MANITOU

HANDLING YOUR WORLD

647865EN (14/01/2021)

MHT 10180 MINING 129M ST4 S1

MHT 10230 MINING 129M ST4 S1

MHT- X 10180 MINING 129M ST3A S1

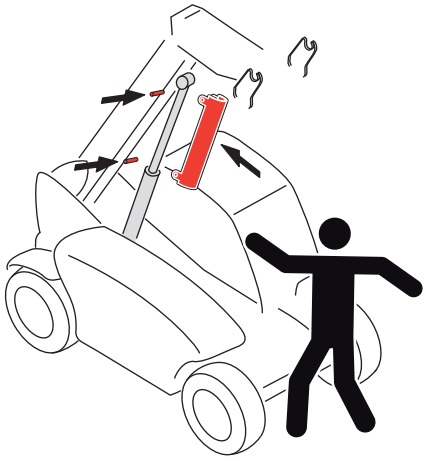
MHT- X 10230 MINING 129M ST3A S1

REPAIR MANUAL

Never step on a part of the machine that has not been designed for it.

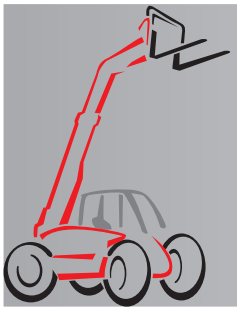
Never wear clothes, jewelry or objects that could get caught during work and cause accidents.

Always wear protection glasses, gloves, safety shoes as well as any other protection required for the work to be carried out.



When carrying out maintenance operations near a mobile object, make sure it is securitized.

When changing, or draining oils or fuel, or any other operation with liquids, solids, gases that are harmful to the environment, make sure the necessary precautions are taken to avoid contaminating the environment.

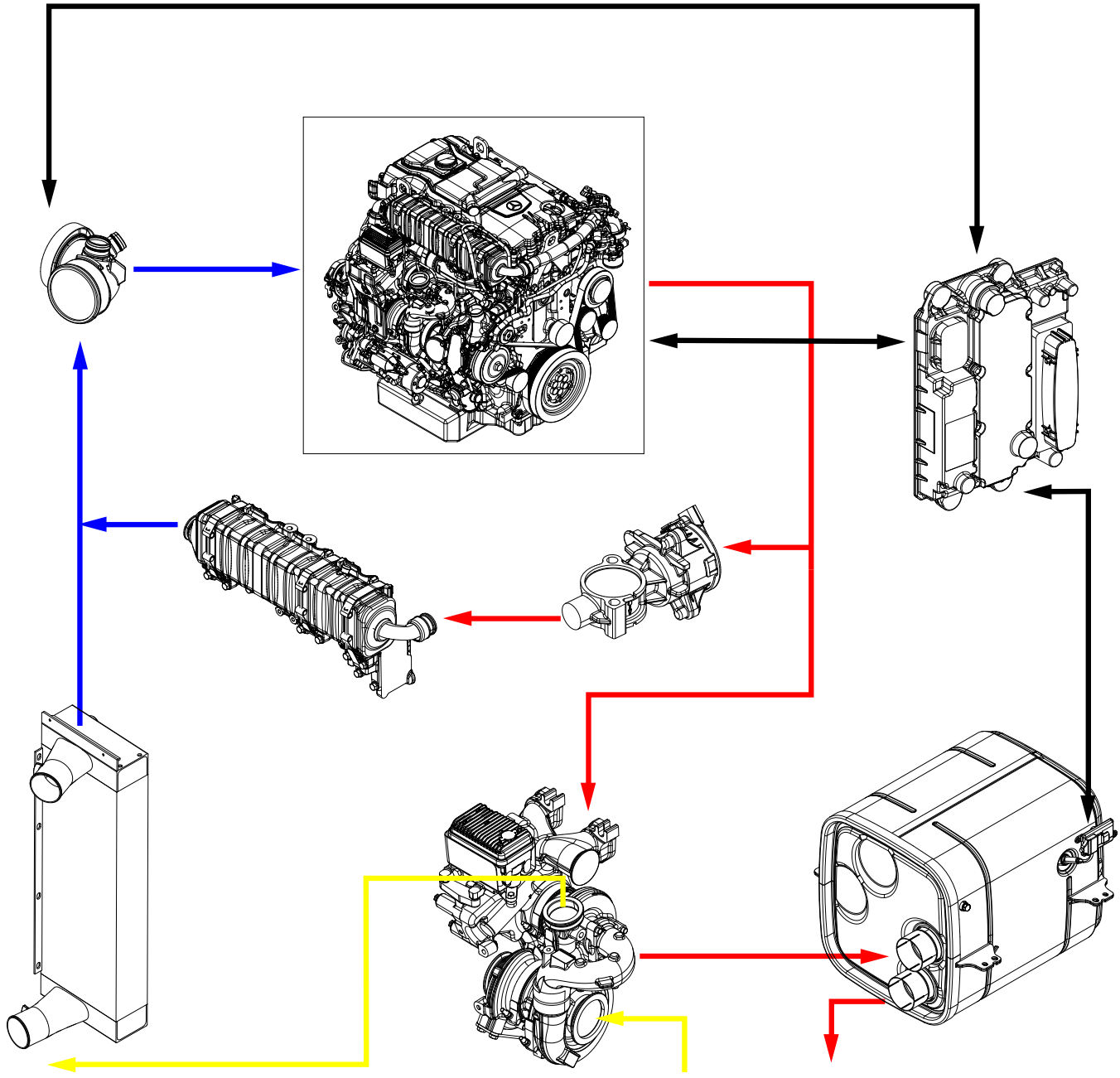


GENERAL CONTROL AND ADJUSTMENT

pages

NETWORKING – SYSTEM OVERVIEW

A4 Motor control module (MCM)
A60 Aftertreatment control module (ACM)



Key

- Cooled air circuit
- Intake air circuit
- Exhaust gas circuit
- Interaction between components

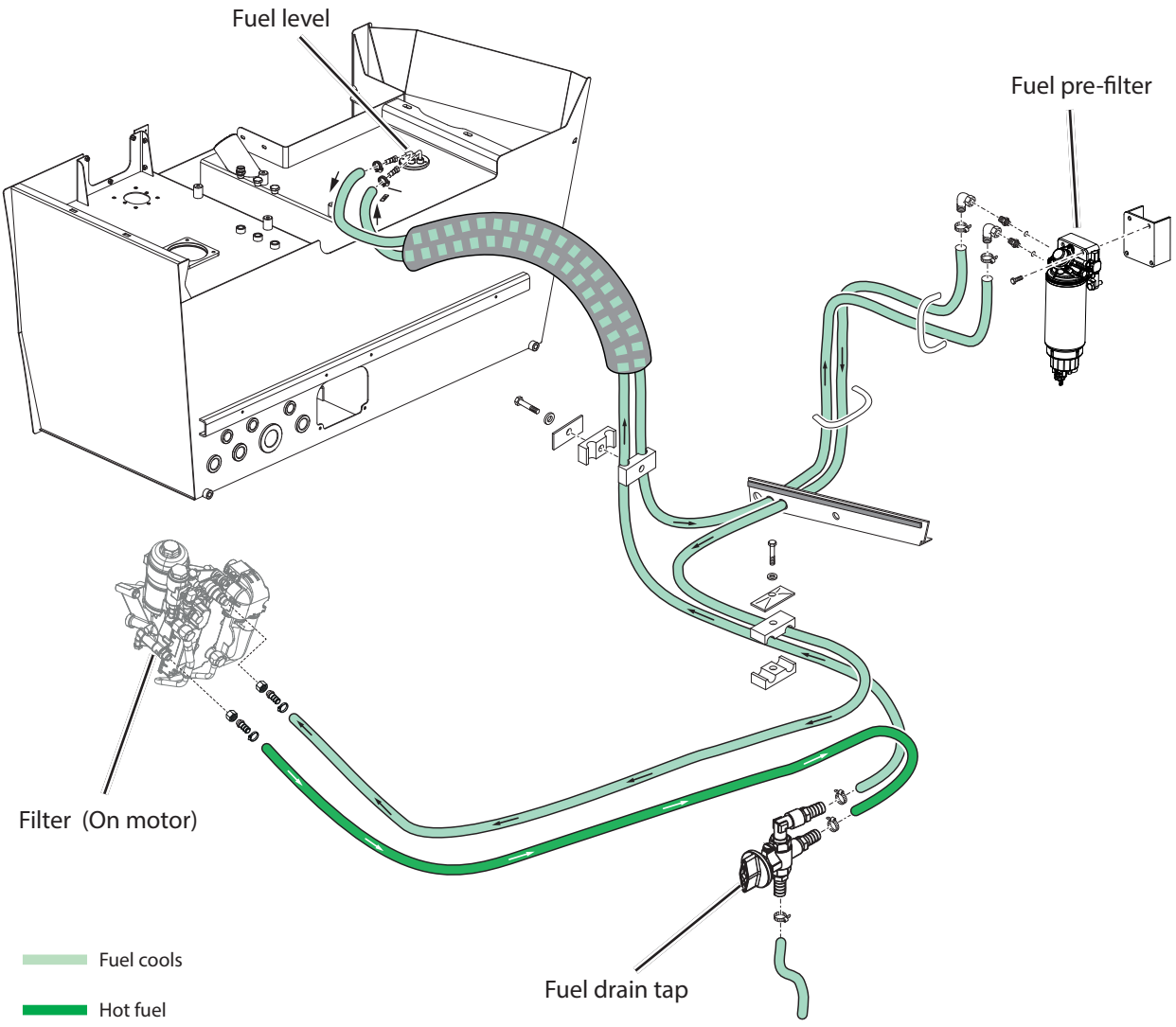
ENGINE GENERAL INFORMATION

The engine is a water-cooled four-stroke diesel engine with direct injection.
The cylinders are arranged in a row. Each cylinder has two inlet valves and one outlet valve.
Each cylinder has its own fuel injection pump (unit pump) with a short high-pressure fuel injection line to the multi-hole nozzle at the centre of the combustion chamber.
The unit pumps sit directly in the crankcase and are driven by the camshaft.
The engine is equipped with exhaust gas turbocharger and intercooler as standard. The engine can be equipped with optional engine brakes (brake valve and constant throttle valves).
It is a low-emission engine.
Start of injection, injection duration and injection quantity are controlled entirely electronically.

ELECTRONIC ENGINE CONTROL UNIT

The engine has a fully electronic management system which, along with the engine and its associated sensors, consists of the following components:
– engine control unit (MR)
– drive control unit (FR) and/or other vehiclespecific control units, e.g. adaptation module (ADM)
– exhaust gas aftertreatment control unit (only for engines with BlueTec® exhaust gas aftertreatment)
The control units are interconnected by a CAN line (Controller Area Network line), which facilitates the exchange of all necessary data.

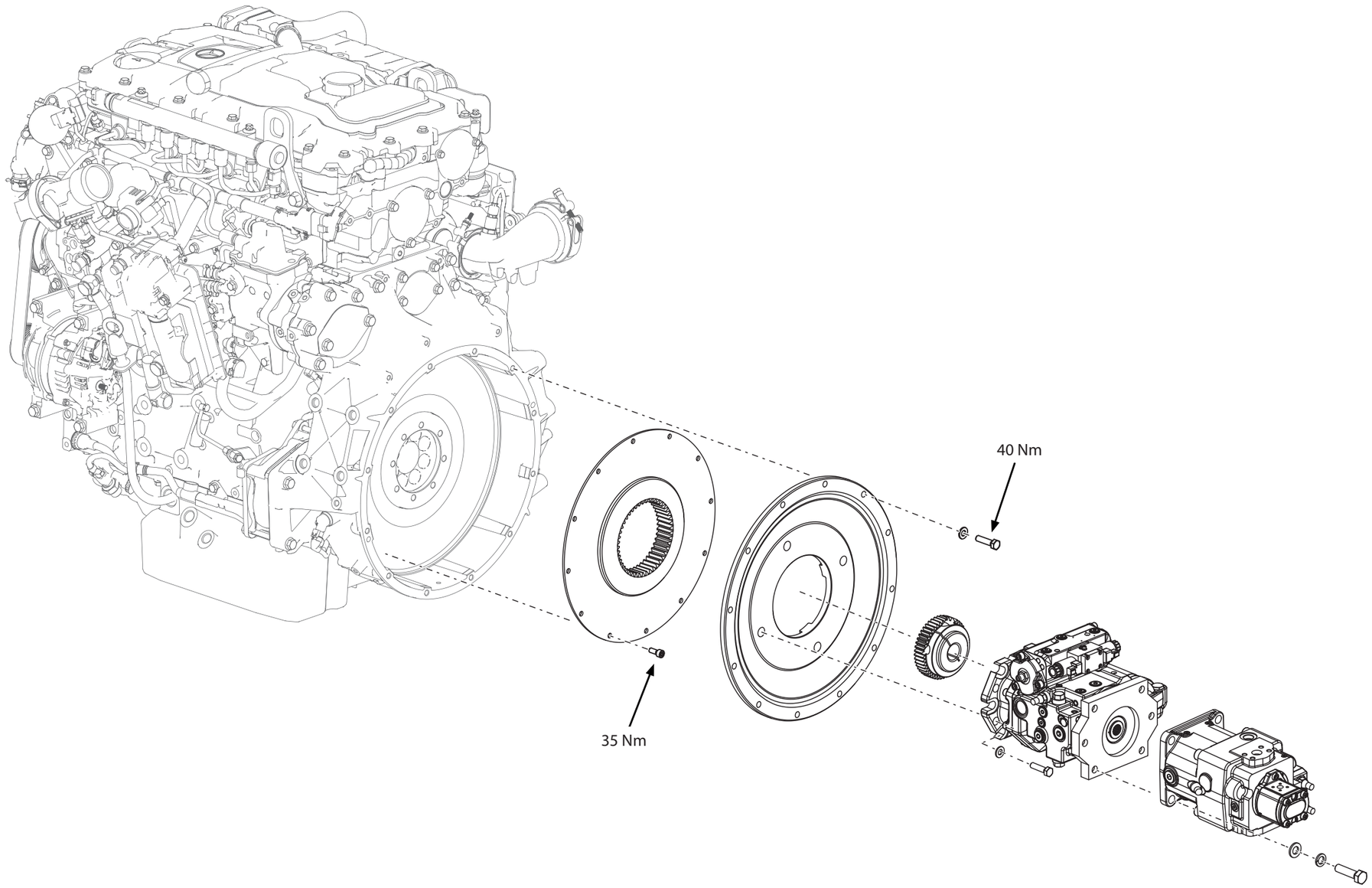
FUEL COOLING CIRCUIT



MHT 10180 / MHT 10230 - TIGHTENING TORQUE

ENGINE SUSPENSION ASSEMBLY

When not specified tighten as indicated in the general table



DIAGNOSTIC SOFTWARE PROCEDURES

Fig. J

Start the control panel of the machine. Place the cursor on the icon underlined in the photo and click double to open the program (Fig. J).

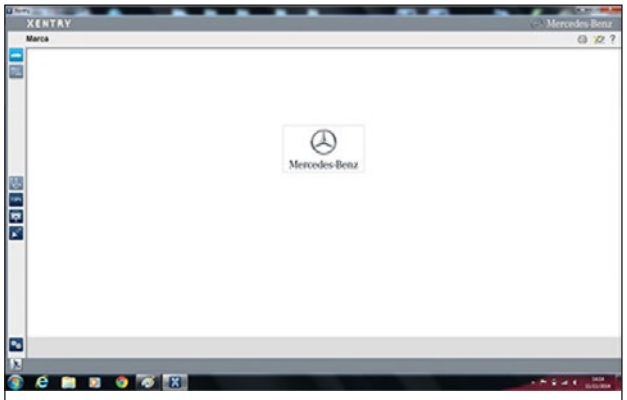


Fig. K

Click on “MERCEDES BENZ” (Fig. K).

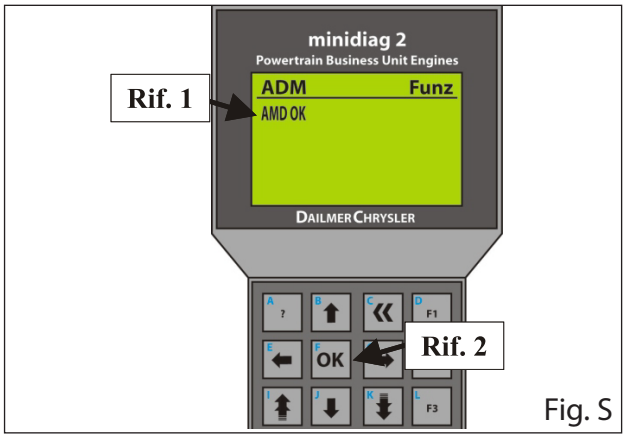


Fig. S

Wait on the display is visualized "**ADM OK**" Ref.1 and push the button "**OK**" Ref.2 (Fig. S).

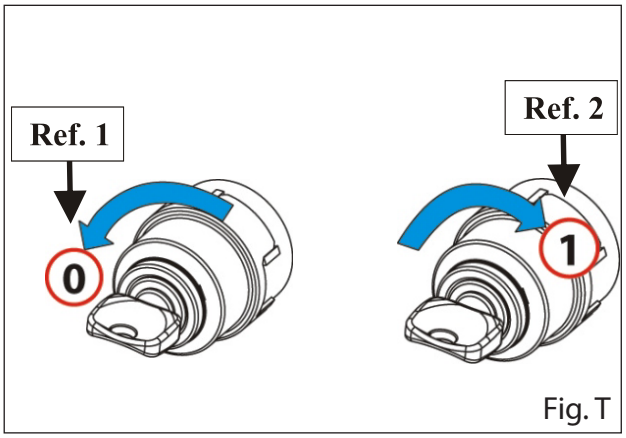


Fig. T

Turn the starting key of the machine and bring it to position "**0**" Ref.1.
Wait that the data progression bar arrives to the end and turn the starting key of the machiune and bring it on position "**1**" Ref. 2 (Fig. T).

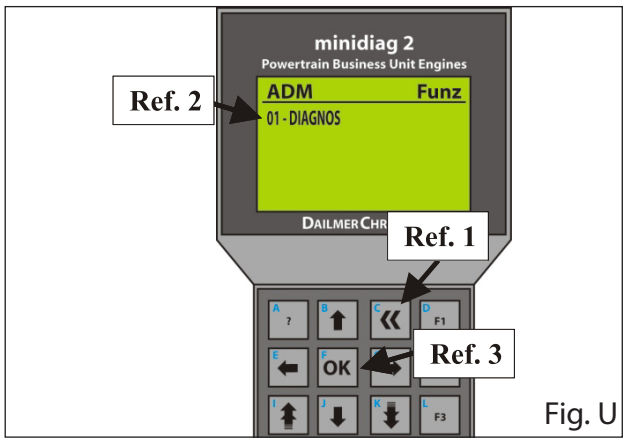


Fig. U

Push the control button "<<" Ref. 1 on the Minidiag2, go on "**01-DIAGNOS**." Ref. 2 and push the button "**OK**" Ref. 3 (Fig. U).

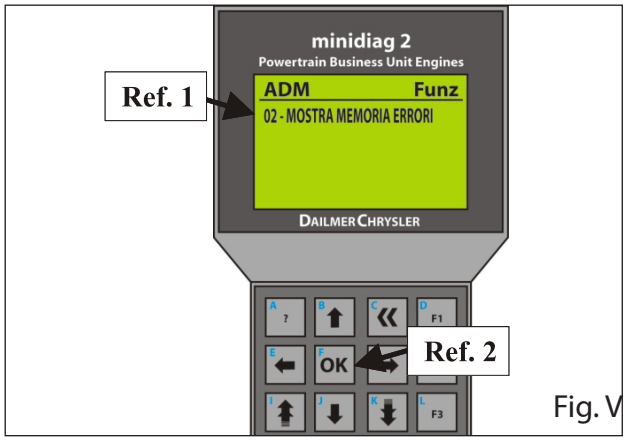


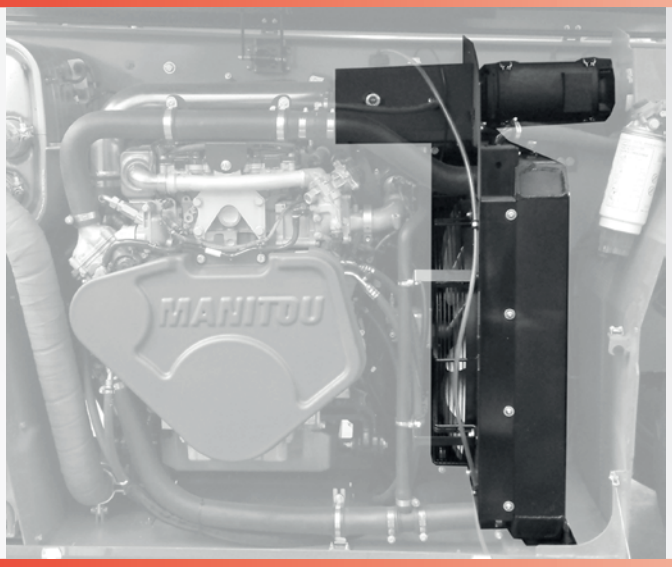
Fig. V

Then go on "**02-MOSTRA MEMORIA ERRORI**" Ref. 1 and push the button "**OK**" Ref.2 (Fig. V).

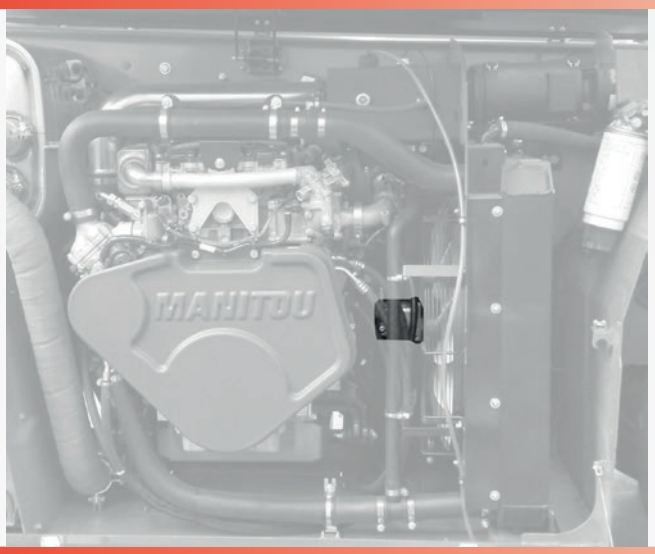
MHT 10180 / 10230 - REMOVING ENGINE AND RADIATOR

DISASSEMBLY ORDER

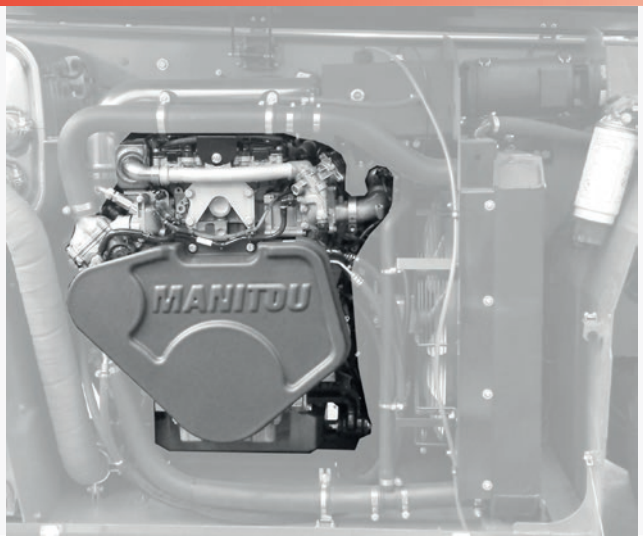
Step 1 REMOVING THE RADIATOR

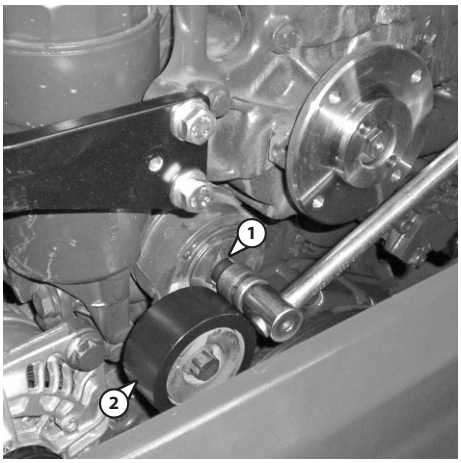


Step 2 REMOVING THE RADIATOR HYDRAULIC MOTOR



Step 3 REMOVING THE I.C. ENGINE

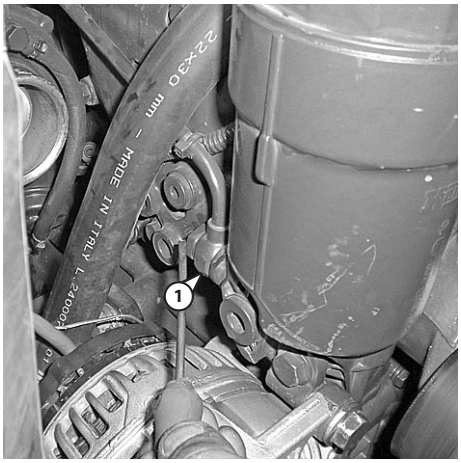




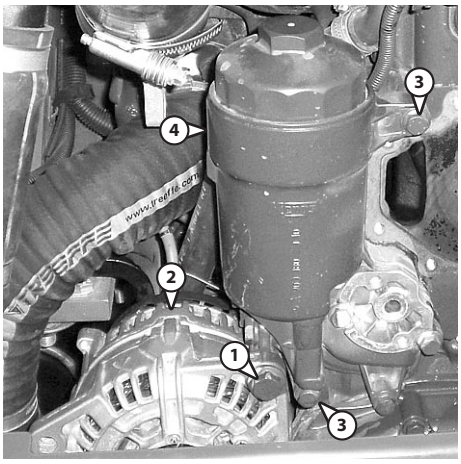
D - REMOVING THE OIL FILTER

Carry out operation B.

Slacken the screw (Ref. 1) and remove the belt tensioner (Ref. 2).



Disconnect the oil inlet pipe (Ref. 1) .
Fix the pipe using a clamp so that it does not slip in the bottom part of the engine housing and oil does not leak out.

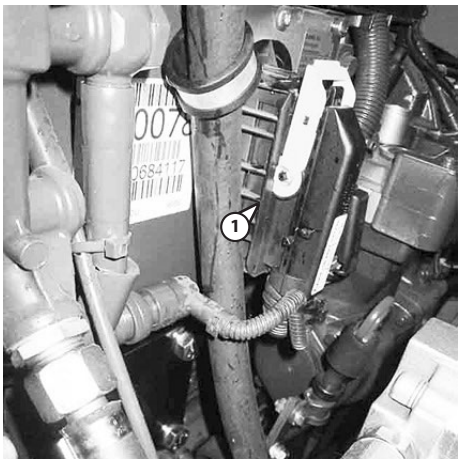


Slacken the screw (Ref. 1) to free the alternator (Ref. 2) and rotate it downwards.
Slacken the screws (Ref. 3) which block the oil filter (Ref. 4) on the engine supports and remove the filter from the engine.

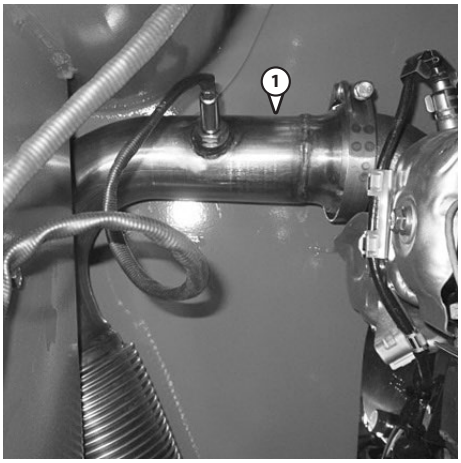
E - REMOVING THE FUEL OIL FILTER AND PUMP

Carry out operation A.

Disconnect the fuel incoming and outgoing tubes (Ref. 1) from the filter, taking care to keep these facing upwards to avoid draining the tank.

