MANITOU

HANDLING YOUR WORLD

REPAIR MANUAL
MANUEL DE RÉPARATION
REPARATURANLEITUNG
MANUAL DE REPARACIÓN
MANUALE RIPARAZIONE

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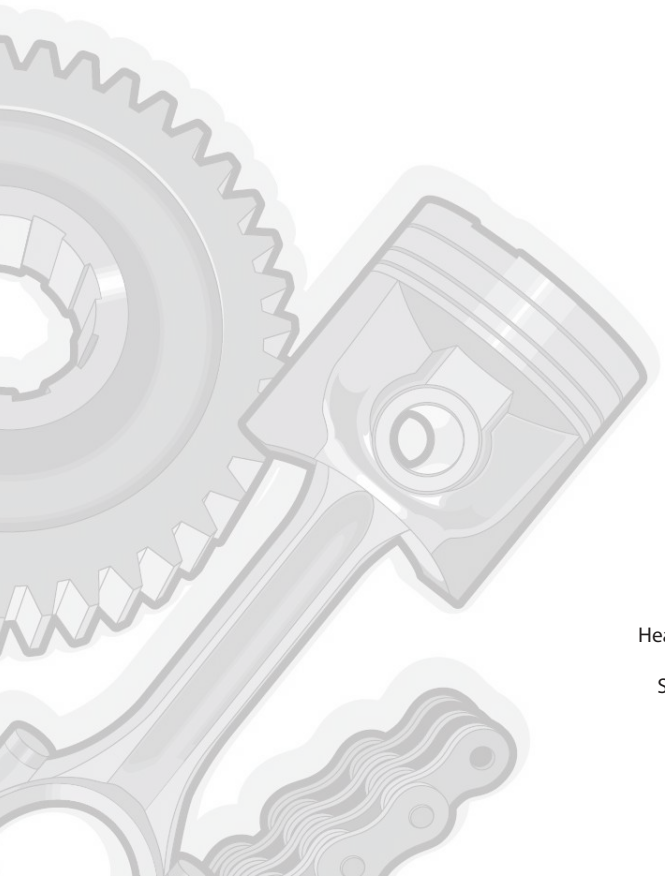

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PREAMBLE

This chapter deals with the general instructions and safety notice during inspection and maintenance work.
Other instructions and warnings are indicated in each chapter concerned.

In order to reduce accident risks, make sure to:

- Follow the instructions in the truck operating and maintenance manual.
  ⇒ This manual should be found in all trucks.
- Please follow all safety instructions.
- Use the appropriate tools for any work to be performed.
- Use original Manitou spare parts.

Any non-compliance increases the risk of accidents occurring which may lead to causing grievous bodily harm and even death.

An efficient, dependable and profitable combination will be formed if the operator follows the safety manual correctly and the machine is serviced properly.

When you see this symbol:

It means: Warning! Be careful! Your safety, somebody else's or the safety of the lift truck itself is at risk.

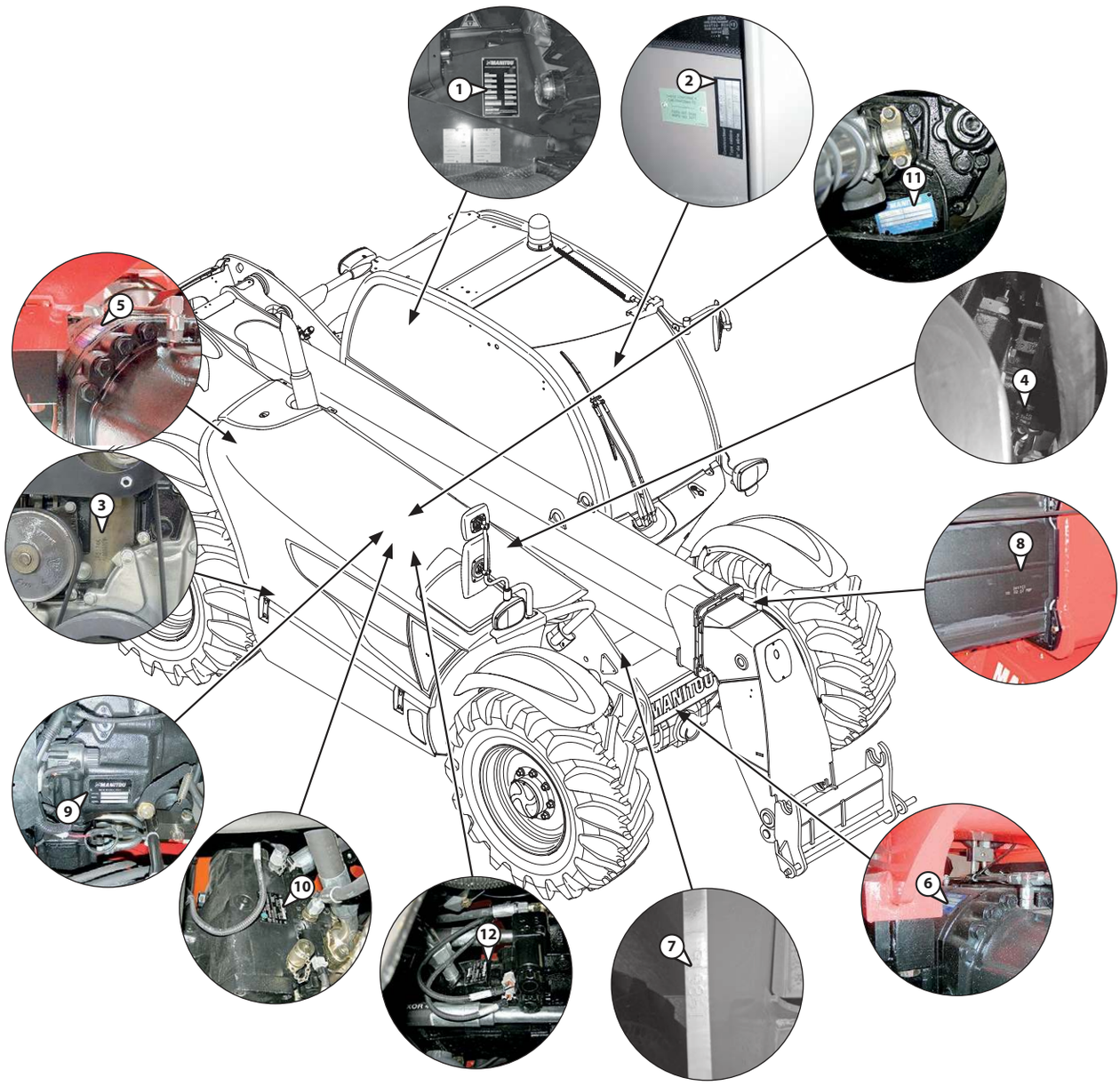
The manufacturer cannot predict all possible risky situations. Consequently, the safety instructions given in the safety manual are not exhaustive.
At any time, as an operator, you must envisage, within reason, the possible risk to yourself, to others or to the lift truck itself when you repair, service or drive it.

Manitou cannot be held responsible for the use of any lifting devices, tools or operating methods other than those specified.

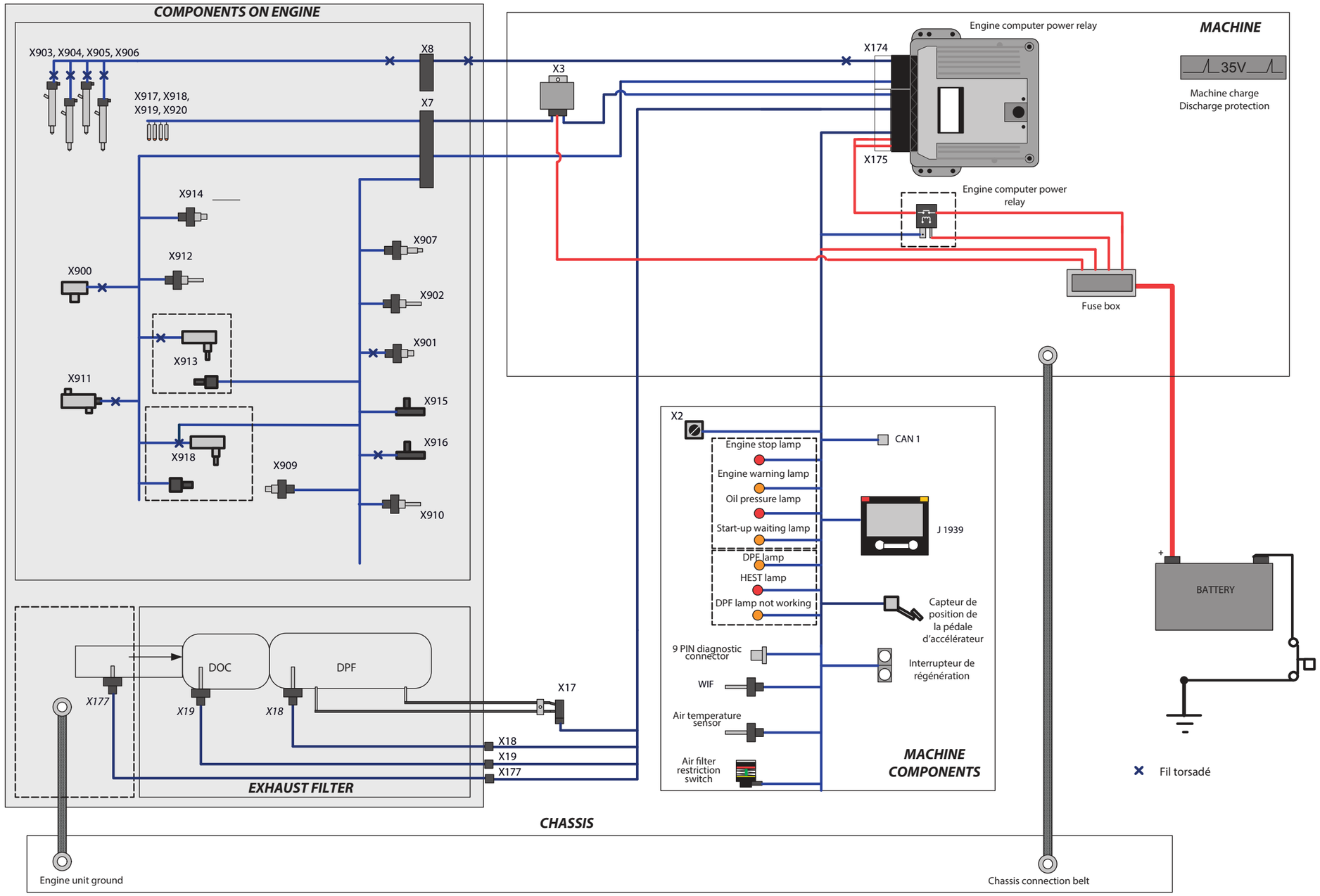
LOCATION OF NAME AND IDENTIFICATION PLATE

Key:

1 - Manufacturer's plate
2 - Cab plate
3 - Engine number
4 - Hydraulic pump plate
5 - Rear axle plate
6 - Front axle plate
7 - Chassis number
8 - Boom number
9 - Gearbox plate
10 - Hydrostatic pump plate
11 - Transfer box plate
12 - Hydrostatic engine plate

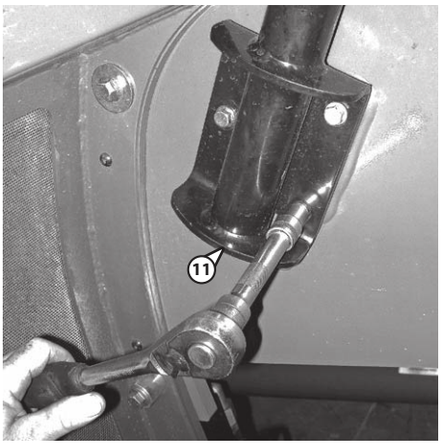


MAIN ELECTRIC DIAGRAM OF PERKINS 854 ENGINE

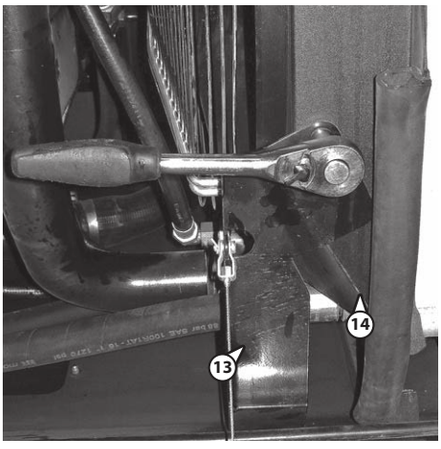


Key:

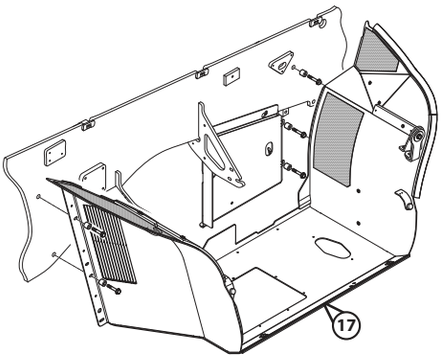
- **X2**: Key operated Ignition switch
- **X3**: Preheating module
- **X7, X8** : Truck /Engine connection
- **X17**: DPF pressure sensor
- **X18**: DPF temperature sensor
- **X19**: DOC temperature sensor
- **X174, X175**: Engine computer
- **X177**: Lambda sensor
- **X900**: Fuel metering valve
- **X901**: Fuel rail pressure sensor
- **X902**: Engine fuel temperature sensor
- **X903 X904, X905, X906**: Injector cylinders
- **X907**: Intake manifold pressure and temperature sensor
- **X908**: Throttle valve position sensor & actuator
- **X909**: Exhaust gas pressure sensor
- **X910**: Exhaust gas temperature sensor
- **X911**: Wastegate valve regulator (Turbo)
- **X912**: Coolant temperature sensor
- **X913**: EGR valve position sensor and actuator
- **X914**: Oil pressure switch
- **X915**: Crankshaft speed sensor
- **X916**: Camshaft speed sensor
- **X917, X918, X919, X920 :** Glow plugs 1, 2, 3 et 4



Remove the front RH headlight (Item 11).

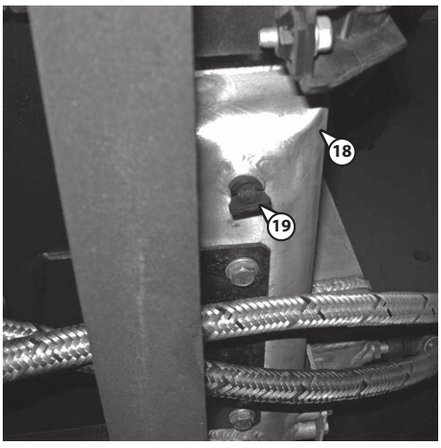


Remove the support bracket (Item 13) from the radiator (Item 14).



Place a pallet truck under the engine housing (Item 17).

Remove the engine housing by backing out the pallet truck.



Drain the coolant (Item 18) through the bleed screw (Item 19) under the cooler.

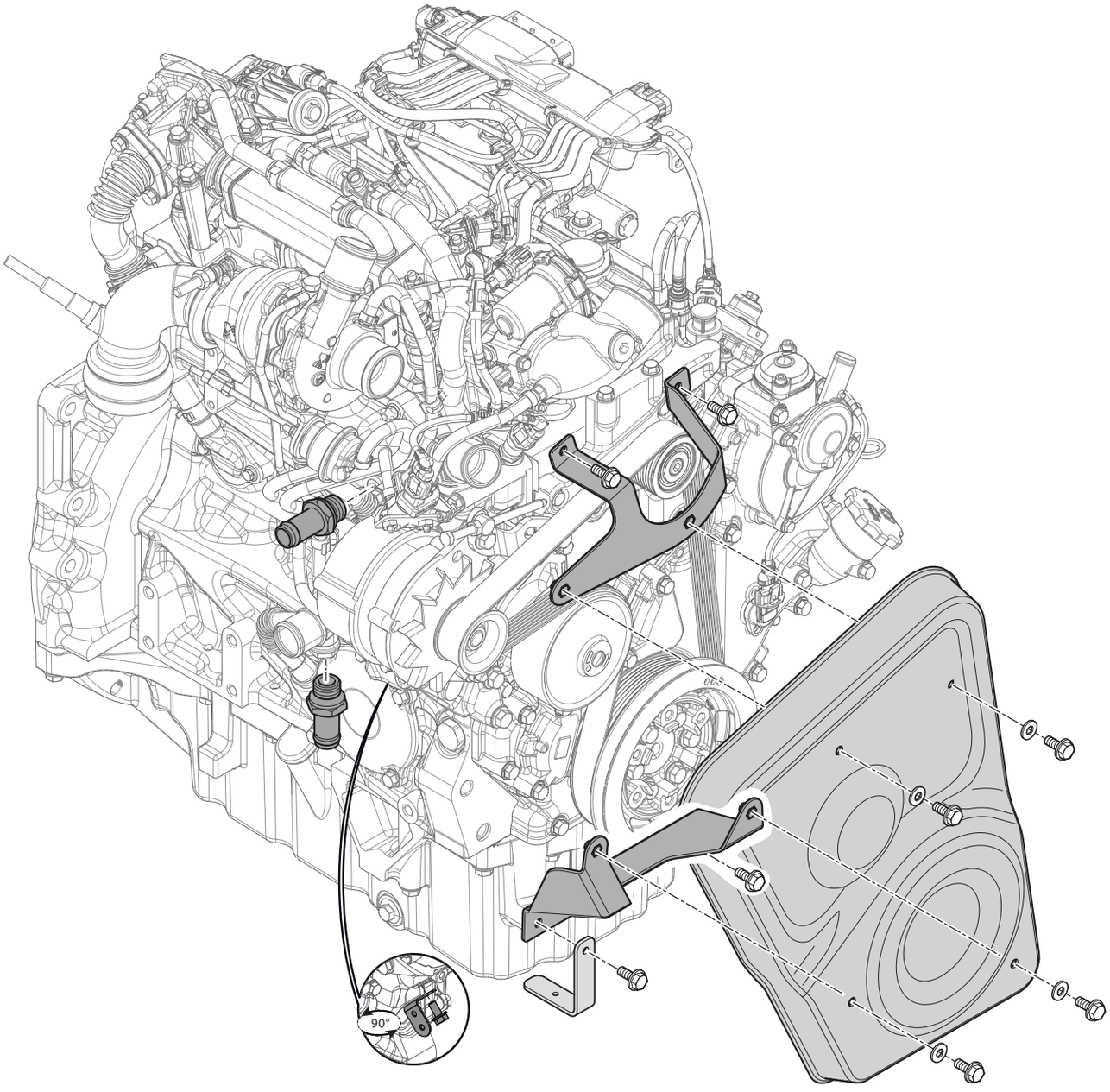
11 - Standard engine change

When replacing the engine:

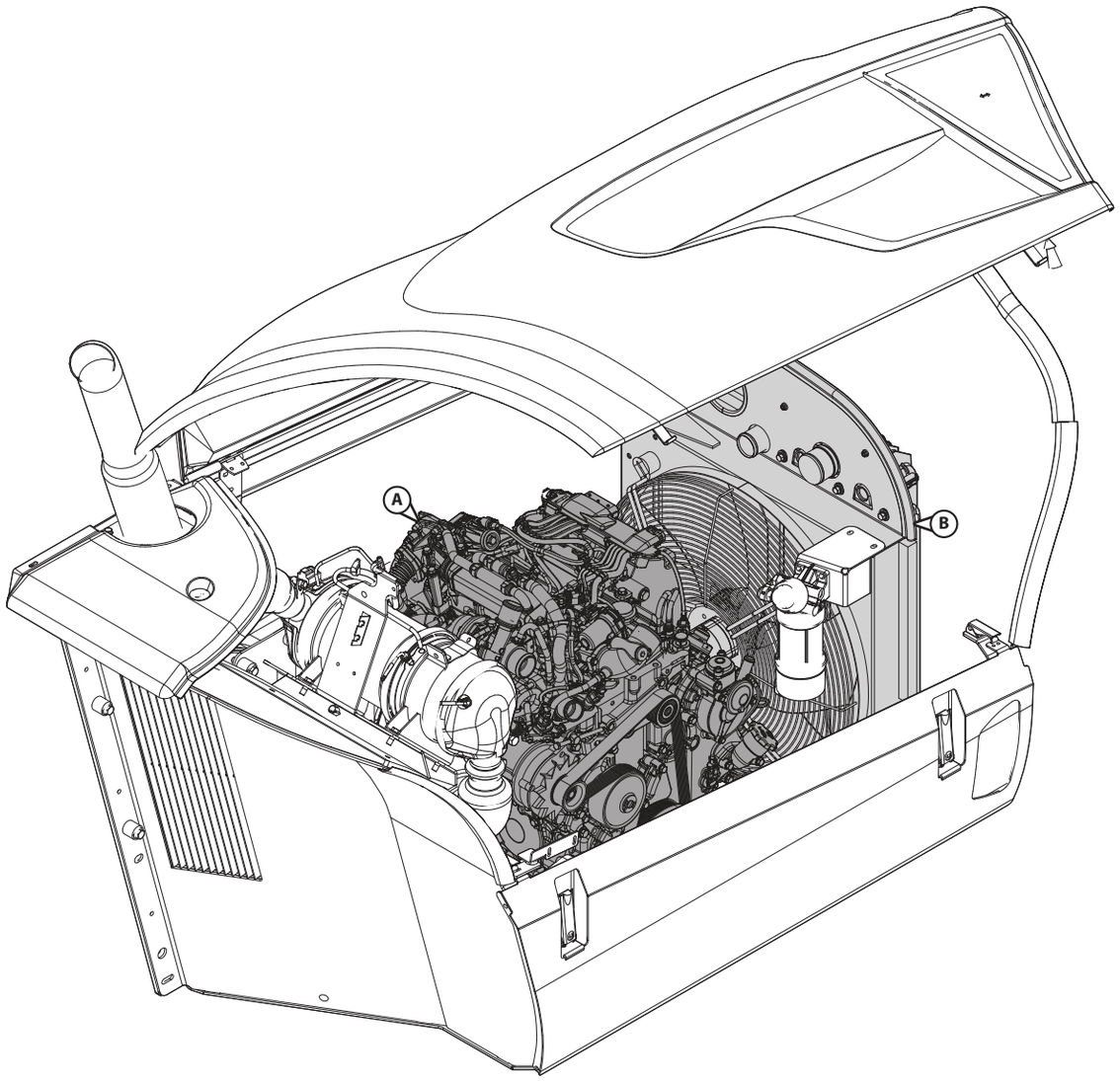
1 - Remove the engine control unit in front of the cooler and attach it to the removed engine

2 - Retain the following items from the removed engine, together with their screws:

- ⇒ The harness fastening lug under the alternator, the ground lugs, the two exhaust and alternator harness support lugs
- ⇒ The 2 connecting oil tubes, the tube support;
- ⇒ The oil hose clamp bracket, the 2 heating circuit connectors;
- ⇒ the bell housing and the coupling flange, recover the centering pins;
- ⇒ The drive belt cover, the 2 supports.
- ⇒ The hose support bracket.



COMPONENT LOCATION



Key:

A - Engine
B - Cooler

PREPARATION AND SAFETY INSTRUCTIONS

Stabilize the machine on level ground.
Maneuver the machine a number of times in forward and reverse (wheels straight) in order to release any stresses acting on the steering and tires.

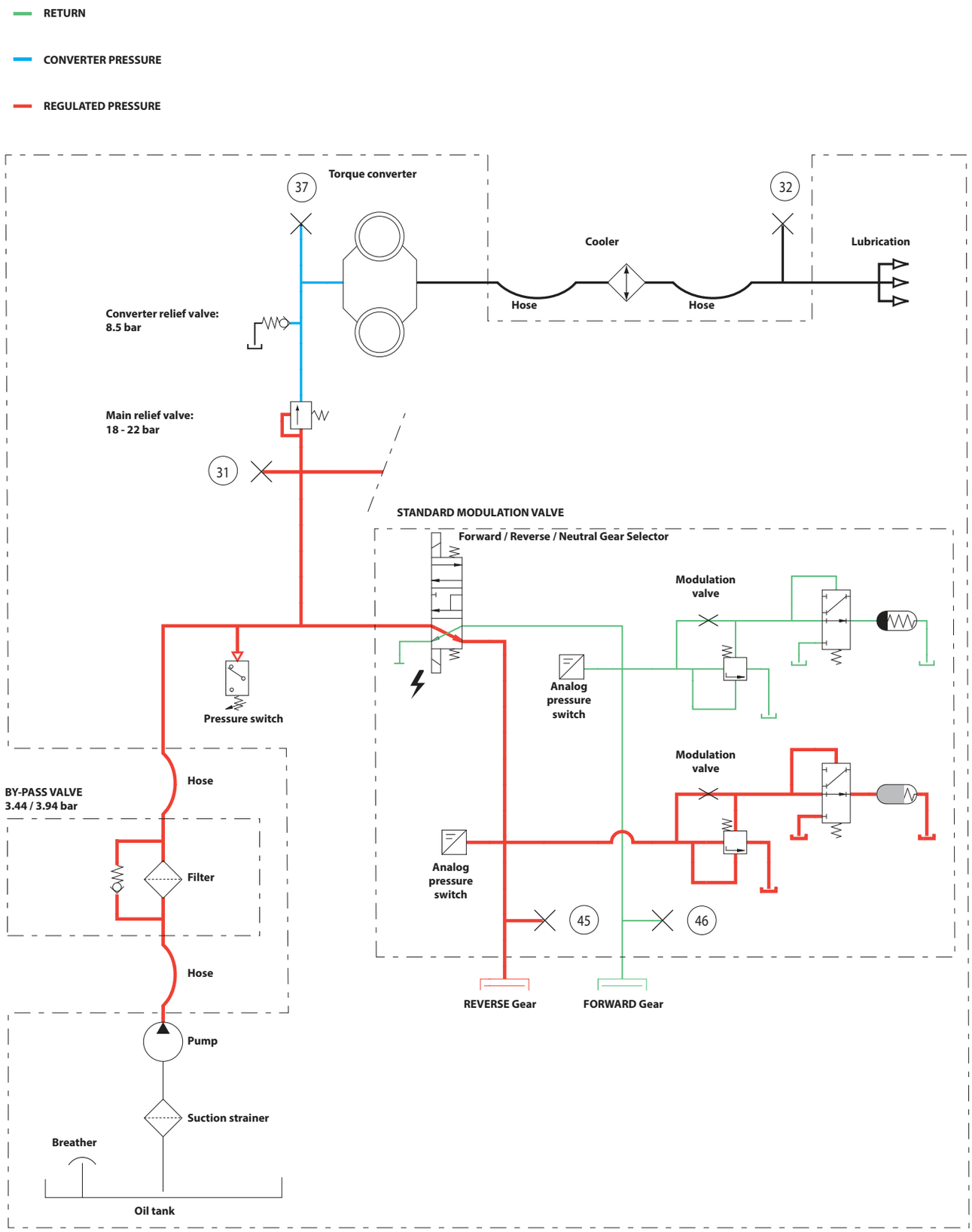
Raise the boom to mid-height and secure in position.

Deactivate battery power supply by means of the battery cut-off.

Specific tooling:

- Pallet truck
- Jib crane (minimum 1,000 kg)

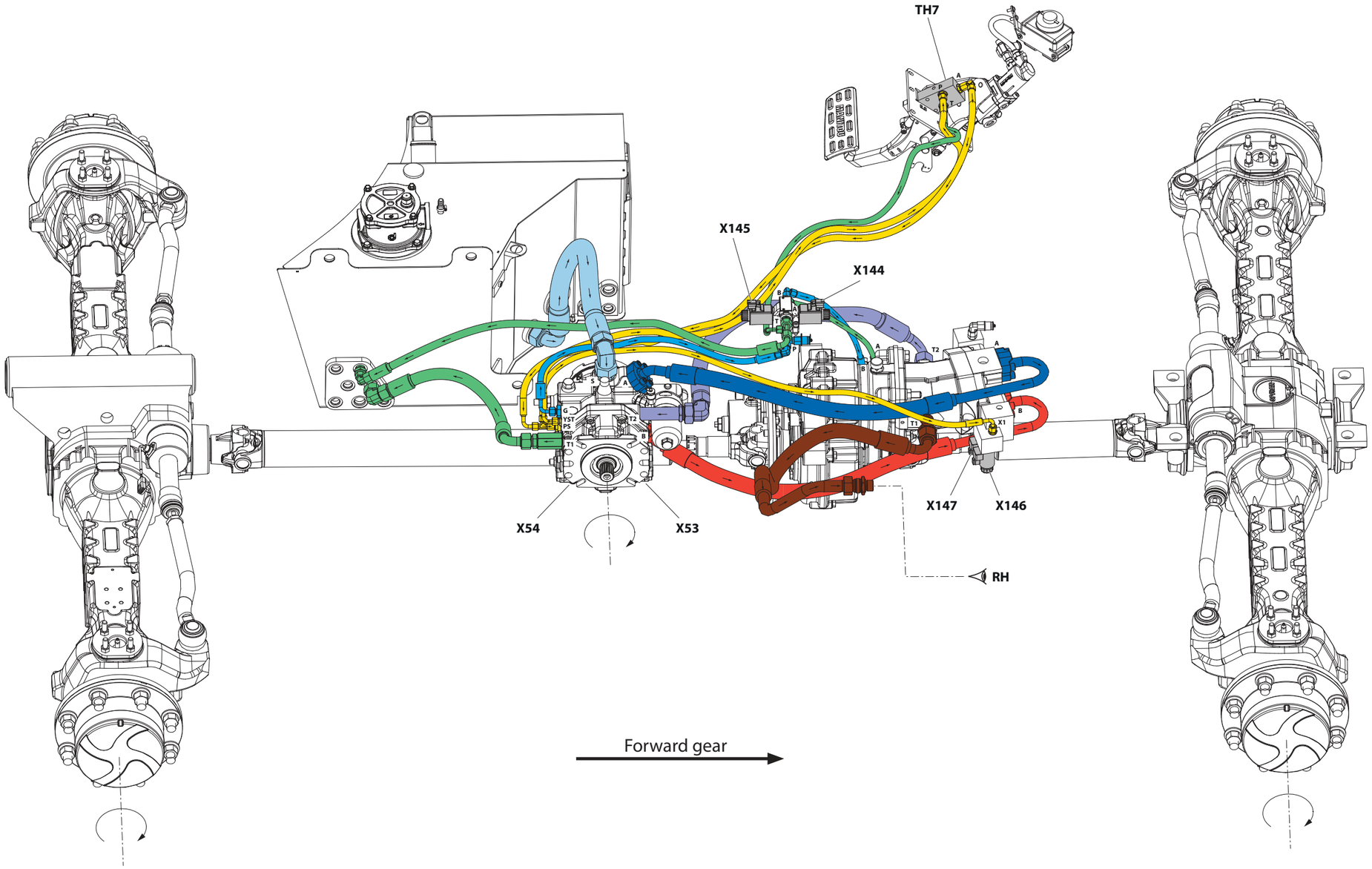
REVERSE GEAR (STANDARD) SCHEMATIC LAYOUT



FORWARD GEAR FLUID FLOW DISPLAY

Conditions:

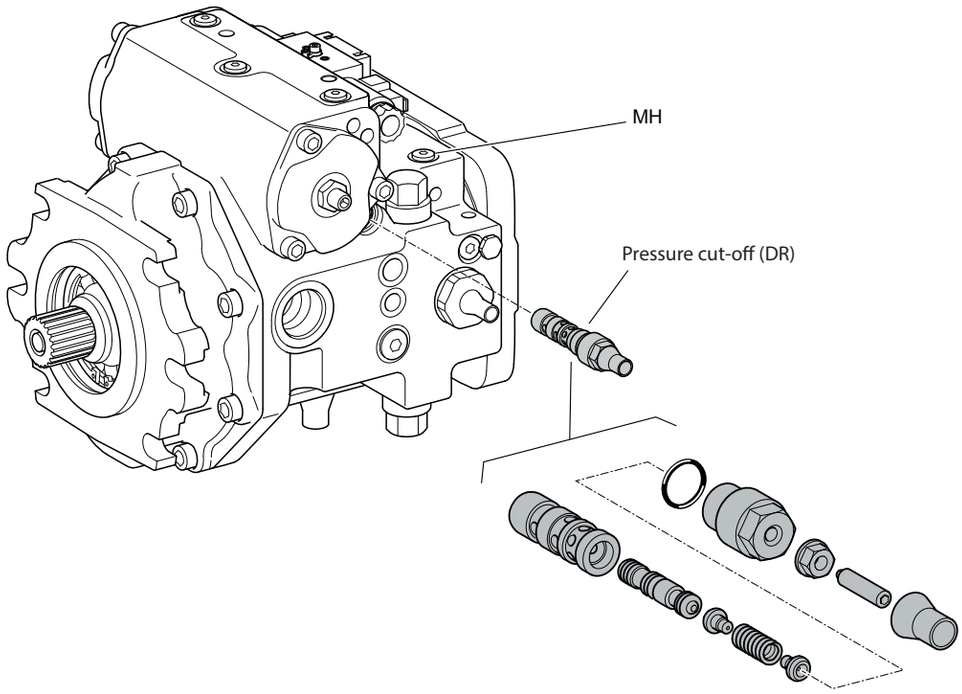
⇒ Forward gear
⇒ Fast gear 2
⇒ Low torque
⇒ Hydrostatic engine min. displacement



Key:

	Suction pressure
	Boost pressure
	High Pressure
	Low Pressure
	Pilot pressure
	Cooling pressure
	Drainage pressure
	Oil tank return
HR	Oil cooler
TH7	TH7 valve
X53	Forward electrovalve
X54	Reverse electrovalve
X147	Motion direction electrovalve
X146	Low speed electrovalve
X144	Gear 1 electrovalve
X145	Gear 2 electrovalve

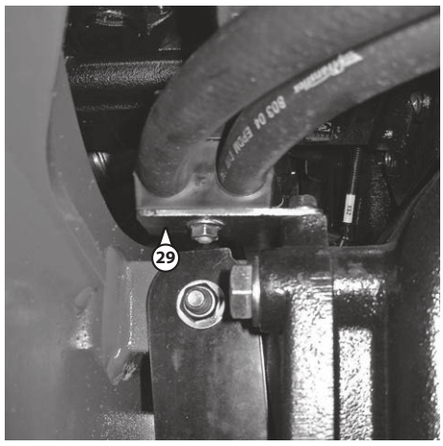
4 - CHECKING PRESSURE CUT-OFF (DR)



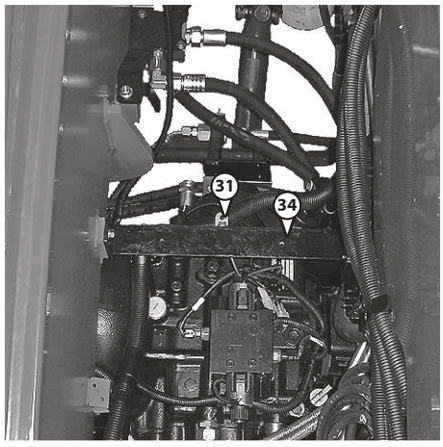
1 - Place the truck on blocks (wheels off the ground) with the brakes applied.
If using the service brake, the TH 7 valve spool must remain coupled to the brake, or a hose must be connected to bypass the valve.

2 - Connect a pressure test port (600 bar) to port MH.

3 - Check the cut-off pressure (470 bar) in forward gear (Mb) or reverse gear (Ma), with the service brake blocked, max. rpm in 2nd gear.

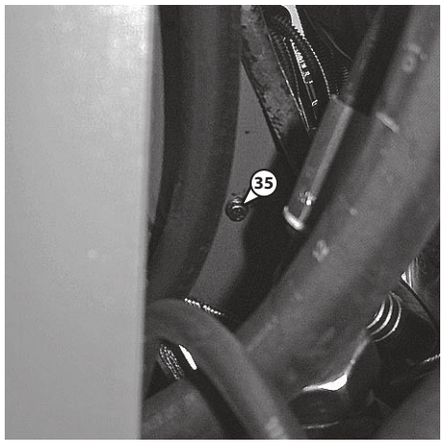


Remove the cab side hose mounting (Item 29).

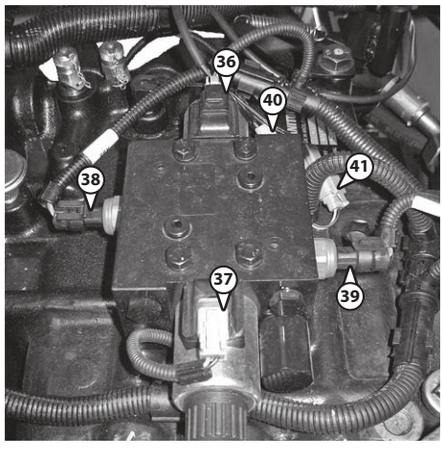


Remove the clamp (Item 31).

Remove the hose support (Item 34).



