HT26 RT O - HT26 RT O SW - HT28 RTJ O - HT28 RTJ O SW - HT28 RTJ PRO - HT28 RTJ PRO SW - HT80 RT O - HT85 RTJ O - HT85 RTJ PRO

MAINTENANCE BOOK

HT26 RT O - HT26 RT O SW - HT28 RTJ O - HT28 RTJ O SW - HT28 RTJ PRO - HT28 RTJ PRO SW - HT80 RT O - HT85 RTJ O - HT85 RTJ PRO

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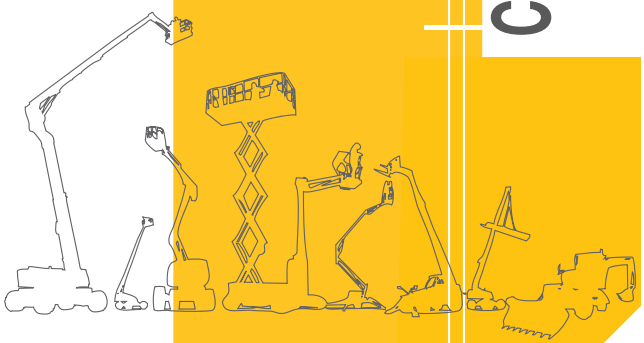
CONTENTS



A

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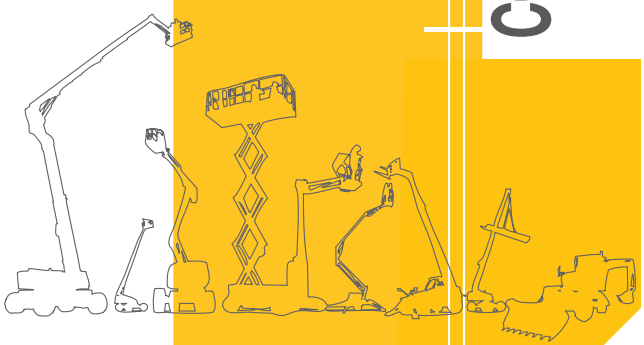
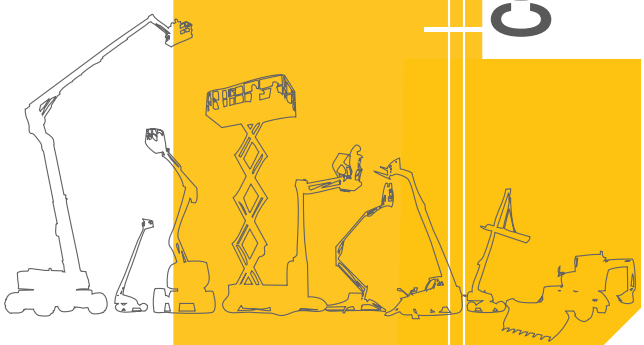


CONTENTS



E

Trouble shooting and diagram

F

Records

A - Preface - Foreword

You have just purchased a HAULOTTE® product and we would like to thank you for your business.

The Aerial Work Platform is a mechanical device primarily designed and manufactured with the intent to position people with the necessary tools and material to overhead elevated temporary workplaces. All other uses or alterations/modifications to the aerial work platform must be approved by HAULOTTE®.

This manual shall be considered a permanent component of the machine and shall be kept with the aerial work platform in the designated Manual Holder, at all times.

Safe operation of this product can only be assured if you follow the operating instructions contained in this manual are followed. To ensure proper and safe use of this equipment, it is strongly recommended that only trained and authorized personnel operate and maintain the aerial work platform.

We would particularly like to draw your attention to 2 essential points :

- Compliance with safety instruction (machine, use, environment).
- Use of the equipment within the performance limits.

With regard to the designation of our equipment, we stress that this is purely for commercial purposes and not to be confused with the technical specifications. Only the specifications in this manual should be used to study the suitability of the equipment for the intended use.

This maintenance and repairs book is specific to the HAULOTTE® products listed on the cover page of this manual. The maintenance book is intended for the on-site maintenance technician.

It is the on-site maintenance technician's duty to carry out the regular maintenance work recommended by HAULOTTE Services®.

This maintenance work is essential for correct machine operation.

If regular maintenance is not carried out, this may :

- Void the warranty.
- Cause machine malfunction.
- Reduce machine reliability and shorten its service life.
- Jeopardize operator safety.

To ensure that the regular maintenance requirements are fully satisfied, contact HAULOTTE Services®.

HAULOTTE Services® technicians are specially trained to carry out extensive repairs, interventions or adjustments on the safety systems or elements of HAULOTTE® machines. They carry genuine HAULOTTE spare parts and tools as required, and also provide fully documented reports on all work completed.

1 - Symbols and colors

Symbols and colors are used to alert the operator of safety precautions and/or to highlight important safety information.

The following safety symbols are used throughout this manual to indicate specific hazards and the hazard severity level when operating or maintaining the Aerial Work Platform.

Symbol

Symbol	Description
	Danger : Risk of injury or death
	Caution : Risk of material damage
	Prohibition relating to work safety and quality
	Reminder to use good practice or follow pre-operation checks
	Cross-reference to another part of the manual
	Cross-reference to another manual
	Cross-reference to repair (contact HAULOTTE Services®)
	Maintenance sheet
	Recommended tools
	Recommended part
	Safety
N.B. :	Additional technical information

A - Preface - Foreword

Decals

Color	Title	Description
		Danger : Indicates a hazardous situation which if not avoided, WILL result in death or serious injury.
		Warning : Indicates a hazardous situation which if not avoided, COULD result in death or serious injury.
		Caution : Failure to comply could result in minor or moderate injury.
		Notice : Indicates practices not related to personal injury.
		Procedure : Indicates a maintenance operation.

N.B.-:-THE FOLLOWING SAFETY ADVISORIES ARE USED THROUGHOUT THIS MANUAL TO INDICATE SPECIFIC HAZARDS WHEN OPERATING OR MAINTAINING THE TELEHANDLER.

Notes

1 - General safety rules

1.1 - MAINTENANCE IMPLEMENTATION

Your safety and the safety of the people around are essential.

Make sure the work area is clean in order to not to pollute the system of the machine.

Before performing any maintenance interventions, place the machine in maintenance configuration.

1. Place the machine on firm, level ground.
2. Stow the machine completely.
3. Position the boom in the axis of the tower.
4. Put the pin in the locked position.

Never leave the hydraulic cylinders fully extended before switching off the machine, or when stationary for an extended period of time. Keep the elements of the machine in configuration of maintenance thanks to mechanics devices.

Report that the machine is under maintenance by tagging the platform and ground control boxes.

Note :

- Using the machine during maintenance is strictly forbidden.
- Do not climb onto the covers.
- The handling of parts must be carried out using appropriate equipment (Chains, Lifting slings, Lifting anchors).
- Plug the end of any hoses removed, and cap any open ports to prevent contamination during maintenance.

Return the machine to operating configuration after maintenance has been completed :

1. Remove the turntable rotation locking pin.
2. Pull the E-stop button.

1.2 - UNCONTROLLED MOVEMENT HAZARD

Be aware of uncontrolled movement and always respect the following :

- Maintain clearance from high voltage lines.
- Maintain clearance from generators, radar, electromagnetic fields.
- Never expose the batteries or electrical components to water (high pressure washer, rain).
- Never tow the machine over extended distances.
- In case of a machine breakdown, it is possible to tow short distance to load it onto a trailer.
- Never leave the hydraulic cylinders fully extended before switching off the machine, or when stationary for an extended period of time.
- Retract and lower the boom to the stowed position rotate the turntable so that the boom is between the non-steering wheels.
- Select a safe parking location, on a firm level surface, clear of obstruction and traffic.
- Ensure all compartments are closed and secured.
- Chock the wheels.

1.3 - ELECTRIC SHOCK HAZARDS

The machine is not electrically insulated and does not provide protection from contact or proximity to electrically charged conductors.

Always position the lift at a safe distance from electrically charged conductors to ensure that no part of the machine is within an unsafe area.

Respect the local rules and the minimum safety distance from power lines.

Minimum safe approach distances

Electric voltage	Minimum safety distance	
	Mètre	Feet
0 - 300 V	Avoid contact	
300 V - 50 kV	3	10
50 - 200 kV	5	15
200 - 350 kV	6	20
350 - 500 kV	8	25
500 - 750 kV	11	35
750 - 1000 kV	14	45

N.B.-:-THIS TABLE IS APPLICABLE, EXCEPT WHEN THE LOCAL REGULATIONS ARE MORE STRICT.

Do not operate the machine :

- Do not operate the machine when close to live power lines, consider the movement of the machine and the sway of the electric power lines particularly in windy conditions.
- Do not operate the machine during lightning, thunderstorms, snow/ice or any weather condition that could compromise operator safety.
- Do not operate the machine during lightning or storms.
- Do not use the machine as a welding earth.
- Do not wash electrical components with a high pressure washer.
- Do not weld on the machine without first disconnecting the battery terminals.
- The machine must not be used while charging the batteries.
- When using the platform AC power line, ensure it is protected with a circuit breaker.

Keep away from the machine if it contacts energized power lines. Personnel on the ground or in the platform must not touch or operate the machine until energized power lines are shut off.

In the event of accidental contact with a high voltage line, wait for the power to the line be de-energized before attempting to operate the machine.

1.4 - EXPLOSION / FIRE HAZARDS

Always wear protective clothing and eye wear when working with batteries and power sources/systems.

N.B.-:-ACID IS NEUTRALIZED WITH SODIUM BICARBONATE AND WATER.

- Do not start the engine if you smell or detect liquid propane gas (LPG), gasoline, diesel fuel or other explosive substances.
- Do not work in an explosive or flammable atmosphere / environment.
- Do not touch hot components.
- Do not bridge the battery terminals with metallic objects.
- Do not service the battery in proximity of spark, open flame, lit cigarettes.
- Do not fill up the fuel tank, when the engine is running and/ or near a flame.

2 - Maintenance and repair training

2.1 - OWNER'S RESPONSABILITY

The owner (or hirer) has the obligation to inform technician of the instructions contained in the Operator Manual and Maintenance Book.

The owner (or hirer) has the obligation to renew all manuals or decals that are either missing or in bad condition.

Additional copies can be ordered from HAULOTTE Services®.

The owner (or hirer) is responsible for applying the local regulations regarding maintenance of the machine.

2.2 - TECHNICIAN'S RESPONSABILITY

The technician must read and understand the contents of this manual, operators manuals and the decals affixed on the machine.

The technician must inform the owner (or hirer) if the manual or any decals are missing or in poor condition, and of any malfunction of the machine.

Only authorized and qualified operators may operate HAULOTTE® machines.

2.3 - HAULOTTE SERVICES®

The HAULOTTE® is at your service in all 5 continents of the world via an extensive network of its own factory trained technicians, who are ready to respond to your every need.

2.4 - TRAINING

Whether you want to just service your equipment or carry out a complete overhaul, HAULOTTE® can provide you with a structured training program or we can tailor a program to suit your specific requirements or circumstances. Training can cover the general operation of the equipment, breakdowns, engine maintenance and repairs and electrical/hydraulic/mechanical repairs and trouble shooting.

2.5 - PRODUCT MODIFICATION

In a constant effort to improve the quality of machines, HAULOTTE continually monitors technical improvements that enable to develop products with improved safety and greater reliability. The target being that HAULOTTE® always work to build confidence in the relationships with our customers.

These improvements will be shared via the following documents :

- OI : Obligatory Intervention, Safety information requiring immediate action (take into account by HAULOTTE®).
- NI : Technical improvement requiring immediate action (take into account by HAULOTTE®).
- RI : Improvement proposed to customers to take into account during maintenance operation.
- PI : Product information for knowledge.

2.6 - AFTER SALES SERVICE

Our HAULOTTE Services® After Sales Service is at your disposal throughout your machine's service life to ensure the optimum use of your HAULOTTE product :

- When contacting our After Sales Service, ensure that you provide the machine model and serial number.
- When ordering any consumables or spare parts, please use this manual and the HAULOTTE® Essential catalogue to receive your genuine HAULOTTE® spare parts, your only guarantee of parts interchangeability and correct machine operation.
- If there is an equipment malfunction involving a HAULOTTE® product, then contact HAULOTTE Services® immediately even if the malfunction does not involve material and/or bodily damage.

2.7 - PRODUCT INFORMATION

Without the written permission from Haulotte, modifying a HAULOTTE® product is a Safety concern. Any modification may violate Haulotte design parameters, local regulations and industry standards.

If you desire a modification to the product, submit a request in writing to HAULOTTE.

With the utmost care to ensure enhanced reliability and greater safety of the HAULOTTE® products, it is pertinent that when a "Service or Safety Bulletin" is issued, action is taken immediately. Once the bulletin has been addressed, make sure that the completed form is submitted to HAULOTTE Services®.

Do not hesitate to contact HAULOTTE Services® , should you have any questions relating to the issued bulletin(s) or with questions on the policy itself.

3 - Conditions of warranty

Our warranty conditions and extension contracts are now available on the websites of our sales network : www.haulotte.com

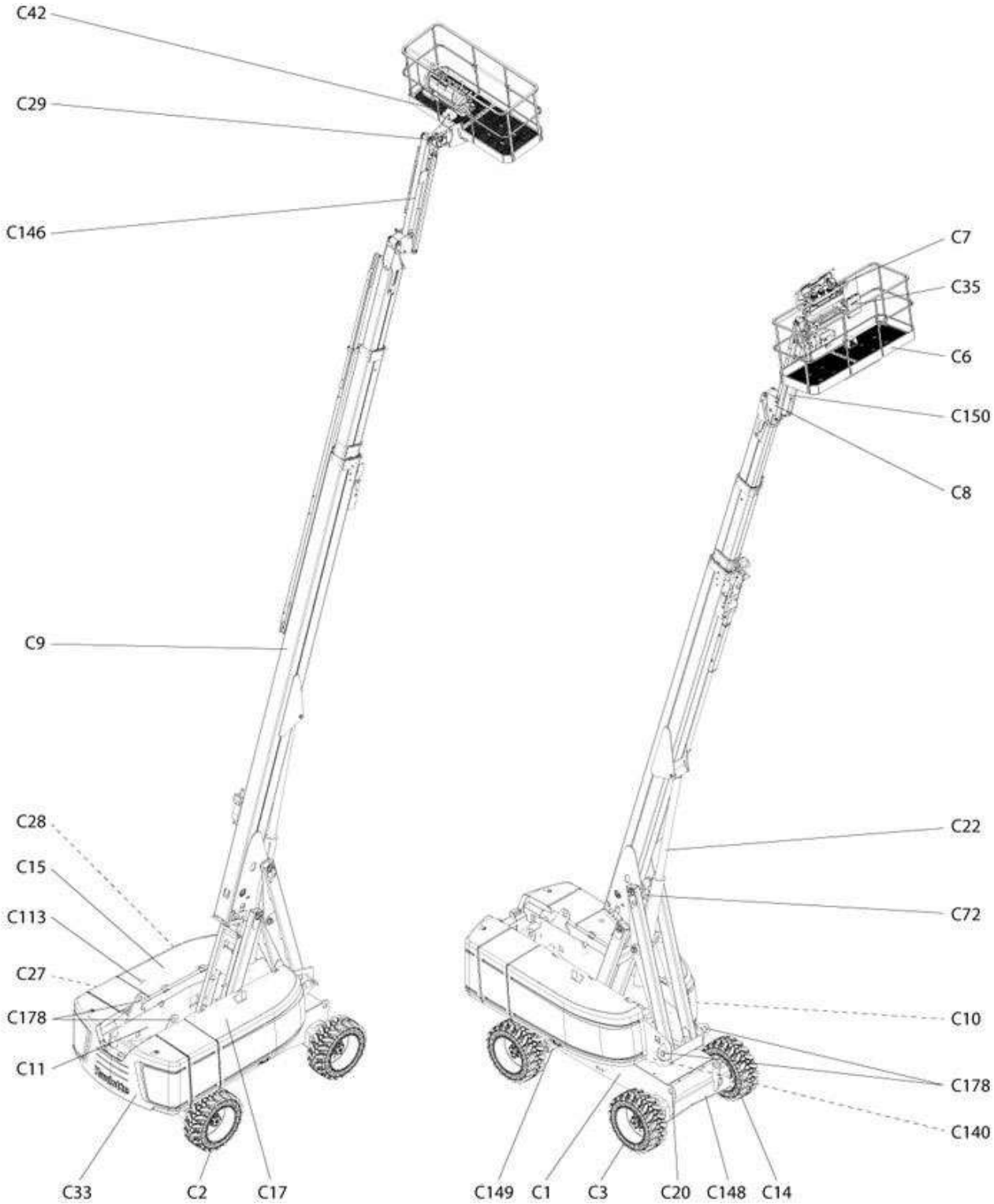
Notes

Notes

1 - Primary machine components

1.1 - LAYOUT

HT26 RT O - HT26 RT O SW - HT80 RT O - HT28 RTJ O - HT28 RTJ O SW - HT85 RTJ O - HT28 RTJ PRO - HT28 RTJ PRO SW - HT85 RTJ PRO



C - Familiarization

Marking	Description	Marking	Description
C1	Chassis	C27	Ground control box + Universal plug
C2	Front driven steering axle	C28	Tilt sensor
C3	Rear drive and/or steer wheel	C29	Platform rotation cylinder
C6	Platform	C33	Counterweight
C7	Platform control box	C35	Document holder
C8	Input jib leveling cylinder	C42	Foot Switch
C9	Telescoping boom	C72	Output jib compensation cylinder
C10	Slew ring	C113	Beacon light
C11	Turntable assembly	C140	Propane bottles - (For ANSI / CSA standard only)
C14	Hydraulic drive motor and reducer	C146	Jib (If equipped)
C15	Right side compartment (hydraulic oil tank and fuel tank)	C148	Fixed axle
C17	Left side compartment (engine, pump and starter battery)	C149	Oscillating axle
C20	Tie-down points	C150	Jib lifting cylinder
C22	Boom lift cylinder	C178	Lifting points

Universal plug

1.2 - GROUND CONTROL BOX

1.2.1 - Layout

General view

C - Familiarization

Controls and indicators

Marking	Name	Description	Function
1	SA720	Platform tilt control	By pressing on  : Tilt the platform towards the front of the machine
			By pressing on  : Tilt the platform towards the back of the machine
2	SA620	Jib raising / lowering switch[1]	By pressing on  : Jib raising
			By pressing on  : Jib lowering
3	SA530	Boom telescoping switch	By pressing on  : Boom extending
			By pressing on  : Boom retracting
4	SA520	Boom raising / lowering switch	By pressing on  : Boom raising
			By pressing on  : Boom lowering
6	SA905EN	Enable Switch / Back-up unit selector	By pressing on  : • Validation of controls when engine started • automatic switching of emergency electropump if the engine is stopped
7	SA250	Turntable rotation switch	By pressing on  : Counter clockwise (CCW) rotation
			By pressing on  : Clockwise (CW) rotation
8	SA750	Platform rotation switch	By pressing on  : Clockwise (CW) rotation
			By pressing on  : Counter clockwise (CCW) rotation
9	SB801	E-stop button	Pulled out : Ground control box energized
			Pushed in (activated) : De-energizes control system
10		Indicator, ground control box selected	LED lights up - ground control box icon

Marking	Name	Description	Function
11	SA801	"Overriding system" control	By pressing on  : This should be used ONLY when normal operation from the ground box is unavailable - use in emergency ONLY
12	SA907	Horn button	By pressing on  : Horn activation
13		Indicator of the platform control box selection	LED lights up - platform control box icon
14	SA903	Beacon light on/off	By pressing on  : Beacon light ON / OFF
15		Overload indicator	Alarm icon  : • When machine is turned on, both (15) and (19) will light up Is blinking if overriding is active : • If there is a fault, an error code will be displayed on the Activ' Screen • Or Hydraulic oil temperature icon is active on the Activ' Screen • Or Engine pressure icon is active on the Activ' Screen • Or Engine stop icon is active on the Activ' Screen • Or Overload machine status is active on the Activ' Screen
16	SA905ST	Engine start-up selector	By pressing on  : Engine start / stop
17		Propane Gas supply[2]	By pressing on  : Propane Gas supply selection
18		Petrol/Gasoline or diesel supply[3]	By pressing on  : Fuel supply selection
19		Engine warning indicator / Engine pre-heating	Alarm icon  : • When machine is turned on, icon (19) and (15) will be lit Is blinking if overriding is active : • Engine warning icon will be displayed on the Activ' Screen • Or Tilt machine status will be displayed on the Activ' Screen • Or Engine is pre-heating
20		DPF regeneration inhibited[4]	By pressing on  : Refusal of the request for regeneration
21		DPF regeneration required[5]	By pressing on  : Regeneration start-up

C - Familiarization

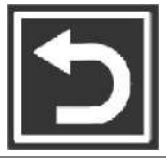
Marking	Name	Description	Function
22	SA900	Control box activation key switch	 : De-energizes control system
			 : Platform control box energized
			 : Ground control box energized
23	U101	Activ'Screen 2	

1. For machines fitted with
2. For machines fitted with
3. For machines fitted with
4. For machines fitted with
5. For machines fitted with

1.2.2 - HAULOTTE Activ'Screen 2

Upon starting and during operation of the machine, the LCD screen "Activ'Screen" located on the ground control box displays in real time the machine operating status.

HAULOTTE Activ'Screen 2

Icon	Description	Function	Icon	Description	Function
HAULOTTE Activ'Screen 2					
					
Navigation buttons - Above Activ'Screen display					
	Home Button	Allows return to the home screen at any time		Up Navigation	Permits scrolling up through the screen (if present)
	Left navigation	Permits navigation to screens to the left (if present)		Down Navigation	Permits allows scrolling down through the screen and onto the following screen (if present)
	Right Navigation	Permits navigation to screens to the right of the current screen (if present)		Cancel Button	Used to refuse or cancel a selection within the menu
	Back button	Returns the user to the previous screen		Validation Button	Used to confirm selection within the menus

C - Familiarization

On initial start-up of the machine or after 3 day of inactivity, the following screens are displayed in order.

Controls and indicators

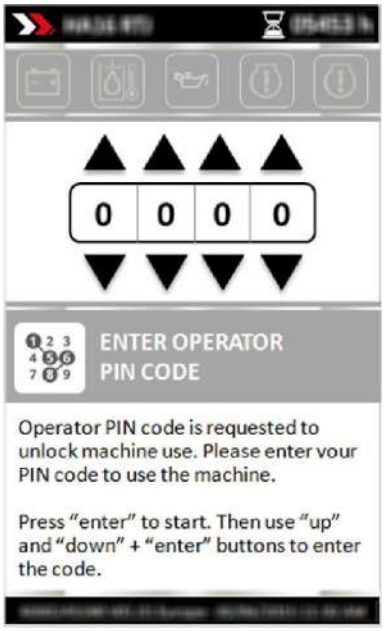
Icon	Description	Function	Icon	Description	Function
Machine power up (Start-up screen)					
					
					

C - Familiarization

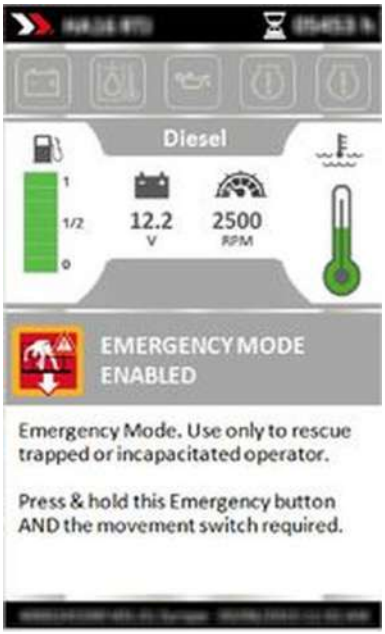
Controls and indicators

Icon	Description	Function	Icon	Description	Function
		Access code (Will be visible - depending on the machine)		Access code not yet entered	
				Access code entered is correct (Level 1, 2 or 3 depending on authorization of technician)	
				Access code entered is incorrect	
		Access code NIV 1 (Will be visible - depending on the machine)	The machine can be personalized with a user identification code. Personalization is only possible with level 1 access. Machine properties display : Soft version, machine serial number, adjustment parameters. Possible change of parameters : Language, fault display format, brightness setting, time, and some options availables.		
				Operator PIN code not yet entered	
				Operator PIN code entered is correct	
				Operator PIN code entered is incorrect	

Controls and indicators

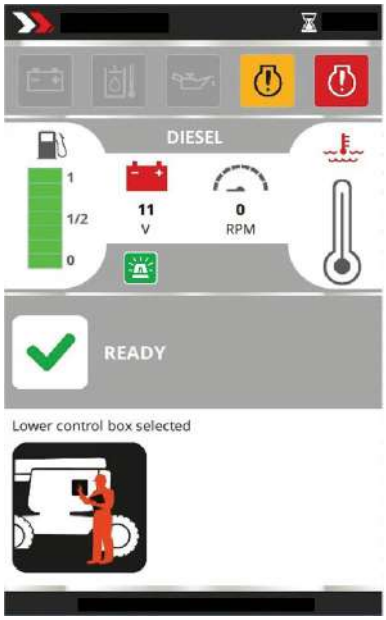
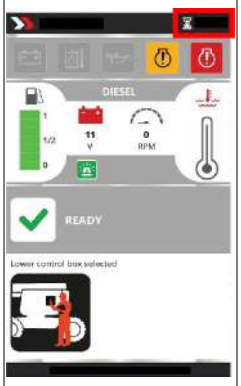
Icon	Description	Function	Icon	Description	Function
		Operator PIN code (Will be visible - depending on the machine)	The machine can be personalized with a user identification code. Personalization is only possible with level 2 access. Contact HAULOTTE Services®.		
				Operator PIN code not yet entered	
				Operator PIN code entered is correct	
				Operator PIN code entered is incorrect	

Controls and indicators

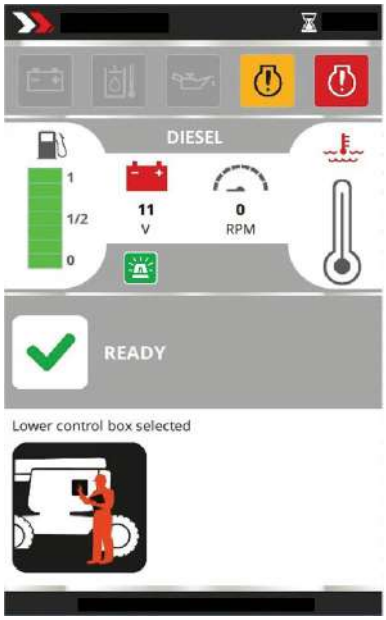
Icon	Description	Function	Icon	Description	Function
		Emergency mode		Emergency mode is activated when : • The E-Stop at platform control box is pushed in (de-energized). • The machine is in overload state. • Ground control box is selected/energized. • The emergency overriding button is activated.	
				Emergency mode is deactivated when : • The E-Stop at platform control box is pulled out (energized). • The machine is NOT in overload state. • Ground control box is NOT selected/ energized.	
				The Emergency mode is out of service/ non-functional	
				Emergency mode has been used and activation of its function saved in the memory of the machine. A HAULOTTE® certified technician is required to reset the Emergency Mode system.	

C - Familiarization

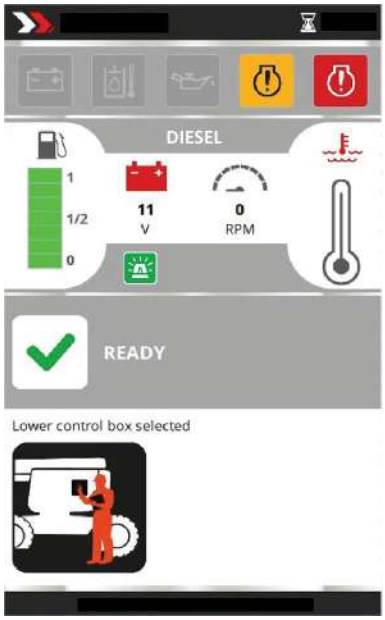
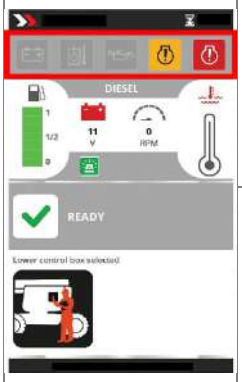
Controls and indicators

Icon	Description	Function	Icon	Description	Function
Home screen (dashboard) (Will be visible - depending on the machine)					
					
	Machine model zone			Machine Model	• Machine model display
	Hour meter/next maintenance zone			Hourmeter	• The timer flashes if the engine is switched on and the hourmeter increases.
				Maintenance use	The Maintenance Tool icon and the number of hours remaining until the next maintenance are displayed for 5 seconds when the machine is started up. Maintenance Tool icon blinks; if maintenance is due.
					The maintenance tool icon turns RED when the next scheduled maintenance must be carried out in under 25 hours.

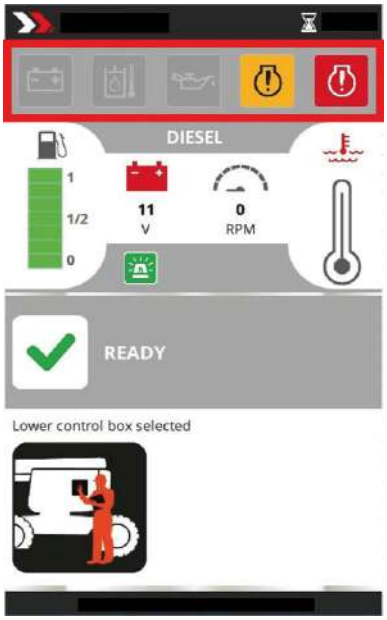
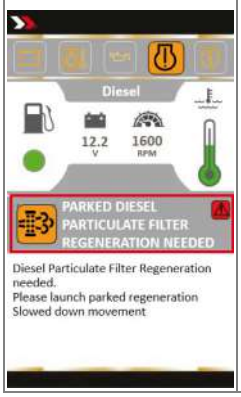
Controls and indicators

Icon	Description	Function	Icon	Description	Function
Home screen (dashboard) (Will be visible - depending on the machine)					
					
	Warning icons zone			Battery State	• Icon is ON if there is no charge output detected from the alternator • Icon is flashing if a failure code for the alternator is detected (code F09.10)
				Hydraulic oil temperature	Icon is ON when the temperature in the hydraulic reservoir has exceeded the maximum required temperature. Stop using the machine and allow the oil to cool down.
				Engine oil pressure	Icon is ON if engine oil pressure is lower than required limit while engine is running. The Engine must be switched OFF immediately to avoid damaging the motor.
				Engine oil level	• The engine oil level is under the acceptable limit for correct engine operation. Top up the oil level.
				Stop motor	• Icon is ON if an engine failure is detected (coolant, pressure, alternator etc) • Or if the Engine shuts down after 3 seconds of running. • Or after 1 second when engine fails to start.

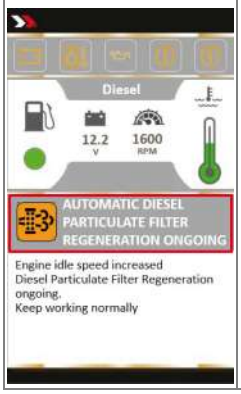
Controls and indicators

Icon	Description	Function	Icon	Description	Function
Home screen (dashboard) (Will be visible - depending on the machine)					
					
	Warning icons zone			Engine warning	• Icon is ON if Engine warning is detected. Or one of the engine maintenance schedules has been exceeded.
	Warning icons zone			Engine decontamination fault (If fitted)	• Engine decontamination system fault. In this case, you must contact HAULOTTE Services® as soon as possible.

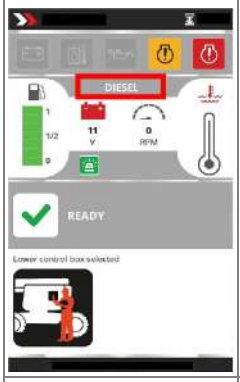
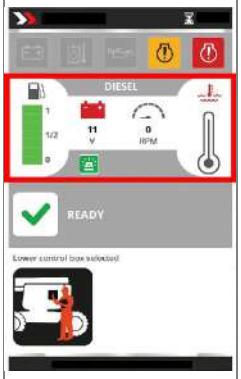
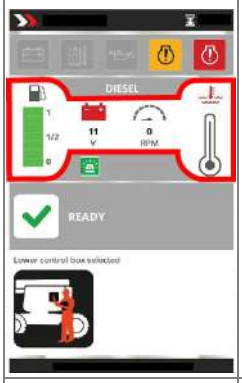
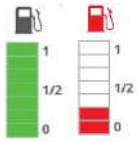
Controls and indicators

Icon	Description	Function	Icon	Description	Function
Home screen (dashboard) (Will be visible - depending on the machine)					
					
	Warning icons zone		DPF regeneration required (If fitted)	• Permanently lighted if the particle filter requires regeneration with a high clogging level
	Warning icons zone		DPF regeneration inhibited (If fitted)	• Light stays on if regeneration is inhibited

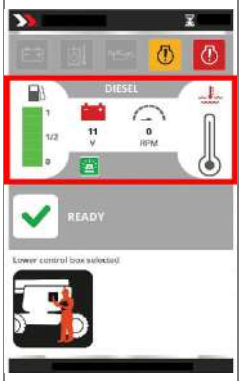
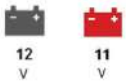
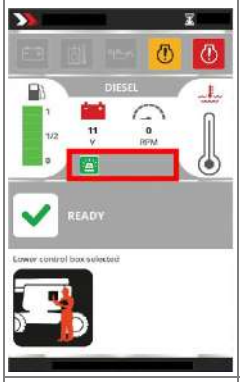
C - Familiarization

Icon	Description	Function	Icon	Description	Function
	Warning icons zone			DPF regeneration in progress, high temperature in the exhaust system (HEST) (If fitted)	• Light stays on during regeneration

Controls and indicators

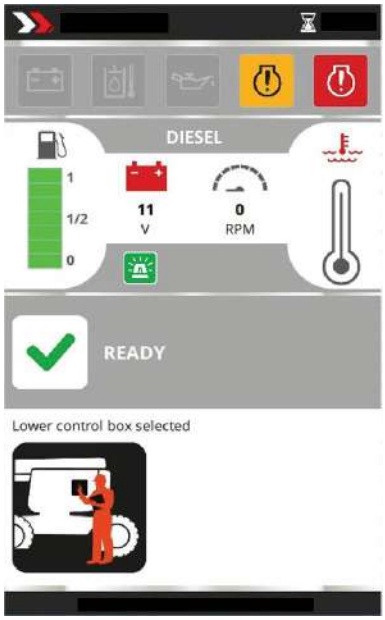
Icon	Description	Function	Icon	Description	Function
Home screen (dashboard) (Will be visible - depending on the machine)					
	Functional information zone			Power mode used	• Diesel • GPL / LPG • Electrical
				Bargraph	
				Digital Gauge - Fuel reserve indicator (ON/OFF)	The indicator changes from GREEN to RED when the fuel level is low and indicator is activated
				Analog Gauge - Fuel level gauge	The fuel level indicator switches from GREEN to RED when the fuel level is low

Controls and indicators

Icon	Description	Function	Icon	Description	Function
Home screen (dashboard) (Will be visible - depending on the machine)					
	Functional information zone			Charge Battery	Displays the machine battery voltage. The indicator switches to RED if the voltage is low.
				Engine Speed (rpm)	Engine speed display
				Temperature motor	Displays Engine coolant temperature. The indicator switches from GREEN to RED when the engine overheats
				Additional functions	
				Beacon	• The icon is ON when the flashing light is switched on
				Working light	• The icon is ON when the work light is switched on
				Activ' Lighting System	• The icon is ON when the Activ' Lighting System is switched on in auto or manual mode
				Stop Emission System	• The icon is ON if the system is active on the machine

C - Familiarization

Controls and indicators

Icon	Description	Function	Icon	Description	Function
Home screen (dashboard) (Will be visible - depending on the machine)					
					
	Machine status zone			Pictogram and title	• Displays the pictogram and machine status
				Ready	Machine ready, displayed when no failures and no other machine state icons is active
				Alarm	Alarm icon is flashing slowly If there is either an active or detected machine failure, or if the machine is in an overload or tilt is active. When the Alarm symbol is displayed, there will also be a symbol displayed to show either the type of machine state, or machine failure that corresponds.

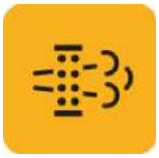
Controls and indicators

Icon	Description	Function	Icon	Description	Function
Home screen (dashboard) (Will be visible - depending on the machine)					
				Layout	
				Platform control selected	Selector switch is in platform control box position
				Ground control selected	Selector switch is in ground control box position
				Tilt	The machine is elevated , and is on a slope greater than the permitted slope. Depending on the machine configuration, the lifting and extension functions are slowed or stopped.
				Overload	The platform is overloaded. Remove the excessive load to or below the rated capacity, to restore functions. In case of an emergency, to rescue the operator in platform, use the Overriding system.

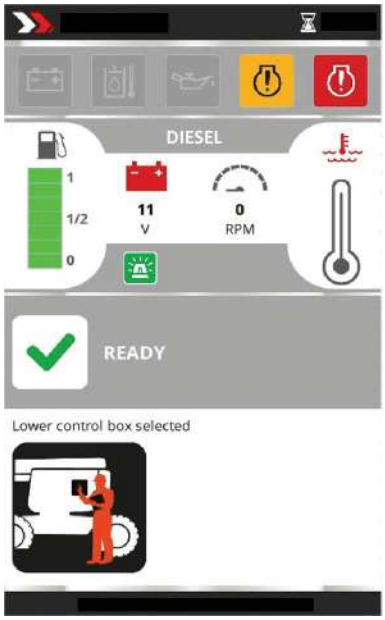
Controls and indicators

Icon	Description	Function	Icon	Description	Function
Home screen (dashboard) (Will be visible - depending on the machine)					
				Layout	
				Pre-heating	Engine's automatic preheat system is active. The time to pre-heat will vary according to engine and ambient temperature. The machine can be started as soon as the indicator goes out.
				Radius limitation	Icon is ON if the range limit is active or faulty
				Machine is charging	The machine is charging by the engine

Controls and indicators

Icon	Description	Function	Icon	Description	Function
Home screen (dashboard) (Will be visible - depending on the machine)					
				Low fuel level	Fuel level is low. Refill the fuel tank to the marked level. Attention: Lack of fuel may damage the motor/engine and will not be covered under warranty.
				Stop Emission System	Icon is ON when the function cuts the engine
				Activ' Lighting System	The function is off. To switch it on, go to the 'Settings' menu
				DPF regeneration required (If fitted)	• Permanently lighted if the particle filter requires regeneration with a high clogging level

Controls and indicators

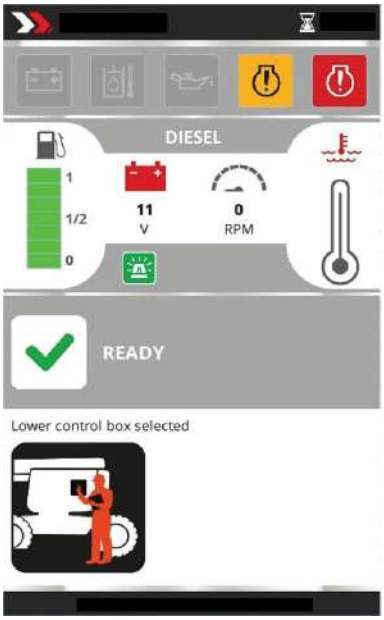
Icon	Description	Function	Icon	Description	Function
Home screen (dashboard) (Will be visible - depending on the machine)					
					
				Layout	
				Diagnostic in progress	The HaulotteDiag console is connected to the machine
				Screen software obsolete	Screen software update essential Contact HAULOTTE Services®

Controls and indicators

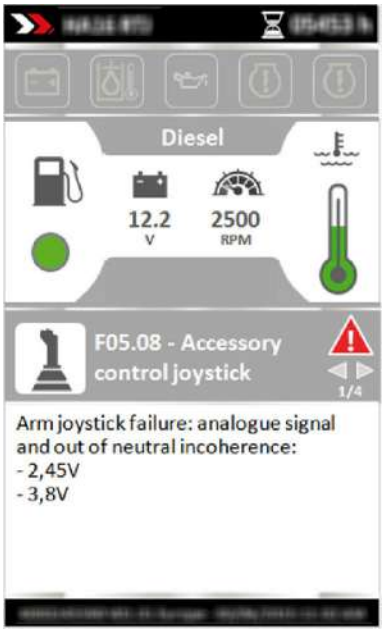
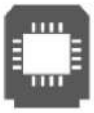
Icon	Description	Function	Icon	Description	Function
Home screen (dashboard) (Will be visible - depending on the machine)					
				F12.01 bus CAN fault	CAN network fault between the screen and the rest of the machine
				Activ' Shield Bar disable	The secondary safety system is switched off
				Activ' Shield Bar triggered	 The secondary safety system is triggered. An operator may be trapped on the platform : • In this situation, supervisor(s) at ground level must turn the control box key selector (22) to the ground control box  position to take control. • The platform box controls are now de-energized. • Check that the E-Stop button (9) at ground is not pressed in. • To safely activate movements from the ground control box, the Enable Switch (6)  must be pressed and held.

C - Familiarization

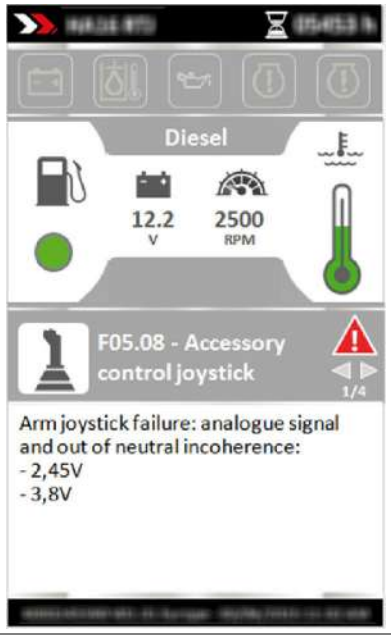
Controls and indicators

Icon	Description	Function	Icon	Description	Function
Home screen (dashboard) (Will be visible - depending on the machine)					
					
	General information zone			Machine software version and code	• Displays the reference and version of the software installed on the machine
				Machine date and time	• Displays the date and time of the machine ECU

Controls and indicators

Icon	Description	Function	Icon	Description	Function
Machine fault (Will be visible - depending on the machine)					
					
Machine fault icons					
	Failure code F01.xx	Fault - Variator		Failure code F09.xx	Fault - IC Engine
	Failure code F02.xx	Fault - power contactor		Failure code F10.xx	Fault - Functions
	Failure code F03.xx	Fault - command relay		Failure code F11.xx	Fault - machine safety
	Failure code F04.xx	Fault - electro-valve		Failure code F12.xx	Fault - electronic control unit ECU

Controls and indicators

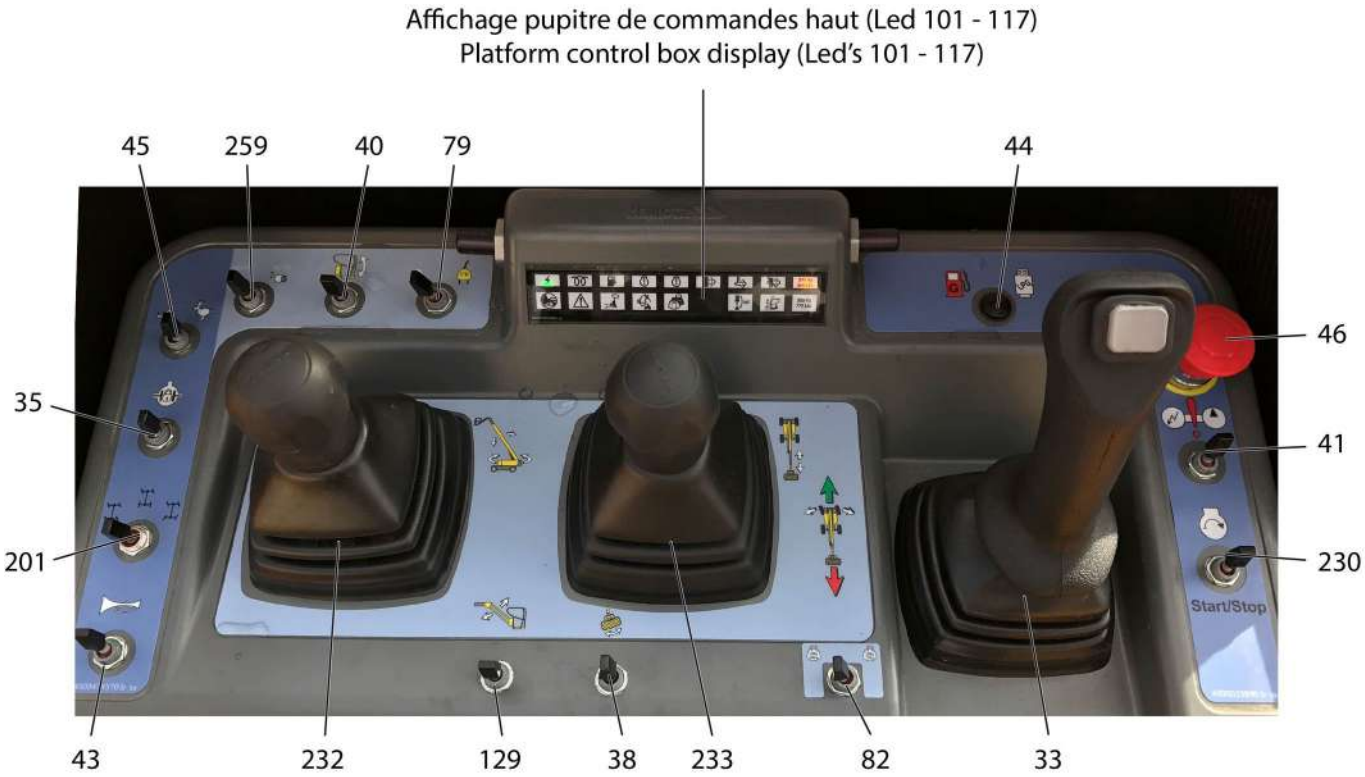
Icon	Description	Function	Icon	Description	Function
Machine fault (Will be visible - depending on the machine)					
					
Machine fault icons					
	Failure code F05.xx	Fault - joystick		Failure code F13.xx	Fault - Switches
	Failure code F06.xx	Fault - weight management system		Failure code F14.xx	Fault - Driving pump
	Failure code F07.xx	Fault - limit switch or sensor		Failure code F15.xx	Fault - data communication system CAN
	Failure code F08.xx	Fault - electrical circuit		Failure code F16.xx	Fault - Electric motor

Notes

1.3 - PLATFORM CONTROL BOX

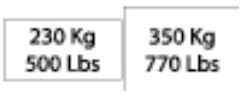
1.3.1 - Layout

General view



C - Familiarization

Controls and indicators

Marking	Name	Description	Function
33	SM902	Drive joystick	Move forward : Forward drive
			Move backwards : Reverse drive
		Steering thumb / rocker switch	Press right side of button : Steer right - According to selected mode (201)
			Press left side of button : Steer left - According to selected mode (201)
35	SA100	Differential lock selector	Toggle left and hold(Activated) : Maximum drive torque (on difficult or sloping ground)
			Release (deactivated) : Standard torque
38	SA751	Platform rotation switch	Move to the right : Counter clockwise (CCW) rotation
			Move to the left : Clockwise (CW) rotation
40	SA721	Platform leveling switch	Move upwards : Raise platform
			Move downwards : Lower platform
41	SA800	Auxiliary power switch	Toggle and hold : Back-up unit activated
			Release : Back-up unit deactivated
43	SA907	Horn button	Horn
44	SA304	Fuel selector[1]	LPG : Propane Gas supply-Move to the right
			G : Petrol/Liquid propane gas or diesel supply-Move to the left
45	SA110	Drive speed selector	 High-speed drive
			 Low-speed drive
46	SB802	E-stop button	Pulled out : Platform control box energized
			Pressed in : De-energizes control system (Engine stopped)
79	SA906	Generator selector[2]	Move to the left : Generator deactivated
			Move to the right : Generator activated
82[3] 	SA802	230 kg (500 lbs) or 350 kg (770 lbs) load selector	Move to the left : 230 kg (500 lbs) load selected
			Move to the right : 350 kg (770 lbs) load selected
129	SA621	Jib raising / lowering switch[4]	Toggle upwards and hold : Jib raising
			Toggle downwards and hold : Jib lowering
			Release : No movement
201	SA101	Steering mode selector[5]	All 4 wheels steer
			Front 2 wheels steer
			Crab mode
230	SA303	Engine start-up / stop selector	Start or stop the engine (depending on the machine's operating status) by moving the toggle switch upwards

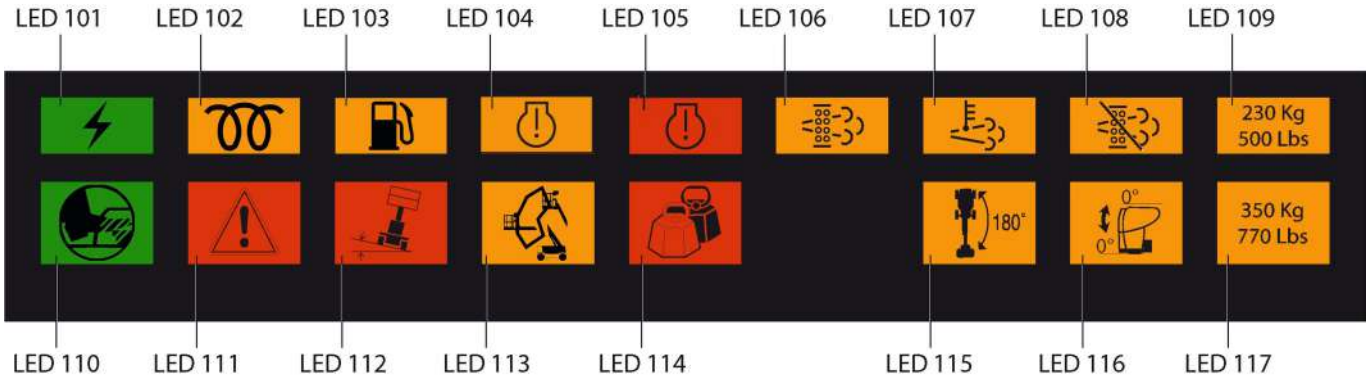
C - Familiarization

Marking	Name	Description	Function
232	SM900	Turntable rotation joystick	Move to the right : Counter clockwise (CCW) rotation
			Move to the left : Clockwise (CW) rotation
		Boom raise / lower joystick	Move forward : Raise boom
			Move backwards : Lower boom
233	SM901	Boom telescope joystick	Move forward : Retract boom Upper boom
			Move backwards : Extend boom Upper boom
259	SA907B	Activ' Lighting System selector	 ON / OFF
			 Automatic lighting

1. For machines fitted with
2. For machines fitted with
3. If machine equipped with dual load
4. For machines fitted with
5. For machines fitted with

1.3.2 - Display Panel (LED'S 101 - 117)

Upper control box display



Marking	Name	Symbol	Function
LED 101	HL900		Power ON
LED 102	HL300		Combustion engine pre-heating
LED 103	HL307		Low fuel level
LED 104	HL304		Engine warning
LED 105	HL305		Engine shutdown
LED 106	HL301		DPF regeneration required (If equipped)
LED 107	HL302		DPF regeneration in progress, high temperature in the exhaust system (HEST) (If fitted)
LED 108	HL303		DPF regeneration inhibited (If equipped)
LED 109[1]	HL805	230 kg 500 lbs	Load selection 230 kg (500 lbs)
LED 110	HL807		Foot Switch / Stop Emission System
LED 111	HL801		Fault
LED 112	HL800		Tilt

C - Familiarization

Marking	Name	Symbol	Function
LED 113	SM804		Radius limit
LED 114	HL802		Overload
LED 115			N/A
LED 116	HL720		Platform leveling
LED 117[2]	HL806		Load selection 350 kg (770 lbs)

1. If machine equipped with dual load
2. If machine equipped with dual load

C - Familiarization

Symbol	Description
	**Machine switched on :** • Rapid flashing : Machine is ON, but platform control box is not active but the ground control box is ON • Illuminated : Machine is turned on and platform control panel is active
	**Foot Switch :** • Illuminated when Foot Switch activated • Blinks after 90 s of inactivity
	**Faults :** • Rapid flashing : If a fault is active (current fault)
	**Overload (If machine equipped with weighing system) :** • Rapid flashing : Faulty weighing / overload system • Illuminated in case of overload
	**Tilt sensor (if fitted) :** • Permanently on in case of tilting, machine folded or unfolded
	**Working area / Range of motion :** Rapid flashing : • Reach limitation system fault. • The machine is in the 230 kg (500 lbs) low load zone, the low load is validated and 350 kg (770 lbs) heavy load is selected by the selector (82) • Permanently lighted : Limit of working area / range of motion with movement cut-off
 	• 230 kg (500 lbs) load selected : LED 109 will be lit on display panel. • 350 kg (770 lbs) load selected : LED 117 will be permanently lit on display panel when the platform is positioned within the restricted working envelope. When the platform arrives in the upper limit of the restricted working envelope, the LED 117 will lit and the LED 109 will blink, with the possibility to switch to 230 kg (500 lbs) load selected if there is less than 230 kg (500 lbs) load in the basket. [1]

1. If machine equipped with dual load

C - Familiarization

Symbol	Description
	**Platform leveling +/- 10° :** • Illuminated if the angle of the platform reaches +/- 10° in relation to the horizontal and movement control
	**Low fuel level**
	**Combustion engine pre-heating :** • Illuminated while engine is pre-heating • Off if engine started and if post-heating
	**Engine warning :** • Lighted in case of minor engine fault (e;g. water in the diesel, clogged air filter, etc.) • Lighted or flashing in case of fault managed by the engine ECU
	**Engine shutdown :** • Lighted in case of major engine fault (e.g. engine overheating, oil pressure, alternator fault, etc.) • Lighted in case of faults managed by the engine ECU
	**DPF regeneration required :** • Permanently lighted if the particle filter requires regeneration with a high clogging level[1]
	**DPF regeneration in progress, high temperature in the exhaust system (HEST)[2]**
	**DPF regeneration inhibited[3]**

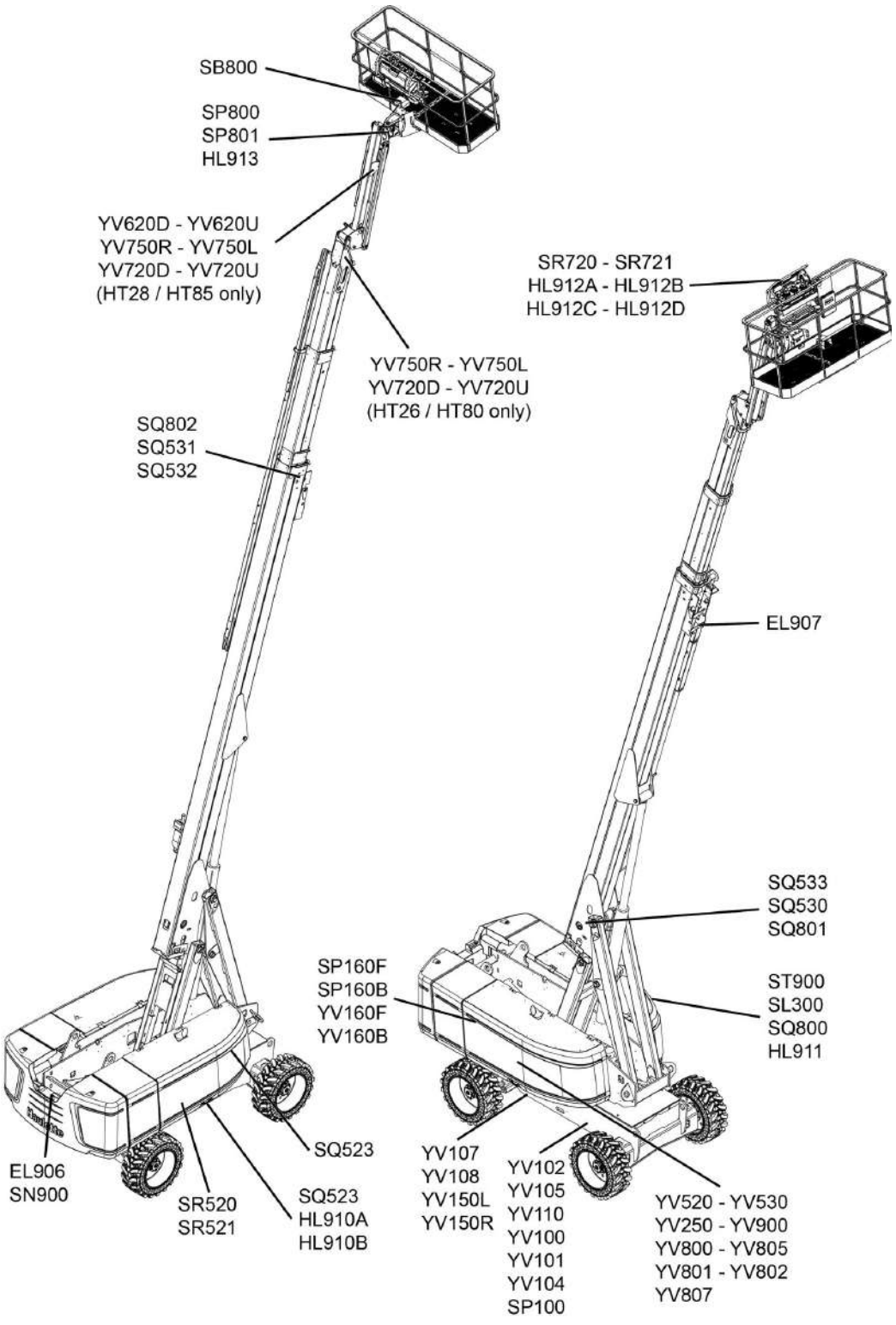
1. If engine equipped with Particulate Filter Regeneration
2. If engine equipped with Particulate Filter Regeneration
3. If engine equipped with Particulate Filter Regeneration

Notes

2 - List of actuators and sensors

2.1 - SENSORS AND ACTUATORS

Sensors and actuators



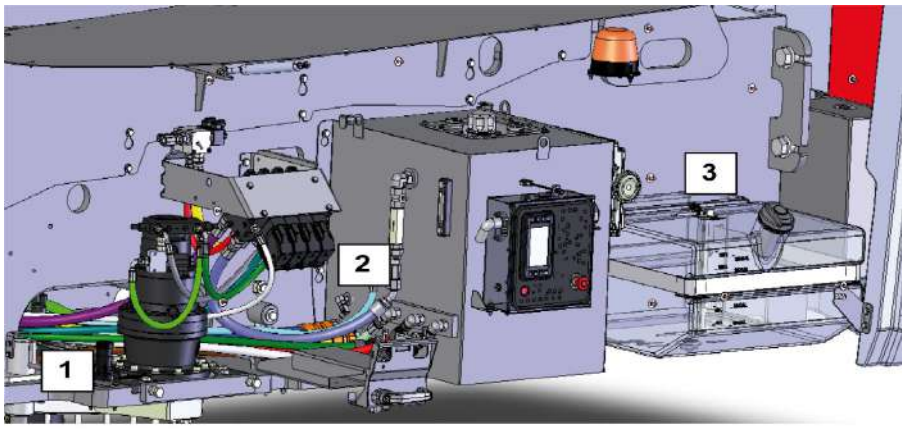
C - Familiarization

Name	Description
EL906	Light - Activ' Lighting System Counterweight light
EL907	Light - Activ' Lighting System Boom light
HL910A	Light - Activ' Lighting System Turret light
HL910B	Light - Activ' Lighting System Turret light
HL911	Light - Activ' Lighting System Ground control box light
HL912A	Light - Activ' Lighting System Platform control box light
HL912B	Light - Activ' Lighting System Platform control box light
HL912C	Light - Activ' Lighting System Platform light
HL912D	Light - Activ' Lighting System Platform light
HL913	Light - Activ' Lighting System Under basket light
SB800	Sensor - Foot Switch sensor
SL300	Sensor - Fuel level sensor
SN900	Sensor - Twilight sensor
SP100	Sensor - High Speed pressure switch sensor
SP160B	Sensor - Drive pressure sensor REV
SP160F	Sensor - Drive pressure sensor FWD
SP800	Sensor - Strain gauges
SP801	Sensor - Strain gauges
SQ250	Sensor - Turret aligned (ILS detection)
SQ251	Sensor - Turret aligned (proximity detection)
SQ523	Sensor - Proximity sensor for boom angle
SQ530	Sensor - ILS boom length
SQ531	Sensor - ILS boom length
SQ532	Sensor - ILS Dual load sensor
SQ533	Sensor - Dual load sensor
SQ800	Sensor - Tilt sensor
SQ801	Sensor - Cable break 1
SQ802	Sensor - Cable break 2
SR520	Sensor - Arm angle
SR521	Sensor - Arm angle
SR721	Sensor - Tilt + 10°
SR720	Sensor - Tilt - 10°
YV100	Valve - Differential lock valve
YV101	Valve - Oscillating axle unlocking solenoid valve 1
YV102	Valve - Rear brake release solenoid valve
YV104	Valve - Oscillating axle unlocking solenoid valve 2
YV105	Valve - Front brake release solenoid valve
YV107	Valve - Steering mode electrovalve 1 (Option 4WS)
YV108	Valve - Steering mode electrovalve 2 (Option 4WS)
YV110	Valve - High speed drive valve
YV150L	Valve - Steering left side valve
YV150R	Valve - Steering right side valve
YV160B	Valve - PWM Reverse driving
YV160F	Valve - PWM Forward driving
YV250	PVG Turret orientation
YV520	PVG Boom raising
YV530	PVG Boom telescoping
YV620D	Valve - Jib lifting down
YV620U	Valve - Jib lifting up
YV720D	Valve - Hydraulic compensation down

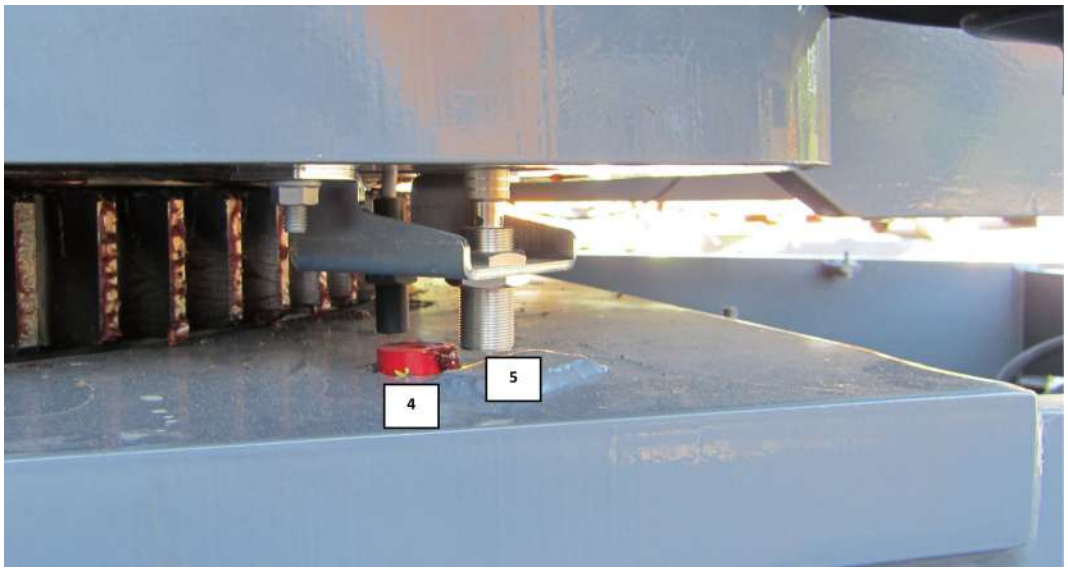
Name	Description
YV720U	Valve - Hydraulic compensation up
YV750L	Valve - Backet rotation left
YV750R	Valve - Basket rotation right
YV800	Valve - LS Valve
YV801	Valve - Boom extension safety valve
YV802	Valve - Boom safety
YV805	Valve - Orientation safety valve
YV807	Valve - Boom lifting safety up / down
YV900	PVG Control movements /steering circuits

2.2 - SENSORS DETAIL

2.2.1 - Turret



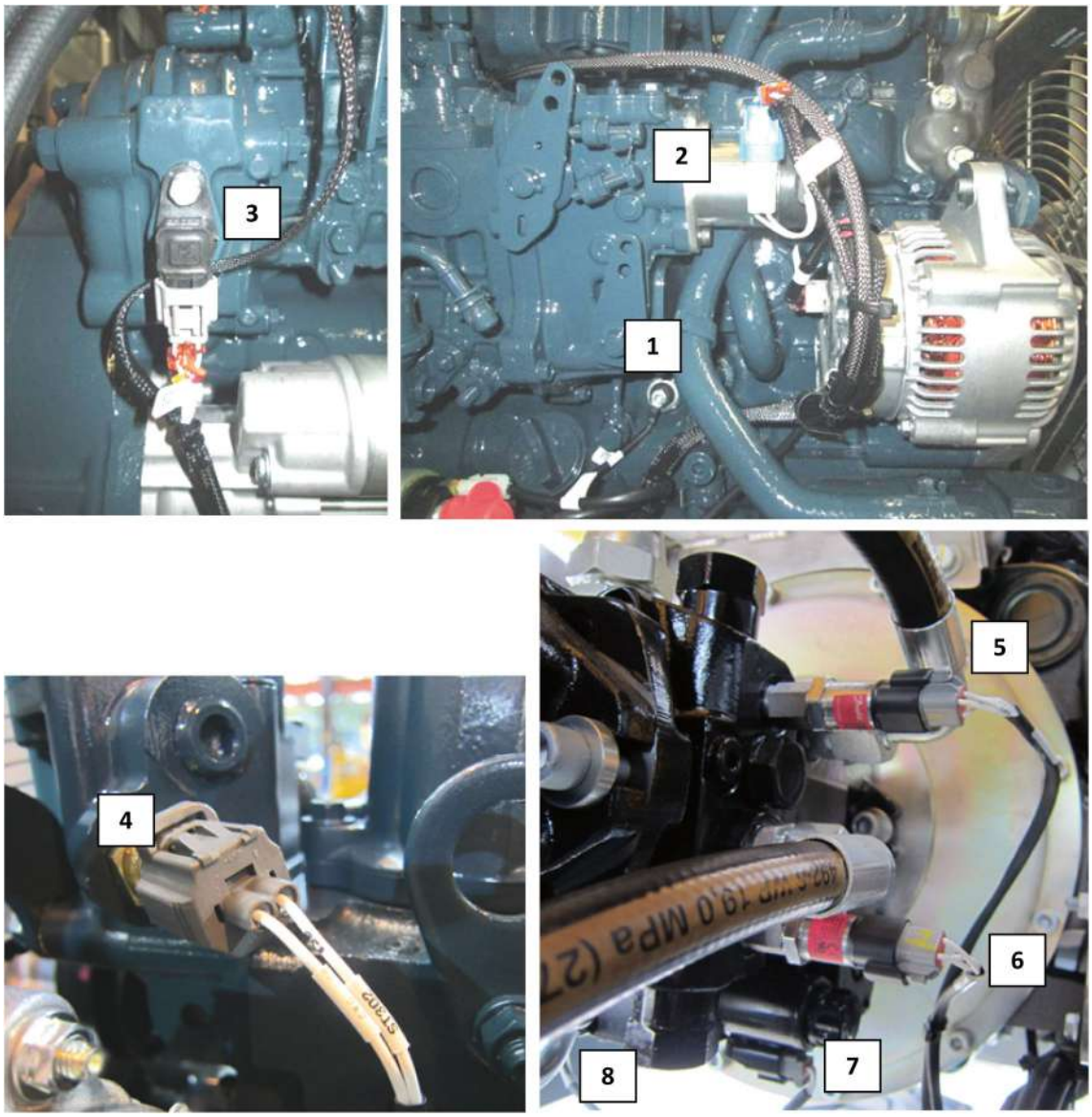
C - Familiarization



Marking	Item	Description
1	SQ800	Tilt sensor
2	ST900	Hydraulic oil temperature sensor
3	SL300	Fuel level detection (if level ≤ 5 liters SL300 = 0)
4	SQ250	ILS turret aligned in redundancy
5	SQ251	Inductive sensor turret aligned

2.2.2 - Engine

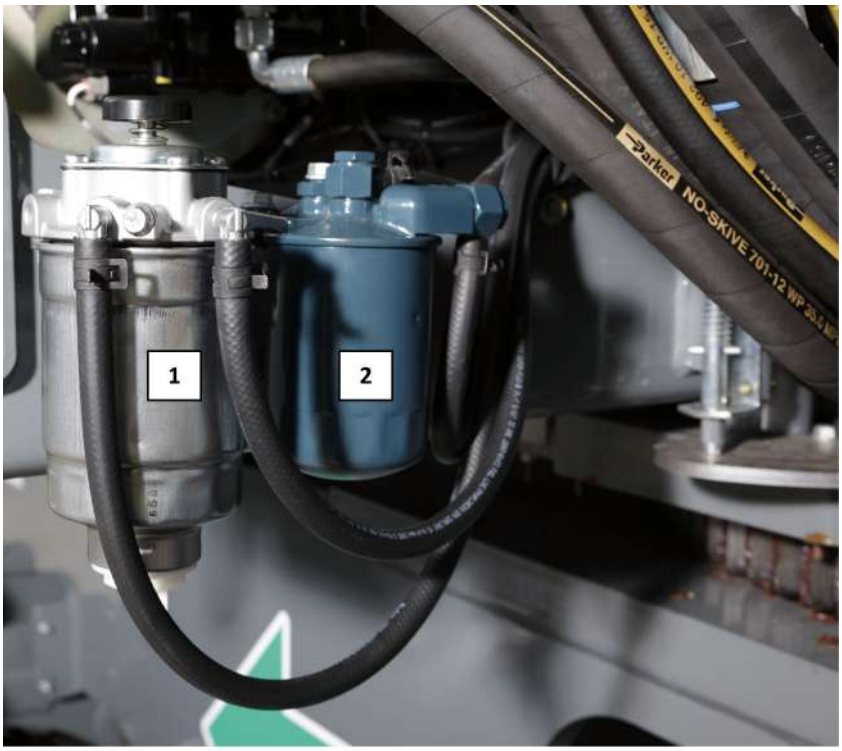
Tier III engine

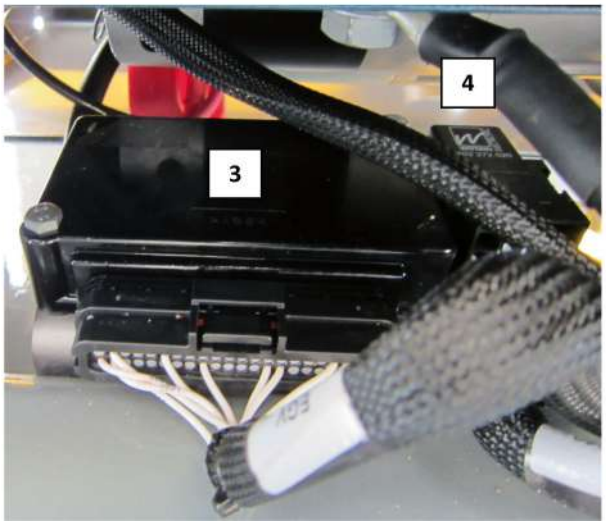


Marking	Item	Description
1	SP300	Oil pressure
2	YA300	Engine variable speed control solenoid (including stop function)
3	SV300	Engine speed sensor
4	ST302	Engine water temperature detection
5	SP160F	Pressure switch in FWD drive mode
6	SP160B	Pressure switch in REV drive mode
7	YV160B	PWM valve for REV drive mode
8	YV160F	PWM valve for FWD drive mode

