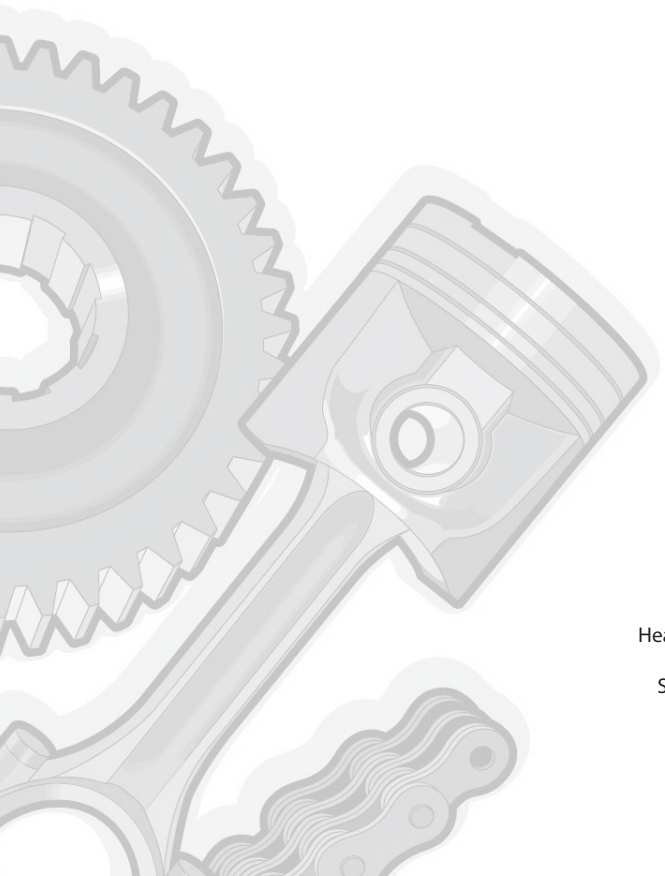
MANITOU

HANDLING YOUR WORLD

REPAIR MANUAL
MANUEL DE RÉPARATION
REPARATURANLEITUNG
MANUAL DE REPARACIÓN
MANUALE RIPARAZIONE



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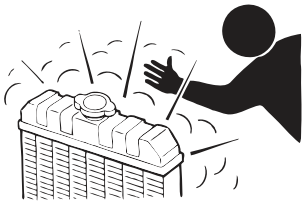
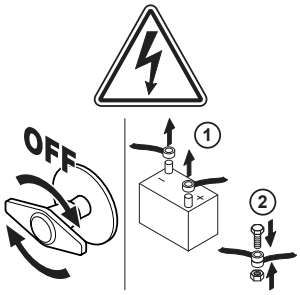
RULES FOR MAINTENANCE

Do not carry out any work on the machine unless you have followed a suitable training course and have the knowledge required for it.

Make sure you have taken into consideration all the indicator plates on the machine and in the instruction manual.

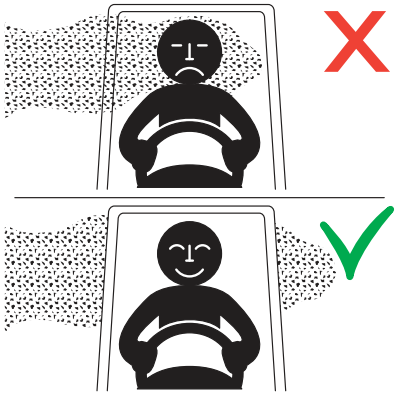


Be careful not to burn yourself when touching hot liquids or parts when operations have to be done before the machine has had time to cool down.



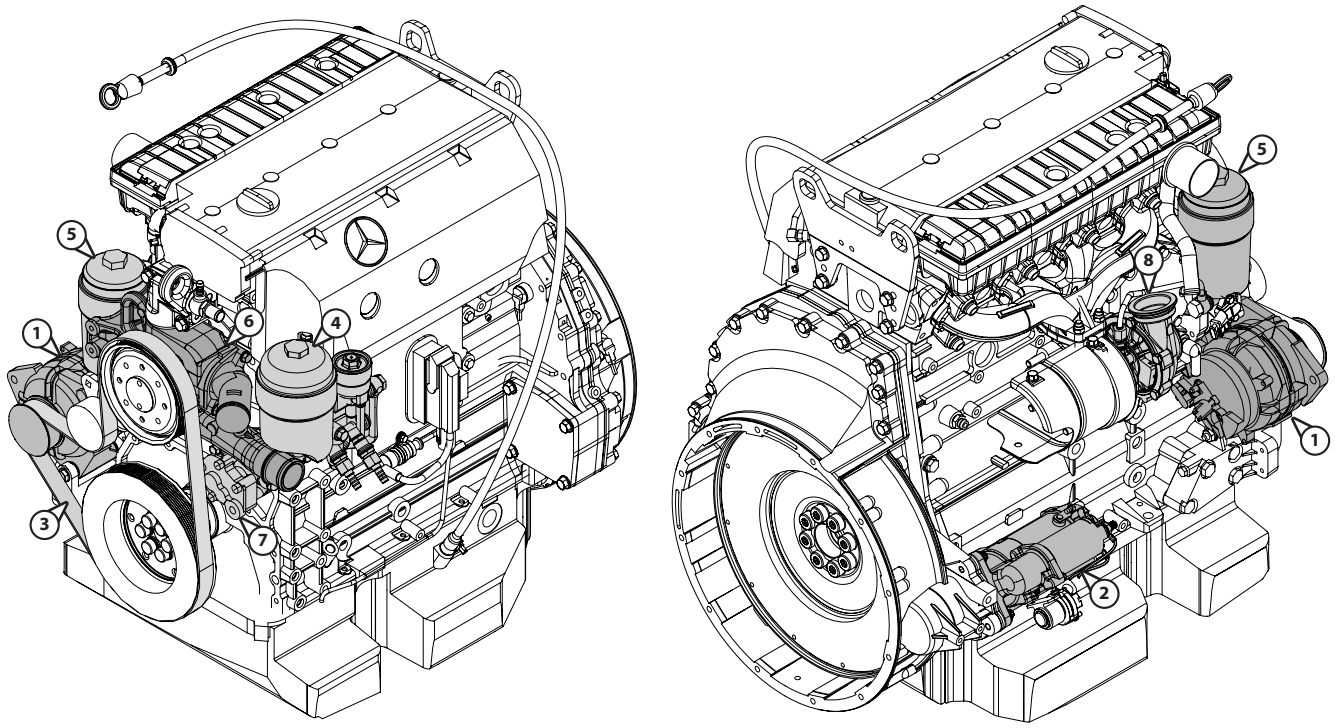
Before carrying out any operation on an electrically powered component, activate the battery cut-off.
If the telehandler does not have a battery isolating switch, disconnect the battery terminals then gather them.

Before carrying out any welding operations, think of disconnecting computers.



A machine operating in a contaminated environment should be specifically equipped. Moreover, local safety notices deal with maintenance and repair work on such machines.

ENGINE COMPONENTS



Legend:

1 - Alternator
2 - Starter motor
3 - Alternator belt
4 - Fuel filter
5 - Oil filter
6 - Engine cooling water pump
7 - Fuel pump
8 - Turbocompressor

GENERAL INFORMATION

Mark all the hydraulic pipes and electrical connections with a marker pen, before disassembling, to ensure correct positioning in the reassembly phase.

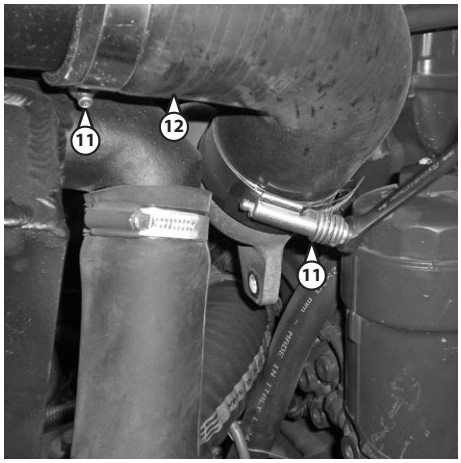
Plug all the hydraulic pipes and orifices to prevent impurities from contaminating the hydraulic circuit.

PREPARATION AND SAFETY INSTRUCTIONS

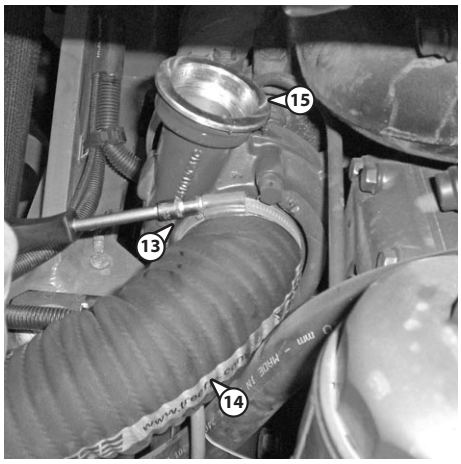
Deactivate the ignition key and disconnect the negative pole from the battery; wait for the engine components to cool down.

Specific tools:
– Crane for lifting (5000 kg. minimum).
– Hydraulic jack.

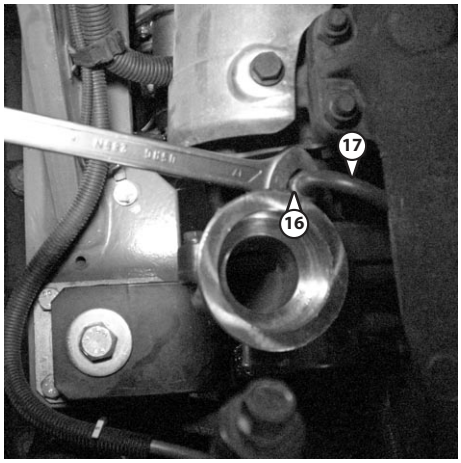
Slacken the clamp (Ref. 9) and remove the hose (Ref. 10).



Slacken the two clamps (Ref. 11) and remove the suction hose (Ref. 12) from the air radiator.



Slacken the clamp (Ref. 13) and remove the suction hose (Ref. 14) from the turbocompressor (Ref. 15).

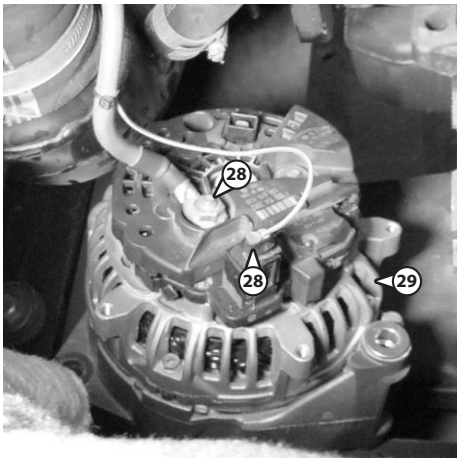


Unscrew the fitting (Ref. 16) and remove the lubrication delivery tube (Ref. 17) from the turbocompressor.

Disconnect the pipes (Ref. 23) for the fuel filter.

Slacken the screws (Ref. 24) and remove the guard (Ref. 25) from the engine.

Disconnect the plug (Ref. 26) from the engine control unit (Ref. 27).

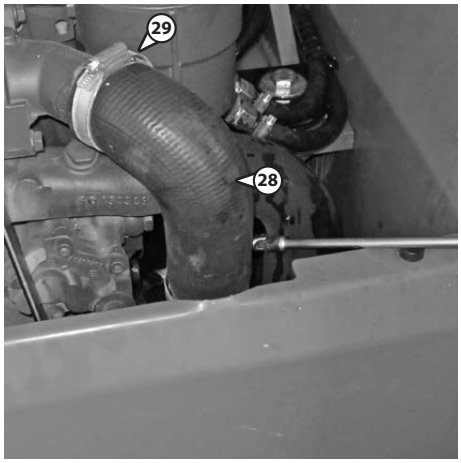


Disconnect all the electrical connections (Ref. 28) from the alternator (Ref. 29).

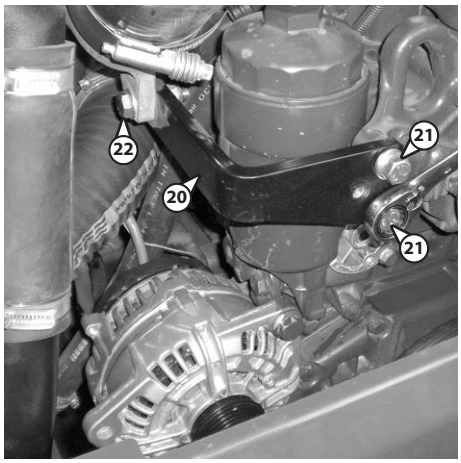
Connect the plug (Ref. 23) on the engine control unit (Ref. 24).

Refit the guard (Ref. 25) on the engine by means of the screws (Ref. 26).

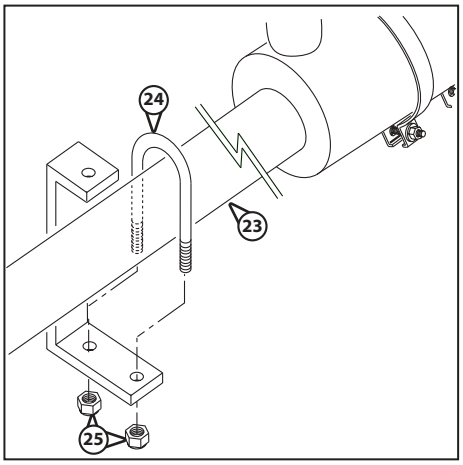
Reconnect the pipes (Ref. 27) on the fuel filter.



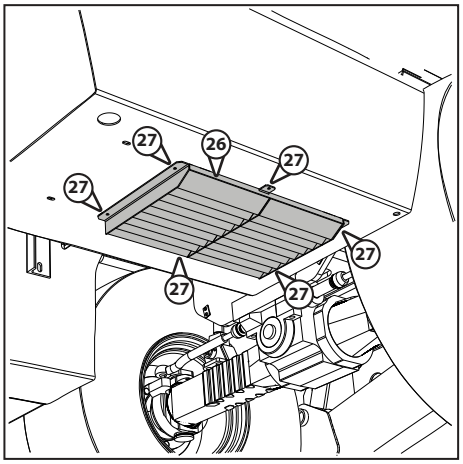
Reconnect the lower hose (Ref. 28) on the water pump and block by tightening the clamps (Ref. 29).



Refit the bracket (Ref. 20) on the air unit by means of the screws (Ref. 21 and 22).

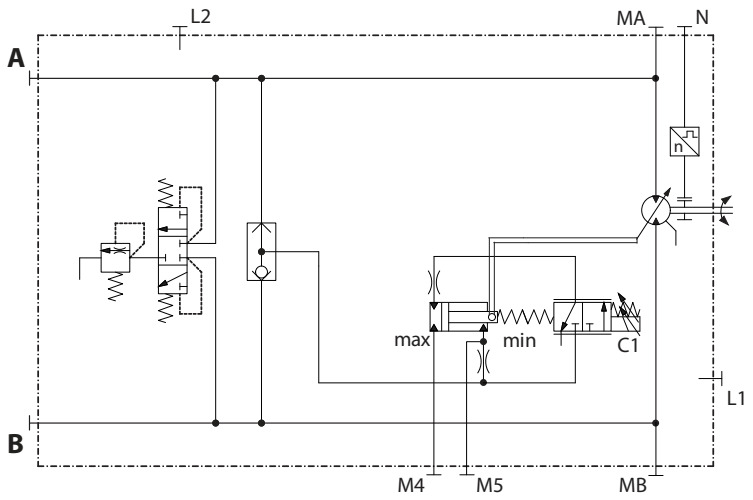


Refit the air suction pipe (Ref. 23) locking it by means of the brackets (Ref. 24) and the two nuts (Ref. 25).



Refit the lower guard (Ref. 26) by means of the six screws (Ref. 27).

HYDRAULIC CIRCUIT

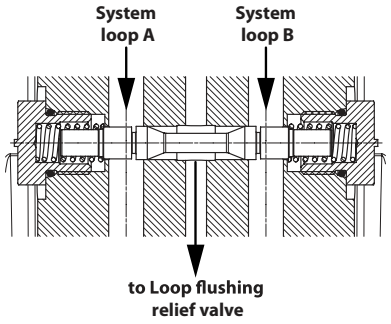


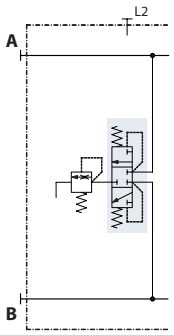
Ports:

A , B	= Main pressure lines
L1 , L2	= Drain lines
MA , MB	= Gage port system pressure for A and B
M4 , M5	= Gage porto servo pressure
N	= Speed sensor

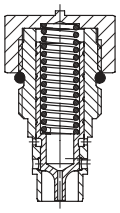
SWITCHING VALVE

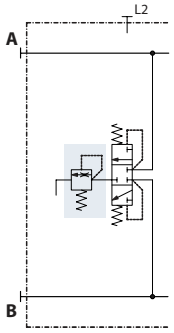
LOOP FLUSHING SHUTTLE SPOOL



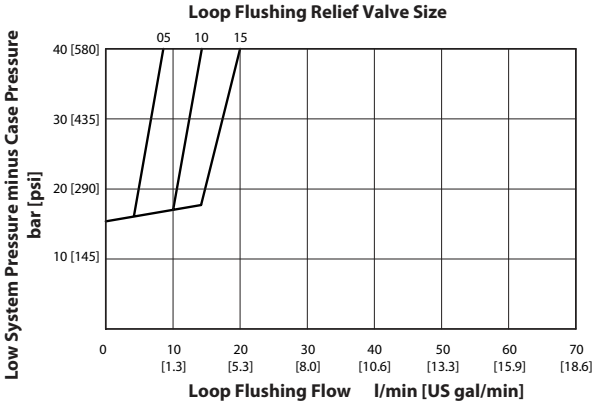


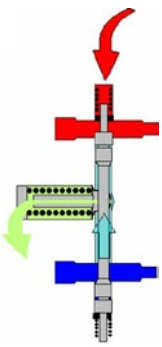
LOOP FLUSHING RELIEF VALVE

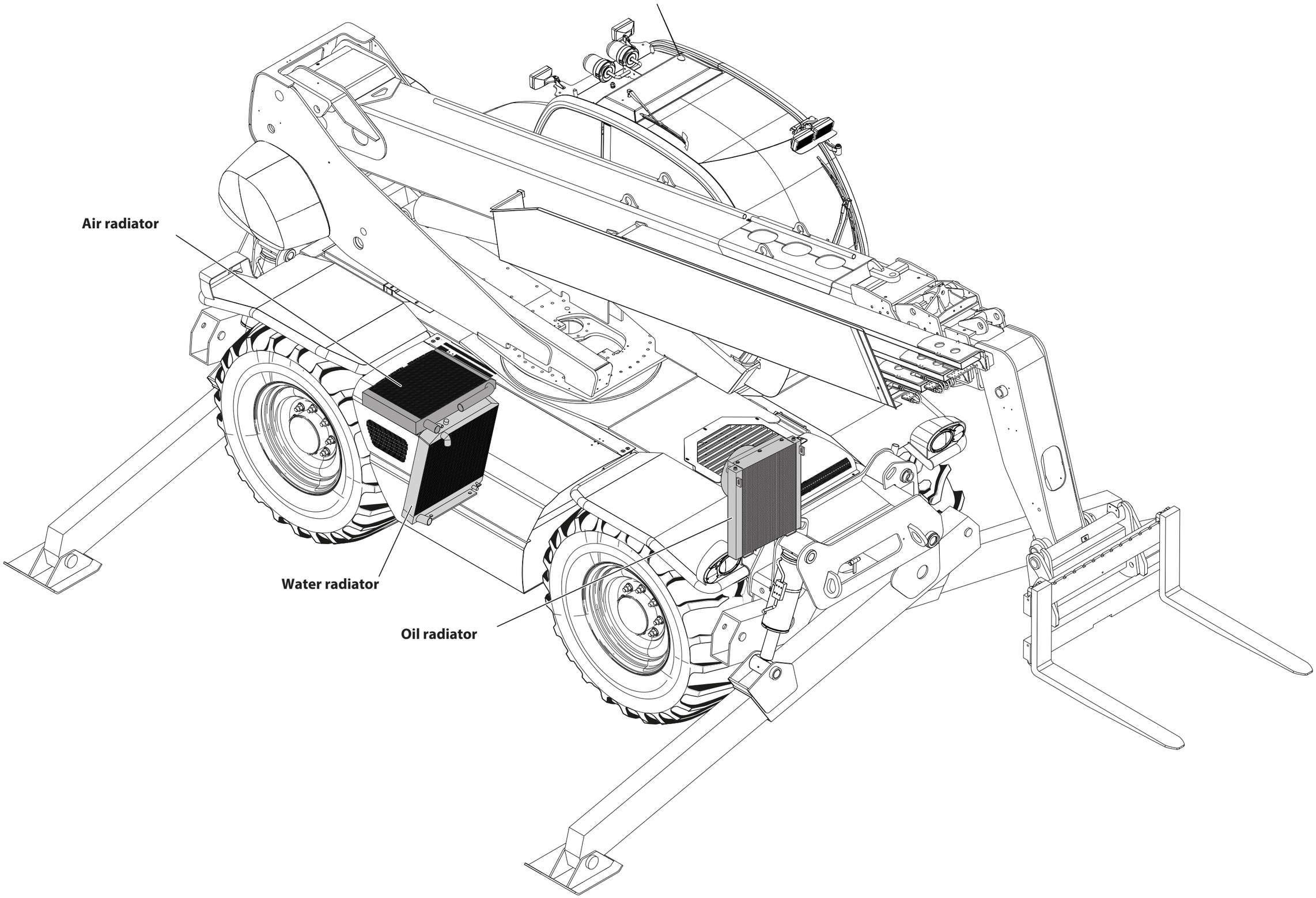


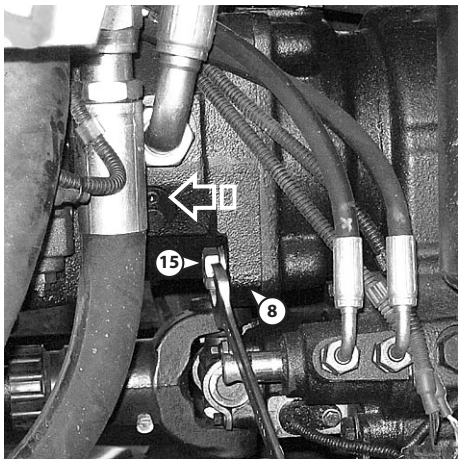


Loop flushing relief valve





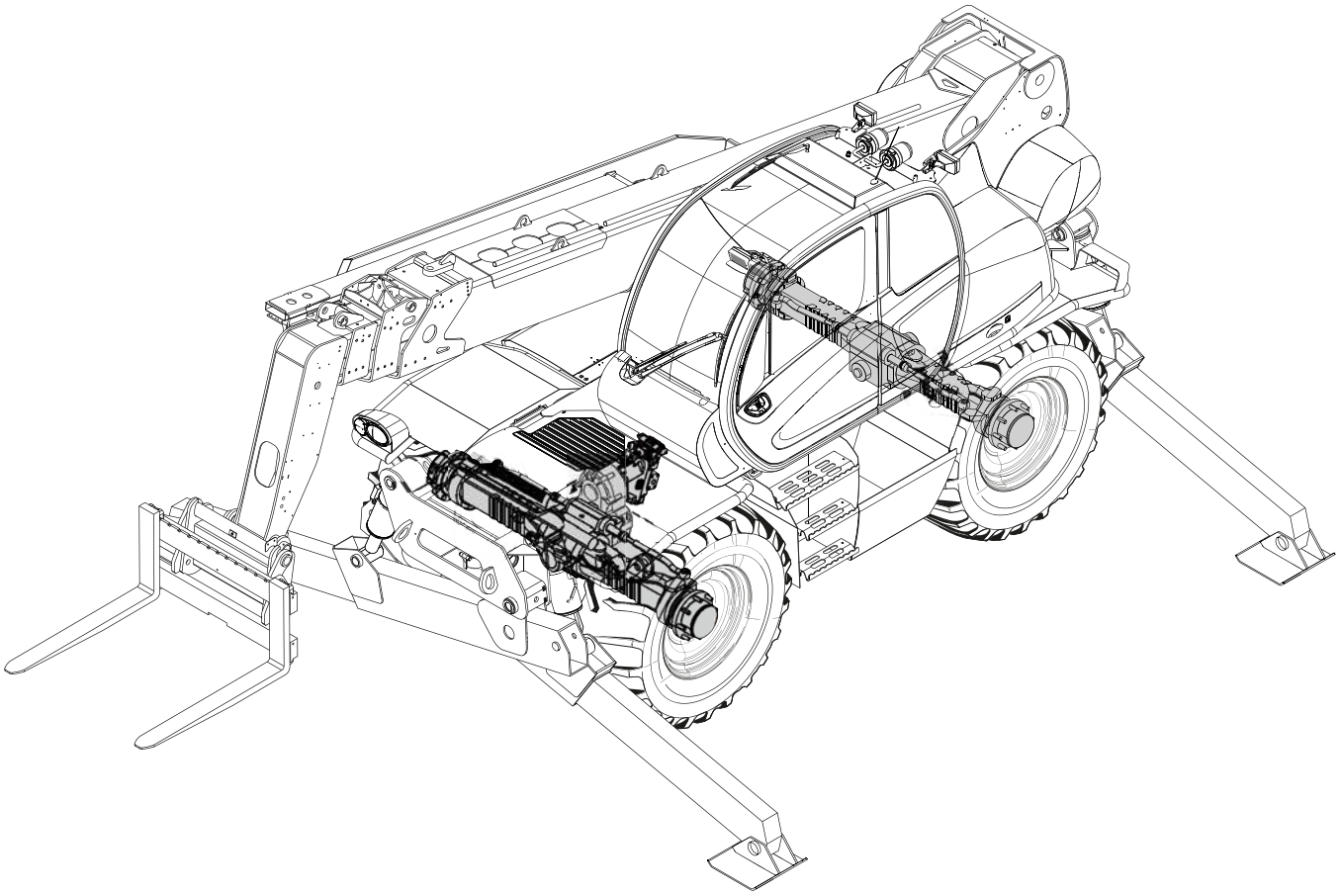

Air radiator
Water radiator
Oil radiator



Slacken the screws (Ref. 15) which block the hydrostatic motor (Ref. 8)
on the gearbox.

Position a trolley under the motor (Ref. 8) and remove it from the front axle reducer so that it comes to rest on the trolley. Remove it from under the vehicle.

REINSERTING THE FRONT AND REAR AXLES



GENERAL INFORMATION

The sequence for disassembly operations must be followed to access the various components.

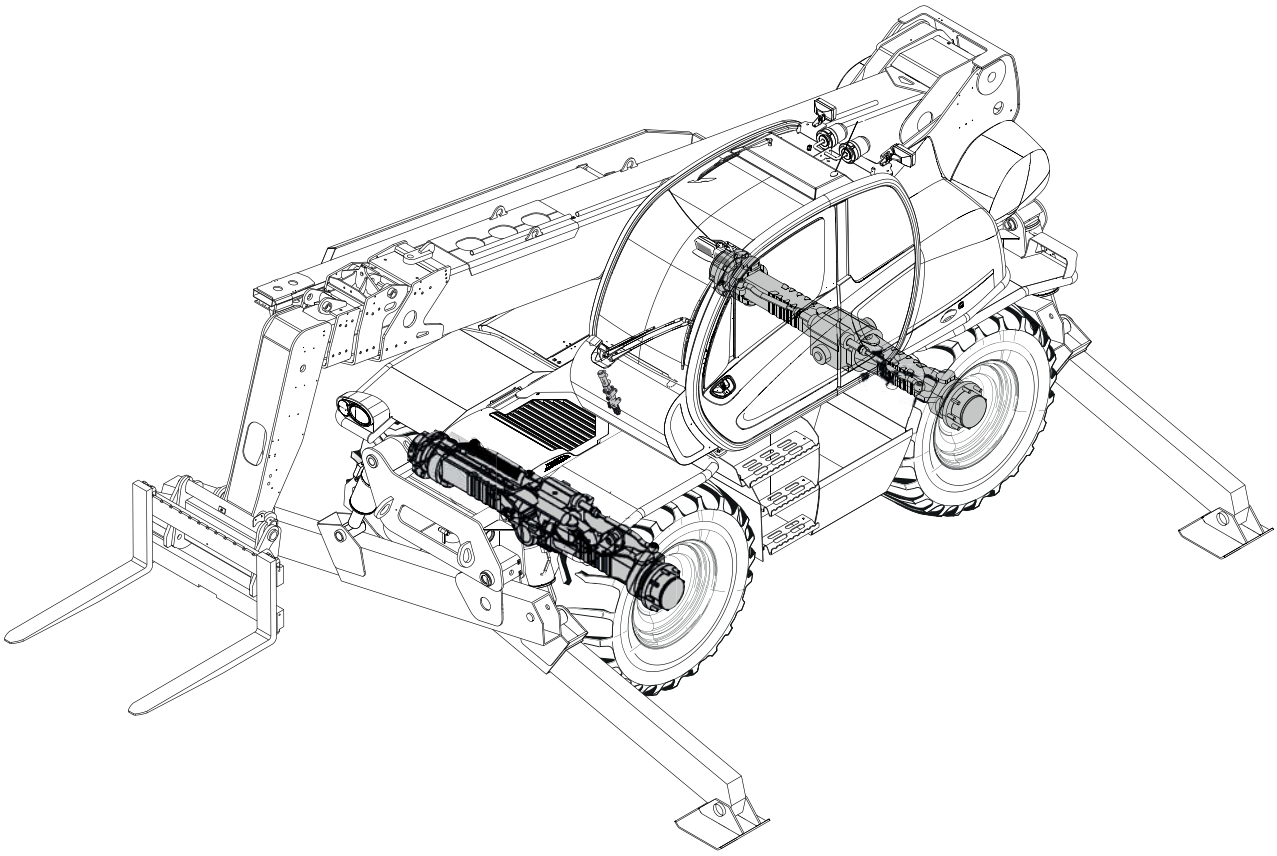
Reposition all the pipes and connections correctly according to the markings made with a marker pen during the disassembly.