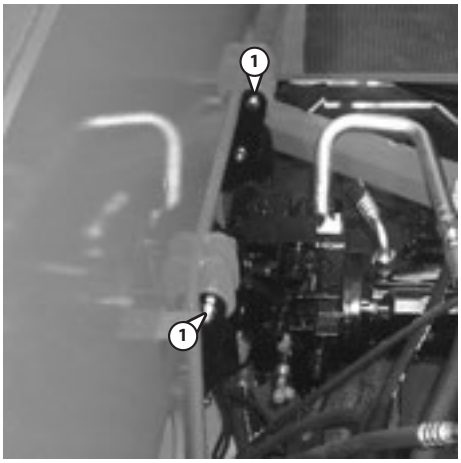


Disconnect the plug from the engine control unit ECU (Ref. 1).
Disconnect all electrical connections.



Disconnect the exhaust pipe (Ref. 1).

Place an hydraulic jack under the hydrostatic pump and slacken the screws (Ref. 1) which block the engine.



Secure the engine to the overhead crane and slacken the screws (Ref. 1) which fix the engine to the chassis.

SPN	FMI	DTC	Fault description	Recommended Action	CEL	SEL	MIL	Fault location
701	3	BD0203	Digital Output 3/07 Circuit shorted to Ubat	"Check wiring of associated pin Check parameters 35/06 (Selection), 35/25 (Fault Detection) and 35/42 (Configuration) for correct configuration of output pin 3/07 Run Service Routine (chapter 6.4, routines 15 to 17): – Digital Output Pin Under Software Control: Start Response with Signal Parameter 9"	ON	OFF	OFF	Pin 3/07
701	4	BD0204	Digital Output 3/07 Circuit shorted to GND	"Check wiring of associated pin Check parameters 35/06 (Selection), 35/25 (Fault Detection) and 35/42 (Configuration) for correct configuration of output pin 3/07 Run Service Routine (chapter 6.4, routines 15 to 17): – Digital Output Pin Under Software Control: Start Response with Signal Parameter 9"	ON	OFF	OFF	Pin 3/07
701	5	BD0205	Digital Output 3/07 Open Circuit (broken wire, terminal floating)	"Check wiring of associated pin Check parameters 35/06 (Selection), 35/25 (Fault Detection) and 35/42 (Configuration) for correct configuration of output pin 3/07 Run Service Routine (chapter 6.4, routines 15 to 17): – Digital Output Pin Under Software Control: Start Response with Signal Parameter 9"	ON	OFF	OFF	Pin 3/07
702	3	BE0203	Digital Output 3/08 Circuit shorted to Ubat	"Check wiring of associated pin Check parameters 35/07 (Selection), 35/26 (Fault Detection) and 35/43 (Configuration) for correct configuration of output pin 3/08 Run Service Routine (chapter 6.4, routines 15 to 17): – Digital Output Pin Under Software Control: Start Response with Signal Parameter 10"	ON	OFF	OFF	Pin 3/08
702	4	BE0204	Digital Output 3/08 Circuit shorted to GND	"Check wiring of associated pin Check parameters 35/07 (Selection), 35/26 (Fault Detection) and 35/43 (Configuration) for correct configuration of output pin 3/08 Run Service Routine (chapter 6.4, routines 15 to 17): – Digital Output Pin Under Software Control: Start Response with Signal Parameter 10"	ON	OFF	OFF	Pin 3/08
702	5	BE0205	Digital Output 3/08 Open Circuit (broken wire, terminal floating)	"Check wiring of associated pin Check parameters 35/07 (Selection), 35/26 (Fault Detection) and 35/43 (Configuration) for correct configuration of output pin 3/08 Run Service Routine (chapter 6.4, routines 15 to 17): – Digital Output Pin Under Software Control: Start Response with Signal Parameter 10"	ON	OFF	OFF	Pin 3/08
703	3	BF0203	Digital Output 3/09 Circuit shorted to Ubat	"Check wiring of associated pin Check parameters 35/08 (Selection), 35/27 (Fault Detection) and 35/44 (Configuration) for correct configuration of output pin 3/09 Run Service Routine (chapter 6.4, routines 15 to 17): – Digital Output Pin Under Software Control: Start Response with Signal Parameter 14"	ON	OFF	OFF	Pin 3/09
703	4	BF0204	Digital Output 3/09 Circuit shorted to GND	"Check wiring of associated pin Check parameters 35/08 (Selection), 35/27 (Fault Detection) and 35/44 (Configuration) for correct configuration of output pin 3/09 Run Service Routine (chapter 6.4, routines 15 to 17): – Digital Output Pin Under Software Control: Start Response with Signal Parameter 14"	ON	OFF	OFF	Pin 3/09
703	5	BF0205	Digital Output 3/09 Open Circuit (broken wire, terminal floating)	"Check wiring of associated pin Check parameters 35/08 (Selection), 35/27 (Fault Detection) and 35/44 (Configuration) for correct configuration of output pin 3/09 Run Service Routine (chapter 6.4, routines 15 to 17): – Digital Output Pin Under Software Control: Start Response with Signal Parameter 14"	ON	OFF	OFF	Pin 3/09
704	3	C00203	Digital Output 4/07 Circuit shorted to Ubat	"Check wiring of associated pin Check parameters 35/16 (Selection), 35/35 (Fault Detection) and 35/52 (Configuration) for correct configuration of output pin 4/07 Run Service Routine (chapter 6.4, routines 15 to 17): – Digital Output Pin Under Software Control: Start Response with Signal Parameter 15"	ON	OFF	OFF	Pin 4/07

SPN	FMI	DTC	Fault description	Recommended Action	CEL	SEL	MIL	Fault location
3842	5	020F05	Analog Ground 3/02 Open Circuit (broken wire, terminal floating)	"Check wiring of associated pin Check Parameters 35/05 (Selection) and 35/24 (Fault Detection) for correct configuration."	ON	OFF	OFF	Pin 3/02
3843	3	030F03	Digital Input 1/01 Circuit shorted to Ubat	"Check wiring of associated pin Check parameters 13/01 (Selection), 13/35 (Fault Detect Ena) for correct configuration of input pin 1/01"	ON	OFF	OFF	Pin 1/01
3843	4	030F04	Digital Input 1/01 Circuit shorted to GND	"Check wiring of associated pin Check parameters 13/01 (Selection), 13/35 (Fault Detect Ena) for correct configuration of input pin 1/01"	ON	OFF	OFF	Pin 1/01
3844	3	040F03	Digital Input 1/02 Circuit shorted to Ubat	"Check wiring of associated pin Check parameters 13/01 (Selection), 13/35 (Fault Detect Ena) for correct configuration of input pin 1/02"	ON	OFF	OFF	Pin 1/02
3844	4	040F04	Digital Input 1/02 Circuit shorted to GND	"Check wiring of associated pin Check parameters 13/02 (Selection), 13/36 (Fault Detect Ena) for correct configuration of input pin 1/02"	ON	OFF	OFF	Pin 1/02
3845	3	050F03	Digital Input 1/12 Circuit shorted to Ubat	"Check wiring of associated pin Check parameter 13/39 (Fault Detect Ena) for correct configuration of Fault Detection of pin 1/12"	ON	OFF	OFF	Pin 1/12
3845	4	050F04	Digital Input 1/12 Circuit shorted to GND	"Check wiring of associated pin Check parameter 13/39 (Fault Detect Ena) for correct configuration of Fault Detection of pin 1/12"	ON	OFF	OFF	Pin 1/12
3846	3	060F03	Digital Input 1/14 Circuit shorted to Ubat	"Check wiring of associated pin Check parameter 13/40 (Fault Detect Ena) for correct configuration of Fault Detection of pin 1/12"	ON	OFF	OFF	Pin 1/14
3846	4	060F04	Digital Input 1/14 Circuit shorted to GND	"Check wiring of associated pin Check parameter 13/40 (Fault Detect Ena) for correct configuration of Fault Detection of pin 1/12"	ON	OFF	OFF	Pin 1/14
3847	3	070F03	Digital Input 1/15 Circuit shorted to Ubat	"Check wiring of associated pin Check parameters 13/04 (Selection), 13/41 (Fault Detect Ena) for correct configuration of input pin 1/15"	ON	OFF	OFF	Pin 1/15
3847	4	070F04	Digital Input 1/15 Circuit shorted to GND	"Check wiring of associated pin Check parameters 13/04 (Selection), 13/41 (Fault Detect Ena) for correct configuration of input pin 1/15"	ON	OFF	OFF	Pin 1/15
3848	3	080F03	Digital Input 1/16 Circuit shorted to Ubat	"Check wiring of associated pin Check parameter 13/42 (Fault Detect Ena) for correct configuration of Fault Detection of pin 1/16"	ON	OFF	OFF	Pin 1/16
3848	4	080F04	Digital Input 1/16 Circuit shorted to GND	"Check wiring of associated pin Check parameter 13/42 (Fault Detect Ena) for correct configuration of Fault Detection of pin 1/16"	ON	OFF	OFF	Pin 1/16
3849	3	090F03	Digital Input 1/17 Circuit shorted to Ubat	"Check wiring of associated pin Check parameters 13/05 (Selection), 13/43 (Fault Detect Ena) for correct configuration of input pin 1/17"	ON	OFF	OFF	Pin 1/17
3849	4	090F04	Digital Input 1/17 Circuit shorted to GND	"Check wiring of associated pin Check parameters 13/05 (Selection), 13/43 (Fault Detect Ena) for correct configuration of input pin 1/17"	ON	OFF	OFF	Pin 1/17
3850	3	0A0F03	Digital Input 1/11 Circuit shorted to Ubat	"Check wiring of associated pin Check parameter 13/38 (Fault Detect Ena) for correct configuration of Fault Detection of pin 1/11"	ON	OFF	OFF	Pin 1/11
3850	4	0A0F04	Digital Input 1/11 Circuit shorted to GND	"Check wiring of associated pin Check parameter 13/38 (Fault Detect Ena) for correct configuration of Fault Detection of pin 1/11"	ON	OFF	OFF	Pin 1/11
3851	3	0B0F03	Digital Input 2/09 Circuit shorted to Ubat	"Check wiring of associated pin Check parameters 13/07 (Selection), 13/46 (Fault Detect Ena) for correct configuration of input pin 2/09"	ON	OFF	OFF	Pin 2/09

SPN	FMI	Fault_name	Fault Description
636	10	Crankshaft Position Sensor Signal Erratic	t.b.d.
636	11	Crankshaft Position Sensor Failure	t.b.d.
636	14	Crankshaft Position Sensor Pins Sw apped	Pins Sw apped
636	15	Phase Shift of CRK Tooth 97 to CAM Tooth 10 is too High (Crankshaft Position - Camshaft Position Correlation)	Phase Shift of CRK tooth 97 to CAM tooth 10 is too high
639	14	J1939 Data Link Failure	CPC 2 Fault
641	3	Turbo Control Circuit Failed High	Short Cut to Battery
641	4	Turbo Control Circuit Failed Low	Short Cut to Ground
641	5	Turbo Control Circuit Open	Open Load
647	3	Fan Stage 1 Circuit Failed High	Short Cut to Battery
647	4	Fan Stage 1 Circuit Failed Low	Short Cut to Ground
647	5	Fan Stage 1 Circuit Failed Open	Open Load
651	3	Injector Cylinder #1 Needle Control Valve, Abnormal Operation (MAX)	Injector Push Error
651	4	Injector Cylinder #1 Needle Control Valve, Abnormal Operation (MIN)	Injector Push Error
651	5	Injector Cylinder #1, Needle Control Valve Circuit Open	Injector Open Load Error
651	6	Injector Cylinder #1 Needle Control Valve, Valve Shorted Circuit	Valve short circuit of injector
651	7	Injector Cylinder #1 Needle Control Valve, Stucks Open	Injector from Cylinder 1 has a sticking needle
651	10	Injector Cylinder #1 Needle Control Valve, Abnormal Rate of Change	Pull-in detection failure
652	3	Injector Cylinder #2 Needle Control Valve, Abnormal Operation (MAX)	Injector Push Error
652	4	Injector Cylinder #2 Needle Control Valve, Abnormal Operation (MIN)	Injector Push Error
652	5	Injector Cylinder #2 Needle Control Valve, Circuit Open	Injector Open Load Error
652	6	Injector Cylinder #2 Needle Control Valve, Valve Shorted Circuit	Valve short circuit of injector
652	7	Injector Cylinder #2 Needle Control Valve, Stucks Open	Injector from Cylinder 2 has a sticking needle
652	10	Injector Cylinder #2 Needle Control Valve, Abnormal Rate of Change	Pull-in detection failure
653	3	Injector Cylinder #3 Needle Control Valve, Abnormal Operation (MAX)	Injector Push Error
653	4	Injector Cylinder #3 Needle Control Valve, Abnormal Operation (MIN)	Injector Push Error
653	5	Injector Cylinder #3 Needle Control Valve, Circuit Open	Injector Open Load Error
653	6	Injector Cylinder #3 Needle Control Valve, Valve Shorted Circuit	Valve short circuit of injector
653	7	Injector Cylinder #3 Needle Control Valve, Stucks Open	Injector from Cylinder 3 has a sticking needle
653	10	Injector Cylinder #3 Needle Control Valve, Abnormal Rate of Change	Pull-in detection failure
654	3	Injector Cylinder #4 Needle Control Valve, Abnormal Operation (MAX)	Injector Push Error
654	4	Injector Cylinder #4 Needle Control Valve, Abnormal Operation (MIN)	Injector Push Error
654	5	Injector Cylinder #4 Needle Control Valve, Circuit Open	Injector Open Load Error
654	6	Injector Cylinder #4 Needle Control Valve, Valve Shorted Circuit	Valve short circuit of injector
654	7	Injector Cylinder #4 Needle Control Valve, Stucks Open	Injector from Cylinder 4 has a sticking needle
654	10	Injector Cylinder #4 Needle Control Valve, Abnormal Rate of Change	Pull-in detection failure
655	3	Injector Cylinder #5 Needle Control Valve, Abnormal Operation (MAX)	Injector Push Error
655	4	Injector Cylinder #5 Needle Control Valve, Abnormal Operation (MIN)	Injector Push Error
655	5	Injector Cylinder #5 Needle Control Valve, Circuit Open	Injector Open Load Error
655	6	Injector Cylinder #5 Needle Control Valve, Valve Shorted Circuit	Valve short circuit of injector

SPN	FMI	Fault_name	Fault Description
5588	19	CAN3 Electrical Failure	Timeout of PBS messages
5926	3	Differential Pressure Icooler Out Sensor Circuit Failed High	Compressor Differential Pressure Inlet Failed High
5926	4	Differential Pressure Icooler Out Sensor Circuit Failed Low	Compressor Differential Pressure Inlet Failed Low
5926	13	Icooler Out Differential Pressure Sensor Out of Calibration Low	zero offset compensation too low
5926	14	Icooler Out Differential Pressure Sensor Out of Calibration High	zero offset compensation too high
5926	20	Icooler Out Differential Pressure Plausibility Fault, Pressure too High (Low Box)	Compressor Delta Pressure Failed High
5926	21	Icooler Out Differential Pressure Plausibility Fault, Pressure too Low (High Box)	Compressor Delta Pressure Failed Low
5927	2	Water Pump Limp Home Mode	MU is set if w ater pump is in limp home mode
5927	7	Water Pump Mechanical Defect Detected	MU ist set if an error from PVH is indicated
5928	3	H Bridge 2 EGR Valve Circiut Shorted to Battery	H Bridge 2: Short Cut Battery
5928	4	H Bridge 2 EGR Valve Circuit Shorted to Ground	H Bridge 2: Short Cut to Ground
5928	5	H Bridge 2 EGR Valve Short Circuit/ Over Current	H Bridge 2: Short Cut Open Load
5928	14	H Bridge 2 EGR Valve Circuit Open Load	H Bridge 2 Open Load
520192	18	EGR Feedback on Lambda too Low	EGR Feedback on Lambda to low
520193	16	EGR Feedback on Lambda too High	EGR Feedback on Lambda to high
520194	14	MU_EGR_OBD_3	spare MU needed for prototyping w ith V4.1
520195	14	MU_EGR_OBD_4	spare MU needed for prototyping w ith V4.1
520196	14	MU_EGR_OBD_5	spare MU needed for prototyping w ith V4.1
520197	14	MU_OBD_PROTO_EV_1	spare event MU needed for prototyping w ith V4.1
520198	14	MU_OBD_PROTO_EV_2	spare event MU needed for prototyping w ith V4.1
520199	14	MU_OBD_PROTO_EV_3	spare event MU needed for prototyping w ith V4.1
520200	14	MU_OBD_PROTO_EV_4	spare event MU needed for prototyping w ith V4.1
520201	14	MU_OBD_PROTO_EV_5	spare event MU needed for prototyping w ith V4.1
520204	3	Reserved 2	TBD4 Temperature Circuit Failed High
520204	4	Reserved 1	TBD4 Temperature Circuit Failed Low
520205	3	Thermal Sw itch Circuit Failed High	
520205	4	Thermal Sw itch Circuit Failed Low	
520206	3	Reserved 4	TBD3 Temperature Circuit Failed High
520206	4	Reserved 3	TBD3 Temperature Circuit Failed Low
520208	3	Turbo Compound Valve Circuit Failed High	Short-circuit to battery
520208	4	Turbo Compound Valve Circuit Failed Low	Short-circuit to ground
520208	5	Turbo Compound Valve Circuit Failed Open	Open Load
520210	3	Function 19 Circuit Failed High	Function 19 (reserved)
520210	4	Function 19 Circuit Failed Low	Function 19 (reserved)
520210	5	Function 19 Circuit Failed Open	Function 19 (reserved)
520211	3	Service Push Button Circuit Failed High	
520214	3	Function 22 Circuit Failed High	Function 22 (reserved)
520214	4	Function 22 Circuit Failed Low	Function 22 (reserved)
520214	5	Function 22 Circuit Failed Open	Function 22 (reserved)
520216	3	Function 25 Circuit Failed High	Function 25 (reserved)
520216	4	Function 25 Circuit Failed Low	Function 25 (reserved)
520216	5	Function 25 Circuit Failed Open	Function 25 (reserved)
520217	3	RCP Test Function 1 Circuit Failed High	Short Cut to Battery
520217	4	RCP Test Function 1 Circuit Failed Low	Short Cut to Ground
520217	5	RCP Test Function 1 Circuit Failed Open	Open Load
520218	3	RCP Test Function 2 Circuit Failed High	Short Cut to Battery

SPN	FMI	Fault_name	Fault Description	Pin No.	Failure cause
3515	19	MU_ISP_UQS_T_DEF_ERR			
3516	1	MU_SCR_DIA_UQS_PCT_DEF			
3516	7	MU_SCR_DIA_UQS_TMPR_DIAG			
3516	9	MU_ISP_UQS_SNA			
3516	19	MU_ISP_UQS_CONC_DEF_ERR			
3516	20	MU_ISP_UQS_CONC_DRIFT_HI			
3516	21	MU_ISP_UQS_CONC_DRIFT_LO			
3517	1	DEF Tank Level - Zone 4			
3517	9	MU_ISP_CAN_L_DEF_TANK_ SRH			
3517	14	DEF Tank Level - Zone 2			
3517	17	DEF tank level check - Lim1 reserve			
3517	18	DEF Tank Level - Zone 3			
3517	19	DEF Tank Signal Erratic via CAN			
3517	31	MU_TRC_L_DEF_TANK_LIM_5			-
3521	31	MU_SCR_DIA_UQS_IS_DIESEL			
3523	8	Regen Frequency Error			
3556	0	Regen Temperature - Out of Range High			
3556	1	Regen Temperature - Out of Range Low			
3556	18	DOC Outlet Temp Low (Low Temp Regen)			
3597	3	High Side Digital Output 1 Circuit Failed High	Short circuit to battery on HS1_SCR	1,3,5	output is shorted to battery
3597	4	High Side Digital Output 1 Circuit Failed Low	Short circuit to ground on HS1_SCR	1,3,5	output is shorted to ground
3598	3	High Side Digital Output 2 Circuit Failed High	Short circuit to battery on HS2 (HS_DPF)	21,23,25	output is shorted to battery
3598	4	High Side Digital Output 2 Circuit Failed Low	Short circuit to ground on HS2 (HS_DPF)	21,23,25	output is shorted to ground
3599	3	High Side Digital Output 3 Circuit Failed High	Short circuit to battery on HS3_SCR	15,39,9	output is shorted to battery
3599	4	High Side Digital Output 3 Circuit Failed Low	Short circuit to ground on HS3_SCR	15,39,9	output is shorted to ground
3609	3	DOC Inlet Pressure Circuit Failed High		87	
3609	4	DOC Inlet Pressure Circuit Failed Low		87	
3609	8	DOC Inlet Pressure Signal Spike	DPF In Pressure sensor sporadic def ect	87	
3609	10	DOC Inlet Pressure Sensor Stuck			
3609	21	DPF Inlet Pressure - Drift Low			
3610	0	DPF System Back Pressure Too High			
3610	2	DPF Outlet Pressure Sensor - Not Plausible			
3610	3	DPF Outlet Pressure Circuit Failed High		72	
3610	4	DPF Outlet Pressure Circuit Failed Low		72	
3610	7	DPF Outlet Pressure High			
3610	8	DPF Outlet Pressure Signal Spike	DPF Out Pressure sensor sporadic def ect	72	
3610	10	DPF Outlet Pressure Sensor Stuck			

FAULT CODES

The background colour is used to indicate the newly supported or changed fault codes since diagnosis version 207.
The background colour is used to indicate the newly supported or changed fault codes since diagnosis version 210.
The background colour is used to indicate the newly supported or changed fault codes since diagnosis version 211.
The background colour indicates PLD/MR2 fault codes which are received from the PLD/MR2 control unit and are broadcasted by the ADM over J1939.

ADM3 fault code (J1939) SPN / FMI	"ADM3 fault code (K-line)"	"MR2 fault code (K-line)"	Fault location	Fault description	Remedial action	Pin
51 / 0	-	12419	Engine Throttle Position	Above Measuring Range		LSCAN-MR
51 / 1	-	12420	Engine Throttle Position	Below Measuring Range		LSCAN-MR
51 / 2	-	12424	Engine Throttle Position	Measuring Range Not Plausible		LSCAN-MR
51 / 2	-	14217	Engine Throttle Position	Performance		LSCAN-MR
51 / 3	-	14205	Engine Throttle Position Sensor	Circuit High		LSCAN-MR
51 / 4	-	14206	Engine Throttle Position Sensor	Circuit Low		LSCAN-MR
51 / 7	-	12431	Engine Throttle Position	Defective		LSCAN-MR
51 / 13	-	14218	Engine Throttle Position	Position Not Learned		LSCAN-MR
69 / 9	17309	-	Two Speed Axle Switch	Abnormal Update Rate		CAN-J1939
69 / 19	17319	-	Two Speed Axle Switch	Received Network Data in Error		CAN-J1939
70 / 9	17409	-	Parking Brake Switch	Abnormal Update Rate		CAN-J1939
70 / 19	17419	-	Parking Brake Switch	Received Network Data in Error		CAN-J1939
84 / 3	10103	-	Vehicle Speed (C3 or J1939)	Open Circuit	- Check wiring	15/03
84 / 9	10109	-	Vehicle Speed (C3 or J1939)	Abnormal Update Rate		CAN-J1939
84 / 14	10114	-	Vehicle Speed (C3 or J1939)	Signal Not Plausible -	Check wiring	15/03
84 / 19	10119	-	Vehicle Speed (C3 or J1939)	Received Network Data in Error		CAN-J1939
91 / 0	10200	-	Accelerator Pedal (AFPS or J1939)	Not Adjusted	"- Restart accelerator pedal adjustment routine - Check wiring - Limit value idle operation position: 5,0 V - Limit value kickdown position: 4,9 V"	21/11
91 / 3	10203	-	Accelerator Pedal (AFPS or J1939)	Voltage too High	"- Pedal unit exchange, if defective - check wiring - Limit value idle operation position: 5,0 V - Limit value kickdown position: 4,9 V"	21/11
91 / 4	10204	-	Accelerator Pedal (AFPS or J1939)	Voltage too Low	"- Pedal unit exchange, if defective - Check wiring - Limit value idle operation position: 5,0 V - Limit value kickdown position: 4,9 V"	21/11

ADM3 fault code (J1939) SPN / FMI	"ADM3 fault code (K-line)"	"MR2 fault code (K-line)"	Fault location	Fault description	Remedial action	Pin
974 / 2	14202	-	Remote Throttle Pedal (HFG)	Supply Voltage Out of Range (Pin HFG+)	- Limit values for the supply voltage of the HFG: Minimum value: 4,8 V and maximum value: 5,2 V.	18/17
974 / 3	14203	-	Remote Throttle Pedal (HFG)	Voltage too High		18/18
974 / 4	14204	-	Remote Throttle Pedal (HFG)	Voltage too Low		18/18
986 / 1	-	10631	Fan Speed	Speed Too Low		LSCANMR
986 / 9	-	10612	Fan Speed	Time Out		LSCANMR
986 / 9	-	17112	Fan Speed	Time Out		LSCANMR
1004 / 3	14403	-	Output Relay 4 (REL 4)	Open Circuit		18/01
1004 / 4	14404	-	Output Relay 4 (REL 4)	Short Circuit to Ground		18/01
1005 / 3	14503	-	Output PWM Pedal Supply or Transmission (FP+)	Open Circuit		15/05
1005 / 4	14504	-	Output PWM Pedal Supply or Transmission (FP+)	Short Circuit to Ground		15/05
1015 / 1	15001	-	PWM Accelerator Pedal (PWM FFG)	No Supply Voltage at Pin FP+	- Check wiring	15/05
1015 / 3	15003	-	PWM Accelerator Pedal (PWM FFG)	No Signal at Path 2 (GAS2)	"- Check wiring - Pins 21/13, 15/05 , 21/14."	
1015 / 4	15004	-	PWM Accelerator Pedal (PWM FFG)	No Signal at Path 1 (GAS1)	"- Check wiring - Pins 21/12, 15/05 , 21/14"	
1015 / 5	15005	-	PWM Accelerator Pedal (PWM FFG)	Not Adjusted	"- Restart accelerator pedal adjustment routine"	-
1015 / 6	15006	-	PWM Accelerator Pedal (PWM FFG)	Idle Position Out of Adjusted Range	"- Restart accelerator pedal adjustment routine"	-
1015 / 7	15007	-	PWM Accelerator Pedal (PWM FFG)	Out of Adjusted Range	"- Restart accelerator pedal adjustment routine"	-
1072 / 3	10003	-	Decompression Brake Valve (MBR_KD)	Open Circuit	"- Check wiring - Check solenoid valve"	15/10
1072 / 4	10004	-	Decompression Brake Valve (MBR_KD)	Short Circuit to Ground	"- Check wiring - Check solenoid valve"	15/10
1074 / 3	14603	-	Exhaust Brake Valve (MBR_BK)	Open Circuit	"- Check wiring - Check exhaust brake valve"	15/06
1074 / 3	-	14256	Exhaust Brake Valve (PLD/MR2)	Circuit High		LSCAN-MR
1074 / 4	14604	-	Exhaust Brake Valve (MBR_BK)	Short Circuit to Ground	"- Check wiring - Check exhaust brake valve"	15/06
1074 / 4	-	14255	Exhaust Brake Valve (PLD/MR2)	Circuit Low		LSCAN-MR
1074 / 5	-	14257	Exhaust Brake Valve (PLD/MR2)	Circuit Open		LSCAN-MR
1074 / 12	-	14254	Exhaust Brake Valve (PLD/MR2)	Performance		LSCAN-MR
1127 / 1	-	14259	Intake Throttle Turbocharger	Underboost		LSCAN-MR
1132 / 3	-	13115	Intake Air Temperature Sensor 2	Circuit High		LSCAN-MR
1132 / 4	-	13116	Intake Air Temperature Sensor 2	Circuit Low		LSCAN-MR
1136 / 0	-	14273	Engine ECU Temperature	Temperature too High		LSCAN-MR

MINIDIAG 2 - RECOVERY RELEASE 2_5.02.69

N° 1 - Minidiag 2 - Powertrain Business Unit Engines
N° 1 - ODB cable

The Minidiag 2 has to be in version recovery release 2_5.02.69

FORWARD GEAR SCHEMATIC DIAGRAM

Key:

- High Pressure
- Low Pressure
- Control pressure
- Drainage pressure
- Boost pressure
- Suction pressure
- To Hydraulic tank

F.A.	Suction strainer
FDAR	Rear Axle Disk Brakes
FDAV	Rear Axle Disk Brakes
M	Engine
MC	Brake pump
M.H.	Hydrostatic motor
P.H.	Hydrostatic pump
P.MOV.	Movements pump
PS	Service pump
RH	Radiator
VCA	Accumulators Charge Valve

FORWARD GEAR

VCA

MC

P.H.

