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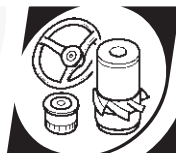
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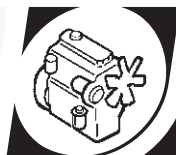
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GENERAL, CHARACTERISTICS AND SAFETY



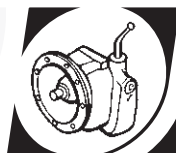
00

ENGINE



10

TRANSMISSION



20

AXLE



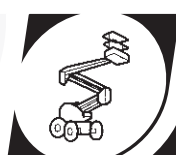
30

BRAKE



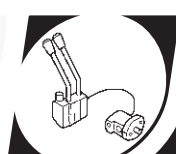
40

JIB - BASKET



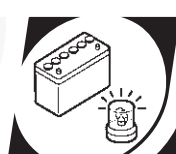
55

HYDRAULICS



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DRIVER'S CAB



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FRAME - BODYWORK



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OPTIONS - ATTACHMENTS



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SYMBOLS

GENERAL:



GENERAL HAZARD

The associated text must be READ and UNDERSTOOD before continuing to the next stage of the procedure.



ELECTRICAL HAZARD

The associated text must be READ and UNDERSTOOD before continuing to the next stage of the procedure.



HIGH TEMPERATURE HAZARD

The associated text must be READ and UNDERSTOOD before continuing to the next stage of the procedure.



HYDRAULIC PRESSURE HAZARD

The associated text must be READ and UNDERSTOOD before continuing to the next stage of the procedure.



MINIMUM WEIGHT


Indicated in removal procedures, this sign enables the selection of the appropriate handling equipment.

 647400EN

Refer to Operator's Manual no. 647400EN.

 647400

Refer to spare parts catalogue no. 647400.

 80-08-M.193EN

Refer to Chapter no. 80-08-M.193EN of the current repair manual.

 § B - 1

Refer to paragraph B - 1 of the current chapter.

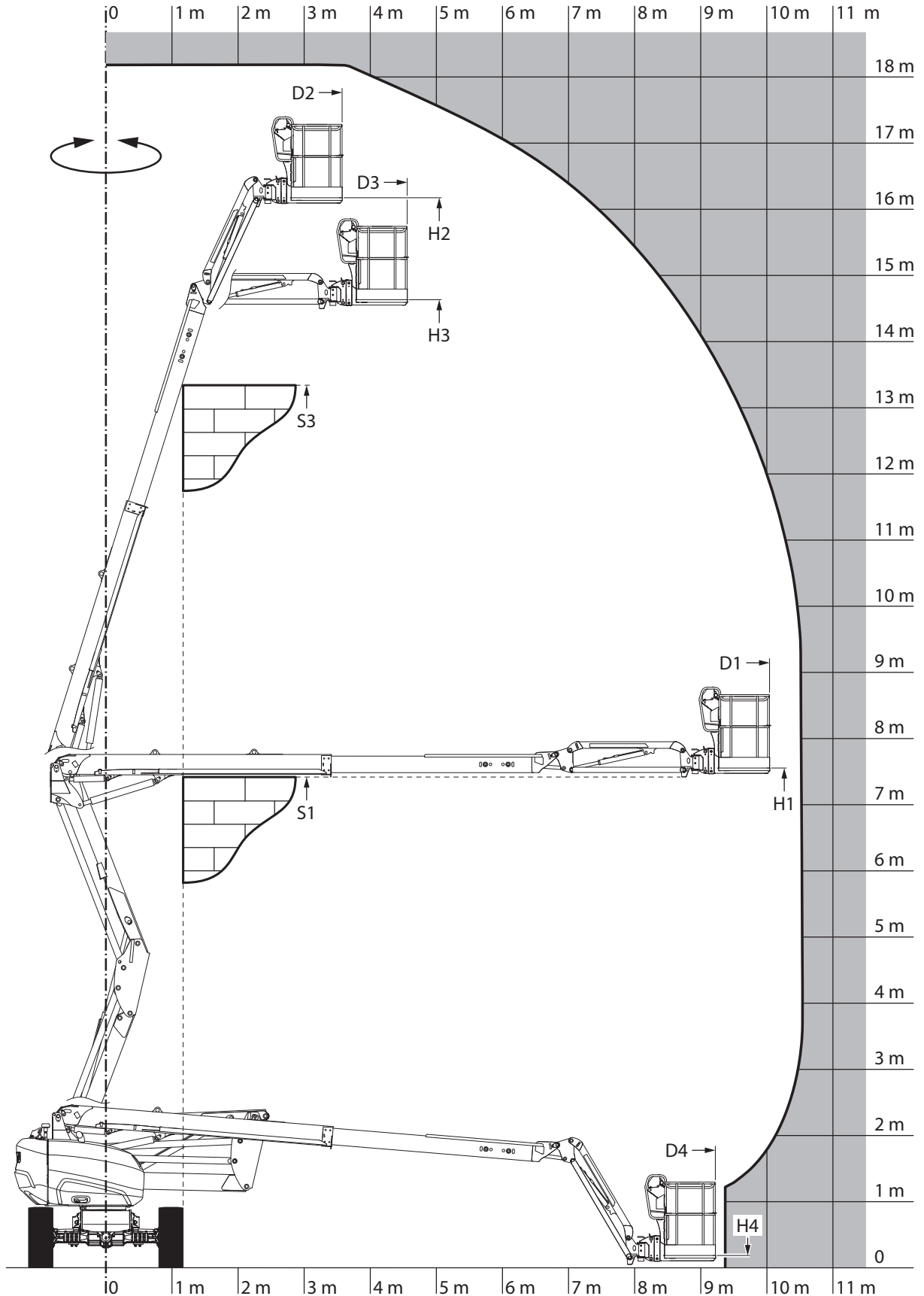
(A1-1)

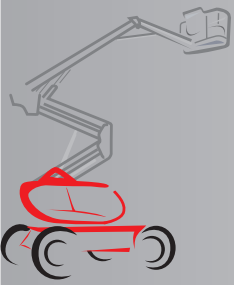
(Figure A1 - Item 1)



Indicates attachment points or bearing surfaces (for lift truck forks) to be used during removal operations.

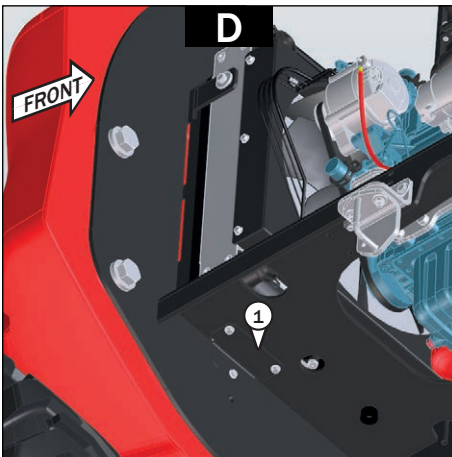
H1	mm	7555	S1	mm	7420
D1	mm	10010			
H2	mm	16180			
D2	mm	3545	S3	mm	13350
H3	mm	14640			
D3	mm	4530			
H4	mm	185			
D4	mm	9190			





ENGINE COMPONENTS LOCATION

	pages
ENGINE	2

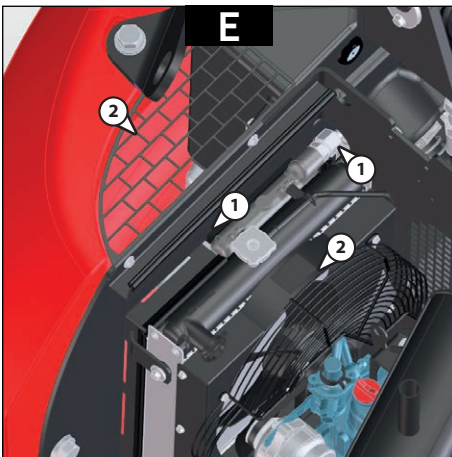


Empty oil cooling circuit

Place the drain pan under the oil radiator

Unscrew the filler cover (D-1) of the radiator (D-2)

Disconnect the oil radiator connection



Disconnect the oil radiator connection (E-1) (F-1)

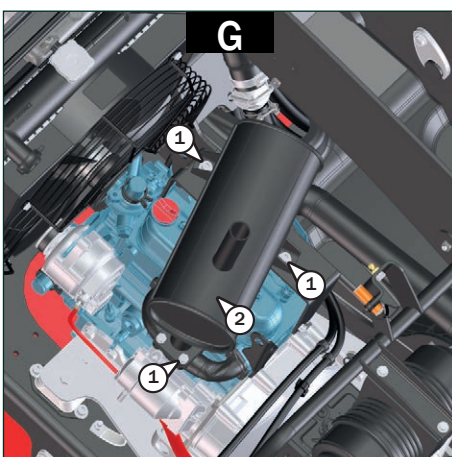
Allow the cooling system to empty completely.



Removal of radiators

Remove the upper grille of the radiator (E-2)

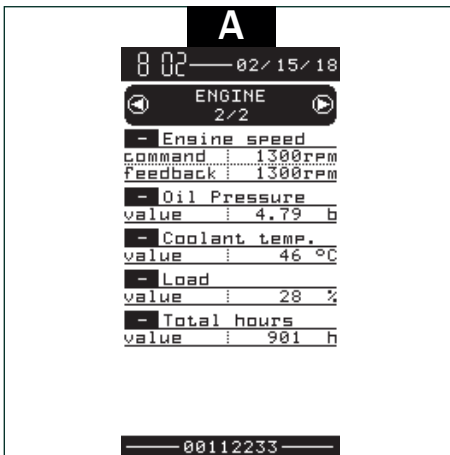
Remove the fastening screws of the water radiator (F-2)



Removal of silencer

Undo all screws (G-1)

Remove the silencer (G-2)



HYDROSTATIC PRESSURE ADJUSTMENT (REXROTH)



In order to carry out the calibration operations described in this chapter, you require two hydraulic manometers as follows:

1 manometer 0 - 400 bars

1 manometer 0 - 100 bars

Engine speed unladen

Switch on the engine, then display the ENGINE menu (A) page on the computer screen.

◀ 80-04-M.177

Check the engine min and max rpm.

📖 647696EN

Adjust the speed settings if required.

◀ 10-04-M.177

REFITTING

Perform the removal operations in reverse order.

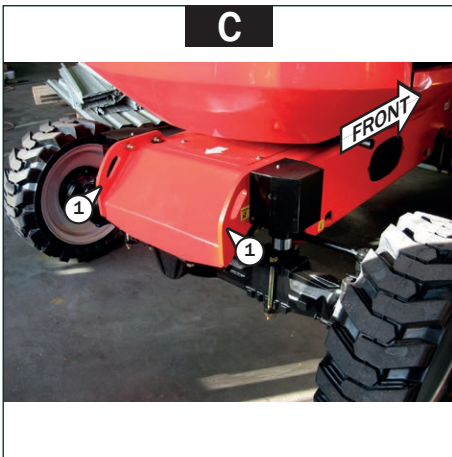
 **Observe the tightening torques:**

FRAME PART		
COMPONENT	SIZE/QUALITY	TIGHTENING TORQUE
WHEELS	M18x150 / ...	34 N.m ± 15%
REAR AXLE PLATES	M20 / 8.8	27 N.m ± 10%
TRAVEL ENGINE	M12 / 8.8	100 N.m ± 10%
ENGINE HP HOSE SCREW	M12 / 8.8	Standard
UNIVERSAL JOINT SCREW	5/16 24 UNF / ...	37 N.m ± 10%
FRONT AXLE PLATES	M20 / 8.8	270 N.m ± 10%
OSCILLATION LOCK BRACKET 1	M20 / 8.8	270 N.m ± 10%
OSCILLATION LOCK BRACKET 2	M16 / 10.9	320 N.m ± 10%
OSCILLATION CYLINDERS	M20 / 8.8	320 N.m ± 10%
CROWN/FRAME	M16 / 10.9	270 N.m ± 10%

Switch on the machine using the cattery cut-off (pre-production), start the engine and perform a forward and reverse travel test.

Switch off the engine, check the hydraulic oil level in the tank and top up the oil level if required.

 **647696EN**

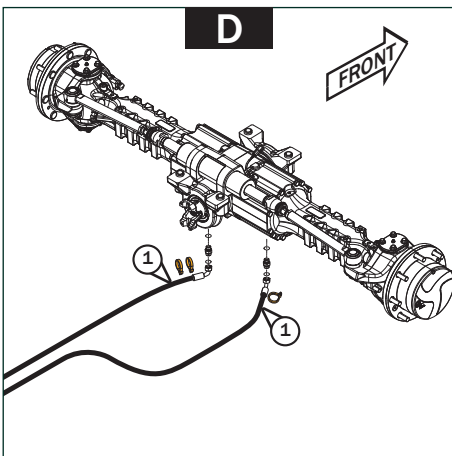


Attach a sling hung from a hoist to the slinging points located at the front of the frame (C-1)

ATJ46	⚠ 2866 kg
160ATJ	⚠ 2866 kg
180ATJ	⚠ 3330 kg

Raise the front axle a few centimetres so that the wheels are no longer in contact with the ground.

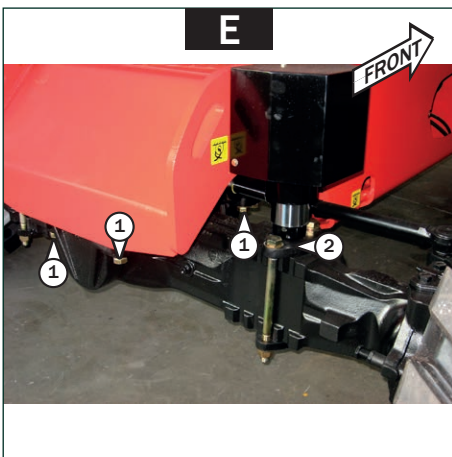
Place blocks under the frame, to the rear of the axle and outside the frame outline, then set the frame down on the blocks.



Locate the hoses (D-1) supplying the steering cylinder, then disassemble as follows:

- Place a drain pan under the middle of the axle.
- Slowly undo the hose fastening screws, a quarter-turn at a time, to release the residual pressure.
- Once the pressure has fallen, fully remove the hoses and fit them with a 12S plug.

Unscrew and remove the wheel nuts.

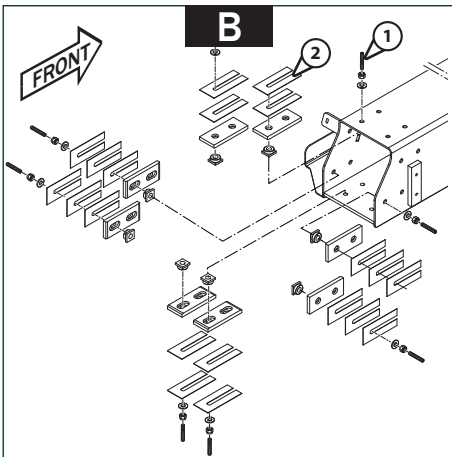


Free each front wheel by applying back-and forth movements and remove them. ⚠ 136 kg

Recover the sling and pass it around the axle as close as possible to the hubs or use a lift truck and place the forks under the axle.