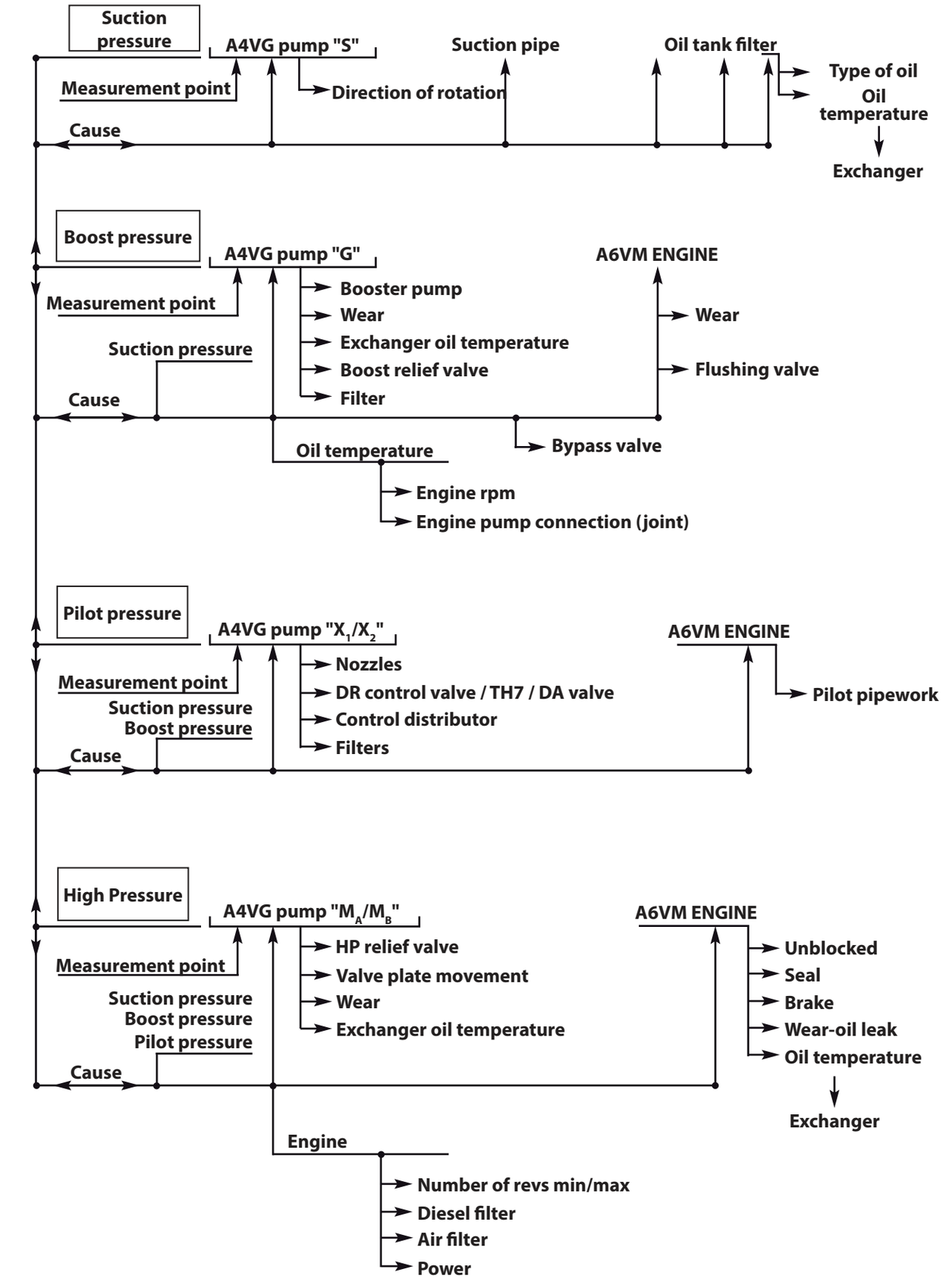
Remove the hose support (Item 35).



Disconnect gearbox electrical connectors X53 (Item 36), X54 (Item 37), X55 (Item 38), X56 (Item 39), X58 (Item 40), X62 (Item 41).

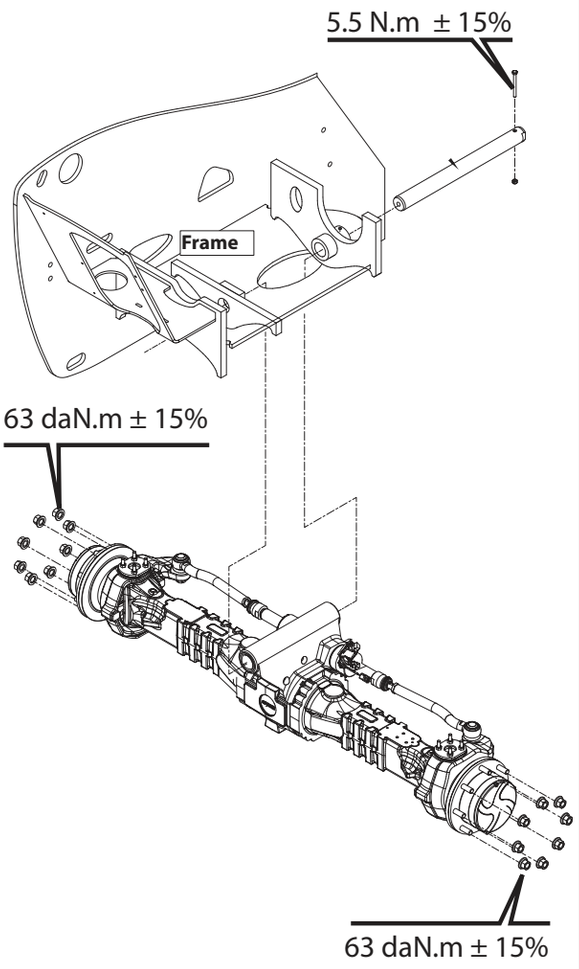
HYDROSTATIC SYSTEM TROUBLESHOOTING

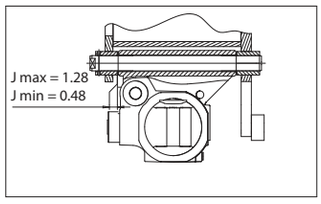
PUMP / ENGINE



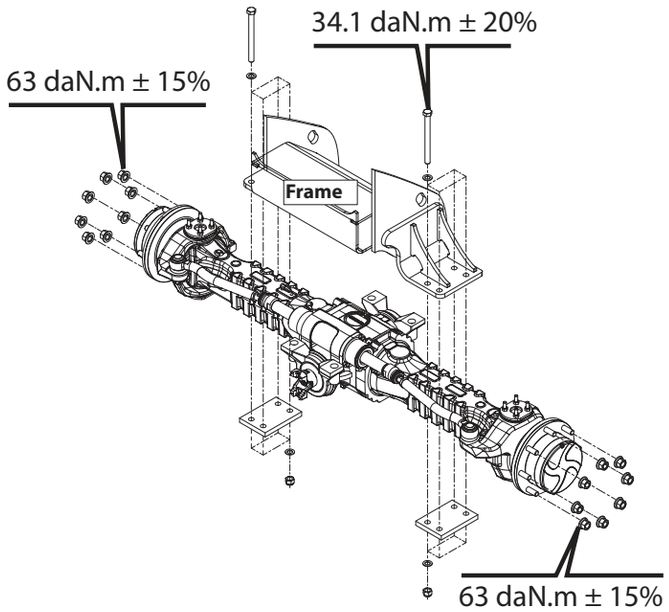
AXLE TIGHTENING TORQUE

REAR AXLE

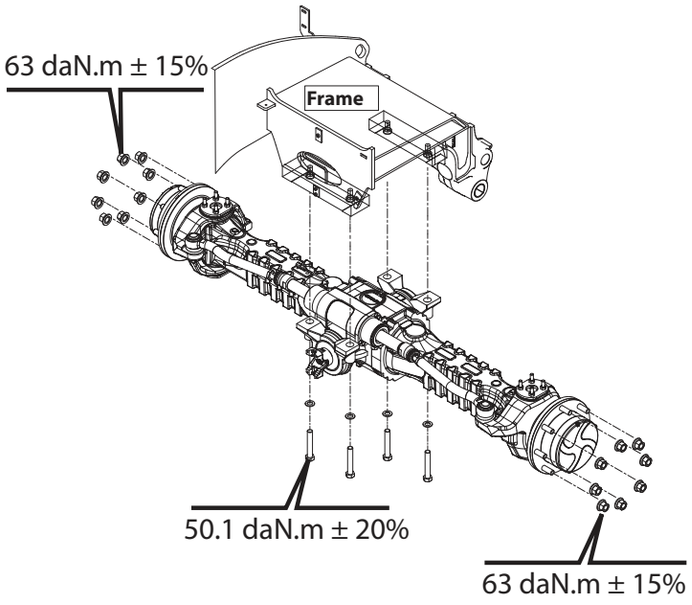




FRONT AXLE MT 835 VERSION



FRONT AXLE MT 1135 VERSION



4 - CALIBRATION OF THE INCHING POINT

The inching point which is calibrated in this procedure corresponds to the Inching limit switch, or the start of braking.

– Switch on the PAD and connect the VCI.

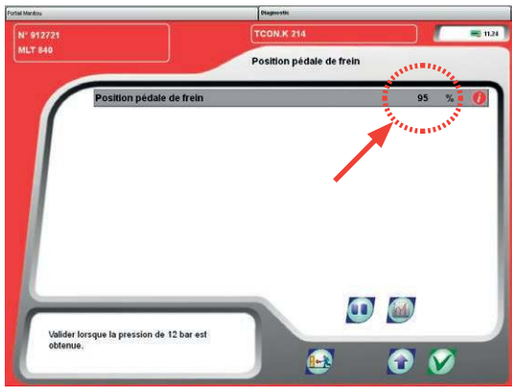
The PAD must be at least version 11.28.

– Select "Diagnostic" and then confirm.
– Select "Maniscopic châssis fixe" (Maniscopic fixed frame) and confirm.
– Select the type of machine range and then confirm.
– Select the type of machine and then confirm.
– Switch on the ignition, start the machine and then confirm.
– Select "Diagnostic global (tous les calculateurs)" (Overall diagnosis (all ECUs)) and confirm.
– Select "Calculateur transmission" (Transmission ECU) and confirm.
– If faults are present, consult and then delete them.
– Select "Calibration" and then confirm.
– Select "Calibration point Inching capteur pédale de frein" (Brake pedal sensor Inching point calibration) and confirm.

– Connect a manometer to measure the pressure in the master cylinder and then confirm.

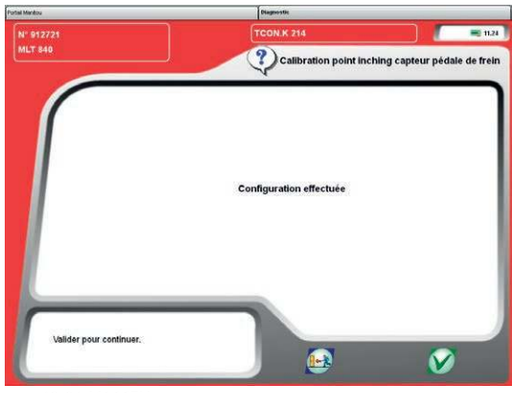
⇒ Pressure test port location:

"Pressure test port" section



– Depress the brake pedal to obtain a pressure of 12 bar. Once this pressure has been obtained, push the confirm button to record the calibration point.

The instruction must not exceed 95%, otherwise calibration will fail.



– Confirm to record calibration.

– Switch off the ignition for 5 seconds to initialize the system.

HYDRAULIC BRAKE BLEED VALVE

Bleed valve supplied with all the components required for bleeding the hydraulic brake circuits of Manitou products. Operating instructions included.

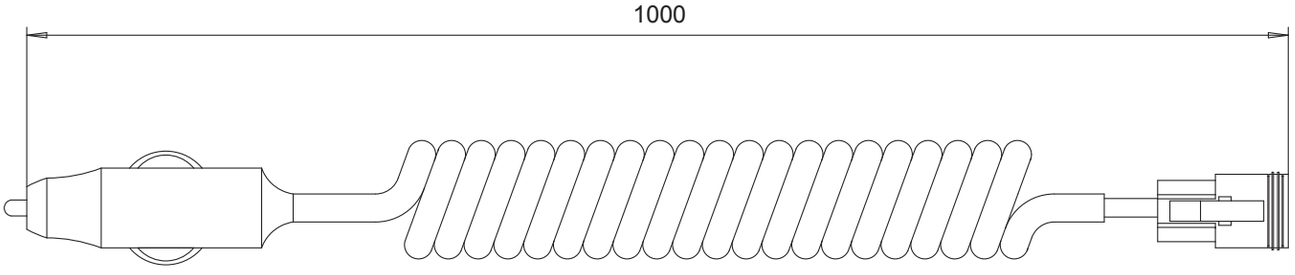
MANITOU Reference

HYDRAULIC BRAKE BLEED KIT 554019

SPARE PARTS:

- TOP MANOMETER 719980
- BOTTOM MANOMETER 719981
- Membrane..... 661913
- HOSE 661914

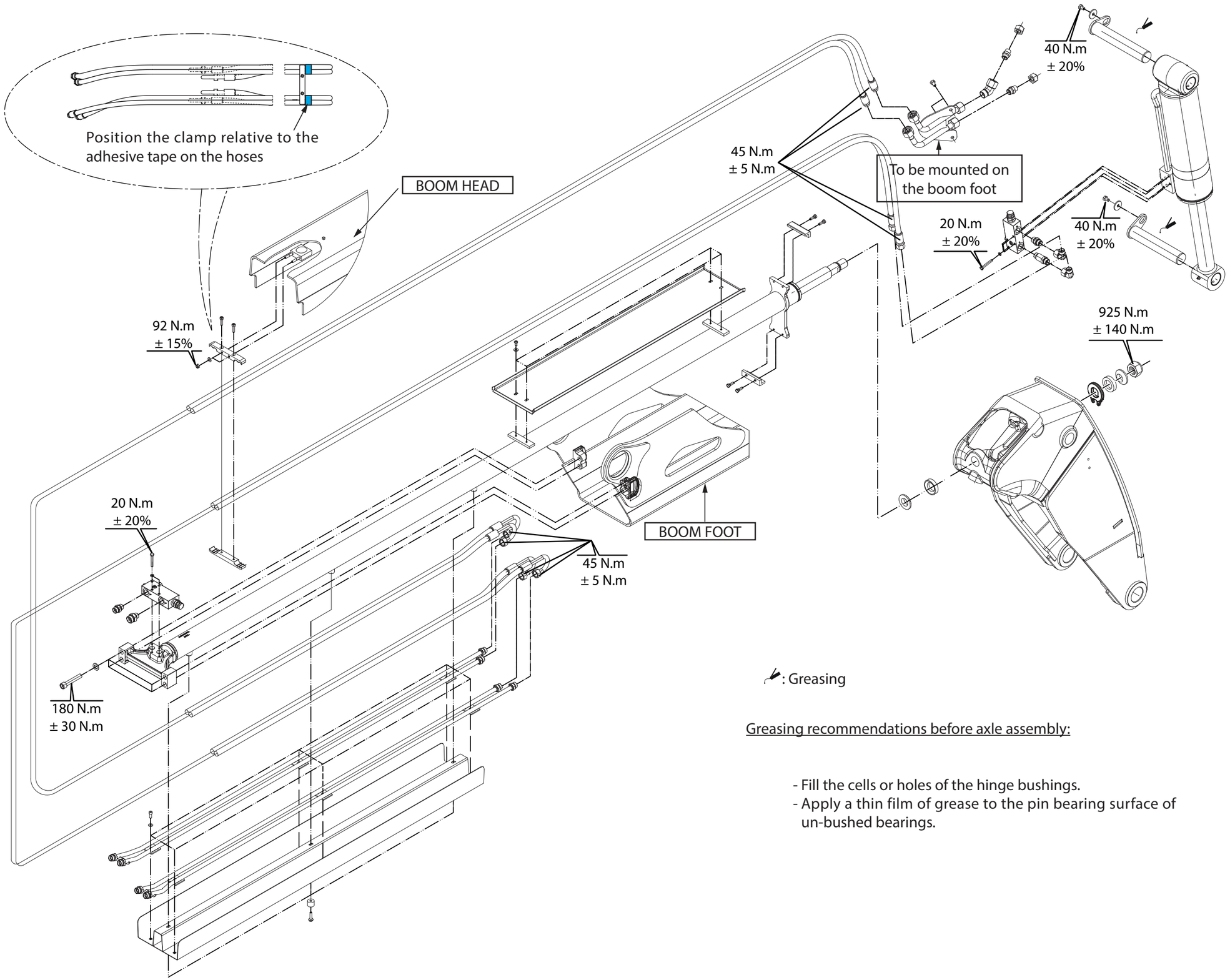
PARKING BRAKE BLEEDER HARNESS



MANITOU Reference

PARKING BRAKE BLEED HARNESS.....265865

TIGHTENING TORQUE AND GREASING AREA

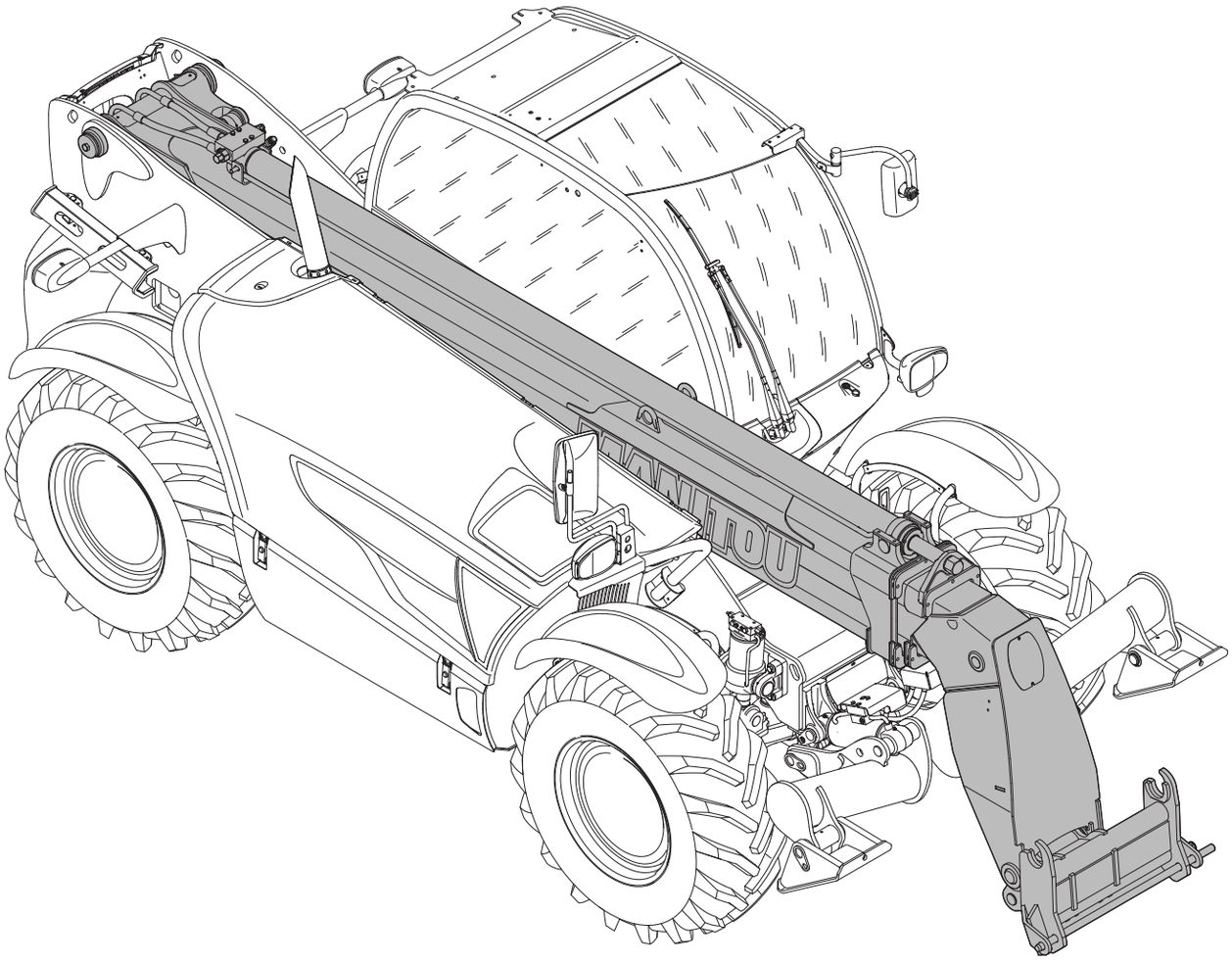


: Greasing

Greasing recommendations before axle assembly:

- Fill the cells or holes of the hinge bushings.
- Apply a thin film of grease to the pin bearing surface of un-bushed bearings.

TRIPLEX BOOM



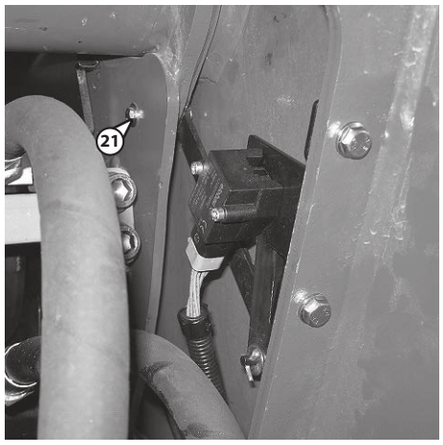
PREPARATION AND SAFETY INSTRUCTIONS

- Stabilize the machine on level ground.
- Fully retract the telescope.
- If an attachment is mounted on the carriage, remove it.
- Place the boom at mid-height so as to gain access the lifting and compensating cylinder head pins.
- Decompress all hydraulic elements.
- Deactivate battery power supply by means of the battery cut-off.

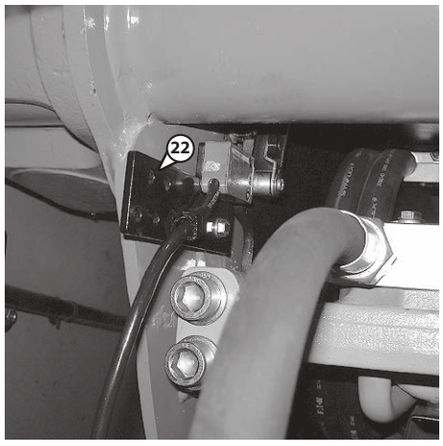
Weight of complete boom ≈ 2,500 kg

Specific tooling:

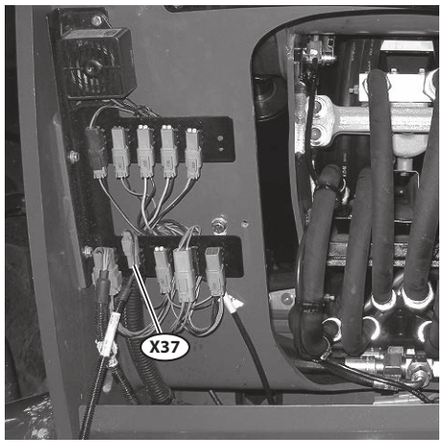
– Jib crane or hoist + slings.
– Wooden chock.
– 36 and 46 mm flare nut wrench with extension and key ◁ *50 "Specific tooling"*.
– Mallet.
– Trestles.



Tighten the screw (Item 21) of the angle sensor connector rod.



Refit the telescope retraction sensor support bracket (Item 22).



Move the rear plate closer and reconnect the X37 plate light connector.

Refit the rear cover plate.

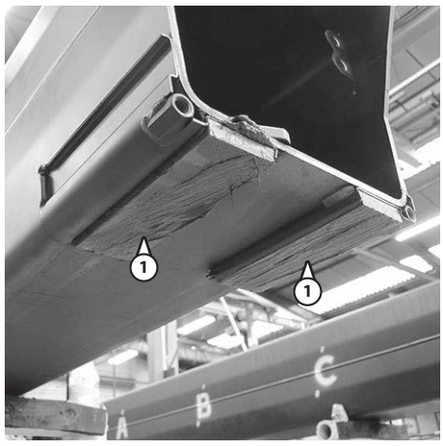
Remove the slings from the boom.

DRAIN THE TELESCOPE CYLINDER:

1 - Switch on the engine.
2 - Extend the telescope by 0.5m.
3 - Retract the telescope.
4 - Extend the telescope by 1m.
5 - Retract the telescope.
6 - Extend the telescope by 1.5m.
7 - Retract the telescope.
8 - Extend the telescope by 2m.
9 - Retract the telescope.

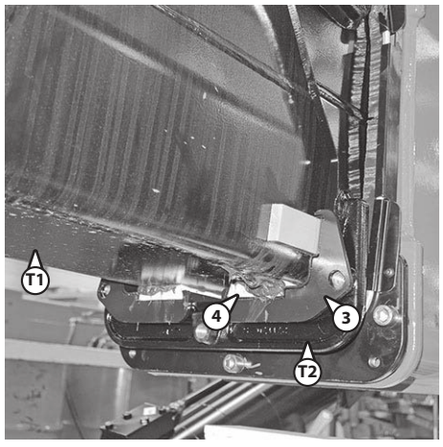
RECHECK AND, IF NECESSARY, ADJUST:

⇒ The angular potentiometer.
⇒ The telescope retraction limit switch.
⇒ If necessary, repeat angle + strain gauge calibration.



BOOM HEAD TELESCOPE T2 REASSEMBLY

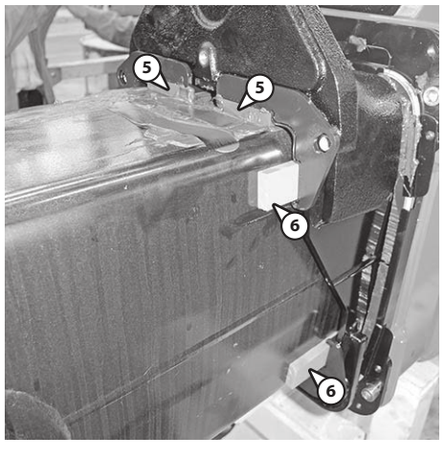
Place the bottom rear slide pads (Item 1) ensuring that they are mounted in the correct direction.
Grease the sliding faces of the pads.



Insert telescope T2 into the intermediate telescope T1.

Place the 4 pad cages (Item 3).
Place the bottom front slide pads (Item 4) ensuring that they are mounted in the correct direction.
Grease the sliding faces of the pads.

Insert telescope T2 into the intermediate telescope T1 to within 400 mm of the end.



Place the top front pads (Item 5) in the correct direction and to the specified clearance (◅ 50 "BOOM CONTROL AND ADJUSTMENT" - SHIM INSTALLATION AND GREASING AREA RECOMMENDATIONS).
Grease the sliding faces of the pads.

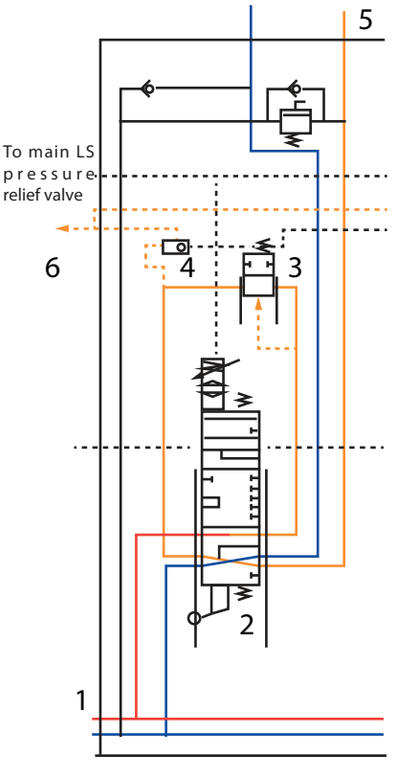
Push telescope T2 to the left.
Insert the RH side pads (Item 6).
Repeat the same operation to insert the LH side pads to the specified clearance

The pads must only be inserted by hand, do not use a mallet.

50

Values for information purposes only.

Single load distribution principle:



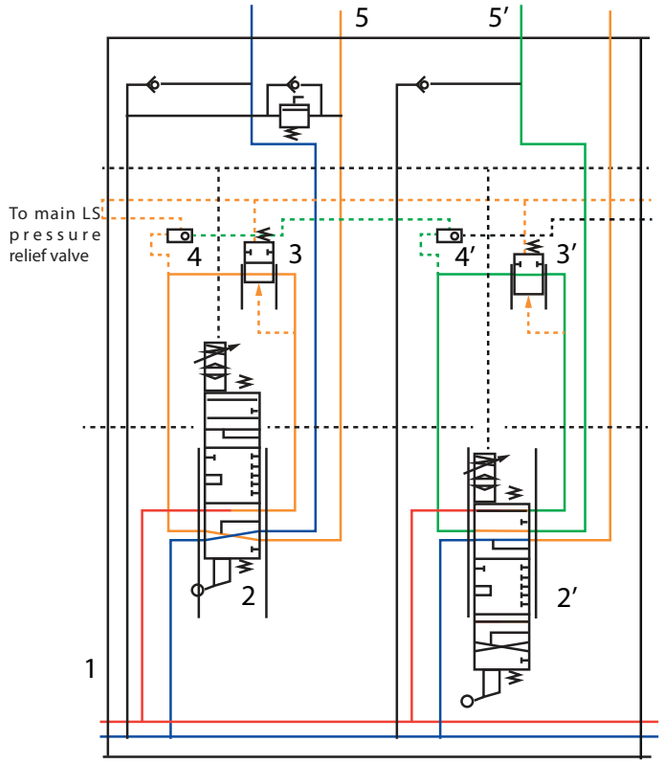
Pump side pressure (P)

Tank side pressure (T)

Load side pressure (LS)

The oil runs from the pump (1) through the main spool (2) to the pressure balance valve (3).
The pressure balance valve (3)
- open the flow to the main spool (2) once again and then in to the load (5),
- sends the load pressure signal through circuit selector (4) to the entree element.

Dual load distribution principle:

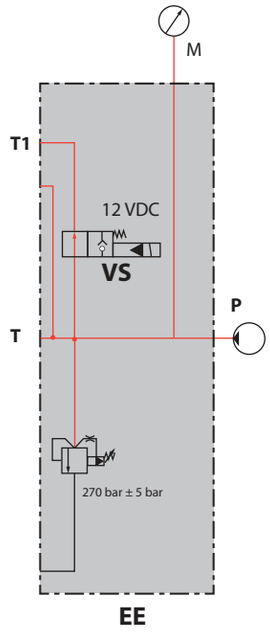


Pump side pressure (P)
Tank side pressure (T)
Load pressure at 100bars (LS)
Load pressure at 150bars (LS)

The operator is running (2) movements simultaneously. One loads at a 100b and another at a 150b.
Pressure balance valve (3) and circuit selector (4) send the 150bar signal to the main LS pressure relief valve for optimum flow and pressure supply.
Pressure balance valve (4′) will regulate the flow in 100b load (5′) by opening and closing.
This system allows an independent oil flow distribution regardless of load pressure differences or flow demand.

Values indicative only

INLET ELEMENT (EE) AND OUTLET ELEMENT (ES)

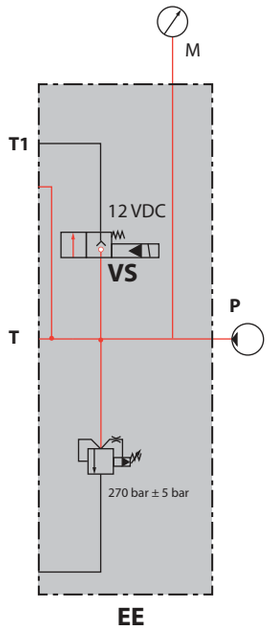


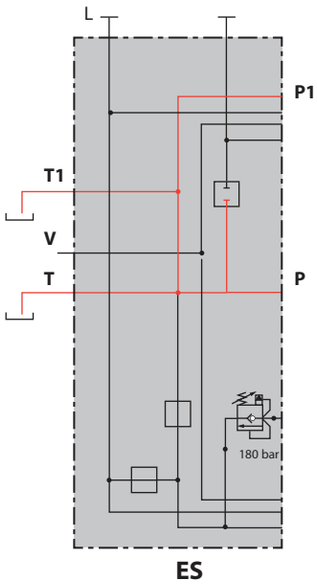
The spool is in neutral.

The flow passes through the safety valve and returns to the tank.

The spool moves under the effect of a pilot pressure on the coil.

The flow passes through the safety valve and returns to the tank.



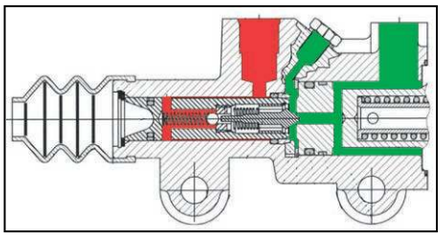


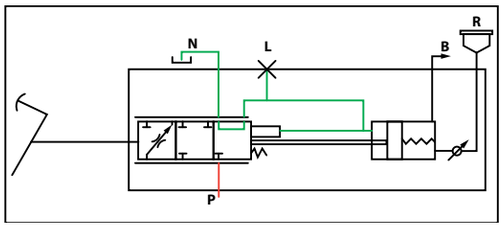
The flow passes through all the distributor elements before collecting to be sent to the tank.

Values for information purposes only.

3 - Working :

Phase 1 (no action)

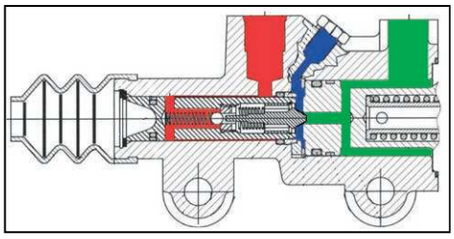


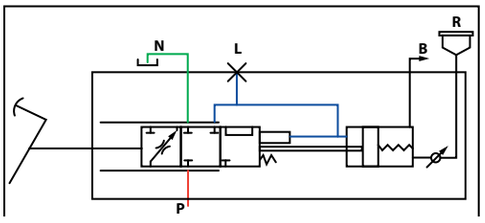


The pressure from the accumulator block arrives on P. The ball prevents the oil to pass because it is maintained on its seat.

Pilot line (L) is connected to the tank return (N) because it does not use the master cylinder.

Phase 2 (the driver starts the action)

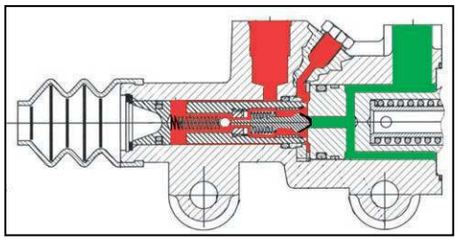


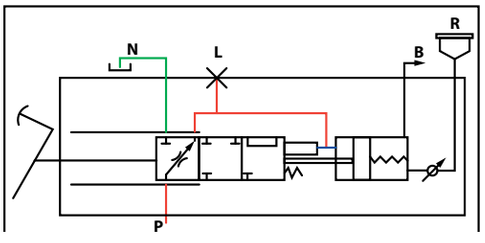


When the driver begins to push on the brake pedal, all components are in contact. In this case, the LS line is cut (L).

The master cylinder is ready to send the pressure toward the brake with the assistance.

Phase 3 (during the action)





When the driver pushes completely the brake pedal, the piston moves and the ball does not stop the oil. In this case, the pressure is sent to help the driver.

In the same time, the master cylinder sends a pilot pressure toward the flow divider to have the priority on braking.

Values for information purposes only.

KEY

Item	Designation	Position on diagram	Characteristics
AC	ACCUMULATOR	A6/E6/I11	
BA	FEED BLOCK	A9	
BE	SEALING PLUG	S20	
BLR	VALVE BLOCK	C34/C37	OPTION
BR	BREATHER PLUG	Q20	
CA	SUCTION STRAINER	Q9	
CAR	ONE WAY VALVE	K11	
CH	HYDRAULIC COLLECTOR	K21	
CSP	COUNTERBALANCE VALVE	G27/I30/K23	
D	4-ELEMENT DISTRIBUTOR	Q23	
EA	- ATTACHMENT ELEMENT	O27	
EE	- INLET ELEMENT	O36	
EI	- TILTING ELEMENT	O30	
EL	- LIFTING ELEMENT	O33	
ES	- OUTPUT ELEMENT	O23	
AND	- TELESCOPE ELEMENT	O24	
EVAA	REAR ATTACHMENT ELECTROVALVE	K36/K39	OPTION
EVTDF	TELESCOPE HEAD ELECTROVALVE	E21/E24/E27/E30	OPTION
FDar	REAR DISC BRAKE	M16	
FDav	FRONT DISC BRAKE	M4	
FPN	NEGATIVE PARKING BRAKE	G9	
FR	RETURN FILTER	S16	
LFN	NEGATIVE BRAKE LEVER	C11	TÜV OPTION
M	PERKINS DIESEL ENGINE	M12	854E-E34TA
	- IDLE SPEED		850 rpm
	- NOMINAL RPM LOADED		2,200 rpm
	- MAX. RPM UNLADEN		2350 rpm
MC	BRAKE MASTER CYLINDER	G5	
MV	FAN ENGINE	A3	
N	LEVEL	S7	
P	HYDRAULIC PUMP	M11	
PAAR	REAR ATTACHMENT PLUG	G39/I36/I39	OPTION
PAAV	FRONT ATTACHMENT CONNECTOR	C19/C24/C27/C30/ C32/C36/C39	OPTION
PD	STEERING PUMP	G13	
PP	PRESSURE TEST PORT	A8/E5/E8/E11/G6/ I32/I34	
PRES	PRESSURE SWITCH	A11/C12/E12/G4	
PRF	LEAKAGE RETURN CONNECTOR	G22	OPTION
R3V	3-WAY VALVE	C20/C29	OPTION
RDU+F	UNIDIRECTIONAL FLOW RATE REDUCTION GEAR + FILTER	G10	
HR	OIL COOLER	A8	
RLF	BRAKE FLUID TANK	G4	
SD	STEERING SELECTOR	E13	
	- POSITION 1 SHORT STEERING		
	- POSITION 2 FRONT WHEEL STEERING		
	- POSITION 3 CRAB STEERING		
VC	COMPENSATING CYLINDER	K34	120x160 C340
VD	DISCHARGE VALVE	K10	
VDar	REAR STEERING CYLINDER	O14	
VDav	FRONT STEERING CYLINDER	O5	
VI	TILTING CYLINDER	I30	130x65C:416
VIC	COMPENSATING ISOLATION VALVE	I32/I34	
VL	LIFTING CYLINDER	G29	140x70 C:805
VRD	FLOW CONTROL VALVE	I27	
VS	SAFETY VALVE	O36	
VT	TELESCOPE CYLINDER	I24	70x50 C:2975
VTDSL	SINGLE SIDE-SHIFT CARRIAGE CYLINDER	A21/A25/A33	
VVT	CARRIAGE LOCKING CYLINDER	A20/A28/A37	60x85 C:183 OPTION

Note:

1 - The pressure relief valves should be adjusted at an oil temperature of 50 °C.