P.MOV.

P.S.

M.H.

RH

FDAV

FDAR

FRONT AXLE

REAR AXLE

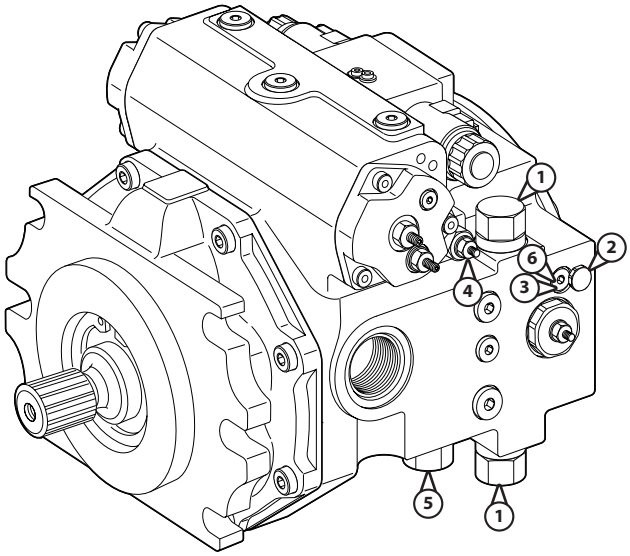
R.

F.A.

PUMP / MOTOR CONTROL AND ADJUSTMENT

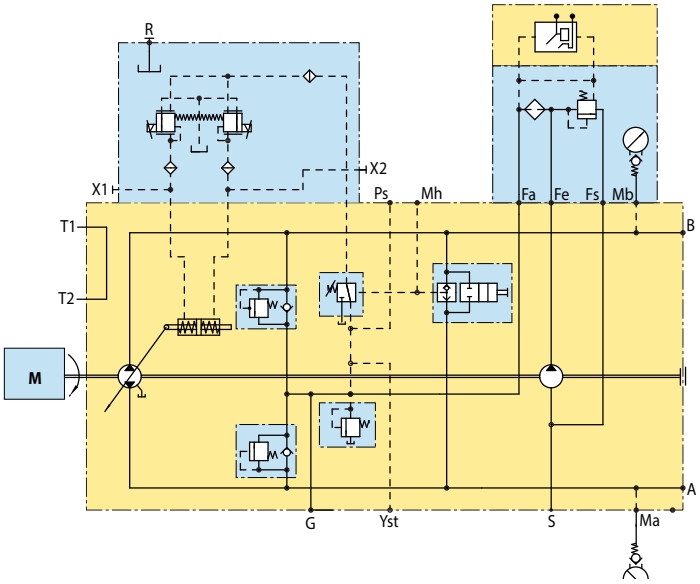
1 - TRANSMISSION ADJUSTMENT POINTS

A4VG 110 DA SERIES 40 PUMP

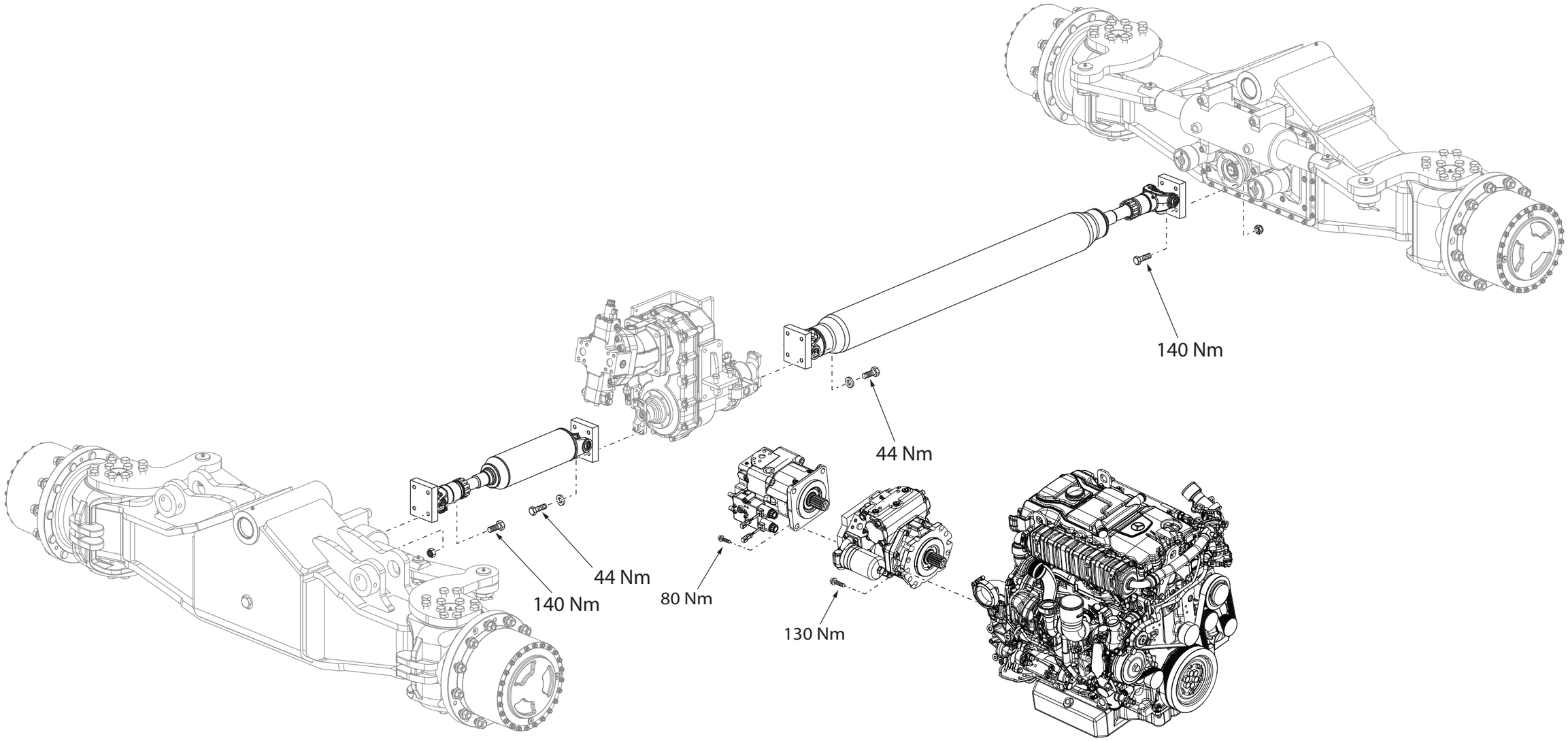


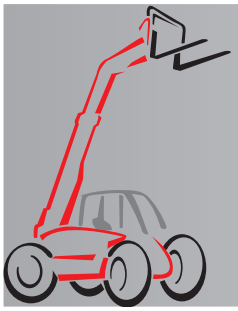
Key:

1 - HP (High Pressure) limiter
2 - Bypass function
3 - Circuit selector
4 - Pressure cut-off (DR)
5 - Boost relief valve
6 - Circuit selector stop screw



TRANSMISSION ASSEMBLY TIGHTENING TORQUES





TRANSMISSION REFIT

pages

DIGITAL GAUGE KIT

FUNCTIONS:

- **Gauge function**: the display allows the following combinations:

  ⇒ The upstream pressure temperature at +/- 2°C
  ⇒ The upstream temperature P1 with its mini and maxi (700 bar in class 0.1)
  ⇒ Downstream pressure P2 with its min. and max. (700 bar in class 0.1)
  ⇒ Differential pressure ΔP=P1-P

- **Hold function**: The user can freeze the screen display at any time to take notes

- **Unit function**: The user can change the unit of measurement at any time (bar, psi, kPa, mCe).

- **Function Tare**: Enables offset to zero

- **Leak test function**: Can measure a pressure variation over a specified time

- **Record function**: A maximum of 16000 readings can be recorded. The sampling period can be configured.

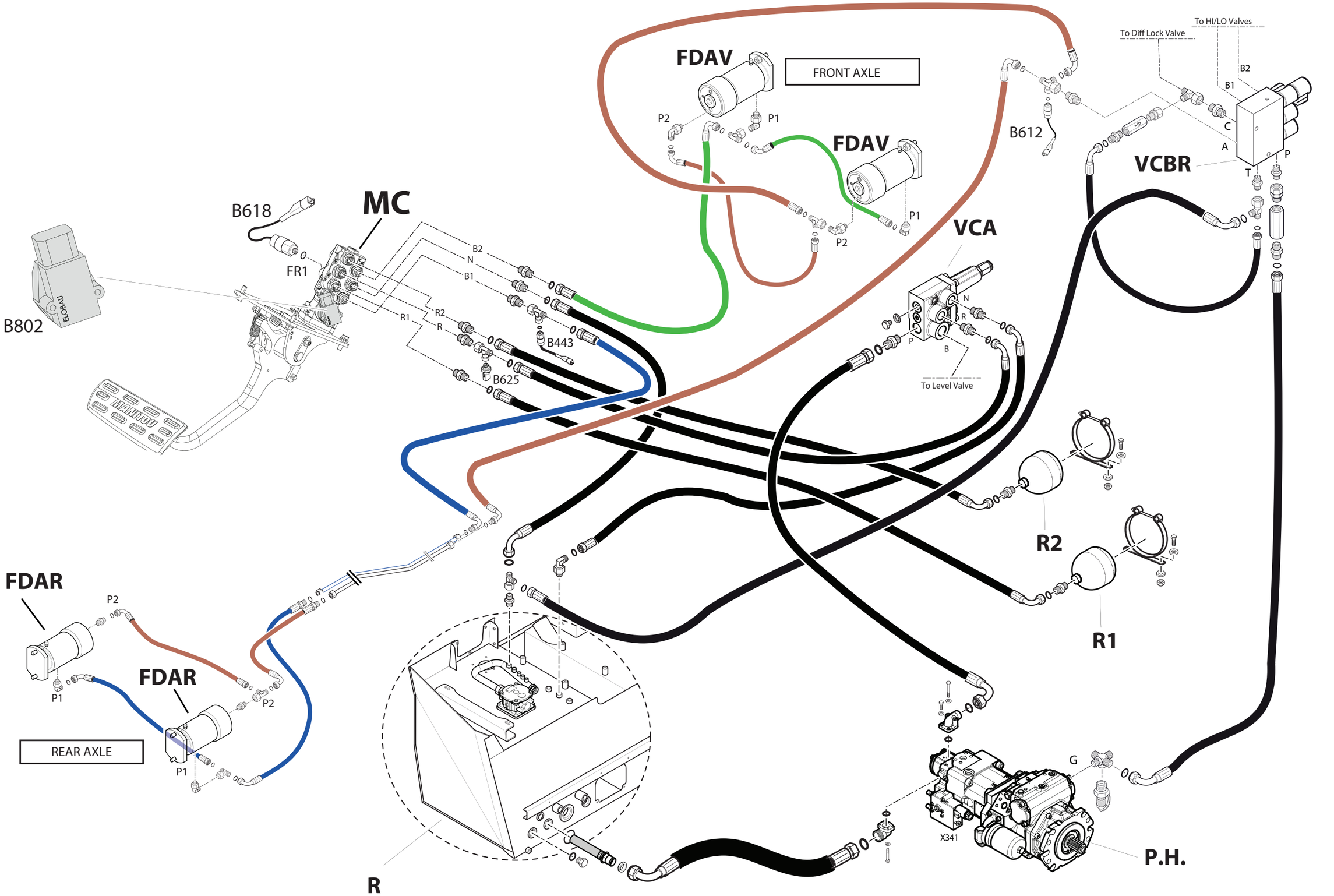
- **Reset function**: The 2 sensors are reset to zero

Digital Manometer kit 662187

Consisting of:

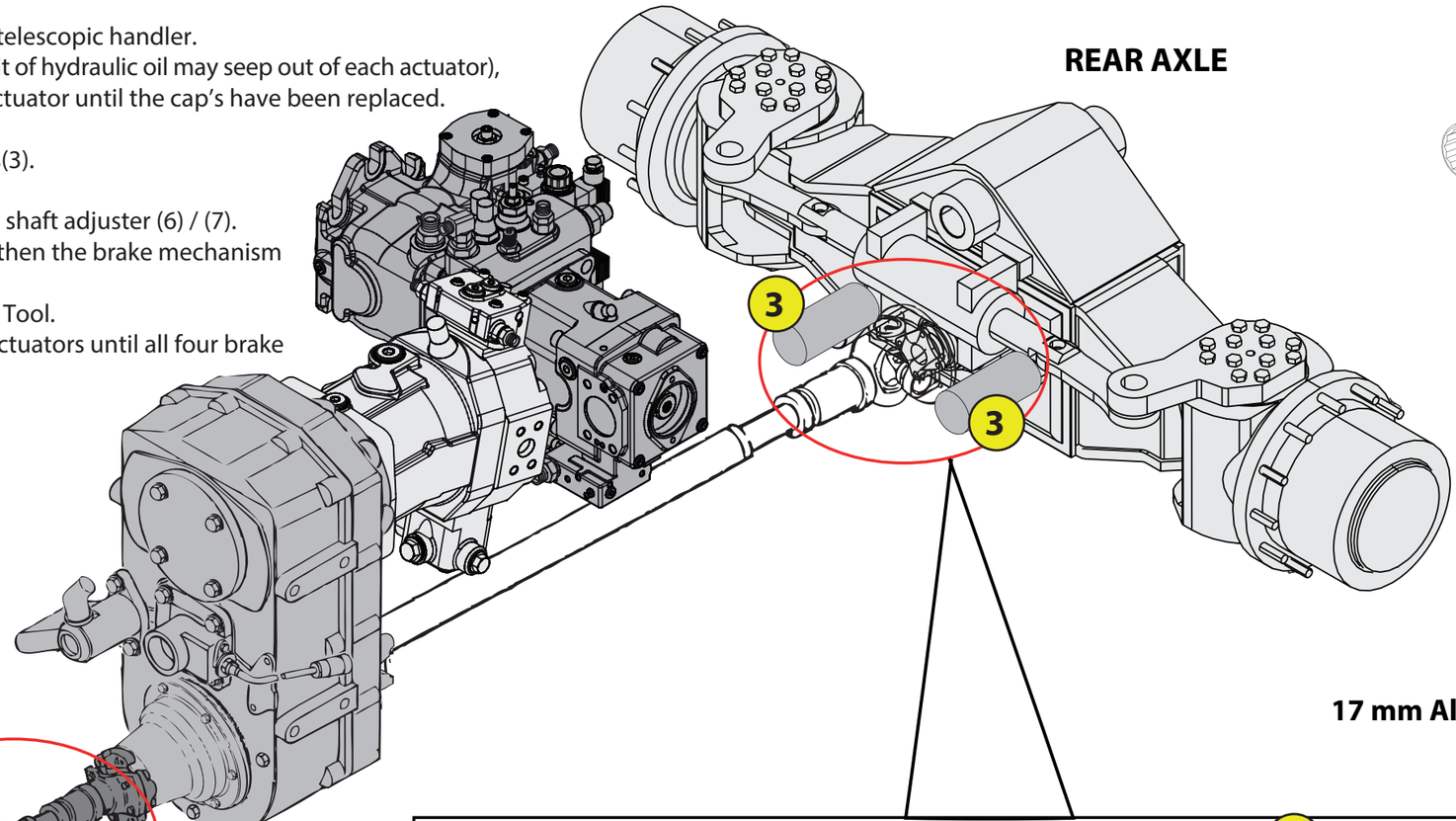
1 - 1 digital gauge ΔP HP 700 bar
2 - 1 measurement hose DN2 1215/1620, L = 1,5m, 630 bar
3 - 2 measurement hoses DN2 1620/1620, L = 1,5m, 630 bar
4 - 2 gauge adaptors 1620

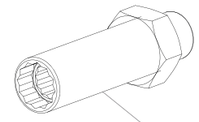
BRAKE CIRCUIT



DEACTIVATE THE NEGATIVE BRAKE (S.A.H.R - SPRING APPLIED HYDRAULIC RELEASE) TYPE 1

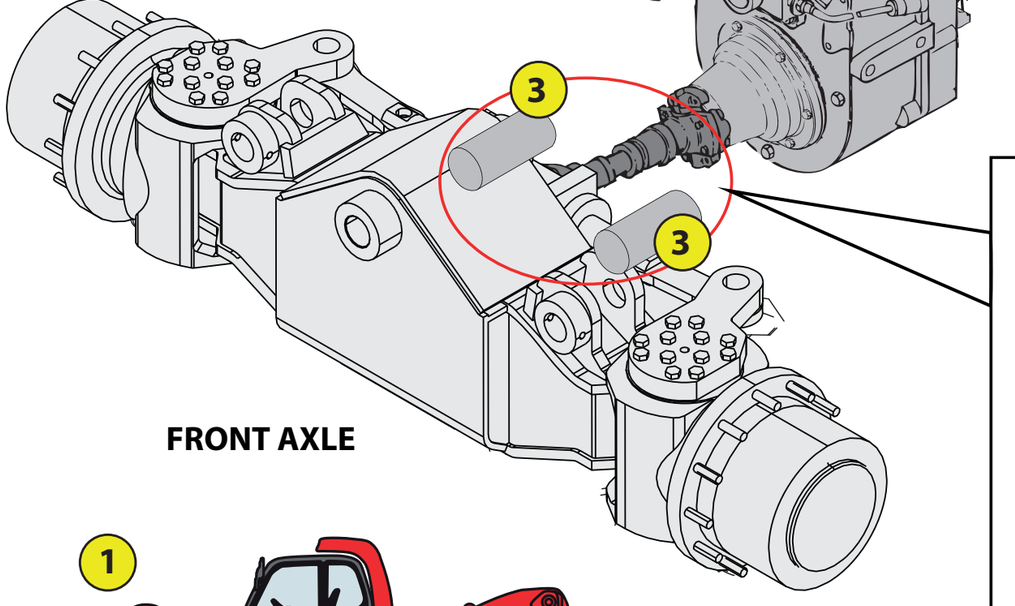
1 - Place stop blocks behind the wheels and secure the telescopic handler.
2 - Unscrew the cap's (2) on all four actuators(3) (a little bit of hydraulic oil may seep out of each actuator), always keep a suitable container underneath each actuator until the cap's have been replaced.
3 - Allen key size 17mm.
4 - Remove the retaining springs(4) on all four actuators(3).
5 - (In no particular order) starting with one actuator (3) at a time loosen the lock nut (5) , loosen the actuator shaft adjuster (6) / (7). Once the actuator shaft adjuster (6) / (7) turns freely then the brake mechanism pertaining the specific actuator is fully released.
6 - Socket sizes – 17 mm & 19 mm long type - or Special Tool.
7 - Repeat the procedure in step "5" for the remaining actuators until all four brake mechanisms is fully released.
8 - Replace all the retaining springs(4) and caps(2) on all the actuators(3); ensure the lock nuts(5) are lightly tightened.



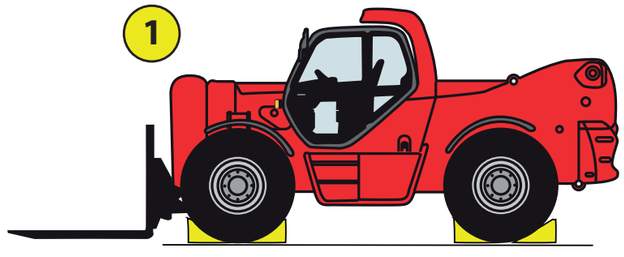


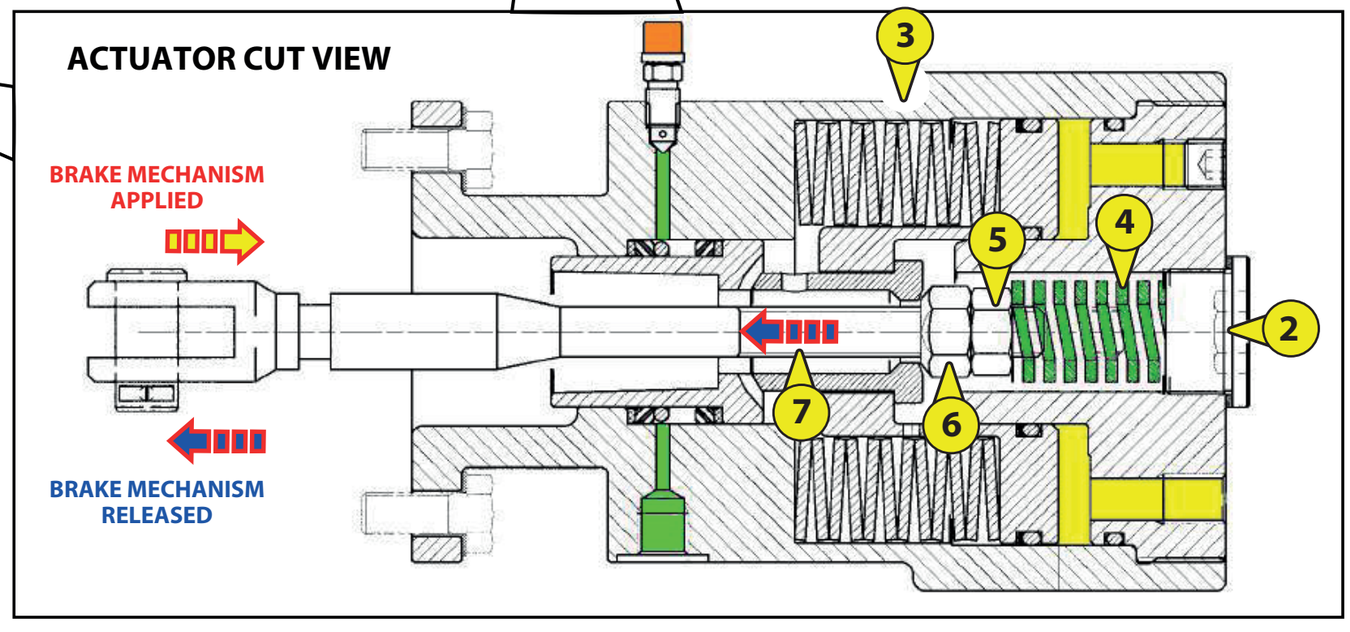
Special Tool
PN: 923397

17 mm Allen Key Required



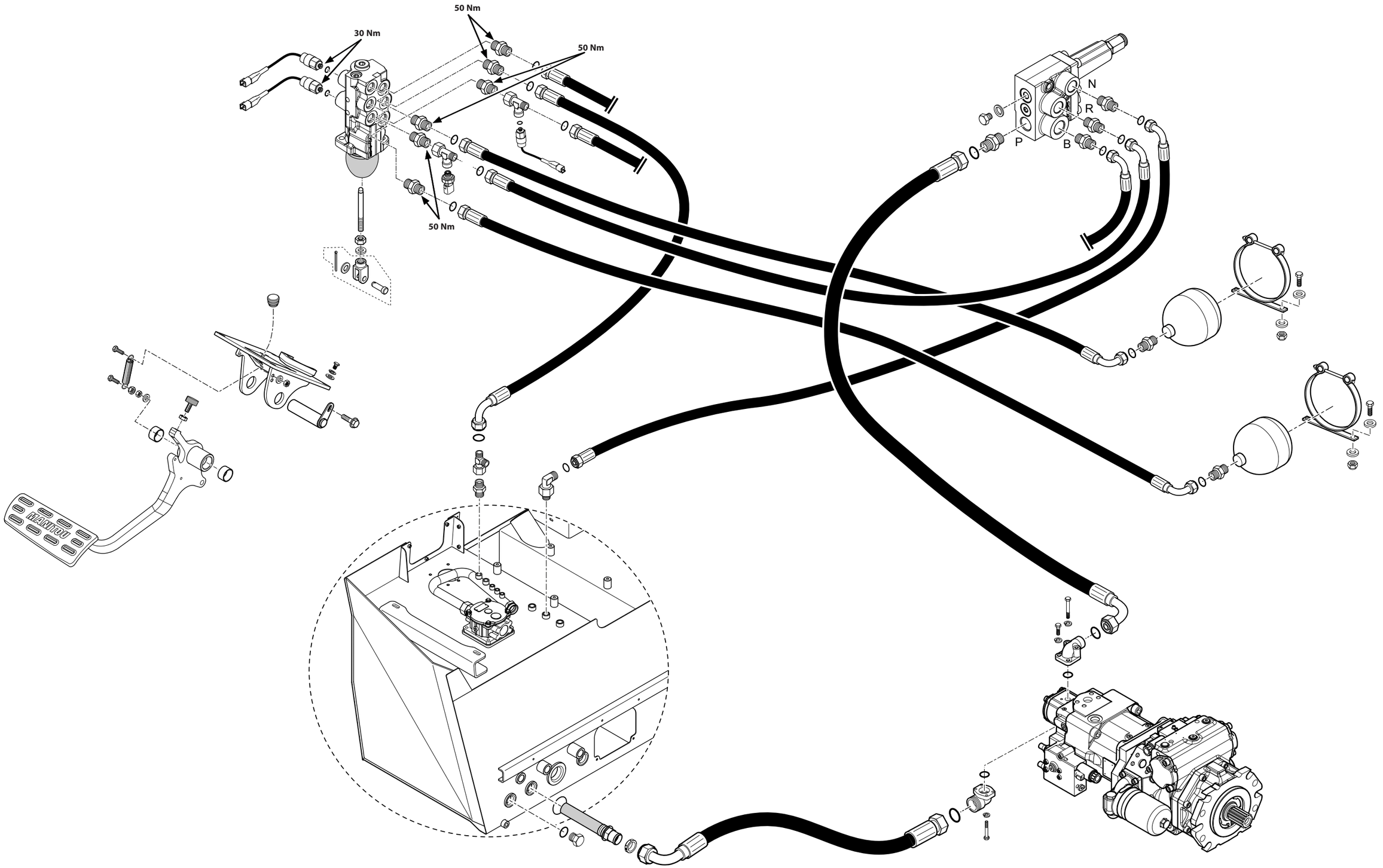
FRONT AXLE



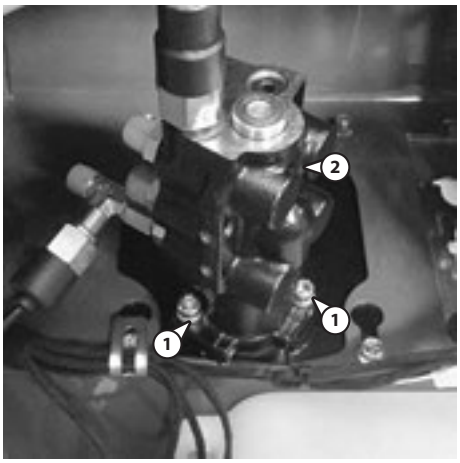


Note: In the absence of hydraulic servo-assistance of the direction and at the brakes, act slowly and forcibly on these two commands. Avoid sudden movements and jerks if the telescopic handler needs to be towed.

