MANITOU

HANDLING YOUR WORLD

647625EN (20/01/2021)

MRT 3050 PRIVILEGE PLUS ST4 S1
MRT-X 3050 PRIVILEGE PLUS ST3A S1
MRT 2470 PRIVILEGE PLUS ST4 S1
MRT-X 2470 PRIVILEGE PLUS ST3A S1

REPAIR MANUAL

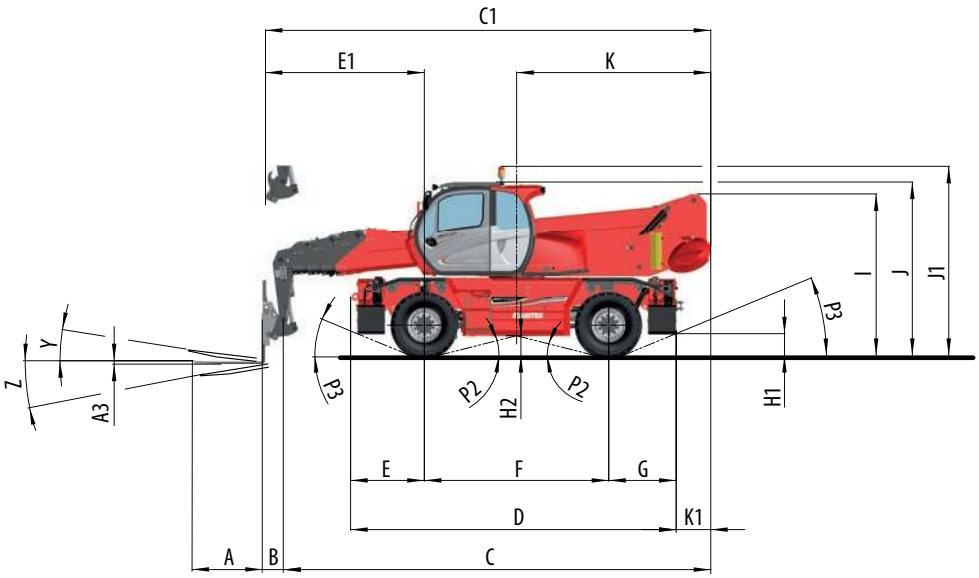
00.2 GENERAL CHARACTERISTICS AND SPECIFICATIONS

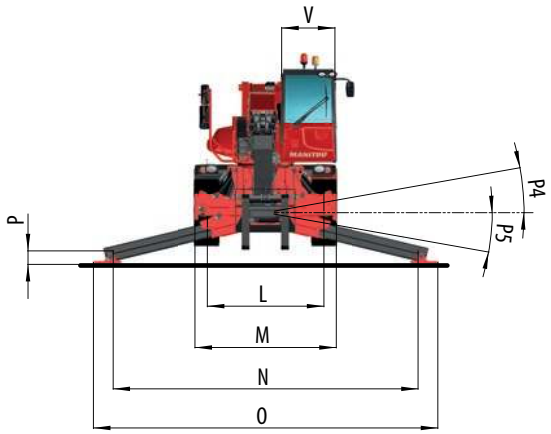
00.2.1 CHARACTERISTICS MRT 3050

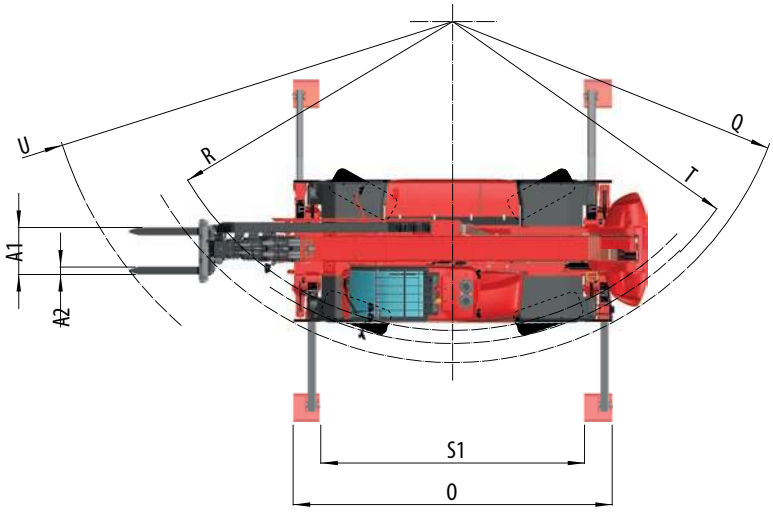
DIMENSION

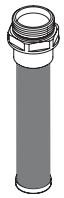
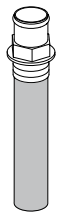
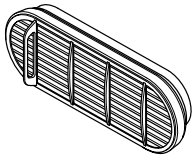
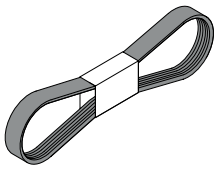
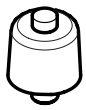
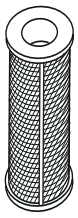
MRT 3050 Privilege Plus ST4 S1
MRT-X 3050 Privilege Plus ST3A S1

#	mm	in
A	1200	47,24
A1	1028	40,47
A2	130	5,12
A3	60	2,36
B	364	14,33
C	7549	297,20
C1	7492	294,96
D	6152	242,20
E	1175	46,26
E1	2515	99,02
F	3250	127,95
G	1727	67,99
H1	364	14,33
H2	350	13,78
I	2846	112,05
J	2980	117,32
J1	3044	119,84
K	3418	134,57
K1	608	23,94
L	2050	80,71
M	2490	98,03
N	5370	211,42
O	6251	246,10
P	274	10,79
P2	14°	
P3	22°	
P4	7°	
P5	7°	
Q	6080	236.21
R	5436	214
S	4656	183,31
S1	5616	221,10
T	5700	224,40
U	6745	265,55
V	990	38,98
Y	12,3°	
Z	108,7°	







	Suction strainer for hydraulic oil tank (Hydrostatic pump)	924767	-	Every 1000 h
	Suction strainer for hydraulic oil tank (movements pump)	924765		
	Security air filter cartridge	923594	Check	Every 1000 h
	Engine belt ***MRT-X 2470 Privilege Plus ST3A S1*** ***MRT-X 3050 Privilege Plus ST3A S1***	53003392	Check	-
	Engine belt ***MRT 2470 Privilege Plus ST4 S1*** ***MRT 3050 Privilege Plus ST4 S1***	53006659	Check	
	Hydraulic oil tank vent	781336	Replace	Every 500 h
	Cartouche filtre refoulement circuit principal	659292	-	Every 500 h

10.1 ENGINE CHARACTERISTICS AND SPECIFICATIONS

10.1.1 MRT 2470/3050 PRIVILEGE PLUS ST4 S1 - ENGINE CHARACTERISTICS

MAKE: MERCEDES BENZ
Model: OM 934
Number of cylinders: 4 in line
Power rating: 176 CV.129 kW @ 2200 rpm

Displacement: 5,10 liter
Bore: 110 mm
Stroke: 135 mm
Firing order: 1-3-4-2

ENGINE SYSTEM GENERAL INFORMATION

The OM 934 serie of engines only function as intended when used in conjunction with the corresponding exhaust gas aftertreatment unit.
Therefore the term «engine system» refers to the engine and the exhaust gas aftertreatment unit.
The engine is a water-cooled four-stroke diesel engine with direct injection.
The engine is equipped with a Common Rail diesel injection system, cooled and regulated exhaust gas recirculation and turbocharging with charge-air pressure control.
The engine turbocharging is two stage exhaust gas turbocharging with two sequential exhaust gas turbochargers of differing dimensions.
The valve gear has:

- twin overhead camshafts, whereby the exhaust camshaft is continuously variable.
- two inlet valves and two exhaust valves per cylinder.

The exhaust gas aftertreatment unit is characterised by the following technologies:

- selective catalytic reduction (SCR) with ammonia slip catalytic converter.
- the diesel oxidation catalytic converter (DOC).
- the diesel particle filter (DPF).

ELECTRONIC ENGINE MANAGEMENT

The engine system is equipped with an electronic engine management system which comprises the following control units:

- Engine management control module (MCM).
- Drive control system unit (CPC).
- Exhaust gas aftertreatment control unit (ACM).

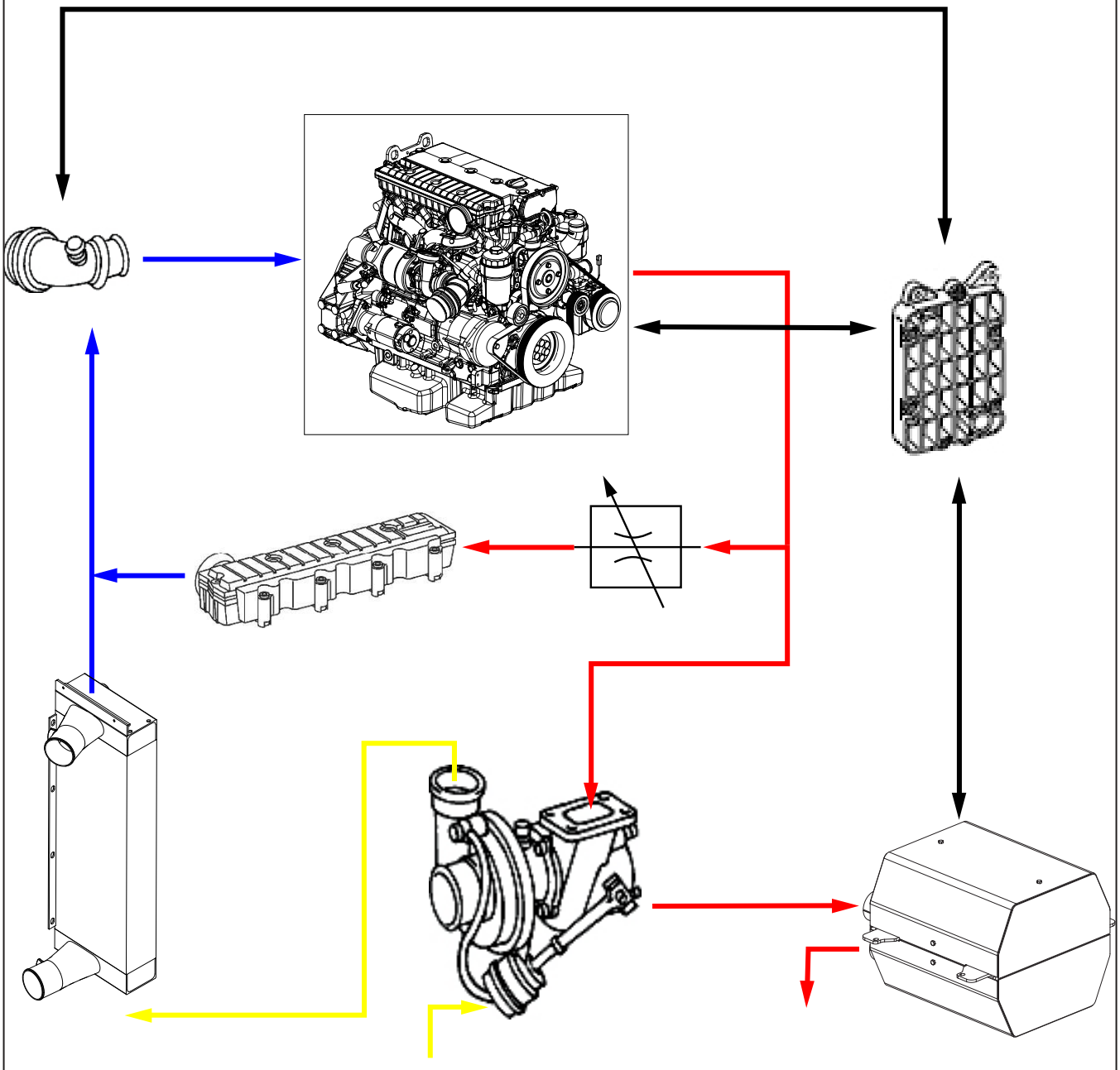
The control units are connected in an electronic network.
Data is exchanged via CAN (Controller Area Network).
In addition to the engine, the exhaust gas aftertreatment and the vehicle-side connection, the electronic engine management system also monitors itself.
Depending on the malfunctions/failures which occur, warning and information displays are activated.
The malfunction is stored in the fault memory and if necessary a safety and emergency mode is automatically selected. If the electronic engine management control detects a fault, the fault code is stored in the control units. It can then be read by a qualified specialist workshop using a diagnostic tester.

MAKE: MERCEDES BENZ
Model: OM 904 LA
Number of cylinders: 4 in line
Power rating: 176 CV.129 kW @ 2200 rpm

Displacement: 4,25 liter
Bore: 102 mm
Stroke: 130 mm
Firing order: 1-3-4-2

ENGINE GENERAL INFORMATION

10 - 10

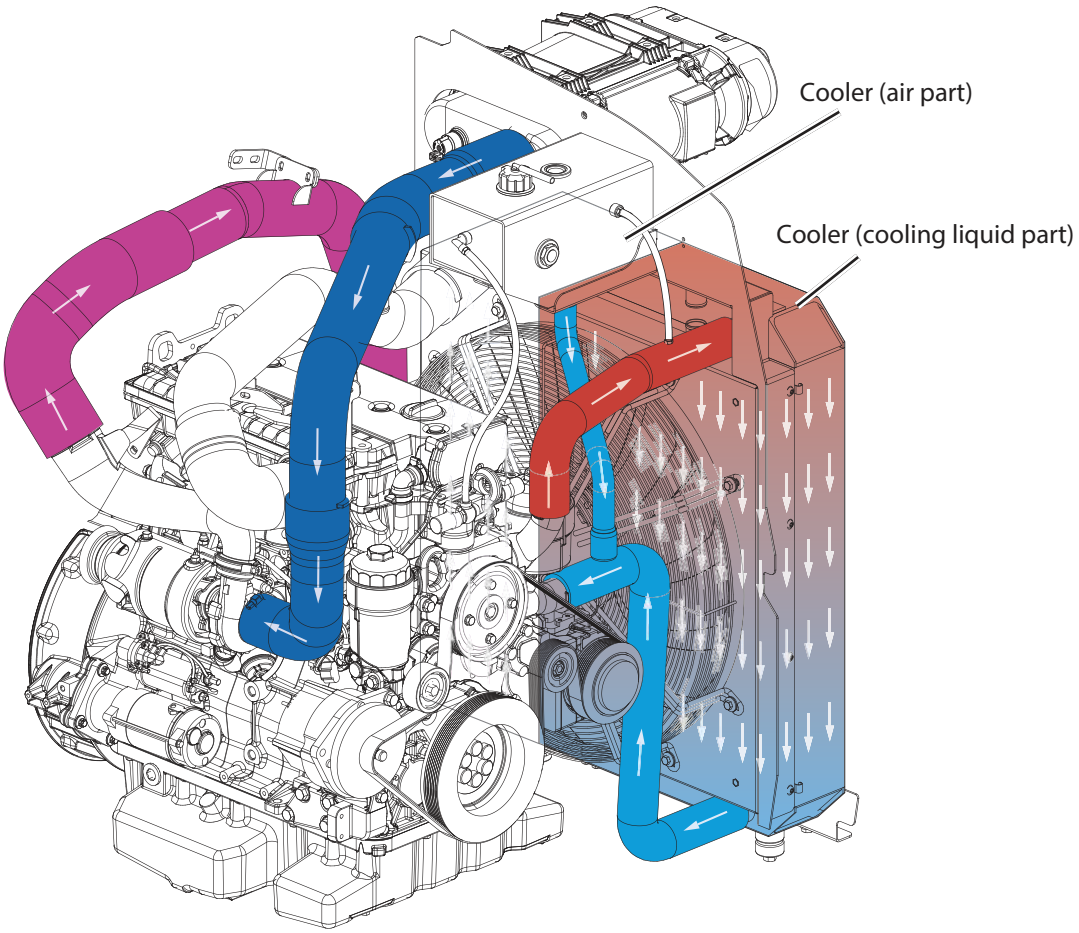


Key

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

AIR COOLING/COOLING LIQUID CIRCUIT

10 - 25



Hot air

Hot cooling liquid

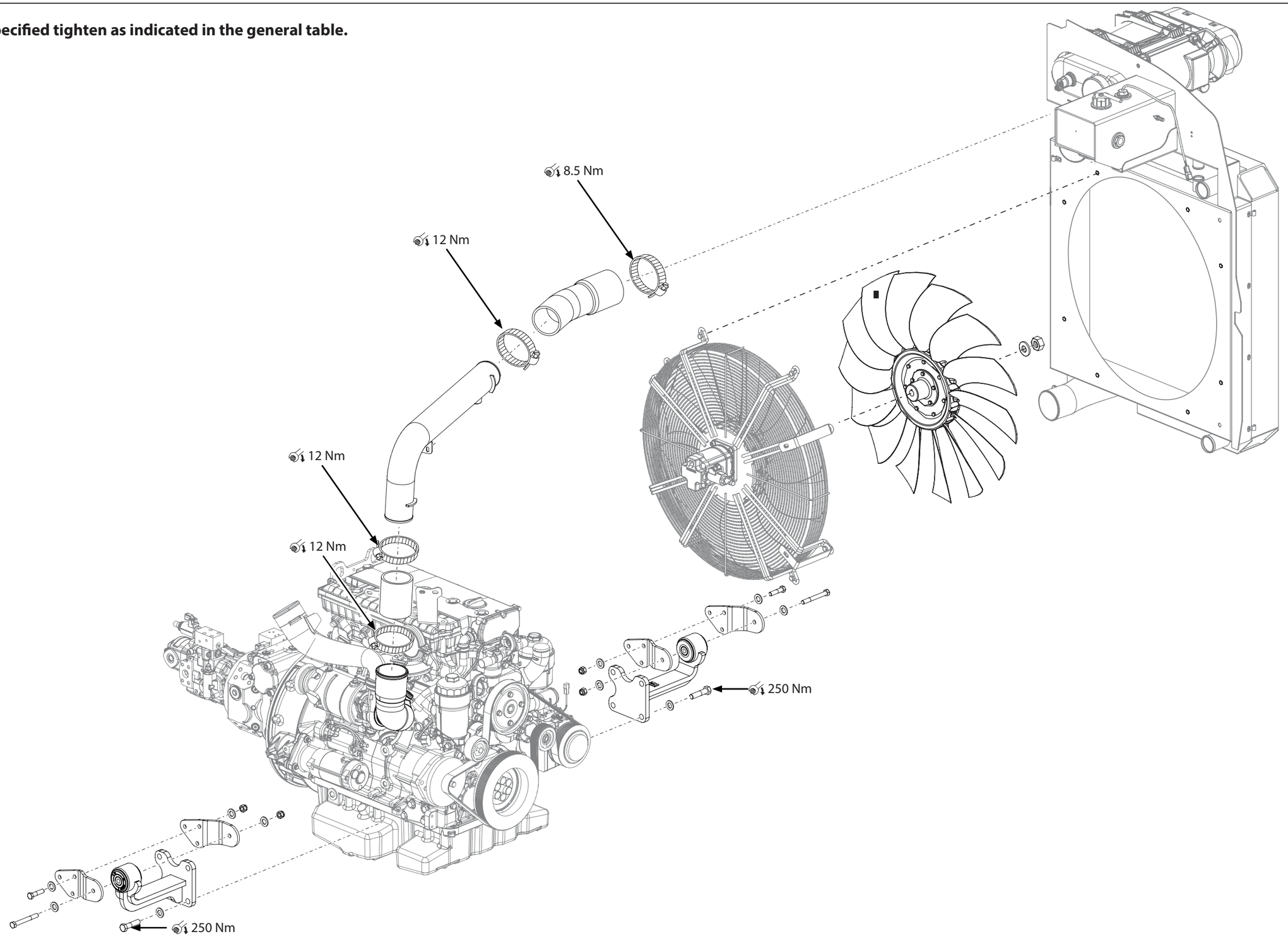
Air cools down

Cooling liquid cools down

FAN CONTROL AND AIR FILTER

10 - 34

When not specified tighten as indicated in the general table.



10.3.5 MRT-X 2470/3050 PRIVILEGE PLUS ST43A - ENGINE CONTROL AND ADJUSTMENT

EQUIPMENT REQUIRED

10 - 66

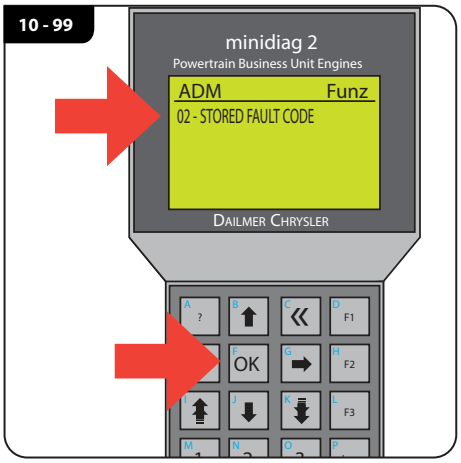
Minidiag 2 - recovery release 2_5.02.69

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

⚠ WARNING

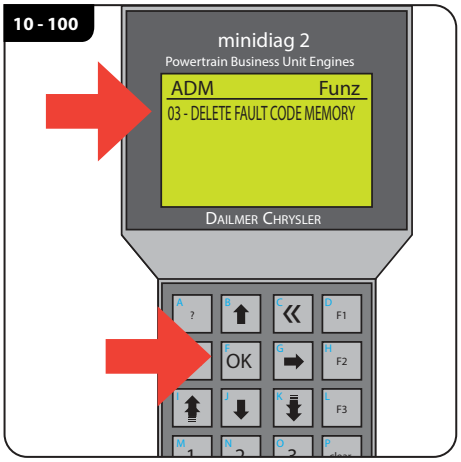
The Minidiag 2 has to be in version recovery release 2_5.02.69.

10 - 99



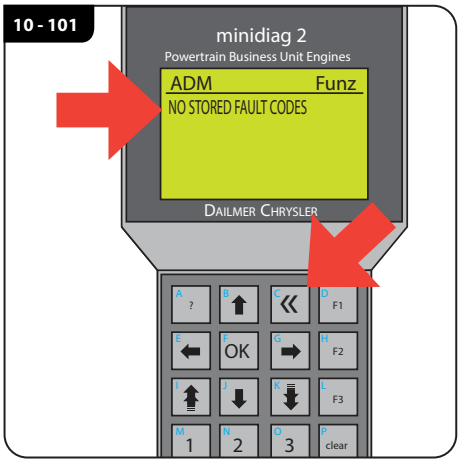
After resetting the errors, go on «02 - STORED FAULT CODE» and push the button «OK» (📷 ***10 - 99***).

10 - 100



Select «03 - DELETE FAULT CODE MEMORY» and push the button «OK» (📷 ***10 - 100***).

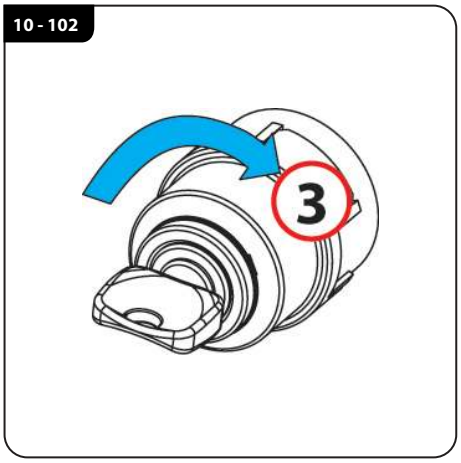
10 - 101



Wait that on the display is visualized «NO STORED FAULT CODES».

Push for six times the control "«" to fi nish the parameters calibration procedure (📷 ***10 - 101***).

