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Pinguely-Haulotte

CE

REPAIR MANUAL

SELF-PROPELLED TELESCOPIC PLATFORM

H14T(X) - H16TP(X)

242 031 9500 - E 02.03 GB

ISO 9001
GROUPE PINGUELY HAULOTTE

ARTICULEES MATS TELESCOPIQUES CISEAUX TRACTEES

Haulotte®
L'ACCES A L'ESPACE

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GENERAL

This manual gives the information required for you to perform servicing and repair operations on certain pieces of equipment yourself.

However, we would like to bring your attention to the importance of:

- respecting the safety instructions concerning the machine itself, its use and its environment,
- use within the limits of its performance,
- correct servicing to ensure long service life.

During and after the guarantee period, our After-Sales service is available to perform any servicing operations you may require.

In this case, contact our local agency or our Plant After-Sales service, specifying the exact type of machine and its serial number.

To order consumables or spare parts, use the "Instructions for use and maintenace" manual and the "Spare parts" catalogue to order original parts, the only guarantee of interchangability and perfect operation.

REMINDER: We would like to remind you that our machines comply with the clauses of the "Machines Directive", 89/392/CEE, dated June 14th 1989, modified by directives 91/368/CEE, dated June 21st 1991, 93/44/CEE, dated June 14th 1993, 93/68/CEE (98/37/CE) dated July 22nd 1993 and 89/336 CEE, dated May 3rd 1989; to directive 2000/14/CE and directive EMC/89/336/CE.

Caution!

The technical data in this manual is not binding and we reserve the right to make improvements or modifications without altering this manual.

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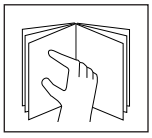
1 - GENERAL RECOMMENDATIONS - SAFETY

1.1 - GENERAL WARNING

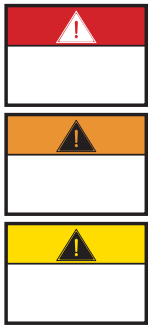


1.1.1 - Manual

This manual aims to help maintenance personnel service and repair the machine. It cannot, however, replace the basic training required by any person working on the site equipment.

The site manager must inform operators of the recommendations in the instruction manual. He is also responsible for application of current "user regulations" in the country of use.

Before operating on the machine, it is essential to be familiar with all the recommendations in this manual and the user manual to ensure personnel and equipment safety.



1.1.2 - Label

Potential dangers and recommendations for the machine are indicated on labels and plates. Read the instructions on them.

All labels conform to the following colour code:

- Red indicates a potentially fatal danger.
- Orange indicates a danger that may cause serious injury.
- Yellow indicates a danger that may cause material damage or slight injury.

Maintenance pesrsonnel must ensure that these labels and plates are in good conditions and keep them legible. Spare labels and plates can be supplied by the manufacturer on request.

1.1.3 - Safety

Ensure that any person entrusted with the machine is take the safety measures implied by its use.

Avoid any working mode that may affect safety. Any use that does not comply with the recommendations may generate risks and damage to people and equipment.

After intervention, maintenance personnel must check that the operator manual is present. This must be kept by the user throughout the machine's service life, even if it is loaned, rented or sold.

Ensure that all the plates or labels related to safety and danger are complete and legible.

Caution !
To attract the reader's attention, instructions are indicated by this standardised sign.

1.2 - GENERAL SAFETY INSTRUCTIONS

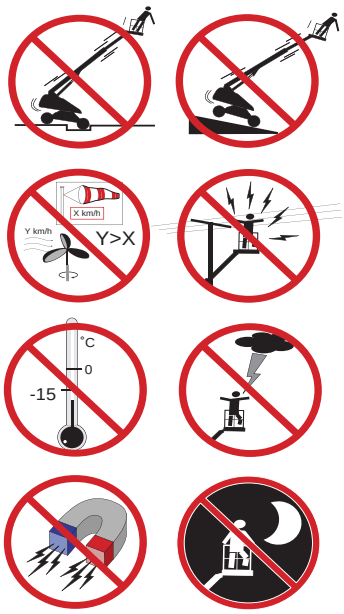
1.2.1 - Operators

Operators must be aged over 18, and hold an operating permit issued by their employer after undergoing a medical check and a practical test that prove they are apt to operate the machine.

Caution !
Only trained operators can use Haulotte self-propelled platforms.

There must always be at least two operators present, so that one can always:

- Take fast action if necessary.
- Take over the controls in case of accident or malfunction.
- Monitor and prevent movement of vehicles and people near the platform.
- Guide the platform operator if required.



1.2.2 - Environment

Never use the machine:

- On ground that is soft, unstable, congested.
- On a ground that has a slope greater than permissible limit.
- In winds greater than the permissible limit. If used outside, use an anemometer to ensure that the wind speed does not exceed the permissible limit.
- Near power lines (check minimum safe approach distances according to voltage carried)
- In temperatures less than -15°C (especially in refrigerated chambers). Consult us if it is necessary to work below -15°C.
- In explosive atmospheres.
- In poorly-ventilated areas, since the exhaust fumes are toxic.
- During storms (risk of lightning).
- In the dark, unless the optional floodlight is fitted.
- In the presence of intense electromagnetic fields (radar, moving and high currents).

DRIVING ON PUBLIC ROADS IS PROHIBITED.

1.2.3 - Using the machine

Do not use the machine:

- with a load greater than allowed load,
- if wind speed exceeds the maximum,
- with more than maximum authorised number of occupants in platform,
- with a side load in the platform greater than permissible limit.

To reduce the risks of **serious falls, operators must respect the following instructions**:

- Hold the guardrail firmly when lifting or driving the platform.
- Remove any traces of oil or grease from the platform steps, floor or guardrails.
- Wear personal protective equipment suited to working conditions and conform to local regulations, particularly when working in hazardous areas.
- Never disable the limit switches of the safety devices.
- Avoid contact with stationary or moving obstacles
- Do not increase the platform operating height by means of ladders or other accessories.
- Never use the guardrails to climb into or out of the platform (use the steps provided).
- Never climb on the guardrails when the platform is up.
- Avoid driving the machine at high speed in narrow or congested areas.
- Never use the machine without putting in place the platform safety bar or closing the safety gate.
- Never climb on the covers.

Caution !
Never use the platform as a crane, hoist or lift.
Never use the machine to pull or tow.
Never use the boom as a ram or thruster or to lift the wheels

To reduce the risks of tipping over, operators **must follow these instructions**:

- Never disable the limit switches of the safety devices.
- Never move the control handles from one direction to the other without stopping in the «O» position. (To stop when travelling, gradually move the handle to «O», keeping your foot down on the pedal.)
- Do not exceed the maximum load or the number of occupants allowed in the platform.
- Spread the load and if possible place in the centre of the platform.
- Check that the ground resists the pressure and load per wheel.
- Avoid contact with stationary or moving obstacles.
- Do not drive the platform at high speed in narrow or congested areas.
- Avoid contact with stationary or moving obstructions.
- Do not drive the platform in reverse gear (poor visibility).
- Do not use the machine with a congested platform.
- Do not use the machine with equipment or objects hanging from the guardrails or boom.
- Do not use the machine with items liable to increase the wind load (e.g. panels).
- Never carry out maintenance on the machine with the platform raised, without first installing the required safety provisions (overhead crane, crane).
- Perform the daily checks and monitor the machine's good working order during periods of use.

NOTA : *Do not tow the platform (it is not designed to be towed and must be transported on a trailer).*

1.3 - RESIDUAL RISKS

Caution !

Operation direction may be inverted on a turntable machine after 180° rotation. Bear in mind the colour of the arrows on the chassis, in relation to the colour shown on the platform control panel (green and red).

Thus, moving the manipulator in the direction of the green arrow on the control panel will move the machine according to the direction indicated by the green arrow on the chassis. Similarly, moving a manipulator in the direction of the red arrow on the control panel, will move the machine in the direction of the red arrow on the chassis.

1.3.1 - Risks of jerky movements and tipping over

Risks of jerky movement and tipping over are high in the following situations:

- Sudden action on the controls.
- Overloading of the platform.
- Uneven ground (Be careful during thaw periods in winter).
- Gusts of wind.
- Contact with an obstacle on the ground or at a height.
- Working on platforms, pavements, etc.

Allow sufficient stopping distances:

- 3 meters at high speed,
- 1 meter at low speed.

Allow sufficient stopping distances: 3 metres at high speed and 1 metre at low speed.

Do not alter or neutralise any components connected in any way to the machine's safety or stability.

Do not place or fasten a load so that it overhangs the machine's parts.

Do not touch adjacent structures with the elevator arm.

1.3.2 - Electrical risk

Caution !

If the machine has a 220 V 16A max. plug, the extension must be connected to a mains socket protected by a 30 mA differential circuit breaker.

Electrical risks are high in the following situations:

- Contact with a live line (check safety distances before operation near electricity lines).
- Use during storms.

1.3.3 - Risk of explosion or burning

The risks of explosion or burning are high in the following situations:

- Working in explosive or inflammable atmosphere.
- Filling the fuel tank near naked flames.
- Contact with the hot parts of the motor.
- Use of a machine generating hydraulic leakage.

1.3.4 - Risks of collision

- Risk of crushing people in the machine operation zone (when travelling or manoeuvring equipment).
- The operator must assess the risks above him before using the machine.
- Pay attention to the position of the arms during turntable rotation.
- Adapt movement speed to conditions related to the ground, traffic, slope and movement of people, or any other factor that may cause a collision.
- When driving down the ramp of a truck, ensure sufficient space is available for safe unloading.
- Check brake pad wear regularly to avoid all risk of collision.

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1.4 - INSPECTIONS

Comply with the national regulations in force in the country of machine use.

For FRANCE: Order dated 9 June 1993 + circular DRT 93 dated 22 September 1993 which specify:

1.4.1 - Periodic inspections

The machine must be inspected every 6 months in order to detect any defects liable to cause an accident.

These inspections are performed by an organisation or personnel specially designated by the site manager and under his responsibility (whether or not they belong to the company) Articles R 233-5 and R 233-11 of the French Labour Code.

The results of these inspections are recorded in a safety register kept by the site manager and constantly available to the labour inspector and the site safety committee (if one exists) and the list of specially designated personnel (Article R 233-5 of the French Labour Code).

Moreover, before each use, check the following:

- the operator's manual is in the storage compartment on the platform,
- the stickers are placed according to the section concerning "Labels and their positions",
- oil level and any elements in the mainteance operation table
- look out for any danaged, incorrectly installed, modified or missing parts.

NOTE : This register can be obtained from trade organisations, and in some cases from the OPPBTP or private prevention agencies.

The designated persons must be experienced in risk prevention (Articles R 233-11 or order n° 93-41).

No member of personnel is allowed to perform any check whatsoever during machine operation (Article R 233-11 of the French Labour Code).