PREPARATION AND SAFETY INSTRUCTIONS

Park the vehicle on horizontal ground and level it (chassis parallel to front axle).
Rest the stabilizers on the ground to ensure utmost stability and safety, bringing them to a height necessary to remove the wheels and switch off the I.C. engine.

Specific tools:
– Crane for lifting (5000 kg. minimum).

BLEEDING THE BRAKES AND ADJUSTING THE INCHING



PREPARATION AND SAFETY INSTRUCTIONS

Park the vehicle on a horizontal surface and switch off the I.C. engine.

Specific tools:
– Bleeding device.

HYDRAULIC BRAKE VENTING VALVE

Venting valve complete with components necessary for venting the brakes hydraulic systems for all Manitou products.

MANITOU reference

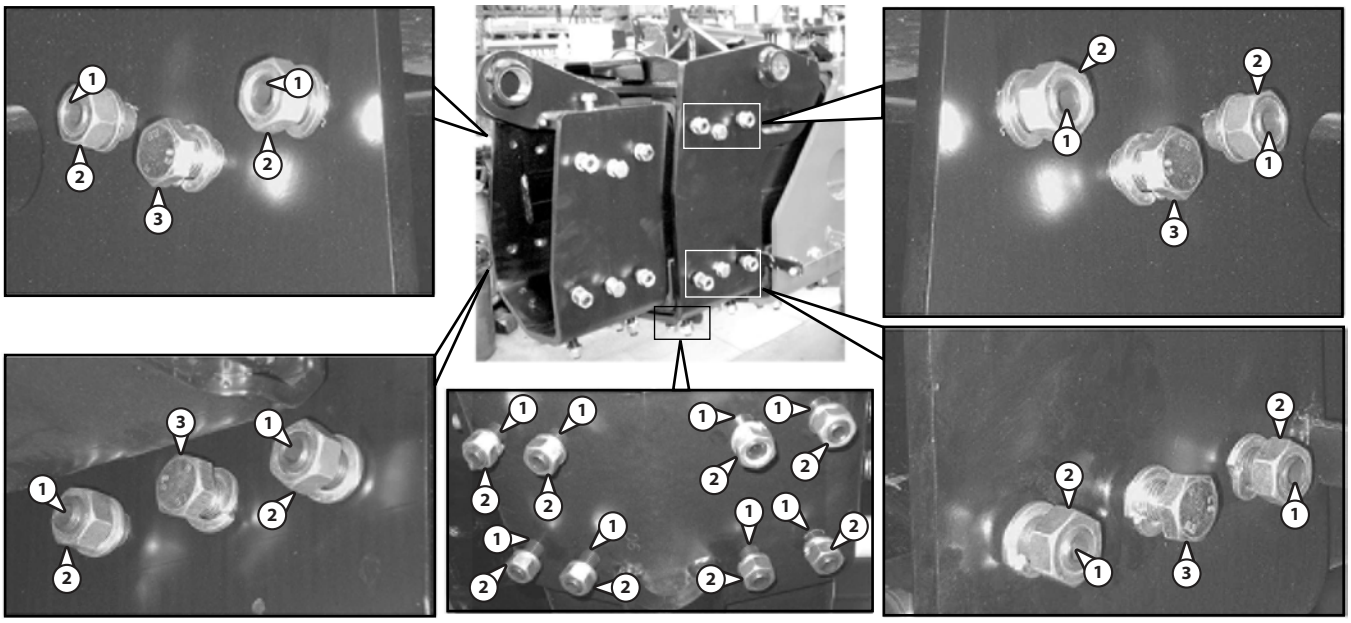
Hydraulic brake venting valve 554019

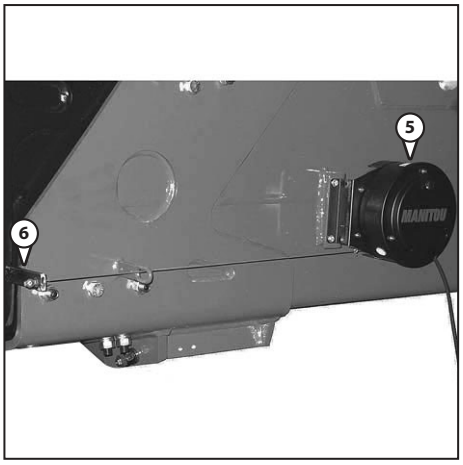
Spare parts:
- Maximum pressure gauge 719980
- Minimum pressure gauge 719981
- Diaphragm 661913
- Brake tube 661914

ADJUSTING THE II EXTENSION BOOM SLIDING BLOCKS

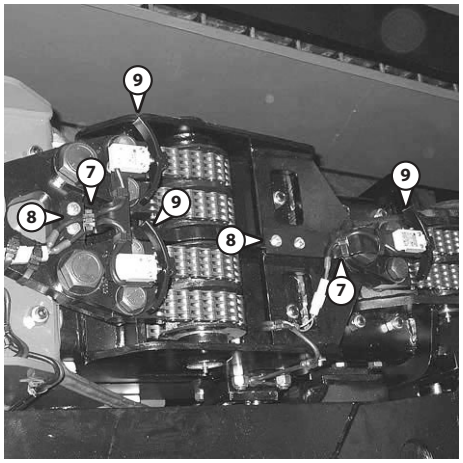
From the rear of the II extension boom, to the front of the I extension boom, tighten the adjuster grub screws (Ref. 1) all the way and then slacken these anticlockwise through half a turn before locking the side nuts (Ref. 2).
To secure the sliding blocks to the brackets, fit the grub screws (Ref. 1) without locking them).
Lock the nuts (Ref. 2) (keeping the screws steady) and the screws (Ref. 3) which fix the sliding blocks holder brackets on the outer booms on the side; use a tightening torque of 100 Nm.
Check to ensure the correct working of the boom by performing the extension and retraction operations.
If the boom is found to be jerky, slacken the screws (Ref. 1) through another half turn.
Make sure there is no oil leakage at the back of the boom (extension cylinder valve).

ATTENTION: the grub screws are sensitive to the slightest movement, therefore they must be tightened only until the play between the booms is eliminated.

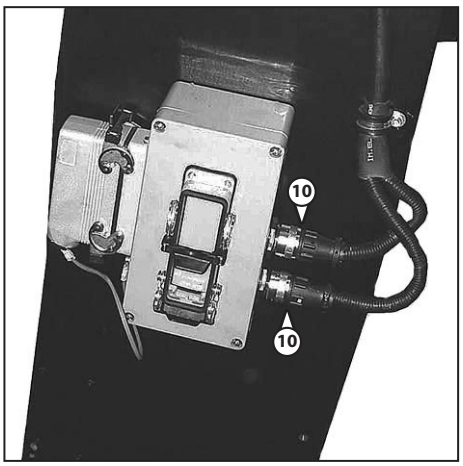




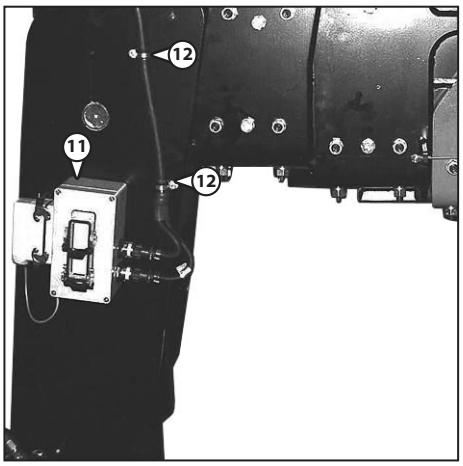
Remove the cable reel (Ref. 5) of the "M.S.S." with its bracket (Ref. 6) in the front part to the LH of the outer boom.



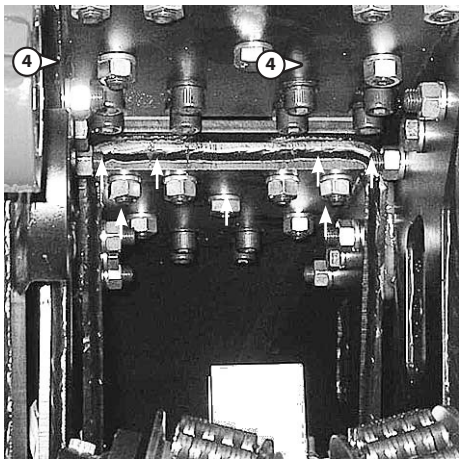
Disconnect the sealed wiring of the micro switches on the fittings of the chains in the upper front part of the boom and remove the clamps (Ref. 7).
Remove the brackets of the micro switches (Ref. 8) and their locators (Ref. 9), in the front upper part of the boom.



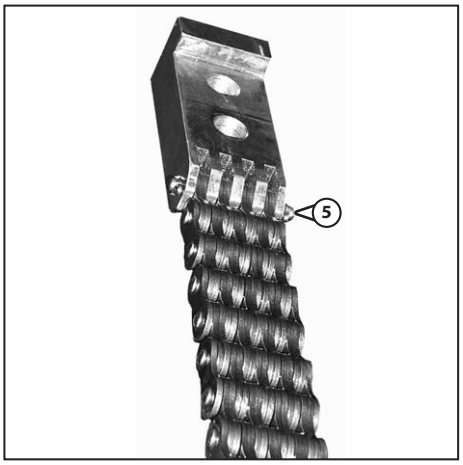
Open the box for the platform socket and disconnect the wiring (Ref. 10) from the socket.



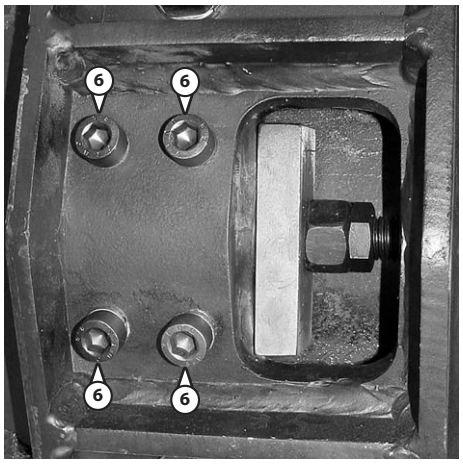
Extract the wiring from the box (Ref. 11) and free these from the clamps (Ref.12).



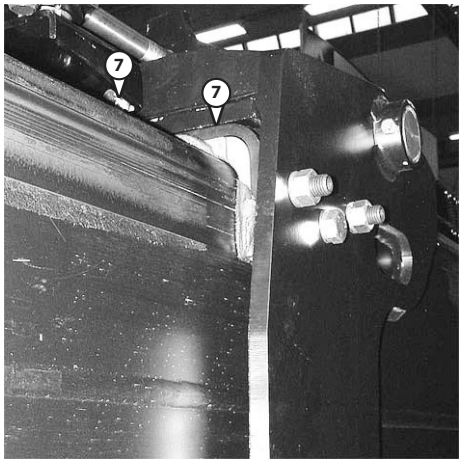
Remove the upper rear sliding blocks (Ref. 4) fixed to the II extension boom.



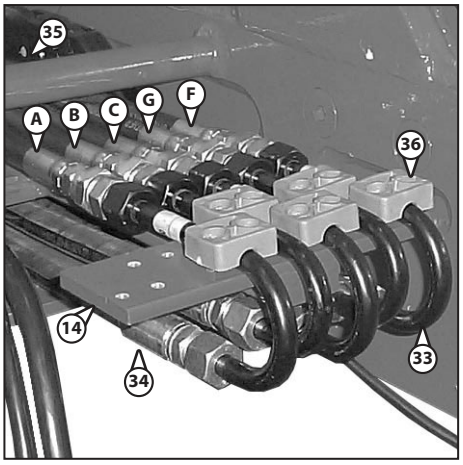
Remove the chain from the pulley seat (Ref. 5).



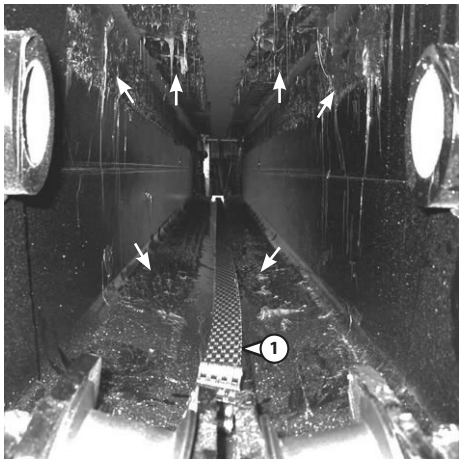
Remove the front fixing block of the III extension retraction chain by means of the screws (Ref. 6) and remove the chain by pulling it towards the quick-coupling.



Dismantle the front sliding blocks on the sides and top (Ref. 7) together with the shims fixed to the I extension boom.

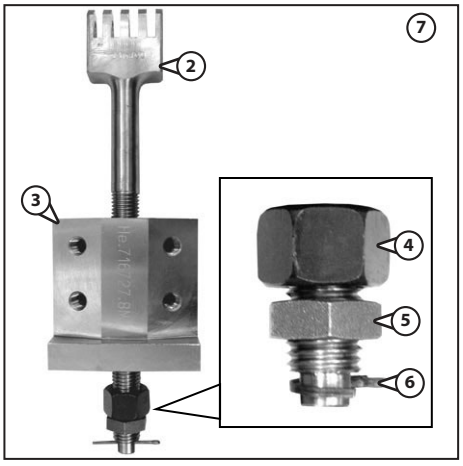


Connect the elbow unions (Ref. 33) to the tubes (Ref. 34) inside the tube (Ref. 14) and then the tubes (Ref. 35) inside the chain (Ref. 29) by following the sequence from inside the boom towards the outside, alternating the long and short connectors. Fix the connectors with the collars (Ref. 36) to the chain-holder tube (Ref. 14).
Secure the electric cables to the hydraulic pipes by means of the clamps in the passages between the chain-holder tubes and tube-holder chains.

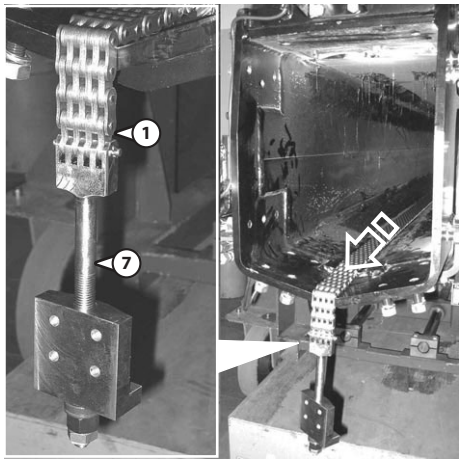


PREASSEMBLY OF THE I EXTENSION BOOM

Grease (see "Lubricants" Table in the Operation and Maintenance Manual) the inner walls of the I extension boom then stretch the chain (Ref. 1) for retraction of the III extension boom.

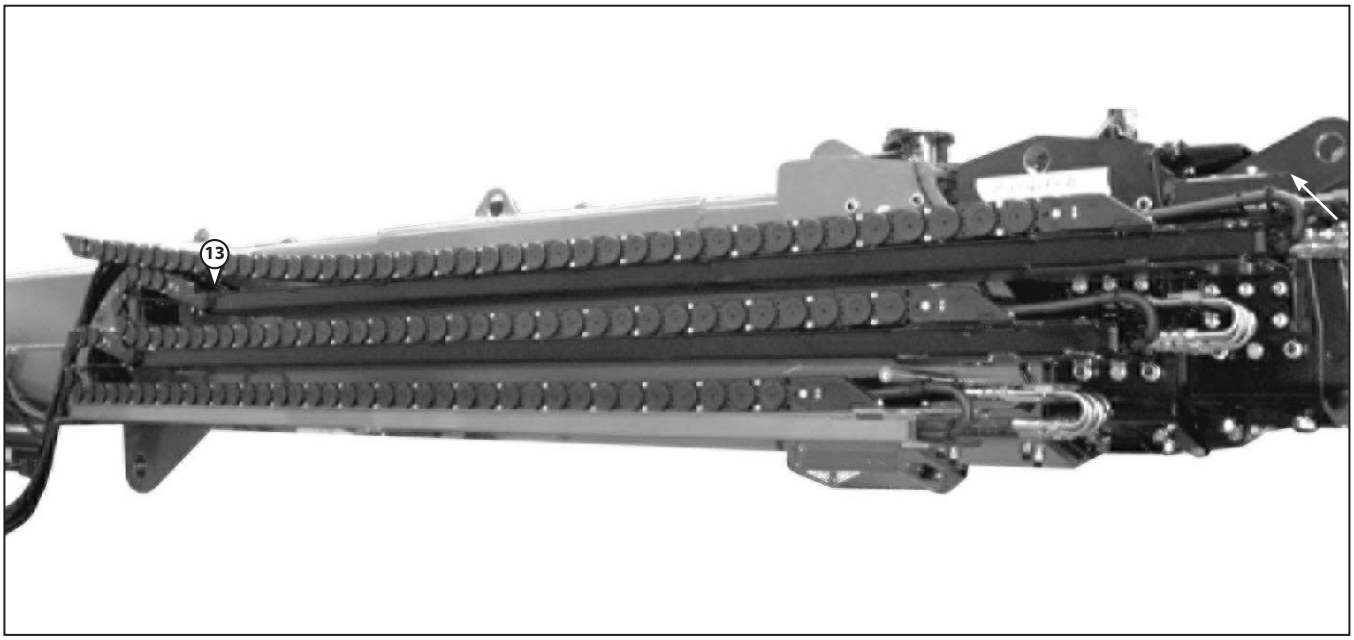


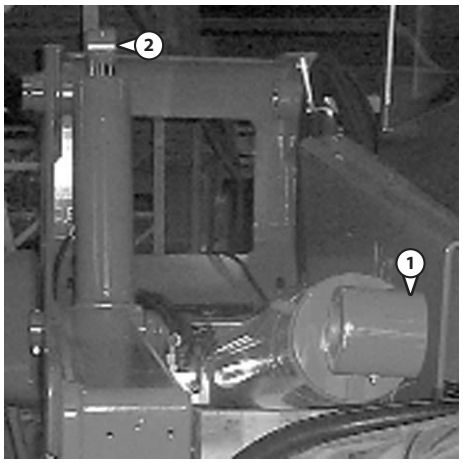
Preassemble the inner chain tie rod for retraction of III extension: fit the tierod with the built-in end connector (Ref. 2) in the fitting for the tierod (Ref. 3); screw a nut and lock nut (Ref. 4 and 5) on the tierod and then insert the split pin (Ref. 6).



Fit the preassembled tierod (Ref. 7) to the front end of the inner chain (Ref. 1), stretch the latter towards the front of the outer boom.

After having connected the tubes as shown earlier, insert the electric cables and hydraulic pipes of the I extension tube-holder chain, in the II extension tube.
Fix the tube-holder chain of the I extension (Ref.13) on the tubular element of the II extension by means of the screws meant for the purpose.



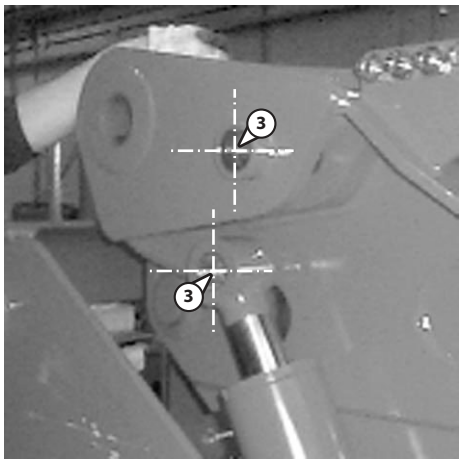


REINSERTING THE TELESCOPIC BOOM ON THE VEHICLE

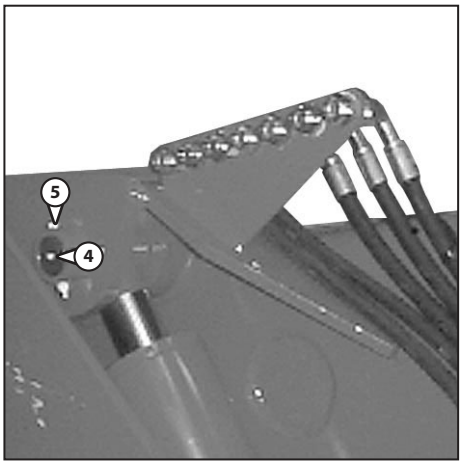
Set up the turret of the vehicle with the lift cylinder (Ref. 1) and compensation cylinder (Ref. 2) in the positions indicated.

With the help of an overhead crane or an elevator, hook up the boom in the eyelets concerned and position it on the vehicle in the seat provided in the turret.

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



Align the compensation cylinder rod eyelet with the corresponding bushing on the boom (Ref. 3).



Insert the compensation cylinder hinge pin (Ref. 4) in the boom and fit the stop screw (Ref. 5).

DIAGRAM 2 - STABILIZERS-LEVELLING-REAR AXLE BLOCK HYDRAULIC SYSTEM

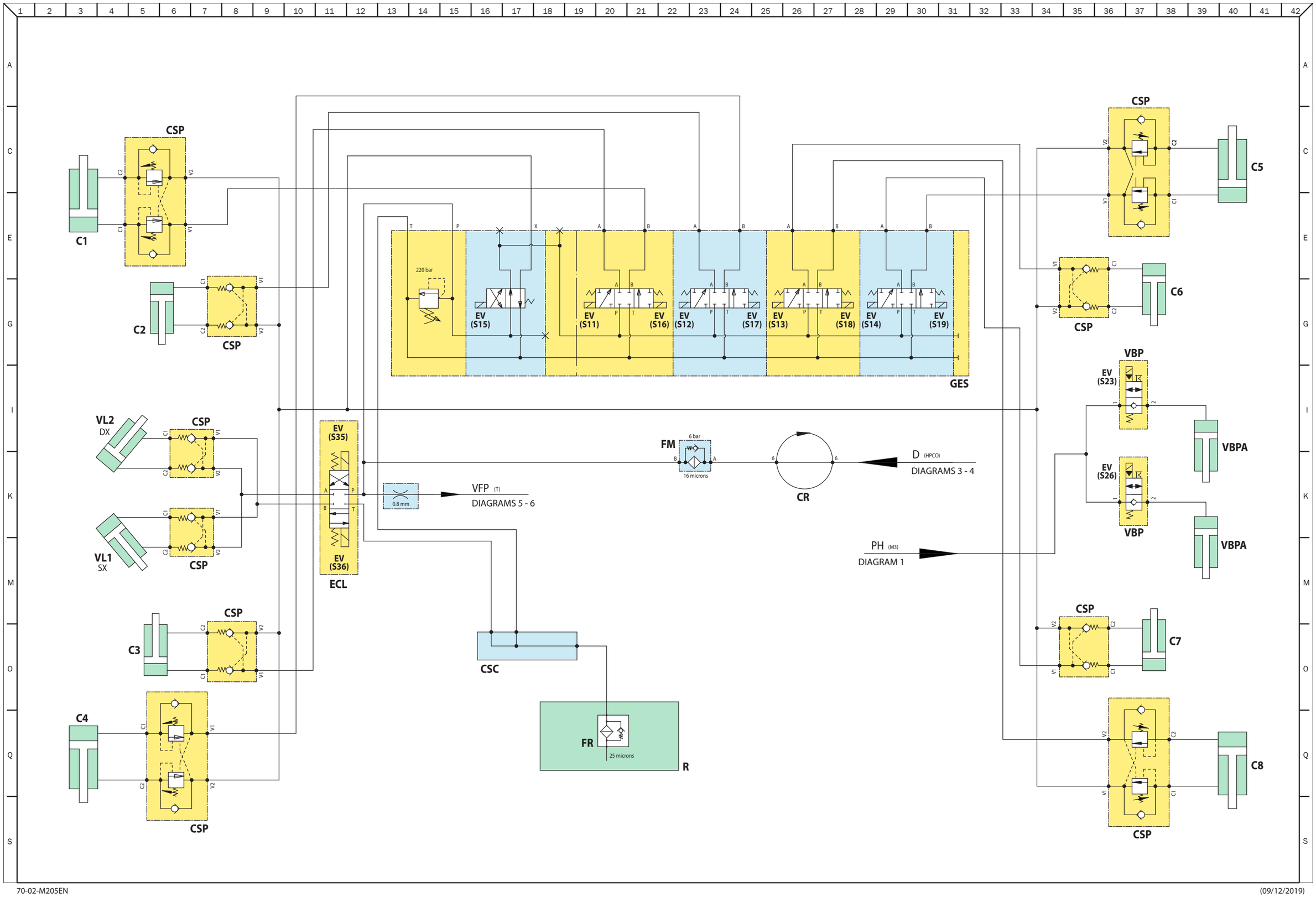
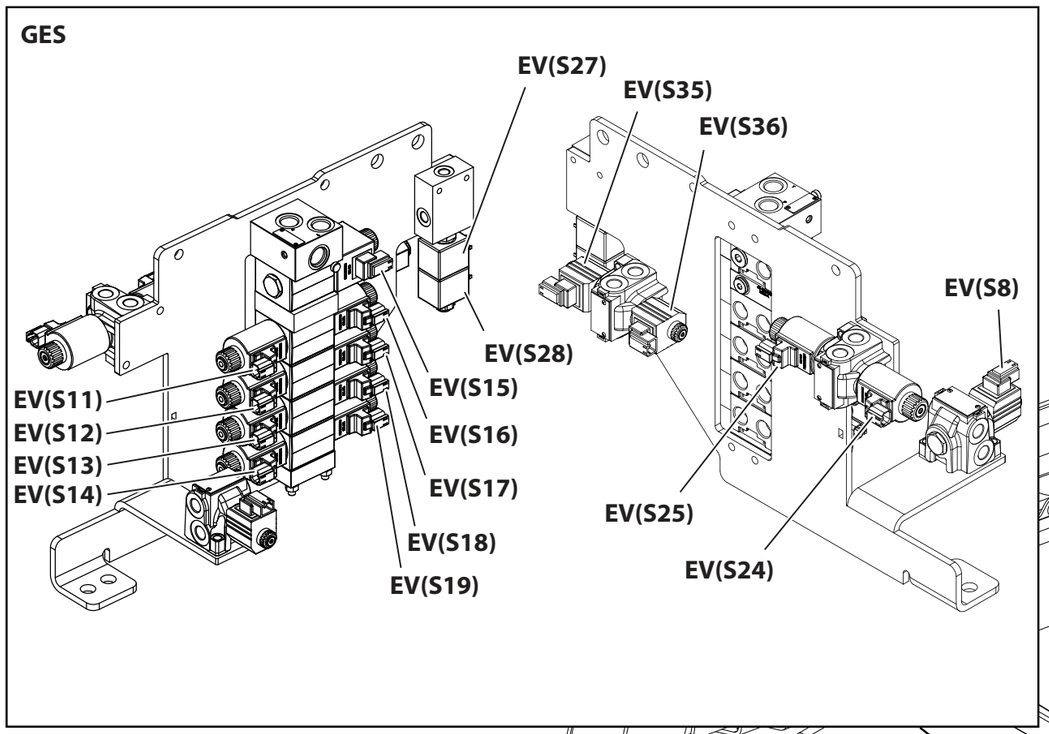
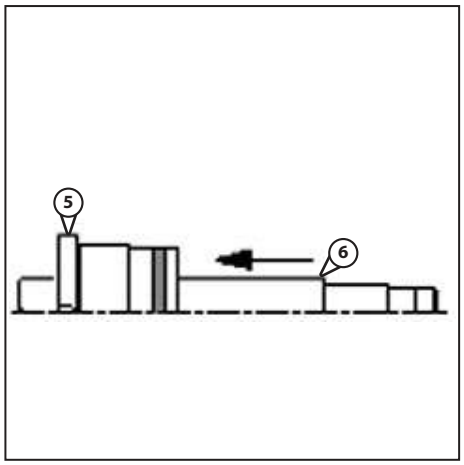


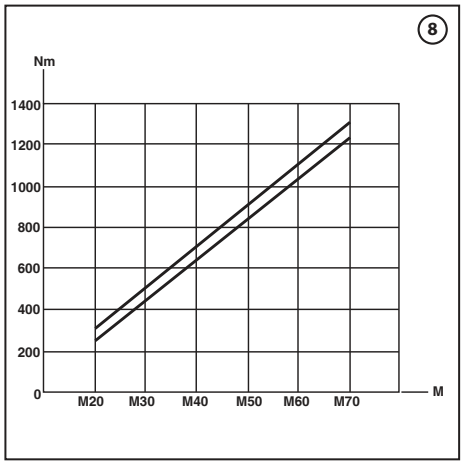
DIAGRAM 4 - POSITION OF HYDRAULIC COMPONENTS



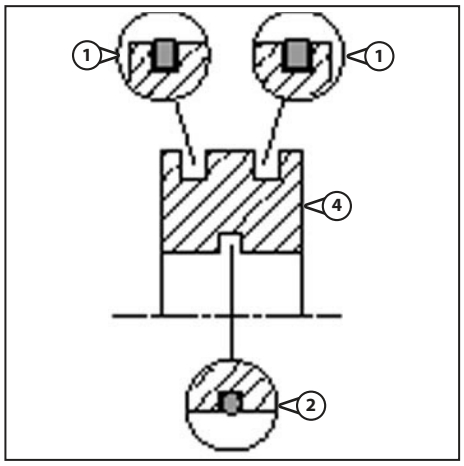


REASSEMBLY

Refit the ring nut (Ref. 5) on the rod (Ref. 6), refit the piston (Ref. 3) on the rod.



