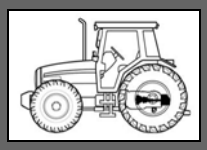
Chapter 7



Power take-off

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HA260/Power take-off - General

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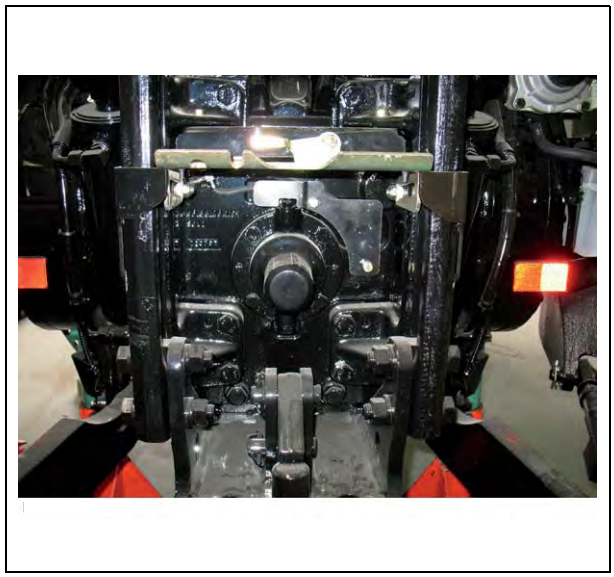
A. General

Description

The PTO drive mechanism is fitted in the rear part of the axle, behind the differential. The gear assembly rests on tapered roller bearings supported by the axle housing at the front and by the removable PTO cover plate at the rear. The assembly is activated directly by the engine via a multidisc clutch. The movement is recovered at the end of the primary shaft of the gearbox.

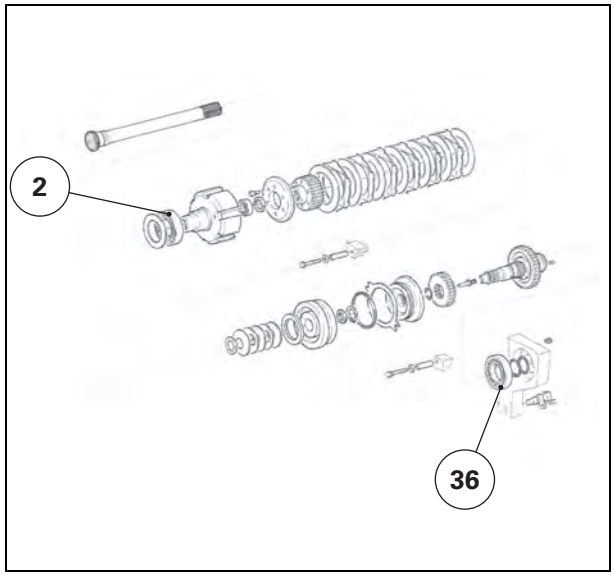


I007500

Fig. 1

Clutch

This is located at the top of the PTO housing.
It is supported by two straight bearings (2) and (36) fitted inside the axle housing on one side and inside the PTO cover plate on the other side.



I007501

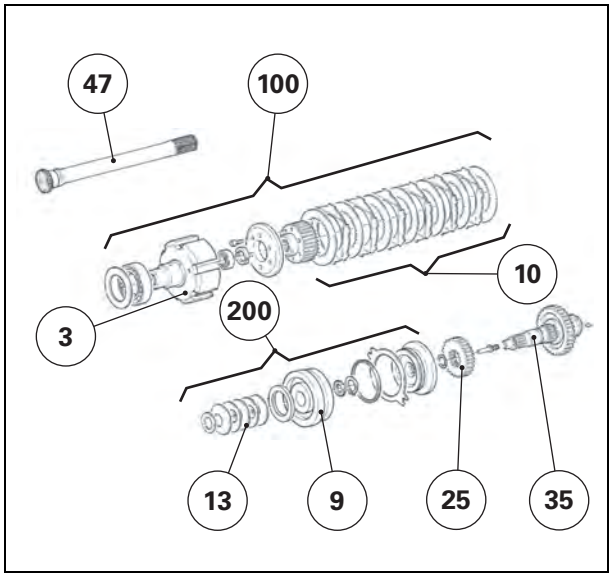
Fig. 2

Upper shaftline

The upper shaftline of the PTO transfers the engine speed to the driving gears via the clutch. The clutch/engine shaft connection is provided by means of a splined shaft (47). The system acting on the clutch is located on the PTO housing side.

The assembly comprises the clutch (100), the mechanism (200) and a shaft gear (35) with an integral gear (25).

The input shaft drives the clutch bell housing (3), which transfers the movement to the driving gears (25) and (35) through the clutch discs (10). The clutch mechanism (200) holds the disc assembly together (100) according to the hydraulic pressure acting on the piston (13). The return of the piston is governed by the spring washers (9).

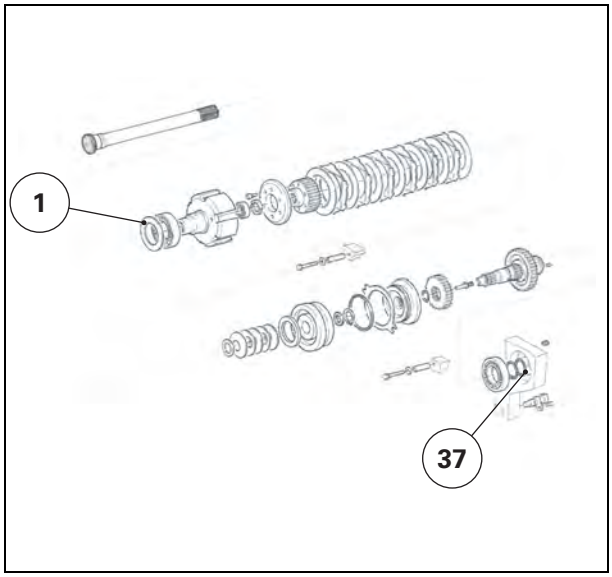


I007502

Fig. 3

The clearance of the bearings supporting the upper shaftline is adjusted by means of shims (1) inserted between the cup and the rear axle housing; the bearings are kept in motion by rings with rectangular sections (37).

A gallery inside the housing provides lubricating oil to the bearings and the driving gears.

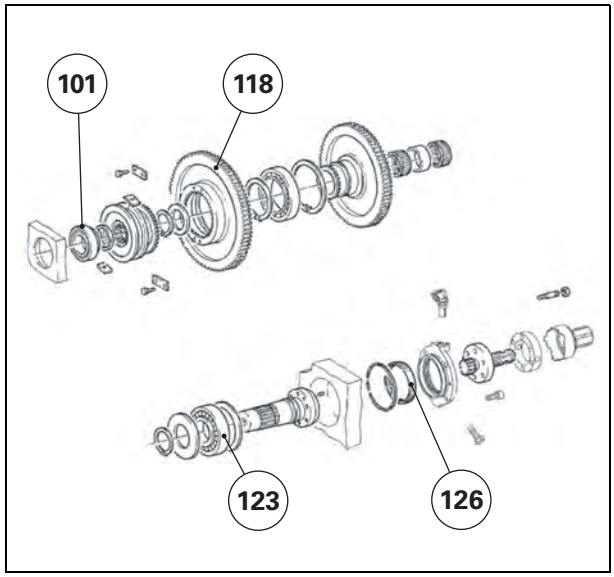


I007503

Fig. 4

Lower shaftline

The lower shaftline is supported at the front by a bearing (101) force fitted into the housing, and at the rear by a hub turning in a bearing (123).
The shaftline's output shaft is lubricated by an internal gallery.
The shaft sealing is provided by a lip seal (126) fitted inside the cover plate of the PTO housing.
The plate (118) differs depending on the PTO option selected: 540 rpm or 750 rpm.



I007504

Fig. 5

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HA260/Power take-off - Error codes

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A. Reading error codes

	ERROR CODES DISPLAYED ON THE INSTRUMENT PANEL			
	DISPLAY with Dash Control Center			DISPLAY without Dash Control Center
Instrument panel		+	Letter D (Dashboard)	Letter D (Dashboard)
Engine		+	Letter E (Engine)	Letter E (Engine)
SCR system	no icon		Letter U (Urea)	Letter U (Urea)
Transmission/4WD/PTO		+	Letter T (Transmission)	Letter T (Transmission)
Lights module		+	Letter L (Light)	Letter L (Light)
ParkLock		+	Letter P (ParkLock)	Letter P (ParkLock)
Front axle		+	Letters FA (Front Axle)	Letters FA (Front Axle)
Linkage		+	Letters R (Linkage)	Letter R (Linkage)
Electrohydraulic		+	Letters H (Hydraulics)	Letter H (Hydraulics)
Cab		+	Letters C (Cab)	Letter C (Cab)
Auto-Guide		+	Letters A (Auto-Guide)	Letter A (Auto-Guide)
Control Arm		+	Letters AR (ARmrest)	Letter AR (ARmrest)

	OTHER DISPLAYS
Automatic air conditioning	Displayed on the air conditioning module.

B. PTO error codes

No.		Components concerned	Causes
T	6101	**X128** - Rear PTO ON/OFF switch	Signal error
T	6103	**X94** - PTO ON/OFF switch on left-hand fender	Signal error
T	6104	**X7** - Rear PTO solenoid valve	Control error
T	6105	**X15** - PTO clutch speed sensor	Signal error
T	6110	**X16** - PTO shaft speed sensor	Signal error
T	6111	**X118** - Automatic PTO switch	Signal error
T	6113	**X16** - PTO shaft speed sensor	Overspeed
T	6115	**X145** - PTO/linkage console	Signal error
T	6116	**X145** - PTO/linkage console	Signal error
T	6117	**X145** - PTO/linkage console	Signal error
T	6118	**X145** - PTO/linkage console	Signal error
T	611A	**X3** - 540 rpm PTO speed solenoid valve	Control error
T	611B	**X3** - 540 rpm PTO speed solenoid valve	Control error
T	611C	**X4** - 1000 rpm PTO speed solenoid valve	Control error
T	6141	**X128** - Rear PTO ON/OFF switch	Pressed down for over 30 seconds, mechanical or electrical error on switch
T	6143	**X94** - PTO ON/OFF switch on left-hand fender	Pressed down for over 30 seconds, mechanical or electrical error on switch
T	6145	**X15** - PTO clutch speed sensor	NEUTRAL speed selection, PTO not activated, X15 displays a speed, the clutch disc does not separate, PTO brake does not engage selected speed, PTO clutch 100% engaged, over 20% difference between PTO clutch speed and engine speed. PTO clutch disc slips: clutch slippage. PTO clutch speed is lower than output shaft speed, X15 sensor supply voltage error.
T	6150	**X16** - PTO shaft speed sensor	The PTO shaft speed is higher than 1300 rpm, signal error (X16 or X15). The selected speed is lower than the PTO output shaft speed, X16 sensor supply voltage error, speed solenoid valve (X4, X3) locked in "deactivated" position.
T	6155	**X145** - PTO/linkage console	Pressed down for over 30 seconds, mechanical or electrical error on switch
T	6156	**X145** - PTO/linkage console	Pressed down for over 30 seconds, mechanical or electrical error on switch
T	6157	**X145** - PTO/linkage console	Pressed down for over 30 seconds, mechanical or electrical error on switch
T	6158	**X145** - PTO/linkage console	Pressed down for over 30 seconds, mechanical or electrical error on switch
T	6160	**X15** - PTO clutch speed sensor **X16** - PTO shaft speed sensor	Difference of at least 12% between the output shaft speed and PTO clutch speed, speed solenoid valve (X4, X3) incorrectly connected or seized up. Mechanical fault with speed selection. Signal error to sensors (X15, X16)
T	61A1	**X128** - Rear PTO ON/OFF switch	Communication error
T	61B0	**X128** - Rear PTO ON/OFF switch	Initialisation error
T	61B5	**X145** - PTO/linkage console	Communication error
T	61B6	**X145** - PTO/linkage console	Communication error
T	61B7	**X145** - PTO/linkage console	Communication error
T	61B8	**X145** - PTO/linkage console	Communication error
T	61E0	**X174** - Autotronic 4 transmission controller	Faulty programming
T	61E1	**X174** - Autotronic 4 transmission controller	Faulty programming

C. Instrument panel error codes

No.		Component(s) concerned	Cause(s)
D	121		Alternator regulator voltage too high (filtered battery signal)
D	122		Alternator regulator voltage too low (filtered battery signal)
D	127	**X197** - Diesel fuel gauge	Electrical signal too high
D	128		Electrical signal too low
D	129		Battery voltage too high (non-filtered battery signal)
D	130		Battery voltage too low (non-filtered battery signal)
D	133	**X71** - Throttle pedal sensor	Electrical signal too high
D	134		Electrical signal too low
D	135	**X56** - Power Control lever**X71** - Throttle pedal sensor	Electrical signal too high - C.N.
D	136		Electrical signal too low - C.N.
D	137	**X106** - Transmission lever in armrest	Electrical signal too high
D	138		Electrical signal too low
D	139	**X68** - Clutch pedal sensor	Electrical signal too high
D	140		Electrical signal too low
D	141	**X25** - Engine speed sensor	Engine speed signal not at maximum level
D	142	**X68** - Clutch pedal sensor	Short circuit to + 12 V AC
D	143		Short circuit to + 12 V AC - C.N.
D	144	**X56** - Power Control lever	Electrical signal too high
D	145		Electrical signal too low
D	146		Electrical signal too high
D	147		Electrical signal too low
D	148	**X55** - Instrument panel	Attempt to program with engine running
D	149		CAN network deactivated (CAN bus off)
D	150		CAN messages lost
D	151		Tractor speed too high
D	152	**X55** - Instrument panel	Hourmeter error for engine maintenance
D	153		Parameter table error
D	154		CAN communications from Autotronic 4 to DCC3 - C.N. Special failed
D	155	**X55** - Instrument panel	Incorrect tractor code selected
D	156	**X68** - Clutch pedal sensor	TOC stuck open
D	157	**X25** - Engine speed sensor	No electrical signal
D	158	**X106** - Transmission lever in armrest	Incorrect calibration of armrest lever
D	159	**X56** - Power Control lever	Neutral switch error in neutral - C.N. position
D	160		Neutral switch error outside neutral - C.N. position
D	164		CAN communications from EEM to DCC3 failed
D	170	**X122** - Hand throttle	
D	183	**X235** - Front axle steering sensor (WAS sensor)	Electrical signal too high
D	184		Electrical signal too low
D	185	**X57** - DOT Matrix keyboard	Electrical signal too high
D	186		Electrical signal too low
D	189	**X55** - Instrument panel	9.5 V output - electrical signal too high
D	190		9.5 V output - electrical signal too low
D	191	**X168** - Pneumatic brake system pressure sensor	Electrical signal too high
D	192		Electrical signal too low

No.		Component(s) concerned	Cause(s)
D	193	**X144** - Variable steering setting potentiometer (fast steering)	Electrical signal too high
D	194		Electrical signal too low
D	195	**X55** - Instrument panel	Electrical signal too high
D	196		Electrical signal too low
D	197	**X1** - Auxiliary hydraulic oil temperature sensor	Electrical signal too high
D	198		Electrical signal too low

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HA260/Power take-off - Diagrams and plans

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A. Hydraulics diagram

Different systems
(1) Valve block (fuel lift/lubrication)
(2) Hydrostatic loop
(3) Settings
(4) Transmission control unit
(5) Rear axle
(6) Solenoid valve block on rear axle

Pumps
(1P1) Service pump
(1P2) Lubrication pump
(2P1) Hydrostatic pump

Drive components
(2A1) Hydrostatic motor
(2A2) Hydrostatic motor
(3A1) Piston for setting the hydrostatic pump displacement
(3A2) Piston for setting the hydrostatic motor displacement
(3A3) Forward speed limiter in limp home mode
(4A1) Forward range selector
(6A1) Rear PTO clutch
(6A3) 1000 rpm PTO selector piston
(6A4) Front axle clutch
(6A5) Rear axle differential lock
(6A6) 750 rpm PTO selector piston
(6A7) Front axle differential lock

Sensors
(1S1) Transmission oil temperature sensor
(1S2) Pressure filter blockage switch
(4S1) HP loop pressure sensor
(4S2) Pressure sensor

Other components
(1Z1) Intake filter with bypass
(1Z2) Pressure filter with bypass
(1Z3) Transmission oil cooler
(1Z4) Transmission lubrication
(3Z1) Cam channel adjustment shaft
(3Z2) Control unit
(4Z1) Clutch pedal with clutch master cylinder
(4Z2) Accumulator
(5Z2) Rear PTO lubrication
(5Z3) Differential and right-hand brake lubrication
(5Z4) Differential and left-hand brake lubrication

Valves (or spool valves/solenoid valves)
(1V1) Cooler bypass valve
(1V2) Flushing pressure relief valve
(1V3) Fuel lift pressure relief valve
(1V4) Lubricating pressure relief valve
(1V5) Service pump pressure relief valve
(1V6) System pressure relief valve
(2V1) Reverse fuel lift non-return valve
(2V2) Forward fuel lift non-return valve
(2V3) Forward high-pressure relief valve
(2V4) Reverse high-pressure relief valve
(2V5) Flushing valve
(2V6) Shuttle valve
(3V1) Hydrostatic pump control spool valve
(3V2) Hydrostatic motor control spool valve
(4V1) Hare range solenoid valve

Valves (or spool valves/solenoid valves)
(4V2) Tortoise range solenoid valve
(4V3) Forward speed limiting solenoid valve
(4V4) Coupler function solenoid valve
(4V5) Clutch function spool valve
(4V6) Rear axle pressure relief spool valve
(6V1) Rear PTO clutch solenoid valve
(6V3) 540 (or 750) rpm PTO control solenoid valve (depending on equipment)
(6V4) Front axle clutch solenoid valve
(6V5) Differential lock solenoid valve
(6V6) 1000 rpm PTO control solenoid valve

Measurement points
(M1) Pressure upstream of cooler
(M2) Lubricating pressure
(M3) Flushing pressure
(M4) Fuel lift pressure
(M5) Service pump pressure
(M6) Transmission system pressure
(M7) Range 1 engaging pressure (Tortoise)
(M8) Range 2 engaging pressure (Hare)
(M9) High pressure
(M10) Rear axle and brake system pressure
(M11) PTO clutch pressure
(M13) 540 (or 750) rpm PTO selector pressure (depending on equipment)
(M14) Front axle clutch pressure
(M15) Differential lock pressure
(M16) 1000 rpm PTO selector pressure
(M18) Lubricating pressure
(M22) Oil leak from clutch or coupler function valve

A.1 Transmission hydraulics diagram

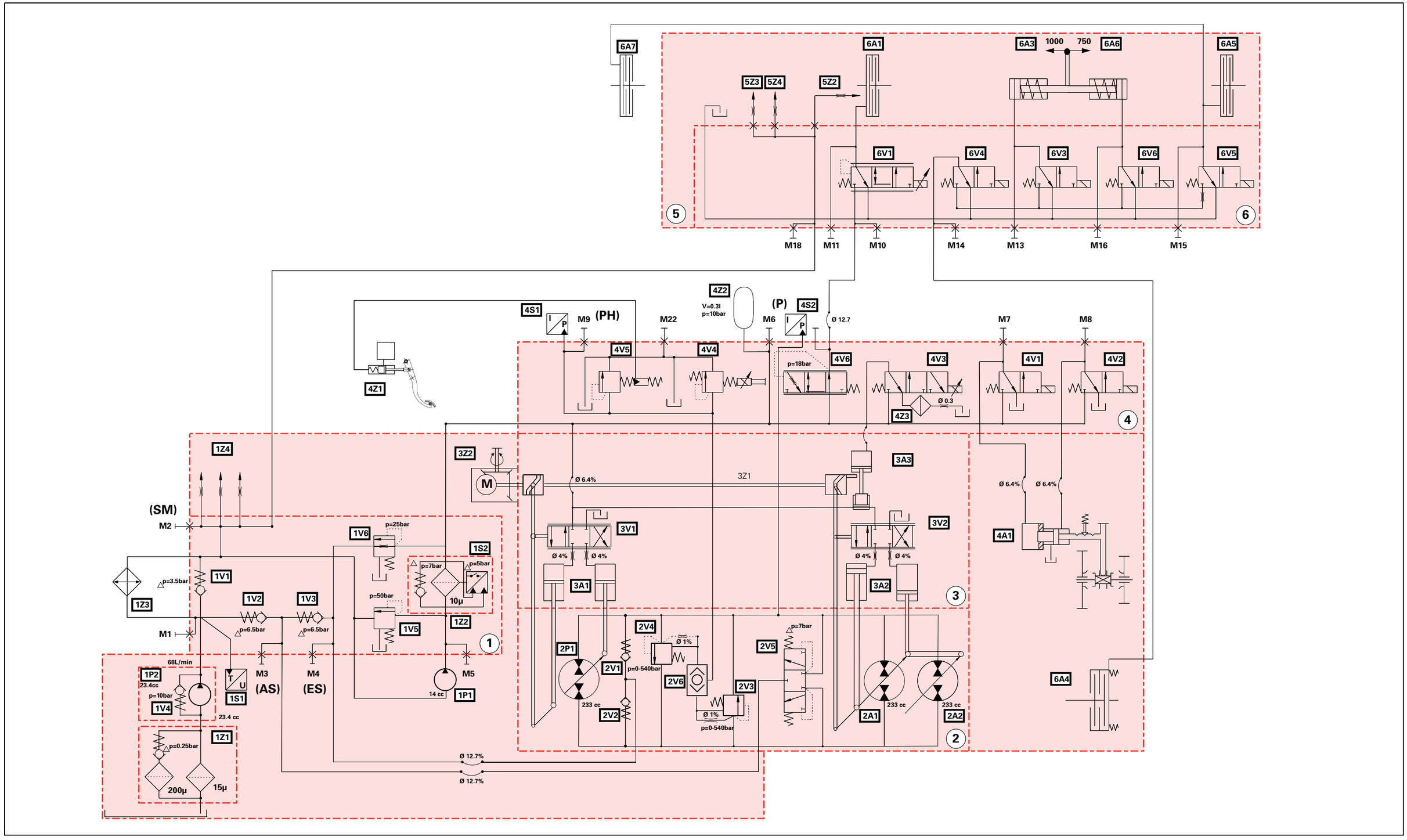

Fig. 1

B. Electrical diagrams

B.1 Identification of electrical connectors and harnesses

Identification of electrical connectors
X1 - Auxiliary hydraulic oil temperature sensor
X2 - Auxiliary hydraulic oil filter blockage switch
X3 - 540 rpm PTO speed solenoid valve
X4 - 1000 rpm PTO speed solenoid valve
X5 - 4WD solenoid valve
X6 - Differential lock solenoid valve
X7 - Rear PTO solenoid valve
X8 - Bevel gear theoretical speed sensor
X9 - Transmission oil high pressure sensor 1
X10 - Collecting shaft speed sensor
X11 - Solenoid valve limiting speed to 30 kph
X12 - Coupler function solenoid valve
X13 - Hare range solenoid valve
X14 - Tortoise range solenoid valve
X15 - PTO clutch speed sensor
X16 - PTO shaft speed sensor
X17 - Hare/Tortoise range position sensor
X18 - Transmission control module
X19 - Transmission hydraulic oil temperature sensor
X20 - Transmission filter blockage switch
X21 - ParkLock brake pressure sensor
X22 - Radar
X23 - Steering pressure sensor
X24 - Auxiliary hydraulic oil gauge
X25 - Engine speed sensor
X26 - Pneumatic brake solenoid valve
X27 - Rear linkage lifting solenoid valve
X28 - Rear linkage lowering solenoid valve
X29 - Dual Control socket connector
X30 - Rear linkage position sensor
X31 - Rear linkage right-hand draft sensor
X32 - Rear linkage left-hand draft sensor
X33 - Transmission harness CAN junction
X34 - Transmission oil high pressure sensor 2
X35 - ParkLock hydraulic system pressure sensor
X36 - LS signal breaker solenoid valve
X37 - ParkLock pressure reversing solenoid valve
X38 - Trailer braking proportional solenoid valve
X39 - Trailer braking safety solenoid valve
X40 - Front linkage single/double acting function solenoid valve
X41 - Divider solenoid valve 1
X42 - Divider solenoid valve 2
X43 - Auto-hitch lifting solenoid valve
X44 - Auto-hitch lowering solenoid valve
X45 - Bleed for pneumatic suspended cab front and rear systems
X46 - Rear left-hand ram position sensor for cab suspension
X47 - Rear right-hand unit for suspended cab
X48 - Rear left-hand unit for suspended cab
X49 - Suspended cab rear lowering solenoid valve
X50 - Suspended cab front lowering solenoid valve
X51 - Transmission harness earth (chassis)
X52 - Engine harness/transmission harness junction
X53 - Cab transmission harness/transmission harness junction
X54 - Suspended cab lifting solenoid valve
X55 - Instrument panel
X56 - Power Control lever
X57 - DOT Matrix keyboard
X58 - Windscreen wiper and indicator control unit
X59 - DOT Matrix keyboard connection on instrument panel
X60 - Engine harness/instrument panel harness junction
X61 - Cab transmission harness/engine harness junction
X62 - Instrument panel harness/cab transmission harness junction
X63 - Instrument panel harness connection on fuse box
X64 - Instrument panel harness connection on fuse box
X65 - Front windscreen wiper motor
X66 - Left-hand brake pedal sensor
X67 - Right-hand brake pedal sensor
X68 - Clutch pedal sensor
X69 - Cab interior temperature sensor
X70 - Solar radiation sensor
X71 - Throttle pedal sensor
X72 - ParkLock switch on Power Control lever
X73 - Buzzer Control
X74 - Buzzer Supply (+12 V APC)
X75 - Pillar harness/right-hand fender harness junction
X76 - Rear right-hand indicator
X77 - Rear right-hand side light and stop light
X78 - Work light on rear right-hand fender
X79 - -
X80 - -
X81 - -
X82 - -
X83 - -
X84 - -
X85 - -
X86 - -
X87 - Linkage lifting/lowering switch on right-hand fender
X88 - Rear right-hand NA indicator extension
X89 - Earth (chassis)
X90 - Pillar harness/left-hand fender harness junction
X91 - Rear left-hand indicator
X92 - Rear left-hand side light and stop light
X93 - Work light on rear left-hand fender
X94 - PTO ON/OFF switch on left-hand fender
X95 - PTO Stop switch on left-hand fender
X96 - Hydraulic spool valve switch on left-hand fender
X97 - Linkage lifting/lowering switch on left-hand fender
X98 - Rear left-hand NA indicator extension
X99 - PTO and linkage console harness/cab transmission harness junction
X100 - Instrument panel harness earth (chassis)
X101 - Instrument panel harness/electric rear-view mirror harness junction
X102 - Right-hand fender lighting harness/trailer connector harness junction
X103 - Armrest harness/cab transmission harness junction
X104 - Armrest Autotronic 5

X105 - Datatronic CCD
X106 - Transmission lever in armrest
X107 - Headland mode switch (headland function)
X108 - FingerTIP 3
X109 - FingerTIP 4
X110 - FingerTIP 5
X111 - DTM dynamic transmission mode switch
X112 - Joystick
X113 - Armrest 6-button keyboard
X114 - Supply on fuse box for 3rd spool valve
X115 - Supply on fuse box for 4th spool valve
X116 - +12 V battery supply (for lighting module)
X117 - Isobus +12 V battery power socket
X118 - Automatic PTO switch
X119 - Rear linkage lifting/lowering switch
X120 - Datatronic CCD navigation keyboard
X121 - Rear linkage height/depth adjustment thumb wheel
X122 - Hand throttle
X123 - Hare/Tortoise range shift switch
X124 - Pedal/lever mode switch
X125 - SV1 speed setting potentiometer
X126 - SV2 speed setting potentiometer
X127 - Front PTO ON/OFF switch
X128 - Rear PTO ON/OFF switch
X129 - Fuse box +12 V battery connection
X130 - FingerTIP 6 front linkage function
X131 - Front linkage suspension solenoid valve
X132 - Instrument panel harness/armrest harness junction
X133 - Console harness/cab transmission harness junction
X134 - Console harness/pillar harness junction
X135 - Braking pressure sensor
X136 - Differential lock switch
X137 - 4WD switch
X138 - Hazard warning lights indicator light and switch
X139 - Suspended front axle switch
X140 - Suspended front axle setting potentiometer
X141 - Suspended cab switch
X142 - Suspended cab setting potentiometer
X143 - Variable steering switch (fast steering)
X144 - Variable steering setting potentiometer (fast steering)
X145 - PTO/linkage console
X146 - Rear linkage suspension switch
X147 - Roof harness/pillar harness junction
X148 - Roof harness/pillar harness junction
X149 - Headlights module (black connector)
X150 - Pillar harness/cab power socket harness junction
X151 - Pillar harness/cab power socket harness junction
X152 - Start switch
X153 - Non-Isobus implement connector
X154 - Suspended front axle lifting solenoid valve
X155 - Cigarette lighter socket (power)
X156 - Cigarette lighter socket (backlighting)
X157 - Left-hand side +12 V socket (power)
X158 - Left-hand side +12 V socket (backlighting)
X159 - Suspended front axle lowering solenoid valve
X160 - Console harness earth (chassis)
X161 - Solenoid valve 1 for suspended front axle suspension
X162 - Pillar harness connection on fuse box
X163 - Solenoid valve 2 for suspended front axle suspension
X164 - Pillar harness/cab transmission harness junction
X165 - Automatic air conditioning harness/pillar harness junction
X166 - Suspended front axle position sensor
X167 - +12 V APC fuse box connection
X168 - Pneumatic brake system pressure sensor
X169 - Power socket control switch (in cab)
X170 - Pillar harness connection on fuse box
X171 - Cab transmission harness connection on fuse box
X172 - Cab transmission harness connection on fuse box
X173 - Cab transmission harness earth
X174 - Autotronic 4 transmission controller
X175 - Emergency control switch
X176 - Earth (Autotronic 4 transmission controller)
X177 - Autotronic 5 Linkage
X178 - ParkLock/suspended front axle/passive suspended cab Autotronic 5
X179 - Main lighting, sidelight/dipped light activation switch
X180 - Front windscreen washer pump
X181 - Front linkage single acting / double acting function switch
X182 - Linkage external lifting switch
X183 - Diagnostics connector (tractor-Isobus CAN)
X184 - Diagnostics connector (engine-valve CAN)
X185 - Sisu EEM unit
X186 - Starter
X187 - Engine start relay
X188 - Engine identification module (ID module)
X189 - Fuel lift pump
X190 - Vistronic fan
X191 - Diesel fuel preheater
X192 - B + alternator 1
X193 - B + alternator 2
X194 - D + alternator 1
X195 - D + alternator 2
X196 - In line fuse (225 A)
X197 - Diesel fuel gauge
X198 - Pneumatic trailer brake sensor
X199 - Work light on left-hand step
X200 - Work light on right-hand step
X201 - Engine harness earth
X202 - Front accessory connection socket harness/front function harness junction
X203 - Engine harness/front headlights harness junction
X204 - Cooling unit harness/engine harness junction
X205 - Front axle harness/engine harness junction
X206 - Sensor detecting water in the diesel fuel
X207 - Pneumatic seat adjustment control
X208 - Front linkage suspension switch LED
X209 - Rear linkage external lowering switch
X210 - Orbitrol steering sensor (SASA sensor)
X211 - Rear Dual Control connector

X212 - Instrument panel harness/armrest harness junction
X213 - Power socket for additional heating
X214 - Armrest harness/cab transmission harness junction
X215 - Trailer connector (right-hand side light and number plate lights)
X216 - Reversing light
X217 - Isobus CAN connector
X218 - External Isobus tool connector
X219 - Cab Isobus harness/external Isobus harness junction
X220 - Trailer connector (left-hand side light)
X221 - Trailer connector (right-hand indicator)
X222 - Trailer connector (left-hand indicator)
X223 - Trailer connector (brake lights)
X224 - Trailer connector (earth)
X225 - Trailer connector (reversing light)
X226 - Trailer connector harness earth
X227 - Console harness/cab transmission harness junction
X228 - Front linkage single/double-acting function LED
X229 - 120 Ohm CAN 1 resistor (cab transmission harness)
X230 - 120 Ohm CAN 2 resistor (cab transmission harness)
X231 - 120 Ohm CAN 3 resistor (cab transmission harness)
X232 - 120 Ohm CAN 4 resistor (cab transmission harness)
X233 - Cab transmission harness/Isobus harness junction
X234 - 120 Ohm CAN ATC resistor
X235 - Front axle steering sensor (WAS sensor)
X236 - Electrohydraulic Orbitrol (grey connector)
X237 - Electrohydraulic Orbitrol (black connector)
X238 - Connector 1 for valve harness
X239 - Connector 2 for valve harness
X240 - 120 Ohm resistor for electrohydraulic spool valves
X241 - Sisu engine preheating supply (Grid Heater)
X242 - Exhaust temperature sensor
X243 - AdBlue/DEF reservoir (urea) level gauge and temperature sensor
X244 - CAN SCR harness
X245 - +12 V APC supply for SCR
X246 - Auto-Guide external harness/engine harness junction
X247 - Roof harness/electric rear-view mirror harness junction
X248 - Right and left-hand electric rear-view mirror adjustment switch
X249 - External rear-view mirror defroster switch
X250 - Power socket in cab
X251 - In line fuse (225 A)
X252 - Automatic air conditioning condenser
X253 - Air filter vacuum sensor
X254 - Horn (earth)
X255 - Horn
X256 - Roof harness/hand rail harness junction
X257 - Side light and indicator on hand rail (right and left)
X258 - Main beam on hand rail (right and left)
X259 - Hand rail upper work light
X260 - Hand rail upper work light
X261 - Front right-hand unit for suspended cab
X262 - Front left-hand unit for suspended cab
X263 - Floating stop relay control (US front-end loader)
X264 - Front linkage suspension switch
X265 - Rear linkage suspension switch indicator light
X266 - Rear linkage diagnostic and lifting/lowering LEDs
X267 - Switch for left-hand side heater
X268 - Pillar harness connection on fuse box
X269 - Cab suspension harness/cab transmission harness junction
X270 - Front accessories connection socket (rotary beacon)
X271 - Front accessories connection socket (+12 V battery)
X272 - Front accessories connection socket (+12 V APC)
X273 - Front accessories connection socket (main beam light)
X274 - Front accessories connection socket (main beam light)
X275 - Front accessories connection socket (work light)
X276 - Earth for front accessory connection socket harness
X277 - Front linkage lifting/lowering external control
X278 - Front linkage lifting switch (external)
X279 - Dual Control or TIC position sensor
X280 - Front linkage rams pressure sensor
X281 - Solenoid valve for front PTO
X282 - Roof harness/cab Auto-Guide harness junction
X283 - TopDock
X284 - Headlights module keyboard
X285 - Ad Blue (urea) metering valve
X286 - Ad Blue (urea) injection valve
X287 - Ad Blue (urea) reservoir preheating valve
X288 - 12/24 V converter for SCR system
X289 - SCR management module
X290 - Front accessory connection socket harness/front function harness junction
X291 - Front accessory connection socket harness/front function harness junction
X292 - Front windscreen washer pump
X293 - 540 rpm PTO switch
X294 - 540 eco rpm PTO switch
X295 - 1000 rpm PTO switch
X296 - USB connector
X297 - PTO/linkage console backlighting
X298 - Headland mode switch (headland function)
X299 - Linkage lowering speed potentiometer
X300 - -
X301 - PTO stop switch on left-hand fender
X302 - Switch for pre-selected engine speed A
X303 - Switch for pre-selected engine speed B
X304 - Instrument panel harness/armrest harness junction
X305 - Headlights module (grey connector)
X306 - Switch for pre-selected engine speed A/B
X307 - FingerTIP 1
X308 - FingerTIP 2
X309 - SV1/SV2 speed regulator switch

X310 - Divider 1 indicator light and solenoid valve (earth)
X311 - Divider 2 indicator light and solenoid valve (+12 V)
X312 - SV1/SV2 speed setting potentiometer in armrest
X313 - Pedal/lever transmission control mode switch and DTM switch
X314 - Hydraulics switch 1, road/field mode
X315 - Hydraulics switch 2, road/field mode
X316 - Headland mode switch (headland function)
X317 - + battery supply for headlights module
X318 - Automatic air conditioning compressor
X319 - + battery supply for headlights module
X320 - + battery supply on headlights module
X321 - + battery supply on headlights module
X322 - + battery supply on headlights module
X323 - + battery supply on headlights module
X324 - +12 V APC fuse box connector (battery isolator switch)
X325 - Pillar harness / non-Isobus implement connector harness junction
X326 - Pillar harness / non-Isobus implement connector harness junction
X327 - Battery earth (chassis)
X328 - Battery isolator switch earth terminal
X329 - Battery isolator switch earth terminal
X330 - Battery negative terminal contact (battery isolator switch)
X331 - Pillar harness connection on fuse box
X332 - + battery (start switch)
X333 - Engine harness earth (chassis)
X334 - Battery isolator switch earth terminal
X335 - Battery isolator switch earth terminal
X336 - Battery isolator switch
X337 - Pneumatic brake ParkLock solenoid valve
X338 - Earth (battery isolator switch)
X339 - Pneumatic trailer braking solenoid valve
X340 - + terminal on battery for fuse box
X341 - Starter supply
X342 - Positive battery terminal
X343 - RS232 diagnostics connector for Auto-Guide
X344 - Isobus connector in cab
X345 - Supply for additional terminal (mitron unit)
X346 - Auto-Guide switch
X347 - Cab transmission harness connection on fuse box
X348 - Cab transmission harness connection on fuse box
X349 - -
X350 - Front right-hand grille work light
X351 - Front right-hand grille work light
X352 - Front right-hand grille work light
X353 - Front left-hand grille work light
X354 - Front left-hand grille work light
X355 - Front left-hand grille work light
X356 - Right-hand main beam and dipped light
X357 - Left-hand main beam and dipped light
X358 - Outside temperature sensor
X359 - Cab suspension harness/cab transmission harness junction
X360 - Pillar harness connection on fuse box
X361 - Pillar harness connection on fuse box
X362 - Fuse box (+12 V battery)
X363 - Auto-hitch (Dromone) switch
X364 - 120 Ohm resistor for Auto-Guide/Isobus CAN network
X365 - Hand rail lower work light
X366 - Pneumatic brake harness / transmission harness junction
X367 - Switch 1 on joystick
X368 - Switch 2 on joystick
X369 - Engine speed + switch
X370 - Engine speed - switch
X371 - Engine speed stop switch
X372 - Orbitrol safety solenoid valve
X373 - Left-hand 12 V socket (cab) (power)
X374 - Left-hand 12 V socket (cab) (backlighting)
X375 - Instrument panel harness/cab transmission harness junction
X376 - Fuse box (reserve for + APC)
X377 - Fuse box (supply for cab suspension compressor)
X378 - FNRP lever and button
X379 - Front left-hand work light on roof
X380 - Front right-hand work light on roof
X381 - Front left-hand work light on roof
X382 - Front right-hand work light on roof
X383 - Front left-hand roof indicator
X384 - Front right-hand roof indicator
X385 - Rear left-hand work light on roof
X386 - Rear right-hand work light on roof
X387 - Rear left-hand work light on roof
X388 - Rear right-hand work light on roof
X389 - Rear left-hand work lights
X390 - Rear right-hand work lights
X391 - Rear left-hand roof indicator
X392 - Rear right-hand roof indicator
X393 - Earth
X394 - Radio aerial connector
X395 - Radio supply
X396 - Radio speaker connector
X397 - Front left-hand speaker
X398 - Front right-hand speaker
X399 - Rear left-hand speaker (+ supply)
X400 - Rear right-hand speaker (+ supply)
X401 - Rear left-hand speaker (- supply)
X402 - Rear right-hand speaker (- supply)
X403 - Rear windscreen wiper motor
X404 - Door switch
X405 - Interior light (earth)
X406 - Interior light (control)
X407 - Interior light (+12 V battery supply)
X408 - Right-hand console light
X409 - Left-hand rotary beacon
X410 - Right-hand rotary beacon
X411 - Rear windscreen wiper switch
X412 - Radio aerial
X413 - Earth (aerial)
X414 - Left-hand number plate light
X415 - Right-hand number plate light
X416 - Radio supply
X417 - Radio speaker connector
X418 - Earth
X419 - Earth
X420 - Rotary beacon harness earth (chassis)

X421 - Earth
X422 - Roof harness earth (chassis)
X423 - Left-hand side fan ON/OFF switch
X424 - Fan speed control knob
X425 - Air conditioning switch
X426 - Air conditioning indicator light
X427 - Manual air conditioning module
X428 - Electronic thermostat for heating
X429 - Speed 1relay for fan
X430 - Speed 2relay for fan
X431 - Speed 3relay for fan
X432 - Speed 4relay for fan
X433 - Left-hand heating resistor
X434 - Right-hand fan
X435 - Left-hand fan
X436 - Left-hand side fan switch
X437 - Relay for left-hand side fan
X438 - Earth (automatic air conditioning)
X439 - Air conditioning control module (blue connector)
X440 - Air conditioning control module (yellow connector)
X441 - Heating temperature sensor
X442 - TT2 sensor
X443 - Evaporator temperature sensor
X444 - Right-hand fan adapter module (signal)
X445 - Left-hand fan adapter module
X446 - Right-hand fan adapter module (supply)
X447 - Left-hand fan adapter module (supply)
X448 - Separation harness for automatic air conditioning
X449 - Motor for left-hand heating shutter
X450 - Motor for right-hand heating shutter
X451 - Motor for heating mixer shutter
X452 - Relay for heater pump
X453 - Heater accelerator pump
X454 - Earth (roof)
X455 - Roof harness earth
X456 - Solar panel
X457 - Earth (Auto-Guide)
X458 - Cab transmission harness/pillar harness junction
X459 - Linkage lifting switch on fender
X460 - Linkage lowering switch on fender
X461 - Pillar harness/TECU harness junction
X462 - Supply indicator light for power socket on pillar
X463 - Earth (Isobus)
X464 - Pillar harness/armrest harness junction
X465 - Battery positive terminal contact
X466 - Active suspended cab Autotronic 5
X467 - Right-hand electric rear-view mirror
X468 - Left-hand electric rear-view mirror
X469 - Additional fan connection
X470 - Operator presence in seat switch
X471 - Suspended cab harness connection

Identification of harnesses
FAI200 - Engine harness
FAI201 - Front headlights harness
FAI202 - Suspended front axle harness
FAI203 - Transmission harness
FAI204 - Cab/platform linkage external harness
FAI205 - Electrohydraulic valves harness
FAI206 - Transmission harness — PTO
FAI207 - Front Dual Control harness
FAI208 - Linkage with Dual Control and TIC harness
FAI209 - Instrument panel harness
FAI210 - Cab transmission harness
FAI211 - Cab linkage harness
FAI212 - Lighting harness
FAI213 - Cab interior lighting harness
FAI214 - Armrest harness
FAI215 - Pillar harness
FAI216 - Diagnostics connector harness
FAI217 - Datatronic 3 harness
FAI218 - Fieldstar harness
FAI219 - Cab interior power socket harness
FAI220 - BOC harness — safety switch
FAI221 - Automatic air conditioning harness — instrument panel
FAI222 - Autotronic 5 ParkLock/suspended front axle harness
FAI223 - Roof harness
FAI224 - Hand rail lighting harness
FAI225 - Electric rear-view mirror harness
FAI226 - Roof/external harness
FAI227 - Automatic air conditioning harness - roof
FAI228 - Number plate lighting harness
FAI229 - Xenon light adapter harness
FAI230 - GSPTO harness
FAI231 - Transmission harness — ParkLock
FAI232 - Radio harness
FAI235 - Front accessory connection socket harness
FAI236 - Start-up harness
FAI237 - +12 APC fuse box harness
FAI238 - +12 APC instrument panel harness
FAI239 - Permanent +12 V supply harness
FAI240 - +12 V permanent fuse box harness
FAI241 - Automatic air conditioning adapter harness
FAI242 - Main beams on hand rail adapter harness
FAI243 - Circuit breaker harness
FAI244 - Linkage external controls extension harness
FAI245 - Left-hand linkage external controls harness
FAI246 - Right-hand linkage external controls harness
FAI247 - PTO shunt harness
FAI248 - Linkage external controls harness
FAI249 - Suspended front axle harness
FAI250 - Engine harness
FAI251 - Parking brake harness
FAI252 - +12 V battery harness
FAI253 - Hand rail harness
FAI254 - Windscreen wiper harness
FAI255 - Windscreen wiper harness
FAI256 - High-visibility roof heating harness
FAI257 - High-visibility roof heating harness
FAI258 - Roof earth harness
FAI260 - Cooling unit harness
FAI261 - Isobus harness
FAI262 - Auto-Guide engine harness
FAI263 - Auto-Guide cab adapter harness
FAI265 - Pneumatic brake harness
FAI267 - Console harness
FAI268 - Front function harness
FAI271 - Cab electric rear-view mirror harness
FAI272 - Active suspended cab harness

FAI273 - Front linkage harness
FAI274 - Rear right-hand lighting harness
FAI275 - Trailer connector harness
FAI276 - Rear left-hand lighting harness
FAI280 - Negative battery harness
FAI281 - Negative battery harness
FAI282 - Negative battery harness
FAI283 - TopDock harness
FAIxxx - Non-Isobus tool connector harness
FAIxxx - Non-Isobus implement connector controller harness
FAIxxx - Additional fan harness

