precautions)	Pitch (front/rear) = 25° Roll (right/left) = 20°
Oil/fuel consumption	Maximum 0.1 %
Lubrication system	By gear pump
Oil cooling system	Radiator
Oil pressure at minimum speed	1,0 bar (15 psi)
Oil pressure at maximum speed	2,5 bar (36 psi) to 5,0 bar (73 psi)
Relief valve adjustment pressure	5,0 bar (73 psi)
Air suction type	Turbo air/air
Air preheating type	Grid Heater
Number of valves	4 per cylinder = 16
Valve clearance value	0,35 mm (0.01 in)
Engine cooling system	Coolant
Fan type	Viscostatic
Thermostat begins to open at	82 °C (180 °F)
Liquid temperature from - to	-35 °C (-31 °F) to 108 °C (226 °F)

Linkage	
Operating pressure (rear)	180 bar (2611 psi)
3-point linkage category (rear)	CAT2 or CAT3
Front lift ram diameter	80 mm (3.2 in) (capacity 2800 kg (6173 lb)) 90 mm (3.5 in) (capacity 4000 kg (8818 lb))
Front linkage travel	-
Maximum lifting capacity at ball joints (front)	2800 kg (6173 lb) or 4000 kg (8818 lb)
Operating pressure (front)	180 bar (2611 psi)
3-point linkage category (front)	CAT2

Rear power take-off (PTO)	
Number of selections possible for rear PTO	540/1000 540/1000/540 ECO/1000 ECO with GSPTO option
Maximum permissible power 540/540 ECO in 1"3/8 (6 and 21 splines)	540 = 73 kW / 540E = 40 kW
Maximum permissible power 540/540 ECO in 1"3/4 (20 splines)	540 = 80 kW / 540E = 40 kW
Maximum permissible power 1000/1000 ECO in 1"3/8 (6 and 21 splines)	1000 = 93 kW / 1000E = 40 kW
Maximum permissible power 1000/1000 ECO in 1"3/4 (20 splines)	1000 = 93 kW / 1000E = 40 kW
Engine speed if PTO 540	1980 rpm
Engine speed if PTO 540 ECO	1550 rpm
Engine speed if PTO 1000	2000 rpm
Engine speed if PTO 1000 ECO	1550 rpm
Rotational direction	Clockwise
Clutch type	Multidisc hydraulic
Number of clutch discs	5
Control pressure	21 bar (305 psi)
Splined shaft type	6 or 21 x 1"3/8 (diameter 35 mm (1.4 in)) splines or 20 x 1"3/4 (diameter 45 mm (1.8 in)) splines

Front power take-off	
Number of selections possible for front PTO	1000 rpm
Maximum permissible power - clockwise	100 kW
Maximum permissible power - anti-clockwise	110 kW
Maximum permissible torque - clockwise	955 Nm (704 lbf ft)
Maximum permissible torque - anti-clockwise	1055 Nm (778 lbf ft)
Rotational direction	2 directions of rotation
Engine speed if PTO 1000	2000 rpm
Ratio	2
Clutch type	Multidisc hydraulic
Splined shaft type	6 or 21 x 1"3/8 (diameter 35 mm (1.4 in)) splines

4WD front axle and 2WD front axle	
Axle type	Suspended or fixed
Supplier reference - fixed front axle	735/526
Supplier reference - suspended front axle	735/607 (1 accumulator) 735/609 (2 accumulators)
Rotational direction	anti-clockwise
Total loaded weight supported by front axle - 40 km/h (25 mile/h)	3800 kg (8377 lb) (assisted brake + double-acting Orbitrol) 3300 kg (7275 lb) (single-acting Orbitrol)
Total loaded weight supported by front axle - 50 km/h (31 mile/h)	3800 kg (8377 lb)
Recommended oil type (beam and final drive)	SAE 85 W 90 (API GL5)
Total ratio for fixed front axle	15.500
Total ratio for suspended front axle	15.500
Number of teeth on final drive	14 x 27 x 70
Ratio for fixed axle final drive	6
Ratio for suspended axle final drive	6
Number of fixed axle pinion/ring gear teeth	12/31
Number of suspended axle pinion/ring gear teeth	12/31
Differential type	Coupler
Number of discs on multidisc differential	-
Maximum steering angle	55°
Oscillation angle	-
Type of oscillation stop	Mechanical
Steering ram diameter	68 mm (2.7 in) x 32 mm (1.3 in)
Steering ram stroke	2 x 129 mm (5.1 in)
Suspension type	Hydraulics
Suspension ram diameter	65 mm (2.6 in) x 60 mm (2.4 in)
Suspension ram stroke	100 mm (3.9 in)
Hydraulic control unit brand	Husco
Hydraulic control unit nominal pressure	200 bar (2901 psi)
Number of accumulators	1 accumulator (735/607) 2 accumulators (735/609)
Accumulator pressure	1 accumulator 1 l (0.3 gal (US)) = 20 bar (290 psi) 2 accumulators: – Left 0,5 l (0.1 gal (US)) = 10 bar (145 psi) – Right 0,75 l (0.2 gal (US)) = 50 bar (725 psi)
Suspension sensor type	Angular potentiometer.
Steering sensor type (with Auto-Guide option)	-
Factor K	1.326

8 Model 6475 SISU

Engine	
Brand	SISU
Type	66CTA
Nominal power in ISO hp *1*(kW) at an engine speed of 2200 rpm	132 (97)
Maximum power in ISO hp *1*(kW) at 2000 rpm	142 (105)
Maximum torque (ISO TR14396)	605 Nm (446 lbf ft)
Maximum power take-off power in ISO hp *1* at PTO 1000 rpm	130
Idle speed	800 rpm
Maximum speed	2260 rpm
Engine weight	515 kg (1135 lb)
Number of cylinders	6
Engine displacement in litres	6,6
Engine displacement in cm^3	6600 cm^3 (402.73 in^3)
Piston travel	120 mm (4.7 in)
Piston diameter	108 mm (4.3 in)
Compression ratio	-
Compression pressure	-
Injection pump brand	Bosch
Injection pump type	CP1
Firing order	1-5-3-6-2-4
Maximum pressure in the high-pressure system	1400 bar (20306 psi)
Injector brand	Bosch
Injector type	CRIN 2/8 holes
Charge pump type	Electric
Fuel prefilter filtration capacity	30 µ
Main fuel filter filtration capacity	5 µ
Low-pressure system pressure at minimum speed	0,75 bar (11 psi)
Low-pressure system pressure at maximum speed	0,75 bar (11 psi)
Recommended oil:	API CI-4 or ACEA E7
Maximum operating tilt (precautions)	-
Oil/fuel consumption	-
Lubrication system	Gear pump at the bottom of the timing
Oil pressure at minimum speed	1 bar (15 psi)
Oil pressure at maximum speed	2,5 bar (36 psi) at 5 bar (73 psi) depending on the temperature
Relief valve adjustment pressure	5 bar (73 psi) (spring pressure)
Air suction type	Turbocharged with air/air intercooler
Air preheating type	Grid Heater
Number of valves	24
Valve clearance value	0,35 mm (0.01 in) (inlet and exhaust)
Engine cooling system	Water cooling
Fan type	Vistronic fan
Thermostat begins to open at	83 °C (181 °F)

Linkage	
Rear lift ram diameter	75 mm (3.0 in)
Rear linkage travel	718 mm (28.3 in) or 728 mm (28.7 in) or 781 mm (30.8 in) (CCLS only)
Maximum lifting capacity at ball joints (rear)	7100 kg (15653 lb) 8000 kg (17637 lb) (CCLS only)
Operating pressure (rear)	180 bar (2611 psi)
3-point linkage category (rear)	CAT2 or CAT3
Front lift ram diameter	80 mm (3.2 in) (capacity 2800 kg (6173 lb)) 90 mm (3.5 in) (capacity 4000 kg (8818 lb))
Front linkage travel	-
Maximum lifting capacity at ball joints (front)	2800 kg (6173 lb) or 4000 kg (8818 lb)
Operating pressure (front)	180 bar (2611 psi)
3-point linkage category (front)	CAT2