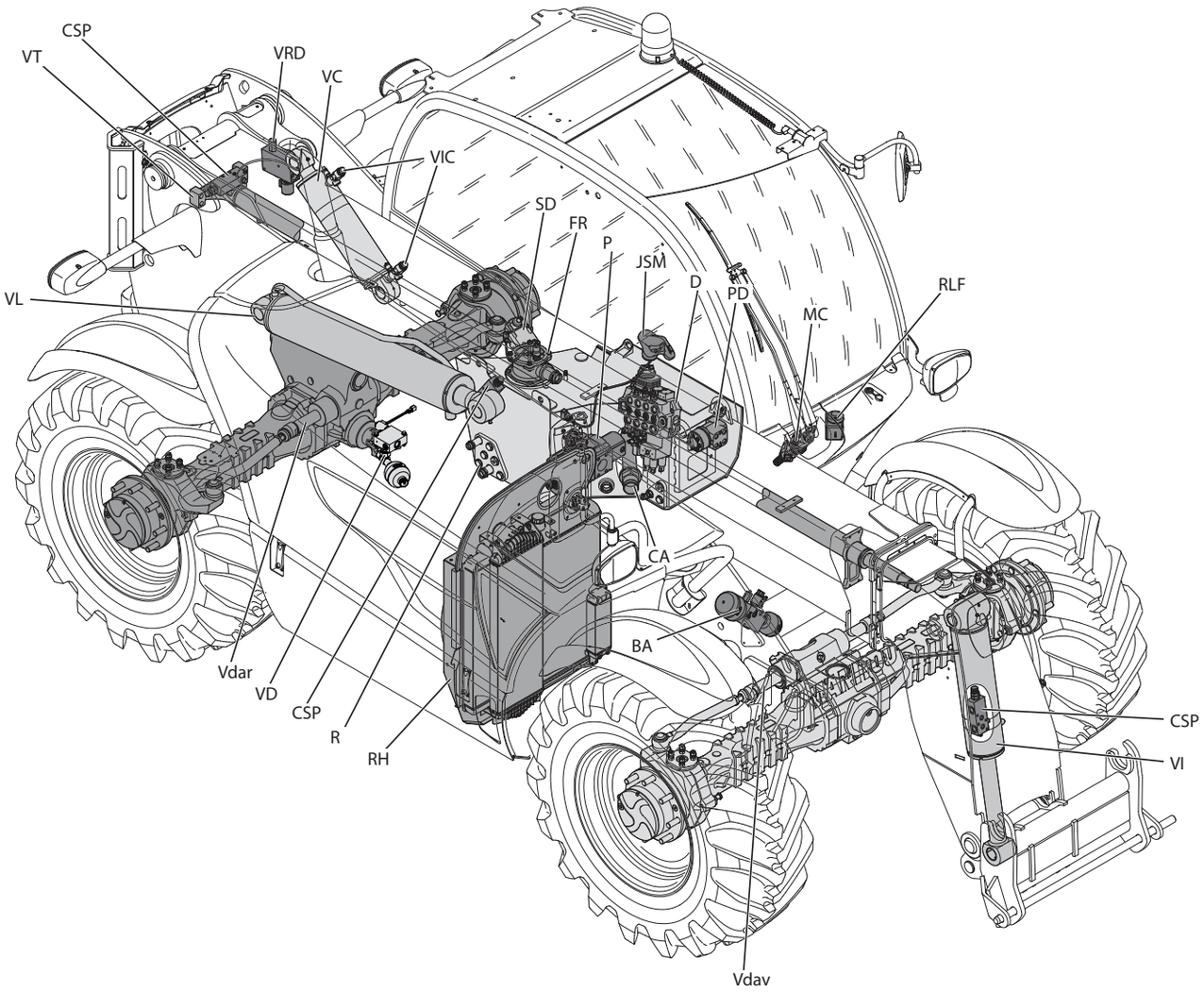
KEY

Item	Designation
BA	Feed block + accumulator
CA	Suction strainer
CSP	Counterbalance valve
CSPD	Double counterbalance valve
D	9-element distributor
D2	Deflector distributor
FR	Return filter
JSM	Hydraulic control lever
MC	Master cylinder
P	Hydraulic pump
PD	Steering pump
R	Hydraulic tank
HR	Hydraulic cooler
RLF	Brake fluid tank
SD	3 position steering distributor
VAO	Anti-oscillation valve

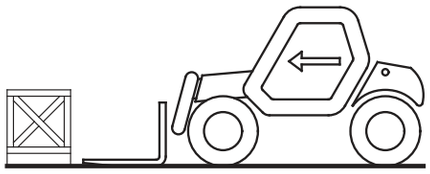
Item	Designation
VBE	Axle lock cylinder
VC	Compensating cylinder
VCD	Leveling cylinder
VD	Discharge valve + accumulator
Vdar	Rear steering cylinder
Vdav	Front steering cylinder
VI	Tilting cylinder
VIC	Compensating insulation valve
VL	Lifting cylinder
VRD	Flow regulation valve
VSD	Right stabilizer cylinder
VSG	Left stabilizer cylinder
VT	Telescope cylinder
VT1	Telescope cylinder 1
VT2	Telescope cylinder 2

COMPONENTS LOCATION

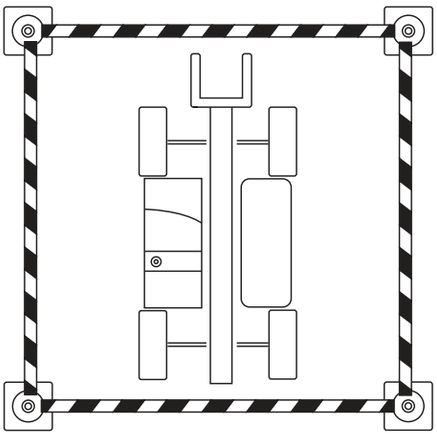
MT 835 ST3B / MT 835 H ST3B



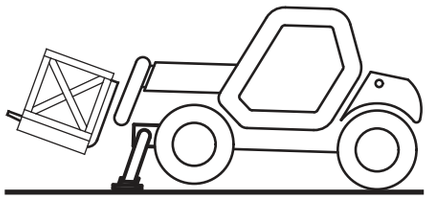
TESTING THE LIFTING AND TILTING CYLINDER VALVES



Use a load representing the nominal capacity.

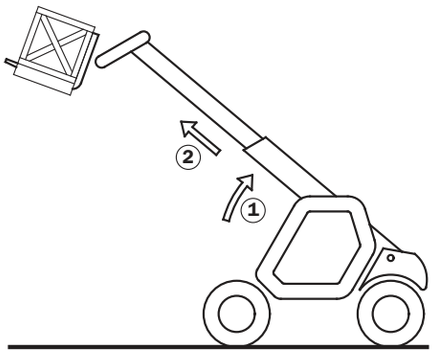


Position the machine in a secure area



Lower the stabilizers to their maximum extent

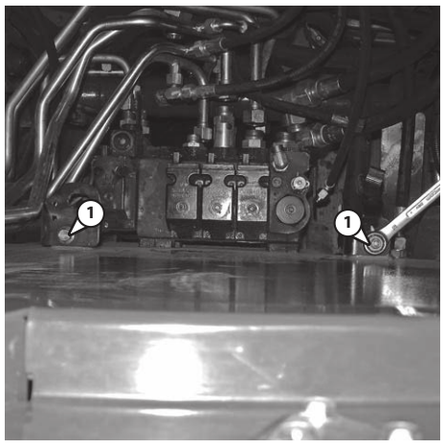
Maximum tilting towards rear (max. reverse tilt)



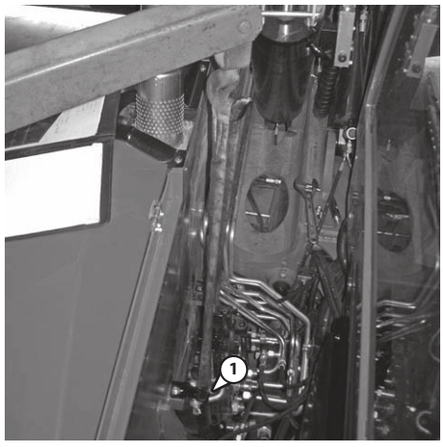
Raise the boom a few degrees (1).

Telescope until the cut-off (2) is reached.

Switch off the engine.

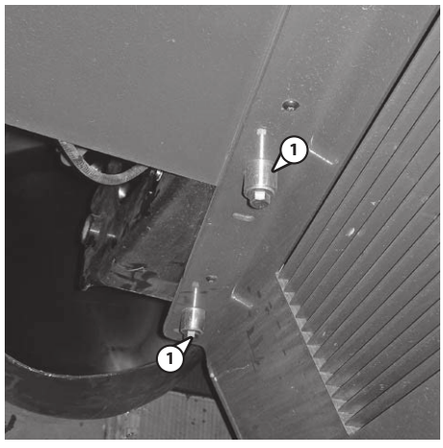


Remove the 2 fastening screws (Item 1) over the distributor support.



Attach a strap to the distributor support (Item 1).

Support the distributor.



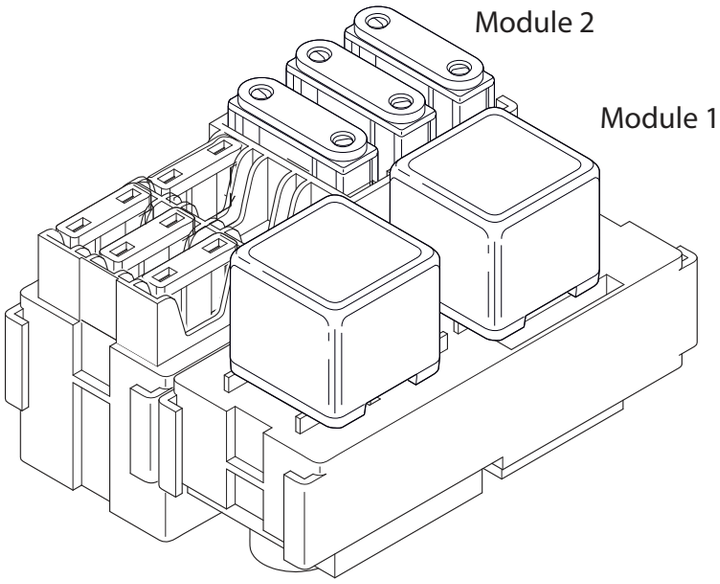
Remove the 2 fixing screws (Item 1).

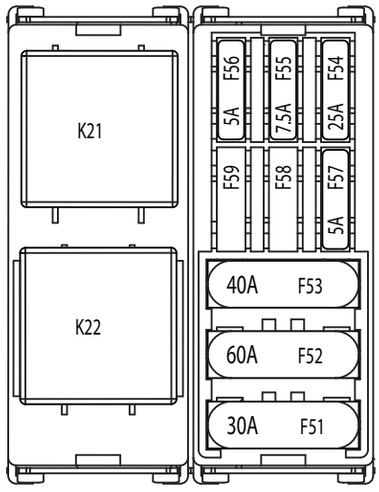
Next raise the assembly using the jib.

Remove the distributor.

FUSES AND RELAYS

FUSE BOX AND RELAYS (ENGINE)

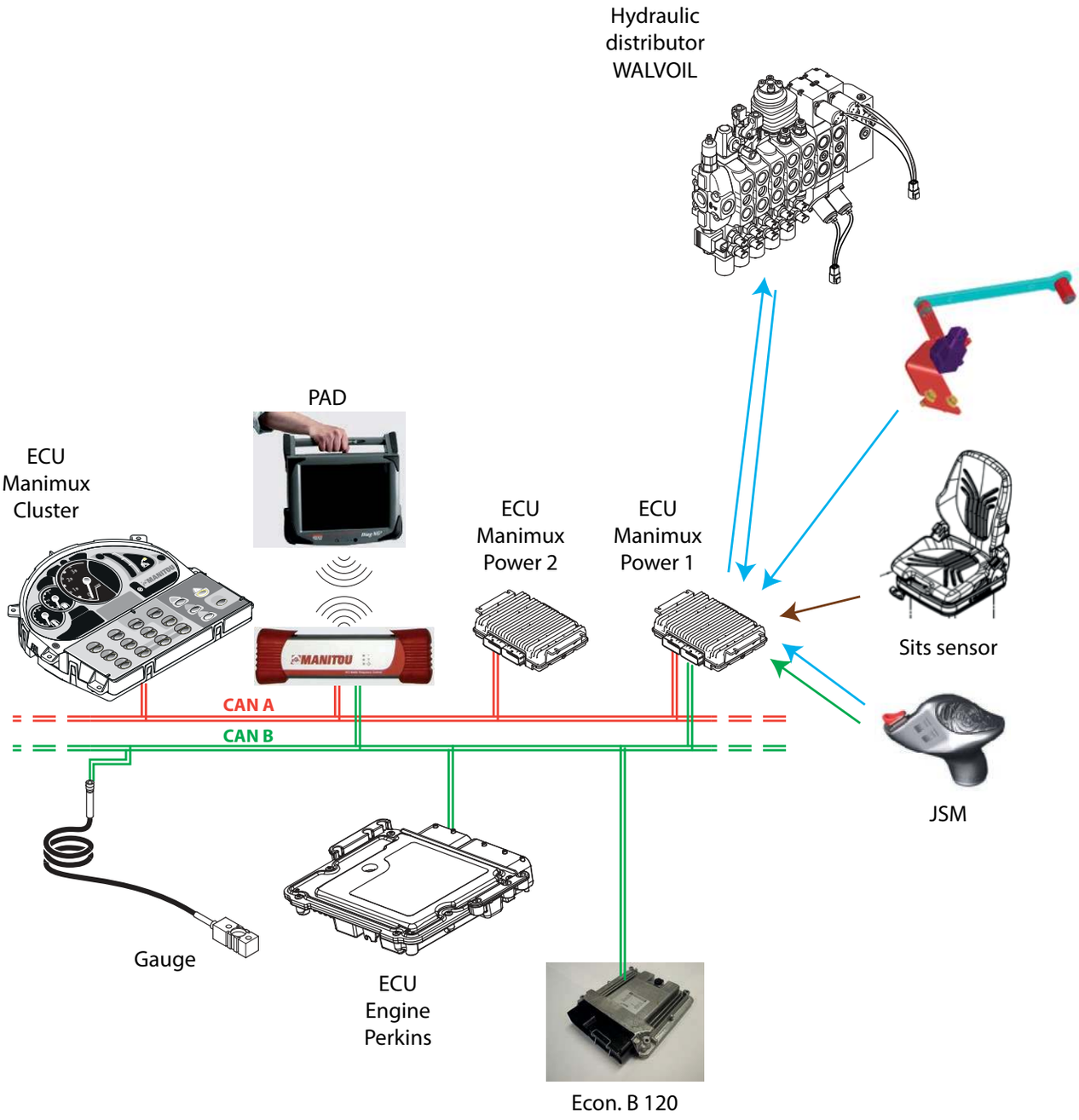




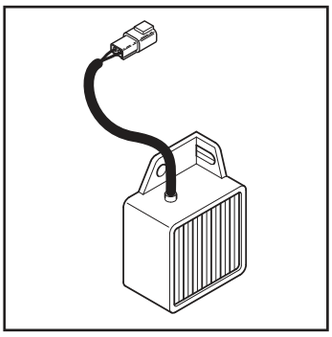
Fuse box BF1 detail

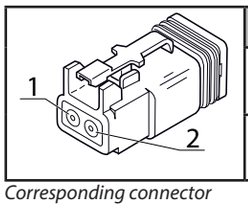
ENGINE FUSES AND RELAYS (BF1)		
Element	**Item**	**Designation**
Module 1	K21	Engine ECM power supply relay (70A)
	K22	Starter control relay (20 / 40 A)
Module 2	F51	Starter control K22 relay (30 A)
	F52	Preheating module (60 A)
	F53	Engine ECM K21 relay (40A)
	F54	Engine ECM power supply (25A)
	F55	Engine ECM power supply (7.5 A)
	F56	Engine ECM K21 control (5A)
	F57	Lambda probe / Diagnostic plug (5A)

MT 1135/1335 ST3B INCH/HYDRAULICS OPT.



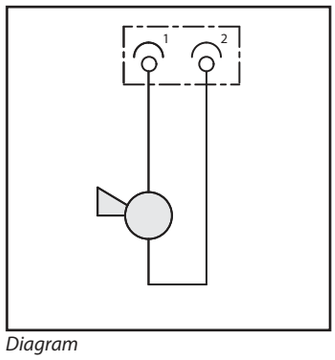
B1 Reversing sound alarm





Corresponding connector

PIN	Function
1	Buzzer power supply
2	Rear cab ground

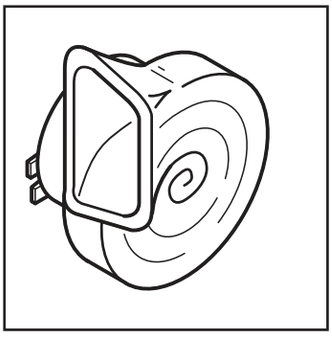


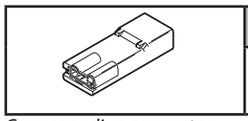
Diagram

	PIN	Minimum	Typical	Maximum
Resistance (10%)		19,5 **Ω**	21,7 **Ω**	
Average current			0,60 A	0,75 A
Voltage			12 V	

Notes: _____

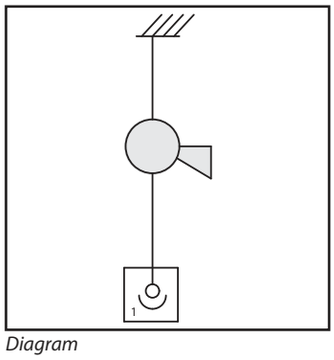
B2 Horn





Corresponding connector

PIN	Function
1	Buzzer power supply



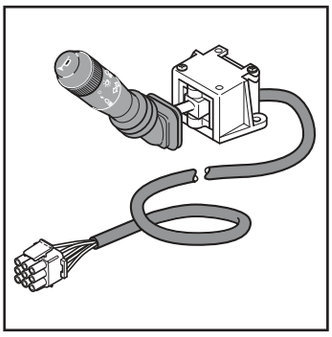
Diagram

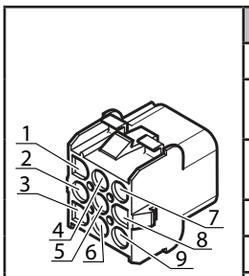
	Typique
Supply voltage	12 V
Resistance	2,17 Ω
Consumption	6,00 A
Nominal frequency	500 ± 20 Hz
Sound level	107 dB(A) / 13V

Note :

Notes: _____

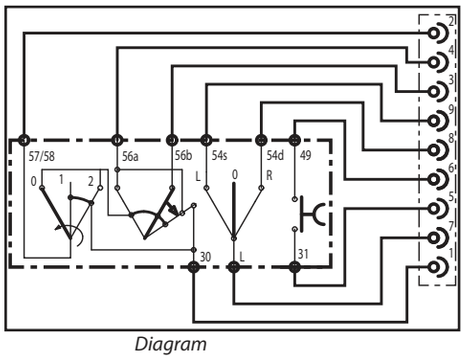
S5 LIGHT COMMUTATOR SWITCH





PIN	Function
1	Light power supply
2	Dipped beam headlights
3	Headlight signal
4	Main beam headlights
5	Horn
6	Horn power supply
7	Indicator lights power supply
8	Right-hand indicator light
9	Left-hand indicator light

Corresponding connector



Diagram

	PIN	Min	Typical	Max
Voltage			12 V	24 V
Consumption		3 A	5 A	7 A

Note :

Notes: _____

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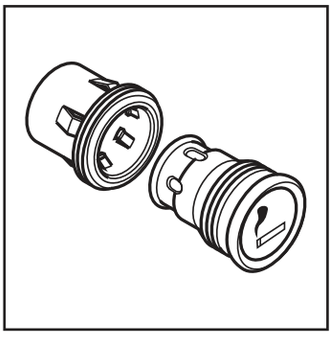
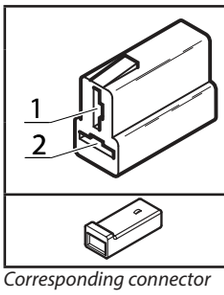
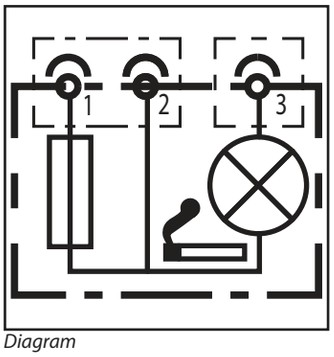
S7 Cigarette lighter





PIN	Function
1	Power supply
2	Ground
3	Rear lighting

Corresponding connector



Diagram

	Minimum	Typical	Max
Voltage	10,5 V	12 V	15 V
Consumption		6 A	10 A

Notes: _____

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1 – START-UP / CUSTOMER DIGICODE

MT 835 ST3B

Electrical connectors					
Wiring harness type	**Item**	**Component name**	**Designation**	**Position on diagram**	**Hydraulic equivalence code**
Cab	X01	S2	Ignition switch (4 way)	C10	
Cab	X02	S2	Ignition switch (6 way)	C16	
Engine	X03	A18	Preheating module	M14	
Engine	X04	M1	Starter electrovalve	K16	
Frame/Engine	X07		Engine/Frame connection	I9	
Frame/Engine	X08		Engine/Frame connection	M4	
Frame/Engine	X09		Fuse box power supply	G16	
Engine	X10		Fuse box power supply	G19	
Cab	X13	A9	Cluster	C40	
Engine/Cab	X23		Engine/Cab Interface	O25	
Cab	X118		Digicode	A26	
Engine	X174	A13	Engine ECU	M7	
Engine	X175	A13	Engine ECU	M9	
Engine	X179		Alternator connection D+	Q19	
Cab	X201	BF3	BF1 fuse box (cab)	G11	
Engine	X268		Engine ECU	S8	

Electrical components			
Item	**Designation**	**Position on diagram**	**Hydraulic equivalence code**
A9	MC4 Cluster	A36	
A13	Engine ECU	Q8	
A18	Preheating module	O13	
G1	Battery	A4	
G2	Alternator	Q13	
M1	Starter	K15	
S1	Battery cut-off	I4	
S2	Ignition switch	A11	
V3	6A/600V varistor protection diode	E36	

Fuse box				
Item	**Designation**	**Current**	**Position on diagram**	**Hydraulic equivalence code**
	BF1 / M1			
F51	K22 starter control relay	30 A	I22	
F52	Preheating module	60 A	I18	
	BF1 / M2			
K22	Starter control relay	20 A / 40 A	K20	
	BF3 / M3			
F7	Digicode Cluster/Customer anti-start (option)	2 A	E15	
F9	Ignition switch position 1	2 A	E15	
	BF3 / M4			
F25	Customer anti-start permanent	2 A	G26	
F31	Engine ECM alarm	5 A	G27	
	BF3 / M5			
F43	Ignition switch	50 A	G10	

Splices	
Item	**Position on diagram**
EP.3	O31
EP.20	G36
EP.21	G37
EP.93	O10
EP.94	O22
EP.95	S12

Electrical connectors					
Wiring harness type	Item	Component name	Designation	Position on diagram	Hydraulic equivalence code
Cab	X6	E15	Rotating beacon light	Q22	
Engine	X9		Engine fuse box supply	A8	
Cab	X11	S4	Wiper stalk switch	C17	
Cab	X12	S4	Wiping reset	C19	
Cab	X13	A9	Cluster	E27	
Cab	X14	S5	Light commutator switch	C30	
Cab	X15		High/low cab interface	Q20	
Cab	X16		High/low cab interface	O9	
Cab	X25	M3	Front windscreen wiper	M18	
Cab	X27	M7	Front windscreen washer pump	G16	
Cab	X28	M8	Rear windscreen washer pump	G13	
Engine	X29	A8	Heating	Q14	
Frame	X31	E3	Rear left headlight	S33	
Frame	X32	E4	Rear right headlight	S40	
Frame	X35	E1	Front left headlight	M30	
Frame	X36	E2	Front right headlight	M34	
Frame	X38	B1	Reverse buzzer	O40	
Frame	X39	B2	Horn	I37	
Cab	X43	M9	Window up engine	O5	
Cab	X46	S7	Cigarette lighter	M17	
Cab	X47	S7	Cigarette lighter light	M14	
Cab	X50	E14	Roof light	Q9	
Cab	X59	M4	Rear windscreen wiper	Q17	
Cab	X68		Roof switch supply	M12	
Cab	X69	S6	Window wind up	K5	
Cab/Frame	X110		Frame/cab Interface	M24	
Cab	X149	A1	Power CN2 - P1	K40	
Engine	X201		B3 fuse box	C9	
Frame	X259		Rear left headlight connection	Q32	
Frame	X260		Rear right headlight connection	Q39	

Electrical components			
Item	Designation	Position on diagram	Hydraulic equivalence code
A1	Manipower MP1	K31	
A8	Heating/ventilation panel	S13	
A9	MC4 Cluster	C27	
B1	Reversing sound alarm	O39	
B2	Horn	G37	
E1	Front left headlights	O29	
E2	Front right headlights	O33	
E3	Rear left headlight with fog light	S33	
E4	Rear right headlight with reverse light	S40	
E14	Roof light	S8	
E15	Rotating beacon light	S22	
M3	Front windscreen wiper engine	M20	

Electrical components			
Item	Designation	Position on diagram	Hydraulic equivalence code
M4	Rear windscreen wiper engine	S17	
M7	Front windscreen washer pump	I14	
M8	Rear windscreen washer pump	I13	
M9	Window up engine	O6	
M16	Heating vent blower fan engine	S13	
S4	Wiper switch	A24	
S5	Light commutator switch	A33	
S6	Window regulator switch	M4	
S7	Cigarette lighter	M14	
V2	Front windscreen wiper reset protection diode 6A / 600V	I19	

Fuse box				
Item	Designation	Current	Position on diagram	Hydraulic equivalence code
BF3 / M3				
K2	Front windscreen-wiper relay		G28	
K3	Free		G30	
K5	Ventilation/heating relay		G32	
K6	Engine oil reheating relay		G34	
BF3 / M3				
F4	Ventilation/Heating + APC	2 A	C4	
F11	Cigarette lighter	10 A	C5	
F12	Front windscreen wiper + windscreen washer + intermittent relay K2	15 A	C6	
F13	Rear windscreen wiper + windscreen washer	10 A	C7	
F20	Electric window up	15 A	C7	
BF3 / M4				
F21	Roof light + door switch + seat switch	3 A	G8	
F24	Front windscreen wiper engine return	15 A	G9	
F27	Rear windscreen wiper engine auto return + Roof option + side option	15A	G10	
F30	Ventilation/Heating	20 A	G11	

Splices	
Item	Position on diagram
Ep.2	K7
Ep.6	K5
Ep.11	E12
Ep.18	I19
Ep.19	G19
Ep.35	Q34

Electrical connectors					
Wiring harness type	Item	Component name	Designation	Position on diagram	Hydraulic code equivalence
Cab	X13	A9	Cluster	C31	
Engine/Cab	X23		Engine / Cab Interface	E11	
Engine	X53	Y3	Forward gear electrovalve	Q19	
Engine	X54	Y4	Reverse gear electrovalve	Q20	
Engine	X57	B13	Clutch front pressure	S24	
Frame	X62	B14	Gearbox output speed sensor	I16	
Engine	X64	B8	Master cylinder pressure switch	E30	
Frame	X65	B9	Front wheel alignment	I24	
Frame	X66	B10	Rear wheel alignment	I25	
Cab	X67	A12	JSM plug	I23	
Frame	X70	B17	Brake assistance circuit pressure switch (TUV)	S22	
Cab	X74		Up - Down Socket / JSM	I18	
Frame	X111		Frame / Cab Interface	O11	
Cab	X139		Pedal potentiometer	K7	
Frame	X144	Y38	Gear 1 electrovalve - slow	O33	
Frame	X145	Y39	Gear 2 electrovalve - quick	M31	
Frame	X146	Y37	Low speed electrovalve	O36	
Frame	X147	Y36	Motion direction electrovalve	O35	
Engine	X148	A1	CN1 P1 Power	K16	
Engine	X149	A1	CN2 P1 Power	K26	
Engine	X151	A2	Power CN2 P2	M35	
Engine	X175	A13	Engine ECU	E7	
Cab	X181		Accelerator pedal potentiometer	E16	
Engine	X264	Y50	Flow control valve	I17	

Electrical components			
Item	Designation	Position on diagram	Hydraulic code equivalence
A1	Manipower MP1	K22	
A2	Manipower MP2	K33	
A9	MC4 Cluster	C30	
A12	JSM lever control	G18	
A13	Engine ECU	G5	
B8	Master cylinder pressure switch	E30	
B9	Front wheel alignment sensor	I24	
B10	Rear wheel alignment sensor	I26	
B14	Gearbox output speed sensor	I16	
B17	Servo brake circuit fault pressure switch (TUV)	S21	
B48	Accelerator pedal angular sensor	E14	
B60	Gear 1 or 2 engaged sensor	S23	
Y3	Forward electrovalve	S19	
Y4	Reverse electrovalve	S20	
Y36	Motion direction electrovalve	O34	
Y37	Low speed electrovalve	O35	
Y38	Gear 1 electrovalve	O33	
Y39	Gear 2 electrovalve	O31	
Y50	Flow control valve	I17	

Splices	
Item	Position on diagram
Ep.94	G9

POSITION OF CONNECTORS BY DIAGRAM

Electrical connectors									
Item	Diag. 1	Diag. 2	Diag. 3	Diag. 4	Diag. 5	Diag. 6	Diag. 7	Diag. 8	Diag. 9
X01	√								
X02	√								
X03	√								
X04	√								
X6							√		
X07	√	√			√				
X7						√			
X08	√								
X8						√			
X09	√	√							
X9								√	
X10	√	√							
X11							√		
X12							√		
X13	√	√	√		√		√	√	√
X14									
X15							√	√	√
X16							√	√	√
X21					√				
X23	√		√		√			√	
X26									√
X27							√		
X28							√		
X29							√	√	
X30								√	
X31							√		
X32							√		
X33								√	√
X34									√
X35							√		
X36							√		
X37									√
X38							√		
X39							√		
X40									√
X43							√		
X45					√				
X46							√		
X47							√		
X48								√	√
X49								√	√
X50							√		
X52					√				
X53			√						
X54			√						
X55			√						
X56			√						
X57			√						
X58			√						
X59							√		
X60			√						
X61					√				

Electrical connectors									
Item	Diag. 1	Diag. 2	Diag. 3	Diag. 4	Diag. 5	Diag. 6	Diag. 7	Diag. 8	Diag. 9
X62			√						
X65					√				
X66					√				
X67			√	√					
X68							√		√
X69							√		
X70			√						
X71				√					
X72				√					
X75					√				
X76				√					
X77				√					
X78				√					
X79				√					
X80				√					
X91								√	
X92								√	√
X95								√	
X97								√	
X101									√
X102									√
X103									√
X104									√
X105									√
X106								√	
X107									√
X108									√
X109								√	
X110		√			√		√		
X111			√		√				
X112		√						√	√
X115		√							
X116		√							
X118	√								
X121					√				
X132									√
X133					√				
X138					√				
X139			√						
X140		√							
X148		√	√	√	√				√
X149		√	√	√	√		√	√	√
X153								√	
X154								√	
X155								√	
X166								√	
X173		√			√				
X174	√	√			√				
X175	√	√	√		√				
X178		√							
X179	√								
X181			√						
X188					√				
X201	√	√			√		√	√	

Electrical connectors					
Wiring harness type	Item	Component name	Designation	Position on diagram	Hydraulic equivalence code
Engine	X7		Truck/engine connection	E22	
Engine	X8		Truck/engine connection	A32	
Engine 2	X900		Fuel metering valve	E14	
Engine 2	X901		Fuel rail pressure sensor	G14	
Engine 2	X902		Engine fuel temperature sensor	K14	
Engine 2	X903		Injector cylinder 1	A22	
Engine 2	X904		Injector cylinder 2	C22	
Engine 2	X905		Injector cylinder 3	C22	
Engine 2	X906		Injector cylinder 4	C22	
Engine 2	X907		Intake manifold pressure & temperature sensor	K14	
Engine 2	X908		Throttle valve position sensor & actuator	Q14	
Engine 2	X909		Exhaust gas pressure sensor	M14	
Engine 2	X910		Exhaust gas temperature sensor	M14	
Engine 2	X911		Wastegate valve regulator (turbo)	O14	
Engine 2	X912		Coolant temperature sensor	I14	
Engine 2	X913		EGR valve position sensor & actuator	O14	
Engine 2	X914		Oil pressure switch	G14	
Engine 2	X915		Crankshaft speed sensor	I14	
Engine 2	X916		Camshaft position sensor	G14	

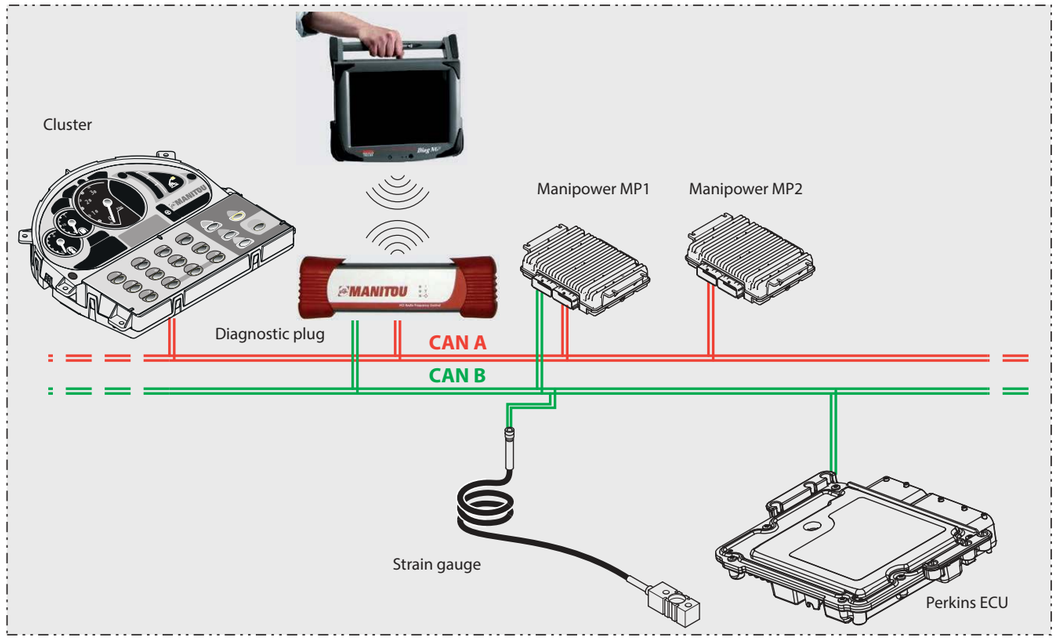
Electrical connectors					
Wiring harness type	Item	Component name	Designation	Position on diagram	Hydraulic code equivalence
Engine	X7		Engine/frame connection	O5	
Cab	X13	A9	Cluster	C28	
Frame/Engine	X110		Frame/Cab Interface	K21	
Cab	X115		Diagnostic	A15	
Frame/Cab	X116		ECU power supply frame/cab interface	A5	
Engine	X140	R4	Resistance shunt	C13	
Engine	X148	A1	CN1 P1 Power	I26	
Engine	X149	A1	CN2 P1 Power	I27	
Engine	X150	A2	Power CN1 P2	I33	
Engine	X151	A2	Power CN2 P	I37	
Frame/Engine	X173	A1	Engine/Frame connection	O15	
Engine	X174	A13	Engine ECU	O7	
Engine	X175	A13	Engine ECU	Q9	
Frame	X177		Lambda sensor	O10	
Cab	X178		Diagnostic plug	S12	
Cab	X201		Fuse box BF1 cab	A9	
Frame	X263	B50	Vishay CAN gauge	O24	

Splices	
Item	Position on diagram
Ep.20	A13
Ep.21	A14
Ep.32	G34
Ep.40	K40
Ep.41	K26
Ep.57	M12
Ep.60	G23
Ep.63	I34
Ep.64	M21
Ep.66	M18
Ep.67	C16
Ep.67	K24
Ep.68	K24
Ep.69	I23
Ep.95	Q13
Ep.96	Q11
Ep.97	Q11

Electrical components			
Item	Designation	Position on diagram	Hydraulic code equivalence
A1	Manipower MP1	I26	
A2	Manipower MP2	G35	
A9	MC4 Cluster	C26	
A13	Engine ECU	O8	
B50	CAN strain gauge	Q24	
B81	Lambda sensor	O12	
R4	120 Ohm resistance	C18	

Fuse box				
Item	Designation	Current	Position on diagram	Hydraulic code equivalence
BF1 / M1				
F55	Engine ECM power supply	7.5 A	M12	
F57	Lambda probe + diagnostic plug	5 A	M13	
BF3 / M4				
F22	Cluster Power Supply	3 A	C9	
F28	Diagnostic plug	2 A	C10	
F33	Diagnostic plug	5 A	C11	
BF3 / M5				
F42	Manipower MP2	40 A	A7	
F43	Ignition switch	50 A	A7	

CAN Network



Key:

- **CAN A**: Manimux CAN (Cluster ⇔ Manipower MP1-MP2)
- **CAN B**: Manimux CAN (Manipower MP1 / Perkins ECU / Strain gauge)