10 - 102



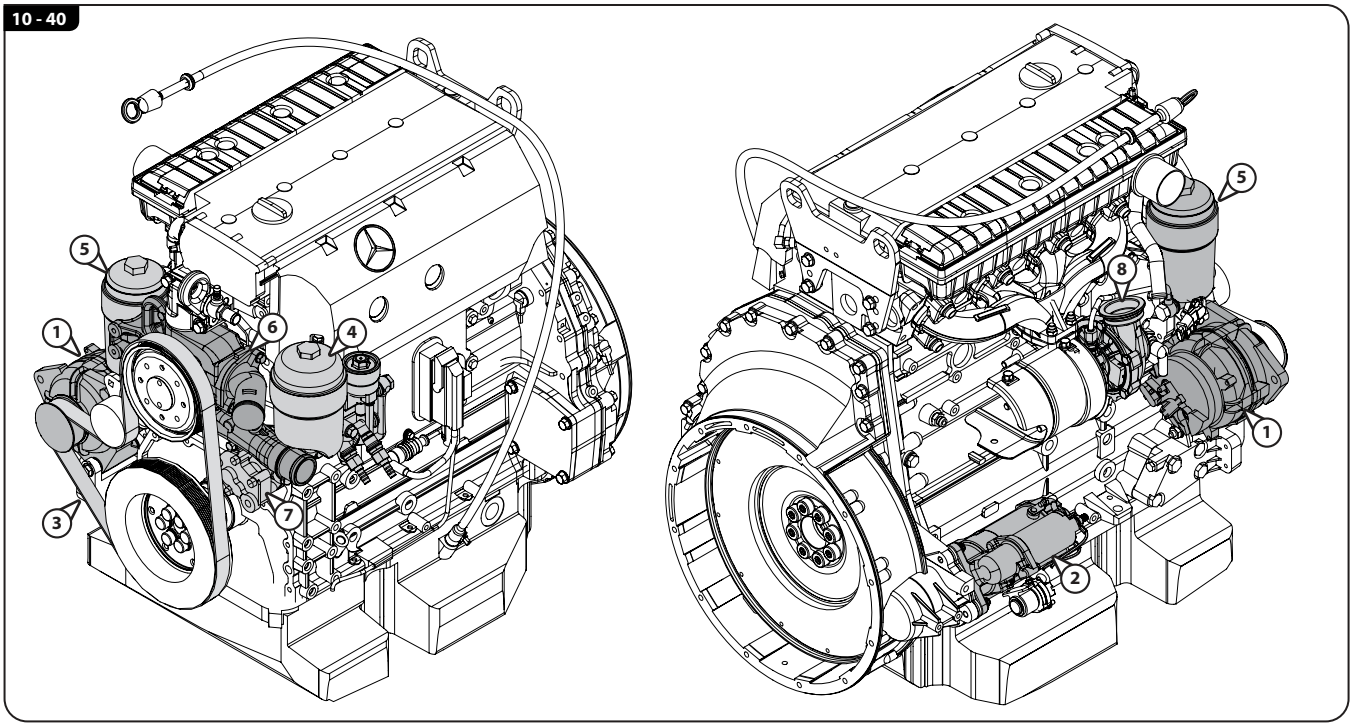
Start the machine and turn the key in position «3» (📷 ***10 - 102***).

10

10.4.3 MRT-X 2470/3050 PRIVILEGE PLUS ST3A

ENGINE COMPONENTS

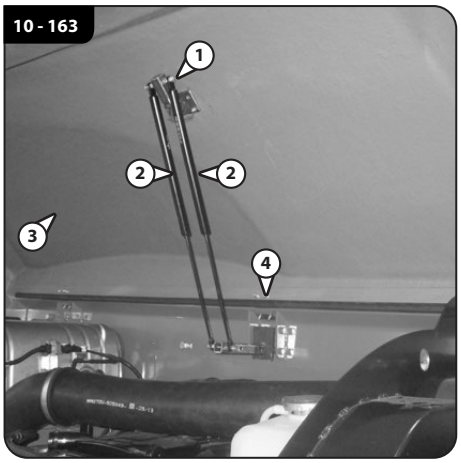
10 - 40



Key:

1 - Alternator
2 - Starter motor
3 - Alternator belt
4 - Fuel filter
5 - Oil filter
6 - Engine cooling water pump
7 - Fuel pump
8 - Turbocompressor

10 - 163



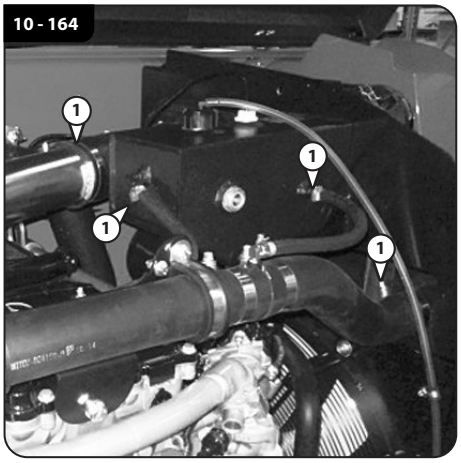
REMOVING THE ENGINE RADIATOR

Slacken the screws (1, 📷 ***10 - 163***) to release the two pairs of gas springs (2, 📷 ***10 - 163***) from the engine hood (3, 📷 ***10 - 163***).

Slacken the screws (4, 📷 ***10 - 163***) and remove the hood (3, 📷 ***10 - 163***) from the vehicle.

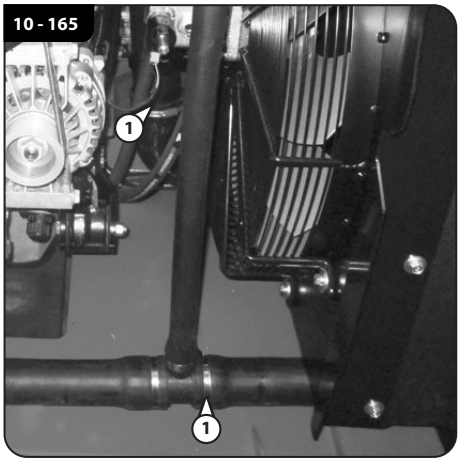
Place containers large enough to hold the quantity of liquid to be collected under the engine compartment.

10 - 164



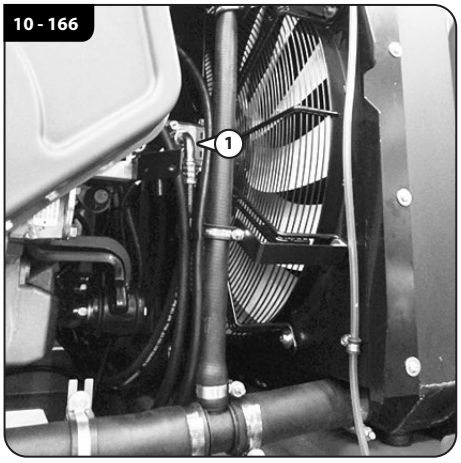
Slacken the clamps (1, 📷 ***10 - 164***) and remove the hoses from the radiator.

10 - 165



Slacken the clamps (1, 📷 ***10 - 165***) and remove the hoses from the radiator.

10 - 166



Remove all hoses (1, 📷 ***10 - 166***) from the radiator hydraulic motor.

SPN	FMI	DTC	Fault description	Recommended Action	CEL	SEL	MIL	Fault location
571	4	3B0204	Engine Brake Disable push-button shorted to Ground or pressed too long	"Check wiring of associated pin Check parameters 13/19 (Selection), 13/62 (Fault Detect Ena) for correct configuration of input pin 4/18"	ON	OFF	OFF	Pin 4/18
596	13	54020D	J1939 Cruise Control Enable Switch Signal from Source CCVS1, CCVS2 or CCVS3 missing or not available = SNA (signal not available)	"Check J1939 link connection to Cruise Control Check Parameter 13/22 (CC ON OFF Switch Config) for correct source Check Parameter 01/04 (CC1 Source Adress SAE J1939), 01/05 (CC2 Source Adress SAE J1939) and 01/06 (CC3 Source Adress SAE J1939) for correct Source Adress"	OFF	OFF	OFF	
596	19	540213	J1939 Cruise Control Enable Switch Signal from Source CCVS1, CCVS2 or CCVS3 erractic = undefined value but not SNA	"Check J1939 link connection to Cruise Control Check Parameter 13/22 (CC ON OFF Switch Config) for correct source Check Parameter 01/04 (CC1 Source Adress SAE J1939), 01/05 (CC2 Source Adress SAE J1939) and 01/06 (CC3 Source Adress SAE J1939) for correct Source Adress"	OFF	OFF	OFF	
597	13	55020D	"J1939 Service Brake Switch Signal from Source CCVS1, CCVS2 or CCVS3 missing or not available = SNA (signal not available)"	"Check J1939 link connection to Cruise Control Check Parameter 13/29 (Service Brake Switch Config) for correct source Check Parameter 01/04 (CC1 Source Adress SAE J1939), 01/05 (CC2 Source Adress SAE J1939) and 01/06 (CC3 Source Adress SAE J1939) for correct Source Adress"	OFF	OFF	OFF	
597	19	550213	"J1939 Service Brake Switch Signal from Source CCVS1, CCVS2 or CCVS3 erractic = undefined value but not SNA"	"Check J1939 link connection to Cruise Control Check Parameter 13/29 (Service Brake Switch Config) for correct source Check Parameter 01/04 (CC1 Source Adress SAE J1939), 01/05 (CC2 Source Adress SAE J1939) and 01/06 (CC3 Source Adress SAE J1939) for correct Source Adress"	OFF	OFF	OFF	
598	2	560202	Clutch switch status not plausible	Check wiring of Clutch Switch and Driveline Open Status	ON	OFF	OFF	
599	4	570204	Cruise Control SET and RESUME Circuits shorted to GND (SET and RESUME applied at the same time)	Check wiring of associated pins	ON	OFF	OFF	Pin 1/12 Pin 1/16
600	13	58020D	J1939 Cruise Control Coast Switch Signal from Source CCVS1, CCVS2 or CCVS3 missing or not available = SNA (signal not available)	"Check J1939 link connection to Cruise Control Check Parameter 13/24 (CC Set Cst Res Accel Sw Config) for correct source Check Parameter 01/04 (CC1 Source Adress SAE J1939), 01/05 (CC2 Source Adress SAE J1939) and 01/06 (CC3 Source Adress SAE J1939) for correct Source Adress"	OFF	OFF	OFF	
600	19	580213	J1939 Cruise Control Coast Switch Signal from Source CCVS1, CCVS2 or CCVS3 erractic = undefined value but not SNA	"Check J1939 link connection to Cruise Control Check Parameter 13/24 (CC Set Cst Res Accel Sw Config) for correct source Check Parameter 01/04 (CC1 Source Adress SAE J1939), 01/05 (CC2 Source Adress SAE J1939) and 01/06 (CC3 Source Adress SAE J1939) for correct Source Adress"	OFF	OFF	OFF	
602	13	5A020D	"J1939 Cruise Control Accelerator Switch Signal from Source CCVS1, CCVS2 or CCVS3 = SNA (signal not available)"	"Check J1939 link connection to Cruise Control Check Parameter 13/24 (CC Set Cst Res Accel Sw Config) for correct source Check Parameter 01/04 (CC1 Source Adress SAE J1939), 01/05 (CC2 Source Adress SAE J1939) and 01/06 (CC3 Source Adress SAE J1939) for correct Source Adress"	OFF	OFF	OFF	
602	19	5A0213	J1939 Cruise Control Accelerator Switch from Source CCVS1, CCVS2 or CCVS3 erractic = undefined value but not SNA	"Check J1939 link connection to Cruise Control Check Parameter 13/24 (CC Set Cst Res Accel Sw Config) for correct source Check Parameter 01/04 (CC1 Source Adress SAE J1939), 01/05 (CC2 Source Adress SAE J1939) and 01/06 (CC3 Source Adress SAE J1939) for correct Source Adress"	OFF	OFF	OFF	
609	12	61020C	CPC electronics are defect (EEPROM, CPU…)	"Try reprogramming the CPC with the new software release. Replace CPC4 and reprogram with the latest software."	OFF	OFF	OFF	

SPN	FMI	DTC	Fault description	Recommended Action	CEL	SEL	MIL	Fault location
2646	3	560A03	Digital Output 4/02 Circuit shorted to Ubat	"Check wiring of associated pin Check parameters 35/14 (Selection), 35/33 (Fault Detection) and 35/50 (Configuration) for correct configuration of output pin 4/02 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 4/02
2646	4	560A04	Digital Output 4/02 Circuit shorted to GND	"Check wiring of associated pin Check parameters 35/14 (Selection), 35/33 (Fault Detection) and 35/50 (Configuration) for correct configuration of output pin 4/02 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 4/02
2646	5	560A05	Digital Output 4/02 Open Circuit (broken wire, terminal floating)	"Check wiring of associated pin Check parameters 35/14 (Selection), 35/33 (Fault Detection) and 35/50 (Configuration) for correct configuration of output pin 4/02 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 4/02
2882	13	420B0D	Off-Highway Engine Configuration Selection message on J1939 was not received or has stopped arriving.	"Check the J1939 link connection Check parameter 01/72 for configuration of OHECS source address Check parameter 05/06 for proper configuration"	ON	OFF	OFF	
2900	9	540B09	J1939 ETC7 Message is missing or not available	Check J1939 link connection to Transmission Controller / Check if Electronic Transmission Controller is CAN capable	ON	OFF	OFF	
3187	9	730C09	Transmission Shift Console Datalink (LIN)	Check LIN wiring / stalk switch	ON	OFF	OFF	
3353	2	190D02	Generator (Charging System) D+ terminal failure	Check wiring of Generator Terminal D+ or check Generator functionality	OFF	OFF	OFF	
3510	4	B60D04	Accelerator Pedal Supply Voltage Circuit shorted to GND	Check wiring of associated pins	ON	OFF	OFF	Pin 1/04 Pin 1/08 Pin 3/02 Pin 3/03
3510	7	B60D07	Accelerator Pedal Supply Voltage Circuit shorted to Ubat	Check wiring of associated pins	ON	OFF	OFF	Pin 1/04 Pin 1/08 Pin 3/02 Pin 3/03
3510	8	B60D08	2-Channel Accelerator Pedal Supply Voltage Missing (supply of either channel is to high or to low)	Check wiring of associated pins	ON	OFF	OFF	Pin 1/04 Pin 1/08 Pin 3/02 Pin 3/03
3511	3	B70D03	Remote Accelerator Pedal Supply Voltage circuit shorted to Ubat	Check wiring of associated pins	ON	OFF	OFF	Pin 3/02 (Supply) Pin 3/03 (GND)
3511	4	B70D04	Remote Accelerator Pedal Supply Voltage circuit shorted to GND	Check wiring of associated pins	ON	OFF	OFF	Pin 3/02 (Supply) Pin 3/03 (GND)
3606	9	160E09	J1939 PROP04 Message is missing or not available	Check J1939 link connection to Diesel Particulate Filter	ON	OFF	OFF	
3645	9	3D0E09	J1939 TCI Message (Transfer Case Information) is missing	Check J1939 link connection	ON	OFF	OFF	
3695	9	6F0E09	J1939 DPF Regen Inhibit MUX Switch Message Stopped Arriving	"Check J1939 link connection to Diesel Particulate Filter. Check Parameter 46/10 (DPF J1939 Inhibt Sw Enable) and 46/11 (DPF J1939 Regen Sw Enable)."	ON	OFF	OFF	
3695	13	6F0E0D	J1939 DPF Regen Inhibit MUX Switch Message Contains SNV(SNA) Indicator	"Check J1939 link connection to Diesel Particulate Filter. Check Parameter 46/10 (DPF J1939 Inhibt Sw Enable) and 46/11 (DPF J1939 Regen Sw Enable)."	ON	OFF	OFF	
3695	14	6F0E0E	J1939 DPF Regen Inhibit MUX Switch Message Not Received this Ignition Cycle	"Check J1939 link connection to Diesel Particulate Filter. Check Parameter 46/10 (DPF J1939 Inhibt Sw Enable) and 46/11 (DPF J1939 Regen Sw Enable)."	ON	OFF	OFF	

SPN	FMI	Fault_name	Fault Description
174	3	Fuel Temperature Circuit Failed High	Fuel Temperature Sensor “A” Circuit High Input
174	4	Fuel Temperature Circuit Failed Low	Fuel Temperature Sensor “A” Circuit Low Input
174	17	MU_IS4_T_FUEL_MC_MON	FIS fault codes using fuel temperature as a monitoring condition w ill not be able to run if the minimum fuel temperature is not achieved.
174	20	Plausibility Error Fuel Temperature Sensor	Temperature Sensor Plausibility Error Fuel
174	31	Fuel Temperature Not Plausible	Determine fuel termperature rationalilty
175	0	Oil Temperature High Warning	Engine oil temperature high, w arning
175	2	Engine Oil Temperature Sensor, General Temperature Plausibility	general temperature diagnostic, t _eng_oil
175	3	Engine Oil Temperature Circuit Failed High	Engine Oil Temperature Sensor Circuit High
175	4	Engine Oil Temperature Circuit Failed Low	Engine Oil Temperature Sensor Circuit Low
175	14	Engine Oil Temperature Sensor Plausibility Fault	Engine Oil above Coolant temperature
175	15	Oil Temperature High Pre Warning	Engine oil temperature high, pre-w arning
175	17	Oil Temperature too Low	Oil Temp too low
175	18	Engine Oil Temperature Rises too Slow or Not At All	Engine oil temperature rises to slow or not at all
175	31	MU_RC4_T_ENG_OIL_GEN2	Temperature Sensor Plausibility Error Engine Oil
188	31	Idle Speed Out of Range	The idle speed out of range
190	0	Engine Speed High	Speed too high
190	15	MU_EPF_ENG_SPEED_PREWARN	engine overspeed prew arning
190	16	MU_EPF_ENGINE_OVERSPEED	Engine-protection-function to save the engine in case of an overspeed because of engine failure (uncontrolled intake of oil or fuel)
191	13	J1939 Transmission Output Shaft Speed Signal is Missing	CPC 2 Fault
191	19	J1939 Transmission Output Shaft Speed Signal is Erratic	CPC 2 Fault
354	3	Relative Humidity Circuit Failed High	Ambient Air Combi Sensor , Part Humidity Circuit Low
354	4	Relative Humidity Circuit Failed Low	Ambient Air Combi Sensor , Part Humidity Circuit Low
411	0	EGR Differential Pressure Failed (Low Box)	EGR Differential Pressure Failed High Speed
411	1	EGR Differential Pressure Failed (High Box)	EGR Differential Pressure Failed Low Speed
411	2	EGR Delta Pressure Sensor Out of Calibration Low	zero offset compensation too low
411	3	EGR Delta Pressure Sensor Circuit High	EGR Differential Pressure Failed High
411	4	EGR Delta Pressure Sensor Circuit Low	EGR Differential Pressure Failed Low
411	13	EGR Delta Pressure Sensor Out of Calibration High	zero offset compensation too high
412	0	EGR Temperature Very High	Temperature exceeds buzzer threshold
412	2	EGR Temperature Sensor, General Temperature Plausibility Error	general temperature diagnostic, t egr
412	3	EGR Temperature Sensor Circuit Failed High	EGR Temperature Circuit Failed High
412	4	EGR Temperature Sensor Circuit Failed Low	EGR Temperature Circuit Failed Low
412	15	EGR Valve Temperature too High	MU ist set if EGR valve temperature is to high
412	16	EGR Temperature Sensor / Temperature too High	Temperature too high
412	20	EGR Temperature Drift (High Box)	Difference betw een EGR and Coolant Temperature less than threshold at high speed
412	21	EGR Temperature Drift (Low Box)	Difference betw een EGR and Coolant Temperature above threshold at low speed
520	1	MU_EBM_BRAKE_MALFUNCTION	Engine brake prohibited due to sensor or actuator failure
520	18	MU_EBM_RED_BRAKE_POWER	Reduced brake pow er due to sensor or actuator failure
523	13	J1939 Transmission Current Gear Signal is Missing	CPC 2 Fault
523	19	J1939 Transmission Current Gear Signal is Erratic	CPC 2 Fault
623	0	Driver Inducement System, SEL solid active	Driver-Inducement: Stop Engine Lamp Solid On
623	16	Driver Inducement System, SEL flash active	Driver-Inducement: Stop Engine Lamp Flash On
624	0	Driver Inducement System, CEL solid active	Driver-Inducement: Check Engine Lamp Flash On
624	16	Driver Inducement System, SEL flash active	Driver-Inducement: Check Engine Lamp Flash On
625	2	Invalid Data on Engine CAN Link	threshold, af ter expiration of start delay