1.4.2 - Examination of machine suitability

The manager of the site where the machine is operated must ensure the machine is suitable, i.e. capable of performing the work in complete safety, and in compliance with the operating manual. Furthermore, the French order of 9 June 1993 addresses problems relative to leasing, examination of the state of conservation, checking upon operation after repairs, and test conditions (static test coefficient 1.25; dynamic test coefficient 1.1). All users must consult this order's requirements and comply with them.

1.4.3 - State of conservation

Detect any deterioration liable to cause hazardous situations (concerning safety devices, load limiters, tilt sensor, cylinder leaks, deformation, welds, bolt tightness, hoses, electrical connections, tyre state, excessive mechanical gaps).

NOTA : In the case of rental, the user of the rented device is responsible for the machine condition and suitability inspection. He must check with the renting party that the general periodic checks and checks prior to operation have been carried out.

1.5 - REPAIRS AND ADJUSTMENTS

These cover major repairs, and work on or adjustments to safety systems or devices (of a mechanical, hydraulic or electrical nature).

These must be performed by personnel from or working for PINGUELY-HAULOTTE who will use only original parts.

Any modification not controlled by PINGUELY-HAULOTTE is unauthorised.

The manufacturer cannot be held responsible if non-original parts are used or if the work specified above is not performed by PINGUELY-HAULOTTE-approved personnel.

1.6 - VERIFICATIONS WHEN RETURNING TO SERVICE

To be performed after:

- extensive disassembly-reassembly operation,
- repair affecting the essential components of the machine.
- any accident caused by the failure of an essential component.

It is necessary to perform a suitability examination, a state of conservation examination, a static test, a dynamic test (see coefficient in paragraph 1.4.2, 11).

1.7 - BEAUFORT SCALE

The Beaufort Scale of wind force is accepted internationally and is used when communicating weather conditions. It consists of number 0 - 17, each representing a certain strength or velocity of wind at 10m (33 ft) above ground level in the open.

Description of Wind		Specifications for use on land	MPH	m/s
0	Calm	Calm; smoke rises vertically	0-1	0-0.2
1	Light Air	Direction of wind shown by smoke	1-5	0.3-1.5
2	Light Breeze	Wind felt on face; leaves rustle; ordinary vanes moved by wind	6-11	1.6-3.3
3	Gentle Breeze	Leaves and small twigs in constant motion; wind extends light flag	12-19	3.4-5.4
4	Moderate Breeze	Raises dust and loose paper; small Branches are moved	20-28	5.5-7.9
5	Fresh Breeze	Small trees in leaf begin to sway; crested wavelets form on inland waterways	29-38	8.0-10.7
6	Strong Breeze	Large branches in motion; whistling heard in telephone wires; umbrellas used with difficulty	39-49	10.8-13.8
7	Near Gale	Whole trees in motion; inconvenience felt when walking against wind	50-61	13.9-17.1
8	Gale	Breaks twigs off trees; generally impedes progress	62-74	17.2-20.7
9	Strong Gale	Slight structural damage occurs (chimney pots and slates removed)	75-88	20.8-24.4

2 - PRESENTATION

Self-propelled platforms, models H14TX and H16TPX, are designed for all types of overhead work within the limits of their characteristics (Operating and maintenance instructions manual) and provided all the safety recommendations specific to the equipment and operating environment are respected.

The main control panel is situated in the platform.

The control panel situated on the turntable is to be used in emergencies or cases of machine failure.

2.1 - TECHNICAL CHARACTERISTICS

2.1.1 - H14T(X) technical characteristics

DESCRIPTION	H14T(X)	Unit
Load	230 (2 peoples)	Kg
Max. lateral manual force	400	N
Max wind speed	60	Km/h
Floor height	12.07	m
Working height	14.07	m
Overall length	7.58	m
Overall width	2.27	m
Overall height	2.20	m
Wheel base	2.00	m
Floor clearance	0.34	m
Max bearing distance	10.60	m
Boom range	-13°/75°	°
Telescoping (travel)	4.33	m
Turntable rotation	360° continu	°
Reducer (torque)	950	
Max travel slope 4*4	50	%
Tyre dimensions	14 - 17.5 SKS HAULER	
Interior turning radius	2	m
Max allowed tilt	5	°
Hydraulic tank	150	l
Fuel tank	150	l
Total weight 4*4	6040	Kg
Number of drive wheels 4*4	4	
Number of steering wheels	2	
Differential blocking	oui	
Hydraulic brakes	2	
Freewheel	oui	
Tightening torque: - Wheel nuts - Slew ring	 320 1000	m.N
DEUTZ diesel motor - Power - Idling power - Consumption - Idling consumption	F3L1011F 38 CH / 28 Kw / 28.33 hp 2400 min-1 20.4 CH / 15KW / 15.21 hp 1250 min-1 2309 kwh 2309 kwh	
Hydraulic pump 45 cm^3/rev	yes 85 l/min maxi	

DESCRIPTION	H14T(X)	Unit
Hydraulic pressure: - General - Travel - Steering - Slew	 24 24 24 10	MPa
Travel speed Low speed Medium speed High speed	 1.6 3.0 6.0	Km/h
Max. force on one wheel	3100	Kg
Max pressure on the floor - hard floor (concrete) - soft floor (beaten earth)	 9500 3100	Kg/m²
Ignition battery	12 V - 95 Ah - 450 A	
Supply voltage	104	dB
Acoustic power	71.5	dB

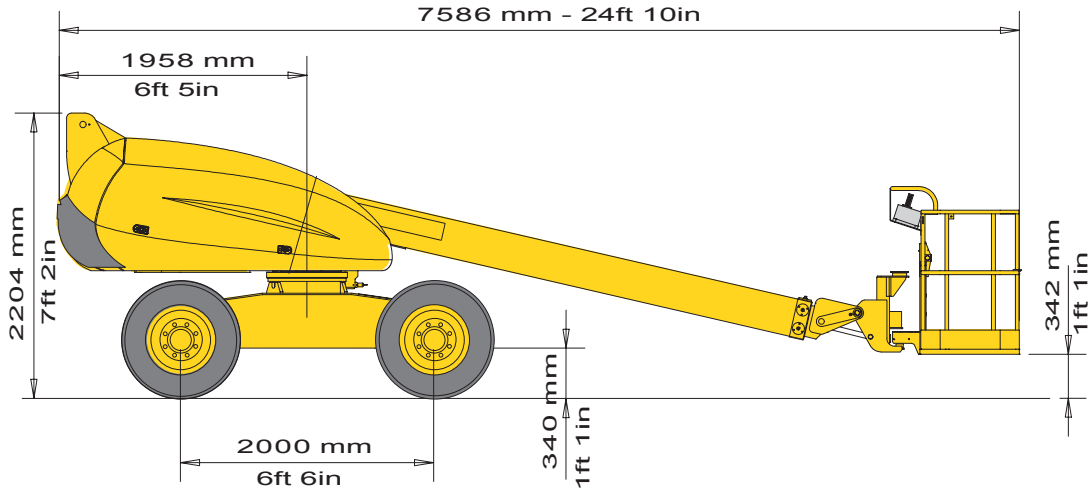
2.1.2 - Technical characteristics H16TP(X)

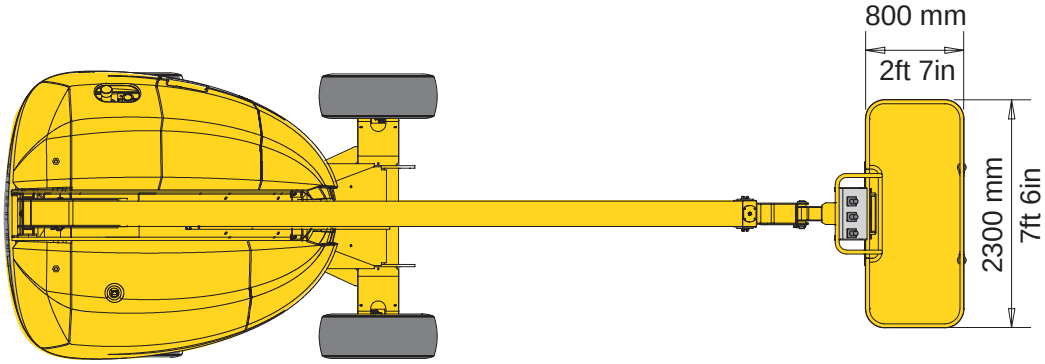
DESCRIPTION	H16TP(X)		Unit
	Standart basket 1800*800	Option basket 2300*800	
Load	230 (2 peoples)	230 (2 peoples)	Kg
Max. lateral manual force	400		N
Max wind speed	45		Km/h
Floor height	13.44		m
Working height	15.44		m
Overall length	8.47		m
Overall width	2.30		m
Overall height	2.21		m
Wheel base	2.00		m
Floor clearance	0.34		m
Max bearing distance	12.30		m
Boom range	-1°/+75°		°
Turntable rotation	360° continu		°
Max travel slope 4*4	 50		%
Tyre dimensions	14 - 17.5 SKS HAULER		
Interior turning radius	2.00		m
Max allowed tilt	5		°
Hydraulic tank	150		l
Fuel tank	150		l
Total weight 4*4	 6800		Kg
Number of drive wheels 4*4	 4		
Number of steering wheels	2		
Differential blocking	yes		
Hydraulic brakes	2		
Freewheel	yes		
Tightening torque: - Wheel nuts - Slew ring	 320 1000		m.N

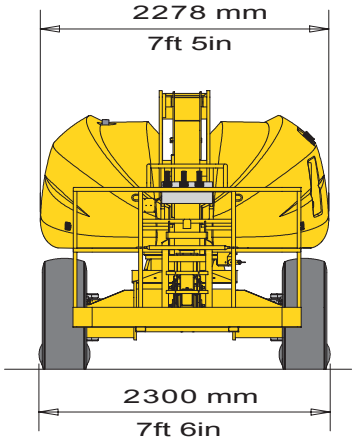
DESCRIPTION	H16TP(X)	Unit
DEUTZ diesel motor - Power - Idling power - Consumption - Idling consumption	F3L1011F 38 CH / 28 Kw / 28.33 hp 2400 min-1 20.4 CH / 15KW / 15.21 hp 1250 min-1 2309 kwh 2309 kwh	
Hydraulic pump 45 cm^3/rev	85 l/min maxi	
Hydraulic pressure: - General - Travel - Steering - Slew	 24 24 24 10	MPa
Travel speed Low speed Medium speed High speed	 1.6 3.0 6.0	Km/h
Max. force on one wheel	3596	Kg
Max pressure on the floor - hard floor (concrete) - soft floor (beaten earth)	 10500 3500	Kg/m²
Ignition battery	12 V-95Ah-450A	
Supply voltage	104	dB
Acoustic power	71.5	dB