Electrical connectors				
Wiring harness type	Item	Component name	Designation	Position on diagram
Cab	X13	A9	Cluster	A24
Cab	X15		Cab high/low interface	I7
Cab	X16		Cab high/low interface	I9
Engine/Cab	X23		Engine/cab interface	G4
Cab	X26		Side and roof screen washer pump	I23
Engine	X29	A8 / M16	Heating	Q7
Cab	X30		Air-conditioning compressor	M4
Frame	X33		Front right and left working light connection	M18
Frame	X34		Trailer socket	G34
Frame	X37		License plate light	E38
Frame	X40		Trailer connector (light)	E34
Frame	X48		Front right working light	M19
Frame	X49		Front left working light	M18
Cab	X59		Rear windscreen wiper	S21
Engine	X68		Fuel gauge	O14
Frame	X91		Boom head electrovalve	I34
Engine	X92		Negative brake electrovalve control	E38
Cab	X93		Car radio supply	E6
Cab	X94		Loudspeakers	E11
Engine/Cab	X95		Cab/air-conditioning condenser harness link	Q10
Engine	X97		Air-conditioning module power supply	O13
Frame	X101		Rear right working light	S34
Frame	X102		Rear left working light	S33
Frame	X103		Right telescope working light	I31
Frame	X104		Left telescope working light	I30
Frame	X105		Working light on boom	I31
Cab	X107		Roof windscreen wiper	S28
Cab	X108		Side windscreen wiper	S25
Frame	X109		Rear hydraulic two way electrovalve	I33
Frame/Cab	X112		Frame/Cab Interface	E31
Cab	X121		Pneumatic seat	I5
Frame	X135		Telescope suspension	M37
Engine	X148		CN1 P1 Power	C33
Engine	X149		CN2 P1 Power	C38
Engine	X150		Power CN1 P2	K36
Engine	X151		Power CN2 P2	K39
Engine	X153		Air-conditioning fan engine 1 plug	S13
Engine	X154		Air-conditioning fan engine 2 plug	S14
Engine	X155		Air-con socket on SNDC condenser	S10
Frame	X166	Y12	Head telescope electrovalve connector	K34
Frame	X167	Y10	Telescope suspension electrovalve 1	M37
Frame	X168	Y11	Telescope suspension electrovalve 2	O39
Frame	X169	B25	Telescope suspension cylinder valve pressure switch 1	M39
Cab	X204		Loudspeaker connector in cab	K8
Cab	X205		Loudspeaker connector in cab	I11
Engine	X254	Y61	Fan regulator valve	O36
Engine	X287		Fan control	M35
Engine/Cab	X290		Cab harness connection/air-conditioning module	O14
Engine	X291		Connection/air-conditioning module	M7
Engine	X292		Connection/air-conditioning module	M15
Engine	X293	Y79	Engine air inlet sensor	O35

Electrical components		
Item	Designation	Position on diagram
A1	Manipower MP1	C37
A2	Manipower MP2	I37
A7	Car radio	E9
A8	Heating/ventilation panel	Q8
A9	MC4 Cluster	A23
A17	Air-conditioning timer module	M16
B25	Telescope suspension cylinder valve pressure switch 1	M39
B27	Right loudspeaker	M8
B28	Left loudspeaker	K11
B46	Air-conditioning high pressure sensor	S10
B79	Air intake temperature transmitter	O35
E5	Left trailer lights	G34
E6	Right trailer lights	G37
E7	Rear license plate light	G39

Splices	
Item	Position on diagram
Ep.33	E31
Ep.34	C37
Ep.35	E39
Ep.80	O23

Electrical components		
Item	Designation	Position on diagram
E12	Front right working light	M18
E13	Front left working light	M19
E16	Rear left working light	S33
E17	Rear right working light	S34
E18	Left telescope working light	K30
E19	Right telescope working light	K31
M4	Rear windscreen wiper engine	S21
M5	Roof windscreen wiper engine	S27
M6	Side windscreen wiper engine	S24
M10	Air-conditioning compressor	M4
M12	Air-conditioning fan engine 1	S13
M13	Air-conditioning fan engine 2	S14
M14	Roof and side windscreen washer pump	I23
M15	Pneumatic seat compressor	K5
M16	Heating vent blower fan engine	S7
R1	Resistance 120 Ω	M16
R3	Rear windscreen defrost	M33
S17	Particle filter regeneration switch	I28
S18	Rear hydraulic two way switch	G25
S19	Override switch	G31
S38	Rear working light switch	Q30
S39	Rear window defrost switch	M29
S40	Roof windscreen wiper switch	O28
S41	Side windscreen wiper switch	O21
S42	Telescope working light switch	M22
S43	Standby switch	M25
S44	Pneumatic seat switch	I5
S57	Telescope head electrovalve reel	K34
Y10	Telescope suspension electrovalve 1	O37
Y11	Telescope suspension electrovalve 2	O38
Y12	Telescope head electrovalve	K34
Y13	Negative brake electrovalve	E37
Y14	Rear hydraulic two way electrovalve	I33
Y61	Fan speed control electrovalve	O36

Fuse box			
Item	Designation	Current	Position on diagram
	BF3 / M2		
K1	Predisposition	10 / 20 A	C25
K3	Free		C26
K4	Front working headlight relay	10 / 20 A	C28
K5	Ventilation/heating relay	10 / 20 A	C30
	BF3 / M3		
F1	Front working headlight control/Xenon front working lights	2 A	C3
F2	Rear hydraulic two way electrovalve	2 A	C4
F5	Override movement forcing circuit breaker/Driver presence seat switch power supply	15 A Max.	C5
F8	Pneumatic seat	15 A Max.	C5
F10	APC car radio	2 A	C6
F16	Boom working light power supply/Cab option	2 A	C6
F17	Rear working lights	15 A Max.	C7
F18	Rear defrost	15 A Max.	C8
F19	Roof windscreen wiper/Windscreen washer	15 A Max.	C8
	BF3 / M5		
F26	Car radio + permanent	3 A	E14
F32	Side windscreen wiper/windscreen washer	5 A	E15
	BF3 / M5		
F45	Compressor and air-conditioning fan engine	30 A	O5

Electrical connectors					
Wiring harness type	Item	Component name	Designation	Position on diagram	Hydraulic code equivalence
Frame/Engine	X07		Engine/Frame connection	G3	
Cab	X13	A9	Cluster	A20	
Frame	X17	B83	Particle filter inlet pressure sensor	Q5	
Frame	X18	B84	Particle filter inlet temperature sensor	O5	
Frame	X19	B82	DOC inlet temperature sensor	K9	
Engine	X20	B6	Air filter clogging	I15	
Frame	X21	B7	Hydraulic filter sensor	G28	
Engine	X22	S11	Brake fluid level	C19	
Engine/Cab	X23		Engine/Cab Interface	I17	
Cab	X45	S9	Door/Cluster switch	G14	
Cab	X52	S10	Door/Power switch	I24	
Engine	X61	B34	Presence of water in diesel fuel	M11	
Frame	X63	R2	Front wheel alignment	E21	
Frame	X75	Y9	Movement safety valve 1	G34	
Frame	X88	B19	Right stabilizer sensor	A32	
Frame	X96	B20	Left stabilizer sensor	A30	
Frame	X100	B23	Boom angle	A27	
Frame/Cab	X110		Frame/Cab Interface	G25	
Frame/Cab	X111		Frame/Cab Interface	O19	
Cab	X121	S8	Pneumatic seat	E16	
Frame	X132	B30	TUV assistance pressure switch	M32	
Frame	X133	B29	ON/OFF negative brake pressure switch	C37	
Frame	X134	S34	Telescope retraction sensor	M28	
Cab	X138	S50	Emergency stop button	K17	
Engine	X148	A1	CN1 P1 Power	C27	
Engine	X149	A1	CN2 P1 Power	C39	
Engine	X150	A2	Power CN1 P2	M22	
Engine	X151	A2	Power CN2 P2	M25	
Frame/Engine	X173		Engine/Frame connection	A25	
Engine	X174	A13	Engine ECU	G6	
Engine	X175	A13	Engine ECU	G8	
Engine	X176	B80	Air intake temperature sensor	G9	
Frame	X194		Intermediate boom inductive sensors	O24	
Frame	X198	B64	Access tilt meter	O15	
Cab	X201	BF3 M5	Fuse box BF3 cab	A6	
Frame	X202	B67	Sensor 1 intermediate	Q24	
Frame	X203	B68	Sensor 2 intermediate	Q23	
Engine	X258	B74	Minimum water level sensor	G23	
Frame	X262	B75	Boom retraction speed sensor	C36	

Electrical components			
Item	Designation	Position on diagram	Hydraulic code equivalence
A1	Manipower MP1	E33	
A2	Manipower MP2	M23	
A9	MC4 Cluster	A19	
A13	Engine ECU	M7	
B6	Engine air filter clogging pressure switch	K14	
B7	Hydraulic filter clogging pressure switch	G27	
B19	Right stabilizer pressure switch	A33	
B20	Left stabilizer pressure switch	A31	
B23	Boom angular sensor	A27	
B29	Negative brake fault pressure switch	A37	
B30	Servo steering circuit fault pressure switch	M31	
B34	Water in diesel sensor	M12	
B64	2-axis leveling sensor	M16	
B67	Intermediate boom extend sensor 1	Q24	
B68	Intermediate boom extend sensor 2	Q23	
B74	Minimum radiator water level sensor	G23	
B75	Telescope retraction speed sensor	A36	
B80	Air intake temperature transmitter	I11	
B82	DOC inlet temperature sensor	K11	
B83	Particle filter inlet pressure sensor	Q4	
B84	Particle filter inlet temperature sensor	O4	
R2	Fuel level sensor	G21	
S8	Driver presence seat switch	E17	
S9	Door switch on cab and cluster	G14	
S10	Door switch on power	I24	
S11	Brake liquid level contact	E19	
S34	Telescope retracted sensor	M29	
S50	Emergency stop button	I18	
Y9	Safety valve 1/VS distributor	G34	

Fuse box				
Item	Designation	Current	Position on diagram	Hydraulic code equivalence
BF3 / M4				
F21	Roof light/door switch/seat switch	3 A	C12	
F34	Inclinometer	2 A	C13	
BF3 / M5				
F43	Cluster Power Supply	50 A	A5	

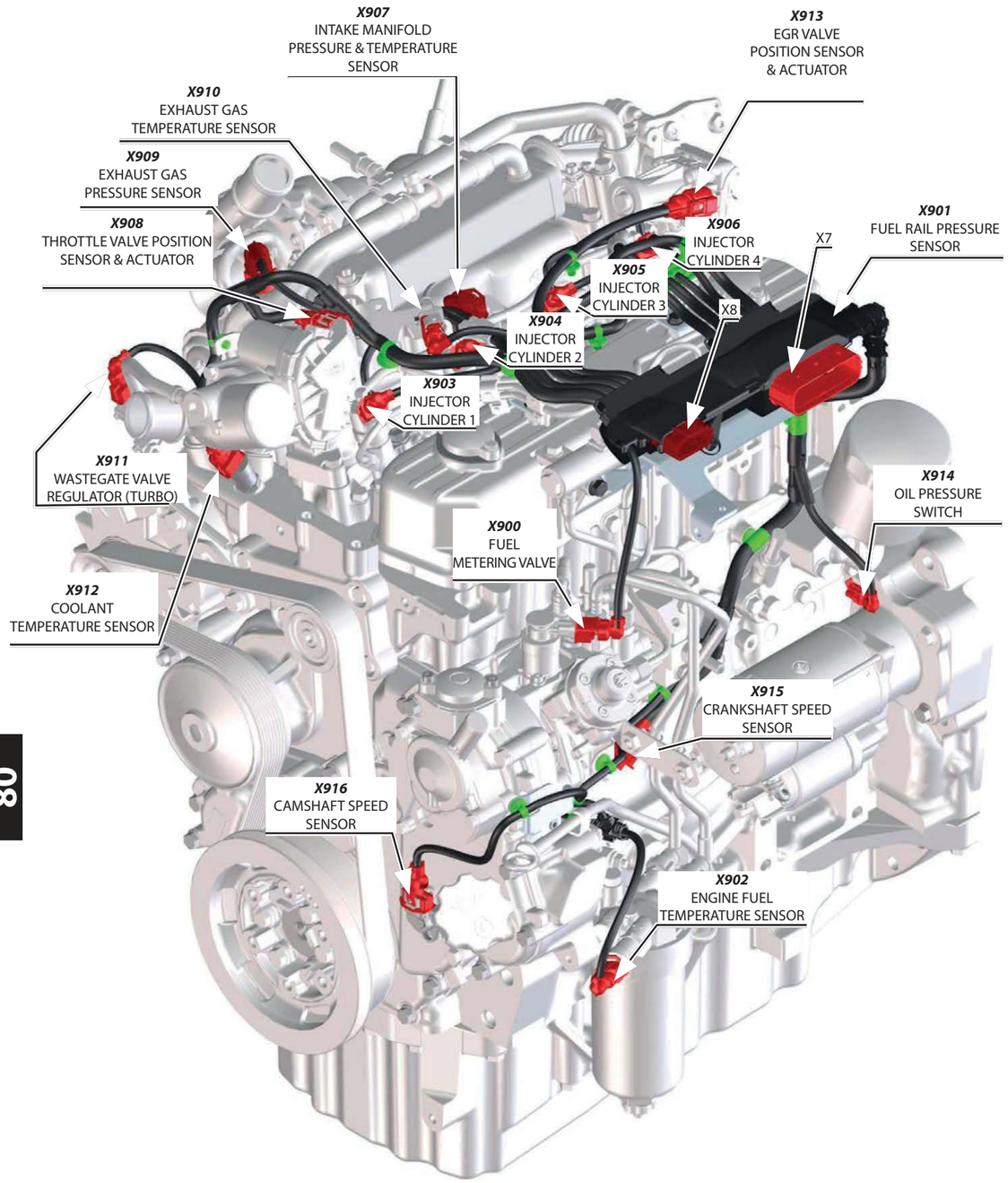
Splices	
Item	Position on diagram
Ep.30	C27
Ep.31	C27
Ep.50	C33
Ep.51	O24

Splices	
Item	Position on diagram
Ep.52	C31
Ep.87	K6
Ep.94	I13

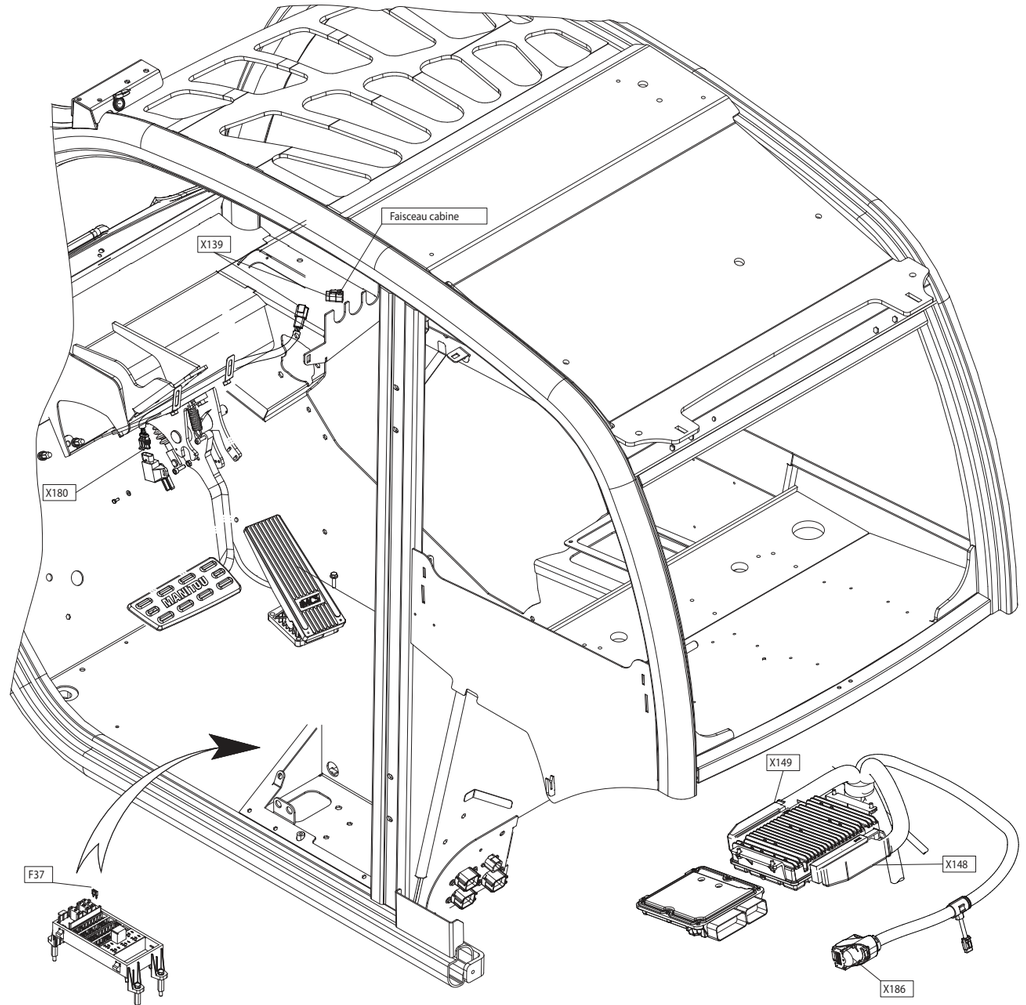
CONNECTORS

Item	Designation	Position on harness layout				Comments
		Assembly	Frame	Engine	Cab	
BF3	Fuse/relay box	I23			Q14	
HPD	Right loudspeaker	C6			A2	
HPG	Left loudspeaker	A6			A7	
S13	Roof windscreen wiper switch	E10			G5	
S14	Option switch	E13			I4	
S15	Rear working light switch	E12			I4	
S16	Roof windscreen wiper switch	E10			G6	
S17	Telescope working light switch	E12			I4	
S17	Particle filter regeneration control switch	I20			C18	
S18	Rear window defrost switch	E11			I5	
S18	Hydraulic two way EV switch	I20			C19	
S19	Override Switch	I20			A20	
S35	Standby switch except Danfoss	I19			A22	
S36	Boom head electrical control switch except Danfoss	I19			C23	
S37	Standby switch except Danfoss	I19			C23	
V2	Front windscreen wiper reset protection diode 6 A/600 V	I28			M31	
V3	6A/600V varistor protection diode	K23			M22	
X1	Ignition switch	K26			O28	
X2	Ignition switch	K25			O29	
X3	Preheating module	O22		K25		
X4	Starter electrovalve	Q21		G17		
X6	Rotating beacon light	C11			C14	
X7	Truck/engine connection	Q20		K22		
X8	Truck/engine connection	Q20		M18		
X10	Power supply terminal	Q27		K34		
X10	Tailgate defrost	A6			A8	
X11	Wiper commutator switch	I28			K35	
X12	Buisard window winder	G18			E18	
X12	Wiper reset	I29			M35	
X13	Cluster	I26			O31	
X15	Cab high/low connection	G17			G13	
X15A	Cab high/low connection	C15			E13	
X16	High/low cab interface	G17			G11	
X16A	High/low cab interface	C15			E11	
X17	Particle filter inlet pressure sensor	Q15		I4		
X18	Particle filter inlet temperature sensor	Q15		I4		
X19	DOC inlet temperature sensor	O15		K4		
X20A	Air filter clogging	O23		M28		
X20B	Air filter clogging	O23		M28		
X21	Hydraulic filter sensor	K17	G31			
X22	Brake fluid level	I27			G31	
X23	Engine/cab interface	M24		G12	O25	
X25	Front windscreen wiper	K29			G30	
X26	Side and roof screen washer pump	I29			A28	
X27	Front windscreen washer pump	G29			A27	
X28	Rear windscreen washer pump	I29			A30	
X29	Heating	I28			K32	

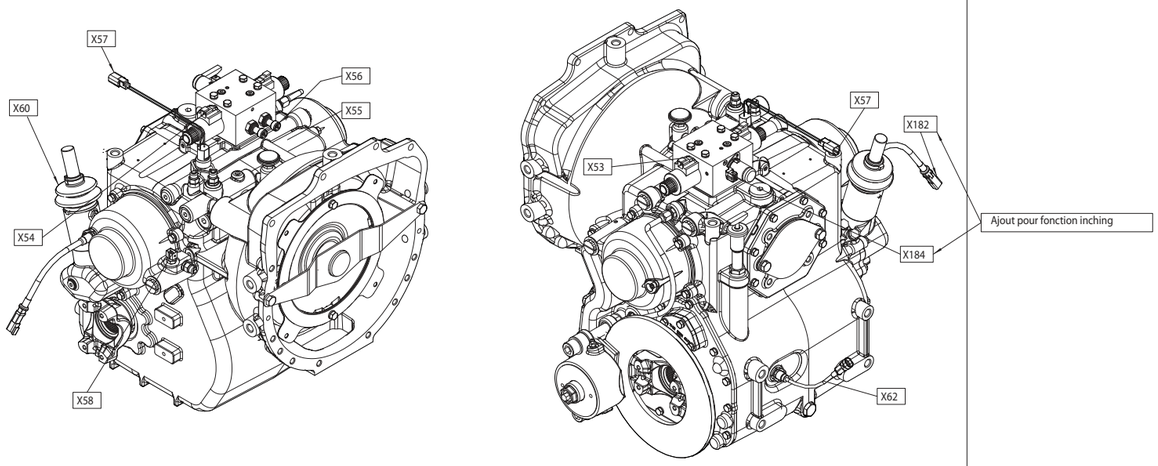
ENGINE HARNESS 2



INCHING HARNESS



Indication branchement faisceaux chassis option sur BV PSR09 Inching



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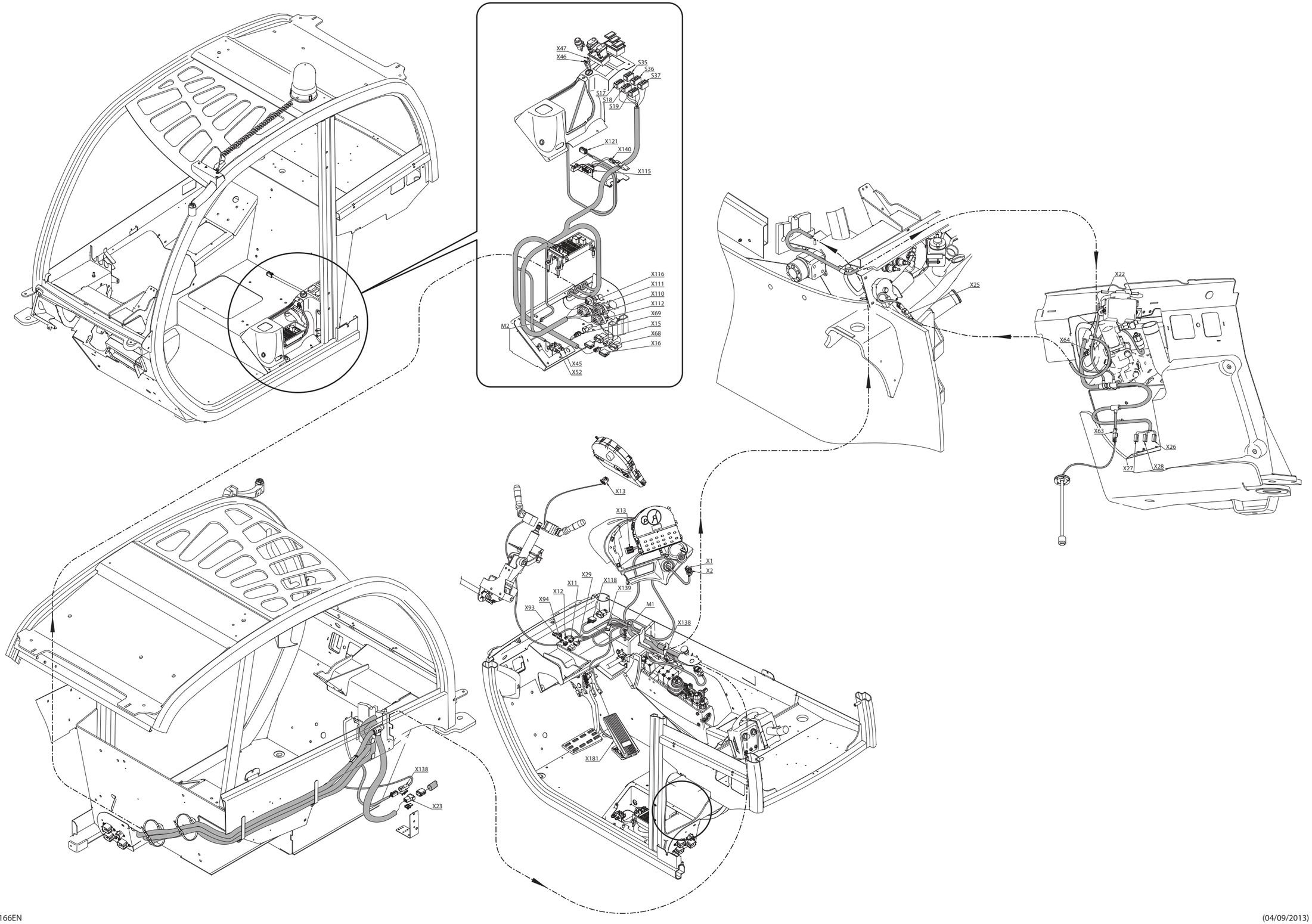
CAB HARNESS 1



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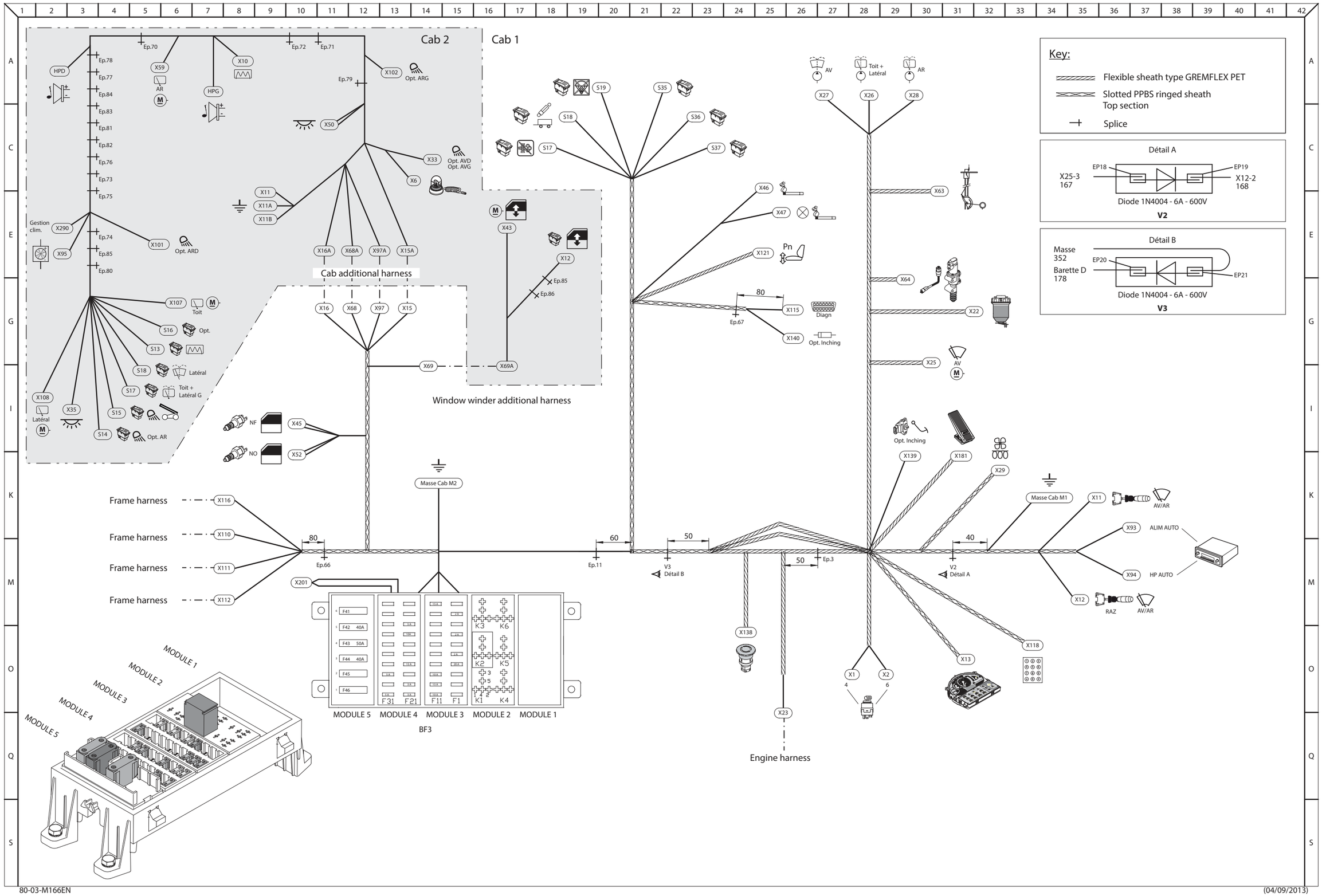
CAB 1 AND 2 HARNESSES



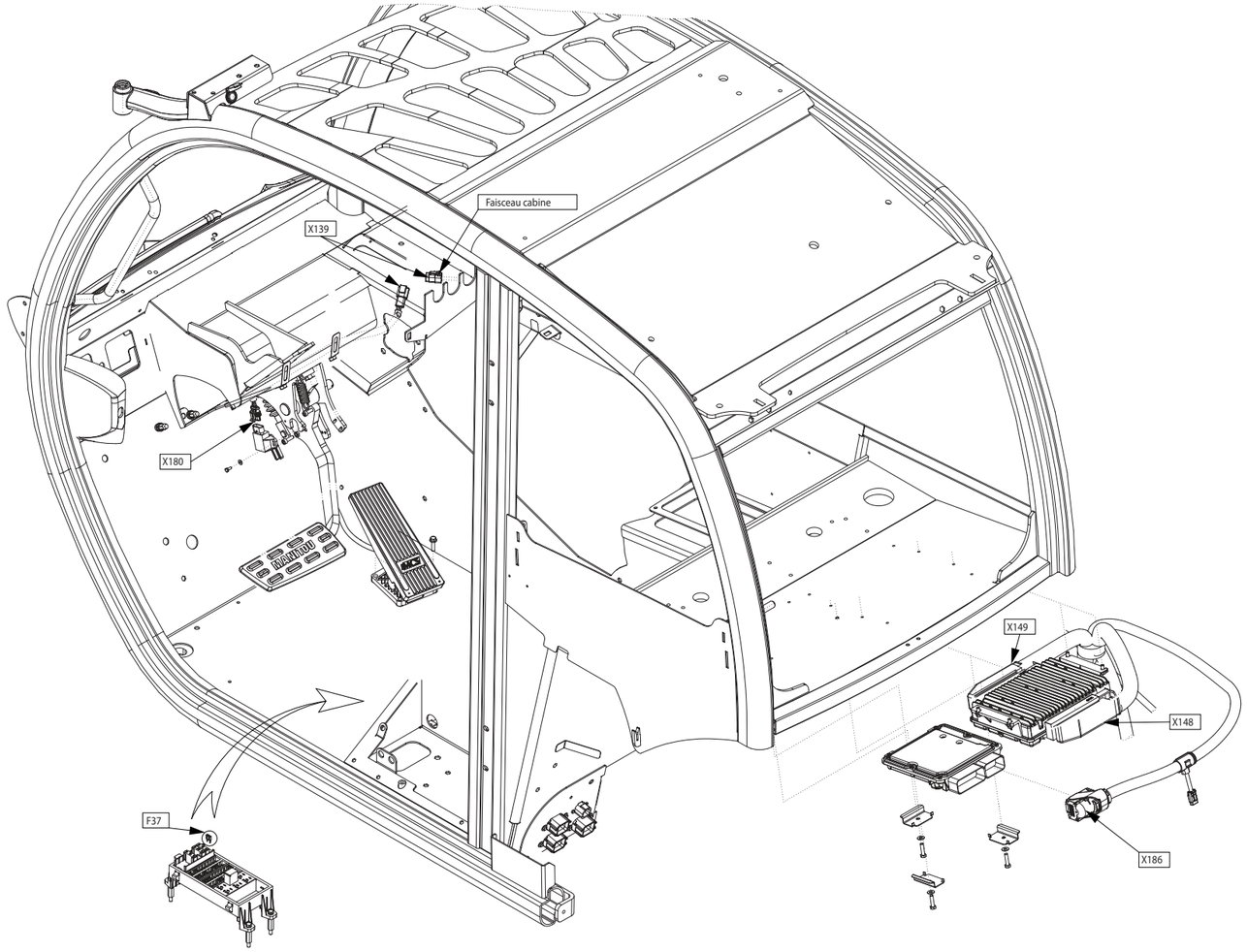
FRAME 2D HARNESS

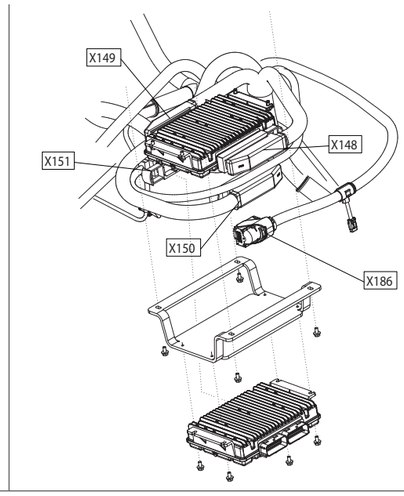
Key:
- Flexible sheath type GREMFLEX PET
- High profile slotted PPBS ringed sheath
- 0.5 mm thick PVC sheath
- Splice

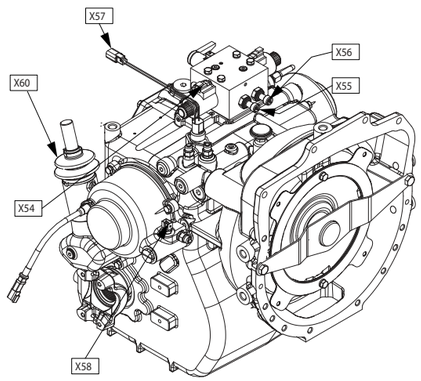
Cab harness
Cab harness
Cab harness
Cab harness
Engine harness

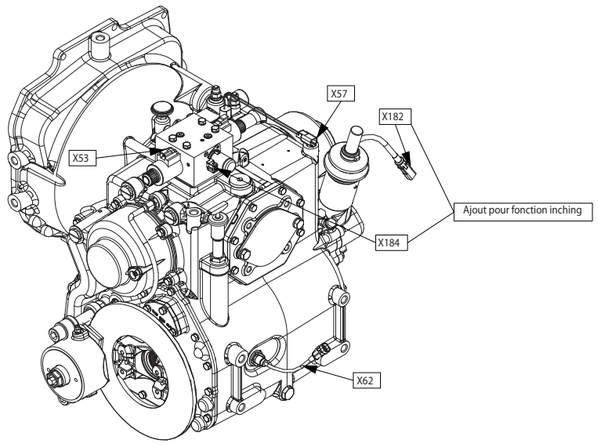
Item	Designation	Position on harness layout				Comments
		Assembly	Frame	Engine	Cab	
EP.84	Splice	C8			A3	
EP.85	Splice	E10 / G18			E3/G18	
EP.86	Splice	G19			G17	
EP.93	Splice	O22		I25		
EP.94	Splice	M24		G14		
EP.95	Splice	O26		K34		
EP.96	Splice	O26		K34		
EP.97	Splice	O26		K34		
EP.98	Splice	Q24		O30		
EP.99	Splice	Q24		O30		
V2	Diode V2	I28			M31	
V3	Diode V3	K23			M22	
V5	Diode V5	G19			M11	

FRAME 3D HARNESS





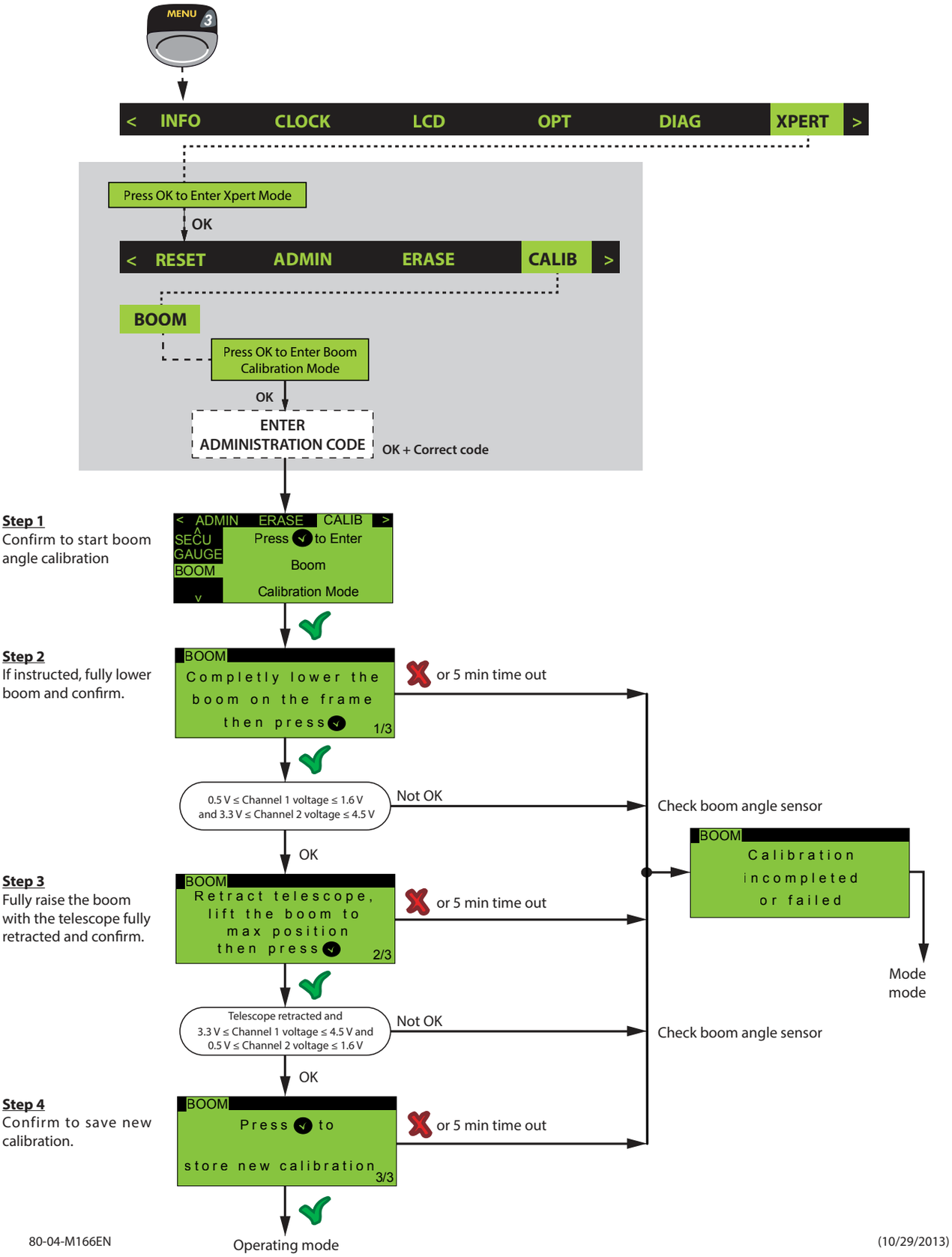


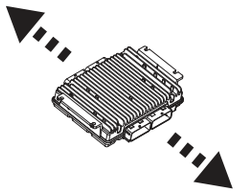


"BOOM" MENU (BOOM ANGLE CALIBRATION)

The appearance of the screen 

informs of non-adherence to an instruction or a cancellation request or an instruction outside of the time limit.