Screw and block the nut (Ref. 1) using a polygonal wrench and a torque wrench applying the torque indicated in the Table (Ref. 8) or, depending on the model, screw the piston back (Ref. 3) on using a pin wrench (see tightening torque (Ref. 8) and lock with a screw pin (Ref. 2).
Note: Fit the screw pin after applying Loctite 243; see the "Application of threadlocker" chapter.
Tightening torque for screw = 20 Nm.
Tap with a chisel to push back the metal on the screw.

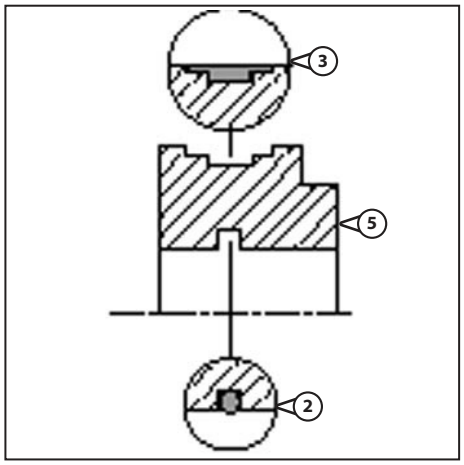


GASKETS FOR THE PISTON

Note: Do not use sharp tools (screwdrivers, blades, etc.) for assembling and removing the gaskets, for any reason whatsoever. Work on clean work benches, free of shavings.

DISASSEMBLY

Remove the gaskets (Ref. 1-2-3) from the piston (Ref. 4 or 5).
Attention: avoid damaging the edges and grooves.

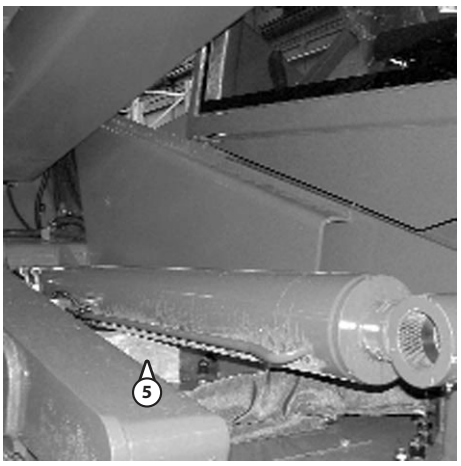


CHECK

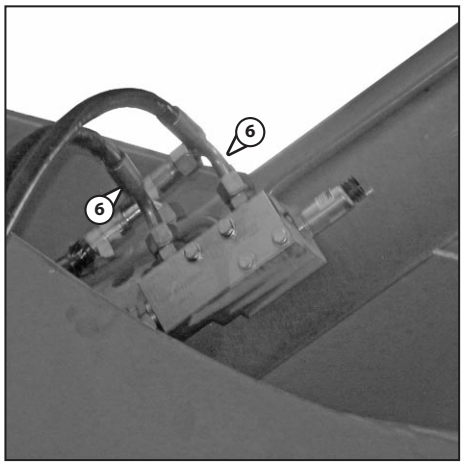
Remove the grease and clean the piston.
Check to make sure the grooves and the surfaces are smooth and free of scratches. The grooves must not contain foreign bodies.

REASSEMBLY

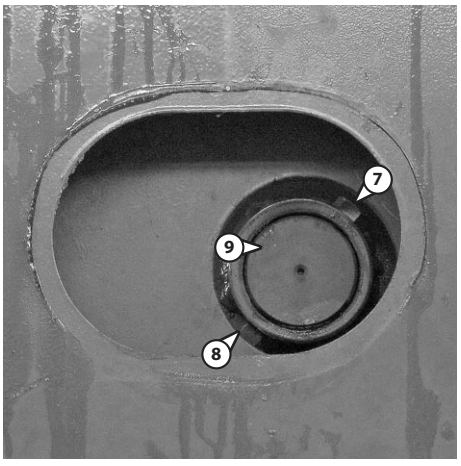
Position the gaskets on the piston (Ref. 4 or 5) according to the assembly sequence.
To fit the outer gaskets (Ref. 1 and 3), open these just enough to fit them into the grooves without breaking.
The inner gasket (Ref, 2) must be fitted manually.



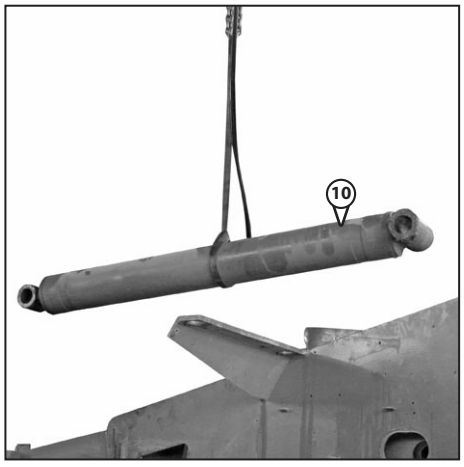
Place the lift cylinder on the turret, resting it on a wooden beam (Ref. 5) and retract the rod using the control in the cab.



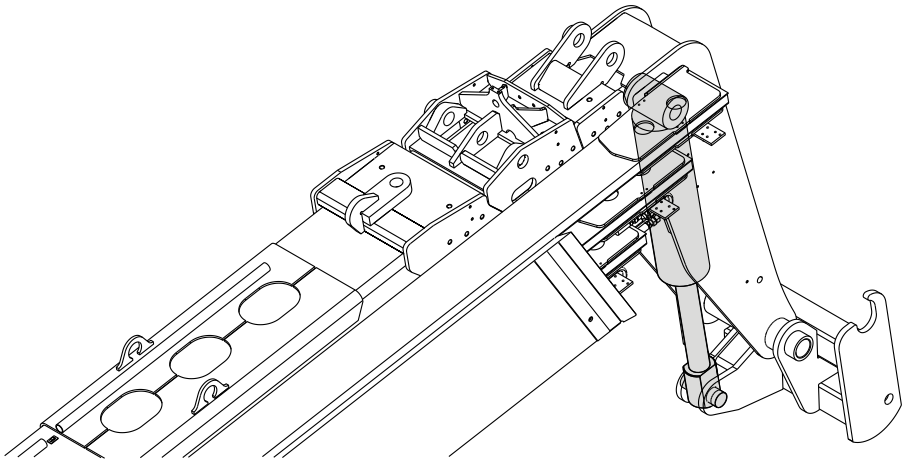
Disconnect the hydraulic pipes (Ref. 6) from the block valve of the cylinder.

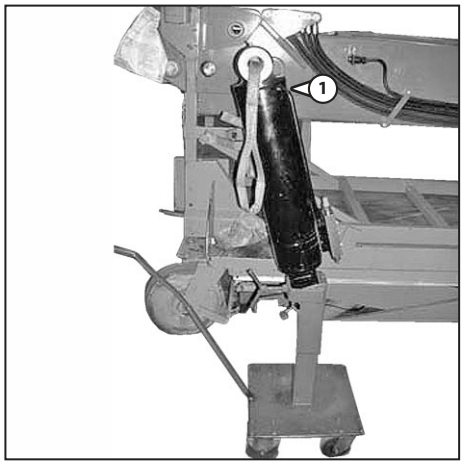


Slacken the screw (Ref. 7) and the nut (Ref. 8) and remove the pin (Ref. 9) locking the lift cylinder through the slot provided on the turret.



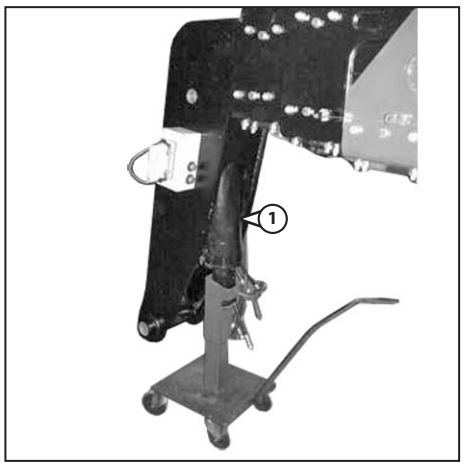
With the help of ropes and an overhead crane, remove the lift cylinder (Ref. 10) from the vehicle.



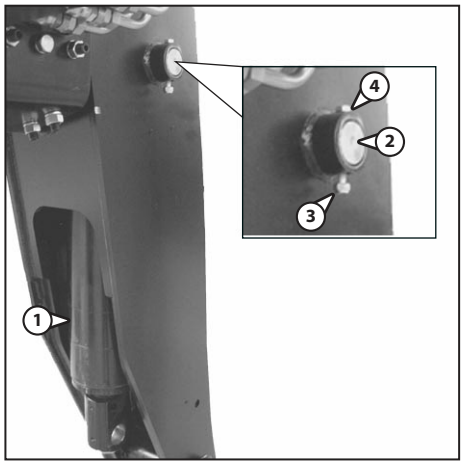


REINSERTING THE SLEWING CYLINDER

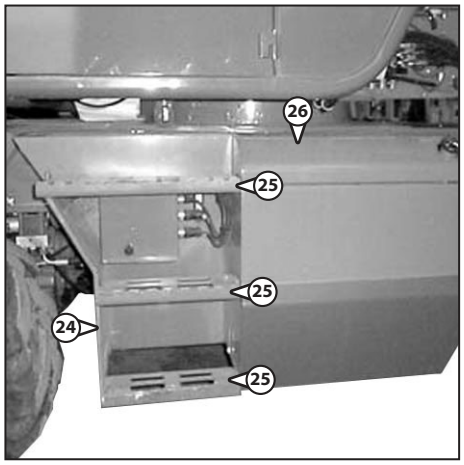
With the help of ropes and an overhead crane, lift the slewing cylinder (Ref. 1) and place it on a jack.



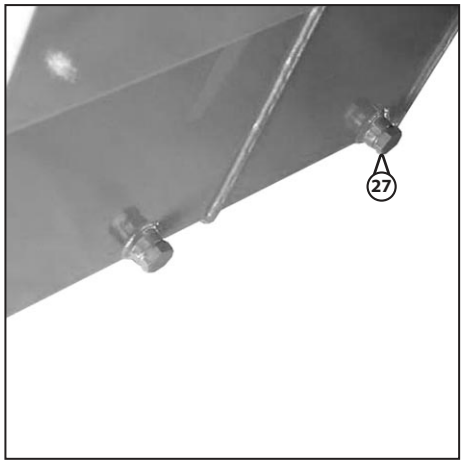
Position the bottom of the slewing cylinder (Ref. 1) on the top of the boom, aligned with the hole for the pin.



Insert the hinge pin (Ref. 2) for the slewing cylinder in the hole in the III extension boom.
Fit the screw (Ref. 3) and the locking nut (Ref. 4).



Refit the front guard (Ref. 24), refit the three steps (Ref. 25).
Refit the cover (Ref. 26).



Refit the drainage plug (Ref. 27)

Fill the tank with 210 litres of hydraulic fluid

VEHICLE ON STABILIZERS WITH PLATFORM

MOVEMENTS ALLOWED FROM PUSHBUTTON PANEL					
	BOOM WITHIN H=3m	BOOM WITHIN H=3m	BOOM MORE THAN H=3m	BOOM MORE THAN H=3m	NOTES
	BOOM RETRACTED	BOOM EXTENDED	BOOM RETRACTED	BOOM EXTENDED	
TURRET ROTATION	√	√	√	√	
SLEWING UPWARDS	√	√	√	√	
SLEWING DOWNWARDS	√	√	√	√	
BOOM ASCENT	√	√	√	√	
BOOM DESCENT	√	√	√	√	
BOOM RETRACTION	√	√	√	√	
BOOM EXTENSION	√	√	√	√	
OPTION 1	√	√	√	√	
OPTION 2	√	√	√	√	

MOVEMENTS ALLOWED FROM PUSHBUTTON PANEL IN VEHICLE TILTING CONDITIONS					
	BOOM WITHIN H=3m	BOOM WITHIN H=3m	BOOM MORE THAN H=3m	BOOM MORE THAN H=3m	NOTES
	BOOM RETRACTED	BOOM EXTENDED	BOOM RETRACTED	BOOM EXTENDED	
TURRET ROTATION	√	√	√	√	The turret can be brought to the central position only if 1 of the 2 proximity switches +/-5° is reading.
SLEWING UPWARDS					
SLEWING DOWNWARDS	√	√	√	√	
BOOM ASCENT	√ (even if more than H=3m)	√ (even if more than H=3m)	√	√	
BOOM DESCENT					
BOOM RETRACTION	√	√	√	√	
BOOM EXTENSION					
OPTION 1	√	√	√	√	
OPTION 2					

MOVEMENTS ALLOWED FROM PUSHBUTTON PANEL IN PLATFORM OVERLOAD CONDITION					
	BOOM WITHIN H=3m	BOOM WITHIN H=3m	BOOM MORE THAN H=3m	BOOM MORE THAN H=3m	NOTES
	BOOM RETRACTED	BOOM EXTENDED	BOOM RETRACTED	BOOM EXTENDED	
TURRET ROTATION					
SLEWING UPWARDS					
SLEWING DOWNWARDS					
BOOM ASCENT					
BOOM DESCENT					
BOOM RETRACTION					
BOOM EXTENSION					
OPTION 1					
OPTION 2					

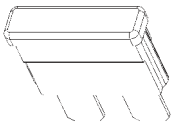
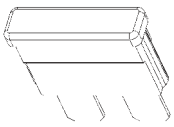
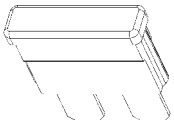
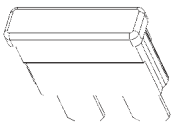
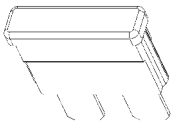
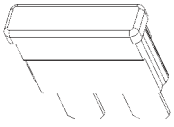
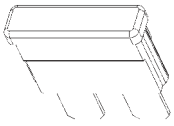
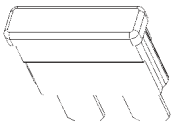
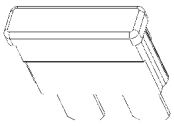
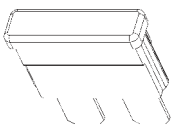
NOTE: the data given in the afore-mentioned tables are applicable for all positions of the turret.

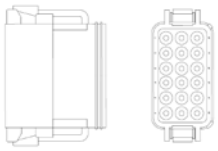
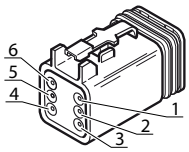
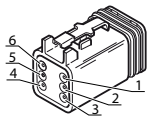
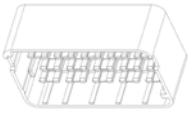
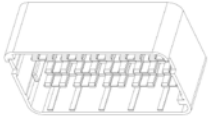
MOVEMENTS ALLOWED FROM THE CAB WITH ROLLOVER PROTECTION EXCLUSION KEY ACTIVATED					
	BOOM WITHIN H=3m	BOOM WITHIN H=3m	BOOM MORE THAN H=3m	BOOM MORE THAN H=3m	NOTES
	BOOM RETRACTED	BOOM EXTENDED	BOOM RETRACTED	BOOM EXTENDED	
STABILIZERS RAISED	√				Only with proximity switch on pendulum in reading mode
STABILIZERS LOWERED	√	√			
TURRET ROTATION					
SLEWING UPWARDS					
SLEWING DOWNWARDS					
BOOM ASCENT					
BOOM DESCENT					
BOOM RETRACTION					
BOOM EXTENSION					
OPTION 1					
OPTION 2					

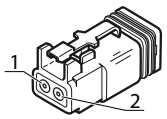
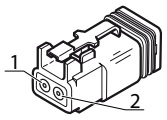
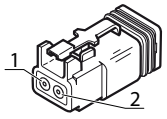
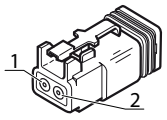
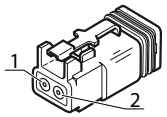
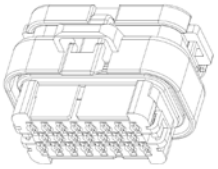
NOTE: the data given in the afore-mentioned tables are applicable for all positions of the turret.

VEHICLE ON STABILIZERS WITH OSCILLATING PLATFORM

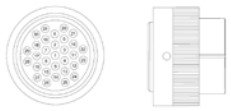
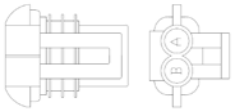
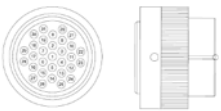
MOVEMENTS ALLOWED FROM THE CAB					
	BOOM WITHIN H=3m	BOOM WITHIN H=3m	BOOM MORE THAN H=3m	BOOM MORE THAN H=3m	NOTES
	BOOM RETRACTED	BOOM EXTENDED	BOOM RETRACTED	BOOM EXTENDED	
STABILIZERS RAISED	√				Only with proximity switch on pendulum in reading mode
STABILIZERS LOWERED	√	√			
TURRET ROTATION					
SLEWING UPWARDS					
SLEWING DOWNWARDS					
BOOM ASCENT					
BOOM DESCENT					
BOOM RETRACTION					
BOOM EXTENSION					
OPTION 1					
OPTION 2					

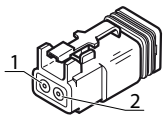
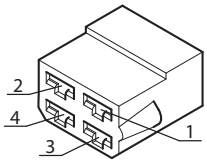
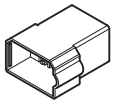
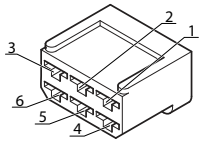
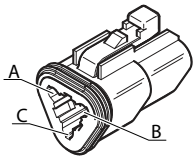
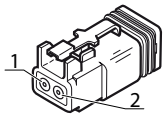
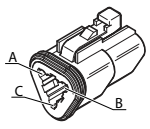
Connectors wiring					
Ref.	**Pin**	**Wire colour**	**Section**	**Destination**	**Image**
F3	IN	Blue	1,5	R4/87	
	OUT	Light blue	1,5	R6/30	
F33	IN	Red-Black	1,5	R78/87	
	OUT	Red-Green3	1	I20/10	
				I56/10	
				I66/10	
				I68/10	
				I7/10	
				X20-F/G	
				X7D-F/P	
F34	IN	Brown	1	R35/87	
	OUT	Pink	1	DM/7	
F35	IN	Brown	2,5	R35/87	
	OUT	Yellow-Black	2,5	R75/30	
				R83/30	
F36	IN	Red	1	KEY/1	
	OUT	Orange-White	1	X20-F/F	
F37	IN	Blue	1,5	R74/87	
	OUT	Blue-Yellow	1	X21-F/10	
		Blue-Yellow	1	X32-F/1	
		Blue-Yellow	1	X107-F/1	
				X107-F/10	
		Blue-Yellow	1	X42-F/5	
F38	IN	White-Red	1,5	KEY/6	
	OUT	Grey-Green	1,5	X16-M/1	
F39	IN	White-Red	1	KEY/1	
	OUT	White-Red	1	MA-F/2	
				X22-F/25	
F4	IN	Yellow-Red	1,5	X18-M/5	
	OUT	Yellow-Black	1,5	X18-M/7	
				X22-F/25	
F40	IN	Red	1,5	KEY/1	
	OUT	Orange-White	1,5	X7D-F/D	

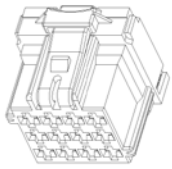
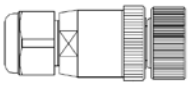
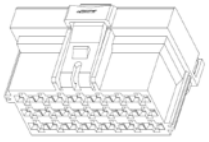
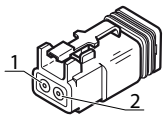
Connectors wiring					
Ref.	**Pin**	**Wire colour**	**Section**	**Destination**	**Image**
M4	1	Black	1	GND	
	2	Yellow-Black	1	M3/2	
				X14-M/B	
	3	Brown	0,5	M3/3	
				X14-M/U	
	4	White	0,5	M3/4	
				X14-M/V	
	5	Shield	-	M3/5	
				X14-M/W	
	15	White-Blue	1	X14-M/L	
	16	White-Yellow	1	X14-M/J	
	17	White-Black	1	X14-M/G	
	18	White-Orange	1	X14-M/N	
M8-F	2	Black	1,5	GND	
	3	Pink-White	1	I56/8	
	4	Pink	1	SV	
	5	Pink-Grey	1	I56/1	
				I56/6	
	6	Brown-White	1	I56/3	
				I56/4	
		Brown-White	1,5	F43	
MA-F	1	Brown-Pink	1	X23-F/11	
	2	White-Red	1	F39	
				X22-F/25	
MC2M CHASSIS	L40	Blue	1,5	X30/2(FADX)	
		Blue	1	X10/4(FPDX)	
		Blue	1	X13/1	
MC2M-CABIN	L1	Brown-Purple	1	X11-F/24	
	L10	Brown-Red	1	X22-M/26	
	L11	Brown-Green	1	X22-M/27	
	L12	White-Blue	1	X14-F/L	
	L13	Pink-Grey	1	X23-M/4	
	L14	White-Pink	1	X14-F/M	
	L17	Orange-Brown	1	X22-M/9	
	L18	Green-Black	1	X22-M/13	
	L19	Black-Blue	1	X10/13	
	L2	Yellow-Green	1	X14-F/R	
	L20	Black-Purple	1	X10/11	
	L21	Orange-White	1	XRD/K2	
	L22	White-Red	1	X14-F/H	
	L23	Blue	1	X11-F/12	
	L24	White	1	X14-F/F	
	L25	Black-Green	1	XRD/F2	
	L26	Red-Black	1	X22-M/14	
	L28	Brown	1	X23-M/2	
		Brown	1	XRD/J1	
	L29	Pink-Yellow	1	X9-F/L	
	L3	Grey-Purple	1	X22-M/17	

Connectors wiring					
Ref.	**Pin**	**Wire colour**	**Section**	**Destination**	**Image**
S28	1	Red-Grey	1	X33-M/7	
	2	Black	1	GND	
S35	1	Red-Purple	1	X33-M/8	
	2	Black	1	GND	
S36	1	Red-Green	1	X33-M/9	
	2	Black	1	GND	
S6	A	Green-Black	1	X33-M/10	
	B	Grey-Purple	1	X33-M/11	
	C	Black	1	GND	
S8	1	Brown-Purple	1	X32-F/3	
	2	Black-Purple	1	X32-F/4	
STR2	1	Green-White	1	I24/2	
	2	Green-Grey	1	I24/8	
	3	Brown-White	1	I69/21	
	4	Brown-Grey	1	I69/11	
	5	Yellow-Green	1	I4/5	
	6	White	0,5	VIEW/6	
				X21-M/34	
	8	Red-Black	1,5	X21-M/14	
	9	Light blue-White	1	I2/1	
	10	Light blue	1	I2/7	
	11	Pink-Green	1	X21-M/20	
	12	Pink-Red	1	X21-M/21	
	14	Brown	0,5	VIEW/5	
				X21-M/33	
	16	White-Orange	1	X21-M/1	
	17	Pink-Brown	1	X21-M/23	
	18	Pink-Blue	1	X21-M/24	
	21	Purple-Yellow	1	I70/1	
				X20-M/U	
	22	Purple	1	X21-M/8	
	23	Black	1	GND	
		Black	1	GND	

Connectors wiring					
Ref.	**Pin**	**Wire colour**	**Section**	**Destination**	**Image**
X16-M	27	Brown	0,5	OBD2-F/3	
				X21-F/12	
				X23-F/13	
				X504-F/2	
				XM4-F/19	
				XS1-F/7	
	28	White	0,5	OBD2-F/11	
				X21-F/13	
				X23-F/14	
				X504-F/1	
				XM4-F/21	
				XS1-F/8	
X17-F	1	Grey-Purple	1,5	X16-M/3	
		Grey-Purple	1	MC2M CHASSIS/R3	
	2	Yellow-Purple	1,5	X16-M/12	
		Yellow-Purple	1,5	X35-M/L	
	3	Pink-Grey	1	MC2M CHASSIS/R10	
	4	Pink-Green	1	X9/1(E35)	
	5	Blue-Pink	1	MC2M CHASSIS/S8	
	6	Grey	1,5	X30/5(FADX)	
	7	Blue-Black	1	MC2M CHASSIS/S9	
	8	Red-Black	1,5	X18-F/17	
		Red-Black	2,5	MC2M-1 CHASSIS/1	
				MC2M-1 CHASSIS/2	
				MC2M-1 CHASSIS/3	
				X17-F/10	
	9	White-Pink	1	MC2M CHASSIS/S19	
	10	Red-Black	1,5	X18-F/17	
		Red-Black	2,5	MC2M-1 CHASSIS/1	
				MC2M-1 CHASSIS/2	
				MC2M-1 CHASSIS/3	
				X17-F/8	
	11	White-Black	1	MC2M CHASSIS/S20	
	12	Black	4	GND	
	13	Pink-Blue	1	MC2M CHASSIS/S17	
	14	White-Red	2,5	X23/A	
	15	Purple-Blue	1	MC2M CHASSIS/S18	
	16	White-Green	2,5	X24/A	
	17	Green	1,5	X30/4(FADX)	
	18	Brown-Red	4	X35-M/G	
	19	Green-Black	1,5	X25/4(FASX)	

Connectors wiring					
Ref.	**Pin**	**Wire colour**	**Section**	**Destination**	**Image**
X22-M	19	Pink-Black	1,5	X9-F/A	
				X9-F/B	
	20	Brown-Blue	1	X11-F/28	
				XRD/K1	
	21	Red-Green	1,5	X14-F/A	
				XRD/F1	
				XRD/H1	
	22	Yellow-Black	1,5	X14-F/B	
	23	Red-Brown	1,5	X14-F/C	
				X46/A	
	24	Green	1,5	M11/1	
	25	White-Red	1	X10/6	
				X11-F/23	
				X9-F/T	
	26	Brown-Red	1	MC2M-CABIN/L10	
	27	Brown-Green	1	MC2M-CABIN/L11	
	28	Pink-White	1	MC2M-CABIN/S19	
	29	Pink-Yellow	1	MC2M-CABIN/S20	
	30	Purple-White	1	X11-F/4	
	31	Purple-Yellow	1	X11-F/3	
X23	A	White-Red	2,5	X17-F/14	
	B	Black	2,5	GND	
X23-F	1	Red-Black	6	F71	
	2	Brown	1	XM4-F/2	
		Brown	1	X21-F/26	
		Brown	1	R81/86	
				X16-M/6	
	3	Grey-Red	1	X20-F/H	
	4	Pink-Grey	1	X21-F/4	
	5	Grey	1	XS1-F/5	
	6	Grey-Black	2,5	F58	
	7	White	2,5	X7D-F/2	
	8	Blue	6	X40-F/1	
	9	Red	1	F49	
				X20-F/C	
				X37-F/1	
	10	Red-Black	1	STR4/6	
		Red-Black	1,5	X21-F/14	
		Red-Black	1	R78/86	
		Red-Black	1,5	X16-M/5	
		Red-Black	2,5	R80/87	
	11	Brown-Pink	1	MA-F/1	
	12	Black	1	GND	
	13	Brown	0,5	OBD2-F/3	
				X16-M/27	
				X21-F/12	
				X504-F/2	
				XM4-F/19	
				XS1-F/7	

Connectors wiring					
Ref.	**Pin**	**Wire colour**	**Section**	**Destination**	**Image**
X4	1	Orange-Grey	1	"MC2M CHASSIS/R9"	
	2	Black	1	GND	
X40-F	1	Blue	6	X23-F/8	
	2	Blue	6	F72	
	3	Black	1	GND	
	4	Orange-Blue	1	F62	
		Orange-Blue	1,5	I7/1	
		Orange-Blue	1	I20/5	
		Orange-Blue	1	X22-F/10	
X40-M	1	White	6	X40-M/2	
	2	White	6	X40-M/1	
X42-F	1	Black	1	GND	
	3	Blue-White	1	X107-F/8	
				X12-F/8	
	5	Blue-Yellow	1	F37	
				X107-F/1	
				X107-F/10	
				X21-F/10	
				X32-F/1	
X46	A	Red-Brown	1,5	X14-F/C	
				X22-M/23	
	B	Red	1	X10/19	
				X15-M/2	
				X23-M/9	
	C	Black	1	GND	
X47	1	White-Red	1	X11-M/23	
	2	Brown-Purple	1	X11-M/24	
X4A	1	White-Green	1	X11A/1	
				X18-F/16	
	2	Black	1	GND	
	3	White-Grey	1	MC2M CHASSIS/R34	

Connectors wiring					
Ref.	**Pin**	**Wire colour**	**Section**	**Destination**	**Image**
XM2-F	1	Light blue-Orange	1	R82/87	
				X16-M/19	
	5	Green	1	XPA-M/5	
				XPA-M/6	
	9	Pink-Brown	1	X16-M/7	
	13	Yellow	0,34	X16-M/23	
				XDM-F/6	
	14	Brown	0,34	X16-M/22	
				XDM-F/8	
	15	White	0,34	X16-M/24	
				XDM-F/7	
XM3-F	4	Purple-Yellow	1	X21-F/15	
	5	Purple-Red	1	X21-F/16	
	6	Black	1	GND	
XM4-F	1	Orange-Green	1	OBD2-F/16	
				XDM/3	
		Orange-Green	1	F61	
	2	Brown	1	X23-F/2	
		Brown	1	X21-F/26	
		Brown	1	R81-86	
				X16-M/6	
	3	Black	1	GND	
	12	Green-Black	1	XPA-M/2	
	13	Green-Brown	1	XPA-M/4	
	14	Green-White	1	XPA-M/1	
				XPA-M/3	
	19	Brown	0,5	OBD2-F/3	
				X16-M/27	
				X23-F/13	
				X504-F/2	
				XS1-F/7	
		Brown	0,5	X21-F/12	
	20	Shield	-	X23-F/15	
	21	White	0,5	OBD2-F/11	
				X16-M/28	
				X21-F/13	
				X23-F/14	
				X504-F/1	
				XS1-F/8	
XMS	1	Yellow-Green	1	X14-M/R	
	2	Red-Brown	1	ISR/1	
				X14-M/C	
		Red-Brown	1,5	X76-F/1	

