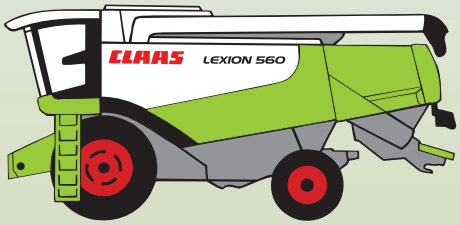
CLAAS



LEXION 600 - 510

From serial number: 589 00018
586 00918
585 00358
584 02256
583 00868

Technical Systems

Electric System

SERVICE & PARTS

Central terminal compartment

Interconnections within central terminal compartment

Centr. ter. comp. address	to	to	to	to	to	to
.40	F51 a	DS 58	DS 59	AA 7	.	.
.41	AA 6	A10 38	.	.	.	.
.42	EB 12	A16 8	.	.	.	.
.43	SL 2	DO 25	KP 3	.	.	.
.44	B 36	A25 22	.	.	.	.
.45	AA 9	A10 31	.	.	.	.
.46	B 34	DS 46	A25 8	.	.	.
.47	.	.	.	.	.	.
.48	.	.	.	.	.	.
.49	.	.	.	.	.	.
.50	.	.	.	.	.	.
.51	EC 1	DS 48	A8 8	.	.	.
.52	F69 a	O 3	.	.	.	.
.53	BB 32	A12 7	.	.	.	.
.54	MB 6	A10 8	.	.	.	.
.55	BB 17	A12 8	.	.	.	.
.56	BB 18	A12 19	.	.	.	.
.57	BB 19	A28 11	DS 47	.	.	.
.58	F03 a	MU 1	B 9	.	.	.
.59	EC 5	A16 10	.	.	.	.
.60	A16 17	EC 4	.	.	.	.
.61	F04 a	A10 14	A12 15	.	.	.
.62	MB 9	A12 11	.	.	.	.
.63	M 12	A10 37	.	.	.	.
.64	MB 8	A10 21	.	.	.	.
.65	MO4	A10 36	.	.	.	.
.66	MO5	A10 35	.	.	.	.
.67	BB 4	A12 5	.	.	.	.
.68	BB 5	A12 6	.	.	.	.
.69	BB 6	A12 18	.	.	.	.

Connecting cable (module PCB – base PCB)

Module PCB		Cable via		Base PCB				Address
From pin		X1b pin	X1a pin	to pin				X
A16/17		1	1	EC 6				60
A10/28	A12/2	2	2	A33 6L	A34 6L	AA 5	B 11	31
A28/2				C 8	D 1	D 4	D 7	
				DA 7	DA 9	DA 11	DI 22	
				DO 30	DS 60	DS 61	EA 8	
				EA 10	EA 11	EC 12	H 1	
				K11 85	K12 30	K12 85	K20 85	
				K23 85	K31 85	K31 87a	K32 85	
				K32 87a	K37 87a	K38 87a	K45 85	
				K46 85	K47 4	K48 31	K51 85	
				K52 85	K55 85	K56 85	K61 85	
				K63 30	K63 85	MA 3	MH 4	
				MH 7	MI 3	MM 6	MM 5	
				MM 7	MM 8	MN 5	MN 8	
				MP 4	MQ 8	MR 8	P 11	
				R 3	SL 11	T 6	T 7	
				TEST A	U 2	MU 6	MU 7	
				MV 2	MW 2	O 6	U 4	
				V 8	V 11	X 5	X 6	
				X 11	Y 8	Y 11	Y 15	
				Y 17	Y 14	Z 5		
A28/12		3	3	MN 12	DS 26			194
A10/34		4	4	CB 1	G 1	DI 20		137
A12/11		5	5	MB 2				62
A28/13		6	6	MN 9	DS 27			195
A16/10		7	7	EC 5				59
A16/5		8	8	EB 15				209
A16/13		9	9	Q 11	DS 24			301
A12/14		10	10	Q 6				167
A16/8		11	11	EB 5				42
A16/25		12	12	Q 12	DS 25			302
A12/12		13	13	V 5	DO 15			163
A16/21		14	14	EB 12				210
A12/1		15	15	Q 9	DO 17			166
A12/13		16	16	V 2	DO 16			162
A16/22		17	17	Q 5				306
A10/29		18	18	V 12				158
A8/12		19	19	V 3	K5 87	DO 8	DS 5	160
A8/13		20	20	V 6	K6 87	DS 6		161
A10/15		21	21	V 9	DO 13			159

Module A12 – Speed monitor (DZW)

Pin	Function	Component	Measuring variable	Direction	Circuit diagram no.
1	Front attachment speed +	Y90	12 V	Output	18
2	Earth (GND)	-31	Earth	Input	6
3	CAN high	-	-	-	6
4	Chopper circuit signal (chopper operating hours)	Z58	12 V	Input	19
5	Feed rake conveyor speed signal	B12	0.4 V - 4.6 V	Input	17, 18, 25
6	Grain elevator speed signal	B21	0.4 V - 4.6 V	Input	25
7	Rotor / finger roller speed signal	B24/B74	0.4 V - 4.6 V	Input	25
8	Uni-spreader speed signal	B27	0.4 V - 4.6 V	Input	25
9	---	---	---	---	---
10	---	---	---	---	---
11	Concave position signal	B30	0.25 - 4.75 V	Input	8
12	Concave clearance +	Y18	12 V	Output	8
13	Concave clearance -	Y17	12 V	Output	8
14	Front attachment speed -	Y89	12 V	Output	18
15	Electronic unit	F4	12 V / 3 A	Input	6
16	CAN low	-	-	-	6
17	---	---	---	---	---
18	Returns speed signal	B29	0.4 V - 4.6 V	Input	25
19	Chopper speed / uni-spreader speed signal	B28	0.4 V - 4.6 V	Input	25
20	Power	F16	12 V / 15 A	Input	8, 17, 18
21	---	---	---	---	---
22	---	---	---	---	---
23	---	---	---	---	---
24	---	---	---	---	---
25	Reverse front attachment	S57	12 V	Output	17

Module A33 – Sidefinder

Pin	Function	Component	Measuring variable	Direction	Circuit diagram no.
2 L	Sidefinder, left-hand	E71	12 V	Output	48
4 L	Power supply	F61	12 V	Input	36
5 L	Dipped lights	K55	12 V	Output	48
6 L	Earth	-31	Earth	Input	48
8 L	Sidefinder, right-hand	E72	12 V	Output	48
2 R	Turn flasher, left-hand	S16	12 V	Input	36
4 R	Turn flasher, right-hand	S16	12 V	Input	36
5 R	Ignition	+15	12 V	Input	48
6 R	Lights main switch	S17	12 V	Input	48
8 R	Ignition / road travel	F15	12 V	Input	48

Module A79 – Rear driving axle module (RAD)

Pin	Function	Component	Measuring variable	Direction	Circuit diagram no.
1	Sensor earth	B117, B203, B204,	0V (200mA)	Output	32
2	---	---	---	---	---
3	---	---	---	---	---
4	Sense of rotation of left rear driving axle motor	B203	High – Low (+)	Input	32
5	Sense of rotation of right rear driving axle motor	B204	High – Low (+)	Input	32
6	---	---	---	---	---
7	---	---	---	---	---
8	---	---	---	---	---
9	---	---	---	---	---
10	---	---	---	---	---
11	---	---	---	---	---
12	---	---	---	---	---
13	RS232 GND (Diagnosis RAD)	XDL	---	---	32
14	Sensors reference voltage	B203, B204, XDL	5V	Output	32
15	Earth supply	-31	Earth	Input	6, 32
16	---	---	---	---	---
17	---	---	---	---	---
18	Left rear driving axle motor speed	B203	High – Low (+)	Input	32
19	Right rear driving axle motor speed	B204	High – Low (+)	Input	32
20	RS232 TxD (Diagnosis RAD)	XDL	---	---	32
21	RS232 RxD (Diagnosis RAD)	XDL	---	---	32
22	---	---	---	---	---
23	Reference - PWM	Y281	~ 0V	Input	32
24	---	---	---	---	---
25	Reference - PWM	Y282	~ 0V	Input	32
26	Left rear driving axle motor adjustment	Y281	12V (PWM)	Output	32
27	Right rear driving axle motor adjustment	Y282	12V (PWM)	Output	32
28	Supply voltage	F20	12V/10A	Input	6, 32
29	Earth supply	-31	Earth	Input	6,32
30	---	---	---	---	---
31	---	---	---	---	---
32	Steering angle	B117	0.25 -4.75 V	Input	32
33	---	---	---	---	---
34	---	---	---	---	---
35	---	---	---	---	---
36	---	---	---	---	---
37	CAN high (J1939)	---	---	---	6
38	CAN low (J1939)	---	---	---	6
39	CAN GND (J1939)	---	---	---	6
40	---	---	---	---	---
41	---	---	---	---	---
42	Supply voltage	F20	12V/10A	Input	6, 32

02b

Starting the diesel engine, diesel engine electric starting motor

CATERPILLAR -
C12, 3126B

Description of function:

Starting

The safety start switch circuit of this engine is identical with the one used on the mechanically controlled engines.
The engine controller module (A15) is activated via relay K51 by the ignition lock (S64). During the starting procedure, the engine controller module (A15) receives the speed signal from the sensor provided on the camshaft and starts the injection.