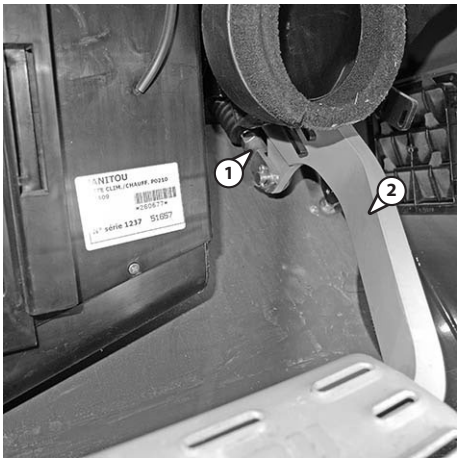
TIGHTENING TORQUES

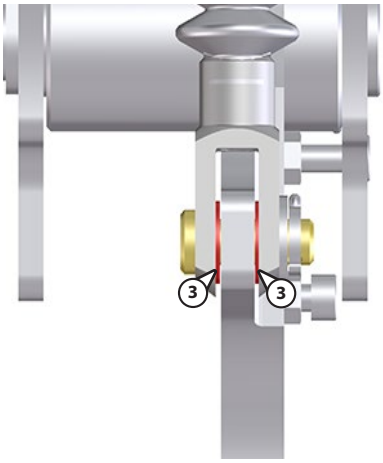


BRAKE REFIT

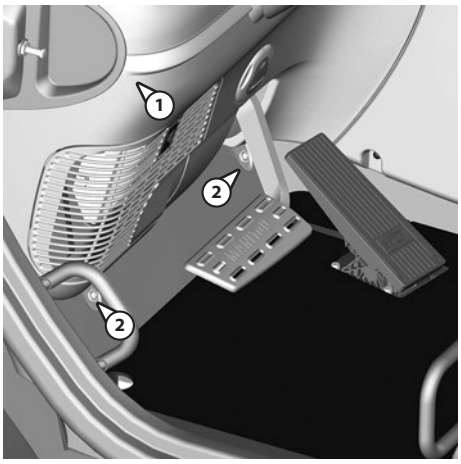


Install the master-cylinder (Ref. 2) and attach with the two fastening screws (Ref. 1), to be tightened to the standard torque.

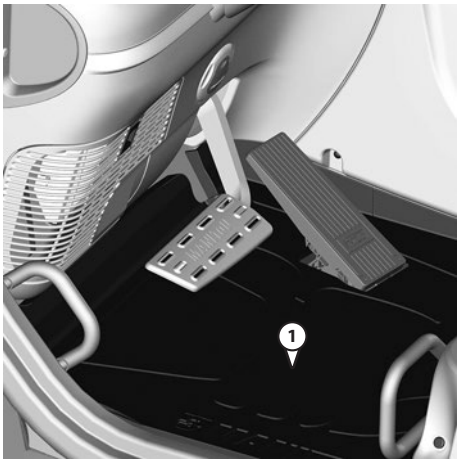




Attach the master cylinder (Ref. 1) to the brake pedal (Ref. 2) ensuring that the friction washers (Ref. 3) are correctly positioned.

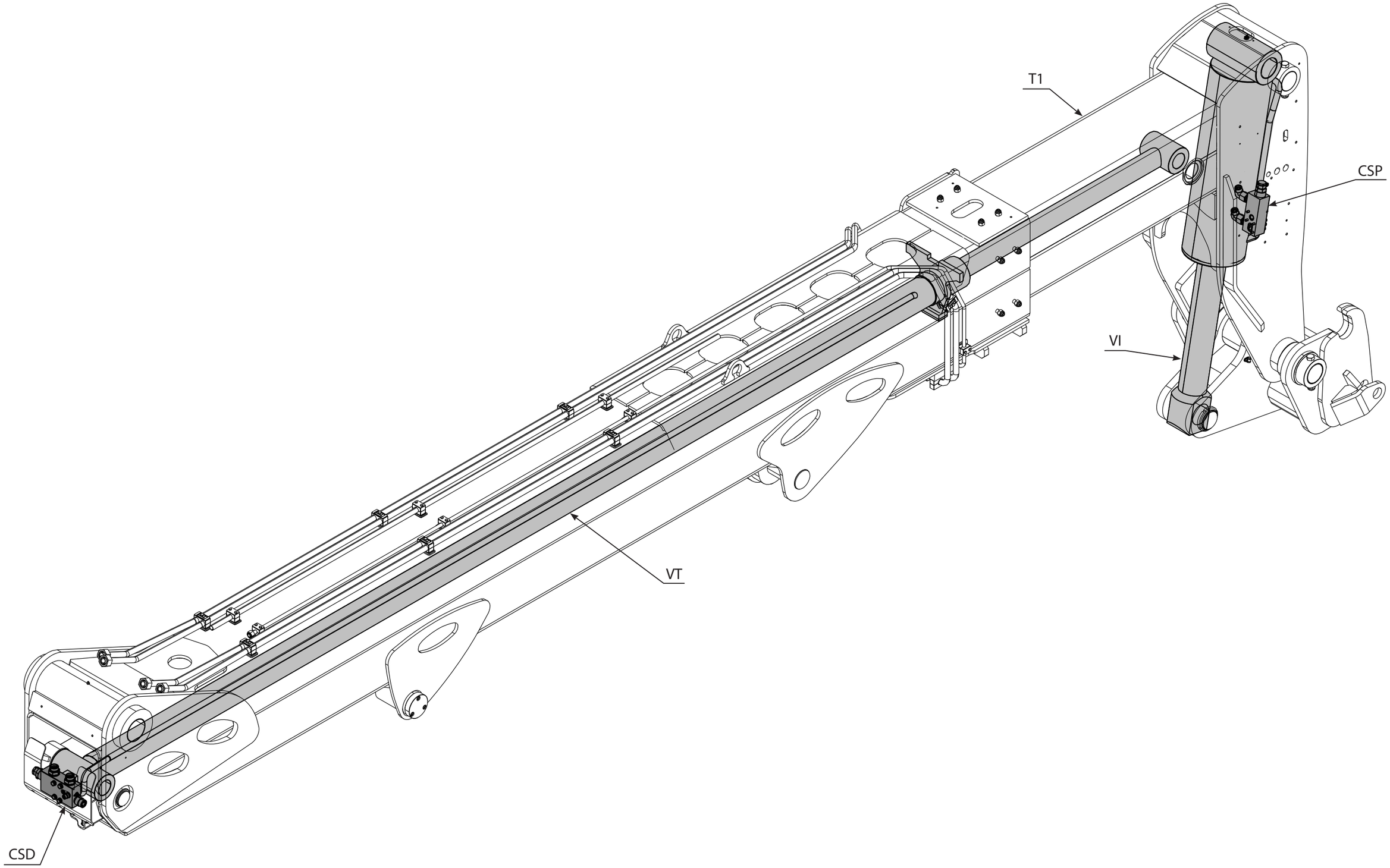


Install the lower dashboard casing (Ref. 1) and attach with two screws (Ref. 2).

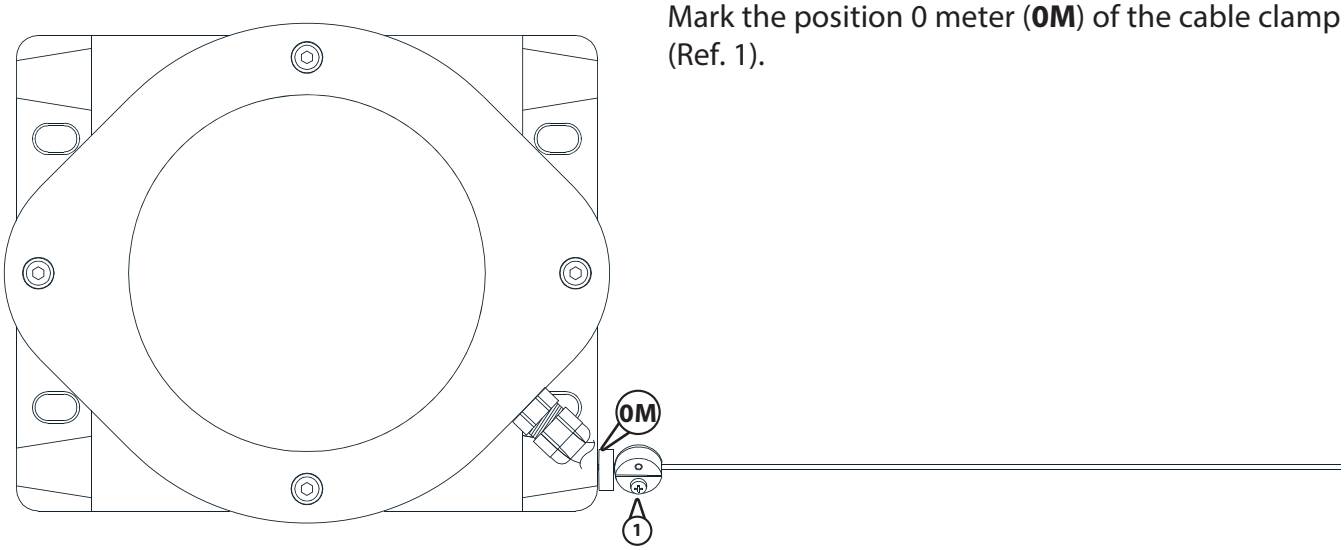


Install the mat (Ref. 1).

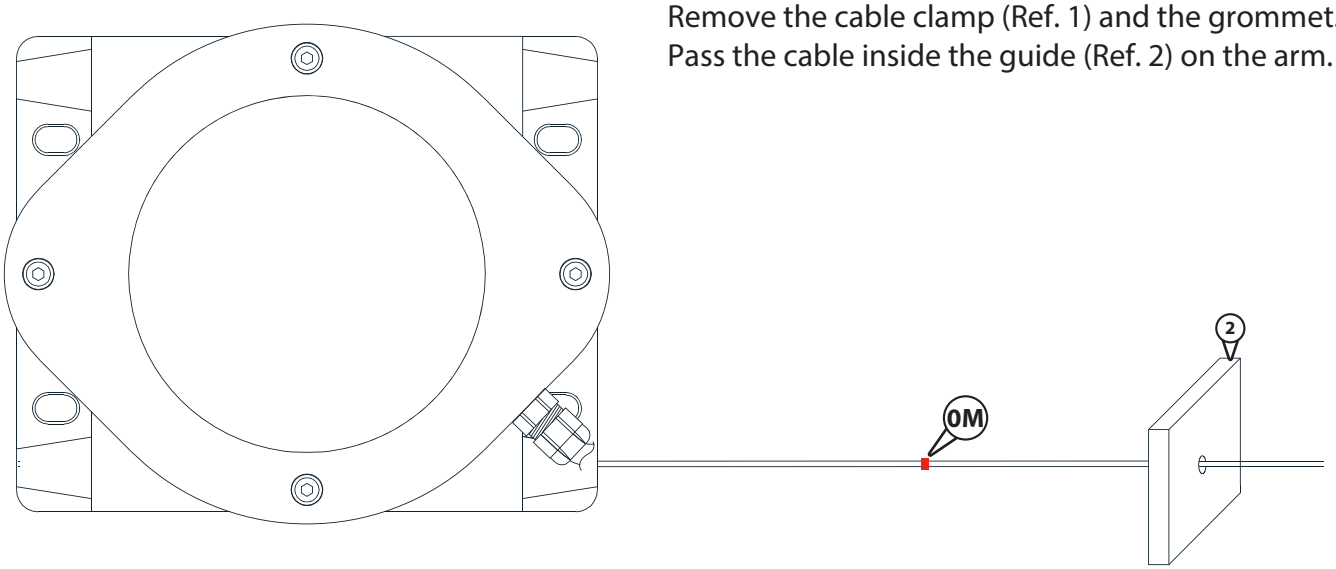
POSITIONING OF THE MAIN COMPONENTS OF THE BOOM



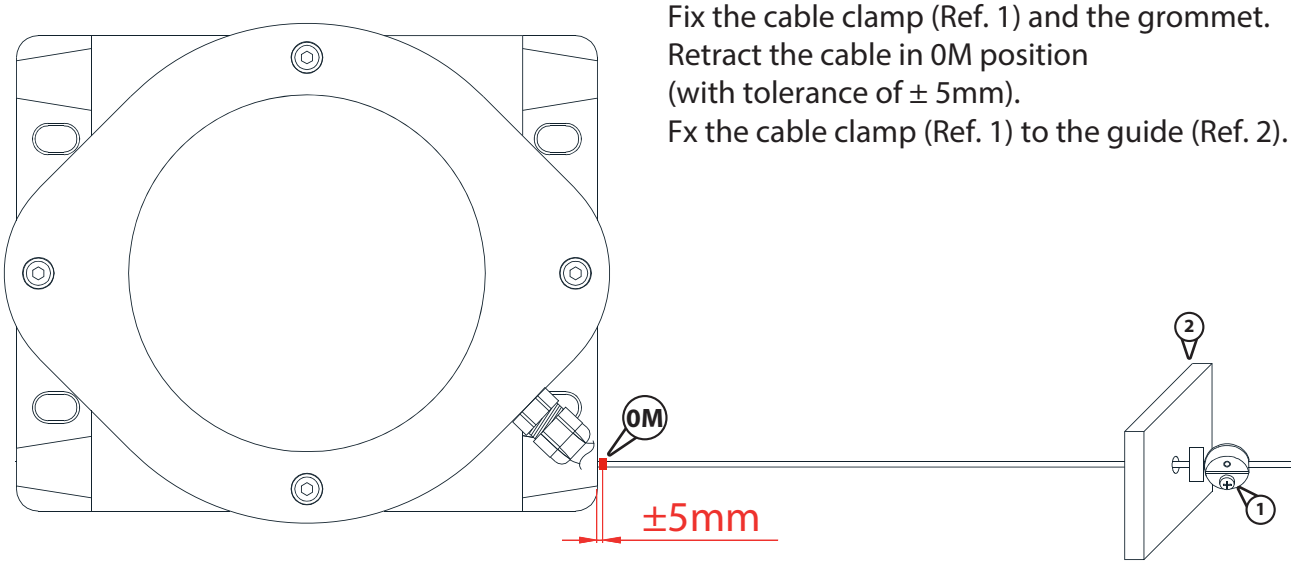
CABLE REEL ADJUSTMENT



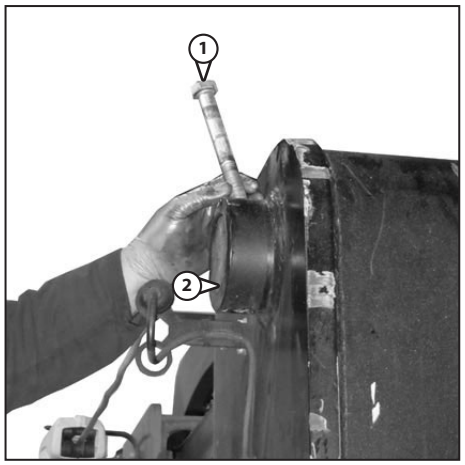
Mark the position 0 meter (**0M**) of the cable clamp (Ref. 1).



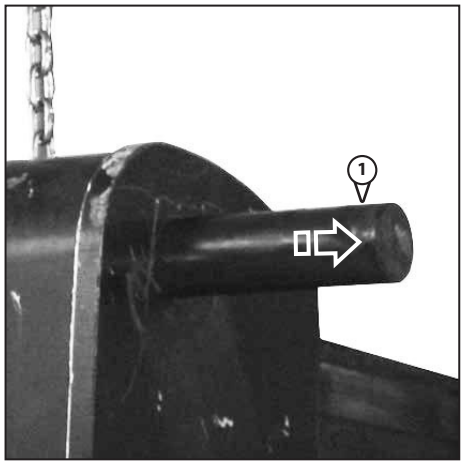
Remove the cable clamp (Ref. 1) and the grommet.
Pass the cable inside the guide (Ref. 2) on the arm.



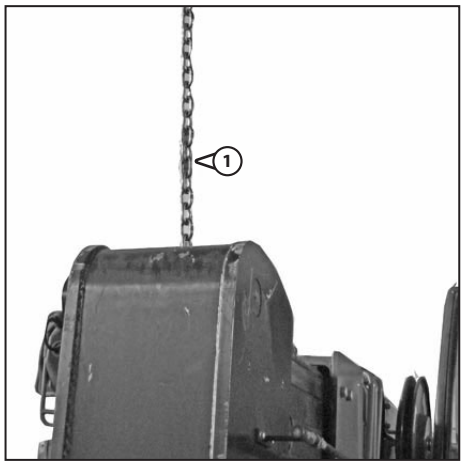
Fix the cable clamp (Ref. 1) and the grommet.
Retract the cable in 0M position
(with tolerance of ± 5mm).
Fx the cable clamp (Ref. 1) to the guide (Ref. 2).



Slacken the screw (Ref. 1) and its nut to release the top pin (Ref. 2) of the slewing cylinder.

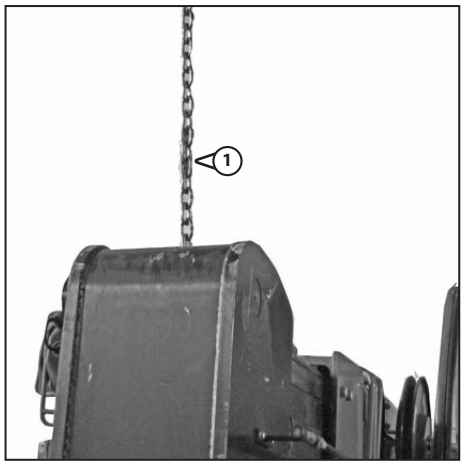


Remove the top pin (Ref. 1) which blocks the slewing cylinder on the boom head.



With the help of an overhead crane (Ref. 1), lower the cylinder until it comes out of the boom head.

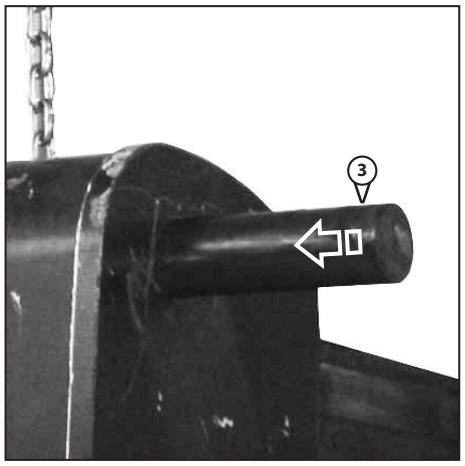
Remove the slewing cylinder (Ref. 1) from the vehicle.



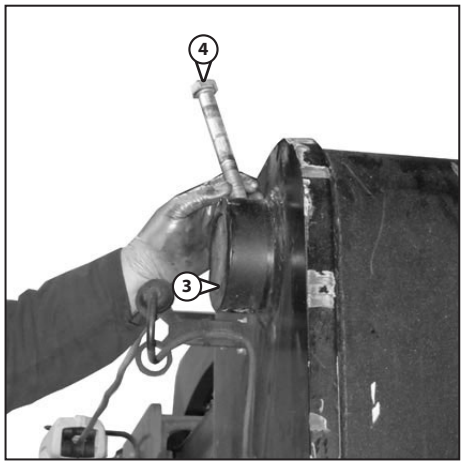
REASSEMBLING THE SLEWING CYLINDER

Insert the chain of the overhead crane (Ref. 1) in the slot on the top of the boom and fix the chain to the head of the slewing cylinder or to an eyebolt fitted on the cylinder.

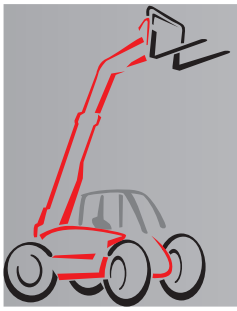
With the help of an overhead crane lift the slewing cylinder (Ref. 1) at the top of the boom.



Insert the upper hinge pin (Ref. 3) to block the slewing cylinder to the boom.



Fit the screw (Ref. 4) and its nut to block the top pin (Ref. 3) of the slewing cylinder.

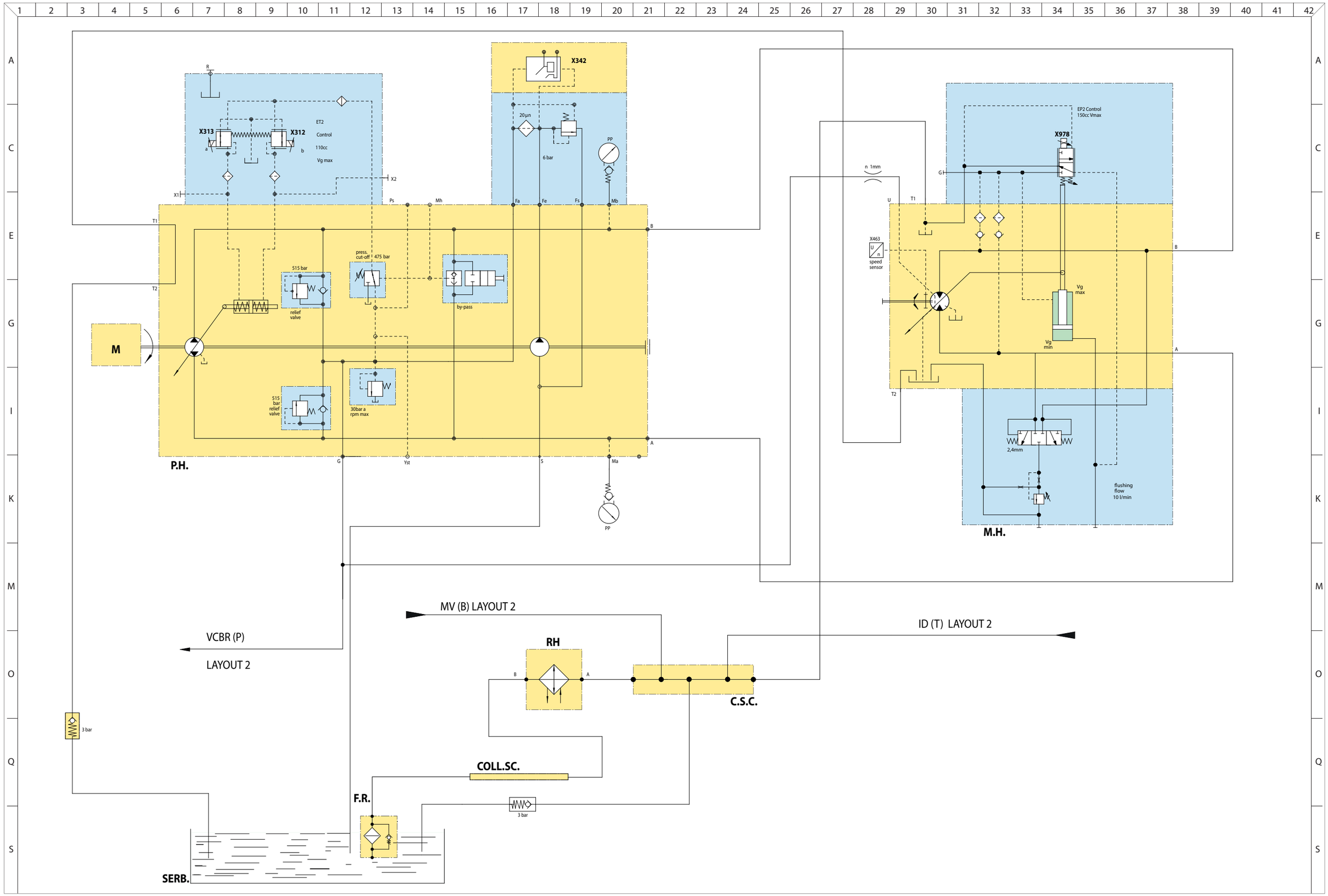


HYDRAULIC CHARACTERISTICS AND SPECIFICATIONS

pages

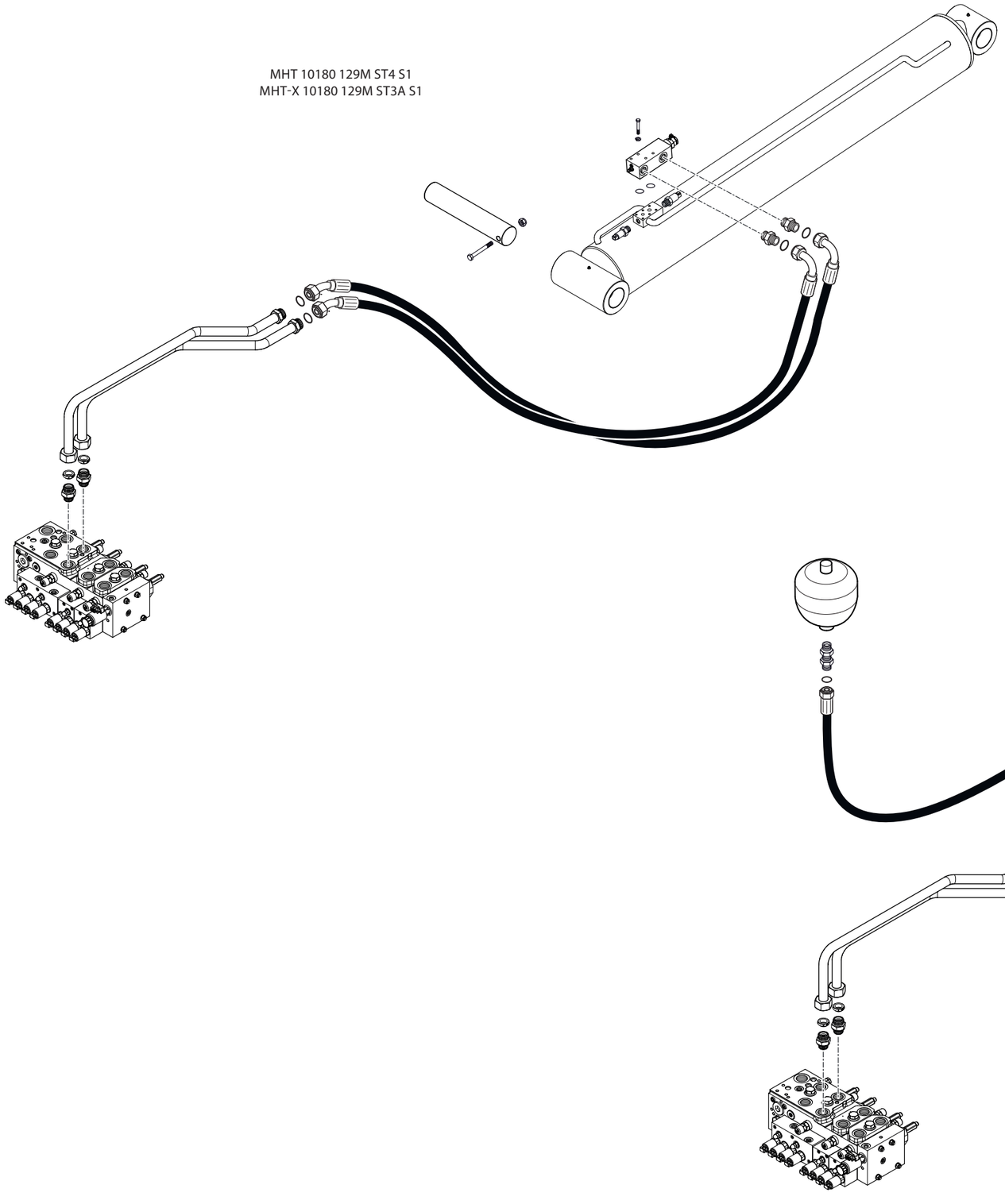
70

HYDRAULIC TRANSMISSION SYSTEM SCHEMA

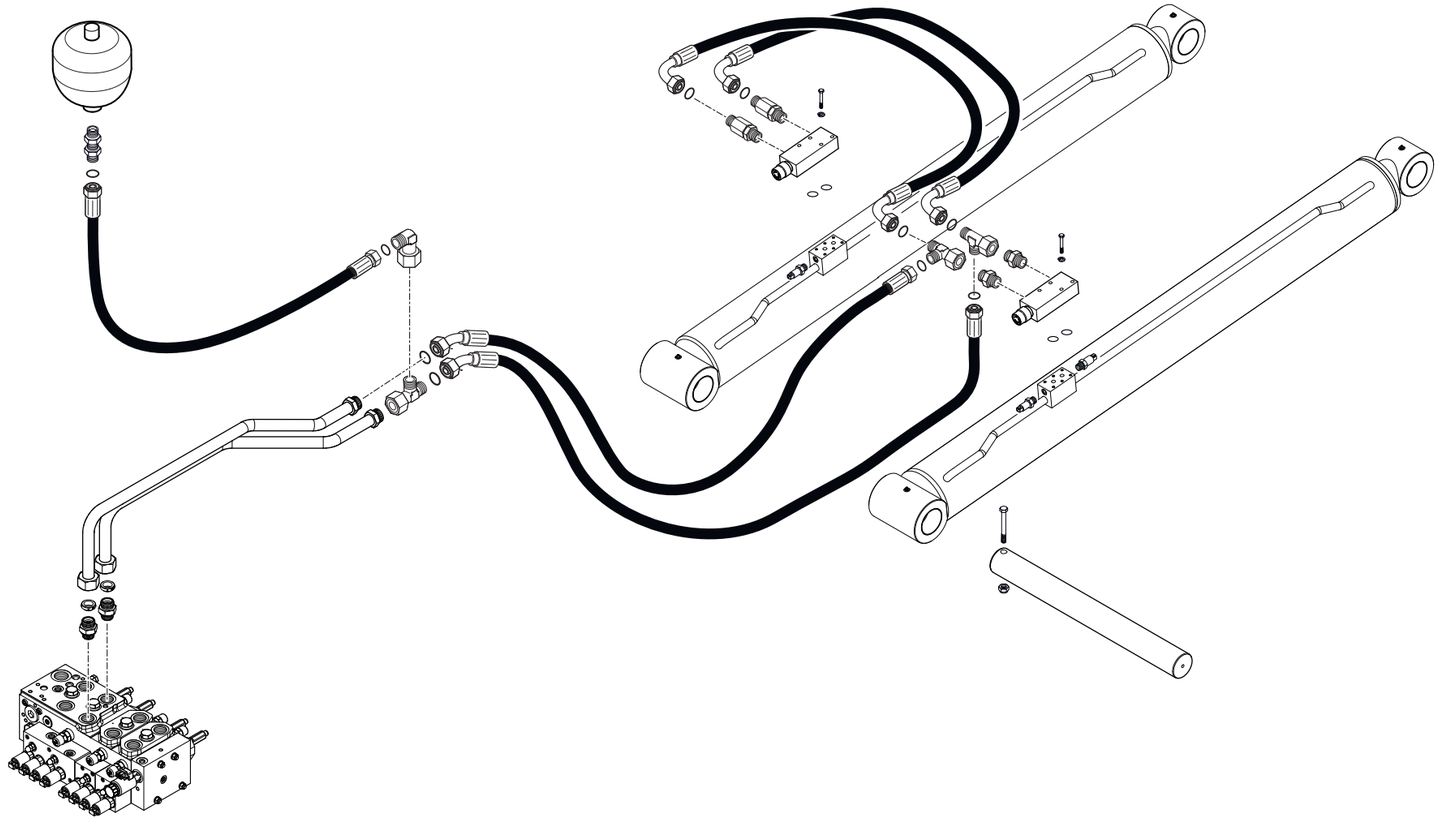


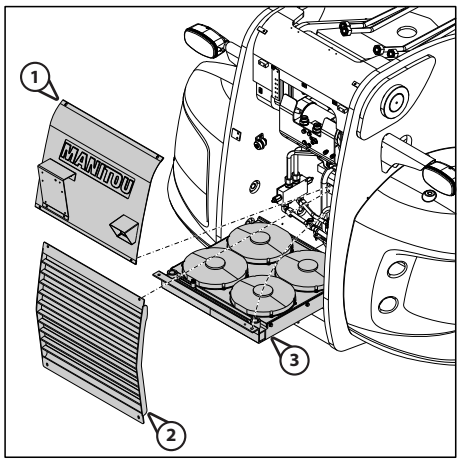
SCHEMATIC DIAGRAM 7 - HYDRAULIC (Lifting circuit)