2.2 - SIZE

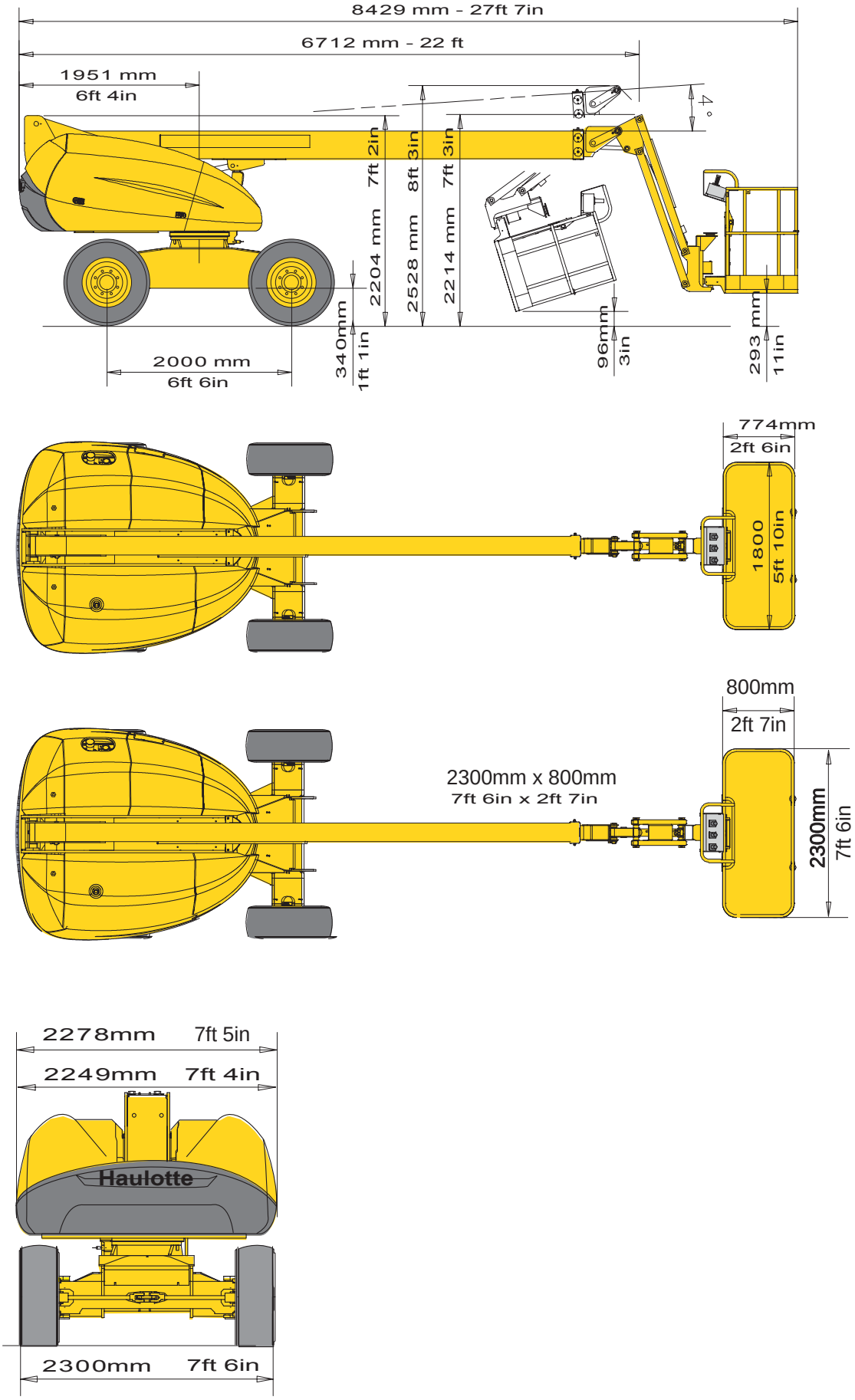
2.2.1 - H14T(X) size







2.2.2 - H16TP(X) size



2.3 - TIGHTENING TORQUE

2.3.1 - Tightening torque for large thread

Nominal diameter	Tightening torque in N.M		
	8.8	10.9	12.9
M 6*1	9 à 11	13 à 14	15 à 17
M 7*1	15 à 19	21 à 24	26 à 28
M 8*1.25	22 à 27	31 à 34	37 à 41
M 10*1.5	43 à 45	61 à 67	73 à 81
M 12*1.75	75 à 94	110 à 120	130 à 140
M 14*2	120 à 150	170 à 190	200 à 220
M 16*2	190 à 230	260 à 290	320 à 350
M 18*2.5	260 à 320	360 à 400	440 à 480
M 20*2.5	370 à 450	520 à 570	620 à 680
M 22*2.5	500 à 620	700 à 770	840 à 930
M 24.3*3	630 à 790	890 à 990	1070 à 1180
M 27*3	930 à 1150	1300 à 1400	1560 à 1730
M 30*3.5	1260 à 1570	1770 à 1960	2200 à 2350

2.3.2 - Tightening torque for fine thread

Nominal diameter	Tightening torque in N.M		
	8.8	10.9	12.9
M 8*1	24 à 29	33 à 37	40 à 44
M 10*1.25	46 à 57	64 à 71	77 à 85
M 12*1.25	83 à 100	120 à 130	140 à 150
M 14*1.5	130 à 160	180 à 200	220 à 240
M 16*1.5	200 à 250	280 à 310	340 à 370
M 18*1.5	290 à 360	410 à 450	490 à 540
M 20*1.5	410 à 510	570 à 630	690 à 760
M 22*1.5	550 à 680	780 à 870	920 à 1000
M 24*1.5	690 à 860	970 à 1070	1160 à 1290
M 27*2	1000 à 1300	1400 à 1560	1690 à 1880
M 30*2	1400 à 1700	1960 à 2180	2350 à 2610

2.3.3 - Pressure table (in bar)

	Generator	Load sensing	Main	Steerin	Brake release	Rotation	Up	Down
H14/16	23	30	240	240	240	100	240	240

	Telescope in	Telesope out	Travel	compensation	Jib ip	Jib down	Emergency unit
H14/16	110	240	240	240	240	240	130

2.3.4 - Table of adjustment times

Movement	*Control*	*Movement duration*
HS deceleration	From the basket	**1,20 m +/- 20cm**
HS travel forward and reverse	From the basket	**12s +/- 2s / 20m**
Micro speed travel	From the basket	**45s +/- 2s /10m**
Boom lifting H14	From the basket	**48s +/- 2s**
Boom lifting H16	From the basket	**40s +/- 2s**
Boom lowering H14	From the basket	**38s +/- 2s**
Boom lowering H16	From the basket	**30s +/- 2s**
Telescope out	From the basket	**30s +/- 2s**
Telescope in	From the basket	**25s +/- 2s**
Rotation	From the basket	**30s +/- 1s per 1/4 turn**
Jib up	From the basket	**30s +/- 2s**
Jib down	From the basket	**23s +/- 2s**
Right/left basket rotation speed	From the basket	**15s +/- 2s**
Compensation speed up	From the basket	**27s +/- 5s**
Compensation speed down	From the basket	**35s +/- 5s**
Steering out	From the basket	**12s**
Steering in	From the basket	**12s**
Boom lifting H14	From the turntable	**48s +/- 2s**
Boom lifting H16	From the turntable	**40s +/- 2s**
Boom lowering H14	From the turntable	**38s +/- 2s**
Boom lowering H16	From the turntable	**30s +/- 2s**
Telescope out	From the turntable	**30s +/- 2s**
Telescope in	From the turntable	**25s +/- 2s**
Rotation left and right	From the turntable	**30s +/- 1s per 1/4 turn**
Jib up	From the turntable	**30s +/- 2s**
Jib down	From the turntable	**23s +/- 2s**

3 - SAFETY SYSTEM

3.1 - MACHINE ELEMENTS

3.1.1 - Motor

Ref	Description
G2	Generator
M3	Starter
YA2	Accelerator
YA1	Motor stop
U3	Frequency module

3.1.2 - Power supplies and fuses

Ref	Description
FU1 10A	**Motor stop**
FU3 80A	**Accelerator**
FU4 30A	**+ Main**
FU5 3A	**212 +Turntable**
FU6 3A	**211 + Platform**
FU7 20A	**201 + Electrovalves**
FU8 5A	**242 +Permanent**
FU9 20A	**+ Accessories**
FU10 3A	**LS Valve**
FU11 250A	**Standby pump**

3.1.3 - Control inputs

SA2	**Accelerator**
SA3	**Differential blocking**
SA4	**Platform basket rotation**
SA5	**Platform compensation**
SA6	**Turntable jib**
SA7	**Platform jib**
SA8	**Turntable telescope**
SA9	
SA11	**LS MS HS**
SB3	**Turntable start**
SB4	**Platform start**
SB5	**Buzzer**
SA13	**Turntable lifting**
SA15	**Turntable rotation**
SM31	**Rotation and lifting**
SM2	**Telescoping**
SM4	**Travel**

3.1.4 - Safety inputs

SQ6	Weight 2nd threshold
SQ5	Weight 1st threshold
SQ1	Tilt
SQ2	Jib from 0 to 90°
SQ3	Boom lifted
SQ9	Telescope out
SQ12	8M break
SQ13	8M break
B4	Oil tank temperature
B3	Motor oil pressure
B1	Filter clogged
D+	Generator

3.1.5 - Relay outputs

KP1	Motor stop
KT2	Accelerator
KA2	Starter

3.1.6 - On/off electrovalve outputs

YV1	LS
YV2a	PVG TOR
YV2b	PVG TOR
YV9	Differential blocking
YV13	Differential blocking
YV8	HS
YV10	MS HS
YV12	MS HS
YV15a	Compensation up
YV15b	Compensation down
YV18a	Jib down
YV18b	Jib up
YV19a	Left basket rotation
YV19b	Right basket rotation
YV16a	Rear left steering in 4*4
YV16b	Rear right steering in 4*4
YV24	Basket rotation \ compensation

3.1.7 - Proportional electrovalve outputs

YV3	Lifting
YV4	Telescoping
YV5	Rotation
YV6	Travel
YV7	Travel

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3.1.8 - Buzzers

HA1	Horn
HA4	Tilt, overload, temperature buzzer
HA2	Overload 1st threshold buzzer

3.1.9 - Light indicators

HL1	Battery charge
HL2	Air filter
HL4	Motor oil pressure
HL9	Fault light indicator

