Haulotte

HA26 RTJ O - HA26 RTJ O SW - HA26 RTJ PRO - HA26 RTJ PRO SW - HA80 RTJ O - HA80 RTJ PRO

MAINTENANCE BOOK

HA26 RTJ O - HA26 RTJ O SW - HA26 RTJ PRO - HA26 RTJ PRO SW - HA80 RTJ O - HA80 RTJ PRO

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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

Decals

Color	Title	Description
	DANGER	Danger : Indicates a hazardous situation which if not avoided, WILL result in death or serious injury.
	WARNING	Warning : Indicates a hazardous situation which if not avoided, COULD result in death or serious injury.
	CAUTION	Caution : Failure to comply could result in minor or moderate injury.
	NOTICE	Notice : Indicates practices not related to personal injury.
	PROCEDURE	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. Push the E-stop button to cut off the electricity supply.
4. Insert the turntable rotation locking pin.

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

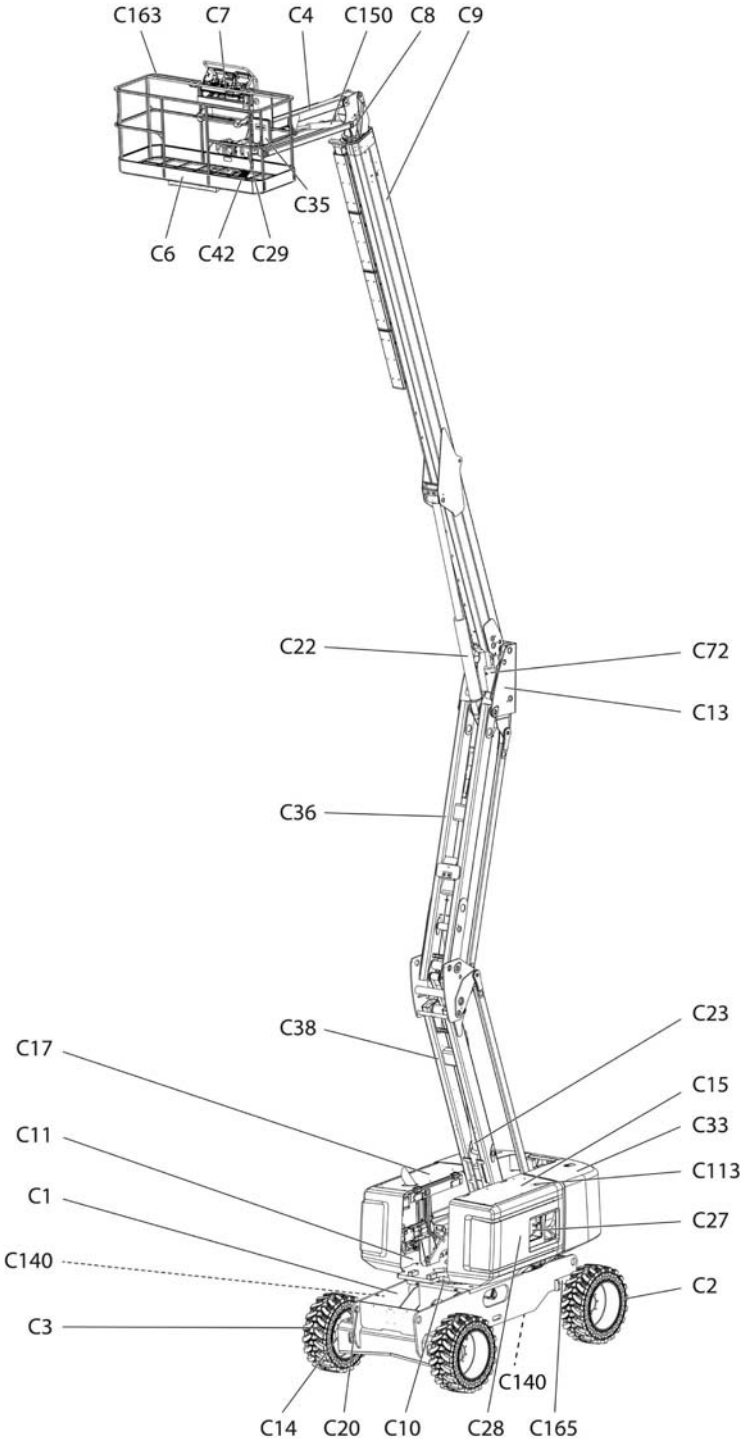
Our warranty conditions and extension contracts are now available on the websites of our sales network : www.haulotte.com

Notes

1 - Primary machine components

1.1 - LAYOUT

HA26 RTJ O - HA26 RTJ O SW - HA26 RTJ PRO - HA26 RTJ PRO SW - HA80 RTJ O - HA80 RTJ PRO



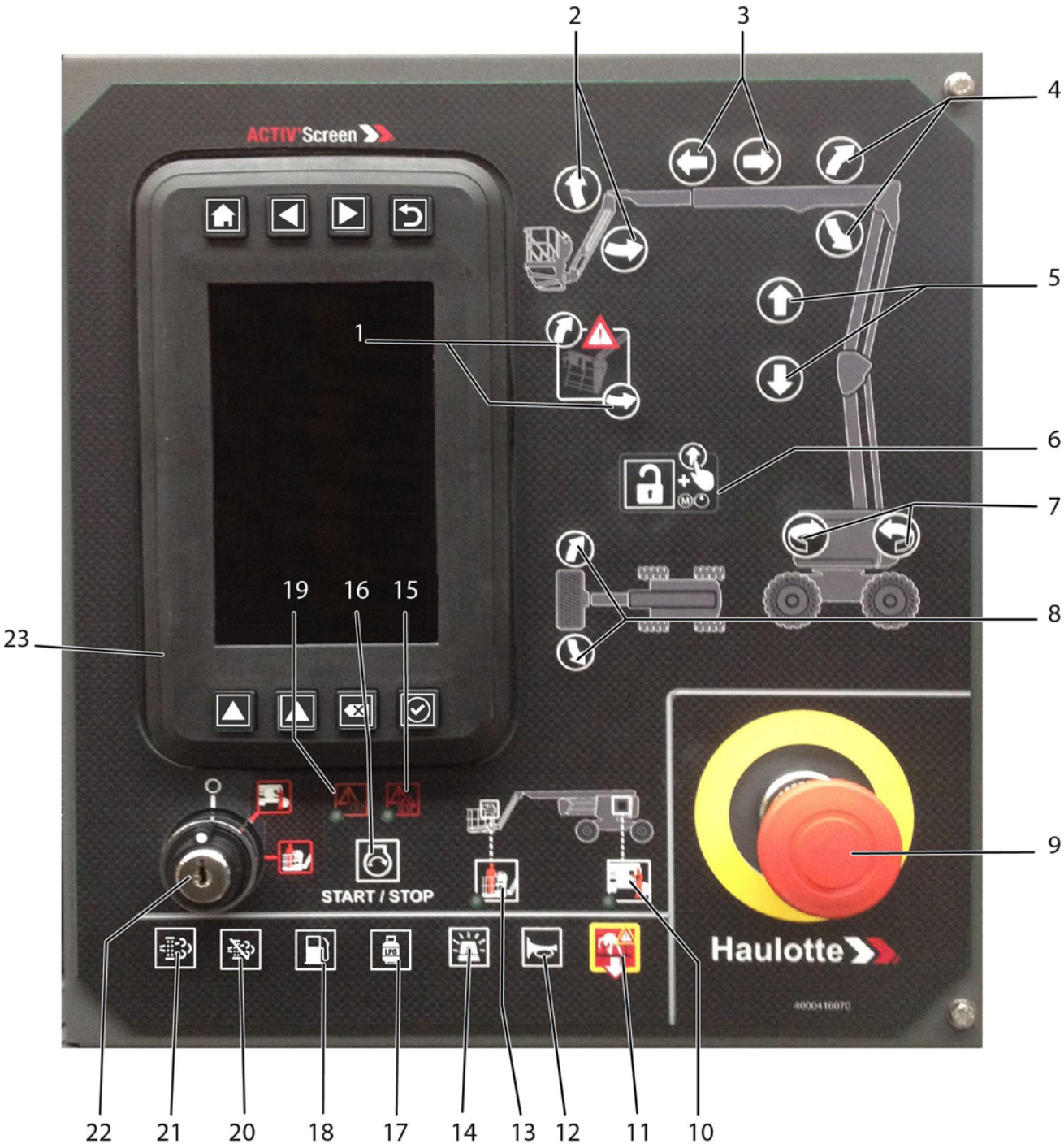
Marking	Description	Marking	Description
C1	Chassis	C23	Arm lifting cylinder
C2	Steering wheel	C27	Ground control box + Universal plug
C3	Rear drive wheel (and steer wheel if 4WS)	C28	Tilt sensor
C4	Jib	C29	Platform rotation cylinder
C6	Platform	C33	Counterweight
C7	Platform control box	C35	Document holder
C8	Input jib leveling cylinder	C36	Top arm
C9	Upper boom	C38	Bottom arm
C10	Slew ring	C42	Foot Switch
C11	Turntable assembly	C72	Output jib compensation cylinder
C13	Arm/Boom link piece	C113	Beacon light
C14	Hydraulic drive motor and reducer	C140	Propane bottles
C15	Right side compartment (hydraulic oil tank and fuel tank)	C150	Jib lifting cylinder
C17	Left side compartment (engine, pump and starter battery)	C163	Hand (grab) rail
C20	Tie-down (and/or lifting) points	C165	Front steering and oscillating axle
C22	Boom lift cylinder		

Universal plug

1.2 - GROUND CONTROL BOX

1.2.1 - Layout

General view



Controls and indicators

Marking	Name	Description	Function
1		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	SA620U	Jib raising / lowering switch[1]	By pressing on : Jib raising
	SA620D		By pressing on : Jib lowering
3	SA530O	Boom telescoping switch	By pressing on : Boom extending
	SA530I		By pressing on : Boom retracting
4	SA520U	Boom raising / lowering switch	By pressing on : Boom raising
	SA520D		By pressing on : Boom lowering
5	SA420U	Arm raising / lowering switch	By pressing on : Arm raising
	SA420D		By pressing on : Arm lowering
6	SB800	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	SA250L	Turntable rotation switch	By pressing on : Counter clockwise (CCW) rotation
	SA250R		By pressing on : Clockwise (CW) rotation
8	SA750L	Platform rotation switch	By pressing on : Clockwise (CW) rotation
	SA750R		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	HL905	Indicator, ground control box selected	LED lights up - ground control box icon

Marking	Name	Description	Function
11	SA801	"Overriding system" control	By pressing on : Authorize movements from the ground control box in case of overload (Use ONLY in case of emergency)
12	SB807	Horn button	By pressing on : Horn activation
13	HL906	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	HL909	Overload indicator	Alarm icon : • Flashes when the machine starts at the same time as the (19) icon • 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	SA303	Engine start-up selector	By pressing on : Engine start / stop
17	SA300	Propane Gas supply[2]	By pressing on : Propane Gas supply selection
18	SA305	Petrol/Gasoline or diesel supply[3]	By pressing on : Fuel supply selection
19	HL908	Engine warning indicator / Engine pre-heating	Alarm icon : • Flashes when the machine starts at the same time as the (15) icon • Is blinking if overriding is active Warning icon is ON if : • 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	SA600F	DPF regeneration inhibited[4]	By pressing on : Refusal of the request for regeneration

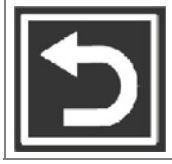
Marking	Name	Description	Function
21	SA600D	DPF regeneration required[5]	By pressing on : Regeneration start-up
22	SA900	Control box activation key switch	: De-energizes control system
			: Platform control box energized
			: Ground control box energized
23		Activ'Screen 2	

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

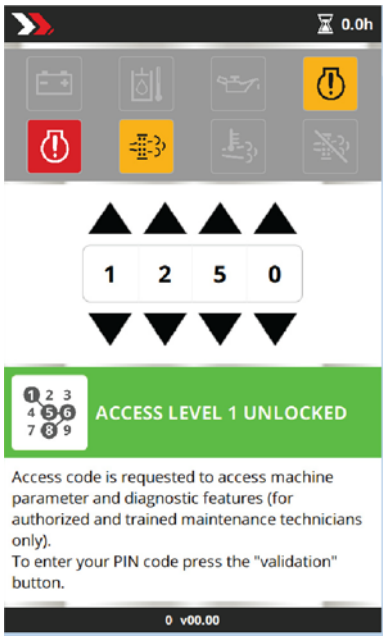
Icon	Description	Function	Icon	Description	Function
HAULOTTE Activ'Screen 2					
Navigation buttons - Above Activ'Screen display					
	Home Button	Allows return to the home screen at any time		Up Navigation	Permits scrolling up through the screen (if present)
	Left navigation	Permits navigation to screens 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

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

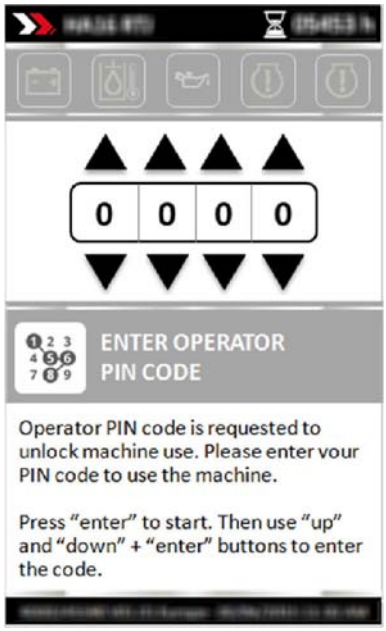
Controls and indicators

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

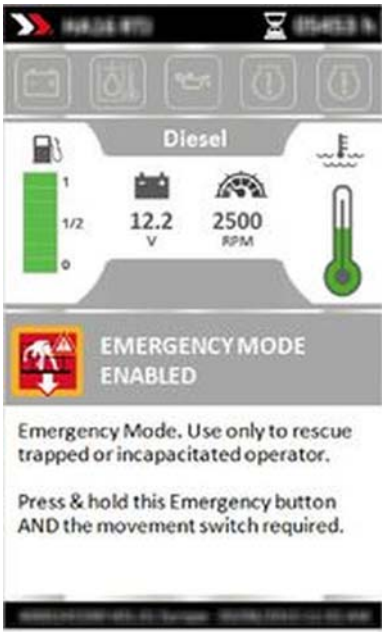
Controls and indicators

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	

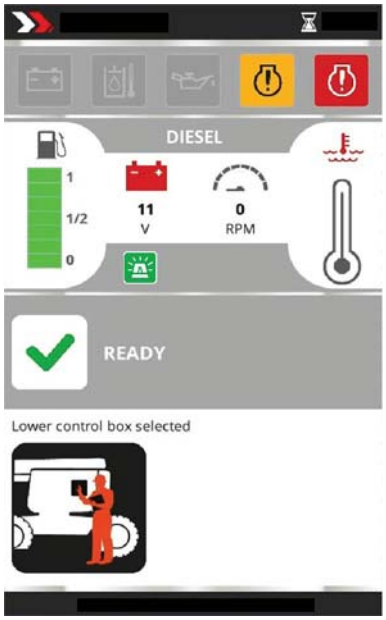
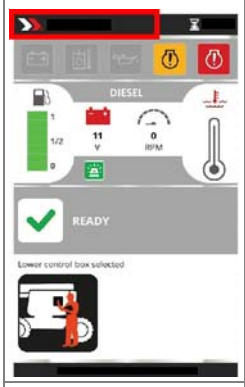
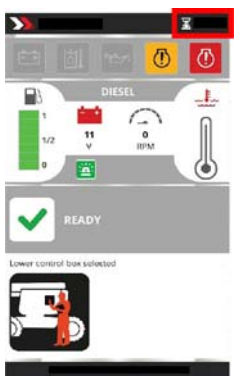
Controls and indicators

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	

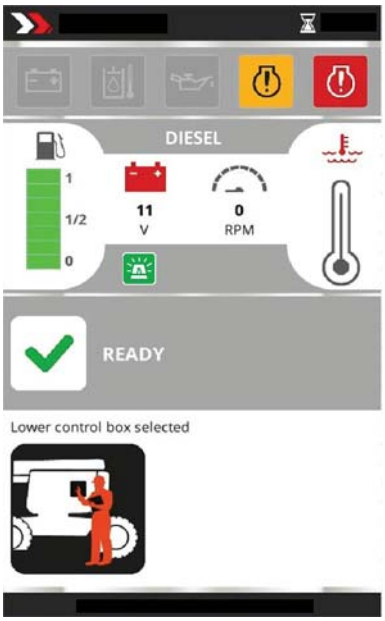
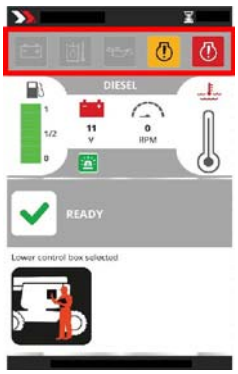
Controls and indicators

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.	

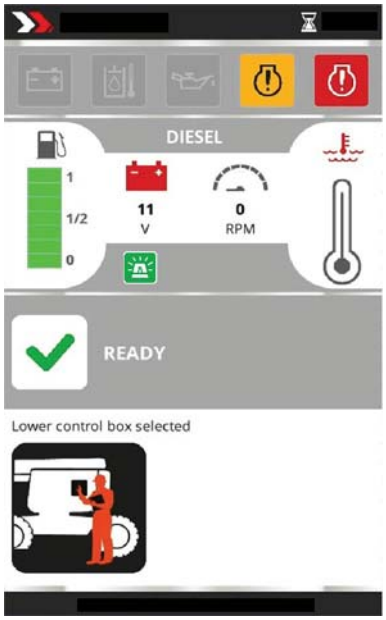
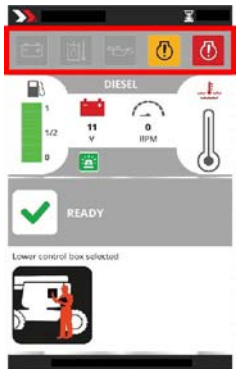
Controls and indicators

Icon	Description	Function	Icon	Description	Function
Home screen (dashboard) (Will be visible - depending on the machine)					
					
	Machine model zone		HT23RTJPRO	Machine Model	• Machine model display
	Hour meter/next maintenance zone		05453 h	Hourmeter	• The timer flashes if the engine is switched on and the hourmeter increases.
			05453 h	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.
			05453h		The maintenance tool icon turns RED when the next scheduled maintenance must be carried out in under 25 hours.

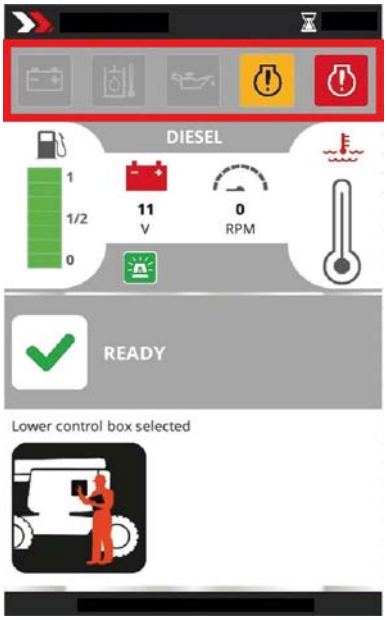
Controls and indicators

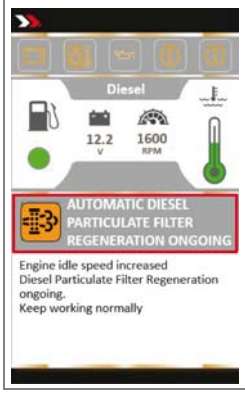
Icon	Description	Function	Icon	Description	Function
Home screen (dashboard) **(Will be visible - depending on the machine)**					
					
	Warning icons zone			Battery State	• Icon is ON if there is no charge output detected from the alternator • Icon is flashing if a failure code for the alternator is 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

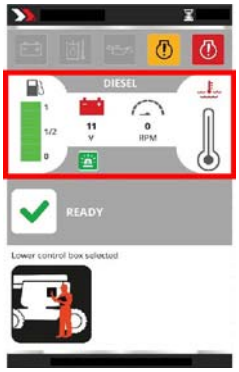
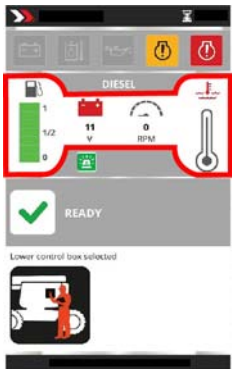
Icon	Description	Function	Icon	Description	Function
Home screen (dashboard) (Will be visible - depending on the machine)					
					
	Warning icons zone			Engine warning	• Icon is ON if Engine warning is detected. Or one of the engine maintenance schedules has been exceeded.
	Warning icons zone			Engine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

Controls and indicators

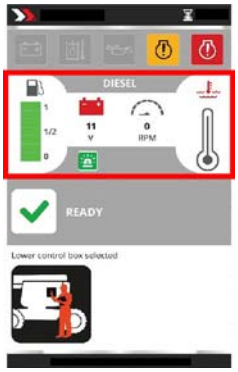
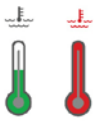
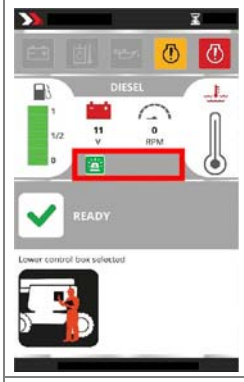
Icon	Description	Function	Icon	Description	Function
Home screen (dashboard) (Will be visible - depending on the machine)					
					
	Warning icons zone		DPF regeneration required (If fitted)	• Permanently lighted if the particle filter requires regeneration with a high clogging level
	Warning icons zone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

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

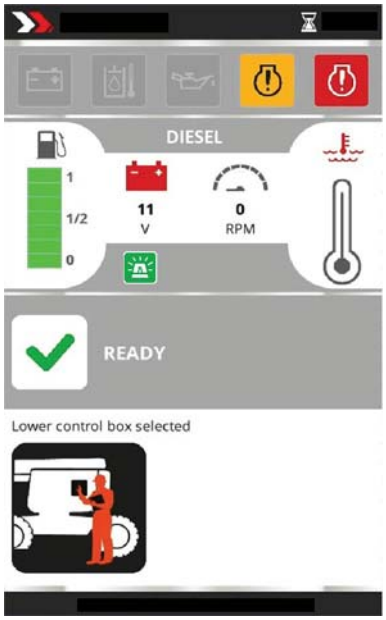
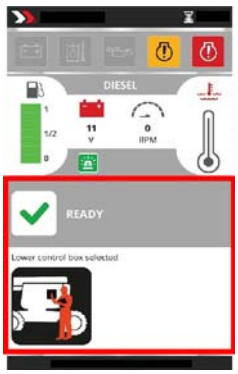
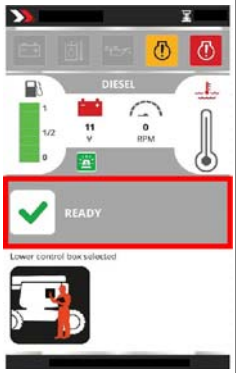
Controls and indicators

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

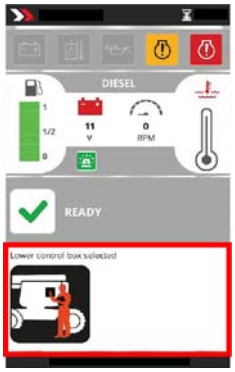
Controls and indicators

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

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.

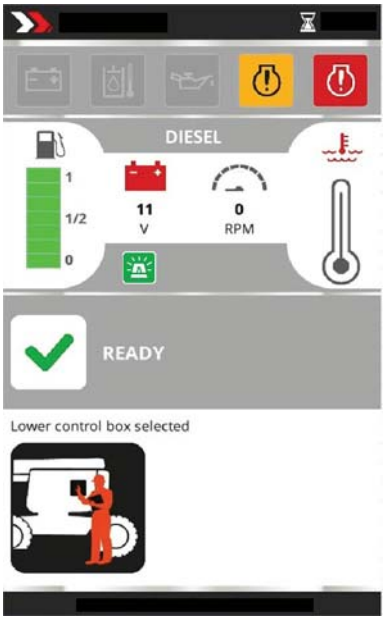
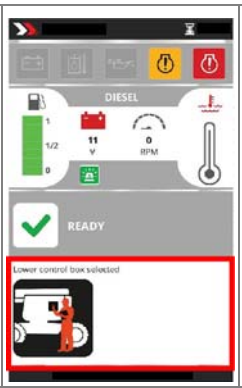
Controls and indicators

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.
				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

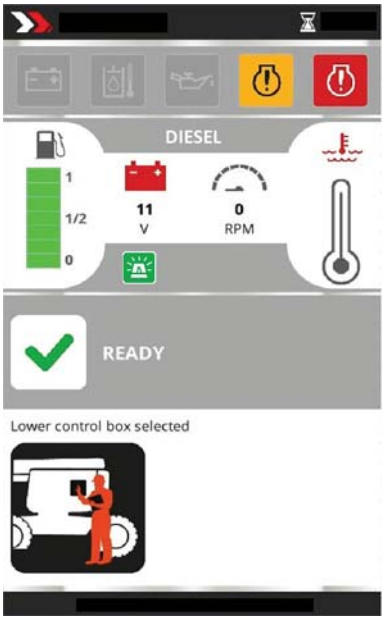
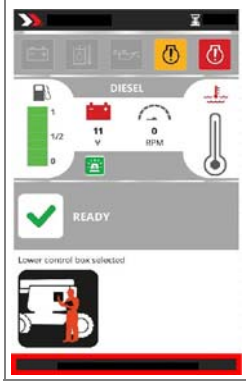
Controls and indicators

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®

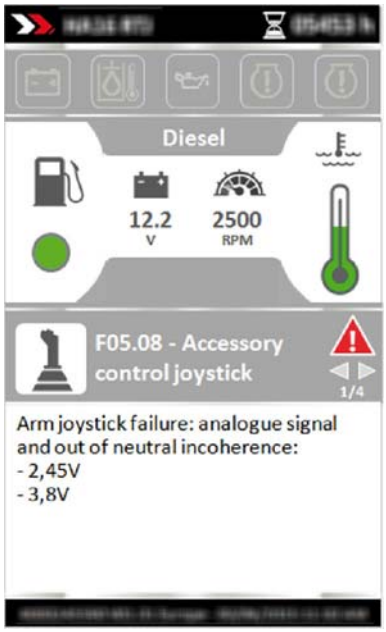
Controls and indicators

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.

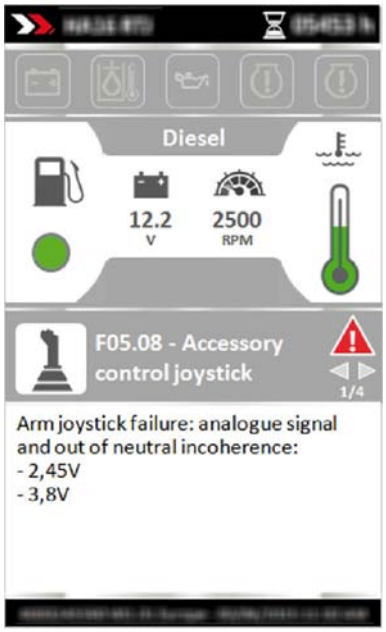
Controls and indicators

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

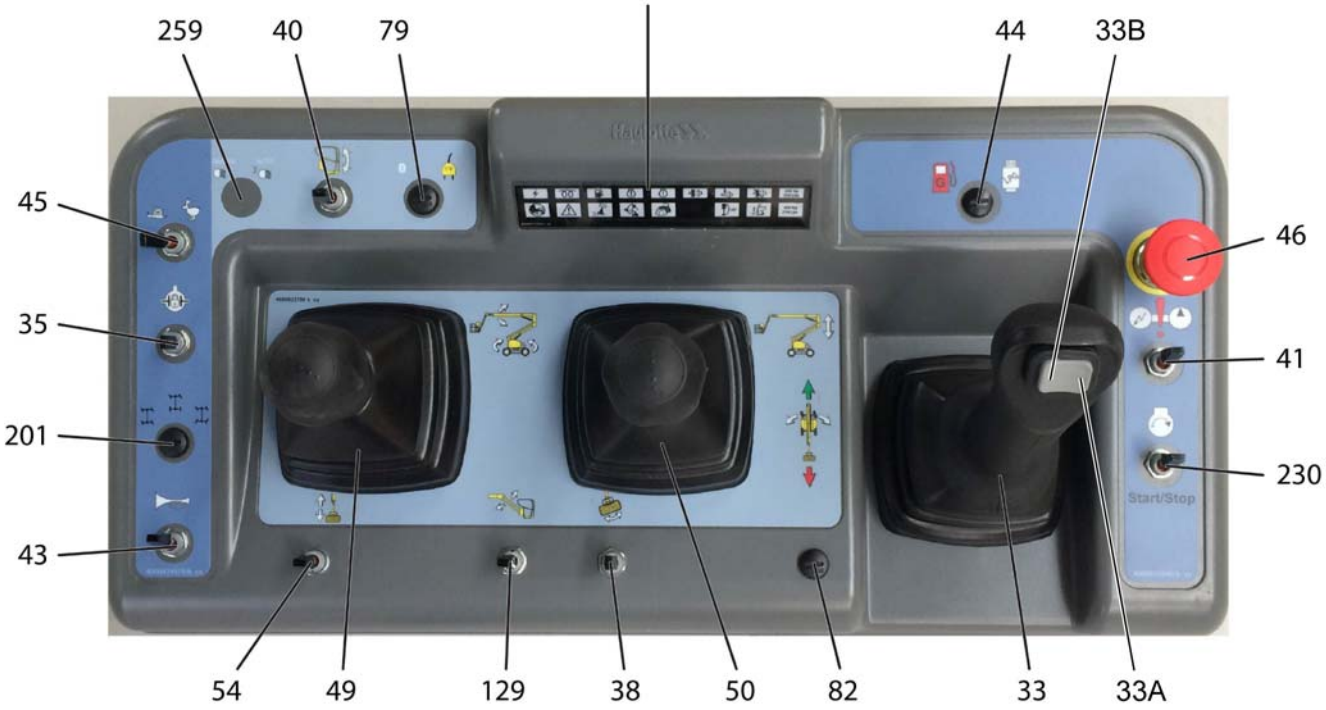
Notes

1.3 - PLATFORM CONTROL BOX

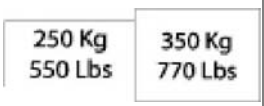
1.3.1 - Layout

General view

Affichage pupitre de commandes haut (Led 101 - 117)
Platform control box display (Led's 101 - 117)



Controls and indicators

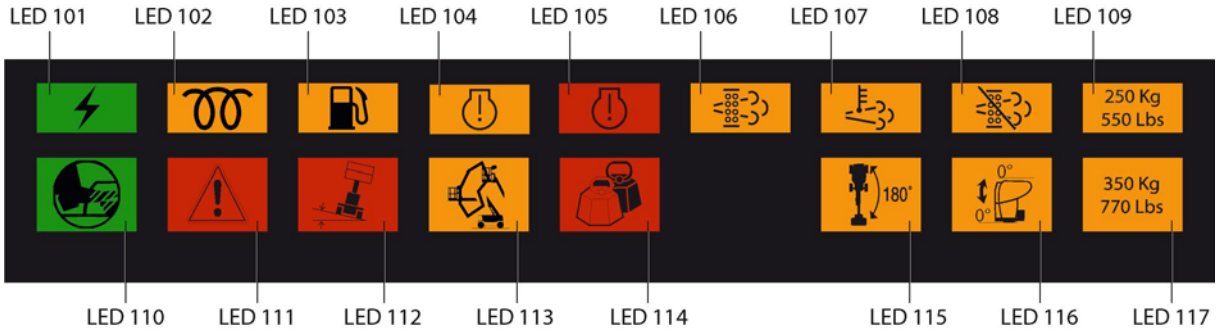
Marking	Name	Description	Function
33	SM902	Drive joystick	Move forward : Forward drive
			Move backwards : Reverse drive
33A		Steering button (Steering thumb / rocker switch)	Press right side of button : Steer right - According to selected mode (201)
33B			Press left side of button : Steer left - According 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	SA751	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	Push the horn selector to the right to sound the horn
			The horn stops when the selector switch is released
44	SA304	Fuel selector[1]	Push switch to the right for LPG (liquid propane gas supply)
			Push switch to the left for gasoline (petrol) or diesel fuel supply
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)
49	SM900	Turntable rotation joystick	Move to the right : Counter clockwise (CCW) rotation
			Move to the left : Clockwise (CW) rotation
		Boom lift joystick	Move forward : Raise boom
			Move backwards : Lower boom
50	SM901	Arm lift joystick	Move forward : Arm raises
			Move backwards : Arm lowers
54	SA531	Boom telescoping switch	Move upwards : Boom retracts
			Move downwards : Boom extends
79	SA906	Generator selector[2]	Move to the left : Generator deactivated
			Move to the right : Generator activated
82[3] 	SA802	250 kg (550 lbs) or 350 kg (770 lbs) load selector	Move to the left : 250 kg (550 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

Marking	Name	Description	Function
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
259	SA910	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 equipped)
LED 108	HL303		DPF regeneration inhibited (If equipped)
LED 109[1]	HL805		Load selection 250 kg (550 lbs)
LED 110	HL807		Foot Switch
LED 111	HL801		Fault
LED 112	HL800		Tilt

C - Familiarization

Marking	Name	Symbol	Function
LED 113	HL804		Radius limit
LED 114	HL802		Overload
LED 115			Turret at 180°
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
	Faults : • Rapid flashing : If a fault is active (current fault)
	Overload : • Rapid flashing : Faulty weighing / overload system • Illuminated when overloaded
	Tilt sensor : • Illuminated when in tilt, machine stowed or unfolded
	Radius limitation : • Rapid flashing : Reach limitation system fault • Slow flashing : The machine is in the 250 kg (550 lbs) low load zone, the low load is validated and 350 kg (770 lbs) heavy load is selected by the selector (82) • Illuminated : Limit of work zone with movement cut-off or machine in 250 kg (550 lbs) low load zone and load not validated
	• 250 kg (550 lbs) load selected : LED LED 109 will be lit on display panel. • 350 kg (770 lbs) load selected : LED LED117 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 LED 117 will lit and the LED LED 109 will blink, with the possibility to switch to 250 kg (550 lbs) load selected if there is less than 250 kg (550 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]

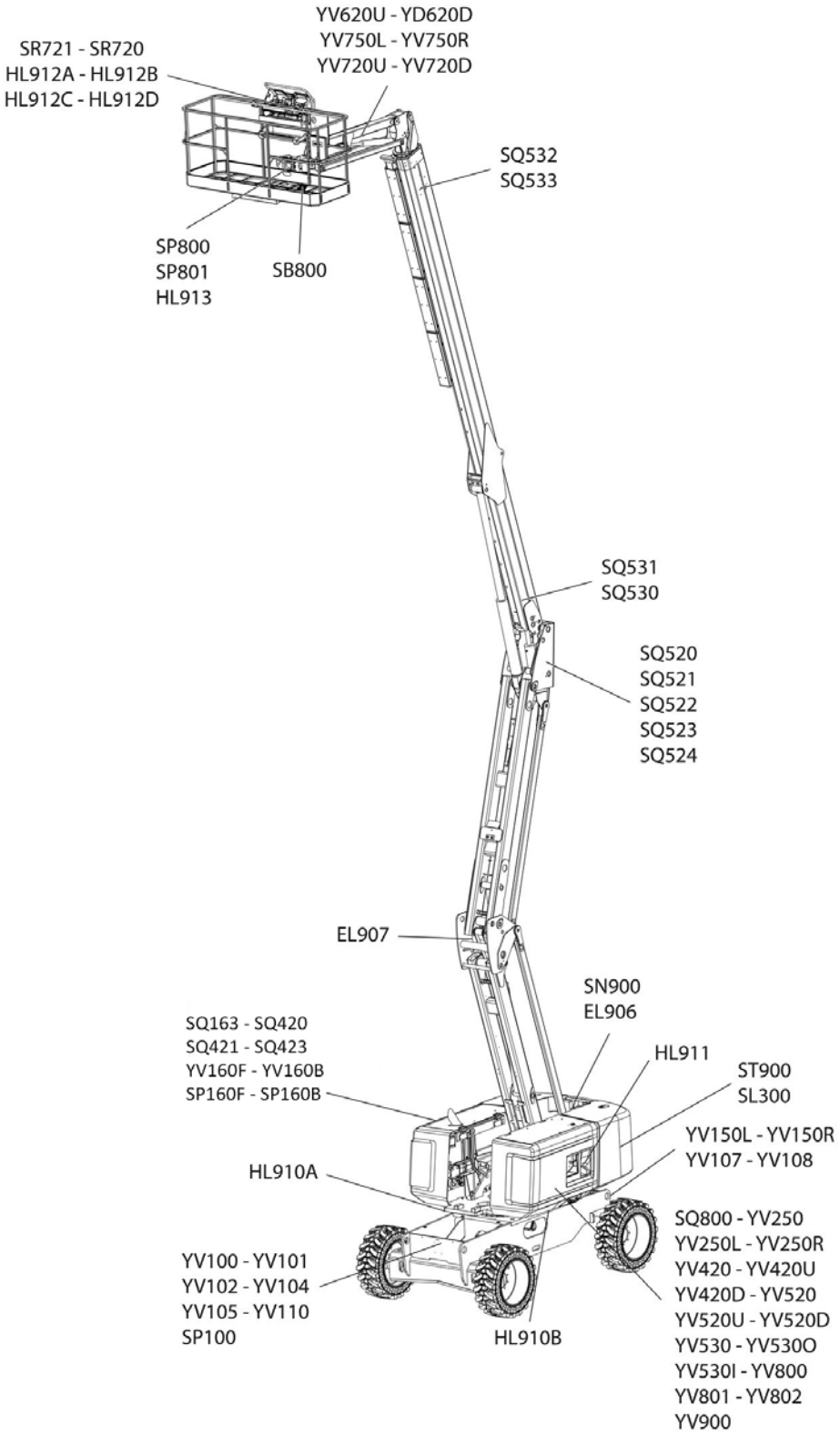
1. If engine equipped with Particulate Filter Regeneration
2. If engine equipped with Particulate Filter Regeneration
3. If engine equipped with Particulate Filter Regeneration

Notes

2 - List of actuators and sensors

2.1 - Sensors and actuators

Sensors and actuators

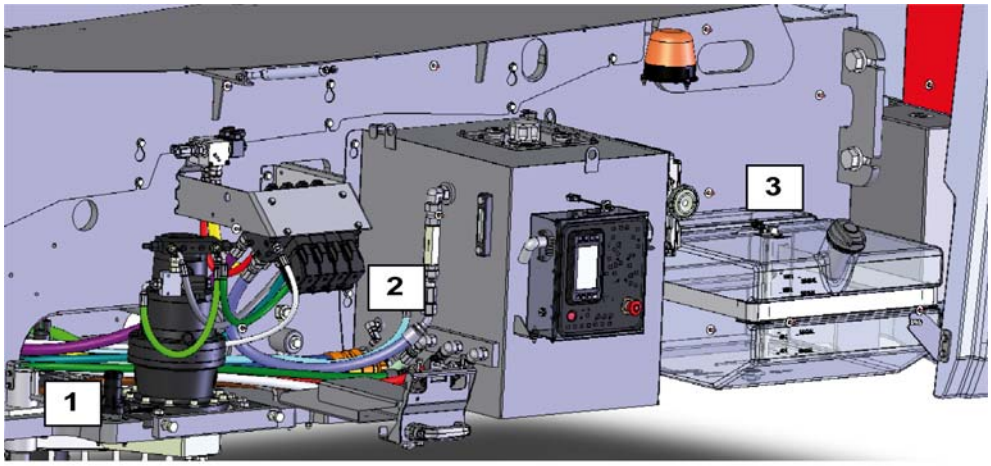


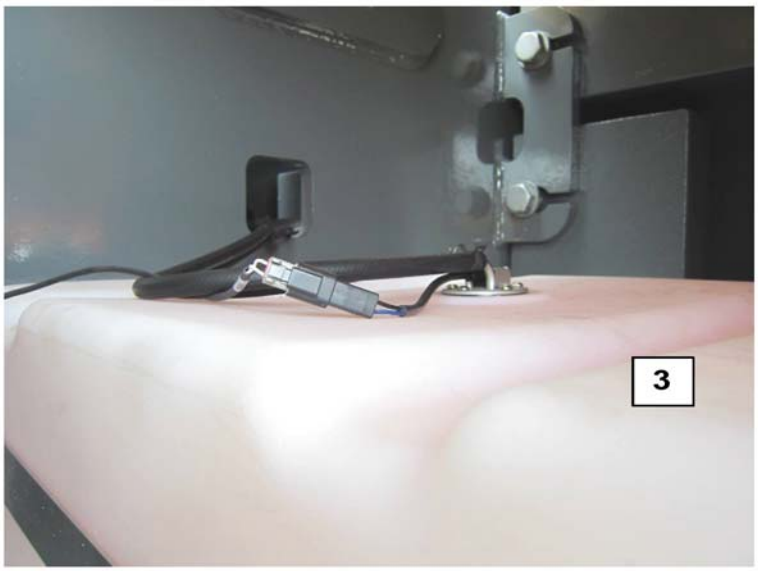
Name	Description
EL906	Light - Activ' Lighting System Counterweight light
EL907	Light - Activ' Lighting System Boom light
HL910 A	Light - Activ' Lighting System Turret light
HL910 B	Light - Activ' Lighting System Turret light
HL911	Light - Activ' Lighting System Ground control box light
HL912 A	Light - Activ' Lighting System Platform control box light
HL912 B	Light - Activ' Lighting System Platform control box light
HL912 C	Light - Activ' Lighting System Platform light
HL912 D	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
SP160 B	Pressure transducer - Reverse drive
SP160 F	Pressure transducer - Forward drive
SP800	Sensor - Strain gauges
SP801	Sensor - Strain gauges
SQ163	Sensor - Detection water in the fuel circuit
SQ420	Sensor - Arm's position sensor (SQ420 = 1 if arm raised)
SQ421	Sensor - Arm's position sensor (SQ421 = 1 if arm folded)
SQ423	Sensor - Arm's position sensor (SQ423 = 1 if arm folded)
SQ520	Sensor - Boom's position sensor (SQ520 = 1 if boom folded)
SQ521	Sensor - Boom's position sensor-Dual load
SQ522	Sensor - Boom's position sensor (SQ522 = 1 if boom folded)
SQ523	Sensor - Proximity sensor for boom angle
SQ524	Sensor - Boom's position sensor (SQ524 = 1 if boom raised)
SQ530	Sensor - Telescope's position sensor (SQ530 = 1 if telescope retracted)
SQ531	Sensor - ILS boom length
SQ532	Sensor - ILS Dual load sensor
SQ533	Inductive sensor
SQ800	Sensor - Tilt sensor
SR720	Sensor - Tilt - 10°
SR721	Sensor - Tilt + 10°
ST900	Sensor - Hydraulic oil overheating sensor
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
YV150 L	Valve - Steering left side valve
YV150 R	Valve - Steering right side valve
YV160 B	Valve - PWM Reverse driving
YV160 F	Valve - PWM Forward driving
YV250	PWM Turret orientation
YV250 L	Valve-Left turntable rotation

Name	Description
YV250 R	Valve-Right turntable rotation
YV420	PWM Arm electrovalve
YV420 U	Valve-Arm lifting
YV420 D	Valve-Arm descent
YV520	PWM Boom raising
YV520 U	Valve-Boom raising
YV520 D	Valve-Boom descent
YV530	PWM Boom telescoping
YV530 O	Valve-Telescope extension
YV530 I	Valve-Telescope retracted
YV620 U	Valve-Jib raising
YV620 D	Valve-Jib lowering
YV720 U	Valve-Hydraulic compensation up
YV720 D	Valve-Hydraulic compensation down
YV750 R	Valve-Basket rotation to the right
YV750 L	Valve-Basket rotation to the left
YV800	Valve-LS Valve
YV801	Valve-Boom extension safety valve
YV802	Valve-Boom safety
YV900	PWM Control movements /steering circuits

2.2 - SENSORS DETAIL

2.2.1 - Turret

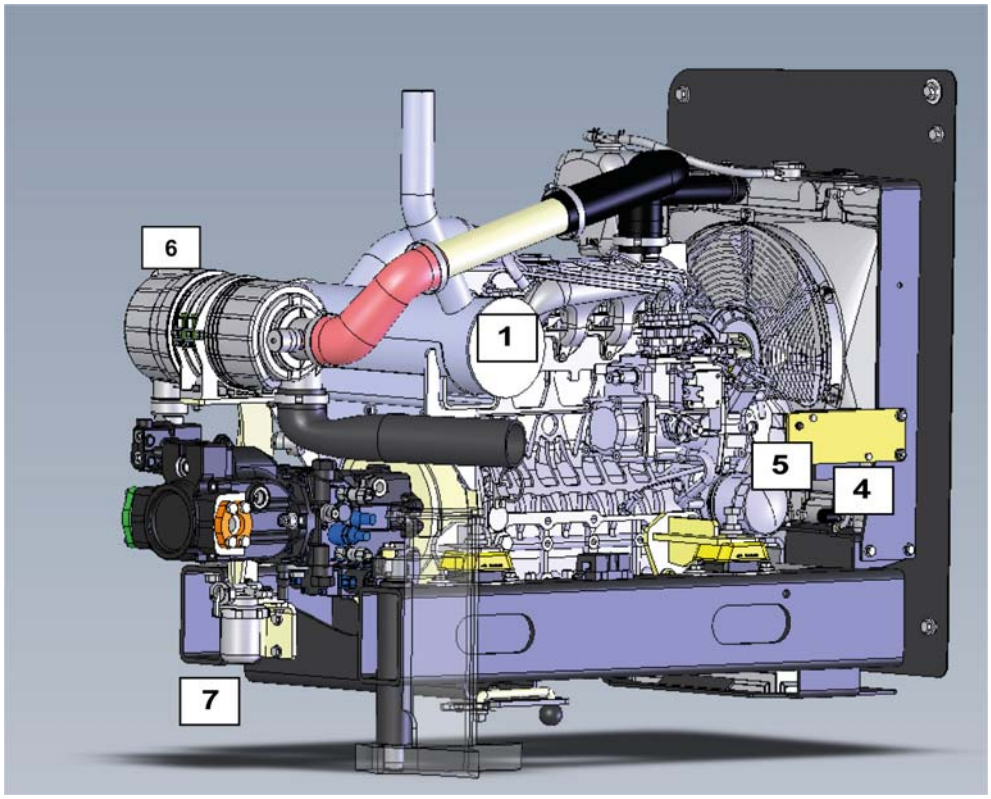




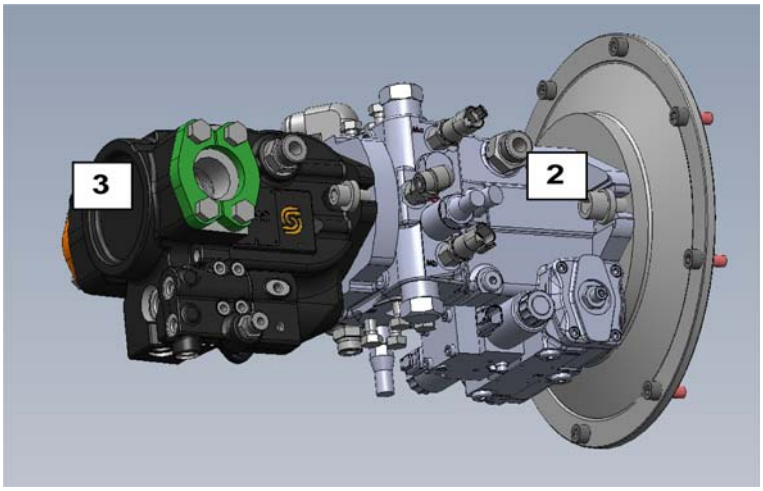
Marking	Item	Description
1	SQ800	Tilt sensor
2	ST900	Hydraulic oil temperature sensor
3	SL300	Fuel level detection (if level ≤ 5 liters SL300 = 0)

2.2.2 - Kubota Engine

Assembly

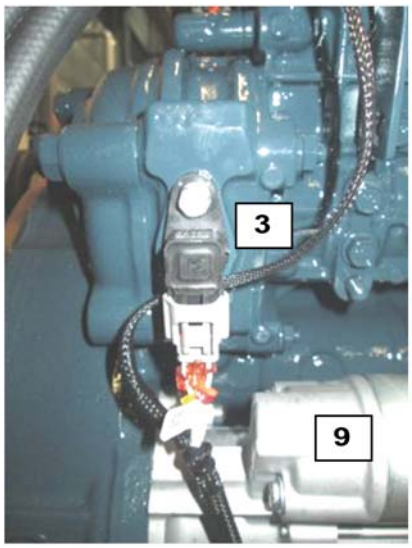


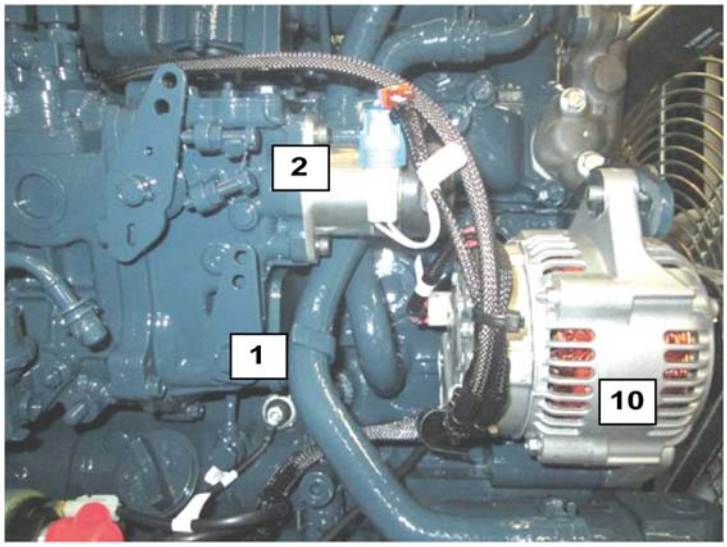
Detail on pumps

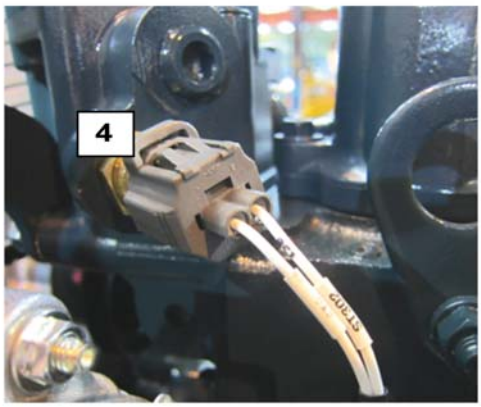


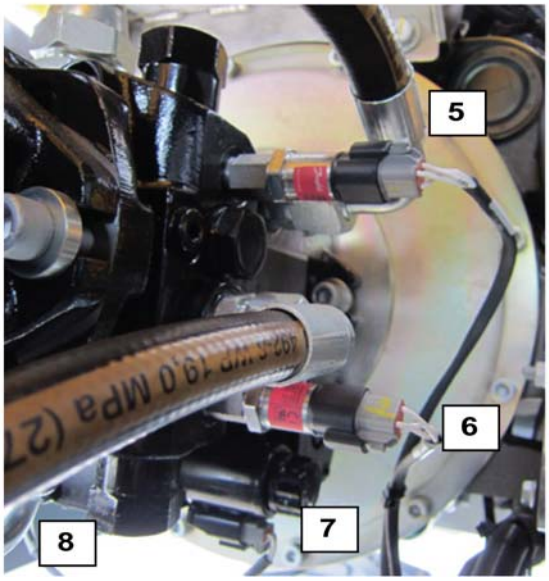
Marking	Item	Description
1		Diesel engine EGV KUBOTA V2403 36.5 KW
2		Drive pump
3		Equipment pump
4	EGV D6	EGV (Electronic Governor) Module D6 KUBOTA
5	KM160	Preheating relay
6		Air filter
7		Fuel filter

2.2.2.1 - Diesel engine Tier 3 V2403 36.5KW

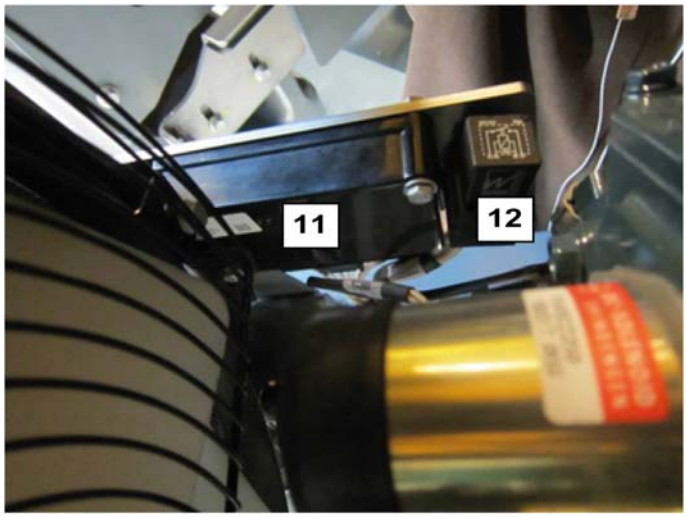






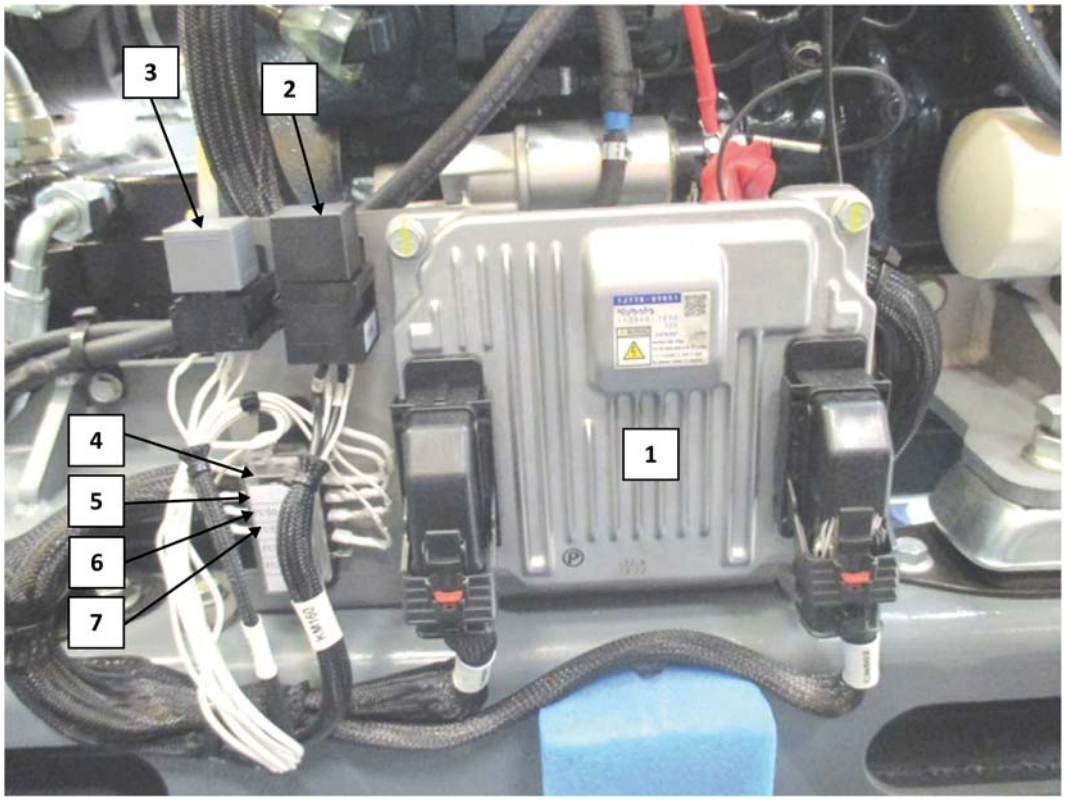


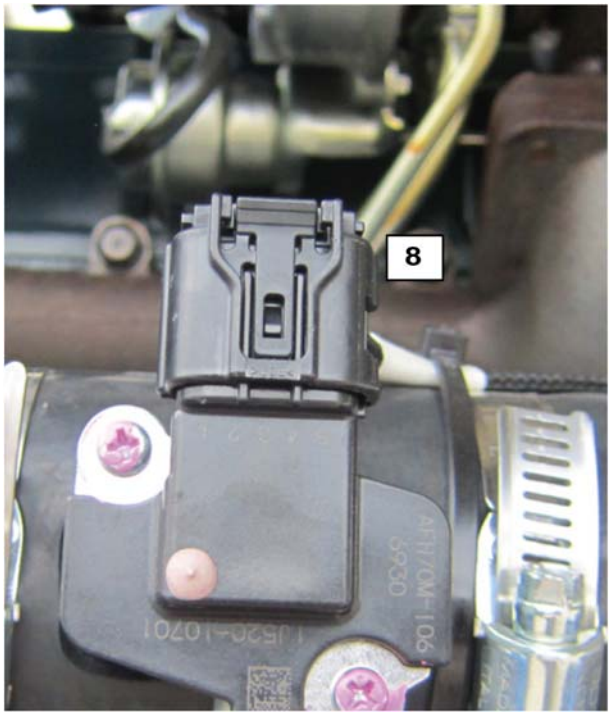
Detail on EGV and relay



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 transducer - Forward drive
6	SP160B	Pressure transducer - Reverse drive
7	YV160B	PWM valve for REV drive mode
8	YV160F	PWM valve for FWD drive mode
9	M300	Starter motor
10		Alternator 60A
11	EGV D6	EGV (Electronic Governor) Module D6 KUBOTA
12	KM160	Preheating relay

Detail on EDC - Kubota module

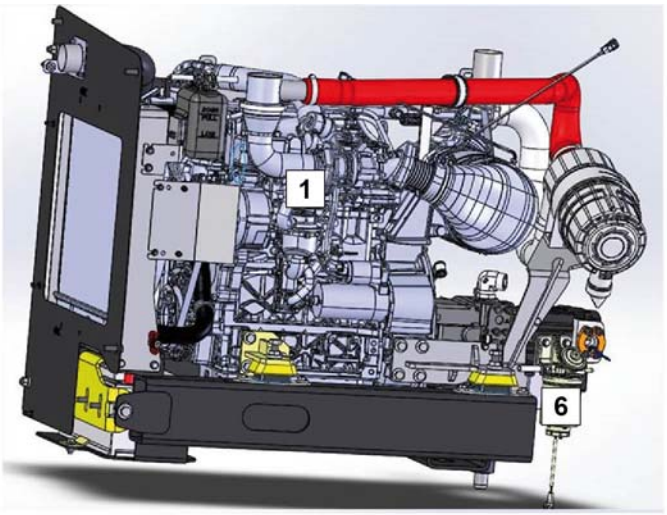


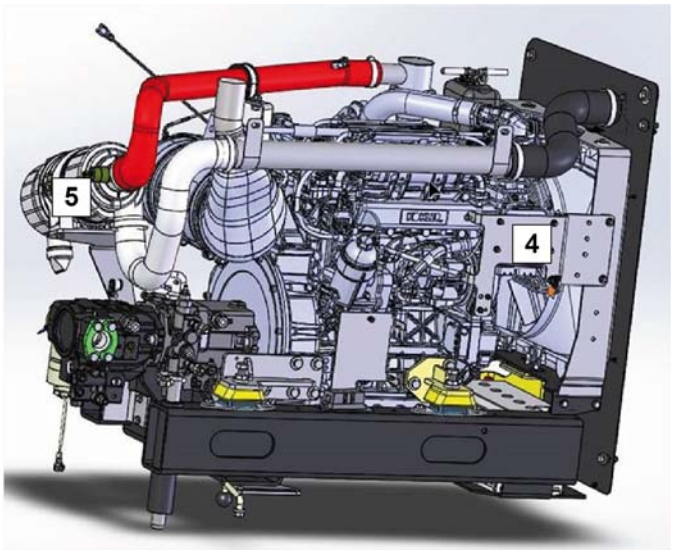


Marking	Item	Description
1	EDC71CV45	ECU KUBOTA module
2	KM160	Preheating relay feed pump
3	KM3	Main relay
4	FU50	Fuse 20A
5	FU51	Fuse 5A
6	FU52	Fuse 5A
7	FU53	Fuse 5A
8	MAF	Mass flow sensor