B.2 Fuse box supply with circuit breaker

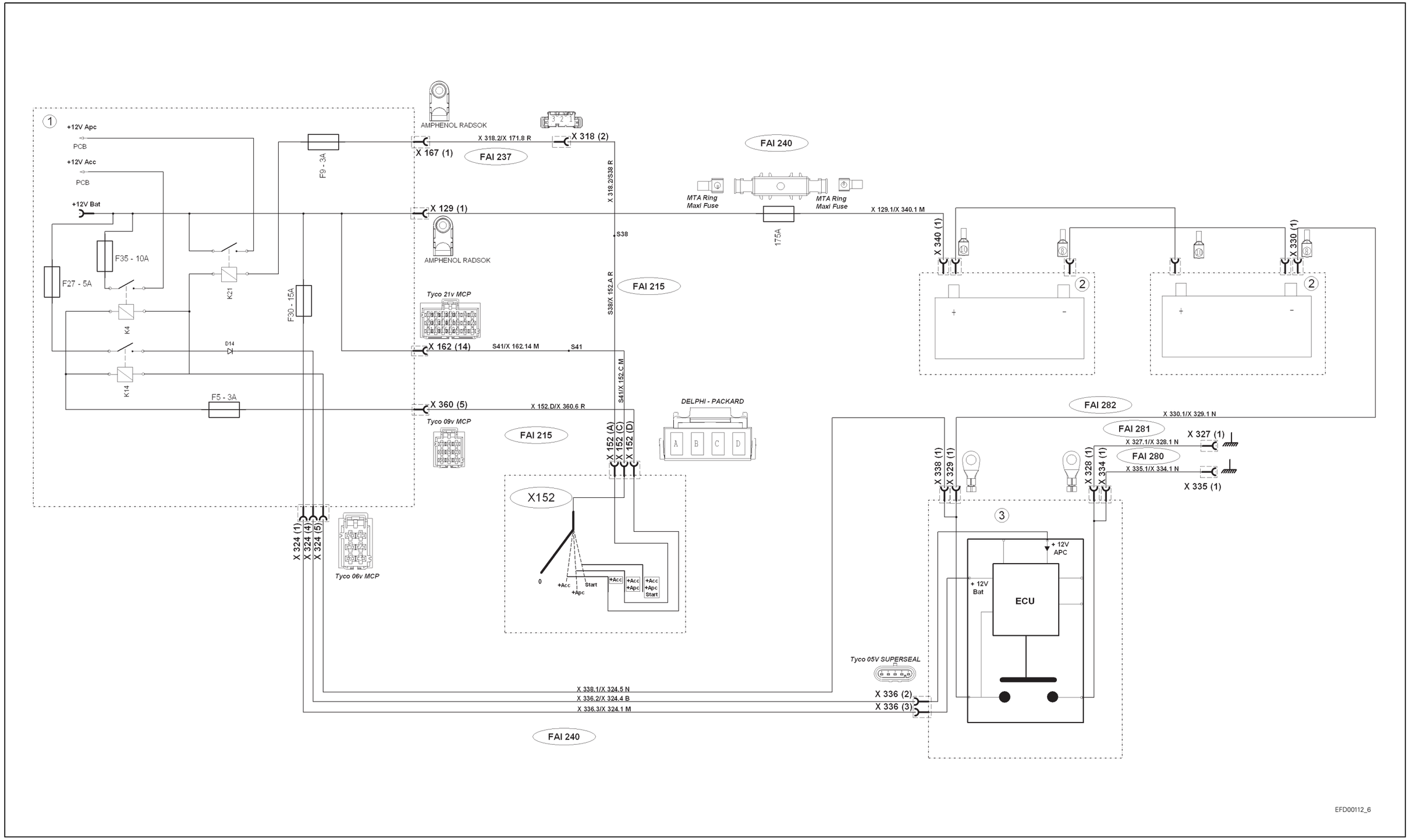

Fig. 2

B.3 Autotronic 4 electrical power supply

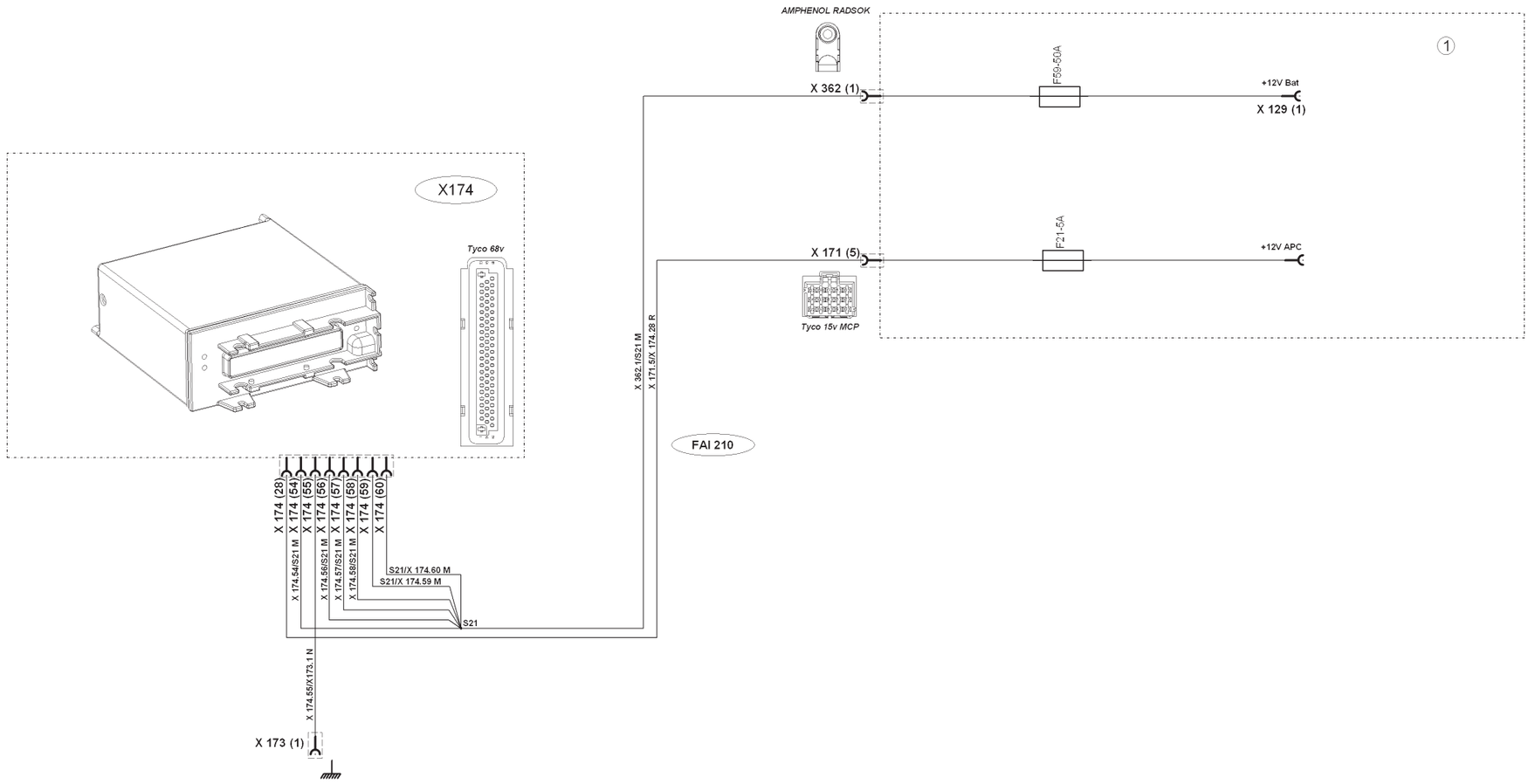

Fig. 3

B.4 Autotronic 5 linkage electrical power supply

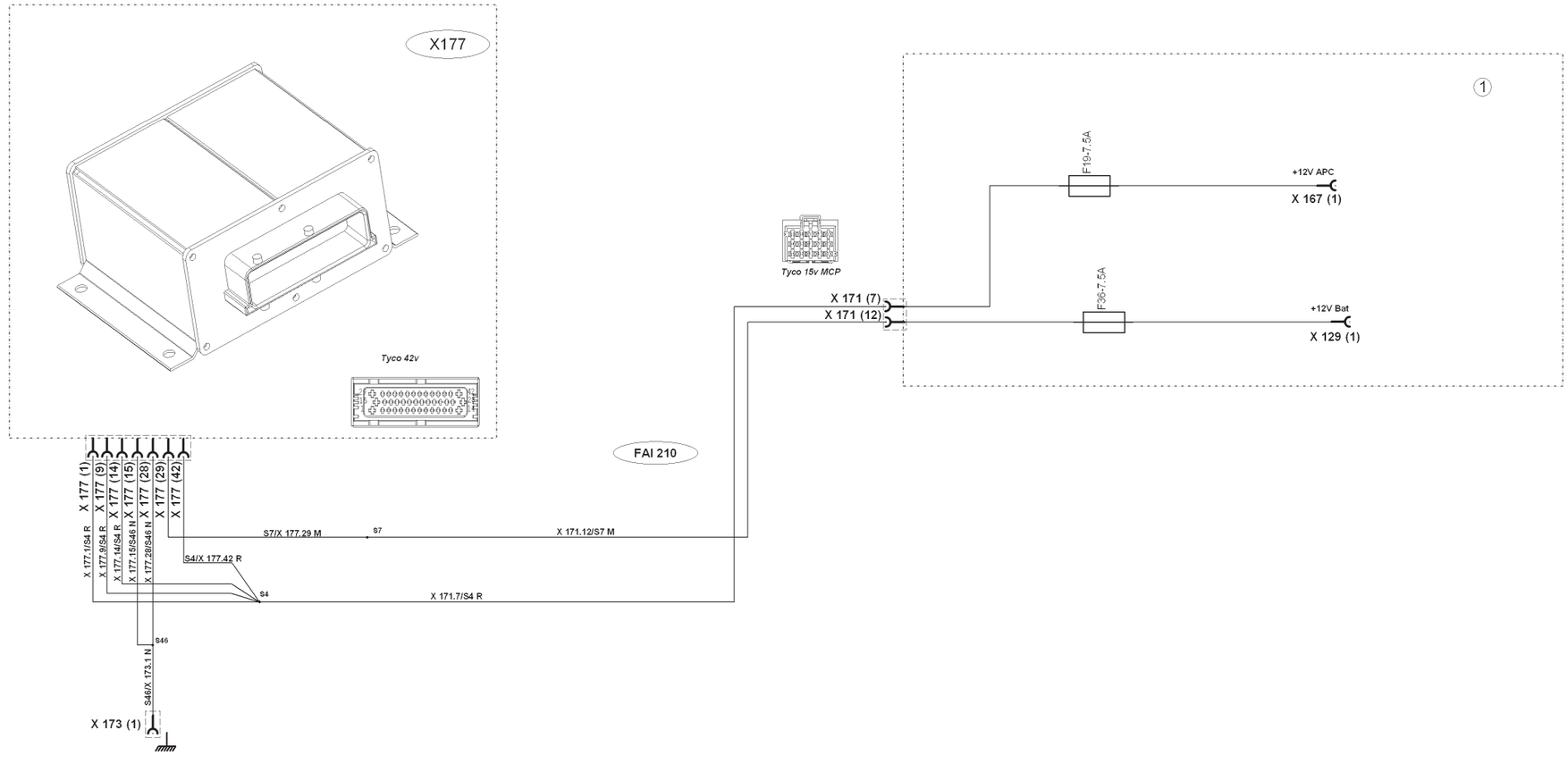

Fig. 4

B.5 Autotronic 5 ParkLock/suspended front axle electrical power supply

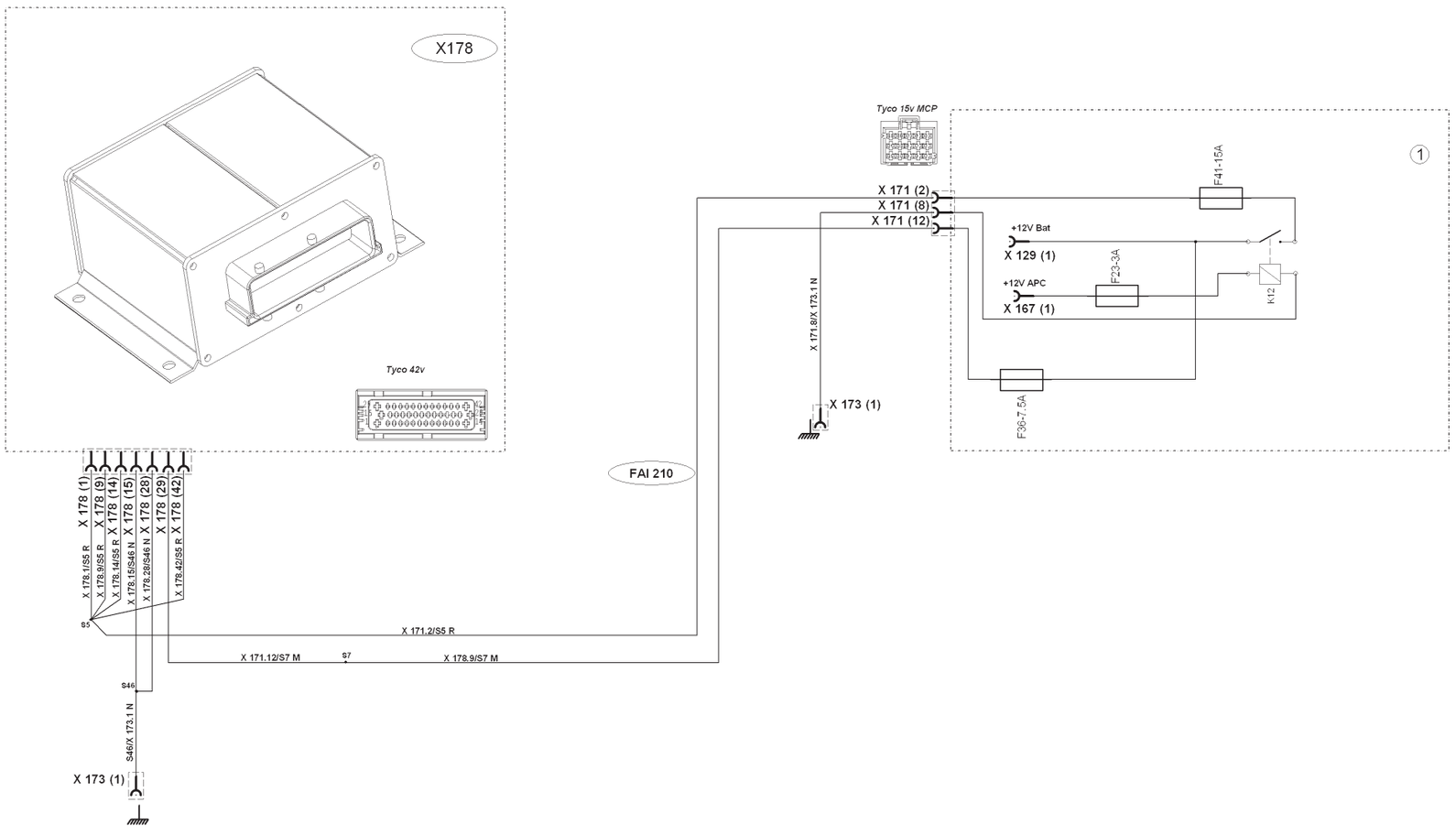

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Fig. 5

B.6 DCC3 instrument panel electrical power supply

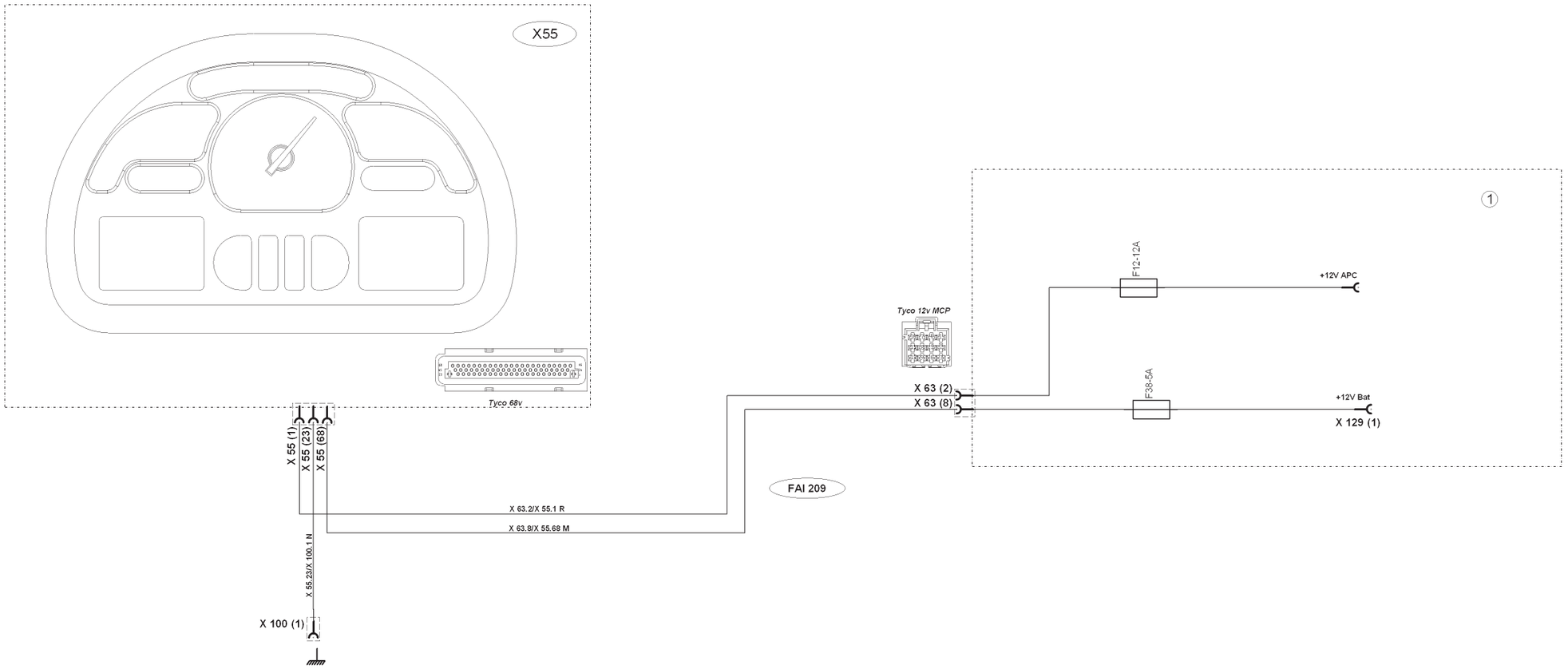

Fig. 6

B.7 Autotronic 5 armrest electrical power supply

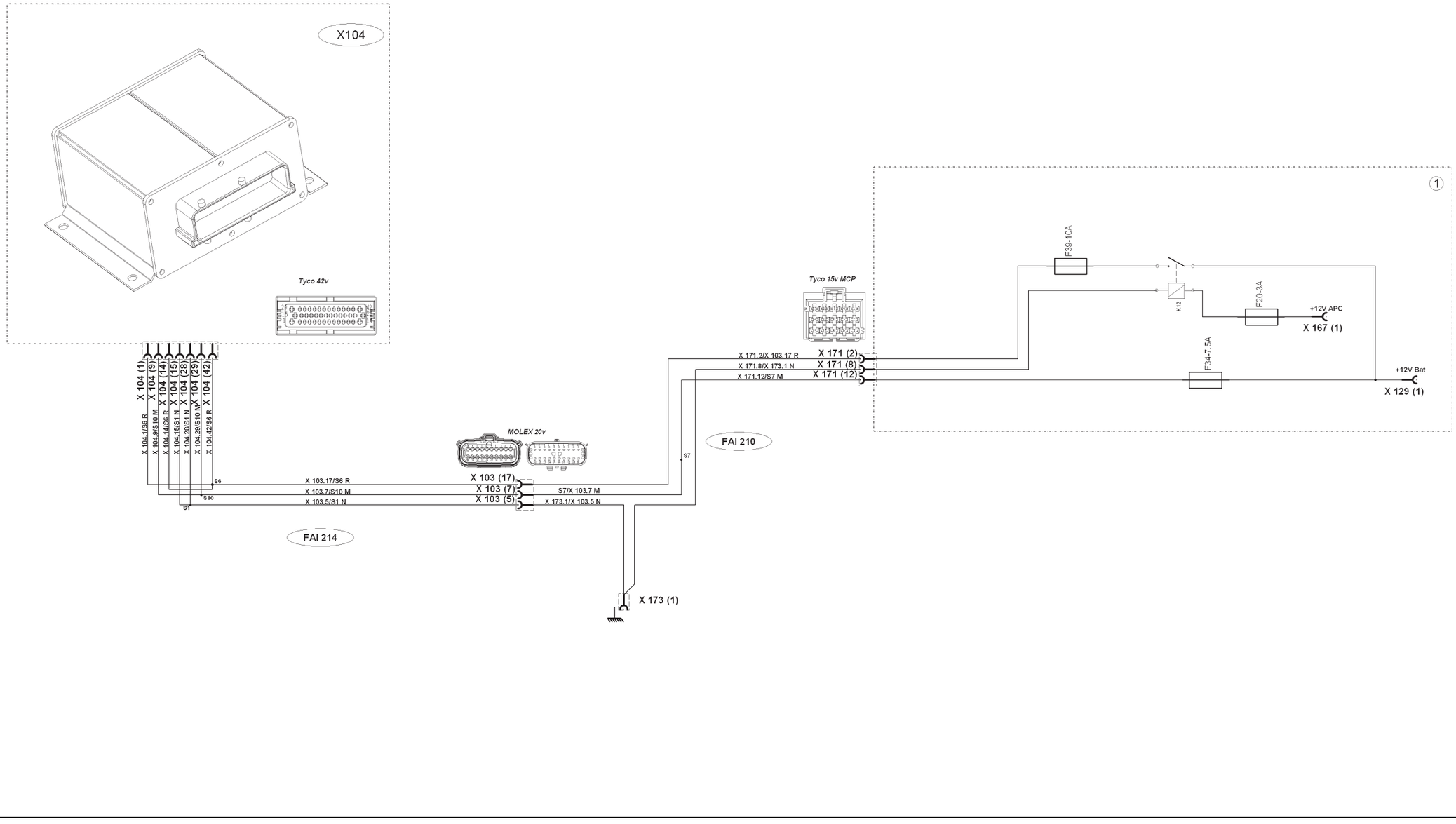

Fig. 7

B.8 Autotronic 5 active suspended cab electrical power supply

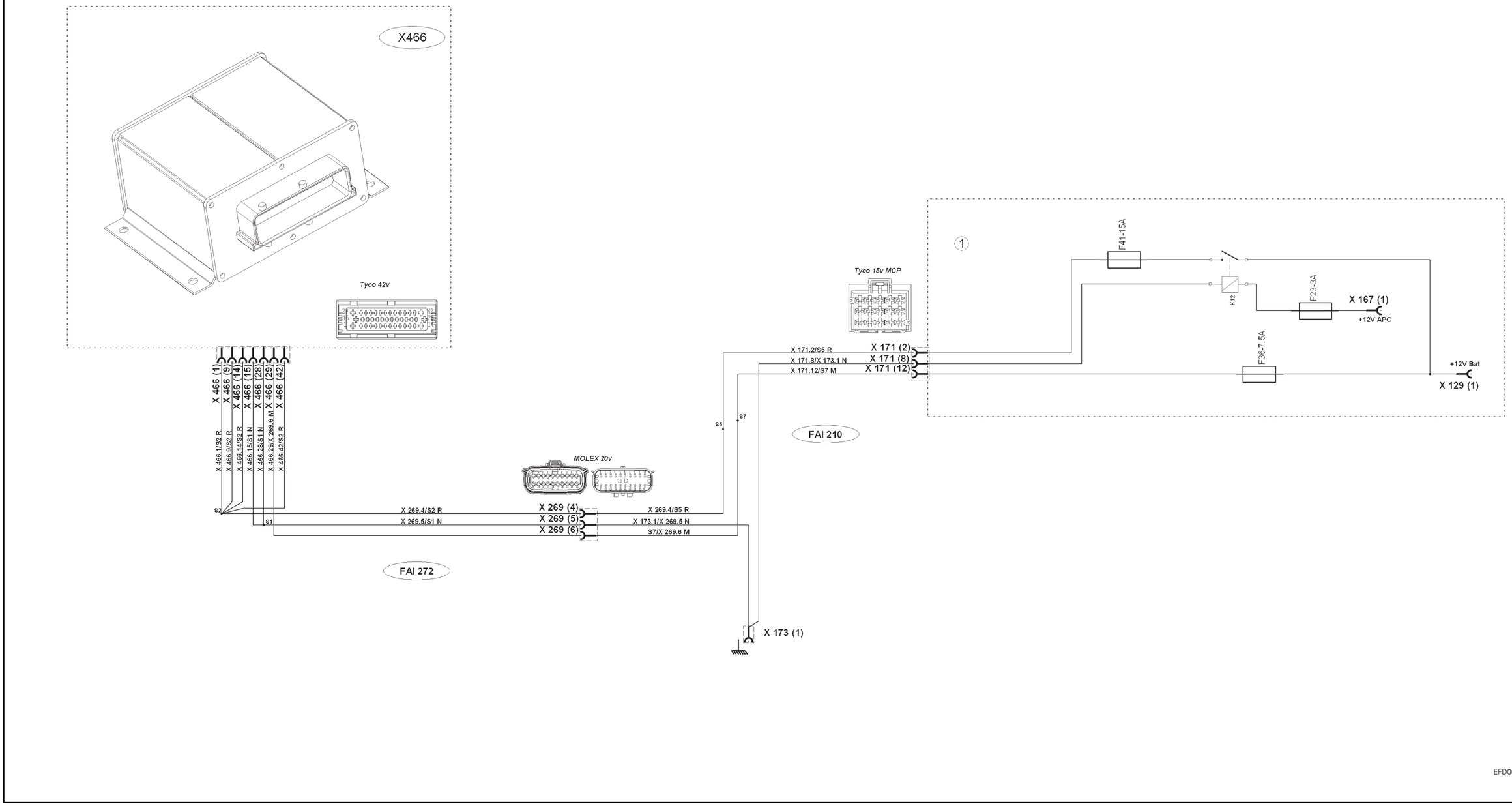

Fig. 8

B.9 Sisu EEM electronic unit electrical power supply

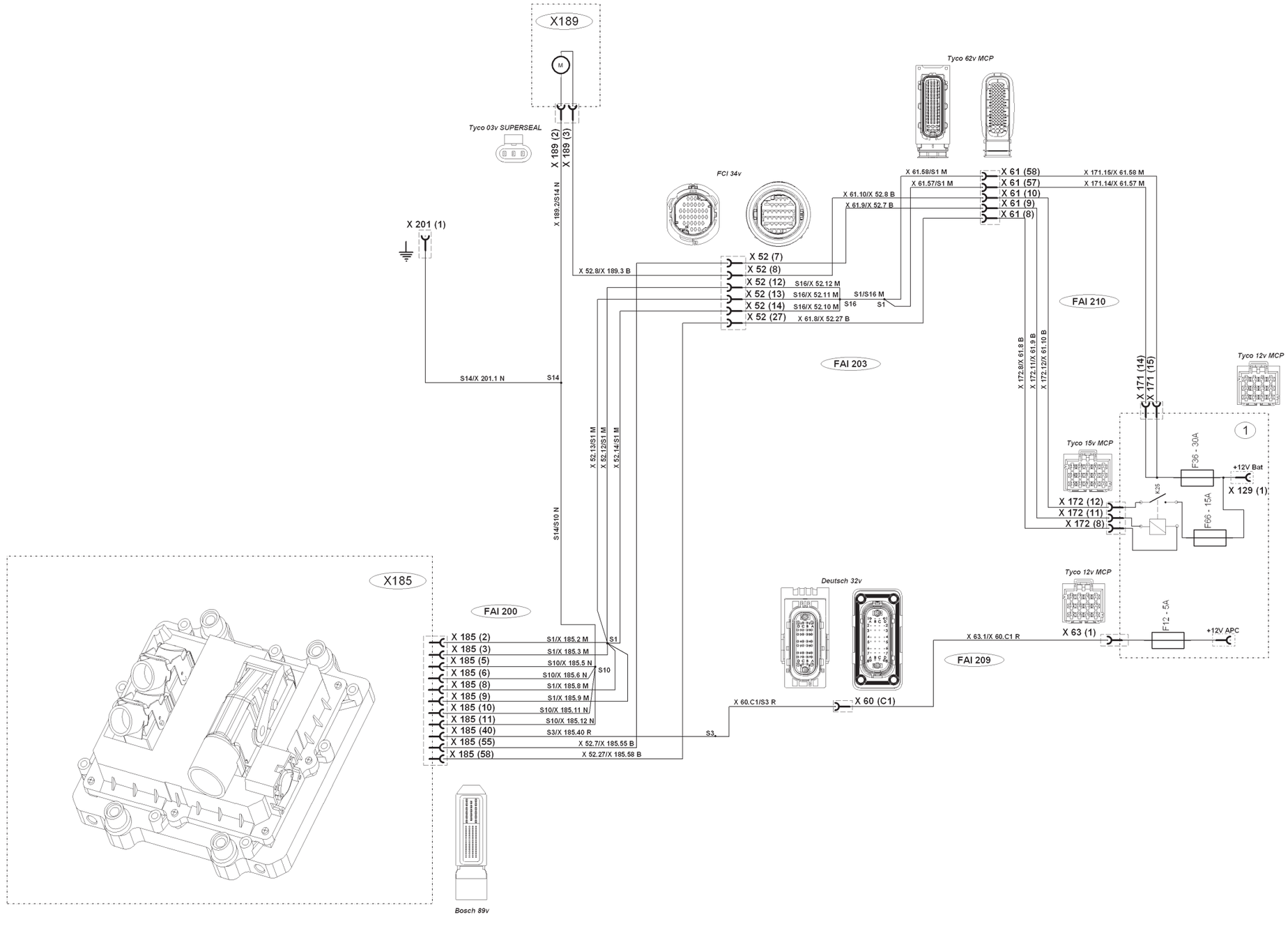

Fig. 9

B.10 Automatic air-conditioning unit electrical power supply

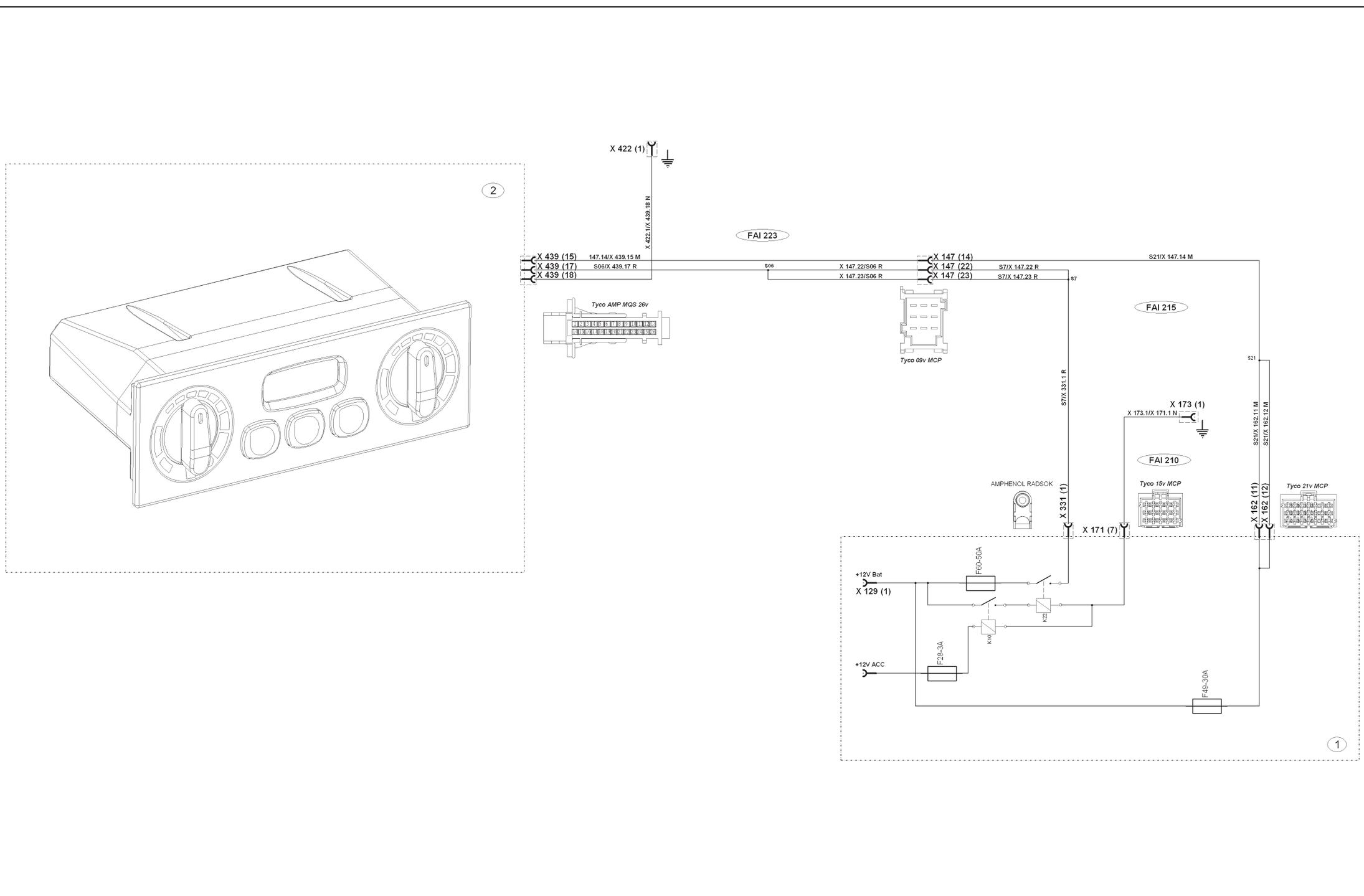

Fig. 10

B.11 Diagnostics connector electrical power supply

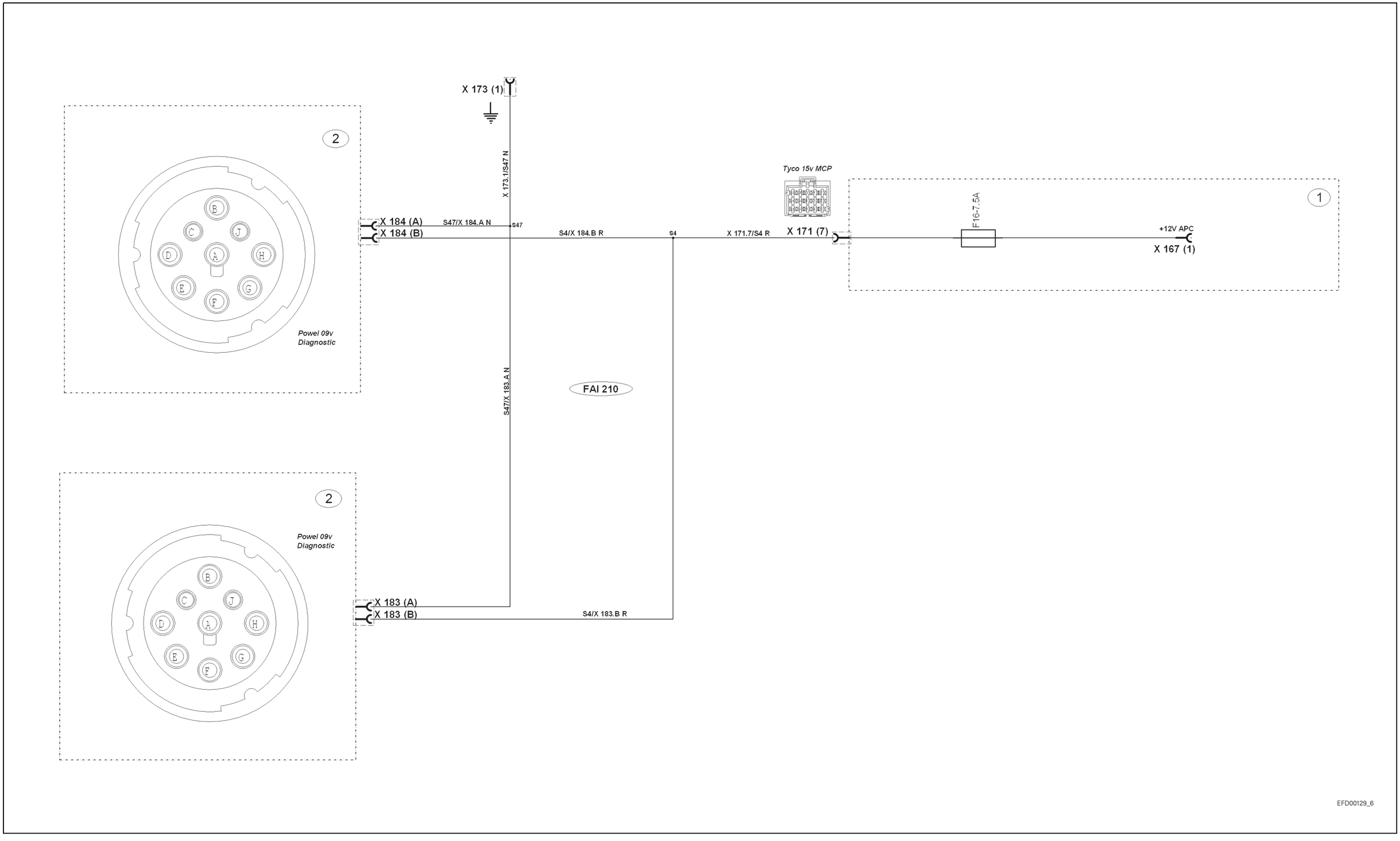

Fig. 11

B.12 Tractor CAN network

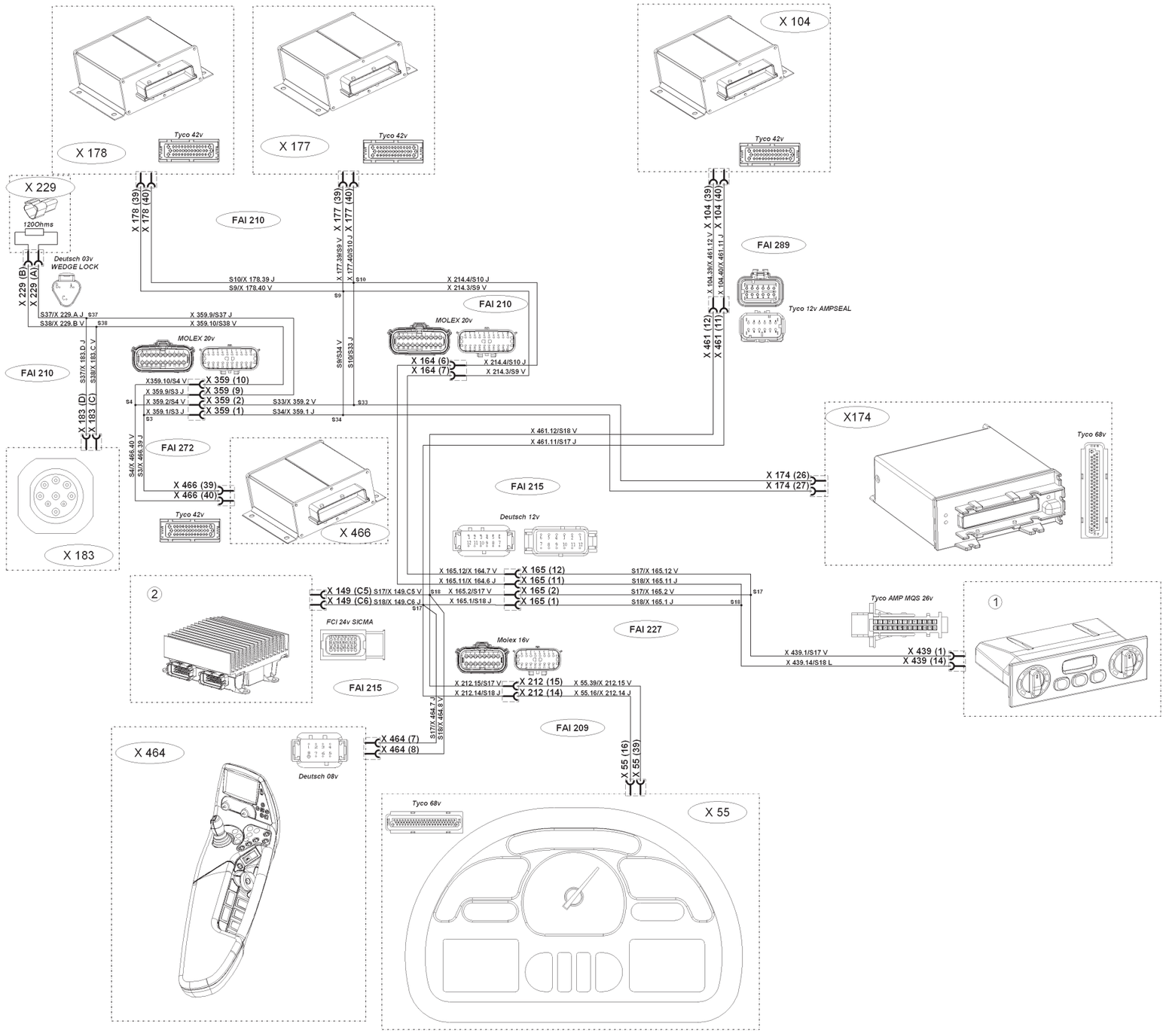

Fig. 12

B.13 Engine CAN network

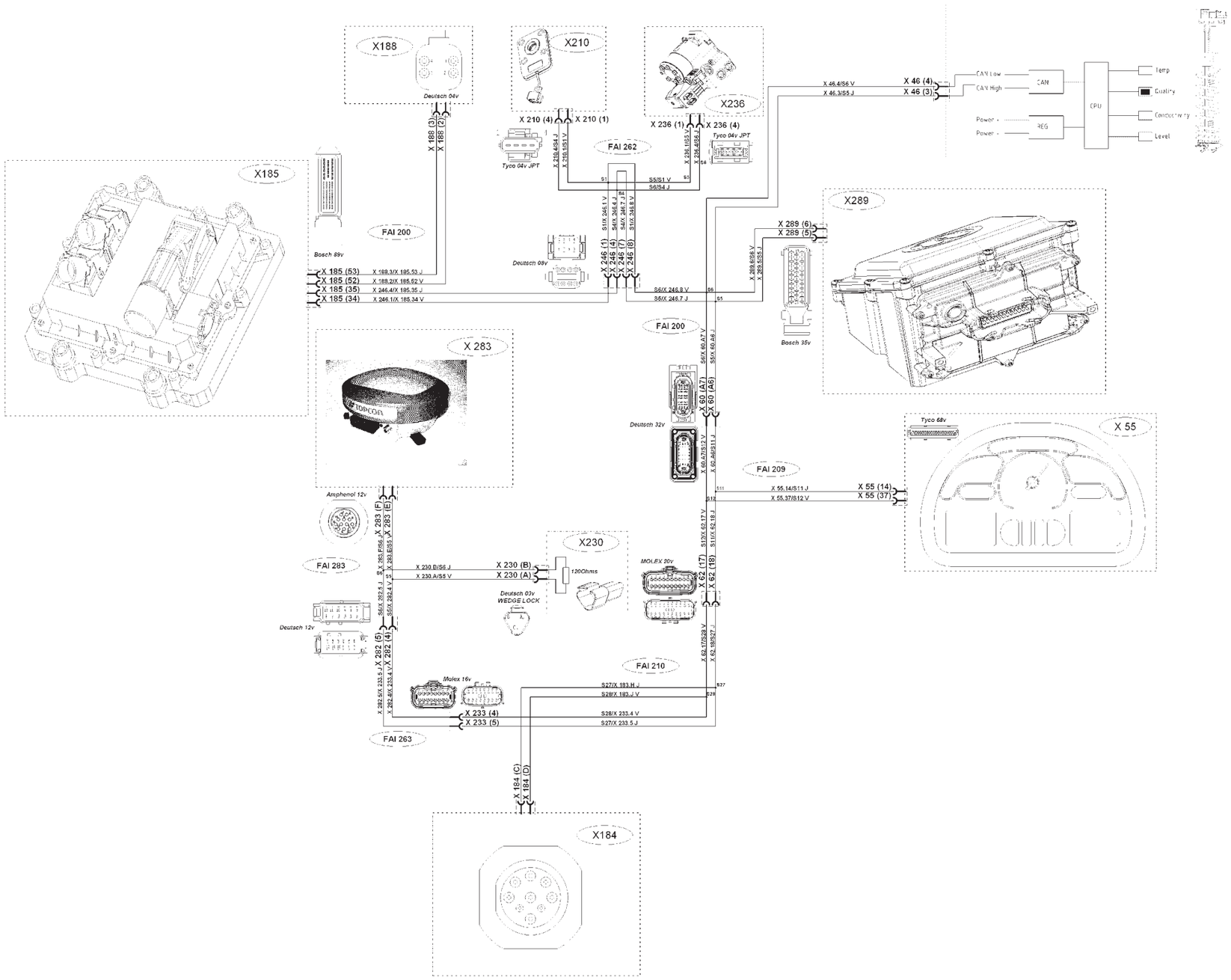

Fig. 13

B.14 Linkage CAN network

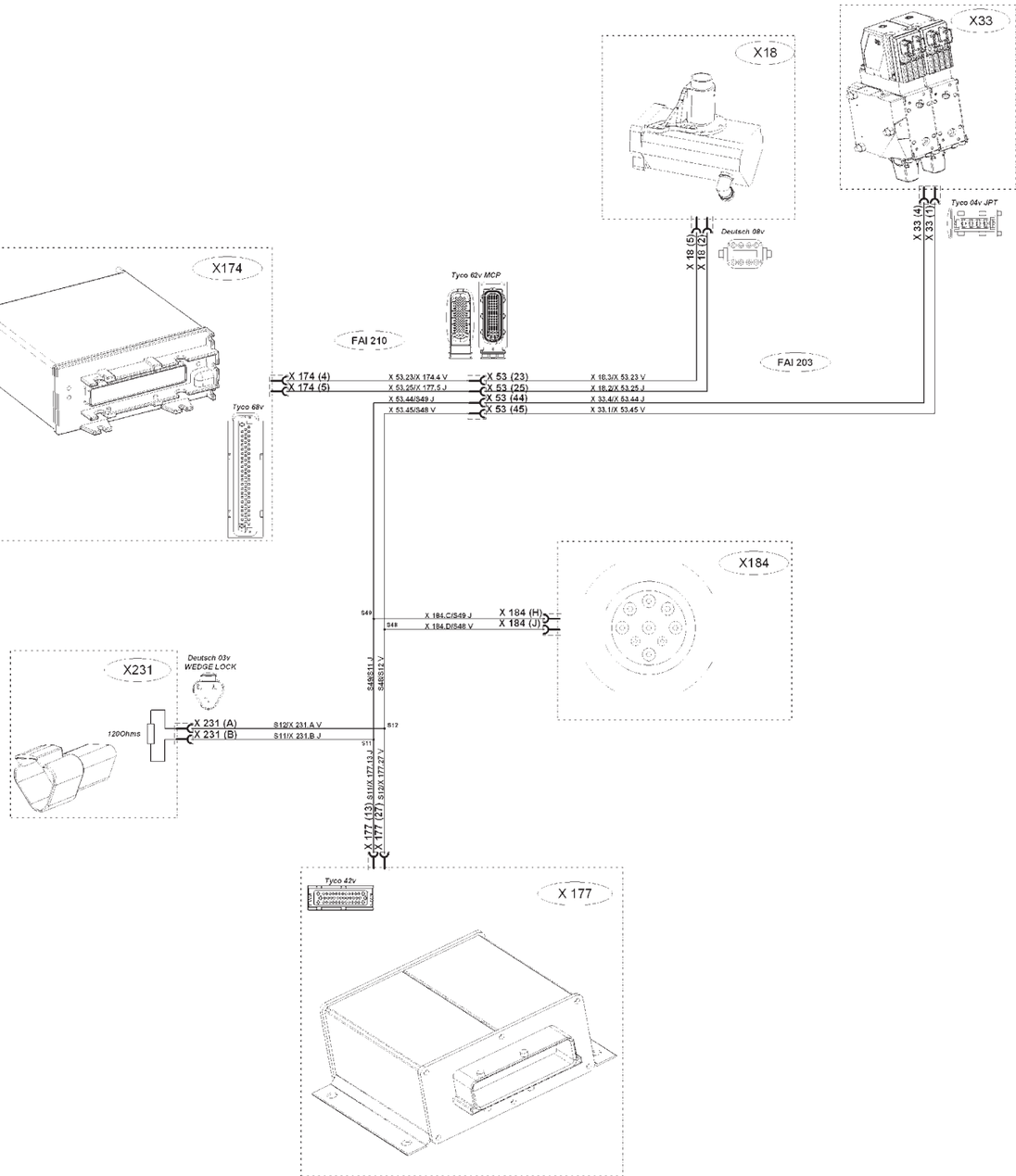

Fig. 14

B.15 Isobus CAN network

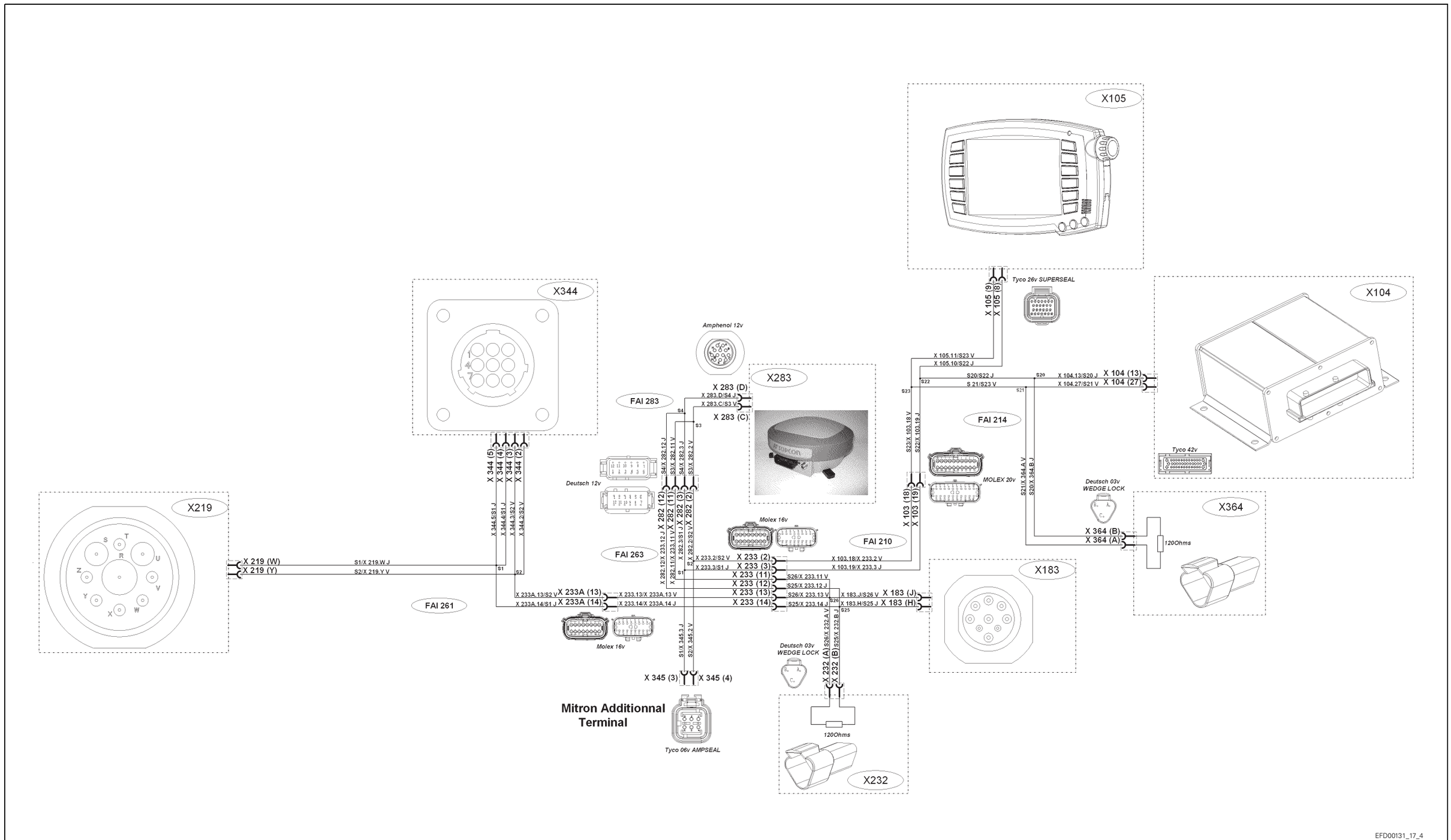

Fig. 15

B.16 Rear power take-off (PTO)

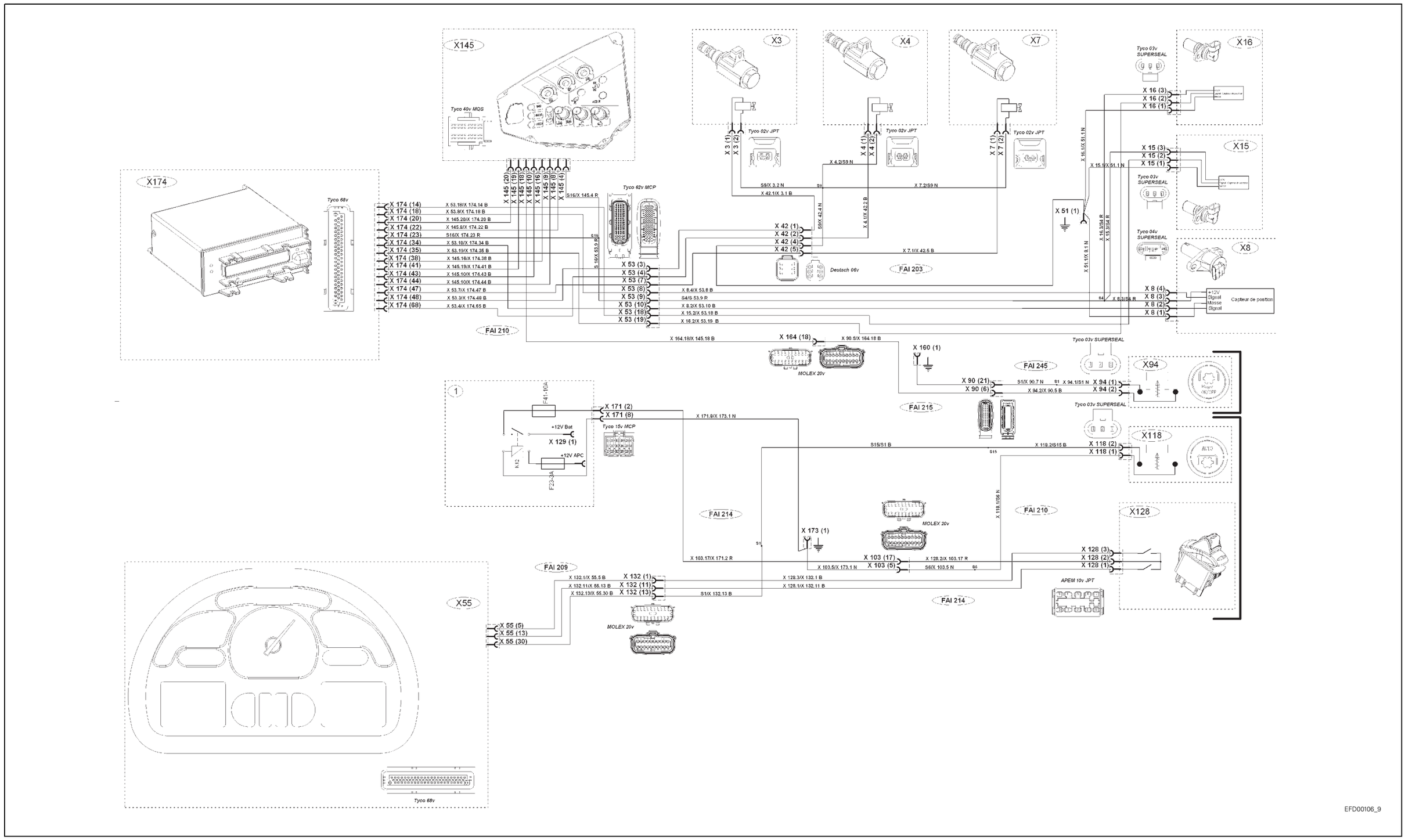

Fig. 16

7A13

HA260/Power take-off - Layout of components

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A. Power take-off (PTO) components - parts list