Engine monitoring

All sensors relevant for operation and monitoring of the engine are mounted on the engine wiring loom. Only the water level sensor is connected to the CLAAS wiring loom.
The engine controller module (A15) transmits the signals for displaying the engine speed, coolant level and the coolant temperature to the CAB module (A10) via the CAN bus J1939. The CAN module (A10) converts this signal to the CLAAS CAN bus, thus allowing display on the terminal.

Engine diagnosis

The number of engine errors occurred and the corresponding error codes can be displayed in the terminal.
The error display using the LED flashing code (D1) is not active on DaimlerChrysler engines. The diesel engine diagnosis switch (XSW) in the central terminal compartment has no function.

Diesel engine speed adjustment

The diesel engine speed depends on the position of switch S35. Three positions are possible, i.e. idle speed, half throttle and full throttle.
When third gear is engaged (LEXION 580 – 510), transmission switch Z95 cuts the power supply to the CAB module (A10) and the diesel engine speed is reduced – road travel.
When second gear is engaged (LEXION 600), transmission switch Z83 cuts the power supply to the CAB module (A10) and the diesel engine speed is reduced – road travel (see also diagram 44).
The maximum speed which can be achieved now is country-specific and can be configured using the Claas diagnosis system CDS.

LEXION type	Idle speed (S35)	Half throttle (S35)*	Full throttle with no load (S35)	Road travel 20 km/h	Road travel 25km/h
510-530	1200 rpm	1500 rpm	2100 rpm	1522 rpm	1903 rpm
540-570	1200 rpm	1500 rpm	2100 rpm	1568 rpm	1960 rpm
580	1200 rpm	1500 rpm	2080 rpm	1781 rpm	2080 rpm
600	1110 rpm	1500 rpm	2080 rpm	automotive up to 30 km/h	

*- Indicated speed valid only for „Front attachment OFF“.
In case of “Front attachment ON”, the idle speed rpm value is used.

Note: The speeds specified above apply to wheel-equipped machines.
Other speeds apply to MTS- or steel track-equipped machines.

Error code lilst J 1939: 6/8

SPN	FMI	Description
655		**Injector Cylinder #5**
	3	Solenoid coil, open circuit or shorted to battery +
	4	Solenoid coil, shorted to ground
	5	Solenoid coil low current
	6	Solenoid coil high current
	7	No feedback
	11	Cylinder injector #5 mechanical failure
	12	Smooth engine running control system limited
	14	Individual cylinder shut-down limited
656		**Injector Cylinder #6**
	3	Solenoid coil, open circuit or shorted to battery +
	4	Solenoid coil, shorted to ground
	5	Solenoid coil low current
	6	Solenoid coil high current
	7	No feedback
	11	Cylinder injector #6 mechanical failure
	12	Smooth engine running control system limited
	14	Individual cylinder shut-down limited
657		**Injector Cylinder #7**
	3	Solenoid coil, open circuit or shorted to battery +
	4	Solenoid coil, shorted to ground
	5	Solenoid coil low current
	6	Solenoid coil high current
	7	No feedback
	11	Cylinder injector #7 mechanical failure
	12	Smooth engine running control system limited
	14	Individual cylinder shut-down limited
658		**Injector Cylinder #8**
	3	Solenoid coil, open circuit or shorted to battery +
	4	Solenoid coil, shorted to ground
	5	Solenoid coil low current
	6	Solenoid coil high current
	7	No feedback
	11	Cylinder injector #8 mechanical failure
	12	Smooth engine running control system limited
	14	Individual cylinder shut-down limited
676		**Common rail pump**
	5	Solenoid coil low current
	6	Solenoid coil high current

Description of function:

Road travel switch (S52)

- locked

During road travel, the safety rocker switch (S52) must be locked in order to cut the power supply for all unnecessary electrical and hydraulic functions.

- unlocked

All necessary electric and hydraulic functions are supplied with power.

In addition, a signal is fed into the fieldwork computer module (A10 – pin 6) after the road travel circuit has been unlocked.
After the signal has been fed in, all necessary power outputs in the fieldwork computer module (A10) are enabled, e.g. for the function threshing mechanism ON, front attachment ON, etc.).
The diesel engine speed adjustment function is an exception to this. These power outputs are active when the road travel circuit is either active or inactive.

Road travel mode (EFA)

Locking the road travel switch (S52) sets the electro-hydraulic ground drive (EFA) to the road travel mode.
In this mode, the ground drive controls itself automotively – i.e. the diesel engine speed is controlled according to the ground speed control lever set point and the operating pressure while driving.

Master valve

In order to be able to build up the necessary working pressure for many hydraulic controls, the neutral hydraulic circulation must be blocked (see also the "Hydraulic system" section). In this case, solenoid coil (Y77) is actuated directly via the diode PCB (DO) in parallel with the function
A LED (D5) provided on the diode PCB indicates the activation of the circuit.

- Relay K70

During the front attachment / machine coupling process, relay K70 prevents actuation of the master valve Y77 for 15 seconds.

Front attachment / machine coupling process:
When supplying relay K70 with voltage at pin 2 and applying a voltage to pin 8 only later (front attachment identification), the internal connection from pin 5 to pin 6 in relay K70 is cut – see circuit diagram 22.

The front attachment is coupled:
When a voltage is applied to pin 2 and pin 8 of relay K70 at the same time, the relay will not interrupt the master valve circuit (Y77) – see circuit diagram 22.

06a

CAN bus, module power supply

for diesel engines
CATERPILLAR - C13, C12, C10, C9, 3126B

Key to diagram: Coordinates

A1	AGROCOM Terminal	2-i-17
A8	AUTOCONTOUR module (CAC)	2-i-20
A9	AUTOPILOT module	2-i-20
A10	Fieldwork computer module (BIF/CAB))	2-i-20
A12	Speed monitor module (DZW)	2-i-20
A13	Performance monitor module (DKG)	4-p-20
A15	Electronic engine control module	3-p-18
A16	Reel controller module (HAS)	2-i-20
A21	YIELD METER module (LEM)	2-i-20
A25	Sieve adjustment module	2-i-20
A27	VARIO module	8-f-20
A30	Terminal	3-g-17
A37	LEXION electro-hydraulic gearshift module (EHS)	2-i-20
A38	Rotor module (RIO)	4-n-20
A39	Cruise pilot module	2-i-20
A46	Deflector adjustment module (RIO)	5-t-16
A64	Teleservice module	3-g-17
A65	GPS pilot terminal	3-g-17
A66	GPS pilot module (GPB)	3-g-17
A83	4-Trac enable module	2-i-20
B50 L	AUTOPILOT left laser sensor	6-e-25
B50 R	AUTOPILOT right laser sensor	6-e-11
DS	Diagnosis plug (63-pin) VIA	3-i-20
XM	Caterpillar Diagnosis connector	4-i-20
K14	Threshing mechanism relay	4-i-20
K49	Road travel main relay	4-i-20
K52	Power supply relay	4-i-20
K51	Power supply relay	4-i-20
K56	Electronic unit plus relay	4-i-20
R14	CAN bus terminal resistor	3-q-18
X27	Radial spreader connector	5-r-16
XFL	External CAN bus connection (e.g. flagging box, Agrocom terminal, etc.)	3-h-17
XGSM	External CAN bus connection Bus (e.g. GSM modem)	3-h-17
XSL	4-Trac connector (ground speed-dependent)	3-h-17
XQ	Performance monitor connector	5-p-20
XA	Multifunction coupling A connector	7-f-20
XB	Multifunction coupling B connector	7-f-20
XC	Multifunction coupling C connector	7-f-20
XD	CAN bus terminal connector (7-pin)	3-g-17
XD-2	CAN bus connector (8-pin)	4-i-17
XV3	AUTOPILOT variant plug connector	7-f-20

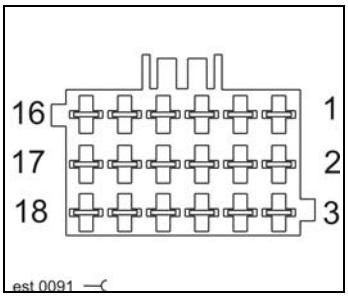
a - for versions with deflector adjustment
b - for versions with radial spreader
c - ground speed-independent MUD-HOG 4-Trac circuit

Measured value table:

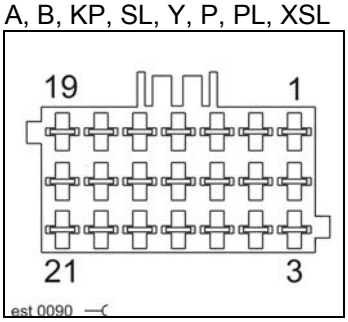
Item	Component	Measured value	Remark
R14	Resistor	121 Ω	

Connector pin definition:

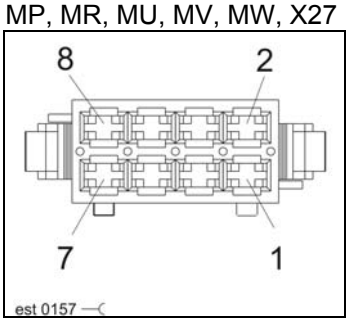
Socket AA



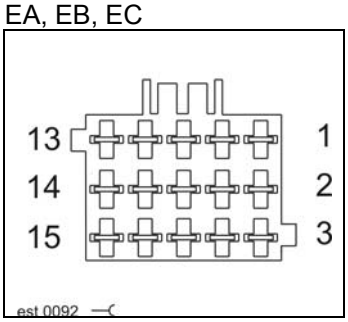
Socket
A, B, KP, SL, Y, P, PL, XSL



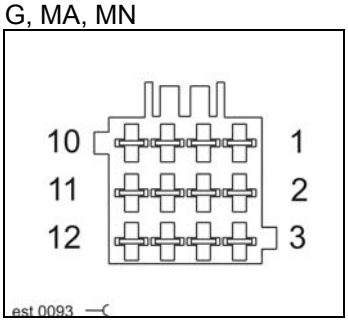
Socket
MP, MR, MU, MV, MW, X27



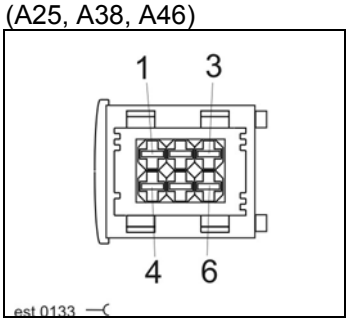
Socket
EA, EB, EC



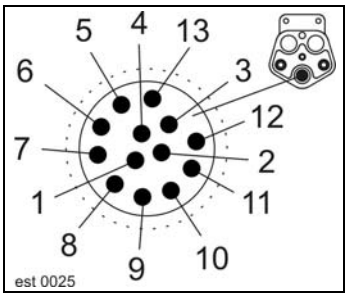
Socket
G, MA, MN



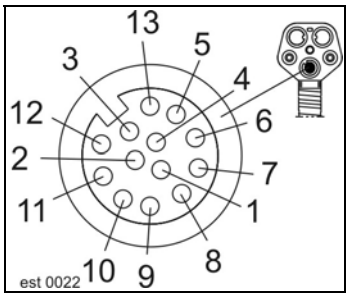
Socket R1
(A25, A38, A46)



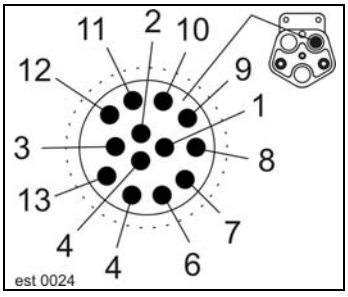
Connector XA



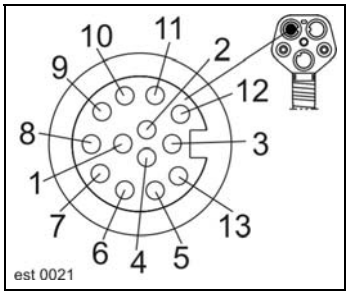
Socket XA



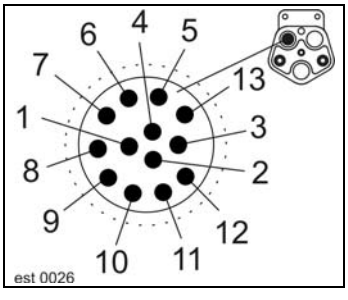
Connector XB



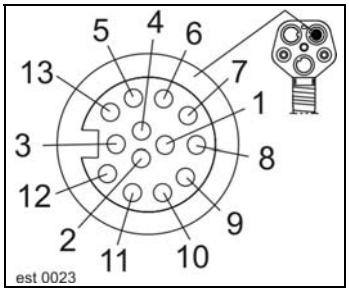
Socket XB



Connector XC



Socket XC



Description of function: 1/2

Threshing drum variable-speed drive	When the threshing mechanism is engaged, a CAN bus signal is transmitted to the fieldwork computer module A10 by the +/- pushbuttons (T19/T26) provided that the function pre-selection rotary switch (T11) is set to the threshing drum position. The fieldwork computer module A10 controls the corresponding solenoid coils (Y19/Y20). The master valve (Y77) is also actuated via the diode PCB (DO) in parallel with the threshing drum fast solenoid coil (Y20) because this function requires that pressure is built up in the system. The fieldwork computer module (A10) ensures the actuation of the solenoid coils (Y19/Y20) and the control of the master valve (Y77) even during the automatic crop selection. The fieldwork computer module (A10) reads in the threshing drum speed actual value via sensor B11 (threshing drum speed) during automatic crop selection.
Threshing drum speed signal display	The fieldwork computer module (A10) reads in a signal from sensor B11 (threshing drum speed). The fieldwork computer module (A10) converts this signal and displays it on terminal A30 via the CAN bus.
Concave adjustment	A CAN bus signal is transmitted to the speed monitor module (DZW) A12 by the +/- pushbuttons (T19/T26) provided that the function pre-selection rotary switch (T11) is set to the concave position. The speed monitor module A12 controls the corresponding solenoid coils (Y17/Y18). The circulation shut-off valve (Y77) is actuated via the diode PCB (DO) in parallel with one of the two solenoid coils (Y17/Y18) because these functions require that pressure is built up in the system. The speed monitor module (A12) ensures the actuation of the solenoid coils (Y17/Y18) and the control of the circulation shut-off valve (Y77) during the automatic crop selection. The speed monitor module (A12) reads in the concave adjustment actual value via the concave position sensor B30 during automatic crop selection.

10a

Fan variable-speed drive

Description of function:

Adjustment motor circuit	To adjust the deflector, the road travel activation switch (S52) and the threshing mechanism clutch switch (S25) must be actuated. According to the setting of the set value potentiometer (R29) in the cab, the deflector adjustment module (A46) controls the positioning motor (M22) until the set value matches that of the integrated actual value potentiometer (R28).

Description of function:

Deflector drive / radial spreader circuit

When the radial spreader is in chopping position, the actual value switch (Z58) is closed (see circuit diagram 19b).
With the threshing mechanism and straw chopper engaged (K14/87), module A51 activates the radial spreader deflector drive ON/OFF solenoid coil Y179 (see circuit diagram 7a and 19b).

The radial spreader starts spreading under program control by alternatingly activating the solenoid coils Y175, Y176, Y177 and Y178.

Here the radial spreader module (A51) detects the position of the deflectors via the sensors B129.
The spreading width and the spreading direction is adjusted according to the set value of the potentiometer in the operating panel (R27/R29).
The programmed parameters in module A51 are modified according to these set values via the CAN bus.

When swathing, the deflectors can be positioned so that the straw and chaff output from the cleaning stage will not be thrown into the swath, using the spreading width potentiometer (R27).

Note: Ensure that the connectors of the solenoid coils at the deflector control unit are not confused (differing current consumption – see measured value table).

Diagnosis

When a fault is detected, an error message is transmitted via the CAN bus.
When the CAN bus is interrupted, the radial spreader makes a factory-programmed move corresponding to a spreading width of approx. 7.5 m.

Description of function:

Grain tank unloading	The grain tank unloading function is controlled by the grain tank module A34. With the road travel circuit (S52) unlocked, the grain tank module (RIO) A34 is supplied with power. Further pre-conditions required for the grain tank unloading function include a closed seat contact (Z5) and a closed grain tank unloading tube swung out switch (Z30). When the grain tank unloading switch S31 transmits a signal to the grain tank module A34, the module energises the grain tank unloading solenoid coil (Y35). When the grain tank unloading switch S31 repeatedly transmits a signal to the grain tank module A34, the module de-energises the grain tank unloading solenoid coil (Y35).
Seat contact circuit	After leaving the operator's seat, all circuits depending on the seat contact (Z5) are interrupted after approx. 5 seconds.
Grain tank unloading aid	When grain tank unloading is active, the grain tank module A34 supplies the grain tank unloading aid switch (S32) and consequently relay K71 with power at pin 86. When relay K71 is energized, solenoid coil (Y36) is actuated via the connection from pin 30 to 87a in the unenergized relay K69. When the hydraulic cylinder reaches its end position, the oil pressure switch (Z25) will close for a short time. Relay K72 switches and the connection from pin 30 to 87 now actuates the solenoid coil (Y37). Diode (D4) now keeps relay K72 actuated until the hydraulic cylinder reaches the other end position and the oil pressure switch (Z26) cuts the electric circuit at pin 86. The master valve (Y77) is actuated via the diode PCB (Do) in parallel with one of the two solenoid coils (Y36/Y37) because these functions require that pressure is built up in the system.