C - Familiarization

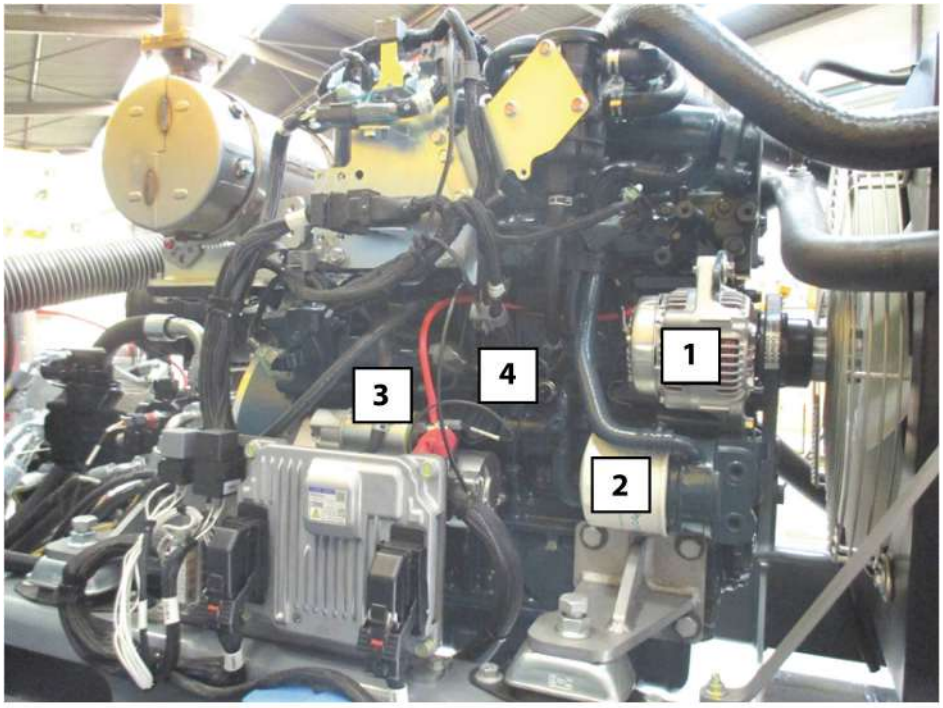
Filters

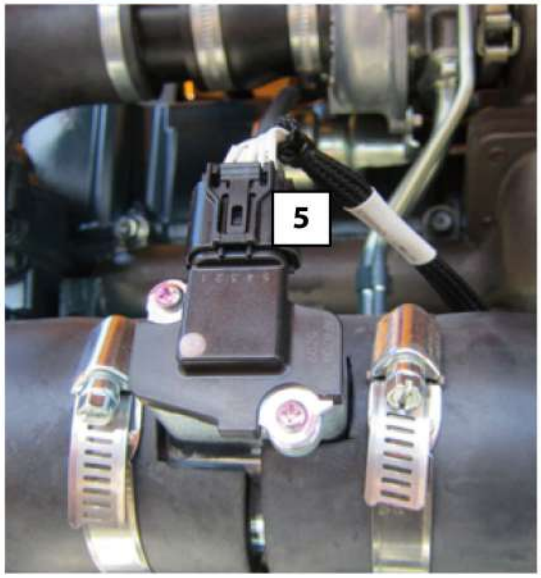




Marking	Item	Description
1		Gas-oil/fuel prefilter
2		Gas-oil/fuel filter
3		EGV D6 KUBOTA module
4	KM160	Preheating relay

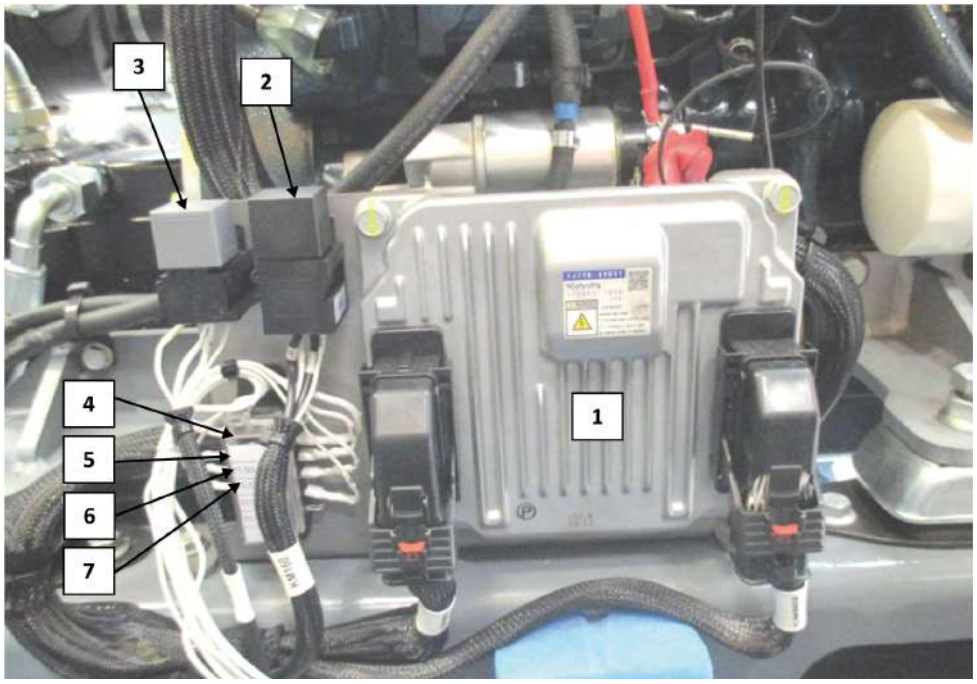
Tier IV engine

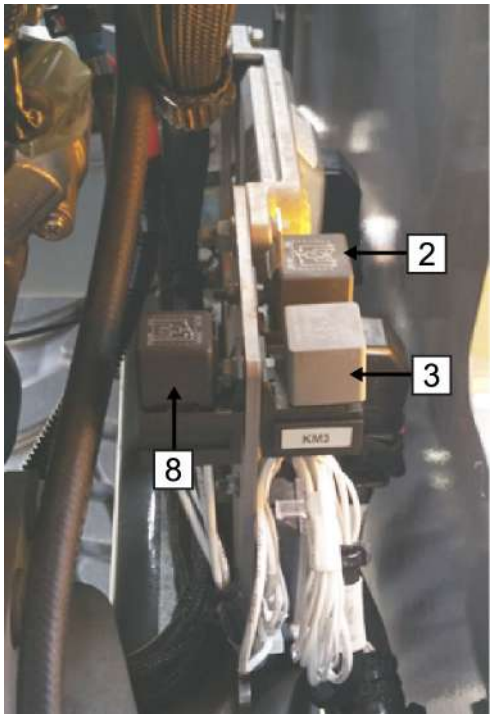




Marking	Item	Description
1		Alternator
2		Oil filter
3	M300	Starter motor
4	SP300	Oil pressure
5	MAF	Mass flow sensor (checks the flow in circuit)

Detail on EDC module

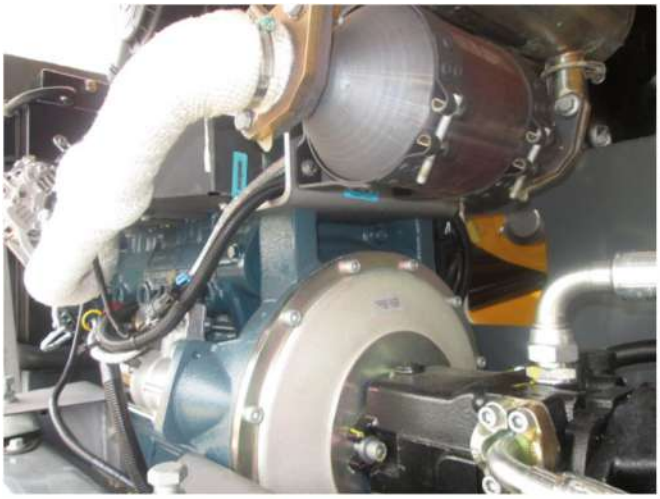


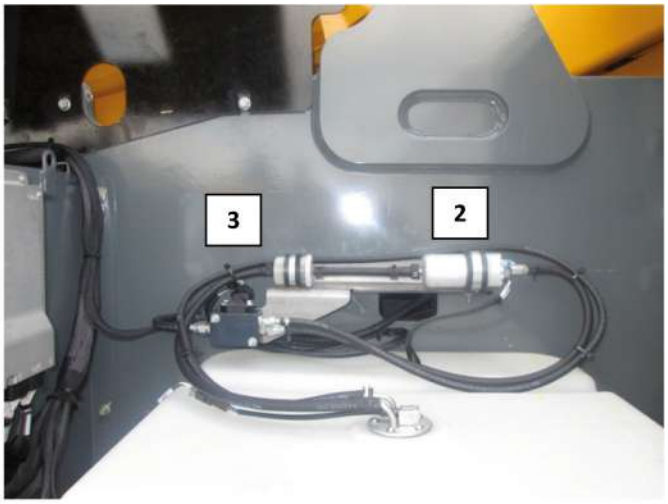


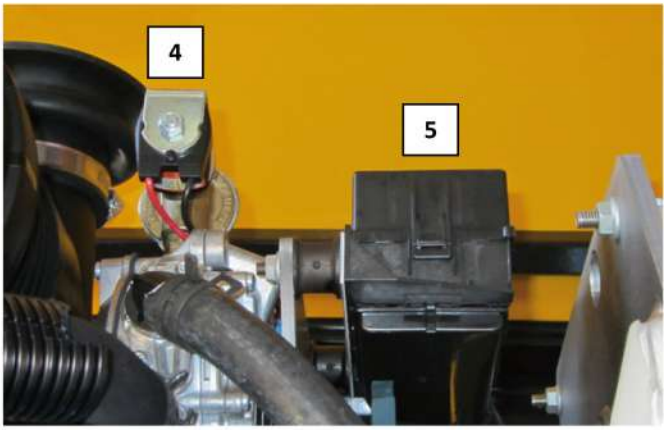
Marking	Item	Description
1	EDC71CV45	ECU KUBOTA module
2	KM160	Preheating relay feed pump
3	KM3	Main relay
4	FU50	Fuse 20A
5	FU51	Fuse 5A
6	FU52	Fuse 5A
7	FU53	Fuse 5A
8	KM7	Start relay for Engine TIER IV

C - Familiarization

Petrol / gas engine







Marking	Item	Description
1	KA140	Relay for selection petrol/gas
2	YA301	Fuel pump
3	FPMP	Pressure regulation coil
4	LOVP	Lock off security valve for gas
5		Box wired by KUBOTA (fuses - contactor KM3 – relay KA FP)

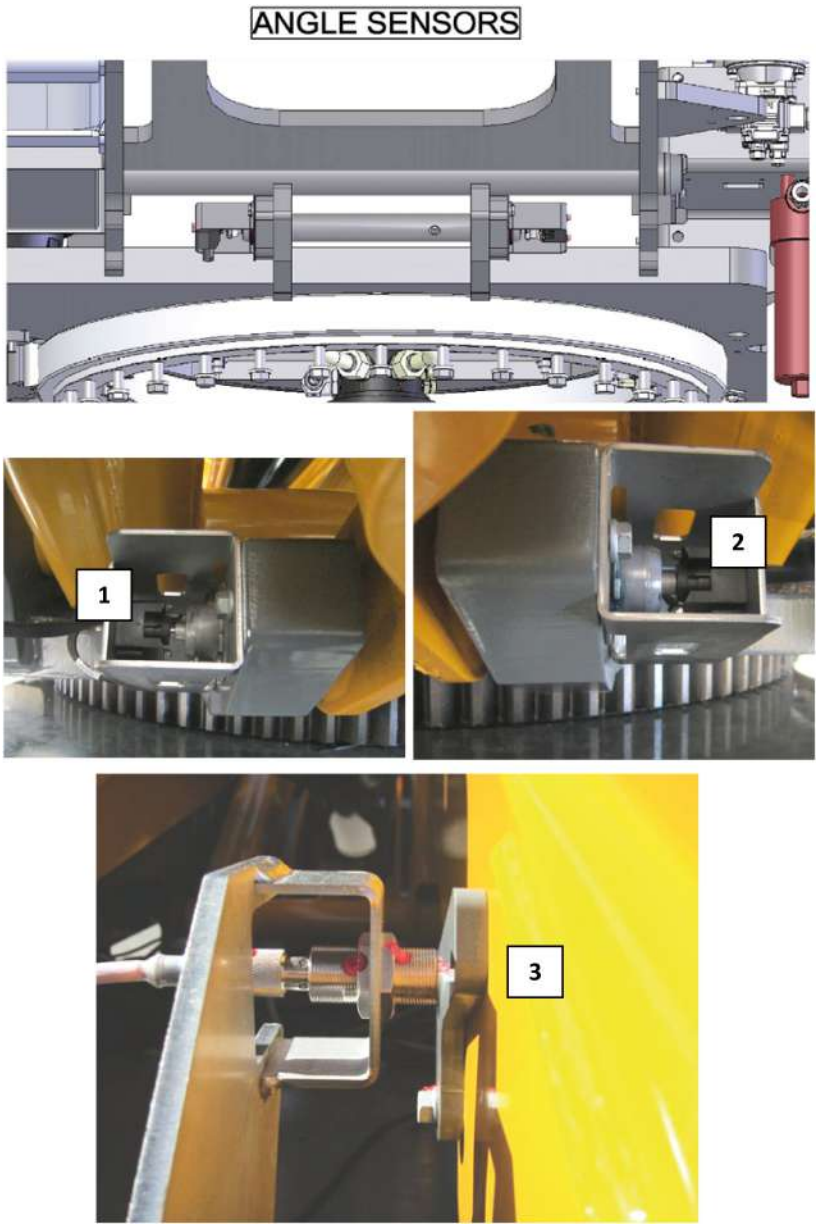
2.2.2.1 - STAGE V engine

The engine is very similar to the Tier 4 (See below).

Rear view

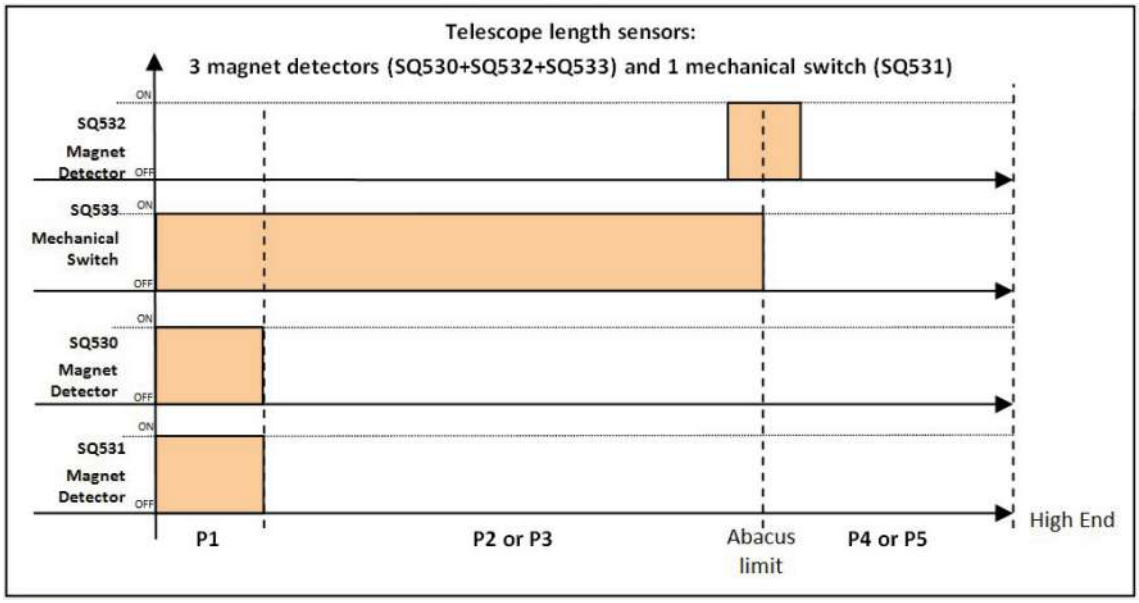
Location of components and EDC module for Kubota engine

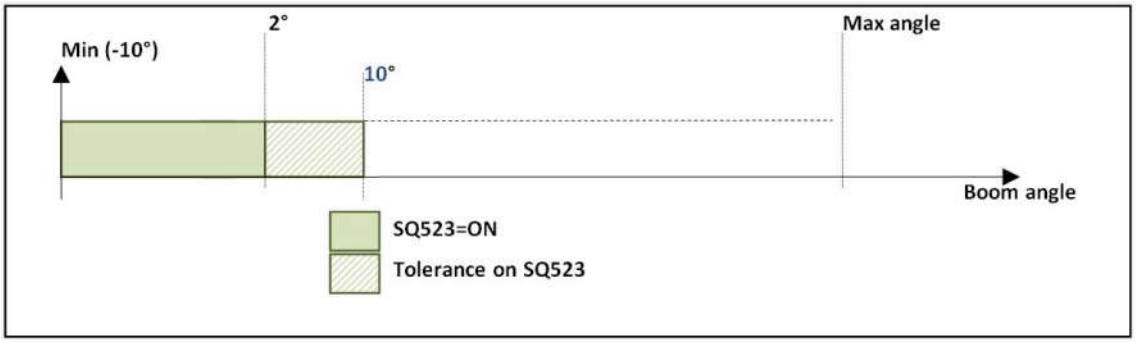
2.2.3 - Boom sensors



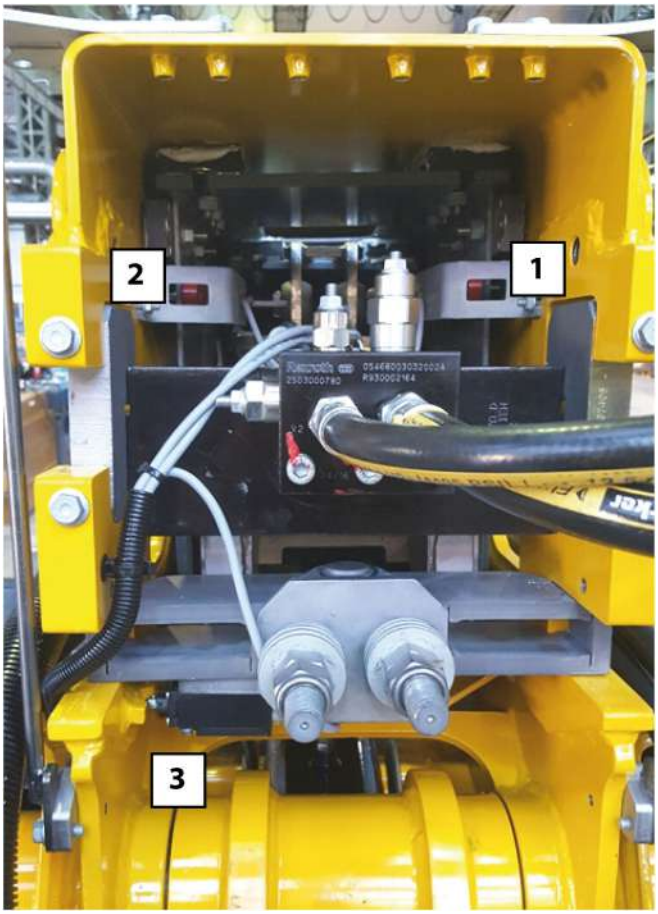
Marking	Item	Description
1	SR520	Arm angle 1 (lower controls side) (The analogical sensors measures arm angle in range [0; 83]°). Signal from 4 to 20 mA
2	SR521	Arm angle 2 (engine side) (The analogical sensors measures arm angle in range [0; 83]°). Signal from 4 to 20 mA
3	SQ523	Inductive sensor for boom zone -10°/8° (SQ523 = 1 if detection metallic plate)

Position of the sensors states





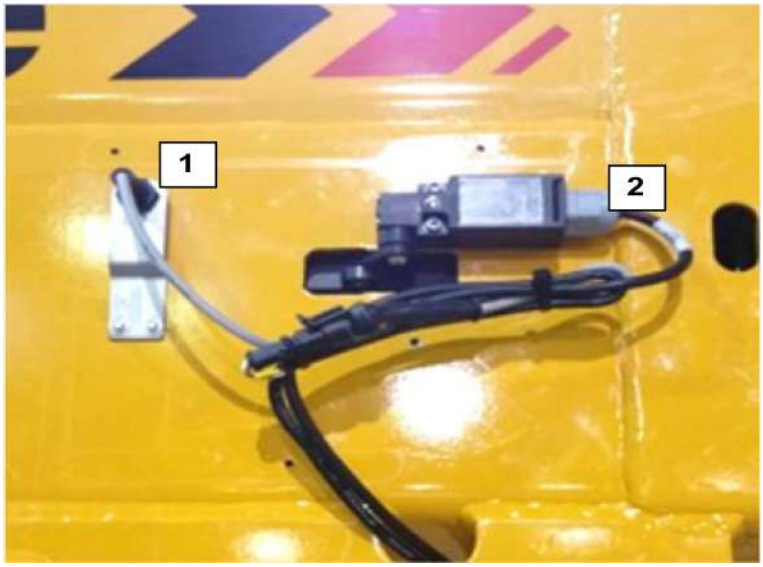
C - Familiarization



Marking	Item	Description
1	SQ530	ILS sensor telescope (SQ530 = 1 if front of magnet)
2	SQ531	ILS sensor telescope (SQ531 = 1 if front of magnet)
3	SQ801	Limit switch cable 1 (SQ801 = 0 if cable broken or not adjusted)

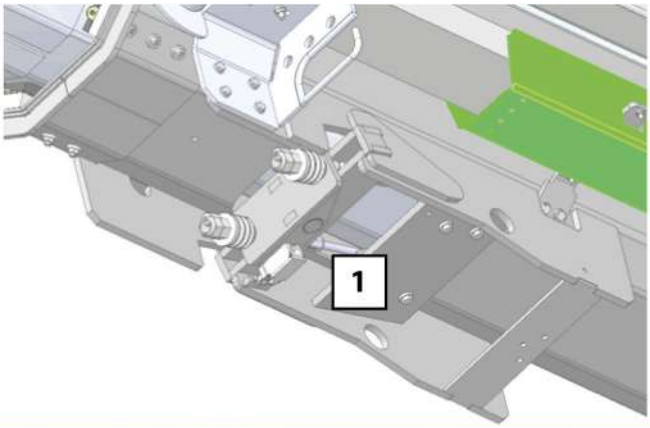
C - Familiarization

For dual load option (only)



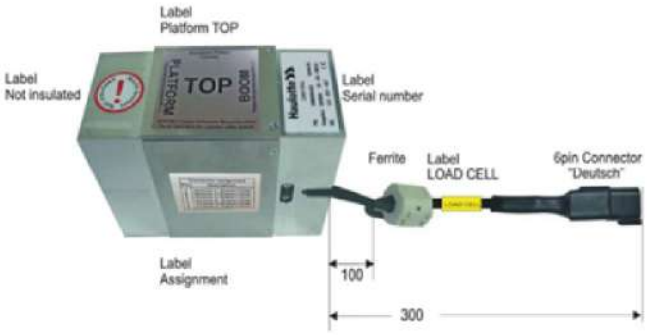
Marking	Item	Description
1	SQ532	ILS sensor telescope for P5 zone (=1 in front of magnet)
2	SQ533	Limit switch telescope detection in P5 zone

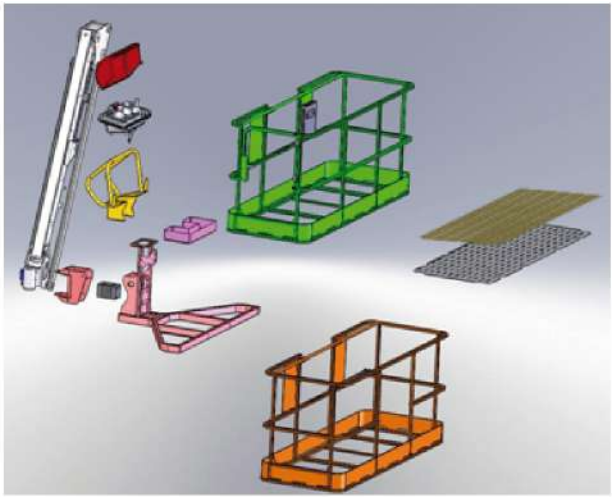
View from jib side



Marking	Item	Description
1	SQ802	Limit switch cable 2 (SQ802 = 0 if cable broken or not adjusted)

2.2.4 - Upper controls



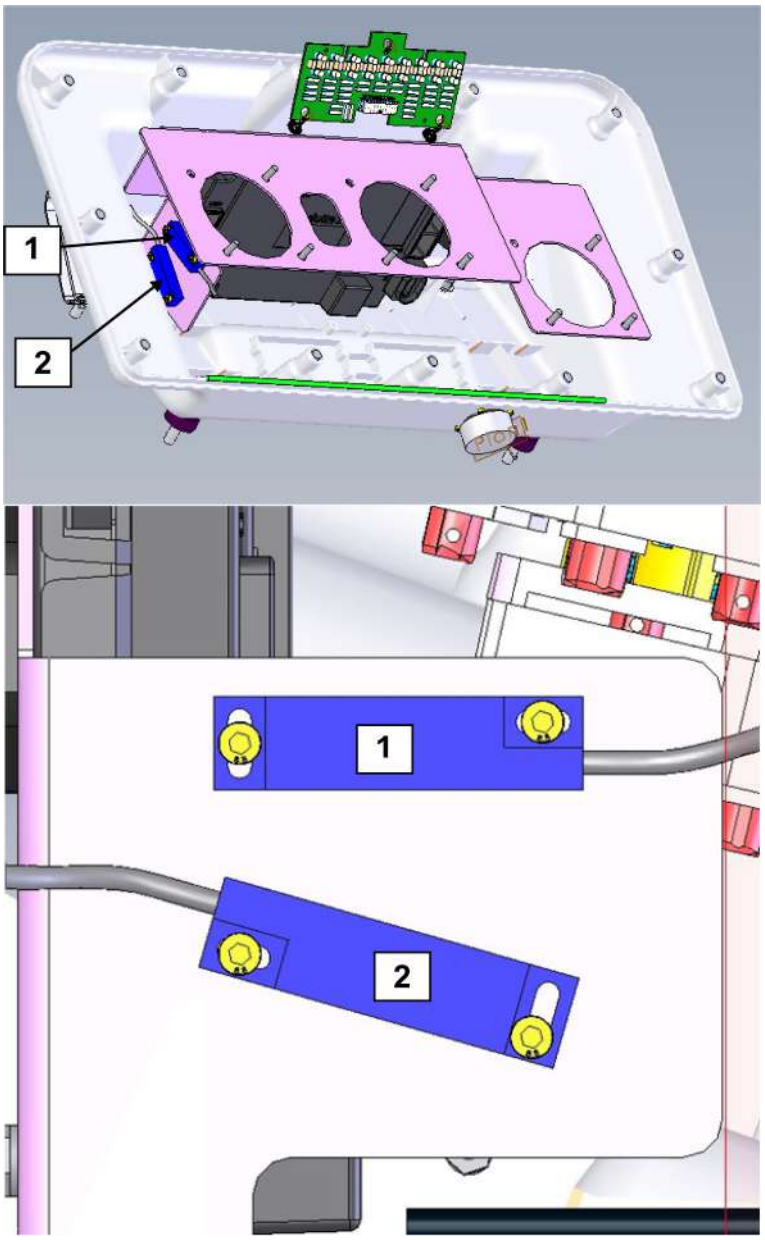


Marking	Item	Description
1	SP800	Strain gauges for load detection on basket
2	SP801	Strain gauges for load detection on basket

N.B.-:-THE STRAIN GAUGES IS PROTECTED BY A FUSE (FU34 = 1A) LOCATED INSIDE THE UPPER CONTROL BOX

C - Familiarization

Upper controls



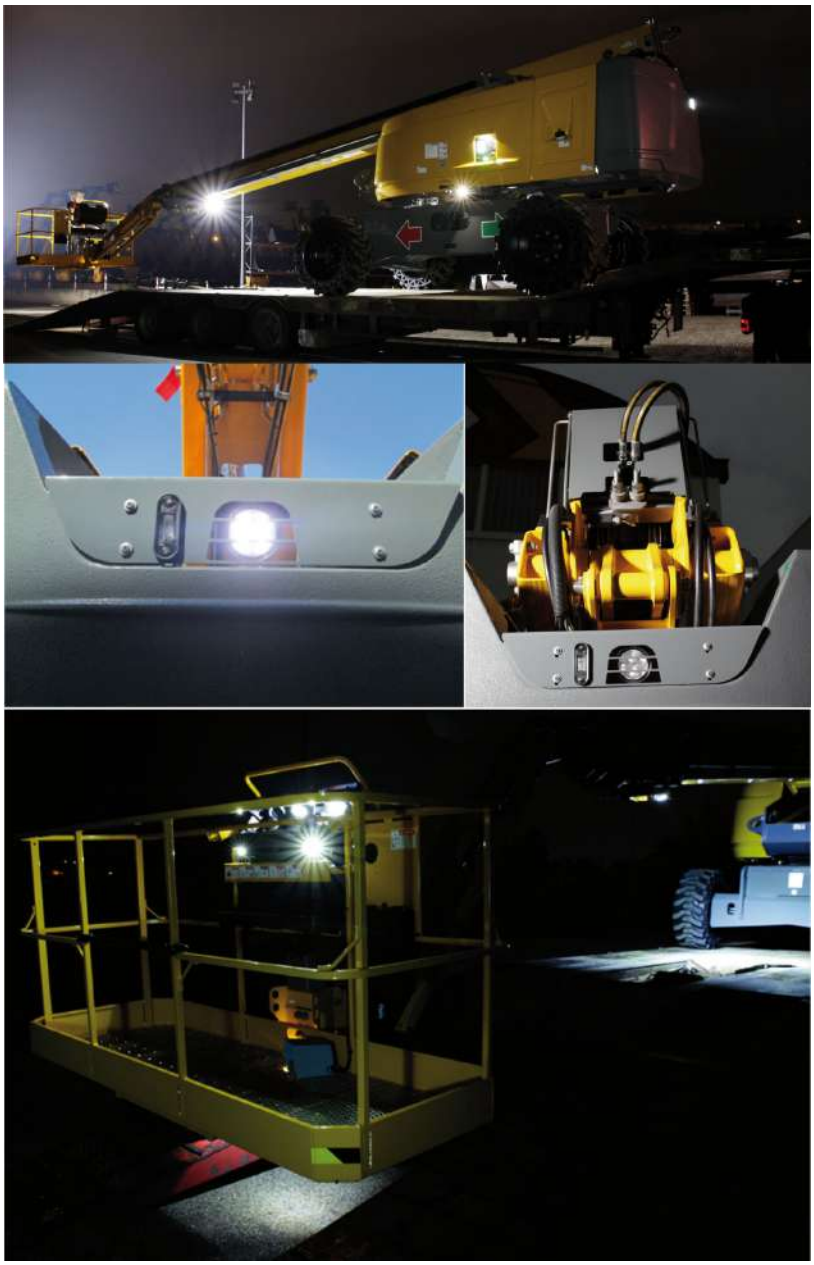
Marking	Item	Description
1	SR720	Detection basket angle (+10°) must be adjusted in parallel to the side of the metal sheet
2	SR721	Detection basket angle (-10°) must be adjusted fully at the bottom of the hole

2.2.5 - Option Activ' Lighting System

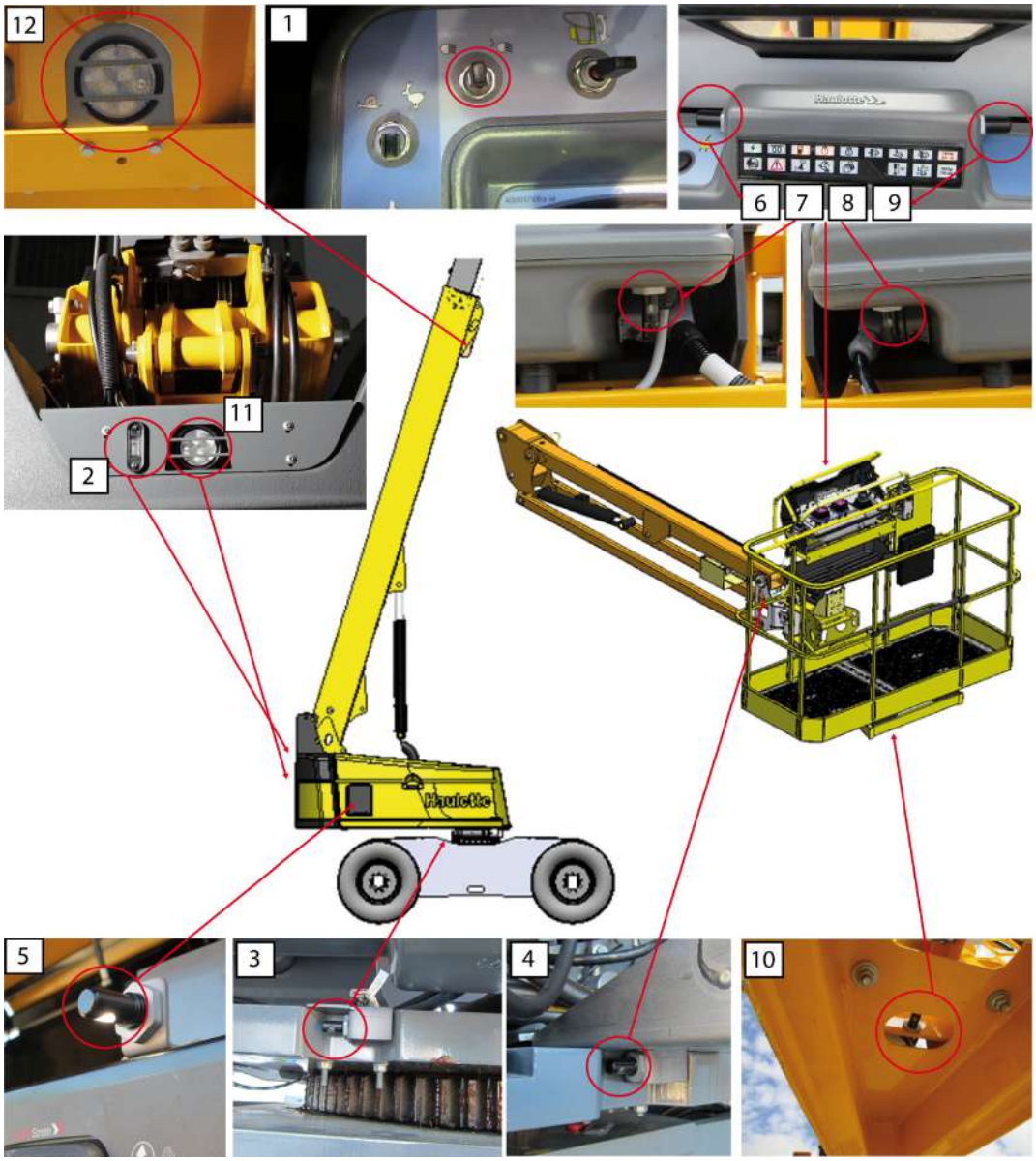
This option will permit the operator to load the AWP on truck in total safety and also keeps working on site when daylight is too dark.

When the luminosity is lower than 50 lumens (night), the auto mode logic is as follow.

Machine state	Light zone		
	Turret light zone	Basket light zone	Movement light zone
Lower control box selected	ON		
Upper control box selected	ON	ON	
Upper control box selected with engine running and movement in process	ON	ON	ON



2.2.5.1 - Architecture of the system



List of components and description

Marking	Item	Description
1	SA910	Selection Activ'lighting system (AUTO, ON/OFF)
2	SN900	Twilight sensor for luminosity detection (ON if < 50 lumens)
3	HL910A	Light under turret (engine side)
4	HL910B	Light under turret (LCB side)
5	HL911	Light above LCB
6	HL912A	Light on upper controls
7	HL912B	Light on upper controls
8	HL912C	Light on upper controls
9	HL912D	Light on upper controls
10	HL913	Light under basket
11	EL906	Light on Counterweight
12	EL907	Light under boom

2.3 - ACTUATORS AND THEIR LOCATION

2.3.1 - List of actuators

In the following tables :

- The column n°2 gives the coordinates of the components on different sheets from the wiring schematics in order to easily find their location.
- The first figure corresponds to the number of pages and the second, to the column (generally from 1 to 20) of the corresponding page.
- The column n°3 indicates the location on the connector on modules.
- The state noted "0" corresponds to 0 V, opened contact or not activated.
- The state noted "1" corresponds to the tension of the circuit, closed or activated contact.

Glossary

Marking	Description
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 reed sensor
UCB	Upper control box
LCB	Lower control box
ECU	Electronic Control Unit
PCB	Printed circuit board
ALS	Activ' Lighting System
E-TOR	Input ON/OFF
S-TOR	Output ON/OFF
E-ANA	Analogic input (Variable signal)
S-ANA	Analogic output (Variable signal)
PWM	Pulse Width Modulation
S-PWM	Analogic output (Variable signal made by Pulse Width Modulation Valve)

2.3.2 - Modules

Modules		
Name	**Location**	**Function**
U101	04 - 18	Multi function CAN display (Activ screen V2)
U104		ECU module node B2 upper controls (slave)
U106		ECU module SPU7066 in turret (master)
U107	04 - 14	Keyboard with touch pad buttons (Lower controls)
EGV	02 - 13	Electronic Governor (KUBOTA module)
EDC	09 - 15	Electronic module for KUBOTA tier 4 engine
WG	10 - 09	Electronic module for KUBOTA petrol/gas 4 engine

2.3.3 - Fuses

Fuses		
Name	**Location**	**Function**
FU2	03 - 02	Generator (20 A)
FU3	03 - 03	Start / stop engine (15 A)
FU4	03 - 04	Engine start (25 A)
FU5	03 - 08	Main supply + Vbat (30 A)
FU6	03 - 08	Overspeed option (20 A)
FU7	03 - 15	Supply V ECU node B2 (15 A)
FU8	03 - 10	Flashing light option (20 A)
FU9	03 - 12	Supply accessories (20 A)
FU11	03 - 09	Activ'screen display (7.5 A)
FU13	03 - 11	Supply V power SPU (20 A)
FU23	02 - 19	Overspeed relay option (40 A)
FU34	08 - 10	Supply strain gauges (1 A)
FU50	09 - 10	Feed pump (20 A: for Tier 4 engine only)
FU51	09 - 10	Power (5 A: for Tier 4 engine only)
FU52	09 - 18	Ignition line (5 A: for Tier 4 engine only)
FU53	09 - 13	Starter line (5 A: for Tier 4 engine only)
FU54	09 - 08	Starter (5 A: for Tier 4 engine only)
FU122	02 - 03	Emergency pump (250 A)
FU161	02 - 05	Preheating (100 A)
FU180	02 - 02	Cooler option (30 A)
FUxx	10	Fuses supplied by KUBOTA petrol /gas engine

N.B.-:-THE STRAIN GAUGES ARE PROTECTED BY A FUSE (FU34 = 1 A) LOCATED INSIDE THE UPPER CONTROL BOX.

2.3.4 - Inputs

Main commands-Switches/joysticks			
Name	**Location**	**Connector**	**Function**
QS100	02 - 01		Battery cut-out switch (Option) (101)
SA100	07 - 09	CN104.19	Differential lock (B110)
SA101	07 - 15	CN104.13/14	4WS Steering (Mode crab B104 /Synchronous B105)
SA110	07 - 10	CN104.6	Drive mode (B111 = 1 in high speed)
SA303	07 - 06	CN105.3	Engine start/stop (B128)
SA304	07 - 12	CN104.12	Petrol/gas (B117)
SA621	07 - 16	CN104.15/16	Jib lift/descent (B120 / B121)
SA721	07 - 18	CN104.9/10	Basket compensation up/down (B114 / B115)
SA751	07 - 17	CN105.36/35	Basket rotation left/right (B124 / B123)
SA800	07 - 07	CN105.4	Emergency pump (B129)
SA802	07 - 10	CN105.14	Dual load (B143)
SA900	03 - 05		Main power switch key ON/OFF (104)
SA904	08 - 18		Working light option (183)
SA906	07 - 11	CN104.11	Generator (B116)
SA907	07 - 08	CN104.1	Horn (B106)
SA907b	12 - 11		Horn (lower controls for RUS/UKR option) (184)
SA910	12 - 17		Activ' Lighting System option (913/914)
SB800	08 - 16	CN105.12	Foot Switch (= 1 for any movement) (B141)
SB801	03 - 05		Main emergency stop button lower controls (113)
SB802	07 - 03	CN104.5	Main emergency push button upper controls (143/B200)
SB900	08 - 11	CN105.10	Activ' Shield Bar reset (=1 to reset the Activ' Bar mode) (B157)
SN900	12 - 13	1B.22	Detection
SM900	08 - 04		Boom / turret rotation Neutral position B103 Signal range B302/B303 (4.5 VDC - 2.5 VDC - 0.5 VDC)
SM901	08 - 06		Telescopic boom Neutral position B102 Signal range B301 (4.5 VDC - 2.5 VDC - 0.5VDC)
SM902	08 - 09		Drive Neutral position B100 / B101 Signal range B300 (4.5 VDC - 2.5 VDC - 0.5 VDC) Front wheels steering (2WS) B109/B108

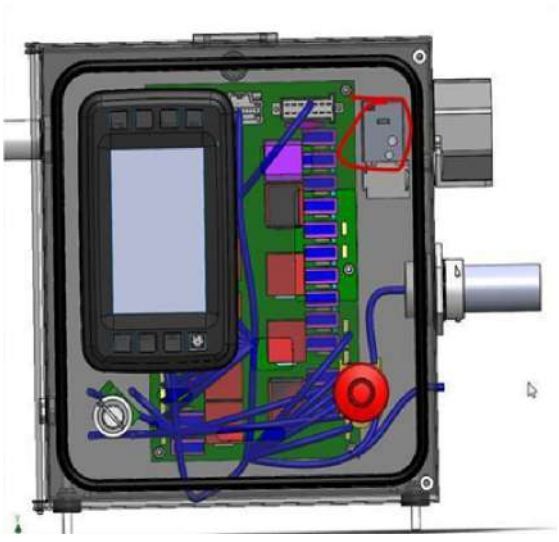
C - Familiarization

Sensors			
Name	**Location**	**Connector**	**Function**
SL300	06 - 02	1A.8	Fuel level (= 0 if low level detected) (189)
SN900	12 - 13	1B.22	Detection for Activ' Lighting system option (ON if < 50 lumens and option selected) (917)
SP100	06 - 13	2A.11	High speed pressure detection in hydraulic drive circuit (212)
SP160B	06 - 06	1A.2	Detection of pressure in drive pump in stand-by mode in REV drive (above charge pressure) (512)
SP160F	06 - 05	1A.4	Detection of pressure in drive pump in stand-by mode in FWD drive (above charge pressure) (512)
SP300	02 - 15		Engine oil pressure detection (ON if P < 1 b) (173)
SP800 / SP801	08 - 18	CN106.4/5	Strain gauges for basket load detection (B310 / B311)
SQ250	06 - 19	1B.12	Turret aligned (ILS detection)
SQ251	06 - 08	2A.17	Turret aligned (proximity detection) (254)
SQ523	06 - 09	2A.12	Boom position (= 1 if between -10°/+8°) (523)
SQ530	06 - 18	1B.13	Telescope ILS detection (ILS in front of magnet =1 if retracted) (530)
SQ531	06 - 11	2B.13	Telescope detection (ILS in front of magnet = 1 if retracted) (533)
SQ532	06 - 14	2B.14	Boom position ILS detection in P5 zone (532)
SQ533	06 - 16	1B.11	Boom position detection in P5 zone (531)
SQ800	06 - 04	1B.21	Slope detection (Signal wire 150 = 1 if machine levelled)
SQ801	06 - 17	1B.14	Chain 1 detection (= 0 if broken) (801)
SQ802	06 - 12	2B.12	Chain 2 detection (= 0 if broken) (802)
SQ902	08 - 12	CN105.10	Activ' Shield Bar detection (=1 if detected) (B150)
SR520	06 - 06	3B.16	Boom angle transducer (lower controls side) (520)
SR521	06 - 07	2B.23	Boom angle transducer (engine side) (521)
SR720	08 - 14	CN105.17	Basket inclination (= 1 if at -10°) (B146)
SR721	08 - 13	CN105.16	Basket inclination (= 1 if at +10°) (B145)
ST302	02 - 11		Water temperature detection in engine (130)
ST900	06 - 10	1A.21	Hydraulic oil overheating detection (= 1 if OK) (125)
ST902	02 - 02		Temperature switch detection (oil cooler) (190)
SV300	02 - 13		Engine speed detection (133)

2.3.5 - Outputs

Relays-Contactors			
Name	**Location**	**Connector**	**Function**
KA2	05 - 17	1B.4	Option generator command (192)
KA3	05 - 18	2A.23	Engine start/stop command (170)
KA4	05 - 19	2A.6	Engine start command (169)
KA7	03 - 03		Start circuit (for Tier 4 engine only) (138)
KA8	05 - 13	2A.25	Option beacon/flashing light (194)
KA9	05 - 14	1B.2	Horn command (187)
KA10	13 - 19	CN105.24	Command for Activ' Lighting System option (915)
KAC	08 - 12	CN105.30	Activ'Shield Bar command (B510)
KA140	10 - 18		Selection Petrol/gas mode
KMG	03 - 17		Main line contactor (143)
KMP	03 - 16		Power relay (Keeps power a few seconds after KMG) (143)
SD85	02 - 19		Option overspeed relay
KM3	09 - 13	502.23	Main relay (for Tier 4 or petrol gas engines only) (134)
KM7			Starter command (for Tier 4 engine only) (144)
KM120	02 - 04		Emergency pump (145)
KM160	02 - 07		Preheating (162)
KMEV	03 - 14		Stand-by relay (If equipped)
M300	02 - 08		Starter (165)

Relay KMEV



C - Familiarization

Valves-Motors			
Name	**Location**	**Connector**	**Function**
YA300	02 - 14		Electronic engine speed control coil (136)
YV100	06 - 12	2B.6	Differential lock (= 1 if axle unlocked in low speed drive and turret aligned) (689)
YV101	06 - 13	2A.19	Oscillating axle unlocking (780)
YV102	06 - 10	2B.8	Brake release rear axle (782)
YV105	06 - 11	2A.25	Brake release front axle (783)
YV107	06 - 08	2B.28	Crab steering mode (YV108 = 1 if right) (621)
YV108	06 - 09	2B.26	Synchro steering mode (YV107 = 1 if left) (622)
YV110	06 - 12	2B.7	Valve for drive mode (= 1 in HS) (686)
YV150L	06 - 15	2B.29	Front left steering (601)
YV150R	06 - 16	2B.27	Front right steering (602)
YV160B	05 - 12	1B.9	PWM REV drive valve (619)
YV160F	05 - 11	1B.31	PWM FWD drive valve (620)
YV250	05 - 06	3A.4	PVG valve for turret rotation (880)
YV520	05 - 02	3A.9	PVG valve for boom lift/descent (124)
YV530	05 - 04	3A.15	PVG valve for telescope extension/retraction (127)
YV620D	08 - 13	CN105.32	Jib descent (B604)
YV620U	08 - 14	CN105.31	Jib lift (B603)
YV720D	08 - 17	CN105.28	Basket compensation down (B600)
YV720U	08 - 18	CN105.27	Basket compensation up (B607)
YV750L	08 - 16	CN105.33	Basket rotation left side (B605)
YV750R	08 - 15	CN105.34	Basket rotation right side (B606)
YV800	05 - 09	1B.4	Load sensing valve (= 1 for any movement) (120)
YV801	06 - 04	3A.25	Safety valve for boom extension (803)
YV802	06 - 03	3A.20	Safety valve for boom lift/descent (804)
YV805	06 - 02	3A.21	Safety valve for turret orientation (805)
YV807	06 - 06	3A.24	Safety valve for boom descent (807)
YV900	05 - 08	3A.5	PVG valve for ON/OFF jib/basket/steering block (620)
YV906	06		Valve for generator option
M300	02 - 08		Starter motor (163)
M800	02 - 04		Emergency pump motor (620)
M900	02 - 02		Cooler motor option (191)

C - Familiarization

Buzzer-Indicators-Receptors			
Name	**Location**	**Connector**	**Function**
R10	03 - 15		Receptor for alternator command (47'Ω, 2W) (102)
HA901	05 - 13	1B.30	Buzzer lower controls (186)
HA902	07 - 09	CN106.16	Buzzer upper controls (B508)
HA907	03 - 12		Horn (184)
EL903	03 - 10		Option flashing light (185)
EL904	08 - 19		Option working light (183)
EL905	08 - 11	CN105.29	Activ'Shield Bar detection (B608)
EL906	12 - 14	3B.1	Light on Counterweight (Activ' Lighting System option)
EL907	12 - 15	3B.25	Light on main boom (Activ' Lighting System option)
HL901	08 - 09	CN106.19	Activ'Shield Bar activated (B609)
HL902	08 - 10	CN105.29	Activ'Shield Bar detection (B608)
HL910A/B	12 - 13	3B.4	Lights under turret (L/R) (Activ' Lighting System option)
HL911	12 - 14	3B.4	Light on lower control box (Activ' Lighting System option)
HL912A/B/C/D	12 - 16		Lights on upper control box (Activ' Lighting System option)
HL913	12 - 18		Light under basket (Activ' Lighting System option)
HLXX	07		Upper controls PCB with 13 leds for indication/alarms

3 - Power source - Engine specifications

3.1 - General safety and specific interventions on motor

The technician should take all steps to protect themselves or others against all risks of injury inherent in his intervention.

The technician should ensure that suitable PPE (personal protective equipment) for the job is used, and check the particular conditions of environment in which the material can be found (see safety information specific to the operation site).

- Turn off the ignition, remove the key, open the battery switch before working on the engine.
- Accidental engine starting can cause injury or death to personnel working on the equipment. To avoid accidental engine starting, disconnect the battery cable from the negative (-) battery terminal. Completely tape all metal surfaces of the disconnected battery cable end in order to prevent contact with other metal surfaces which could activate the engine electrical system. Place a do not operate tag at the start/stop switch location to inform personnel that the equipment is being worked on.
- The hot engine parts can cause injury and burns. Before performing maintenance on the engine, cool the engine and parts.
- By touching a functioning engine, there is a risk of burns from contact with hot parts, and injuries by the rotating parts.
- To avoid any risk of accident, using compressed air (example : blowing air filter), always wear a headband and goggles.
- The hot coolant, steam and alkalis can cause injury. At the operating temperature, the engine coolant is hot and under pressure. Do not open the cap of the expansion chamber before letting the circuit cool.
- The radiator and all the pipes going to the heaters or engine contain hot coolant or steam. Contact can cause severe burns.

The engine exhaust gases contain harmful combustion products. Always start and run the engine in a well ventilated area. In an enclosed area, evacuate the exhaust outside.

3.2 - General Specifications

N.B.-:-Using unsuitable fuel may cause diminished performance, difficulties starting, excessive pollution and prematurate wear. To established the type of the fuel suitable for the engine fitted on your HAULOTTE®, please refer to the engine manufacturer's manual. The engine may not be covered by the warranty in case of damage caused by using unsuitable fuel.

3.3 - CONSUMABLES

Consumable	HAULOTTE® code
Air filter (system)	4000466890
Primary air filter	2820302900
Secondary air filter	2820302910
Oil filter	4000353990
Engine oil filter	4000076270
Hydraulic oil filter (Red)	2427002910
Hydraulic oil filter (Black)	2427003110
Diesel filter Tier III	4000468190
Pre-filtered with diesel Tier III	4000503860
Diesel filter Tier IV	4000466930
Pre-filtered with diesel Tier IV	4000466920

3.4 - INGREDIENT

List of ingredients

Ingredient	Packaging	HAULOTTE® code
Engine oil - 5W40	60 l(15,8 gal US)	4000010660
Engine oil - 10W40	20 l(5,3 gal US)	4000531300
Engine oil - 15W40	5 l(1,32 gal US)	4000530600
	20 l(5,3 gal US)	2420801360
	209 l(55,2 gal US)	2820305720
Hydraulic oil - HV32	20 l(5,3 gal US)	4000096350
Hydraulic oil - HV46	5 l(1,32 gal US)	4000530620
	20 l(5,3 gal US)	2420801320
	209 l(55,2 gal US)	2420801310
Biological hydraulic oil - HV46	209 l(55,2 gal US)	2505003830
Transmission oil - 80W90	1 l(0.22 gal US)	4000530610
	20 l(5.3 gal US)	2420801370
Extreme-pressure lithium grease	0,4 l(0.1 gal US)	2820304320
Grease cartridge	0,4 l(0.1 gal US)	2326005400
Grease cartridge	0,4 l(0.1 gal US)	4000561720
Telescope grease	1 kg(2.20 lb)	4000813570
Telescope grease	5 kg(11.02 lb)	4000813560
Coolant	5 l(1,32 gal US)	4000813540
	25 l(6,6 gal US)	4000564860

4 - Consumables (Oils - Fuels - Engine oil - Coolant level...)

4.1 - FUEL

N.B.-:-THESE FUELS CAN BE USED ON ANY TYPE OF MECHANICAL INJECTION ENGINE. PLEASE SEE MACHINE CONFIGURATION.

Table of technically permitted fuels

Engines	Fuels			
Hydraulic filter cartridge	European gas oil according to EN590	European fuel oil according to BS2869 class 2	American gas oil according to ASTMD975-07b	Japanese gas oil according to NATO F54
HATZ 41C	✓	✓	✓	✓
DEUTZ 2011/2012	✓	✓	✓	✓
PERKINS 403/804/1104	✓	✓	✓	✓
LOMBARDINI LDW 1404	✓	✗	✗	✓
KUBOTA D1105-W1	✓	✗	✓	✗
KUBOTA V2403	✓	✓	✓	✓
KUBOTA V2703	✓	✓	✓	✓

Compliant	✓
Not compliant	✗

4.1.1 - Other fuels

- Biofuels : According to EN14214 (EU) and ASTM D6751-07a (USA) biofuels are allowed on some engines and under certain conditions. For more information, please contact HAULOTTE Services®.
- Jet engine fuels (kerosene) : F34 and F35 types under OTAN designation are possible on some engines and under certain conditions. For more information, please contact HAULOTTE Services®.
- The use of vegetable oils is forbidden.

4.2 - ENGINE OIL

The correct SAE viscosity grade of oil is determined by the minimum ambient temperature during cold engine start-up, and the maximum ambient temperature during engine operation.

Refer to Table "Engine Oil Viscosity" (minimum temperature) in order to determine the required oil viscosity for starting a cold engine.

Refer to Table "Engine oil Viscosity" (maximum temperature) in order to select the oil viscosity for engine operation at the highest ambient temperature that is anticipated.

Generally, use the highest viscosity oil that is available to meet the requirement for the temperature at start-up.

Engine oil viscosity

EMA LGR-1 / API CH-4 Viscosity grade	Ambient temperature	
	Minimum	Maximum
SAE 0W20	-40°C (-40°F)	10°C (50°F)
SAE 0W30	-40°C (-40°F)	30°C (86°F)
SAE 0W40	-40°C (-40°F)	40°C (104°F)
SAE 5W30	-30°C (-22°F)	30°C (86°F)
SAE 5W40	-30°C (-22°F)	40°C (104°F)
SAE 10W30	-20°C (-4°F)	40°C (104°F)
SAE 15W40	-10°C (14°F)	50°C (122°F)

Classification API

Fuel type	Engine oil classification
	Engines with non EGR Engines with internal EGR
High sulfur fuel ≤ [0.05% (500 ppm)] Sulfur content < 0.50% (5000 ppm)	CF (If the engine oil is used with a high sulfur level, change the engine oil at shorter intervals, approximately half)
EGR : Exhaust Gas Re-circulation	

4.3 - HYDRAULIC OIL

Hydraulic oils must comply with the following requirements :

- Oil filterability must be compatible with absolute filters 5 µ
- COmpatibility with elastomers (polyurethane, NBR, VITON, etc.).
- Have properties such as :
  - Antifoam and deaeration
  - Anti-wear, anti-shear and antioxydant
  - Rust and corrosion inhibitors (copper)

Biodegradable oils may be used if they comply with the following requirements :

- HEES type biodegradable oil only according to standards ISO 15380 and VDMA 24568

The recommended viscosity grades depending on the environmental conditions are as follows :

N.B.-:-REFER TO CONSOMMABLES

	Viscosity grade	HV46	HV46 Biodegradable	HV32	HV68
Ambient temperature		Between - 15° C (- 9° F) and + 40° C (+ 104° F)	Between - 15° C (- 9° F) and + 40° C (+ 104° F)	Between - 35° C (- 31° F) and + 35° C (+ 95° F)	Between 0° C (+ 32° F) and + 45° C (+ 113° F)
Hydraulic oil temperature		Between - 15° C (- 9° F) and + 80° C (+ 176° F)	Between - 15° C (- 9° F) and + 80° C (+ 176° F)	Between - 35° C (- 31° F) and + 80° C (+ 176° F)	Between 0° C (+ 32° F) and + 85° C (+ 185° F)
	Standards				
Viscosity at + 40° C (+ 104° F)	ISO 3104	46 +/- 3 cst	46 +/- 3 cst	32 +/- 3 cst	68 +/- 3 cst
Viscosity at + 100° C (+ 260° F)	ISO 3104	> 8 cst	> 8 cst	> 8 cst	> 10,5 cst
Viscosity Index	ISO 2909	> 150	> 160	> 250	> 150
Flashpoint	ISO 2592	> 210° C (> 410° F)	> 220° C (> 428° F)	> 125° C (> 257° F)	> 220° C (> 428° F)
Pour point	ISO 3016	< - 40 ° C (< - 40° F)	< - 40 ° C (< - 40° F)	< - 50 ° C (< - 58° F)	< - 35 ° C (< - 31° F)

4.4 - GEAR MOTOR OIL

The recommended oil is EP type, the characteristics of which comply with standards MIL-L-2105 and API GL5.

N.B.-:-REFER TO CONSOMMABLES

	Mineral	Synthetic
Normal operating condition	SAE 80W/90	SAE 75W/90
Harsh operating condition	SAE 85W/140	SAE 80W/140 - SAE 75W/140

4.5 - COOLANT

Always use a 50/50 blend of coolant and clean soft water.

The coolant is available in different types. For this engine, use the ethylene glycol type (EG).

The procedure for the blend of water and antifreeze differs according to the manufacture of the antifreeze. Refer to standard SAEJ1034 and more precisely SAE J814c.

N.B.-:-REFER TO CONSOMMABLES

Antifreeze volume (%)	Freezing point		Boiling point	
	° C	° F	° C	° F
50	- 37	- 34	108	226

Never add a different brand of coolant. The different brands may have different additive components, and the engine may fail to perform as specified. When the liquid is mixed, do not use any radiator cleaning agent. If the liquid is mixed with a cleaning agent, an emulsion may form and the engine components may be damaged.

4.6 - CYLINDER STORAGE OIL

If a cylinder is not used, the surface of the cylinder rod may be exposed to a corrosive environment (Example : When new equipment is stored before shipping.).

1 time per month, apply oil diluted in a solvent (Recommendations : UNIL OPAL PROTECT SHX 12).

Procedure :

- Wash the machine completely to remove any trace of harsh environmental pollution. Clean the cylinder rods, which are sensitive to corrosion, using clean water.
- Perform a dynamic test. For each cylinder perform a movement from stop to stop (3 times each movement).
- Dry the cylinder rods.
- Grease the cylinder rods with protective oil (See recommendations)
- Verify absence of any oil leaks.

N.B.-:-REFER TO CONSOMMABLES

4.7 - GREASE

N.B.-:-REFER TO CONSOMMABLES

	Units	Standards	Grease for telescope	Shell gadus S2 V220AC 2 grease	Polyplex Bardahl grease
Nature of the lubricating oil			Semi-synthetic	Mineral oil	Semi-synthetic
Appearance			Viscous grease	Semi-solid	Semi-solid
Thickening nature			Lithium	Lithium / Calcium	Complex lithium
Color			Ivory	Red	Blue
Grade NLGI			1	2	2
Operating temperature	°C		- 40 at 140	- 20 at 120	- 20 at 160
Viscosity of the basic oil at 40° C / 104° F	mm² / s	ISO 3104	25	220	140
Viscosity of the basic oil at 100°C / 212° F	mm² / s	ISO 3104	-	18	14,5
Penetration at 25° C / 77° F	0,1 mm	ISO 2137	310 - 340	277	265 - 295
Drop point	°C / °F	ISO 2176	> 180	175	> 250
Welding 4 ball test	kg		> 315	-	> 315
Density at 20° C / 68° F			0,91	0,9	0,9

5 - Machine specifications

5.1 - MOVEMENT SPEED

To allow checking operation, refer to the following table about originally time per movement. If the values measured by test are not equal to the following :

- Do not use the machine.
- Setting updating is needed.

Always check speed movement from the ground control box.

	HT26 RT O - HT80 RT O	HT28 RTJ O - HT85 RTJ O - HT28 RTJ PRO - HT85 RTJ PRO
Low drive speed	1,4 km/h - 0.9 m/h	
High drive speed	5 km/h - 3.1 m/h	
Maximum towing speed	1,4 km/h - 0.9 m/h	
Time for telescopic boom extension	63 s +/-3	
Time for telescopic boom retraction	60 s +/-3	
Time for raising boom	72 s +/-3	
Time for descent boom	63 s +/-3	
Time for lifting at maximum height	90 s	
Time for descent at height 0, platform at horizontal	90 s	
Time for continue turntable rotation 90°	40 s +/-2	
Time for complete left / right cage rotation	22 s +/-3	

D - Inspection and maintenance schedule

1 - Inspection program

The machine must be inspected at regular intervals in accordance with the requirements set out in the country of use and at least once a year. The purpose of the inspection is to detect any defect which could lead to an accident during routine use of the machine.

Inspections and maintenance must be carried out by a qualified company or person chosen by the owner of the machine.

The results of these visits must be recorded in a safety register created by the owner. This register as well as the list of competent repair persons must made available to the work inspector, government inspector and company safety committee at any time.

Frequency	Person-in-charge	Stakeholder	Type	Documentation
Before each hire	Owner	On-site technician	Daily inspection	Operator's manual
Before each use or each change of user	Operator	Operator	Daily inspection	Operator's manual
At intervals recommended by HAULOTTE®	Owner	On-site technician, qualified HAULOTTE Services® technician	Preventive maintenance	Maintenance Book
Before sale	Owner	On-site technician, qualified HAULOTTE Services® technician	Periodic inspection	Maintenance Book
Annually (1 year) (*)	Owner	On-site technician, qualified HAULOTTE Services® technician	Periodic inspection	Maintenance Book
After 10 years then every 5 years	Owner	Qualified technician HAULOTTE Services®	Major inspection	Maintenance Book

(*) Or according to local regulations.

2 - Daily inspection

The daily inspection must be performed every day, before the start of a new work shift and at every change of user.

This inspection is performed by and under the responsibility of the user and includes the visual and functional inspection of the machine as well as the testing of its safety systems.

A description of the daily inspection can be found in the machine's user manual.

We recommend these forms to be completed daily and stored to assist with your maintenance schedule.

3 - Preventive maintenance

Maintenance operations must be carried out by a qualified technician chosen by the owner and ensure that the machine operates correctly.

Severity of operating conditions may require a reduction in time between maintenance periods.

Maintenance operations performed must be recorded in a register / log book of the machine.

The information contained in our manual is to be complemented by the information found in the engine manufacturer's maintenance manual, which can be found on the link in the associated maintenance sheet MS0238.

Symbol meanings

	Oil change		To check by test		Tightening
	Levelling		Visual inspection		Functional adjustments / Checks / Cleaning
	Lubrication-Lubrication				Systematic replacement

Preventive Maintenance Level 1 - First 50H

First 50H	Page or associated procedure	First 50H	OK	NOK	Corrected	Comments
Chassis assembly : Wheel, reducer, steering, wheel pivot						
Tighten the wheel nuts						
KUBOTA V2607M / V2607CR engine - KUBOTA WG3800 engine						
Drain the engine oil						
Replace the oil filter						
Hydraulic : oils, filters and hoses						
Replace the hydraulic filter						
Arm, boom						
Control telescoping cables state and tension						

D - Inspection and maintenance schedule

Preventive Maintenance Level 1 - Every 250H

Every 250H	Page or associated procedure	Every 250H	OK	NOK	Corrected	Comments
Chassis assembly : Wheel, reducer, steering, wheel pivot						
Grease the steering system						
Grease the bushings and pins						
Slew ring						
Grease the turntable slew ring						
KUBOTA V2607M / V2607CR engine - KUBOTA WG3800 engine						
Clean the fuel filter						
Clean the air filter						
Check the belt tension and condition						
Arm, boom						
Grease the pads						

D - Inspection and maintenance schedule

Preventive Maintenance Level 1 - Every 6 months or 500H

Every 6 months or 500H	Page or associated procedure	Every 6 months or 500H	OK	NOK	Corrected	Comments
Chassis assembly : Wheel, reducer, steering, wheel pivot						
Tighten the wheel nuts						
Check the wheel reducer level						
Tighten the steering system						
Slew ring						
Tighten the slew ring						
Check the movement reducer level						
KUBOTA V2607M / V2607CR engine						
Drain the engine oil*						
Replace the oil filter*						
Clean the fuel filter*						
Check the belt tension and condition*						
KUBOTA WG3800 engine						
Drain the engine oil*						
Replace the oil filter*						
Check the belt tension and condition*						
Hydraulic : oils, filters and hoses						
Check the hydraulic oil level						
Jib						
Tighten the rotary cylinder						
Tighten the load cell						
Platform						
Tighten the mounting on the platform support, the platform floor and the platform access						

* Do not take into account the deadline of 6 months, only 500H.

D - Inspection and maintenance schedule

Preventive Maintenance Level 2 - Every 1 year or 1000H

Every 1 year or 1000H	Page or associated procedure	Every 1 year or 1000H	OK	NOK	Corrected	Comments
Chassis assembly : Wheel, reducer, steering, wheel pivot						
Drain the wheel reducer						
Slew ring						
Drain the movement reducer						
KUBOTA V2607M / V2607CR engine						
Replace the air filter						
KUBOTA WG3800 engine						
Replace the fuel filter						
Replace the air filter						
Hydraulic : oils, filters and hoses						
Replace the hydraulic filter						
Arm, boom						
Check the pads-Replacement if necessary						
Control telescoping cables state and tension						

D - Inspection and maintenance schedule

Preventive Maintenance Level 2 - Every 2 years or 2000H

Every 2 years or 2000H	Page or associated procedure	2 year(s) or 2000H	OK	NOK	Corrected	Comments
Chassis assembly : Wheel, reducer, steering, wheel pivot						
Check the bushings and pins-Replacement if necessary						
Slew ring						
Check the slew ring clearance						
KUBOTA V2607M / V2607CR engine - KUBOTA WG3800 engine						
Drain the oil tank						
Drain the cooling circuit						
Hydraulic : oils, filters and hoses						
Hydraulic oil						

D - Inspection and maintenance schedule

Preventive Maintenance Level 2 - Every 3000H

Every 3000H	Page or associated procedure	Every 3000H	OK	NOK	Corrected	Comments
KUBOTA V2607M / V2607CR engine						
Clean and check the particulate filter - Replace if necessary (Contact HAULOTTE Services®)	See manufacturer's guide					

Preventive Maintenance Level 2 - Every 10 years

Every 10 years	Page or associated procedure	Every 10 years	OK	NOK	Corrected	Comments
Arm, boom						
Replace telescoping cables						

4 - Periodic inspection

The Periodic inspection is a thorough inspection of the operation and safety features of the machine. This must take place prior to the sale or resale of the machine and every 1 year. Local regulations may have specific requirements on frequency, and content of inspections.

This intervention must take place after :

- Extensive dismantling and reassembly
- Repairs involving the machine's essential components
- Any accident causing stress to the machine

This inspection is the responsibility of the owner, and must be conducted by a qualified technician.

Under no circumstances may this inspection replace the control required by local regulations.

Use the detailed program below.

Periodic	Page or associated procedure	Periodic	OK	NOK	Corrected	Comments
Chassis assembly : Wheel, reducer, steering, wheel pivot						
Check state of tires/tyres and inflations						
Motor						
Check that there are no leaks from the engine's components (engine, hose, radiator)						
Check the condition of the battery						
Check for visible damage and broken welds on the exhaust system						
Check the operation of the lock on the engine casing						
Turntable						
Test the operation of the turntable locking system						
Hydraulic : oils, filters and hoses						
Check the hoses, blocks and pumps, fittings, cylinders and the tank for the absence of leaks, deformations and damage						
Platform						
Test the automatic closure and locking of access basket						
Check that the harness anchor points are not cracked or damaged						

D - Inspection and maintenance schedule

Periodic	Page or associated procedure	Periodic	OK	NOK	Corrected	Comments
General						
Check for the presence, cleanliness and readability of the manufacturer's plates, security labels, user manual and maintenance manual						
Check the cleanliness and readability of the control box						
Test the opening and closure of covers (chassis, turntable, upper control box)						
Check the condition of electrical harnesses, cables and connectors						
Check for the absence of abnormal noise and jerky movements						
Check for the absence of visible deterioration and damage						
Check for the absence of cracks, broken welds and chipped paintwork on the structure						
Check for the absence of missing or loose screws and bolts						
Check for the absence of deformation, cracking and breakage of axis stops, bushing and axes						
Check for the absence of foreign bodies in joints and sliding parts						
Safety devices						
Test the operation of the upper and lower control boxes: manipulators, switches, buttons, horn, emergency stops, screens and lights						
Check for the absence of visual and audible alarms						
Test the operation of the tilt system						
Test the operation of the emergency lowering system						
Test the operation of the axle locking system	MP0008					
Test the operation of the loading control system (visual alarm on the control box)						
Test the operation of the Activ Shield Bar (If equipped)						
Test the operation of the drive speed limiter systems						
Test the speed and behavior of movements						
Check the operation of the load control system- Calibrate if necessary						

5 - Major inspection

The inspection is a thorough inspection of the machine to ensure that it is fully functional. It must be carried out after 10 years then every 5 years.

This inspection is the responsibility of the owner and must be carried out by a technician HAULOTTE Services® or an authorized and qualified person.

In order to carry it out, contact the subsidiary HAULOTTE® or the authorized distributor.

1 - Warning

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- **The use of this form implies that its user has been trained on this type of equipment.**
- **It is important that the person working on the machine is familiar with all of the safety information contained in the user manual.**
- **Generally speaking, the user must comply with regulatory obligations in force, particularly those relating specifically to working alone, co-activity and manual load handling...**
- **The user must have all the permits/authorizations required to work (fire permit, etc.) and comply with the specific safety instructions at the intervention site.**
- **Only risks linked specifically to activities relating to the disassembly and assembly of the machine HAULOTTE® are described in this sheet.**

2 - Risk prevention

Means of protection to be used when implementing the range

	Appropriate workwear		Gloves
	Safety shoes		

3 - You will need

	• Standard tool kit		• Place barriers around the perimeter of the work area

4 - Control and maintenance

To guarantee the integrity of the machine, it is necessary to carry out periodical controls on the mechanical structure such as defines hereafter.

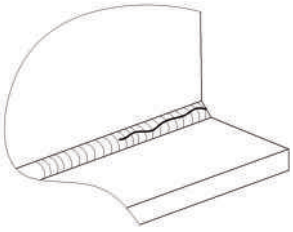
4.1 - DAILY INSPECTION

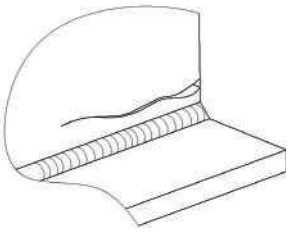
All the accessible structural part without disassembling must be subjected to a fast visual inspection.

If anomalies are noted, according to the list below, a reinforced control will have to be carried out to judge conformity of the part :

- Absence of foreign body to the articulations and slides.
- Absence of deformation and visible damage.
- Absence of crack, broken welding, oxidation, glare of painting.
- Absence of excessive gap to the articulations and slides.
- Check that locking device are not damaged and are functional.
- No screws or missing part loosened or unscrew.
- Anchorage points firmly fixed and not damaged.

The list of part to check are define Section Familiarization.