MHT 10180 129M ST4 S1
MHT-X 10180 129M ST3A S1



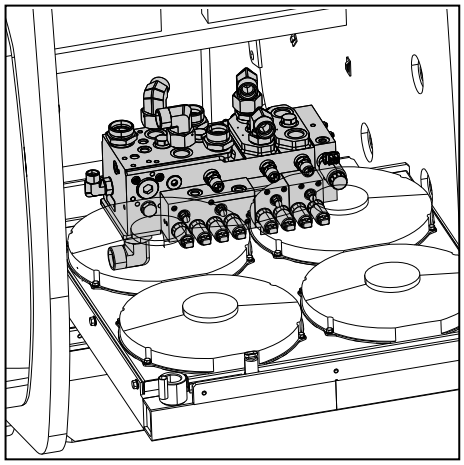
MHT 10230 129M ST4 S1
MHT-X 10230 129M ST3A S1





REMOVING THE DIRECTIONAL CONTROL VALVE

Removing carter rear upper(Ref. 1), carter rear lower (Ref. 2) and oil cooler (Ref. 3), as seen in the picture to access the directional control valve.

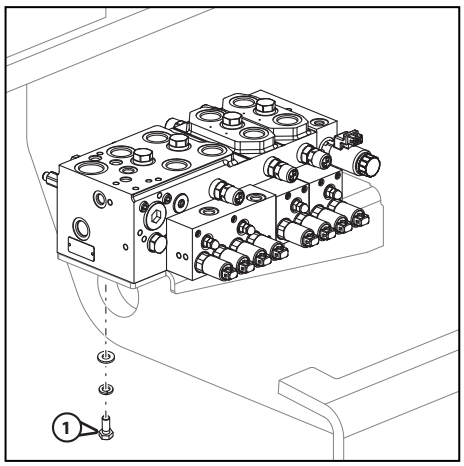


Place a container under the machine.

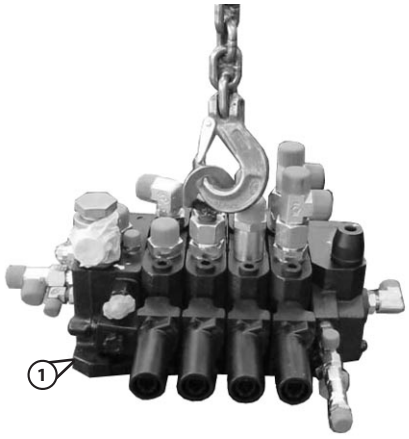
Mark all electrical connections, all tubes and attacks with a marker ,before disassembly to ensure proper repositioning when reassembling

Remove the tubes from the directional control valve and disconnect the electric connectors from the directional control valve.

Plug all the pipes and connectors to prevent impurities from contaminating the hydraulic circuit.



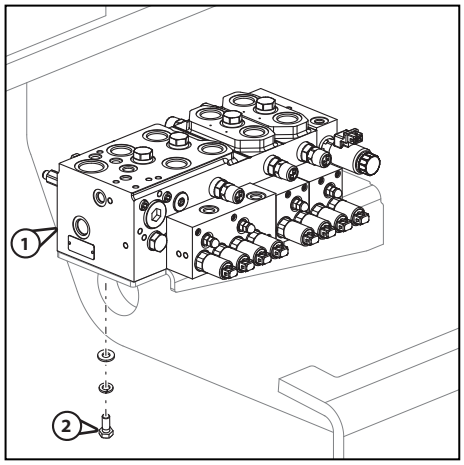
Slacken the screws (Ref. 1) secure the distributor to appropriate lifting means and unscrew the screws (Item 1) and washers.



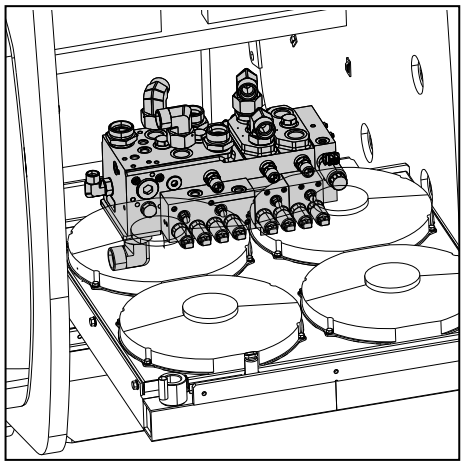
Remove the directional control valve (Ref. 1) from the vehicle.

REFITTING THE DIRECTIONAL CONTROL VALVE

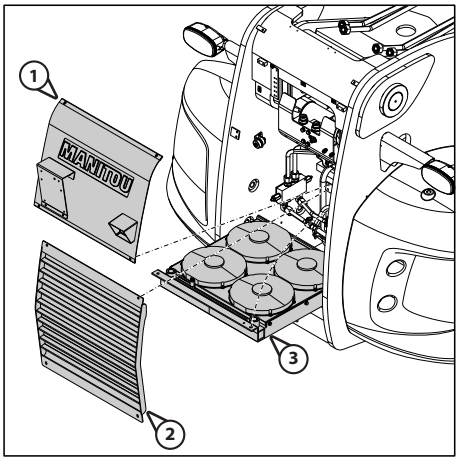
Reposition the directional control valve on the vehicle using the appropriate lift means.



Block the directional control valve (Ref. 1) on the truck frame by means of the screws (Ref. 2).



Reconnect all the electrical connections and hydraulic pipes on the directional control valve (Ref. 1), taking care to reposition them correctly, by following the markings made in the disassembly phase.

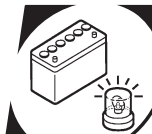


Refit the upper rear carter (Ref . 1) , the rear lower carter (Ref . 2) and radiator (Ref . 3) , as seen in the picture with appropriate screws.

ELECTRICITY

- *ELECTRICAL CHARACTERISTICS AND SPECIFICATIONS*
- *ELECTRICAL SCHEMATIC DIAGRAMS*
- *ELECTRICAL COMPONENTS LOCATION*
- *ELECTRICAL CONTROL AND ADJUSTMENT*
- *ELECTRICAL TROUBLESHOOTING*
- *ELECTRICAL SPECIFIC TOOLING*

647954
RADIOCONTROL AUTEC DYNAMIC
(Installation manual)



647955
RADIOCONTROL AUTEC DYNAMIC
(Service manual)

647805
RADIOCONTROL AUTEC SERIE DYNAMIC PLUS
(Repair manual)

Reference	Pin	Colour	Cross-section	Direction	Wire N°
X912.s	1				
	2				
	3				
	4				
	5				
	6				
X913.p	1	C	1	X162.s/10	0F70
	2	N	1	Gnd3.1	
	3	B	1	X162.s/11	7368
	4	V	1	X162.s/12	3058
X913.s	1				
	2				
	3				
	4				
X936.p	1	Z	1	X162.s/2	F100
	2	N	1	Gnd3.1	
X936.s	1				
	2				
X977	1	SCH	0.32	SA32	
	2	R	0.32	SA30	
	3	N	0.32	SA31	
	4	B	0.2	SA34	
	5	L	0.2	SA33	

CABIN LINE

Reference	Pin	Colour	Cross-section	Direction	Wire N°
A	1	SCH		SA105	
B	1	SCH		SA122	
C	1	SCH		SA117	
D	1	SCH		SA114	
E	1	SCH		SA108	
Gnd5.1	-	N	1	X446/2	
		N	1	X452/24	
		N	1	X817/2	
		N	1	x1022/2	
		N	1	X444/8	
		N	1	X412/1	
		N	0.5	X625/1	
		N	1	X880/5	

Reference	Pin	Colour	Cross-section	Direction	Wire N°
X103.p	1	M	2.5	SA73	0005
	2	R	4	X807.s/1	F206
	3	R	2.5	X469/1	0F56
	4	M	2.5	SA91	0013
	5	H	1	X434/R37	1008
	6	B	1	SA67	6527
	7				
	8	M	1	SA72	
	9	L	1	X470/21	
	10	G	1	X470/19	
	11	B	1	X433/9	6905
	12	B	1	X434/R36	7405
	13				
	14	H	1	SA74	1007
	15	B	1	SA89	6353
	16				
	17	C	1	X436.2/6	0400
	18	B	1	X434/L33	6021
	19	B	1	X454/22	6744
	20	C	0.5	SA59	00F2
	21				
	22	G	1.5	X407/R1_87	2010
	23	G	1.5	X407/R2_87	2009
	24	G	1	SA69	2001
	25	G	1	X459/7	2003
	26				
	27	V	1	X433/19	3325
	28	B	1.5	X404.s/6	6100
	29	V	1	X433/20	3061
X118.p	1	B	1	X118.p	
	2				
	3				
	4				
	5				
	6				
	7	B	1	X118.p/1	
	8				

Reference	Pin	Colour	Cross-section	Direction	Wire N°
X422	1				
	2				
	3				
	4	N	1	Gnd6.2	
	5	B	0.5	SA95	6162
	6	G	0.5	SA55	
	7				
	8	C	0.5	X1007/F7b	F149
	9				
	10				
	11				
	12				
	13				
	14	V	0.5	SA61	
	15				
	16	R	1	X1007/F8b	F148
		R	0.5	X415/16	F148
X432	1	C	2.5	SA64	0407
	2	C	2.5	SA64	0407
	3	C	2.5	SA64	0407
	4	N	2.5	Gnd7	
X433	1	C	1	SA62	
	2	V	1	X160.p/2	3323
	3	B	1	X877.s/6	6561
	4	V	1	X160.p/23	3057
	5	A	1	X160.p/10	1391
	6	A	1	X160.p/11	1390
	7	G	0.5	SA129	
	8	V	1	X162.p/4	3336
	9	B	1	X103.p/11	6905
	10	A	1	X160.p/30	1337
	11	Z	1	X128.p/1	0600
	12	B	1	X450/B	6877
	13	B	1	X466/2	6435
	14	V	1	X162.p/12	3058
	15	V	1	X128.p/7	3309
	16	V	1	X128.p/14	3310
	17	V	1	X160.p/7	3012
	18	V	1	X160.p/1	3013
	19	V	1	X103.p/27	3325
	20	V	1	X103.p/29	3061
	21	M	1	SA91	0013

Reference	Pin	Colour	Cross-section	Direction	Wire N°
X468	1				
	2				
	3	A	0.5	X449/4	1332
	4	M	1	SA73	0005
	5				
	6	A	0.5	X449/3	1331
	7	B	0.5	X449/1	6843
	8	B	0.5	X449/5	6841
	9				
	10				
	11				
	12				
	13				
	14				
	15				
	16				
	17				
	18	H	1	X434/L10	1072
		H	1	X1002.s/2	1072
X469	1	R	2.5	X103.p/3	0F56
	2	M	1.5	SA73	0005
	3	B	1.5	SA67	6527
	4				
	5				
	6				
	7				
	8				
	9				
	10				
	11				
	12				
	13				
	14	B	1	X118.s/2	7790
	15	B	1	X118.s/3	7791
	16	V	0.5	X472/A	
		V	0.5	SA121	
	17	B	1	SA7	6162
	18	G	0.5	X472/B	
		G	0.5	SA120	

Reference	Pin	Colour	Cross-section	Direction	Wire N°
X1011.p	A	B	0.5	SA260	6358
	B				
	C	L	0.5	X806/F	
	D				
	E				
	F	B	0.5	X806/G	
	G				
	H	B	0.5	SA261	6162
	J	G	0.5	SA129	
	K	V	0.5	SA130	
	L	Z	1	X160.p/4	0609
	M	B	1	X160.p/6	6054
	N	C	1	X1020/2	0F80
	P	R	1	X345.s/5	F302
	R	M	1	X345.s/6	0005
	S	A	1	X160.p/12	1316
	T	A	1	X160.p/14	1350
	U	A	1	X345.s/7	1339
	V	A	1	X345.s/8	1340
	W	C	1	X1006/F2b	0F18
	X				
X1020	1	C	1	SA63	0400
	2	C	1	X1011.p/N	0F80
X1021	1	C	1	X1005/F5b	00F5
	2	B	1	X618/1	8012
X1022	1	2	X1007/F9b	F150	
	2	2	Gnd5.1		

ENGINE LINE MHT 10180 / 10230

Reference	Pin	Colour	Cross-section	Direction	Wire N°
B	1	SCH		SA20	
D	1	SCH		SA25	
Gnd1	-	N	2	X325/B	
		N	2	X324/B	
		N	2	X323/B	
		N	2	X322/B	
		N	1	X1002/4	

Reference	Pin	Colour	Cross-section	Direction	Wire N°
X314	15	R	2.5	SA9	F230
	16	M-H	1	SA205	
	17				
	18				
	19	G	1	SA204	
	20	B	1	X103.s/15	6307
	21	B	1	X1002/2	1072
X315	1	C	1.5	X319/6	0F52
	2	N	1.5	Gnd2.2	
X316	1	H	1	X103.s/16	1036
	2	H	1	X103.s/14	1007
	3	C	1	X319/4	0F50
	4	R	1	X319/5	0F51
	5				
X317	-	H	4	X321/R1-87	1001
X318	F1	R	4	X320/R1-30	F255
	F2	R	4	X320/R2-30	F256
	F3	R	4	X321/R2-30	F258
		R	1	X319/2	F258
	F4	R	4	X103.s/2	F260
	F5				
	F6	R	4	X321/R1-30	F259
	COM	R	35	X326	
X319	1	B	1.5	X321/R2-87	6907
	2	R	1	X318/F3	F258
	3	B	1.5	X321/R2-87	6907
	4	C	1	X316/3	0F50
	5	R	1	X316/4	0F51
	6	C	1.5	X315/1	0F52
	7	R	1.5	SA13	0201
	8	R	4	SA14	
	9	R	4	SA14	
	10	R	2.5	X103.s/3	0F56
	11	R	4	SA23	F301
	12	R	1	SA22	F300
		R	1	X750/1	F300
	13	R	10	SA13	0201
	14	R	10	SA5	F230
	15				
	16				
	17	R	4	SA14	
	18	R	2.5	X892.s/1	F231

Reference	Pin	Colour	Cross-section	Direction	Wire N°
SA9	-	R	6	X319/14	F230
		R	2.5	X314/5	F230
		R	2.5	X314/6	F230
SA16	-	G	0.5	X1011.s/J	
		G	0.5	X991/A	
		G	0.5	SA118	
SA19	-	V	0.5	SA119	
		V	0.5	X991/B	
		V	0.5	X1011.s/K	
SA24	-	M	2.5	X997/2	0005
		M	0.75	X998/23	0005
		M	1.5	X997/7	0005
		M	4	X1009	0005
		M	0.75	X998/22	0005
		M	1.5	X998/24	0005
		M	1.5	X997/33	0005
		M	1.5	X997/46	0005
		M	1.5	X997/20	0005
SA25	-	SCH		D/1	
		B	0.5	X1011.s/A	6358
SA26	-	SCH		SA27	
		SCH		SA99	
		SCH		B/1	
SA27	-	SCH		SA26	
		B	1	X1011.s/H	6162
SA28	-	R	0.5	X997/58	F300
		R	0.5	X997/45	F300
		R	1	X319/12	F300
SA29	-	R	2.5	X997/3	F301
		R	2.5	X997/5	F301
		R	2.5	X997/1	F301
		R	2.5	X997/4	F301
		R	4	X319/11	F301
		R	2.5	X997/6	F301
SA98	-	B	0.5	X993.s/2	6054
		B	0.5	X1011.s/M	6054
		B	0.75	X998/46	6054
SA99	-	N	0.5	Gnd2.1	
		SCH		SA26	
		N	0.5	X991/C	
SA118	-	G	0.5	X997/53	
		G	0.5	SA16	

Reference	Pin	Colour	Cross-section	Direction	Wire N°
X998	78	A	0.75	X993.s/5	1441
	79	A	0.75	X341/2	1476
	80				
	81				
	82				
	83	A	0.75	X313/2	1341
	84	A	0.75	X312/2	1342
	85	A	0.75	X993.s/6	1415
	86	A	0.75	X978/2	1414
	87				
	88				
	89				
	90				
	91				
	92				
	93				
	94				
	95				
	96				
X1002	1	B	1	X321/R1-86	1072
	2	B	1	X314/12	1072
	3	A	1	X1011.s/W	0F18
	4	N	1	Gnd9	
X1002.p	1	H	1	X1002.p/2	1072
	2	H	1	X1002.p/1	1072
	3				
	4				
X1003	-	R	16	X1008	0201
X1004	-	R	16	X413.s/1	
X1008	-	R	16	X1003	0201
X1009	-	M	4	X103.s/4	005
		M	4	SA24	005
		M	1.5	X1011.s/R	005

Reference	Pin	Colour	Cross-section	Direction	Wire N°
XFEM.s	1	CB	1.5	X04.p/1	
	2	CV	1.5	X03/2	
	3	RB	1	X1001.p/1	
	4	N	1	SA01	

PRE-START ALLARM LINE

Reference	Pin	Colour	Cross-section	Direction	Wire N°
+30	-	N	70	TL.30	
TL.30	-	N	70	+30	

Reference	Pin	Colour	Cross-section	Direction	Wire N°
TL.87	-	N	70	Pump+	
Pump+	-	N	70	TL.87	

Reference	Pin	Colour	Cross-section	Direction	Wire N°
Gnd	-	N	70	Pump-	
Pump-	-	N	70	Gnd	

Reference	Pin	Colour	Cross-section	Direction	Wire N°
TL.85	-	N	1	X627.p/B	
TL.86	-	G	1	X627.p/A	
X627.p	A	G	1	TL.86	
	B	N	1	TL.85	
	C				

Reference	Pin	Colour	Cross-section	Direction	Wire N°
X737	1	N	1.5	SA39	
	2	G-V	1.5	SA40	
	3	H	1.5	SA41	
	4	M	1.5	SA43	
X738.1	-	M	1.5	SA42	
X738.2	-	L	1.5	SA44	
X739	1	B	1	X746/5	6551
	2	B	1	X746/7	6562
	3	N	1	SA38	
	4	C	1	SA35	00F3
X740	1	B	1	X745/5	7510
	2	B	1	X745/7	7511
	3	N	1	SA38	
	4	C	1	SA35	00F3
X741	1	B	1	X741/B	7509
		B	1.5	X733/1	7509
	2				
	3				
	4				
	5	C	1.5	X404.p/10	00F8
		C	1	X741/10	00F8
	6				
	7				
	8				
	9	N	1	X745/9	
		N	1	X742/9	
	10	C	1	X741/5	00F8
	A				
	B	B	1	X741/1	7509

Reference	Pin	Colour	Cross-section	Direction	Wire N°
X792.s	1	Z	1.5	SA5	
	2	B	1	X791/26	7685
	3	B	1	X791/27	7686
	4	B	1	X791/34	7682
	5	B	1	X791/24	7684
	6	B	1	X791/25	7690
	7				
	8	B	1	X791/28	7683
	9	H	0.5	X993.p/9	
	10	G	0.5	X993.p/7	
	11	S	0.5	X993.p/8	
	12	B	0.5	X993.p/5	
	13	V	0.5	X993.p/6	
	14	B	1	X791/32	7687
	15	V	1	X791/12	3571
	16	B	1	X791/33	7688
	17	B	1	X993.p/10	6173
	18	B	1	X993.p/11	6983
	19	B	1	X993.p/12	7367
	20	L	0.5	SA7	
	21	V	1	X791/11	3075
	22	V	1	X791/10	3297
	23	V	1	X791/9	3264
	24	B	0.5	SA6	
	T1	N	1.5	SA1	
	T2				
X794.p	1				
	2				
	3				
	4				
	5				
	6				
X794.s	1	Z	1	SA5	
	2	N	1	SA1	
	3	B	0.5	SA6	
	4	L	0.5	SA7	
	5				
	6				

CLAMP CONTROL CABIN LINE

Reference	Pin	Colour	Cross-section	Direction	Wire N°
A	-	SCH		SA3	
SA1	-	G	0.5	X989/C6	
		G	0.5	X120.p/A	
		G	0.5	X120.s/A	
SA2	-	V	0.5	X989/B7	
		V	0.5	X120.s/A	
		V	0.5	X120.p/A	
SA3	-	SCH		A/-	
		SCH		SA5	
		SCH		SA4	
SA4	-	B	0.5	X120.s/C	6162
		SCH		SA3	
SA5	-	B	0.5	X120.s/C	6162
		SCH		SA3	
SA6	-	C	1	X479.s/8	0F63
		C	1	X479.p/8	0F63
		C	1	X989/C1	0F63
		C	1	X989/A8	0F63
		C	1	X987/1	0F63
SA7	-	N	1	X479.p/2	
		N	1	X479.s/2	
		N	1	X989/B1	
X120.p	A	G	0.5	SA1	
	B	V	0.5	SA2	
	C	B	0.5	SA5	6162
X120.s	A	G	0.5	SA1	
	B	V	0.5	SA2	
	C	B	0.5	SA5	6162
X479.p	1	R	1	X479.s/1	0F57
	2	N	1	SA7	
	3	B	1.5	X479.s/3	6308
	4	B	1	X479.s/4	6307
	5	B	1	X479.s/5	6353
	6	B	1.5	X479.s/6	6983
	7	H	1	X479.s/7	1007
	8	C	1	SA6	0F63

GUARDIAN ANGEL LINE

Reference	Pin	Colour	Cross-section	Direction	Wire N°
BZ01	1	L	1	X019/A8	
	2	N	1	SA3	
SA01	-	C	1	X026/1	
		C	1	X026/3	
		C	1	X479.p/8	
		C	1	X019/A1	
		C	1	X479.a/8	
SA02	-	H	1	X019/C3	
		H	1	X479.a/7	
		H	1	X479.p/7	
SA03	-	N	1	X479.P/2	
		N	1	BZ01/2	
		N	1	X025/1	
		N	1	X024/1	
		N	1	X479.A/2	
		N	1	X019/C8	
SCH	-	SCH		X120.p/C	
		SCH		X472A.s/C	
		SCH		X472.p/C	
		SCH		X120A.s/C	
X04.s	1	CV	1.5	X019/B8	
X016.s	1	A	1	X026/4	

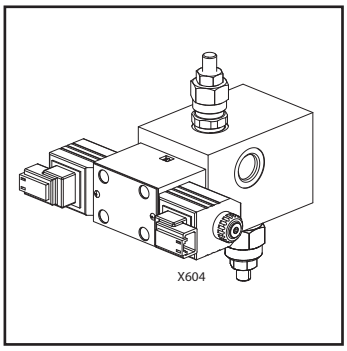
ECU INPUTS/OUTPUTS

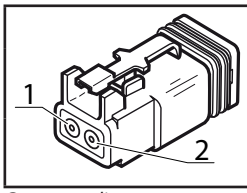
pages

TECHNICAL SHEETS FOR ELECTRICAL COMPONENTS

pages

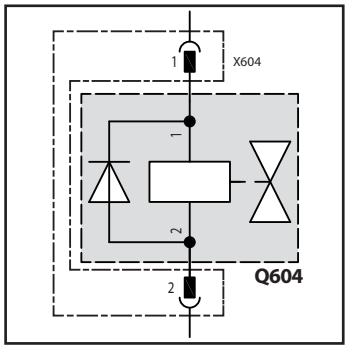
Q604 LEFT LEVEL SOLENOID VALVE





PIN	Function
1	EV Level LH
2	GND

Corresponding connector

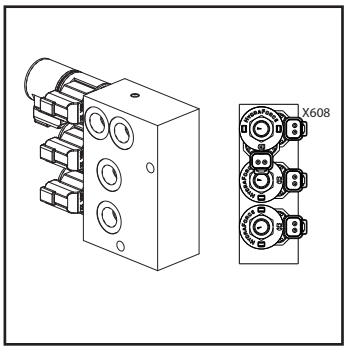


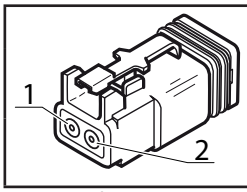
Diagram

	Typical
Supply voltage	24 V
Consumption	0.8 A

Notes: _____

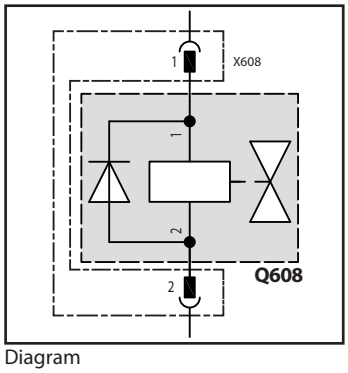
Q608 SLOW SPEED SOLENOID VALVE





PIN	Function
1	EV Slow speed
2	GND

Corresponding connector

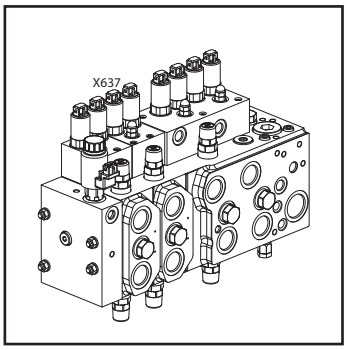


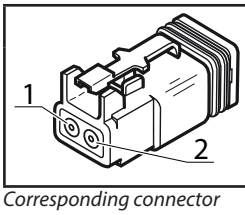
Diagram

	Typical
Supply voltage	24 V
Consumption	0.8 A

Notes: _____

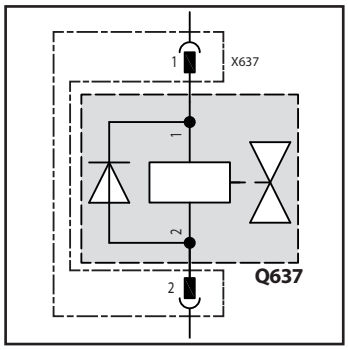
Q637 EV DOWNLOAD TILTING SOLENOID VALVE





Corresponding connector

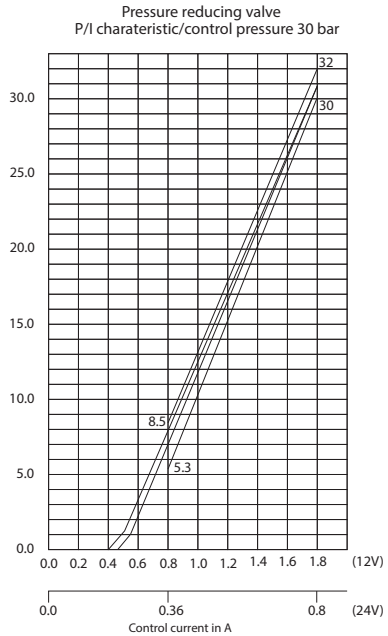
PIN	Function
1	EV Download tilting solenoid valve
2	GND



Diagram

	Typical
Supply voltage	24 V
Consumption	0.18÷0.8 A

Notes:



Representation of a track.