< IDENT | OUTOR | INTOR | OUTANA | INANA | ERROR >

MC

MP1

MP2

Component description	Line	Column	PIN	Page
Boom descent movement discharge electrovalve current	1	1	***X150-62***	1/9
Anti-clockwise electrovalve current	2	1	***X150-63***	1/9
Boom suspension electrovalve current 1	3	1	***X151-65***	1/9
Hydrostatic rapid speed electrovalve current	4	1	***X151-66***	1/9
Boom suspension electrovalve current 2	1	1	***X151-67***	2/9
Hydrostatic slow speed electrovalve current	2	1	***X151-68***	2/9
Hydrostatic motion direction electrovalve current	3	1	***X151-69***	2/9
/	4	1	***X151-40/70***	2/9
/	1	1	***X150-61***	3/9
/	2	1	***X150-64***	3/9
DANFOSS right stabilizer electrovalve current	3	1	***X151-42/72***	3/9
2A Wheel alignment electrovalve current	4	1	***X151-14/15/45/75***	3/9
DANFOSS left stabiliser electrovalve current	1	1	***X151-44/75***	4/9
DANFOSS levelling electrovalve current	2	1	***X151-43/73***	4/9
2B Wheel alignment electrovalve current	3	1	***X151-77***	4/9
3A Wheel alignment electrovalve current	4	1	***X151-48/78***	4/9
3B Wheel alignment electrovalve current	1	1	***X151-79***	5/9
/	2	1	***X151-16/17/46/76***	5/9
/	3	1	***X151-87***	5/9
/	4	1	***X151-59/89***	5/9
Hydrostatic slow gear electrovalve current	1	1	***X151-90***	6/9
DANFOSS telescope electrovalve	2	1	***X151-85***	6/9
DANFOSS auxiliary electrovalve	3	1	***X151-26***	6/9
DANFOSS lifting electrovalve	4	1	***X151-86***	6/9
DANFOSS tilting electrovalve	1	1	***X151-56***	7/9
Fan control electrovalve current	2	1	***X150-66/36***	7/9
Husco tilting up electrovalve current	3	1	***X150-67/37***	7/9
Husco tilting down electrovalve current	4	1	***X150-68/38***	7/9
Husco lifting electrovalve current	1	1	***X150-69/39***	8/9
Husco descent electrovalve current	2	1	***X150-70/40***	8/9
Hand operated accelerator voltage power supply	3	1	***X150-34***	8/9
Electro-proportionnal manipulator bloc power supply voltage	4	1	***X150-02/03/32***	8/9
Intake air sensor power supply voltage	1	1	***X151-01/02***	9/9

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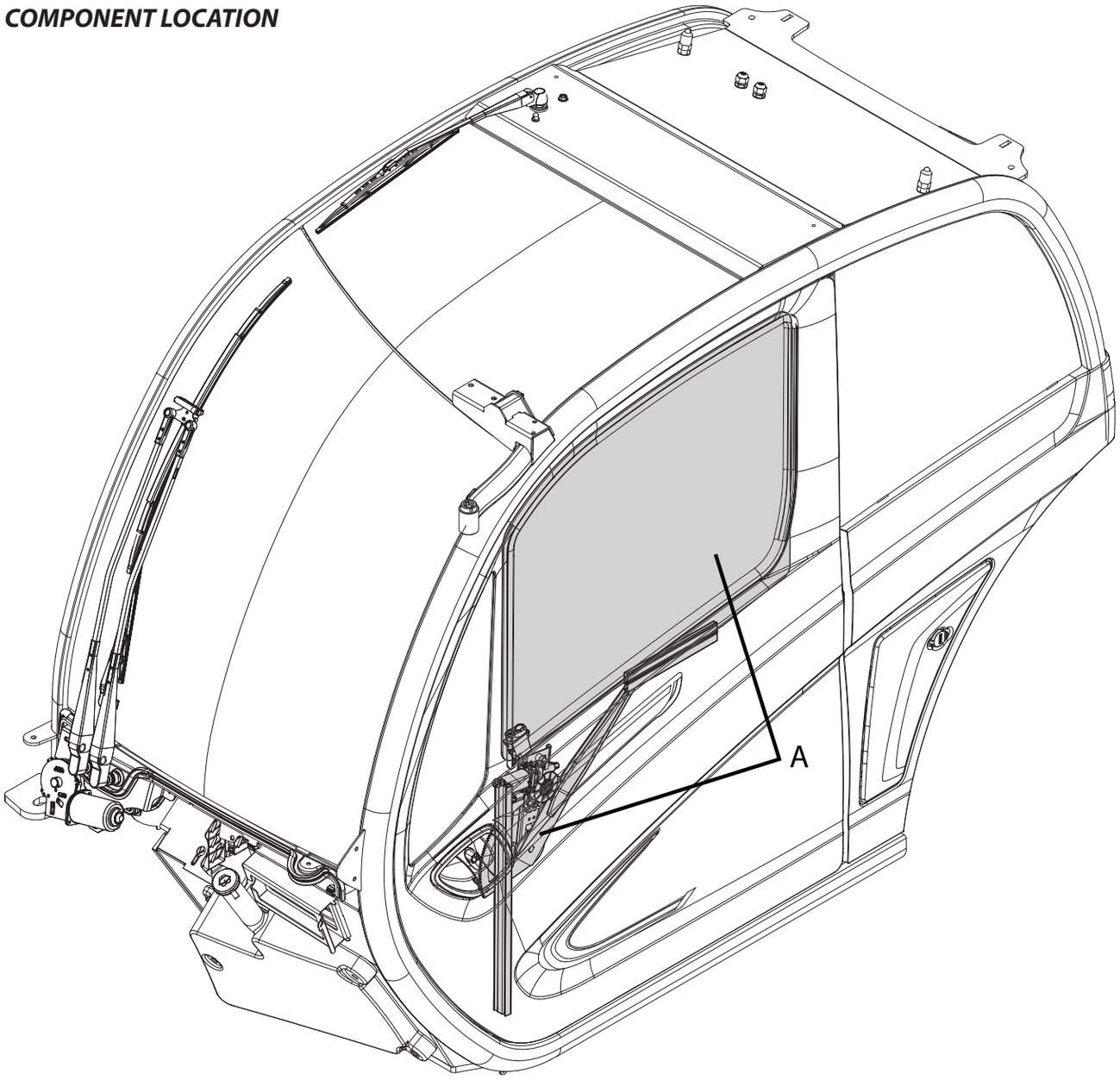
Engine ECU					
Code on PAD or on machine screen		Code on machine screen		COMPONENT	PROBLEMS
Hexadécimal		Decimal			
Error code	Fault type	Error code	Fault type		
004A4	06	1188	6	Engine Turbocharger Wastegate Actuator 1 Position	Current Above Normal, or Grounded Circuit
004B9	03	1209	3	Engine Exhaust Gas Pressure	Voltage Above Normal, or Shorted to High Source
004B9	04	1209	4	Engine Exhaust Gas Pressure	Voltage Below Normal, or Shorted to High Source
004C5	02	1221	2	Continuously Monitored Systems Support/Status	Data Erratic, Intermittent or Incorrect (rationality)
004C5	0E	1221	14	Continuously Monitored Systems Support/Status	Special Instruction
004D7	00	1239	0	Engine Fuel Leakage 1	Data Valid but Above Normal Operational Range, Most Severe Level
005CD	07	1485	7	ECM Main Relay	Mechanical System not Responding or Out of Adjustment
005CD	0E	1485	14	ECM Main Relay	Special Instruction
00AE7	05	2791	5	Engine Exhaust Gas Recirculation (EGR) Valve Control	Current Below Normal, or Open Circuit
00AE7	06	2791	6	Engine Exhaust Gas Recirculation (EGR) Valve Control	Current Above Normal, or Grounded Circuit
00AE7	07	2791	7	Engine Exhaust Gas Recirculation (EGR) Valve Control	Mechanical System not Responding or Out of Adjustment
00AED	06	2797	6	Engine Injector Group 1	Current Above Normal, or Grounded Circuit
00AED	07	2797	7	Engine Injector Group 1	Mechanical System not Responding or Out of Adjustment
00AEE	06	2798	6	Engine Injector Group 2	Current Above Normal, or Grounded Circuit
00B18	0C	2840	12	ECU Instance	Bad Intelligent Device or Component
00B18	0E	2840	14	ECU Instance	Special Instruction
00B40	02	2880	2	Engine Operator Primary Intermediate Speed Select	Data Erratic, Intermittent or Incorrect (rationality)
00B40	03	2880	3	Engine Operator Primary Intermediate Speed Select	Voltage Above Normal, or Shorted to High Source
00B40	04	2880	4	Engine Operator Primary Intermediate Speed Select	Voltage Below Normal, or Shorted to High Source
00B9A	02	2970	2	Accelerator Pedal 2 Low Idle Switch	Data Erratic, Intermittent or Incorrect (rationality)
00C91	03	3217	3	Aftertreatment #1 Intake O2	Voltage Above Normal, or Shorted to High Source
00C91	04	3217	4	Aftertreatment #1 Intake O2	Voltage Below Normal, or Shorted to High Source
00C91	05	3217	5	Aftertreatment #1 Intake O2	Current Below Normal, or Open Circuit
00C91	06	3217	6	Aftertreatment #1 Intake O2	Current Above Normal, or Grounded Circuit
00C91	0C	3217	12	Aftertreatment #1 Intake O2	Bad Intelligent Device or Component
00C91	0D	3217	13	Aftertreatment #1 Intake O2	Out of Calibration
00C91	0F	3217	15	Aftertreatment #1 Intake O2	Data Valid but Above Normal Range : Least Severe Level
00C93	0F	3219	15	Aftertreatment #1 Intake Gas Sensor at Temperature	Data Valid but Above Normal Range : Least Severe Level
00C93	11	3219	17	Aftertreatment #1 Intake Gas Sensor at Temperature	Data Valid but Below Normal Range: Least Severe Level
00C96	03	3222	3	Aftertreatment #1 Intake Gas Sensor Heater	Voltage Above Normal, or Shorted to High Source
00C96	04	3222	4	Aftertreatment #1 Intake Gas Sensor Heater	Voltage Below Normal, or Shorted to High Source
00C96	05	3222	5	Aftertreatment #1 Intake Gas Sensor Heater	Current Below Normal, or Open Circuit
00CAA	03	3242	3	Particulate Trap Intake Gas Temperature	Voltage Above Normal, or Shorted to High Source
00CAA	04	3242	4	Particulate Trap Intake Gas Temperature	Voltage Below Normal, or Shorted to High Source
00CB3	00	3251	0	Particulate Trap Differential Pressure	Data Valid but Above Normal Operational Range, Most Severe Level
00CB3	03	3251	3	Particulate Trap Differential Pressure	Voltage Above Normal, or Shorted to High Source
00CB3	04	3251	4	Particulate Trap Differential Pressure	Voltage Below Normal, or Shorted to High Source
00CB3	07	3251	7	Particulate Trap Differential Pressure	Mechanical System not Responding or Out of Adjustment
00CB3	0A	3251	10	Particulate Trap Differential Pressure	Abnormal Rate of Change
00CB3	10	3251	16	Particulate Trap Differential Pressure	Data Valid but Above Normal Range: Moderately Severe Level
00CB3	12	3251	18	Aftertreatment #1 DPF Trap Differential Pressure	Data Valid but Below Normal Range: Moderately Severe Level
00DB5	02	3509	2	Sensor Supply Voltage 1	Data Erratic, Intermittent or Incorrect (rationality)
00DB6	02	3510	2	Sensor Supply Voltage 2	Data Erratic, Intermittent or Incorrect (rationality)
00DB7	02	3511	2	Sensor Supply Voltage 3	Data Erratic, Intermittent or Incorrect (rationality)
00E71	06	3697	6	Particulate Trap Lamp Command	Current Above Normal, or Grounded Circuit
00E72	06	3698	6	Exhaust System High Temperature Lamp Command	Current Above Normal, or Grounded Circuit
00E76	06	3702	6	Diesel Particulate Filter Active Regeneration Inhibited Status	Current Above Normal, or Grounded Circuit
0129D	03	4765	3	Aftertreatment #1 Diesel Oxidation Catalyst Intake Gas Temperature	Voltage Above Normal, or Shorted to High Source

ELECTRIC WINDOW AND ENGINE REMOVAL

COMPONENT LOCATION



Key:

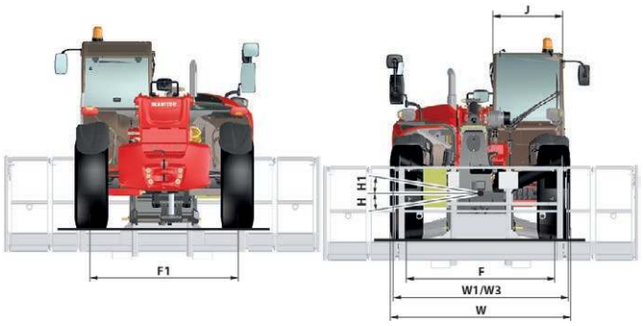
A - Electric window and engine

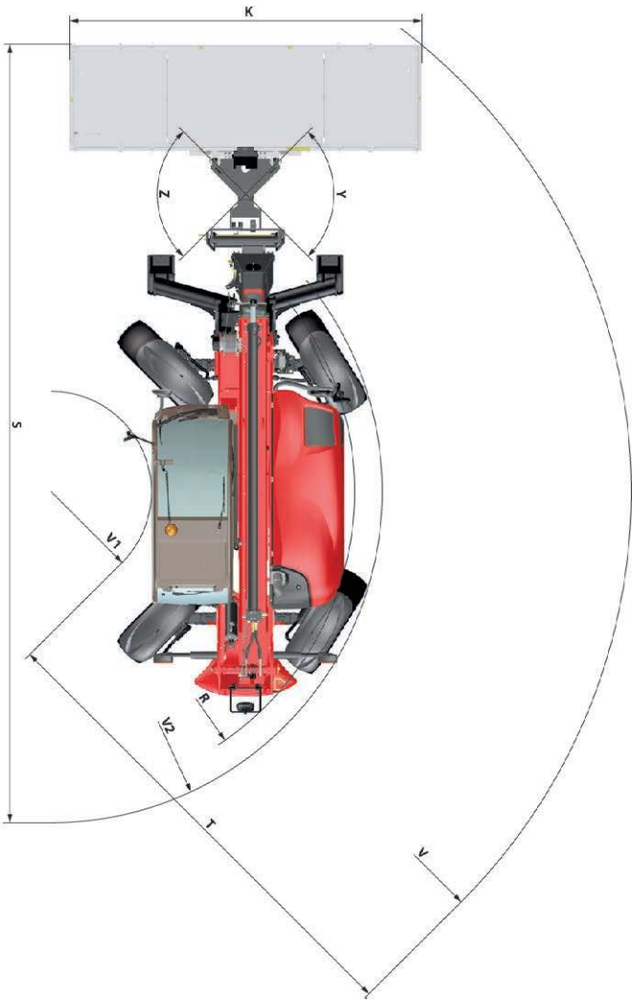
PREPARATION AND SAFETY INSTRUCTIONS

- Stabilize the machine on level ground.

MT 1135 H A ST3B CHARACTERISTICS (EXTENDABLE PLATFORM 2M25/4M 1,000 KG)

Designation		Value
Truck weight with standard equipment (extendable platform 2M25/4M 1,000 kg)		9,685 kg
Ground distribution with standard equipment (extendable platform 2M25/4M 1,000 kg)	Front axle	3,630 kg
	Rear axle	6,055 kg
Overall width		2,284 mm
Overall height		2,559 mm
Overall length (with extendable platform 2M25/4M 1,000 kg)		7,398 mm
Ground clearance		445 mm
Pulling force		7,000 daN
Fuel tank		120 L
Hydraulic oil tank		175 L
Cooling system		17 L
Reduction gearbox		2 L

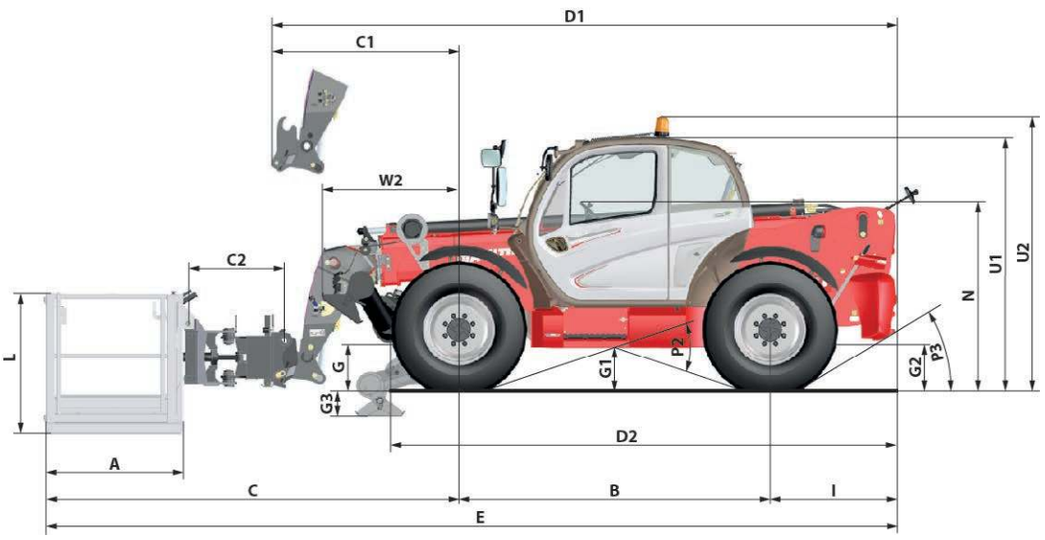




DIMENSIONS

Item	Value
A	1,200 mm
B	2,880 mm
C	3,630 mm
C1	1,702 mm
D1	5,470 mm
D2	4,226 mm
E	7,398 mm
F	1,870 mm
F1	1,870 mm
G	445 mm
G1	415 mm
G2	445 mm
G3	135 mm
H	10 °
H1	10 °
I	888 mm
J	884 mm
K	2,250 - 4,000 mm
L	1300 mm
N	1,740-1,803 mm
P2	38 °
P3	44 °

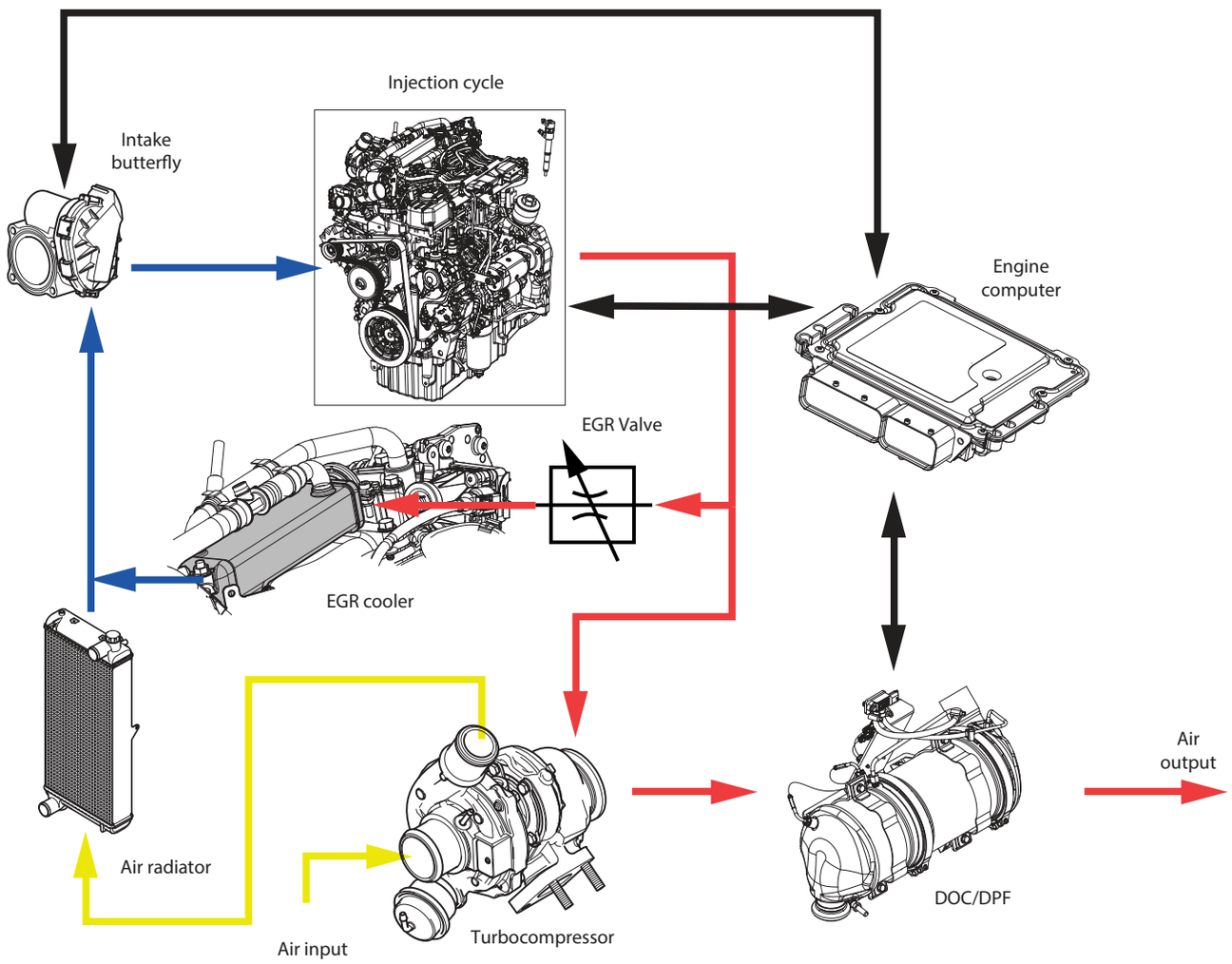
Item	Value
R	3,643 mm
S	10,120 mm
T	5,397 mm
U1	2,419 mm
U2	2,559 mm
V	6,537 mm
V1	1,140 mm
V2	3,850 mm
W	2,284 mm
W1	2,214 mm
W2	1,267 mm
W3	2,214 mm
Y	90 °
Z	90 °



ENGINE CHARACTERISTICS

⇒ 4 online cylinders
⇒ Electronic management
⇒ Direct injection
⇒ Compression ratio: 17.0
⇒ Dry engine weight: 270 kg

PERKINS ENGINE OVERVIEW



Key:

Cooled air circuit

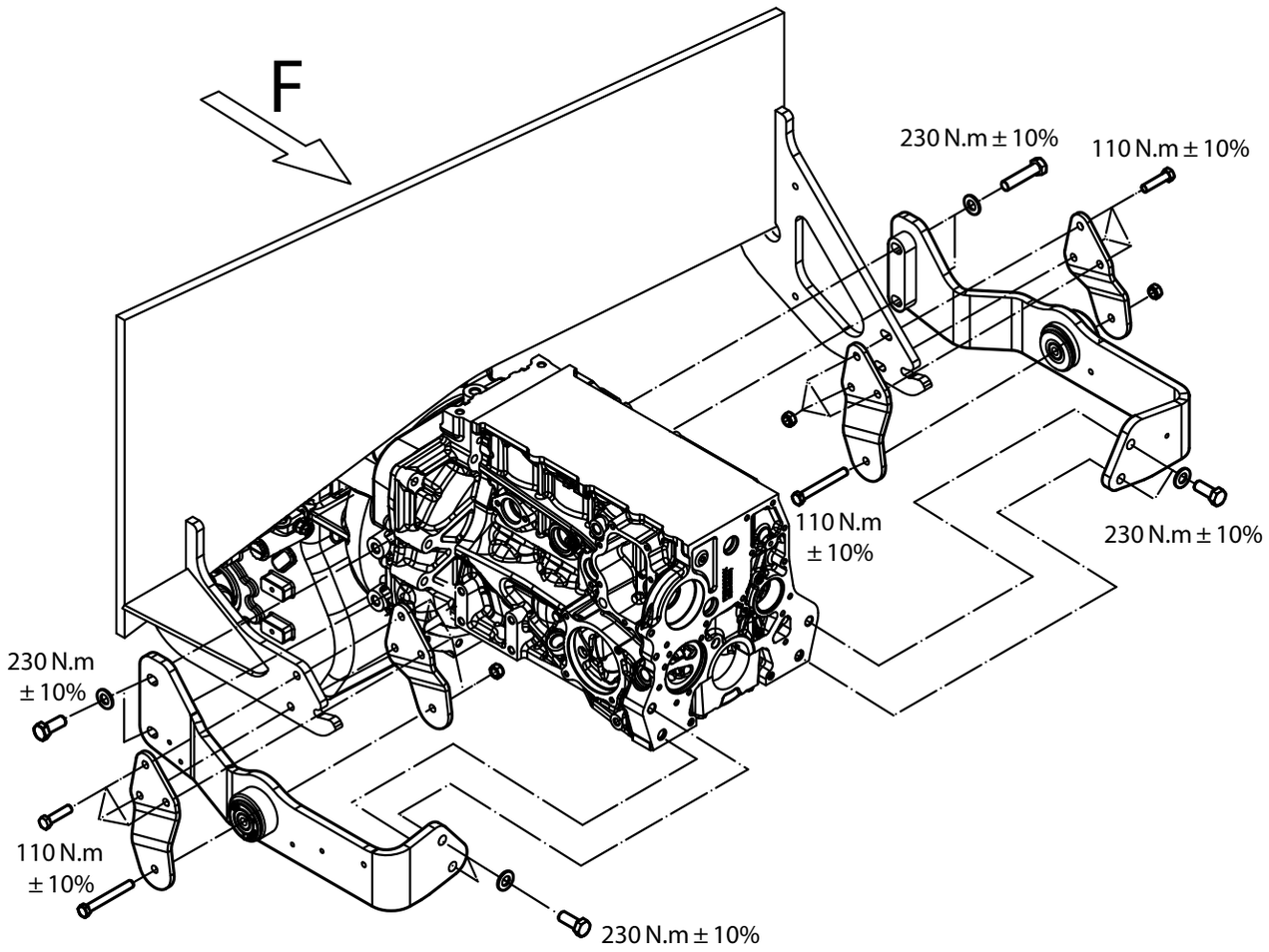
Air intake circuit

Exhaust gas circuit

Interaction between components

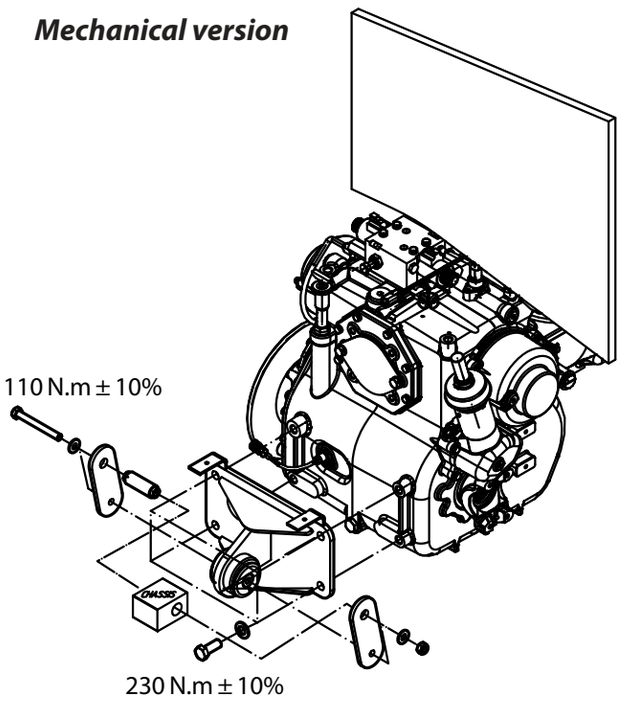
10

ENGINE TIGHTENING TORQUES



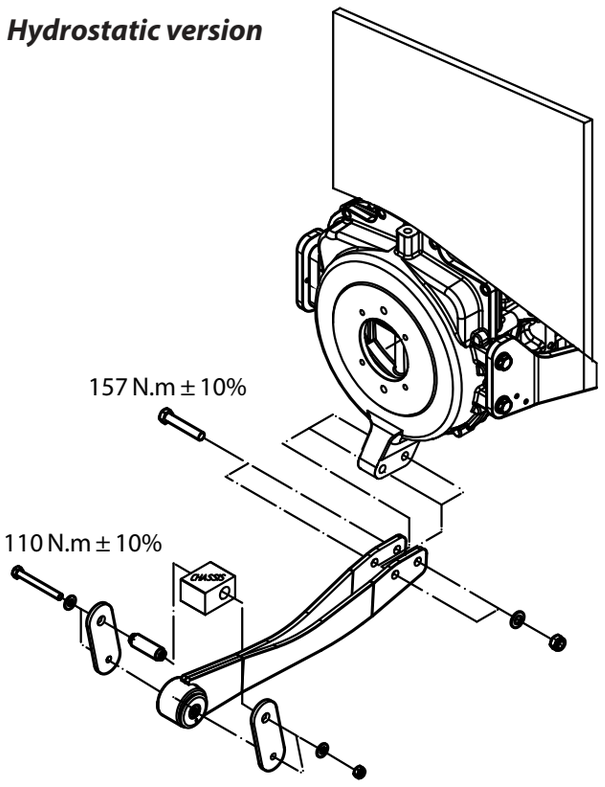
F

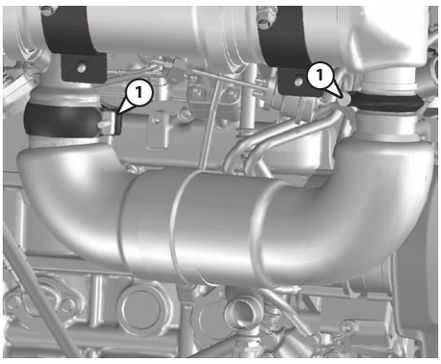
Mechanical version



F

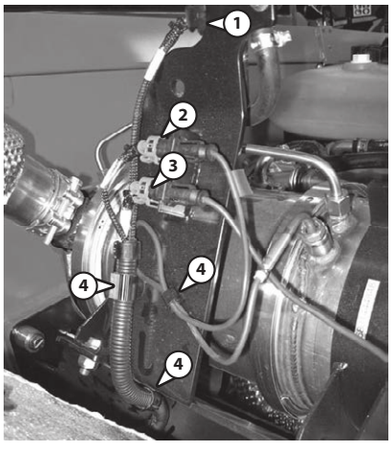
Hydrostatic version





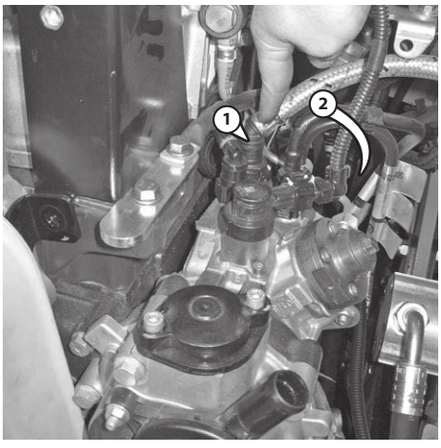
Undo the exhaust pipe clamps (Item 1).

Remove the turbo pipe.

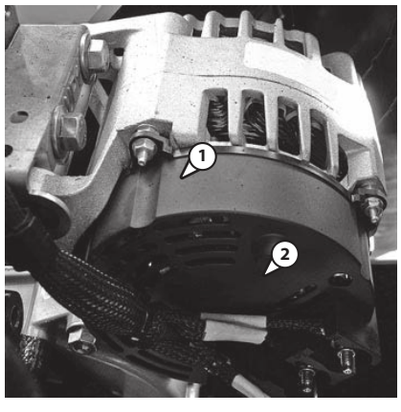


Disconnect the DPF pressure intake sensors (Item 1), DPF intake temperature (Item 2), DOC intake temperature (Item 3).

Unclip the harness (3 sheath clamps) (Item 4).



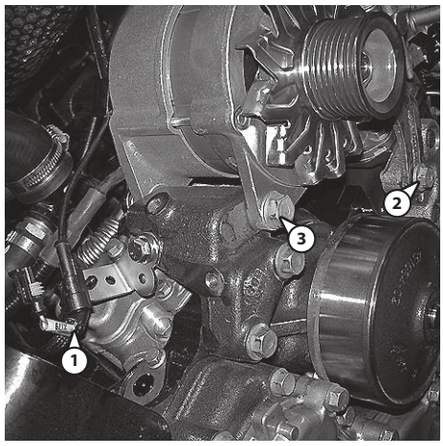
Disconnect the supply hose (Item 1) and the injection return hose (Item 2) behind.



5 - Disconnect the alternator, starter, water trap

Unscrew the B+ terminal power cable (Item 1).

Disconnect the D+ Link connector (Item 2).



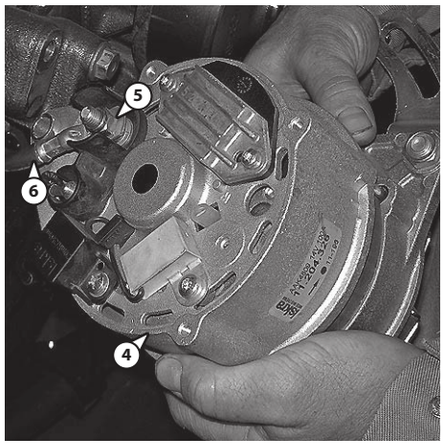
F – ALTERNATOR REMOVAL

Perform the belt removal.
◅ Section E – ALTERNATOR BELT REMOVAL

Disconnect X179 (Item 1).

Remove the holding screw (Item 2).

Remove the bolt (Item 3).

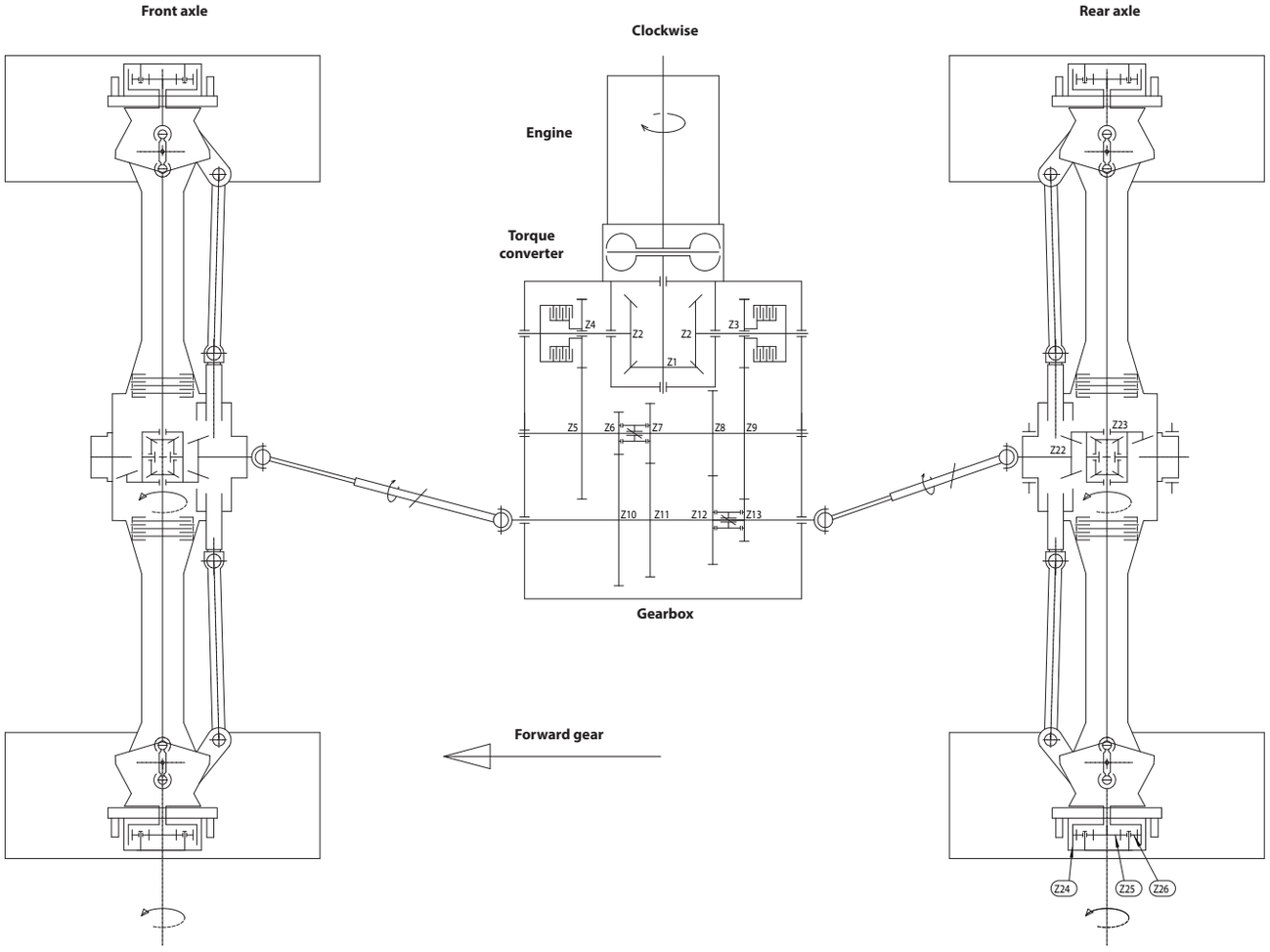


Remove the alternator (Item 4), unscrew the nut (Item 5) of the ground cable (Item 6).