4.2 - MAJOR INSPECTION

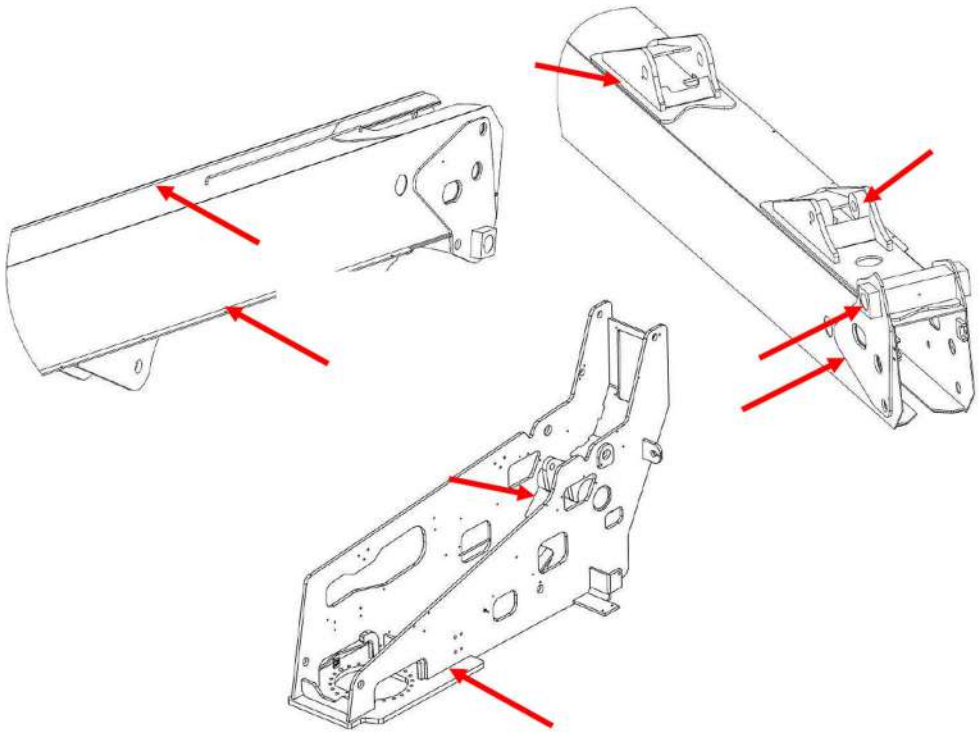
All structural part listed Section Familiarization must be disassembled and all weldsmust be review using non-destructive checks Section D - Inspection and maintenance schedule.

The criteria quoted above are applicable.

The main items to be inspected are :

- Boss welds on chassis, turret, arms, booms and jib.
- Booms and arms welds.

Example



In the event of suspicion of crack, a cleaning and a sweating are to be carried out to guarantee the integrity of the part before reassembly.

Check presence and torque of each bolts and screw used to assembly part listed in Section Familiarization. Refer to spare part catalog for additional information if needed.

Some screws are not reusable and must be systematically changed (ex: screws from the gear ring).

4.3 - FUNCTIONAL TESTS

The following tests must be performed periodically Section D - Inspection and maintenance schedule :

- An important technical intervention.
- An accident resulting from a failure of a major component.

The following tests must be realized by a qualified staff under secure conditions.

The results of the tests must be entirely documented.

To avoid the swing of the machine during the test, it is imperative that a device of reserve (chain, not of anchoring) is used during the test.

4.4 - DYNAMIC TESTS

The machine must be place on level and firm ground.

With 100% of the maximum allowed load, operate from ground control box (or emergency control box) all the movements ; the platform floor must reach a height of about 1 above the ground.

The functional tests must show the following facts :

- The machine carried out all the movements without jolts while supporting the load.
- All the security device function correctly.
- Authorized maximum speeds of operation are not exceeded.

Refer to the user manual for the description of the safety device and technical characteristics to be reached.

4.5 - STRUCTURAL TEST

The following test shows that the structure of the machine is in conformity with the safety requirements.

The machine must be place on level and firm ground.

With 100% of the maximum allowed load, operate from ground control box (or emergency control box) all the movements ; the platform floor must reach a height of about 1 above the ground :

- Measure the distance between the ground and the basket (or of the platform).
- Leave the machine in static during 15 mnn.
- Measure the distance between the ground and the basket (or of the platform).

If the difference between two measurements does not exceed 4 cm (1.575 in) : the test is validated.

If the difference between two measurements exceeds 4 cm (1.575 in), to contact HAULOTTE Services® or to carry out the additional tests described below. MS0003 - § 3.2 Cylinder inspection.

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- **The user must have all the permits/authorizations required to work (fire permit, etc.) and comply with the specific safety instructions at the intervention site.**
- **Only risks linked specifically to activities relating to the disassembly and assembly of the machine HAULOTTE® are described in this sheet.**

2 - Risk prevention

Means of protection to be used when implementing the range

	Appropriate workwear		Gloves
	Safety shoes		

3 - You will need

	• Standard tool kit		• Place barriers around the perimeter of the work area

4 - Control and maintenance

Inspection of the pins, stop pins, bushings and bearings must be carried out according to the recommendations Section D - Inspection and maintenance schedule :

- Fast visual inspection without disassembling Section D - Inspection and maintenance schedule :
    - Check the presence of the pins and visible stops pins without disassembling.
    - Check the presence of the screws.
    - Check absence of deformations, cracks or breakage of pins and/or stops pins.
    - Check absence of heavy abrasion, wear or oxidation of the pins, stops pins.
- Reinforced visual inspection with disassembling of certain elements to reach the bushes or bearing Section D - Inspection and maintenance schedule : In addition to the above cited criteria, verify the following :
    - Check the presence and the position of the bushes and bearings.
    - Check the absence of shaving in periphery of the pins.
    - Check the absence of heavy abrasion, wear or oxidation of the bushes and bearing.
    - Check the absence of deformations, cracks or breakage of the bushes and bearing.
    - Check the absence of radial gap > 0,5 mm (19690 µ in) on the pins.
- Complete disassembling of the pins, bushes and bearing Section D - Inspection and maintenance schedule : In complement of the inspections above cited, it is necessary to check :
    - For the stages :
- Check the presence of material of friction.
    - For the bearings :
- After disassembling, protect the bearing from pollution and shocks.
- Clean the bearing with a suitable solvent.
- Check the absence of shaving in the housing of the bearing and/or the bearing.
- Check the absence of heavy abrasion, wear, oxidation, deformations of the balls (or rollers) and the ball races.

The periodicity can evolve under the following conditions Section D - Inspection and maintenance schedule :

- Abnormal noise during movements of the structure.
- Prolonged storage of the machine (6 months).
- Specific storage and use Environment (strong moisture and salinity of the air).

5 - Criteria of replacement

The pins, stop pins, bushes and bearing must be replaced as soon as one of the anomalies quoted above is noted. Bearing and bushes must be imperatively changed at the end of 10 years of use.

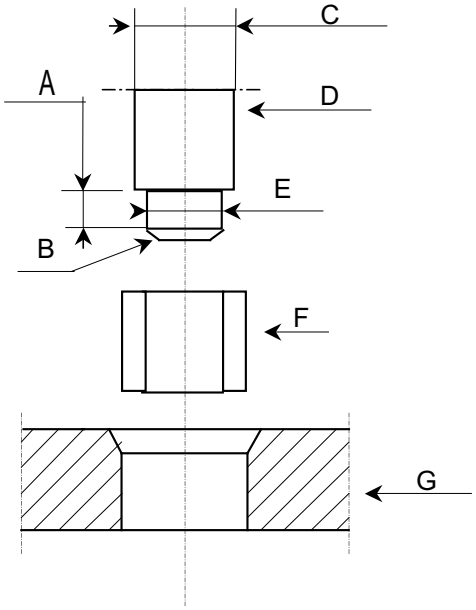
6 - Procedure of reassembly

6.1 - PINS AND BUSHES

When reassembling bearings and pins ensure that :

- Lightly lubricate the housing into which the bearing is to be installed.
- Insert the bearing using a bearing drift, preferably out of mild steel.
- The bearing, the bearing drift and the bearing housing must be correctly aligned during the assembly process.
- The recommended values for the bearing drift are given on the diagram below :

Recommended Values



Marking	Description
A	At least 0,5 times the nominal diameter
B	Make a chamfer
C	Nominal diameter of the bearing - 0,2 / - 0,3 mm (-7874 µ in / -11810 µ in)
D	Bearing drift
E	Diameter of the bearing guide - 0,20 / - 0,25 mm (-7874 µ in / -9843 µ in)
F	Bearing
G	Housing

- After inserting the bearing, lubricate and fit the pin.

6.2 - BEARINGS

For the reassembly of bearings, respect the following stages :

- Clean boring and/or the pins to remove all the foreign bodies.
- Slightly lubricate boring and/or pins.
- Lubricate the ring of the bearing slightly.
- To fit bearing in a boring: take support on the external ring of the bearing.
- To fit bearing on an axis: take support on the interior ring of the bearing.

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- Generally speaking, the user must comply with regulatory obligations in force, particularly those relating specifically to working alone, co-activity and manual load handling...
- The user must have all the permits/authorizations required to work (fire permit, etc.) and comply with the specific safety instructions at the intervention site.
- Only risks linked specifically to activities relating to the disassembly and assembly of the machine HAULOTTE® are described in this sheet.

- Beware of the risk of burns; the hydraulic system operates at high temperatures.
- The pressure in the hydraulic system is very important. It can cause accidents. Relieve the pressure before beginning any work and never search for oil leaks using your hands.

2 - Risk prevention

Means of protection to be used when implementing the range

	Appropriate workwear		Gloves
	Safety shoes		

3 - You will need

	• Standard tool kit		• Place barriers around the perimeter of the work area

4 - Control and maintenance

4.1 - VISUAL INSPECTIONS

The hydraulic actuating cylinders must be subjected to visual inspections periodic all the 250 hours or 6 months such as defined below :

- Absence of leakage.
- Absence of deformations, visible damage , cracks on the body and fixing of the cylinder.
- Absence of rust and shock on the rod.
- Absence of foreign objects on all surfaces.
- Absence of missing or loosened part (bolt, nut, connection, flexible device, etc).

4.2 - FUNCTIONAL TESTS

To guarantee an optimal level of performance and safety, functional tests must be realized all the 250 hours or 6 months.

The periodicity can evolve under the following conditions :

- Anomaly noted during visual inspection.
- Abnormal noise during movements of the structure.
- Prolonged storage of the machine (6 months).
- Specific storage and use Environment (strong moisture and salinity of the air).

Generic Control :

- Position a load equal to the rated capacity on the cage (or platform).
- Raise the cage (or the platform) using the ground control box. To activate the cylinder to be tested, proceed as follows :
  - Lift Arm hydraulic cylinder : Lift the arm to approximately half full height. The telescopic boom should be fully extended and in the horizontal position. (For machines fitted with).
  - Boom lifting cylinder or Jib cylinder : Lift the concerned equipment (boom or jib) of approximately half way. Extend the telescope to its maximum.
  - Telescoping cylinder : Lift the boom to its maximum angle and telescope approximately 50 cm (19.69 in).
- Measure the distance between the floor of the cage (or of the platform) and the ground.
- Leave the machine in this condition for 15 mn (minutes).
- Measure the distance between the floor of the cage (or of the platform) and the ground.
  - If the difference between two measurements does not exceed 4 cm (1.575 in) : the test validates correct operation.
  - If the difference between two measurements exceeds 4 cm (1.575 in), contact HAULOTTE Services® or carry out the additional tests described below.

Control cylinder by cylinder :

- Position a load equal to the rated capacity on the cage (or platform).
- Perform the movement of the concern cylinder to half of its stroke.
- Fix the cylinder with a comparator :
  - Attach the body of the comparator on the cylinder rod.
  - The needle of the comparator must be in contact with the end of the casing of the cylinder.
  - The target is to measure the creep of the cylinder rod.
- If the creep of the cylinder rod is higher than the values indicated in the table below, replace the cylinder.

Type of cylinders	Maximum drift authorised due to an internal leak of the cylinder	
Lift cylinder arm or boom (Machine with working heights > 26 m(85 ft4 in))	After 10 mn, creep < 0,2 mm (7874 µ in)	After 60 mn, creep < 1 mm (0.039 in)
Outriggers cylinder, Oscillating axle locking, Lift cylinder arm or boom (Machine with range-limiting system)	After 10 mn, creep < 0,5 mm (0.01196 in)	After 60 mn, creep < 2,5 mm (0.098 in)
Lift cylinder arm or boom, Telescoping, Compensation, ...	After 10 mn, creep < 1 mm (0.039 in)	After 60 mn, creep < 6 mm (0.236 in)
Steering cylinder	After 10 mn, creep < 1,5 mm (0.059 in)	After 60 mn, creep < 9 mm (0.354 in)

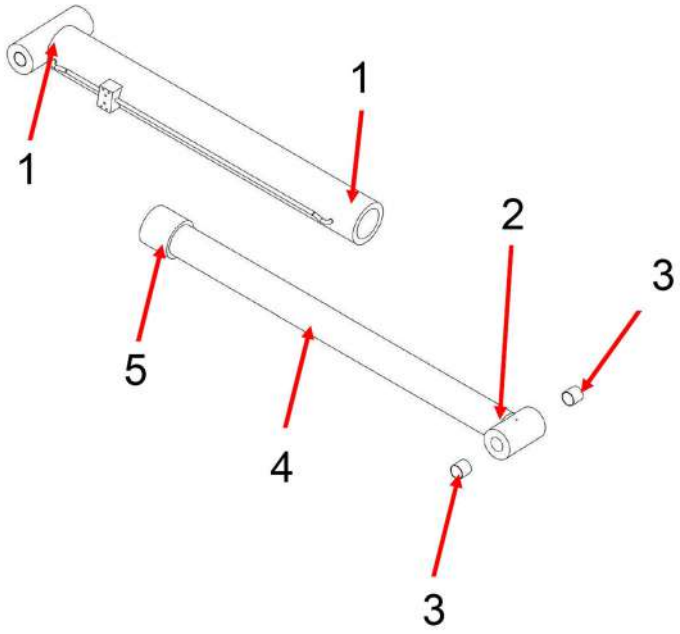
These tests must be made in conditions of equivalent temperatures.

4.3 - MAJOR INSPECTION

A thorough inspection of the structural parts must be realized all the 5000 h or 10 years with disassembling of the element to check the entirety of the welding. Each Cylinder must be disassembled and must be review using non-destructive checks.

The criteria quoted above are applicable :

- Absence of deformation and visible damage.
- Absence of crack, broken welding, oxidation, glare of painting.



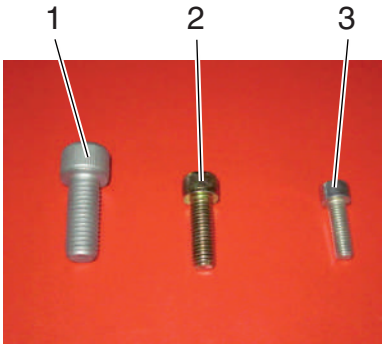
Check :

1. Pipe weld connection.
2. Rod weld connection.
3. Ring.
4. Rod.
5. Piston.

1 - Metric torque chart

For screws HAULOTTE®, use columns (A), (B) and (C) :

- Screw (1) grey dull dry, use colums (A)
- Screw (1) grey dull greasy, use column (B)
- Screw (2) yellow dry, use column (C)
- Screw (2) yellow greasy, use column (B)
- Screw (3) grey bright dry, use column C
- Screw (3) grey bright greasy, use column (B)



Metric fastener torque chart
This charts is to be used as a guide only unless noted elsewhere in this manual

Size (mm)	Class 4.6						Class 8.8												Class 12.9					
	Dull dry (A)		Lubed (B)		Yellow dry (C)		Dull dry (A)		Lubed (B)		Yellow dry (C)		Dull dry (A)		Lubed (B)		Yellow dry (C)		Dull dry		Lubed		Yellow dry	
	in-lbs	Nm	in-lbs	Nm	in-lbs	Nm	in-lbs	Nm	in-lbs	Nm	in-lbs	Nm	in-lbs	Nm	in-lbs	Nm	in-lbs	Nm	in-lbs	Nm	in-lbs	Nm	in-lbs	Nm
5	17.7	2	16	1.8	21	2.4	44	5	41	4.63	54	6.18	68	7.7	58	6.63	78	8.84	79	9	68	7.75	91	10.3
6	30	3.4	19	3.05	36	4.07	80	9.1	69	7.87	93	10.5	118	13.4	100	11.3	132	15	139	15.7	116	13.2	155	17.6
Size (mm)	Dull dry		Lubed		Yellow dry		Dull dry		Lubed		Dry		Dull dry		Lubed		Dry		Dull dry		Lubed		Dry	
	ft-lbs	Nm	ft-lbs	Nm	ft-lbs	Nm	ft-lbs	Nm	ft-lbs	Nm	ft-lbs	Nm	ft-lbs	Nm	ft-lbs	Nm	ft-lbs	Nm	ft-lbs	Nm	ft-lbs	Nm	ft-lbs	Nm
8	5.9	8	5.4	7.41	7.2	9.88	16.2	22	14	19.1	18.8	25.5	23.6	32	20.1	27.3	26.9	36.5	28	38	23.6	32	31.4	42.6
10	12.17	16.5	10.8	14.7	14.4	19.6	32.45	44	27.9	37.8	37.2	50.5	47.2	64	39.9	54.1	53.2	72.2	55	75	46.7	63.3	62.3	84.4
12	20.65	28	19.8	25.6	25.1	34.1	56	76	48.6	66	64.9	88	81.8	111	69.7	94.5	92.2	125	95.9	130	81	110	108	147
14	33.19	45	30.1	40.8	40	54.3	89.24	121	77.4	105	103	140	131.28	178	110	150	147	200	154.15	209	129	175	172	234
16	52.37	71	46.9	63.6	62.5	84.8	139.4	189	125	170	166	226	205.04	278	173	235	230	313	239.7	325	202	274	269	365
18	72.28	98	64.5	87.5	86.2	117	192.5	261	171	233	229	311	283.2	384	238	323	317	430	331	449	278	377	371	503
20	102.5	139	91	124	121	165	272.9	370	243	330	325	441	401.2	544	337	458	450	610	469.8	637	394	535	525	713
22	140.87	191	124	169	166	225	345.4	509	331	450	442	600	551.7	748	458	622	612	830	645.3	875	536	727	715	970
24	176.27	239	157	214	210	285	469.8	637	420	570	562	762	690.3	936	583	791	778	1055	807.6	1095	682	925	909	1233

2 - SAE fastener torque chart

SAE fastener torque chart This charts is to be used as a guide only unless noted elsewhere in this manual											
Size	Thread	Grade 5				Grade 8				A574 High strength black oxide bolts	
		Lubed		Dry		Lubed		Dry		Lubed	
		in-lbs	Nm	in-lbs	Nm	in-lbs	Nm	in-lbs	Nm	in-lbs	Nm
1/4	20	80	9	100	11.3	110	12.4	140	15.8	130	14.7
	28	90	10.1	120	13.5	120	13.5	160	18	140	15.8
		Lubed		Dry		Lubed		Dry		Lubed	
		ft-lbs	Nm	ft-lbs	Nm	ft-lbs	Nm	ft-lbs	Nm	ft-lbs	Nm
5/16	18	13	17.6	17	23	18	24	25	33.9	21	28.4
	24	14	19	19	25.7	20	27.1	27	36.6	24	32.5
3/8	16	23	31.2	31	42	33	44.7	44	59.6	38	51.5
	24	26	35.2	35	47.4	37	50.1	49	66.4	43	58.3
7/16	14	37	50.1	49	66.4	50	67.8	70	94.7	61	62.7
	20	41	55.5	55	74.5	60	81.3	80	108.4	68	92.1
1/2	13	57	77.3	75	101.6	80	108.4	110	149	93	126
	20	64	86.7	85	115	90	122	120	162	105	142
9/16	12	80	108.4	110	149	120	162	150	203	130	176
	18	90	122	120	162	130	176	170	230	140	189
5/8	11	110	149	150	203	160	217	210	284	180	244
	18	130	176	170	230	180	244	240	325	200	271
3/4	10	200	271	270	366	280	379	380	515	320	433
	16	220	298	300	406	310	420	420	569	350	474
7/8	9	320	433	490	583	450	610	610	827	510	691
	14	350	474	470	637	500	678	670	908	560	759
1	8	480	650	640	867	680	922	910	1233	770	1044
	12	530	718	710	962	750	1016	990	1342	840	1139
1 1/8	7	590	800	790	1071	970	1315	1290	1749	1090	1477
	12	670	908	890	1206	1080	1464	1440	1952	1220	1654
1 1/4	7	840	1138	1120	1518	1360	1844	1820	2467	1530	2074
	12	930	1260	1240	1681	1510	2047	2010	2725	1700	2304
1 1/2	6	1460	1979	1950	2643	2370	3213	3160	4284	2670	3620
	12	1640	2223	2190	2969	2670	3620	3560	4826	3000	4067

3 - Hydraulic couplings and hoses tightening torque charts

Hydraulic fitting torque (Tolerance = 0 / +10%)

BSPP threads according to ISO1179		
Thread	Torque	
	ft-lbs	Nm
G1/4	26	35
G3/8	52	70
G1/2	66	90
G3/4	133	180
G1"	229	310
G1"1/4	332	450
G1"1/2	398	540
UNF threads according to ISO11926-2/3		
Thread	Torque	
	ft-lbs	Nm
7/16-20	15	20
1/2-20	30	40
9/16-18	33	45
3/4-16	59	80
7/8-14	100	135
1"1/16-12	136	185
1"5/16-12	199	270
1"5/8-12	251	340
1"7/8-12	306	415

Metric threads according to ISO 6149-2/3 or ISO9974 / DIN 3852-1				
Thread	Torque ISO 6149-2/3		Torque DIN 3852-1	
	ft-lbs	Nm	ft-lbs	Nm
M10x1,0	18	25	18	25
M12x1,5	26	35	26	35
M14x1,5	30	40	33	45
M16x1,5	51	70	41	55
M18x1,5	66	90	52	70
M20x1,5	92	125	59	80
M22x1,5	100	135	74	100
M26x1,5	133	180	125	170
M33x2,0	229	310	229	310
M42x2,0	332	450	243	330

N.B.-:- ISO6149: SEALING WITH O-RING WITHOUT ANY RETAINING RING (OR FORM). ISO9974 / DIN3852: SEALING WITH O-RING AND RETAINING RING (OR FORM).

Hydraulic hose torque (Minimum / Maximum)

Hose size	JIC thread	JIC torque		ORFS thread	ORFS torque	
		ft-lbs	Nm		ft-lbs	Nm
DN06 - 1/4"	7/16-20	11-15	15-21	9/16-18	18-21	25-28
DN10 - 3/8"	9/16-18	22-31	30-42	11/16-16	30-33	40-45
DN12 - 1/2"	3/4-16	37-52	50-70	13/16-16	41-44	55-60
DN16 - 5/8"	7/8-14	51-69	69-94	1"-14	59-66	80-90
DN19 - 3/4"	1"1/16-12	72-99	98-133	1"3/16-12	85-96	115-130
DN25 - 1"	1"5/16-12	103-140	140-190	1"7/16-12	111-125	150-170
DN32 - 1"1/4	1"5/8-12	155-210	210-285	1"11/16-12	148-166	200-225
DN38 - 1"1/2	1"7/8-12	214-280	290-380	2"-12	221-243	300-330
DN50 - 2"	2"1/2-12	332-443	450-600	2"1/2-12	367-406	500-550

4 - HT26 RT O - HT28 RTJ O - HT28 RTJ PRO - HT80 RT O - HT85 RTJ O - HT85 RTJ PRO

Sub-assemblies	Concerned elements	Torque
Axles	Wheels	450 Nm
	Wheel studs / Driving reducer	Loctite 243 - Normal threadlocker
	Hydraulic motor / Driving reducer	57 Nm
	Wheel reducer / Chassis	260 Nm
	Wheel reducer / Wheel steering pivots	260 Nm
Slew ring	Slew ring / Chassis	215 Nm
	Turntable / Slew ring	215 Nm
Turret reducer	Turret reducer / Turret	189 Nm
	Turret reducer / Support plate	76 Nm
Engine	Drive pump / Engine housing	100 Nm
	Equipment pump / Drive pump	100 Nm
	Screw fastening elastic coupling / Flywheel	49 Nm
Counterweight	Counterweight / Turntable	500 Nm
Telescope	Pads rear telescope	Screws : 15 Nm Nuts : 45 Nm
Platform rotation cylinder	Cylinder / Link piece	44 Nm Medium threadlocker
	Screw connecting cylinder / link piece	800 Nm
Strain gauge MOBA	Mounting on platform support and link piece Apply torque in 3 times : 1. 70 Nm 2. 140 Nm 3. 215 Nm	215 Nm
Strain gauge MOBA-Dual load	Mounting on platform support and link piece Apply torque in 3 times : 4. 123 Nm 5. 246 Nm 6. 370 Nm	370 Nm
Platform control box		16 Nm
Silentbloc fastening platform control boxPlatform	Floor	16 Nm

Notes

1 - Warning

- **Only an authorised and qualified technician is permitted to work on the machines HAULOTTE®.**
- **The use of this form implies that its user has been trained on this type of equipment.**
- **It is important that the person working on the machine is familiar with all of the safety information contained in the user manual.**
- **Generally speaking, the user must comply with regulatory obligations in force, particularly those relating specifically to working alone, co-activity and manual load handling...**
- **The user must have all the permits/authorizations required to work (fire permit, etc.) and comply with the specific safety instructions at the intervention site.**
- **Only risks linked specifically to activities relating to the disassembly and assembly of the machine HAULOTTE® are described in this sheet.**

- **Beware of the risk of burns; the hydraulic system operates at high temperatures.**
- **The pressure in the hydraulic system is very important. It can cause accidents. Relieve the pressure before beginning any work and never search for oil leaks using your hands.**

2 - Risk prevention

Means of protection to be used when implementing the range

	Appropriate workwear		Gloves
	Safety shoes		

3 - You will need

	• Standard tool kit		• Place barriers around the perimeter of the work area

4 - Oscillating axles

The front axles will oscillate when the boom is in transport position (i.e. when the boom is less than 15° above horizontal and not extended beyond 30 cm (12") on the machine and drive is selected.

Lockout system test must be performed quarterly, any time a system component is replaced, or when improper system operation is suspected.

N.B.-:-ENSURE THE AXLES ARE EXTENDED AND THE BOOM IS FULLY RETRACTED, LOWERED, AND CENTERED BETWEEEN THE REAR WHEELS PRIOR TO BEGINNING LOCKOUT CYLINDER TEST.

1. Place a 15 cm (6 in) high block with ascension ramp in front of left front wheel.
2. From platform control box, start engine.
3. Place the drive control lever to the forward position and carefully drive machine up ascension ramp until left front wheels is on top of block.
4. Carefully extend the boom just enough to get it out of the transport position.
5. With boom in this position, place drive control lever to reverse and carefully drive machine off of block and ramp.
6. Have an assistant check to see that left front or right rear wheel remains elevated in position off of the ground.
7. Carefully return the boom to the transport position. When boom reaches the transport position, carefully activate drive to release cylinders. To lockout cylinders should release and allow the wheel to rest on ground. This operation must be realized with extremes precautions by standing strongly on the platform by the contact with the ground.
8. Repeat the procedure for the right oscillation cylinder checking to see that the right front or left rear wheel remains elevated in position off of the ground.
9. If lockout cylinders do not function properly, have qualified personnel correct the malfunction prior to any further operation.

Fuel tank - Filling-up

MS0009

1 - Warning

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- **Generally speaking, the user must comply with regulatory obligations in force, particularly those relating specifically to working alone, co-activity and manual load handling...**
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- **Only risks linked specifically to activities relating to the disassembly and assembly of the machine HAULOTTE® are described in this sheet.**

2 - Risk prevention

Means of protection to be used when implementing the range

	Appropriate workwear		Gloves
	Safety shoes		

3 - You will need

	• Standard tool kit		• Place barriers around the perimeter of the work area

4 - Consumable

Use only oils whose features correspond to HAULOTTE® recommendations (Section C - Familiarization - Consumable) or contact HAULOTTE Services®.

Not mix two different characteristics fuel: if necessary, purge and clean the circuit.

5 - Filling

Touch the exterior of the filling hole with the pump spout before starting pouring to avoid any risk of static electricity causing sparks.

Make sure you are standing up-wind to avoid being splashed by the fuel.

1. Loosen and remove the tank cap .
2. Fill up the tank.
3. Refit and tighten the tank cap .
4. Clean up any fuel that may have escaped from the tank.

1 - You will need

	• Standard tool kit • Protective goggles • Gloves • EPI (Personal protective equipment) • 2 hoisting strap(s) for 3500 kg / 7716 lbs at a length of 3 m / 9 ft 8 in • Ratchet wrench and 46 mm / 2 in socket • Lifting and handling equipment(bridge crane, crane, etc) • 2 hoisting rings M30 (3000 kg / 6614 lbs minimum) • 2 bow shackles (3000 kg / 6614 lbs minimum) • Torque spanner 500 Nm + 46 mm / 2 in socket • Tap M30 • Grease		• Place barriers around the perimeter of the work area
Major component masses	• Main counterweight : 4880 kg / 10759 lbs • Secondary counterweight : 1070 kg / 2359 lbs		1 person

2 - Preliminary operation

The operations of disassembling if they exist should be carried out only on the installations completely disconnected and must be entrusted only to people having the necessary technical training.

Respect, in addition to the instructions appearing in the present instructions, the legal tendencies generally applicable for safety accident prevention.

All the precautions must be done in work before intervening on and near the machine.

After completion of work, all the covers and safety devices must be positioned back completely and operational.

- The worker must make sure to have the EPI (Personal Protective Equipment) suited to the work and to the environment's specific conditions in which the equipment is located (see safety information specific to the work site.
- Position the machine on a flat and firm surface, clear of obstructions (beware of power lines).
- Mark out the work area.
- Switch off the ignition and remove the ignition key.
- Put a "DO NOT USE" decal near the start/stop button to inform personnel that work is currently in progress on the equipment.
- Beware of the risk of burns; the hydraulic system operates at high temperatures.
- The pressure in the hydraulic system is very important. It can cause accidents. Relieve the pressure before beginning any work and never search for oil leaks using your hands.
- Engine exhaust gases contain harmful products of combustion. Always start and run the engine in a well-ventilated area. In a closed room, ensure the exhaust gases are evacuated to the outside.

3 - Removal

- Position the machine on a flat and firm surface, clear of obstructions (beware of power lines). Mark out the work area.
- Stow the machine completely.
- Switch off the ignition and remove the ignition key.
- Remove the covers fixed on the left and right.

- Disconnect the twilight sensor.

- Take off the plastic caps that protect the threads on the counterweight.

- If the threads are oxidized, pass a M30 thread tap over them.
- Grease the threads on the hoisting ring.
- Screw the rings all the way into the counterweight.
- Sling the counterweight by using the 2 hoisting straps and the 2 bow shackles.
- Apply a small amount of tension to the hoisting device.

- Remove the 3 counterweight fastening screws.

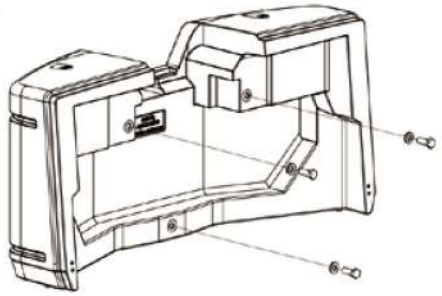
N.B.-:- 46 MM / 2 IN SOCKET.

- Lift the counterweight slightly then pull it out while ensuring that it doesn't hit the fuel tank.
- Remove the counterweight.

4 - Re-installation

Make sure not to hit the fuel tank while installing the counterweight.

- Perform the operations in the reverse order of dismantling.
- Replace the 3 screws and washers and torque tighten to 500 Nm.



- Grease the inside of the counterweight threading.
- Re-install the plastic caps.

5 - Additional operations

- Clean the counterweight.

1 - You will need

	• Standard tool kit • Protective goggles • Gloves • EPI (Personal protective equipment) • ORFS plug kit : 2505001600 • Pin diameter 30 mm / 1.18 in, length 500 mm / 20 in • Pin diameter 25 mm / 1 in, length 300 mm / 12 in • 1 ratcheting straps that support 1000 kg / 2,205 lbs at a length of 4 m / 13 ft / 1 in • Oil collection pan • Palettes for placement under the platform (about 700 mm / 28 in) • Hydraulic oil • 290 kg / 640 lbs load for static test • Grease for pins and rings		• Place barriers around the perimeter of the work area
Major component masses	Jib cylinder : 23 kg / 51 lbs		1 person

2 - Preliminary operation

The operations of disassembling if they exist should be carried out only on the installations completely disconnected and must be entrusted only to people having the necessary technical training.

Respect, in addition to the instructions appearing in the present instructions, the legal tendencies generally applicable for safety accident prevention.

All the precautions must be done in work before intervening on and near the machine.

After completion of work, all the covers and safety devices must be positioned back completely and operational.

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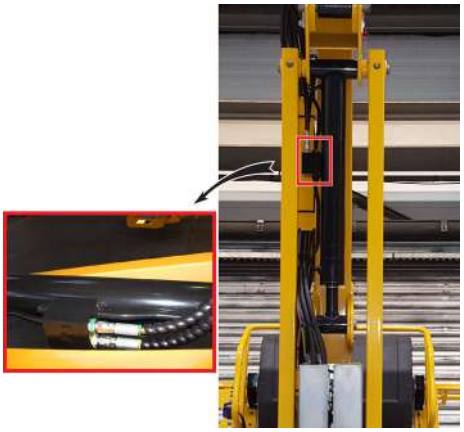
- Position the machine on a flat and firm surface, clear of obstructions (beware of power lines).
- Mark out the work area.
- Switch off the ignition and remove the ignition key.
- Put a "DO NOT USE" decal near the start/stop button to inform personnel that work is currently in progress on the equipment.
- Beware of the risk of burns; the hydraulic system operates at high temperatures.
- The pressure in the hydraulic system is very important. It can cause accidents. Relieve the pressure before beginning any work and never search for oil leaks using your hands.
- Engine exhaust gases contain harmful products of combustion. Always start and run the engine in a well-ventilated area. In a closed room, ensure the exhaust gases are evacuated to the outside.

3 - Removal

- Position the machine on a flat and firm surface, clear of obstructions (beware of power lines). Mark out the work area.
- With the boom stowed and the telescope retracted, support the platform on a stable wedge.

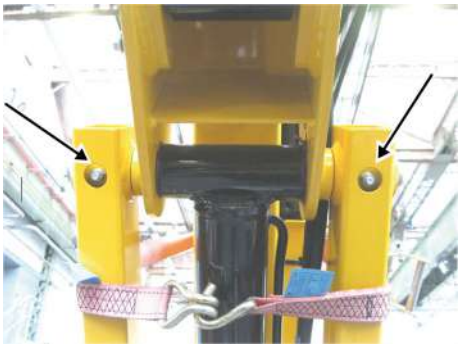
- Switch off the ignition and remove the ignition key.

- Mark, disconnect and plug the hoses supplying the jib cylinder.



- Strap the arm and jib tie-rods using a ratchet strap.

- Remove the 2 pin stop screws.



- Withdraw the pin from the cylinder but leave the pin used for withdrawal in place. Only remove it after removing the pin on the rod side.

- Remove the rod-side clevis pin and remove the pin.

- Hold the cylinder and remove the extraction pin on the back side.
- Slide the cylinder to free it of the ratchet strap.
- Remove the cylinder.

4 - Re-installation

- If you are installing a new cylinder, note the traceability number.
- Carry out the operations in the reverse order. To pin the cylinder on the back side more easily, extend the cylinder rod to give a longer lever arm.
- Grease the pins, the seals, and the bored holes.
- Remember to refit the pin stop screws.
- Check for the presence of seal on connections.
- Hold the hoses to ensure that they don't turn while tightening the connections (risk of seal damage). This will avoid the hoses twisting when they are connected to the rigid tubes.

Ensure of the good hose path.

5 - Additional operations

- Clean off any residual oil or grease.
- From the ground control box, operate the cylinder to flush out the hydraulic circuit.
- Check that there is no leak of oil at the removing connections.
- Top up the hydraulic oil if necessary.
- Perform a static test by putting 290 kg / 639 lbs on the platform. Machine unfolded, 15 mn after checking the performance of its parts
    - Lift cylinder.
    - Boom telescopic cylinder.
    - Input jib leveling cylinder.
    - Jib cylinder.

In compliance with the country's laws, have the machine approved by an accredited organization.

1 - You will need

	• Standard tool kit • Protective goggles • Gloves • EPI (Personal protective equipment) • ORFS plug kit : 2505001600 • Support arm axis tools : 4000598170. Pin diameter 70 mm / 2 ft 3.56 in, length 810 mm / 2ft 8 in. • 4 hoisting strap(s) for 3000 kg / 6,615 lbs at a length of 4 m / 13 ft 1 in 2 slings 3000 kg / 6,615 lbs. • 2 ratcheting straps that support 1000 kg / 2,205 lbs at a length of 2 m / 6 ft 56 in • Wooden pallets • 4 shackles 3000 kg / 6,615 lbs • 2 trestles with a minimum capacity of 3000 kg / 6,615 lbs • Lifting and handling equipment(bridge crane, crane, etc) • Weight of 290 kg / 639 lbs for performing the static test • Collars COLSON • Hydraulic oil • 290 kg / 640 lbs load for static test • Grease for pins and rings • Pry bar		• Place barriers around the perimeter of the work area
Major component masses	• Boom cylinder : 390 kg / 860 lbs • Upper boom : 3000 kg / 6614 lbs		2 persons

2 - Specific tools

- Axis : 4000598170

3 - Preliminary operation

The operations of disassembling if they exist should be carried out only on the installations completely disconnected and must be entrusted only to people having the necessary technical training.

Respect, in addition to the instructions appearing in the present instructions, the legal tendencies generally applicable for safety accident prevention.

All the precautions must be done in work before intervening on and near the machine.

After completion of work, all the covers and safety devices must be positioned back completely and operational.

- The worker must make sure to have the EPI (Personal Protective Equipment) suited to the work and to the environment's specific conditions in which the equipment is located (see safety information specific to the work site.
- Position the machine on a flat and firm surface, clear of obstructions (beware of power lines).
- Mark out the work area.
- Switch off the ignition and remove the ignition key.
- Put a "DO NOT USE" decal near the start/stop button to inform personnel that work is currently in progress on the equipment.
- Beware of the risk of burns; the hydraulic system operates at high temperatures.
- The pressure in the hydraulic system is very important. It can cause accidents. Relieve the pressure before beginning any work and never search for oil leaks using your hands.
- Engine exhaust gases contain harmful products of combustion. Always start and run the engine in a well-ventilated area. In a closed room, ensure the exhaust gases are evacuated to the outside.

4 - Removal

- Position the machine on a flat and firm surface, clear of obstructions (beware of power lines). Mark out the work area.
- Retract the telescope arm, place the jib in the horizontal position and empty the platform.
- Remove the covers. Refer to MS0132 Remove/replace covers.

- Remove the counterweight. Refer to MS0114 Remove - Replace counterweight.
- Position the support arm in the designated space on the chassis.
- Insert the safety pins on each side of the support arm.

- From the bottom control box, lower the boom until the arm comes to rest on the bar.

- Switch off the ignition and remove the ignition key.

- Attach 2 the shackes with 2 slings to the end of the boom :
- 2 hoisting strap(s) for 3000 kg / 6,615 lbs at a length of 4 m / 13 ft 1 in
- 2 slings 3000 kg / 6,615 lbs.
- Bridge crane 3000 kg / 6,615 lbs (minimum)
- Apply a small amount of tension on the bridge crane.

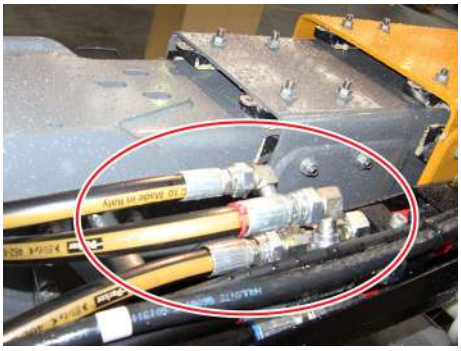
N.B.-:-IF THERE ARE NO SHACKLES AVAILABLE, SECURELY SLING THE BOOM'S TUBE.

- Sling the double arm together with the support arm :
- 1 ratcheting straps that support 1000 kg / 2,205 lbs at a length of 2 m / 6 ft 56 in.

N.B.-:-THIS OPERATION IS NECESSARY TO KEEP THE LINK PART IN THE CORRECT POSITION.

- Relieve the pressure between the output compensation cylinder and the compensation receiver cylinder. That prevents the shaft of the output compensation cylinder from coming out while removing the shaft-side pin.
- Carefully loosen the hoses that go to the compensation receiver cylinder.
- Plug the hoses and the cylinder.

N.B.-:-THIS OPERATION PREVENTS THE RECEIVER COMPENSATION CYLINDER FROM LOWERING THE PLATFORM SECTION.



- Sling the boom lifting cylinder :
- 1 hoisting strap(s) for 3000 kg / 6,615 lbs at a length of 4 m / 13 ft 1 in
- Bridge crane 3000 kg / 6,615 lbs (minimum).
- Place a wooden wwdge underneath the cylinder.

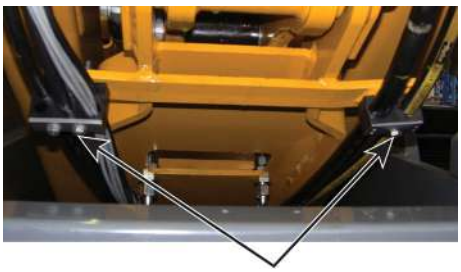
- Loosen the screw (1) and remove the clevis pin (2).
- Apply a small amount of tension on the bridge crane.
- Pull out the pin (3).
- Place the cylinder on the wooden wedge.

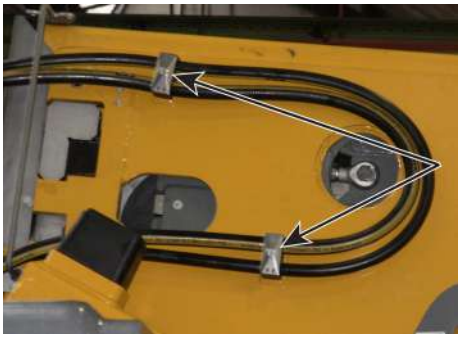
- Lift the cover at the rear of the turret.

- Mark and disconnect the 2 telescope cylinder supply hoses.
- Plug the openings after disassembly.

- Disconnect the plugs CN06-1 / CN06-2.
- In order to avoid getting the connectors dirty, protect the plugs with a plastic bag.

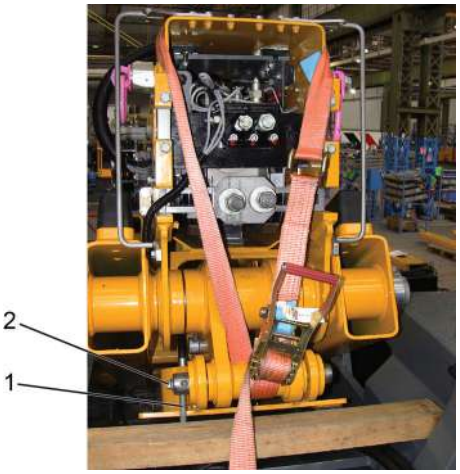
- Loosen the clamping pads.
- Mark the cables at the entrance and exit of the collar. This is so you can reposition them correctly during reassembly.



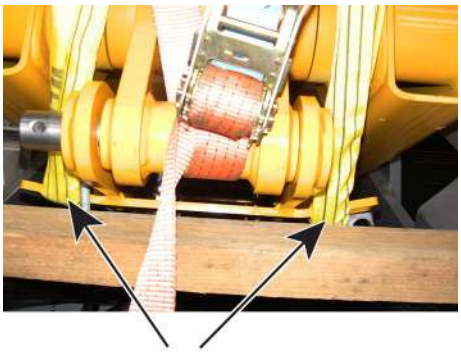


- Bring the turret's harness BUS CAN (1) and cable 220 V to the boom.
- Mark, disconnect, and lock the hoses that supply the unit ON/OFF (2).

- Place the wooden wedge underneath the double link part.
- Strap the link part to the telescope :
- 1 ratcheting straps that support 1000 kg / 2,205 lbs at a length of 2 m / 6 ft 56 in.
- Attach the 2 shackles 3000 kg / 6,615 lbs to the shaft of the boom.
- Loosen the screw (2) and remove the clevis pin (1).



- Place a sling around the outside legs of the double link part : 1 hoisting strap(s) for 1000 kg / 2,205 lbs at a length of 4 m / 13 ft 1 in



- Apply a small amount of tension on thebridge crane and extract the pin.

- Strap the output compensation cylinder to the boom :
- 1 ratcheting straps that support 1000 kg / 2,205 lbs at a length of 2 m / 6 ft 56 in.

- Sling the shaft-side of the boom :
- 1 hoisting strap(s) for 3000 kg / 6,615 lbs at a length of 4 m / 13 ft 1 in.
- Apply a small amount of tension on the bridge crane.

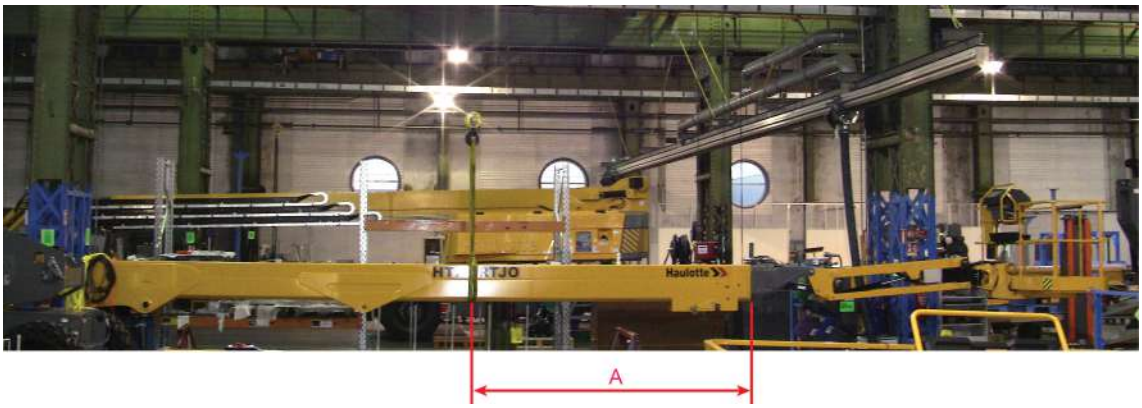
- Loosen the screw (1) and remove the clevis pin (3).
- Apply a small amount of tension on the bridge crane.
- Pull out the pin (2) :
- Pin diameter of 70 mm / 2,76 in length of 400 mm / 1 ft 3,75 in.
- Axis with a diameter of 50 mm / 2 in and length of 900 mm / 2 ft 11,5 in.

- Strap the arms together to prevent them from moving apart : 1 ratcheting straps that support 1000 kg / 2,205 lbs at a length of 2 m / 6 ft 56 in.
- Loosen the screw (1) and remove the clevis pin (3).
- Apply a small amount of tension on the bridge crane.
- Pull out the pin (2) :
- Pin diameter of 70 mm / 2,76 in length of 400 mm / 1 ft 3,75 in.
- Axis with a diameter of 50 mm / 2 in and length of 900 mm / 2 ft 11,5 in.

- Power up the 2 bridge cranes and raise the boom.

Before positioning the boom on the trestles, place the platform-side trestle at the end of the boom foot. If the trestle is not positioned correctly, there's a risk of it tipping over.

Center of gravity



A =3520 mm / 11 ft 6,58 in.

5 - Re-installation

- Perform the operations in the reverse order of dismantling.
- Grease all the pins, seals, and bore holes.
- Remember to refit the locking pins on the pin stops and the immobilisation screws.
- Check that the seals are on the connections before reconnecting the hoses.
- Hold the hoses to ensure that they don't turn while tightening the connections (risk of seal damage). This will avoid the hoses twisting when they are connected to the rigid tubes.
- Make sure the hoses and harnesses are set in their correct routes.

6 - Additional operations

- Clean off any residual oil or grease.
- From the ground control box :
- Operate the platform leveling functions to flush out the hydraulic circuit.
- Extend and retract the telescope to flush out the hydraulic circuit.
- Raise and lower the boom and check the displacement of the harnesses and hoses.
- Check that there is no leak of oil at the removing connections.
- Top up the hydraulic oil if necessary (machine in stowed position).
- From the ground and platform control boxes, test all of the machine's functions.
- Perform a static test by putting 290 kg / 639 lbs on the platform. Machine unfolded, 15 mn after checking the performance of its parts :
- Lift cylinder.
- Boom telescopic cylinder.
- Input jib leveling cylinder.
- Jib cylinder.

In compliance with the country's laws, have the machine approved by an accredited organization.

Removing/re-installing the oscillating axle actuator

MS0117

1 - You will need

	• Standard tool kit • Protective goggles • Gloves • EPI (Personal protective equipment) • ORFS plug kit : 2505001600 • 2 axes with diameter of 30 mm / 1.18 in, length of 400 mm / 16 in • Hydraulic oil • 290 kg / 640 lbs load for static test • Grease for pins and rings		• Place barriers around the perimeter of the work area
Major component masses	Oscillating axle cylinder : 27 kg / 59,5 lbs		1 person

2 - Preliminary operation

The operations of disassembling if they exist should be carried out only on the installations completely disconnected and must be entrusted only to people having the necessary technical training.

Respect, in addition to the instructions appearing in the present instructions, the legal tendencies generally applicable for safety accident prevention.

All the precautions must be done in work before intervening on and near the machine.

After completion of work, all the covers and safety devices must be positioned back completely and operational.

- The worker must make sure to have the EPI (Personal Protective Equipment) suited to the work and to the environment's specific conditions in which the equipment is located (see safety information specific to the work site.
- Position the machine on a flat and firm surface, clear of obstructions (beware of power lines).
- Mark out the work area.
- Switch off the ignition and remove the ignition key.
- Put a "DO NOT USE" decal near the start/stop button to inform personnel that work is currently in progress on the equipment.
- Beware of the risk of burns; the hydraulic system operates at high temperatures.
- The pressure in the hydraulic system is very important. It can cause accidents. Relieve the pressure before beginning any work and never search for oil leaks using your hands.
- Engine exhaust gases contain harmful products of combustion. Always start and run the engine in a well-ventilated area. In a closed room, ensure the exhaust gases are evacuated to the outside.

3 - Removal

- Position the machine on a flat and firm surface, clear of obstructions (beware of power lines). Mark out the work area.
- Turn the turret so that the counterweight is located opposite the cylinder to be disassembled.
- Stow the machine completely.

- Switch off the ignition and remove the ignition key.

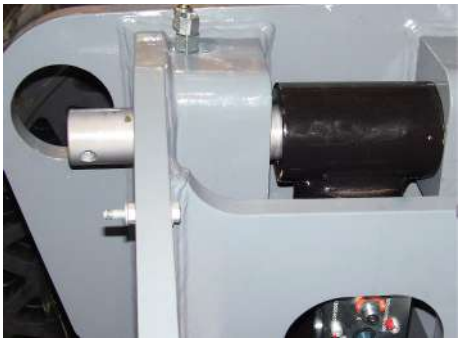
Do not remove the 2 cylinders simultaneously, but replace them one after the other after if necessary.

- Remove the cover (3).
- Loosen the screws (2) and remove the clevis pins (1).

- Mark, disconnect, and plug the telescope cylinder feed hoses.
- Remove the union fittings to facilitate the movement of the cylinder.

- Withdraw the pin from the cylinder but leave the pin used for withdrawal in place.

- Extract the pin on the back side.
- Hold the cylinder manually.
- Remove the tool that was used to extract the pin from the back-side of the cylinder.
- Lift the cylinder out from the top.



- Remove the cylinder.

4 - Re-installation

- If you are installing a new cylinder, note the traceability number.
- Carry out the operations in the reverse order.
- Grease the pins, the seals, and the bored holes.
- Remember to refit the pin stop screws.
- Check for the presence of seal on connections.
- Hold the hoses to ensure that they don't turn while tightening the connections (risk of seal damage). This will avoid the hoses twisting when they are connected to the rigid tubes.

Ensure of the good hose path.

5 - Additional operations

- Clean off any residual oil or grease.
- Check that there is no leak of oil at the removing connections.
- Top up the hydraulic oil if necessary.
- Perform a static test by putting 290 kg / 639 lbs on the platform. Machine unfolded, 15 mn after checking the performance of its parts :
    - Boom lifting cylinder.
    - Boom telescopic cylinder.
    - Input jib leveling cylinder.
    - Jib cylinder.

In compliance with the country's laws, have the machine approved by an accredited organization.

1 - You will need

	• Standard tool kit • Protective goggles • Gloves • EPI (Personal protective equipment) • ORFS plug kit : 2505001600 • Jack : 20 Tonnes / 44092 lbs • 1 hoisting strap(s) for 1000 kg / 2,205 lb at a length of 2 m / 6 ft 7 in • Lifting and handling equipment(bridge crane, crane, etc) • Wood wedges of approximately 400 mm / 16 in under the chassis • Oil collection pan • 1 syringe for oil filling • Torque spanner : 450 Nm • Torque spanner : 260 Nm • Torque spanner : 57 Nm • 8 the washers NORLOCK should be replaced after each wheel is removed • Oil SAE 80W90. Quantity for a reducer : 1,1 L		• Place barriers around the perimeter of the work area
Major component masses	• Wheel : 272 kg / 600 lbs • Wheel reducer : 60 kg / 132,3 lbs • Wheel steering pivots : 63 kg / 139 lbs • Hydraulic motor : 16 kg / 35,2 lbs		1 person
Exclusively use tools and auxiliary average adapted. Always wear necessary safety clothing.			

2 - Preliminary operation

The operations of disassembling if they exist should be carried out only on the installations completely disconnected and must be entrusted only to people having the necessary technical training.

Respect, in addition to the instructions appearing in the present instructions, the legal tendencies generally applicable for safety accident prevention.

All the precautions must be done in work before intervening on and near the machine.

After completion of work, all the covers and safety devices must be positioned back completely and operational.

- The worker must make sure to have the EPI (Personal Protective Equipment) suited to the work and to the environment's specific conditions in which the equipment is located (see safety information specific to the work site.
- Position the machine on a flat and firm surface, clear of obstructions (beware of power lines).
- Mark out the work area.
- Switch off the ignition and remove the ignition key.
- Put a "DO NOT USE" decal near the start/stop button to inform personnel that work is currently in progress on the equipment.
- Beware of the risk of burns; the hydraulic system operates at high temperatures.
- The pressure in the hydraulic system is very important. It can cause accidents. Relieve the pressure before beginning any work and never search for oil leaks using your hands.
- Engine exhaust gases contain harmful products of combustion. Always start and run the engine in a well-ventilated area. In a closed room, ensure the exhaust gases are evacuated to the outside.

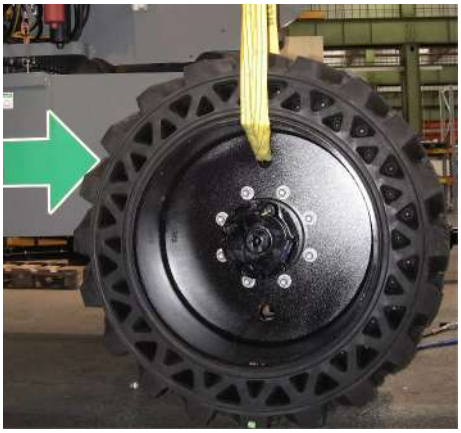
3 - Removal

- Position the machine on a flat and firm surface, clear of obstructions (beware of power lines). Mark out the work area.
- Machine stowed.

- Switch off the ignition and remove the ignition key.

- Make a stable pallet stack about 400 mm / 16 in tall.
- Loosen the screws without removing them from the wheel.
- Lift the machine with the jack to raise the wheel off the ground.
- Place wedges under the chassis and lower the jack slowly.

- Sling the wheel with the strap.



Remove/Re-install wheel reduction gear

MS0118

- Remove the wheel and lay it down flat on a pallet with the outer side downwards.

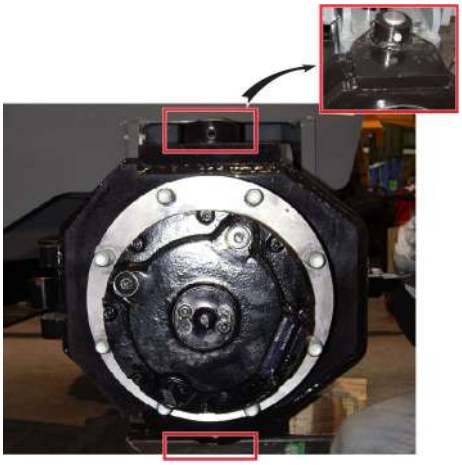
- Loosen the screw and remove the clevis pin .
- Remove the pin that connects the steering cylinder to the wheel pivot.
- Put the cylinder to one side.

- Mark, disconnect and plug the hoses.

Remove/Re-install wheel reduction gear

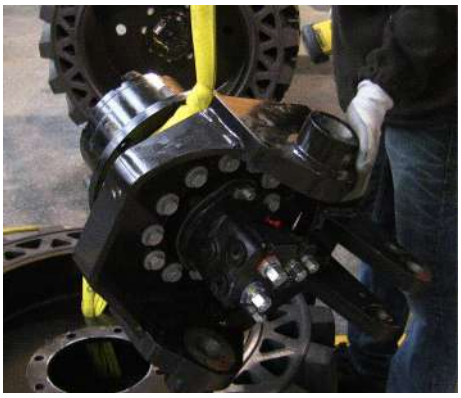
MS0118

- Sling the steering pivot.
- Apply a small amount of tension on the bridge crane.
- Remove the locking pin screws and withdraw the pins connecting the steering pivot to the chassis.



- Remove the steering pivot + reduction gear assembly.

Set aside the bronze washers.



- Place the assembly on the ground.
- Sling the assembly by the holes in the wheel steering pivot.
- Position the assembly on the wheel with the reduction gear studs inserted into the rim.

- Remove the hydraulic motor. Undo the 2 screws .
- Loosen the 12 screws connecting the reduction gear to the wheel steering pivot. Mark the position of the reducer on the wheel pivot before removal.
- Sling the steering pivot.
- Remove the wheel steering pivot.

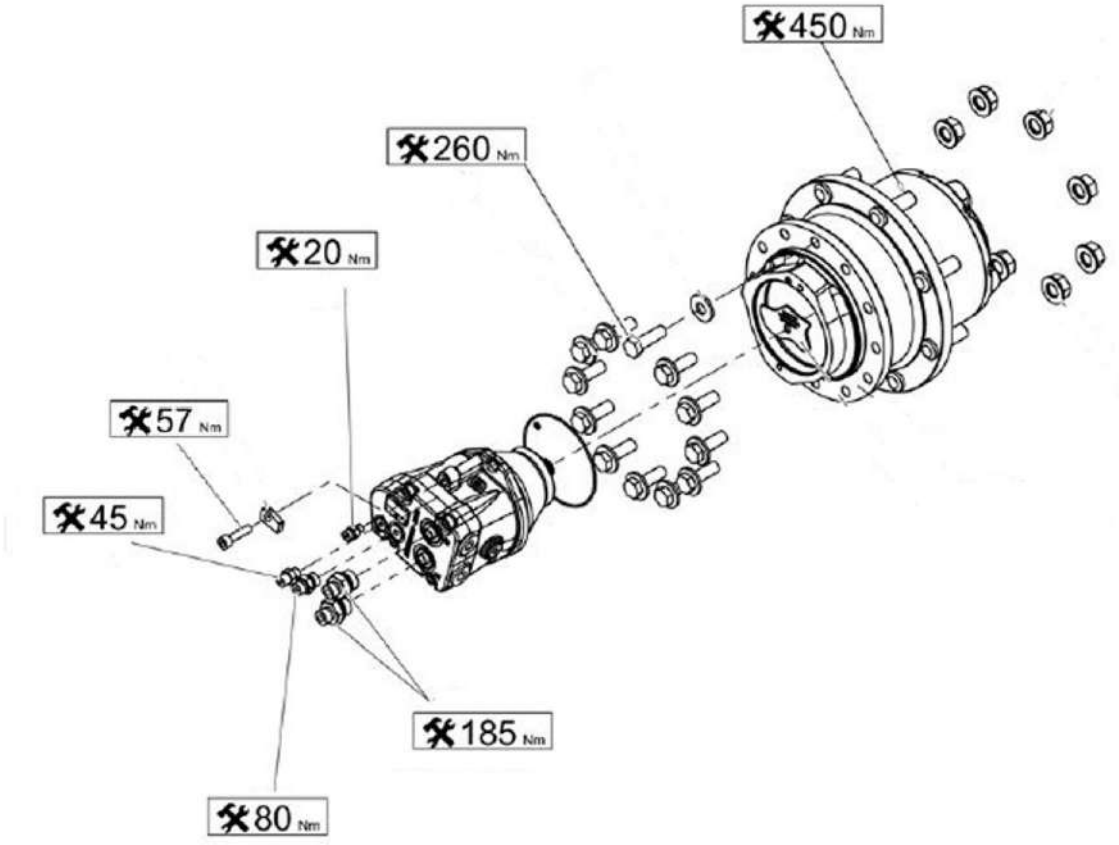
4 - Re-installation

- If the reduction gear has been replaced, note its traceability number.

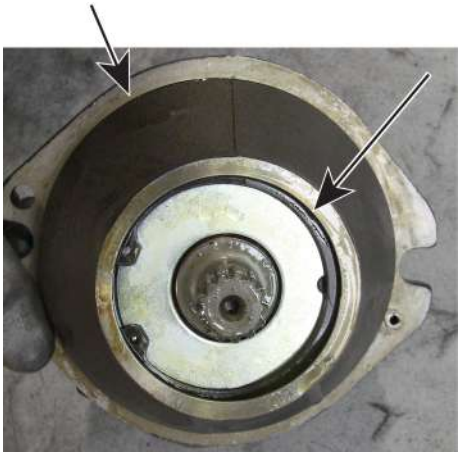
- Perform the operations in the reverse order of dismantling.

Remember to refit the bronze rings.

- Grease the pins when re-installing and comply with the tightening torque.



- Check state and presence of the seals on hydraulic motor.

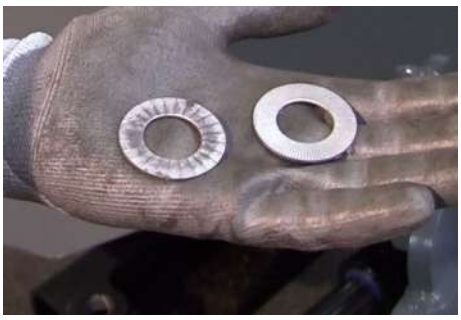


Remove/Re-install wheel reduction gear

MS0118

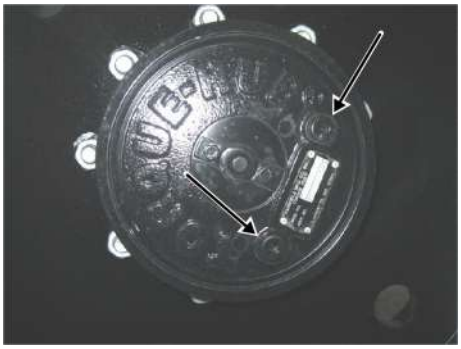
The reducer's break release must be positioned at the bottom of the pivot.

- Refit the wheel's fastening washers NORLOCK to the reducer.



5 - Additional operations

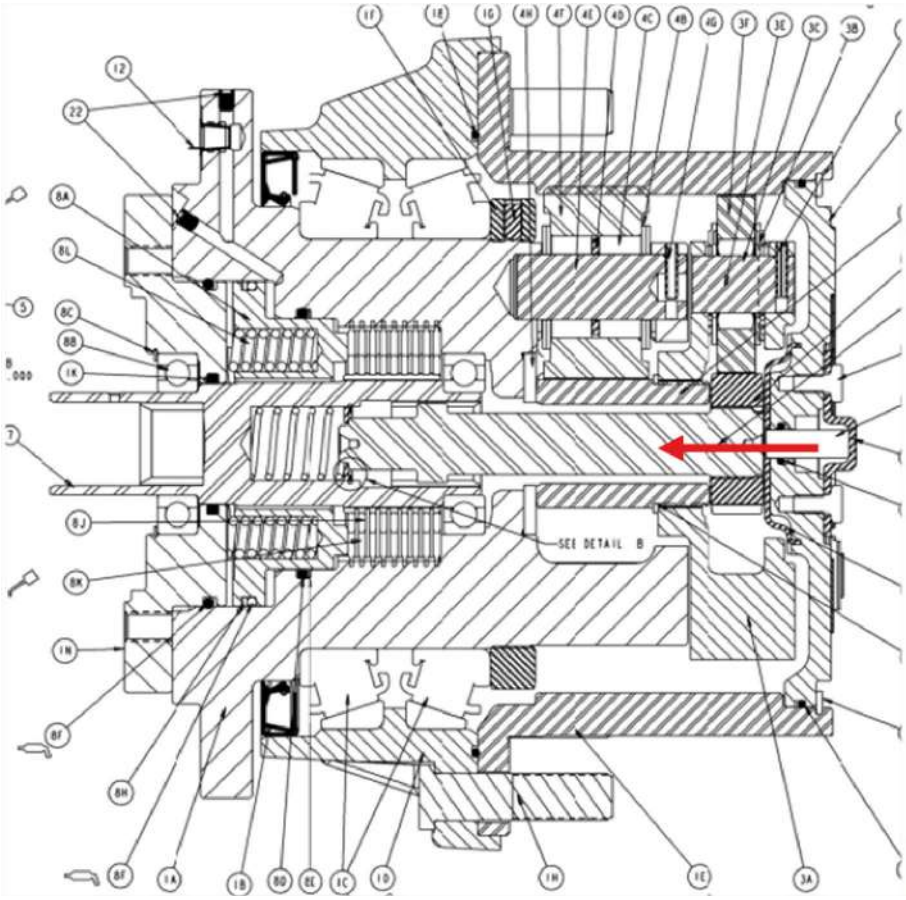
- If the reduction gear has been replaced, check the oil level.
- Fill the reduction gear if it is empty.
- If the machine is still on wedges, disengage the reducer in order to turn it manually.
- Position the plugs correctly to fill up or top up with oil :
- Manually release the reduction gear.
- Loosen the 2 screws from the central plate and turn it over to disengage the reduction gear.



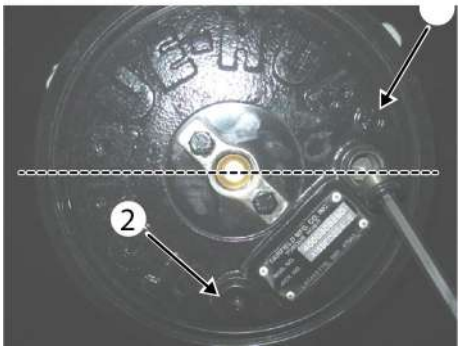
- When the plate is in the correct position, the reduction gear is disengaged from the brake.

Remove/Re-install wheel reduction gear

MS0118



- Turn the reduction gear to position the oil top-up, filling and drain plugs.
- The level can only be established when the plug is positioned in the horizontal axis of the reduction gear.
- Remove the plug.
- The oil should be just level with the hole.
- Top up using the syringe if necessary.



- Remember to put the plate back into the correct position once the operation is finished.
- Grease the wheel steering pivot pins.
- Clean off any residual oil or grease.
- Move the steering and check that the hose movement range is correct.
- Perform a travel test and check the stopping distance. At high speed, the machine must stop between 1,3 m and 1,6 m.
- Check for any oil leaks.

1 - You will need

	• Standard tool kit • Protective goggles • Gloves • EPI (Personal protective equipment) • ORFS plug kit : 2505001600 • Oil collection pan • Torque spanner : 57 Nm		• Place barriers around the perimeter of the work area
Major component masses	Hydraulic motor : 16 kg / 35,2 lbs		1 person

2 - Preliminary operation

The operations of disassembling if they exist should be carried out only on the installations completely disconnected and must be entrusted only to people having the necessary technical training.

Respect, in addition to the instructions appearing in the present instructions, the legal tendencies generally applicable for safety accident prevention.

All the precautions must be done in work before intervening on and near the machine.

After completion of work, all the covers and safety devices must be positioned back completely and operational.

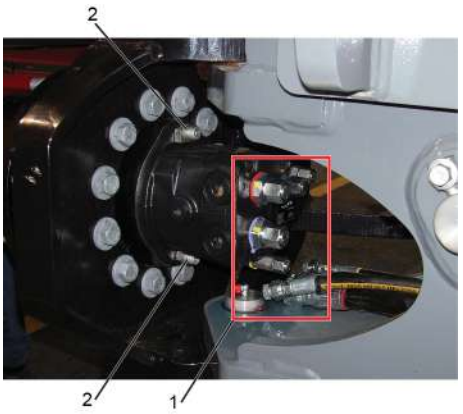
- The worker must make sure to have the EPI (Personal Protective Equipment) suited to the work and to the environment's specific conditions in which the equipment is located (see safety information specific to the work site.
- Position the machine on a flat and firm surface, clear of obstructions (beware of power lines).
- Mark out the work area.
- Switch off the ignition and remove the ignition key.
- Put a "DO NOT USE" decal near the start/stop button to inform personnel that work is currently in progress on the equipment.
- Beware of the risk of burns; the hydraulic system operates at high temperatures.
- The pressure in the hydraulic system is very important. It can cause accidents. Relieve the pressure before beginning any work and never search for oil leaks using your hands.
- Engine exhaust gases contain harmful products of combustion. Always start and run the engine in a well-ventilated area. In a closed room, ensure the exhaust gases are evacuated to the outside.

3 - Removal

- Position the machine on a flat and firm surface, clear of obstructions (beware of power lines). Mark out the work area.
- Machine stowed.

- Switch off the ignition and remove the ignition key.

- Mark and disconnect the hoses from the hydraulic motor (1). Plug the hoses to avoid pollution.
- Undo the 2 screws (2).

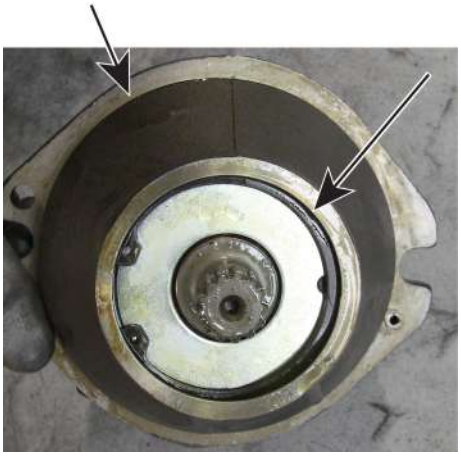


- Remove the hydraulic motor.

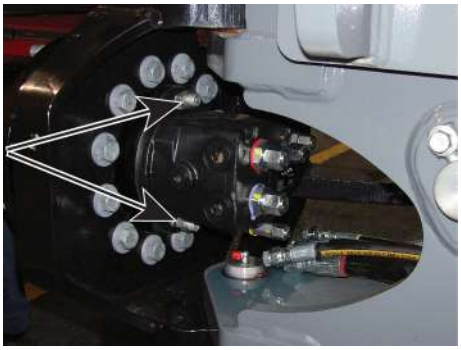
4 - Re-installation

- Perform the operations in the reverse order of dismantling.
- If the motor has been replaced, remove and retain its traceability number.

- Check state and presence of the seals on hydraulic motor.



- Replace and tighten the 2 screws to a torque of 57 Nm.
- Check for the presence of seal on connections.
- Maintain hoses so they do not turn when tightening fittings.



5 - Additional operations

- Clean off any residual oil or grease.
- Change direction and check that the displacement of the hoses is correct.
- Carry out a driving test.
- Check for any oil leaks.
- Top up the oil level, if necessary.