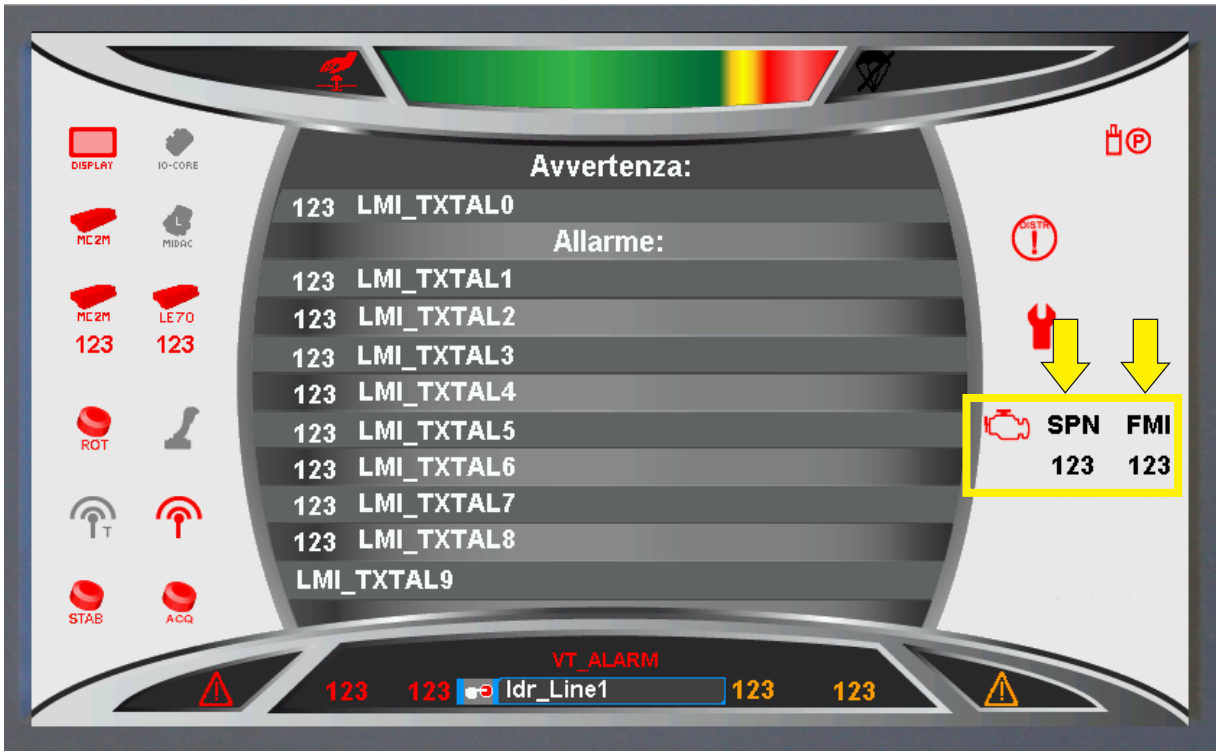
SPN	FMI	Fault_name	Fault Description
4193	10	Coolant Temperature Sensors Not Plausible	Engine coolant temperature sensor monitor
4193	17	MU_ISP_ENG_WARM_MON	Engine w arm up monitor
4193	21	MU_RC4_T_COOLANT_IN_GEN2	Temperature Sensor Plausibility Error Engine Coolant Inlet
4193	31	Engine Coolant Sensor (IN), General Temperature Plausibility Error	general temperature diagnostic, t coolant in
4227	3	Electrostatic Oil Separator Circuit Failed High	Short Cut to Battery
4227	4	Electrostatic Oil Separator Circuit Failed Low	Short Cut to Ground
4227	5	Electrostatic Oil Separator Circuit Failed Open	Open Load
4257	3	Injector Amplifier Control Valve Cylinder #1, #2, #3, Shorted to Battery	Short-circuit to battery
4257	4	Injector Amplifier Control Valve Cylinder #1, #2, #3, Shorted to Ground	Short-circuit to ground
4258	3	Injector Amplifier Control Valve Cylinder #4, #5, #6, Shorted to Battery	Short-circuit to battery
4258	4	Injector Amplifier Control Valve Cylinder #4, #5, #6, Shorted to Ground	Short-circuit to ground
4752	0	EGR Cooler Low Efficiency	EGR cooler fail high by detecting a high intake manifold temperature
4752	15	EGR Cooler Performance Monitor	EGR High/Low OBD Monitor
4752	16	Cooling Efficiency of EGR Cooler too Low	The measured lambda-value (is1_lambda_act) is lower than the set point value (egr_des_lambda_corr_filt) for Lambda
4765	0	MU_EPF_T_EXH_HIGH	Exhaust temperature too high, most likely fault in either engine gas- path or component
4809	3	Catalyst Temperature Sensor Circuit Low Input (Bank 1 Sensor 1)	Catalyst Temperature Sensor Circuit High Input (Bank 1 Sensor 1)
4809	4	Catalyst Temperature Sensor Circuit High Input (Bank 1 Sensor 1)	Catalyst Temperature Sensor Circuit Low Input (Bank 1 Sensor 1)
4810	3	Catalyst Temperature Sensor Circuit Low (Bank 1 Sensor 2)	Catalyst Temperature Sensor Circuit High (Bank 1 Sensor 2)
4810	4	Catalyst Temperature Sensor Circuit High (Bank 1 Sensor 2)	Catalyst Temperature Sensor Circuit Low (Bank 1 Sensor 2)
4814	3	Water Pump Circuit Failed High	Water Pump:Short Cut to Battery
4814	4	Water Pump Circuit Failed Low	Water Pump: Short Cut to Ground
4814	5	Water Pump Circuit Failed Open	Water Pump:Open Load
5125	3	MU_ISP_ULIN_SRH	ULIN voltage too high
5125	4	MU_ISP_ULIN_SRL	ULIN voltage too low
5246	0	MU_OBD_INDC_FLT_FNL_ACT	Driver Final Inducement (EPA)
5246	14	MU_OBD_INDC_FNCT_NOT_ACT	Inducment Final-Shut-Down is active
5246	15	MU_OBD_INDC_FLT_FNL_WRNG	Driver Inducement Warning (EPA)
5246	16	MU_OBD_INDC_FLT_DERATE	Driver Inducement Derate (EPA)
5246	31	MU_OBD_INDC_FNL_SHTDWN_ACT	Inducment Final-Shut-Down is active
5312	7	MU_RC4_P_INT_LOW_CEL	The set point signal and the actual sensor signal for the intake manifold pressure are compared to each other.Check if difference exceeds a maximum negative threshold (intake manifold pressure to high).
5323	13	Excessive Time to Enter Closed Loop Fuel Pressure Control	low rail pressure
5357	16	Total Injected Fuel Mass too High	Injection quantity drift detection high
5357	18	Total Injected Fuel Mass too Low	Injection quantity drift detection low
5357	31	MU_ESC_MULTI_CYL	ESC correction factor for more than 1 cylinder out of range
5358	16	Engine Smoothness Control / Cylinder #1 Quantity Deficit	correction factor for cyl1 out of range
5358	18	Engine Smoothness Control / Cylinder #1 Quantity Excess	Cylinder 1 Fueling Error
5359	16	Engine Smoothness Control / Cylinder #2 Quantity Deficit	correction factor for cyl2 out of range
5359	18	Engine Smoothness Control / Cylinder #2 Quantity Excess	Cylinder 2 Fueling Error
5360	16	Engine Smoothness Control / Cylinder #3 Quantity Deficit	correction factor for cyl3 out of range
5360	18	Engine Smoothness Control / Cylinder #3 Quantity Excess	Cylinder 3 Fueling Error
5361	16	Engine Smoothness Control / Cylinder #4 Quantity Deficit	correction factor for cyl4 out of range

SPN	FMI	Fault_name	Fault Description	Pin No.	Failure cause
3363	3	DEF Coolant Valve Circuit Failed High	short circuit to battery on tank heating	34 (and 8 if sys_sel_ep a10_ fcn_1 m selected)tank heating or harness shorted to battery	Broken w ire, open connector or corroded connector pin of tank heating
3363	4	DEF Coolant Valve Circuit Failed Low	short circuit to ground on tank heating	34 (and 8 if sys_sel_ep a10_ fcn_1 m selected) tank heating or harness shorted to ground	Broken w ire, open connector or corroded connector pin of tank heating
3363	5	DEF Coolant Valve Circuit Failed Open	Open load on tank heating	34 8and 8 if sys_sel_ep a10_ fcn_1 m selected)	Broken w ire, open connector or corroded connector pin of tank heating
3363	7	DEF Tank Temperature Too Low			
3363	31	DEF Tank Temperature Too High			
3364	1	Improper DEF Quality Final Warning	Diesel exhaust Fluid Quailty Warning (Speed Limit Imposed)		
3364	2	Improper DEF Quality			
3364	17	Improper DEF Quality Warning	Diesel exhaust Fluid Quailty Warning		
3364	18	Improper DEF Quality Warning			
3490	3	DEF Purge Lamp Circuit Failed High			
3490	4	DEF Purge Lamp Circuit Failed Low			
3490	5	DEF Purge Lamp Circuit Failed Open			
3509	3	ACM Sensor Supply 1 Short to Battery	short circuit to U_Batterie on sensor supply 1	117	short circuit to battery or an other external voltage
3509	4	ACM Sensor Supply 1 Short to Ground	short circuit to ground on sensor supply 1	117	short circuit to ground or an other external voltage
3510	3	ACM Sensor Supply 2 Short to Battery	short circuit to U_Batterie on sensor supply 2	84	short circuit to battery or an other external voltage
3510	4	ACM Sensor Supply 2 Short to Ground	short circuit to ground on sensor supply 2	84	short circuit to ground or an other external voltage
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			

10.5.2 USE OF THE ONBOARD DIAGNOSTIC MERCEDES ST3A

The errors underlined on the engine system will be visualized on the display (SPN / FMI) as shown below.

10 - 181



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.

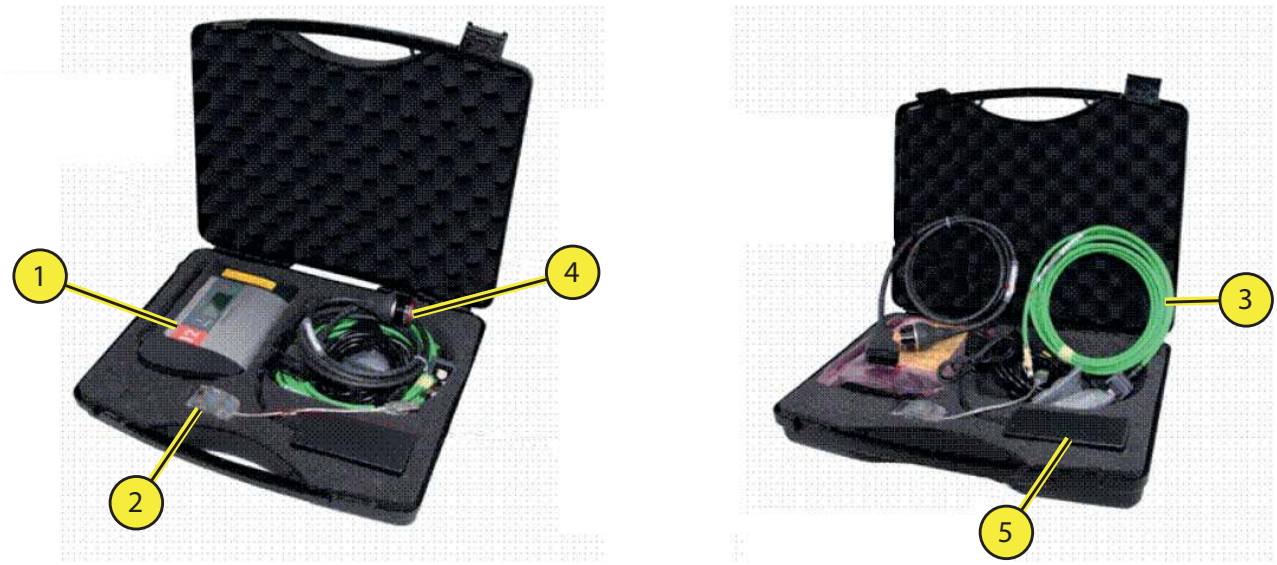
ADM3 fault code (J1939) SPN / FMI	*"ADM3 fault code (K-line)"*	*"MR2 fault code (K-line)"*	*Fault location*	*Fault description*	*Remedial action*	*Pin*
51 / 0	-	12419	Engine Throttle Position	Above Measuring Range		LSCAN-MR
51 / 1	-	12420	Engine Throttle Position	Below Measuring Range		LSCAN-MR
51 / 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

ADM3 fault code (J1939) SPN / FMI	"ADM3 fault code (K-line)"	"MR2 fault code (K-line)"	Fault location	Fault description	Remedial action	Pin
730 / 1	13901	-	Output Relay 2 (REL 2)	Relay Permanently Closed (Grid Heater)	- Check wiring - Check relay 2	15/09
730 / 2	13902	-	Output Relay 2 (REL 2)	Relay Permanently Open (Grid Heater)	- Check wiring - Check relay 2	15/09
730 / 3	13903	-	Output Relay 2 (REL 2)	Voltage too High when Activated	- Check wiring	15/09
730 / 4	13904	-	Output Relay 2 (REL 2)	Voltage too Low when Activated	- Check wiring - Check relay 2	15/09
870 / 3	-	14223	SCR Diusor Heating	Circuit High		LSCANMR
870 / 3	-	14270	Heater Regeneration System	Circuit High		LSCANMR
870 / 4	-	14222	SCR Diusor Heating	Circuit Low		LSCANMR
870 / 4	-	14269	Heater Regeneration System	Circuit Low		LSCANMR
870 / 5	-	14221	SCR Diusor Heating	Circuit Open		LSCANMR
904 / 9	18809	-	Front Axle Speed	Abnormal Update Rate		CANJ1939
904 / 19	18819	-	Front Axle Speed	Received Network Data in Error		CANJ1939
925 / 3	-	17905	SCR Module Proportional Valve Bank	Circuit High		LSCANMR
925 / 4	-	17908	SCR Module Proportional Valve Bank	Circuit Low		LSCANMR
973 / 9	18909	-	Engine Retarder Selection	Abnormal Update Rate		CANJ1939
973 / 19	18919	-	Engine Retarder Selection	Received Network Data in Error		CANJ1939
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

10.6 SPECIFIC ENGINE TOOLING

10.6.1 XENTRY DIAGNOSTICS HARDWARE CASE

10 - 182



The entire hardware for XENTRY Diagnostics (Open Shell variants) is delivered in a case.
This case includes all hardware components:

SDconnect	Item. 1.
USB2LAN adapter	Item. 2.
LAN cable	Item. 3.
OBD cable	Item. 4.
Power supply	Item. 5.

The hardware can also be ordered afterwards if, for example, you have previously only used the XENTRY Diagnostics Open Shell software.

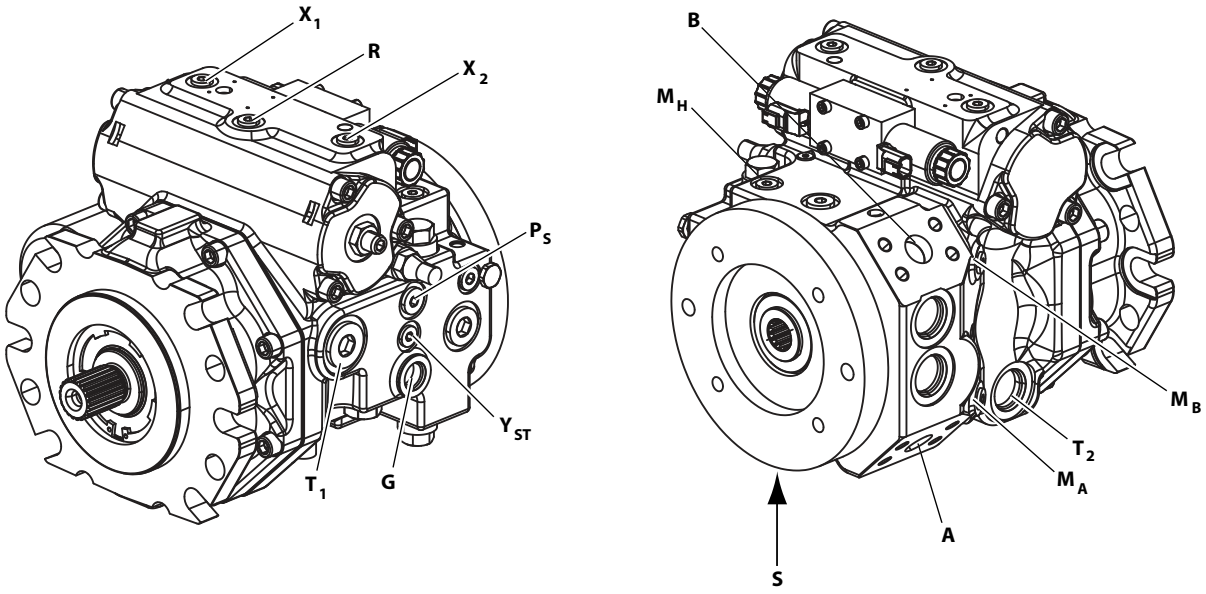
If you have any questions, please contact the Customer Assistance Center (CAC) or the local support centers specified for the respective product variant.

20.4 TRANSMISSION CONTROL AND ADJUSTMENT

20.4.1 PRESSURE TAKE-OFF POINTS

A4VG 110 ET PUMP

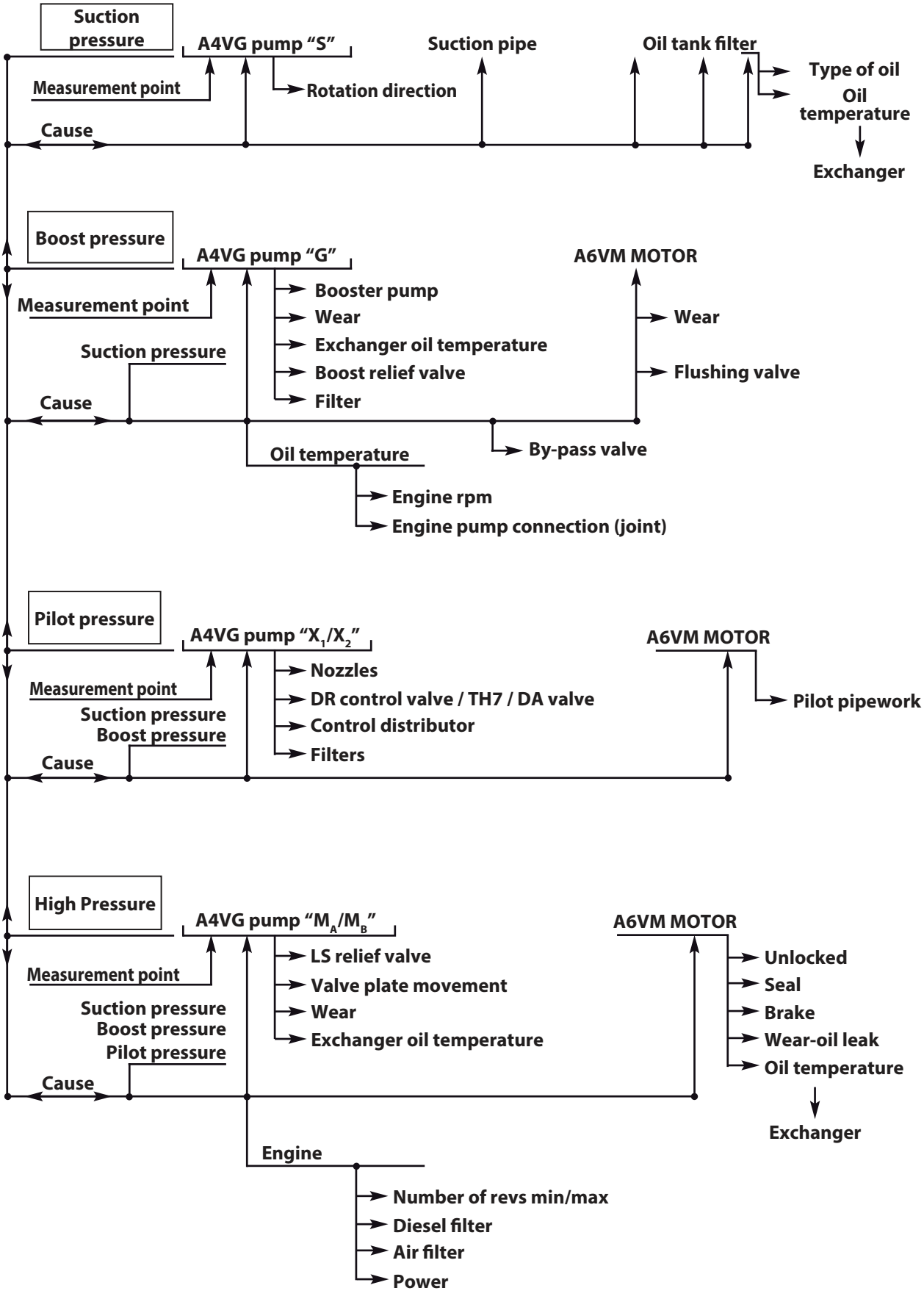
20 - 5

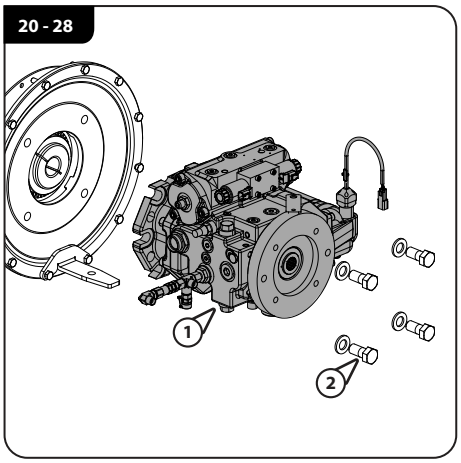


Port	Designation
A , B	Service line
S	Suction
T1	Tank
T2	Tank
R	Air bleed
X1 , X2	Control pressure (upstream of orifice)
G	Boost pressure
PS	Pilot pressure inlet
YST	Pilot pressure outlet
MA , MB	Measuring pressure A, B
MH	Measuring high pressure

HYDROSTATIC SYSTEM TROUBLESHOOTING

PUMP / MOTOR

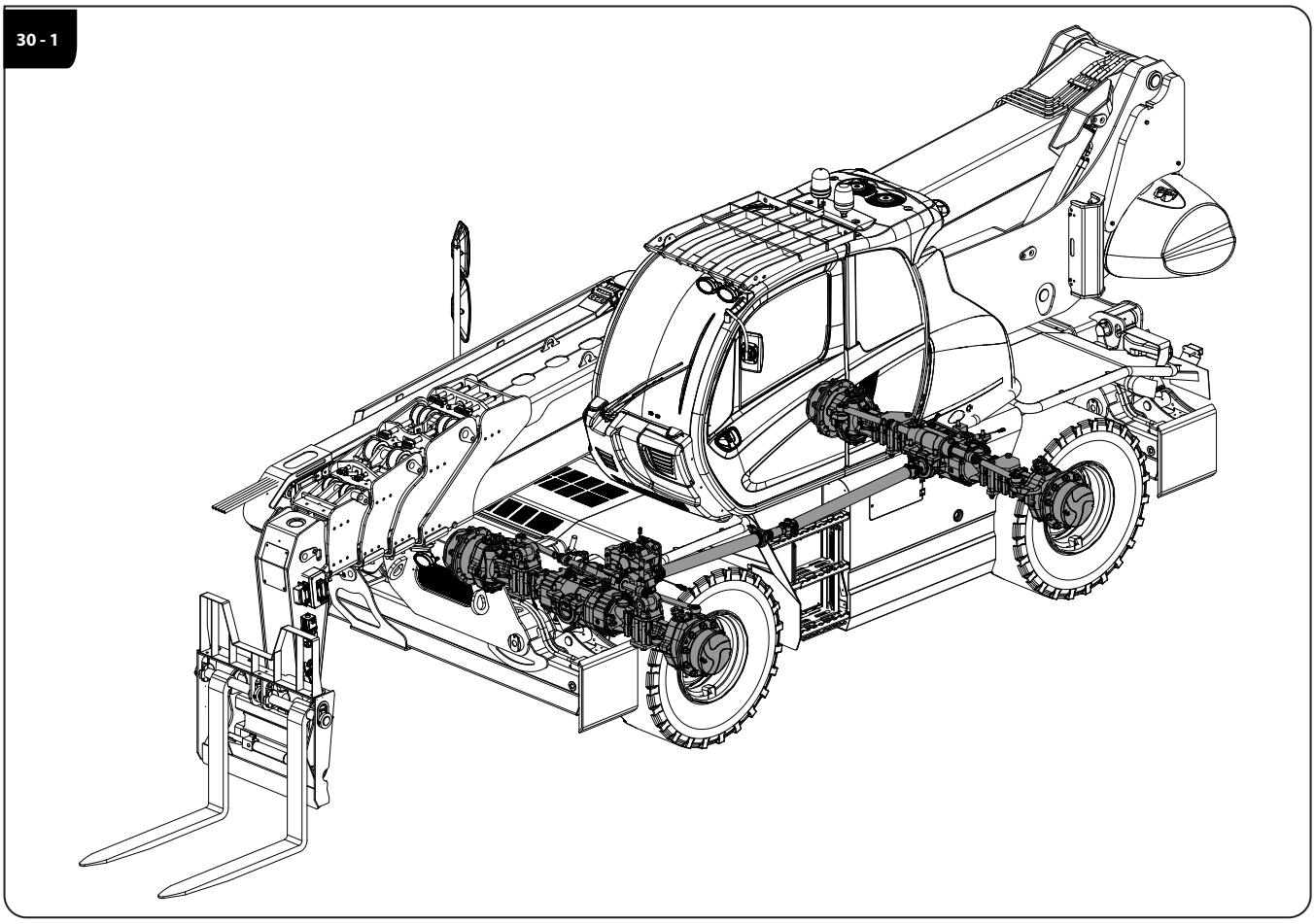




Secure the pump (1, 📷 ***20 - 28***) to appropriate lifting means, slacken the screws (2, 📷 ***20 - 28***) and remove the pump from the machine.

30.1 REMOVING THE AXLE

30 - 1



GENERAL INFORMATION

The sequence for disassembly operations must be followed to access the various components.

Mark all the hydraulic pipes and electrical connections with a marker pen, before disassembling, to ensure correct positioning in the reassembly phase.

⚠ WARNING

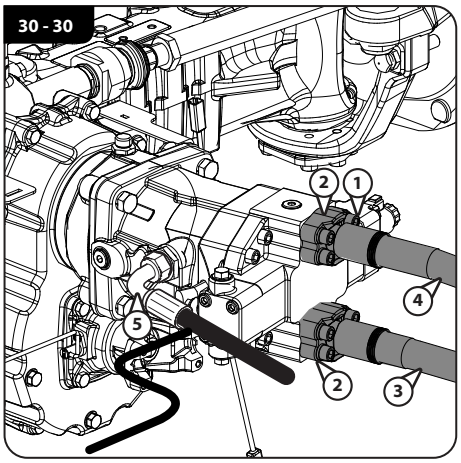
Plug all the hydraulic pipes and orifices to prevent impurities from contaminating the hydraulic circuit.

PREPARATION AND SAFETY INSTRUCTIONS

Park the vehicle on horizontal ground and level it (chassis parallel to front axle).