Ref.	Component description	Location
(A)[1]	PTO assembly	At the rear of the rear axle
(B)[1]	ON control selector switch	On the armrest in the cab
(C)[1]	OFF control selector switch	On the armrest in the cab
(D)[1]	Automatic mode selector switch	On the armrest in the cab
(E)[1]	PTO speed selector switch	In the cab
(F)[1]	PTO external control	Rear fenders
(G)[1]	PTO external control	Rear fenders
(H)[1]	Solenoid valve unit	On the rear axle
(I)[1]	1000 rpm solenoid valve	On the rear axle
(J)[1]	750 rpm solenoid valve	On the rear axle
(K)[1]	PTO clutch solenoid valve	On the rear axle
(1)	Shim	In front of the PTO clutch
(2)	Roller bearing	In front of the PTO clutch
(3)	Clutch bell housing	PTO top section
(4)	Screw	Under the PTO clutch bell housing
(5)	Shim	In the PTO clutch
(6)	Clutch inner shaft	In the PTO clutch
(8)	Shim	In the PTO clutch
(9)	Spring washer	In the PTO clutch
(10)	Set of discs and backing plates	In the PTO clutch
(11)	Thrust plate	In the PTO clutch
(12)	Disc	In the PTO clutch
(13)	Piston	In the PTO clutch
(14)	Ring	In the PTO clutch
(16)	Seal	In the PTO clutch
(18)	Plate	In the PTO clutch
(19)	Seal	In the PTO clutch
(20)	Shaft	Behind the PTO clutch
(21)	Screw	Behind the PTO clutch
(22)	Lock washer	Behind the PTO clutch
(23)	Socket	Behind the PTO clutch
(25)	Gear	Behind the PTO clutch
(28)	Roller bearing	Behind the PTO clutch
(29)	Nozzle	At the end of the shaft
(31)	Circlip	Behind the PTO clutch
(32)	Seal	Behind the PTO clutch
(35)	Brake disc	Behind the PTO clutch
(36)	Bearing	In front of the PTO clutch
(37)	Ring with square section	In the PTO clutch
(38)	Grub screw	At the end of the shaft
(39)	Nozzle	At the rear of the clutch
(40)	Sensor	On the PTO housing
(42)	Primary shaft	In front of the clutch
(101)	Roller bearing	PTO secondary shaft
(102)	Shim	PTO secondary shaft

Ref.	Component description	Location
(104)	Drive body	PTO secondary shaft
(105)	Roller	PTO secondary shaft
(107)	Circlip	PTO secondary shaft
(108)	Washer	PTO secondary shaft
(109)	Needle roller cage (X2)	PTO secondary shaft
(110)	Spacer	PTO secondary shaft
(112)	Circlip	PTO secondary shaft
(113)	Bearing	PTO secondary shaft
(114)	Circlip	PTO secondary shaft
(115)	Screw	PTO secondary shaft
(116)	Stop	PTO secondary shaft
(118)	Gear (1000 rpm)	PTO secondary shaft
(118a)	Gear (540 or 750 rpm)	PTO secondary shaft
(120)	Shaft	PTO secondary shaft
(121)	Circlip	PTO secondary shaft
(122)	Washer	PTO secondary shaft
(123)	Roller bearing	PTO secondary shaft
(124)	Shim	PTO secondary shaft
(125)	Grub screw	PTO secondary shaft
(126)	Seal	PTO secondary shaft
(127)	Seal	PTO secondary shaft
(128)	Bearing cover	PTO secondary shaft
(129)	Screw	PTO secondary shaft
(132)	Spacer	PTO secondary shaft
(133)	Threaded stud M10-50 - cl 10.9	PTO secondary shaft
(134)	Nut M10-10	PTO secondary shaft
(135)	PTO protection	On PTO output shaft
(137)	Output shaft	PTO lower section
(139)	Sensor	On the bearing cover
(140)	Screw	On the bearing cover
(201)	Actuator plate	Behind the PTO secondary shaft
(202)	Nut	Behind the PTO secondary shaft
(203)	Screw	Behind the PTO secondary shaft
(205)	Screw	Behind the PTO secondary shaft
(206)	Nut	Behind the PTO secondary shaft
(207)	Spacer	Behind the PTO secondary shaft
(210)	Nut	Behind the PTO secondary shaft
(211)	Counter-nut	Behind the PTO secondary shaft
(212)	Washer	Behind the PTO secondary shaft
(213)	Nut	Behind the PTO secondary shaft
(214)	Roller	Behind the PTO secondary shaft
(216)	Screw	Behind the PTO secondary shaft
(217)	Ram	Behind the PTO secondary shaft
(218)	"O" ring	Behind the PTO secondary shaft
(219)	Seal ring	Behind the PTO secondary shaft
(220)	Seal ring	Behind the PTO secondary shaft
(221)	Spring	Behind the PTO secondary shaft
(222)	Piston	Behind the PTO secondary shaft

Ref.	Component description	Location
(224)	Piston	Behind the PTO secondary shaft
(225)	Screw	Behind the PTO secondary shaft
(226)	Ram	Behind the PTO secondary shaft

(1) Depending on equipment

B. Rear power take-off components - diagram

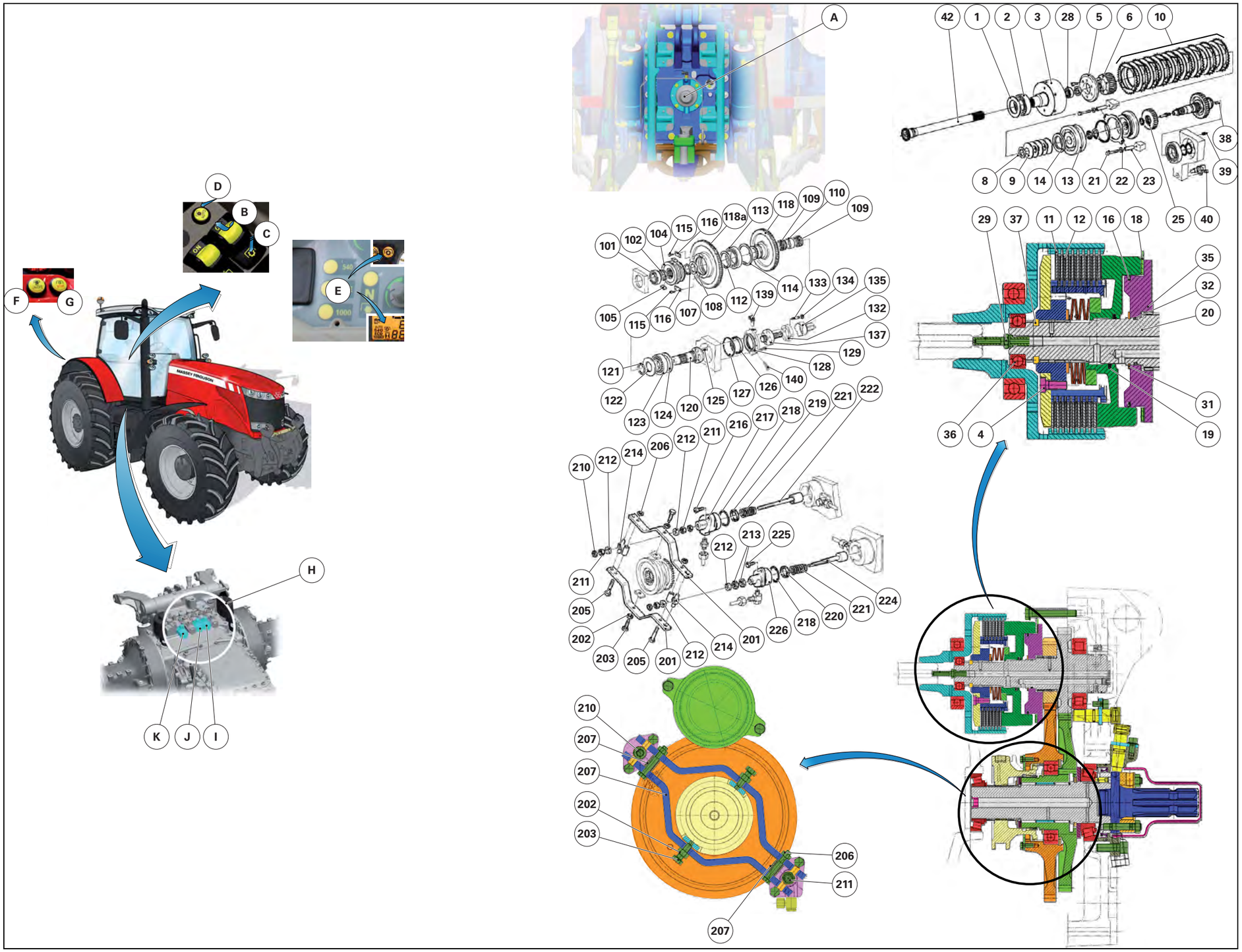

Fig. 1

7A14

HA260/Power take-off - Tests and diagnostics

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A. Hydraulic tests

A.1 Supply pressure measurements

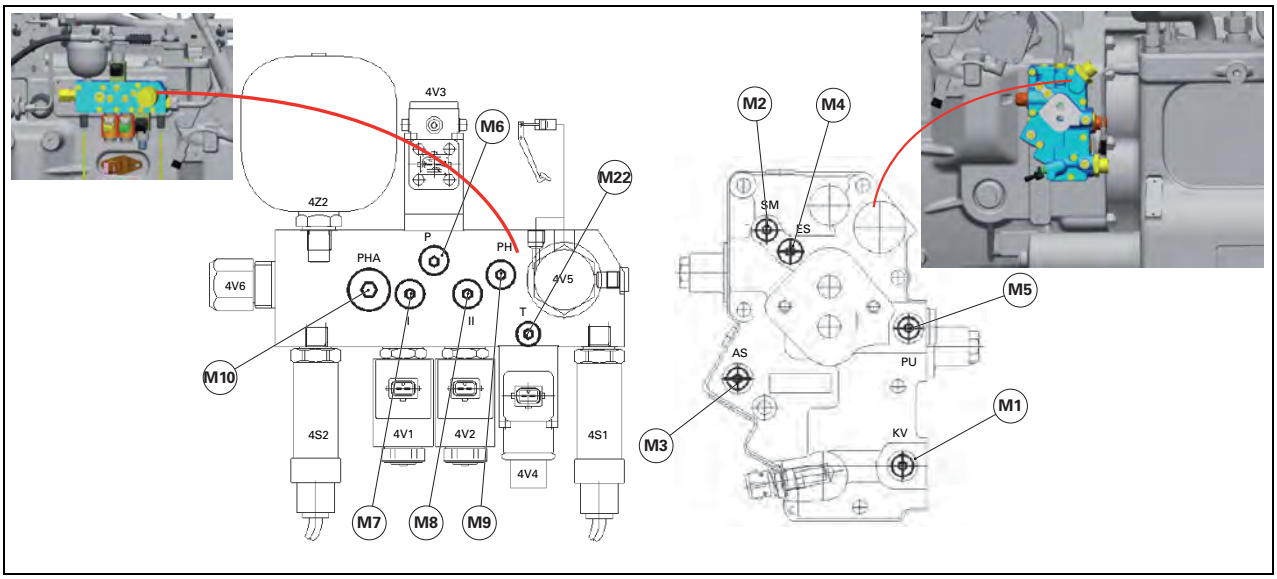

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Fig. 1

Measurement points	Reference on component	Description
M1	KV	Cooler upstream pressure
M2	SM	Lubricating pressure
M3	AS	Flushing pressure
M4	ES	Fuel lift pressure
M5	PU	Service pump pressure
M6	P	Transmission system pressure
M7	I	Tortoise range engaging pressure
M8	II	Hare range engaging pressure
M9	PH	High pressure (HP)
M10	PHA	Rear axle and brake system pressure
M22	T	Oil leak on clutch function spool valve / coupler function solenoid valve

Precaution to be taken during the pressure measurements: the oil temperature must be between 35°C and 45°C.

IMPORTANT: *When measuring the transmission pressure, raise all wheels of the tractor to prevent accidents.*

1. Set transmission ratio (hare/tortoise) to speed of 0.

2. Release the hand brake.

3. Engage the front axle.

4. Differential lock and PTO clutch are not engaged.

On right-hand side, in the middle of the tractor:

5. Remove right-hand rear wheel and the protection plate.

6. Connect a pressure gauge. Measure the pressures set out below according to the different engine speeds (see settings table below)
- PU Pressure (M5). Pressure measuring point located between the service pump and the pressure filter.
- P Pressure (M6). System pressure downstream of pressure filter.
- ES charge pressure.
- AS flushing or discharge pressure.
- SM transmission lubricating pressure.

Set values for pressure measurement

Engine speeds	PU (M5)	P (M6)	ES (M4)	AS (M3)	SM (M2)
800	25 bar ± 2 bar	25 bar ± 2 bar	16 bar ± 2 bar	9 bar ± 2 bar	2 bar ± 0.4 bar
1200	26 bar ± 2 bar	25.5 bar ± 2 bar	19 bar ± 2 bar	11 bar ± 2 bar	3 bar ± 0.5 bar
1600	27 bar ± 2 bar	26 bar ± 2 bar	21 bar ± 2 bar	13 bar ± 2 bar	4.2 bar ± 0.6 bar
2000	28 bar ± 2 bar	27 bar ± 2 bar	24.5 bar ± 3 bar	16 bar ± 2.5 bar	5.5 bar ± 0.8 bar

A.2 High pressure (HP) measurements

DANGER: High pressure measurements must never exceed a maximum of 5 seconds, to prevent the oil from heating.

Preliminary steps
Engage hare range and set the starting speed to maximum, or transmission to limp home mode (do not turn the control unit by more than 15° in order to avoid heating the oil).

Measurement points	Engine speed	Specified value:
PH (M9)	1600	540 bar + 20 bar

NOTE: *Load the hydrostatic loop for a maximum of 5 seconds before taking the following measurements.*

Measurement points	Engine speed	Specified value
P (M6)	1600	26 bar ± 2 bar
ES (M4)	1600	22 bar ± 2 bar
AS (M3)	1600	15 bar ± 2 bar
SM (M2)	1600	3.5 bar ± 0.4 bar

NOTE: *If the high pressure PH is not reached, but the AS and ES pressures are correct, check the clutch pressure relief valves 4V4 and 4V5.*

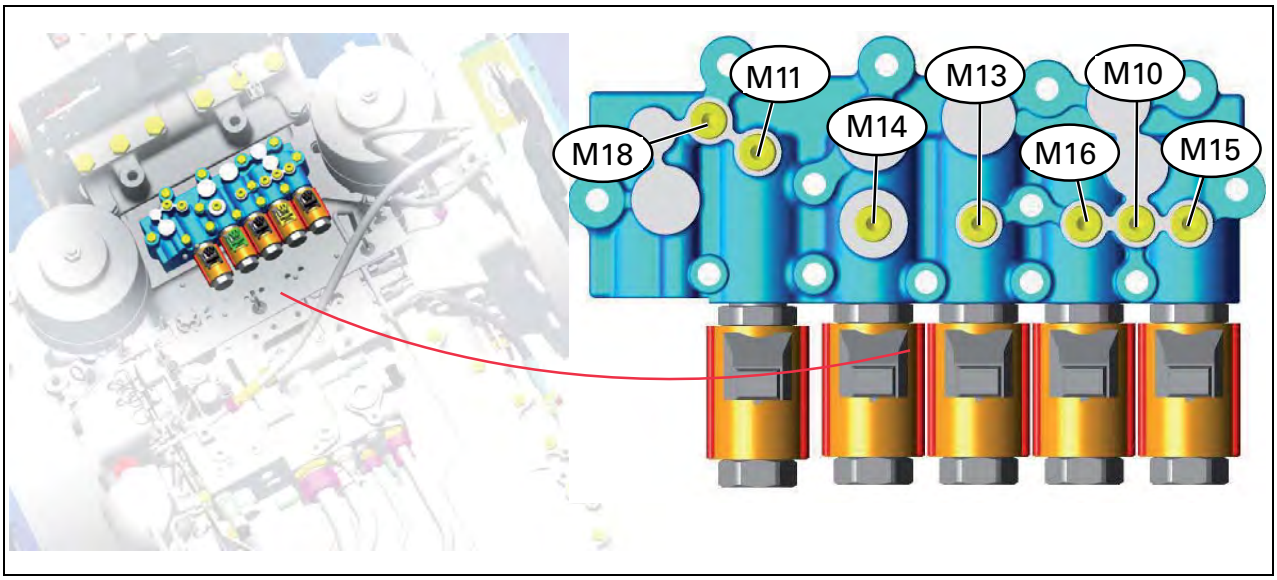
A.3 Shifting pressure measurements

Measurement points	Engine speed	Specified value:
In Hare or Tortoise range (M7/M8)	1600	26 bar ± 2 bar

NOTE: *Alternately supply solenoid valves 1 (4V1) and 2 (4V2) with a 12 V (DC) supply*

A.4 Rear PTO, differential lock and front axle clutch solenoid valve measurement

NOTE: *The unit is located on the rear axle housing, behind the spool valves. Access is limited, so great care must be taken.*



I008345

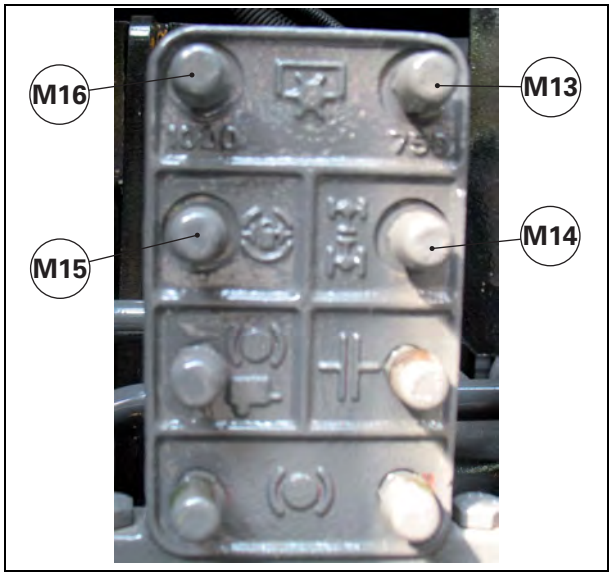
Fig. 2

M10 Rear axle, brakes and front PTO system pressure
M11 Rear PTO clutch
M13 750 rpm PTO selector pressure
M14 Front axle clutch (4WD)
M15 Differential lock
M16 1000 rpm PTO selector pressure
M18 Rear axle lubricating pressure

The pressure connectors can be accessed from the rear of the tractor.

NOTE: *Run the engine at 1200 rpm. Simultaneously check the pressure at unions M10 and M18 (SM).*

Switching status of components that consume electricity	Measurement points	M10 system pressure	M18 lubricating pressure
Power take-off - On / Off	M11	18 bar ± 0.2 bar	2 bar ± 0.3 bar
Differential lock - On/Off	M15	18 bar ± 0.2 bar	2 bar ± 0.3 bar
Front axle (4WD) - On / Off	M14	18 bar ± 0.2 bar	2.1 bar ± 0.3 bar
Activation of locked brake pedal		18 bar ± 0.2 bar	1.2 bar ± 0.3 bar

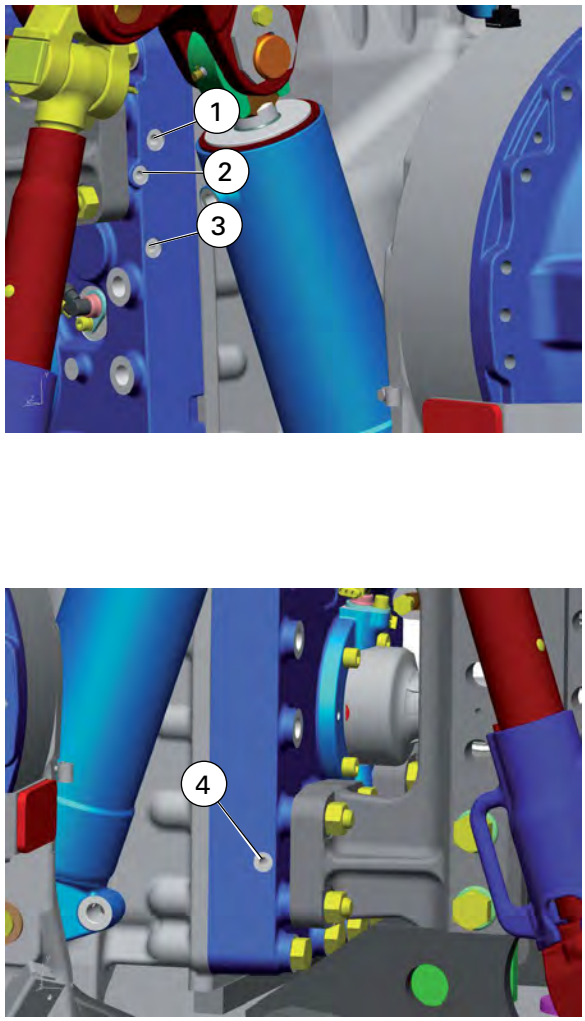


I008346

Fig. 3

(1) Rear PTO clutch (M12 - 1.5 union)
(2) Rear axle lubricating pressure (M10 - 1 union)
(3 - 4) 750 or 540 speed selection (M10 - 1 union)

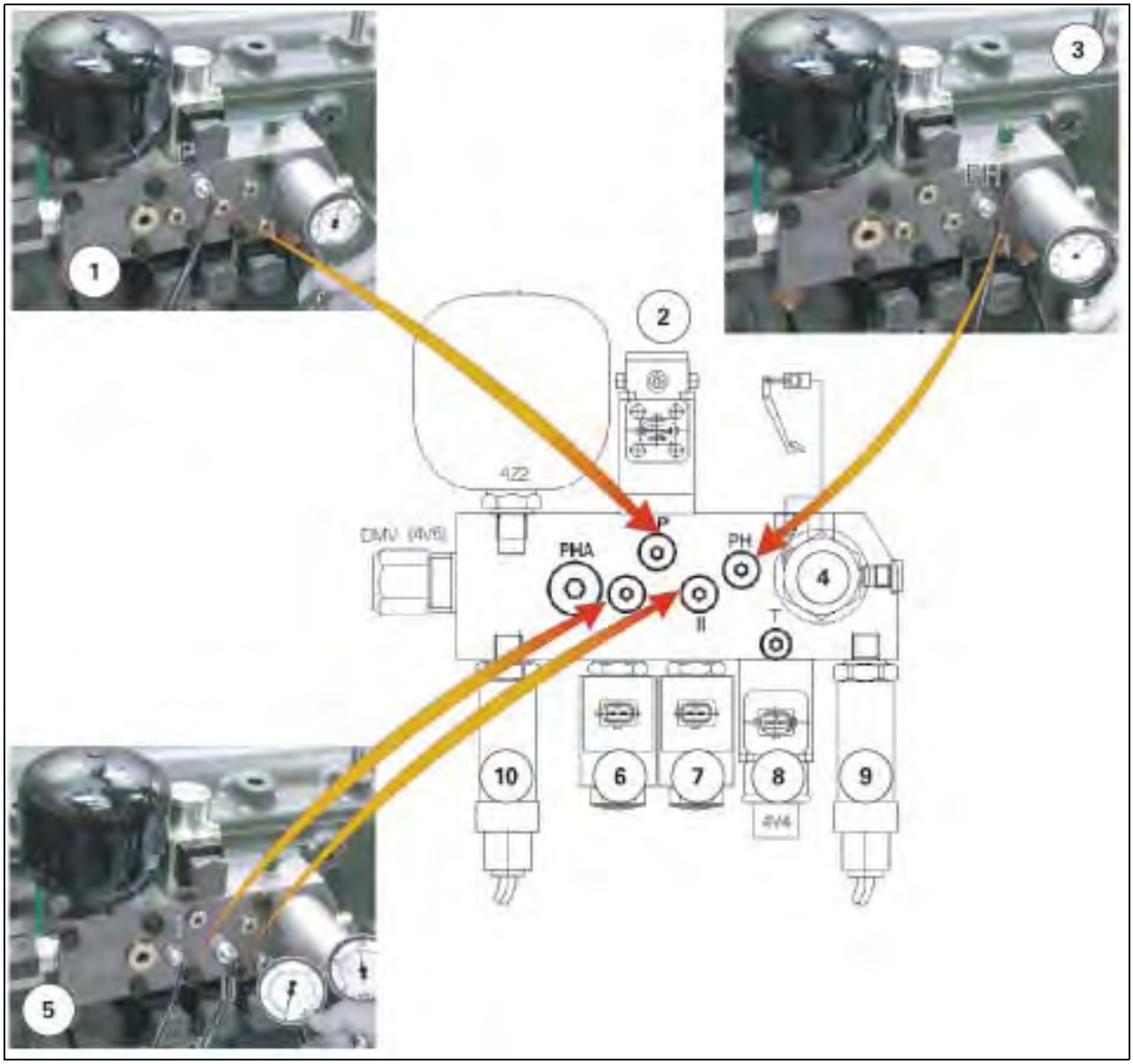
In order to check the rear PTO, it is also possible to measure pressure levels at the unions located at the rear right and left-hand sides of the rear axle housing.



I008347

Fig. 4

Diagram showing the pressure connectors on the valve block

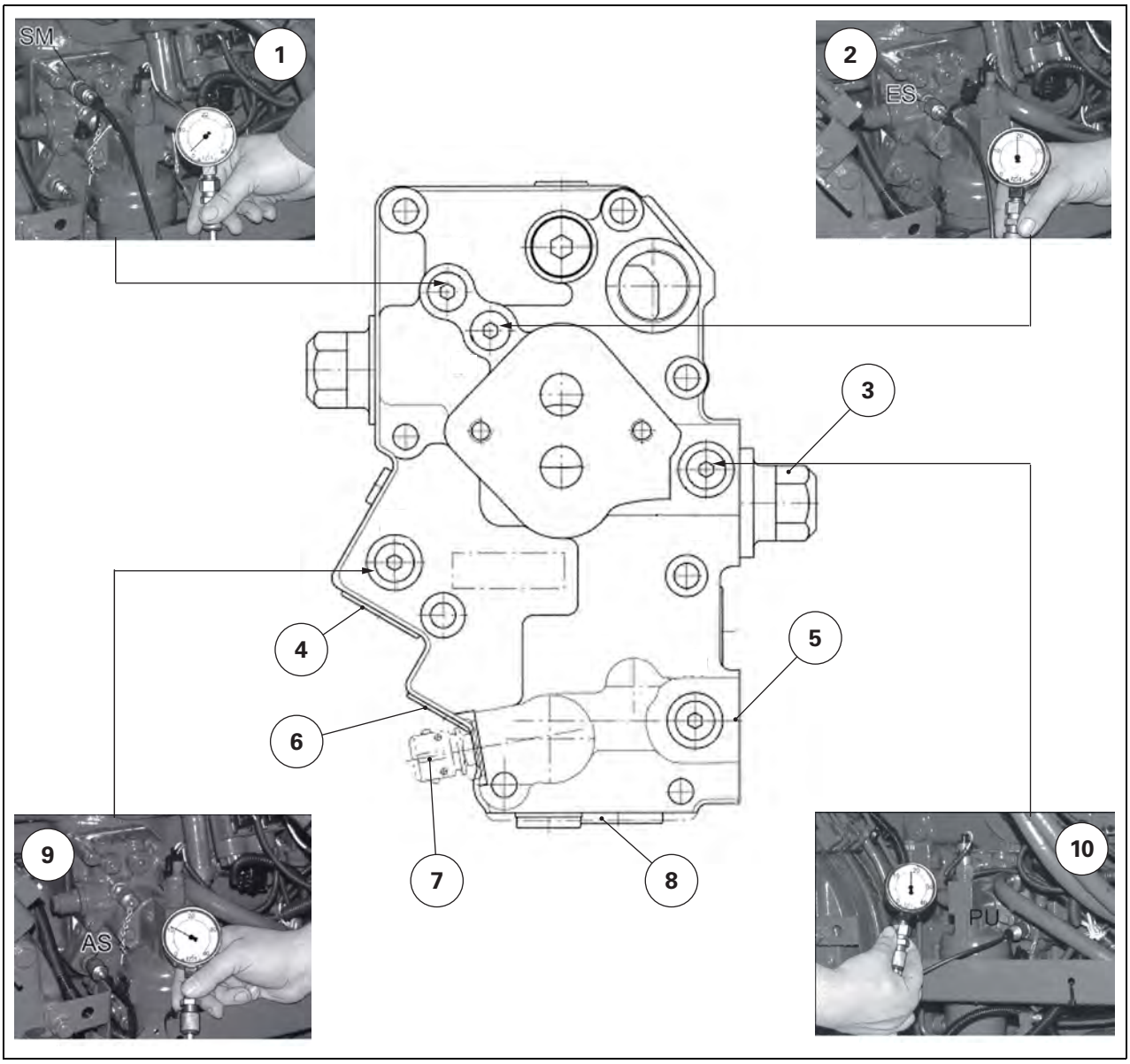


I008349

Fig. 5

(1) Service pump check
(2) Speed limiting solenoid valve
(3) PH pressure check
(4) Clutch function controlled valve
(5) Supply pressure for Hare/Tortoise range check
(6) Tortoise range solenoid valve
(7) Hare range solenoid valve
(8) Coupler function solenoid valve
(9) HP Pressure sensor
(10) HP Pressure sensor

Valve block with test connections



I008350

Fig. 6

(1) Lubricating pressure check (SM)
(2) Charge pressure check (ES)
(3) Service pump relief valve (50 b)
(4) Charge valve (6.5 b)
(5) Cooler bypass valve
(6) Flushing valve (6 b)
(7) Temperature sensor
(8) Lubricating pressure valve (6.5 b)
(9) Flushing pressure check (AS)
(10) Service pressure check (PU)

A.5 Checking the hydrostatic loop in the control unit

DANGER: Chock the tractor (HP pressure measurement).

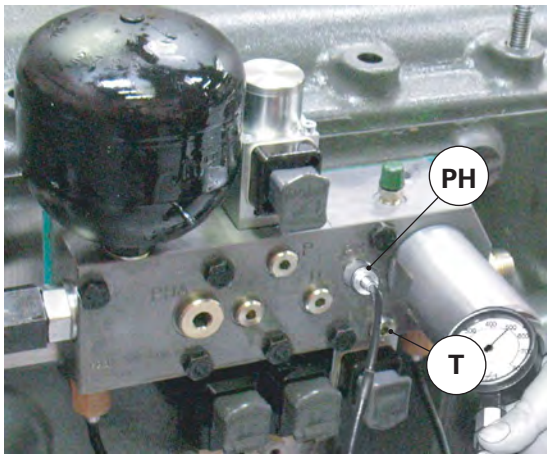
1. Remove the right-hand rear wheel and the protection plate located behind it.

2. Remove the T union.

3. Fit a pressure gauge to measure pressures higher than 540 bar at the PH union.

Checking procedure:

4. Start the engine.



I008341 Fig. 7

5. Activate limp home mode by pressing in the clutch pedal fully and pressing the button.

6. Apply the hand brake.

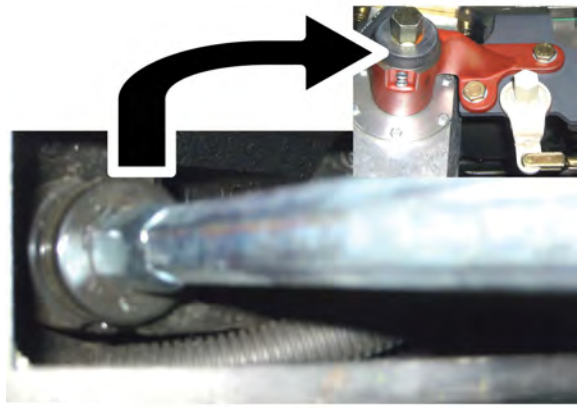
I008342 Fig. 8

7. Use the limp home mode lever to start the transmission.

PH	T union	Possible causes
250 bar	No oil flow to the T union	Transmission module error (shuttle valve, pressure pipe union). =>Remove the module.
250 bar	Oil flows from the T union	Coupler function valve (4V4) or clutch function valve (4V5) not tightly sealed. => Change the valve.

Checking the coupler function valve (4V4)

8. Mechanically lock the valve.



I008343 Fig. 9

PH	T union	Possible causes
250 bar	Oil flows from the T union	Clutch function valve (4V5) not tightly sealed => Change the valve.
540 bar	Oil flows from the T union, but the pressure is not constant	Electrically check the coupler function valve > Change the valve if faulty

7A15

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7A16

HA260/Power take-off - Adjustments, bleeding and calibrations

TABLE OF CONTENTS

A. Autotronic 4 - Hare/Tortoise range - Transmission - Coupler function - Power take-off

Calibration of the following Autotronic 4 functions is necessary for optimum performance:
- Hare/Tortoise range
- transmission
- coupler function

Calibration of the power take-off is also possible with special tools if there is a problem when starting.

Input at level 1 - CAL 1

IMPORTANT: *In order to carry out a calibration, any error codes must be corrected.*
If an error code is active: the calibration returns an error immediately.
To select CAL1:

1. Start the engine.

2. Engage and release the clutch pedal in order to delete the "TC" "DC" display from the screen on the right-hand side of the instrument panel

3. Within the next 5 seconds, simultaneously press keys  on the Dash Control Center keypad.

4. The screen (Fig. 9) appears, displaying the 4 symbols of the functions to be calibrated:

 Hare/Tortoise range

 Transmission

 Coupler function

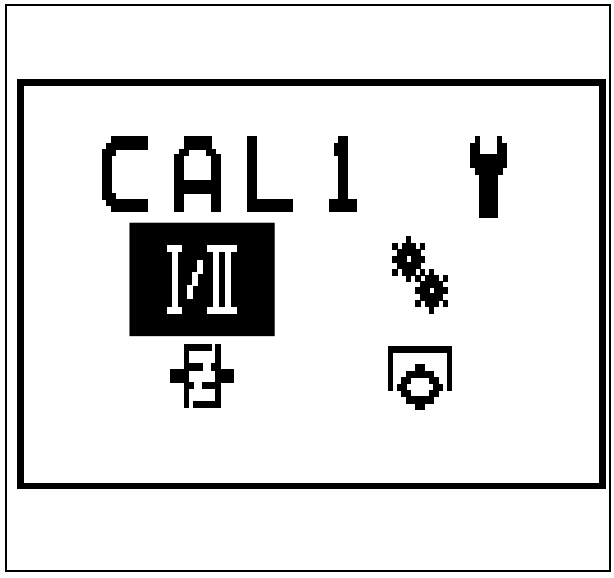
 Power take-off

The selected function is displayed in reverse video.

5. Before starting calibration, ensure that the tractor is in a suitable condition.

6. Select the function to be calibrated using keys  on the Dash Control Center keypad and then press "OK".

NOTE: *This procedure must be repeated for each calibration.*



I007464 Fig. 1

Hare/Tortoise range

Calibration procedure

This calibration must be carried out systematically after changing any of the following:

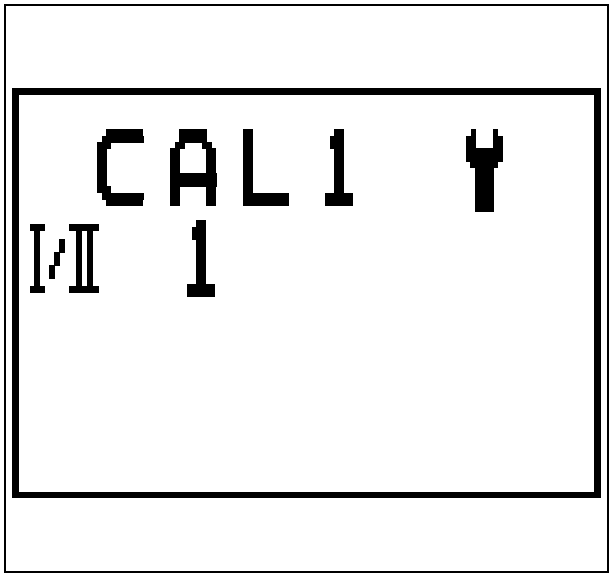
- Hare range solenoid valve
- Tortoise range solenoid valve
- Range position sensor
- Autotronic 4

Preliminary conditions

1. Hand brake or ParkLock disengaged.
2. Power Control lever in neutral position.
3. Clutch pedal pressed down.
4. Engine speed less than 1000 rpm.

Calibration

5. Having selected Ⅰ/Ⅱ in the CAL1 screen (Fig. 9), press "OK" to start calibration.
6. The calibration lasts for approximately 6 minutes and takes place in 3 steps, shown one after the other on the screen (Fig. 10):
   - Step 0: Tortoise range
   - Step 1: Hare range
   - Step 2: Neutral (intermediate position)
7. The calibration result is displayed:
   - "OK": successful calibration (since the calibration procedure is ended by placing the transmission in neutral, the Hare/Tortoise symbols flash alternately on the right-hand screen)
   - "ERROR": calibration failed (repair the fault before resuming the procedure)
8. ***IMPORTANT:*** *Switch off the ignition for at least 30 seconds in order to validate the calibration.*



I007465 Fig. 2

Transmission

Calibration procedure

This calibration must be carried out systematically after changing any of the following:

- transmission control module
- transmission
- transmission high pressure sensor
- Autotronic 4

Preliminary conditions

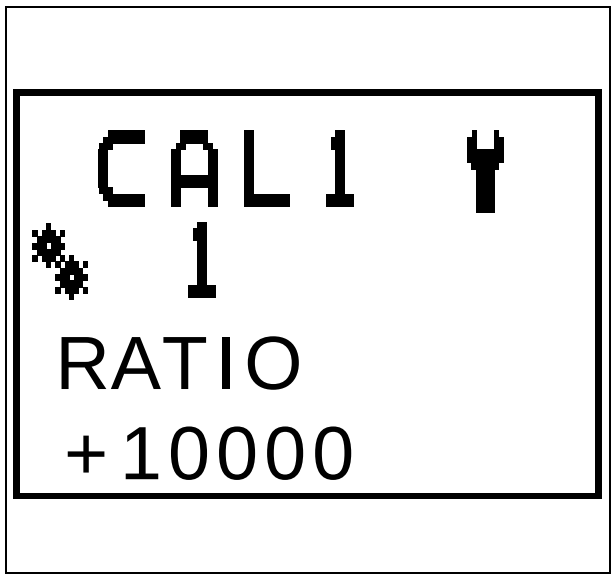
Calibration must be carried out just after the range has been calibrated:

1. Hand brake applied or ParkLock engaged.
2. Power Control lever in neutral position.
3. Hare/Tortoise range in neutral (Hare/Tortoise symbols flash alternately on the right-hand screen).

The Hare/Tortoise range should be in neutral because calibration of the range has been carried out in the previous step.

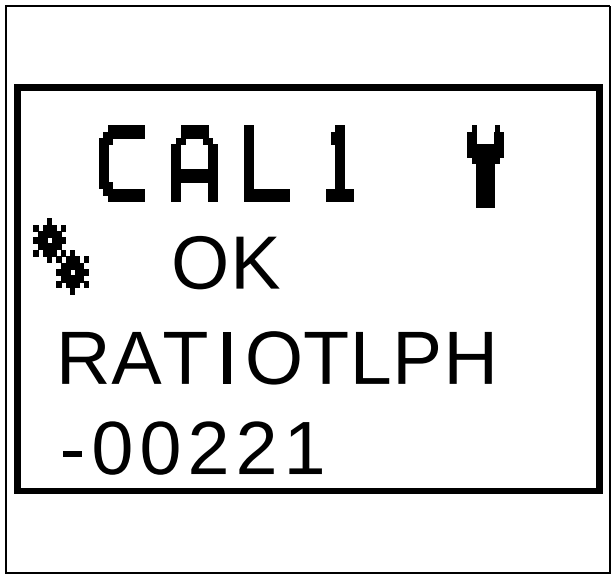
Calibration

4. Having selected in the CAL1 screen (Fig. 9), press "OK" to start calibration.
5. Engine speed automatically adjusts to 1600 rpm.
6. Hare/Tortoise symbols continue to flash alternately.
7. The calibration lasts for approximately 6 seconds and takes place in 7 steps, shown one after the other on the screen (Fig. 11).
   These 7 steps allow calibration of the hydraulic motors and pumps.



I007466 Fig. 3

8. The calibration result is displayed:
   - "OK": successful calibration (Fig. 12)
   - "ERROR": calibration failed (repair the fault before resuming the procedure)
9. ***IMPORTANT:*** *Switch off the ignition for at least 30 seconds in order to validate the calibration.*



I007467 Fig. 4

Coupler function

Calibration procedure

This calibration must be carried out systematically after changing any of the following:
- coupler function solenoid valve
- transmission oil high pressure sensor
- Autotronic 4

Preliminary conditions

1. Transmission temperature higher than or equal to 40°C (recommendation: do not cancel calibration if the value is too low).

   There are 2 ways to view the transmission temperature:
   - The value can be viewed on the gearbox screen of the diagnostic tool.
   - Use the instrument panel DIAG mode via the Dash Control Center:

- Press the top arrow for 3 seconds.
- Select DATA (in reverse video) then press "OK".
- The value is indicated by the "Trans Temp" line.

2. Hand brake applied or ParkLock engaged.

3. Power Control lever in neutral position.

4. Hare range engaged.

Calibration

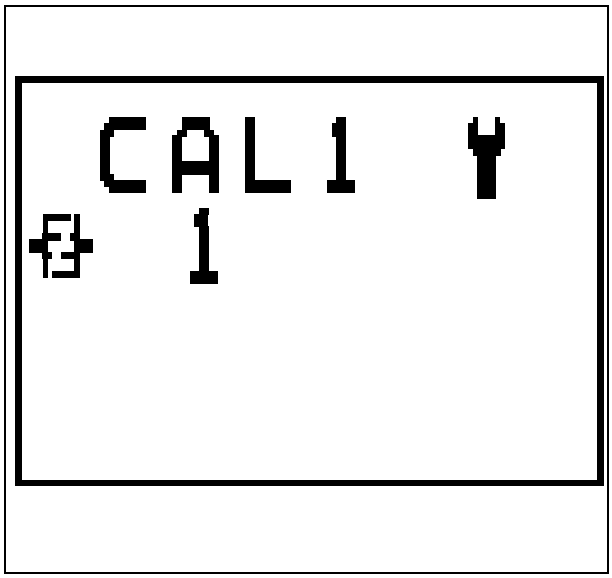
5. Having selected in the CAL1 screen (Fig. 9), press "OK" to start calibration.

6. Engine speed automatically adjusts to 1100 rpm.

7. The calibration lasts for approximately 2 minutes and takes place in 9 steps, shown one after the other on the screen (Fig. 13).
These 9 steps allow calibration of the solenoid valve current.

8. The calibration result is displayed:
- "OK": successful calibration
- "ERROR": calibration failed (repair the fault before resuming the procedure)

9. ***IMPORTANT:*** *Switch off the ignition for at least 30 seconds in order to validate the calibration.*



I007468 Fig. 5

Power take-off

Calibration procedure

- This calibration must be performed only in the event of a starting problem with a high-inertia implement
- when changing the PTO solenoid valve
- when changing the Autotronic 4

Preliminary conditions

1. Hand brake applied or ParkLock engaged.

2. Power Control lever in neutral position.

3. Select a PTO speed (540, 540ECO or 1000 rpm) depending on the implement.

Calibration

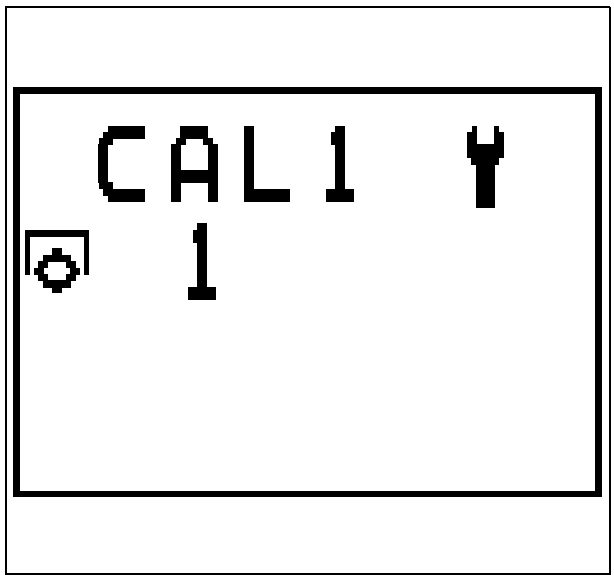
4. Having selected in the CAL1 screen (Fig. 9), press "OK" to start calibration.

5. Engage the PTO.

6. Calibration takes place automatically, and the time taken depends on the implement (Fig. 14).

7. The calibration result is displayed:
- "OK": successful calibration
- "ERROR": calibration failed

8. ***IMPORTANT:*** *Switch off the ignition for at least 30 seconds in order to validate the calibration.*



I007469 Fig. 6

7A17

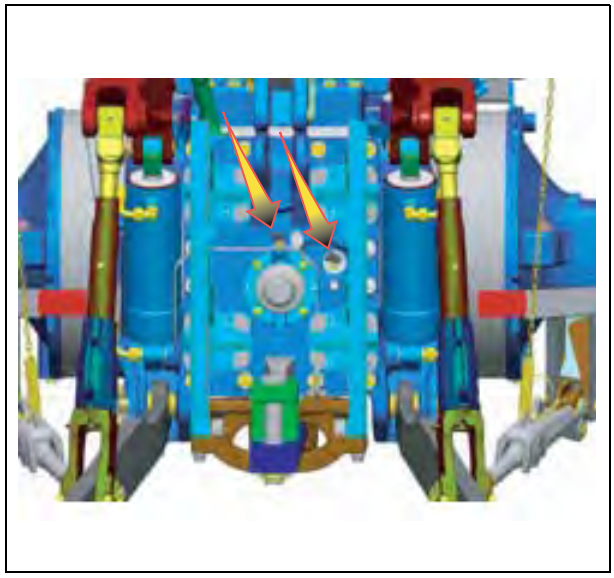
HA260/Power take-off - Disassembly and reassembly

TABLE OF CONTENTS

A. Disassembling the power take-off

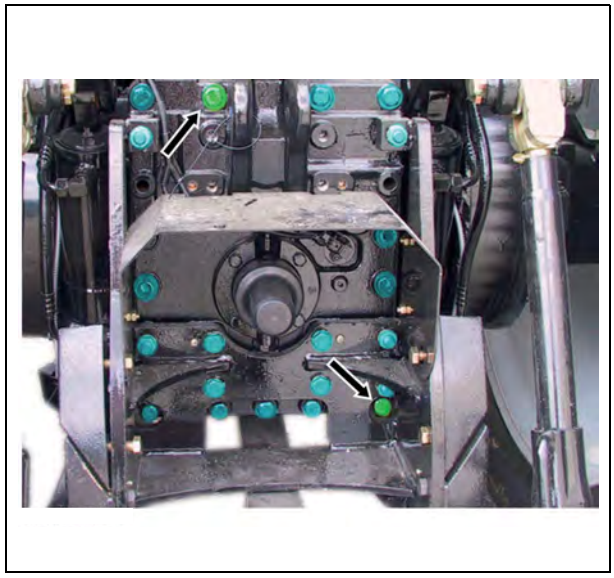
Preparation

1. Lower the rear linkage.
2. Drain the transmission oil (65 l).
3. Remove the trailer linkage (depending on equipment).
4. Mark and remove the PTO connectors (arrows).



I008585 Fig. 1

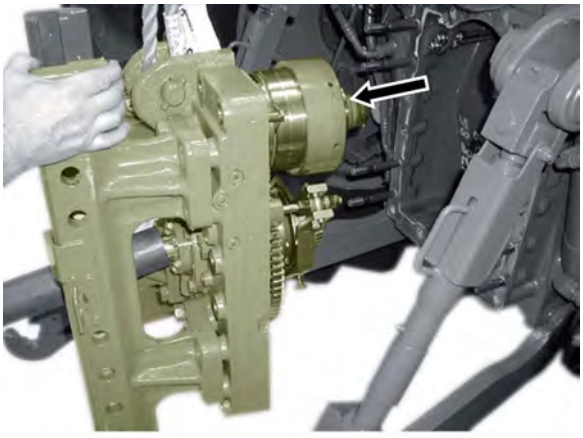
5. Unscrew all retaining nuts.
6. Take the silicone out of the threaded bores and tighten two M12 screws (arrows).
7. Support the cover using a lifting device and push it back using the two screws.



I008586 Fig. 2

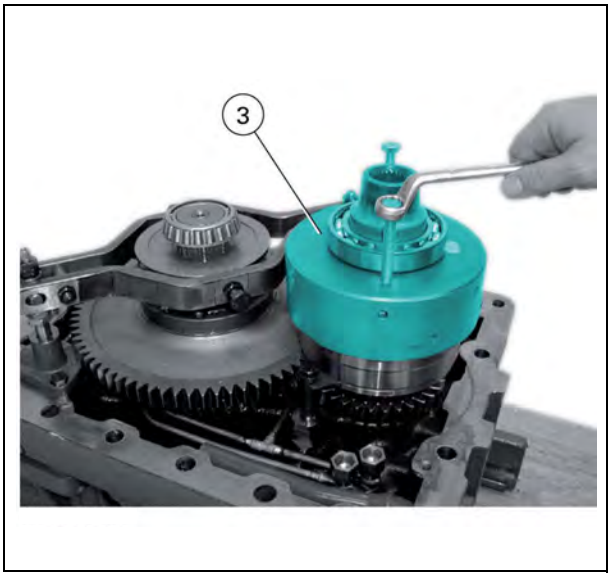
8. Take off the rear PTO transmission cover.