Remove the fastenings of the axle to the frame:
6 bolts (E-1), two plates (E-2)

Remove the front axle (F) ⚠ 351 kg



ARM 3 PAD REMOVAL

Remove the telescope cylinder head pivot pin.

Raise the basket with a hoist to unload the slide pads.

Remove the boom head slide pad fasteners (B-1).

Carefully note the number and position of the adjustment plates (B-2).

Remove the pads.

REFITTING

Carry out the operations described above in reverse order.

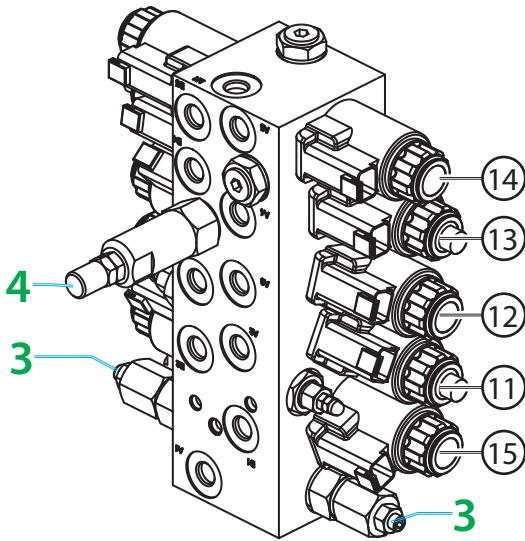
Place adjustment plates if necessary:

Plates (B-2) ✕ 647696EN

⚠ The maximum clearance to be left between the moving tube and the slide pads of arm 3 is 0.5 mm.

DISTRIBUTOR BLOCK MA-250-CDC 016

Values present (as an indication)

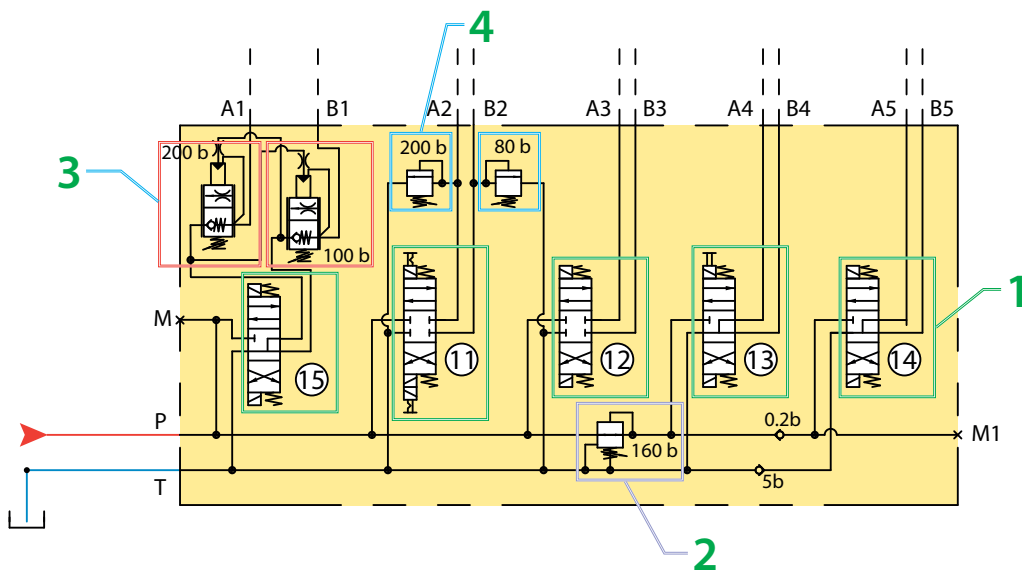


ROLE:

- Division of the hydraulic flow.
- Restriction of the maximum pressure.
- Cut off of the hydraulic movements.

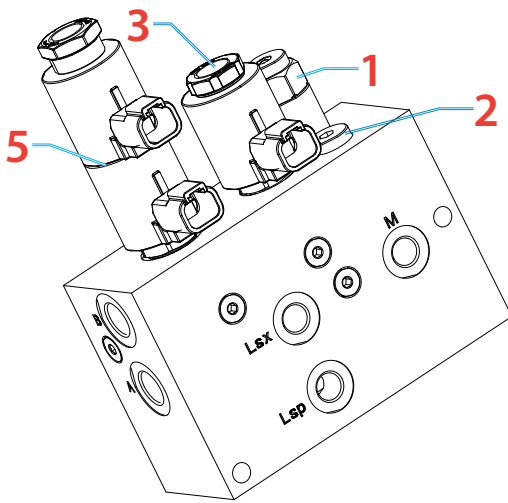
LEGEND:

- 1** - Slide valves
- ① Pendular arm UP/DOWN
 - ② Steer right/left
 - ③ Turret
 - ④ Basket rotation
 - ⑤ Tilt compensation
- 2** - Pressure reducer
- 3** - Tilt compensation valves
- 4** - Pendular shutter valves



STEERING & ROTATION BLOCK (Option)

Values present (as an indication)



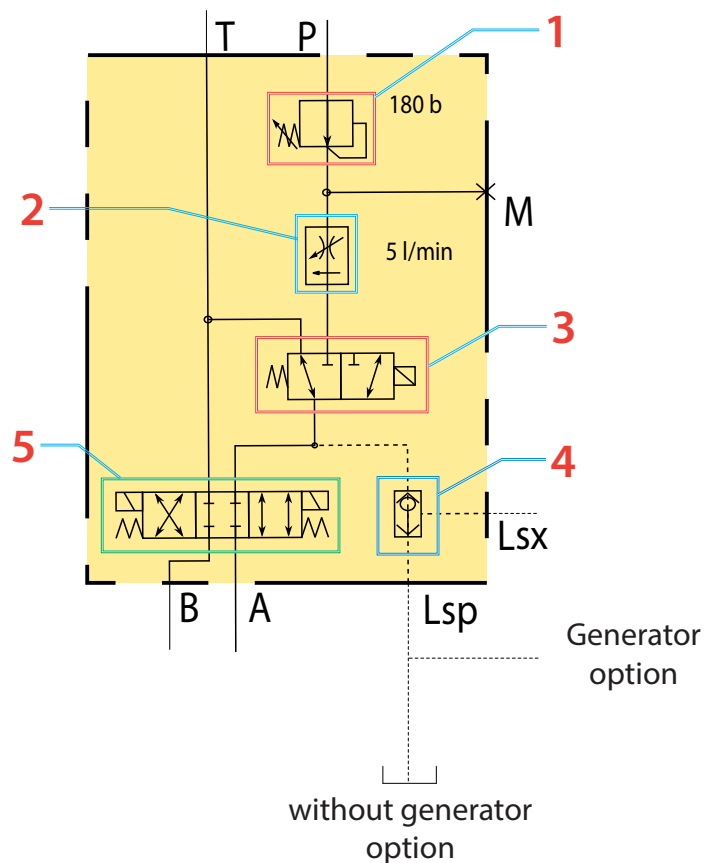
ROLE:

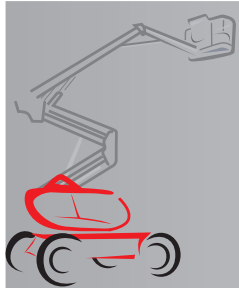
- Restriction of the maximum pressure.
- Restriction of the maximum flow.
- Cut off of the hydraulic movements.

LEGEND:

- 1 - Pressure relief
- 2 - Flow regulator
- 3 - Safety valve
- 4 - Steering control slide
- 5 - Right / left steering control slide

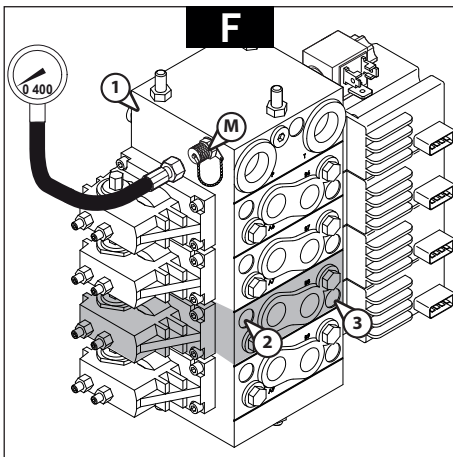
- **T** : Back to the tank.
- **P** : Pressure.
- **M** : pressure control.
- **Lsx** : Control line.
- **Lsp** : Control line.





HYDRAULIC COMPONENTS LOCATION

	pages
HYDRAULIC COMPONENTS IN THE FRAME.....	3
HYDRAULIC COMPONENTS IN THE TURRET.....	4
HYDRAULIC COMPONENTS IN THE ARMS.....	5



ARM 3 LIFTING CYLINDER RELIEF VALVES

Connect the manometer to the pressure test port (F-M) marked M on the upper block (F-1).

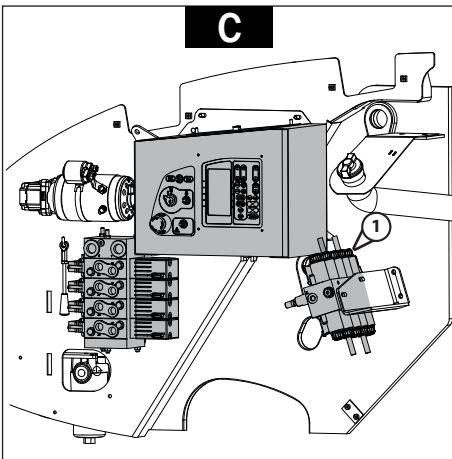
From the base control panel (A-3), extend/retract the arm 3 lifting cylinder. Maintain the command when the cylinder is fully extended/retracted, and check that the manometer displays a pressure of:

"PVP 210 bar" PVG	ATJ46 / 160 ATJ
- cylinder extension	190 bar
- cylinder retraction	120 bar
"PVP 240 bar" PVG	180 ATJ
- cylinder extension	220 bar
- cylinder retraction	120 bar

If the values displayed are different, remove the caps and adjust using an Allen key:

- the arm 3 lifting cylinder extension relief valve (F-2),
- the arm 3 lifting cylinder retraction relief valve (F-3).

Refit the caps.



DISTRIBUTOR BLOCK REMOVAL

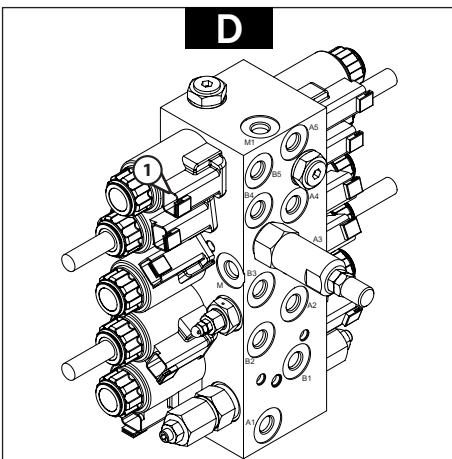
Switch off the power to the access platform.

Open the right-hand turret cover panel and place the strut.

Locate the distributor block (C-1).

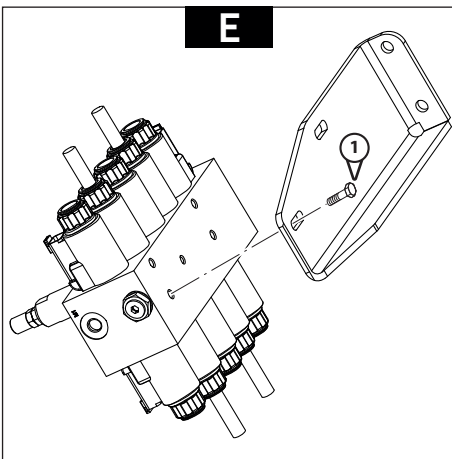
Decompress all the hoses connected to the distributor.

Identify and remove the hoses.



Identify the wiring harnesses connected to the solenoids (D-1) and disconnect them.

Remove the fastening screws (E-1) and remove the distributor block.



REFITTING

Perform the operations described above in reverse order.

⚠ Check the calibration settings before restarting the machine ◀ 70-04-M177EN

DIGITAL MANOMETER BOX



Digital Manometer Set 0 to 600 bar (0 - 8,700 psi) allows:

- MIN and MAX values to be stored.
- Pressure peaks to be read.

Display units: mbar, bar, PSI, Mpa, kPa and kg/cm².