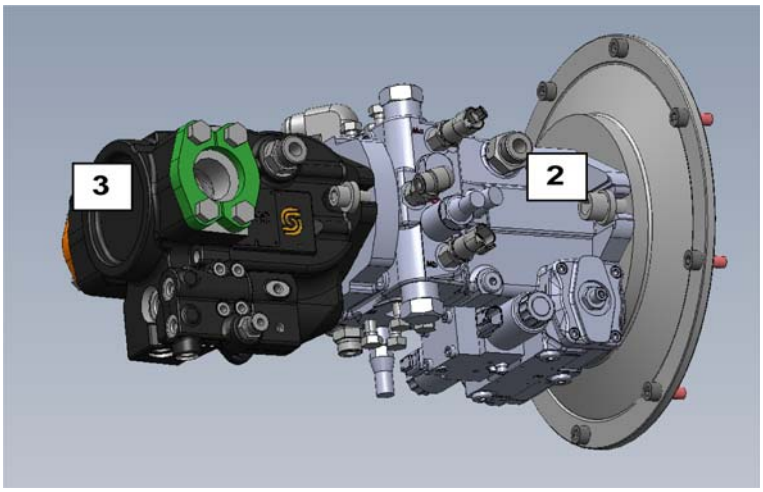
2.2.3 - Kohler Engine

Assembly





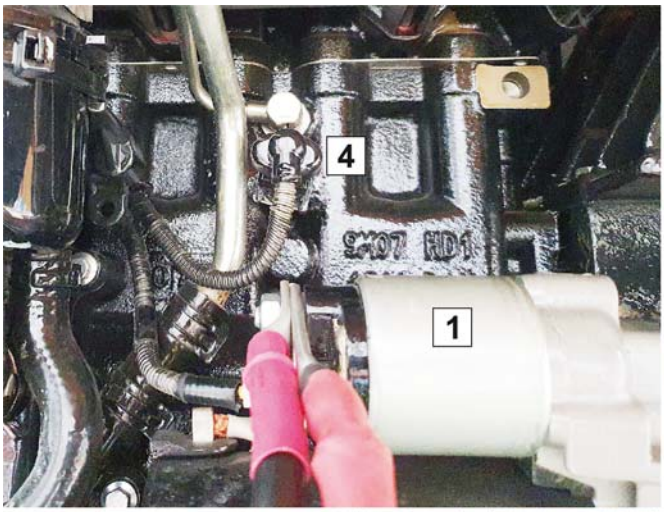
Detail on pumps



Marking	Item	Description
1		Diesel engine Kohler KDI1903
2		Drive pump
3		Equipment pump
4		Module ECU Kohler
5		Air filter
6		Fuel filter

2.2.3.1 - Diesel engine - Kohler STAGE V (KDI 1903 TC - 36,5 kW - 50hp)

Overview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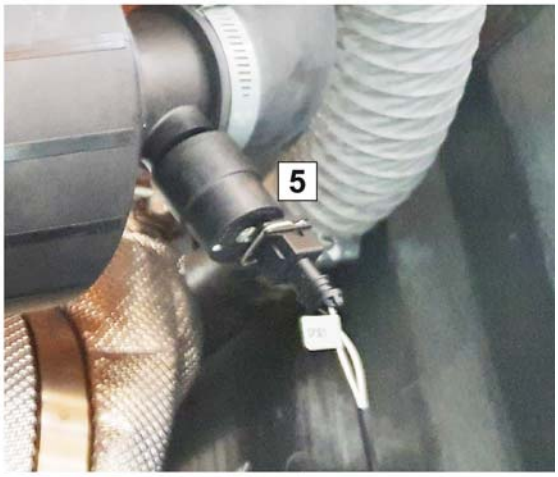
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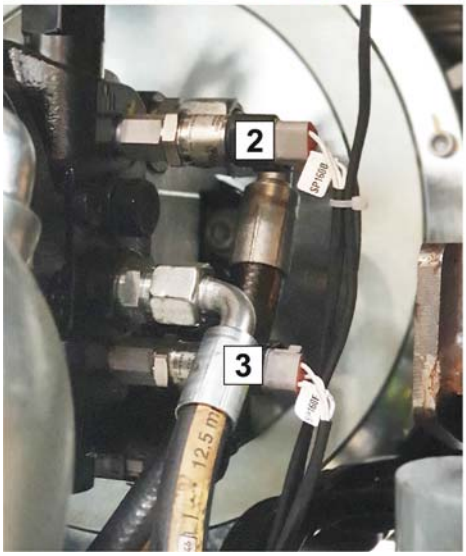
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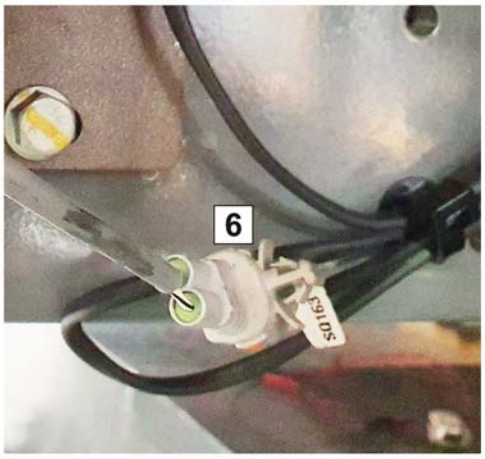
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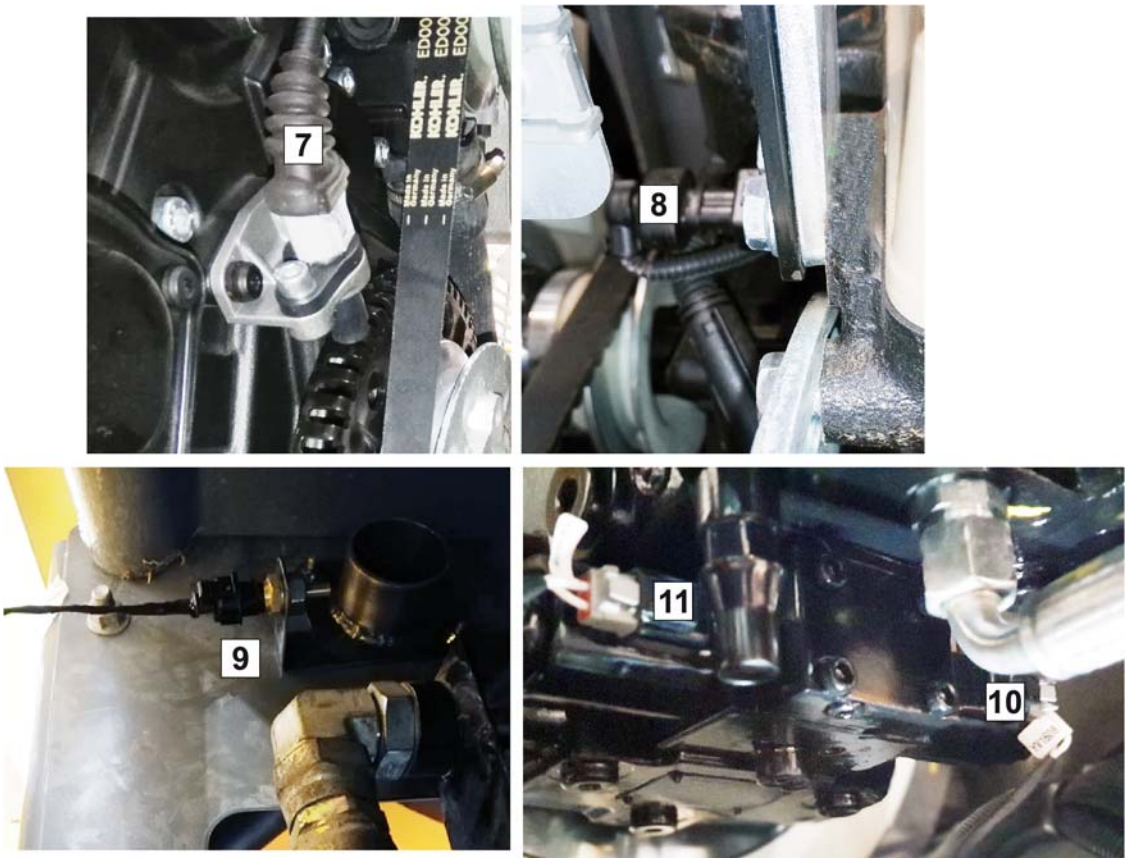
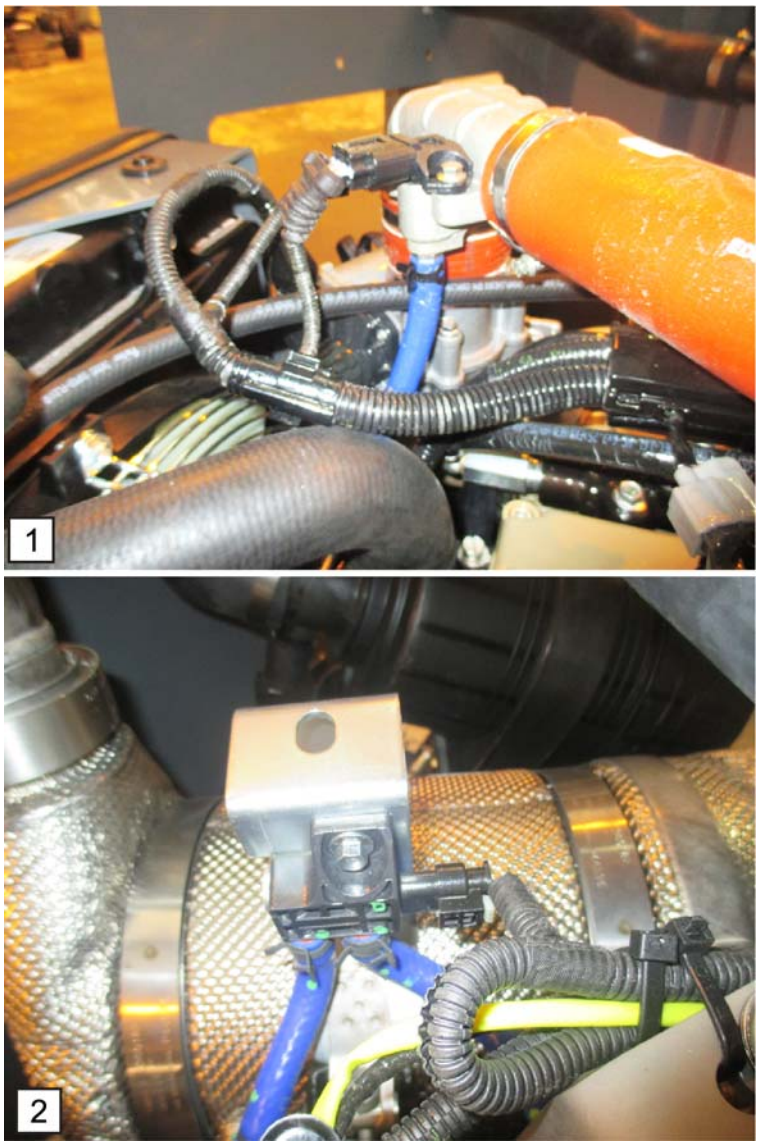


Marking	Item	Description
1		Starter motor
2	SP160B	Pressure transducer - Reverse drive
3	SP160F	Pressure transducer - Forward drive
4	SP300	Oil pressure
5	SP301	Clogged filter sensor
6	SQ163	Sensor - Detection water in the fuel circuit
7	SV300	Engine speed sensor
8	ST302	Water temperature sensor
9	ST901	Engine temperature sensor
10	YV160B	PWM valve for REV drive mode
11	YV160F	PWM valve for FWD drive mode

Ambient air temperature sensor - ST901

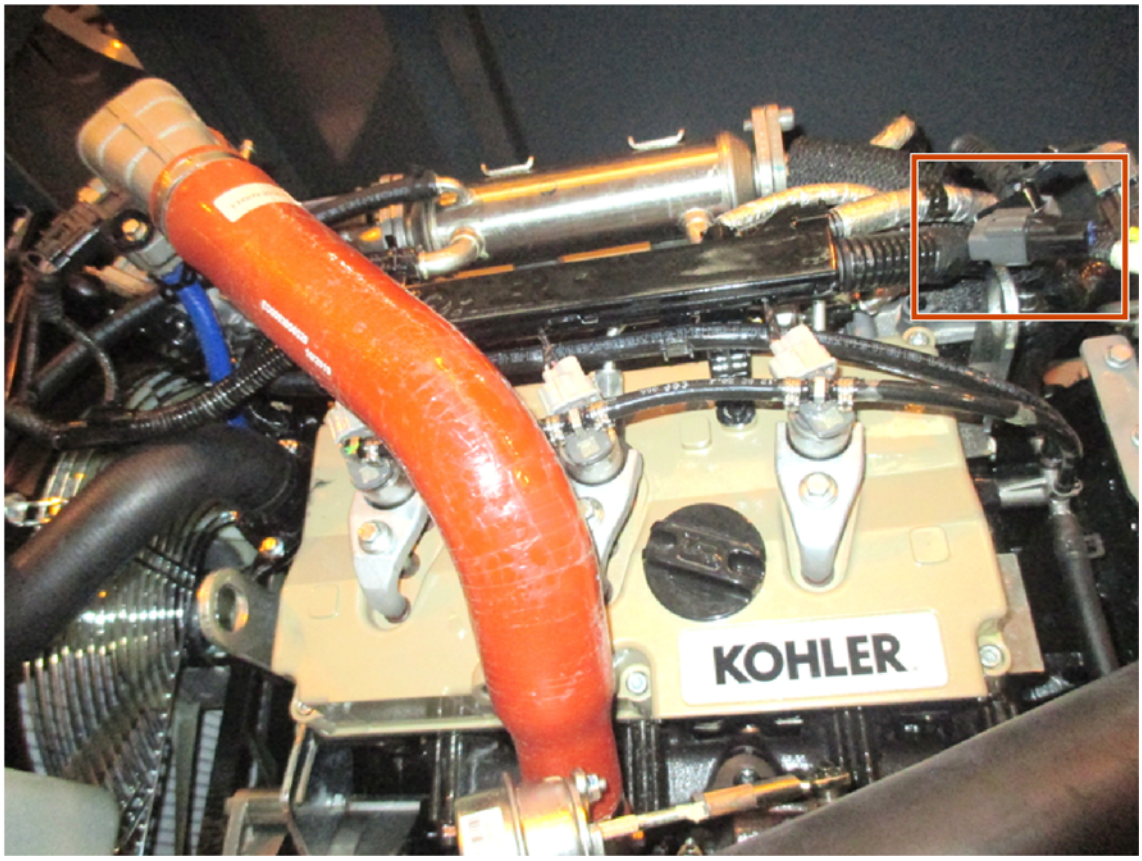
EGR valve



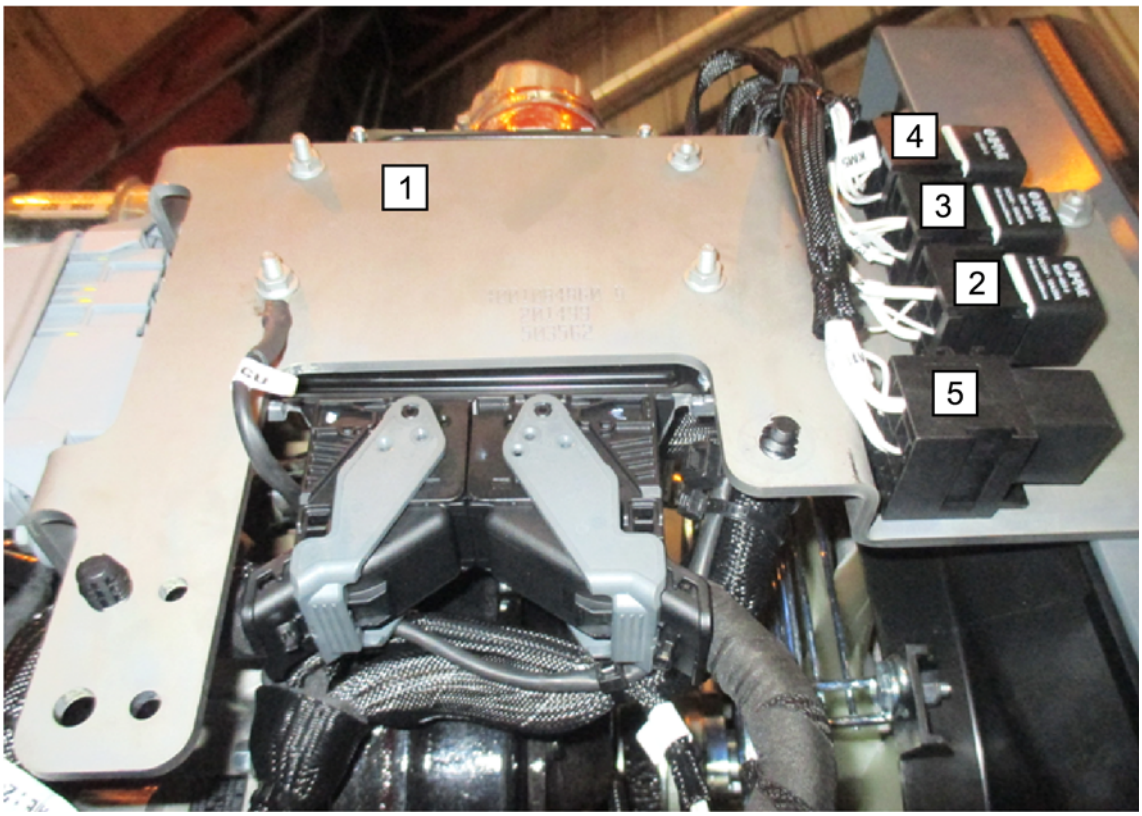
Marking	Description
1	T MAP sensor: Input pressure detection
2	Delta P sensor: Detection of clogging level of DPF filter

Marking	Description
1	EGTS sensor: Controls the DPF regeneration strategy

Fuel pressure sensor in common rail

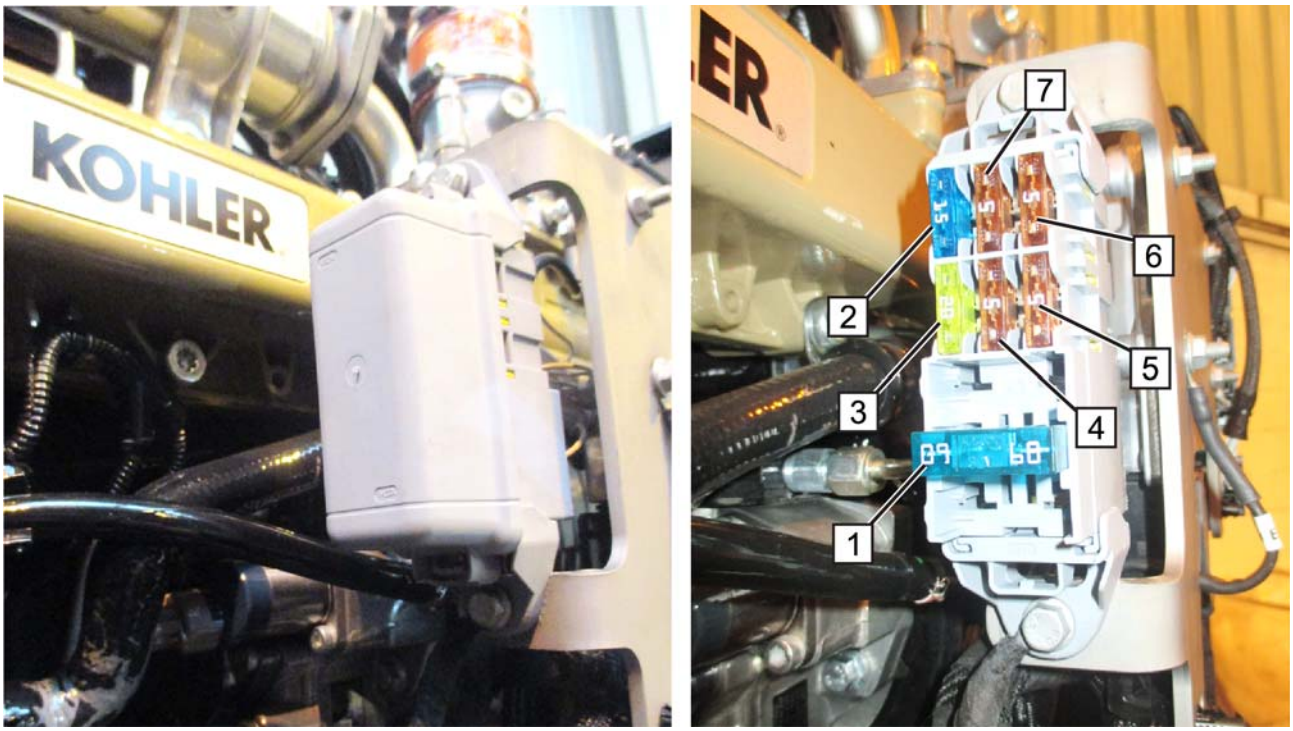


Detail on ECU and relay



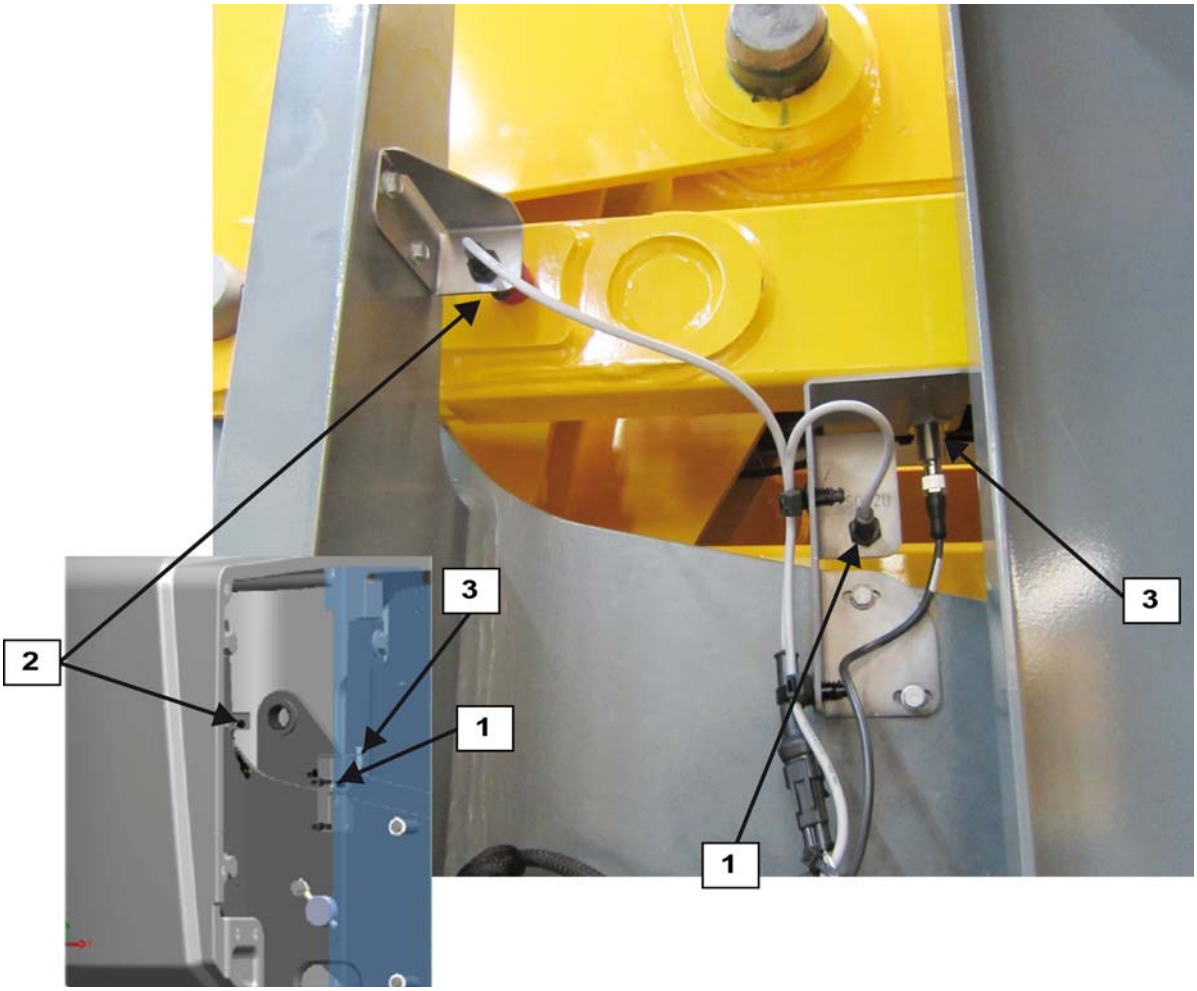
Marking	Item	Description
1		ECU Kohler module
2	KM4	Start relay
3	KM3	Main relay
4	KM5	Electric pump relay
5	KM160	Preheating relay feed pump

Fuses box



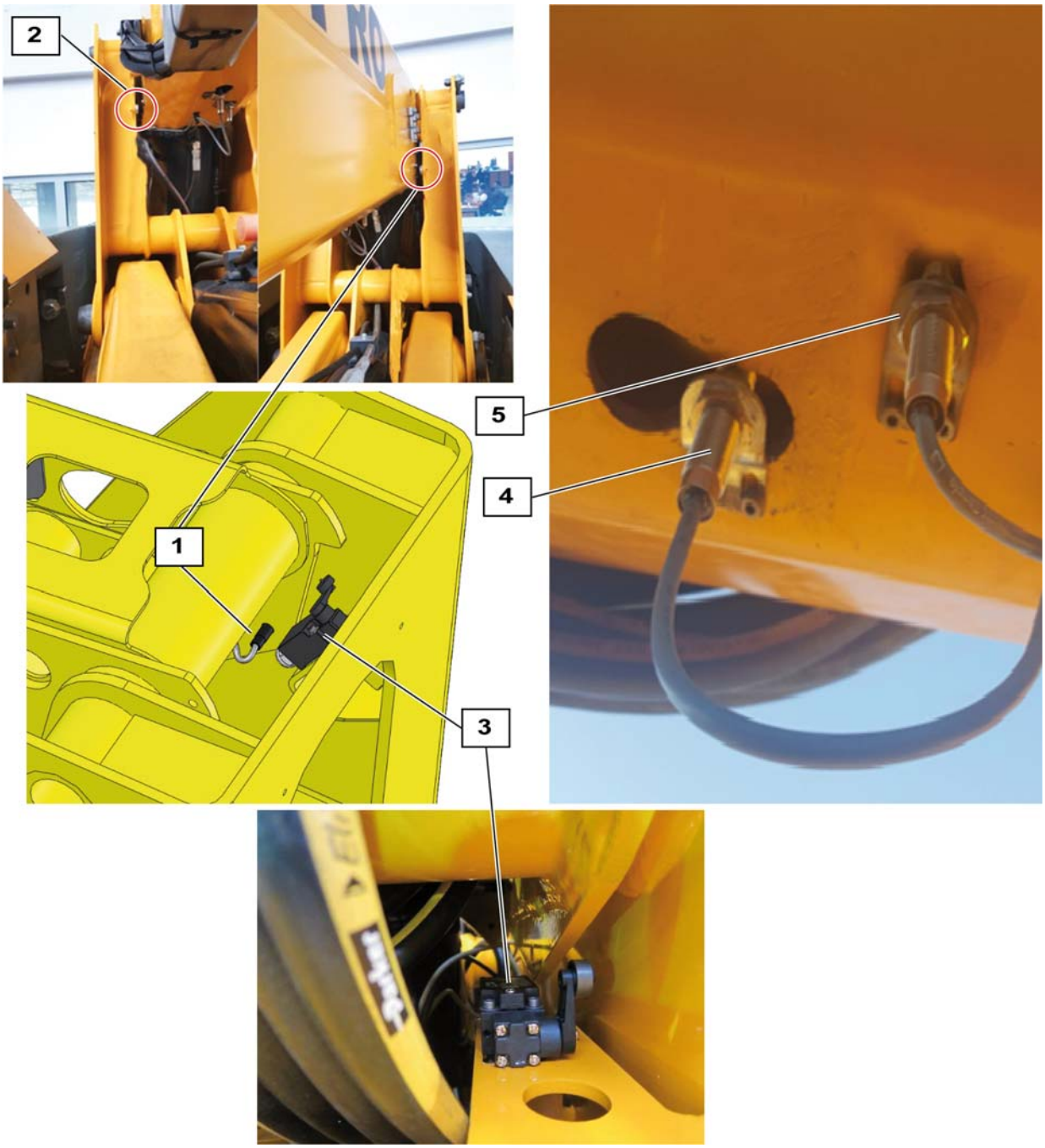
Marking	Item	Description
1	FU400 (60A)	Protection main supply
2	FU406 (15A)	Protection starter
3	FU401 (20A)	Protection KM3
4	FU402 (5A)	Protection supply
5	FU403 (5A)	Protection ignition
6	FU404 (5A)	Protection - EGR valve
7	FU405 (5A)	Protection option

2.2.4 - Arm sensors



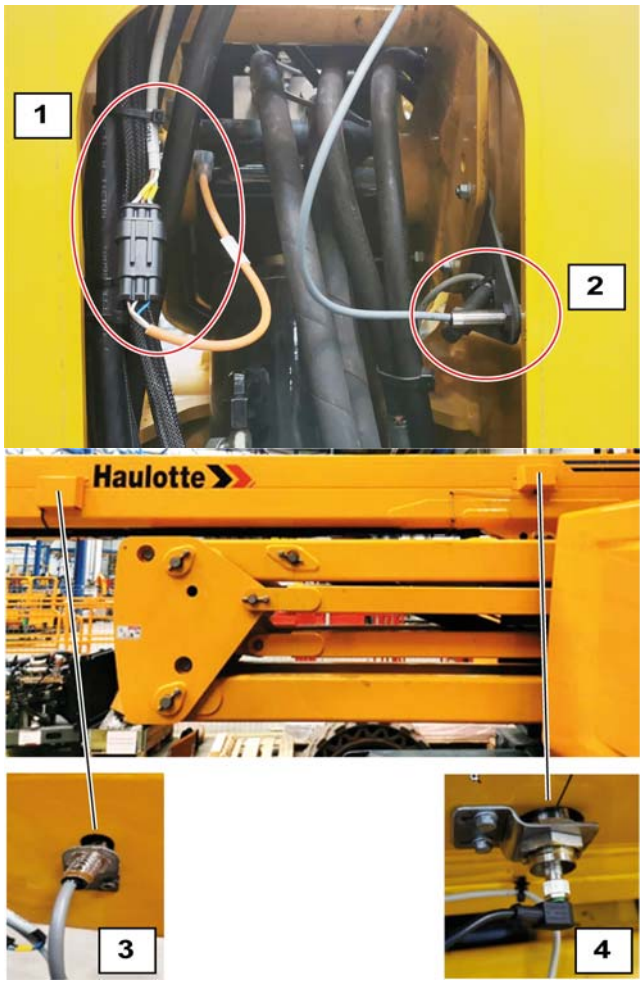
Marking	Item	Description
1	SQ420	ILS sensor (Arm up)
2	SQ421	ILS sensor (Arm stowed)
3	SQ423	Proximity sensor in redundancy with SQ421 (Arm stowed)

2.2.5 - Boom sensors



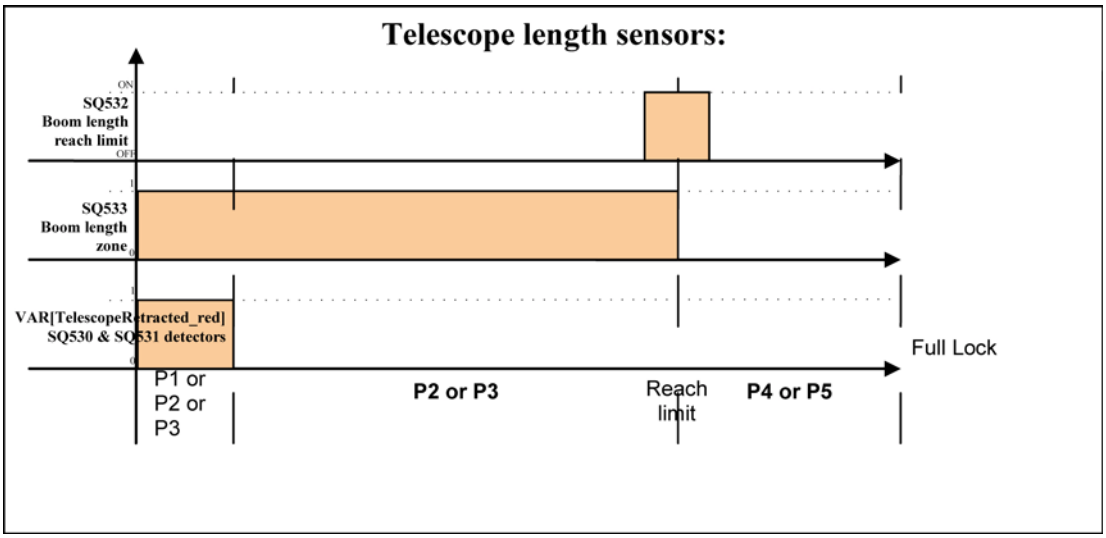
Marking	Item	Description
1	SQ520	ILS sensor (Boom stowed)
2	SQ522	ILS sensor (boom stowed) in redundancy with SQ520
3	SQ524	Limit switch detection (boom up)
4	SQ530	ILS sensor (Telescopic boom IN)
5	SQ531	ILS sensor (telescopic boom IN) in redundancy with SQ530

For dual load option (only)

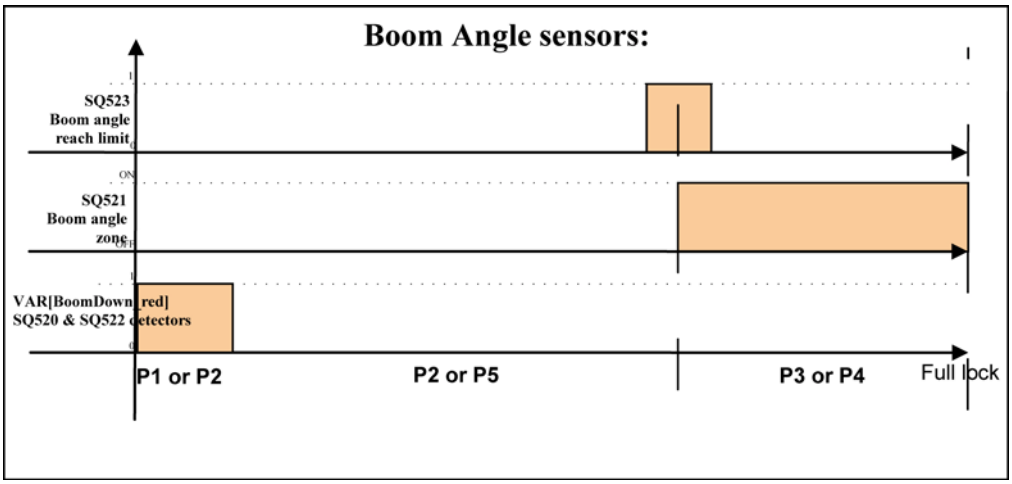


Marking	Item	Description
1	SQ521	Proximity sensor for dual load option (Boom stowed)
2	SQ523	ILS sensor in redundancy with ILS for dual load option (Boom stowed)
3	SQ532	ILS sensor for telescopic boom length detection (OFF if retracted)
4	SQ533	Boom length inductive sensor (ON if retracted)

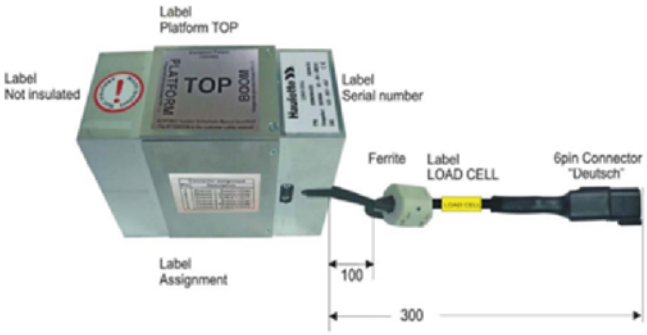
State of telescopic length sensors

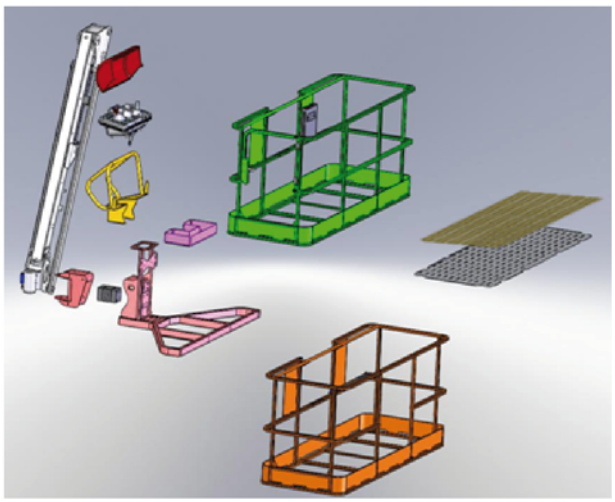


State of boom angle sensors



2.2.6 - Upper controls

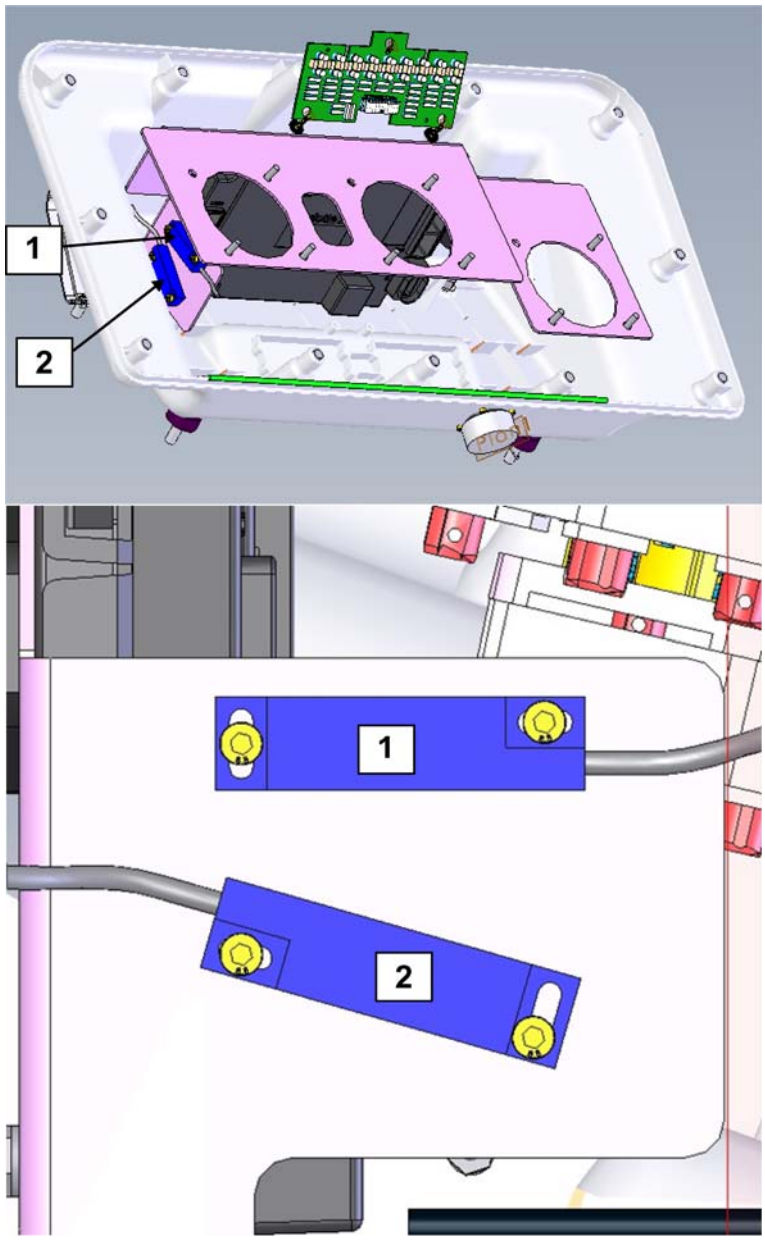




Marking	Item	Description
1	SP800	Strain gauges for load detection on basket
2	SP801	Strain gauges for load detection on basket

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

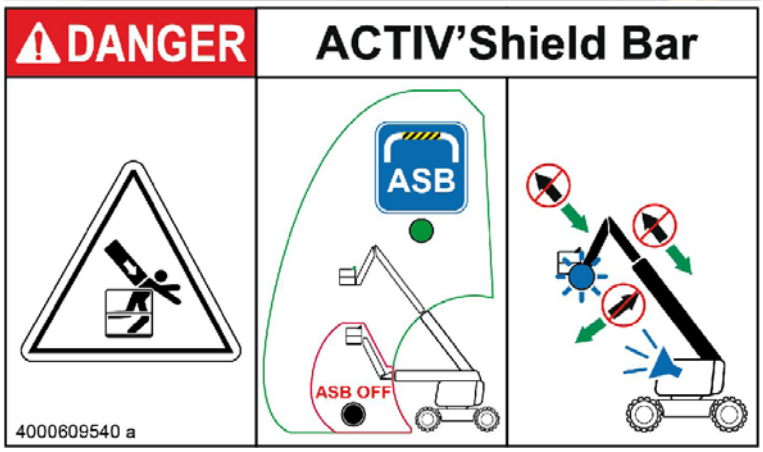
Upper controls

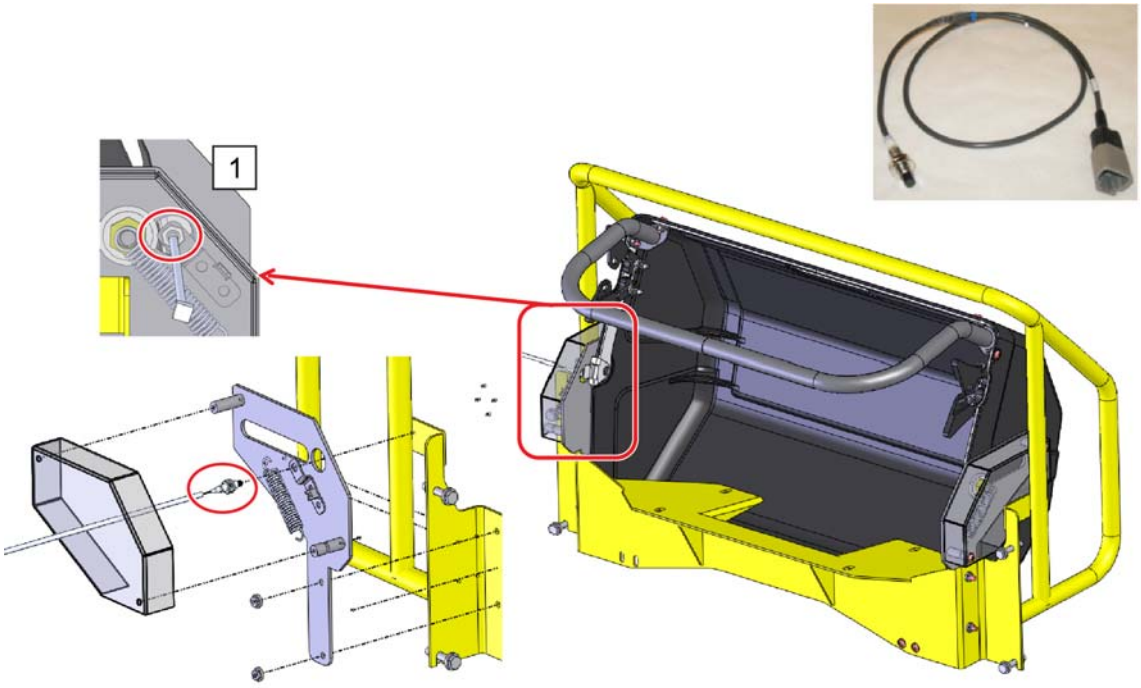


Marking	Item	Description
1	SR720	Detection basket angle (+10°) must be adjusted in parallel to the side of the metal sheet
2	SR721	Detection basket angle (-10°) must be adjusted fully at the bottom of the hole

Upper controls (with Activ'Shield Bar device)

This anti-entrapement device prevents the operator to be trapped when using the machine.





Marking	Item	Description
1	SQ902	Proximity sensor for ASB bar detection (Reset done by pressing foot switch SB800)

2.2.7 - Option Activ' Lighting System

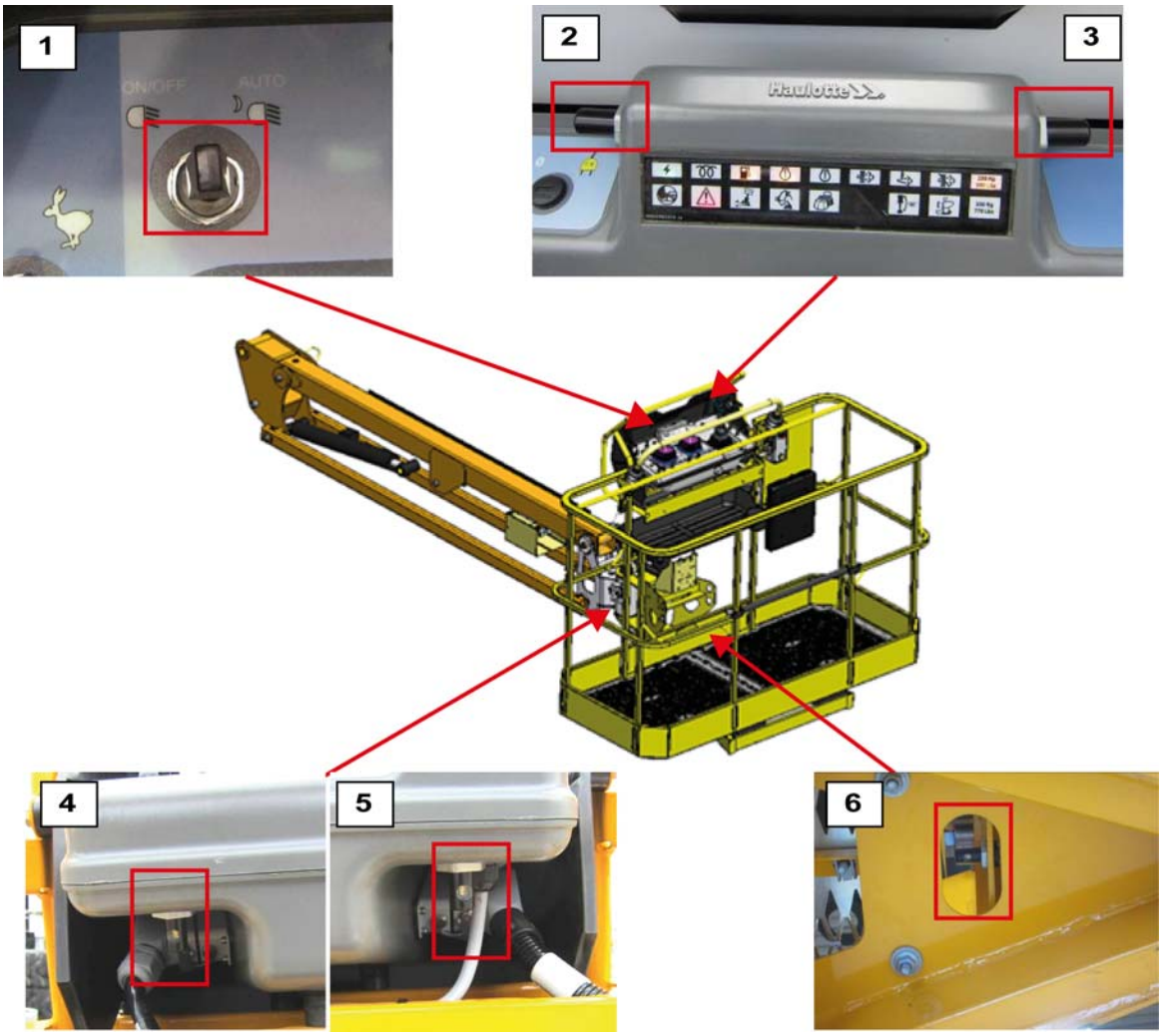
This option will permit the operator to load the AWP on truck in total safety and also keeps working on site when daylight is too dark.

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

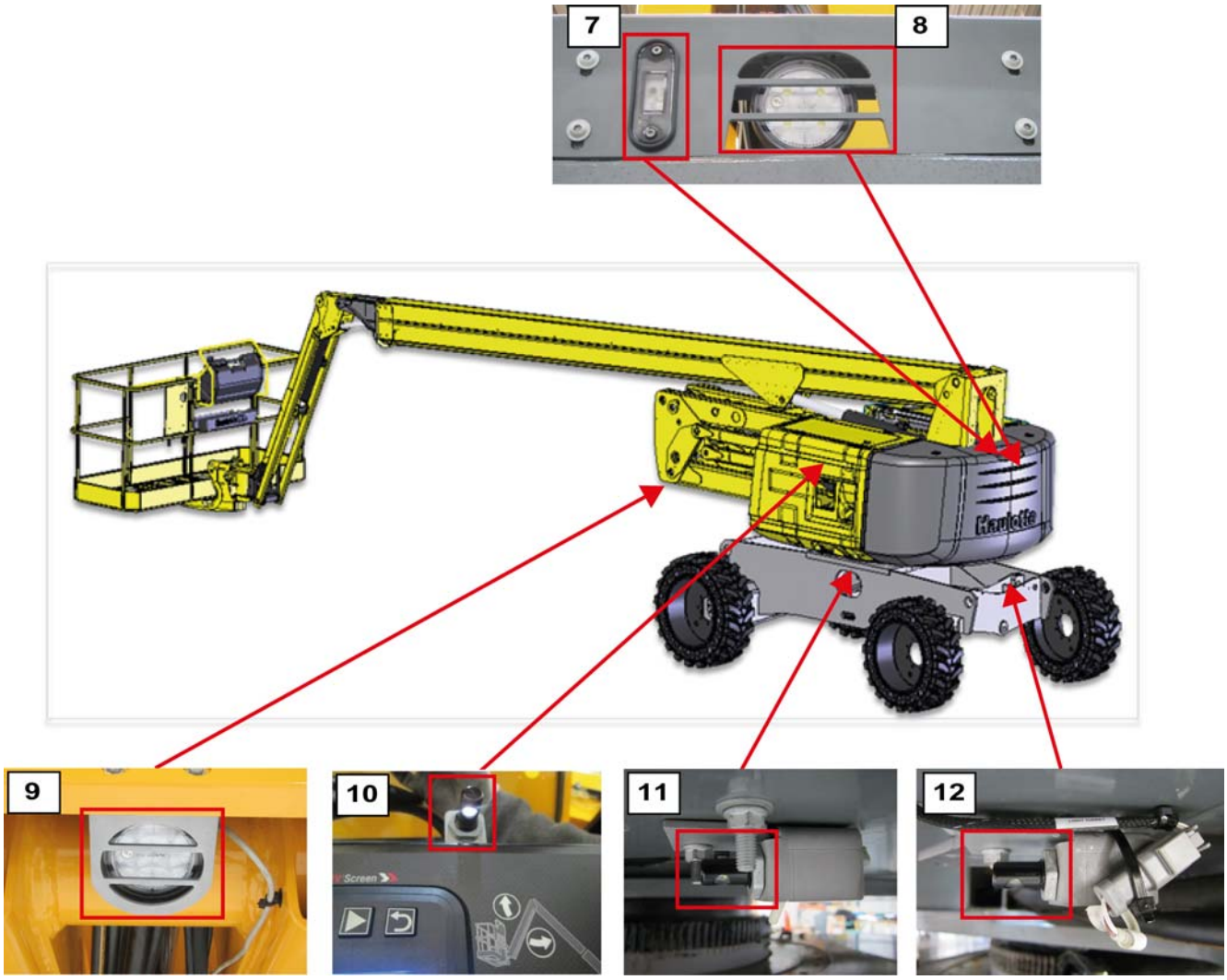
Machine state	Light zone		
	Turret light zone	Basket light zone	Movement light zone
Lower control box selected	ON		
Upper control box selected	ON	ON	
Upper control box selected with engine running and movement in process	ON	ON	ON

2.2.7.1 - Architecture of the system

Upper controls



Turntable



List of components and description

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

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 2)
U104	07	ECU module node B2 upper controls (slave)
U106	04	ECU module SPU7066 in turret (master)
U107	04 - 15	Keyboard with touch pad buttons (Lower controls)
EGV	02 - 13	Electronic Governor (KUBOTA module)
EDC71CV45	09 - 15	Electronic module for KUBOTA tier 4 engine
WG1605-GL	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	Option ignition overspeed (20 A)
FU7	03 - 15	Power supply V ECU node B2 (15 A)
FU8	03 - 10	Option flashing light (20 A)
FU9	03 - 13	Power supply for accessories (20 A)
FU11	03 - 09	Power supply on Activ' Screen display (7.5 A)
FU13	03 - 11	Power supply V for SPU7066 module (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)
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 - 08	CN104.19	Differential lock (B110)
SA101	07 - 13	CN104.13/14	4WS Steering (Mode crab B104 /Synchronous B105)
SA110	07 - 18	CN104.6	Drive mode (B111 = 1 in high speed)
SA303	07 - 05	CN105.3	Engine start/stop (B128)
SA304	07 - 10	CN104.12	Petrol/gas (B117)
SA621	07 - 14	CN104.15/16	Jib lift/descent (B120 / B121)
SA721	07 - 18	CN104.9/10	Basket compensation up/down (B114 / B115)
SA751	07 - 15	CN105.36/35	Basket rotation left/right (B124 / B123)
SA800	07 - 06	CN105.4	Emergency pump (B129)
SA802	07 - 11	CN105.14	Dual load (B143)
SA900	03 - 06		Main power switch key ON/OFF (106)
SA904	08 - 18		Working light option (183)
SA906	07 - 09	CN104.11	Generator (B116)
SA907	07 - 07	CN104.1	Horn (B106)
SA907b	11 - 10		Horn (lower controls for RUS/UKR option) (184)
SA910	11 - 15		Activ' Lighting System option (913/914)
SB800	08 - 16	CN105.12	Foot Switch (= 1 for any movement) (B141)
SB801	03 - 06		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)
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		Arm 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

Sensors			
Name	Location	Connector	Function
SL300	06 - 02	1A.8	Fuel level (= 0 if low level detected) (189)
SN900	05 - 02	1B.22	Detection for Activ' Lighting system option (ON if < 50 lumens and option selected) (917)
SP100	06 - 09	2A.11	High speed pressure detection in hydraulic drive circuit (212)
SP160B	06 - 05	1A.2	Detection of pressure in drive pump in stand-by mode in REV drive (above charge pressure) (512)
SP160F	06 - 04	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)
SQ420	06 - 16	1B.12	ILS detection for arm angle (=1 if UP) (224)
SQ421	06 - 19	2B.14	ILS detection arm in stowed position (281)
SQ423	06 - 11	1B.13	Proximity detection for arm in stowed position in redundancy with SQ421 (222)
SQ520	06 - 18	2B.12	ILS detection for boom in stowed position (384)
SQ521	06 - 12	2A.17	Proximity sensor for boom angle position (dual load only) (521)
SQ522	06 - 07	3B.30	ILS detection for boom in stowed position in redundancy with SQ520 (223)
SQ523	06 - 15	1B.14	Boom position (= 1 if between -10°/+8°) (523)
SQ524	06 - 08	2A.12	Limit switch for boom angle (=1 if UP) (524)
SQ530	06 - 17	2B.13	Telescope ILS detection (ILS in front of magnet =1 if retracted) (530)
SQ531	06 - 06	3A.17	Telescope detection (ILS in front of magnet = 1 if retracted) (533)
SQ532	06 - 13	2A.10	Boom position ILS detection in P5 zone (532)
SQ533	06 - 14	1B.11	Boom position detection in P5 zone (531)
SQ800	06 - 03	1B.21	Slope detection (Signal wire 150 = 1 if machine levelled)
SQ902	08 - 12	CN105.05	Activ' Shield Bar detection (=1 if detected) (B150)
SQ910/SQ911	08 - 11	CN105.10	ILS detection for basket (Aircraft option)
SR720	08 - 14	CN105.17	Basket inclination (= 1 if at -10°) (B146)

Sensors			
Name	Location	Connector	Function
SR721	08 - 13	CN105.16	Basket inclination (= 1 if at +10°) (B145)
ST302	02 - 11		Water temperature detection in engine (130)
ST900	06 - 10	3B.23	Hydraulic oil overheating detection (= 1 if OK) (125)
ST902	02 - 02		Temperature switch detection (oil cooler) (191)
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	1B.7	Engine start/stop command (170)
KA4	05 - 19	2A.23	Engine start command (169)
KA6	03 - 14		Overriding command (188)
KA7	03 - 03		Start circuit (for Tier 4 engine only) (138)
KA8	05 - 13	1B.28	Option flashing light (194)
KA9	05 - 14	1B.2	Horn command (187)
KA10	11 - 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 - 15		Main line contactor (143)
KMP	03 - 14		Power relay (Keeps power a few seconds after KMG) (143)
SD85	02 - 19		Option overspeed relay (Option)
KM3	09 - 13 / 10 - 7		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)
KM300	02 - 08		Starter (165)

Valves-Motors			
Name	Location	Connector	Function
YA3	02 - 14		Engine coil hold (for overspeed option only) (136)
YA300	02 - 14		Electronic engine speed control coil (136)
YV100	06 - 07	2A.5	Differential lock (=1 if axle unlocked in low speed drive and turret aligned and not in slope) (689)
YV101	06 - 13	2A.19	Oscillating axle unlocking (780)
YV102	06 - 07	2A.25	Brake release rear axle (782)
YV104	06 - 04	2A.26	Oscillating axle unlocking (780)
YV105	06 - 08	1B.9	Brake release front axle (783)
YV107	06 - 08	2B.28	Crab 4WS steering mode (YV108=1 for right side) (621)
YV108	06 - 02	2A.24	Synchronous 4WS steering mode (YV107 =1 for left side) (622)
YV110	06 - 05	1B.3	Valve for drive mode (= 1 in HS) (680)
YV150L	06 - 09	2B.29	Front left steering (601)
YV150R	06 - 16	2B.27	Front right steering (602)
YV160B	05 - 05	3A.19	PWM REV drive valve (619)
YV160F	05 - 06	3A.26	PWM FWD drive valve (620)
YV250	05 - 06	3A.4	PVG valve for turret rotation (880)
YV420	05 - 10	2A.20	PWM valve for am lift/descent (282)
YV520	05 - 11	2A.4	PWM valve for boom lift/descent (381)
YV530	05 - 12	2A.3	PWM valve for telescope extension/retraction (387)
YV620D	08 - 14	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 - 07	1B .1	Load sensing valve (= 1 for any movement) (120)
YV801	05 - 08	3A.24	Safety valve for telescopic boom extension (803)
YV802	06 - 03	2B.17	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			Valve for generator option

Valves-Motors			
Name	Location	Connector	Function
M300	02 - 08 / 09 - 07		Starter motor (163)
M800	02 - 08 / 09 - 07		Emergency pump motor (141)
M900	02 - 02 / 10 - 02		Cooler motor option (191)

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 - 18		Option working light (183)
EL905	09 - 11	CN105.29	Activ'Shield Bar detection (B608)
EL906	11 - 14	3B.1	Light on Counterweight (Activ' Lighting System option)
EL907	11 - 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	11 - 13	3B.4	Lights under turret (L/R) (Activ' Lighting System option) (906)
HL911	11 - 14	3B.4	Light on lower control box (Activ' Lighting System option) (906)
HL912A/B/C/D	11 - 16		Lights on upper control box (Activ' Lighting System option) (914)
HL913	11 - 18		Light under basket (Activ' Lighting System option) (913)
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	Packaging
Air filter (system)	2324007620	
Primary air filter	4000044230	
Secondary air filter	4000044240	
Diesel filter Tier III	4000079430	
Pre-filtered with diesel Tier IV	4000077770	
Diesel filter - Kubota	4000503090	
Oil filter - Kubota	4000076270	
Diesel filter - Kohler	4000389280	
Oil filter - Kohler	4000389200	
Engine belt - Kohler	4001064000	
Engine oil - 5W40	4000010660	60 l(15,8 gal US)
Engine oil - 10W40	4000531300	20 l(5,3 gal US)
Engine oil - 15W40	4000530600	5 l(1,32 gal US)
	2420801360	20 l(5,3 gal US)
	2820305720	209 l(55,2 gal US)
Hydraulic oil - HV32	4000096350	20 l(5,3 gal US)
Hydraulic oil - HV46	4000530620	5 l(1,32 gal US)
	2420801320	20 l(5,3 gal US)
	2420801310	209 l(55,2 gal US)
Biological hydraulic oil - HV46	2505003830	209 l(55,2 gal US)
Transmission oil - 80W90	4000530610	1 l(0.22 gal US)
	2420801370	20 l(5.3 gal US)
Extreme-pressure lithium grease	2820304320	0,4 l(0.1 gal US)
Grease cartridge	2326005400	0,4 l(0.1 gal US)
Grease cartridge	4000561720	0,4 l(0.1 gal US)
Telescope grease	4000813570	1 kg(2.20 lb)
Telescope grease	4000813560	5 kg(11.02 lb)
Aggressive environment grease	4001088590	5 l(1,32 gal US)
Coolant	4000813540	5 l(1,32 gal US)
	4000564860	25 l(6,6 gal US)

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 V2403 CR	✓	✗	✓	✓
KUBOTA V2703	✓	✓	✓	✓
KOHLER KD1903	✓	✗	✓	✓

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 CF, CF-4, CG-4, CH-4 / CI-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
High sulfur fuel ≤ [0.05% (500 ppm)] Sulfur content < 0.50% (5000 ppm)	API CJ4 (If the engine oil is used with a high sulfur level, change the engine oil at shorter intervals, approximately half)

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

4.8 - MARINE PROTECTION

In harsh environments (high levels of salinity in the atmosphere: close to the sea, industrial environment with chloride emissions and/or humidity > 70%), we recommend applying the following protection process :

- Wash the machine completely to remove any trace of harsh environmental pollution.
- Dry all the machine.
- Apply directly a solvent-based oil leaving an oily film after evaporation of the solvent.
- Re-apply the product every month.