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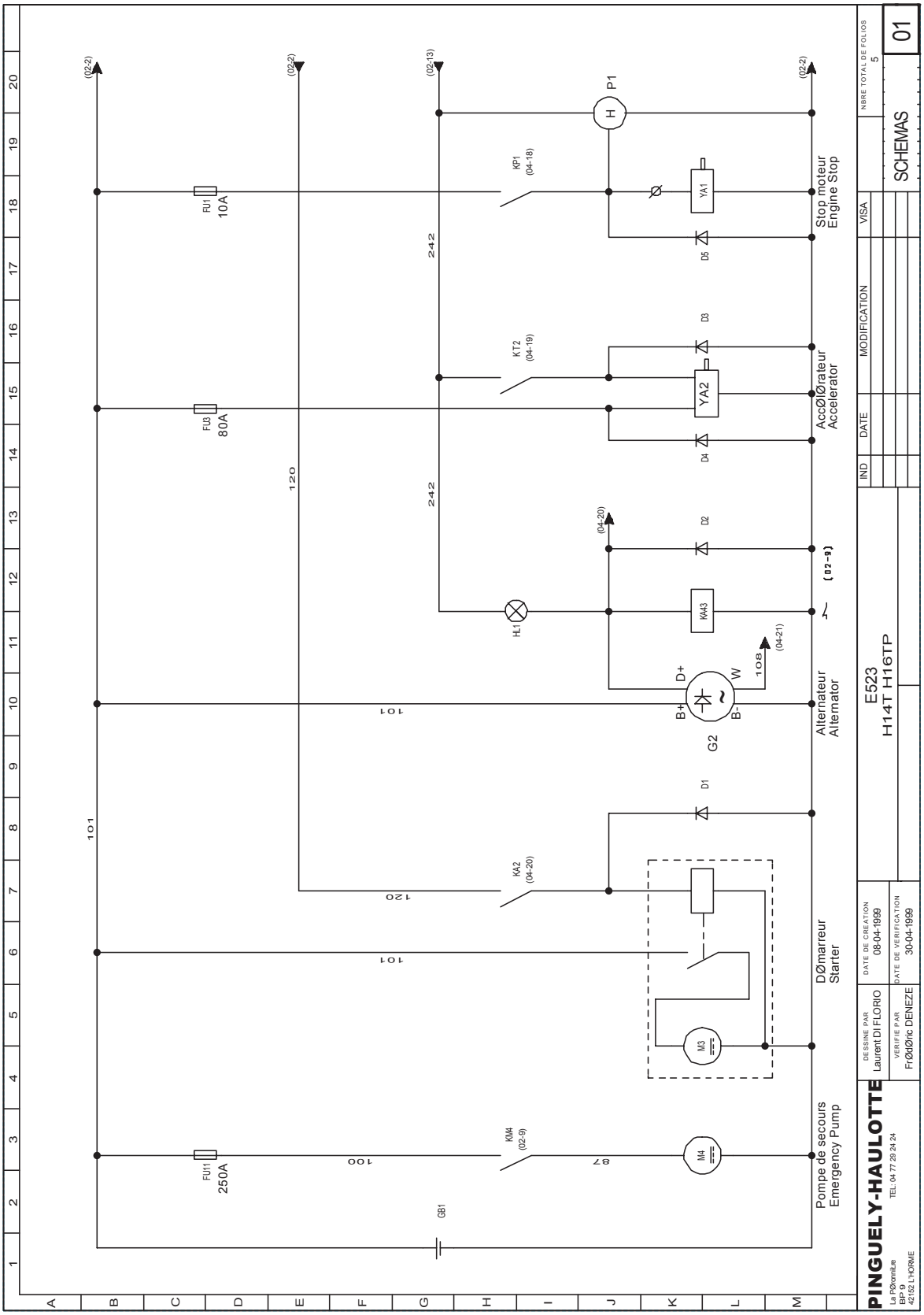
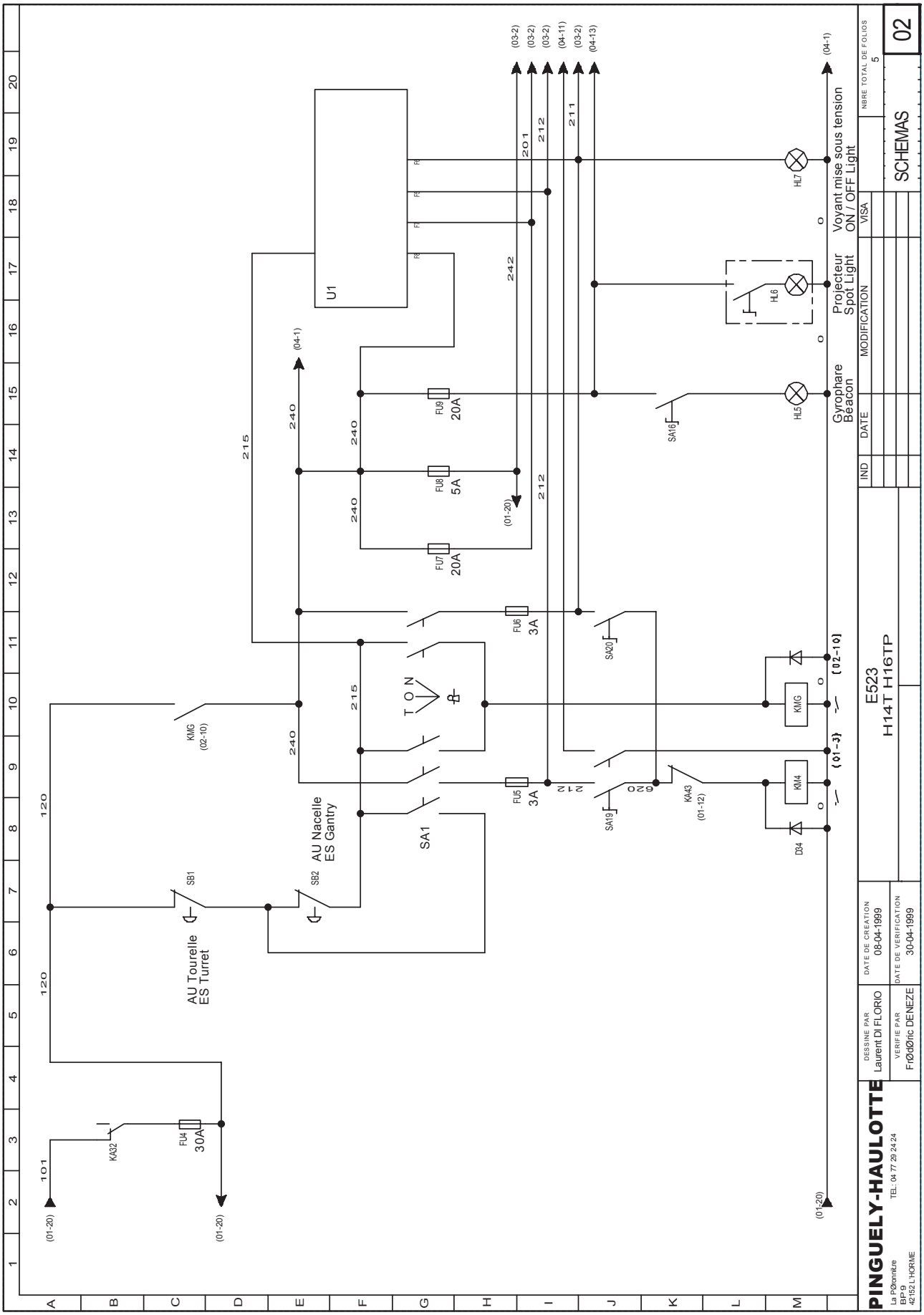
4 - WIRING DIAGRAM