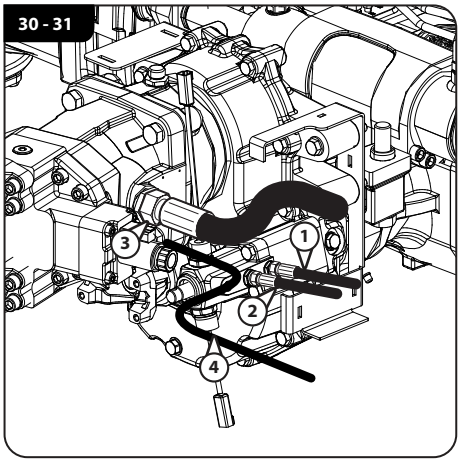
Rest the stabilizers on the ground to ensure utmost stability and safety, bringing them to a height necessary to remove the wheels and switch off the I.C. engine.

Specific tools:
– Crane for lifting (5000 kg. minimum).



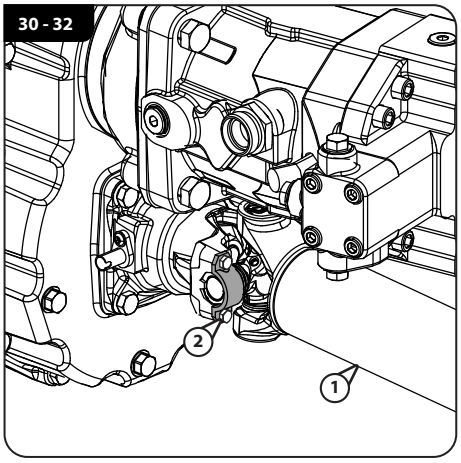
Refit the flanges (2, 📷 ***30 - 30***) on the two sides of the hydrostatic motors, tightening the screws (R1, 📷 ***30 - 30***) apply 110 Nm, and reconnect the tubes (3, 4, 📷 ***30 - 30***).

Reconnect the tubes on the connector (5, 📷 ***30 - 30***).

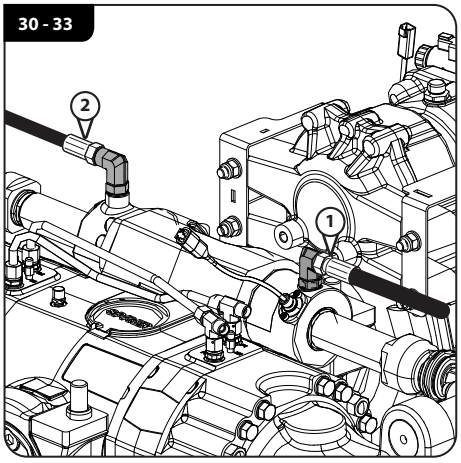


Reconnect the hydraulic tubes (1, 2, 📷 ***30 - 31***).

Reconnect the hydraulic tube (3, 📷 ***30 - 31***) and reconnect the electrical connections (4, 📷 ***30 - 31***).



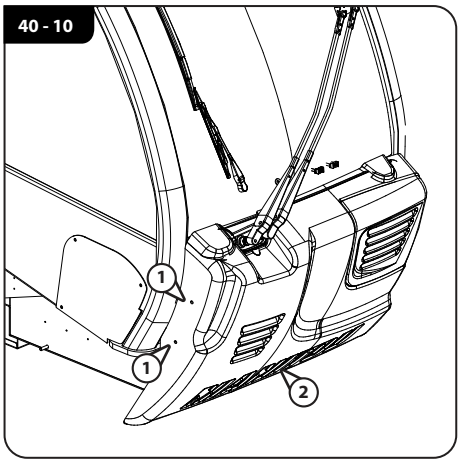
Refit the universal shaft (1, 📷 ***30 - 32***) in its predefined position, using Loctite 270 for fixing the screws of the flange (2, 📷 ***30 - 32***), apply 38 Nm.



Reconnect the tube (1, 📷 ***30 - 33***) (LH of the axle) concerned with the working of the steering.

Reconnect the tube (2, 📷 ***30 - 33***) (RH of the axle) concerned with the working of the steering.

40 - 10



40.3 BRAKE REMOVAL

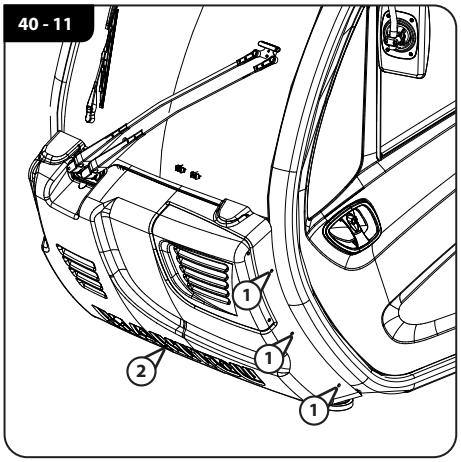
40.3.1 SERVICE BRAKE

PREPARATION AND SAFETY INSTRUCTIONS

This operation should preferably be carried out on a flat surface.
This operation is best carried out with the wheels straight.

Before fully unscrewing a hose coupling, detach the hose from the coupling to which it is attached to check that there is no residual pressure in the circuit.

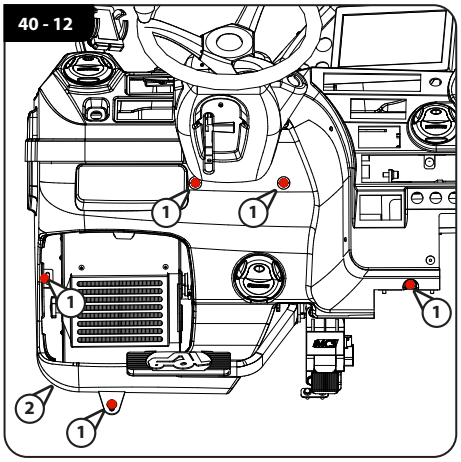
40 - 11



For the correct operation of the machine after repair, it is recommended to plug all open sections of the hydraulic circuit.

Remove the screws (1, 📷 ***40 - 10***) - (1, 📷 ***40 - 11***) from the cab's front fairing (2, 📷 ***40 - 10***) - (2, 📷 ***40 - 11***).

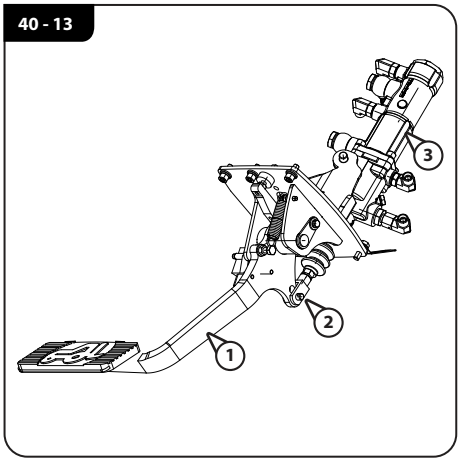
40 - 12



BRAKE PUMP REMOVAL

Slacken the screws (1, 📷 ***40 - 12***) securing the dashboard lower casing (2, 📷 ***40 - 12***) and remove it.

40 - 13



Remove the cotter pin and remove the locking pin (2, 📷 ***40 - 13***) on the brake pump (3, 📷 ***40 - 13***) of the brake pedal (1, 📷 ***40 - 13***).

50.1.2 FOUR EXTENSION BOOM

Comprising five parts:

- 1 fixed
- 4 moving (T1 - T2 - T3 - T4)

Distribution:

Distribution of the boom with three simultaneously controlled extensions.
⇒ T1, T2, T3 and T4 are extended simultaneously.

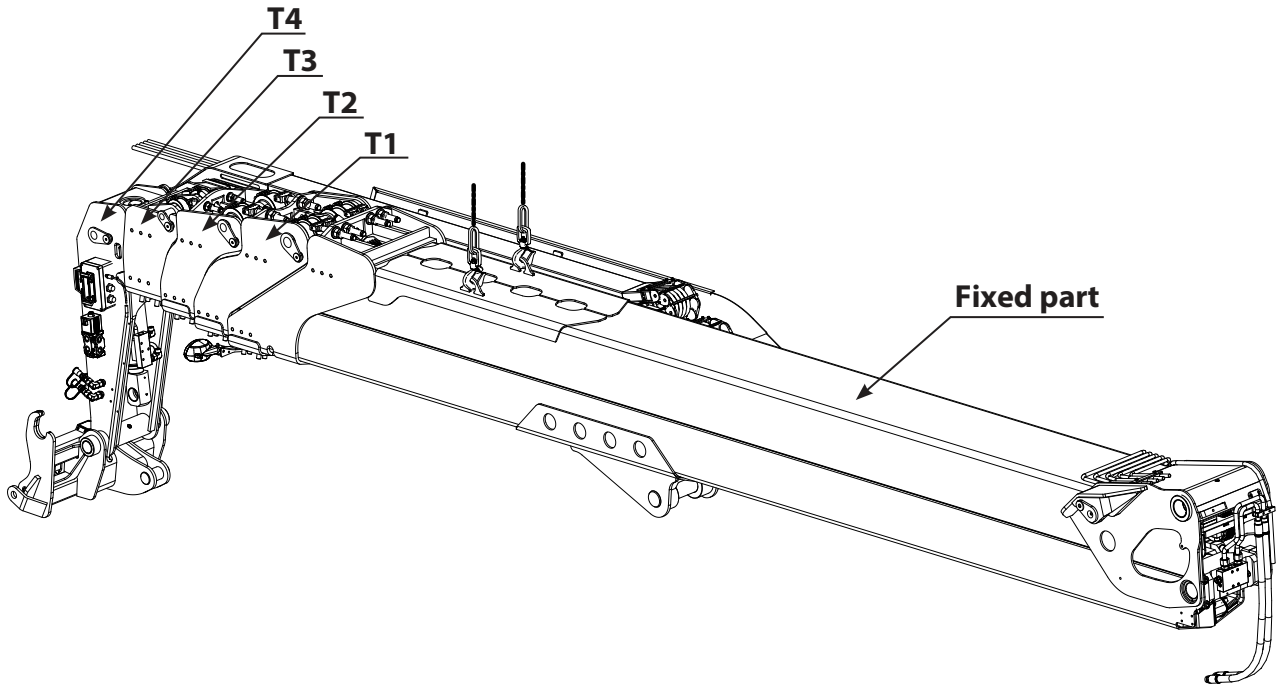
Trucks fitted with four-extension boom:

- **MRT 3050 PRIVILEGE PLUS ST4 S1**
- **MRT 3050 PRIVILEGE PLUS ST3A**

Weight of the boom:

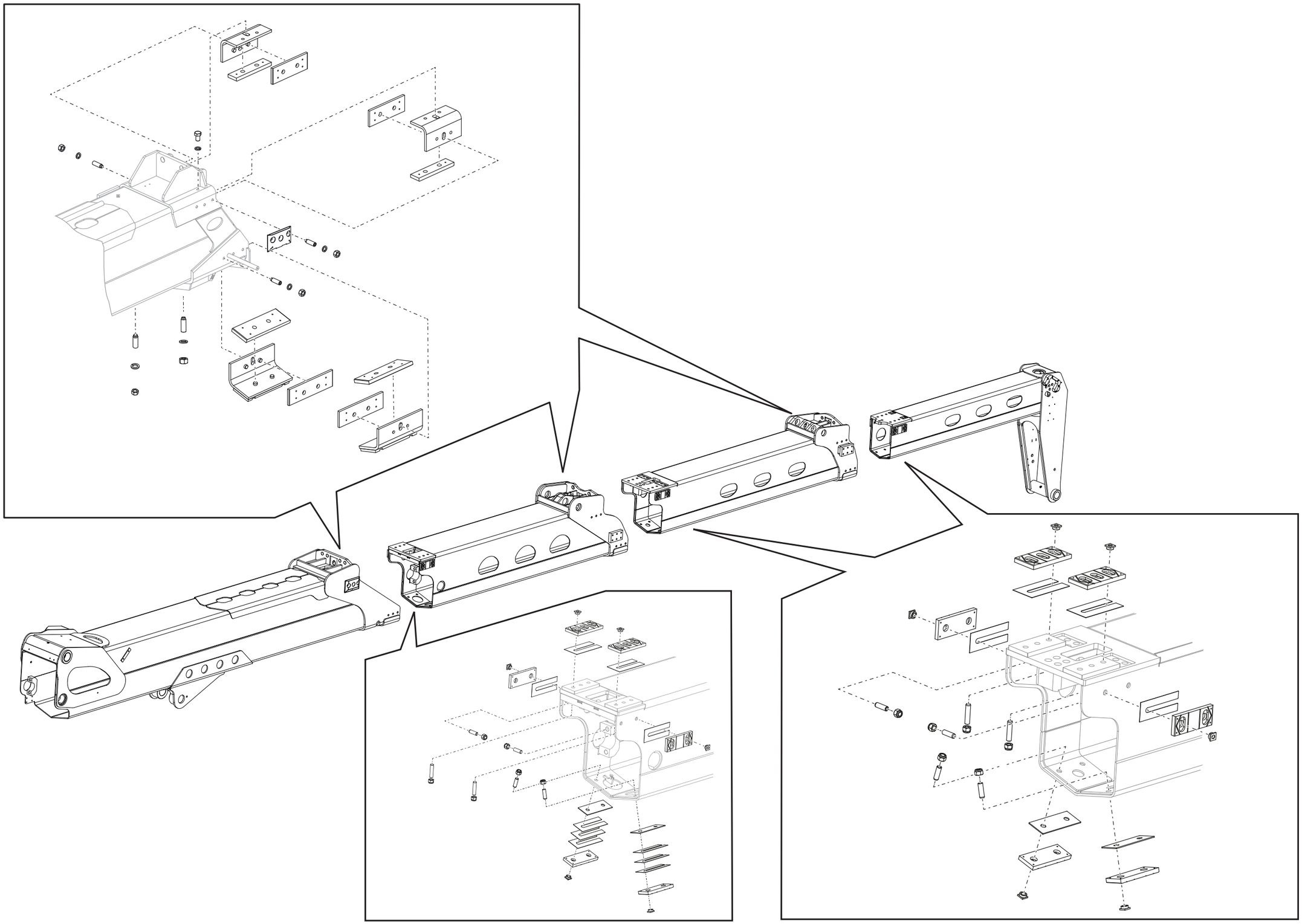
Truck	*Weight of the boom*
MRT 3050	5100 Kg

50 - 2

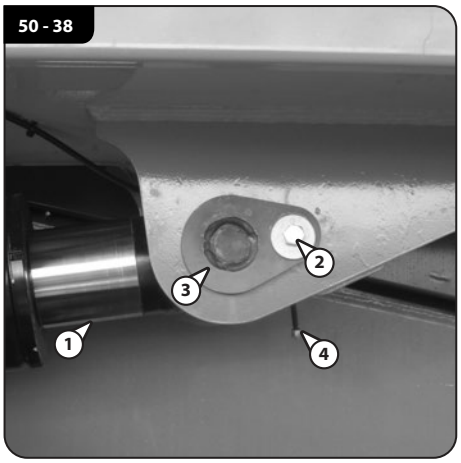


THREE EXTENSION BOOM ASSEMBLY OVERVIEW

50 - 21



50 - 38



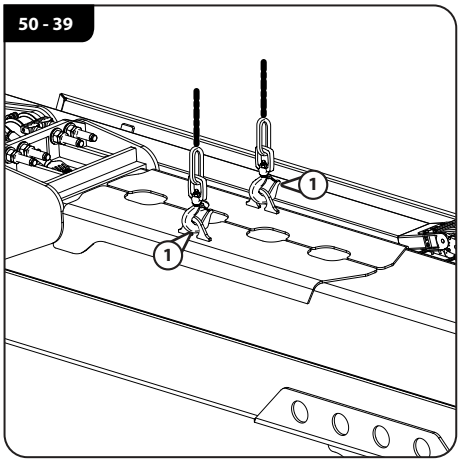
Secure the lifting ram (1, 📷 ***50 - 38***) with ropes and an overhead crane, unscrew the screw (2, 📷 ***50 - 38***) locking the hinge pin (3, 📷 ***50 - 38***) of the ram.

Remove the hinge pin (3, 📷 ***50 - 38***) from the boom.

Lay down the ram (1, 📷 ***50 - 38***) on the turret, resting it on a wooden beam.

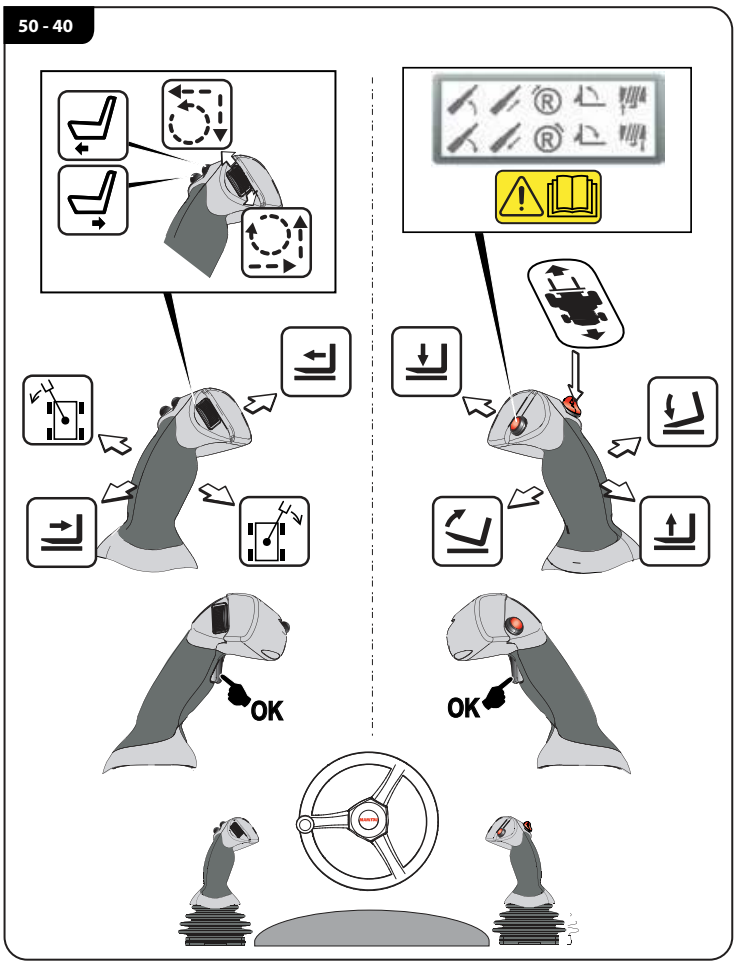
Disconnect the ram pin lubrication pipe (4, 📷 ***50 - 38***) and and remove all the fixing clamps.

50 - 39



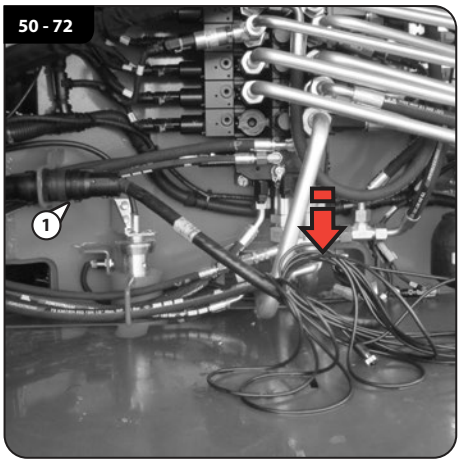
Secure the boom to the overhead crane with the appropriate eye bolts (1, 📷 ***50 - 39***).

50 - 40



Turn the ignition key to position “I” (ignition key switch on the dashboard) and carry out all movements possible with the commands to release the residual pressure in the hydraulic system.

50 - 72

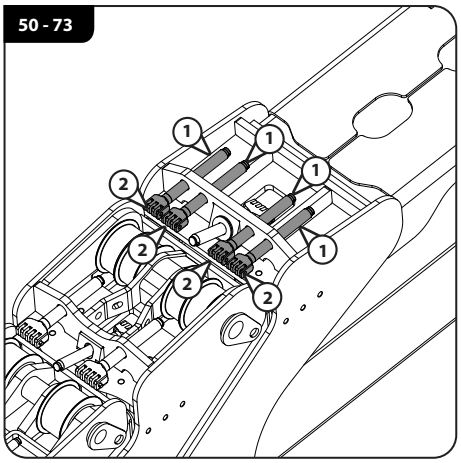


Open the back cover of the cabin and disconnect the electrical system connector (1, 📷 ***50 - 72***).

Insert the electrical system connector inside the chassis and remove the clips.

REMOVING THE BOOM EXTENSIONS FROM THE EXTERNAL BOOM

50 - 73

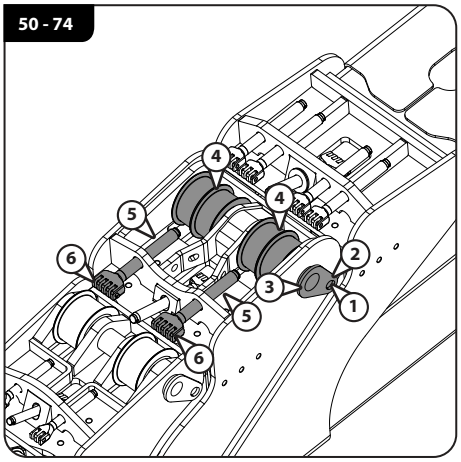


⚠ WARNING

Be careful to mark all the sliding blocks and their shims that are removed from the telescopic boom to ensure correct refitting.

In the upper front part of the boom, slacken the tie rods (1, 📷 ***50 - 73***) of the upper chains of the external boom until to release the chains (2, 📷 ***50 - 73***).

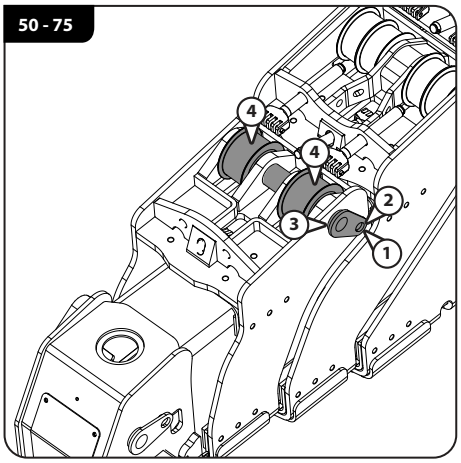
50 - 74



Unscrew the screws (1, 📷 ***50 - 74***) and remove the washers (2, 📷 ***50 - 74***) to remove the locks the pin (3, 📷 ***50 - 74***) and remove the pulleys (4, 📷 ***50 - 74***) from the 1st extension boom.

Slacken the upper chain pull rods (5, 📷 ***50 - 74***) of the 2nd extension boom until to release the chains (6, 📷 ***50 - 74***).

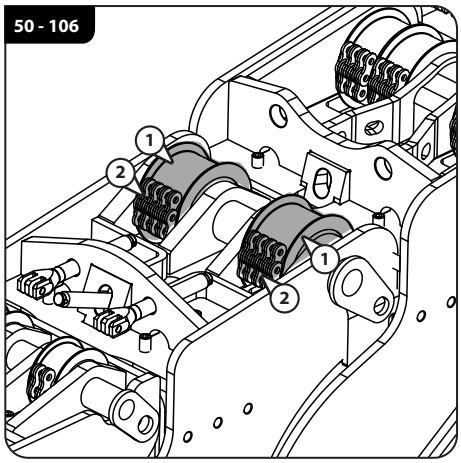
50 - 75



Three extension boom

Unscrew the screws (1, 📷 ***50 - 76***) and remove the washers (2, 📷 ***50 - 76***) to remove the locks the pin (3, 📷 ***50 - 76***) and remove the pulleys (4, 📷 ***50 - 76***) from the 2nd extension boom.

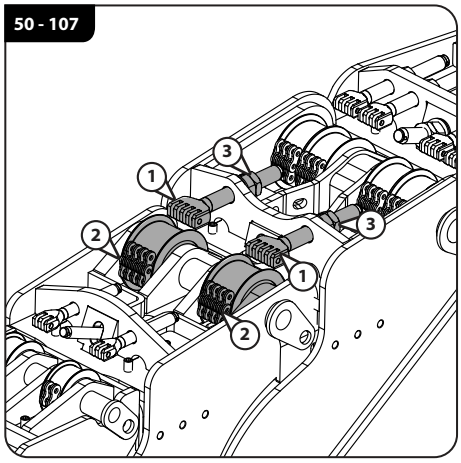
50 - 106



Refit the pulleys (1, 📷 ***50 - 106***).