⇒ Flows are refferedto 16 bar LS-DELTA P.

⇒ Unloading 30 bar ± 2 whit 15 LPM.

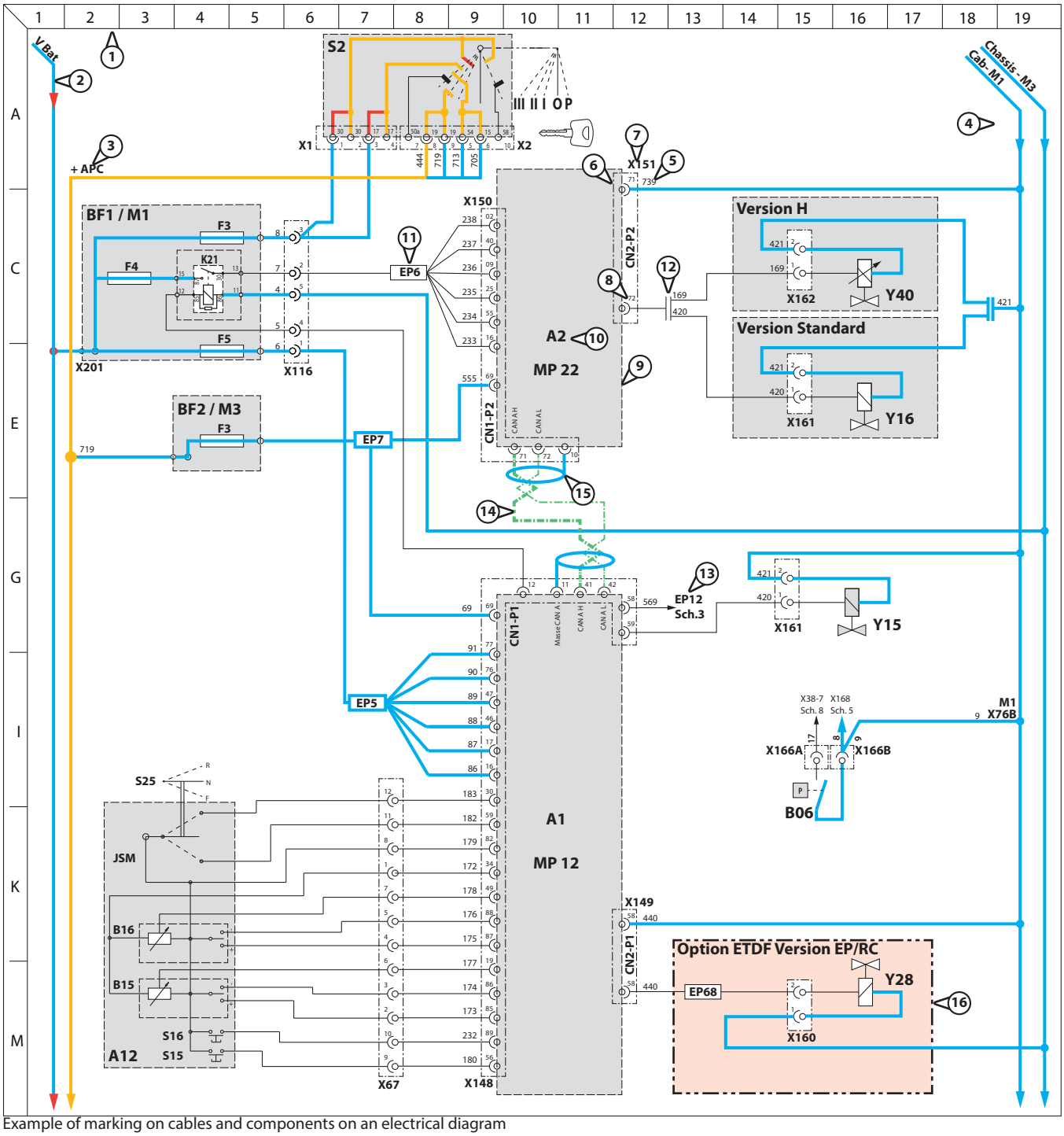
⇒ Port relief valves setting flow 10 LPM.

⇒ LS relief valve/LS.

It is detailed in the following chapter:
◁ *Group 80 - Electrical control and adjustment*

Notes:

EXAMPLE OF CODES ON ELECTRICAL DIAGRAMS



Example of marking on cables and components on an electrical diagram

Key:

1 - Marking grid
2 - + Permanent
3 - + After ignition
4 - Grounds
5 - Wire N°
6 - Electrical connector
7 - Electrical connector name
8 - Electrical connector PIN N°
9 - Electrical component
10 - Electrical component name
11 - Splice
12 - Version choice
13 - Other diagram reference
14 - CAN
15 - CAN Shielding
16 - Option

Electrical connectors																																								
Item	**Diag. 1**	**Diag. 2**	**Diag. 3**	**Diag. 4**	**Diag. 5**	**Diag. 6.1**	**Diag. 6.2**	**Diag. 7.1**	**Diag. 7.2**	**Diag. 8**	**Diag. 9**	**Diag. 10**	**Diag. 11**	**Diag. 12**	**Diag. 13**	**Diag. 14**	**Diag. 15**	**Diag. 16**	**Diag. 17**	**Diag. 18**	**Diag. 19**	**Diag. 20**	**Diag. 21**	**Diag. 22**	**Diag. 23**	**Diag. 24**	**Diag. 25**	**Diag. 26**	**Diag. 27**	**Diag. 28**	**Diag. 29**	**Diag. 30**	**Diag. 31**	**Diag. 32**	**Diag. 33**	**Diag. 34**	**Diag. 35**	**Diag. 36**	**Diag. 37**	**Diag. 38**	**Diag. 39**	**Diag. 40**
X43																			√																						
X50																			√																						
X59																			√																						
X68A																			√																						
X69A																			√																						
X95																			√																						
X96																			√																						
X101																			√																						
X102																			√																						
X103.p	√	√		√	√							√	√	√	√	√	√	√	√		√	√																			
X103.s	√	√		√	√							√	√	√	√	√	√	√	√		√	√																			
X104.p			√																																						
X104.s		√																																							
X107																			√																						
X108																			√																						
X112																																								√
X117																																								√
X118								√																									√							
X118.p								√																																
X118.s						√		√																																
X119						√		√																																
X119.p			√																																					
X120				√	√																							√								√				
X120.p																								√												√				
X120.s																								√			√													
X120A.p																											√													
X120A.s																								√																
X128.p				√	√					√	√	√	√	√			√	√			√	√																		
X128.s				√	√					√	√	√	√	√			√	√			√	√																		
X132																																								√
X135																																								√
X136																																								√
X145												√	√	√																										
X160.p						√		√		√	√	√	√	√																										
X160.s						√		√		√	√	√	√	√																										
X162.p										√	√						√	√			√	√																		
X162.s										√	√						√	√			√	√																		
X300	√			√								√	√																												
X301												√	√																												
X302												√	√																												
X303												√	√																												
X304	√																																							
X305				√																																				
X307												√	√																												
X308	√																																							
X309				√																																				
X310				√																																				
X311												√	√	√																										
X312						√		√																																
X313						√		√																																

DIAGRAM 1 (STARTER MHT 10180/10230)

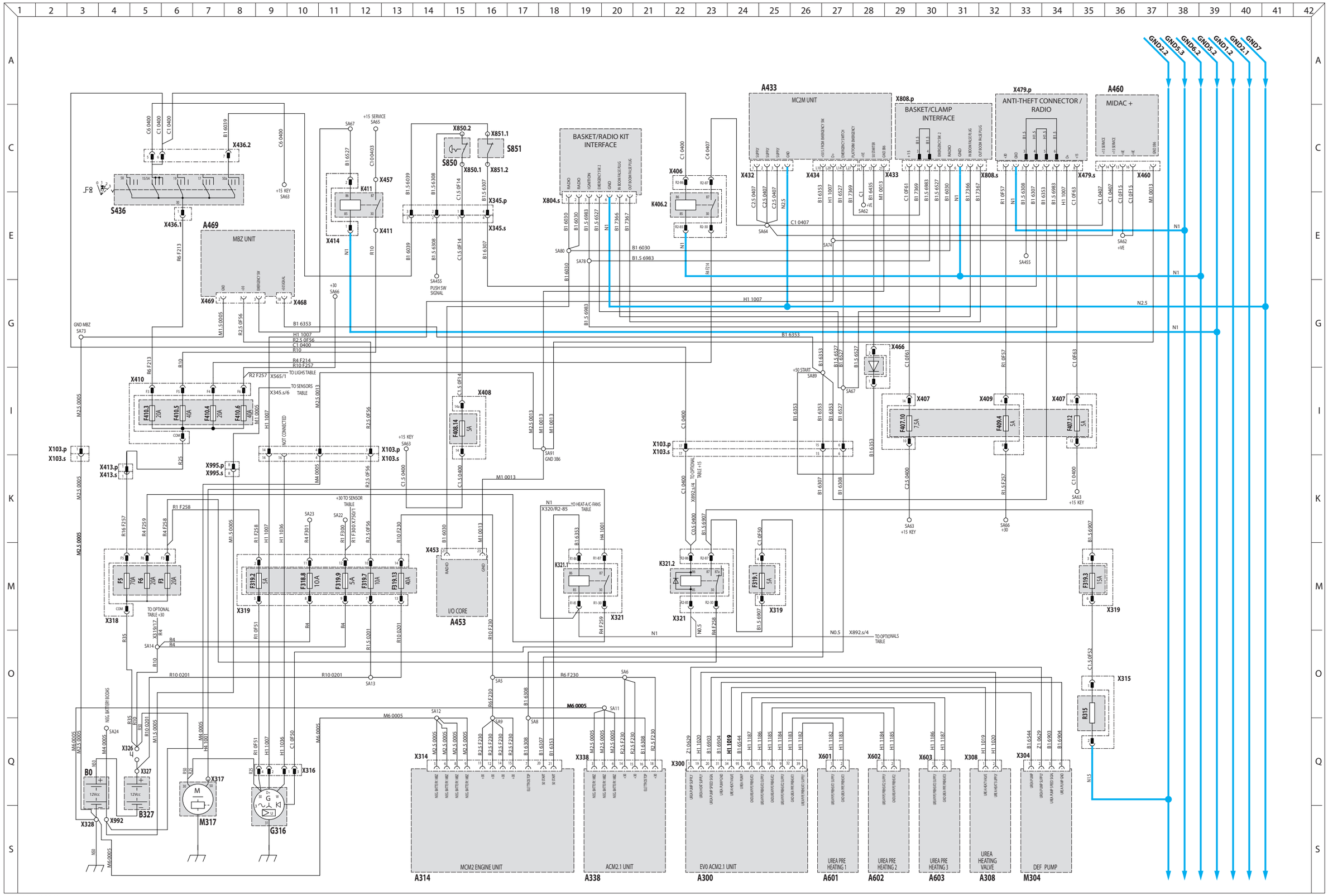
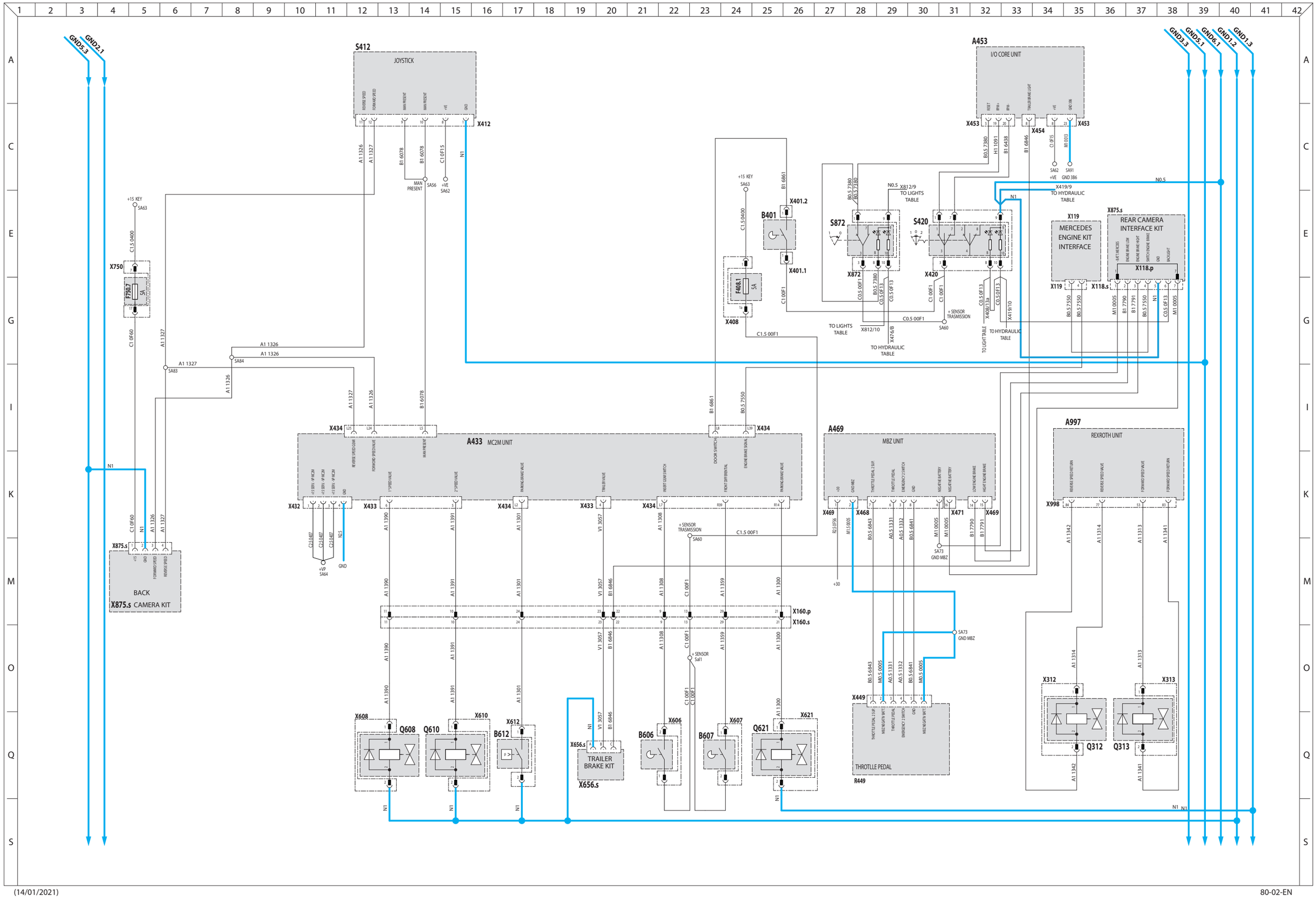


DIAGRAM 6.1 (Transmission MHT 10180/10230)



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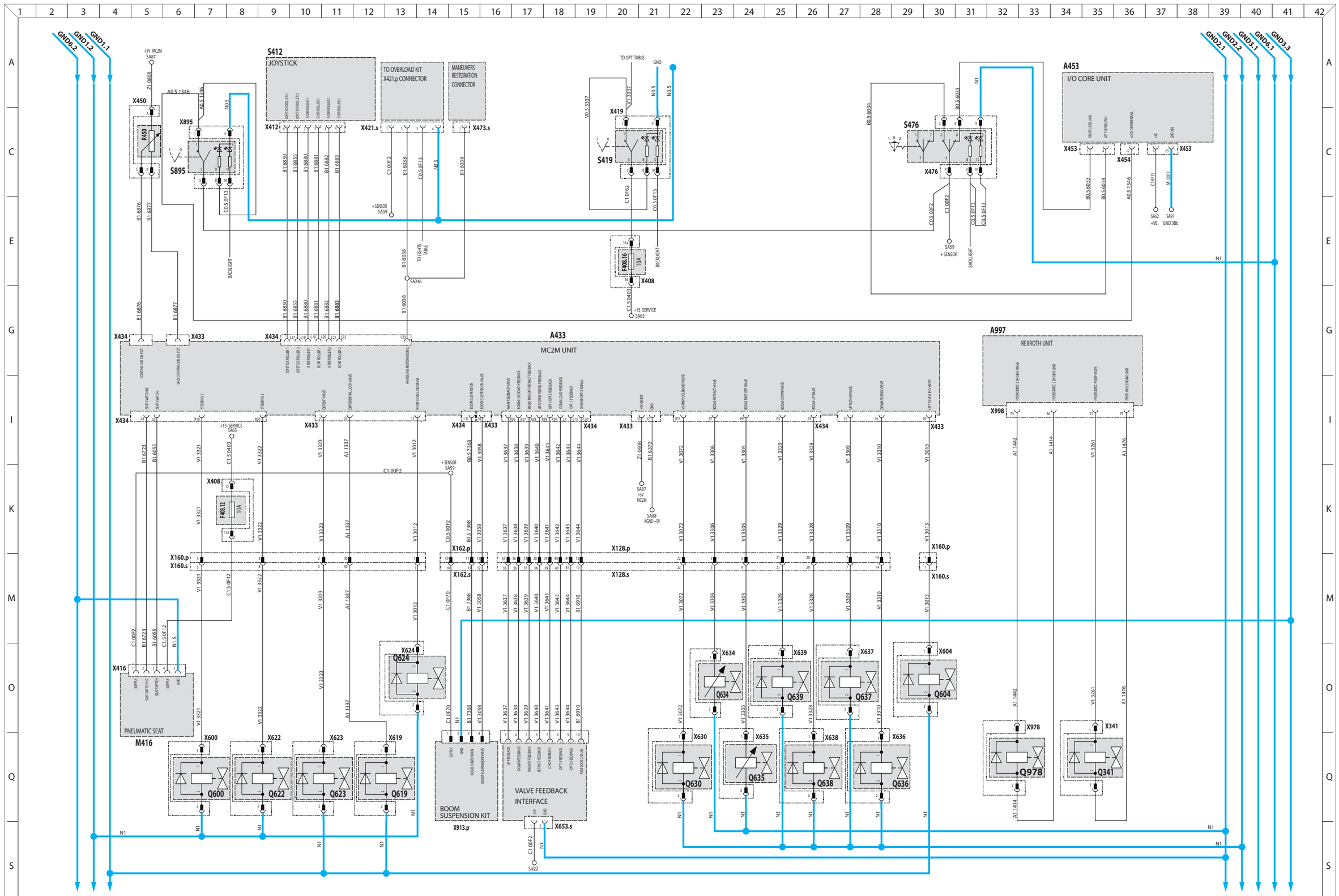
S412
JOYSTICK
TO OVERLOAD KIT
X421.p CONNECTOR
MANEUVERS
RESTORATION
CONNECTOR
TO OPT. TABLE
GND
A453
I/O CORE UNIT
S476
S419
X450
X895
S895
R450
X412
X421.s
X473.s
X419
X476
X453
X454
X408
F408.16
10A
SA246
SA65
SA59
SA62
SA91
A433
MC2M UNIT
A997
REXROTH UNIT
X998
PNEUMATIC SEAT
M416
X416
X600
X622
X623
X619
Q600
Q622
Q623
Q619
X624
Q624
X634
X639
X637
X604
Q634
Q639
Q637
Q604
X630
X635
X638
X636
Q630
Q635
Q638
Q636
X978
X341
Q978
Q341
BOOM
SUSPENSION KIT
X913.p
VALVE FEEDBACK
INTERFACE
X653.s
X162.p
X162.s
X128.p
X128.s
X160.p
X160.s
SA87
+5V
MC2M
SA88
AGND +5V
SA22
+SENSOR
SA59
+15 SERVICE
SA65
BACKLIGHT
TO LIGHTS
TABLE
GND6.2
GND1.2
GND1.1
GND2.1
GND2.2
GND3.1
GND6.1
GND3.3
N1

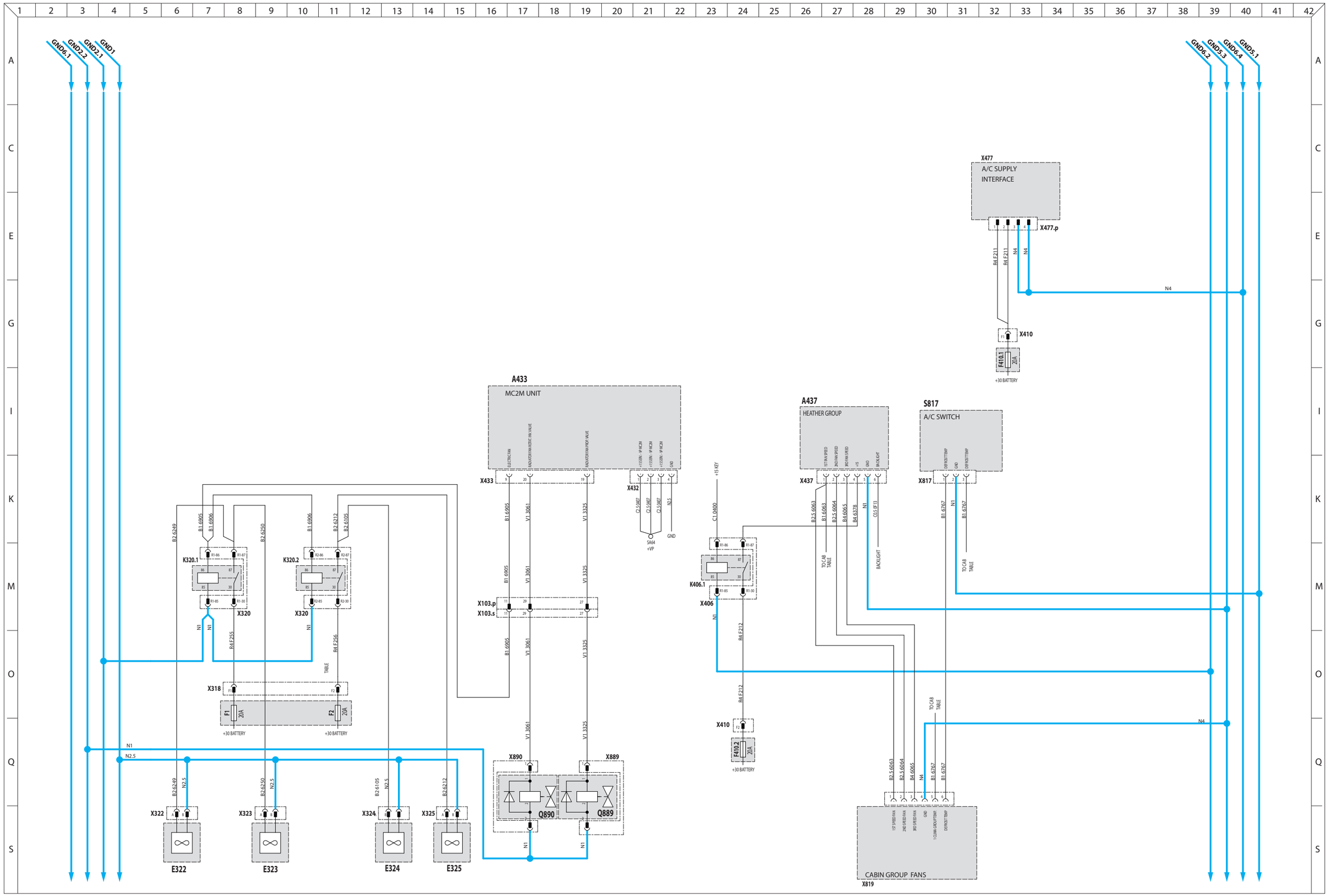
GND6.1
GND2.2
GND2.1
GND1
GND6.2
GND5.3
GND6.4
GND5.1
X477
A/C SUPPLY INTERFACE
X477.p
R4 F211
N4
X410
F410.1
20A
+30 BATTERY
A433
MC2M UNIT
ELECTRIC FAN
EQUALIZER FAN/DEFLECTOR VALVE
HEATER FAN/HEATER VALVE
+15 SW - VP MC2M
GND
X433
X432
SA64
+VP
A437
HEATHER GROUP
1ST FAN SPEED
2ND FAN SPEED
3RD FAN SPEED
+15
GND
BACKLIGHT
X437
S817
A/C SWITCH
DEFROST TEMP
X817
+15 KEY
C1.04000
K406.1
X406
C0.5 F13
TO CAB TABLE
B2.5 6063
B1.6063
B2.5 6064
B4.6065
B4.6378
N1
B1.6767
B2.6249
B2.6250
B2.6105
B2.6212
B1.6905
B1.6906
K320.1
K320.2
X320
R4 F255
R4 F256
X318
F1
F2
20A
+30 BATTERY
V1.3061
V1.3325
X103.p
X103.s
X890
X889
Q890
Q889
N2.5
X322
X323
X324
X325
E322
E323
E324
E325
B2.5 6064
B4.6065
B1.6767
CABIN GROUP FANS
X819
1ST SPEED FAN
2ND SPEED FAN
3RD SPEED FAN
GND
1 CLIMA GROUP TEMP
DEFROST TEMP

DIAGRAM 19 (Optionals MHT 10180/10230)

