



**647489EN (04/08/2020)**

MHT 790 104JD H ST3B S1  
MHT-X 790 104JD H ST3A S1

**REPAIR MANUAL**

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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.

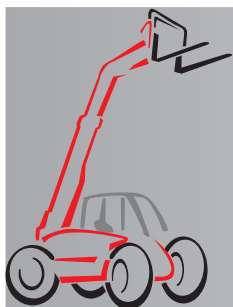


<b>FRONT AXLE</b>				
<b>ORGANS TO LUBRICATED</b>	<b>CAPACITY</b>	<b>RECOMMENDATION</b>	<b>PACKAGING</b>	<b>REFERENCE</b>
FRONT AXLE DIFFERENTIAL	12 Litter	MANITOU Oil Special immersed brakes	5 l	545976
			20 l	582391
			209 l	546222
			1000 l	720149
FRONT WHEELS REDUCTION GEARS	1,7 Litter	MANITOU Oil SAE80W90 Mechanical transmission	2 l	499237
			5 l	720184
			20 l	546330
			55 l	546221
209 l	546220			
FRONT WHEELS REDUCTION GEAR PIVOTS		MANITOU Grease BLUE multi-purpose	400 g	545996
			1 kg	161590
			5 kg	499235

<b>REAR AXLE</b>				
<b>PARTS TO LUBRICATED</b>	<b>CAPACITY</b>	<b>RECOMMENDATION</b>	<b>PACKAGING</b>	<b>REFERENCE</b>
REAR AXLE DIFFERENTIAL	13,5 Litter	MANITOU Oil Special immersed brakes	5 l	545976
			20 l	582391
			209 l	546222
			1000 l	720149
REAR WHEELS FINAL DRIVES	1,9 Litter	MANITOU Oil SAE80W90 Mechanical transmission	2 l	499237
			5 l	720184
			20 l	546330
			55 l	546221
209 l	546220			
REAR WHEEL FINAL DRIVE PIVOTS REAR AXLE OSCILLATION		Grease MANITOU BLUE multi-purpose	400 g	545996
			1 kg	161590
			5 kg	499235

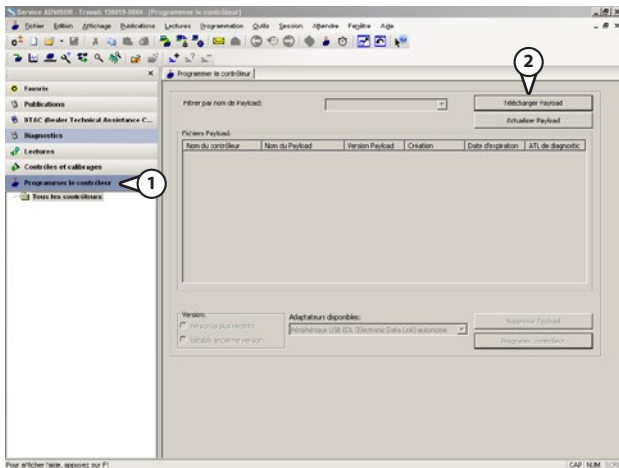
**TYPES OF REGENERATION**

Active regeneration	Soot level	Indicator lamp	Action
Passive	Normal		Regeneration takes place as a matter of course when the engine is heavily used over a long period. The hotter the exhaust gases, the more efficient regeneration will be.
	Low or Moderate		
	High		
Active	Low or Moderate		The DPF inlet temperature reaches 650 °C, the engine speed is increased to 1 000 rpm throughout the procedure, the lift truck can be operated as normal.
	High		It is activated every 50 hours as per to the previous regeneration (active or stationary).
Active Stationary (Parked)	High		Forced regeneration Press the upper part of the switch for 2 seconds to start the regeneration.  Note: The INTERMEDIATE position of the regeneration switch is the preset automatic regeneration position. Note: It is possible to return to normal operation at any point during the regeneration.
	Very High		Carrying out the regeneration To carry out the regeneration, the following conditions must exist:  Automatic regeneration The engine must be at the operating temperature to allow automatic regeneration.  If the engine ignition key is turned to the OFF position during regeneration, the regeneration will stop. When the regeneration is interrupted, the soot is not removed from the DPF and fuel is wasted.  DPF Wall Flow filter  For regeneration to start, the engine, RPM must be more than 1200. Normal operation can be continued. During automatic regeneration, the minimum speed is controlled at ± 950 rpm.  Manual regeneration The DPF must be switched On. Press the forced regeneration switch for 2 seconds. Do not activate the application during manual regeneration.
Passive stationary (Recovery) (Maintenance required)	Clogged		Regeneration activated with the "Service Advisor" software incorporated within the diagnostic tool.  Stationary (recovery) regeneration can last up to 3 hours, the engine speed is increased to 1 800 rpm and all hydraulic movements are forbidden.  If a component is damaged, the number of Recovery regeneration attempts is limited to 5.



## ENGINE CONTROL AND ADJUSTMENT

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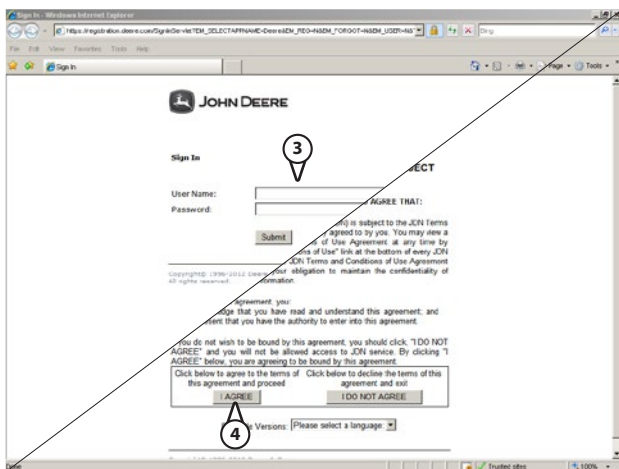
## A – DOWNLOAD CONFIGURATION FILE

This will let you download the file containing all the data relating to the new engine ECU or complete engine.

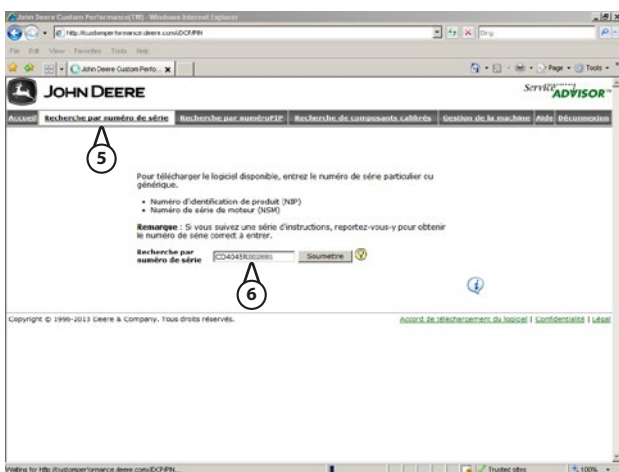
- Click on "Programmer le contrôleur" (Program the controller) (Ref. 1)
- Then on "Télécharger Payload" (Download Payload) (Ref. 2)

⇒ John Deere Web Site

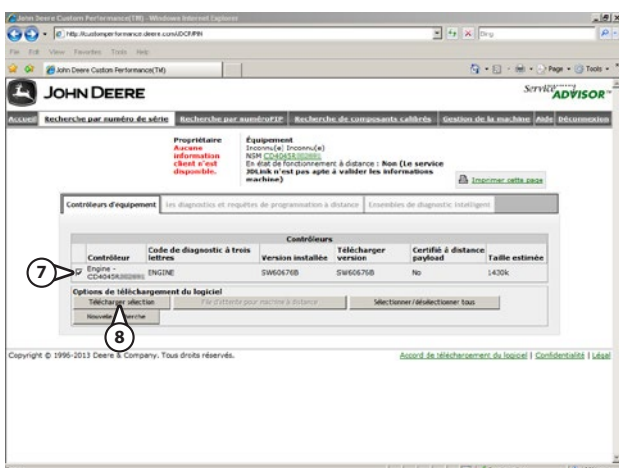
"<http://customperformance.deere.com>"



- Enter your User Name/Password (Ref. 3)
- Read and accept the conditions of use "I Agree" (Ref. 4)



- Click on "Recherche par numéro de série" (Search by serial number) (Ref. 5)
- Enter serial number starting with "CD4045R\*\*\*\*\*" (Ref. 6)
- "Soumettre" (Submit)



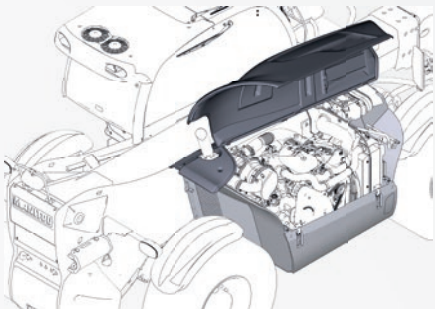
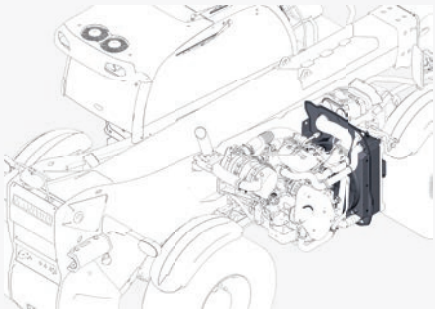
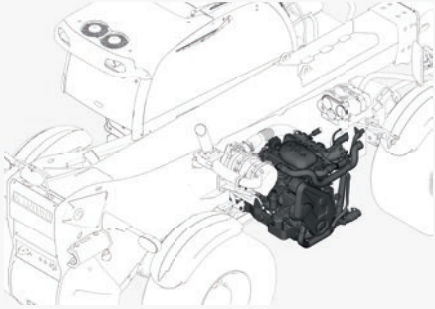
- Select the controller to download (Ref. 7)
- Then "Télécharger sélection" (Download selection) (Ref. 8).

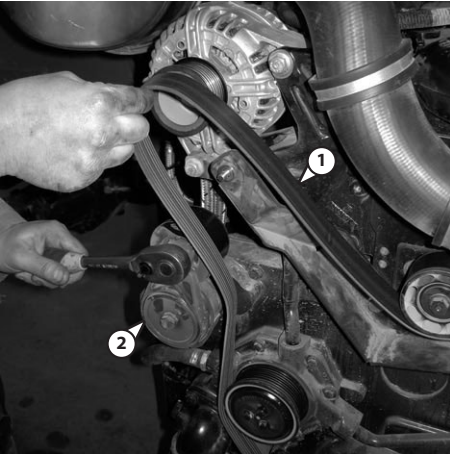
## STARTER REMOVAL

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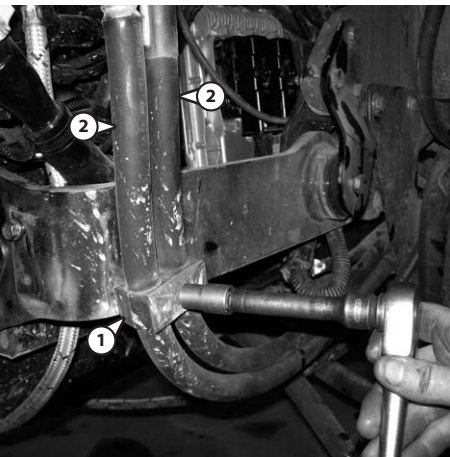
# ORDER OF REMOVAL

<p>Step 1</p>	<p>ENGINE BONNET AND HOUSING REMOVAL</p>  A technical line drawing of a tractor's front engine compartment. The engine bonnet is shown in a raised position, revealing the engine and various components underneath. The drawing is a perspective view from the front-left side.
<p>Step 2</p>	<p>COOLER REMOVAL</p>  A technical line drawing of the tractor's front engine compartment. The engine bonnet is closed. A component, likely the cooler, is highlighted in a darker shade, indicating it is the focus of the removal step.
<p>Step 3</p>	<p>ENGINE REMOVAL</p>  A technical line drawing of the tractor's front engine compartment. The engine and cooler assembly is highlighted in a darker shade, indicating it is the focus of the removal step.