1 - You will need

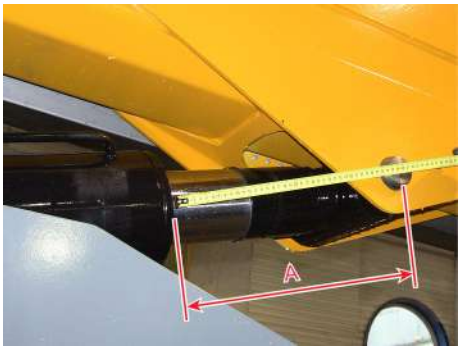
	• Standard tool kit • Protective goggles • Gloves • EPI (Personal protective equipment) • Collars COLSON • Grease for pins • ORFS plug kit : 2505001600 • Pin diameter 25 mm / 1 in, length 300 mm / 12 in • 1 hoisting strap(s) for 1000 kg / 2,205 lbs at a length of 4 m / 13 ft 1,5 in • Lifting and handling equipment(bridge crane, crane, etc) • Palettes for placement under the platform (about 140 mm / 5,5 in) • Hydraulic oil • 290 kg / 640 lbs load for static test • Pry bar		• Place barriers around the perimeter of the work area
Major component masses	• Output jib compensation cylinder : 47 kg / 103,6 lbs		2 persons
Exclusively use tools and auxiliary average adapted. Always wear necessary safety clothing.			

2 - Preliminary operation

- The worker must make sure to have the EPI (Personal Protective Equipment) suited to the work and to the environment's specific conditions in which the equipment is located (see safety information specific to the work site.
- Position the machine on a flat and firm surface, clear of obstructions (beware of power lines).
- Mark out the work area.
- Switch off the ignition and remove the ignition key.
- Put a "DO NOT USE" decal near the start/stop button to inform personnel that work is currently in progress on the equipment.
- Beware of the risk of burns; the hydraulic system operates at high temperatures.
- The pressure in the hydraulic system is very important. It can cause accidents. Relieve the pressure before beginning any work and never search for oil leaks using your hands.
- Engine exhaust gases contain harmful products of combustion. Always start and run the engine in a well-ventilated area. In a closed room, ensure the exhaust gases are evacuated to the outside.

3 - Removal

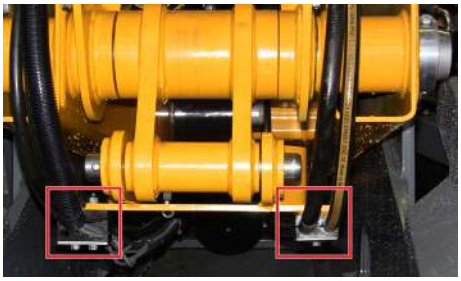
- Position the machine on a flat and firm surface, clear of obstructions (beware of power lines). Mark out the work area.
- Remove the covers. Refer to MS0132 Remove/replace covers.
- From the ground control box, extend boom lifting cylinder to a distance of 500 mm / 19,7.



- Put the platform on a pallet stack by using the jib function. Wedges under the platform of 140 mm / 5,5 in.

- Switch off the ignition and remove the ignition key.

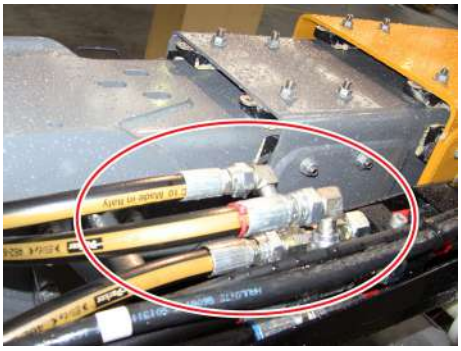
- Loosen the tightening pads and put the hoses and cables to one side.



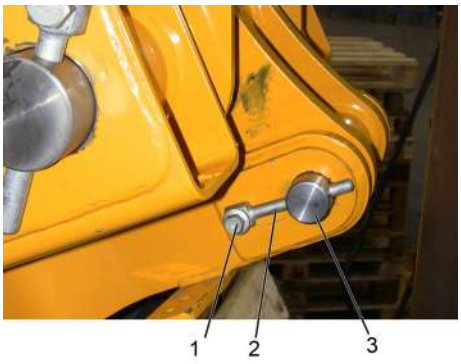
- Place a sling around the outside legs of the double link part.
- Apply a small amount of tension on the bridge crane.

Relieve the pressure between the output compensation cylinder and the compensation receiver cylinder. That prevents the shaft of the output compensation cylinder from coming out while removing the shaft-side pin :

- Carefully loosen the hoses that go to the compensation receiver cylinder.
- As soon as a trickle of oil appears, let it flow out.
- When there is no longer any residual pressure, re-tighten the fittings.



- Loosen the screw (1), remove the clevis pin (2), and put the pin to one side (3).



- Place the wooden wedge underneath the double link part. Wood pallet length 800 mm / 31,5 in, width 50 mm / 2 in, height 50 mm / 2 in estimated.

N.B.-:-THE DOUBLE LINK PART WILL COME TO REST ON THE WEDGE WHEN IT IS UNHINGED.

- Place the double link part on the wooden wedge and take off the sling.

- Sling the output compensation cylinder onto the boom :
- Bridge crane 1000 kg / 2,205 lbs (minimum).
- 1 hoisting strap(s) for 1000 kg / 2,205 lbs at a length of 4 m / 13 ft 1,5 in.

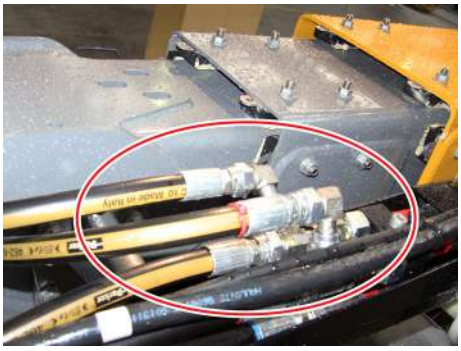
N.B.-:-SLING THE CYLINDER SO THAT IT DOESN'T SLIDE. PASS THE SLING AROUND THE OUTSIDE OF THE BOOM.

- From the ground control box, control the compensation to extend the output compensation cylinder rod. By doing this, the rod-side of the cylinder will be accesible. Place a shock underneath the cylinder for safety reasons.
- Loosen the screw (1), remove the clevis pin (2), and put the pin to one side (3)

Ensure that the link part does not strike the cable ties.

- From the ground control box, retract the cylinder rod.
- Switch off the ignition and remove the ignition key.

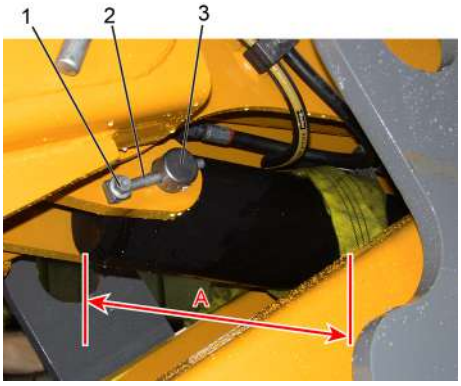
- Relieve the pressure between the output compensation cylinder and the compensation receiver cylinder. That prevents the shaft of the output compensation cylinder from coming out while removing the shaft-side pin :
- Carefully loosen the hoses that go to the compensation receiver cylinder.
- As soon as a trickle of oil appears, let it flow out.
- When there is no longer any residual pressure, re-tighten the fittings.



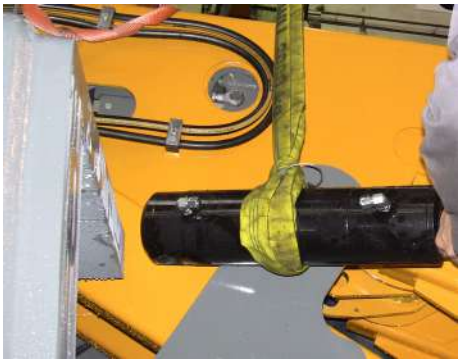
- Mark, disconnect and plug the hoses supplying the output compensation cylinder.

- Sling the link part so that it doesn't interfere with the cylinder's removal.

- Sling the cylinder at its center of gravity : 300 mm / 11,8 in bottom-side of the cylinder.
- Loosen the screw (1), remove the clevis pin (2), and put the pin to one side (3).



- Remove the cylinder.

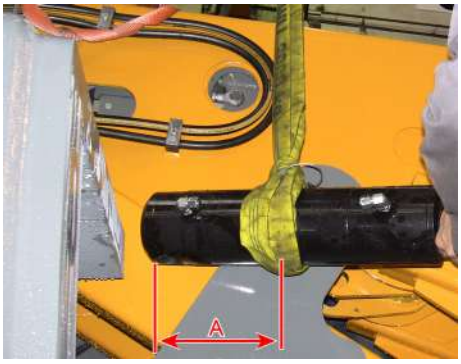


4 - Re-installation

Grease the pins and bores before refitting.

- If you are installing a new cylinder, note the traceability number.
- Sling the cylinder at its center of gravity : A= 300 mm / 11,8 in bottom-side of the cylinder.

N.B.-:-SLING THE CYLINDER SO THAT IT DOESN'T SLIDE.



- Re-install the cylinder and fit only the pin on the back side :
- Set the pin (3), the clevis pin (2), and tighten the screw (1).
- Place the rod-side of the cylinder on the wooden wedge.

- Reconnect the hoses.

- **Check for the presence of seal on connections.**
- **Hold the hoses to ensure that they don't turn while tightening the connections (risk of seal damage).**

- Remove the ratchet strap from the link part.

Remove/Re-install output compensation cylinder

MS0120

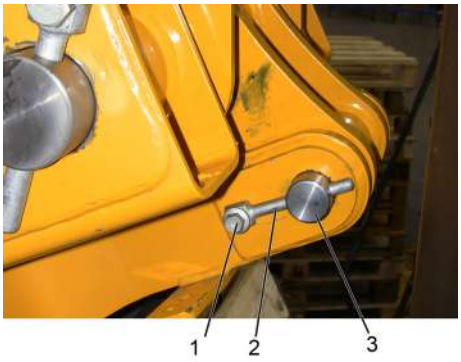
- Start the machine.
- From the ground control box, control the compensation to extend the output compensation cylinder rod.
- Reposition the ratchet strap on the cylinder. Adjust the height of the cylinder to be able to align the pin-side of the rod with the link part.
- Turn the rod-side of the cylinder towards the link part.

- Switch off the ignition and remove the ignition key.

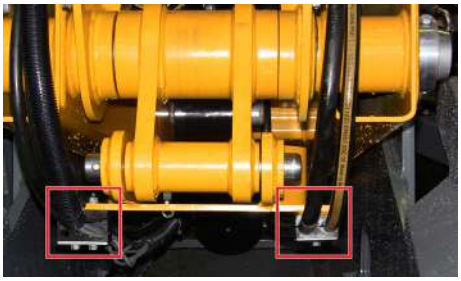
- Place a sling around the outside legs of the double link part.

- Apply a small amount of tension on the bridge crane.
- Turn the link part and the double link part.

- Set the pin (3), the clevis pin (2), and tighten the screw (1).
- Remove the wedge from underneath the double link part.



- Reposition the tubes and cables inside the tightening pads.
- Remove the wedges and straps.



5 - Additional operations

- Clean off any residual oil or grease.
- From the lower control box, operate the platform compensation functions to flush out the hydraulic circuit.
- Check that there is no leak of oil at the removing connections.
- Top up the hydraulic oil if necessary.
- Perform a static test by putting 290 kg / 639 lbs on the platform. Machine unfolded, 15 mn after checking the performance of its parts :
  - Boom lifting cylinder.
  - Boom telescopic cylinder.
  - Input jib leveling cylinder.
  - Jib cylinder.

In compliance with the country's laws, have the machine approved by an accredited organization.

Notes

1 - You will need

	• Standard tool kit • Protective goggles • Gloves • EPI (Personal protective equipment) • ORFS plug kit : 2505001600 • 2 hoisting strap(s) for 1000 kg / 2,204 lbs at a length of 4 m / 13 ft 1 in • 2 trestles with a minimum capacity of 1000 kg / 2,204 lbs • Lifting and handling equipment(bridge crane, crane, etc) • Collars COLSON • Hydraulic oil • 290 kg / 640 lbs load for static test • Torque wrench for 10 Nm • Torque wrench for 45 Nm • Glue LOCTITE (average fixation) • Pry bar • Pin with diameter 18 mm / 0,71 in passing through the 3 boom sections to lock them together • Locking plates 4000004140 • Cable tension procedure : See plan 4000392570		• Place barriers around the perimeter of the work area
Major component masses	• Telescope cylinder : 400 kg / 882 lbs		2 persons

2 - Preliminary operation

The operations of disassembling if they exist should be carried out only on the installations completely disconnected and must be entrusted only to people having the necessary technical training.

Respect, in addition to the instructions appearing in the present instructions, the legal tendencies generally applicable for safety accident prevention.

All the precautions must be done in work before intervening on and near the machine.

After completion of work, all the covers and safety devices must be positioned back completely and operational.

- The worker must make sure to have the EPI (Personal Protective Equipment) suited to the work and to the environment's specific conditions in which the equipment is located (see safety information specific to the work site.
- Position the machine on a flat and firm surface, clear of obstructions (beware of power lines).
- Mark out the work area.
- Switch off the ignition and remove the ignition key.
- Put a "DO NOT USE" decal near the start/stop button to inform personnel that work is currently in progress on the equipment.
- Beware of the risk of burns; the hydraulic system operates at high temperatures.
- The pressure in the hydraulic system is very important. It can cause accidents. Relieve the pressure before beginning any work and never search for oil leaks using your hands.
- Engine exhaust gases contain harmful products of combustion. Always start and run the engine in a well-ventilated area. In a closed room, ensure the exhaust gases are evacuated to the outside.

3 - Removal

- Position the machine on a flat and firm surface, clear of obstructions (beware of power lines). Mark out the work area.
- With the boom in a horizontal position and the telescope stowed, support the platform with a stable wedge : Wedges under the platform of 140 mm / 5,5 in.

- Switch off the ignition and remove the ignition key.

- Pin the 3 blocks using the hole provided for this purpose.

N.B.-:-PIN DIAMETER 18 MM / 0,71 IN

- Loosen the nuts without removing them.

N.B.-:-THIS PROCEDURE SLACKENS THE RETRACTION CABLES.

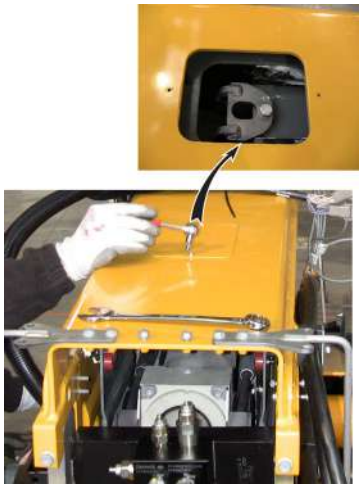
- Lift the cover at the rear of the turret.

- Remove the fastening pads from the sensors ILS (1) as well as the mechanical sensor (2).
- Remove the nuts and washers from the output cables.

- Remove the nuts and washers from the retraction cables.
- Remove the cover from the head of the boom.

- Remove the sensor (3).
- Disconnect the plate (1) and jib from the retraction cables (2).

- Lift the plate above the boom to access the jib screw.
- Loosen the screw .



- Remove the 2 stop wedges.

- Remove the wedges from each side.

Remove - Replace telescope cylinder

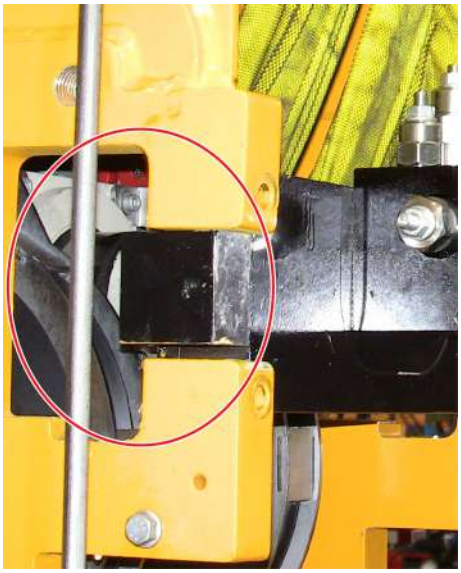
MS0121

- Loosen the 2 screws located on each side of the telescope cylinder connecting the output cables to the second telescope.

Remove - Replace telescope cylinder

MS0121

- Strap the cylinder's telecope.
- From the ground control box, gently pull the telecope cylinder's rod to move it from its position.
- Use the bridge to extract the cylinder.

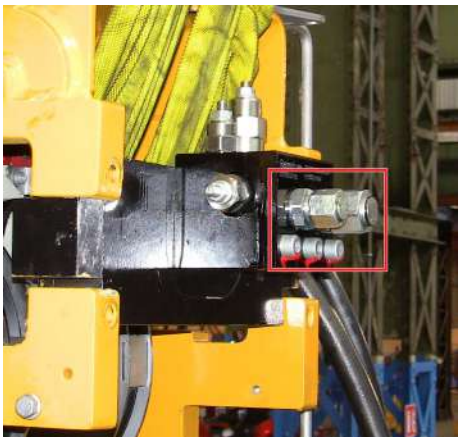


- From the ground control box, retract the cylinder rod.
- Switch off the ignition and remove the ignition key.

Remove - Replace telescope cylinder

MS0121

- Mark and disconnect the 2 telescope cylinder supply hoses.
- Plug the openings after disassembly.



- Gradually pull the cylinder from the rear.
- Before completely freeing the cylinder, you must first attach all the cables (underneath and on top of the cylinder) with plastic collars spaced 0,50 metre apart.

- When the cylinder has come out far enough and the guidance portion of the cylinder is still in the foot of the boom, position fork lift (or another means of handling the movement) under the cylinder.

- Extend the cylinder.

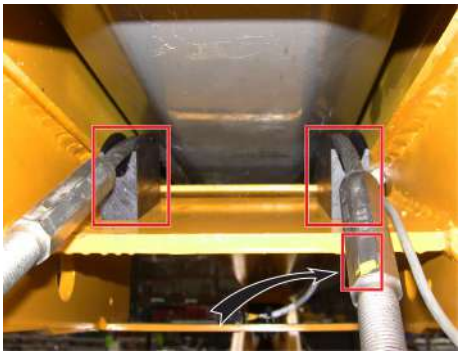
- Place the cylinder on 2 trestles or a wooden wedge.

4 - Re-installation

- If you are installing a new cylinder, note the traceability number.
- Perform the operations in the reverse order of dismantling.
- Grease all the pins, seals, and bore holes.
- Remember to refit the locking pins on the pin stops and the immobilisation screws.
- Check that the seals are on the connections before reconnecting the hoses.
- Hold the hoses to ensure that they don't turn while tightening the connections (risk of seal damage). This will avoid the hoses twisting when they are connected to the rigid tubes.
- Make sure the hoses and harnesses are set in their correct routes.

- Position the output cables correctly :
- Before passing the cable through the jib: allow it to move freely so that the cable finds its position naturally.
- From this position, rotate the cable in an ANTI-CLOCKWISE direction until the first side appears with the engraving "TOP" on the top.
- Then place the cable in this position by pulling it.

- Correctly position the retraction cables :
- Before passing the cable through the jib: allow it to move freely so that the cable finds its position naturally.
- From this position, rotate the cable in an ANTI-CLOCKWISE direction until the first side appears with the engraving "TOP" on the top.
- Then place the cable in this position by pulling it.



- The output cable 2 fastening screws on the second telescope must be fixed with glue LOCTITE (average fixation).

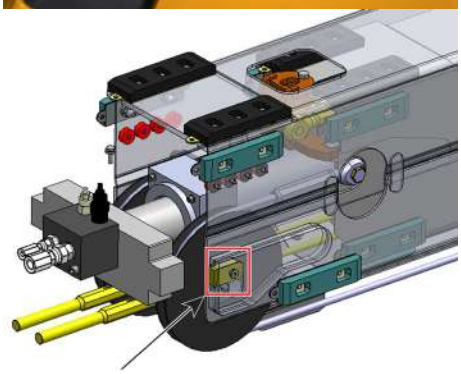
N.B.-:-TIGHTENING AT A TORQUE OF 10 NM.

- **The screw head of the clevis pins must face towards the outside of the boom.**
- **Fold in the locking plates 4000004140 after tightening the screws.**

- The retracton cable fastening screw on the jib must be fixed with a LOCTITE glue and torque tightened.

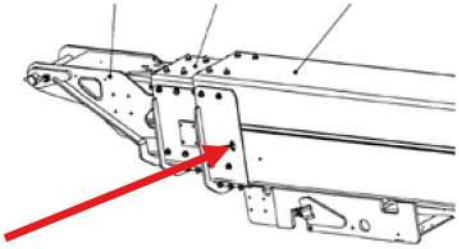
N.B.-:-TIGHTENING AT A TORQUE OF 45 NM.

- Replace the wedges and fasten the screws with LOCTITE (medium fixation) at a torque of 10 Nm.



4.1 - CABLE TENSION ADJUSTMENT PROCEDURE

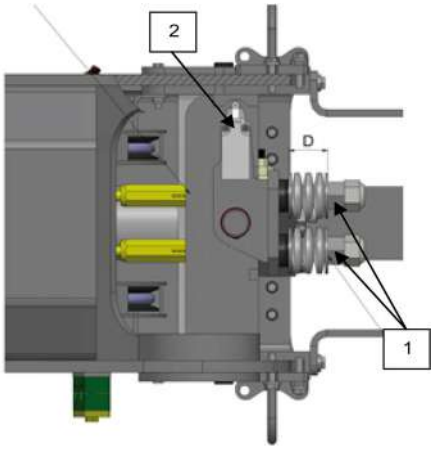
- Before adjusting cable tension, place a pin with a diameter of 18 mm through the 3 blocks to lock them together.



- Power up the output cables :

• The adjustment should be done 3 times (D - 5 mm).

• Start by compressing the washers of 2 mm then 2 mm and 1 mm to align the sensor (mark 2).

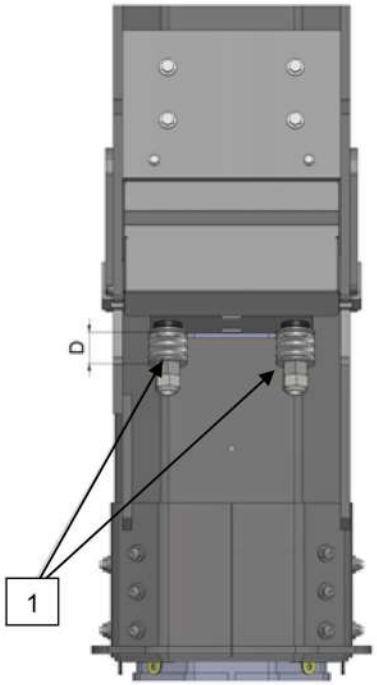


- Insert the nut H (mark 1) until it comes into contact with the stack of washers.
- Measure the external dimension between the 2 flat washers (distance D).
- Tighten by alternating between the left nut and the right nut until the distance is reached (D - 5 mm +/- 0,2 mm).
- In this position, make any small corrections by re-tightening in order to recenter the position sensor (mark 2). The sensor must remain parallel to the edge of the pivot jib.
- Lock it with locknuts.

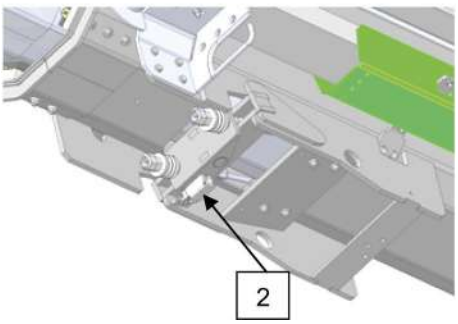
- Power up the retraction cables :

• The adjustment should be done 3 times (D - 5 mm).

• Start by compressing the washers of 2 mm then 2 mm and 1 mm to align the sensor (mark 2).



- Insert the nut H (mark 1) until it comes into contact with the stack of washers.
- Measure the external dimension between the 2 flat washers (distance D).
- Tighten by alternating between the left nut and the right nut until the distance is reached (D - 5 mm +/- 0,2 mm).
- In this position, make any small corrections by re-tightening in order to recenter the position sensor (mark 2). The sensor must remain parallel to the edge of the pivot jib.
- Lock it with locknuts.



- Remove the pin that is locking the blocks together.

5 - Additional operations

- Clean off any residual oil or grease.
- From the ground control box, extend and retract the telescope in order to flush out the hydraulic circuit :
- Check the articulation of the hoses.
- Check the articulation of the wire harnesses.
- Check that there is no leak of oil at the removing connections.
- Top up the hydraulic oil if necessary (machine in stowed position).
- From the ground and platform control boxes, apply weight through all of the machine's movements.
- Perform a static test by putting 290 kg / 639 lbs on the platform :
- Machine unfolded, 15 mn after checking the performance of its parts :
- Boom lifting cylinder.
- Boom telescopic cylinder.
- Input jib leveling cylinder.
- Jib cylinder.

In compliance with the country's laws, have the machine approved by an accredited organization.

Notes

1 - You will need

	• Standard tool kit • Protective goggles • Gloves • EPI (Personal protective equipment) • Torque wrench for		• Place barriers around the perimeter of the work area
	1 person		

2 - Preliminary operation

The operations of disassembling if they exist should be carried out only on the installations completely disconnected and must be entrusted only to people having the necessary technical training.

Respect, in addition to the instructions appearing in the present instructions, the legal tendencies generally applicable for safety accident prevention.

All the precautions must be done in work before intervening on and near the machine.

After completion of work, all the covers and safety devices must be positioned back completely and operational.

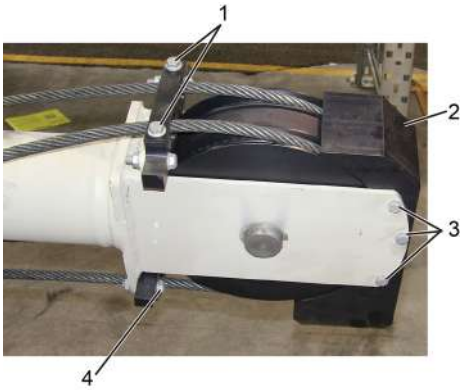
- The worker must make sure to have the EPI (Personal Protective Equipment) suited to the work and to the environment's specific conditions in which the equipment is located (see safety information specific to the work site.
- Position the machine on a flat and firm surface, clear of obstructions (beware of power lines).
- Mark out the work area.
- Switch off the ignition and remove the ignition key.
- Put a "DO NOT USE" decal near the start/stop button to inform personnel that work is currently in progress on the equipment.
- Beware of the risk of burns; the hydraulic system operates at high temperatures.
- The pressure in the hydraulic system is very important. It can cause accidents. Relieve the pressure before beginning any work and never search for oil leaks using your hands.
- Engine exhaust gases contain harmful products of combustion. Always start and run the engine in a well-ventilated area. In a closed room, ensure the exhaust gases are evacuated to the outside.

3 - Removal

- Remove the telescope cylinder. Refer to MS0121 Remove/replace the telescope cylinder.
- Place the cylinder on 2 trestles or a wooden wedge.

- Rod-side of the cylinder :
- Loosen the screws on the cable protector.
- Remove the cable from the grooves of the pulley.

- Bottom-side of the cylinder :
- Loosen the screws (1) (3) (4).
- Remove the guiding pad (2).
- Remove the cable from the grooves of the pulley.



4 - Re-installation

- Perform the operations in the reverse order of dismantling.

When reinstalling, the cables must not cross.

Notes

1 - You will need

	• Standard tool kit • Protective goggles • Gloves • Jack • Hoist • Torque spanner		• Place barriers around the perimeter of the work area

2 - Preliminary operation

For safety reasons, imperatively respect the following stages during the tests :

- To set up a beaconing of safety around the test area.
- Put the machine in stowed position.

The operations of disassembling if they exist should be carried out only on the installations completely disconnected and must be entrusted only to people having the necessary technical training.

Respect, in addition to the instructions appearing in the present instructions, the legal tendencies generally applicable for safety accident prevention.

All the precautions must be done in work before intervening on and near the machine.

After completion of work, all the covers and safety devices must be positioned back completely and operational.

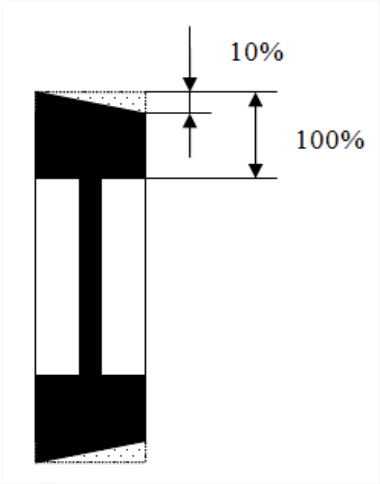
3 - Technical specifications

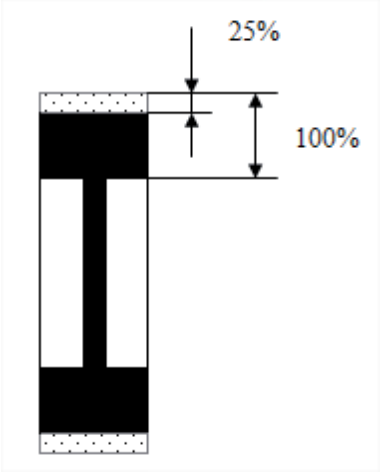
Characteristics	Standard wheel
Type	Solid tires/tyres
Wheel mass	278 kg +/- 6 kg (613 lbs +/- 13 lbs)
Size	1025/365 mm (3 ft 4 in / 1 ft 2 in)

4 - Wheel and tires/tyres inspections

Replace the wheels and the tires if any of the following conditions exist :

- Presence of cracks, damage, deformation or other faults on the hub
- Damage to the tire :
- Cut or hole > 3 cm (2 in) in the rubber side wall.
- Blister or pronounced lump on the external and lateral wall.
- Damaged wheel stud.
- Damage or wear on the side wall to the extent that the reinforcing wire is visible.
- Consistent wear of the ground contact surface greater than 25%





Tires and rims are critical components for the stability of the machine. For safety reasons :

- **Use only HAULOTTE® spare parts according to the technical characteristics of the machine. Refer to the spare parts catalog.**
- **Never replace foam filled tire with a pneumatic (air filled) tire.**

5 - Wheel replacement

Procedure of replacement :

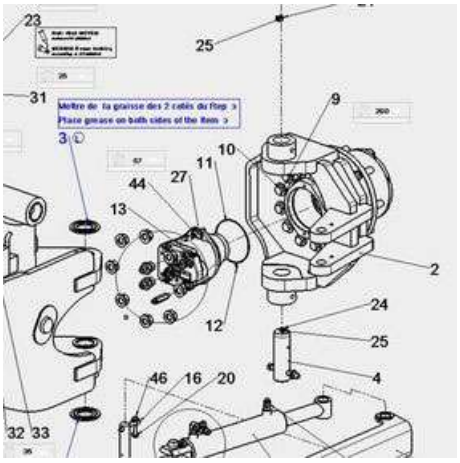
- Loosen the wheel nuts on the wheel to be removed.
- Raise the machine using a jack or a hoist.
- Remove the wheel nuts.
- Remove the wheel.
- Install the new wheel.
- Lower the machine to the ground.
- Tighten the wheel nuts to the recommended torque Refer to maintenance and repair manuals.

Component	Standard wheel
Reference number	Solideal 1025 x 365
Type	Solid tires/tyres
Wheel mass	278 kg +/- 6 kg (613 lbs +/- 13 lbs)
Size	1025/365 mm (3 ft 4 in / 1 ft 2 in)
Torque	450 Nm (332 ft lbs)

Machine type	Wheel type	Metric torque value / Imperial torque value
HT26 RT O - HT80 RT O	**Drive wheel**	**450 N.m / 332 ft lbs**
HT28 RTJ O - HT28 RTJ PRO - HT85 RTJ O - HT85 RTJ PRO	**Drive wheel**	**450 N.m / 332 ft lbs**

6 - Bronze washer replacement

Replace the bronze washer (3) if its thickness is below 2,5 mm.



1 - You will need

	• Standard tool kit • Protective goggles • Gloves		• Place barriers around the perimeter of the work area

Exclusively use tools and auxiliary average adapted. Always wear necessary safety clothing.
For safety reasons, imperatively respect the following stages during the tests :
• Put the machine in stowed position.
• Do not smoke.

2 - Preliminary operation

The operations of disassembling if they exist should be carried out only on the installations completely disconnected and must be entrusted only to people having the necessary technical training.

Respect, in addition to the instructions appearing in the present instructions, the legal tendencies generally applicable for safety accident prevention.

All the precautions must be done in work before intervening on and near the machine.

After completion of work, all the covers and safety devices must be positioned back completely and operational.

3 - Lubrication

The maintenance of the slew ring is essential for the safety of the machine and to guarantee its service life. Whatever the type of system installed on the machine, interior or external teeth, follow the recommendations of greasing as indicated in the program.

- Grease the (internal and external) crown gear teeth.
- Grease the crane runway (offset grease nipples).

3.1 - FOR HT26 RT O - HT28 RTJ O - HT28 RTJ PRO - HT80 RT O - HT85 RTJ O - HT85 RTJ PRO ONLY

- Slew ring : 2 offset points

- Greasing the crown gear teeth

- Movement reducer

4 - Tightening

To ensure safety operation, tightening check should be performed on slew ring.

Please refer to follow value for this procedure using a torque wrench.

Machine type	Metric torque value	Imperial torque value
HT26 RT O - HT80 RT O	215 Nm	158.6 lb ft
HT28 RTJ O - HT28 RTJ PRO - HT85 RTJ O - HT85 RTJ PRO	215 Nm	158.6 lb ft

5 - Slew ring inspection

Check the slewing system every 500 h or each major intervention done on the machine.

5.1 - VISUAL AND SOUND CHECK

- Check for the presence of all the locating bolts.
- Check that the accessible screws are not loosened. If necessary, tighten the screws. (Refer to the "tightening torque" table.)
- Visually check the presence of the teeth and gear (if possible).
- Check the appearance of the teeth.

A tight spot or grinding sound during rotation or the presence of metal particles escaping from the lip seal are signs of abnormal wear in the raceway (Contact HAULOTTE Services®).

Replace slew ring in the following cases :

- Abnormal noise during the turret rotation.
- Movement jolts during the rotation of the turret.
- Gear teeth missing or damaged.
- Presence of metal particles in the grease.
- Wear on gear teeth.
- Abnormal clearance of the gear ring.

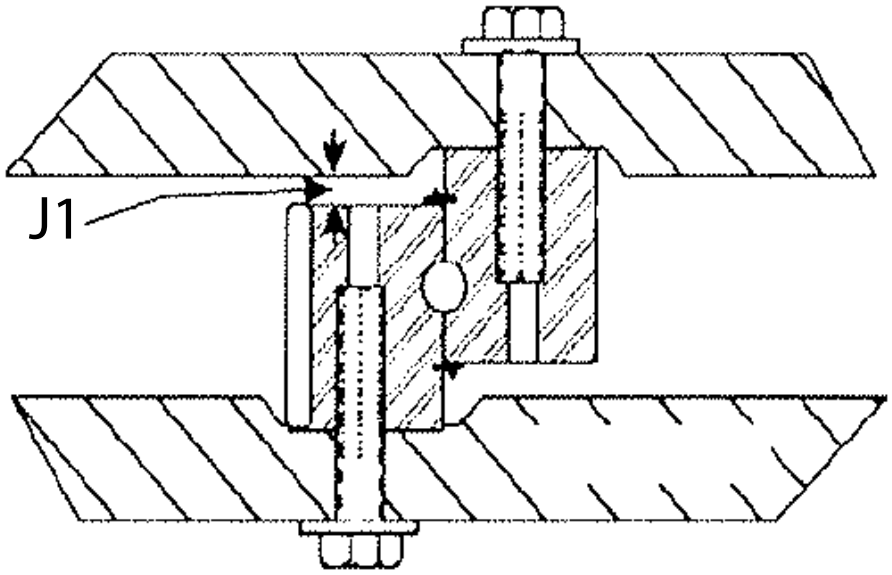
5.2 - MEASUREMENT OF THE CLEARANCE

Place the machine in the following conditions :

- On flat ground, Set up barriers to define the test area.
- No load in the platform.
- From the ground control box, align the turret at 90 ° to the chassis.
- Lift the boom approximatively 30 ° from the ground.
- Completely retract the boom telescope.
- Jib in horizontal position (if fitted).

From the magnetic comparator, note the clearance (J1) between chassis (or turret) and the slew ring.

Clearance between chassis (or turret) and slew ring



After having carried out the measurement :

- Lower the boom at horizontal position.
- Lift the arm (if exists) as its maximum position. Don't extend the telescopic boom.
- Telescope the boom to its maximum angle (completely extend the telescope).
- Jib in horizontal position(if fitted).

In its new configuration, note the clearance (J1) between chassis (or turret) and the slew ring as previously.

- If the difference between two measurements does not exceed 2 mm (0.08 in) : the test validates correct operation.
- Otherwise, contact HAULOTTE Services® to repair the system.

1 - You will need

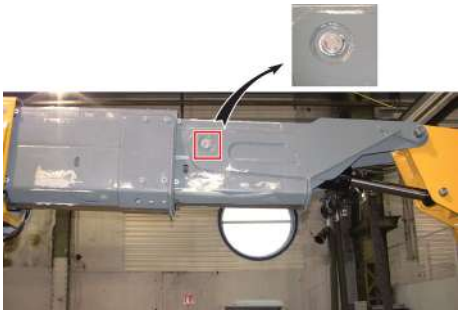
	• Standard tool kit • Protective goggles • Gloves • EPI (Personal protective equipment) • Collars COLSON • Grease for pins • ORFS plug kit : 2505001600 • Pin diameter 25 mm / 1 in, length 300 mm / 12 in • 1 hoisting strap(s) for 1000 kg / 2,205 lbs at a length of 4 m / 13 ft 1,5 in • Lifting and handling equipment(bridge crane, crane, etc) • Palettes for placement under the platform (about 600 mm / 23,6 in) • Hydraulic oil • 290 kg / 640 lbs load for static test • Pry bar		• Place barriers around the perimeter of the work area
Major component masses	• Compensation cylinder : 35 kg / 77,16 lbs		2 persons
Exclusively use tools and auxiliary average adapted. Always wear necessary safety clothing.			

2 - Preliminary operation

- The worker must make sure to have the EPI (Personal Protective Equipment) suited to the work and to the environment's specific conditions in which the equipment is located (see safety information specific to the work site.
- Position the machine on a flat and firm surface, clear of obstructions (beware of power lines).
- Mark out the work area.
- Switch off the ignition and remove the ignition key.
- Put a "DO NOT USE" decal near the start/stop button to inform personnel that work is currently in progress on the equipment.
- Beware of the risk of burns; the hydraulic system operates at high temperatures.
- The pressure in the hydraulic system is very important. It can cause accidents. Relieve the pressure before beginning any work and never search for oil leaks using your hands.
- Engine exhaust gases contain harmful products of combustion. Always start and run the engine in a well-ventilated area. In a closed room, ensure the exhaust gases are evacuated to the outside.

3 - Removal

- Position the machine on a flat and firm surface, clear of obstructions (beware of power lines). Mark out the work area.
- With the boom stowed and the telescope retracted, support the platform on a stable wedge. Wedges under the platform of 600 mm / 23,6 in.

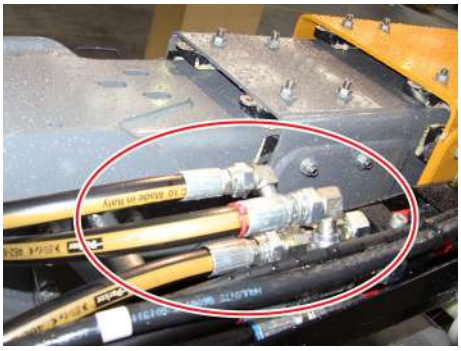


- Switch off the ignition and remove the ignition key.

- Loosen the screw , remove the clevis pin , and put the pin to one side .

- Start the ignition and retract the cylinder rod.

- Switch off the ignition and remove the ignition key.
- Mark and gently unplug the hoses to the input cylinder. As soon as a trickle of oil appears, let it flow out. When there is no longer any residual pressure, disconnect the hoses and plug the connectors.



Remove/Re-install input compensation cylinder

MS0125

- Bring the hoses up to the cylinder.

- Sling the receiver compensation cylinder.

Sling the cylinder so that it doesn't slide.

- Remove the circlips.
- Pull out the pin.

Ensure the cylinder does not slip forwards during extraction. Do not remove the pin used for extraction without first holding the cylinder in place manually

- Remove the cylinder

4 - Re-installation

- If you are installing a new cylinder, note the traceability number.
- Carry out the operations in the reverse order. To pin the cylinder on the back side more easily, extend the cylinder rod to give a longer lever arm.
- Grease the pins and bores before refitting.
- Remember to refit the locking pins in the pins, the immobilisation screws and the circlips.
- Check for the presence of seal on connections.
- Hold the hoses to ensure that they don't turn while tightening the connections (risk of seal damage). This will avoid the hoses twisting when they are connected to the rigid tubes.

5 - Additional operations

- Clean off any residual oil or grease.
- From the lower control box, operate the platform compensation functions to flush out the hydraulic circuit.
- Check that there is no leak of oil at the removing connections.
- Top up the hydraulic oil if necessary.
- Perform a static test by putting 290 kg / 639 lbs on the platform : Machine unfolded, 15 mn after checking the performance of its parts :
    - Boom lifting cylinder.
    - Boom telescopic cylinder.
    - Input jib leveling cylinder.
    - Jib cylinder.

In compliance with the country's laws, have the machine approved by an accredited organization.

Notes

1 - You will need

	• Standard tool kit • Protective goggles • Gloves • EPI (Personal protective equipment) • Grease • Wooden pallets • Height wedge 140 mm / 5,5 in • ORFS plug kit2505001600 • 2 hoisting strap(s) for 3000 kg / 6,615 lbs at a length of 4 m / 13 ft 1 in • Support arm axis tools : 4000598170. Pin diameter 70 mm / 2 ft 3.56 in, length 810 mm / 2ft 8 in. • Pin extractor : • 4000509180 • 4000598170 • 4000509220 • Pin diameter 25 mm / 1 in, length 300 mm / 12 in • Lifting and handling equipment(bridge crane, crane, etc) • Weight of 290 kg / 639 lbs for performing the static test • Oil collection pan		• Place barriers around the perimeter of the work area
Major component masses	• Boom cylinder : 390 kg / 860 lbs • Upper boom : 3000 kg / 6614 lbs		2 persons
Exclusively use tools and auxiliary average adapted. Always wear necessary safety clothing.			

2 - Preliminary operation

The operations of disassembling if they exist should be carried out only on the installations completely disconnected and must be entrusted only to people having the necessary technical training.

Respect, in addition to the instructions appearing in the present instructions, the legal tendencies generally applicable for safety accident prevention.

All the precautions must be done in work before intervening on and near the machine.

After completion of work, all the covers and safety devices must be positioned back completely and operational.

- The worker must make sure to have the EPI (Personal Protective Equipment) suited to the work and to the environment's specific conditions in which the equipment is located (see safety information specific to the work site.
- Position the machine on a flat and firm surface, clear of obstructions (beware of power lines).
- Mark out the work area.
- Switch off the ignition and remove the ignition key.
- Put a "DO NOT USE" decal near the start/stop button to inform personnel that work is currently in progress on the equipment.
- Beware of the risk of burns; the hydraulic system operates at high temperatures.
- The pressure in the hydraulic system is very important. It can cause accidents. Relieve the pressure before beginning any work and never search for oil leaks using your hands.
- Engine exhaust gases contain harmful products of combustion. Always start and run the engine in a well-ventilated area. In a closed room, ensure the exhaust gases are evacuated to the outside.

3 - Removal

- Position the machine on a flat and firm surface, clear of obstructions (beware of power lines). Mark out the work area.
- Position the support arm in the designated space on the chassis.
- Insert the safety pins on each side of the support arm.

- From the bottom control box, lower the boom until the arm comes to rest on the bar.

- Put the platform on a pallet stack by using the jib function. Wedges under the platform of 140 mm / 5,5 in.

- Switch off the ignition and remove the ignition key.

Remove - Replace Boom cylinder

MS0127

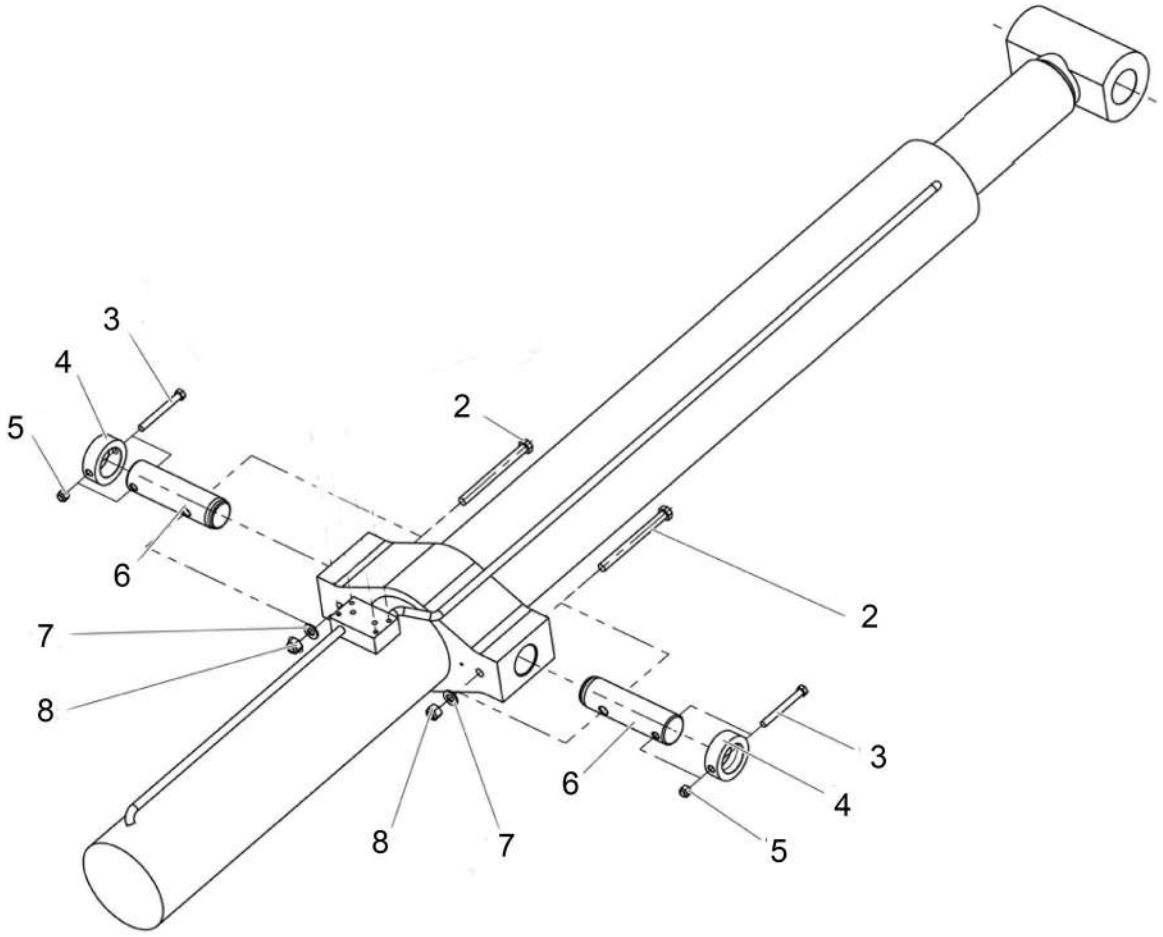
- Attach slings to the boom.
- Apply a small amount of tension on the bridge crane :
- 1 hoisting strap(s) for 3000 kg / 6,615 lbs at a length of 4 m / 13 ft 1 in.
- Bridge crane 3000 kg / 6,615 lbs (minimum).

- Sling the boom lifting cylinder :
- 1 hoisting strap(s) for 3000 kg / 6,615 lbs at a length of 4 m / 13 ft 1 in.
- Bridge crane 3000 kg / 6,615 lbs (minimum).
- Place a wooden wwdge underneath the cylinder.

- Loosen the screws (2) and nuts (8) on the cylinder.

Remove - Replace Boom cylinder

MS0127

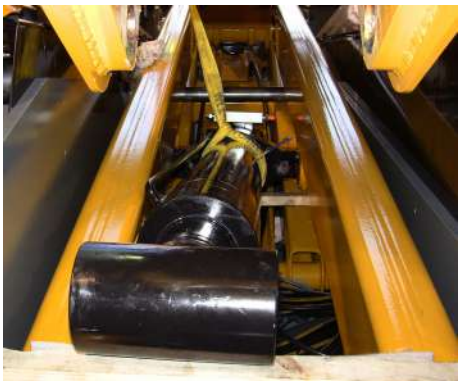


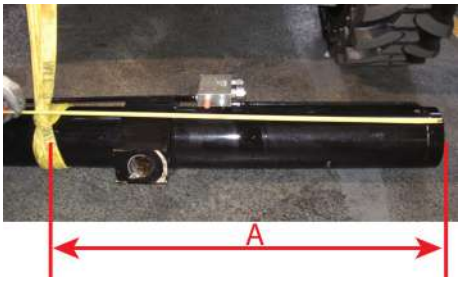
- Loosen the screw (1) and remove the clevis pin (2).
- By manoeuvring the bridge connected to the boom, relieve the stress on the pin in order to extract it.
- Pull out the pin (3).
- From the ground control box, control the retraction of the cylinder rod.
- Put the cylinder on the wooden pallet.

- Switch off the ignition and remove the ignition key.

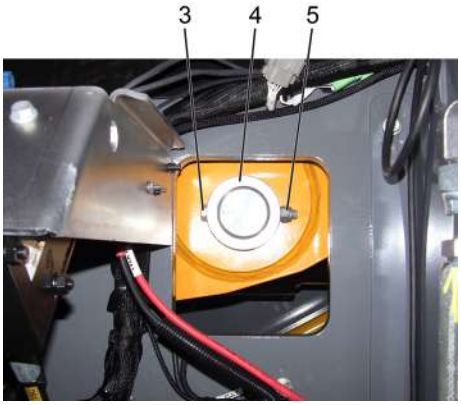
- Mark, disconnect, and plug the telescope cylinder feed hoses.

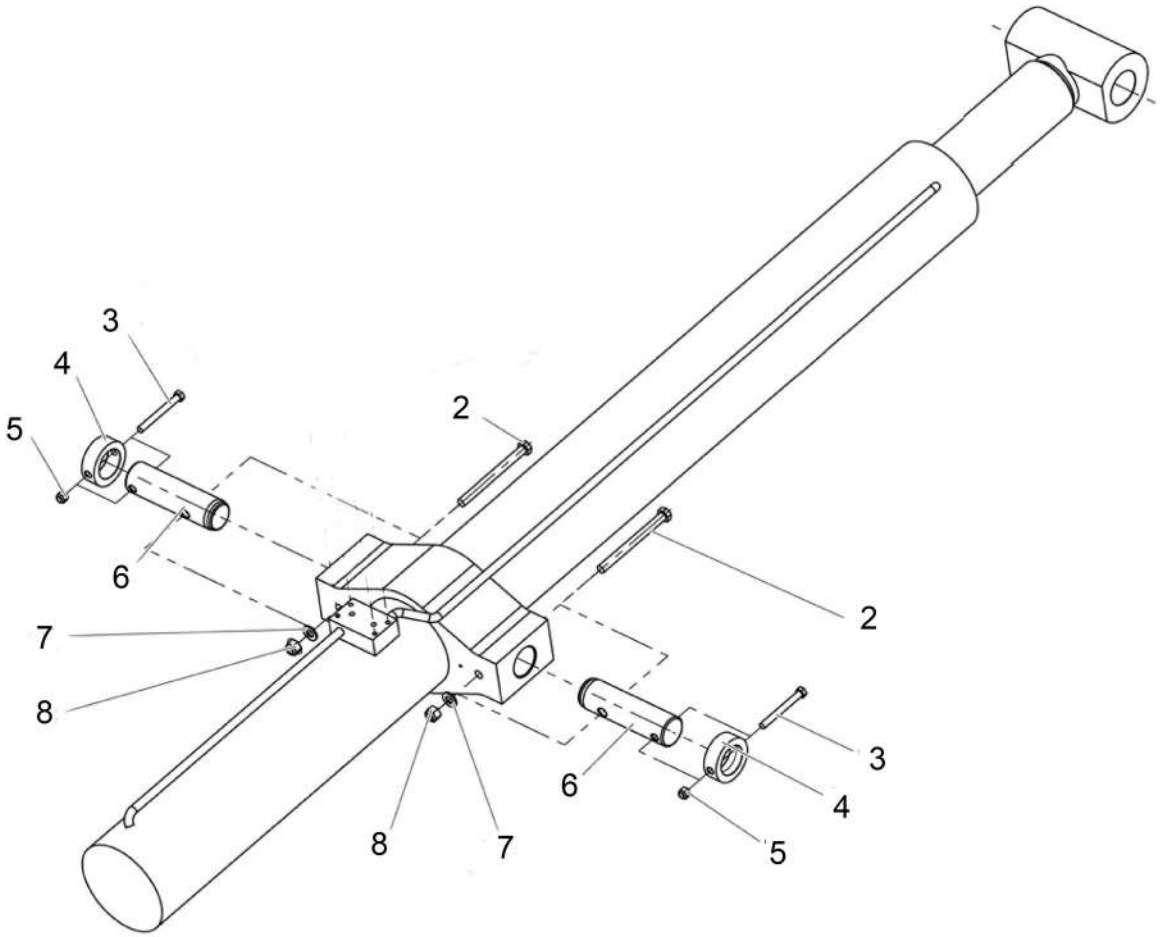
- Place a wedge under the bottom-side cylinder.
- Move the hoisting strap to tie the cylinder at the center of gravity : A = 1230 mm / 48,42 in





- Loosen the screws (3) and nuts (5) on the cylinder.
- Remove the stop rings (4)





- Remove the pins (8) with the extractor .

- Lift the cylinder slightly with the bridge.
- Rotate the cylinder a quarter of a turn so that the cylinder's boss is perpendicular to the turret.
- Remove the cylinder from the front.

- Remove the boom lifting cylinder.

4 - Re-installation

- If you are installing a new cylinder, note the traceability number.
- Perform the operations in the reverse order of dismantling.
- Grease all the pins, seals, and bore holes.
- Make sure to install the locking pin screws and circlips (change them if they became damaged during disassembly).
- Check that the seals are on the connections before reconnecting the hoses.
- Hold the hoses to ensure that they don't turn while tightening the connections (risk of seal damage). This will avoid the hoses twisting when they are connected to the rigid tubes.
- Ensure of the good hose path.

5 - Additional operations

- Clean off any residual oil or grease.
- From the lower control box, raise up and down boom up to purge the cylinder.
- Check that there is no leak of oil at the removing connections.
- Top up the hydraulic oil if necessary (machine in road driving position).
- From the ground and platform control boxes, test all of the machine's functions.
- Perform a static test by putting 290 kg / 639 lbs on the platform. Machine unfolded, 15 mn after checking the performance of its parts :
- Lift cylinder.
- Boom telescopic cylinder.
- Input jib leveling cylinder.
- Jib cylinder.

In compliance with the country's laws, have the machine approved by an accredited organization.

Notes

1 - You will need

	• Standard tool kit • Protective goggles • Gloves • EPI (Personal protective equipment) • Collars COLSON • Spanner 46 mm • 41 mm thick ground flat key (maximum thickness 6 mm)		• Place barriers around the perimeter of the work area
	1 person		

2 - Preliminary operation

The operations of disassembling if they exist should be carried out only on the installations completely disconnected and must be entrusted only to people having the necessary technical training.

Respect, in addition to the instructions appearing in the present instructions, the legal tendencies generally applicable for safety accident prevention.

All the precautions must be done in work before intervening on and near the machine.

After completion of work, all the covers and safety devices must be positioned back completely and operational.

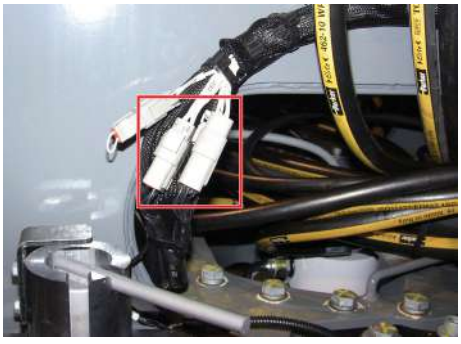
- The worker must make sure to have the EPI (Personal Protective Equipment) suited to the work and to the environment's specific conditions in which the equipment is located (see safety information specific to the work site.
- Position the machine on a flat and firm surface, clear of obstructions (beware of power lines).
- Mark out the work area.
- Switch off the ignition and remove the ignition key.
- Put a "DO NOT USE" decal near the start/stop button to inform personnel that work is currently in progress on the equipment.
- Beware of the risk of burns; the hydraulic system operates at high temperatures.
- The pressure in the hydraulic system is very important. It can cause accidents. Relieve the pressure before beginning any work and never search for oil leaks using your hands.
- Engine exhaust gases contain harmful products of combustion. Always start and run the engine in a well-ventilated area. In a closed room, ensure the exhaust gases are evacuated to the outside.

3 - Removal

- Position the machine on a flat and firm surface, clear of obstructions (beware of power lines). Mark out the work area.
- With the boom at 45° and the telescope retracted, support the platform on a stable wedge.

- Switch off the ignition and remove the ignition key.

- To remove the manifold, disconnect connector CE01 and CE02 located in the turret.

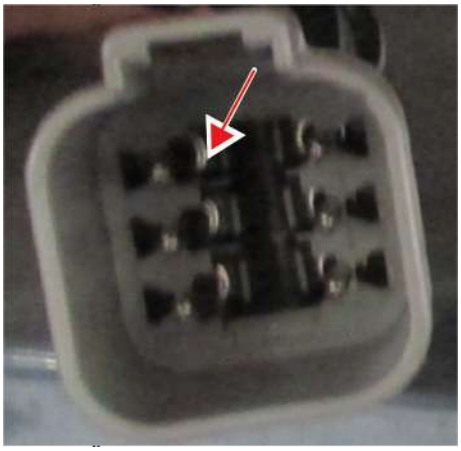


Remove/Re-install slip ring (electric rotary coupling)

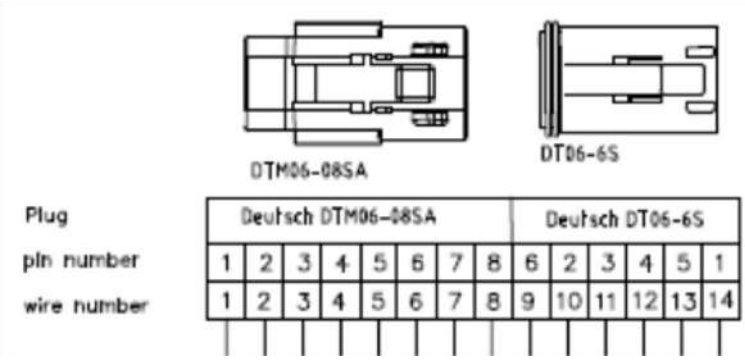
MS0128

- Using needle-nose pliers, remove the wedges in the wiring harness connectors on the slip ring (electric rotary coupling) side.

- Use a small flat screwdriver to push the tabs, then pull on the wires to withdraw them from the connectors. Remove the wires from the 2 connectors.

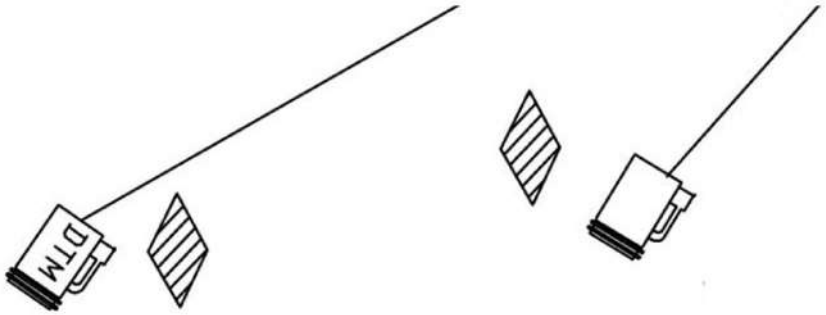


Correspondance between the location and the wire numbers on the connectors on the slip ring (electric rotary coupling) side



Plug	Deutsch DTM06-08SA								Deutsch DT06-6S					
pin number	1	2	3	4	5	6	7	8	6	2	3	4	5	1
wire number	1	2	3	4	5	6	7	8	9	10	11	12	13	14

Correspondance between the location and the wire numbers on the connectors on the turret wiring harness side



CE01

FRAME CN1 (SLIP RING)

P.	SIZ.	REF.	NUM.	TERM./ PLUG
1	1	CN2B/8	782	1062-20-0122
2	1	CN2B/25	783	1062-20-0122
3	1	CN2B/29	601	1062-20-0122
4	1	CN2B/27	602	1062-20-0122
5	1	CN2B/28	621	1062-20-0122
6	1	CN2B/26	622	1062-20-0122
7	1	CN2B/7	780	1062-20-0122
8	1	CN2B/6	689	1062-20-0122

(B)

CE02

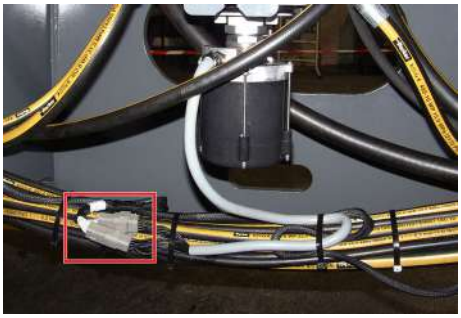
FRAME CN2 (SLIP RING)

P.	SIZ.	REF.	NUM.	TERM./ PLUG
1	2	SPL0_1	0	1062-16-0122
2	1	SPL109	109	1062-16-0122
3	2	SPL0_1	0	1062-16-0122
4	1	CN2B/5	686	1062-16-0122
5	1	CN2B/34	687	1062-16-0122
6	0,5	CN2A/11	212	1062-16-0622

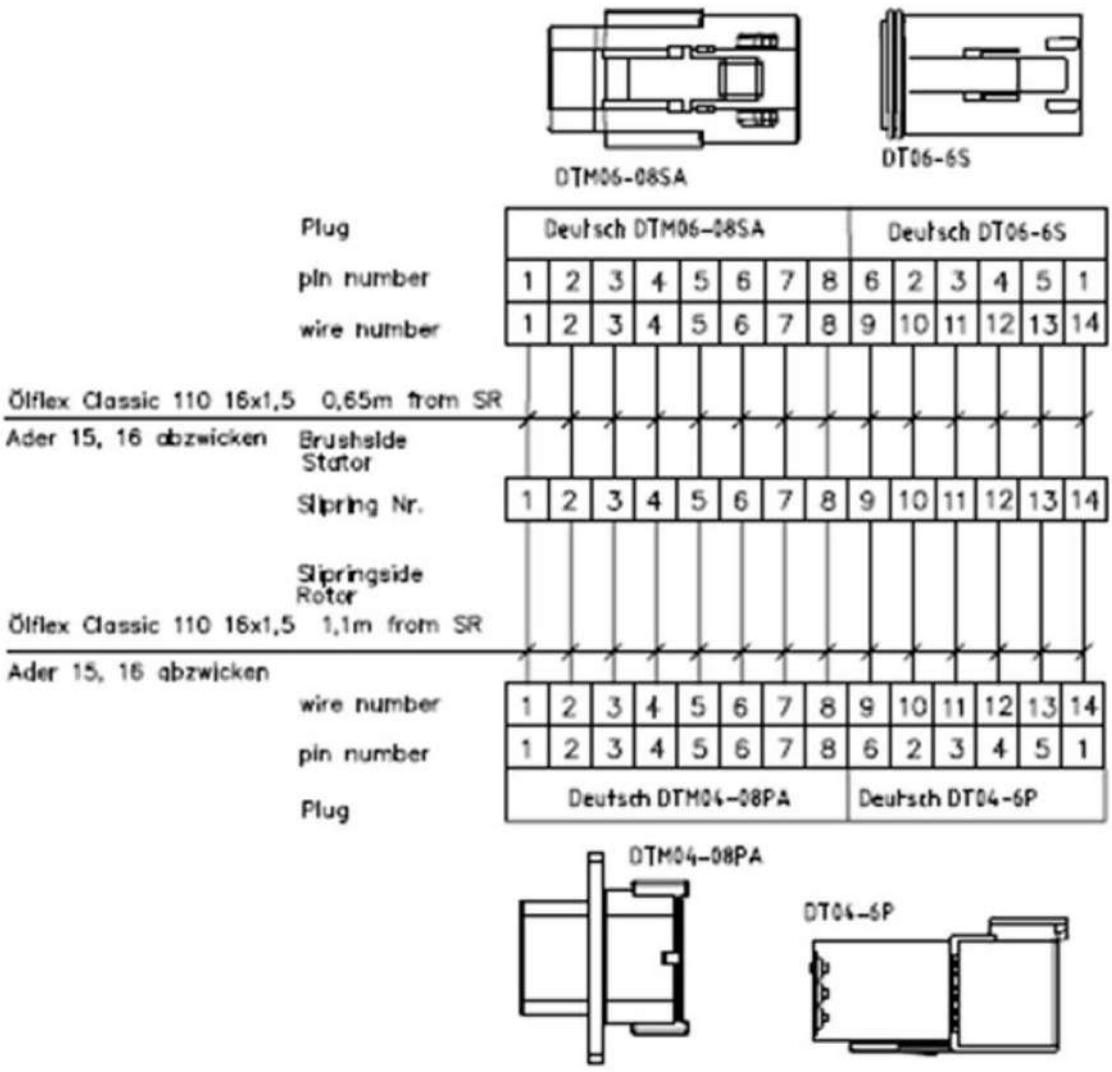
- Protect the wires with adhesive tape.

- Unscrew the plastic nut on the cable gland.
- Remove the nut and the rubber seal from the cable.

- Cut the collar and disconnect the 2 CE01 and CE02 plugs on the slip ring (electric rotary coupling) side



Correspondance between the location and the wire numbers on the connectors on the slip ring (electric rotary coupling) side

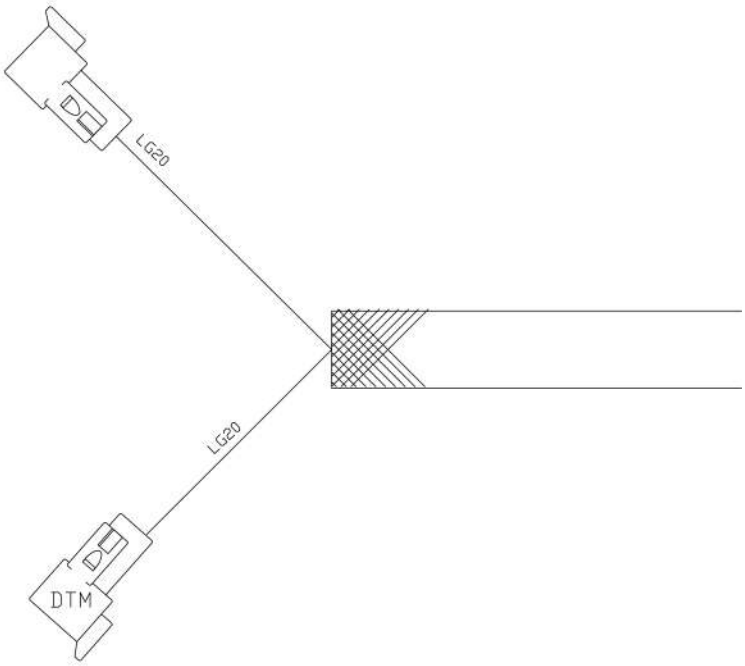


Correspondance between the location and the wire numbers on the connectors on the chassis wiring harness side

CE02

FRAME CN2 (SLIP RING)

P.	SIZ.	REF.	NUM.	TERM./ PLUG
1	2	SPL0_1	0	1060-16-0122
2	1	SP100/2	109	1060-16-0122
3	2	SPL0_1	0	1060-16-0122
4	1	YV101/1	686	1060-16-0122
5	1	YV104/1	687	1060-16-0122
6	1	SP100/1	212	1060-16-0122



CE01

FRAME CN1 (SLIP RING)

P.	SIZ.	REF.	NUM.	TERM./ PLUG
1	1	YV102/1	782	1060-20-0122
2	1	YV105/1	783	1060-20-0122
3	1	YV150L/1	601	1060-20-0122
4	1	YV150R/1	602	1060-20-0122
5	1	YV107/1	621	1060-20-0122
6	1	YV108/1	622	1060-20-0122
7	1	YV110/1	780	1060-20-0122
8	1	YV100/1	689	1060-20-0122

- Remove the rotation stop lug on the slip ring (electric rotary coupling).

Remove/Re-install slip ring (electric rotary coupling)

MS0128

- Loosen the lockwasher.
- Loosen the nut.

- Fully release the slip ring (electric rotary coupling).
- Pull the cable to withdraw it from the hydraulic rotary joint.

4 - Re-installation

- If the manifold has been replaced, remove and retain its traceability number.
- Carry out the operations in the reverse order.
- Remember to refit the rotation stop lug.
- Connect the plugs.
- Attach the cables.

5 - Additional operations

- Clean off any residual oil or grease.
- Test all the functions on the chassis part.

Notes

1 - You will need

	• Standard tool kit. • Protective goggles. • Gloves. • EPI (Personal protective equipment). • Torque wrenches for torque of 70 Nm / 140 Nm / 215 Nm. • 24 mm / 1 in socket. • Short 24 mm / 1 in socket. • M16 x 1,5 bushing. • Circlips pliers. • Palettes for placement under the platform (about 700 mm / 28 in).		• Place barriers around the perimeter of the work area
Exclusively use tools and auxiliary average adapted. Always wear necessary safety clothing.			1 person

2 - Preliminary operation

The operations of disassembling if they exist should be carried out only on the installations completely disconnected and must be entrusted only to people having the necessary technical training.

Respect, in addition to the instructions appearing in the present instructions, the legal tendencies generally applicable for safety accident prevention.

All the precautions must be done in work before intervening on and near the machine.

After completion of work, all the covers and safety devices must be positioned back completely and operational.

- The worker must make sure to have the EPI (Personal Protective Equipment) suited to the work and to the environment's specific conditions in which the equipment is located (see safety information specific to the work site.
- Position the machine on a flat and firm surface, clear of obstructions (beware of power lines).
- Mark out the work area.
- Switch off the ignition and remove the ignition key.
- Put a "DO NOT USE" decal near the start/stop button to inform personnel that work is currently in progress on the equipment.
- Beware of the risk of burns; the hydraulic system operates at high temperatures.
- The pressure in the hydraulic system is very important. It can cause accidents. Relieve the pressure before beginning any work and never search for oil leaks using your hands.
- Engine exhaust gases contain harmful products of combustion. Always start and run the engine in a well-ventilated area. In a closed room, ensure the exhaust gases are evacuated to the outside.

3 - Removal

- Position the machine on a flat and firm surface, clear of obstructions (beware of power lines). Mark out the work area.
- With the arm and boom folded and the telescope retracted, support the platform on pallets.

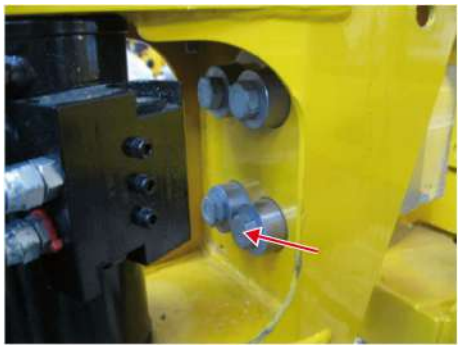
- Switch off the ignition and remove the ignition key.

- Loosen the 4 screws connecting the platform support to the gauge.

- Remove the circlip and withdraw the pin linking the link piece to the platform support.

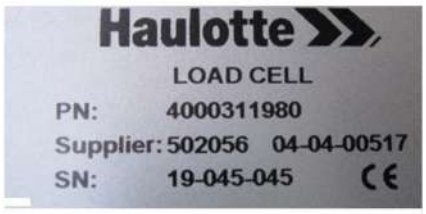
- Disconnect the stress gauge plug.
- Pull slightly on the platform assembly to free access to the stress gauge.

- Loosen the 4 screws that hold the strain gage onto the connecting element.
- Remove the strain gage.