After washing the machine, make sure it is fully air-dry and does not contain moisture on corrosive parts (cylinders rods for example).

Do not wash any electrical components, particularly with high pressure washer. Wipe away dirt from around electrical components with a dry cloth.

N.B.-:-REFER TO CONSOMMABLES

Viscosity at + 40° C (+ 104° F)	4 mm²/s
Flashpoint	28 °C

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.

	HA26 RTJ O - HA80 RTJ O	HA26 RTJ PRO - HA80 RTJ PRO
Low drive speed	1,2 km/h / 0.7 mph	
High drive speed	5 km/h / 3.1 mph	
Maximum towing speed	5 km/h / 3.1 mph	
Time for telescopic boom extension	60 s +/-5	
Time for telescopic boom retraction	60 s +/-5	
Time for raising boom	44 s +/-4	
Time for descent boom	44 s +/-4	
Time for continue turntable rotation	33 s +/-3 (per 1/2 rotation)	
Time for complete left / right cage rotation	22 s +/-3	
Time for arm lifting	50 s +/-5	
Time for descent arm	50 s +/-5	
Time for jib lifting	30 s +/- 3 s	
Time for jib descent	30 s +/- 3 s	
Time for raising compensation	15 s +/- 2 s	
Time for lowering compensation	15 s +/- 2 s	
Stop point to stop point steering	5 s +/- 1 s	

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	MP0001					
KUBOTA WG2503 engine						
Drain the engine oil	MP0036					
Replace the oil filter	MP0004					
KUBOTA V2403M / V2403CR T4B / V2403CR T5B engine						
Drain the engine oil	MP0036					
Replace the oil filter	MP0004					
Hydraulic : oils, filters and hoses						
Replace the hydraulic filter	MP0006					

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	MP0027					
Grease the bushings and pins						
Slew ring						
Grease the turntable slew ring	MP0044					
KUBOTA WG2503 engine						
Drain the engine oil	MP0036					
Replace the oil filter	MP0004					
Clean the air filter	MP0030					
Check the belt tension and condition	MP0007/ MP0025					
KUBOTA V2403M / V2403CR T4B / V2403CR T5B engine						
Clean the fuel filter	MP0026					
Clean the air filter	MP0030					
Check the belt tension and condition	MP0007/ MP0025					
KOLHER KDI1903 engine						
Clean the air filter						
Check the belt tension and condition						
Arm, boom						
Grease the pads	MP0028					

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	MP0001					
Check the wheel reducer level	MP0002					
Tighten the steering system	MS0005					
Slew ring						
Tighten the slew ring	MP0019					
KUBOTA WG2503 engine						
Replace the belt*	MP0032					
KUBOTA V2403M / V2403CR T4B / V2403CR T5B engine						
Drain the engine oil*	MP0036					
Replace the oil filter*	MP0004					
Replace the fuel filter*	MP0005					
Replace the belt*	MP0032					
KOLHER KDI1903 engine						
Drain the engine oil*						
Replace the oil filter*						
Replace the fuel filter*						
Replace the belt*						
Hydraulic : oils, filters and hoses						
Check the hydraulic oil level	MP0013					
Jib						
Tighten the rotary cylinder	MP0016					
Tighten the load cell	MP0015					
Platform						
Tighten the mounting on the platform support, the platform floor and the platform access	MP0017					

* 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	MP0043					
KUBOTA WG2503 engine						
Replace the fuel filter	MP0005					
Replace the air filter	MP0010					
KUBOTA V2403M / V2403CR T4B / V2403CR T5B engine						
Replace the air filter	MP0010					
KOLHER KDI1903 engine						
Replace the air filter						
Hydraulic : oils, filters and hoses						
Replace the hydraulic filter	MP0006					
Arm, boom						
Check the pads-Replacement if necessary	MP0011					

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	MS0002/ MP0024					
Slew ring						
Check the slew ring clearance	MP0018					
KUBOTA WG2503 engine						
Drain the oil tank	MP0020					
Drain the cooling circuit	MP0021					
KUBOTA V2403M / V2403CR T4B / V2403CR T5B engine						
Drain the oil tank	MP0020					
Drain the cooling circuit	MP0021					
KOLHER KDI1903 engine						
Drain the oil tank						
Hydraulic : oils, filters and hoses						
Drain the hydraulic oil	MP0014					

D - Inspection and maintenance schedule

Preventive Maintenance Level 2 - Every 3000H

Every 3000H	Page or associated procedure	Every 3000H	OK	NOK	Corrected	Comments
KUBOTA V2403CR T4B / V2403CR T5B engine						
Clean the diesel particulate filter						

Preventive Maintenance Level 2 - Every 5000H

Every 5000H	Page or associated procedure	Every 5000H	OK	NOK	Corrected	Comments
KOLHER KDI1903 engine						
Drain the cooling circuit						

Preventive Maintenance Level 2 - Every 6000H

Every 6000H	Page or associated procedure	Every 6000H	OK	NOK	Corrected	Comments
KUBOTA V2403CR T4B / V2403CR T5B engine						
Replace the particulate filter						

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.

N.B.-:-The list of Maintenance Sheets is not exhaustive. Other Sheets may be sent upon request. Contact HAULOTTE Services®.

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- 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

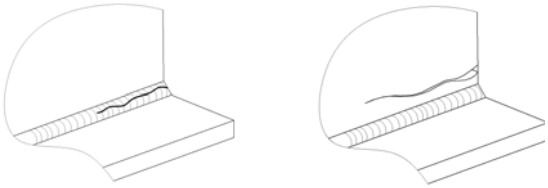
To guarantee the integrity of the machine, it is necessary to carry out periodical controls on the mechanical structure such as defines hereafter.

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

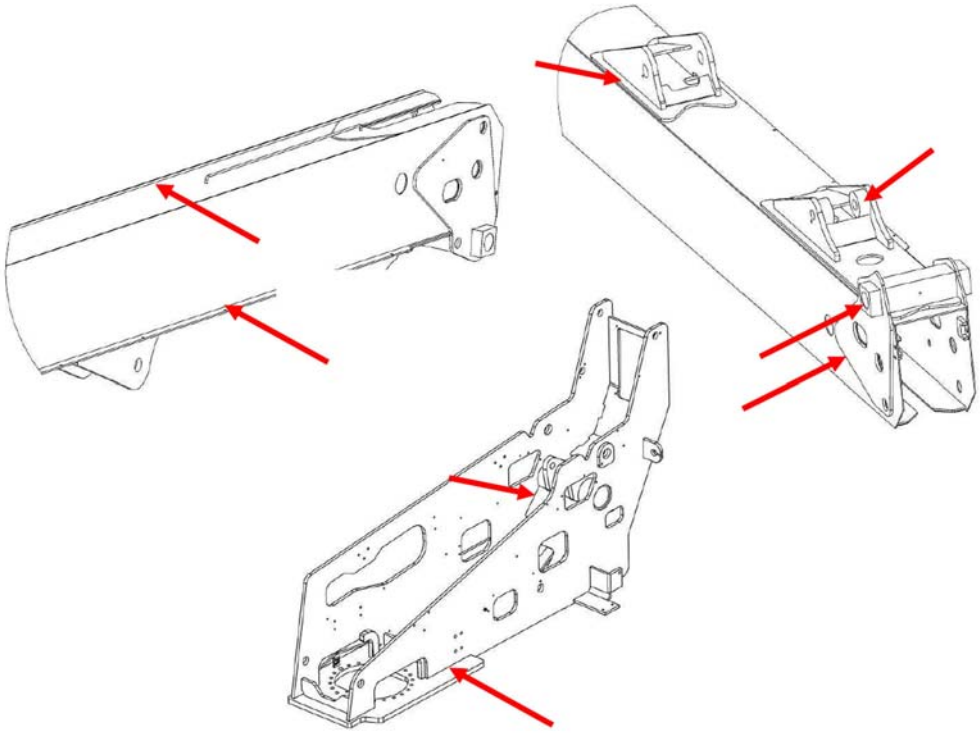
All structural part listed Section Familiarization must be disassembled and all weldsmust be review using non-destructive checks Section D - Inspection and maintenance schedule.

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.

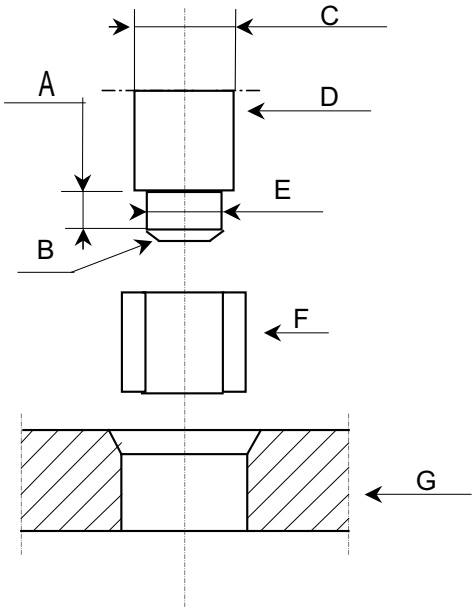
6 - Procedure of reassembly

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.

Notes

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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.

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)

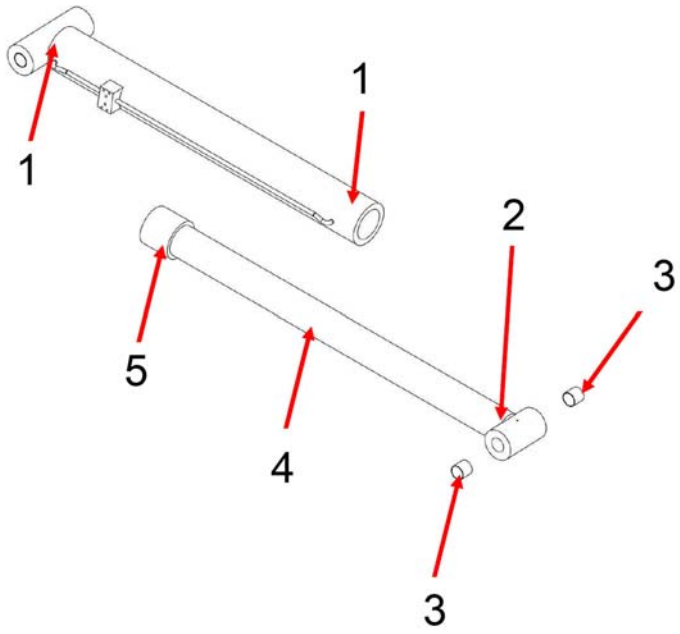
These tests must be made in conditions of equivalent temperatures.

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.

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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 - Test procedure

The brake system is a significant component of the safety of the machine. The following tests must be performed periodically Section D - Inspection and maintenance schedule.

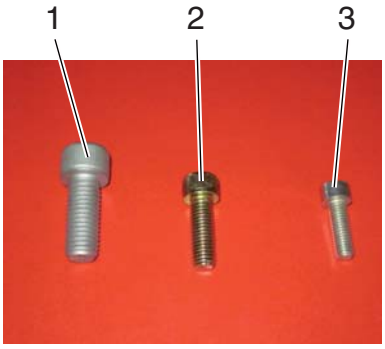
High speed :

- 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 :
- Between 3 km/h (1.9 mph) and 6,5 km/h (4,039 mph) according to the machines.
- 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 0.2 m (0ft 8in) and 2,7 m (8 ft 11 in), the test is validated.
- If not, Contact HAULOTTE Services® to repair the system.

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 - HA26 RTJ O - HA26 RTJ PRO - HA80 RTJ O - HA80 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	280 Nm
Slew ring	Slew ring / Chassis	215 Nm
	Turntable / Slew ring	215 Nm
Turret orientation motor	Turret reducer / Turret	105 Nm
Engine	Drive pump / Engine housing	160 Nm
	Equipment pump / Drive pump	160 Nm
	Screw fastening elastic coupling / Flywheel	44 Nm
Counterweight	Counterweight / Turntable	500 Nm
Telescope	Pads rear telescope	Screws : 10 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.**

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		• Place barriers around the perimeter of the work area

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

2 - Control and inspections

The state of hoses devices plays a significant role in the safety of the machines.

Section D - Inspection and maintenance schedule :

- Check the absence of leakage to the junctions of the hoses.
- Check that all the hoses are correctly tightened.
- Check the absence of tear and crack of the external hoses.
- Check that the shielding of the hose is not apparent.
- Check the absence of chemical aggression of the membrane of the hose.

If anomalies are noted, it is necessary to replace the elements by respecting the following recommendations.

3 - Hoses Disassembling

For safety reasons, respect imperatively the following conditions of disassembling :

- Fold the machine on a flat and released ground :
- The machine is not in slope.
- The boom is horizontal.
- Put the turret (if equipped) in the axis.
- Carry out a beaconing of the sector (maximum risk zone = machine height).
- Locate the hoses and their connections points to guarantee the good performance of the machine after intervention.
- Locate the hoses course to facilitate the reassembly.

To recover oil, use an oils container in order not to pollute the environment.

Unscrew the flexible device slowly in order to make fall residual water pressure.

It is imperative to secure and maintain cylinders when removing hoses cylinders. An analysis of the hydraulic system is imperative.

After disassembling :

- Close the hose openings and the hydraulic components to avoid the pollution of the hydraulic system.
- Check the cleanliness of the hoses and the hydraulic components :
- Absence of plastic, rubber or metal shaving.
- If necessary, purge and clean the circuit (tank included).

4 - Hoses Reassembly

For safety reasons, respect imperatively the following conditions of reassembly :

- Using the reference marks carried out previously; carry out the courses of hoses.
- During the fixing of the hoses, respect the tightening torques below.

Tightening torque table

Description	Torque (JIC)	Torque (ORFS)
Hose 1/4" (diameter 6mm)	1,5 daN.m(11,08 lbf.ft)	2,6 daN.m(19,22 lbf.ft)
Hose 3/8" (diameter 10mm)	3,5 daN.m(25,86 lbf.ft)	4,2 daN.m(31,04 lbf.ft)
Hose 1/2" (diameter 12mm)	5 daN.m(36,95 lbf.ft)	5,7 daN.m(42,12 lbf.ft)
Hose 5/8" (diameter 16mm)	8 daN.m(59,12 lbf.ft)	8,5 daN.m(62,82 lbf.ft)
Hose 3/4" (diameter 19)	10 daN.m(73,91 lbf.ft)	12,2 daN.m(90,17 lbf.ft)

Once all the hoses are correctly tight :

- Put the machine in operational configuration
- Carry out some movements implementing the hoses concerned in order to purge the hydraulic system.
- Check the absence of leakage.
- Control the level of hydraulic oil tank.
- Check the pressures.

1 - You will need

	• Standard tool kit • Protective goggles • Gloves • Weight of 250 kg / 551 lb (for procedure reset 250 kg / 551 lb) • Weight between 75 kg / 165 lb and 300 kg / 662 lb (for procedure reset using variable weight) • Lifting equipment adapted and suitable for placing and removing the load from the platform • Computer with HaulotteDiag and diagnostic kit (4000009300) or DiagPad diagnostic console (400031760)		• Place barriers around the perimeter of the work area

2 - Level of knowledge required

The use of this card implies that its user is trained on this kind of machine and that this training was delivered by HAULOTTE® or an authorised representative, following the program for DIAG LEVEL II.

It is important that the person performing the work on the machine knows all the relative safety information contained in the instruction manual.

Only an authorized and qualified technician can work on HAULOTTE® machines.

3 - Safety instructions

- **The technician should take all steps to protect themselves or others against all risks of injury related to this 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).**
- **Position the machine on a flat ground, stabilized and in a released environment.**
- **Mark out the work area.**
- **Cut the contact, to remove the key, open the battery cut if fitted.**
- **Place a "DO NOT USE" decal near the start/stop contactor (key switch) to inform personnel that interventions are currently underway on the equipment.**
- **The pressure in the hydraulic system is very important. It can cause accidents. Relieve the pressure before any intervention and never search for oil leaks using your hands.**
- **Attention to the risks of burns, the hydraulic system works at high temperatures.**
- **The exhaust fumes of the engines contain harmful products of combustion. Only start and run the engine in a well ventilated area. In a closed room, you must use a suitable system to evacuate the exhaust to the outside.**

4 - Periodic inspection

To test the function :

- Put the machine in lower position on flat ground.
- Select turret control box using the key selector.
- Level the platform if needed
- Put a load of 300 kg (662 lb) in the center of the platform (as drawn below), using adequat tools.

- Verify that audible and visual warning device are actuated.

If not, overload system setting is needed. Do not use the machine. Refer to maintenance book for operation setting.

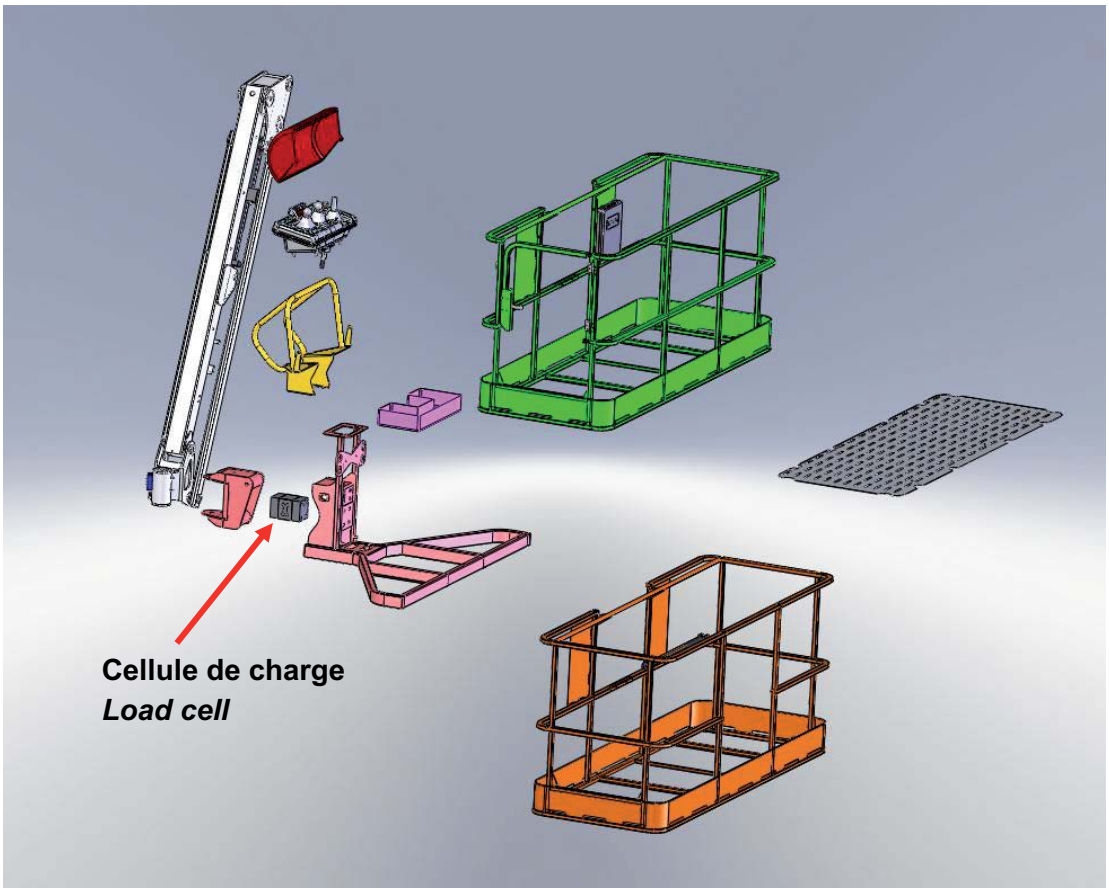
5 - Calibration procedure

The machine is equipped with a 2 channel load cell type weight management system, mounted between the platform and the boom assembly.

The location of the load cell means calibration is required when the system values become out of correct range, or when any of the platform sub assembly components (cage, support, flooring etc) are replaced.

The system can be recalibrated in 3 ways depending on the software version :

- Reset of the Zero (empty cage) value.
- Calibration using a fixed known weight of 250 kg (551 lb).
- Calibration with a known weight of any value between 50 kg (110 lb) and 300 kg (662 lb).



5.1 - CONFIGURING THE MACHINE BEFORE START CALIBRATION

- The machine must be completely stowed.
- Tilt inactive
- Weight sensors not out of range.
- Platform tilt in **- 10°, + 10°**.
- Ground control box selected.

5.2 - CONNECTION AND USE CONSOLE

N.B.-:-CONTACT HAULOTTE SERVICES®

5.3 - PROCEDURE

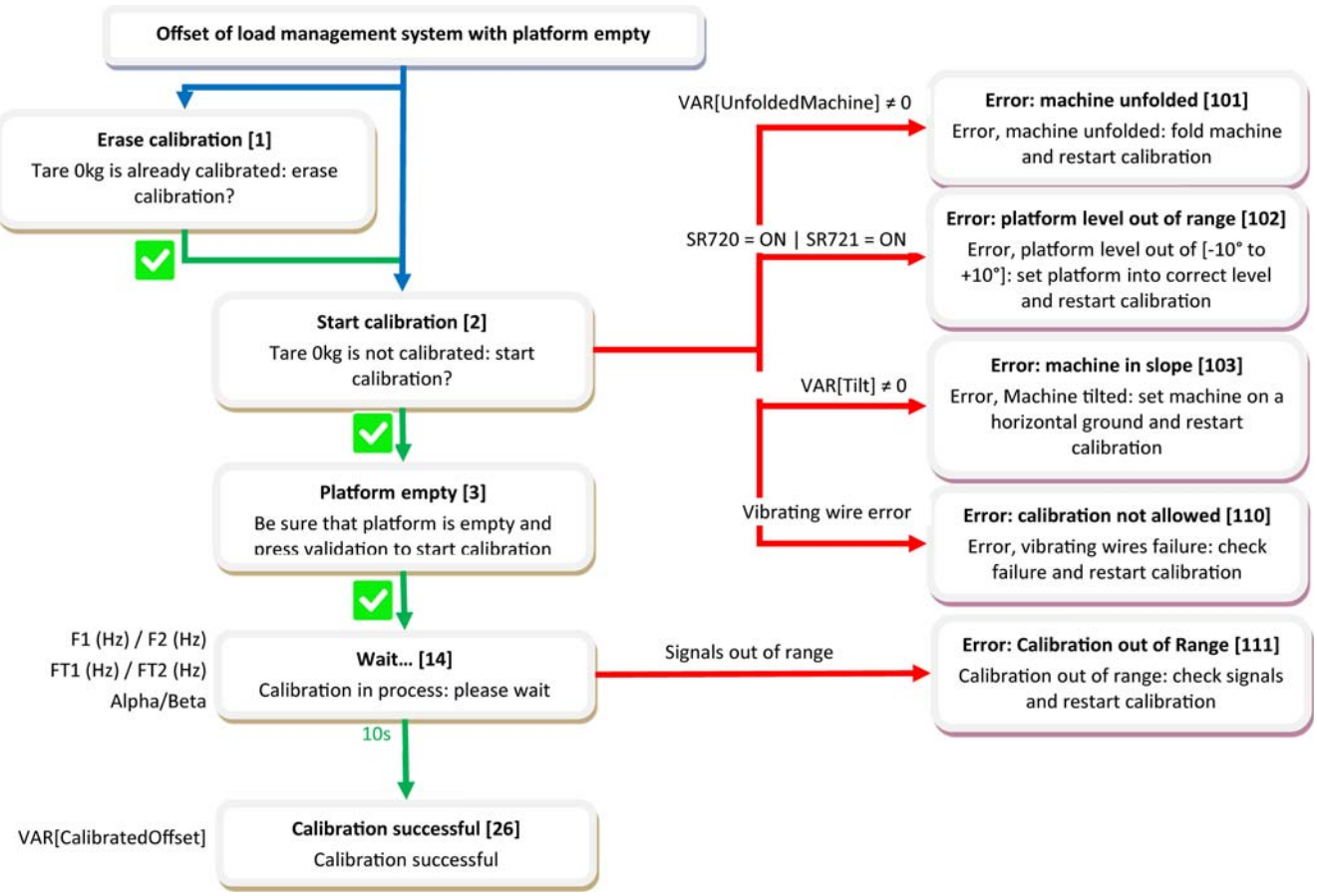
- Depending on the calibration you will do, select the code level 2 or 3 in ACCESS CODE : Main menu > Access code(Level 2 or 3)
- In the main menu select : Main menu > Machine settings > Calibration
- Then select the calibration you will do RESET 0KG (calibration of the offset) or RESET 250KG (calibration of the gain with fixed weight of 250 kg / 551 lbs) or 75 kg / 165 lbs (calibration of the gain with adjustable weight between 300 kg / 662 lbs and 75 kg / 165 lbs)

5.4 - RESET OF THE ZERO (EMPTY CAGE) VALUE

Before any calibration procedure, make sure to remove from the basket / platform all options weighing more than 15 kg / 33 lbs (Welding machine support, Basket mesh, ...).

For calibration with a fixed or adjustable weight, the load must integrate the weight of all basket options.

N.B.-:-ACCESS CODE LEVEL (2)

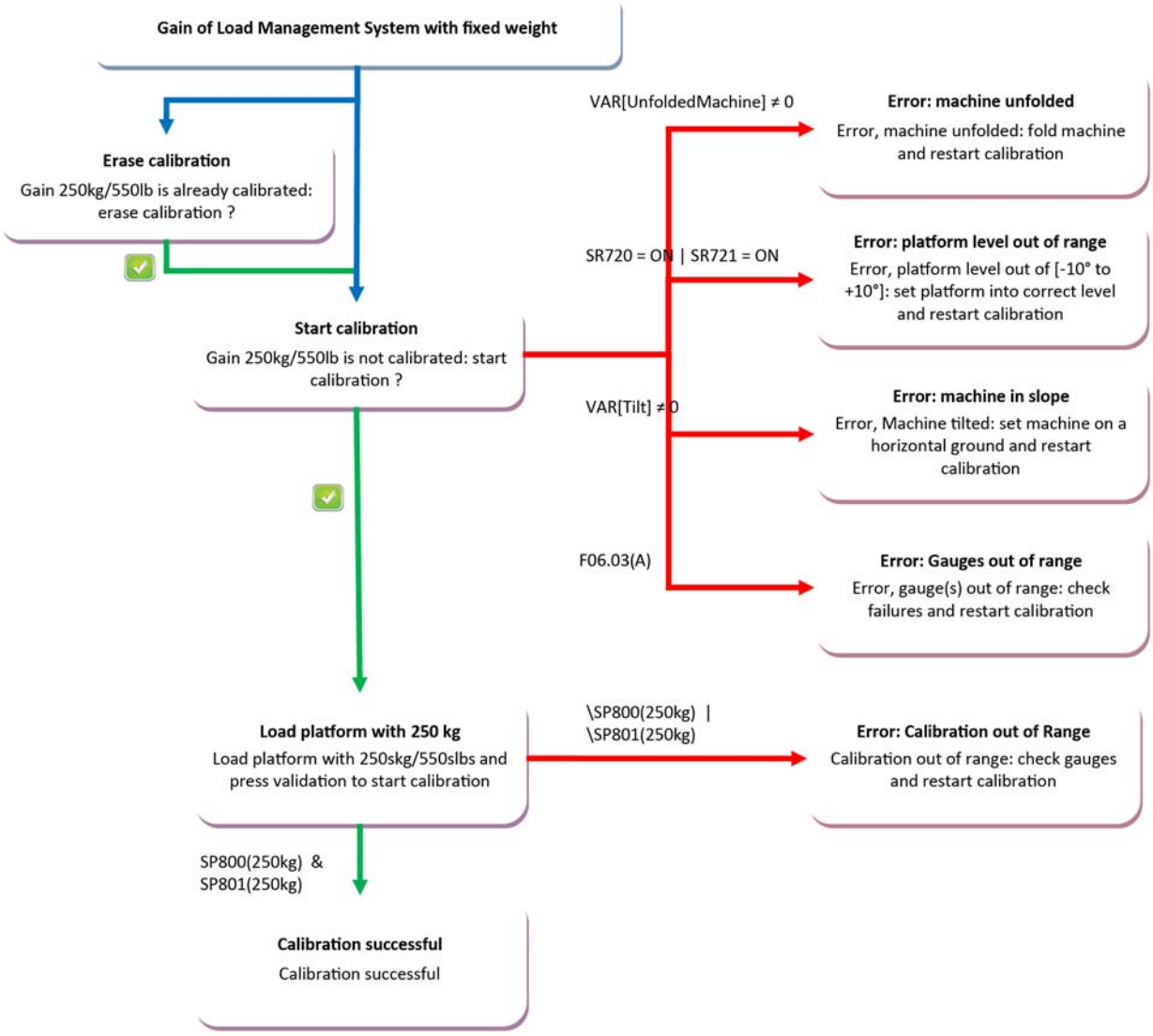


5.5 - CALIBRATION USING A FIXED KNOWN WEIGHT OF 250 KG (551 LBS)

Before any calibration procedure, make sure to remove from the basket / platform all options weighing more than 15 kg / 33 lbs (Welding machine support, Basket mesh, ...).

For calibration with a fixed or adjustable weight, the load must integrate the weight of all basket options.

N.B.-:-ACCESS CODE LEVEL (2)

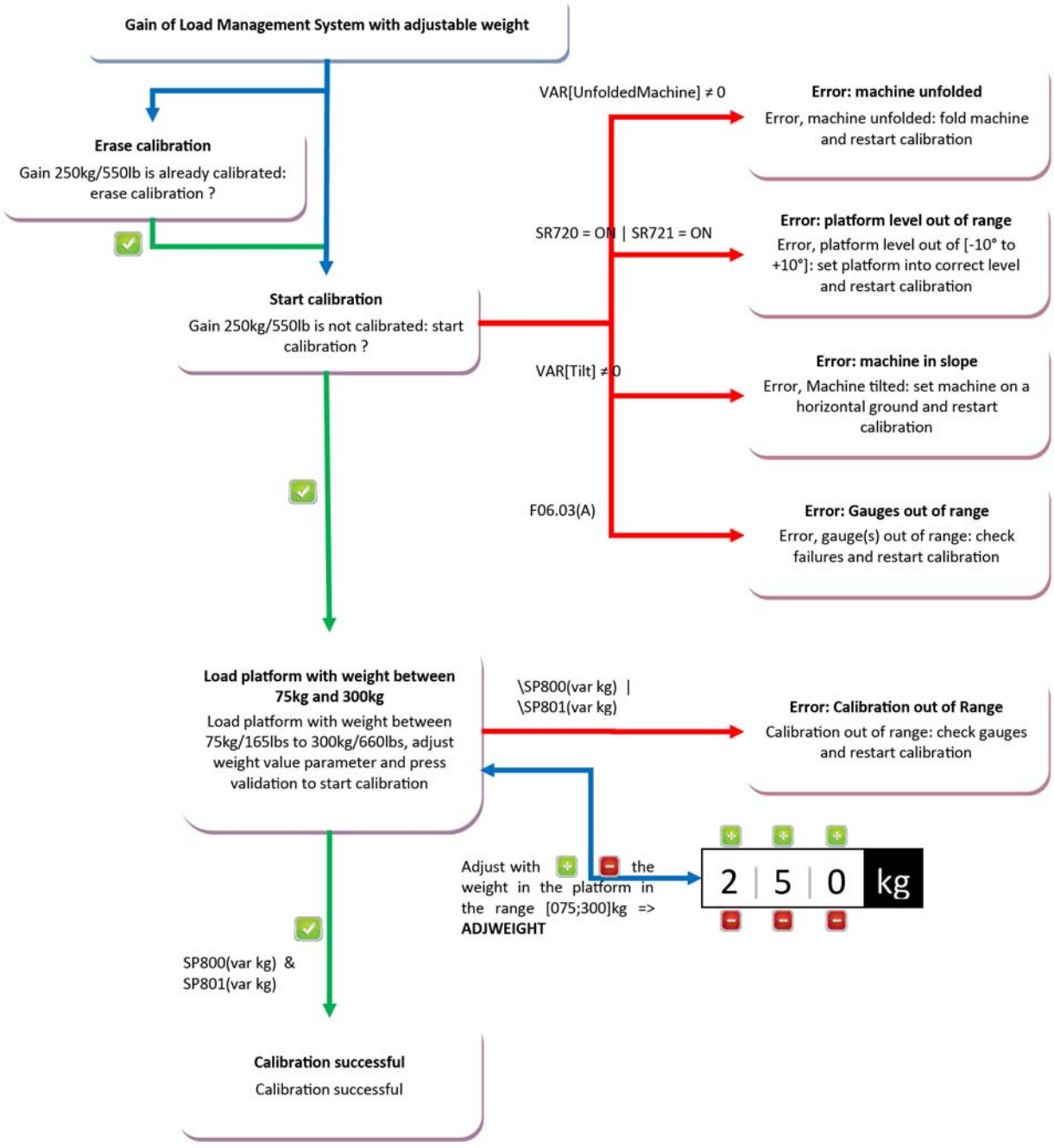


5.6 - CALIBRATION WITH A KNOWN WEIGHT OF ANY VALUE BETWEEN 75 KG (165 LBS) AND 300 KG (662 LBS)

Before any calibration procedure, make sure to remove from the basket / platform all options weighing more than 15 kg / 33 lbs (Welding machine support, Basket mesh, ...).

For calibration with a fixed or adjustable weight, the load must integrate the weight of all basket options.

N.B.-:-AVEC CODE D'ACCÈS NIVEAU 3 (CODE JOURNALIER)



5.7 - FAULT CODES LINKED TO THE OVERLOAD SYSTEM

Failures	Description
Load management system	
F06.01 **No Loading Cal** Calibrate	No overload calibration, do/redo overload calibration. Complete calibration.
F06.03 **Gauges out of Range** SP800/SP801	Gauges out of range (load management system activated). —> SP800 not in [1500; 20500] µA Check SP800 connections to ground, to U104 ECU analogue inputs
	Gauges out of range (load management system activated). —> SP801 not in [1500; 20500] µA Check SP801 connections to ground, to U104 ECU analogue inputs
F06.04 **Incoh Gauges** SP800/SP801	SP800 measured weight and SP801 measured weight are more than 50 kg far (and gauges are not out of range and gauges are calibrated) Check SP800 and SP801 connections to ground, to U104 ECU analog inputs Redo calibration
F06.05 **Low Power** Gauges supply	Low power for strain gauges is detected low : VbattB2 basket is under 8500mV Check gauges power supply
F06.09 **Negative load**	Negative load detected on SP800 gauge: measured load is below - 40kg 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.
	Negative load detected on SP801 gauge: measured load is below - 40kg and platform level angle is the range [-10 ; +10]° 4.Check the platform does not lie on an obstacle 5.Check weighing system (adjustment), check measured load when platform is empty 6.Check the integrity of the structure.

6 - Checks

Set a known weight in the cage and check the value displayed in Activ'Screen :

- Main menu > Diagnosis > Machine status > Overload(Strain gauge) > Estimated weight

1 - You will need

	• Standard tool kit • Protective goggles • Gloves • EPI (Personal protective equipment) • ORFS plug kit : 2505001600 • Oil collection pan • Torque wrench : 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.

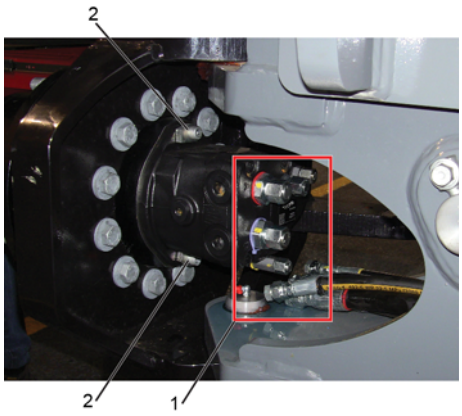
- The worker must make sure to have the EPI (Personal Protective Equipment) suited to the work and to the environment's specific conditions in which the equipment is located (see safety information specific to the work site.
- Position the machine on a flat and firm surface, clear of obstructions (beware 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).

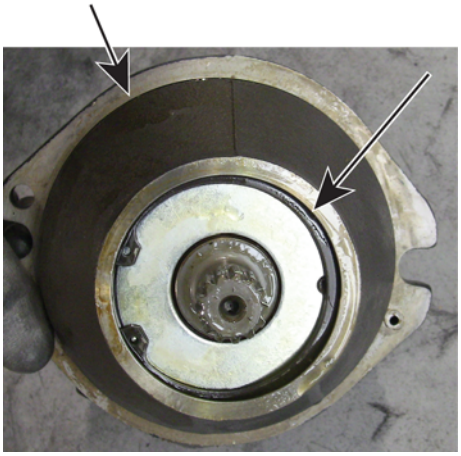


- Remove the hydraulic motor.

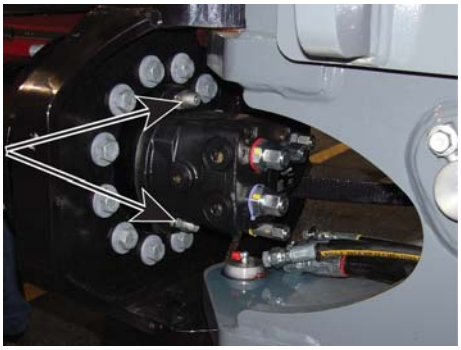
4 - Re-installation

- 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.

Notes

1 - You will need

	• Standard tool kit • Protective goggles • Gloves • Jack • Hoist • Torque wrench		• 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.

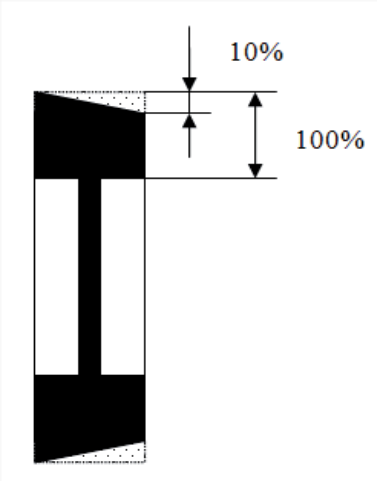
3 - Technical specifications

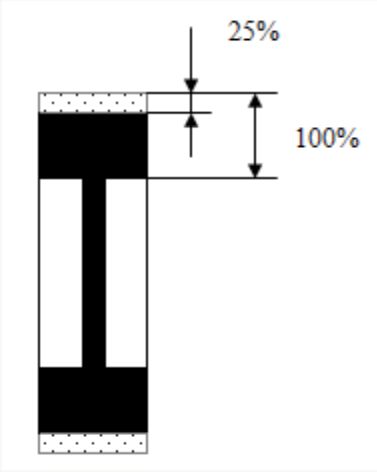
Characteristics	Standard wheel
Type	Solid tires/tyres
Wheel mass	278 kg +/- 6 kg (613 lbs +/- 13 lbs)
Size	1025/365 mm (3 ft 4 in / 1 ft 2 in)

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 :

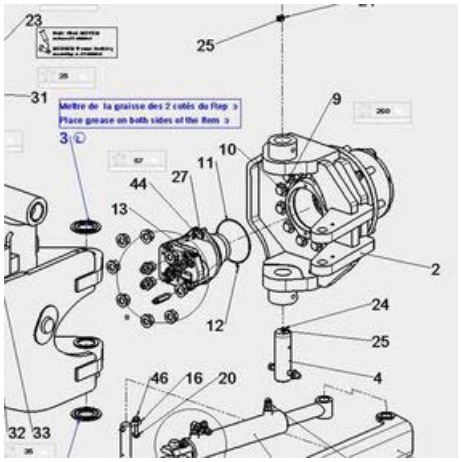
- Loosen the wheel nuts on the wheel to be removed.
- Raise the machine using a jack or a hoist.
- Remove the wheel nuts.
- Remove the wheel.
- Install the new wheel.
- Lower the machine to the ground.
- Tighten the wheel nuts to the recommended torque Refer to maintenance and repair manuals.

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

	• 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		

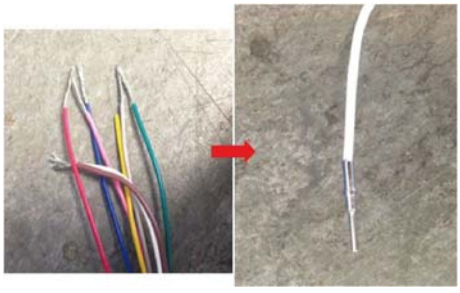
2 - Procedure

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.



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.

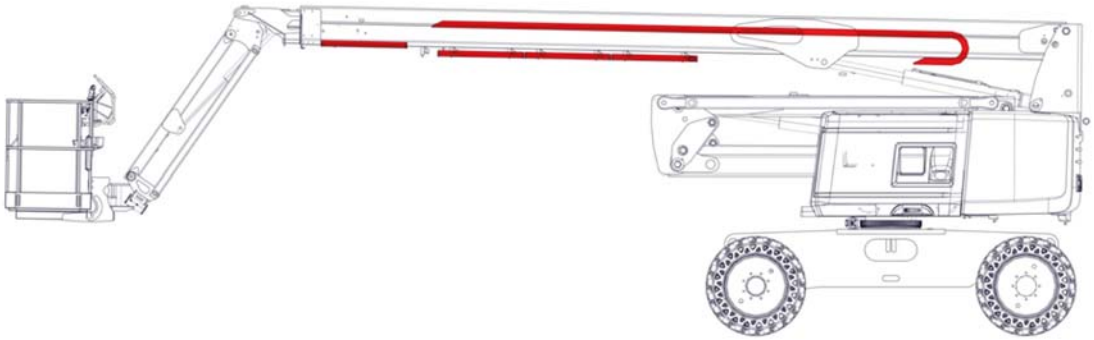
Step 4 :

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

Step 5 :

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

1 - Concerned area



2 - Warning

- **The use of this form implies that its user has been trained on this type of equipment.**
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Only an authorised and qualified technician is permitted to work on the machines HAULOTTE®.

3 - Risk prevention

Means of protection to be used when implementing the range :

- Appropriate workwear .
- Safety shoes .
- Gloves .

Specific protective measures to be used for the stage concerned :

- Risk of fluids being splashed into eyes. Glasses must be work during the stage when indicated by this pictogram .
- Risk of knocks to the head. A helmet must be work during the stage when indicated by this pictogram .

4 - You will need

	• Standard tool kit • Collars COLSON • Needle thread • Wooden block		• Place barriers around the perimeter of the work area
	1		

5 - Removal

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

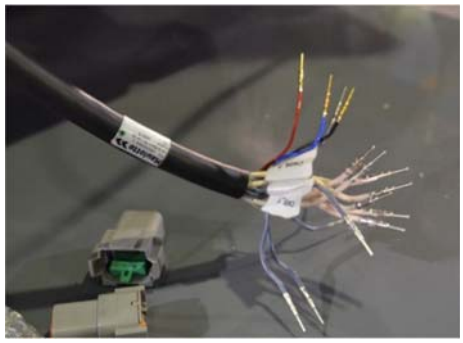
- Switch off the ignition and remove the ignition key.

- Place a block under the boom.

- Remove the counterweight. Refer to MS0138 Remove/re-install the main counterweights.

- On the turntable, behind the main block, disconnect the CN06.1 and CN06.2 plugs.

- Remove the connectors.
- Protect the wires with a plastic bag.



- Identification of connectors.

CN06_1

TURRET-BASKET

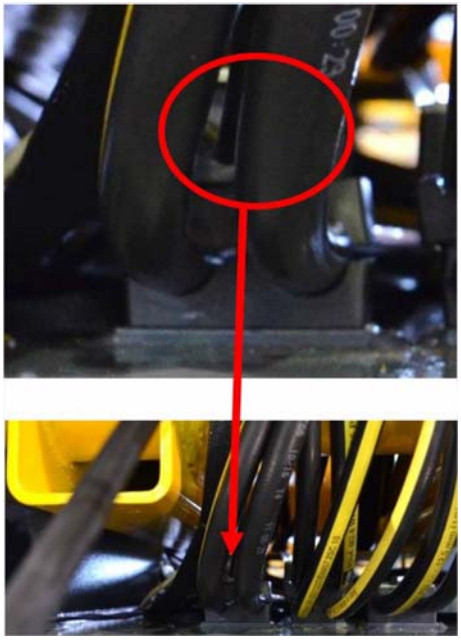
P.	SIZ.	REF.	NUM.	TERM./ PLUG
1	1.5	SPL183	183	1062-16-0122
2	1.5	SPL183	183	1062-16-0122
3	1.5	SPL0_1	0	1062-16-0122
4	1.5	SPL0_1	0	1062-16-0122
5	1.5	SPL0_1	0	1062-16-0122
6	1.5	SPL109	109	1062-16-0122
7	1.5	SPL103	103	1062-16-0122
8	1.5	SPL0_1	0	1062-16-0122

CN06_2

TURRET-BASKET

P.	SIZ.	REF.	NUM.	TERM./ PLUG
1	1.5	SPL113	113	1062-20-0122
2	1.5	SPL143	143	1062-20-0122
3	1.5	SPL0_1	0	1062-20-0122
4	1.5	SPL109	109	1062-20-0122
5	1.5	SPL0_1	0	1062-20-0122
6	0.5	SPL0_1	0	1062-20-0144
7	0.5	SPL1001	1001	1062-20-0144
8	0.5	SPL1002	1002	1062-20-0144

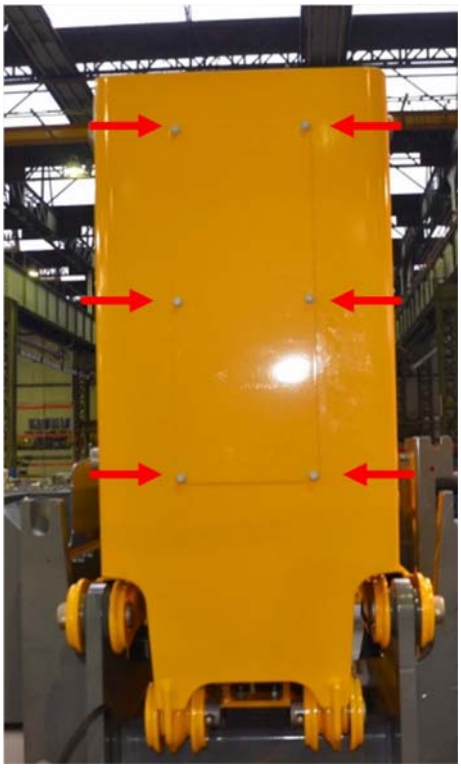
- Unscrew the STAUFF clamp through which the wiring harnesses run.



- Cut the collars and pull the basket-side cable bundle.

- Remove the collar STAUFF from the cable bundle CAN.

- Remove the 6 fixing screws from the panel to enable access to the cylinder.



- Then pull the wiring harness on the output compensation cylinder side.
- Cut the collars in the link piece.

- Bring the wiring harness on the outside right-hand side of the boom.

- Remove the protective panels and cut the collars that fix the cable bundle to the rails/conduits

- Attach the hoses to the boom.

- Remove the cable bundle from the cable chain.

- Bring the cable bundle up to the jib.

- Remove the panel from the arm assembly.

- Remove the cable bundle from the sheath at the basket level.

- Disconnect the connector located on the basket.

6 - Re-installation

- Perform the operations in the reverse order of dismantling.

7 - Additional operations

- Clean off any residual oil or grease.
- Clean the work area.
- Machine stopped :
- Check the absence of leakage.
- Check oil level.
- Test all of the functions from the ground station and platform station.
- Perform a static test by putting 290 kg / 639 lbs on the platform : Machine unfolded, 15 mn after checking the performance of its parts (Arm cylinder, boom cylinder, telescope cylinder, compensation receiver cylinder, jib cylinder).

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

1 - Concerned area

2 - Warning

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3 - Risk prevention

Means of protection to be used when implementing the range :

- Appropriate workwear .
- Safety shoes .
- Gloves .

Specific protective measures to be used for the stage concerned :

- Risk of knocks to the head. A helmet must be work during the stage when indicated by this pictogram .

4 - You will need

	• Standard tool kit • Ratchet wrench and 46 mm / 2 in socket • Torque wrench • Tap M30 • 1 hoisting strap(s) for 3000 kg / 6614 lbs at a length of 2 m / 6 ft 7 in • 2 hoisting rings M30 (3000 kg / 6614 lbs minimum) • Grease		• Place barriers around the perimeter of the work area
	• Counterweight mass : 51200 kg / 11,243 lbs		1

5 - Removal

- Position the machine on a flat and firm surface, clear of obstructions (beware of power lines).
- Mark out the work area (barriers, cones, marking tape).
- Restrict access to the area (restricted access sign).

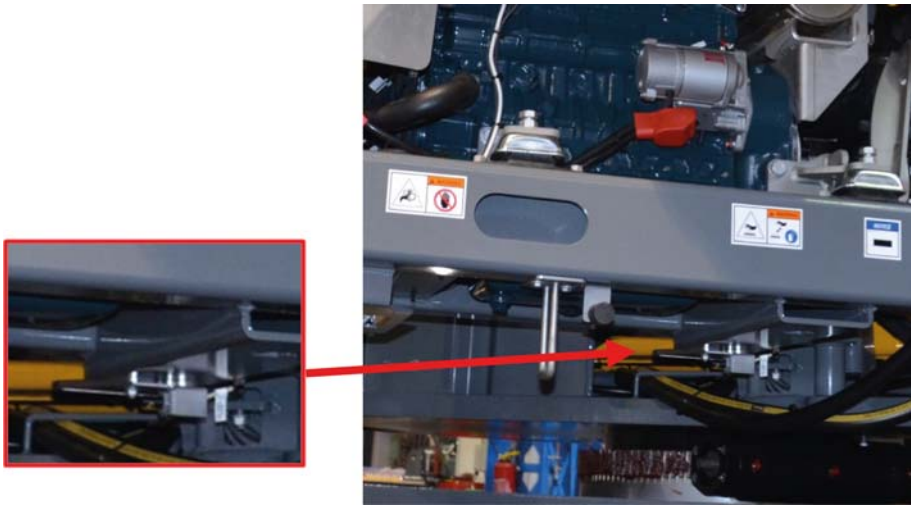
- Switch off the ignition and remove the ignition key.

- 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.

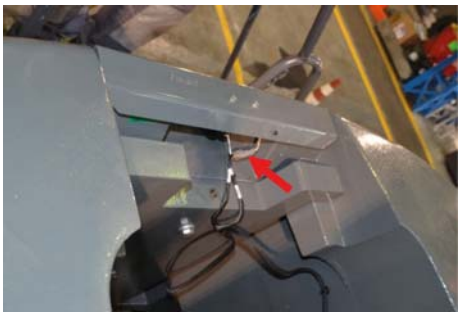
- Secure the counterweight with rings using 2 lyre shackles of at least 3000 kg and 2 lifting straps of 3000 kg,length 2000 mm
- Apply a small amount of tension on the bridge crane.

- Unscrew the engine casing fastening screws.

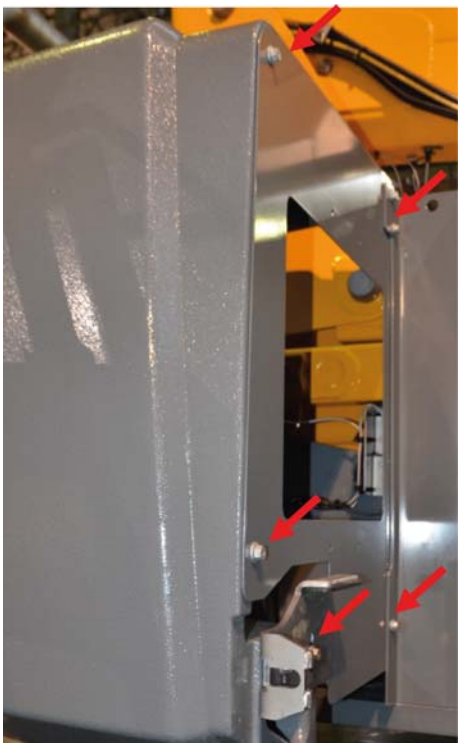
- Lock the engine tray in the open position.



- Disconnect the twilight sensor.
- Remove the collars COLSONS from the fasteners to remove the cable bundle from the length of the counterweight.



- Remove the 5 screws that fix the panel to the counterweight and put it to one side.



- Place the counterweight on the floor and secure it so that it is stable.

6 - Re-installation

- Perform the operations in the reverse order of dismantling.

Counterweight tightening torque : 500 N.m.

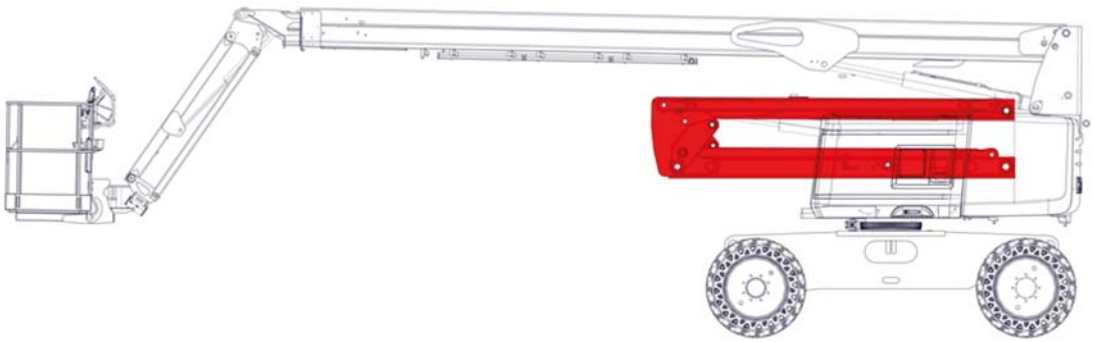
7 - Additional operations

- Clean off any residual oil or grease.
- Clean the work area.
- Machine stopped :
- Check the absence of leakage.
- Check oil level.
- Perform a static test by putting 290 kg / 639 lbs on the platform. Machine unfolded, 15 mn after checking the performance of its parts.

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

Notes

1 - Concerned area



2 - Warning

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3 - Risk prevention

Means of protection to be used when implementing the range :

- Appropriate workwear .
- Safety shoes .
- Gloves .

Specific protective measures to be used for the stage concerned :

- Risk of fluids being splashed into eyes. Glasses must be work during the stage when indicated by this pictogram .
- Risk of knocks to the head. A helmet must be work during the stage when indicated by this pictogram .

4 - You will need

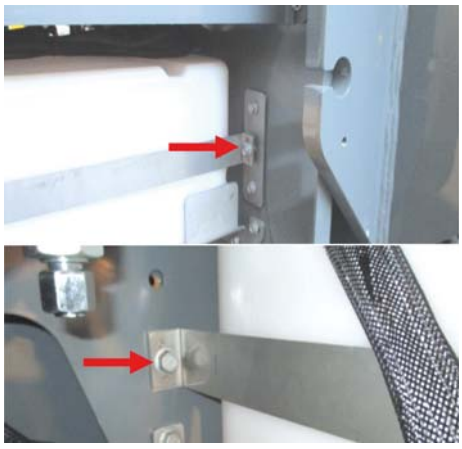
	• EPI (Personal protective equipment) : • Safety shoes • Protective goggles • Gloves • Standard tool kit • Circlips pliers • Pin 25 mm / 1 in length 130 mm / 6 in for extracting the tie rod pins • Pin 40 mm / 2 in length 800 mm / 32 in minimum for extracting the arm hinge pin • ORFS plug kit : 2505001600 • 3 hoisting strap(s) for 3000 kg / 6,615 lbs at a length of 3000 mm / 9 ft 10 in • 2 ratcheting straps that support 2000 kg / 4,41 lbs at a length of 4000 mm / 13 ft 1 in • 1 ratcheting straps that support 1000 kg / 2,205 lbs at a length of 4000 mm / 13 ft 1 in • 2 shackles 4500 kg / 9,921 lbs • 1 axis of handling arm : 800-070-010 • A bridge or handling device 3000 kg / 6,615 lbs • Weight of the arm assembly to be removed of around 1700kg / 3,748 lbs • Weight of 290 kg / 639 lbs for performing the static test • Collars COLSON		• Place barriers around the perimeter of the work area
	• Arm assembly mass : 1700kg / 3,748 lbs		2

5 - Removal

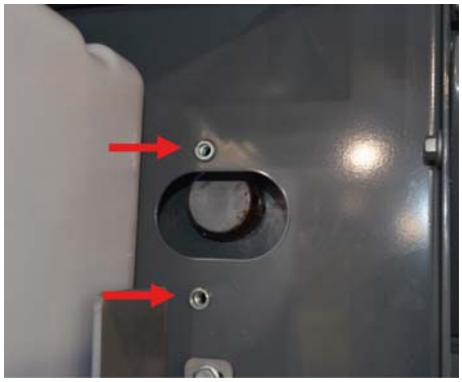
- Remove the counterweight. Refer to MS0138 Remove/re-install the main counterweights.
- Remove the boom. Refer to MS0140 Remove - Replace boom assembly.

- Raise the arm to clear access to the tie rod's axes.

- Unscrew the 2 the fastening strap screws on the fuel tank.

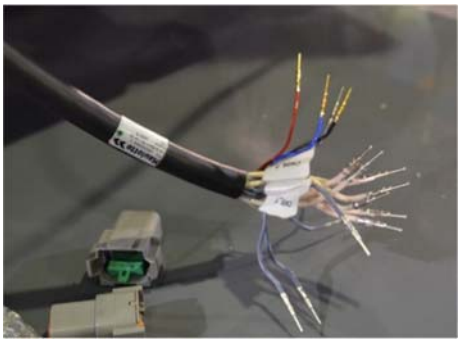


- To access the the lower arm hinge pin, unscrew the 2 fastening screws on the strap support plate.



- On the turntable, behind the main block, disconnect the CN06.1 and CN06.2 plugs.

- Remove the connectors.
- Protect the wires with a plastic bag.



- Identification of connectors.