IMPORTANT: *Take care of the adjustment shims (arrow), which are used to adjust the bearing clearance.*



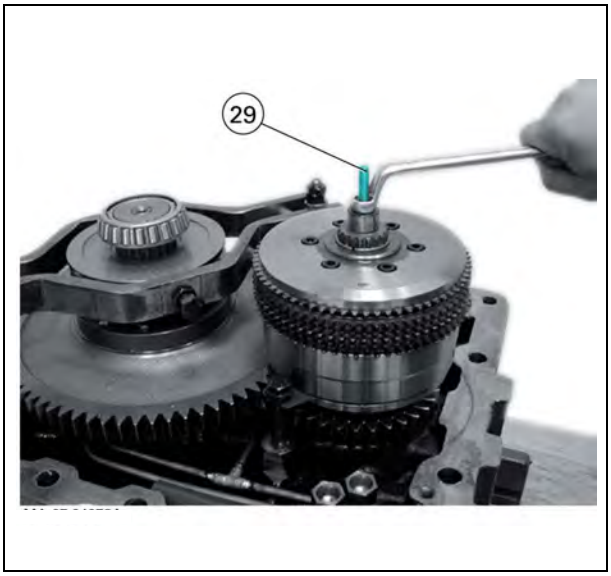
I008587 Fig. 3

9. Push back the clutch bell housing (3) using two M10 screws.



I008588 Fig. 4

10. Remove the nozzle (29).



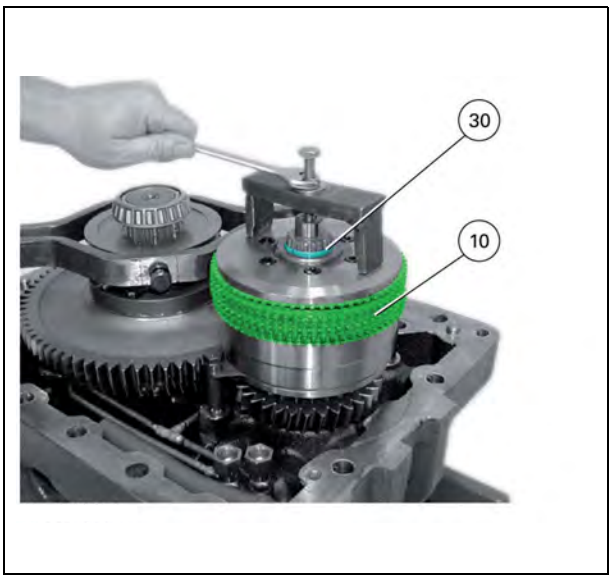
I008589 Fig. 5

11. Fit the compression tool (ref. X899.980.145.000) and compress the clutch.

12. Extract the locking half-rings (30).

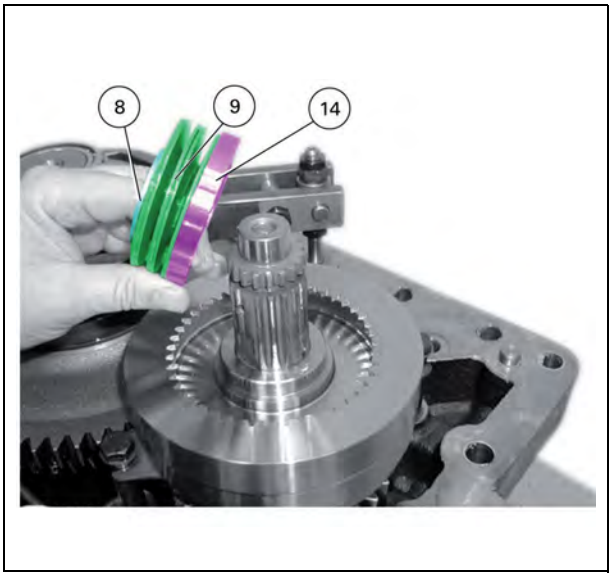
13. Release the clutch.

14. Remove the disc carrier and the set of discs (10).



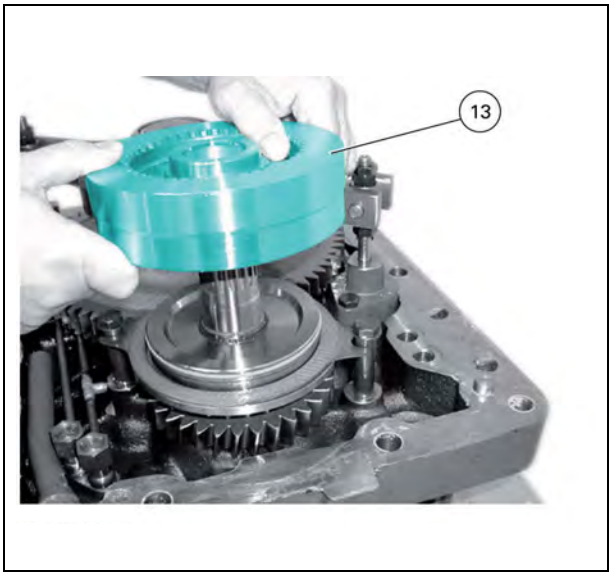
I008590 Fig. 6

15. Remove the adjustment shims (8), the set of Belleville washers (9) and the ring (14).



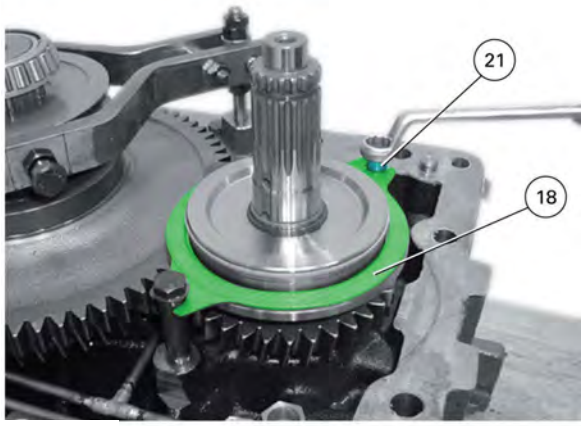
I008591 Fig. 7

16. Remove the piston (13).



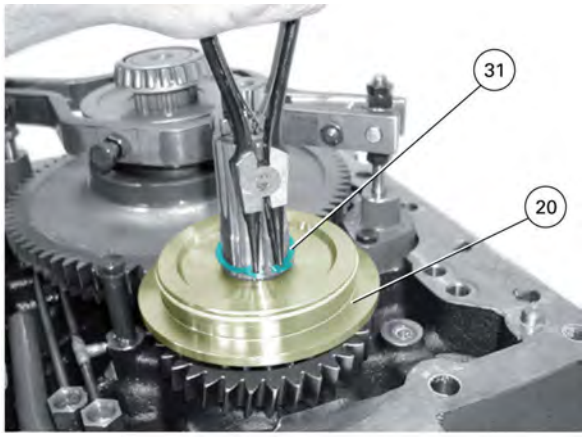
I008592 Fig. 8

17. Remove the screw (21) and take off the blade (18).



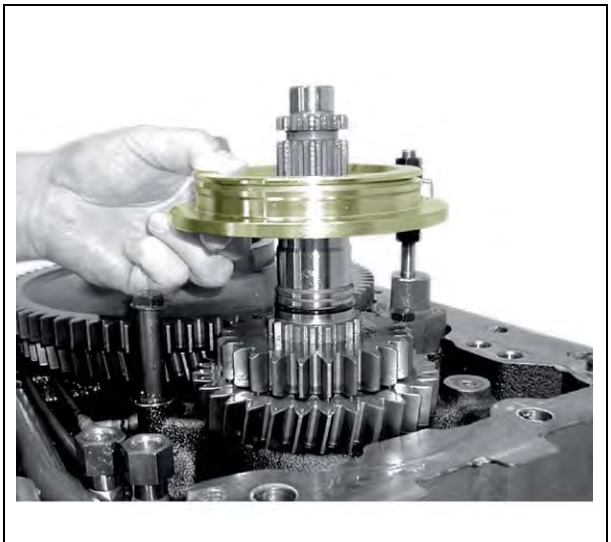
I008593 Fig. 9

18. Take off the circlip (31) and remove the brake disc (20).



I008594 Fig. 10

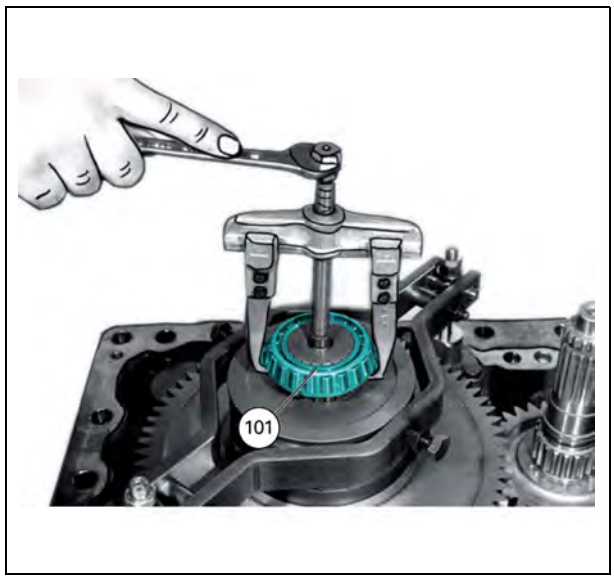
19. Take off the brake disc.



I008595 Fig. 11

20. Extract the bearing (101) using a puller.

21. Remove the washer.



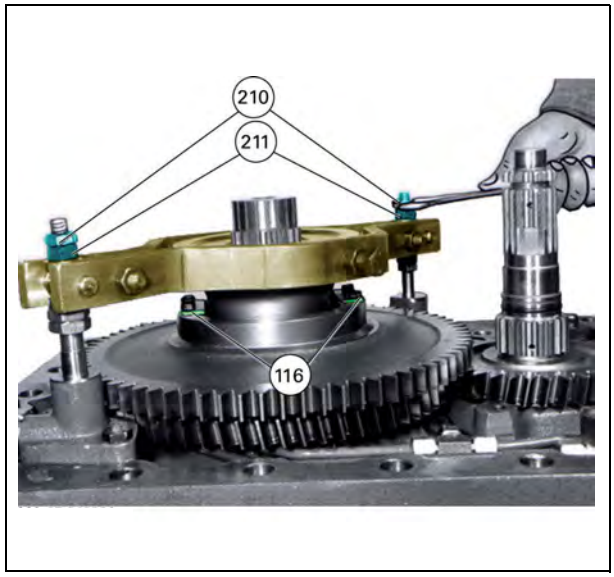
I008596 Fig. 12

22. Unscrew the nuts (210 and 211).

23. Note the values of the nuts (210 and 211) if required.

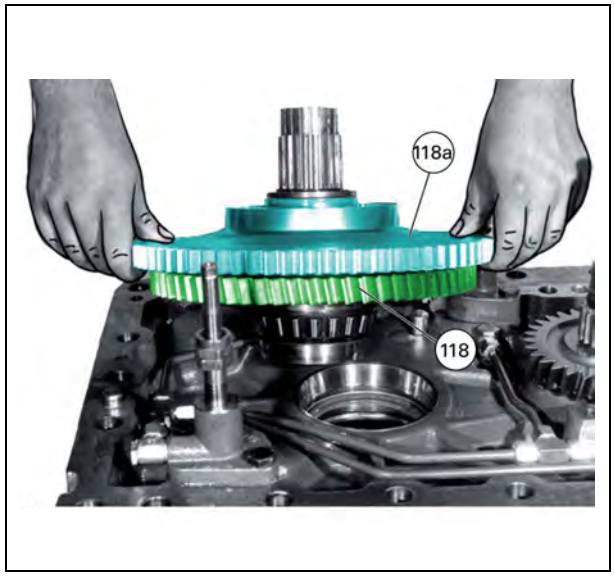
24. Remove the stops (116).

25. Take out the control mechanism.



I008597 Fig. 13

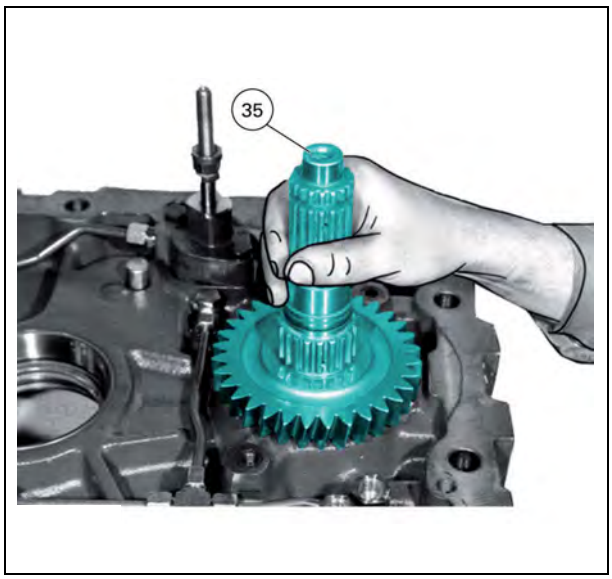
26. Remove the gears (118) and (118a).



I008598 Fig. 14

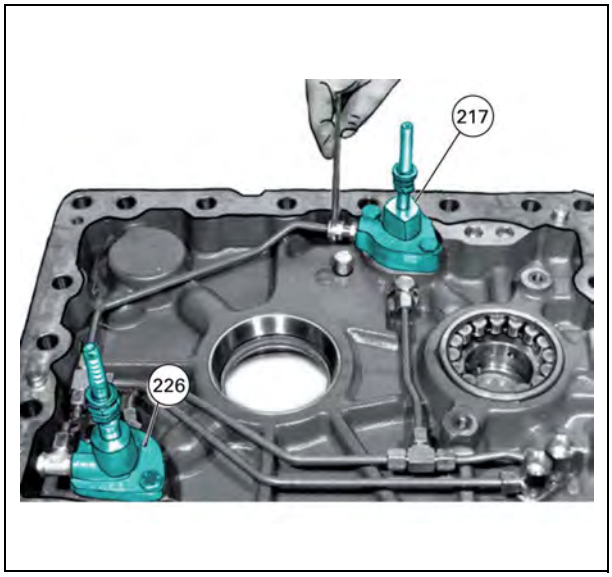
27. Take out the shaft (35).

28. If required, take off the external rings of the bearing.



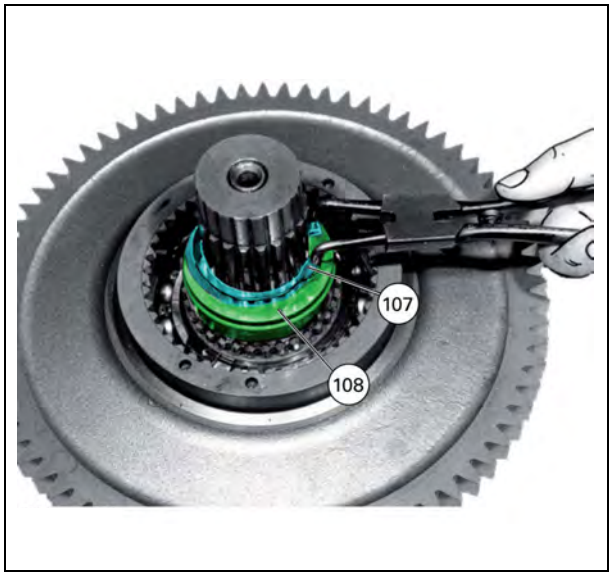
I008599 Fig. 15

29. If necessary, remove the ram (217) and / or (226).



I008600 Fig. 16

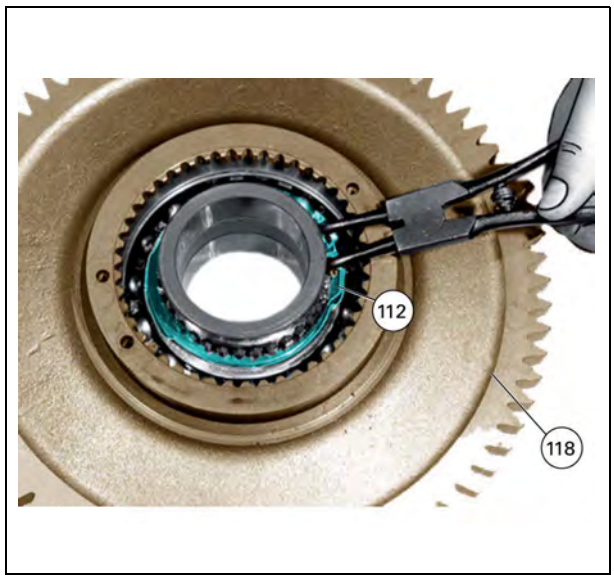
30. Take off the circlip (107), washer (108) and gears.



I008601 Fig. 17

31. Remove the circlip (112).

32. Release the gear (118).



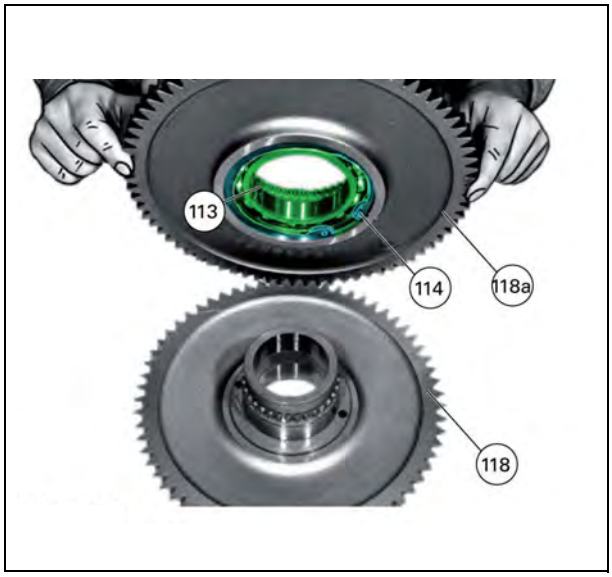
I008602

Fig. 18

B. Reassembling the power take-off

IMPORTANT: *Before reassembly, all components, mating faces and grooves must be clean. Any rust, mud or water must be removed.*

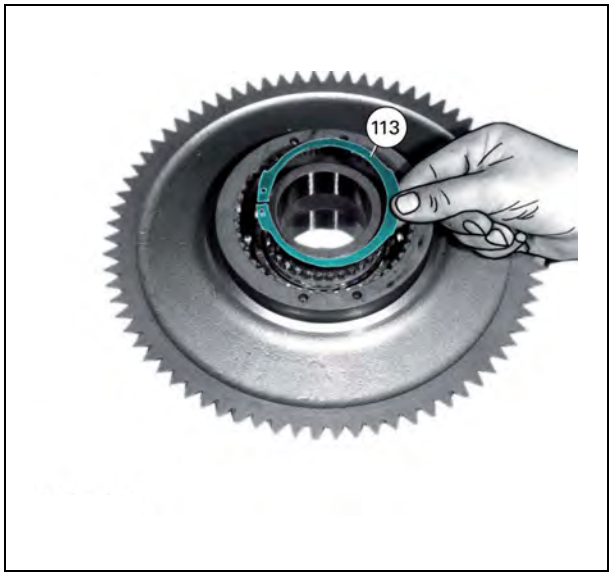
1. Fit home the bearing (113) in the gear (118a) and lock with the circlip (114), then fit the gear (118) to its stop.



I008603

Fig. 19

2. Fit the circlip (112) on the opposite side.



I008604

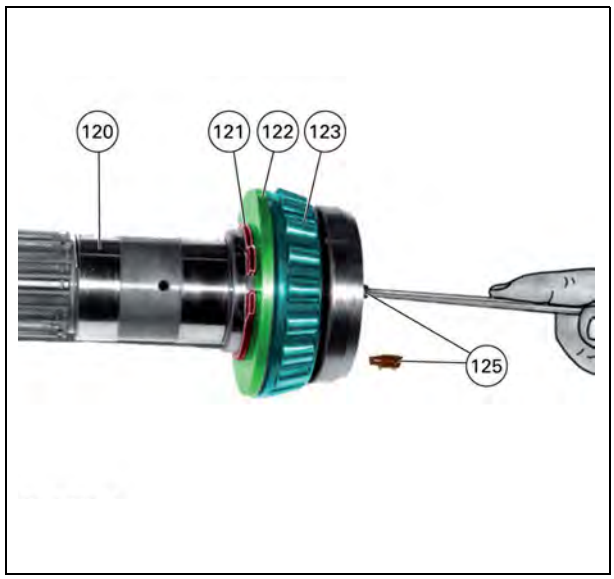
Fig. 20

3. Fit home the internal ring of the bearing (123) on the shaft (120).

4. Position the washer (122).

5. Fit the circlip (121).

6. Smear the two grub screws (125) with threadlock Loctite 242 and tighten them until the internal ring of the bearing (123) reaches its stop. The washer (122) must be fitted home.



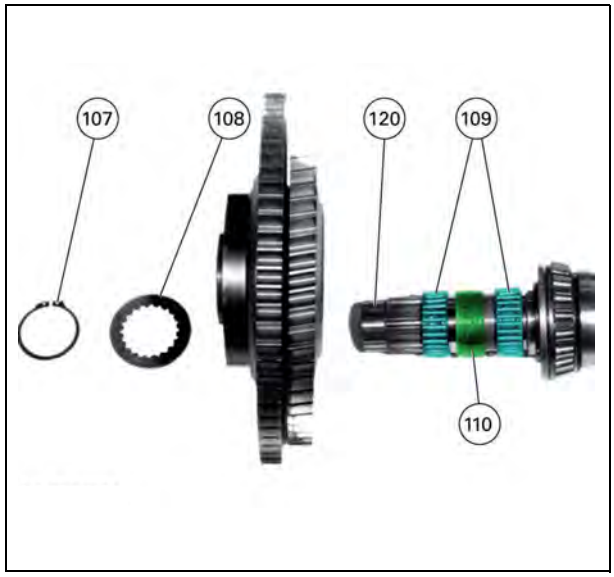
I008605 Fig. 21

7. Fit the first needle roller cage (109), the spacer (110) and the second needle roller cage (109) on the shaft (120).

8. Fit the shaft (120).

9. Position the washer (108).

10. Fit the circlip (107).



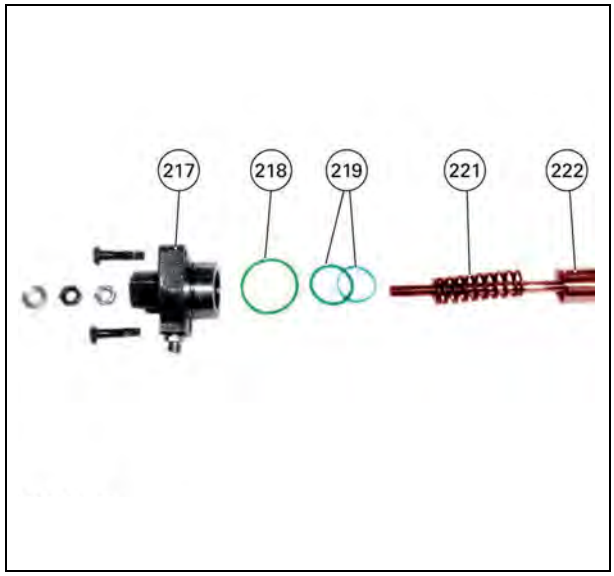
I008607 Fig. 22

11. Fit new seals (219) in the ram (217).

12. Fit a new "O" ring (218) in the groove of the ram (217). Smear the oil tight seals with miscible grease.

13. Insert the piston (222) and spring (221) into the ram (217) as indicated.

NOTE: *The oil tight seal (219) is comprised of two parts: an "O" ring on the outside and a piston strip guide on the inside.*



I008608 Fig. 23

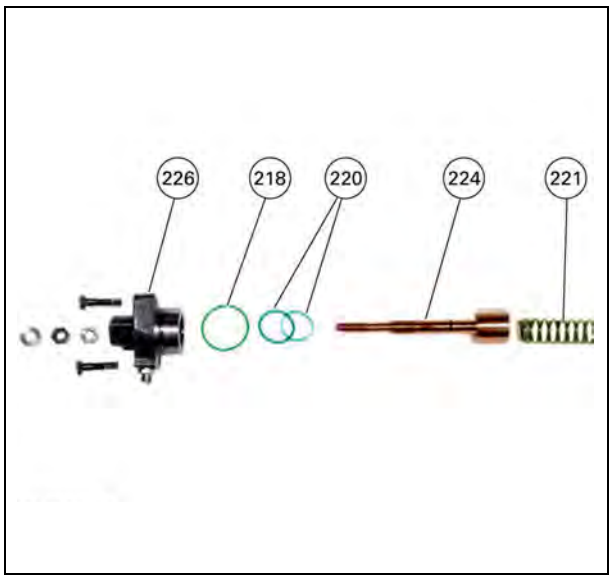
14. Fit new seals (220) in the ram (226).

15. Fit a new "O" ring (218) in the groove of the ram (226).

16. Smear the oil tight seals with miscible grease.

17. Insert the piston (224) and spring (221) as indicated in the ram (226).

NOTE: *The oil tight seal (219) is comprised of two parts: an "O" ring on the outside and a piston strip guide on the inside.*

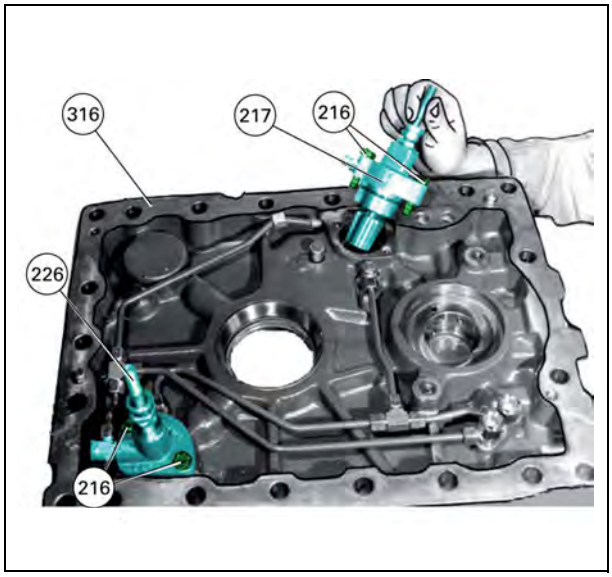


I008609 Fig. 24

18. Fit the rams (217 and 226).

19. Smear the thread of the screws (216 and 225) with threadlock Loctite 242 and tighten the screws to the corresponding torque:

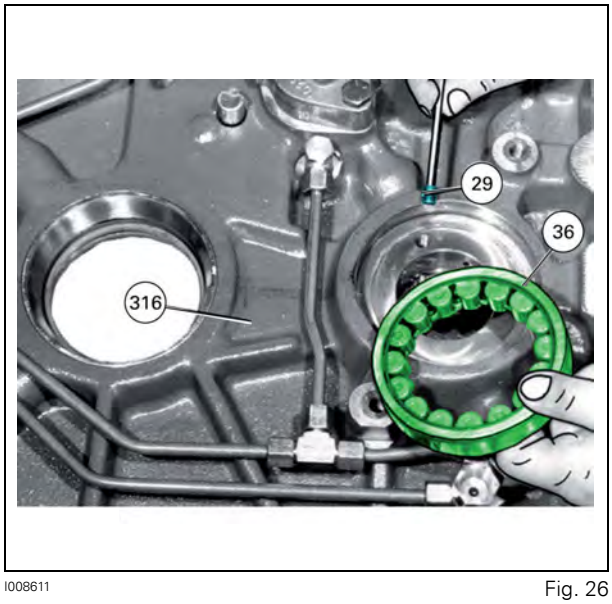
20. Refit the hydraulic pipes which have been removed in the housing cover (316).



I008610 Fig. 25

21. If the housing is fitted with a new cover (316), screw the nozzle (29) to its stop in the threaded bore.

22. Fit home the external ring of the bearing (36).



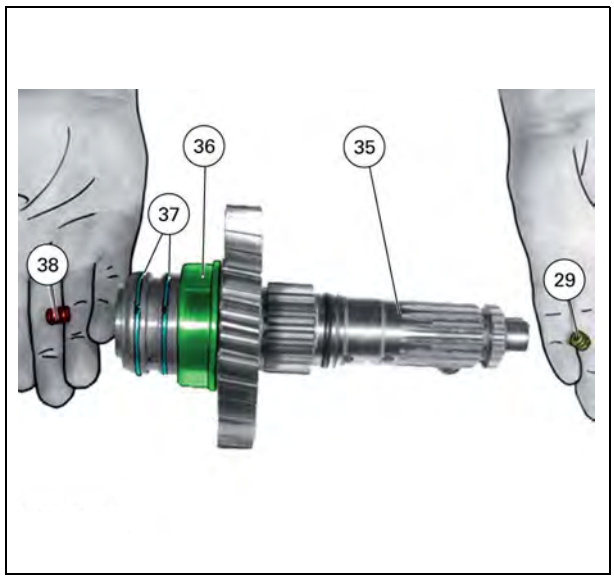
I008611 Fig. 26

23. Smear two new rings (37) with miscible grease and install and lock them in the grooves of the shaft (35).

24. Fit home the internal ring of the bearing (36).

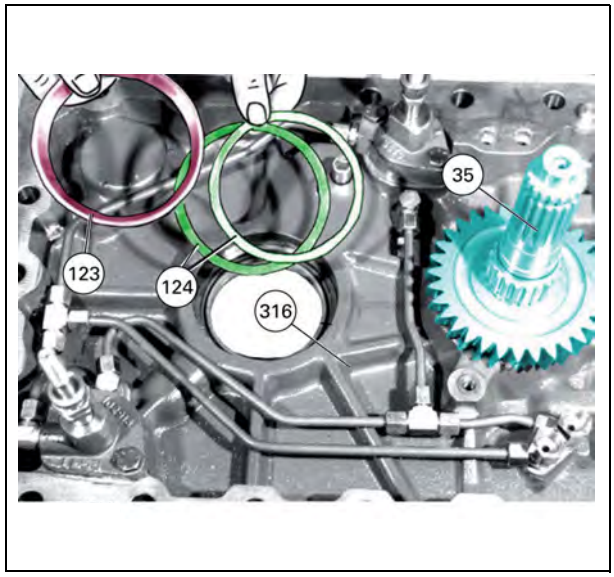
25. When assembling a new shaft (35), smear the thread of the threaded stud (38) with threadlock Loctite 242, and screw to its stop.

26. Tighten the nozzle (29) to its stop.



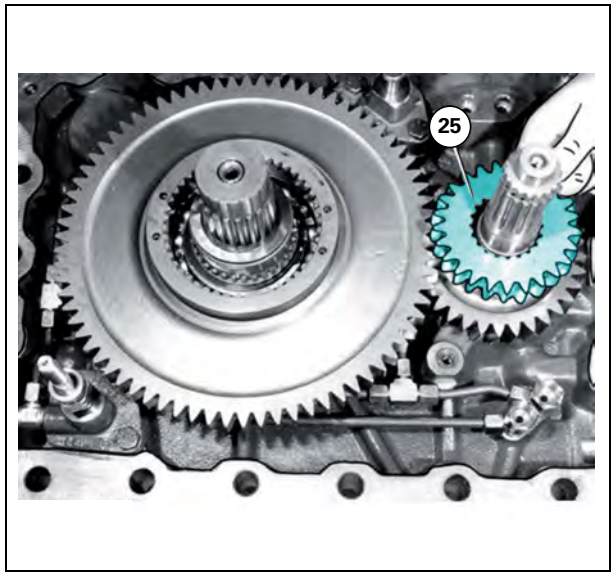
I008612 Fig. 27

27. Fit the pre-assembled shaft (35) in the housing cover (316). If required, fit compensating shims (124) and fit home the external ring of the bearing (123).



I008613 Fig. 28

28. Fit the pair of ring gears and the gear (25).



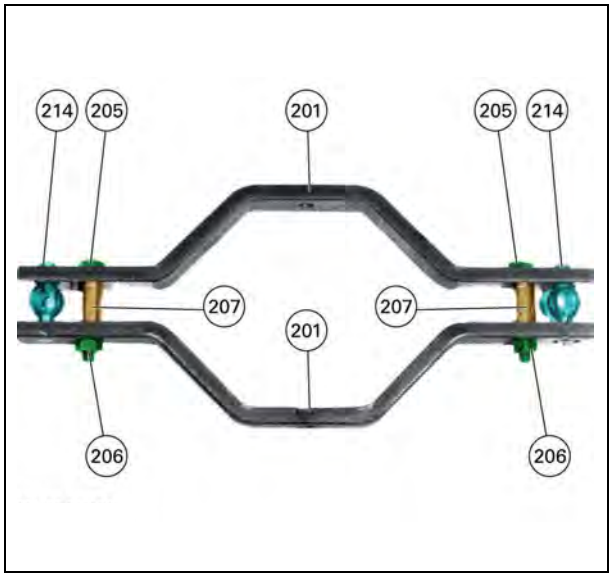
I008614 Fig. 29

Pre-assembling the stirrup

29. Smear the thread of the screws (205) with threadlock Loctite 242.

30. Fit the spacers (207) and rollers (214).

31. Tighten the nuts (206).



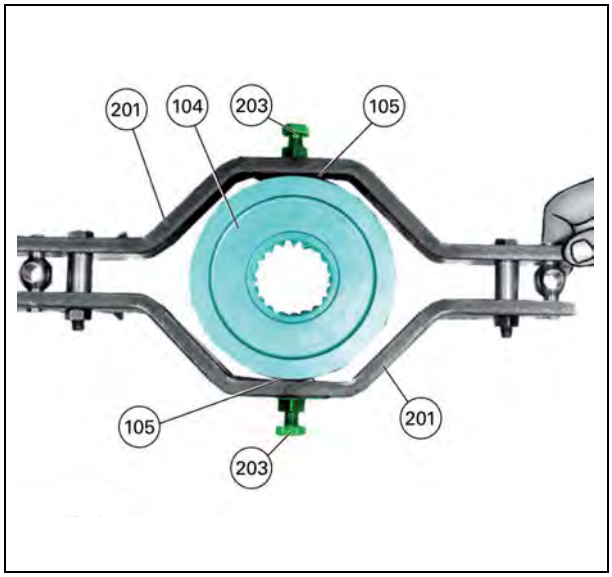
I008615

Fig. 30

32. Insert the rollers (105) into the clutch body (104).

33. Smear the thread of the screws (203) with threadlock Loctite 242.

34. Fit the stirrup tight to an identical distance, then loosen each screw (203) by 1/6 of a turn and lock them in this position.

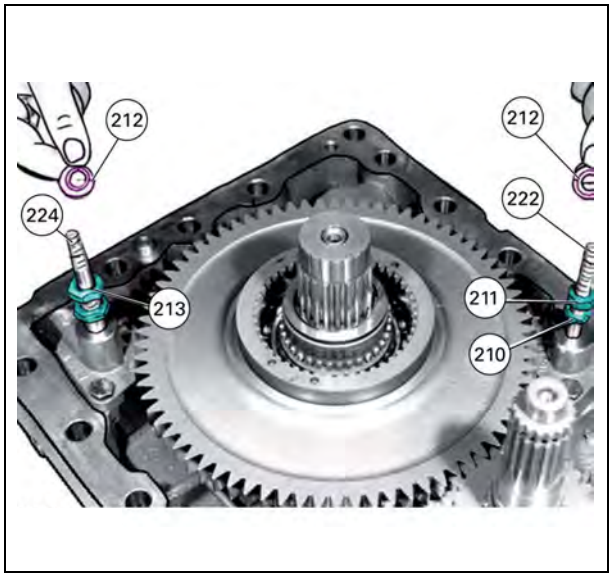


I008616

Fig. 31

35. Screw the nuts (ref. 210, 211 and 213) onto the rods of the pistons (222, 224).

36. Fit the washers (212) with their chamfer turned upwards.



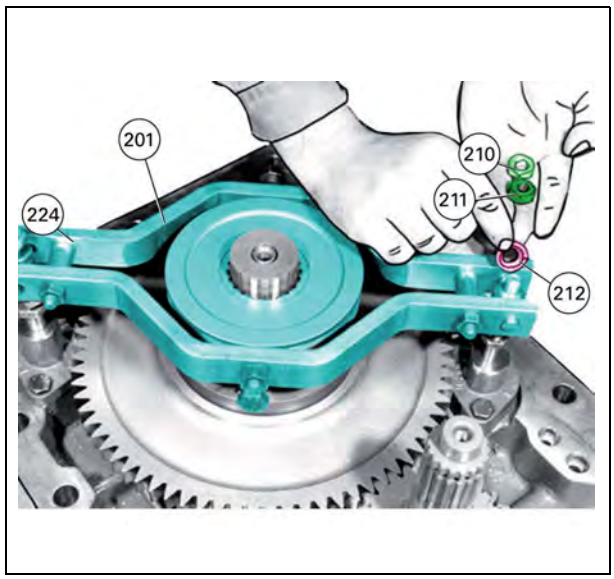
I008617

Fig. 32

37. Fit the pre-assembled stirrup (201).

38. Fit the washers (212) with their chamfer turned downwards.

39. Unscrew the nuts (210 and 211).

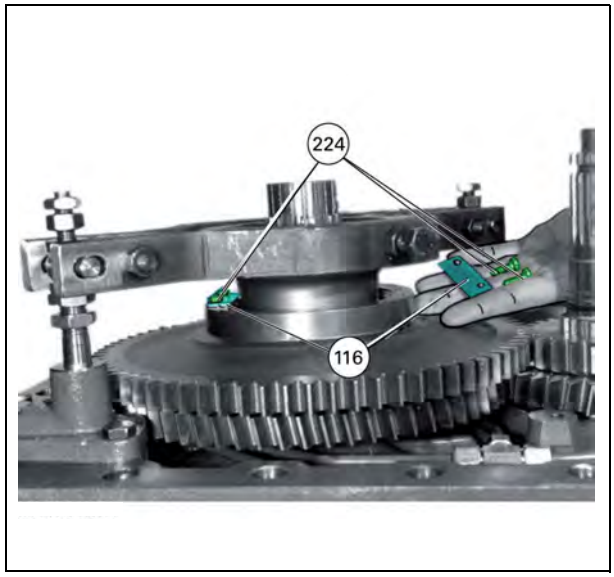


I008618 Fig. 33

40. Smear the thread of the screws (224) with threadlock Loctite 242.

41. Fit the stops (116) and lock the screws (224).

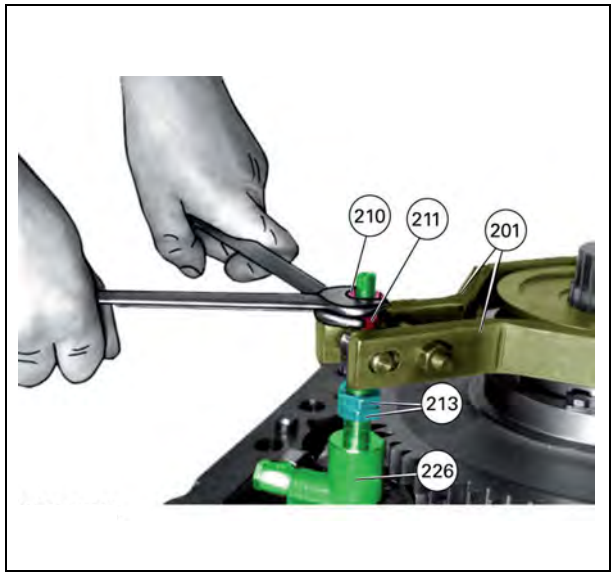
NOTE: *The following must be carried out before setting stirrup travel:*



I008619 Fig. 34

42. The oblong hole in the stirrup (201) must be turned towards the ram (226).

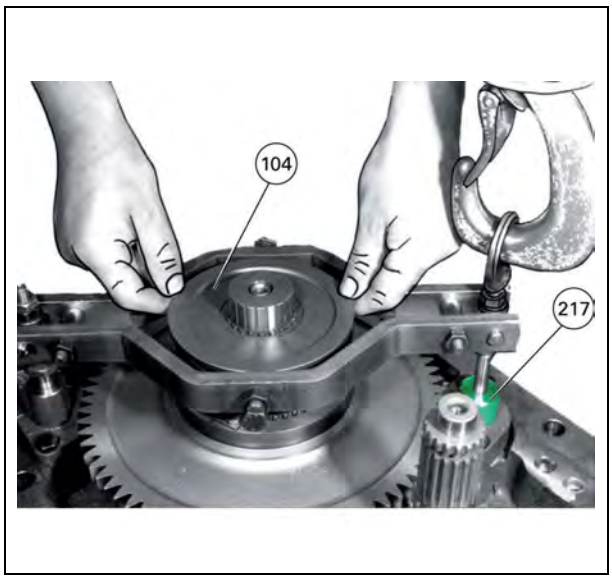
43. Screw and lock the nuts (211, 210) to their stop.



I008620 Fig. 35

44. Screw a locally made M12 eye nut onto the piston rod of the ram (217). Using a lifting tool, pull hard on the piston rod. (Coupling at 750 or 540 rpm).

45. Check the clearance of the clutch body (104).
Specified value: 0.1 mm to 0.2 mm clearance.



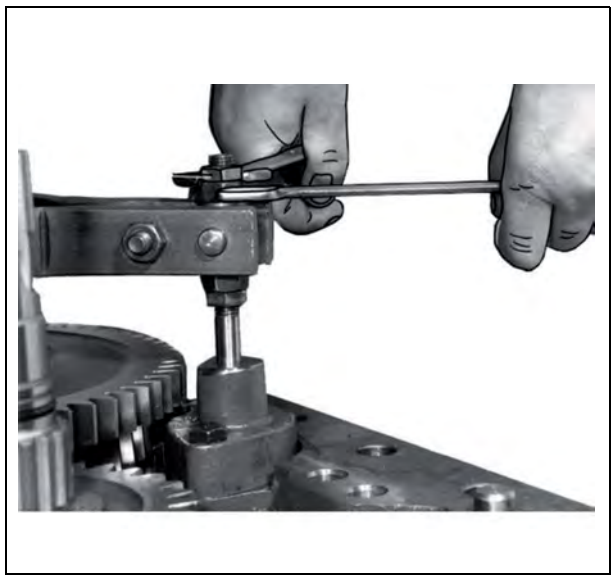
I008621 Fig. 36

If outside the specified clearance:

46. Adjust with M12 nuts (top and bottom) until a clearance of 0.1 mm to 0.2 mm is obtained.

I008622 Fig. 37

47. Take off the lifting tool and unscrew the M12 eye nut.

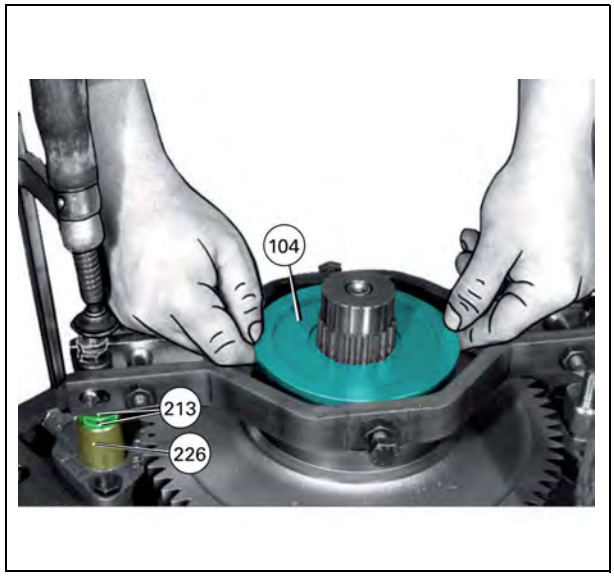


I008623

Fig. 38

48. Push the piston rod of the ram (226) fully in using a clamp, until the nuts (213) reach their stop. (Lifting limit, 1000 rpm position).

49. Check the clearance of the clutch body (104).
Specified value: 0.1 mm to 0.2 mm clearance.

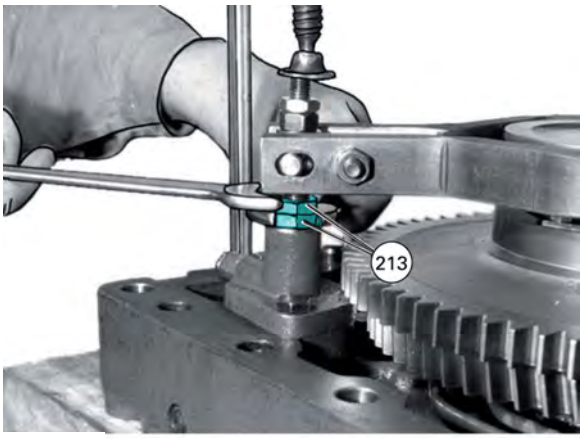


I008624

Fig. 39

If outside the specified clearance:

50. Adjust the nuts (213) until a clearance of 0.1 mm to 0.2 mm is obtained.



I008625

Fig. 40

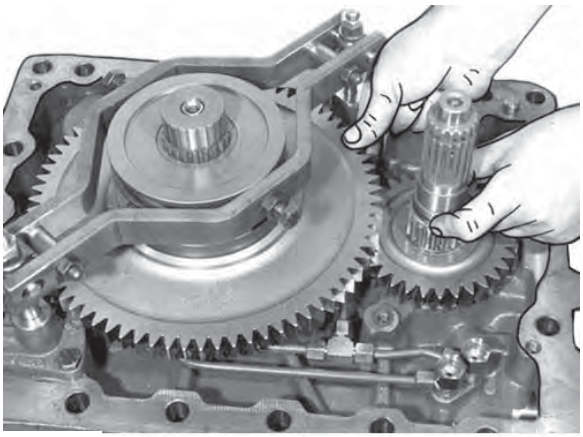
51. Take off the clamp.

52. The coupling shifts to "Neutral" position.

53. The 750 or 540 and 1000 rpm ring gears should be able to turn freely.

54. The upward and downward free travel of the coupling should be identical.

55. If not, readjust the coupling.

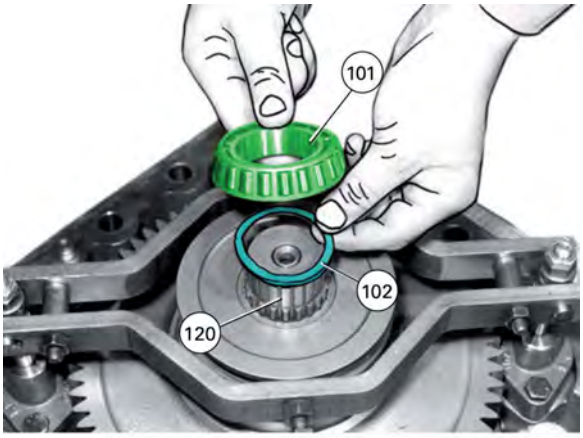


I008626

Fig. 41

56. Fit the shim (102).

57. Fit the internal ring of the bearing (101) up against the shaft (120).



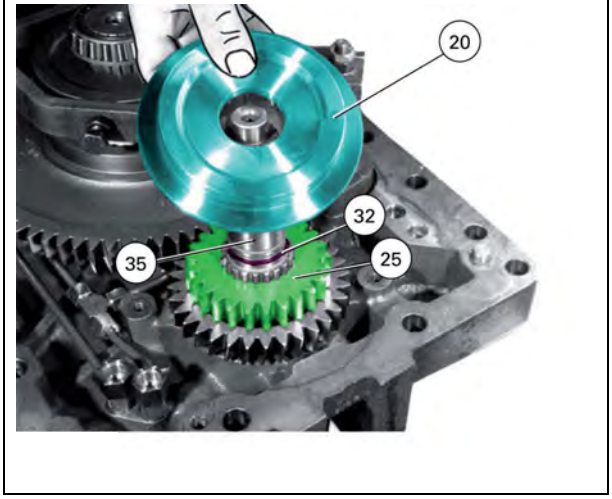
I008627

Fig. 42

58. Fit the gear (25).

59. Smear a new "O" ring with miscible grease and fit it in the groove of the shaft (35).

60. Check the brake disc (20) for wear. If necessary, fit a new brake disc (20).

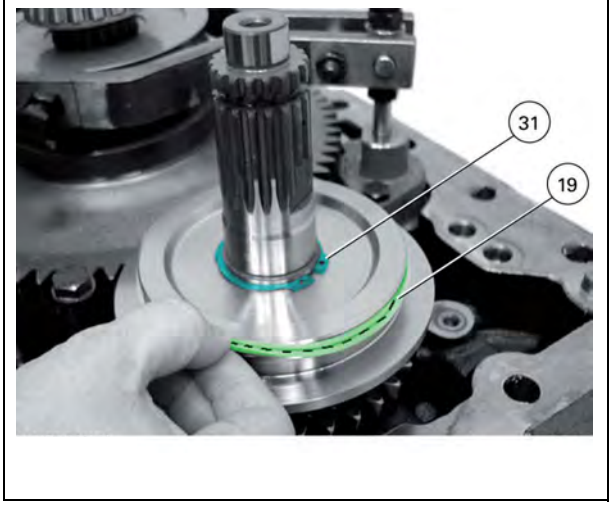


I008628

Fig. 43

61. Fit the circlip (31).

62. Smear a new lip seal (19) with miscible grease and fit it in the brake disc groove, with the seal lips turned towards the oil chamber.



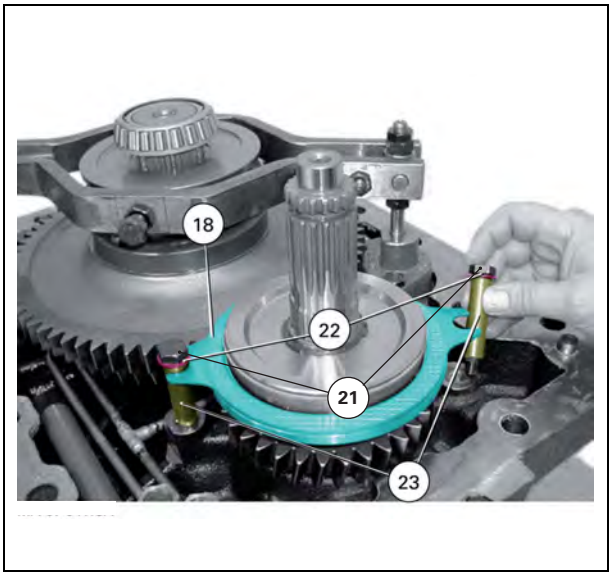
I008629

Fig. 44

63. Fit the blade (18).

64. Smear the thread of the screw (21) with threadlock Loctite 242, and fit the lock washer (22) and socket (23).

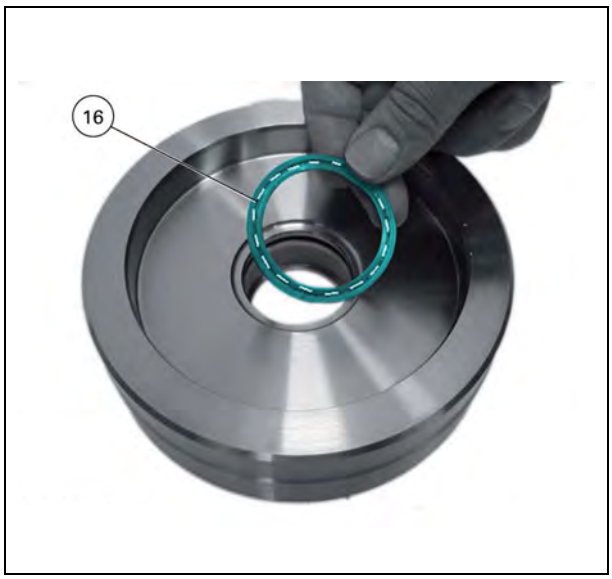
65. Tighten the screw.



I008630

Fig. 45

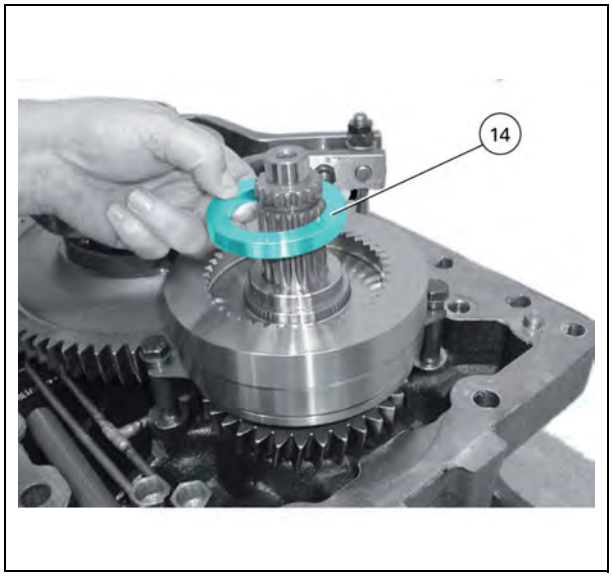
66. Smear a new lip seal (16) with miscible grease and fit it in the inner groove of the piston, with the seal lips turned towards the oil chamber.