Remove the alternator.

For the refit, perform the removal operations in the opposite order.

DRIVE TRAIN



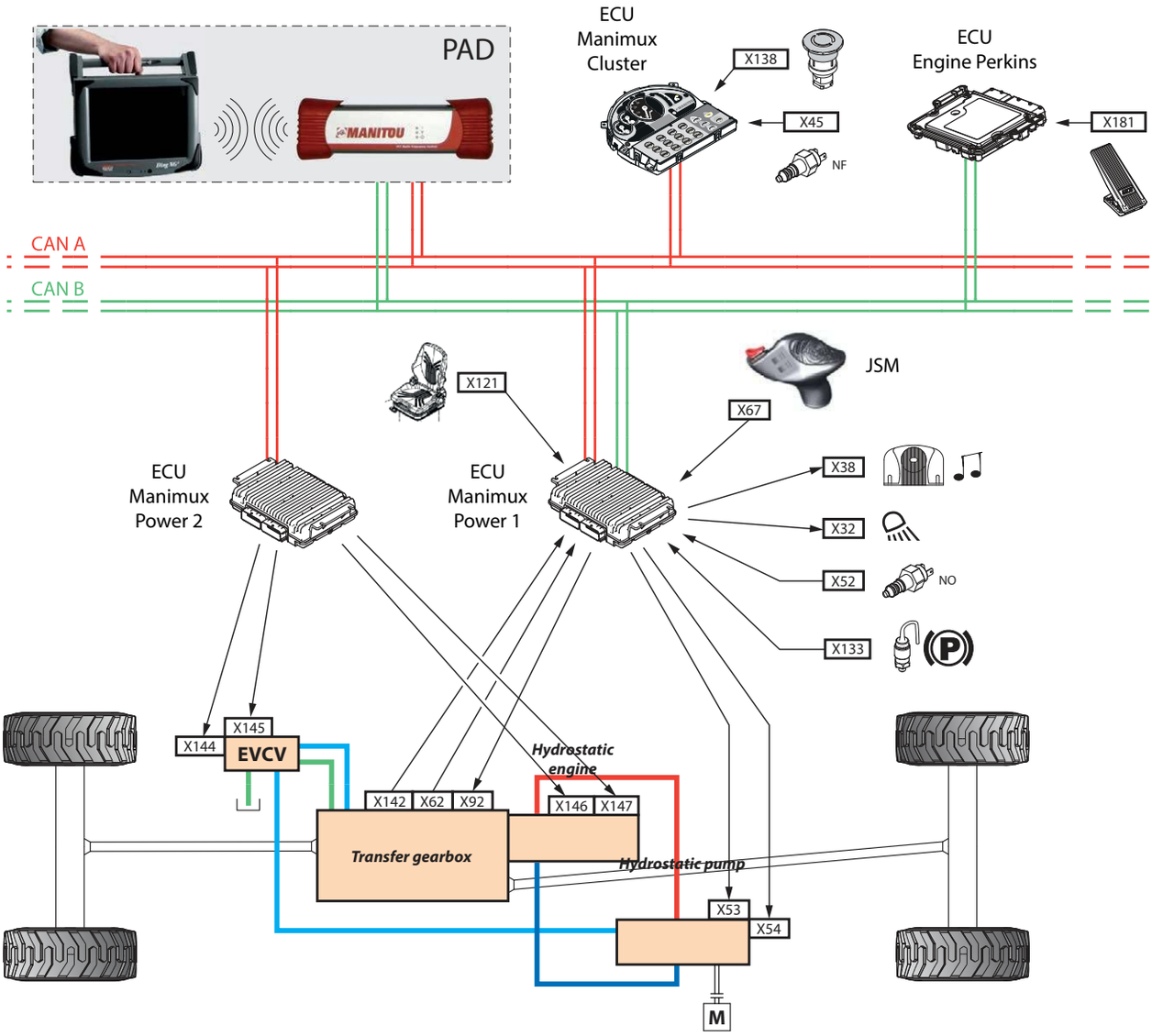
Gearbox	
Gear	**Number of teeth**
Z1	45
Z2	47
Z3	37
Z4	37
Z5	71
Z6	23
Z7	32
Z8	46
Z9	71
Z10	49
Z11	43
Z12	33
Z13	30

Standard axle	
Gear	**Number of teeth**
Z22	9
Z23	34
Z24	70
Z25	14
Z26	27

Axle option 35 km/h	
Gear	**Number of teeth**
Z22	12
Z23	35
Z24	70
Z25	14
Z26	27

HYDROSTATIC TRANSMISSION

OPERATION OVERVIEWS



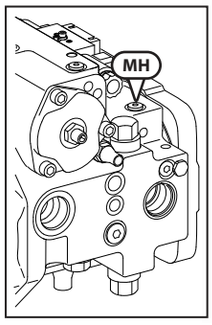
Key:

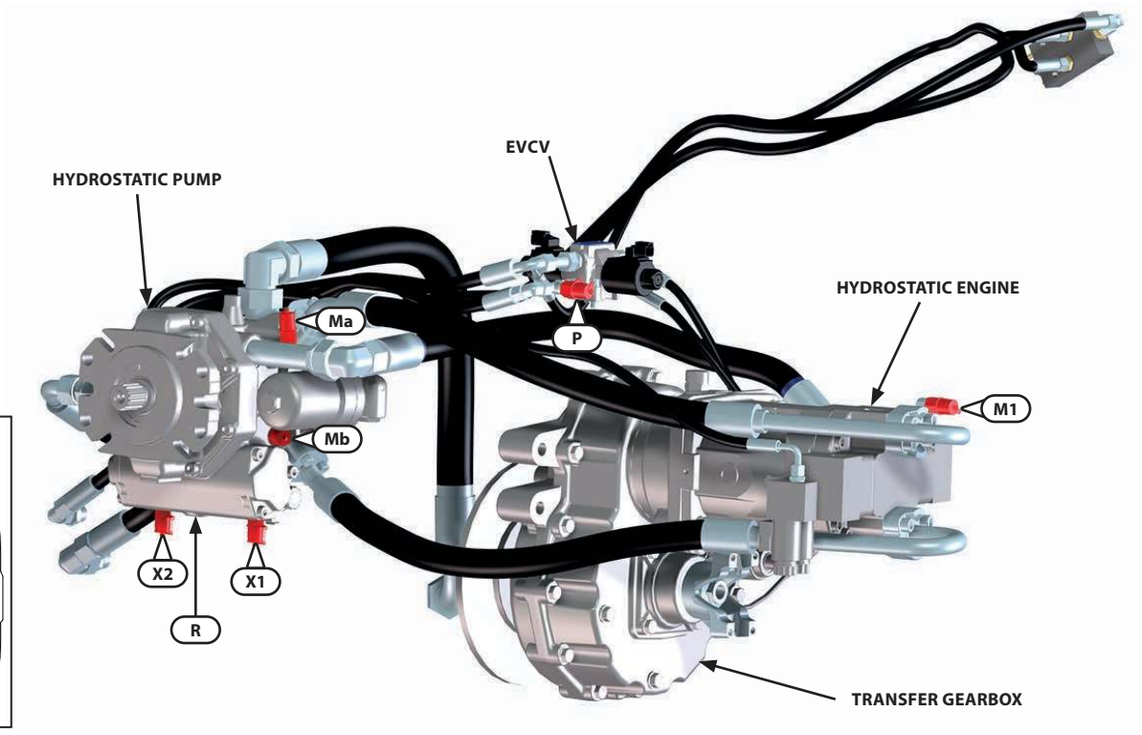
: High Pressure
: Low Pressure
: Boost pressure
: Oil tank return

EVCV: Speed change electrovalve
M: Engine
X32: Rear right headlight
X38: Reversing buzzer
X45: Door switch (NC)
X52: Door switch (NO)
X53: Forward gear electrovalve
X54: Reverse gear electrovalve
X62: Gearbox output speed sensor
X67: JSM lever control
X92: Negative brake electrovalve control
X121: Pneumatic seat
X133: ON/OFF negative brake pressure switch
X138: Emergency stop
X142: 1st gear engaged sensor
X144: Gear 1 electrovalve
X145: Gear 2 electrovalve
X146: Low speed electrovalve
X147: Motion direction electrovalve
X181: Accelerator pedal potentiometer

PRESSURE TEST PORTS

LOCATION





VALUES

Port No.	Correspondence	Min. (bar)	Max. (bar)	Comments
X1 (forward)	Pilot pressure	5*		Forward gear enabled, no movement
		7*		Forward gear enabled, start of movement
		0*		Forward gear not selected
			21*	Forward gear, max. rpm
X2 (reverse)	Pilot pressure	5*		Reverse gear enabled, no movement
		7*		Reverse gear enabled, start of movement
		0*		Reverse gear not selected
			21*	Reverse gear, max. rpm
M1	⊲ Section 6-b *"Maximum displacement control: (max. pulling force)"*			
Ma / Mb	HP Pressure	23*	510*	High Pressure with DR set higher for 505-bar monitoring
Ma / Mb / MH	HP Pressure	23*	480*	High Pressure with DR not set higher
P	Boost pressure	25*	26*	Boost pressure
R	Case pressure	1*	2*	Pressure test port on hydrostatic pump between X1 and X2

* Real values

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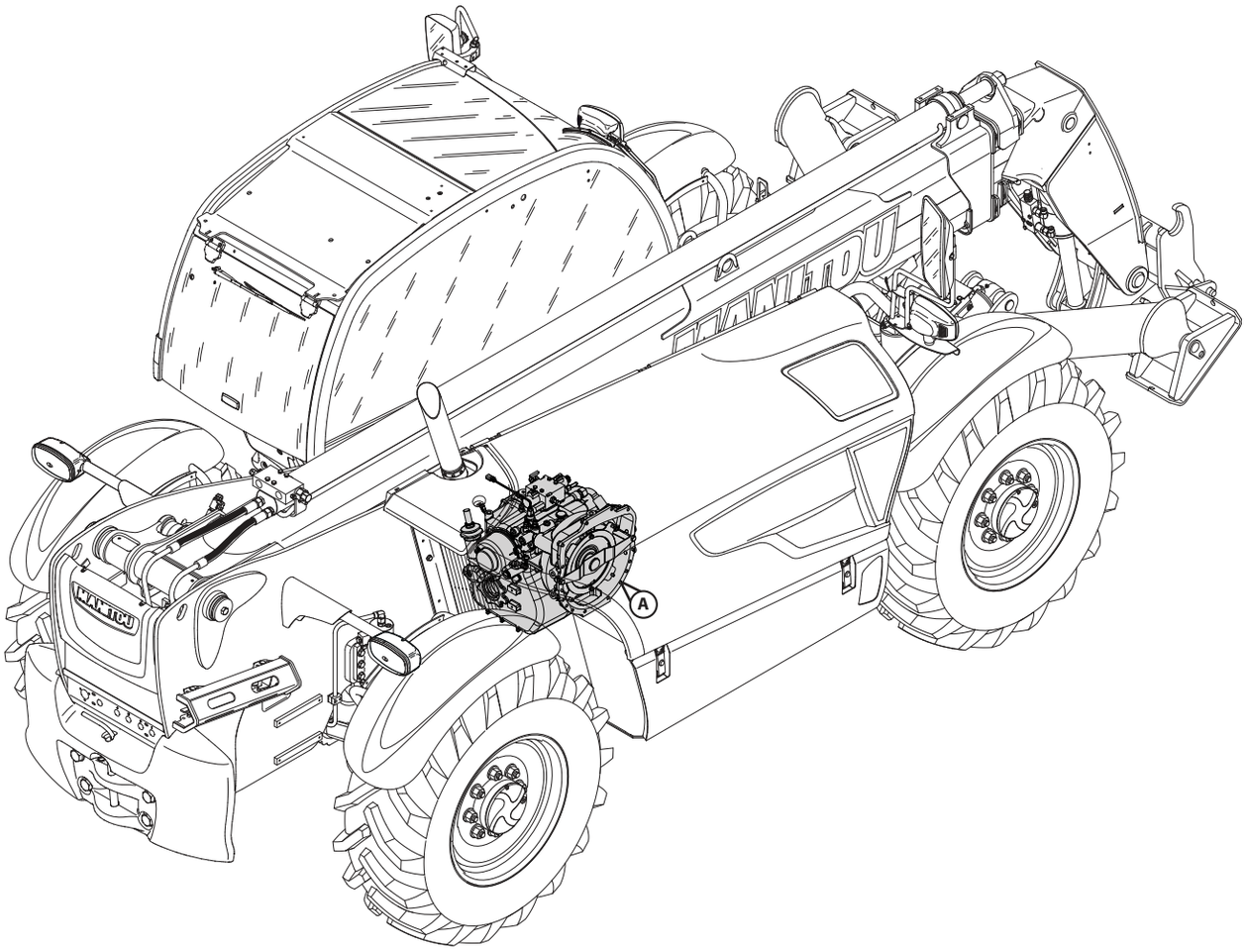
MECHANICAL TRANSMISSION REMOVAL



Key:

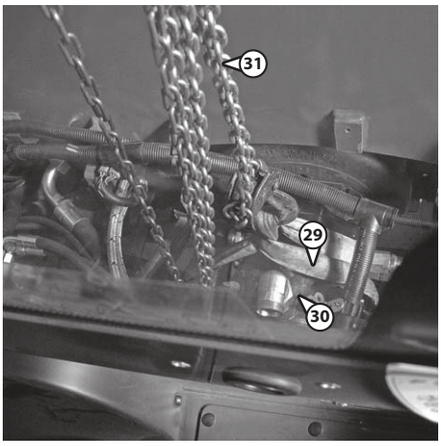
A - Gearbox

PREPARATION AND SAFETY INSTRUCTIONS

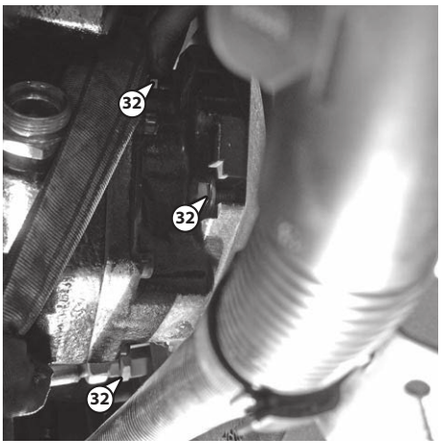
- Stabilize the machine on level ground above a pit, lower the stabilizers.
- Raise the boom approx. 40°, so as to position the sling above the gearbox.
- Deactivate battery power supply by means of the battery cut-off.

Specific tooling:

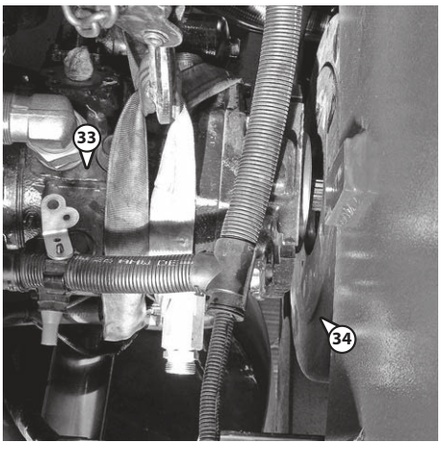
- Allen key.
- Jib crane (min. 1,000 kg).



Install a sling (Item 29) on the pump (Item 30) and install a hoist (Item 31).



Remove the 4 retaining screws (Item 32).



Disconnect the pump (Item 33) from the engine (Item 34), then lift it up.

Remove the hydrostatic pump.

To refit, perform the operations in the reverse order.
Top up with oil.

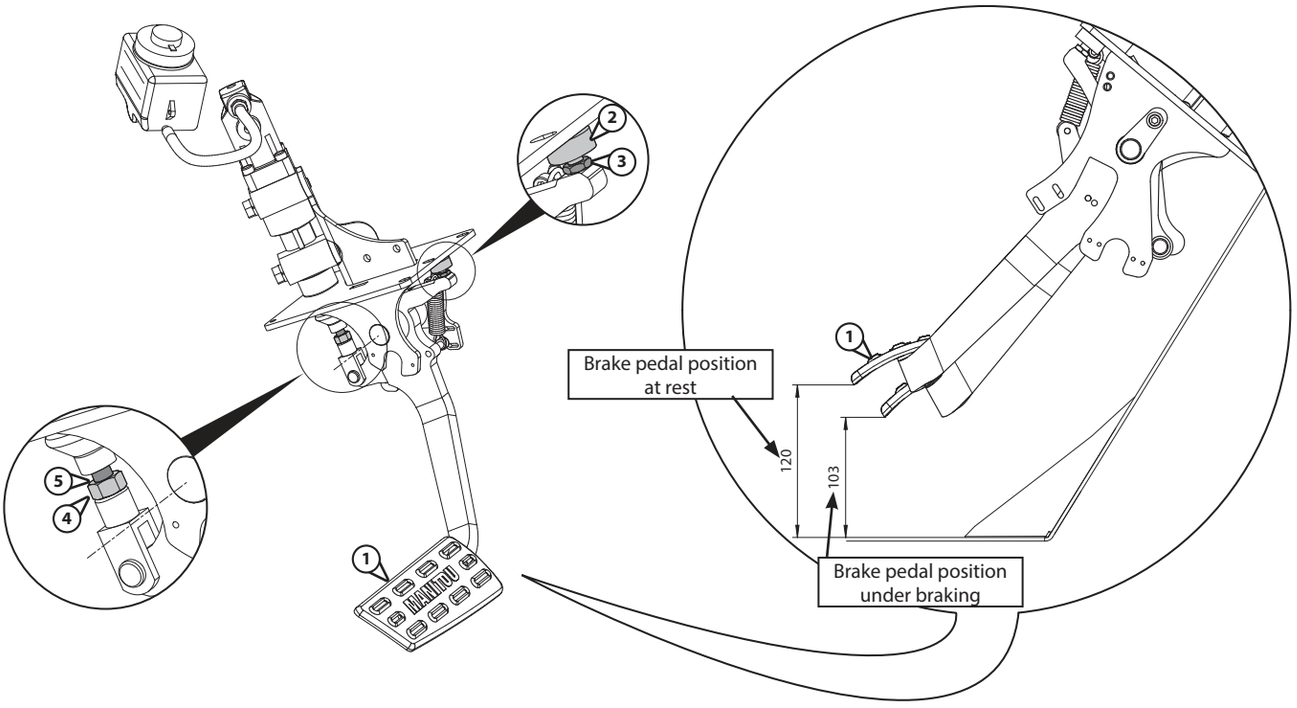
SERVICE BRAKE

MECHANICAL TRANSMISSION ADJUSTMENT PROCEDURE

STOP ADJUSTMENT

Brake pedal (Item 1):

- Use the stop (Item 2) to set the brake pedal (Item 1) to a height of 120 mm above the cab floor (without floor mat).
- Tighten the locknut (Item 3).
- Set the brake pedal clearance to 103 mm from the cab floor (without floor mat) undo the locknut (Item 4) and turn the push rod (Item 5).
- Tighten the locknut (Item 4).

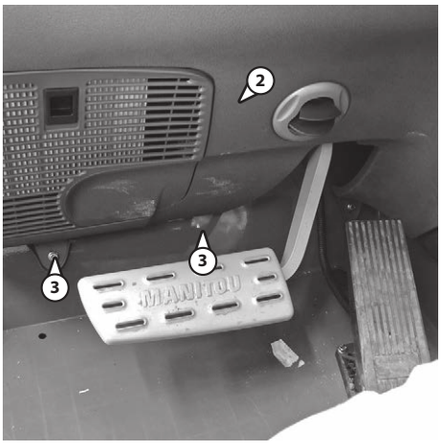


HYDROSTATIC TRANSMISSION ADJUSTMENT PROCEDURE

Group 20 - "Transmission control and adjustment"
PUMP / ENGINE CONTROL AND ADJUSTMENT
8 - BRAKE AND TH7 VALVE PEDAL ADJUSTMENT

PREPARATION AND SAFETY INSTRUCTIONS

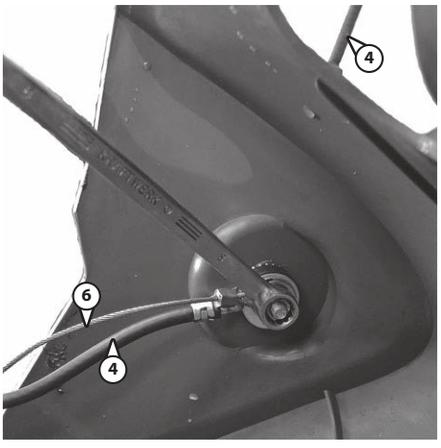
⇒ Stabilize the machine on level ground.
⇒ Maneuver the machine a number of times in forward and reverse (wheels straight) in order to release any stresses acting on the steering and tires.
⇒ Raise the boom to mid-height and secure in position.
⇒ Deactivate battery power supply by means of the battery cut-off.



MASTER CYLINDER REMOVAL

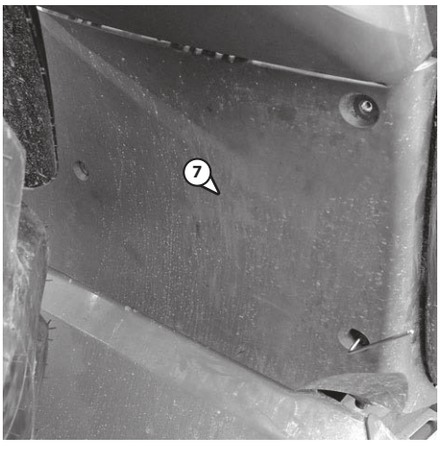
Remove the floor mat.

Remove the 2 screws (Item 3) to remove the case (Item 2).



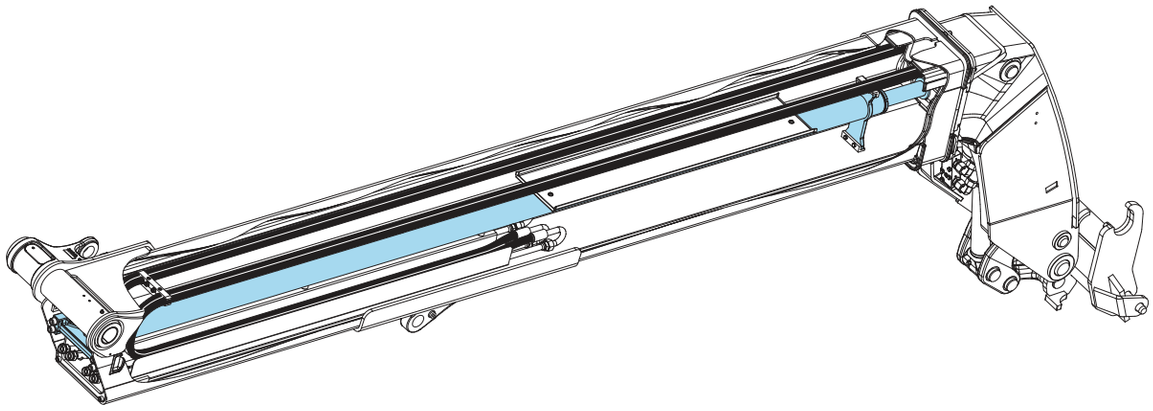
Disconnect the antenna (Item 4).

Remove the antenna cable (Item 5) and the cable support cover (Item 6).



Remove the case (Item 7).

TELESCOPING CIRCUIT REMOVAL

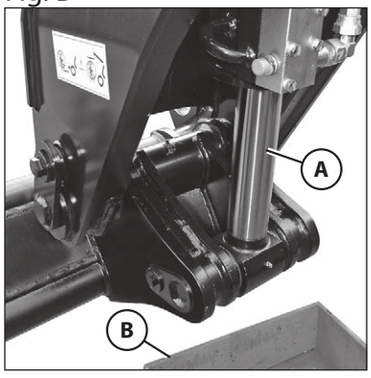


Place the boom in the horizontal position (Fig. A).
Extend the tilting cylinder rod A half-way (Fig. B).
Place an oil collection container B under the cylinder (Fig. B).

Decompress the hydraulic circuits of the boom.

Fig. A

Fig. B



Remove the cover C from the head of the boom (Fig. C).
Disconnect the tilting cylinder hoses D (Fig. D).
Disconnect and remove the two tubes E from the attachment circuit (Fig. E).

Fig. C

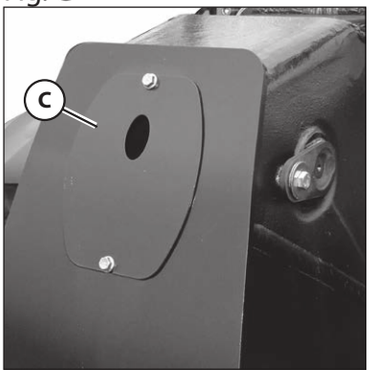


Fig. D

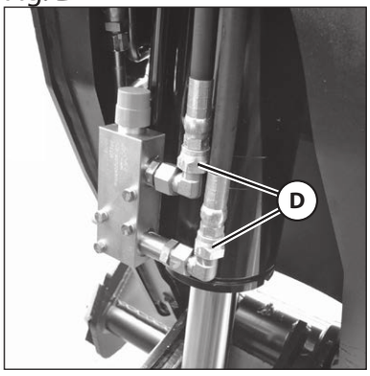
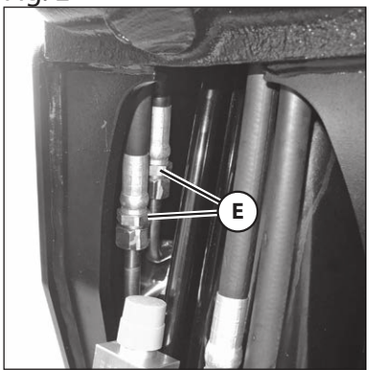
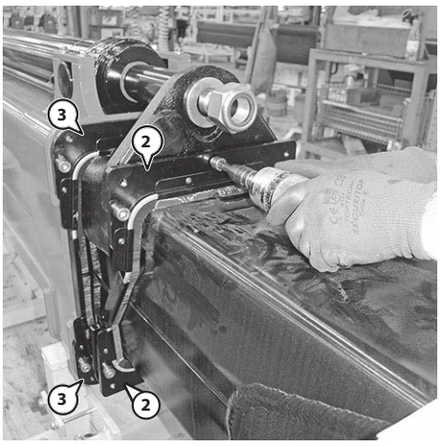


Fig. E

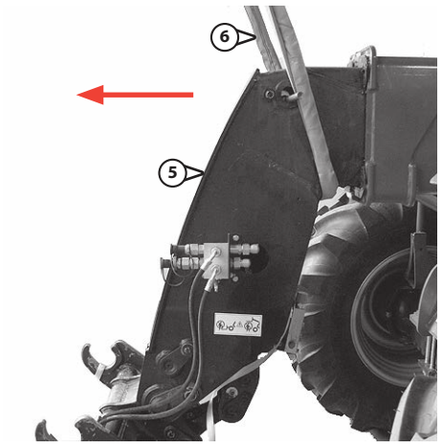




REMOVAL OF TELESCOPES T1+T2

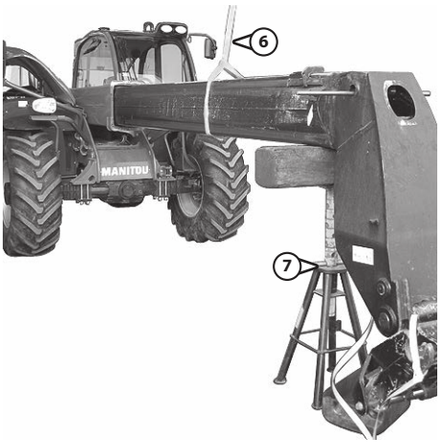
Remove the 2 pad cover plates (Item 2).

Take out the 4 pad cages (Item 3) and remove the 8 pads.



Weight of telescope T2 ≈ 400 kg.

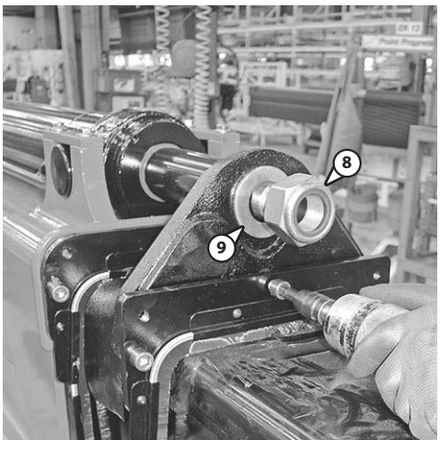
Sling the telescope (Item 5) using a strap (Item 6) and a jib crane.
Pull telescope T2 (Item 5) without completely removing it from the intermediate telescope T1.



Place a support stand (+block if needed) (Item 7) under the boom head.
This procedure allows the boom to be stabilized while moving the strap to the telescope's center of gravity.

Reposition the strap (Item 6) at the telescope's center of gravity to balance it while it is being removed.

Completely remove and set down the telescope, while preventing it from tipping.

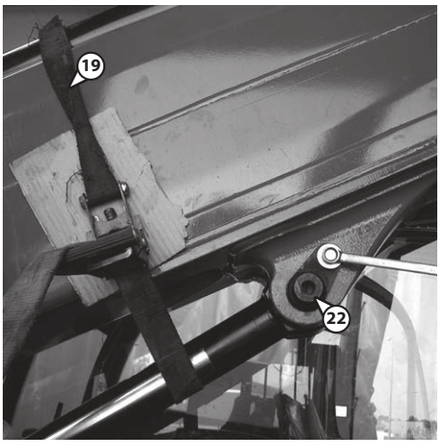


Remove the nut (Item 8) and the washer (Item 9) from the telescope T1 cylinder

Then repeat the same operations as for removing telescope T1

Weight of telescope T1 ≈ 300 kg.

50



Place a strap (Item 19) around the lifting cylinder and the boom to refit the cylinder head.

Start the truck and retract the lifting cylinder rod.
Align the lifting cylinder head attachment pin holes and boom feet.

<u>Greasing recommendations before pivot pin assembly:</u>

– Fill the cells or pivot pin ring holes.
– Apply a fine film of grease on the pin bearing surface.

Insert the lifting cylinder head pin (Item 22) on the boom foot and tighten the locking screw.
Remove the block under the lifting cylinder body.

Align the compensating cylinder pin holes and the boom.

Fit the pin (Item 26) and do up the locking screw.

⚠ DRAIN THE TELESCOPE CYLINDER:

NOTE: The purpose of this operation is to have both telescopes extending simultaneously.

1 - Switch on the engine.
2 - Extend the telescope by 0.2m.
3 - Retract the telescope.
4 - Extend the telescope by 0.5m.
5 - Retract the telescope.
6 - Fully extend the boom.
7 - Retract the telescope.

⚠ RECHECK AND, IF NECESSARY, ADJUST:

⇒ The angular potentiometer.
⇒ The telescope retraction limit switch.
⇒ If necessary, repeat angle + strain gauge calibration.

FLARE NUT WRENCH

30 mm Flare nut wrench .....Part no.: 947228

32 mm Flare nut wrench .....Part no.: 947229

36 mm Flare nut wrench .....Part no.: 895113

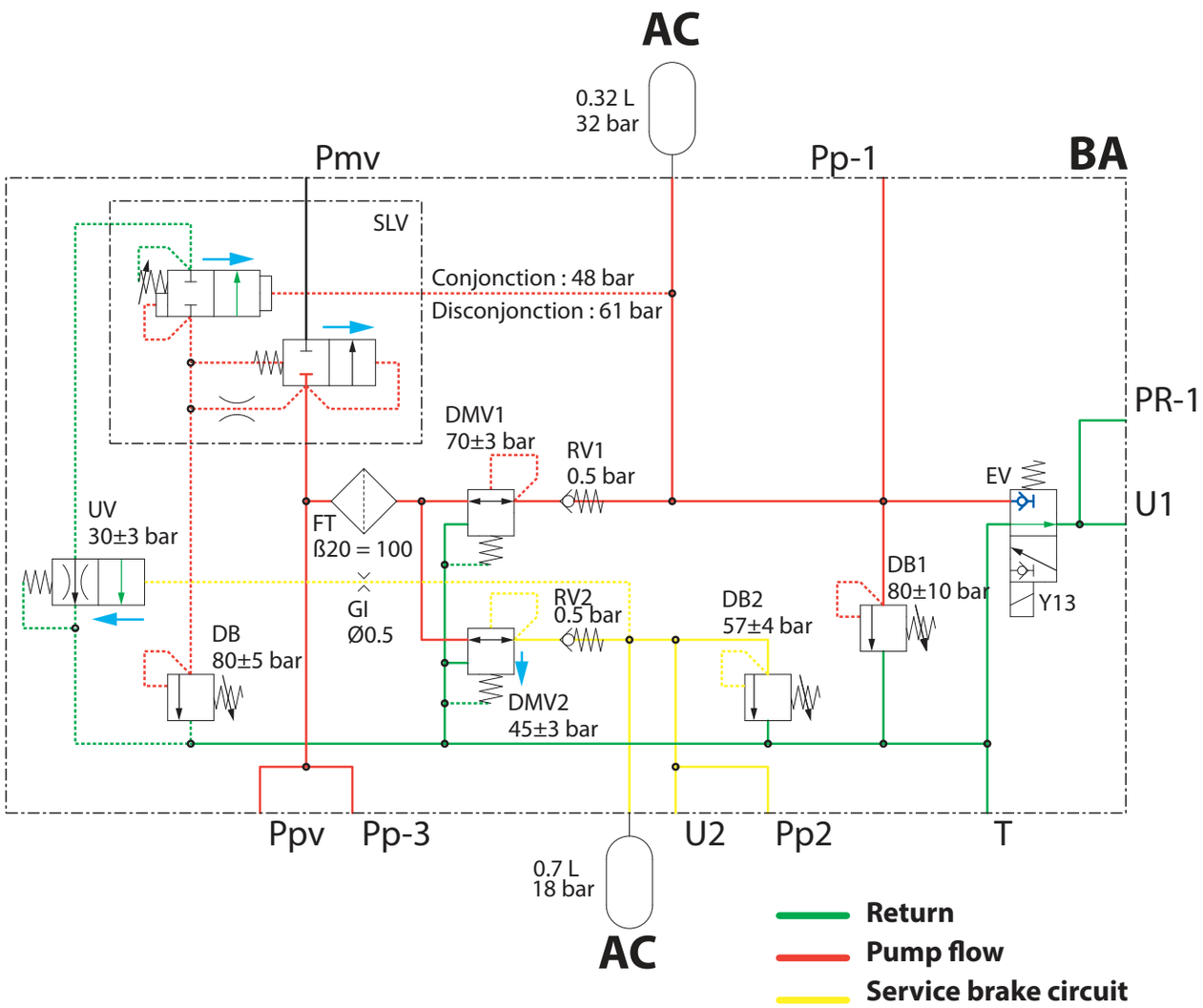
41 mm Flare nut wrench .....Part no.: 947300

46 mm Flare nut wrench .....Part no.: 895114

MAGNETIC LIFTER

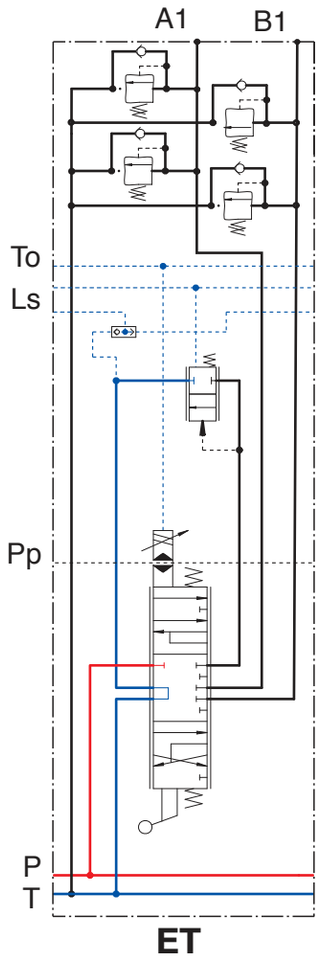
Magnetic lifter .....Part no.: 947386

Values indicative only



If the pressure is less than 48 bar in the parking brake circuit, the SLV closes in order to recharge the circuit.

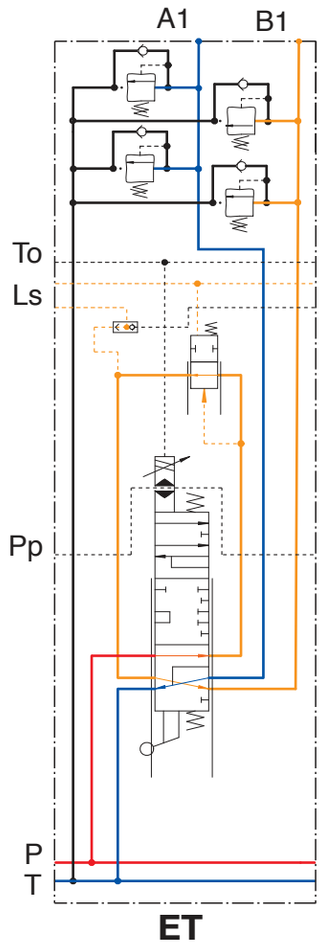
Values for information purposes only.



The slide is in neutral position.

The pressure which is on the closed position of the slide, corresponds to the waiting pressure created by the inlet composent. This pressure is 15 bars.