CN06_1

TURRET-BASKET

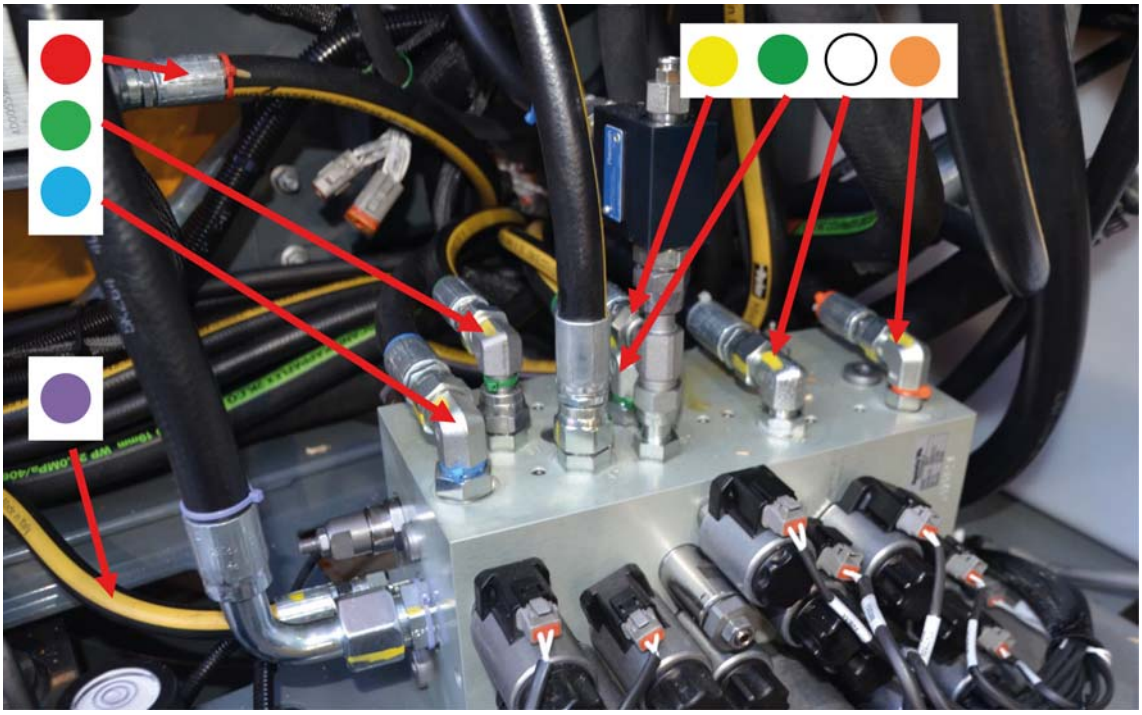
P.	SIZ.	REF.	NUM.	TERM./ PLUG
1	1.5	SPL183	183	1062-16-0122
2	1.5	SPL183	183	1062-16-0122
3	1.5	SPL0_1	0	1062-16-0122
4	1.5	SPL0_1	0	1062-16-0122
5	1.5	SPL0_1	0	1062-16-0122
6	1.5	SPL109	109	1062-16-0122
7	1.5	SPL103	103	1062-16-0122
8	1.5	SPL0_1	0	1062-16-0122

CN06_2

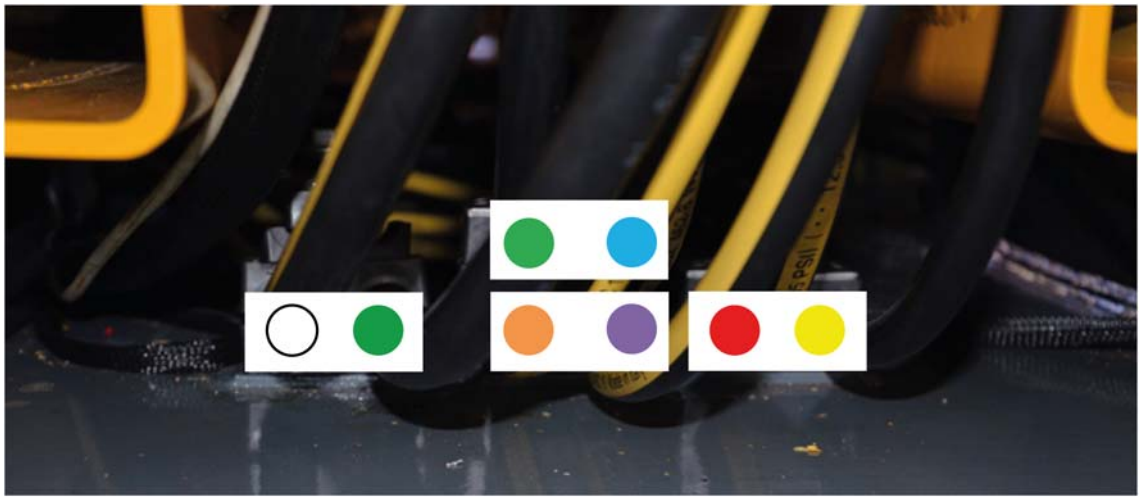
TURRET-BASKET

P.	SIZ.	REF.	NUM.	TERM./ PLUG
1	1.5	SPL113	113	1062-20-0122
2	1.5	SPL143	143	1062-20-0122
3	1.5	SPL0_1	0	1062-20-0122
4	1.5	SPL109	109	1062-20-0122
5	1.5	SPL0_1	0	1062-20-0122
6	0.5	SPL0_1	0	1062-20-0144
7	0.5	SPL1001	1001	1062-20-0144
8	0.5	SPL1002	1002	1062-20-0144

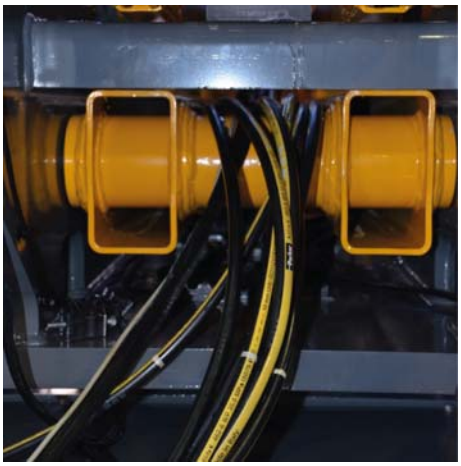
	• Locate, disconnect and seal all designated hoses from the main hydraulic block.



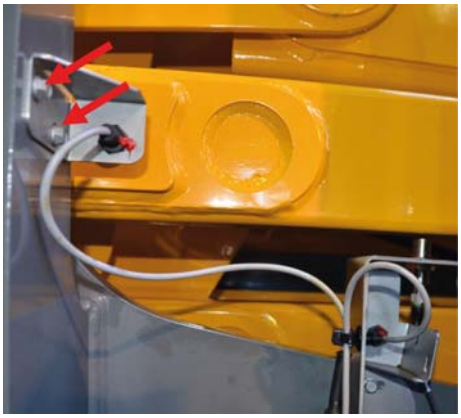
- Mark the passage of the hoses through the collars STAUFF.
- Make a mark on each hose at the entrance or exit of the collars.
- This will allow them to be easily repositioned during reassembly.



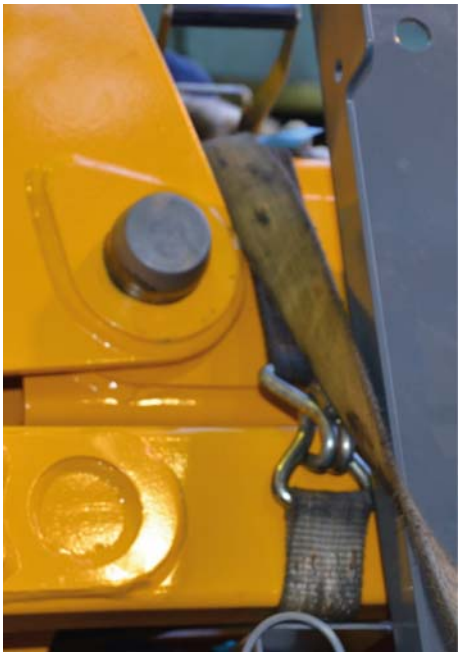
- Remove the fastening screws from the collars.
- Bring the hoses to the back of the arm.



- Disconnect the arm sensor plug SQ421.



- Strap the tie rods to the link piece using a ratcheting strap supporting 1000 kg / 2,205 lbs at a length of 4000 mm / 13 ft 1 in .
- Put a small amount of tension on the strap.



- With the 2000 kg / 4,41 lbs ratchet strap, length 4000 mm / 13 ft 1 in, sling the front side of the lower and upper arm. Pass the strap between the arms and the tie rods and tension the strap.

- Tie down the basket side using the holes in the connecting part and a suitable axis.

- On the counterweight side, raise the axis of the boom with the smooth clevis circlip.
- Make a slip knot on the axle with the lifting strap of 3000 kg / 6,615 lbs, length 3000 mm / 9 ft / 10 in.

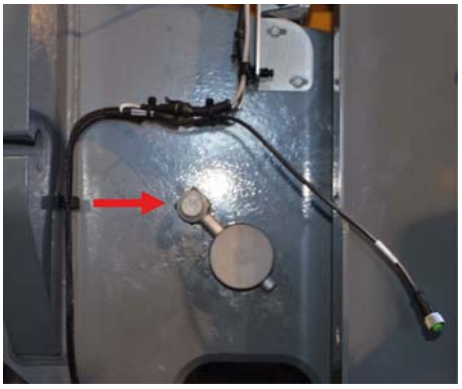
- Make a slip knot on the axle with the lifting strap of 3000 kg / 6,615 lbs, length 3000 mm / 9 ft / 10 in.

- For safety, place a block under the arm.
- Align the bridge and add tension to it.
- In the test center, we use a 1 strap of 4000 kg / 8819 lbs and the position here (black line)

- Loosen the screws that hold the locking pins.

- Remove the circlips.
- Remove the pins on the lower tie rods.

- Take out the screw that holds the locking pin.



- Extract the pin by knocking it out to the fuel tank side, connecting the lower arm casing to the turntable.

- Place the assembly on a flat surface while ensuring the assembly's stability.

- Mark out the work area.

6 - Re-installation

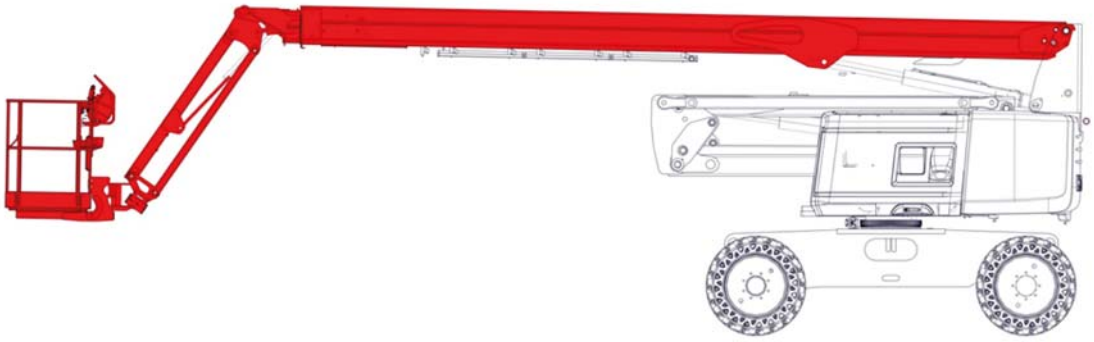
- Perform the operations in the reverse order of dismantling.
- Make adjustments if the sensors are disconnected.
- Check for seals on the fittings.
- Maintain hoses so they do not turn when tightening fittings. (Risk of damaging the seals). The hoses must not be twisted.
- If you are installing a new cylinder, note the traceability number.
- Lubricate the cylinder's axes and rings.

7 - Additional operations

- Clean off any residual oil or grease.
- Clean the work area.
- Move the cylinders several times to empty them.
- Machine stopped :
- Check the absence of leakage.
- Check oil level.
- Perform a static test by putting 290 kg / 639 lbs on the platform : Machine unfolded, 15 mn after checking the performance of its parts (Arm cylinder, boom cylinder, telescope cylinder, compensation receiver cylinder, jib cylinder).

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

1 - Concerned area



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3 - Risk prevention

Means of protection to be used when implementing the range :

- Appropriate workwear .
- Safety shoes .
- Gloves .

Specific protective measures to be used for the stage concerned :

- Risk of fluids being splashed into eyes. Glasses must be work during the stage when indicated by this pictogram .
- Risk of knocks to the head. A helmet must be work during the stage when indicated by this pictogram .

4 - You will need

	• Standard tool kit • Mallet and punch diameter 30 mm / 1,18 in • Tray • 2 articulated lifting rings 1000 kg / 2,205 lbs • 1 lyre shackle with capacity of 1000 kg / 2,205 lbs • 3 straps, length 4 m / 13 ft 1 in, capacity 3000 kg / 6,615 lbs • 1 multi-strand chain strap with a minimum capacity of 2000 kg / 4,410 lbs • Axle capacity 3000 kg / 6,615 lbs. • Grease for pins • ORFS plug kit : 2505001600 • Hydraulic oil • Collars RILSAN		• Place barriers around the perimeter of the work area
	• Boom assembly mass : 1700 kg / 3,748 lbs		2

5 - Removal

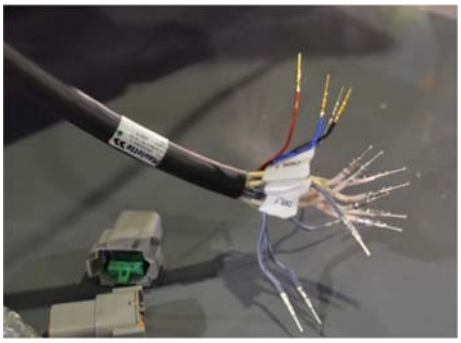
- Position the machine on a flat and firm surface, clear of obstructions (beware of power lines).
- Mark out the work area.
- Retract the telescope arm, place the jib in the horizontal position and empty the platform.
- For safety, put a forklift under the basket or support the basket with a bridge.

- Switch off the ignition and remove the ignition key.

- Remove the counterweight. Refer to MS0138 Remove/re-install the main counterweights.

- On the turntable, behind the main block, disconnect the CN06.1 and CN06.2 plugs.

- Remove the connectors.
- Protect the wires with a plastic bag.



- Identification of connectors.

CN06_1

TURRET-BASKET

P.	SIZ.	REF.	NUM.	TERM./ PLUG
1	1.5	SPL183	183	1062-16-0122
2	1.5	SPL183	183	1062-16-0122
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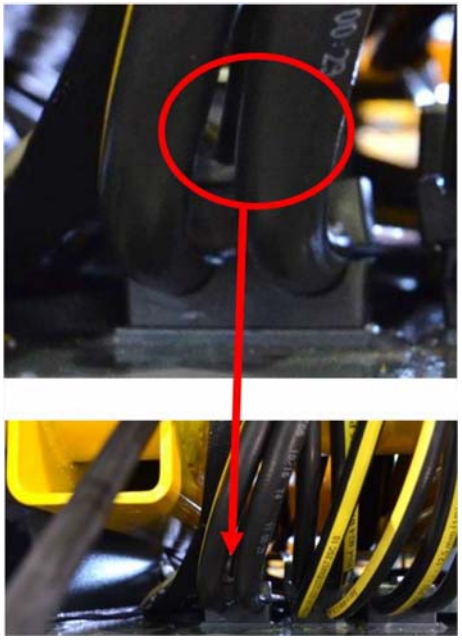
4	1.5	SPL0_1	0	1062-16-0122
5	1.5	SPL0_1	0	1062-16-0122
6	1.5	SPL109	109	1062-16-0122
7	1.5	SPL103	103	1062-16-0122
8	1.5	SPL0_1	0	1062-16-0122

CN06_2

TURRET-BASKET

P.	SIZ.	REF.	NUM.	TERM./ PLUG
1	1.5	SPL113	113	1062-20-0122
2	1.5	SPL143	143	1062-20-0122
3	1.5	SPL0_1	0	1062-20-0122
4	1.5	SPL109	109	1062-20-0122
5	1.5	SPL0_1	0	1062-20-0122
6	0.5	SPL0_1	0	1062-20-0144
7	0.5	SPL1001	1001	1062-20-0144
8	0.5	SPL1002	1002	1062-20-0144

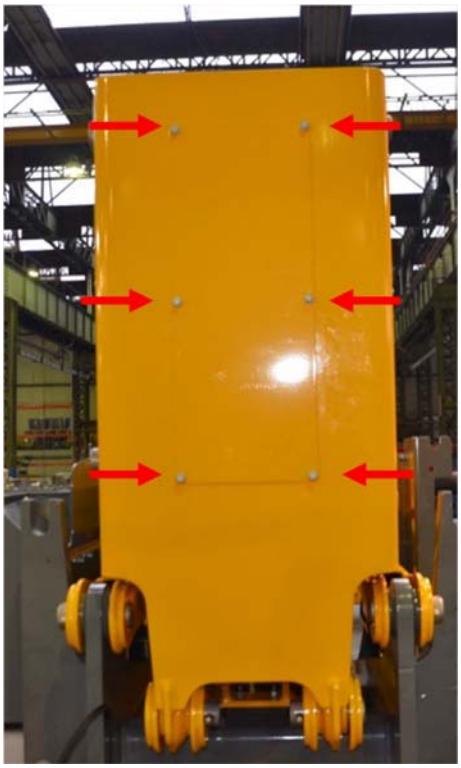
- Remove the collars STAUFF at the front of the arm.



- Remove the protective panel on the basket side so that you can pull the cable bundle.

- Remove the collar STAUFF located at the top of the arm.

- Remove the 6 fixing screws from the panel to enable access to the cylinder.

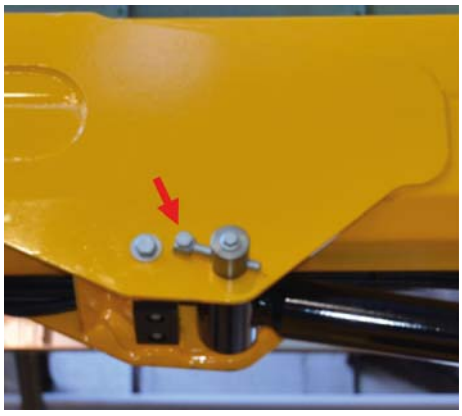


- Then pull the wiring harness on the output compensation cylinder side.
- Cut the collars in the link piece.

- Attach a sling to the cylinder.

- Place a container underneath the connections.
- Carefully and gradually loosen the fastenings.
- Disconnect the hoses and plug them.

- Remove the fixing screw from pin on the rod side and push the pin.



- Remove the axle from the cylinder.

- Place the cylinder on the wooden wedge.

- Locate the 2 hoses leading to the compensation receiver cylinder.

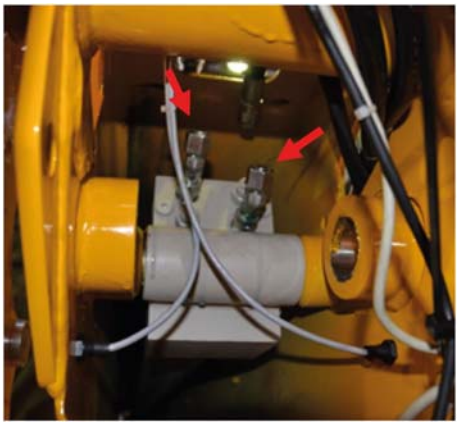
- Place a container underneath the connections.
- Carefully and gradually loosen the fittings until there is a trickle of oil.
- Re-tighten the fittings when the pressure has dropped.

- Remove the fixing screw from the pin on the shaft side of the cylinder and then push the pin.

- Pull out the pin.

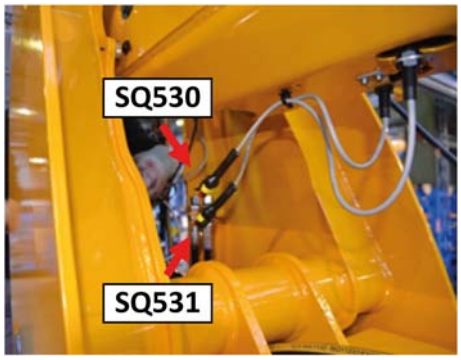
- Spread the hoses and cable bundle to tilt the cylinder backwards.

- Disconnect the supply hoses from the telescope cylinder.
- Seal the holes using the plug kit.

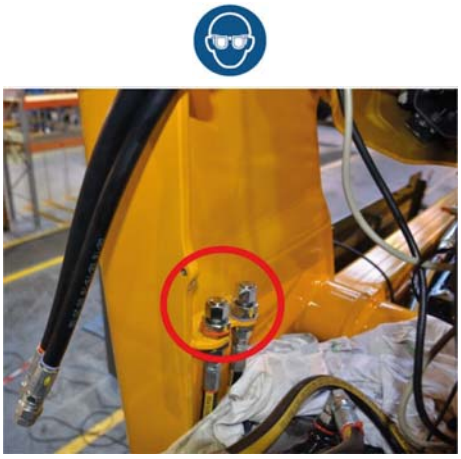


- Remove the sensors SQ520 and SQ522 (If there is a double load option, also disconnect SQ523 and SQ521).

- Disconnect the sensors SQ530 and SQ531.



- Mark and disconnect, at the bulkheads, the 2 block supply hoses ON / OFF.
- Plug the openings after disassembly.



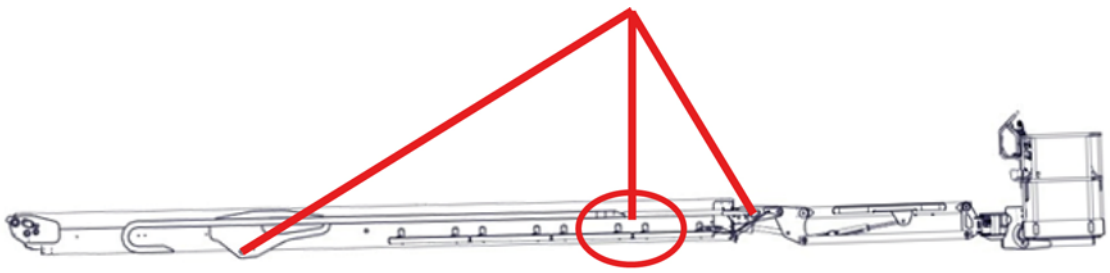
- Disconnect the sensors from the top of the connecting part.

- Remove the bolt for lifting rings.

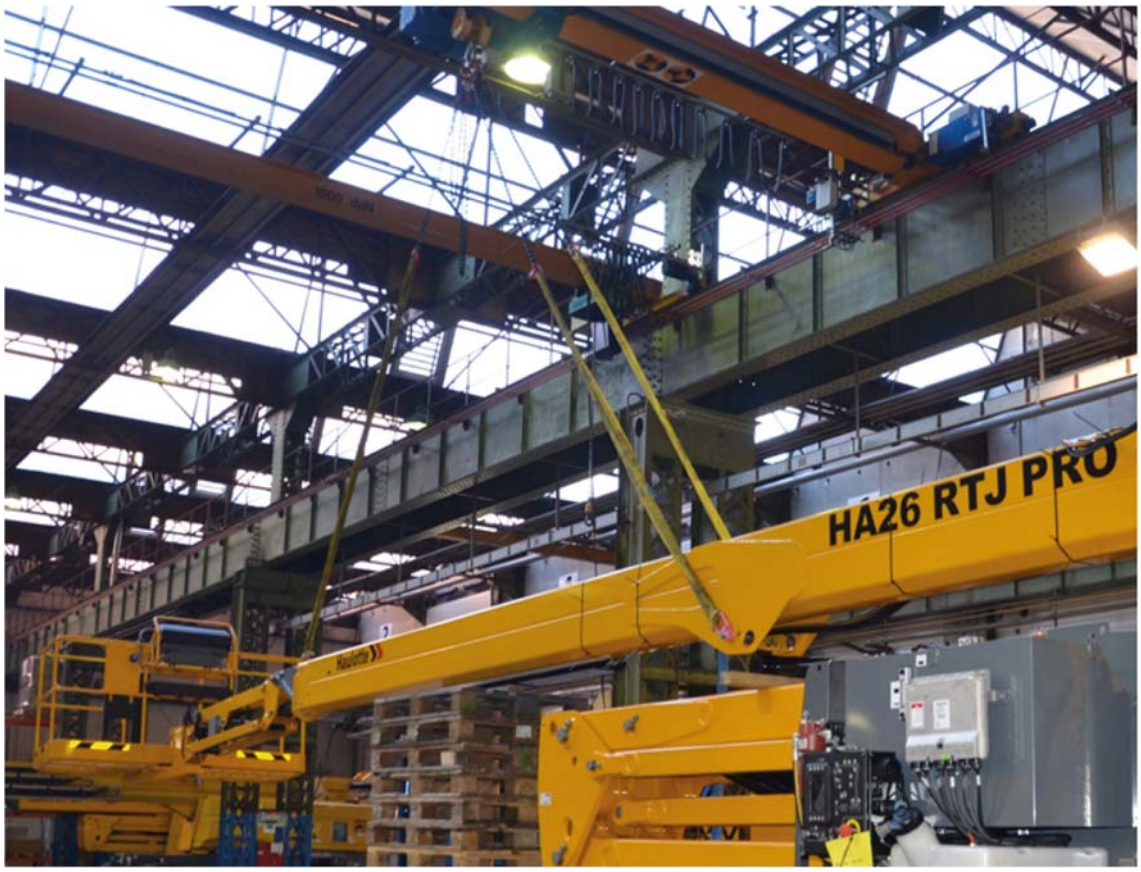
- Place the 2 articulated lifting rings onto the boom.
- Sling it with 2 straps of 4 m / 13 ft 1 in with a capacity of 3000 kg / 6,615 lbs.

- Place the articulated lifting ring and lyre shackle at the end of the telescope.
- Sling using a strap of 4 m / 13 ft 1 in with a capacity of 3000 kg / 6,615 lbs.

Center of gravity of the boom assembly



- Apply a small amount of tension on the bridge crane.



- Remove the locking pin from the boom's hinge.

- Pull out the pin.

- Remove the boom.

6 - Re-installation

- Perform the operations in the reverse order of dismantling.
- If you are installing a new cylinder, note the traceability number.
- Lubricate the cylinder's axes and rings.
- 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.

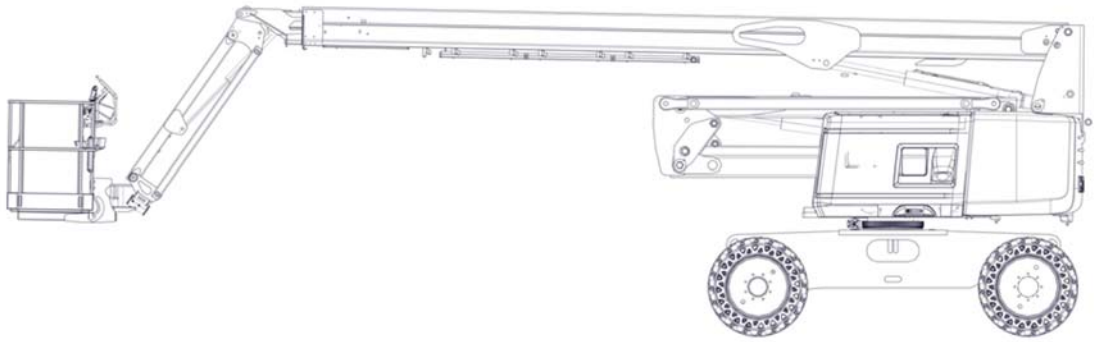
7 - Additional operations

- Clean off any residual oil or grease.
- Clean the work area.
- Move the cylinder several times to empty it.
- Machine stopped :
- Check the absence of leakage.
- Check oil level.
- Perform a static test by putting 290 kg / 639 lbs on the platform : Machine unfolded, 15 mn after checking the performance of its parts (Arm cylinder, boom cylinder, telescope cylinder, compensation receiver cylinder, jib cylinder).

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

Notes

1 - Concerned area



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3 - Risk prevention

Means of protection to be used when implementing the range :

- Appropriate workwear .
- Safety shoes .
- Gloves .

Specific protective measures to be used for the stage concerned :

- Risk of fluids being splashed into eyes. Glasses must be work during the stage when indicated by this pictogram .
- Risk of knocks to the head. A helmet must be work during the stage when indicated by this pictogram .

4 - You will need

	• Standard tool kit • Tray • BTR 5 mm / 2 in • Mallet • Pin punch diameter 35 mm / 4 in • Torque wrench for 10 Nm • Torque wrench for 44 Nm • Normal threadlocker • 1 strap, length 3 m / 9 ft 10 in, capacity 1000 kg / 2,205 lbs • 1 hoisting strap(s) for 3000 kg / 6,615 lbs at a length of 2 m / 6 ft 7 in • A bridge or handling device • Palettes for placement under the platform (about 300 mm / 12 in)		• Place barriers around the perimeter of the work area
	1		

5 - Removal

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

- Raise the arm above the counterweight to remove the access plate from the output compression cylinder.

- Extend the telescope about 100 mm / 4 in to disassemble the front pads located on the boom shaft.

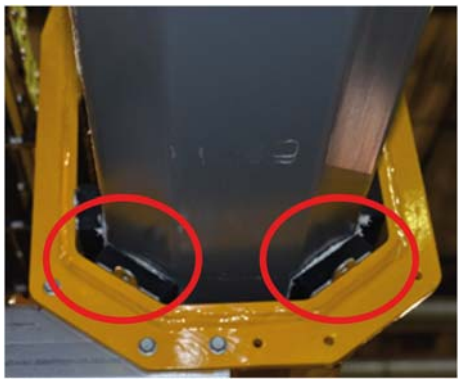
- Place blocks under the basket.

- Switch off the ignition and remove the ignition key.

- Mark the adjustment pallets and disassemble the pads on the boom shaft.
- The 2 upper pads on the jib-side and then the 4 lateral pads.

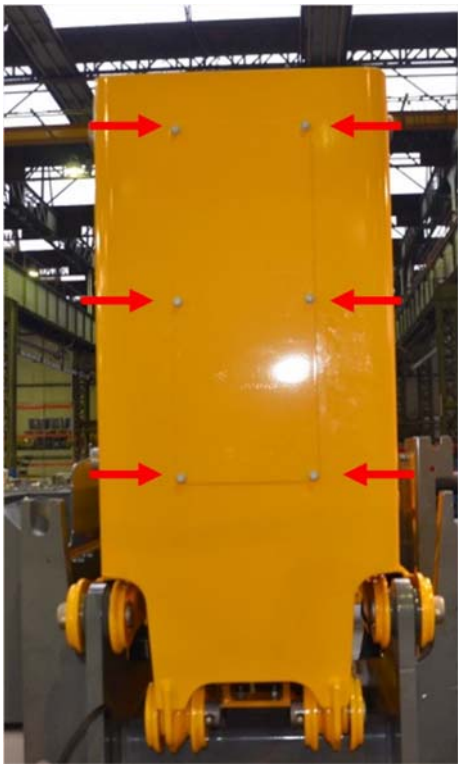
- Sling the telescope by using a hoisting strap that supports 3000 kg / 6,65 lbs at a length of 2 m / 6 ft 7 in.

- Tension the bridge to raise the telescope box so that the pads can be pulled out.
- Mark the adjustment pallets then disassemble the 2 lower front pads.

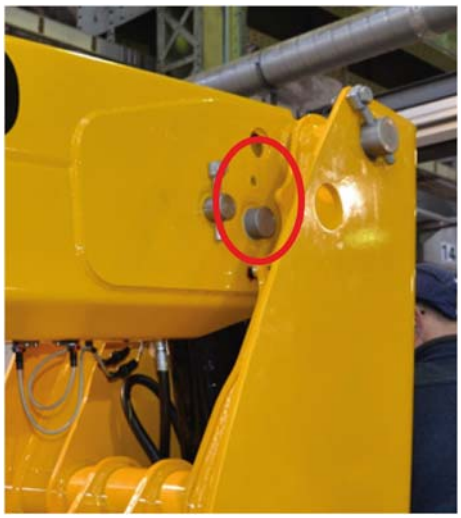


- Disassembly of the rear pads is complete.

- Remove the 6 fixing screws from the panel to enable access to the cylinder.



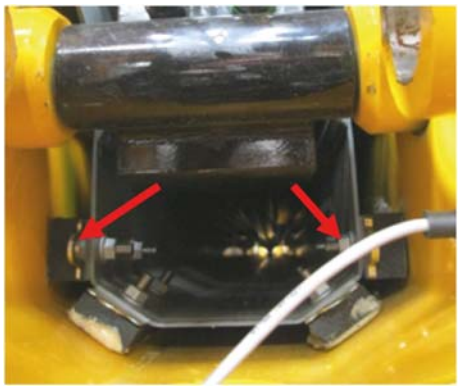
- Remove the fixing screw from the pin on the shaft side of the cylinder and then push the pin.



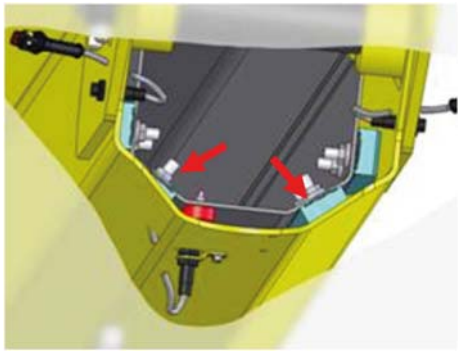
- Pull out the pin.

- Spread the hoses and cable bundle to tilt the cylinder backwards.

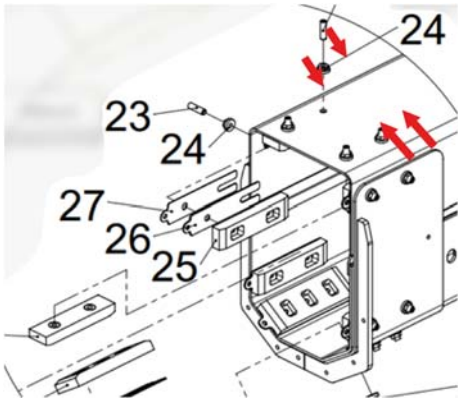
- Mark the adjustment pallets and remove the 2 lateral pads.



- Remove the 2 lower pads.



- For the upper pads, mark the adjustment pallets and take out the screws.
- Put a small amount of tension on the telescope to remove the pads.



6 - 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.
- Install the screws with threadlock.
- Install the back upper pads.
- Install the back upper lateral pads.
- Install the telescope cylinder : Grease the pin. Install the pin's stopper clevis. Check that the seals are on the connections before reconnecting the hoses.
- Install the back lower pads.
- Install the back lower lateral pads.
- Install the output compensation cylinder : Grease the pin. Install the pin's stopper clevis.
- Install the front lower pads.
- Install the front lateral pads.
- Install the front upper pads.

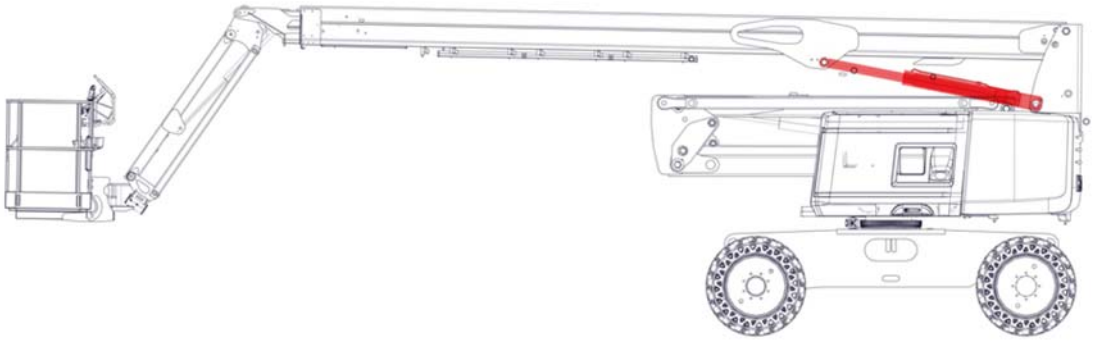
7 - Additional operations

- Clean the work area.
- Perform a static test by putting 290 kg / 639 lbs on the platform : Machine unfolded, 15 mn after checking the performance of its parts (Arm cylinder, boom cylinder, telescope cylinder, compensation receiver cylinder, jib cylinder).

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

Notes

1 - Concerned area



2 - Warning

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3 - Risk prevention

Means of protection to be used when implementing the range :

- Appropriate workwear .
- Safety shoes .
- Gloves .

Specific protective measures to be used for the stage concerned :

- Risk of fluids being splashed into eyes. Glasses must be work during the stage when indicated by this pictogram .
- Risk of knocks to the head. A helmet must be work during the stage when indicated by this pictogram .

4 - You will need

	• Height wedge 400 mm / 1 ft 5 in • Height wedge 1700 mm / 5 ft 6 in • Wooden pallets • Standard tool kit • Tray • Mallet • Pin punch diameter 30 mm / 1,18 in • 1 strap, length 3 m / 9 ft, capacity 1000 kg / 2,205 lbs • Ratchet strap • Boom cylinder : 4000471480 • Grease for pins • ORFS plug kit : 2505001600 • Hydraulic oil		• Place barriers around the perimeter of the work area
Major component masses	• Boom cylinder : 208 kg / 459 lbs • Upper boom : 1700 kg / 3,748 lbs		2

5 - Removal

• Lift the arm to release the boom cylinder's axis.

• Remove the panel from the cable bundle.

- Lower the boom on the wedging.

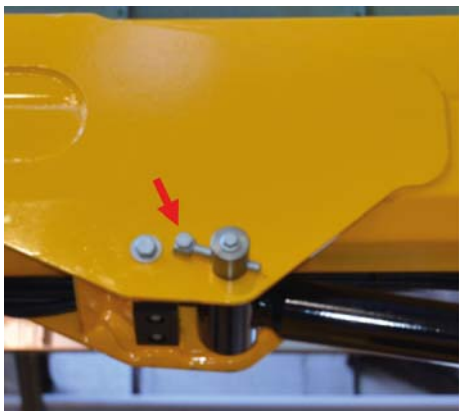
- Secure the arm and sling the rear side.

- Switch off the ignition and remove the ignition key.

- Sling the rod-side of the cylinder.

- Place a container underneath the connections.
- Disconnect the hoses and plug them.

- Remove the fixing screw from pin on the rod side and push the pin.



- Remove the axle from the cylinder.

- Place the cylinder on the wooden wedge.

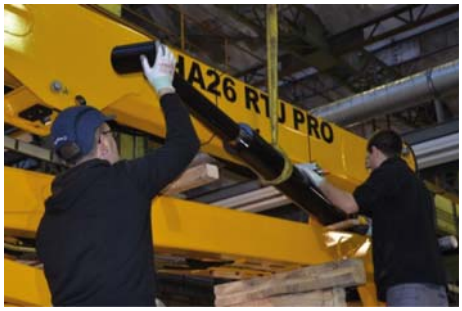
- Move the hoisting strap to tie the cylinder at the center of gravity (Middle of the cylinder).

- Remove the fixing screw from pin on the rod side and push the pin.

Do not remove completely the axis as it maintains the upper arm and link part.

- Use a shaft diameter 35 mm / 2 in and length 800 mm / 32 in.
- Remove the axis from the body-side of the cylinder.
- Take out the axis of maximum length 400 mm / 16 in in order to be able to release the cylinder.

- Remove the cylinder.



6 - Re-installation

- Perform the operations in the reverse order of dismantling.
- If you are installing a new cylinder, note the traceability number.
- Lubricate the cylinder's axes and rings.
- 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.

7 - Additional operations

- Clean off any residual oil or grease.
- Clean the work area.
- Move the cylinder several times to empty it.
- Machine stopped :
- Check the absence of leakage.
- Check oil level.
- Perform a static test by putting 290 kg / 639 lbs on the platform : Machine unfolded, 15 mn after checking the performance of its parts (Arm cylinder, boom cylinder, telescope cylinder, compensation receiver cylinder, jib cylinder).

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

1 - Concerned area

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- Safety shoes .
- Gloves .

Specific protective measures to be used for the stage concerned :

- Risk of fluids being splashed into eyes. Glasses must be work during the stage when indicated by this pictogram .
- Risk of knocks to the head. A helmet must be work during the stage when indicated by this pictogram .

4 - You will need

	• Standard tool kit • Height wedge 300 mm / 12 in • Tray • Mallet • Pin punch diameter 30 mm / 1,18 in • 1 strap, length 3 m / 9 ft 8 in • Handling equipment • Seal pouch • Grease for pins • ORFS plug kit : 2505001600 • Hydraulic oil		• Place barriers around the perimeter of the work area
Major component masses	• Output compensation cylinder : 40 kg / 896 lbs		1

5 - Removal

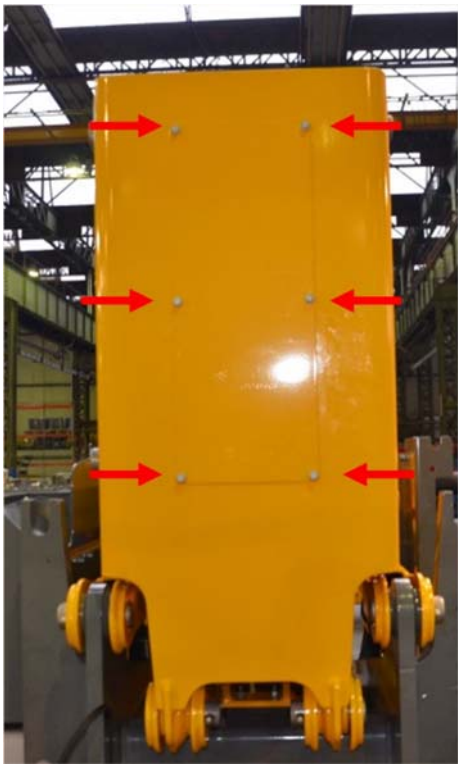
- Position the machine on a flat and firm surface, clear of obstructions (beware of power lines).
- Mark out the work area.
- Restrict access to the area (restricted access sign).
- Remove the covers. Refer to MS0132 Remove/replace covers.
- Machine stowed.
- Place blocks under the basket.

- Switch off the ignition and remove the ignition key.

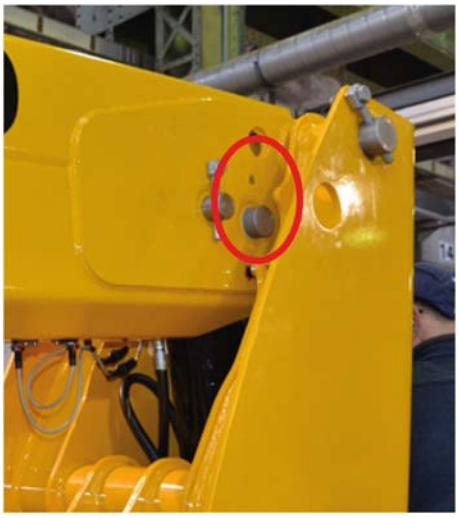
- Locate the 2 hoses leading to the compensation receiver cylinder.

- Place a container underneath the connections.
- Carefully and gradually loosen the fittings until there is a trickle of oil.
- Re-tighten the fittings when the pressure has dropped.

- Remove the 6 plate's fastening screws that give access to the output compensation cylinder.



- Remove the fixing screw from the pin on the shaft side of the cylinder and then push the pin.



- Pull out the pin.

- Spread the hoses and the cable bundle to tilt the transmitter cylinder backwards.

- Carefully and gradually loosen the hoses to decrease the pressure.
- Disconnect the hoses and plug them.

- Attach a sling to the cylinder.

- Remove the fixing screw from the pin on the body side of the cylinder and push the pin
- Pull out the pin.

- Extract the cylinder.

- Remove the cylinder and place it on blocks.
- Removal operation is complete.

6 - Re-installation

- Perform the operations in the reverse order of dismantling.
- If you are installing a new cylinder, note the traceability number.
- Lubricate the cylinder's axes and rings.
- 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.

7 - Additional operations

- Clean off any residual oil or grease.
- Clean the work area.
- Move the cylinder several times to empty it.
- Machine stopped :
- Check the absence of leakage.
- Check oil level.
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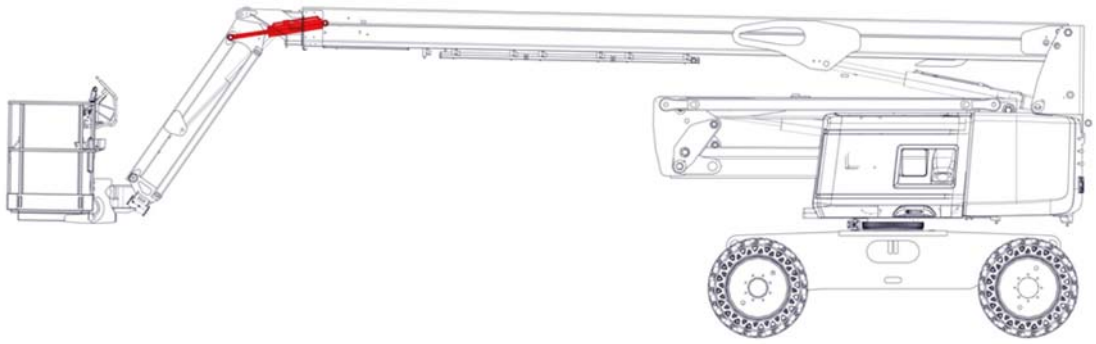
Notes

1 - Concerned area



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3 - Risk prevention

Means of protection to be used when implementing the range :

- Appropriate workwear .
- Safety shoes .
- Gloves .

Specific protective measures to be used for the stage concerned :

- Risk of fluids being splashed into eyes. Glasses must be work during the stage when indicated by this pictogram .
- Risk of knocks to the head. A helmet must be work during the stage when indicated by this pictogram .

4 - You will need

	• Standard tool kit • Mallet • Pin punch diameter 30 mm / 1,18 in • Tray • Circlips pliers • 1 strap, length 3 m / 9 ft, capacity 1000 kg / 2,205 lbs • Handling device • Receiver compensation cylinder • Seal pouch • Grease for pins • ORFS plug kit : 2505001600 • Hydraulic oil		• Place barriers around the perimeter of the work area
Major component masses	• Compensation cylinder : 30 kg / 67 lbs		2

5 - 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 extended to access the pin on the side at the bottom of the output compensation cylinder, support the platform on pallets

- Switch off the ignition and remove the ignition key.

- Strap the cylinder's rod to the boom.
- Place a wooden wwdge underneath the cylinder.

- Remove the fixing screw from the pin on the shaft side of the cylinder and then push the pin.

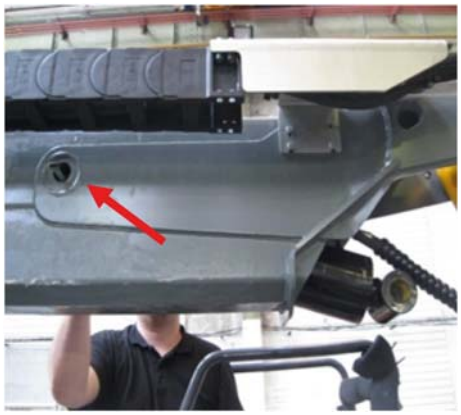
- Pull out the pin.
- Lower the cylinder onto the block and remove the strap.

- Start the ignition and retract the cylinder rod.

- Place a container underneath the connections.
- Carefully and gradually loosen the fittings until there is a trickle of oil.
- Re-tighten the fittings when the pressure has dropped.

- Bring the hoses to the cylinder side.

- Remove the circlip from the body-side axis.
- Secure the cylinder before pushing out the axis.



- Pull out the pin.
- Place the cylinder onto the blocks.

6 - Re-installation

- Perform the operations in the reverse order of dismantling.
- If you are installing a new cylinder, note the traceability number.
- Lubricate the cylinder's axes and rings.
- 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.

7 - Additional operations

- Clean off any residual oil or grease.
- Clean the work area.
- Move the cylinder several times to empty it.
- Machine stopped :
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2 - Risk prevention

Means of protection to be used when implementing the range :

- Appropriate workwear .
- Safety shoes .
- Gloves .

Specific protective measures to be used for the stage concerned :

- Risk of fluids being splashed into eyes. Glasses must be work during the stage when indicated by this pictogram .
- Risk of knocks to the head. A helmet must be work during the stage when indicated by this pictogram .

3 - You will need

	• Height wedge 400 mm / 1 ft 5 in • Wooden block • Standard tool kit • Tray • Collars RILSAN or straps • Mallet • Pin punch diameter 30 mm / 1,18 in • plug kit • 1 straps, length 3 m / 9 ft 8 in, capacity 1000 kg / 2,205 lbs • 1 straps, length 2 m / 6 ft 7 in, capacity 1000 kg / 2,205 lbs • Ratchet strap		• Place barriers around the perimeter of the work area

4 - Removing the cylinder

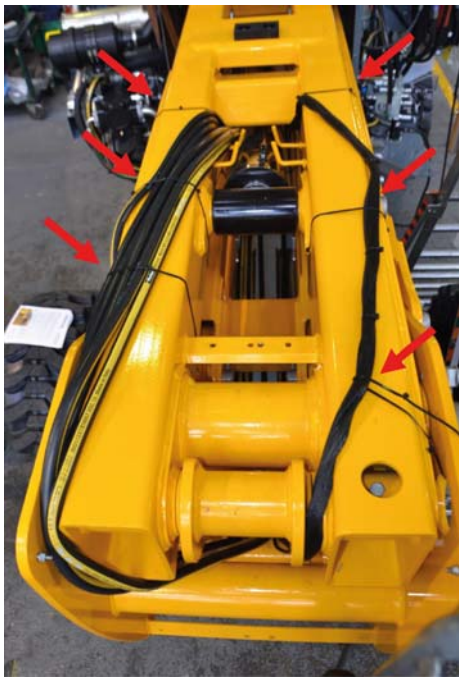
- Lift the boom to clear access to the arm cylinder.
- Secure the boom.

- For safety, secure the lower tie rods.

- Switch off the ignition and remove the ignition key.

- Remove the collars STAUFF.

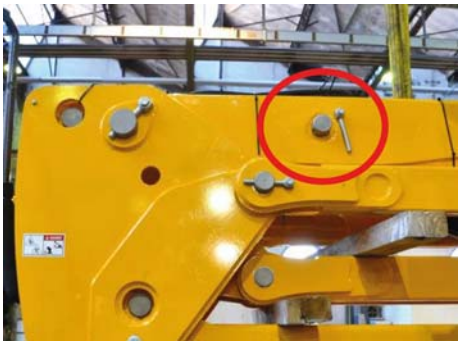
- Remove the collars from the hoses and cables and fix them to the arm to enable access to the cylinder.



- Place a strap on the cylinder's rod.

- Empty the arm's cylinder.
- Plug the hoses and the cylinder.

- Remove the fixing screw from the pin on the shaft side of the cylinder and then push the pin.



- Pull out the pin.
- Put the cylinder on the wooden pallet.

- Strap the body-side of the cylinder.

- Remove the fixing screw from the pin on the body side of the cylinder and push the pin.
- Pull out the pin.

- Extract the cylinder diagonally.

- Remove the cylinder and place it on blocks.
- Removal operation is complete.

5 - Re-installing the cylinder

- Perform the operations in the reverse order of dismantling.
- If you are installing a new cylinder, note the traceability number.
- Lubricate the cylinder's axes and rings.
- 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.
- Use a ratchet strap to slide the cylinder diagonally when reassembling.

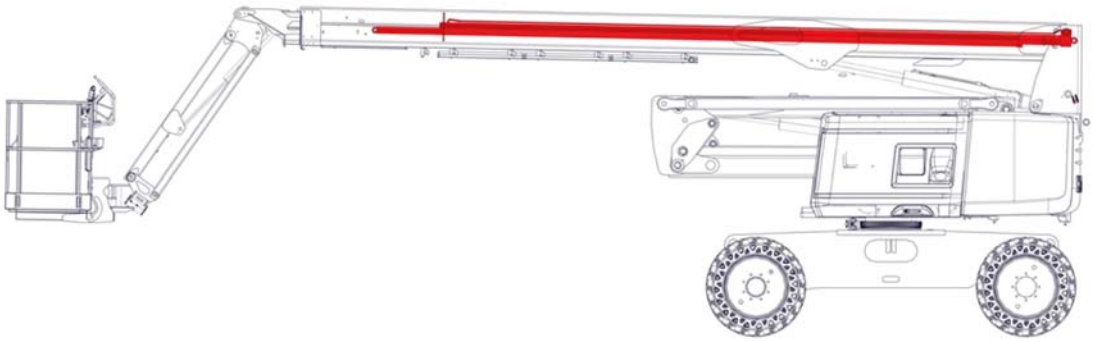
6 - Additional operations

- Clean off any residual oil or grease.
- Clean the work area.
- Move the cylinder several times to empty it.
- Machine stopped :
- Check the absence of leakage.
- Check oil level.
- Perform a static test by putting 290 kg / 639 lbs on the platform : Machine unfolded, 15 mn after checking the performance of its parts (Arm cylinder, boom cylinder, telescope cylinder, compensation receiver cylinder, jib cylinder).

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

Notes

1 - Concerned area



2 - Warning

- **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.**

Only an authorised and qualified technician is permitted to work on the machines HAULOTTE®.

3 - Risk prevention

Means of protection to be used when implementing the range :

- Appropriate workwear .
- Safety shoes .
- Gloves .

Specific protective measures to be used for the stage concerned :

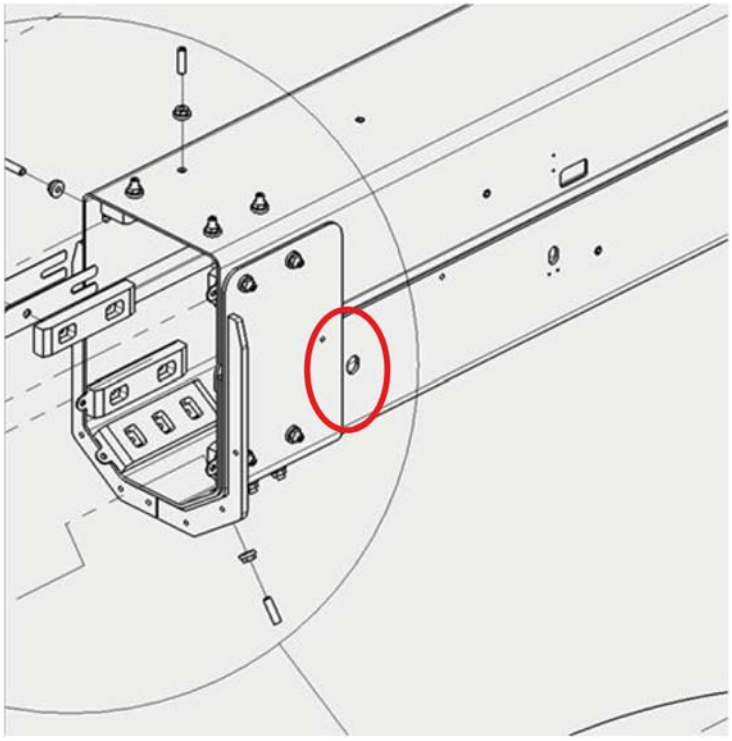
- Risk of fluids being splashed into eyes. Glasses must be work during the stage when indicated by this pictogram .
- Risk of knocks to the head. A helmet must be work during the stage when indicated by this pictogram .
- Use of handling equipment .

4 - You will need

	• Height wedge 700 mm / 28 in • Wooden block • 1 prong diameter 22 mm / 0,87 in • Standard tool kit • Tray • Lamp • 2 straps, length 2 m / 6 ft 7 in, capacity 1000 kg / 2,205 lbs • Bridge • A second handling device • Grease for pins • ORFS plug kit : 2505001600 • Hydraulic oil		• Place barriers around the perimeter of the work area
Major component masses	• Telescope cylinder : 260 kg / 574 lbs		2

5 - Removing the cylinder

- Position the machine on a flat and firm surface, clear of obstructions (beware of power lines).
- Mark out the work area.
- Restrict access to the area (restricted access sign).
- With the boom in a horizontal position, take out the telescope to access the shaft-side pin.
- Pin the telescope barrel and boom to prevent the barrel from coming out.



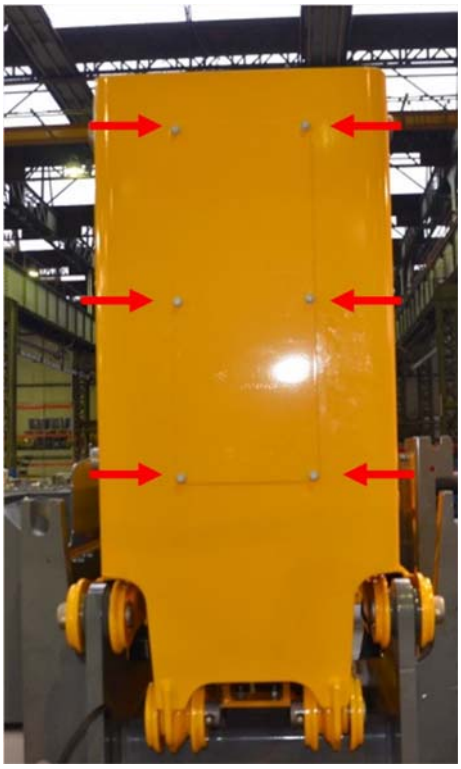
- Prepare a stable block of around 700 mm / 28 in and place the basket on top of it using the tilt function.

- Switch off the ignition and remove the ignition key.

- Locate the 2 hoses leading to the compensation receiver cylinder.

- Place a container underneath the connections.
- Carefully and gradually loosen the fittings until there is a trickle of oil.
- Re-tighten the fittings when the pressure has dropped.

- Remove the 6 fixing screws from the panel to enable access to the cylinder.

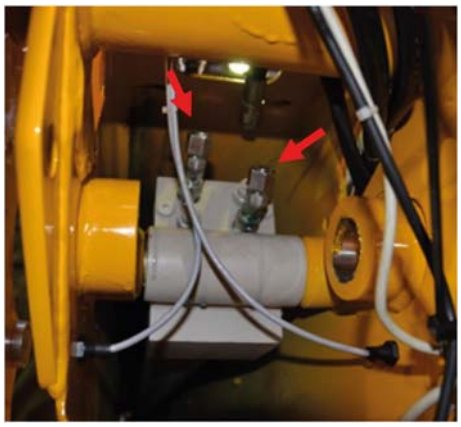


- Remove the fixing screw from the pin on the shaft side of the cylinder and then push the pin.

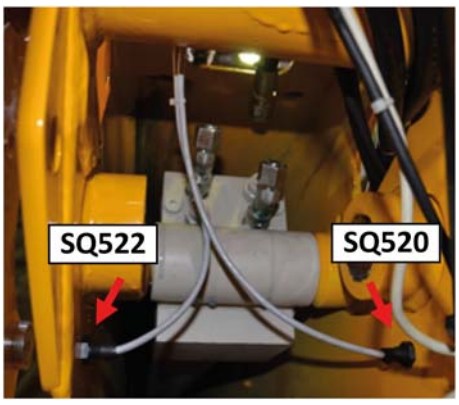
- Pull out the pin.

- Move the hoses and cables aside so that you can tilt the transmitter cylinder.

- Disconnect the supply hoses from the telescope cylinder.
- Plug the hoses and the cylinder.

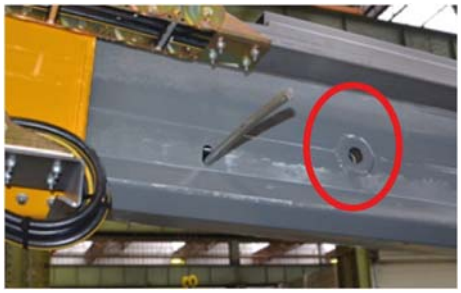


- Remove the sensors SQ520 and SQ522 (If there is a double load option, also disconnect SQ523 and SQ521).

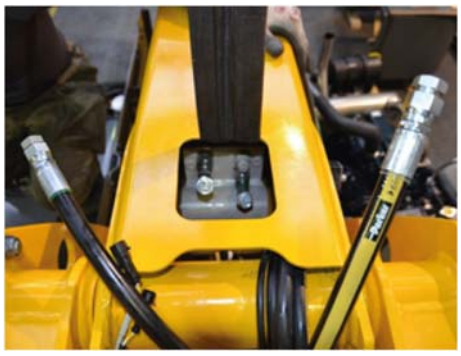


- Disconnect the sensors.

- Take off the circlips and extract the shaft-side pin.



- Place a strap under the cylinder through the opening.



- Remove the fixing screw from the pin on the body side of the cylinder and push the pin.

- Using the bridge, take the weight of the cylinder in order to extract the body-side axis.
- Place a wooden wwdge underneath the cylinder.
- Position the cylinder on the bottom part of the telescope's barrel.

- Sling the body-side of the cylinder passing it through the rear door.

- Pull the cylinder lightly.

- Be careful not to hang anything onto the outlet of the anti-buckling plate.

- Take hold of the rod side of the cylinder with the second handling device.
- Lay down the cylinder on wooden blocks.

6 - Re-installing the cylinder

- Perform the operations in the reverse order of dismantling.
- If you are installing a new cylinder, note the traceability number.
- Lubricate the cylinder's axes and rings.
- 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.
- In order to make it easier for the guidance part to enter the telescope, position a wooden wedge in the boom foot (Wood pallet length 1100 mm / 3 ft 7 in, width 50 mm / 5 in, height 20 mm / 1 in estimated).

7 - Additional operations

- Clean off any residual oil or grease.
- Clean the work area.
- Move the cylinder several times to empty it.
- Machine stopped :
- Check the absence of leakage.
- Check oil level.
- Perform a static test by putting 290 kg / 639 lbs on the platform : Machine unfolded, 15 mn after checking the performance of its parts (Arm cylinder, boom cylinder, telescope cylinder, compensation receiver 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		• 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	830 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-).

HA26 RTJ O - HA26 RTJ PRO - HA80 RTJ O - HA80 RTJ PRO

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.

Notes

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		

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

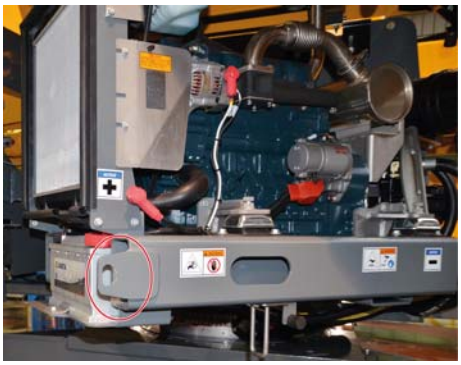
3.1 - MOVABLE COVER ON THE MOTOR-SIDE

- 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.