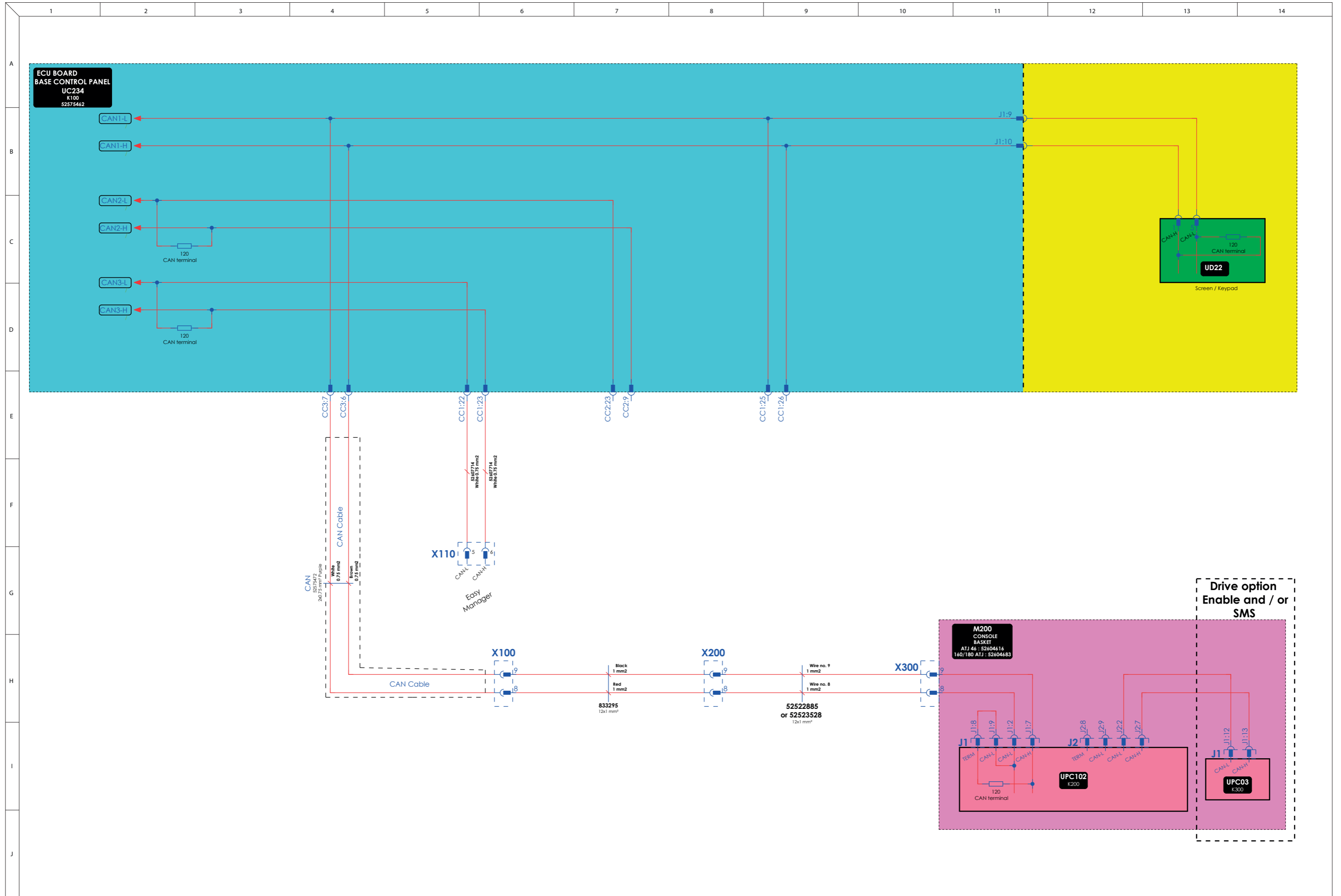
Digital Manometer Set947785

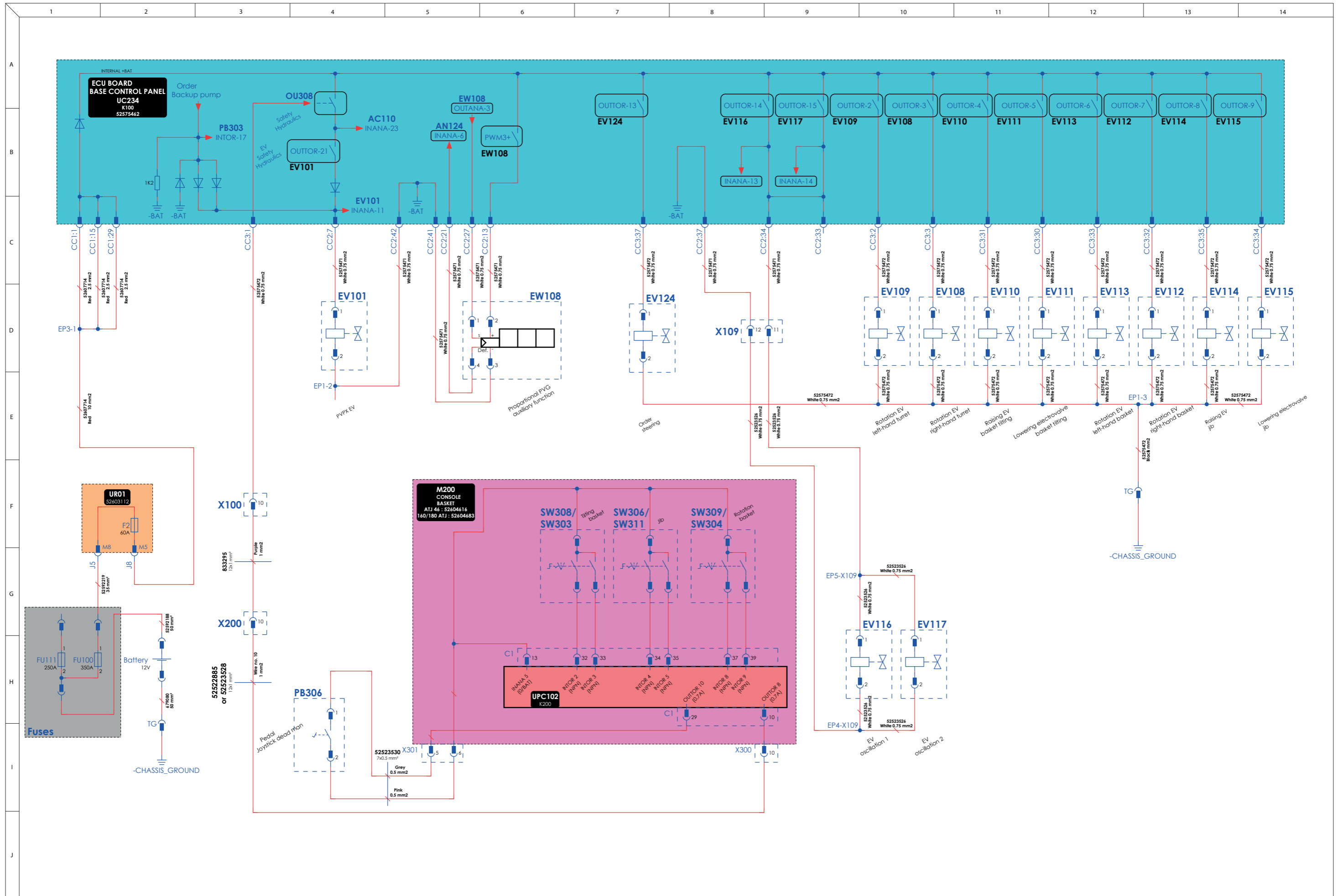
Consisting of:

- 1 - 1 Digital manometer 0 to 600 bar (0 - 8,700 psi)
- 2 - 1 Pressure connector adapter (M16x200)
- 3 - 1 Pressure connector hose 1,500 mm long

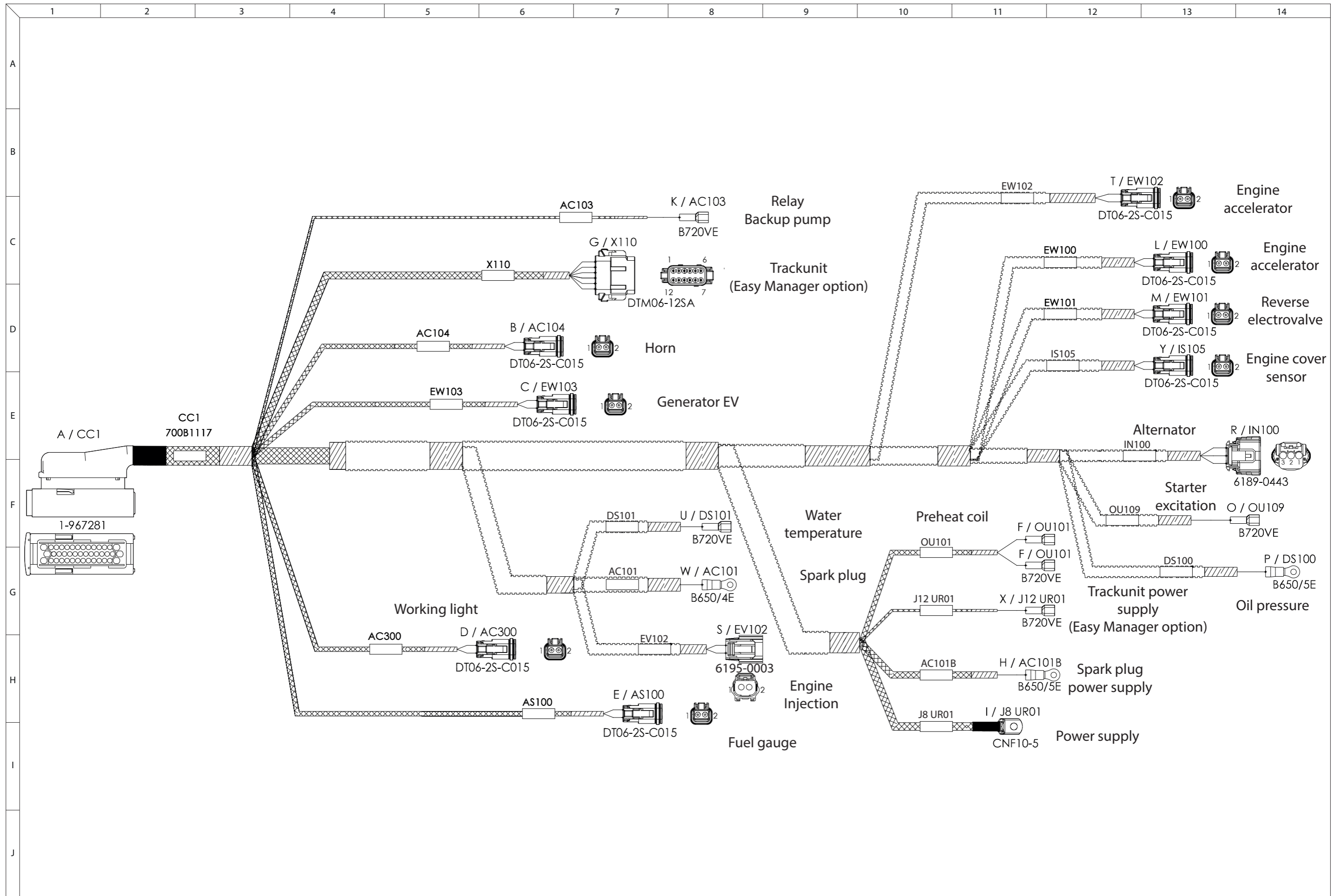
ELECTRICAL COMPONENTS LOCATION

Item	Designation	Diag. 1	Diag. 2	Diag. 3	Diag. 4	Diag. 5	Diag. 6	Diag. 7	Diag. 8	Diag. 9
-	Alternator	H7	H7							
-	Battery 12V	H3	H3				H2	H2	H2	
-	Battery cut-off 12V		H3							
-	Base control front panel	A14	A14		H1	H1		H1	H1	
-	Fuses							H1		
-	Frame ground	F1/J2	F1/J2				F3/I2	I2	I2/F12	
-	Engine earth	J3	J3							
-	Engine	I6	I6							
AC100	Starter	I7	I7							
AC101	Preheat	I5	I5							
AC103	Backup pump	H1	H1							
AC104	Horn				G7/I7					
AC105	Rotating beacon light				G8					
AC110	Starter	B6	B6				B6	B5	B4	
AC111	SMS flashing light				G6					
AC300	Working light	F6	F6							
AN121	PVG jib 1/2 fault							B6		
AN122	Telescope PVG fault							B8		
AN123	Jib 3 PVG fault							B9		
AN124	Auxiliary PVG fault							B11	B5	
AS100	Fuel gauge					C4/G3				
AU101	Base emergency stop button	B11/ B13	B11/ B13							
AU301	Basket emergency stop button	H11	H11							
BP300	Basket engine starter PB	I13	I13							
BP303	Control panel/basket backup pump PB	D8/I14	D8/I14							
DS100	Engine oil pressure sensor					C9/G8				
DS101	Engine water temperature sensor					C8/G9				
DS102	Oscillation pressure switch					C14/ H13				
DS202	Jib 3 down limit switch input					C7				
DS203	Jib 3 up limit switch input					C7				
DS301	240 kg overload sensor 1									C3/F12
DS302	240 kg overload sensor 2									F11
EV100	Brake EV						B5/B6/ D6			
EV101	Hydraulic safety electrovalve (EV PVPX)	F7/C6	F7/C6					B5/D5	B4/C4/ D4	C5/D6/ E5
EV102	Engine injection electrovalve	D3/I5	D3/I5							
EV103	Differential lock EV						A7/D7			
EV104	Crab EV						A7/D8			
EV105	4-Wheel EV						A8/D8			
EV106	RH steering EV						A4/D4			
EV107	LH steering EV						A3/D3			
EV108	Turret RH rotation EV								A10/ D10	





AMP1 harness - ITEM 2



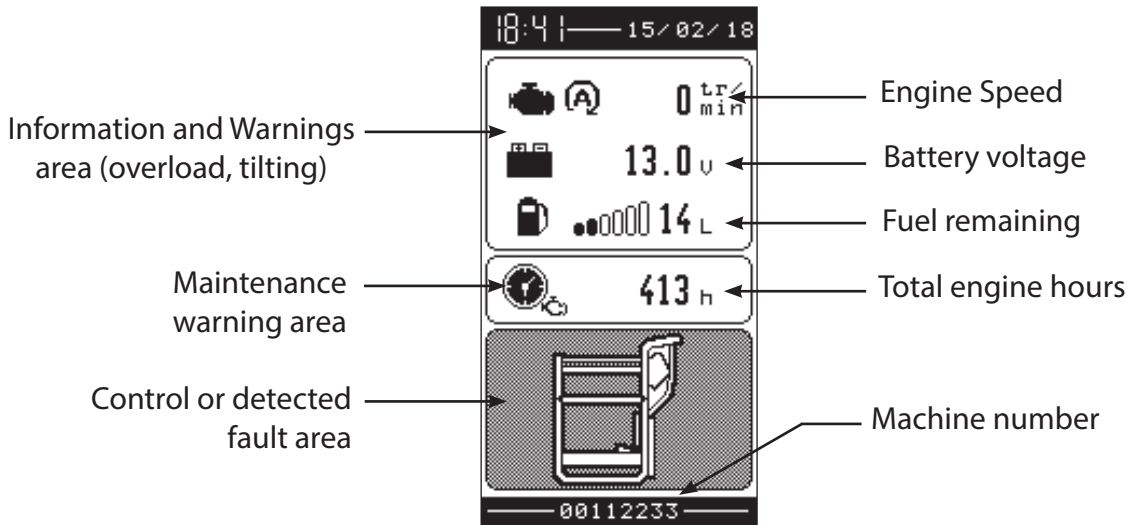
Connector CC1		
Pin No.	Type	Allocation
1		+BAT system
2	OUTTOR19	Started engine info for TRACKUNIT
3	OUTTOR17	Horn+
4	OUTTOR15	-
5	OUTTOR14	-
6	OUTTOR22	Brake EV
7	PWM4-	PWM4- Engine acceleration PWM5
8	PWM5-	PWM5- Forward travel
9	PWM6-	PWM6- Reverse travel
10	PWM7-	PWM7- Generator EV
11	OUTTOR20	-
12	OUTTOR20	+Levelling sensor
13	13 -	+Work light power supply
14	INTOR13	Trackunit immobiliser setting
15	+BAT	+BAT system
16	INANA0	Gauge+
17	INTOR0	-
18	INTOR2	Oil pressure
19	INTOR3	Water T°
20	INTOR6	Terminal D+
21	INTOR16	-
22	-	CAN 3 L Trackunit
23	-	CAN 3 H Trackunit
24	-BAT	-Work light power supply + Trackunit
25	-	CAN 1 L
26	-	CAN 1 H
27	-	+Alternator power supply
28	-	Pull
29	+BAT	+BAT system
30	PWM4+	PWM4+ engine accel
31	PWM5+	PWM5+ Forward travel
32	PWM6+	PWM6+ Reverse travel
33	PWM7+	PWM7+ Generator EV
34	-	+Preheat relay control
35	-	-Preheat relay control
36	-BAT	Gauge
37	-BAT	Horn
38	-BAT	-
39	HSCE0	Terminal W
40	INTOR17	Backup pump relay control
41	OUTTOR23	Hold
42	-	Starter

