

# ***TECHNICAL TRAINING***

## ***DIAGNOSTIC LEVEL II***



***All Compact – Optimum  
Compact RTE***

## How to use this document?

**MAINTENANCE AND REPAIR OPERATIONS ON YOUR HAULOTTE MACHINE  
MUST BE DONE ONLY BY TRAINED, EXPERIENCED AND AUTHORIZED TECHNICIANS**

*You have between the hands the summary given during the HAULOTTE technical training . It will enable you to find information necessary for the maintenance and the repair of your HAULOTTE machine.*

*Thanks to the guide below you will reach the required chapter quickly.*

### **Chapter 1: Main features and functions**

It is a resume of the information contained in the user manual delivered with the machine: components, overall dimensions, working zones, commands, etc...

### **Chapter 2: Study of the electric schematics**

You will find there the elements as following:

- A summary of the standardized symbols used by HAULOTTE Group
- The complete wiring diagram of the studied model
- The non exhaustive list of the electric looms and electronic boards
- Localization of the main safety units (tilt , limit switches, sensors,transducers...)
- Logical equations of operation: by function, to diagnose the main dysfunctions

### **Chapter 3: Study of the hydraulic schematics**

You will find there the elements as following:

- a summary of the standardized symbols used by HAULOTTE Group
- the complete hydraulic diagram of the studied model
- the non exhaustive list of the hoses track
- a localization of the main hydraulics manifold (proportional block , on/off movements block,)

### **Chapter 4: Adjustments**

This is the adjustments and calibrations, hydraulics and electric, necessary for the good maintenance of the material. You will find as well the methods of adjustment with table values.

### **Chapter 5: Guide of breakdown**

Quick summary of the step to be followed for possible sources of breakdown.

In case of any defect or any dysfunction you will be able to identify the elements in question, whatever they are electric or hydraulic.

### **Chapter 6: Summary of the versions**

This manual treats of the latest version, however this summary table enables you to find the former versions of the material (electric and hydraulics).

### **Chapter 7: Special functions**

This chapter gathers all the functions and specific adjustment in order to carry out on the machine. This does not exist for all the models and depends on the studied model.

It must be the subject of a special attention because an intervention badly carried out can deteriorate the good performance of the machine and thus consequently the safety of the users. On this chapter, some special adjustment (sensors) are also explained prior to calibration (depends on the model)

Only a technician HAULOTTE or approved by HAULOTTE Services is able to carry out this kind of intervention.

### **Chapter 8: Compact RTE**

This chapter treats on C10RTEcompact 10 and 12RTE newest models equipped with node B2 module and outriggers.

### **Chapter 9 List of schematics**

This chapter lists all versions of schematics (electric and hydraulic) and some layout if required

## REVISION

Revision	Edition	Subject	Created by	Validated by	Modified by	Translated by	Language
00	05-07	Creation	MGD	FRE		External companies	FR/EN/D
01	03-12	Add C14 model + MK6 bloc			MGD	MGD	FR/EN/SP
02	07-13	Add newest parameters on compact models + RTE models		MGD	PUS	PUS	EN
03	12-13	Add console Diag pad	MGD	R&D	MGD	MGD	EN
04	02-14	Add chapter schematics			MGD		EN
05	07-14	Update newest alarm code with Diag PAd			MGD		EN

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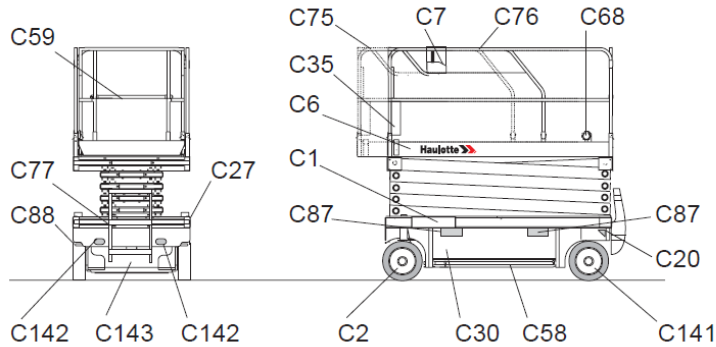
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# 1. MAIN FEATURES AND FUNCTIONS

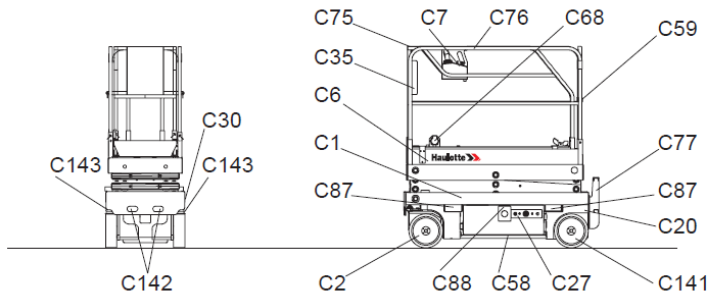
## 1.1. CHARACTERISTICS

### 1.1.1. MAIN COMPONENTS

COMPACT 8 (COMPACT 2032E) - COMPACT 8W (COMPACT 2247E) - COMPACT 10N (COMPACT 2632E) - COMPACT 10 (COMPACT 2747E) - COMPACT 12 (COMPACT 3347E) - COMPACT 14 (COMPACT 3947E) - Major Component Location Diagram



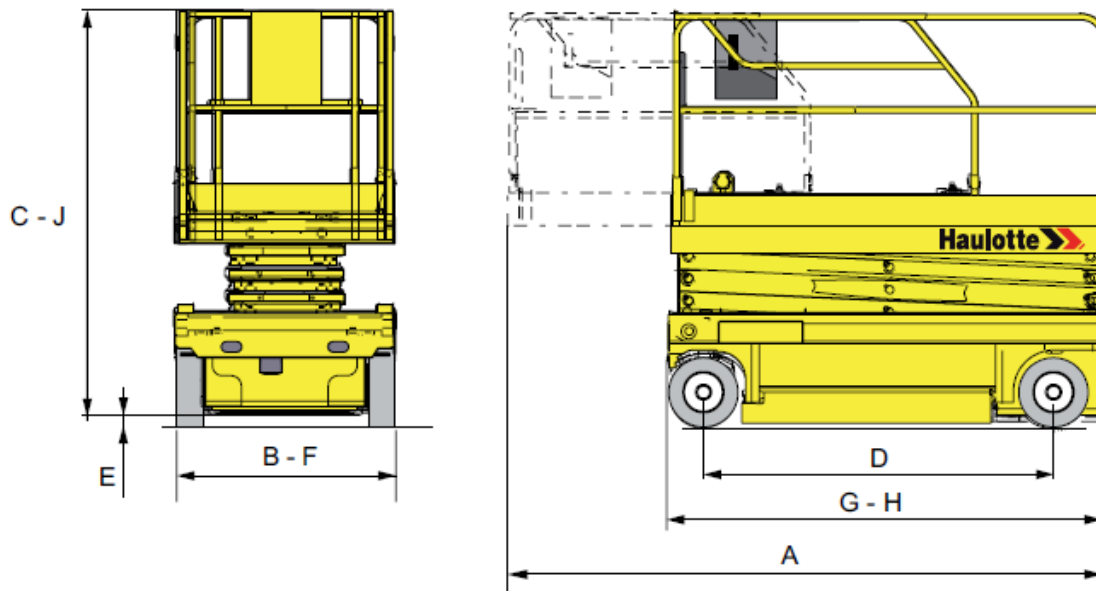
OPTIMUM 6 (OPTIMUM 1530E) - OPTIMUM 8 (OPTIMUM 1930E) - Major Component Location Diagram



Marking	Description
C1	Chassis
C2	Front driven steering axle
C6	Platform
C7	Platform control box
C20	Tie-down (and/or lifting) points
C27	Ground control box
C30	Hydraulic oil tank
C35	Document holder
C58	Pothole protection
C59	Hinged midrail
C68	Electric socket(Option)
C75	Extension
C76	Guardrail
C77	Platform access ladder
C87	Position of the lift truck forks
C88	Battery drawer lock
C141	Rear wheel
C142	Machine anchorage point
C143	Battery drawer

## 1.1.2. OVERALL DIMENSIONS

General diagram COMPACT 8 (COMPACT 2032E)-COMPACT 8W (COMPACT 2247E)-COMPACT 10N (COMPACT 2632E)-COMPACT 10 (COMPACT 2747E)-COMPACT 12 (COMPACT 3347E)-COMPACT 14 (COMPACT 3947E)-OPTIMUM 6 (OPTIMUM 1530E)-OPTIMUM 8 (OPTIMUM 1930E)



Overall dimension specifications

Marking	COMPACT 8 (COMPACT 2032E)		COMPACT 8W (COMPACT 2247E)	
	Mètre	Feet Inch	Mètre	Feet Inch
A	3,40	11 ft 1 in	3,40	11 ft 1 in
B	0,80	2 ft 7 in	1,20	3 ft 11 in
C	1,99	6 ft 6 in	2,14	7 ft
D	1,86	6 ft 1 in	1,86	6 ft 1 in
E	0,13	0 ft 5 in	0,13	0 ft 5 in
F x G	2,30 x 0,80	7 ft 6 in x 2 ft 7 in	2,30 x 1,20	7 ft 6 in x 3 ft 11 in
H	2,30	7 ft 6 in	2,30	7 ft 6 in
J	1,99	6 ft 6 in	2,14	7 ft

Overall dimension specifications

Marking	COMPACT 10N (COMPACT 2632E)		COMPACT 10 (COMPACT 2747E)	
	Mètre	Feet Inch	Mètre	Feet Inch
A	3,40	11 ft 1 in	3,40	11 ft 1 in
B	0,80	2 ft 7 in	1,20	3-11
C	2,18	7 ft 1 in	2,26	7 ft 5 in
D	1,86	6 ft 1 in	1,86	6 ft 1 in
E	0,13	0 ft 5 in	0,13	0 ft 5 in
F x G	2,30 x 0,80	7 ft 6 in x 2 ft 7 in	2,30 x 1,20	7 ft 6 in x 3 ft 11 in
H	2,30	7 ft 6 in	2,30	7 ft 6 in
J	2,18	7 ft 1 in	2,26	7 ft 5 in

Overall dimension specifications

Marking	COMPACT 12 (COMPACT 3347E)		COMPACT 14 (COMPACT 3947E)	
	Mètre	Feet Inch	Mètre	Feet Inch
A	3,40	11 ft 1 in	3,40	11 ft 1 in
B	1,20	3 ft 11 in	1,20	3 ft 11 in
C	2,38	7 ft 9 in	2,50	7 ft 9 in
D	1,86	6 ft 1 in	1,86	6 ft 1 in
E	0,13	0 ft 5 in	0,13	0 ft 5 in
F x G	2,30 x 1,20	7 ft 1 in x 3 ft 11 in	2,30 x 1,20	7 ft 1 in x 3 ft 11 in
H	2,30	7 ft 6 in	2,30	7 ft 6 in
J	2,38	7 ft 9 in	2,50	7 ft 9 in

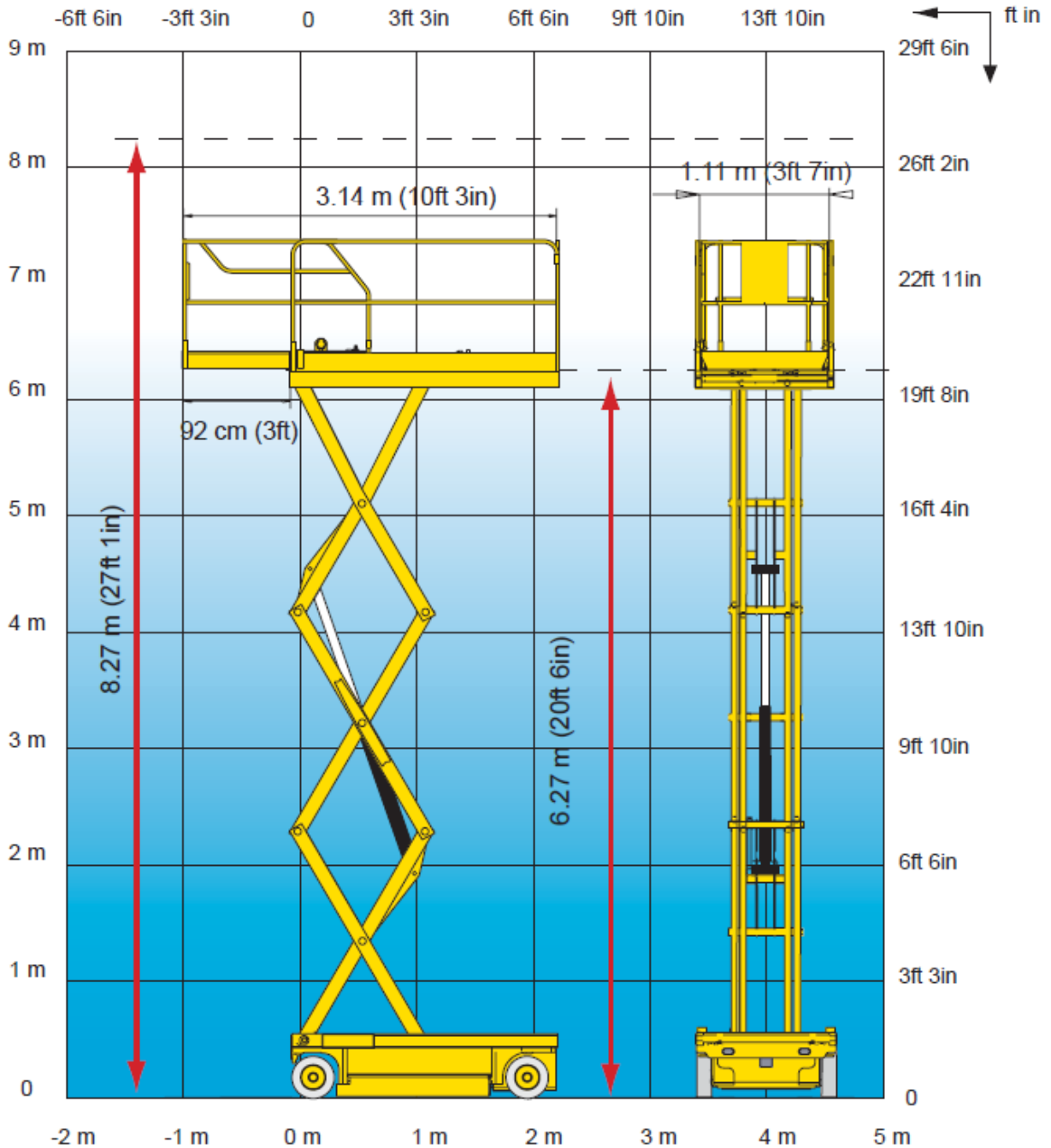
Overall dimension specifications

Marking	OPTIMUM 6 (OPTIMUM 1530E)		OPTIMUM 8 (OPTIMUM 1930E)	
	Mètre	Feet Inch	Mètre	Feet Inch
A	2,80	9 ft 2 in	2,80	9 ft 2 in
B	0,76	2 ft 5 in	0,76	0 ft 29 in
C	1,90	6 ft 2 in	1,99	6 ft 6 in
D	0,13	0 ft 5 in	0,13	4 ft 6 in
E	0,80	2 ft 7 in	0,80	0 ft 3 in
F x G	1,73 x 0,68	5 ft 8 in x 2 ft 2 in	1,73 x 0,68	5 ft 8 in x 6 ft 2 in
H	1,73	5 ft 8 in	1,73	5 ft 8 in
J	1,90	6 ft 2 in	1,99	6 ft 6 in

### 1.1.3. WORKING ZONES

#### 3.2 - MACHINE C8W (COMPACT 2247E)

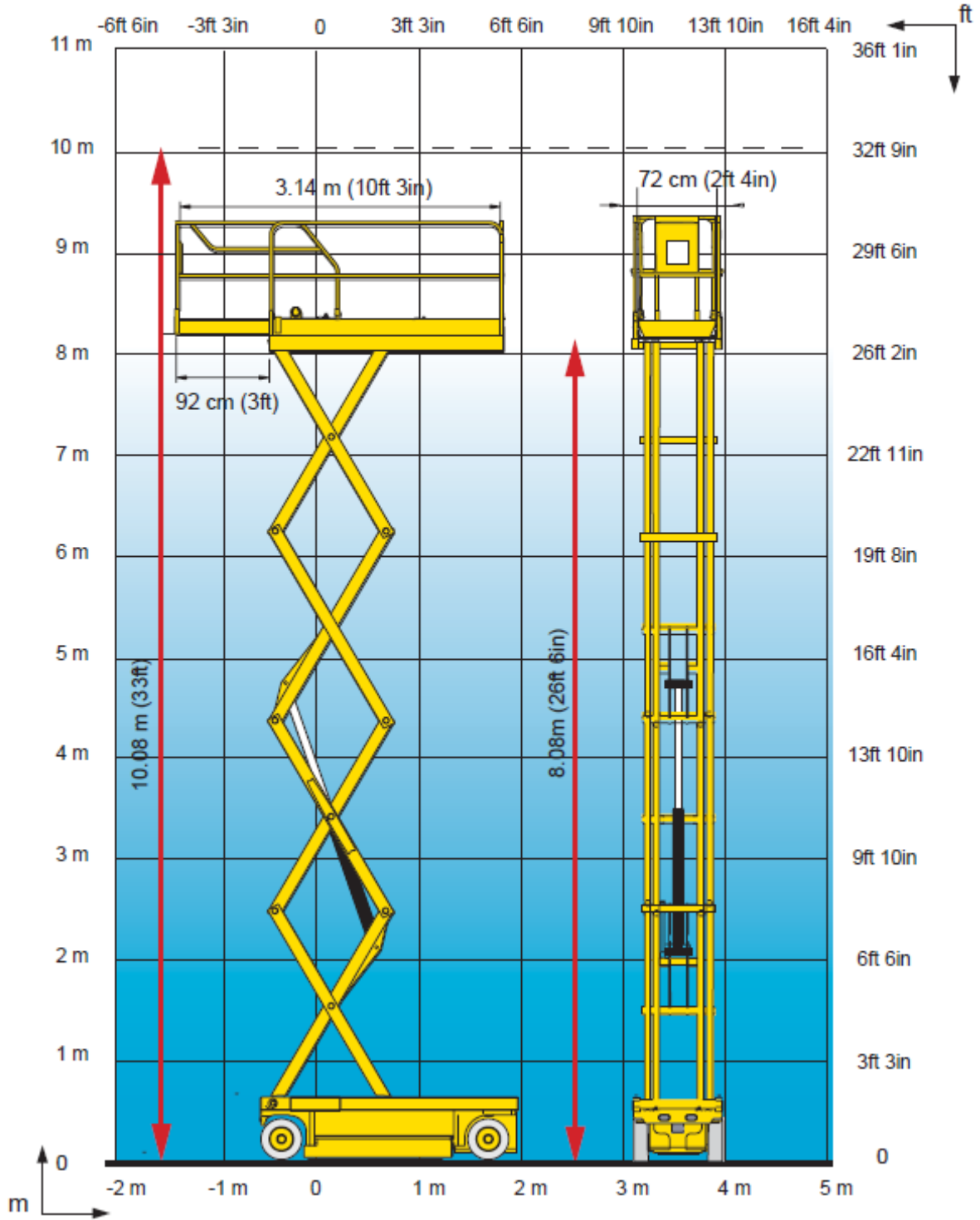
Working area





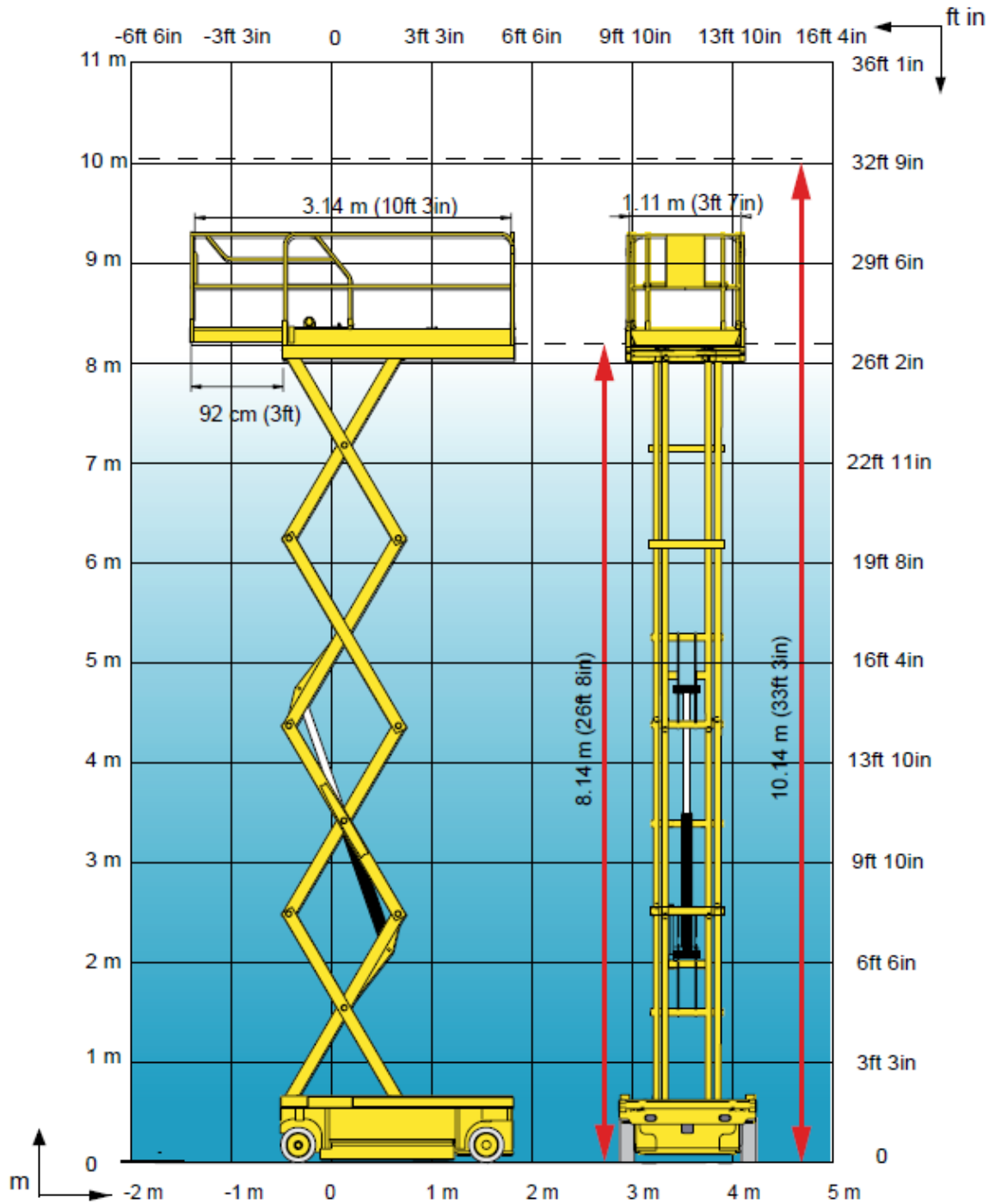
**3.3 - MACHINE C10N (COMPACT 2632E)**

Working area



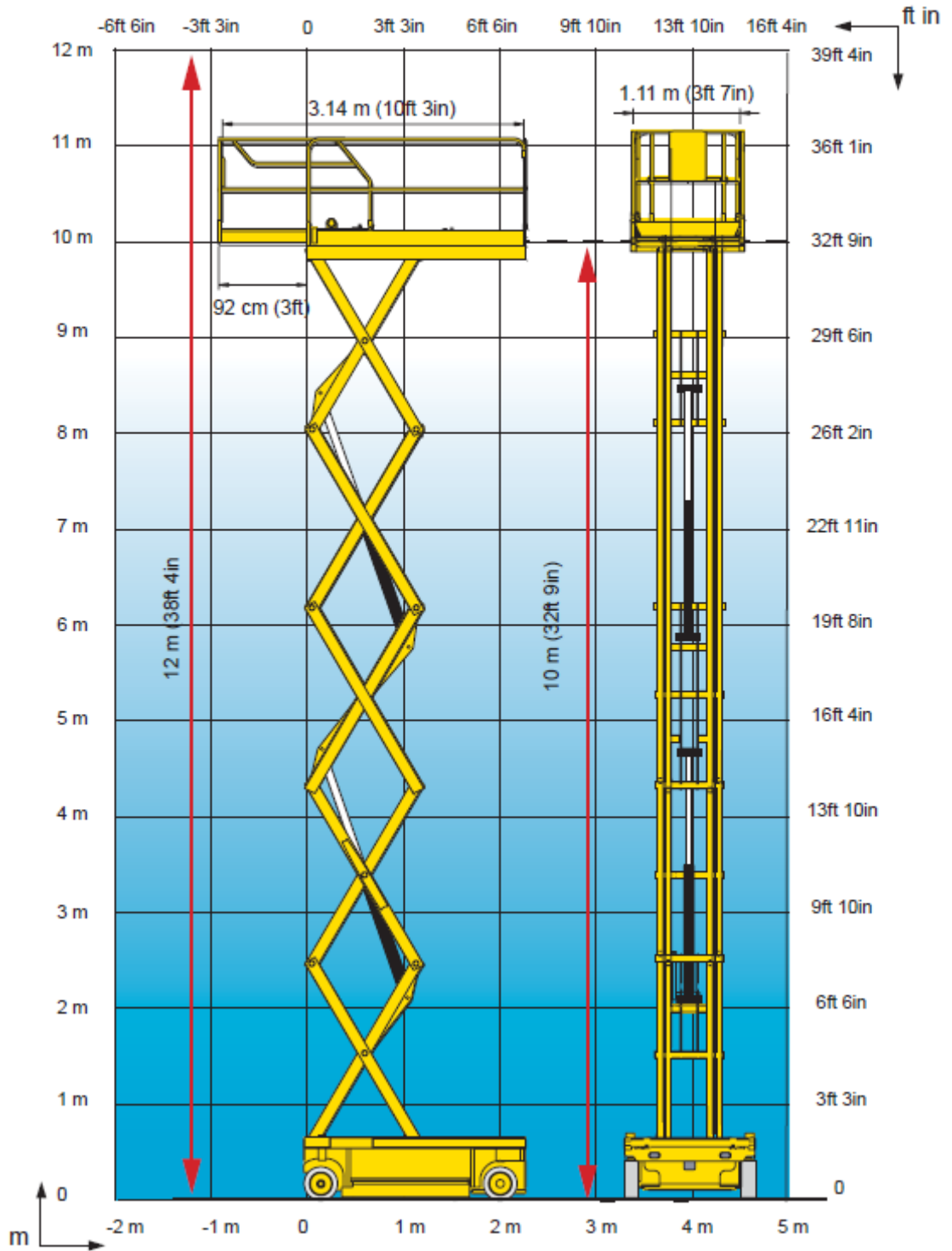
**3.4 - MACHINE C10 (COMPACT 2747E)**

Working area



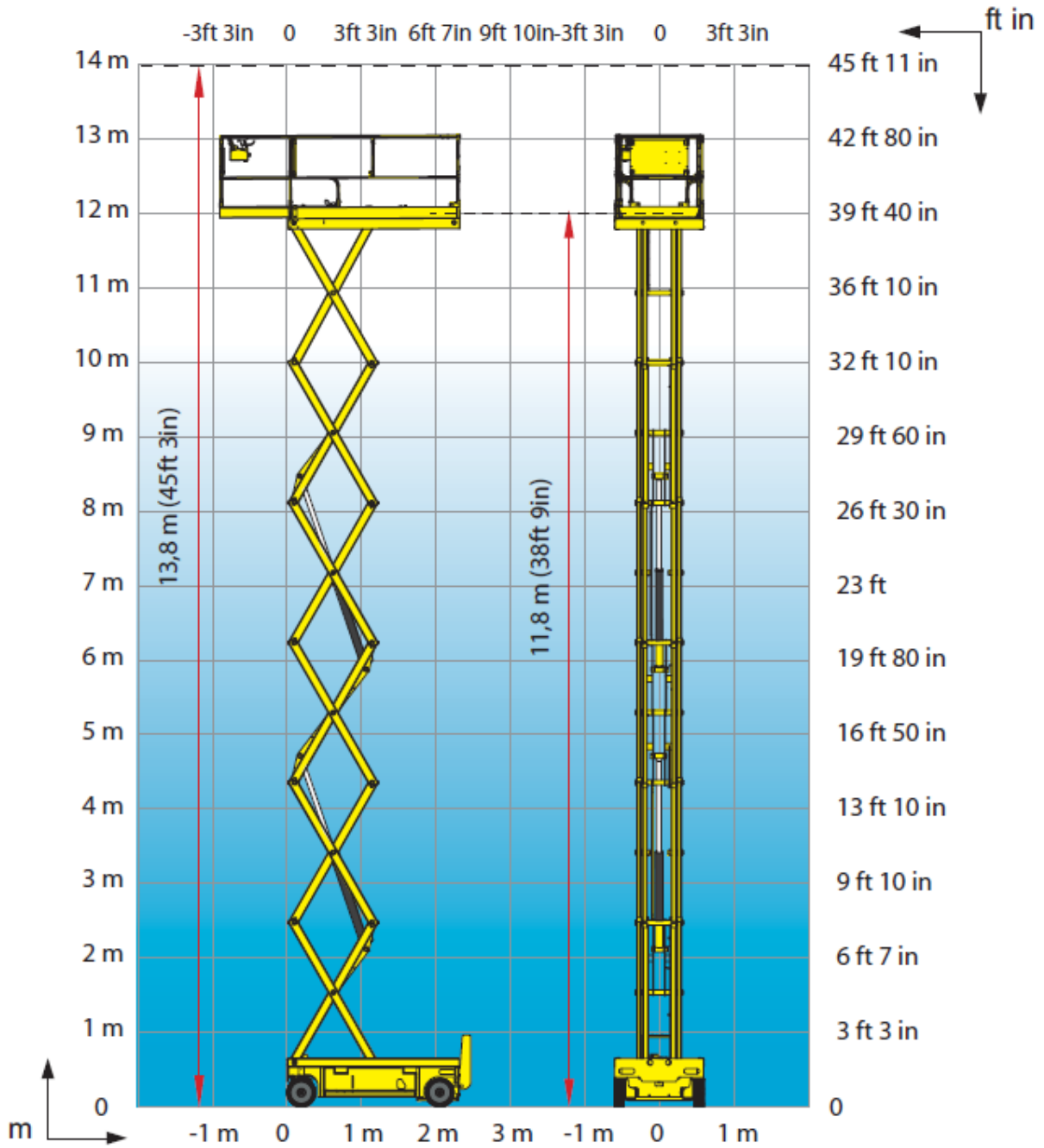
**3.5 - MACHINE C12 (COMPACT 3347E)**

Working area



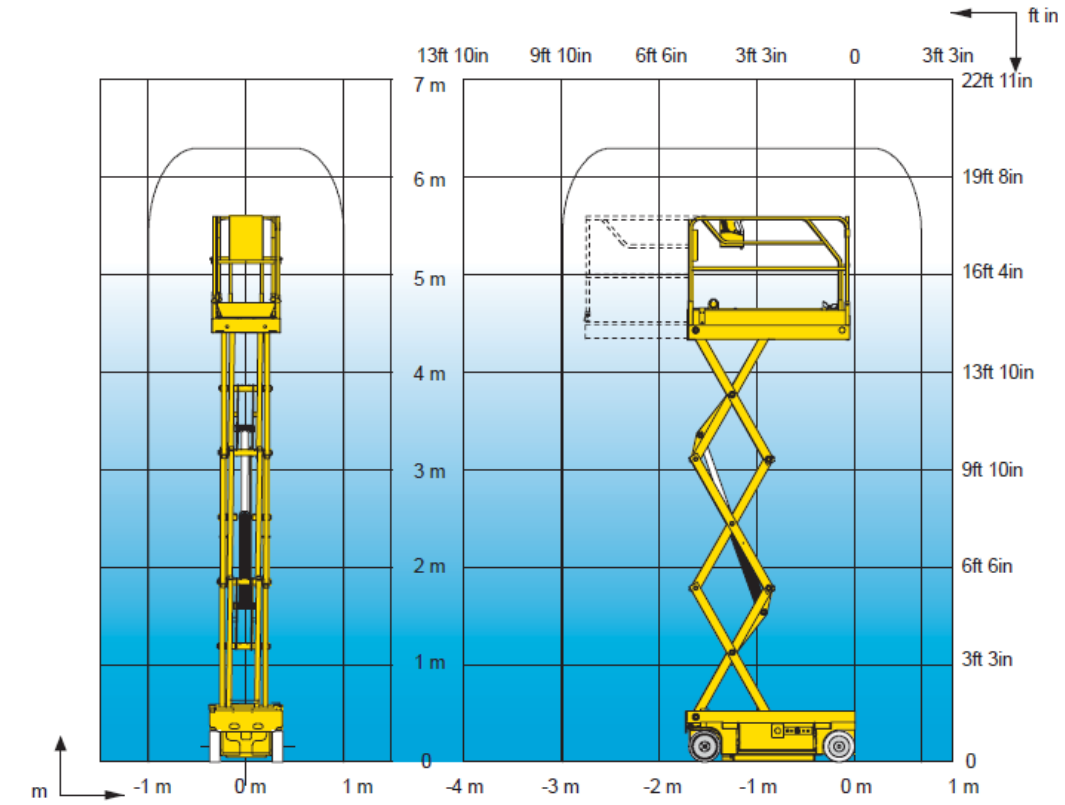
**3.6 - MACHINE C14 (COMPACT 3947E)**

Working area



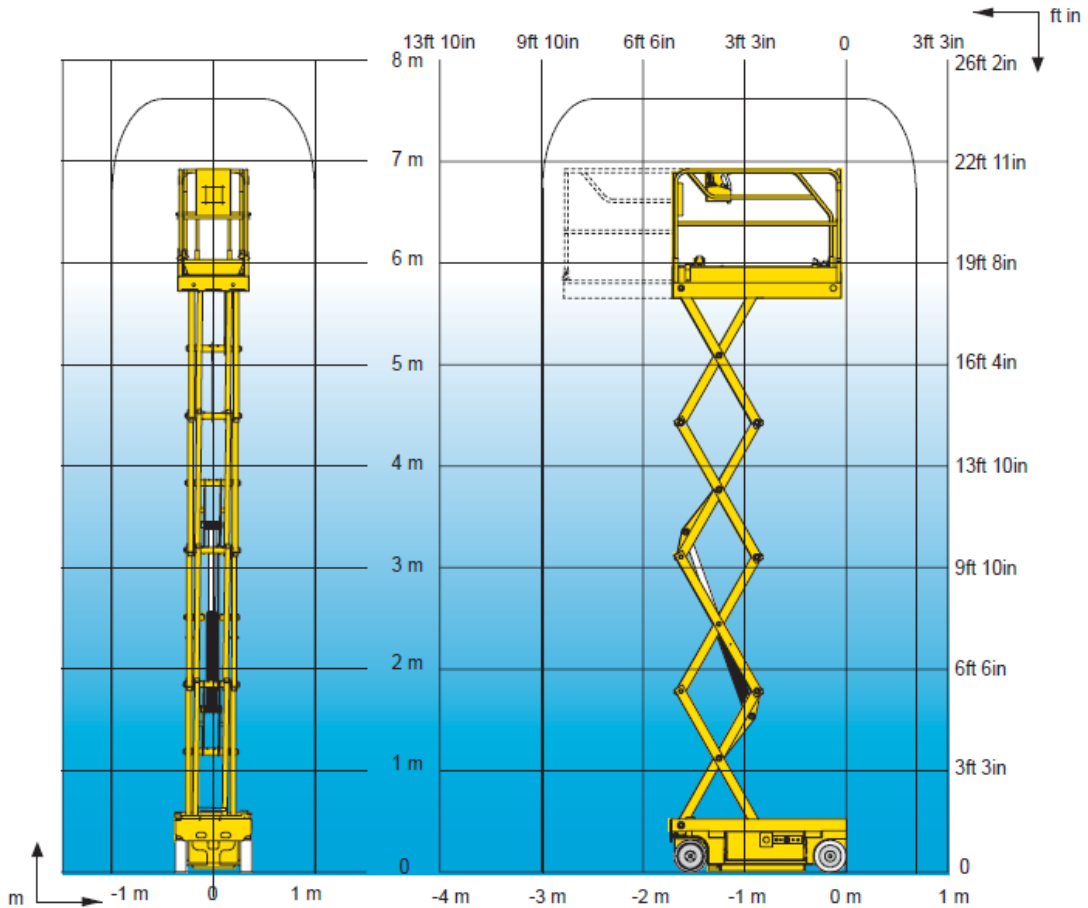
**3.7 - MACHINE OPTIMUM 6 (OPTIMUM 1530E)**

Working area




**3.8 - MACHINE OPTIMUM 8 (OPTIMUM 1930E)**


Working area









### 1.1.4. MAIN DATAS

Machine Characteristics	COMPACT 8W		COMPACT 2047E	
	Metric	Imperial	Metric	Imperial
Length of machine in stowed position	2,45 m	(8 ft 0 in)	2,45 m	(8 ft 0 in)
Width of the machine in stowed position	1,20 m	(3 ft 11 in)	1,20 m	(3 ft 11 in)
Platform length	3,22 m	(10 ft 7 in)	3,22 m	(10 ft 7 in)
Number of extensions	1			
Machine height	2,14 m	(7 ft 0 in)	2,14 m	(7 ft 0 in)
Maximum ground clearance	0,13 m	(0 ft 5 in)	0,13 m	(0 ft 5 in)
Transport height	1,28 m	(4 ft 2 in)	1,28 m	(4 ft 2 in)
Maximum work height	8,25 m	(27 ft 1 in)	8,25 m	(27 ft 1 in)
Maximum platform height	6,25 m	(20 ft 6 in)	6,25 m	(20 ft 6 in)
Platform width	1,20 m	(3 ft 11 in)	1,20 m	(3 ft 11 in)
Platform length	2,30 m	(7 ft 6 in)	2,30 m	(7 ft 6 in)
Outer turning circle	2,50 m	(8 ft 2 in)	2,50 m	(8 ft 2 in)
Inner turning circle	0,20 m	(0 ft 7 in)	0,20 m	(0 ft 7 in)
Distance between centres of the wheels	1,86 m	(6 ft 1 in)	1,86 m	(6 ft 1 in)
Rated slope ANSI - CSA			0 °	
Slope warning ANSI - CSA			2 °	
Total weight	1950 kg	(4300 lb)	1950 kg	(4300 lb)
Maximum platform load	450 kg	(992 lb)	450 kg	(992 lb)
Recommended load capacity when extended	150 kg -	(331 lb) -	150 kg -	(331 lb) -
Manual lateral effort	445 N	100 lbs	445 N	100 lbs
Maximum number of persons on the platform	3			
	 Section C 4.1.1 Specific labels COMPACT 8W (COMPACT 2247E)			
Power source	24 V			
Additional power source	255 Ah			
Hydraulic tank capacity	25 l	(7 gal US)	25 l	(7 gal US)
Starter battery	24 V-250 Ah			
Maximum climbable slope	23 %			
Type of tyres	15 x 5 - No Marking			
Platform elevation time (when empty)	44 s			
Platform lowering time (when empty)	56 s			
Low drive speed	1 km/h (N/A mph)	N/A km/h (0,6 mph)	1 km/h (N/A mph)	N/A km/h (0,6 mph)
High drive speed	3,5 km/h (N/A mph)	N/A km/h (2,2 mph)	3,5 km/h (N/A mph)	N/A km/h (2,2 mph)
Hand vibration	<2,5 m/s <sup>2</sup>	(98 in/s <sup>2</sup> )	<2,5 m/s <sup>2</sup>	(98 in/s <sup>2</sup> )
Feet vibration	<0,5 m/s <sup>2</sup>	(19 in/s <sup>2</sup> )	<0,5 m/s <sup>2</sup>	(19 in/s <sup>2</sup> )
Sound power	< 70 dB (A)			

Machine Characteristics	COMPACT 10		COMPACT 2747E	
	Metric	Imperial	Metric	Imperial
Length of machine in stowed position	2,45 m	(8 ft 0 in)	2,45 m	(8 ft 0 in)
Width of the machine in stowed position	1,20 m	(3 ft 11 in)	1,20 m	(3 ft 11 in)
Platform length	3,22 m	(10 ft 7 in)	3,22 m	(10 ft 7 in)
Number of extensions	1			
Machine height	2,26 m	(7 ft 5 in)	2,26 m	(7 ft 5 in)
Maximum height of platform in folded position with ramps removed	1,40 m	(4 ft 7 in)	1,40 m	(4 ft 7 in)
Maximum ground clearance	0,13 m	(0 ft 5 in)	0,13 m	(0 ft 5 in)
Transport height	1,14 m	(3 ft 9 in)	1,14 m	(3 ft 9 in)
Maximum work height	8,15 m	(26 ft 9 in)	8,15 m	(26 ft 9 in)
Maximum platform height	8,15 m	(26 ft 9 in)	8,15 m	(26 ft 9 in)
Platform width	1,20 m	(3 ft 11 in)	1,20 m	(3 ft 11 in)
Platform length	2,30 m	(7 ft 7 in)	2,30 m	(7 ft 7 in)
Outer turning circle	2,50 m	(8 ft 2 in)	2,50 m	(8 ft 2 in)
Inner turning circle	0,20 m	(0 ft 7 in)	0,20 m	(0 ft 7 in)
Distance between centres of the wheels	1,86 m	(6 ft 1 in)	1,86 m	(6 ft 1 in)
Rated slope ANSI - CSA			0 °	
Slope warning ANSI - CSA			2 °	
Total weight	2330 kg	(5138 lb)	2330 kg	(5138 lb)
Maximum platform load	450 kg	(992 lb)	450 kg	(992 lb)
Recommended load capacity when extended	150 kg	(331 lb)	150 kg	(331 lb)
Manual lateral effort	445 N	100 lbs	445 N	100 lbs
Maximum number of persons on the platform	3			
	 Section C 4.1.1 Specific labels COMPACT 10 (COMPACT 2747E)			
Power source	24 V			
Additional power source	255 Ah			
Hydraulic tank capacity	25 l	(7 gal US)	25 l	(7 gal US)
Starter battery	24 V-250 Ah			
Maximum climbable slope	23 %			
Type of tyres	15 x 5 - No Marking			
Platform elevation time (when empty)	51 s			
Platform lowering time (when empty)	42 s			
Low drive speed	1 km/h (N/A mph)	N/A km/h (0,6 mph)	1 km/h (N/A mph)	N/A km/h (0,6 mph)
High drive speed	3,5 km/h (N/A mph)	N/A km/h (2,2 mph)	3,5 km/h (N/A mph)	N/A km/h (2,2 mph)
Hand vibration	<2,5 m/s <sup>2</sup>	(98 in/s <sup>2</sup> )	<2,5 m/s <sup>2</sup>	(98 in/s <sup>2</sup> )
Feet vibration	<0,5 m/s <sup>2</sup>	(19 in/s <sup>2</sup> )	<0,5 m/s <sup>2</sup>	(19 in/s <sup>2</sup> )
Sound power	< 70 dB (A)			

Machine Characteristics	COMPACT 12		COMPACT 3347E	
	Metric	Imperial	Metric	Imperial
Length of machine in stowed position	2,45 m	(8 ft 0 in)	2,45 m	(8 ft 0 in)
Width of the machine in stowed position	1,20 m	(3 ft 11 in)	1,20 m	(3 ft 11 in)
Platform length	2,30 m	(7 ft 7 in)	2,30 m	(7 ft 7 in)
Number of extensions	1			
Machine height	2,38 m	(7 ft 10 in)	2,38 m	(7 ft 10 in)
Maximum height of platform in folded position with ramps removed	1,53 m	(5 ft 0 in)	1,53 m	(5 ft 0 in)
Maximum ground clearance	0,13 m	(0 ft 6 in)	0,13 m	(0 ft 6 in)
Transport height	1,53 m	(5 ft 0 in)	1,53 m	(5 ft 0 in)
Maximum work height	12 m	(39 ft 4 in)	12 m	(39 ft 4 in)
Maximum platform height	10 m	(32 ft 10 in)	10 m	(32 ft 10 in)
Platform width	1,20 m	(0 ft 48 in)	1,20 m	(0 ft 48 in)
Platform length	2,30 m	(7 ft 7 in)	2,30 m	(7 ft 7 in)
Outer turning circle	2,38 m	(7 ft 9 in)	2,38 m	(7 ft 9 in)
Inner turning circle	0,34 m	(1 ft 1 in)	0,34 m	(1 ft 1 in)
Distance between centres of the wheels	1,86 m	(6 ft 1 in)	1,86 m	(6 ft 1 in)
Rated slope ANSI - CSA	0 °			
Slope warning ANSI - CSA	2 °			
Total weight	2630 kg	(5799 lb)	2630 kg	(5799 lb)
Maximum platform load	-300 kg	- (662 lb)	-300 kg	- (662 lb)
Recommended load capacity when extended	150 kg	(331 lb)	150 kg	(331 lb)
Manual lateral effort	445 N	100 lbs	445 N	100 lbs
Maximum number of persons on the platform	2			
	 Section C 4.1.1 Specific labels COMPACT 12 (COMPACT 3347E)			
Power source	24 V			
Additional power source	255 Ah			
Hydraulic tank capacity	25 l	(7 gal US)	25 l	(7 gal US)
Starter battery	24 V-250 Ah			
Maximum climbable slope	23 %			
Type of tyres	15 x 5 - No Marking			
Platform elevation time (when empty)	83 s			
Platform lowering time (when empty)	52 s			
Low drive speed	1 km/h (N/A mph)	N/A km/h (0,6 mph)	1 km/h (N/A mph)	N/A km/h (0,6 mph)
High drive speed	3,5 km/h (N/A mph)	N/A km/h (2,2 mph)	3,5 km/h (N/A mph)	N/A km/h (2,2 mph)
Hand vibration	<2,5 m/s <sup>2</sup>	(98 in/s <sup>2</sup> )	<2,5 m/s <sup>2</sup>	(98 in/s <sup>2</sup> )
Feet vibration	<0,5 m/s <sup>2</sup>	(19 in/s <sup>2</sup> )	<0,5 m/s <sup>2</sup>	(19 in/s <sup>2</sup> )
Sound power	< 70 dB (A)			

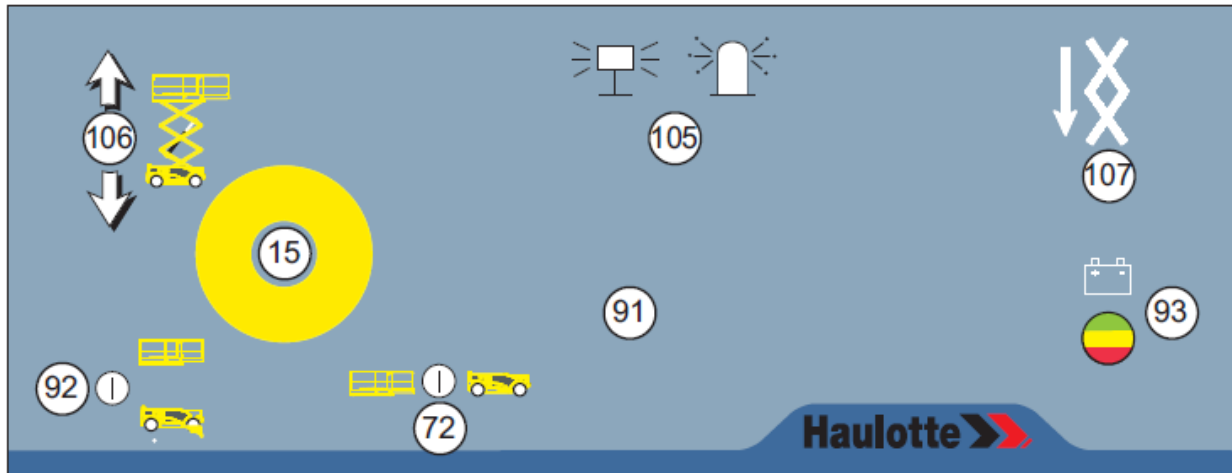
Machine Characteristics	COMPACT 12 (COMPACT 3347E)		COMPACT 14 (N / A)	
	Metric	Imperial	Metric	Imperial
Length of machine in stowed position	2,45 m	(8 ft 0 in)	2,45 m	(8 ft 0 in)
Width of the machine in stowed position	1,20 m	(3 ft 11 in)	1,20 m	(3 ft 11 in)
Platform length	2,30 m	(7 ft 7 in)	2,30 m	(7 ft 7 in)
Number of extensions	1		1	
Machine height	2,38 m	(7 ft 10 in)	2,50 m	(8 ft 2 in)
Maximum height of platform in folded position with ramps removed	1,53 m	(5 ft 0 in)	1,65 m	(5 ft 5 in)
Maximum ground clearance	0,13 m	(0 ft 6 in)	0,13 m	(0 ft 6 in)
Transport height	1,53 m	(5 ft 0 in)	1,65 m	(5 ft 5 in)
Maximum work height	12 m	(39 ft 4 in)	14 m	(45 ft 11 in)
Maximum platform height	10 m	(32 ft 10 in)	12 m	(39 ft 4 in)
Platform width	1,20 m	(0 ft 48 in)	1,20 m	(0 ft 48 in)
Platform length	2,30 m	(7 ft 7 in)	2,30 m	(7 ft 7 in)
Outer turning circle	2,38 m	(7 ft 9 in)	2,38 m	(7 ft 9 in)
Inner turning circle	0,34 m	(1 ft 1 in)	0,34 m	(1 ft 1 in)
Distance between centres of the wheels	1,86 m	(6 ft 1 in)	1,86 m	(6 ft 1 in)
Tilt	2 °		2 ° / 3 °	
Maximum wind speed allowed	0 km/h -Indoor use -45 km/h -Outdoor use	(0 mph) - Indoor use - (28 mph) - Outdoor use	0 km/h -Indoor use	(0 mph) - Indoor use
Total weight	2630 kg	(5799 lb)	3170 kg	(6990 lb)
Maximum platform load	300 kg -Indoor use -300 kg -Outdoor use	(662 lb) - Indoor use - (662 lb) - Outdoor use	350 kg -Indoor use	(772 lb) - Indoor use
Recommended load capacity when extended	150 kg	(331 lb)	150 kg	(331 lb)
Manual lateral effort	40 daN -Indoor use -20 daN -Outdoor use	(90 lbf) - Indoor use - (45 lbf) - Outdoor use	40 daN -Indoor use -20 daN -Outdoor use	(90 lbf) - Indoor use - (45 lbf) - Outdoor use
Maximum number of persons on the platform	2-Indoor use -1-Outdoor use  Section C 4.1.1 Specific labels COMPACT 12 (COMPACT 3347E)		3-Indoor use -0-Outdoor use  Section C 4.1.1 Specific labels COMPACT 14 (N/A)	
Power source	24 V		24 V	
Additional power source	255 Ah		255 Ah	
Hydraulic tank capacity	25 l	(7 gal US)	25 l	(7 gal US)
Starter battery	24 V-250 Ah		24 V-250 Ah	
Maximum climbable slope	23 %		23 %	
Type of tyres	15 x 5 - No Marking		15 x 5 - No Marking	
Platform elevation time (when empty)	83 s		66 s	
Platform lowering time (when empty)	52 s		54 s	
Low drive speed	1 km/h (N/A mph)	N/A km/h (0,6 mph)	0.9 km/h (N/A mph)	N/A km/h (0,6 mph)
High drive speed	3,5 km/h (N/A mph)	N/A km/h (2,2 mph)	2.8 km/h (N/A mph)	N/A km/h (1.7 mph)
Hand vibration	<2,5 m/s <sup>2</sup>	(98 in/s <sup>2</sup> )	<2,5 m/s <sup>2</sup>	(98 in/s <sup>2</sup> )
Feet vibration	<0,5 m/s <sup>2</sup>	(19 in/s <sup>2</sup> )	<0,5 m/s <sup>2</sup>	(19 in/s <sup>2</sup> )
Sound power	< 70 dB (A)			

Machine Characteristics	OPTIMUM 6		OPTIMUM 1530E	
	Metric	Imperial	Metric	Imperial
Length of machine in stowed position	1,88 m	(6 ft 2 in)	1,88 m	(6 ft 2 in)
Width of the machine in stowed position	0,76 m	(0 ft 30 in)	0,76 m	(0 ft 30 in)
Platform length	1,73 m	(5 ft 8 in)	1,73 m	(5 ft 8 in)
Number of extensions	1			
Machine height	1,90 m	(6 ft 3 in)	1,90 m	(6 ft 3 in)
Maximum ground clearance	0,22 m	(0 ft 1 in)	0,22 m	(0 ft 1 in)
Transport height	1,90 m	(6 ft 3 in)	1,90 m	(6 ft 3 in)
Maximum work height	6,45 m	(21 ft 2 in)	6,45 m	(21 ft 2 in)
Maximum platform height	4,45 m	(14 ft 7 in)	4,45 m	(14 ft 7 in)
Platform width	0,68 m	(2 ft 3 in)	0,68 m	(2 ft 3 in)
Platform length	1,73 m	(5 ft 8 in)	1,73 m	(5 ft 8 in)
Outer turning circle	2,38 m	(7 ft 9 in)	2,38 m	(7 ft 9 in)
Inner turning circle	0,34 m	(1 ft 1 in)	0,34 m	(1 ft 1 in)
Distance between centres of the wheels	1,38 m	(4 ft 6 in)	1,38 m	(4 ft 6 in)
Rated slope ANSI - CSA	0 °			
Slope warning ANSI - CSA	2 °			
Total weight	1335 kg	(2943 lb)	1335 kg	(2943 lb)
Maximum platform load	270 kg	(595 lb)	270 kg	(595 lb)
Recommended load capacity when extended	115 kg	(254 lb)	115 kg	(254 lb)
Manual lateral effort	445 N	100 lbs	445 N	100 lbs
Maximum number of persons on the platform	2			
	 Section C 4.1.1 Specific labels OPTIMUM 6 (OPTIMUM 1930E)			
Power source	24 V			
Additional power source	185 Ah			
Hydraulic tank capacity	20 l	(5 gal US)	20 l	(5 gal US)
Starter battery	24 V-180 Ah			
Maximum climbable slope	25 %			
Type of tyres	12.5 x 4.25 - No Marking			
Platform elevation time (when empty)	20 s			
Platform lowering time (when empty)	35 s			
Low drive speed	0,6 km/h (N/A mph)	N/A km/h (0,4 mph)	0,6 km/h (N/A mph)	N/A km/h (0,4 mph)
High drive speed	4,5 km/h (N/A mph)	N/A km/h (2,8 mph)	4,5 km/h (N/A mph)	N/A km/h (2,8 mph)
Hand vibration	<2,5 m/s <sup>2</sup>	(98 in/s <sup>2</sup> )	<2,5 m/s <sup>2</sup>	(98 in/s <sup>2</sup> )
Feet vibration	<0,5 m/s <sup>2</sup>	(19 in/s <sup>2</sup> )	<0,5 m/s <sup>2</sup>	(19 in/s <sup>2</sup> )
Sound power	< 70 dB (A)			