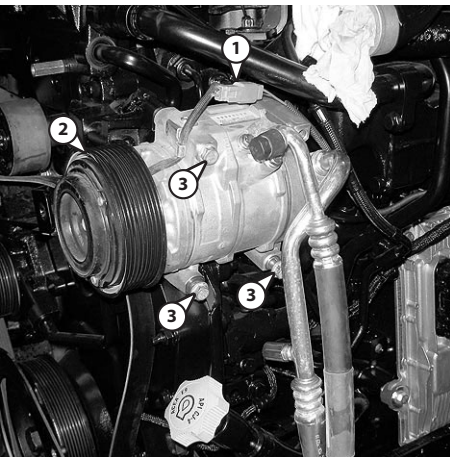
**AIR CONDITIONING OPTION:**

Dismantle the protective housing of the accessory belt.

Slacken the belt (Ref. 1) by means of the automatic tensioner (Ref. 2) Then remove the belt.



Remove the clamp (Ref. 1) holding the 2 air conditioning hoses (Ref. 2).

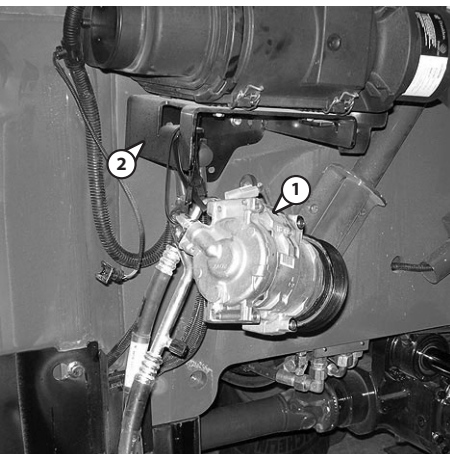


Disconnect the electric connector (Ref. 1) from the compressor (Ref. 2).

Unscrew the 3 screws (Ref. 3) of the compressor.

**NOTE:**



*To avoid having to recharge the cooling system, do not disconnect the hoses from the compressor.*

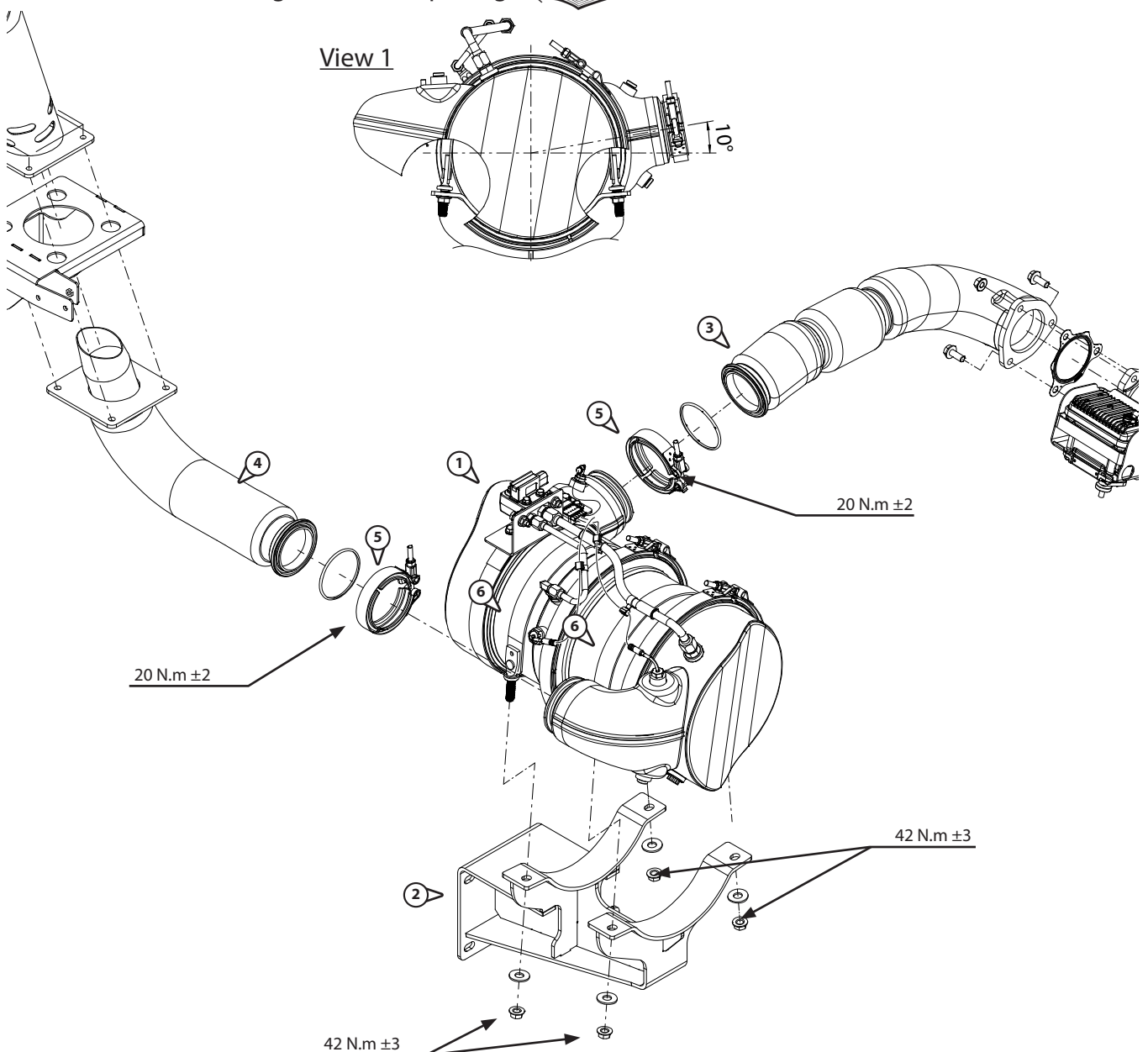


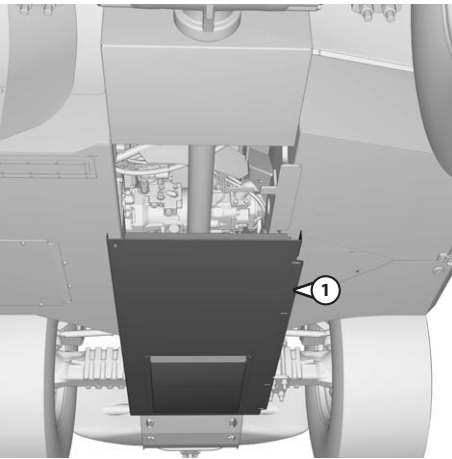
Remove the compressor (Ref. 1) and securely attach it to a fixed part, for example, the air filter support bracket (Ref. 2).

## REFITTING PROCEDURE

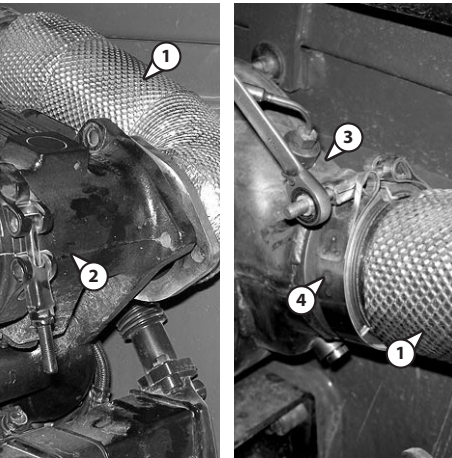
If refitting the filter, first carry out  647146EN (Section 02 - Group 115)

- Position the exhaust gas filter (Ref. 1) on its support bracket (Ref. 2) without attaching it.
- Direct the exhaust gas filter (Ref. 1) so that it is in the same axis as the exhaust inlet pipe (Ref. 3) and the exhaust outlet pipe (Ref. 4).
- Secure the two fixing clamps (Ref. 5). Then apply the tightening torque.
- Attach the exhaust filter (Ref. 1) on the support bracket (Ref. 2) using the two fasteners (Ref. 6) (4-point attachment). Tighten each side of the fastener equally ( view 1). Then apply the tightening torque on the 4 nuts.
- Connect the two electrical connectors.
- Perform the exhaust gas filter/ECU pairing  647146EN



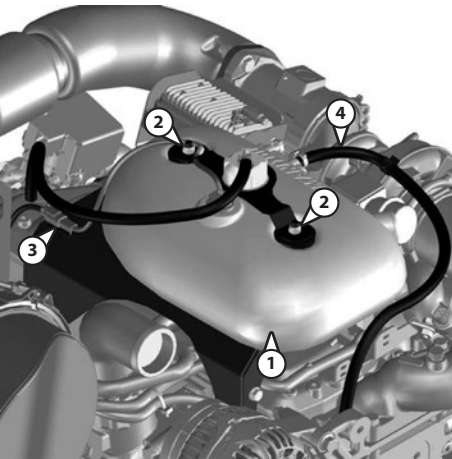


Place the carter (Ref. 1)



Place the exhaust manifold pipe (Ref. 1) between the turbo (Ref. 2) and the exhaust (Ref. 3).

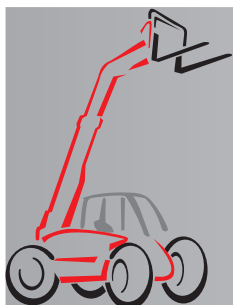
Apply a tightening torque of 20N.m  $\pm$ 10% to the clamp (Ref. 4).



Attach the expansion tank (Ref. 1) by means of the two nuts (Ref. 2).

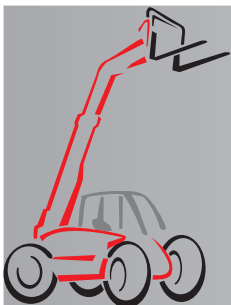
Connect the water level sensor (Ref. 3) to the expansion tank.

Secure the hose (Ref. 4) with a clamp.



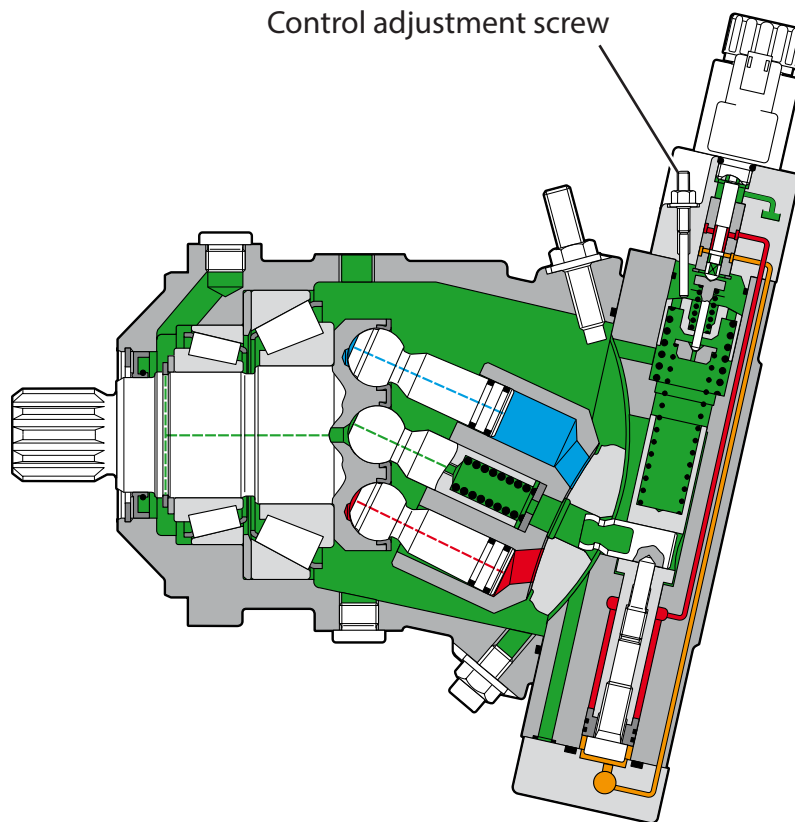
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**B. CHECKING MAXIMUM DISPLACEMENT (MAXIMUM TRACTION FORCE)**

- 1 - Install two 600 bar manometers.
  - ⇒ One on the pump (pressure test port Mb) to measure the High Pressure in forward drive.
  - ⇒ The other on the motor (pressure test port M1) to measure the back pressure of the motor displacement control cylinder.
- 2 - Take the nominal load and place the truck on a 15% incline in forward gear. The back pressure of M1 must be half of Mb (320 bar at Mb and 160 bar at M1 approx.).

If it is incorrect, turn the motor adjustment screw (Item 1) (screw seal to be broken with a screwdriver):

- ⇒ if M1 too high, undo the screw (Item 1) (a quarter turn on average).
- ⇒ if M1 too low, tighten the screw (Item 1).