POSITION OF THE COMPONENTS ON THE DIAGRAMS

Electrical connectors													
Component	**Diagram 1.1**	**Diagram 1.2**	**Diagram 2**	**Diagram 3**	**Diagram 4.1**	**Diagram 4.2**	**Diagram 5**	**Diagram 6**	**Diagram 7**	**Diagram 8**	**Diagram 9.1**	**Diagram 9.2**	**Diagram 10**
								√					
A1								√					
A2								√					
A4						√							
A6													√
B1	√												
BPD				√									
CAN-1	√		√										
CAN			√										
CC1				√									
CC2				√									
CC3								√					
DL								√					
DM		√											
E35													√
F1							√						
F2							√						
F3								√					
F4								√					
F5								√					
F6											√		
F7	√												
F8													√
F9					√								
F10											√		
F11								√					
F12								√					
F13								√					
F14				√									
F15				√									
F16	√												
F17				√									
F18	√												
F19						√							
F20						√							
F33		√		√	√			√	√	√		√	√
F34		√											
F35											√		
F36								√					
F37										√			

Electrical connectors													
Component	**Diagram 1.1**	**Diagram 1.2**	**Diagram 2**	**Diagram 3**	**Diagram 4.1**	**Diagram 4.2**	**Diagram 5**	**Diagram 6**	**Diagram 7**	**Diagram 8**	**Diagram 9.1**	**Diagram 9.2**	**Diagram 10**
F38	√												
F39							√						
F40									√				
F41							√						
F42										√			
F43									√				
F44								√					
F45										√			
F46											√		
F47							√						
F48								√					
F49		√											
F50						√							
F51									√				
F52		√										√	
F53						√							
F54									√				
F55									√				
F56									√				
F57		√		√	√							√	√
F58	√												
F59								√					
F60									√				
F61											√		
F62												√	
F63		√											
F64							√						
F65		√											
F66									√				
F67									√				
F68									√				
F69									√				
F70										√			
F71				√									
F72												√	
F75	√			√		√					√		
FADX								√					
FASX								√					
FPDX								√					
FPSX								√					

4.1 – HYDRAULICS MOVEMENTS

Connectors				
Type of wiring	**Ref.**	**Description**	**Position on the diagram**	**Hydraulic equivalent**
Frame	X4	Lh rear axle block solenoid valve	S8	
Frame	X5	1st lh rear micro switch for stabilizer on ground	M6	
Frame	X5A	2nd lh rear micro switch for stabilizer on ground	M7	
Frame	X5B	1st lh rear beam micro switch	M9	
Frame	X5C	2nd lh rear beam micro switch	M10 / M11	
Frame	X7	1st rh rear micro switch for stabilizer on ground	M12	
Frame	X7A	2nd rh rear micro switch for stabilizer on ground	M13 / M14	
Frame	X7B	1st rh rear beam micro switch	M15	
Frame	X7C	2nd rh rear beam micro switch	M16 / M17	
Frame	X11B	Rh rear axle block solenoid valve	S5 / S6	
Frame	X18	Interface	I11	
Frame/Cab	X20	Hydraulic fluid temperature bulb	C28	
Cab	X21	Interface	G15	
Frame	X22	Limit switch inserted	G15	
Frame	X27	1st lh front micro switch for stabilizer on ground	M18	
Frame	X27A	2nd lh front micro switch for stabilizer on ground	M19 / M20	
Frame	X27B	1st lh front beam micro switch	M21	
Frame	X27C	2nd lh front beam micro switch	M22 / M23	
Frame	X29	1st rh front micro switch for stabilizer on ground	M24	
Frame	X29A	2nd rh front micro switch for stabilizer on ground	M25 / M26	
Frame	X29B	1st rh front beam micro switch	M27	
Frame	X29C	2nd rh front beam micro switch	M28 / M29	
Cab	X55	Folding stabilizers configuration	I25 / I26	
	XBS	Up/Down stabilizer connector	I20	
	XD4	Diode	S9 / S10	
	XD11	Diode	S11 / S12	

Fuses and relays			
Ref.	**Description**	**Position on the diagram**	**Posizione sullo schema**
F9	Micro switch power supply fuse	10A	C12
F33	Switches indicator lights fuse	7,5A	A28
F57	Switches "15" positive fuse	15A	A25
R4	Chassis primaries power supplies relay		A4
R35	Cab section power supplies remote control switch		A4 / A5
R74	Radio and heater relay		A3
R78	3b6 control units power positives relay		A2 / A3

Components			
Ref.	**Description**	**Position on the diagram**	**Hydraulic equivalent**
I26	Beams in/out or stabilizers up/down switch	E20	
I27	Beams and stabilizers selection switch	E25 / E26	
I28	Rh front beam/stabilizer switch	I31	
I29	Lh front beam/stabilizer switch	I33 / I34	
I30	Rh rear beam/stabilizer switch	I36	
I31	Lh rear beam/stabilizer switch	I39	
I69	Levelling joystick	E18	
KEY	Start-up panel	A2	
L28	Selected beams indicator	I27	
L29	Selected stabilizers indicator	I29	
L30	Stabilizers feet beams/descent extension indicator	I24	
L31	Stabilizers feet beams/descent retraction indicator	I22	
MC2M-3 CABIN	Cab section inputs/outputs 3B6 control unit	E15 / E17	
MC2M-3 CHASSIS	Chassis section inputs/outputs 3B6 control unit	O28 / O29	
STR2	3b6 primary instrument inputs/outputs	I18	
STR3	3b6 primary instrument inputs/outputs	K40	

Connectors				
Type of wiring	**Ref.**	**Description**	**Position on the diagram**	**Hydraulic equivalent**
Frame/Cab	X7D	Cab connector	O31	
Rear turret	X10	Optional connector	O29	
Frame/Cab	X16	Interface	K16 / K17	
Frame	X18	Interface	E34 / E35 / E38 / K34 / K35	
Frame	X19	Interface	G16 / G17 / K39	
Frame	X22	Limit switch inserted	K23 / O17	
Frame	X23	Fan-1 oil cooling	O14 / O21 / O22 / O31 / O32	
Frame	X28	Hydraulic braking solenoid valve	O8	
Elettrovalvole/ Frame/Cab	X32	Thermostat	G38 / K38	
Elettrovalvole/ Frame/Cab	X33	Ambient thermostat	G39 / K39	
Frame	X34	Stabilizers block optional kit	O6	
Engine/Frame	X35	Interface	E34 / E35 / K32	
Cab	X38A	Vehicle radio power supply connector	I31 / I32	
Elettrovalvole	X81	Set-up connector	I37	
Cab	XDM	Diagnostics connector	I17	
Cab	XM2	Adm connector	I30	
Cab	XM4	Adm2 connector	I22	
Cab	XS1	Installation connector	O17	
Frame	XSC	Set-up connector	I15	

Fuses and relays			
Ref.	**Description**	**Position on the diagram**	**Posizione sullo schema**
F6	Spark plugs power supply fuse	7,5A	C33
F10	Set-up fuse	10A	C37 / C38
F35	Boom head output third relay fuse	7,5A	C27
F46	Diagnostics power supply fuse	10A	C19
F61	Diagnostics power supply fuse	15A	C21
F75	Main fuse		C35 / C36
R4	Chassis primaries power supplies relay		A4
R8	Spark plugs preheating relay		I33
R15	Set-up relay		E9
R17	Set-up relay		E13
R35	Cab section power supplies remote control switch		A4 / A5
R74	Radio and heater relay		A3
R75	Boom head output second relay		I24
R78	3b6 control units power positives relay		A2 / A3
R83	Boom head output third relay		I27

Components			
Ref.	**Description**	**Position on the diagram**	**Hydraulic equivalent**
KEY	Start-up panel	A2	
MA	Winch micro switch	O23	
MC2M-2 CABIN	Cab section inputs/outputs 3B6 control unit	O12 / O13	
MC2M-2 CHASSIS	Chassis section inputs/outputs 3B6 control unit	K12 / K13	
MC2M-3 CABIN	Cab section inputs/outputs 3B6 control unit	O20 / O21	
MC2M-3 CHASSIS	Chassis section inputs/outputs 3B6 control unit	K8 / K9	
OBD2	Diagnostics connector	I19 / I20	
S6	Set-up connector	I40	

Type of wiring	Ref.	Description	Position on the diagrams		Observations
			Diagram 1	Diagram 2	
Dashboard	I78	Sideshift by-pass switch		I30	OPTIONAL
Dashboard	I79	Automatic levelling switch		E31	OPTIONAL
Driver's seat	ISR		G20		OPTIONAL
Dashboard	J1939	Line can bus J1939		E30	
Dashboard	KEY	Start-up panel		C33	
Dashboard	L28	Selected beams indicator		I34	
Dashboard	L29	Selected stabilizers indicator		I34	
Dashboard	L30	Stabilizers feed beams/descent extension indicator		G34	
Dashboard	L31	Stabilizers feed beams/descent retraction indicator		G34	
Driver's seat	LSR		G20		OPTIONAL
Engine	M1	Starter motor	M16		
Driver's seat	M3	Seat LH side joystick	G20		
Driver's seat	M4	Seat RH side joystick	G19		
Dashboard	M8			Q39	
Dashboard	M10	Heating fan		O37	OPTIONAL
Rear of turret	M11	Heater pump	I12		
Driver's seat	M12		G19		OPTIONAL
Dashboard	MA	Winch micro switch		Q38	
Rear of turret	MC2M-1	Cab part inputs/outputs 3B6 control unit	G12		
Rear of turret	MC2M-2	Cab part inputs/outputs 3B6 control unit	G12		
Rear of turret	MC2M-3	Cab part inputs/outputs 3B6 control unit	G12		
Chassis primary	MC2M-1	Carriage part inputs/outputs 3B6 control unit	G17		
Chassis primary	MC2M-2	Chassis section inputs/outputs 3B6 control unit	G17		
Chassis primary	MC2M-3	Chassis section inputs/outputs 3B6 control unit	G17		
Rear of turret	MDCP	Midak-plus connector	G12		
Dashboard	OBD2	Diagnostics connector		O35	
Dashboard	R35	Emergency pump remote control switch coil		Q38	
Dashboard	RS232	Connector XRS232		C27	
Solenoid valves	S6	Set-up connector	K25		OPTIONAL
Solenoid valves	S8	Parking brake solenoid valve	I22		
Solenoid valves	S11	RH front beam solenoid valve	K22		
Solenoid valves	S12	LH front beam solenoid valve	K22		
Solenoid valves	S13	LH rear beam solenoid valve	K23		
Solenoid valves	S14	RH rear beam solenoid valve	K24		
Solenoid valves	S15	Stabilizers retraction/ascent solenoid valve	K25		
Solenoid valves	S16	RH front stabilizer solenoid valve	K26		
Solenoid valves	S17	LH front stabilizer solenoid valve	K26		
Solenoid valves	S18	LH rear stabilizer solenoid valve	K26		
Solenoid valves	S19	RH rear stabilizer solenoid valve	I26		
Solenoid valves	S24	Crab steering solenoid valve	K22		
Solenoid valves	S25	Concentric steering solenoid valve	K23		
Solenoid valves	S27	High speed solenoid valve	K26		
Solenoid valves	S28	Low speed solenoid valve	K26		
Solenoid valves	S35	RH levelling solenoid valve	K26		
Solenoid valves	S36	LH levelling solenoid valve	K26		
Dashboard	STR2	3B6 main instrument inputs/outputs		E28 / E29	
Dashboard	STR3	3B6 main instrument inputs/outputs		E29	
Dashboard	SV			E6	
Chassis primary	T1	Fuel level sensor	E16		

PAGE ON ROAD (DRIVE MODE)

1 - Water temperature gauge
2 - Fuel level gauge
3 - Engine RPM gauge
4 - Hour counter and time
5 - Km counter
6 - Actual gear and direction
7 - On Road function lamps. (On the left and on the right)

In this page is possible, with the  Home Key, the zeroing of partial hours of work.

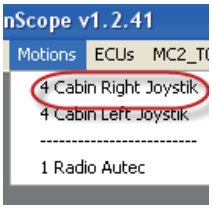
MOTION CONTROL

Motion controls are performer from MC2M_Turret unit.

Joystick

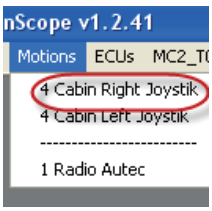
The cabin joysticks are redundant: the channels A are can bus and Channels B are analogic. The Master unit read and adjust both and set a correct values for motion control.

Right Joystick



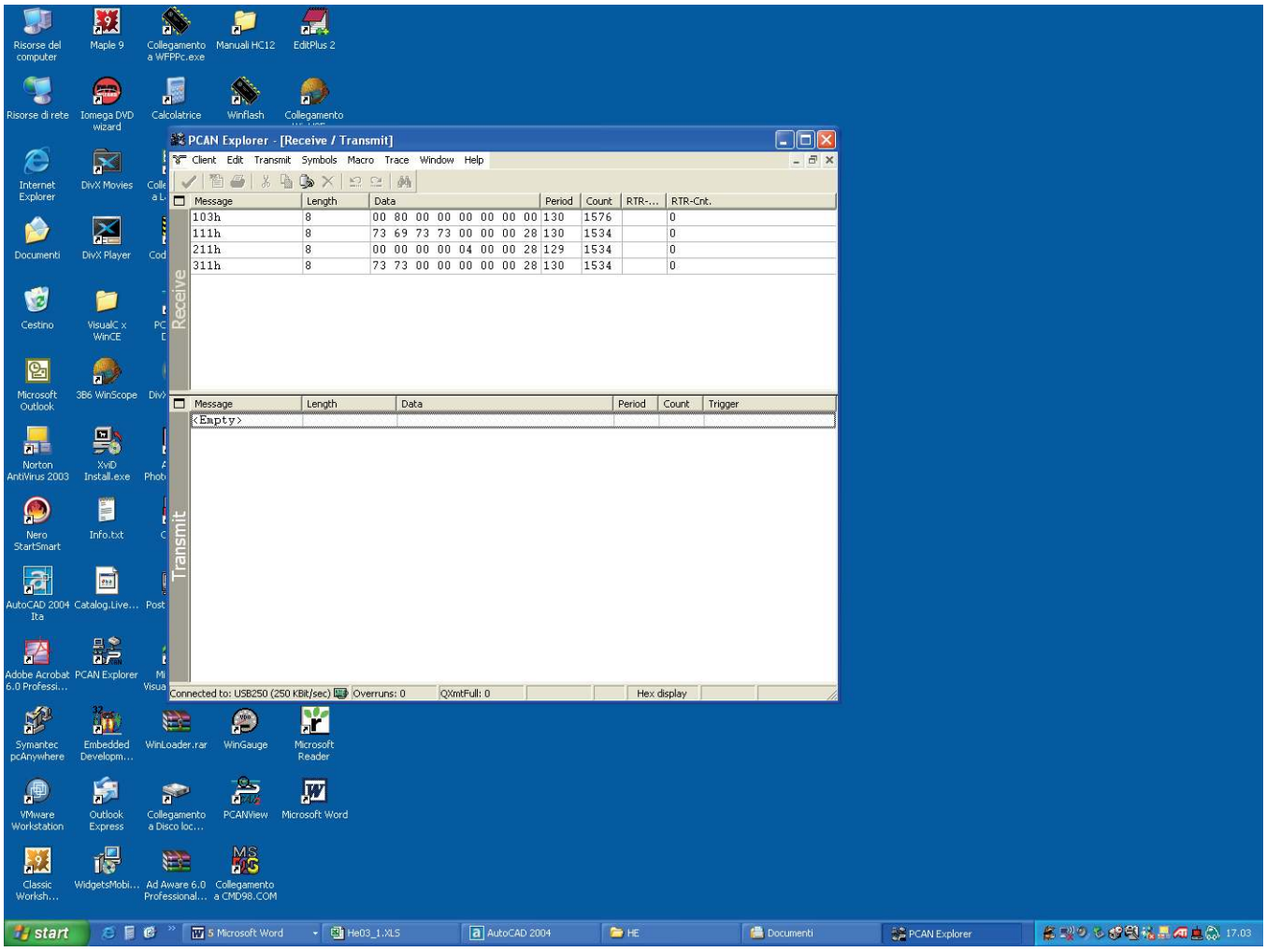
ID	Npar	T1	Value	Um	Joystick / Cabin
0	WM_540		0		X-Axis: raw value from Canbus
1	WM_548		10		X-Axis: raw value from Analog
2	_		0		
3	WM_541		0		Y-Axis: raw value from Canbus
4	WM_549		10		Y-Axis: raw value from Analog
5	_		0		
6	WM_544		0		P1 button
7	WM_545		0		P2 button
8	WM_546		0		P3 button
9	WM_547		0		Deadmen button
10	_		0		
11	WM_741		0		Can bus message 1 count
12	WM_744		0		Can bus message 2 count
13	WM_747		0		Can bus message 3 count
14	WM_750		0		Can bus message 4 count
15					
16					
17					

Left Joystick



ID	Npar	T1	Value	Um	Joystick / Cabin
0	WM_540		0		X-Axis: raw value from Canbus
1	WM_548		10		X-Axis: raw value from Analog
2	_		0		
3	WM_541		0		Y-Axis: raw value from Canbus
4	WM_549		10		Y-Axis: raw value from Analog
5	_		0		
6	WM_544		0		P1 button
7	WM_545		0		P2 button
8	WM_546		0		P3 button
9	WM_547		0		Deadmen button
10	_		0		
11	WM_741		0		Can bus message 1 count
12	WM_744		0		Can bus message 2 count
13	WM_747		0		Can bus message 3 count
14	WM_750		0		Can bus message 4 count
15					
16					
17					

Code	Description
IDS_WARNING48	Generic enable missing
IDS_WARNING49	Attachment not confirmed
IDS_WARNING50	Attachment not locked
IDS_WARNING51	Radio with machine not stabilized
IDS_WARNING52	Boom not under 3 m
IDS_WARNING53	Gear not engage
IDS_WARNING54	Right limit
IDS_WARNING55	Left limit
IDS_WARNING56	High Speed
IDS_WARNING57	TCU limited state
IDS_WARNING58	TCU safe state
IDS_WARNING59	Tag not present in loadcharts



The presence of several messages running means the CAN LINE ok

In case CAN LINE is not working:

- Disconnect all the units and devices from the BUS
- Double check all CAN BUS wirings and in particolar check that the lines CANH and CANL are not crossed in some point
- Check the presence of the “END LINE RESISTANCES”
- Connect one device per time on the BUS and check its activity with the PCAN Explorer software.
- Consider that a unit may work in not proper way even if OK by the Hardware point of view.

Following a list of angle and length values in some control point.

Boom Angles	ACT 1A	ACT1B
Boom Close 0°	1800	1800
Boom Open 80°		
Boom Length	ACT 1A	ACT1B
Boom Close		
Boom Open		
Jib Angle	ACT 2A	
Boom Close 0°		
Boom Open 80°		
Jib Length	ACT 2A	
Boom Close		
Boom Open		

EXTENSION AND ANGLE CALIBRATION

This operation consists in the automatic self calibration extension and angle sensors in boom in IN/OUT and UP/DOWN conditions.

SENSORS SELF CALIBRATION AT CLOSED MACHINE CONDITIONS

A00 S 6.8 W.0 12 Trasd. Min	Position the machine with boom and jib totally retracted. By means of "+" and "-" keys look for the page indicated here Press ENTER and INDEX to confirm the calibration at "Machine closed" condition. Check that the displayed angle and extension values are correct. Afterwards, proceed to self calibration of sensors at "Open machine" condition.

SENSORS SELF CALIBRATION AT OPEN MACHINE CONDITIONS

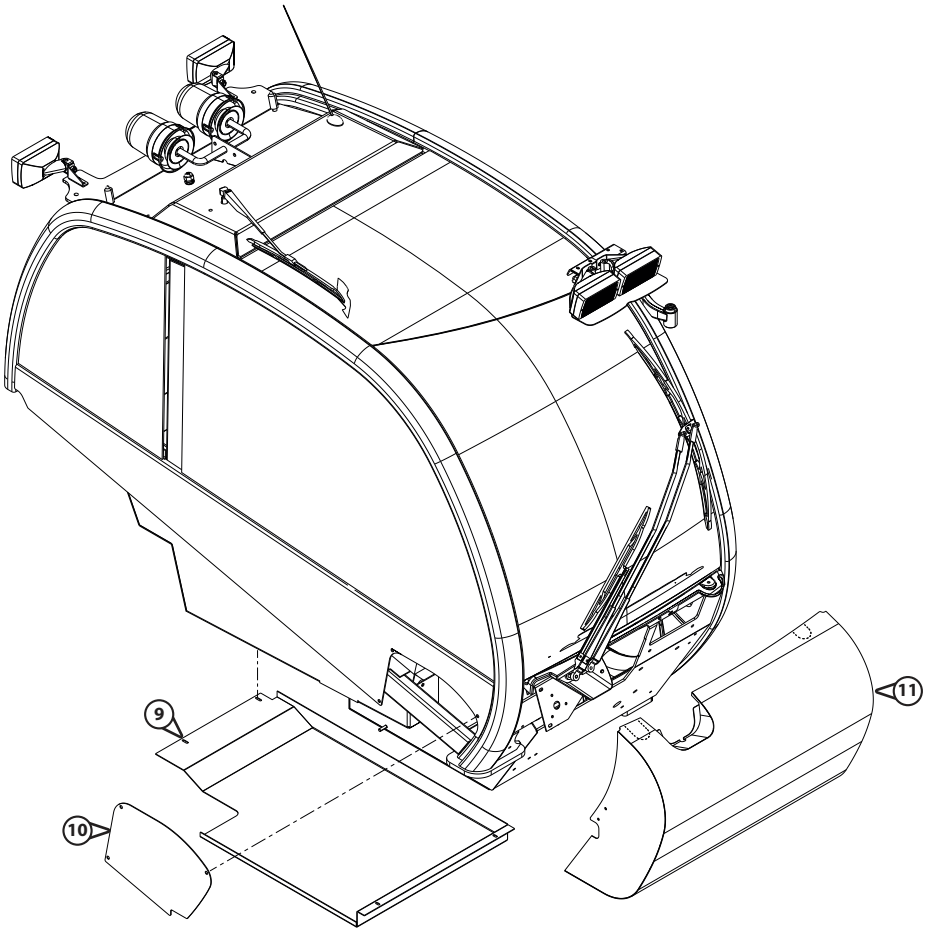
A00 S 6.8 W.0 13 Trasd. Max	Extend totally boom and Jib making sure that the two cylinders of raising and extension are at the end of their stroke. In this conditions angle and extension readings might correspond to the memorised ones. By means of "+" and "-" keys look for the page indicated here. Press ENTER and INDEX to confirm the calibration at "Machine open" condition.

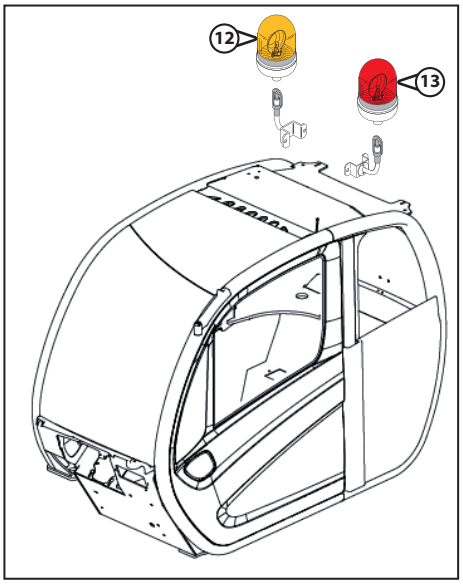
CALIBRATION PROCEDURE INITIALISATION

Following the load table activation of the accessory to be used, perform first of all a check of the correspondence of the load weight reading on the display to some lifted loads with known weight.
If readings exceed the 10% tolerance, it is suggested to refine the calibration starting from this "Initialisation":

A00 S 6.8 W.0 26 INIT WEIGHT	By means of + and – keys scroll on the menu here indicated. Press ENTER to enter the accessory configuration
A00 S 6.8 W.0 Index to Confirm	Press INDEX to confirm Initialisation = deleting of preceding calibration

Remove the guard on the compartment from under the cab (Ref. 9), the guard on the power steering (Ref. 10) and the front guard (Ref. 11).





Disconnect the rotary beacon and emergency lamp (Ref. 12 and 13) from the cab.

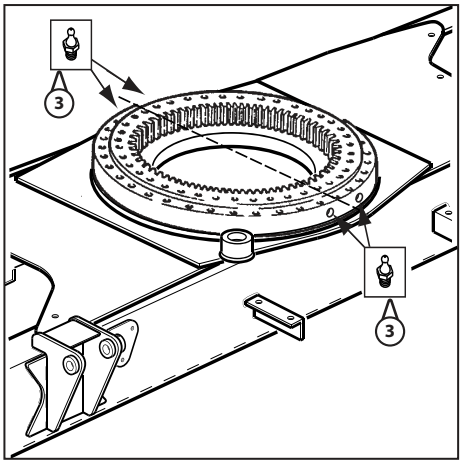
Reconnect the hydraulic pipes (Ref. 15) to the power steering.

RECONNECT THE CAB ELECTRICAL SYSTEM

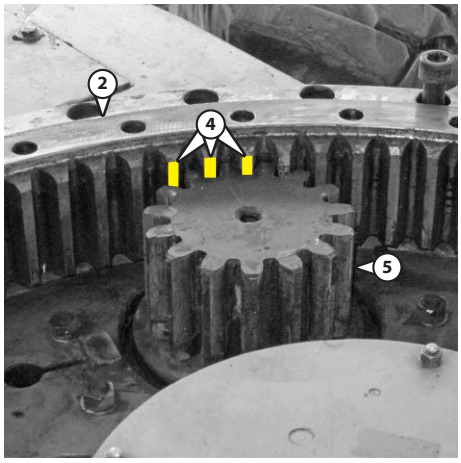
Reconnect all the connectors (Ref. 16) on the back of the display (Ref. 17).

Refit the display (Ref. 17) on the vehicle dashboard.

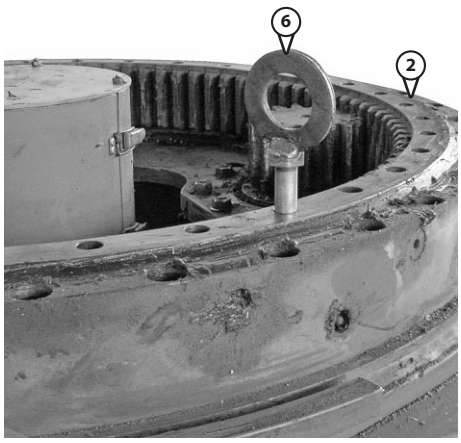
Reconnect the electric connectors for connection to the chassis line.



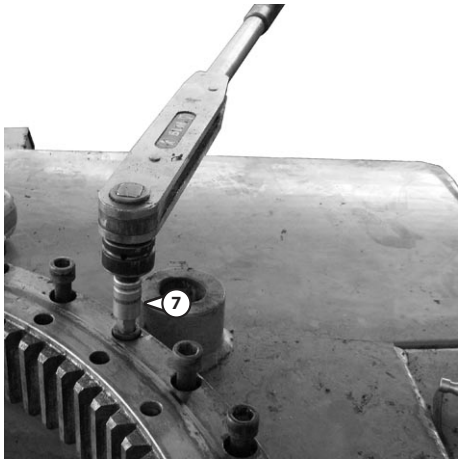
While positioning the slewing ring bearing on the vehicle, take care to ensure that the sides of the slewing ring bearing on which the grease nipples (Ref. 3) are mounted, are to the RH and LH of the base, to leave the grease nipples easily accessible.



The slewing ring bearing gear (Ref. 2) has three coloured reference teeth (Ref. 4) which have greater tolerance and must be inserted on the pinion (Ref. 5) of the rotation gear.