Machine Characteristics	OPTIMUM 8		OPTIMUM 1930E	
	Metric	Imperial	Metric	Imperial
Maximum number of persons on the platform	2			
Power source	24 V			
Additional power source	185 Ah			
Hydraulic tank capacity	20 l	(5 gal US)	20 l	(5 gal US)
Starter battery	24 V-180 Ah			
Maximum climbable slope	25 %			
Type of tyres	12.5 x 4.25 - No Marking			
Platform elevation time (when empty)	23 s			
Platform lowering time (when empty)	32 s			
Low drive speed	0,6 km/h (N/A mph)	N/A km/h (0,4 mph)	0,6 km/h (N/A mph)	N/A km/h (0,4 mph)
High drive speed	4,5 km/h (N/A mph)	N/A km/h (2,8 mph)	4,5 km/h (N/A mph)	N/A km/h (2,8 mph)
Hand vibration	<2,5 m/s <sup>2</sup>	(98 in/s <sup>2</sup> )	<2,5 m/s <sup>2</sup>	(98 in/s <sup>2</sup> )
Feet vibration	<0,5 m/s <sup>2</sup>	(19 in/s <sup>2</sup> )	<0,5 m/s <sup>2</sup>	(19 in/s <sup>2</sup> )
Sound power	< 70 dB (A)			
Length of machine in stowed position	2,48 m	(8 ft 2 in)	2,48 m	(8 ft 2 in)
Width of the machine in stowed position	0,81 m	(0 ft 32 in)	0,81 m	(0 ft 32 in)
Platform length	3,22 m	(10 ft 7 in)	3,22 m	(10 ft 7 in)
Number of extensions	1			
Machine height	2,00 m	(6 ft 7 in)	2,00 m	(6 ft 7 in)
Maximum height of platform in folded position with ramps removed	1,13 m	(3 ft 8 in)	1,13 m	(3 ft 8 in)
Maximum ground clearance	0,125 m	(0 ft 5 in)	0,125 m	(0 ft 5 in)
Transport height	2,00 m	(6 ft 7 in)	2,00 m	(6 ft 7 in)
Maximum work height	8,18 m	(26 ft 10 in)	8,18 m	(26 ft 10 in)
Maximum platform height	6,18 m	(20 ft 3 in)	6,18 m	(20 ft 3 in)
Platform width	0,92 m	(3 ft 0 in)	0,92 m	(3 ft 0 in)
Platform length	2,30 m	(7 ft 7 in)	2,30 m	(7 ft 7 in)
Outer turning circle	2,38 m	(7 ft 9 in)	2,38 m	(7 ft 9 in)
Inner turning circle	0,34 m	(1 ft 1 in)	0,34 m	(1 ft 1 in)
Distance between centres of the wheels	1,86 m	(6 ft 1 in)	1,86 m	(6 ft 1 in)
Tilt	2 °			
Maximum wind speed allowed	0 km/h -Indoor use -45 km/h -Outdoor use	(0 mph) - Indoor use - (28 mph) - Outdoor use	0 km/h -Indoor use -45 km/h -Outdoor use	(0 mph) - Indoor use - (28 mph) - Outdoor use

## 1.2. COMMANDS (DOWN/UP)



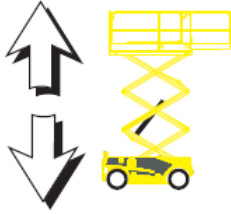


Controls and indicators

Marking	Description	Function
72	Control box activation key selector <sup>1</sup>	Left : Platform control box activation Center : Switching off Right : Ground control box activation
91	Hour meter-Battery charge indicator	Number of hours of usage of the machine-Battery charger status
92	Control box activation key selector <sup>1</sup>	Upwards : Platform control box activation Center : Switching off Downwards : Ground control box activation
93	Battery charging indicator <sup>1</sup>	Battery level status during battery charging
105	Flashing light selector	Upwards : Switching on the flashing light Downwards : Switching off the flashing light
106	Platform elevation / lowering selector <sup>1</sup>	Upwards : Platform elevation Downwards : Lowering of platform
107	Pull rod for emergency lowering	Pulled : Lowering of platform Released : Stops platform lowering
144	Emergency stop push-button-Cut-off	Pulled out (activated) : Ground control box switched on Pushed in (deactivated) : Switching off


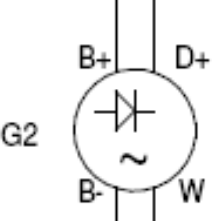
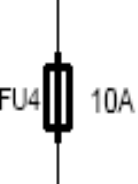
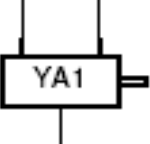
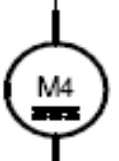
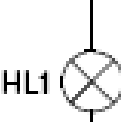

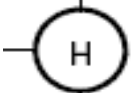
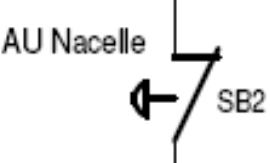


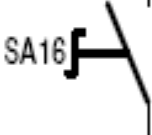
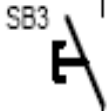

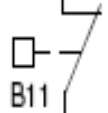
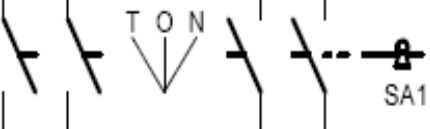
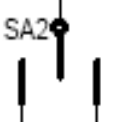
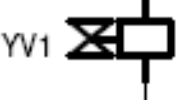

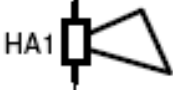
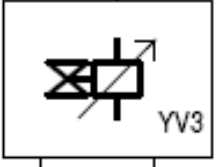


Marking	Description	Function
27	Tilt indicator	Machine in tilted position
30	Overload indicator	Platform overloaded
43	Horn selector	Horn
46	Emergency stop push-button	Pulled out (activated) : Ground control box switched on Pushed in (deactivated) : Switching off
85	Fault indicator	Faulty or tilting or overload machine
108	Movement joystick	To the front : Forward drive or platform elevation To the rear : Reverse drive or platform lowering
	Front axle steering selector	Press right : Right-hand steering Press left : Left-hand steering
109	Power ON indicator-Fault indicator	On : Machine switched on Flashing : Fault indicated
110	Elevation / Lowering selection indicator	On : Elevation / Lowering selection activated Off : Elevation / Lowering movement is not selected
111	Driving selection indicator	On : Driving selection activated Off : Driving movement is not selected
		 high-speed driving
		 low-speed driving
112	3-position selector	 Platform elevation/lowering
145	Platform overload indicator	Platform overload

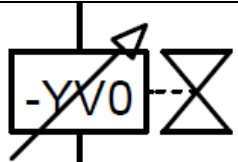
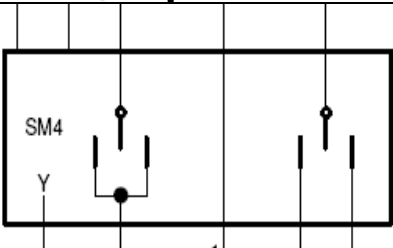
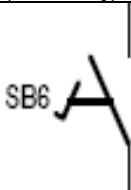


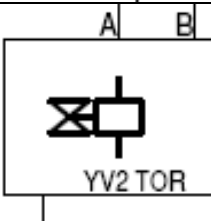
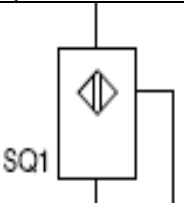
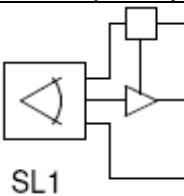

## 2. ELECTRICAL PART

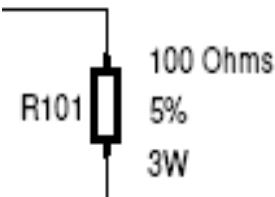
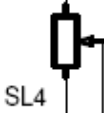
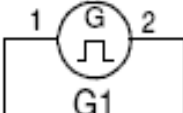


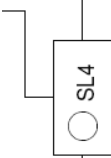

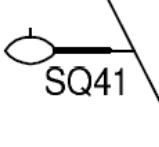
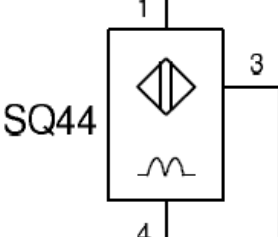
### 2.1. SYMBOLS USED

	<p>Battery with one element</p>
	<p>Alternator</p>
	<p>Fuse (Here 10 amps)</p>
	<p>Coil winding roll</p>
	<p>Electric motor</p>
	<p>light</p>
	<p>Diode</p>
	<p>Hourmeter</p>
	<p>Standard push-button of safety "mushroom-headed button"</p>

	<p>Rotary knob</p>
	<p>Push-button</p>
	<p>Limit switch</p>
	<p>Pressure switch</p>
	<p>Key selector with 3 positions (T turret, O neutral, N platform)</p>
	<p>Toggle switch with 2 positions</p>
	<p>Electrovalve</p>
	<p>relay</p>
	<p>horn</p>
	<p>Proportional electrovalve</p>



	<p>Proportional valve PWM type ( Pulse Width Modulation)</p>
	<p>Controller/joysticks</p>
	<p>Foot switch pedal</p>
	<p>buzzer</p>
	<p>"light"</p>
	<p>Electrovalve "ON/OFF » ( bang-bang)</p>
	<p>Tilt sensor ( ramp detection)</p>
	<p>Angle sensor (reach limitation)</p>
	<p>Contact « mercury » (angle detection)</p>

	<p>Resistor (here value 100 ohms, 3 Watts, tolerance of 5%)</p>
	<p>Sensor length (reach limitation)</p>
	<p>Pressure sensor (weighing)</p>
	<p>Angle sensor (weighing)</p>
	<p>Standard light "Led"</p>
	<p>Strain gauge</p>
	<p>Flexible Lame switch (ILS) detection of the magnets on the telescopic boom/arm extension</p>
	<p>Level fuel detector (diesel tank)</p>
	<p>Proximity detector with impulses (detection teeth slew ring)</p>

## 2.2. METHODOLOGY OF CONTROL

Note: During an intervention on a component or a loom, it is important to switch OFF the power supply of the machine in order to avoid any risk.

### 2.2.1. ELECTRIC CONTINUITY CONTROL

The continuity check of a loom or an electric component determines the resistor of this device, in order to detect a possible interruption of continuity (open circuit, short-circuit...).

This control is carried out with a multimeter commutated in position Ohmmeter ( $\Omega$ ).

First of all, it is necessary to determine the terminals of the component or the cable to control and insulate them.

Then, connect the multimeter in order to record the value.

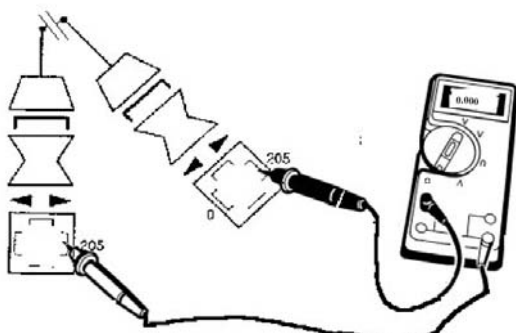
It must indicate a value of resistor close to  $0 \Omega$  if continuity is good.

In the contrary case (resistor which tends towards the infinite one :  $\infty$ ), continuity presents a defect.

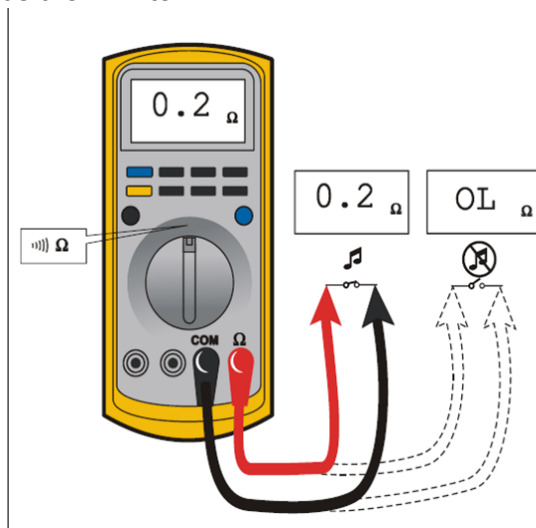
#### Control of insulation

At the contrary of continuity, insulation represents a non electric connection between the ground and the component

The test of insulation consists in obtaining the opposite result of that described for continuity, i.e. a value of the Ohmmeter which must tend towards the infinite  $\infty$



Exemple: test de continuité d'un faisceau électrique



### 2.2.2. CONTROL OF AN ON/OFF VALVE

Note: These tests are to be carried out when power is ON .

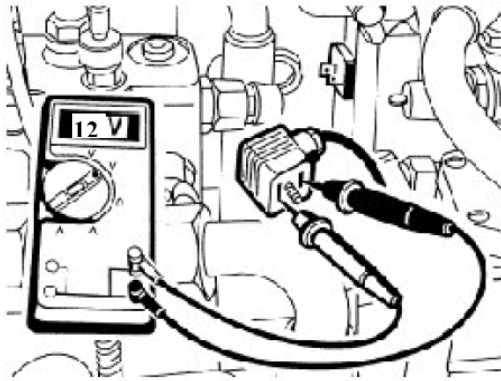
Also control the state of the terminals or any other connectors (oxidation...)

#### Control supply of the coil

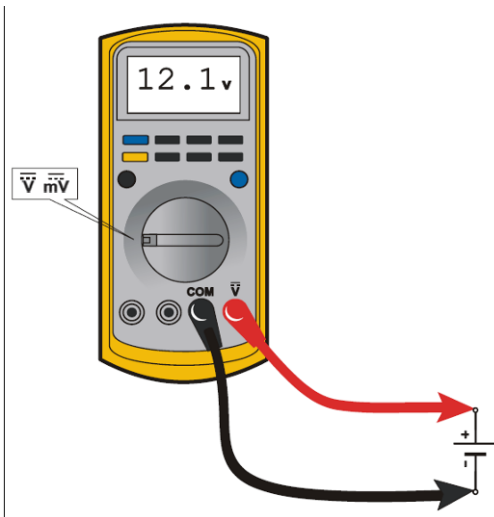
Disconnect the plug socket of supply of the valve in order to connect in derivation the multimeter on the terminals of the connector (see below).

Select the position to voltmeter (V), then activate the command to the valve which must be tested.

The voltage indicated by the voltmeter must be close to the tension of battery

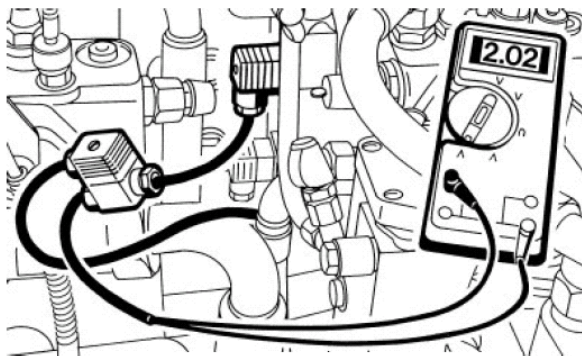


*Contrôle de la tension d'alimentation du solénoïde*



**Control intensity of the coil**

Disconnect the plug socket of supply of the valve in order to connect in series the multimeter on the terminals of the the connector (example below).  
 Select the position Ammeter (A), then activate the command to the valve which must be tested.  
 The intensity indicated by the voltmeter must be of approximately 2A (to be checked according to the data manufacturer)



*Contrôle de l'intensité du solénoïde*



**Control resistance of the coil**

Disconnect the plug socket of supply of the valve in order to connect the multimeter on the terminals of the connector industry.  
 Select the position Ohmmeter ( $\Omega$ ), then compare the value measured with that of the data manufacturer.  
 In the event of nonconformity of the coil, to carry out its replacement

**2.2.3. CONTROL OF COMPONENTS**

• **Control of an electric relay**

Disconnect the relay, then locate its various terminals.  
 Control the resistor of the solenoid terminals 85 and 86 (see manufacturer datas) using a multimeter in Ohmmètre position.  
 If the resistor is null, change the relay.  
 If this test is OK, check continuity between terminals 30 and 87a and insulation between terminals 30 and 87  
 In the event of dysfunction, replace the relay.

- **supply control of the relay**

Locate the relay without disconnecting it and locating it its various terminals.

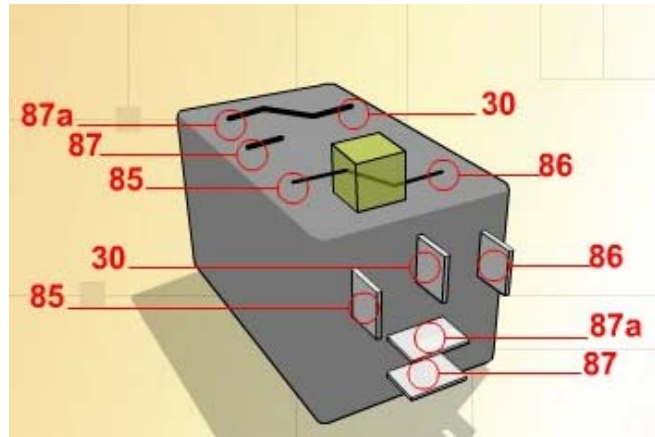
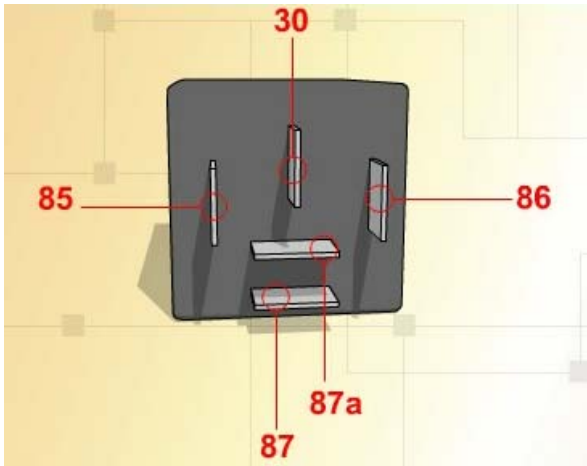
control the continuity of terminal 86 with the ground

(In the event of defect of continuity, check the concerned loom)

Connect the multimeter in position Voltmeter (V) between terminal 30 and the ground and thus control the power supply of the component (It must be close to the battery voltage Vbat)

Select the function of this relay and check the output voltage between terminal 87 and ground.

In the event of dysfunction, replace the relay.



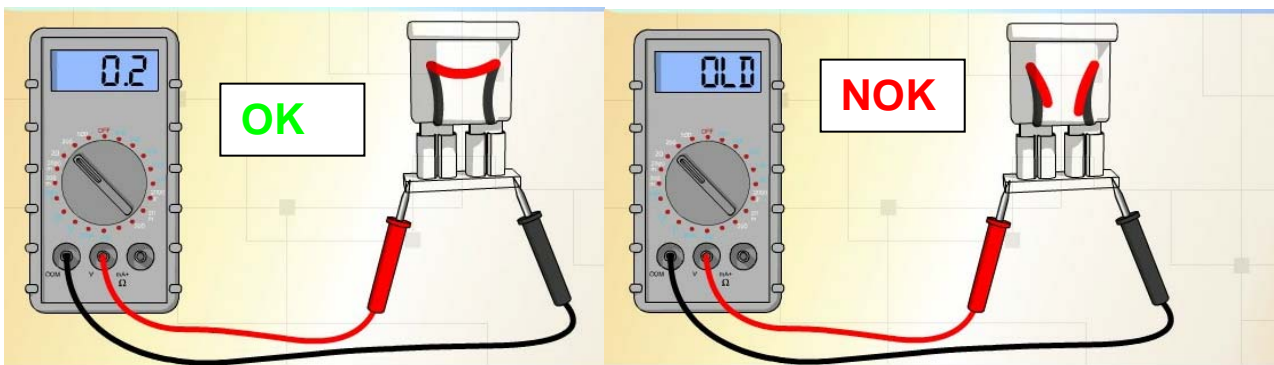
- Control of a fuse

## Color code

Intensité	Couleur		
	Mini. fusible	Fusible	Maxi. fusible
3 A	Violet	Violet	
5 A	Beige	Beige	
7.5 A	Marron	Marron	
10 A	Rouge	Rouge	
15 A	Bleu	Bleu	
20 A	Jaune	Jaune	
25 A	Blanc	Blanc	
30 A	Vert	Vert	
40 A		Orange	Orange
50 A			Rouge
60 A			Bleu
70 A			Marron

## Fuse check

Multimeter in  $\Omega$  position, it must indicate a value near 0



- Control of a diode

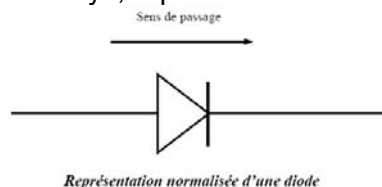
locate the diode and disconnect it from the loom.

Control must be done with a multimeter in “diode” position.

connect the multimeter on each terminal of the diode, in one direction then on the other.

In one direction, the diode should have no continuity, in the other it must beep

If the diode is beeping in both ways, replace it.



## 2.3. THE WIRING SCHEMATICS

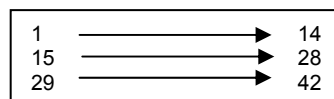
See all versions at the end of this manual



## 2.4. LOOMS

### 2.4.1. VARIATOR CONNECTOR

**COMPACT - OPTIMUM (equipped weighing board BPE)**



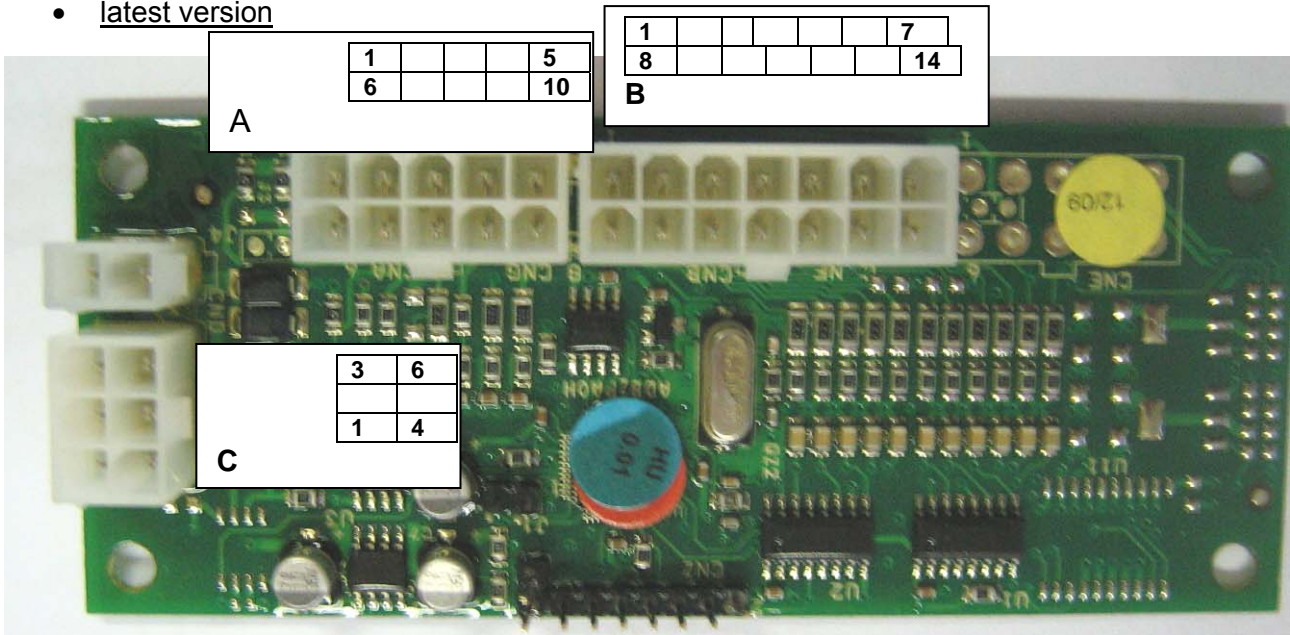
Detail of plug in the Variable speed unit

Terminal	wire		Terminal	wire		Terminal	wire	
1		Not used	15		Not used	29	30	Input limit switch for HS drive (SQ3)
2	58	Input - coming from the board series upper control box	16	50	Output lifting valve YV9	30	45	Signal hour recorder
3	26	Electrovalve command descent YV7	17	27	valve YV8 on C12	31	46	Signal hour recorder
4	9	Input +	18	25	valve command anti-tipping over device YV6	32	47	Signal hour recorder
5	16	Negative input command SB1	19	24	Output command left steering valve YV5b	33	48	Signal hour recorder
6	22	Output command YV4 not ok	20	23	Output command right steering valve YV5a	34	11	Validation command upper controls
7	21	Output command YV3 not ok	21	43	Input signal series	35		Not used
8	20	Output command YV2B REV	22	12	Not used	36	31	+ Battery/End of drive stop drive
9	19	Output commande YV2 FWD	23	49	Signal MDI	37	14	Command raise frame
10	18	Output supply YV1: selection movement of drive	24	33	Input anti-tipping (SQ5 and SQ6)	38	15	Input descent frame
11	54	Input - light indicator of defect	25	29	Input (SQ1)	39		Not used

12	44	Command light overload	26	28	Input board BPE overload weighing version Std	40	61	Not used
13	9	Input +	27	12	Signal of the indicator of slope sensor	41		Not used
14		Not used	28		Not used	42	42	Output command SB1

**2.4.2. THE SERIAL CARD**

- latest version



A	B	C
A7 – Wire 51 A9 – Wire 39 A6 – Wire 52 Accelerator potentiometer	B1 wire 40 : Left steering switch B12 wire 41 : Right steering switch B13 wire 38 : Except neutral B5 wire 37 : Dead man switch B2 wire 35 : Travel selection B4 wire 34 : Movement selection B8 wire 36 : Horn	C1 : battery + C2 : battery – C4 : battery signal

## 2.5. LOCALIZATION OF THE MAIN SAFETY COMPONENTS

Compact all models (except C14)



SQ4 SQ1



SQ3



SQ5



SQ6



SQ7  
PESAGE



SQ10



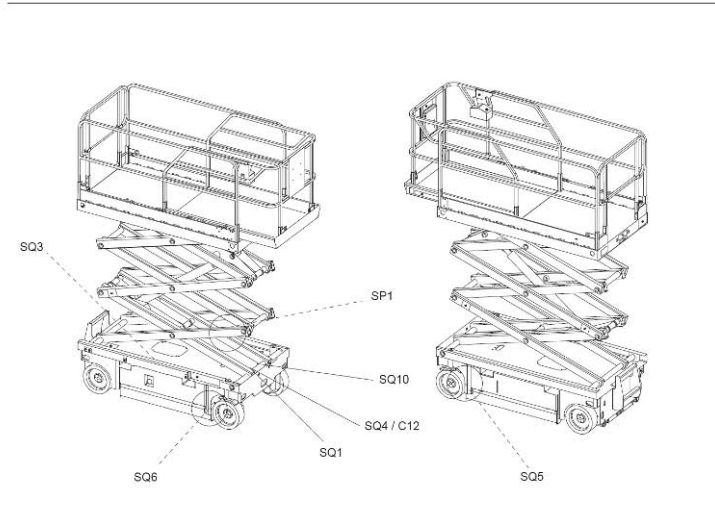
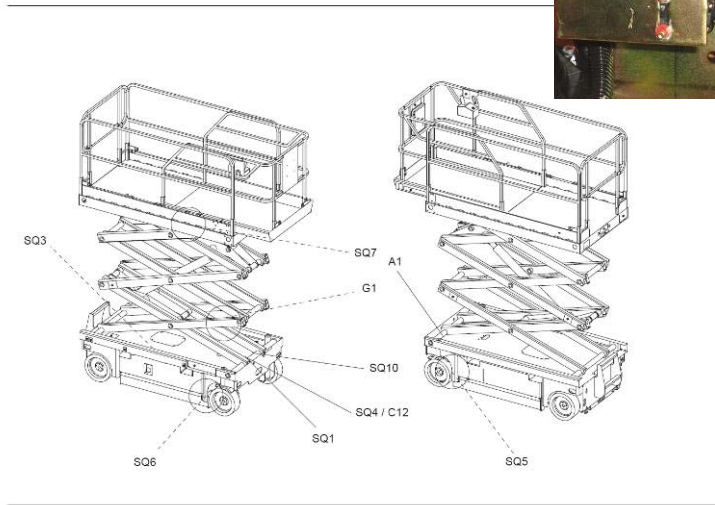
A1  
PESAGE



G1  
PESAGE

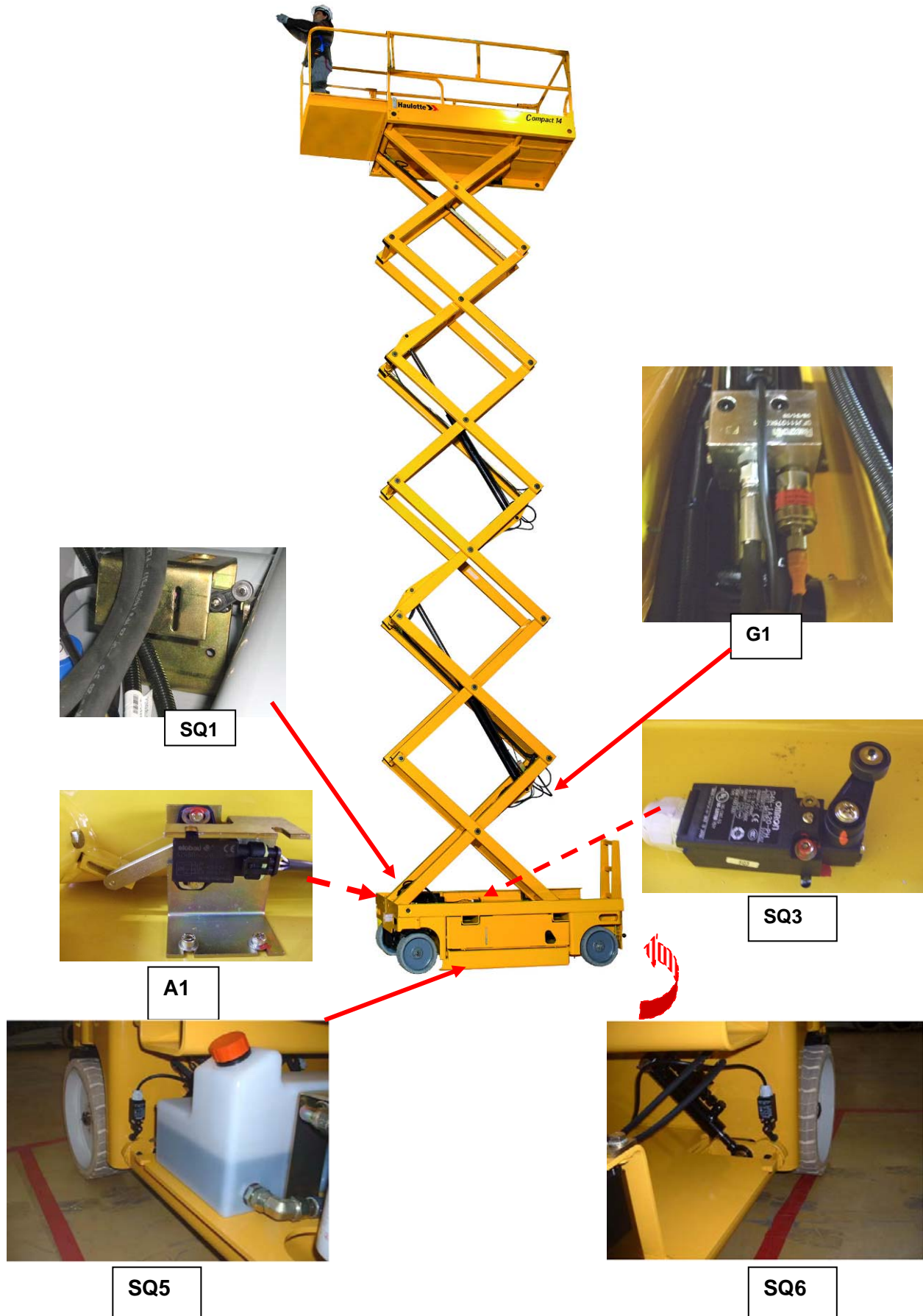


(if overload option installed)  
SP1  
PRESSOSTAT





- C14 model



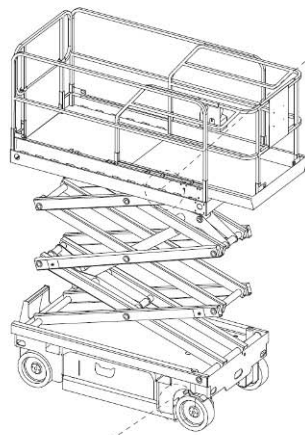


SQ1

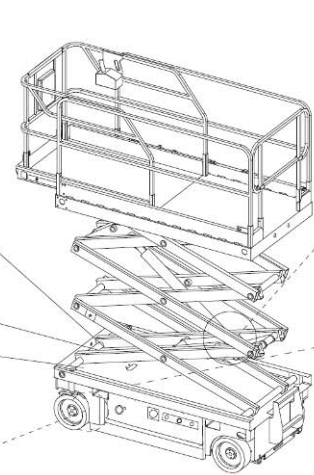


SQ3

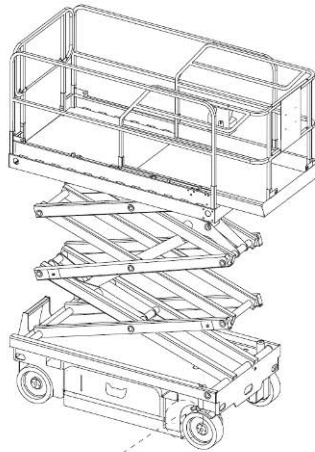
**SQ5 SQ6 PRÉSENTS MAIS  
INVISIBLES DE L'EXTÉRIEUR  
MEME ASPECT QUE COMPACT  
MAIS SITUÉS COTE INTERIEUR  
ROUES**



SQ6



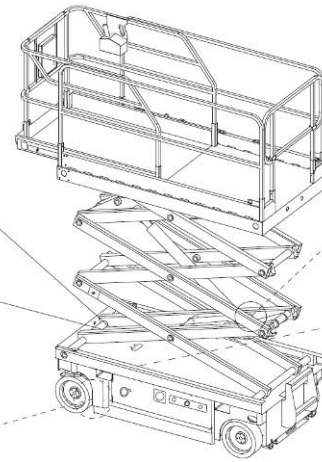
SQ5



SQ10

A1

SQ6



SQ1

SQ10

SQ5

SP1

SQ3



SQ10



A1



G1

**CAPTEURS VERSION PRESSOSTAT**



SQ1



SQ3

**SQ5 SQ6 PRÉSENTS MAIS  
INVISIBLES DE L'EXTÉRIEUR  
MEME ASPECT QUE COMPACT  
MAIS SITUÉS COTE INTERIEUR  
ROUES**



SP1



SQ10

## 2.6. LIST OF COMPONENTS (DIAGRAM E 614G)

In the following tables, the column n°2 gives the coordinates of the components on the sheets from the wiring schematics in order to find easily their position.

The first figure corresponds the number of page and to the second to the column (generally from 1 to 20) of the corresponding page.

The possible options specific to certain countries are not indexed (for more information, it is appropriate to refer to the wiring schematics corresponding to your machine

The state noted "0" corresponds to 0V, opened contact or not activated.

The state noted "1" corresponds to the tension of the circuit, closed or activated contact.

### 2.6.1. FUSES

FUSES		
FU1	2	Main 300A (2)
FU2	01 -3	Electrovalves + horn 10A (7)
FU3	01 -3	Command 10A (5)
FU4	01 - 4	Accessories 10 A (59)

### 2.6.2. INPUTS

INPUTS		
SA1	01 - 8	Key selector (CH: chassis/O: neutral/PF: Platform)
SA2	8	Selector of movement lower control box (14 raise, 15 descent)
SA3	01.-20	Selector drive (35)/lifting (34)
SB1	01 -2	Emergency stop chassis (2)
SB2	01.-13	Emergency stop platform (6)
SB3	01.-15	Horn upper control box (9)
SM1	01.-17	Controller/joystick <ul style="list-style-type: none"> <li>- right steering (41)</li> <li>- left steering (40)</li> <li>- HM trigger (37)</li> <li>- Off neutral (38)</li> <li>- signal (39 - 51-52)</li> </ul> Forward or raise from 2.5 to 4.5 V Reverse or descent from 2.5 to 0.5 V



ELECTRONIC MODULES		
U1	01 -4	Battery charger
U2	01.-15	Electronic variable speed unit/chopper/variator
U4	01.-18	Serial card upper control box
U5	01.-14	BPE weighing card

SAFETY COMPONENTS		
SQ1	01 - 19	detection low stop (29 =1 if PF < 3m)
SQ3	01 - 19	high detection (30 = 0 if platform with maximum height)
SQ4		Drive cut with 10 meters on certain models of C12)
SQ5 and SQ6	01 - 18	Anti-tipping device (32 + 33 = 0 if potholes ( side gates) are IN
SQ10	01 - 9	Slope detection (12 = 0 if in slope)
SP1	01.-15	Overload pressure controller (28) if weighing sytem not installed
A1	01 - 11	Relative angle sensor (384) for weighing sytem (BPE board)
G1	01 - 11	Pressure sensor G1 (382) for weighing sytem (BPE board)

### 2.6.3. OUTPUTS

RELAYS		
KA1	01 - 2	horn (36)
RCH	01 - 5	battery charger (5a) if RCH OFF no movements
SB1	01 - 8	main contactor (16)

Battery charger 220VAC\_24V – 35A (290 100 9770) compatible all models



VALVES		
YV1	01 - 10	Selection drive/lifting (18)
YV2A	01 - 11	Forward drive (19)
YV2B	01 - 12	Reverse drive (20)
YV3	01 - 13	High speed drive (21)
YV4	01 - 14	High speed drive (22)
YV5a	01 - 16	Left steering (23)
YV5b	01 - 17	Right steering (24)
YV6	01 - 19	Command anti-tipping devices - potholes (25)
YV7	01 - 20	Descent (26)
YV8	01 - 21	Descent (27) (C12 only)
YV9	01.-16	quick descent (> SQ1) (50)

LIGHTS AND BUZZER		
HA1	01 - 7	Buzzer (101)
HL1	01 - 17	Light defect (platform) (54)
HL2	01 - 6	Flashing light (60) (Option)
HL3	01 - 5	Work headlight (59) (Option)
HL4	01 - 21	Light selection lifting (platform) (34)
HL5	01 - 21	Light selection drive (platform) (58)
HL6	01 - 13	Overload (platform) (44)

#### 2.6.4. OTHERS DEVICES

M1	01 - 2	Pump motor unit 24 V 3000 W
PT1	01 - 11	Hour recorder and indicator of codes alarm (MDI)

## 2.7. LOGICAL EQUATIONS OF OPERATION

The state noted "0" corresponds to 0V, opened contact or not activated.

The state noted "1" corresponds to the tension of the circuit, closed or activated contact.

The logical equations described below refer to C14 (with weighing option installed)

For C12, drive cut SQ4 is included in the diagnostic (to be removed if the machine is not equipped with)

For all these conditions, the fuses will have to be checked as a preliminary

The condition of the equations of operation described below refers to the standard EN280, (for other standards USA, CDN, AUS) thank you to refer to HAULOTTE SERVICES of your area which will indicate you the characteristics of your machine

- **Glossary**

FWD	Forward (drive)
REV	Reverse (drive)
FL	Front Left
FR	Front Right
RL	Rear Left
RR	Rear Right
PF	Platform
LS	Low Speed drive
LS valve/adj	Load sensing valve/adjustment
MS	Medium Speed drive
HS	High Speed drive
ILS	Magnet sensor (Interrupteur Lame Souple)

### 2.7.1. POWERING

Function	Action	CONDITIONS		
		Necessary	Prohibiting the function	Modifying the function
Powering upper controls	SB1=1	SA1 (side PF) + SA1=1 Batteries charged	RCH=0 SB2=0	
Powering lower controls		SA1=1 (hold in chassis position) Batteries charged	RCH=0	

### 2.7.2. STEERING

Function	Action	CONDITIONS		
		Necessary	Prohibiting the function	Modifying the function
Right steering	YV5b=1	SA1 (side PF) + HM=1 + SM1d=1 + SA3 on drive side)	SB1=0 SB2=0 SA3 on lift side	
Left steering	YV5a=1	SA1 (side PF) + HM=1 + SM1g=1 + SA3 on drive side)		

### 2.7.3. DRIVE

Function	Action	CONDITIONS		
		Necessary	Prohibiting the function	Modifying the function
Low speed forward	YV2a=1 + YV6=1 if > SQ1	SA1 (side PF) + HM=1 + SM1a=1 + SA3 on drive side + SM1 between 2.5 and 4.5 V	Machine in slope (SQ10 = 0) SQ4=0 (C12) SP1=0	
Low speed reverse	YV2b=1 + YV6=1 if > SQ1	SA1 (side PF) + HM=1 + SM1b=1 + SA3 on drive side + SM1 between 2.5 and 0.5 V	or sensors of weighing A1 and/or G1 out of range if option installed (if PF > SQ1)	
High speed forward	YV2a=1 + YV3=1 + YV4=1 + YV6=1	SA1 (side PF) + HM=1 + SM1a=1 + SA3 on drive side + SM1 between 2.5 and 4.5 V	SP1=0 SQ1=0 SQ10=0 SQ4=0 (C12) SP1=0	
High speed reverse	YV2b=1 + YV3=1 + YV4=1 + YV6=1	SA1 (side PF) + HM=1 + SM1b=1 + SA3 on drive side + SM1 between 2.5 and 0.5 V	or sensors of weighing A1 and/or G1 out of range if option installed	

### 2.7.4. LIFT

Function	Action	CONDITIONS		
		Necessary	Prohibiting the function	Modifying the function
Raise upper controls	YV1=1	SA1 (side PF) + HM=1 + SM1a=1 + SA3 on mvts side + SQ5=1 + SQ6=1 (> SQ1) + SM1 between 2.5 and 4.5 V	Machine in slope (SQ10=0) YV9=1 SQ3=0 sensors of weighing A1 and/or G1 out of range if option installed (if PF > SQ1)	
Descent upper controls	+ YV7=1 + YV9=1 (when > SQ1) + YV8=1 if C12 or C14	SA1 (side PF) + HM=1 + SM1b=1 + SA3 on mvts side + SM1 between 2.5 and 0.5 V	YV1=spool locked SP1=0 or sensors of weighing A1 and/or G1 out of range if option installed	

Raise lower controls	YV1=1	SA1 (CH side) + SA2=1 + SQ5=1 + SQ6=1 (>SQ1)	Machine in slope (SQ10=0) YV9=1 SQ3=0 sensors of weighing A1 and/or G1 out of range if option installed (if PF > SQ1)
Descent lower controls	+ YV7=1 + YV9=1 + YV8=1 if C12 or C14	SA1 (CH side) + SA2=1	SP1=0 (or sensors of weighing A1 and/or G1 out of range if option installed)

### **2.7.5.OPTIONS USA**

Sound alarm only on ramp  
 No stop the 3 seconds on anti-crashing system at SQ1  
 (option LOWERING BLOCK at OFF but audible signal only)  
 Sound alarm only if machine is in overload and tilt

### **2.7.6.OPTIONS AUSTRALIA**

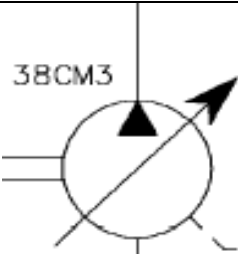
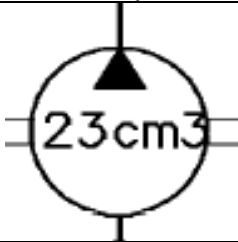
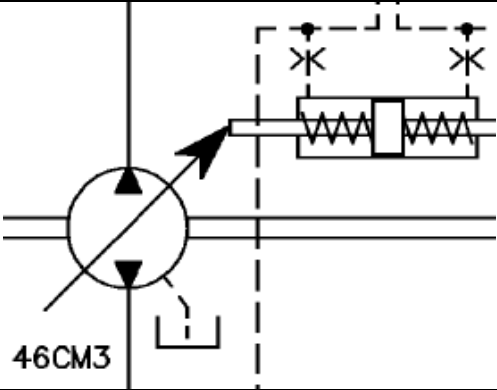
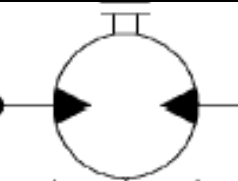
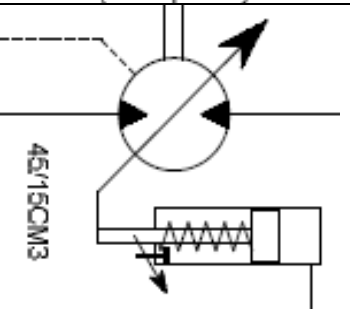

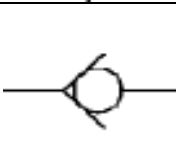
No stop the 3 seconds on anti-crashing system at SQ1  
 (option LOWERING BLOCK at OFF but audible signal only)  
 Overload and tilt stop movement if PF > 3m

### **2.7.7.OPTIONS CANADA**


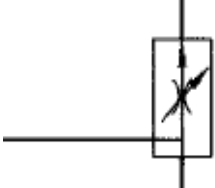
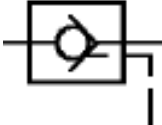
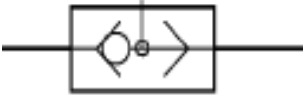
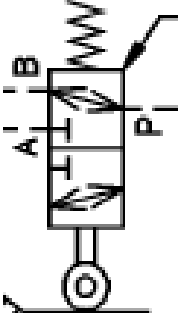
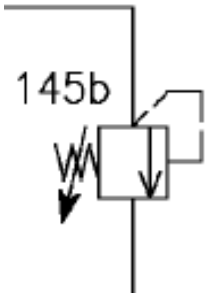
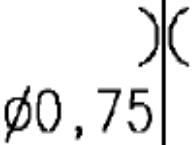
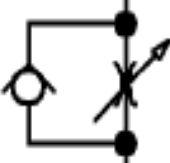
No stop the 3 seconds on anti-crashing system at SQ1  
 (option LOWERING BLOCK at OFF but audible signal only)  
 Prohibit in Tilt option for slope detection  
 (Ramp detection is active and stop movements if PF>3m)  
 Sound alarm only if machine is in overload


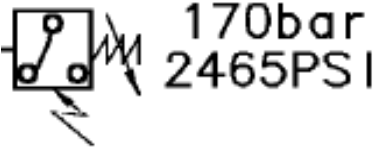
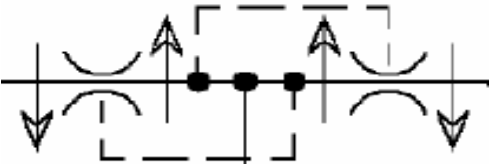
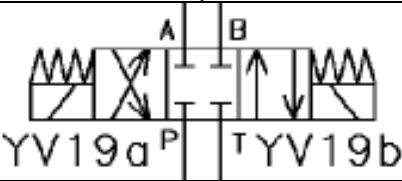
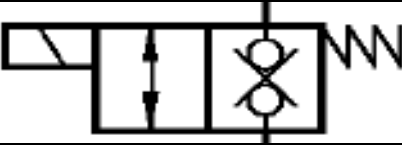
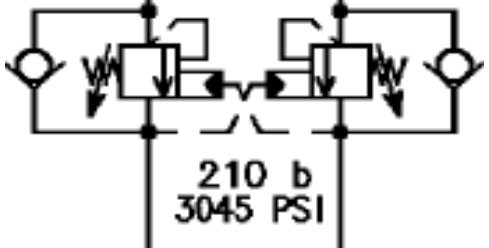
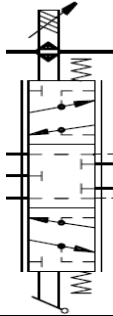
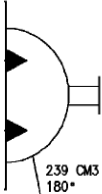
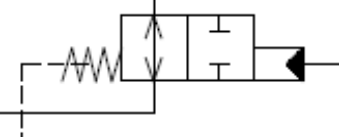
### 3. THE HYDRAULIC PART

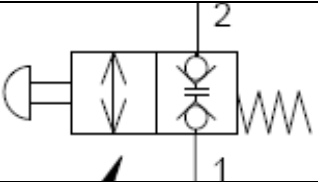
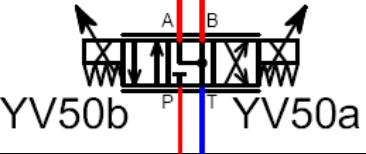

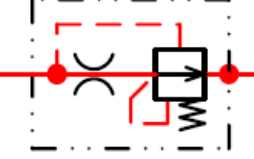
#### 3.1. SYMBOLS USED

	<p>Pump with variable cc flow (here maximum 38 cc /rpm)</p>
	<p>Pump with fixed cubic capacity flow (here 23 cc/rpm)</p>
	<p>Pump with variable flow (used for the hydrostatic transmission in closed circuits on HAULOTTE superior booms like HA32PX, HA41PX, H28TJ+, H43TPX)</p>
	<p>Hydraulic motor with 2 directions of drive (ex FWD/REV)</p>
	<p>Variable cubic capacity drive motor with 2 directions of drive 15cc for High speed drive 45 cc for Low speed drive</p>
	<p>Filter (normally 10 microns)</p>
	<p>check valve</p>



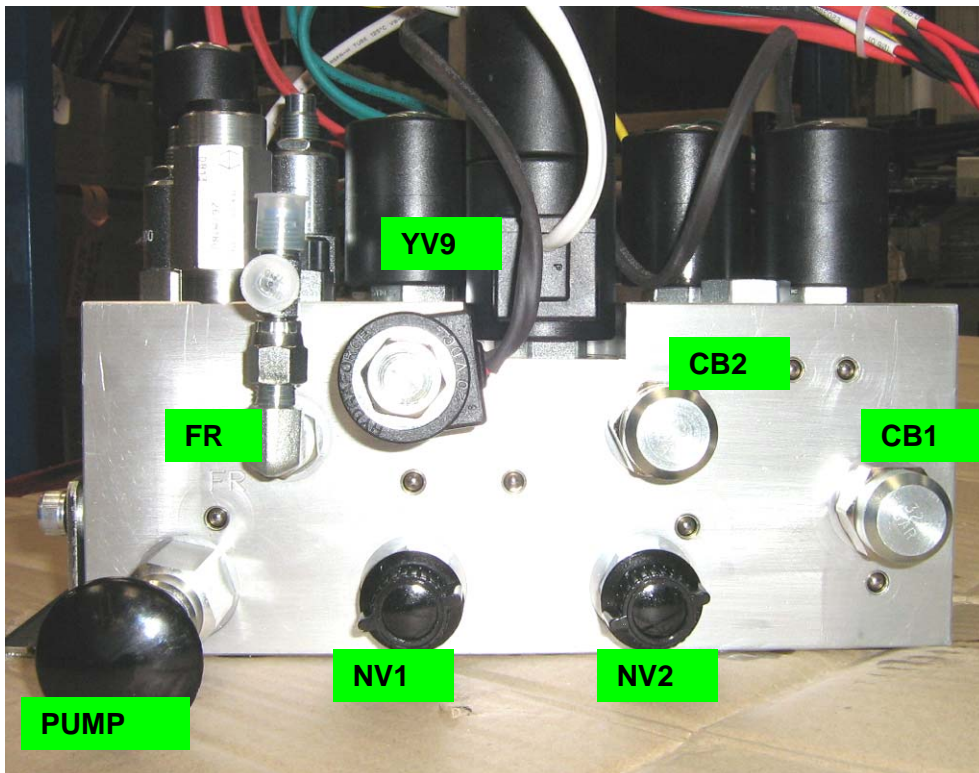
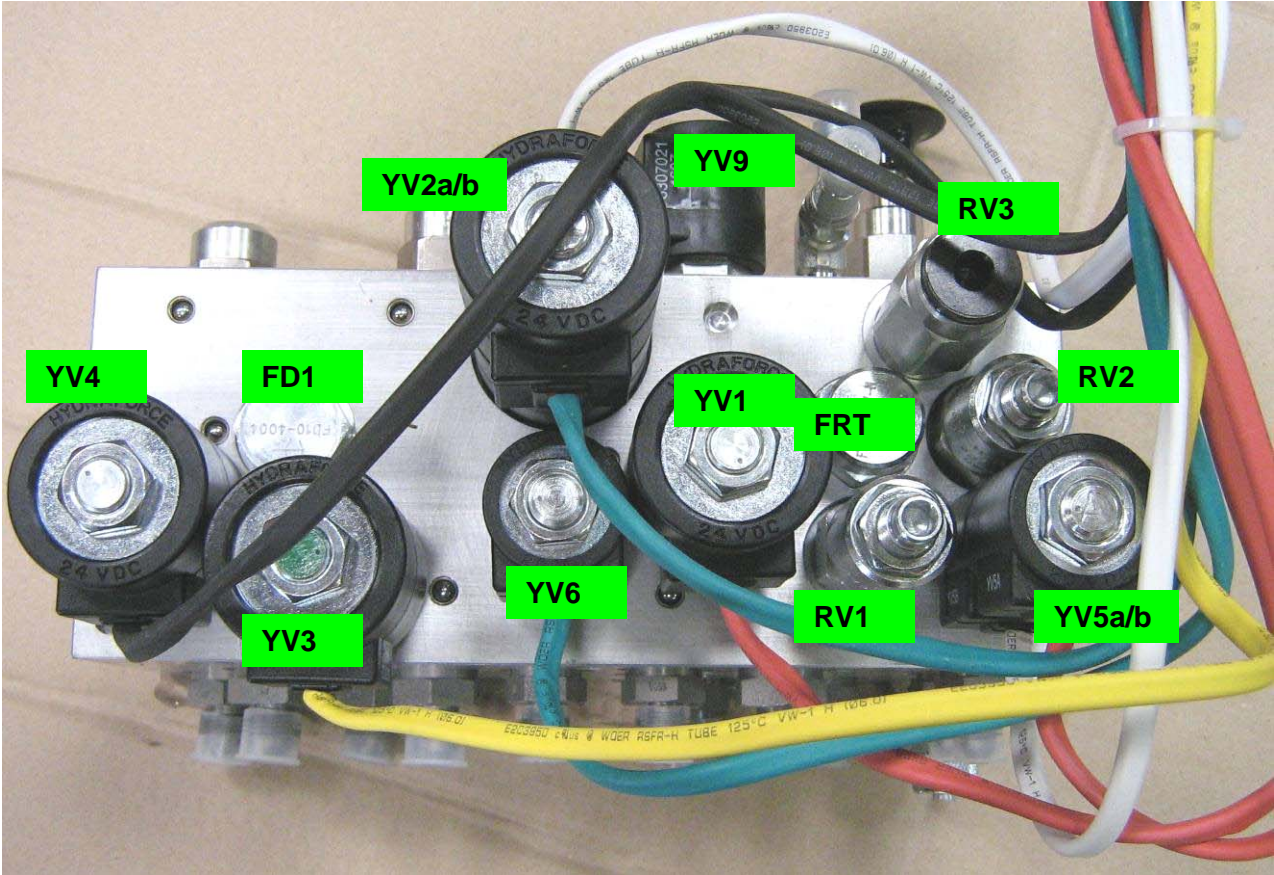
	<p>calibrated check valve</p>
	<p>Priority valve /shuttle valve</p>
	<p>piloted check valve</p>
	<p>Circuit selector switch/shuttle valve</p>
	<p>Position hydraulic valve (used for the HA32PX/HA41PX)</p>
	<p>Adjustable pressure relief valve (here set at 145 bars/2104 psi)</p>
	<p>Fixed flow restrictor or spray nozzle (here diameter of 0.75 mm)</p>
	<p>Adjustable flow restrictor + check valve</p>