I008631 Fig. 46

67. Fit the pre-assembled piston (13).

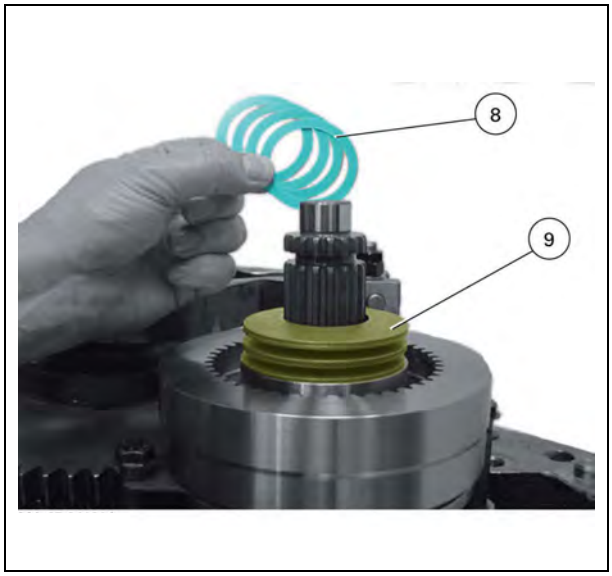
68. Fit the ring (14).



I008632 Fig. 47

69. Fit 5 Belleville washers (9), with the large external diameters facing each other, and the compensating shims (8).

NOTE: *The external diameter of the first Belleville washer (9) should be turned towards the ring (14) of the piston (13). If required, for example if compensating shims (8) are lost, set the preload of the Belleville washer set (9).*

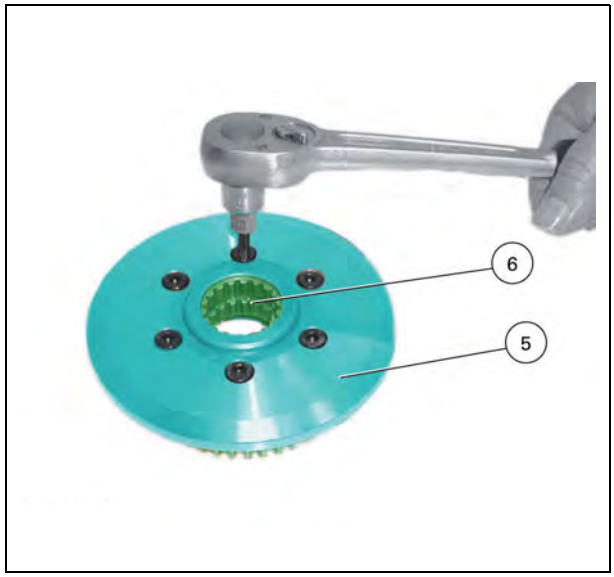


I008633 Fig. 48

Setting the preload of the Belleville washer set

70. Remove the shim (5) from the internal disc carrier (6).

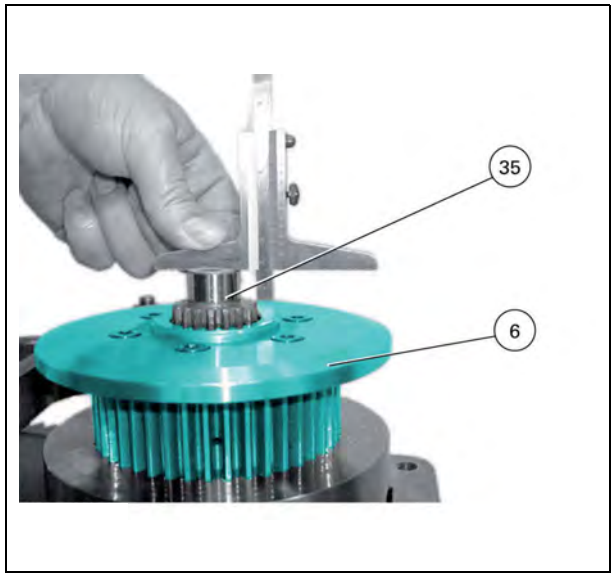
71. Smear the thread of the screw (4) with threadlock Loctite 242 and tighten it.



I008634 Fig. 49

72. Fit the pre-assembled disc carrier (6).

73. Measure and note the distance between the disc carrier (6) and the end of the shaft (35). Example: 23.2 mm.



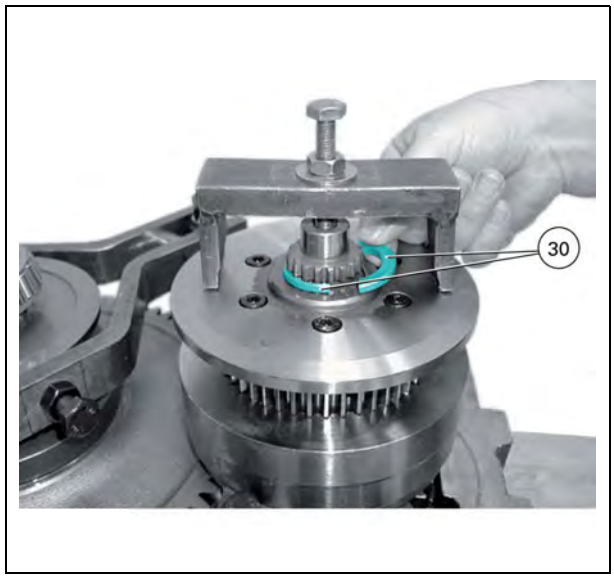
I008635 Fig. 50

74. Fit the compression tool (ref. X 899.980.145) and compress the set of Belleville washers (9).

75. Fit the locking half-rings (30).

76. If the locking half-rings (30) are chamfered on just one side, the chamfered side must face the disc carrier (6).

77. Remove the compression tool (ref. X 899.980.145.000)



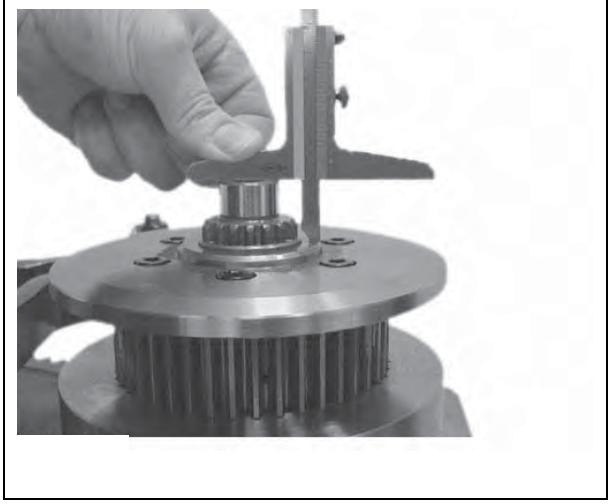
I008636 Fig. 51

78. Measure and note the distance between the disc carrier (6) and the end of the shaft (35). Example: 25.8 mm.
If the washer set gives compensating clearance of approximately 2.5 mm when completely compressed, the preload is correct.

79. If not, correct it with compensating shims.

Installing the set of discs (10) on the disc carrier (6)

For references, see the "General" section in the "Rear power take-off" chapter.

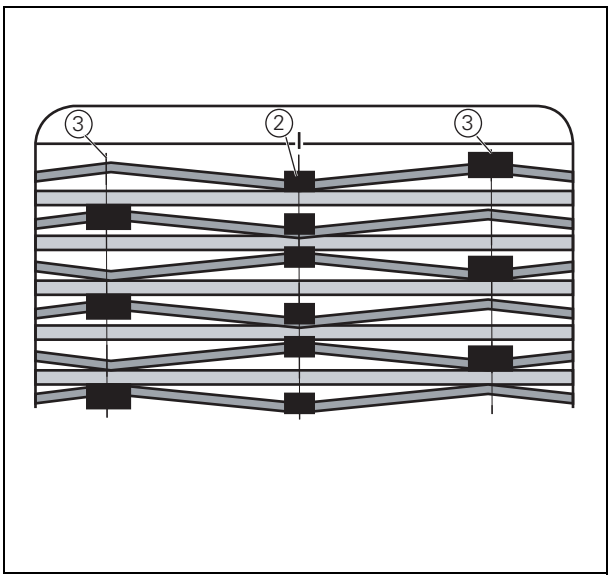


I008637 Fig. 52

80. Start with an external blade.

81. Next alternate with an internal blade (11). Each internal blade (11) should be fitted according to the narrow slot (pos. 2) while the wide slot (pos. 3) should be positioned alternately on either side.

NOTE: *Total number of discs: seven external discs (12) and six internal discs (11).*



I008638 Fig. 53

82. Fit the disc carrier (6) together with the set of Belleville washers (9).

I008639 Fig. 54

83. Fit the compression tool (ref. X 899.980.145.000).

84. Compress the clutch.

85. Fit the locking half-rings (30). If the locking half-rings are chamfered on just one side, the chamfered side must face the disc carrier (6).

NOTE: *If the disc carrier (6) does not fit into place, fit it without the set of discs (10) and mark the teeth.*

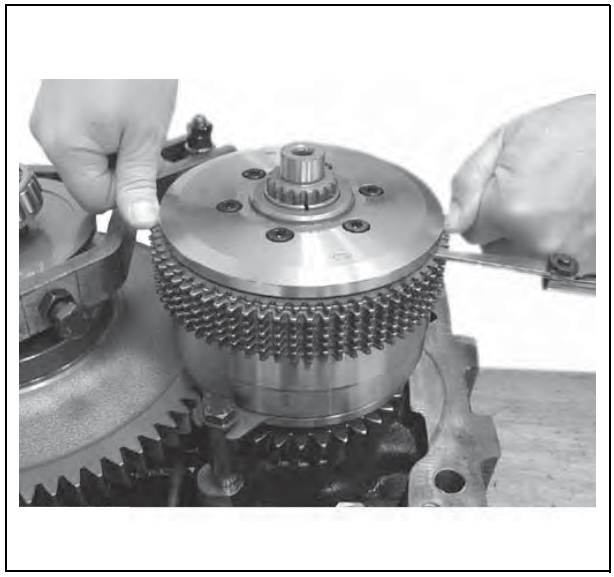
I008640 Fig. 55

86. Push the set of discs home, ensuring it is correctly centred.

87. Measure the distance (uncoupling clearance) using shims. Specified values: 1.75 mm to 3.50 mm clearance.

88. If the minimum distance of 1.75 mm is not obtained, the discs are warped.

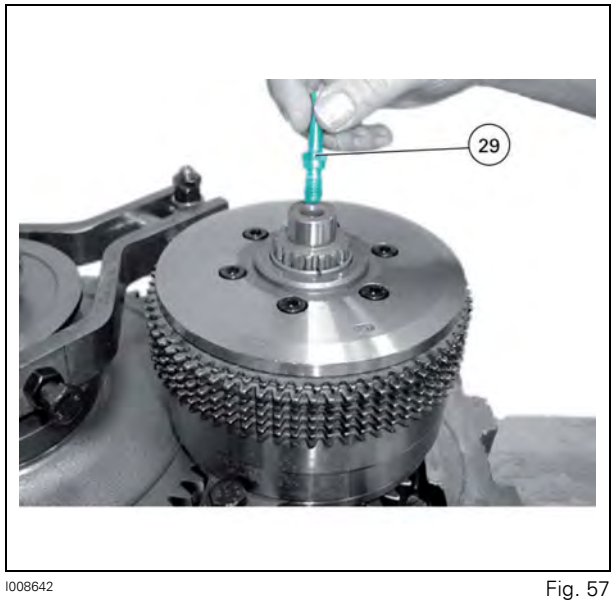
89. Fit a new set of discs (10).



I008641 Fig. 56

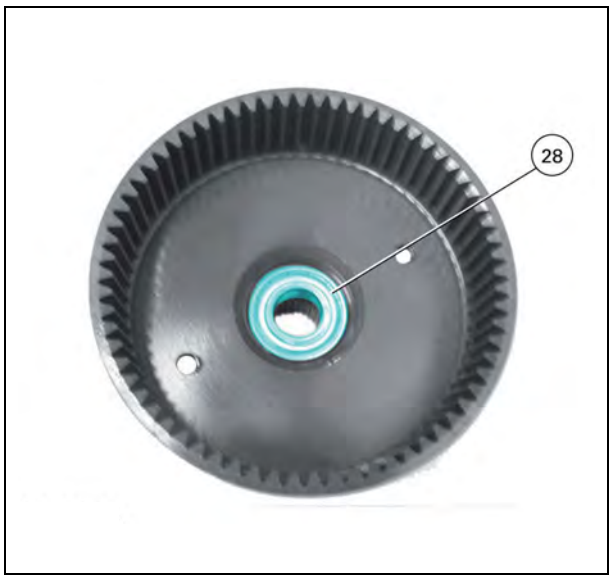
90. Smear the thread of the nozzle (29) with threadlock Loctite 242.

91. Tighten the nozzle (29) to a torque of:



I008642 Fig. 57

92. If necessary, fit the bearing (28) to its stop with its closed part facing upwards into the interior of the clutch bell housing (3).

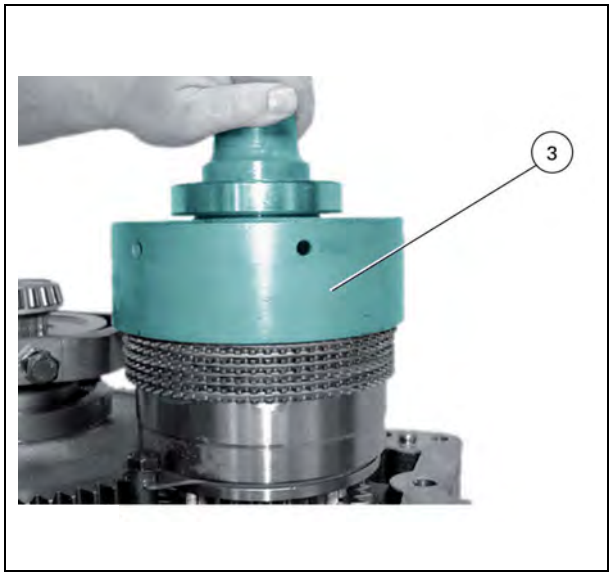


I008643 Fig. 58

93. Fit the bearing (2) up against the clutch bell housing (3).

I008644 Fig. 59

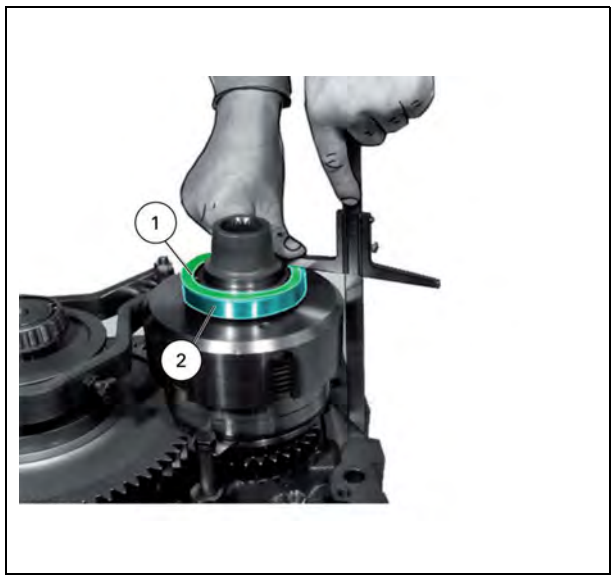
94. Adjust the position of the external discs (12) and fit the clutch bell housing (3) to its stop.



I008645 Fig. 60

95. Fit compensating shims (1) on the bearing (2).

96. Measure and note the distance between the mating faces. For example: 178.6 mm.

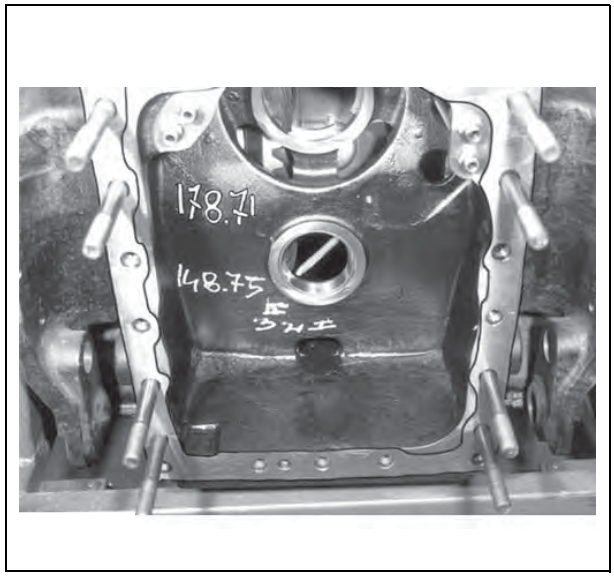


I008646 Fig. 61

97. The distance between the flange face and the mating face of the journal is written in white on the top part of the rear axle housing. Example: 178.71.

98. The distance between the journal of the bearing (2) and the flange face of the housing cover should be less than 0.1 mm to 0.2 mm, as the written value indicates.
This means that the journal clearance must be 0.1 mm to 0.2 mm.

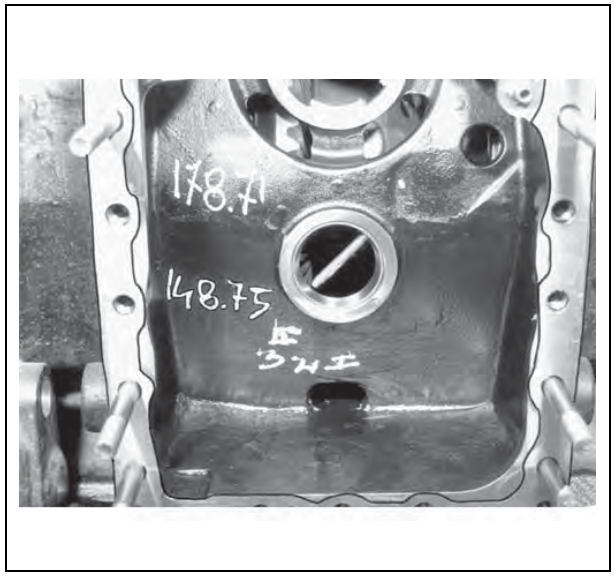
99. If not, correct it with compensating shims (1).



I008647 Fig. 62

100. The distance between the flange face and the mating face of the journal of the lower shaft is written in white on the lower part of the rear axle housing. Example: 148.75.

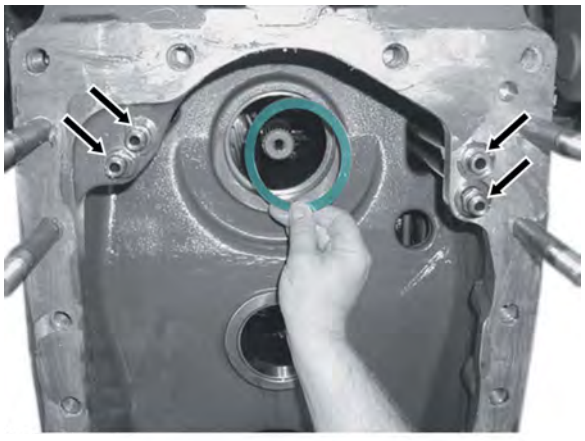
NOTE: *This value is not necessary in case of repair, because a dial gauge must be used to measure the bearing clearance. Check the bearing clearance of the lower shaft (120).*



I008648 Fig. 63

101. Fit the compensating shims (1) in the upper bore.

102. Smear four new "O" rings with miscible grease and fit them at the position of the oil pressure pipes (arrows).



I008649

Fig. 64

103. Clean the housing mating face.

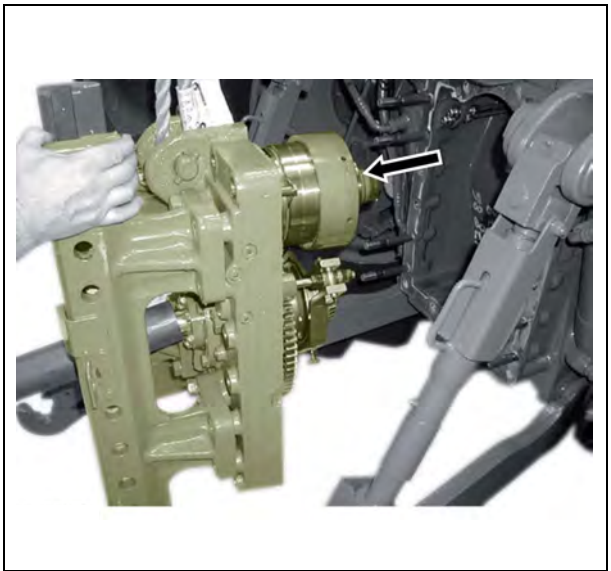
104. Check the two centring pins are fitted correctly (arrows).

105. Smear the mating face with Loctite 549.

I008650

Fig. 65

106. Carefully raise the housing cover and fit it on the rear axle housing.

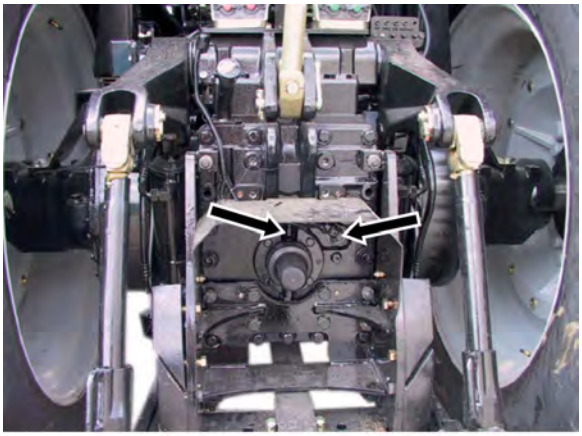


I008587

Fig. 66

107. Tighten the M18 screws and nuts to a torque of:

If necessary:



I008651

Fig. 67

108. Smear the outside of a new shaft sealing ring (126) with a thin layer of sealing product and, with the seal lips turned towards the oil chamber, insert it into the cover (128) until it comes to a gentle stop.
Depth approximately 5 mm.

109. Fill the lip seals 2/3 full with miscible grease.

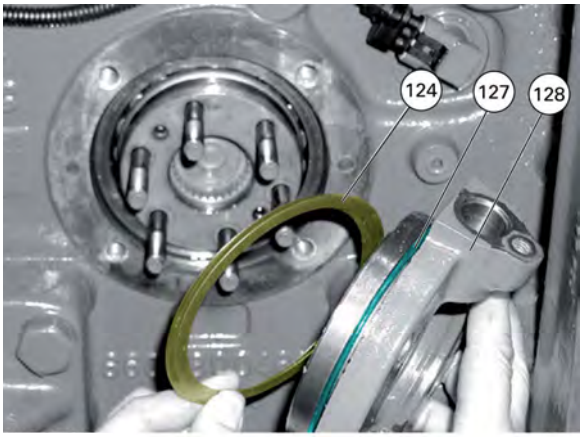
I008652

Fig. 68

110. Fit the corresponding compensating shims (124).

111. Smear new "O" rings (127) with miscible grease and fit them in the groove of the cover (128).

112. Smear the thread of the screws (129) with threadlock Loctite 242 and tighten them.



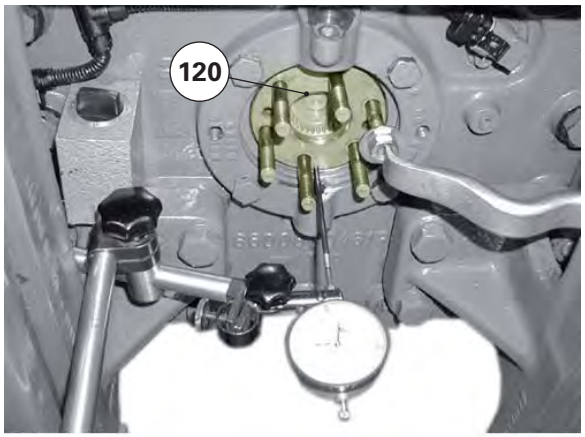
I008653

Fig. 69

113. Rotate the shaft (120) ten times.

114. Fit a dial gauge.

115. Push in the shaft (120) once and note clearance value J2.



I008654 Fig. 70

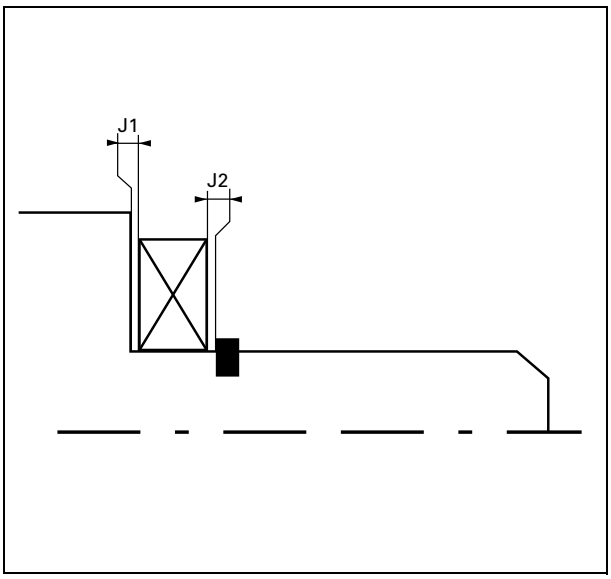
116. Rotate the shaft (120) ten times.

117. Fit a dial gauge.

118. Pull once on the shaft (120) and note clearance value J1.

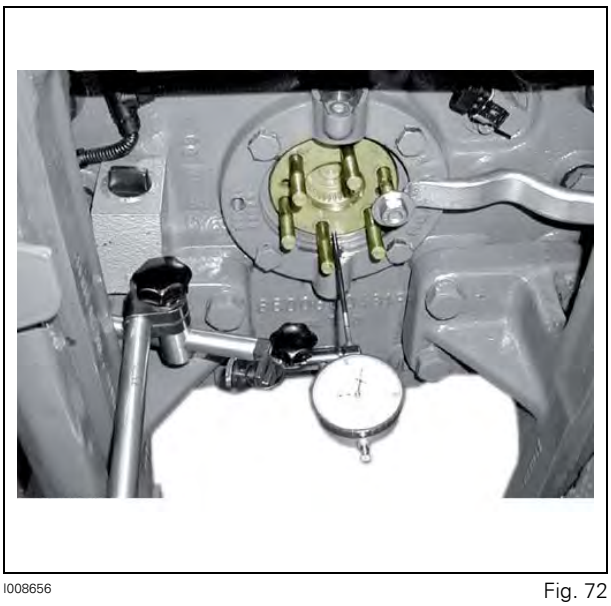
Total clearance J = J1 + J2

0.02 mm < J < 0.07 mm



I008655 Fig. 71

119. If not, correct it with compensating shims (124).



I008656 Fig. 72

120.PTO end-fitting with 6 x 1 3/8" splines

Also compatible:
- PTO end-fitting with 21 x 1 3/8" splines
- PTO end-fitting with 6 x 1 3/4" splines
- PTO end-fitting with 20 x 1 3/4" splines

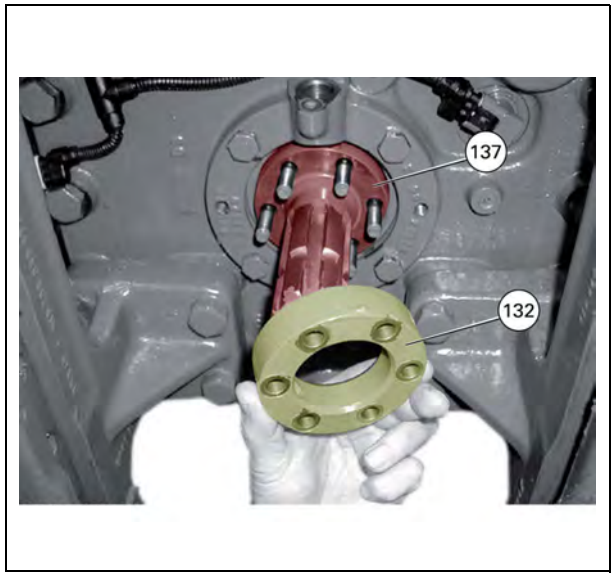
NOTE: *The PTO end-fitting has 4 drive holes for the PTO sensor (arrow).*

I008657 Fig. 73

121. Fit the end-fitting (137).

122. Fit the spacer (132).

123. Top up the transmission oil level (see Operator Instruction Book).



I008658 Fig. 74

124. Lock the end-fitting (137) with an M16 screw (arrow) (for easier assembly).

125. Tighten the nuts (134) (M0-10) to a torque of:

126. Top up the transmission oil level (see Operator Instruction Book).

I008659 Fig. 75

7A18

HA260/Power take-off - Service tools

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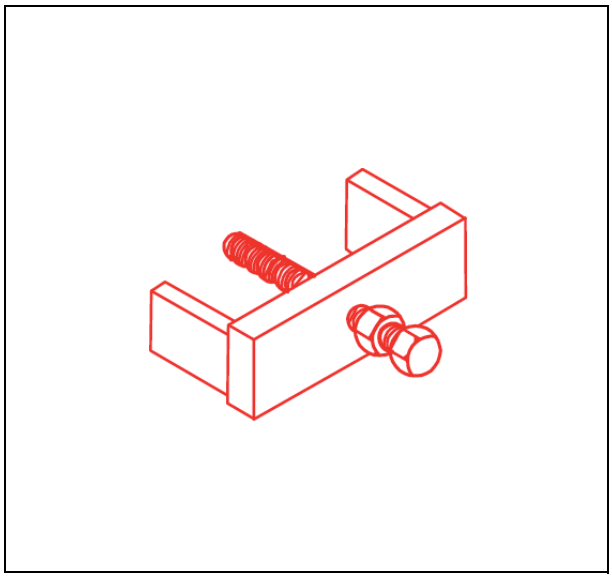
A. General

The tools described in this section can be ordered from the AGCO spare parts department or by contacting the tooling division of Beauvais by referring to AGCOnet bulletin Trac 60/07.
The prices will then be sent out to you.

B. HA260/Power take-off - Service tools

Ref.	X899.980.145.000
Description	Securing system for rear power take-off (PTO) clutch
Order	Parts Division



I009420

Fig. 1

7B10

Zuidberg front power take-off - General

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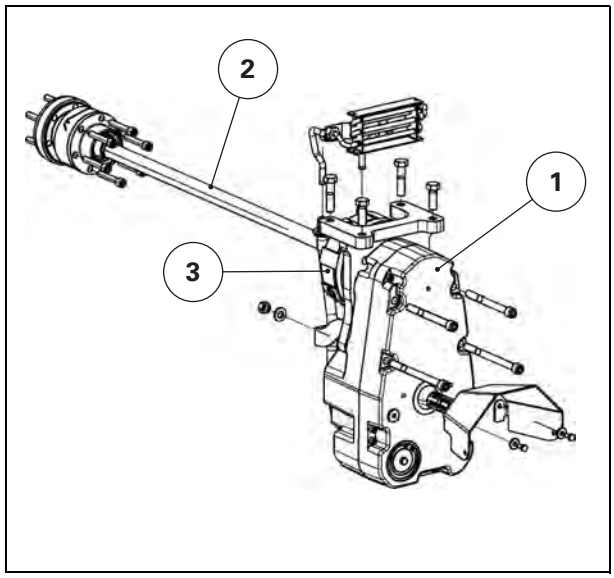
A. General

Description

The power take-off unit (1) (Fig. 1) comprises a housing, which serves as the oil tank.
The housing contains the following parts:

- the power take-off drive gears
- a multidisc clutch
- a gear pump to ensure clutch engagement and gear lubrication
- a solenoid valve for engaging the clutch
- an oil filter
- a pressure relief valve for the clutch system
- a pressure relief valve for the cooling system



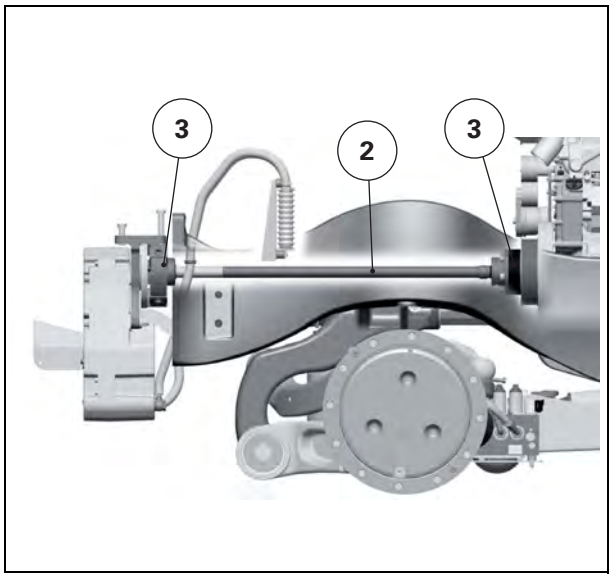
I010381

Fig. 1

B. Principles of operation

Mechanical

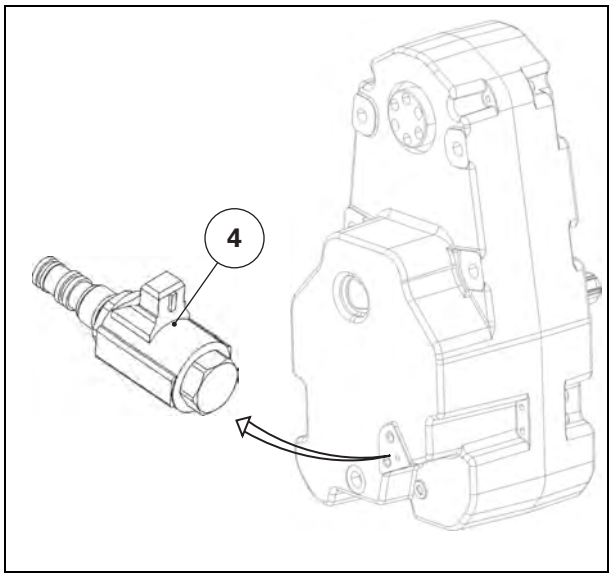
The front power take-off is driven from the front pulley of the engine via a shaft (2) fitted with two shock absorbers (3) (Fig. 2).



I010385

Fig. 2

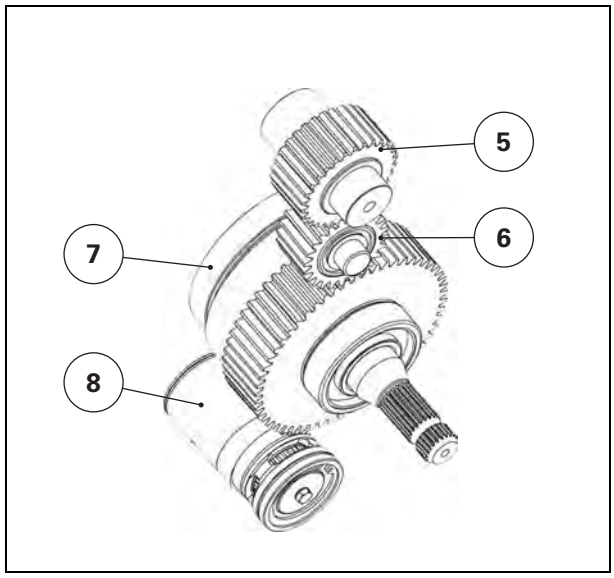
The power take-off clutch is controlled by a solenoid valve (4) .



I010382

Fig. 3

Power take-off clockwise

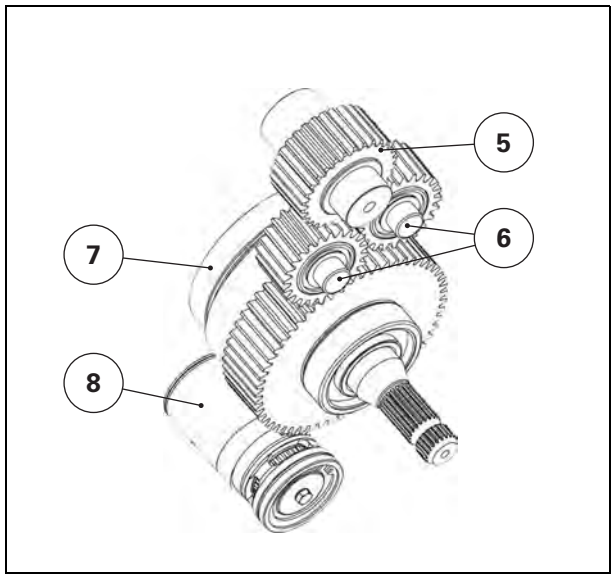


I010383

Fig. 4

Reduction is obtained by a series of straight-cut gears. The reduction comprises 3 or 4 gears, depending on the type of power take-off (clockwise or anti-clockwise).
The driving gear (5) drives the clutch (7) via one or two lay-shaft gears (6).

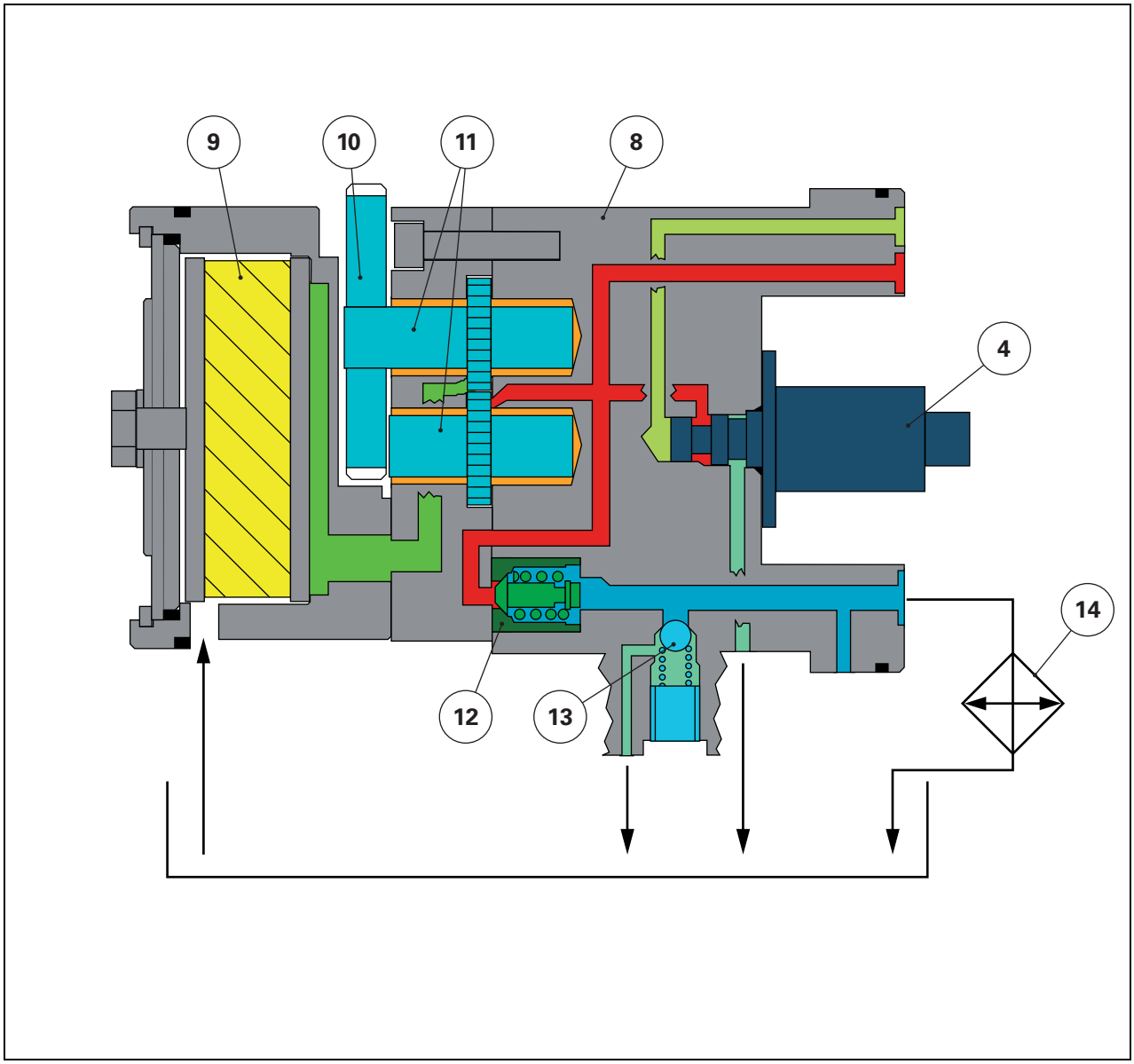
Power take-off anti-clockwise



I010384

Fig. 5

Hydraulics



I010386

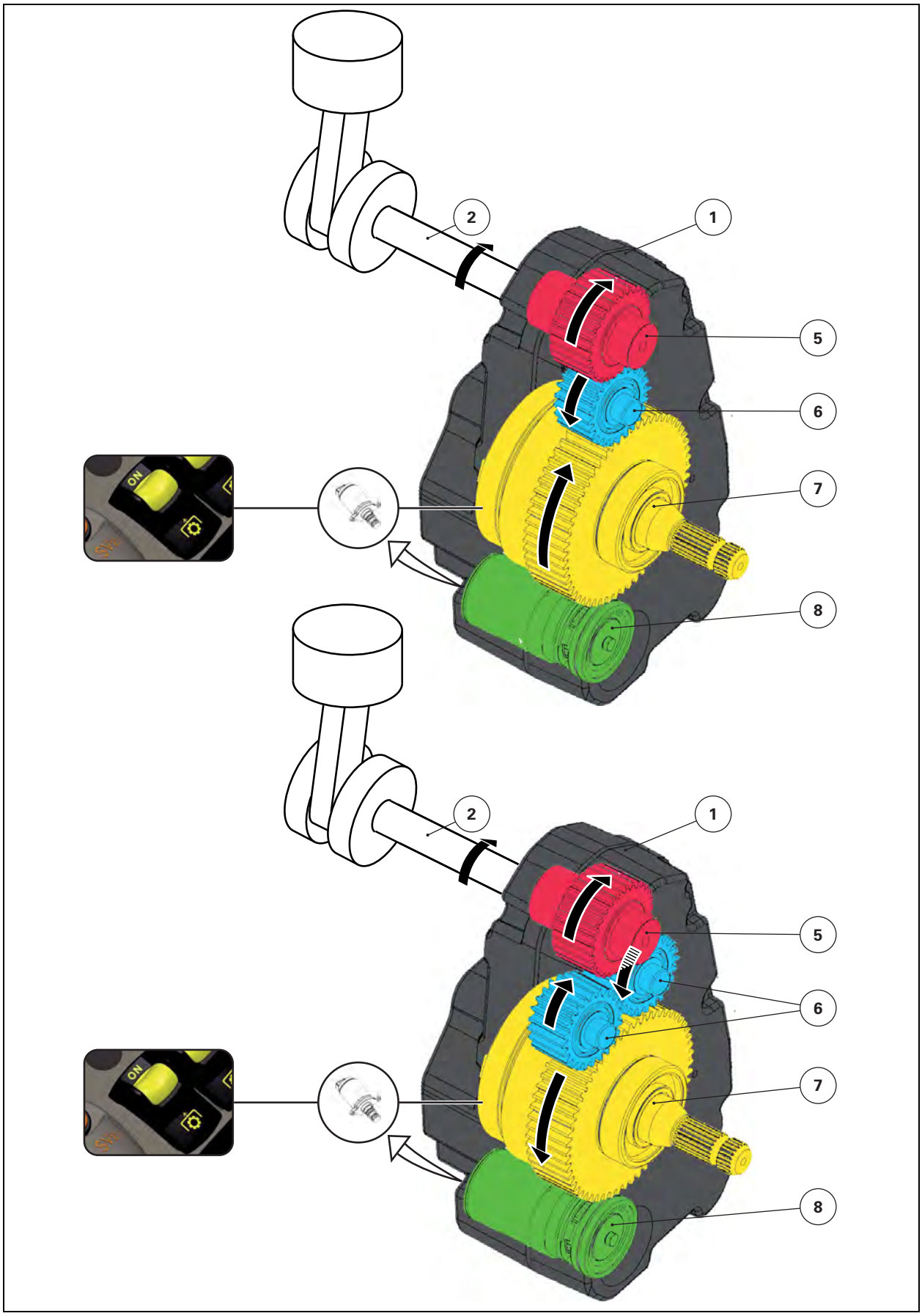
Fig. 6

The power take-off clutch (7) is a wet multidisc type. It drives a hydraulic gear pump (8), which provides the pressure for engaging the clutch, lubricating the system and cooling.

The front power take-off hydraulic system is self-contained. The clutch unit (8) drives the pump gears (11) via the gear (10). The system pressure is limited by a valve (12) set to 20 bar. The cooling system (14) is protected by a valve (13) set to 6 bar. The solenoid valve (4) directs the pressure to the clutch or the tank.