- 3 - Check the pulling force in 1st gear (approx. 8 tonnes)
- 4 - Re-seal the hydrostatic motor control adjustment screw and remove the manometers.

**Note: Sealing the valve**

The original lead seal is yellow. It is not available as a spare.

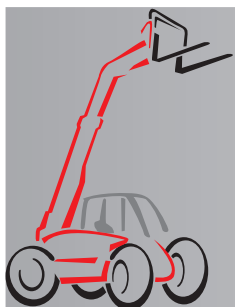
The lead seal to be used in the event that the seal is removed for renovation is orange and is available as a spare.

Lead seal (orange)..... Part no. 601469

**6 - SEAL REPLACEMENT / TIGHTENING TORQUES**

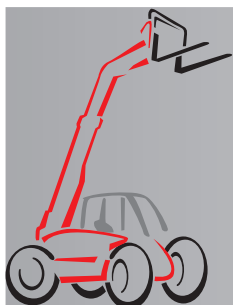
A4VG 85 DA 1D Series 40 pump ◀ Repair manual Part no. 647447

A6VM 107 DA2 Series 63 hydraulic motor ◀ Repair manual Part no. 647524



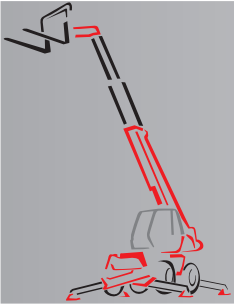
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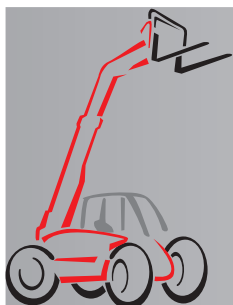
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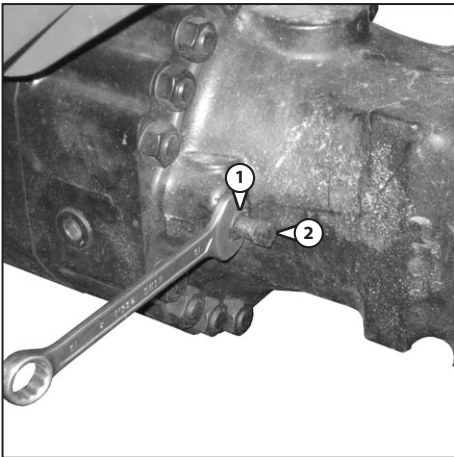
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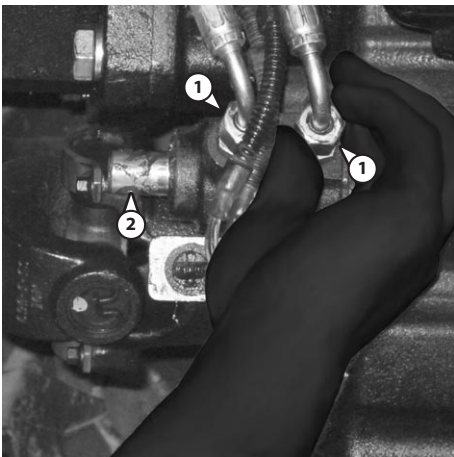


## DEACTIVATE THE NEGATIVE BRAKE

Deactivate the action of the "negative" parking brake with the help of a 19 mm hex wrench:

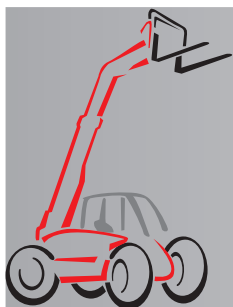
- Unscrew the nut (Ref. 1).
- Tighten the screw to fit flush (Ref. 2).

Repeat the operation on both sides of the front axle.



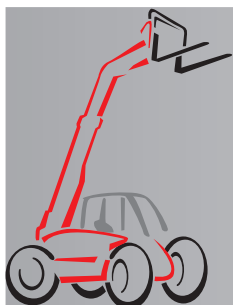
## SETTING THE GEAR IN NEUTRAL (FOR TOWING)

If the vehicle is to be towed, the gear must be set in neutral. Disconnect the tubes (Ref. 1) of the gear, remove or insert the pin (Ref. 2) (depending on the gear engaged) bringing it to the central position.



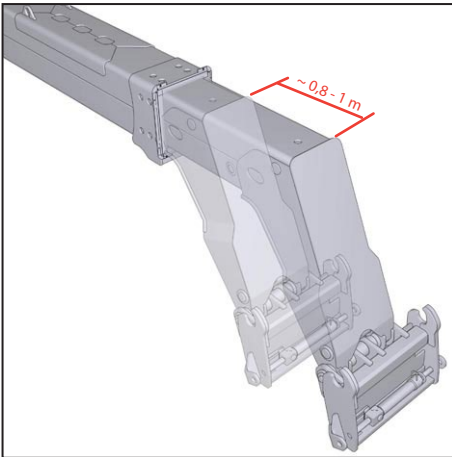
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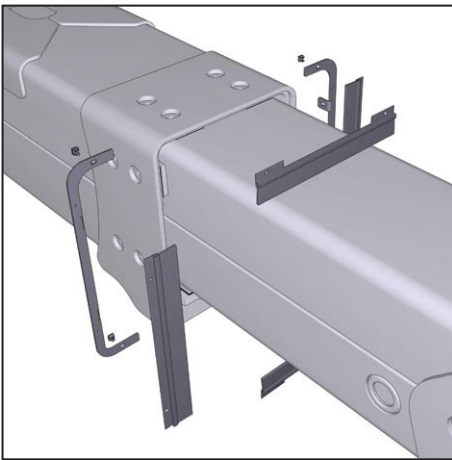


## REPLACING THE SLIDING BLOCKS

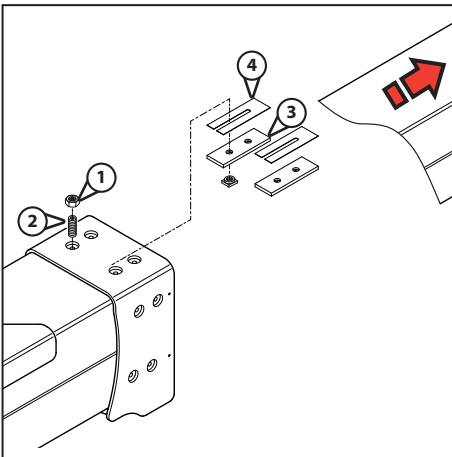
### REPLACING THE FRONT SLIDING BLOCKS

Extend the boom by about 0.8 - 1 m.

**⚠ Caution: number each shim and make a note of its position in relation to the sliding block.**

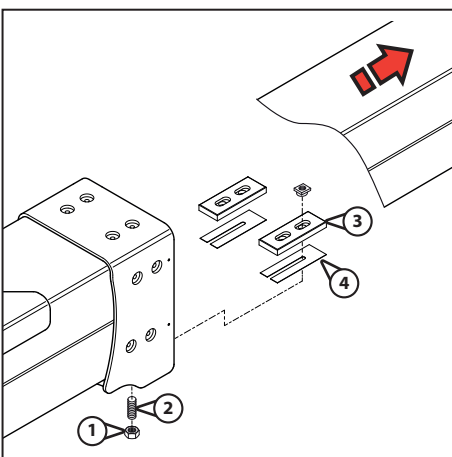


Remove the dust guard (Ref. 1) from the outer boom.



Slacken the nuts (Ref. 1) and screws (Ref. 2) to release the upper sliding blocks (Ref. 3).

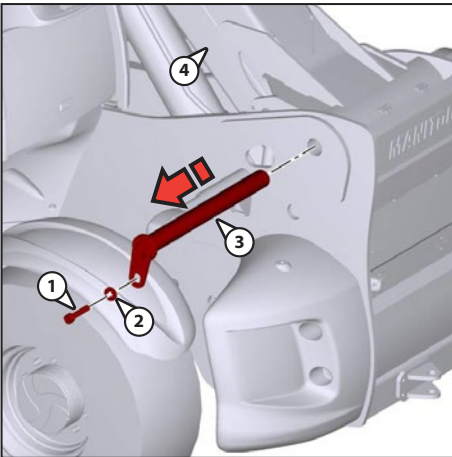
Slacken and remove the upper sliding blocks (Ref. 3) with their shims (Ref. 4) from the boom.



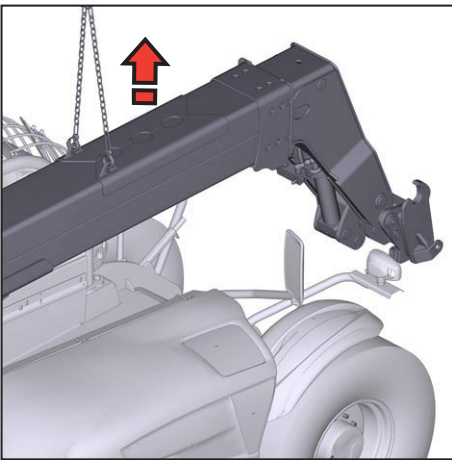
Lift the boom using suitable lifting equipment.

Slacken the nuts (Ref. 1) and screws (Ref. 2) to release the lower sliding blocks (Ref. 3) and their shims (Ref. 4).

Loosen and remove the lower sliding blocks (Ref. 3) from the boom.

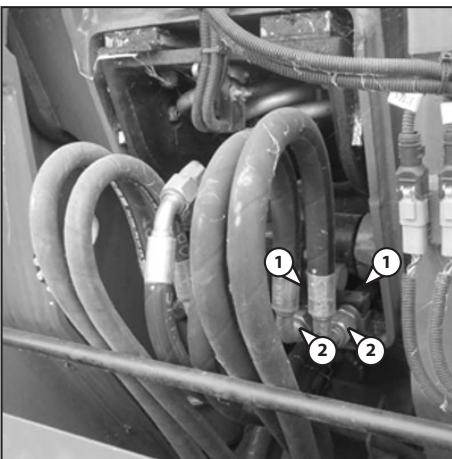


Unscrew the screws (Ref. 1) and the washer (Ref. 2).  
Remove the locking pin (Ref. 3) to free the boom (Ref. 4).



Using suitable lifting means, remove the boom from the vehicle.

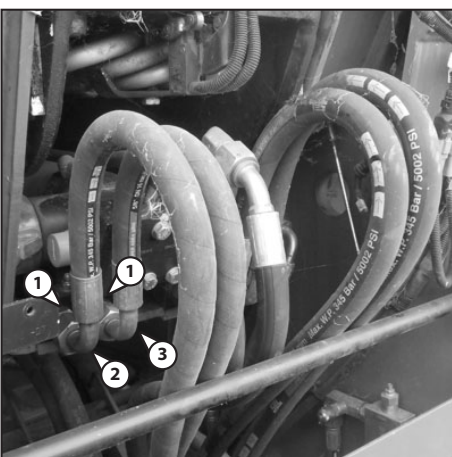
**⚠ Take care while lifting. The boom must be guided by an operator to prevent it from losing balance and rolling over.**



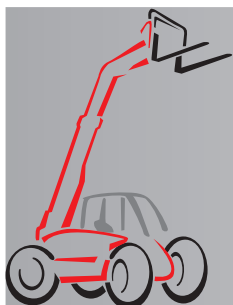
## REMOVING THE COMPONENTS FROM THE BOOM

### REMOVING THE BOOM HYDRAULIC SYSTEM

Disconnect the tubes (Ref. 1) from the wallpenetration connectors (Ref. 2).

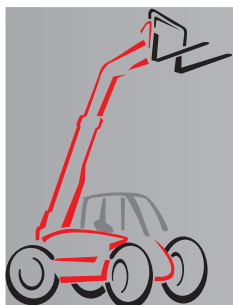


Disconnect the tubes (Ref. 1) from the wallpenetration connectors (Ref. 2).