	<p>Pressure sensor (used for weighing)</p>
	<p>Adjustable pressure switch (here set at 170 bars)</p>
	<p>Flow divider</p>
	<p>Position valve 4 ways, 3 positions in closed center</p>
	<p>Distributor/ safety valve</p>
	<p>Counter balance valve with piloting line of the opposite line (here set at 210bars)</p>
	<p>Position valve proportional 5/3 with piloting manual by lever</p>
	<p>Rotary cylinder /jack (here range at 180°)</p>
	<p>Piloted valve</p>

	<p>Manual valve with automatic return (used to readjust the part of compensation on HA32/41PX)</p>
	<p>Position valve proportional 4 ways/3 positions</p>
	<p>Pressure balance/flow control valve</p>
	<p>Flow regulator</p>



### 3.2. DETAILS OF HYDRAULIC BLOCK MK5

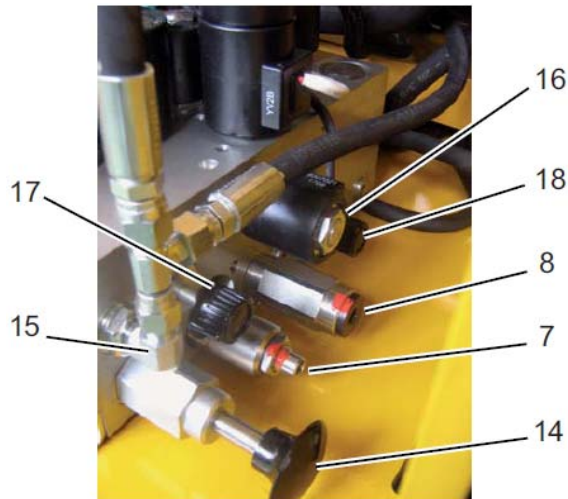
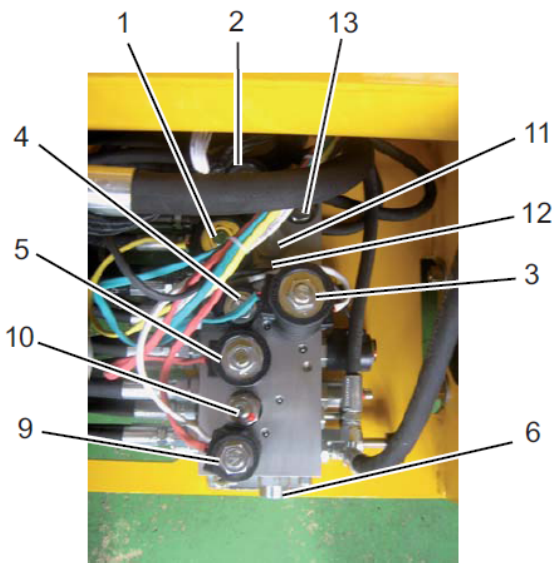


LABEL	FUNCTION
YV3	Selection High Speed drive
YV4	Selection High Speed drive
YV2	Selection of drive (FWD/REV)
YV6	anti-tipping over (pothole)
YV1	Selection drive/lift
FRT	Priority valve/ Flow control valve
RV2	Main pressure relief valve
RV3	relief valve for lifting
YV5	Steering
RV1	relief valve for steering
FD1	Flow divider for drive
CB2	Counterbalance valve drive circuit
CB1	Counterbalance valve drive circuit
Pump	Manual pump for free wheel (brake release) for towing
FR	Output supply of the rear brakes circuit
YV9	Lift valve
NV1	Valve of discharge of the brake release circuit
NV2	Valve of by-pass of the brake release circuit

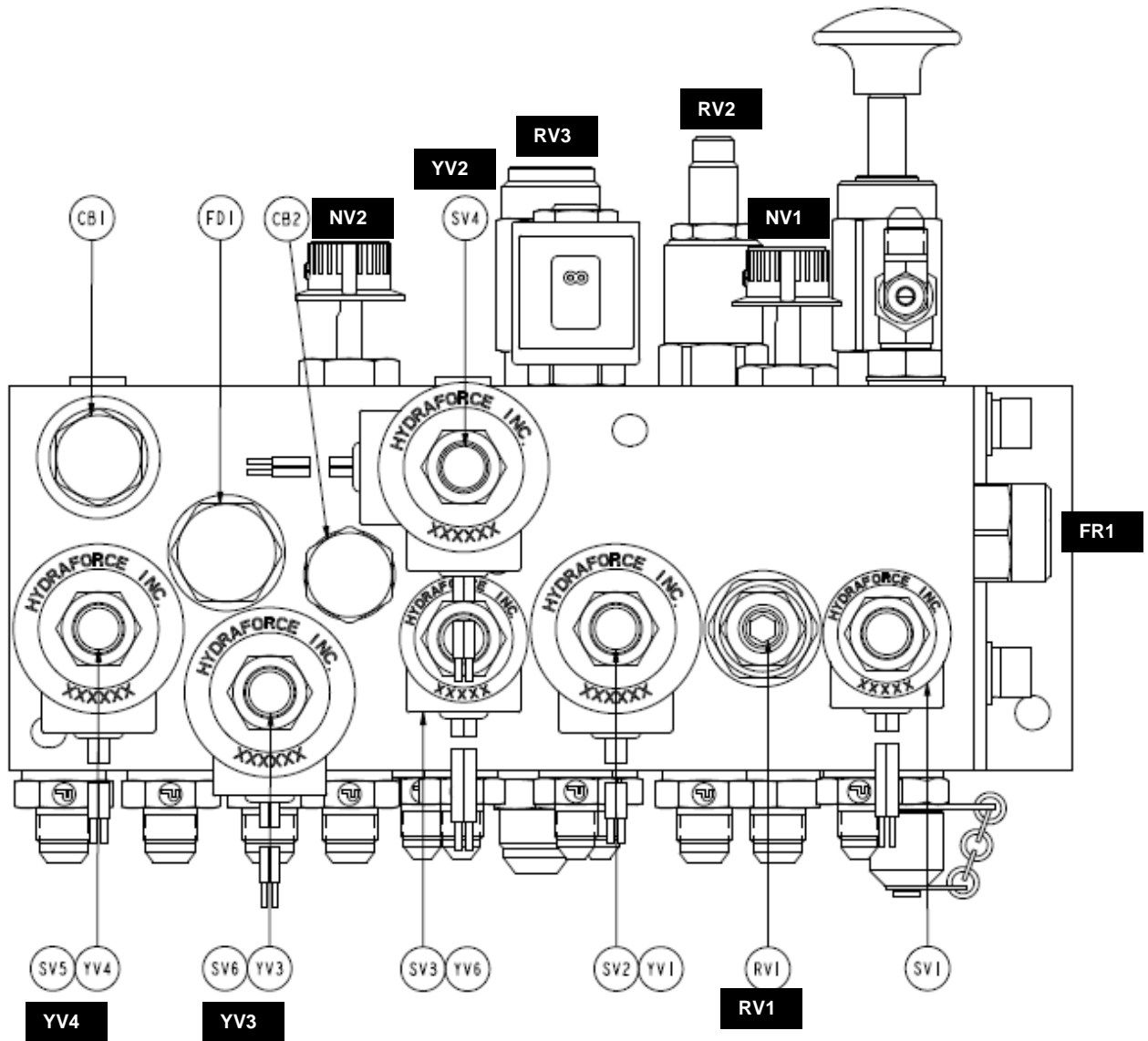




### 3.3. DETAILS OF HYDRAULIC BLOCK MK6



Marking	Description
1	YV3 - High / Low speed selection
2	YV4 - High / Low speed selection
3	YV2 a/b - Movement direction selection
4	YV6 - Pothole control
5	YV1 - Drive/Lift selection
6	FRT- Priority valve (shuttle valve)
7	RV1 - Steering pressure relief valve
8	RV3 - Lifting pressure relief valve
9	YV5 a/b - Steering
10	RV2 General pressure relief valve
11	FD1 - Driving flow divider
12	CB2 - Driving circuit balancing valve
13	CB1 - Driving circuit balancing valve
14	Pump - Manual freewheeling (brake release) pump for towing
15	FR - Rear brake power supply output
16	YV9 - Lifting solenoid valve
17	NV1 - Brake release relief valve
18	NV2 - Brake release bypass valve



## 4. ADJUSTMENTS

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### 4.1. ADJUSTMENT OF PRESSURES

Note: for all the adjustments of time and pressure, the oil temperature must be sufficiently hot according to the ambient temperature

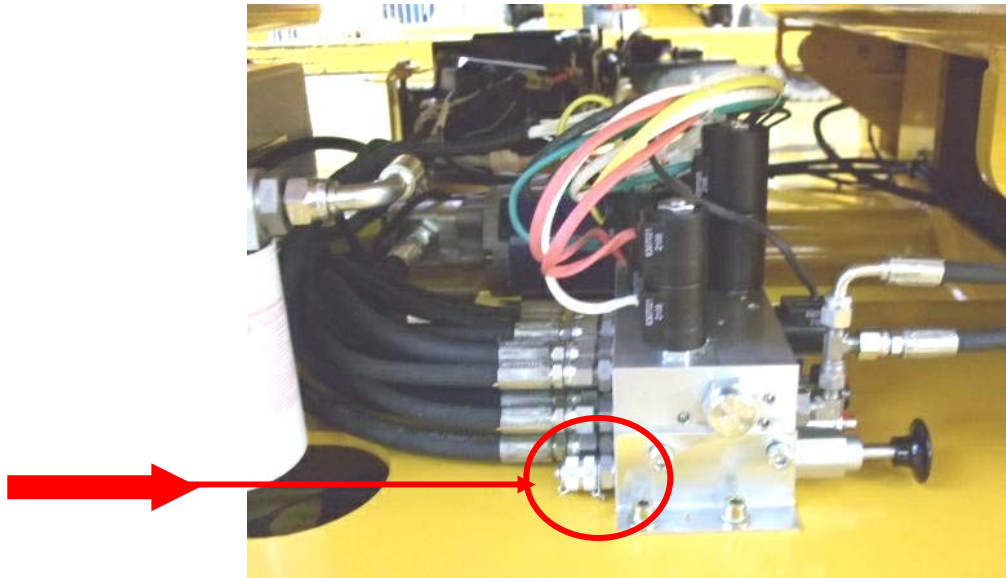
(in general 2 to 3 cycles of lifting and drive on a few meters are sufficient on this kind of machines)

#### 4.1.1. TABLE OF PRESSURES

Machine type	Nominal Load	Main hydraulic pressure (bars)	Steering pressure
H8SN	External 120kg Internal : 350kg	200b	150b
H8W	External 120kg Internal : 450kg	220b	150b
H10S	External 120kg Internal : 350kg	220b	150b
H10N	Internal : 230kg	220b	150b
H12SN	External 120kg Internal : 300kg	220b	150b
H14SN	External 120kg Internal : 300kg	240b	165b
OPT6	External 115kg Internal : 270kg	230b	100b
OPT8	Internal : 230kg	230b	100b

**4.1.2. PROCEDURE FOR PRESSURES ADJUSTMENT**

Connect the pressure gauge on the minimess port M as indicated below



- **Bloc MK5**

<b>Steering pressure : RV1</b>
connect the pressure gauge on the port of the hydraulic block
unscrew the upper part with the wrench of 19 mm
select low speed and bring the steering lock to lock
Adjust the pressure: (key of 1/4)
OPTIMUM: between 95 and 105 bars.
COMPACT: between 145 and 155 bars.
tighten back the whole unit



**Relief valve  
for steering**

<b>Drive pressure (or main): RV2</b>
connect the pressure gauge on the port of the hydraulic block
block the axle motodirector with câles and to unscrew with the wrench of 19 mm
select high speed and to command the drive
Adjust the pressure:
OPT6 and OPT8: between 225 and 235 bars
H8SN: between 195 and 205 bars
H10S - H8SW - H10N: between 215 and 225 bars
H12SN and C14: between 235 and 245 bars
Tighten back the whole unit



**Relief valve for Pmax**

<b>.Lifting pressure : RV3 (see value according to table of the adjustments)</b>
connect the pressure gauge on the port of the hydraulic block
Put the correct load corresponding to the model
unscrew the cap with the Allen key CHC
check the separation of the scissors arms if not adjust the pressure relief valve



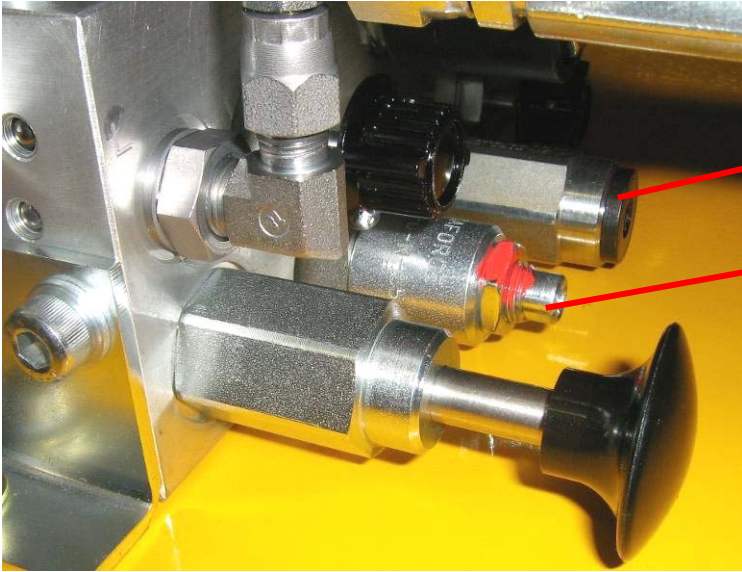
**Relief valve for lifting**

extension retracted: place the weights in the center of the platform:

<b>OPT6</b>	<b>OPT8</b>	<b>C8</b>	<b>C8 CU</b>
297Kg	253Kg	385Kg	330Kg
<b>C10N</b>	<b>C8W C10</b>	<b>C12</b>	<b>C14</b>
253Kg	495Kg	330Kg	405Kg



- For block MK6 (normally for C14)



**RV3 Relief valve  
for lifting**

**RV2 Relief valve  
for main pressure**



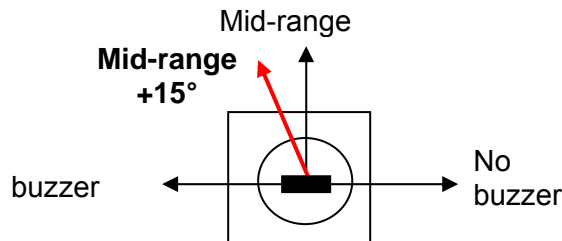
**RV1 Relief valve  
for steering**



### 4.1.3. OVERLOAD ADJUSTMENT PRESSURE SWITCH SP1

Note that the following procedure is valid for machines equipped with the overload pressure switch SP1 only  
Procedure:

- All process must be done from low control box
- put the nominal load corresponding to the model of the machine
- raise the scissors from approximately 1 meter in order to reach the setting screw of the pressure switch SP1
- unscrew the setting screw in order to make it more sensitive
- lift the scissors until the movement stops (at SQ1) and buzzer sounds
- Adjust the setting screw until the buzzer stops sounding
- Lower the platform below SQ1 then lift it again and check that the buzzer sounds a short moment with a short stop of the lifting movement (if not readjust the screw by turning each time of 1/8 turn)
- Lower the platform and to put an additional load of 50kg (C10N, C8W and 8) or of 60kg (C8, C10 and C12)
- Lift the scissors in order to check that the lifting stops at SQ1 and with buzzer sounds
- Check that descent is stopped and microspeed automatically engaged when the buzzer sounds.
- End of the adjustment



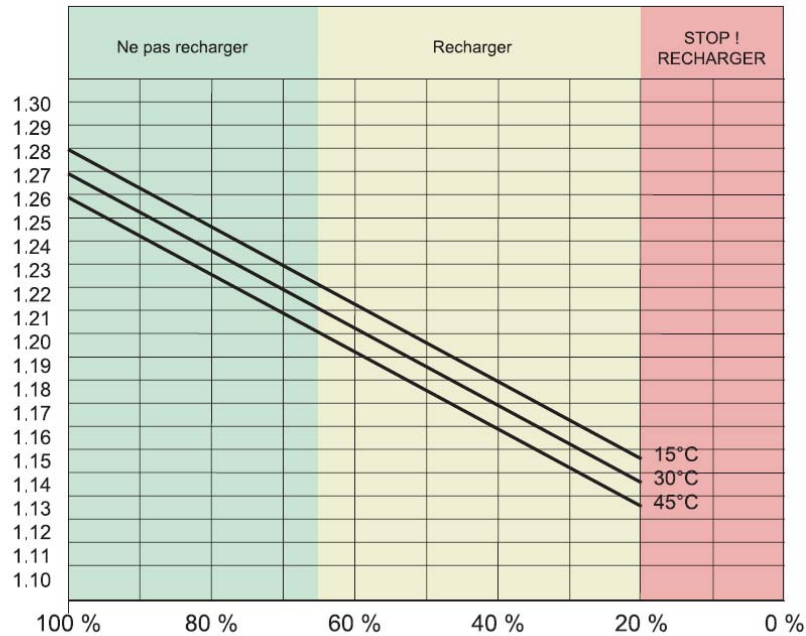
### 4.2. SPEEDS

	C8	C8W	C10	C10N	C12	C14	OPT6	OPT8
Lift(s)	37	44	45	46	75	66	21	23
Descent(s)	41	56	49	49	52	50	37	29

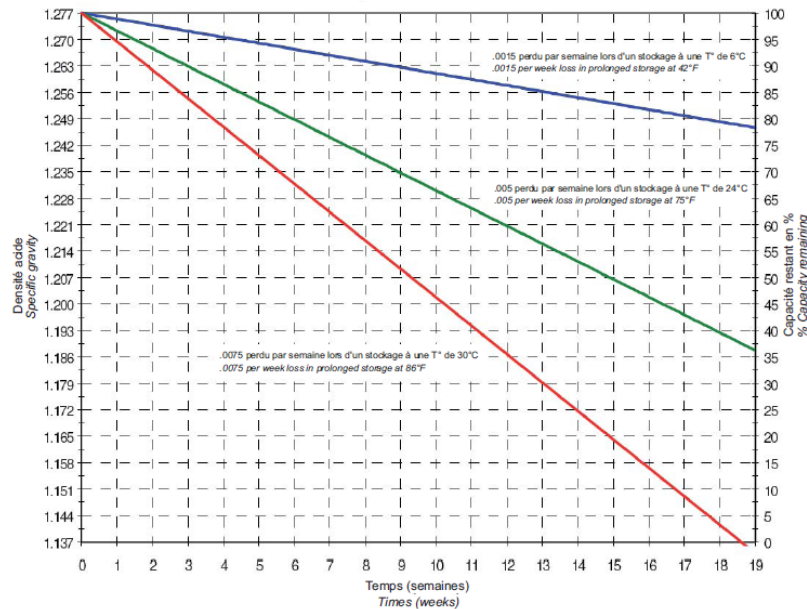
### 4.3. BATTERY CHARGER

To keep your batteries in good condition, test the density of each element once a month using a battery hydrometer, according to the temperature indicated in the curves below :

Battery charge status according to density and temperature

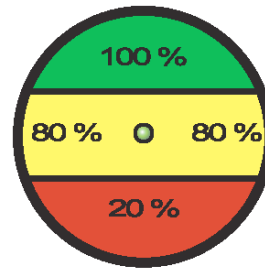


Loss of capacity during prolonged storage



Electrolyte freezing point according to the density of the acid and state of charge

Specific gravity	Battery charger status	Freezing point
1.280	100 %	-69 °C (-92 °F)
1.265	92 %	-57 °C (-71,3 °F)
1.250	85 %	-52 °C (-62 °F)
1.200	62 %	-27 °C (-16 °F)
1.150	40 %	-15 °C (5 °F)
1.100	20 %	-7 °C (19 °F)



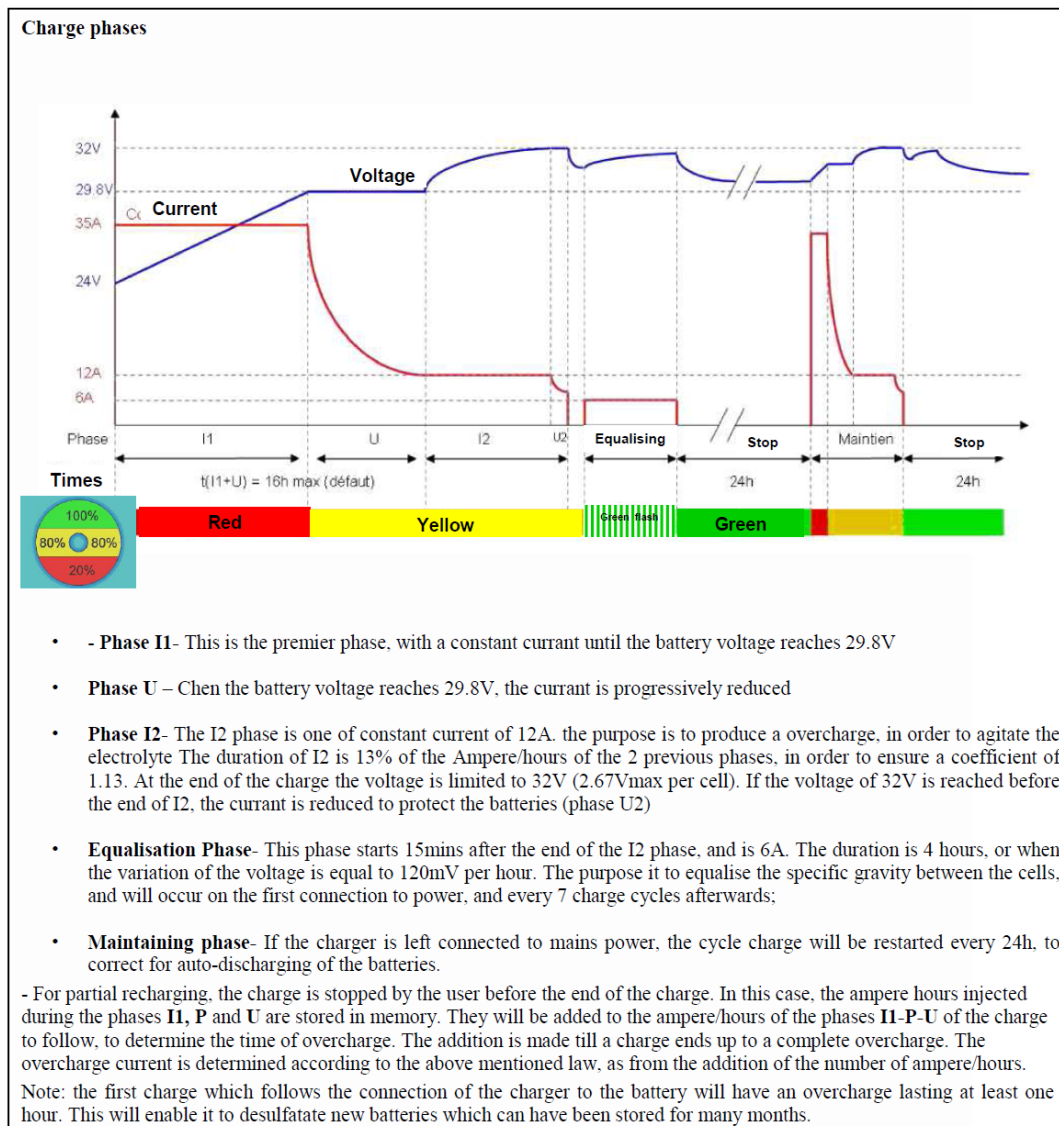
Green LED : Battery 100 % charged

Yellow LED : Battery 80 % charged

Red LED : Charger in the initial charge phase

Red led	phase 1
Blinking red	in case of failure ( disconnect and reconnect the battery charger for reset
Yellow led	phase U, I2 and stop before equalisation
Green led	at the end of this phase
Blinking green led	in equalisation phase
OFF	no power

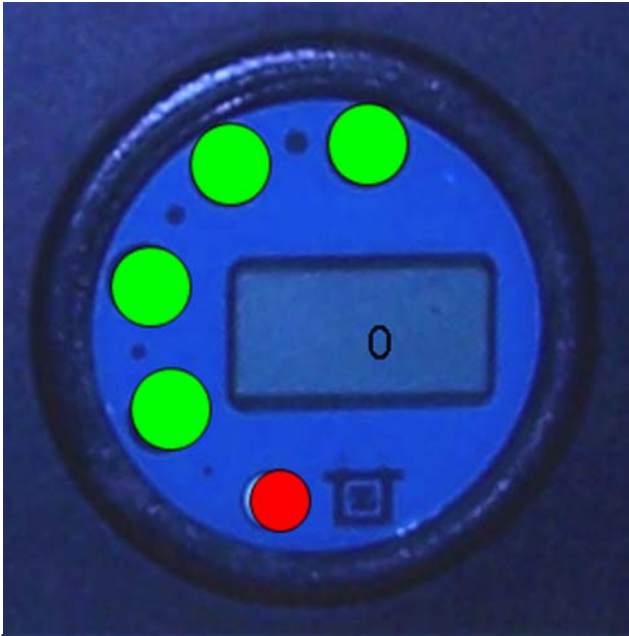
When batteries are fully charged, the led is green fixed



#### 4.4. THE MDI

The MDI (Multi Display indicator) has many functions

##### 4.4.1. FUNCTION 1



#### Battery Indicator

4 lights	100% full
3 lights	60-80% full
2 lights	40-60% full
1 light	20-40% full

When the hour meter indicates 20%, the cut-off threshold is activated and all elevation movements ceased. Only drive movement is possible with slow speed. The batteries need to be charged.

##### 4.4.2. FUNCTION 2



EPxx each time power is ON, the MDI shows the type of EEPROM in variator (ie EP2.25)

#### Error Code Display

When the machine encounters problem, error code will be displayed. This is a diagnostic function for fast troubleshooting to reduce downtime.



## 4.5. ZAPI CALIBRATOR

The specific adjustments, parameter settings and options are accessible only through this calibrator ZAPI

### 4.5.1. CONNECTION CONSOLE

The console must be connected at hourmeter connector (inside the chassis of the machine)

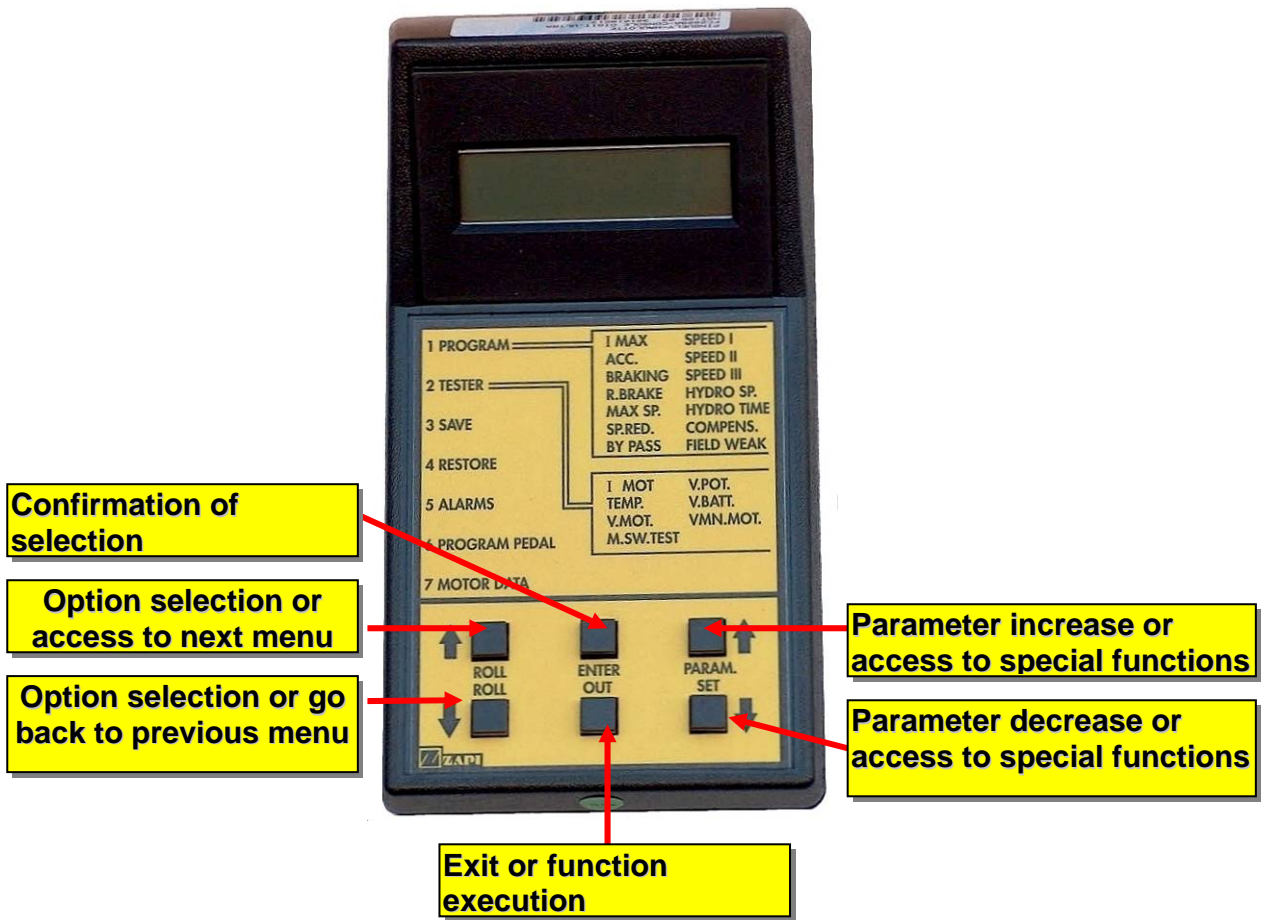
**Version 1**



**Version 2:**

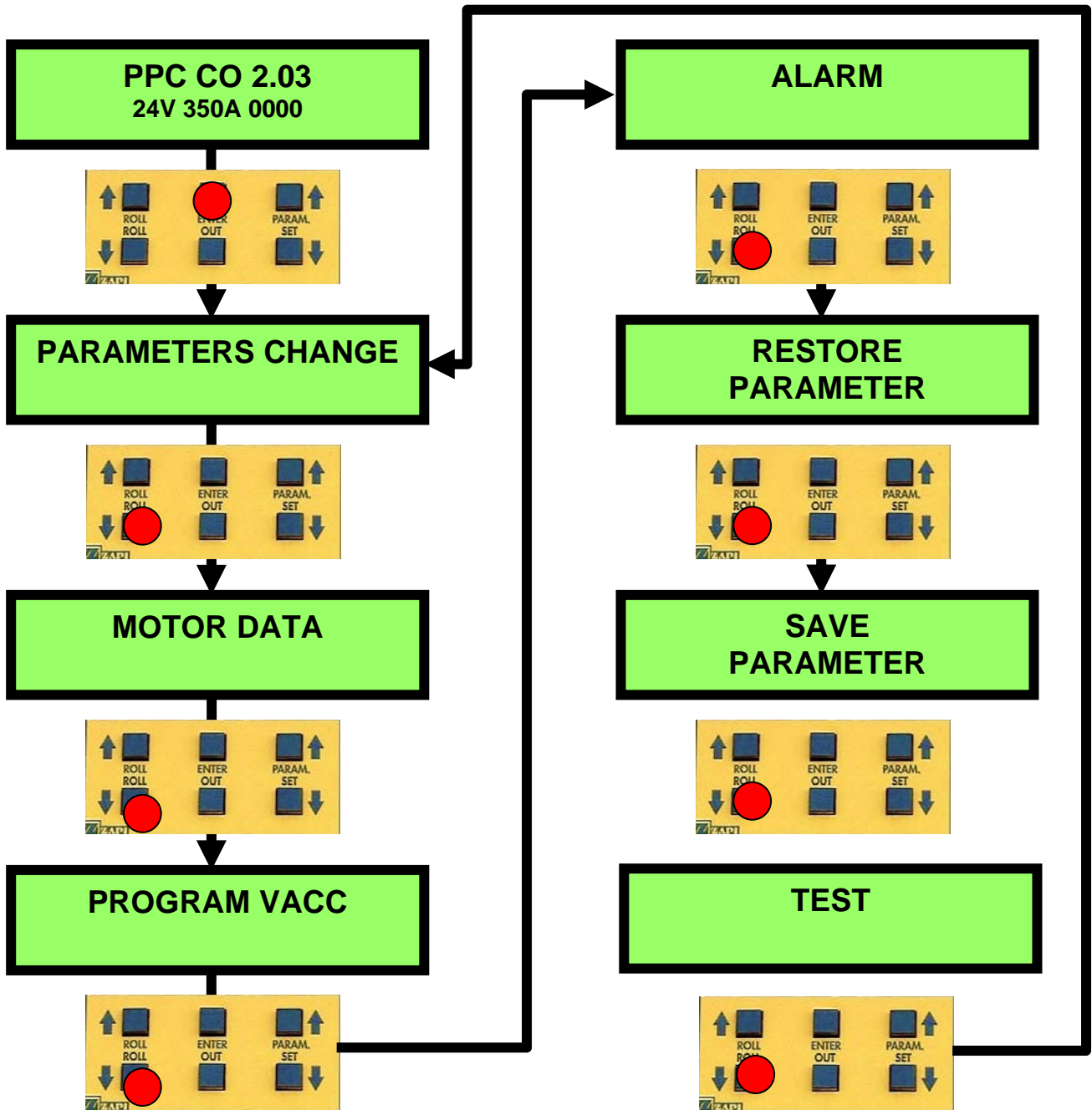


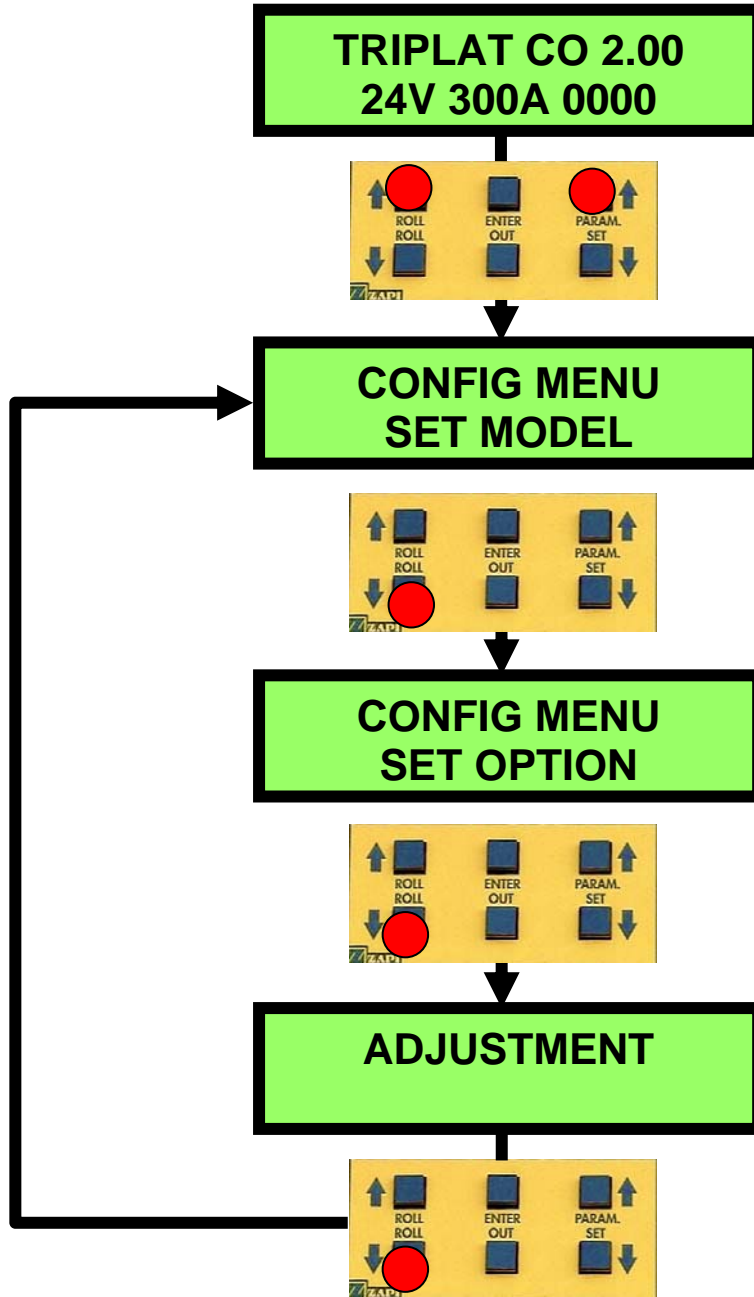
**4.5.2. DESCRIPTION OF THE CONSOLE**

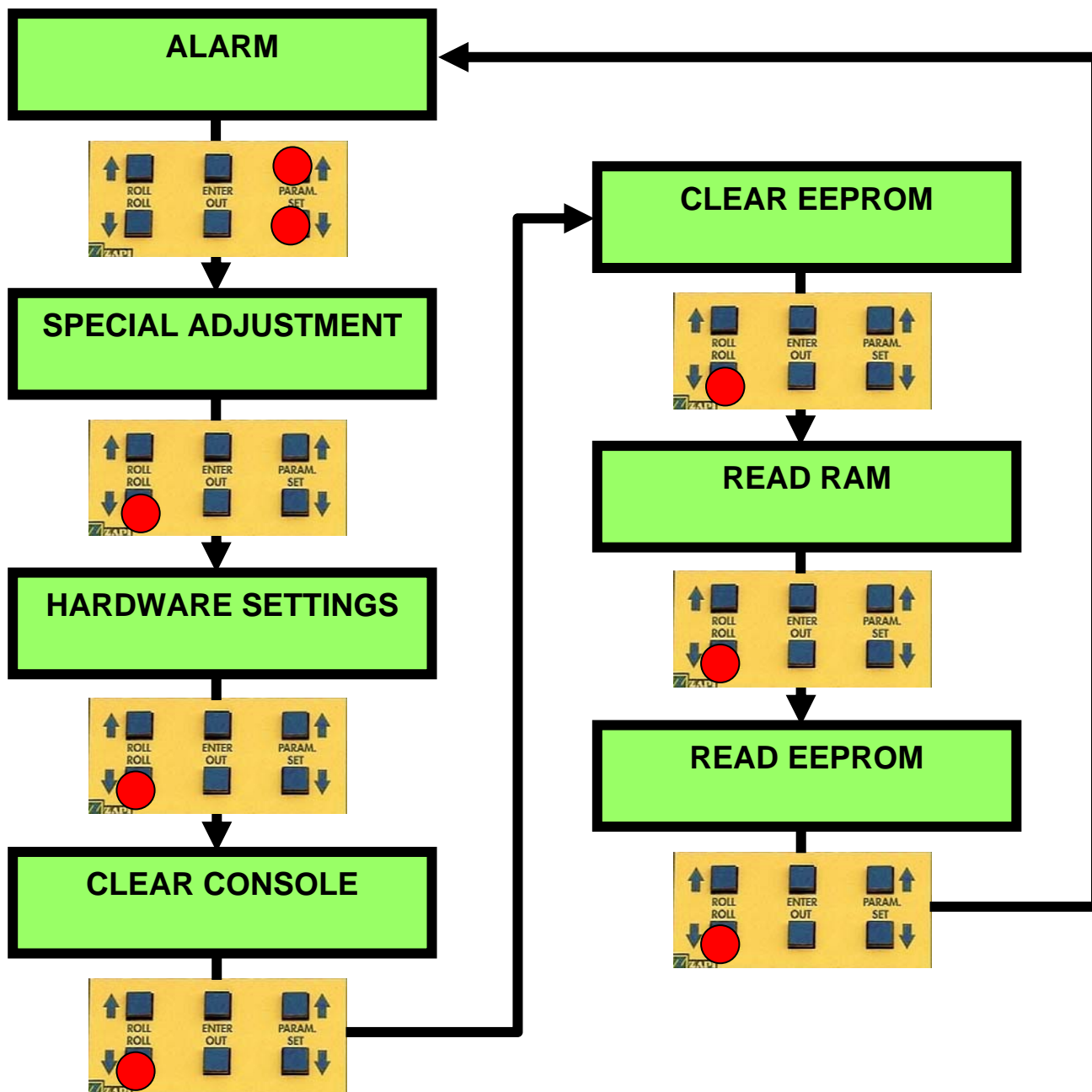




- Menu description







## 4.6. ALARMS CODES

ALARM CODE	FLASH CODE	DESCRIPTION	POSSIBLE CAUSES	DIAGNOSTIC
0 to the MDI + Red LED	8	BATTERY LOW	Batteries below 5% of charge	Put in charge the batteries
			Bad adjustment of adjust battery parameter	Adjust the voltage with the value of batteries by the parameter adjust battery
			Change ZAPI variator	check specific gravity + voltage batteries if Ok replace ZAPI variator
AL 01	3	EVP NOT OK	See option: Parameter "AUX FUNCTION 2"	ABSENT (pin 3 is for ON/OFF valve) default PRESENT (pin 3 is for proportional valve)
			Voltage on YV7 + YV9	Check continuity wires between YV7, YV9 and ZAPI variator
			Wire n°3 (Input B+, verify if wires 100 & 3 are not mixed)	Visually verify if the wire 3 coming from SB1 is on the terminal B+
			SB1 (battery cut off) in short circuit	Check continuity of SB1 coil
			If AL 01 + all LED on the MDI are switch ON change ZAPI Variator	Replace ZAPI variator
			Wire n°3 on P instead to B+	Change wire
AL 06	6	SERIAL ERROR #1	MDI	Change MDI or check continuity on wires 45,46,49 between MDI and ZAPI variator
			Loom between MDI and ZAPI Variator	1a) Connect console instead MDI, if "NO COMMUNICATION" see step 2.
			ZAPI variator	change DC motor controller (variator)
			Loom between upper control box and variator	1b) if no alarm in the console, check serial line wire 43 between upper control box and variator
			ZAPI variator or serial card	if same problem, check serial card or variator
AL 10	2	WEIGHING CARD KO	Too quickly selection between high and low box with key selector	Switch OFF the machine, wait for a few seconds then switch ON the machine
			If machine without overload system :on spécial adjust parameter the value of parameters "version" and "ok for version" are in mode #1	Change the 2 parameters and insert #2
			Change weighing card	Replace BPE weighing card
AL 13	6	EEPROM KO	Problem on EEPROM (variator KO)	<ol style="list-style-type: none"> <li>1. Do a clear eeprom and recycle the key</li> <li>2. If the fault disappears, the previously stored parameters will be replaced by the default parameters</li> <li>3. If the fault continues when the Key switch is turned OFF and ON again, replace ZAPI variator</li> </ol>

AL 32	3	VMN NOT OK	Short circuit on unit motor pump	Vérify continuity on electric motor
			Incorrect motor connection	Check motor connection Wires 3 and 4
			Frame fault of motor to chassis.	Check isolation between motor and chassis.
			Defect in the power unit	Check wire 4 (VMNP) with multimeter (between VMNP an B- Batteries), At STARTUP it must have around 24V. If no replace the variator.
AL 37	4	CONTACTOR CLOSED	Battery cut off switch stuck	Check power contact on SB1 Check SB1 coil Check SB1 wirings (wire 16 or wire 42)
			ZAPI variator	Replace ZAPI variator
AL 38	4	CONTACTOR OPEN	Battery cut off switch open	Check power contact SB1a (wire16 or wire42)
			The safety microprocessor can open the Main Contactor if it is broken or if there is dangerous situation detected by the safety microprocessor	1. Replace the main contactor and check the contactor wiring 2. Replace variator
AL 49	5	I = 0 EVER	Electric motor	Vérify continuity on M1 electric motor
			M1 motor power cables	Check continuity and states of M1 motor power cables
			Defective current sensor,	Replace variator
			Feed back circuit failure or logic failure or power unit failure	Replace variator
AL 53	5	STBY I HIGH	Electric motor	Vérify continuity on M1 electric motor
			M1 motor power cables	Check continuity and states of M1 motor power cables
			Defective current sensor,	Replace variator
			Feed back circuit failure or logic failure or power unit failure	Replace variator
AL 60	3	CAPACITOR CHARGE	Fuse 300A	Check the fuse
			Unit motor pump connexion	Vérify condition and cleaned connections between electric motor and ZAPI variator
			Horn relay in short circuit	Disconnect the coil of horn relay
			Change ZAPI variator	Measure the internal impedance of ZAPI variator between P et B- (around 47.4 KOhms)
AL 62	9	TH PROTECTION	This alarm is displayed when the chopper's temperature is the same as ambient temp	Temperature is not calibrated. Calibrate the "SET TEMPERATURE" in SPECIAL ADJUSTMENT menu

				Switch off the machine in order to cool down the variator (running time too long)
			This alarm is generated if the chopper temperature raises above 75°C	The temperature sensor may be defective (test can not be done) replace variator
				The logic may be defective. (test could not be done) replace variator
AL 73	1	POWER FAILURE #1	Horn in short circuit or Horn relay coil in short circuit	Disconnect the horn
			Battery cut off coil in short circuit	Check continuity of SB1 coil (check if it is shorted) + check wires 16 and 42
			ON / OFF or PWM valves coil in short circuit	Vérify if the valves coils are shorted + check wires 16,18,19,20,21,22,23,24,25,26
			ZAPI variator	If any of previous causes, than replace the variator
AL 74	4	DRIVER SHORTED	Driver of battery cut off in short circuit	Measure voltage on wire 42 & 16 of SB1 <b>0V</b> replace ZAPI variator <b>24V</b> vérify the continuity on SB1 coil
			Problems in the feed back circuit of the battery cut off driver SB1	Replace the variator
			RCH battery charger relay failing (machines produced before april 2008). It cuts the positive of SB1	install a shunt on RCH and make test
AL 75	4	CONTACTOR DRIVER	Defect in the battery cut off SB1 coil driver feed back circuit.	If SB1 and wiring are OK , replace the variator
AL 78	2	VACC NOT OK	Release accelerator (joystick) to neutral position	<ol style="list-style-type: none"> <li>1. the track of the potentiometer has become open</li> <li>2. the potentiometer is not wired correctly</li> <li>3. The potentiometer itself is defective.</li> <li>4. wire 38 (null position) is open when move the cursor</li> </ol> For test (1,2,3,4) You need to check with a multimeter between the track of the potentiometer and the GND, and see if the analog value follows the joystick movement.
AL 79	2	INCORRECT START	Incorrect start sequence	Check the deadman switch (wire 37)
				Check the joystick. SM1
AL 80	2	FORW+BACK	Failure on joystick	Replace joystick
				Failure on serial card
AL90	4	DRIVER 1 KO	Bad connexion on YV6 coil or coil broken	Check continuity of coil on YV6
				Vérifier continuity of wire 25 between coil and ZAPI variator
AL 91	2	VERSION NOT OK	With ZAPI IN SPECIAL ADJUSTMENT MENU the values of parameters "version" et "ok for version" are différent	Check if the 2 parameters have the same values (#1 => Overload sensor et #2=> overload electronic system). If different, then set both at the correct value



AL 93	0	WRONG INPUT CONF.	Lift from chassis (wire14) and enable (wire 34) active at same time.	Check wire 14 and 34. There is a not allowed input configuration
			Lower from chassis (wire15) and enable (wire 34) active at same time.	Check wire 15 and 34. There is a not allowed input configuration
AL 94	6	MICRO CONTROL KO	If low horn change battery cut off coil in short circuit	Try to change SB1 cut battery
			Mismatch between master/slave micro controllers.	If alarm persists change the variator.
AL 95	7	PRESSURE NOT OK	Overloaded platform	Check if the platform is not in overload
			Problem with loom connexion	check the continuity weighing loom (wires 9, 28)
				check the continuity on the loom between angle sensor and pressure sensor
				If machine without overload system check weighing jump
Fault on calibration	Make new calibration + adjustments			
AL 96	7	HEIGHT 8 METERS	Cut traction after 8 high meter (only C12)	If C12, normal fonction before on (not all models) Vérify continuity on line of terminal switch SQ4 if other machines to C12
			Machine with option load on extension platform	If machine with overload system , check continuity on line terminal switch SQ7
				If machine with overload check continuity traction cut line (wires 9 and 386)
				If machine with overload make new calibration for overload extension platform
AL 97	5	CURR. PROTECT.	Variator detect a peak of current.	Check if motor is mechanically locked + Check with other motor
			Problem in motor connection	Check the motor wiring
			Problem in feedback current sensor.	Replace variator
AL 98	0	NONE	It appens at startup, when you change the variator or the MDI.	Switch ON the machine and wait for at least, than AL98 should disappear Hourmeter MDI shows the hourcounter of the variator.
			The hourcounters (variator and MDI) differes more than 10hours.	
AL 99	6	CHECK UP NEEDED	Maintenance request	This alarm can be erased by setting "Check Up Done" = OFF in SET OPTION MENU ( always OFF with HG machines)

## 4.7. PARAMETERS ZAPI

- Machines settings for all standard version EP V2.25 (except US,CDN)  
(For machines with version < EP V2.25, refer to TN142)

PARAMETERS	Change parameters	DESCRIPTION	Values for COMPACT (Model type #1)	Values for OPTIMUM (Model type #2)
<b>***PARAMETRE CHANGE***</b>				
ACCELER. DELAY	YES	Acceleration ramp for traction	4	9
DECELER. DELAY	YES	Deceleration ramp for traction	5	0
CUTBACK SPEED	YES	Speed reduction (microspeed)	9	9
CREEP SPEED	YES	Minimum speed for traction	2	3
MAX SPEED FORW	YES	Maximum speed for traction (FWD)	9	7
MAX SPEED BACK	YES	Maximum speed for traction (REV)	9	7
COMPENSATION	YES	Compensation between battery voltage and value read by the speed variator unit	7	7
TRACTION IMAX	YES	Maximum current on traction motors	9	9
1ST SPEED COARSE	YES	Lifting speed	9	9
1ST SPEED COMP	YES	Compensation between the lift speed and load on platform	5	5
STEERING SPEED	YES	Steering speed	1	5
ADJ TR + ST SPEED	YES	Traction and steering speed ajustement	2	0
ADJ ST VALVE DEL	YES	Delay to close the steering valve	5	5
CREEP PUMP	YES	Minimum speed for pump and lifting	9	2
PU. ACCELER. DEL	YES	Acceleration ramp for lifting	5	5
PU. DECELER DEL	YES	Deceleration ramp for lifting	4	4
EV. ACCELER DEL	YES	Acceleration ramp for proportional valve <b>(not used by Haulotte Group)</b>	5	5
EV. DECELER DEL	YES	Deceleration ramp for proportional valve <b>(not used by HG)</b>	5	5
MIN VALVE VOLT	YES	Minimum voltage on proportional valve <b>(not used by HG)</b>	5	5

MAX VALVE VOLT	YES	Maximum voltage on proportional valve <b>(not used by HG)</b>	5	5
AUX CURRENT #1	YES	Intensity limit with micro speed + steering	4	2
STEER CORRECTION	YES	Speed difference of steering right/left and left/right	127	127
<b>***ADJUSTMENTS*</b>				
ADJUST BATTERY	YES	Battery voltage adjustment	Under battery voltage	Under battery voltage
TIME UP WAIT	YES	Parameters for the temporisation of overload calibration when system is installed	200 (0 with BPE board 2901001750)	0 (200 with BPE Board 2901012820)
TIME UP YV7	YES	Parameters for the temporisation of overload calibration when system is installed	100 (0 with BPE board 2901001750)	0 (100 with BPE Board 2901012820)
TIME DOWN START	YES	Parameters for the temporisation of overload calibration when system is installed	800 (0 with BPE board 2901001750)	0 (800 with BPE Board 2901012820)
TIME DOWN YV7	YES	Parameters for the temporisation of overload calibration when system is installed	400 (0 with BPE board 2901001750)	0 (400 with BPE Board 2901012820)
LOWER DELAY	YES	Acquisition time weighing card	5	5
<b>***SET OPTIONS***</b>				
HOUR COUNTER	YES	Hourmeter : SB1 key ON=> it's counting RUNNING=> it's counting only when pump is running	RUNNING	RUNNING
BATTERY CHECK	YES	Control the discharge of batteries ( lift is cut if batteries are discharged)	ON	ON
AUX FUNCTION 2	YES	Proportional valve : PRESENT/ABSENT <b>(no used by HG)</b>	ABSENT	ABSENT
BUZZER OPTION	YES	Buzzer is active during traction FWD or REV (choice PRESENT : YES /ABSENT : NO)	ABSENT	ABSENT
BUZZER OPTION #2	YES	Buzzer is active for all movements (choice PRESENT : YES /ABSENT : NO)	ABSENT	ABSENT
CHECK UP ENABLE	YES	Activation for sheduled maintenance routine check <b>(not used by HG)</b>	OFF	OFF

CHECK UP DONE	YES	Manutention routine check done <b>(not used by HG)</b>	OFF	OFF
SET BATTERY TYPE	YES	Selection of battery type ( 24V/48V)	24V	24V
LOWERING BLOCK	YES	Activation of the scissors arm descent stop when reaching SQ1 limit switch (OFF for AUS)	ON (version EUR)	ON (version EUR)
OVER. LEARNING	YES if overload option	Validation of the overload process with lower control box (Automatically OFF after machine reset)	OFF (ON for calibration from upper or lower control box)	OFF ( ON for calibration from upper or lower control box)
SURCH SECU	YES	Authorization of sudden release during an overload. The operator can lower the scissor. Only available with weighing card 2901012810 Compact and 2820 Optimum	ON	ON
FLASHING LIGHT	YES	Option choice for flashing light ( from 1 to 4 depends customer's choice) #1: Stopped #2: Traction only #3: Lift and lower + traction + steer #4: All time	Option #1	Option #1