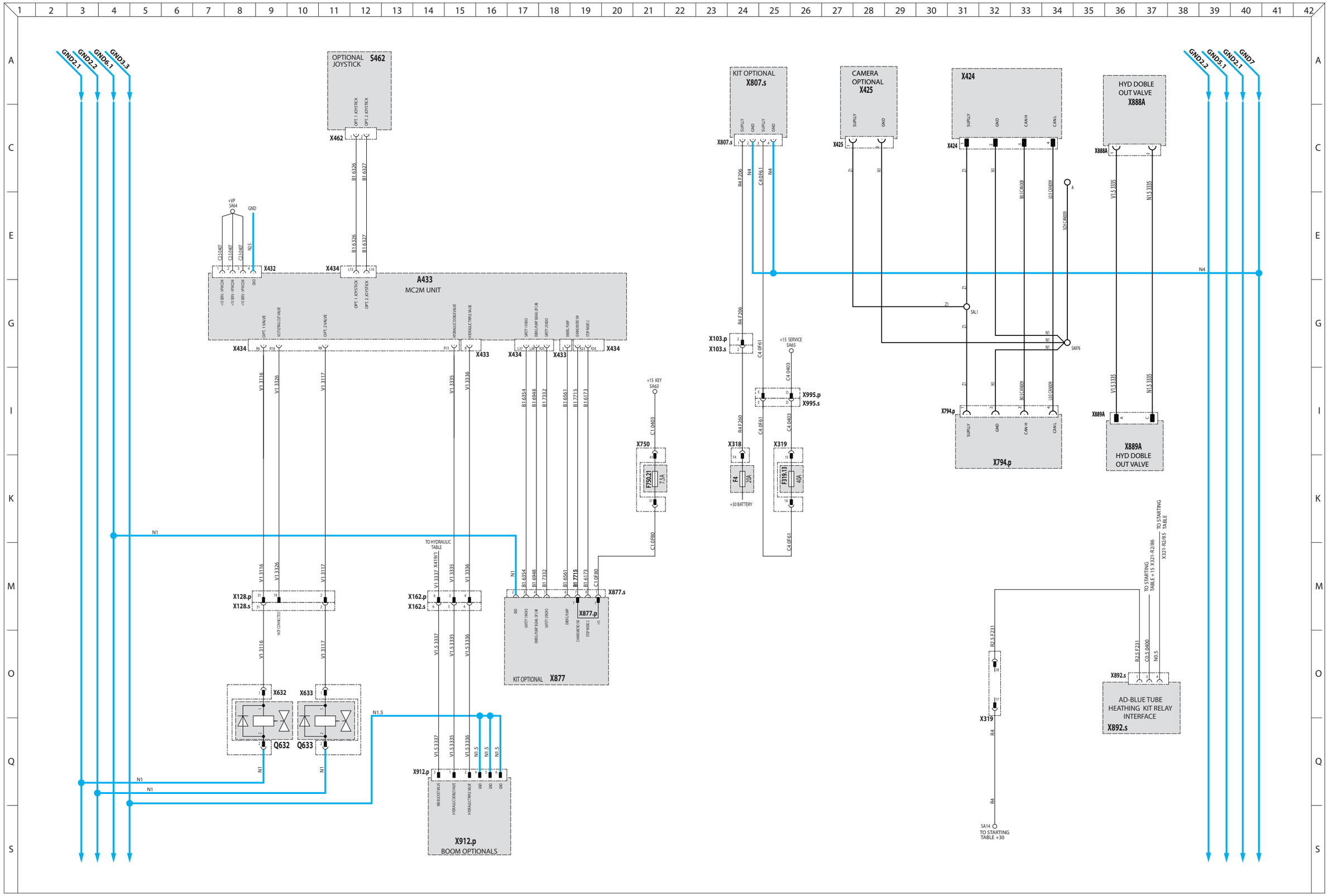

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DIAGRAM 24 (Roof amber light)

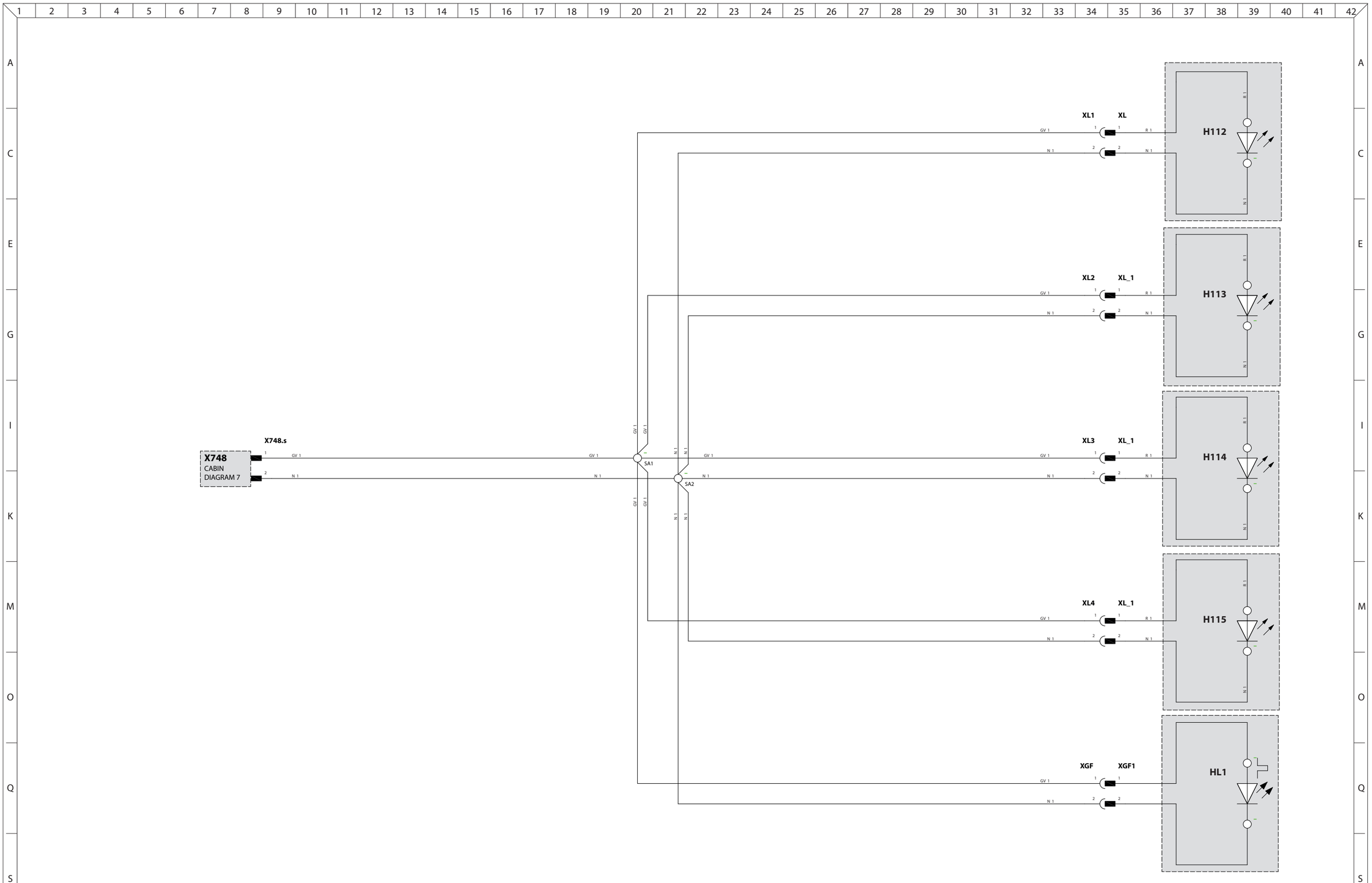


DIAGRAM 29 (LED bars)

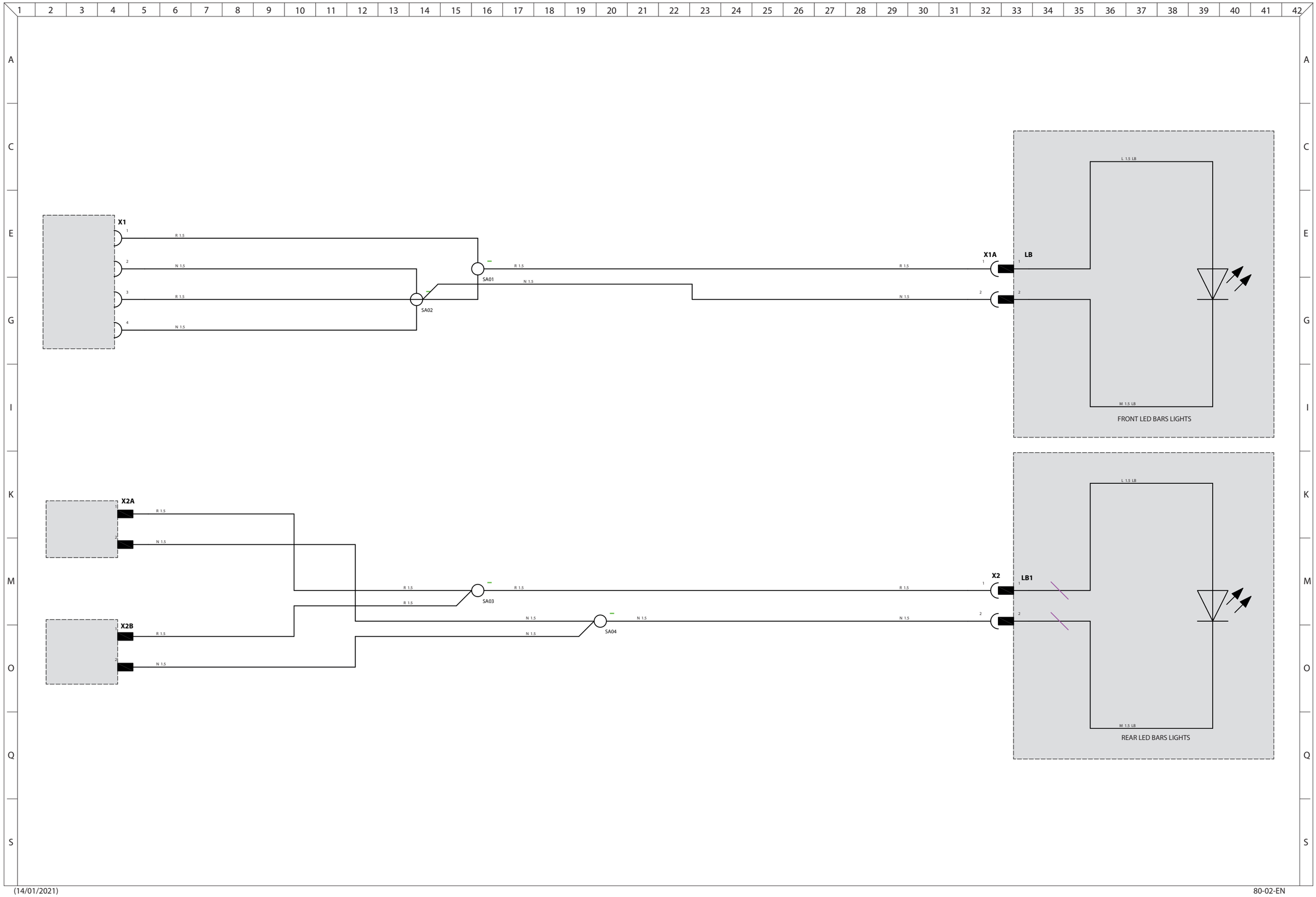


DIAGRAM 34 (Radio-clamp boom head)

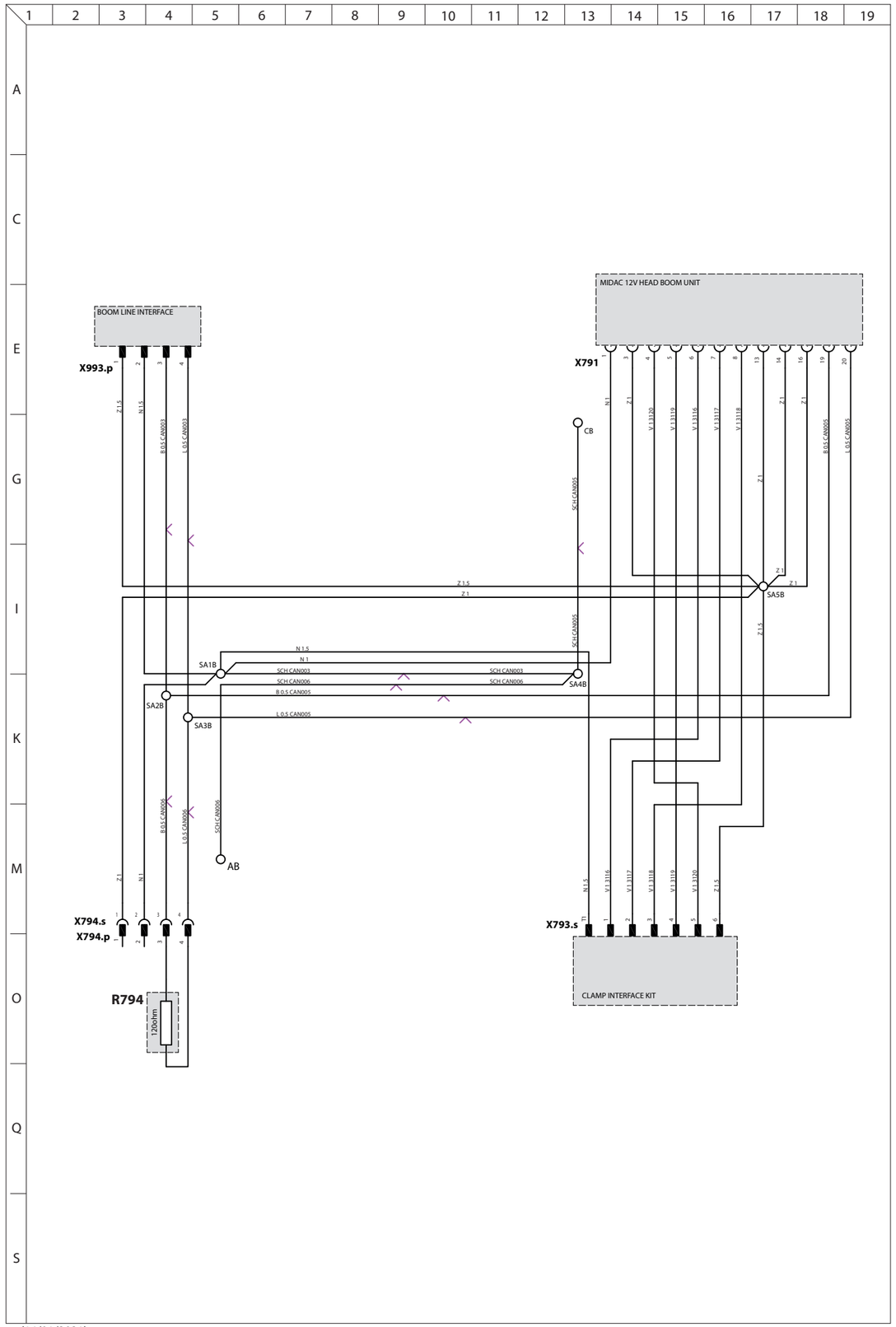
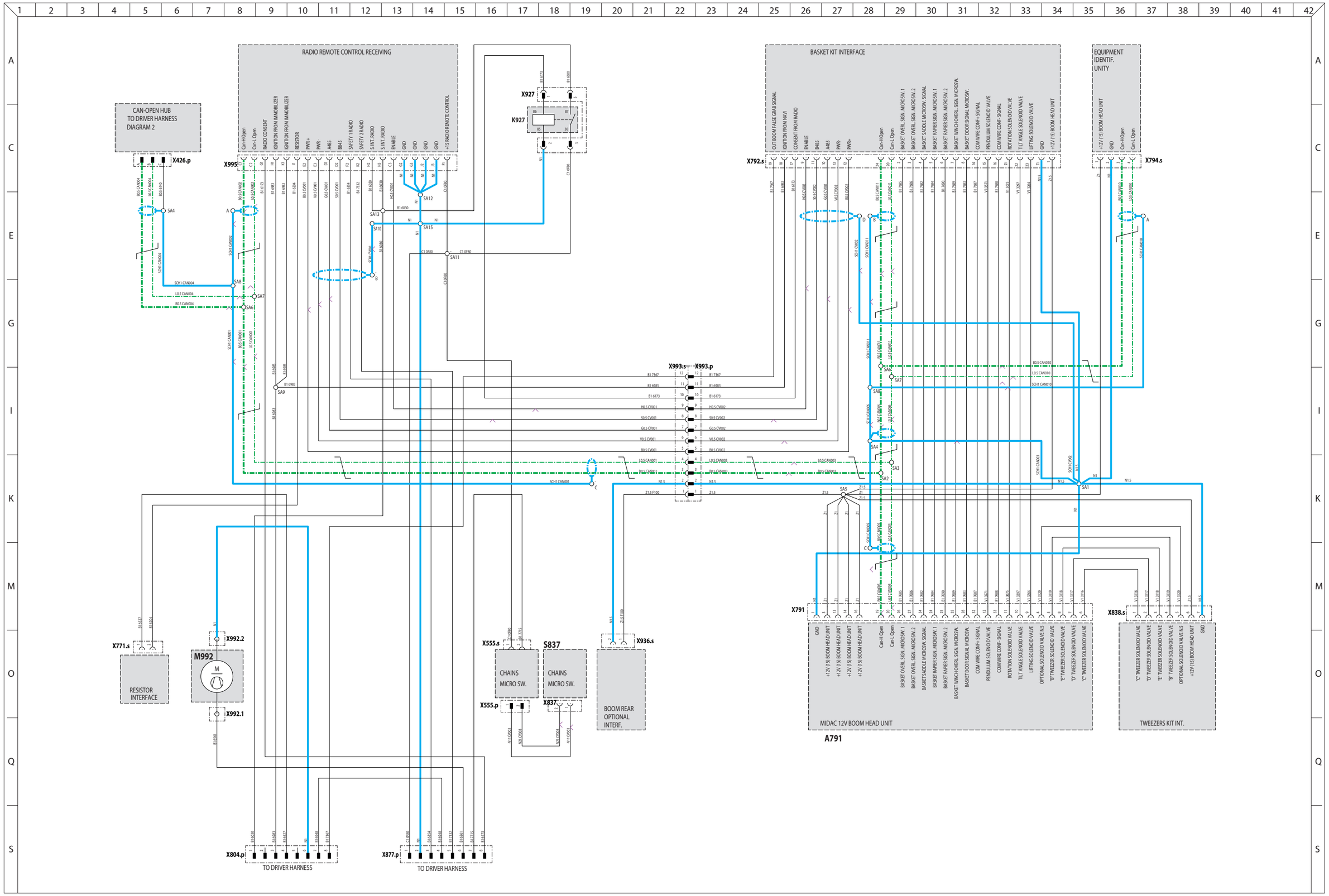
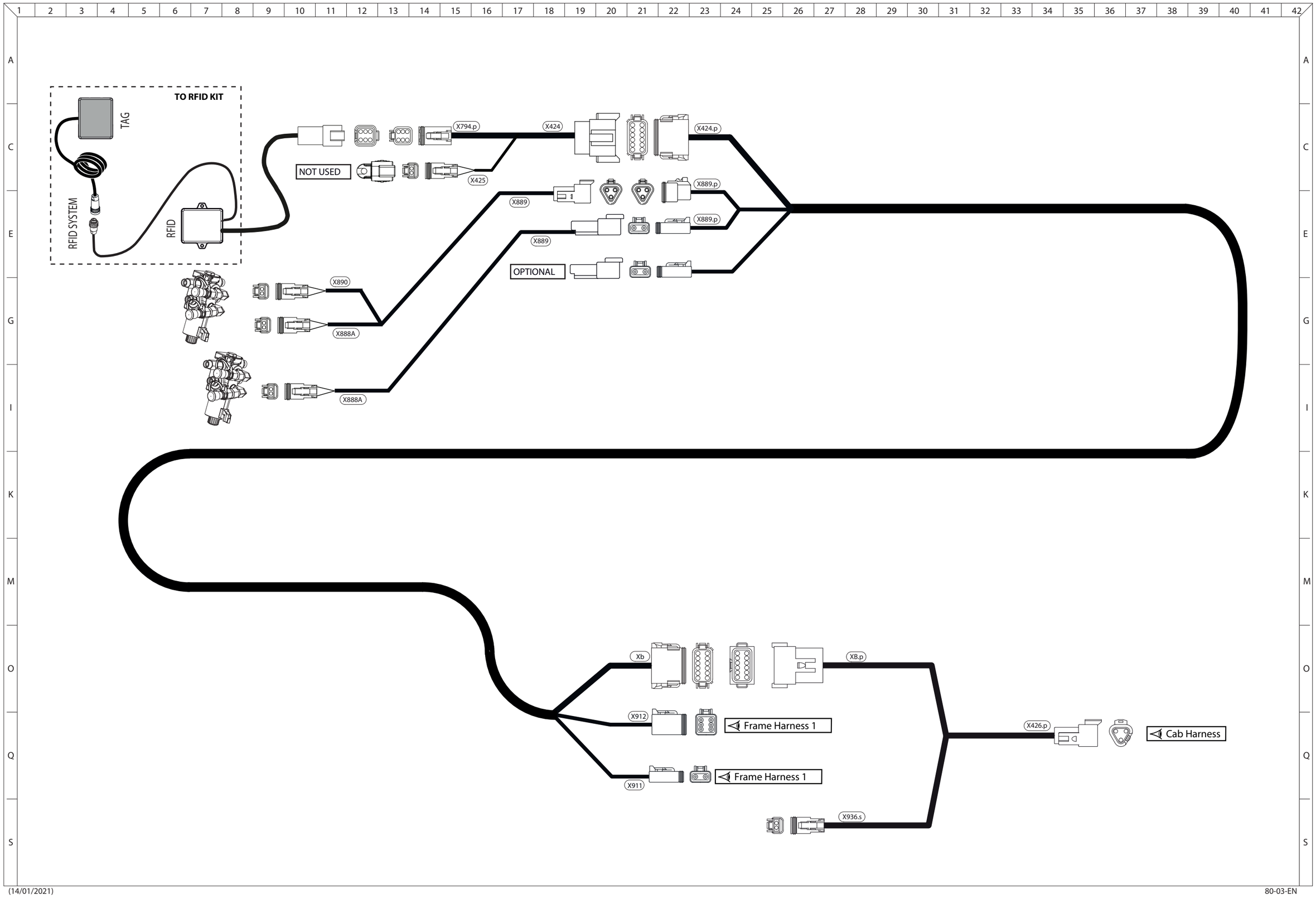


DIAGRAM 39 (Basket-radio frame)

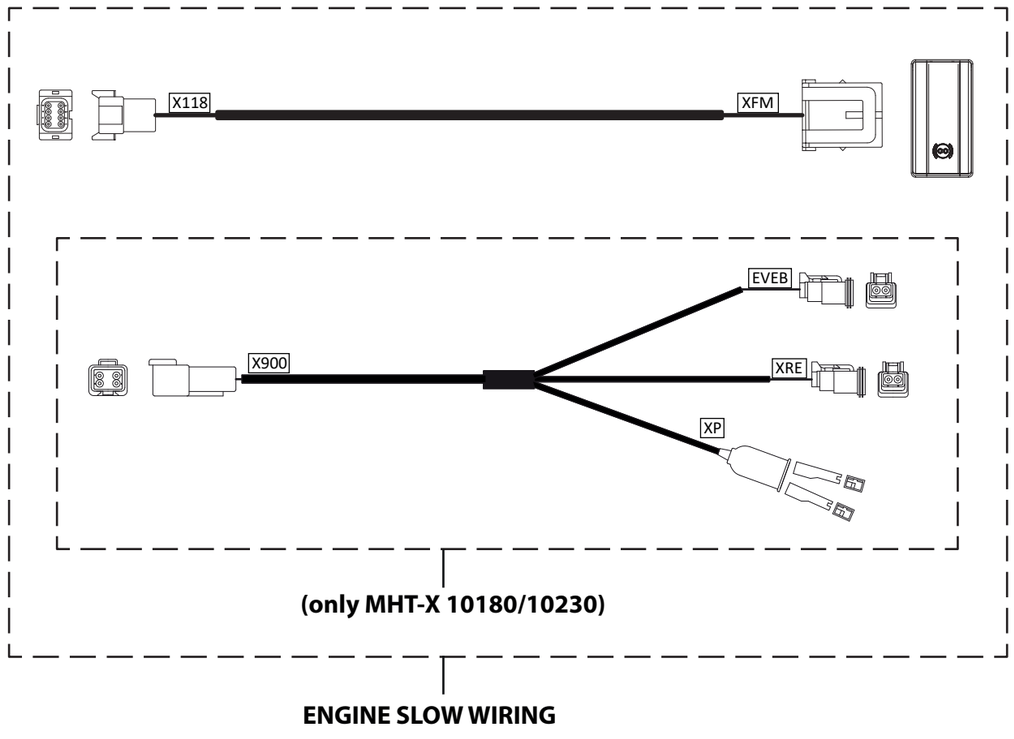


Item	Designation	Position on harness layout																				
		CHASSIS 1	CHASSIS 2	BOOM	CABIN	ENGINE ST4	ENGINE ST3A	Downgrade ST3A	MAIN POWER CABLES	Emergency stop	Brake	Security device	Optionals 1	Optionals 2	Radio control - cabin	Radio-basket boom head	Radio-basket chassis / radio control signal	Clamp control cabin	Radioclamp boom head	Boom clamp (with basket)	Cabin roof	ROOF AMBER LIGHTS	Red/ Green indicator lights
X453	I/o core unit				Q38																		
X454	I/o core unit				Q38																		
X455	Encoder can open				C32																		
X456	Can control pannel				E33 / E34																		
X457	Service relay				E4 / E5																		
X458	Flasher unit				G12 / G13																		
X459	Warning switch				O20																		
X460	Midac unit				I25 / I26																		
X461.1	Front windshield diode				Q27 / Q28																		
X461.2	Diode reset windshield wiper				Q28																		
X462	Dptidnal jdystick				G38																		
X463	Cardan speed sensdr		I24																				
X467	Reverse speed alarm				Q33 / Q34																		
X468	Mercedes unit				Q38																		
X468.p	Driver's seat line cpc4-1							G12 / G13															
X468.s	X1 cpc4 connector							K26															
X469	Mercedes unit				S38																		
X469.p	Driver's seat line cpc4-2							G18 / G19															
X469.s	X2 cpc4 connector							K20 / K21															
X470	Mercedes unit				S38																		
X470.p	Driver's seat line cpc4-3							G24															
X470.s	Cpc4-ecan 3							K31 / K32															
X471	Mercedes unit				S38																		
X471.p	Driver's seat line cpc4-4							G28 / G29															
X471.s	X4 cpc4 connector							K14 / K15															
X472	End j1939 can line resistor				Q15																		
X472.p	Power / Signals											E23											
X472A.s	Can J1939											E20 / E21											
X473.s	Maneuvers restoration connector				G25 / G26																		
X474	Generatdr and engine service relay fuse				G12																		
X476	Levelling switch				K33																		
X477.p	Clima grdup interf ace				I16 / I17																		
X478.p	Optional	S8 / S9																					
X478.s	Optional	S14 / S15																					
X479.a	Power / Signals											O22 / O23											
X479.p	Anti-theft system mating part connector				O14 / O15							O19						G31 / G32					
X479.s	Anti-theft system connector				O16													I34					
X481.s	Rpm signal pull up resistence				A21 / A22																		
X555.s	Chains extension																K15						
X600	1steering solenoid valve		C9																				
X601	Urea pipe preheating 1					C15																	
X602	Urea pipe preheating 2					C16																	
X603	Urea pipe preheating 3					C17 / C18																	
X604	Left level solenoid valve		E16																				

BOOM HARNESS

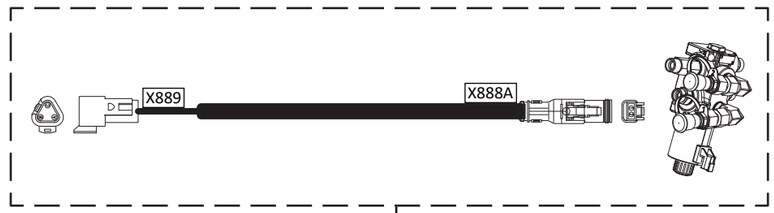


OPTIONALS 2

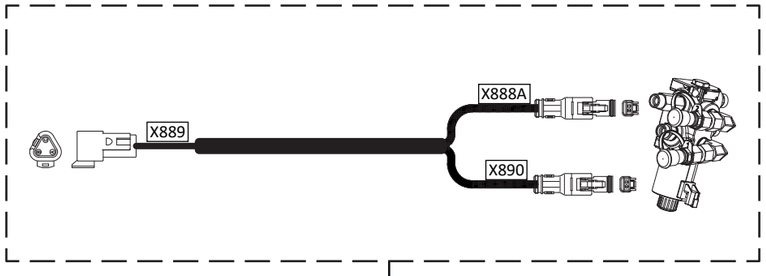


(only MHT-X 10180/10230)

ENGINE SLOW WIRING



2nd BOOM-HEAD WIRNING OR
2nd BOOM-HEAD + BLOCK ACCESSORIES WIRING



BLOCK ACCESSORIES + 3st BOOM-HEAD WIRNING

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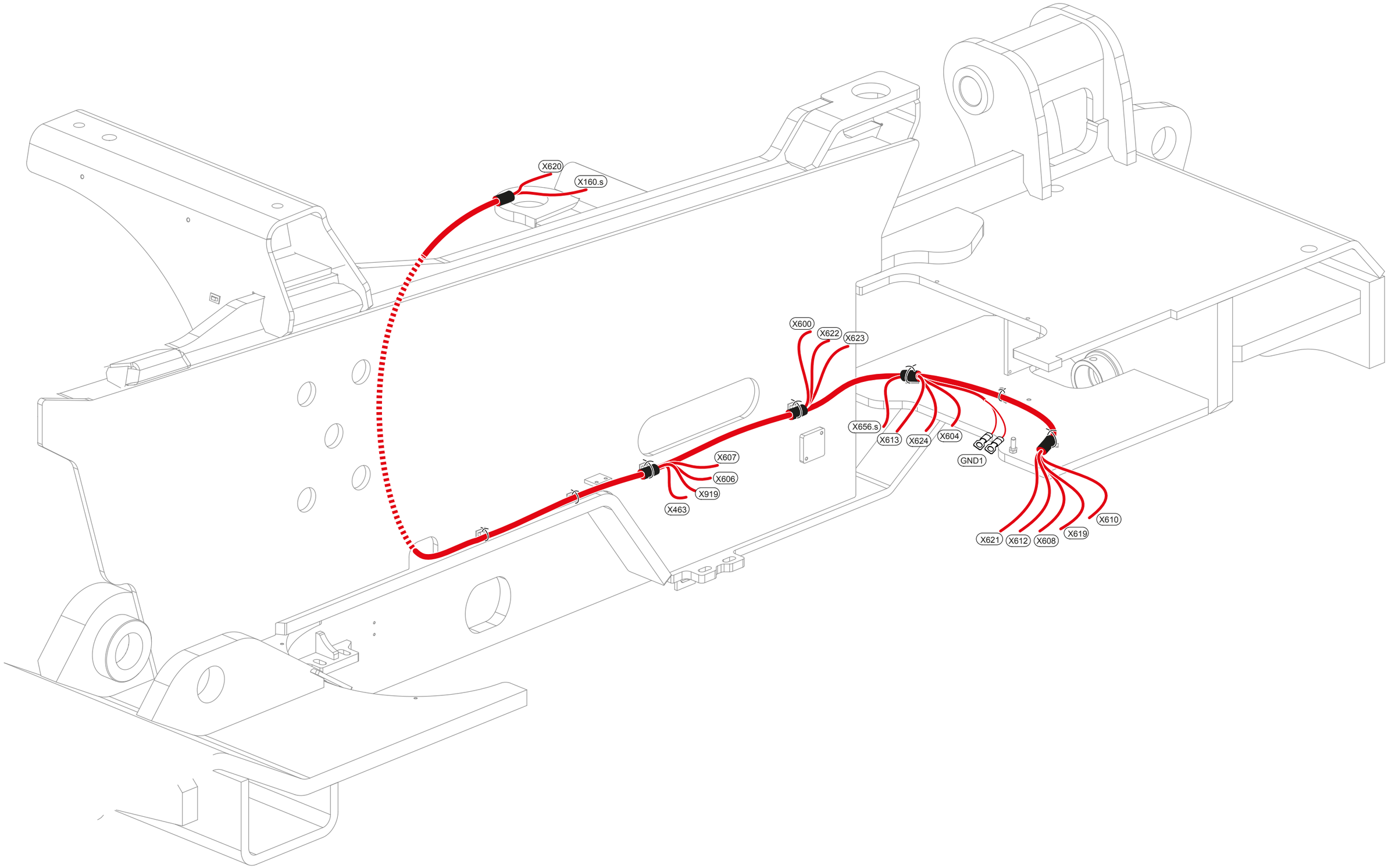
3D LOCATIONS

CHASSIS HARNESS 1



OPERATOR PANEL

INSTRUMENT CONTROL PANEL

The control panel (Ref.1) with 9" colour screen display shows and informs the operator of all the steps of the operation of the telehandler.
Six control modes are saved in the memory of the "HMI" panel (Ref.1) and can be selected by means of the human-machine interface keypad (Ref.2) on the armrest (Ref.3) in the cabin.