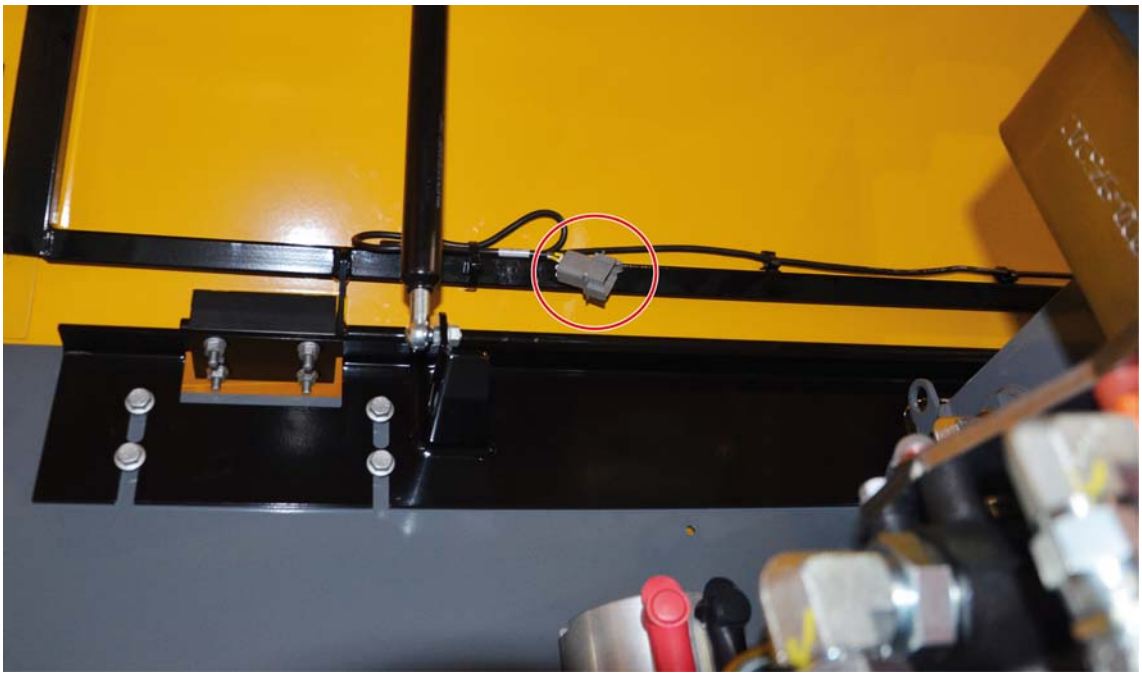
- Loosen the screws that fix the cover support plate to the turret.

- 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.

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

	• 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 wrench : 450 Nm • Torque wrench : 260 Nm • Torque wrench : 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
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.

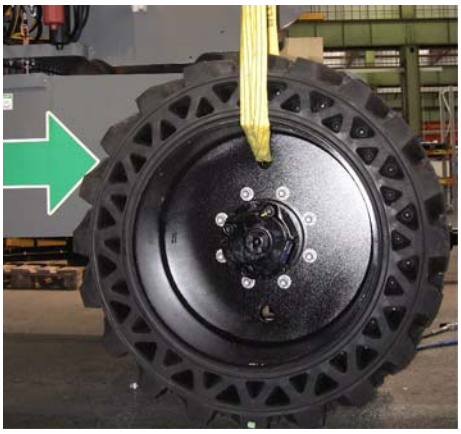
3 - Removal

- 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.

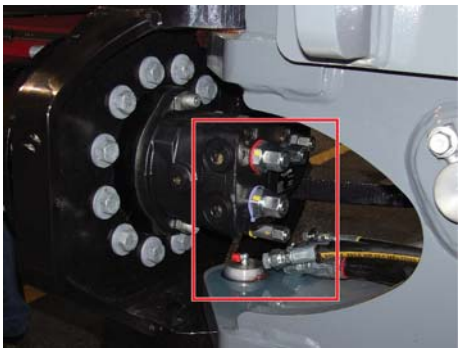
- Sling the wheel with the strap.



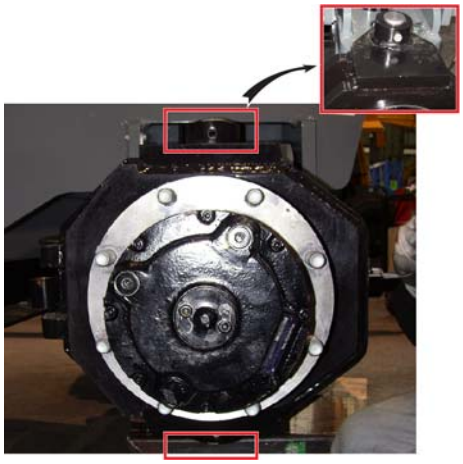
- Remove the wheel and lay it down flat on a pallet with the outer side downwards.

- 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.

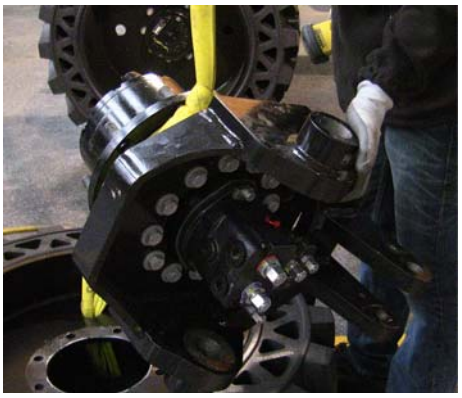


- Sling the steering pivot.
- Apply a small amount of tension on the bridge crane.
- Remove the locking pin screws and withdraw the pins connecting the steering pivot to the chassis.



- Remove the steering pivot + reduction gear assembly.

Set aside the bronze washers.

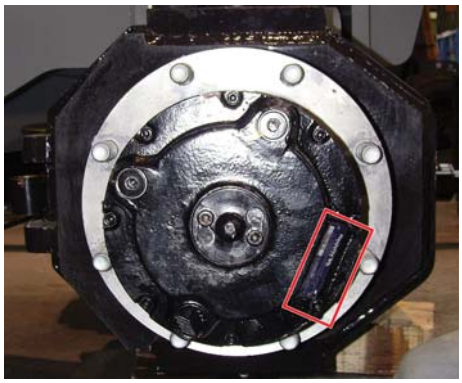


- Place the assembly on the ground.
- Sling the assembly by the holes in the wheel steering pivot.
- Position the assembly on the wheel with the reduction gear studs inserted into the rim.

- 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

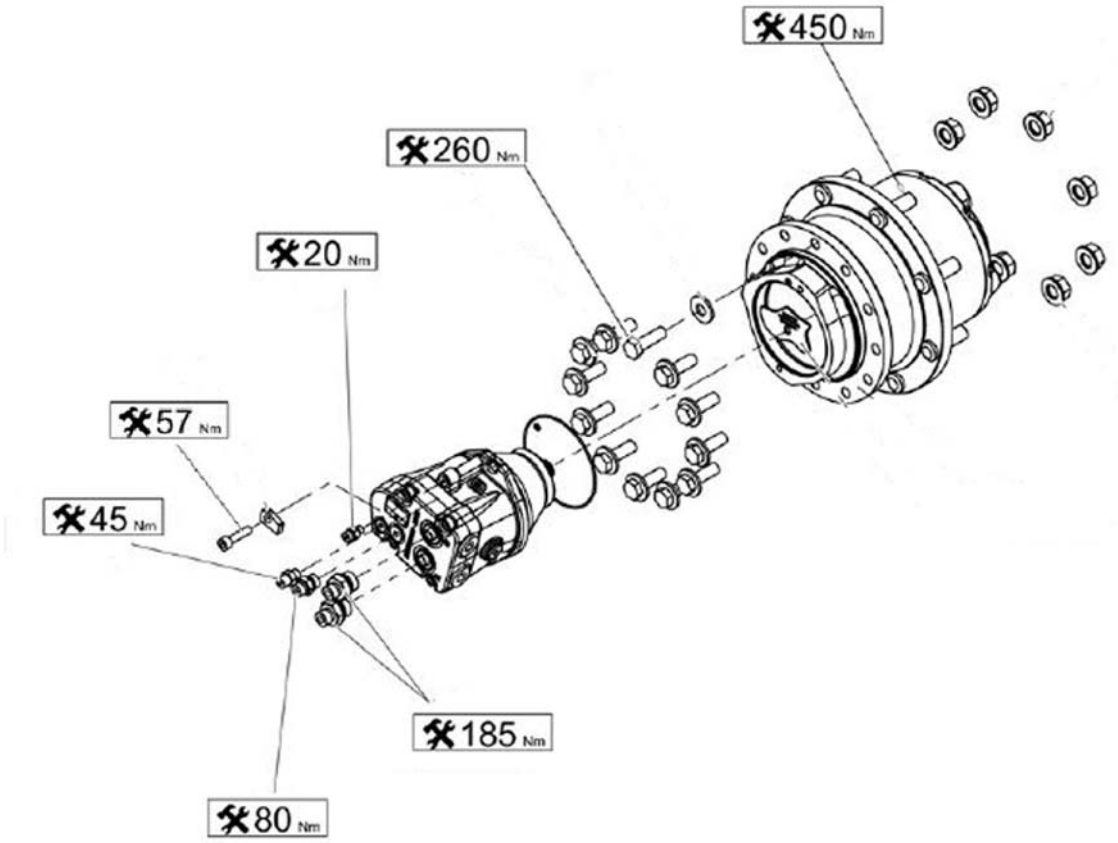
- If the reduction gear has been replaced, note its traceability number.



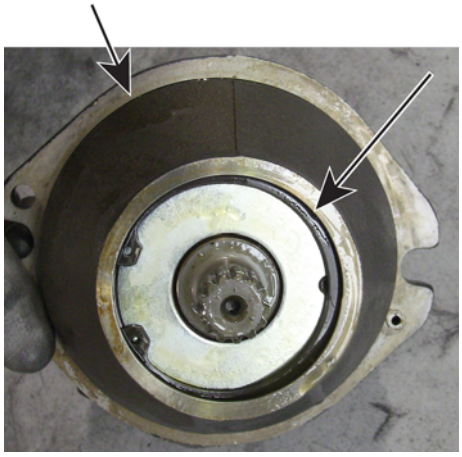
- Perform the operations in the reverse order of dismantling.

Remember to refit the bronze rings.

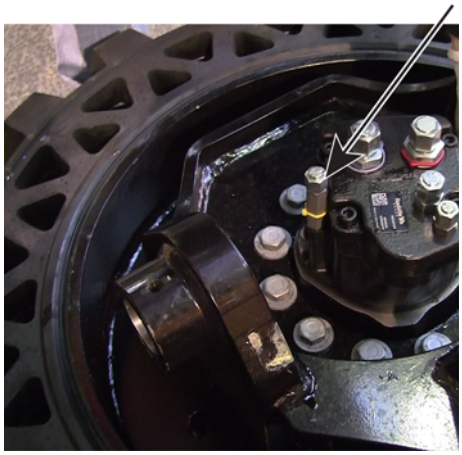
- Grease the pins when re-installing and comply with the tightening torque.



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



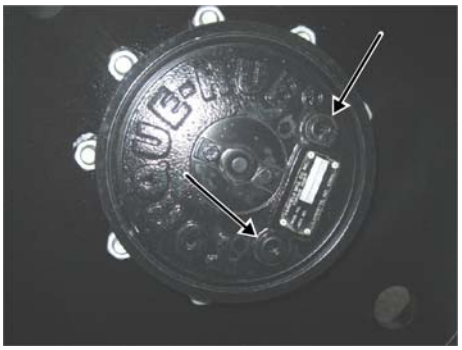
The reducer's break release must be positioned at the bottom of the pivot.



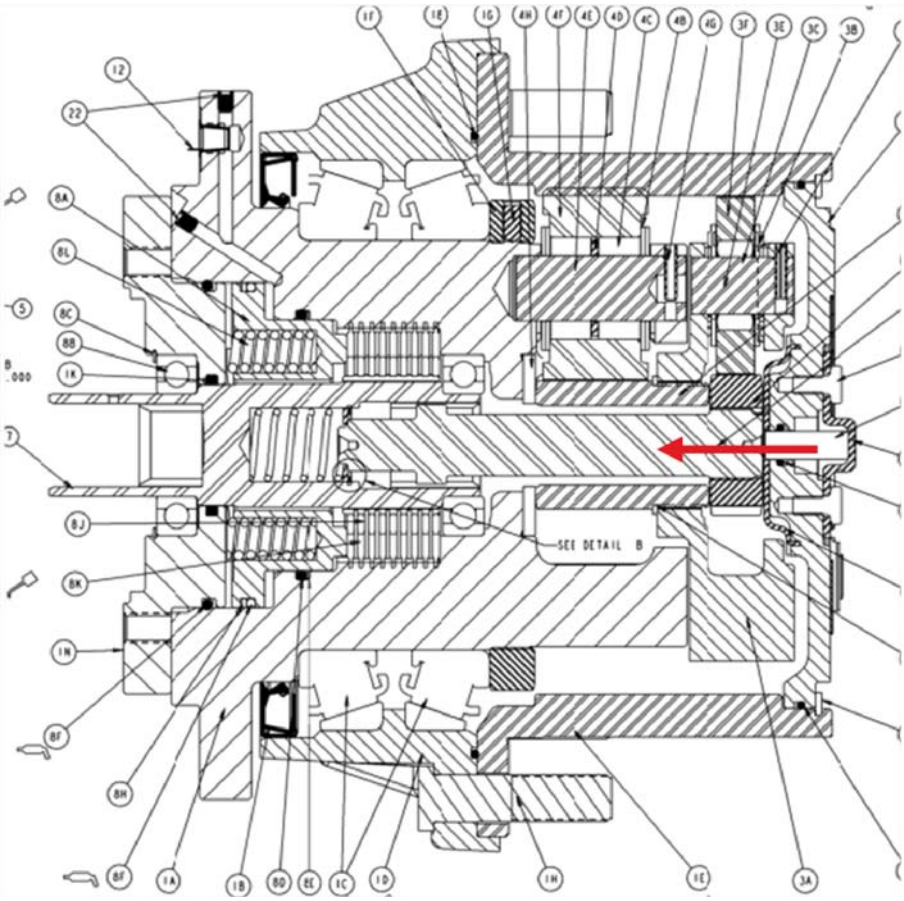
- Replace the washers with a minimum thickness of 2.5 mm for fixing the wheel to the gear unit.

5 - Additional operations

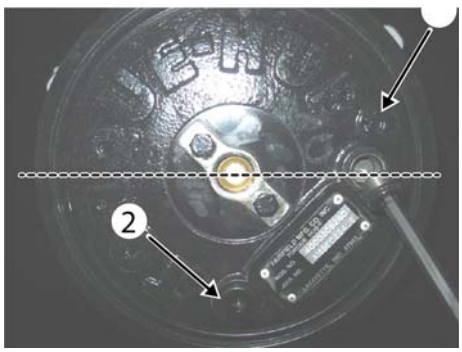
- If the reduction gear has been replaced, check the oil level.
- Fill the reduction gear if it is empty.
- If the machine is still on wedges, disengage the reducer in order to turn it manually.
- Position the plugs correctly to fill up or top up with oil :
- Manually release the reduction gear.
- Loosen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



- 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 1,2 m (3,9 ft) and 1,6 m (5,2 ft).
- Check for any oil leaks.

Notes

1 - Links to engine manufacturer manuals - Fuel-powered machines

For online reference and to download engine maintenance manuals for HAULOTTE® machines, go to :

https://www.e-technical-information.com :

- Username : Haulotte-Manuals
- Password : manuals

2 - KUBOTA

V1505 – D1105 E3 Engine :

- In french : Manuel d'atelier 9Y111-00543
- In english : Workshop manual 9Y111-00126

V1505 – D1105 E4 Engine :

- In french : Manuel d'atelier 9Y111-14251
- In english : Workshop manual 9Y111-07841

V2403 CR Engine :

- In french : Manuel d'atelier 9Y111-10985
- In english : Workshop manual 9Y111-07825

V2403M Engine :

- In french : Manuel d'atelier 9Y111-02584
- In english : Workshop manual 9Y111-02574

V2607 CR E4 Engine :

- In french : Manuel d'atelier 9Y111-11034
- In english : Workshop manual 9Y111-06744

V2607 MT E3 Engine :

- In french : Manuel d'atelier 9Y111-01726
- In english : Workshop manual 9Y111-01036

WG1605 Engine :

- In french : Manuel atelier moteur réf 4000208650
- In english : Workshop manual engine ref 4000208650

WG2503 Engine :

- In french : Manuel d'atelier 9Y111-10902
- In english : Workshop manual 9Y111-09142

WG3800 Engine :

- In french : Manuel d'atelier 9Y111-13101
- In english : Workshop manual 9Y111-13091

WG972 Engine :

- In french : Manuel d'atelier 9Y111-03190
- In english : Workshop manual 9Y111-03180

3 - PERKINS

1104D Engine :

- In french : Manuel de l'opérateur Moteur PERKINS 1104D-44T
- In english : Operator's manual PERKINS engine type 1104D-44T

4 - DEUTZ

TCD 2,9 L4 Engine :

- In french : Manuel de l'opérateur 03124630_10_2013
- In english : Operator's manual 03124628 en

5 - KOHLER

KDI 3404 TCR Engine :

- In french : ED0053030060 UM_KDI_3404TCR_REV_00_FR_HD
- In english : ED0053030050 UM_KDI_3404TCR_REV_00_EN_HD

KDI 1903 TC - STAGE V Engine :

- In english : ED0053029490_UM_KDI_1903_2504TCR_REV_19_1_EN
- In french : ED0053029710_UM_KDI_1903_2504TCR_REV_19_1_FR

6 - YANMAR

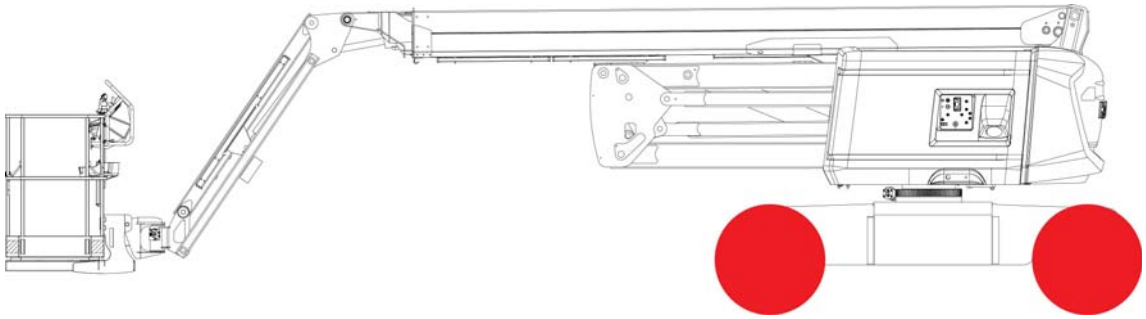
Range Extender P6000 :

- In english : Yanmar Operation Manual EN0016

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

5 - You will need

	• "DO NOT OPERATE" tag • Personal protective equipment • Standard tool kit • Torque wrench		• 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 :

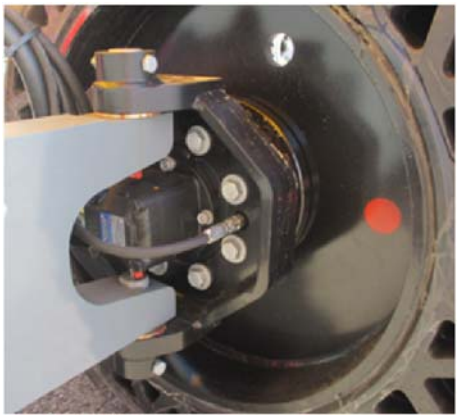
- Check the tightening torque of the 8 studs : 450 N.m (332 lbf.ft).

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

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

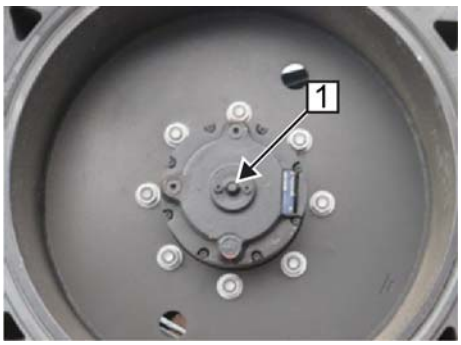
Packaging	Part number HAULOTTE®
Can 1L	4000530610
Can 20L	2420801370
Barrel 209L	2420801380

6 - Procedure

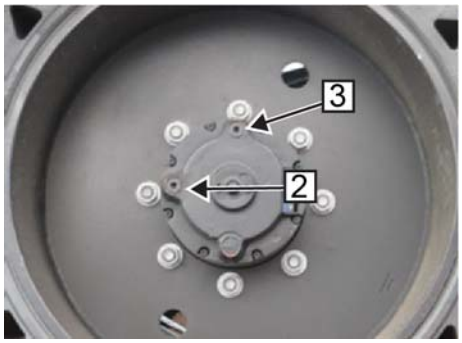
6.1 - YOU HAVE A MEANS OF LIFTING THE MACHINE

- 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.

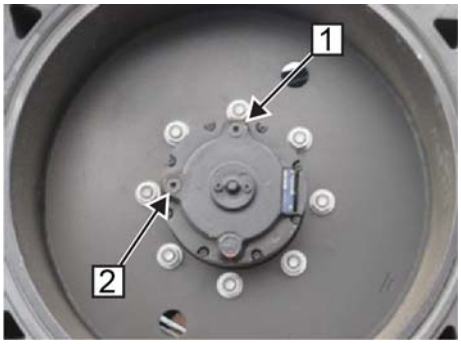


- Manually turn the wheel to position the filler cap to the top of the vertical axis (3).
- Open the caps (2, 3) :
- If the level is correct, oil should drain from the orifice (2).
- If not, add oil via the cap (3) using the syringe until oil flows through the hole (2).
- Re-tighten the central screw,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

1 - Concerned machines

- HA20 RTJ - HA 20RTJ 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
- HT16 RTJ O - HT16 RTJ PRO - HT46 RTJ O - HT46 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

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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

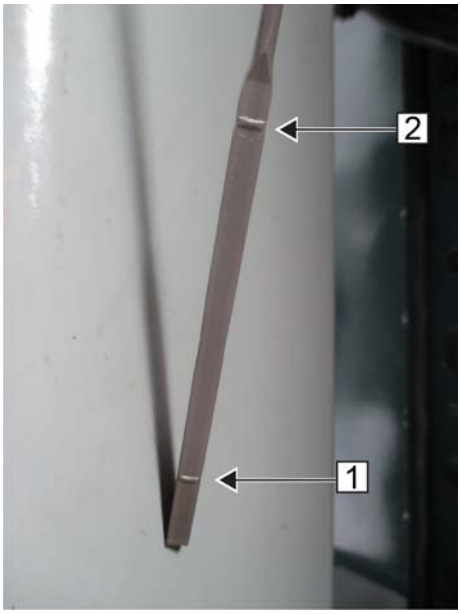
	• "DO NOT OPERATE" tag • Personal protective equipment • Rags • Standard tool kit		• Place barriers around the perimeter of the work area
	1 person		

5 - Procedure

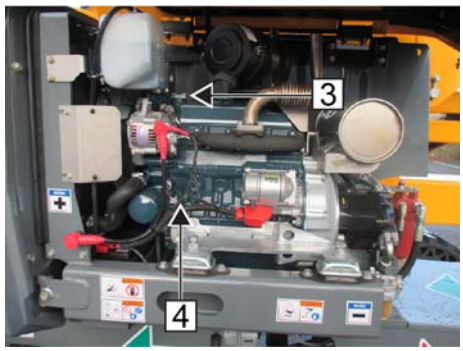
- Position the machine on a flat and firm surface, clear of obstructions (beware of power lines).
- Put the machine in stowed position, boom and arm fully retracted and lowered.

- 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

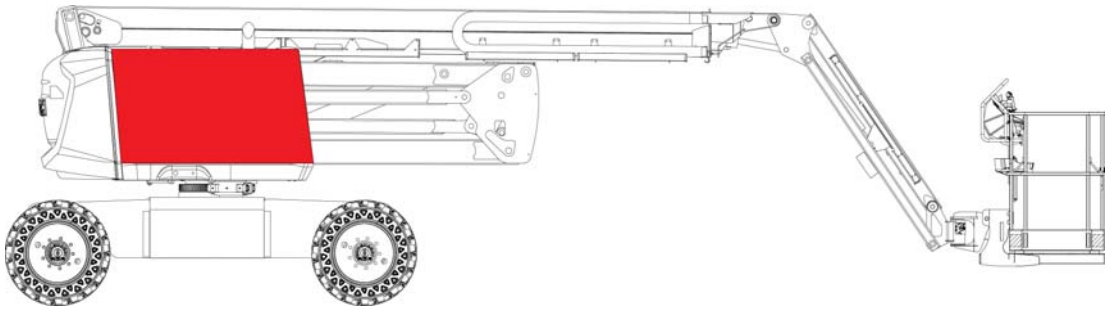
- Clean the work area.

Notes

1 - Concerned machines

- HA26 RTJ O - HA26 RTJ O SW - HA26 RTJ PRO - HA26 RTJ PRO SW - HA80 RTJ O - HA80 RTJ PRO

2 - Concerned area



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4 - Risk prevention

Means of protection to be used when implementing the range

	Appropriate workwear		Gloves
	Safety shoes		Safety goggles

5 - 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		

6 - Procedure

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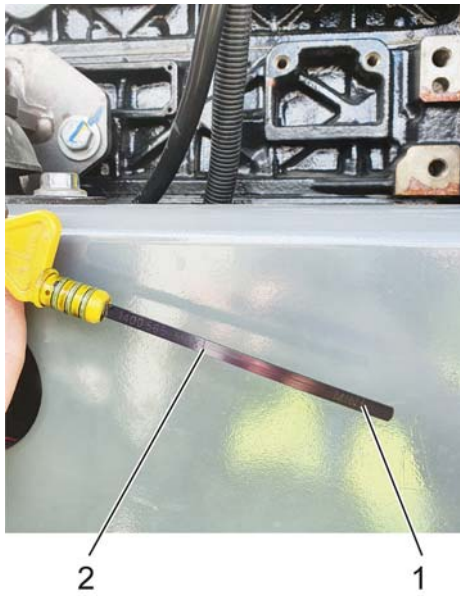

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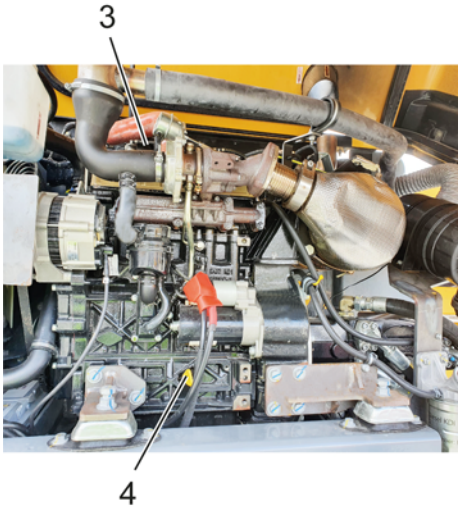


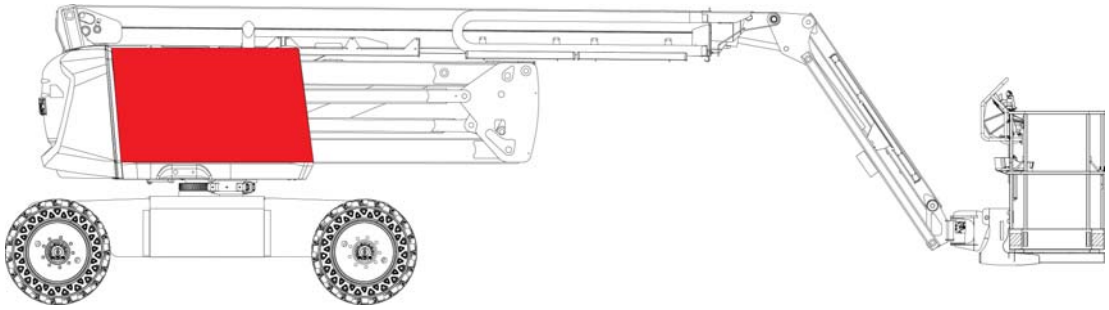
7 - Additional operations

- Clean the work area.

1 - Concerned machines

- HA20RTJ - HA20RTJ O - HA20RTJ PRO - HA61RTJ O - HA61RTJ PRO
- HA26 RTJ O - HA26 RTJ O SW - HA26 RTJ PRO - HA26 RTJ PRO SW - HA80 RTJ O - HA80 RTJ PRO

2 - Concerned area



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4 - Risk prevention

Means of protection to be used when implementing the range

	Appropriate workwear		Gloves
	Safety shoes		Safety goggles

5 - You will need

	• "DO NOT OPERATE" tag • Personal protective equipment • Standard tool kit • Oil filter wrench • Rags • Engine oil filter - 4000076270 • Container		• Place barriers around the perimeter of the work area
	1 person		

6 - Procedure

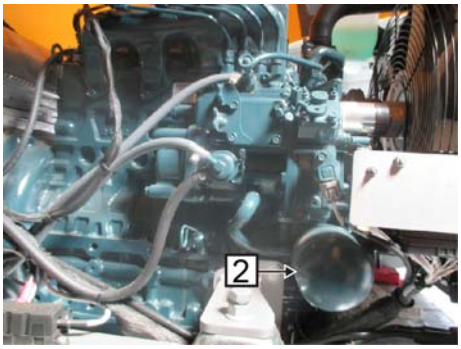
- Position the machine on a flat and firm surface, clear of obstructions (beware of power lines).
- Put the machine in stowed position, boom and arm fully retracted and lowered.

- 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.

- The oil cartridge is at the rear of the engine. To access it, swivel the engine by removing the screw (1).

- Remove the oil filter (2) 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.



7 - Additional operations

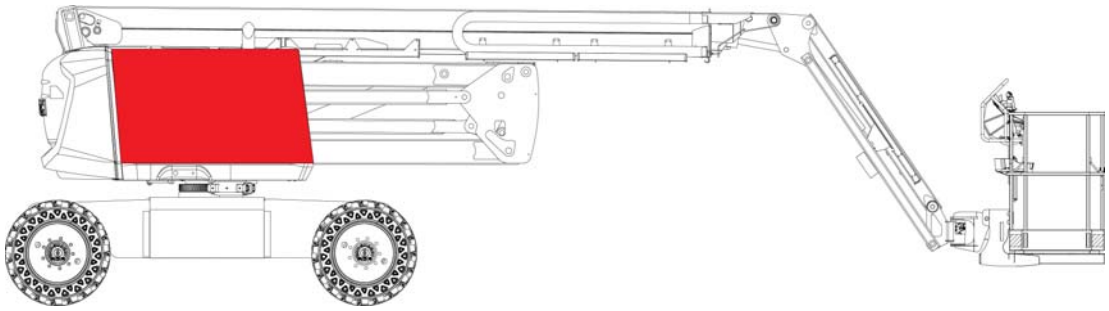
- Clean the work area.

Notes

1 - Concerned machines

- HA26 RTJ O - HA26 RTJ O SW - HA26 RTJ PRO - HA26 RTJ PRO SW - HA80 RTJ O - HA80 RTJ PRO

2 - Concerned area



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4 - Risk prevention

Means of protection to be used when implementing the range

	Appropriate workwear		Gloves
	Safety shoes		Safety goggles

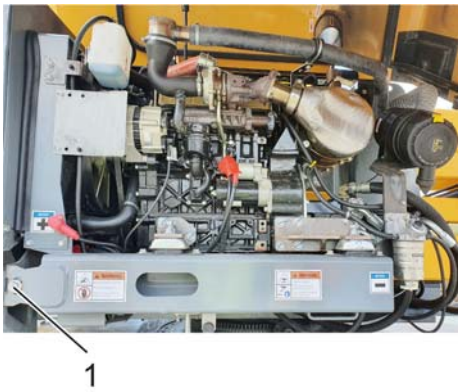
5 - You will need

	• "DO NOT OPERATE" tag • Personal protective equipment • Standard tool kit • Oil filter wrench • Rags • Engine oil filter - 4000389200 • Container		• Place barriers around the perimeter of the work area
	1 person		

6 - Procedure

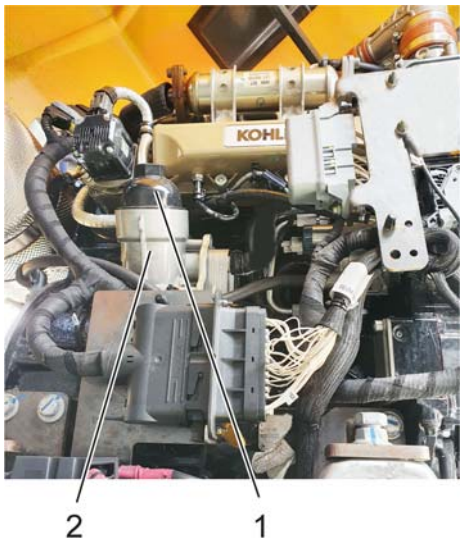
- Position the machine on a flat and firm surface, clear of obstructions (beware of power lines).
- Put the machine in stowed position, boom and arm fully retracted and lowered.
- Switch off the ignition and remove the ignition key.
- Place a do not operate tag at the start/stop switch location to inform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

- The oil cartridge is at the rear of the engine. To access it, swivel the engine by removing the screw (1).



- Undo the cartridge holder cover (1) by performing 3 complete turns and wait 1 minute.
- Unscrew the cartridge holder cover (1) and check that the oil in the filter support (2) has flowed.
- Remove the cartridge from the oil filter support.
- Replace the 3 seals on the cartridge support.
- Fit the new cartridge.
- Screw on the cover to a torque of 25 N.m using a torque wrench.

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



7 - Additional operations

- Clean the work area.

Notes

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
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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

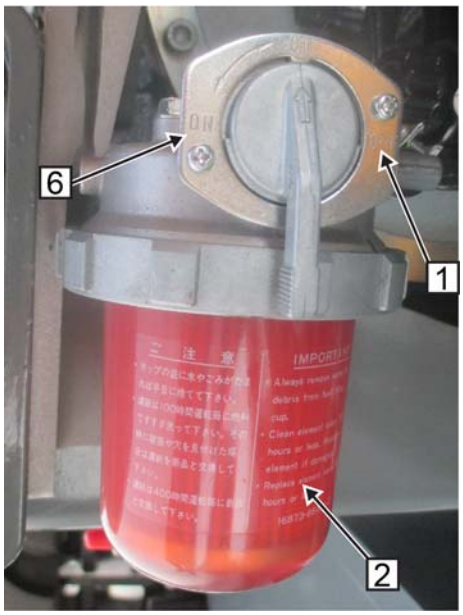
	• Diesel filter cartridge - 4000079430 • Seals - 4000210630 - 4000079450 • "DO NOT OPERATE" tag • Standard tool kit • Filter wrench • Container • Oil collection pan		Place barriers around the perimeter of the work area
	1 person		

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.

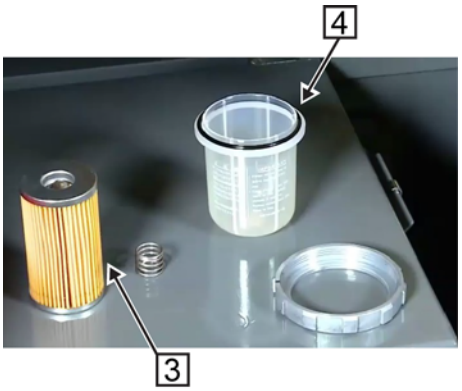
Dis-assembly :

- 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).



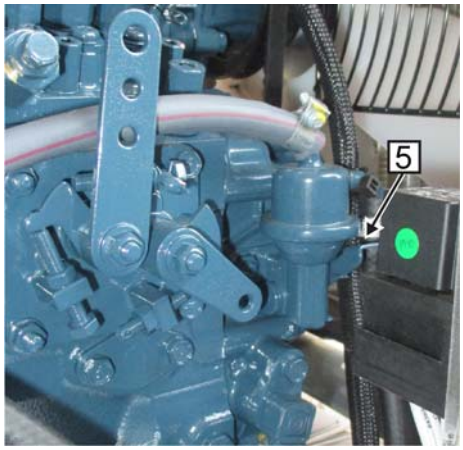
Assembly :

- 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

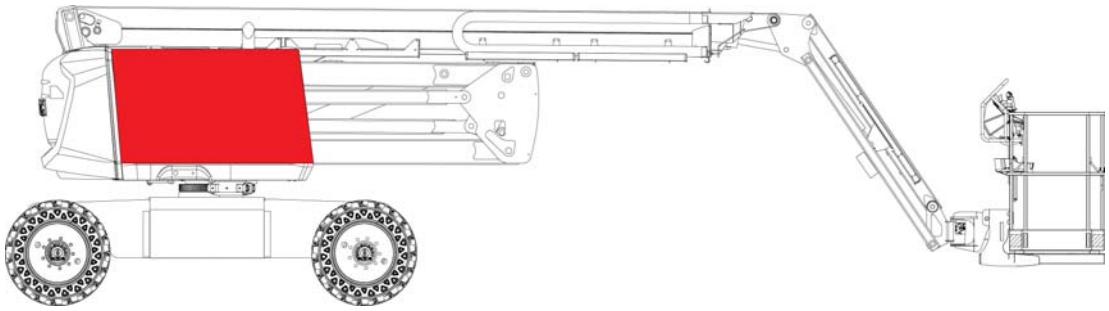
- Clean the work area.

Notes

1 - Concerned machines

- HA26 RTJ O - HA26 RTJ O SW - HA26 RTJ PRO - HA26 RTJ PRO SW - HA80 RTJ O - HA80 RTJ PRO

2 - Concerned area



3 - Warning

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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.**

4 - Risk prevention

Means of protection to be used when implementing the range

	Appropriate workwear		Gloves
	Safety shoes		

5 - You will need

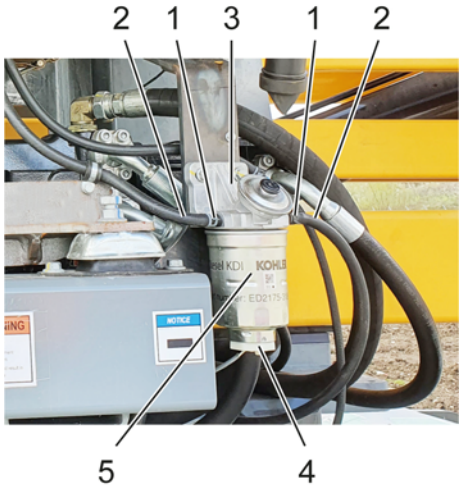
	• Diesel filter cartridge - 4000389280 • "DO NOT OPERATE" tag • Standard tool kit • Filter wrench • Container • Oil collection pan		Place barriers around the perimeter of the work area
	1 person		

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.

Dis-assembly :

- Remove the clamps (1) and pull the pipes (2) out of the support (3).
- Unscrew the sensor (4) from the cartridge (5).
- Unscrew and remove the cartridge (5).



Assembly :

- Clean the diesel filter support (3).
- Replace the seal of the container (6) and reassemble in the reverse order to disassembly.
- Apply a thin layer of fuel to the surface of the seal of the container (6).
- Tighten the cartridge to a torque of 17 N.m using a wrench.
- Tighten the sensor (4) to a torque of (1), reconnect the 5N.m pipes to the support and tighten the collars (2).

6

- Reprime the diesel circuit using the pump button (7).
- Switch on the engine for a few moments and check that there are no fuel leaks in the filter.

7

7 - Additional operations

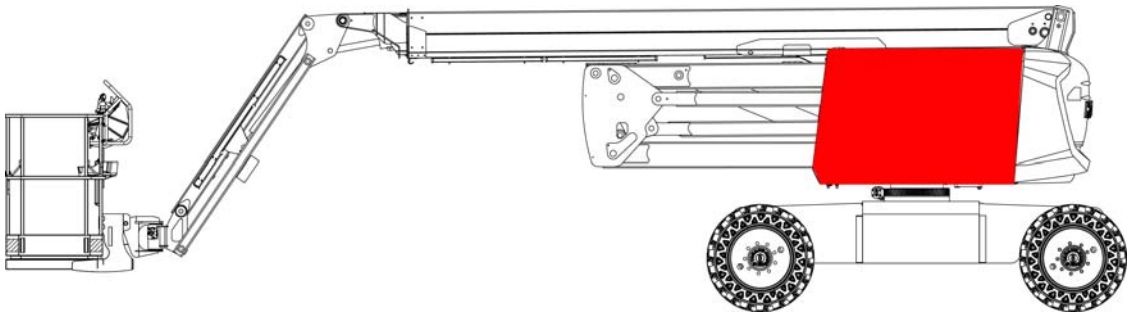
- Clean the work area.

Notes

1 - Concerned machines

- HA26 RTJ O - HA26 RTJ O SW - HA26 RTJ PRO - HA26 RTJ PRO SW - HA80 RTJ O - HA80 RTJ PRO

2 - Concerned area



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4 - Risk prevention

Means of protection to be used when implementing the range

	Appropriate workwear		Gloves
	Safety shoes		Safety goggles

5 - 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		

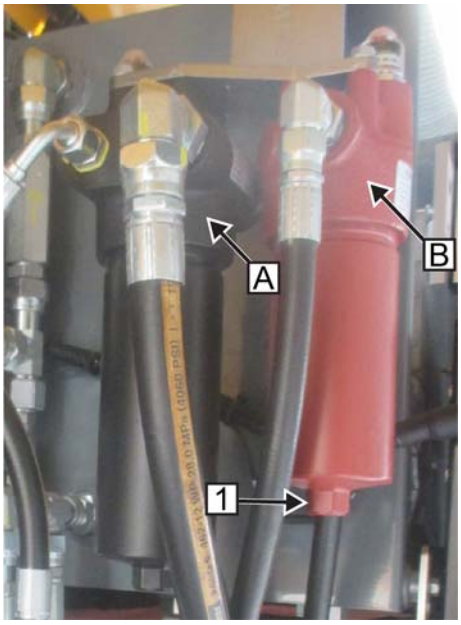
6 - Procedure

- 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.

- 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.



7 - Additional operations

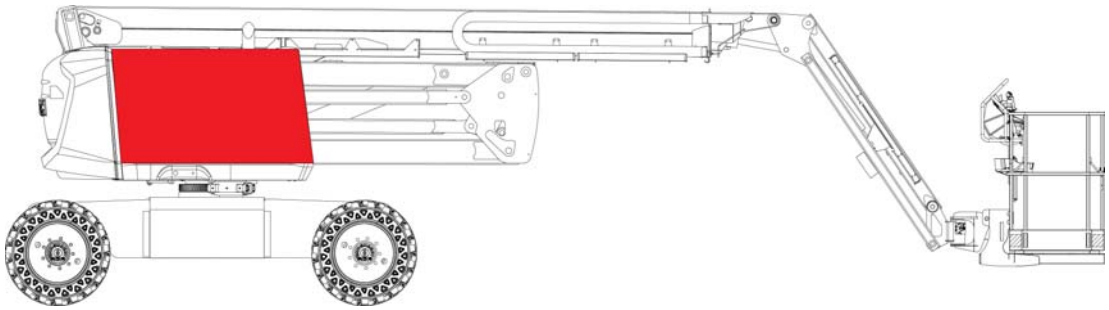
- Clean the work area.

Notes

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
- HT16 RTJ O - HT16 RTJ PRO - HT46 RTJ O - HT46 RTJ PRO

2 - Concerned area



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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.**

4 - Risk prevention

Means of protection to be used when implementing the range

	Appropriate workwear		Gloves
	Safety shoes		

5 - You will need

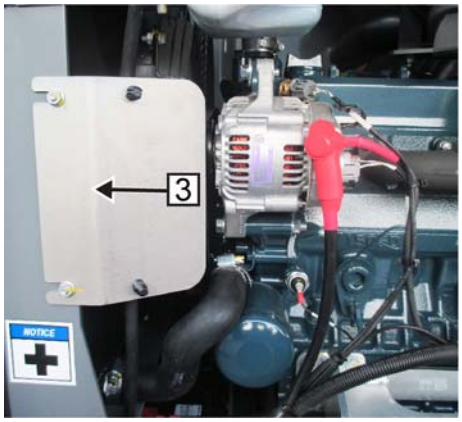
	• "DO NOT OPERATE" tag • Tools for checking belt tension • Standard tool kit • Lever		Place barriers around the perimeter of the work area
	1 person		

6 - Procedure

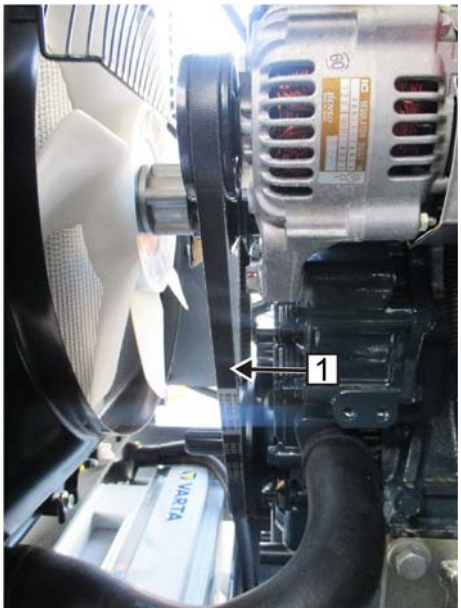
- Position the machine on a flat and firm surface, clear of obstructions (beware of power lines).
- Put the machine in stowed position, boom and arm fully retracted and lowered.

Do not start the engine and disconnect the battery.

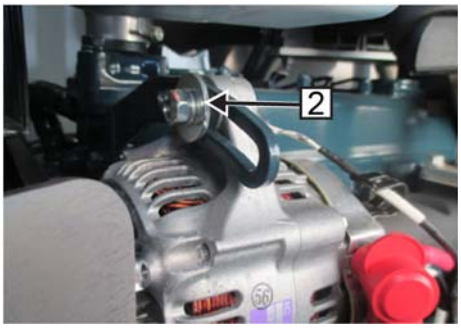
- Remove the protective cover if there is not sufficient access (3).



- Press halfway between the fan drive pulley and the alternator pulley with a force of 98 N (10 kg) to measure the deflection(1).
- The value measured must be between 7 mm and 9 mm.
- 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.



7 - Additional operations

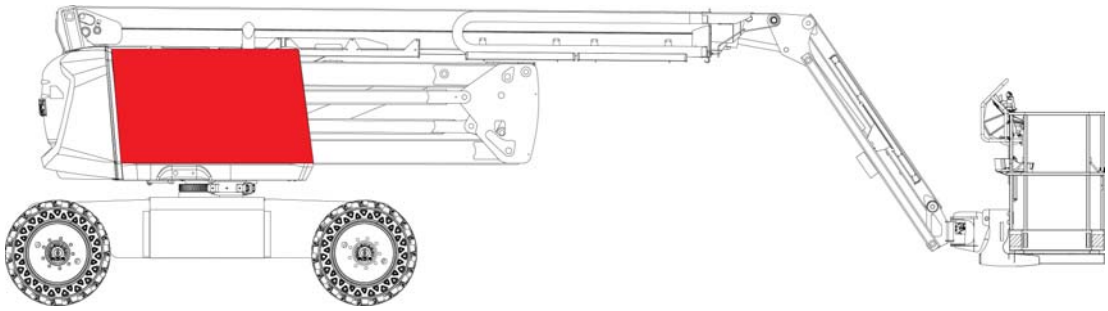
- Clean the work area.

Notes

1 - Concerned machines

- HA26 RTJ O - HA26 RTJ O SW - HA26 RTJ PRO - HA26 RTJ PRO SW - HA80 RTJ O - HA80 RTJ PRO

2 - Concerned area



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4 - Risk prevention

Means of protection to be used when implementing the range

	Appropriate workwear		Gloves
	Safety shoes		

5 - You will need

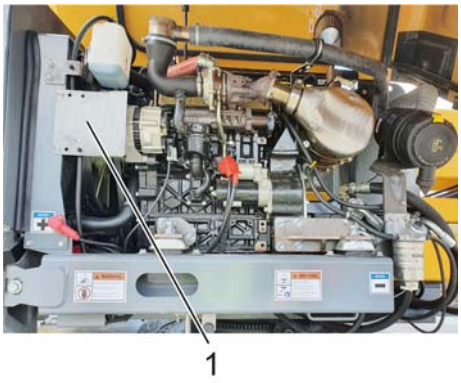
	• "DO NOT OPERATE" tag • Tools for checking belt tension • Standard tool kit • Lever		Place barriers around the perimeter of the work area
	1 person		

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.

Do not start the engine and disconnect the battery.

- Remove the protective cover if there is not sufficient access (1).



Procedure for checking engine belt tension - Kohler engine

MP0007

- Press the point P (2), halfway between the fan drive pulley and the alternator pulley, to measure deflection.
- Check that the value of the voltage is between 80 and 85Hz with an appropriate instrument.
- If no instruments are available, to check that the voltage is correct, apply a force of approximately 10 kg to the point P (2).
- The belt flexion must be less than 10mm.
- Otherwise, adjust it.

- If the value is not within this range :
- Unscrew the fixing screws (3), (4).
- Adjust its position.
- Maintaining the position, tighten the fastening screws (3) to a torque of 25 N.m and (4) to a torque of 69 N.m.

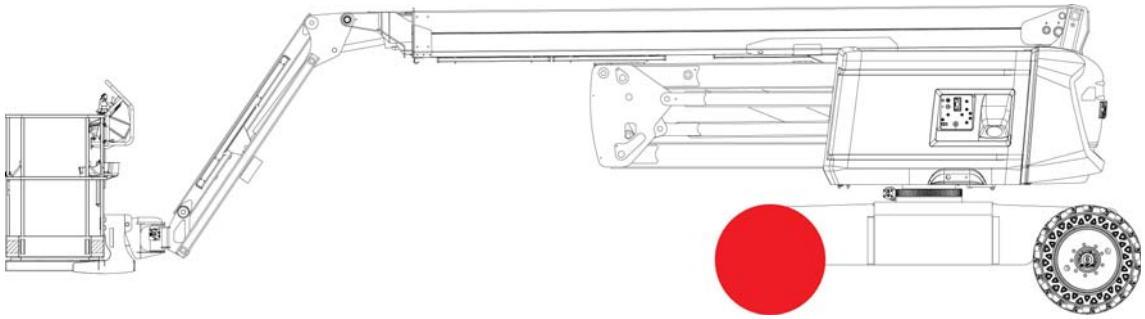
7 - Additional operations

- Clean the work area.

1 - Concerned machines

- HA26 RTJ O - HA26 RTJ O SW - HA26 RTJ PRO - HA26 RTJ PRO SW - HA80 RTJ O - HA80 RTJ PRO
- HA32RTJ PRO - HA100 RTJ PRO - HA41 RTJ PRO - HA130 RTJ PRO

2 - Concerned area



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4 - Risk prevention

Means of protection to be used when implementing the range

	Appropriate workwear		Gloves
	Safety shoes		

5 - You will need

	• Personal protective equipment		• Place barriers around the perimeter of the work area
	1 person		

6 - Procedure

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 30cm (12in) on the machine and drive is selected.

Ensure the axles are extended and the boom is fully retracted, lowered, and centered betweeen the rear wheels prior to beginning lockout cylinder test :

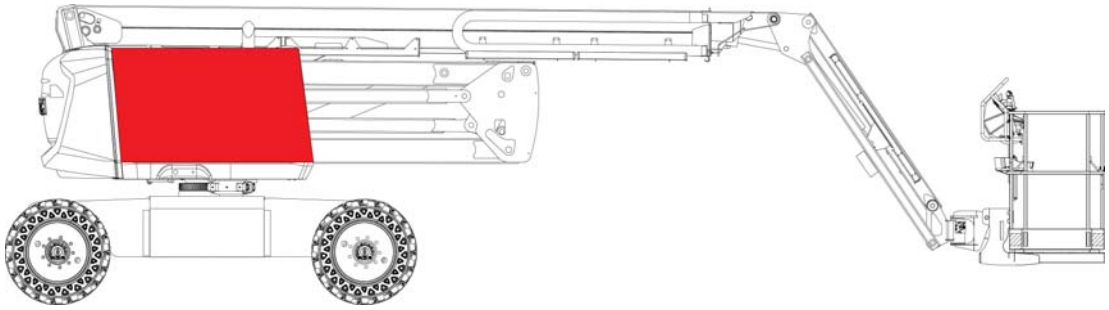
- Place a ramp 15 cm (6 in) high in front of the front right wheel.
- From platform control box, start engine.
- Place the drive control lever to the forward position and carefully drive machine up ascension ramp until left front wheels is on top of block.
- Carefully extend the boom just enough to get it out of the transport position.
- With boom in this position, place drive control lever to reverse and carefully drive machine off of block and ramp.
- Have an assistant check to see that left front or right rear wheel remains elevated in position off of the ground.
- 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.
- 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.
- If lockout cylinders do not function properly, have qualified personnel correct the malfunction prior to any further operation.

Notes

1 - Concerned machines

- 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

2 - Concerned area



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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 • Personal protective equipment • Primary cartridge – 4000044230 • Secondary cartridge – 4000044240		• Place barriers around the perimeter of the work area
	1 person		

6 - Procedure

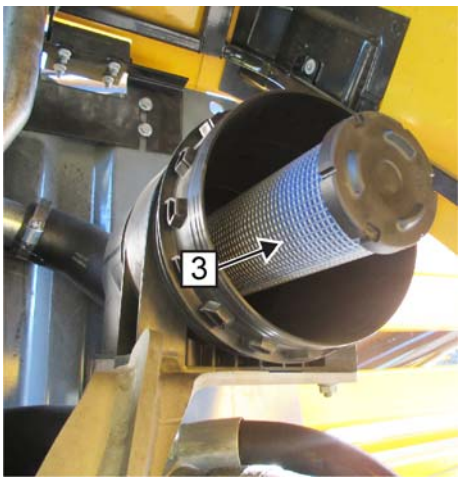
- Position the machine on a flat and firm surface, clear of obstructions (beware of power lines).
- Put the machine in stowed position, boom and arm fully retracted and lowered.

- 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.

- Pull the pin and swivel the cover to remove it (1).

- Remove the main element (2) and secondary element (3).
- Replace with new cartridges.
- Close the cover again using the pin (1).

Do not use oil.



Notes

1 - Concerned machines

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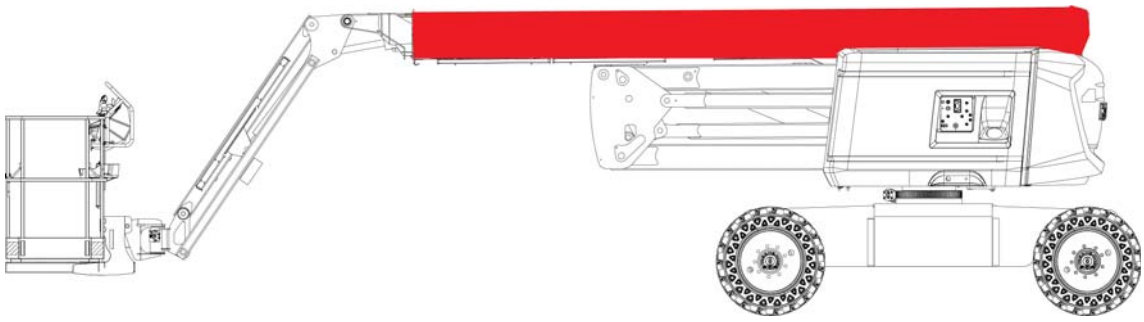

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4 - Risk prevention

Means of protection to be used when implementing the range

	Appropriate workwear		Gloves
	Safety shoes		

5 - You will need

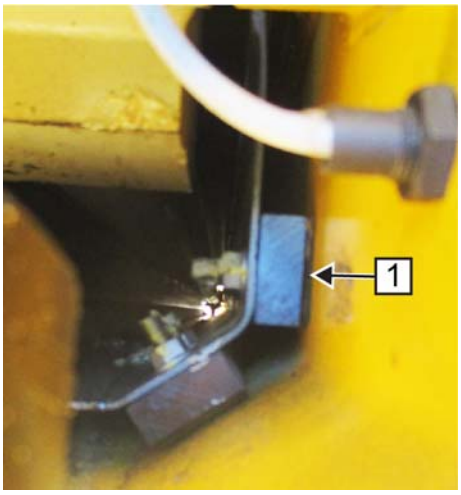
	• "DO NOT OPERATE" tag • Personal protective equipment • Grease • Wear pads kit - KITPATINHA20RTJ		• Place barriers around the perimeter of the work area
	1 person		

6 - Procedure

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

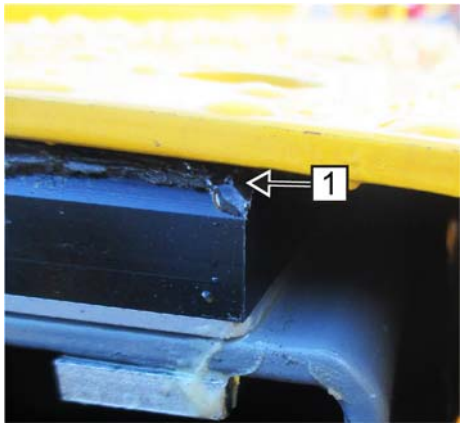
Front pads :

- Telescope of the boom slightly.
- Check the wear on the 8 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 :

- Remove the plate on the back of the boom.
- Retract the telescoping boom.
- Check the wear on the 8 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.



1 - Concerned machines

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- HA16 RTJ - HA16 RTJ O - HA16 RTJ PRO - HA46 RTJ O - HA46 RTJ PRO
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- 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

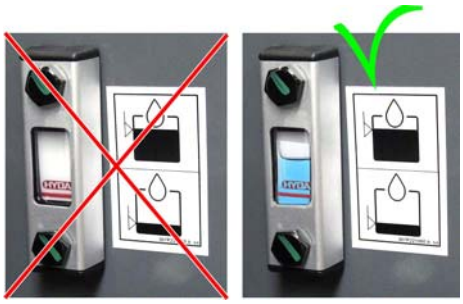
	• "DO NOT OPERATE" tag • Personal protective equipment • Standard tool kit • - 2505003830 Hydraulic oil • Rags		• Place barriers around the perimeter of the work area
	1 person		

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

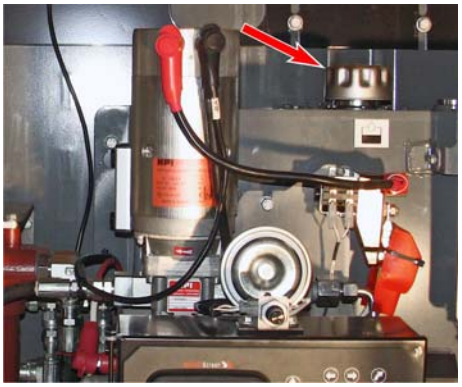
6 - Procedure

- 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.



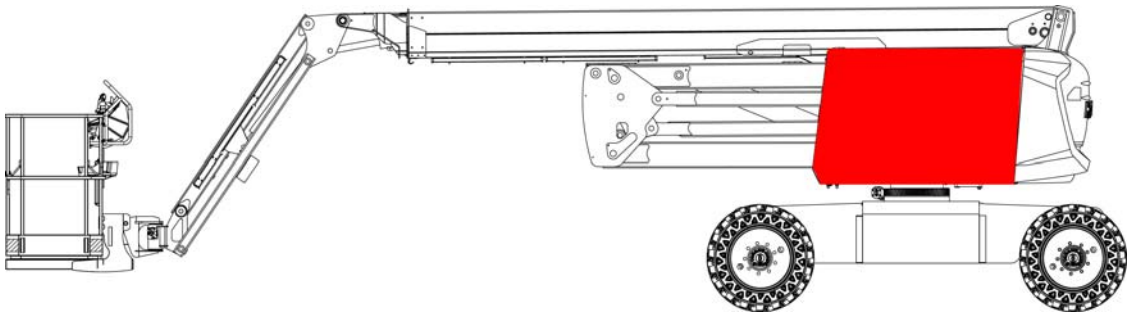
7 - Additional operations

- Clean the work area.

1 - Concerned machines

- HA26 RTJ O - HA26 RTJ O SW - HA26 RTJ PRO - HA26 RTJ PRO SW - HA80 RTJ O - HA80 RTJ PRO

2 - Concerned area



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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.**

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 • Personal protective equipment • Standard tool kit • Vacuum pump • Funnel with a pipe of around 1 m / 3 ft 28 in • 140 l / 37 gal canister for hydraulic oil collection • Oil collection pan • Rags • Hand pump • 140 L / 37 gals tank		• Place barriers around the perimeter of the work area
	1 person		

6 - Consumable

Hydraulic oil

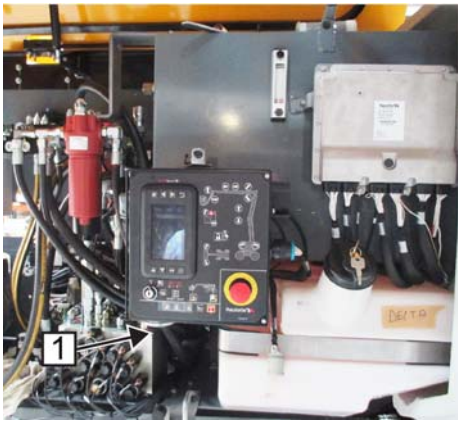
Reference	Part number HAULOTTE®
Can - 5L, Standard oil HV46	4000530620
20L bucket, Standard oil HV46	2420801320
Barrel 209L, Standard oil HV46	2420801310
Barrel 209L, Oil - Winter option	2505002640
Barrel 209L, Organic oil	2820304310

7 - Procedure

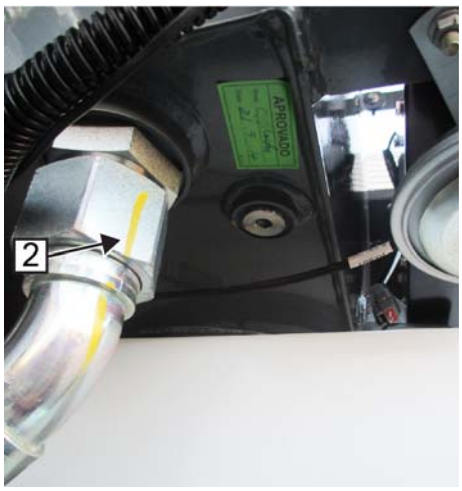
- Position the machine on a flat and firm surface, clear of obstructions (beware of power lines).
- Put the machine in stowed position, boom and arm fully retracted and lowered. Jib is in transportation position and telescope is retracted.