***SET MODEL***				
OPTION #	YES	Validation for model choice (if bad setting : problem on microspeed)	OPTION # 1	OPTION # 2
***SPECIAL ADJUST***				
SET TEMPERATURE	YES	Thermal probe adjustment on speed variator unit	Variable	Variable
MAXIMUM CURRENT	NO	Fiedl I max setting on drive motors <b>(not used for scissors machines)</b>		
VERSION	YES	Overload option (#1 pressure sensor; #2 overload sensor)	Option #1	Option #1
OK FOR VERSION	YES	Overload option (#1 pressure sensor; #2 overload sensor)	Option #1	Option #1
***HARDWARE SETTING				
SET COURANT	YES	Impose the maximum current on speed unit variator	350 A	350 A

ADJUSTMENT #01	YES	Maximum correction on discharge battery indicator curve	Level = 5	Level = 5
ADJUSTMENT #02	YES	Minimum correction on discharge battery indicator curve	Level = 5	Level = 5
AUX FUNCTION 1	YES	Habilitation for hours priority when MDI or variator has been changed (OFF hours from variator hours /ON hours from MDI)	ON	ON
<b>***TESTER***</b>		<b>Machine in lower position</b>		
BATTERY VOLTAGE	NO	Battery voltage reading (reading between terminals B+ and B - in VOLTS	Under battery voltage	Under battery voltage
MOTOR VOLTAGE	NO	Voltage on drive motor in Volts	0.0 v	0.0 v
MOTOR CURRENT	NO	Current on drive motors in Amp	0.0 A	0.0 A
EVP VOLTAGE	NO	Tension on proportional valve	Between 0 and 1V	Between 0 and 1V
TEMPERATURE	NO	Temperature on the speed unit variator in °C	Under outside T°	Under outside T°
ACCELERATOR	NO	Joystick signal in Volts and % (display is at 5,00V maxi only if joystick handle is pushed without trigger and 100% if joystick trigger is pushed) in both ways	0.00 v / 0%	0.00 v / 0%
FORWARD SWITCH	NO	FWD movement when joystick is pushed forward (ON/OFF)	OFF GND	OFF GND
BACKWARD SWITCH	NO	REV movement when joystick is pulled backwards (ON/OFF)	OFF GND	OFF GND
ENABLE SWITCH	NO	Emergency stop button SB2	ON	ON
CUTBACK SWITCH	NO	Speed reduction SA3 , ON / OFF	ON	ON
LIFTING SWITCH	NO	Lift demand (SA3 + push on joystick without trigger) ON / OFF	OFF GND	OFF GND
DESCENT SWITCH	NO	Descent demand (SA3 + pull on joystick without trigger) ON / OFF	OFF GND	OFF GND
STOP UP SWITCH	NO	Limit switch SQ3 for lift stop , ON / OFF	OFF GND	OFF GND
STOP DOWN SWITCH	NO	Limit switch SQ1 for low detection and high speed cut, ON / OFF	ON	ON
8M BLOCK SWITCH	NO	Limit switch SQ4 for 8 m height detection for drive cut ON / OFF ( only C12 )	OFF GND	OFF GND

SIDES GATES	NO	Pothole ( stabilisers) SQ5 - SQ6 , ON /OFF	ON	ON
RIGHT STEER SW	NO	Right steering switch on joystick, ON / OFF	OFF GND	OFF GND
LEFT STEER SW	NO	Left steering switch on joystick, ON / OFF	OFF GND	OFF GND
PRESSURE SWITCH	NO	Pressure switch input SP1 ON / OFF ( if overload system is not installed)	OFF GND	OFF GND
INCLINAISON SW	NO	Slope sensor input SQ10, ON / OFF	OFF GND	OFF GND
DEADMAN	NO	Joystick trigger HM ON / OFF	OFF GND	OFF GND
BATTERY CHARGE	NO	Battery charge indicator in %	Under battery charge	Under battery charge



- **Machines settings EP V1.31 (only for US,CDN)**  
(For machines with versions < EPV1.31, refer to TN142)

PARAMETERS	Change parameters	DESCRIPTION	Values for COMPACT (Model type #1)	Values for OPTIMUM (Model type #2)
<b>***PARAMETRE CHANGE***</b>				
ACCELER. DELAY	YES	Acceleration ramp for traction	4	9
DECELER. DELAY	YES	Deceleration ramp for traction	4	0
CUTBACK SPEED	YES	Speed reduction (microspeed)	2	9
CREEP SPEED	YES	Minimum speed for traction	2	3
MAX SPEED FORW	YES	Maximum speed for traction (FWD)	9	7
MAX SPEED BACK	YES	Maximum speed for traction (REV)	9	7
COMPENSATION	YES	Compensation between battery voltage and value read by the speed variator unit	7	7
TRACTION IMAX	YES	Maximum current on traction motors	9	9
1ST SPEED COARSE	YES	Lifting speed	9	9
1ST SPEED COMP	YES	Compensation between the lift speed and load on platform	5	5
STEERING SPEED	YES	Steering speed	4	5
ADJ TR + ST SPEED	YES	Traction and steering speed adjustment	2	0
ADJ ST VALVE DEL	YES	Delay to close the steering valve	5	5
CREEP PUMP	YES	Minimum speed for pump and lifting	9	2
PU. ACCELER. DEL	YES	Acceleration ramp for lifting	5	5
PU. DECELER DEL	YES	Deceleration ramp for lifting	4	4
EV. ACCELER DEL	YES	Acceleration ramp for proportional valve <b>(not used by Haulotte Group)</b>	5	5
EV. DECELER DEL	YES	Deceleration ramp for proportional valve <b>(not used by HG)</b>	5	5
MIN VALVE VOLT	YES	Minimum voltage on proportional valve <b>(not used by HG)</b>	5	5
MAX VALVE VOLT	YES	Maximum voltage on proportional valve <b>(not used by HG)</b>	5	5

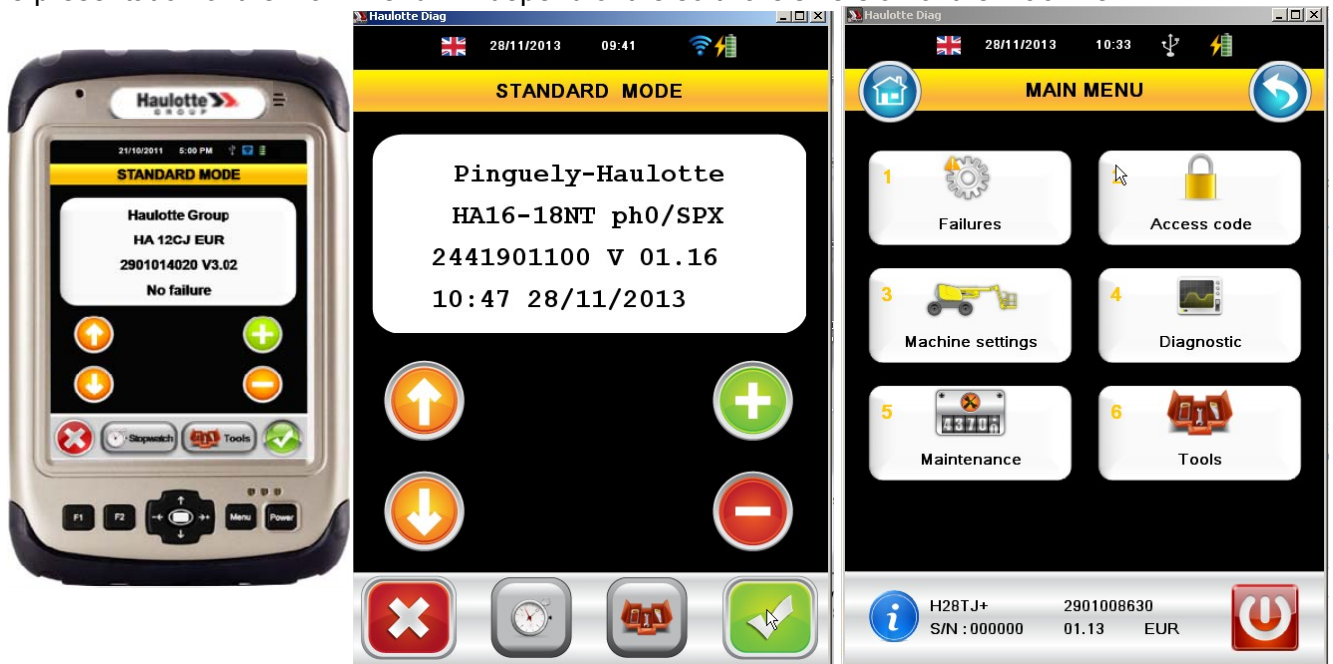
AUX CURRENT #1	YES	Intensity limit with micro speed + steering	4	2
<b>***ADJUSTMENTS***</b>				
ADJUST BATTERY	YES	Battery voltage adjustment	Under battery voltage	Under battery voltage
<b>***SET OPTIONS***</b>				
HOUR COUNTER	YES	Hourmeter : SB1 key ON=> it's counting RUNNING=> it's counting only when pump is running	RUNNING	RUNNING
BATTERY CHECK	YES	Control the discharge of batteries ( lift is cut if batteries are discharged)	ON	ON
AUX FUNCTION 2	YES	Proportional valve : PRESENT/ABSENT <b>(not used by HG)</b>	ABSENT	ABSENT
BUZZER OPTION	YES	Buzzer is active during traction FWD or REV (choice PRESENT : YES /ABSENT : NO)	ABSENT	ABSENT
BUZZER OPTION #2	YES	Buzzer is active for all movements (choice PRESENT : YES /ABSENT : NO)	ABSENT	ABSENT
CHECK UP ENABLE	YES	Activation for sheduled maintenance routine check <b>(not used by HG)</b>	OFF	OFF
CHECK UP DONE	YES	Manutention routine check done <b>(not used by HG)</b>	OFF	OFF
SET BATTERY TYPE	YES	Selection of battery type ( 24V/48V)	24V	24V
LOWERING BLOCK	YES	Activation of the scissors arm descent stop when reaching SQ1 limit switch (OFF for AUS)	OFF (US version)	OFF (US version)
OPT CANADA	YES	Validation for CANADA regulations (slope activated , no overload) for US version is OFF	OFF	OFF
FLASHING LIGHT	YES	Option choice for flashing light ( from 1 to 4 depends customer's choice) #1:Stopped #2:Traction only #3:Lift and lower + traction + steering #4:All time	Option #1	Option #1

***SET MODEL***				
OPTION #	YES	Validation for model choice ( if bad setting : problem on microspeed)	OPTION # 1	OPTION # 2
***SPECIAL ADJUST***				
SET TEMPERATURE	YES	Thermal probe adjustment on speed variator unit	Variable	Variable
MAXIMUM CURRENT	NO	Field I max setting on drive motors <b>(not used for scissors machines)</b>		
***HARDWARE SETTING***				
SET COURANT	YES	Impose the maximum current on speed unit variator	350 A	350 A
ADJUSTMENT #01	YES	Maximum correction on discharge battery indicator curve	Level = 5	Level = 5
ADJUSTMENT #02	YES	Minimum correction on discharge battery indicator curve	Level = 5	Level = 5
AUX FUNCTION 1	YES	Habilitation for hours priority when MDI or variator has been changed (OFF hours from variator hours /ON hours from MDI)	ON	ON
***TESTER***		Machine in lower position		
BATTERY VOLTAGE	NO	Battery voltage reading ( reading between terminals B+ and B - in VOLTS	Under battery voltage	Under battery voltage
MOTOR VOLTAGE	NO	Voltage on drive motor in Volts	0.0 v	0.0 v
MOTOR CURRENT	NO	Current on drive motors in Amp	0.0 A	0.0 A
EVP VOLTAGE	NO	Tension on proportional valve	Between 0 and 1V	Between 0 and 1V
TEMPERATURE	NO	Temperature on the speed unit variator in °C	Under outside T°	Under outside T°
ACCELERATOR	NO	Joystick signal in Volts and % (display is at 5,00V maxi only if joystick handle is pushed without trigger and 100% if joystick trigger is pushed) in both ways	0.00 v / 0%	0.00 v / 0%
FORWARD SWITCH	NO	FWD movement when joystick is pushed (ON/OFF)	OFF GND	OFF GND
BACKWARD SWITCH	NO	REV movement when joystick is pulled (ON/OFF)	OFF GND	OFF GND
ENABLE SWITCH	NO	Emergency stop button SB2	ON	ON

CUTBACK SWITCH	NO	Speed reduction SA3 , ON / OFF	ON	ON
LIFTING SWITCH	NO	Lift demand (SA3 + push on joystick without trigger) ON / OFF	OFF GND	OFF GND
DESCENT SWITCH	NO	Descent demand (SA3 + pull on joystick without trigger) ON / OFF	OFF GND	OFF GND
STOP UP SWITCH	NO	Limit switch SQ3 for lift stop , ON / OFF	OFF GND	OFF GND
STOP DOWN SWITCH	NO	Limit switch SQ1 for low detection and high speed cut, ON / OFF	ON	ON
8M BLOCK SWITCH	NO	Limit switch SQ4 for 8 m height detection for drive cut ON / OFF ( only C12 )	OFF GND	OFF GND
SIDES GATES	NO	Pothole ( stabilisers) SQ5 - SQ6 , ON /OFF	ON	ON
RIGHT STEER SW	NO	Right steering switch on joystick, ON / OFF	OFF GND	OFF GND
LEFT STEER SW	NO	Left steering switch on joystick, ON / OFF	OFF GND	OFF GND
PRESSURE SWITCH	NO	Pressure switch input SP1 ON / OFF ( if overload system is not installed)	OFF GND	OFF GND
INCLINAISON SW	NO	Slope sensor input SQ10, ON / OFF	OFF GND	OFF GND
DEADMAN	NO	Joystick trigger HM ON / OFF	OFF GND	OFF GND
BATTERY CHARGE	NO	Battery charge indicator in %	Under battery charge	Under battery charge

## 4.8. CONSOLE DIAG PAD

It's possible to use the 2<sup>nd</sup> generation of diagnostic console (also available through laptop)  
 The presentation of the main menu will depend of the software's version of the machine



This diagnostic console could be used in WIFI using a VCI adapter (Vehicle Computer Interface)



The full description of how to use that console and their menus is explained in an other technical note (refer to your nearest HAULOTTE SERVICES of your area)





Note :

With that 2<sup>nd</sup> generation of console, the name of alarm's code has been changed (not the description and function)

These new codes are for all Compact- Optimum models

New failure code	Original failure code
F01.06	AL62
F01.13	AL06
F01.14	AL13
F01.15	AL94
F01.16	AL01
	AL10
	AL32
	AL37
	AL38
	AL49
	AL53
	AL60
	AL74
	AL75
	AL78
	AL79
	AL80
	AL90
	AL91
	AL95
AL96	
AL97	
AL99	

## 4.9. THE SYSTEM OF LOAD CONTROL

### 4.9.1. PRINCIPLE

The potentiometric sensor measures the relative angle of a moving part compared to the structure on which it is fixed

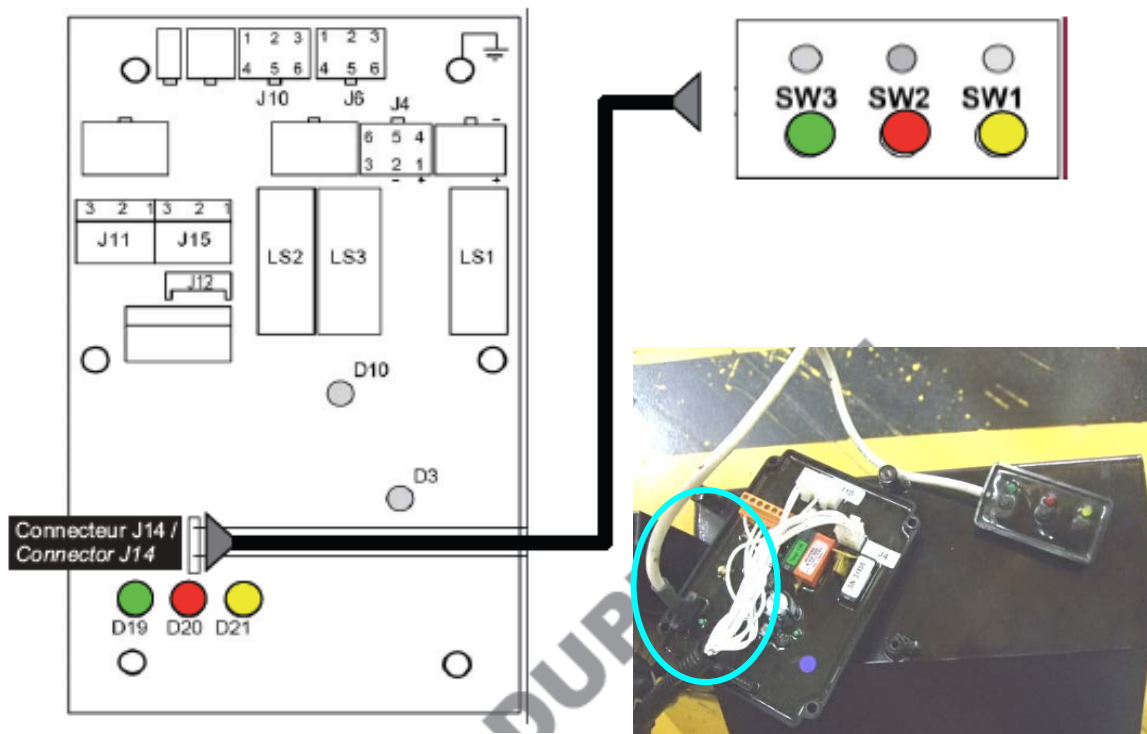
The potentiometer axle follows the movement of the scissors arms and delivers a signal proportional to the position of the platform.

So the pressure is representative of load on platform, the lift cylinder should never be at full mechanical stroke

The stroke of this cylinder is thus limited by 2 electric stops (position retracted - position extended)

This information is sent to the variable speed unit via 2 relays located in the BPE weighing board

### 4.9.2. CONNECTION OF THE BPE CONSOLE



Console “push button” for overload calibration  
(part number 2440309320)



### 4.9.3. CALIBRATION OF LOAD MANAGEMENT SYSTEM (VALID FOR C14)

NOTE: Check the technical note TN092 depends on the version of your machine and the variator EEPROM as the way to calibrate the machine might vary from one model to the other one (ask your nearest HAULOTTE SERVICES for more details)

- put the load at the center of the platform ( value depends on the model)

Extension inside platform: to place the weights in the centre of the platform:

OPT6	OPT8	C8	C8 cu	C10N	C8W C10	C12	C14
297Kg	253Kg	385Kg	330Kg	253Kg	495Kg	330Kg	385Kg

Check that overload parameters are correctly set according to the model , type of BPE boad and type of EPROM version ( for mode details see below and ask to HAULOTTE Services of your area in order to get the technical note TN092)

#### Summary table of the adjustment to the 5 overload parameters:

Type of machine : COMPACT

EPROM Version	Only 2.14		> 2.14	
Parameters Type of BPEcard	2901001750	2901012810ou 2901001750 index NG (see page 5)	2901001750	2901012810ou 2901001750 index NG (see page 5)
Time Up Wait	0	200	0	200
Time Up Yv7	0	100	0	100
Time down Start	0	800	0	800
Time down YV7	0	400	0	400
Lower delay	5	5	5	5

Type of machine : OPTIMUM

EPROM Version	Only 2.14		> 2.14	
Parameters Type of BPE card	2901000970	2901012820 ou 2901000970 index NG (see page 5)	2901000970	2901012820 ou 2901000970 index NG (see page 5)
Time Up Wait	0	200	0	200
Time Up Yv7	0	100	0	100
Time down Start	0	800	0	800
Time down YV7	0	400	0	400
Lower delay	5	5	5	5

**Caution : When replacing variator with Eprom < 2.14 by variator with Eprom ≥2.14 the 4 parameters Time.... must be set to 0 and Lower delay to 5**

• **Calibration process ( for C14 )**

*Note : during all the calibration , the toggle switch for upper/lower control box selection must not be released ( hold it with a tie wrap for example)*

- Put the key switch on CH position ( try to hold it)
- Connect the BPE console on J14
- With ZAPI console, scroll for Menu SET OPTION/parameter OVERLEARNING and put it at ON
- Press and hold the red pushbutton on console at least 3 sec (led SW2 lit ON then green led is flashing) , a beep will sound in order to confirm it
- Lift the PF until the highest position, the machine will lift step by step (depends of the version)
- Maintain the lifting switch at least during 3 seconds ( the pump must stop running)
- Lower the PF until its lowest position (the buzzer should beep when reaching SQ1) and hold the command for at least 3 seconds
- Lift again the platform ( no stop)
- Once the highest position is reached , hold the command for 3 seconds
- Lower the platform until the lowest position ( the red led SW2 on console should be OFF)
- Calibration is done (if red led SW2 is not OFF or it's flashing , the calibration has not been done correctly and the full process must be done again
- If OK switch OFF the machine and remove the BPE console

**Adjustment limit switch SQ3**

In case the limit switch has been removed for calibration , it must be readjusted:

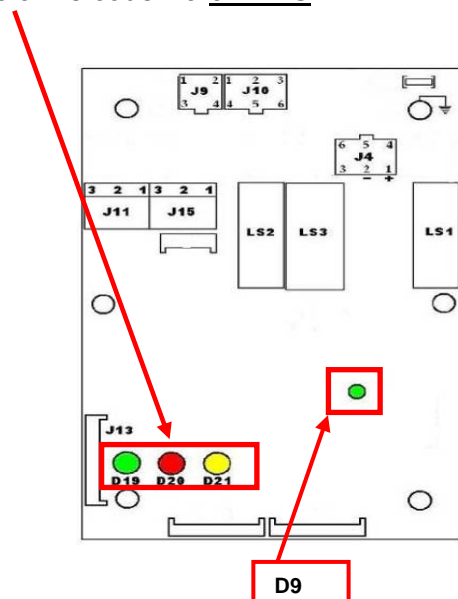
Put scissors full UP and adjust to regulate the height compared to the ground (see values on following table according to the model)

OPT6	OPT8	C8- C8W	C10	C10N	C12	C14
4.23 + 0.15 m	5.8 + 0.15 m	6.15 + 0.15 m	8,015 + 0.15 m	8.05 + 0.15 m	9.90 + 0.05	11.82 + 0.02 m

- Note: any change of component in the weighing circuit automatically involves the cancellation of the calibration of weighing made before

**4.9.4. CODE ALARMS WEIGHING BOARD**

The board has alarms code via 3 LEDS:



## Green LED D19: Error on analogical input

Nb of flashes	DESCRIPTION
0	No error
1	Error line pressure sensor
2	Error line angle sensor
3	Value of too low pressure
4	Too low value of angle
5	Inactive
6	Value of too high pressure at angle 0
7	Inactive

## Orange LED D21: Board error

Nb of flashes	DESCRIPTION
0	No error
1	Loss of communication between microprocessors
2	Error on test of control on inputs
3	Error on the polarity of connections to the relays <b>(check J4.4 and J4.6 even J4.1 tension)</b>
4	Inactive
5	Loss of communication micro/memory

## LED D20 red: State of the calibration

State	DESCRIPTION
Extinct	calibration validated
Flickering	Calibration not carried out or procedure not OK
Continuous	Calibration in progress

### 4.9.5. CONTROL I/O BOARD BPE

- **Control state of supply of the board**

Measure on weighing board with machine powered	voltage	D9 light
Between J4.1 and J4.2	24V	ON

- **Control BPE outputs**

In order to measure the outputs the solution is to measure the voltage on terminals J4.3 and J4.5  
When the contacts are closed

Between J4.3 and J4.2 (-) voltage of +24 V

Between J4.5 and J4.2 (-) voltage of +24 V

J4.3	J4.5	DESCRIPTION
OPEN	OPEN	In overload , no drive , no lift , no steering
OPEN	CLOSED	In overload , no drive , no lift , no steering
CLOSED	OPEN	Overload on extension , lift OK but no drive, no steering
CLOSED	CLOSED	Normal , lift and drive OK

### Control of the analogical inputs

- Pressure sensor G1

Measure pressure sensor	Voltage
Between J11.1 and J4.2	24V
Between J11.3 and J4.2	Between 0 and 5 V according to the pressure

- Angle sensor A1

Measure angle sensor	Value
Between J15.1 and J15.2 board BPE	5V
Between J15.2 and J15.3 of board BPE mini/maximum range	Between 0,5V and 4.5 V for an angle of 120° Low position ~ 3.44VDC Higher position ~ 1.38VDC

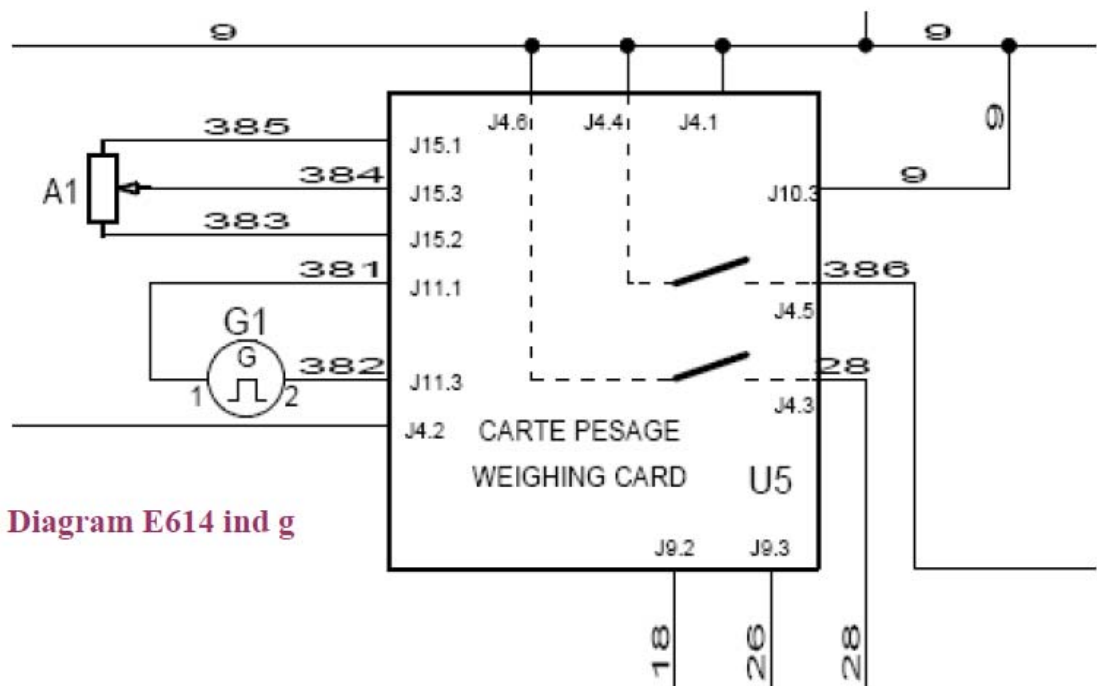
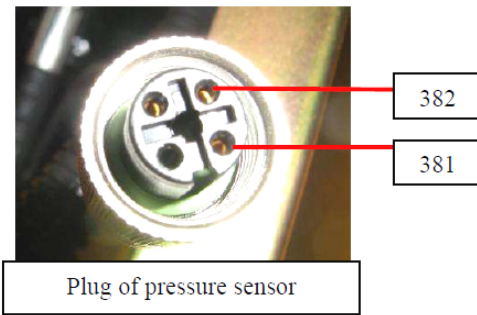
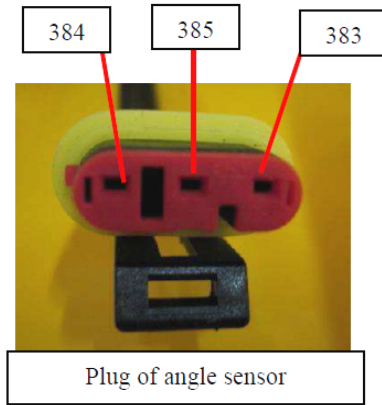
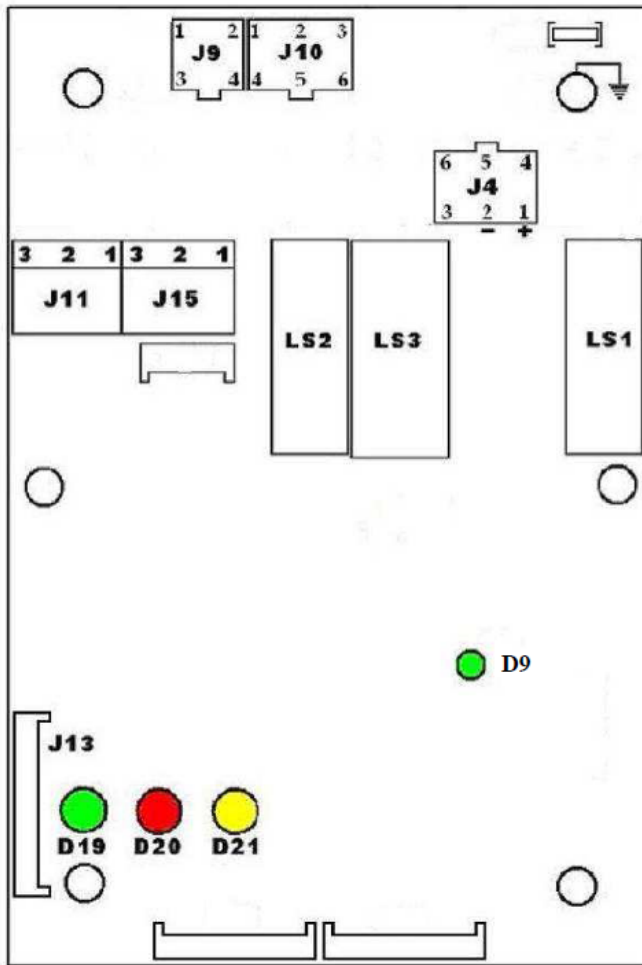
- Table value according to the pressure in G1

Voltage between J11.3 and minus(J4.2)	Signal of pressure sensor (mA)	Pressure on the cylinder (bar)
0	0	Defect on sensor
0,1	0,5	Defect on sensor
0,2	1	Defect on sensor
0,3	1,5	Defect on sensor
0,4	2	Defect on sensor
0,5	2,5	Defect on sensor
0,6	3	Defect on sensor
0,7	3,5	Defect on sensor
0,8	4	0
0,9	4,5	8
1	5	16
1,1	5,5	23
1,2	6	31
1,3	6,5	39
1,4	7	47
1,5	7,5	55
1,6	8	63
1,7	8,5	70
1,8	9	78
1,9	9,5	86
2	10	94
2,1	10,5	102
2,2	11	109
2,3	11,5	117
2,4	12	125
2,5	12,5	133

Voltage between J11.3 and minus (J4.2)	Signal of pressure sensor (mA)	Pressure on the cylinder (bar)
2,6	13	141
2,7	13,5	148
2,8	14	156
2,9	14,5	164
3	15	172
3,1	15,5	180
3,2	16	188
3,3	16,5	195
3,4	17	203
3,5	17,5	211
3,6	18	219
3,7	18,5	227
3,8	19	234
3,9	19,5	242
4	20	250
4,1	20,5	Defect on sensor
4,2	21	Defect on sensor
4,3	21,5	Defect on sensor
4,4	22	Defect on sensor
4,5	22,5	Defect on sensor
4,6	23	Defect on sensor
4,7	23,5	Defect on sensor
4,8	24	Defect on sensor
4,9	24,5	Defect on sensor
5	25	Defect on sensor



- Pin location for sensors check



## 5. BREAKDOWN SERVICE GUIDE

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This guide does not replace the logical equations described previously in this manual, it allows the technician to have a logical step of breakdown service, detailing the successive step to be followed starting from the main point until the detail.

The checking of the electric part is carried out in priority because less sensitive to the external parameters than the hydraulics part (temperature, pollution, viscosity...).

The machine of reference is Compact 14, the other models are relatively similar

All fuses have been checked, all movements described below implies both ways ( ex UP/DOWN)

### 5.1. NO START

- Batteries (GB1)
- Buttons emergency stops SB1 and/or SB2
- Key SA1 selector
- Relay charger RCH
- U2 variable speed unit(variator)/serial card

### 5.2. NO LIFT

- Sélecteur SA3 upper control box
- Limit switch SQ3
- joystick SM1 (off neutral and/or signal)
- Electrovalves YV1/YV6
- Sélecteur SA3 upper control box
- Limit switch SQ3
- Potholes/side gates SQ5 – SQ6 (if PF > SQ1)
- Machine in slope (SQ10 = 0)
- joystick SM1 (off neutral and/or signal)
- Pressure switch SP1 (if not equipped with BPE weighing board)
- Sensors of weighing A1 – G1 (signal)
- weighing board BPE (U5)
- overload calibration not carried out
- Pressure relief valve RV3

### 5.3. NO DESCENT

- Electrovalves YV7 (+ YV8 if > C12)/YV9 (if PF > SQ1)
- joystick SM1 (off neutral and/or signal)

#### **5.4. NO DRIVE**

- Selection SA3 upper control box
- joystick SM1 (off neutral and/or signal)
- Electrovalve YV2a/b + (YV3 – YV4 for High Speed)
- Limit switch SQ4 (if machine equipped)
- Machine in overload (SP1 or A1/G2/BPE board)
- Brake blocked (open knob NV2)
- Pressure relief valve general RV2
- Defective flow control valve FRT
- Defective counterbalance valves CB1-CB2
- Defective flow divider FD1
- Drive motors

#### **5.5. NO STEERING**

- joystick SM1 (rocker)
- Selection SA3 upper control box
- Electrovalve YV5
- Pressure relief valve RV1
- Flow control valve FRT
- Steering cylinder

## 6. SUMMARY OF THE VERSIONS

Compact – Optimum	Country	Wiring diagram	Hydraulic diagram
Compact 8/10 (until July 2003)	ALL	E501 Variable speed unit 244 220 1730	B15785
Compact 12 (until July 2003)	ALL	E501 Variable speed unit 244 220 1730	B16188
Compact 8/10 (until September 2005)	ALL	E591 Variable speed unit 244 220 1920	B16187
Compact 12 (until September 2005)	ALL	E591 Variable speed unit 244 220 1920	B15940
Compact 8/10	ALL	E614 Version with overload management system	121P251510
C8/C10 with new pump unit and drive motors (300cc)			4000022940
Compact 12	ALL	E614F Version with overload management system	121P251530
C12 with new pump unit			4000019180
Compact 14	ALL	E614G Version with overload management system	167P326860
Compact 14 equipped with PWM valve		Pending	

Hydraulic blocks	Comments	Code
Block MK2 (until March 2003)	Head of the valves equipped with LED	242 020 9290
Block MK3 (until July 2003)	Head of the valves not equipped with LED but separate coils	242 021 0470
Block MK4	Loom of valves with wires in color	242 021 2090
Block MK4 Weighing		242 021 2090
Block MK5 (starting from the serial number CE 139454)	Block identical to the MK4 (smaller size)	250 300 2330
Block MK6 (for C14)	Identical block with different location for certain components and CB different settings (compatible to all compact models)	250 300 3980

## 7. SENSORS MOUNTING INSTRUCTIONS

### 7.1. PRESSURE SWITCH SP1

All models equipped with pressure switch



### 7.2. PRESSURE SENSOR G1

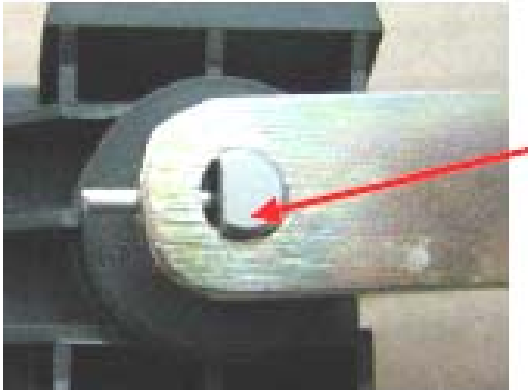
It must be tight with torque wrench (30-35Nm)



### 7.3. ANGLE SENSOR A1



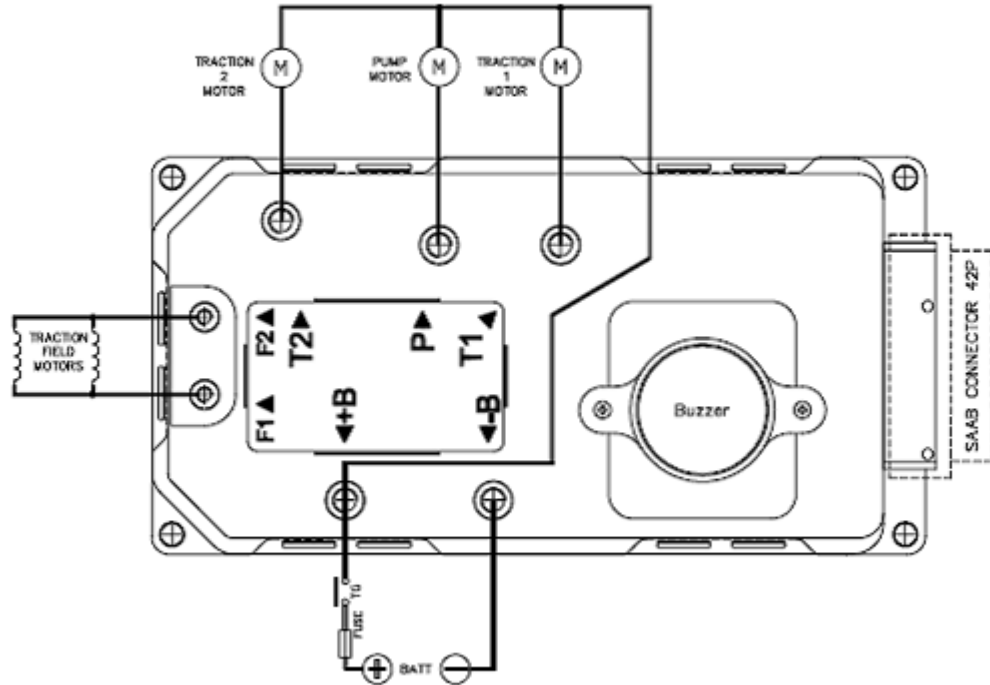
•  
Be sure that the pin is correctly mounted on its bracket (see below)  
Fix on plate (the screws should be in the center of the oblong holes)  
(when the bracket of the angle sensor is aligned , the signal should be at 2.5VDC  
( if  $< 0.5$  or  $> 4.5V$  alarm comes on BPE board ) )





## 7.4. VARIATOR PPC IMPEDANCE CHECK

Before any impedance control, remove all connections to the variator



TERMINALS	TERMINALS	IMPEDANCE VALUE
B --	B +	Measure not stable (impossible to read)
B --	P	47.4 KΩ
B +	B -	Measure not stable (impossible to read)
B +	P	Measure not stable (impossible to read)

## 7.5. NEW LEVEL SENSOR ADJUSTMENT

Some machines are now equipped with that kind of level sensors  
(Optimum w/serial number >CE145227 + all Optimum w/serial number starting by CE5xxxxx  
produced in Archbold(OH) and Optimum w/serial number starting by 8xxxxx produced in Changzhou



On that kind of sensor, an adjustment must be done



- **Procedure**
- Position the machine on a perfect flat ground
- Switch ON the machine (Red and green LEDs will be lit or flashing)
- Press and hold the button "SET ZERO" during 3 seconds (both LEDs will be OFF)
- Red and Green LEDs will now flash. Launch the calibration within 5 seconds
- Press (and release) 3 times the button with a small plastic pen
- The calibration program is now in process for approximately 4 seconds (red LED blinking)
- After, the green LED will turn on solid, indicating unit is calibrated and unit is ready for normal operation

## 7.6. COMPACT EQUIPPED WITH PWM VALVE

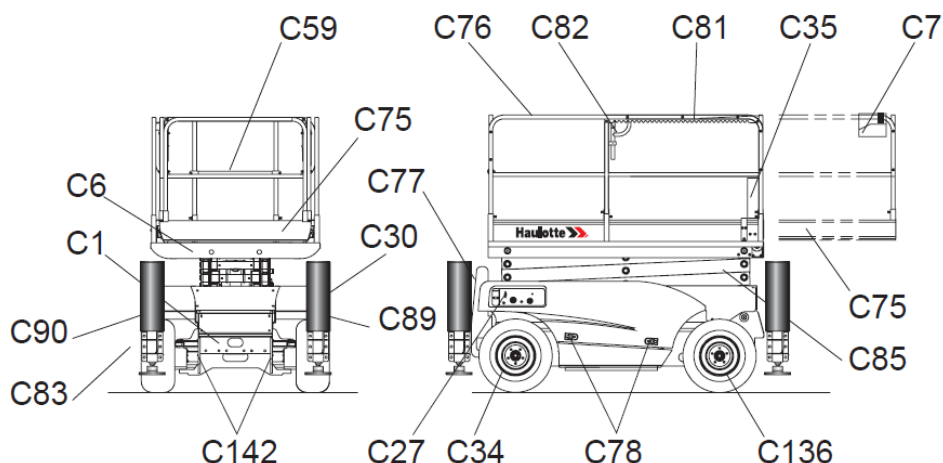
pending

## 8. COMPACT RTE

### 8.1. MAIN DATAS

#### 8.1.1. MAIN COMPONENTS

COMPACT 10RTE (COMPACT2668RTE) -COMPACT 12RTE (COMPACT 3368RTE) - Major Component Location Diagram

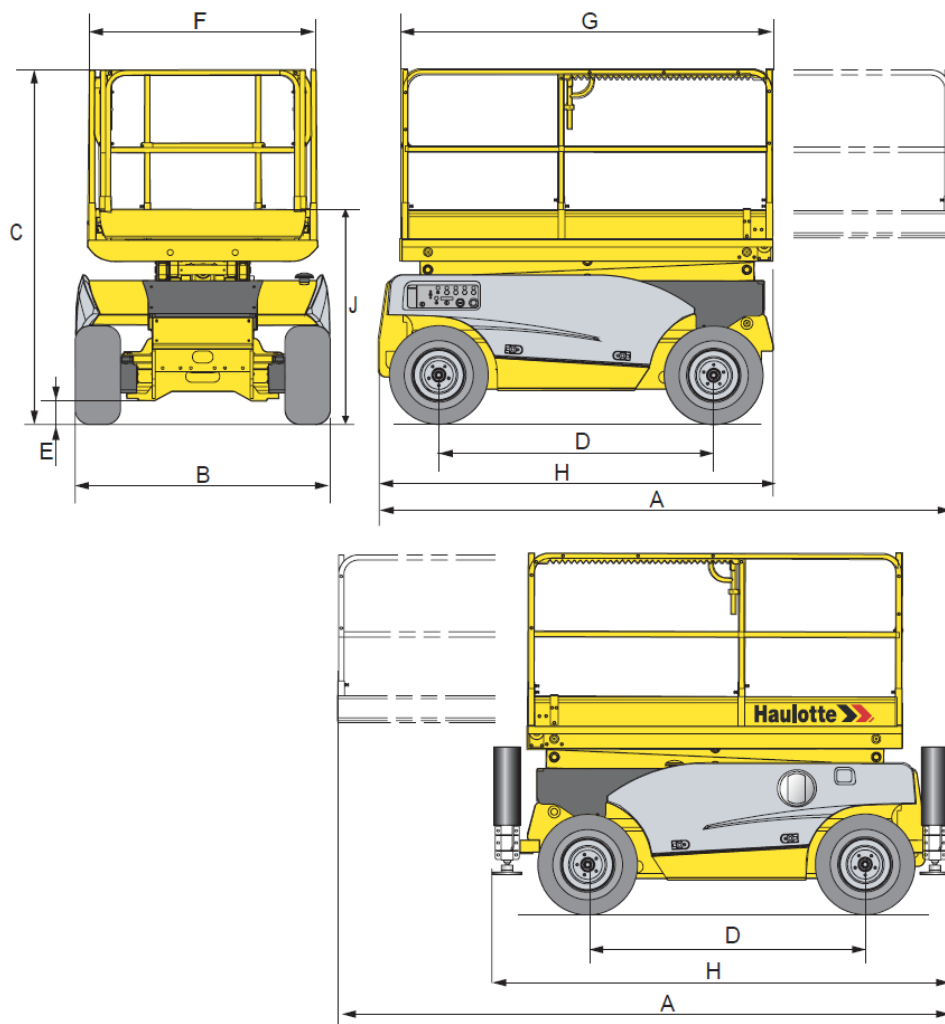


Marking	Description
C1	Chassis
C6	Platform
C7	Platform control box
C27	Ground control box
C30	Hydraulic oil tank
C34	Drive wheels
C35	Document holder
C59	Hinged midrail
C75	Extension
C76	Guardrail
C77	Platform access ladder
C78	Hood locking catch
C81	Sliding guardrail
C82	Doeck extension handle
C83	Stabiliser <sup>(1)</sup>
C85	Scissors
C89	Battery bay (electropump unit)
C90	Battery bay (hydraulic block and filter)
C136	Steer wheels
C142	Machine anchorage point

(1) : Outriggers option only

## 8.1.2. OVERALL DIMENSIONS

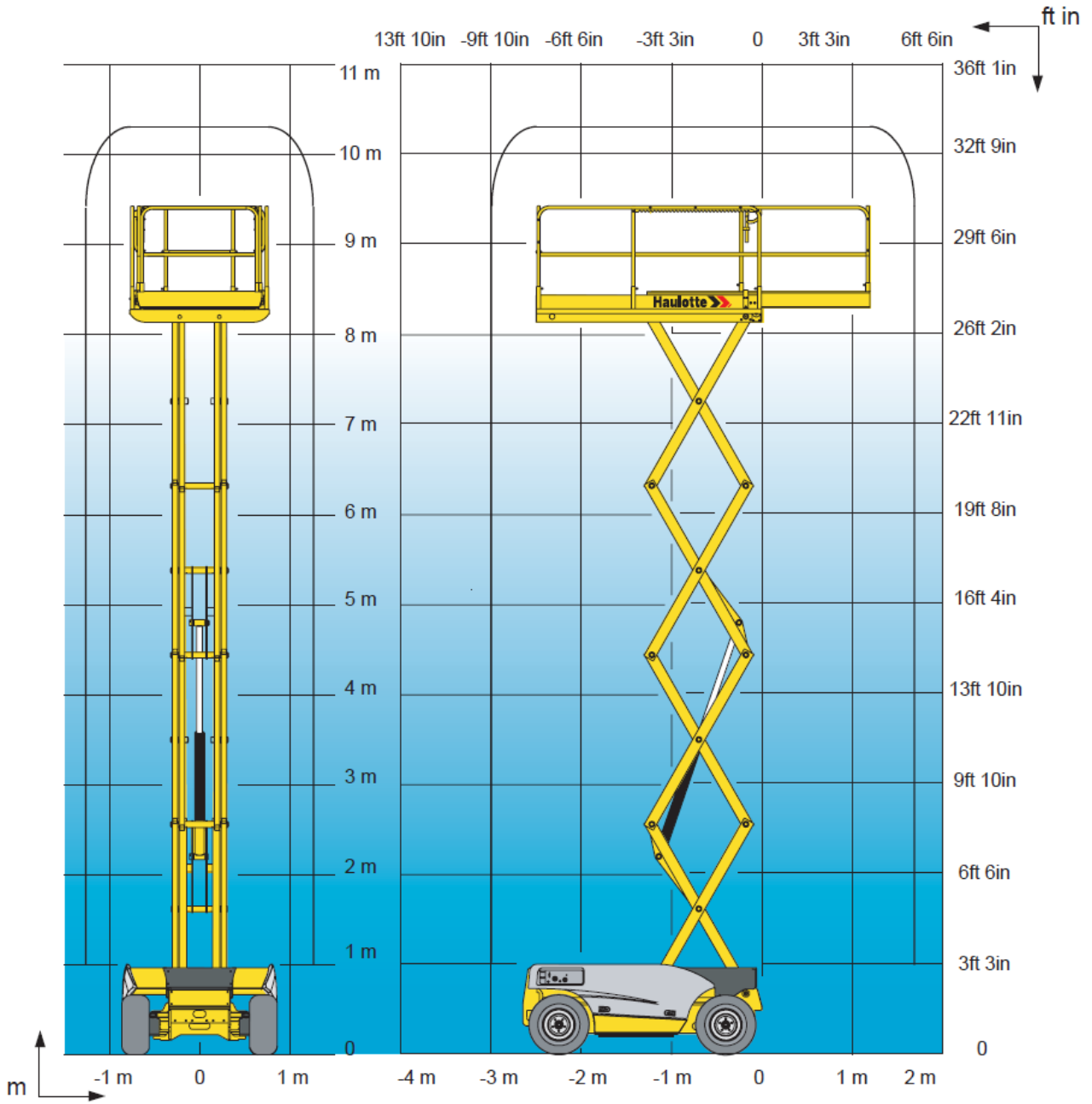
General diagram COMPACT 10RTE (COMPACT 2668RTE) -COMPACT 12RTE (COMPACT 3368RTE)



Marking	COMPACT 10RTE (COMPACT 2668RTE)		COMPACT 12RTE (COMPACT 3368RTE)	
	Mètre	Feet inch	Mètre	Feet inch
A	3,85	12 ft 7 in	3,85	12 ft 7 in
B	1,80	5 ft 10 in	1,80	5 ft 10 in
C	2,42	7 ft 11 in	2,54	8 ft 4 in
D	1,87	6 ft 1 in	1,87	6 ft 1 in
E	0,21	0 ft 8 in	0,21	0 ft 8 in
F x G	2,50 x 1,54	8 ft 2 in x 5 ft 0 in	2,50 x 1,54	8 ft 2 in x 5 ft 0 in
H	2,65	8 ft 8 in	2,65	8 ft 8 in
J	2,42	7 ft 11 in	2,54	8 ft 4 in

**8.1.3. WORKING AREA**

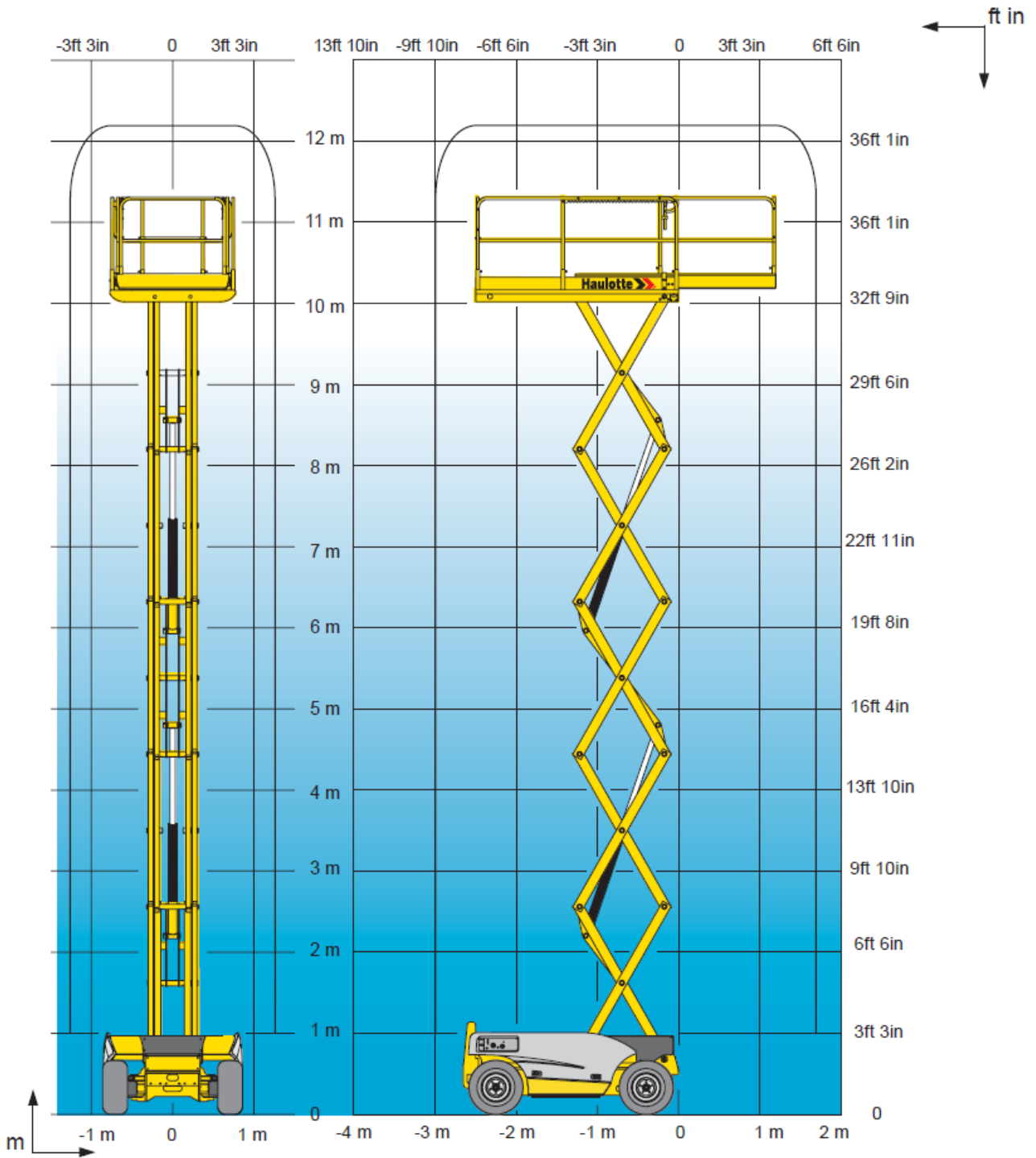
**MACHINE COMPACT 10RTE (COMPACT 2668RTE)**