Connector CC2		
Pin No.	Type	Allocation
1	-	-
2	-	-
3	OUTTOR12	Differential lock EV
4	-	-
5	OUTTOR10	Crab EV
6	OUTTOR11	4-Wheel EV
7	OUTTOR21	PVPX EV
8	OUTTOR22	Brake EV
9	-	Engine CAN 2 H
10	PWM0+	+ PVG jib 1/2
11	PWM1+	+ PVG telescopic boom jib 1/2
12	PWM2+	+ PVG jib 3
13	PWM3+	+ Auxiliary PVG
14	INTOR15	Oscillation pressure switch
15	-	-
16	INTOR1	Front axle aligned
17	INTOR2	Rear axle aligned
18	INTOR3	PVG jib 1/2 fault
19	INTOR4	Telescope PVG fault
20	INTOR5	Jib 3 PVG fault
21	INTOR6	Auxiliary PVG fault
22	-	-
23	-	Engine CAN 2 L
24	OUTANA0	PVG jib 1/2 setting
25	OUTANA1	Telescope PVG setting
26	OUTANA2	PVG jib 3 setting
27	OUTANA3	Auxiliary PVG setting
28	INTOR9	Turntable position +/- 90°
29	-	-
30	OUTTOR20	+Front/Rear axle sensor/oscillation lock pressure switch
31	-	-
32	OUTTOR20	+Turntable position +/- 90° sensor
33	-	-
34	OUTTOR14	Oscillation EV 1 and 2
35	-BAT	-BAT front axel and rear axle aligned
36	-	-
37	-BAT	-BAT oscillation 1 and 2
38	-BAT	-BAT PVG jib 1/2
39	-BAT	-BAT PVG telescope
40	-BAT	-BAT PVG jib 3
41	-BAT	-BAT auxiliary PVG
42	-BAT	-BAT EV diff. blo.+ crab + 4-wheel + EV PVPX

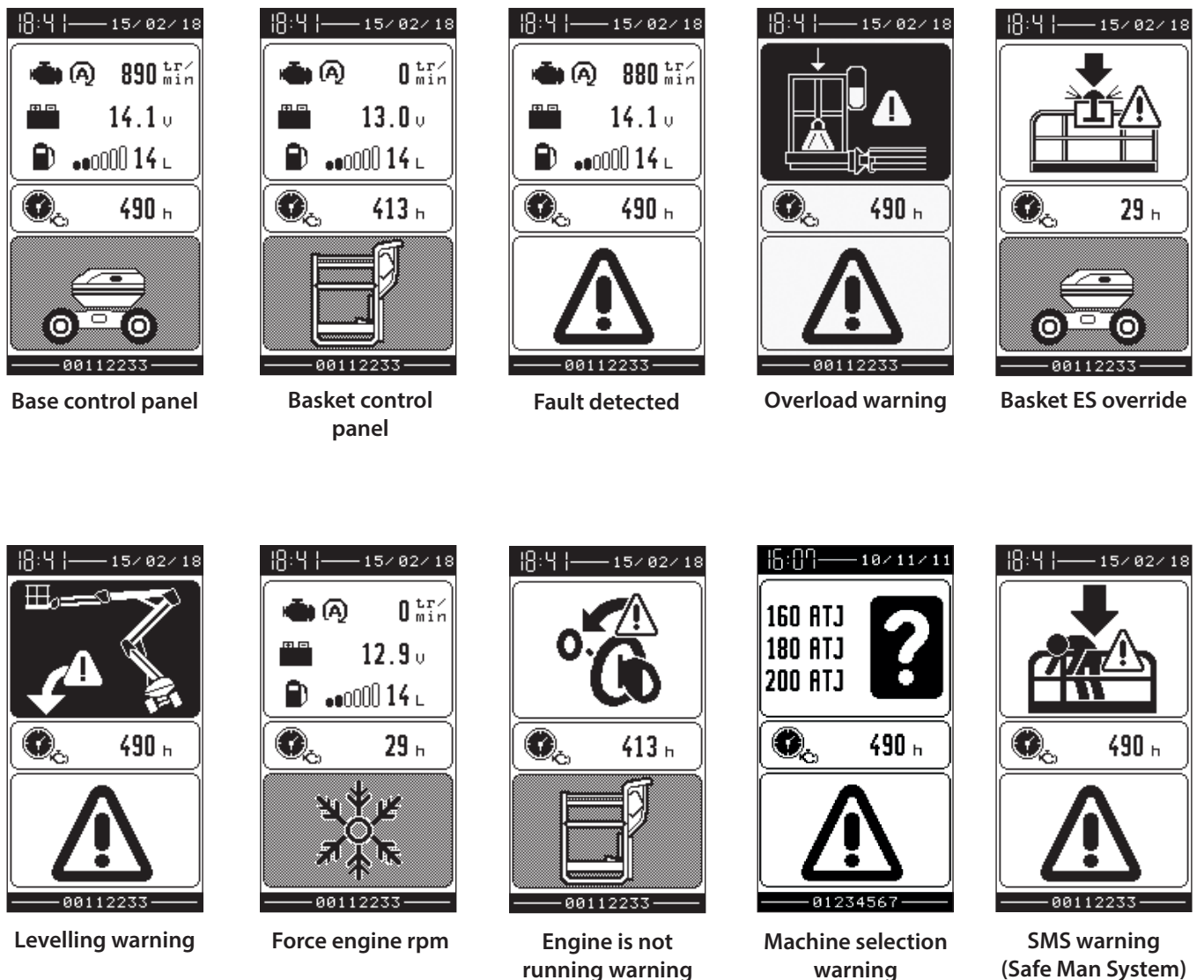
Connector CC3		
Pin No.	Type	Allocation
1	-	Overload safety
2	OUTTOR2	Turret LH rotation EV
3	OUTTOR3	Turret RH rotation EV
4	OUTTOR0	LH steering EV
5	OUTTOR1	RH steering EV
6	-	CAN 1 H basket
7	-	CAN 1 L basket
8	OUTTOR20	+ Arm limit switch sensor
9	OUTTOR21	Function block safety EV
10	INTOR17	Basket backup pump pushbutton PB
11	OUTTOR16	Flashing light
12	-	Basket start-up pushbutton
13	-	+Basket backup pump pushbutton PB power supply
14	-	+APC (basket return)
15	INTOR1	Overload 1
16	OUTTOR18	Rotating beacon light
17	INTOR4	Jib down limit switch
18	INTOR5	Telescope limit switch
19	INTOR7	Jib 3 down limit switch
20	INTOR8	Jib 3 up limit switch
21	INTOR10	AU basket
22	OUTTOR12	-
23	OUTTOR10	-
24	PWM0-	-
25	PWM1-	-
26	PWM2-	-
27	-	-BAT basket
28	-	-BAT base control panel
29	-	+AU basket
30	OUTTOR5	Basket tilting retraction EV
31	OUTTOR4	Basket tilting extension EV
32	OUTTOR7	RH Basket rotation EV
33	OUTTOR6	LH Basket rotation EV
34	OUTTOR9	Jib retract EV
35	OUTTOR8	Jib extend EV
36	OUTTOR20	Telescope limit switch sensor+
37	OUTTOR13	Steering control activation EV
38	OUTTOR11	-
39	PWM0+	-
40	PWM1+	-
41	PWM2+	-
42	-BAT	-BAT base control panel

3 Work pages

Presentation




Examples of work pages





Diagnostics menu

Access to sub-menus

The  tab can be used to select the Hour Counter, Daily Hours, Input/Output Display, Diagnostic and Fault Log sub-menus.



Sub-menu selection:

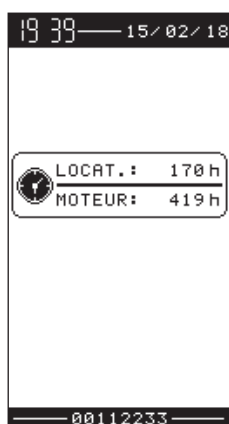
- HOUR COUNTERS (User level)
- DAILY HOURS (User/ Dealer/Rolling code level)
- INPUT/OUTPUT DISPLAY (User level)
- DIAGNOSTIC (User level)
- FAULT LOG (User level)

HOURLY COUNTER sub-menu

This sub-menu displays the number of hours the engine has run since the access platform was put into service.

A Rental sub-menu is also available for displaying the number of hours the engine has run since the last reset by the dealer.

User level




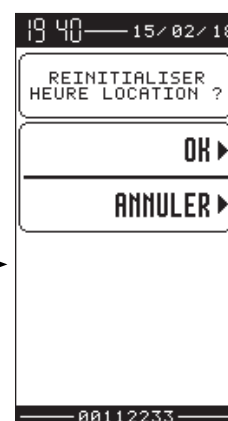
The Rental hours can be reset to zero at the Dealer access level (secret code required).



The  key can be used to reset the counter (with confirmation to follow).

Dealer level



 key:
Reset hours



Confirm with the
  keys

OUTTOR - UPC102 (basket)

17:35 — 20/06/18

OUTTOR UPC102
7/10

			Description	ON	OFF
0	OU300	OFF	Basket buzzer	Active	Inactive
1	OU301	ON	Front axle aligned	Lit	Unlit
2	OU302	ON	Rear axle aligned	Lit	Unlit
3	OU312	OFF	Machine fault indicator light	Lit	Unlit
4	OU304	OFF	Levelling fault indicator lamp	Lit	Unlit
5	OU305	OFF	Overload alarm indicator lamp	Lit	Unlit
6	OU306	OFF	Preheat indicator lamp // Automatic start-up (Stop&Go)	Lit // Flashing	Off // Off (Stop&Go)
7	OU307	OFF	Low fuel level indicator lamp	Lit	Unlit
8	OU308	ON	Overload safety	No overload	Overload
9	OU319	OFF	Low battery level indicator lamp (Stop&Go)	Lit	Unlit
10	OU310	ON	Basket components power supply 2	Powered	Not powered

3/4

00112233

OUTOR - UPC03

18:47 — 15/02/18

OUTOR UPC03
7/10

			Description	ON	OFF
1	OU315	OFF	Turntable position > 90° indicator lamp	> 90°	<90°
2	OU311	ON	Basket components power supply 2	Powered	Not powered

4/4

00112233

OUTANA - UC234

18:47 — 15/02/18

OUTANA UC234
8/10

			Description			
0	EW105		Arm lifting proportional electrovalve	Lifting	Neutral	Lowering
	valeur	50.00 %		25%	50%	75%
1	EW106		Telescoping proportional electrovalve	Removals	Neutral	Retracted
	valeur	50.00 %		25%	50%	75%
2	EW107		Turntable proportional electrovalve	Left	Neutral	Right
	valeur	50.00 %		25%	50%	75%
3	EW108		Auxiliary proportional electrovalve	Activated	Neutral	Activated
	valeur	50.00 %		25%	50%	75%

00112233



Engine Menu

Access to sub-menus



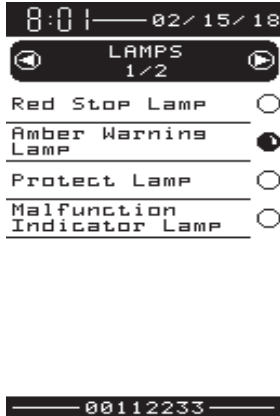
Sub-menu selection:

- INDICATOR LAMPS (Read level)
- ENGINE (Read level)

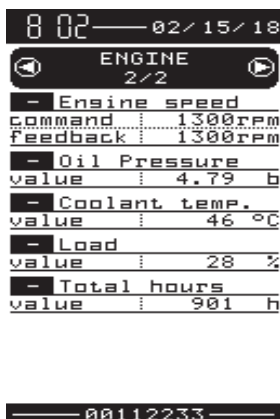
Sub-menu CAN J1939 ENGINE

This sub-menu can be used to view

- The status of the indicator lamps
- Information from the ECU.



Indicator lamps selected



Engine selected

STEP 2: GENERATOR PRESET

Select the  icon using the   keys, then select "Generator calibration" (Fig. E) using the   keys, then press .

Lower the value to 26 using the   keys. (Fig. F), then press .

STEP 3: GENERATOR SETTING

Switch on the engine. Activate the generator by means of the starter switch (4) (Fig. G) on the basket control panel.

Using a multimeter (5) (Fig. H), check the (no load) voltage at the terminals of the two generator sockets: the voltage reading should be between 240-250 V (in the case of a 3.5 kW - 5 kW 230 V generator) or 115-125 V (in the case of a 3.5 kW 110 V generator).

Fig. G

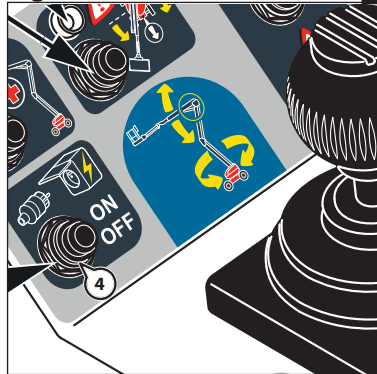


Fig. E



Fig. F

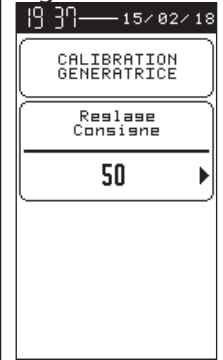
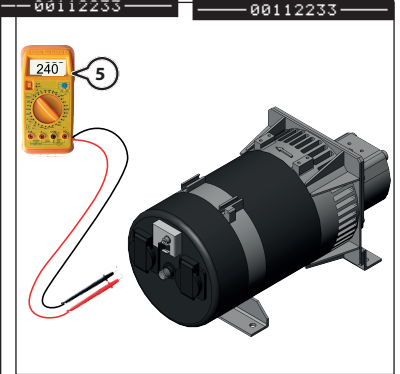








Fig. H



 **It there is no 230V supply at the terminals of the sockets, modify the program parameters.**
STEP 4: GENERATOR SETTING

Return to the menu and select the  icon using the   keys, then select "Calibration génératrice" (Generator calibration) (Fig. I) using the   keys, then press .




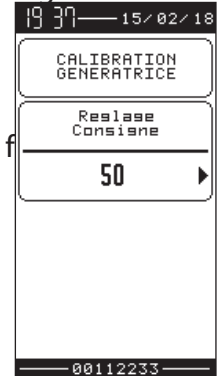
Adjust the setting using the   keys (Fig. K), to obtain a value 240-250 V (in the case of a 3.5 kW - 5 kW 230 V generator) or 115-125 V (in the case of a 3.5 kW 110 V generator) on the multimeter. Then press .

Fig. I



Fig. K



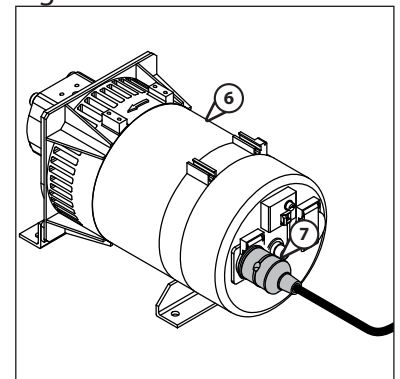
Using the multimeter, check that the generator stops when a movement is requested. To do this carry out the following operation:

- From the base control panel, extend the jib or extend the telescope: the voltage should disappear.
- Stop the movement: the voltage should reappear after 3 seconds.

Connect the socket 7 (Fig. L) to the generator 6 (Fig. L).

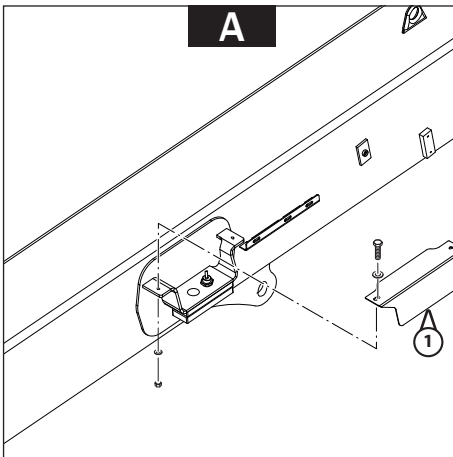
Using the multimeter, perform all the previous checks on the socket located in the basket.