Rear power take-off (PTO)	
Number of selections possible for rear PTO	540/1000 540/1000/540 ECO/1000 ECO with GSPTO option
Maximum permissible power 540/540 ECO in 1"3/8 (6 and 21 splines)	540 = 73 kW / 540E = 40 kW
Maximum permissible power 540/540 ECO in 1"3/4 (20 splines)	540 = 80 kW / 540E = 40 kW
Maximum permissible power 1000/1000 ECO in 1"3/8 (6 and 21 splines)	1000 = 93 kW / 1000E = 40 kW
Maximum permissible power 1000/1000 ECO in 1"3/4 (20 splines)	1000 = 93 kW / 1000E = 40 kW
Engine speed if PTO 540	1980 rpm
Engine speed if PTO 540 ECO	1550 rpm
Engine speed if PTO 1000	2000 rpm
Engine speed if PTO 1000 ECO	1550 rpm
Rotational direction	Clockwise
Clutch type	Multidisc hydraulic
Number of clutch discs	5
Control pressure	21 bar (305 psi)
Splined shaft type	6 or 21 x 1"3/8 (diameter 35 mm (1.4 in)) splines or 20 x 1"3/4 (diameter 45 mm (1.8 in)) splines

Front power take-off	
Number of selections possible for front PTO	1000 rpm
Maximum permissible power - clockwise	100 kW
Maximum permissible power - anti-clockwise	110 kW
Maximum permissible torque - clockwise	955 Nm (704 lbf ft)
Maximum permissible torque - anti-clockwise	1055 Nm (778 lbf ft)
Rotational direction	2 directions of rotation
Engine speed if PTO 1000	2000 rpm

4WD front axle and 2WD front axle	
Supplier reference - fixed front axle	740/538
Supplier reference - suspended front axle	Tractors with GSPTO – 750/607 (1 accumulator) – 750/627 (2 accumulators) Tractors without GSPTO – 740/603 (1 accumulator) – 740/611 (2 accumulators)
Rotational direction	anti-clockwise
Total loaded weight supported by front axle - 40 km/h (25 mile/h)	5200 kg (11464 lb)
Total loaded weight supported by front axle - 50 km/h (31 mile/h)	5200 kg (11464 lb)
Recommended oil type (beam and final drive)	SAE 85 W 90 (API GL5)
Total ratio for fixed front axle	16.800
Total ratio for suspended front axle	Tractors with GSPTO = 20.400 Tractors without GSPTO = 16.800
Number of teeth on final drive	14 x 27 x 70
Ratio for fixed axle final drive	6
Ratio for suspended axle final drive	6
Number of fixed axle pinion/ring gear teeth	10/28
Number of suspended axle pinion/ring gear teeth	Tractors with GSPTO = 10/34 Tractors without GSPTO = 10/28
Differential type	Multidisc
Number of discs on multidisc differential	15
Maximum steering angle	55°
Oscillation angle	-
Type of oscillation stop	Mechanical
Steering ram diameter	75 mm (3.0 in) x 40 mm (1.6 in)
Steering ram stroke	2 x 149 mm (5.9 in)
Suspension type	Hydraulics
Suspension ram diameter	80 mm (3.2 in) x 70 mm (2.8 in)
Suspension ram stroke	100 mm (3.9 in)
Hydraulic control unit brand	Husco
Hydraulic control unit nominal pressure	200 bar (2901 psi)
Number of accumulators	Tractors with GSPTO – 1 accumulator (750/607) – 2 accumulators (750/627) Tractors without GSPTO – 1 accumulator (740/603) – 2 accumulators (740/611)
Accumulator pressure	1 accumulator 1 l (0.3 gal (US)) = 20 bar (290 psi) 2 accumulators: – Left 0,75 l (0.2 gal (US)) = 10 bar (145 psi) – Right 1 l (0.3 gal (US)) = 50 bar (725 psi)
Suspension sensor type	Angular potentiometer.
Steering sensor type (with Auto-Guide option)	Angular potentiometer.
Factor K	Tractors with GSPTO = 1.348 Tractors without GSPTO = 1.345

13 Model 6495

Engine	
Brand	Sisu
Type	66CTA
Nominal power (ISO TR14396) at 2200 rpm	185 hp
Maximum power (ISO TR14396) at 2000 rpm	198 hp
Maximum torque (ISO TR14396)	841 Nm (620 lbf ft)
Maximum PTO power (OECD) at PTO 1000 rpm	180 hp
Idle speed	800 rpm
Maximum speed	2400 rpm
Engine weight	515 kg (1135 lb)
Number of cylinders	6
Engine cubic capacity	6,6 l (1.7 gal (US))
Piston travel	120 mm (4.7 in)
Piston diameter	108 mm (4.3 in)
Compression ratio	17.4:1
Compression pressure	-
Injection pump brand	Bosch
Injection pump type	CP 1H
Firing order	1-5-3-6-2-4
Maximum pressure in the high-pressure system	1100 bar (15954 psi)
Injector brand	Bosch
Injector type	CRIN 2
Charge pump type	Electric
Fuel prefilter filtration capacity	30 µ
Main fuel filter filtration capacity	5 µ
Low-pressure system pressure at minimum speed	0,75 bar (11 psi)
Low-pressure system pressure at maximum speed	0,75 bar (11 psi)
Recommended oil:	CI - 4 (ACEA and API)
Maximum operating tilt (precautions)	Pitch (front/rear) = 25° Roll (right/left) = 20°
Oil/fuel consumption	Maximum 0.1 %
Lubrication system	By gear pump
Oil cooling system	Radiator
Oil pressure at minimum speed	1,0 bar (15 psi)
Oil pressure at maximum speed	2,5 bar (36 psi) to 5,0 bar (73 psi)
Relief valve adjustment pressure	5,0 bar (73 psi)
Air suction type	Turbo air/air
Air preheating type	Grid Heater
Number of valves	4 per cylinder = 24
Valve clearance value	0,35 mm (0.01 in)
Engine cooling system	Coolant
Fan type	Viscostatic
Thermostat begins to open at	82 °C (180 °F)
Liquid temperature from - to	-35 °C (-31 °F) to 108 °C (226 °F)

Rear power take-off (PTO)	
Number of selections possible for rear PTO	540/1000 540/540 ECO/1000 ECO
Maximum permissible power 540/540 ECO in 1"3/8 (6 and 21 splines)	540 = 104 kW / 540E = 63 kW
Maximum permissible power 540/540 ECO in 1"3/4 (20 splines)	540 = 104 kW / 540E = 63 kW
Maximum permissible power 1000/1000 ECO in 1"3/8 (6 and 21 splines)	145 kW
Maximum permissible power 1000/1000 ECO in 1"3/4 (20 splines)	145 kW
Engine speed if PTO 540	2000 rpm
Engine speed if PTO 540 ECO	1550 rpm
Engine speed if PTO 1000	2000 rpm
Engine speed if PTO 1000 ECO	1550 rpm
Rotational direction	Clockwise
Clutch type	Multidisc hydraulic
Number of clutch discs	6
Control pressure	21 bar (305 psi)
Splined shaft type	6 or 21 x 1"3/8 (diameter 35 mm (1.4 in)) splines or 20 x 1"3/4 (diameter 45 mm (1.8 in)) splines