(See inlet composent sheet)

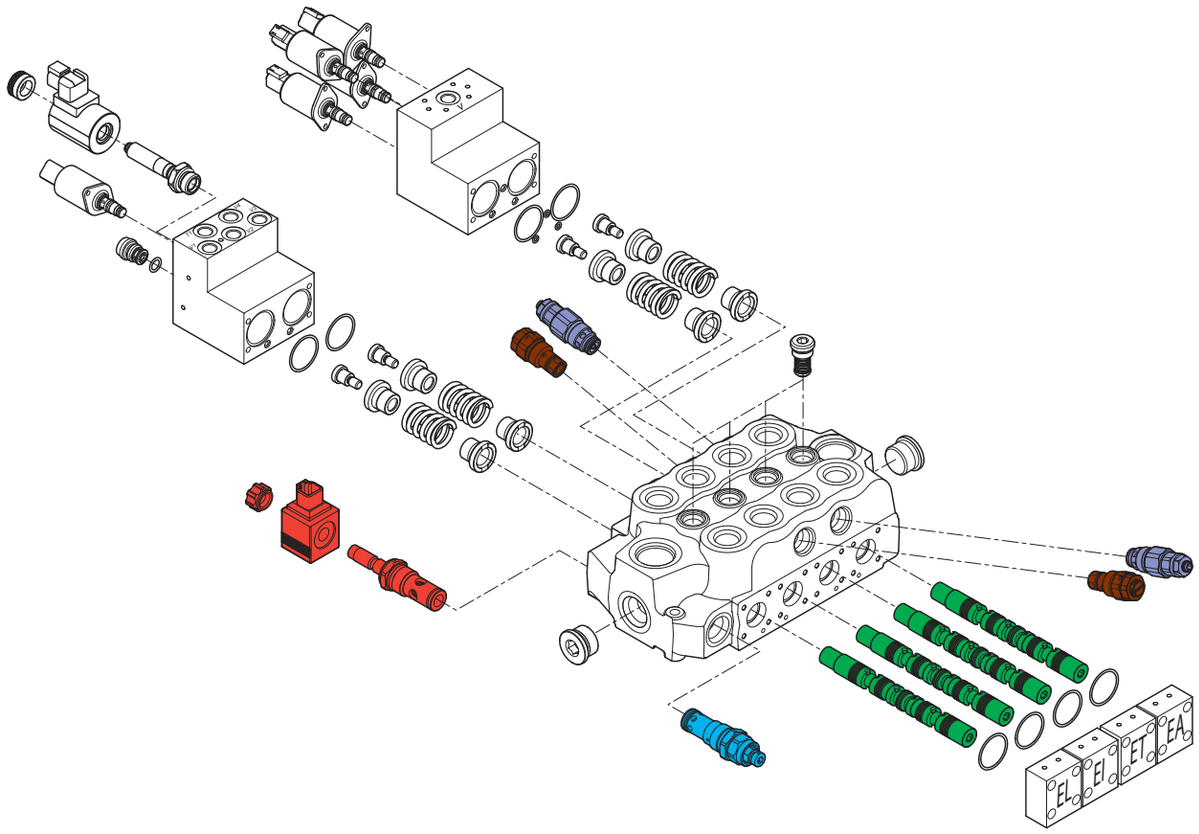


Hydraulic pressure arrives at P.

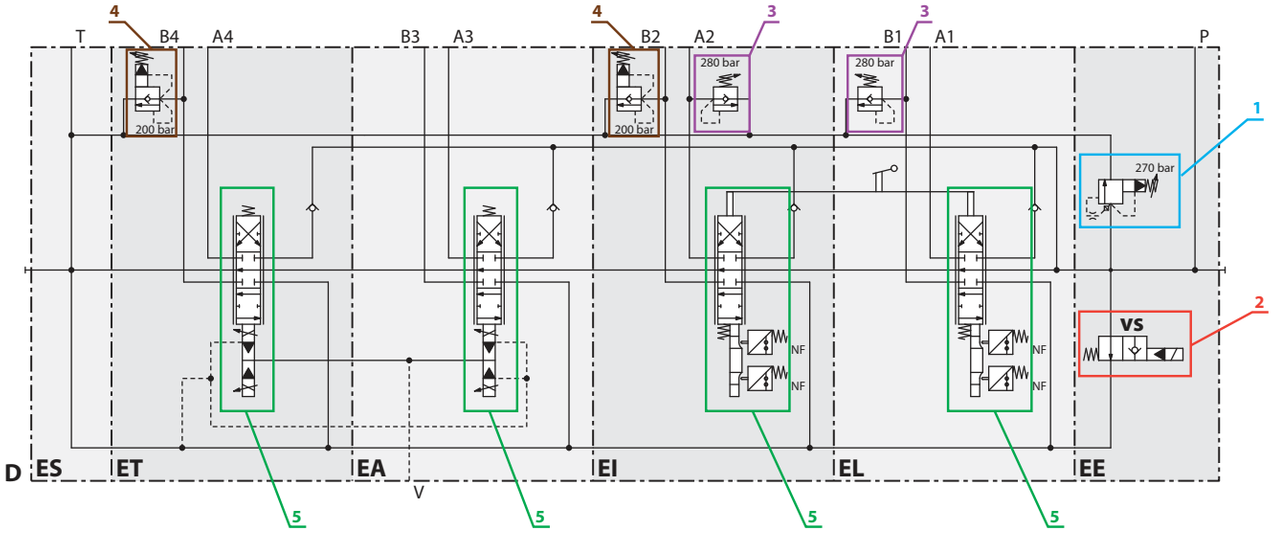
Oil goes through the valve, then through the pressure balance.

The pressure balance:
- open the circuit to the valve and to the load.
- send a pressure signal to the inlet composent through the circuit selector.

Values for information purposes only.



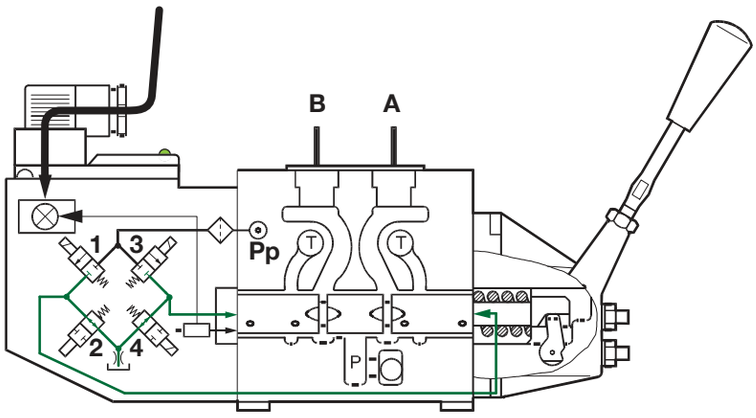
1. Main relief valve.
2. Movement cut-off valve (VS).
3. Pressure spike relief valve.
4. Pressure spike relief valve.
5. Valve slide.



CONTROL HEAD (TILTING COMPONENT)

Values for information purposes only.

The electronic system is always comparing the Usc control signal with the Usp position signal. This signal will be within: 0, 25U and 0.75 U. U is the electronic card's voltage.

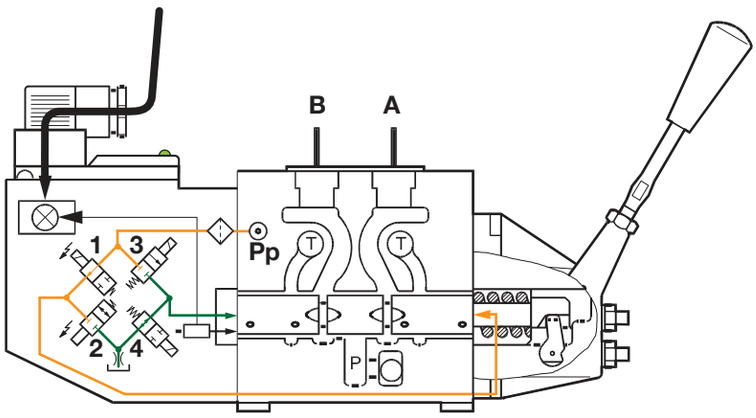


Signal = 0.50 x U

Consequences:

- No excited electrovalve.

- No slide movement.
(No flowrate towards «A» and «B».)

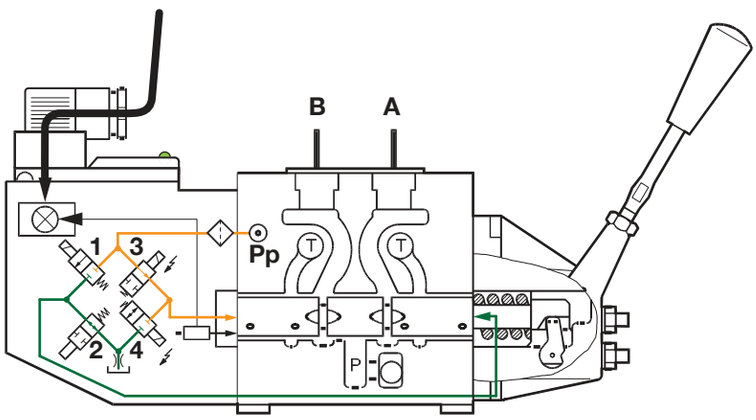


Signal = 0.25 x U

Consequences:

- Electrovalves 1 and 2 excited.

- Max. movement of slide towards «A».
(Max flowrate towards «A».)



Signal = 0.75 x U

Consequences:

- Electrovalves 3 and 4 excited.

- Max. movement of slide towards «B».
(Max. flowrate towards «B».)

Notes: _____

KEY

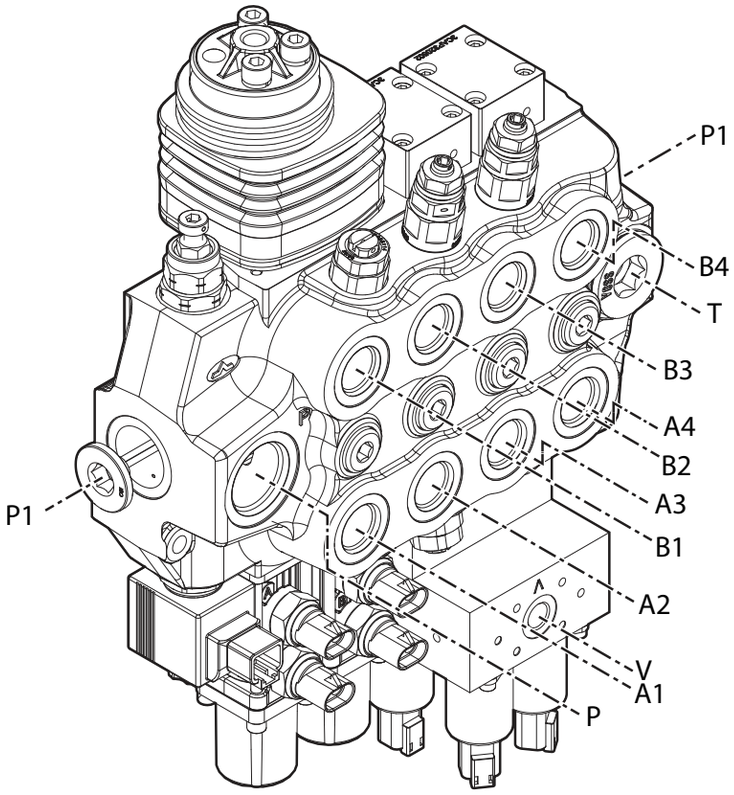
Item	Designation	Position on diagram	Characteristics
AC	ACCUMULATOR	C5/G5/I32/Q37	
BA	FEED BLOCK + ACCUMULATOR	C8	
BE	SEALING PLUG	S19	
BLR	VALVE BLOCK	E33/E37	
BR	BREATHER PLUG	S19	
BT	TRANSFER GEARBOX	M8	
CA	SUCTION STRAINER	S11	
CAR	ONE WAY VALVE	A7/K13/O20	
CH	HYDRAULIC COLLECTOR	S23	
CSP	COUNTERBALANCE VALVE	I24/I27/I28/M30	
CSPD	DOUBLE COUNTERBALANCE VALVE	M24/M33/M35/M38	
D	4-ELEMENT DISTRIBUTOR	O27	
EA	- ATTACHMENT ELEMENT	S36	
EE	- MAIN INLET ELEMENT	S27	
EI	- TILTING ELEMENT	S33	
EL	- LIFTING ELEMENT	S31	
ES	- OUTLET ELEMENT	S34	
AND	- TELESCOPE ELEMENT	S30	
D2	DEFLECTOR DISTRIBUTOR	M35	
ECD	- LEVELING ELEMENT	O36	
ESD	- RIGHT STABILIZER ELEMENT	O39	
ESG	- RIGHT STABILIZER ELEMENT	O37	
EVAA	REAR ATTACHMENT ELECTROVALVE	I36/I39	OPTION
EVCV	SPEED CHANGE ELECTROVALVE	Q12	
EVTDF	TELESCOPE HEAD ELECTROVALVE	E21/E24/E27/E30	OPTION
F	FILTER	A9/S37	
FDar	REAR DISC BRAKE	O22	
FDav	FRONT DISC BRAKE	O3	
FPN	NEGATIVE PARKING BRAKE	I9	
FR	RETURN FILTER	S15	
LFN	NEGATIVE BRAKE LEVER	E10	TÜV OPTION
M	ENGINE	M20	854E-E34TA
	- IDLE SPEED		850 rpm
	- NOMINAL RPM LOADED		2,200 rpm
	- MAX. RPM UNLADEN		2,350 rpm
MC	MASTER CYLINDER	G5	
MH	HYDROSTATIC ENGINE	O5	
MV	FAN ENGINE	C3	
N	LEVEL	S6	
P	HYDRAULIC PUMP	M10	
PAAR	REAR ATTACHMENT PLUG	G36/G39	OPTION
PAAV	FRONT ATTACHMENT CONNECTOR	A19/A25/A27/A30/C19/C25/C27/C30/E32/E36/E39/E40	OPTION
PD	STEERING PUMP	G14	
PH	HYDROSTATIC PUMP	O13	
Pp	PRESSURE TEST PORT	A13/A16/C7/E10/G4/G7/I5/I32/I34/K14/K16/K17/K20/O6/O14/Q11/S29/S38	
PRES	PRESSURE SWITCH	C10/E11/G11/I4/O40	
PRF	LEAK RETURN	G20	OPTION
PS	EMERGENCY PUMP	S39	
R3V	3-WAY VALVE	A21/A29	OPTION
RDU+F	UNIDIRECTIONAL FLOW RATE REDUCTION GEAR + FILTER	I10	
HR	OIL COOLER	A6	
RLF	BRAKE FLUID TANK	G3	
SD	STEERING SELECTOR	G14	
	- POSITION 1 SHORT STEERING	E15	
	- POSITION 2 FRONT WHEEL STEERING	E14	
	- POSITION 3 CRAB STEERING	E14	
TH7	TH7 VALVE	I7	
VAO	ANTI-OSCILLATION VALVE	I30	
VC	COMPENSATING CYLINDER	i34	DE 120x60 C:340
VCD	LEVELING CYLINDER	K34	DE 120x55 C:340
VCV	SPEED CONTROL CYLINDER	Q9	
VD	DISCHARGE VALVE	M12	
VDar	REAR STEERING CYLINDER	O21	
VDav	FRONT STEERING CYLINDER	O3	
VI	TILTING CYLINDER	K31	DE 130x65 C:416
VIC	COMPENSATING ISOLATION VALVE	G32/G34	
VL	LIFTING CYLINDER	G30	DE 160x70 C:830
VS	SAFETY VALVE	Q40	
VSD	RIGHT STABILIZER CYLINDER	K38	DE 125x60 C:170
VSG	LEFT STABILIZER CYLINDER	K35	DE125x60 C:170
VT1	TELESCOPE CYLINDER 1	K26	DE 100x60 C:3032
VT2	TELESCOPE CYLINDER 2	I26	DE 80x50 C:3032
VTSDL	SINGLE SIDE-SHIFT CARRIAGE CYLINDER	A22/A24/C33	OPTION
VVT	CARRIAGE LOCKING CYLINDER	A19/A27/C36	60x45 C:183-OPTION

Note:

1 - The calibration pressures of the main relief valves, on the inlet elements, are given for maximum engine speed.
2 - The calibration pressures of the secondary relief valves are for an engine speed of 1,000 rpm.
3 - The pressure relief valves should be adjusted at an oil temperature of 50 °C.

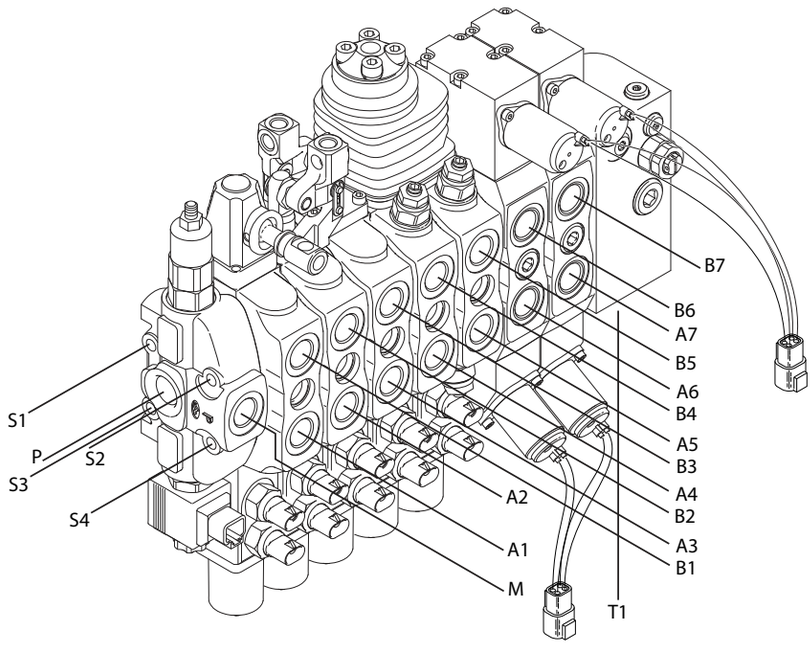
TIGHTENING TORQUES

MAIN DISTRIBUTOR (MT 835 / MT 835 H)

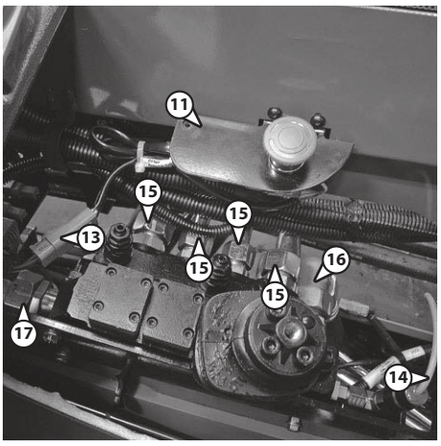


Item	Distributor / Connector (N.m)
A1	60 ±10 %
A2	
A3	
A4	
B1	
B2	
B3	
B4	
P	100 ± 10 %
P1	
T	
T1	
V	20 ± 10 %

MAIN DISTRIBUTOR (MT 1135/1335 + H)



Item	Distributor / Connector (N.m)
A1	60 ± 10%
A2	
A3	
A4	
A5	
A6	
A7	
B1	60 ± 10%
B2	
B3	
B4	
B5	
B6	
B7	
M	35 ± 10%
P1	100 ± 10%
L	30 ± 10%
S1 - S4	30
T	100 ± 10%
T1	100 ± 10%
V	35 ± 10%

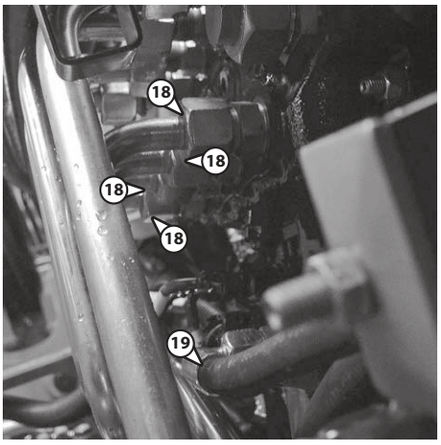


Remove the emergency stop button support (Item 11).

Disconnect connector X138 (Item 13) and connector X76 from the gray wire (Item 14).

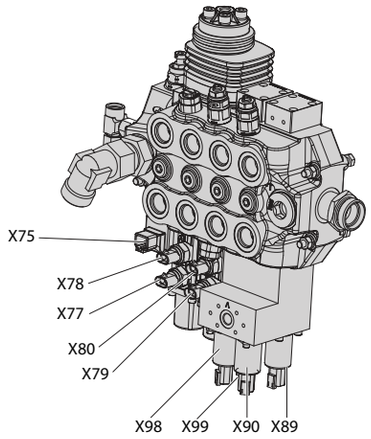
Mark and undo the 4 hoses (Item 15).

Disconnect the coupling (Item 16) and the hose (Item 17).



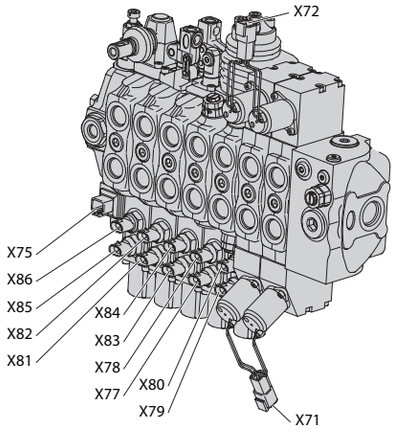
Mark and undo the 4 hoses (Item 18).

Disconnect the leak hose (Item 19).



MT 835 / MT 835 H

Disconnect connectors X75, X77, X78, X79, X80, X89, X90, X98 and X99.

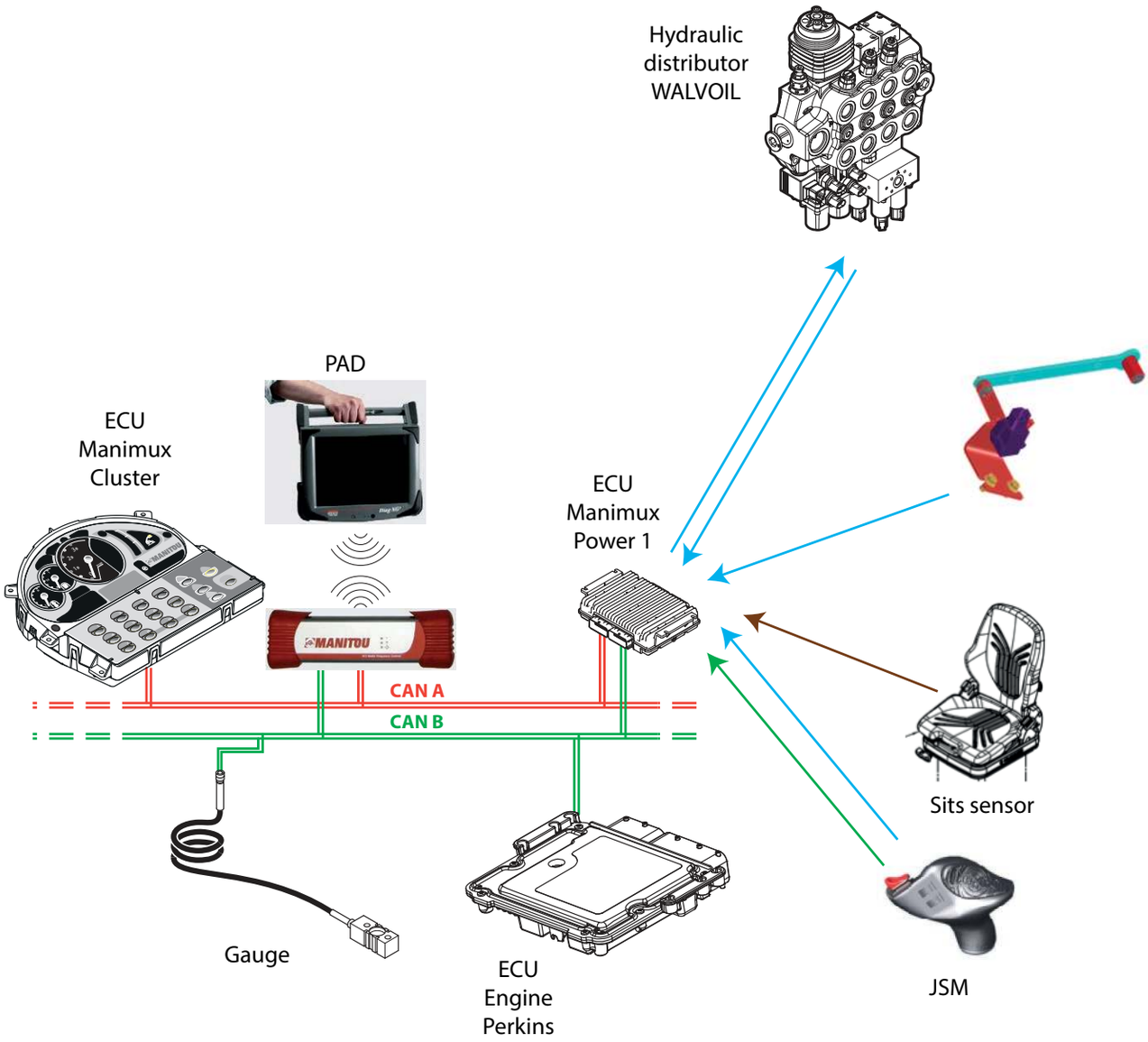


MT 1135 / MT 1135 H

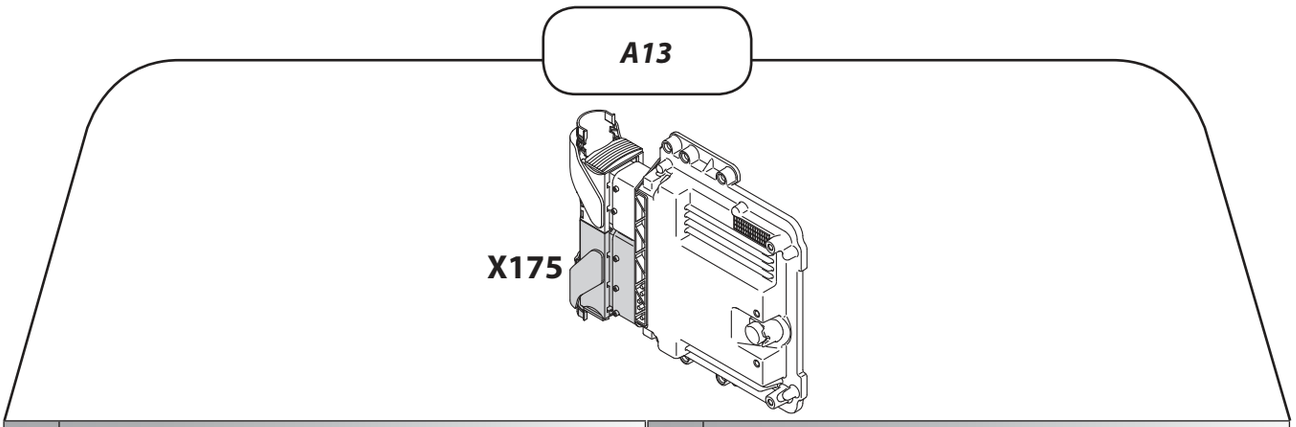
Disconnect connectors X71, X72, X75 and X77 to X86.

OVERVIEW OF ELECTRICAL AND ELECTRONIC SYSTEM

MT 835 / 1135 / 1335 ST3B



Can-Bus A
Can-Bus B
Hydraulic function
Transmission
Operator presence

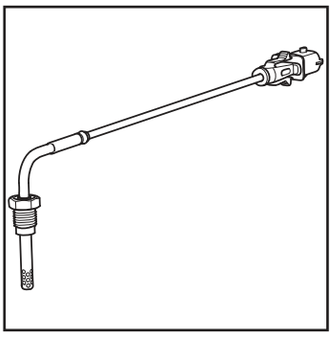


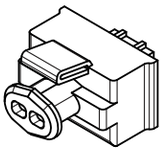
No. Pin	Designation
1	Battery +
2	Battery -
3	Battery +
4	Battery -
5	Battery +
6	Battery -
7	ST3B: Oxygen sensor heating ST4: DEF water circuit tank valve ground
9	PTO mode - On/Off
10	PTO mode - reset
11	Coolant pressure sensor*
14	DPF pressure sensor power supply (+5V)
16	Accelerator pedal sensors power supply (+5V)
18	P3 exhaust gas pressure sensor power supply
19	Inlet air temperature sensor signal
20	Inlet air temperature sensor ground
22	Preheat module signal
23	CAN High
26	Preheat module control
27	Starter relay negative command
28	Engine ECU control relay command
30	Water in diesel sensor
36	DPF pressure sensor ground
37	Exhaust gas pressure sensor ground P3
38	Accelerator pedal sensor ground
41	Preheat module control ground
43	Parked regeneration *
45	CAN Low
46	CAN High
47	CAN Low
48	Regeneration deactivated indicator lamp *

No. Pin	Designation
50	Preheat indicator lamp *
51	Engine stop indicator lamp *
52	Preheat module control
53	Starter relay positive command
54	After contact signal
56	DOC air inlet temperature sensor signal
57	P3 exhaust gas pressure sensor signal
58	DPF change in pressure signal
59	Parking brake (Ground) *
60	Accelerator pedal potentiometer signal
63	Oxygen sensor signal
64	Oxygen sensor "pump" power supply
65	DOC inlet temperature sensor ground
66	Regeneration inhibited switch *
67	Accelerator pedal idle signal (IVS)
69	Low oil pressure indicator lamp *
72	DEF pump motor
74	Regeneration activated indicator lamp (high exhaust gas temperature) *
76	Accelerator pedal idle signal (IVS)
79	ST3B: DOC inlet temperature sensor ground ST4: Exhaust outlet temperature sensor ground
80	ST3B: DOC inlet temperature sensor signal ST4: Exhaust outlet temperature sensor signal
81	ST3B: Exhaust temperature sensor ground ST4: SCR inlet temperature sensor ground
82	ST3B: Exhaust temperature sensor signal ST4: SCR inlet temperature sensor signal
83	DPF inlet temperature sensor ground
84	DPF inlet temperature sensor signal
85	Oxygen sensor ground
86	Oxygen sensor current adjustment
92	Engine fault indicator lamp *
94	High soot level indicator lamp *

* If the data passes through the CAN, the PIN cannot be used. Check the electrical diagram ◅ 80 - ELECTRICAL SCHEMATIC DIAGRAMS

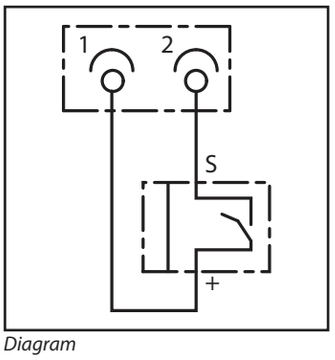
B82 DOC temperature sensor





Corresponding connector

PIN	Function
1	Sending information on the DOC temperature
2	Ground



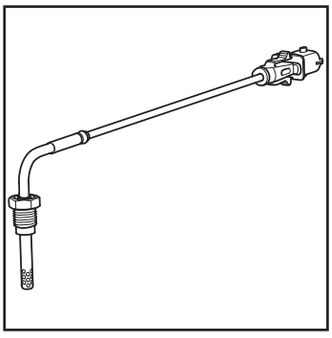
Diagram

	PIN	Minimum	Typical	Max
Manimux current		4 mA	6 mA	

Note :
Indicates the DOC inlet gas temperature to the ECM.
During regeneration, the temperature is close to 350 °C/400 °C.

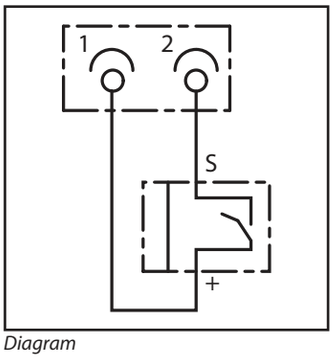
Notes: _____

B83 DPF temperature sensor



PIN	Function
1	Sending information on the DPF temperature
2	Ground

Corresponding connector



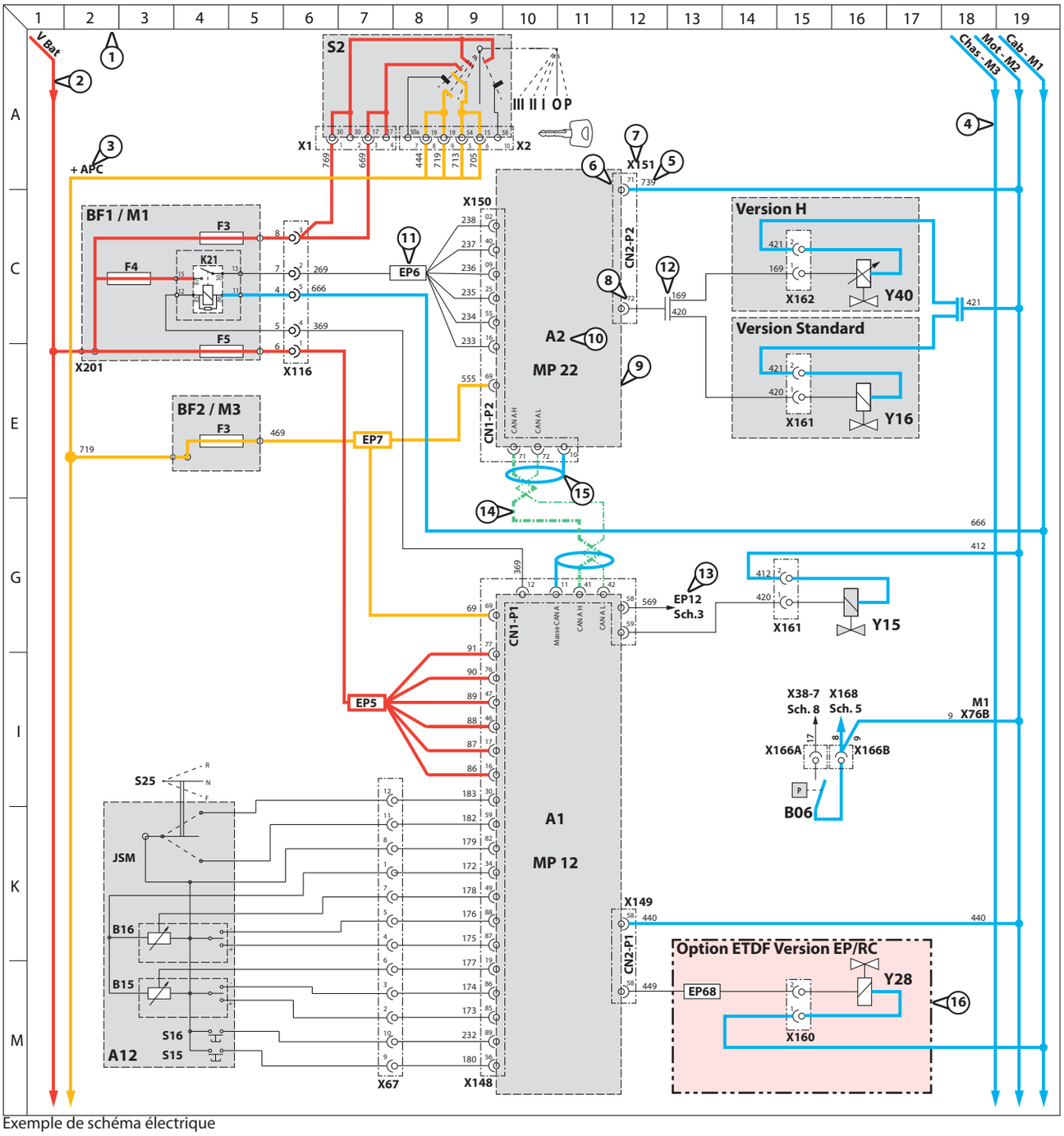
Diagram

	PIN	Minimum	Typical	Max
Manimux current		4 mA	6 mA	

Note :
It indicates to the ECM the temperature reached in the particle filter.
During regeneration, the temperature is close to 650 °C.