Fig. L



Parameters 750B1775-C for 180ATJ

SCREEN GROUP						
Sub-group	Number	Description	Value	Minimum value	Maximum value	Number Total
USER OPTION	0	Horn mode none/travel/movements	0	0	2	0
	1	Rotating beacon light always on	0	0	1	1
	2	Stop & Go option	1	0	1	2
DEALER OPTION.	0	Block telescope (Hirer mode)	0	0	1	3
	1	Authorise working travel	1	0	1	4
	2	Authorise working tilting (basket)	0	0	1	5
	3	Wheel realignment activation	0	0	1	6
	4	Safe Man System activation	0	0	1	7
	5	Ramp speed in reverse + high speed (hare)	1	0	1	8
	6	Easy Manager activation	0	0	1	9
	7	Option Drive Enable	0	0	1	10
MANUFACTURER OPTION	0	Allow translation movements	0	0	1	11
	1	Steer & Rotate option	0	0	1	12
	2	Temperature safety option	0	0	1	13
SPEED CALIBRATION	0	Arm 1/2 up setting value	0	-15	15	14
	1	Arm 1/2 down setting value	0	-15	15	15
	2	Arm 3 up setting value	0	-15	15	16
	3	Arm 3 down setting value	0	-15	15	17
	4	Telescope extension setting value	0	-15	15	18
	5	Telescope retraction setting value	0	-15	15	19
	6	Jib up setting value	0	-15	15	20
	7	Jib down setting value	0	-15	15	21
	8	Turntable RH rotation setting value	0	-15	15	22
	9	Turntable LH rotation setting value	0	-15	15	23
	10	Basket tilt up - setting value	0	-15	15	24
	11	Basket tilt down - setting value	0	-15	15	25
	12	Basket RH rotation setting value	0	-15	15	26
	13	Basket LH rotation setting value	0	-15	15	27
	14	Forward working travel setting value	0	-15	15	28
15	Reverse working travel setting value	0	-15	15	29	
PARAMETER MANAGEMENT	0	Restore machine parameters	0	0	1	30
	1	Save machine parameters	0	0	1	31
	2	Restoring basic factory values	0	0	1	32
PARAMETER LANGUAGE	0	Parameter language	0	0	1	33
INPUT MANAGEMENT	0	Calculation coefficient engine speed	5.64	5.64	5.64	34
	1	Engine rpm filter delay	10	0	50	35
	2	Working travel manipulator filter	10	0	100	36
	3	Slow (tortoise) transport travel manipulator filter	15	0	100	37
	4	Fast (hare) transport travel manipulator filter	25	0	100	38
	5	Ramp transport travel manipulator filter	25	0	100	39
	6	Fuel sensor filter	50	0	100	40
	7	Levelling unlock time delay OFF (s)	0.5	0.0	3.0	41
	8	Backup pump request time delay OFF (s)	2.0	0.0	5.0	42
	9	Overload time delay ON (s)	2.0	0.0	5.0	43
	10	Overload time delay OFF (s)	1.0	0.0	5.0	44
	11	Telescope limit switch time delay ON (s)	0.2	0.0	3.0	45
	12	Telescope limit switch time delay OFF (s)	0.5	0.0	3.0	46
	13	Arm down limit switch time delay ON (s)	0.2	0.0	3.0	47
	14	Arm down limit switch time delay OFF (s)	0.5	0.0	3.0	48
	15	Jib 3 down limit switch time-out ON (s)	0.2	0.0	3.0	49
	16	Jib 3 down limit switch time-out OFF (s)	0.2	0.0	3.0	50
	17	Jib 3 up limit switch time-out ON (s)	0.2	0.0	3.0	51
18	Jib 3 up limit switch time-out OFF (s)	0.2	0.0	3.0	52	



ARM DOWN SENSOR ADJUSTMENT

Raise the arm a few centimetres to facilitate access to the sensor.

Switch off the engine and switch on the power to the platform.

Locate the arm down sensor housing (↖ COMPOSANTS ÉLECTRIQUES DE COMMANDE, 3).

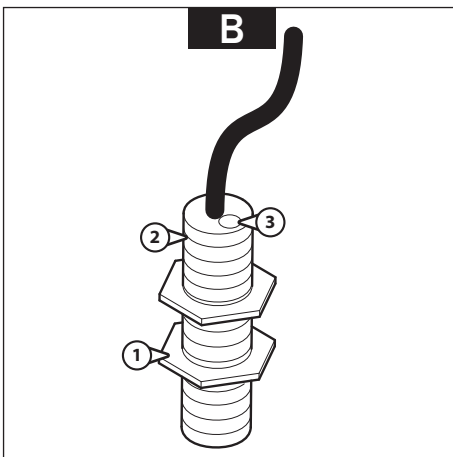
Remove the protective casing from the sensor (A-1) and retrieve the rubber strip.

Unscrew the lock nuts (B-1).

Screw or unscrew the sensor (B-2) until the LED (B-3), located next to the power supply wire, switches from red to green (the clearance remaining between the support and the sensor is approximately 3 mm).

Re-tighten the lock nuts.

Refit the rubber skirt and the casing.



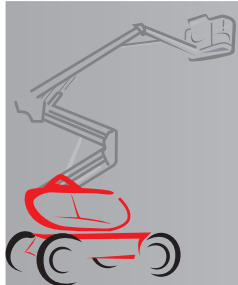
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ELECTRICAL TROUBLESHOOTING

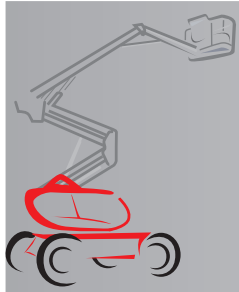
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– 3 – COMPONENT IDENTIFICATION.....	3
– 4 – CREATION OF A FAULT TYPE CODE.....	3
– 5 – SYSTEM FAULTS.....	4
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WARNING AND FAULT CODE LIST.....	5



647697EN (31/08/2018)

ATJ 46 RNC 2RD T4 S1
160 ATJ RNC 4RD ST5 S1
160 ATJ RC 4RD ST5 S1
180 ATJ RNC 4RD ST5 S1
180 ATJ RC 4RD ST5 S1

REPAIR MANUAL



GENERAL INSTRUCTIONS AND SAFETY NOTICE

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GENERAL INSTRUCTIONS.....	2
SPARE PARTS	3
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REPAIR PROCEDURES.....	5
HYDRAULICS.....	6
SYMBOLS	7
SERVICING AND REPAIR EQUIPMENT.....	8

REAR AXLE											
DESCRIPTION	CAPACITY	RECOMMENDATION									
		-40°C	-30°C	-20°C	-10°C	0°C	10°C	20°C	30°C	40°C	50°C
DIFFERENTIAL	4.8 L	SPECIAL MANITOU OIL FOR IMMERSSED BRAKES									
		-40°C	-30°C	-20°C	-10°C	0°C	10°C	20°C	30°C	40°C	50°C
WHEEL GEAR REDUCER	2 x 0.8 L	MANITOU SAE80W90 MECHANICAL TRANSMISSION OIL									
		-40°C	-30°C	-20°C	-10°C	0°C	10°C	20°C	30°C	40°C	50°C
WHEEL GEAR REDUCER PIVOTS		MANITOU BLACK MULTI-PURPOSE LUBRICANT									

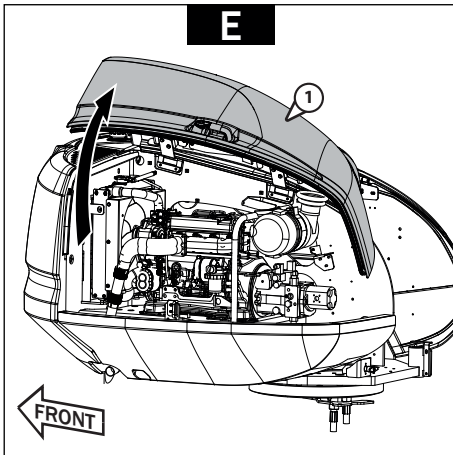
LIFTING STRUCTURE											
DESCRIPTION	CAPACITY	RECOMMENDATION									
		-40°C	-30°C	-20°C	-10°C	0°C	10°C	20°C	30°C	40°C	50°C
GENERAL GREASING		MANITOU BLACK MULTI-PURPOSE LUBRICANT									
		-40°C	-30°C	-20°C	-10°C	0°C	10°C	20°C	30°C	40°C	50°C
TELESCOPE LUBRICATION		MANITOU BLACK MULTI-PURPOSE LUBRICANT									
		-40°C	-30°C	-20°C	-10°C	0°C	10°C	20°C	30°C	40°C	50°C
CROWN GEAR BEARINGS		MANITOU MULTI-PURPOSE EXTREME PRESSURE LUBRICANT									
		-40°C	-30°C	-20°C	-10°C	0°C	10°C	20°C	30°C	40°C	50°C
CROWN GEAR TEETH		BLACK G ULTRA GREASE									
		-40°C	-30°C	-20°C	-10°C	0°C	10°C	20°C	30°C	40°C	50°C
TURRET ROTATION ENGINE	0.85 L	MANITOU SAE80W90 MECHANICAL TRANSMISSION OIL									

METRIC - IMPERIAL UNIT CONVERSION**CONVERSION COEFFICIENTS:**

Metric Unit (S.I)	Coefficient	Imperial Unit US
°C (Celsius degree)	x 1.8 + 32	= °F (Fahrenheit degree)
cm ³ (centimeter cube)	x 0.06102	= cu.in. (cubic inches)
cv (cheval vapeur)	x 0.9859	= hp (horsepower)
bar (bar)	x 14.51	= psi (pound-force/square inch)
g (gram)	x 0.0353	= oz av (ounce avoirdupois) (oz : lat. onza)
kg (kilogram)	x 2.2046	= lb (pound) (lat . libra)
km/h (kilometer per hour)	x 0.6214	= mph (miles per hour)
kW (kilowatt)	x 1.34048	= hp (horsepower)
ℓ (liter)	x 0.2642	= gal US (US gallon)
ℓ (liter)	x 1.0567	= qt US (quart US gallon)
m (meter)	x 3.2808	= ft (foot)
m (meter)	x 39.37	= in (inch)
mℓ (milliliter)	x 0.0338	= fl oz (fluid ounce) (fl : fluid, oz : lat. onza)
mm (millimeter)	x 0.03937	= in (inch)
μm (micrometer)	x 0.03937	= mil (thousands of an inch)
N (Newton)	x 0.2248	= lbf (pound-force) (lb : lat. libra, f : force)
N.m (Newton meter)	x 0.7376	= ft-lb (pound-force-foot) (ft : foot, lb : lat. libra)
rad/s (radian/second)	x 9.5493	= rpm (revolution per minute)
t (metric ton)	x 2204.62	= lb (pound) (lat. libra)
tr/min (tour per minute)	x 1	= rpm (revolution per minute)

OTHER UNIT CONVERSIONS:

Unit	Coefficient	Unit
ft (foot)	x 12	= in (inch) (pouce)
lb (pound) (lat. libra)	x 16	= oz av (once avoirdupois)
m (meter)	x 1000	= mm (millimeter)
mm (millimeter)	x 1000	= μm (micrometer)
t (metric ton)	x 1000	= kg (kilogram)
rad (radian)	x 57.2958	= ° (angle degree)



Open the left-hand turret cover panel (E-1), then remove it as follows:

- Remove the cylinder head.

! *Hold the cover panel*  **22 kg**

- Remove the cover panel hinge fasteners.
- Remove the cover panel.
- Remove the cylinder.

REFITTING

Perform the removal operations in reverse order.

 **Observe the tightening torques:**

ENGINE SECTION		
COMPONENT	SIZE/QUALITY	TIGHTENING TORQUE
SILENTBLOC/TURRET	M10 / 8.8	44 N.m ± 10%
ENGINE BRACKET/SILENTBLOC	M12 / 10.9	27 N.m ± 10%
ENGINE/ENGINE BRACKET	M10x125 / 8.8	47 N.m ± 10%
COUPLING	M10 / 8.8	49 N.m ± 10%
ENGINE FLYWHEEL CASING (without washer)	M8 / 8.8	22 N.m ± 10%
ENGINE FLYWHEEL CASING	M8 / 8.8	24 N.m ± 10%
ENGINE FLYWHEEL CASING	M10 / 8.8	47 N.m ± 10%
HYDROSTATIC PUMP	M14 / 8.8	140 N.m ± 10%
AUXILIARY PUMP	M10 / 8.8	76 N.m ± 10%

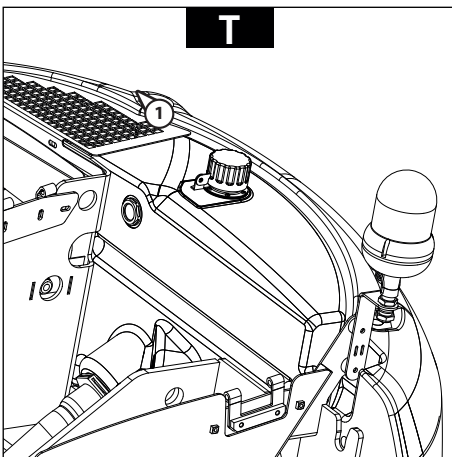
Fill the radiator with coolant and hydraulic fluid.

 **647696EN**

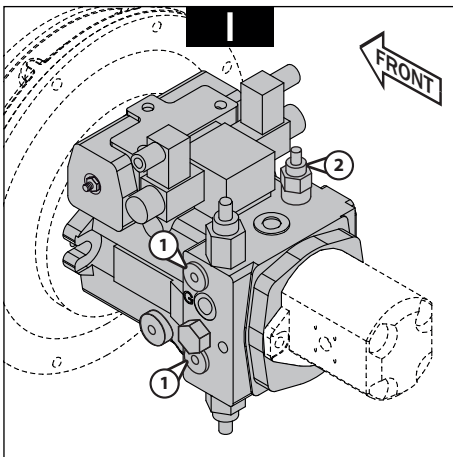
Switch on the machine, start the engine and perform a complete test of all machine movements.

Place the machine in the "Transport" position (Arms down).

Switch off the engine.



Check the hydraulic oil level in the tank (T-1) and top up the oil level if required.



Calibration - Zero flow valve DR

Warning, during this test, the pressure in the hydrostatic circuit could turn the wheels: the machine is only immobilized by its brakes. Check that there is nobody within the safety perimeter.

Disconnect the brake electrovalve control wiring harness from the brake/steering hydraulic block.

Install a manometer (0-400 bar) on each HP port (I-1).

Ensure that the arms are folded in and the telescope is retracted.

Check the engine revs at maximum speed on the computer screen.

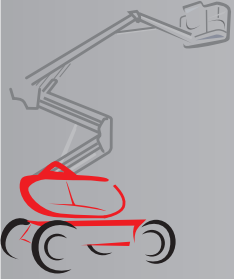
Select the high-speed setting (hare) on the basket control panel and run the machine at full speed in forward gear.