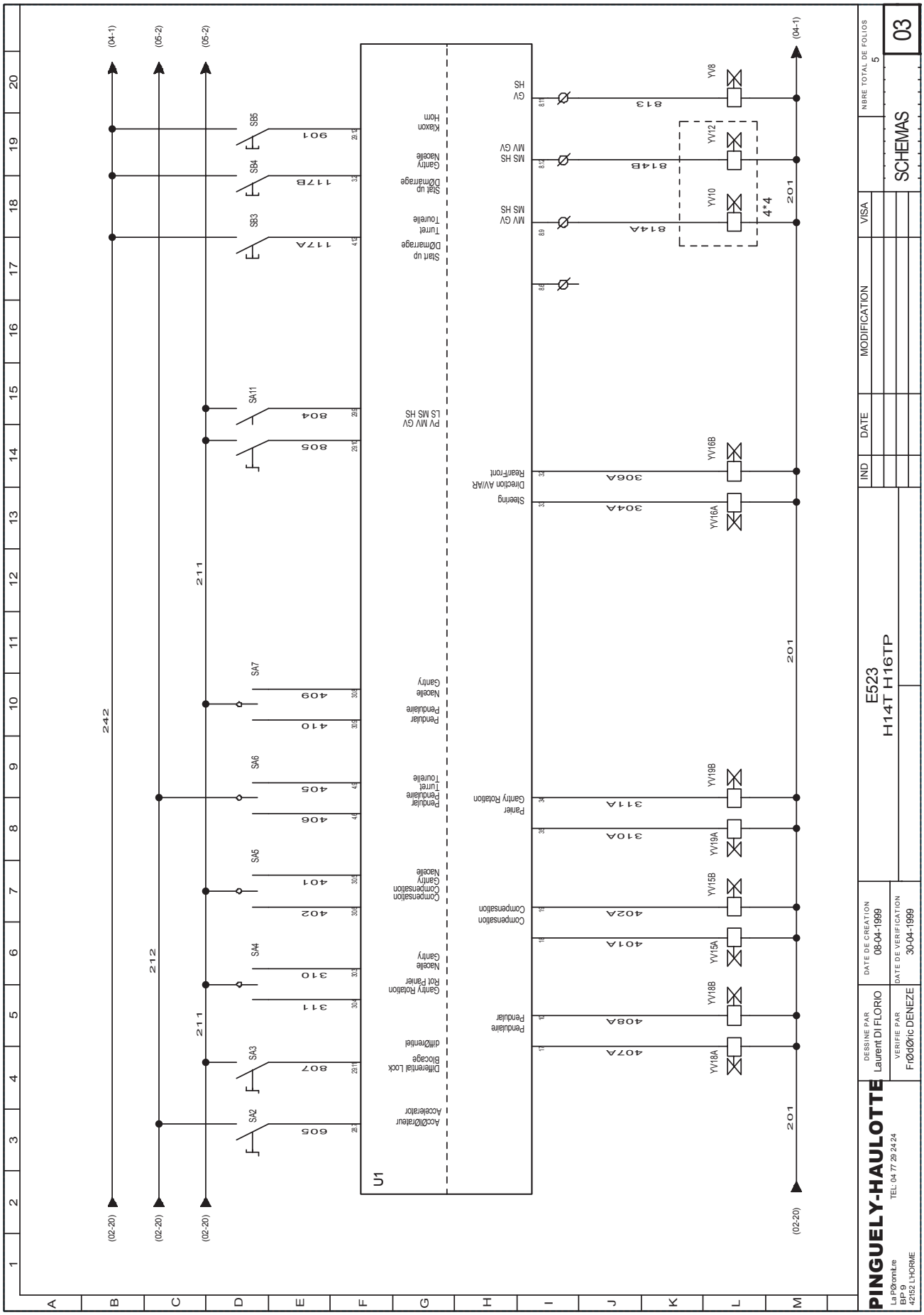
4.1 - DIAGRAM E 523 - FOLIO 01/05



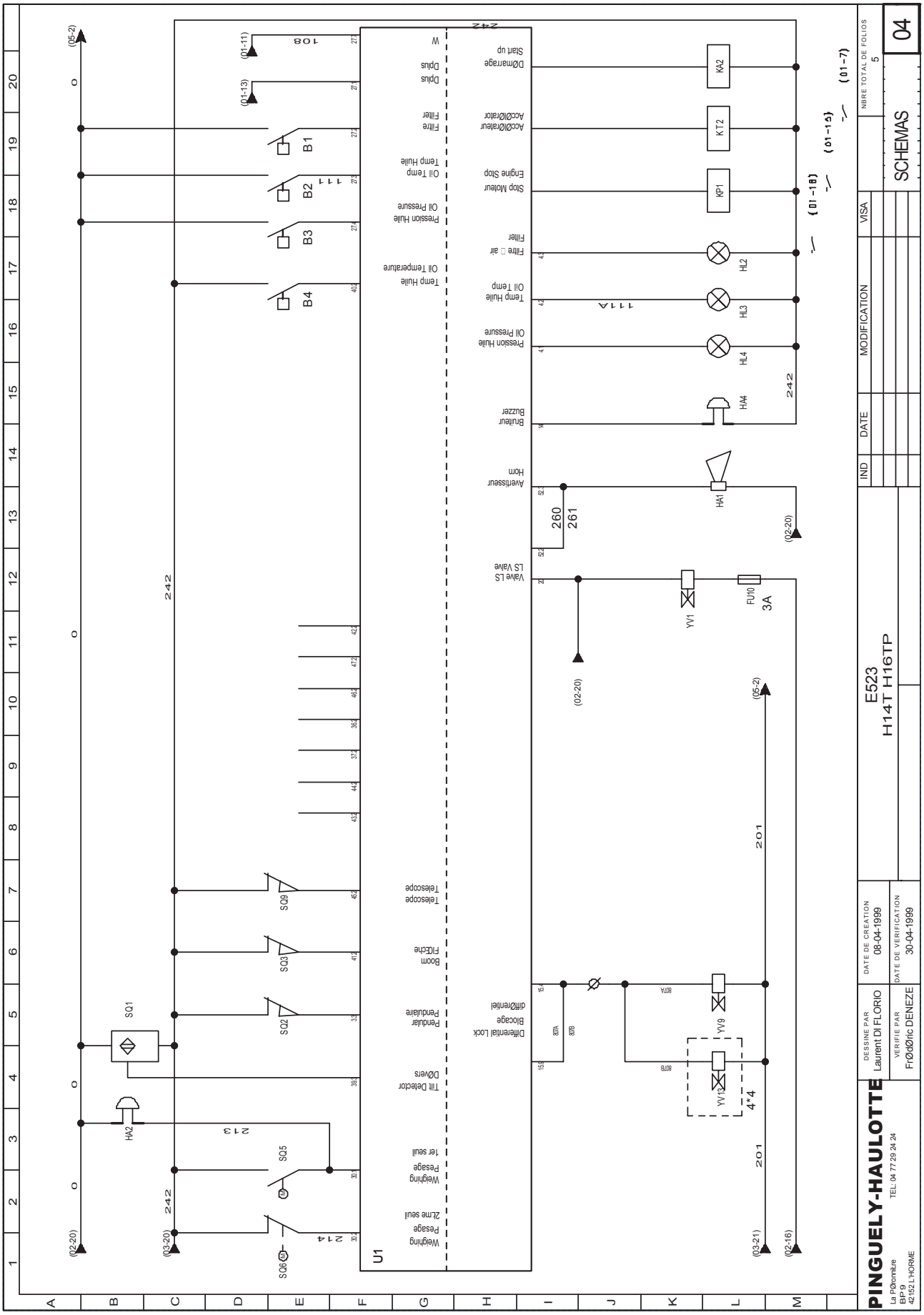
4.2 - DIAGRAM E 523 - FOLIO 02/05



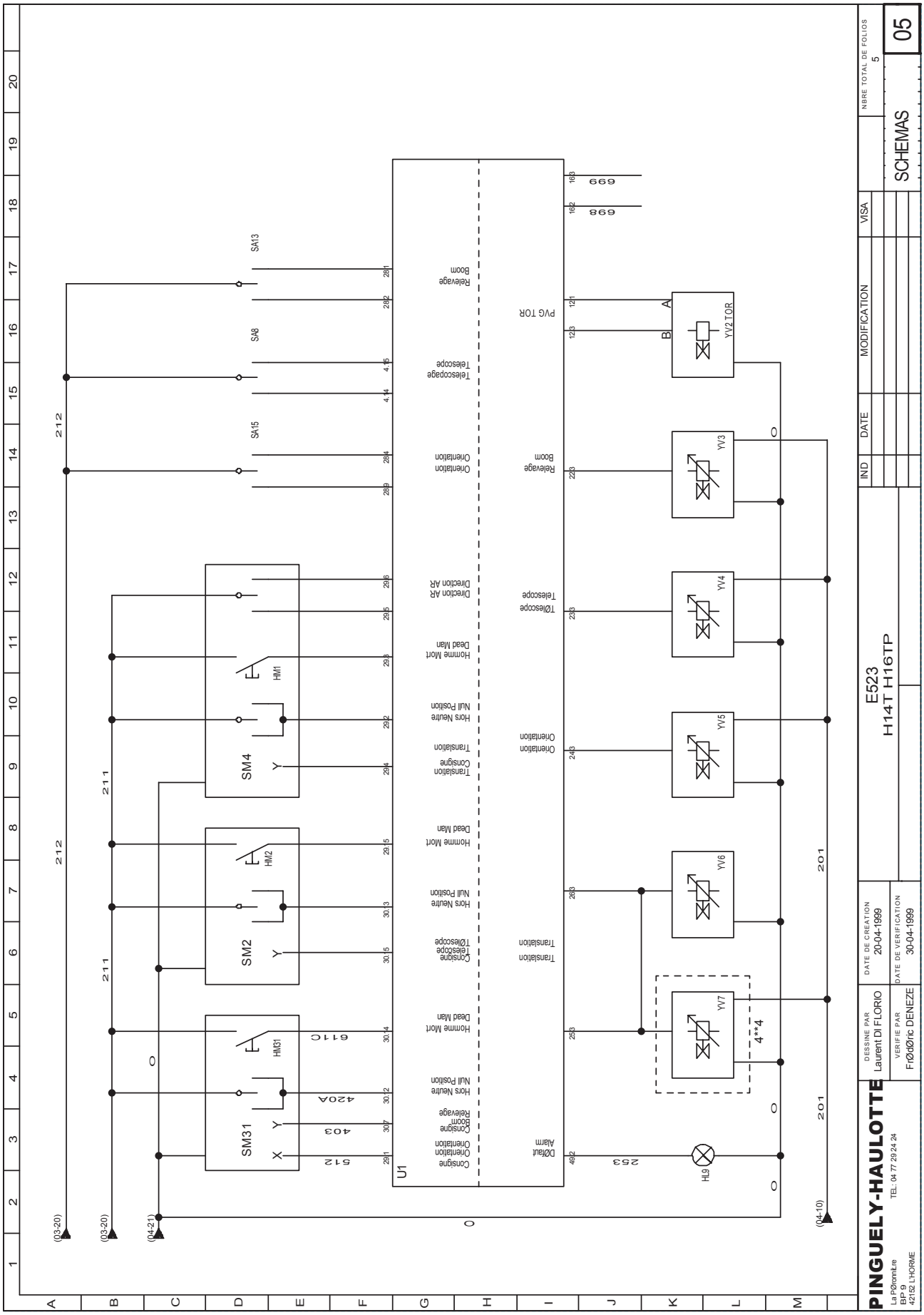
4.3 - DIAGRAM E 523 - FOLIO 03/05



4.4 - DIAGRAM E 523 - FOLIO 04/05



4.5 - DIAGRAM E 523 - FOLIO 05/05



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5 - OPERATING INSTRUCTIONS

5.1 - START

If (SB3=1 or SB4=1) and W=0 and D+=0 and YV1=0 then KA2=1

By selecting turntable, platform is impossible.

5.2 - STOP MOTOR

If KA2=1 or (mo motor fault for more 6 seconds)* then KP1=1

*No motor fault => D+=1 and B2=1 and B3=1

5.3 - ACCELERATOR

If (HM4=1 or HM31=1 or HM2=1 or SA2=1) and SQ6=1 then KT2=1

5.4 - COMPENSATION

5.4.1 - Up

If SA5a=1 and SQ6=1 and SM31ab=0 and SM2ab=0 then YV15a=1 and Yet YV1=1

YV1 is time delayed for 2 seconds

If SQ6 passes to O during a movement, this one is not cut.

5.4.2 - Down

If SA5b=1 and SQ6=1 and SM31ab=0 and SM2ab=0 then YV15b=1 and YV2b=1 and YV1=1

YV1 is time delayed for 2 seconds

If SQ6 passes to O during a movement, this one is not cut.

5.5 - ROTATION

5.5.1 - Right

If SA4b=1 and SM31ab=0 and HM31=0 then YV19b=1 and YV2b=1 and YV1=1

YV1 is time delayed for 2 seconds

5.5.2 - Left

If SA4a=1 and SM31ab=0 and HM31=0 then YV19a=1 and YV2b=1 and YV1=1

YV1 is time delayed for 2 seconds

5.6 - JIB

5.6.1 - Up

If (SA6b=1 or SA7b=1) and (SQ1=1 or machine folded) and (SQ6=1 or turntable position)

then YV18b=1 and YV2a=1 and YV1=1

YV1 is time delayed for 2 seconds

machine folded => SQ2=1 and SQ9=1 and SQ3=1

If SQ6 passes to O during a movement, this one is not cut.

5.6.2 - Down

If (SA6a=1 or SA7a=1) and (SQ6=1 or turntable position)

then YV18a=1 and YV2a=1 and YV1=1

YV1 is time delayed for 2 seconds

If SQ6 passes to O during a movement, this one is not cut.