Front power take-off	
Number of selections possible for front PTO	1000 rpm
Maximum permissible power - clockwise	100 kW
Maximum permissible power - anti-clockwise	110 kW
Maximum permissible torque - clockwise	955 Nm (704 lbf ft)
Maximum permissible torque - anti-clockwise	1055 Nm (778 lbf ft)
Rotational direction	2 directions of rotation
Engine speed if PTO 1000	2040 rpm
Ratio	2.04
Clutch type	Multidisc hydraulic
Splined shaft type	6 or 21 x 1"3/8 (diameter 35 mm (1.4 in)) splines

Electric	
Battery brand	TAB
Battery specifications (2 batteries)	12 V - 66 A/H
Maximum current at start-up (IEC standard)	840 A
Starter type	12 V
Starter power	3 kW
Alternator type	14 V/150 A
Current available on ISOBUS connector	50 A

1 6445-6455-6460-6470 forward speeds

1.1 Forward speed at 2200 rpm with Dyna-6 transmission 40 km/h (25 mile/h) and 18.4R38 tyres

Forward and reverse travel, Dyna-6 transmission

Ratio engaged	Standard	Creeper gears	Super creeper gears
1/A	1,68 km/h (1 mile/h)	0,42 km/h (0.3 mile/h)	0,12 km/h (0.07 mile/h)
1/B	2,02 km/h (1 mile/h)	0,5 km/h (0.3 mile/h)	0,14 km/h (0.09 mile/h)
1/C	2,37 km/h (1 mile/h)	0,59 km/h (0.4 mile/h)	0,17 km/h (0.1 mile/h)
1/D	2,85 km/h (2 mile/h)	0,71 km/h (0.4 mile/h)	0,2 km/h (0.1 mile/h)
1/E	3,35 km/h (2 mile/h)	0,84 km/h (0.5 mile/h)	0,24 km/h (0.1 mile/h)
1/F	4,03 km/h (3 mile/h)	1,01 km/h (0.6 mile/h)	0,29 km/h (0.2 mile/h)
2/A	4,54 km/h (3 mile/h)	1,13 km/h (0.7 mile/h)	0,32 km/h (0.2 mile/h)
2/B	5,45 km/h (3 mile/h)	1,36 km/h (0.8 mile/h)	0,39 km/h (0.2 mile/h)
2/C	6,4 km/h (4 mile/h)	1,6 km/h (1 mile/h)	0,45 km/h (0.3 mile/h)
2/D	7,7 km/h (5 mile/h)	1,93 km/h (1 mile/h)	0,55 km/h (0.3 mile/h)
2/E	9,06 km/h (6 mile/h)	2,27 km/h (1 mile/h)	0,64 km/h (0.4 mile/h)
2/F	10,9 km/h (7 mile/h)	2,73 km/h (2 mile/h)	0,77 km/h (0.5 mile/h)
3/A	9,22 km/h (6 mile/h)		0,65 km/h (0.4 mile/h)
3/B	11,08 km/h (7 mile/h)		0,79 km/h (0.5 mile/h)
3/C	13 km/h (8 mile/h)		0,92 km/h (0.6 mile/h)
3/D	15,65 km/h (10 mile/h)		1,11 km/h (0.7 mile/h)
3/E	18,4 km/h (11 mile/h)		1,31 km/h (0.8 mile/h)
3/F	22,14 km/h (14 mile/h)		1,57 km/h (1 mile/h)
4/A	19,71 km/h (12 mile/h)		1,4 km/h (0.9 mile/h)
4/B	23,69 km/h (15 mile/h)		1,68 km/h (1 mile/h)
4/C	27,81 km/h (17 mile/h)		1,97 km/h (1 mile/h)
4/D	33,47 km/h (21 mile/h)		2,37 km/h (1 mile/h)
4/E	39,36 km/h (24 mile/h)(1		2,79 km/h (2 mile/h)
4/F			3,36 km/h (2 mile/h)

1. The speed limit is governed by the engine's electronic management system.

C - Dimensions

Rear axle

Reference	Measured specification	Dimension/weight
(G)	Distance between flanges Distance between flanges (short shaft, diameter 82 mm (3.2 in)) Distance between flanges (long shaft, diameter 82 mm (3.2 in))	1835 mm (72.3 in) 1742 mm (68.6 in) - 2035 mm (80.2 in) 742 mm (68.6 in) - 2668 mm (105.1 in)
(H)	Centre-to-centre distance between studs	
	– Flanged shaft	203 mm (8.0 in)
	– Straight shaft	335 mm (13.2 in)
(I)	Centring diameter	
	– Flanged shaft	152 mm (6.0 in)
	– Straight shaft	281 mm (11.1 in)
(J)	Stud length	
	– Flanged shaft	40 mm (1.6 in)
	– Flanged shaft with spacer	81 mm (3.2 in)
	– Straight shaft	53 mm (2.1 in) - 71 mm (2.8 in)
(K)	Stud or screw diameter	M18 x 1.5
(L)	Number of studs or screws	
	– Flanged shaft	8
	– Straight shaft	10

Front axle

Reference	Measured specification	Dimension/weight(1	
		Front axle 735	Front axle 740
(G)	Distance between flanges	1800 mm (70.9 in)	1784 mm (70.3 in)
(H)	Centre-to-centre distance between studs	275 mm (10.8 in)	335 mm (13.2 in)
(I)	Centring diameter	221 mm (8.7 in)	281 mm (11.1 in)
(J)	Stud length	35 mm (1.4 in)	50 mm (2.0 in)
(K)	Stud diameter	M18 x 1.5	M22 x 1.5
(L)	Number of studs (per side)	8	10

1. 4WD models

1 6445-6455-6460-6470 capacities

1.1 Capacities

Type	Model	Displacement
Fuel tank	All	190 l (50.2 gal (US))
Cooling system	All	27 l (7.1 gal (US))
Transmission/rear axle	All	70 l (18.5 gal (US))
Zuidberg front power take-off	All	2,5 l (0.7 gal (US))
Fixed or suspended front axle	All	9 l (2.4 gal (US))
Front axle front final drive 735	All	0,8 l (0.2 gal (US))
Front axle front final drive 740	All	2 l (0.5 gal (US))
Refrigerant fluid R134A	All	1550 g (54.67 oz)
Windscreen washer bottle	All	4 l (1.1 gal (US))

IMPORTANT: *When continuously using hydraulic implements taking a large quantity of oil out of the transmission (hydraulic motors, large capacity cylinders), top up oil to the maximum level on the gauge and add 10 l (2.6 gal (US)).*
If using the tractor on steeply sloping ground, top up to the maximum level on the dipstick.

2 - Error codes

A Indicator light panel
B Error codes

B - Error codes

No.		FMI	Components concerned	Causes
E	9135	6	Solenoid valve 5	Solenoid valve 5, short circuit to EARTH (bank off)
E	9135	3	Solenoid valve 5	Solenoid valve 5, short circuit between cables (bank off)
E	9135	5	Solenoid valve 5	Solenoid valve 5, OPEN CIRCUIT
E	9135	31	Solenoid valve 5	Solenoid valve 5, fast decay error (bank off)
E	9135	11	Solenoid valve 5	Solenoid valve 5, current level error (bank off)
E	9136	6	Solenoid valve 6	Solenoid valve 6, short circuit to EARTH (bank off)
E	9136	3	Solenoid valve 6	Solenoid valve 6, short circuit between cables (bank off)
E	9136	5	Solenoid valve 6	Solenoid valve 6, OPEN CIRCUIT
E	9136	31	Solenoid valve 6	Solenoid valve 6, fast decay error (bank off)
E	9136	11	Solenoid valve 6	Solenoid valve 6, current level error (bank off)
E	9150	16	Rail pressure sensor	Rail pressure, negative deviation
E	9150	18	Rail pressure sensor	Rail pressure, positive deviation
E	9150	5	Rail pressure sensor	Rail pressure, leakage detected during idle
E	9150	8	Rail pressure sensor	Rail pressure, leakage detected through quantity balance
E	9150	31	Rail pressure sensor	Rail pressure, leakage detected during overrun
E	9151	31	Pressure regulating valve	PRV recognised as OPEN
E	9151	7	Pressure regulating valve	PRV is sticking
E	9152	31	Fuel filter pressure sensor	Fuel filter pressure, fluctuating
E	9153	31	Fuel filter pressure sensor	Fuel filter pressure sensor, loose contact
E	9170	6	Lift pump control	Lift pump control (ECU), short circuit to earth
E	9170	5	Lift pump control	Lift pump control (ECU), open circuit
E	9171	6	Preheater control	Preheater control, short circuit to earth
E	9171	5	Preheater control	Preheater control, open circuit
E	9172	6	Starter relay control	Start relay control, short circuit to earth (lower side)
E	9172	3	Starter relay control	Start relay control, short circuit to BAT+ (lower side)