Read the pressure on the manometer connected to the lower pressure test port (line A): the theoretical pressure is:

For hydrostatic engine A2FM:

- 46ATJ = 340 bar
- 160 ATJ = 340 bar.
- 180 ATJ = 340 bar

If the pressure reading is incorrect, switch off the engine and modify the DR valve calibration setting (I-2).



AXLE CONTROL AND ADJUSTMENT

	pages
PLACING IN FREEWHEEL MODE	3
– RESTORING BRAKE FUNCTION	4

REAR AXLE REFIT

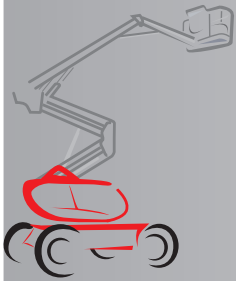
Perform the removal operations in reverse order.

 **Observe the tightening torques:**

FRAME PART		
COMPONENT	SIZE/QUALITY	TIGHTENING TORQUE
WHEELS	M18x150 / ...	340 N.m \pm 15%
ENGINE HP HOSE SCREW	M12 / 8.8	Standard
UNIVERSAL JOINT SCREW	5/16 24 UNF / ...	37 N.m \pm 10%
FRONT AXLE PLATES	M20 / 8.8	270 N.m \pm 10%
OSCILLATION CYLINDERS	M20 / 8.8	320 N.m \pm 10%

Switch on the machine, start the engine and perform a complete test of all machine movements.

Switch off the engine, check the hydraulic oil level in the tank and top up the oil level if required.



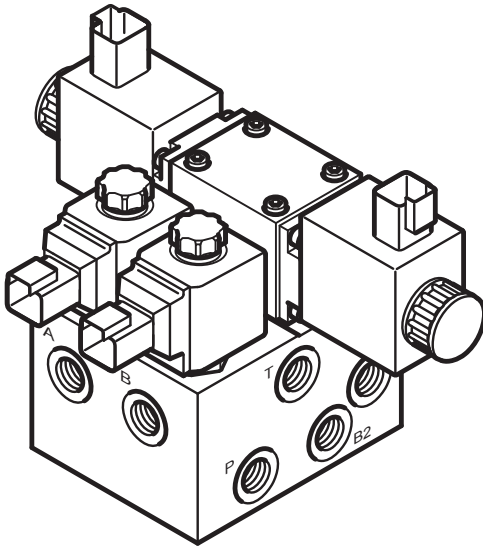
HYDRAULIC CHARACTERISTICS AND SPECIFICATIONS

HYDRAULIC COMPONENT SHEETS

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BRAKE BLOCK AND DIFFERENTIAL LOCK DISTRIBUTOR (ATJ 46)	9
BRAKE BLOCK AND STEERING DISTRIBUTOR (160 & 180 ATJ)	11
VALVE BLOCK	13
VARIABLE DISPLACEMENT PUMP A10VG	15
STEERING & ROTATION BLOCK (OPTION)	17
GENERATOR BLOCK (OPTION).....	19

BRAKE BLOCK AND STEERING DISTRIBUTOR (160 & 180 ATJ)

Values present (as an indication)

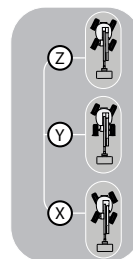
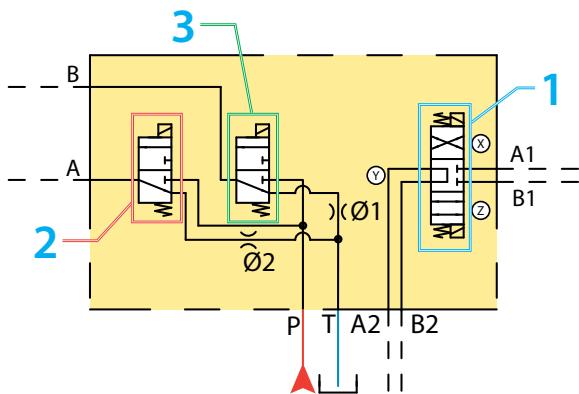
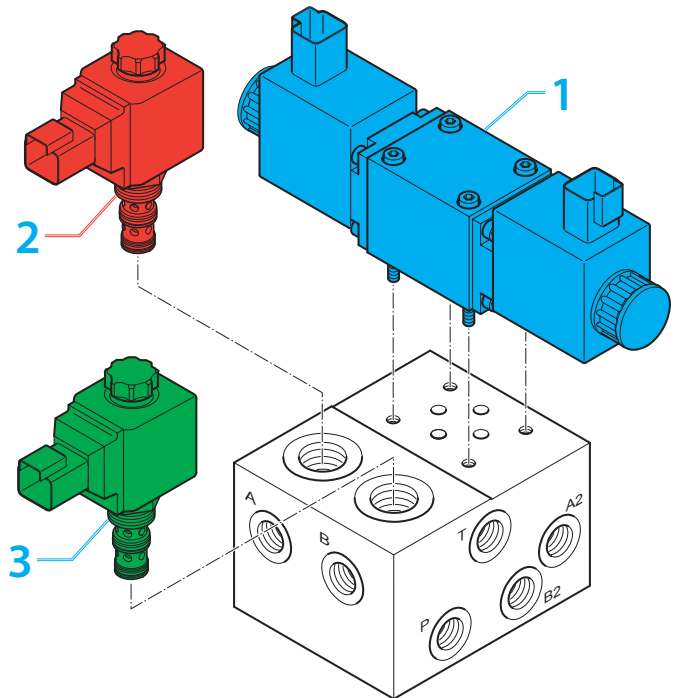


ROLE:

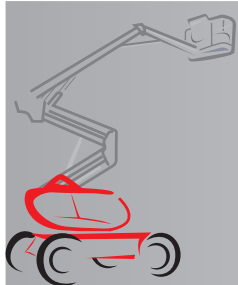
- Turn the hydraulic flow to the brake and differential locking functions
- Select the Steering mode (2-wheel drive, 4-wheel drive, Crab)

LEGEND:

- 1** - Slide valve (2-wheel, 4-wheel, Crab steer)
- 2** - Electro-valve (brake)
- 3** - Electro-valve (differential locking)

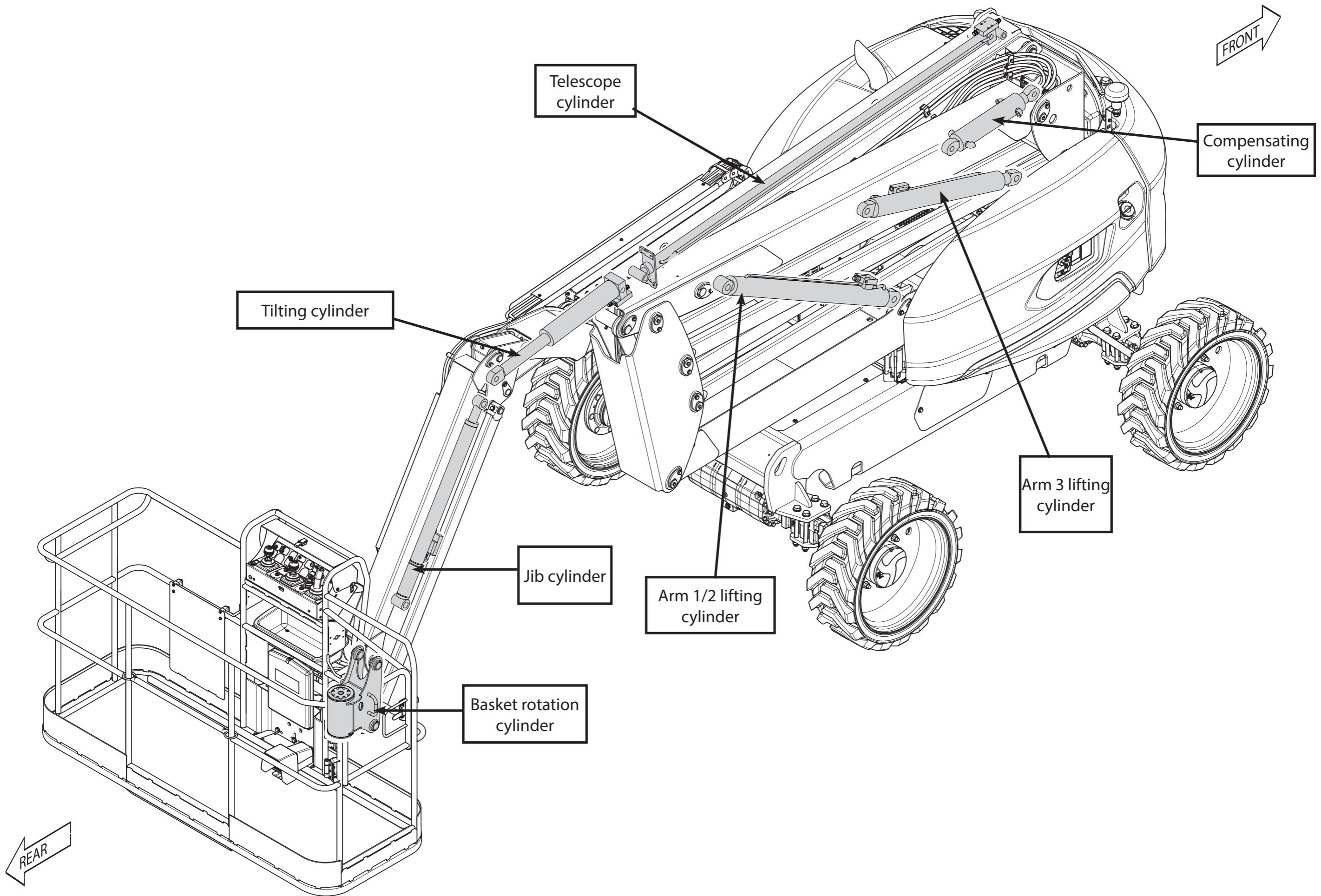


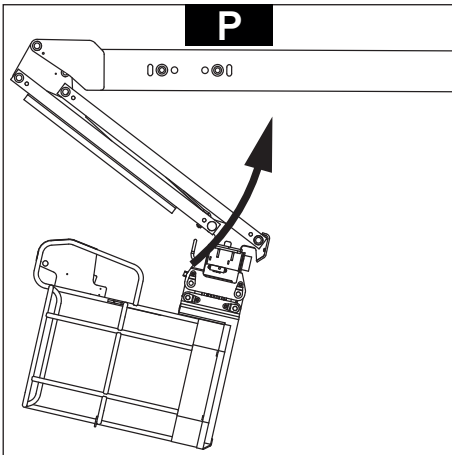
Note : _____



HYDRAULIC SCHEMATIC DIAGRAMS

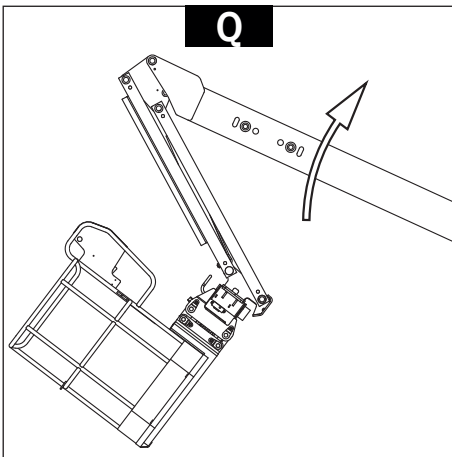
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SETTINGS.....	4
HYDRAULIC SCHEMATIC DIAGRAM.....	5
ELECTROVALVE ACTIVATION TABLE.....	6





TILTING CYLINDER RETRACTION VALVE ADJUSTMENT

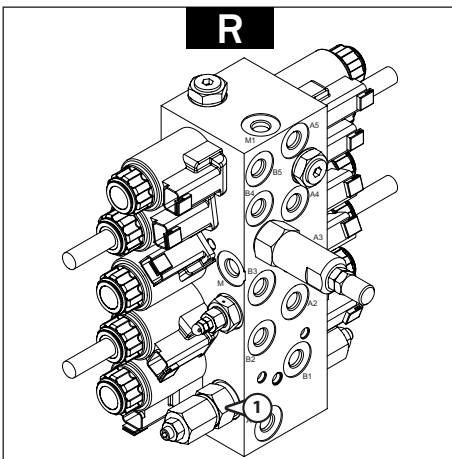
From the base control panel, tilt the basket until the cylinder is fully retracted (P).

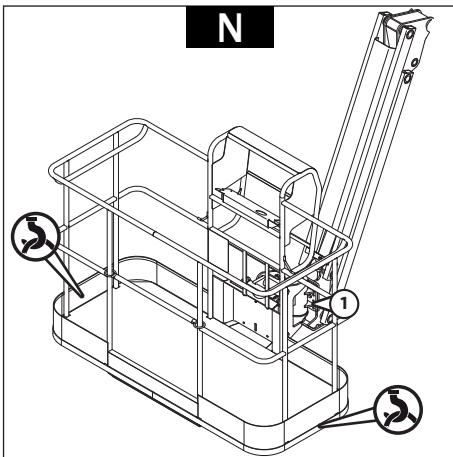


Raise arm 3 (Q) and **simultaneously** check that the manometer connected to the outlet (L-6) displays a pressure of:

"PVP 210 bar" PVG	ATJ46 / 160 ATJ
- cylinder retraction	120 bar
"PVP 240 bar" PVG	180 ATJ
- cylinder retraction	120 bar

If the value displayed is different, adjust the tilting cylinder retraction valve (R-1).





Basket rotation cylinder

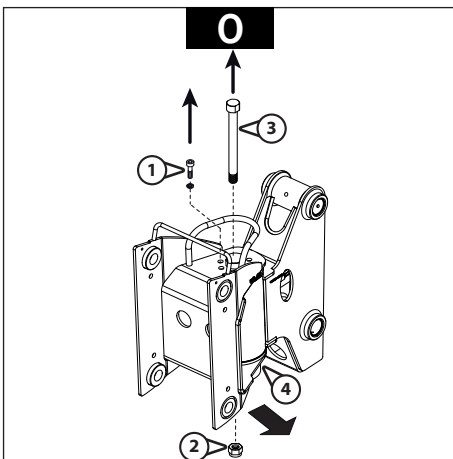
Place the platform in the transport position.

Switch off the engine.

Switch off the power to the access platform.

Attach a sling hung from a hoist to several points on the basket or place the forks of a lift truck under the basket.

Locate the basket rotation cylinder (N-1) situated between the jib head and the basket pivot joint.



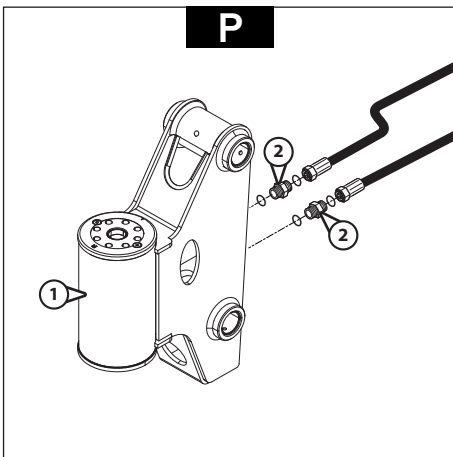
Remove the fastening screws (O-1).