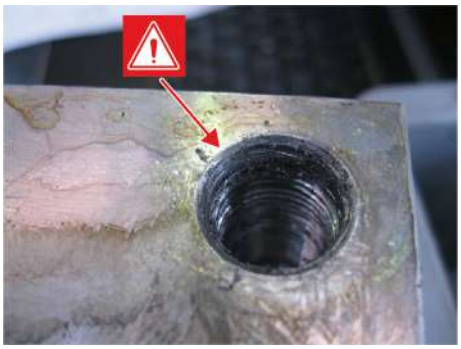


4 - Re-installation

- If the cell has been replaced, note the traceability number.

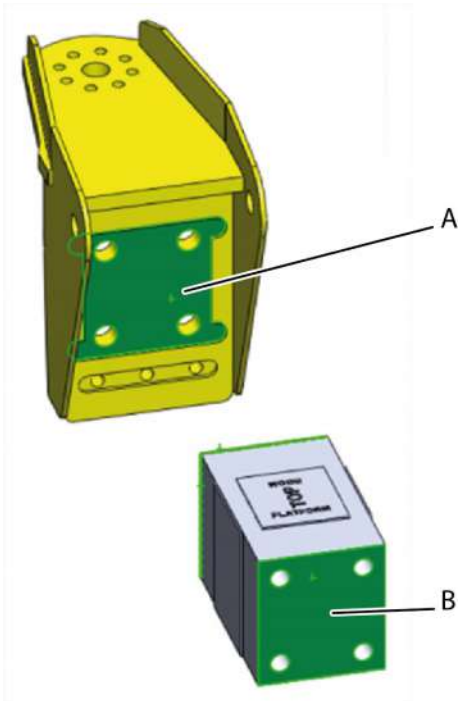


- If the screws are replaced, fit the M16 x 1,5 bushing (extra thickness linked to the screw treatment). If this is not done, the tapping in the load cell will be damaged.



Precautions on the surfaces in contact with the stress gauge :

- A : The surfaces in contact with load cell must not be painted. The load cell must not be in contact with the machined side or with the paint.
- B : Ensure that the load cell has no marks (impacts or scratches) on the surface in contact or the grooves on the 2 sides.



Remove - Replace load cell

MS0129

- Reassemble in the reverse order of dismantling.
- Apply the following torques (Single load) :
- 70 Nm
- 140 Nm
- 215 Nm
- Apply the following torques (Dual load) :
- 123 Nm
- 246 Nm
- 370 Nm

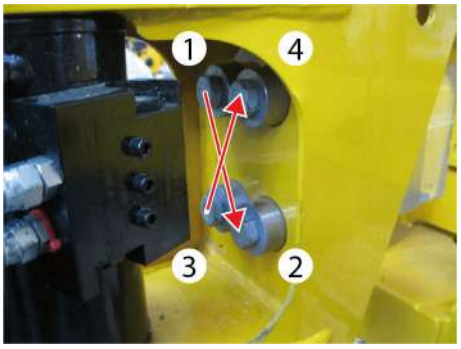
N.B.-:-Ensure the spacer washers are correctly positioned on the platform side. They must be centred in the counterbores.

When re-installing the cell on the link piece, ensure the cell is fitted the right way round (A label indicates the top). Place the label marked TOP at the top. Check there are no foreign bodies (even small) between the cell and the brackets.

- Tighten the fastening screws successively 3 times with a torque wrench.

Tightening recommendations :

- No lubrication on these screws.
- Tighten the screws crosswise.
- Tighten to the indicated final torque in 3 phases :
- Tighten to a third of the torque (impact wrench authorised without exceeding one third of the torque).
- Tighten to 2 of the torque with a torque wrench.
- Tighten to nominal torque using a torque wrench.
- If tightened too much and not in a crosswise fashion, the weight indicator will be damaged and will give incorrect results.
- Tighten the screws in the order 1, 2, 3, 4 (See photo opposite).
- Proceed in the same way on the 2 sides.



- Remember to re-install the pin connecting the link piece to the platform bracket.
- Fit the washer and circlip (circlip to be changed if stretched when removing).

5 - Additional operations

- Calibrate the load cell. MS0057 Overload system.
- Perform a static test by putting 290 kg / 639 lbs on the platform. Machine unfolded, 15 mn after checking the performance of its parts :
- Lift Arm hydraulic cylinder.
- Boom lifting cylinder.
- Telescoping cylinder.
- Input jib leveling cylinder.
- Jib cylinder.

In compliance with the country's laws, have the machine approved by an accredited organization.

1 - You will need

	• Standard tool kit • Protective goggles • Gloves • EPI (Personal protective equipment) • Collars COLSON		• Place barriers around the perimeter of the work area
	1 person		

2 - Preliminary operation

The operations of disassembling if they exist should be carried out only on the installations completely disconnected and must be entrusted only to people having the necessary technical training.

Respect, in addition to the instructions appearing in the present instructions, the legal tendencies generally applicable for safety accident prevention.

All the precautions must be done in work before intervening on and near the machine.

After completion of work, all the covers and safety devices must be positioned back completely and operational.

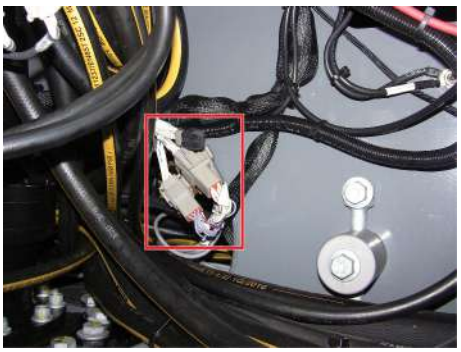
- The worker must make sure to have the EPI (Personal Protective Equipment) suited to the work and to the environment's specific conditions in which the equipment is located (see safety information specific to the work site.
- Position the machine on a flat and firm surface, clear of obstructions (beware of power lines).
- Mark out the work area.
- Switch off the ignition and remove the ignition key.
- Put a "DO NOT USE" decal near the start/stop button to inform personnel that work is currently in progress on the equipment.
- Beware of the risk of burns; the hydraulic system operates at high temperatures.
- The pressure in the hydraulic system is very important. It can cause accidents. Relieve the pressure before beginning any work and never search for oil leaks using your hands.
- Engine exhaust gases contain harmful products of combustion. Always start and run the engine in a well-ventilated area. In a closed room, ensure the exhaust gases are evacuated to the outside.

3 - Removal

- Position the machine on a flat and firm surface, clear of obstructions (beware of power lines). Mark out the work area.
- With the boom stowed and the telescope retracted, support the platform on a stable wedge.

- Switch off the ignition and remove the ignition key.

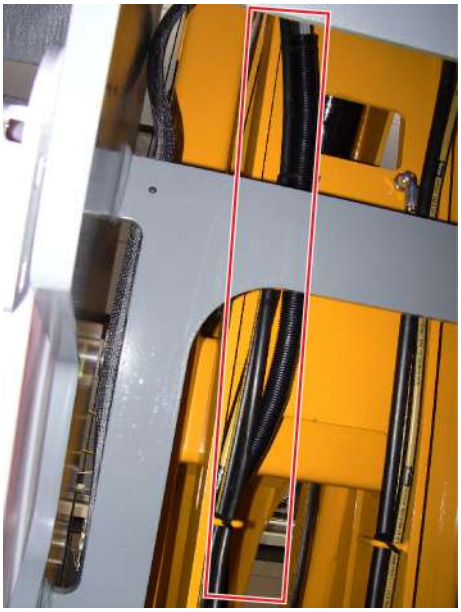
- Disconnect the plugs from the harness BUS CAN CN06-1 - CN06-2.
- Place the plugs inside a plastic bag for protection so as not to contaminate the connectors.



Remove/re-install the harness BUS CAN

MS0130

- Remove the harness from the turret and bring it to the boom.

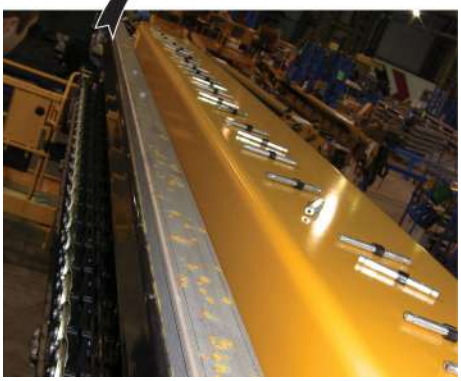


Remove/re-install the harness BUS CAN

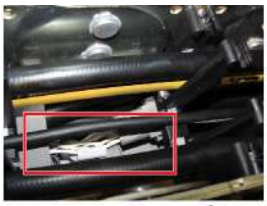
MS0130

- Loosen the clamping pads.
- Make a mark on the cables where they enter and exit the clamps. This will enable them to be correctly repositioned when re-installing.

- Unclip the fastening clips from the chain's spacers. Turn the key a quarter turn to remove them.



- Remove the harness BUS CAN from the lower duct.



- Remove the protective cable cover from the top rail.
- Remove the harness BUS CAN from the top rail.

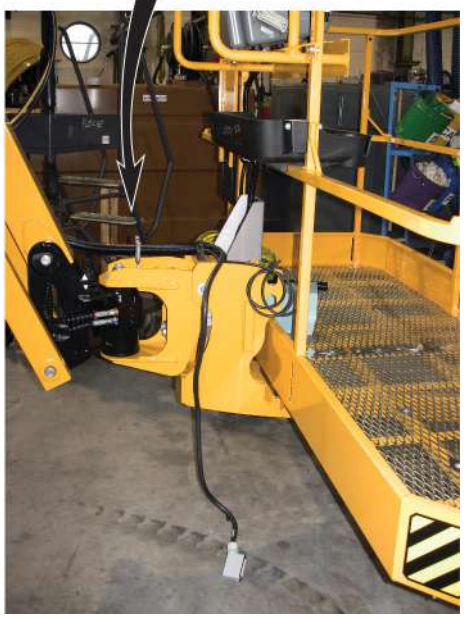
- Remove the cable guide from the jib's connecting element.

Remove/re-install the harness BUS CAN

MS0130

- Cut the COLSON clamps that hold the BUS CAN harness along the arm of the jib.

- Loosen the BUS CAN harness' retention bracket.
- Disconnect the plug on the platform control box and cut the COLSON collars.
- Remove the cable from the plastic sleeve.



- Remove the BUS CAN harness.

4 - Re-installation

- Carry out the operations in reverse order starting with the platform-side installation.
- Follow the initial harness routing.
- Connect the plugs.
- Attach the cables.

5 - Additional operations

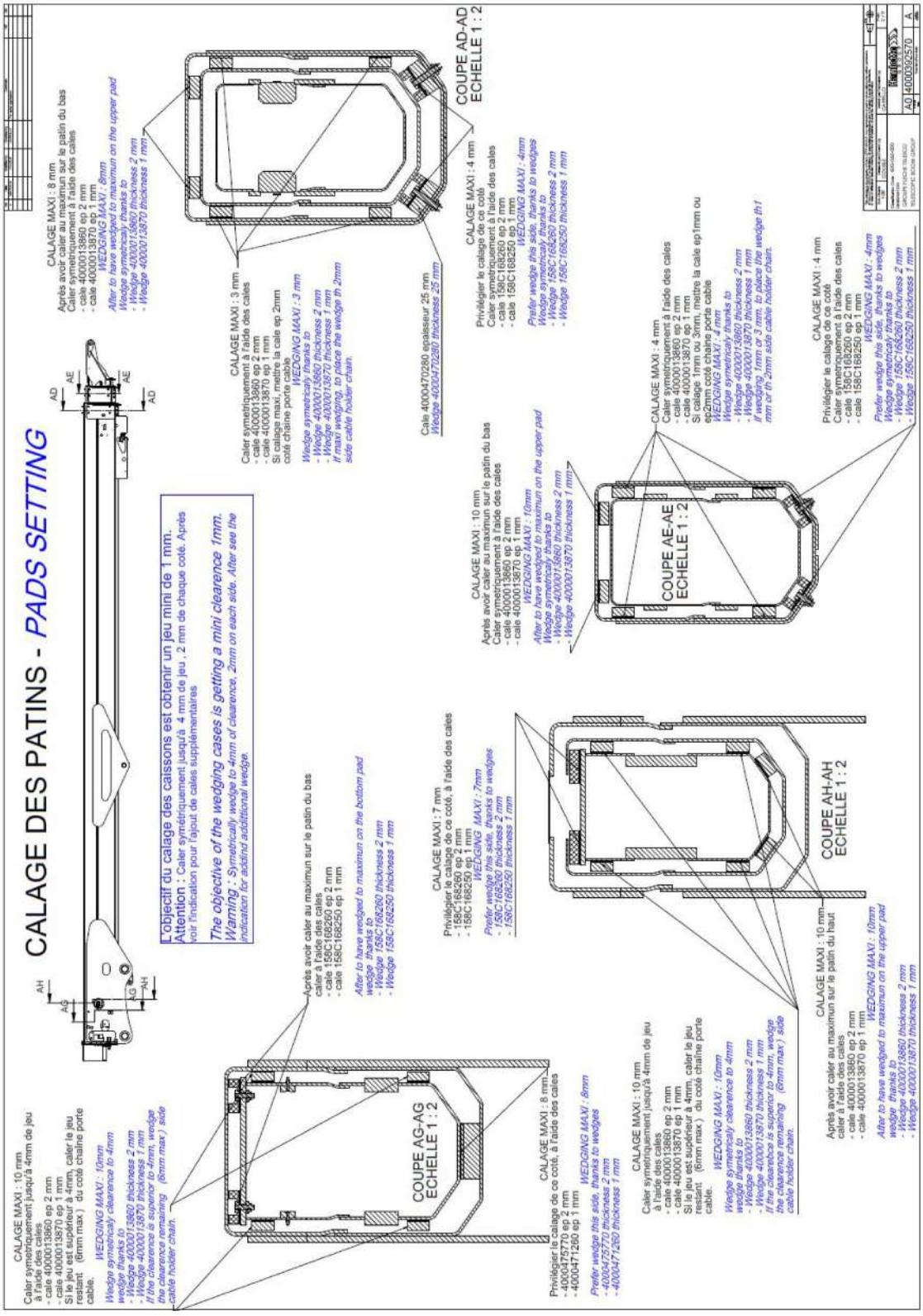
- Clean off any residual oil or grease.
- Test all of the functions from the ground station and platform station.
- Maneuver the lifting boom, extend and retract the telescope, and raise and lower the boom to check that the movements are consistent.

Notes

1 - You will need

	• Standard tool kit • Protective goggles • Gloves • EPI (Personal protective equipment) • Normal threadlocker • Grease for the pads • ORFS plug kit : 2505001600 • 1 hoisting strap(s) for 3000 kg / 6,615 lbs at a length of 2 m / 6 ft 7 in • Lifting and handling equipment(bridge crane, crane, etc) • Work platform for reaching the telescope's front and back pads • Lifting and handling equipment(bridge crane, crane, etc) • Wear pads : See Spare Parts manual • Adjustment chocks : See Spare Parts manual • Torque wrench for 10 Nm • Torque wrench for 45 Nm		• Place barriers around the perimeter of the work area
	2 persons		

Wear pad adjustment



2 - Preliminary operation

The operations of disassembling if they exist should be carried out only on the installations completely disconnected and must be entrusted only to people having the necessary technical training.

Respect, in addition to the instructions appearing in the present instructions, the legal tendencies generally applicable for safety accident prevention.

All the precautions must be done in work before intervening on and near the machine.

After completion of work, all the covers and safety devices must be positioned back completely and operational.

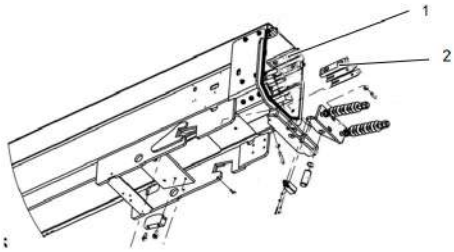
- The worker must make sure to have the EPI (Personal Protective Equipment) suited to the work and to the environment's specific conditions in which the equipment is located (see safety information specific to the work site.
- Position the machine on a flat and firm surface, clear of obstructions (beware of power lines).
- Mark out the work area.
- Switch off the ignition and remove the ignition key.
- Put a "DO NOT USE" decal near the start/stop button to inform personnel that work is currently in progress on the equipment.
- Beware of the risk of burns; the hydraulic system operates at high temperatures.
- The pressure in the hydraulic system is very important. It can cause accidents. Relieve the pressure before beginning any work and never search for oil leaks using your hands.
- Engine exhaust gases contain harmful products of combustion. Always start and run the engine in a well-ventilated area. In a closed room, ensure the exhaust gases are evacuated to the outside.

3 - Removal

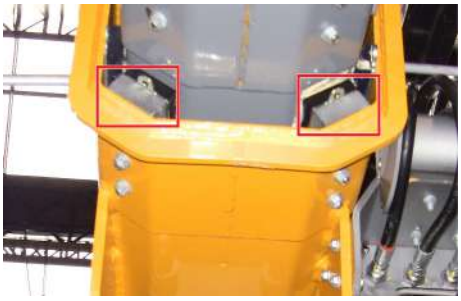
3.1 - FRONT PADS REPLACEMENT

- Position the machine on a flat and firm surface, clear of obstructions (beware of power lines). Mark out the work area.
- Extend the telescope by approximatively 100 mm / 4 in to make removing of front pads.

- Mark the adjustment pallets and disassemble the pads on the boom shaft.
- Carry out the dismantling following the order :
- The 2 upper pads (1).
- The 4 side pads (2).



- Sling the telescope by using a hoisting strap that supports 3000 kg / 6,65 lbs at a length of 2 m / 6 ft 7 in.
- To remove the lowere pads, lift up the tube by using the hoisting device.
- Mark the adjustment pallets then disassemble the 2 lower front pads.
- Perform reassembly in the reverse order from dismantling with new pads, respecting the adjustment process.

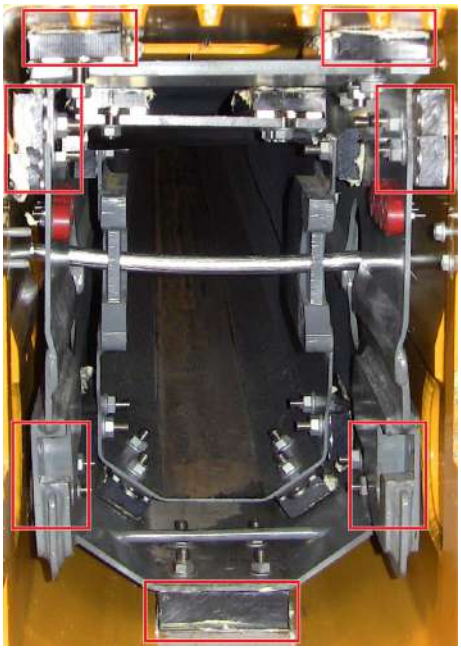


3.2 - INTERMEDIATE TUBE PADS REPLACEMENT

- Perform the same procedure as for replacing front pads.

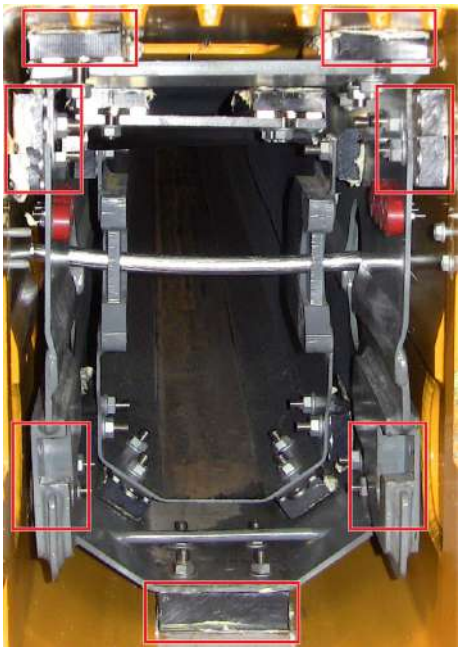
3.3 - REAR PADS REPLACEMENT

- Position the machine on a flat and firm surface, clear of obstructions (beware of power lines). Mark out the work area.
- Remove the telescope cylinder. Refer to MS0121 Remove/replace the telescope cylinder.



3.4 - REAR PADS REPLACEMENT ON INTERMEDIATE TUBE

- Mark the adjustment pallets and remove the 4 lateral pads.
- Mark the adjustment pallets and remove the lower pad.
- For the upper pads, mark the adjustment pallets and take out the screws.
- Sling the intermediate telescope side platform by using a hoisting strap that supports 3000 kg / 6,65 lbs at a length of 2 m / 6 ft 7 in.
- Put a small amount of tension on the telescope to remove the pads.
- Perform reassembly in the reverse order from dismantling with new pads, respecting the adjustment process.



4 - Re-installation

- To install the new pads, go through the disassembly instructions in reverse order.
- Grease the surface of the new pads while making sure to put the adjustment palettes in the same places.

5 - Additional operations

- Clean off any residual oil or grease.
- Move the telescope back and forth to ensure that it is not stuck and no backlash.
- Check that there is no leak of oil at the removing connections.
- Top up the hydraulic oil if necessary.

1 - You will need

	• Standard tool kit • Protective goggles • Gloves • EPI (Personal protective equipment) • 2 hoisting strap(s) for 1000 kg / 2,205 lbs at a length of 4 m / 13 ft 13 in • Lifting and handling equipment(bridge crane, crane, etc)		• Place barriers around the perimeter of the work area
	2 persons		

2 - Preliminary operation

The operations of disassembling if they exist should be carried out only on the installations completely disconnected and must be entrusted only to people having the necessary technical training.

Respect, in addition to the instructions appearing in the present instructions, the legal tendencies generally applicable for safety accident prevention.

All the precautions must be done in work before intervening on and near the machine.

After completion of work, all the covers and safety devices must be positioned back completely and operational.

- The worker must make sure to have the EPI (Personal Protective Equipment) suited to the work and to the environment's specific conditions in which the equipment is located (see safety information specific to the work site.
- Position the machine on a flat and firm surface, clear of obstructions (beware of power lines).
- Mark out the work area.
- Switch off the ignition and remove the ignition key.
- Put a "DO NOT USE" decal near the start/stop button to inform personnel that work is currently in progress on the equipment.
- Beware of the risk of burns; the hydraulic system operates at high temperatures.
- The pressure in the hydraulic system is very important. It can cause accidents. Relieve the pressure before beginning any work and never search for oil leaks using your hands.
- Engine exhaust gases contain harmful products of combustion. Always start and run the engine in a well-ventilated area. In a closed room, ensure the exhaust gases are evacuated to the outside.

3 - Removal

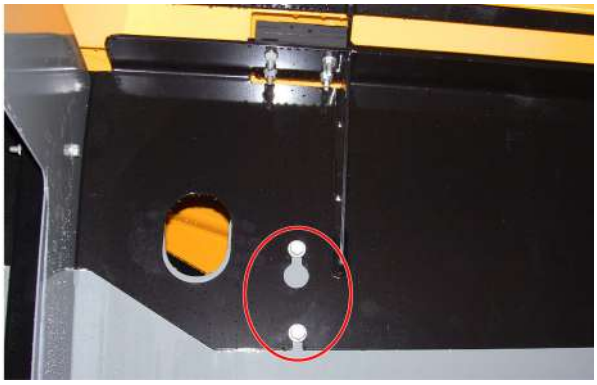
3.1 - MOVABLE COVER ON THE MOTOR-SIDE

- Position the machine on a flat and firm surface, clear of obstructions (beware of power lines). Mark out the work area.
- Machine in stowed position.
- Switch off the ignition and remove the ignition key.

- Open the engine cover.
- Sling each side of the cover.

- Loosen the screw that the fixes the engine casing to the turret.
- Open and lock the engine casing to access the casing's screws.

- Apply a small amount of tension on the bridge crane.
- Loosen the screws that fix the cover support plate to the turret.

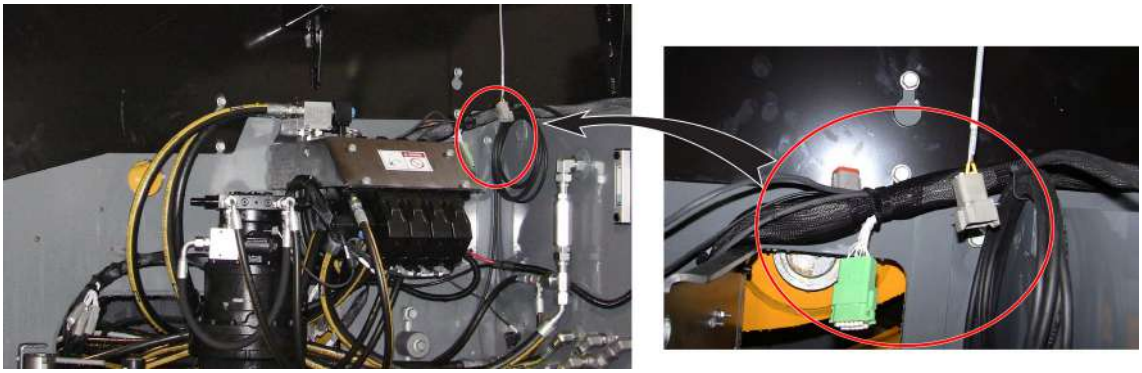


- Lift the cover slightly with the bridge.
- Remove the cover.

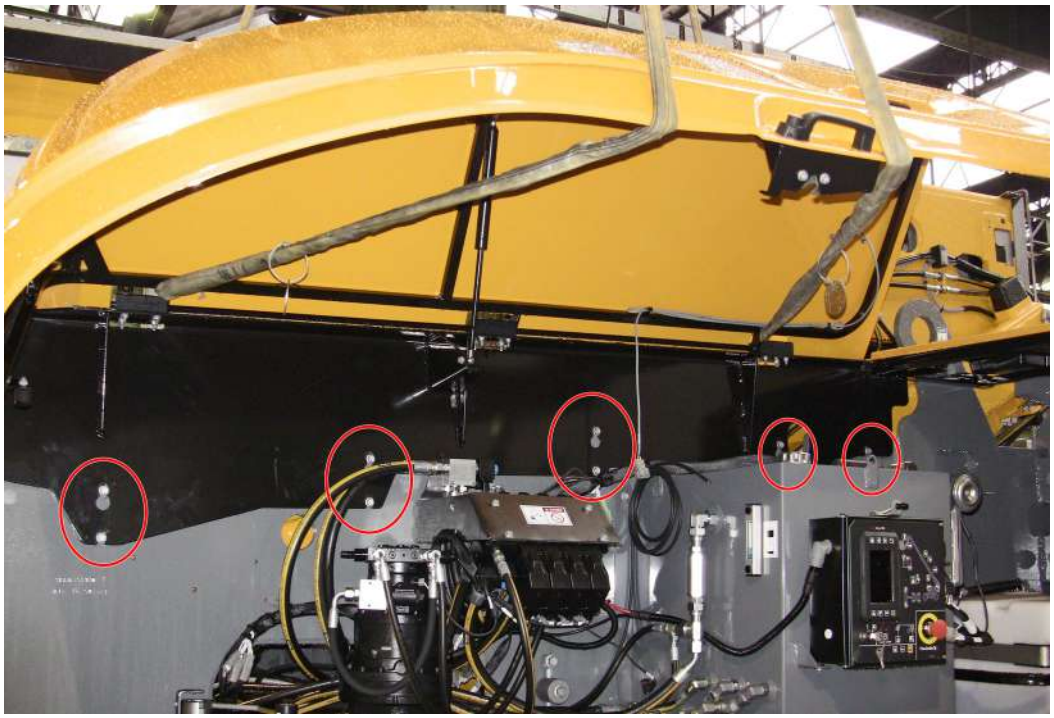
3.2 - MOVABLE COVER ON THE CONTROL BOX-SIDE

- Open the cover on the control box-side.
- Sling each side of the cover.

- Disconnect the beacon switch.



- Apply a small amount of tension on the bridge crane.
- Loosen the screws that fix the cover support plate to the turret.



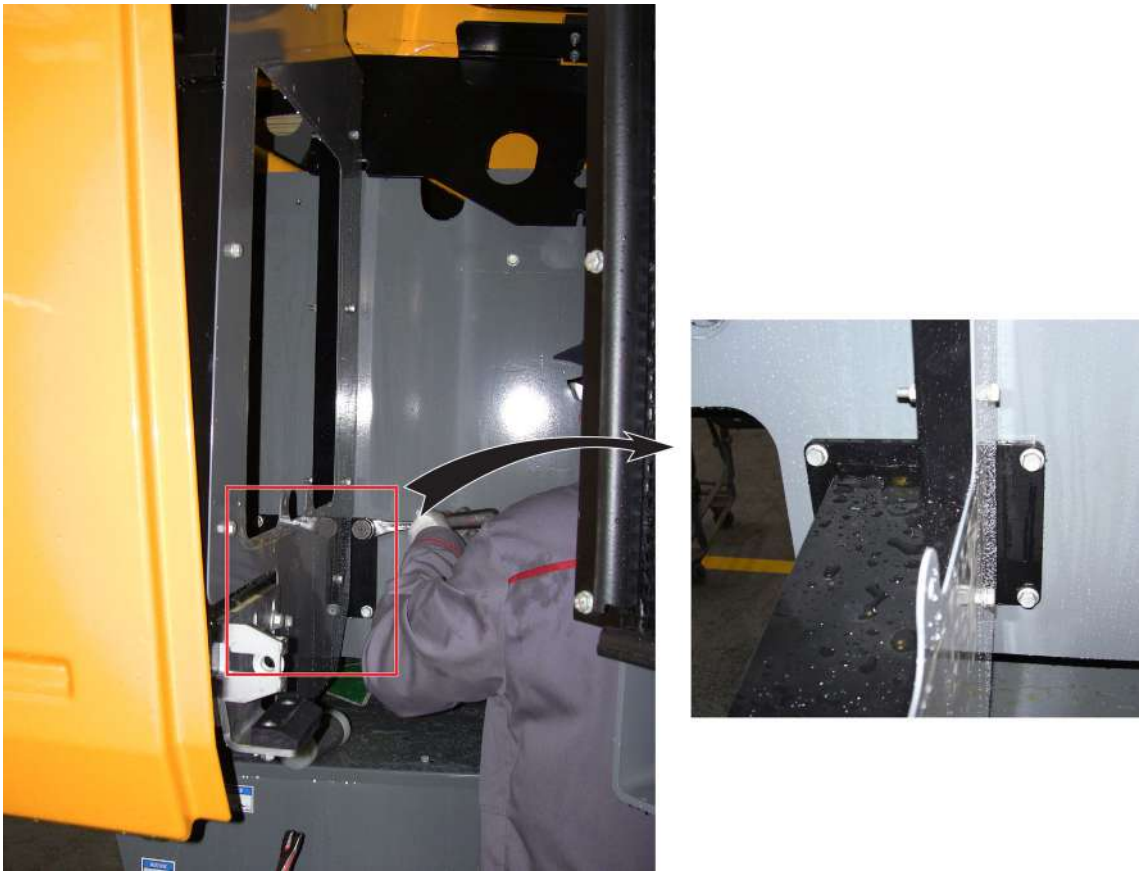
- Remove the cover.

Remove/re-install the covers

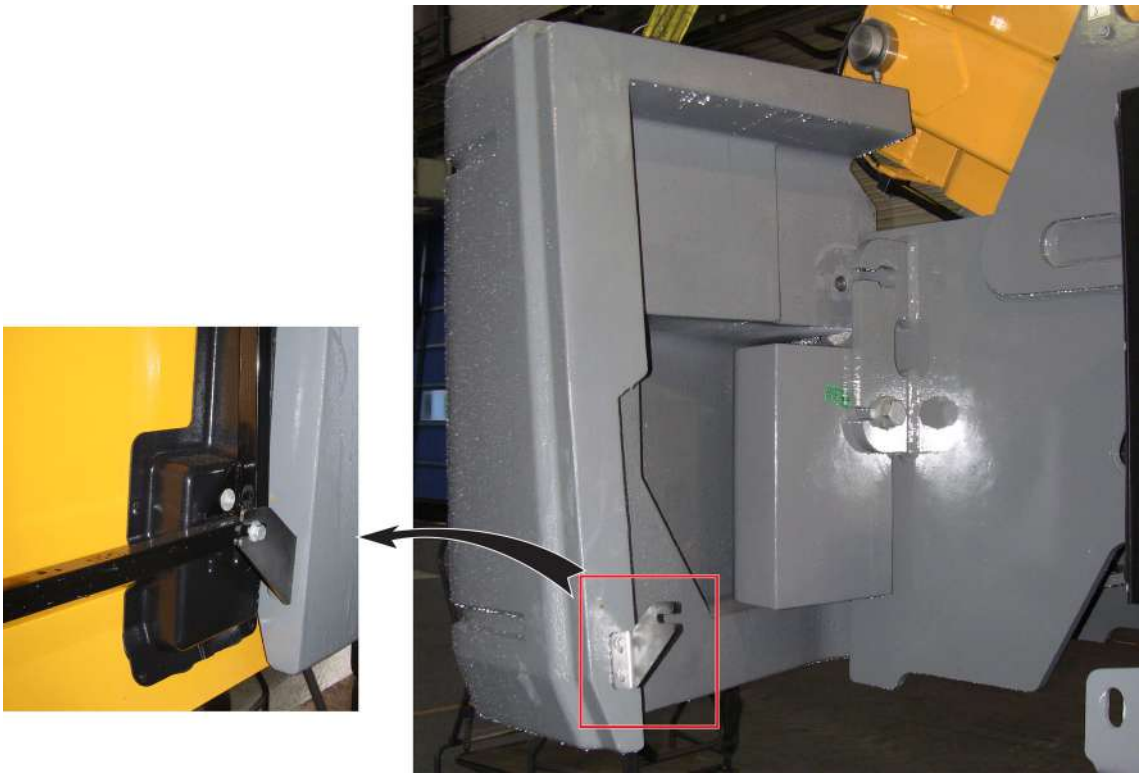
MS0132

3.3 - FIXED COVER ON THE ENGINE-SIDE

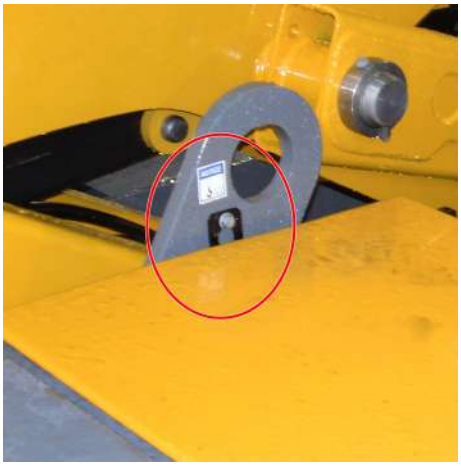
- Undo the 4 screws .



- Loosen the screw .

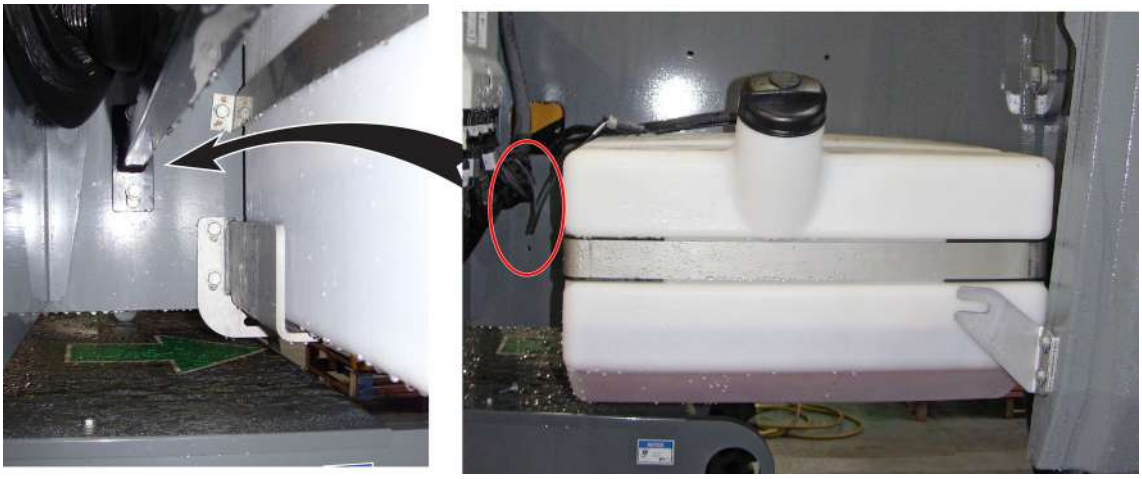


- Loosen the screw on the top of the cover.
- Remove the fixed cover from the engine-side.



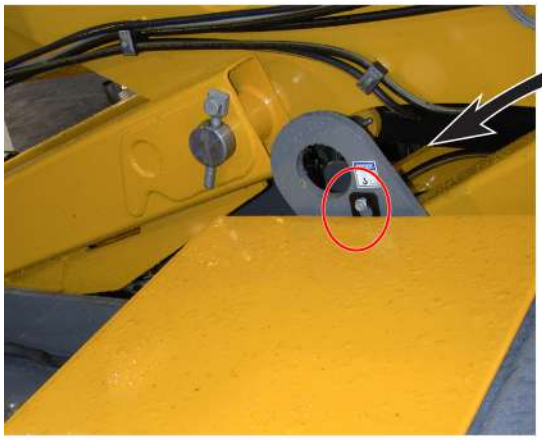
3.4 - FIXED COVER ON THE CONTROL BOX-SIDE

- Loosen the 2 screws located behind the tank.



- Loosen the screw .

- Loosen the screw on the top of the cover.



- Remove the fixed cover from the engine-side.

4 - Re-installation

- Perform the operations in the reverse order of dismantling.

5 - Additional operations

- Clean off any residual oil or grease.
- Ensure that the locks on the movable covers are locked properly.

1 - You will need

	• The tracker with its cable. • A clamp to strip the wires. • A clamp to crimp the wires.		• Place barriers around the perimeter of the work area
	1 person		

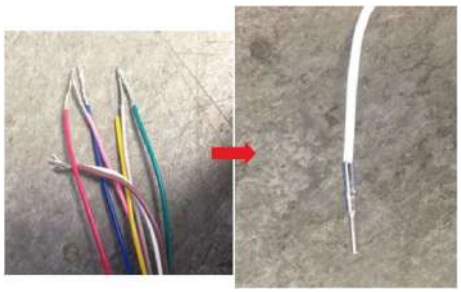
2 - Procedure

Step 1 :

- Disconnect the plug 2.
- Remove the caps on the plug.

Step 2 :

- Pick up the pins in the plastic bag.
- Strip the wires of the tracker.
- Crimp the wires with the pins with a crimping clamp.



Universal plug

MS0133

Step 3 :

- Take the wedgelock off the plug.
- Thread the wires in the positions regarding the information.

C1	Universal connector
Pin 1	+ permanent battery
Pin 2	GND (0 V)
Pin 3	+ battery voltage
Pin 4	• Machine with engine : Engine ON information. • Electrical machine : Movement and driving information.
Pin 5	Power ON information
Pin 6	
Pin 7	Movement information (Flashing light option activation)
Pin 8	Driving information
Pin 9	CAN 1 H
Pin 10	CAN 1 L
Pin 11	CAN 2 H
Pin 12	CAN 2 L

N.B.-:-Refer to the instructions provided with the tracker for the wires correspondence. Depending of the type of unit, a resistance (200 Ohms, 1 W) must be integrated between signal and ground.

Step 4 :

- Put the wedgelock back on the plug to fix the pins.

Step 5 :

- Reconnect the plugs.
- Mount the tracker.
- The tracking device is operational.

Notes

To ensure the maintenance of the engines, please go to our website https://www.e-technical-information.com to consult the supplier manuals whose references are 4000421640, 4000421610, 4000415380.

If access is denied, contact your HAULOTTE® branch..

Notes

1 - You will need

	• Standard tool kit • Protective goggles • Gloves		• Place barriers around the perimeter of the work area

Exclusively use tools and auxiliary average adapted. Always wear necessary safety clothing.
For safety reasons, imperatively respect the following stages during the tests :
• Set up a beaconing of safety around the test area.
• Put the machine in position transport (Pendular horizontal accepted).
• Use safety straps.

2 - Preliminary operation

The operations of disassembling if they exist should be carried out only on the installations completely disconnected and must be entrusted only to people having the necessary technical training.

Respect, in addition to the instructions appearing in the present instructions, the legal tendencies generally applicable for safety accident prevention.

All the precautions must be done in work before intervening on and near the machine.

After completion of work, all the covers and safety devices must be positioned back completely and operational.

3 - Test procedure

The brake system is a significant component of the safety of the machine. It is necessary to carry out functional tests periodically all the 200 hours or every 6 months.

High speed :

- On a flat ground or slightly inclined (always lower than the authorized slope: see plate manufacturer).
- Trace on the ground, a line being used as reference mark of stop.
- Roll moving front until reaching maximum speed : 5 km/h - 3.1 m/h.
- Release the manipulator as soon as the wheels axles are on the level of the traced reference mark.
- Stopped machine, measure the distance between the wheel axles and traced reference mark on the ground :
- If the distance lies between 1,3 m (4 ft 3 in) and 1,6 m (5 ft 3 in), the test is validated.
- If not, Contact HAULOTTE Services® to repair the system.

Notes

1 - You will need

	• Standard tool kit • Protective goggles • Gloves		• Place barriers around the perimeter of the work area

Exclusively use tools and auxiliary average adapted. Always wear necessary safety clothing.

2 - Technical specifications

Type	12 V DC, Group 34/78
Quantity	1
Cold cranking ampere	900 A

3 - Battery inspection

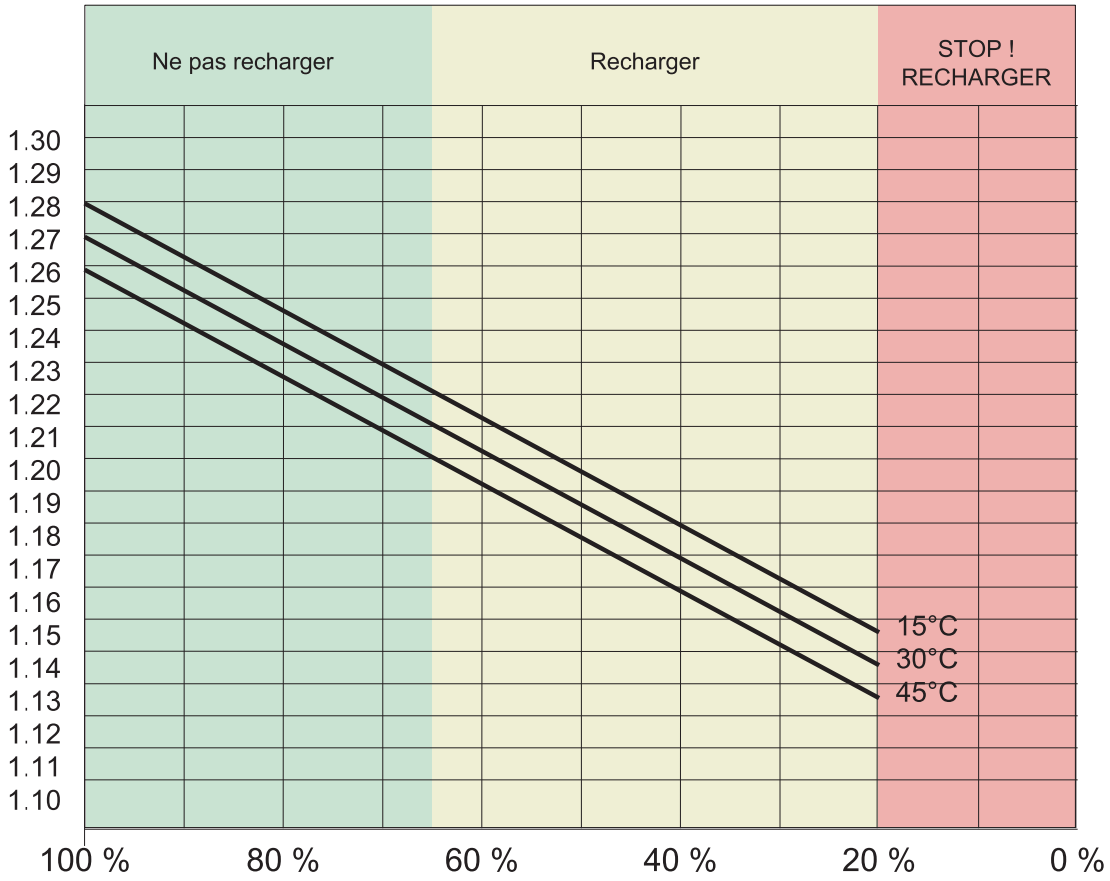
Proper battery condition is essential to good engine performance and operational safety. Improper fluid levels or damaged cables and connections can result in engine component damage and hazardous conditions. :

1. Put on protective clothing and eye wear.
2. Be sure that the battery cable connections are free of corrosion.
3. Be sure that the battery separator wire connections are tight (if equipped).
4. Fully charge the battery(s) and allow the battery(s) to rest at least 6 hours.
5. Remove the battery vent caps and check the specific gravity of each battery cell with a hydrometer. Note the results.
6. Check the ambient air temperature and adjust the specific gravity reading for each cell as follows :
   - Result : All battery cells display an adjusted specific gravity of 1.277 or higher. The battery is fully charged. Proceed to Step 9.
   - Result : One or more battery cells display a specific gravity of 1.277 or below. Proceed to Step 7.
7. Perform an equalizing charge OR fully charge the battery(s) and allow the battery(s) to rest at least 6 hours.
8. Remove the battery vent caps and check the specific gravity of each battery cell with a hydrometer. Note the results.
9. Check the battery acid level. If needed, replenish with distilled water to 1/8 inch / 3 mm below the bottom of the battery fill tube. Do not overfill.
10. Install the vent caps and neutralize any electrolyte that may have spilled.

N.B.-:-To access easily to the battery, turn the engine tray (photo *1). The battery terminals were deported in front of the engine tray (rep B+ and B-).

HT26 RT O - HT28 RTJ O - HT28 RTJ PRO - HT80 RT O - HT85 RTJ O - HT85 RTJ PRO

Battery charge status according to density and temperature



4 - Battery

- Never leave the batteries discharged.
- Do not put off recharging the batteries in cold weather as the electrolyte may freeze.
- Top up the electrolyte level, if necessary.
- Avoid overflowing.
- Wash the top of the batteries without removing the caps.
- Dry with compressed air or clean cloths.
- Oil the terminals.

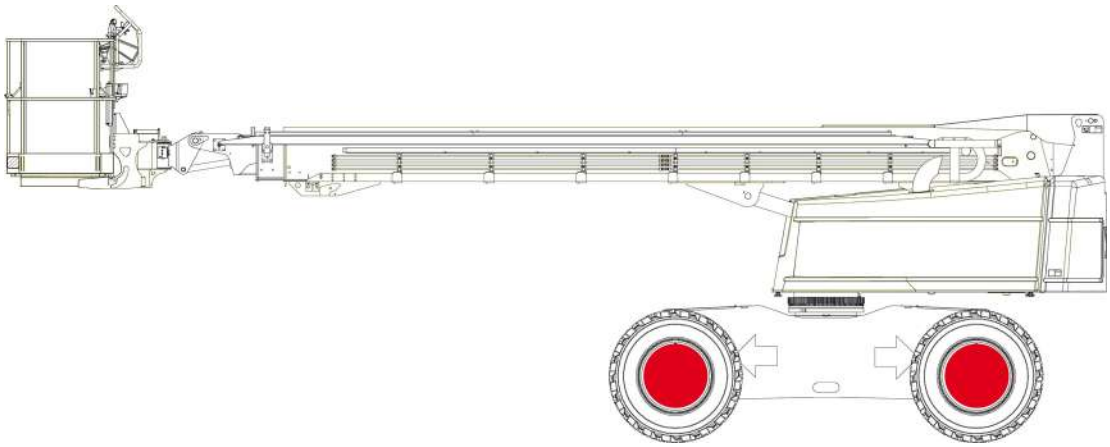
Wheel tightening procedure

MP0001

1 - Concerned machines

- HA26 RTJ O - HA26 RTJ O SW - HA26 RTJ PRO - HA26 RTJ PRO SW - HA80 RTJ O - HA80 RTJ PRO
- HT26 RT O - HT26 RT O SW - HT28 RTJ O - HT28 RTJ O SW - HT28 RTJ PRO - HT28 RTJ PRO SW - HT80 RT O - HT85 RTJ O - HT85 RTJ PRO

2 - Concerned area



3 - Warning

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4 - Risk prevention

Means of protection to be used when implementing the range

	**Appropriate workwear**		**Gloves**
	**Safety shoes**		**Safety goggles**

Wheel tightening procedure

5 - You will need

	• "DO NOT OPERATE" tag • Personal protective equipment • Standard tool kit • Torque spanner		• Place barriers around the perimeter of the work area
	1 person		

6 - Procedure

- Position the machine on a flat and firm surface, clear of obstructions (beware of power lines).
- Put the machine in stowed position, boom and arm fully retracted and lowered.
- Mark out the work area (barriers, cones, marking tape).
- Restrict access to the area (restricted access sign).

- Switch off the ignition and remove the ignition key.
- Place a do not operate tag at the start/stop switch location to inform personnel that the equipment is being worked on.

Wheel / Reduction gear :

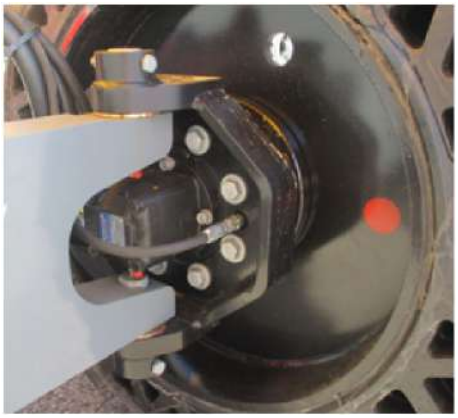
- Check the tightening torque of the 8 studs : 450 N.m (332 lbf.ft).

Chassis / Reduction gear (Non-steering wheels) :

- Check the tightening torque of the 8 studs : 260 N.m (192 lbf.ft).

wheel pivot / Reduction gear (Steer wheels) :

- Check the tightening torque of the 8 studs : 280 N.m (206 lbf.ft).



7 - Additional operations

- Clean the work area.

Notes

Wheel reducer level procedure

MP0002

1 - Concerned machines

- HA20 LE - HA20 LE PRO - HA61 LE - HA61 LE PRO
- HA20 RTJ PRO - HA61 RTJ PRO
- HA26 RTJ O - HA26 RTJ O SW - HA26 RTJ PRO - HA26 RTJ PRO SW - HA80 RTJ O - HA80 RTJ PRO
- HT26 RT O - HT26 RT O SW - HT28 RTJ O - HT28 RTJ O SW - HT28 RTJ PRO - HT28 RTJ PRO SW - HT80 RT O - HT85 RTJ O - HT85 RTJ PRO

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3 - Risk prevention

Means of protection to be used when implementing the range

	Appropriate workwear		Gloves
	Safety shoes		

4 - You will need

	• "DO NOT OPERATE" tag • Standard tool kit • Jack 20T • Chocks 4000mm • 1 syringe for oil filling • Oil collection pan		Place barriers around the perimeter of the work area
	1 person		

5 - Consumables

Gear box oil SAE 80W90

Packaging	Part number HAULOTTE®
Can 1L	4000530610
Can 20L	2420801370
Barrel 209L	2420801380

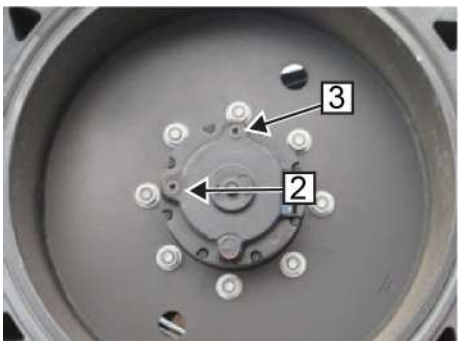
6 - Procedure

6.1 - YOU HAVE A MEANS OF LIFTING THE MACHINE

- Lift the machine with the jack to raise the wheel off the ground.
- Place wedges under the chassis and lower the jack slowly.

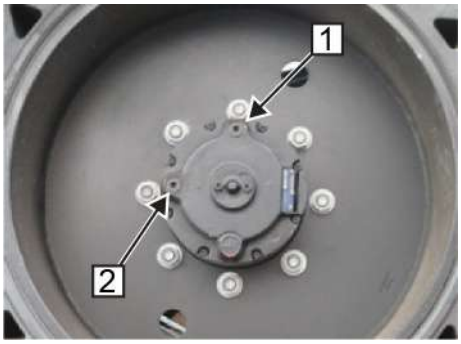
- Disconnect the gear system :
- Loosen the 2 screws from the central plate and turn it over to disengage the reduction gear.

- Manually turn the wheel to position the filler cap to the top of the vertical axis (3).
- Open the caps (2, 3) :
- If the level is correct, oil should drain from the orifice (2).
- If not, add oil via the cap (3) using the syringe until oil flows through the hole (2).
- Re-tighten the central screw, close the caps and wipe any oil that has spilled on the floor.



6.2 - YOU DO NOT HAVE THE MEANS TO LIFT THE MACHINE

- Rotate the wheel, moving it slowly to place a filler cap at the top of the vertical axis (1).
- Open the caps (1, 2) :
- It is level when the oil overflows from the hole (2).
- If not, add oil via the cap (1) using the syringe until oil flows through the hole (2).
- Close the caps and wipe up any oil that has spilled on the floor.



7 - Additional operations

- Clean any oil traces.
- Clean the work area.

Notes

Procedure for checking the level of engine oil

MP0003

1 - Concerned machines

- HT26 RT O - HT26 RT O SW - HT28 RTJ O - HT28 RTJ O SW - HT28 RTJ PRO - HT28 RTJ PRO SW - HT80 RT O - HT85 RTJ O - HT85 RTJ PRO

2 - Warning

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- **Beware of the risk of burns; the hydraulic system operates at high temperatures.**
- **The pressure in the hydraulic system is very important. It can cause accidents. Relieve the pressure before beginning any work and never search for oil leaks using your hands.**
- **The engine exhaust gases contain harmful combustion products. Always start and run the engine in a well ventilated area. In a closed room, ensure the exhaust gases are evacuated to the outside.**
- **Be sure to stop the engine before checking and changing the engine oil and the oil filter cartridge.**
- **Do not touch muffler or exhaust pipes while they are hot; Severe burns could result.**
- **Always stop the engine and allow it to cool before conducting inspections, maintenance, or for a cleaning procedure.**
- **Contact with engine oil can damage your skin.**
- **If you come in contact with engine oil, wash it off immediately.**

3 - Risk prevention

Means of protection to be used when implementing the range

	Appropriate workwear		Gloves
	Safety shoes		Safety goggles

4 - You will need

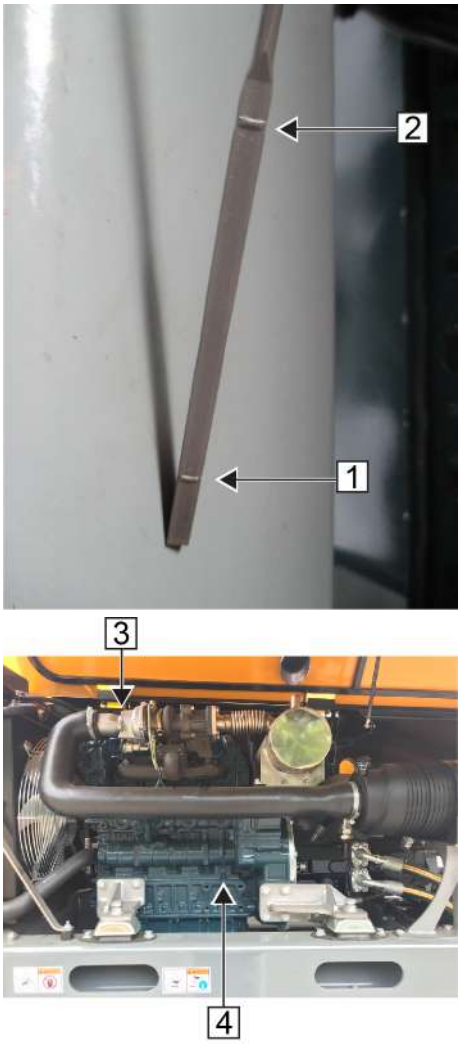
	• "DO NOT OPERATE" tag • Personal protective equipment • Rags • Standard tool kit		• Place barriers around the perimeter of the work area
	1 person		

5 - Procedure

- Position the machine on a flat and firm surface, clear of obstructions (beware of power lines).
- Put the machine in stowed position, boom and arm fully retracted and lowered.

- Switch off the ignition and remove the ignition key.
- Place a do not operate tag at the start/stop switch location to inform personnel that the equipment is being worked on.

- Check the engine oil level before starting or more than 5 minutes after stopping the engine.
- Remove the oil level gauge, wipe it clean and reinstall it 4.
- Remove the gauge again :
- If the oil level is between the marks (1) and (2), the oil level is correct.
- If the oil level is lower than the minimum mark 1 :
- Remove the oil filling cap (3) and top up with new oil until it reaches the correct level.
- After adding oil, wait more than 5 minutes and check the oil level again.
- If the level is still below the limit, repeat the operation.



6 - Additional operations

- Clean the work area.

Notes

1 - Concerned machines

- HT26 RT O - HT26 RT O SW - HT28 RTJ O - HT28 RTJ O SW - HT28 RTJ PRO - HT28 RTJ PRO SW - HT80 RT O - HT85 RTJ O - HT85 RTJ PRO

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- **The engine exhaust gases contain harmful combustion products. Always start and run the engine in a well ventilated area. In a closed room, ensure the exhaust gases are evacuated to the outside.**
- **Be sure to stop the engine before checking and changing the engine oil and the oil filter cartridge.**
- **Do not touch muffler or exhaust pipes while they are hot; Severe burns could result.**
- **Always stop the engine and allow it to cool before conducting inspections, maintenance, or for a cleaning procedure.**
- **Contact with engine oil can damage your skin.**
- **If you come in contact with engine oil, wash it off immediately.**

3 - Risk prevention

Means of protection to be used when implementing the range

	Appropriate workwear		Gloves
	Safety shoes		Safety goggles

4 - You will need

	• "DO NOT OPERATE" tag • Personal protective equipment • Standard tool kit • Oil filter wrench • Rags • Engine oil filter - 4000532930 • Container		• Place barriers around the perimeter of the work area
	1 person		

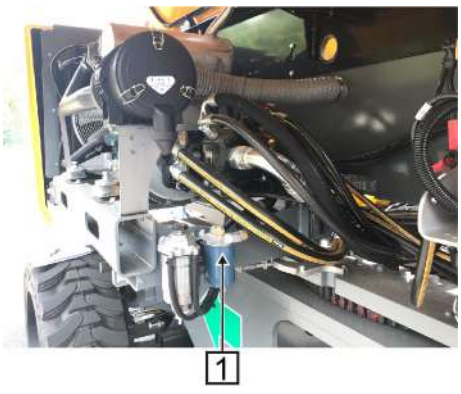
5 - Procedure

- Position the machine on a flat and firm surface, clear of obstructions (beware of power lines).
- Put the machine in stowed position, boom and arm fully retracted and lowered.

- Switch off the ignition and remove the ignition key.
- Place a do not operate tag at the start/stop switch location to inform personnel that the equipment is being worked on.

- Remove the oil filter (1) using a filter wrench.
- Apply a layer of clean oil to the seal of the new cartridge.
- Tighen the new cartridge by hand until it comes into contact, then tighten through 3/4 of a turn using the wrench.

N.B.-:-AFTER REPLACING THE CARTRIDGE, THE OIL LEVEL FALLS SLIGHTLY. REMEMBER TO CHECK THE LEVEL.



6 - Additional operations

- Clean the work area.

1 - Concerned machines

- HA20 LE - HA20 LE PRO - HA61 LE - HA61 LE PRO
- HA16 RTJ - HA16 RTJ O - HA16 RTJ PRO - HA46 RTJ O - HA46 RTJ PRO
- HA20 RTJ - HA20 RTJ O - HA20 RTJ PRO - HA61 RTJ O - HA61 RTJ PRO
- HA26 RTJ O - HA26 RTJ O SW - HA26 RTJ PRO - HA26 RTJ PRO SW - HA80 RTJ O - HA80 RTJ PRO
- HT21 RT O - HT21 RT O SW - HT61 RT O - HT21 RT PRO - HT21 RT PRO SW - HT61 RT PRO - HT23 RTJ O - HT23 RTJ O SW - HT67 RTJ O HT23 RTJ PRO - HT23 RTJ PRO SW - HT67 RTJ PRO
- HT26 RT O - HT26 RT O SW - HT28 RTJ O - HT28 RTJ O SW - HT28 RTJ PRO - HT28 RTJ PRO SW - HT80 RT O - HT85 RTJ O - HT85 RTJ PRO

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- **The engine exhaust gases contain harmful combustion products. Always start and run the engine in a well ventilated area. In a closed room, ensure the exhaust gases are evacuated to the outside.**

3 - Risk prevention

Means of protection to be used when implementing the range

	Appropriate workwear		Gloves
	Safety shoes		

4 - You will need

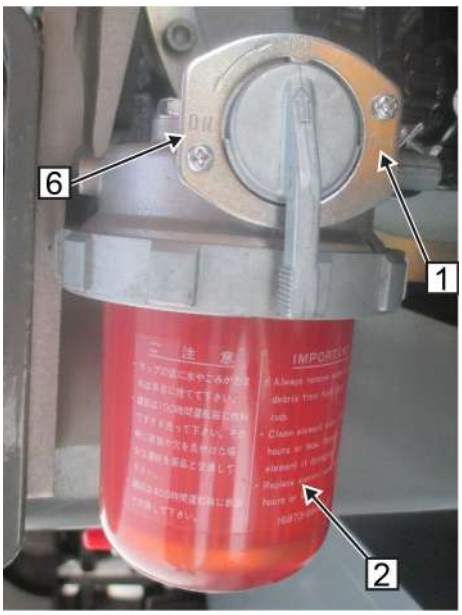
	• Diesel filter cartridge - 4000079430 • Seals - 4000210630 - 4000079450 • "DO NOT OPERATE" tag • Standard tool kit • Filter wrench • Container • Oil collection pan		Place barriers around the perimeter of the work area
	1 person		

5 - Procedure

- Position the machine on a flat and firm surface, clear of obstructions (beware of power lines).
- Put the machine in stowed position, boom and arm fully retracted and lowered.
- Switch off the ignition and remove the ignition key.
- Place a do not operate tag at the start/stop switch location to inform personnel that the equipment is being worked on.

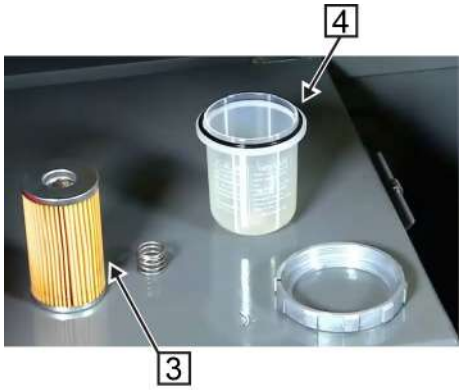
Dis-assembly :

- Set the handle of the separator to "OFF" (1).
- Loosen and remove the container (2) using a filter wrench.
- Remove the cartridge from the diesel filter (3).



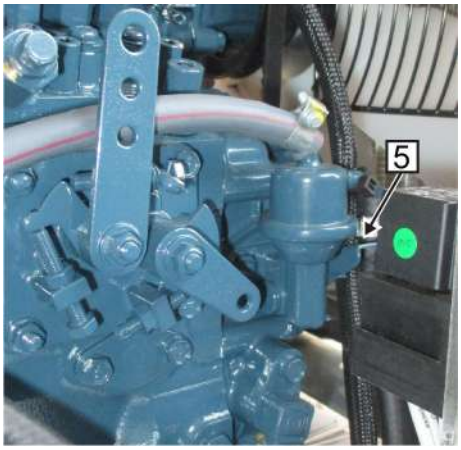
Assembly :

- Clean the inside of the diesel filter jar (2).
- Replace the seal of the container (4) and reassemble in the reverse order to disassembly.
- Apply a thin layer of fuel to the surface of the seal of the container (4).
- Tighten the container by hand then lock with the filter wrench.
- Open the fuel valve (1), setting it to "ON", and reboot the system using the button behind the engine (5).
- Release the air by loosening the screw, then re-tightening it (6).



Disconnecting the engine start sensor to reboot the pump is recommended.

- Switch on the engine for a few moments and check that there are no fuel leaks in the filter.



6 - Additional operations

- Clean the work area.

Notes

1 - Concerned machines

- HT26 RT O - HT26 RT O SW - HT28 RTJ O - HT28 RTJ O SW - HT28 RTJ PRO - HT28 RTJ PRO SW - HT80 RT O - HT85 RTJ O - HT85 RTJ PRO

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3 - Risk prevention

Means of protection to be used when implementing the range

	Appropriate workwear		Gloves
	Safety shoes		Safety goggles

4 - You will need

	• Filter replacement every year or every 1000 h • Hydraulic filter cartridge (Red) - 2427002910 • Hydraulic filter cartridge (Black) - 2427003110 • "DO NOT OPERATE" tag • Personal protective equipment • Standard tool kit • Vacuum pump • Rags • Container • Collection tray 1L		• Place barriers around the perimeter of the work area
	1 person		

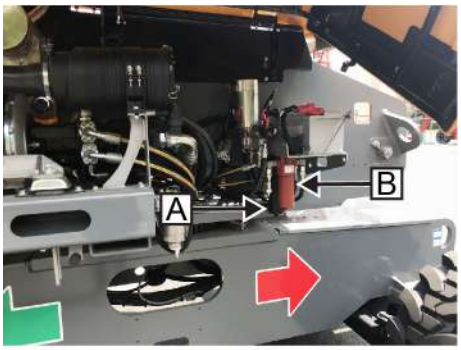
5 - Procedure

- Position the machine on a flat and firm surface, clear of obstructions (beware of power lines).
- Put the machine in stowed position, boom and arm fully retracted and lowered.

- Switch off the ignition and remove the ignition key.
- Place a do not operate tag at the start/stop switch location to inform personnel that the equipment is being worked on.

- There are two hydraulic filters (A and B).
- Place a container under the filter.
- Unlock the filter container using a wrench then unscrew by hand (1).
- Change the cartridge inside the container.
- Re-tighten the container by hand then tighten using a wrench to finish.
- Wipe away any run-off and check that the system has no leaks.

Perform the operation when it is at room temperature.



6 - Additional operations

- Clean the work area.

Notes

Procedure for checking engine belt tension

MP0007

1 - Concerned machines

- HT26 RT O - HT26 RT O SW - HT28 RTJ O - HT28 RTJ O SW - HT28 RTJ PRO - HT28 RTJ PRO SW - HT80 RT O - HT85 RTJ O - HT85 RTJ PRO

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- **Beware of the risk of burns; the hydraulic system operates at high temperatures.**

3 - Risk prevention

Means of protection to be used when implementing the range

	Appropriate workwear		Gloves
	Safety shoes		

4 - You will need

	• "DO NOT OPERATE" tag • Tools for checking belt tension • Personal protective equipment • Standard tool kit • Lever		• Place barriers around the perimeter of the work area
	1 person		

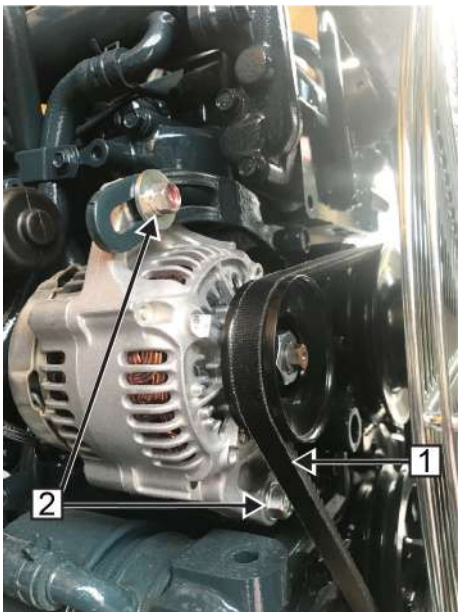
5 - Procedure

- Position the machine on a flat and firm surface, clear of obstructions (beware of power lines).
- Put the machine in stowed position, boom and arm fully retracted and lowered.

Do not start the engine and disconnect the battery.

- Swivel the engine casing to access the belt.

- Press halfway between the fan drive pulley and the alternator pulley with a force of 98N (10kg) to measure the deflection(1).
- The value measured must be between 10mm and 12mm.
- If the value is within this range, the tension is correct.
- If the value is not within this range :
- Loosen the fastening screw of the alternator (2).
- Adjust its position.



6 - Additional operations

- Clean the work area.

1 - Concerned machines

- HT26 RT O - HT26 RT O SW - HT28 RTJ O - HT28 RTJ O SW - HT28 RTJ PRO - HT28 RTJ PRO SW - HT80 RT O - HT85 RTJ O - HT85 RTJ PRO

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- **The pressure in the hydraulic system is very important. It can cause accidents. Relieve the pressure before beginning any work and never search for oil leaks using your hands.**

3 - Risk prevention

Means of protection to be used when implementing the range

	Appropriate workwear		Gloves
	Safety shoes		

4 - You will need

	• "DO NOT OPERATE" tag • Personal protective equipment • Primary cartridge – 2820302900 • Secondary cartridge – 2820302910		• Place barriers around the perimeter of the work area
	1 person		

5 - Procedure

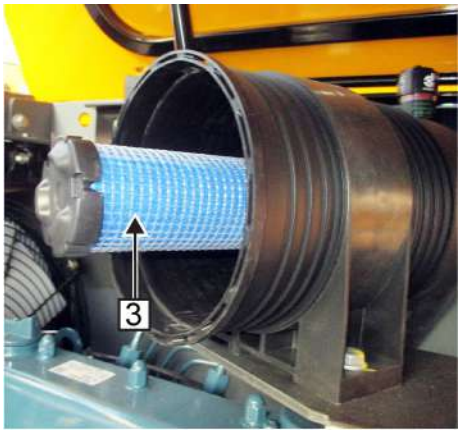
- Position the machine on a flat and firm surface, clear of obstructions (beware of power lines).
- Put the machine in stowed position, boom and arm fully retracted and lowered.
- Switch off the ignition and remove the ignition key.
- Place a do not operate tag at the start/stop switch location to inform personnel that the equipment is being worked on.

- Pull the pins (1) to remove the cover.

- Remove the main element (2) and secondary element (3).

- Replace with new cartridges.
- Close the cover using the pins (1).

Do not use oil.



Notes

1 - Concerned machines

- HT26 RT O - HT26 RT O SW - HT28 RTJ O - HT28 RTJ O SW - HT28 RTJ PRO - HT28 RTJ PRO SW - HT80 RT O - HT85 RTJ O - HT85 RTJ PRO

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3 - Risk prevention

Means of protection to be used when implementing the range

	Appropriate workwear		Gloves
	Safety shoes		

4 - You will need

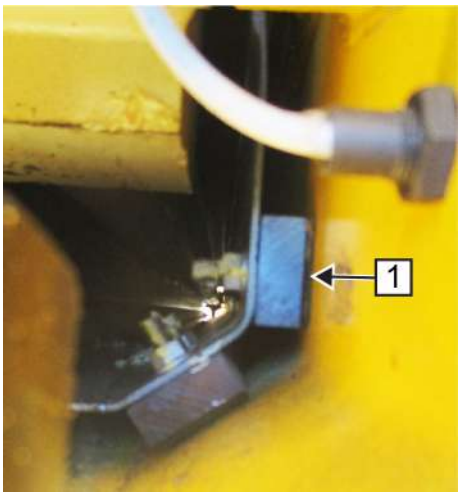
	• "DO NOT OPERATE" tag • Personal protective equipment • Grease • Wear pads kit KITPATINHT28RTJ		• Place barriers around the perimeter of the work area
	1 person		

5 - Procedure

- Position the machine on a flat and firm surface, clear of obstructions (beware of power lines).