Raise the chains (2, 📷 ***50 - 106***) on the 3rd extension framework, passing them through the pulleys of the 2nd extension.

50 - 107

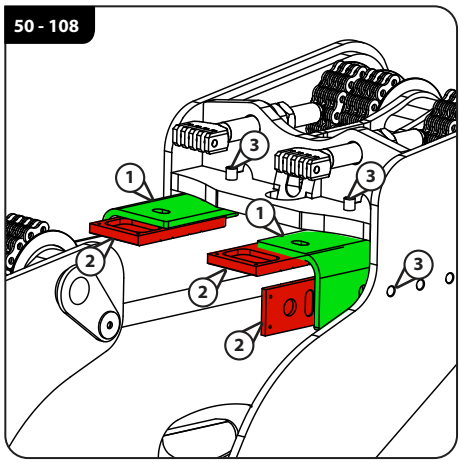


Fit the tie rods (3, 📷 ***50 - 107***) to the chains (2, 📷 ***50 - 107***) using the pins (1, 📷 ***50 - 107***).

Fit the tie rods (3, 📷 ***50 - 107***) to the framework, taking care when fitting the bucket springs (quantity and direction of fitting).

To adjust the chains : **(◁ 50-03 - BOOM CONTROL AND ADJUSTMENT).**

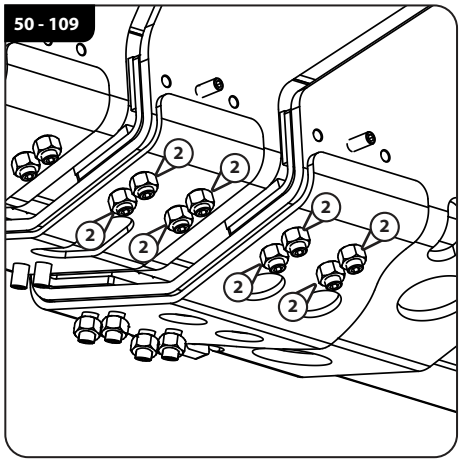
50 - 108



Refit the plates (1, 📷 ***50 - 108***) and the upper and lateral sliding blocks (2, 📷 ***50 - 108***) of the 2nd extension using their respective grub screws (3, 📷 ***50 - 108***).

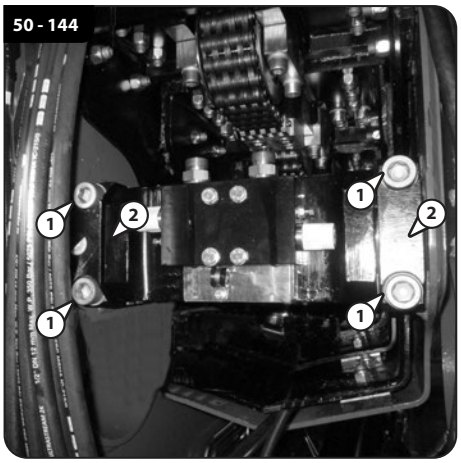
For registration of the feet: **(◁ 50-03 - BOOM CONTROL AND ADJUSTMENT).**

50 - 109



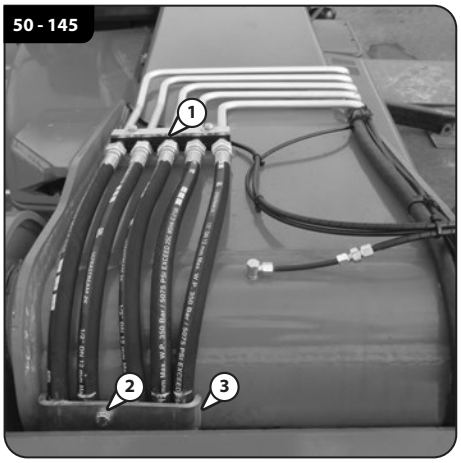
Using the grub screws (2, 📷 ***50 - 109***) raise the lower sliding blocks-carrier plates until the framework is not in contact with the upper sliding blocks; adjust it so that there is 1,5/2 mm clearance between the feet and the framework (take care not to strain the frameworks excessively).

50 - 144



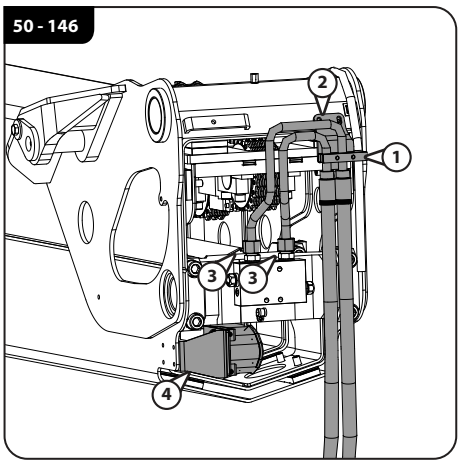
Remount the two front fixing brackets of the telescope cylinder (2, 📷 ***50 - 144***) and secure with the four screws (1, 📷 ***50 - 144***).

50 - 145



Reconnect all the five pipes (1, 📷 ***50 - 145***), remount the locking hoses clamps (3, 📷 ***50 - 145***), and secure with the screw (2, 📷 ***50 - 145***).

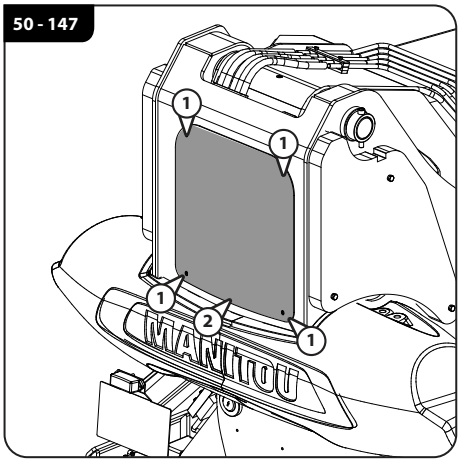
50 - 146



Remount the support bracket of the 3B6 lenght and angle sensor (4, 📷 ***50 - 146***) and reconnect the electric connector.

Reconnect the two hoses (3, 📷 ***50 - 146***) to the valve of the 1st extension ram, fixing the bracket (2, 📷 ***50 - 146***), and lock the hoses with the clamps (1, 📷 ***50 - 146***).

50 - 147



Remount the rear guard (2, 📷 ***50 - 147***) with the four screws (1, 📷 ***50 - 147***).

70.2 HYDRAULIC SCHEMATIC DIAGRAMS

70.2.1 MRT 2470/3050 PRIVILEGE PLUS LEGEND

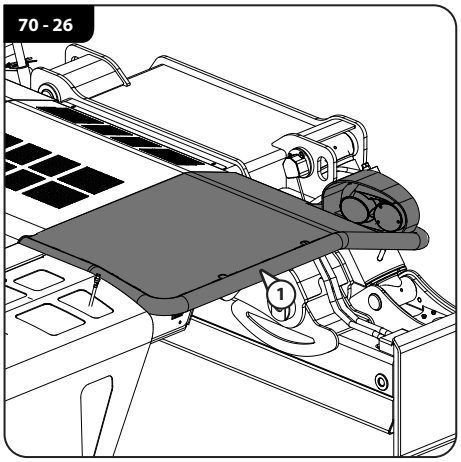
Item.	Designation	Diagram position	Features (Options)
G.E.S.	Outrigger solenoid valve unit	E7	X
I.D.	Steering pump	C20	X
ACC.	Accumulator	C23	X
M.R.T	Mast turning motor	A39	X
C.S.T.	Turret discharge manifold	E23	X
C.S.C.	Truck discharge manifold	O8	X
R.F.	Return filter	S5	X
M.	Internal combustion engine	O13	X
P.H.	Hydrostatic pump	O18	X
P.P.	Pression point test	M21 - O21	X
M.C.	Brake pump	I12	X
P.F.	Brake pedal	I11	X
S. - TANK	Oil tank	G13 - S7	X
M.H.	Hydrostatic motor	Q30	X
E.P.	Electro pump	M25	X
S.F.	Suction filter	S10 - S11	X
-	Levelling cylinders	I4	X
-	Rear axle block cylinders	Q11	X
-	Heat exchanger	Q7	X
-	Rear axle	M4	X
-	Front axle	M39	X
-	Gearbox	O35	X

70.4.2 TIGHTENING TORQUES

MAIN DISTRIBUTOR

70 - 6

70 - 26

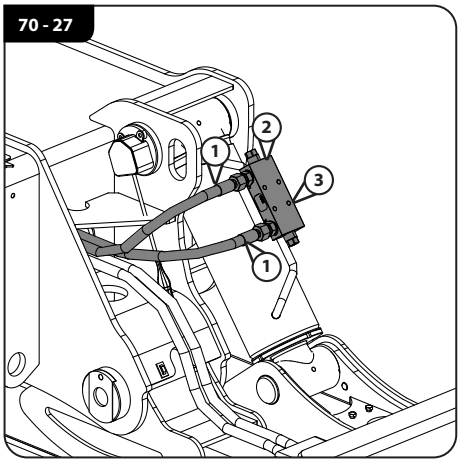


REMOVING HYDRAULIC CYLINDER

STABILISER LIFT CYLINDER

Remove the mudguard (1, 📷 ***70 - 26***).

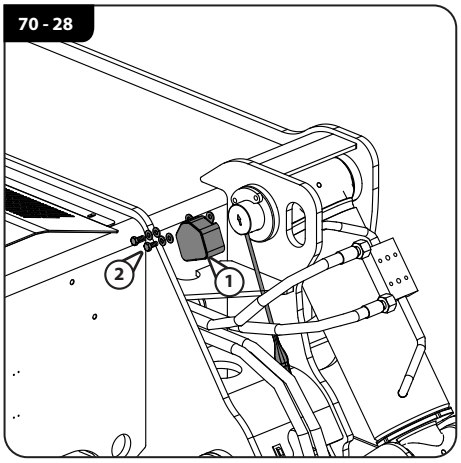
70 - 27



Disconnect the hydraulic tubes (1, 📷 ***70 - 27***) from the control valve (2, 📷 ***70 - 27***).

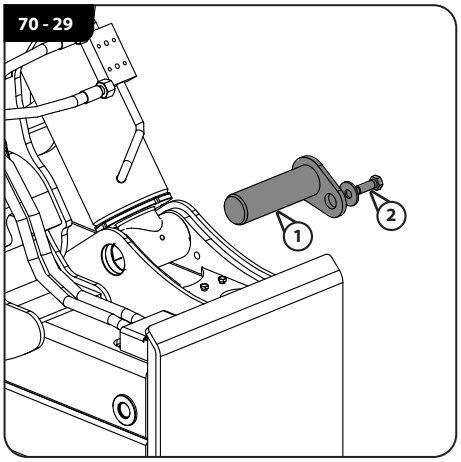
Unscrew the screws (3, 📷 ***70 - 27***) and remove the control valve (2, 📷 ***70 - 27***) from the lift cylinder.

70 - 28



Unscrew the screw (2, 📷 ***70 - 28***) and remove the pin sensor protection (1, 📷 ***70 - 28***).

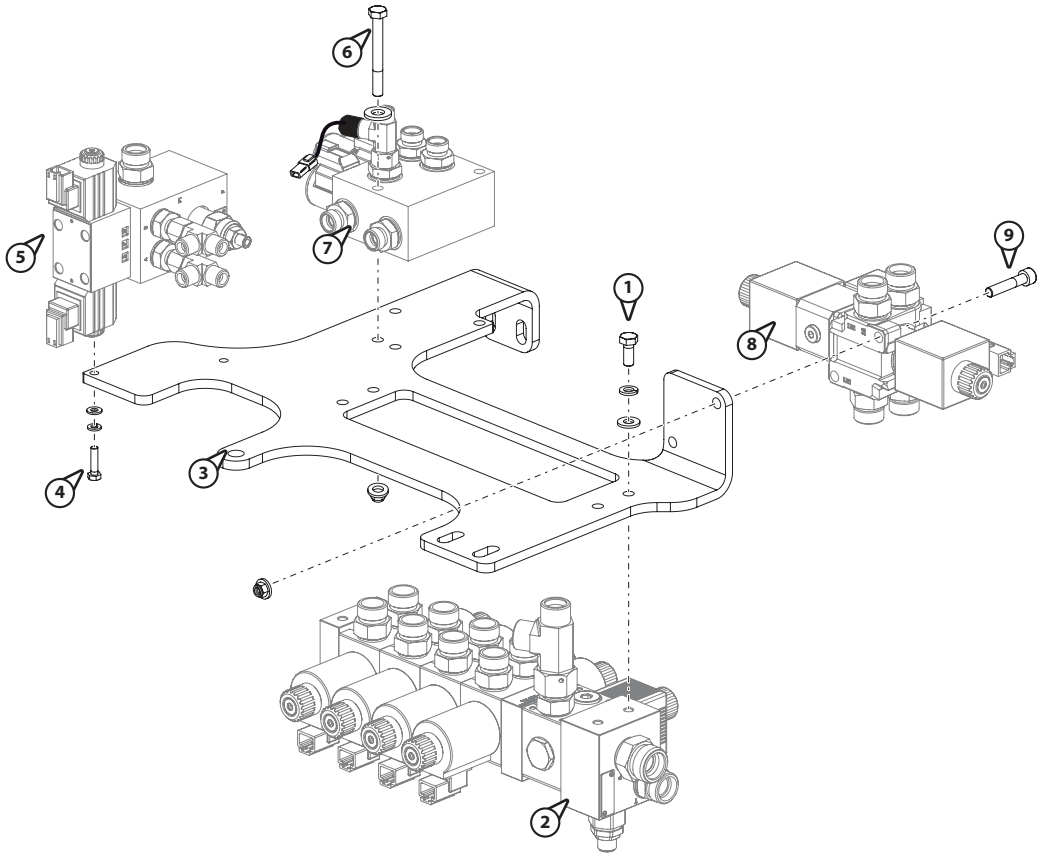
70 - 29



Secure the stabiliser lift cylinder with ropes and an overhead crane, unscrew the screw (2, 📷 ***70 - 29***) and remove the lower pin (1, 📷 ***70 - 29***).

REFIT STABILISERS ELECTROVALVE GROUP

70 - 55



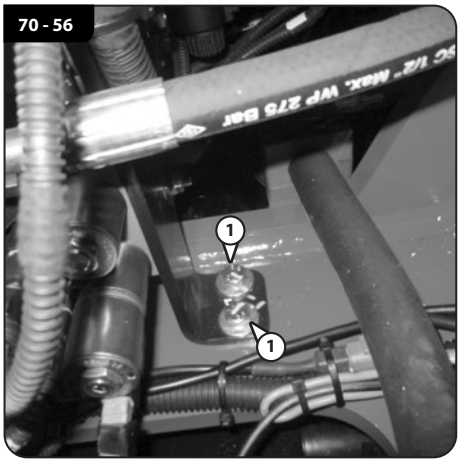
Screw the screws (1, 📷 ***70 - 55***) to remove the stabilisers electrovalve group (2, 📷 ***70 - 55***) from the plate (3, 📷 ***70 - 55***).

Screw the screws (4, 📷 ***70 - 55***) to remove the leveling valve (5, 📷 ***70 - 55***) from the plate (3, 📷 ***70 - 55***).

Screw the screws (6, 📷 ***70 - 55***) and the nuts to remove the gear-brake solenoid (7, 📷 ***70 - 55***) from the plate (3, 📷 ***70 - 55***).

Screw the screws (9, 📷 ***70 - 55***) and the nuts to remove the steering valve (Item 8) from the plate (3, 📷 ***70 - 55***).

70 - 56



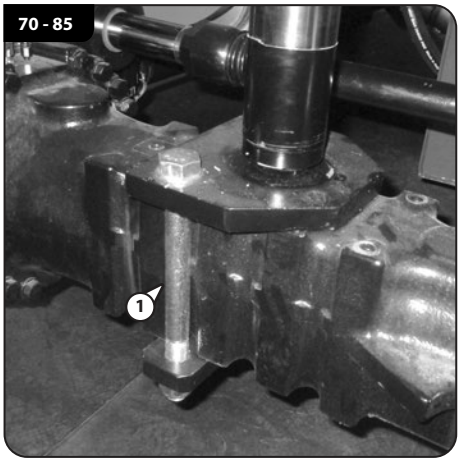
Secure the stabilisers electrovalve group to appropriate lifting means, position it on the machine and fix it on the chassis using the screws (1, 📷 ***70 - 56***).

70 - 84

REFIT THE LOCKING REAR CYLINDER

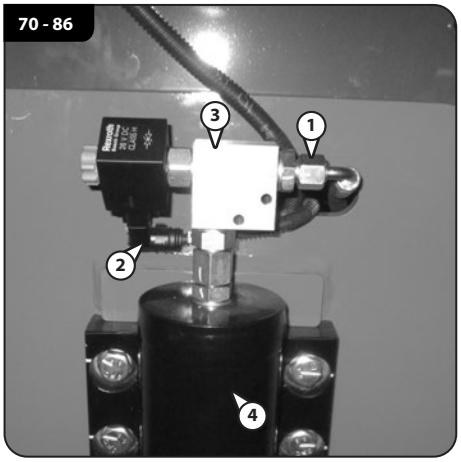
Secure the locking rear cylinder (2, 📷 ***70 - 84***) with ropes and an overhead crane, reposition it on the frame, and then lock it by means the screw (1, 📷 ***70 - 84***). Apply 120 Nm.

70 - 85



Refit the connecting plate of the cylinder and secure it with screws (1, 📷 ***70 - 85***). Using Loctite 270 and apply 450 Nm.

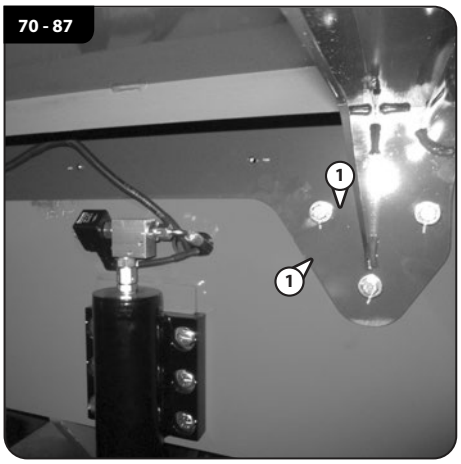
70 - 86



Refit the control valve (3, 📷 ***70 - 86***) from the locking rear cylinder (4, 📷 ***70 - 86***).

Connect the hydraulic tubes (1, 📷 ***70 - 86***) and the connectors (2, 📷 ***70 - 86***) to the control valve (3, 📷 ***70 - 86***).

70 - 87



Refit the mudguard (1, 📷 ***70 - 87***).

80.1.2 MACHINE OPERATING LOGIC

The software program of the MC2M control unit limits the movements of the machine according to:

- The installed attachment;
- The machine status (on wheels or outriggers);
- The position of the boom;
- The orientation of the cabin;
- The type of control (from cabin or from radiocontrol).

The operating logic implemented in the machine software are shown below.

NOTES:

RMA_012_PR801: name of the software project and name of the machine project.
LT_Name: version of the load tables.
LMI / MCC / MCT / TERA7: versions of the control units.

MOVEMENTS ALLOWED FROM THE CABIN WITH BASKET OVERRIDE KEY ON					
	BOOM WITHIN H=3m	BOOM WITHIN H=3m	BOOM BEYOND H=3m	BOOM BEYOND H=3m	NOTES
	BOOM WITHDRAWN	BOOM EXTRACTED	BOOM WITHDRAWN	BOOM EXTRACTED	
OUTRIGGER ASCENT	√				
OUTRIGGER DESCENT	√	√			
TURRET ROTATION	√	√			
PANNING UP	√	√			
PANNING DOWN	√	√			
BOOM ASCENT	√ (only up to H=3m)	√ (only up to H=3m)			
BOOM DESCENT	√	√	√	√	
BOOM WITHDRAWN	√	√			
BOOM EXTENSION					
OPTION 1	√	√			
OPTION 2	√	√			

MOVEMENTS ALLOWED FROM THE CABIN WITH ANTI-TILTING OVERRIDE KEY ON					
	BOOM WITHIN H=3m	BOOM WITHIN H=3m	BOOM BEYOND H=3m	BOOM BEYOND H=3m	NOTES
	BOOM WITHDRAWN	BOOM EXTRACTED	BOOM WITHDRAWN	BOOM EXTRACTED	
OUTRIGGER ASCENT	√				
OUTRIGGER DESCENT	√	√			
TURRET ROTATION	√	√			
PANNING UP	√	√			
PANNING DOWN	√	√			
BOOM ASCENT	√ (only up to H=3m)	√ (only up to H=3m)			
BOOM DESCENT	√	√	√	√	
BOOM WITHDRAWN	√	√			
BOOM EXTENSION					
OPTION 1	√	√			
OPTION 2	√	√			

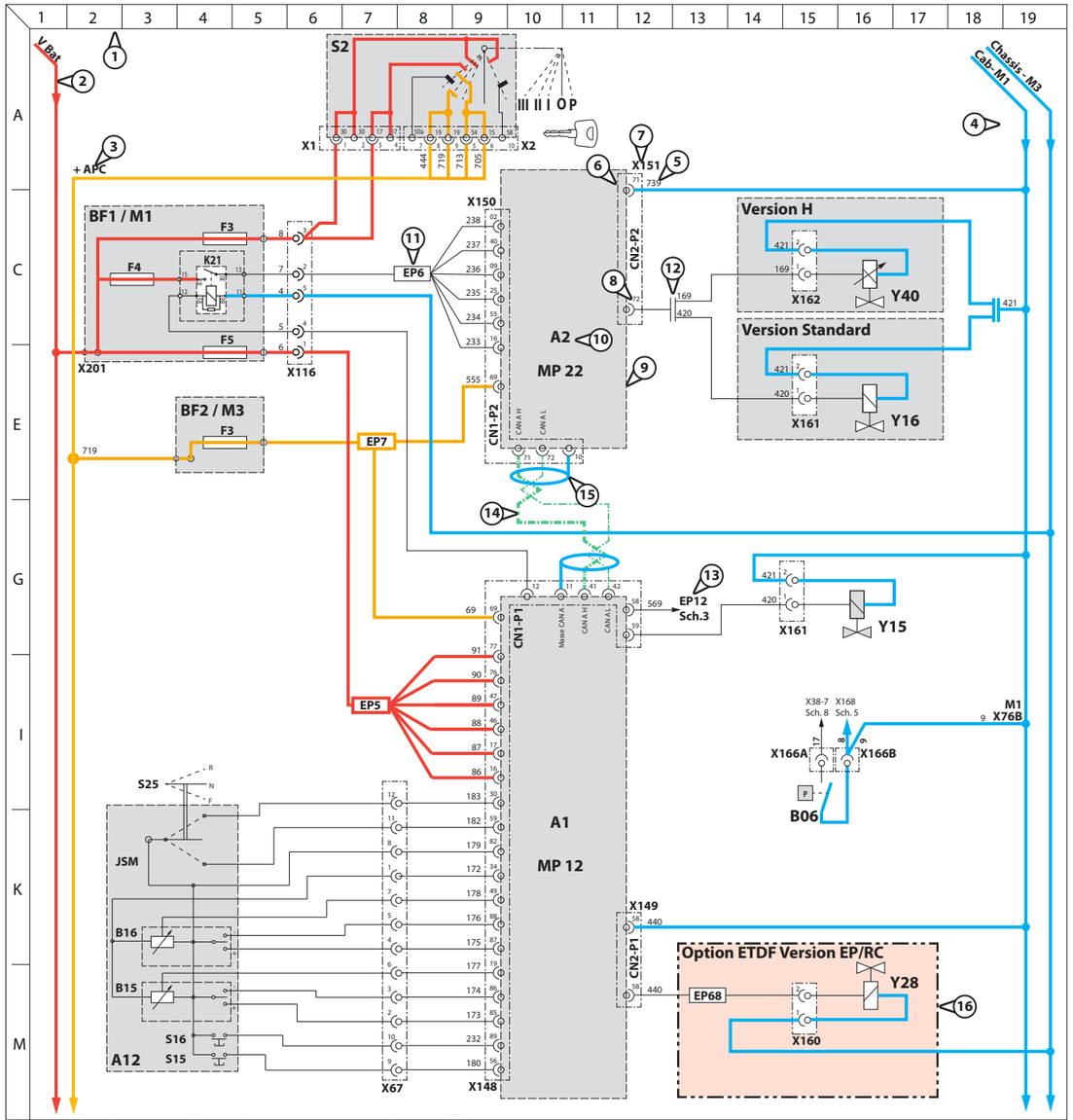
NOTES: the data in the above tables are valid for any position of the turret.