**8.1.4. WORKING AREA**



**MACHINE COMPACT 12RTE (COMPACT 3368RTE)**



## 8.1.5. MAIN DATAS

Machine Characteristics	COMPACT 10RTE		COMPACT 2668RTE	
	Metric	Imperial	Metric	Imperial
Length of machine in stowed position	2,65 m	(8 ft8 in)	2,65 m	(8 ft8 in)
Overall width of machine	1,80 m	(0 ft71 in)	1,80 m	(0 ft71 in)
Platform length	2,50 m	(8 ft2 in)	2,50 m	(8 ft2 in)
Number of extensions	1			
Machine height	2,42 m	(7 ft11 in)	2,42 m	(7 ft11 in)
Maximum overall height of the machine in folded/stowed position guard-rail dismounted	1,51 m	(4 ft11 in)	1,51 m	(4 ft11 in)
Maximum ground clearance	0,25 m	(0 ft10 in)	0,25 m	(0 ft10 in)
Transport height	1,51 m	(4 ft11 in)	1,51 m	(4 ft11 in)
Maximum work height	10,25 m	(33 ft8 in)	10,25 m	(33 ft8 in)
Maximum platform height	8,25 m	(27 ft1 in)	8,25 m	(27 ft1 in)
Platform width	1,54 m	(5 ft10 in)	1,54 m	(5 ft10 in)
Outer turning circle	3,73 m	(12 ft3 in)	3,73 m	(12 ft3 in)
Inner turning circle	1,21 m	(4 ft0 in)	1,21 m	(4 ft0 in)
Distance between centres of the wheels	1,87 m	(6 ft2 in)	1,87 m	(6 ft2 in)
Rated slope CE - AS	3°			
Rated slope ANSI - CSA	0°			
Slope warning ANSI - CSA	2°			
Maximum wind speed allowed CE - AS	Indoor use : 0 km/h	Indoor use : (0 mph)		
	Outdoor use : 45 km/h	Outdoor use : (28 mph)		
Total weight - Machine without stabilizers	3380 kg	(7453 lb)	3380 kg	(7453 lb)
Total weight - Machine with outriggers	3620 kg	(7982 lb)	3620 kg	(7982 lb)
Maximum platform load CE - AS	565 kg	(1246 lb)		
Maximum platform load ANSI - CSA			565 kg	(1246 lb)
Recommended load capacity when extended	150 kg	(330 lb)	150 kg	(330 lb)
Manual lateral force at platform CE - AS	400 N	90 lbf		
Manual lateral force at platform ANSI - CSA			445 N	100 lbf
Maximum number of people on the platform CE - AS	2			
	 Section C 4.1.1 Specific labels COMPACT 10RTE (COMPACT 2668RTE)			
Maximum number of people on the platform ANSI - CSA	2			
	 Section C 4.1.1 Specific labels COMPACT 10RTE (COMPACT 2668RTE)			
Power source	48 V			
Additional power source	285 Ah			
Maximum climbable slope	25 %			
Tyre type and/ or size	26 x 12 - 12			
Platform elevation time (when empty)	35 s			
Platform lowering time (when empty)	40 s			
Micro drive speed	0,8 km/h	(0,49 mph)	0,8 km/h	(0,49 mph)
Low drive speed	1,6 km/h	(0,99 mph)	1,6 km/h	(0,99 mph)

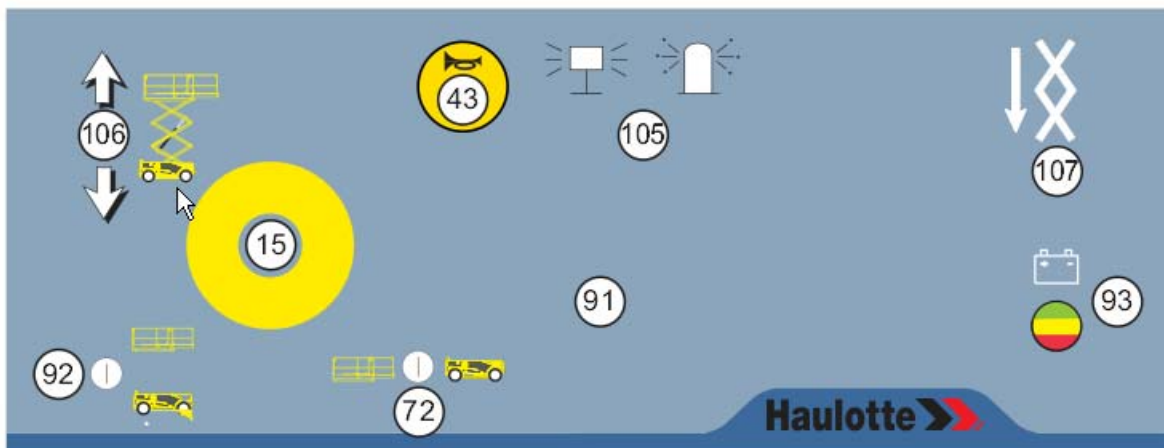
Machine Characteristics	COMPACT 10RTE		COMPACT 2668RTE	
	Metric	Imperial	Metric	Imperial
High drive speed	5,8 km/h	(3,6 mph)	5,8 km/h	(3,6 mph)
Hand vibration	<2,5 m/s <sup>2</sup>	(98 in/s <sup>2</sup> )	<2,5 m/s <sup>2</sup>	(98 in/s <sup>2</sup> )
Feet vibration	<0,5 m/s <sup>2</sup>	(19 in/s <sup>2</sup> )	<0,5 m/s <sup>2</sup>	(19 in/s <sup>2</sup> )
Noise emission level	< 70 dB (A)			

Machine Characteristics	COMPACT 12RTE		COMPACT 3368RTE	
	Metric	Imperial	Metric	Imperial
Length of machine in stowed position	2,65 m	(8 ft8 in)	2,65 m	(8 ft8 in)
Overall width of machine	1,80 m	(0 ft71 in)	1,80 m	(0 ft71 in)
Platform length	2,50 m	(8 ft2 in)	2,50 m	(8 ft2 in)
Number of extensions			1	
Machine height	2,54 m	(8 ft4 in)	2,54 m	(8 ft4 in)
Maximum overall height of the machine in folded/stowed position guard-rail dismounted	1,68 m	(5 ft6 in)	1,68 m	(5 ft6 in)
Maximum ground clearance	0,25 m	(0 ft10 in)	0,25 m	(0 ft10 in)
Transport height	1,68 m	(5 ft6 in)	1,68 m	(5 ft6 in)
Maximum work height	12,15 m	(39 ft10 in)	12,15 m	(39 ft10 in)
Maximum platform height	10,15 m	(33 ft4 in)	10,15 m	(33 ft4 in)
Platform width	1,54 m	(5 ft10 in)	1,54 m	(5 ft10 in)
Outer turning circle	2,50 m	(8 ft2 in)	2,38 m	(7 ft9 in)
Inner turning circle	1,21 m	(4 ft0 in)	0,34 m	(1 ft1 in)
Distance between centres of the wheels	1,87 m	(6 ft2 in)	1,86 m	(6 ft1 in)
Rated slope CE - AS	3°			
Rated slope ANSI - CSA			0°	
Slope warning ANSI - CSA			2°	
Maximum wind speed allowed CE - AS	Indoor use : 0 km/h	Indoor use : (0 mph)		
	Outdoor use : 45 km/h	Outdoor use : (28 mph)		
Total weight - Machine without stabilizers	3800 kg	(8379 lb)	3800 kg	(8379 lb)
Total weight - Machine with outriggers	4040 kg	(8908 lb)	4040 kg	(8908 lb)
Maximum platform load CE - AS	450 kg	(992 lb)		
Maximum platform load ANSI - CSA			450 kg	(992 lb)
Recommended load capacity when extended	150 kg	(330 lb)	150 kg	(330 lb)
Manual lateral force at platform CE - AS	400 N	90 lbf		
Manual lateral force at platform ANSI - CSA			445 N	100 lbf
Maximum number of people on the platform CE - AS	3		3	
	 Section C 4.1.1 Specific labels COMPACT 12RTE (COMPACT 3368RTE)		 Section C 4.1.1 Specific labels COMPACT 12RTE (COMPACT 3368RTE)	
Maximum number of people on the platform ANSI - CSA			3	
Power source	48 V			
Additional power source	285 Ah			
Maximum climbable slope	25 %			
Tyre type and/ or size	26 x 12 - 12			
Platform elevation time (when empty)	50 s			
Platform lowering time (when empty)	40 s			
Micro drive speed	0,8 km/h	(0,49 mph)	0,8 km/h	(0,49 mph)
Low drive speed	1,6 km/h	(0,99 mph)	1,6 km/h	(0,99 mph)
High drive speed	5,8 km/h	(3,6 mph)	5,8 km/h	(3,6 mph)

Machine Characteristics	COMPACT 12RTE		COMPACT 3368RTE	
	Metric	Imperial	Metric	Imperial
Hand vibration	<2,5 m/s <sup>2</sup>	(98 in/s <sup>2</sup> )	<2,5 m/s <sup>2</sup>	(98 in/s <sup>2</sup> )
Feet vibration	<0,5 m/s <sup>2</sup>	(19 in/s <sup>2</sup> )	<0,5 m/s <sup>2</sup>	(19 in/s <sup>2</sup> )
Noise emission level	< 70 dB (A)			

## 8.1.6. COMMANDS (UP/DOWN)

- **Ground controls**



### Controls and indicators

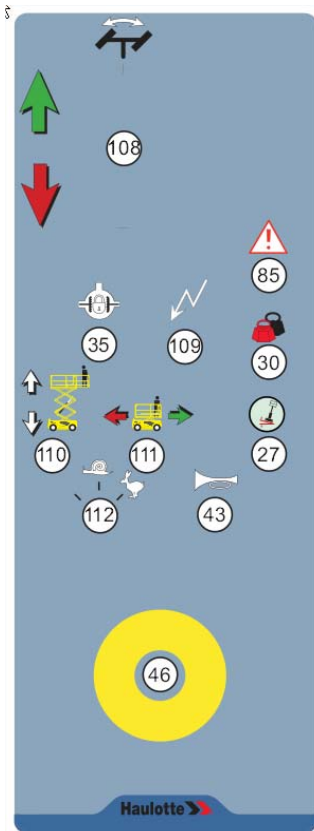
Marking	Description	Function
43	Horn selector <sup>(1)</sup>	Horn
72	Control box energizing key selector <sup>(2)</sup>	Left : Platform control box energized Center : De-energizes control system Right : Ground control box energized
91	Hour meter-Battery charge indicator	Total machine running hours-Battery charger status Move upwards : Platform control box energized
92	Control box energizing key selector <sup>(2,))</sup>	Center : De-energizes control system Move downwards : Ground control box energized
93	Battery charging indicator <sup>(2,))</sup>	Battery charge level status during battery charging
105	Flashing light selector	Move upwards : Switching on the flashing light Move downwards : Switching off the flashing light
106	Platform elevation / lowering selector <sup>(2,))</sup>	Move upwards : Platform raises Move downwards : Lowering of platform
107	Pull rod for emergency lowering	Pulled out : Lowering of platform Release : Stops platform lowering
144	Emergency stop button-Cut-off	Pulled out (activated) : Ground control box energized Pushed down (deactivated) : De-energizes control system

(1.) For machines fitted with  
(2.) Depending on the machine





- **Upper control box (without outriggers)**

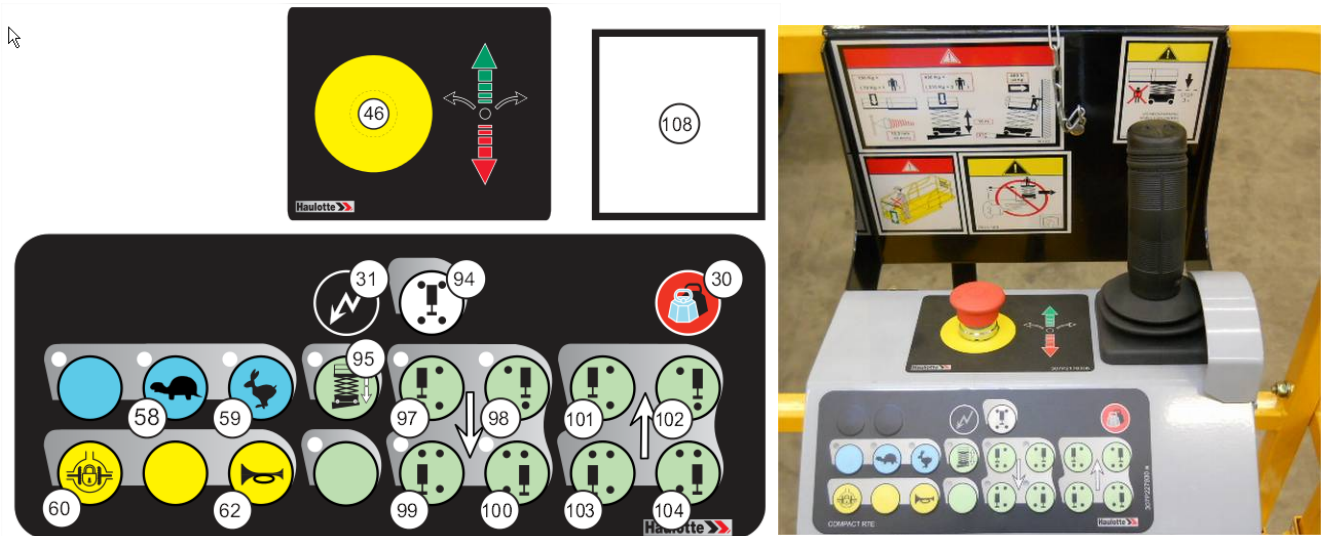


### Controls and indicators

Marking	Description	Function
27	Tilt indicator	Machine on excessive slope
30	Overload indicator	Platform overloaded
35	Differential lock selector	Press in and hold (activated) : Maximum drive torque (on difficult or sloping ground) Release (deactivated) : Standard torque
43	Horn selector	Horn
46	Emergency stop button	Pulled out (activated) : Ground control box energized Pushed down (deactivated) : De-energizes control system
85	Fault indicator	Faulty or tilting or overload machine

108	Movement joystick	Move forward : Forward drive or platform elevation Move backward : Reverse drive or platform lowering
	Front axle steering selector	Press right side of button : Right-hand steering Press left side of button : Left-hand steering
109	Power ON indicator-Fault indicator	On : Machine switched on Flashing : Fault indicated
110	Elevation / Lowering selection indicator	On : Elevation / Lowering selection activated Off : Elevation / Lowering movement is not selected
111	Driving selection indicator	On : Driving selection activated Off : Driving movement is not selected
		high-speed driving
		low-speed driving
112	3-position selector	 Platform elevation/lowering
145	Platform overload indicator	Platform overload

- Upper control box RTE with outriggers.



Marking	Description	Function
30	Platform overload indicator	Platform overload
31	Power ON indicator	On : Machine switched on Off : Machine switched off
46	Emergency stop button	Pulled out (activated) : Ground control box energized Pushed down (deactivated) : De-energizes control system
58	Medium-drive speed selector switch and indicator	Pressed down (activated and LED on) : Medium-drive speed selection (difficult ground, slope)
59	High-speed drive selector switch with indicator light	Pressed down (activated and LED on) : High-speed drive selection (for long distance)
60	Differential lock selector switch	Pressed down (activated) : Differential blocking selection
62	Horn selector switch	Pressed down (activated) : Horn
94	Centralized outriggers selector switch	Pressed down (activated) : Automatic stabilizer lowering until the machine is stabilized
95	Platform elevation/lowering selector switch and indicator	Pressed down (activated and LED on) : Platform elevation/lowering selection
97	Front left stabilizer extension selector switch and indicator	Pressed down (activated) : Stabilizer extended and LED on (continuously: stabilizer extended and set against the ground; rapid flashing: stabilizer extended but not yet set; slow flashing: stabilizer totally extended but not set)
98	Front right stabilizer extension selector switch and indicator	Pressed down (activated) : Stabilizer extended and LED on (continuously: stabilizer extended and set against the ground; rapid flashing: stabilizer extended but not yet set; slow flashing: stabilizer totally extended but not set)
99	Rear left stabilizer extension selector switch and indicator	Pressed down (activated) : Stabilizer extended and LED on (continuously: stabilizer extended and set against the ground; rapid flashing: stabilizer extended but not yet set; slow flashing: stabilizer totally extended but not set)
100	Rear right stabilizer extension selector switch and indicator	Pressed down (activated) : Stabilizer extended and LED on (continuously: stabilizer extended and set against the ground; rapid flashing: stabilizer extended but not yet set; slow flashing: stabilizer totally extended but not set)
101	Front left stabilizer retraction selector switch	Pressed down (activated) : Stabilizer retraction and corresponding LED off during lowering P97
102	Front right stabilizer retraction selector switch	Pressed down (activated) : Stabilizer retraction and corresponding LED off during lowering P98
103	Rear left stabilizer retraction selector switch	Pressed down (activated) : Stabilizer retraction and corresponding LED off during lowering P99
104	Rear right stabilizer retraction selector switch	Pressed down (activated) : Stabilizer retraction and corresponding LED off during lowering P100
108	Movement joystick	Move forward : Forward drive or platform elevation Move backward : Reverse drive or platform lowering
	Front axle steering selector	Press right side of button : Right-hand steering Press left side of button : Left-hand steering

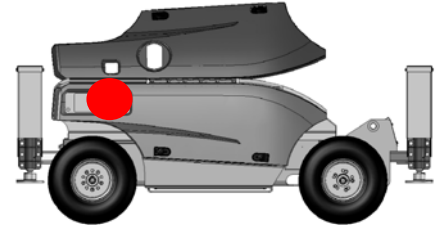


## 8.2. THE WIRING SCHEMATICS

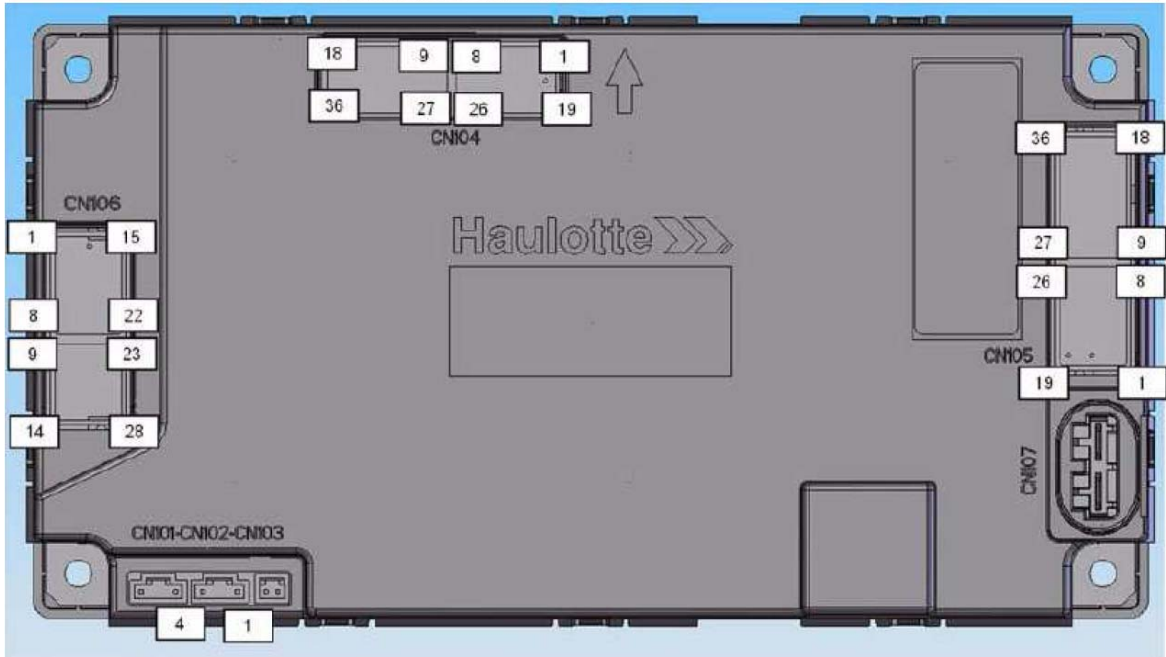
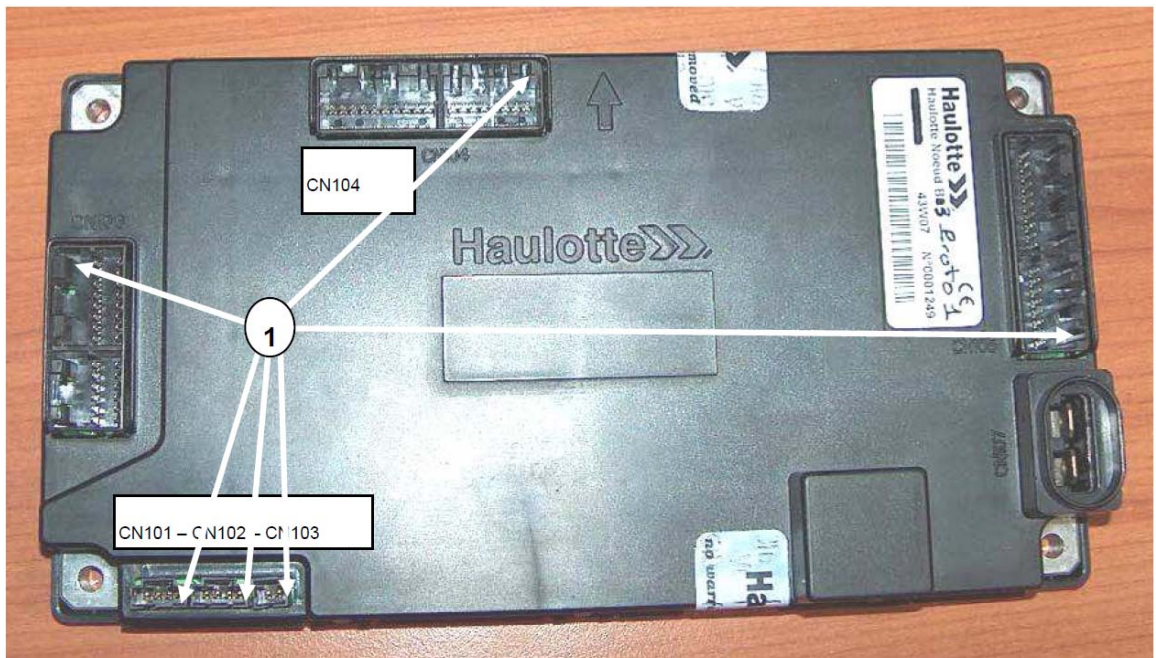
See all versions at the end of this manual

### 8.2.1. LOCATION OF MAIN ITEMS

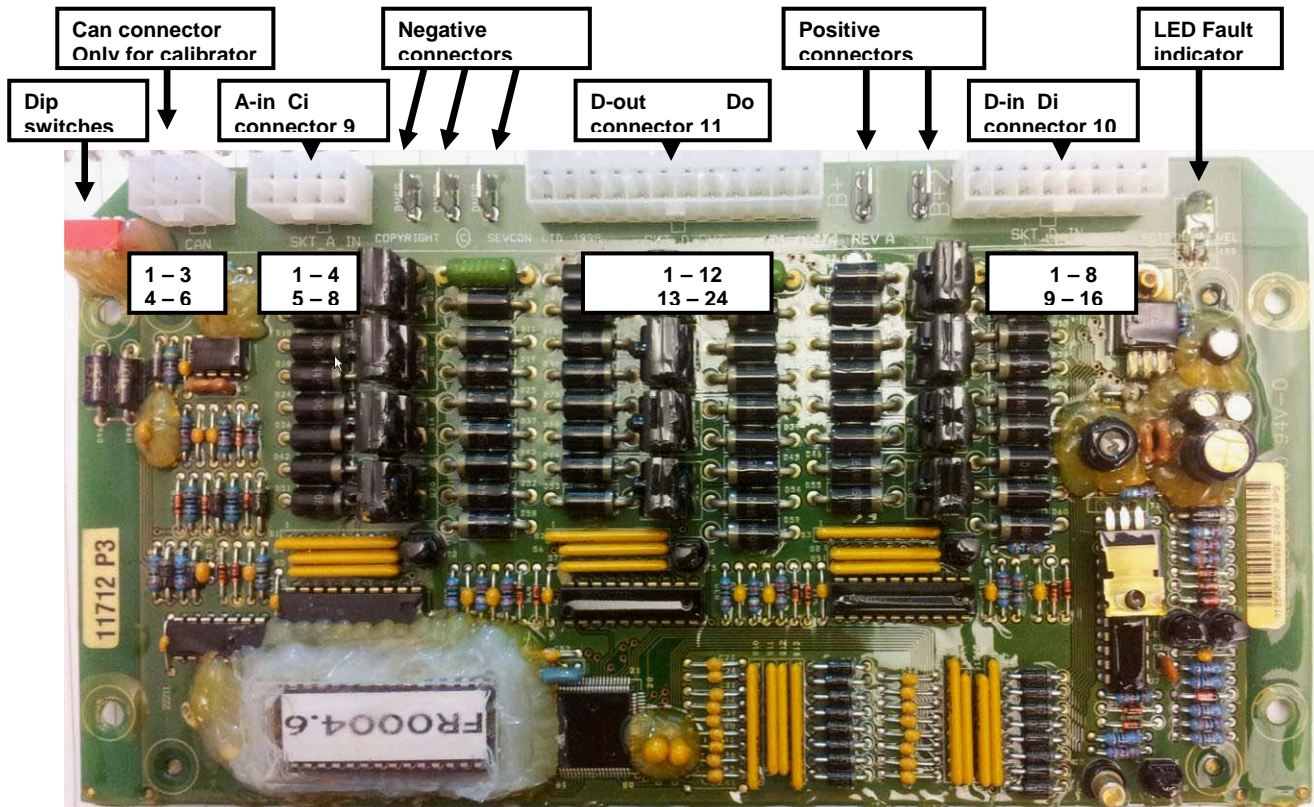
They are all located inside the chassis, behind the lower control box door and in the grey box inside.



**NODE B2**

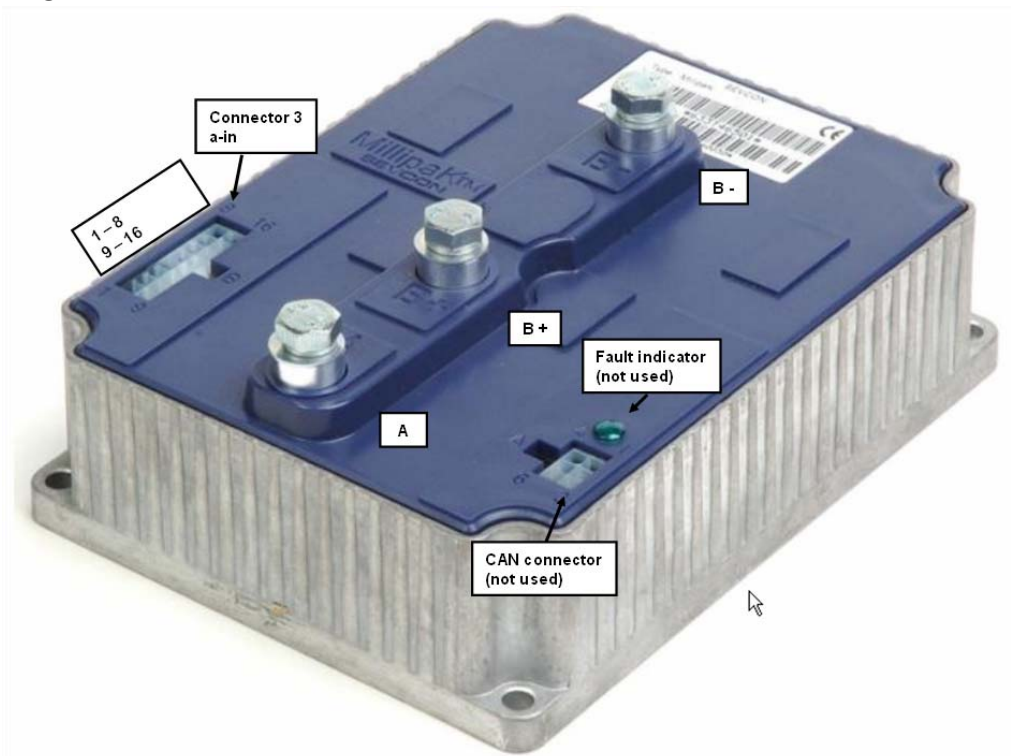


## SEVCON I/O BOARD U1



Connector Ci			Connector Do			Connector Di		
Pin	Wire	Function	Pin	Wire	Function	Pin	Wire	Function
1	49a	Joystick signal	1	42	YV5 High speed	1	57	Steering right
2	64	Communication a8	2	40	HL1 MVT *	2	55	Steering left
3	50	Positive to Joystick*	3	38	HL4 Translation*	3	53	Neutral position
4	19	CH/PF	4	36	HL5 Fault indicator*	4	52	Enable (dead man)
5			5	56	YV10 Lift/Drive	5	46	Differential
6	64	Communication a8	6	54	YV11 Steering without drive	6	45	Klaxon
7			7	51	YV8 YV9 Lowering	7	43	Selection Translation
8			8	48	YV7b Steer right	8	41	Selection Lift
			9	39	YV4 High speed	9	65	Battery discharge lift cut out
			10	47b	YV20/YV7a Outriggers/Steer left**	10	34	SQ4 8 meters cut out
			11	44	YV6 Differential	11	32	SQ3 top limit
			12	35	YV2b Drive reverse	12	31	SQ1 down limit
			13	33	YV2a Drive forward	13	B502	Overload (SP1*)
			14	30	YV1 Lowering >SQ10	14	27	SA2 Lowering
			15	25	HA1 Klaxon	15	26	SA2 Lifting
			16	25	HA1 Klaxon	16	B501	Tilt (SQ10, KA1*)
			17	37	YV3 High speed			
			18	28	HA2 Buzzer			* Not on outrigger versions
			19	60	RCH			** On outrigger versions
			20	66	HL6 Overload*			this output is used for both
			21	61	Communication a2			outriggers and steer left.
			22	62	Communication a3			
			23	63	Communication a4			
			24	58	Communication a6			

**SEVCON VARIATOR VAR**



Connector 3 ai		
Pin	Wire	Function
1	14	Key on B+
2	61	Communication Do 21
3	62	Communication Do 22
4	63	Communication Do 23
5		
6	58	Communication Do 24
7		
8	64	Communication Ci 2 & 6
9		
10	49a	Joystick signal
11	41	Selection Lift
12		
13		
14		
15		
16		



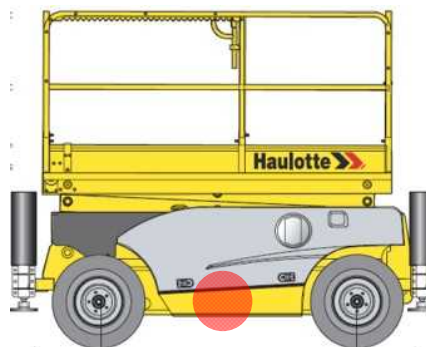
**CONVERTER 48V to 12V**

This converter is protected by 2 fuses of 20A each (primary/secondary)



Connector		
Pin	Wire	Function
+ IN	14	Positive 48V supply
- IN	100	Negative ground
+ OUT	114	Positive 12V output
- OUT	0	Negative ground

**PUMP UNIT**

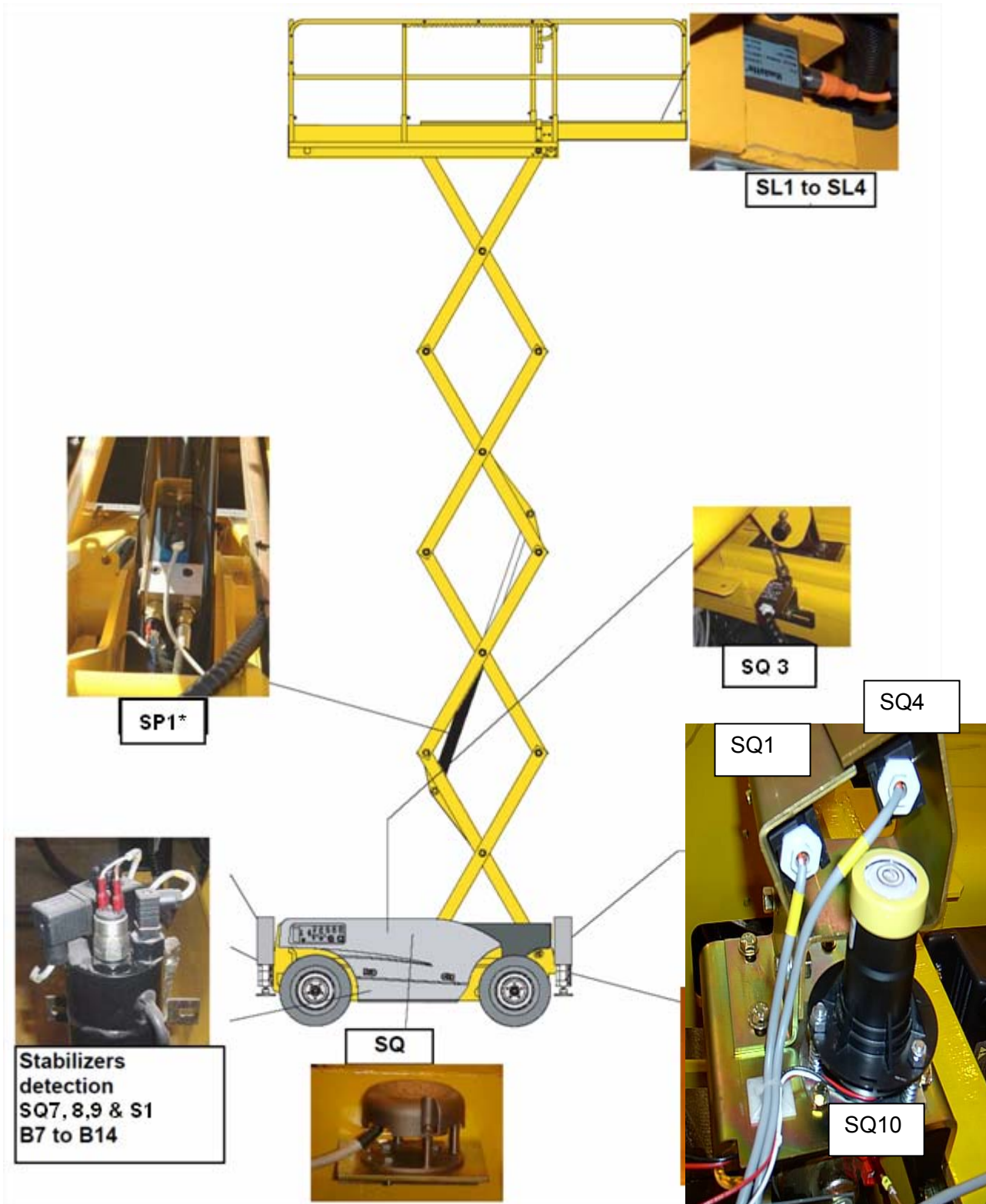


**BATTERY CHARGER**



### 8.3. LOCALIZATION OF THE MAIN SAFETY COMPONENTS

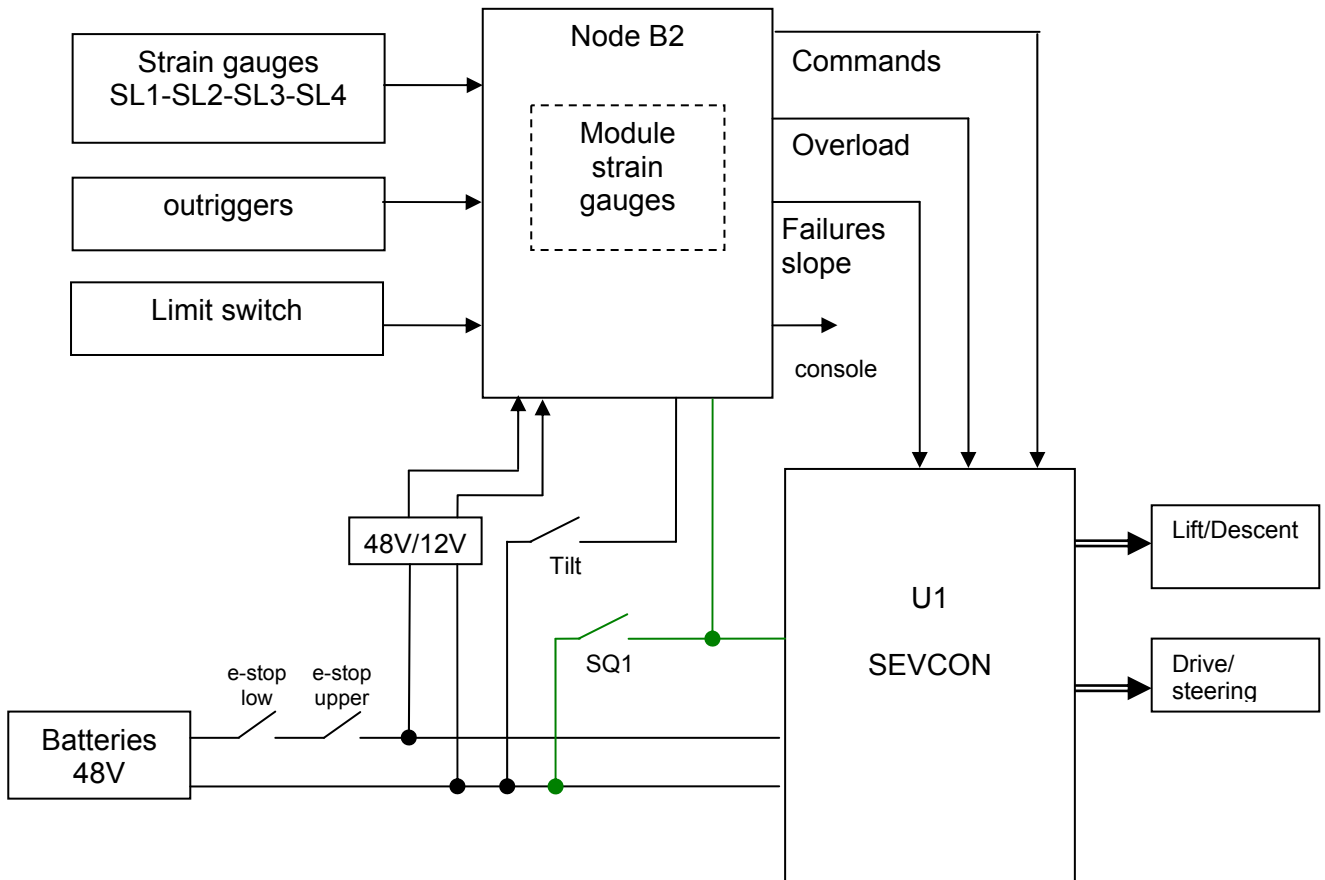
#### COMPACT RTE



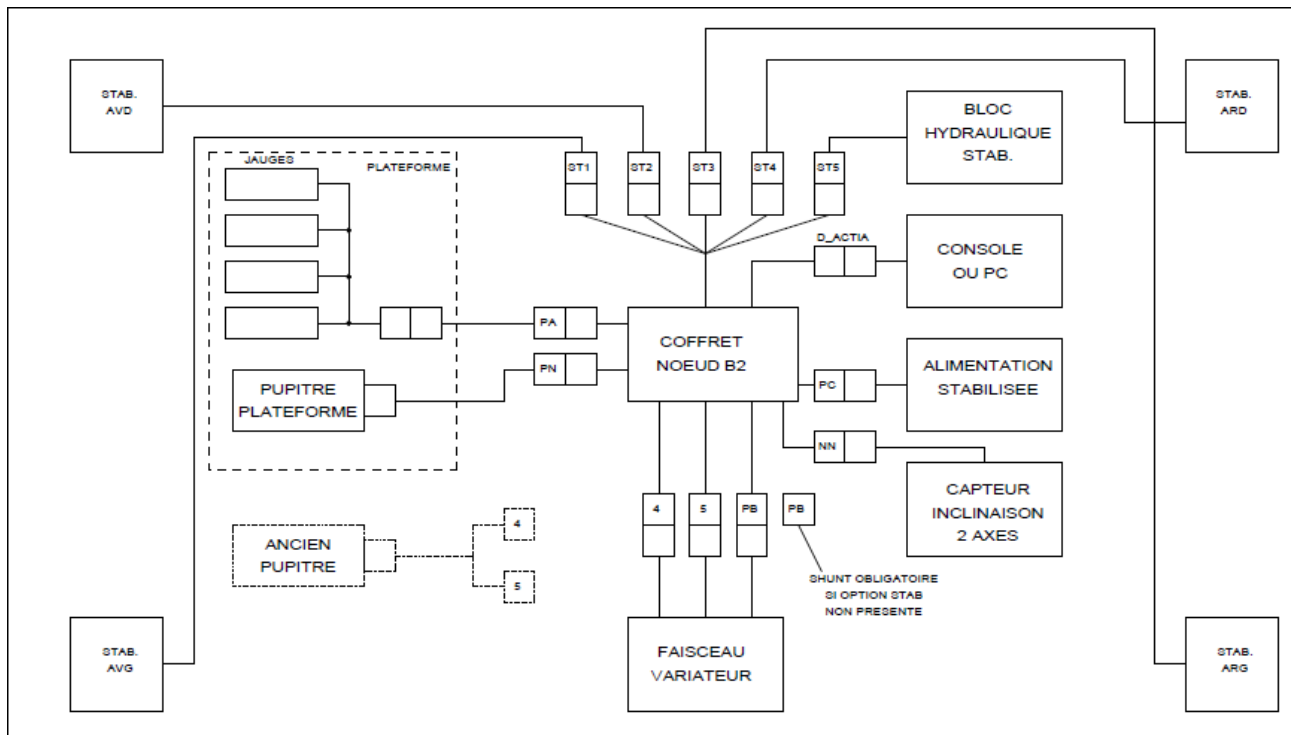
\* SP1 only on machines without NODE B2

### 8.4. STRUCTURE OF THE SYSTEM

The variator SEVCON is the master and receive all informations coming from node B2



#### Detail of node B2 structure





## 8.5. LIST OF COMPONENTS (SCHEMATICS 129P318500)

In the following tables, the column n°2 gives the coordinates of the components on the sheets from the wiring schematics in order to find easily their position.

The first figure corresponds to the number of page and to the second to the column (generally from 1 to 20) of the corresponding page.

The possible options specific to certain countries are not indexed (for more information, it is appropriate to refer to the wiring schematics corresponding to your machine)

The state noted "0" corresponds to 0V, opened contact or not activated.

The state noted "1" corresponds to the tension of the circuit, closed or activated contact.

### **Note :**

The model described below is the Compact RTE equipped with strain gauges and outriggers

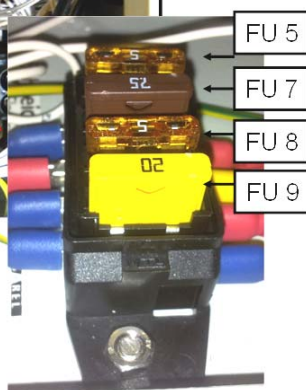
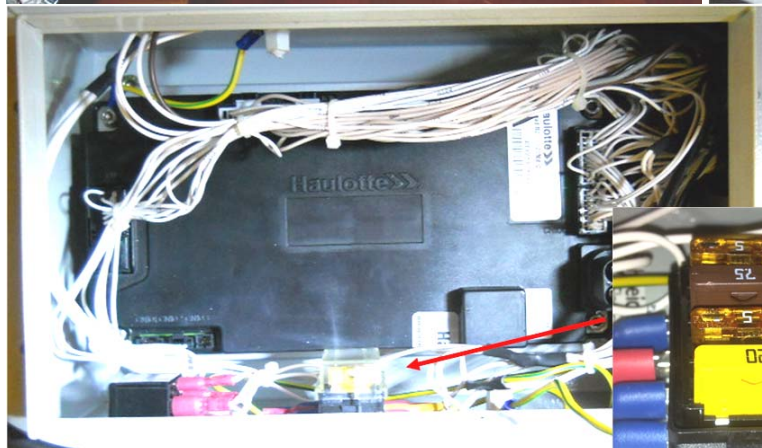
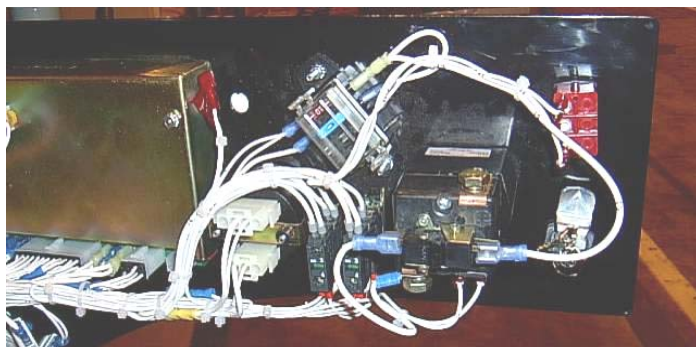
- **Glossary**

FWD	Forward (drive)
REV	Reverse (drive)
FL	Front Left
FR	Front Right
RL	Rear Left
RR	Rear Right
PF	Platform
LS	Low Speed drive
LS valve/adj	Load sensing valve/adjustment
MS	Medium Speed drive
HS	High Speed drive
ILS	Magnet sensor (Interrupteur Lame Souple)

### 8.5.1. FUSES

FUSES		
FU1	01 -2	Main 425A
FU3	01 - 5	Electrovalves + horn 15A
FU4	01 - 4	Accessories 10A
FU5	02 - 6	12V supply for ECU module node B2 5A (2 <sup>nd</sup> FU5 on door not used)
FU6	02 - 10	Sensors SL1 to SL4 1A
FU7	02 - 5	Vout converter 5A without outriggers option ( otherwise 20A with option stabs)
FU8	02 – 17	Supply upper control outrigger switch 5A + Node B2
FU9	02 – 19	Supply outrigger block valves 20A +

- Fuses location



ELECTRONIC MODULES (ECU)		
U	01 - 4	Battery charger
U1	01 - 15	I/O Board SEVCON
VAR	01 - 3	Motor controller SEVCON
B2	02, 03, 04 -10	Node B2
Converter	02 - 3	Converter 48V/12V with 2 fuses 2x 20A on each

## 8.5.2. INPUTS

INPUTS		
KA3	03 - 14	Differential blocking (807)
SA1	01 - 8	Key selector (CH: chassis/O: neutral/PF: Platform)
SA2	01 - 8	Selector of movement lower control box (26 raise, 27 descent)
SA10	03 - 19	Centralized outriggers (214)
SA11a	03 - 12	Selection low speed (805)

SA12a	03 - 17	Rear left outrigger retract (708)
SA12b	03 - 17	Rear left outrigger extract (707)
SA4a	03 - 15	Front left outrigger retract (311)
SA4b	03 - 15	Front left outrigger extract (310)
SA5a	03 - 13	High speed selection (401)
SA5b	03 - 11	Lift selection (402)
SA7a	03 - 16	Front right outrigger retract (410)
SA7b	03 - 16	Front right outrigger extract (409)
SA9a	03 - 18	Rear right outrigger retract (419)
SA9b	03 - 18	Rear right outrigger extract (418)
SB1	01 - 2	Emergency stop chassis
SB2	01.-13	Emergency stop platform
SB5	03.-10	Horn upper control box (901)
SM4	01.-17	Controller/joystick <ul style="list-style-type: none"> <li>- right steering (705)</li> <li>- left steering (703)</li> <li>- HM dead man (611A)</li> <li>- Off neutral (606)</li> <li>- signal (612)</li> </ul> Forward or raise from 2.5 to 4.5 V Reverse or descent from 2.5 to 0.5 V

<b>SAFETY COMPONENTS</b>		
SQ1	01 - 11	detection low stop (31 = 1 if PF < 3m)
SQ3	01 - 12	high detection (32 = 0 if platform with maximum height)
SQ4	01 - 12	Drive cut with 10 meters on C12RTE
S1	04 - 5	Rear right outrigger retracted (218A)
SQ7	04 - 2	Front left outrigger retracted (115A)
SQ8	04 - 3	Front right outrigger retracted (115B)
SQ9	04 - 4	Rear left outrigger retracted (204)
SQ10	02 - 7	Slope detection (20 = 0 if in slope)
B7	04 - 7	Front left ground detection (517)
B8	04 - 8	Front right ground detection (516)
B9	04 - 9	Rear left ground detection (511)
B10	04 - 10	Rear right ground detection (510)
B11	04 - 11	Front left full stroke detection (915)

B12	04 – 12	Front right full stroke detection (605)
B13	04 – 13	Rear left full stroke detection (255)
B14	04 – 14	Rear right full stroke detection (266)
Level detector SQ	04 – 17	Level detection rear high (505) Level detection front high (504) Level detection left high (920) Level detection right high (919)

Note :If machine has no outriggers, a jumper must be installed on connector PB as shown below



### 8.5.3. OUTPUTS

RELAYS		
KA6	02 - 6	selector relay steer or outriggers (6)
RCH	01 - 8	battery charger (60)
SB1	01 - 8	main contactor (23)

VALVES		
YV1	01 – 10	Quick descent (> SQ1) (30)
YV2A	01 – 11	Forward drive (33)
YV2B	01 – 12	Reverse drive (35)
YV3	01 – 12	High speed drive (37)
YV4	01 – 13	High speed drive (39)
YV4'	01 – 14	High speed drive (39)
YV5	01 – 15	High speed drive (42)
YV6	01 – 15	Differential brake (44)
YV7a	01 – 16	Steering left (47)

YV7b	01 – 17	Steering right (48)
YV8	01 – 18	Lowering (51)
YV9	01 – 19	Lowering C12RTE (51)
YV10	01 – 20	Pressure enable (dump valve) (56)
YV11	01 – 7	Front axle brake release if steer without traction (54)
YV15a	04 – 3	Outrigger front right (401A)
YV15b	04 – 4	Outrigger front left (402A)
YV18a	04 – 1	Outriggers extract (407A)
YV18b	04 – 2	Outriggers retract (408A)
YV19a	04 – 5	Outrigger rear right (310A)
YV19b	04 – 5	Outrigger rear left (311A)
YV20	01 – 16	Outriggers chosen (47A)

LIGHTS AND BUZZER		
HA1	01 – 9	Klaxon (25)
HA2	01 – 10	Buzzer (28)
HL2	01 – 4	Flashing light (16) (Option)
HL3	01 – 5	Work headlight (18) (Option)
HL7	03 – 10	Power on upper control (114C)
HL10	03 – 13	Outrigger front left (415)
HL11	03 – 16	Outrigger front right (305)
HL12	03 – 17	Outrigger rear right (253)
HL13	03 – 14	Outrigger rear left (914)
HL15	03 – 6	Lift chosen (699)
HL16	03 – 5	Low speed (398)
HL17	03 – 4	High speed (303)
HL19	03 – 18	Overload (304A)

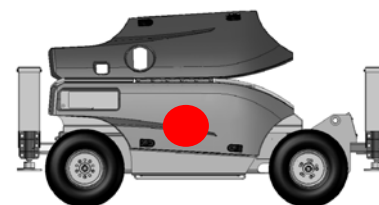


**8.5.4. OTHERS**

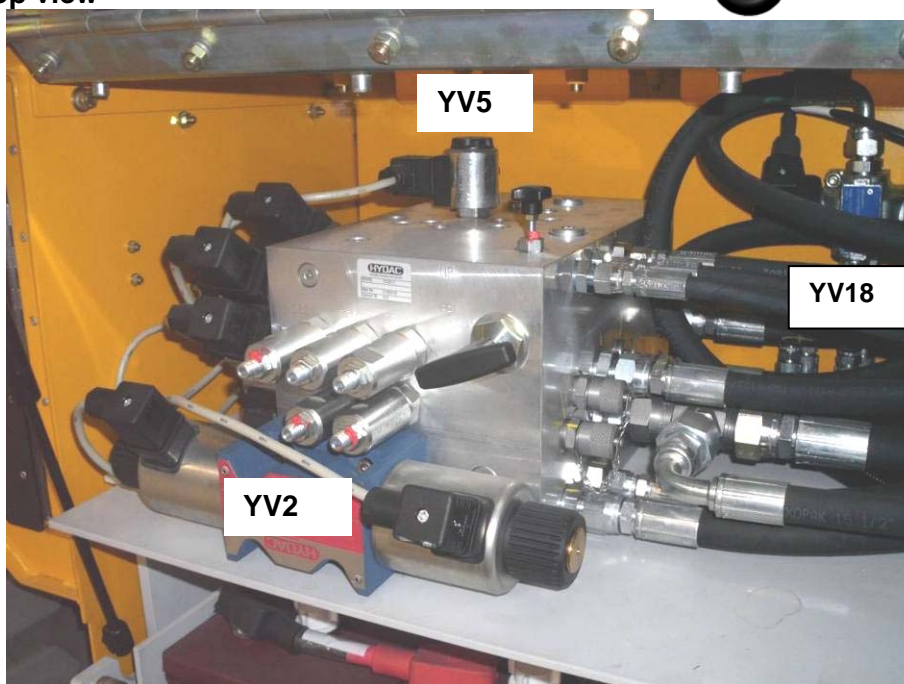
OTHERS		
M1	01 – 2	Pump motor unit 48 V
PV	01 – 6	Hour recorder and low battery cut out
R1	02 – 9	Pull up resistor 470 ohm 1W
R2	02 – 16	Pull up resistor 470 ohm 1W
R3	03 – 20	Pull up resistor 220 ohm 1W
D ACTIA	03 - 4	Communication port Node B2