17a

Front attachment drive, reverser drive, front attachment quick stop

19a

Straw chopper

Standard chopper

20a

Front attachment raise/lower, cross levelling

Connection	C.t.c. position	mm²	Colour
EA – 1	202	0.75	gn-bl
EA – 3	201	0.75	gn-rd
EA – 4	199	0.75	gn-gr
EA – 7	200	0.75	gn-wh
EA – 10	31	1.5	br
EA – 11	31	1.5	br
M – 1	74	0.5	rd-wh
M – 7	75	0.5	ye-or
M – 10	77	0.5	vi-bl
MA – 3	31	1.5	br
MA – 5	76	0.5	pi-br
X8 – 7	---	0.5	rd-bk
X8 – 8	---	0.5	rd-wh
X8 – 11	---	0.5	gr-rd
X8 – 13	---	0.5	gr-wh
X8 – 25	---	1.5	br
XA – 1		1.5	br
XA – 2		1.5	br
XA – 7		1.5	gn-gr
XA – 8		1.5	gn-wh
XA – 9		1.5	gn-rd
XA – 10		1.5	gn-bl

Description of function:

Folding the maize picker / Snapping plate adjustment

When the road travel circuit is unlocked, relays K3, K4 and the fold maize picker switch (S34) are supplied with power by relay K49. The pushbuttons (37c/37d) actuate one of the two solenoid coils (Y46/Y47) via the corresponding relay K3 or K4 for snapping plate adjustment whereas switch (S34) directly controls the solenoid coils (Y42/Y43) in order to fold the picker.

The master valve (Y77) is actuated via the diode PCB (DO) in parallel with one of the solenoid coils (Y42/Y43/Y46/Y47) because this function requires that pressure is built up in the system.

The reel controller module (HAS) (A16) converts the analogue signal from sensor (B55) into a digital signal which is displayed on terminal (A30) via the CAN bus. Sensor (B55) receives the necessary 12 V reference voltage from the actuated road travel main relay K49/87.

Down maize auger drive

The down maize augers are driven hydraulically by the reel drive variable displacement pump. The reel controller module (A16) controls the speed – circuit diagram 22a
The speed adjustment is by means of the +/- keys on the terminal (A30). Since there is no speed sensor for speed monitoring/control, the automatic reel speed control in the terminal (A30) must be switched off.

22a

Reel variable-speed drive

Connection	C.t.c. position	mm²	Colour
A27-13	---	1.0	gn-br
A27-14	---	1.0	gn-bk
A27-17	---	1.0	ye-bl
A220-20	---	1.0	bl
EA – 10	31	1.5	br
EA – 11	31	1.5	br
EA – 13	150	1.5	gn-bk
EA – 14	153	1.5	gn-wh
EB – 1	208	1.5	bk-vi
EB – 2	205	1.5	gn-br
EB – 3	207	1.5	gn-br
EB – 4	206	1.5	gn-bk
U - 8	153	1.5	gn-wh
U - 10	152	1.5	gn-bk
U - 11	96	1.5	bk-vi
U15-1	---	0.75	bl
U15-2	---	1.0	gn-br
U16-1	---	0.75	bl
U16-2	---	1.0	gn-bk
U17-1	---	1.0	ye-bl
U17-2	---	1.0	bk-gn
U17-3	---	1.0	gn-bk
U17-4	---	1.0	ye-bl
U17-5	---	1.0	br-gn
U17-6	---	1.0	gn-br
XA – 1	---	1.5	br
XA – 2	---	1.5	br
XA – 7	---	1.5	gn-gr
XA – 11	---	1.5	gn-wh
XA – 12	---	1.5	bk-gn
XA – 10	---	1.5	gn-bl
XB – 3	---	1.5	gn-br
XB – 4	---	1.5	gn-bk
XB – 7	---	1.5	gn-br
XB – 9	---	1.5	bk-vi

Measured value table:

Item	Component	Measured value	Remark
B2	Pressure sensor	12 V 0.25 V - 4.75 V 0.25 V = 0 bar 4.75 V = 250 bar	Power supply Signal / linear
B 3 B 4 B35 B39 B40 B68 B70	Sensor	12 V 0.25 V - 4.75 V	(Pin 1-2) (Pin 1-3)

Description of function:

AUTOCONTOUR System (CAC)

The AUTOCONTOUR (CAC) function includes automatic cutterbar guiding, reel control and cutting table adjustment (VARIO), depending on the respective machine equipment.

The pushbuttons (S38c/d) activate the function cutting height preselection or cutting height control in the AUTOCONTOUR module (A8). Now the relevant solenoid coils of the individual functions are actuated by the modules A8, A16 and A27 until the actual values of the respective sensors agree with the setpoints.

Influence on control system

- Setting of drop rate (Hydraulic system, chapter 3.2)
- Setting of spring pre-stress (Hydraulic system, chapter 3.2)
- Setting of CAC sensitivity (Terminal A30 = Cebis)
- Learning of limit stops (Terminal A30 = Cebis)
- Storing the work positions (Terminal A30 = Cebis)

Reel height limitation

In order to avoid collisions of the reel with the cab roof, the CAC II equipment (front attachment cylinder without spring) includes the reel height limitation function.

When the distance between reel and cab roof is too small (front attachment height > 65%, reel height > 53%), the reel is automatically lowered to 50% ot its lift height and the front attachment is stopped.

The learned limit stops of front attachment and reel height (diagram 24a) serve as reference values.

The function is realised in the reel controller module (A16).

26a

Machine monitor

(not with electro-hydraulic ground drive)

Connection	C.t.c. position	mm²	Colour
B – 20	300	0.75	br-bl
BB – 13	19	0.75	or-bk
BB – 14	18	0.75	or-rd
MB – 1	23	0.75	gn-or
MN – 8	31	1.5	br
MW – 1	229	1.0	bk-bl
MW – 2	31	1.0	br
MW – 7	37	0.5	bl-gr
RA – 2	312	0.75	bl-gr
RA – 3	313	0.75	br
RA – 4	314	0.5	bk-rd
RA – 5	315	0.75	br
T – 4	27	0.75	br-rd
U – 4	31	2.5	br
W – 9	33	1.0	gn-gr
W – 12	34	1.0	gn-rd
Z – 3	300	1.0	br-bl
Z – 6	329	0.75	ye-bl
Z – 11	309	0.75	gn-wh

Description of function:

AUTOPILOT

When the road travel circuit is unlocked and the threshing mechanism is engaged, the AUTOPILOT module (A9) is supplied with power by the main switch (S10).

Following the start signal from switch (S9), the solenoid coils (Y9/Y10) are energized according to the signals:
- Sensors (B7/B8) and/or
- Laser pilot (B50)
- of the GPS steering system (via CAN bus)

The control of the steering position is performed by the wheel angle sensor (B6) in the steering cylinder.

For safety reasons, the autopilot function is interrupted immediately by the signal of the overrider switch (B83) when using manual steering. If the driver seat is left, the seat contact (Z5) will interrupt the autopilot function after approx. 5 s.

The centralizing switch (R3) enables the machine to drive precisely straight ahead even when driving on a slope.

For a quick response of the steering in autopilot mode, the hydraulic system is equipped with a pressure accumulator. If the pressure in this pressure accumulator falls below approx. 135 bar, an oil pressure sensor (B5) actuates the master valve (Y77) via the Autopilot module (A9 - pin 25) until the pressure level reaches approx. 165 bar again.

Accumulator filling

For quick response of the steering in autopilot mode, the hydraulic system is equipped with a pressure accumulator.

- pressure-controlled (by B5)

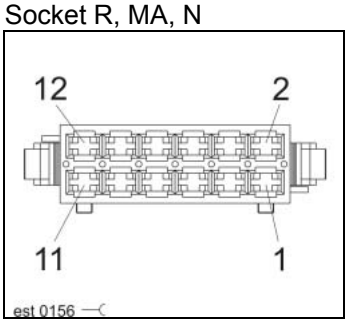
If the pressure in this pressure accumulator falls below approx. 135 bar, an oil pressure sensor (B5) actuates the master valve (Y77) via the Autopilot module (A9-/ 25) until the pressure reaches approx. 165 bar again.
An existing oil pressure sensor (B5) is automatically identified by the AUTOPILOT module (A9). There is no need for configuration.
If no oil pressure sensor (B5) exists or if it fails, the Autopilot system automatically switches over to time-controlled filling of the accumulator.

- time-controlled (without B5)

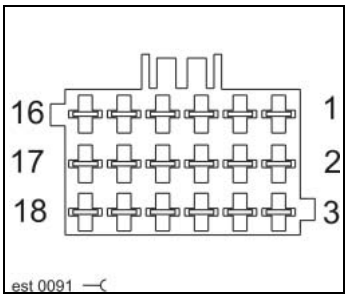
The accumulator is filled cyclically. The steering cylinder path is considered in this process.
After activating the Autopilot function, the AUTOPILOT module (A9) actuates the master valve (Y77) for 0.7 sec. The accumulator pressure thus corresponds to the working hydraulics system pressure.
The path covered by the steering cylinder as a function of steering movements is added up in the AUTOPILOT module (A9). After a path corresponding roughly to a drop of accumulator pressure to 150 bar, the AUTOPILOT module (A9) again actuates the master valve (Y77) automatically for 0.7 sec.