NOTE: *The pump flow is around 4 l/min.*

C. Schematic diagrams



I010492

Fig. 7

1-..... Housing
2..... Shaft
5..... Input gear
6..... Idler gear
7..... Clutch
8..... Hydraulic system

7B11

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Zuidberg front power take-off - Diagrams and plans

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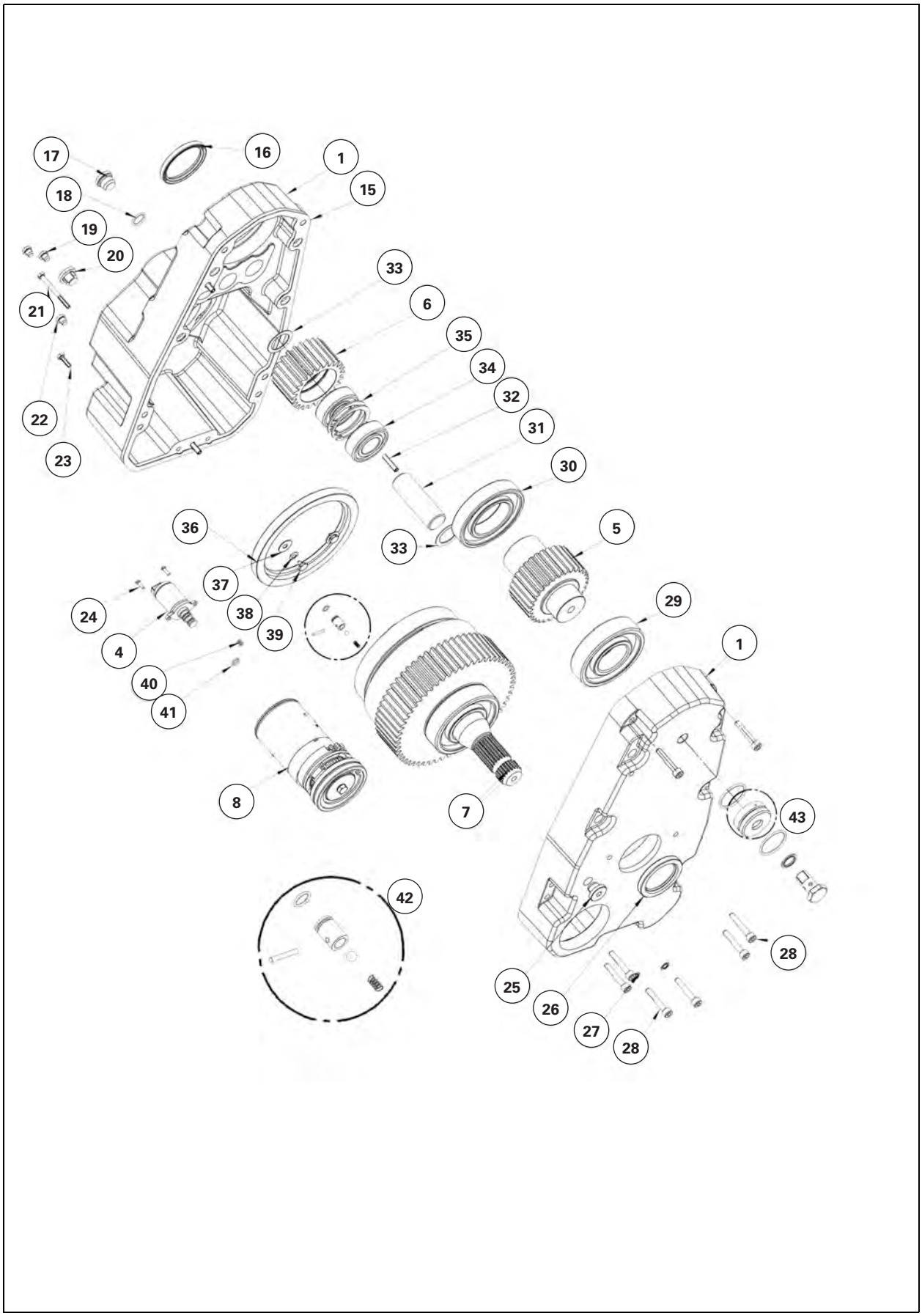
A. Plans

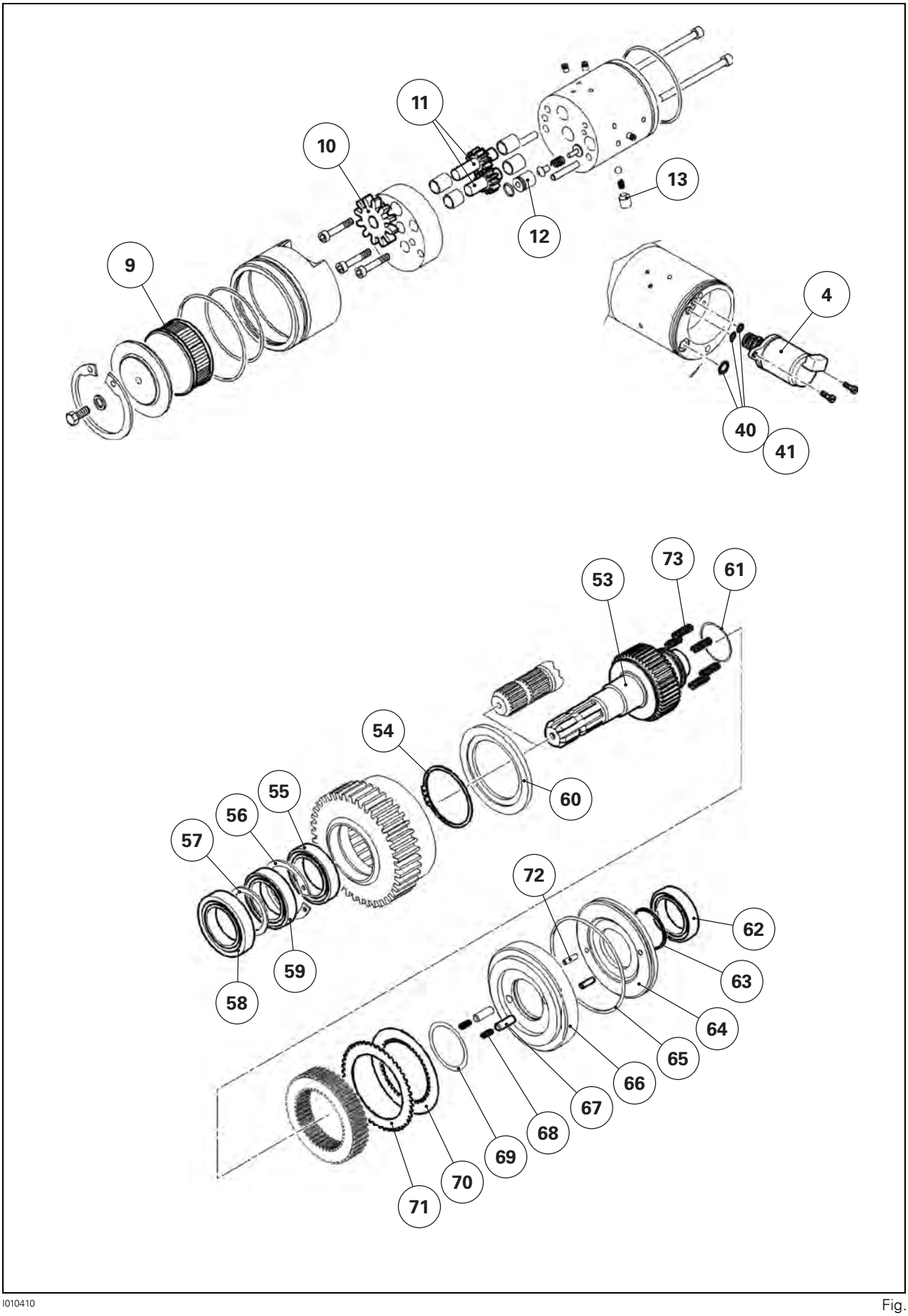
Blown-up view of the PTO unit



I010409

Fig. 1

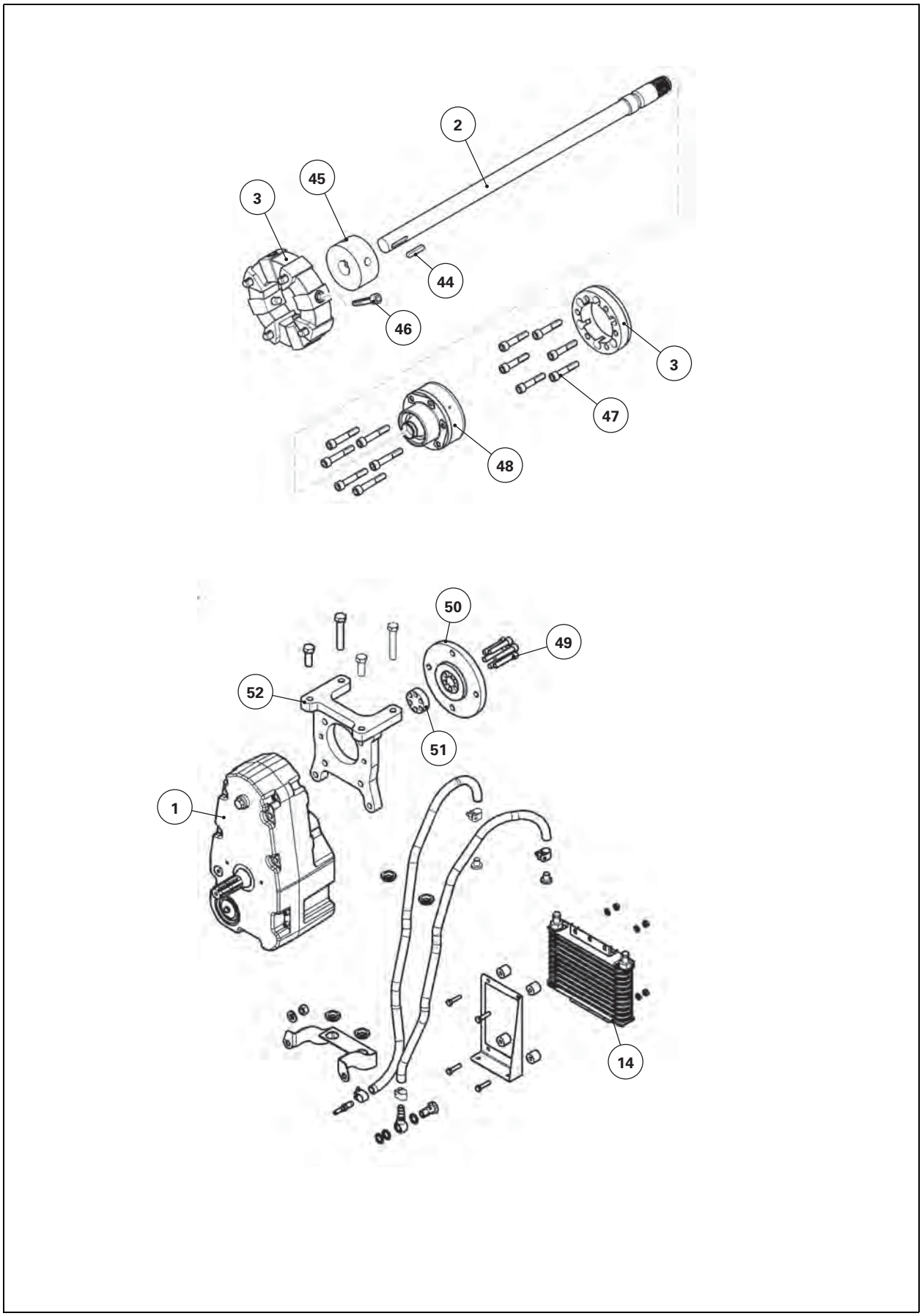
Blown-up view of the hydraulic pump and the PTO clutch



I010410

Fig. 2

Blown-up view of the drive shaft and the oil cooler



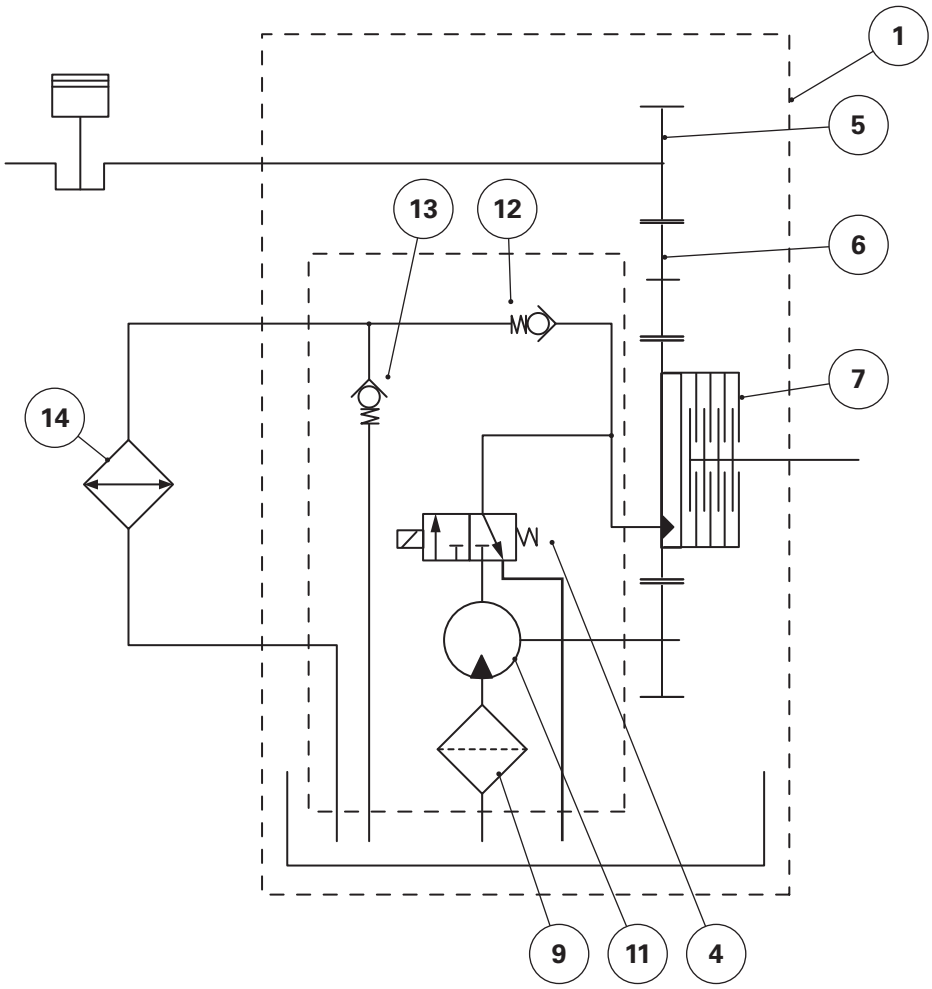
I010412

Fig. 3

1- ..... Housing
2 ..... Shaft
3 ..... Shock absorber
4 ..... Solenoid valve
5 ..... Input gear
6 ..... Idler gear
7 ..... Clutch
8 ..... Hydraulic system
9 ..... Filter
10 ..... Gear
11 ..... Gear pump
12 ..... Valve 20 bar
13 ..... 5 bar valve
14 ..... Cooler
15 ..... Seal
16 ..... Seal ring
17 ..... Plug
18 ..... "O" ring
19 ..... Plug
20 ..... Plug
21 ..... Screw
22 ..... Plug
23 ..... Screw
24 ..... Screw
25 ..... Plug
26 ..... Seal ring
27 ..... Seal
28 ..... Screw
29 ..... Bearing
30 ..... Bearing
31 ..... Pin
32 ..... Centring pin
33 ..... Shim
34 ..... Bearing
35 ..... Circlip
36 ..... Ring
37 ..... Washer
38 ..... Spring washer
39 ..... Screw
40 ..... "O" ring
41 ..... "O" ring
42 ..... Connecting pipe
43 ..... Breather
44 ..... Key
45 ..... Hub
46 ..... Screw
47 ..... Screw
48 ..... Hub
49 ..... Screw
50 ..... Screw
51 ..... Spacer
52 ..... Support
53 ..... Output shaft
54 ..... Circlip
55 ..... Bearing
56 ..... Circlip
57 ..... Shim
58 ..... Bearing
59 ..... Bearing
60 ..... Thrust plate
61 ..... Seal
62 ..... Bearing
63 ..... Circlip

64..... Piston
65..... "O" ring
66..... Cylinder
67..... Centring pin
68..... Spring
69..... "O" ring
70..... Disc
71..... Thrust plate
72..... Centring pin
73..... Spring

B. Hydraulic diagrams



I010387

Fig. 4

1-..... Housing
4..... Solenoid valve
5..... Input gear
6..... Idler gear
7..... Clutch
9..... Filter
11 ..... Gear pump
12..... 20 bar valve
13..... 5 bar valve
14..... Cooler

C. Electrical diagrams

C.1 Identification of electrical connectors and harnesses

Identification of electrical connectors
X1 - Auxiliary hydraulic oil temperature sensor
X2 - Auxiliary hydraulic oil filter blockage switch
X3 - 540 rpm PTO speed solenoid valve
X4 - 1000 rpm PTO speed solenoid valve
X5 - 4WD solenoid valve
X6 - Differential lock solenoid valve
X7 - Rear PTO solenoid valve
X8 - Bevel gear theoretical speed sensor
X9 - Transmission oil high pressure sensor 1
X10 - Collecting shaft speed sensor
X11 - Solenoid valve limiting speed to 30 kph
X12 - Coupler function solenoid valve
X13 - Hare range solenoid valve
X14 - Tortoise range solenoid valve
X15 - PTO clutch speed sensor
X16 - PTO shaft speed sensor
X17 - Hare/Tortoise range position sensor
X18 - Transmission control module
X19 - Transmission hydraulic oil temperature sensor
X20 - Transmission filter blockage switch
X21 - ParkLock brake pressure sensor
X22 - Radar
X23 - Steering pressure sensor
X24 - Auxiliary hydraulic oil gauge
X25 - Engine speed sensor
X26 - Pneumatic brake solenoid valve
X27 - Rear linkage lifting solenoid valve
X28 - Rear linkage lowering solenoid valve
X29 - Dual Control socket connector
X30 - Rear linkage position sensor
X31 - Rear linkage right-hand draft sensor
X32 - Rear linkage left-hand draft sensor
X33 - Transmission harness CAN junction
X34 - Transmission oil high pressure sensor 2
X35 - ParkLock hydraulic system pressure sensor
X36 - LS signal breaker solenoid valve
X37 - ParkLock pressure reversing solenoid valve
X38 - Trailer braking proportional solenoid valve
X39 - Trailer braking safety solenoid valve
X40 - Front linkage single/double acting function solenoid valve
X41 - Divider solenoid valve 1
X42 - Divider solenoid valve 2
X43 - Auto-hitch lifting solenoid valve
X44 - Auto-hitch lowering solenoid valve
X45 - Bleed for pneumatic suspended cab front and rear systems
X46 - Rear left-hand ram position sensor for cab suspension
X47 - Rear right-hand unit for suspended cab
X48 - Rear left-hand unit for suspended cab
X49 - Suspended cab rear lowering solenoid valve
X50 - Suspended cab front lowering solenoid valve
X51 - Transmission harness earth (chassis)

X52 - Engine harness/transmission harness junction
X53 - Cab transmission harness/transmission harness junction
X54 - Suspended cab lifting solenoid valve
X55 - Instrument panel
X56 - Power Control lever
X57 - DOT Matrix keyboard
X58 - Windscreen wiper and indicator control unit
X59 - DOT Matrix keyboard connection on instrument panel
X60 - Engine harness/instrument panel harness junction
X61 - Cab transmission harness/engine harness junction
X62 - Instrument panel harness/cab transmission harness junction
X63 - Instrument panel harness connection on fuse box
X64 - Instrument panel harness connection on fuse box
X65 - Front windscreen wiper motor
X66 - Left-hand brake pedal sensor
X67 - Right-hand brake pedal sensor
X68 - Clutch pedal sensor
X69 - Cab interior temperature sensor
X70 - Solar radiation sensor
X71 - Throttle pedal sensor
X72 - ParkLock switch on Power Control lever
X73 - Buzzer Control
X74 - Buzzer Supply (+12 V APC)
X75 - Pillar harness/right-hand fender harness junction
X76 - Rear right-hand indicator
X77 - Rear right-hand side light and stop light
X78 - Work light on rear right-hand fender
X79 - -
X80 - -
X81 - -
X82 - -
X83 - -
X84 - -
X85 - -
X86 - -
X87 - Linkage lifting/lowering switch on right-hand fender
X88 - Rear right-hand NA indicator extension
X89 - Earth (chassis)
X90 - Pillar harness/left-hand fender harness junction
X91 - Rear left-hand indicator
X92 - Rear left-hand side light and stop light
X93 - Work light on rear left-hand fender
X94 - PTO ON/OFF switch on left-hand fender
X95 - PTO Stop switch on left-hand fender
X96 - Hydraulic spool valve switch on left-hand fender
X97 - Linkage lifting/lowering switch on left-hand fender
X98 - Rear left-hand NA indicator extension
X99 - PTO and linkage console harness/cab transmission harness junction
X100 - Instrument panel harness earth (chassis)
X101 - Instrument panel harness/electric rear-view mirror harness junction
X102 - Right-hand fender lighting harness/trailer connector harness junction
X103 - Armrest harness/cab transmission harness junction
X104 - Armrest Autotronic 5
X105 - Datatronic CCD

X106 - Transmission lever in armrest
X107 - Headland mode switch (headland function)
X108 - FingerTIP 3
X109 - FingerTIP 4
X110 - FingerTIP 5
X111 - DTM dynamic transmission mode switch
X112 - Joystick
X113 - Armrest 6-button keyboard
X114 - Supply on fuse box for 3rd spool valve
X115 - Supply on fuse box for 4th spool valve
X116 - +12 V battery supply (for lighting module)
X117 - Isobus +12 V battery power socket
X118 - Automatic PTO switch
X119 - Rear linkage lifting/lowering switch
X120 - Datatronic CCD navigation keyboard
X121 - Rear linkage height/depth adjustment thumb wheel
X122 - Hand throttle
X123 - Hare/Tortoise range shift switch
X124 - Pedal/lever mode switch
X125 - SV1 speed setting potentiometer
X126 - SV2 speed setting potentiometer
X127 - Front PTO ON/OFF switch
X128 - Rear PTO ON/OFF switch
X129 - Fuse box +12 V battery connection
X130 - FingerTIP 6 front linkage function
X131 - Front linkage suspension solenoid valve
X132 - Instrument panel harness/armrest harness junction
X133 - Console harness/cab transmission harness junction
X134 - Console harness/pillar harness junction
X135 - Braking pressure sensor
X136 - Differential lock switch
X137 - 4WD switch
X138 - Hazard warning lights indicator light and switch
X139 - Suspended front axle switch
X140 - Suspended front axle setting potentiometer
X141 - Suspended cab switch
X142 - Suspended cab setting potentiometer
X143 - Variable steering switch (fast steering)
X144 - Variable steering setting potentiometer (fast steering)
X145 - PTO/linkage console
X146 - Rear linkage suspension switch
X147 - Roof harness/pillar harness junction
X148 - Roof harness/pillar harness junction
X149 - Headlights module (black connector)
X150 - Pillar harness/cab power socket harness junction
X151 - Pillar harness/cab power socket harness junction
X152 - Start switch
X153 - Non-Isobus implement connector
X154 - Suspended front axle lifting solenoid valve
X155 - Cigarette lighter socket (power)
X156 - Cigarette lighter socket (backlighting)
X157 - Left-hand side +12 V socket (power)
X158 - Left-hand side +12 V socket (backlighting)
X159 - Suspended front axle lowering solenoid valve
X160 - Console harness earth (chassis)
X161 - Solenoid valve 1 for suspended front axle suspension

X162 - Pillar harness connection on fuse box
X163 - Solenoid valve 2 for suspended front axle suspension
X164 - Pillar harness/cab transmission harness junction
X165 - Automatic air conditioning harness/pillar harness junction
X166 - Suspended front axle position sensor
X167 - +12 V APC fuse box connection
X168 - Pneumatic brake system pressure sensor
X169 - Power socket control switch (in cab)
X170 - Pillar harness connection on fuse box
X171 - Cab transmission harness connection on fuse box
X172 - Cab transmission harness connection on fuse box
X173 - Cab transmission harness earth
X174 - Autotronic 4 transmission controller
X175 - Emergency control switch
X176 - Earth (Autotronic 4 transmission controller)
X177 - Autotronic 5 Linkage
X178 - ParkLock/suspended front axle/passive suspended cab Autotronic 5
X179 - Main lighting, sidelight/dipped light activation switch
X180 - Front windscreen washer pump
X181 - Front linkage single acting / double acting function switch
X182 - Linkage external lifting switch
X183 - Diagnostics connector (tractor-Isobus CAN)
X184 - Diagnostics connector (engine-valve CAN)
X185 - Sisu EEM unit
X186 - Starter
X187 - Engine start relay
X188 - Engine identification module (ID module)
X189 - Fuel lift pump
X190 - Vistronic fan
X191 - Diesel fuel preheater
X192 - B + alternator 1
X193 - B + alternator 2
X194 - D + alternator 1
X195 - D + alternator 2
X196 - In line fuse (225 A)
X197 - Diesel fuel gauge
X198 - Pneumatic trailer brake sensor
X199 - Work light on left-hand step
X200 - Work light on right-hand step
X201 - Engine harness earth
X202 - Front accessory connection socket harness/front function harness junction
X203 - Engine harness/front headlights harness junction
X204 - Cooling unit harness/engine harness junction
X205 - Front axle harness/engine harness junction
X206 - Sensor detecting water in the diesel fuel
X207 - Pneumatic seat adjustment control
X208 - Front linkage suspension switch LED
X209 - Rear linkage external lowering switch
X210 - Orbitrol steering sensor (SASA sensor)
X211 - Rear Dual Control connector
X212 - Instrument panel harness/armrest harness junction
X213 - Power socket for additional heating
X214 - Armrest harness/cab transmission harness junction

X215 - Trailer connector (right-hand side light and number plate lights)
X216 - Reversing light
X217 - Isobus CAN connector
X218 - External Isobus tool connector
X219 - Cab Isobus harness/external Isobus harness junction
X220 - Trailer connector (left-hand side light)
X221 - Trailer connector (right-hand indicator)
X222 - Trailer connector (left-hand indicator)
X223 - Trailer connector (brake lights)
X224 - Trailer connector (earth)
X225 - Trailer connector (reversing light)
X226 - Trailer connector harness earth
X227 - Console harness/cab transmission harness junction
X228 - Front linkage single/double-acting function LED
X229 - 120 Ohm CAN 1 resistor (cab transmission harness)
X230 - 120 Ohm CAN 2 resistor (cab transmission harness)
X231 - 120 Ohm CAN 3 resistor (cab transmission harness)
X232 - 120 Ohm CAN 4 resistor (cab transmission harness)
X233 - Cab transmission harness/Isobus harness junction
X234 - 120 Ohm CAN ATC resistor
X235 - Front axle steering sensor (WAS sensor)
X236 - Electrohydraulic Orbitrol (grey connector)
X237 - Electrohydraulic Orbitrol (black connector)
X238 - Connector 1 for valve harness
X239 - Connector 2 for valve harness
X240 - 120 Ohm resistor for electrohydraulic spool valves
X241 - Sisu engine preheating supply (Grid Heater)
X242 - Exhaust temperature sensor
X243 - AdBlue/DEF reservoir (urea) level gauge and temperature sensor
X244 - CAN SCR harness
X245 - +12 V APC supply for SCR
X246 - Auto-Guide external harness/engine harness junction
X247 - Roof harness/electric rear-view mirror harness junction
X248 - Right and left-hand electric rear-view mirror adjustment switch
X249 - External rear-view mirror defroster switch
X250 - Power socket in cab
X251 - In line fuse (225 A)
X252 - Automatic air conditioning condenser
X253 - Air filter vacuum sensor
X254 - Horn (earth)
X255 - Horn
X256 - Roof harness/hand rail harness junction
X257 - Side light and indicator on hand rail (right and left)
X258 - Main beam on hand rail (right and left)
X259 - Hand rail upper work light
X260 - Hand rail upper work light
X261 - Front right-hand unit for suspended cab
X262 - Front left-hand unit for suspended cab
X263 - Floating stop relay control (US front-end loader)

X264 - Front linkage suspension switch
X265 - Rear linkage suspension switch indicator light
X266 - Rear linkage diagnostic and lifting/lowering LEDs
X267 - Switch for left-hand side heater
X268 - Pillar harness connection on fuse box
X269 - Cab suspension harness/cab transmission harness junction
X270 - Front accessories connection socket (rotary beacon)
X271 - Front accessories connection socket (+12 V battery)
X272 - Front accessories connection socket (+12 V APC)
X273 - Front accessories connection socket (main beam light)
X274 - Front accessories connection socket (main beam light)
X275 - Front accessories connection socket (work light)
X276 - Earth for front accessory connection socket harness
X277 - Front linkage lifting/lowering external control
X278 - Front linkage lifting switch (external)
X279 - Dual Control or TIC position sensor
X280 - Front linkage rams pressure sensor
X281 - Solenoid valve for front PTO
X282 - Roof harness/cab Auto-Guide harness junction
X283 - TopDock
X284 - Headlights module keyboard
X285 - Ad Blue (urea) metering valve
X286 - Ad Blue (urea) injection valve
X287 - Ad Blue (urea) reservoir preheating valve
X288 - 12/24 V converter for SCR system
X289 - SCR management module
X290 - Front accessory connection socket harness/front function harness junction
X291 - Front accessory connection socket harness/front function harness junction
X292 - Front windscreen washer pump
X293 - 540 rpm PTO switch
X294 - 540 eco rpm PTO switch
X295 - 1000 rpm PTO switch
X296 - USB connector
X297 - PTO/linkage console backlighting
X298 - Headland mode switch (headland function)
X299 - Linkage lowering speed potentiometer
X300 - -
X301 - PTO stop switch on left-hand fender
X302 - Switch for pre-selected engine speed A
X303 - Switch for pre-selected engine speed B
X304 - Instrument panel harness/armrest harness junction
X305 - Headlights module (grey connector)
X306 - Switch for pre-selected engine speed A/B
X307 - FingerTIP 1
X308 - FingerTIP 2
X309 - SV1/SV2 speed regulator switch
X310 - Divider 1 indicator light and solenoid valve (earth)
X311 - Divider 2 indicator light and solenoid valve (+12 V)
X312 - SV1/SV2 speed setting potentiometer in armrest
X313 - Pedal/lever transmission control mode switch and DTM switch
X314 - Hydraulics switch 1, road/field mode

X315 - Hydraulics switch 2, road/field mode
X316 - Headland mode switch (headland function)
X317 - + battery supply for headlights module
X318 - Automatic air conditioning compressor
X319 - + battery supply for headlights module
X320 - + battery supply on headlights module
X321 - + battery supply on headlights module
X322 - + battery supply on headlights module
X323 - + battery supply on headlights module
X324 - +12 V APC fuse box connector (battery isolator switch)
X325 - Pillar harness / non-Isobus implement connector harness junction
X326 - Pillar harness / non-Isobus implement connector harness junction
X327 - Battery earth (chassis)
X328 - Battery isolator switch earth terminal
X329 - Battery isolator switch earth terminal
X330 - Battery negative terminal contact (battery isolator switch)
X331 - Pillar harness connection on fuse box
X332 - + battery (start switch)
X333 - Engine harness earth (chassis)
X334 - Battery isolator switch earth terminal
X335 - Battery isolator switch earth terminal
X336 - Battery isolator switch
X337 - Pneumatic brake ParkLock solenoid valve
X338 - Earth (battery isolator switch)
X339 - Pneumatic trailer braking solenoid valve
X340 - + terminal on battery for fuse box
X341 - Starter supply
X342 - Positive battery terminal
X343 - RS232 diagnostics connector for Auto-Guide
X344 - Isobus connector in cab
X345 - Supply for additional terminal (mitron unit)
X346 - Auto-Guide switch
X347 - Cab transmission harness connection on fuse box
X348 - Cab transmission harness connection on fuse box
X349 - -
X350 - Front right-hand grille work light
X351 - Front right-hand grille work light
X352 - Front right-hand grille work light
X353 - Front left-hand grille work light
X354 - Front left-hand grille work light
X355 - Front left-hand grille work light
X356 - Right-hand main beam and dipped light
X357 - Left-hand main beam and dipped light
X358 - Outside temperature sensor
X359 - Cab suspension harness/cab transmission harness junction
X360 - Pillar harness connection on fuse box
X361 - Pillar harness connection on fuse box
X362 - Fuse box (+12 V battery)
X363 - Auto-hitch (Dromone) switch
X364 - 120 Ohm resistor for Auto-Guide/Isobus CAN network
X365 - Hand rail lower work light
X366 - Pneumatic brake harness / transmission harness junction
X367 - Switch 1 on joystick
X368 - Switch 2 on joystick

X369 - Engine speed + switch
X370 - Engine speed - switch
X371 - Engine speed stop switch
X372 - Orbitrol safety solenoid valve
X373 - Left-hand 12 V socket (cab) (power)
X374 - Left-hand 12 V socket (cab) (backlighting)
X375 - Instrument panel harness/cab transmission harness junction
X376 - Fuse box (reserve for + APC)
X377 - Fuse box (supply for cab suspension compressor)
X378 - FNRP lever and button
X379 - Front left-hand work light on roof
X380 - Front right-hand work light on roof
X381 - Front left-hand work light on roof
X382 - Front right-hand work light on roof
X383 - Front left-hand roof indicator
X384 - Front right-hand roof indicator
X385 - Rear left-hand work light on roof
X386 - Rear right-hand work light on roof
X387 - Rear left-hand work light on roof
X388 - Rear right-hand work light on roof
X389 - Rear left-hand work lights
X390 - Rear right-hand work lights
X391 - Rear left-hand roof indicator
X392 - Rear right-hand roof indicator
X393 - Earth
X394 - Radio aerial connector
X395 - Radio supply
X396 - Radio speaker connector
X397 - Front left-hand speaker
X398 - Front right-hand speaker
X399 - Rear left-hand speaker (+ supply)
X400 - Rear right-hand speaker (+ supply)
X401 - Rear left-hand speaker (- supply)
X402 - Rear right-hand speaker (- supply)
X403 - Rear windscreen wiper motor
X404 - Door switch
X405 - Interior light (earth)
X406 - Interior light (control)
X407 - Interior light (+12 V battery supply)
X408 - Right-hand console light
X409 - Left-hand rotary beacon
X410 - Right-hand rotary beacon
X411 - Rear windscreen wiper switch
X412 - Radio aerial
X413 - Earth (aerial)
X414 - Left-hand number plate light
X415 - Right-hand number plate light
X416 - Radio supply
X417 - Radio speaker connector
X418 - Earth
X419 - Earth
X420 - Rotary beacon harness earth (chassis)
X421 - Earth
X422 - Roof harness earth (chassis)
X423 - Left-hand side fan ON/OFF switch
X424 - Fan speed control knob
X425 - Air conditioning switch
X426 - Air conditioning indicator light
X427 - Manual air conditioning module
X428 - Electronic thermostat for heating

X429 - Speed 1relay for fan
X430 - Speed 2relay for fan
X431 - Speed 3relay for fan
X432 - Speed 4relay for fan
X433 - Left-hand heating resistor
X434 - Right-hand fan
X435 - Left-hand fan
X436 - Left-hand side fan switch
X437 - Relay for left-hand side fan
X438 - Earth (automatic air conditioning)
X439 - Air conditioning control module (blue connector)
X440 - Air conditioning control module (yellow connector)
X441 - Heating temperature sensor
X442 - TT2 sensor
X443 - Evaporator temperature sensor
X444 - Right-hand fan adapter module (signal)
X445 - Left-hand fan adapter module
X446 - Right-hand fan adapter module (supply)
X447 - Left-hand fan adapter module (supply)
X448 - Separation harness for automatic air conditioning
X449 - Motor for left-hand heating shutter
X450 - Motor for right-hand heating shutter
X451 - Motor for heating mixer shutter
X452 - Relay for heater pump
X453 - Heater accelerator pump
X454 - Earth (roof)
X455 - Roof harness earth
X456 - Solar panel
X457 - Earth (Auto-Guide)
X458 - Cab transmission harness/pillar harness junction
X459 - Linkage lifting switch on fender
X460 - Linkage lowering switch on fender
X461 - Pillar harness/TECU harness junction
X462 - Supply indicator light for power socket on pillar
X463 - Earth (Isobus)
X464 - Pillar harness/armrest harness junction
X465 - Battery positive terminal contact
X466 - Active suspended cab Autotronic 5
X467 - Right-hand electric rear-view mirror
X468 - Left-hand electric rear-view mirror
X469 - Additional fan connection
X470 - Operator presence in seat switch
X471 - Suspended cab harness connection

Identification of harnesses
FAI200 - Engine harness
FAI201 - Front headlights harness
FAI202 - Suspended front axle harness
FAI203 - Transmission harness
FAI204 - Cab/platform linkage external harness
FAI205 - Electrohydraulic valves harness
FAI206 - Transmission harness — PTO
FAI207 - Front Dual Control harness
FAI208 - Linkage with Dual Control and TIC harness
FAI209 - Instrument panel harness
FAI210 - Cab transmission harness
FAI211 - Cab linkage harness
FAI212 - Lighting harness
FAI213 - Cab interior lighting harness
FAI214 - Armrest harness

FAI215 - Pillar harness
FAI216 - Diagnostics connector harness
FAI217 - Datatronic 3 harness
FAI218 - Fieldstar harness
FAI219 - Cab interior power socket harness
FAI220 - BOC harness — safety switch
FAI221 - Automatic air conditioning harness — instrument panel
FAI222 - Autotronic 5 ParkLock/suspended front axle harness
FAI223 - Roof harness
FAI224 - Hand rail lighting harness
FAI225 - Electric rear-view mirror harness
FAI226 - Roof/external harness
FAI227 - Automatic air conditioning harness - roof
FAI228 - Number plate lighting harness
FAI229 - Xenon light adapter harness
FAI230 - GSPTO harness
FAI231 - Transmission harness — ParkLock
FAI232 - Radio harness
FAI235 - Front accessory connection socket harness
FAI236 - Start-up harness
FAI237 - +12 APC fuse box harness
FAI238 - +12 APC instrument panel harness
FAI239 - Permanent +12 V supply harness
FAI240 - +12 V permanent fuse box harness
FAI241 - Automatic air conditioning adapter harness
FAI242 - Main beams on hand rail adapter harness
FAI243 - Circuit breaker harness
FAI244 - Linkage external controls extension harness
FAI245 - Left-hand linkage external controls harness
FAI246 - Right-hand linkage external controls harness
FAI247 - PTO shunt harness
FAI248 - Linkage external controls harness
FAI249 - Suspended front axle harness
FAI250 - Engine harness
FAI251 - Parking brake harness
FAI252 - +12 V battery harness
FAI253 - Hand rail harness
FAI254 - Windscreen wiper harness
FAI255 - Windscreen wiper harness
FAI256 - High-visibility roof heating harness
FAI257 - High-visibility roof heating harness
FAI258 - Roof earth harness
FAI260 - Cooling unit harness
FAI261 - Isobus harness
FAI262 - Auto-Guide engine harness
FAI263 - Auto-Guide cab adapter harness
FAI265 - Pneumatic brake harness
FAI267 - Console harness
FAI268 - Front function harness
FAI271 - Cab electric rear-view mirror harness
FAI272 - Active suspended cab harness
FAI273 - Front linkage harness
FAI274 - Rear right-hand lighting harness
FAI275 - Trailer connector harness
FAI276 - Rear left-hand lighting harness
FAI280 - Negative battery harness
FAI281 - Negative battery harness
FAI282 - Negative battery harness
FAI283 - TopDock harness

FAIxxx - Non-Isobus tool connector harness
FAIxxx - Non-Isobus implement connector controller harness
FAIxxx - Additional fan harness

C.2 Fuse box supply with circuit breaker

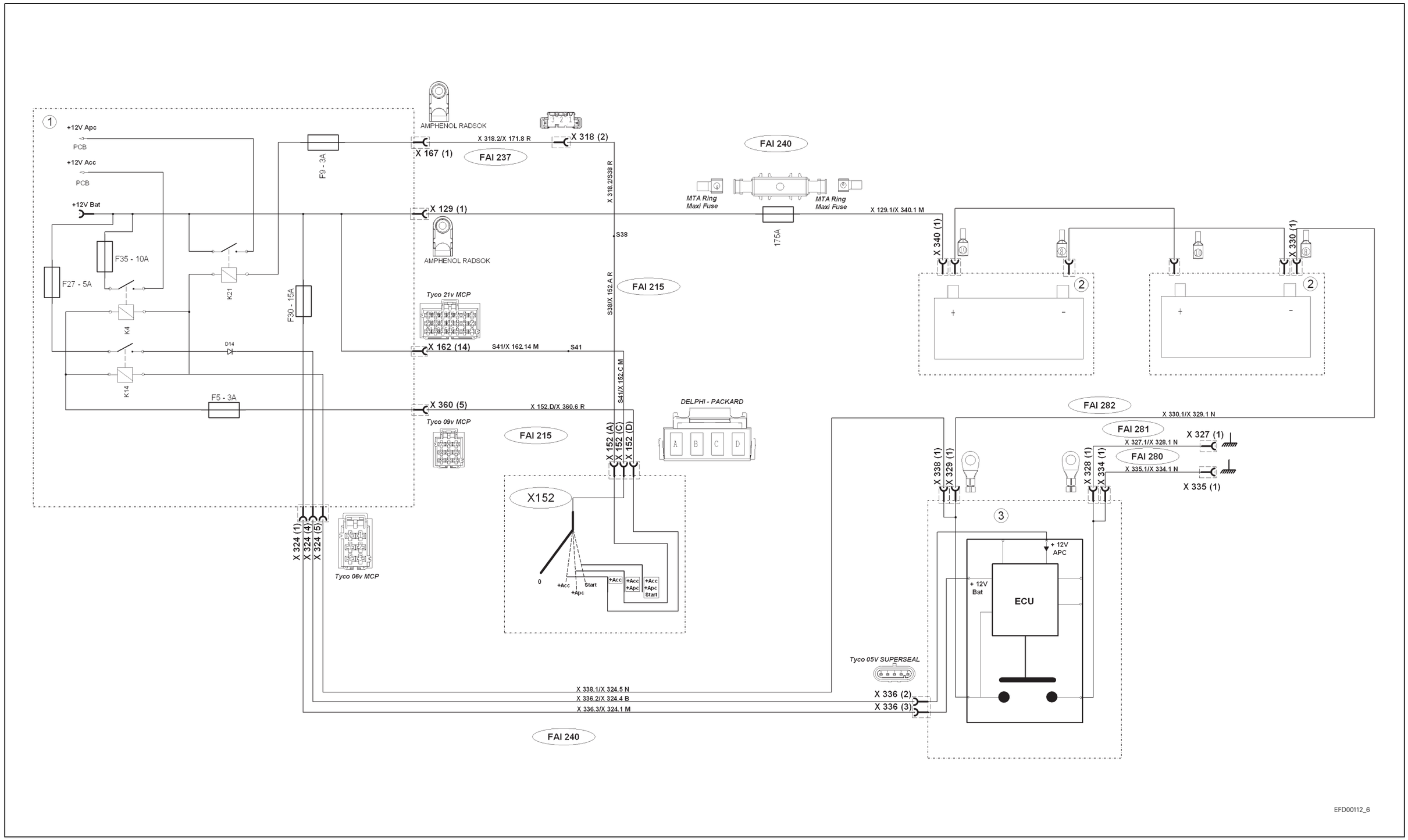


Fig. 5

C.3 Autotronic 4 electrical power supply

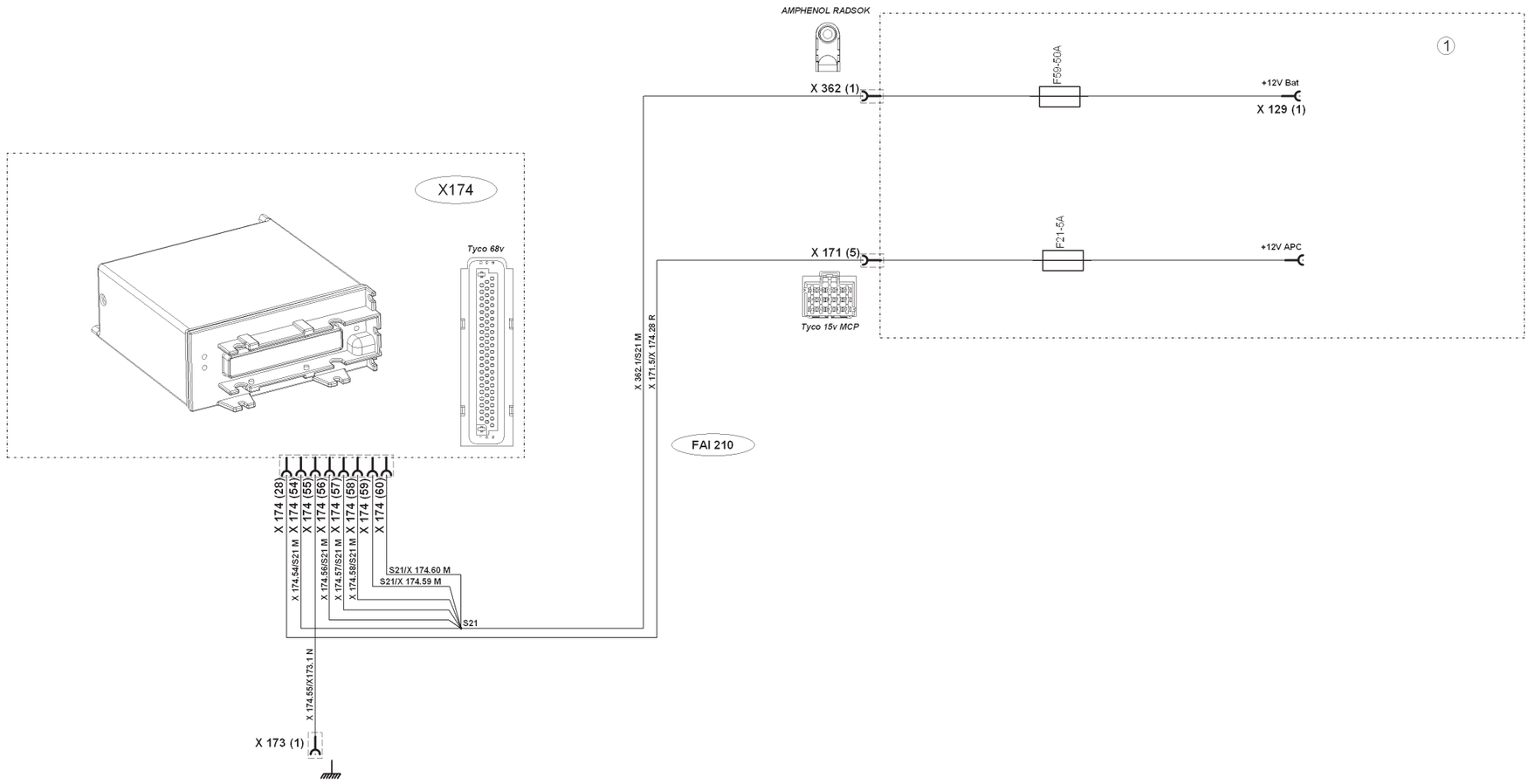


Fig. 6

C.4 Autotronic 5 linkage electrical power supply

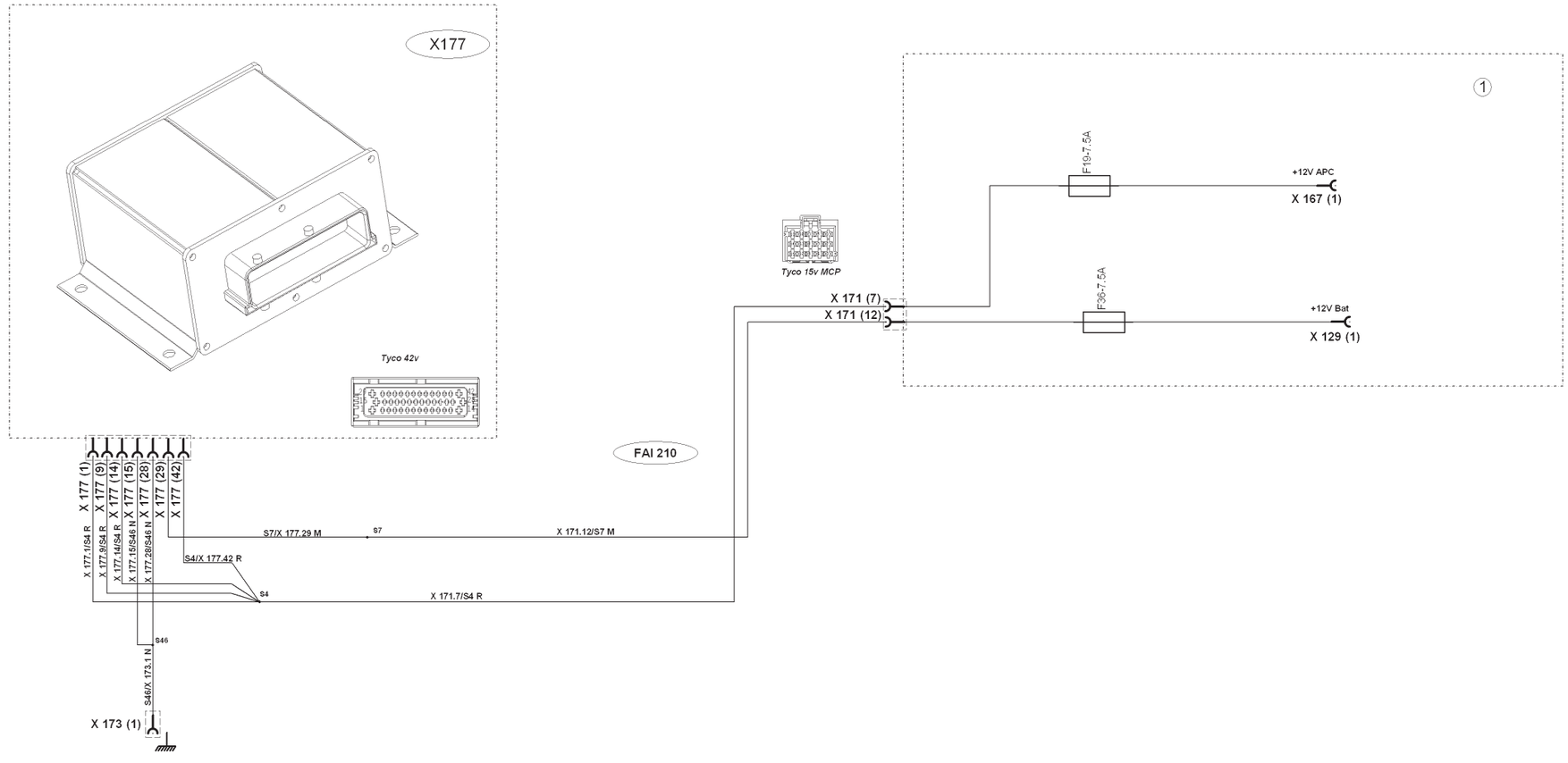
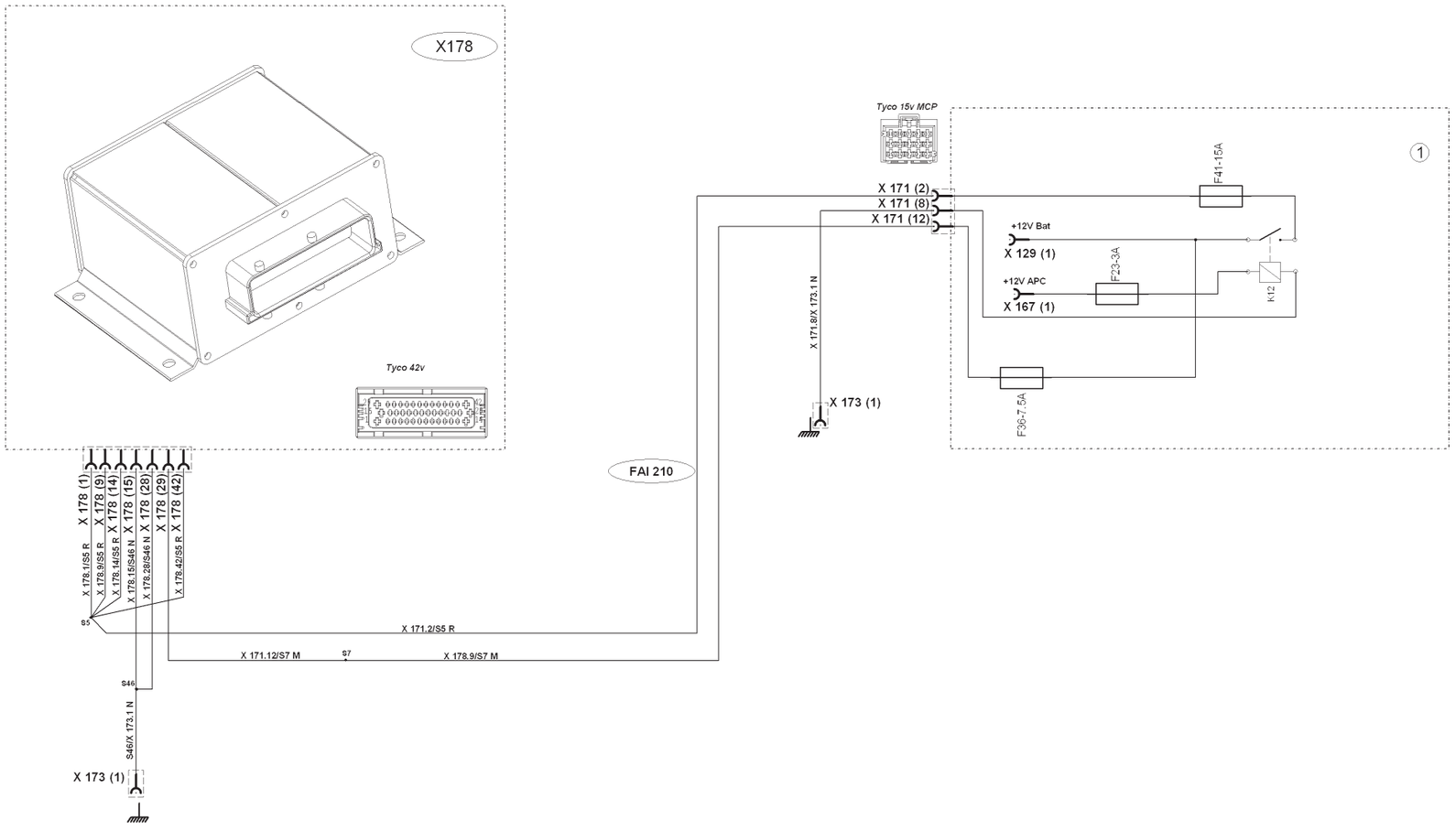