**8.6. HYDRAULIC BLOCKS**

All hydraulic valve blocks are located under the right side cover

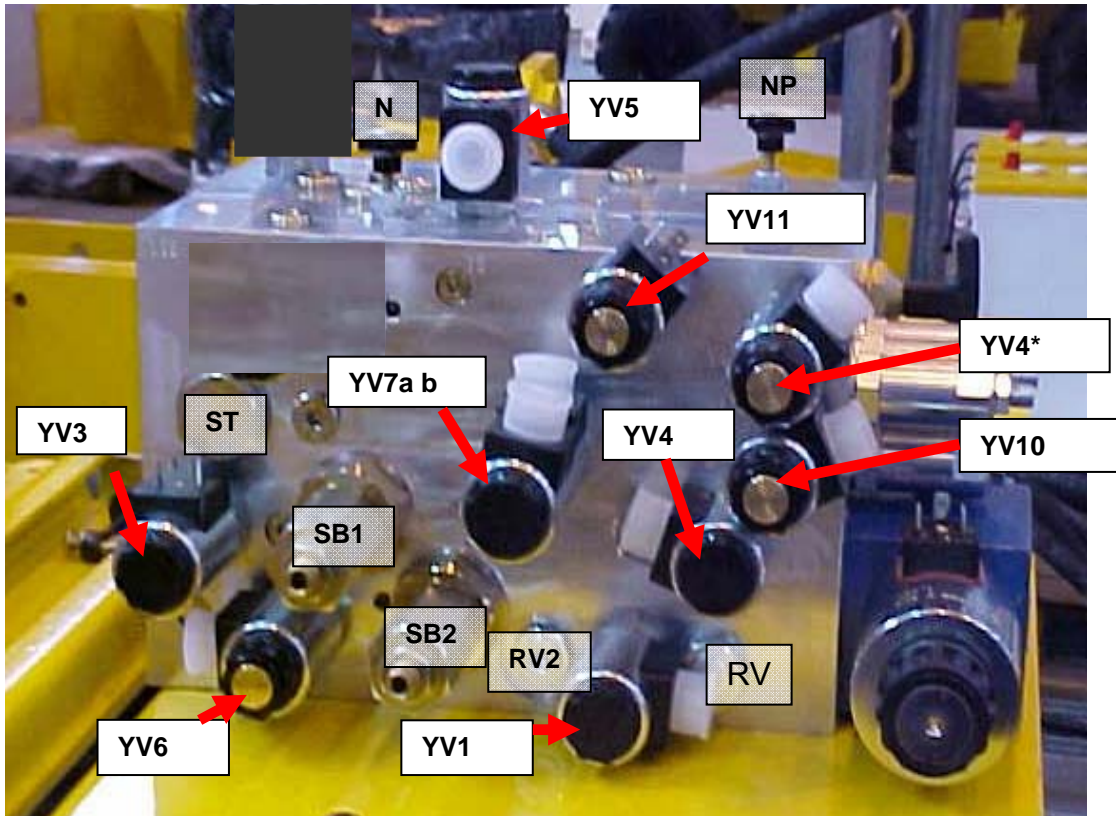


- Front and top view

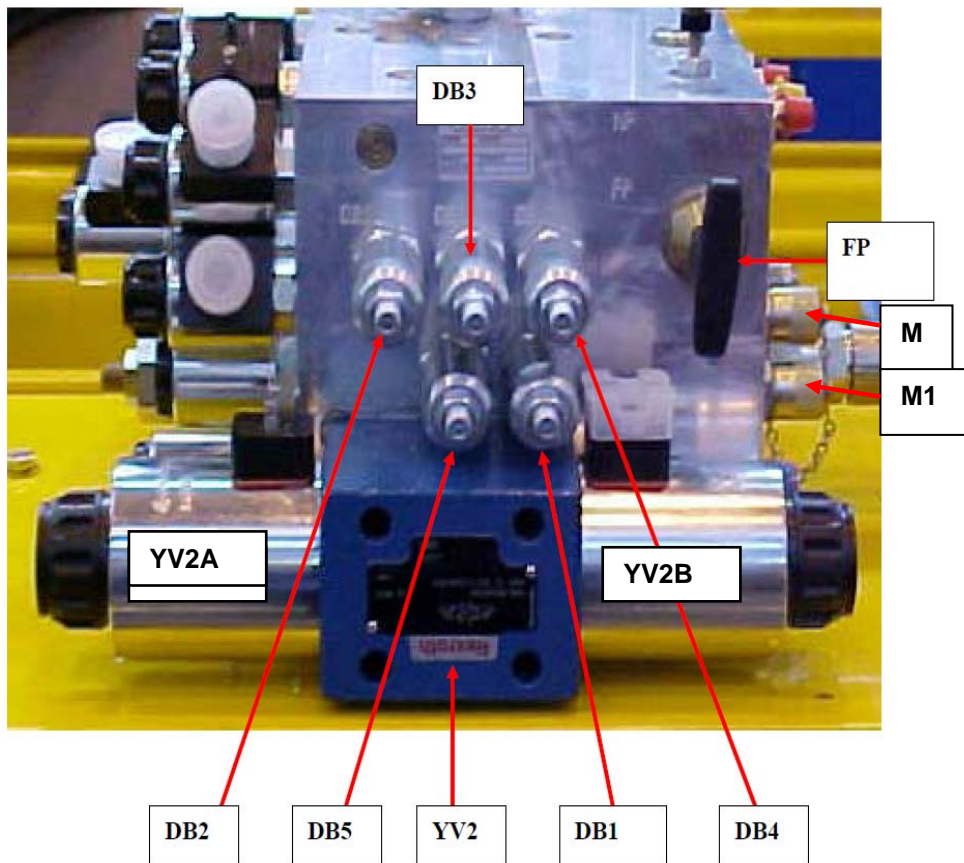




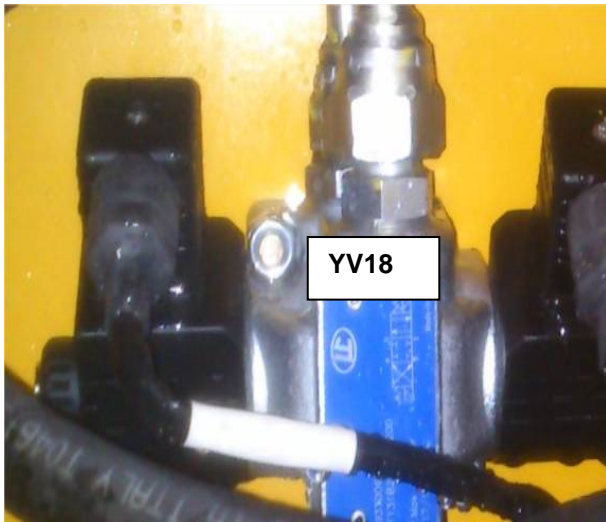
- Right view



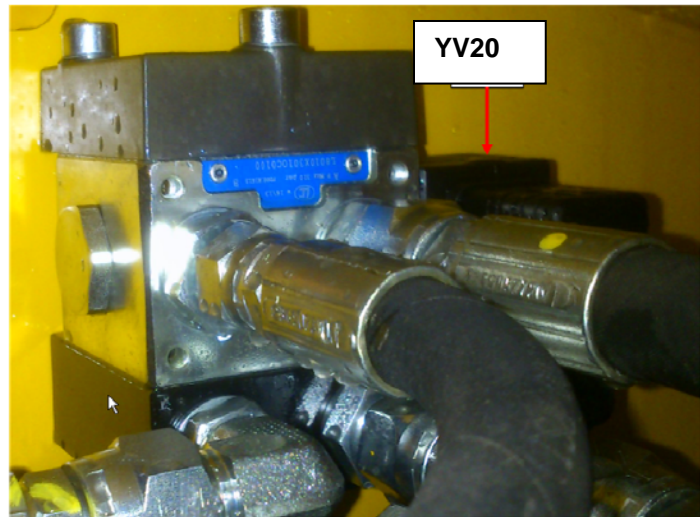
- Front view



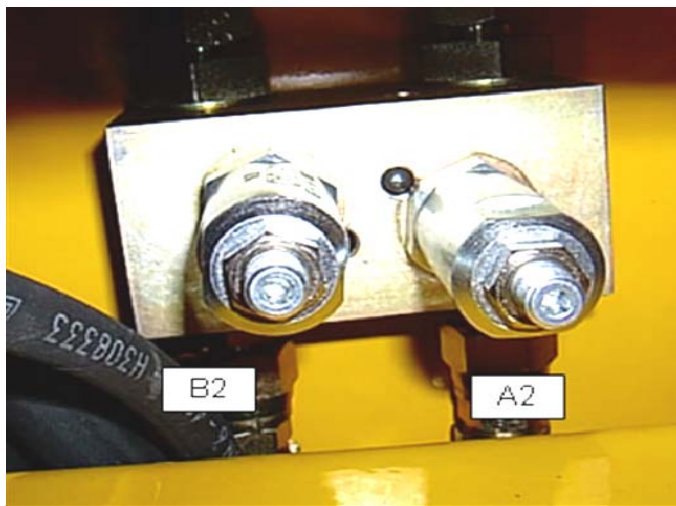
Small block YV18



Small block YV20



Drive over pressure relief valves

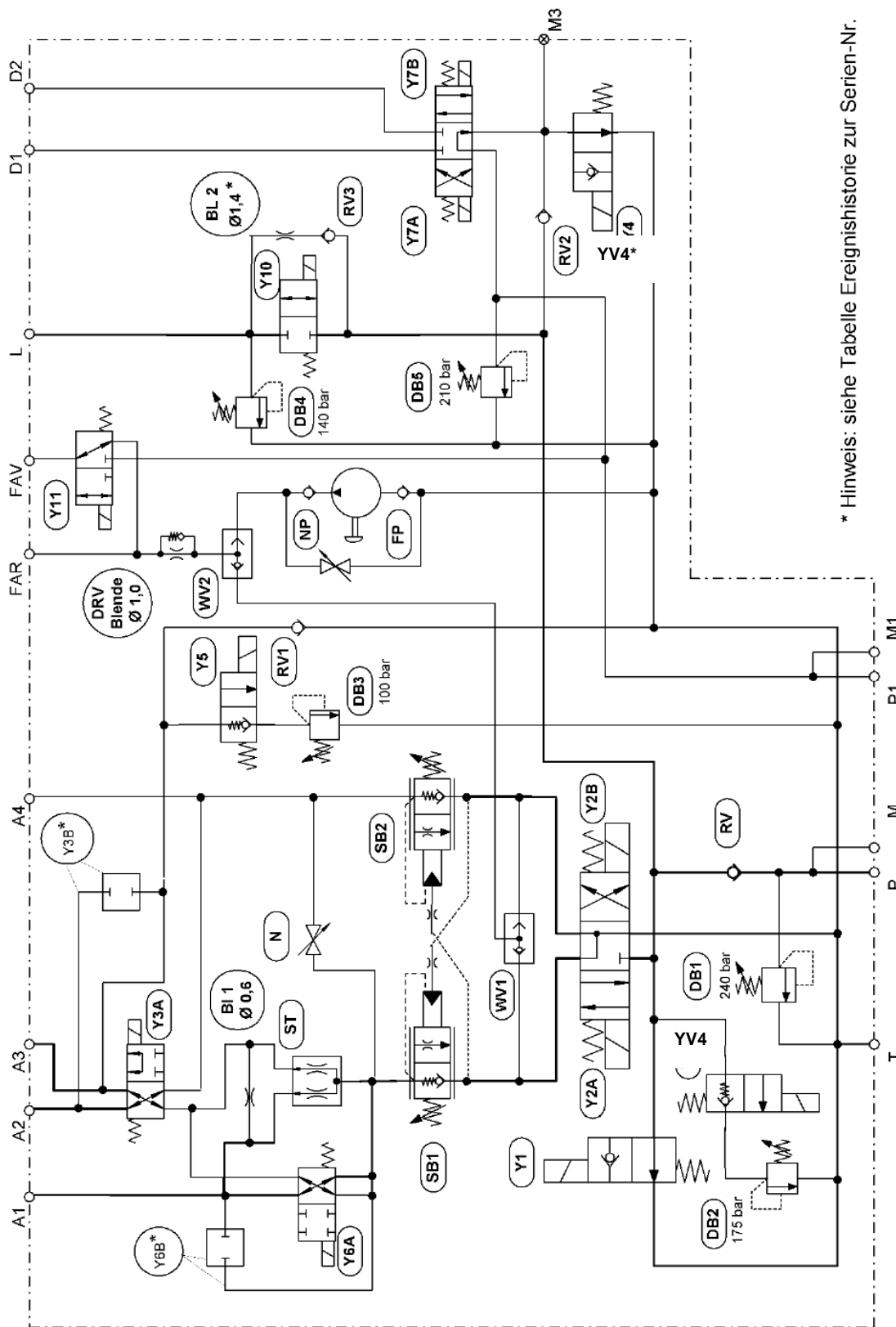


VALVES	
YV1	Quick descent (> SQ1)
YV2A	Forward drive
YV2B	Reverse drive
YV3	High speed drive (switch to series drive)
YV4	High speed drive (connect 175 bar relief valve to the circuit)
YV4*	High speed drive (connect 5.5 cm <sup>3</sup> pump to drive circuit)
YV5	High speed drive (connect 100 bar relief valve between the motors)
YV6	Differential brake (connect ST to the drive circuit)
YV7a	Steering left
YV7b	Steering right
YV8	Lowering
YV9	Lowering C12RTE (only on cylinder)

YV10	Pressure enable (dump valve)
YV11	Front axle brake release if steer without traction
YV15a	Outrigger front right (on outrigger)
YV15b	Outrigger front left (on outrigger)
YV18a	Outriggers extract (small block)
YV18b	Outriggers retract (small block)
YV19a	Outrigger rear right (on outrigger)
YV19b	Outrigger rear left (on outrigger)
YV20	Outriggers chosen (small block)
ST	Flow divider combinder (differential)
RV	One way check valve for 8.0 cm <sup>3</sup> pump
RV2	One way check valve for 5.5 cm <sup>3</sup> pump
SB1	Counter balancing brake valve
SB2	Counter balancing brake valve
DB1	Main pressure relief valve 240 bar
DB2	High speed pressure relief valve 175 bar
DB3	Series between motors pressure relief valve 100 bar
DB4	Lifting pressure relief valve 140 bar
DB5	Steering pressure relief valve 210 bar
DBYV20	On YV20 valve block outriggers pressure relief valve 210 bar
A2	Drive shock over pressure relief valve 220 bar
B2	Drive shock over pressure relief valve 220 bar
FP	Hand pump for brake release
N	Free wheling for brake release (normally closed)
NP	Enable hand pump for brake release (normally open)
M	Minimess connection for 8.0 cc pump functions .(lifting, µspeed ,low speed)
M1	Minimess connection for 5.5 cc pump functions. (steering)

**8.6.1. LOCATION OF COMPONENTS**

SYMBOLS / Symbol:

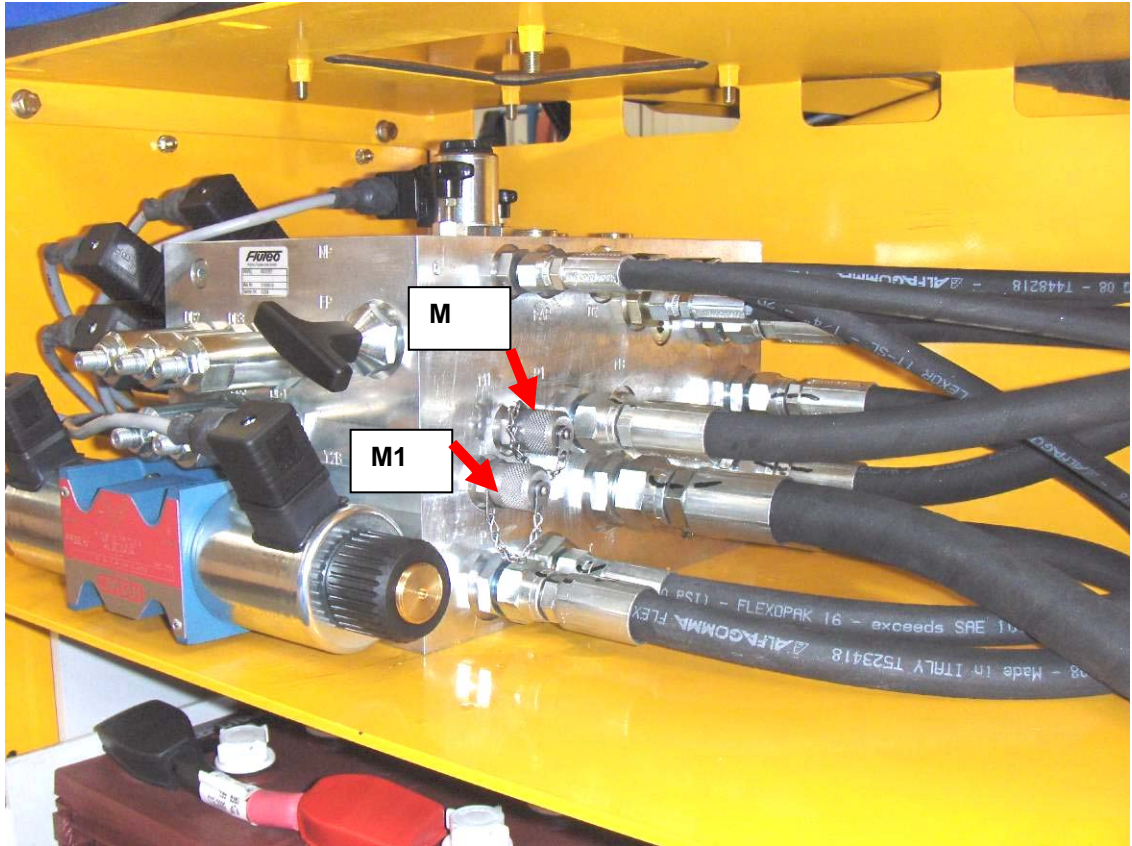


\* Hinweis: siehe Tabelle Ereignishistorie zur Serien-Nr.



**8.6.2. PRESSURE ADJUSTMENT**

The following procedure explains how and where to adjust the main pressure of Compact RTE



RELIEF VALVE	VALUE in bars
DB1 (low speed drive)	240 +5/0 on M port
DB2 (high speed drive)	175 ± 5 on M port
DB3 (between motors)	Sealed at 100b
DB4 (Lift mode)	~ 170b done at nominal load on M port
DB5 (steering)	210 ± 5 on M1 port

**Procedure for drive/steering**

- Connect the pressure gauge on the desired minimess plug (M or M1)
- Disconnect the drive valve YV2a/b
- Unscrew the counternut of the concerned relief valve
- Ask the movement until full lock
- Tight or untight the relief valve in order to get the right value
- Tight the counternut
- Reconnect the valve YV2

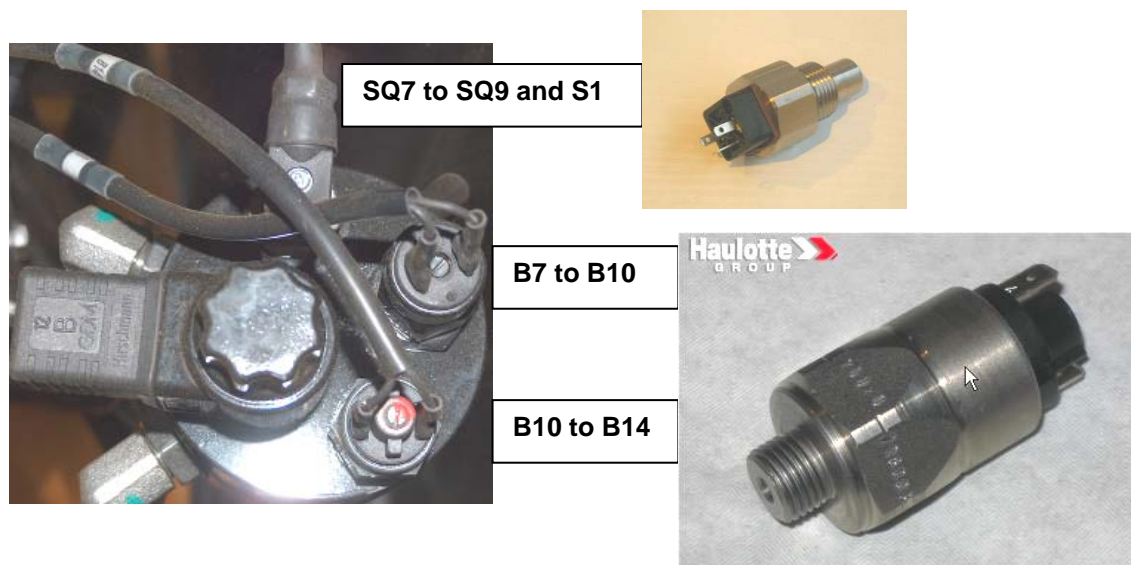
**Procedure for lifting**

- Connect the pressure gauge on M port
- Put the nominal load (+ 15%) in the center of the platform
- Ask for the lifting mode from ground controls
- Unscrew the counternut of the relief valve DB4 and adjust the relief valve until the scissors stack start to lift
- Remove the extra weight (15%)
- Check that lifting at nominal load is OK



### 8.6.3. OUTRIGGERS

The 4 outriggers are equipped with sensors, each one have a specific function



SQ7	Magnetic detection if outrigger is fully retracted (if OK drive permitted)
SQ8	Magnetic detection if outrigger is fully retracted (if OK drive permitted)
SQ9	Magnetic detection if outrigger is fully retracted (if OK drive permitted)
S1	Magnetic detection if outrigger is fully retracted (if OK drive permitted)
B7	Detection 14 bars front left stab on ground = authorization lifting
B8	Detection 14 bars front right stab on ground = authorization lifting
B9	Detection 14 bars rear left stab on ground = authorization lifting
B10	Detection 14 bars rear right stab on ground = authorization lifting
B11	Full stroke front left stab at 150 bars = lifting forbidden
B12	Full stroke front right stab at 150 bars = lifting forbidden
B13	Full stroke rear left stab at 150 bars = lifting forbidden
B14	Full stroke rear right stab at 150 bars = lifting forbidden

## 8.7. ADJUSTMENTS WITH CONSOLES

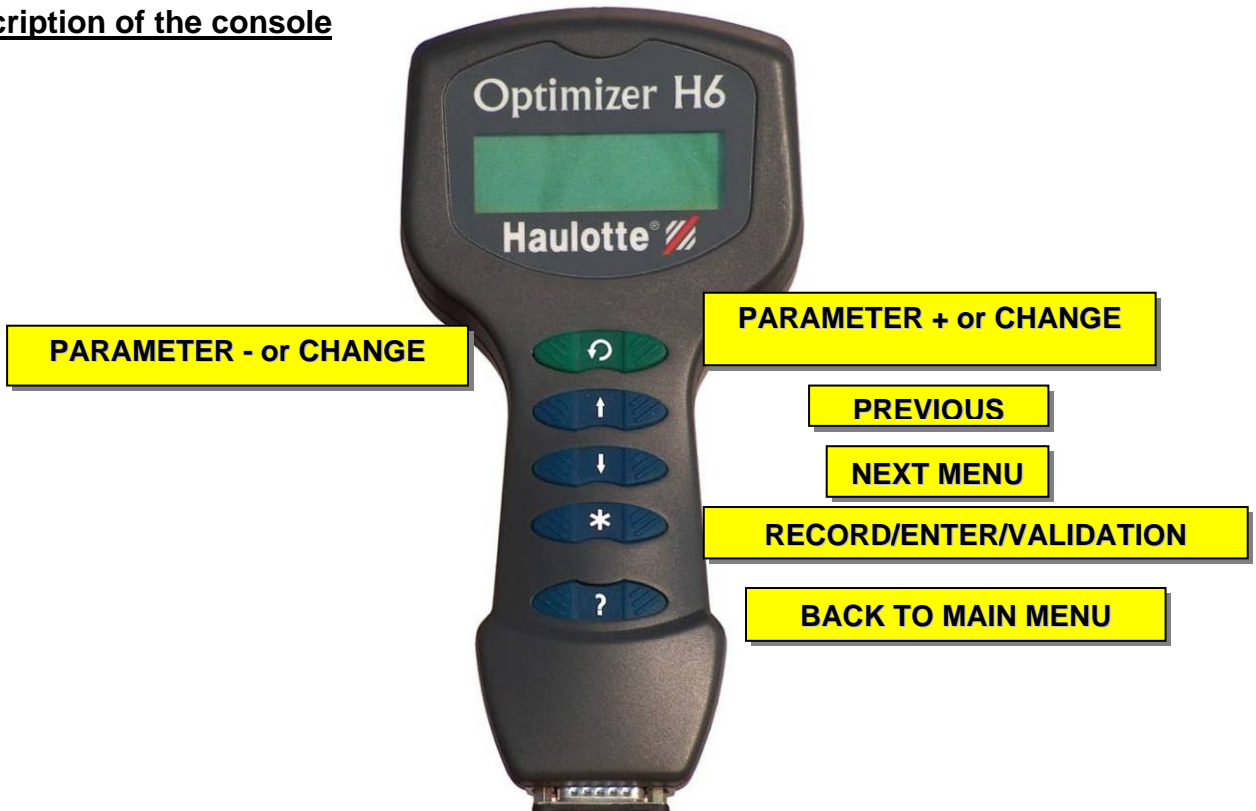
There are 2 consoles (one is connected to the Sevcon IO board and the other to node B2 module) all parameters settings and lists of alarms of the machine are accessible through those consoles.

### 8.7.1. CONSOLE OPTIMIZER

The connection is done directly on the specific connector located inside the chassis (behind the cover as shown below)



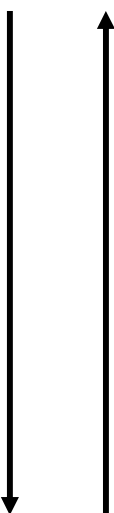
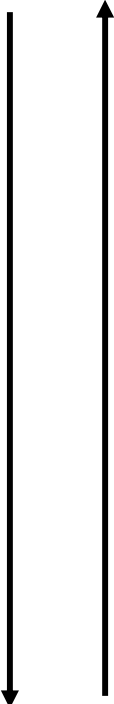
#### Description of the console



**NOTE:** on any blue key pads, pressing on left, right or in the center have the same result

List of menus

Access to the menu



HAULOTTE GROUP  
COMPACT RTE EUR  
2901010880 V 01.12

-----MAIN MENU-----  
PARAMETERS 1

Parameters setting access

-----MAIN MENU-----  
INPUTS - OUTPUTS 2

Input/output state access

-----MAIN MENU-----  
DIAGNOSTIC 3

Trouble shooting guide per function

-----MAIN MENU-----  
INFORMATIONS 4

Machines status

FAILURES

Failures list

HAULOTTE GROUP  
COMPACT RTE EUR  
2901010880 V 01.12

-----MAIN MENU-----  
PARAMETERS 1

--PARAMETERS MENU--  
SPEEDS 1

Speed parameters adjust

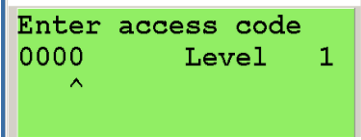
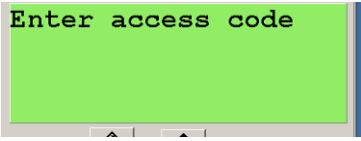
--PARAMETERS MENU--  
RAMPS 2


Ramp parameters adjust

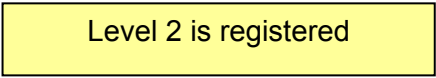
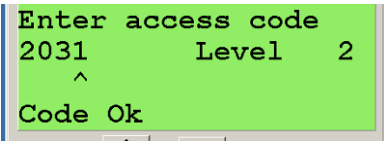
--PARAMETERS MENU--  
OPTIONS 3

Options setting

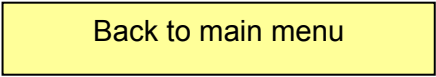
Validation by the key:  , then enter then the code



Navigation by this key in order to enter the code 



press key:



The console is in code level 2 (access to calibration menu)

## 8.7.2. LIST OF THE OPTIMIZER MENU

Note: some menus are controlled by the SEVCON variator (ex speed/ramps)

MENU	PARAMETERS	DESCRIPTION	COMMENTS
<b>Menu PARAMETERS</b>			
SPEEDS	-	-	Controlled by SEVCON chopper
RAMPS	-	-	Controlled by SEVCON chopper
OPTIONS	Enter access code	Access code	+/- for modification Access to level 2 /3
	Stabilisers	Activation of outriggers option	+/- for modification (Active or Inactive)
	Ground Lift	Temporisation de décollement de la plate-forme (ms), par défaut 1000ms	+/- for modification (Value from 1000 to 2400ms by step of 40 )
	Hdl Corr 1	Offset value for correction of the signal sent from node B2 to Sevcon when 1 stab is in function)	+/- for modification (value by default = 20) Note if NOK failure on joystick )
	Hdl Corr 2	Offset value for correction of the signal sent from node B2 to Sevcon when 2 stabs are in function)	+/- for modification (value by default = 40) Note if NOK failure on joystick )
	Hdl Corr 3	Offset value for correction of the signal sent from node B2 to Sevcon when 3 stabs are in function)	+/- for modification (value by default = 50) Note if NOK failure on joystick )
CALIBRATION access level 2 & 3	Cells are calibrated Calibrate load cells ? Use button :(*)	Load calibration of the machine equipped with strain gauges	See full process at chapter 8.7.3



MENU	PARAMETERS	DESCRIPTION	COMMENTS
Load System	Cells current (uA) C.1:9888 C.2: 9908 C.3:9908 C.4: 9846	1 <sup>st</sup> screen : value of current in $\mu$ Amp on the 4 load transducers	
	Load Measure (Kg): +382 Max (Kg): 565	2 <sup>nd</sup> screen current load on PF Load max acceptable on PF(565kg)	
	Calibration: YES NO Tare:1928 Gain:382 Machine: C10RTE	3 <sup>rd</sup> screen : informations on calibration if done or not YES if machine calibrated , NO if not Tare : offset of the load cells Gain : gain of the load cells Machine : type of machine as defined during the calibration process	
	Unfolded: YES NO Tilt: YES NO Overload: YES NO Def./Tilt: YES NO	4 <sup>th</sup> screen : state of the machine Unfolded : YES platforme>SQ1, NO platforme>SQ1 Tilt : YES tilt active, NO tilt not activaved Overload : YES static overload, NO : in overload Def./Tilt : default in progress	
	Links B2 <-> U1 Def./Tilt: OK FAILURE Overload: OK FAILURE	5 <sup>th</sup> screen : state of the network connection between module node B2 and SEVCON variator Def Tilt : OK if slope connection OK Def Overload : OK if overload connection OK	
Stabilisers	All Stabs Up : Y N Scissor blocked: Y N Scissor Levelled Y N Cylndr(s) bottom Y N	1 <sup>st</sup> screen : general state of the outriggers Y if all stabs are retracted , N if at least one is OUT Y si all stabs are on ground , N if at least one is not on pressure on ground Y if machine levelled (sensor 2 ways), N if not Y if at least one is extended at full stroke , N if the 4 stabs are not at full lock	
	YV18A : ON OFF YV18B : ON OFF YV15A : ON OFF YV15B : ON OFF YV19A : ON OFF YV19B : ON OFF KA6 : ON OFF PUMP:ON OFF	2 <sup>nd</sup> screen command state on outriggers valves ON command in process on the corresponding valve or relay OFF no command (KA6 = relay for cummutaion between steering<-> outriggers PUMP : command on pump unit	
VERSIONS		Versions of softwares	
JOURNAL 1		Not accessible	

Menu FAILURES			
Alarme Pesage	OL01	Strain gauges out of range	Check wiring on load cells
	OL02	Calibration out of range	Tare : at 0kg, value is 1930 +/- 40 Gain : at 500kg , value is = 380 +/- 40
	OL03	Power supply too weak	Check if VBATT>10.5V Chek wiring on load cells
	OL04	Strain gauge blocked	Check wiring on load cells
	OL05	Negative overload (static or dynamic)	Check wiring on load cells or if any obstacle twist mechanically the PF
Alarmes stabilisers	ST01	KA6 relay in short or open circuit)	Ouput of KA6 in SC or OC
	CA01	Incoherent fault on FR stab	Check all 3 sensors on stab
	CA02	Incoherent fault on FL stab	Check all 3 sensors on stab
	CA03	Incoherent fault on RR stab	Check all 3 sensors on stab
	CA04	Incoherent fault on RL stab	Check all 3 sensors on stab
	EV01	Fault on valve YV18a	Short or open circuit on valve
	EV02	Fault on valve YV18b	Short or open circuit on valve
	EV03	Fault on valve YV15a	Short or open circuit on valve
	EV04	Fault on valve YV15b	Short or open circuit on valve
	EV05	Fault on valve YV19a	Short or open circuit on valve
EV06	Fault on valve YV19b	Short or open circuit on valve	
Alarme EEPROM calculateur	EE01	EEPROM fault during overlaod calibration registration of the checksum value	Do again the overload calibration and erase the failure
	EE02	EEPROM fault	Wrong reading or writing datas in EEPROM

### **8.7.3.OVERLOAD CALIBRATION**

This calibration must be done when the following components have been replaced

- One or more strain gauges
- Module node B2
- Full platform (only tare could be done in emergency)

#### **Prerequisite**

- All commands must be done from lower control box
- The machine is not in slope
- During all the calibration (tare and 500Kg), the power supply must not be switched OFF.
- The way to proceed for calibration must be respected.
- The load to be used for 500kg must be within 500 +/-5 Kg.
- The platform must be in stowed position
- In case of problem during calibration process, a message will indicate the type of problem.  
Go in menu FAILURES and erase the existing alarms (OL01 to OL05) through code level 2 or 3.

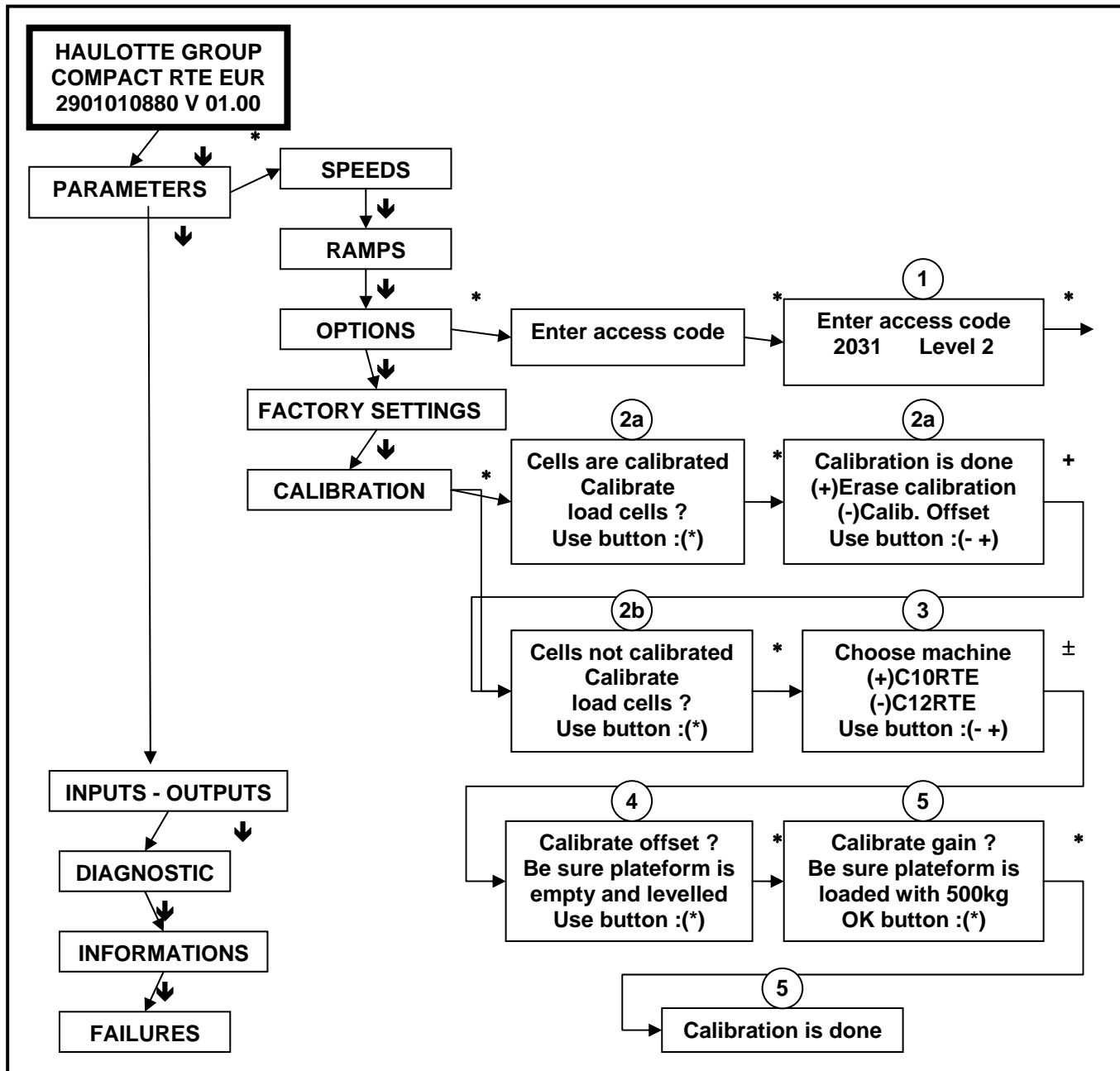
#### **Fit the console in level 2 mode (2031) and follow instructions shown on display**

- Connect the Optimizer calibrator on the connector as shown below on photo 1
- "Go in menu level 2" in sub-menu PARAMETERS/OPTIONS.
- Start the calibration process in sub-menu PARAMETERS/CALIBRATION and validate by (\*) :
  - If the calibration has already been done, it must be erased using the key (+) (it's possible to calibrate only the offset by pushing the key (-)).
  - If no calibration has already been registered, the process starts normally.
- Choose the right model : key (+) for the Compact 10 RTE or key (-) for the Compact 12 RTE
- Check that the platform is empty , then confirm the tare by using the validation key (\*)
- Charge the platform with 500 +/- 5 kg , then confirm the load by using the validation key (\*)
- Check that the following message « Calibration is done » appears on the display.

**Note** : at the end , check that overload system is working

Nominal load C10RTE 565 kg (threshold cut out at 110% which is 621 kg)

Nominal load C12RTE 450 kg (threshold cut out at 110% which is 495kg)



### Check the possible failures

ALARMS CODE	DESCRIPTION	DIAGNOSTIC
OL01	Strain gauges out of range	Signal of one the load cell is $< 3.5\text{mA}$ or $> 20.5\text{ mA}$
OL02	Calibration out of range	The calibrated values from tare ou gain are too far from the default value: $1890 < \text{Tare} < 1970$ (C10/C12RTE) $340 < \text{nominal load Gain} < 420$
OL03	Power supply too weak	Battery voltage $< 10.5\text{V}$ (the information given by the sensors are not coherent for a too low voltage)
OL04	Strain gauge blocked	No variation on one of the sensor when the real load is changing
OL05	Negative overload (static or dynamic)	Negative measurement $> -400\text{kg}$
EE01	EEPROM fault	the current CRC (cyclic redundancy check) is different from the CRC memorised for the calibration datas (system checked at each EEPROM access)
EE02	EEPROM fault	Wrong reading or writing datas in EEPROM

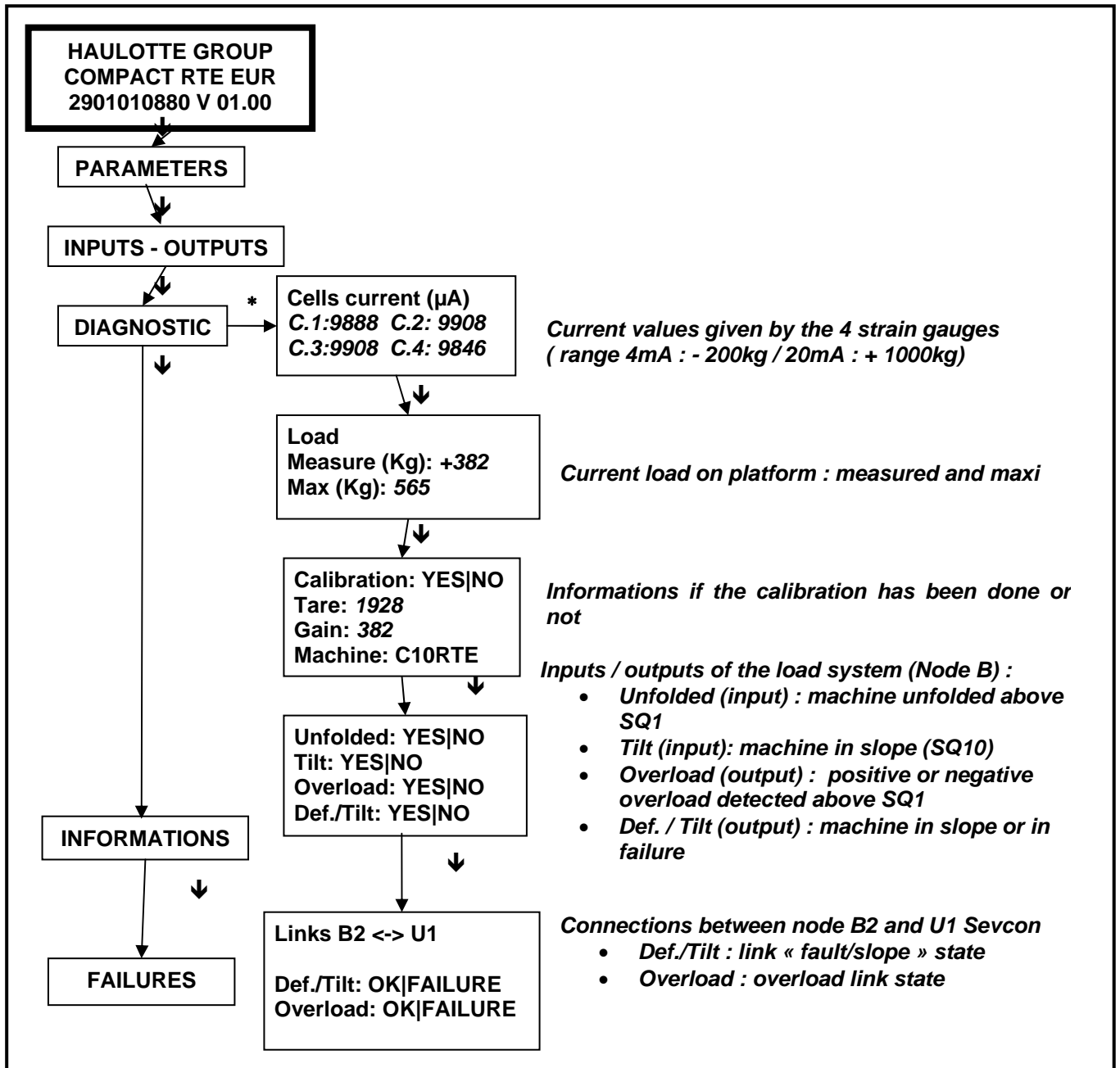
The overload faults active the output «fault/ slope sensor» (wire B501) on the load system (except in case of negative overload detected by OL05 , in this case the output “overload” is activated (wire B502))  
 The wire connections between both calculators node B2 and SEVCON U1 are checked permanently.

1<sup>st</sup> case: the system goes in overload if a failure is detected on the «fault/ slope sensor» line (wire B501 = 0)

2<sup>nd</sup> case: the system goes in fault mode if a failure is detected on « overload » line (wire B502 = 0) (see DIAGNOSTIC menu)



## How to diagnostic the possible problem during calibration



the sensors values

example	Platform empty		PF with 500kg
	stowed	extended	stowed
SL1			
SL2			
SL3			
SL4			
Meas load			
Tare			

## 8.7.4. OUTRIGGERS SETTING

The setting of the outrigger correction signals must be done when the following components has been replaced.

- HEAD node B2
- SEVCON VAR variator
- SEVCON I/O board

### Procedure

#### A- Select acces code with the Optimizer

- Connect Optimizer
- Select Parameters
- Select Options
- enter access code 3165
- exit from menu with ' ?'

#### B - Select the machine type

##### 1. Select Parameters

- Options → *Enter* scroll down untill reach to
- Stabilisers → activate (initialy they are inactive) then press Enter then Save
- Scroll down to HDL CORR
- There are 4 HDL CORR named HDL CORR 1.....HDL CORR 4 their initial parameters are equal to 0 ;

##### 2. Setting parameters procedure :

- 1.HDL CORR 1 = 30 → Save
- 2.HDL CORR 2 = 40 → Save
- 3.HDL CORR 3 = 50 → Save
- 4.HDL CORR 4 = 60 → Save

3. Connect the CAN CALIBRATOR to the control door, then go to menu 2.4.2 and read the tension (see next page for connections)

##### 4. The correction settings.

- activate one stabilizer (a single one) (extract or retract makes no difference, retract might be easier)
- modify the HDL CORR 1 value so the tension value read to be in the interval 2.28 – 2.32 V\* (*for increasing the tension value, the parameter must be decreased, for the opposite you increase the parameter for decreasing the tension value*)

- final value for HDL CORR 1 → Save and record the value for future maintenance. For example 15

- activate two stabilizers (two simultaneosly)

- modify the HDL CORR 2 value so the tension value read to be in the interval 2.28 – 2.32 V\*

- final value for HDL CORR 2 → Save and record the value for future maintenance. For example 25

- activate three stabilizers (three simultaneosly)

- modify the HDL CORR 3 value so the tension value read to be in the interval 2.28 – 2.32 V\*

- final value for HDL CORR 3 → Save and record the value for future maintenance. For example 35

- activate four stabilizers (four simultaneosly)

- modify the HDL CORR 4 value so the tension value read to be in the interval 2.28 – 2.32 V\*

- final value for HDL CORR 4 → Save and record the value for future maintenance. For example 45

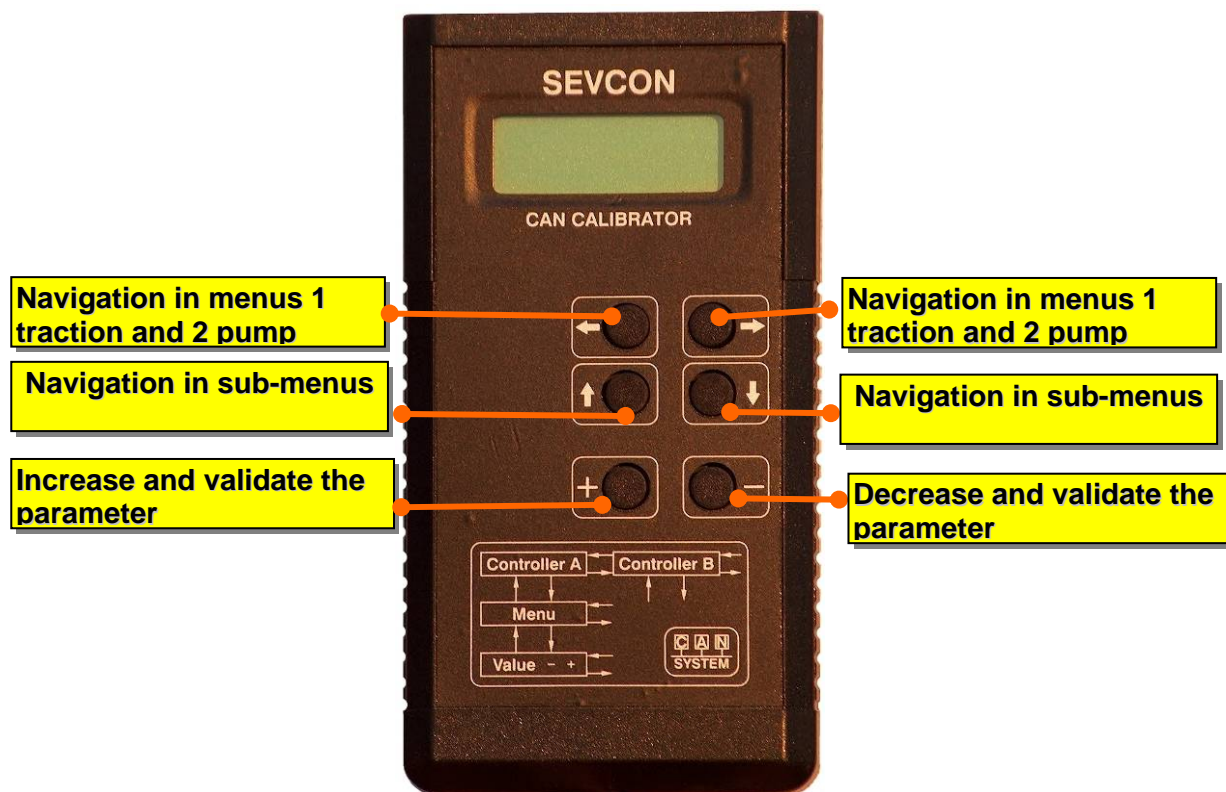
**\* If the tension value is not between the requested interval, the system will cut and report 6 flashes from the IO boards LED indicator and therefore the CORR must be modified in such a manner that the resulting tension to be found is in the interval of 2.28 - 2.32V.**

**If the 6 flashes occurs the system needs to be restarted and proceed thru step a, jump to b3.**

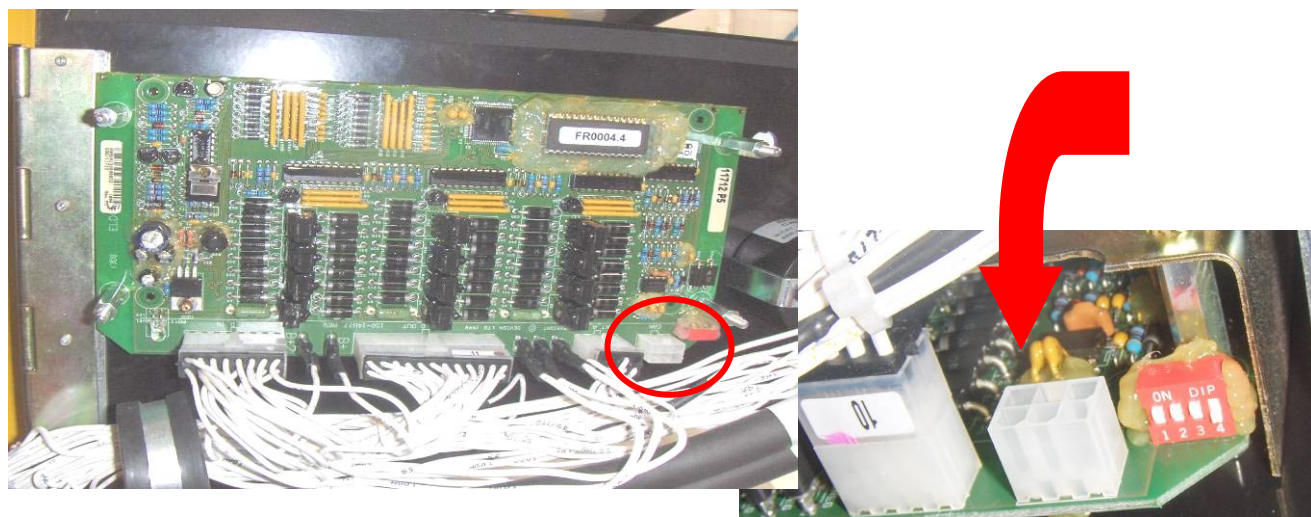
NB. There are test done in Scandinavia whith a better negative connection between B- on the VAR to the negative connection on the NODE B2. This seems to delete the complete HDL CORR procedure. All settings are tuned to Zero. This gives stable tension of 2.26V normally (2,26V works fine).

Look for updated info on the Haulotte E-training Commuity.