Notes: _____

ELECTRICAL DIAGRAM CODIFICATION EXAMPLE



Exemple de schéma électrique

Légende :

1 - Grille de repérage
2 - **+ Permanent**
3 - **+ Après contact**
4 - **Masses**
5 - N° fil
6 - Connecteur électrique
7 - Nom connecteur électrique
8 - N° Pin connecteur électrique
9 - Composant électrique
10 - Nom composant électrique
11 - Épissure
12 - Choix de version
13 - Renvoi vers autre schéma
14 - **CAN**
15 - **Blindage CAN**
16 - **Option**

Electrical connectors					
Wiring harness type	Item	Component name	Designation	Position on diagram	Hydraulic equivalence code
Frame/Engine	X07		Truck/engine connection	A2	
Cab	X13	A9	Cluster	C31	
Engine	X17	B83	Particle filter inlet pressure sensor	S5	
Engine	X18	B84	Particle filter inlet temperature sensor	Q5	
Engine	X19	B82	DOC inlet temperature sensor	O11	
Engine	X20	B6	Air filter clogging	E19	
Frame	X21	B7	Hydraulic filter sensor	O28	
Cab	X22	S11	Brake fluid level	C26 / E26	
Cab/Engine	X23		Engine/cab interface	C20	
Cab	X45		Door/Cluster switch	C13	
Cab	X52		Door/Power switch	I19	
Engine	X61	B34	Presence of water in diesel fuel	Q14	
Engine	X63	R2	Fuel gauge	C27	
Frame	X64	B8	Master cylinder pressure switch	C29	
Frame	X65	B9	Front wheel alignment	I36	
Frame	X66	B10	Rear wheel alignment	I38	
Frame	X100	B23	Boom angle	G31	
Frame/Cab	X110		Frame/Cab Interface	I16	
Cab	X121		Pneumatic seat	E16 / G16	
Frame	X134	S34	Telescope retraction sensor	Q31	
Cab	X148	A1	Power CN1 - P1	K27	
Cab	X149	A1	Power CN2 - P1	K39	
Frame/Engine	X173		Engine/frame connection	G37	
Engine	X174	A13	Engine ECU	C7	
Engine	X175	A13	Engine ECU	S7	
Engine	X176	B80	Air intake temperature sensor	G11	
Engine	X177	B81	Lambda sensor	M12	
Frame	X188	Y21	Discharge valve	S36	
Cab	X201	BF3 M5	Fuse box BF3 cab	A10	
Engine	X258	B74	Minimum radiator coolant level sensor	G38	

Electrical components			
Item	Designation	Position on diagram	Hydraulic equivalence code
A1	Manipower MP1	M34	
A9	MC4 Cluster	A24	
A13	Engine ECU	K8	
B6	Engine air filter clogging pressure switch	G19	
B7	Hydraulic filter clogging pressure switch	Q28	
B8	Brake master cylinder pressure switch	E29	
B9	Front wheel alignment sensor	I36	
B10	Rear wheel alignment sensor	I38	
B23	Boom angle sensor	G31	
B34	Water in diesel sensor	S15	
B74	Mini-radiator water level sensor	G39	
B80	Air intake temperature transmitter	G13	
B81	Lambda sensor	M13	
B82	DOC inlet temperature sensor	O13	
B83	Particle filter inlet pressure sensor	S3	
B84	Particle filter inlet temperature sensor	Q3	
R2	Fuel level sensor	E28	
S8	Driver presence seat switch	E16	
S9	Cluster cab door contact	E11	
S10	Power cab door contact	I19	
S11	Brake liquid level contact	E25	
S17	Diesel Particle filter regeneration control switch	G24	
S34	Telescope retracted sensor	S32	
Y21	Offloading electrovalve	S35	

Fuse box				
Item	Designation	Current	Position on diagram	Hydraulic equivalence code
BF3 / M4				
F21	Roof light + door switch + seat switch	3 A	C9	
F43	Ignition switch	50 A	A9	

Splices	
Item	Position on diagram
Ep.30	I32
Ep.31	I33
Ep.57	I15
Ep.89	I5
Ep.94	M15

1 – START-UP / CUSTOMER DIGICODE

MT 835 H ST3B

Electrical connectors					
Wiring harness type	**Item**	**Component name**	**Designation**	**Position on diagram**	**Hydraulic code equivalence**
Cab	X01	S2	Ignition switch (4 way)	A11	
Cab	X02	S2	Ignition switch (6 way)	A15	
Engine	X03	A18	Preheating module	K13	
Engine	X04	M1	Starter electrovalve	S5	
Frame/Engine	X07		Engine / Frame connection	I20	
Frame/Engine	X08		Engine / Frame connection	K20	
Frame/Engine	X09		Fuse box power supply	I8	
Engine	X10		Fuse box power supply	K7	
Cab	X13	A9	Cluster	C39	
Engine/Cab	X23		Engine / Cab Interface	M26	
Cab	X52		Door / Power connector	Q36	
Frame/Cab	X110		Frame / Cab Interface	O37	
Frame/Engine	X116		MP power supply engine / frame interface	E18	
Cab	X118		Digicode	C32	
Engine	X148	A1	CN1 P1 Power	M36	
Engine	X174	A13	Engine ECU	K18	
Engine	X175	A13	Engine ECU	K16	
Engine	X179		Alternator connection D+	G6	
Cab	X201	BF3	BF1 fuse box (cab)	E14	
Engine	X268		Engine ECU	Q17	

Electrical components			
Item	**Designation**	**Position on diagram**	**Hydraulic code equivalence**
A1	Manipower MP1	K37	
A9	MC4 Cluster	A36	
A13	Engine ECU	O17	
A18	Preheating module	K13	
G1	Battery 12 V/110 Ah	C4	
G2	Alternator 12 V/110 AH	I5	
M1	Starter	Q5	
S1	Battery cut-off	M4	
S2	Ignition switch	A16	
V3	6A/600V varistor protection diode	I29	
S10	Power cab door contact	Q37	

Fuse box				
Item	**Designation**	**Current**	**Position on diagram**	**Hydraulic code equivalence**
	BF1 / M1			
F51	K22 starter control relay	30 A	Q8	
F52	Preheating module	60 A	Q7	
F53	Engine ECM K21 relay	40 A	O10	
F54	Engine ECM power supply	25 A	O12	
F55	Engine ECM power supply	7.5 A	O14	
F56	Engine ECM K21 control	5 A	Q10	
	BF1 / M2			
K21	Engine ECM power supply relay	70 A	Q11	
K22	Starter control relay	20 A / 40 A	Q7	
	BF3 / M3			
F7	Digicode Cluster/Customer anti-start (option)	2 A	C21	
F9	Ignition switch position 1	2 A	C22	
	BF3 / M4			
F22	Cluster Power Supply	3 A	I25	
F25	Customer anti-start permanent	2 A	I26	
F31	Engine ECM alarm	5 A	I27	
	BF3 / M5			
F43	Ignition switch	50 A	E15	
F44	Manipower 1	40 A	G15	

Splices	
Item	**Position on diagram**
Ep.3	M31
Ep.20	G29
Ep.21	I29
Ep.32	Q37
Ep.93	K15
Ep.94	Q24
Ep.95	Q30

Electrical connectors					
Wiring harness type	Item	Component name	Designation	Position on diagram	Hydraulic code equivalence
Cab	X6	E15	Rotating beacon light	O14	
Cab	X11	S4	Wiper stalk switch	C15	
Cab	X12	S4	Wiper reset	C22	
Cab	X13	A9	Cluster	A28	
Cab	X15		Cab high/low interface	I15	
Cab	X16		Cab high/low interface	M8	
Cab	X25	M3	Front windscreen wiper	G19	
Cab	X27	M7	Front windscreen washer pump	E17	
Cab	X28	M8	Rear windscreen washer pump	K16	
Engine	X29	A8 / M16	Heating	Q8	
Frame	X31	E3	Rear left headlight	G34	
Frame	X32	E4	Rear right headlight	G38	
Frame	X35	E1	Front left headlight	C31	
Frame	X36	E2	Front right headlight	E33	
Frame	X38	B1	Reversing buzzer	C38	
Cab	X39		Horn	A39	
Cab	X43	M9	Window up engine	M6	
Cab	X46		Cigarette lighter	I10	
Cab	X47	S7	Cigarette lighter light	I9	
Cab	X50	E14	Roof light	M8	
Cab	X59	M4	Rear windscreen wiper	K18	
Cab	X68		Roof switch supply	I19	
Cab	X69	S6	Window wind up	K4	
Frame	X106		Boom electrical connector	M35	
Cab	X108		Side windscreen wiper	I20	
Frame/Cab	X110		Frame/cab Interface	G28	
Frame	X149	A1	CN1 P1 Power	A38	
Frame/Cab	X112		Frame/Cab Interface	M32	
Frame	X148		Power CN1 - P1	A29	
Frame	X172		Boom electrical connector	O36	
Cab	X201		Fuse box BF1 cab	E7	
Frame	X259		Rear left headlight connection	G34	
Frame	X260		Rear right headlight connection	G38	
Engine	X294		Oil vapor heater/connection	S34	
Engine	X295	R5	Oil vapor heater	S34	

Electrical components			
Item	Designation	Position on diagram	Hydraulic code equivalence
A1	Manipower MP1	A31	
A8	Heating/ventilation panel	Q9	
A9	MC4 Cluster	A27	
B1	Reversing sound alarm	C38	
B2	Horn	A40	
E1	Front left headlights	C33	
E2	Front right headlights	E35	
E3	Rear left headlight with fog light	I34	
E4	Rear right headlight with reverse light	I38	
E14	Roof light	M10	
E15	Rotating beacon light	Q15	
H1	Rear fog light	I36	
H2	Rear right and left position light	I35 / I37	
H3	Rear right and left stop light	I36 / I38	
H4	Rear left direction indicator light	I36	
H5	Rear right reverse light	I38	

Electrical components			
Item	Designation	Position on diagram	Hydraulic code equivalence
H6	Rear right direction indicator light	I37	
H7	Front right and left position light	C32 / E34	
H8	Right and left dipped beam light	C32 / E34	
H9	Right and left main beam light	C32 / E34	
H10	Front right direction indicator light	E34	
H11	Front left direction indicator light	C33	
M3	Front windscreen wiper engine	G19	
M4	Rear windscreen wiper engine	K19	
M7	Front windscreen washer pump	E17	
M8	Rear windscreen washer pump	K16	
M9	Window up engine	O5	
M16	Heating vent blower fan engine	S8	
R5	Engine oil vapor heater	S34	
S4	Wiper stalk switch	A24	
S6	Window regulator switch	K4	
S7	Cigarette lighter	I9	
S35	Standby switch except Danfoss	S24	
S36	Boom head electrical control switch except Danfoss	S26	
S37	Standby switch except Danfoss	S29	
V2	Front windscreen wiper parking diode protection 6 A/600 V	C21	
V3	6A/600V varistor protection diode	E25	

Fuse box				
Item	Designation	Current	Position on diagram	Hydraulic code equivalence
BF3 / M2				
K1	Predisposition	10 / 20 A	K22	
K2	Front windscreen wiper intermittent relay	10 / 20 A	K23	
K3	Free	10 / 20 A	K24	
K4	Front working headlight relay	10 / 20 A	K26	
K5	Ventilation/heating relay	10 / 20 A	K27	
K6	Engine oil reheating relay	10 / 20 A	K28	
BF3 / M3				
F3	S35 switch supply	15 A Max.	C9	
F4	Ventilation/Heating + APC	2 A	C10	
F11	Cigarette lighter	15 A Max.	C23	
F12	Front windscreen wiper + windscreen washer + intermittent relay K2	2 A	C20	
F13	Rear windscreen wiper + windscreen washer	2 A	C21	
F14	Relay K1 predisposition (X112.5)	2 A	C20	
F15	Switch S37 power supply	15 A Max.	C13	
F20	Electric window up	15 A Max.	C23	
BF3 / M4				
F21	Roof light + door switch + seat switch	3 A	G7	
F24	Front windscreen wiper engine return	2 A	G8	
F27	Rear windscreen wiper engine auto return + Roof option + side option	5 A	G8	
F30	Compressor and air-conditioning fan engine	2 A	G9	
F38	Engine oil vapor heater	3 A	G9	

Splices	
Item	Position on diagram
Ep.2	K5
Ep.6	K4
Ep.11	E13
Ep.18	C20

Splices	
Item	Position on diagram
Ep.19	C21
Ep.20	E25
Ep.21	E26
Ep.35	C35

Electrical connectors					
Wiring harness type	Item	Component name	Designation	Position on diagram	Hydraulic equivalence code
Cab	X67	A12	JSM plug	E11	
Frame	X71	Y6 / Y8	Port A/Telescope (retraction) and Attachment	C10	
Frame	X72	Y5 / Y7	Port B/Telescope (extension) and Attachment	C4	
Frame	X76	B22	Pressure safety valve/distributor switch	C32	
Frame	X77	B36	Boom raising (NC) sensor - B	Q19	
Frame	X78	B35	Boom lowering (NC) sensor - A	S18	
Frame	X79	B37	Tilting (NO) sensor - B	Q23	
Frame	X80	B38	Tilting (NC) sensor - A	S21	
Frame	X81	B42	Right stabilizer up (NC) sensor - B	S25	
Frame	X82	B41	Right stabilizer lowering (NC) sensor - A	S28	
Frame	X83	B40	Left stabilizer lowering (NC) sensor - B	Q29	
Frame	X84	B39	Left stabilizer up (NC) sensor - A	Q26	
Frame	X85	B43	Slope (NO) sensor - B	S31	
Frame	X86	B44	Slope (NC) sensor - A	Q32	
Frame	X135		Boom suspension	O13	
Cab	X148	A1	CN1 P1 Power	A4	
Cab	X149	A1	CN2 P1 Power	A39	
Cab	X150	A2	Power CN1 P2	I6	
Cab	X151	A2	Power CN2 P2	I15	
Frame	X167		Telescope suspension electrovalve 1	O12	
Frame	X168		Telescope suspension electrovalve 1	Q14	
Frame	X169		Telescope suspension cylinder valve pressure switch 1	Q15	
Frame	X190	Y22	Left axle lock cylinder electrovalve	I34	
Frame	X191		Right axle lock cylinder electrovalve link	E37	
Frame	X194		Intermediate boom inductive sensors	M8	
Frame	X202		Boom intermediate sensor 1	Q10	
Frame	X203		Boom intermediate sensor 2	O8	
Frame	X241	Y23	Right axle lock cylinder electrovalve	G37	
Frame	X252	Y64	Compensation isolation electrovalve on cylinder	K38	
Engine	X254		Fan regulator valve	Q6	
Frame	X255		Sensor connection on distributor	M31	
Frame	X256	Y80	Compensation isolation electrovalve on cylinder	K35	
Frame	X264	Y50	Walvoil flow control valve (VRD)	C19	
Cab	X287		Fan control	M5	
Engine	X293		Engine air inlet sensor	O6	

Electrical components			
Item	Designation	Position on diagram	Hydraulic equivalence code
A1	Manipower MP1	A18	
A2	Manipower MP2	I12	
A12	JSM lever control	G17	
B22	Hydraulic cut-off security valve/distributor pressure switch (NC)	E38	
B25	Telescope suspension cylinder valve pressure switch 1	S15	
B35	Sensor A/boom lowering distributor (NC)	S20	
B36	Sensor B/boom lifting distributor (NC)	Q21	
B37	Sensor B / tilting neutral distributor (NO)	Q22	
B38	Sensor A / tilting neutral distributor (NC)	S23	
B39	Sensor B/left stabilizer lowering distributor (NC)	Q25	
B40	Sensor A/left stabilizer lifting distributor (NC)	Q28	
B41	Sensor A/right stabilizer lowering distributor (NC)	S28	
B42	Sensor B/right stabilizer lifting distributor (NC)	S25	
B43	Sensor B/tilting neutral distributor (NO)	S31	
B44	Sensor A/tilting neutral distributor (NC)	Q32	
B67	Intermediate boom extend sensor 1	Q10	
B68	Intermediate boom extend sensor 2	Q9	
B79	Air intake temperature transmitter	Q4	
Y5	Extension telescope proportional electrovalve	E10	
Y6	Telescope retraction proportional electrovalve	E7	
Y7	Attachment proportional electrovalve direction 1	E9	
Y8	Attachment proportional electrovalve direction 2	E6	
Y10	Telescope suspension electrovalve 1	Q13	
Y11	Telescope suspension electrovalve 2	Q14	
Y22	Left axle lock cylinder electrovalve	I33	
Y23	Right axle lock cylinder electrovalve	G36	
Y50	Flow control valve	E19	
Y61	Fan speed control electrovalve	S6	
Y64	Compensation insulation electrovalve	K38	
Y80	Compensation insulation electrovalve	K35	

Fuse box				
Item	Designation	Current	Position on diagram	Hydraulic equivalence code
BF3 / M4				
F21	Roof light + door switch + seat switch	3 A	C9	
F43	Ignition switch	50 A	A9	

Splices	
Item	Position on diagram
Ep.22	O22
Ep.36	O28
Ep. 37	I38
Ep.38	I39
Ep.63	K11

POSITION OF CONNECTORS BY DIAGRAM

	Electrical connectors							
Item	Diag. 1	Diag. 2	Diag. 3	Diag. 4	Diag. 5	Diag. 6	Diag. 7	Diag. 8
X01	√							
X02	√							
X03	√					√		
X04	√							
X06							√	
X07	√	√			√	√		
X08	√					√		
X09	√							
X10	√							
X11							√	
X12							√	
X13	√	√	√		√		√	√
X15							√	√
X16							√	√
X17					√	√		
X18					√	√		
X19					√	√		
X20					√			
X21					√			
X22					√			
X23	√		√		√			√
X25							√	
X26								√
X27							√	
X28							√	
X29							√	√
X30								√
X31							√	
X32							√	
X33								√
X34								√
X35							√	
X36							√	
X37								√
X38							√	
X39							√	
X40								√
X43							√	
X45					√			
X46							√	
X47							√	
X48								√
X49								√
X50							√	
X52	√				√			
X53			√					
X54			√					
X57			√					
X59							√	√
X61					√			
X62			√					
X63					√			

	Electrical connectors							
Item	Diag. 1	Diag. 2	Diag. 3	Diag. 4	Diag. 5	Diag. 6	Diag. 7	Diag. 8
X64			√					
X65			√					
X66			√					
X67			√	√				
X68							√	√
X69							√	
X70			√					
X71				√				
X72				√				
X74			√					
X75					√			
X76				√				
X77				√				
X78				√				
X79				√				
X80				√				
X81				√				
X82				√				
X83				√				
X84				√				
X85				√				
X86				√				
X88					√			
X91								√
X92								√
X93								√
X94								√
X95								√
X96					√			
X97								√
X100					√			
X101								√
X102								√
X103								√
X104								√
X105								√
X106							√	
X107								√
X108							√	√
X109								√
X110	√	√			√		√	
X111			√		√			
X112							√	√
X115		√						
X116	√	√						
X118	√							
X121					√			√
X132					√			
X133					√			
X134					√			
X135								√
X138					√			
X139			√					

80

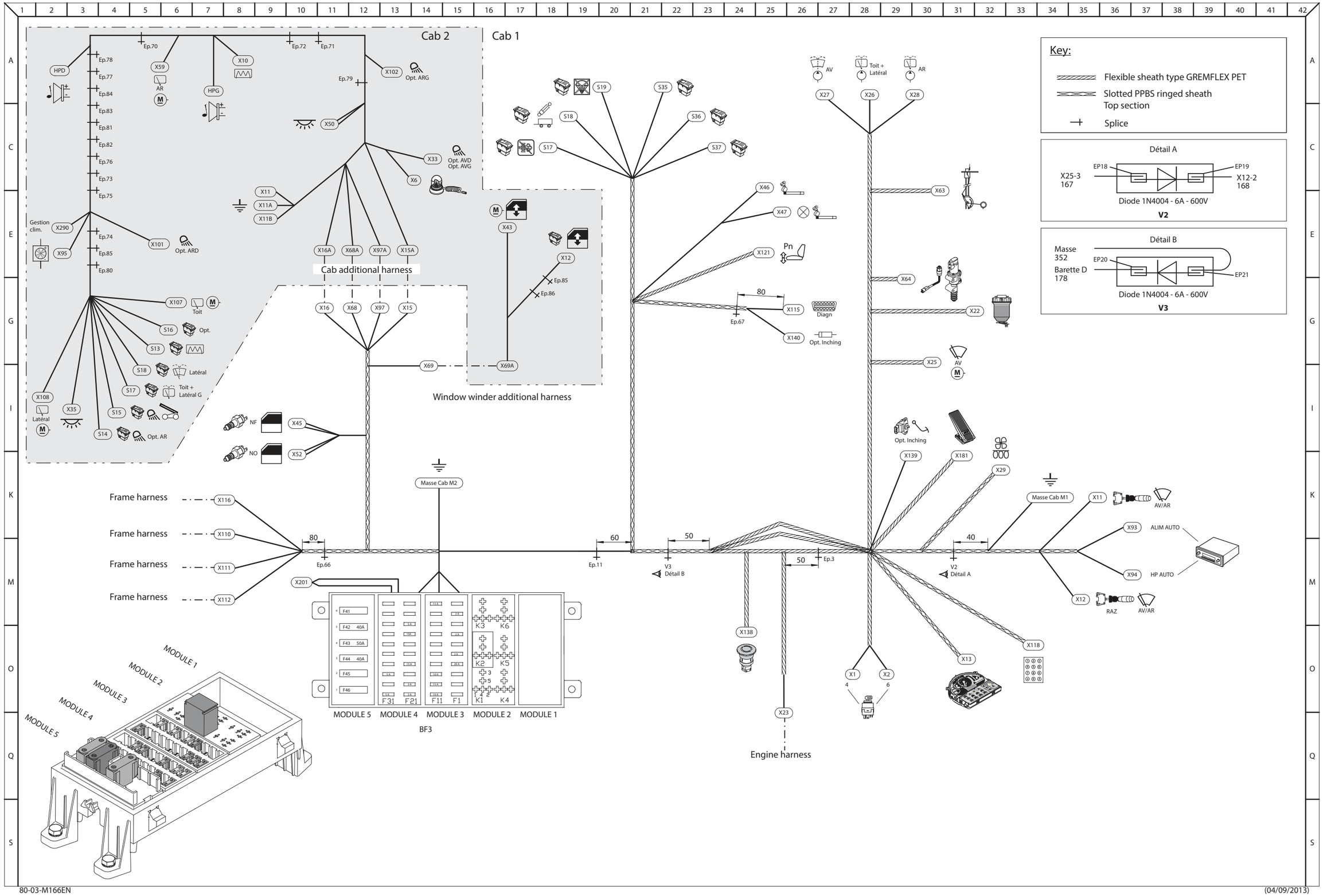
Electrical connectors					
Wiring harness type	Item	Component name	Designation	Position on diagram	Hydraulic equivalence code
Engine	X7		Truck/engine connection	E22	
Engine	X8		Truck/engine connection	A32	
Engine 2	X900		Fuel metering valve	E14	
Engine 2	X901		Fuel rail pressure sensor	G14	
Engine 2	X902		Engine fuel temperature sensor	K14	
Engine 2	X903		Injector cylinder 1	A22	
Engine 2	X904		Injector cylinder 2	C22	
Engine 2	X905		Injector cylinder 3	C22	
Engine 2	X906		Injector cylinder 4	C22	
Engine 2	X907		Intake manifold pressure & temperature sensor	K14	
Engine 2	X908		Throttle valve position sensor & actuator	Q14	
Engine 2	X909		Exhaust gas pressure sensor	M14	
Engine 2	X910		Exhaust gas temperature sensor	M14	
Engine 2	X911		Wastegate valve regulator (turbo)	O14	
Engine 2	X912		Coolant temperature sensor	I14	
Engine 2	X913		EGR valve position sensor & actuator	O14	
Engine 2	X914		Oil pressure switch	G14	
Engine 2	X915		Crankshaft speed sensor	I14	
Engine 2	X916		Camshaft position sensor	G14	

Electrical connectors					
Wiring harness type	Item	Component name	Designation	Position on diagram	Hydraulic code equivalence
Cab	X13	A9	Cluster	C31	
Engine/Cab	X23		Engine/Cab Interface	E11	
Engine	X53	Y3	Forward gear electrovalve	S19	
Engine	X54	Y4	Reverse gear electrovalve	S20	
Frame	X62	B14	Gearbox output speed sensor	I16	
Engine	X64	B8	Master cylinder pressure switch	E30	
Frame	X65	B9	Front wheel alignment	I24	
Frame	X66	B10	Rear wheel alignment	I25	
Cab	X67	A12	JSM plug	I23	
Frame	X70	B17	Brake assistance circuit pressure switch (TUV)	S21	
Cab	X74	A12	Up - Down Socket/JSM	I18	
Engine	X142	B60	Speed engagement sensor	S23	
Engine	X144	Y38	Gear 1 electrovalve slow	O32	
Engine	X145	Y39	Gear 2 electrovalve quick	M31	
Engine	X146	Y37	Low speed electrovalve	O35	
Engine	X147	Y36	Motion direction electrovalve	O34	
Engine	X148	A1	CN1 P1 Power	M13	
Engine	X149	A1	CN2 P1 Power	M27	
Engine	X151	A2	Power CN1 P2	M36	
Engine	X175	A13	Engine ECU	E8	
Cab	X181	B48	Accelerator pedal potentiometer	E14	

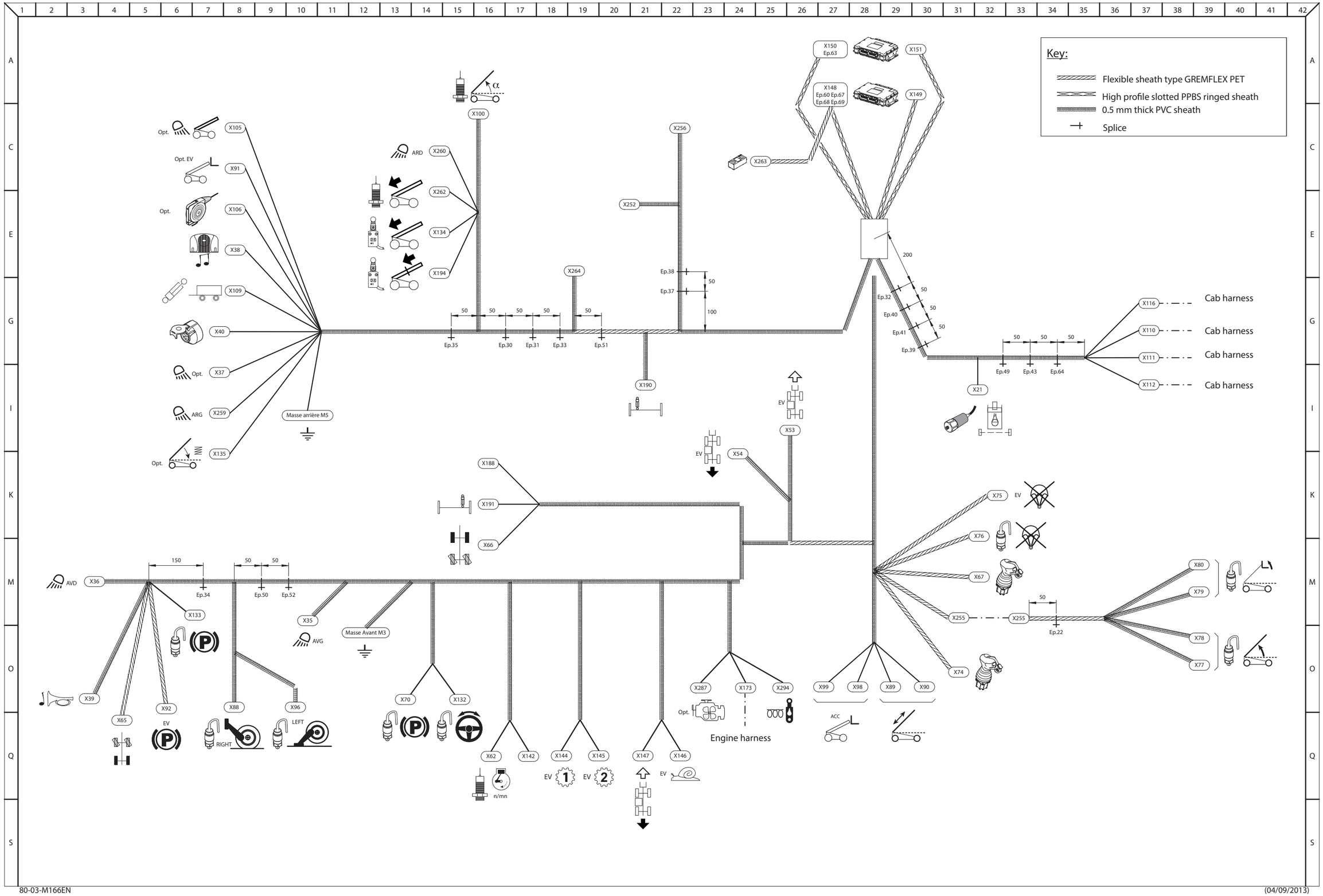
Electrical components			
Item	Designation	Position on diagram	Hydraulic code equivalence
A1	Manipower MP1	K28	
A2	Manipower MP2	K33	
A9	MC4 Cluster	C30	
A12	JSM lever control	I18	
A13	Engine ECU	G7	
B8	Master cylinder pressure switch	E30	
B9	Front wheel alignment sensor	I25	
B10	Rear wheel alignment sensor	I26	
B14	Gearbox output speed sensor	I15	
B17	Servo brake circuit fault pressure switch (TUV)	S21	
B48	Accelerator pedal angular sensor	E12	
B60	Gear 1 or 2 engaged sensor	S23	
Y3	Forward electrovalve	S19	
Y4	Reverse electrovalve	S20	
Y36	Motion direction electrovalve	O34	
Y37	Low speed electrovalve	O35	
Y38	Gear 1 electrovalve	O33	
Y39	Gear 2 electrovalve	O32	

Splices	
Item	Position on diagram
EP13	E12
EP14	E13
Ep.32	K14
Ep.94	G10

CAB 1 AND 2 HARNESSES



FRAME HARNESS



Item	Designation	Position on harness layout				Comments
		Assembly	Frame	Engine	Cab	
X255	Sensor connection on distributor	K19/M20	M31/M32			
X256	Compensation insulation valve	K8	C22			
X258	Mini-radiator water level sensor	Q20		M21		
X259	Rear left headlight connection	M2/M3	I6/I8			
X260	Rear right headlight connection	M5	C13/C15			
X262	Boom retraction speed sensor	M5	E15			
X263	CAN Strain gauge	K15	C25			
X264	Flow control valve	M8	E19			
X268	Computer ground	O25		M33		
X287	Fan regulator option	O19	O23			
X290	Air-conditioning management	E6			E2	
X294	Oil vapor heater/connection	O18	O25			
X900	Fuel metering valve	Q17	See "Engine harness" 3D location			
X901	Fuel rail pressure sensor	Q17				
X902	Engine fuel temperature sensor	Q17				
X903	Injector cylinder 1	Q17				
X904	Injector cylinder 2	Q18				
X905	Injector cylinder 3	Q18				
X906	Injector cylinder 4	Q20				
X907	Intake manifold pressure & temperature sensor	Q17				
X908	Throttle valve position sensor & actuator	Q17				
X909	Exhaust gas pressure sensor	Q17				
X910	Exhaust gas temperature sensor	Q16				
X911	Wastegate valve regulator (turbo)	Q16				
X912	Coolant temperature sensor	Q16				
X913	EGR valve position sensor & actuator	Q16				
X914	Oil pressure switch	Q16				
X915	Crankshaft speed sensor	Q16				
X916	Camshaft speed sensor	Q16				

GROUNDS

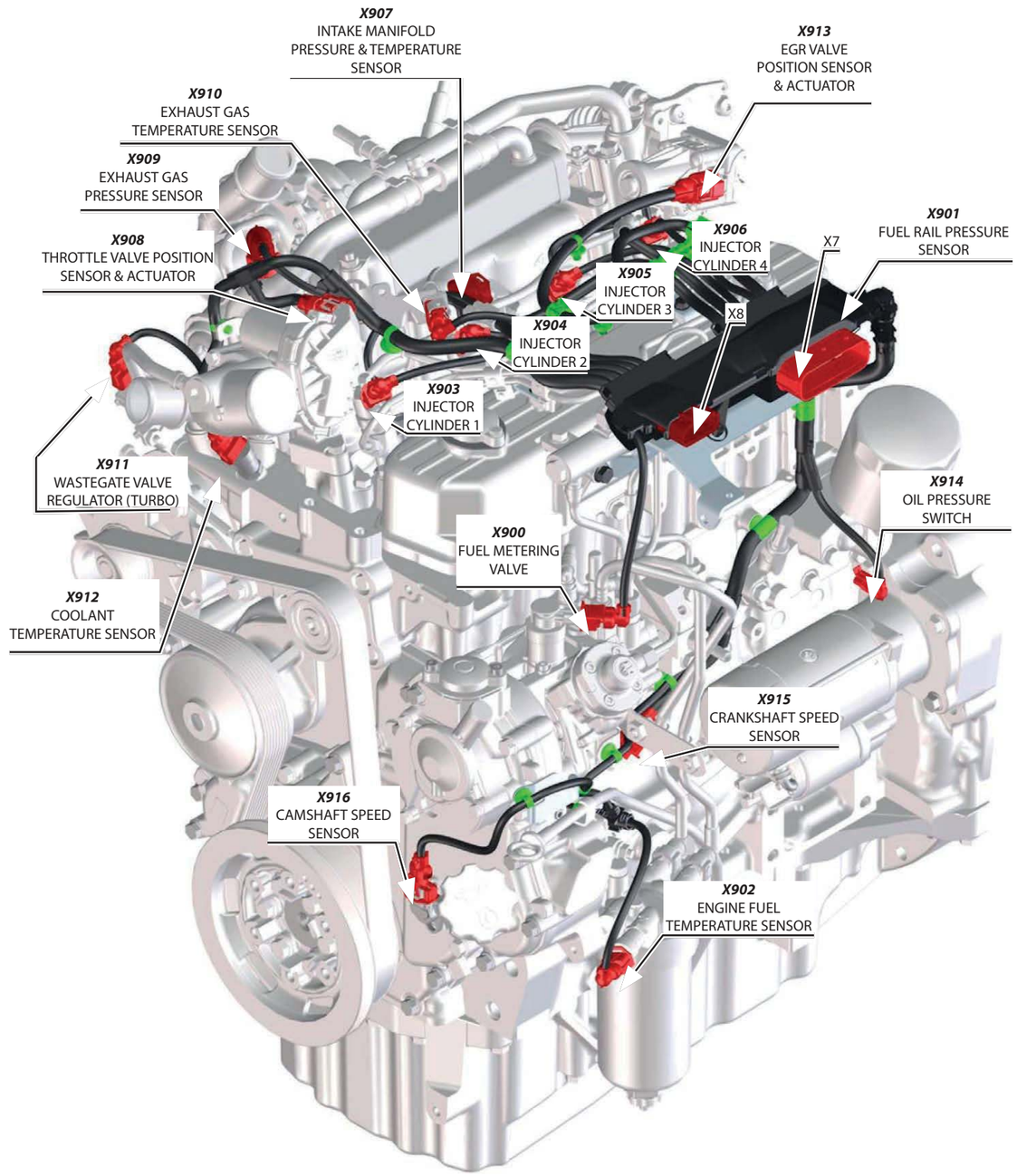
Item	Designation	Position on harness layout				Comments
		Assembly	Frame	Engine	Cab	
M1	Cab dashboard module ground	K28			K34	
M2	Cab fuse/relay box ground	I18			K14	
M3	Frame front ground	M28	O11			
M3	Engine ground	M27		E14		
M5	Rear frame ground	O4	I10			
X11	Buisard cab ground	A15			E9	
X11A	Buisard cab ground	A15			E9	
X11B	Buisard cab ground	A15			E9	

DIODES AND SPLICES

Item	Designation	Position on harness layout				Comments
		Assembly	Frame	Engine	Cab	
EP.3	Splice	K27			M27	
EP.11	Splice	I19			M19	
EP.30	Splice	K6	G17			

Item	Designation	Position on harness layout				Comments
		Assembly	Frame	Engine	Cab	
X32	Rear right headlight	Q7	C11			
X33	Front L/R working headlight link	C17			C14	
X35	Roof light	E13			I3	
X35	Front left headlight	G29	M10			
X36	Front right headlight	Q29	M3			
X37	Rear number plate light	M3	G8			
X38	Reverse buzzer	M4	C8			
X39	Main horn	M31	O3			
X40	Trailer socket	M3	G8			
X43	Window up engine	G19			E17	
X45	Door switch closed/Cluster	G20			I10	
X46	Cigarette lighter	K20			E24	
X47	Cigarette lighter light	K19			E24	
X50	Roof light	A10			C11	
X52	Door switch closed/Manimux Power	G19			K10	
X53	Forward electrovalve	M17	I27			
X54	Reverse electrovalve	M15	K25			
X59	Rear windscreen wiper engine	c6			A6	
X61	Presence of water in diesel sensor	Q23		G19		
X62	Gearbox output speed sensor	M19	Q17			
X63	Fuel gauge	I28			C30	
X64	Master cylinder pressure switch	I28			G29	
X65	Front wheel alignment sensor	M31	Q4			
X66	Rear wheel alignment sensor	O10	M15			
X67	JSM plug	K19	O35			
X68	Roof switch supply + air-conditioning	G17			G12	
X68A	Roof switch supply + air-conditioning	C15			E12	
X69	Cab/window control connection	G20			I14	
X69A	Cab/window winder connection	G20			G17	
X70	Brake assistance circuit pressure switch (TUV)	K26	O13			
X74	JSM raising/lowering	M19	O34			
X75	Movement safety electrovalve	M13	I21			
X88	Right stabilizer high pressure switch	M35	O8			
X91	Telescope head electrovalve option	M4	C8			
X92	Negative brake electrovalve	M31	O6			
X93	Car radio supply	I30			K36	
X94	Loudspeakers	I29			M36	
X95	Cab/air-conditioning condenser harness link	E6			E2	
X96	Left stabilizer low pressure switch	K35	O10			
X97	Air-conditioning module management	G17			G12	
X97A	Air-conditioning module management	A15			E12	
X100	Boom angle sensor	M6	C16			
X101	Rear right working light	E6			E5	
X102	Rear left working light	A7			A13	
X105	Boom working light (predisposition connector option)	M4	E8			
X107	Cab roof windscreen wiper engine	E10			G6	
X108	Side windscreen wiper engine	E14			I2	
X109	Rear hydraulic two way electrovalve	M4	E8			
X110	Frame/cab Interface	G17	G37		K8	

ENGINE 3D HARNESS 2



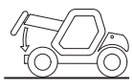
WARNING DEVICE / LONGITUDINAL STABILITY LIMITER TEST

Scrupulously follow the boom positioning instructions. If in doubt during the test procedure, exit cleanly by short pressing the cancel button .

The appearance of the screen [TEST: Security Test incomplete or faile] informs of non-adherence to an instruction or a cancellation request or an instruction outside of the time limit.

These tests are essential for checking the correct operation and adjustment of the different components of the device.

- Place the lift truck on flat, level ground with the wheels straight.
- Hold down the test button .

STEP 1	TEST: Press ↓ to Enter Security Test Mode	→	Beginning of the procedure.	→	***Confirm***	Go to stage 2.
STEP 2	TEST: Fully extend the stabilizers then press ↓	→	Lower the stabilizers completely.	→	***Confirm***	Go to stage 3.
STEP 3	TEST: Retract telescope lift the boom to max position then press ↓	→	 Place the lift truck without any attachment, with the boom fully retracted and raised. → Confirm	→	***TEST OK***	Go to stage 4.
				→	***TEST NOT OK*** Screen display TEST: Retract Telescope OK / Boom Sensor NOK / Strain Gauge NOK	Check sensors
STEP 4	TEST: Lower the boom at full speed	→	 Lower the boom with the engine running at full revs and the hydraulic control at the maximum setting. Slow lowering until movement is cut-off.	→	***TEST OK***	Go to stage 5.
				→	***TEST NOT OK*** Screen display TEST: Regulation NOK / Security Valve OK	Check valves
STEP 5	TEST: Lower the boom until stop	→	 Continue to lower the boom with the engine running at full revs and the hydraulic control at the maximum setting. Slow lowering until movement is next cut-off.	→	***TEST OK***	Go to stage 6.
				→	***TEST NOT OK*** Screen display TEST: Security Valve NOK	Check valves
STEP 6	TEST: Test movements then if test OK : ↓ or test NOK : ⌫	→	Request in the following order: a reverse tilt, a forward tilt and a telescope extension. None of these 3 movements should be possible.	→	***TEST OK*** ***Confirm***	Go to stage 7.
				→	***TEST NOT OK*** ***Cancel*** Exit test mode.	
STEP 7	TEST: Security Test Procedure OK	→	End of procedure.			

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