- 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.

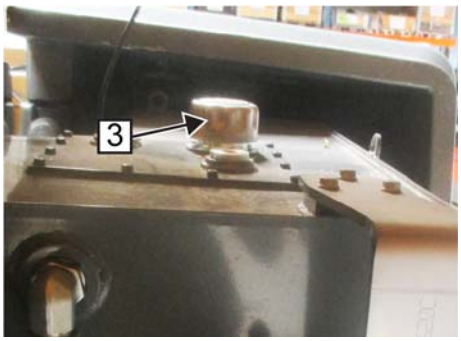
- Place a recipient under the hydraulic oil tank (1).



- 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.

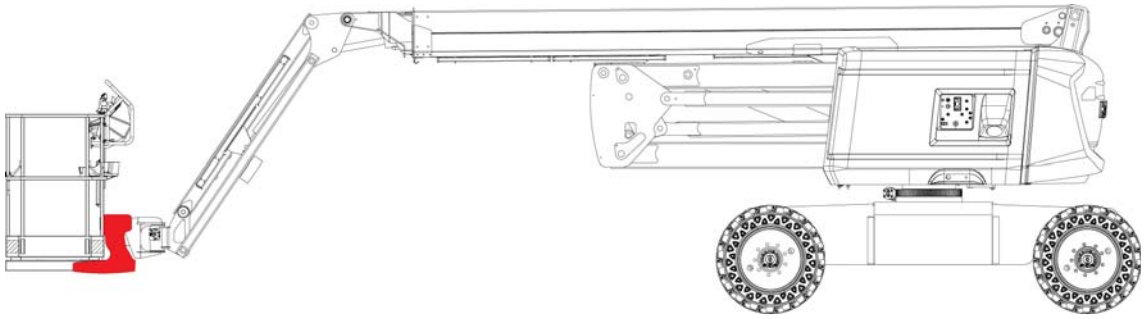
8 - Additional operations

- 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
- 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



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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 wrench • 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.

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
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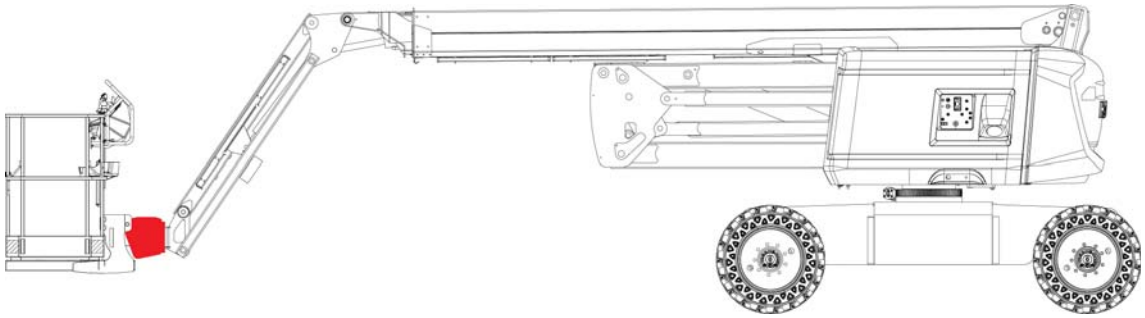
- HT26 RT O - HT26 RT O SW - HT28 RTJ O - HT28 RTJ O SW - HT28 RTJ PRO - HT28 RTJ PRO SW - HT80 RT O - HT85 RTJ O - HT85 RTJ PRO
- HT43 RTJ PRO - HT132 RTJ PRO

2 - Concerned area



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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 wrench • 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.

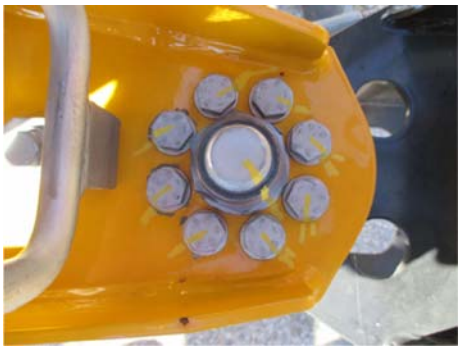
- Switch off the ignition and remove the ignition key.
- Place a do not operate tag at the start/stop switch location to inform personnel that the equipment is being worked on.

- Check the 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.



Notes

1 - Concerned machines

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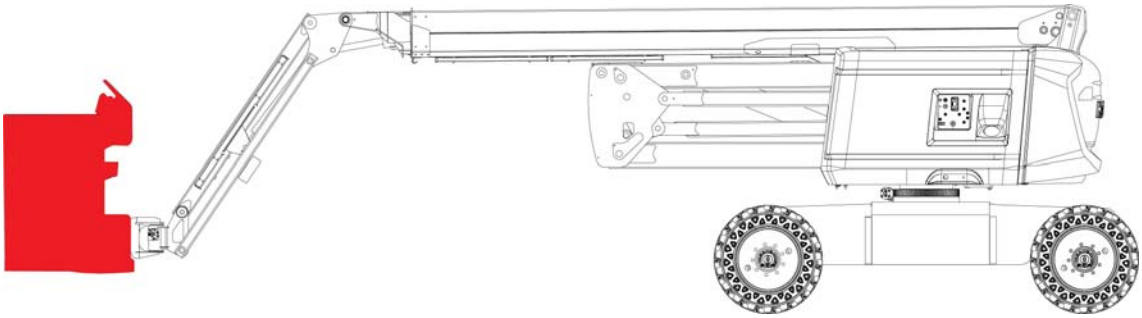
- HT43 RTJ PRO - HT132 RTJ PRO

2 - Concerned area



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4 - Risk prevention

Means of protection to be used when implementing the range

	Appropriate workwear		Gloves
	Safety shoes		

5 - You will need

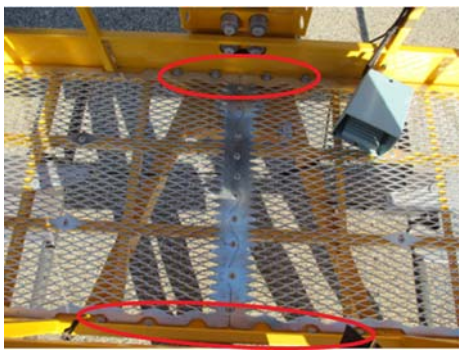
	• "DO NOT OPERATE" tag • Personal protective equipment • Standard tool kit		• Place barriers around the perimeter of the work area
	1 person		

6 - Procedure

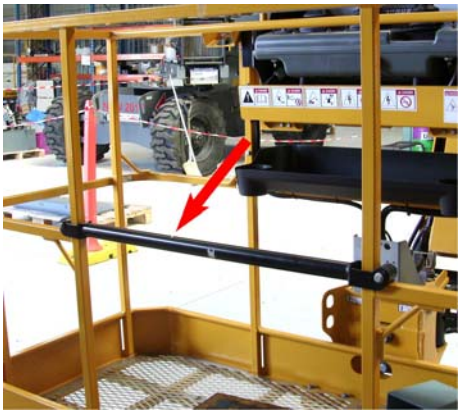
- Position the machine on a flat and firm surface, clear of obstructions (beware of power lines).
- Put the machine in stowed position, boom and arm fully retracted and lowered.
- Switch off the ignition and remove the ignition key.
- Place a do not operate tag at the start/stop switch location to inform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

- Check the platform floor is mounted.

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



- Check the platform access rail or gate.



Notes

1 - Concerned machines

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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 • Magnetic piston comparator		• Place barriers around the perimeter of the work area
	1 person		

5 - Procedure

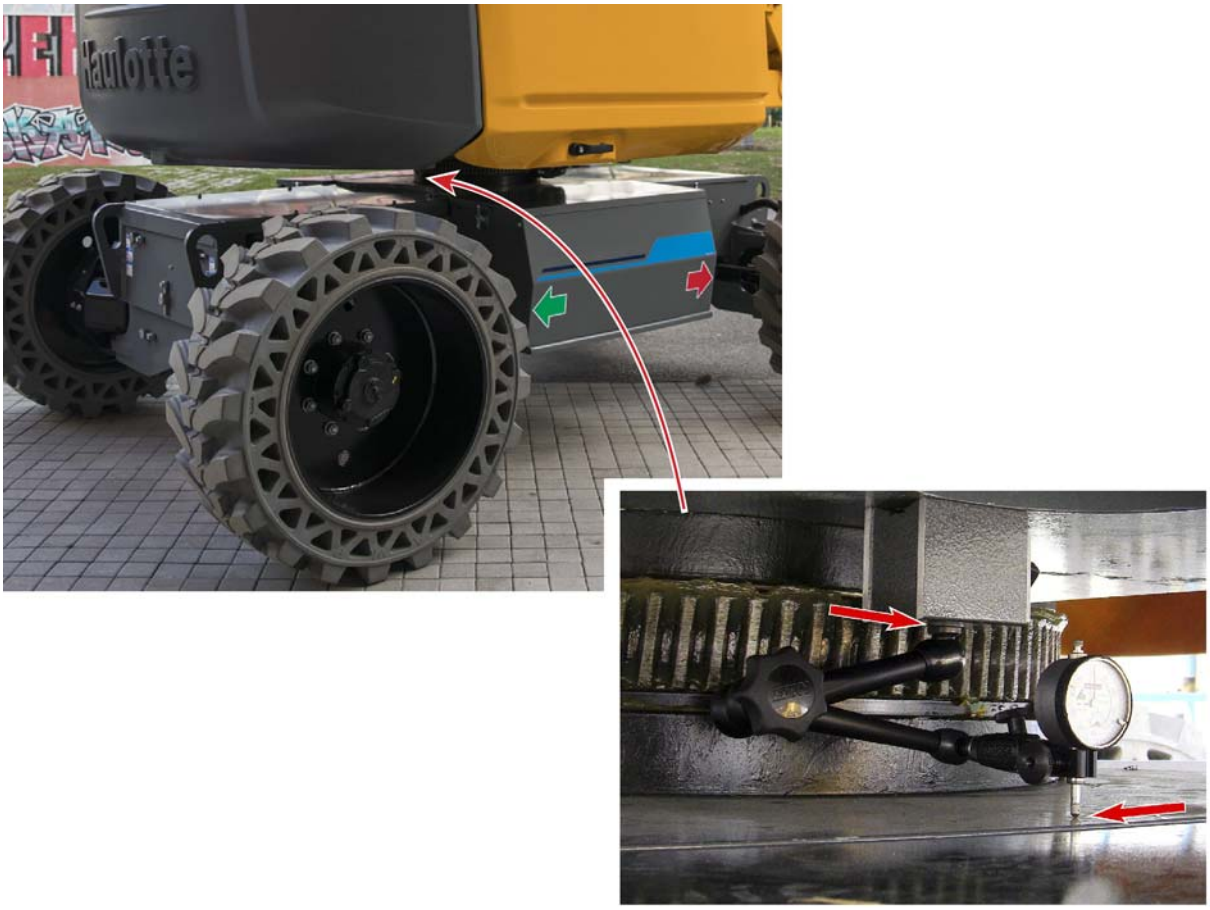
- Position the machine on a flat and firm surface, clear of obstructions (beware of power lines).

Put the machine into the following configuration :

- No load in the platform.
- Boom raised as far as possible.
- Telescope retracted.
- Jib lifted as far as possible.
- Boom aligned.

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

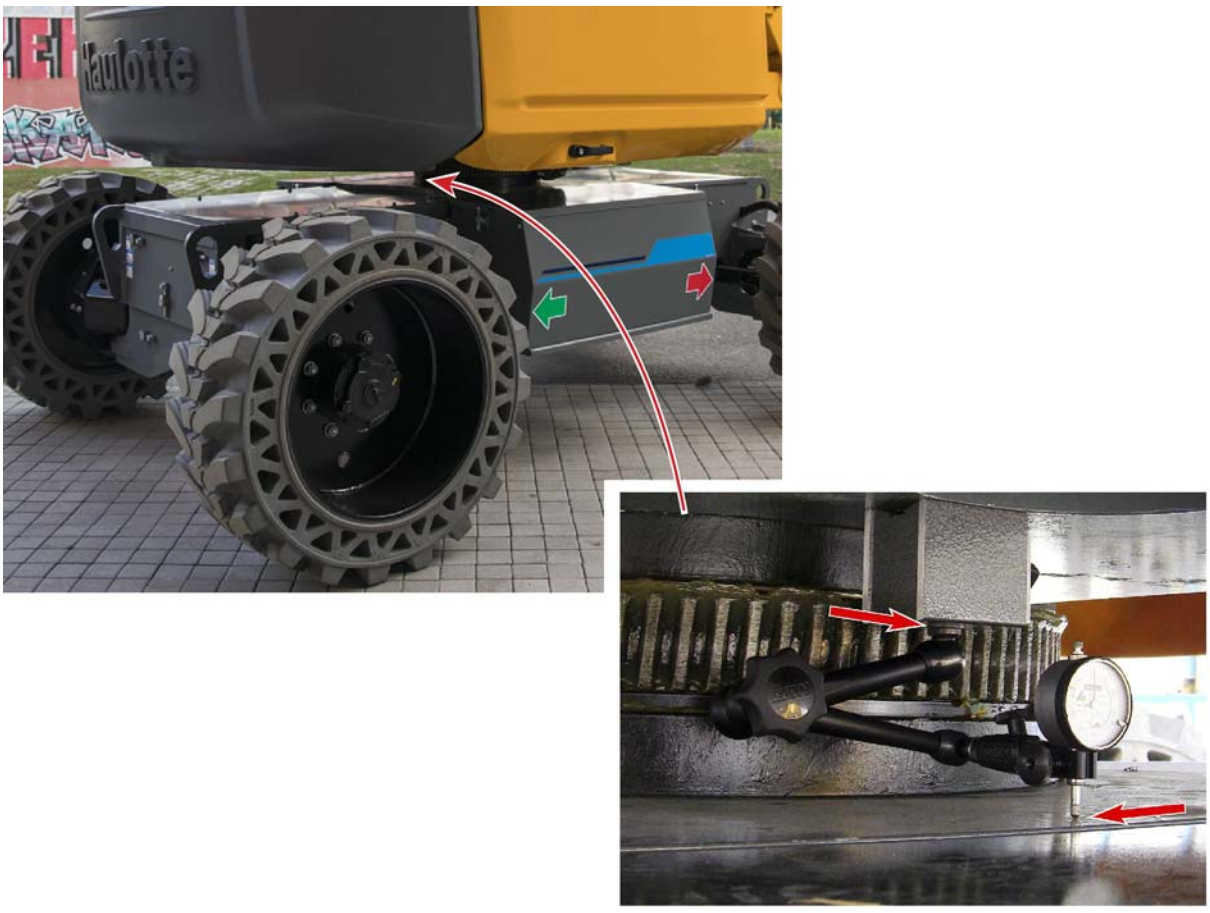
- Using the magnetic comparator, read the clearance (J1) between the chassis and the turntable.



Put the machine into the following configuration :

- Lower the arm to the lowest point.
- Jib platform assembly :
- Extend the telescope as far as possible.
- Boom aligned.

- Using the magnetic comparator, read the clearance (J2) between the chassis and the turntable.



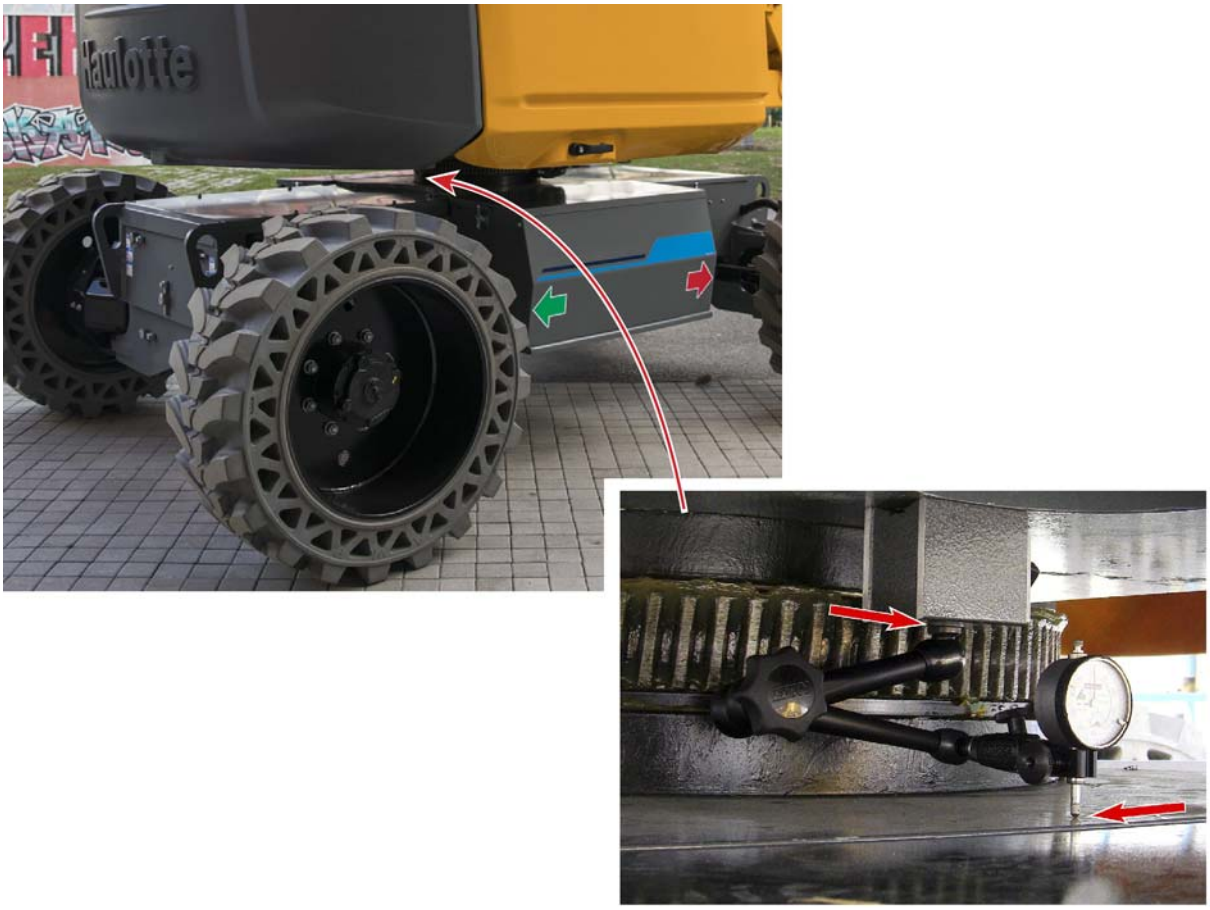
The clearance between (J1) and (J2) must be less than 2 mm :

- **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 checking the tightness, if the value remains greater than 2 mm, replace the slew ring**

Put the machine into the following configuration :

- No load in the platform.
- Boom raised as far as possible.
- Telescope retracted.
- Jib lifted as far as possible.
- Turret at 90°.

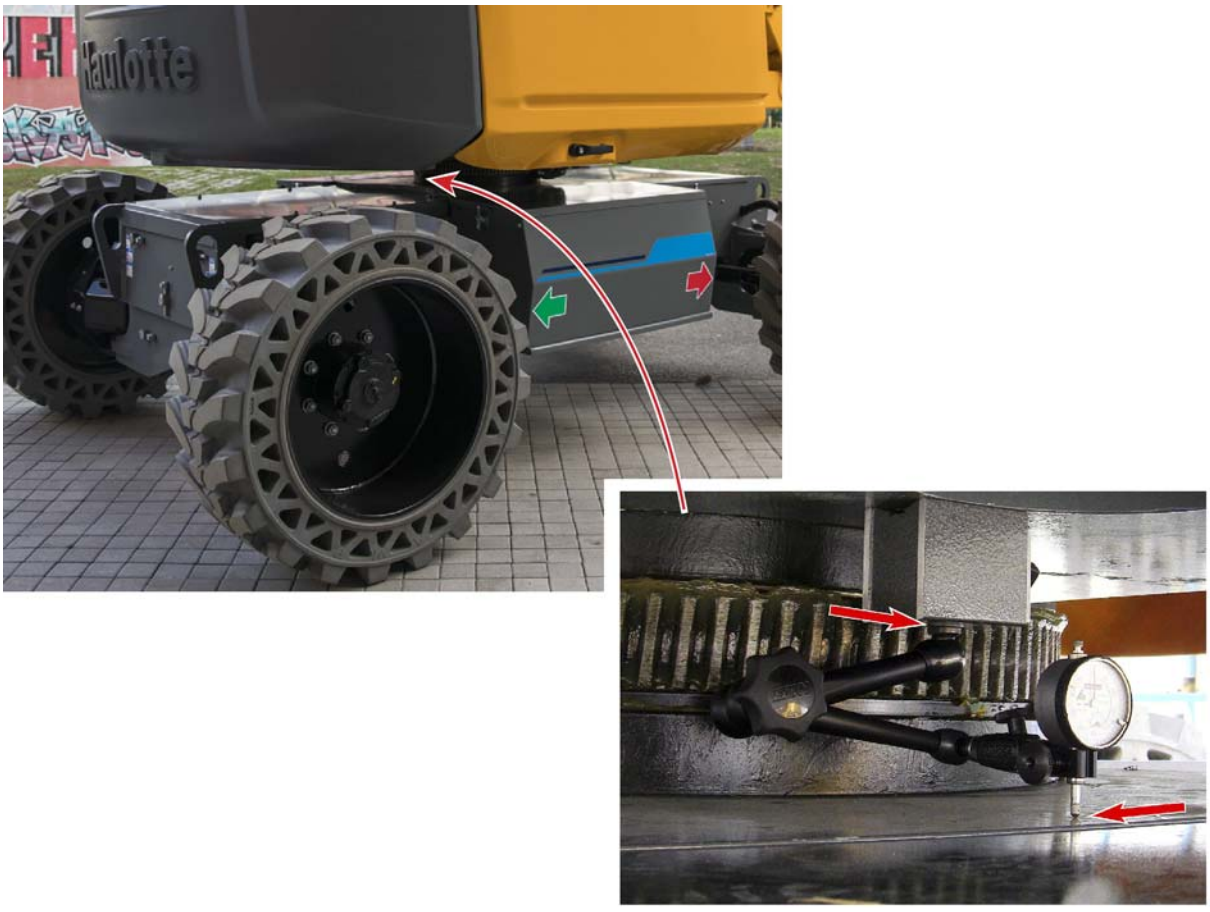
- Using the magnetic comparator, read the clearance (J3) between the chassis and the turntable.



Put the machine into the following configuration :

- Lower the arm to the lowest point.
- Jib platform assembly :
- Extend the telescope as far as possible.
- Turret at 90°.

- Using the magnetic comparator, read the clearance (J4) between the chassis and the turntable.



The clearance between (J3) and (J4) must be less than 2 mm :

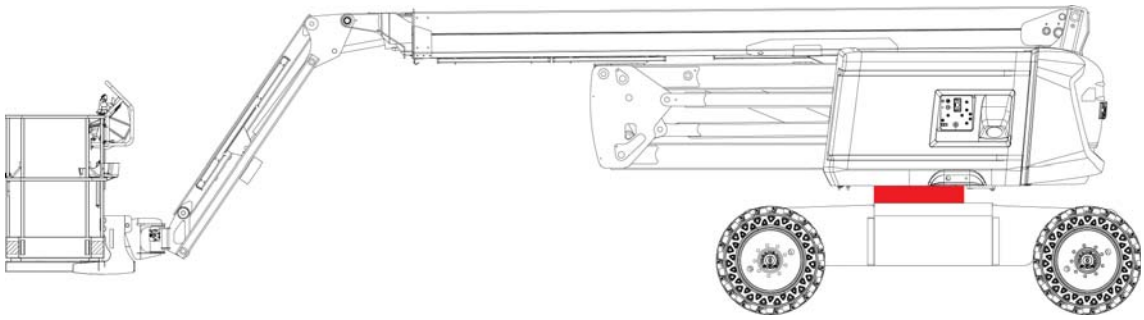
- **If the clearance is greater than this, check that the tightness of the slew ring. Refer to MP0019 - Serrage au couple de la couronne d'orientation.**
- **After checking the tightness, if the value remains greater than 2 mm, replace the slew ring**

Notes

1 - Concerned machines

- HA26 RTJ O - HA26 RTJ O SW - HA26 RTJ PRO - HA26 RTJ PRO SW - HA80 RTJ O - HA80 RTJ PRO

2 - Concerned area



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4 - Risk prevention

Means of protection to be used when implementing the range

	Appropriate workwear		Gloves
	Safety shoes		

5 - You will need

	• Voltage absence tester • "DO NOT OPERATE" tag • Handling equipment • Standard tool kit • Hose clamps • Torque wrench		• 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). Mark out the work area
- Lift the arm to access the ring's screw.
- 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 18 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 support and under the hoses, check the tightening using a flat spanner.

Notes

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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

	• Standard tool kit • Provide a container sufficient for the contents of the tank • Rags • "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.
- 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.
- Open the cover on the control box-side.
- Place a container under the diesel fuel tank.

- Unscrew the drain plug from the diesel fuel tank.
- 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.

Notes

1 - Concerned machines

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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.

• 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

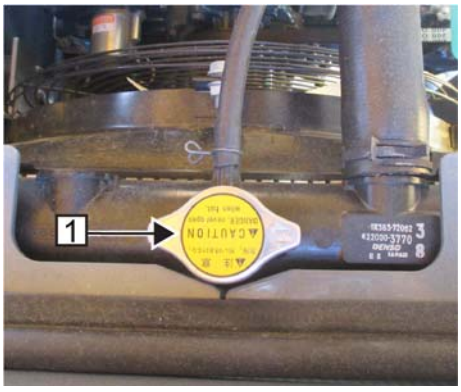
5 - Procedure

- 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.

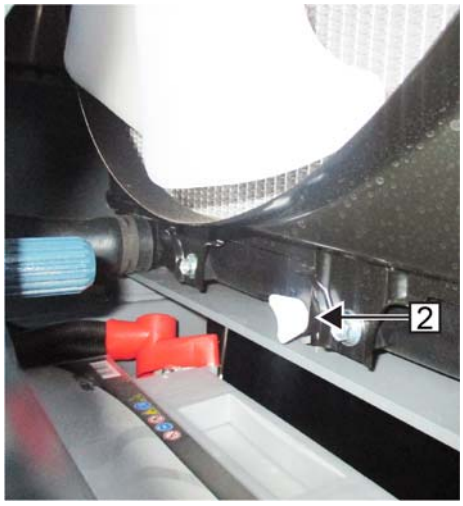
N.B.-:-GENTLY UNSCREW THE RADIATOR PLUG TO RELEASE THE PRESSURE.



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

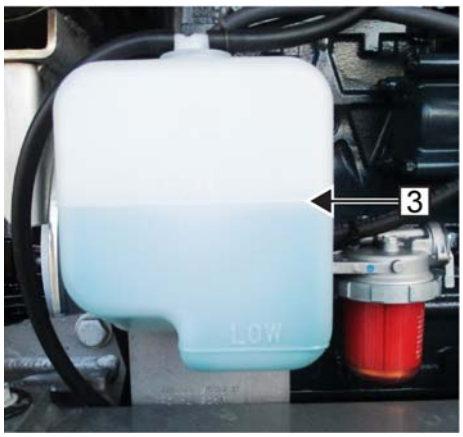
N.B.-:-IT IS ADVISABLE TO PLACE A PIPE BETWEEN THE DRAIN VALVE AND THE COLLECTION TRAY.

- 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%.



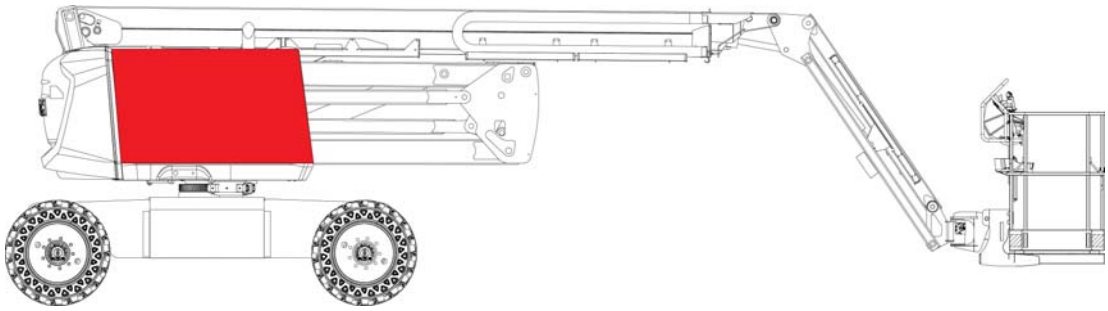
6 - Additional operations

- Clean the work area.

1 - Concerned machines

- HA26 RTJ O - HA26 RTJ O SW - HA26 RTJ PRO - HA26 RTJ PRO SW - HA80 RTJ O - HA80 RTJ PRO

2 - Concerned area



3 - 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.**
- **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.**

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 • 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

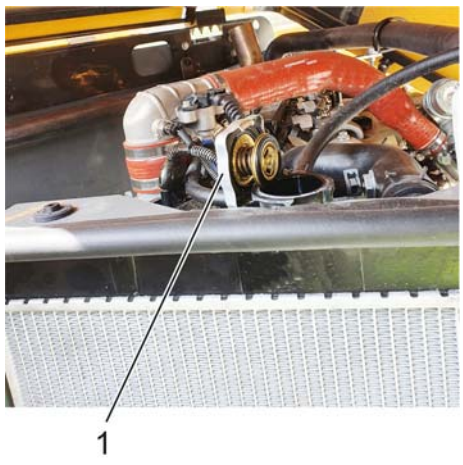
6 - Procedure

- 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.
- 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.



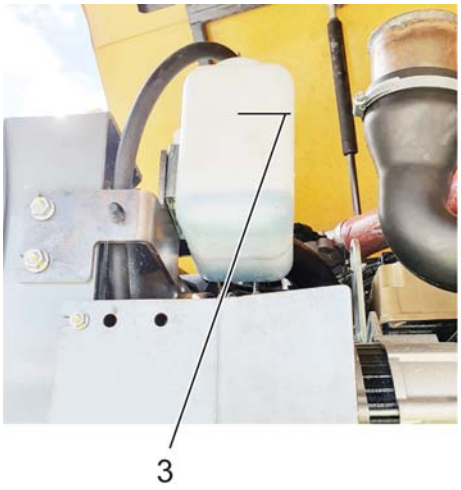
- Position the collection tray. Open the drain valve (2).

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%.



7 - 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

• 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.

• 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		

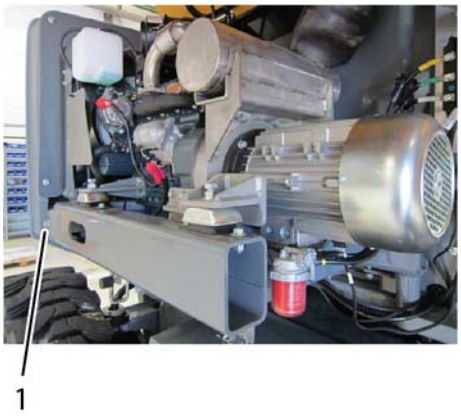
4 - You will need

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

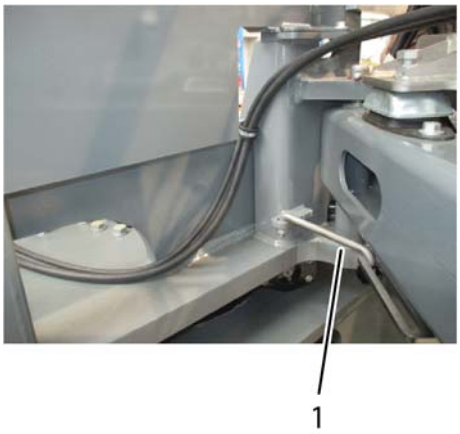
5 - Procedure

- 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).



- 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

1 - Concerned machines

- HA26 RTJ O - HA26 RTJ O SW - HA26 RTJ PRO - HA26 RTJ PRO SW - HA80 RTJ O - HA80 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 • 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).

- 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.

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
- HT16 RTJ O - HT16 RTJ PRO - HT46 RTJ O - HT46 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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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

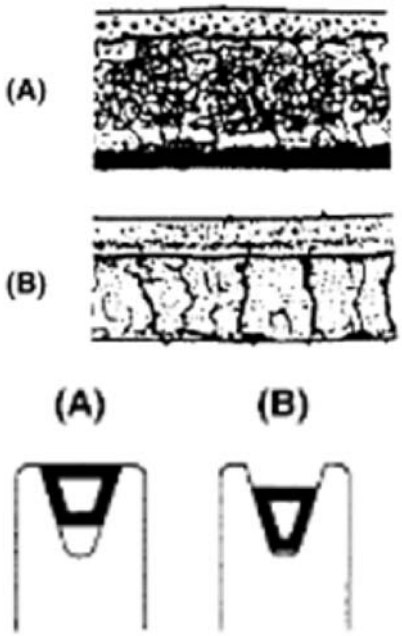
- Position the machine on a flat and firm surface, clear of obstructions (beware of power lines).
- Put the machine in stowed position, boom and arm fully retracted and lowered.

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.



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
- HT16 RTJ O - HT16 RTJ PRO - HT46 RTJ O - HT46 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		

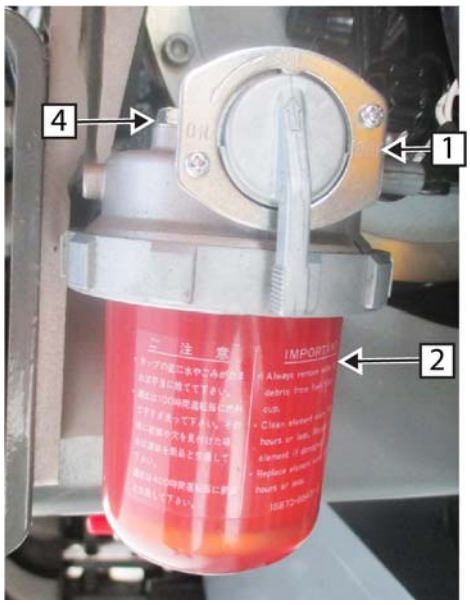
4 - You will need

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

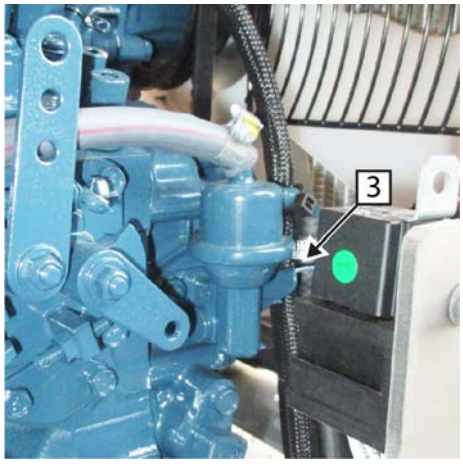
5 - Procedure

- 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

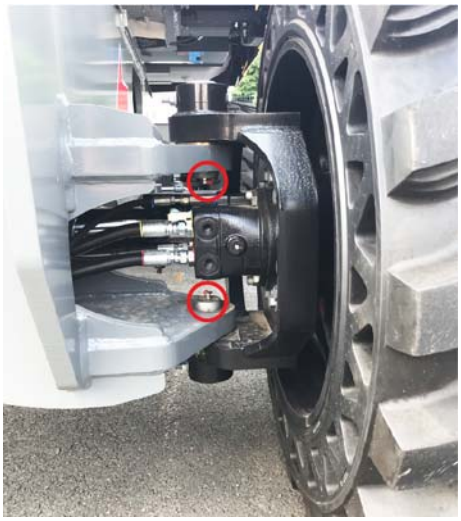
Packaging	Part number HAULOTTE®
Aerosol 0.4L	2820304330
Can 5L	2820304340

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

- HA26 RTJ O - HA26 RTJ O SW - HA26 RTJ PRO - HA26 RTJ PRO SW - HA80 RTJ O - HA80 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 brush		• Place barriers around the perimeter of the work area
	1 person		

5 - Consumable

Teflon grease aerosol

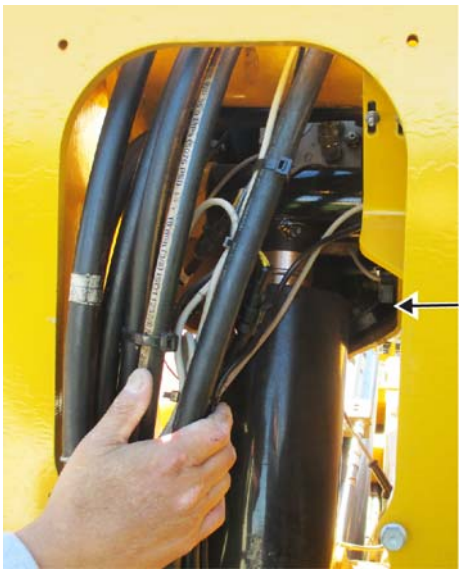
Packaging	Part number HAULOTTE®
Aerosol 400ml	2326005410

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.



1 - Concerned machines

- HA26 RTJ O - HA26 RTJ O SW - HA26 RTJ PRO - HA26 RTJ PRO SW - HA80 RTJ O - HA80 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.

1 - Concerned machines

- 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

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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		

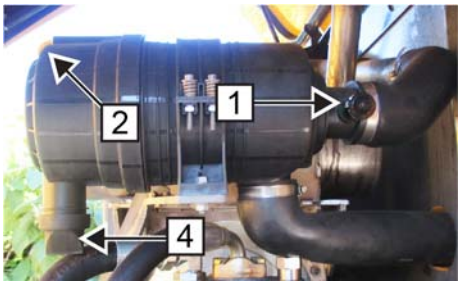
4 - You will need

	• Personal protective equipment • Standard tool kit • Air compressor		• Place barriers around the perimeter of the work area
	1 person		

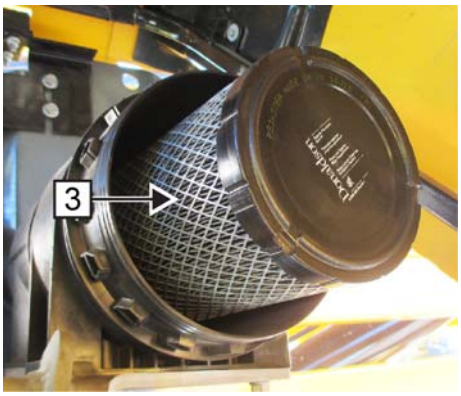
5 - Procedure

- 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.
- Mark out the work area (barriers, cones, marking tape).
- Restrict access to the area (restricted access sign).

- 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 (4).
- Pull the pin (2) and swivel the cap to remove it.



- Remove the main element (3).
- Blow the inside of the main element (3) 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 (3). Close the cover again using the pin (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
- HT16 RTJ O - HT16 RTJ PRO - HT46 RTJ O - HT46 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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- **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

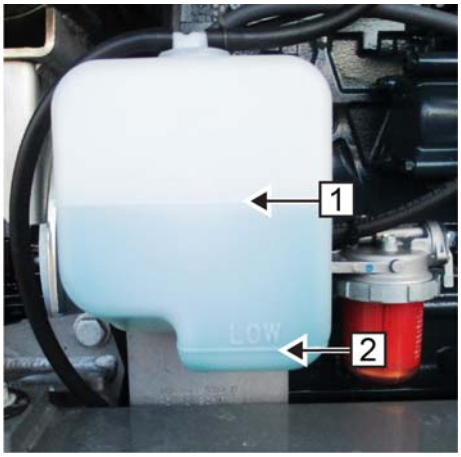
	• Personal protective equipment • Standard tool kit • "DO NOT OPERATE" tag • Coolant -37°, Can 25L - 4000564860		• Place barriers around the perimeter of the work area
	1 person		

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

- HA16RTJ - HA16RTJO - HA16RTJ PRO - HA46RTJO - HA46RTJ 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
- HT16 RTJ O - HT16 RTJ PRO - HT46 RTJ O - HT46 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		

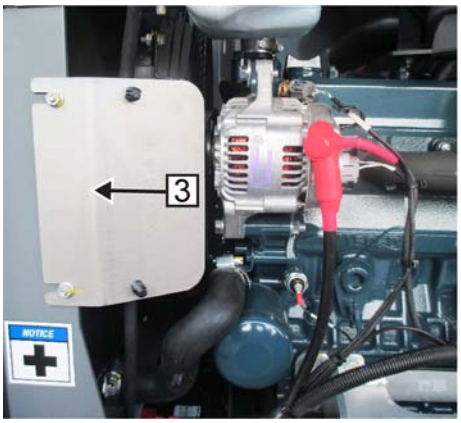
4 - You will need

	• Personal protective equipment • Standard tool kit • "DO NOT OPERATE" tag • Belt 4000210820		• Place barriers around the perimeter of the work area
	1 person		

5 - Procedure

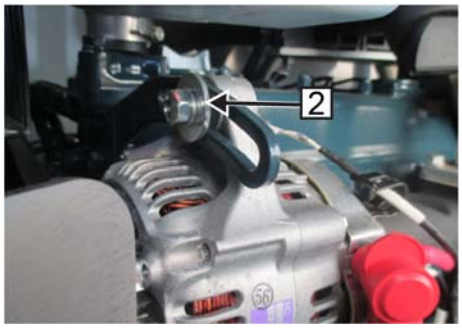
- Position the machine on a flat and firm surface, clear of obstructions (beware of power lines).
- Put the machine in stowed position, boom and arm fully retracted and lowered.

Do not start the engine and disconnect the battery.

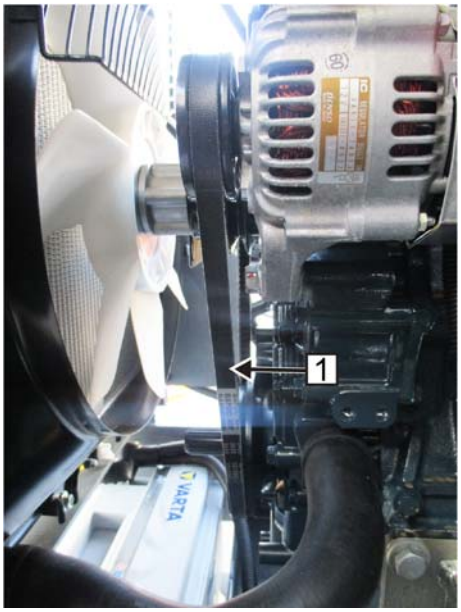


- Remove the protective cover if there is not sufficient access (3).

- 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 7 mm and 9 mm.
- 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.



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
- HT16 RTJ O - HT16 RTJ PRO - HT46 RTJ O - HT46 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 • Oil collection pan		• Place barriers around the perimeter of the work area
	1 person		

5 - Consumables

Engine oil 15W40

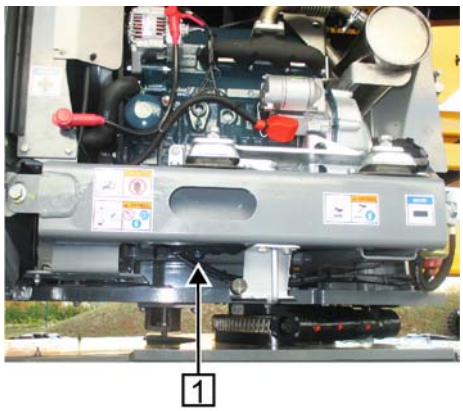
Packaging	Part number HAULOTTE®
Can 5L	4000530600
20L bucket	2420801360
Barrel 209L	2820305720

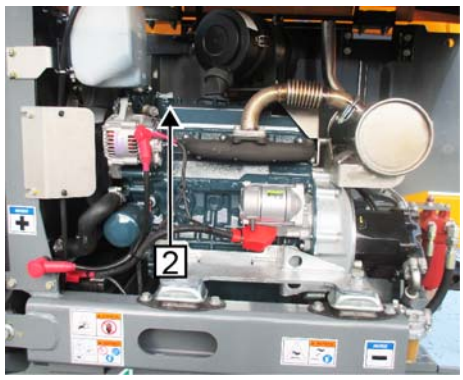
6 - Procedure

- 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.

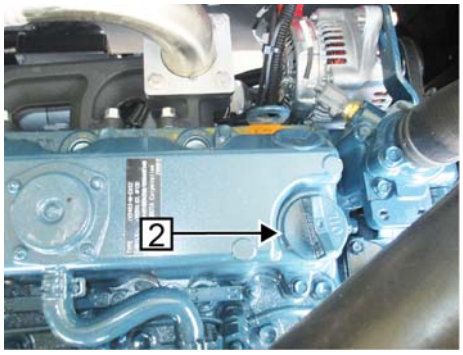
- Place a container under the engine.
- Remove the drain plug (1) under the engine and leave the oil to drain out completely.
- Refit and tighten the drain out (1).

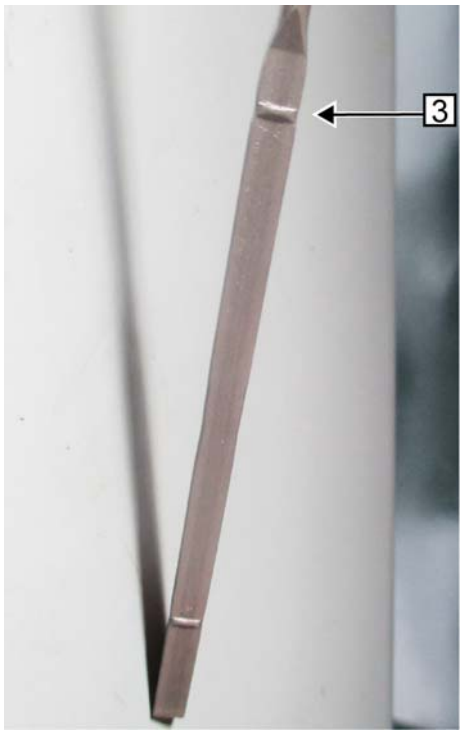




- Open the cap (2) and fill the engine with new oil until it reaches the upper mark of the gauge (3).

Do not touch the hot parts of the engine.



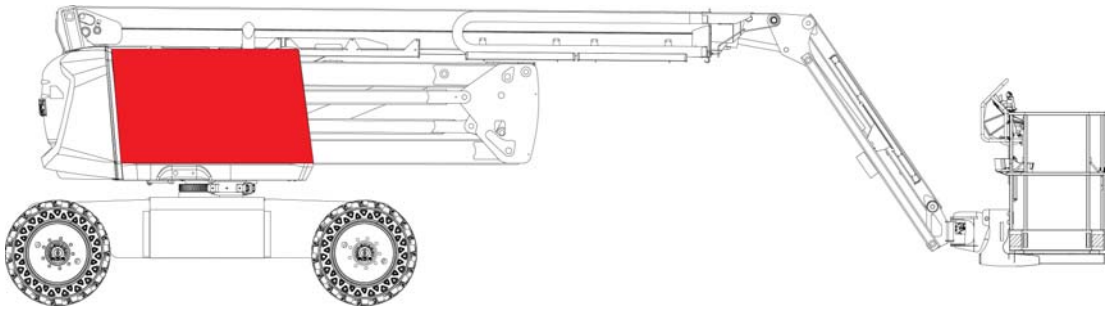


Notes

1 - Concerned machines

- HA26 RTJ O - HA26 RTJ O SW - HA26 RTJ PRO - HA26 RTJ PRO SW - HA80 RTJ O - HA80 RTJ PRO

2 - Concerned area



3 - Warning

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

4 - Risk prevention

Means of protection to be used when implementing the range

	Appropriate workwear		Gloves
	Safety shoes		

5 - 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		

6 - Consumables

Engine oil 15W40

Packaging	Part number HAULOTTE®
Can 5L	4000530600
20L bucket	2420801360
Barrel 209L	2820305720

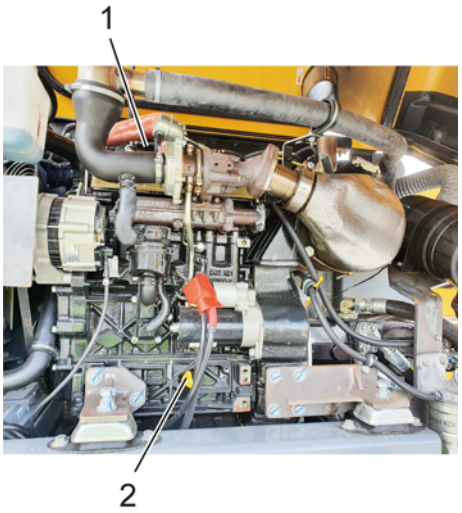
7 - Procedure

- 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.

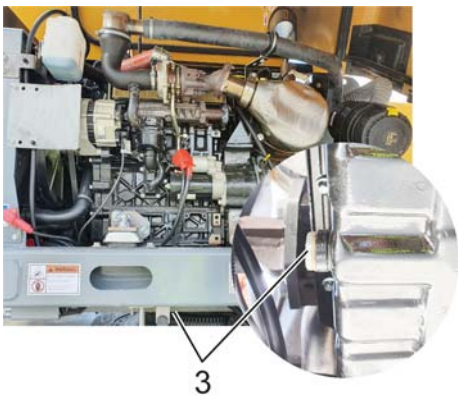
Shut off the engine before draining the engine oil.

- Remove the oil filling cap (1).
- Remove the gauge (2).



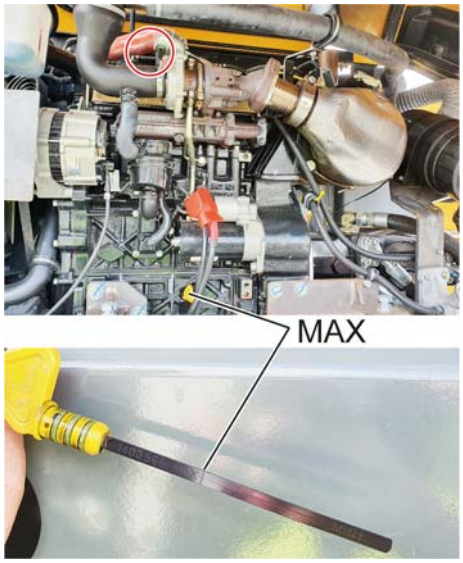
- Place a container under the engine.
- Remove the drain plug (3) under the engine and leave the oil to drain out completely.
- Refit and tighten the drain out (3).

N.B.-:-REPLACE THE JOINT(S).



- Fill the engine with oil up to the dipstick level.

Do not touch the hot parts of the engine.



Notes

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
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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 • Grease pump		• Place barriers around the perimeter of the work area
	1 person		

5 - Consumables

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 the greasers located under the basket rotation cylinder pin.
- There is enough grease when you can see grease running from the axle.

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
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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

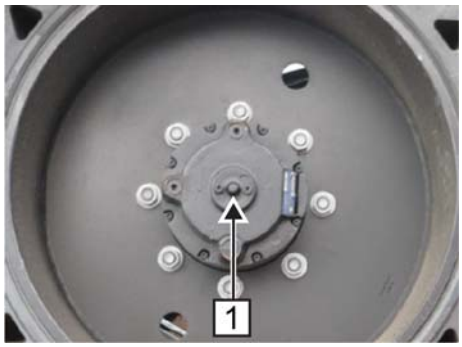
6 - Procedure

- 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.

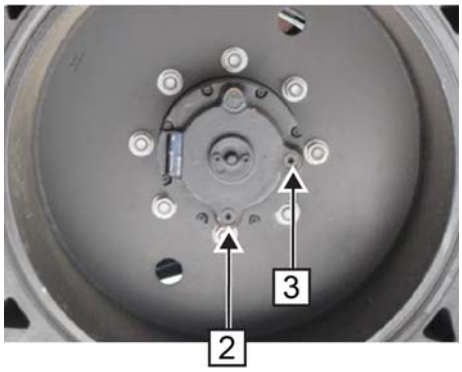
You have a means of lifting the machine :

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

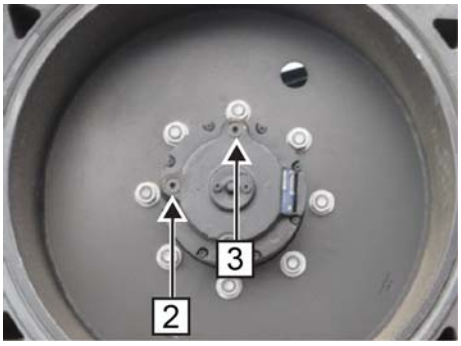
- Disconnect the gear system :
- Loosen the 2 screws from the central plate and turn it over to disengage the reduction gear (1).



- 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.

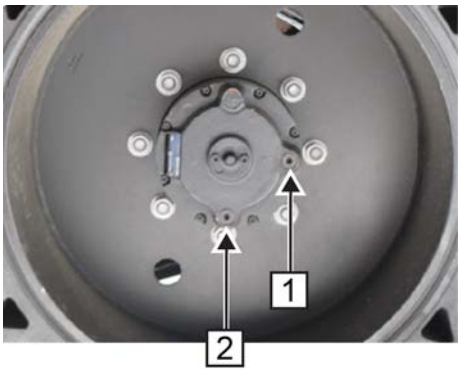


- Manually turn the wheel to position the filler cap to the top of the vertical axis (3).
- Add the oil via the hole (3) using a syringe until the oil flows from the hole (2).
- Quantity 1.1L.
- Retighten the 2 central plate screws ; Close the caps and wipe up any oil that has spilled on the floor.

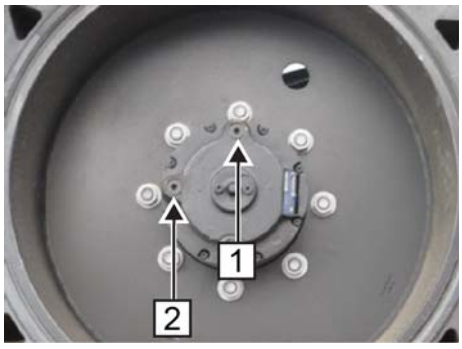


You do not have the means to lift the machine :

- 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

1 - Concerned machines

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- 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
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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		Safety goggles

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

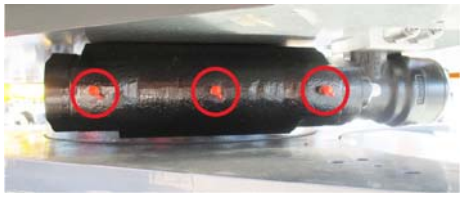
Extreme-pressure lithium grease

Packaging	Part number HAULOTTE®
Extreme-pressure lithium grease	2820304320

6 - Procedure

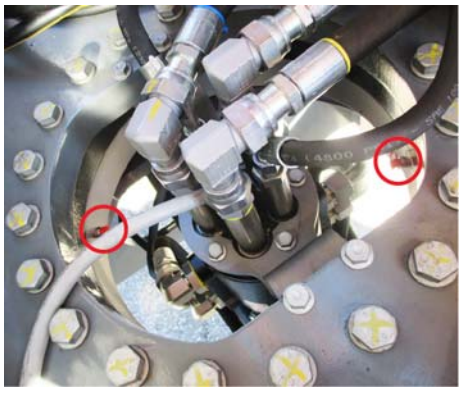
- Position the machine on a flat and firm surface, clear of obstructions (beware of power lines).
- Put the machine in stowed position, boom and arm fully retracted and lowered.

- Place the grease pump on each of the 3 greasers located on the worm screw system :
- Lead-free grease.



- Place the grease pump on each of the 2 greasers located inside the slew ring :
- Lead-free grease.

Lift the arm in order to access the 2 greasers.