Connector pin definition:

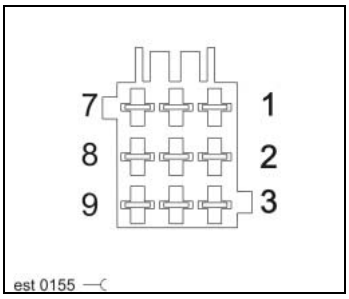
Socket R, MA, N



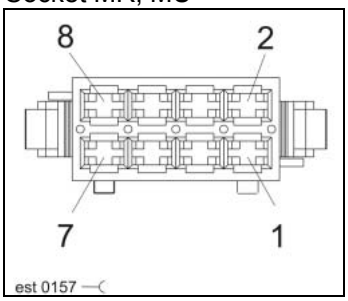
Socket C



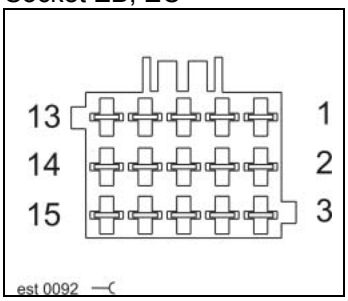
Socket CB



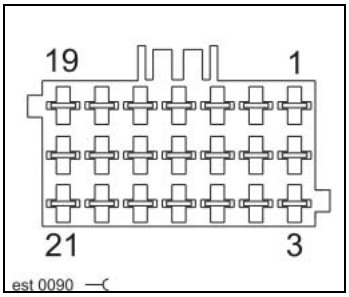
Socket MR, MU



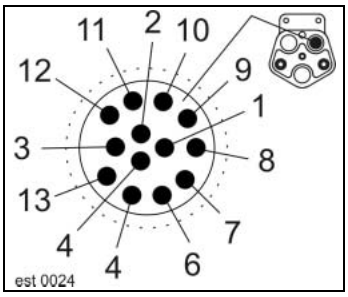
Socket EB, EC



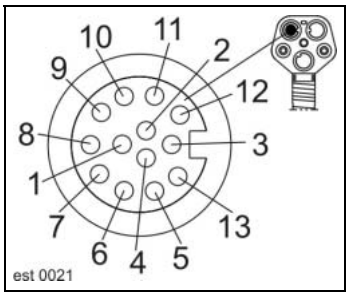
Socket P



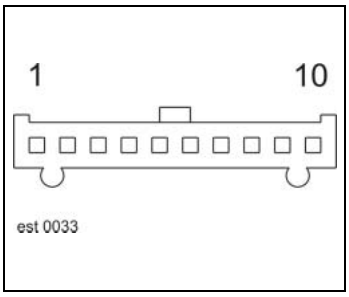
Connector XB



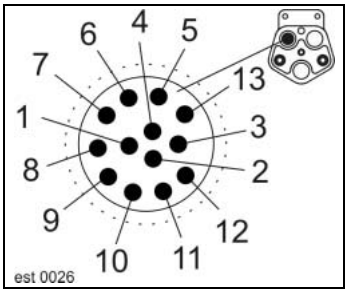
Socket XB



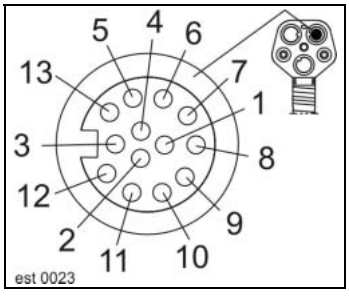
Socket X4



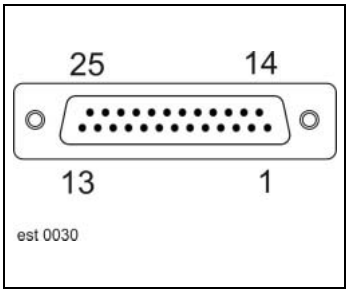
Connector XC



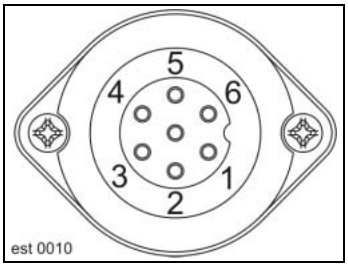
Socket XC



Socket X8



Socket XV3



29a

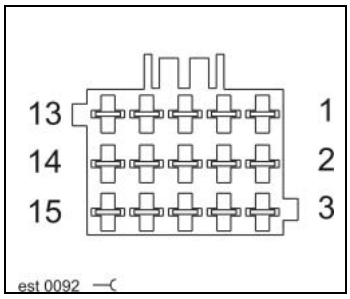
Performance monitor

Description of function:

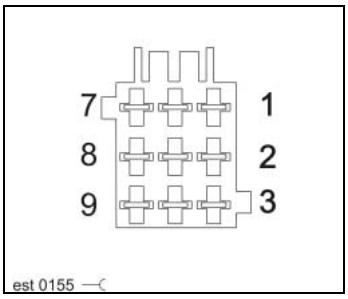
Grain tank extension (hydraulic)	When the road travel circuit is unlocked, relays (K31) and (K32) are supplied with power at pin 87. Earth is applied at pins 85 and 87a. The double push-button switch (S29) actuates the relays K31 and K32, actuating also the respective solenoid coil (Y182/Y183). Parallel to one of the solenoid coils (Y182/Y183), the diode PCB (DO) also actuates the master valve (Y77), since a buildup of pressure in the system is necessary for this function.
Grain tank full indicator / Warning beacon	The earth signal of the 70% microswitch (Z28) and 100% microswitch (Z27) is displayed as a corresponding message on the terminal (A30). If the 70 % full signal is activated via warning beacon (E47a/b) through switch (S40), the warning beacon is activated via microswitch (Z28) and relay K62.

Connector pin definition:

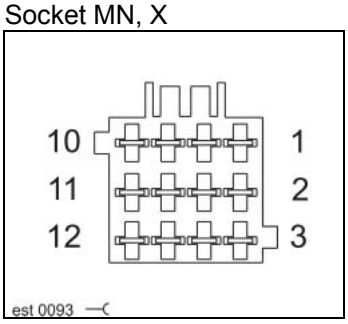
Socket BB



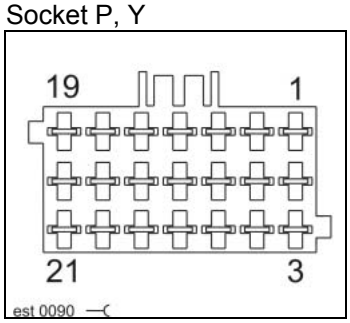
Socket MB



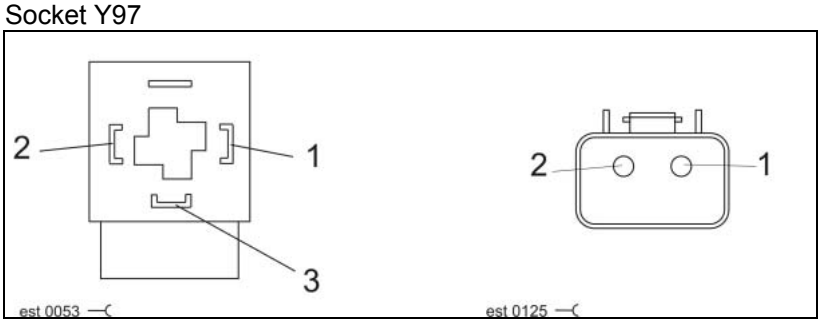
Socket MN, X



Socket P, Y



Socket Y97



Connection	C.t.c. position	mm²	Colour
BB – 6	70	0.75	ye-br
BB – 15	73	1.0	gn-or
MB – 9	7	1.5	gn-bk
MN – 3	297	1.5	rd-gn
MN – 10	300	1.5	br-bl
P – 1	117	1.5	bk-vi
P – 19	118	1.5	gn-wh
P – 20	7	1.5	bl-bk
X – 6	31	1.5	br
X – 12	118	1.5	gn-wh
Y – 15	31	1.5	br
X21 – 1	-	1,5	br
X21 – 2	-	1,5	gn-wh
X21 – 3	-	1,5	gn-bk

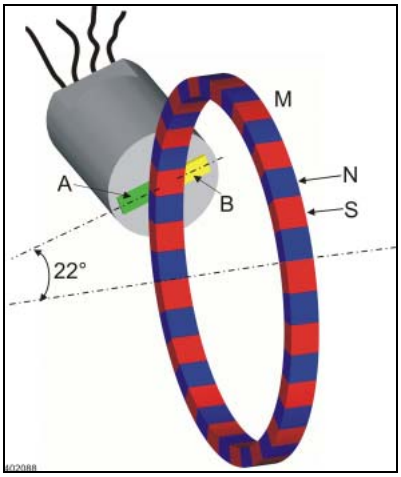
Description of function: 2/2

- Direction of travel (Identification of sense of rotation)

The 4-Trac speed sensors (B203, B204) are also able to identify the current direction of travel (sense of rotation). When the machine is heavily decelerated, the axial piston motors are set to minimum input volume (Q_{min} = 0 litres) due to the identification of the sense of rotation and reverse rotation of the motors is thus avoided.

The 4-Trac speed sensors (B203, B204) work according to the Hall sensor principle and can identify the polarity of the magnetic field using two signal chips (A/B) each.
Here the “North” polarity corresponds to the “low” signal and “South” to the “high” signal.
The signal chips are installed with a 22° twist to the ring axis and thus produce an overlap of half a pole length.
This means that in one sense of rotation, chip A sees a pole first and after that, chip B sees the same pole.
The signals generated are out of phase by 90°.