No.	Error	Description	Reaction of the system
15	Error at recirculation shutter potentiometer	There is a short circuit at the earth of the potentiometer signal. The signal is below the minimum threshold.	The recirculation shutter is forced to outside air intake position.
16	Error at temperature selection potentiometer	The signal is outside its operating range. The signal is lower than the minimum threshold or higher than the maximum threshold.	The system reverts to automatic mode and selects a default temperature.
17	Error at fan selection potentiometer	The signal is outside its operating range. The signal is lower than the minimum threshold or higher than the maximum threshold.	The system automatically controls the fan speed.
18	Error at ambient temperature sensor fan	Short circuit to earth or open circuit The fan does not turn.	The water valve is controlled manually. The compressor is controlled manually.
19	Error at stepper motor of heating water valve	The motor does not operate correctly. Short circuit of one position at earth or supply, or open circuit.	The stepper motor is stopped. Fan speed is selected manually.
20	Error at recirculation shutter motor	The motor does not operate correctly. Short circuit at earth or supply, or open circuit.	The motor is stopped.
21	Error at compressor relay	The relay does not operate correctly. Short circuit at earth or supply, or open circuit.	The compressor relay is switched off.
22	Error at water pump relay	The relay does not operate correctly. Short circuit at earth or supply, or open circuit.	The water pump relay is switched off.
24	Engine speed error	The CAN network message is invalid. Error at CAN bus.	The system considers the latest value for a certain period of time. The system then uses a default value (1500 rpm).
25	Forward speed error	The CAN network message is invalid. Error at CAN bus.	The system considers the latest value for a certain period of time. The system then uses a default value.
26	Engine water temperature error	The CAN network message is invalid. Error at CAN bus.	The system considers the latest value for a certain period of time. The system then uses a default value (90 °C (194.00 °F)).
27	Fan speed regulator outlet	The signal is outside its operating range. The signal is lower than the minimum threshold or higher than the maximum threshold.	
28	Undervoltage	The electrical supply is lower than the minimum threshold	The system operates in degraded mode
29	Overvoltage	The electrical supply is higher than the maximum threshold	The system is stopped

1. The reference thresholds are as follows:

   $T_{max.} = 92\% \ V_{reference}$ (4.41 to 4.60 V)

Error codes		Components concerned	Description	Reaction of the system	Action required
CAN errors	1-1	Detected by electrohydraulic spool valves	CAN message missing	Valve returns to neutral Correct voltage received within 4 seconds = valve returns to previous position Error present after 4 seconds = valve remains in neutral	Repair fault and / or move control to neutral to reinitialise
	1-2		CAN message missing		
	1-3		CAN message incorrect		
	1-4		CAN message incorrect		
	1-5		Spool valve internal signal error (PWM)		Repair fault
	1-6		Valve EEPROM error	Valve returns to neutral	Repair fault
	1-7		No error but return to neutral necessary	Displayed when return to neutral not carried out after 1-1, 1-2, 1-3, 1-4, 2-3, 2-4, 3-1 and 3-2 errors	Move control to neutral to reinitialise
Minor errors	2-1		Undervoltage: < 8.2 V and > 8 V	Error displayed but system continues to operate	Repair fault
	2-2		Overvoltage: > 18 V and < 36 V		
	2-3		Spool movement too low		
	2-4		Spool movement too great	Spool returns to neutral	Move control to neutral to reinitialise
	2-5		Floating position not reached		
	2-6		Manual control	Valve responds to manual control, electronic control locked	Stop and restart tractor
Major errors	3-1		Undervoltage: < 8 V	Spool returns to neutral. Correct voltage received within 4 seconds = valve returns to previous position. Error present after 4 seconds = valve remains in neutral.	Stop and restart tractor
	3-2		Overvoltage: > 36 V		
	4-1		Very high overvoltage: > 45V	Valve returns to neutral. Safety solenoid valve cut off (OFF)	Stop and restart tractor
	4-2		Valve power error		
	4-3		Position sensor error		
	8-1		Valve cannot return to neutral	Safety solenoid valve cut off (OFF)	
	8-2		Valve spool not in neutral at start-up	Valve remains in neutral	

2 Identification of electrical connectors and harnesses

Identification of electrical connectors

AC1 - Armrest harness/cab linkage harness junction
AC2 - Armrest harness/cab transmission harness junction
AC3 - Electrohydraulic spool valves ON/OFF switch on armrest — signal
AC4 - Electrohydraulic spool valves ON/OFF switch on armrest — power supply
AC5 - Flow rate memory button on armrest
AC6 - Quick soil engagement switch
AC7 - Range change switch
AC8 - Not used
AC9 - Linkage height/depth setting potentiometer
AC10 - Headland switch
AC11 - Armrest lever potentiometer
AC12 - Joystick
AC13 - Lift/neutral/lower selector switch
AC14 - FingerTIPs
AC15 - Not used
AC16 - Not used
BAF1 - Pillar harness connection on fuse box
BAF2 - Instrument panel harness connection on fuse box
BAF3 - Pillar harness connection on fuse box
BAF4 - Pillar harness connection on fuse box
BAF5 - Cab interior lighting harness connection on fuse box
BAF6 - Console harness connection on fuse box
BAF7 - Instrument panel harness connection on fuse box
BAF8 - Instrument panel harness connection on fuse box
BAF9 - Instrument panel harness connection on fuse box
BAF10 - Instrument panel harness connection on fuse box
BAF11 - Console harness connection on fuse box
BAF12 - Console harness connection on fuse box
BOC1 - Bottom-of-clutch switch (BOC)
CA1 - Air conditioning control unit
CA2 - Sunlight sensor
CA3 - Automatic air conditioning harness — roof/instrument panel harness junction
CA4 - Ambient temperature sensor
CA6 - Automatic air conditioning harness/roof harness junction
CA7 - Roof earth
CA8 - Automatic air conditioning — roof harness/diagnostics connector harness CAN junction
CA9 - Air conditioning compressor relay
CA10 - Water pump relay
CAB1 - Instrument panel (DCC2)
CAB3 - Road lights switch
CAB4 - Warning switch
CAB5 - Hand rail main beam light switch
CAB6 - Buzzer
CAB9 - Buzzer
CAB10 - Right-hand brake switch
CAB11 - Left-hand brake switch
CAB12 - Clutch pedal potentiometer sensor
CAB13 - Top-of-clutch switch (TOC)
CAB14 - Instrument panel harness/BOC switch harness junction
CAB15 - DCC2 connector for Dot Matrix control keyboard
CAB16 - Dot Matrix control keyboard
CAB17 - Windscreen wiper control unit
CAB18 - Instrument panel harness/cab transmission harness junction
CAB19 - Power Control lever
CAB20 - Instrument panel harness/cab interior lighting harness junction
CAB22 - Start switch
CAB27 - Automatic air conditioning harness — instrument panel/instrument panel harness junction
CAB28 - Earth at the front of the cab