MOVEMENTS ALLOWED FROM THE CABIN WITH ANTI-TILTING OVERRIDE KEY ON					
	BOOM WITHIN H=3m	BOOM WITHIN H=3m	BOOM BEYOND H=3m	BOOM BEYOND H=3m	NOTES
	BOOM WITHDRAWN	BOOM EXTRACTED	BOOM WITHDRAWN	BOOM EXTRACTED	
OUTRIGGER ASCENT	√				
OUTRIGGER DESCENT	√	√	√		
TURRET ROTATION	√	√	√		It is allowed to bring the turret back in central position, only if 1 of the 2 proximity sensors are +/-5° and reading.
PANNING UP					
PANNING DOWN					
BOOM ASCENT					
BOOM DESCENT	√				
BOOM WITHDRAWN					
BOOM EXTENSION					
OPTION 1					
OPTION 2					

NOTES: the data in the above tables are valid for any position of the turret.

MC2M-2 CHASSIS						MC2M-1 CHASSIS		
Connector S						Connector P		
No. PIN	TYPE	Designation	No. PIN	TYPE	Designation	No. PIN	TYPE	Designation
S1	+VB	Vbat	S21	-VB	GND	P1	VP_A	+VB
S2	OUT16	EV 31 parking brake	S22	VAref		P2	VP_B	+VB
S3	OUT06	Telma 1 command	S23	CAN0-L	CAN OPEN Low	P3	VP_C	+VB
S4	OUT07	Telma 2 command	S24	CAN0-R		P4	WDO_OUT_A	GND
S5	OUT04	Telma 3 command	S25	CAN0-H	CAN OPEN high			
S6	OUT05	Telma 4 command	S26	CAN1-L	CAN J1939 low			
S7	CAN1-H	CAN J1939 high	S27	CAN1-R				
S8	OUT21	Front lights - low beam	S28	CAN2-H				
S9	OUT22	Front lights - high beam	S29	CAN2-R				
S10	OUT23	Oil heating EV	S30	CAN2-L				
S11	+15Vout	+15V output	S31	+5Vout	supply sensors suspension (5V)			
S12	AGND		S32	AGND				
S13	OUT17	Right leveling valve	S33	DGND				
S14	OUT18	Left leveling	S34	DGND				
S15	OUT19		S35	DGND				
S16	OUT20	Water cooling proportional EV	S36	LIN1				
S17	OUT02	Stop lights	S37	LIN0				
S18	OUT03	activation oil cooler motor fans	S38	RS232-RX				
S19	OUT00	Reverse gear light	S39	RS232-TX				
S20	OUT01	Anti stall motor proportional EV	S40	EGND				

IDENTIFICATION MARKINGS REGARDING THE WIRING DIAGRAMS



Example of marking on cables and components on an electrical diagram

Key:

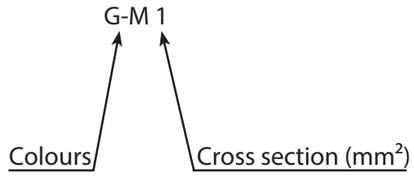
1 - Marking grid
2 - **+ Permanent**
3 - **+ After ignition**
4 - **Grounds**
5 - Wire N°
6 - Electrical connector
7 - Electrical connector name
8 - Electrical connector PIN N°
9 - Electrical component
10 - Electrical component name
11 - Splice
12 - Version choice
13 - Other diagram reference
14 - **CAN**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

IDENTIFICATION OF CONNECTORS and CONDUCTORS OF THE ELECTRIC WIRING

The wiring installed on the machine consists of connectors.
Each connector is identifi ed by means of a code shown on an indelible plate applied near it.

The connector code and the features of the conductors (colour and cross-section) connected to it are shown on the wiring diagrams.

On the wiring diagram, each conductor is identifi ed by a series of alphanumeric characteristics which describe the cross-section (mm2) and the colour (GM).



Colour code:

A	Light blue
B	White
C	Orange
G	Yellow
H	Grey
L	Blue
M	Brown
N	Black
R	Red
S	Pink
V	Green
Z	Purple

DIAGRAM 5

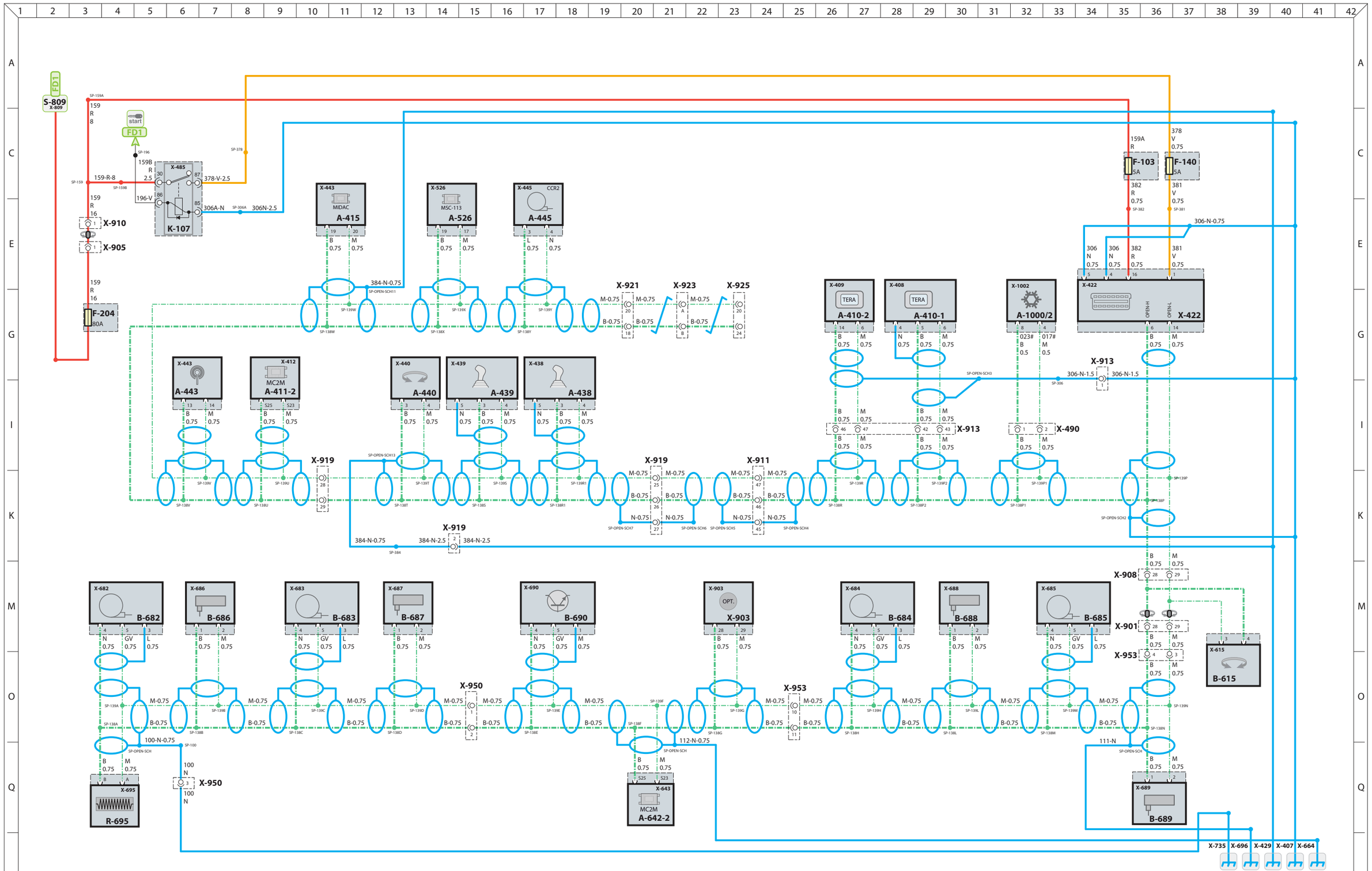

S-809
X-809
FD1
start
K-107
X-485
F-204
80A
F-103
5A
F-140
5A
X-910
X-905
A-415
MIDAC
A-526
MSC-113
A-445
CCR2
A-443
A-411-2
MC2M
A-440
A-439
A-438
A-410-2
A-410-1
A-1000/2
A-422
X-422
X-913
X-490
X-919
X-911
X-921
X-923
X-925
X-950
X-953
X-908
X-901
X-615
B-615
X-682
B-682
X-686
B-686
X-683
B-683
X-687
B-687
X-690
B-690
X-903
OPT.
B-684
B-688
B-685
X-695
R-695
X-643
A-642-2
X-689
B-689
X-735
X-696
X-429
X-407
X-664

DIAGRAM 9

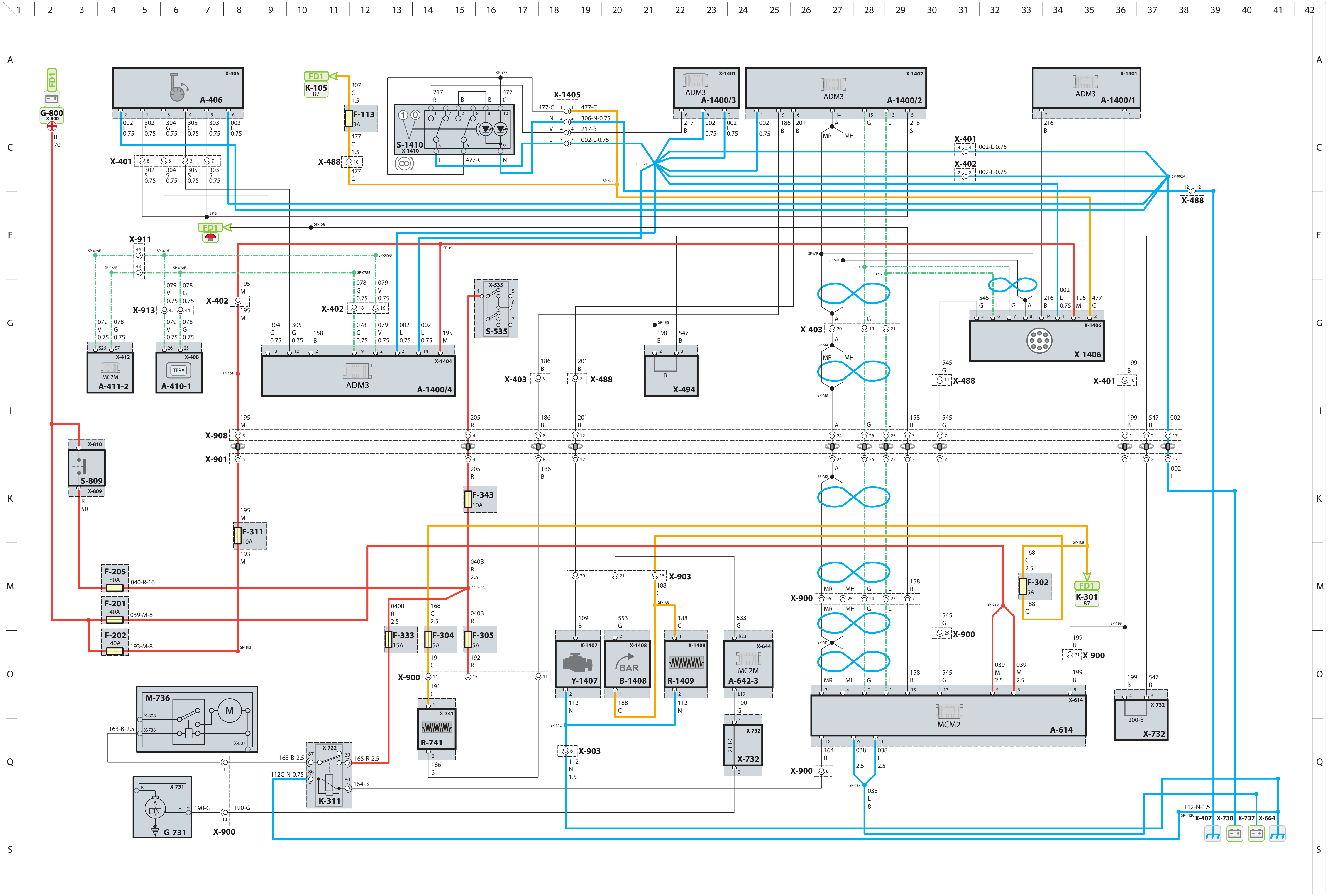
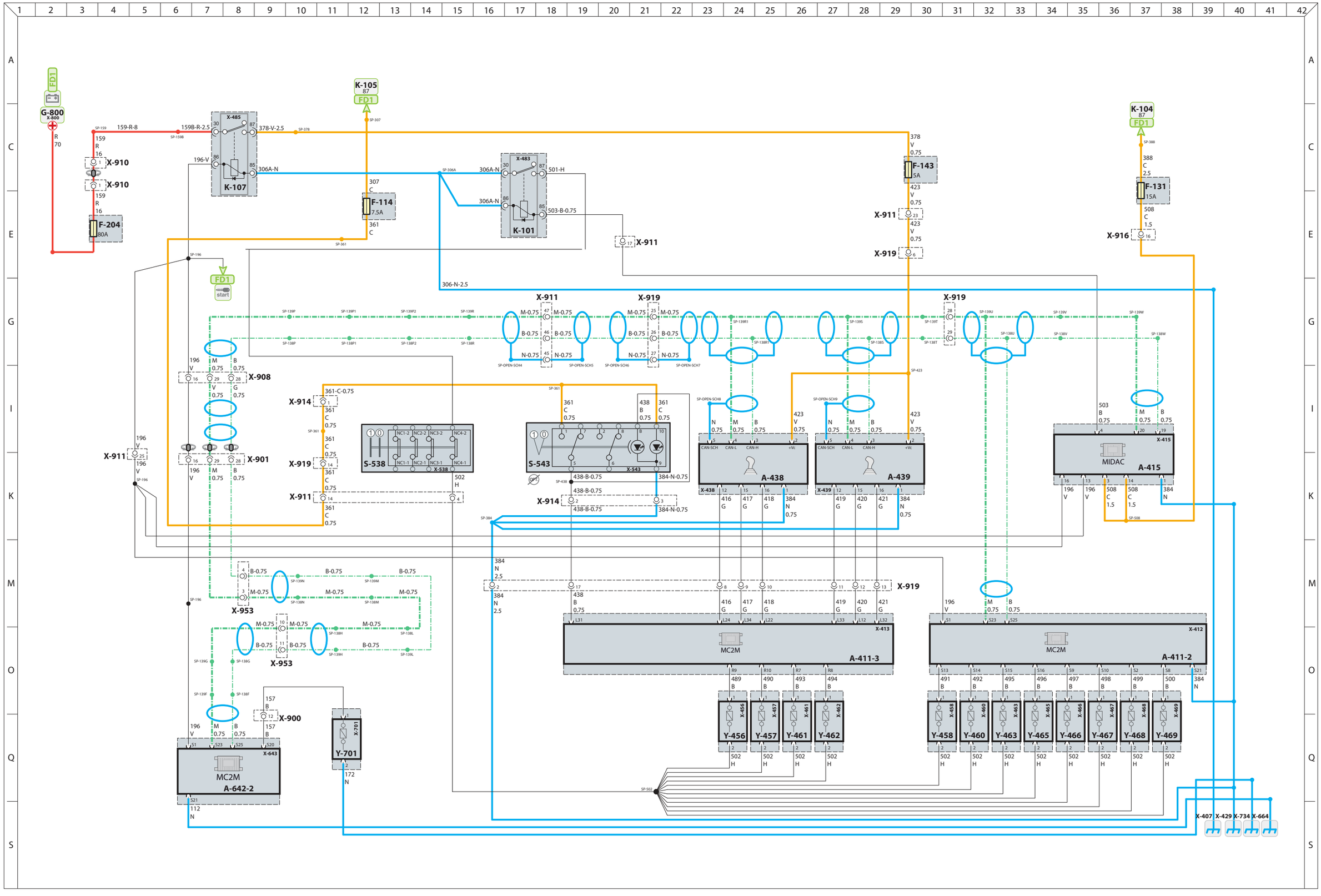
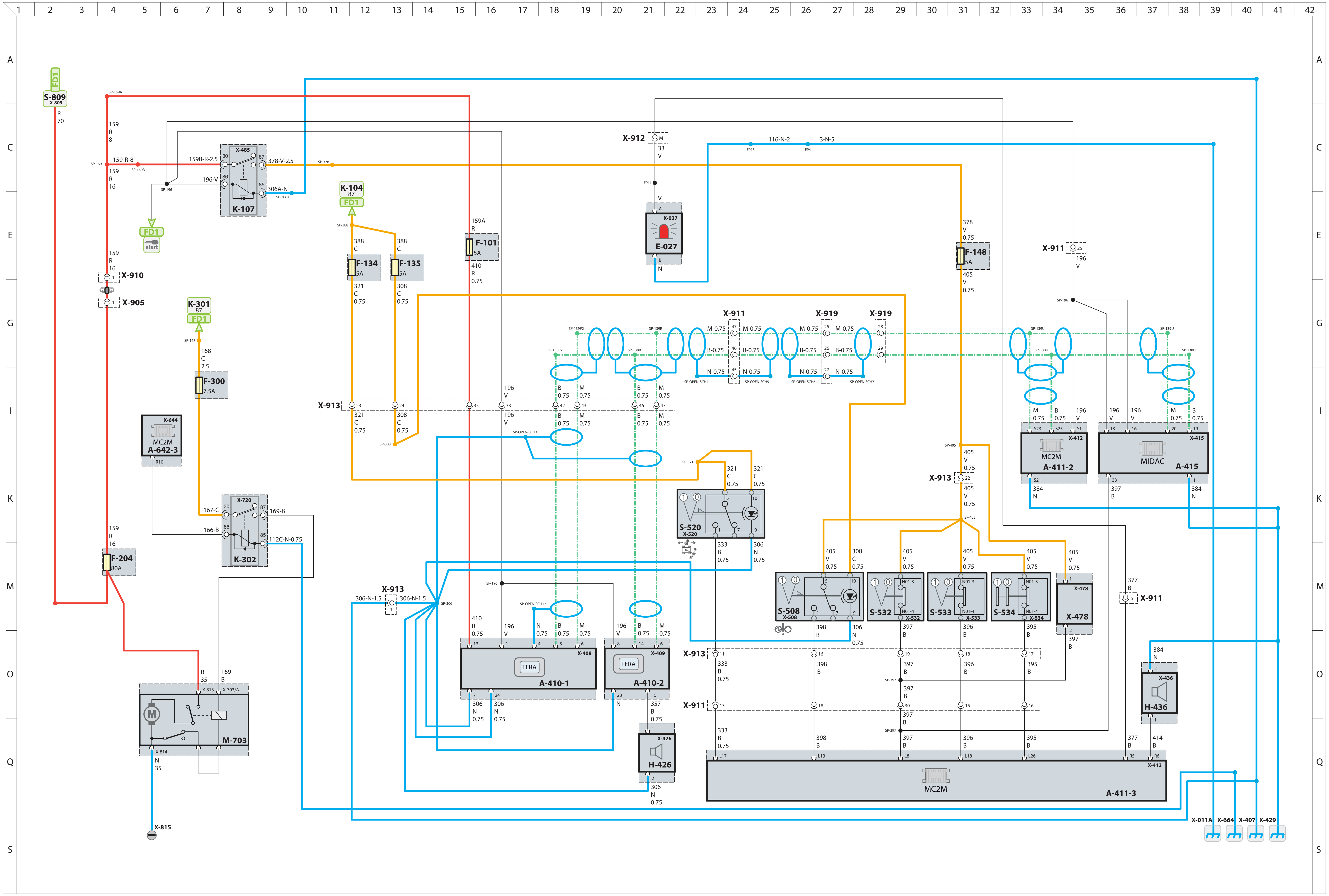

G-800
X-406
A-406
K-105
F-113
S-1410
X-1405
ADM3
A-1400/3
A-1400/2
A-1400/1
X-401
X-402
X-488
X-911
X-913
X-412
A-411-2
X-408
A-410-1
A-1400/4
S-535
X-403
X-494
X-1406
S-809
X-908
X-901
F-343
F-311
F-205
F-201
F-202
F-333
F-304
F-305
X-903
F-302
K-301
X-900
Y-1407
B-1408
R-1409
MC2M
A-642-3
MCM2
A-614
X-732
M-736
R-741
K-311
G-731
X-407
X-738
X-737
X-664

DIAGRAM 13



80

DIAGRAM 18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X-910
X-905
K-301
FD1
F-300
A-642-3
MC2M
X-644
K-107
X-485
K-104
F-134
F-135
F-101
X-912
E-027
X-027
F-148
X-911
X-919
X-913
K-302
X-720
F-204
M-703
X-813
X-703/A
X-814
X-815
A-410-1
X-408
TERA
A-410-2
X-409
H-426
X-426
S-520
X-520
S-508
X-508
S-532
X-532
S-533
X-533
S-534
X-534
X-478
A-411-2
X-412
MIDAC
A-415
X-415
H-436
X-436
A-411-3
X-413
X-011A
X-664
X-407
X-429