The correct installation position of the 4-Trac speed sensors (B203, B204) is defined by the design.



A – Signal chip
B – Signal chip
M – Magnetic ring
N – North pole
S – South pole

Description of function:

Sidefinder function:

Additional lights (sidefinder) are available as an accessory for better lateral lighting during threshing.

When actuating the indicator switch (S16), a signal input is connected to the sidefinder module (A33) in parallel.

With the threshing mechanism **activated** (K14 - circuit diagram 7a) and the lighting switched on by the vehicle lighting main switch (S17), the sidefinders (E71/E72) can now be switched on and off using the indicator switches (S16).

As soon as the vehicle lighting main switch (S17) signal or the threshing mechanism ON (K14) signal is missing, the sidefinders are switched off.

Pathfinder function:

Activation of the pathfinder function using the indicator switch (S16):

- The function is possible only when the machine is at standstill (lights off, threshing mechanism off, ignition off).
- Actuate the indicator switch (S16).
- The pathfinder function is started by means of the headlight flasher (wake up) and it does not matter if the indicator switch (S16) has been actuated to the left or to the right.

The pathfinder function is activated by the vehicle lighting main switch (S17):

- Threshing mechanism off
- Ignition off
- Lighting off
- Repeatedly switching on/off the lighting re-starts the pathfinder function (up to 15 min. max until ignition off)
- Both sidefinders plus headlights are switched on simultaneously.

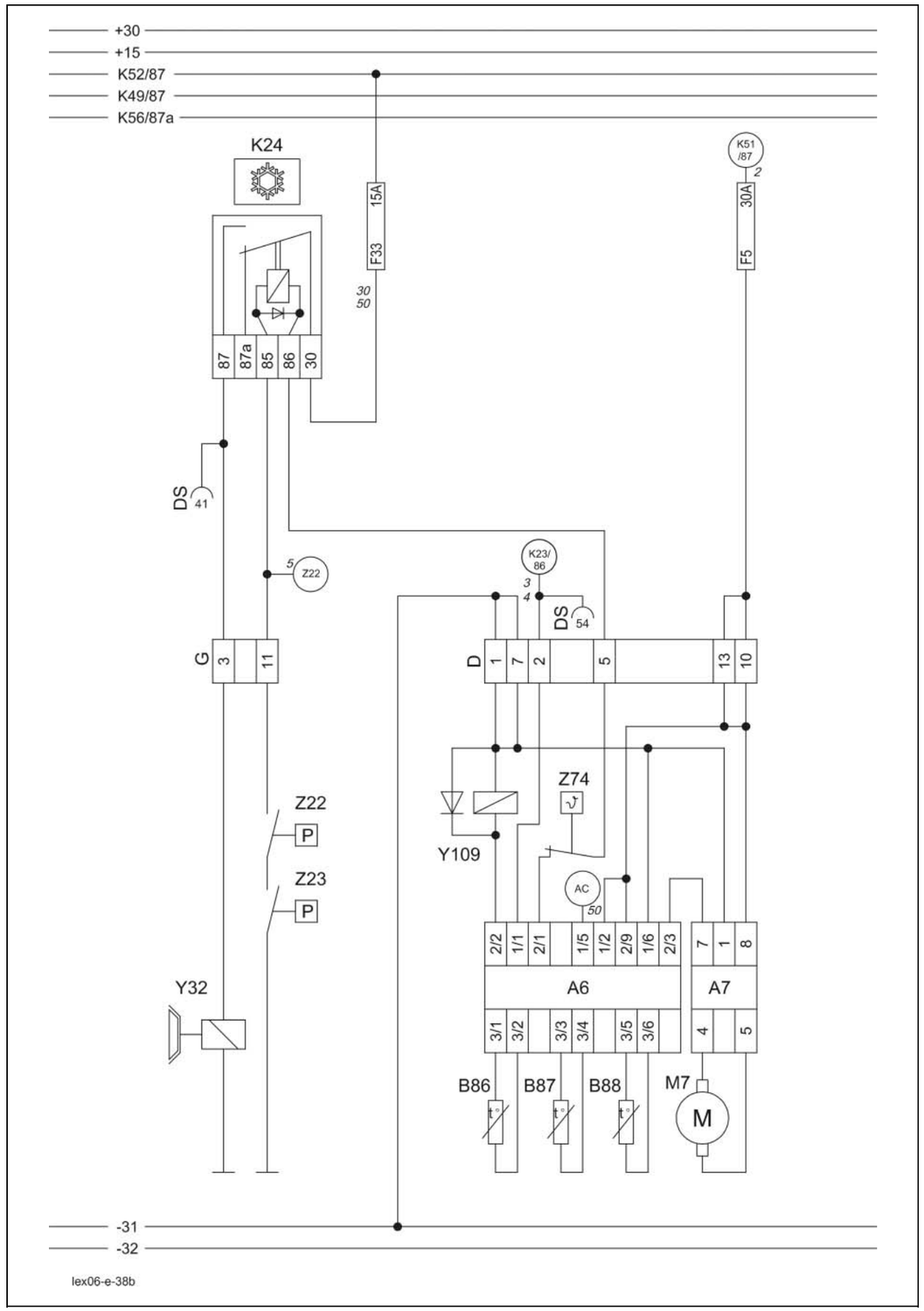
Until 1 minute has expired or until the indicator or the lighting has been actuated again, the module shuts down all outputs and then it shuts down itself.

Note:

- Indicator switch (S16) → circuit diagram 36
- Vehicle lighting main switch (S17) → circuit diagram 45
- Pathfinder lighting → circuit diagram 47, 48
- Sidefinder lighting → circuit diagram 48

XA – 2	---	1.5	br
XA – 3	---	1.5	bk-wh
XA – 6	---	1.5	bk-gn
XA – 13	---	1.5	br

38b Automatic air conditioner



Key to diagram:

Coordinates

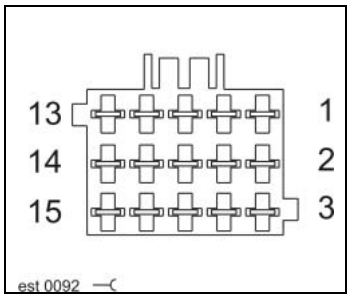
AC	Automatic air conditioner instrument lighting	2-g-18
A6	Automatic air conditioner module	2-g-18
A7	Cab fan speed controller module	2-g-18
B86	AC cab temperature sensor	2-h-17
B87	AC air discharge temperature sensor	2-g-18
B88	AC outside temperature sensor	2-h-19
DS	Diagnosis plug (63-pin) VIA	3-i-20
K24	Compressor-type air conditioner relay	4-i-20
K51	Ignition lock relay	4-i-20
K52	Power supply relay	4-i-20
K58	Alternator time relay	4-i-20
M7	Cab fan motor	2-g-18
Y32	Compressor-type air conditioner electro-magnetic clutch solenoid coil	2-p-17
Y109	Heater solenoid coil	2-h-19
Z22	Compressor-type air conditioner high pressure actual value switch	2-n-17
Z23	Compressor-type air conditioner low pressure actual value switch	2-n-17
Z74	Anti-icing device actual value switch	2-g-18

Measured value table:

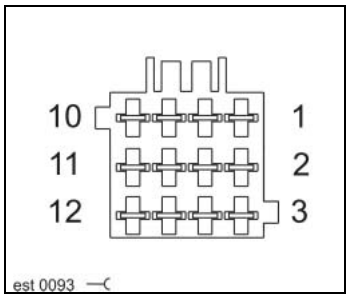
Item	Component	Measured value	Remark
B86	Cab temperature sensor	20° - 97070 Ω -10° - 55330 Ω 0° - 32650 Ω	blue; fault by flashing code in display
B87	Air discharge temperature sensor	10° - 19900 Ω 20° - 12490 Ω 30° - 8057 Ω	yellow; fault by flashing code in display
B88	Outside temperature sensor	40° - 5327 Ω 50° - 3603 Ω 60° - 2488 Ω	red; fault by flashing code in display
K68 K75	Remote control relay	85±7 Ω 20A 40A	(Pin 85 - Pin 86) (Pin 30 - Pin 87a) (Pin 30 - Pin 87)
Y32	Solenoid coil	3.0 A 4.0 Ω	
Y109	Solenoid coil	0.8 A 15 Ω	Messrs. Konvekta

Connector pin definition:

Socket D

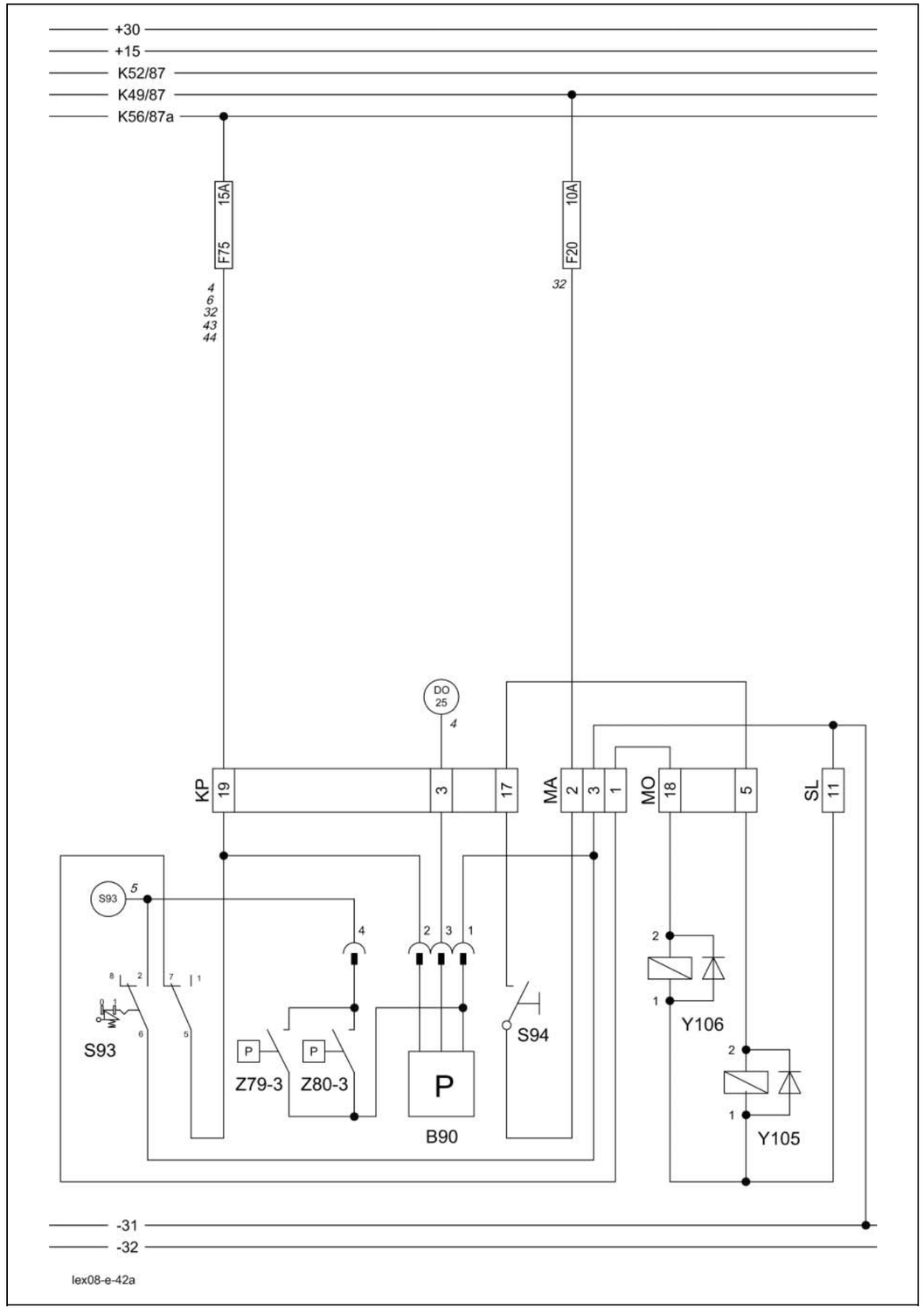


Socket G



Connection	C.t.c. position	mm²	Colour
D – 1	31	2.5	br
D – 5	185	0.75	rd-gn
D – 7	31	2.5	br
D – 10	187	2.5	bk
D – 13	187	2.5	bk
D – 1	31	2.5	br
G – 3	224	1.5	bk-or
G – 11	22	0.75	bk-pi

42a Ground drive and brake control - with electro-hydraulic ground drive (EFA)



Key to diagram:

Coordinates

A45	Ground drive hydraulic motor brake restrictor module (HBM)	4-i-20
B90	Brake accumulator pressure sensor/switch	5-g-20
S93	Parking brake switch	3-g-17
S94*	Differential lock switch	3-g-17
Y105*	Differential lock solenoid coil	7-h-18
Y106	Parking brake solenoid coil	7-h-18
Z79-3	Left brake circuit pressure actual value switch (accumulator warning)	
Z80-3	Right brake circuit pressure actual value switch (accumulator warning)	

* - Not used

Measured value table:

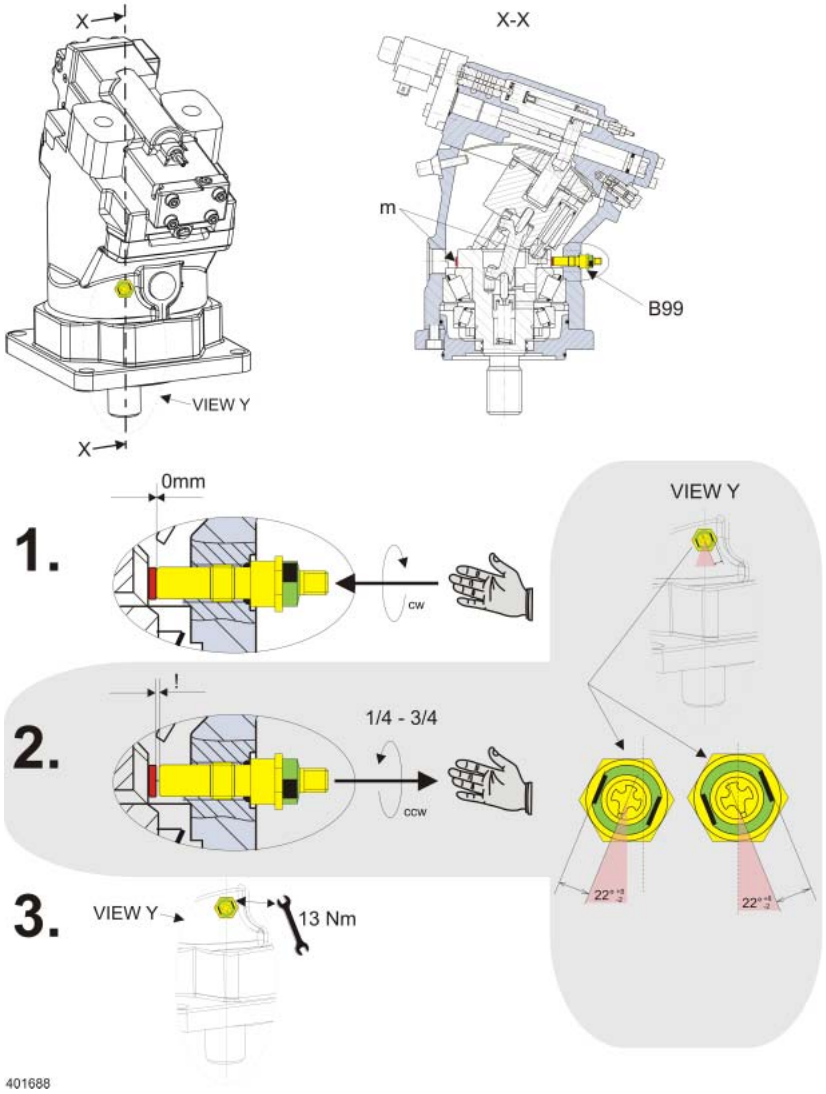
Item	Component	Measured value	Remark
B90	Brake circuit oil pressure / charge pressure	ON OFF	< 135 bar > 165 bar
Y105 Y106	Solenoid coil	3.8 A 3.2 Ω	See inscription
Z79-3 Z80-3	Pressure switch	115 bar	Closed < 115 bar

Description of function: 4/4

A – Signal chip
B – Signal chip
M – Magnetic ring
N – North pole
S – South pole

Hydraulic motor speed adjustment sensor (B99)

To identify the speed and the sense of rotation correctly, a defined adjustment of the hydraulic motor speed adjustment sensor (B99) is required.



1 - Turn in the sensor manually up to the contact point.

2 - Turn out the sensor by ¼ of a turn (min.) to ¾ of a turn (max.). In this process, the sensor surfaces must be at an angle 22° with respect to the motor axis; (20°-30° are acceptable).

3 - Tighten lock nut to 13 Nm.