KEYPAD WITH CONTROL KNOB

This tool provides the operator with an excellent touch feedback and the greatest benefi t of the keypad with knob is increasing the functions in a single control.
Put display functions within reach
- 5 hot keys for rapid navigation
- scroll with rotary knob
- Select with pushbutton

Functions:
- Rotary knob with select pushbutton (Ref. 1): turn the knob to scroll the pages and to navigate between pages (if possible) after pressing it to select or confi rm the choice.
- LOAD CHART key (Ref. 2) press it to enter in " F2 - Load limiter page",
- HOME key (Ref. 3): push it to enter in "Machine diagnostic mode control",
- BACK key (Ref. 4): press it to back in the choice,
- MENU key (Ref. 5): press it to enter in "Menu screen",
- OPTIONAL key (Ref. 6): from "F1 - Driving page" press it to enter in the "Driving setup page".

CONNECTION AND DIAGNOSTICS OF 3B6 CONTROL UNITS

EQUIPMENT REQUIRED

1 CAN PEAK	Ref. 729458
1 cable	Ref. 887194

PROCEDURE

Fig. A

For carrying out diagnostics on 3B6 control units use the "3B6 WinScope" program present on the Pad.

Connect the PC or the PAD to the machine using the CAN PEAK cable and the OBD cable in the socket marked "M" (Fig. A).

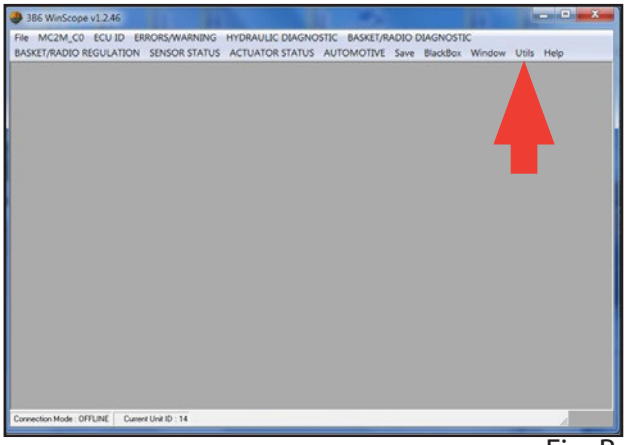


Fig. B

Switch on the machine panel.

Open the "3B6 WinScope" program.

Select "Utils" (Fig. B).

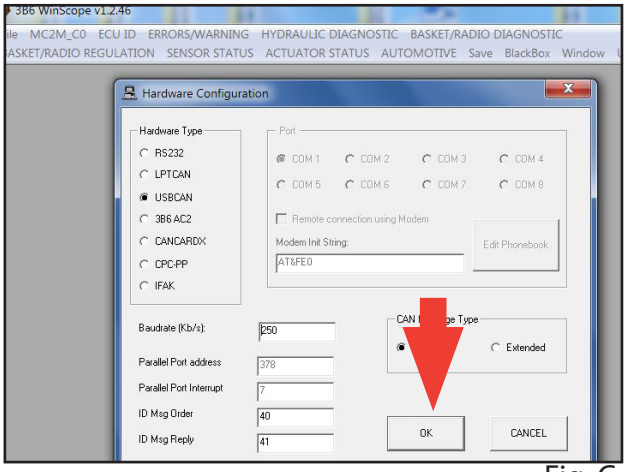


Fig. C

Select "Hardware Configuration" and check to make sure the display (Fig. C) shows the following parameters selected and highlighted:

Hardware Type:	USBCAN
Port:	COM 1
Modem Init String:	AT&FEO
CAN Message Type:	Standard
Baudrate (Kb/s):	250
Parallel Port Address:	378
Parallel Port Interrupt:	7
ID Msg Order:	40
ID Msg Reply:	41

Press "Ok" to confirm.

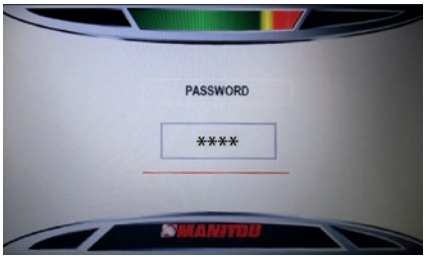
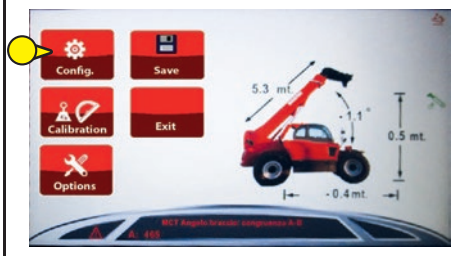
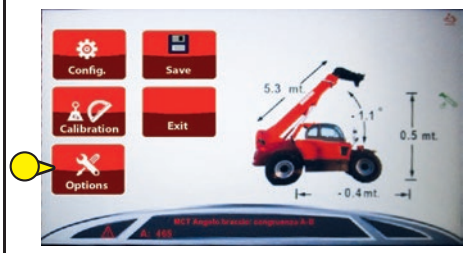
SPN / FMI	SPN / FMI	DTC	Fault / Description	Possible Cause	Reaction	Remedy
"FMI = 2, DATA ERRATIC, INTERMITTENT OR INCORRECT"	2	2	j1939_registerRxDataboxes() <> J1939_BOXSTATUS_VALID_ DU16			
8011			res_17			
8012	32786	7F012	CAN CVC2TCU_1	Timeout data received	Ramp down --> Machine stops	"Check the wiring CAN2 pin: 253 (CAN H2) 254 (CAN L2) Check the vehicle controller opera- tion."
"FMI = 2, DATA ERRATIC, INTERMITTENT OR INCORRECT"	2	2	j1939_registerRxDataboxes() <> J1939_BOXSTATUS_VALID_ DU16			
8013	32787	7F013	CAN CVC2TCU_2	Timeout data received	Ramp down --> Machine stops	"Check the wiring CAN2 pin: 253 (CAN H2) 254 (CAN L2) Check the vehicle controller opera- tion."
"FMI = 2, DATA ERRATIC, INTERMITTENT OR INCORRECT"	2	2	j1939_registerRxDataboxes() <> J1939_BOXSTATUS_VALID_ DU16			
8014	32788	7F014	HW Monitor Ignore	HW errors: inputs, outputs, can bus module. Error occurs during initialization.	No reaction	Check the hw inputs, outputs, can bus
FMI = 31, CONDITION EXISTS	31	1F		Some output solenoids faulty		
8015	32789	7F015	HW Monitor LimpHome	HW errors: inputs, outputs, can bus module. Error occurs during initialization.	Machine moves at limited velocity	Check the hw inputs, outputs, can bus
FMI = 31, CONDITION EXISTS	31	1F		Some output solenoids faulty		
8016	32790	7F016	HW Monitor Stop	HW errors: inputs, outputs, can bus module. Error occurs during initialization.	Machine doesn't move	Check the hw inputs, outputs, can bus
FMI = 31, CONDITION EXISTS	31	1F				
8017	32791	7F017	HW Monitor Switch	HW errors: inputs, outputs, can bus module. Error occurs during initialization.	Machine doesn't move	Check the hw inputs, outputs, can bus
FMI = 31, CONDITION EXISTS	31	1F				
8018			res_24			
8019			res_25			
801A			res_26			
801B			res_27			
801C			res_28			
801D			res_29			

SPN / FMI	SPN / FMI	DTC	Fault / Description	Possible Cause	Reaction	Remedy
805B	32859	7F05B	Scicos Active	Simulation flag active	Vehicle doesn't move	
FMI=14, SPECIAL INSTRUCTIONS	14	E	SCICOS_ACTIVE: Simulation active			
805C			res_92			
805D			res_93			
805E			res_94			
805F			res_95			
8060			res_96			
8061			res_97			
8062			res_98			
8063			res_99			
8064	32868	7F064	Wrong Machine Configuration	Machine configuration from master controller is wrong. Drive controller is not initialized.	Vehicle doesn't move	
FMI=14, SPECIAL INSTRUCTIONS	14	E	set_Machine.WrgMchCfg_b8 PLC_PRG.StSysInit_u16 <> 16#0000			
8065	32869	7F065	ECU Temperature above normal operation limit	The traction controller temperature above normal operation limit	"Ramp down to velocity limited --> Machine moves at limited velocity in both direction. Gearbox is locked."	
"FMI = 12 BAD INTELLIGENT DEVICE OR COMPONENT"	12	C	sys_getHwTemp() > 85°C			
8066	32870	7F066	ECU Maximum continuous operating time reached	The traction controller runs for more of 24h	No reaction	
"FMI = 12 BAD INTELLIGENT DEVICE OR COMPONENT"	12	C	sys_getTime() > 24h			
8067	32871	7F067	ECU Maximum operating lifetime reached	The traction controller operating lifetime above maxi- mum value limit	No reaction	
"FMI = 12 BAD INTELLIGENT DEVICE OR COMPONENT"	12	C	sys_getAge() > 10000h			
8067			res_103			
8068			res_104			
8069			res_105			
806A			res_106			
806B			res_107			
806C			res_108			
806D			res_109			
806E			res_110			
806F			res_111			
8070			res_112			
8071			res_113			
8072			res_114			

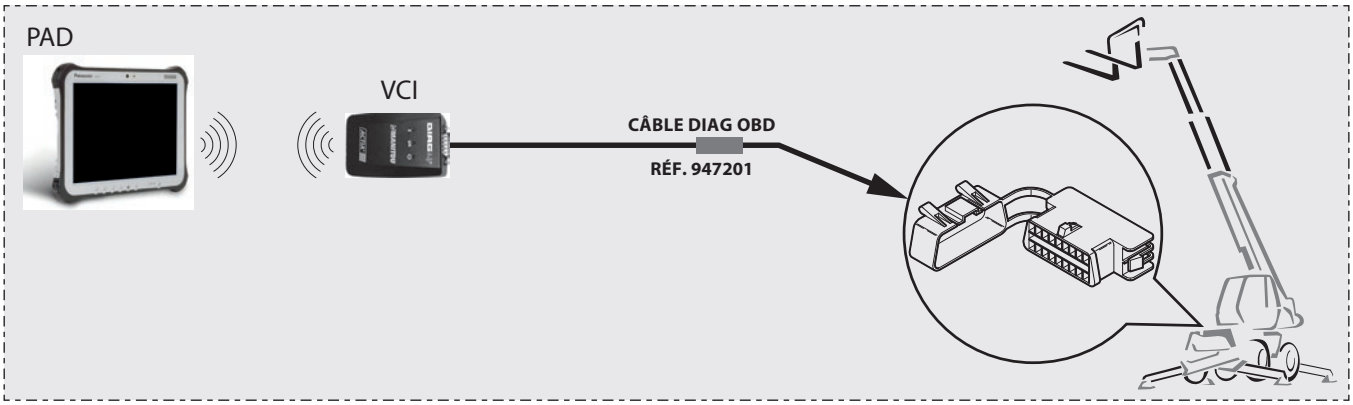
ANNEX A

CALIBRATION PROCEDURES WITH TEXT DISPLAY

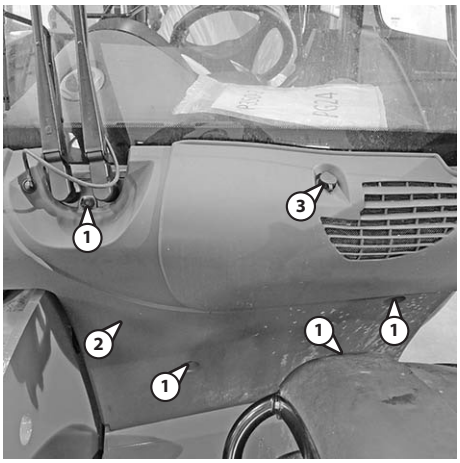
Insert the first level password to carry out the following calibrations.

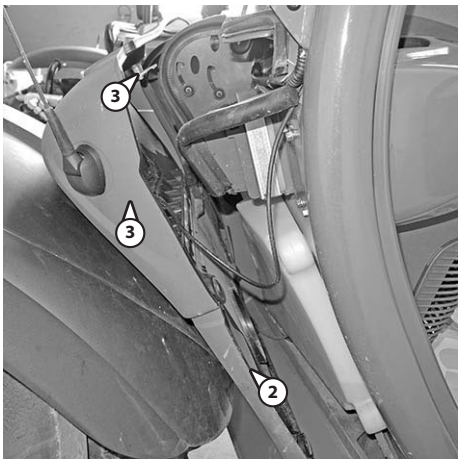
		Description
	CODE	Main page. Enter the password and press "+" to access the programming mode.
	CONFIGURATION Config	Vehicle configuration (no password needed). The following parameters are available. • language • brightness • unit
	OPTIONS	The following parameters are available. • Partial Hours • Time Setting • Machine Type • Event Long
	OPTIONS Time setting	The following parameters are available. • Day • Month • Year • Hour • Minute

CONNECTIONS TO FORKLIFT TRUCK



Note: The cable Ref. 947201 can diagnose the entire machine.

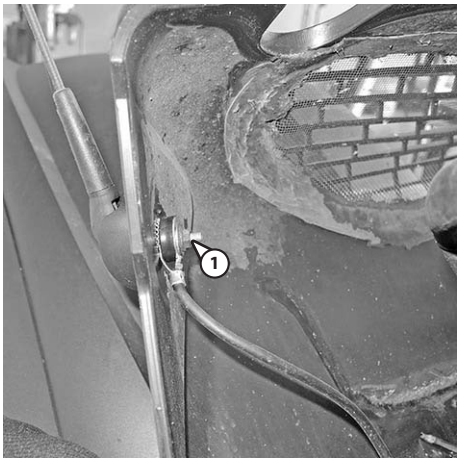




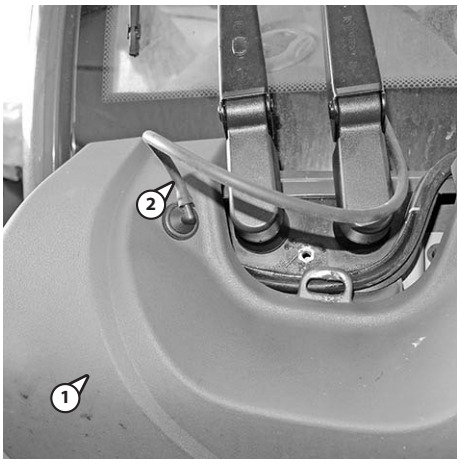
REMOVING THE CAB HOUSING

Remove the 4 screws (Ref. 1) from the cab's front fairing (Ref. 2).

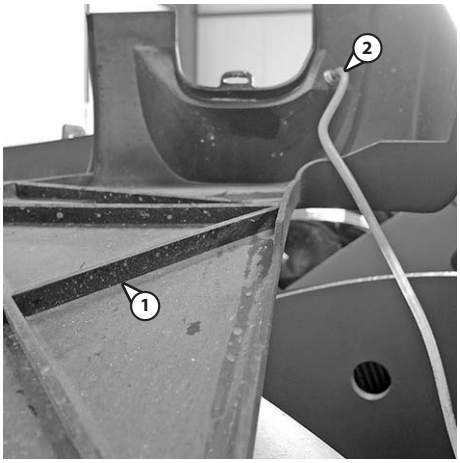
Open the inspection case (Ref. 3) with the ignition key.

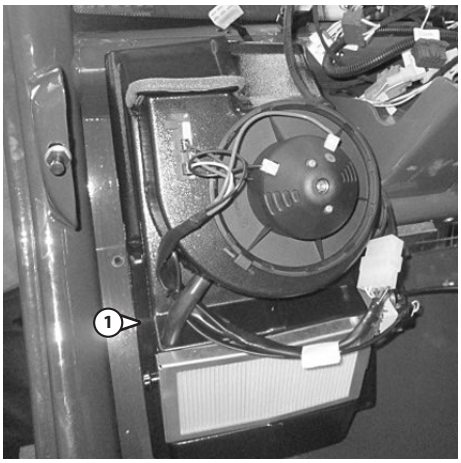


Remove the antenna cable from the casing (Ref. 1).

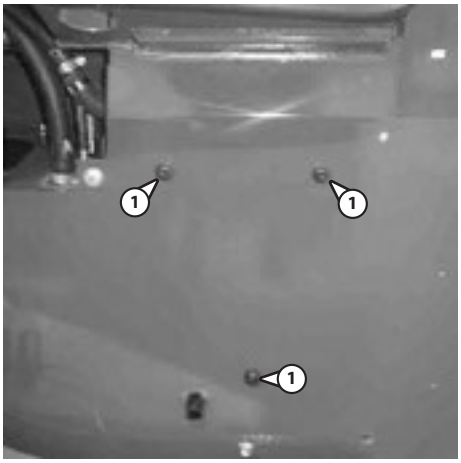


Remove the windscreen washer hoses (Ref. 2) from the fairing (Ref. 1).

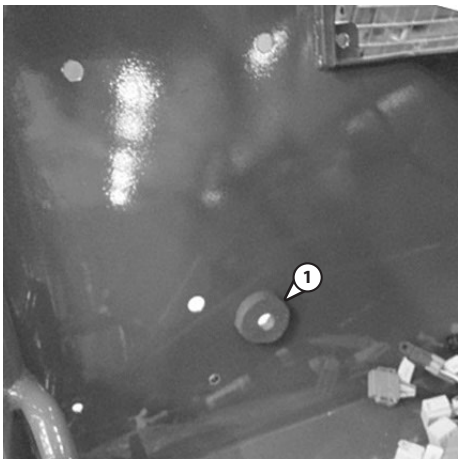




Secure the heater (Ref. 1) to an overhead crane with ropes and chains.

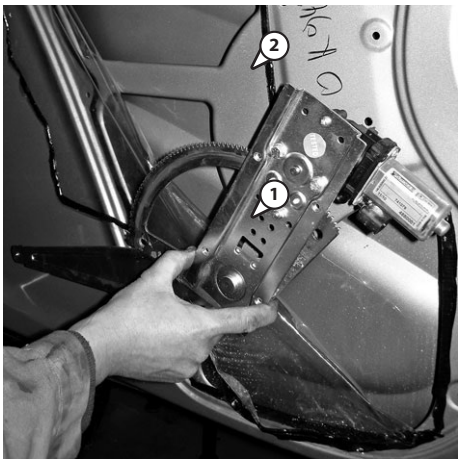


Unscrew the screws (Ref. 1) in the cabin front and remove the heater.



Pay attention at the seal (Ref. 1) between the heater and the cabin.

A - ELECTRIC WINDOW AND MOTOR REFIT

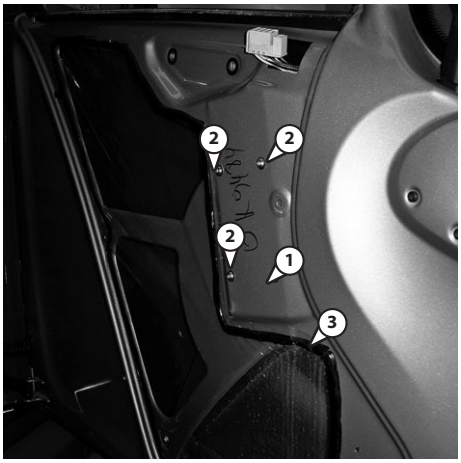


Slide the whole rack and pinion motor (Ref. 1) into the door (Ref. 2).

Connect the connector (Ref. 1).

Insert the roller (Ref. 2) in the rail (Ref. 3)

Pivot the motor in the door.



Press the electric window motor against the bracket (Ref. 1) and mount it using the four screws (Ref. 2).

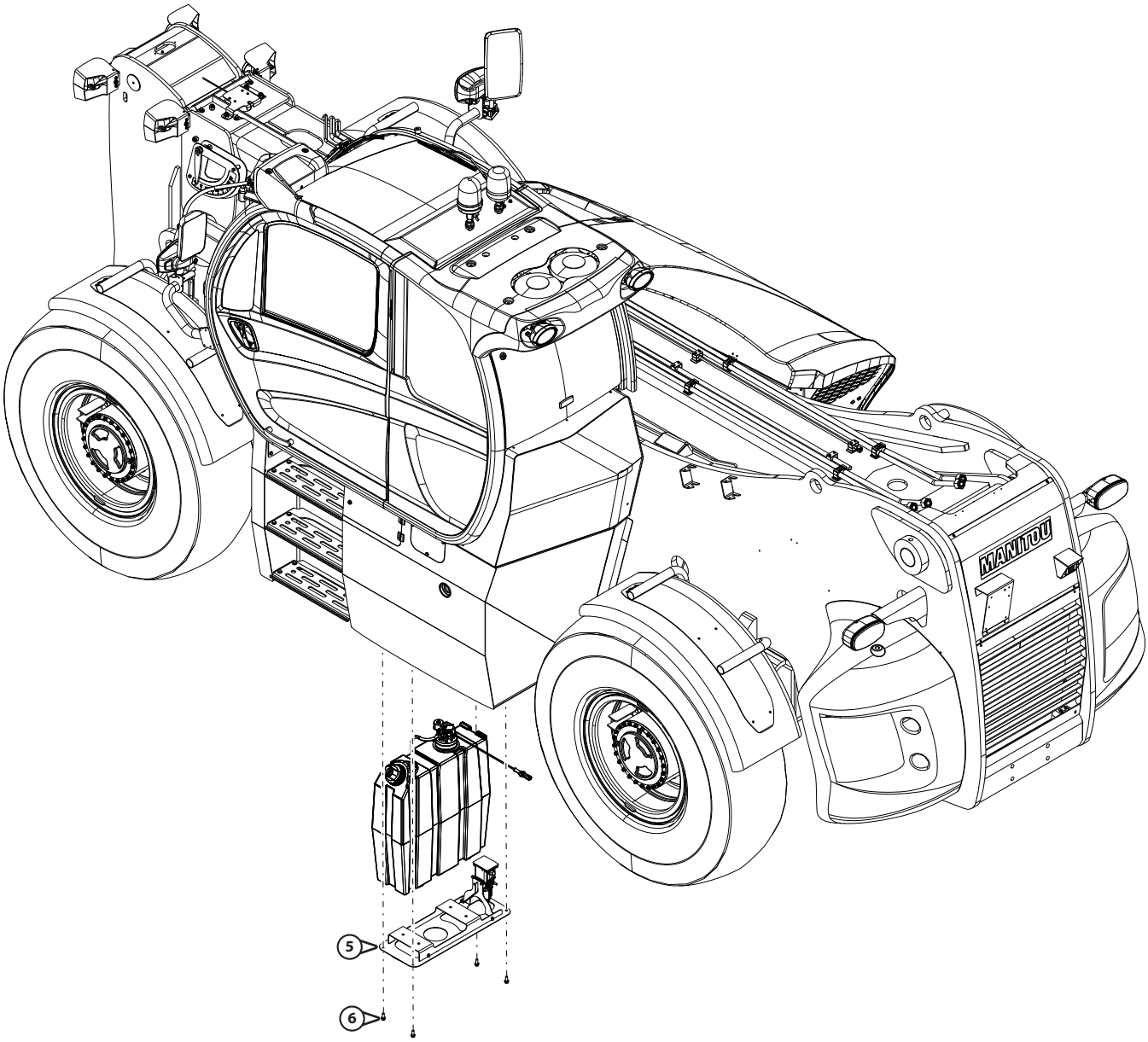
Re-stick the plastic film (Ref. 3) or change it, depending on its condition.

Check the condition of the door's interior trim clips (Ref. 1) before refitting it

– Remove the screws on DEF tank support (Ref 6) to remove it

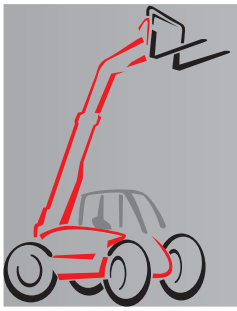
Pay attention to the weight of the tank.

– Pull-down the DEF tank (Ref 5)



REFITTING PROCEDURE

Proceed in reverse order to refit the DEF tank.



OPTIONS - ATTACHMENTS COMPONENTS LOCATION

pages