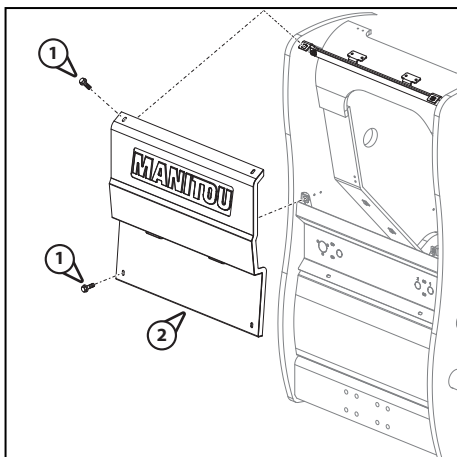
## **HYDRAULIC CHARACTERISTICS AND SPECIFICATIONS**

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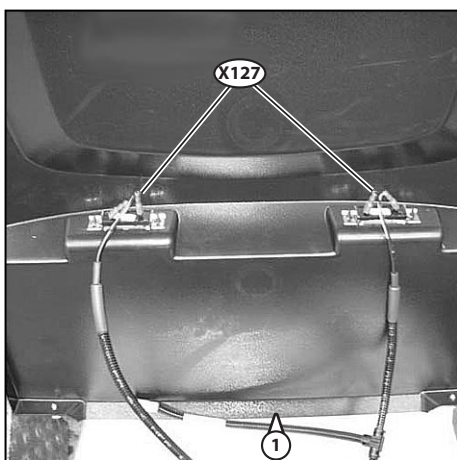
## HYDRAULIC COMPONENTS LOCATION

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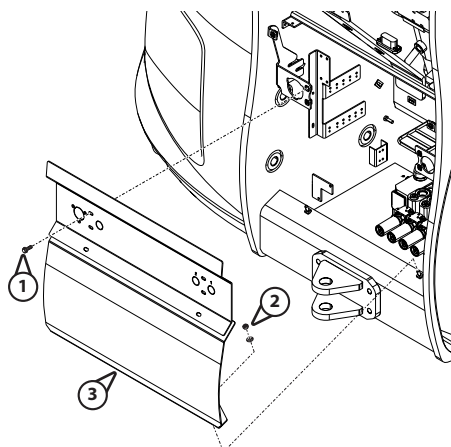


## REMOVING THE DIRECTIONAL CONTROL VALVE

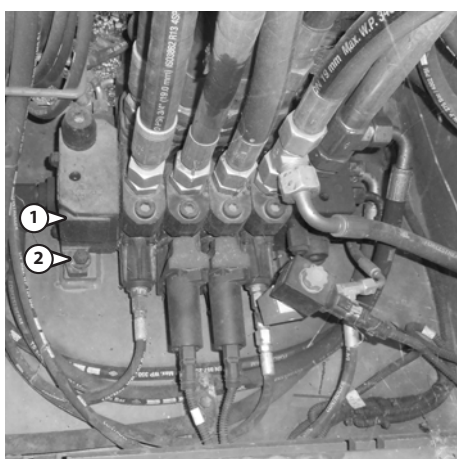
Slacken the screws and the washers (Ref. 1) and remove the bottom guard (Ref. 2).



**Attention:** before removing the rear guard (Rif. 1) disconnect the connectors X127 of the ID plate lights.



Slacken the screws and the washers (Ref. 1) and remove nuts and the washers (Ref. 2) to remove the bottom guard (Ref. 3).



Place a container under the machine.  
Disconnect the all hydraulic pipes and electrical connections from the directional control valve (Ref. 1).  
After that unscrew the four screws (Ref. 2) to remove the directional control valve (Ref. 1).

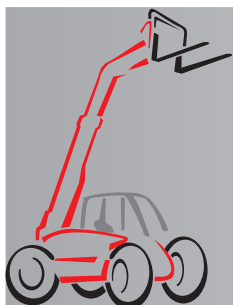
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## **ELECTRICAL CHARACTERISTICS AND SPECIFICATIONS**

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<b>WIRING .....</b>	<b>A</b>
<b>ELECTRICAL AND ELECTRONIC SYSTEM OVERVIEW .....</b>	<b>B</b>
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## 3B6 WIRING TRANSDUCTORS

Reference	Pin	Colour	Cross-section	Direction	Wire N°
SA1	-	L	0.34	Xccr2/3-L	
		B	0.5	SA10	
		B	0.5	SA5	
SA2	-	L	0.5	SA6	
		L	0.5	SA11	
		N	0.34	Xccr2/4-N	
SA3	-	N	1	Xsc/2	
		N	1	Xfc/2	
		N	1	Xs/4	2019
		N	1	Xss/2	
		N	1	Xfs/2	
		B	0.34	Xccr2/2-B	
		N	1	SA7	
		N	1	Xmdc/1	
SA4	-	Z	1	Xfc/1	
		Z	1	Xsc/1	
		Z	1	Xmdc/8	
		Z	1	Xss/1	
		Z	1	Xfs/1	
		M	0.34	Xccr2/1-M	
SA5	-	B	1	X125.s/3	
		B	0.5	SA1	
SA6	-	L	1	X125.s/4	
		L	0.5	SA2	
SA7	-	N	1	X125.s/2	
		SCH		SA9	
		N	1	SA3	
SA9	-		SCH	SA7	
			SCH	SCH/-	
SA10	-	B	0.5	SA1	
		B	0.5	Xmdc/19	
SA11	-	L	0.5	SA2	
		L	0.5	Xmdc/20	
SA12	-	C	1	Xmdc/3	00F2
		C	1	Xmdc/13	00F2
		C	1	X125.s/1	00F2
		C	1	Xmdc/16	00F2
		C	1	Xmdc/14	00F2
SCH	-		SCH	SA9	
Xc	1	B	1	Xmdc/33	6487

Reference	Pin	Colour	Cross-section	Direction	Wire N°
<b>X014</b>	1	G	1	EP74	39
		G	1	EP72	40
	2	V	1	X33	69
		V	1	X014	71
	3	H	0.6	X014	54
		G	2	X15A	55
	4	G	2	X15A	67
		G	0.6	X014	68
	5				
	6				
	7				
	8	V	1	X33	70
		V	1	X014	71
	9	N	0.6	EP70	5
	10	H	0.6	X014	54
	A				
B	G	0.6	X014	62	
<b>X015</b>	1	G	0.6	X015	63
		G	2.5	X15A	34
	2				
	3				
	4				
	5	B	2.5	X68A	48
		H	0.6		50
	6				
	7				
	8				
	9				
	10	H	0.6	X015	50
	A				
	B	G	0.6	X015	63

<b>Reference</b>	<b>Pin</b>	<b>Colour</b>	<b>Cross-section</b>	<b>Direction</b>	<b>Wire N°</b>
<b>Gnd6.3</b>	-	N	4	X470/4	
		N	2	X472.p/4	
		N	1.5	X416/5	
		N	2.5	X465.s/2	
<b>H</b>	1	SCH		SA107	
<b>I</b>	1	SCH		SA95	
<b>SA50</b>	-	B	0.5	X103.p/11	6162
		SCH		SA98	
<b>SA51</b>	-	SCH		SA101	
		B	0.5	X128.p/21	6140
<b>SA54</b>	-	B	1	X473.s/4	6377
		B	1	X466/1	6377
		B	1	X103.p/12	6377
		B	1	X434/L10	6377
<b>SA59</b>	-	C	1	X450/A	00F2
		C	1	X421.s/1	00F2
		C	1.5	X408/2a	00F2
		C	1	X128.p/14	00F2
		C	1	X407/R2_30	00F2
		C	1	X416/1	00F2
		C	1	X128.p/19	00F2
		C	1	X870.p/31	00F2
		C	1	X451/1	00F2
<b>SA60</b>	-	C	1	X121.p/11	00F1
		C	1	X104.p/6	00F1
		C	1	X420/4	00F1
		C	0.5	X415/1	00F1
		V	1	X469/1	00F1
		C	1	X443/1	00F1
		C	1.5	X408/1a	00F1
		C	1.5	X480.s/1	00F1
<b>SA62</b>	-	C	1	X452/1	0F15
		C	1.5	X408/15a	0F15
		C	1	X433/1	
		C	1	X870.p/16	0F15
		C	1	X407/12	0F15
		C	1	X453/8	0F15

Reference	Pin	Colour	Cross-section	Direction	Wire N°
<b>X406</b>	R1-30	R	4	X410/F2	F212
	R1-87	B	4	X437/4	6378
	R1-85	N	1	Gnd6.2	
		N	0.5	X406/R2-85	
	R1-86	C	0.5	X406/R2-86	0400
		C	1	X414/2	0400
	R1-87a				
	R1-1				
	R1-1				
	R1-2				
	R1-3				
	R2-30	R	4	X410/F4	F214
	R2-87	C	4	SA64	0407
	R2-85	N	1	X407/R1_85	
		N	0.5	X406/R1-85	
	R2-86	C	0.5	X406/R1-86	0400
		C	1	X436.2/6	0400
	R2-87a				
	R2-1				
	R2-1				
R2-2					
R2-3					
<b>X407</b>	R1_30	R	1.5	X409/14	0F24
	R1_87	G	1.5	X194/2	2010
		G	1.5	X121.p/1	2010
	R1_85	N	1	X406/R2-85	
		N	0.5	X407/R3_85	
	R1_86	B	1	X440/3	6113
	R1_87a				
	R2_30	C	1	SA59	00F2
	R2_87	G	1	X128.p/7	2015
		G	1	X453/10	2015
	R2_85	N	0.5	X407/R4_85	
	R2_86	B	1	X468/1	6879
	R2_87a				
	R3_30	R	1.5	X409/13	0F33
	R3_87	B	1.5	X121.p/9	6072
	R3_85	N	0.5	X407/R4_85	
		N	0.5	X407/R1_85	
	R3_86	B	1	X453/15	6115
		B	1	X440/6	6115

Reference	Pin	Colour	Cross-section	Direction	Wire N°
X440	1	C	1	X408/13a	0F13
	2	B	1	X408/19	6087
	3	B	1	X407/R1_86	6113
		B	0.5	X453/11	6113
	4	B	0.5	X453/12	6112
		B	1	X409/R1_86	6112
	5	R	1	X409/13	0F33
	6	B	1	X407/R3_86	6115
	7	B	1	X459/5	6044
	8	G	1	X459/7	2003
		G	1	X454/5	2003
	9	G	1	SA79	2002
		G	1	X454/9	2002
X441	1				
	2	N	1	Gnd5.2	
	3	B	1	X461.2/1	6056
	4	B	1	X438/7	6057
	5	B	1	X438/8	6058
	6	C	1	X408/10a	0F10
X442.1	1	B	1	X454/21	6123
X442.2	1	N	1	Gnd5.2	
X443	1	C	1	SA60	00F1
	2	B	1	X434/R35	6611
X444	1				
	2				
	3				
	4	C	1	X408/16a	0F16
	5				
	6				
	7	R	1	X409/1	0F21
	8	N	1	Gnd6.1	
X445	1	B	1	X403.s/1	6210
	2	B	1	X403.s/2	6211
	3				
	4				
	5				
	6				
	7	B	1	X403.s/3	6208
	8	B	1	X403.s/4	6209