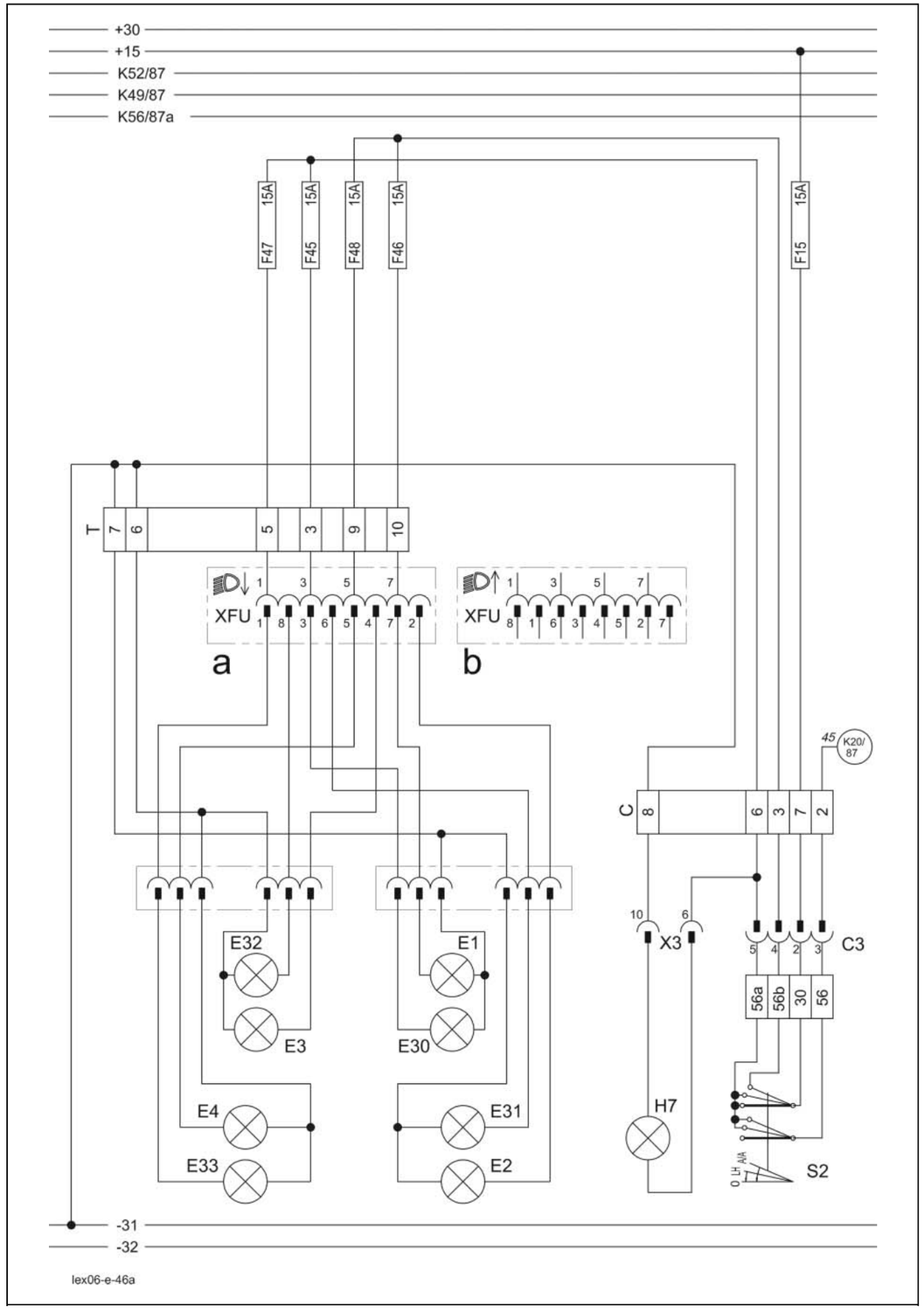
Diagnosis

When a fault is detected, an error message is transmitted via the CAN bus and displayed in the CEBIS terminal (A30).
Moreover, the sensors can be displayed using the CLAAS Diagnosis System CDS.

Possible errors:

Brake pressure switch of gearshift defective	When the signal from switches Z79 and Z80 has been identified for more than 30 minutes, the message "Braking pressure switch for gear-shift mechanism defective" is displayed on terminal A30. Shifting gears is prevented until the signals from switches Z79-2 and Z80-2 are again identified as being a correct function. The error is stored in the error memory.
Ground speed control lever neutral position defective	If signals from the ground speed sensor (B16) are still present although the "Ground speed control lever neutral" signal has been detected, the message "Ground speed control lever neutral position switch defective" is displayed on terminal A30. Shifting gears is prevented until a correct function is again detected. The error is stored in the error memory (see also diagram 25).
Gearshift operating error	If the signals from the brake circuit pressure switches (Z79-2/Z80-2) or from the ground speed control lever neutral switch (Z57) are interrupted during the shifting process, the changeover is not carried out any more. The message **"Ground speed lever in neutral position! / Apply foot brake – otherwise unable to change gear!"** is displayed on terminal A30.
Diesel engine speed adjustment (road travel)	When third gear is engaged, the gearbox switch Z95 cuts the power supply to the CAB module (A10) and the diesel engine speed is reduced – road travel (see also circuit diagram 2). The maximum speed which can be achieved is country-specific and can be configured using the Claas diagnosis system CDS.

46a Dipped headlights, full beam, dipped headlights changeover switch



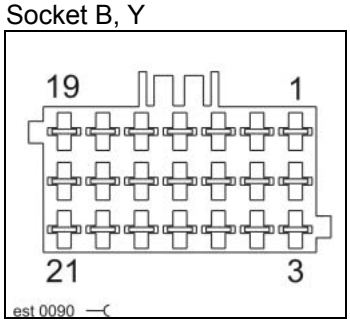
Key to diagram: Coordinates

DS	Diagnosis plug (63-pin) VIA	3-i-20
E1	Dipped headlights, left	5-g-19
E2	Dipped headlights, top left	2-f-20
E3	Dipped headlights, top right	2-f-16
E4	Dipped headlights, right	5-g-17
E30	Full beam, left	5-g-19
E31	Full beam, top left	2-f-20
E32	Full beam, top right	2-f-16
E33	Full beam, right	5-g-17
H7	Full beam signal light	4-g-18
K20	Lighting main relay	4-i-20
S2	Dipped headlights / Full beam switch	2-g-18
C3	Steering column switch lever connector	4-g-18
X3	Steering column indicator lights connector	4-g-18
XFU	Bottom / top drive lights changeover connector	5-g-19

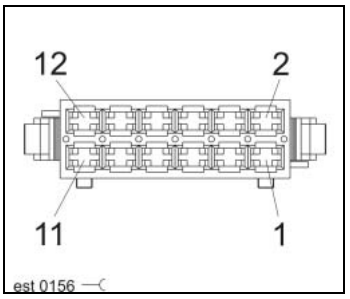
a - Bottom drive lights
b - Top drive lights

Connector pin definition:

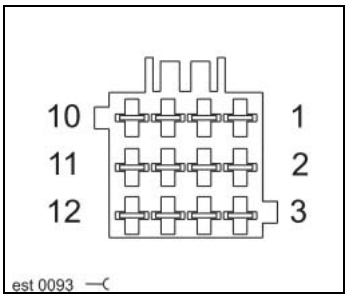
Socket B, Y



Socket DA



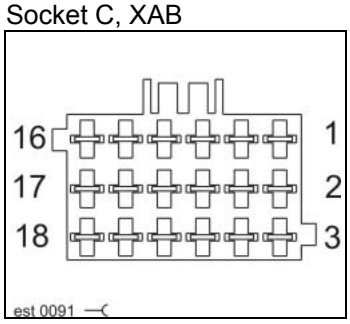
Socket X



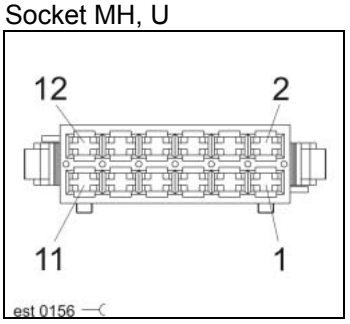
Connection	C.t.c. position	mm²	Colour
B – 1	345	1.5	gr
B – 3	333	1.5	rd-gn
DA – 3	344	1.5	gr-gn
DA – 6	343	1.5	gr-vi
DA – 7	31	1.5	br
X – 6	31	1.5	br
Y – 2	345	1.5	gr
Y – 6	333	1.5	pi-gn
Y – 11	31	1.5	br
Y – 17	31	1.5	br

Connector pin definition:

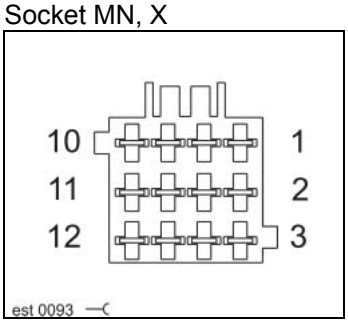
Socket C, XAB



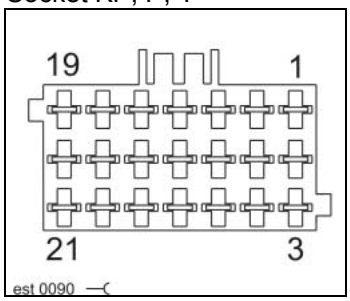
Socket MH, U



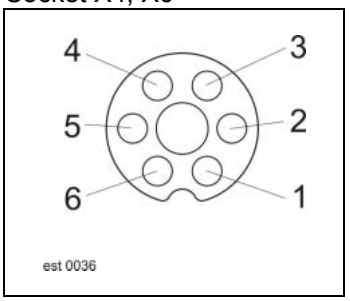
Socket MN, X



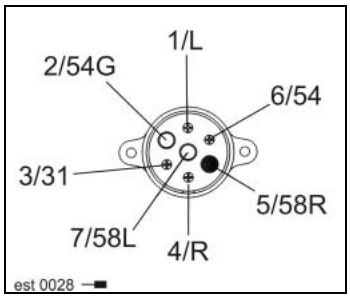
Socket KP, P, Y



Socket X4, X6



Connector XH



Socket XH