5.7 - STEERING

Rear Axle

5.7.1 - Left

If SM4d=1 then YV16a=1 and YV2b=1 and YV1=1

YV1 is time delayed for 2 seconds

5.7.2 - Right

If SM4c=1 then YV16b=1 and YV2b=1 and YV1=1

YV1 is time delayed for 2 seconds

5.8 - TRANSLATION

LS MV HS MicroS

If SQ2=0 or SQ3=0 or SQ9=0 then MicroS=1

If MicroS=0 then NoMicroS=1

If SA11a=0 and SA11b=1 and NoMicroS=1 and SM4ab=0 and HM4Ý then LS=1

If SA11a=0 and SA11b=0 and NoMicroS=1 and SM4ab=0 and HM4Ý then MV=1

If SA11a=1 and SA11b=0 and NoMicroS=1 and SM4ab=0 and HM4Ý then HS=1

If NoMicroS=1 and HS=1 then YV8=1 and YV1=1

If (HS=1 or MV=1) and NoMicroS=1 then YV12=1 and YV10=1 and YV1=1

If SM4ab=1 and HM4=1et (SQ1=1 or machine folded)and SM31ab=0 and SM2ab=0

then YV6 and YV7 LS MV HS : Full setpoint

MicroS : low setpoint

YV1 is time delayed for 2 seconds

If SQ6 passes to O during a movement, this one is not cut.

machine folded => SQ2=1 and SQ3=1 and SQ9=1

5.9 - TELESCOPING

5.9.1 - Turntable

5.9.1.1 -Out

If SA8b=1 and (SQ1=1 or machine folded) then YV1=1 and YV4=1

YV1 is time delayed for 2 seconds

machine folded => SQ2=1 and SQ9=1 and SQ3=1

If SQ6 passes to O the movement is carried more slowly..

5.9.1.2 -In

If SA8a=1 then YV1=1 and YV4=1

YV1 is time delayed for 2 seconds

If SQ6 passes to O the movement is carried more slowly..

5.9.2 - Platform

5.9.2.1 -Out

If SM2ab=1 and SQ6=1 and HM2=1 and (SQ1=1 or machine folded) then YV1=1 and YV4=1

YV1 is time delayed for 2 seconds

machine folded => SQ2=1 and SQ9=1 and SQ3=1

If SQ6 passes to O during a movement, this one is not cut.

5.9.2.2 -In

If SM2ab=1 and SQ6=1 and HM2=1 then YV1=1 and YV4=1

YV1 is time delayed for 2 seconds

If SQ6 passes to O during a movement, this one is not cut.

5.10 - ROTATION

5.10.1 -Turntable

5.10.1.1 -Left

If SA15a=1 then YV1=1 and YV5=1

YV1 is time delayed for 2 seconds

If SQ6 passes to O the movement is carried more slowly.

5.10.1.2 -Right

If SA15b=1 then YV1=1 and YV5=1

YV1 is time delayed for 2 seconds

If SQ6 passes to O the movement is carried more slowly.

5.10.2 -Platform

5.10.2.1 -Left

If SM31ab=1 and SQ6=1 and HM31=1
then YV1=1 and YV5=1

YV1 is time delayed for 2 seconds
If SQ6 passes to O during a movement, this one is not cut.

5.10.2.2 -Right

If SM31ab=1 and SQ6=1 and HM31=1
then YV1=1 and YV5=1

YV1 is time delayed for 2 seconds
If SQ6 passes to O during a movement, this one is not cut.

5.11 - LIFTING

5.11.1 -Turntable

5.11.1.1 -Up

If SA13a=1 and (SQ1=1 or machine folded or SQ9=1) then YV1=1 and YV3=1
YV1 is time delayed for 2 seconds
machine folded => SQ2=1 and SQ9=1 and SQ3=1
If SQ6 passes to O the movement is carried more slowly.

5.11.1.2 -Down

If SA13b=1 and (SQ1=1 or machine folded or SQ9=1) then YV1=1 and YV3=1

YV1 is time delayed for 2 seconds
If SQ6 passes to O the movement is carried more slowly.

5.11.2 -Platform

5.11.2.1 -Up

If SM31ab=1 and SQ6=1 and HM31=1 and (SQ1=1 or machine folded or SQ9=1) then YV1=1 and YV3=1

YV1 is time delayed for 2 seconds
machine folded => SQ2=1 and SQ9=1 and SQ3=1
If SQ6 passes to O during a movement, this one is not cut.

5.11.2.2 -Down

If SM31ab=1 and SQ6=1 and HM31=1 and (SQ1=1 or machine folded or SQ9=1) then YV1=1 and YV3=1

YV1 is time delayed for 2 seconds
If SQ6 passes to O during a movement, this one is not cut.

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5.12 - DIFFERENTIAL BLOCKING

If SA3=1 and SA11a=0 and HS=0 then YV9=1 and YV13=1

5.13 - GENERATOR

If SQ11 = 1 and Platform position and KA2 = 0 and D+ = 1 then YV24 = 1

The generator functions only if the machine is in turntable position, if the thermal engine turns and if the operator engaged the button located in the platform. In this case the green indicator is light.

Dans ce cas le voyant vert est allumé.

SAFETY AT START :

If the button is in ON position, during all the phase of start, the generator and the accelerator are cut. Once this phase finished the generator is automatically given in service.

5.14 - HORN

If SB5=1 then HA1=1

5.15 - BUZZER

If SQ1=0 and machine unfolded then the buzzer sounds continuously.

If B4=0 then the buzzer sounds with a frequency F1.

If SQ6=0 and turntable position then the buzzer sounds with a frequency F1.

If travel_Buzzer_option=1 and HM4=1

then the buzzer sounds with a frequency F2.

If movements are carried out (YV1=1 or SA4a=1 or SA4b=1) and movement_Buzzer_option = 1 then the buzzer sounds with a frequency F2.

Machine unfolded => SQ2=0 or SQ9=0 or SQ3=0

5.16 - HL2

If B1=0 then HL2=1

5.17 - HL4

If B3=0 then HL4=1

5.18 - OTHER FUNCTIONS: OVERLOAD, SAFETY…

5.18.1 -Overload

The overload through SQ6 cuts all the ordered movements of the platform. When one passes in turntable position, one recovers the movements with a limited speed. Moreover the turntable buzzer sounds.

5.18.2 -Fuse safety

If an electrovalve is controlled permanently for any reason (short-circuited electrovalve, etc ...) fuse FU7 is destroyed.

The emergency stop is relayed. For any reasons, we must constantly monotor that the relay does not remain stuck after an emergency stop.

5.18.3 -Fail-safe

If the fail-safe is held for 10 seconds (Controller or neutral), movement is de-validated..

x = 6s for travel

x = 4s for movements

5.18.4 -Indicator defect

If SQ6=0 or (SA8a=1 or SA8b=1 or (HM2=1 and SM2ab=1))

or (SA13a=1 or SA13b=1 or (HM31=1 and SM1ab=1)))

then HL9=1

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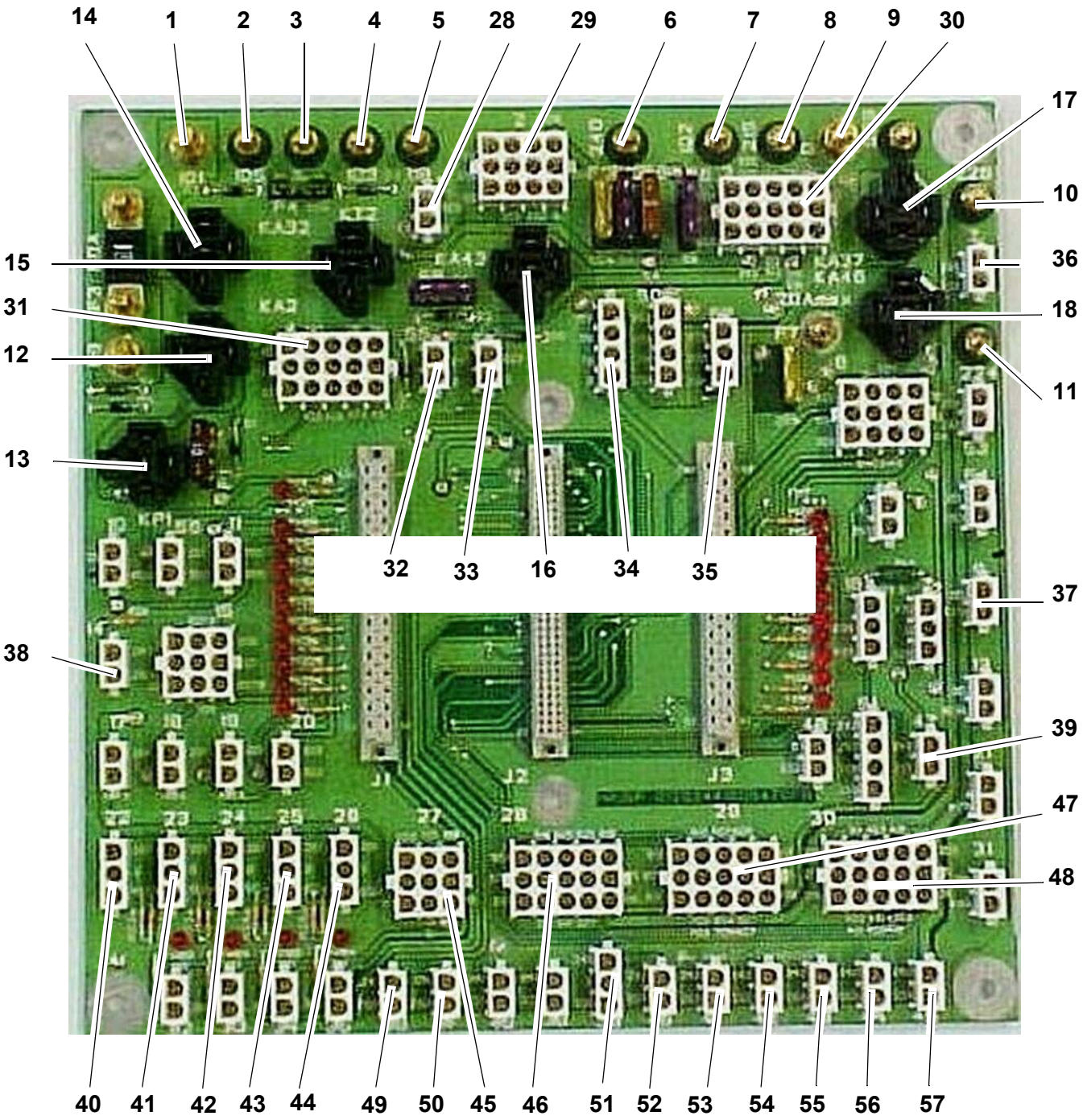
6 - POSITIONS OF ELECTRIC COMPONENTS