5 50 km/h (31,07 mile/h (mph)) braking

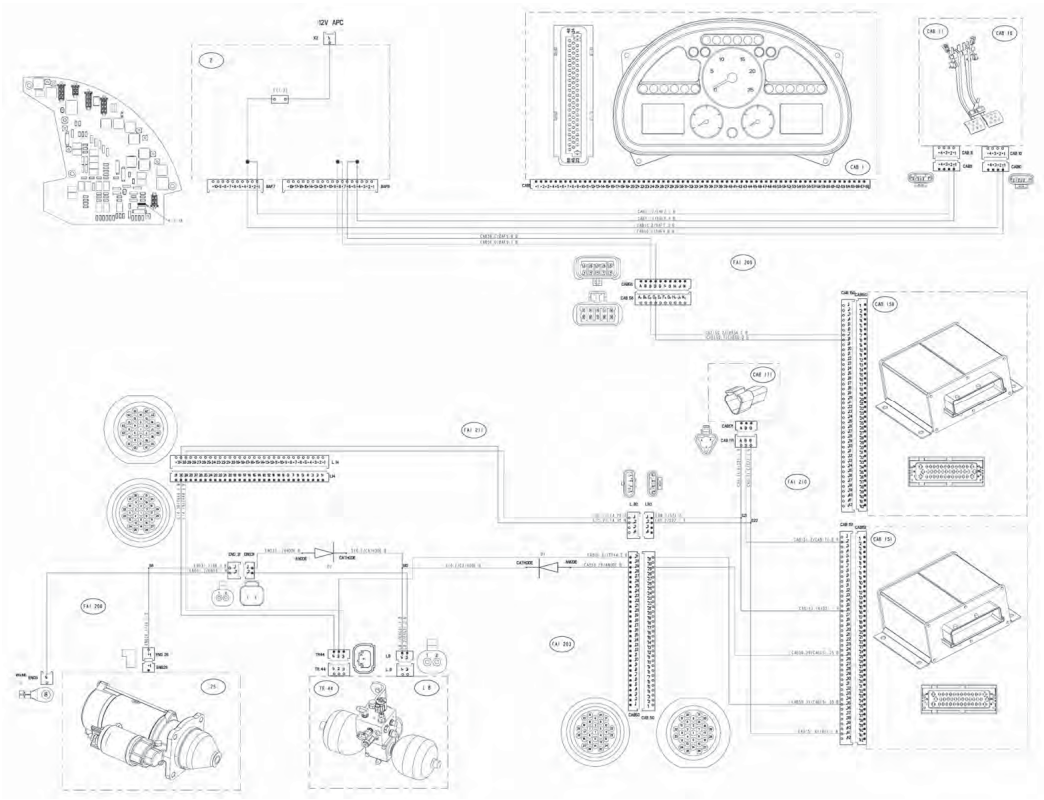
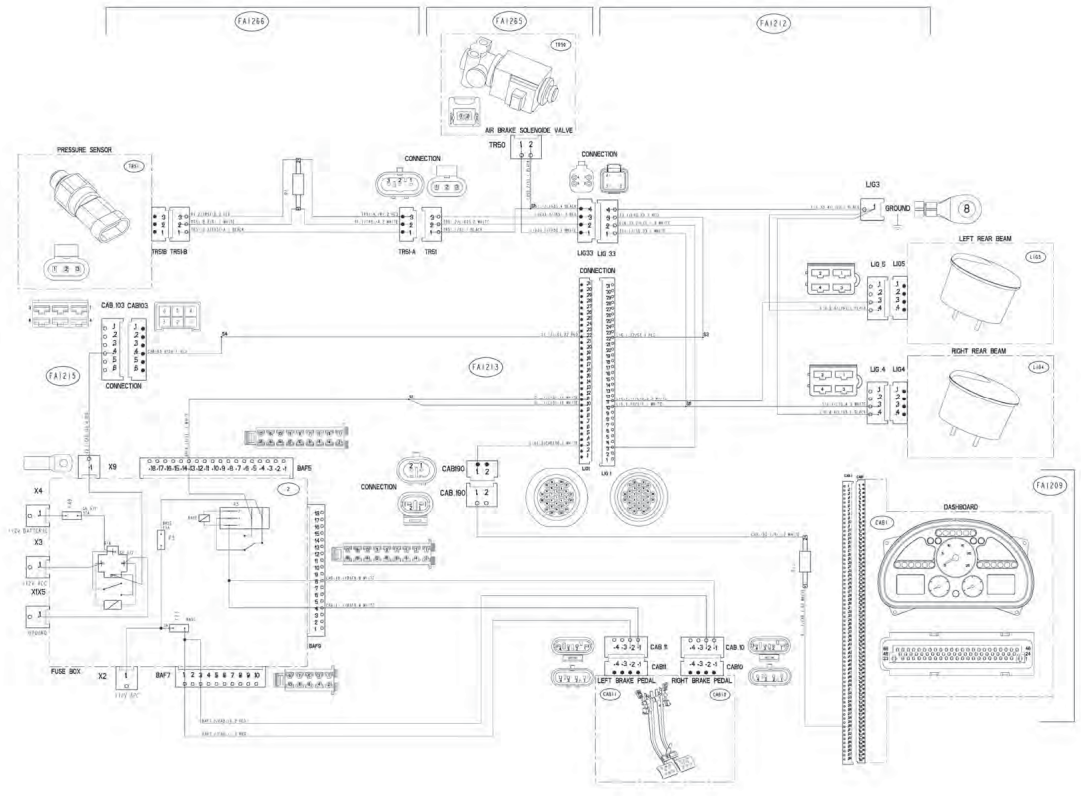


Fig. 4. I011471

15 Pneumatic brake



EFDC013A_1

Fig. 14.

1011843

25 Suspended cab

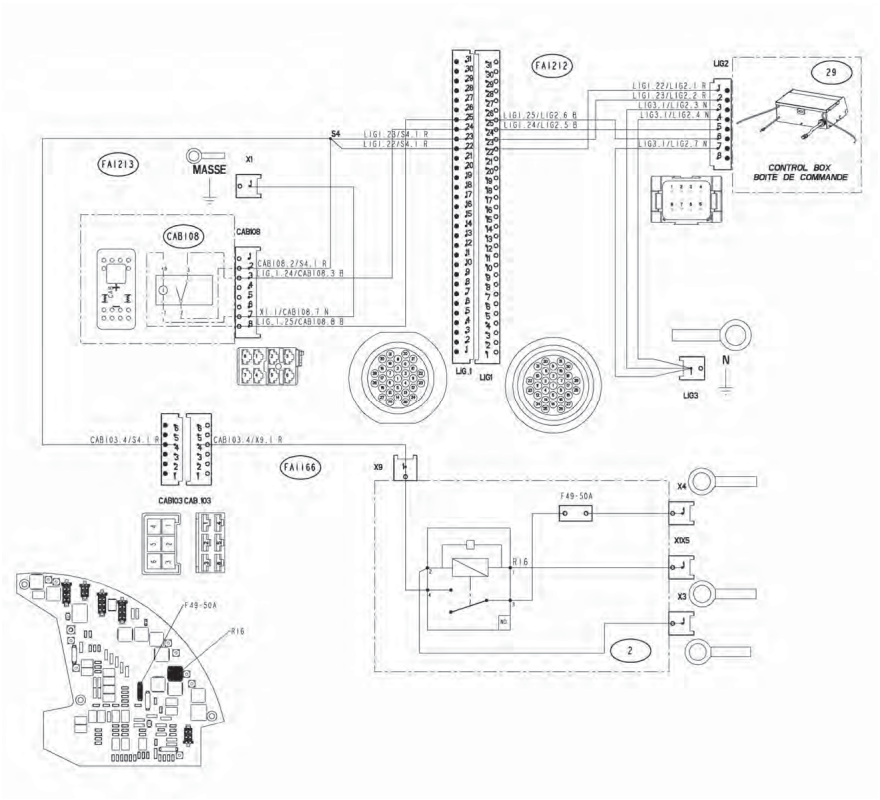


Fig. 24.