Remove the basket rotation pivot pin:

- Remove the nut (O-2).
- Remove the pin (O-3) while holding the basket.

Remove the clevis of the overload rotation support (O-4) from the basket rotation cylinder by moving the basket sideways approximately fifteen centimeters.

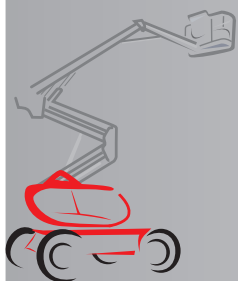
Warning, do not pull on the wiring harnesses in the black plastic spiral sheath.



Place a drain pan under the cylinder valve block (P-1).

Remove the right-hand connections (P-2), fit MA8S plugs and drain the oil from the cylinder.

Remove the rotation cylinder.

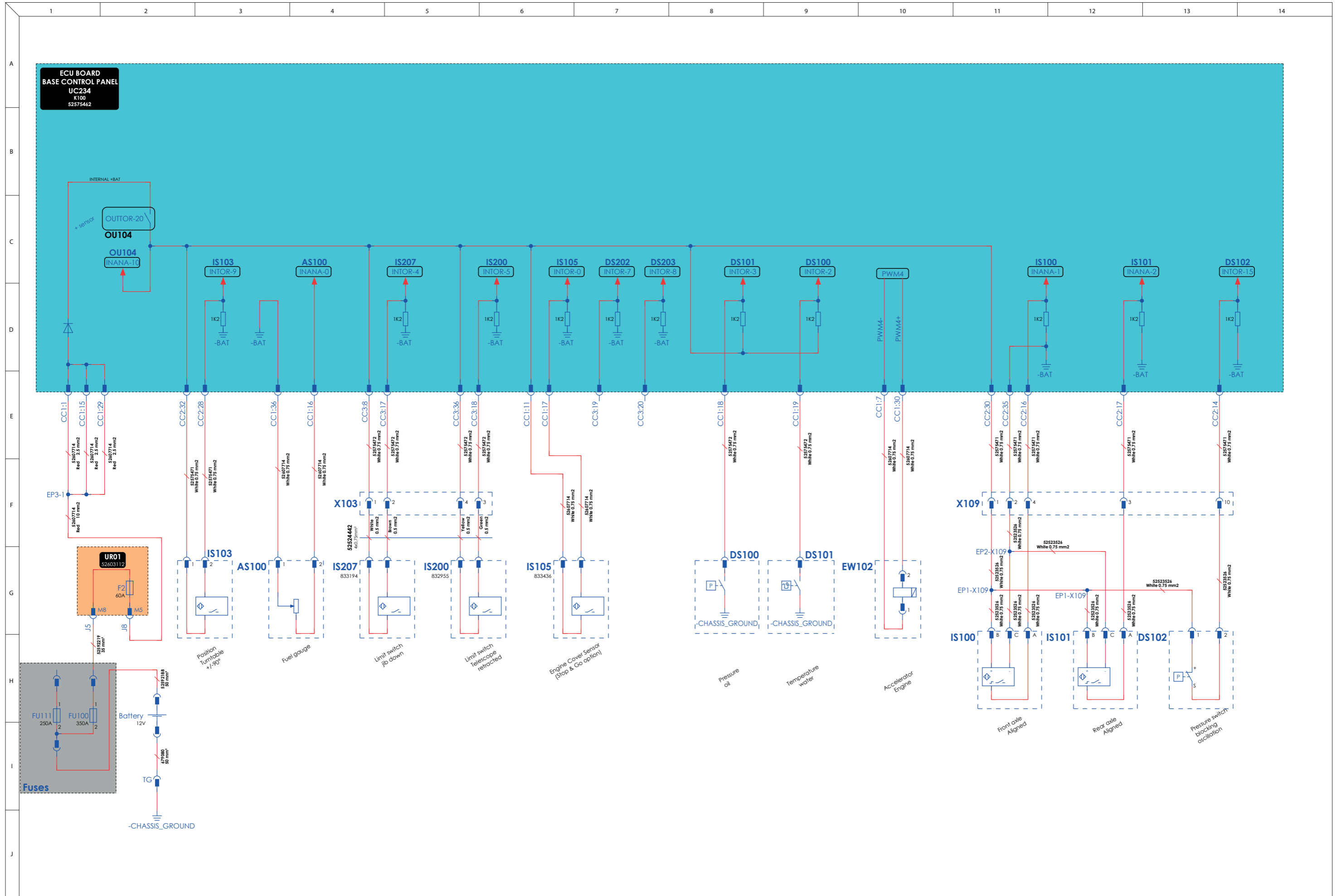


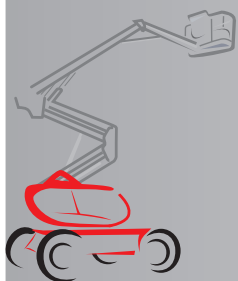
ELECTRICAL CHARACTERISTICS AND SPECIFICATIONS

pages

TECHNICAL SHEETS FOR ELECTRICAL COMPONENTS

FUSE BOX	3
– MAIN FUSE BOX	3
– ENGINE FUSE/RELAY BOX UR01	3
BASE CONTROL PANEL	4
– ECU BOX UC234	4
– BASE ECU FUSE	4

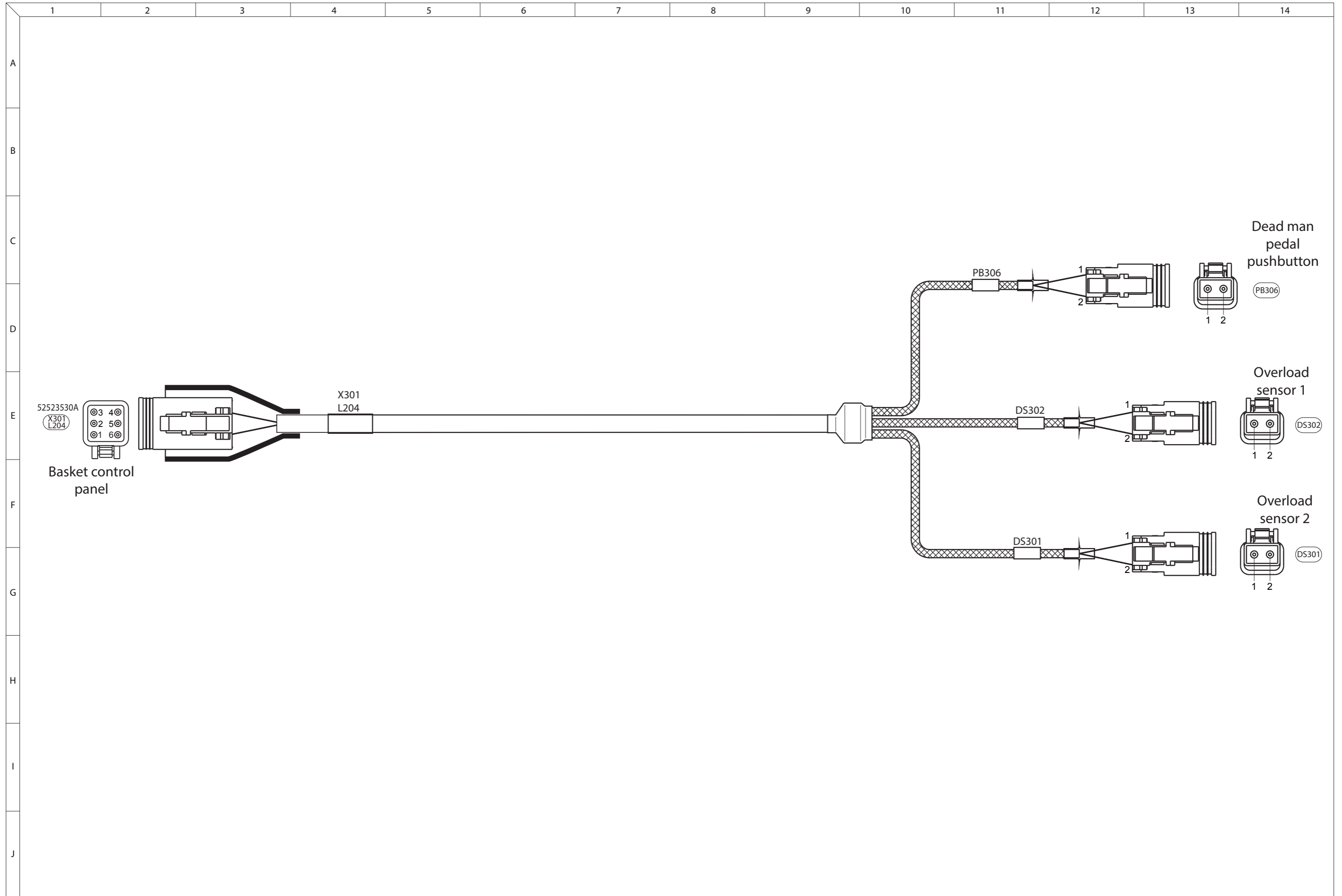





ELECTRICAL COMPONENTS LOCATION

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ELECTRICAL CONTROL COMPONENTS.....	3
ELECTRICAL POWER COMPONENTS	4
HARNESS ASSEMBLY	5
CHASSIS HARNESS - ITEM 1	6
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BASE AND BASKET CONTROL PANELS	13

BASKET harness - ITEM 7



Connector C1		
Pin No.	Type	Allocation
1	-	-
2	OU300	+Buzzer
3	OU301	+Front axle aligned indicator lamp
4	OU302	+Rear axle aligned indicator lamp
5	OU303	+Engine fault indicator lamp
6	OU304	+Tilt alarm light
7	OU305	+Overload alarm indicator lamp
8	OU306	+Preheat indicator lamp
9	OU307	+Diesel indicator lamp
10	-	X300 link connector pin 10
11	-	-
12	-	Connector C2 pin 1
13	-	Connection +APC Splice EP2
14	+APC	Splice EP2
15	PB307	Generator PB
16	-	Connector C5 pin 5
17	-	Connector C5 pin 2
18	-	Connector C4 pin 5
19	-	Connector C4 pin 2
20	PB304	Horn BP
21	PB302	Levelling unlock PB
22	-	Connector C2 pin 5
23	-	Connector X301 pin 4
24	PB301	Differential lock PB
25	-	Splice EP3
26	-	Connector C4 pin 3
27	-	Connector C5 pin 3
28	-	Connection +BAT splice EP1
29	-	Splice EP4
30	-	Connector C2 pin 3
31	-	Connector C2 pin 4
32	SW308/SW303	Basket tilt up switch
33	SW308/SW303	Basket tilt down switch
34	SW306/SW311	Jib up switch
35	SW306/SW311	Jib down switch
36	SW300/SW313	Low speed (tortoise) selector
37	SW309/SW304	Left basket rotation switch
38	SW309/SW304	Right basket rotation switch
39	SW301/SW312	"Crab" steering mode switch
40	SW301/SW312	4-wheel steering mode switch
41	SW300/SW313	High speed (hare) selector
42	-	Connection -BAT splice EP1

MENU	SUB-MENU	ACCESS LEVEL	COMMENTS
 CALIBRATION	ENGINE ACCELERATION CALIBRATION	DEALER	Access to the engine accelerator calibration page. READ: display possible.
	MANIPULATOR CALIBRATION	DEALER	Access the control panel manipulator calibration page.
	LEVELLING CALIBRATION	USER	Access to the engine accelerator calibration page. READ: display possible
	SPEED CALIBRATION	DEALER	Access to the movement speed calibration page (adjusted at end of production line). READ: display possible.
	OVERLOAD CALIBRATION	DEALER	Access to the redundant strain gauge settings page.
	GENERATOR CALIBRATION	DEALER	Access to the generator calibration page. READ: display possible.
	PRESSURE ADJUSTMENT	DEALER	Access to the electric limit switch deactivation page for adjusting basket pressures
	RUNNING-IN CYCLES	MANUFACTURER	Access to management page for jib/telescopic boom/turntable movement cycles
	PARAMETER MANAGEMENT	DEALER	Access the management of the machine's complete set of parameters (save/recover/reset)

17:33 — 20/06/18

INTOR UC234
4/10

14	AU101	ON
15	DS102	ON
16	-	OFF
17	PB303	OFF
18	SW100	OFF

Description	ON	OFF
Base emergency stop button	Not pressed	Pressed
Oscillation pressure switch	Pressure OK	Pressure NOK
-	-	-
Backup pump (basket)	Pressed	Released
Base / basket panel selector	Basket	Basis

2/6

00112233

INTOR - UPC102

18 42 — 15/02/18

INTOR UPC102
4/10

0	SW307	OFF
1	SW302	OFF
2	SW308	OFF
3	SW303	OFF
4	SW306	OFF
5	SW311	OFF
6	SW300	ON
7	SW312	OFF
8	SW309	OFF
9	SW304	OFF
10	SW313	OFF
11	SW301	OFF
12	J0306	OFF
13	J0307	OFF

Description	ON	OFF
LH steering	Pressed	Released
RH steering	Pressed	Released
Basket tilting retracted	Pressed	Released
Basket tilting extended	Pressed	Released
Jib up	Pressed	Released
Jib lowering	Pressed	Released
Tortoise mode	Low speed	Other mode
Hare mode	High speed	Other mode
LH Basket rotation	Pressed	Released
RH Basket rotation	Pressed	Released
Crab mode	Crabe	Other mode
4-Wheel mode	4-wheel	Other mode
Lower jib/telescope joystick	Not neutral	Neutral
Upper jib/telescope joystick	Not neutral	Neutral

3/6

00112233

18 43 — 15/02/18

INTOR UPC102
4/10

14	PB305	OFF
15	PB301	OFF
16	DS302	ON
17	J0305	OFF
18	PB302	OFF
19	PB304	OFF





Description	ON	OFF
Movement trigger	Pressed	Released
Differential lock	Pressed	Released
Overload sensor no. 2	No overload	Overload
Movement joystick	Not neutral	Neutral
Levelling unlock	Pressed	Released
Horn	Pressed	Released

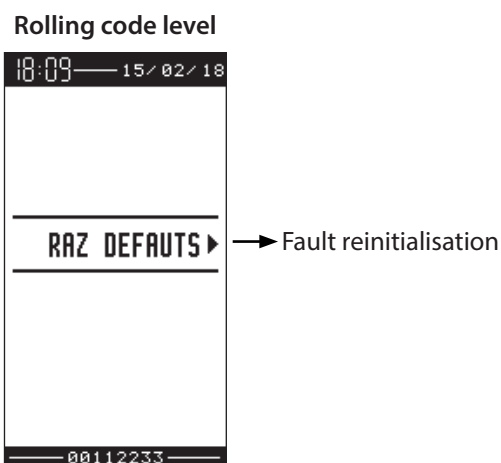
4/6

00112233

FAULT HISTORY sub-Menu

This sub-menu makes it possible to see the latest faults memorised by the system (1000 max.). These faults are displayed from newest to oldest. The oldest faults are erased to leave space for the most recent faults.

- The   keys are used to navigate between the different pages.
- The  or  keys will return the user to the Menu page.



Secret Code Menu

Access to sub-menus

The Secret Code sub-menu is selected by means of the  tab.