Fig. 7

C.5 Autotronic 5 ParkLock/suspended front axle electrical power supply



EFD00169_5_3

Fig. 8

C.6 DCC3 instrument panel electrical power supply

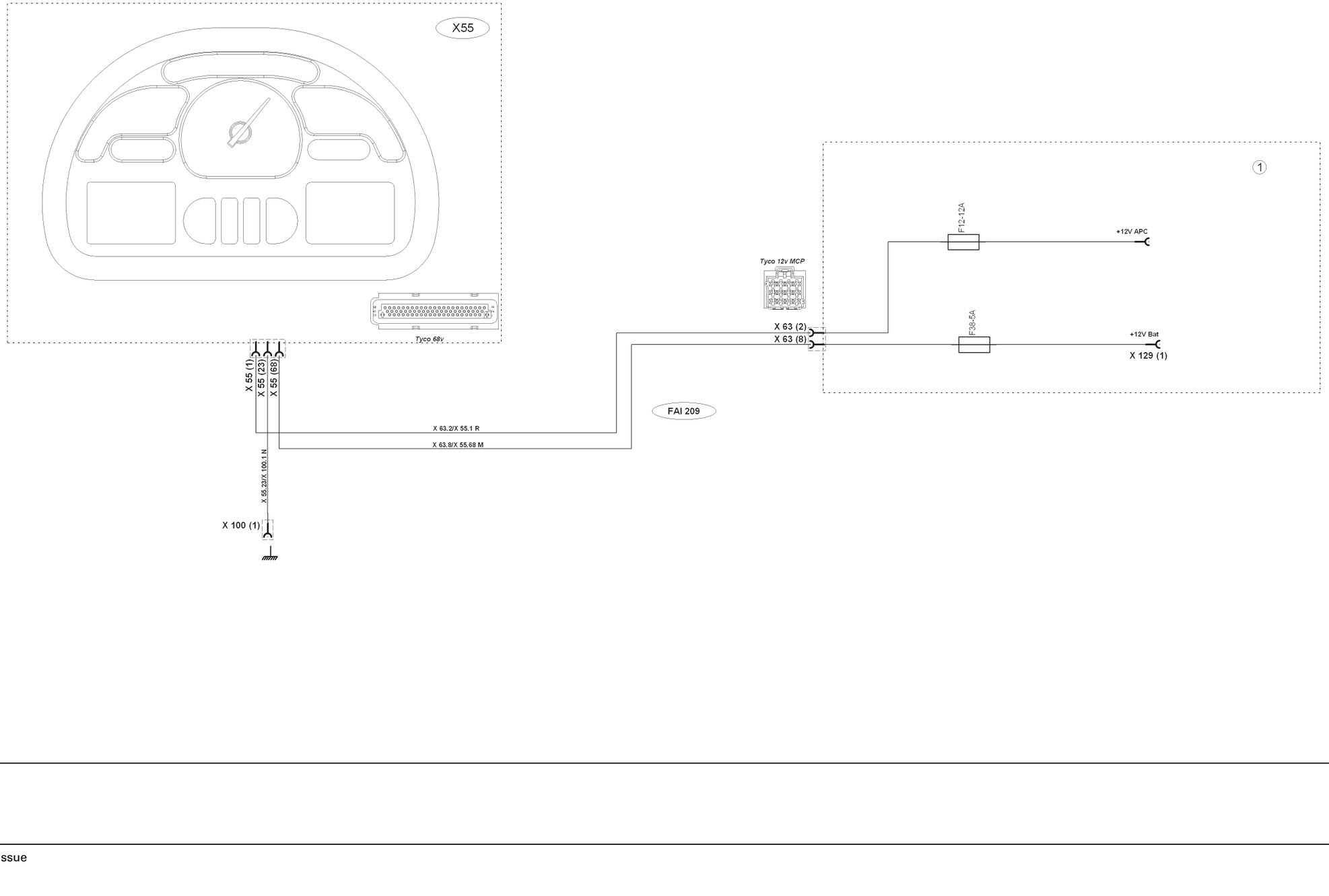


Fig. 9

C.7 Autotronic 5 armrest electrical power supply

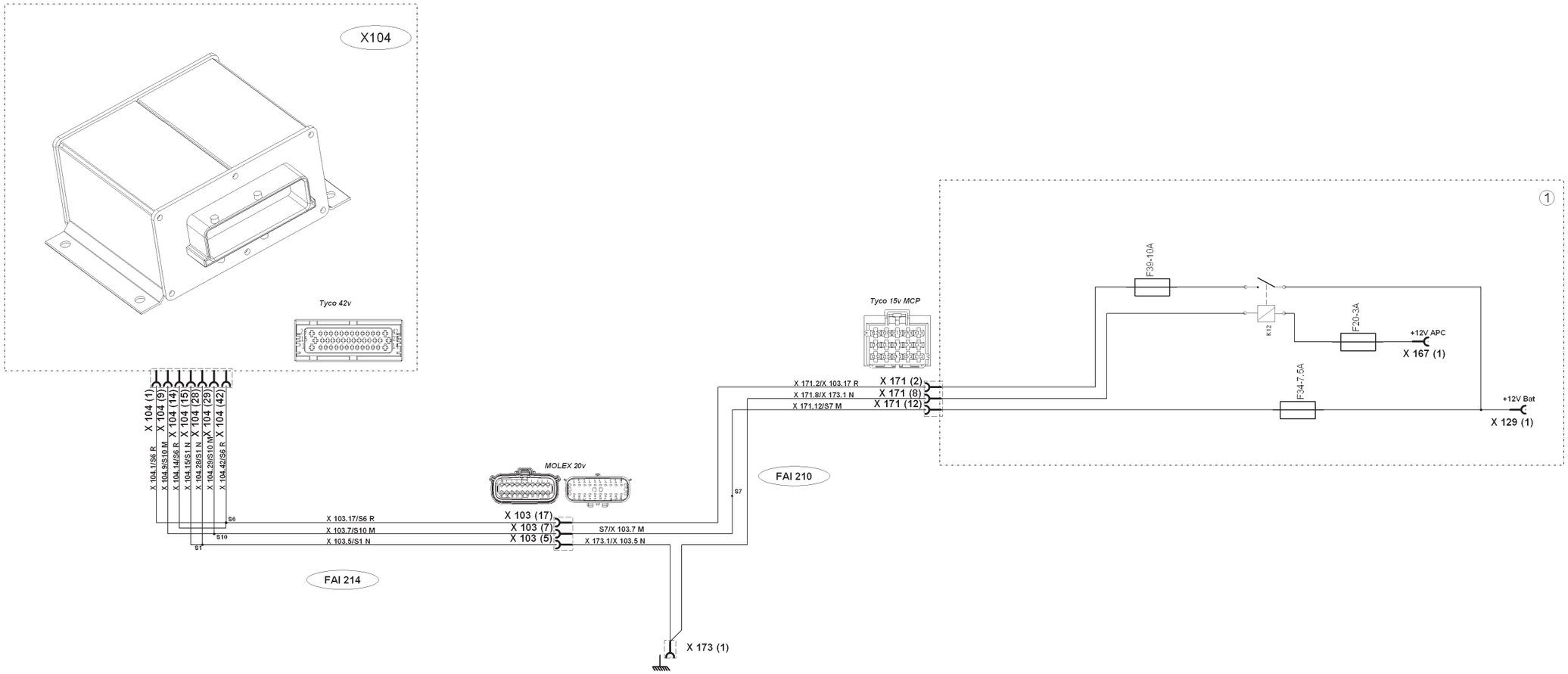


Fig. 10

C.8 Autotronic 5 active suspended cab electrical power supply

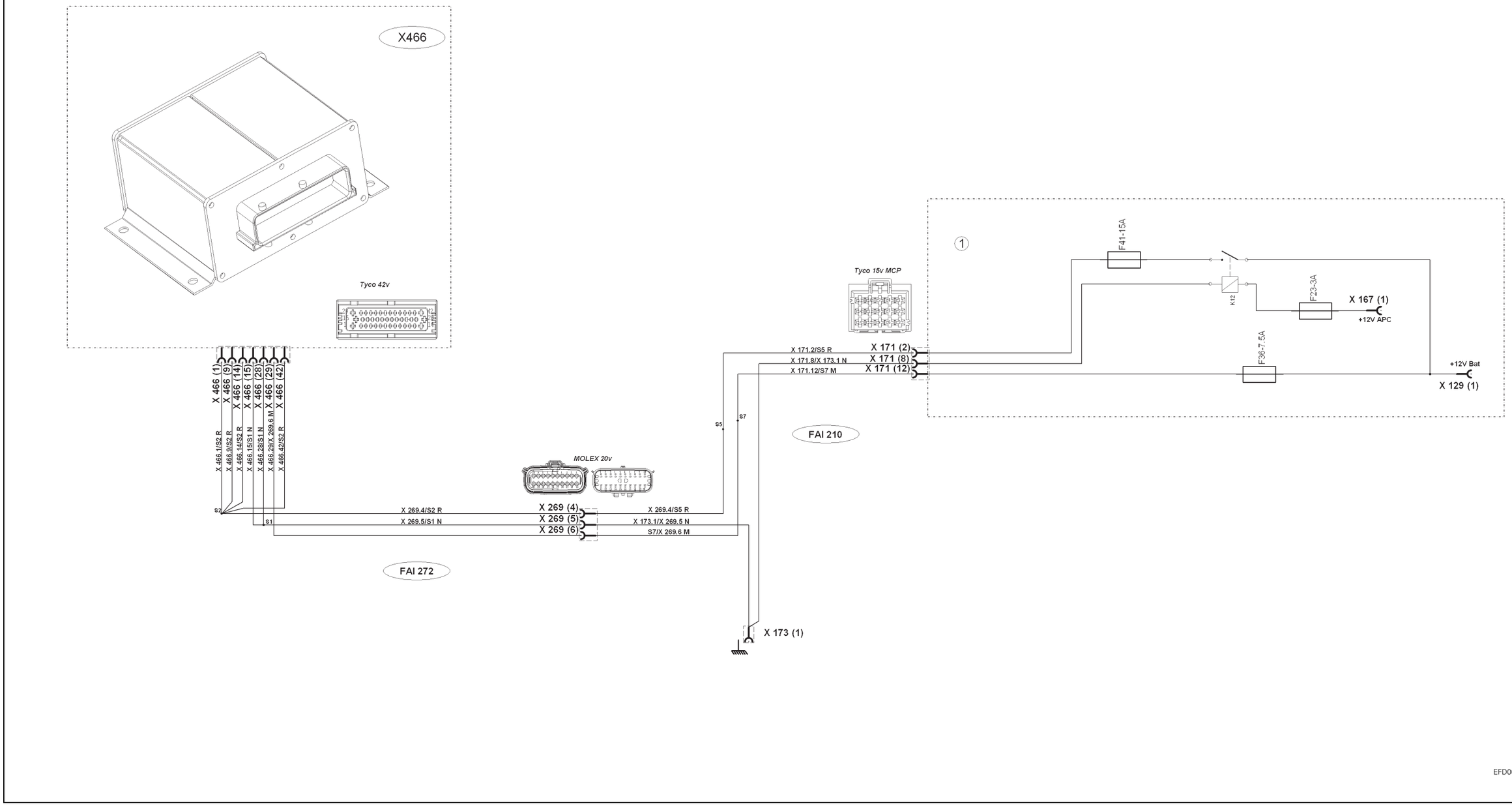


Fig. 11

C.9 Sisu EEM electronic unit electrical power supply

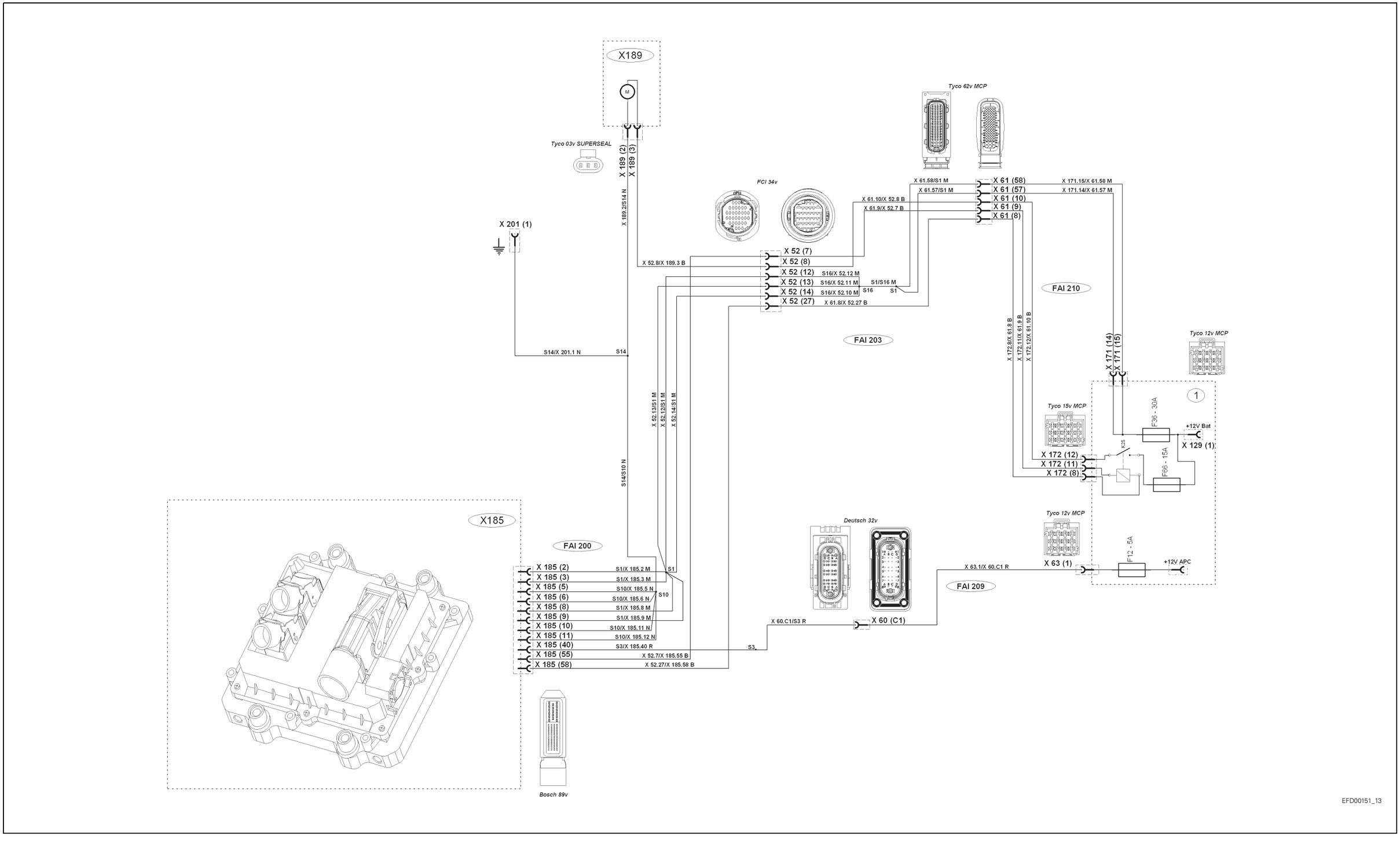


Fig. 12

C.10 Automatic air-conditioning unit electrical power supply

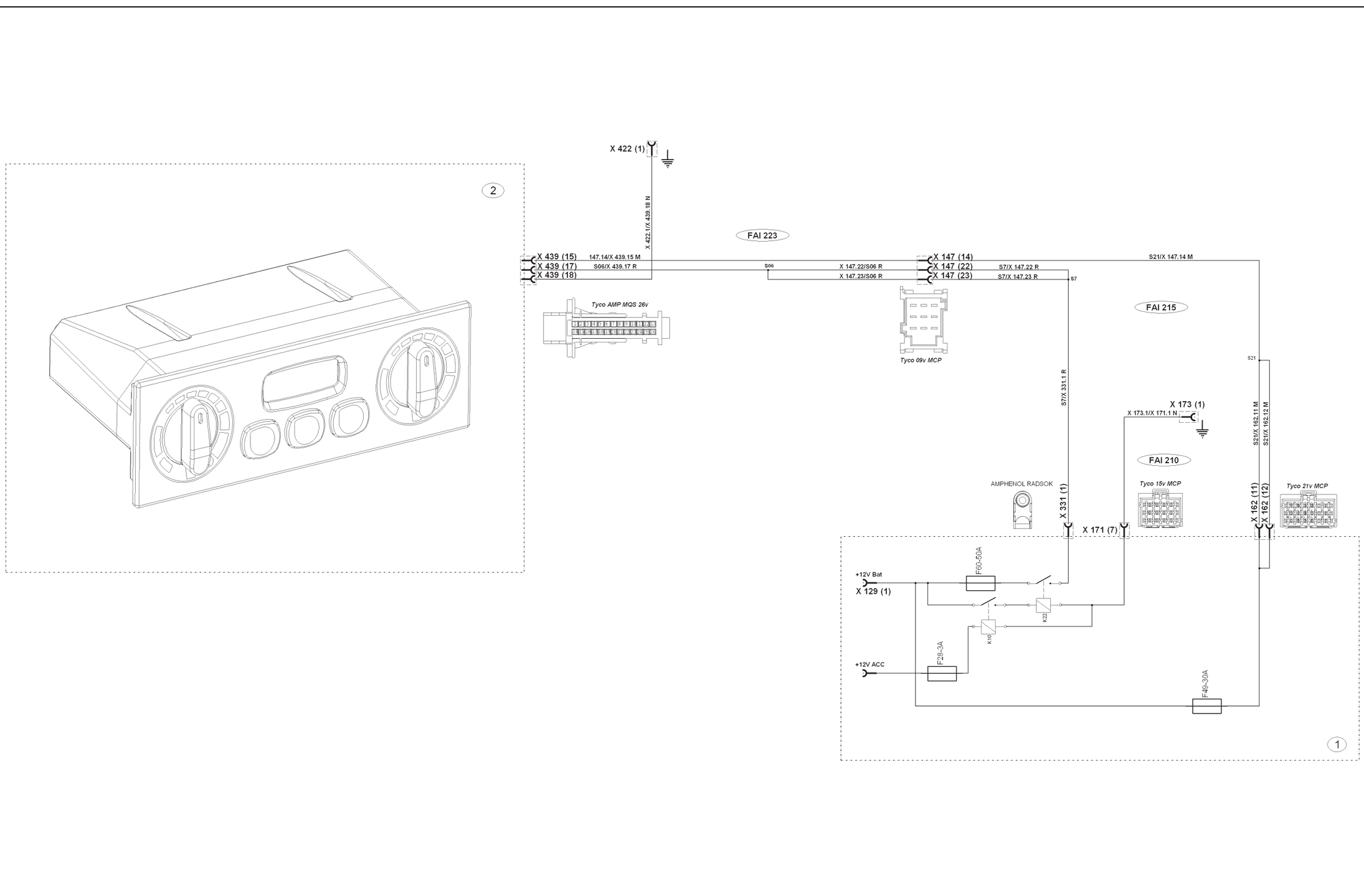


Fig. 13

C.11 Diagnostics connector electrical power supply

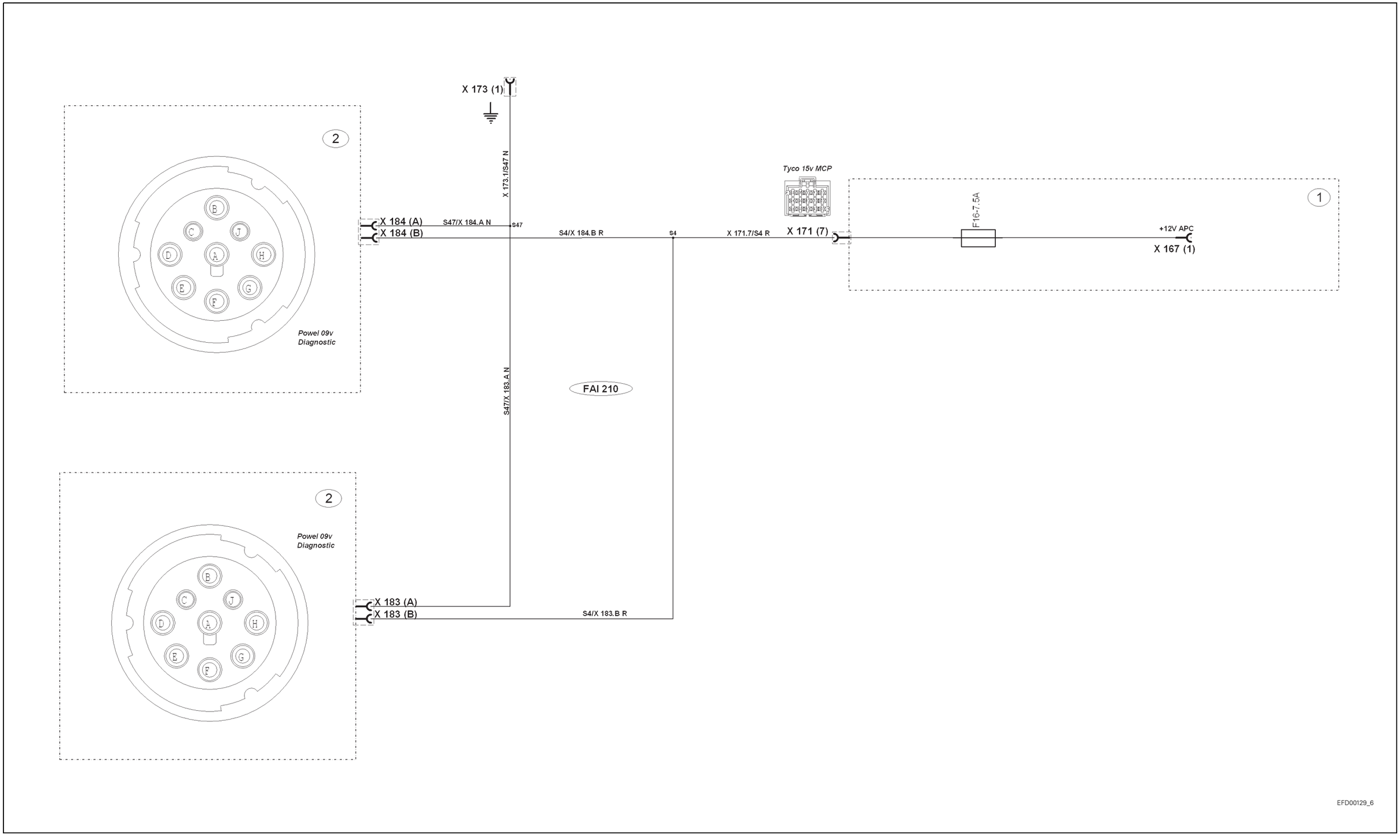


Fig. 14

C.12 Tractor CAN network

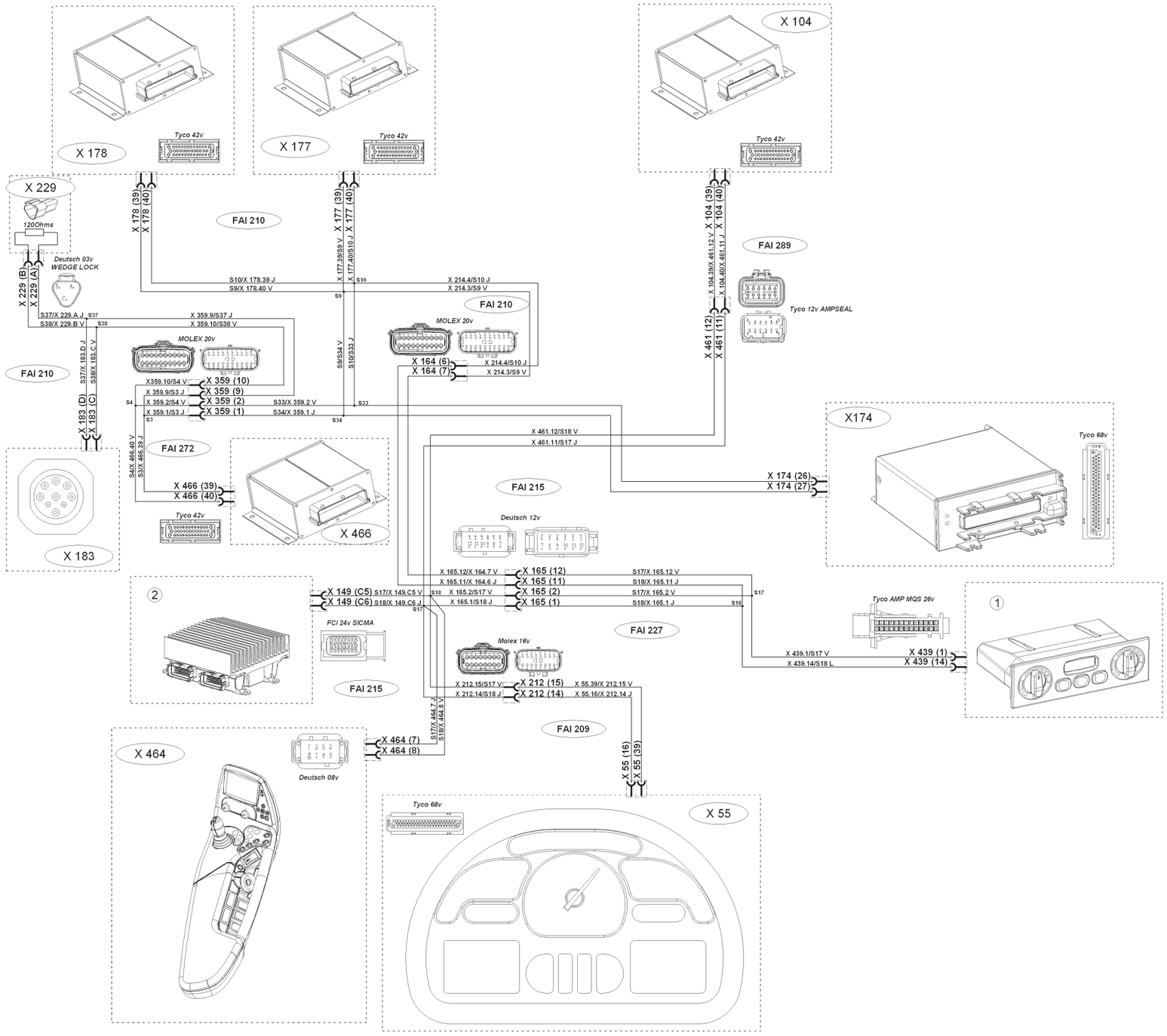


Fig. 15

C.13 Engine CAN network

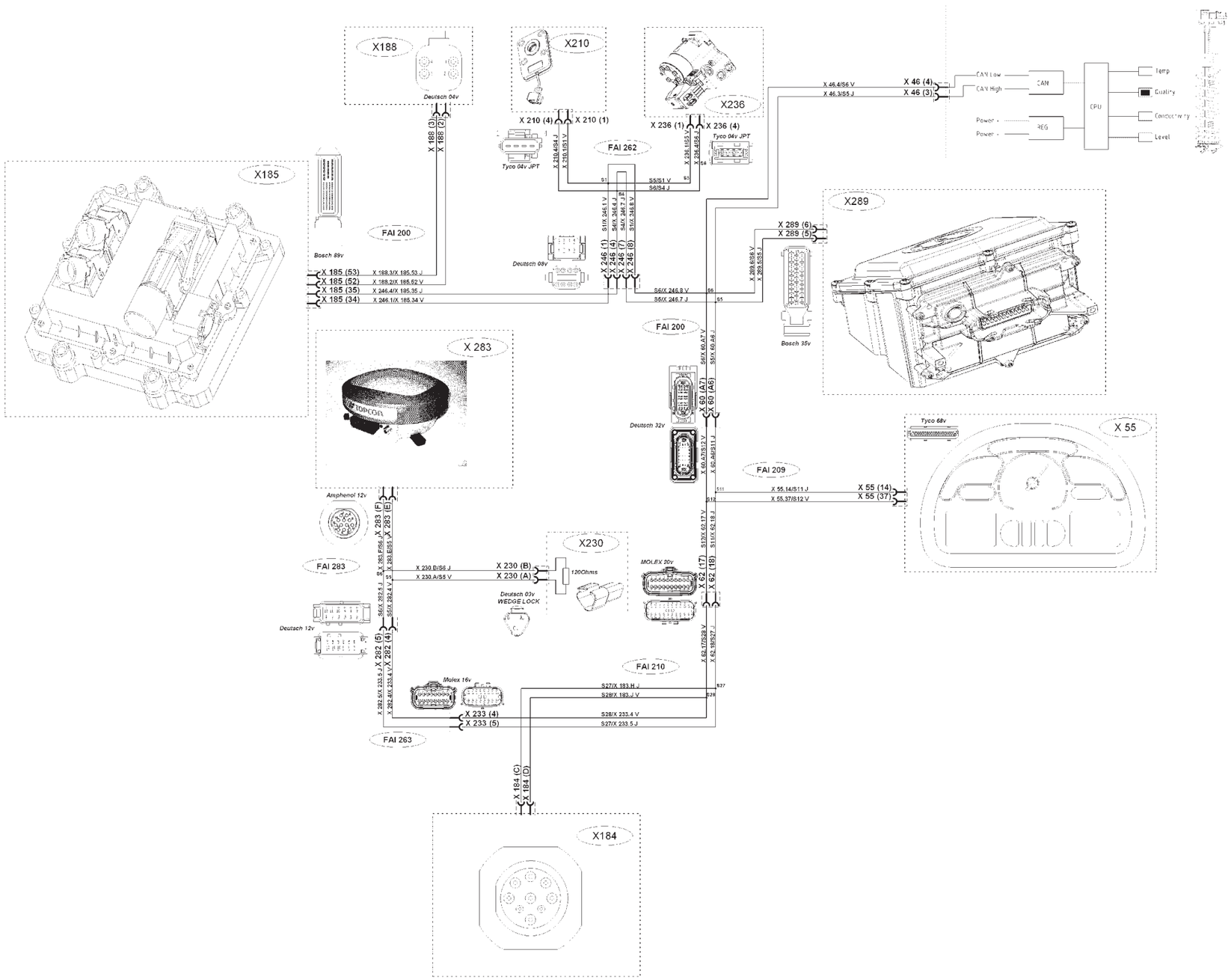


Fig. 16

C.14 Linkage CAN network

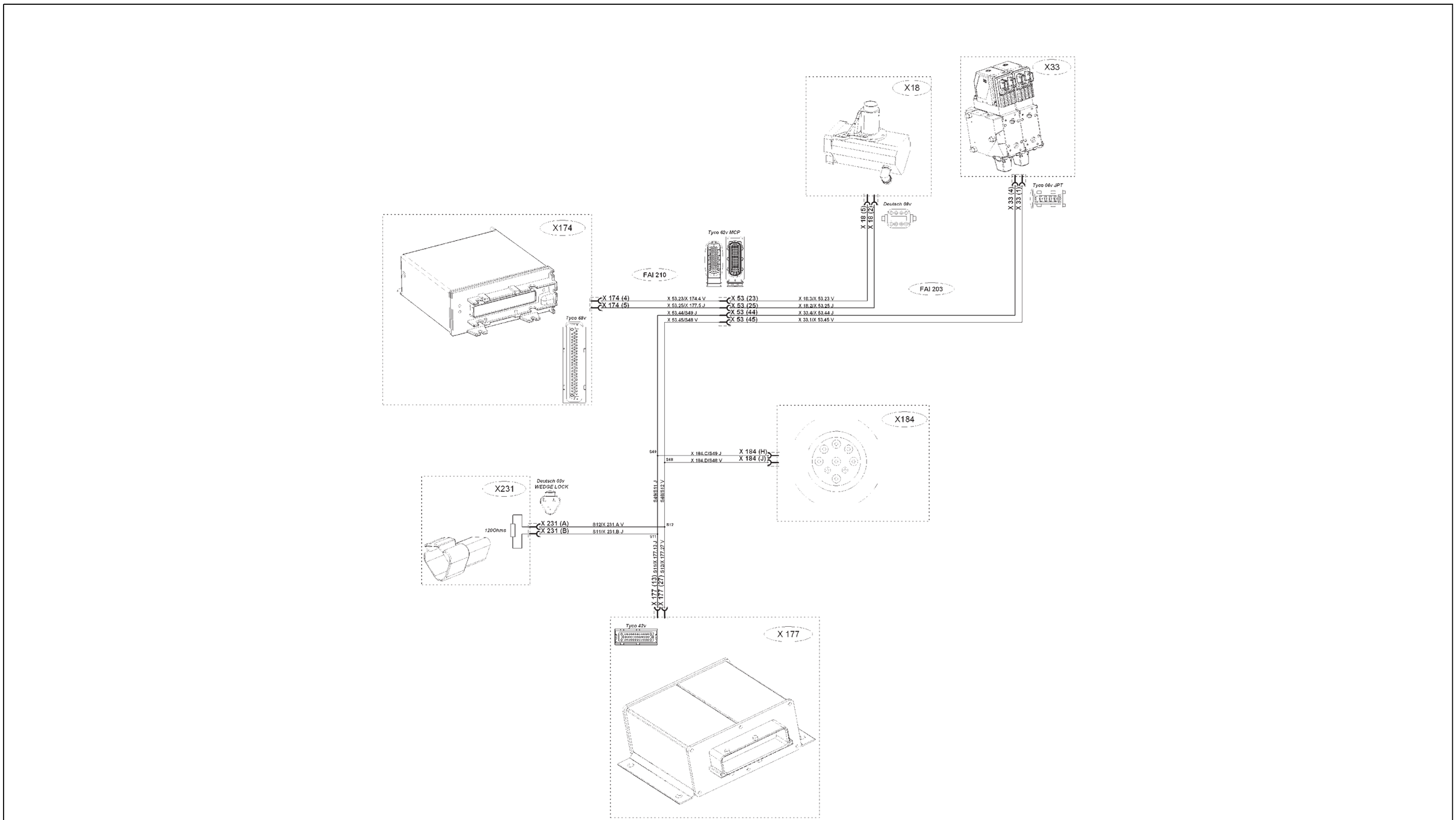


Fig. 17

C.15 Isobus CAN network

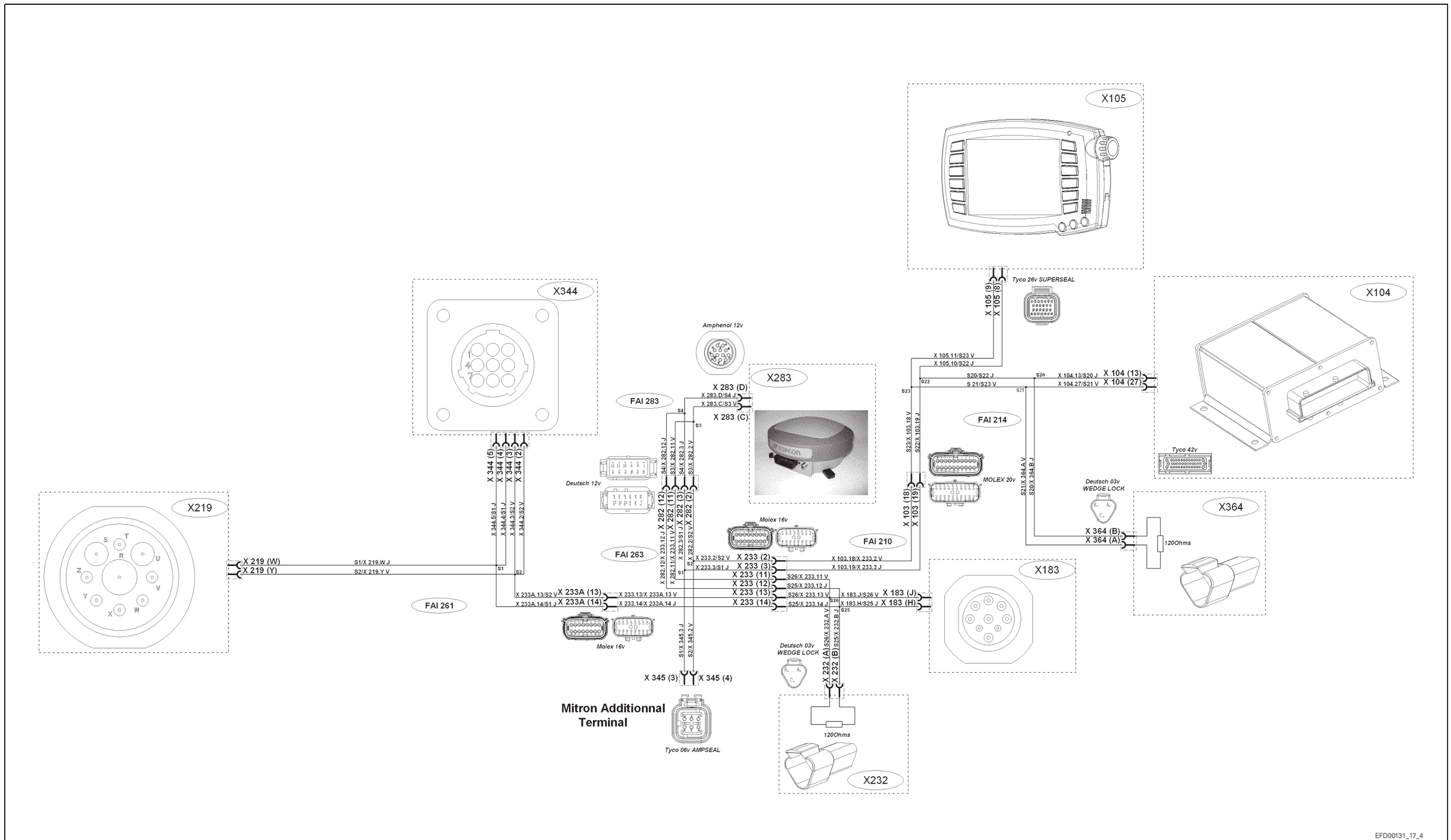


Fig. 18

C.16 Front power take-off

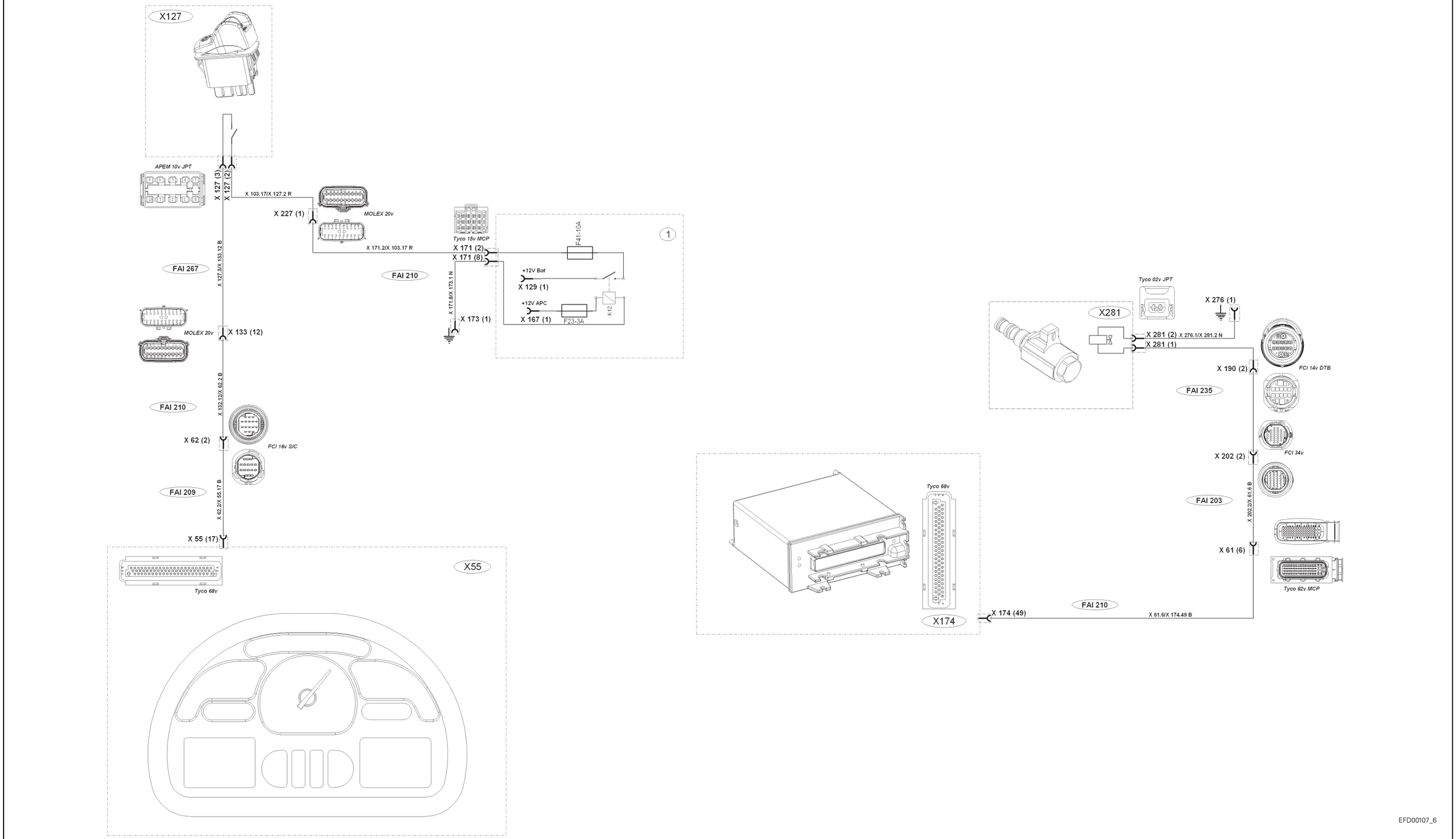


Fig. 19

7B13

Zuidberg front power take-off - Layout of components

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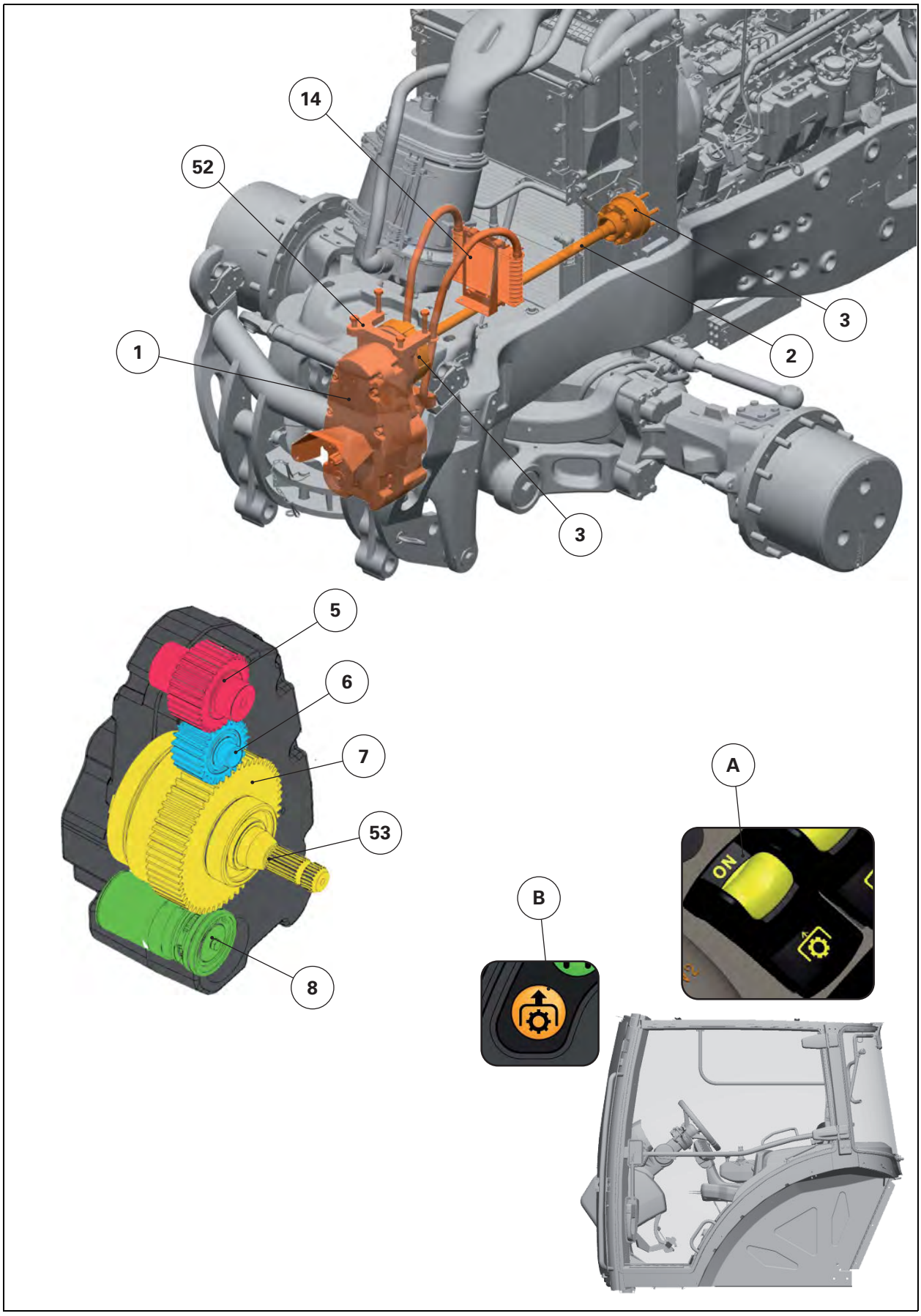
A. Location of the Zuidberg front power take-off components

Location of the front power take-off components



I010568

Fig. 1

1- ..... Housing
2 ..... Shaft
3 ..... Shock absorber
5 ..... Input gear
6 ..... Idler gear
7 ..... Clutch
8 ..... Hydraulic system
14 ..... Cooler
52 ..... Support
53 ..... Output shaft
A ..... Front PTO engagement switch
B ..... Front PTO indicator light

7B14

Zuidberg front power take-off - Tests and diagnostics

TABLE OF CONTENTS

A. Hydraulic tests

C Clutch pressure connector
P Pump pressure connector

Clutch pressure test

Using a pressure gauge (30 bar (435.12 lbf/in minimum)) and a suitable union (M10x1), check the pressure of the PTO clutch according to the following values:

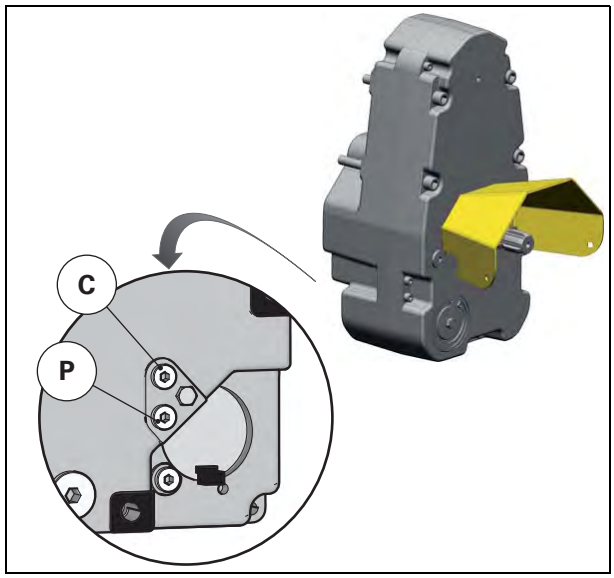
PTO disengaged	0 bar
PTO engaged	22 bar ± 1 bar

Pump pressure test

Using a pressure gauge (30 bar (435.12 lbf/in minimum)) and a suitable union (M10x1), check the pressure of the pump delivery:

PTO disengaged and engaged	24 bar ± 1 bar

Pressure connectors



I010563

Fig. 1

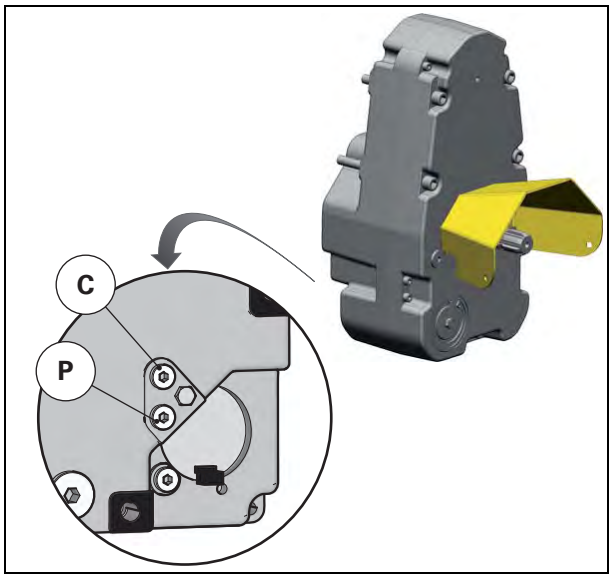
B. Electrical tests

Checking the solenoid valve

Using a multimeter, check the resistance at the solenoid valve terminals:

Resistance	5.3 to 5.6 Ohms

Checking the solenoid valve



I010563

Fig. 2

7B15

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7B16

Zuidberg front power take-off - Adjustments, bleeding and calibrations

TABLE OF CONTENTS

A. Adjustments and bleeding

Draining and changing the filter

Draining

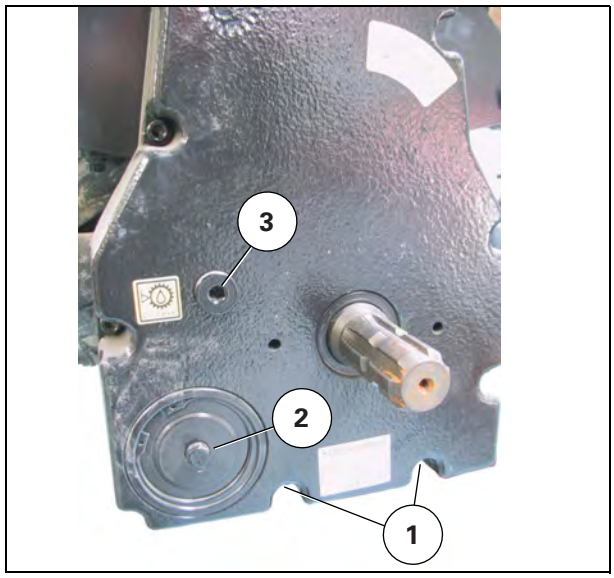
1) To drain the PTO, remove the two screws (1).
2) Remove the oil cooler (4) in order to drain it.

Changing the filter

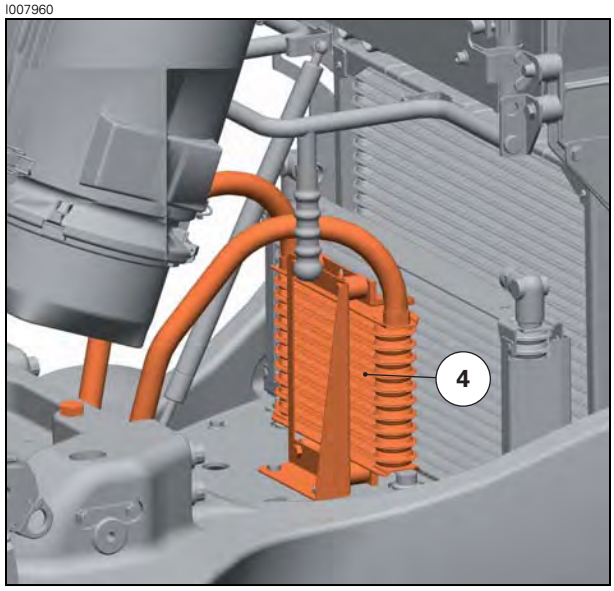
3) To change or clean the filter, remove the circlip and the screw securing the plug (2). Remove the filter to clean (at each draining) or replace it. Carry out the operations in reverse order to refit.

Filling

4) Refit the oil cooler (4) then fill it with oil (approximate capacity 0,5 l).
5) To top up the oil, remove the plug (3). The level should be flush with the port.
6) Start up and allow the engine to run for several minutes to bleed the cooling system.
7) Check the oil level at the plug (3). Top up if necessary.