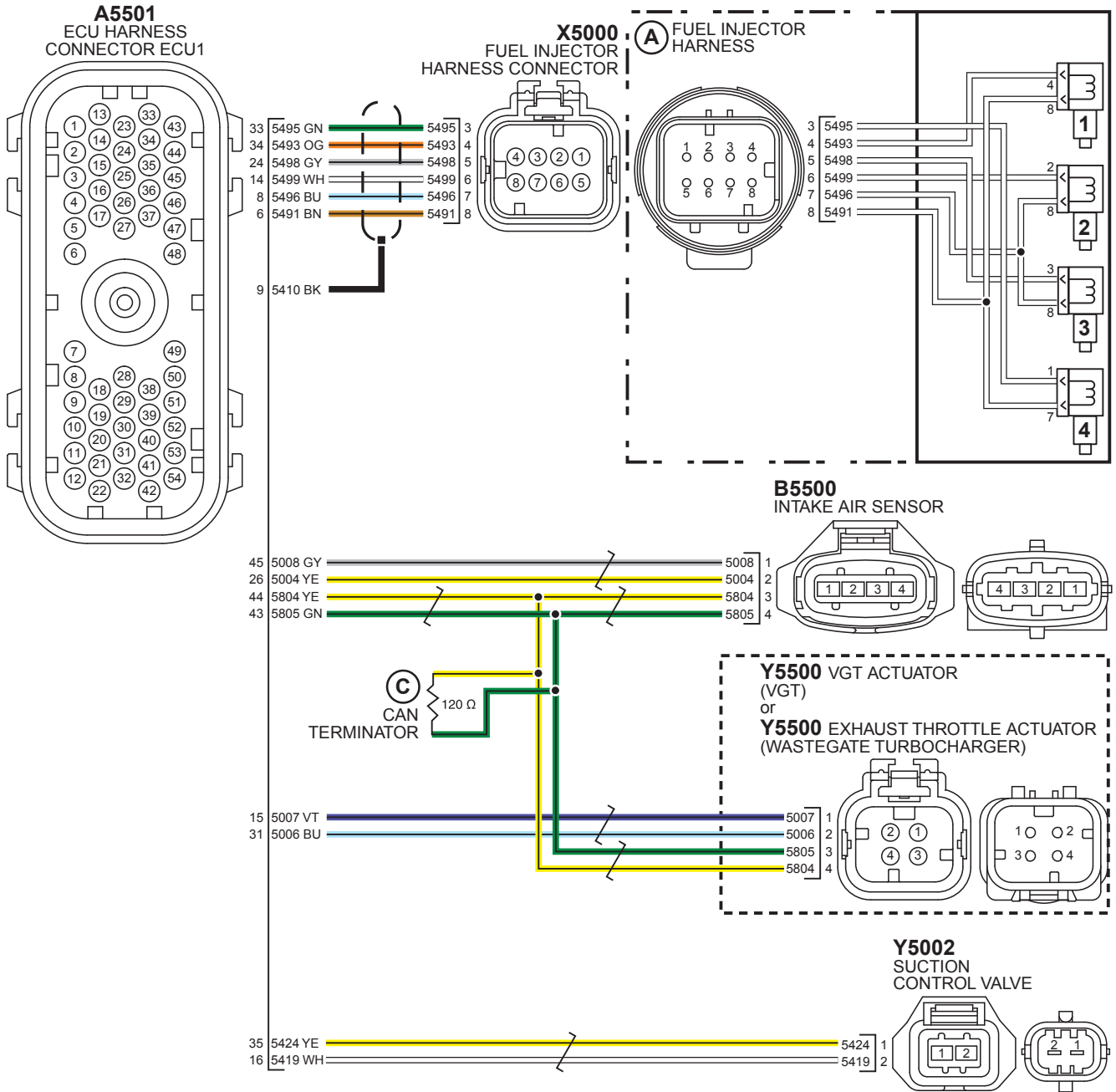
Reference	Pin	Colour	Cross-section	Direction	Wire N°
SA10	-	V	0.5	X103.s/9	
		V	0.5	X118/D	
		V	0.5	SA4	
SA11	-	SCH		SA5	
		SCH		SA7	
		SCH		SA12	
SA12	-	SCH		SA11	
		B	1	X103.s/11	6162
SA13	-	R	1	X202/1	0201
		R	8	X203/F1a	0201
		R	6	X204/F1a	0201
		R	16	X115	
SA45	-	H	0.5	X205/29	1007
		H	0.5	X109/1	1007
		H	1	X104.s/8	1007
X	1	SCH		SA5	
X100.p	1				
	2				
X100.s	1	V	1	X104.s/1	3062
	2	N	1	Gnd3.1	3062
X102.p	1	V	1	X104.s/2	3061
	2	N	1	Gnd3.1	
X102.s	1				
	2				
X103.s	1	A	1	X205/9	1331
	2	A	1	X205/10	1332
	3	B	1	X205/33	6840
	4	B	1	X205/34	6841
	5	B	1	X205/28	6842
	6	B	1	X205/49	6843
	7	B	1	X205/7	6308
	8	G	0.5	SA9	
	9	V	0.5	SA10	
	10	B	1.5	X207.s/A	6100
	11	B	1	SA12	6162
	12	B	1	X114/1	6377

Reference	Pin	Colour	Cross-section	Direction	Wire N°
X121.s	26	B	1	X114.s/3	6844
	27	V	1	X237/1	3261
	28				
	29	G	1	Sal6	2002
	30	G	1	Sal4	2000
	31	A	1	X134/1	1391
X123.s	1	G	1	Sal3	2001
	2	N	1	Gnd1.1	
X124	1	A	1	X121.s/15	1301
	2	N	1	Gnd1.2	
X125	1	V	1	X121.s/24	3072
	2	N	1	Gnd2.3	
X126.s	A	N	1	Gnd1.2	
	B	V	1	X121.s/16	3057
	C	B	1	X121.s/17	6846
X127	1	G	1	Sal4	2000
	2	N	1	Gnd2.4	
X128.s	1	B	1	X147/2	6546
	2	V	1.5	X162.p/1	3335
	3	B	1	X115.s/4	6844
	4	G	2	X146.p/1	2013
	5				
	6				
	7	G	1	Sal7	2015
	8	A	1	X133/1	1390
	9	G	1	Sal9	2012
	10	V	1	X131/1	3322
	11	A	1	X140/2	1310
	12	B	1	X145.p/2	6488
	13	V	1	X113/1	3326
	14	C	1	Sal20	00F2
	15	B	1	X604/3	6739
	16	B	1	X604/6	6740
	17	B	0.5	Sal12	
	18	L	0.5	Sal13	
	19	R	1	Sal14	00F2
	20	N	1	Sal15	
	21	B	1	Sal19	6140
	22	V	1	X618/1	3305
	23	V	1	X619/1	3306
	24	V	1	X616/1	3116

<i>Reference</i>	<i>Pin</i>	<i>Colour</i>	<i>Cross-section</i>	<i>Direction</i>	<i>Wire N°</i>
<b>XME</b>	1	RL		X473.a/8	
				XME/2	
	2	RL		X473.a/8	
				XME/1	
	3	R		F1	
				X292.a/1	
	4	N		XB-	
	5	G	0.75	X423.a/A	
		G	0.75	X423.b/A	
	6				
	7				
	8	V	0.75	X423.a/B	
		V	0.75	X423.b/B	
	9	N		X292.a/4	
	10				
	11				
12					

Reference	Pin	Colour	Cross-section	Direction	Wire N°
<b>X792.s</b>	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					
<b>X794.p</b>	1				
	2				
	3				
	4				
	5				
	6				
<b>X794.s</b>	1	Z	1	SA5	
	2	N	1	SA1	
	3	B	0.5	SA6	
	4	L	0.5	SA7	
	5				
	6				

# CONNECTORS (ENGINE HARNESS 2)



**A5501**—ECU harness connector ECU 1  
**A5501-6**—[5491 brown] Injector no. 1 and 4, supply  
**A5501-8**—[5496 light blue] Injector no. 2 and 3, supply  
**A5501-9**—[5410 black] Wiring shield  
**A5501-14**—[5499 white] Injector no. 2, inject pulse  
**A5501-15**—[5007 purple] Actuator supply signal  
**A5501-16**—[5419 white] Suction valve, control -  
**A5501-17**—[5443 orange]

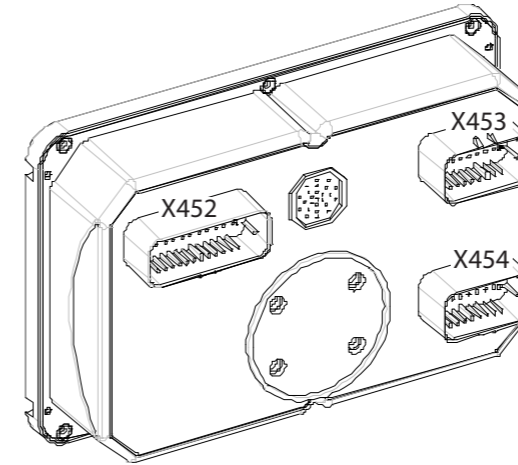
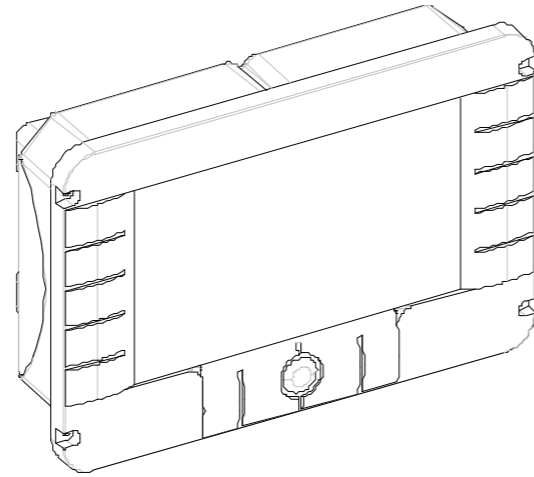
Camshaft position return  
**A5501-18**—[5478 gray] 5V sensor supply no. 2A, return  
**A5501-19**—[5444 gray] 5V sensor supply no. 3, return  
**A5501-24**—[5498 gray] Injector no. 3, inject pulse  
**A5501-26**—[5004 yellow] Sensor supply, return  
**A5501-31**—[5006 blue] Actuator return  
**A5501-33**—[5495 green] Injector no. 4, inject pulse  
**A5501-34**—[5493 orange] Injector no. 1, inject pulse  
**A5501-35**—[5424 yellow] Suction

valve, control +  
**A5501-43**—[5805 green] Engine CAN Low Signal  
**A5501-43**—[5804 yellow] Engine CAN High Signal  
**A5501-45**—[5008 gray] 10V Sensor supply no. 9B, positive  
**B5500**—Intake air sensor  
**C**—CAN terminal resistance of 120 ohms  
**X5000**—Fuel injector harness connector  
**Y5002**—Suction valve **Y5500**—VGT actuator (VGT)

**Y5500**—Exhaust throttle valve actuator (boost pressure-limiting turbocompressor)

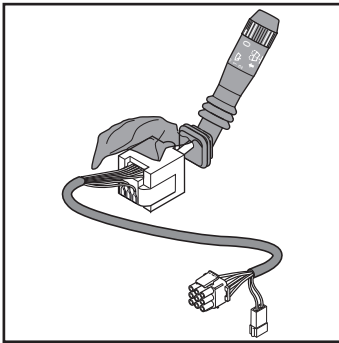
## ECU INPUTS/OUTPUT

## TERA 7 INPUTS/OUTPUT



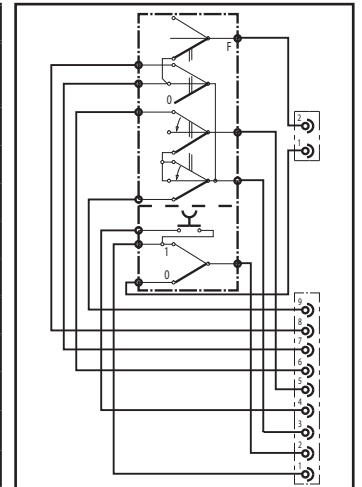
Tera 7								
X452			X453			X454		
No. PIN	TYPE	Designation	No. PIN	TYPE	Designation	No. PIN	TYPE	Designation
1		+VE	1		Hydroguide pressure sensor	1		Continous oil ow option light
5	CAN010	Can-H Open	2		Oil lter's clogged signal	3		Hydraulic oil temperature signal
6	CAN010	Can-L Open	5		Reset signal (opt)	5		RH direction indicator signal
13		+30 display Tera 7	6	CAN011	Can-L Open	6		Front axle wheels alignment light
24		Ground from battery	8		+VE	7		Rear axle wheels alignment light
25	CAN003	Can-H J1939	9		Hydrostatic motor Oil lter's clogged signal	8		Rear trailer light
26	CAN003	Can-L J1939	10		Rear fog light signal	9		LH direction indicator signal
8	UART4_TX	UART TX line 4	11		Low beam signal	10		Start DPF
9	ETH_T+	Ethernet TX pair +	12		Hight beam signal	11		Stop DPF
10	ETH_T-	Ethernet TX pair -	14	CAN011	Can-H Open	15		Reverse fan switch signal
11	ETH_R+	Ethernet RX pair +	15		Horn command	16		Boom suspension signal
12	ETH_R-	Ethernet RX pair -	16		Rear fog light consent	17		Easy connect
13	+VB_STBY	Logic input power supply for Stand-by	17		Position lights signal	21		Brake oil level signal
14	UART1_DSR	Input 0	19		RPM+ signal			
15	UART1_RTS	Input 0	20		RPM- signal			
16	UART1_CTS	Input 1	21		Radio remote control switch signal			
17	UART1_RI	Input 2	23		Ground from batery			
18	UART1_DTR	Input 3						
19	UART1_TX	UART TX line 1						
20	UART1_RX	UART RX line 1						
21	UART1_DCD	Input 3						
22	GND	Ground Signal						
23	UART4_RX	UART RX line 4						

**S438 WINDSHILED WASHER COLUMN SWITCH**



PIN	Function
1	Rear windscreen wiper and windscreen washer power supply
2	Rear screen wiper control
3	Front windscreen wiper power supply
4	Rear screen washer
5	Front screen washer supply
6	Front screen washer control
7	Front screen wiper speed 1
8	Front screen wiper speed 2
9	Intermittent
1	Rear screen wiper parking
2	Front windscreen wiper parking