35 Datatronic 3 electrical power supply

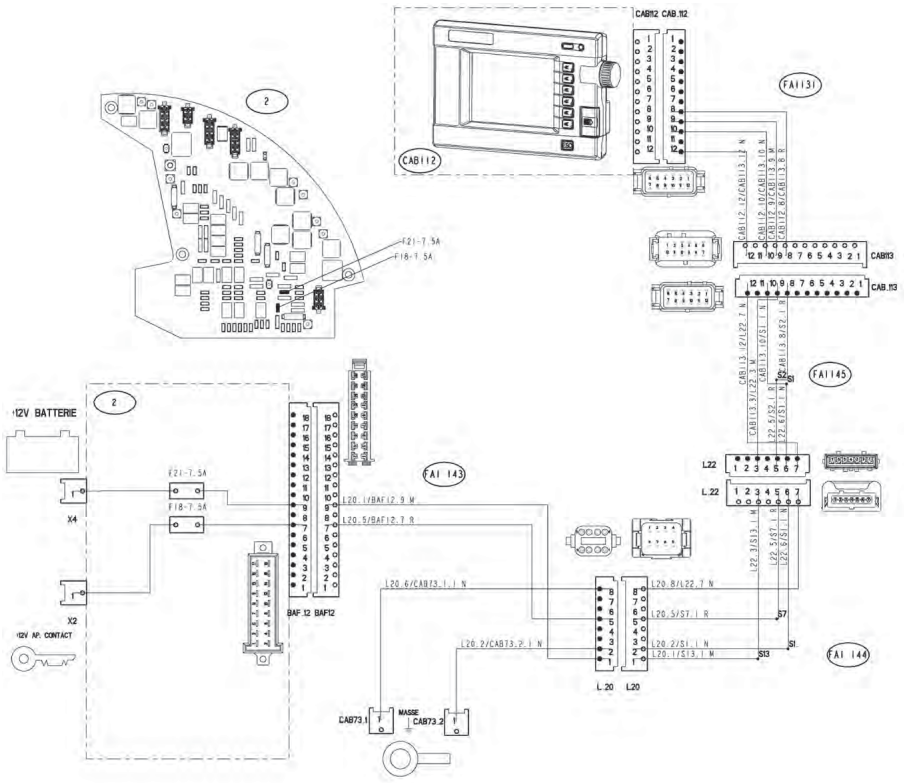


Fig. 34.

I011385

45 Diagnostics connector electrical power supply

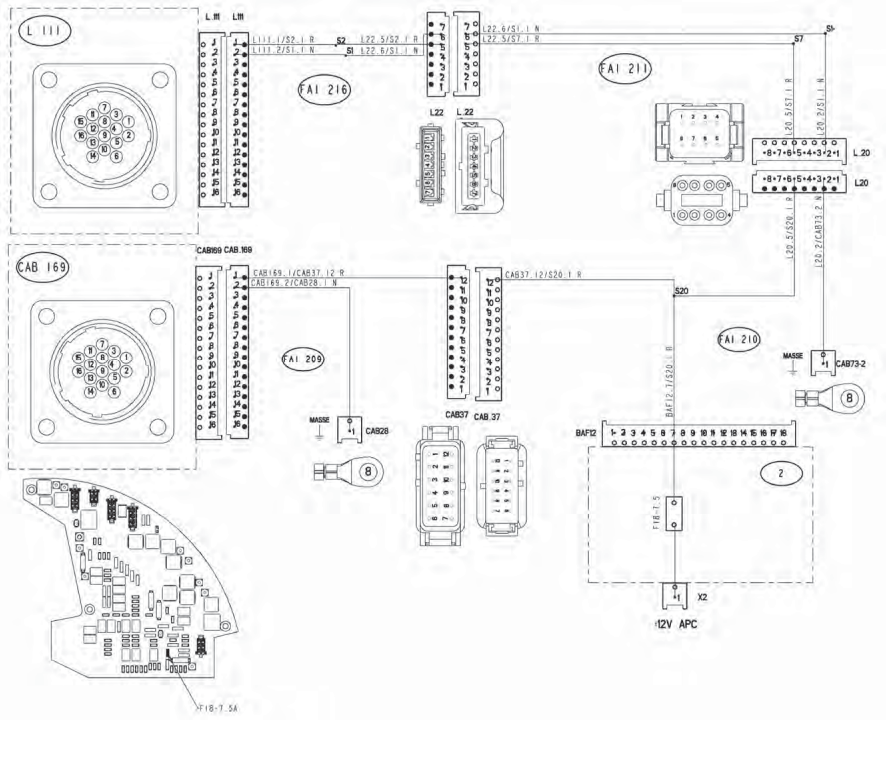
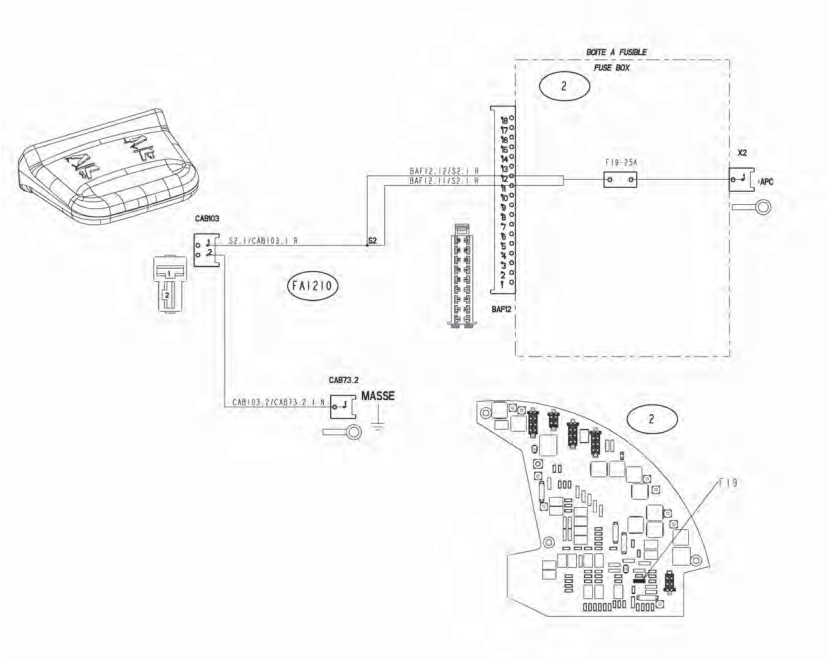


Fig. 44.

I011397

55 Pneumatic seat



EFD00133_1

Fig. 54.