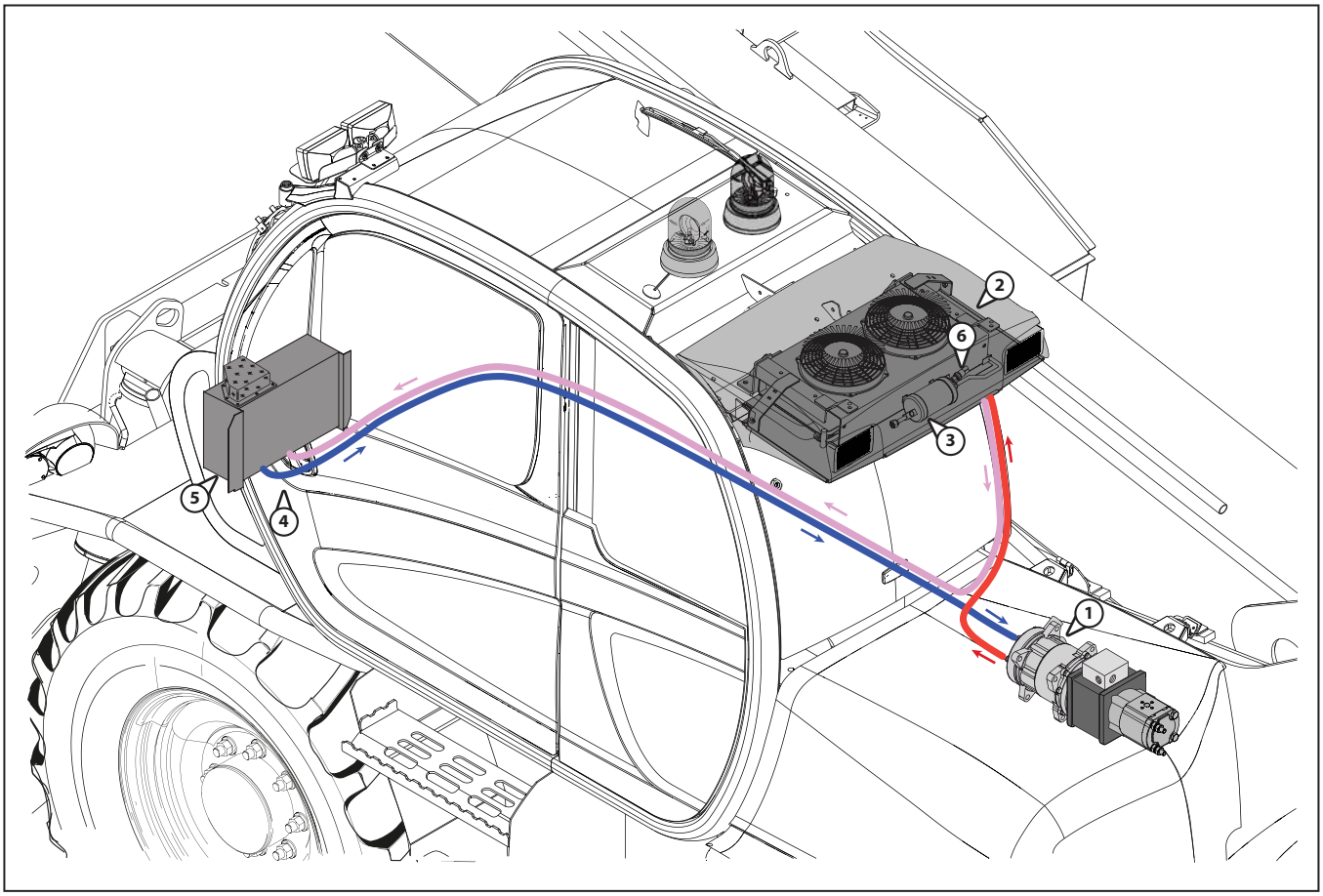


Remove the eyebolts (Ref. 6) from the slewing ring bearing.



Apply threadlocker Loctite on the screws (Ref. 7) and tighten these by applying a 346 Nm tightening torque.

FLUID CIRCUIT



– Fluid in gaseous state at high pressure and high temperature.
– Fluid in liquid state at high pressure and high temperature.
– Fluid in liquid state at low pressure and low temperature.

Excess liquids (duration 15 minutes) with the vehicle engine running

1 - Preparation (approx. 10 minutes).
- Connect the station to the circuit.
- Run the engine at 800 to 1200rpm.
- At the same time start up the air conditioner at maximum speed.

2 - Additional filling (approx. 5 minutes).

In the open air, liquid R134a is a colourless odourless gas heavier than air and in certain conditions it can be hazardous for humans. Always recover the coolant from the refilling station.

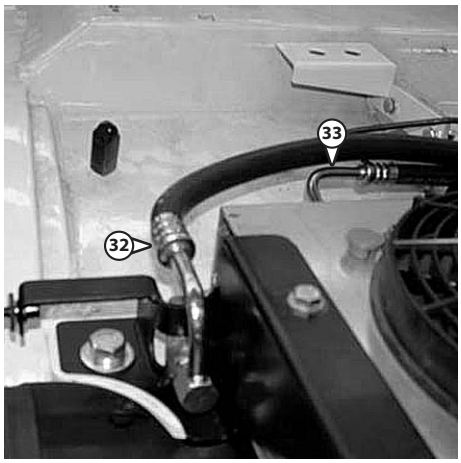
CHECKING THE WORKING

The following checks must be performed with the vehicle engine switched on.

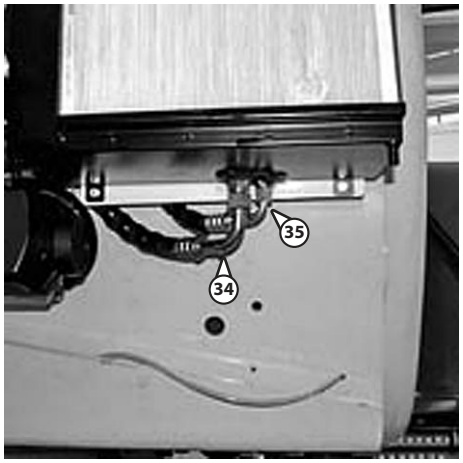
AIR CONDITIONER CONTROLS

The air conditioner works only when the telescopic lift is started up. With the air conditioner running, always work with the doors and windows closed.
In winter: To ensure the correct working and complete efficacy of the air conditioning system, start up the compressor once a week, even if it is only for short periods, to allow lubrication of the internal gaskets. At low temperatures: Heat the engine before starting up the compressor to allow the coolant in the liquid state, collected at the bottom of the compressor circuit, to get transformed into gas under the action of the heat given out by the engine; in the liquid state the coolant can damage the compressor.

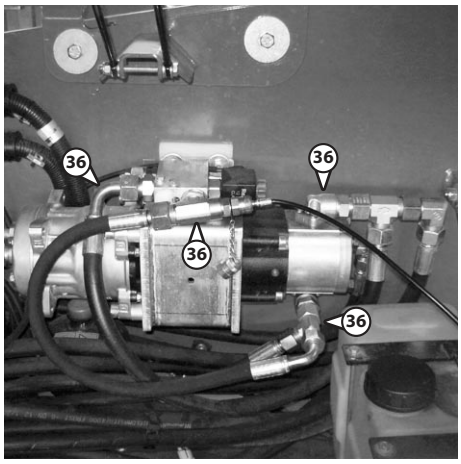
If the air conditioner is not working properly, have it checked by your dealer (see: 3 - MAINTENANCE: F - EVERY 2000 HOURS OF OPERATION). Never attempt to repair faults yourself.



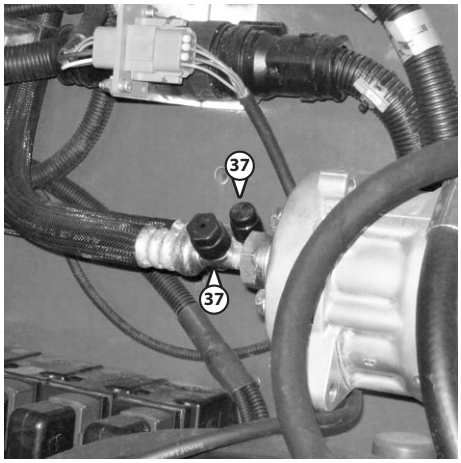
Connect the tubes (Ref. 32) on the condenser kit and (Ref. 33) on the condenser filter.



Connect the pipes (Ref. 34 and 35) on the evaporator.



Connect all the hydraulic pipes (Ref. 36) on the hydraulic pump and on the solenoid valve.



Connect the tubes on the compressor connectors (Ref. 13).

STANDARD TIGHTENING TORQUES

Standard tightening torque to be used when not otherwise indicated in the removal and refitting operations:

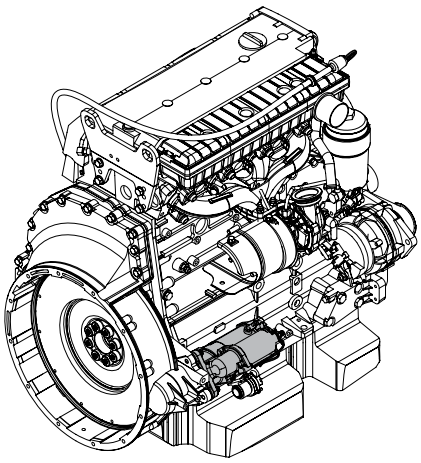
- The following tightening torques are given for hexagon head screws without flanges and cylinder head hexagon socket screws.
- The torques are given for a friction coefficient μ = 0,20 corresponding to dry-fitted zinc-plated fasteners and for torque tools having a ± 20 % class C tightening torque accuracy (equivalent to pneumatic screwdrivers).

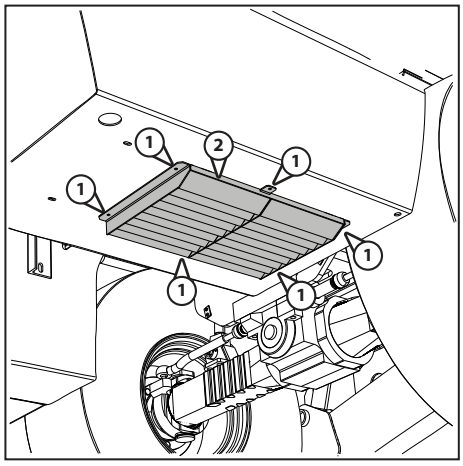
NF E 25-030-1 Screw / Nut connection :

Tightening torque in N•m (±20%)					
Ø x "coarse" pitch	**Grade 8.8**	**Grade 10.9**	**Ø x "fine" pitch**	**Grade 8.8**	**Grade 10.9**
M3 x 0,5	1	1,5	-	-	-
M4 x 0,7	2,4	3,5	-	-	-
M5 x 0,8	4,8	7,1	-	-	-
M6 x 1	8,2	12,1	-	-	-
M8 x 1,25	20	30	M8 x 1	22	32
M10 x 1,5	40	59	M10 x 1,25	43	63
			M10 x 1	46	68
M12 x 1,75	69	102	M12 x 1,5	74	108
			M12 x 1,25	78	115
M14 x 2	111	163	M14 x 1,5	123	181
M16 x 2	175	256	M16 x 1,5	190	279
M18 x 2,5	240	352	M18 x 1,5	279	410
M20 x 2,5	341	501	M20 x 1,5	391	574
M22 x 2,5	470	691	M22 x 1,5	531	780
M24 x 3	588	864	M24 x 2	659	967
M27 x 3	874	1284	M27 x 2	965	1418
M30 x 3,5	1181	1735	M30 x 2	1351	1984
M33 x 3,5	1614	2371	M33 x 2	1821	2674
M36 x 4	2068	3037	-	-	-

For hexagon screws with flanges:
Apply an increased torque of +10%.
(Standard NF E 25-030-1)

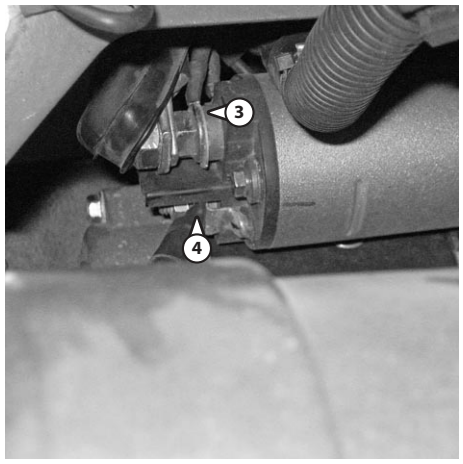
Where washers are used, the following coefficient is to be applied (FD E 25-502) :
- Smooth tapered washer (CL): +5%
- Spring (or Grower) washer without jaws (W) : +10%
- Conical, internal teeth (CDJ-JZC) : +15%



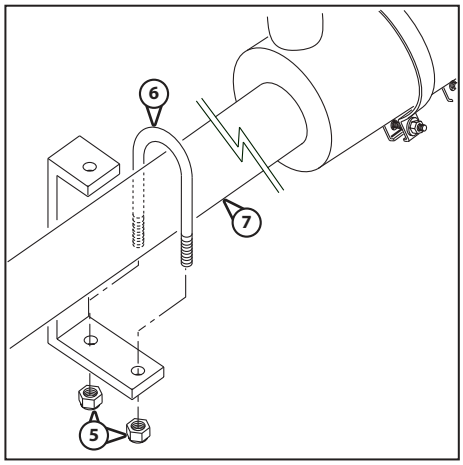


C - REMOVING THE STARTER MOTOR

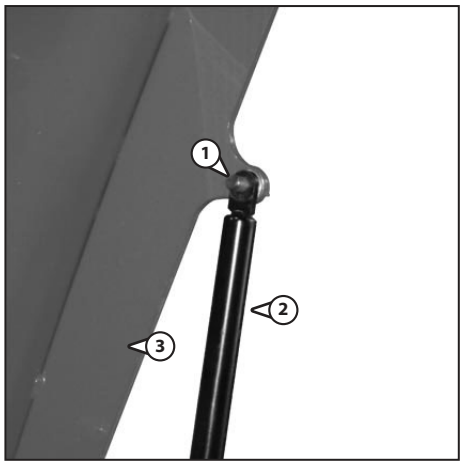
Slacken the six screws (Ref. 1) and remove the lower guard (Ref. 2).



Disconnect the electric wires (Ref. 3 and 4) for connection of the starter motor.

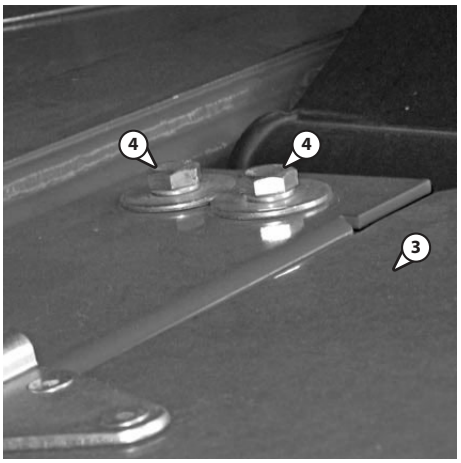


Slacken the two nuts (Ref. 5) which block the brackets (Ref. 6) which secure the air suction duct (Ref. 7), thereby allowing easier access to the starter motor.

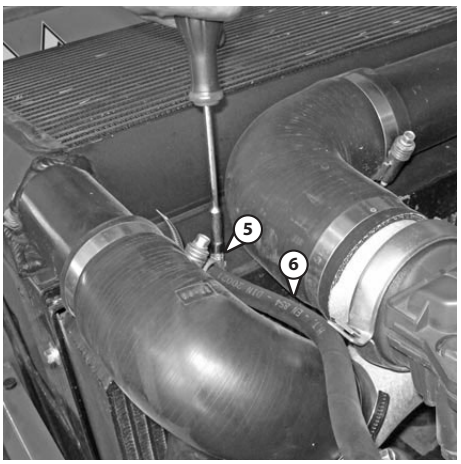


REMOVING THE RADIATOR MOTOR

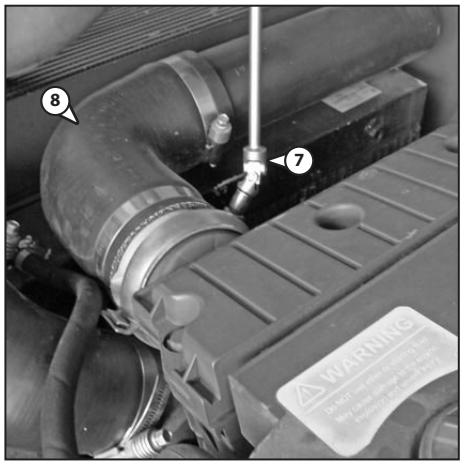
Slacken the screw (Ref. 1) to release the gas spring (Ref. 2) from the engine hood (Ref. 3).



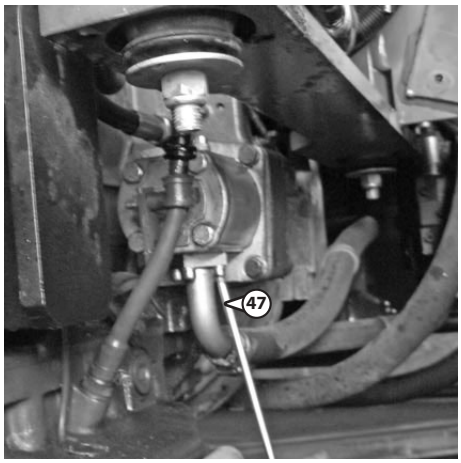
Slacken the screws (Ref. 4) and remove the hood (Ref. 3) from the vehicle.



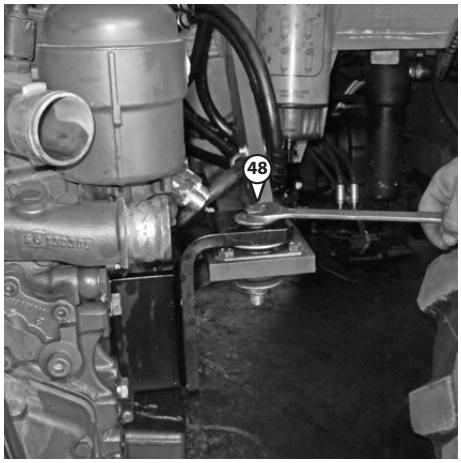
Slacken the clamp (Ref. 5) and remove the hose (Ref. 6) from the radiator.



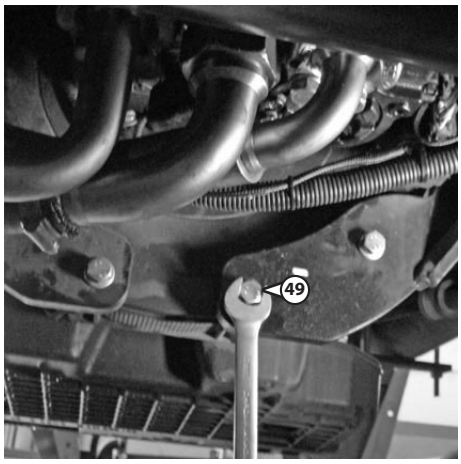
Slacken the clamps (Ref. 7) and remove the bent rubber pipe (Ref. 8) from the radiator.



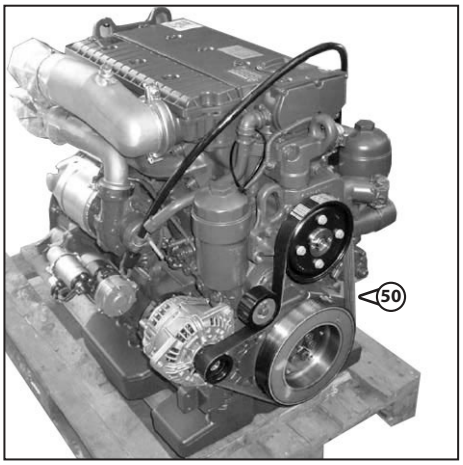
Disconnect the lower pipes (Ref. 47) of the hydraulic pump on the engine.



Secure the engine to an overhead crane.
Slacken the screws (Ref. 48) of the silent blocks of the engine supports.



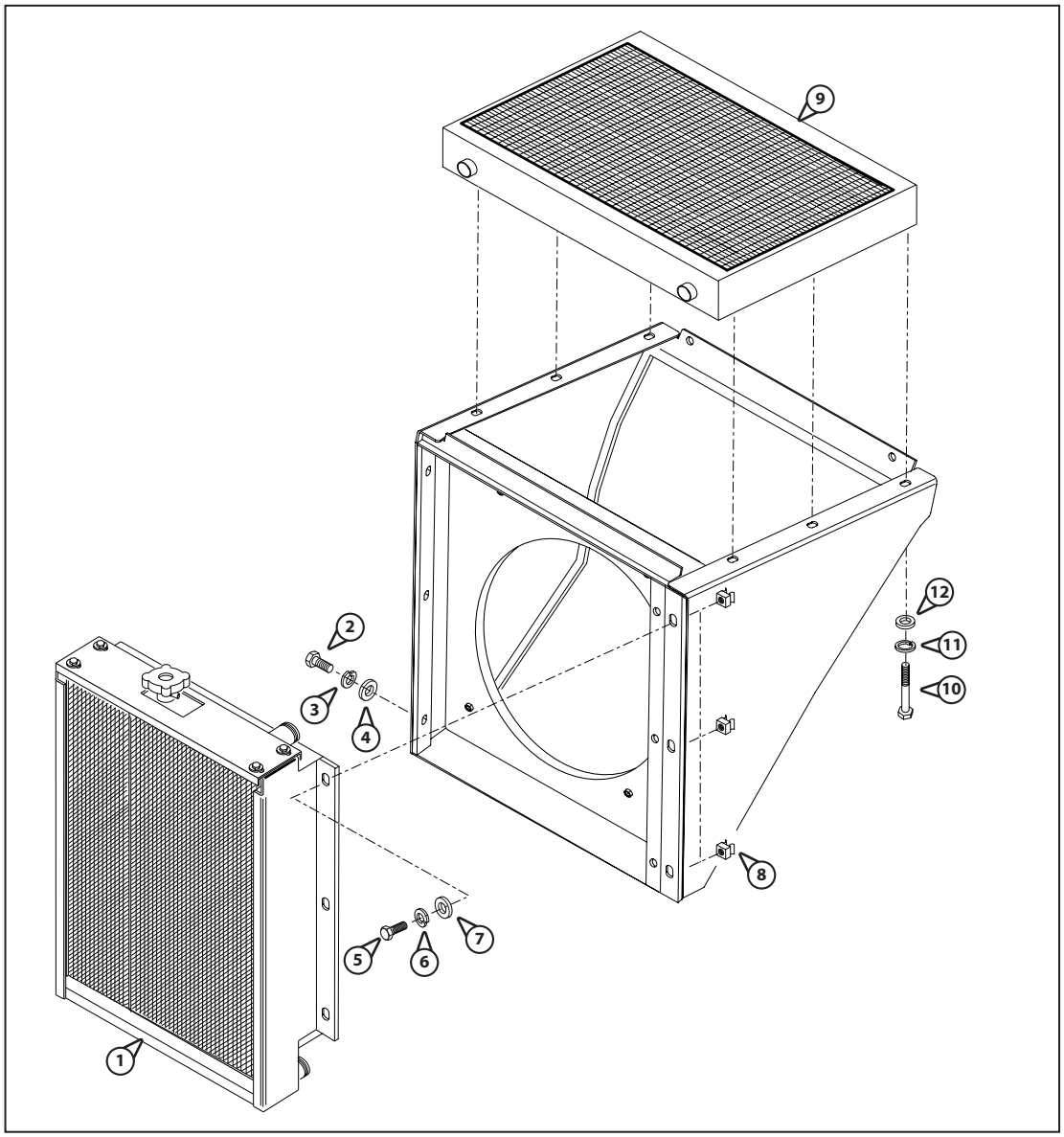
Slacken the screws (Ref. 49) which fix the engine on the hydraulic pump supports.

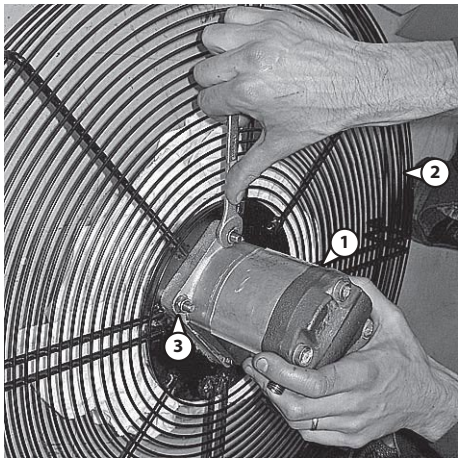


Remove the engine from the vehicle with the help of the overhead crane and place it on a pallet.

REINSERTING THE RADIATOR

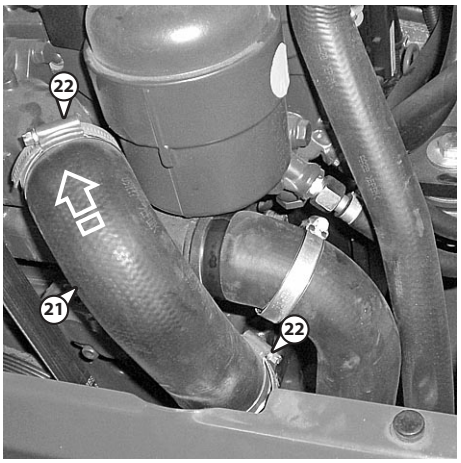
Refit the water radiator (Ref. 1) on the frame using the screws, nuts and washers (Ref. 2, 3, 4, 5, 6, 7 and 8).
Refit the air radiator (Ref. 9) on the frame by means of the screws and washers (Ref. 10, 11 and 12).



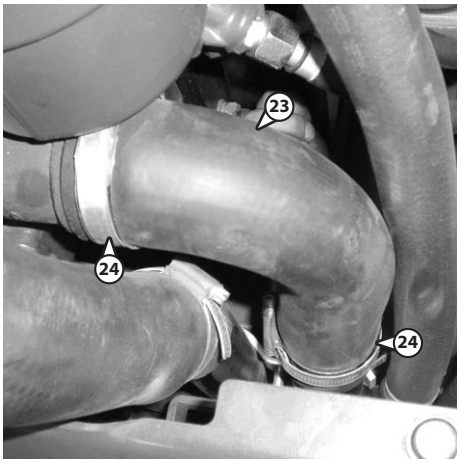


REINSERTING THE RADIATOR MOTOR

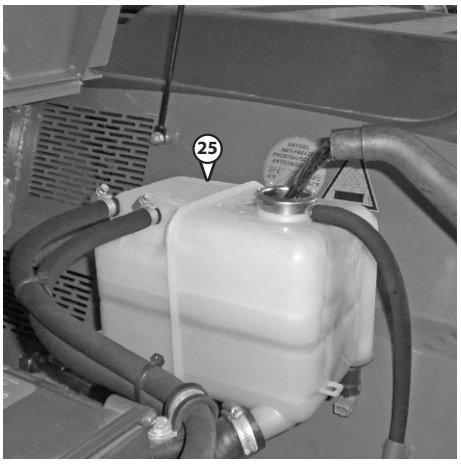
Insert the hydraulic motor (Ref. 1) on the grille (Ref. 2) and fix by means of screws Ref. 3).



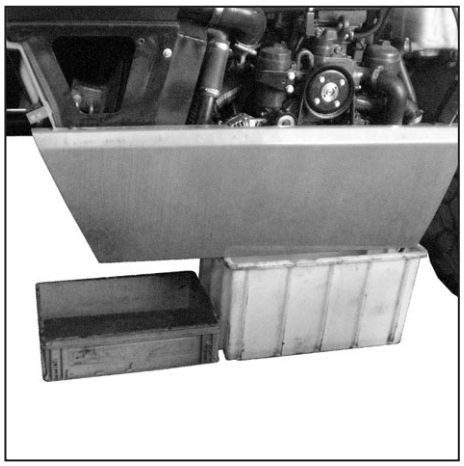
Reconnect the upper hose (Ref. 21) on the pump and screw the two clamps (Ref. 22) back on.



Reconnect the lower hose (Ref. 23) on the pump and screw the two clamps (Ref. 24) back on.



Fill the cooling system tank (Ref. 25) with the liquid concerned; the liquid level must be between the two notches indicating the minimum and maximum levels (approx. 18 litres).



Remove the containers from under the engine compatment.

SAUER HYDROSTATIC TRANSMISSION

FEED PUMP

Generally integrated in the body of the main pump, these prevent the cavitation of the system by recirculating the fluid lost by leakage to the circuit, also providing the pressure necessary for the system for variation of the displacement of the main pump.

PUMP/ENGINE CONTROLS

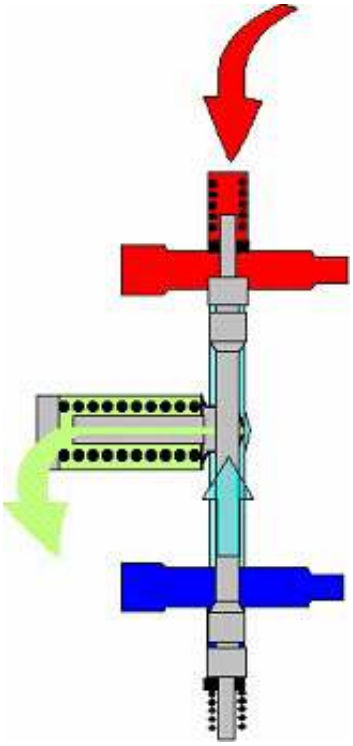
These are organs which guide the displacement variation of both components.