6.1 - MOTHER BOARD

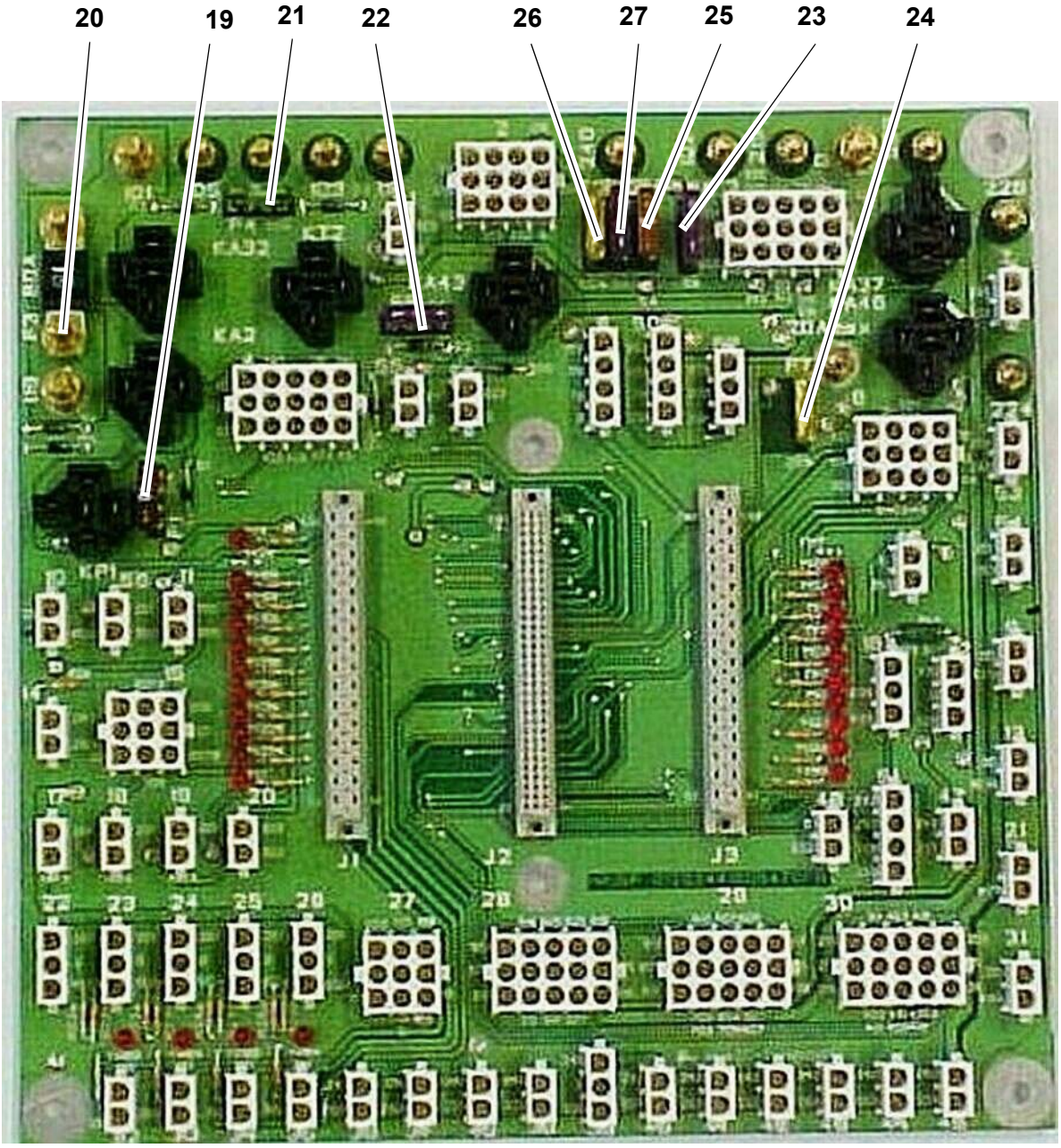
6.1.1 - Description

Ref	SCREW		Ref	Connector	
1	101	+ Battery	**28**	1	Flashing light
2	105	+ Bi-energy machine - option	**29**	2	Bottom box door
3	120	+ Main	**30**	3	Top control panel
4	103	Starter	**31**	4	Bottom box door
5	118	Accelerator control	**32**	55	KMG main relay
6	240	Main supply after switch	**33**	5	KM4 standby pump switch
7	102	Emergency stop circuit	**34**	6	Console connector
8	215	Emergency stop circuit	**35**	52	HA1 horn
9	0	- Battery	**36**	7	Gas electrovalves option
10	226	Petrol gas machine - option	**37**	54	Proportional valve output
11	224	Petrol gas machine - option	**38**	14	Buzzer
	RELAYS		**39**	47	SQ13
12	KA2	Start	**40**	22	Boom lifting PVG
13	KP1	Motor stop	**41**	23	Telescoping or arm lifting PVG
14	KA32	Electric power / thermal power switch	**42**	24	Rotation PVG
15	KT2	Accelerator	**43**	25	Travel PVG
16	KA43	Standby pump safety system	**44**	26	Travel PVG
17	KA37	Converter for bi-energy machine	**45**	27	Motor wiring harness
18	KA46	Petrol / gas switch	**46**	28	Top control panel
	FUSES		**47**	29	Top control panel
19	F1	Motor stop	**48**	30	Top control panel
20	F3	Maintain accelerator	**49**	36	SQ11
21	F4	Main	**50**	37	SQ10
22	F5	+ Bottom position	**51**	39	SQ6 Tilt
23	F6	+ Top position	**52**	40	Hydraulic tank temperature probe B4
24	F7	+ Electrovalve	**53**	41	SQ3
25	F8	+ Permanent (sensor supply)	**54**	42	SQ4 or SQ14
26	F9	+ Accessories	**55**	43	SQ7
27	F10	+ Load Sensing valve for machine with PVG	**56**	44	SQ8
			57	45	SQ9

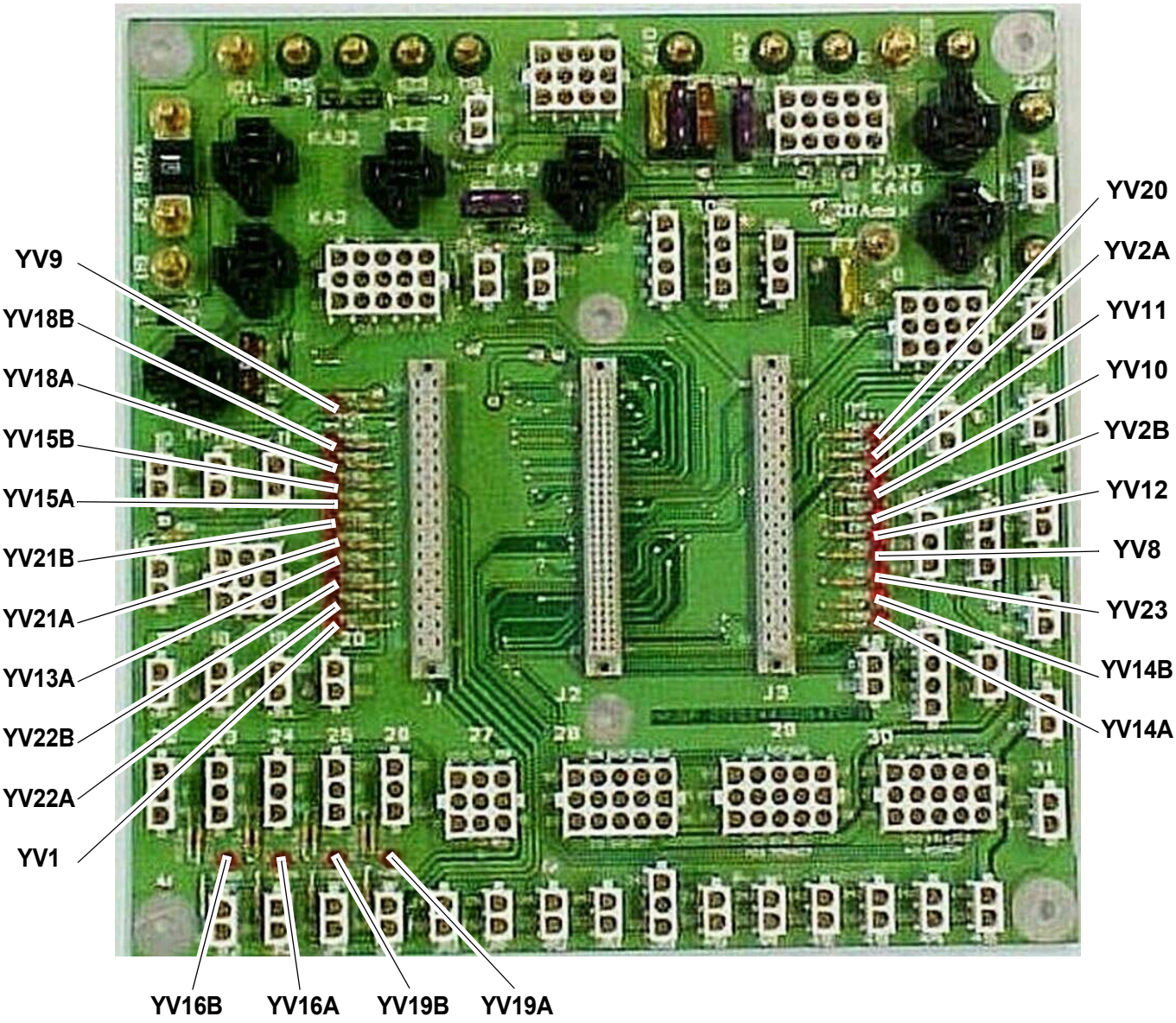
6.1.2 - Positions of screws, connectors and relays