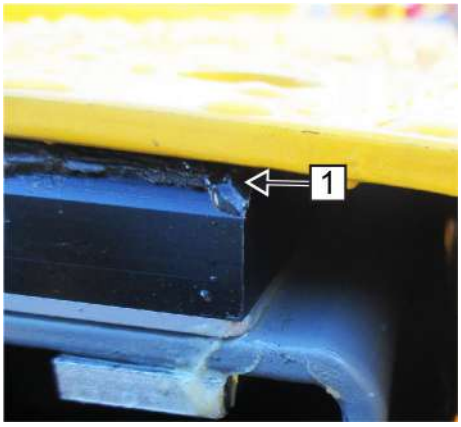
Front pads :

- Carefully fully extend the 2 tubes.
- Check the wear on the 16 wear pads.
- If the chamfers (1) are visible on the pads, the pad is compliant.
- If the chamfers are not visible on the pads, replace the pads.



Rear pads :

- Retract the 2 tubes.
- Check the wear on the 16 wear pads.
- If the chamfers (1) are visible on the pads, the pad is compliant.
- If the chamfers are not visible on the pads, replace the pads.
- Refit the panel : Screws 15 Nm. Nut 45 Nm.



1 - Concerned machines

- HA20 LE - HA20 LE PRO - HA61 LE - HA61 LE PRO
- HA16 RTJ - HA16 RTJ O - HA16 RTJ PRO - HA46 RTJ O - HA46 RTJ PRO
- HA20 RTJ - HA20 RTJ O - HA20 RTJ PRO - HA61 RTJ O - HA61 RTJ PRO
- HA26 RTJ O - HA26 RTJ O SW - HA26 RTJ PRO - HA26 RTJ PRO SW - HA80 RTJ O - HA80 RTJ PRO
- HA32 RTJ PRO - HA100 RTJ PRO - HA41 RTJ PRO - HA130 RTJ PRO
- HT21 RT O - HT21 RT O SW - HT61 RT O - HT21 RT PRO - HT21 RT PRO SW - HT61 RT PRO - HT23 RTJ O - HT23 RTJ O SW - HT67 RTJ O HT23 RTJ PRO - HT23 RTJ PRO SW - HT67 RTJ PRO
- HT26 RT O - HT26 RT O SW - HT28 RTJ O - HT28 RTJ O SW - HT28 RTJ PRO - HT28 RTJ PRO SW - HT80 RT O - HT85 RTJ O - HT85 RTJ PRO
- HT43 RTJ PRO - HT132 RTJ PRO

2 - Warning

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- **Only risks linked specifically to activities relating to the disassembly and assembly of the machine HAULOTTE® are described in this sheet.**

- **Beware of the risk of burns; the hydraulic system operates at high temperatures.**
- **The pressure in the hydraulic system is very important. It can cause accidents. Relieve the pressure before beginning any work and never search for oil leaks using your hands.**

3 - Risk prevention

Means of protection to be used when implementing the range

	Appropriate workwear		Gloves
	Safety shoes		

4 - You will need

	• "DO NOT OPERATE" tag • Personal protective equipment • Standard tool kit • - 2505003830 Hydraulic oil • Rags		• Place barriers around the perimeter of the work area
	1 person		

5 - Consumable

Reference	Part number HAULOTTE®
Can - 5L, Standard oil HV46	4000530620
20L bucket, Standard oil HV46	2420801320
Barrel 209L, Standard oil HV46	2420801310
Barrel 209L, Oil - Winter option	2505002640
Barrel 209L, Organic oil	2820304310

6 - Procedure

- Position the machine on a flat and firm surface, clear of obstructions (beware of power lines).
- Put the machine in stowed position, boom and arm fully retracted and lowered. Jib is in transportation position and telescope is retracted.

- Check the filling level of the hydraulic tank.
- The oil level should be between the minimum and maximum levels.

- Open the hydraulic tank cap to refill the oil level.

N.B.-:-DO NOT FILL TO THE MAXIMUM LEVEL , AS THE OIL COULD LEAK OUT.

7 - Additional operations

- Clean the work area.

Notes

1 - Concerned machines

- HT26 RT O - HT26 RT O SW - HT28 RTJ O - HT28 RTJ O SW - HT28 RTJ PRO - HT28 RTJ PRO SW - HT80 RT O - HT85 RTJ O - HT85 RTJ PRO

2 - Warning

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- **Only risks linked specifically to activities relating to the disassembly and assembly of the machine HAULOTTE® are described in this sheet.**

- **Beware of the risk of burns; the hydraulic system operates at high temperatures.**

3 - Risk prevention

Means of protection to be used when implementing the range

	Appropriate workwear		Gloves
	Safety shoes		

4 - You will need

	• "DO NOT OPERATE" tag • Personal protective equipment • Standard tool kit • Vacuum pump • Funnel with a pipe of around 1 m / 3 ft 28 in • 150 L / 39 gals canister for hydraulic oil collection • Oil collection pan • Rags • Hand pump • 150 L / 39 gals tank		• Place barriers around the perimeter of the work area
	1 person		

5 - Consumable

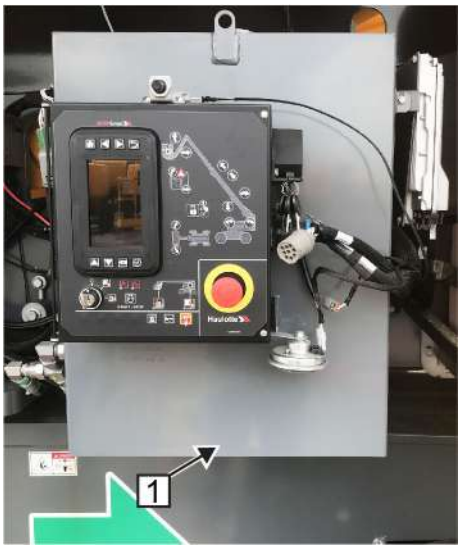
Hydraulic oil

Reference	Part number HAULOTTE®
Can - 5L, Standard oil HV46	4000530620
20L bucket, Standard oil HV46	2420801320
Barrel 209L, Standard oil HV46	2420801310
Barrel 209L, Oil - Winter option	2505002640
Barrel 209L, Organic oil	2820304310

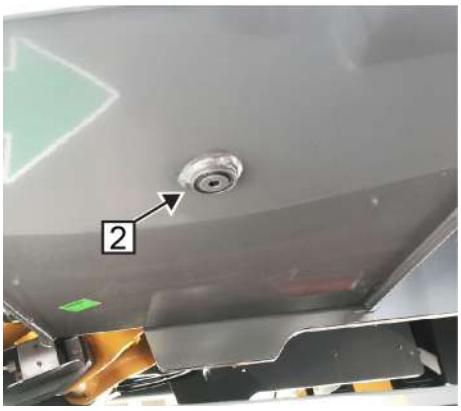
6 - Procedure

- Position the machine on a flat and firm surface, clear of obstructions (beware of power lines).
- Put the machine in stowed position, boom and arm fully retracted and lowered. Jib is in transportation position and telescope is retracted.
- Switch off the ignition and remove the ignition key.
- Place a do not operate tag at the start/stop switch location to inform personnel that the equipment is being worked on.

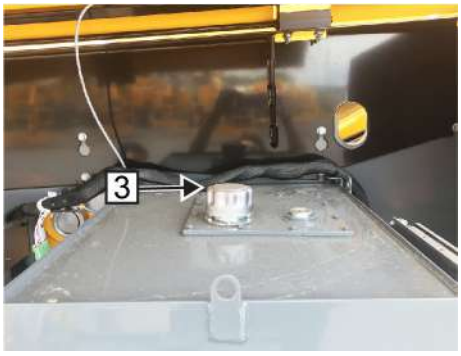
- Place a recipient under the hydraulic oil tank (1).



- Remove the drain plug (2) under the tank and allow the oil to fully drain out.



N.B.-:-REMOVE THE FILLING CAP TO FACILITATE DRAINING (3).



- Refit and tighten the drain out (2).

- Fill the tank with new oil.

  N.B.-:-DO NOT FILL TO THE MAXIMUM LEVEL , AS THE OIL COULD LEAK OUT.

- Run several cycles with the machine and ensure that the oil is between the minimum and maximum level.

7 - Additional operations

- Clean the work area.

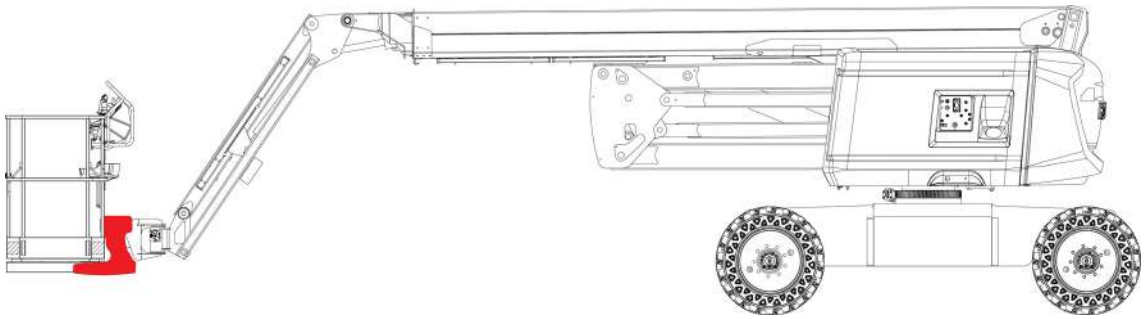
Load cell tightness check

MP0015

1 - Concerned machines

- HA20 LE - HA20 LE PRO - HA61 LE - HA61 LE PRO
- HA16 RTJ - HA16 RTJ O - HA16 RTJ PRO - HA46 RTJ O - HA46 RTJ PRO
- HA20 RTJ - HA20 RTJ O - HA20 RTJ PRO - HA61 RTJ O - HA61 RTJ PRO
- HA26 RTJ O - HA26 RTJ O SW - HA26 RTJ PRO - HA26 RTJ PRO SW - HA80 RTJ O - HA80 RTJ PRO
- HA32 RTJ PRO - HA100 RTJ PRO - HA41 RTJ PRO - HA130 RTJ PRO
- HT21 RT O - HT21 RT O SW - HT61 RT O - HT21 RT PRO - HT21 RT PRO SW - HT61 RT PRO - HT23 RTJ O - HT23 RTJ O SW - HT67 RTJ O HT23 RTJ PRO - HT23 RTJ PRO SW - HT67 RTJ PRO
- HT26 RT O - HT26 RT O SW - HT28 RTJ O - HT28 RTJ O SW - HT28 RTJ PRO - HT28 RTJ PRO SW - HT80 RT O - HT85 RTJ O - HT85 RTJ PRO
- HT43 RTJ PRO - HT132 RTJ PRO

2 - Concerned area



3 - Warning

- **Only an authorised and qualified technician is permitted to work on the machines HAULOTTE®.**
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Load cell tightness check

MP0015

4 - Risk prevention

Means of protection to be used when implementing the range

	Appropriate workwear		Gloves
	Safety shoes		

5 - You will need

	• "DO NOT OPERATE" tag • Standard tool kit • Torque spanner • Torque multiplier		• Place barriers around the perimeter of the work area
	1 person		

6 - Procedure

- Position the machine on a flat and firm surface, clear of obstructions (beware of power lines).
- Put the machine in stowed position, boom and arm fully retracted and lowered.
- Switch off the ignition and remove the ignition key.
- Place a do not operate tag at the start/stop switch location to inform personnel that the equipment is being worked on.

Check the tightness of the jib-side load cell :

- Single load machine : Torque wrench for 215 Nm. Short 24 mm socket.
- Dual load machine : Torque wrench for 370 Nm. Short 30 mm socket.

N.B.-:-CHECK THE SCREWS IN LINE A TIGHTENING CROSSWISE ORDER.

Check the tightness of the platform-side load cell :

- Single load machine : Torque wrench for 215 Nm. 24 mm pin with extension.
- Dual load machine : Torque wrench for 370 Nm. 30 mm pin with extension.

N.B.-:-CHECK THE SCREWS IN LINE A TIGHTENING CROSSWISE ORDER.

Rotary cylinder tightness check

MP0016

1 - Concerned machines

- HA20 LE - HA20 LE PRO - HA61 LE - HA61 LE PRO
- HA16 RTJ - HA16 RTJ O - HA16 RTJ PRO - HA46 RTJ O - HA46 RTJ PRO
- HA20 RTJ - HA20 RTJ O - HA20 RTJ PRO - HA61 RTJ O - HA61 RTJ PRO
- HA26 RTJ O - HA26 RTJ O SW - HA26 RTJ PRO - HA26 RTJ PRO SW - HA80 RTJ O - HA80 RTJ PRO
- HA32 RTJ PRO - HA100 RTJ PRO - HA41 RTJ PRO - HA130 RTJ PRO
- HT21 RT O - HT21 RT O SW - HT61 RT O - HT21 RT PRO - HT21 RT PRO SW - HT61 RT PRO - HT23 RTJ O - HT23 RTJ O SW - HT67 RTJ O HT23 RTJ PRO - HT23 RTJ PRO SW - HT67 RTJ PRO
- HT26 RT O - HT26 RT O SW - HT28 RTJ O - HT28 RTJ O SW - HT28 RTJ PRO - HT28 RTJ PRO SW - HT80 RT O - HT85 RTJ O - HT85 RTJ PRO
- HT43 RTJ PRO - HT132 RTJ PRO

2 - Warning

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3 - Risk prevention

Means of protection to be used when implementing the range

	Appropriate workwear		Gloves
	Safety shoes		

4 - You will need

	• "DO NOT OPERATE" tag • Standard tool kit • Torque spanner • Torque multiplier		• Place barriers around the perimeter of the work area
	1 person		

5 - Procedure

- Position the machine on a flat and firm surface, clear of obstructions (beware of power lines).
- Put the machine in stowed position, boom and arm fully retracted and lowered.

- Switch off the ignition and remove the ignition key.
- Place a do not operate tag at the start/stop switch location to inform personnel that the equipment is being worked on.

- Check the torque of the rotatory cylinder central nut is at 800 Nm (590lbf.ft)

N.B.-:-USE A SPANNER AND A TORQUE SPANNER FOR TIGHTENING.

- Visually inspect the 8 screws on the rotary cylinder

N.B.-:-DO NOT TIGHTEN USING A TORQUE WRENCH AS THE SCREWS ARE TIGHTENED WITH THREADLOCKER.

1 - Concerned machines

- HA20 LE - HA20 LE PRO - HA61 LE - HA61 LE PRO
- HA16 RTJ - HA16 RTJ O - HA16 RTJ PRO - HA46 RTJ O - HA46 RTJ PRO
- HA20 RTJ - HA20 RTJ O - HA20 RTJ PRO - HA61 RTJ O - HA61 RTJ PRO
- HA26 RTJ O - HA26 RTJ O SW - HA26 RTJ PRO - HA26 RTJ PRO SW - HA80 RTJ O - HA80 RTJ PRO
- HA32 RTJ PRO - HA100 RTJ PRO - HA41 RTJ PRO - HA130 RTJ PRO
- HT21 RT O - HT21 RT O SW - HT61 RT O - HT21 RT PRO - HT21 RT PRO SW - HT61 RT PRO - HT23 RTJ O - HT23 RTJ O SW - HT67 RTJ O HT23 RTJ PRO - HT23 RTJ PRO SW - HT67 RTJ PRO
- HT26 RT O - HT26 RT O SW - HT28 RTJ O - HT28 RTJ O SW - HT28 RTJ PRO - HT28 RTJ PRO SW - HT80 RT O - HT85 RTJ O - HT85 RTJ PRO
- HT43 RTJ PRO - HT132 RTJ PRO

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3 - Risk prevention

Means of protection to be used when implementing the range

	Appropriate workwear		Gloves
	Safety shoes		

Checking the platform

MP0017

4 - You will need

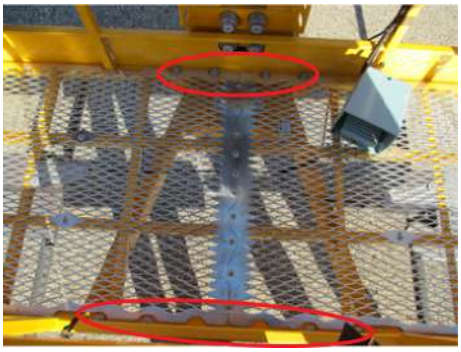
	• "DO NOT OPERATE" tag • Personal protective equipment • Standard tool kit		• Place barriers around the perimeter of the work area
	1 person		

5 - Procedure

- Position the machine on a flat and firm surface, clear of obstructions (beware of power lines).
- Put the machine in stowed position, boom and arm fully retracted and lowered.
- Switch off the ignition and remove the ignition key.
- Place a do not operate tag at the start/stop switch location to inform personnel that the equipment is being worked on.

- Check the platform floor is mounted.

- Check the tightening torque of the 8 screws between the platform and the platform mount 44 Nm.



Checking the platform

- Check the platform access rail or gate.

Notes

Slew ring clearance check

MP0018

1 - Concerned machines

- HT21 RT O - HT21 RT O SW - HT61 RT O - HT21 RT PRO - HT21 RT PRO SW - HT61 RT PRO - HT23 RTJ O - HT23 RTJ O SW - HT67 RTJ O HT23 RTJ PRO - HT23 RTJ PRO SW - HT67 RTJ PRO
- HT26 RT O - HT26 RT O SW - HT28 RTJ O - HT28 RTJ O SW - HT28 RTJ PRO - HT28 RTJ PRO SW - HT80 RT O - HT85 RTJ O - HT85 RTJ PRO
- HT43 RTJ PRO - HT132 RTJ PRO

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3 - Risk prevention

Means of protection to be used when implementing the range

	Appropriate workwear		Gloves
	Safety shoes		

4 - You will need

	• "DO NOT OPERATE" tag • Personal protective equipment • Standard tool kit • Magnetic piston comparator		• Place barriers around the perimeter of the work area
	1 person		

5 - Procedure

- Position the machine on a flat and firm surface, clear of obstructions (beware of power lines).

Put the machine into the following configuration :

- No load in the platform
- From the ground control box, align the turret at 90° to the chassis
- Boom at 30°.
- Telescope retracted.
- Horizontal platform and jib.

- Fix the magnetic comparator between the chassis and turntable (at 100mm from the bearing).

From the magnetic comparator, note the clearance (J1) between chassis (or turret) and the slew ring.

Put the machine into the following configuration :

- On flat ground.
- No load in the platform.
- Horizontal boom and jib platform set.
- Fully extend the telescopic cylinder.
- Note the clearance indicated by the magnetic comparator.

Clearance must be less than 2 mm.

- If the clearance is greater than this, check that the tightness of the slew ring. Refer to MP0019 - Serrage au couple de la couronne d'orientation.
- After the check of tightness, si the value remains lower than 2 mm, replace the slew ring.

Torque tightening of the slew ring

MP0019

1 - Concerned machines

- HT26 RT O - HT26 RT O SW - HT28 RTJ O - HT28 RTJ O SW - HT28 RTJ PRO - HT28 RTJ PRO SW - HT80 RT O - HT85 RTJ O - HT85 RTJ PRO

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3 - Risk prevention

Means of protection to be used when implementing the range

	Appropriate workwear		Gloves
	Safety shoes		

4 - You will need

	• Voltage absence tester • "DO NOT OPERATE" tag • Handling equipment • Standard tool kit • Hose clamps • Torque spanner		• Place barriers around the perimeter of the work area
	1 person		

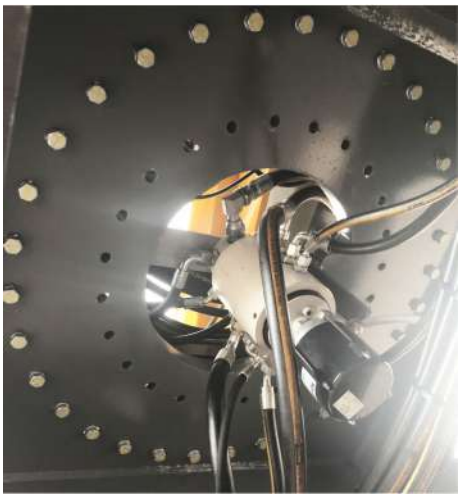
5 - Procedure

- Position the machine on a flat and firm surface, clear of obstructions (beware of power lines). Mark out the work area
- Switch off the ignition and remove the ignition key.
- Place a do not operate tag at the start/stop switch location to inform personnel that the equipment is being worked on.

Tightening the chassis / Slew ring :

- Check the tightening torque on the 32 screws: 215 N.m (159 ft.lbf).

  These screws can be accessed by opening the side of the chassis.



Tightening the turntable / Slew ring :

- Check the tightening torque on the 18 screws: 215 N.m (159 ft.lbf).

  Lift the boom to access the screws.

  For the non-accessible screws under the hoses, check the tightness visually or using a flat spanner if possible.

1 - Concerned machines

- HT26 RT O - HT26 RT O SW - HT28 RTJ O - HT28 RTJ O SW - HT28 RTJ PRO - HT28 RTJ PRO SW - HT80 RT O - HT85 RTJ O - HT85 RTJ PRO

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3 - Risk prevention

Means of protection to be used when implementing the range

	Appropriate workwear		Gloves
	Safety shoes		Safety goggles

4 - You will need

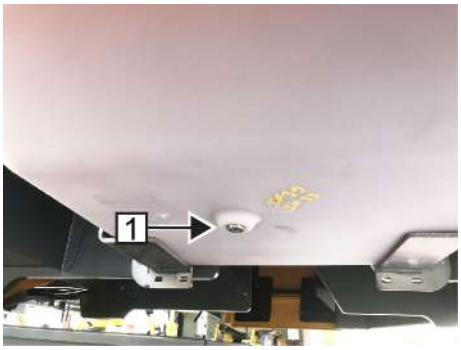
	• "DO NOT OPERATE" tag • Personal protective equipment • Standard tool kit • Provide a container sufficient for the contents of the tank • Rags		• Place barriers around the perimeter of the work area
	1 person		

5 - Procedure

- Position the machine on a flat and firm surface, clear of obstructions (beware of power lines).
- Put the machine in stowed position, boom and arm fully retracted and lowered.
- Mark out the work area (barriers, cones, marking tape).
- Restrict access to the area (restricted access sign).
- Switch off the ignition and remove the ignition key.
- Place a do not operate tag at the start/stop switch location to inform personnel that the equipment is being worked on.

- Place a container under the diesel fuel tank.

- Unscrew the drain plug from the diesel fuel tank (1).
- Allow the fuel to completely drain.
- Then rinse with clean diesel.



- Once drained, screw the drain plug back on (At 15 N.m).
- Fill the tank back up with fuel.

6 - Additional operations

- Clean the work area.

Draining the cooling circuit

MP0021

1 - Concerned machines

- HA20 LE - HA20 LE PRO - HA61 LE - HA61 LE PRO
- HA16 RTJ - HA16 RTJ O - HA16 RTJ PRO - HA46 RTJ O - HA46 RTJ PRO
- HA20 RTJ - HA20 RTJ O - HA20 RTJ PRO - HA61 RTJ O - HA61 RTJ PRO
- HA26 RTJ O - HA26 RTJ O SW - HA26 RTJ PRO - HA26 RTJ PRO SW - HA80 RTJ O - HA80 RTJ PRO
- HT21 RT O - HT21 RT O SW - HT61 RT O - HT21 RT PRO - HT21 RT PRO SW - HT61 RT PRO - HT23 RTJ O - HT23 RTJ O SW - HT67 RTJ O HT23 RTJ PRO - HT23 RTJ PRO SW - HT67 RTJ PRO
- HT26 RT O - HT26 RT O SW - HT28 RTJ O - HT28 RTJ O SW - HT28 RTJ PRO - HT28 RTJ PRO SW - HT80 RT O - HT85 RTJ O - HT85 RTJ PRO

2 - Warning

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- **Only risks linked specifically to activities relating to the disassembly and assembly of the machine HAULOTTE® are described in this sheet.**

- **Beware of the risk of burns; the hydraulic system operates at high temperatures.**
- **The pressure in the hydraulic system is very important. It can cause accidents. Relieve the pressure before beginning any work and never search for oil leaks using your hands.**
- **The engine exhaust gases contain harmful combustion products. Always start and run the engine in a well ventilated area. In a closed room, ensure the exhaust gases are evacuated to the outside.**
- **Do not wear any metal jewellery (rings, watches, chains, etc.) when working on the batteries.**
- **ONLY use insulated tools when working on or near batteries or electrical connections.**
- **Do not produce sparks or flames or smoke near the battery.**
- **Do not stop the engine suddenly, stop it after about 5 minutes of unloaded idling.**
- **Work only after letting the engine and radiator cool off completely (more than 30 minutes after it has been stopped).**
- **Do not remove the radiator cap while coolant is hot. Slightly loosen the cap when stationary, before completely removing it**
- **If overheating occurs, steam may spout from the radiator or emergency tank. This could result in severe burns.**

3 - Risk prevention

Means of protection to be used when implementing the range

	Appropriate workwear		Gloves
	Safety shoes		

4 - You will need

	• "DO NOT OPERATE" tag • Personal protective equipment • Standard tool kit • 1 tube of around 1 m / 3 ft 28 in • Collection tray 10L • Coolant - Can 25L - 4000564860		• Place barriers around the perimeter of the work area
	1 person		

N.B.-:-THE WAY COOLING WATER AND ANTIFREEZE ARE MIXED VARIES DEPENDING ON THE PRODUCT MANUFACTURER. IT MUST FUNDAMENTALLY BE IN LINE WITH STANDARD SAE J1034. FOR MORE DETAILS, SEE SAE J814C.

Anti-freeze :

- Antifreeze volume in % : 50
- Solidification point : -37
- Boiling point : 108° C

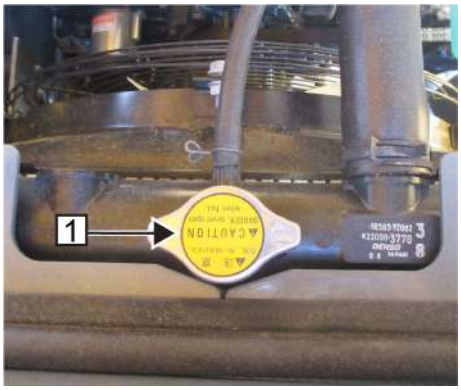
5 - Procedure

- Position the machine on a flat and firm surface, clear of obstructions (beware of power lines).
- Put the machine in stowed position, boom and arm fully retracted and lowered.
- Restrict access to the area (restricted access sign).

- Stop the engine and leave the coolant to reach room temperature.
- Pivot the engine compartment.

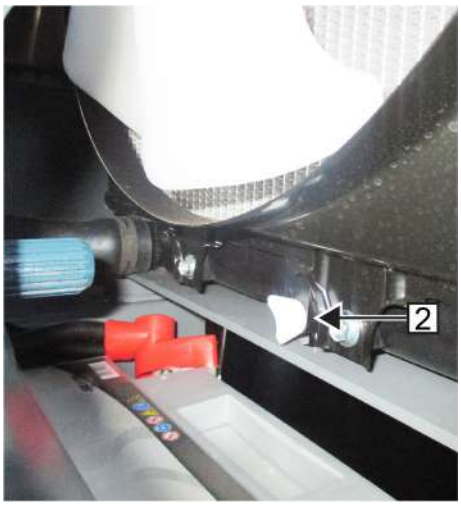
- Remove the plug from the radiator (1) in order to fully drain the coolant liquid.

N.B.-:-GENTLY UNSCREW THE RADIATOR PLUG TO RELEASE THE PRESSURE.



- Position the collection tray. Open the drain valve (2).

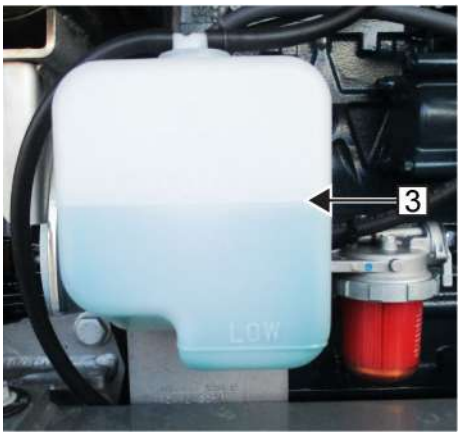
N.B.-:-IT IS ADVISABLE TO PLACE A PIPE BETWEEN THE DRAIN VALVE AND THE COLLECTION TRAY.



- Remove the expansion bottle and empty it.
- Once all of the coolant liquid is drained, close the drain valve again.

- Fill with liquid through the radiator cap (1) and into the expansion tank up to the maximum mark (3).
- Start the engine and leave it to turn over for a few minutes.
- Stop the engine and leave the coolant to reach room temperature.
- Check the coolant liquid level in the radiator and expansion tank (3).

N.B.-:-WHEN MIXING ANTI-FREEZE AND WATER, ENSURE THAT THE PROPORTION OF ANTI-FREEZE IS 50%.



6 - Additional operations

- Clean the work area.

1 - Concerned machines

- HA20 LE - HA20 LE PRO - HA61 LE - HA61 LE PRO
- HA16 RTJ - HA16 RTJ O - HA16 RTJ PRO - HA46 RTJ O - HA46 RTJ PRO
- HA20 RTJ - HA20 RTJ O - HA20 RTJ PRO - HA61 RTJ O - HA61 RTJ PRO
- HA26 RTJ O - HA26 RTJ O SW - HA26 RTJ PRO - HA26 RTJ PRO SW - HA80 RTJ O - HA80 RTJ PRO
- HA32 RTJ PRO - HA100 RTJ PRO - HA41 RTJ PRO - HA130 RTJ PRO
- HT21RT O - HT21RT O SW - HT61RT O HT21RT PRO - HT21RT PRO SW - HT61RT PRO HT23RTJ O - HT23RTJ O SW - HT67RTJ O HT23RTJ PRO - HT23RTJ PRO SW - HT67RTJ PRO
- HT26 RT O - HT26 RT O SW - HT28 RTJ O - HT28 RTJ O SW - HT28 RTJ PRO - HT28 RTJ PRO SW - HT80 RT O - HT85 RTJ O - HT85 RTJ PRO
- HT43 RTJ PRO - HT132 RTJ PRO

2 - Warning

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- **Only risks linked specifically to activities relating to the disassembly and assembly of the machine HAULOTTE® are described in this sheet.**

- **Do not wear any metal jewellery (rings, watches, chains, etc.) when working on the batteries.**
- **ONLY use insulated tools when working on or near batteries or electrical connections.**
- **Do not produce sparks or flames or smoke near the battery.**

3 - Risk prevention

Means of protection to be used when implementing the range

	Appropriate workwear		Gloves
	Safety shoes		

4 - You will need

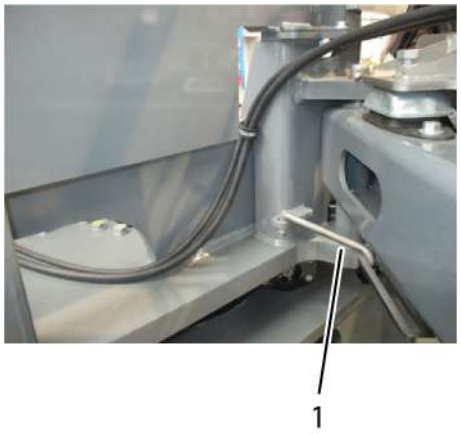
	• "DO NOT OPERATE" tag • Personal protective equipment • Standard tool kit		• Place barriers around the perimeter of the work area
	1 person		

5 - Procedure

- Position the machine on a flat and firm surface, clear of obstructions (beware of power lines).
- Put the machine in stowed position, boom and arm fully retracted and lowered.
- Mark out the work area (barriers, cones, marking tape).
- Restrict access to the area (restricted access sign).

- Open the engine cover.
- Remove screw (1) that is blocking the engine compartment.

- Pull then swivel the engine compartment.
- Lock the engine compartment using the locking lever (1).



Starter battery inspection

MP0023

- Check battery terminals for oxidation.
- Check terminals for oxidation.
- Check battery terminals for cleanliness and tightness.
- Check that the battery is secure.

- Carry out the operations in the reverse order.

Notes

Checking the bushings and pins

MP0024

1 - Concerned machines

- HT26 RT O - HT26 RT O SW - HT28 RTJ O - HT28 RTJ O SW - HT28 RTJ PRO - HT28 RTJ PRO SW - HT80 RT O - HT85 RTJ O - HT85 RTJ PRO

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3 - Risk prevention

Means of protection to be used when implementing the range

	Appropriate workwear		Gloves
	Safety shoes		

4 - You will need

	• "DO NOT OPERATE" tag • Personal protective equipment • Standard tool kit		• Place barriers around the perimeter of the work area
	1 person		

5 - Procedure

- Position the machine on a flat and firm surface, clear of obstructions (beware of power lines).
- Put the machine in stowed position, boom and arm fully retracted and lowered.
- Check the presence and the position of the rings.
- Check the absence of heavy abrasion, wear or oxidation of the rings.
- Check the absence of deformations, cracks or breakage of the rings.

Criteria of replacement : Replace as soon as the anomaly indicated above appears.

- Check the absence of radial gap > 0,5 mm (19690 µ in) on the pins.
- Check the absence of shaving in periphery of the pins.

Criteria of replacement : Replace as soon as the anomaly indicated above appears.

On each wheel

Ground control side

Checking the bushings and pins

Engine side

Checking the condition of belts

MP0025

1 - Concerned machines

- HA16 RTJ - HA16 RTJ O - HA16 RTJ PRO - HA46 RTJ O - HA46 RTJ PRO
- HA20 RTJ - HA20 RTJ O - HA20 RTJ PRO - HA61 RTJ O - HA61 RTJ PRO
- HA26 RTJ O - HA26 RTJ O SW - HA26 RTJ PRO - HA26 RTJ PRO SW - HA80 RTJ O - HA80 RTJ PRO
- HT21 RT O - HT21 RT O SW - HT61 RT O - HT21 RT PRO - HT21 RT PRO SW - HT61 RT PRO - HT23 RTJ O - HT23 RTJ O SW - HT67 RTJ O HT23 RTJ PRO - HT23 RTJ PRO SW - HT67 RTJ PRO
- HT26 RT O - HT26 RT O SW - HT28 RTJ O - HT28 RTJ O SW - HT28 RTJ PRO - HT28 RTJ PRO SW - HT80 RT O - HT85 RTJ O - HT85 RTJ PRO

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3 - Risk prevention

Means of protection to be used when implementing the range

	Appropriate workwear		Gloves
	Safety shoes		

4 - You will need

	• "DO NOT OPERATE" tag • Personal protective equipment • Standard tool kit		• Place barriers around the perimeter of the work area
	1 person		

5 - Procedure

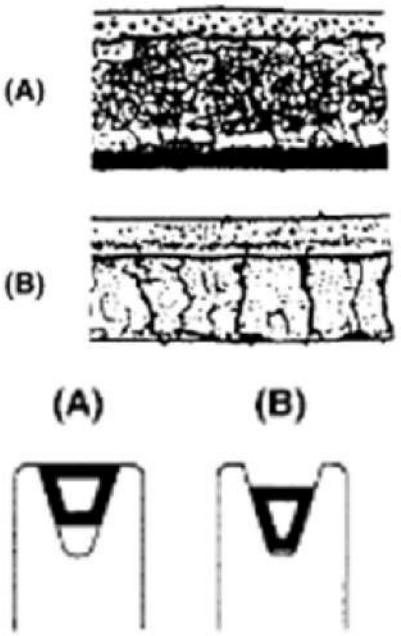
- Position the machine on a flat and firm surface, clear of obstructions (beware of power lines).
- Put the machine in stowed position, boom and arm fully retracted and lowered.

Do not start the engine and disconnect the battery.

- Check the degree of wear on the fan belt.
- Check the subsidence of the belt in the pulley groove :

  (A) Proper.

  (B) Wear.
- Replace it/them if necessary.



Checking and cleaning the fuel filter

MP0026

1 - Concerned machines

- HA16 RTJ - HA16 RTJ O - HA16 RTJ PRO - HA46 RTJ O - HA46 RTJ PRO
- HA20 RTJ - HA20 RTJ O - HA20 RTJ PRO - HA61 RTJ O - HA61 RTJ PRO
- HA26 RTJ O - HA26 RTJ O SW - HA26 RTJ PRO - HA26 RTJ PRO SW - HA80 RTJ O - HA80 RTJ PRO
- HT21 RT O - HT21 RT O SW - HT61 RT O - HT21 RT PRO - HT21 RT PRO SW - HT61 RT PRO - HT23 RTJ O - HT23 RTJ O SW - HT67 RTJ O HT23 RTJ PRO - HT23 RTJ PRO SW - HT67 RTJ PRO
- HT26 RT O - HT26 RT O SW - HT28 RTJ O - HT28 RTJ O SW - HT28 RTJ PRO - HT28 RTJ PRO SW - HT80 RT O - HT85 RTJ O - HT85 RTJ PRO

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- **Beware of the risk of burns; the hydraulic system operates at high temperatures.**
- **The pressure in the hydraulic system is very important. It can cause accidents. Relieve the pressure before beginning any work and never search for oil leaks using your hands.**

3 - Risk prevention

Means of protection to be used when implementing the range

	Appropriate workwear		Gloves
	Safety shoes		

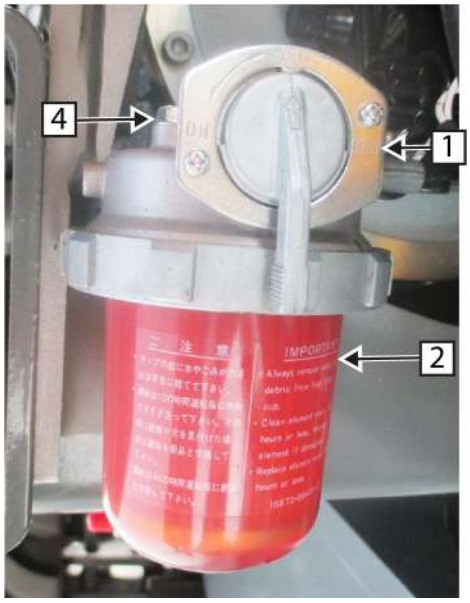
4 - You will need

	• "DO NOT OPERATE" tag • Personal protective equipment • Standard tool kit • Filter wrench		• Place barriers around the perimeter of the work area
	1 person		

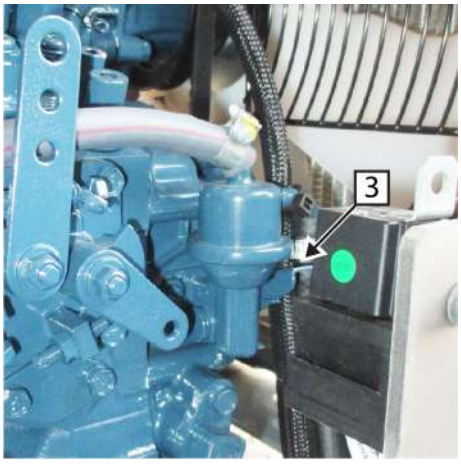
5 - Procedure

- Position the machine on a flat and firm surface, clear of obstructions (beware of power lines).
- Put the machine in stowed position, boom and arm fully retracted and lowered.

- Check whether the water and dirt contained in the fuel has been decanted into the water separator.
- If there are no impurities in the water: no action to be taken.
- If there are impurities or water in the bottom of the container :
- Set the handle of the separator to "OFF" (1).
- Loosen and remove the container (2) using a filter wrench ; Clean with diesel.
- Clean the filtering part with diesel.
- Replace the filtering element with diesel protected from dust.



- Re-tighten the container (2) then reboot the system using the button at the back of the engine (3).
- Release the air by loosening the screw, then re-tightening it (4).



1 - Concerned machines

- HA26 RTJ O - HA26 RTJ O SW - HA26 RTJ PRO - HA26 RTJ PRO SW - HA80 RTJ O - HA80 RTJ PRO
- HT26 RT O - HT26 RT O SW - HT28 RTJ O - HT28 RTJ O SW - HT28 RTJ PRO - HT28 RTJ PRO SW - HT80 RT O - HT85 RTJ O - HT85 RTJ PRO

2 - Warning

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3 - Risk prevention

Means of protection to be used when implementing the range

	Appropriate workwear		Gloves
	Safety shoes		

4 - You will need

	• "DO NOT OPERATE" tag • Personal protective equipment • Grease pump		• Place barriers around the perimeter of the work area
	1 person		

5 - Consumable

Lead-free grease

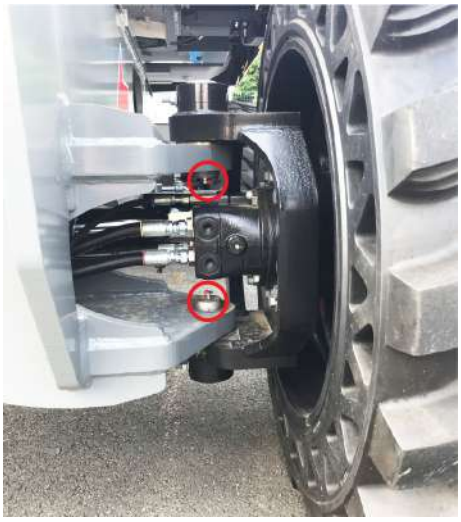
Packaging	Part number HAULOTTE®
Aerosol 0.4L	2820304330
Can 5L	2820304340

6 - Procedure

- Position the machine on a flat and firm surface, clear of obstructions (beware of power lines).
- Put the machine in stowed position, boom and arm fully retracted and lowered.

On each of the steering wheels :

- Place the grease pump on each of the two greasers located between the steering pivot and the chassis.
- There is enough grease when you can see grease running from the axle.



- Place the grease pump on the greaser on the steering rod.
- There is enough grease when you can see grease running from the axle.

1 - Concerned machines

- HT26 RT O - HT26 RT O SW - HT28 RTJ O - HT28 RTJ O SW - HT28 RTJ PRO - HT28 RTJ PRO SW - HT80 RT O - HT85 RTJ O - HT85 RTJ PRO

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3 - Risk prevention

Means of protection to be used when implementing the range

	Appropriate workwear		Gloves
	Safety shoes		

4 - You will need

	• "DO NOT OPERATE" tag • Personal protective equipment • Brush		• Place barriers around the perimeter of the work area
	1 person		

5 - Consumable

Teflon grease aerosol

Packaging	Part number HAULOTTE®
Aerosol 400ml	2326005410

6 - Procedure

- Position the machine on a flat and firm surface, clear of obstructions (beware of power lines).
- Put the machine in stowed position, boom and arm fully retracted and lowered.

- Fully extend the boom.
- Clean the greased surfaces.
- Apply the Teflon grease to the boom using a spray or brush.

Jib cylinder lubrication

MP0029

1 - Concerned machines

- HA26 RTJ O - HA26 RTJ O SW - HA26 RTJ PRO - HA26 RTJ PRO SW - HA80 RTJ O - HA80 RTJ PRO
- HT26 RT O - HT26 RT O SW - HT28 RTJ O - HT28 RTJ O SW - HT28 RTJ PRO - HT28 RTJ PRO SW - HT80 RT O - HT85 RTJ O - HT85 RTJ PRO

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3 - Risk prevention

Means of protection to be used when implementing the range

	Appropriate workwear		Gloves
	Safety shoes		

4 - You will need

	• "DO NOT OPERATE" tag • Personal protective equipment • Grease pump		• Place barriers around the perimeter of the work area
	1 person		

5 - Consumable

Lead-free grease

Packaging	Part number HAULOTTE®
Aerosol 0.4L	2820304330
Can 5L	2820304340

6 - Procedure

- Position the machine on a flat and firm surface, clear of obstructions (beware of power lines).
- Put the machine in stowed position, boom and arm fully retracted and lowered.

- Place the grease pump on each of the two greasers at the ends of the jib cylinder.
- There is enough grease when you can see grease running from the axle.

Cleaning of air cleaner element

MP0030

1 - Concerned machines

- HT26 RT O - HT26 RT O SW - HT28 RTJ O - HT28 RTJ O SW - HT28 RTJ PRO - HT28 RTJ PRO SW - HT80 RT O - HT85 RTJ O - HT85 RTJ PRO

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- **Beware of the risk of burns; the hydraulic system operates at high temperatures.**

3 - Risk prevention

Means of protection to be used when implementing the range

	Appropriate workwear		Gloves
	Safety shoes		

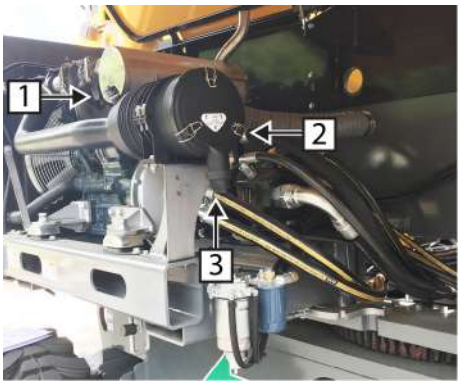
4 - You will need

	• Personal protective equipment • Standard tool kit • "DO NOT OPERATE" tag • Air compressor		• Place barriers around the perimeter of the work area
	1 person		

5 - Procedure

- Position the machine on a flat and firm surface, clear of obstructions (beware of power lines).
- Put the machine in stowed position, boom and arm fully retracted and lowered.

- Turn on the engine.
- Check the clogging indicator (1).
- If the LED is green, the filter does not need to be changed.
- If the LED turns red :
- Remove the drain valve, let the particles escape then refit it (3).
- Pull the pin (2) and swivel the cap to remove it.



- Remove the main element (4).
- Blow the inside of the main element (4) with clean and dry compressed air. Pressure of compressed air must be under 205 kPa (2,1 kgf/cm 2,30 psi).
- Remove the main element (4). Close the cover using the pins (2).

Do not use oil.

Do not touch the secondary element unless it has to be replaced.

1 - Concerned machines

- HA16 RTJ - HA16 RTJ O - HA16 RTJ PRO - HA46 RTJ O - HA46 RTJ PRO
- HA20 RTJ - HA20 RTJ O - HA20 RTJ PRO - HA61 RTJ O - HA61 RTJ PRO
- HA26 RTJ O - HA26 RTJ O SW - HA26 RTJ PRO - HA26 RTJ PRO SW - HA80 RTJ O - HA80 RTJ PRO
- HT21 RT O - HT21 RT O SW - HT61 RT O - HT21 RT PRO - HT21 RT PRO SW - HT61 RT PRO - HT23 RTJ O - HT23 RTJ O SW - HT67 RTJ O HT23 RTJ PRO - HT23 RTJ PRO SW - HT67 RTJ PRO
- HT26 RT O - HT26 RT O SW - HT28 RTJ O - HT28 RTJ O SW - HT28 RTJ PRO - HT28 RTJ PRO SW - HT80 RT O - HT85 RTJ O - HT85 RTJ PRO

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- **Beware of the risk of burns; the hydraulic system operates at high temperatures.**

3 - Risk prevention

Means of protection to be used when implementing the range

	Appropriate workwear		Gloves
	Safety shoes		

4 - You will need

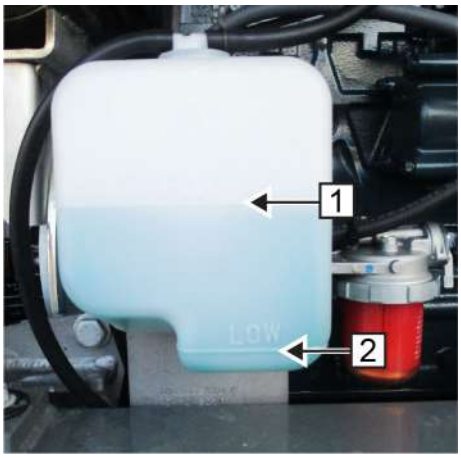
	• Personal protective equipment • Standard tool kit • "DO NOT OPERATE" tag • Coolant -37°, Can 25L - 4000564860		• Place barriers around the perimeter of the work area
	1 person		

5 - Procedure

- Position the machine on a flat and firm surface, clear of obstructions (beware of power lines).
- Put the machine in stowed position, boom and arm fully retracted and lowered.

Before unscrewing the cooling system filler cap, shut off the engine and wait for the parts of the cooling system to cool down. Then slowly unscrew the cooling system filler cap to release the pressure :

- Check that the cooling liquid sits between the maximum (1) and minimum (2) levels of the expansion vessel.
- If the cooling liquid level is too low, find out why this is the case.



Case 1 :

Evaporation has lowered the cooling liquid level: top up with clean fresh water only.

Case 2 :

A leak has lowered the cooling liquid level: top up with a cooling liquid with the same brand and reference number using the recommended mixing ratio (clean fresh water and L.L.C.).

If it is not possible to identify the brand of coolant, drain it and add a new coolant mixture.

1 - Concerned machines

- HT26 RT O - HT26 RT O SW - HT28 RTJ O - HT28 RTJ O SW - HT28 RTJ PRO - HT28 RTJ PRO SW - HT80 RT O - HT85 RTJ O - HT85 RTJ PRO

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3 - Risk prevention

Means of protection to be used when implementing the range

	Appropriate workwear		Gloves
	Safety shoes		

4 - You will need

	• Personal protective equipment • Standard tool kit • "DO NOT OPERATE" tag • Belt 4000598290		• Place barriers around the perimeter of the work area
	1 person		

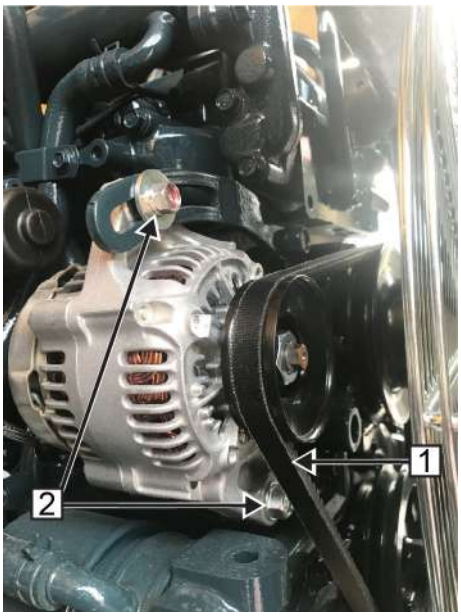
5 - Procedure

- Position the machine on a flat and firm surface, clear of obstructions (beware of power lines).
- Put the machine in stowed position, boom and arm fully retracted and lowered.

Do not start the engine and disconnect the battery.

- Swivel the engine casing to access the belt.

- Loosen the alternator using the screw (2).
- Remove the fan belt (1).
- Replace the belt with a new one.
- Refit the alternator.
- Check the belt deflection to tighten it correctly :
- Press halfway between the fan drive pulley and the alternator pulley with a force of 98N (10 kg) to measure the deflection (1).
- The value measured must be between 10 mm and 12 mm.
- If the value is within this range, the tension is correct.
- If the value is not within this range :
- Unscrew the alternator fastening screws (2).
- Adjust its position.



Check the condition of cables

MP0034

1 - Concerned machines

- HT21 RT O - HT21 RT O SW - HT61 RT O - HT21 RT PRO - HT21 RT PRO SW - HT61 RT PRO - HT23 RTJ O - HT23 RTJ O SW - HT67 RTJ O HT23 RTJ PRO - HT23 RTJ PRO SW - HT67 RTJ PRO
- HT26 RT O - HT26 RT O SW - HT28 RTJ O - HT28 RTJ O SW - HT28 RTJ PRO - HT28 RTJ PRO SW - HT80 RT O - HT85 RTJ O - HT85 RTJ PRO
- HT43 RTJ PRO - HT132 RTJ PRO

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3 - Risk prevention

Means of protection to be used when implementing the range

	Appropriate workwear		Gloves
	Safety shoes		

4 - You will need

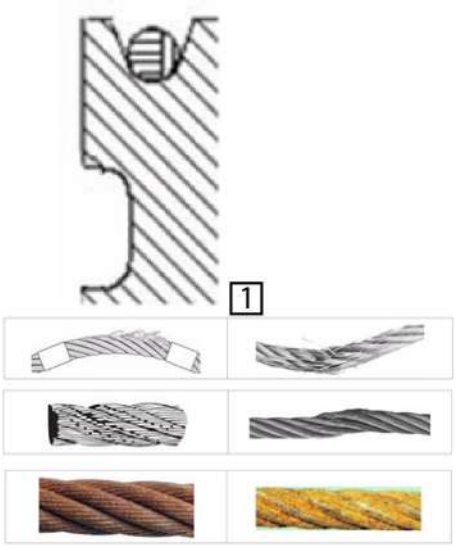
	• Personal protective equipment • Standard tool kit • "DO NOT OPERATE" tag		• Place barriers around the perimeter of the work area
	1 person		

5 - Procedure

- Position the machine on a flat and firm surface, clear of obstructions (beware of power lines).
- Put the machine in stowed position, boom and arm fully retracted and lowered.

State :

- Check that cables are properly aligned with one another.
- Check that the cables under are equal tension.
- Check that the pulleys are properly aligned with the cables.
- Check that the cable is properly seated in the pulley (1).
- Check that nothing blocks the chain guides.
- Check the condition of the cables.
- Minimum diameter :
- Replacement is compulsory when 3 strands or more are broken along the length of the cable.
- Replacement is compulsory when 1 strand is broken near the ends.
- No deformed folds or frayed strands must be observed.
- No signs of corrosion must be observed.



Check the tension of cables

MP0035

1 - Concerned machines

- HT21 RT O - HT21 RT O SW - HT61 RT O - HT21 RT PRO - HT21 RT PRO SW - HT61 RT PRO - HT23 RTJ O - HT23 RTJ O SW - HT67 RTJ O HT23 RTJ PRO - HT23 RTJ PRO SW - HT67 RTJ PRO
- HT26 RT O - HT26 RT O SW - HT28 RTJ O - HT28 RTJ O SW - HT28 RTJ PRO - HT28 RTJ PRO SW - HT80 RT O - HT85 RTJ O - HT85 RTJ PRO
- HT43 RTJ PRO - HT132 RTJ PRO

2 - Warning

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3 - Risk prevention

Means of protection to be used when implementing the range

	Appropriate workwear		Gloves
	Safety shoes		

4 - You will need

	• Personal protective equipment • Standard tool kit • "DO NOT OPERATE" tag		• Place barriers around the perimeter of the work area
	1 person		

5 - Procedure

- Position the machine on a flat and firm surface, clear of obstructions (beware of power lines).
- Put the machine in stowed position, boom and arm fully retracted and lowered.

- Fold the machine on a flat and released ground.
- Remove the protective cover SQ380 and SQ381.

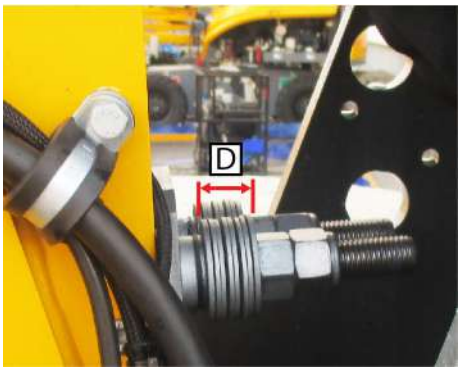
- Insert a pin to lock the tubes (Ø16mm, Length 80cm) ; It may be necessary to lift or lower the boom slightly to align the boom shaft holes.

- Remove the plate on the back of the boom.

Step 1 :

- Put the nuts in contact with the washers of the output cables and measure the external dimension between the flat washers.

  They are adjusted behind the boom.
- Tighten the nuts to have a side equal to the distance D-2mm.



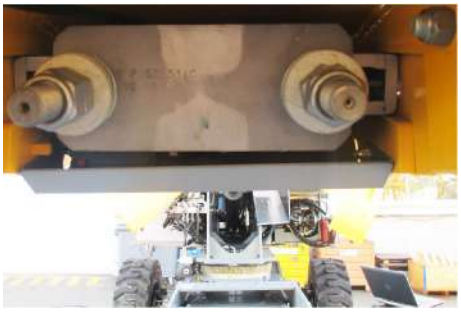
Check the tension of cables

MP0035

Step 2 :

- Put the nuts in contact with the washers of the input cables and measure the external dimension between the flat washers.
- Tighten the nuts to have a side equal to the distance D-2mm.

They are adjusted under the boom, on the cage side.



Step 3 :

- Tighten the nuts of the output cables to obtain a dimension equal to the distance D- 4mm.
- Tighten the lock nuts and seal.

Step 4 :

- Tighten the nuts of the input cables to obtain a dimension equal to the distance D- 4mm.
- Tighten the lock nuts and seal.
- Remove the pin .
- Retract/expand the boom telescope several times.

Notes

Drain the engine oil

MP0036

1 - Concerned machines

- HA16 RTJ - HA16 RTJ O - HA16 RTJ PRO - HA46 RTJ O - HA46 RTJ PRO
- HA20 RTJ - HA20 RTJ O - HA20 RTJ PRO - HA61 RTJ O - HA61 RTJ PRO
- HA26 RTJ O - HA26 RTJ O SW - HA26 RTJ PRO - HA26 RTJ PRO SW - HA80 RTJ O - HA80 RTJ PRO
- HT21 RT O - HT21 RT O SW - HT61 RT O - HT21 RT PRO - HT21 RT PRO SW - HT61 RT PRO - HT23 RTJ O - HT23 RTJ O SW - HT67 RTJ O HT23 RTJ PRO - HT23 RTJ PRO SW - HT67 RTJ PRO
- HT26 RT O - HT26 RT O SW - HT28 RTJ O - HT28 RTJ O SW - HT28 RTJ PRO - HT28 RTJ PRO SW - HT80 RT O - HT85 RTJ O - HT85 RTJ PRO
- HT16 RTJ O - HT16 RTJ PRO - HT46 RTJ O - HT46 RTJ PRO

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- **Only risks linked specifically to activities relating to the disassembly and assembly of the machine HAULOTTE® are described in this sheet.**

- **Beware of the risk of burns; the hydraulic system operates at high temperatures.**

3 - Risk prevention

Means of protection to be used when implementing the range

	Appropriate workwear		Gloves
	Safety shoes		

4 - You will need

	• Personal protective equipment • Standard tool kit • "DO NOT OPERATE" tag • Oil collection pan		• Place barriers around the perimeter of the work area
	1 person		

5 - Consumables

Engine oil 15W40

Packaging	Part number HAULOTTE®
Can 5L	4000530600
20L bucket	2420801360
Barrel 209L	2820305720

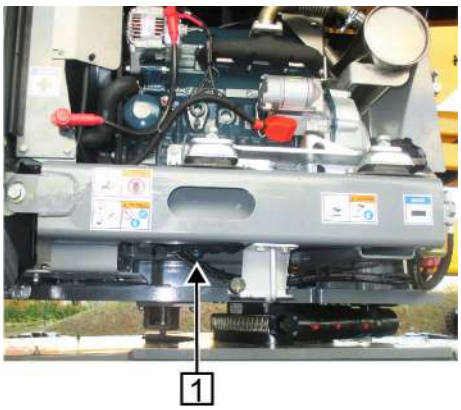
6 - Procedure

- Position the machine on a flat and firm surface, clear of obstructions (beware of power lines).
- Put the machine in stowed position, boom and arm fully retracted and lowered.

- Start the engine and leave it to turn over for a few minutes.

Shut off the engine before draining the engine oil.

- Place a container under the engine.
- Remove the drain plug (1) under the engine and leave the oil to drain out completely.
- Refit and tighten the drain out (1).



- Open the cap (2) and fill the engine with new oil until it reaches the upper mark of the gauge (3).

Do not touch the hot parts of the engine.

Notes

1 - Concerned machines

- HT26 RT O - HT26 RT O SW - HT28 RTJ O - HT28 RTJ O SW - HT28 RTJ PRO - HT28 RTJ PRO SW - HT80 RT O - HT85 RTJ O - HT85 RTJ PRO
- HA32 RTJ PRO - HA100 RTJ PRO - HA41 RTJ PRO - HA130 RTJ PRO
- HT43 RTJ PRO - HT132 RTJ PRO

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- **Beware of the risk of burns; the hydraulic system operates at high temperatures.**

3 - Risk prevention

Means of protection to be used when implementing the range

	Appropriate workwear		Gloves
	Safety shoes		

4 - You will need

	• Personal protective equipment • Standard tool kit • "DO NOT OPERATE" tag • Filling syringe		• Place barriers around the perimeter of the work area
	1 person		

5 - Consumables

Gear box oil SAE 80W90

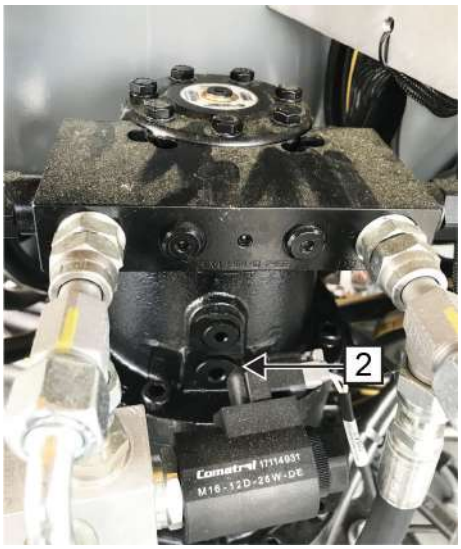
Packaging	Part number HAULOTTE®
Can 1L	4000530610
Can 20L	2420801370
Barrel 209L	2420801380

6 - Procedure

- Position the machine on a flat and firm surface, clear of obstructions (beware of power lines).
- Put the machine in stowed position, boom and arm fully retracted and lowered.

- Loosen the filling cap (2).
- If the level is correct, oil should drain from the orifice (2).

- If not, add oil via the cap (2) using the syringe until oil flows through the hole (2).
- Close the caps and wipe up any oil that has spilled on the floor.



1 - Concerned machines

- HT26 RT O - HT26 RT O SW - HT28 RTJ O - HT28 RTJ O SW - HT28 RTJ PRO - HT28 RTJ PRO SW - HT80 RT O - HT85 RTJ O - HT85 RTJ PRO
- HA32 RTJ PRO - HA100 RTJ PRO - HA41 RTJ PRO - HA130 RTJ PRO
- HT43 RTJ PRO - HT132 RTJ PRO

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- **Beware of the risk of burns; the hydraulic system operates at high temperatures.**

3 - Risk prevention

Means of protection to be used when implementing the range

	Appropriate workwear		Gloves
	Safety shoes		

4 - You will need

	• Personal protective equipment • Standard tool kit • "DO NOT OPERATE" tag • Oil collection pan • Funnel + Hose		• Place barriers around the perimeter of the work area
	1 person		

5 - Consumables

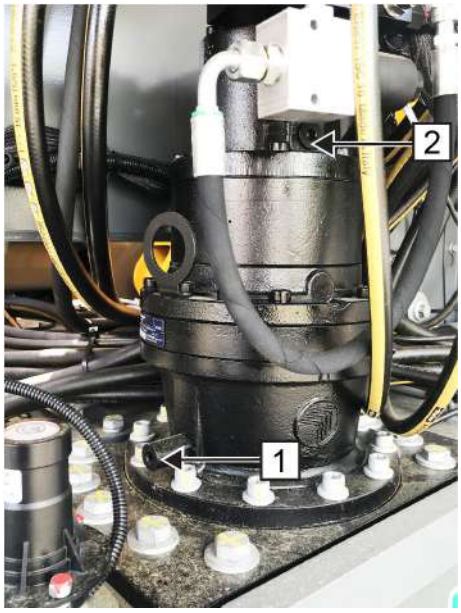
Gear box oil SAE 80W90

Packaging	Part number HAULOTTE®
Can 1L	4000530610
Can 20L	2420801370
Barrel 209L	2420801380

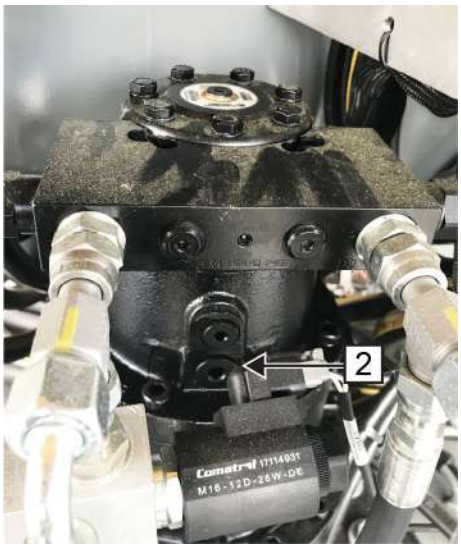
6 - Procedure

- Position the machine on a flat and firm surface, clear of obstructions (beware of power lines).
- Put the machine in stowed position, boom and arm fully retracted and lowered.

- Under the drain plug (1), place a funnel and a hose leading to the collection tray.
- Open the drain plugs (1) and filling plugs (2) ; Allow the oil to run out.
- Refit and tighten the drain out (1).



- Using a filling syringe, fill with oil via the orifice (2) up to the orifice.
- Refit and tighten plug ; Wipe up any oil spills from the ground.



Draining the wheel reducer

MP0043

1 - Concerned machines

- HA20 RTJ PRO - HA61 RTJ PRO
- HA26 RTJ O - HA26 RTJ O SW - HA26 RTJ PRO - HA26 RTJ PRO SW - HA80 RTJ O - HA80 RTJ PRO
- HT26 RT O - HT26 RT O SW - HT28 RTJ O - HT28 RTJ O SW - HT28 RTJ PRO - HT28 RTJ PRO SW - HT80 RT O - HT85 RTJ O - HT85 RTJ PRO

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3 - Risk prevention

Means of protection to be used when implementing the range

	Appropriate workwear		Gloves
	Safety shoes		

4 - You will need

	• Personal protective equipment • Standard tool kit • "DO NOT OPERATE" tag • Jack 20T • Chocks 4000mm • Filling syringe • Collection tray 1.5L		• Place barriers around the perimeter of the work area
	1 person		

5 - Consumable

Gear box oil SAE 80W90 - Quantity 1.1L

Packaging	Part number HAULOTTE®
Can 1L	4000530610
Can 20L	2420801370
Barrel 209L	2420801380

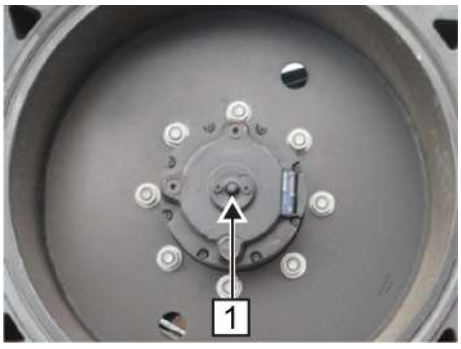
6 - Procedure

- Position the machine on a flat and firm surface, clear of obstructions (beware of power lines).
- Put the machine in stowed position, boom and arm fully retracted and lowered.

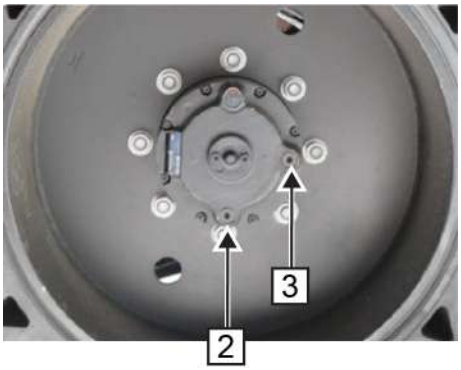
You have a means of lifting the machine :

- Lift the machine with the jack to raise the wheel off the ground.
- Place wedges under the chassis and lower the jack slowly.

- Disconnect the gear system :
- Loosen the 2 screws from the central plate and turn it over to disengage the reduction gear (1).



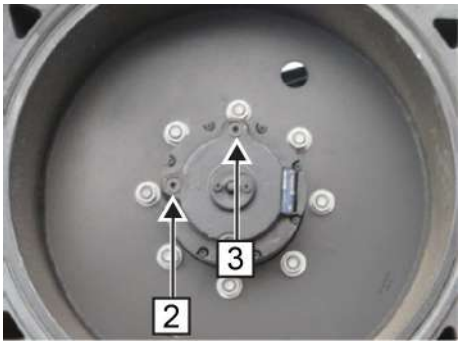
- Manually turn the wheel to place the drain plug to the bottom of the vertical axis (2) and the other horizontal (3).
- Position the oil collection tray under the plug (2).
- Open the caps (2, 3).
- Allow the liquid to drain completely ; To make the flow easier, the oil should still be hot.



Draining the wheel reducer

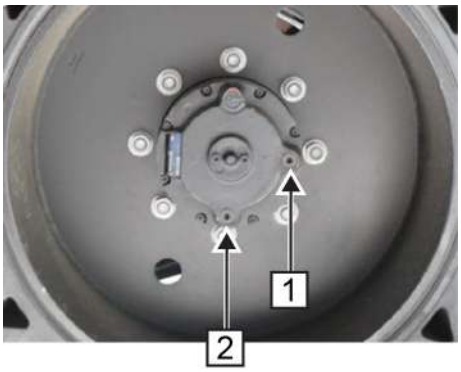
MP0043

- Manually turn the wheel to position the filler cap to the top of the vertical axis (3).
- Add the oil via the hole (3) using a syringe until the oil flows from the hole (2).
- Quantity 1.1L.
- Retighten the 2 central plate screws ; Close the caps and wipe up any oil that has spilled on the floor.

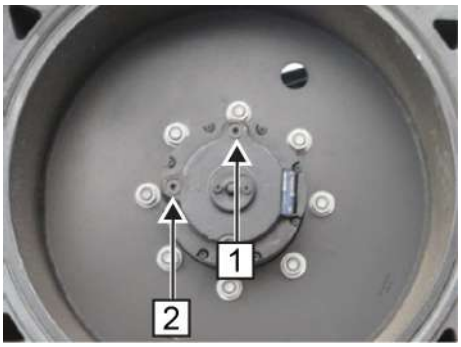


You do not have the means to lift the machine :

- Turn the wheel slowly to place a drain plug to the bottom of the vertical axis (2) and the other horizontal (1).
- Position the oil collection tray under the plug (2).
- Open the caps (1, 2).
- Allow the liquid to drain completely ; To make the flow easier, the oil should still be hot.



- Rotate the wheel, moving it slowly to place a filler cap at the top of the vertical axis (1).
- Add the oil via the hole (1) using a syringe until the oil flows from the hole (2).
- Quantity 1.1L.
- Close the caps and wipe up any oil that has spilled on the floor.



Notes

Greasing the turntable rotation gearbox

MP0044

1 - Concerned machines

- HT26 RT O - HT26 RT O SW - HT28 RTJ O - HT28 RTJ O SW - HT28 RTJ PRO - HT28 RTJ PRO SW - HT80 RT O - HT85 RTJ O - HT85 RTJ PRO

2 - Warning

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- **Beware of the risk of burns; the hydraulic system operates at high temperatures.**

3 - Risk prevention

Means of protection to be used when implementing the range

	Appropriate workwear		Gloves
	Safety shoes		

4 - You will need

	• Personal protective equipment • Standard tool kit • "DO NOT OPERATE" tag • Grease pump • Brush		• Place barriers around the perimeter of the work area
	1 person		

5 - Consumable

Lead-free grease

Packaging	Part number HAULOTTE®
Aerosol 0.4L	2820304330
Can 5L	2820304340

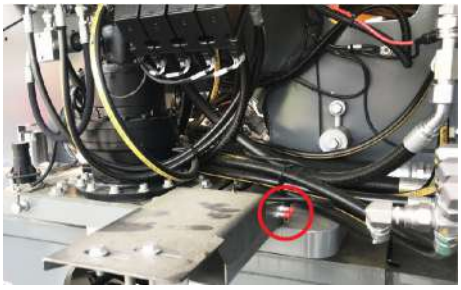
Extreme-pressure lithium grease

Packaging	Part number HAULOTTE®
Extreme-pressure lithium grease	2820304320

6 - Procedure

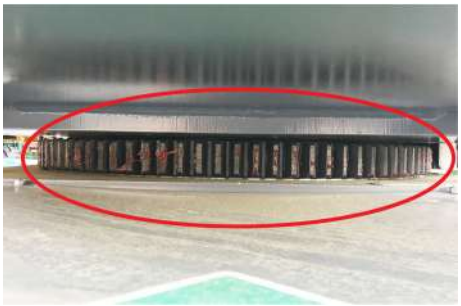
- Position the machine on a flat and firm surface, clear of obstructions (beware of power lines).
- Put the machine in stowed position, boom and arm fully retracted and lowered.

- Place the grease pump on each of the 2 greasers of the slew ring which are offset in the hydraulic cover :
- Lead-free grease.