I011407

65 Reversing light

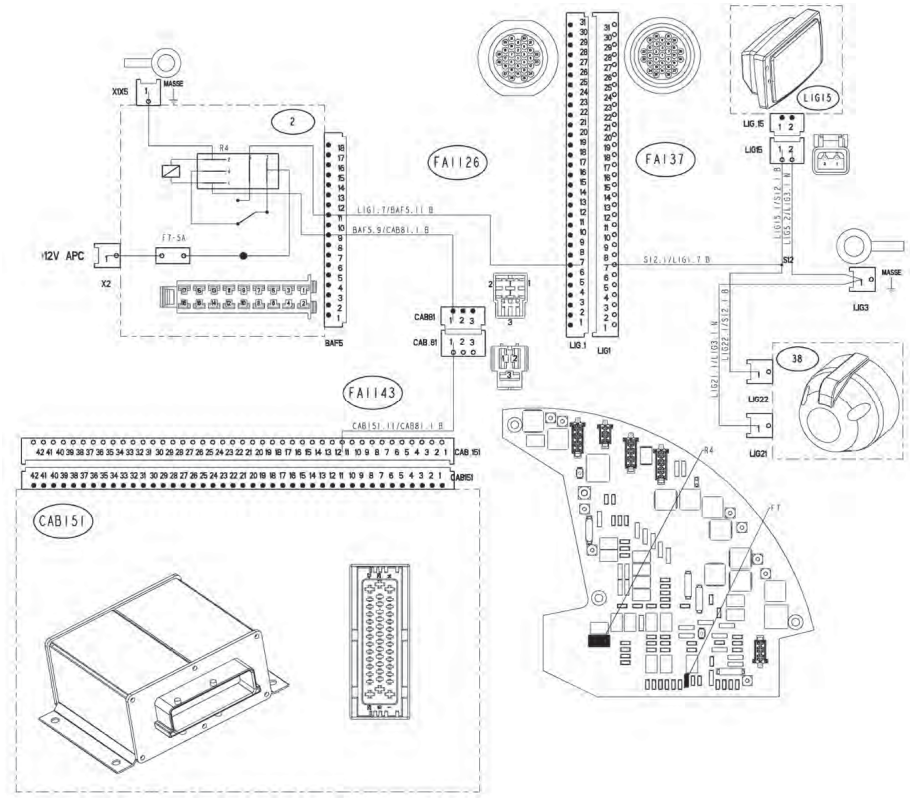
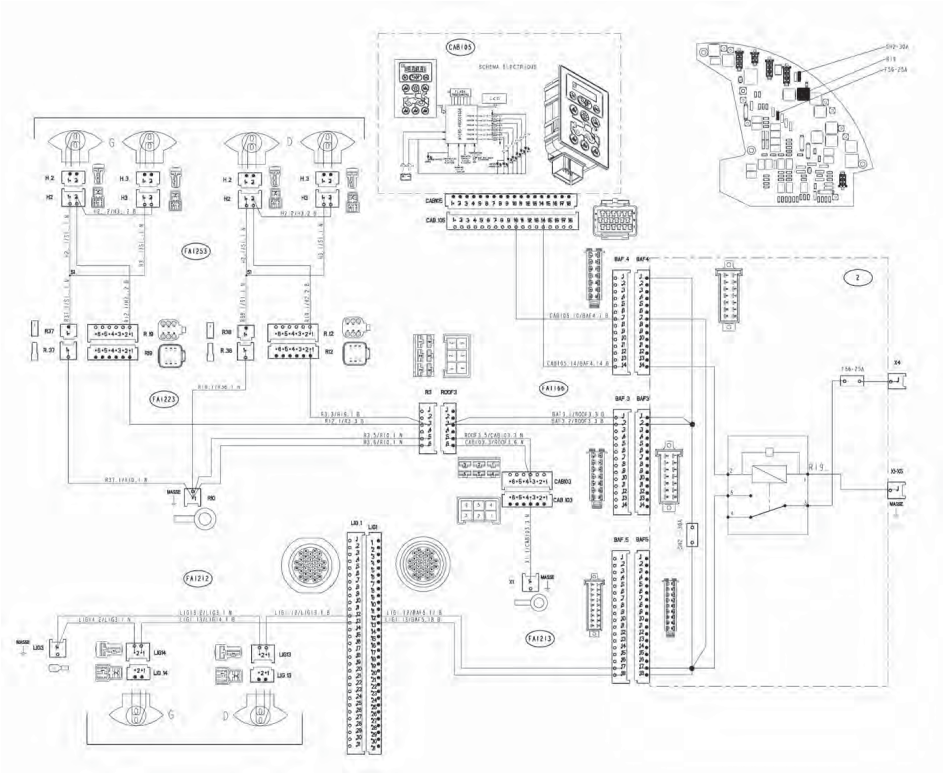


Fig. 64.

75 Standard roof work lights on fenders and hand rails — EU



EFD00141_14

Fig. 74.

I011429

85 Sisu EEM electronic unit electrical power supply

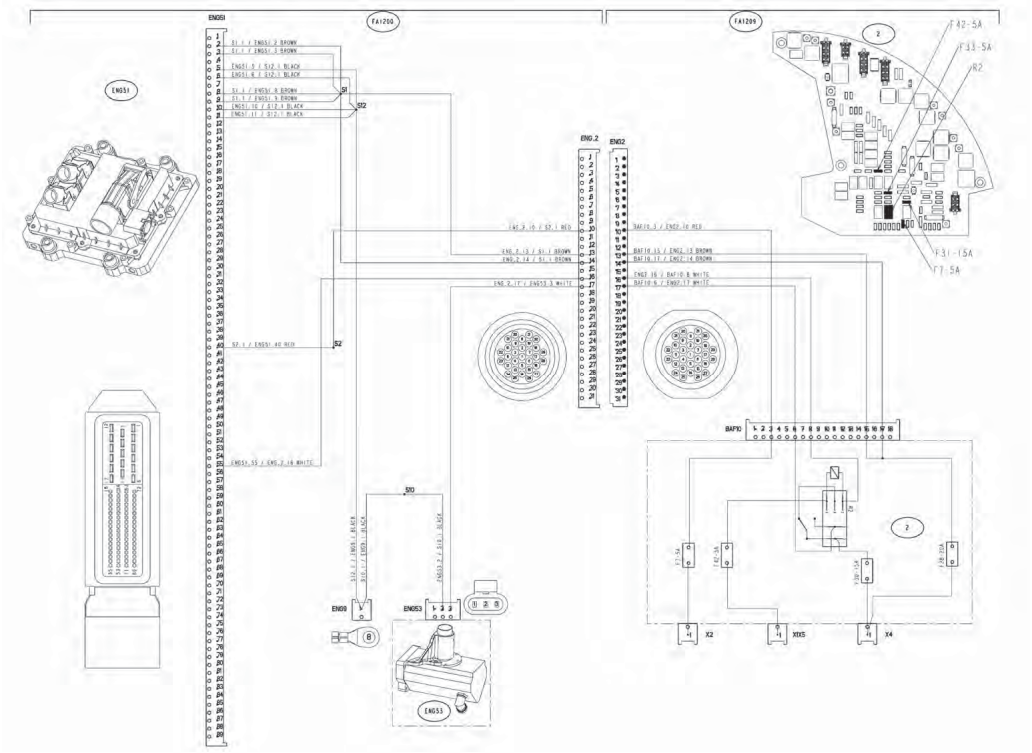


Fig. 84.