Corresponding connector

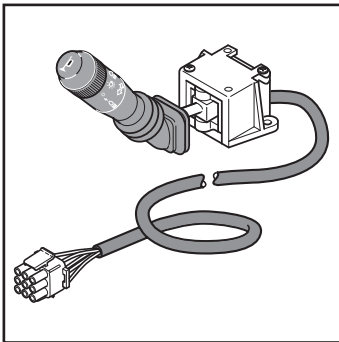


Diagram

	Typical
Voltage	12 V
Consumption	As per outputs

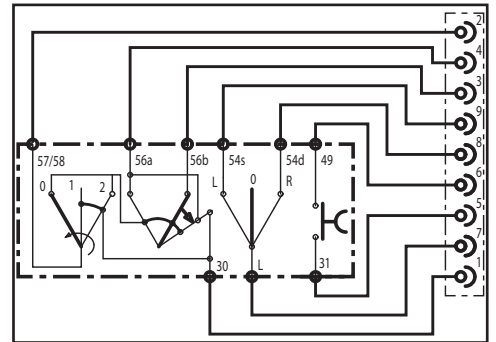
Notes: \_\_\_\_\_

**S440 STEERING LIGHTS COLUMN SWITCH**



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

Corresponding connector



Diagram

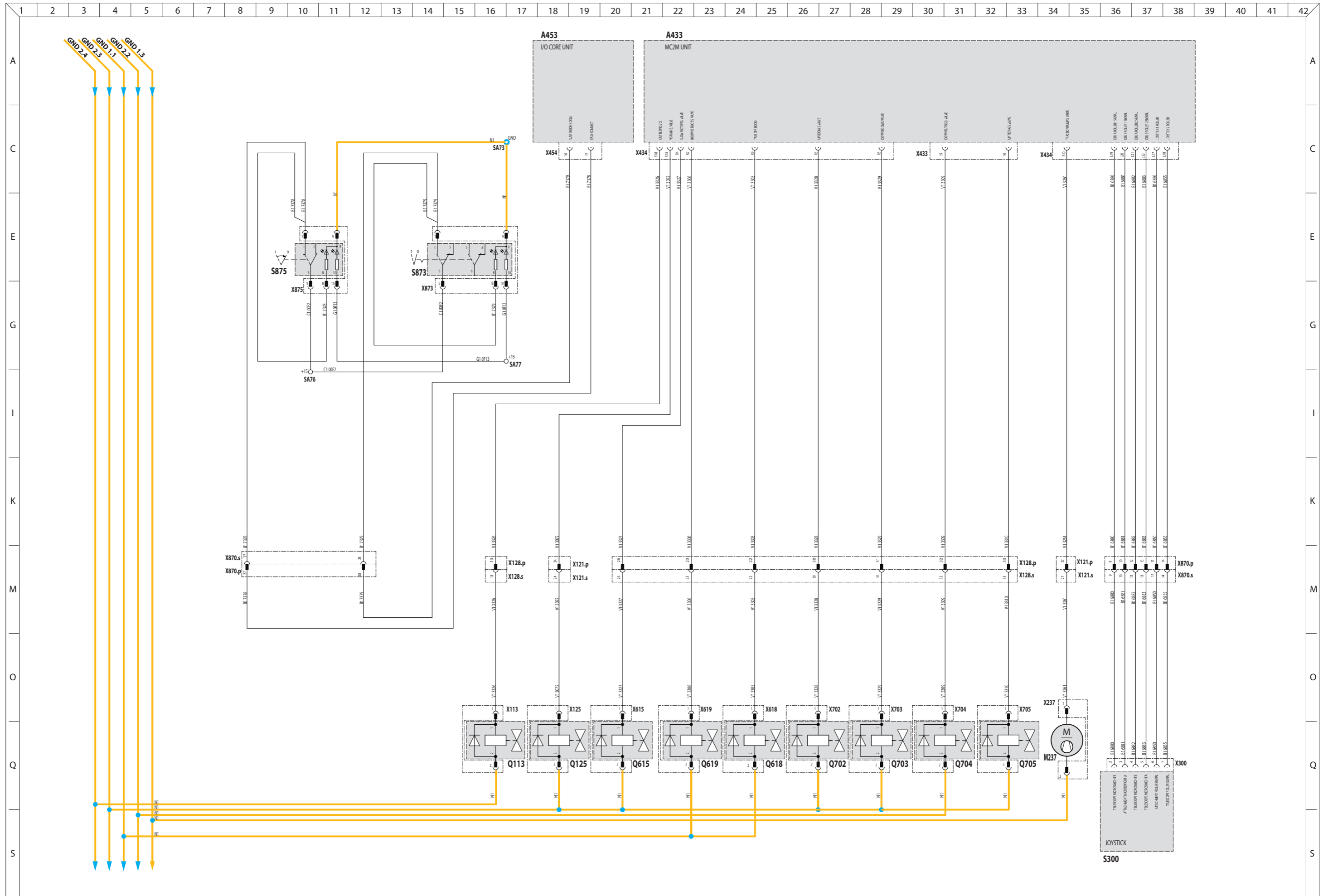
	PIN	Min	Typical	Max
Voltage			12 V	24 V
Consumption			As per outputs	

Note :

Notes: \_\_\_\_\_

Electrical connectors												
Item	Diag. 1	Diag. 2	Diag. 3	Diag. 4	Diag. 5	Diag. 6	Diag. 7	Diag. 8	Diag. 9	Diag. 10	Diag. 11	Diag. 12
X306			√									
X307			√									
X400.1							√					
X400.2							√					
X401.1			√									
X401.2			√									
X402.p							√					
X403.s						√	√					
X404.s							√					
X405.s							√					
X406	√							√				
X407	√					√	√		√			
X408	√	√	√		√	√	√					
X409						√	√		√			
X410	√							√				
X411	√											
X413.p	√											
X413.s	√											
X414	√											
X415		√										
X416					√							
X417							√					
X417.1							√					
X417.2							√					
X419									√			
X420			√									
X421.p									√			
X421.s					√							
X422.s		√										
X423.s		√										
X426.p										√		
X427									√			
X432	√											
X433	√	√	√	√	√			√	√			
X434	√		√	√	√				√			
X435.s		√										
X436.1	√											
X436.2	√											
X437								√				
X438							√					
X439							√					
X440						√						
X441							√					
X442.1					√							
X442.2					√							
X443					√							
X444							√					
X445							√					
X446							√					
X447							√					
X448							√					

Electrical connectors												
Item	Diag. 1	Diag. 2	Diag. 3	Diag. 4	Diag. 5	Diag. 6	Diag. 7	Diag. 8	Diag. 9	Diag. 10	Diag. 11	Diag. 12
X449	√											
X450					√							
X451					√							
X452		√										
X453	√	√	√		√	√						
X454	√		√	√	√	√		√				
X455.p			√									
X455.s			√									
X457	√											
X458						√						
X459						√						
X460		√										
X461.1									√			
X461.2									√			
X463					√							
X464								√				
X465.s									√			
X466	√											
X468						√						
X469						√						
X470								√				
X471.s								√				
X472.p								√				
X473.p	√											
X473.s	√											
X474									√			
X475									√			
X476									√			
X477									√			
X478.s									√			
X480.s						√						
X500			√									
X501			√									
X555.p										√		
X555.s										√		
X604						√						
X605		√										
X615				√								
X618				√								
X619				√								
X700			√									
X701			√									
X702				√					√			
X703				√					√			
X704				√					√			
X705				√					√			
X804.p	√											
X808.p	√											√
X808.s	√											
X837										√		
X838.s										√		