PRESSURE LIMITER VALVES

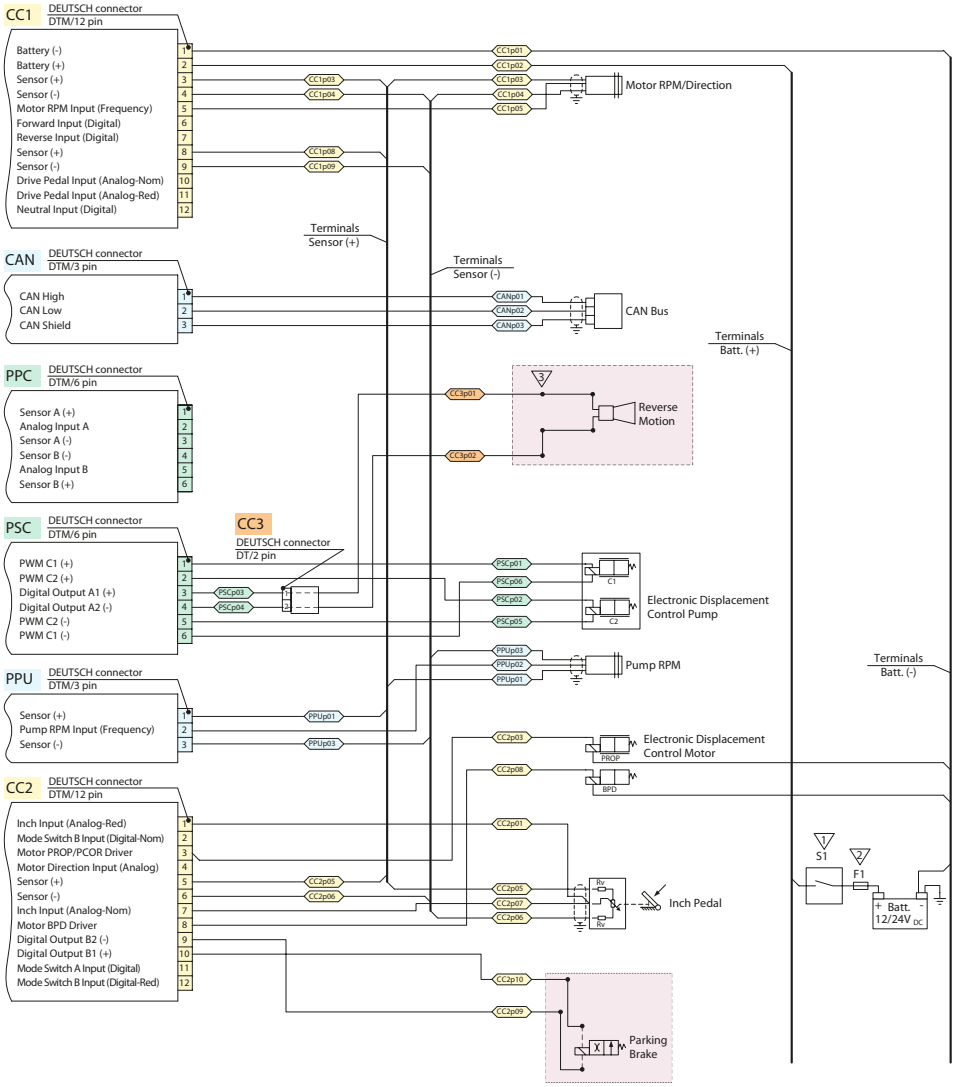
Limit the maximum pressure on both branches of the transmission.

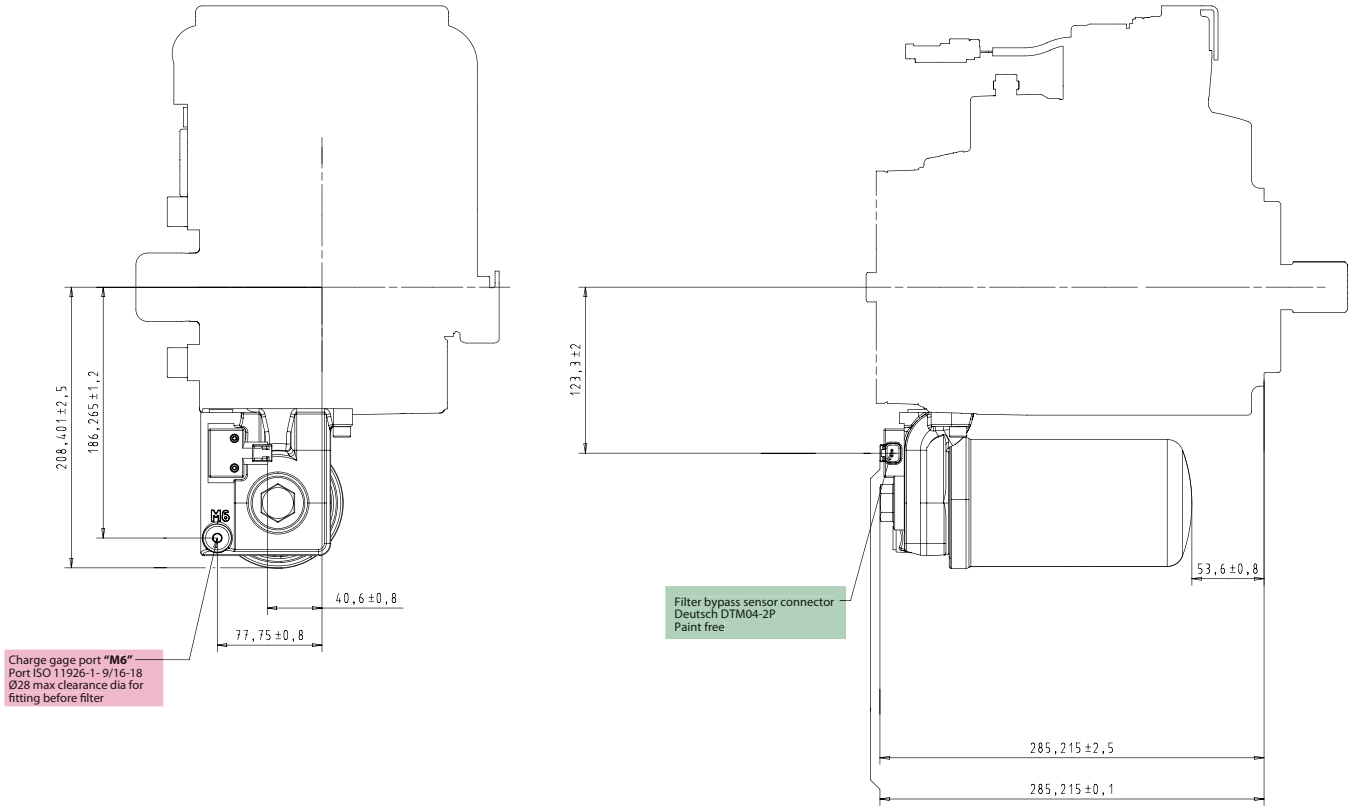
FLUSHING VALVE

The purpose of this valve is to optimise the operating conditions, making it easier to remove the contamination from the closed circuit, helping thermal stability, expelling the air from the circuit rapidly.



CONNECTIONS DIAGRAM





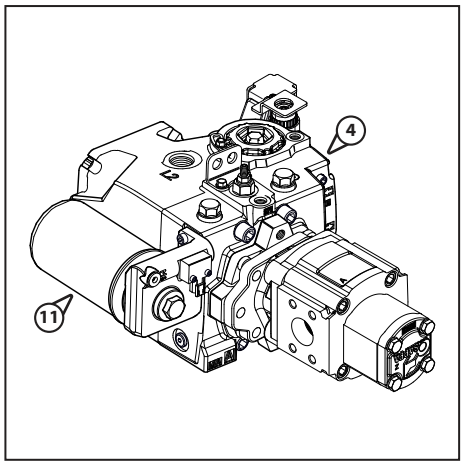
Connections

Pressure control points

Electrical connections

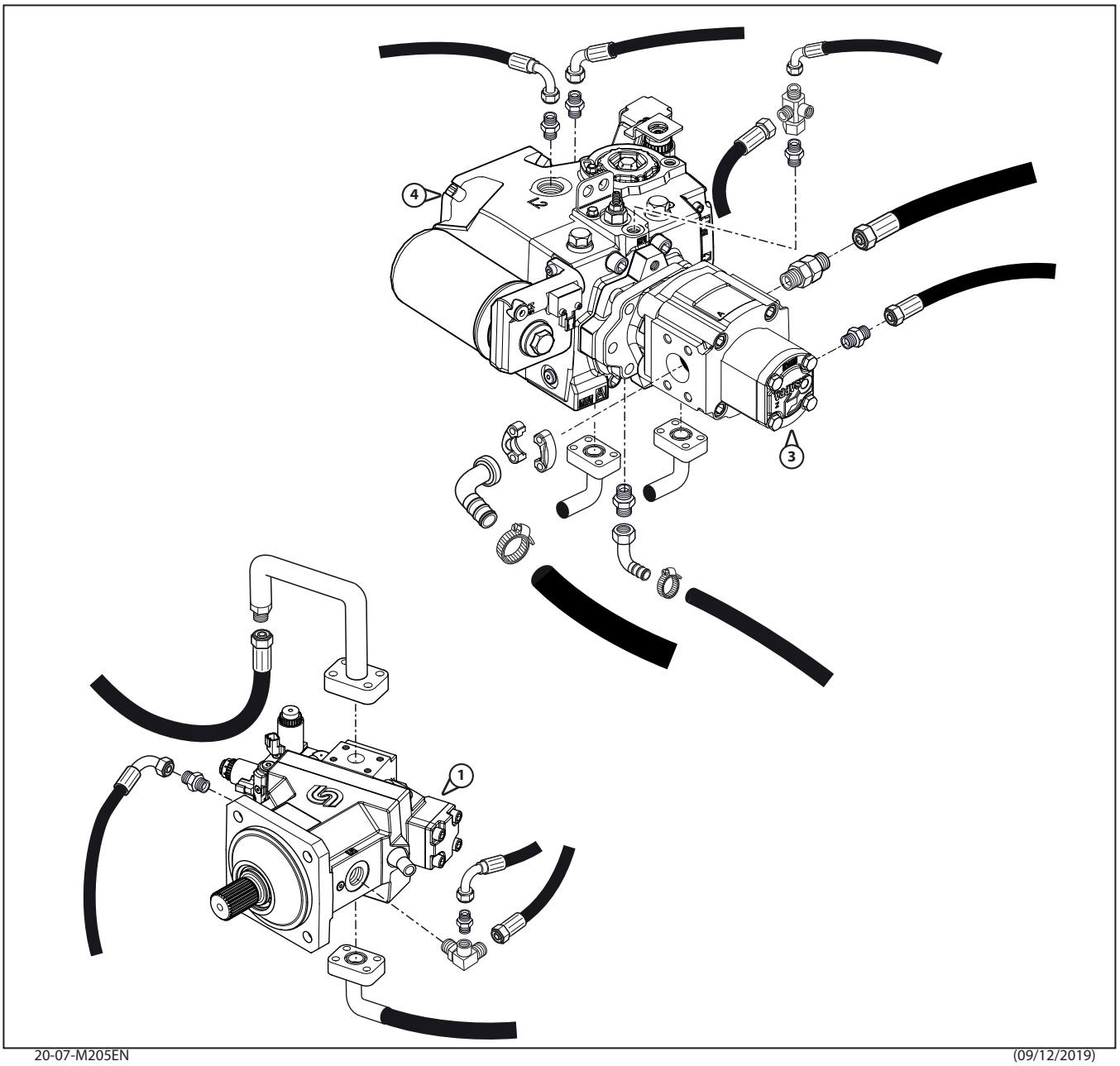
Port Description

Port	Description	Sizes
A	System Port "**A** "	Ø 25.4
B	System Port "**B** "	Ø 25.4
L2	Case Drain Port	1 1/16-12
L4	Case Drain Port	1 1/16-12
MA	System "**A**" Gage Port	9/16-18
MB	System "**B**" Gage Port	9/16-18
M3	Charge Gage Port, after Filtering	9/16-18
M4	Servo Gage Port	7/16-20
M5	Servo Gage Port	7/16-20
M6	Charge Gage Port, before Filtering	7/16-20
S	Charge Inlet Port	1 5/16-12

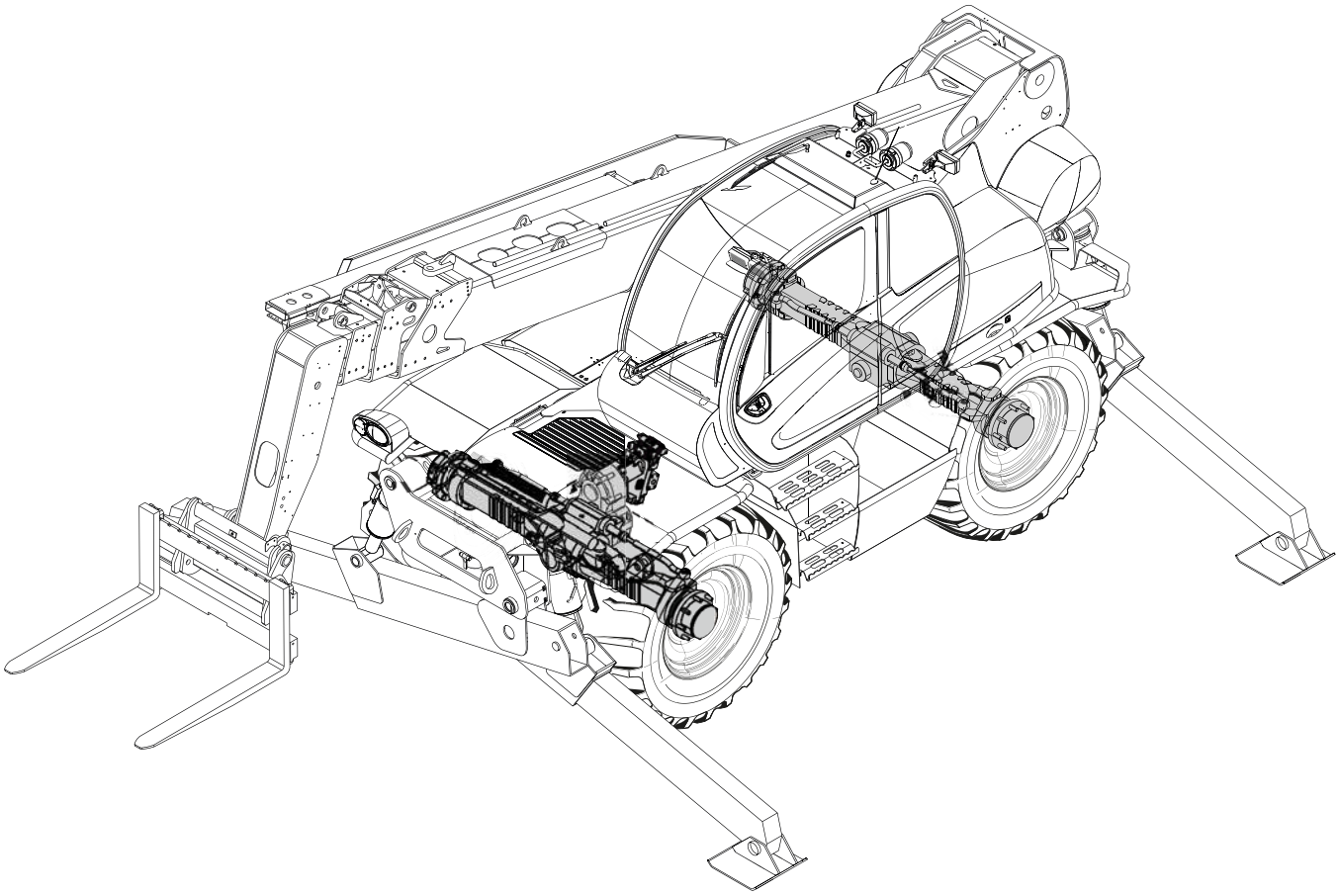


If the transmission oil filter (Ref. 11) had to be removed in the disassembly step, refit it now on the hydrostatic pump (Ref. 4).

Wash and dry all the pipes of the hydraulic fluid system and suction thoroughly, fit the pipes on the services pump (Ref. 3), on the hydrostatic pump (Ref. 4) and on the hydraulic motor (Ref. 1), taking care to position these correctly back in place according to the markings made with the marker pen in the dismantling phase.



REMOVING THE FRONT AND REAR AXLES



GENERAL INFORMATION

The sequence for disassembly operations must be followed to access the various components.

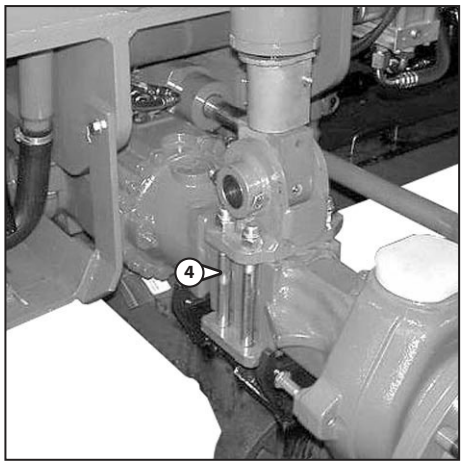
Mark all the hydraulic pipes and electrical connections with a marker pen, before disassembling, to ensure correct positioning in the reassembly phase.

Plug all the hydraulic pipes and orifices to prevent impurities from contaminating the hydraulic circuit.

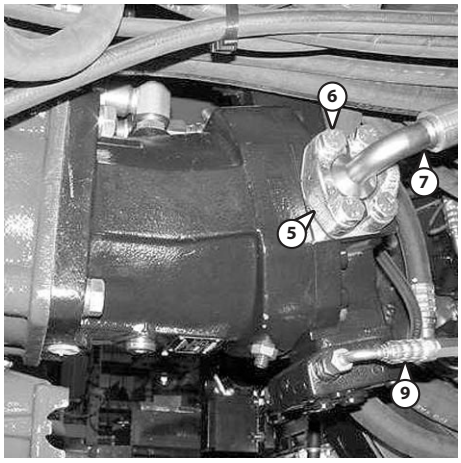
PREPARATION AND SAFETY INSTRUCTIONS

Park the vehicle on horizontal ground and level it (chassis parallel to front axle).
Rest the stabilizers on the ground to ensure utmost stability and safety, bringing them to a height necessary to remove the wheels and switch off the I.C. engine.

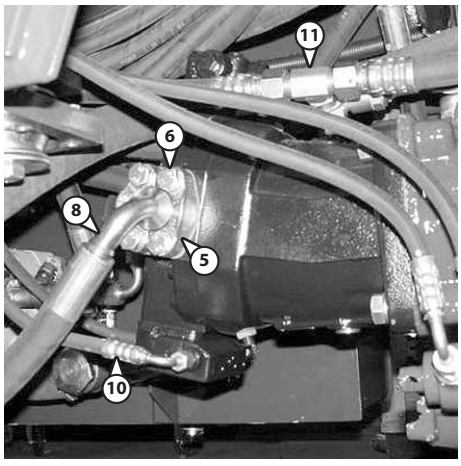
Specific tools:
– Crane for lifting (5000 kg. minimum).



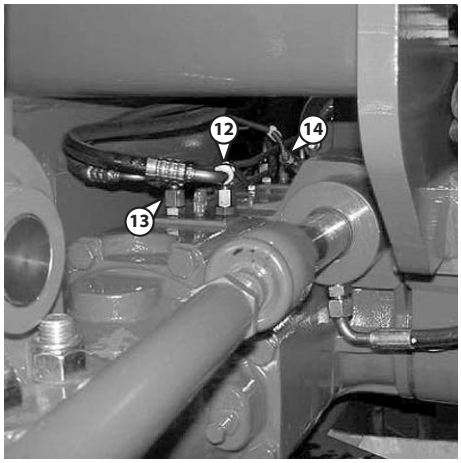
Connect the LH levelling cylinder to the axle by means of the screws (Ref. 4).



Refit the flanges (Ref. 5) on the two sides of the hydrostatic motors, tightening the screws (Ref. 6) and reconnect the tubes (Ref. 7 and 8).
Reconnect the hydraulic tubes (Ref. 9 and 10).



Reconnect the tubes on the "T" connector (Ref. 11) and reconnect the electrical connection on the connector.



Reconnect the two tubes (Ref. 12 and 13) concerned with the working of the service brake and parking brake.
Reconnect the electrical connection (Ref. 14) of the wheels alignment sensor.

BOOM WITH THREE EXTENSIONS

Consists of four elements:

- 1 FIXED
- 3 MOVABLE (T1 - T2 - T3)

Distribution:

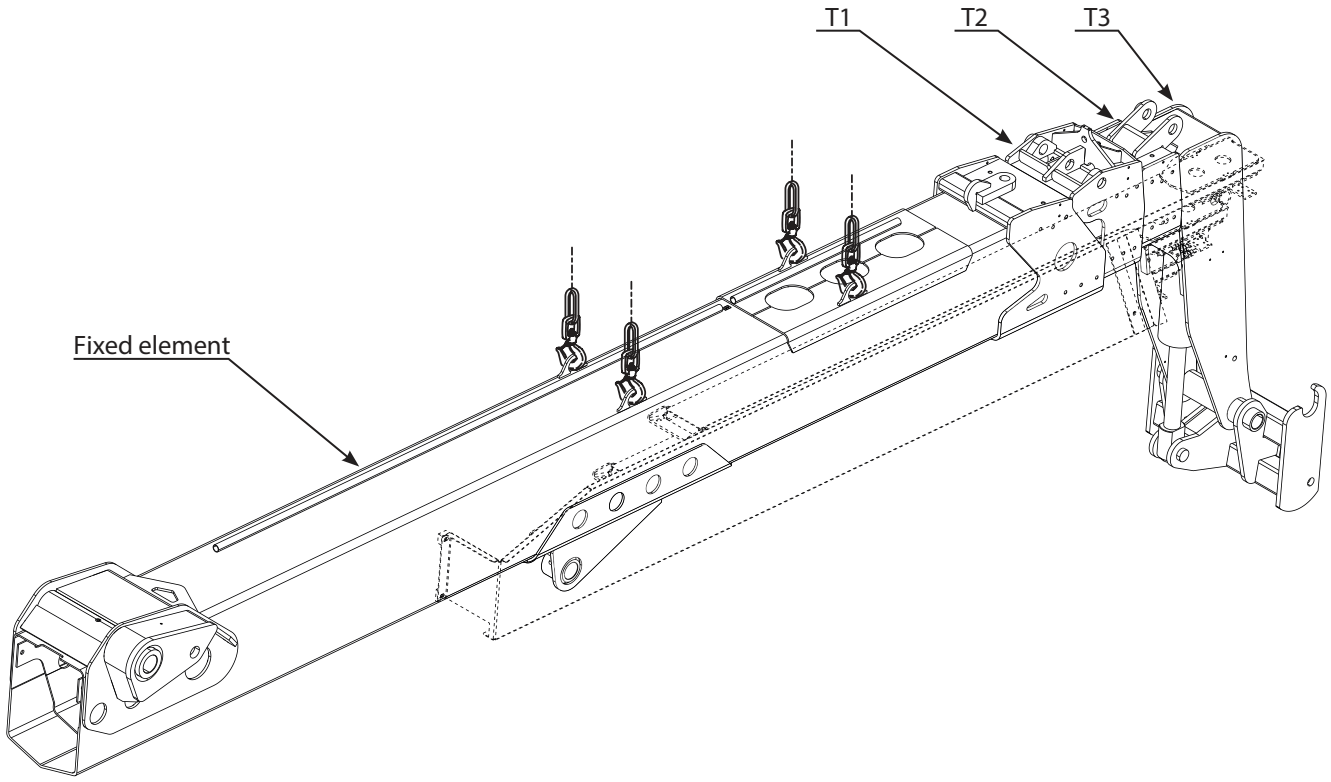
Distribution of boom with three extensions controlled simultaneously.
⇒ T1, T2 and T3 are extended simultaneously.

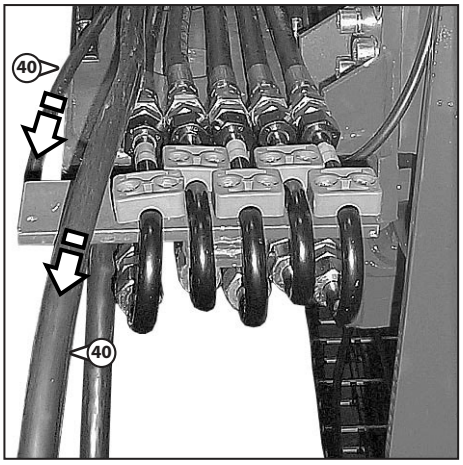
Vehicles provided with boom with three extensions:

- **MRT 1850 PLUS-E3 PRIVILEGE**
- **MRT 2150 PLUS-E3 PRIVILEGE**
- **MRT 2540 PLUS-E3 PRIVILEGE**

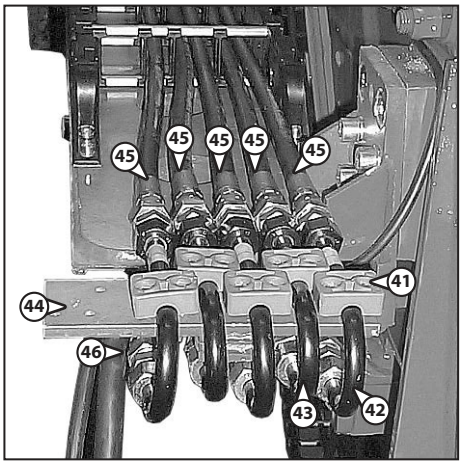
Boom weight:

Vehicle	*Boom weight:*
MRT 1850	3187 kg
MRT 2150	3514 kg
MRT 2540	3910 kg

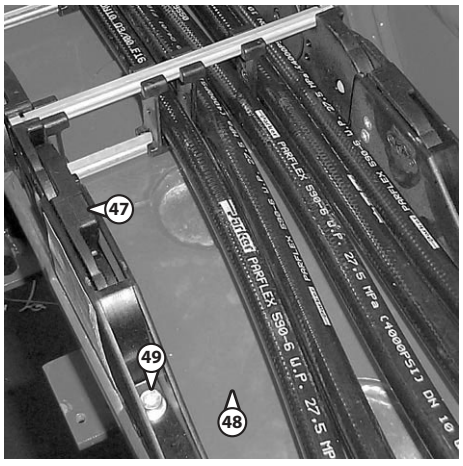




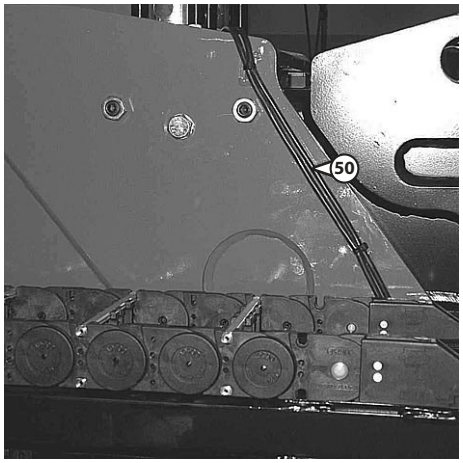
Extract the electric cables (Ref. 40) from the second tube-holder chain towards the quick-release coupling.



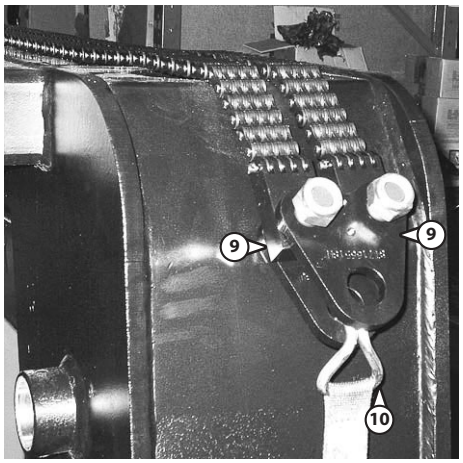
Remove the collars (Ref. 41) locking the elbow unions (Ref. 42 and 43) from the fixing plate on the I extension chain-holder tube (Ref. 44).
Disconnect the iron tubes (Ref. 42 and 43) from the hydraulic pipes (Ref. 45) inside the second tube-holder chain; disconnect the iron tubes (Ref. 42 and 43) from the hydraulic pipes (Ref. 46) inside the I extension chain-holder tube.



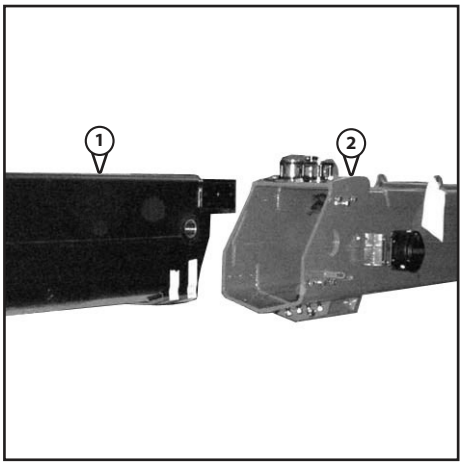
Dismantle the second tube-holder chain (Ref. 47) from the chain-holder tube (Ref. 48) by removing the screws concerned (Ref. 49).



Free the cable (Ref. 50) from the clamps for the micro switch on the single equaliser of the chain fitting to the I extension boom.

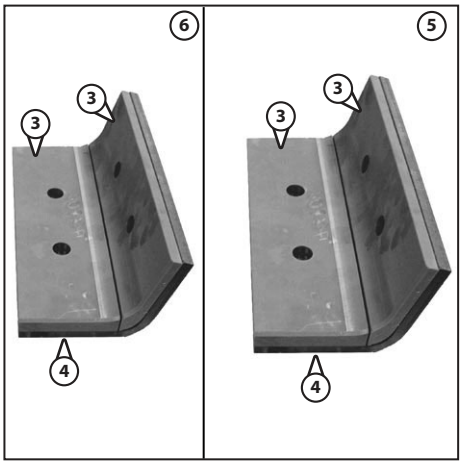


Disconnect the two end connectors of the upper chains (Ref. 9) after removing the pair of single chain equalisers (Ref. 10).



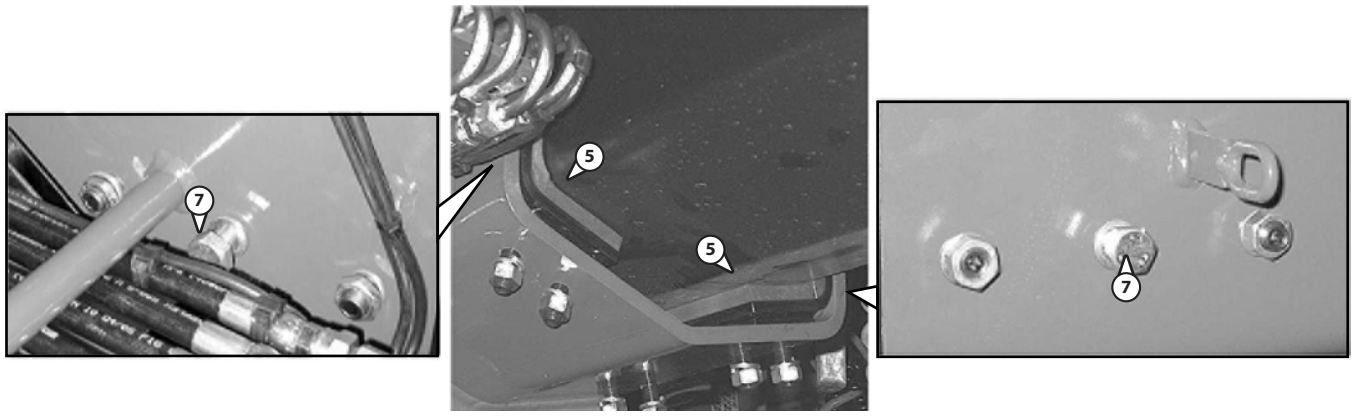
INSERT THE I EXTENSION BOOM IN THE OUTER BOOM

Using an elevator or overhead crane lift the I extension boom (Ref. 1)
and insert it into the outer boom (Ref. 2), leaving it to project by about 30-40 cm.