- 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

1.4 - FAILURES LIST

1.4.1 - List of failures per category

Failures	N	Dec	Description
Contactors			
F02.02 **Emergency Pump Contactor** KM120	D		Digital output's failure : Emergency pump relay --> KM120=FAIL • Check relay • Check connection to ground • Check connection to U106 ECU
F02.04 **Power Contactor** KMP	D		Incoherence between the emergency stop status and the presence of voltage on power line --> =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) • Check emergency stops • Check relay KMP • Check fuses • Check wiring
F02.05 **Heating Relay** KM160	D		Digital output's failure : Preheating relay and engine is not Tier IV --> KM160=FAIL & CFG[Engine]=TierIII • Check relay • Check connection to ground • Check connection to U106 ECU

Failures	N	Dec	Description
Relays			
F03.06 **Horn Relay** KA9	D		Digital output's failure : Horn relay --> KA9=FAIL • Check relay • Check connection to ground • Check connection to U106 ECU
F03.08 **Start Relay** KA4	D		Digital output's failure : Starter relay --> KA4=FAIL • Check relay • Check connection to ground • Check connection to U106 ECU
F03.09 **Supply/KeySwitch Rel** KA3	D		Digital output's failure : Engine supply relay --> KA3=FAIL • Check relay • Check connection to ground • Check connection to U106 ECU
F03.11 **Generator Relay** KA2	D		Digital output's failure : Generator relay failure while generator on (And failure is not low current) --> =FAIL & SETP[Generator] = ON • Check relay • Check connection to ground • Check connection to U106 ECU
F03.13 **Fuel/Gazoline relay** KA140	D		Digital output's failure : Fuel selector relay --> KA140=FAIL & CFG[Engine] = WG2503-GL • Check relay • Check connection to ground • Check connection to U106 ECU

E - Trouble shooting and diagram

Failures	N	Dec	Description
Electrovalves			
For each failure, check the internal code. For failures about digital electro valves controlled by the U104 ECU (platform slave ECU) : • The detected failures are "open circuit" or "short circuit", check the harness between the ECU and the hydraulic block controlling the movement, check the valves. For failures about proportional or digital electro valves controlled by U106 ECU (turret master ECU) : • The detected failures are open circuit (OC), short-circuit to VBAT (SC+) , short-circuit to GROUND (SC-), low current (LC) and power supply error (PSE) • First check the type of failure by reading the status of the output in the menu "INPUTS-OUTPUTS => DIGITAL OUTPUTS / ANALOGUE OUTPUTS". If OC/SC+/SC-/LC : • check harness, check there is no misconnection between signal and ground supply or power supply. If PSE : • Check the supplies are well connected : 12VD1 (1B.18), 12VD2 (2A.08), 12VD3 (2B.02), 12VD4 (3A.01), 12VF1 (1B.32), 12VF2 (2A.07), 12VF4 (3A.07). Failures are acknowledged if : • Movement set point corresponding to the failing electro valve is neutral. • AND movement control corresponding to the failing electro valve is neutral. • AND electrovalve failure state corresponds to the "no failure" flag (generally state =OK, or for safety electrovalve state =OC)			
F04.01 **Steering** YV901/YV150L/ YV150R	D	1	Proportional output's failure : Steering movement --> YV902=FAIL
		2	Digital output's failure : Left steering movement --> YV150L=FAIL
		4	Digital output's failure : Right steering movement --> YV150R=FAIL
F04.02 **Platform level** YV900/YV720U/ YV720D	D	1	Proportional output's failure : Basket level movement --> YV900=FAIL
		2	Digital output's failure : Platform level raise movement --> YV720U=FAIL
		4	Digital output's failure : Platform level descent movement --> YV720D=FAIL
F04.03 **Turret rotation** YV250/YV250L/ YV250R	D	1	Proportional output's failure : Turntable rotate movement speed --> YV250=FAIL
		2	Digital output's failure : Leftwards turntable rotate movement --> YV250L=FAIL
		4	Digital output's failure : Rightwards turntable rotate movement --> YV250R=FAIL
F04.04 **Arm** YV420/YV420U/ YV420D	D	1	Proportional output's failure : Boom movement --> YV420 = FAIL
		2	Digital output's failure : Upwards boom movement --> YV420U = FAIL
		4	Digital output's failure : Downwards boom movement --> YV420D = FAIL

Failures	N	Dec	Description
Electrovalves			
F04.05 **Boom** YV520/YV520U/ YV520D/YV802/GND6	D	1	Proportional output's failure : Boom movement speed --> YV520 = FAIL
		2	Digital output's failure : Upwards boom movement --> YV520U=FAIL
		4	Digital output's failure : Downwards boom movement --> YV520D=FAIL
		8	Digital output's failure : Safety boom descent movement --> YV802=FAIL • Normal state of YV802 output when boom control is neutral is "open-circuit" • Normal state of YV802 output when boom control is neutral is "OK" • When state is different from these defined states, YV802 output is seen as failing ; The failure is then acknowledged when state is "Open-circuit" with neutral set point and neutral control
		16	Digital output's failure : Safety ground boom movement --> GND6=FAIL • Normal state of GND6 output when boom control is neutral is "open-circuit" • Normal state of GND6 output when boom control is neutral is "OK" • When state is different from these defined states, GND6 output is seen as failing ; The failure is then acknowledged when state is "Open-circuit" with neutral set point and neutral control
F04.06 **Boom Telescope** YV530/YV530O/ YV530OI/YV801/GND6	D	1	Proportional output's failure : Telescope movement speed --> YV530=FAIL
		2	Digital output's failure : Outwards telescope movement --> YV530O=FAIL
		4	Digital output's failure : Inwards telescope movement --> YV530OI=FAIL
		8	Digital output's failure : Safety telescope extend movement --> YV801=FAIL • Normal state of YV801 output when boom control is neutral is "open-circuit" • Normal state of YV801 output when boom control is neutral is "OK" • When state is different from these defined states, YV801 output is seen as failing ; The failure is then acknowledged when state is "Open-circuit" with neutral set point and neutral control
		16	Digital output's failure : Safety ground boom movement --> GND6=FAIL • Normal state of GND6 output when boom control is neutral is "open-circuit" • Normal state of GND6 output when boom control is neutral is "OK" • When state is different from these defined states, GND6 output is seen as failing ; The failure is then acknowledged when state is "Open-circuit" with neutral set point and neutral control
F04.07 **Jib** YV900/YV620U/ YV620D	D	1	Proportional output's failure : Upper movements --> YV900=FAIL
		2	Digital output's failure : Jib raise movement --> YV620U=FAIL
		8	Digital output's failure : Jib descent movement --> YV620D=FAIL
F04.08 **Platform Rotation** YV901/YV750L/ YV750R	D	1	Proportional output's failure : Platform rotation movement --> YV901=FAIL
		2	Digital output's failure : Platform rotation left movement --> YV750L=FAIL
		4	Digital output's failure : Platform rotation right movement --> YV750R=FAIL

Failures	N	Dec	Description
Electrovalves			
F04.10 **Drive** YV160F/YV160B	D	1	Proportional output's failure : Drive movement, forward direction --> YV160F=FAIL
		2	Proportional output's failure : Drive movement, reverse direction --> YV160B=FAIL
F04.11 **Principal movements** YV800	D	1	Digital output's failure : LS valve (HSD) --> YV800=FAIL • Normal state of YV800 output when boom control is neutral is "open-circuit" • Normal state of YV800 output when boom control is neutral is "OK" • When state is different from these defined states, YV800 output is seen as failing ; The failure is then acknowledged when state is "Open-circuit" with neutral set point and neutral control
		2	Digital output's failure : LS valve ground supply (LSD) --> GND1=FAIL • Normal state of GND1 output when boom control is neutral is "open-circuit" • Normal state of GND1 output when boom control is neutral is "OK" • When state is different from these defined states, GND1 output is seen as failing ; The failure is then acknowledged when state is "Open-circuit" with neutral set point and neutral control
F04.20 **Drive Speed** YV110	D		Digital output's failure : YV110 valve --> YV110=FAIL
F04.21 **Differential locking** YV100	D		Digital output's failure : YV100 valve --> YV100=FAIL
F04.33 **Steering mode** YV107/YV108	D	1	Digital output's failure : Steering mode with 4 wheels steering option activated --> YV107=FAIL & VAR[4WSEnable]
		2	Digital output's failure : Steering mode with 4 wheels steering option activated --> YV108=FAIL & VAR[4WSEnable]
F04.34 **Front Axle Unlocking** YV101/YV104	D	1	Digital output's failure : Oscillating axle unlocking --> YV101=FAIL
		2	Digital output's failure : Oscillating axle unlocking --> YV104=FAIL
F04.35 **Brake Releasing** YV102/YV105	D	1	Digital output's failure : Brake releasing --> YV102=FAIL
		2	Digital output's failure : Brake releasing --> YV105=FAIL

Failures	N	Dec	Description
Joysticks			
The following joysticks' failures are relevant if failure F08.05 is not active (failure of 5 V supplying signal). First check the 5 V supplying the joysticks, then the harness between ECU and joysticks			
F05.01 **Drive Joystick** SM902Y	D	1	Drive joystick failure : Out of range [0.2..4.8] V --> SM902Y<0.20V I SM902Y>4.80V
		2	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
F05.02 **Arm Joystick** SM901Y	D	1	Arm joystick failure : Out of range [0.2..4.8] V --> SM901Y<0.20V I SM901Y>4.80V
		2	Arm joystick failure : Analogue signal and out of neutral incoherence --> SM901N = 1 & 2.45V<SM901Y<2.55V --> Or SM901N=0 & (SM901Y<2.00V I SM901Y>3.00V)
F05.04 **Boom Joystick** SM900Y	D	1	Boom joystick failure : Out of range [0.2..4.8] V --> SM900Y<0.20V I SM900Y>4.80V
		2	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 I SM900Y>3.00V) & (SM900X<2.00V I SM900X>3.00V)
F05.05 **Turntable Joystick** SM900X	D	1	Turret rotation joystick failure : Out of range [0.2..4.8] V --> SM900X<0.20V I SM900X>4.80V
		2	Turret rotation joystick failure : Analogue signal and out of neutral incoherence 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 I SM900Y>3.00V) & (SM900X<2.00V I SM900X>3.00V)
F05.11 **Joystick neutral** SM902Y	A		No detection of joystick's neutral position at machine's power-on --> SM902Y<2.35V I SM902Y>2.65V Release joystick / Check joystick
F05.12 **Joystick neutral 2** SM901Y	A		No detection of joystick's neutral position at machine's power-on --> SM901Y<2.35V I SM901Y>2.65V Release joystick / Check joystick
F05.13 **Joystick neutral 3** SM900X/Y	A		No detection of joystick's neutral position at machine's power-on --> SM900X<2.35V I SM900X>2.65V I SM900Y<2.35V I SM900Y>2.65V Release joystick / Check joystick

Failures	N	Dec	Description
Load management system			
F06.01 **No Loading Cal** Calibrate	A		No overload calibration, do/redo overload calibration --> VAR[GaugesNotCalibrated] = 1 Complete calibration
F06.03 **Gauges out of Range** SP800/SP801	D	1	Gauges out of range (load management system activated) --> SP800 Not in [1500; 20500]µA --> VAR[GaugesOutOfRange] = 1 Check SP800 connections to ground, to U104 ECU analogue inputs
		2	Gauges out of range (load management system activated) --> SP801 Not in [1500; 20500]µA --> VAR[GaugesOutOfRange] = 1 Check SP801 connections to ground, to U104 ECU analogue inputs
F06.04 **Incoh Gauges** SP800/SP801	D		SP800 measured weight and SP801 measured weight are more than 50kg far (and gauges are not out of range and gauges are calibrated) --> VAR[GaugesIncoherent] = 1 Check SP800 and SP801 connections to ground, to U104 ECU analog inputs Redo calibration
F06.05 **Low Power** Gauges supply	D		Low power for strain gauges detected (lower than 8.5V) while engine is not starting and when CAN failure is not active --> 12VBSLAVE < 8.50V
F06.06 **Vibrating wire**			Vibrating string option
F06.07 **Vibrating wire**			Vibrating string option
F06.08 **Vibrating wire**			Vibrating string option
F06.09 **Negative load**	A		Negative load (<-40kg)
		1	Gauge 1 measures negative load below -40kg VAR[WeightSP800] < -40kg
		2	Gauge 2 measures negative load below 40kg VAR[WeightSP801] < -40kg
			1.Check the platform does not lie on an obstacle 2.Check weighing system 3.Check the integrity of the structure

Failures	N	Dec	Description
Sensors			
F07.03 **Boom Angle** SQ520	D	1	Voltage failure of SQ520 sensor --> SQ520 > 6.00V
F07.04 **Boom Angle** SQ521/SQ523	General check on angle position can be done as following : Telescope retracted, boom down Raise the boom to nearly 10deg Raise the boom (nearly 50deg) Raise the boom (nearly 50deg+) Raise the boom (nearly 50deg++) Raise the boom to high end Descent the boom (nearly 50deg++) Descent the boom (nearly 50deg+) Descent the boom (nearly 50deg) Descent the boom (nearly 10deg) Telescope retracted, boom down		
	To erase F07.04 failure: fold the machine completely (boom telescope, then arm and boom), check the position detectors (repair if one is broken), power OFF the machine and then power ON. If failure is still active then one of the six detectors defining the machine position is not in the expected state.		
	D	1	Voltage failure of SQ523 sensor --> SQ523 > 6.00V
		2	Incoherence between boom position sensors : Falling edge on boom high detector out of the allowed zone (boom limit not detected) --> SQ521=↓ & SQ523=OFF
		4	Incoherence between boom position sensors : Raising edge on boom high detector out of the allowed zone (boom limit not detected) --> SQ521=↑ & SQ523=OFF
		8	Incoherence between boom position sensors : Raising edge on limit switch angle sensor during boom descent movement and boom not detected in high position --> SQ523=↑ & SQ521=OFF & CTRL[Boom] = D
		16	Incoherence between boom position sensors : Falling edge on boom zone magnet detector not in allowed zone (limit switch sensor active) during boom descent --> SQ523=↓ & SQ521=ON & CTRL[Boom]= D
		32	Incoherence between boom limit sensor and boom down sensor --> SQ521=ON & SQ520=ON
		64	Incoherence between boom high detector and boom down detector --> SSQ523=ON & SQ520=ON
F07.06 **Arm angle** SQ420/SQ421	D	1	Voltage failure of SQ523 sensor --> SQ421 > 6.00V
		2	Voltage failure of SQ523 sensor --> SQ420 > 6.00V
		4	Incoherence between SQ420 arm high detector and SQ421 arm down detector --> SSQ420=ON & SQ421=ON
		8	Incoherence between SQ420 arm high detector and SQ422 arm down detector --> SQ420=ON & SQ423=ON
F07.10 **Telescope length sensor** SQ530	D		Voltage failure of SQ530 sensor --> SQ530 > 6.00V

E - Trouble shooting and diagram

Failures	N	Dec	Description
Sensors			
F07.11 **Telescope length** SQ533	General check on angle position can be done as following : Telescope retracted, horizontal boom Extend the boom (nearly 1m) Extend the boom (nearly 8m) Extend the boom (nearly 8m+) Extend the boom (nearly 8m++) Extend the boom to high end Retract the boom (nearly 8m++) Retract the boom (nearly 8m+) Retract the boom (nearly 8m) Retract the boom (nearly 1m) Telescope retracted, boom down		
	To erase F07.11 failure: retract the boom telescope then descent arm and boom, check the position detectors (repair if one is broken), power OFF the machine and then power ON If failure is still active then one of the six detectors defining the machine position is not in the expected state		
	D	1	Voltage failure of SQ533 sensor --> SQ523 > 6.00V
		2	Incoherence between telescope position sensors : Falling edge on telescope extended sensor out of the allowed zone (telescope limit not detected) --> SQ533=↓ & SQ532=OFF
		4	Incoherence between telescope position sensors : Raising edge on telescope extended sensor out of the allowed zone (telescope limit not detected) --> SQ533=↓ & SQ532=OFF
		8	Incoherence between telescope position sensors : Raising edge on telescope limit detector not in allowed zone (telescope extended sensor) during telescope extend movement --> SQ533=OFF & SQ532=↑
		16	Incoherence between telescope position sensors : Falling edge on telescope limit detector not in allowed zone (telescope extended sensor) during telescope extend movement --> SQ533=ON & SQ532=↓
		32	Incoherence between telescope limit detector and telescope retracted position detectors -->SQ532=ON & SQ530=ON & SQ531=ON
		64	Incoherence between telescope extended detector and telescope retracted position detectors --> SQ533=OFF & SQ530=ON & SQ531=ON
F07.15 **Compensation pos.** SR721 / SR720	D		Incoherence between basket tilt sensors : SR721/SR720 • Check position sensors with basket tilt = 0° --> SR721=OFF & SR720=0FF • Check position sensors with basket tilt > 10° --> SR721=ON & SR720=OFF • Check position sensors with basket tilt <-10° --> SR721=OFF & SR720=ON
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		Engine is not running and DPLUS signal is active

E - Trouble shooting and diagram

Failures	N	Dec	Description
Sensors			
F07.37 **Drive press. Sensor** SP160F / SP160B	D	1	Drive hydraulic circuit pressure sensor is out of normal operative range --> SP160F < 200mV I SP160F > 4800mV
		2	Drive hydraulic circuit pressure sensor is out of normal operative range --> SP160B < 200mV I SP160F > 4800mV
F07.39 **Fuel level sensor** SL300	D	1	Open circuit on fuel level sensor
		2	Short circuit (to ground) on fuel level sensor
F07.40 **Twilight sensor** SN900	D	1	Open circuit on SN900 twilight sensor
			Short circuit to ground on SN900 twilight sensor

Failures	N	Dec	Description
Supplies			
F08.04 **ECU Input Supply** U104 / U106	D	1	Detected ECU voltage difference : Difference between U106 (SPU) and U104 (basket B2) : 2V for 2s --> 12VB – 12VBSLAVE > 2.00V • Check U100, U104 and U106 supply voltage • Check fuses • Check supply voltage coherence between all ECU (more than 2000 V far during the first 4 seconds after start)
		2	Overvoltage of U106 supply --> 12VB > 17.00V
		3	Overvoltage of U104 supply --> 12VBSLAVE > 17.00V
F08.05 **ECU Output Supply** U106 5V regul	D	1	Failure on regulated 5V output of U106 ECU (SPU 70-66) supplying position sensors --> 5VSUPPLY = FAIL • Check fuses • Check the harness (check short circuit to power supply, to ground supply, open circuit…)
		2	Failure on regulated 5V 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 • Check fuses • Check the harness (check short circuit to power supply, to ground supply, open circuit…)
		4	Failure on regulated 5V output of U104 ECU (basket slave node) supplying the joysticks --> Detected failure on 5V output Switch OFF/ON the machine, check the failure has gone (probable cause: internal failure of the ECU)
F08.07 **Circuit Selector**	D		Incoherence on control box selector SA900 : --> Check contactor output status
F08.08 **Unplugged connector** Connectors/Fuses	D	1	Supplies' input detected as unplugged on connectors : Check the CN1.B connectors for U106 ECU : --> 12VD1<5.00V & 12VF1<5.00V
		2	Supplies' input detected as unplugged on connectors : Check the CN2.A connectors for U106 ECU : --> 12VD2<5.00V & 12VF2<5.00V
		4	Supplies' input detected as unplugged on connectors : Check the CN2.B connectors for U106 ECU : --> 12VD3<5.00V & 12VF3<5.00V
		8	Supplies' input detected as unplugged on connectors : Check the CN3.A connectors for U106 ECU : --> 12VD4<5.00V & 12VF4<5.00V
		16	Supplies' input detected as unplugged on connectors : Check the CN3.B connectors for U106 ECU : --> 12VD5<5.00V

Failures	N	Dec	Description
Engine			
F09.01 **Water temperature** Engine overheat	D		Engine overheat : --> T2s(ST300 & T15s(VAR[Engine] = RUNNING))
F09.02 **Oil pressure** Engine pressure	D		Engine oil pressure --> T6s(SP300 & T15s(VAR[Engine] = RUNNING))
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 **Engine D+** Engine alternator	D		Alternator failure : D+ is OFF while thermal engine is running : CFG[Engine] = TIER3 KUBOTA V2403-M l CFG[Engine] = TIER4 KUBOTA V2403 CR E4B l CFG[Engine] = TIER4 KUBOTA V2403 CR TIE4B l CFG[Engine] = STAGE 5 KUBOTA V2403 CRT E5B DPF Alternator failure : D+ is ON while thermal engine is powered but not running : CFG[Engine] = STAGE 5 KOLHER KDI1903 CT

E - Trouble shooting and diagram

Failures	N	Dec	Description
Functions			
F10.01 **Drive valve 1** YV160F/YV160B	D	1	While driving in micro speed, measured current for YV160F or YV160B proportional electrovalves is too high : --> VAR[MachinePosition] ≠ P1 & YV160F > 900mA
		2	While driving in micro speed, measured current for YV160F or YV160B proportional electrovalves is too high : --> VAR[MachinePosition] ≠ P1 & YV160B > 900mA
F10.02 **Drive valve 2** SP100	D	1	Pressure detected in high speed circuit while machine should be in micro speed --> VAR[MachinePosition]≠P1 & SP100=OFF • Check high speed circuit (YV110), check SP110 sensor (15b) : probably hydraulic failure, or SP110 disconnected
		2	No detected pressure on high speed circuit while drive function is active in high speed --> VAR[MachinePosition] = P1 & CTRL[DriveSpeed]=High & CTRL[Drive] ≠ N & SP100=ON • Check high speed circuit (YV110), check SP110 sensor (15b) : probably SP110 failure (shunt, wrong calibration adjusting pressure)
F10.05 **Drive 3**	A		Engine speed detected above 2550RPM when drive function is active with unfolded machine (micro speed)
F10.17 **Activ' Lighting System**	A	1	Active short circuit on output controlling HL910/HL911 lights (turret ECU) : --> HL910_HL911 =FAIL
		2	Active short circuit on output controlling EL906 lights (turret ECU) : --> EL906=FAIL
		3	Active short circuit on output controlling EL907 lights (turret ECU) : --> EL906=FAIL
		4	Active short circuit on output controlling KA10 relay for platform lights (platform ECU) : --> KA10=FAIL
F10.26 **Reach Limit**	A	1	Load selector cannot be on 350 kg (770 lbs) position when machine position is P5 and applied load is 250 kg (550 lbs) validated
		2	Incoherence between position sensors --> F07.04(A) || F07.11(A)

Failures	N	Dec	Description
Securities			
F11.06 **Buzzer** HA901	D		Digital output's failure : Buzzer output detected as 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 --> ABS(VAR[DrivePressureDiff]) > 20 bar & 5s{CTRL[Drive] = Neutral & CTRL[Steering] = Neutral}

Failures	N	Dec	Description
Internal faults			
F12.01 **CAN Fault**	D	1	CAN network failure detected with platform ECU (U104) • Machine switched OFF, with multimeter, check the resistance between 1001 (CAN high) and 1002 (CAN low) is nearly 60 ohms (if 0 ohm or 120 ohm : 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	CAN network failure detected with membrane switch ECU (U107) • Machine switched OFF, with multimeter, check the resistance between 1001 (CAN high) and 1002 (CAN low) is nearly 60 ohms (if 0 ohm or 120 ohm : 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)
		4	CAN network failure detected with Activ'Screen ECU (U101) • Machine switched OFF, with multimeter, check the resistance between 1001 (CAN high) and 1002 (CAN low) is nearly 60 ohms (if 0 ohm or 120 ohm : 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)
F12.02 **E2P Read/Write Error** Change U106 ECU	D	1	Internal failure of SPU: access to EEPROM (read or write) • Restart machine
		2	Internal failure of SPU: EEPROM stack full • Restart machine
F12.04 **E2P Param Reset** Change SETTINGS	D	1	Detected change in software machine identification : all the settings forced to default values (ramps, speeds, options, machine configuration and erase of calibration)
F12.05 **Parameters reset into EEPROM**	D	1	Machine's model is not set Set machine model (HA26RTJ O or HA26RTJ PRO)
		2	Country not set Set country (USA/AUS/STD/RUS)
		4	Serial number not set Set machine serial number
		8	Some speed or ramp parameters are not set
		16	Some options are not set
		32	Some configurations are not set
F12.08 **ECU fault (master)**	D	1	ECU over temperature (> 110°C for more than 30s)
		2	Over current detected during more than 5s
		4	Internal voltage out of range
		8	Issue with analogue to digital converter (voltage out of range or blocked converter)
		16	Ground lost detected
		32	One of SPI daisy chains failed
		64	Over power detected
		128	ECU yellow zone: the overall current or temperature is outside specification limits
		256	ECU red zone: the ECU is forced to safe mode after hardware out of specification usage or failure detection, all outputs are inhibited

Failures	N	Dec	Description
Internal faults			
F12.16 Internal error of diagnostic system (request)	A	4	Invalid Maintenances Log ID
		6	Invalid Events log ID
		7	Invalid Events log ID
		193	Invalid Failure ID
		196	Invalid Machine Parameter (Speed or Ramp) ID
		197	Invalid Machine Calibration ID
		198	Invalid Option ID
		199	Invalid Country ID
		200	Invalid Machine Configuration ID
		201	Invalid Machine Model ID
		205	Invalid Security Setting ID
		206	Invalid Machine State ID
		207	Invalid Input/Output ID
		209	Invalid Internal Function ID
		210	Invalid Internal Cut out ID
		211	Invalid Machine Maintenance ID
		212	Invalid Event Counter ID
		213	Invalid Internal Version ID
F12.17 Internal error of diagnostic system (set)	A	4	Invalid Maintenances Log ID
		6	Invalid Events log ID
		7	Invalid Events log ID
		193	Invalid Failure ID
		196	Invalid Machine Parameter (Speed or Ramp) ID
		197	Invalid Machine Calibration ID
		198	Invalid Option ID
		199	Invalid Country ID
		200	Invalid Machine Configuration ID
		201	Invalid Machine Model ID
		205	Invalid Security Setting ID
		206	Invalid Machine State ID
		207	Invalid Input/Output ID
		209	Invalid Internal Function ID
		210	Invalid Internal Cut out ID
		211	Invalid Machine Maintenance ID
		212	Invalid Event Counter ID
		213	Invalid Internal Version ID

Failures	N	Dec	Description
Switches			
F13.02 **Platform switches**	A	1	Two directions active failure for upper console switches : Steering switch
		2	Two directions active failure for upper console switches : Boom telescope switch
		4	Two directions active failure for upper console switches : Jib switch
		8	Two directions active failure for upper console switches : Platform rotation switch
		16	Two directions active failure for upper console switches : Platform level switch
		32	Two directions active failure for upper console switches : Steering mode switch
F13.10 **Switches neutral** Sw.: Lower box	A	1	Neutral detection failure at machine's power-on for lower console switches : Turntable rotate switch is active
		2	Neutral detection failure at machine's power-on for lower console switches : Arm switch is active
		4	Neutral detection failure at machine's power-on for lower console switches : Boom switch is active
		8	Neutral detection failure at machine's power-on for lower console switches : Boom telescope switch is active
		16	Neutral detection failure at machine's power-on for lower console switches : Jib switch is active
		32	Neutral detection failure at machine's power-on for lower console switches : Platform level switch is active
		64	Neutral detection failure at machine's power-on for lower console switches : Platform rotation switch is active
		128	Neutral detection failure at machine's power-on for lower console switches : Engine start/ stop switch is active
		256	Neutral detection failure at machine's power-on for lower console switches : Enable switch is active
		512	Neutral detection failure at machine's power-on for lower console switches : DPF switch is active
		1024	Neutral detection failure at machine's power-on for lower console switches : Overriding switch is active
		2048	Neutral detection failure at machine's power-on for lower console switches : Horn switch is active
		2048	Neutral detection failure at machine's power-on for lower console switches : Beacon switch is active

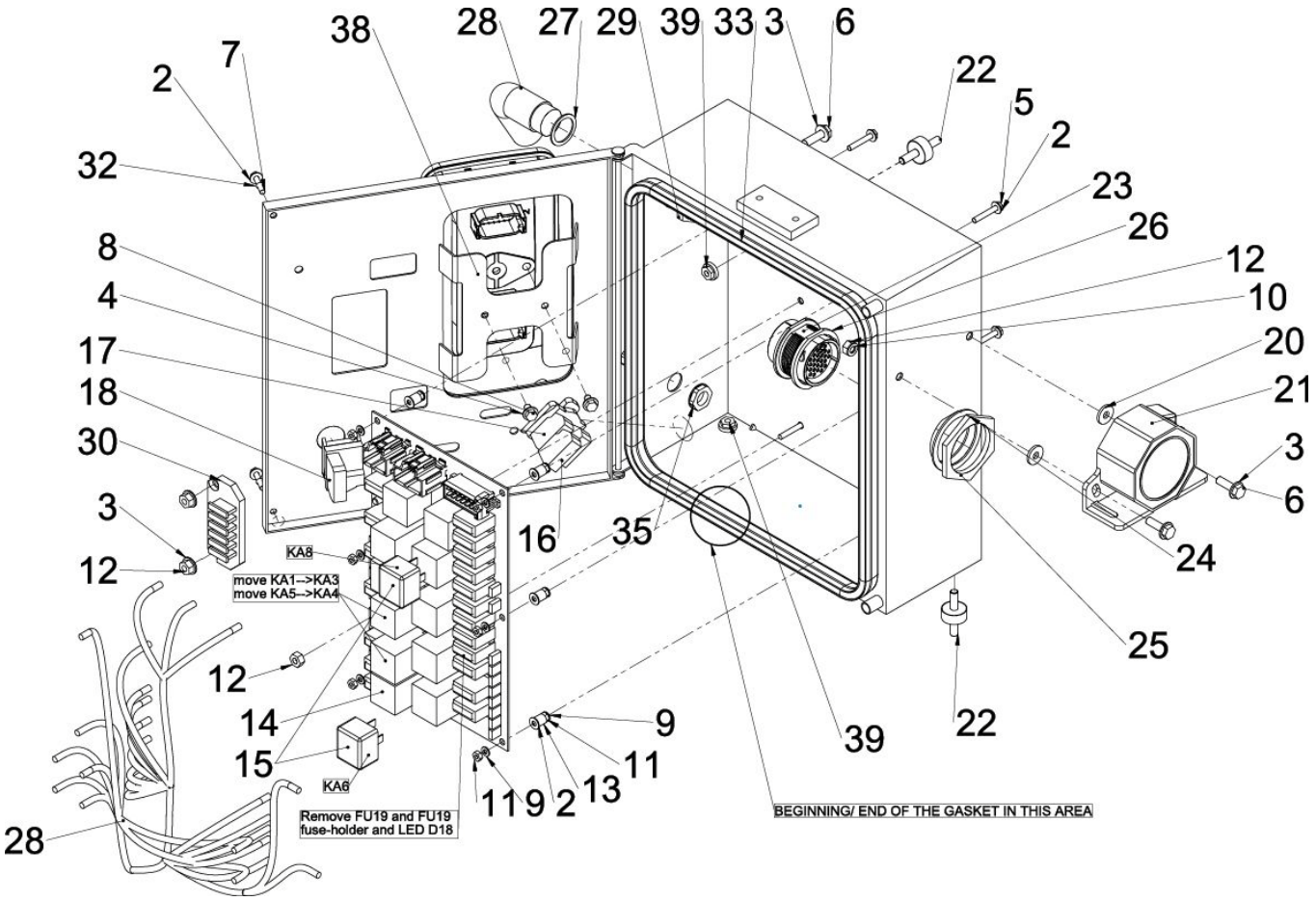
Failures	N	Dec	Description
Switches			
F13.11 **Switches neutral 2** Sw.: Upper box	A	1	Neutral detection failure at machine's power-on for upper console switches : Steering switch is active
		2	Neutral detection failure at machine's power-on for upper console switches : Boom telescope switch is active
		4	Neutral detection failure at machine's power-on for upper console switches : Jib switch is active
		8	Neutral detection failure at machine's power-on for upper console switches : Platform rotation switch is active
		16	Neutral detection failure at machine's power-on for upper console switches : Platform level switch is active
		32	Neutral detection failure at machine's power-on for upper console switches : Engine start/ stop switch is active
		64	Neutral detection failure at machine's power-on for upper console switches : Emergency pump switch is active
		128	Neutral detection failure at machine's power-on for upper console switches : Horn switch is active
		256	Neutral detection failure at machine's power-on for upper console switches : Enable switch is active
		512	Neutral detection failure at machine's power-on for upper console switches : Differential lock switch is active
		1024	Neutral detection failure at machine's power-on for upper console switches : Activ'Lighting System switch is active

Failures	N	Dec	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 ohms (if 0 ohm or 120 ohm : failure, check RES TERM connection for all ECUs) • Check ECU supplies line • Check CAN connection for Display and/or engine

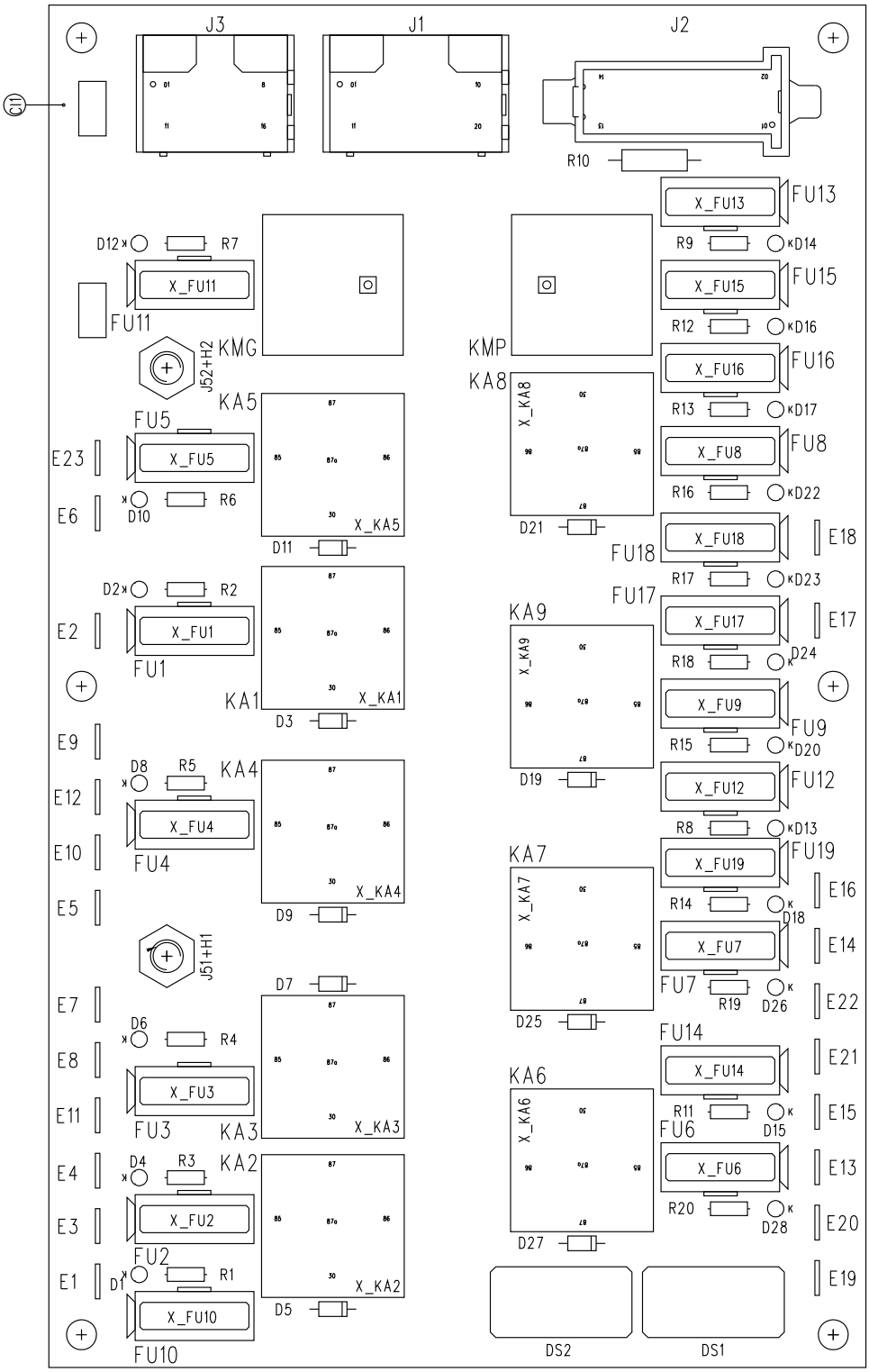
2 - Legend

2.1 - PCB TURRET

Location on the machine



Location


J3
J1
J2
R10
X_FU13
FU13
R9
D14
X_FU15
FU15
R12
D16
X_FU16
FU16
R13
D17
X_FU8
FU8
R16
D22
X_FU18
FU18
R17
D23
X_FU17
FU17
R18
D24
X_FU9
FU9
R15
D20
X_FU12
FU12
R8
D13
X_FU19
FU19
R14
D18
X_FU7
FU7
R19
D26
X_FU14
FU14
R11
D15
X_FU6
FU6
R20
D28
D12
R7
X_FU11
FU11
KMG
J52+H2
KA5
FU5
X_FU5
E23
E6
D10
R6
X_KA5
D11
D2
R2
X_FU1
FU1
E2
KA1
X_KA1
D3
E9
D8
R5
KA4
E12
X_FU4
FU4
E10
E5
X_KA4
D9
J51+H1
D7
E7
D6
R4
X_FU3
FU3
E8
E11
KA3
X_KA3
D4
R3
KA2
E4
X_FU2
FU2
E3
X_KA2
D5
D1
R1
X_FU10
FU10
E1
KMP
KA8
X_KA8
D21
KA9
X_KA9
D19
KA7
X_KA7
D25
KA6
X_KA6
D27
E18
E17
E16
E14
E22
E21
E15
E13
E20
E19
DS2
DS1

Notes

Diagram - 1/2

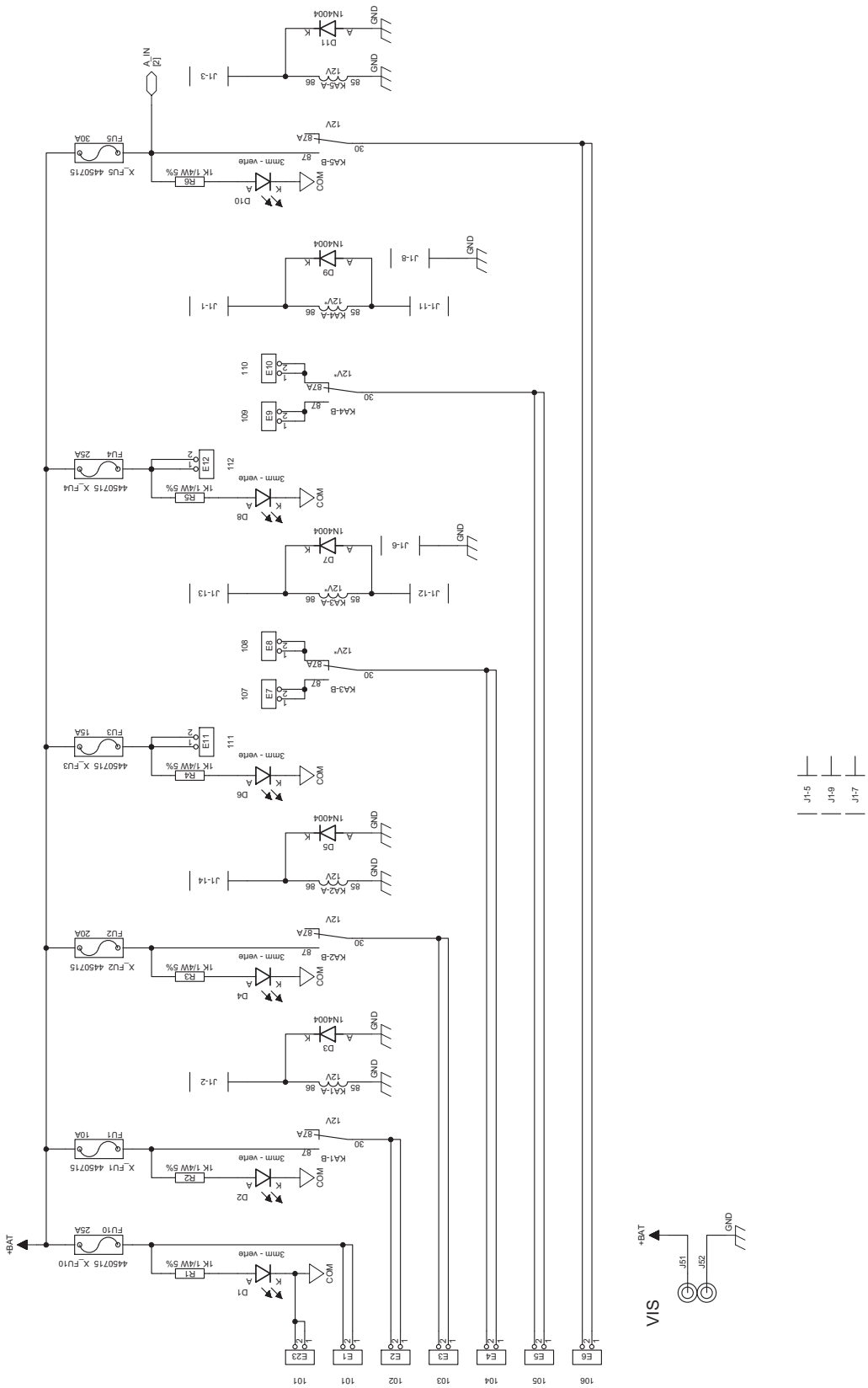
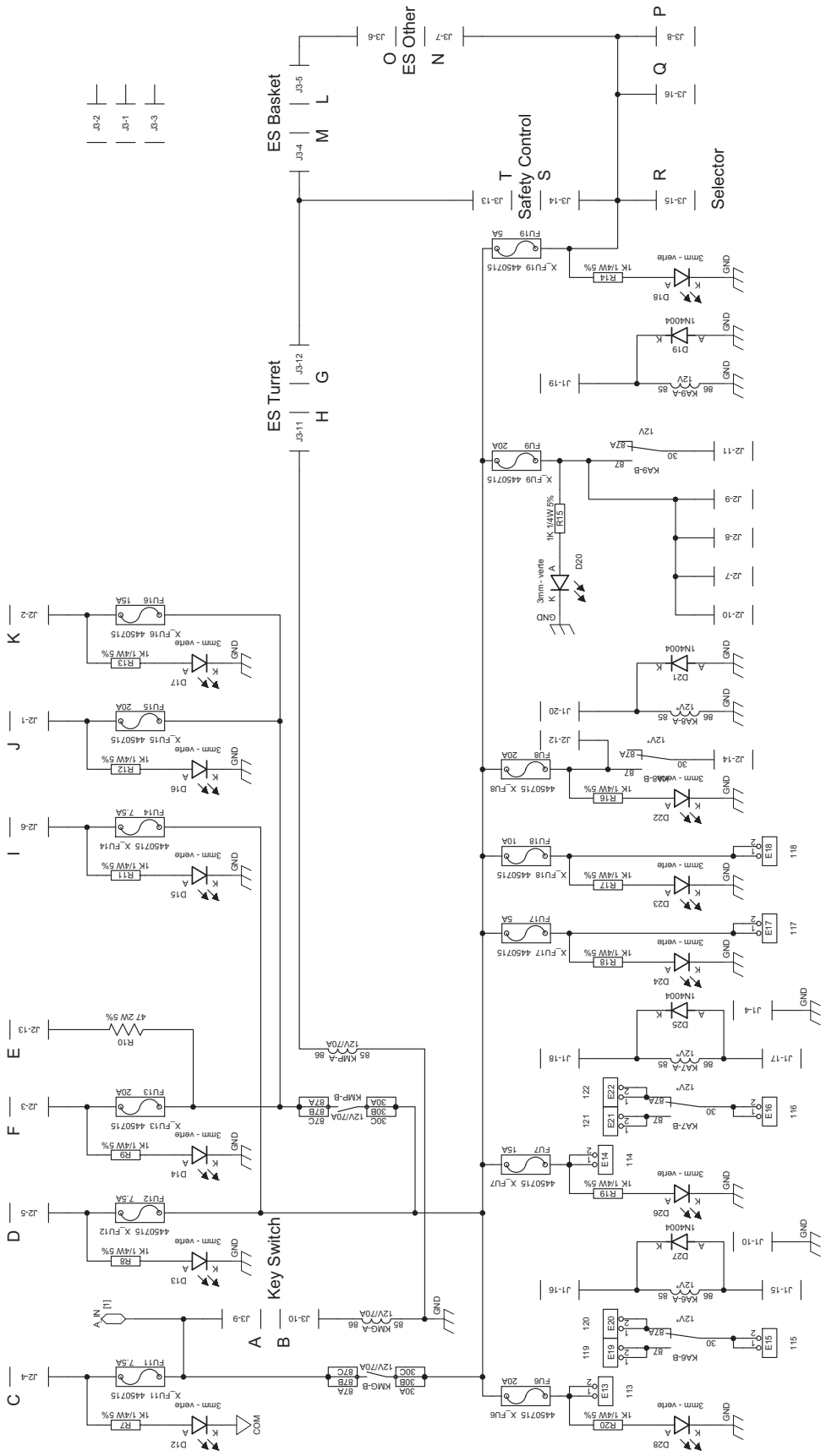

A_IN
+BAT
GND
12V
1N4004
D1
D2
D3
D4
D5
D6
D7
D8
D9
D10
D11
R1
R2
R3
R4
R5
R6
3mm - verte
1K 1/4W 5%
COM
FU1 10A
FU2 20A
FU3 15A
FU4 25A
FU5 30A
FU10 25A
X_FU1 4450715
X_FU2 4450715
X_FU3 4450715
X_FU4 4450715
X_FU5 4450715
X_FU10 4450715
KA1-A
KA1-B
KA2-A
KA2-B
KA3-A
KA3-B
KA4-A
KA4-B
KA5-A
KA5-B
85
86
87
87A
30
E1
E2
E3
E4
E5
E6
E7
E8
E9
E10
E11
E12
E23
101
102
103
104
105
106
107
108
109
110
111
112
J1-1
J1-2
J1-3
J1-5
J1-6
J1-7
J1-8
J1-9
J1-11
J1-12
J1-13
J1-14
J51
J52
VIS

Diagram - 2/2


ES Other
ES Basket
ES Turret
Safety Control
Selector
Key Switch
GND
12V
COM

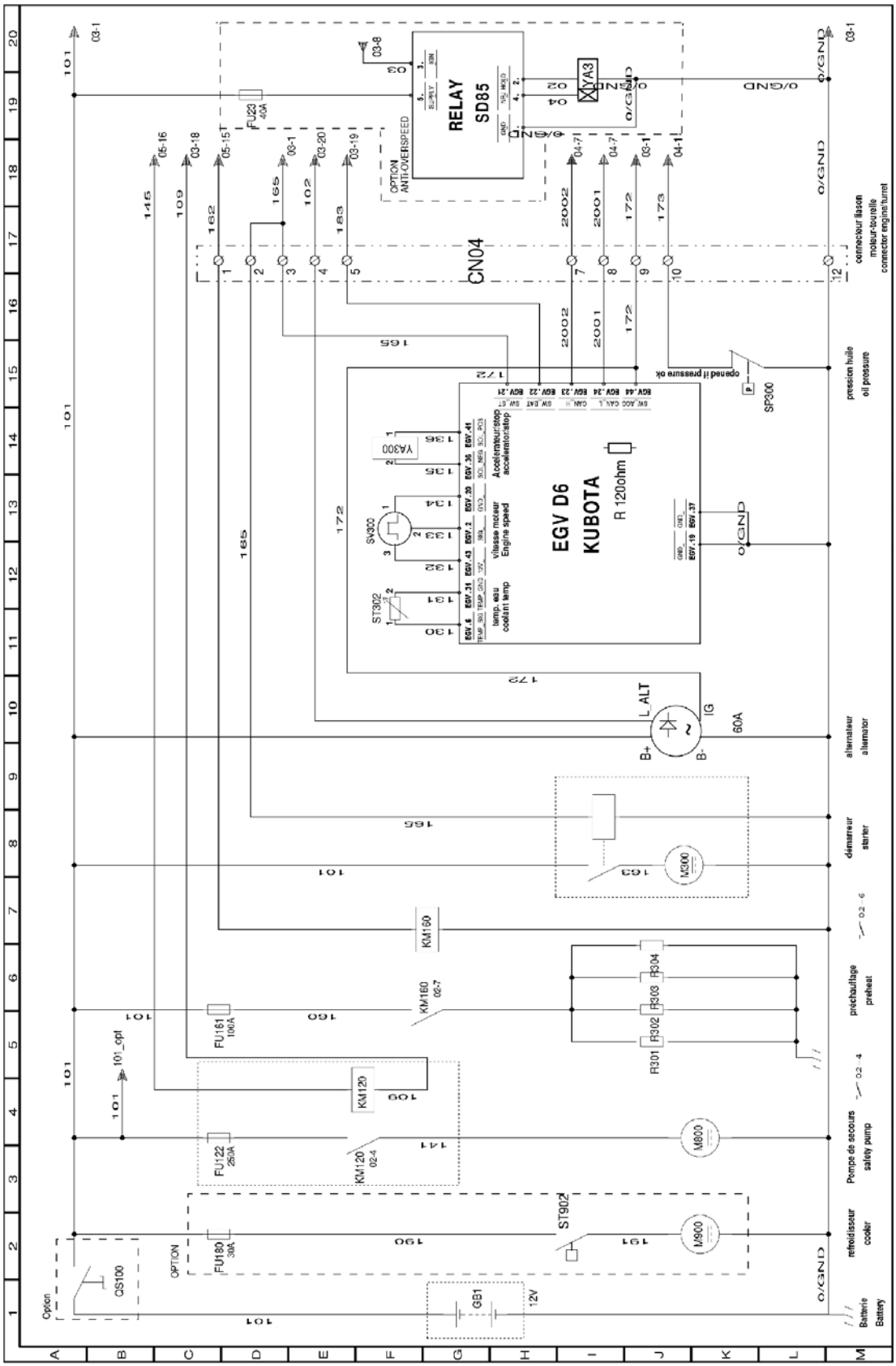
E - Trouble shooting and diagram

Machine switched on, the LED off near the fuse indicates that the fuse is defective.

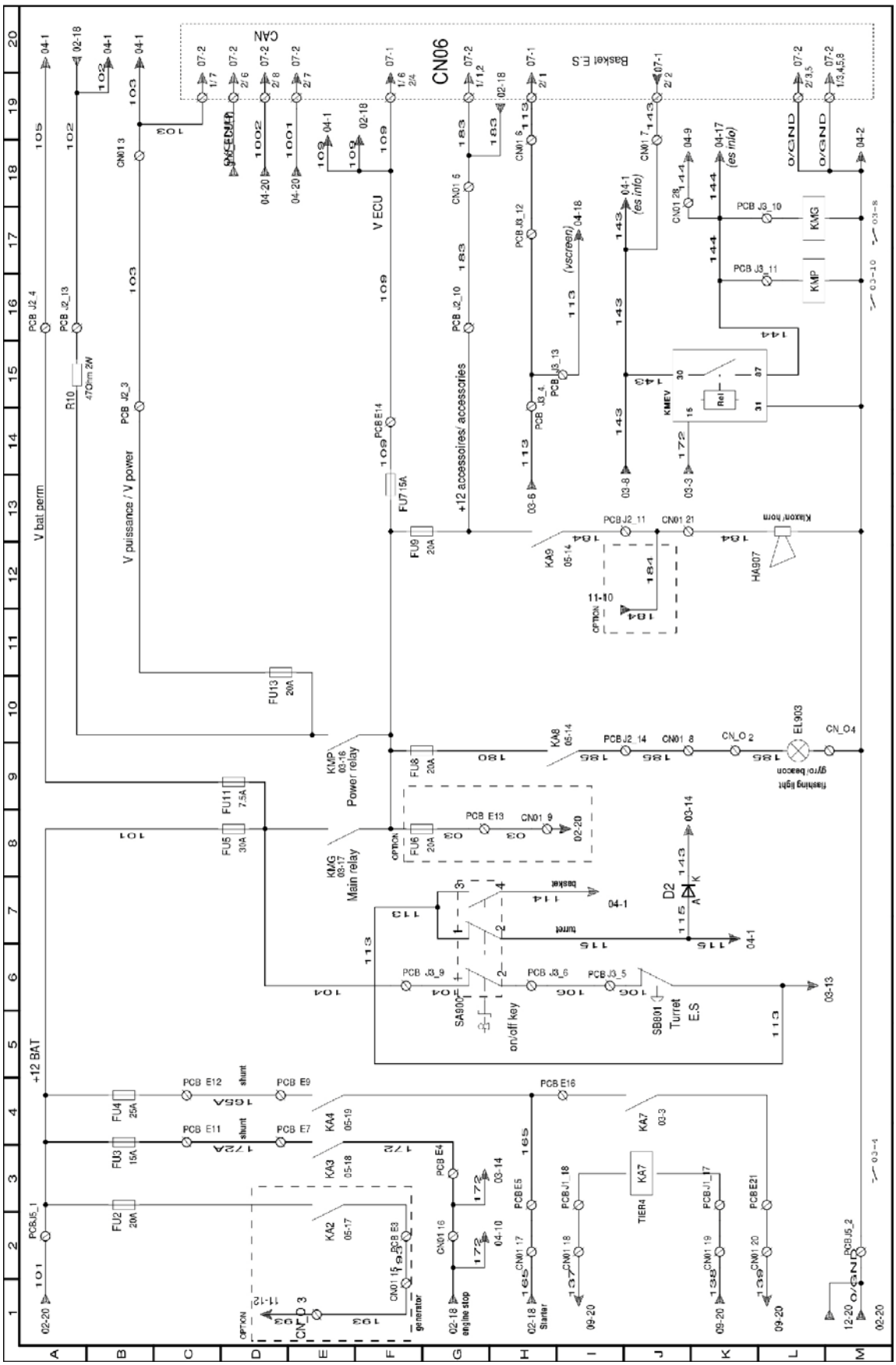
Marking	Description
FU1	Not used
FU2	Fuse - 20A - Generator
FU3	Engine shutdown / Acceleration - 15A -
FU4	Fuse - 25A - Starter
FU5	Fuse - 30A - General
FU6	Fuse - 20A - Options
FU7	Fuse - 15A - ECU
FU8	Fuse - 20A - Option
FU9	Fuse - 20A - Attachments
FU10	Not used
FU11	Fuse - 7.5A - + Permanent
FU12	Not used
FU13	Fuse - 20A - Power
FU14	Not used
FU15	Not used
FU16	Not used
FU17	Fuse - 5A -Selection ground / upper controls
FU18	Not used
FU19	Not used
FU23	Option overspeed relay - 40A -
FU34	Supply strain gauges -1A-
FU122	Emergency pump -250A-
FU161	Preheating -100A-
FU180	Cooler option -30A-
KA1	Not used
KA2	Relay - 1RT - 12V - Generator (192)
KA3	Engine shutdown / Acceleration (170)
KA5	Not used
KA4	Starter (169)
KA5	Not used
KA7	For engine start
KA9	Relay - 1RT - 12V - Horn (187)
KMG	Relay - 1T - 12V/70A - Main relay (142)
KMP	Relay - 1T - 12V/70A - Power (142)
SD85	Option overspeed relay
KM120	Emergency pump (145)
KM160	Pre-heating (162)
KM300	Starter motor (165)

3 - Electric diagram

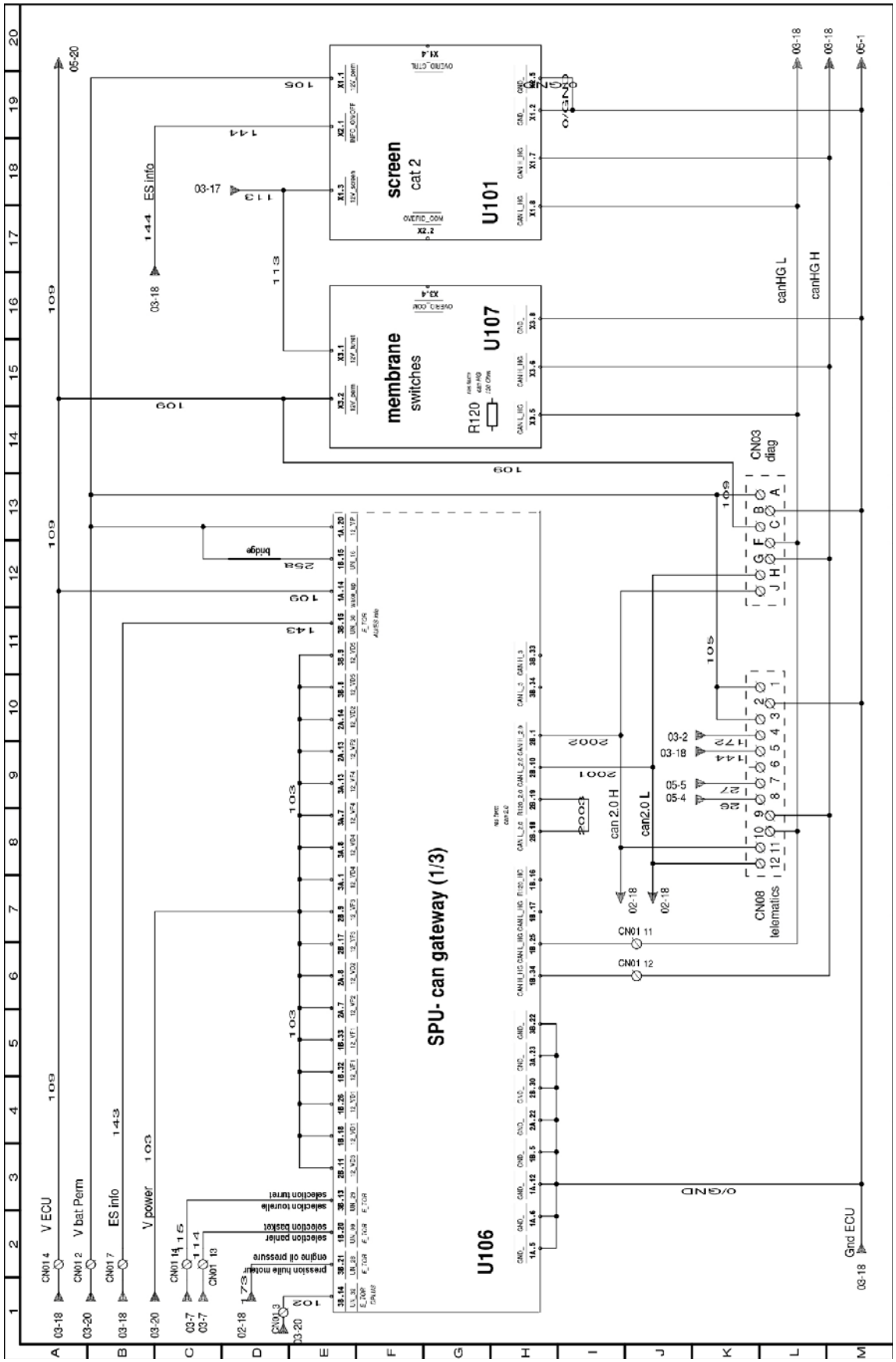
Engine part Tier III - 4000498810K - folio 02



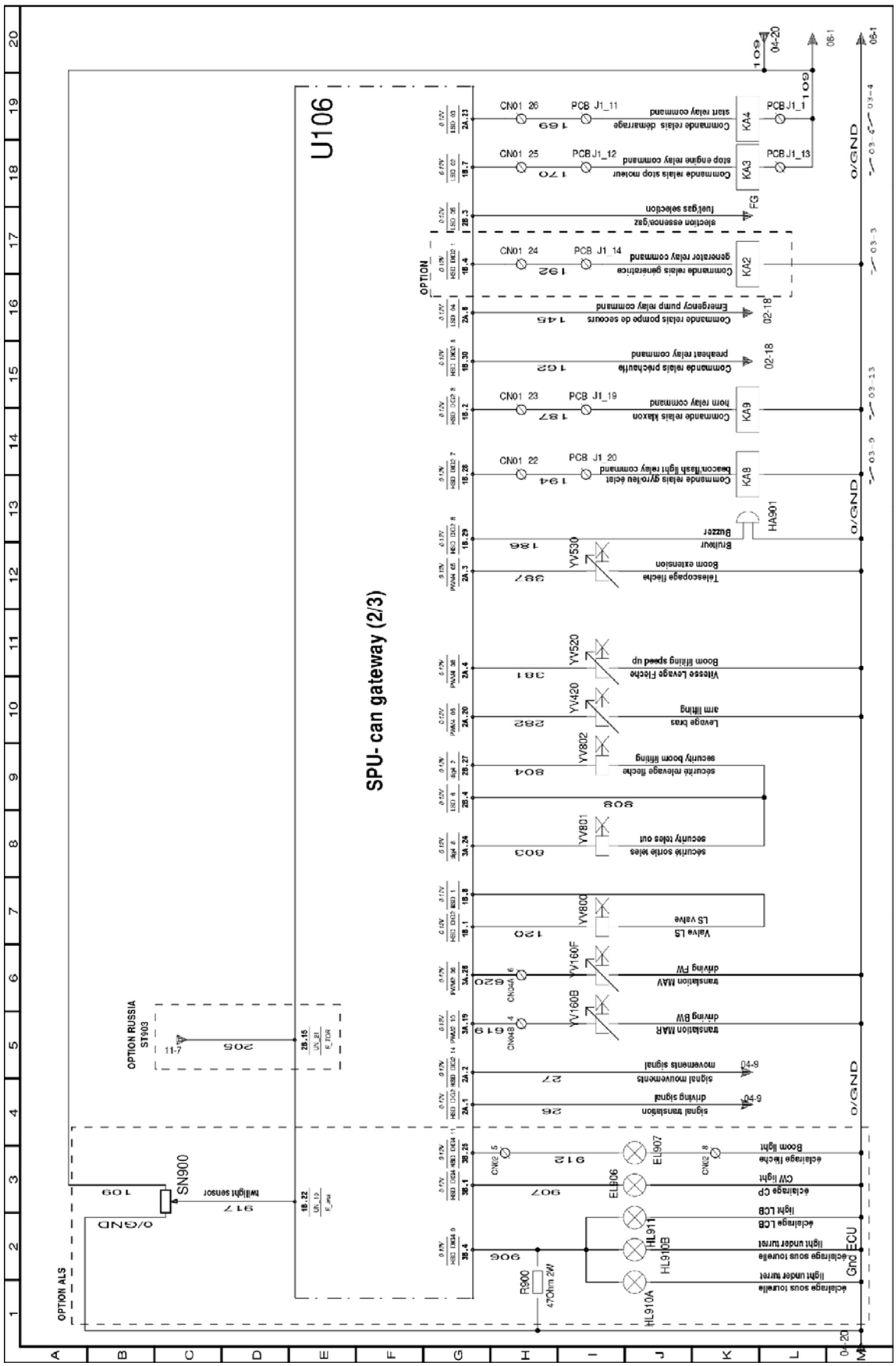
Turntable part - PCB - 4000498810K - folio 03



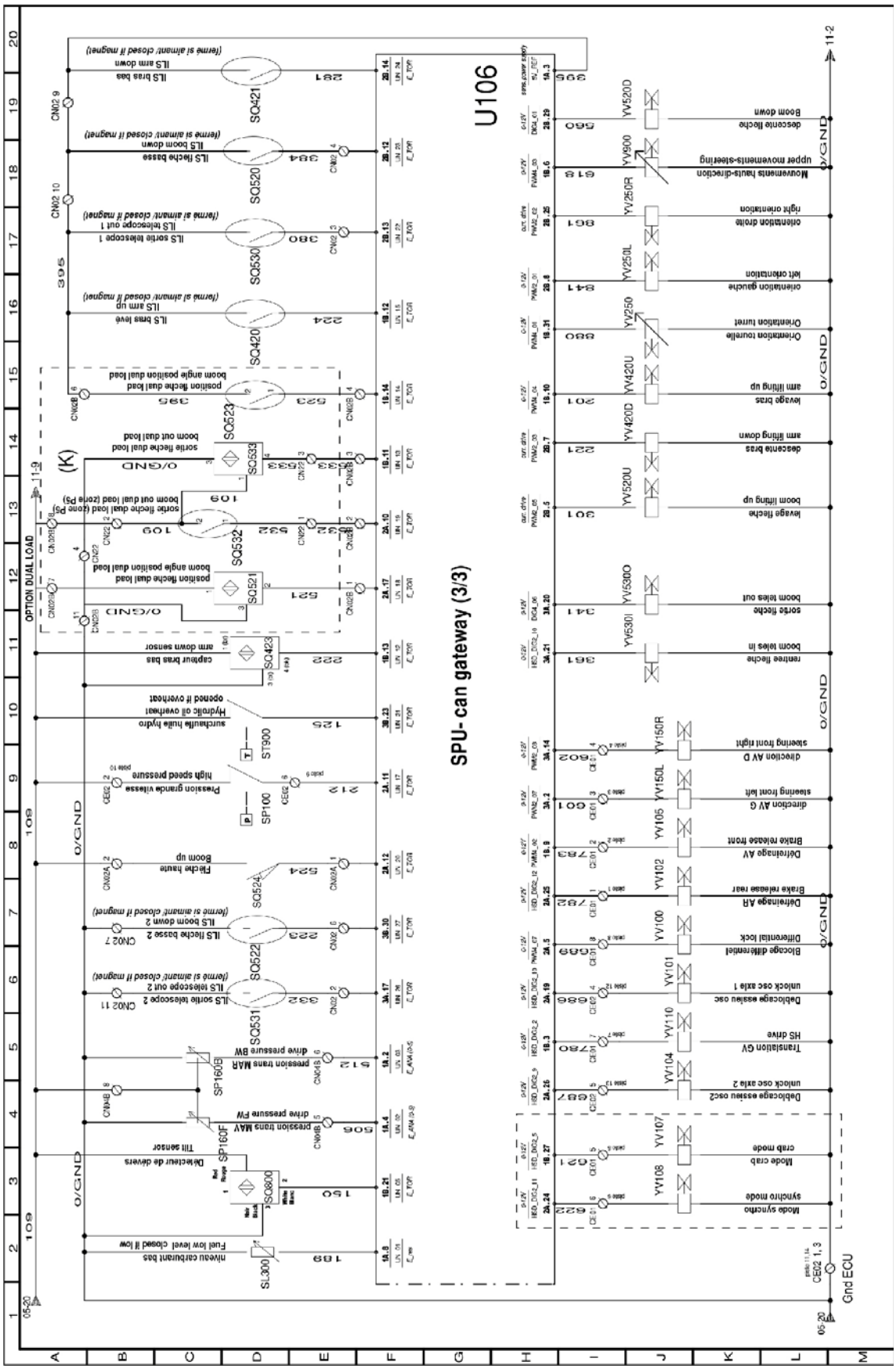
Turntable part - SPU 1/3 + CLUSTER - 4000498810K - folio 04