- Grease the slew ring using a brush :
- Extreme-pressure lithium grease.

In order to grease the slew ring well, pivot the turntable several times to access all of the teeth.



1 - Trouble shooting

1.1 - RECOMMENDATIONS

If a malfunction occurs, check the following points :

- There is sufficient fuel.
- Sufficient engine oil.
- Sufficient hydraulic oil in the tank.
- Batteries are charging.
- Control box E-stop push-buttons are pulled out.
- The control box selector key is set to platform or ground control box.
- Control box relays are engaged.
- Fuse status.
- Ground control box solenoid valve status.

If the malfunction persists, consult the troubleshooting table to identify the problem.

IF you cannot identify the problem, contact HAULOTTE Services®.

1.2 - DESCRIPTION

The FAILURES function describes the requirements relative to failures : monitoring, information recording, information reading.

1.3 - REQUIREMENTS

Requirements	Definition
FAIL_xx_001	An ACTIVE failure (A) signals that the failure is stive active
FAIL_xx_002	A DETECTED failure (D) signals the cause of the failure has been valid one at least power on, but is inactive
FAIL_xx_003	A code CODE is linked to failures which have several causes of activation to identify the one of activation (if many conditions are active the code are added)
FAIL_xx_004	At power on, the failure log and failure counter are not changed for a failure which was already active at power off
FAIL_xx_005	The failure log and failure counter are changed for a failure which internal code is changed

N.B.-:- VAR[ACTIVEFAILURE] = 1 IF ONE OR MORE OF THE FOLLOWING FAILURES ARE IN ACTIVE STATE

Failures	N	Dec	Bit	Description
Contactors				
F02.02 Emergency Pump KM120	D			Digital output's failure : Emergency pump relay --> KM120 = FAIL
F02.04 Power Contactor KMP	D			Incoherence between the emergency stop status and the presence of voltage on power line --> EMSTOP=0 & (12VD1>8.00V | 12VD2>8.00V | 12VD3>8.00V | 12VD4>8.00V | 12VD5>8.00V | 12VF1>8.00V | 12VF2>8.00V | 12VF3>8.00V | 12VF4>8.00V)
F02.05 Heating Relay KM160	D			Digital output's failure : Preheating relay --> KM160=FAIL & CFG[Engine]=TierIII

Failures	N	Dec	Bit	Description
Relays				
F03.06 Horn Relay KA9	D			Digital output's failure : Horn relay --> KA9=FAIL
F03.07 Overriding Relay KA6	D			Overriding relay stuck --> SB802=1 & KA6=0 & PowerOn=1
F03.08 Start Relay KA4	D			Digital output's failure : Starter relay --> KA4=FAIL
F03.09 Supply/Key Switch Rel KA3	D			Digital output's failure : Engine supply relay --> KA3=FAIL
F03.11 Generator Relay KA2	D			Digital output's failure : Generator relay failure while generator on (And failure is not low current) --> KA2=FAIL& SETP[Generator]=ON
F03.13 Gasoline/LPG selector Relay KA140				Digital output's failure : Gasoline/LPG selector relay --> KA140=FAIL& CFG[Engine]= TierIII Dual Fuel

E - Trouble shooting and diagram

Failures	N	Dec	Bit	Description
Electrovalves				
F04.01 Steering YV900/160L/160R	D	1	b0	Proportional output's failure : --> YV900=FAIL
		2	b1	Failure indicator for PVG is active : --> YV900FA=1 : Failure indicator provided by PVG component, mechanical problem detected (incoherence between requested value and position of the valve; internal filtered of 700 ms)
		8	b3	Digital output's failure : Left steering movement --> YV150L=FAIL
		16	b4	Digital output's failure : Right steering movement --> YV150R=FAIL
F04.02 Compensation YV900/720U/720D	D	1	b0	Proportional output's failure : Platform level movement (with or without movement) --> YV900=FAIL
		2	b1	Failure indicator for PVG is active : --> YV900FA=1 : Failure indicator provided by PVG component, mechanical problem detected (incoherence between requested value and position of the valve; internal filtered of 700 ms)
		8	b3	Digital output's failure : Platform level descent movement (with or without movement) --> YV720D=FAIL
		16	b4	Digital output's failure : Platform level raise movement (with or without movement) --> YV720U=FAIL
F04.03 Turret rotation YV250/805	D	1	b0	Proportional output's failure : --> YV250=FAIL
		2	b1	Failure indicator for PVG is active : --> YV250FA=1 : Failure indicator provided by PVG component, mechanical problem detected (incoherence between requested value and position of the valve; internal filtered of 700 ms)
		8	b3	Digital output's failure : Orientation safety valve --> YV805=FAIL
		16	b4	Digital output's failure : Ground of orientation safety valve --> YV805G=FAIL
F04.05 Boom YV520/802/807	D	1	b0	Proportional output's failure : --> YV520=FAIL
		2	b1	Failure indicator for PVG is active : --> YV520FA=1 : Failure indicator provided by PVG component, mechanical problem detected (incoherence between requested value and position of the valve; internal filtered of 700 ms)
		8	b3	Digital output's failure : Boom safety valve --> YV802=FAIL
		16	b4	Digital output's failure : Ground of boom safety valve --> YV802G=FAIL
		32	b3	Digital output's failure : Boom descent safety valve --> YV807=FAIL
		64	b4	Digital output's failure : Ground of boom descent safety valve --> YV807G=FAIL

E - Trouble shooting and diagram

Failures	N	Dec	Bit	Description
Electrovalves				
F04.06 Telescope YV530/801	D	1	b0	Proportional output's failure : --> YV530=FAIL
		2	b1	Failure indicator for PVG is active : --> YV530FA=1 : Failure indicator provided by PVG component, mechanical problem detected (incoherence between requested value and position of the valve; internal filtered of 700 ms)
		8	b3	Digital output's failure : Out telescope safety valve --> YV801=FAIL
		16	b4	Digital output's failure : Ground of out telescope safety valve --> YV801G=FAIL
F04.07 Jib YV900/620U/620D	D	1	b0	Proportional output's failure : --> YV900=FAIL
		2	b1	Failure indicator for PVG is active : --> YV900FA=1 : Failure indicator provided by PVG component, mechanical problem detected (incoherence between requested value and position of the valve; internal filtered of 700 ms)
		8	b3	Digital output's failure : Jib descent movement --> YV620D=FAIL
		16	b4	Digital output's failure : Jib lift movement --> YV620U=FAIL
F04.08 Platform Rotation YV900/750L/750R	D	1	b0	Proportional output's failure : --> YV900=FAIL
		2	b1	Failure indicator for PVG is active : --> YV900FA=1 : Failure indicator provided by PVG component, mechanical problem detected (incoherence between requested value and position of the valve; internal filtered of 700 ms)
		8	b3	Digital output's failure : Platform rotation right movement --> YV750R=FAIL
		16	b4	Digital output's failure : Platform rotation left movement --> YV750L=FAIL
F04.10 Drive YV160F/160B	D	1	b0	Proportional output's failure : Drive movement, forward direction --> YV160F=FAIL
		2	b1	Proportional output's failure : Drive movement, reverse direction --> YV160B=FAIL
F04.11 Principal movements YV800	D	1	b0	Digital output's failure : LS valve (HSD) --> YV800=FAIL
F04.20 Drive Speed YV110	D		b0	Digital output's failure : High speed drive --> YV110=FAIL
F04.21 Differential locking YV100	D			Digital output's failure : Differential locking --> YV100=FAIL
F04.33 Steering mode YV107/YV108	D	1	b0	Digital output's failure : Steering mode with 4 wheels steering option activated --> YV107=FAIL & VAR[4WSEnable]
		2	b1	Digital output's failure : Steering mode with 4 wheels steering option activated --> YYV108=FAIL & VAR[4WSEnable]

Failures	N	Dec	Bit	Description
Electrovalves				
F04.34 Front Axle Unlocking YV101/104	D	1	b0	Digital output's failure : Oscillating axle unlocking --> YV101=FAIL
		2	b1	Digital output's failure : Oscillating axle unlocking --> YV104=FAIL
F04.35 Brake Releasing YV102/YV105	D	1	b0	Digital output's failure : Rear brake releasing --> YV102=FAIL
		2	b1	Digital output's failure : Front brake releasing --> YV105=FAIL

E - Trouble shooting and diagram

Failures	N	Dec	Bit	Description
Joysticks				
The following joysticks' failures are filtered if failure F08.05 is active (failure of 5 V supplying signal)				
F05.01 **Drive Joystick** SM902Y	D	1	b0	Drive joystick failure : Out of range [0.2..4.8] V --> SM902Y<0.20V | SM902Y>4.80V
		2	b1	Drive joystick failure : Analogue signal and out of neutral incoherence --> (SM902F = 1 & SM902B = 1) & (2.45V<SM902Y<2.55V) --> Or SM902F = 0 & SM902Y<2.00V --> Or SM902B = 0 & SM902Y>3.00V
F05.03 **Telescope Joystick** SM901Y	D	1	b0	Telescope joystick failure : Out of range [0.2..4.8] V --> SM901Y<0.20V | SM901Y>4.80V
		2	b1	Telescope joystick failure : Analogue signal and out of neutral incoherence --> SM901N = 1 & (2.45V<SM901Y<2.55V) --> Or SM901N=0 & (SM901Y<2.00V | SM901Y>3.00V)
F05.04 **Boom Joystick** SM900Y	D	1	b0	Boom joystick failure : Out of range [0.2..4.8] V --> SM900Y<0.20V | SM900Y>4.80V
		2	b1	Boom joystick failure : Analogue signal and out of neutral incoherence --> SM900N = 1 & (2.45V<SM900Y<2.55V) & (2.45V<SM900X<2.55V) --> Or SM900N=0 & (SM900Y<2.00V | SM900Y>3.00V) & (SM900X<2.00V | SM900X>3.00V)
F05.05 **Turret Joystick** SM900X	D	1	b0	Turret rotation joystick failure : Out of range [0.2..4.8] V --> SM900X<0.20V | SM900X>4.80V
		2	b1	Turret rotation joystick failure : Analogue signal and out of neutral incoherence --> SM900N=1 & (2.45V<SM900Y<2.55V) & (2.45V<SM900X<2.55V) --> Or SM900N=0 & (SM900Y<2.00V | SM900Y>3.00V) & (SM900X<2.00V | SM900X>3.00V)
F05.11 **Joystick neutral** SM902Y	A			No detection of joystick's neutral position at machine's power-on --> SM902Y<2.3V | SM902Y>2.65V
F05.12 **Joystick neutral 2** SM901Y	A			No detection of joystick's neutral position at machine's power-on --> SM901Y<2.3V | SM901Y>2.65V
F05.13 **Joystick neutral 3** SM900X/Y	A			No detection of joystick's neutral position at machine's power-on --> SM900X<2.35V | SM900X>2.65V | SM900Y<2.35V | SM900Y>2.65V

Failures	N	Dec	Bit	Description
Load management system				
F06.01 **No Loading Cal** Calibrate	A			No overload calibration, do/redo overload calibration VAR[GaugesNotCalibrated]=1
F06.03 **Gauges out of Range** SP800/SP801	D	1	b0	Gauges out of range (load management system activated) -->SP800 Not in [1500; 20500]µA
		2	b1	Gauges out of range (load management system activated) --> SP801 Not in [1500; 20500]µA
F06.04 **Incoh Gauges** SP800/SP801	D			SP800 measured weight and SP801 measured weight have more than 50 kg of difference (and gauges are calibrated and not out of) VAR[GaugesIncoherent]=1
F06.05 **Low Power** Gauges supply	D			Low power for strain gauges is detected low : VbattB2 basket is under 8500 V
F06.06 **Vibrating wire**				Electrical issue of the vibrating gauges
F06.07 **Vibrating wire**				Logical issue of the vibrating gauges
F06.08 **Vibrating wire**				Strong overload with the vibrating gauges
F06.09 **Negative load**	A			Negative load detected : For one of the two gauges at least measured load is below -40 kg and platform level angle is the range [-10;+10]° : 1. Check the platform does not lie on an obstacle. 2. Check weighing system (adjustment), check measured load when platform is empty. 3. Check the integrity of the structure.

E - Trouble shooting and diagram

Failures	N	Dec	Bit	Description
Sensors				
F07.02 **Cable break** SQ801/802	A	1	b0	Cable break sensor SQ801 activated (SQ801=0)
		2	b1	Cable break sensor SQ802 activated (SQ801=0)
		3	b2	Short circuit of the 5 V supply or of the SQ801 (SQ801>7V)
F07.03 **Boom Angle** SR520/521	D	1	b0	Out of range of the angle sensor SQ520 Present only if the boom angle is calibrated and sensors are not in an electrical failure (F08.11)
		2	b1	Out of range of the angle sensor SQ521 Present only if the boom angle is calibrated and sensors are not in an electrical failure (F08.11)
		4	b2	Incoherence between the two angle sensors Present only if the boom angle is calibrated and the angle sensors are on their range and sensors are not in an electrical failure (F08.11)
		8	b3	The angle is between 8° and 10° and SQ523 is equal to 0
		16	b4	The angle is higher than 65° and SQ523 is equal to 0
		32	b5	There is a change of state of SQ523 (0->1 or 1->0) during the boom movement whereas the boom angle is lower than 0°, between 15° and 55° or higher than 65°
F07.11 **Telescope Length** SQ530/531/532/533	*These failures are present only on dual load machine. See Boom Length for more details. To erase the failure it is necessary to completely fold the machine and to restart it			
	A	1	b0	Incoherence between SQ533 and SQ532 : There is a change of state of SQ533 whereas SQ532=0
		2	b1	Incoherence between SQ533 and SQ532 : During a telescope in movement, SQ532 goes from 1 to 0 whereas SQ533=0
		4	b2	Incoherence between SQ533 and SQ532 : During a telescope out movement, SQ532 goes from 1 to 0 whereas SQ533=1
		8	b3	Incoherence between SQ530 and SQ532 : Both sensors are seen at one whereas it is mechanically impossible
		16	b4	Incoherence between SQ531 and SQ532 : Both sensors are seen at one whereas it is mechanically impossible
		32	b5	Short circuit of the 5 V supply or of the SQ533 (SQ520>7V)
		64	b6	Short circuit of the 5 V supply or of the SQ530 (SQ530>7V)
F07.14 **Turret In Line** SQ521/SQ520	D	1	b0	Incoherence between turret position detectors SQ250 and SQ251 (turret in line)
		2	b1	Short circuit of the 5 V supply or of the SQ520 (SQ520>7V)
F07.15 **Compensation pos.** SR721/SR720	D			Incoherence between basket tilt sensors : Both SR721/SR720 are seen at 1
F07.30 **Engine oil pressure** SP300	N			Incoherence between engine pressure signal and engine state : engine is not running and SP300 in ON position (engine running)
F07.31 **D+ failure**	N			D+ is present but engine is not running
F07.37 **Drive press. Sensor** SP160F / SP160B	D	1	b0	Drive hydraulic circuit pressure sensor is out of normal operative range --> SP160F < 200mV | SP160F > 4800mV
		2	b1	Drive hydraulic circuit pressure sensor is out of normal operative range --> SP160B < 200mV | SP160F > 4800mV

E - Trouble shooting and diagram

Failures	N	Dec	Bit	Description
Sensors				
F07.39 **Fuel level sensor** SL300	D	1	b0	Open circuit on fuel level sensor (only for analog fuel level sensor type) : --> SL300 > 500 ohms & CONFIG[FuelLevelSensorType] = Analog
		2	b1	Short circuit to ground on fuel level sensor (only for analog fuel level sensor type) : --> SL300 =0 ohm & CONFIG[FuelLevelSensorType] = Analog
F07.40 **Twilight sensor** SN900	D	1	b0	Twilight sensor is out of range (Short circuit) --> SN900>4.8V
		2	b1	Twilight sensor is out of range (Open circuit) --> SN900<0.2V

E - Trouble shooting and diagram

Failures	N	Dec	Bit	Description
Supplies				
F08.04 Calc. Input Supply U104 / U106	D	1	b0	Detected ECU voltage difference --> Difference between U106 (SPU) and U104 (basket B2)
		2	b1	Overvoltage of U106 (SPU) supply
		4	b2	Overvoltage of U104 (basket B2) supply
F08.05 Calc. Input Supply U106 5V regul	D	1	b0	Failure on regulated 5 V output of U104 ECU (basket slave node) supplying the joysticks --> 5 V output is measured out the range [4.5;5.5] V and 5 V output not failing
		2	b1	Failure on regulated 5 V output of U104 ECU (basket slave node) supplying the joysticks --> Detected failure on 5 V output
		4	b2	Failure on regulated 5 V output of U106 ECU (SPU)
F08.07 Selector incoherence SA900T/SA900B	D	1	b0	Both key's signals are seen at ON which is electrically impossiblde SA900T=1 & SA900B=1
		2	b1	Both key's signals are seen at OFF and the machine is power on which is electrically impossible SA900T=0 & SA900B=0
F08.08 Unplugged connector Connectors/Fuses	D	1	b0	Supplies' input detected as unplugged on connectors : Check the CN1.B connectors for U106 ECU : --> 12VD1<1.00V & 12VF1<1.00V
		2	b1	Supplies' input detected as unplugged on connectors : Check the CN2.A connectors for U106 ECU : --> 12VD2<1.00V & 12VF2<1.00V
		4	b2	Supplies' input detected as unplugged on connectors : Check the CN2.B connectors for U106 ECU : --> 12VD3<1.00V & 12VF3<1.00V
		8	b3	Supplies' input detected as unplugged on connectors : Check the CN3.A connectors for U106 ECU : --> 12VD4<1.00V
F08.11 Boom angle electrical SR520/SR521	D	1	b0	Sensor SR520 of type 4/20 mA return a value < 3 mA => Open circuit or damaged electrical circuit
		2	b1	Sensor SR520 of type 4/20 mA return a value > 22 mA => Open circuit or damaged electrical circuit
		4	b2	Sensor SR521 of type 4/20 mA return a value< 3 mA => Open circuit or damaged electrical circuit
		8	b3	Sensor SR521 of type 4/20 mA return a value > 22 mA => Open circuit or damaged electrical circuit

Failures	N	Dec	Bit	Description
Engine				
F09.01 **Water temperature** Engine overheat	D			Engine overheat --> SPN110 of the frame DM1 sent by the engine
F09.02 **Oil pressure** Engine pressure	D			Engine oil pressure --> SP300 =0
F09.07 **Amber warning lamp** Check engine	D			Available with Tier III variable RPM electronic engine and Tier III dual fuel engine, warning lamp received from engine ECU Check DIAGNOSTIC => FUNCTIONS => Engine => Failure SPN
F09.08 **Red stop lamp** Check engine	D			Available with Tier III variable RPM electronic engine and Tier III dual fuel engine, stop lamp code received from engine ECU Check DIAGNOSTIC => FUNCTIONS => Engine => Failure SPN
F09.10 **D+** Engine alternator	D			Alternator not charging battery or alternator voltage greater than 6 V while engine is OFF and supplied
F09.11 Removal of DPF system				Detecting removal or disconnection of all sensors on DPF muffler => Frame DM1: SPN = 3936, FMI = 7
F09.12 Loss of function of DPF system	D			Abnormal delta pressure during the engine operation => Frame DM1: SPN = 3936, FMI = 2
F09.13 Failure of Particle Control Diagnostic (PCD) system	D			Removal of delta pressure sensor => Frame DM1: SPN = 3251, FMI = 3
F09.14 Removal of Mass Air Flow (MAF) Sensor	D			Disconnection of EGR-CAN line => Frame DM1: SPN = 523578, FMI = 2
F09.15 Disconnection of Mass Air Flow (MAF) Sensor	D			Disconnection of Mass Air Flow (MAF) sensor => Frame DM1: SPN = 132, FMI = 4

E - Trouble shooting and diagram

Failures	N	Dec	Bit	Description
Functions				
F10.01 Microspeed and overcurrent YV160F/YV160B	D	1	b0	Unfolded machine and current on the PWM upper than the maximum current at this speed --> VAR[UnfoldedMachine]=1 & YV160F>900mA
		2	b1	Unfolded machine and current on the PWM upper than the maximum current at this speed --> VAR[UnfoldedMachine]=1 & YV160B>900mA
F10.02 High speed SP100	D	1	b0	Unfolded machine and pressure present on high speed circuit --> VAR[UnfoldedMachine]=1 & SP100=0
		2	b1	High speed selected and no pressure on high speed circuit --> SP100=1
F10.05 No boom angle calibration	A	1	b0	Boom angle not calibrated
		2	b1	Boom angle limit with dual load configuration not calibrated
F10.17 Activ' Lighting System	A	1	b0	Short circuit on HL910
		2	b1	Short circuit on EL906
		4	b2	Short circuit on EL907
		8	b3	Failure on KA10

Failures	N	Dec	Bit	Description
Securities				
F11.06 Buzzer HA901	A			Lower control box buzzer has been unplugged --> HA901=Open circuit
F11.08 Drive press. Incoh. SP160F / SP160B / Drive pump	D			Absolute pressure difference in drive circuit is greater than 20bar, except if the following conditions are true (because they cause the pressure difference to raise) : • Machine is driving • Or steering is active • Or engine is starting --> ABS(VAR[DrivePressureDiff]) > 20 bar & 5s{CTRL[Drive] = Neutral & (CTRL[Steering] = Neutral | CTRL[BrakeReleasing] = ON)}
F11.11 Boom Speed Incoh				Boom speed of the raised movement is too fast. Failure in PVG behavior. The failure remains active once occurred, even if the machine is powered OFF then ON, and is only reset if machine if folded. When boom angle is not calibrated, the failure is also reset if machine is powered OFF then ON, in order to not fall into a locked situation where it is impossible to calibrate (because of the failure which prevents boom raise) and it is also impossible to reset the failure (because machine is considered as unfolded in P3 position when boom angle is not calibrated).

Failures	N	Dec	Bit	Description
Internal faults				
F12.01 **CAN Fault** Check wires	A	1	b0	CAN network failure detected with turret B2 ECU (U100) Machine switched OFF, with multimeter, check the resistance between 1001 (CAN high) and 1002 (CAN low) is nearly 60 Ω (if 0 Ω or 120 Ω : failure, check RES TERM connection for all ECUs) Check ECU supplies line Check address connections for each B2 ECU (CN106.18/CN106.19/CN106.20)
		2	b1	CAN network failure detected with keyboard switches ECU (U107)
		4	b2	CAN network failure detected with onboard screen ECU (U101)
F12.02 **E2P Read/Write Error** Change U106 ECU	D			Internal failure of SPU: access to EEPROM (read or write)
F12.04 **E2P Param Reset** Check SETTINGS	D	1	b0	ID of software loaded into machine is different from the ID stored into EEPROM: all machine parameters have been reset and must then be set again (speeds, ramps, options, configs, access code level 2, failure counters and calibration data)
		2	b1	Detected changes in machine speeds and ramps
		4	b2	Detected changes in machine options
		8	b3	Detected changes in machine configuration
		16	b4	Detected changes in machine maintenances
		32	b5	Detected changes in machine daily logs
		64	b6	Detected changes in machine events counters
		128	b7	Detected changes in machine events logs
F12.05 **Machine not set**	D	1	b0	Machine's model is not set Set machine model (HT26RT O - HT28RTJ O - HT28 RTJ PRO)
		2	b1	"Country" is not set Set country (USA/AUS/STD/RUS)
		4	b2	Serial number not set Set machine serial number
		8	b3	Some speed or ramp parameters are not set Set all speed and ramp parameter
		16	b4	Some options are not set Set machine options (Buzzer, Flashing light, Fleet management, Activ' Shield Bar)
		32	b5	Some configurations are not set Set all machine's options (Engine)
		64	b6	Activ'Shield Bar option is active while Activ'Shield Bar system version is set to "Not mounted" Set the Activ'Shield Bar system configuration

Failures	N	Dec	Bit	Description
Switches				
F13.02 Platform switches Sw.:2 dir active	D	1	b0	Detected failure on upper console switches : Two directions active at the same time for steering rocker switch --> SM902L=ON & SM902R=ON
		2	b1	Detected failure on upper console switches : Two directions active at the same time for jib switch --> SA621U=ON & SA621D=ON
		4	b2	Detected failure on upper console switches : Two directions active at the same time for platform rotation switch --> SA751U=ON & SA751D=ON
		8	b3	Detected failure on upper console switches : Two directions active at the same time for platform level switch --> SA721U=ON & SA721D=ON
		16	b4	Detected failure on upper console switches : Two directions active at the same time for steering mode switch --> SA101C=ON & SA101S=ON
F13.10 Switches neutral Sw.: Lower box	A	1	b0	Neutral detection failure at machine's power-on for lower console switches : Turntable rotate switch is active
		2	b1	Neutral detection failure at machine's power-on for lower console switches : Boom switch is active
		4	b2	Neutral detection failure at machine's power-on for lower console switches : Telescope switch is active
		8	b3	Neutral detection failure at machine's power-on for lower console switches : Jib switch is active
		16	b4	Neutral detection failure at machine's power-on for lower console switches : Platform level switch is active
		32	b5	Neutral detection failure at machine's power-on for lower console switches : Engine start/stop switch is active
		64	b6	Neutral detection failure at machine's power-on for lower console switches : Enable switch is active
		128	b7	Neutral detection failure at machine's power-on for lower console switches : Overriding switch is active (Not checked if platform emergency switch is pushed)
		256	b8	Neutral detection failure at machine's power-on for lower console switches : Platform rotation switch is active
		512	b9	Neutral detection failure at machine's power-on for lower console switches : Horn switch is active
		1024	b10	Neutral detection failure at machine's power-on for lower console switches : Beacon switch is active
		2048	b11	Neutral detection failure at machine's power-on for lower console switches : Emergency pump switch is active

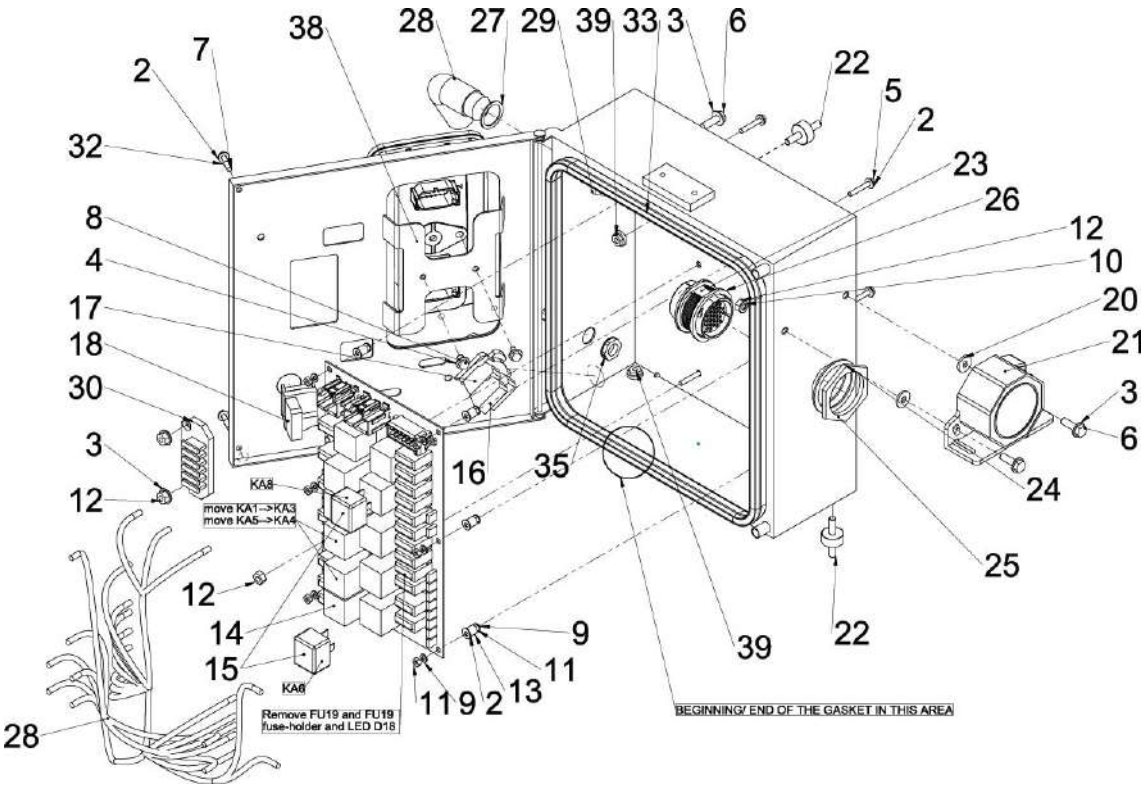
Failures	N	Dec	Bit	Description
Switches				
F13.11 **Switches neutral 2** Sw.: Upper box	A	1	b0	Neutral detection failure at machine's power-on for upper console switches : Steering rocker switch is active
		2	b1	Neutral detection failure at machine's power-on for upper console switches : Jib switch is active
		4	b2	Neutral detection failure at machine's power-on for upper console switches : Platform rotation switch is active
		8	b3	Neutral detection failure at machine's power-on for upper console switches : Platform level switch is active
		16	b4	Neutral detection failure at machine's power-on for upper console switches : Engine start/stop switch is active
		32	b5	Neutral detection failure at machine's power-on for upper console switches : Emergency pump switch is active
		64	b6	Neutral detection failure at machine's power-on for upper console switches : Horn switch is active
		128	b7	Neutral detection failure at machine's power-on for upper console switches : Differential lock switch is active
		256	b8	Neutral detection failure at machine's power-on for upper console switches : Foot Switch is active
		512	b9	Neutral detection failure at machine's power-on for upper console switches : Night and day is active

Failures	N	Dec	Bit	Description
CAN J1939				
F15.06 **Check CAN2** -	D			Problem detected in J1939 CAN Machine not supplied, with multimeter, check the resistance between 2001 (CAN high) and 2002 (CAN low) is nearly 60 Ω (if 0 Ω or 120 Ω : failure, check RES TERM connection for all ECUs) Check ECU supplies line Check CAN connection for Display and/or engine

2 - Legend

2.1 - PCB TURRET

Location on the machine



E - Trouble shooting and diagram

Location

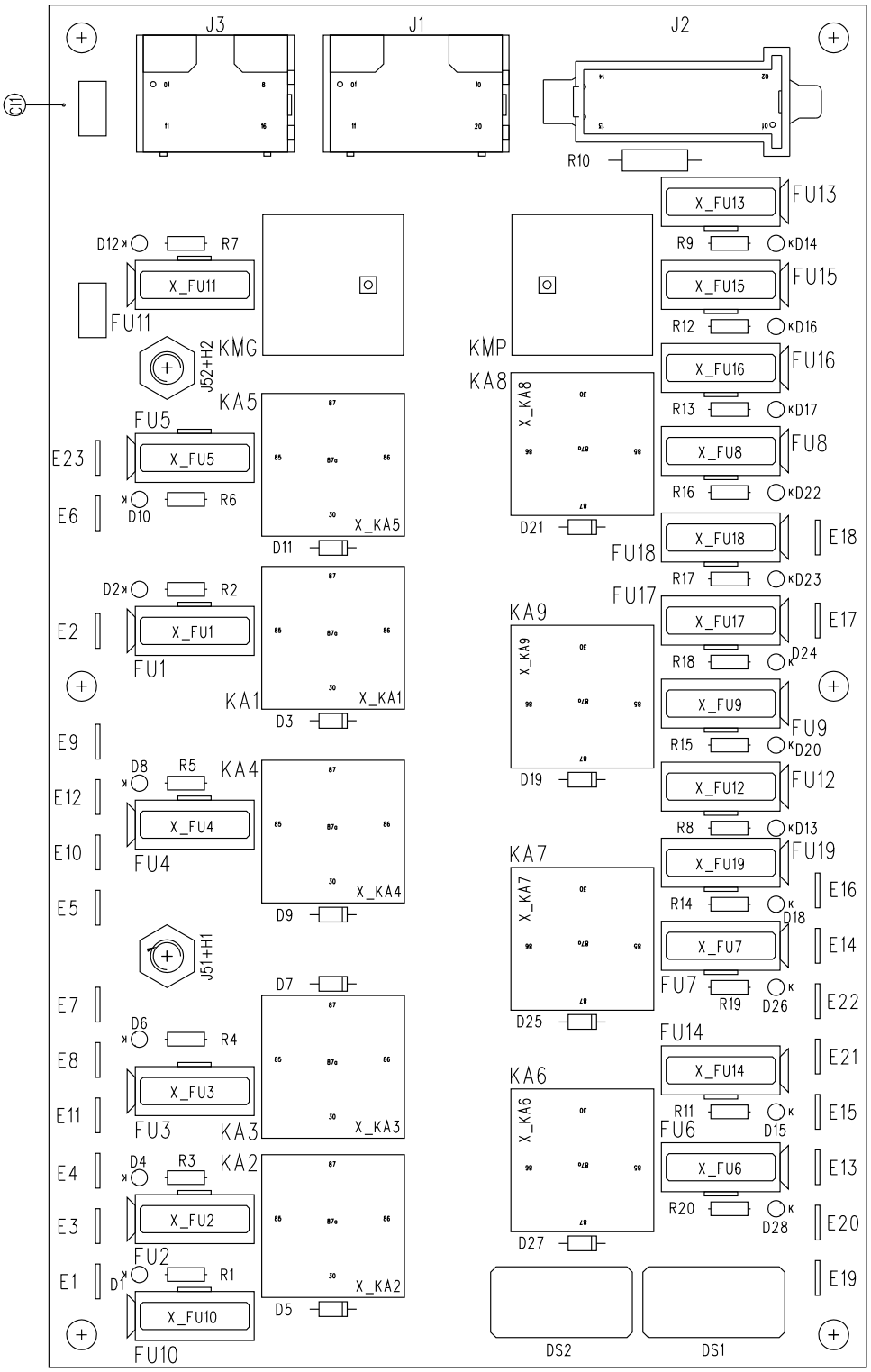


Diagram - 1/2

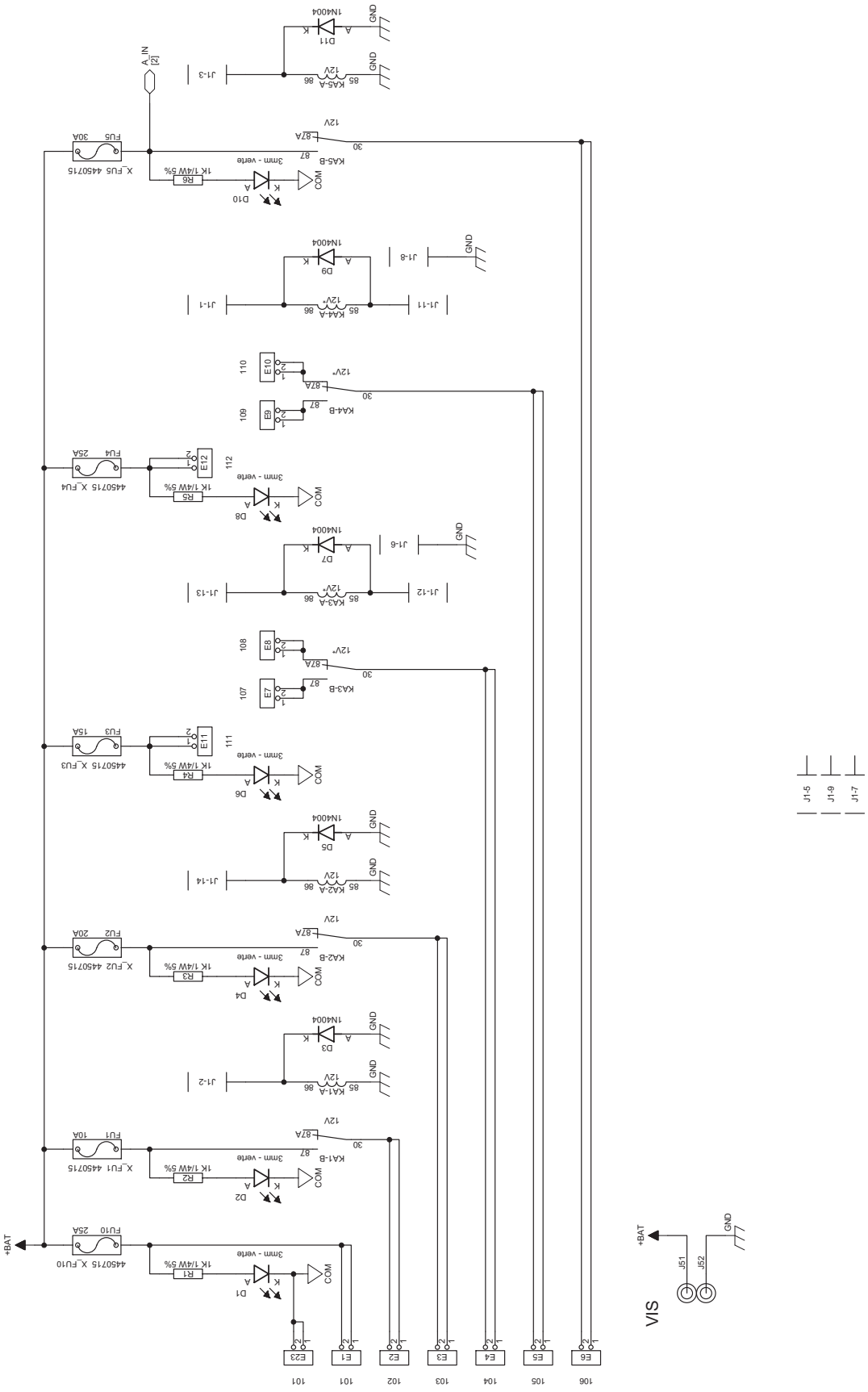
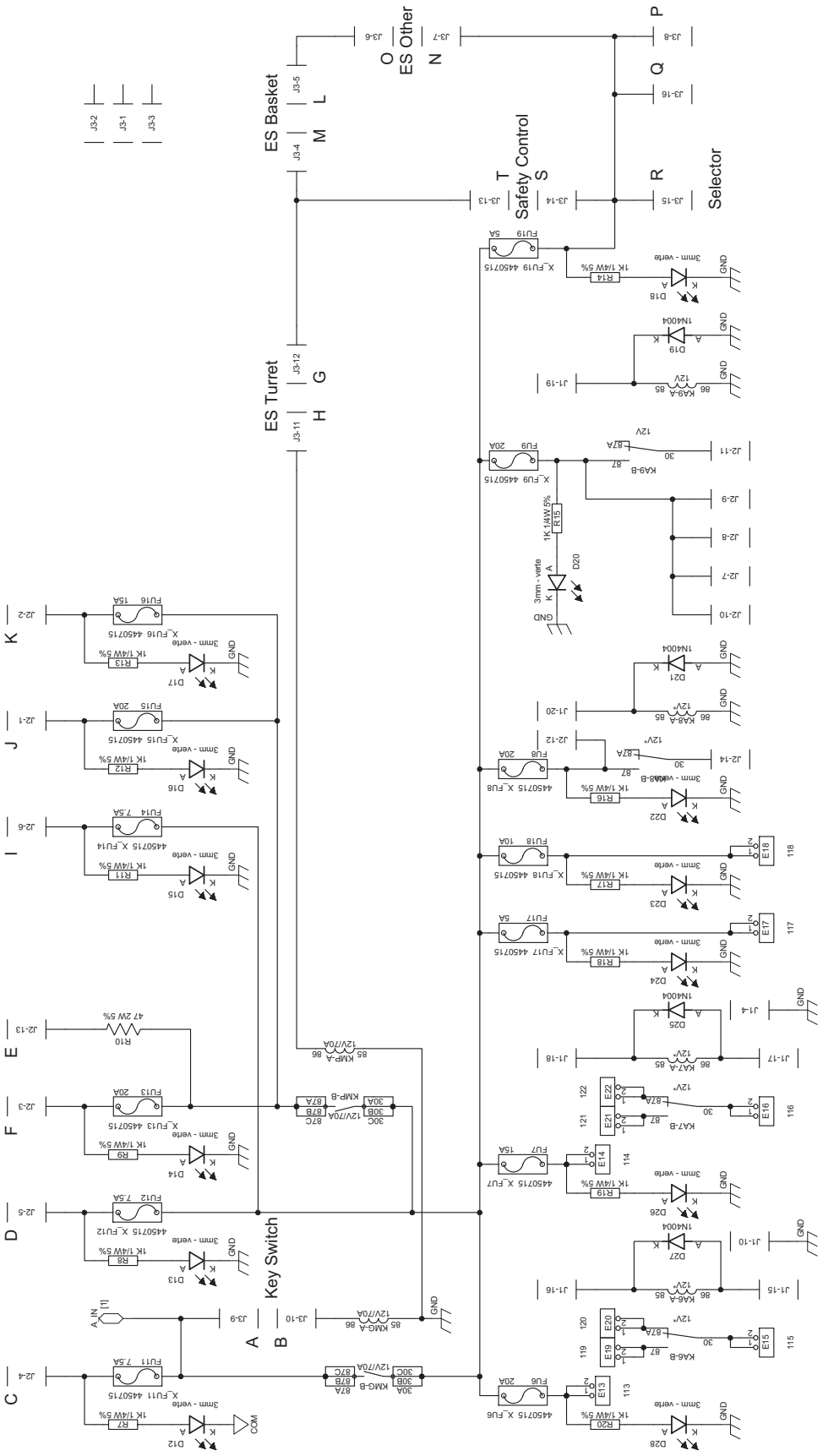

A IN
+BAT
GND
12V
1N4004
K
A
D11
D10
D9
D8
D7
D6
D5
D4
D3
D2
D1
K44-A
K43-A
K42-A
K41-A
K45-A
K45-B
K44-B
K43-B
K42-B
K41-B
85
86
87
87A
30
J1-3
J1-11
J1-12
J1-13
J1-14
J1-2
J1-1
J1-8
J1-6
J1-5
J1-9
J1-7
FU5 30A
FU4 25A
FU3 15A
FU2 20A
FU1 10A
FU10 25A
X_FU5 4450715
X_FU4 4450715
X_FU3 4450715
X_FU2 4450715
X_FU1 4450715
X_FU10 4450715
R6
R5
R4
R3
R2
R1
1K 1/4W 5%
3mm - verte
COM
E10
E9
E8
E7
E12
E11
E23
E1
E2
E3
E4
E5
E6
101
102
103
104
105
106
108
107
109
110
111
112
J51
J52
VIS

Diagram - 2/2


ES Other
ES Basket
ES Turret
Safety Control
Selector
Key Switch
Haulotte

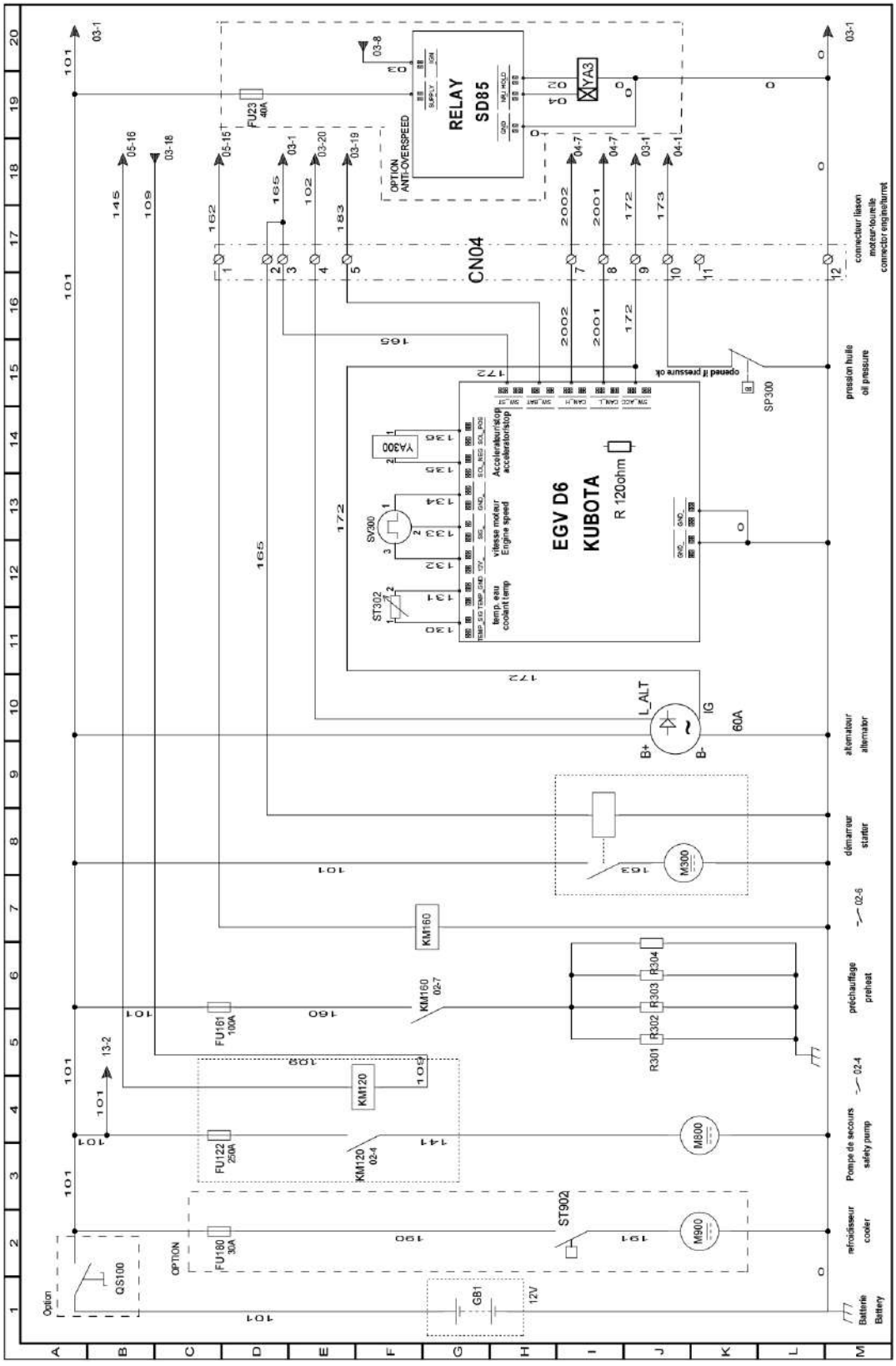
E - Trouble shooting and diagram

Machine switched on, the LED off near the fuse indicates that the fuse is defective.

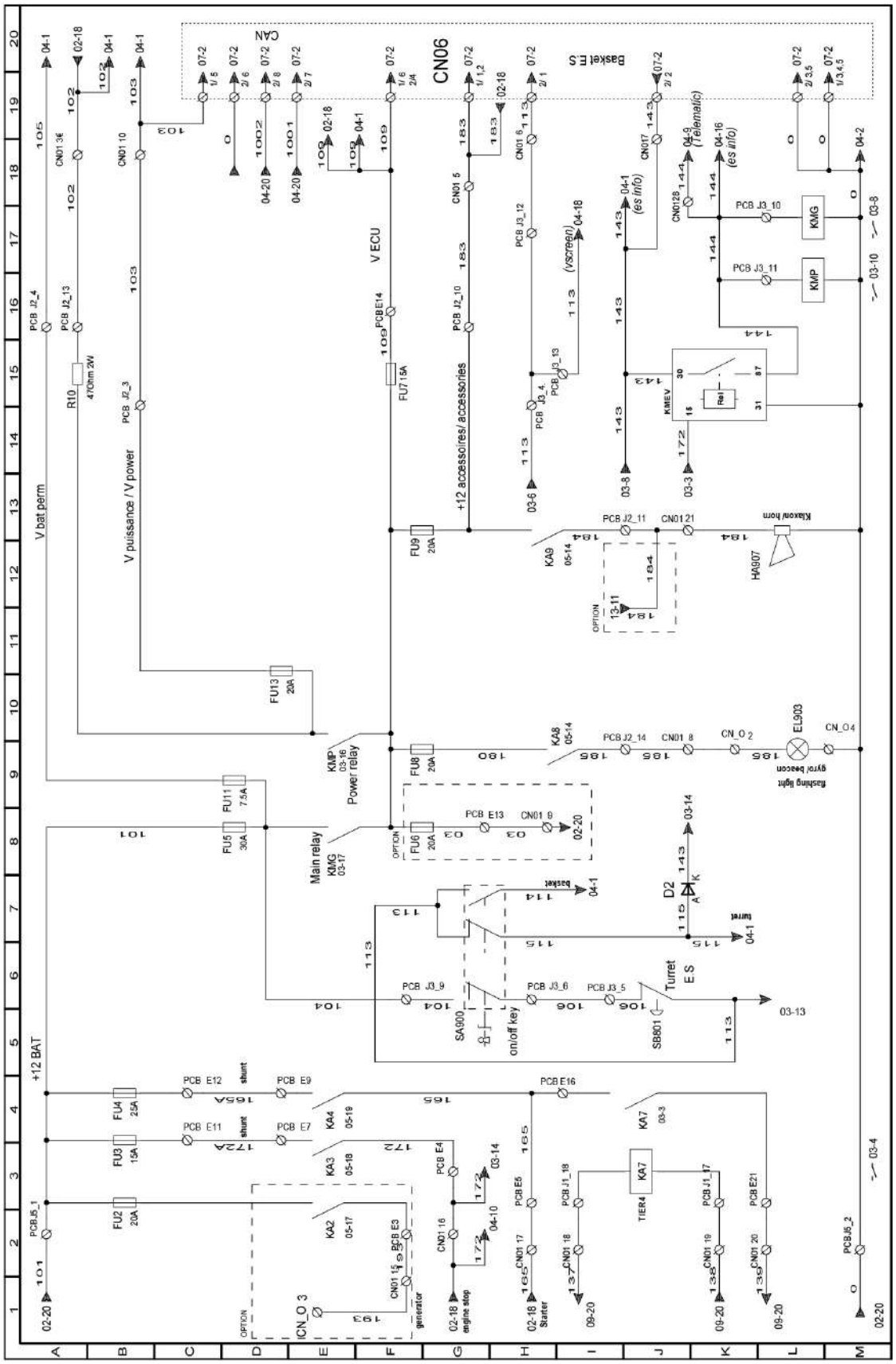
Marking	Description
FU1	Fuse -10 A - Engine shutdown
FU2	Fuse - 20A - Starter
FU3	Not used
FU4	Fuse - 25A - Generator
FU5	Fuse - 30A - General
FU6	Not used
FU7	Fuse - 15A - ECU
FU8	Fuse - 20A - Option
FU9	Fuse - 20A - Attachments
FU10	Not used
FU11	Fuse - 7.5A - + Permanent
FU12	Not used
FU13	Fuse - 20A - Power
FU14	Not used
FU15	Not used
FU16	Not used
FU17	Not used
FU18	Not used
FU19	Fuse - 5A - Emergency stop and selectors
KA1	Relay - 1RT - 12V - Engine shutdown
KA2	Relay - 1RT - 12V
KA3	Solenoid valve
KA4	General
KA5	Relay - 1RT - 12V - Engine speed
KA9	Relay - 1RT - 12V - Horn
KMG	Relay - 1T - 12V/70A - Main relay
KMP	Relay - 1T - 12V/70A - Power

3 - Electric diagram

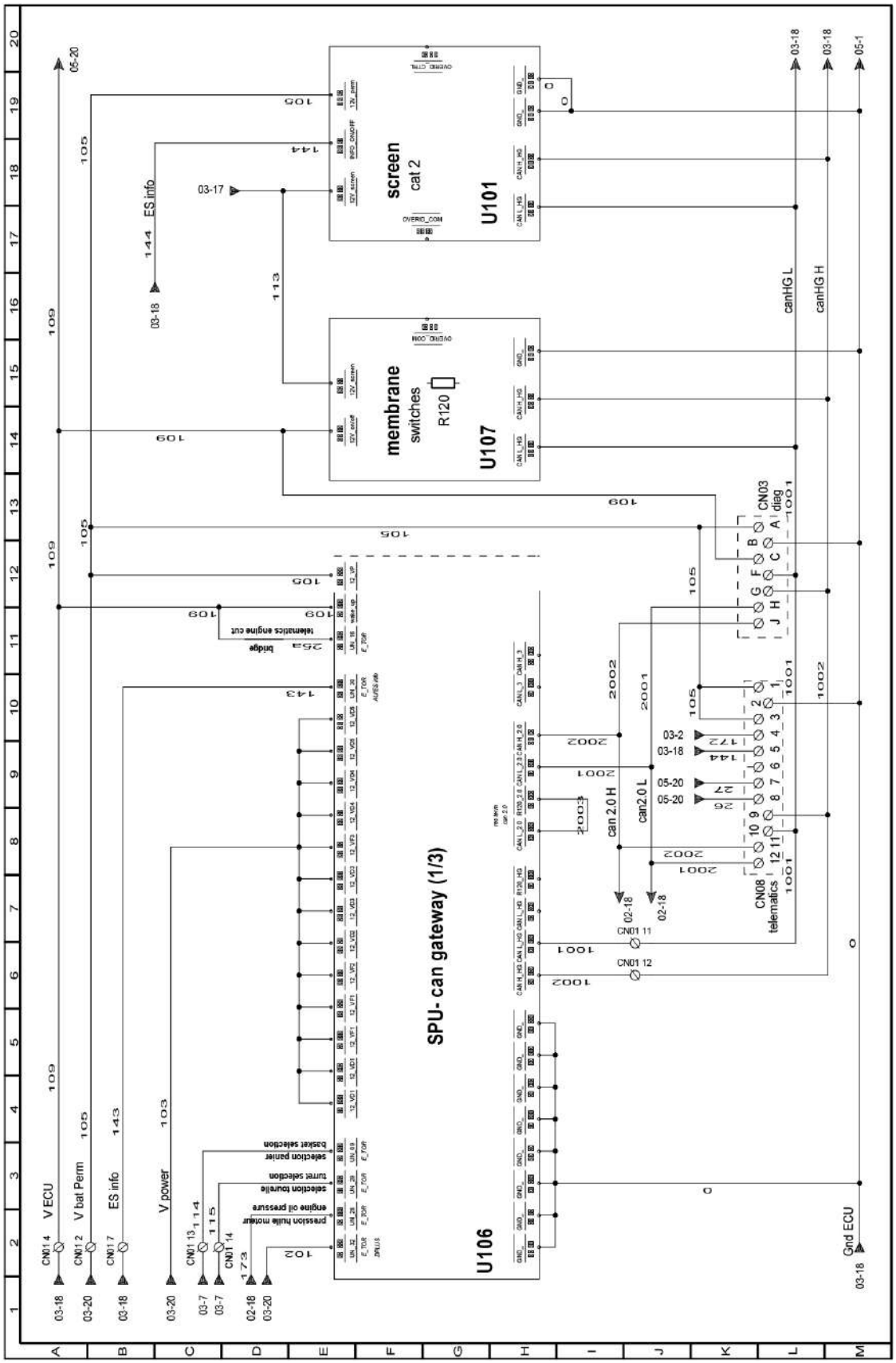
Engine part - Tiers 3 - 4000427470H - folio 2



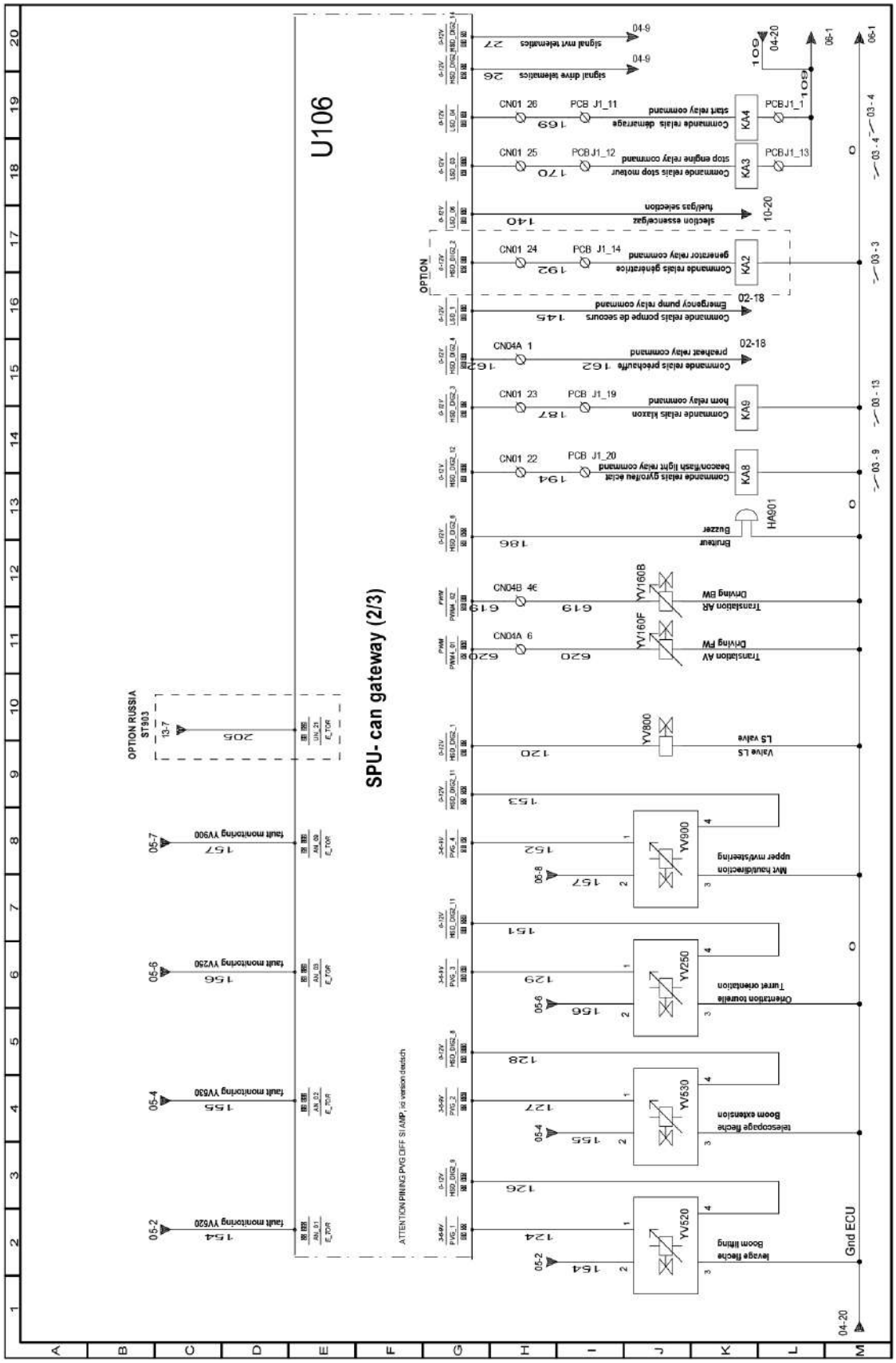
Turntable part - PCB - 4000427470H - folio 3