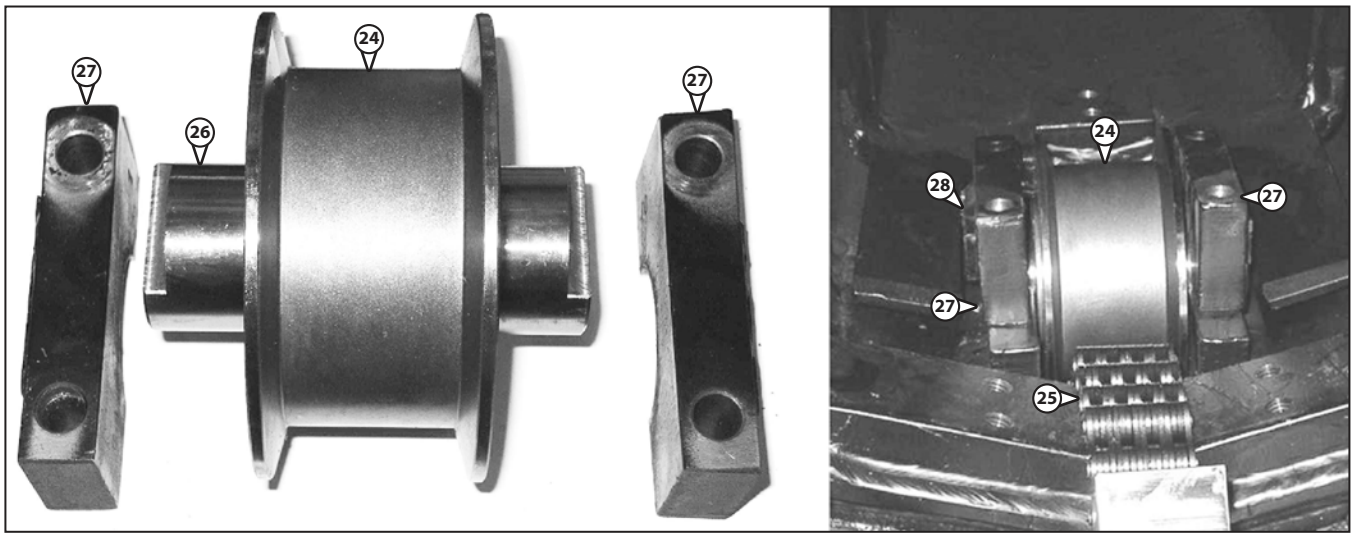


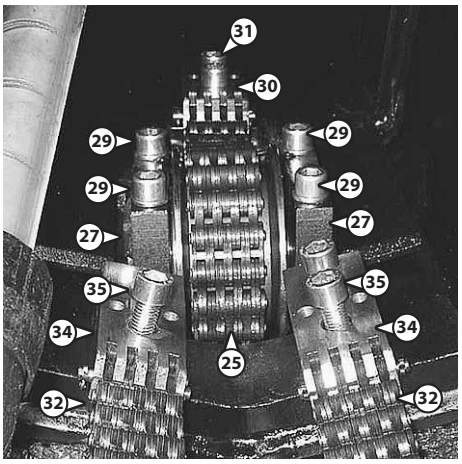
Prepare the sliding blocks (Ref. 3) on its supports (Ref. 4).
Note: the sliding blocks and supports are of two different sizes. Assembled, the smaller ones are positioned on the upper side of the boom, while the larger ones are positioned on the lower side.

Fit the preassembled lower and lateral sliding blocks in front between the outer boom and the I extension (Ref. 5).
Fit only the sliding blocks support fixing screw (Ref. 7), present on the outer boom.

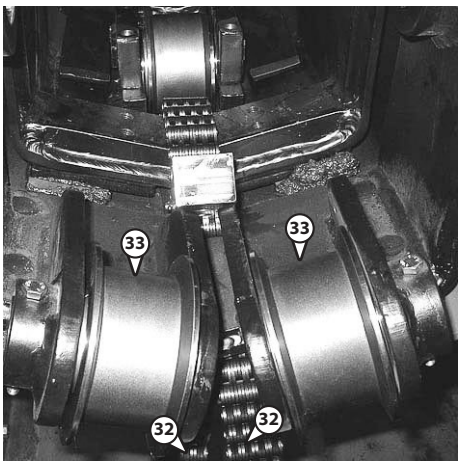


Prepare the pulley (Ref. 24) for the sliding of the single inner chain (Ref. 25), with its pin (Ref. 26) and the 2 half-moon shaped supports (Ref. 27) for locking the pin.



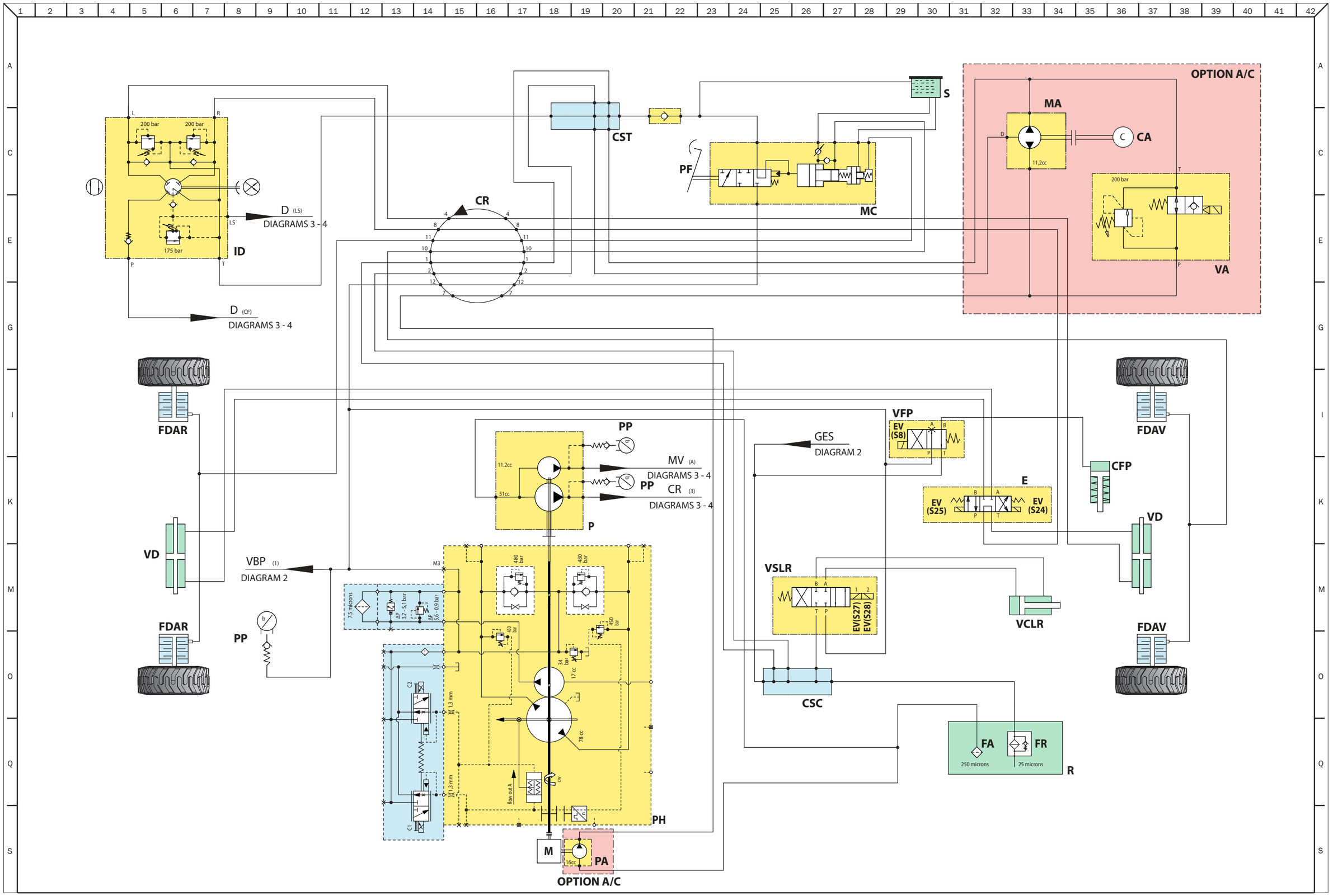


Fit the pulley (Ref. 24) with the pin (Ref. 26) in their seat, in the rear part of the III extension, keeping the two chamfers (Ref. 28) of the pin facing upwards.
Lock the pin (Ref. 26) by means of the two half-moon shaped supports (Ref. 27) using the screws (Ref. 29).
Use Loctite blu 243 before tightening the screws.
Tighten the screws (Ref. 29) using a tightening torque of 70 Nm.
Slide the single inner chain (Ref. 25) in the pulley (Ref. 24) and fix its end connector (Ref. 30) in the lower wall of the III extension, in its seat, by means of the screws (Ref. 31).



Run the two inner chains (Ref. 32) in the pulleys (Ref. 33) of the I extension, in the rear part of the II extension, position the end connectors (Ref. 34) of the chains on the lower wall of the II extension, in its seat, fixing it by means of the screws (Ref. 35).

DIAGRAM 6 - BRAKES HYDRAULIC SYSTEM - STEERING - AIR CONDITIONING OPTION



GENERAL INFORMATION

The pressures must be checked by means of a suitable pressure gauge, the oil temperature must be about 60°, the I.C. engine must be running at maximum speed for all the checks, except for checking the rotation, which must be done at minimum speed.

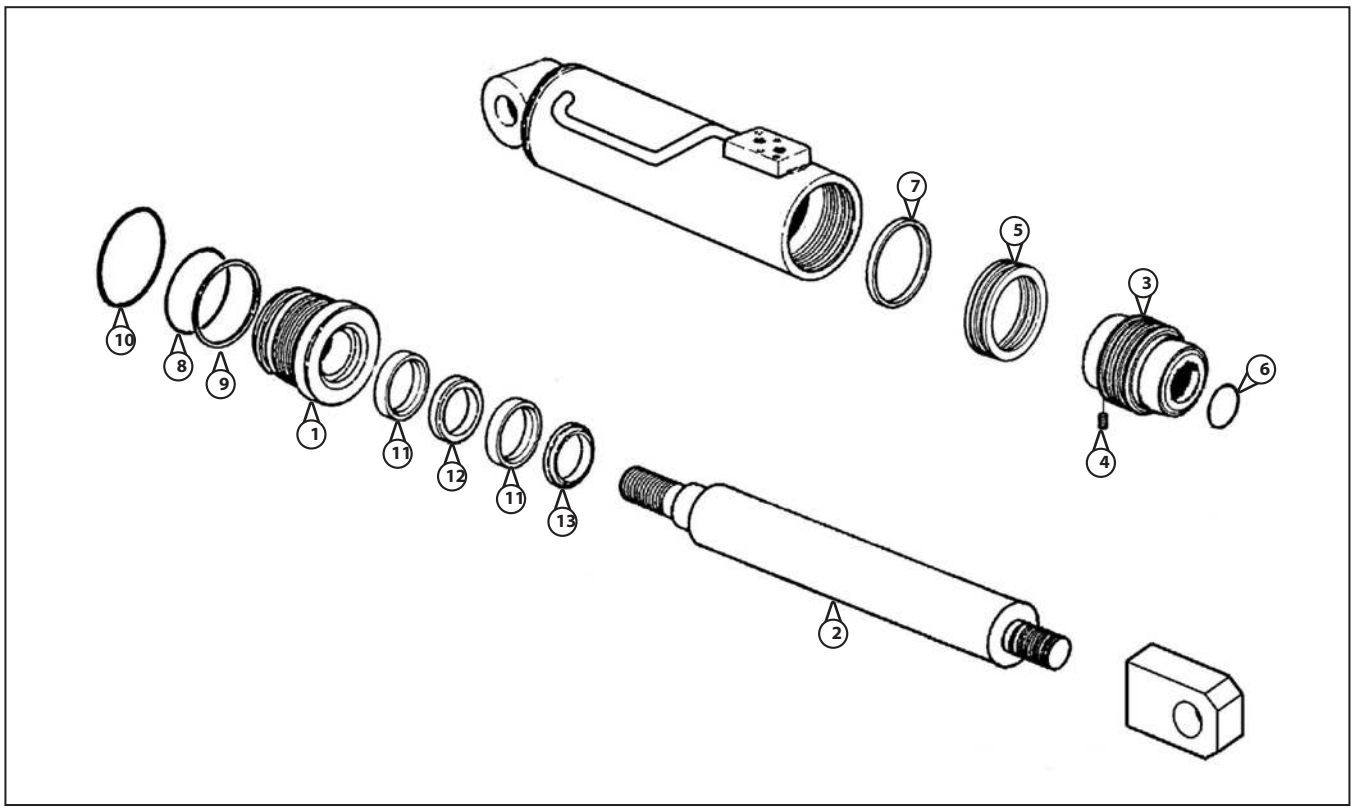
PREPARATION AND SAFETY INSTRUCTIONS

Park the vehicle on a horizontal surface and rotate the turret through 180°.

Specific tools:
– Pressure gauge (600 bar):

SLEWING CYLINDER

Tools required:
- 1 hook spanner (for ring nuts)
- 1 4mm Allen key

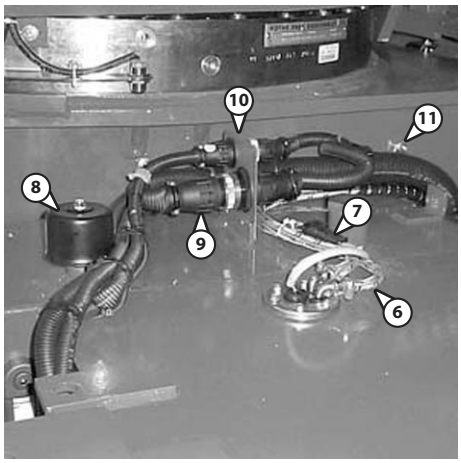


DISASSEMBLY

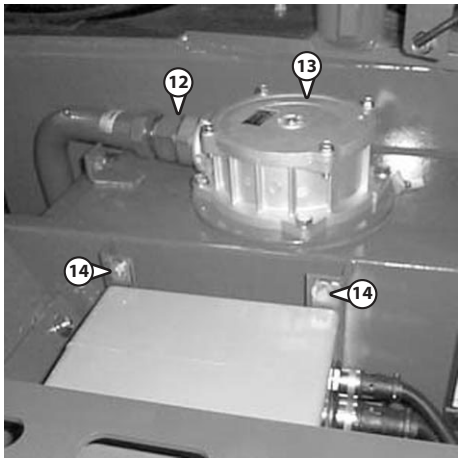
Unscrew the head (Ref. 1) using a hook spanner by dislodging the tab on the rim of the jacket that is staked into a corresponding location on the head.
Remove from the rod assembly cylinder jacket (Ref. 2) + piston (Ref. 3) assembly.
Remove the Allen screw (Ref. 4) (4mm Allen key) of the piston.
Attention: screw locked with loctite (see "Application of threadlock" chapter).
Unscrew the piston (Ref. 3) of the cylinder using a hook spanner.
Remove the piston (Ref. 3) of the cylinder and the head piece (Ref. 1) from the rod.
Remove the gaskets (Ref. 5 and 6) and the guide rings (Ref. 7) of the piston.
Remove the gaskets (Ref. 8-9-10), the guide rings (Ref. 11) and the gaskets (Ref. 12 -13) of the head piece.
Check the condition of the valve, the valve seat and spring; change the gaskets and the components if necessary.
Attention to the direction of reassembly.

REASSEMBLY

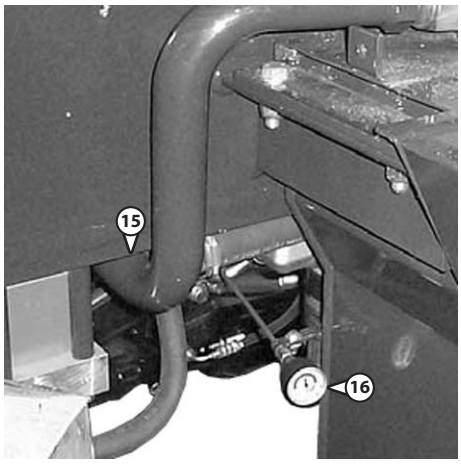
Operation reverse to that for disassembly.
Note: The outer tab of the jacket must be staked into the corresponding location on the head to prevent the head from working loose.
Loctite threadlock must be used for fitting the Allen screw.
Smear hydraulic fluid on the gaskets.



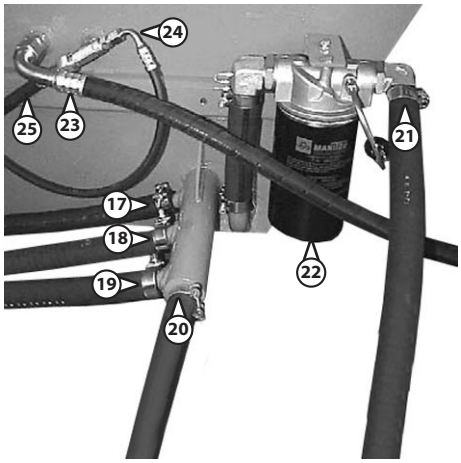
Disconnect the fuel suction and return pipes (Ref. 6) fitted on the level indicator, disconnect the electric connection (Ref. 7) of the fuel level indicator.
Unscrew the venting filter (Ref. 8) and screw an eyelet on the tank to secure the tank to an overhead crane or elevator.
Disconnect the electric sockets (Ref. 9) and the support (Ref. 10) on the tank and unscrew the clamp (Ref. 11) which holds together the electric cables, from the chassis.



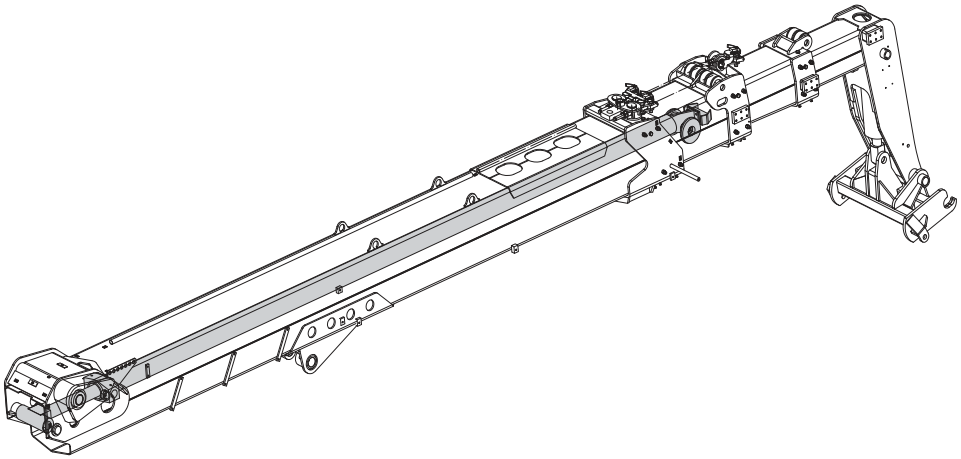
Unscrew the oil return manifold (Ref. 12) fitted on the exhaust filter (Ref. 13), removing the relays box after unscrewing the screws (Ref. 14).

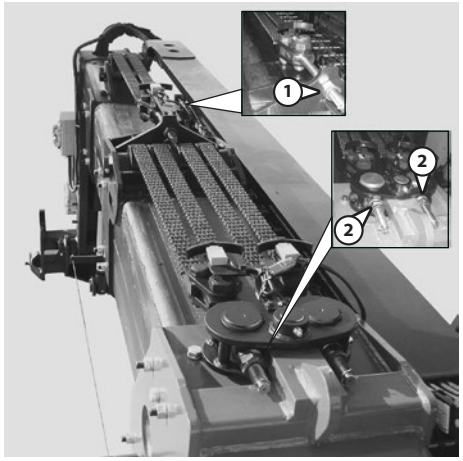


Slacken the screws (Ref. 15) fixing the manifold to the chassis, remove the vacuum indicator (Ref. 16).



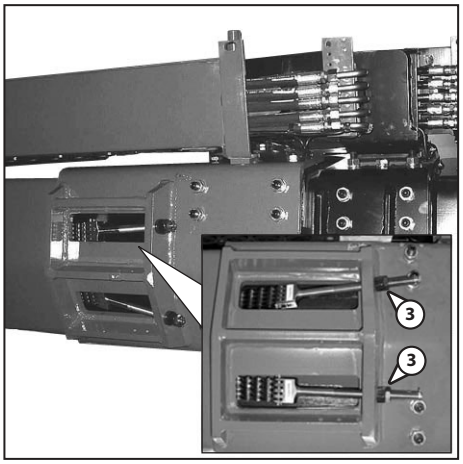
Disconnect the hydraulic fluid suction pipes (Ref. 17, 18, 19, 20) fitted on the tank.
Note: the tube (Ref. 20) is present only in the models equipped with air conditioning.
Disconnect the hydraulic suction pipes (Ref. 21) on the transmission oil filter (Ref. 22).
Disconnect the hydraulic tube (Ref. 23) for oil return from the radiator, disconnect the hydraulic drainage pipe of the rotation motor (Ref. 24) and the hydraulic pipe (Ref. 25) for oil return from the hydrostatic pump.



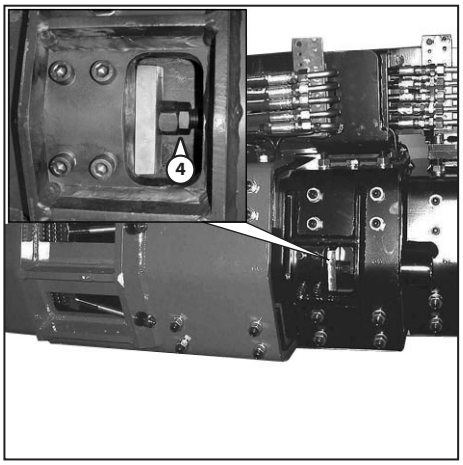


REMOVING THE BOOM EXTENSION CYLINDER

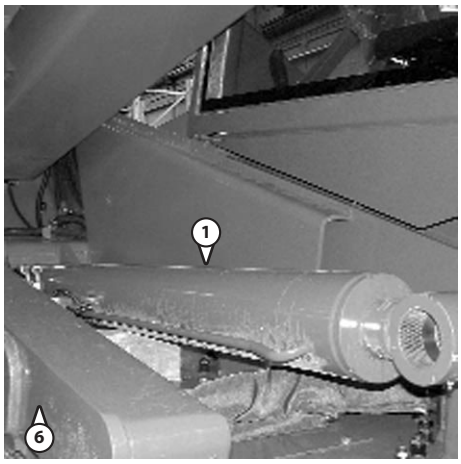
With the boom extended by about 25-30cm, unscrew the lock nuts and nuts on the tierods for the booms extension chains (Ref. 1 and 2) up to the split pins.



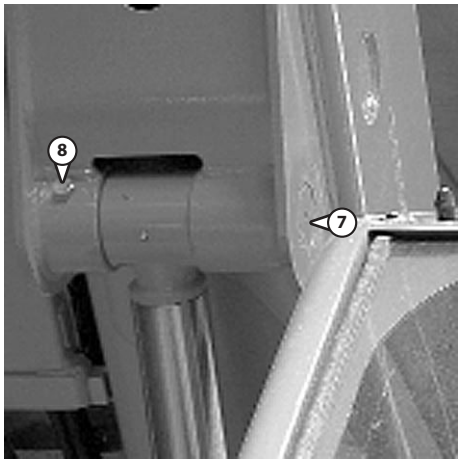
Unscrew the lock nuts and nuts (Ref. 3) of the tierods for the chains for extraction of the II extension boom up to the split pins.



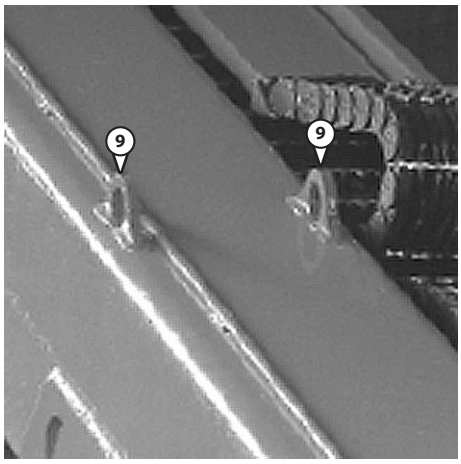
Unscrew the lock nuts and nuts (Ref. 4) of the tierods for the chains for retraction of the III extension boom up to the split pins.



Raise the lift cylinder (Ref. 1) from the turret (Ref. 6), until the rod gets inserted in its seat on the boom



Insert the lift cylinder hinge pin (Ref. 7) of the rod-boom side, blocking it by means of the screw (Ref. 8).



Remove the overhead crane or elevator from the eyelets (Ref. 8) present in the upper part of the boom.

Remove the support from the lift cylinder.

MOVEMENTS ALLOWED FROM THE CAB WITH PLATFORM EXCLUSION KEY ACTIVATED					
	BOOM WITHIN H=3m	BOOM WITHIN H=3m	BOOM MORE THAN H=3m	BOOM MORE THAN H=3m	NOTES
	BOOM RETRACTED	BOOM EXTENDED	BOOM RETRACTED	BOOM EXTENDED	
STABILIZERS RAISED	√				
STABILIZERS LOWERED	√	√			
TURRET ROTATION	√	√			Only for returning to the centre
SLEWING UPWARDS					
SLEWING DOWNWARDS	√	√	√	√	
BOOM ASCENT	√ (even if more than H=3m)	√ (even if more than H=3m)	√ (even if more than H=3m)	√ (even if more than H=3m)	
BOOM DESCENT					
BOOM RETRACTION	√	√	√	√	
BOOM EXTENSION					
OPTION 1	√	√	√	√	
OPTION 2					

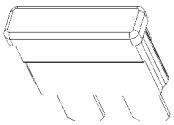
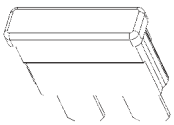
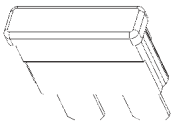
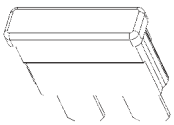
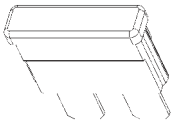
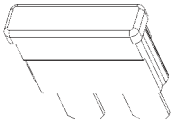
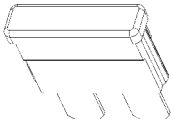
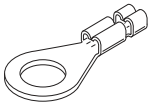
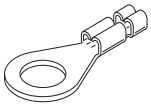
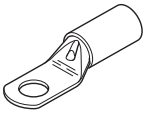
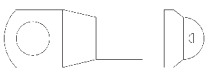
MOVEMENTS ALLOWED FROM THE CAB WITH ROLLOVER PROTECTION EXCLUSION KEY ACTIVATED					
	BOOM WITHIN H=3m	BOOM WITHIN H=3m	BOOM MORE THAN H=3m	BOOM MORE THAN H=3m	NOTES
	BOOM RETRACTED	BOOM EXTENDED	BOOM RETRACTED	BOOM EXTENDED	
STABILIZERS RAISED	√				
STABILIZERS LOWERED	√	√			
TURRET ROTATION					
SLEWING UPWARDS					
SLEWING DOWNWARDS					
BOOM ASCENT					
BOOM DESCENT	√				
BOOM RETRACTION					
BOOM EXTENSION					
OPTION 1					
OPTION 2					

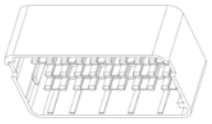
NOTE: the data given in the afore-mentioned tables are applicable for all positions of the turret.