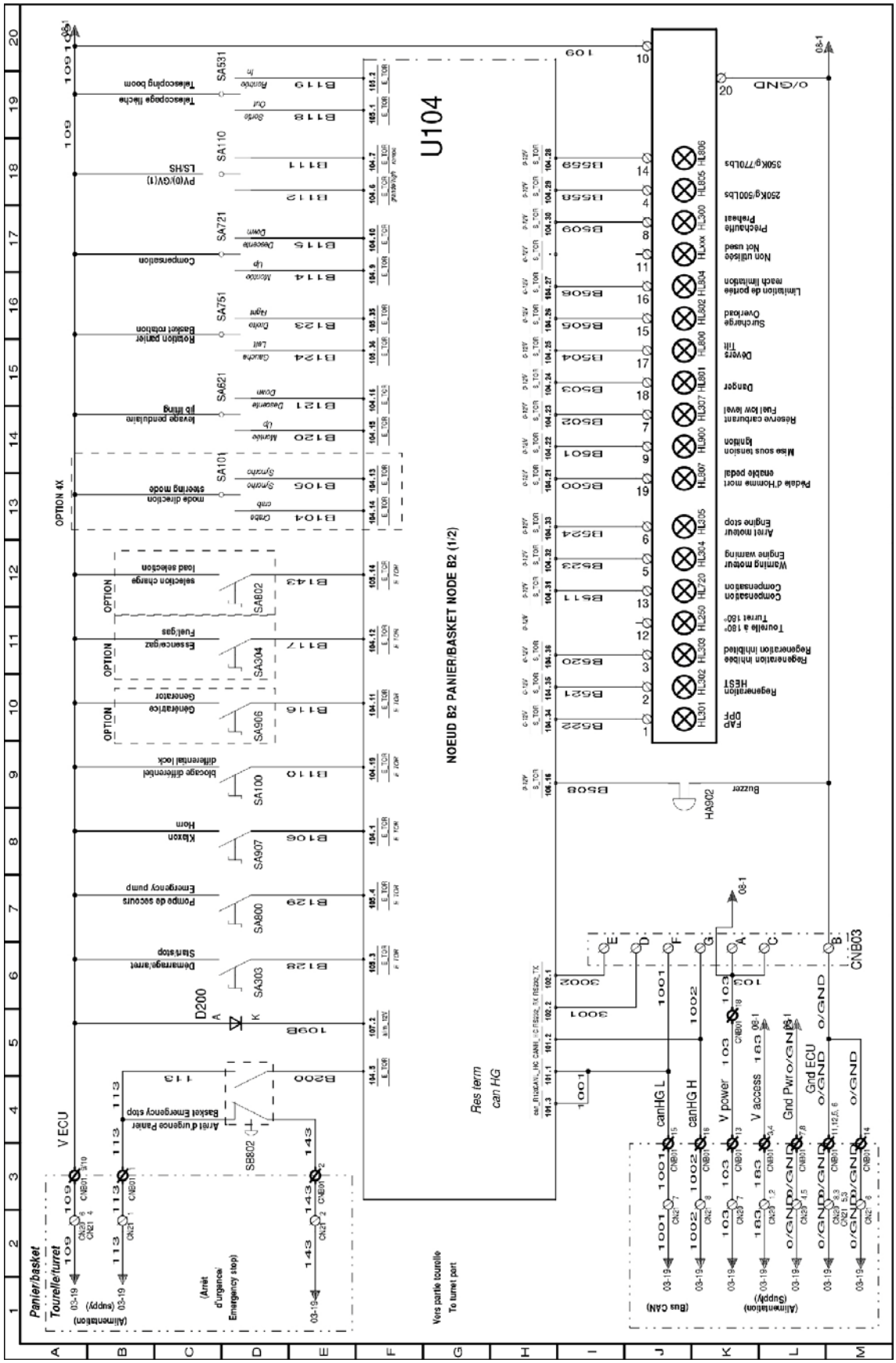
Turntable part - SPU 2/3 - 4000498810K - folio 05



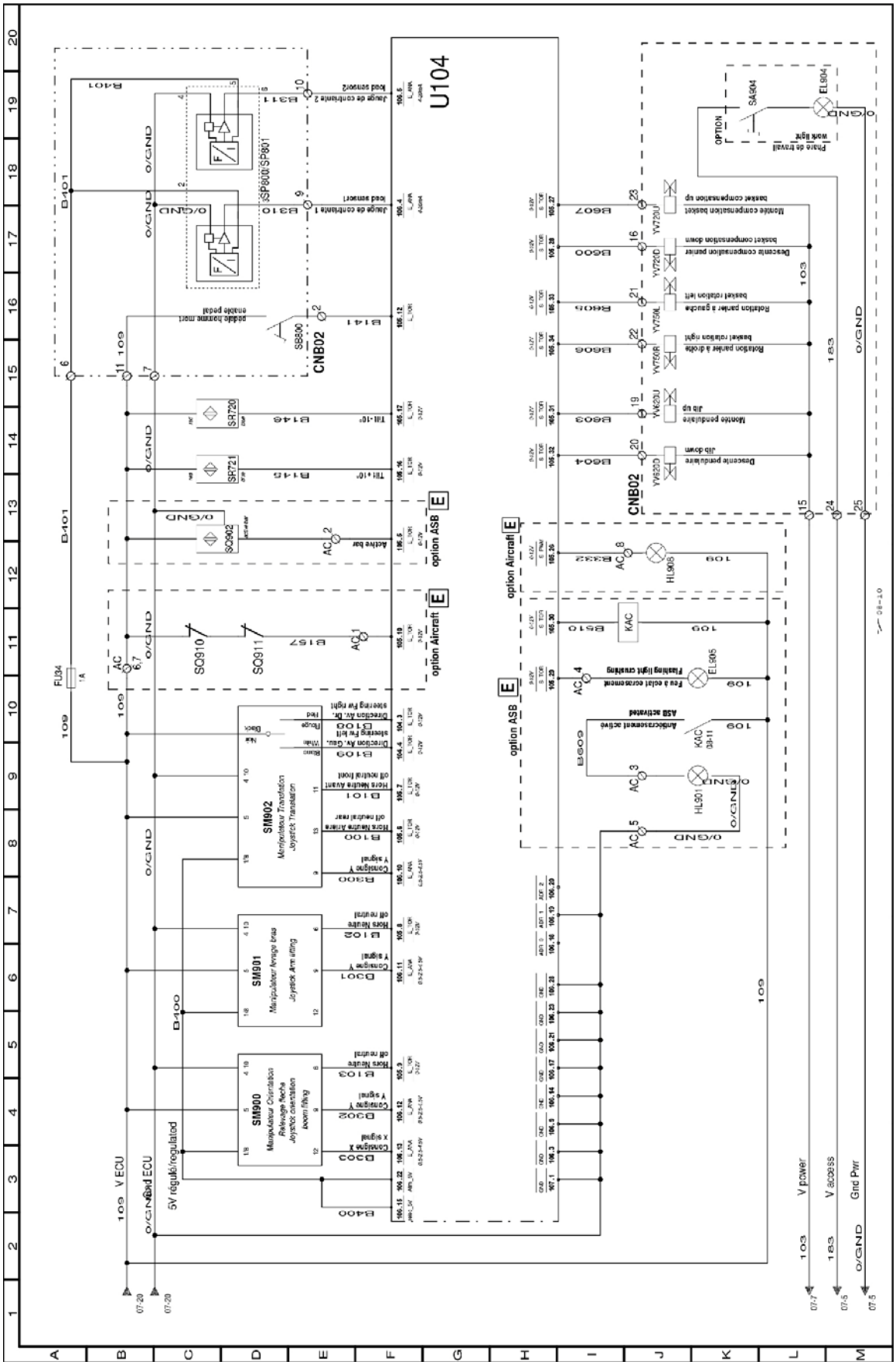
Turntable part - SPU 3/3 - 4000498810K - folio 06



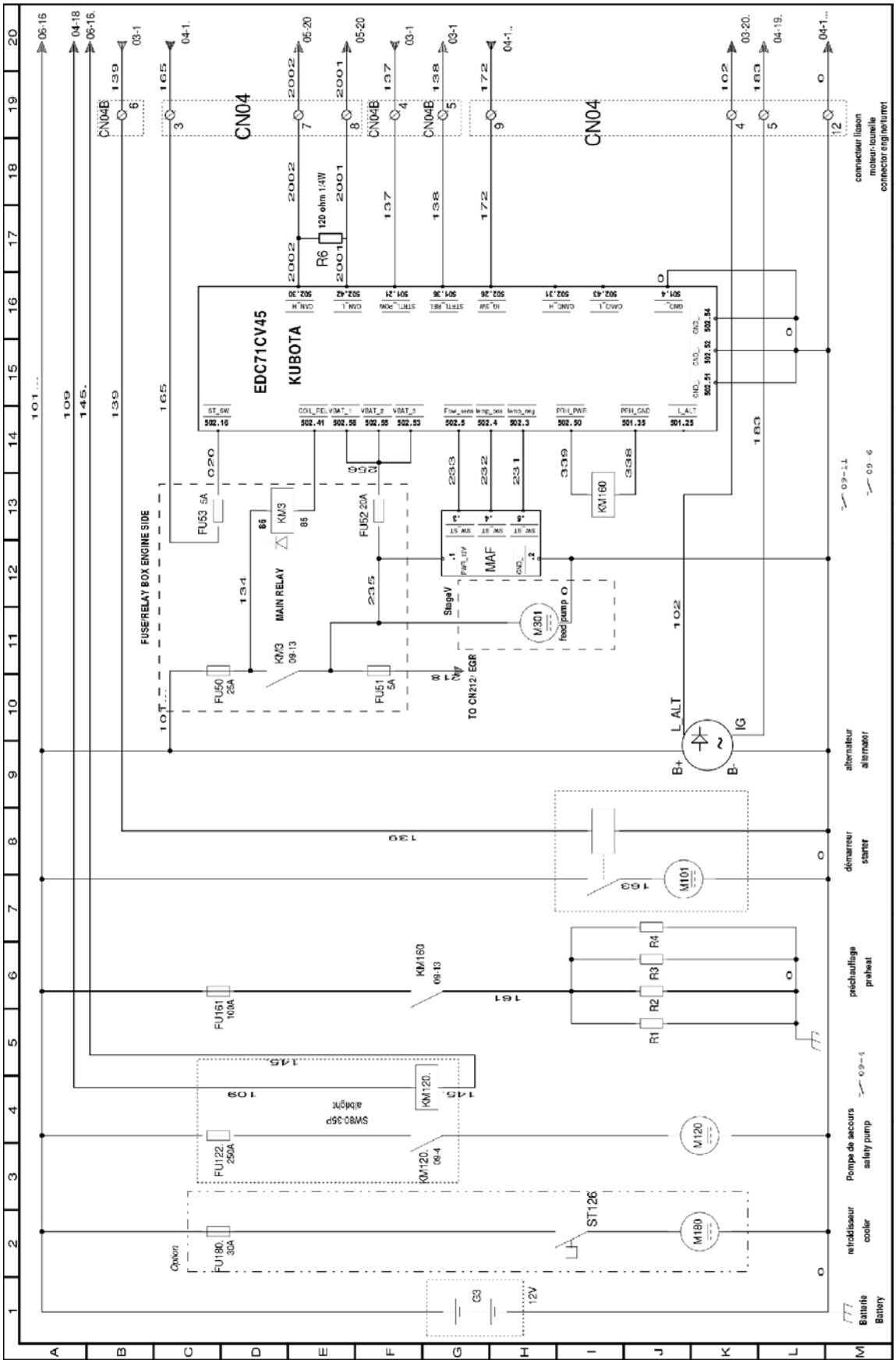
Cage part-Node B 1/2 - 4000498810K - folio 07



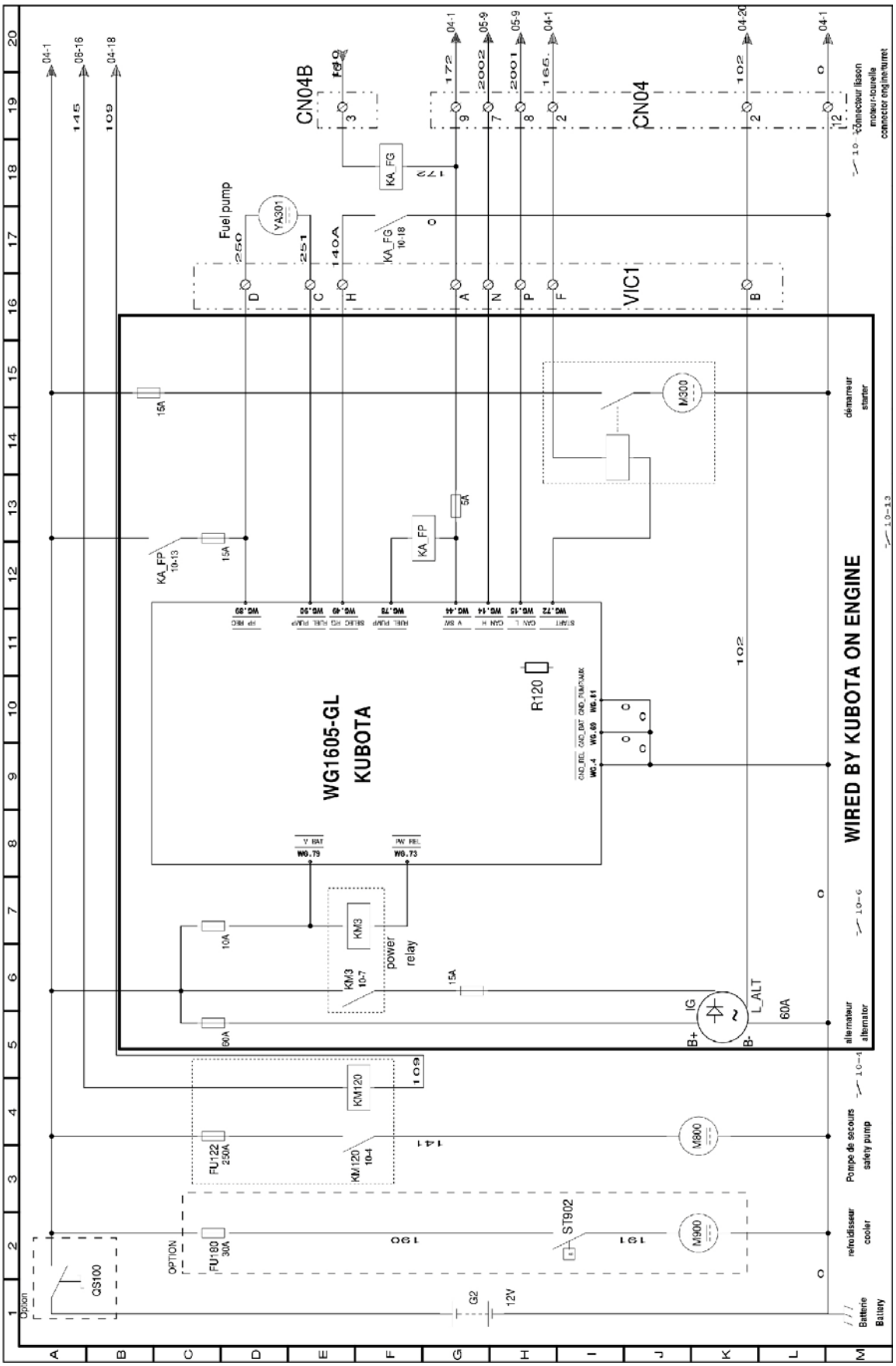
Cage part-Node B 2/2 - 4000498810K - folio 08



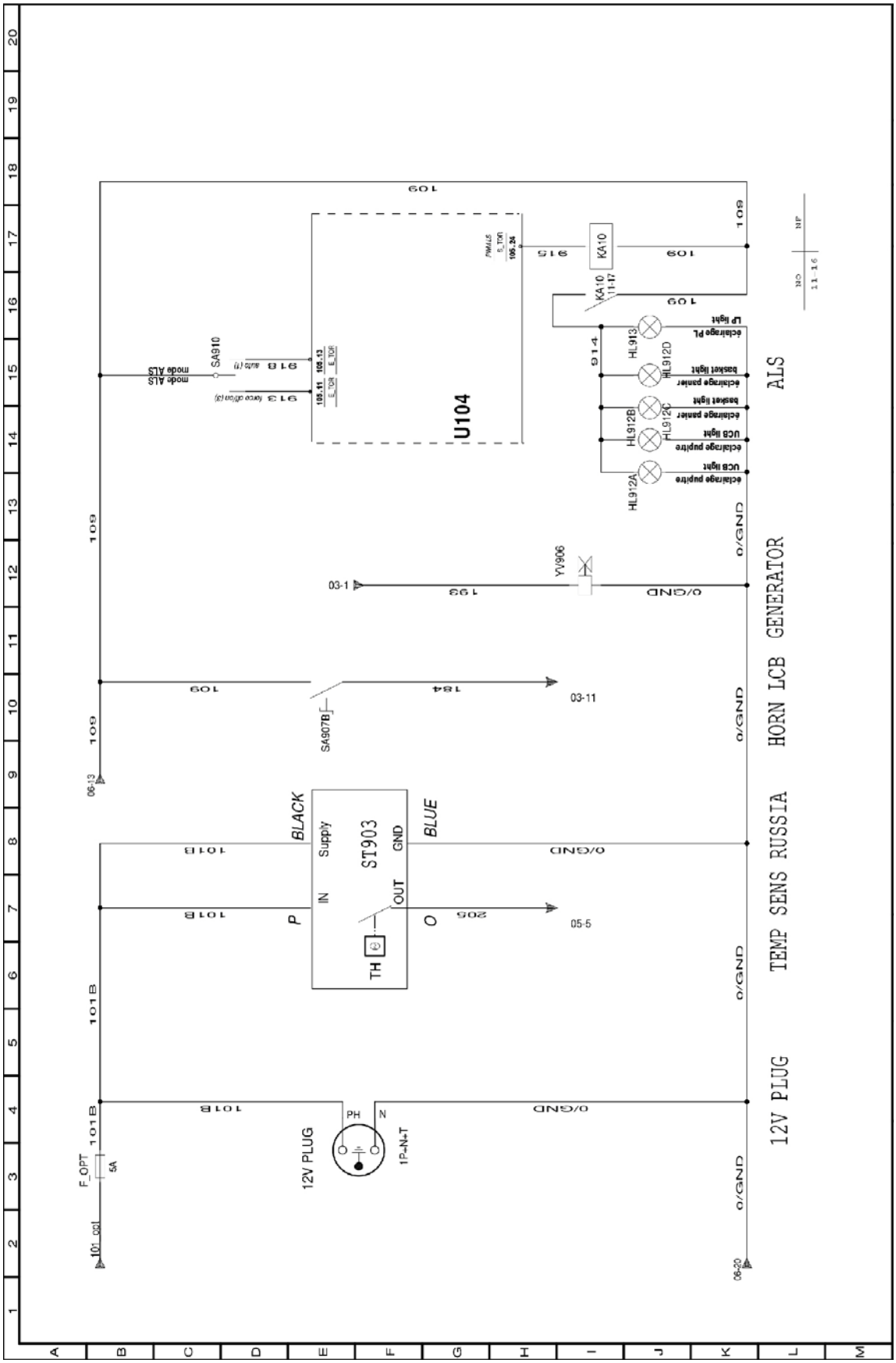
Engine part Tier IV / Stage 5 Kubota - 4000498810K - folio 09



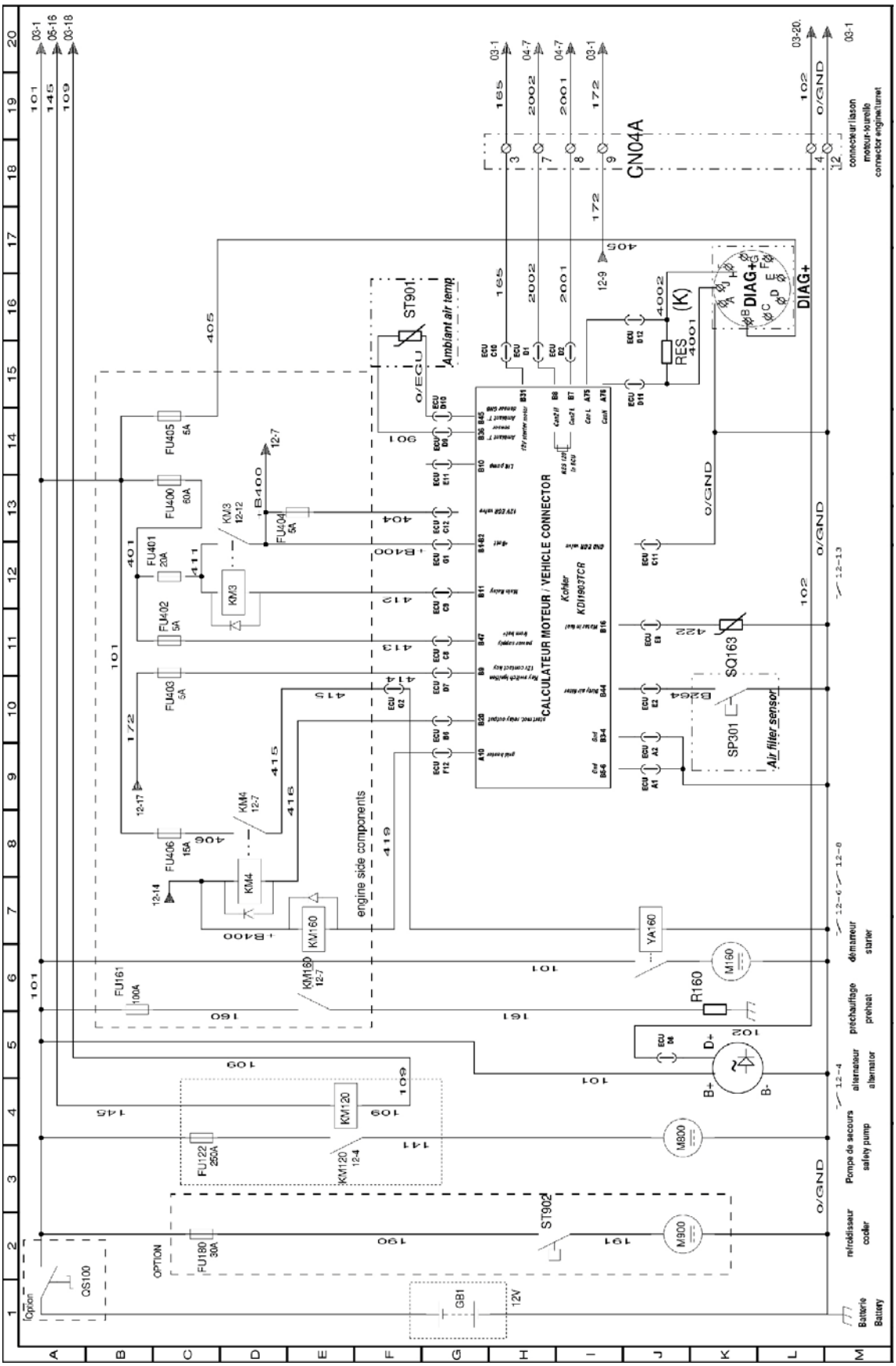
Engine part-Petrol/gas - 4000498810K - folio 10



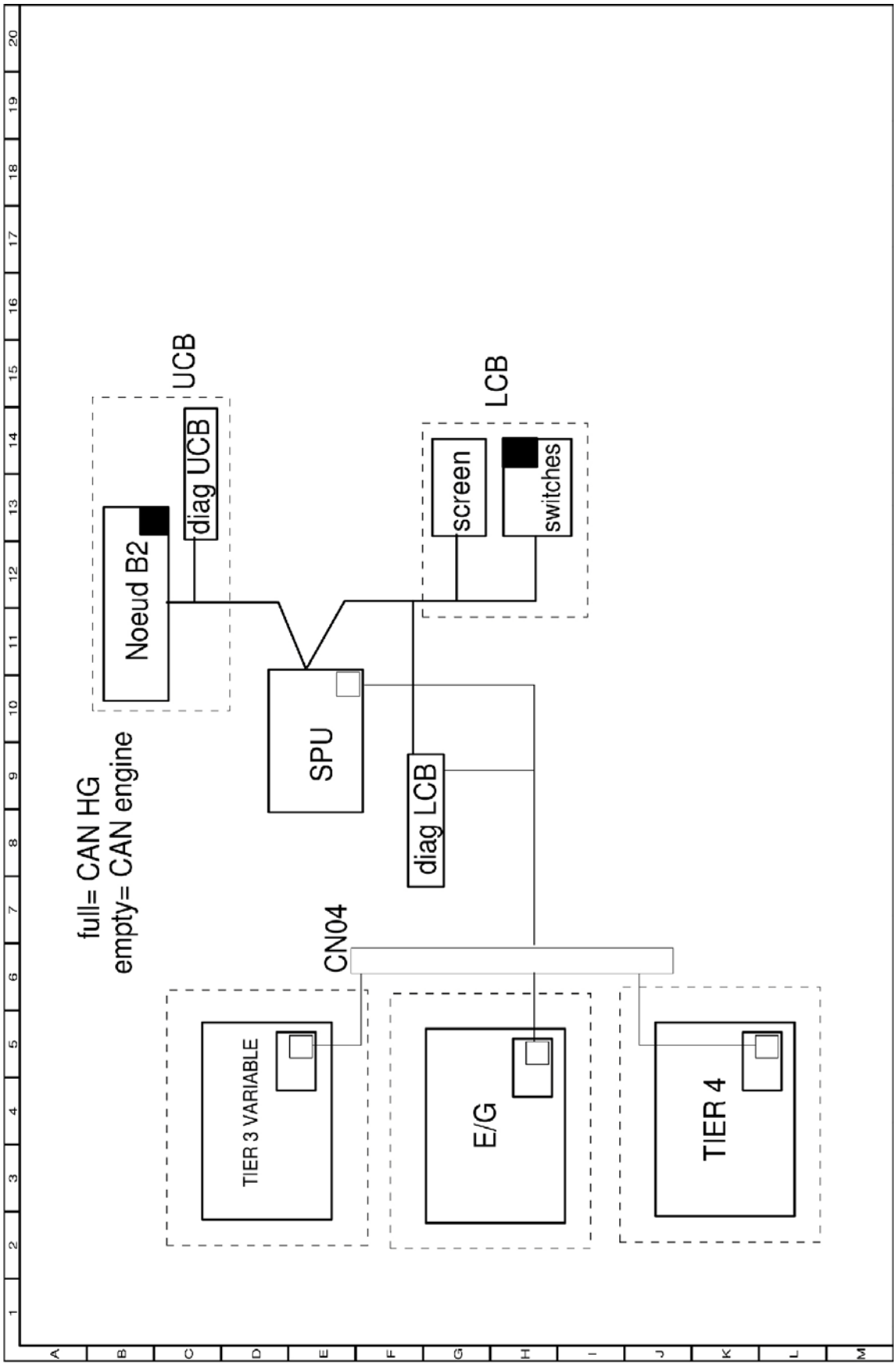
Option - 4000498810K - folio 11



STAGE V Kohler Engine - 4000498810K - folio 12

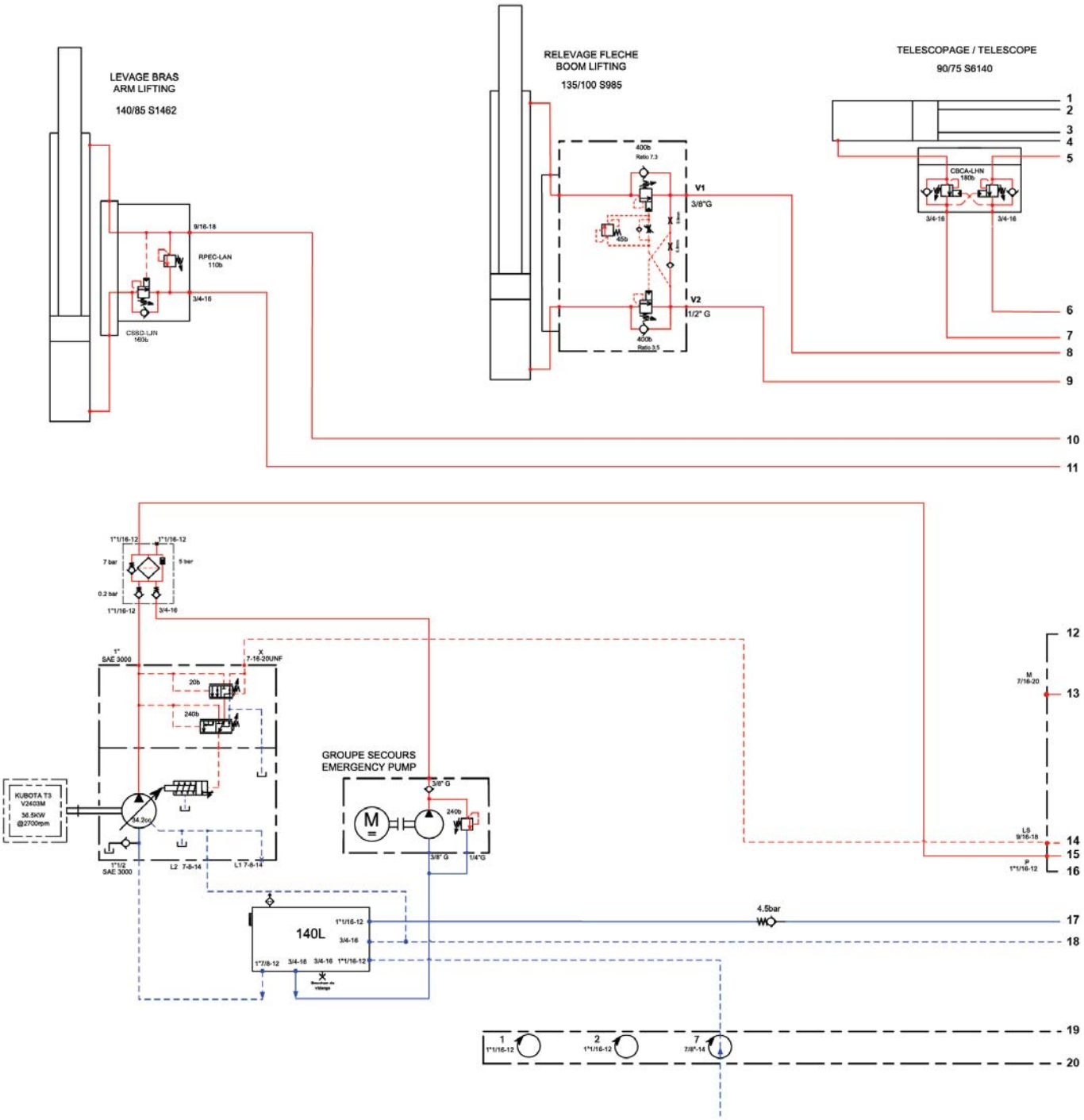


System architecture - 4000498810K - folio 14

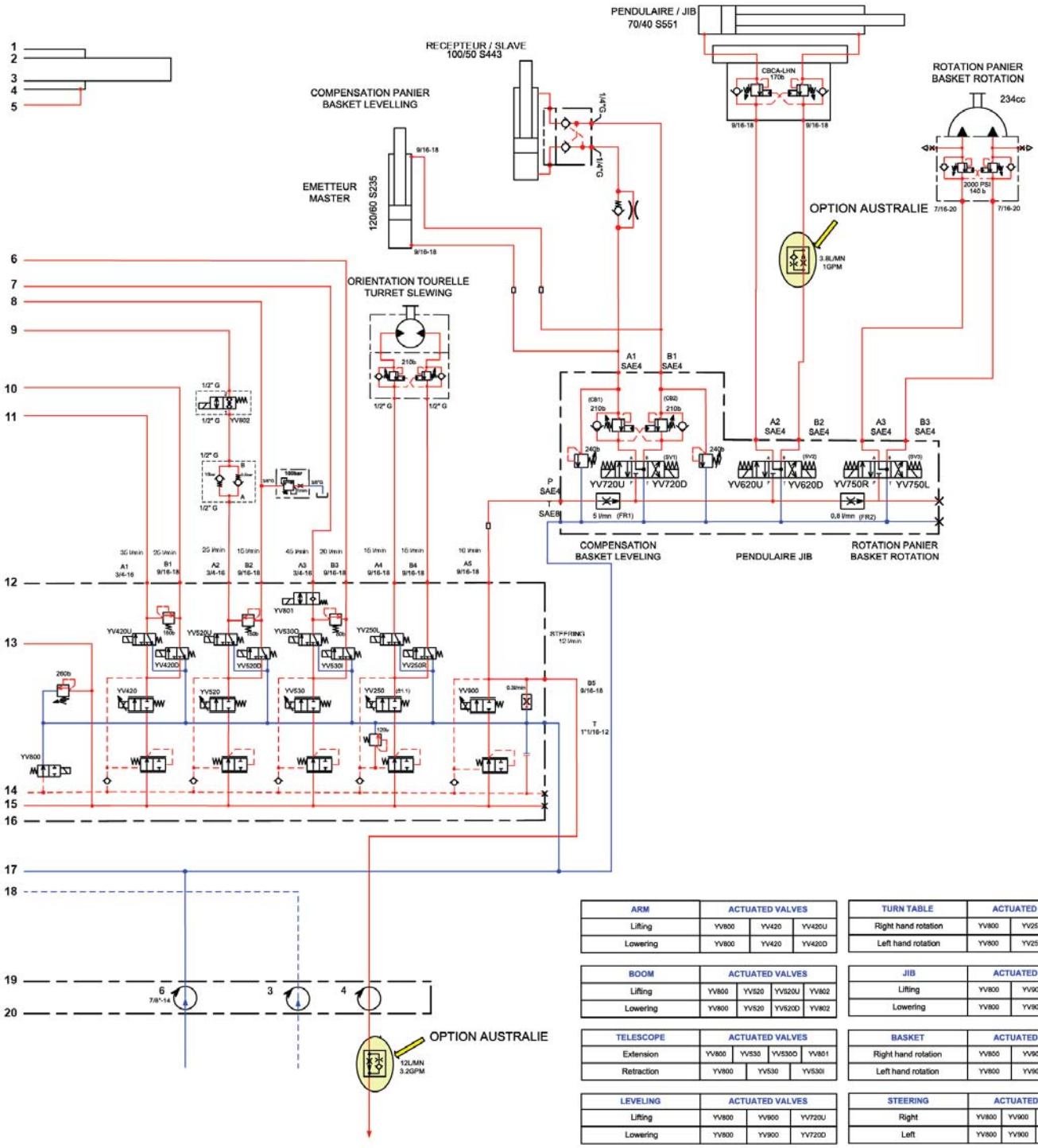


4 - Hydraulic diagram

Lower part-Sheet 1 - HA26 RTJ O - HA26 RTJ O SW - HA80 RTJ O - 4000560890H - 1/2



Lower part-Sheet 1 - HA26 RTJ O - HA26 RTJ O SW - HA80 RTJ O - 4000560890H - 2/2



ARM	ACTUATED VALVES		
Lifting	YV800	YV420	YV420U
Lowering	YV800	YV420	YV420D

TURN TABLE	ACTUATED VALVES		
Right hand rotation	YV800	YV250	YV250R
Left hand rotation	YV800	YV250	YV250L

BOOM	ACTUATED VALVES			
Lifting	YV800	YV520	YV520U	YV802
Lowering	YV800	YV520	YV520D	YV802

JIB	ACTUATED VALVES		
Lifting	YV800	YV900	YV620U
Lowering	YV800	YV900	YV620D

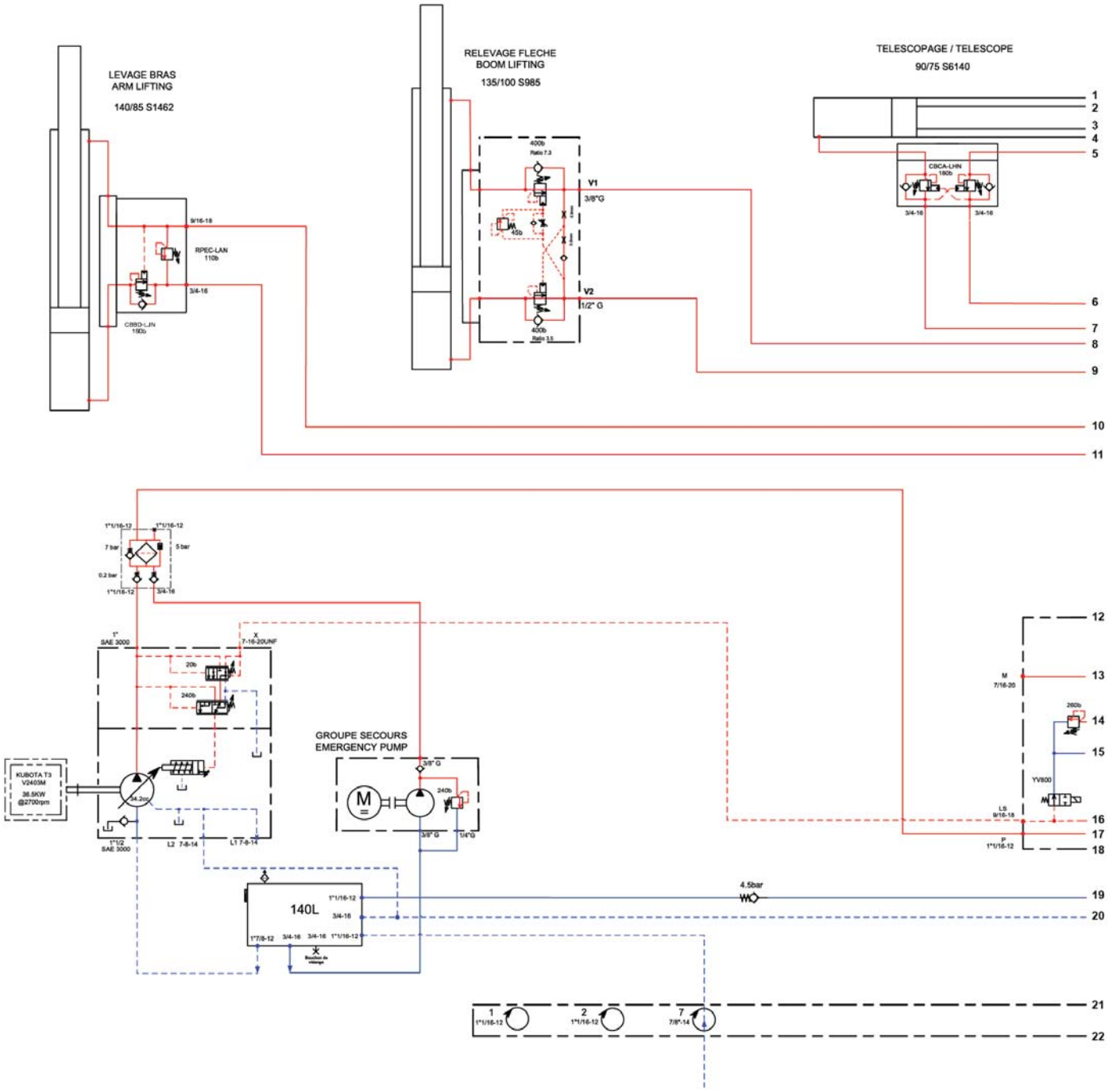
TELESCOPE	ACTUATED VALVES			
Extension	YV800	YV530	YV530D	YV801
Retraction	YV800	YV530	YV530I	

BASKET	ACTUATED VALVES		
Right hand rotation	YV800	YV900	YV750R
Left hand rotation	YV800	YV900	YV750L

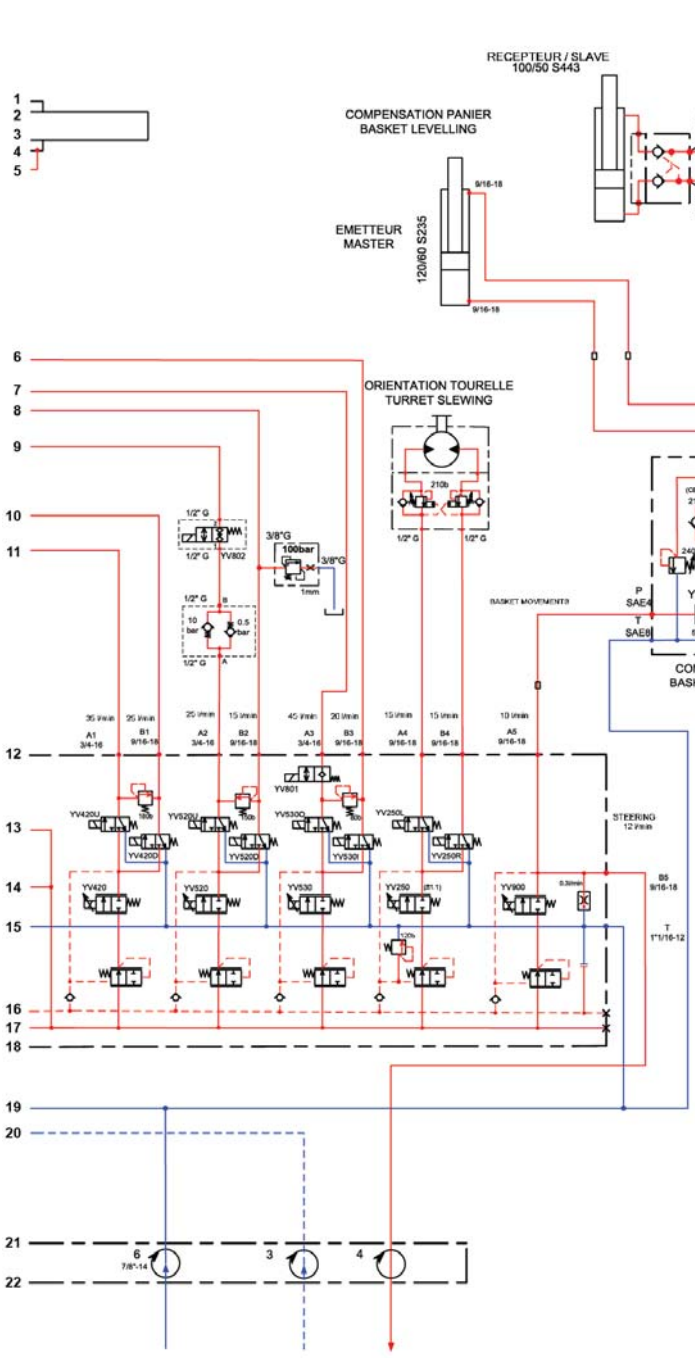
LEVELING	ACTUATED VALVES		
Lifting	YV800	YV900	YV720U
Lowering	YV800	YV900	YV720D

STEERING	ACTUATED VALVES			
Right	YV800	YV900	YV105	YV150R
Left	YV800	YV900	YV105	YV150L

Lower part-Sheet 1 - HA26 RTJ PRO - HA26 RTJ PRO SW - HA80 RTJ PRO - 4000571610H - 1/2



Lower part-Sheet 1 - HA26 RTJ PRO - HA26 RTJ PRO SW - HA80 RTJ PRO - 4000571610H - 2/2



ARM	ACTUATED VALVES		
Lifting	YV800	YV420	YV420U
Lowering	YV800	YV420	YV420D

TURN TABLE	ACTUATED VALVES		
Right hand rotation	YV800	YV250	YV250R
Left hand rotation	YV800	YV250	YV250L

BOOM	ACTUATED VALVES			
Lifting	YV800	YV520	YV520U	YV802
Lowering	YV800	YV520	YV520D	YV802

JIB	ACTUATED VALVES		
Lifting	YV800	YV900	YV620U
Lowering	YV800	YV900	YV620D

TELESCOPE	ACTUATED VALVES			
Extension	YV800	YV530	YV530O	YV801
Retraction	YV800	YV530	YV530I	

BASKET	ACTUATED VALVES		
Right hand rotation	YV800	YV900	YV750R
Left hand rotation	YV800	YV900	YV750L

LEVELING	ACTUATED VALVES		
Lifting	YV800	YV900	YV720U
Lowering	YV800	YV900	YV720D

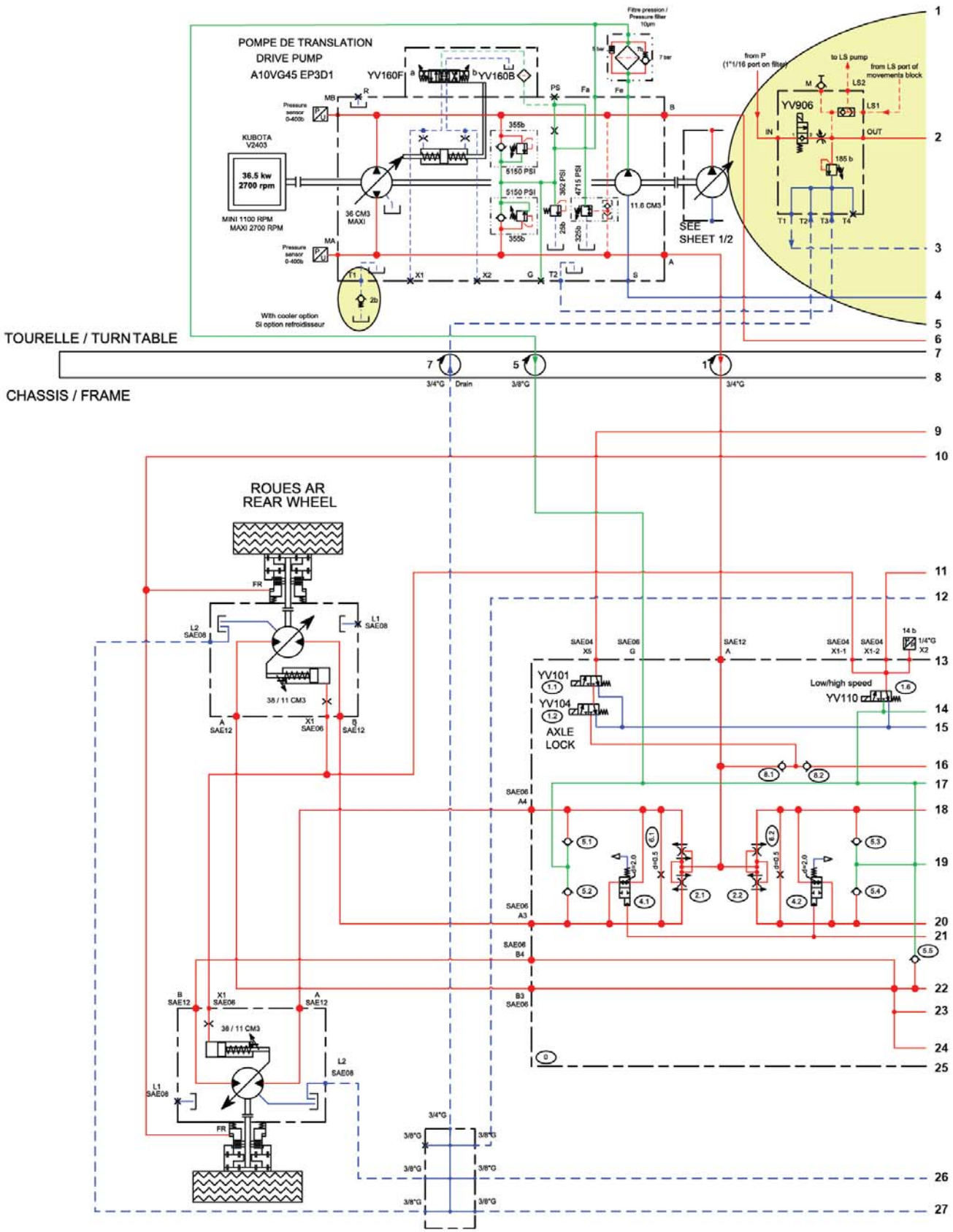
STEERING: 2WS	ACTUATED VALVES			
Right	YV800	YV900	YV105	YV150R
Left	YV800	YV900	YV105	YV150L

4WS STEERING SYNCHRO	ACTUATED VALVES					
Right	YV800	YV900	YV150R	YV107	YV102	YV105
Left	YV800	YV900	YV150L	YV108	YV102	YV105

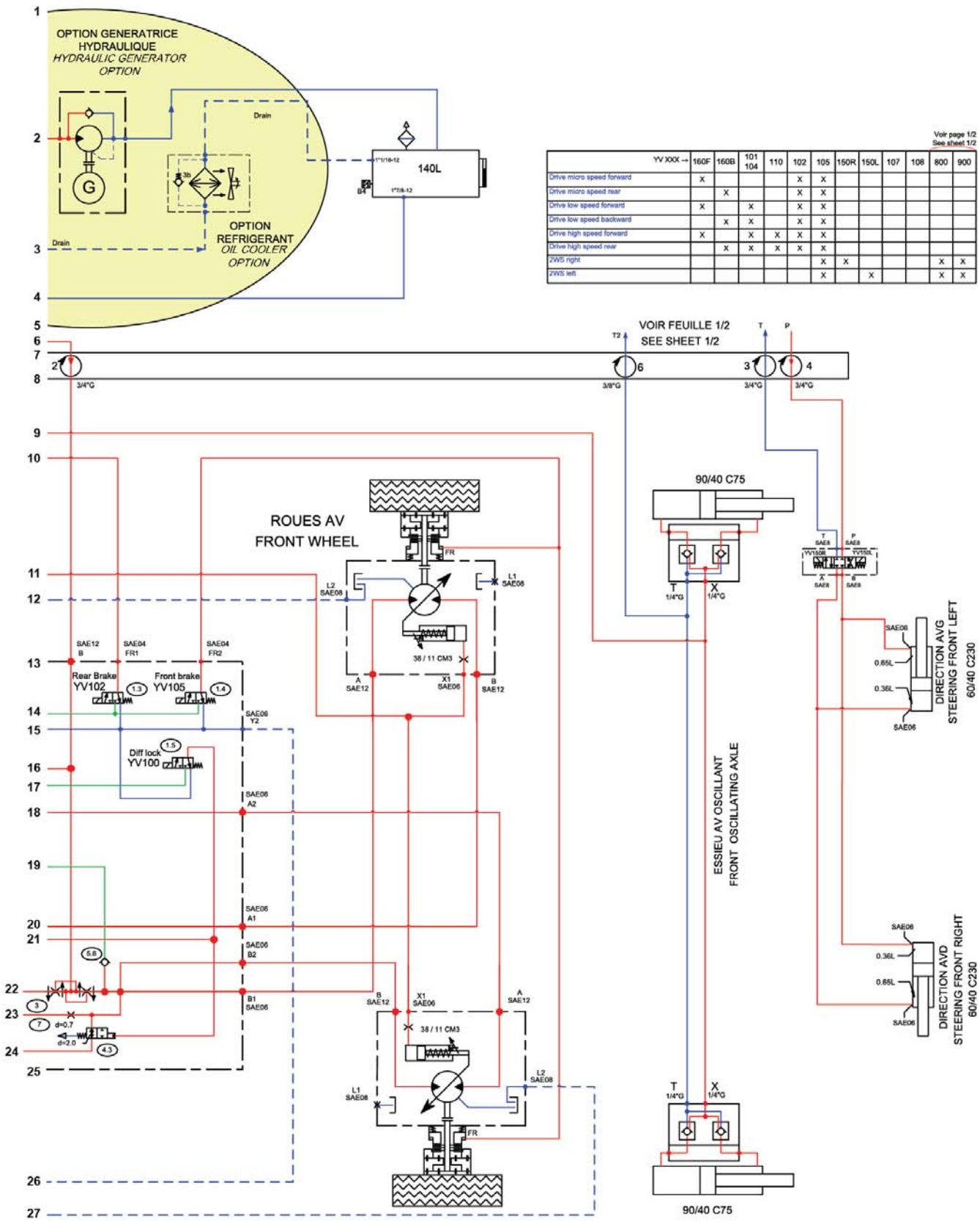
4WS STEERING CRAB	ACTUATED VALVES					
Right	YV800	YV900	YV150R	YV108	YV102	YV105
Left	YV800	YV900	YV150L	YV107	YV102	YV105

Valves en rouge: voir feuille 2/2
Valves in red: see sheet 2/2

Upper section-Sheet 2 - HA26 RTJ O - HA26 RTJ O SW - HA80 RTJ O - 4000560890H - 1/2



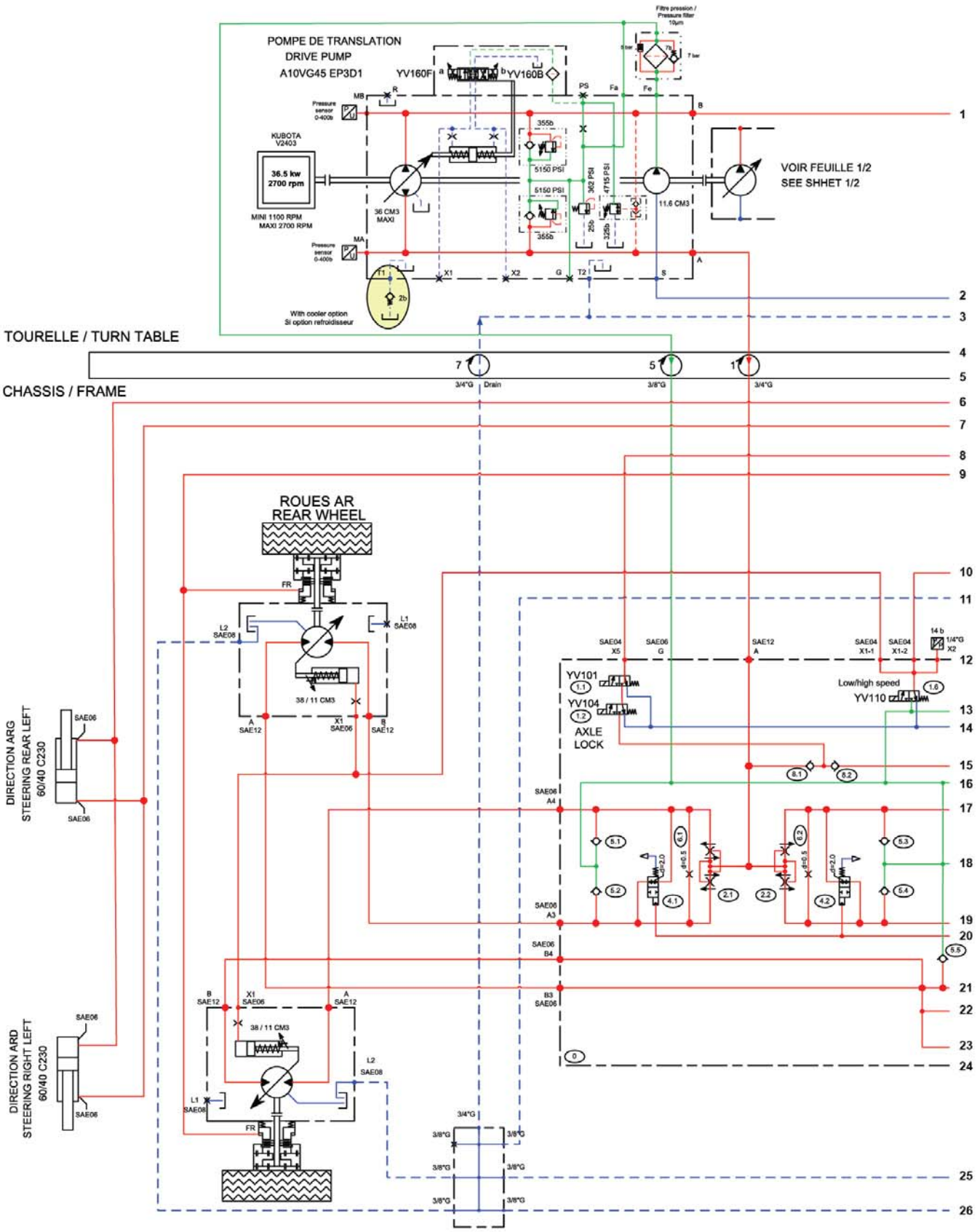
Upper section-Sheet 2 - HA26 RTJ O - HA26 RTJ O SW - HA80 RTJ O - 4000560890H - 2/2



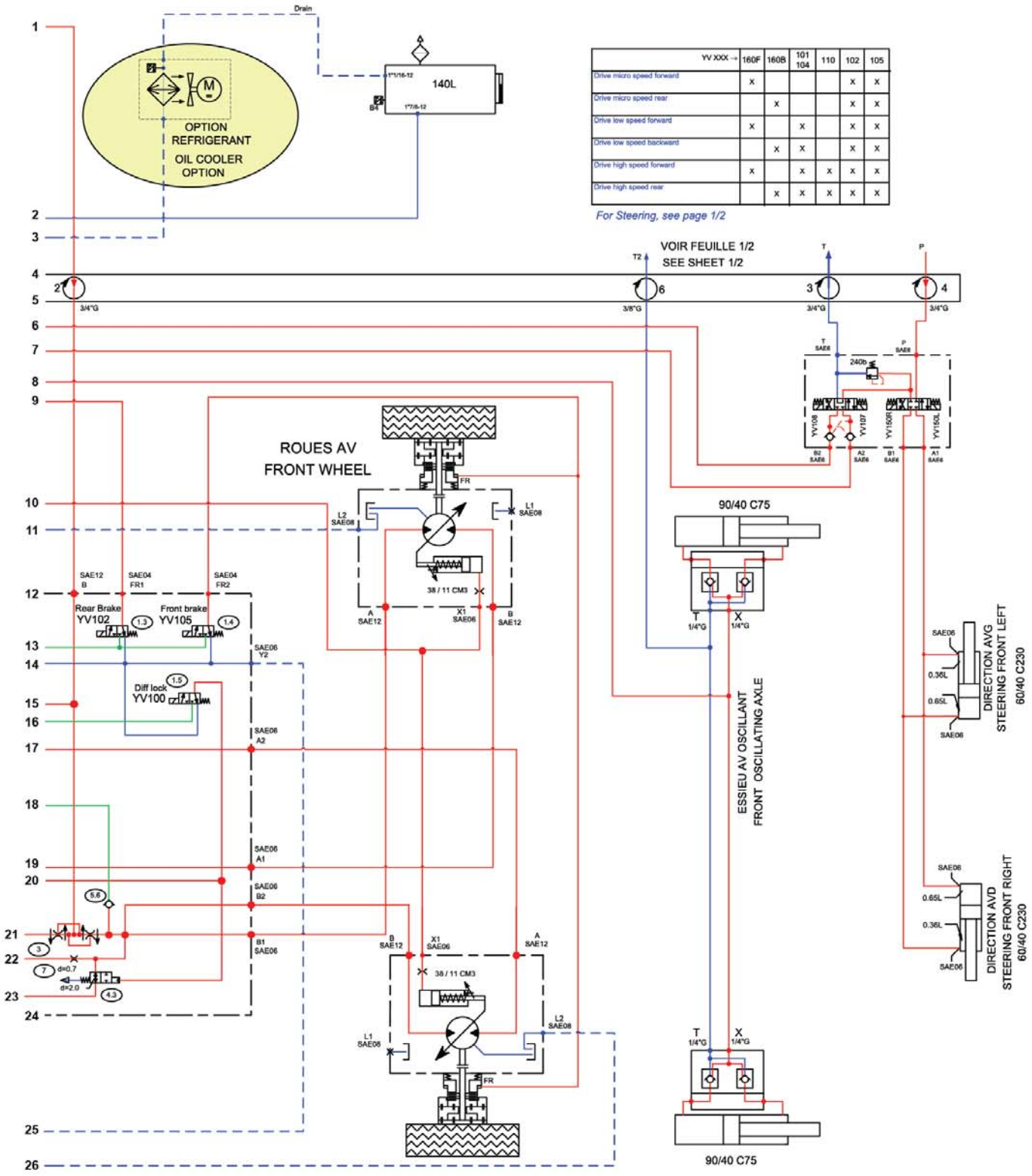
Voir page 1/2
See sheet 1/2

YV XXX →	160F	160B	101 104	110	102	105	150R	150L	107	108	800	900
Drive micro speed forward	X				X	X						
Drive micro speed rear		X			X	X						
Drive low speed forward	X		X		X	X						
Drive low speed backward		X	X		X	X						
Drive high speed forward	X		X	X	X	X						
Drive high speed rear		X	X	X	X	X						
2WS right						X	X				X	X
2WS left						X		X			X	X

Upper section-Sheet 2 - HA26 RTJ PRO - HA26 RTJ PRO SW - HA80 RTJ PRO - 4000571610H - 1/2



Upper section-Sheet 2 - HA26 RTJ PRO - HA26 RTJ PRO SW - HA80 RTJ PRO - 4000571610H - 2/2



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