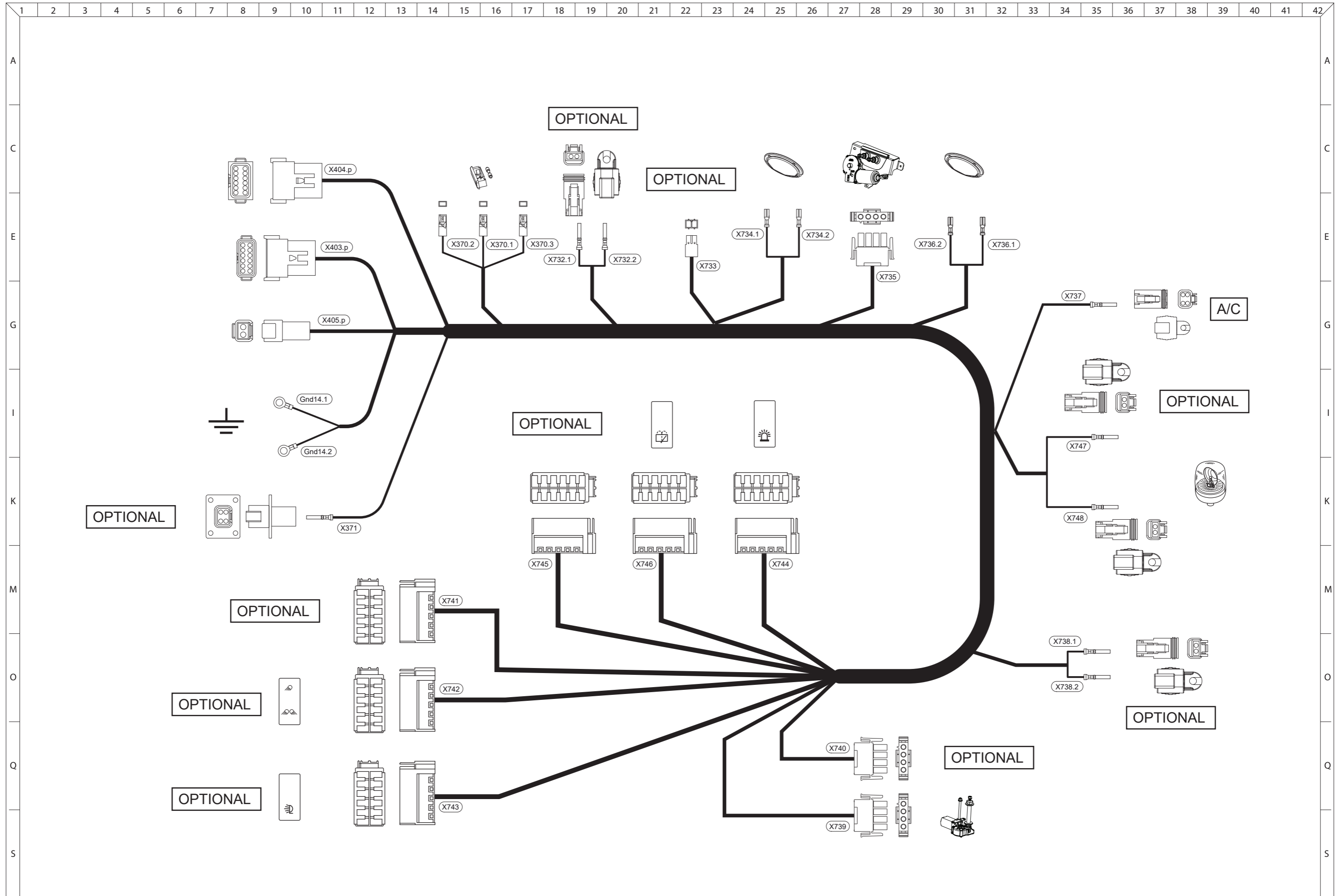




## KEYS

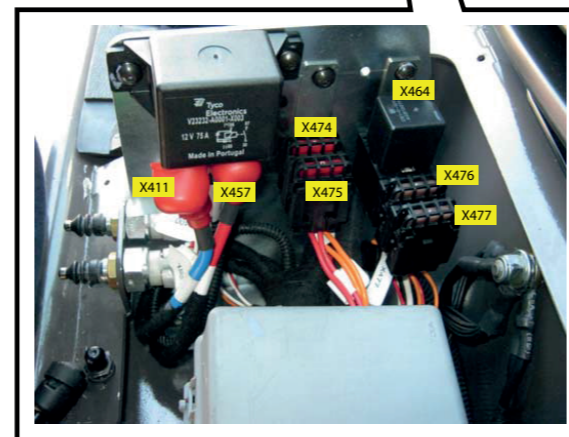
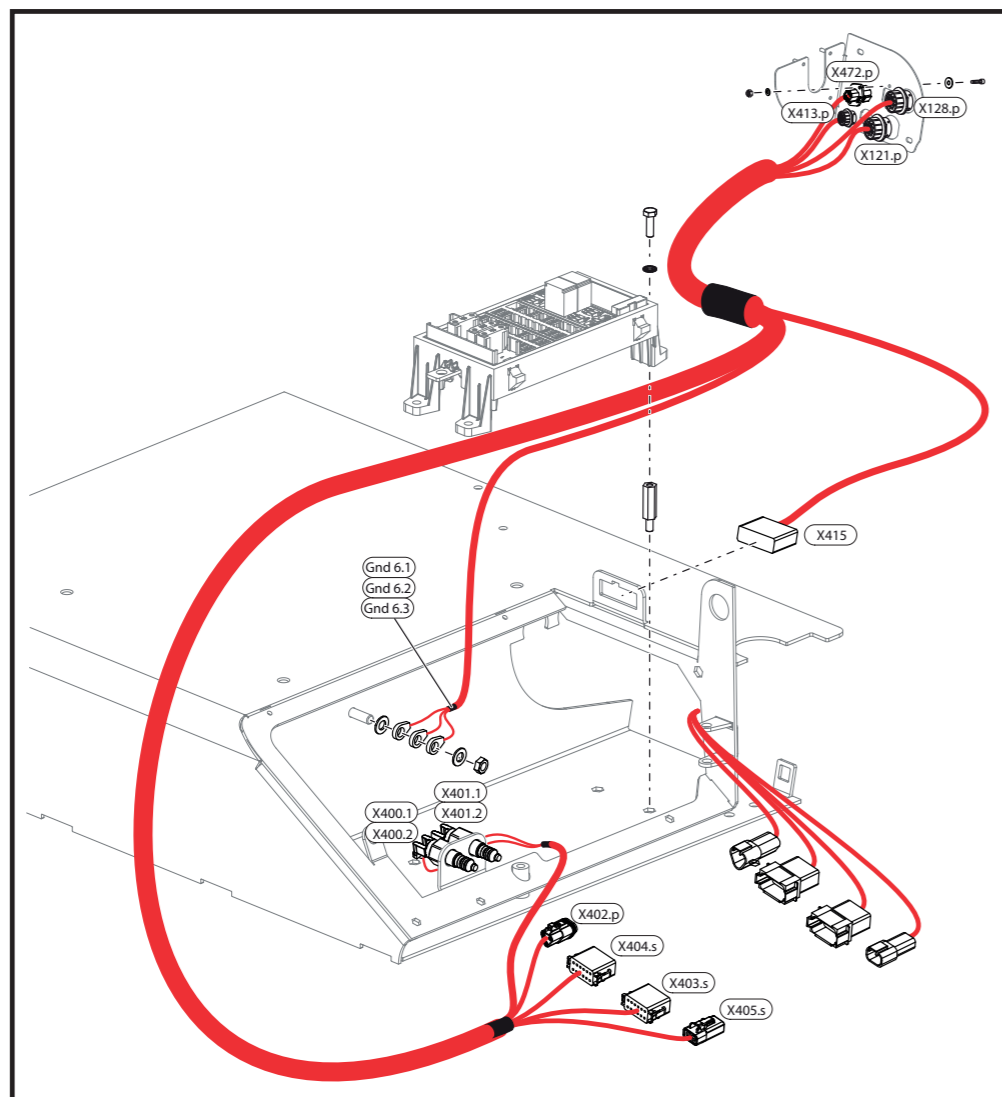
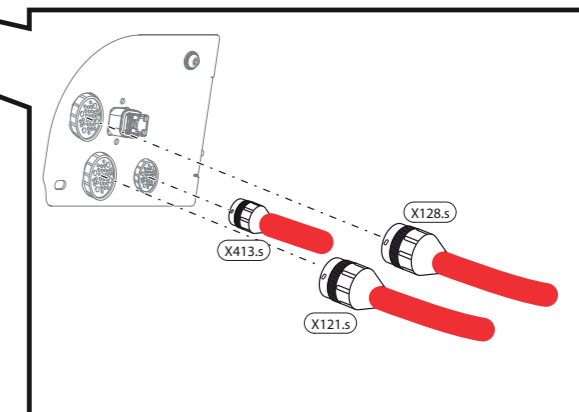
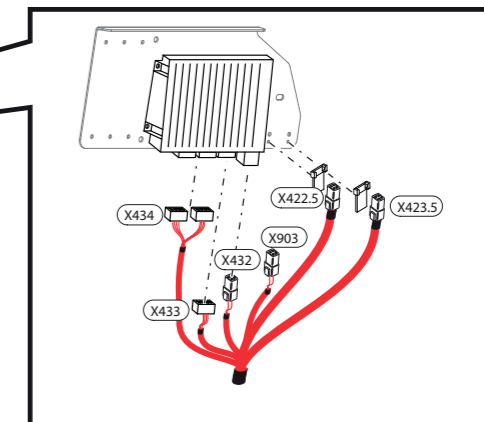
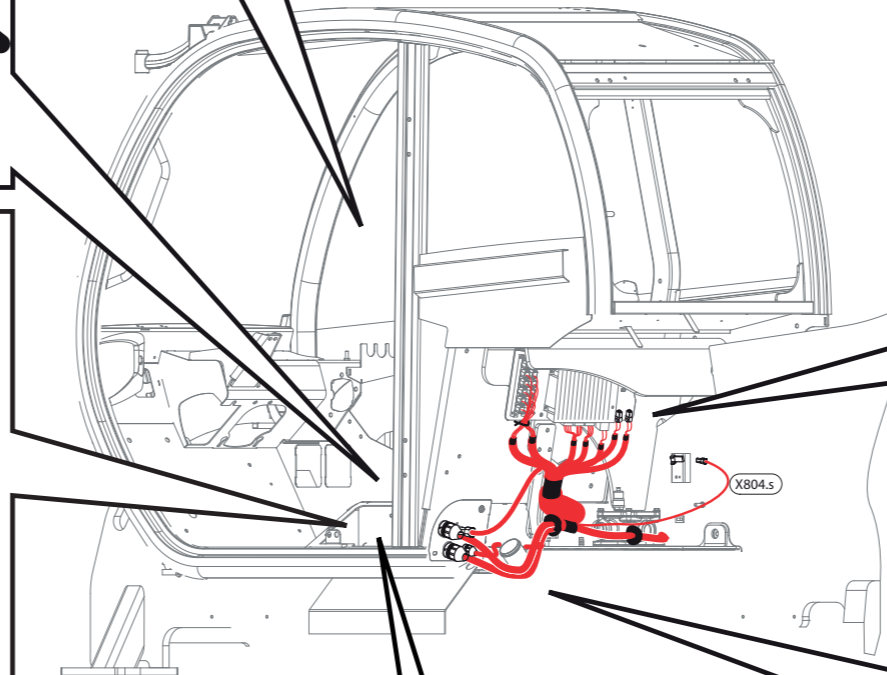
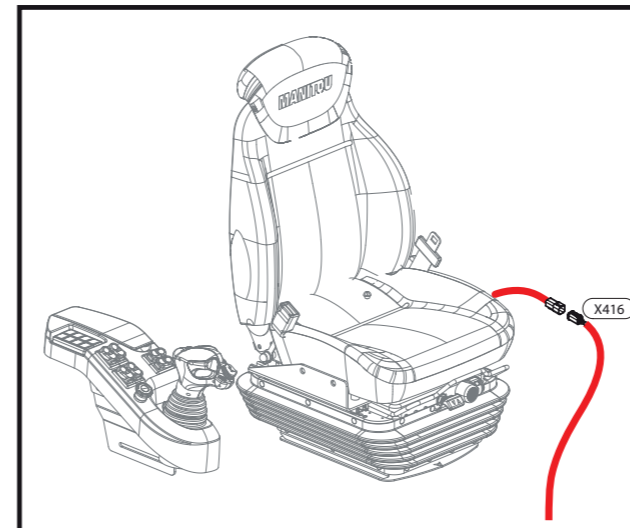
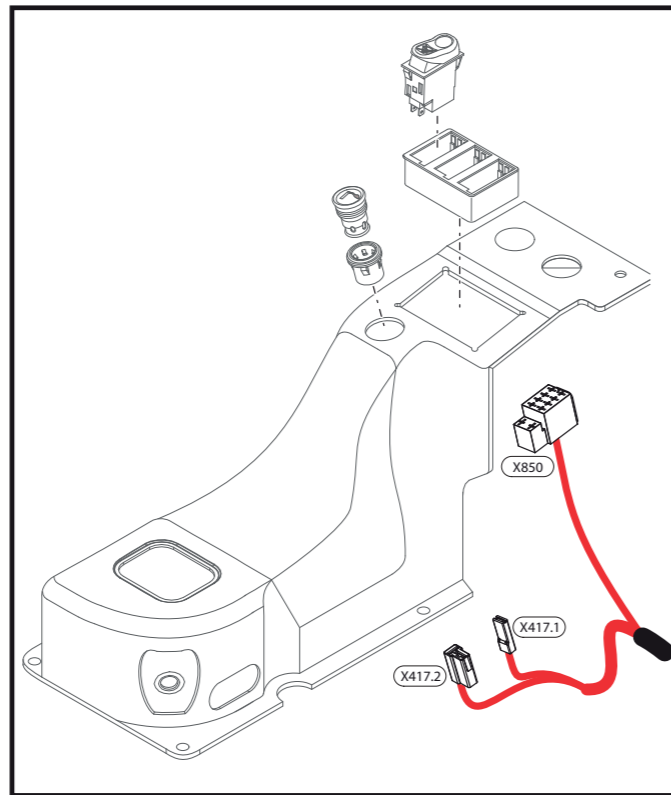
## CONNECTORS

Item	Designation	Position on harness layout												
		Cabin	Chassis	Engine	Cabin Roof	Kit 3b6 + E-Reco	Radio control-Cabin	Radio-Basket boom head	Radio-Basket chassis/Radio control signal	Clamp control cabin	Radio-Clamp boom head	Boom clamp	Optionals	Preheating
EV	Solenoid valve for upper boom cut					O18 / O19								
IMS	Micro maximum up					Q18 / Q19								
M12	Fan motor 1												E36 / E37	
M13	Fan motor 1												C33 / C34	
X1	Rh boom lights												O15	
X2	Lh boom lights												O15 / Q15	
X100	Fan speed regulation solenoid valve connector			K13										
X101	Right front light		K28 / K29 / M28 / M29											
X102	Fan rotation inversion solenoid valve connector			K15										
X103.p	Engine-driver harness interf. connector	I29												
X103.s	Engine-driver harness interf. connector			E17 / E18										
X104.p	Engine-driver harness interf. connector	I30 / I31												
X104.s	Engine-driver harness interf. connector			E13										
X105.1	Horn connector		G18 / G19 / I18 / I19											
X105.2	Horn connector		G20 / I20											
X106	Rear axle alignment sensor connector		O23 / O24											
X107	Stop lights switch connector		O19 / O20											
X108.s	Left front marker light connector	I25												
X109	Fap unit connector			G20 / G21										
X110	Hydraulic oil temperature sensor connector			E27 / E28										
X111	Parking brake solenoid valve connector		O16 / O17											
X112	Front axle alignment sensor connector		I14 / I15 / M21 / M22 / O21 / O22											
X113	Tilting cut-off valve		E16 / E17											
X114.s	1 retract boom switch connector		C20											
X115.s	2 retract boom switch connector		C21 / C22											
X116	Right rear light connector		I21											
X118.s	Trailer interf. connector connector		G25 / G26											
X119	Left rear light connector		I21 / I22											
X120	Reverse speed alarm		A26											
X120.p	Can open									C29 / C30				
X120.s	End j1939 can line resistor									E32				
X121.p	Chassis-driver harness interf. connector	I5												
X121.s	Chassis-driver harness interf. connector		G13 / G14 / I13 / I14											
X123.s	Right front marker light connector		M28 / M29											
X124	Parking brake pressure switch connector		O21											
X125	Vs solenoid valve connector		E24											
X125.s	Y caterpillar joystick connector					C3								
X125A.p	Rfid chassis without basket					O36 / O37						I34 / I35		
X125A.s	Rfid chassis without basket					Q30 / Q31						K30 / K31		
X126.s	Trailer brake kit interf. connector		M26 / O26											
X127	Number plate light connector		C26											



### 3D LOCATIONS

#### CAB HARNESS 1



## FUNCTIONAL DESCRIPTION

### **MC2M**

Is a Master LMI unit.

It is the controller of load cell status and controls machine situation.

Manages the Machine movement.