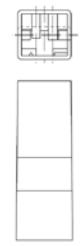
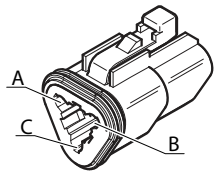
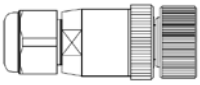
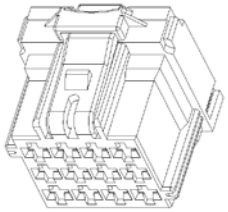
VEHICLE ON STABILIZERS WITH RADIO CONTROL IN TILTING CONDITION

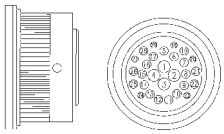
MOVEMENTS ALLOWED FROM THE CAB					
	BOOM WITHIN H=3m	BOOM WITHIN H=3m	BOOM MORE THAN H=3m	BOOM MORE THAN H=3m	NOTES
	BOOM RETRACTED	BOOM EXTENDED	BOOM RETRACTED	BOOM EXTENDED	
STABILIZERS RAISED	√				
STABILIZERS LOWERED	√	√	√		
TURRET ROTATION	√	√	√		The turret can be brought to the central position only if 1 of the 2 proximity switches +/-5° is reading.
SLEWING UPWARDS					
SLEWING DOWNWARDS					
BOOM ASCENT					
BOOM DESCENT					
BOOM RETRACTION					
BOOM EXTENSION					
OPTION 1					
OPTION 2					

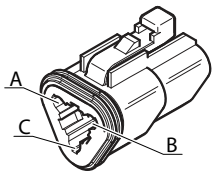
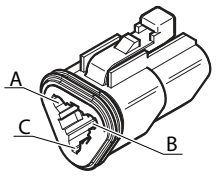
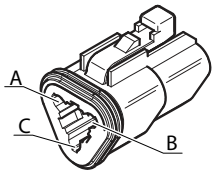
MOVEMENTS ALLOWED FROM THE CAB WITH PLATFORM EXCLUSION KEY ACTIVATED					
	BOOM WITHIN H=3m	BOOM WITHIN H=3m	BOOM MORE THAN H=3m	BOOM MORE THAN H=3m	NOTES
	BOOM RETRACTED	BOOM EXTENDED	BOOM RETRACTED	BOOM EXTENDED	
STABILIZERS RAISED	√				
STABILIZERS LOWERED	√	√			
TURRET ROTATION	√	√	√	√	The turret can be brought to the central position only if 1 of the 2 proximity switches +/-5° is reading.
SLEWING UPWARDS					
SLEWING DOWNWARDS	√	√	√	√	
BOOM ASCENT					
BOOM DESCENT					
BOOM RETRACTION	√	√	√	√	
BOOM EXTENSION					
OPTION 1	√	√	√	√	
OPTION 2					

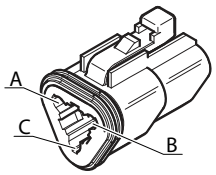
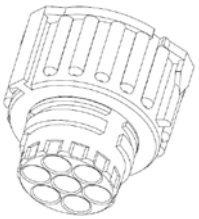
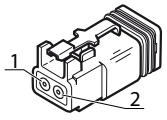
Connectors wiring					
Ref.	**Pin**	**Wire colour**	**Section**	**Destination**	**Image**
F69	IN	Brown	1,5	R35/87	
	OUT	Yellow-Red	1,5	X7D-F/L	
F7	IN	Blue	1,5	R4/87	
	OUT	Red-Green	1	X19-F/A	
		Red-Green	1	X18-M/20	
F70	IN	Red	4	KEY/1	
	OUT	Green	1	X107-F/11	
		Green	4	X12-F/1	
F71	IN	Brown	1,5	R35/87	
	OUT	Yellow-Red	1,5	X7D-F/L	
F72	IN	Brown	6	R35/87	
	OUT	Blue	6	X40-F/2	
F75	IN	Red	35	B1	
	OUT	Red	16	X35-B-D-E	
		Red	25	X1-1	
F8	IN	Blue	1	R4/87	
	OUT	Pink-Red	1	R9/30	
F9	IN	Blue	1,5	R4/87	
	OUT	Orange	1,5	X18-M/8	
G1	1	Grey	1	X35-C	
	/	Red	25	M1/F75	
CARRIAGE SYSTEM LINE GND	/	Black	35	Black	
MERCEDES ENGINE PART LINE GND	/	Black	4	Black	
DASHBOARD LINE GND	/	Black	16	Black	
	/	Black	25	Black	

Connectors wiring					
Ref.	**Pin**	**Wire colour**	**Section**	**Destination**	**Image**
MC2M CHASSIS	S16	Grey-Blue	1	XSC1-F/3	
	S17	Pink-Blue	1	X17-F/13	
	S18	Purple-Blue	1	X17-F/15	
	S19	White-Pink	1	X17-F/9	
	S2	Brown-Green	1	X28/B	
	S20	White-Black	1	X17-F/11	
	S21	Black	1	GND	
	S23	White	0,5	X16-M/26	
				X500-F/1	
				X71/C	
	S24	Shield	-	X16-M/21	
	S25	Brown	0,5	X16-M/25	
				X500-F/2	
				X71/D	
	S26	White	0,5	CAN/2	
				X16-M/28	
				X501-F/1	
	S27	Shield	-	CAN/3	
	S4	Red-Grey	1	X33-F/7	
	S5	Red-Blue	1	X33-F/6	
	S6	Green-Black	1	X33-F/10	
	S7	Brown	0,5	CAN/1	
				X16-M/27	
				X501-F/2	
	S8	Blue-Pink	1	X17-F/5	
	S9	Blue-Black	1	X17-F/7	
MC2M-1 CABIN	1	Red-Black	1,5	MDCP/3	
		Red-Black	2,5	MC2M-1 CABIN/2	
				MC2M-1 CABIN/3	
		Red-Black	6	X23-M/1	
	2	Red-Black	1,5	MDCP/3	
		Red-Black	2,5	MC2M-1 CABIN/1	
				MC2M-1 CABIN/3	
		Red-Black	6	X23-M/1	
	3	Red-Black	1,5	MDCP/3	
		Red-Black	2,5	MC2M-1 CABIN/1	
				MC2M-1 CABIN/2	
		Red-Black	6	X23-M/1	
	4	Black	2,5	GND	

Connectors wiring					
Ref.	**Pin**	**Wire colour**	**Section**	**Destination**	**Image**
X103-F	1	Grey-Red	1	X107-F/6	
				X12-F/7	
				X32-F/4	
	2	Brown-White	1	X107-F/9	
				X12-F/6	
				X32-F/3	
				X32-F/5	
				X33-M/2	
X105	1	Pink-Black	1	X106/1	
				X107A/1	
				X9-M/B	
	2	Black	1	GND	
	3	Brown	0,5	X9-M/P	
	4	White	0,5	X9-M/Q	
X106	1	Pink-Black	1	X105/1	
				X107A/1	
				X9-M/B	
	2	Black	1	GND	
	3	Orange-Purple	1	X9-M/O	
	4	Brown-Grey	1	X9-M/J	
X107A	1	Pink-Black	1	X105/1	
				X106/1	
				X9-M/B	
	2	Black	1	GND	
	3	Grey-Blue	1	X9-M/E	
	4	White-Grey	1	X9-M/K	
X107-F	1	Blue-Yellow	1	X21-F/10	
		Blue-Yellow	1	X42-F/5	
		Blue-Yellow	1	X32-F/1	
		Blue-Yellow	1	F37	
				X107-F/10	
	2	Yellow	1	X101-F/1	
		Yellow	1	X12-F/4	
		Yellow	1	X32-F/2	
	4	Black	1	GND	
	6	Grey-Red	1	X103-F/1	
		Grey-Red	1	X12-F/7	
		Grey-Red	1	X32-F/4	
	8	Blue-White	1	X12-F/8	
				X42-F/3	
	9	Brown-White	1	X103-F/2	
				X12-F/6	
				X32-F/3	
				X32-F/5	
				X33-M/2	

Connectors wiring					
Ref.	**Pin**	**Wire colour**	**Section**	**Destination**	**Image**
X18-M	3	Red	1,5	R14/30	
				R5/30	
		Red	2,5	F19	
				F20	
		Red	4	F16	
				F17	
				X18-M/1	
				X18-M/2	
				X18-M/4	
		Red	6	F18	
	4	Red	1,5	R14/30	
				R5/30	
		Red	2,5	F19	
				F20	
		Red	4	F16	
				F17	
				X18-M/1	
				X18-M/2	
				X18-M/3	
		Red	6	F18	
	5	Yellow-Red	1,5	F4/F5	
	6	Yellow	1,5	F5	
	7	Yellow-Black	1,5	F4	
	8	Orange	1,5	F9	
	9	Brown-Grey	1	R6/86	
	10	Light blue-Yellow	1,5	R6/87	
	11	Brown-Black	1	R7/85	
	12	Pink-Black	1,5	R7/87	
	13	Red-White	1,5	F14	
	14	Black-Yellow	1	R1/85	
				R2/85	
	15	Green-Red	1	F2	
	16	White-Green	1	F1	
	17	Red-Black	1,5	R3/87	
		Red-Black	2,5	X17-M/10	
				X17-M/8	
		Red-Black	1,5	F14	
	18	Grey-Purple	1	F10	
	19	Grey-Green	1	R4/86	
	20	Red-Green	1	X19-F/A	
		Red-Green	1	F7	
	21	Grey-Red	1,5	R5/87	
	22	Grey-Black	1,5	R12/87	
	23	Black-Blue	1	R8/87	
	24	Pink-Brown	1	R8/85	
	25	Light blue-Red	1,5	F15	
	26	Light blue-Red	1,5	F15	
	27	Red-Yellow	1	R5/86	
	28	Red-Black	1	R3/86	
	29	Light blue-Orange	1	R14/85	

Connectors wiring					
Ref.	**Pin**	**Wire colour**	**Section**	**Destination**	**Image**
X27B	3	Orange	1	X18-F/8	
				X27/1	
				X27A/3	
				X27C/1	
				X29/1	
				X29A/3	
				X29B/3	
				X29C/1	
				X5/1	
				X5A/3	
				X5B/3	
				X5C/1	
				X7/1	
				X7A/3	
				X7B/3	
				X7C/1	
	4	Grey-Green	1	MC2M CHASSIS/R24	
X27C	1	Orange	1	X18-F/8	
				X27/1	
				X27A/3	
				X27B/3	
				X29/1	
				X29A/3	
				X29B/3	
				X29C/1	
				X5/1	
				X5A/3	
				X5B/3	
				X5C/1	
				X7/1	
				X7A/3	
				X7B/3	
				X7C/1	
	2	Grey-Red	1	MC2M CHASSIS/L1	
X28	A	Black	1	GND	
	B	Brown-Green	1	MC2M CHASSIS/S2	
	C	Black-Red	1	MC2M CHASSIS/L6	

Connectors wiring					
Ref.	**Pin**	**Wire colour**	**Section**	**Destination**	**Image**
X5C	1	Orange	1	X18-F/8	
				X27/1	
				X27A/3	
				X27B/3	
				X27C/1	
				X29/1	
				X29A/3	
				X29B/3	
				X29C/1	
				X5/1	
				X5A/3	
				X5B/3	
				X7/1	
				X7A/3	
				X7B/3	
				X7C/1	
	2	Purple-Red	1	MC2M CHASSIS/L3	
X6(FPSX)	1	Black	1	GND	
	2	Yellow	1	X6A/1	
		Yellow	1	X13/5	
		Yellow	1	X30/3(FADX)	
		Yellow	1,5	X18-F/6	
	3	Light blue-Yellow	1	A2/1	
		Light blue-Yellow	1	X10/3(FPDX)	
		Light blue-Yellow	1	X13/2	
		Light blue-Yellow	1	X18-F/10	
	4	Blue-Black	1,5	X25/2(FASX)	
		Blue-Black	1,5	X16-M/8	
		Blue-Black	1	MC2M CHASSIS/L39	
		Blue-Black	1	X13/4	
	5	Pink-Black	1,5	X18-F/12	
		Pink-Black	1	X10/5(FPDX)	
		Pink-Black	1	X13/6	
X6A	1	Yellow	1	X13/5	
		Yellow	1,5	X30/3(FADX)	
		Yellow	1,5	X18-F/6	
		Yellow	1	X6(FPSX)	
	2	Black	1	GND	

WIRING DIAGRAMS BY FUNCTIONS

1.1 – STARTER

Connectors				
Type of wiring	**Ref.**	**Description**	**Position on the diagram**	**Hydraulic equivalent**
Rear turret	X11	Boom/platform functions interface connector	G38	
	X11C	Interface	I37 / I38	
Frame/Cab	X16	Interface	E25 / E34 / G25 / G34 / M15 / O24	
Frame	X17	Interface	G29 / M17 / M18 / O24	
Frame	X18	Interface	G7 / G34 / I19 / M19 / M26 / M27	
Frame	X19	Interface	E27 / E28 / G8 / G9	
Frame	X22	Limit switch inserted	E21 / E22	
Rear turret/Cab	X22A	Limit switch inserted	I7 / I8	
Frame	X23	Fan-1 oil cooling	E38	
Frame	X26	Lower front overall light	I33	
	X29D	Anti-theft connector	Q21	
Engine/Frame	X35	Interface	G14 / G15 / M17 / M18 / O19	
Engine	X36	Mercedes engine mr2 control unit	Q18	
Engine/Cab	X37	Anti-theft device connector	O15	
Frame	X71	Planarity sensor (electronic level gauge)	I36	
	XA	Interface	G38	
	XBI	Installation connector	K28 / K29	
	XD+	d+alternator signal by-pass	C13 / E13	
Cab	XDK	Installation connector	E26	
Cab	XDM	Diagnostics connector	O10	
	XDR	D+ Alternator by-pass signal	I13	
Cab	XM1	Adm2 connector	Q13	
Cab	XM2	Adm connector	O28	
Frame	XSC	Set-up connector	E27 / I9	

Components			
Ref.	**Description**	**Position on the diagram**	**Hydraulic equivalent**
B1	12V DC battery	A4	
CAN-1	R.F.ID. connection head boom	I39	
G	Alternator	C13	
KEY	Start-up panel	C32	
M1	Starter motor	E10	
MC2M-3 CABIN	Cab section inputs/outputs 3B6 control unit	G22 / G23	
MC2M-3 CHASSIS	Chassis section inputs/outputs 3B6 control unit	I23 / I24 / K10 / K11 / M28 / M29	
OBD2	Diagnostics connector	O12	

Fuses and relays			
Ref.	**Description**	**Position on the diagram**	**Posizione sullo schema**
F7	Gear micro switch fuse	10A	O34
F16	Mercedes control unit power supply fuse	25A	K17
F18	Chassis primaries power supplies relay fuse	30A	K34
F38	Start-up panel auxiliary power supply	7,5A	E33 / E34
F58	Platform functions power supply fuse	15A	E38
F75	Main fuse		C6
R4	Chassis primaries power supplies relay		M34
R5	Start-up relay		M20
R14	Relay for start up control by adm-2		M25
R16	Set-up relay		I26
R35	Cab section power supplies remote control switch		C3
R74	Radio and heater relay		C2 / C3
R78	3b6 control units power positives relay		C2
R82	Neutral position negative signal relay		S25

Connectors				
Type of wiring	**Ref.**	**Description**	**Position on the diagram**	**Hydraulic equivalent**
Frame	X4A	Lh rear axle block micro switch	K10	
Frame/Cab	X7D	Cab connector	G17	
Frame/Rear turret/ Dispositivo di sicurezza	X9	Emergency pump switch	E40	
Rear turret	X10	Optional connector	C26	
Rear turret	X11	Boom/platform functions interface connector	G18 / G19	
Frame	X11A	Rh rear axle block micro switch	K11 / K12	
Frame	X12A	Air filter pressure switch	K21 / K22	
Rear turret	X15	Danfoss directional control valve connector	G30 / K6	
Frame	X18	Interface	E10 / E11 / O24	
Frame/Cab	X20A	Hydraulic fluid temperature bulb	Q25 / Q26	
Frame	X22	Limit switch inserted	G6 / G7 / G23 / O27	
Frame/Cab	X22A	Limit switch inserted	K23	
Frame	X28	Hydraulic braking solenoid valve	Q19	
Elettrovalvole/ Frame/Cab	X32	Thermostat	O12 / S12	
Engine/Frame	X35	Interface	K25 / M25	
Engine	X39	Oil filter pressure switch	K26	
Cab	X40	Big mixer bucket connector	Q28	
	X47	Boom chains breakage limit stop	G20	
Dispositivo di sicurezza	X105A	Cable reel 3B6	C29 / C30	
Dispositivo di sicurezza	X106	Bottom plate-compensation	C32	
Cab	X107A	Rod-compensation	C34 / C35	
Dispositivo di sicurezza	X108	Bottom plate-lift	C37	
Dispositivo di sicurezza	X109	Rod-lift	C39 / C40	
Cab	XM2	Adm connector	O35	
Cab	XM4	Adm2 connector	O38	
Cab	XPA	Accelerator pedal	O34	

Components			
Ref.	**Description**	**Position on the diagram**	**Hydraulic equivalent**
I6	Rear axle alignment proximity switches	K14	
I8	Front axle alignment proximity switches	Q13	
I15	Turret alignment proximity switch	K28	
I22	Emergency mushroom-shaped button	G10	
I41	Boom ascent maximum limit stop	C27 / C28	
I71	Blocked cab proximity switch	K30	
KEY	Start-up panel	A2 / A3	
MA	Winch micro switch	C24 / C25	
MC2M-2 CHASSIS	Chassis section inputs/outputs 3B6 control unit	Q17 / Q18	
MC2M-3 CABIN	Cab section inputs/outputs 3B6 control unit	G27 / G28	
MC2M-3 CHASSIS	Chassis section inputs/outputs 3B6 control unit	K19 / K20	
MDCP	Midak-plus connector	G39	
S8	Parking brake solenoid valve	Q15	
T1	Fuel level sensor	K25	
TV	Predispositon of monitor cameras	G15	

Fuses and relays			
Ref.	**Description**	**Position on the diagram**	**Posizione sullo schema**
F1	Rear axle block fuse	7,5A	C11
F2	Axle alignment sensors fuse	7,5A	C13
F39	Boom limit stop fuse	7,5A	C23
F41	Cab door limit stop fuse	7,5A	C15
F47	Engine stop emergency button fuse	10A	C10
F64	3b6 transducers fuse	15A	C21 / C22
R1	Oil cooling fan -1 relay		Q23
R4	Chassis primaries power supplies relay		A4
R35	Cab section power supplies remote control switch		A5
R74	Radio and heater relay		A3 / A4
R76	Danfoss directional control valve enabling relay		K8
R77	3b6 transducers power supply relay		G25
R78	3b6 control units power positives relay		A3

Connectors				
Type of wiring	**Ref.**	**Description**	**Position on the diagram**	**Hydraulic equivalent**
Rear turret	X11	Boom/platform functions interface connector	O37	
	X11C	Interface	S36	
Frame	X17	Interface	I19 / K11	
Frame	X18	Interface	K7	
Frame/Cab	X20	Hydraulic fluid temperature bulb	E28 / E29	
Cab	X21	Interface	I27 / I32	
Frame	X22	Limit switch inserted	I32	
Frame	X23	Fan-1 oil cooling	I27 / I28	
	XA	Interface	Q37	
	XB	Interface	Q30	
Rear turret	XRD	Radio control unit connector	M36	

Fuses and relays			
Ref.	**Description**	**Position on the diagram**	**Posizione sullo schema**
F8	Emergency pump relay power supply fuse	10A	C16
F33	Switches indicator lights fuse	7,5A	C28
F57	Switches "15" positive fuse	15A	C26
R4	Chassis primaries power supplies relay		A4
R9	Emergency pump activation relay		G16
R35	Cab section power supplies remote control switch		A5
R74	Radio and heater relay		A3 / A4
R78	3b6 control units power positives relay		A3
R81	Relay for cutting power supply from emergency mushroom switch		G12

Components			
Ref.	**Description**	**Position on the diagram**	**Hydraulic equivalent**
A6	Emergency pump active buzzer	K25	
E35	Emergency pump remote control switch coil	K15	
I9	Emergency pump switch	G24	
I10	Platform exclusion key	G36	
I51	Rollover protection exclusion key	G32	
I73	Start up enabling with i10 activated	K38	
KEY	Start-up panel	A2 / A3	
MC2M-1 CHASSIS	Chassis section inputs/outputs 3B6 control unit	M10 / M11 / O10 / O11	
MC2M-2 CABIN	Cab section inputs/outputs 3B6 control unit	M31 / M32	
MC2M-3 CABIN	Cab section inputs/outputs 3B6 control unit	K36 / K37	
MC2M-3 CHASSIS	Chassis section inputs/outputs 3B6 control unit	K17 / K18	
MDCP	Midak-plus connector	G29	

GROUNDS

Type of wiring	Ref.	Description	Position on the diagrams		Observations
			Diagram 1	Diagram 2	
Solenoid valves	Ground	Ground	I23 / i25		
Chassis primary	Ground	Chassis ground	I25		
Back of turret	Ground	Chassis ground	I13		
Engine	Ground	Engine ground	M17		
Dashboard	Ground	Dashboard ground		Q37	

DIAGNOSTIC PAGE

Lamps lighting means fault or error in component or unit.

1 - Display Tera 7
2 - Mc2m Turret
3 - Midac Plus
4 - Turret rotation sensor
5 - Joystick left
6 - Attachment identification
7 - Mc2m Chassis
8 - Cable-reel on main boom
9 - Radio remote control
10 - Joystick Right
11 - Engine
12 - Hydraulics
13 - Maintenance
14 - Pressure switch transducers
15 - Transmission
16 - Allarm display area

Associated parameter:

Movement	*Output*	*Input*	*Accel. positive*	*Decel. positive*	*Accel. negative*	*Decel. negative*
Boom Up/ Boom Down	P706	P707	P708	P709	P710	P711
Telescopic boom	P726	P727	P728	P729	P730	P731
Forks						
Slewing	P766	P767	P768	P769	P770	P771
Options	P786	P787	P788	P789	P790	P791
Winch	P806	P807	P808	P809	P810	P811

The values of ramps depends on the helm. (cabin/radio or basket).

If there is a cabin command, the ramp values take the values from Cabin table. (Look table below)

Winscope pages of ramps parameters are in the motion page of each movement.

The ramps of cabin and basket are divided in two block:
Cabin or radio ramps:

Movement	*Accel. positive*	*Decel. positive*	*Accel. negative*	*Decel. negative*
Boom Up/ Boom Down	P1500	P1501	P1502	P1503
Telescopic boom	P1505	P1506	P1507	P1508
Forks				
Slewing	P1515	P1516	P1517	P1518
Options	P1520	P1521	P1522	P1523

Basket ramps:

Movement	*Accel. positive*	*Decel. positive*	*Accel. negative*	*Decel. negative*
Boom Up/ Boom Down	P1530	P1531	P1532	P1533
Telescopic boom	P1535	P1536	P1537	P1538
Forks				
Slewing	P1545	P1546	P1547	P1548
Options	P1550	P1551	P1552	P1553

Code	Description
IDS_ALARM439	Can bus time out from device [MCT]
IDS_ALARM446	Boom Angle A: Min Value
IDS_ALARM447	Boom Angle A: Max Value
IDS_ALARM448	Boom Angle B: Min Value
IDS_ALARM449	Boom Angle B: Max Value
IDS_ALARM450	Boom Angle: Congruency A-B
IDS_ALARM455	Boom Length A: Min Raw value
IDS_ALARM456	Boom Length A: Max Raw Value
IDS_ALARM457	Boom Length A: Min Value
IDS_ALARM458	Boom Length A: Max Value
IDS_ALARM459	Boom Length B: Min Raw value
IDS_ALARM460	Boom Length B: Max Raw Value
IDS_ALARM461	Boom Length B: Min Value
IDS_ALARM462	Boom Length B: Max Value
IDS_ALARM464	Boom Length: Congruency A-B
IDS_ALARM473	Pressure Low chamber main cylinder A: Min
IDS_ALARM474	Pressure Low chamber main cylinder A: Max
IDS_ALARM475	Pressure Low chamber main cylinder B: Min
IDS_ALARM476	Pressure Low chamber main cylinder B: Max
IDS_ALARM477	Pressure Low chamber main cylinder : Congruency A-B
IDS_ALARM482	Pressure High chamber main cylinder A: Min
IDS_ALARM483	Pressure High chamber main cylinder A: Max
IDS_ALARM484	Pressure High chamber main cylinder B: Min
IDS_ALARM485	Pressure High chamber main cylinder B: Max
IDS_ALARM486	Pressure High chamber main cylinder : Congruency A-B
IDS_ALARM491	Pressure Low chamber compensation A: Min
IDS_ALARM492	Pressure Low chamber compensation A: Max
IDS_ALARM493	Pressure Low chamber compensation B: Min
IDS_ALARM494	Pressure Low chamber compensation B: Max
IDS_ALARM495	Pressure Low chamber compensation : Congruency A-B
IDS_ALARM500	Pressure High chamber compensation A: Min
IDS_ALARM501	Pressure High chamber compensation A: Max
IDS_ALARM502	Pressure High chamber compensation B: Min
IDS_ALARM503	Pressure High chamber compensation B: Max
IDS_ALARM504	Pressure High chamber compensation : Congruency A-B
IDS_ALARM518	Switch err. Stabilize front right:Congruency
IDS_ALARM519	Switch err. Stabilize front left:Congruency
IDS_ALARM520	Switch err. Stabilize rear right:Congruency
IDS_ALARM521	Switch err. Stabilize rear left:Congruency
IDS_ALARM522	Switch err. Outrigger front right: Congruency
IDS_ALARM523	Switch err. Outrigger front left:Congruency
IDS_ALARM524	Switch err. Outrigger rear right:Congruency
IDS_ALARM525	Switch err. Outrigger rear left:Congruency
IDS_ALARM527	Overload condition 1
IDS_ALARM528	Overload condition 1
IDS_ALARM529	Overload condition 1
IDS_ALARM530	Fault condition output Pin [Pin - Extra CutOff]
IDS_ALARM531	Extra CutOff From LMI
IDS_ALARM536	Can bus time out from Tools Recognition
IDS_ALARM537	Fault from Tools Recognition: Blk
IDS_ALARM538	Fault from Tools Recognition: Error Code

P26 : CCT Sbt BL	Length transducer outrigger Backward Left CCT
CctBL A:aaaa ccc Eee B:ssss	A Length 1 B Length 2 E Fault code CCC Incoming message counter
P27 : AsaC	Chassis levelling sensors
AsaC X:aaaa ccc Eee Y:ssss	X: truck roll angle value Y: truck pitch angle value Ccc : message counter Eee: planarity sensor error

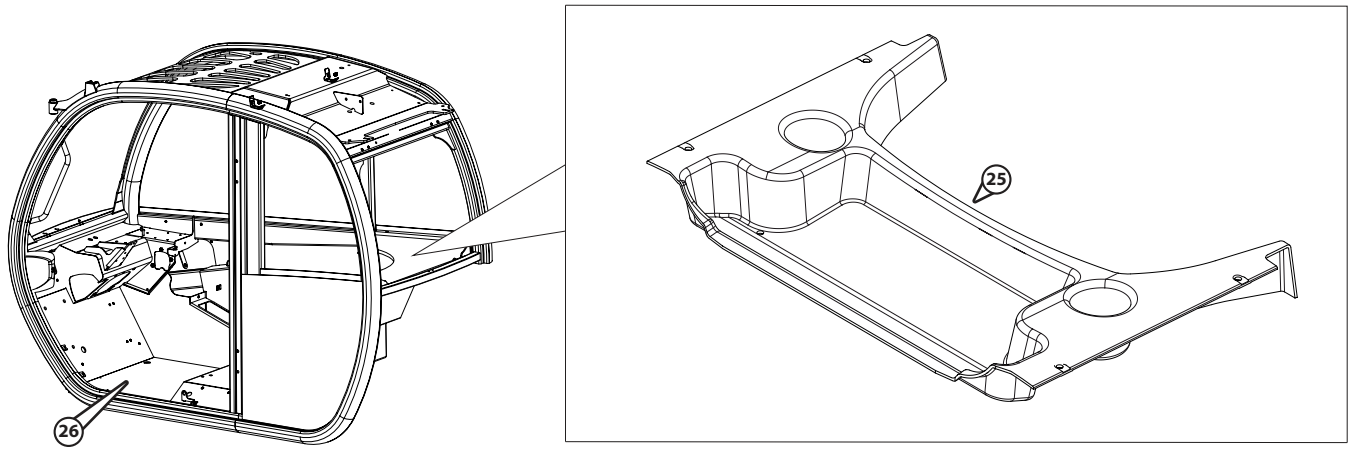
STATUS PAGES

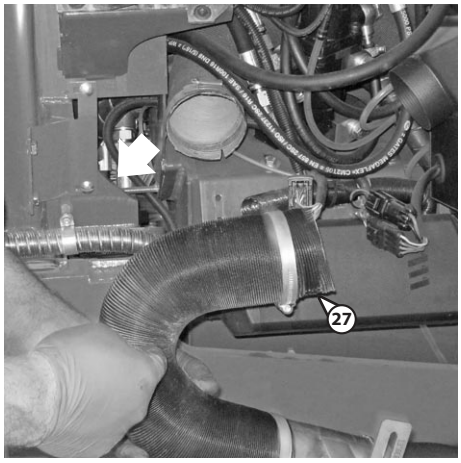
From display cabin it is possible (without password) check status and conditions of all machine units.
Setting a password with adequate level, with same form it is possible to modify all parameters.
That should be useful for diagnostic, calibration and in general for machine setup.

The pages are the following:

P09 : Lmi Status	
* M IIII: VVVV	Lmi status
P10 : Mac.Status	
* M IIII: VVVV	Machine status

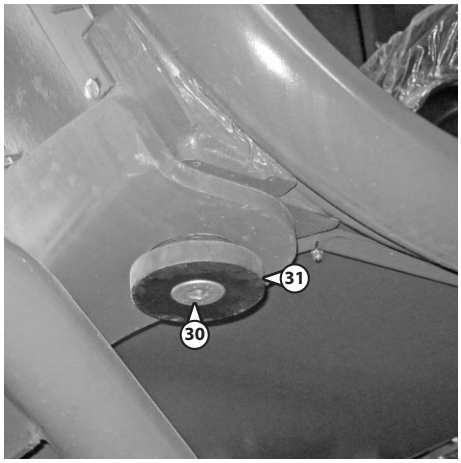
DIAGNOSTICS KIT CASE





Remove the plastic guard (Rif. 25) on the back of the seat, to access the nuts locking the rear cab supports, remove the mat (Ref. 26) to access the nut which blocks the LH front cab support. It may be necessary to remove or shift the burner duct (Ref. 27) or its bracket, to access the nut which blocks the RH front cab support.

Unscrew the nuts (Ref. 28) and remove the vibration damper supports (Ref. 29).



Unscrew the screws (Ref. 30) and remove the vibration damper supports (Ref. 31).