Turntable part - SPU 1/3 + CLUSTER - 4000427470H - folio 4

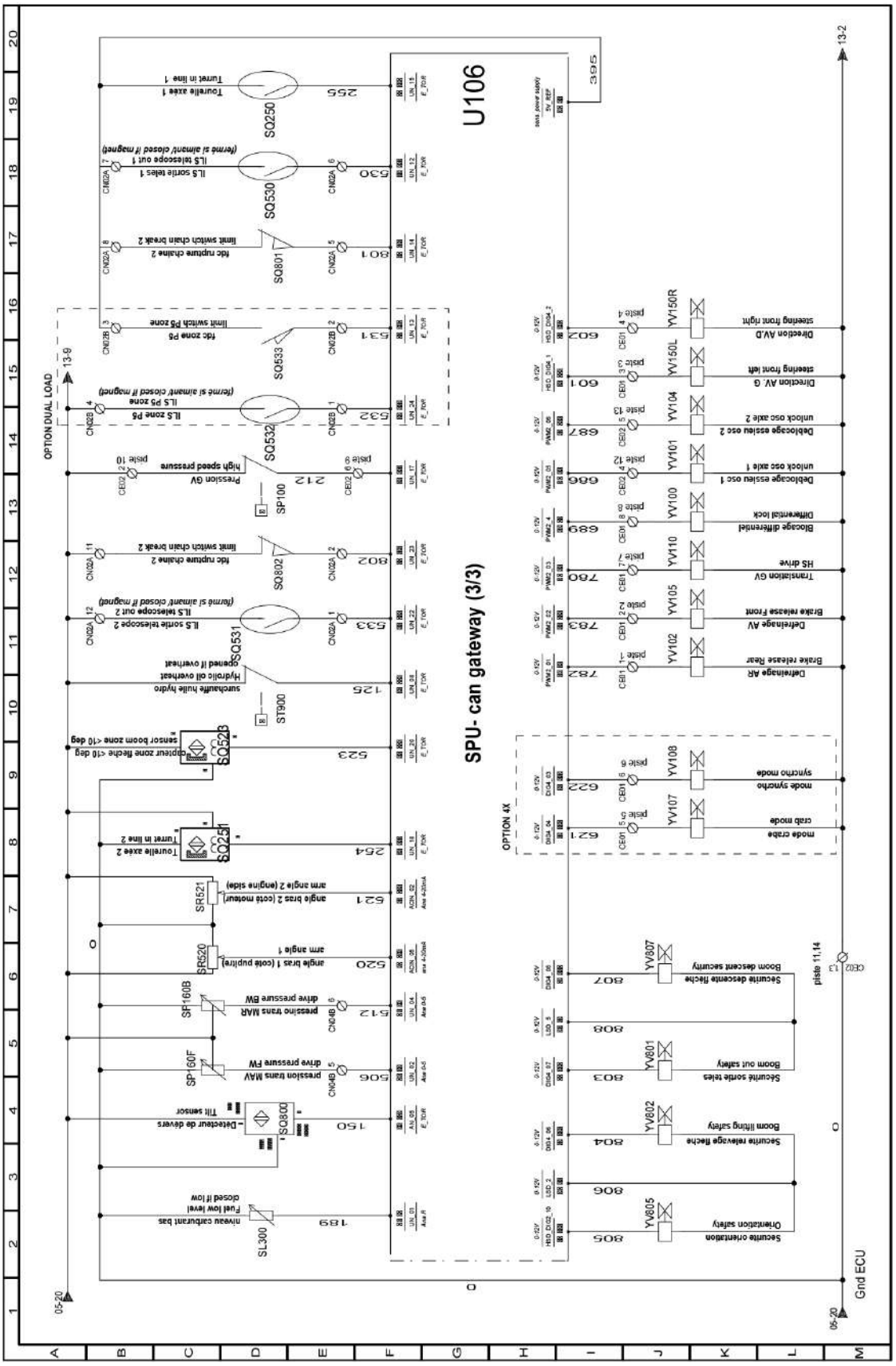


Turntable part - SPU 2/3 - 4000427470H - folio 5



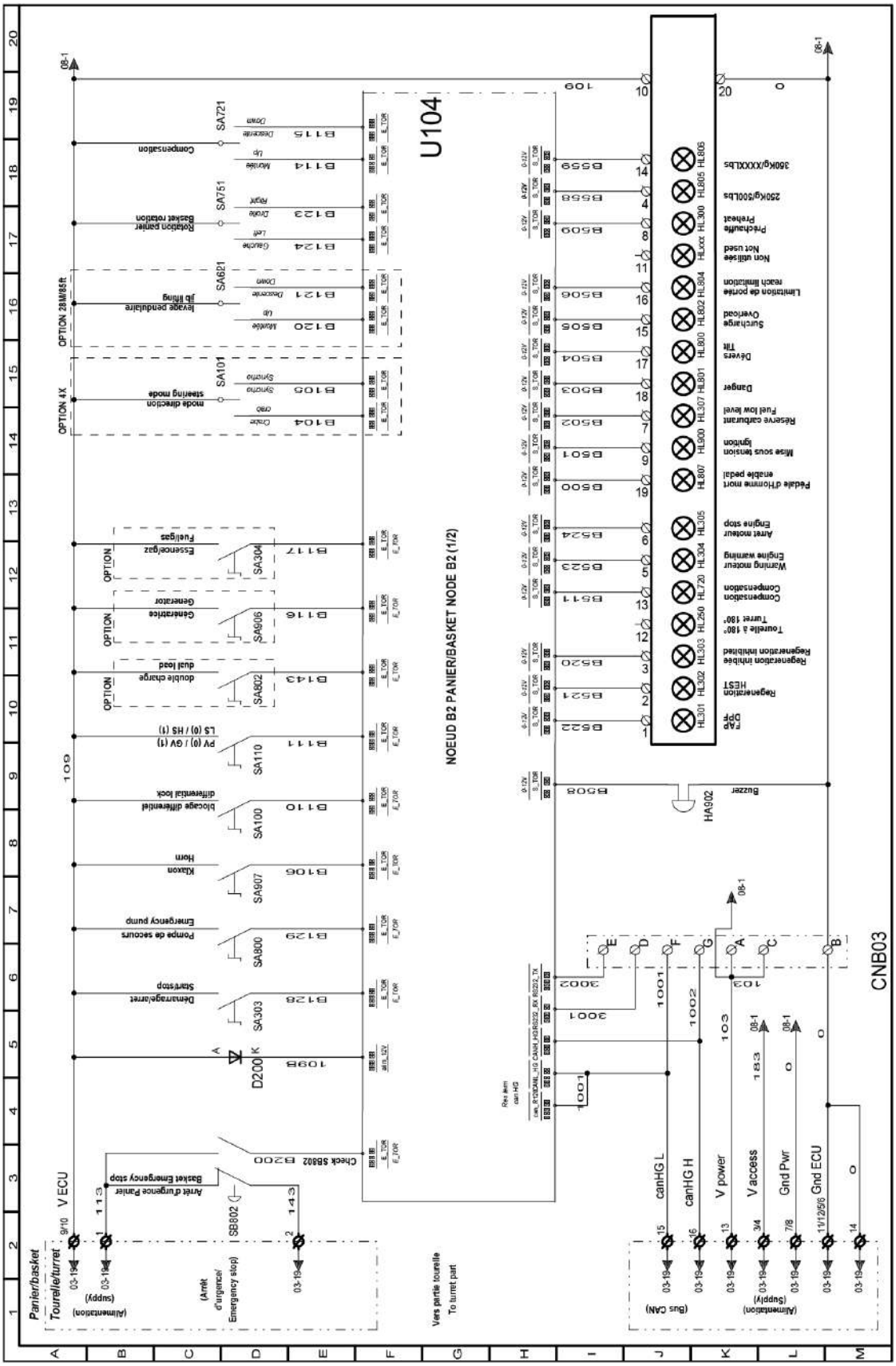
E - Trouble shooting and diagram

Turntable part - SPU 3/3 - 4000427470H - folio 6



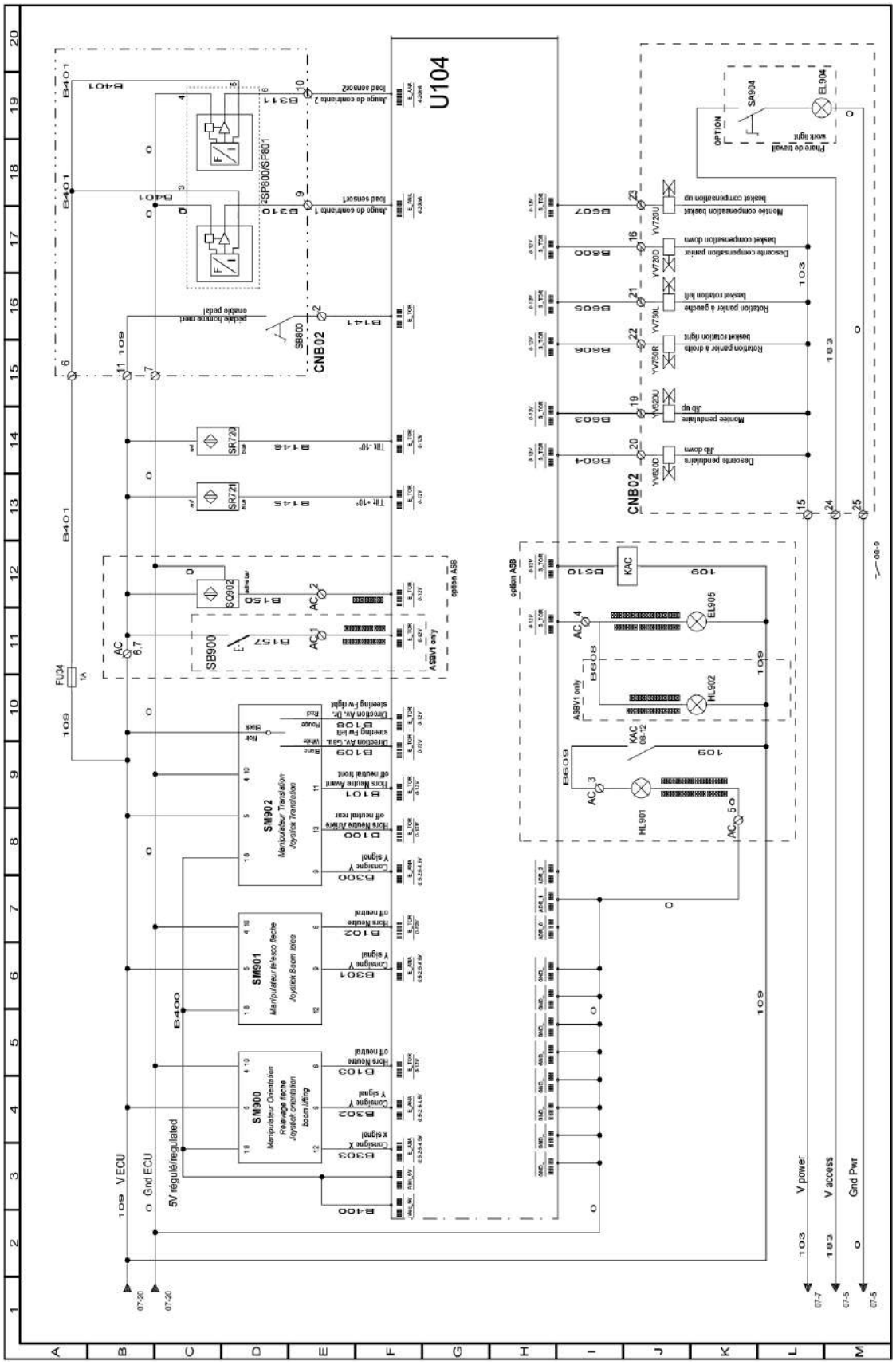
E - Trouble shooting and diagram

Cage part - Noeud B - B Node 1/2 - 4000427470H - folio 7

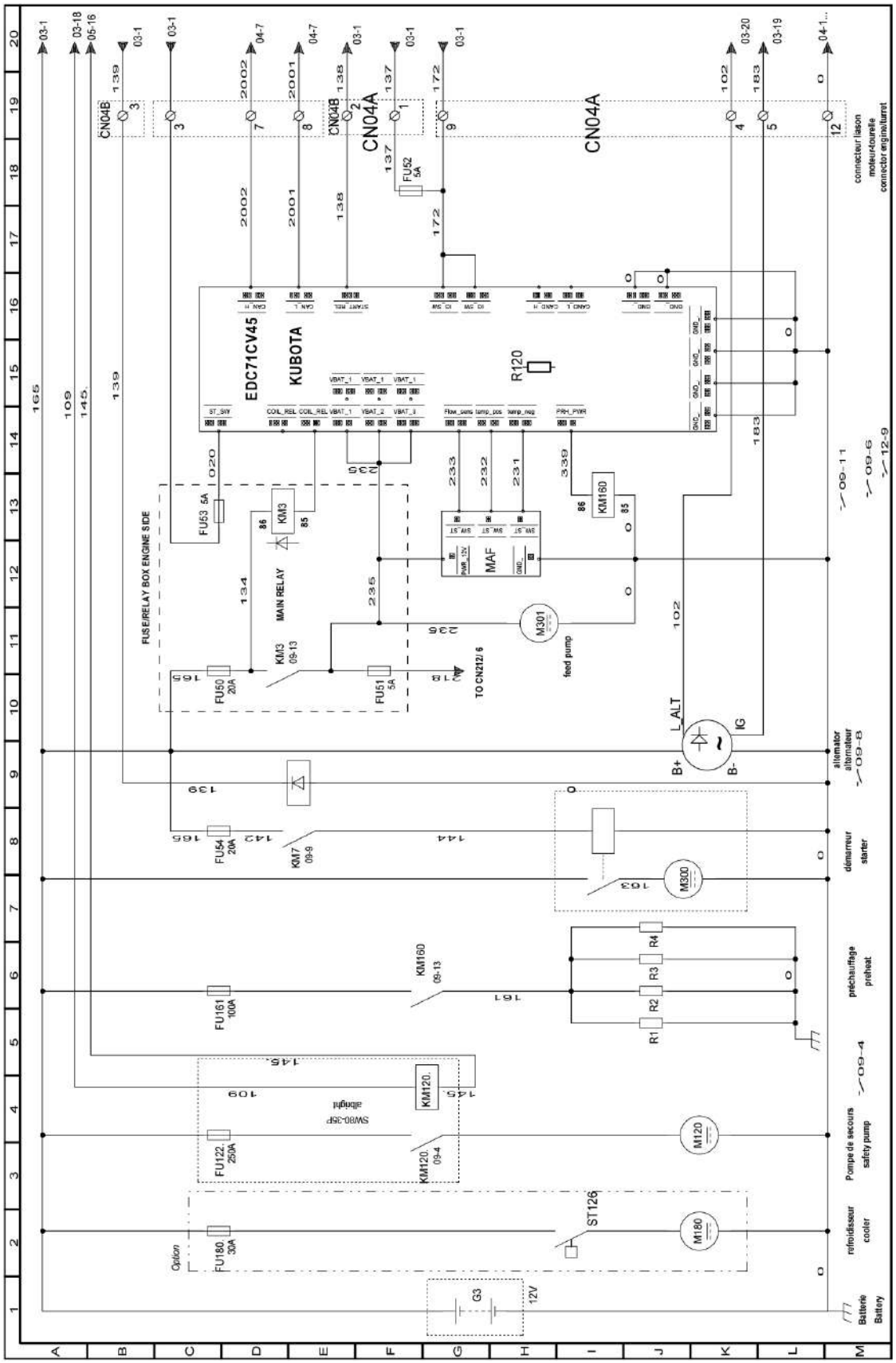


E - Trouble shooting and diagram

Cage part - Noeud B - B Node 2/2 - 4000427470H - folio 8

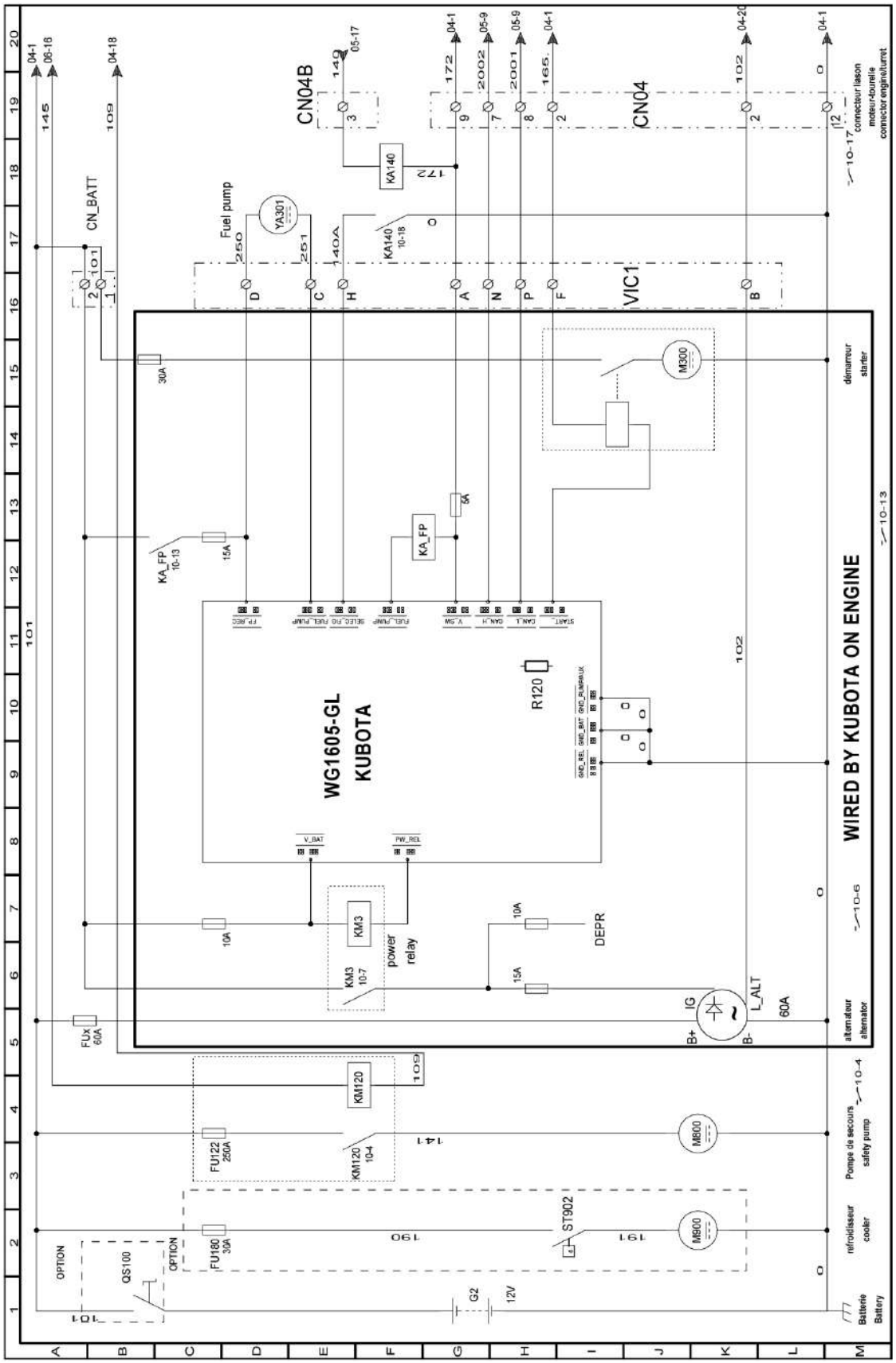


Engine part - Tiers 4 - 4000427470H - folio 9

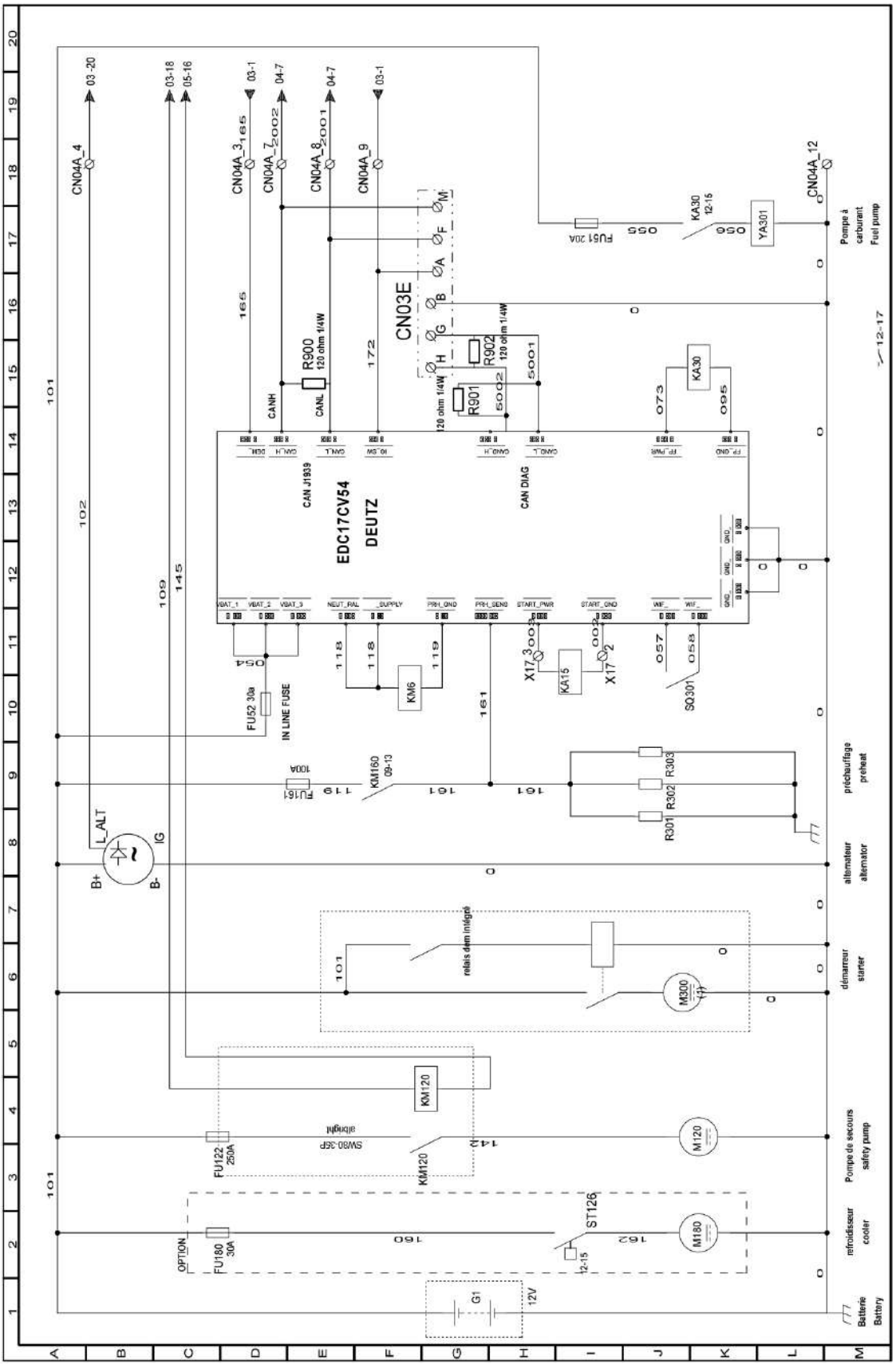


E - Trouble shooting and diagram

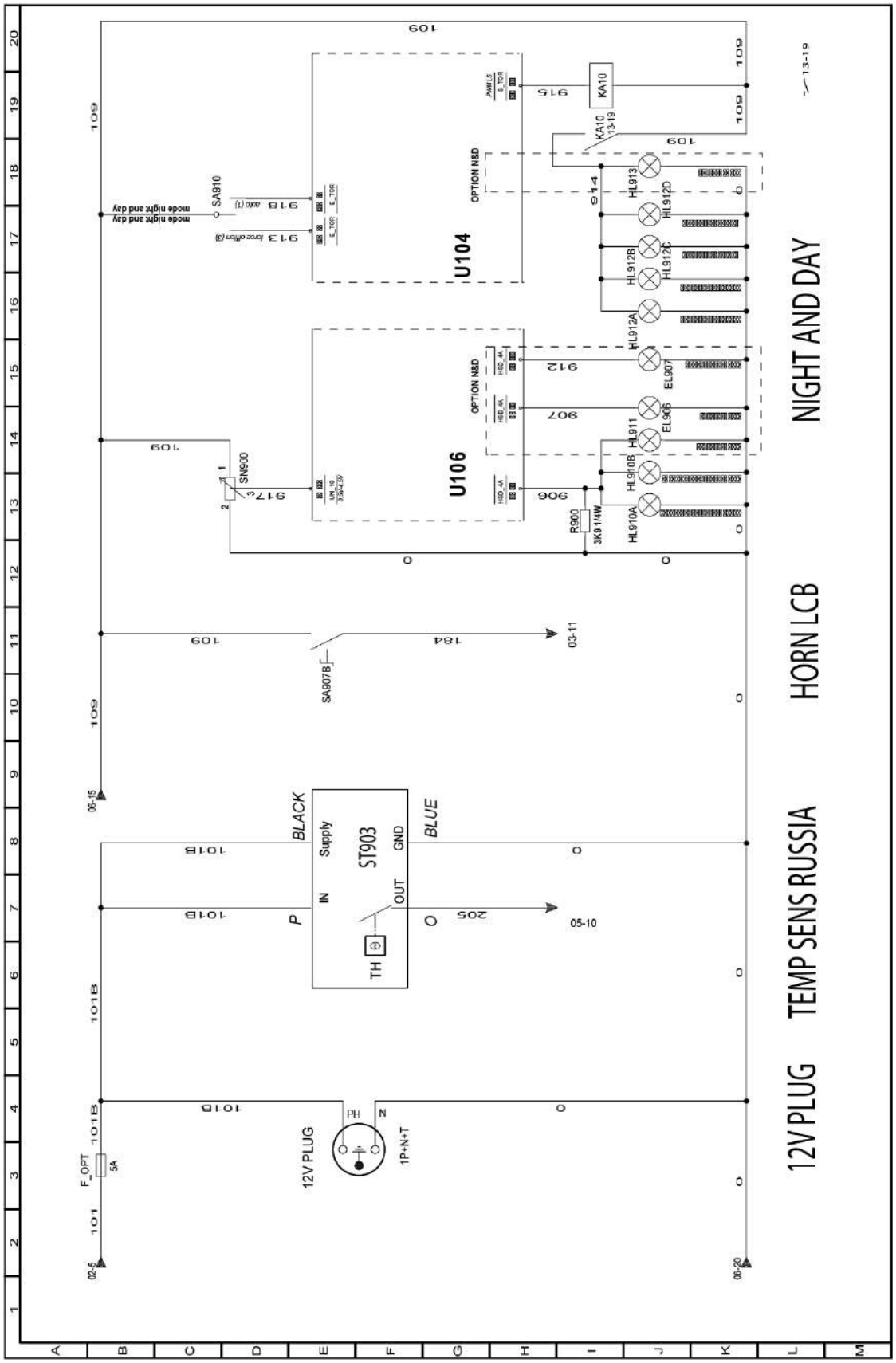
Engine part-Petrol/gas 4000427470H - folio 10



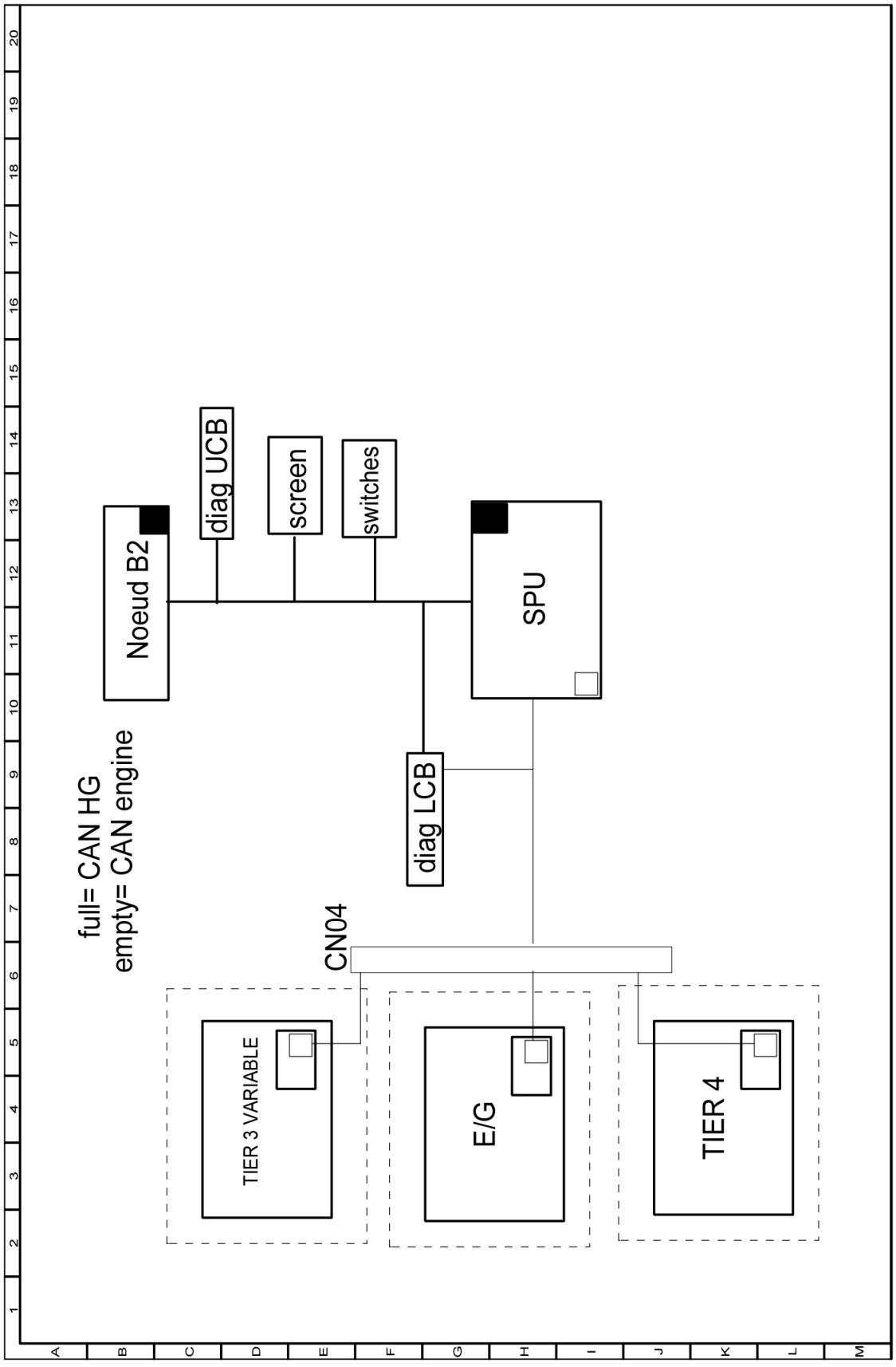
Engine part 4000427470H - folio 12



Options 4000427470H - folio 13



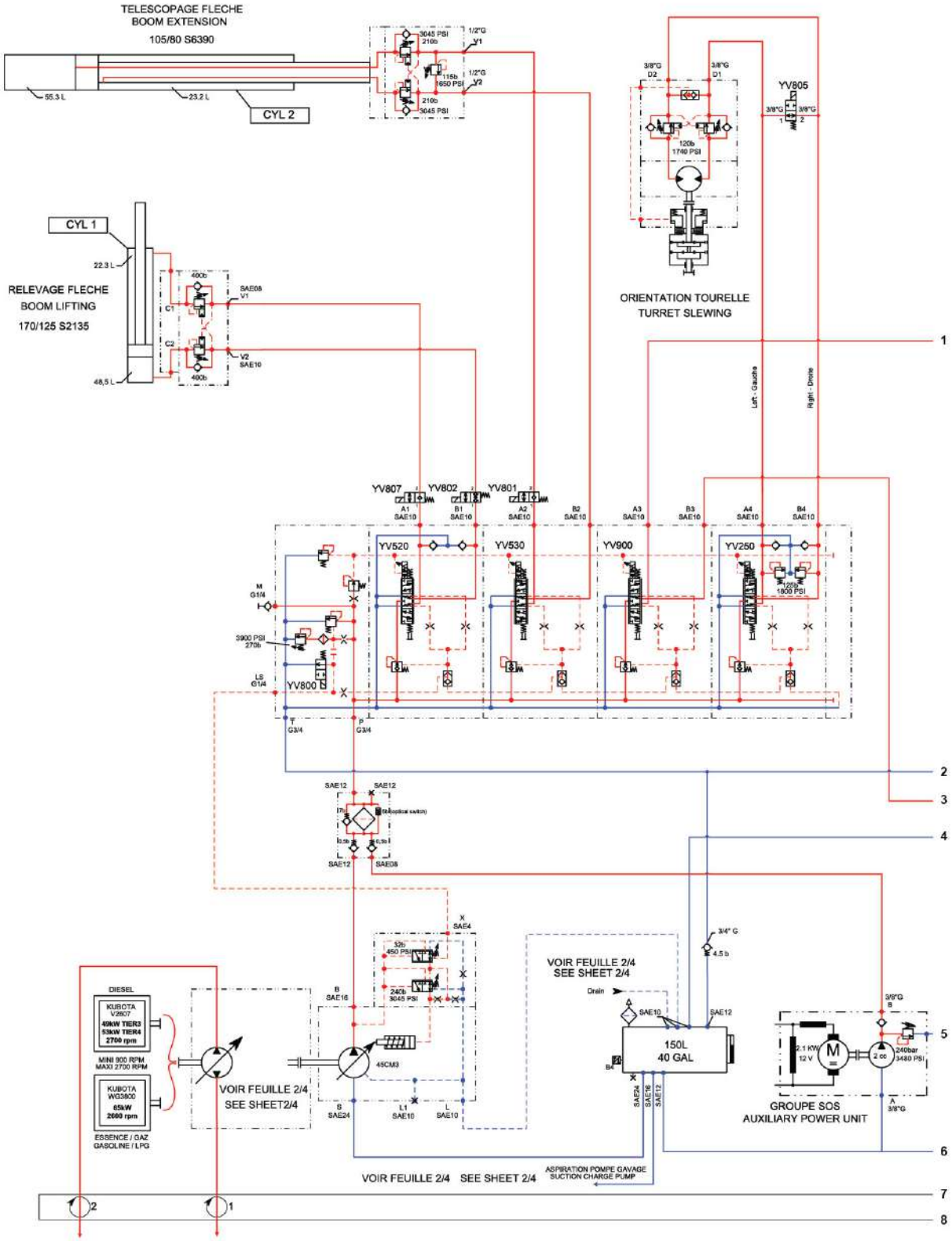
System architecture 4000427470H - folio 14



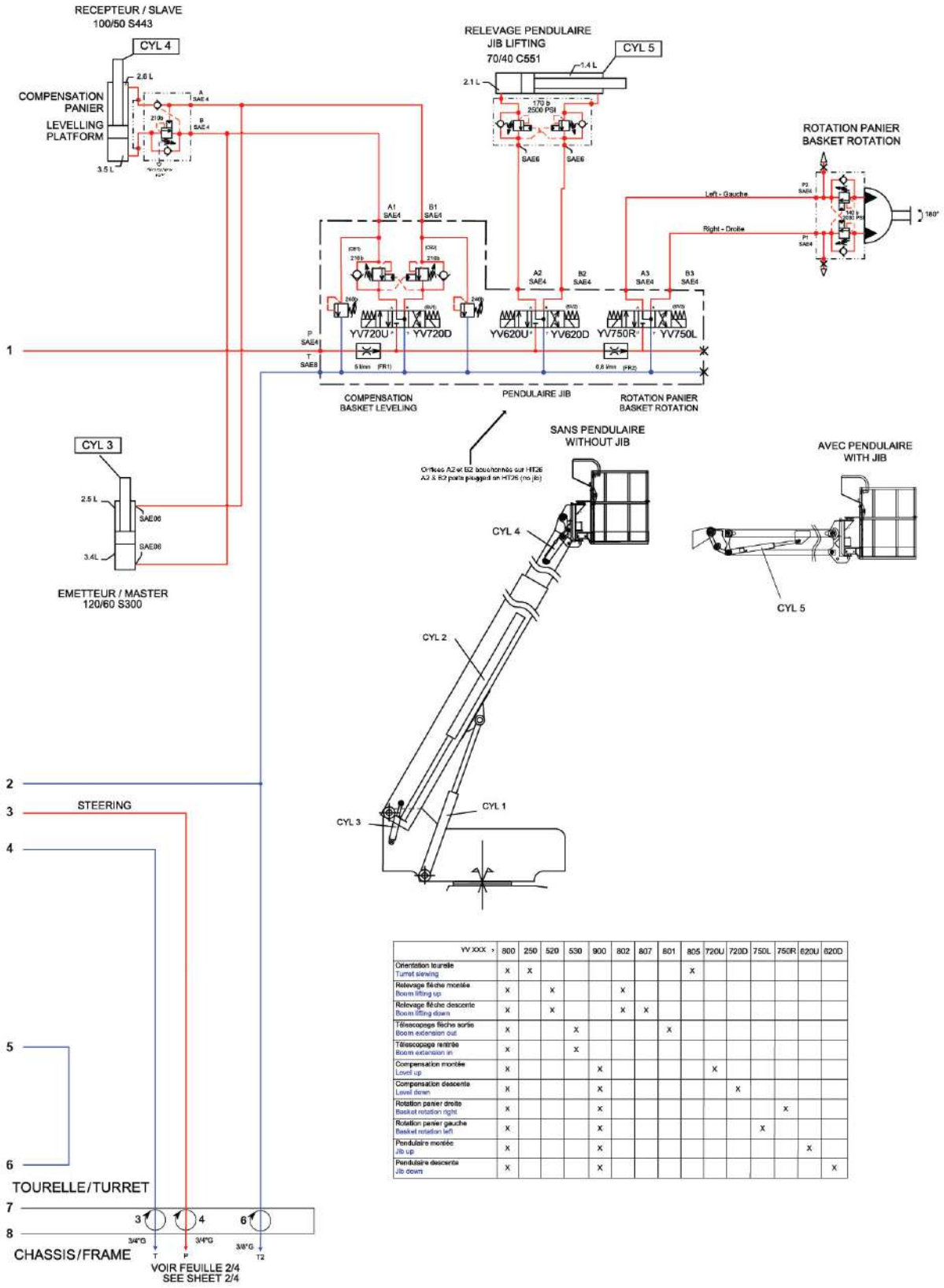
Notes

4 - Hydraulic diagram

Lower part-Sheet 1 - HT26 RT O - HT26 RT O SW - HT28 RTJ O - HT28 RTJ O SW - HT80 RT O - HT85 RTJ O - 4000421170B - 1/2

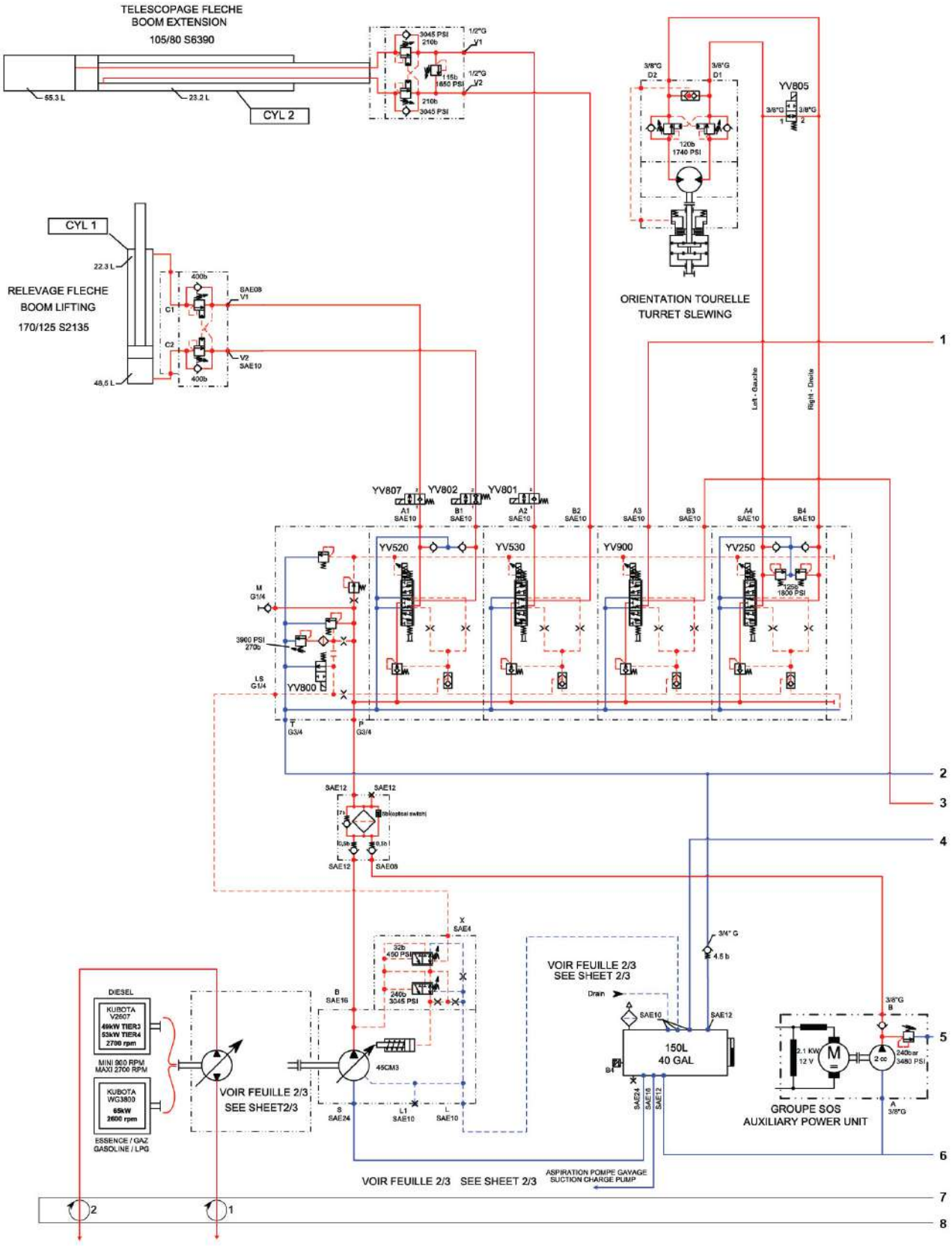


Lower part-Sheet 1 - HT26 RT O - HT26 RT O SW - HT28 RTJ O - HT28 RTJ O SW - HT80 RT O - HT85 RTJ O - 4000421170B - 2/2



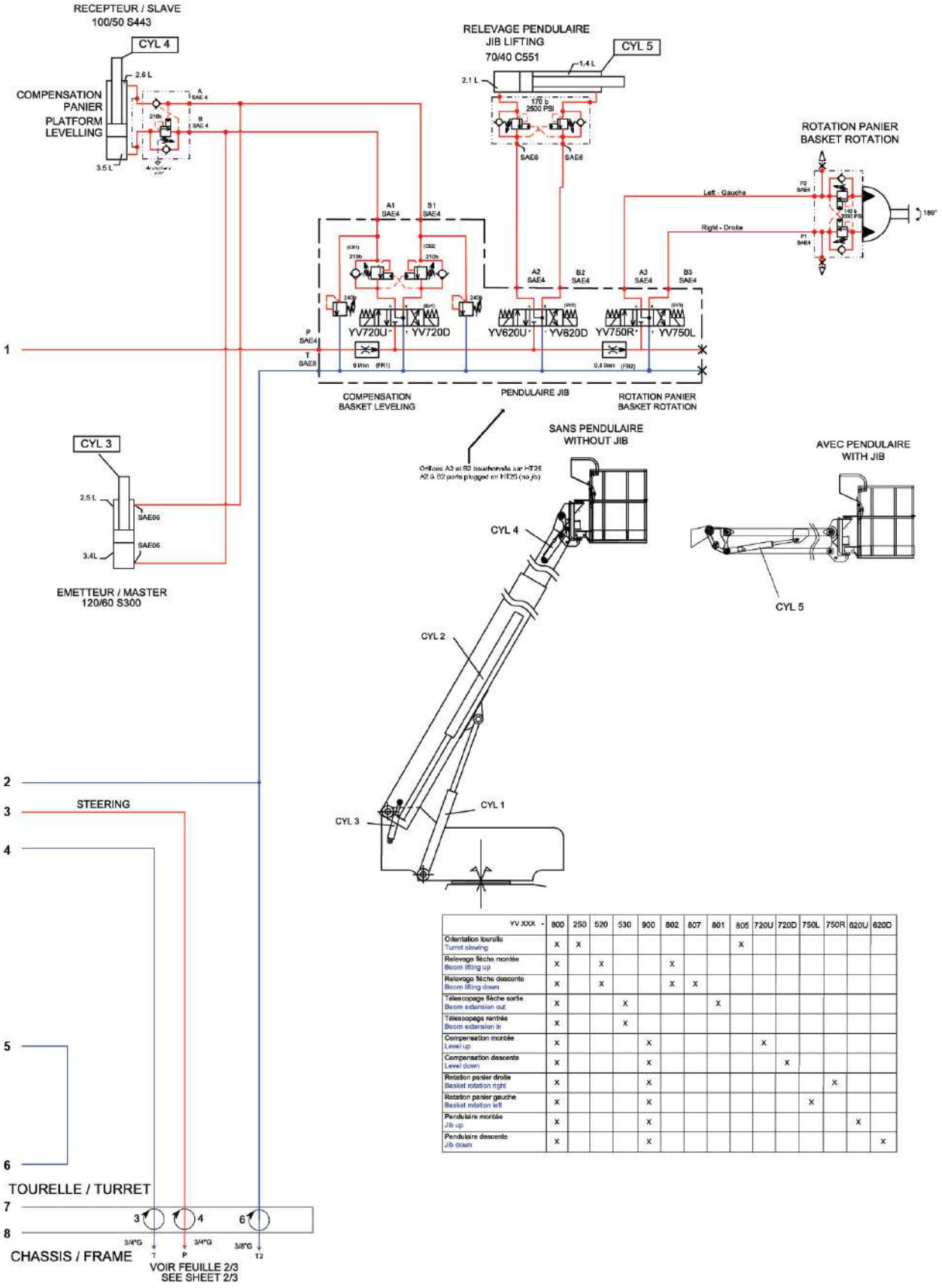
YV XXX	800	250	520	530	900	802	807	801	805	720U	720D	750L	750R	620U	620D
Orientation tourelle Turret slewing	X	X							X						
Relevage flèche montée Boom lifting up	X		X			X									
Relevage flèche descente Boom lifting down	X		X			X	X								
Télescopage flèche sortie Boom extension out	X			X				X							
Télescopage rentrée Boom extension in	X			X											
Compensation montée Level up	X				X					X					
Compensation descente Level down	X				X						X				
Rotation panier droite Basket rotation right	X				X								X		
Rotation panier gauche Basket rotation left	X				X							X			
Pendulaire montée Jib up	X				X									X	
Pendulaire descente Jib down	X				X										X

Lower part-Sheet 1 - HT28 RTJ PRO - HT28 RTJ PRO SW - HT85 RTJ PRO - 4000506180C - 1/2



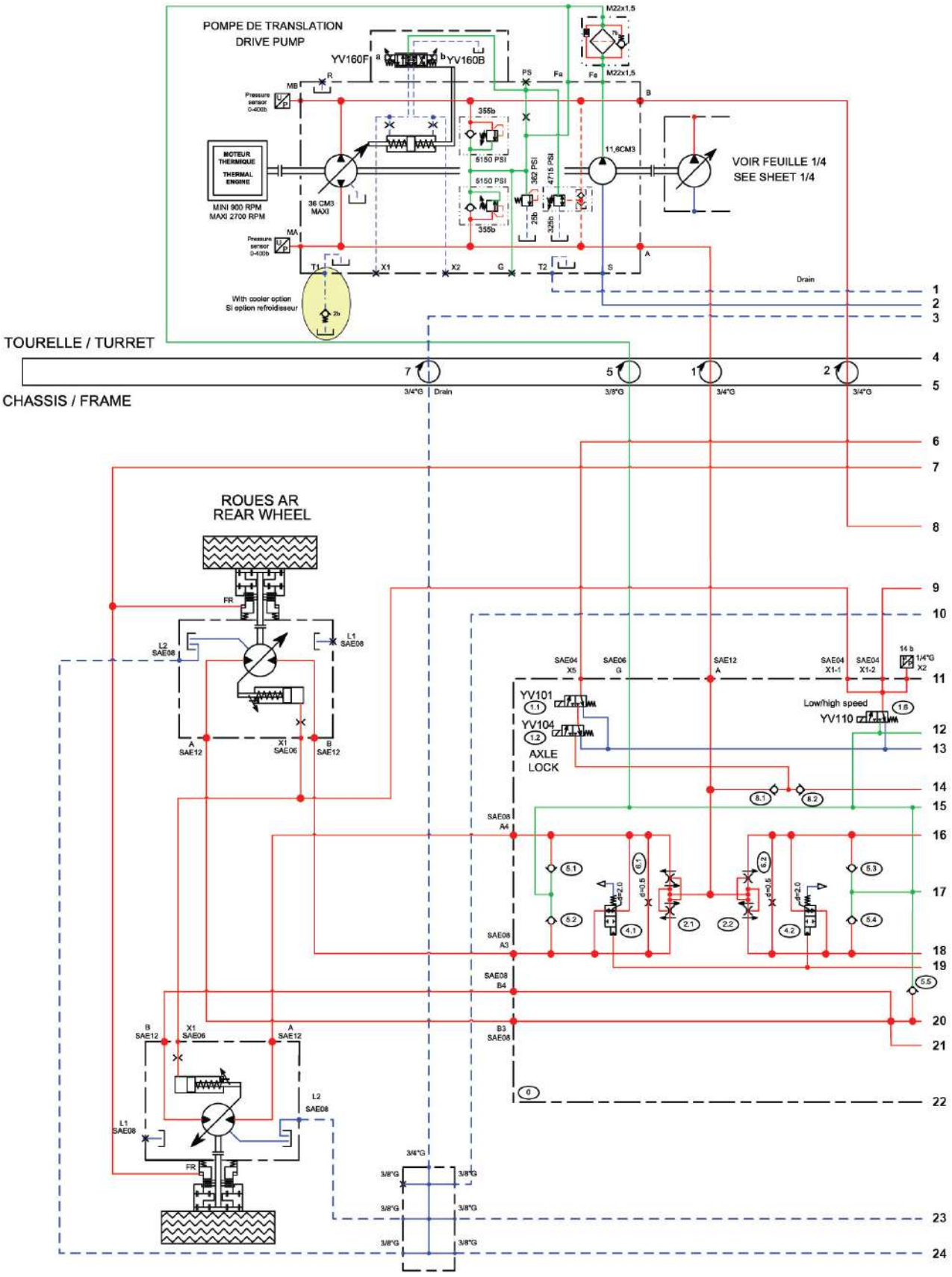
E - Trouble shooting and diagram

Lower part-Sheet 1 - HT28 RTJ PRO - HT28 RTJ PRO SW - HT85 RTJ PRO - 4000506180C - 2/2

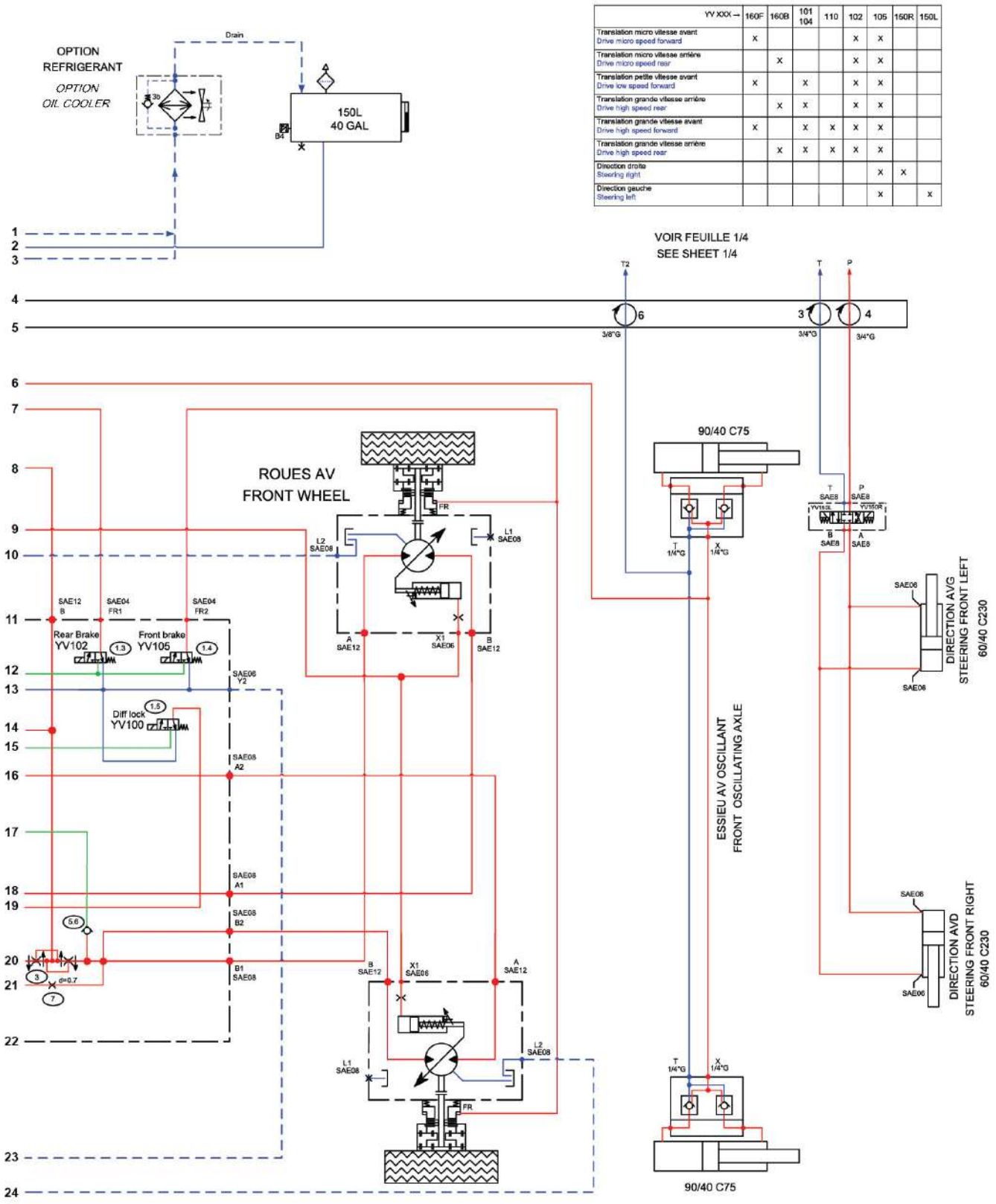


YV XXX	800	250	520	530	900	802	807	801	805	720U	720D	750L	750R	620U	620D
Orientation tourelle Turret slewing	x	x							x						
Relevage flèche montée Boom lifting up	x		x			x									
Relevage flèche descente Boom lifting down	x		x			x	x								
Télescopage flèche sortie Boom extension out	x			x				x							
Télescopage rentrée Boom extension in	x			x											
Compensation montée Level up	x				x					x					
Compensation descente Level down	x				x						x				
Rotation panier droite Basket rotation right	x				x								x		
Rotation panier gauche Basket rotation left	x				x							x			
Pendulaire montée Jib up	x				x									x	
Pendulaire descente Jib down	x				x										x

Upper section-Sheet 2 - HT26 RT O - HT26 RT O SW - HT28 RTJ O - HT28 RTJ O SW - HT80 RT O - HT85 RTJ O - 4000421170B - 1/2

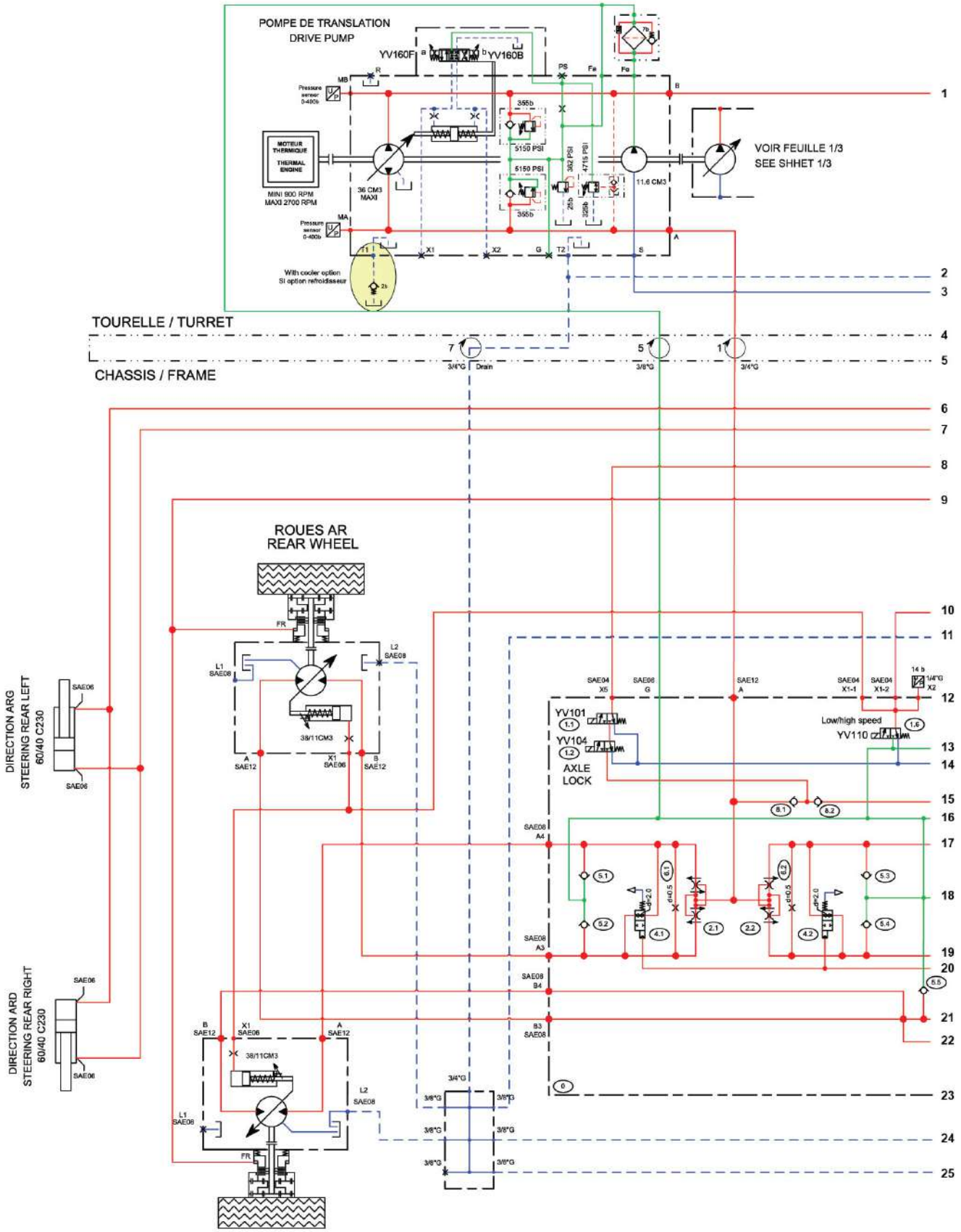


Upper section-Sheet 2 - HT26 RT O - HT26 RT O SW - HT28 RTJ O - HT28 RTJ O SW - HT80 RT O - HT85 RTJ O - 4000421170B - 2/2



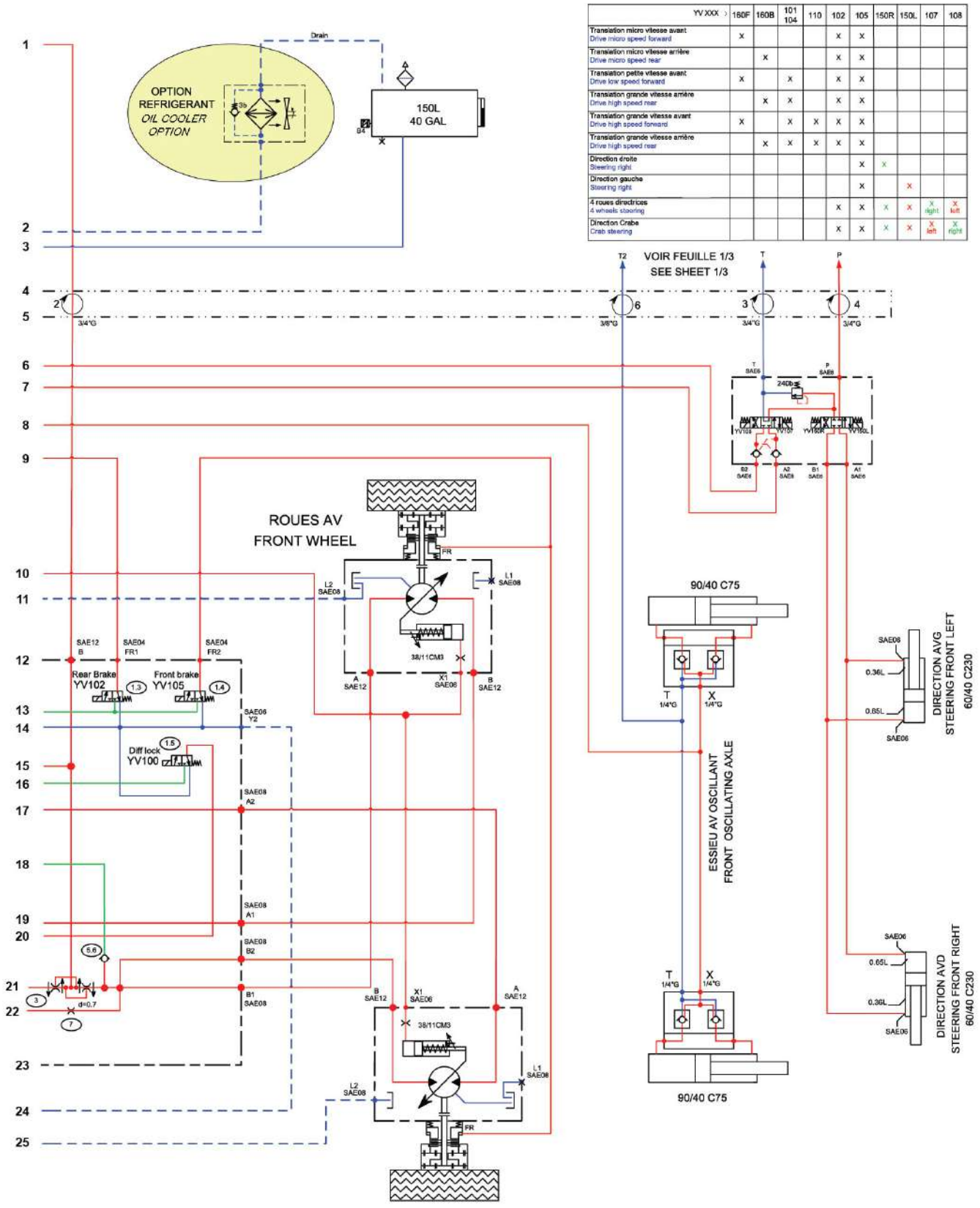
YV XXX →	160F	160B	101 104	110	102	105	150R	150L
Translation micro vitesse avant Drive micro speed forward	x				x	x		
Translation micro vitesse arrière Drive micro speed rear		x			x	x		
Translation petite vitesse avant Drive low speed forward	x		x		x	x		
Translation grande vitesse arrière Drive high speed rear		x	x		x	x		
Translation grande vitesse avant Drive high speed forward	x		x	x	x	x		
Translation grande vitesse arrière Drive high speed rear		x	x	x	x	x		
Direction droite Steering right						x	x	
Direction gauche Steering left						x		x

Upper section-Sheet 2 - HT28 RTJ PRO - HT28 RTJ PRO SW - HT85 RTJ PRO - 4000506180C - 1/2

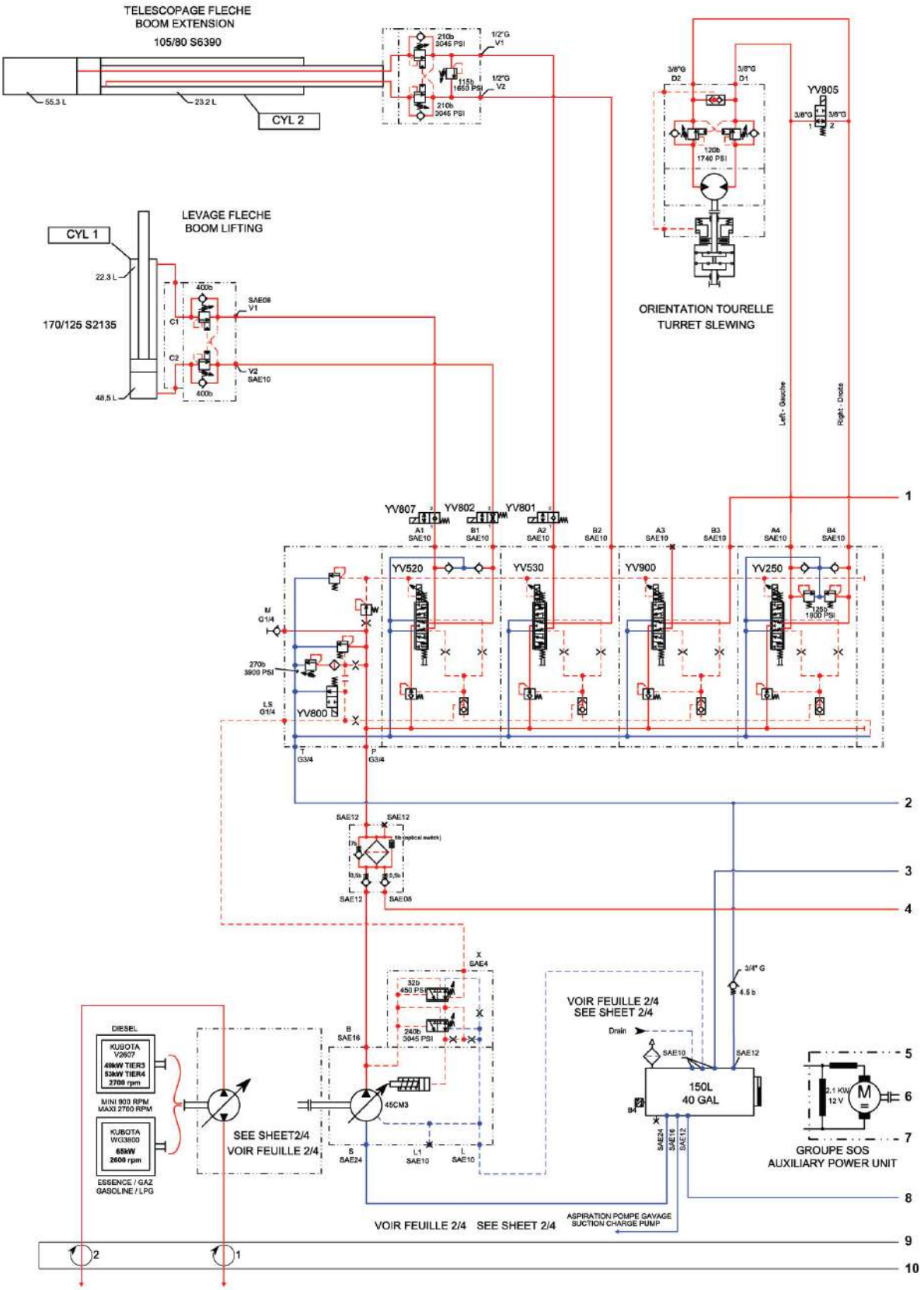


E - Trouble shooting and diagram

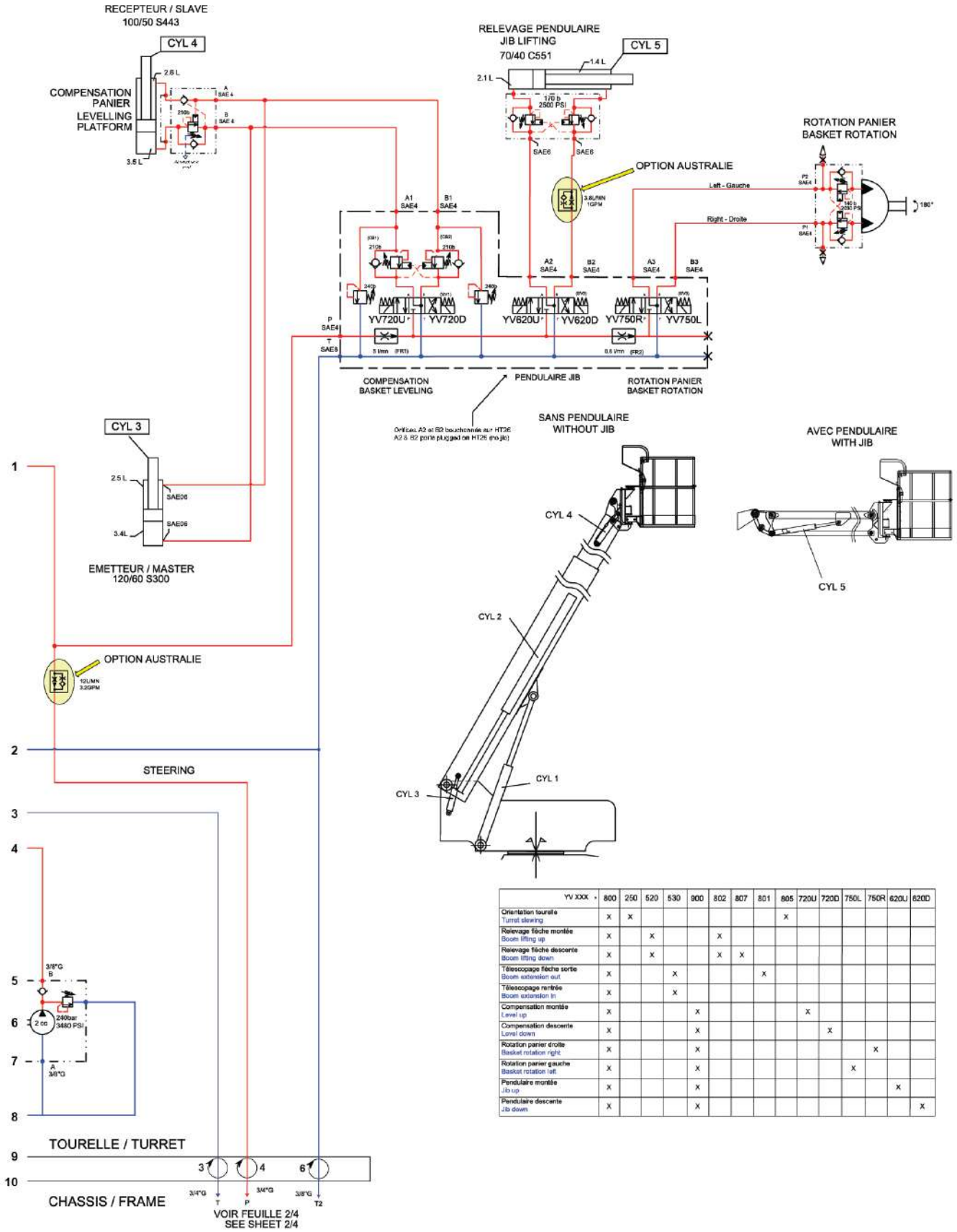
Upper section-Sheet 2 - HT28 RTJ PRO - HT28 RTJ PRO SW - HT85 RTJ PRO - 4000506180C - 2/2



Option Australia-Sheet 3 - HT26 RT O - HT26 RT O SW - HT28 RTJ O - HT28 RTJ O SW - HT80 RT O - HT85 RTJ O - 4000421170B - 1/2

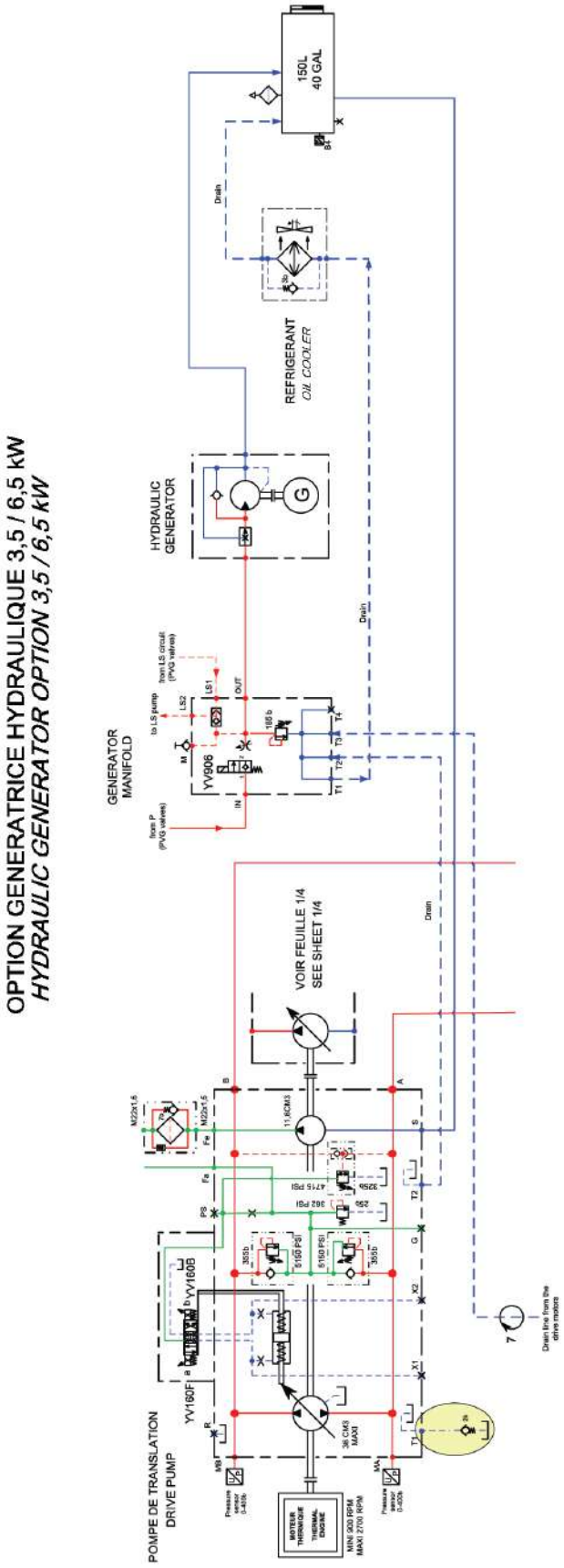


Option Australia-Sheet 3 - HT26 RT O - HT26 RT O SW - HT28 RTJ O - HT28 RTJ O SW - HT80 RT O - HT85 RTJ O - 4000421170B - 2/2

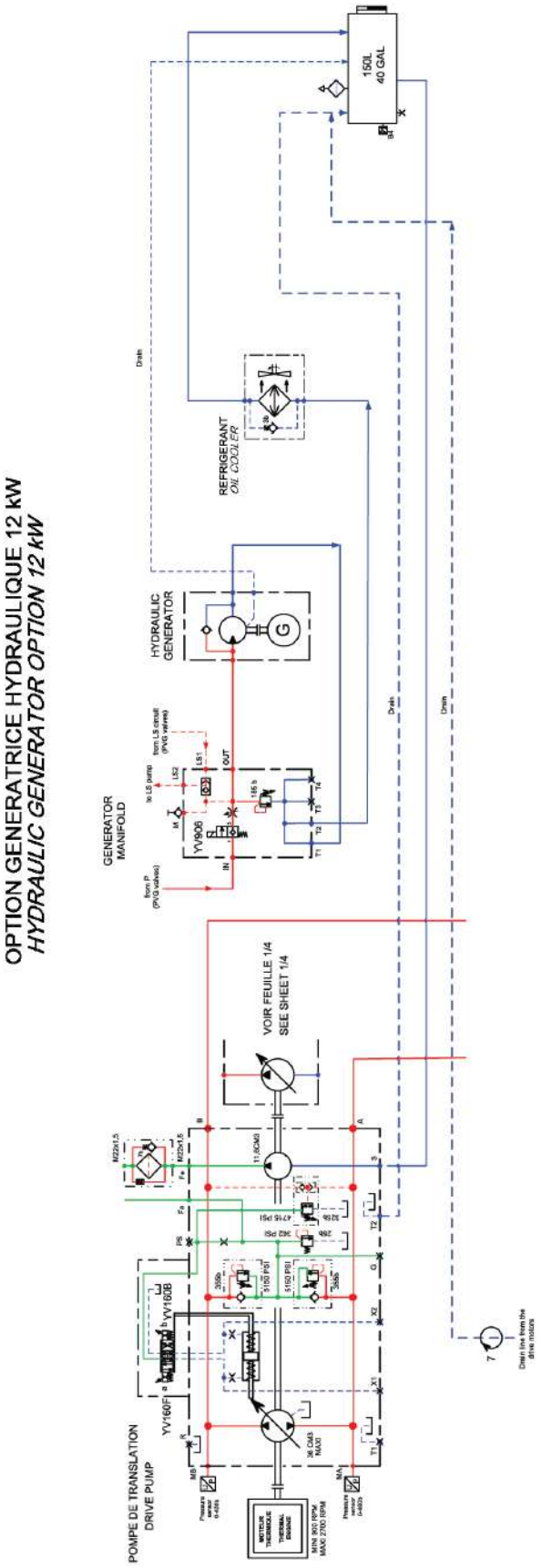


YV XXX	800	250	520	530	900	802	807	801	805	720U	720D	750L	750R	620U	620D
Orientation tourelle Turret slewing	X	X							X						
Relevage flèche montée Boom lifting up	X		X			X									
Relevage flèche descente Boom lifting down	X		X			X	X								
Télescopage flèche sortie Boom extension out	X			X				X							
Télescopage rentrée Boom extension in	X			X											
Compensation montée Level up	X				X					X					
Compensation descente Level down	X				X						X				
Rotation panier droite Basket rotation right	X				X								X		
Rotation panier gauche Basket rotation left	X				X							X			
Pendulaire montée Jib up	X				X									X	
Pendulaire descente Jib down	X				X										X

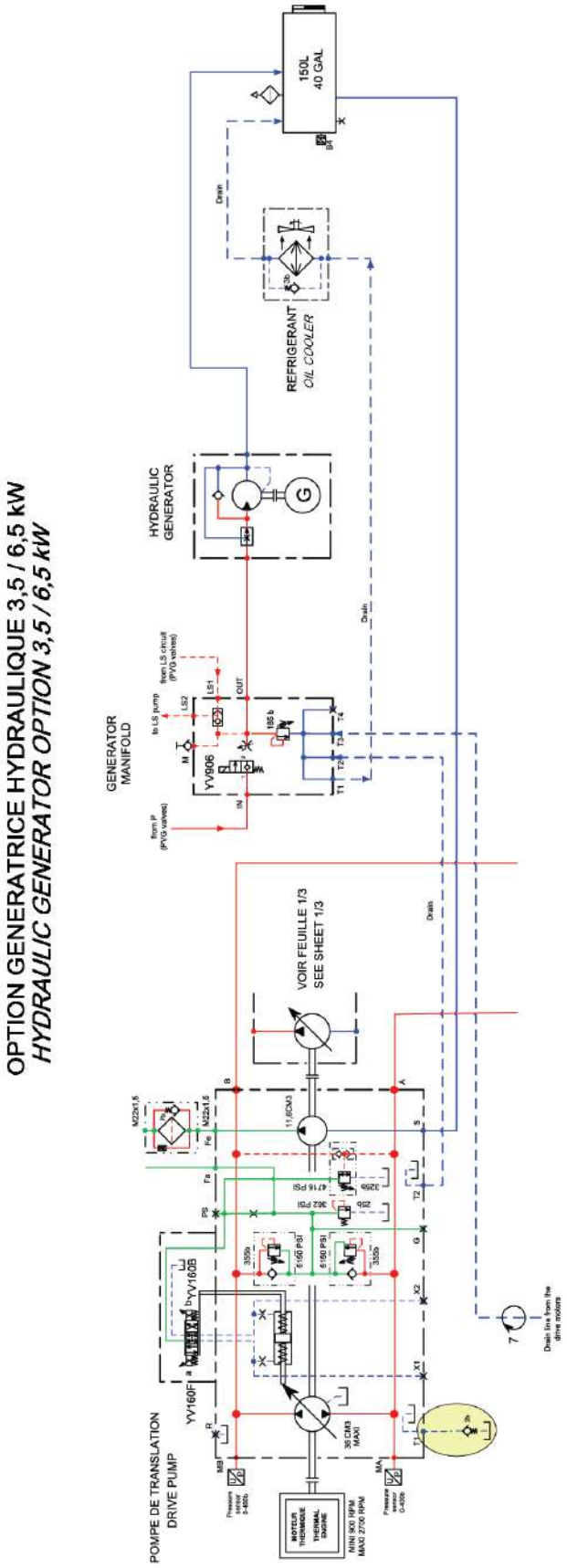
Hydraulic generator option-Sheet 4 - HT26 RT O - HT26 RT O SW - HT28 RTJ O - HT28 RTJ O SW - HT80 RT O - HT85 RTJ O - 4000421170B - 1/2



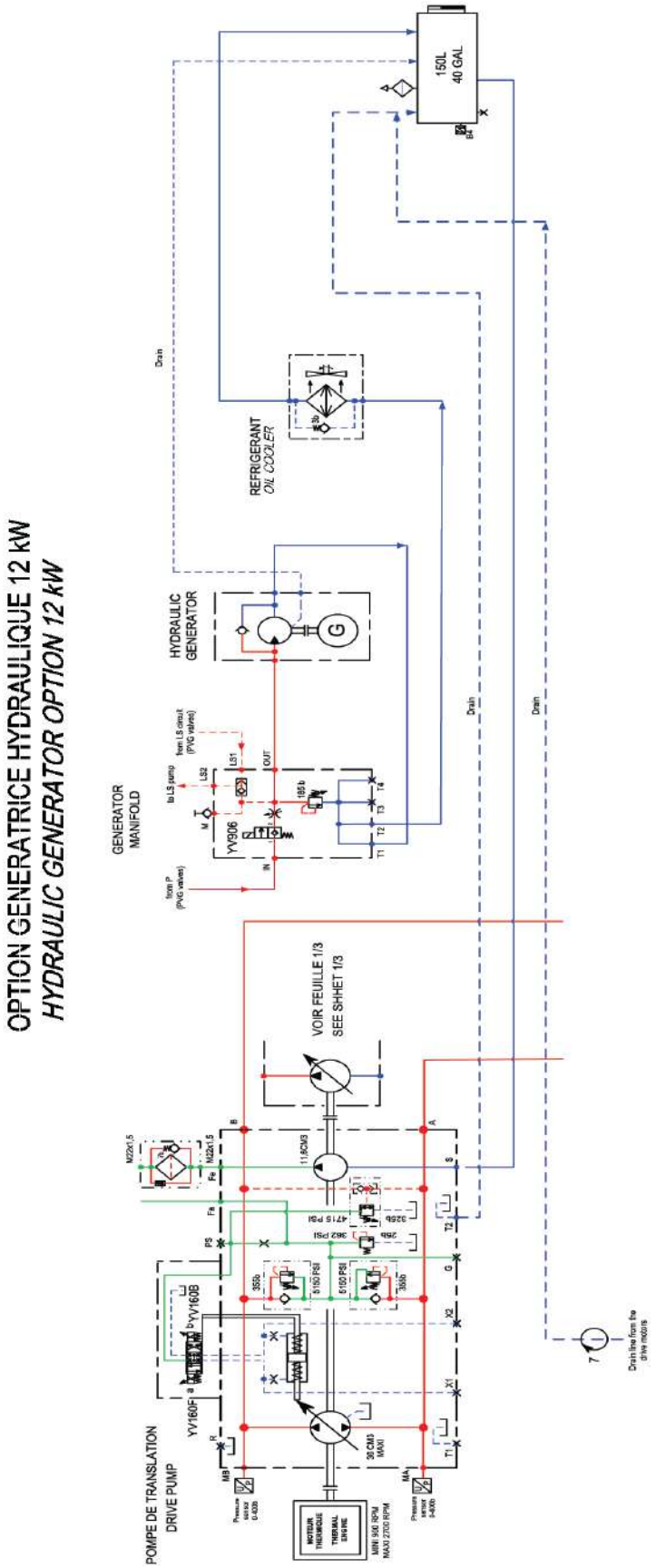
Hydraulic generator option-Sheet 4 - HT26 RT O - HT26 RT O SW - HT28 RTJ O - HT28 RTJ O SW - HT80 RT O - HT85 RTJ O - 4000421170B - 2/2



Hydraulic generator option-Sheet 3 - HT28 RTJ PRO - HT28 RTJ PRO SW - HT85 RTJ PRO - 4000506180C - 1/2



Hydraulic generator option-Sheet 3 - HT28 RTJ PRO - HT28 RTJ PRO SW - HT85 RTJ PRO - 4000506180C - 1/2



Notes

1 - Intervention register

The intervention register keeps a record of maintenance and repair work carried out inside or outside the maintenance programme.

N.B.-:-In the case of a HAULOTTE Services® intervention, the qualified technician must indicate the HAULOTTE Services® intervention number.

Date	Type of intervention	Number of hours	Intervenor	HAULOTTE Services® intervention number

F - Records

Date	Type of intervention	Number of hours	Intervenor	HAULOTTE Services® intervention number