This Unit is useful to capture the joystick signals, to check the feedbacks from the distributor and other general function.

The LMI unit works by cutting off power when some problems occur

The main functions are:

- ⇒ reading input and control output;
- ⇒ capturing e manage signals from other unit of machine;
- ⇒ interfacing with display TERA7;
- ⇒ interfacing with distributor;
- ⇒ capturing joysticks and command movement;
- ⇒ capturing engine data from canbus;
- ⇒ interfacing with transmission;
- ⇒ LMI function.

### **MIDAC PLUS (LMI)**

Is a Master LMI unit.

It is in charge of managing the pressure transducers and controls machine situation.

The LMI unit works by cutting off power when some problems occur

The main functions are:

- ⇒ reading input and control output;
- ⇒ capturing e manage signals from other unit of machine;
- ⇒ interfacing with display TERA7;
- ⇒ interfacing with distributor;
- ⇒ LMI function.

### **IO-CORE (TERA 7)**

Is a slave unit Useful to read and active output.

It is in charge of the management of the cabin lights and buttons (dashboard).

The main functions are:

- ⇒ reading input and controlling output;
- ⇒ communicating with other unit of machine;
- ⇒ interfacing with display TERA7.

# DOWNLOADING THE XENTRY STARTKEY ONLINE

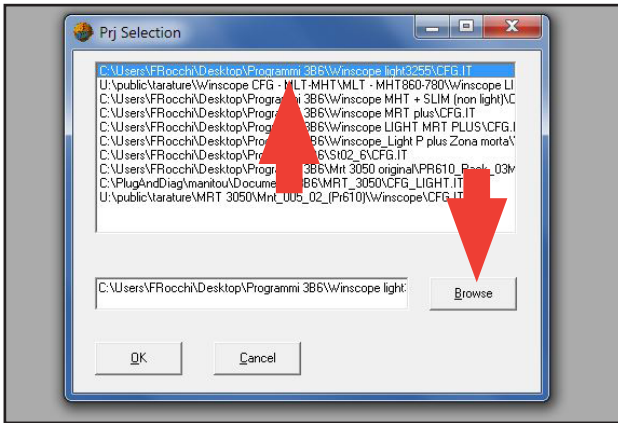


Fig. D

Again select "Utils" then "Project Selection".

Using the "Browse" key select the "WinScope Light XXX" folder (XXX = machine model) on your device, and select file "CFG.IT" (Fig. D).

The "WinScope Light XXX" folder with its contents can be sent by email.

Press "Ok" to confirm.

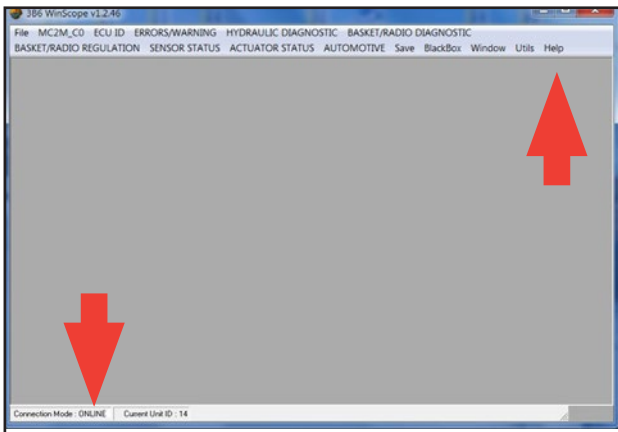


Fig. E

Check (bottom LH) to make sure the Connection Mode status is "ON LINE" (Fig. E).

If it is "OFFLINE", select "Unit" and then "ON LINE".

It is not necessary to use a password to check for the presence of errors on the forklift truck.

The password is only required for adjusting the forklift truck speed.

The password is only provided after the technician has attended a specific course concerning a specific machine model.

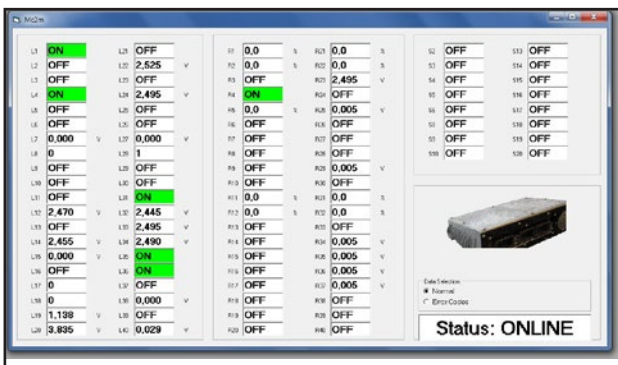


Fig. F

Menu available:

ECUs: select the boards for checking the inputs and outputs of a forklift truck (Fig. F).

ID	Par	T1	Value	Um	ECU ID
0	v555		102		MIDAC+C0 Software Vrs. Unit 6
1	v588		100		MIDAC+C1 Software Vrs. Unit 7
2	v555		102		MC2M_T0 Software Vrs. Unit 14
3	v591		0		MC2M_T1 Software Vrs. Unit 13
4	v555		100		MC2M_C0 Software Vrs. Unit 12
5	v555		100		MC2M_C1 Software Vrs. Unit 11
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					

Fig. G

ECUs ID: check the program versions of each board (Fig. G).

## 3B6 TROUBLESHOOTING

### ALARM CODE



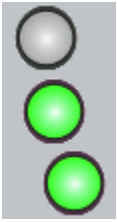

ALARM CODE	
Code	Description
1	MCT: E2Prom Alarm
2	MCT: Crc Error in program Flash
21	MCT: Error on close boom microswitch
22	MCT Boom angle: due to A-B
23	MCT Boom angle: error on signal B
24	MCT Boom angle: error on signal A
25	MCT Joystick: Error on optional Roller command
26	MCT Joystick: Error on extend boom Roller
27	MCT: Error optional continuous mode
28	MCT joystick: time out from PDO2
29	MCT Joystick: Lifting error (Y Axis)
30	MCT Joystick: Swing error (X Axis)
31	MCT Cell: error on signal 1
32	MCT Cell: error on signal 2
33	MCT Cell: error on signal due to 1-2
34	MCT Cella: Time out from Cell 1
35	MCT Cella: Time out from Cell 2
36	MCT Tera: Time out from Tera7
39	MCT: timeout can bus from Tera7/loCore1 [1]
40	MCT: timeout can bus from Tera7/loCore2 [1]
46	Can bus timeout from Tools Recognition
55	Exhaust Fluid tank
58	Switch err. Stabilize front left:Congruency
59	Switch err. Stabilize front right:Congruency
60	Due to [Rear left axle valve unlocked]
61	Due to [Rear right axle valve unlocked]
64	MCT: timeout can bus from Midac Lmi
65	MCT: timeout can bus from Midac Stab
66	MCT: timeout can bus da Midac Nav
68	MPS: E2Prom Alarm
70	MPS: Error on pin J04
71	MPS: Error on pin J05
72	MPS: Error on pin J06
73	MPS: Error on pin J07
74	MPS: Error on pin J08
75	MPS: Error on pin J09
76	MPS: Error on pin J10
77	MPS: Error on pin J11
78	MPS: Error on pin J12
79	MPS: Error on pin J23
80	MCT slave: E2Prom Alarm
81	MCT slave: Crc Error in program Flash
82	MCT slave: Data Error in program
83	MCT slave: Error on Cell 1 signal
84	MCT slave: Error on Cell 2 signal

ALARM CODE	
Code	Description
85	MCT slave: Error on Angle 1 signal
86	MCT Fault: calibration NOT done
90	MCT cell: due to 1 between the two CPU
91	MCT cell: due to 2 between the two CPU
92	MCT Boom angle: due to A between the two CPU
93	MCT Boom angle: due to B between the two CPU
94	MCT: congruency [Radio safety]
95	MCT: congruency [Basket connected]
96	MCT: congruency [Basket overload switch]
97	MCT: congruency [Basket lock switch]
98	MCT: Low Battery [Radio]
99	MCT: Rx/Tx Connection [Radio]
100	MCT: Error on pin R03
101	MCT: Error on pin R04
102	MCT: Error on pin R05
103	MCT: Error on pin R06
104	MCT: Error on pin R07
105	MCT: Error on pin R08
106	MCT: Error on pin R09
107	MCT: Error on pin R10
108	MCT: Error on pin R13
109	MCT: Error on pin R14
110	MCT: Error on pin R15
111	MCT: Error on pin R16
112	MCT: Error on pin R17
113	MCT: Error on pin R18
114	MCT: Error on pin R19
115	MCT: Error on pin R20
116	MCT: Error on pin S02
117	MCT: Error on pin S04
118	MCT: Error on pin S05
119	MCT: Error on pin S06
120	MCT: Error on pin S08
121	MCT: Error on pin S09
122	MCT: Error on pin S10
123	MCT: Error on pin S13
124	MCT: Error on pin S14
125	MCT: Error on pin S15
126	MCT: Error on pin S16
127	MCT: Error on pin S17
128	MCT: Error on pin S18
129	MCT: Error on pin S19
130	MCT: Error on pin S20
131	Machine overspeed
133	Error on feedback of Boom lift valve

**ANGLE AND LENGTH CALIBRATION** (available on machine equipped with strain gauge system)

The calibration is made of three points, you can move up and down or confirm calibration points with the keys.

Your position on the calibration is shown by the blinking green led (first three leds).

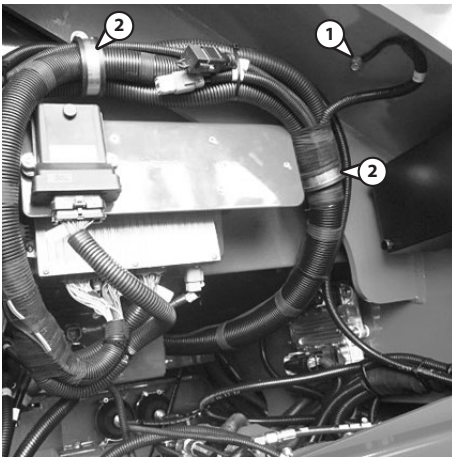
CONDITION	DESCRIPTION	HELP BOX
	First point represents the angle minimum point.	 <p>Boom closed and low</p>
	Second point represents the angle maximum point and the minimum point for the load cell.	 <p>Boom closed and high</p>

## **DRIVER'S CAB**

**- DRIVER'S CAB COMPONENTS LOCATION**

**- DRIVER'S CAB REMOVAL**

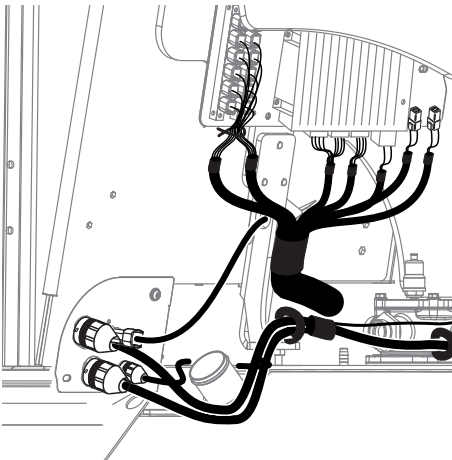




### **DISCONNECT THE CAB ELECTRICAL SYSTEM**

Disconnect the ground cab cables (Ref. 1) on the frame under the cab.

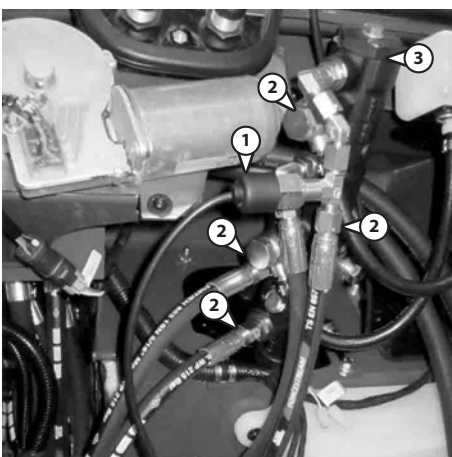
Remove all the clips (Ref. 2) holding the cables of the cab electrical systems.



Disconnect the electric connectors connecting to the frame line.



Disconnect the electric connectors on the control unit.



### **DISCONNECT THE CAB HYDRAULIC SYSTEM**

Remove the electric connectors (Ref. 1) and the hydraulic hoses (Ref. 2) from the brake pump (Ref. 3) located at the front of the cab.

# FRAME - BODY

## *- FRAME - BODY REMOVAL*



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