**8.7.5. CONSOLE SEVCON CAN CALIBRATOR**

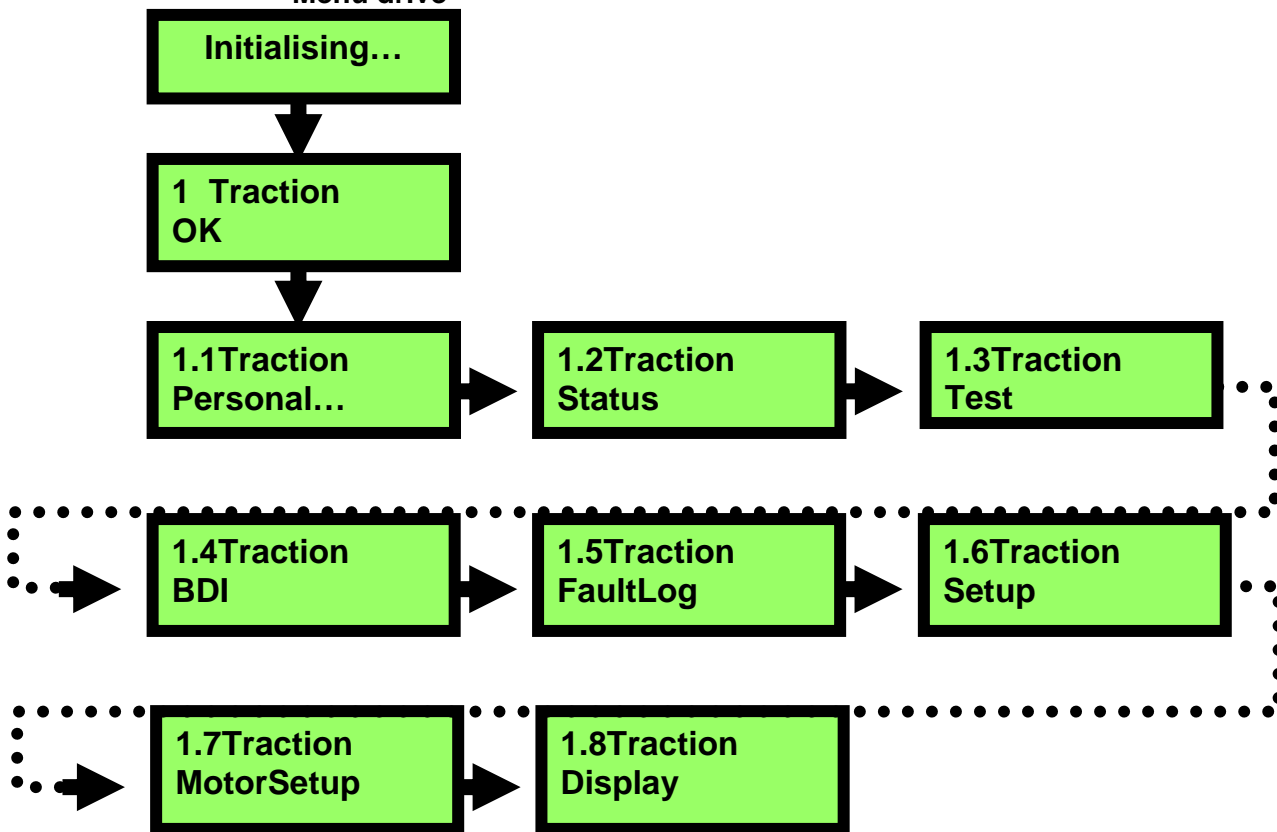


Connection of console (connector A : logic board)

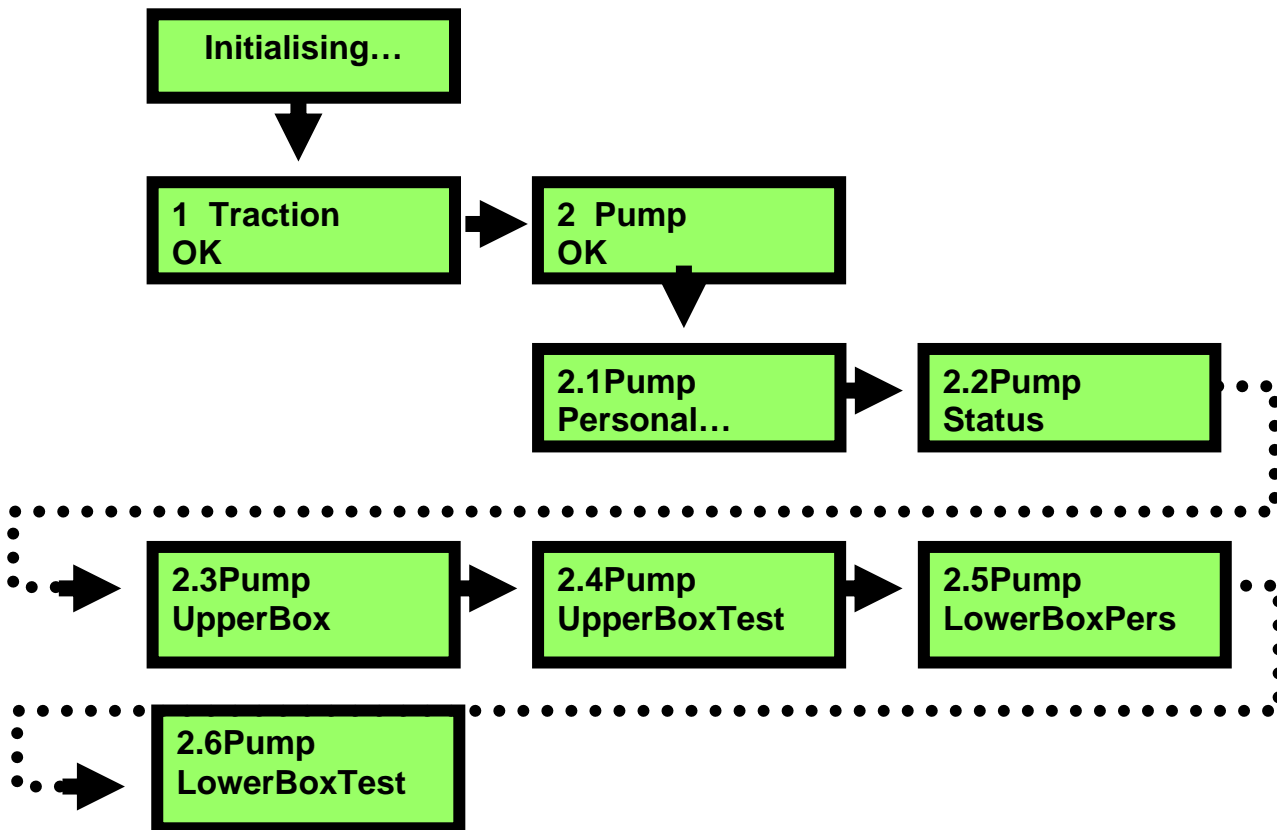


**8.7.6. HOW TO SCROLL THROUGH THE PARAMETERS**

- Menu drive



- Menu movements



## 8.7.7. LIST OF SEVCON PARAMETERS

Some parameters could be displayed on thesevcon console but are not used in RTE models

Personality	Range		Resolution	Default	Valeur réglée	Commentaires	
	Minimum	Maximum					
0.01	Lift Speed 1	0%	100%	1%	100%	100	Traction LOW/HIGH max speed, UCB Lift speed Max
0.02	Lift Comp 1	0	200%	1%	0%	50	Compensation en TRACTION
0.03	Accel 1 Zero V	0.00V	4.50V	0.02V	0.00V	1.04	
0.04	Accel 1 Full V	0.00V	4.50V	0.02V	4.50V	3.70	
0.05	cutback Speed 1	0%	100%	1%	100%	32	Speed 1 cutback = Elevated speed Limitation Traction micro vitesse
1.01	Lift Speed 2	0%	100%	1%	100%	0	
1.02	Lift Comp 2	0	200%	1%	0%	0	
1.03	Accel 2 Zero V	0.00V	4.50V	0.02V	0.00V	(0.68)	
1.04	Accel 2 Full V	0.00V	4.50V	0.02V	4.50V	(3.90)	
2.01	Lift Speed 3	0%	100%	1%	100%	70	Steer only speed Vitesse pour Direction Seule
2.02	Lift Comp 3	0	200%	1%	0%	0	
3.01	Lift Speed 4	0%	100%	1%	100%	100	LCB lift up speed
3.02	Lift Comp 4	0	200%	1%	0%	0	
3.03	Cutback speed 4	0	100%	1%	0%	17	Speed 4 cutback Vitesse réduite Levage Base
4.01	Lift Speed 5	0%	100%	1%	100%	0	
4.02	Speed 5 (P/A)	Priority Additive		-	Priority	PRI	
5.01	Lift Speed 6	0%	100%	1%	100%	0	
5.02	Speed 6 (P/A)	Priority Additive		-	Priority	PRI	
6.01	Lift Speed 7	0%	100%	1%	100%	0	
6.02	Speed 7 (P/A)	Priority Additive		-	Priority	PRI	
8.01	Creep Speed	0%	25%	1%	0%	0	
9.01	Lift Ramp Up Delay	0.1s	5.0s	0.1s	1.5s	0.9	Rampe acceleration en Levage
9.02	P Steer Ramp Up Delay	0.1s	5.0s	0.1s	1.5s	0.1	
9.03	Ramp Down Delay	0.1s	0.5s	0.1s	0.1s	0.3	Rampe decel en Levage
9.04	Acceleraiion 1 Delay	0.1s	5.0s	0.1s	1..5s	2.3	Traction All speed accel delay
9.05	Speed 1 cutback deceleraion Delay	0.1s	5.0s	0.1s	1..5s	4	Traction Elevated speed decel delay (Micro vitesse)
9.06	Low/High spd slop 1 Decel Dly	0.1s	5.0s	0.1s	1..5s	0.7	Traction Low/High speed decel 1 delay (Première rampe de freinage en traction)
9.07	Low/High spd slop 2 Decel Dly	0.1s	5.0s	0.1s	1..5s	2.5	Traction Low/High speed decel 2 delay (Seconde rampe de freinage en traction)
9.08	Low/High spd slop brake level	10%	90%	1%	90%	40	Traction Low/High speed decel brake Level (Seuil de changement de rampe de freinage en traction)
10.01	P Steer Speed	0%	100%	1%	100%	0	
10.02	P Steer Delay	0s	60s	1s	2s	0	
10.03	P Steer Comp	0	200%	1%	0%	0	
10.04	Steering Current Limit	0%	100%	1%	100%	16	Seuil du détection du courant en traction micro vitesse (blocage Direction)
11.01	Current Limit	50A	CBR <sup>3</sup>	10A	CBR	600	
11.02	Seat Delay	0.0s	5.0s	0.1s	2.0s	0.1	
11.03	Low V Start	Low V Cutout	System Voltage	0.5V	Low V Cutout	16.5	
11.04	Low V Cutout	14.5V	Low V Start	0.5V	14.5V	14.5	
12.01	Chop Select	Off / On / 24V		-	Off	OFF	
12.02	Digital I/O	1	7	1	1	7	
12.03	Analogue I/P	0	2	1	1	2	
12.04	Seat Cuts Lift	Off / On		-	Off	OFF	
12.05	System Voltage	24V	48V	2V	24V	48	
12.06	Accel 1 Type	Linear / Centre-Pot		-	Linear	CPO	Centre POT ou LINear



Cal. Ref.	Parameter Displayed	VALUE
1.3.1	Accelerator %	
1.3.2	Accelerator Voltage	
1.3.3	Deadman	
1.3.4	Joystick Forward	no use
1.3.5	Joystick Reverse	no use
1.3.6	Steer Left	
1.3.7	Steer Right	
1.3.8	Horn (SB4)	
1.3.9	Traction Select	CLOSED in High speed mode
1.3.10	Tilt (KA1)	closed
1.3.11	Boom Rest-> SQ1	closed
1.3.12	8m High (SQ4)	CLOSED
1.3.13	BRAKE RELEASED	OPEN
1.3.14	BDI Input	CLOSED
1.3.15	Frame Fault	open
1.3.16	Drive Inhibit	closed
1.3.17	B2 cut (SQ3 : PF high))	CLOSED
1.3.18	Joystick NTRL sw	open
1.3.19	LS traction (SA3 selection Low/High speed drive)	
1.3.20	software	<b>Ex: Ver FR004.6</b>
1.3.21	controller Serial number	
1.3.22	controller type	PP745

	Traction	
1.4.1	charge BDI	0
1.4.2	BDI Battery Voltage (V)	48
1.4.3	BDI Reset Level	2,09/cell
1.4.4	BDI Discharge Level (V) empty	1,73/cell
1.4.5	BDI warning Level (%)	30%
1.4.6	BDI cutout Level (%)	20%

	TRACTION DISPLAY	VALUE
1.8.1	Display Default Hours	KEY/TRACTION/PUMP
1.8.2	Display Status Type	OFF
1.8.3	Display contrast	Set at 10
1.8.4	ind 1	Normally OFF
1.8.5	ind 2	PUMP I
1.8.6	Display Fault Messages	ON : fault errors displayed Fxxxxxx OFF : no display of error codes

Cal. Ref.	Input Displayed	VALUE
2.4.1	Y axis Joystick %	Range : 0
2.4.2	Y axis Joystick Voltage	Range : 2.22V
2.4.3	X axis Joystick %	Range 100
2.4.4	X axis Joystick Voltage	Range 5.10
2.4.5	Deadman switch	Switch OPEN
2.4.6	Joystick Forward	Not used
2.4.7	Joystick Reverse	Not used
2.4.8	jib extended	Not used
2.4.9	cage over (SP1)	Switch OPEN
2.4.10	Traction Select	Not used
2.4.11	Boom 1 Select	Not used
2.4.12	Boom 2 Select	Not used
2.4.13	Jib Select (SA3 )	Switch OPEN
2.4.14	Tele Select	Not used
2.4.15	Slew Select	Not used
2.4.16	Cage Level Select	Not used
2.4.17	Cage Rotate	Not used
2.6.1	Boom 1 UP	PF lift from chassis
2.6.2	Boom 1 Down	PF down from chassis

In situation of default, the display presents on the hour meter, a fault code

This code is represented like Fxxyyy in the following way

F: Fault

xx: level of defect

yy: number of defect

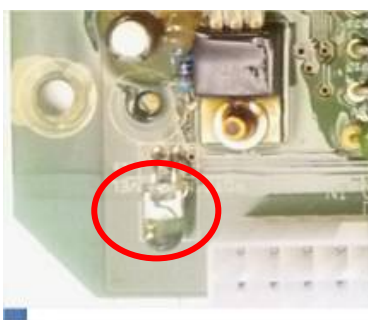
Level of defect	Type of defect
Level 0	Normal functioning
Level 1	Warning message only
Level 2	Defect leading to a reduction of performance
Level 4	Defect prohibiting the start-up
Level 5	Defect causing the opening of the line contactor KM1

Fault code	Calibrateur display	DESCRIPTION
<b>F05000</b>	Coil s/c	overload current fault of line contactor SB1
<b>F05001</b>	EEPROM Fault	defect memory parameters
<b>F05003</b>	Internal Fault	defect internal in variable speed unit
<b>F05004</b>	12V Supply Low	defect in logical power supply
<b>F05005</b>	System Fault	defect of can bus network between printed circuit board /variator
<b>F05006</b>	Mosfet s/c	defect of short-circuit of the MOSFETs transistors of the variable speed units
<b>F05008</b>	P.Up Trac. Weld	contactor of line already stuck at start (KM1)
<b>F05009</b>	P.Up Trac. Mos	defect of the MOSFET at start (check the variator)
<b>F05011</b>	Drive 0 one	defect activation output contactor N°0 (low speed)
<b>F05012</b>	Drive 1 one	defect activation output contactor N°1 (high speed)
<b>F05013</b>	Drive 0 off	defect desactivation output contactor N°0 (low speed)
<b>F05014</b>	Drive 1 off	defect desactivation output contactor N°1 (high speed)
<b>F05019</b>	Stack Corrupted	error internal to variable speed unit: (battery dysfunction)
<b>F05020</b>	Line Cont o/c	defect of closure on line contactor (SB1)
<b>F05021</b>	Coil s/c (standard)	Digital output in short-circuit on the module of Input/output (chassis CAN board)
<b>F05022</b>	Coil s/c (ext.)	Digital output in short-circuit on Input/output board
<b>F04000</b>	Contacteur o/c	defect of closure on contactor
<b>F04001</b>	Contacteur s/c	stuck contactor
<b>F04003</b>	Fault sequence	defect of sequence of the variator command dead man /setpoint)
<b>F04005</b>	SRO fault	Time delay of exceeded sequence (> 5 seconds after push on validation dead man switch without another action)
<b>F04009</b>	BatteryLow	Battery: low charge level (restore charge)
<b>F04010</b>	BatteryHigh	Battery: high charge level (check B+ presence on variable speed unit)
<b>F04012</b>	Pers Error	Defect of parameter setting
<b>F04013</b>	CRC Error	error of control of the parameters (switch OFF then ON the machine)

<b>F02000</b>	Accel. Fault	defect accelerator of the joystick (out of range 0.5-2.5-4.5Vdc)
<b>F02001</b>	Accel. Fault	selection already present at start (joystick pushed or pullet when power is ON or problem of connection)
<b>F02002</b>	Overload cage	Defect of the load management system whe power is ON (check connection between output CAN)
<b>F01004</b>	BDI Cutout	cut-off on threshold of discharge battery (charge the battery)
<b>F01005</b>	Thermal Cutback	thermal threshold variable speed unit (> 75°C)

### **8.7.8. I/O BOARD LED FAULT CODE INDICATOR**

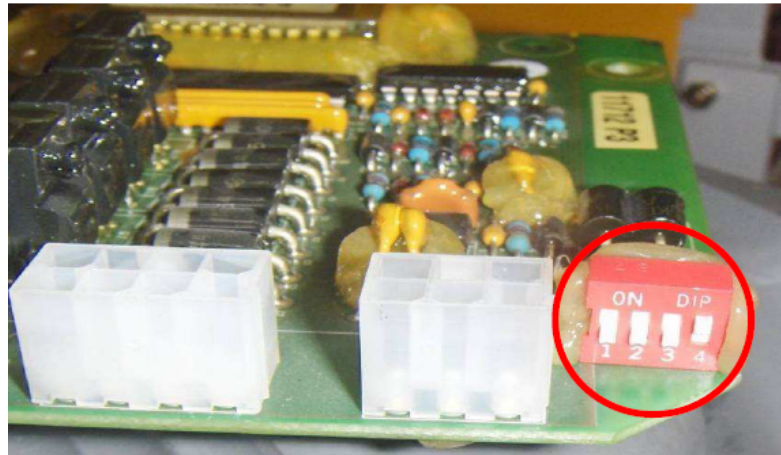
Lower left corner of I/O board



<b>Number of flashes</b>	<b>Description</b>
Led on fixed NTR.	Chopper operation is OK , normal conditions
led off	Internal module power fault
1 flash	Parameter fault
2 flashes	Wrong start sequence / on cabling faults
3 flashes	Not used
4 flashes	Contacteur fault (SC or OC) / cabling fault /motor in open circuit
5 flashes	Dead man time out
6 flashes	Joystick signal cabling type fault
7 flashes	Low or High battery voltageor BDI (Battery Digital Input) cut out operationg
8 flashes	Over temperature
9 flashes	Not used
12 flashes	Not used

**8.7.9. DIP SWITCH SETTING**

This procedure must be done according to the local regulations (EN280/US/CDN or AUS requirements ) or when the logic board has been changed



DIP SWITCH	POSITION 1	POSITION 2	POSITION 3	POSITION 4
COMMENTS	Tilt sensor ON (UP) movement stopped OFF (Down) alarm only	Lowering block ON (UP) descent stopped at SQ1 OFF (Down)inactive	Alarm on all movements ON (UP) Inactive OFF (Down) Active	NO USE

Configuration of the dip switches by country

COUNTRY	POSITION OF SWITCH WITH MULTIPLE POSITIONS	COMMENTS
EUROPE/STANDARD	ON 1 2 3 4 ■ ■ ■ ■	Stop on SQ1/ No alarm on movements
EUROPE/STANDARD <i>Optional</i>	ON 1 2 3 4 ■ ■ ■ ■	Stop on SQ1/ alarm on all movements
AUSTRALIA	ON 1 2 3 4 ■   ■ ■   ■	Not stop on SQ1/ no alarm on movements
USA	ON 1 2 3 4 ■ ■ ■   ■	Not stop on SQ1/ not alarm on movements
USA	ON 1 2 3 4 ■ ■ ■ ■	Not stop on SQ1/ alarm on all movements
CANADA	ON 1 2 3 4 ■ ■ ■ ■	Not stop on SQ1/ alarm on all movements

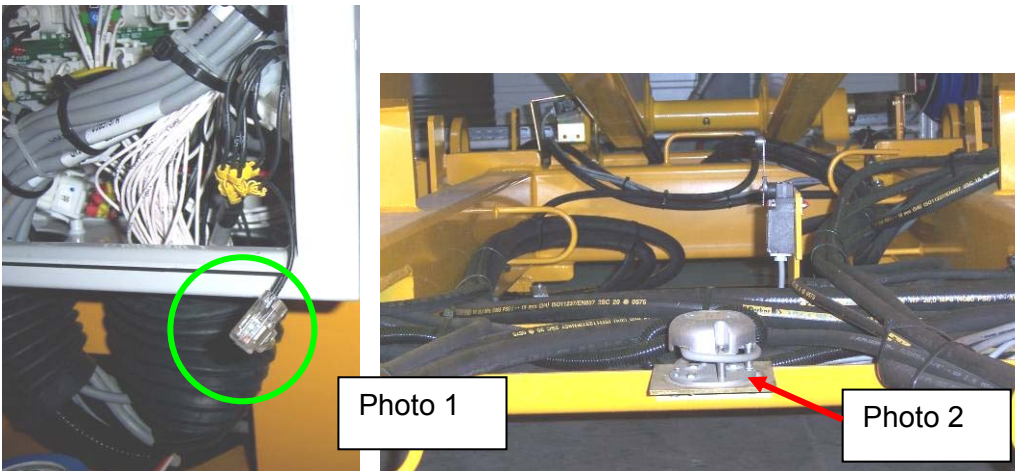


### 8.7.10. SLOPE 2 WAYS ADJUSTMENT

This component has as a function to detect on the 2 ways (longitudinal, X and transversal, Y), the physical position of the platform of the machine  
 It needs to be adjusted if it has been replaced or it has lost the memory and the automatic platform levelling is not correct performed.

**Procedure:**

- put the machine on a ground perfectly flat
- In the lower control box, connect the black wire at a GND (photo 1)
- The green led located under mushroom of the dual level sensor will flicker (photo 2)
- wait for 10 seconds when it starts to flicker
- Once the lit green led is fixed, remove the black wire and insulate it well so that it does not touch any metal piece
- The calibration is carried out
- check the correct operation of the automatic levelling and see if the platform is levelled ( check with the water bubble on platform)



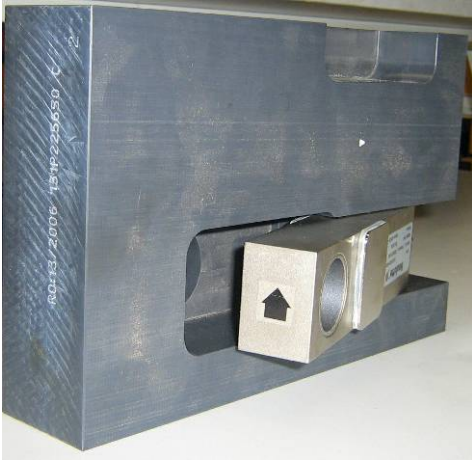
**Connection of the level sensor:**

COLOR	Wire number	FUNCTION	CONDITION	WIRE on schematics
brown	1	+ Battery	Supply +	114C
Blue	2	- Battery	Supply -	0M
purple	4	X back	Output + get to 0V if front up	505
white	5	X front	Output + get to 0V if rear up	504
yellow	6	Y right	Output + get to 0V if left up	919
Grey	7	Y left	Output + get to 0V if right up	920
green	3	Tilt signal 0,5°	Not connected	
black	8	reset	Reset	

**8.7.11. STRAIN GAUGES REPLACEMENT**

This sensor is based on the deformation of the gauge, it will be measured then a signal through operational electronic amplifiers

The strain gauges deliver a current 4 - 20mA according to load applied to platform, the signal is sent to the module node B2



Two types of information of weight are elaborated (the instantaneous weight and the average weight), they are then converted and gauged into kilograms using safeguarded information of tare (strain gauges if platform empty) and signal (delta of the sums of the gauges from 0 to 500kg)

According to the received signal, the dynamic or static overload conditions will be detected and the machine will be then out of overload

- **How to fix the strain gauges**

Use an axle to center the gauge

Be careful as gauges are fragile

Tight the 2 fixations screws with torque wrench (value 85Nm)

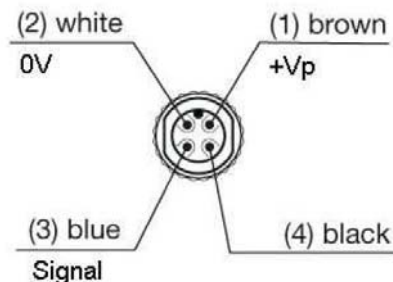


Signal of the strain gauges

4 mA for - 200kg

20mA for + 1000kg

Connection on plug



## 8.8. TROUBLE SHOOTING GUIDE

### 8.8.1. LOGIC EQUATIONS

This table is showing which valve(s) is energised according to the function

Function/valves	YV1	YV2 a/b	YV3	YV4*	YV4*	YV5	YV6	YV7 a/b	YV8	YV9	YV10	YV11
LIFTING	X										X	
QUICK DESCENT	X								X	X		
LOW DESCENT									X	X		
LOW SPEED		X									X	
HIGH SPEED		X	X	X	X	X					X	
STEERING ONLY								X				X
STEER+DRIVE		X						X			X	
DIFF LOCK							X					

### 8.8.2. LIFTING/DESCENT MODE

This table is showing the components involved in lifting/descent mode

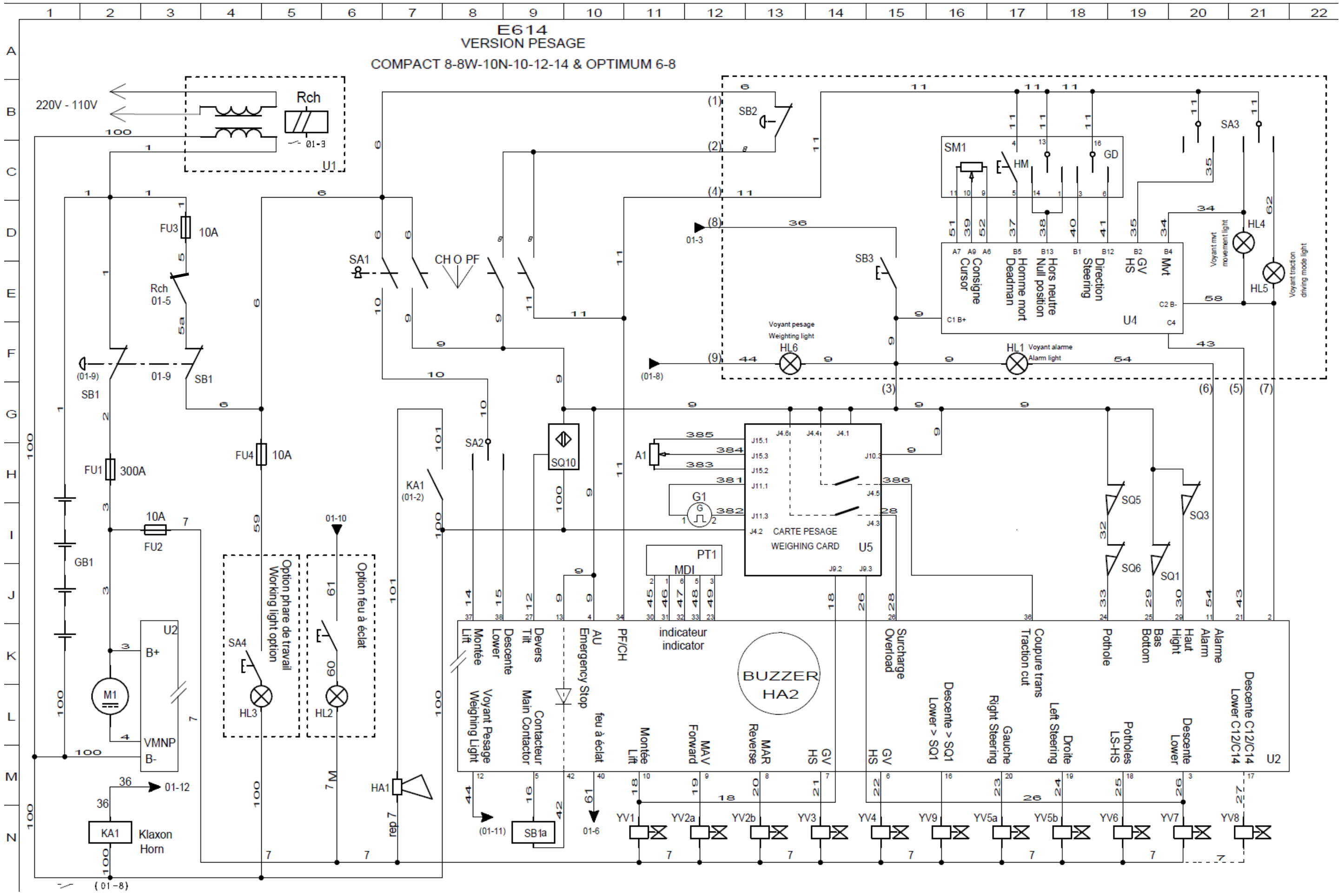
Composant / Statut Component / Status																						
	YV1	YV8	YV9 (C12)	YV10	SQ1	SQ3	SQ4 (C12 coupure 8M)	SQ10	SL1 & B310	SL2 & B311	SL3 & B312	SL4 ou B313	EB6 surcharge / Overload	SM1 HM	SM1 neutre	SM1 (0,2V < hors palge > 4,8V)	SA2 monté	SA2 descente	SA3 levage /lift	SA3 traction		
Fil / Wire N° 0 (FU7 5A) & Fil / Wire N° 114B (FU6 1A) & Fil / Wire N° 100 (Ov) & Fil / Wire N° 14(+) & Fil / Wire N° 19 &					31	32	34	20					29					26	27			
Fil / Wire N° 14 (FU3 +) & Fil / Wire N° 22 (OV) &	30	51	51	54											52	53	49			41	43	
Levage chassis / Chassis lifting	1	0	0	1	1	1	1	1	De 4mA a 20mA					0	0	0	2,5	1	0	1	0	
Levage plate forme / Platform lifting	1	0	0	1	1	1	1	1							0	1	1	2,5	0	0	1	0
Descente rapide chassis /Fast speed chassis lowering	1	1	1	0	1	1	1	1							1	0	0	2,5	0	1	1	0
Descente lente chassis /Slow speed chassis lowering	0	1	1	0	0	0	1	1							1	0	0	2,5	0	1	1	0
Descente rapide plate forme / Slow speed chassis lowering	1	1	1	0	1	1	1	1							0	1	1	2,5	0	0	1	0
Descente lente plate forme / Slow speed chassis lowering	0	1	1	0	0	0	1	1							1	1	1	2,5	0	0	1	0
Descente lente plate forme / Slow speed chassis lowering	0	1	1	0	0	0	1	1							1	1	1	4,5	0	0	1	0
x indifferent																						

### 8.8.3. DRIVE/STEERING

This table is showing the components involved in drive/steering mode

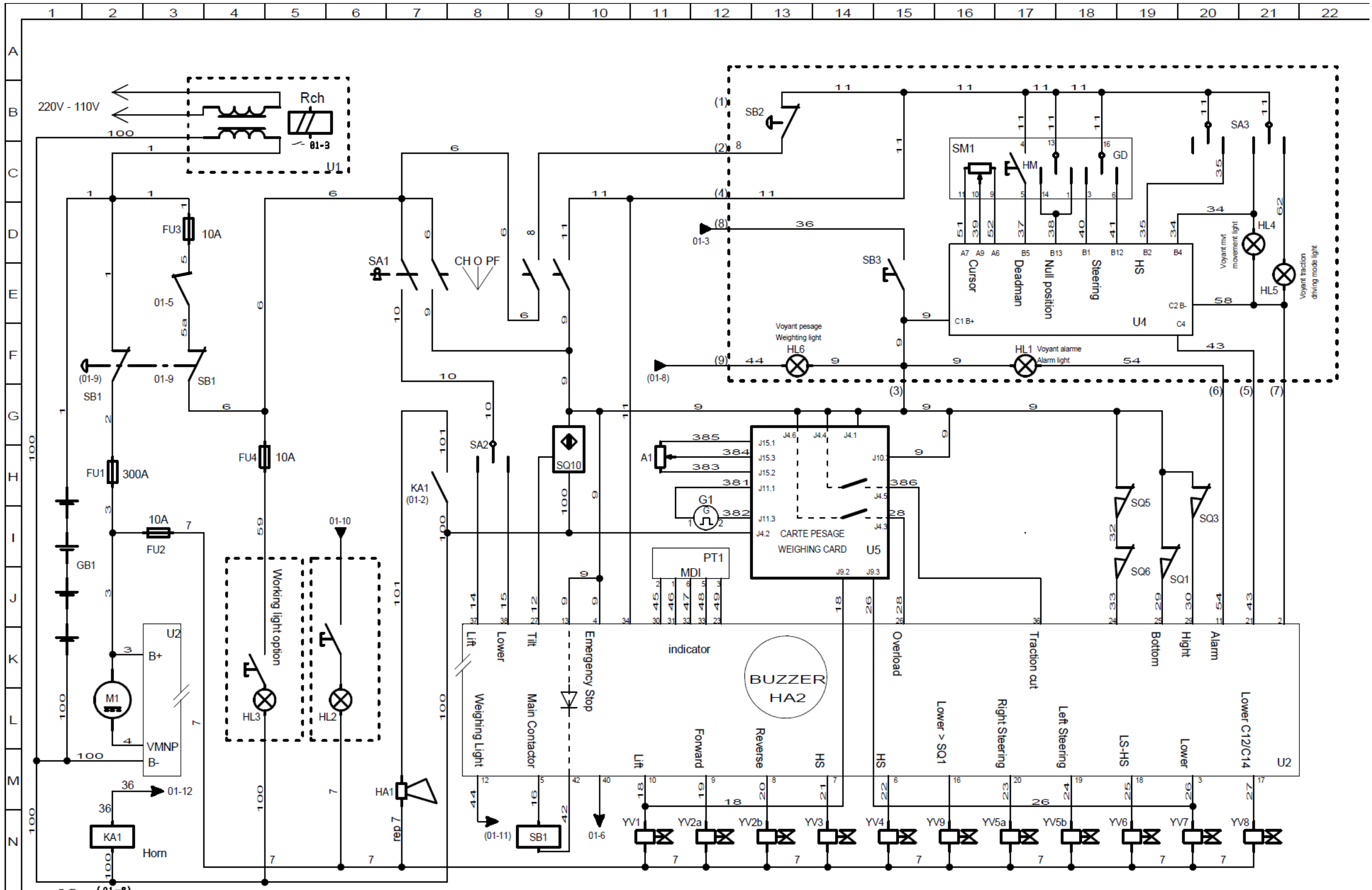
Composant / Statut Component / Status																												
RTE																												
Fonction Function	YV2a	YV2b	YV3	YV4	YV4*	YV5	YV6	YV7a	YV7b	YV10	YV11	SQ1 Bas	SQ3 Haut	SQ4 (C12coupure 8M)	SQ10	B310	B311	B312	B313	SP1 surcharge / Overload	SM1 HM	SM1 (0,2V<hors page > 4,8V)	SM1 D	SM1 G	SA3 levage /lift	SA3 traction	SB3	
Fil / Wire N° 0 (FU7 5A) &																												
Fil / Wire N° 114B (FU6 1A) &																												
Fil / Wire N° 100 &												31	32	34							29							
Fil / Wire N° 14(+)&															20													
Fil / Wire N° 14( FU3 +) &	33	35	37	39	39	42	44	47	48	56	54																	
Fil / Wire N° 22( DV) &																						52	49	57	55	41	43	46
Direction droite / Right steering	0	0	0	0	0	0	0	1	0	0	1	X	X	1	1						0	0	1	0	0	1	0	
Direction gauche / Left steering	0	0	0	0	0	0	0	0	1	0	1	X	X	1	1						0	0	0	1	0	0	1	0
Translation AV micro vitesse consigne reduite	1	0	0	0	0	0	0	0	0	1	0	0	1	1	1						1	1	2,5 a	0	0	0	1	0
Micro speed forward motion																							4,5					
Translation AR micro vitesse consigne reduite	0	1	0	0	0	0	0	0	0	1	0	0	1	1	1						1	1	2,5 a	0	0	0	1	0
Micro speed reverse motion																							0,5					
Translation AV petite vitesse Slow speed forward motion	1	0	0	0	0	0	0	0	0	1	0	0	1	1	1						1	1	2,5 a	0	0	0	1	0
Slow speed forward motion																							4,5					
Translation AR petite vitesse Slow speed reverse motion	0	1	0	0	0	0	0	0	0	1	0	0	1	1	1						1	1	2,5 a	0	0	0	1	0
Slow speed reverse motion																							0,5					
Translation AV grande vitesse High speed forward motion	1	0	1	1	1	1	0	0	0	1	0	1	1	1	1						1	1	2,5 a	0	0		1	0
High speed forward motion																							4,5					
Translation AR grande vitesse High speed reverse motion	0	1	1	1	1	1	0	0	0	1	0	1	1	1	1						1	1	2,5 a	0	0	0	1	0
High speed reverse motion																							0,5					
Blocage differenciel PV / Lock	0	0	0	0	0	0	1	0	0	0	0	1	1	1	1						0	0	0	0	0	0	0	1
x indifferent																												

## 9. LIST OF SCHEMATICS

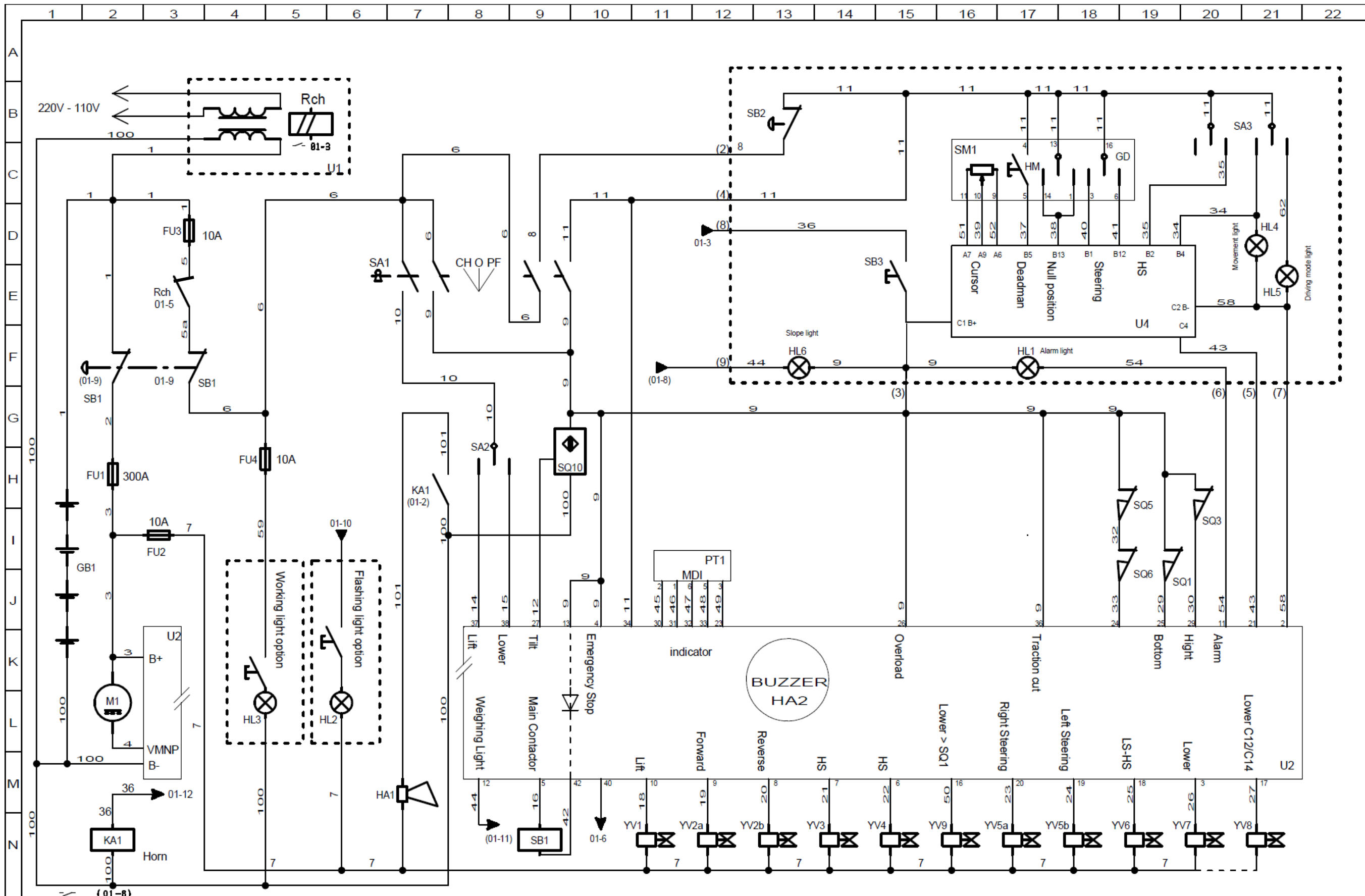




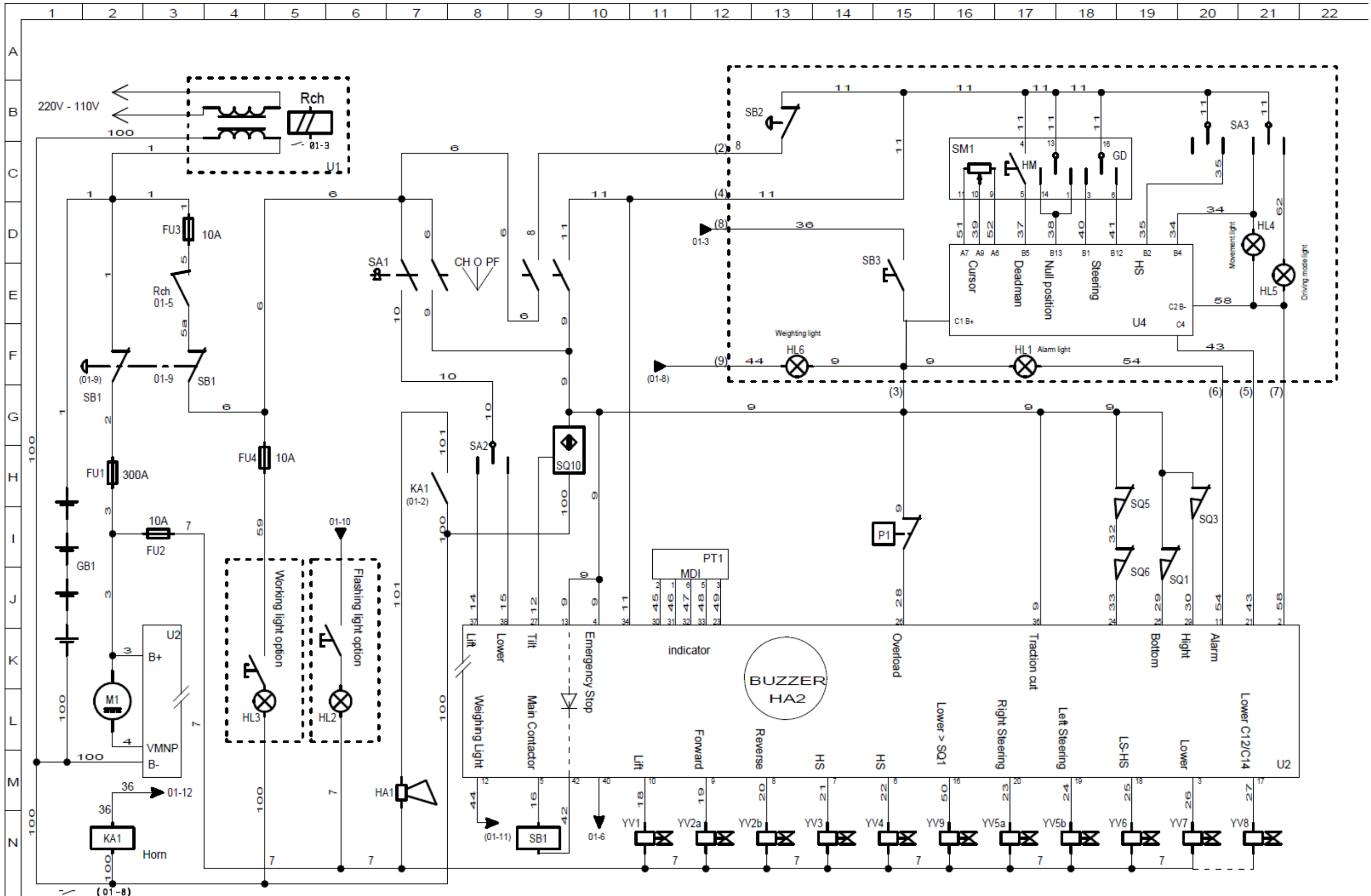




<b>Haulotte</b> GROUP La Péronnière BP 9 42152 L'HORME TEL: 04 77 29 24 24	DESSINE PAR A DURO	DATE DE CREATION 28/04/2011	1 6 7 P 3 5 1 2 4 0 VERSION PESAGE COMPACT 8-8W-10N-10-12-14 & OPTIMUM 6-8	MODIF DURO	IND A	DATE 28/04/2011	MODIFICATION Création suite DDM8588	VISA DI FLORIO	NBRE TOTAL DE FOLIOS 01
	VERIFIE PAR	DATE DE VERIFICATION 28/04/2011							SCHEMA STD



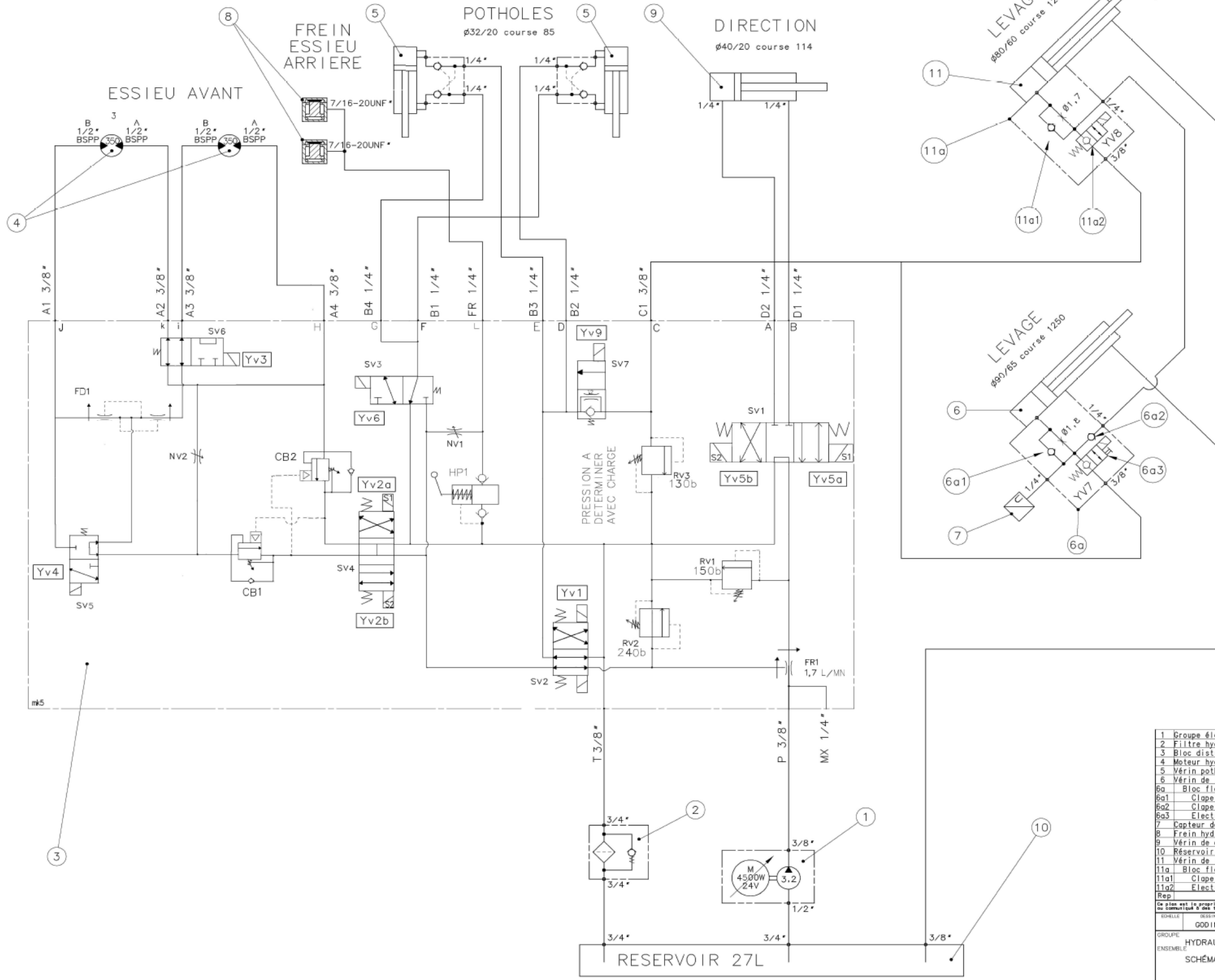
<b>Haulotte</b> <b>GROUP</b> La Péronnière BP 9 42152 L'HORME TEL: 04 77 29 24 24	DESSINE PAR A DURO	DATE DE CREATION 28/04/2011	167P351250 VERSION USA COMPACT 8-8W-10N-10-12-14 & OPTIMUM 6-8	MODIF DURO	IND A	DATE 28/04/2011	MODIFICATION Création suite DDM8586	VISA DI FLORIO	NBRE TOTAL DE FOLIOS 01
	VERIFIE PAR	DATE DE VERIFICATION 28/04/2011		SCHEMA USA	01				



<b>Haulotte</b> <b>GROUP</b> La Péronnière BP 9 42152 L'HORME TEL: 04 77 29 24 24	DESSINE PAR A DURO	DATE DE CREATION 28/04/2011	167P352180 SCHEMA COMPACT 8-8W-10N-10-12-14 & OPTIMUM 6-8				MODIF DURO	IND A	DATE 28/04/2011	MODIFICATION Création suite DDM8586	VISA DI FLORIO	NBRE TOTAL DE FOLIOS 01
	VERIFIE PAR	DATE DE VERIFICATION 28/04/2011									SCHEMA	01



MODIFICATIONS				
INDICE	DATE	MODIFIE PAR	VERIFIE PAR	OBJET
A	29-09-05	GODINEAU	DEVAUX	Création (basé sur B16188) Capteur pression remplace pressostat
B	04-10-05	JEANNARD	JEANNARD	Mise à jour bloc MK4 et Cde de secours sur YV7
C	04-02-10	MATIN	N MA	Mise à jour bloc MK5 et MODIFICATION 775,8

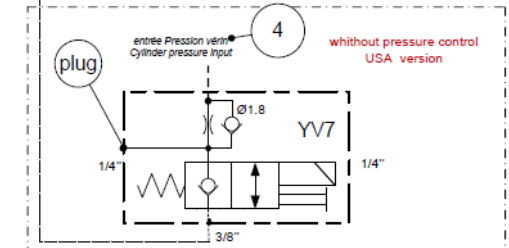
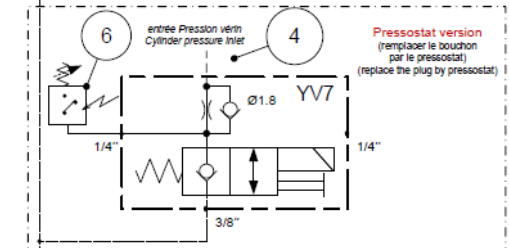
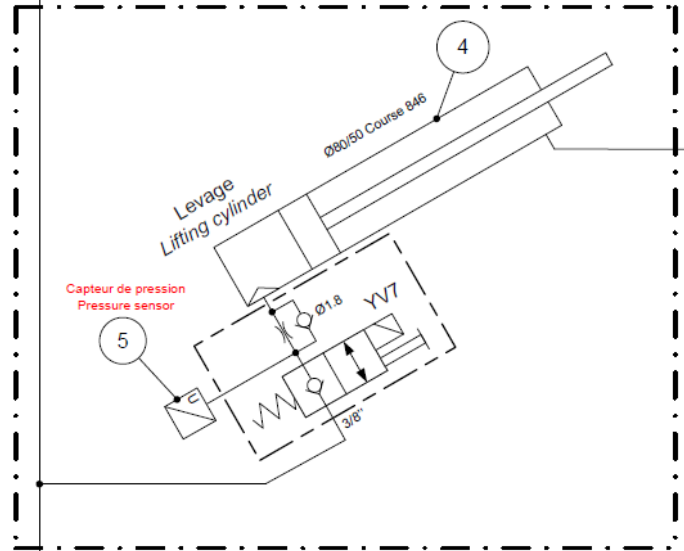
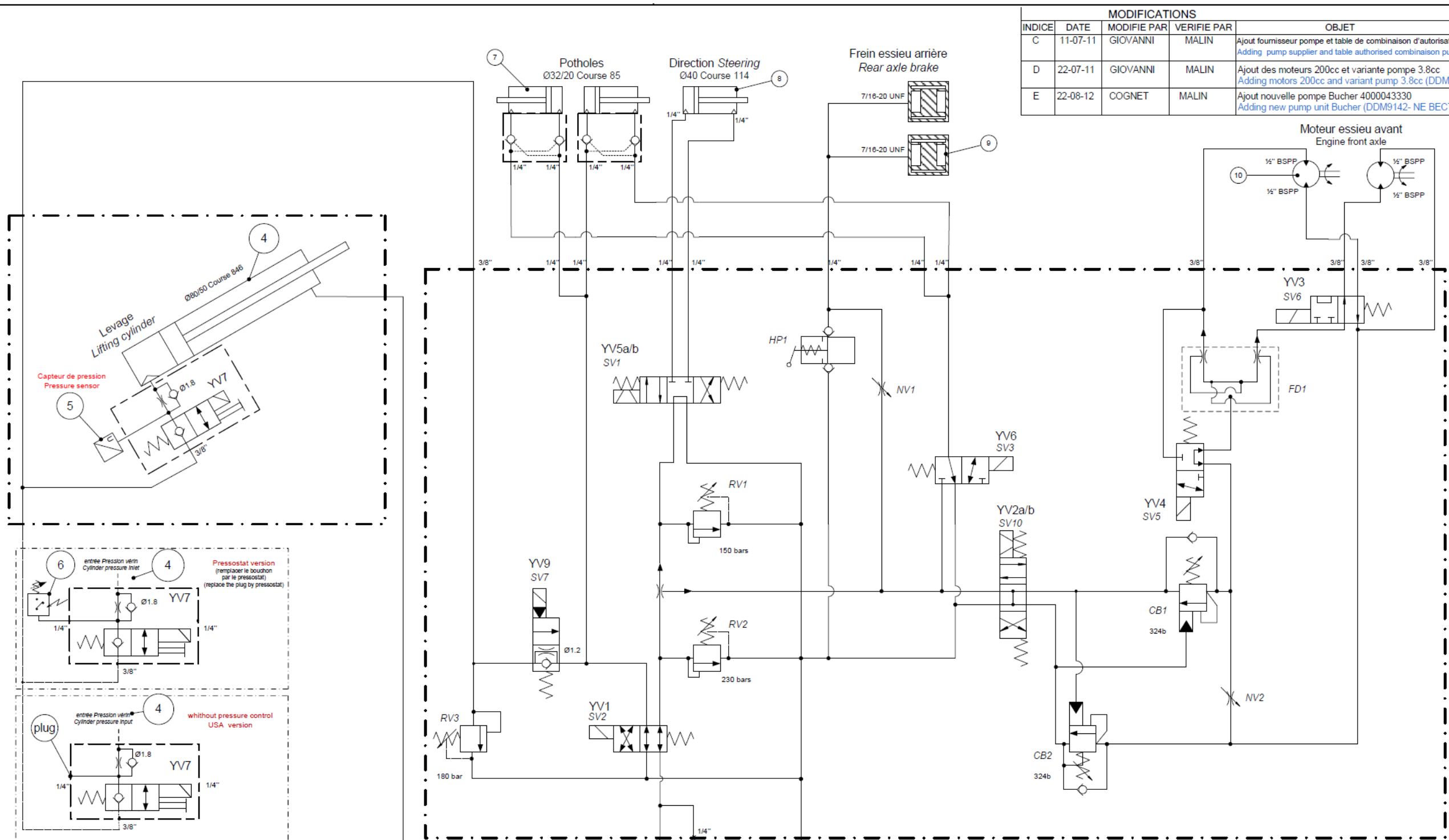


1	Groupe électropompe 4kw 24V 3,2cm3 S021259	1	250 500 4040
2	Filtere hydraulique retour 3/4" BSPP	1	242 701 0430
3	Bloc distribution 24V mk5 svt S020949	1	250 300 2330
4	Moteur hydraulique 350cm3 svt S021067	2	250 500 4260
5	Vérin pothole	2	118 C17 4240
6	Vérin de levage Ø90/65 comprenant :	1	121 P24 8820
6a	Bloc flasqué comprenant :	1	242 021 1000
6a1	Clapet anti-retour + gicleur Ø1.8	1	
6a2	Clapet antiretour	1	
6a3	Electrovanne + Cde manuelle	1	
7	Capteur de pression S5865	1	242 162 0600
8	Frein hydraulique S5123	2	242 060 2750
9	Vérin de direction	1	118 C14 9370
10	Réservoir hydraulique 27 L	1	B16560 118 060 7010
11	Vérin de levage Ø80/60 comprenant :	1	C16490 121 C16 4900
11a	Bloc flasqué comprenant :	1	242 021 0990
11a1	Clapet anti-retour + gicleur Ø1.7	1	
11a2	Electrovanne	1	

Rep	DESIGNATION	Qté	Plan	Code
<small>De plan est la propriété de PINGELY-HAULOTTE. Il ne pourra, sans son autorisation écrite, être utilisé ou communiqué à des tiers. Toutes précautions utiles devront être prises pour en éviter la divulgation.</small>				
SCHEMELLE	DESIGNE PAR	CONTROLE PAR	REVISION	MATERIEL
	GODINEAU	DEVAUX	COMPACT 12	ÉLECTRIQUE
DATE	25-09-05			
GROUPES	HYDRAULIQUE			
ENSEMBLE	SCHEMA HYDRAULIQUE			
		<b>Haulotte-group</b>		
FORMAT	A1	NUMERO	121P251530	INDICES
			C	



MODIFICATIONS				
INDICE	DATE	MODIFIE PAR	VERIFIE PAR	OBJET
C	11-07-11	GIOVANNI	MALIN	Ajout fournisseur pompe et table de combinaison d'autorisation pompe/moteur Adding pump supplier and table authorised combinaison pump unit/motor (DDM7799)
D	22-07-11	GIOVANNI	MALIN	Ajout des moteurs 200cc et variante pompe 3.8cc Adding motors 200cc and variant pump 3.8cc (DDM8681)
E	22-08-12	COGNET	MALIN	Ajout nouvelle pompe Bucher 4000043330 Adding new pump unit Bucher (DDM9142- NE BECTL 1775)