I007960



I011313

Fig. 1

7B17

Zuidberg front power take-off - Disassembly and reassembly

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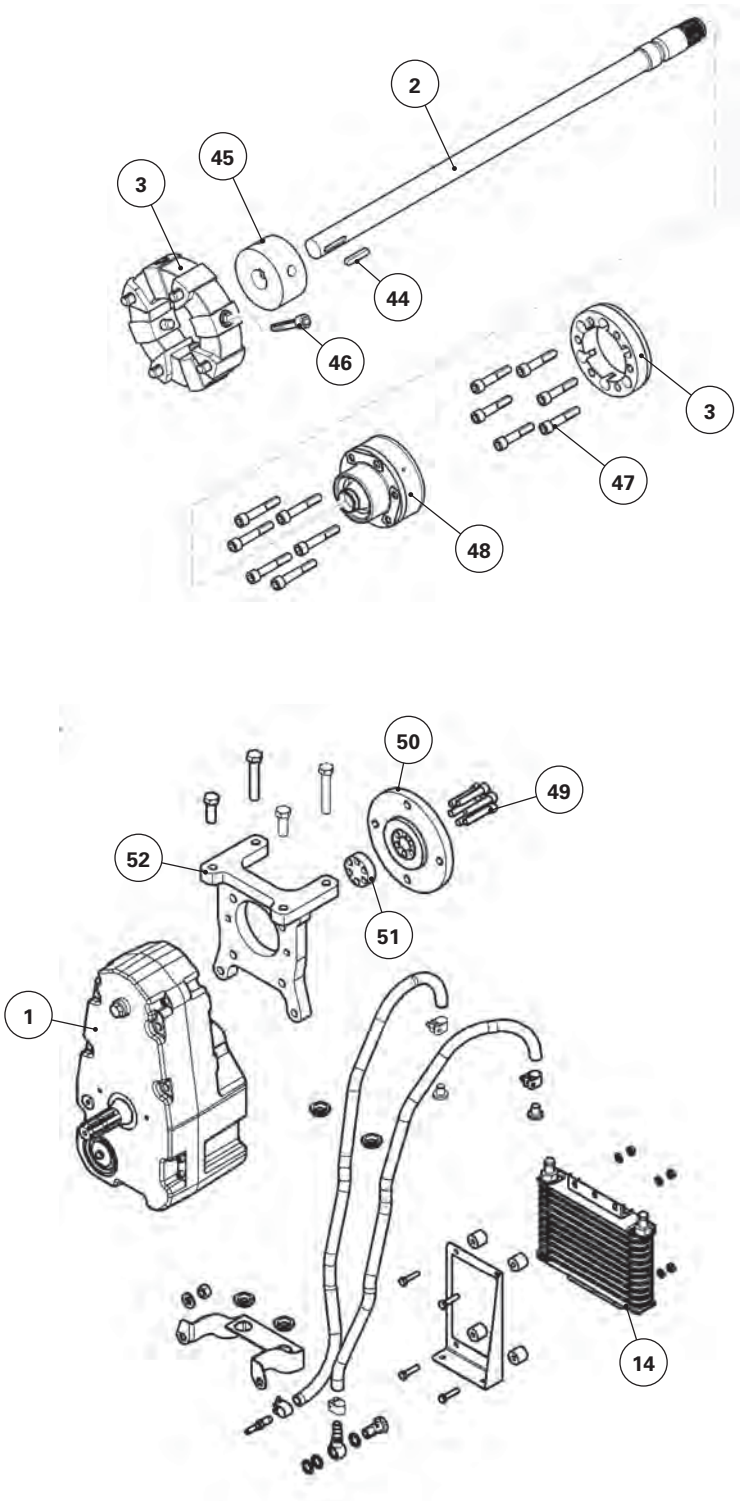
A. Removing and refitting the front PTO

Removing the front PTO

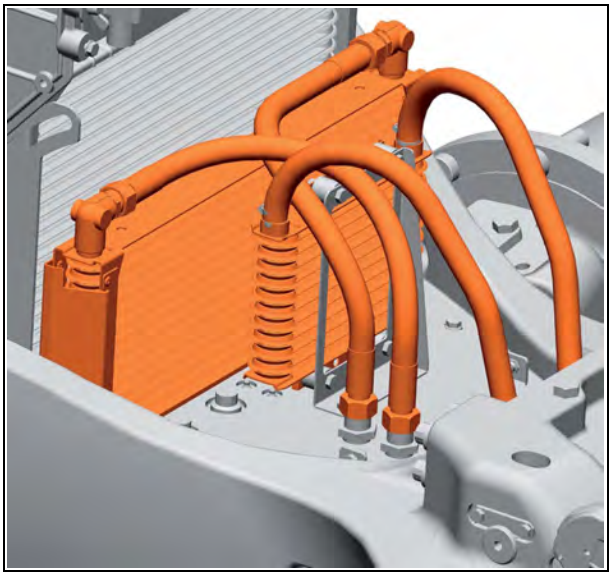


I010412

Fig. 1

Removing the front PTO

1) Drain the front PTO housing.
2) Disconnect the hoses from the auxiliary oil cooler.
   Block the ports using suitable plugs.
3) Disconnect the oil cooler hoses from the power take-off.
   Block the ports using suitable plugs.
4) Remove the coolers.
5) Support the radiators using a locally made tool (L-shaped iron fitting with a 8 mm to 400 mm diameter hole in the edge).
6) Remove the support rams from the radiators.

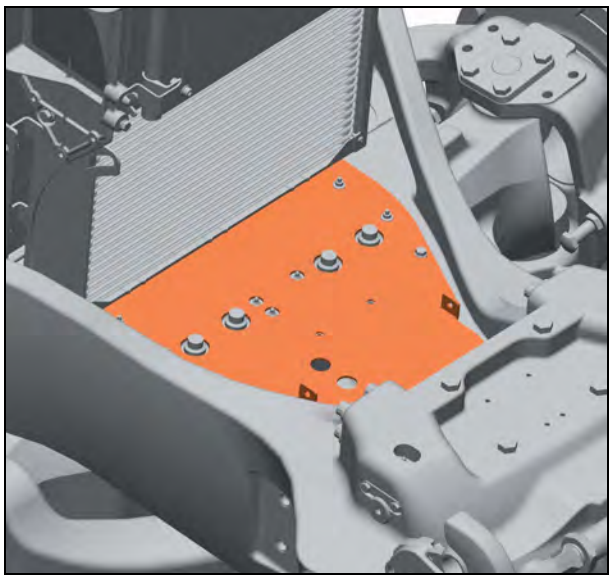


I010619 Fig. 2

7) Remove the retaining screws from the cooler support plate and then remove the support plate.

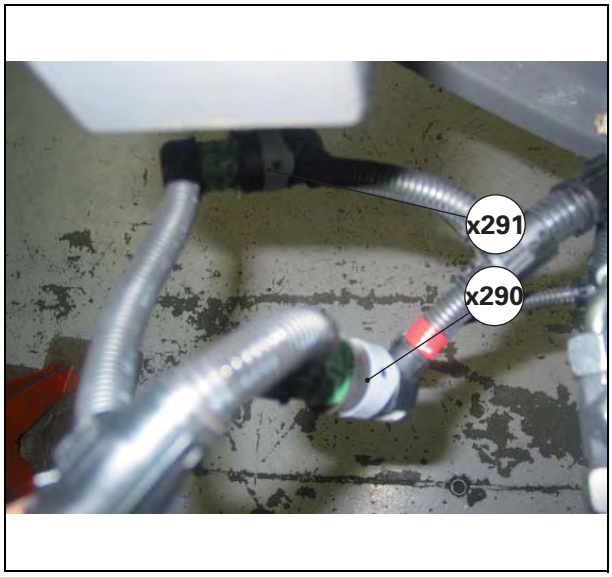
I010620 Fig. 3

8) Mark and disconnect the front PTO/linkage harness.



I010621 Fig. 4

9) Mark and disconnect the hydraulic unions from the linkage rams.

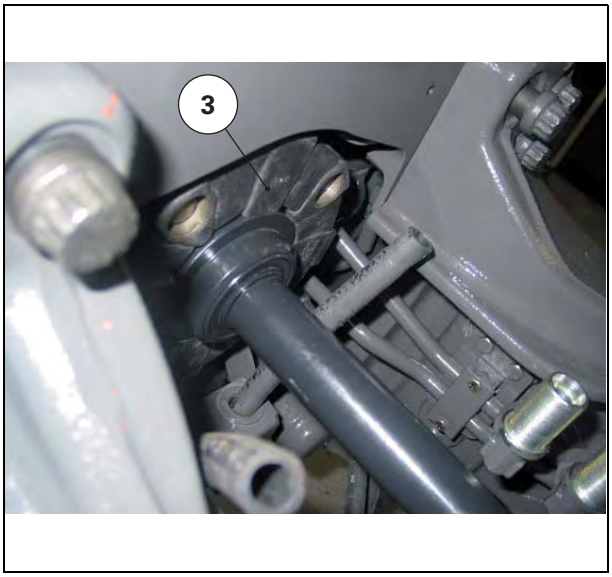


I010622 Fig. 5

10) Remove the screws of the shock absorber (3) on the PTO.

I010623 Fig. 6

11) Remove the covers from the front couplers and the coupler screws.



I010632 Fig. 7

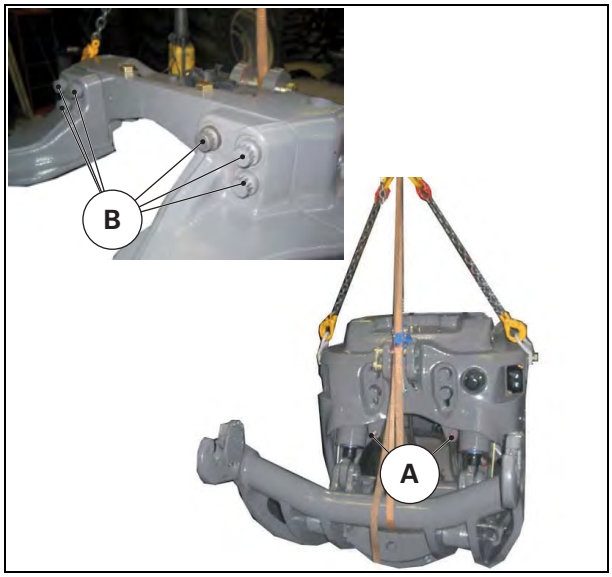
12) Sling the PTO/front linkage assembly.

I010641 Fig. 8

13) Remove the nuts (A) and the screws (B).
14) Remove the PTO/front linkage assembly.

I010637 Fig. 9

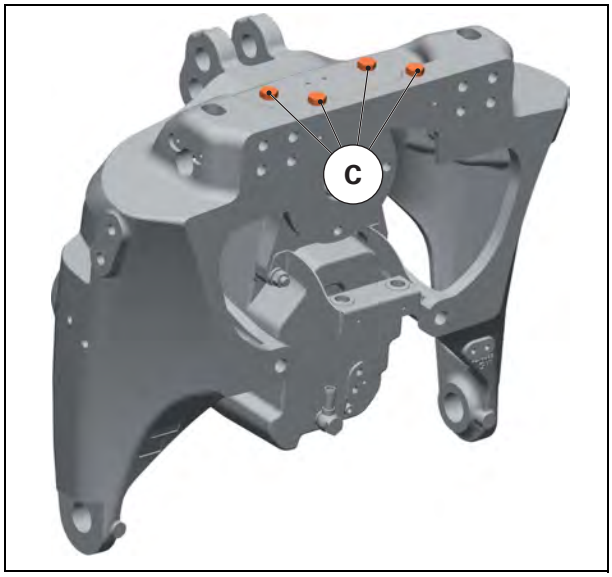
15) Remove the screws (C) and then separate the PTO unit from the front linkage structure.



I010644 Fig. 10

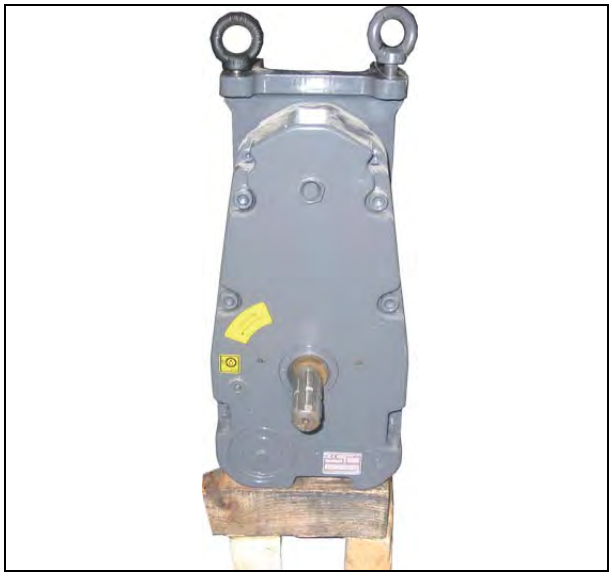
Refitting the front PTO

16) Position blocks under the PTO unit (approx. 150 mm).



I010665 Fig. 11

17) In order to align the PTO on the front linkage, place the threaded rods and M16 nuts on the front linkage structure.
Sling the front linkage using the same method as for removal.

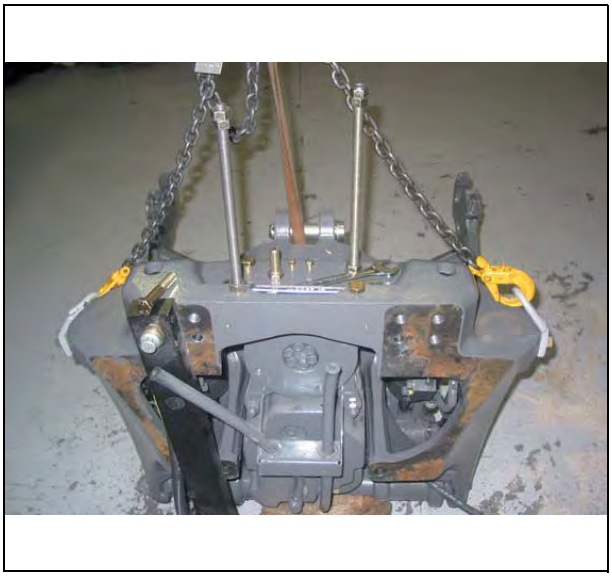


I010676 Fig. 12

18) Place the front linkage above the PTO.
Using the threaded rods, centre and bring together the unit and the front linkage.

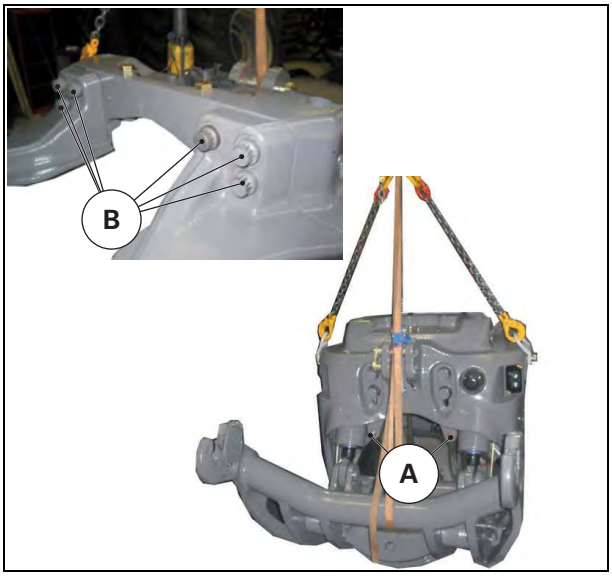
I010677 Fig. 13

19) Refit the PTO/front linkage assembly. Tighten the screws (A) to 700 Nm and the screws (B) to 560 Nm.



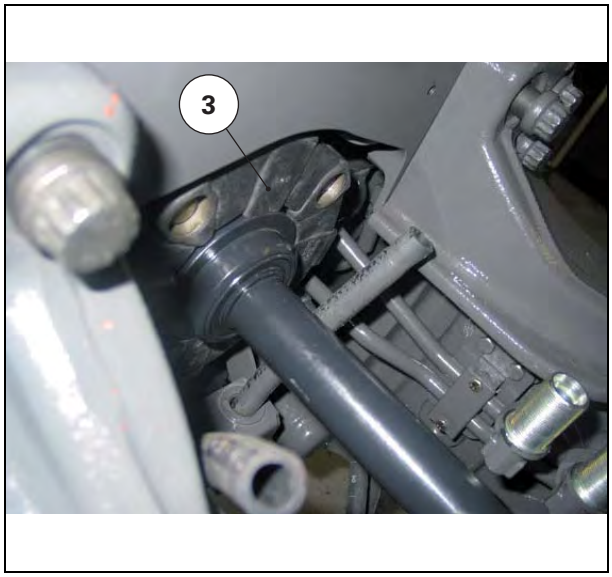
I010678 Fig. 14

20) Fit the screws of the shock absorber (3) onto the PTO. Tighten the screws to 220 Nm.



I010644 Fig. 15

21) Refit the coupler screws. Tighten the screws to 30 Nm. Refit the front coupler covers.



I010632 Fig. 16

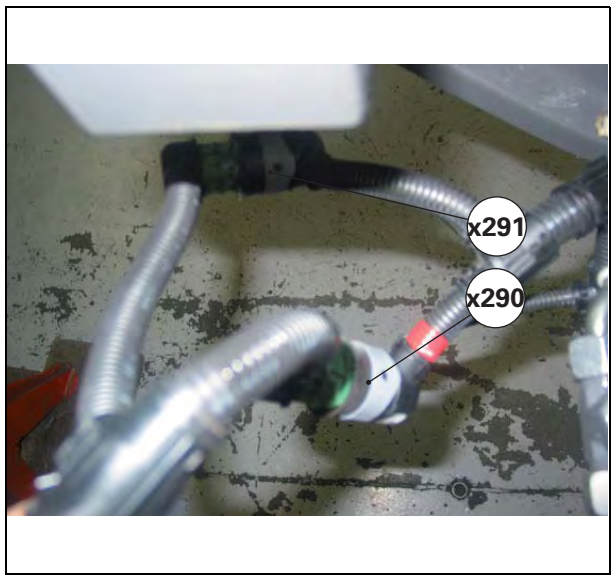
22) Connect the linkage ram hydraulic unions.

I010641 Fig. 17

23) Connect the front PTO/linkage harness.

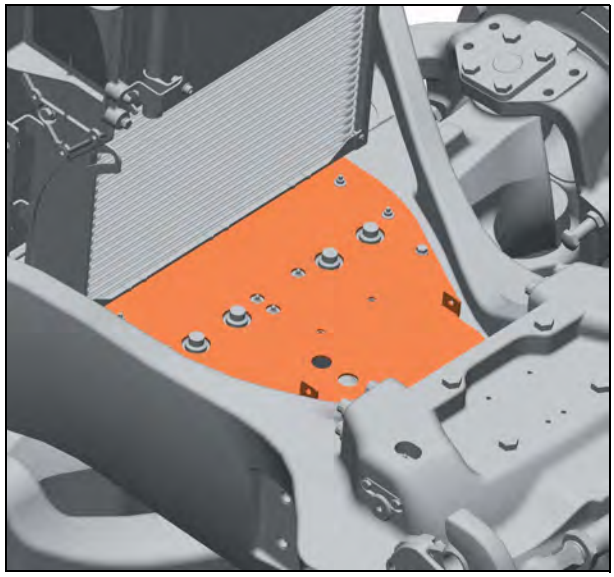
I010623 Fig. 18

24) Refit the cooler support plate.



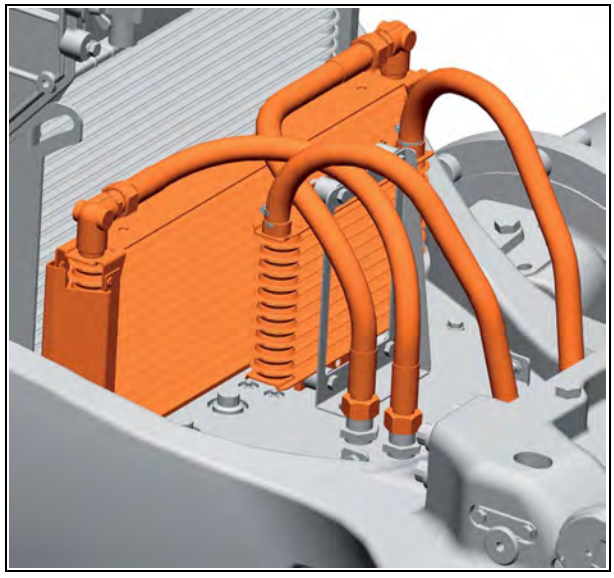
I010622 Fig. 19

25) Refit the coolers and their hoses.



I010621 Fig. 20

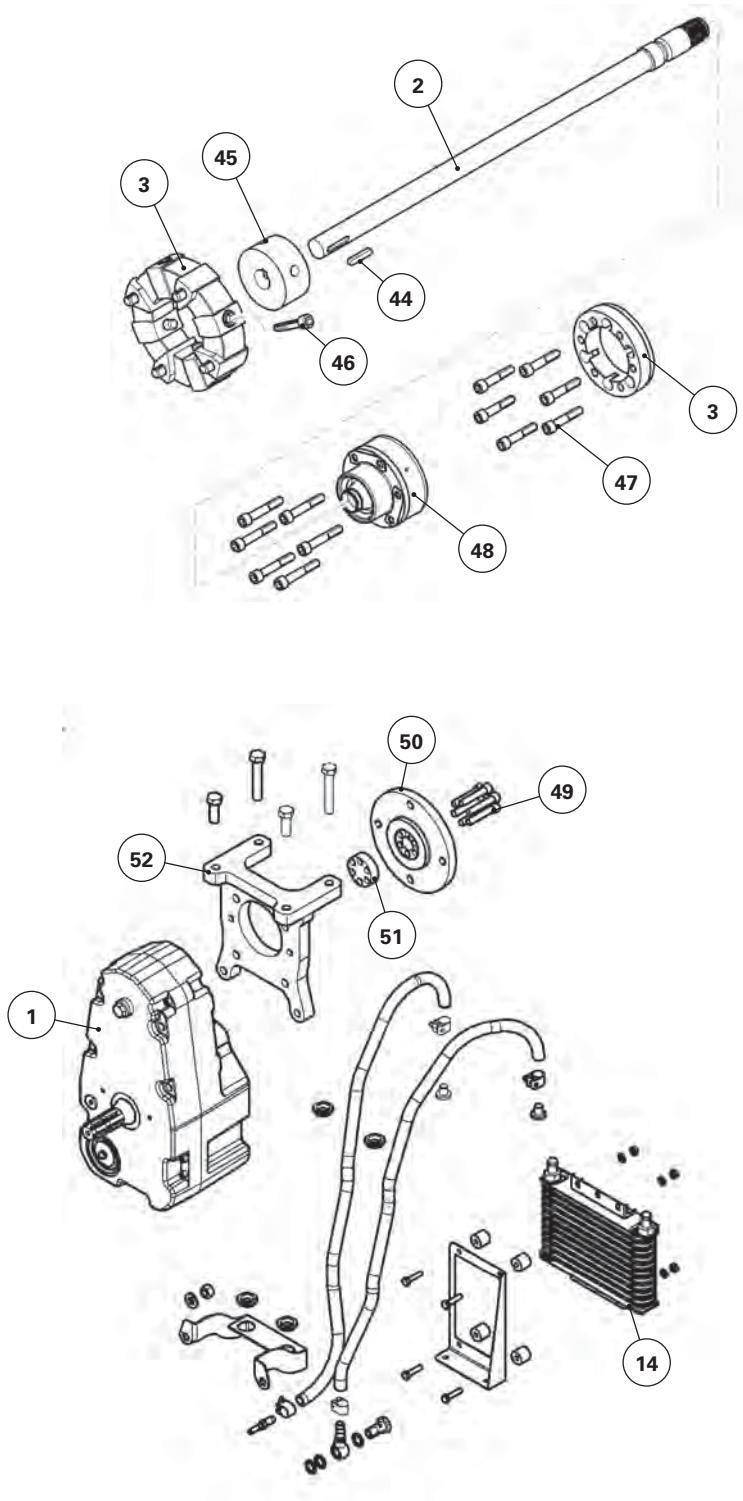
26) Fill the front PTO with oil.



I010619 Fig. 21

B. Removing and refitting the front PTO shaft

Removing the front PTO shaft



I010412

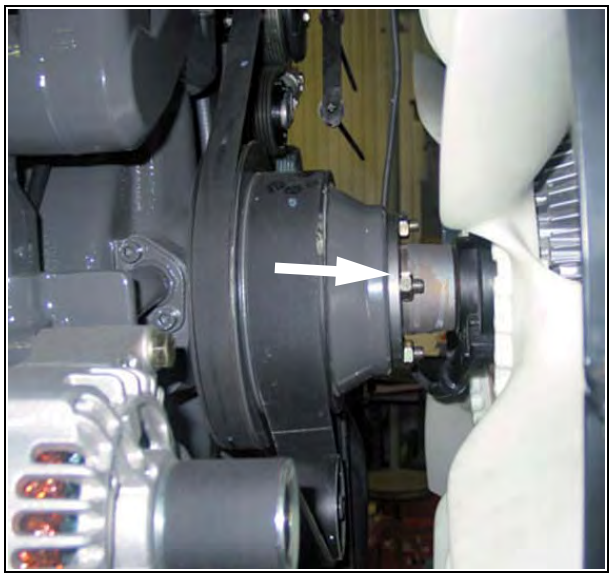
Fig. 22

1) Remove the front PTO Removing the front PTO.

2) Remove the engine fan cowling screws.
3) Disconnect the fan harness and remove the harness support.
4) Protect the radiator with cardboard.
5) Remove the fan attachment screws.

I010682 Fig. 23

6) Fit the fan up against the radiator in order to remove the fan cowling.
7) Remove the fan.
8) Remove the radiator mounting flanges from each side of the radiator.



I010683 Fig. 24

9) Using a jack and suitable wedges, lift the engine radiator by approx. 50 mm.

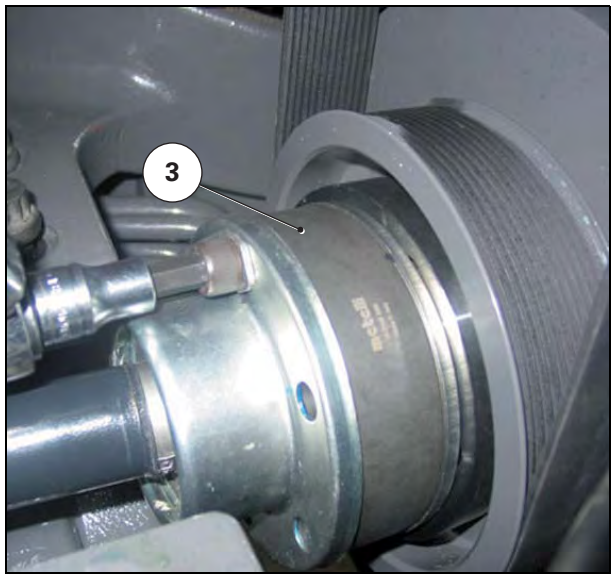
I010684 Fig. 25

10) Remove the screws from the shock absorber (3) on the engine side.
11) Remove the PTO shaft.

I010685 Fig. 26

Refitting the front PTO shaft

12) Carry out the removal steps in reverse order.
Tighten the shock absorber screws on the engine side to 147 Nm.
13) Refit the front PTO Refitting the front PTO

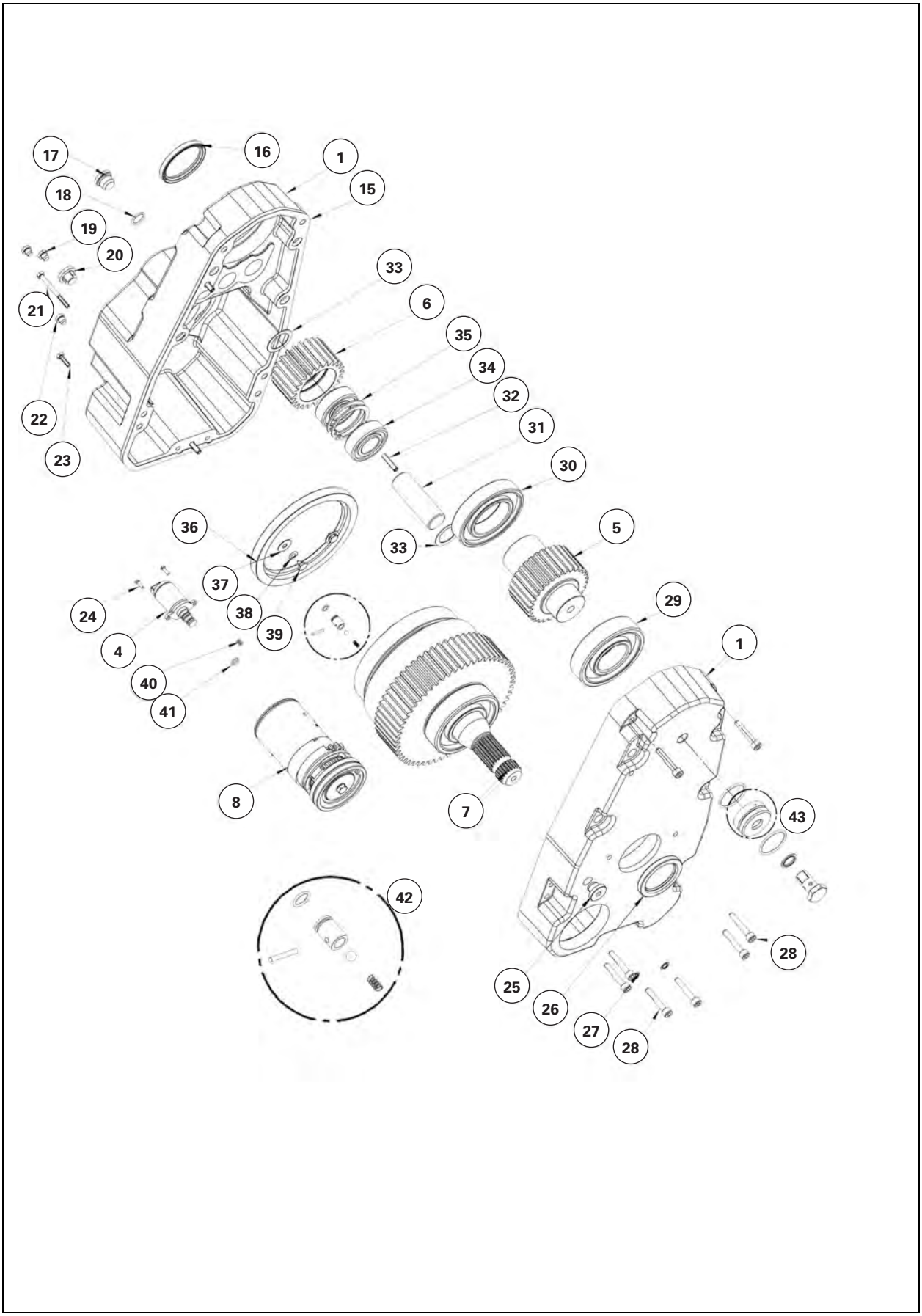


I010686 Fig. 27

C. Disassembling and reassembling the front PTO

Disassembling the front PTO

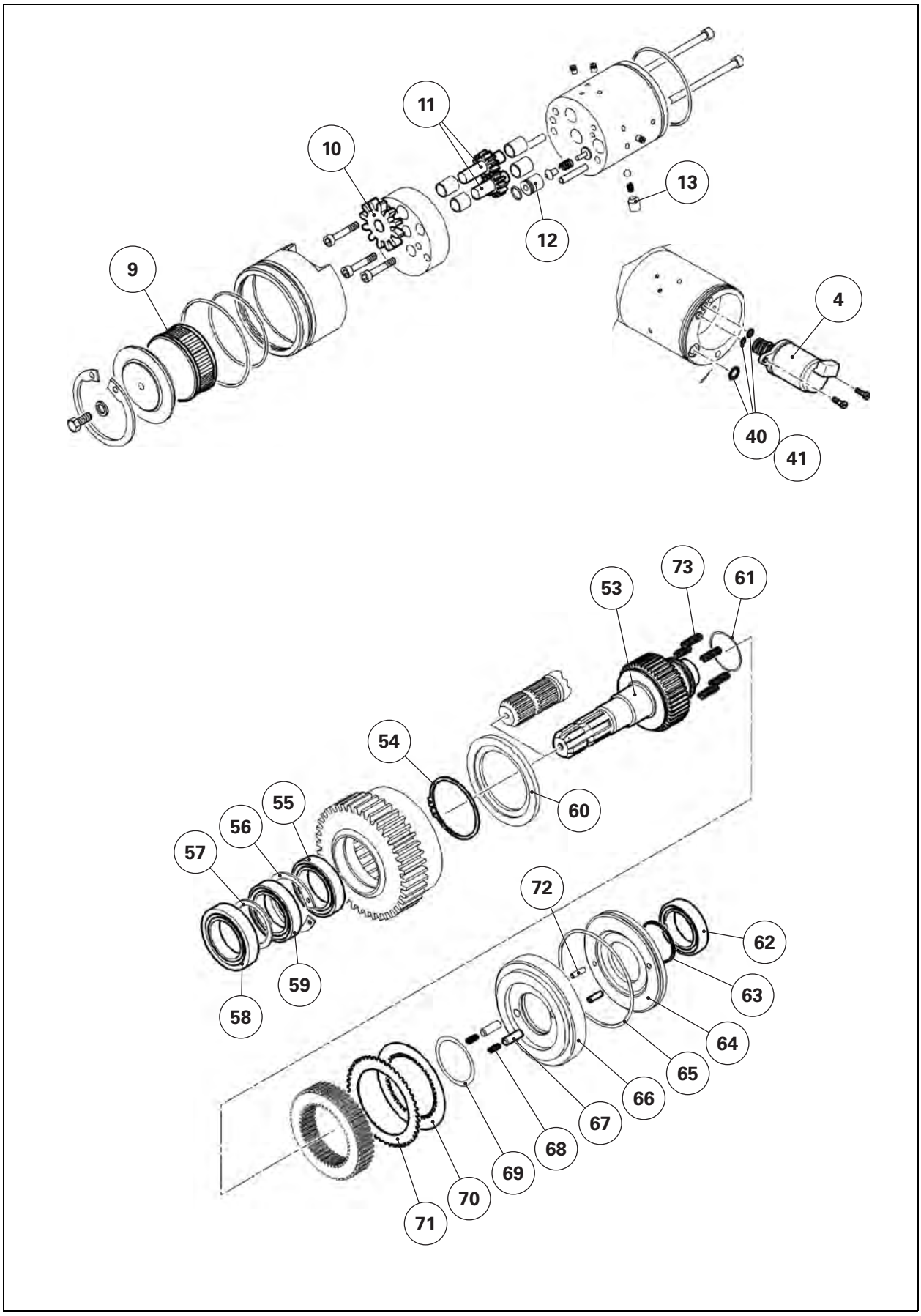
Blown-up view of the PTO unit



I010409

Fig. 28

Blown-up view of the hydraulic pump and the PTO clutch



I010410

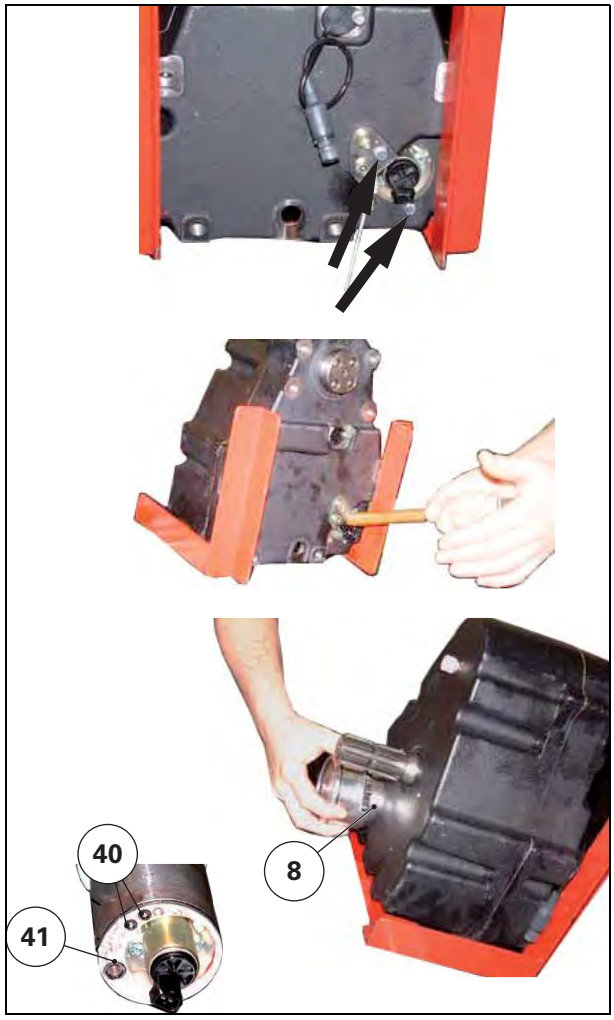
Fig. 29

NOTE: *The PTO shown may differ slightly from the disassembled model. However, the procedure is identical.*

Disassembling the front PTO

1) Remove the front PTO Removing the front PTO.
2) Place the PTO unit (1) on a workbench.
3) On the rear face, remove the two pump attachment screws.
4) Gently tap on the rear of the pump (8) to release it and then take it out through the front.

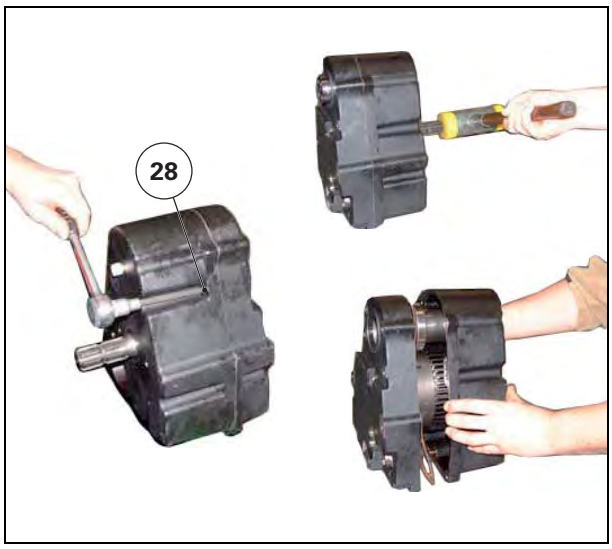
   NOTE: *Do not leave the seals (40) and (41) in the PTO housing once the pump has been removed.*
5) Remove the screws (28) from the half-housings. Separate the housing into two.



I010688

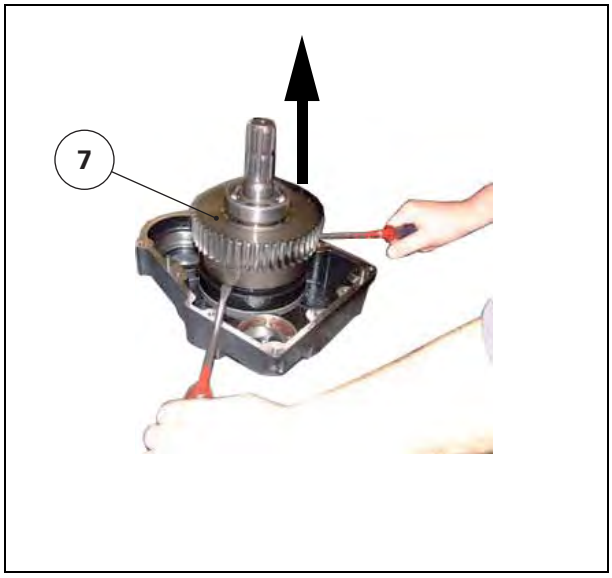
Fig. 30

6) Place the rear section of the housing on a workbench.
7) Using two screwdrivers, prise loose and remove the complete clutch (7).
8) Recover the connecting pipe (42) with the seal and the spring.



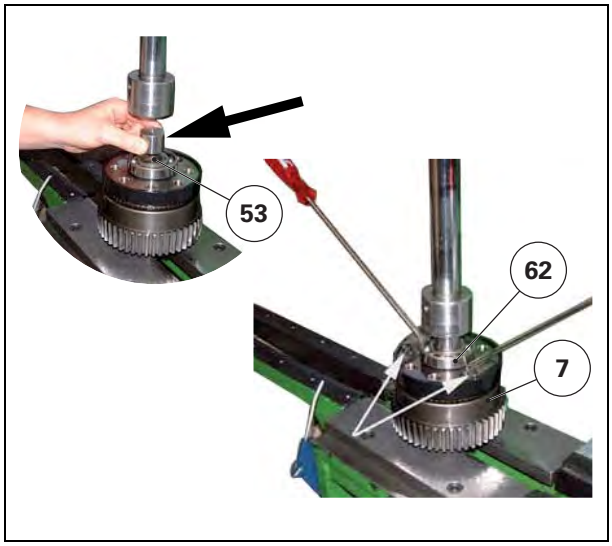
I010689 Fig. 31

9) Place the clutch (7) on a press with the output shaft facing downwards. Using a shim, compress the clutch by pressing on the shaft (53).
10) Using two screwdrivers, prise loose and remove the bearing (62).



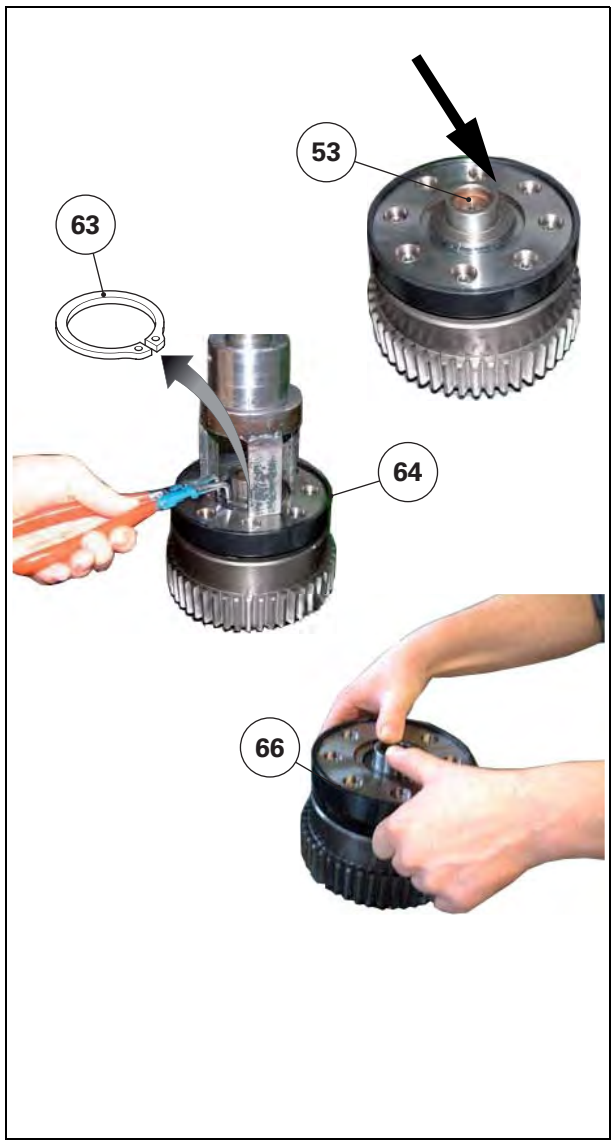
I010690 Fig. 32

11) Check the bearing face of the connecting pipe (42) on the shaft (53). If the surface is worn excessively, the shaft must be replaced.
12) Using a press and a locally made tool, slightly compress the piston (64) and remove the circlip (63).
13) Remove the complete cylinder (66).



I010691 Fig. 33

14) Remove the discs (70) and the backing plates (71).
15) Using a press, separate the output shaft (53) from the clutch unit. Recover the bearing (58).
16) Remove the piston (64) from the cylinder (66). Check the condition of the centring pins (52).
17) Check the parts. Check the condition of the wear points, replace the defective parts and all the seals.



I010692

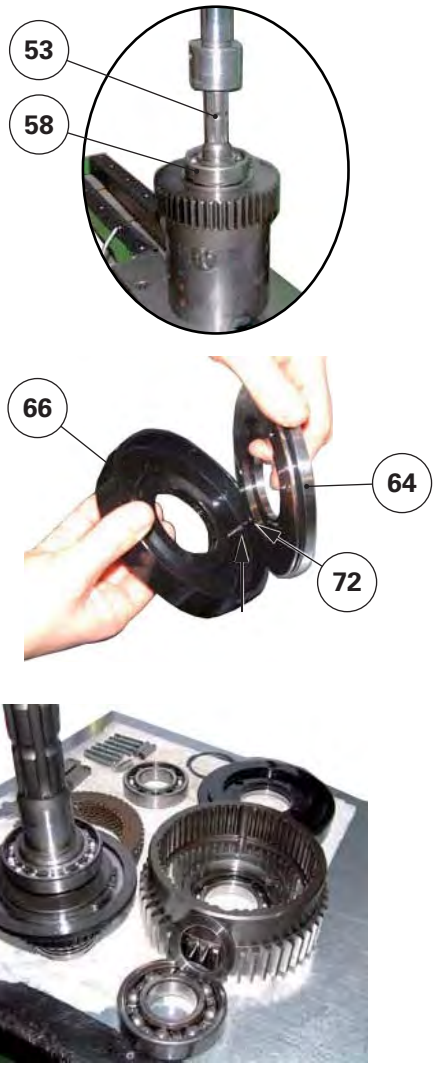
Fig. 34

Reassembling the front PTO

18) Carefully clean the parts that will be refitted.
19) Place the output shaft (53) in the clutch unit with the bearings (55) and (59) and the circlip (56).
20) Place the discs (70) and the backing plates (71) alternately in the clutch unit.
21) Position the pins (67) and their springs (68).

    IMPORTANT: *The pins have a rounded side which should be fitted facing upwards.*

22) Position the springs (73).



I010694

Fig. 35

23) Position the cylinder and piston assembly (64) (66) on the clutch unit. Compress the piston slightly using a press and a locally made tool. Position the circlip (63).
24) Check the clutch operation with compressed air.
25) Using a press, fit the bearings (58) and (62) onto the clutch.

NOTE: *Do not forget the washer (57) underneath the bearing (58).*

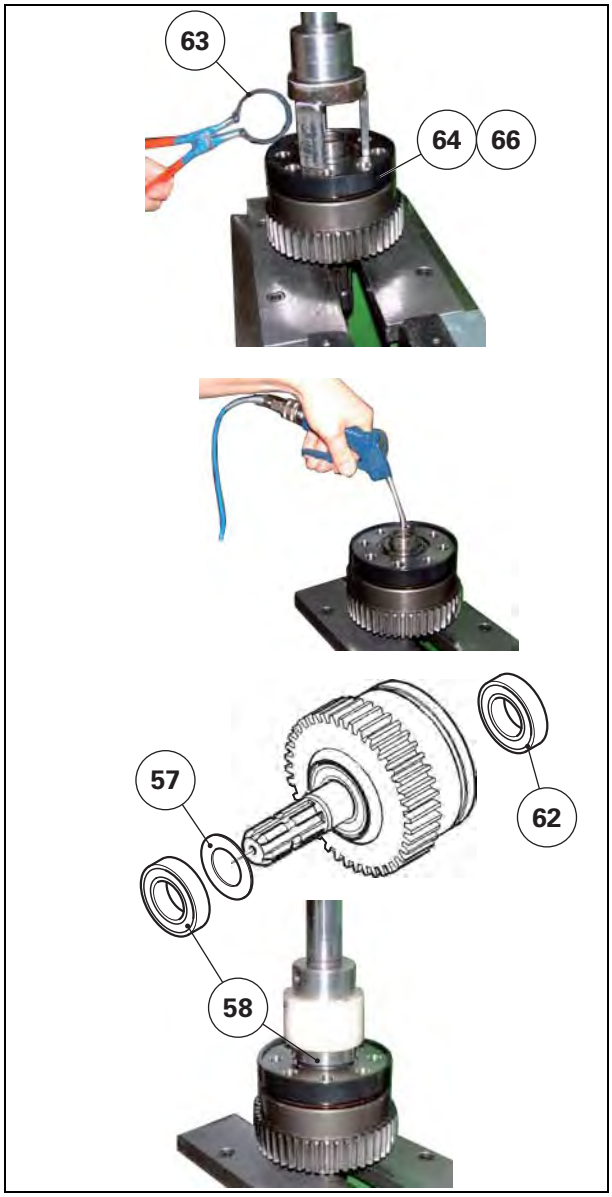
I010697

Fig. 36

26) Fit the seal rings (16) and (26) of the input and output shafts onto each half-housing.
27) Check that the three ball bearings under the thrust plate (60) are present. The thrust plate must rotate freely.

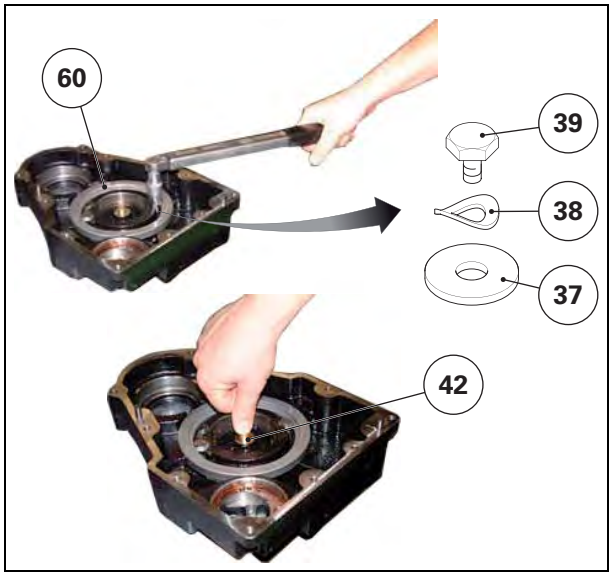
NOTE: *The thrust plate (60) allows the output shaft to turn to provide assistance in hitching implements.*

28) Check the fitting of the screws (39) securing the thrust plate (60). The screws are fitted with a spring washer (38) and a large washer (37). Tighten the screws to 5 Nm.
29) Position the connecting pipe (42) with a new seal. Check that it slides properly in the housing.



I010702 Fig. 37

30) Lubricate the mating face of the housing (1) to support the seal (15).
31) Position the clutch (7) and the input gear (5). Position the idler gear(s) (6) (according to model).

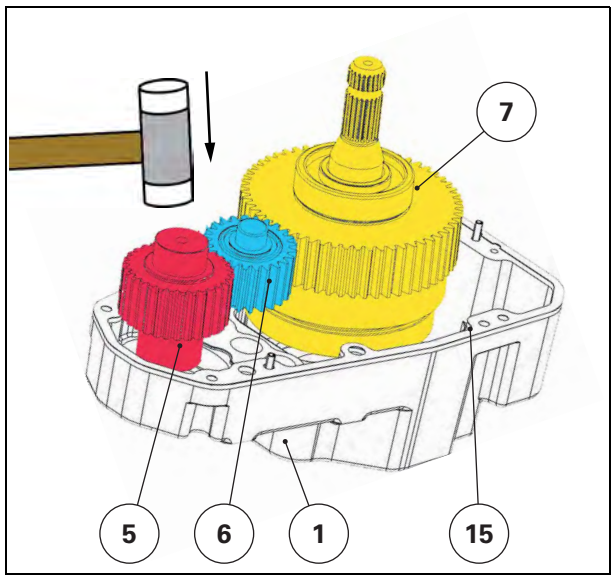


I010703 Fig. 38

32) Position the upper half-housing. Secure the two sections using a hammer.
33) Fit the screws (28) and tighten to 42 Nm.

NOTE: *Replace the sealing washers on the drain holes.*

34) On the pump unit (8), position the new "O" rings (40) and (41) using grease to keep them in place.
35) Fit the pump (8) in the housing (1), keeping an eye on the "O" rings. Refit the two pump attachment screws.
36) Refit the PTO to the tractor.



I010704 Fig. 39

7B18

Zuidberg front power take-off - Service tools

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