DIAGRAM 22

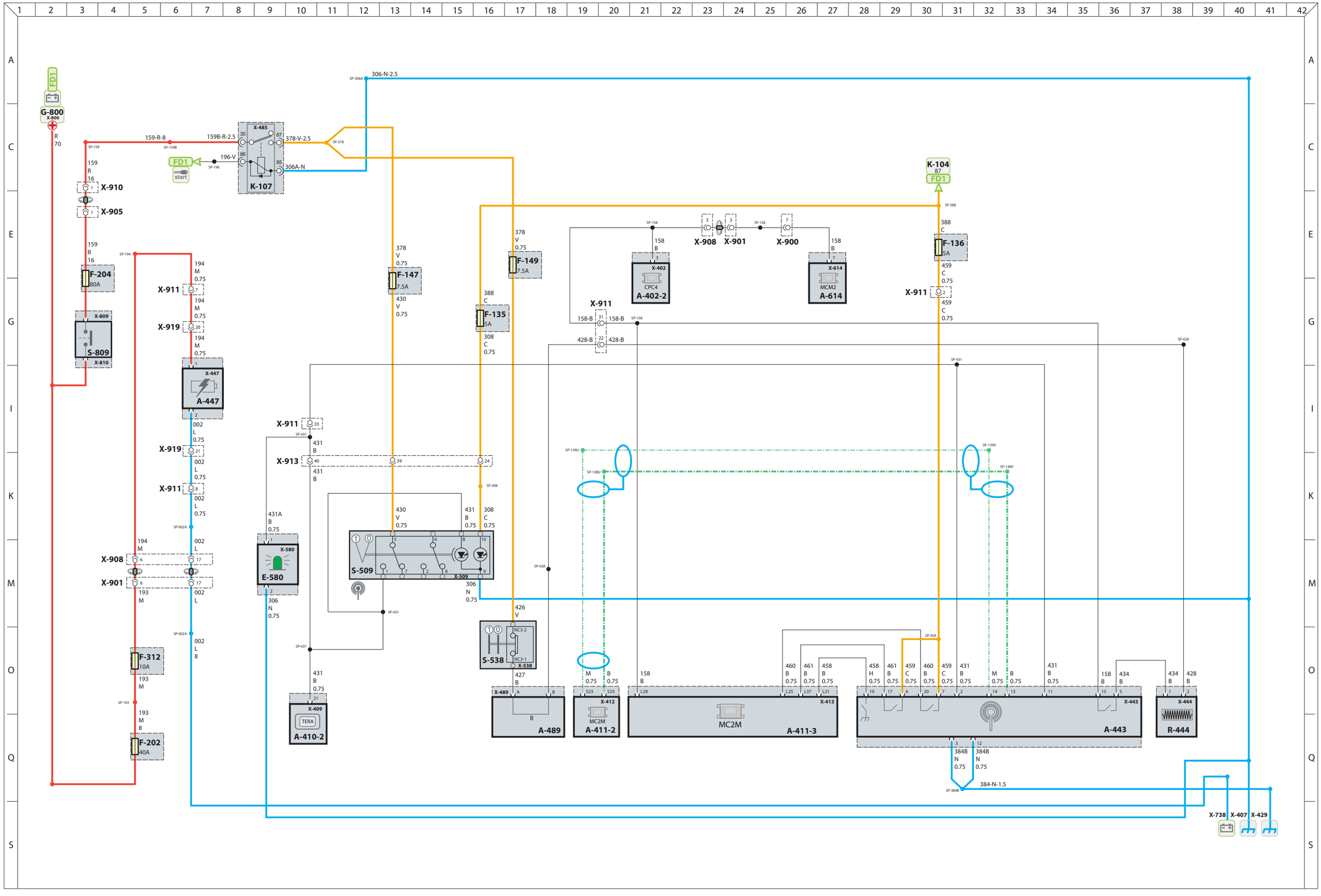
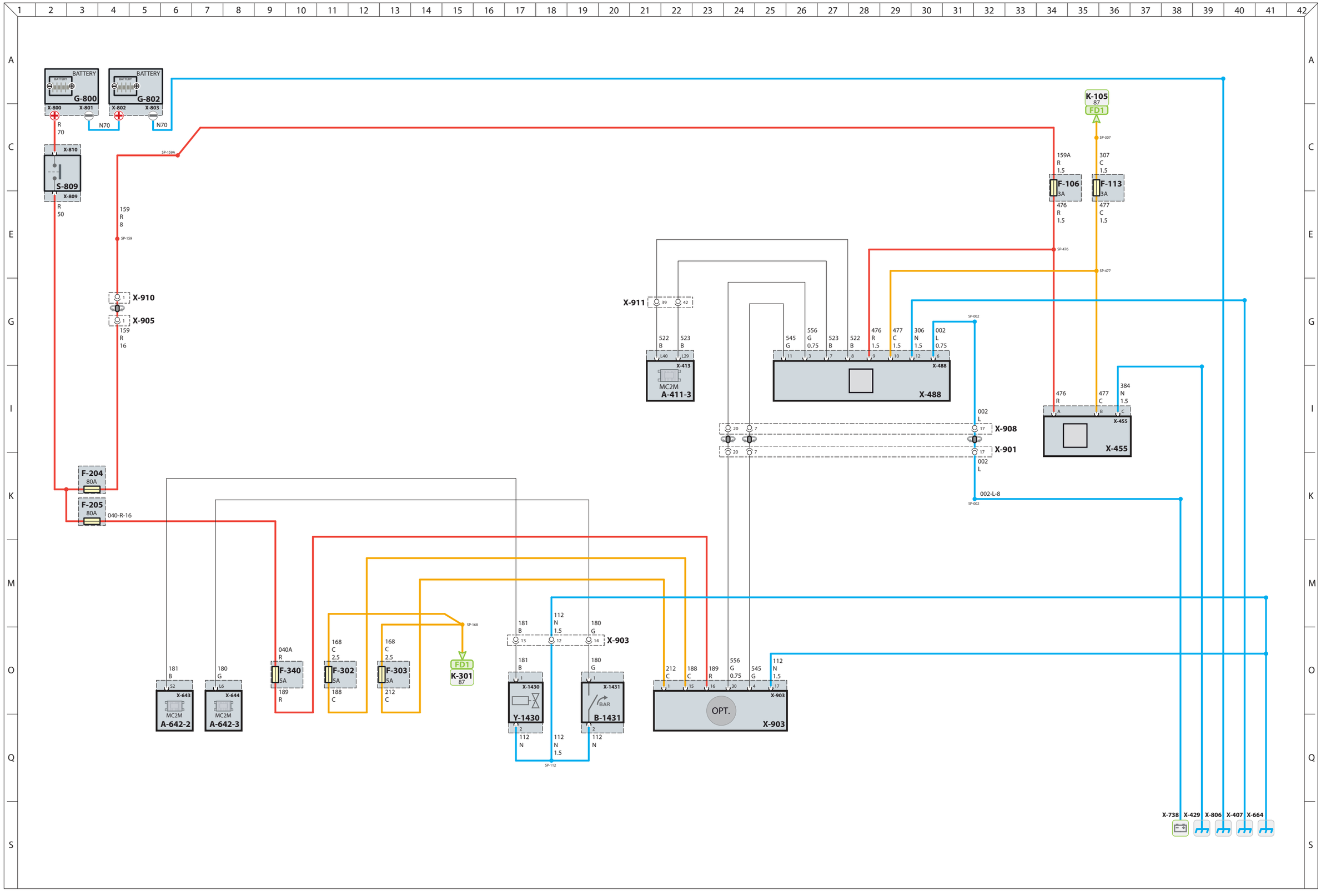

G-800
X-800
FD1
R
70
159
R
16
X-910
X-905
F-204
80A
X-809
S-809
X-810
159-R-8
159B-R-2.5
196-V
FD1
start
X-485
K-107
306-N-2.5
378-V-2.5
306A-N
F-147
7.5A
378
V
0.75
430
V
0.75
F-149
7.5A
F-135
5A
388
C
308
C
0.75
X-911
194
M
0.75
X-919
X-447
A-447
002
L
0.75
X-913
431
B
431A
B
0.75
X-580
E-580
306
N
0.75
S-509
X-509
430
V
0.75
431
B
0.75
308
C
0.75
S-538
NC3-2
NC3-1
X-538
426
V
427
B
X-489
A-489
X-409
TERA
A-410-2
X-908
X-901
193
M
F-312
10A
F-202
40A
X-402
CPC4
A-402-2
X-614
MCM2
A-614
158
B
158-B
428-B
K-104
87
FD1
F-136
5A
459
C
0.75
X-412
MC2M
A-411-2
X-413
MC2M
A-411-3
X-443
A-443
X-444
R-444
460
B
0.75
461
B
0.75
458
B
0.75
458
H
0.75
459
C
0.75
460
B
0.75
459
C
0.75
431
B
0.75
434
B
428
B
384B
N
0.75
384-N-1.5
X-738
X-407
X-429
SP-306A
SP-378
SP-159
SP-159B
SP-196
SP-194
SP-002A
SP-193
SP-158
SP-388
SP-428
SP-431
SP-308
SP-459
SP-139U
SP-138U
SP-139V
SP-138V
SP-384B

DIAGRAM 27


BATTERY
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X-800
X-801
BATTERY
G-802
X-802
X-803
N70
N70
R
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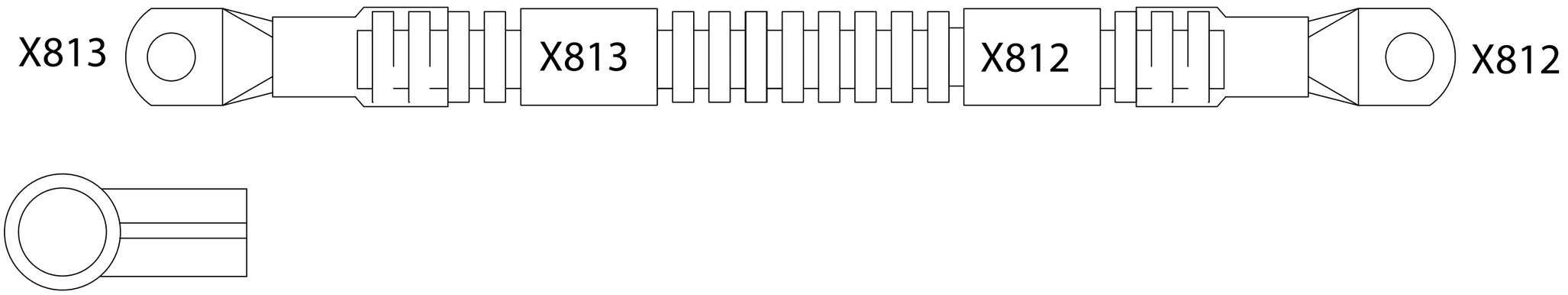
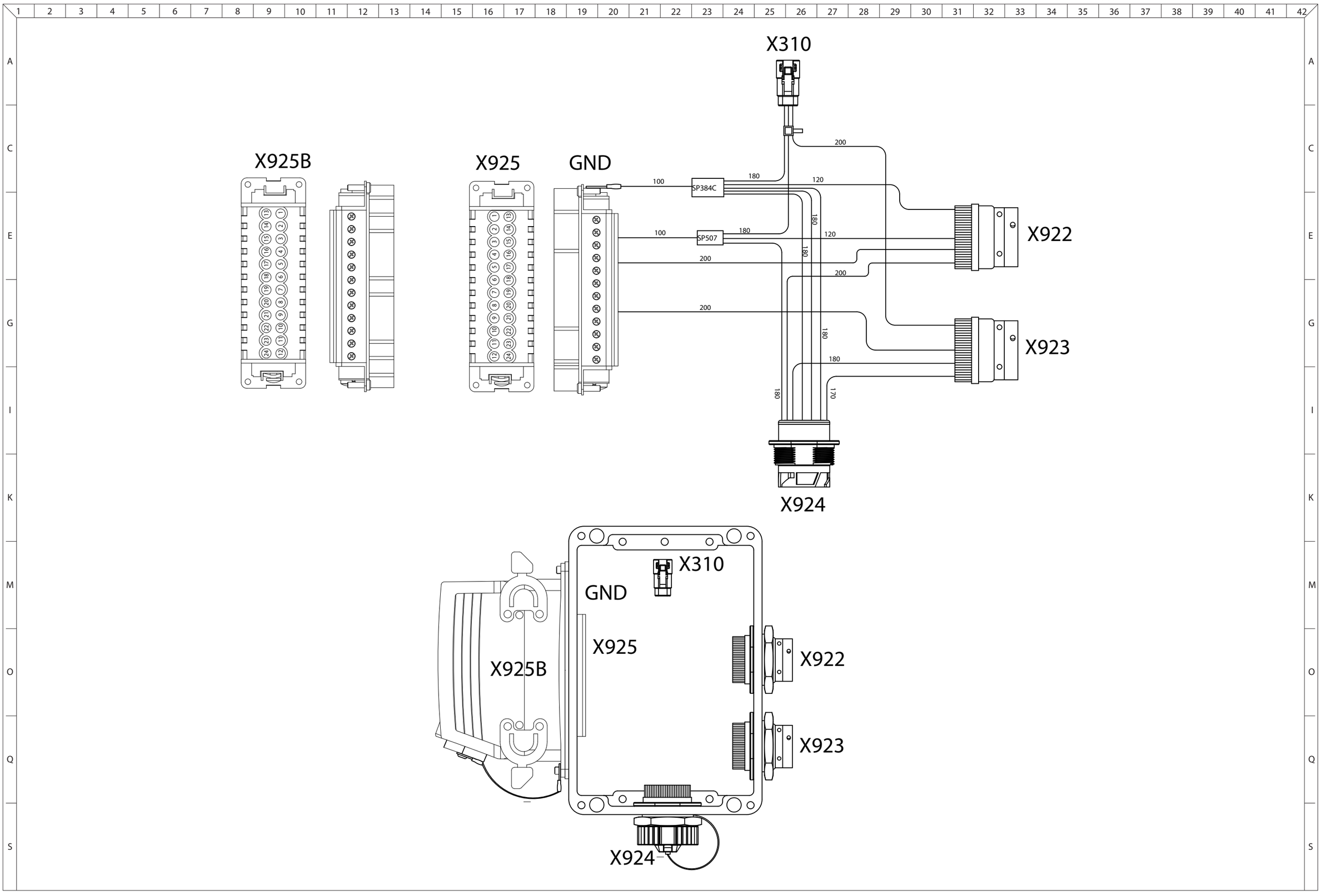
X-810
S-809
X-809
R
50
SP-159A
159
R
8
SP-159
X-910
X-905
159
R
16
K-105
87
FD1
SP-307
159A
R
1.5
307
C
1.5
F-106
3A
F-113
3A
476
R
1.5
477
C
1.5
SP-476
SP-477
X-911
39
42
522
B
523
B
X-413
MC2M
A-411-3
545
G
556
G
0.75
523
B
522
B
476
R
1.5
477
C
1.5
306
N
1.5
002
L
0.75
X-488
SP-002
002
L
X-908
X-901
002
L
002-L-8
SP-002
476
R
477
C
384
N
1.5
X-455
F-204
80A
F-205
80A
040-R-16
181
B
180
G
X-643
MC2M
A-642-2
X-644
MC2M
A-642-3
040A
R
F-340
5A
189
R
168
C
2.5
F-302
5A
188
C
168
C
2.5
F-303
5A
212
C
SP-168
FD1
K-301
87
181
B
112
N
1.5
180
G
X-903
181
B
X-1430
Y-1430
180
G
X-1431
B-1431
112
N
112
N
112
N
1.5
SP-112
212
C
188
C
189
R
556
G
0.75
545
G
112
N
1.5
X-903
OPT.
X-903
X-738
X-429
X-806
X-407
X-664

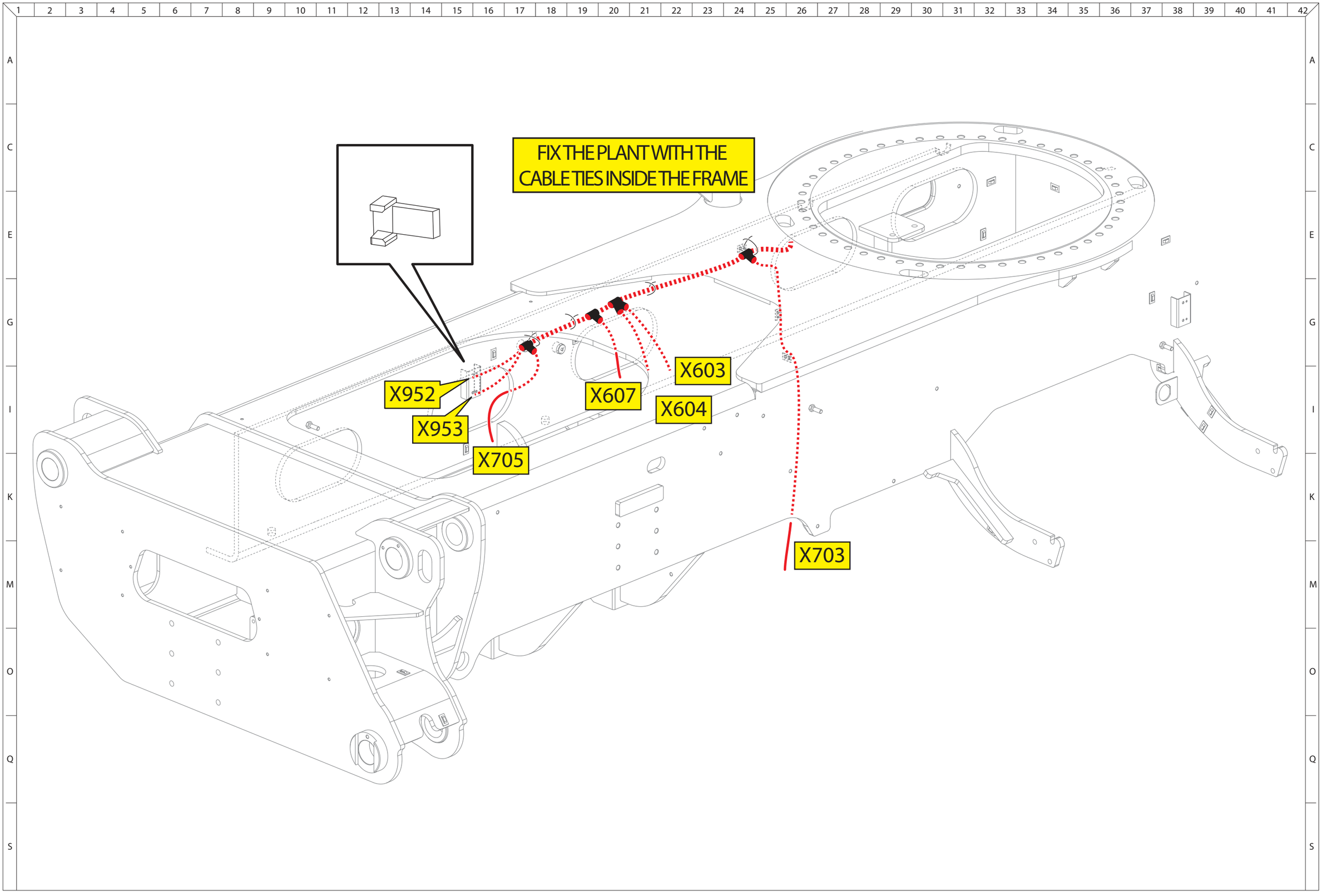
4 - EMERGENCY PUM CABLE KIT



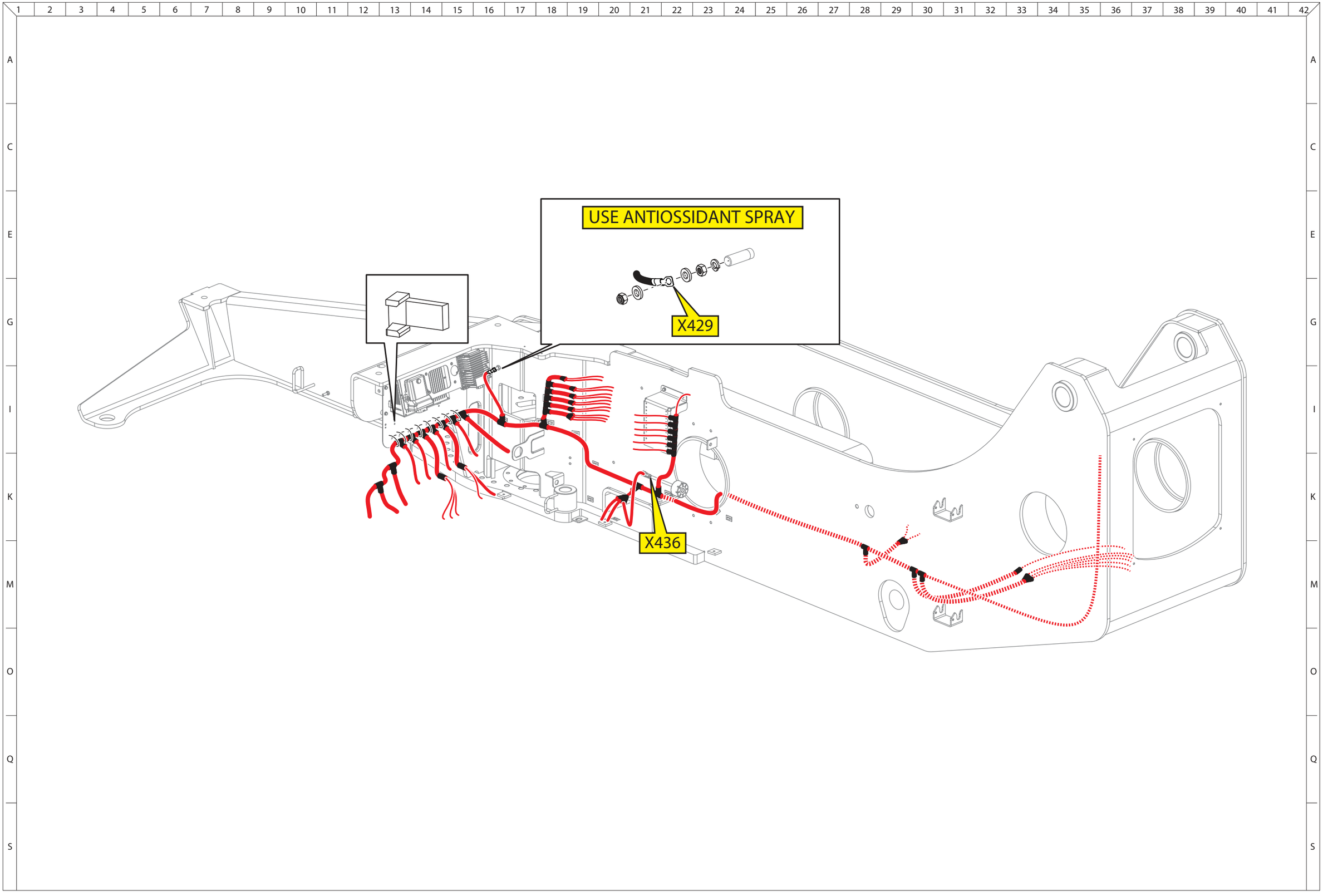
14 - WIRING THE BOX IN THE HEAD TO THE ARM



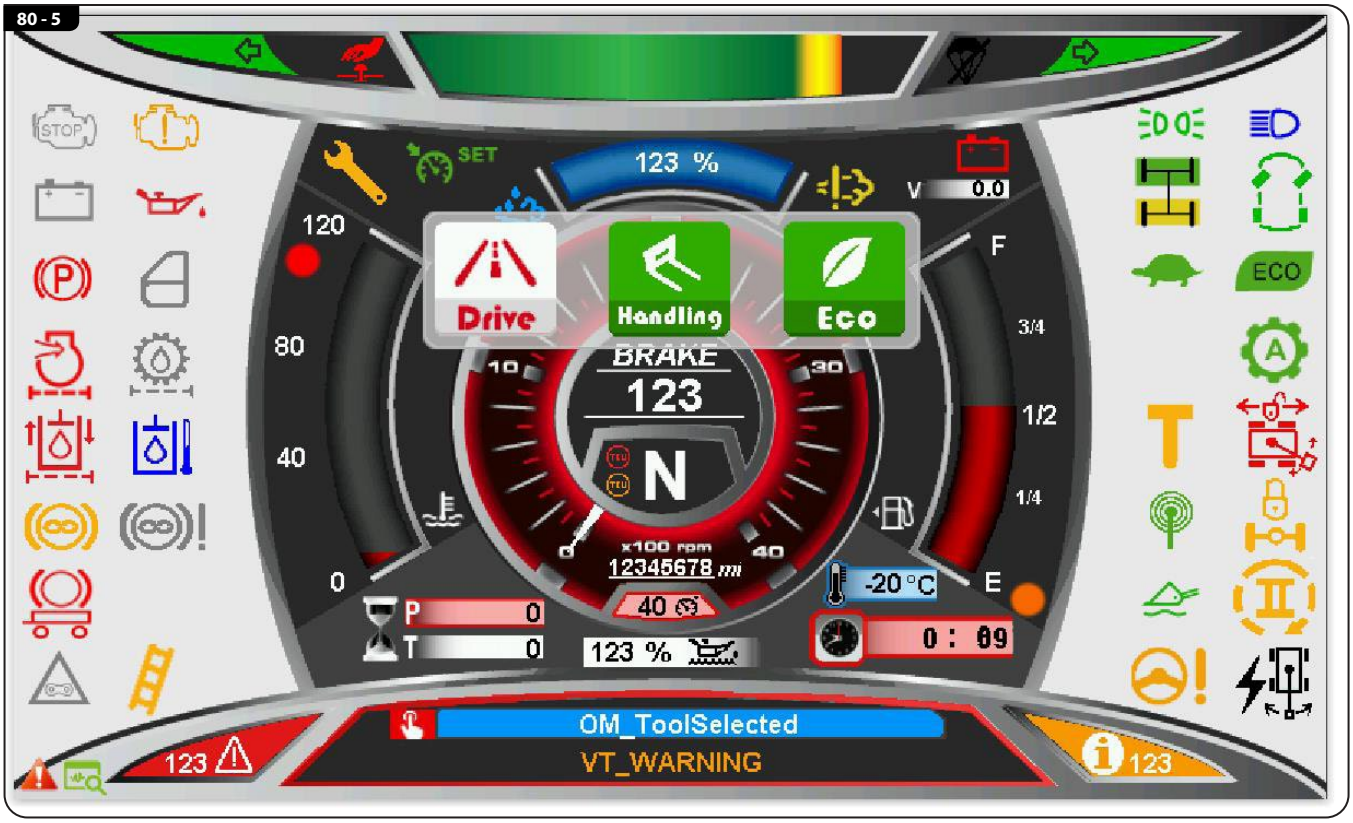
2 - CARRIAGE - MAIN WIRING



12 - TURRET - MAIN WIRING



80.3.5 ENGINE PAGE



On the left, there are the follow icons:

Icon	Description	Function
	Engine alarm lamp	This light comes on when the Mercedes-Benz ECUs sends the engine stop alarm (CPC4, MCM, ACM).
	Engine warning lamp	This light comes on when the Mercedes-Benz ECUs sends the engine warning alarm (CPC4, MCM, ACM).
	Alternator	The alternator light will be on when the alternator is not charging.
	Engine oil pressure low	The light is ON when the oil engine pressure is less than 12 bar.
	Parking brake	The light is ON when the parking brake is engaged.
	Cabin door	The light is ON when the cabin door is open.