**Rev E**  
Hydraulic Motor

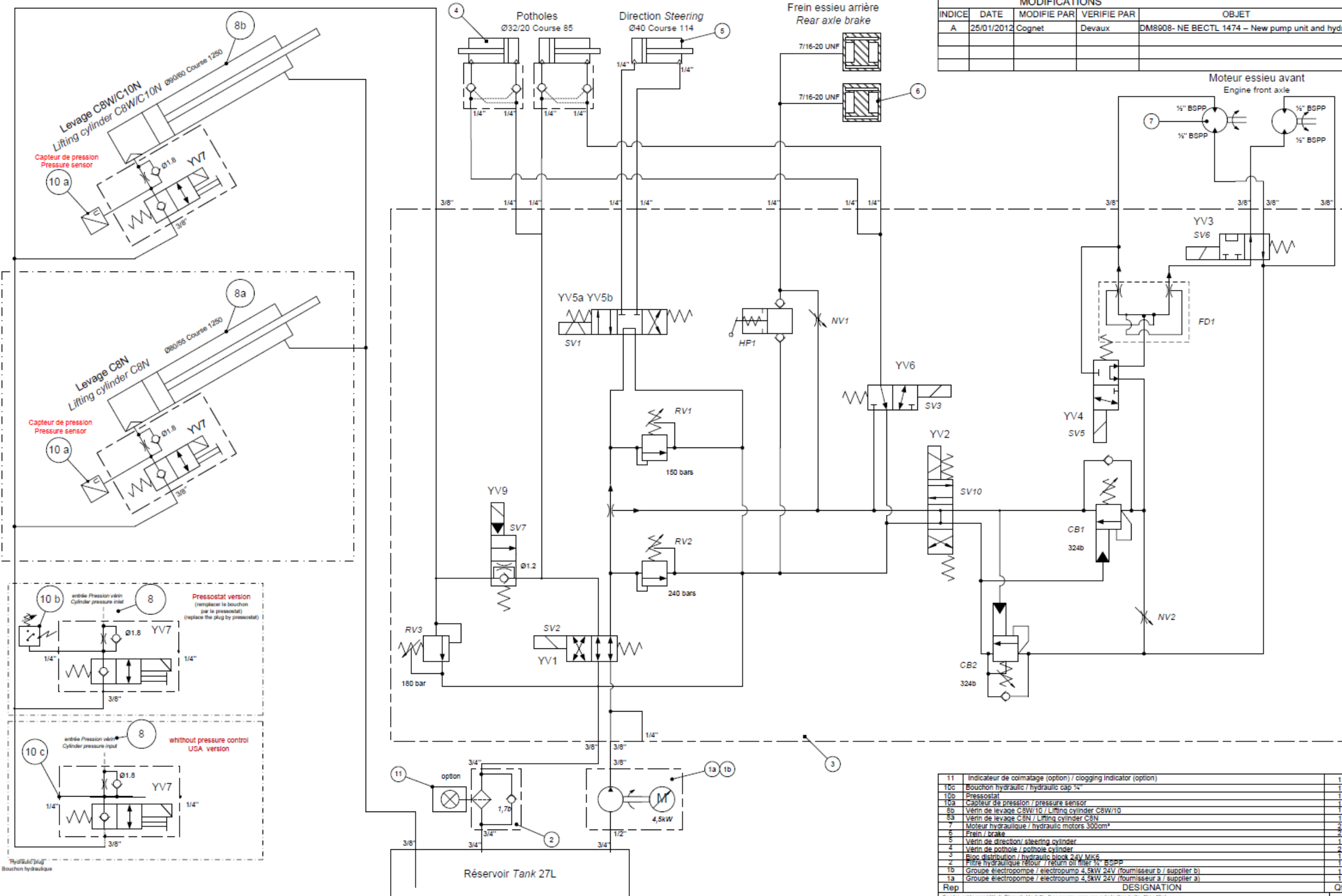
	DANFOSS 160cc 2431203560		WHITE 160cc 2505004270		WHITE 200cc 2505007050		Commentaires
	-	±1.21	±1.32	-	±1.21	±1.31	
EPROM VARIATOR USA	-	±1.21	±1.32	-	±1.21	±1.31	Se référer à/see: NT142
EPROM VARIATEUR EUROPE	2.03	±2.03	±2.24	2.03	±2.03	±2.24	Se référer à/see: NT142
BOSCH 2420703820	ok	ok	ok (1)	ok	ok (1)	not ok	(1) La vitesse sera réduite (ajuster la vitesse) (Speed will be reduced (to adjust speed parameters))
HALDEX 3.2cc 2505004040	ok (2)	ok (2)	ok	ok (2)	ok (2)	not ok	(2) Réduire paramètre vitesse variateur (To reduce a speed with unit speed variator parameters)
BUCHER 2505006160 (old) 4000043330 (new)	ok (2)	ok (2)	ok	ok (2)	ok (2)	ok	
HALDEX 3.8cc 2901012520	not ok	not ok	ok	not ok	not ok	ok	

Association possible / authorised combination

10	Moteur hydraulique / Hydraulic motor	2	See the table
9	Frein de parking / Hydraulic parking brake	2	2420602880
8	Vérin de direction / Steering cylinder	1	126C157210
7	Vérin de pothole / Pothole cylinder	2	118C174240
6	Pressostat / Pressure switch	1	2441303620
5	Capteur de pression (si détection de charge) / Pressure sensor (if load detection)	1	2421620600
4	Vérin de levage / Lifting cylinder	1	126P248830
3	Bloc distribution / Hydraulic manifold MK6	1	2503002330
2	Filtre hydraulique retour / Hydraulic return filter	1	2427010430
1	Groupe électropompe / Pump unit	1	See the table

DESIGNATION				Qté		Plan - Specif	
Rep	COGNET	DEVaux	Optimum				
Ce plan est la propriété de Pinguet-Haulotte. Il ne pourra, sans son autorisation écrite, être utilisé ou communiqué à des tiers. Toutes précautions utiles devront être prises pour en éviter la divulgation.							
ECHELLE	DESSINE PAR	CONTROLE PAR	MACHINE	MATERIEL	DATE		
	Cognet	Devau	Optimum		09/12/2010		
GROUPE				ENSEMBLE			
Schéma hydraulique / Hydraulic schematic				A2 126P332290 E			
FORMAT		NUMERO		INDICE			

MODIFICATIONS				
INDICE	DATE	MODIFIE PAR	VERIFIE PAR	OBJET
A	25/01/2012	Cognet	Devaux	DM8908- NE BECTL 1474 – New pump unit and hydraulic motors (300cc)

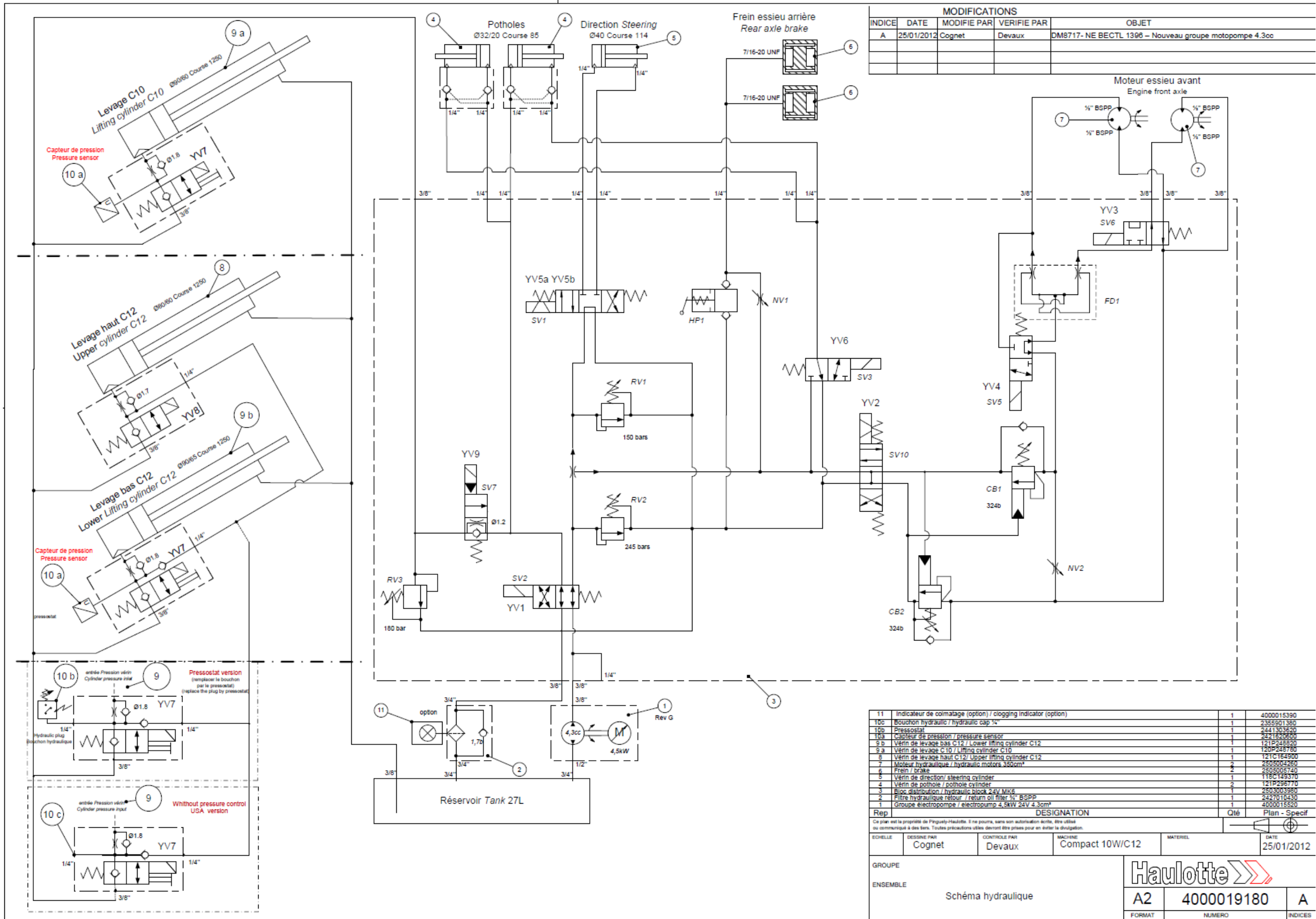


Rep	DESIGNATION	Qté	Plan - Specif
11	Indicateur de colmatage (option) / clogging indicator (option)	1	4000015390
10c	Bouchon hydraulique / hydraulic cap 1/4"	1	2355501380
10b	Pressostat	1	2441303620
10a	Capteur de pression / pressure sensor	1	2421820800
8b	Vérin de levage C8W/10N / Lifting cylinder C8W/10	1	121P248780
8a	Vérin de levage C8N / Lifting cylinder C8N	1	121P248770
7	Moteur hydraulique / hydraulic motors 300cm³	2	4000022840
6	Frein / brake	2	2535005740
5	Vérin de direction / steering cylinder	1	118C149370
4	Vérin de pothole / pothole cylinder	2	121P298770
3	Bloc distribution / hydraulic block 24V MK6	1	2503003980
2	Filtere hydraulique retour / return oil filter 1/2" BSPP	1	2427010430
1b	Groupe électropompe / electropump 4.5kW 24V (fournisseur b / supplier b)	1	2501012530
1a	Groupe électropompe / electropump 4.5kW 24V (fournisseur a / supplier a)	1	4000043330
Rep	DESIGNATION	Qté	Plan - Specif

Ce plan est la propriété de l'Équipementier. Il ne pourra, sans autorisation écrite, être utilisé ou communiqué à des tiers. Toutes précautions utiles devront être prises pour en éviter la divulgation.

ÉCHELLE: COGNET    DEVAUX    MACHINE: Compact 8N/8W/10N    DATE: 27/02/2012

GRUPE	Haulotte		
ENSEMBLE	Schéma hydraulique		
FORMAT	A2	NUMERO	4000022940
INDICES			A



MODIFICATIONS				
INDICE	DATE	MODIFIE PAR	VERIFIE PAR	OBJET
A	25/01/2012	Cognet	Devaux	DM8717-NE BECTL 1396 – Nouveau groupe motopompe 4.3cc

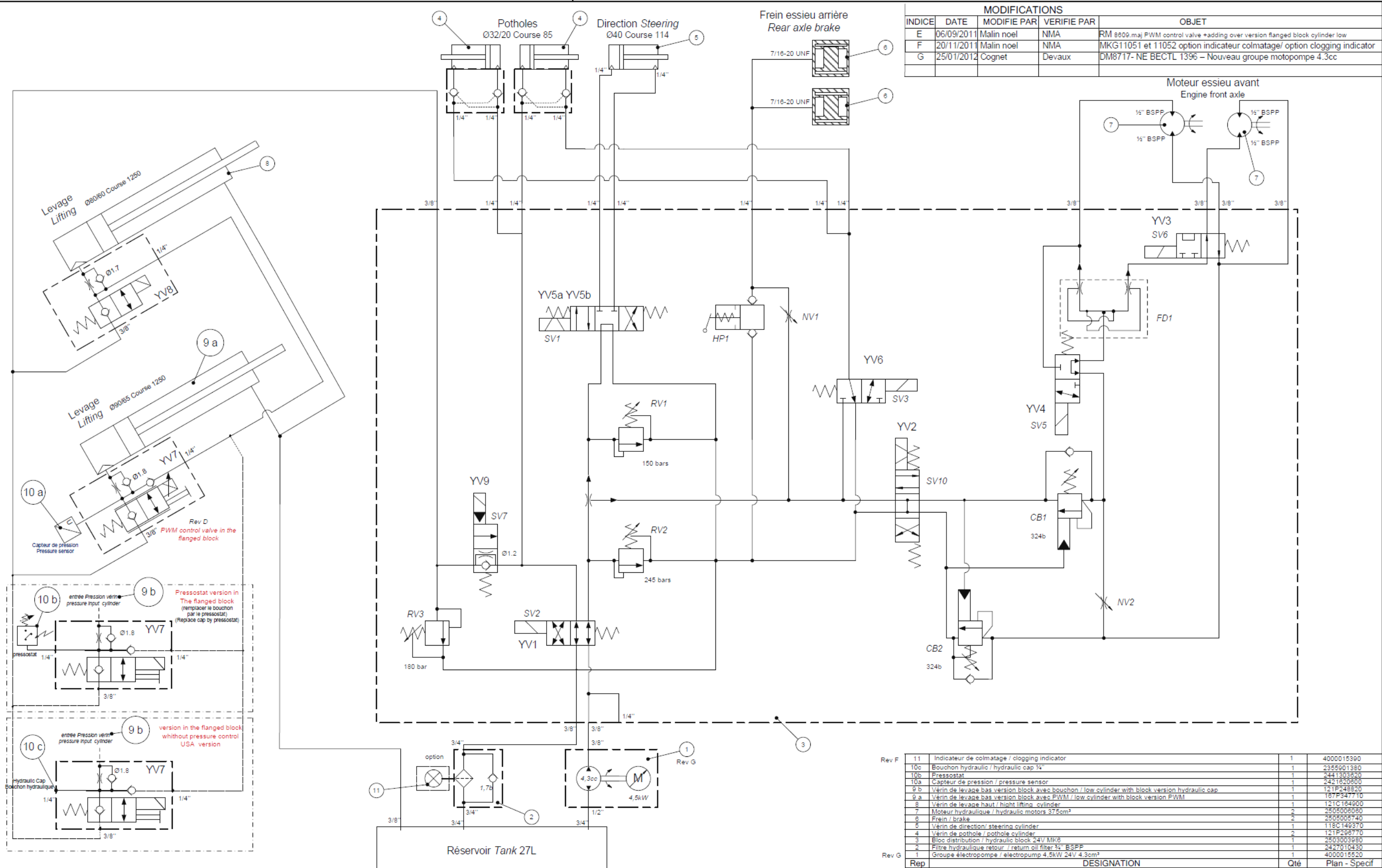
11	Indicateur de coimatage (option) / clogging indicator (option)	1	4000015390
10c	Bouchon hydraulique / hydraulic cap 1/4"	1	2355901380
10b	Pressostat	1	2441303620
10a	Capteur de pression / pressure sensor	1	2421620600
9 b	Vérin de levage bas C12 / Lower lifting cylinder C12	1	121P248820
9 a	Vérin de levage C10 / Lifting cylinder C10	1	120P248780
8	Vérin de levage haut C12 / Upper lifting cylinder C12	1	121C154900
7	Moteur hydraulique / hydraulic motors 350cm³	2	250004260
6	Frein / brake	2	260005740
5	Vérin de direction / steering cylinder	1	118C149370
4	Vérin de potohole / pothole cylinder	2	121P298770
3	Bloc distribution / hydraulic block 24V MK6	1	2503003980
2	Filtre hydraulique retour / return oil filter 1/2" BSPP	1	2427010430
1	Groupe électropompe / electropump 4.5kW 24V 4.3cm³	1	4000015520

Rep: **DESIGNATION** Qté: **Plan - Specif**

CE PREN EST LA PROPRIÉTÉ DE PINGUET-HAULOTTE. IL NE PEUT ÊTRE REPRODUIT, NI COMMUNIQUÉ À DES TIERS, NI UTILISÉ, NI COMMUNIQUÉ À DES TIERS. Toutes précautions utiles devront être prises pour en éviter la divulgation.

ECHELLE	DESIGNÉ PAR	CONTROLÉ PAR	MACHINE	MATÉRIEL	DATE
	Cognet	Devaux	Compact 10W/C12		25/01/2012

GROUPÉ	ENSEMBLE		FORMAT	NUMÉRO	INDICES
	Schéma hydraulique		A2	4000019180	A



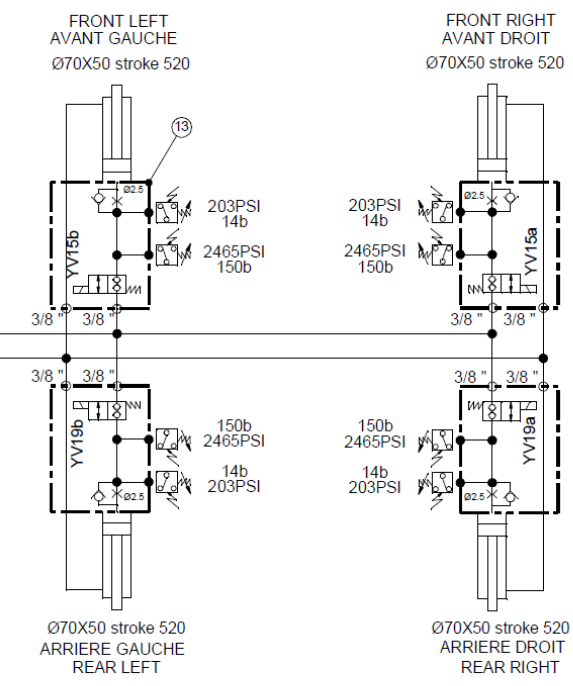
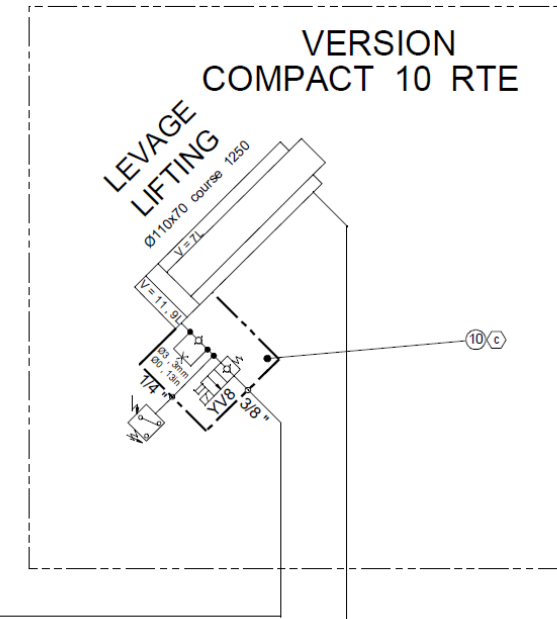
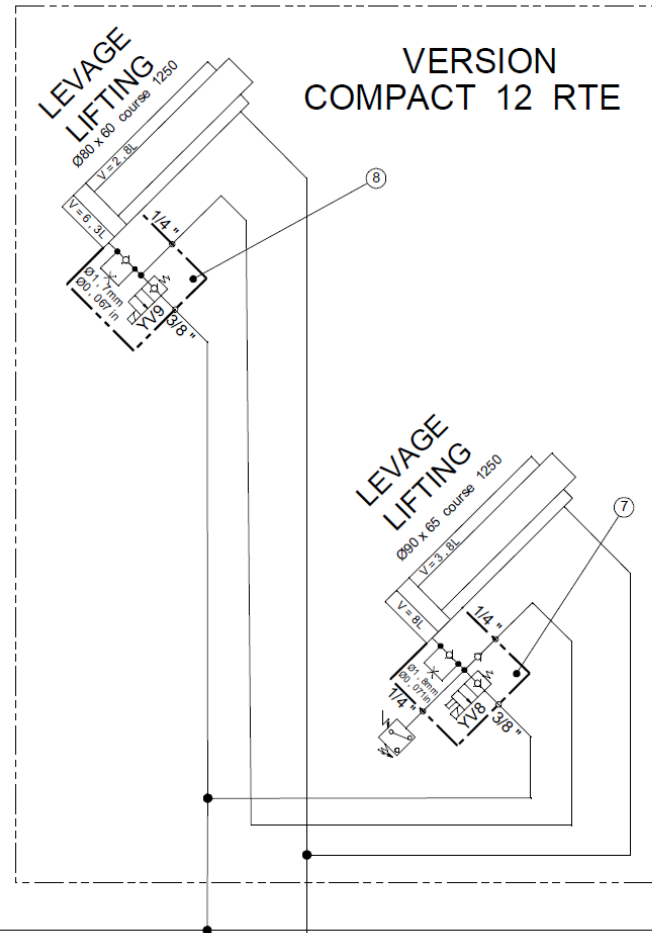
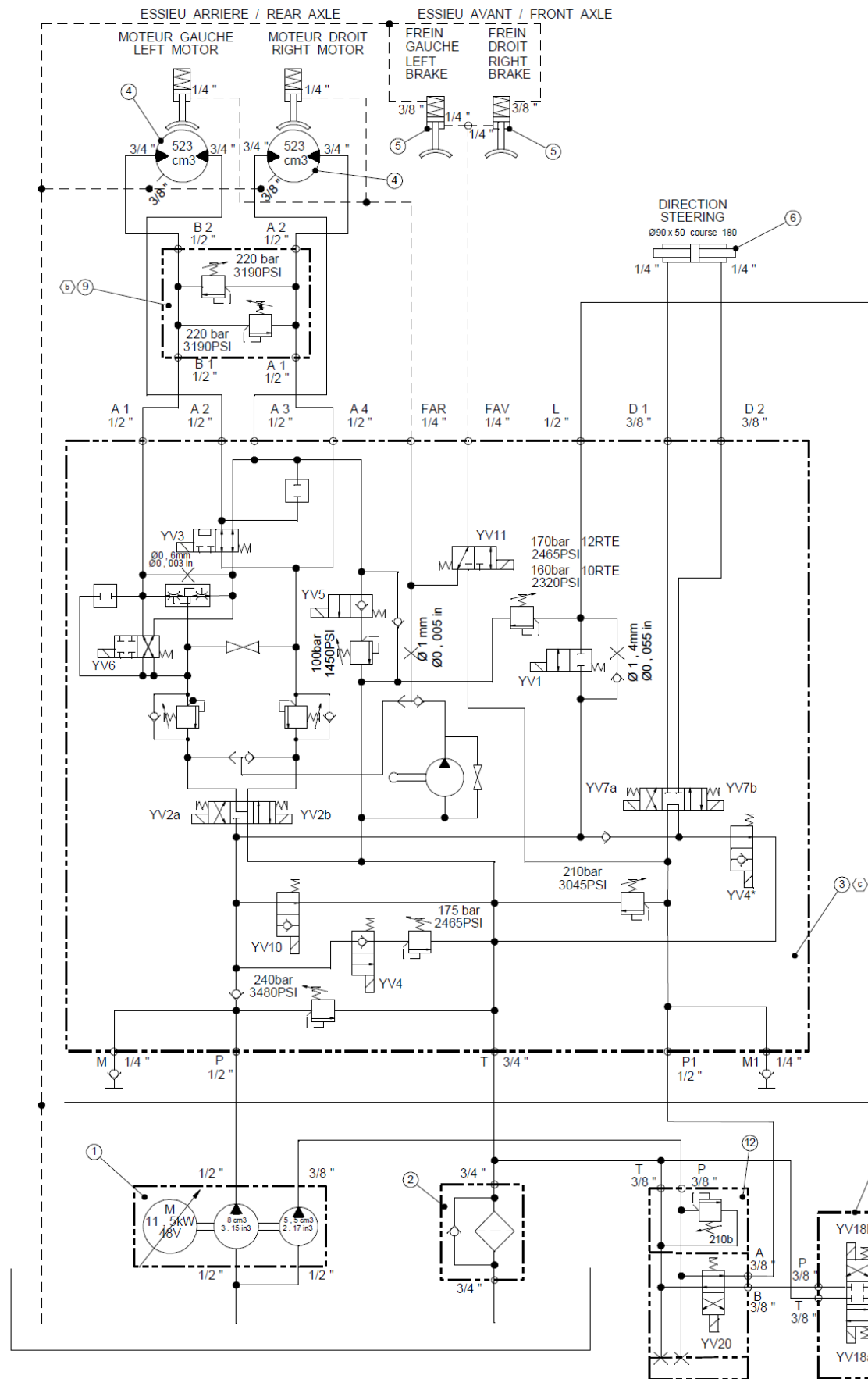
Commentaire / comments:  
 Ajout des différentes versions du bloc flasqué et du vérin  
 Addition of different versions of flanged block and cylinder  
 Repère 11: pour option uniquement/ for option only

Rev	DESCRIPTION	Qté	Plan - Specif
Rev F	11 Indicateur de colmatage / clogging indicator	1	4000015390
	10c Bouchon hydraulique / hydraulic cap 1/4"	1	2355901380
	10b Pressostat	1	2441303650
	10a Capteur de pression / pressure sensor	1	2421803660
	9 b Vérin de levage bas version block avec bouchon / low cylinder with block version hydraulic cap	1	121P248820
	9 a Vérin de levage bas version block avec PWM / low cylinder with block version PWM	1	187P347710
	8 Vérin de levage haut / high lifting cylinder	1	121C164900
	7 Moteur hydraulique / hydraulic motors 375cm <sup>3</sup>	2	2509008080
	6 Frein / brake	2	2505005740
	5 Vérin de direction / steering cylinder	1	119C149370
	4 Vérin de poutre / notches cylinder	2	121P298770
	3 Bloc distribution / hydraulic block 24V MK6	1	2503003980
	2 Filtre hydraulique retour / return oil filter 1/2" BSPP	1	2427010430
Rev G	1 Groupe électropompe / electropump 4.5kW 24V 4.3cm <sup>3</sup>	1	4000015520

Rep	DESIGNATION	Qté	Plan - Specif
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ECHELLE	DESSINÉ PAR	CONTROLÉ PAR	MACHINE
	C. Maujoin		Compact 14
GROUPE		MATERIEL	
ENSEMBLE		DATE	
Schéma hydraulique		15/06/09	
Haulotte		A2	167P326860
FORMAT	NUMERO	INDICES	
		G	



MODIFICATIONS				
INDICE	DATE	MODIFIE PAR	VERIFIE PAR	OBJET
A	06/04/2009	COGNET	BLANCHON	CREATION SCHEMA AVEC STABILISATEURS



	YV10	YV2a	YV2b	YV4	YV4*	YV3	YV5	YV6	YV7a	YV7b	YV11	YV1	YV8	YV9
Translation Pv														
Translation Gv														
Blocage différentiel														
Direction + Translation														
Direction à l'arrêt														
Levage montée														
Descente														
Levage fin de descente														

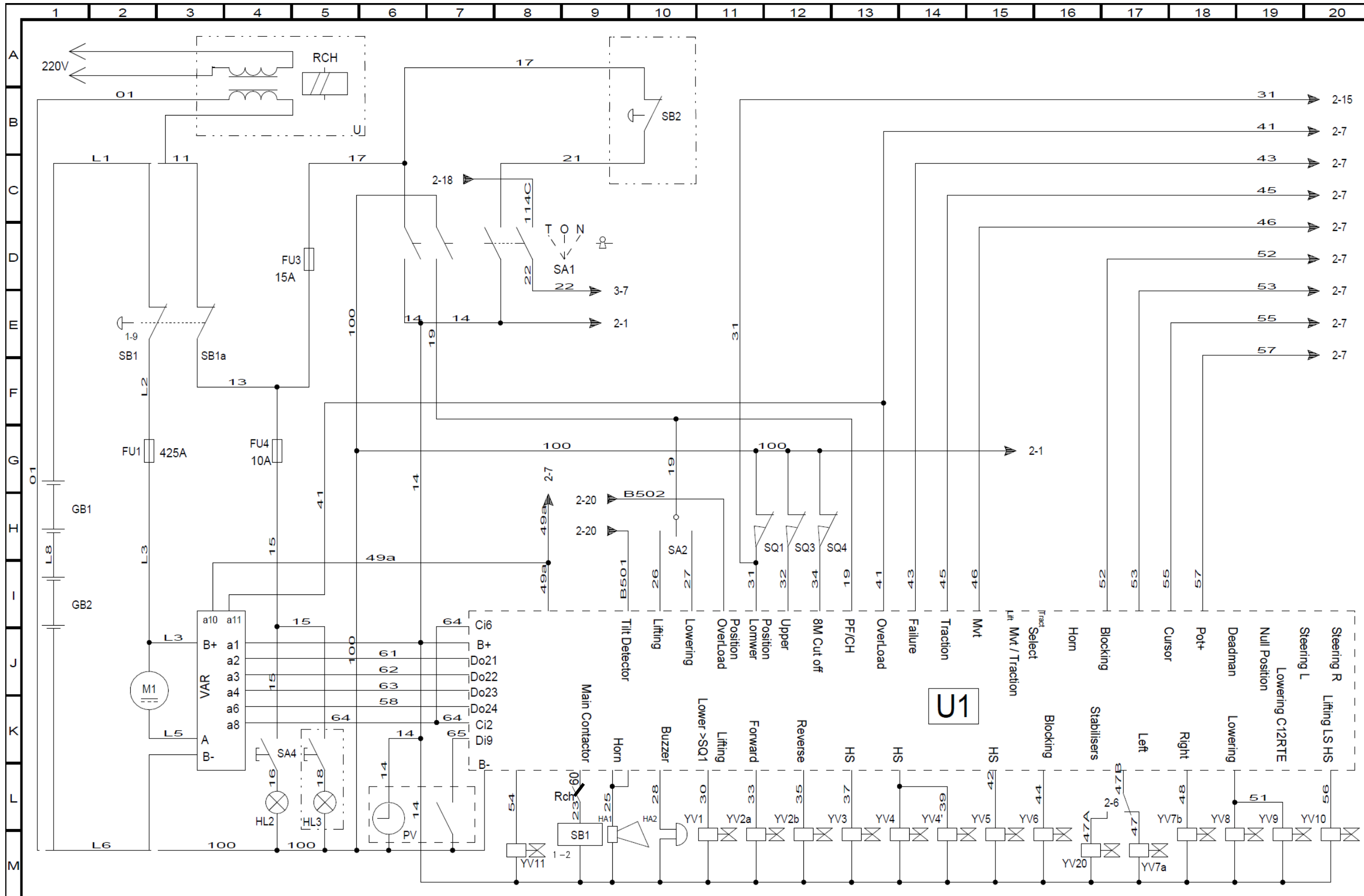
Rep	DESIGNATION	Qté	Plan	Code	REMARQUES
13	Vérin de calage	4	B16546	128 B16 5460	
12	Valve 4/2 sélection stabilisateurs	1	S021211	250 300 3700	
11	Valve 4/3 montée/descente stabilisateurs	1	S021212 B	250 300 3710	
10	Vérin de levage	1	C17177	129 C17 1770	
9	Bloc anti-choc 220bar S5572	1		242 021 1990	
8	Vérin de levage haut	1	C17179	129 C17 1790	
7	Vérin de levage bas	1	C17178	129 C17 1780	
6	Vérin de direction double tige	1	C16038	128 C16 0380	
5	Frein suivant S5302	2		242 060 2810	
4	Moteur frein hydraulique suivant S5312	2		243 120 3520	
3	Bloc hydraulique 24V suivant S5309	1		242 021 0820	
2	Filtre hydraulique retour 3/4" BSPP	1		242 070 0430	
1	Groupe électropompe 48V suivant S5301	1		242 070 3760	

SCHELE	DESIGNE PAR	CORRIGEE PAR	REVISION	MATERIEL	DATE
	COGNET	BLANCHON	COMPACT 10-12 RTE	ELECTRIQUE	05-04-2009

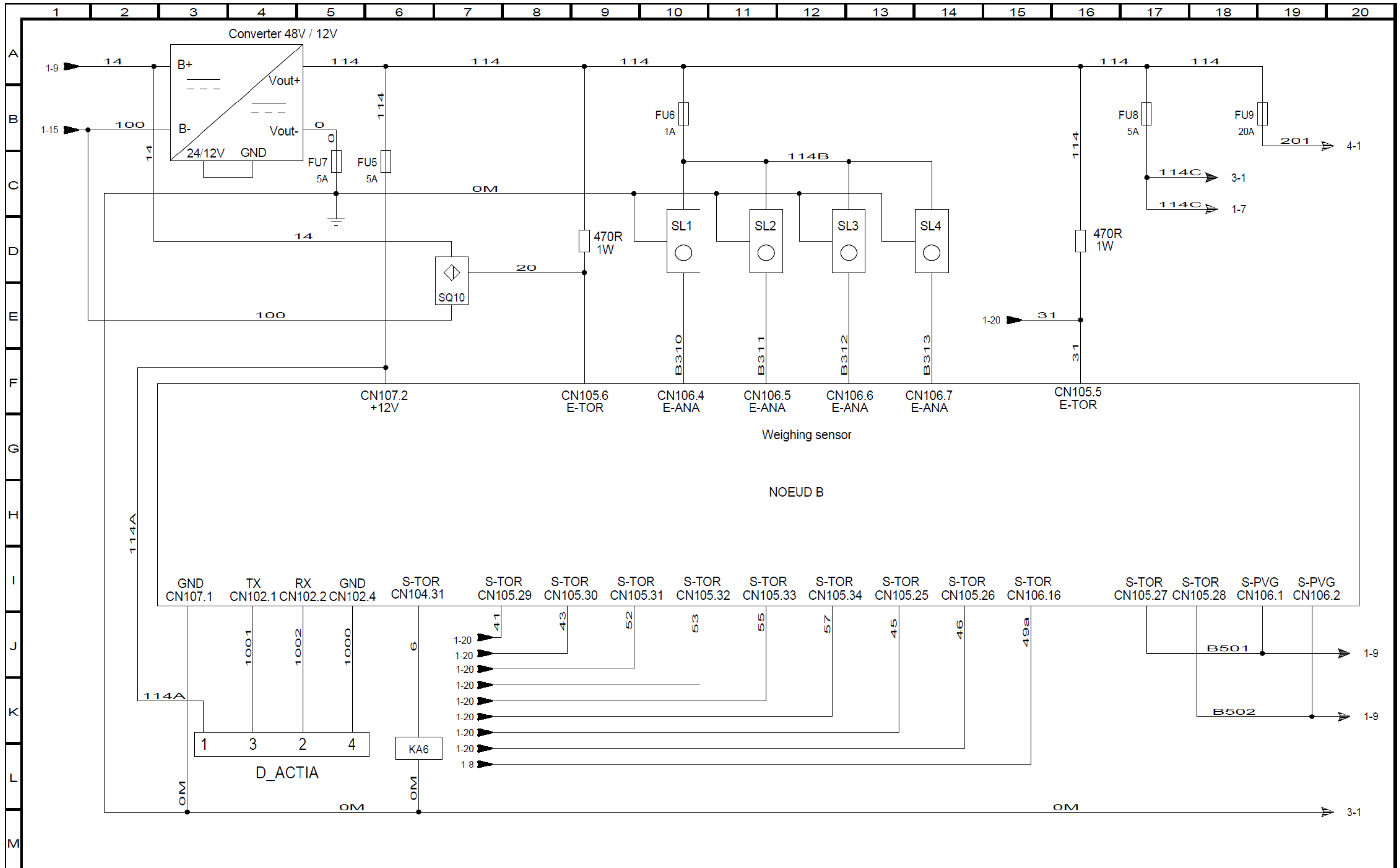
  

GRUPE	PARTIE BASSE		
ENSEMBLE	SCHEMA HYDRAULIQUE (OPTION STABILISATEURS)		
FORMAT	A1	NUMERO	129P319610
INDICES			A

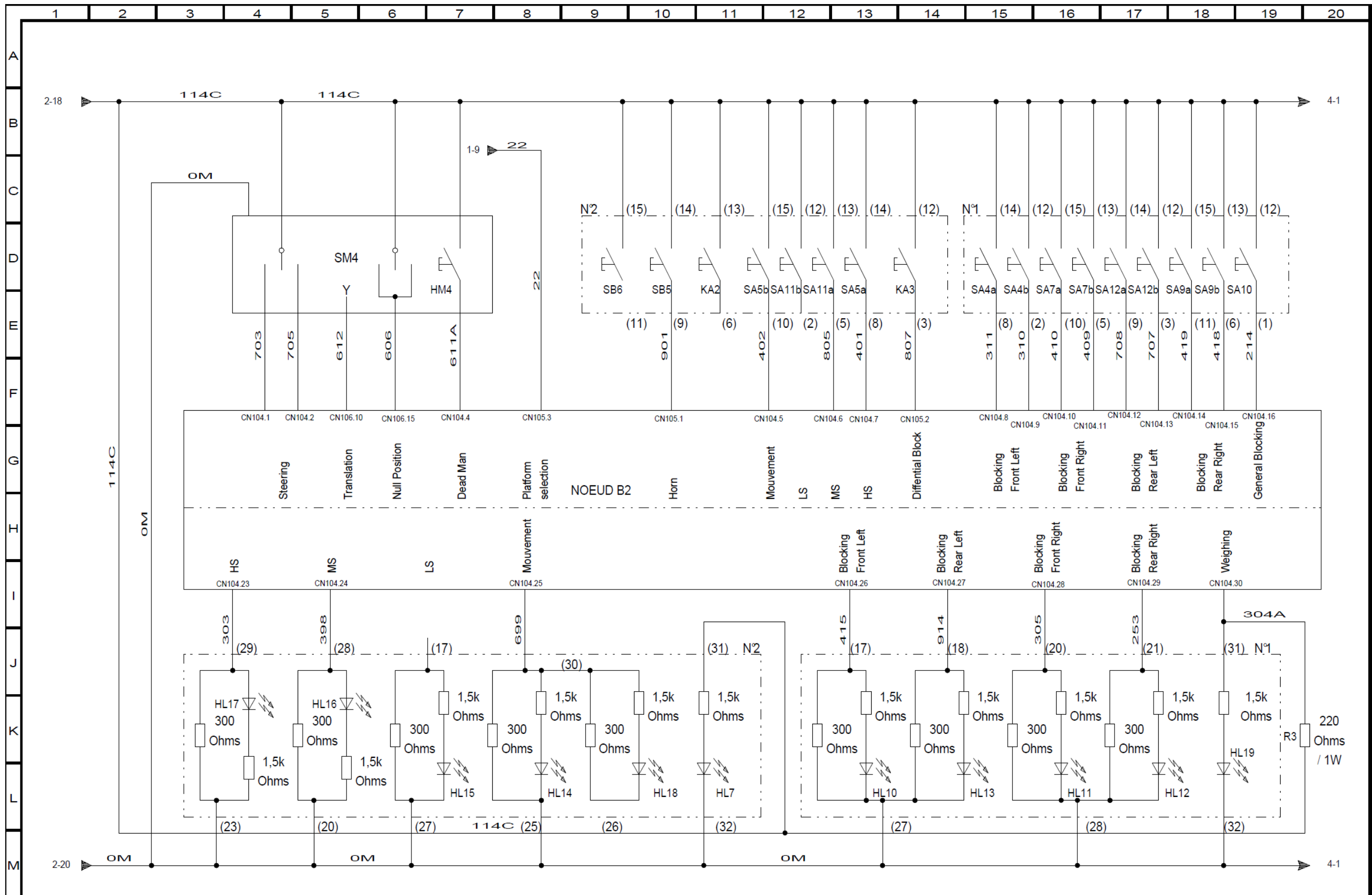




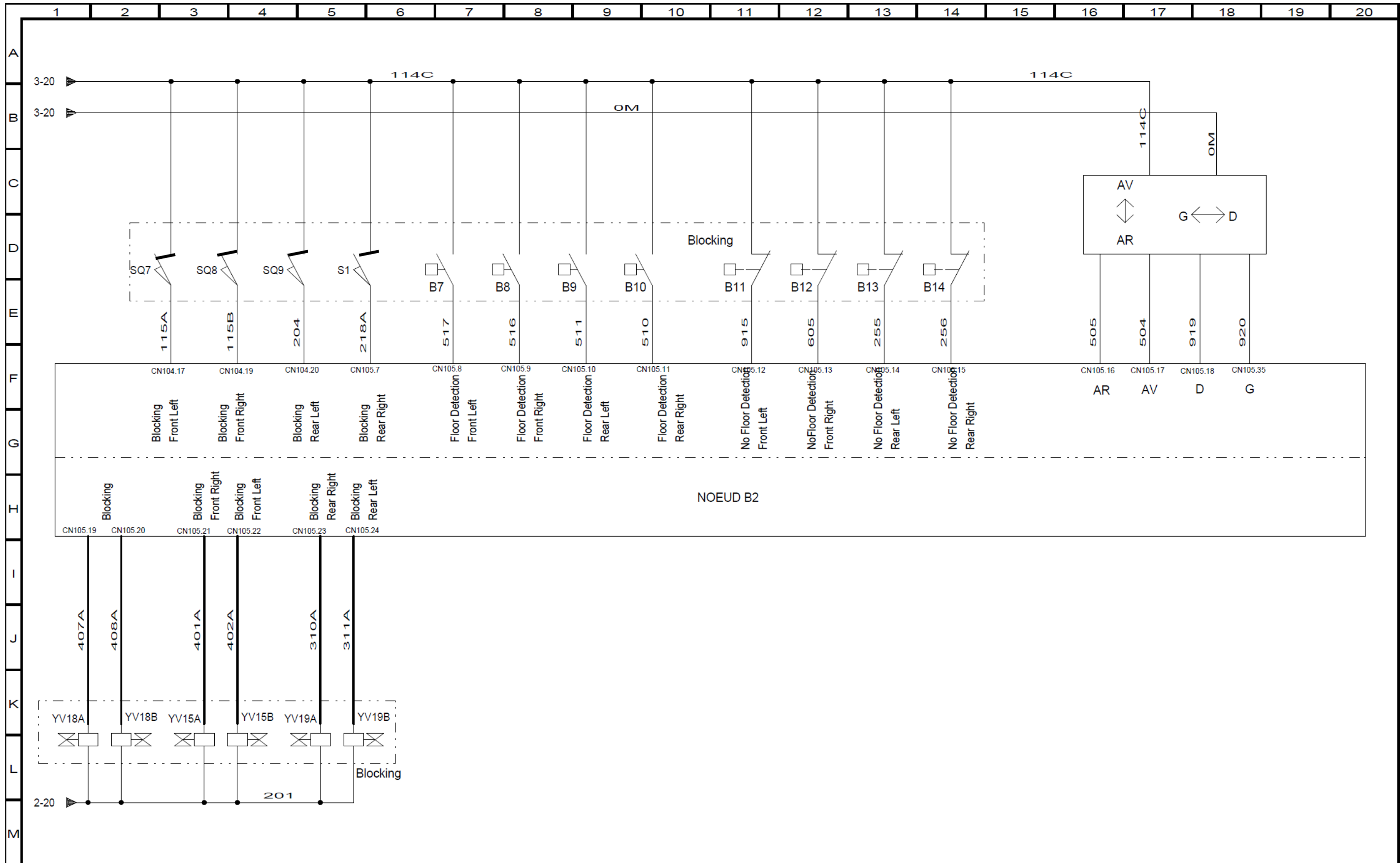
<p>La Péronnière BP 9 42152 L'HORME TEL: 04 77 29 24 24</p>	DESSINE PAR jffayolle	DATE DE CREATION 2009-01-29	ELECTRICAL DIAGRAM RTE 10-12 STAB POWER	MODIF A	IND A	DATE 29/01/2009	MODIFICATION	VISA JFF	INDICE A	NBRE TOTAL DE FOLIOS 04
	VERIFIE PAR E HUBER	DATE DE VERIFICATION 30/01/2009		CODE PROJET 129	129P318500	1				



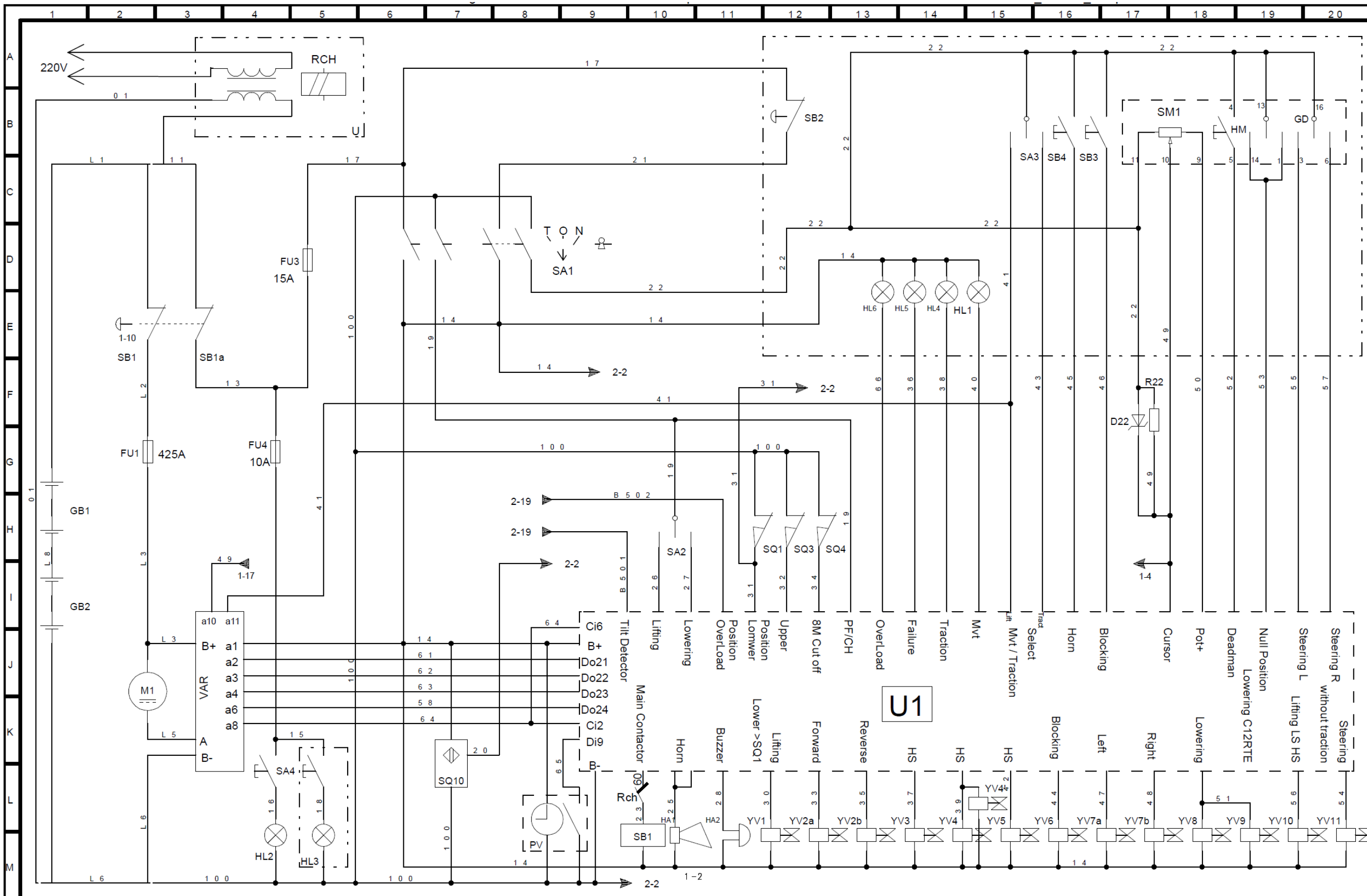
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	VERIFIE PAR E HUBER	DATE DE VERIFICATION 30/01/2009		CODE PROJET 129	---	---	---	---	---	129P318500



<p>La Péronnière BP 9 42152 L'HORME TEL: 04 77 29 24 24</p>	DESSINE PAR jffayolle	DATE DE CREATION 2009-01-29	ELECTRICAL DIAGRAM RTE 10-12 STAB PLATFORM CONTROL BOX				MODIF A	IND A	DATE 29/01/2009	MODIFICATION	VISA JFF	INDICE A	NBRE TOTAL DE FOLIOS 04
	VERIFIE PAR E HUBER	DATE DE VERIFICATION 30/01/2009	CODE PROJET 129									129P318500	3

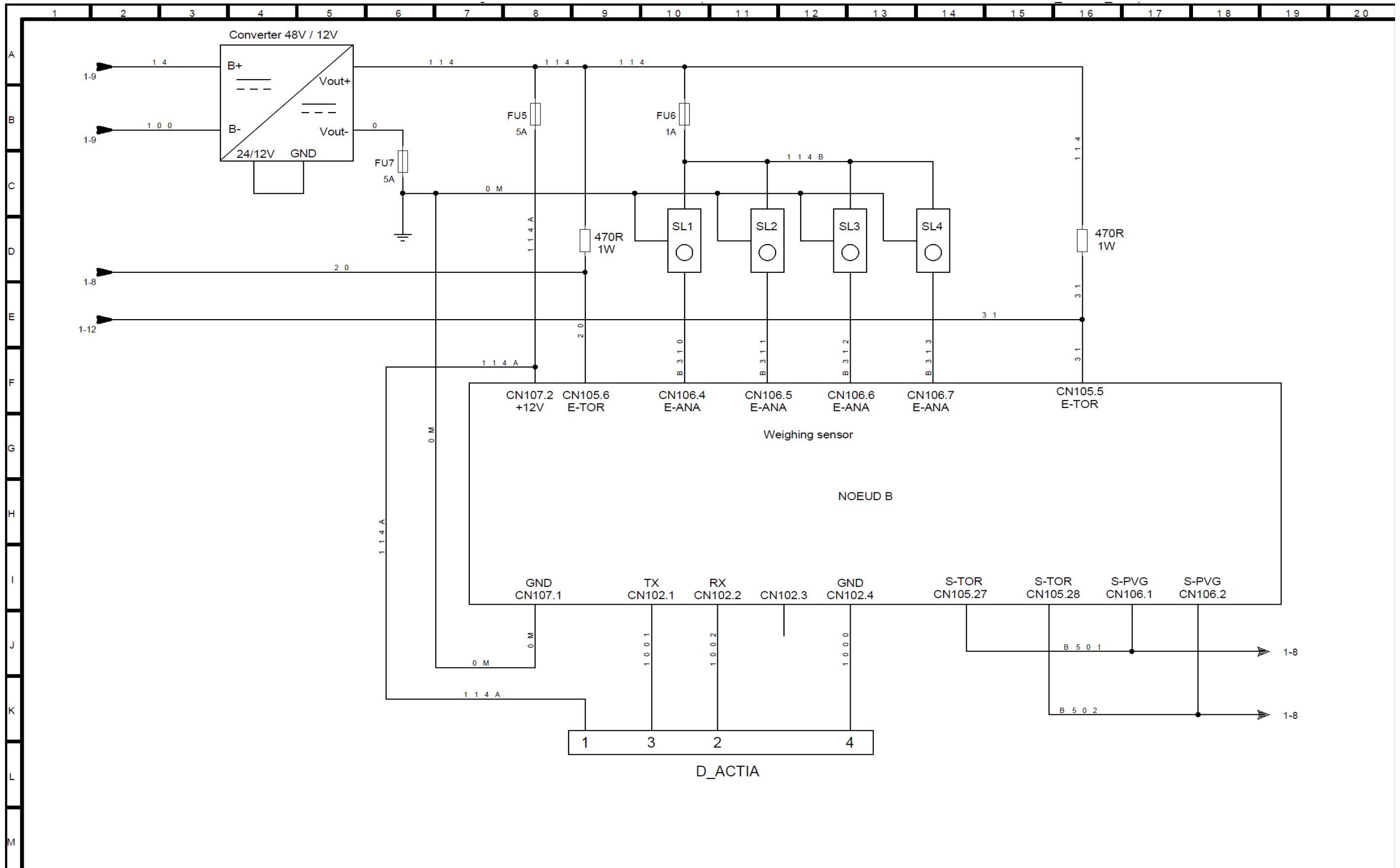


<p>La Péronnière BP 9 42152 L'HORME TEL: 04 77 29 24 24</p>	DESSINE PAR jffayolle	DATE DE CREATION 2009-01-29	ELECTRICAL DIAGRAM RTE 10-12 STAB STABILISERS		MODIF -	IND A	DATE 29/01/2009	MODIFICATION -	VISA JFF	INDICE A	NBRE TOTAL DE FOLIOS 04
	VERIFIE PAR E HUBER	DATE DE VERIFICATION 30/01/2009			CODE PROJET 129	-	-	-	-	-	-



<p>La Péronnière BP 9 42152 L'HORME TEL: 04 77 29 24 24</p>	DESSINE PAR FAYOLLE	DATE DE CREATION 05/06/2008	ELECTRICAL DIAGRAM RTE 10-12 PES 129P308270		MODIF C	IND 01/12/2008	MODIFICATION	VISA JFF	INDICE C	NBRE TOTAL DE FOLIOS 02
	VERIFIE PAR HUBER	DATE DE VERIFICATION 05/06/2008			CODE PROJET 129	MODIF B A		IND 19/11/2008 10/10/2008		





<p>La Péronnière BP 9 42152 L'HORME TEL: 04 77 29 24 24</p>	DESSINE PAR FAYOLLE	DATE DE CREATION 05/06/2008	ELECTRICAL DIAGRAM RTE 10-12 PES 129P308270		MODIF C	IND C	DATE 01/12/2008	MODIFICATION	VISA JFF	INDICE C	NBRE TOTAL DE FOLIOS 02
	VERIFIE PAR HUBER	DATE DE VERIFICATION 05/06/2008			CODE PROJET 129	MODIF B A	IND B A	DATE 19/11/2008 10/10/2008	MODIFICATION	VISA JFF JFF	INDICE C
				129P308270						129P308270	2