Sub-menu selection (WITHOUT Anti-start option):

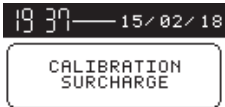
- CODE (User level)

Sub-menu selection (WITH Anti-start option):

- CODE (User level)
- ANTI-START LOCK (User level)
- ANTI-START MANAGEMENT (Dealer level)
- ANTI-START CODE CHANGE (Dealer level)
- DEFAULT ANTI-START CODE (Rolling code level)

OVERLOAD CALIBRATION sub-menu

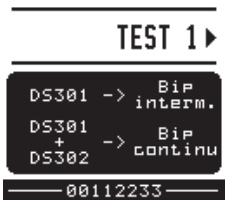
This sub-menu can be used to calibrate the overload sensors.



Use the **OK** key to toggle between the two overload sensors (test only 1 sensor).

Activation of calibration:

- Press one then both overload sensors (◀ STRAIN GAUGE ADJUSTMENT, 64).



Calibration result:

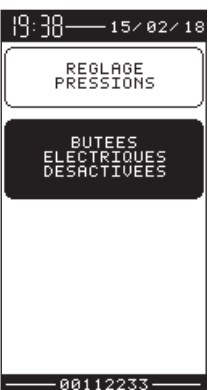
The basket buzzer indicates the result of the calibration.

- Intermittent beep = a single sensor is activated (Test 1: sensor DS301, Test 2: sensor DS302).
- Continuous beep = both sensors are activated.

Sub-menu GENERATOR CALIBRATION

This sub-menu can be used to calibrate the generator.

- (◀ GENERATOR SETTING (optional), 44)

Sub-menu PRESSURE ADJUSTMENTS

This sub-menu can be used to set the max. pressures for each cylinder (cylinder electric limit switches disabled).

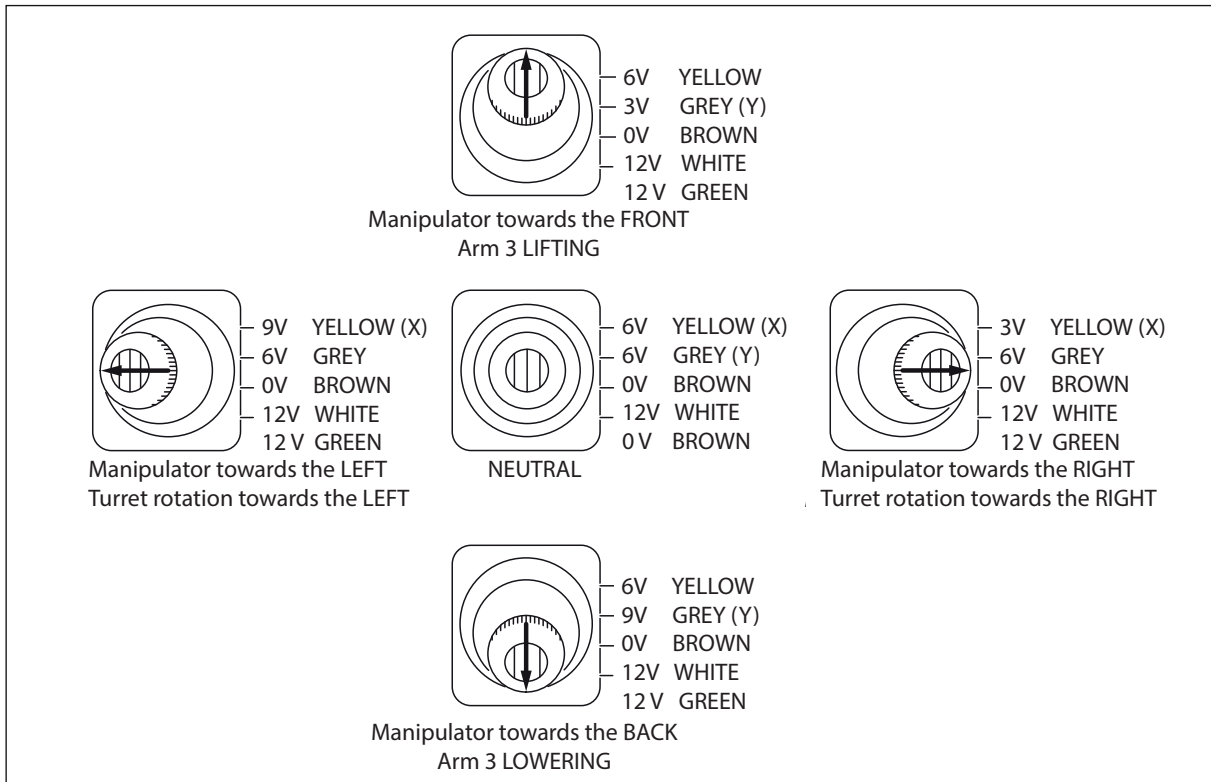
SCREEN GROUP						
Sub-group	Number	Description	Value	Minimum value	Maximum value	Number Total
ENGINE MANAGEMENT	0	Preheat Time Delay (s)	7.0	5.0	10.0	109
	1	Forced Engine Speed not started Time-out (s)	30	5	180	110
	2	Snow Mode Engine Speed Forcing Duration (s)	120	10	1800	111
	3	Idling engine Speed (rpm)	1300	0	3500	112
	4	Forced engine Speed (rpm)	1800	0	3500	113
	5	Work engine Speed (rpm)	2000	0	3500	114
	6	Slow (tortoise) engine Speed (rpm)	2000	0	3500	115
	7	Ramp engine Speed (rpm)	2600	0	3500	116
	8	Fast (hare) engine Speed (rpm)	3000	0	3500	117
	9	Generator engine Speed (rpm)	1700 (160 ATJ) 2200 (ATJ46)	0	3500	118
	10	Engine speed Level 1 (rpm)	1450	0	3500	119
	11	Engine speed Level 2 (rpm)	1650	0	3500	120
	12	Engine speed Level 3 (rpm)	1850	0	3500	121
	13	Engine speed Level 4 (rpm)	2050	0	3500	122
	14	Engine speed Level 5 (rpm)	2250	0	3500	123
	15	Engine speed Level 6 (rpm)	2450	0	3500	124
	16	Engine speed Level 7 (rpm)	2650	0	3500	125
	17	Engine speed Level 8 (rpm)	2850	0	3500	126
	18	Engine speed max Level 1 (rpm)	3000	0	3500	127
	19	J1939 SPN Conversion Mode	4	1	4	128
	20	Engine Fault Deletion Delay (s)	5.0	1.0	10.0	129
	21	Force Kubota Engine rpm	0	0	1	130
22	Kubota Engine Speed Value (rpm)	0	0	30000	131	
GENERAL TRAVEL	0	Travel Time Delay After Stop (s)	0.3	0.0	1.0	132
	1	Travel Stop Detection Time delay (s)	0.1	0.0	2.0	133
	2	Manipulator Profile Fast (hare) Travel Mode	1	0	2	134
	3	Manipulator Profile Ramp Travel Mode	1	0	2	135
	4	Manipulator Profile Slow (tortoise) Travel Mode	1	0	2	136
	5	Manipulator Profile Working Travel Mode	1	0	2	137
	6	Manipulator Profile Slow Speed Travel Mode	1	0	2	138
	7	Joystick Front Limit Linear Offset Profile (%)	66.00	55.00	75.00	139
	8	Front Setpoint Limit Linear Offset Profile (%)	70.00	55.00	75.00	140
	9	Joystick Rear Limit Linear Offset Profile (%)	34.00	25.00	45.00	141
	10	Rear Setpoint Limit Linear Offset Profile (%)	30.00	25.00	45.00	142
	11	Square Profile Front Setting Value	200	0	500	143
12	Square Profile Rear Setting Value	200	0	500	144	

SCREEN GROUP						
Sub-group	Number	Description	Value	Minimum value	Maximum value	Number Total
TELESCOPIC BOOM MANAGEMENT	0	Max Extension Speed (%)	46	31	61	201
	1	Extension acceleration ramp (%)	25	0	100	202
	2	Extension deceleration ramp (%)	10	0	100	203
	3	Max Retraction Speed (%)	38	23	53	204
	4	Retraction acceleration ramp (%)	35	0	100	205
	5	Retraction deceleration ramp (%)	14	0	100	206
	6	Max Extension Speed Base Cont Reduction (%)	-5	-20	0	207
	7	Max Retraction Speed Base Ctrl Reduction (%)	-5	-20	0	208
TELESCOPE STOP	0	Stop max speed (%)	12	1	30	209
	1	Deceleration ramp stop (%)	8	0	100	210
	2	Stop time-out stop (s)	1.5	0.0	10.0	211
JIB MANAGEMENT	0	Maximum Rising Speed (%)	44	29	59	212
	1	Rising acceleration ramp (%)	20	0	100	213
	2	Rising deceleration ramp (%)	10	0	100	214
	3	Max Lowering Speed (%)	20	5	35	215
	4	Lowering Acceleration Ramp (%)	48	0	100	216
	5	Lowering Deceleration Ramp (%)	20	0	100	217
TURNTABLE MANAGEMENT	0	Max Rotation Speed (%)	25	10	40	218
	1	Rotation Acceleration Ramp (%)	63	0	100	219
	2	Rotation Deceleration Ramp (%)	30	0	100	220
	3	Base Control Reduction Max Speed (%)	0	-20	0	221
	4	Max Speed Telescope Retracted Correction (%)	11	0	50	222
BASKET TILT MANAGEMENT	0	Maximum Rising Speed (%)	25	10	40	223
	1	Rising Acceleration Ramp (%)	10	0	100	224
	2	Rising Deceleration Ramp (%)	10	0	100	225
	3	Max Lowering Speed (%)	10	5	25	226
	4	Lowering Acceleration Ramp (%)	10	0	100	227
	5	Lowering Deceleration Ramp (%)	10	0	100	228
BASKET rotation MANAGEMENT	0	Max Rotation Speed (%)	8	5	23	229
	1	Rotation Acceleration Ramp (%)	10	0	100	230
	2	Rotation Deceleration Ramp (%)	10	0	100	231
STEERING MANAGEMENT	0	Max RH Steering Speed (%)	90	75	100	232
	1	RH Steering Acceleration Ramp (%)	5	0	10	233
	2	RH Steering Deceleration Ramp (%)	4	0	15	234
	3	Max LH Steering Speed (%)	90	75	100	235
	4	LH Steering Acceleration Ramp (%)	5	0	10	236
	5	LH Steering Deceleration Ramp (%)	4	0	15	237
GENERATOR	0	Generator Activated via LS/PVPx	0	0	1	238
	1	Setting value	50	5	300	239
	2	Generator Restart Time Delay After Movements (s)	4.0	0.0	10.0	240
	3	Generator Setpoint Ramp Increment (mA)	10	1	2000	241
	4	Generator Setpoint Ramp Decrement (mA)	14	1	2000	242
	5	Setpoint Value (mA)	50	0	300	243
	6	Setpoint Duration (s)	0.5	0.0	5.0	244
SAFE MAN SYSTEM	0	Auto Telescope Retraction Activated	0	0	1	245
	1	Time-out Before Telescopic Boom Retraction (s)	0.0	0.0	5.0	246
	2	Telescopic Boom Retraction Duration (s)	4.0	0.0	60.0	247
	3	Max Auto Retraction Speed (%)	25	5	100	248
	4	Auto Retraction Acceleration Ramp (%)	40	0	100	249
	5	Auto Retraction Deceleration Ramp (%)	20	0	100	250
	6	Safe Man with movement - Time-out ON (s)	0.1	0.0	0.5	251
	7	Safe Man without movement - Time-out ON (s)	2.0	0.0	5.0	252
TEMPERATURE MANAGEMENT	0	Fault Threshold Low Temp Threshold (deg)	-25	-60	25	253
	1	Hysteresis Fault Low Temp Threshold (deg)	2	0	20	254
	2	Temp Fault Time-out On (s)	30	0	1800	255
	3	Temp Fault Time-out Off (s)	30	0	1800	256

Analogue output test

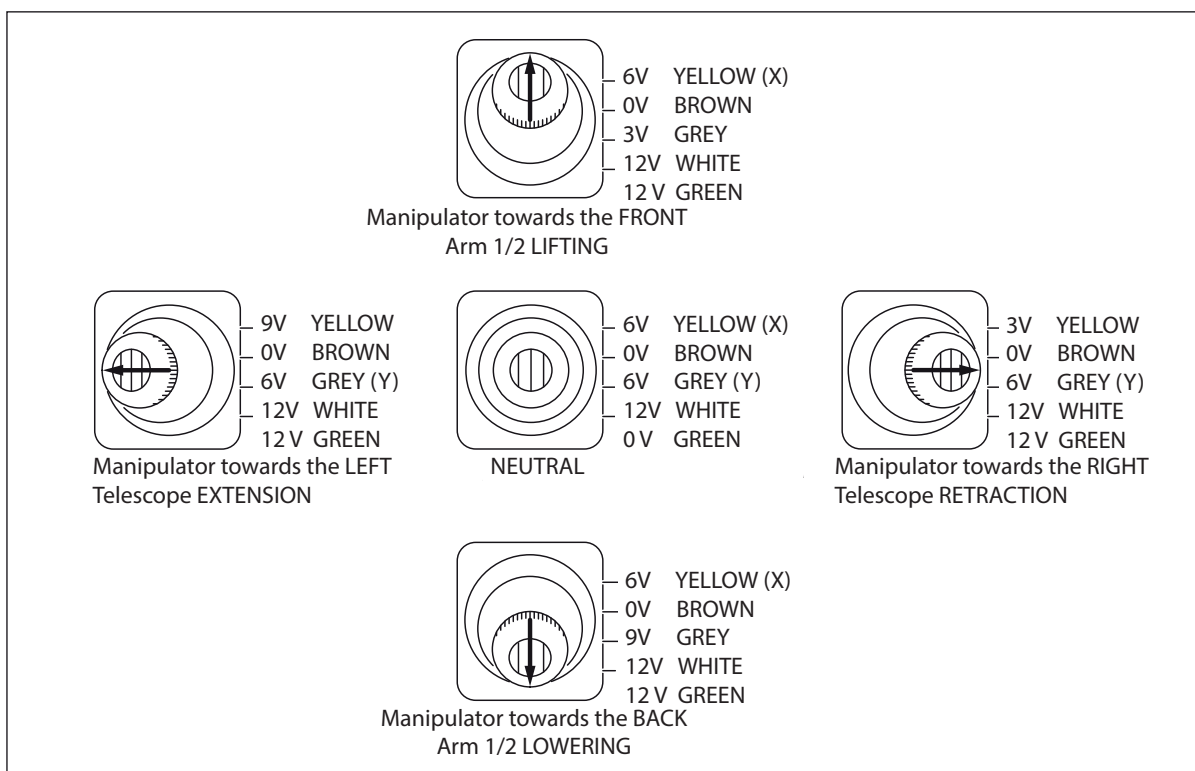
Turret rotation and arm 3 manipulator (A-1).

Move the ball towards the front, the back, the left then the right and check the values displayed by the voltmeter:



Telescope and arm 1/2 manipulator (A-2).

Move the ball towards the front, the back, the left then the right and check the values displayed by the voltmeter:



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