The erfuel light and the urea warning light are show in this page.

80 - 16

The machine is represented with the geometrical values.
The machine has the outriggers status and the level position of the chassis.
The attachment is shown by the image.
The actual load and the maximum are displayed.
Slowing-down are shown.
It is shown, if the kit is mounted, the optional continouos management.
Geometrical limit selectable (ISAAC).

Icon	Description
	Ceiling funciton.
	Left corridor function.
	Right corridor function.
	Left wall function.
	Right wall function.

80 - 17

Note: it is shown when the romastor attachment is mounted.

80 - 33

	SPN	FMI
MAIN	123	123
MCM	123	123
ACM	123456	123
DRC	123456	123

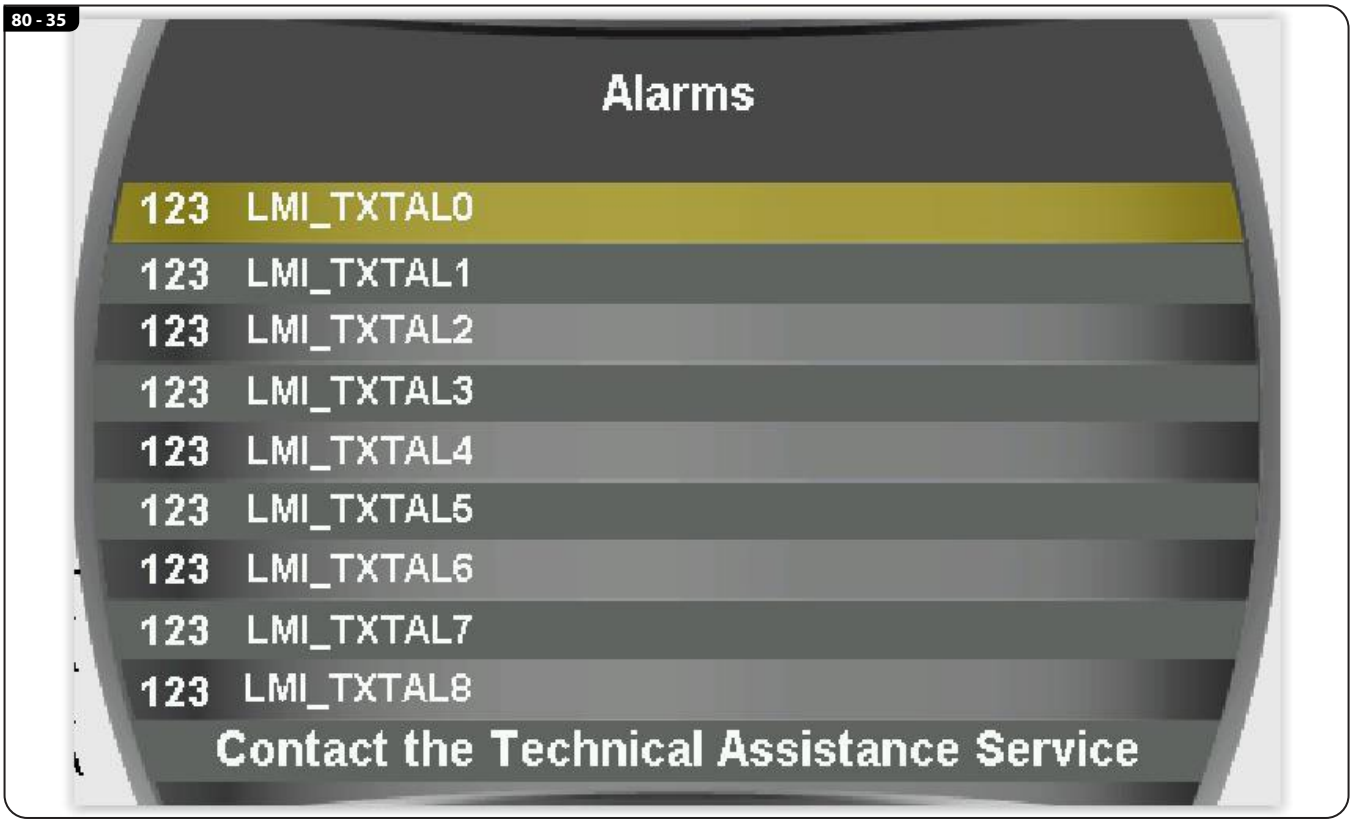
MAIN, MCM, and ACM are engine control units, while the DRC is the transmission control unit.

80 - 34

Fuel reserve	Urea light
Engine	Pressure transducers
Distributor	Transmission
Service	

In the middle, there are the description about the alarm and warning present.

80 - 35



Normally, the rows are grey, when there are no alarm and warning.

The first row comes yellow, when a warning is ON

IDENTIFIER	Description	Control list
IDS_ALARM56	Err. Outrigger rear right:Signal B	Make sure the winder cable is in good condition
		Calibrate the stabilisers
		Replace the sensor
IDS_ALARM57	Err. Outrigger rear left:Signal B	Make sure the winder cable is in good condition
		Calibrate the stabilisers
		Replace the sensor
IDS_ALARM58	MCT: can bus timeout from Lmi [1]	Check the power supply +VDC and GND
		Check the CAN BUS line
		Replace the MIDAC control unit
IDS_ALARM59	MCT: can bus timeout from Lmi [4]	Check the power supply +VDC and GND
		Check the CAN BUS line
		Replace the MIDAC control unit
IDS_ALARM60	Fault from Cabin Joystick [Boom lift A]	Check the power supply VDC and GND on the RH joystick
		Check the CAN BUS line
IDS_ALARM61	Fault from Cabin Joystick [Boom lift B]	Make sure the signal is between 0.5V and 4.5V
		Check the wiring between the joystick and the MC2M turret control unit
		Replace the RH joystick
IDS_ALARM62	Fault from Cabin Joystick [Boom Extention A]	Check the power supply VDC and GND on the LH joystick
		Check the CAN BUS line
IDS_ALARM63	Fault from Cabin Joystick [Boom Extention B]	Make sure the signal is between 0.5V and 4.5V
		Check the wiring between the joystick and the MC2M turret control unit
		Replace the LH joystick
IDS_ALARM64	Fault from Cabin Joystick [Forks A]	Check the power supply VDC and GND on the RH joystick
		Check the CAN BUS line
IDS_ALARM65	Fault from Cabin Joystick [Forks B]	Make sure the signal is between 0.5V and 4.5V
		Check the wiring between the joystick and the MC2M turret control unit
		Replace the RH joystick
IDS_ALARM66	Fault from Cabin Joystick [Rotation A]	Check the power supply VDC and GND on the LH joystick
		Check the CAN BUS line
IDS_ALARM67	Fault from Cabin Joystick [Rotation B]	Make sure the signal is between 0.5V and 4.5V
		Check the wiring between the joystick and the MC2M turret control unit
		Replace the LH joystick
IDS_ALARM68	Fault condition from Cabin Joystick [Optional A]	Check the power supply VDC and GND on the LH joystick
		Check the CAN BUS line
IDS_ALARM69	Fault condition from Cabin Joystick [Optional B]	Make sure the signal is between 0.5V and 4.5V
		Check the wiring between the joystick and the MC2M turret control unit
		Replace the LH joystick
IDS_ALARM70	Congruency Cabin Joystick [Boom Lift]	Using Winscope, check that the joystick value is between 1000 and -1000
		Check the analogue signal varies from 0.5V to 4.5V
		Replace the component
IDS_ALARM71	Congruency Cabin Joystick [Boom Extention]	Using Winscope, check that the joystick value is between 1000 and -1000
		Check the analogue signal varies from 0.5V to 4.5V
		Replace the component
IDS_ALARM72	Congruency Cabin Joystick [Fork]	Using Winscope, check that the joystick value is between 1000 and -1000
		Check the analogue signal varies from 0.5V to 4.5V
		Replace the component
IDS_ALARM73	Congruency Cabin Joystick [Rotation]	Using Winscope, check that the joystick value is between 1000 and -1000
		Check the analogue signal varies from 0.5V to 4.5V
		Replace the component
IDS_ALARM74	Congruency Cabin Joystick [Optional]	Using Winscope, check that the joystick value is between 1000 and -1000
		Check the analogue signal varies from 0.5V to 4.5V
		Replace the component

IDENTIFIER	Description	Control list
IDS_ALARM506	High pressure of offset chamber: CPUs B-B congruence	Redundant value on channel B transducer (upper chamber) between CPU0 and CPU1
		Reload the transducer parameters
		Replace the transducer
IDS_ALARM509	Pressure Low chamber main cylinder A Cpu1: Fault	The transducer (lower chamber) has a current value on channel A below the MIN or above the MAX
		Check the transducer
		Check the wiring
IDS_ALARM510	Pressure Low chamber main cylinder B Cpu1: Fault	The transducer (lower chamber) has a current value on channel B below the MIN or above the MAX
		Check the transducer
		Check the wiring
IDS_ALARM511	Pressure High chamber main cylinder A Cpu1: Fault	The transducer (upper chamber) has a current value on channel A below the MIN or above the MAX
		Check the transducer
		Check the wiring
IDS_ALARM512	Pressure High chamber main cylinder B Cpu1: Fault	The transducer (upper chamber) has a current value on channel B below the MIN or above the MAX
		Check the transducer
		Check the wiring
IDS_ALARM513	Pressure Low chamber compensation A Cpu1: Fault	The transducer (lower chamber) has a current value on channel A below the MIN or above the MAX
		Check the transducer
		Check the wiring
IDS_ALARM514	Pressure Low chamber compensation B Cpu1: Fault	The transducer (lower chamber) has a current value on channel B below the MIN or above the MAX
		Check the transducer
		Check the wiring
IDS_ALARM515	Pressure High chamber compensation A Cpu1: Fault	The transducer (upper chamber) has a current value on channel A below the MIN or above the MAX
		Check the transducer
		Check the wiring
IDS_ALARM516	Pressure High chamber compensation B Cpu1: Fault	The transducer (upper chamber) has a current value on channel B below the MIN or above the MAX
		Check the transducer
		Check the wiring
IDS_ALARM518	Can bus time out from CAT [Pdo1A]	The CAN BUS signal of the rotary forks does not arrive
		Check the connection
IDS_ALARM519	Can bus time out from CAT [Pdo1B]	The CAN BUS signal of the rotary forks does not arrive
		Check the connection
IDS_ALARM520	Can bus time out from CAT [Pdo2A]	The CAN BUS signal of the rotary forks does not arrive
		Check the connection
IDS_ALARM521	Can bus time out from CAT [Pdo2B]	The CAN BUS signal of the rotary forks does not arrive
		Check the connection
IDS_ALARM525	Congruency error form CAT [Fork Angle]	Difference in the rotary fork angle read signals
		Reload the sensor parameters
		Check the sensors
IDS_ALARM527	Overload condition 1	121% overload - check the parameters set by Manitou
		Return to a safe condition
IDS_ALARM528	Overload condition 2	130% overload - check the parameters set by Manitou
		Return to a safe condition
IDS_ALARM529	Overload condition 3	140% overload - check the parameters set by Manitou
		Return to a safe condition
IDS_ALARM532	LMI: By-Pass Key activated	LMI bypass activated

DRIVER'S CAB

TABLE OF CONTENTS

COMPONENT LOCATION

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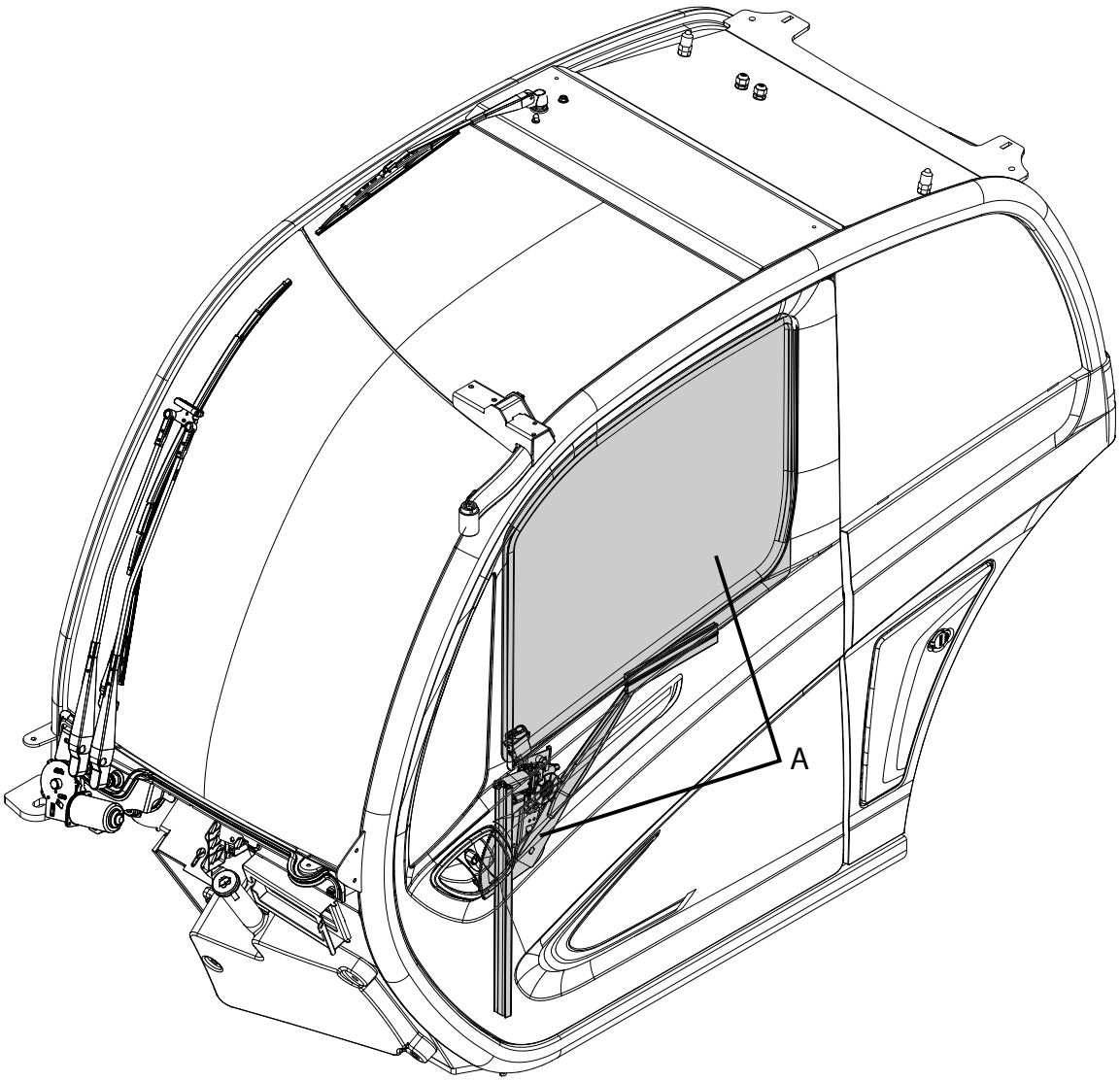
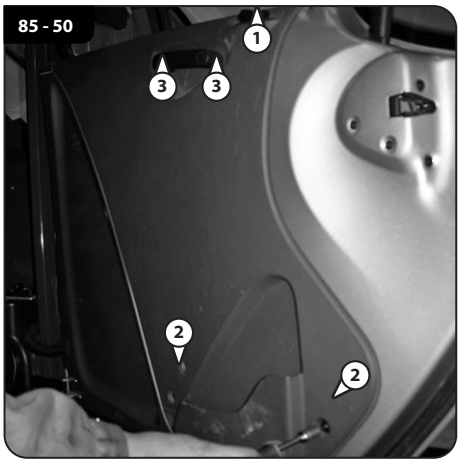


Key:

A - Electric window and motor.

PREPARATION AND SAFETY INSTRUCTIONS

- Stabilize the machine on level ground.

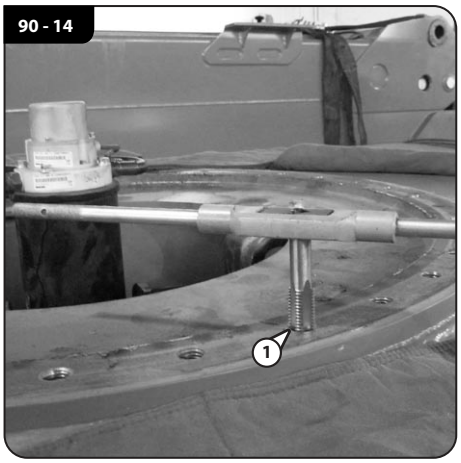


Reconnect the electric window control button (1, 📷 ***85 - 50***).

Attach the four screws (2, 📷 ***85 - 50***) and the handle and trim covers (3, 📷 ***85 - 50***).

90.2.3 REFITTING THE THRUST RING

90 - 14

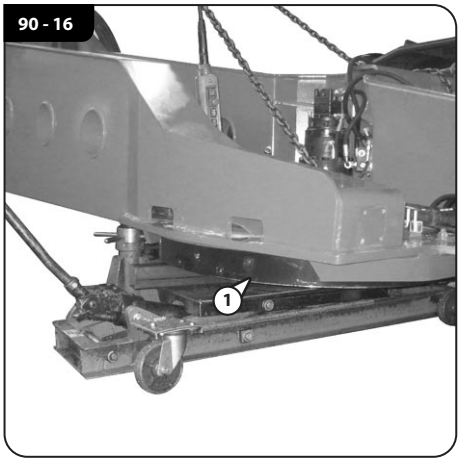


Use a tap (1, 📷 ***90 - 14***) to remove Loctite residue from the holes for fixing the thrust ring to the frame of the truck and the turret.

90 - 15

Use an orbital sander (1, 📷 ***90 - 15***) to clean the surfaces of the frame where the thrust ring is to be fitted, repeat this operation on the turret.

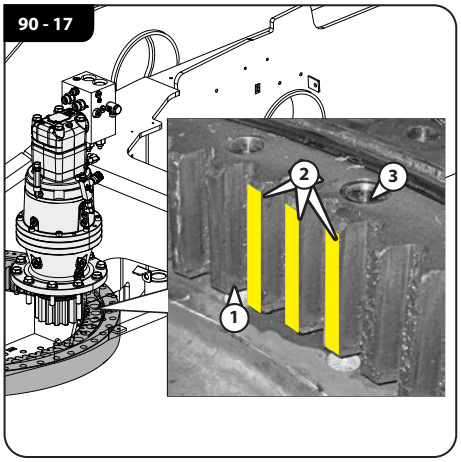
90 - 16



With the help of the crane position the thrust ring (1, 📷 ***90 - 16***) to their original location.

When placing the thrust ring on the truck, be careful to orientate the edge of the thrust ring on which the grease nipples are mounted, towards the outside of the base.

90 - 17



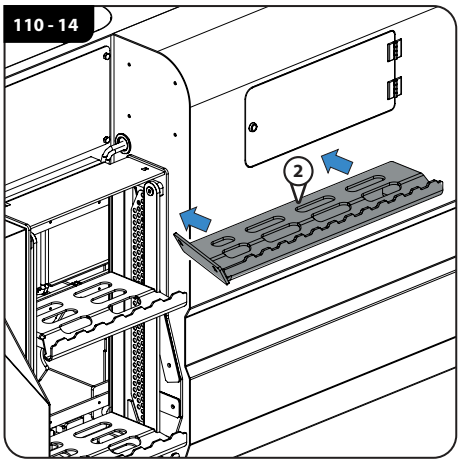
The thrust gear ring (1, 📷 ***90 - 17***) has three coloured reference teeth (2, 📷 ***90 - 17***) which must be positioned to correspond with the seating where the turret rotation motor is to be fitted because they have a larger tolerance to facilitate their coupling.

Refit the thrust ring (1, 📷 ***90 - 17***) to the truck frame by screwing in the screws (3, 📷 ***90 - 17***) after applying Loctite medium strength threadlock.

Tighten the screws using a 450 Nm.

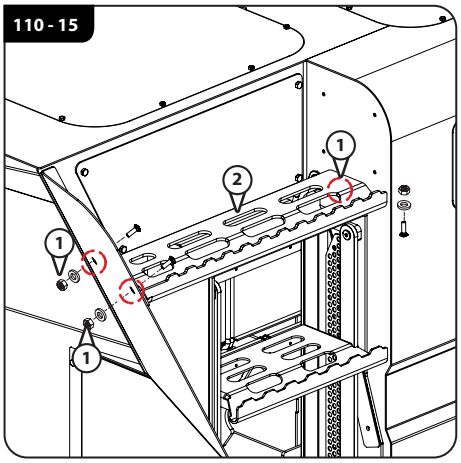
For adjustment of the turret rotation motor: **(◁ 90.2.5 - REFITTING THE TURRET ROTATION MOTOR).**

110 - 14



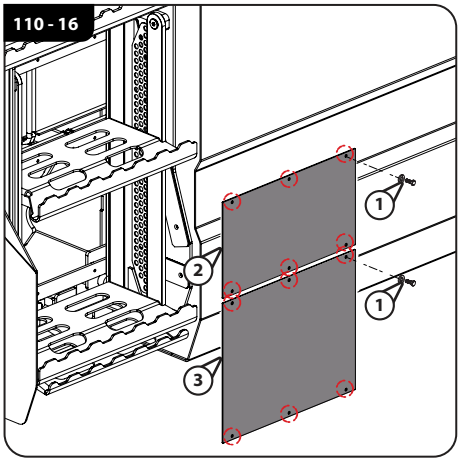
Reposition the upper tread (2, 📷 ***110 - 14***).

110 - 15



Tighten the three retaining screws (1, 📷 ***110 - 15***) of the upper tread (2, 📷 ***110 - 15***).

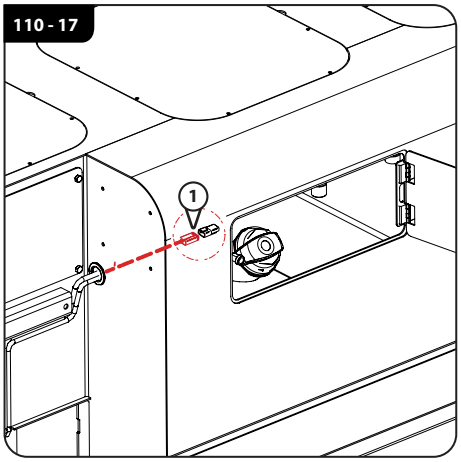
110 - 16



Refit the lower guard (3, 📷 ***110 - 16***) using the six screws (1, 📷 ***110 - 16***).

Then refit the upper guard (2, 📷 ***110 - 16***) using the six screws (1, 📷 ***110 - 16***).

110 - 17



Refit the cable in its housing and reconnect the connector XAE.s (1, 📷 ***110 - 17***).

Close the tank flap.