I011454

95 Rear linkage

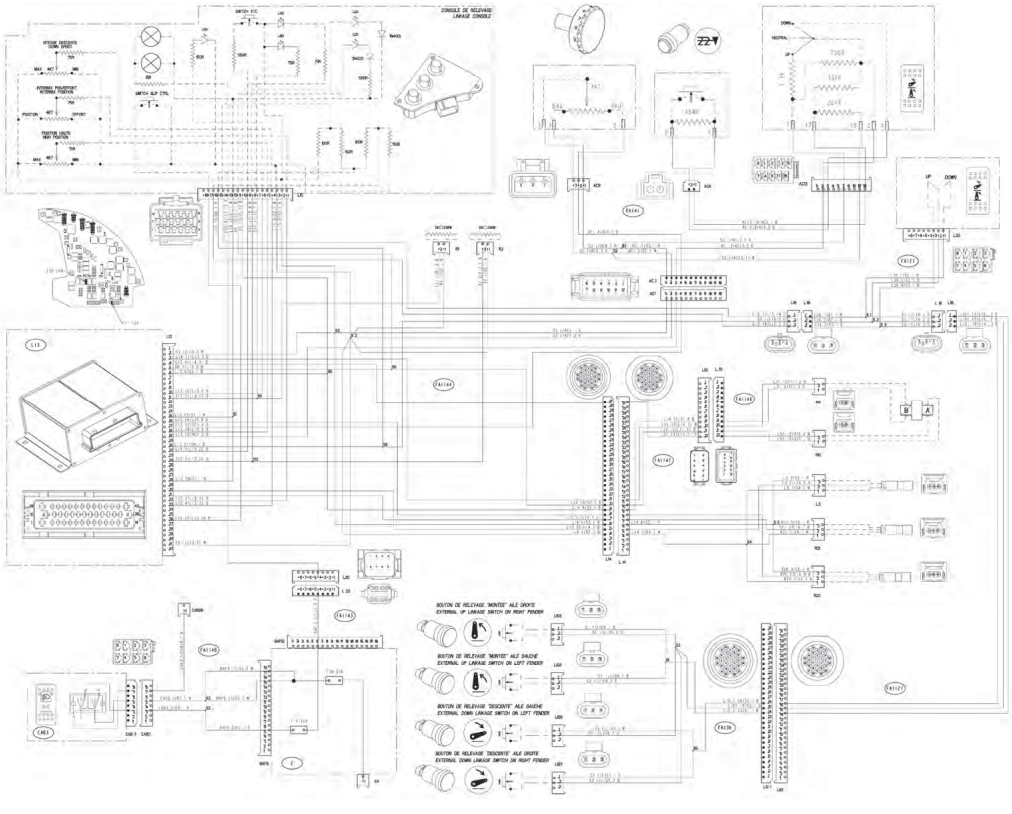


Fig. 94. I011464

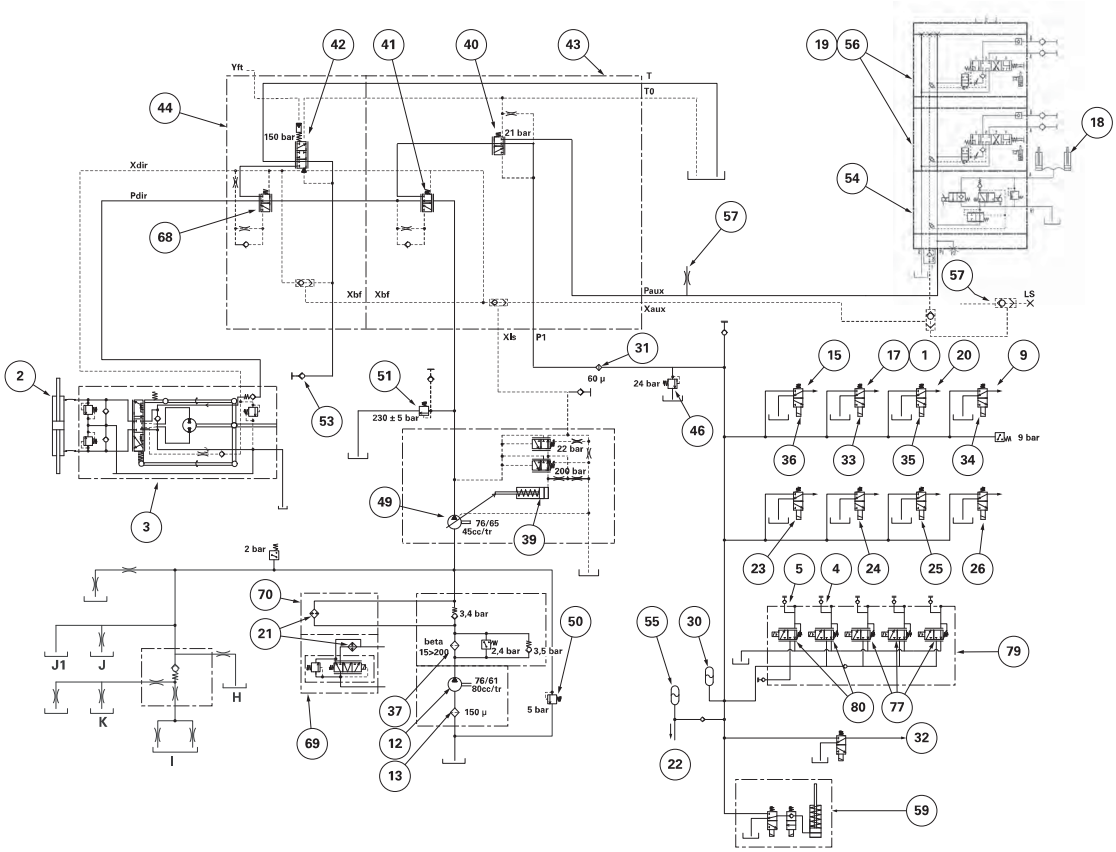


Fig. 2.

1019505

A - Calibrations

6 Calibrating the rear linkage

Adjusting the position sensor

For correct linkage calibration, ensure that the position sensor is fitted properly. Calibration is the only way to obtain precise linkage positioning.

GPA20 assembly

1. Leave a gap of approximately 20 mm (0.8 in) between the sensor body and the locknut.

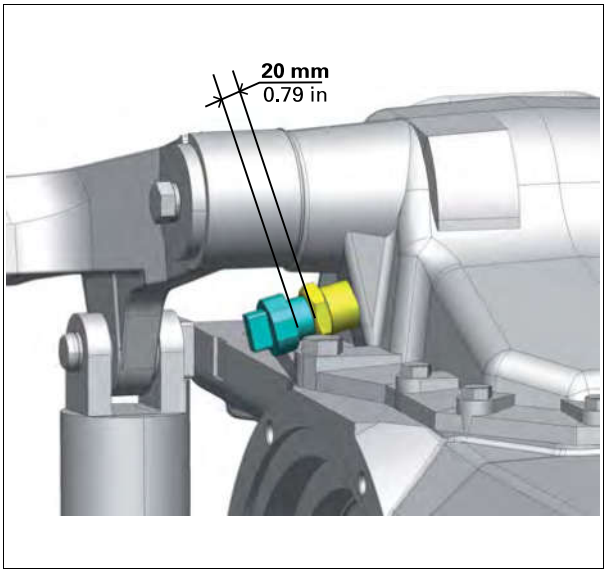


Fig. 13. I011107

2. After adjusting, the linkage must be calibrated.

Rear linkage calibration: general

The linkage must be calibrated after changing:

- a linkage solenoid valve
- the position sensor
- the linkage height/depth setting potentiometer
- the Autotronic 5 or software type (e.g. PowerShuttle to Linkage).

The purpose of this calibration is:

- to define the high and low stops of the linkage for optimum use of the linkage travel
- to measure sensor signals to obtain maximum linkage position precision according to the setting potentiometer
- to measure the solenoid valve starter currents that start to move the linkage

Calibrating the linkage

NOTE: *To exit the calibration process at any time, press the shock absorber switch or the lifting/lowering/neutral selector switch. In this case, the system uses the parameter settings stored previously or, in the event of a new Autotronic 5 unit, the default parameter settings are used.*

DANGER:
Ensure that no one can enter the linkage operating area throughout the calibration process.

NOTE: *If the calibration appears to be incorrect (impossible to change position), reset the linkage by pressing the shock absorber switch 5 times in quick succession. In this case, the controller uses the default values. A new calibration procedure must then be started.*

Preliminary steps

1. Hitch a weight of approximately 200 kg (441 lb) to the linkage.
2. Check that, with the hitch, the linkage is able to move through its entire operating range, between the upper and lower stops.
3. Position the tractor in a location where the linkage can operate freely, and ensure that no one can enter the area of linkage travel throughout the calibration process.

Procedure

4. Set the tractor engine to idle speed.