6.1.3 - Positions of fuses

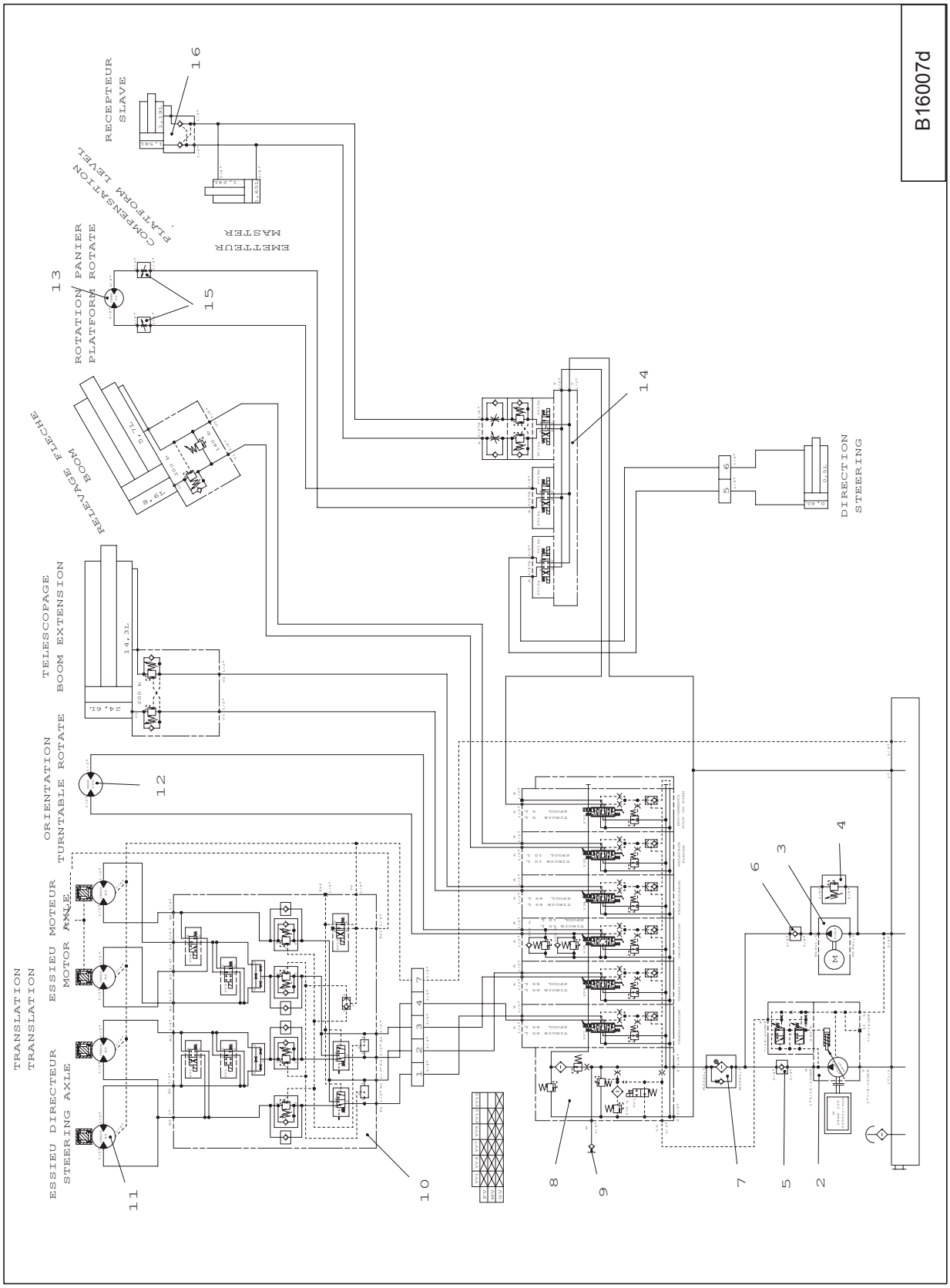


6.1.4 - Positions of diagnosis help LEDs

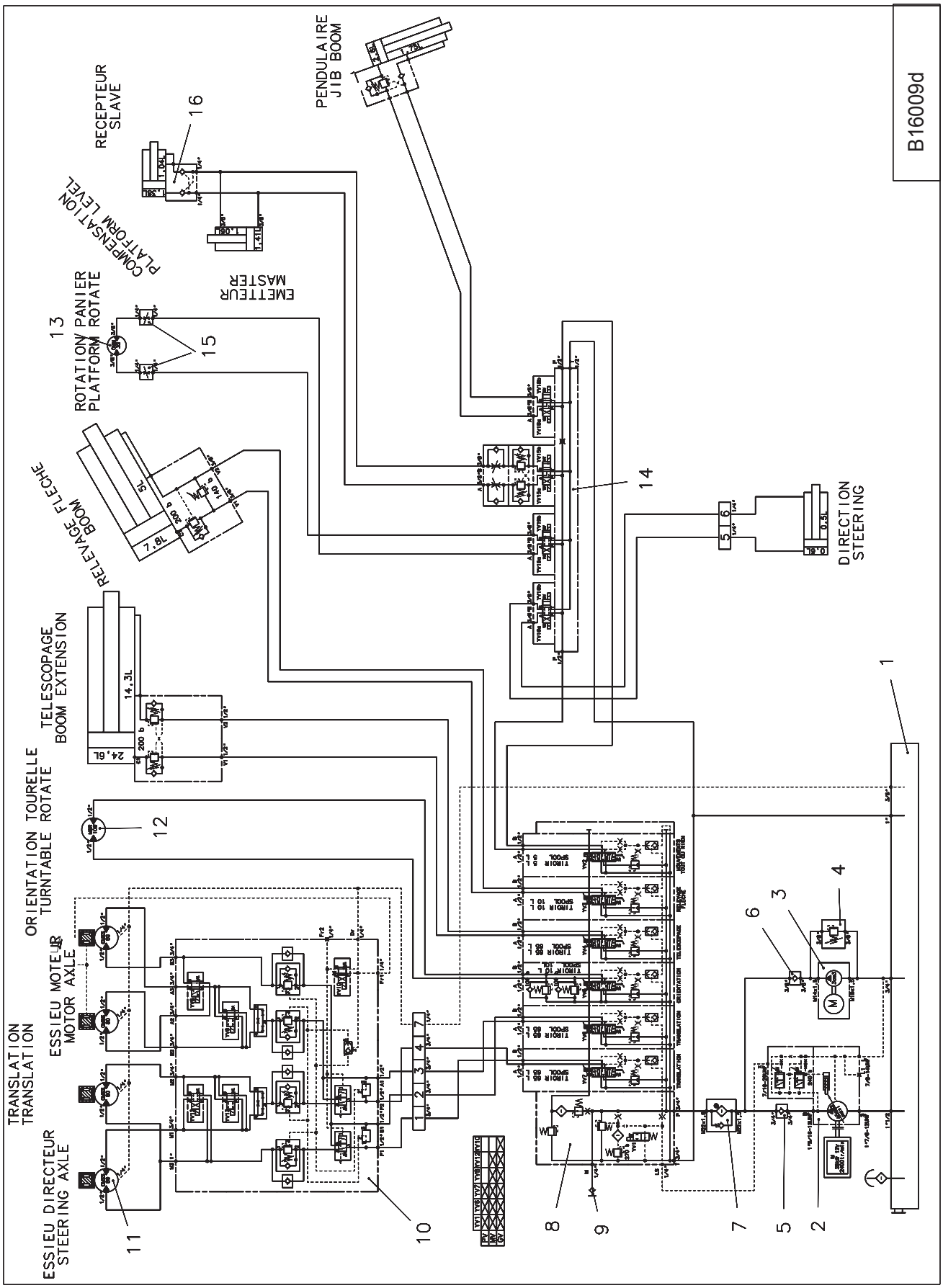


7 - HYDRAULIC DIAGRAMS

7.1 - DIAGRAM H14T(X) REFERENCE B16007



7.2 - DIAGRAM H16TP(X) REFERENCE 16009



8 - MAINTENANCE

8.1 - GENERAL RECOMMENDATIONS

Servicing operation described in this manual are given for normal conditions of use.

In difficult conditions: extreme temperatures, high hygrometry, polluted atmosphere, high altitude, etc ..., certains operations must be carried out more frequently and specific precautions must be taken: consult PINGUELY HAULOTTE After-Sales Service for information.

Only authorised and competent personel may operate on the machine and must comply with the safety instructions related to Personnel and Environment protection..

As far as the motor is concerned, refer to the manufacturer's manual and instructions.

Attention !

- Do not use the machine as a welding earth.
- Do not weld without disconnecting the (+) and (-) terminals of the batteries.
- Do not start other vehicles with the batteries connected.

For the motor part, consult the instructions in the Manufacturer’s manual.

Safety mechanisms should be checked regularly:

- Tilt: buzzer and movements disabled.

Buzzer: load between 100% and 110% of permitted load.

Movements disabled: Load above 110% of permitted load.

- Change to micro-speed when the machine is unfolded.

8.2 - PARTICULAR RECOMMENDATIONS

Before any maintenance intervention on the elevating platform, indicate on the turntable and platform control stations that the machine is being serviced. If possible, restrict access to the elevating platform to intervention personnel only.

8.2.1 - Specific tools

Personnel should therefore be familiar with the use of the specific tools used (measurement device, torque tightening device, lifting apparatus, etc.) and respect the operating limits specified in the documentation that is supplied with the tools.

Incorrect use of a tool (incorrect adjustment after a reading error) may lead to premature deterioration of the elevating platform (or more seriously, an accident), for which PINGUELY-HAULOTTE cannot be held responsible.

8.2.2 - Replacing an element

Before replacing an element, the machine must be put in the maintenance configuration (see chap. 8.3, page 38) and the electric power supply cut off (see chap. 8.4, page 45).

All distributing valves are "with open centre": breaking the electric circuit therefore decreases pressure in the hydraulic circuits, up to the non-return valves flanged on the cylinders. An element can be replaced safely, if the procedures described in the maintenance sheets are respected (unscrew hydraulic connectors slowly to release residual pressure).

To preserve the integrity of the safety systems and the technical characteristics of the elevating platform, it is essential to use original parts and to respect the initial setting and tightening torque values (see Chapitre 2, page 11).

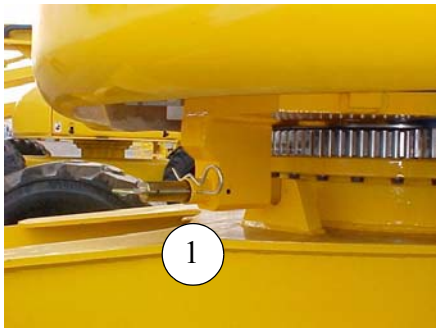
8.2.3 - Locating the breakdown

Certain checks require the elevating platform to be switched on. In this case, personnel must ensure:

- that the measurement devices used are properly insulated,
- that they do not touch the live parts,
- that they are not wearing or carrying metal objects that may deteriorate the live components (e.g.: dropping a spanner during an intervention on the batteries).

8.3 - MAINTENANCE SYSTEM

Photo 1



Instructions

Maintenance configuration:

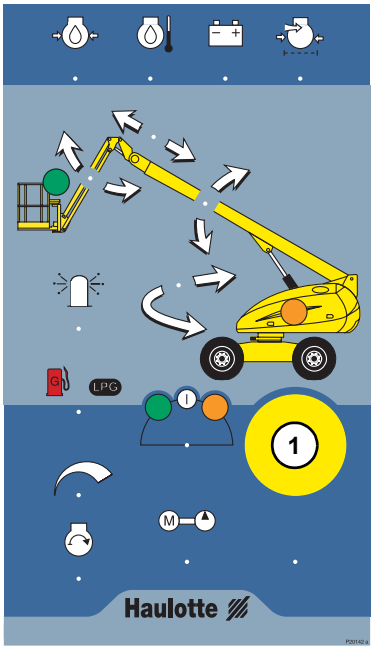
- Position the elevating platform on a firm, horizontal surface.
- If possible, fold the machine completely.
- Put the turntable rotation blocking pin into place (ref. 1 Photo. 1, page 44).

Restoring operational configuration:

Remove the blocking pin (ref. 1 Photo. 1, page 44).

8.4 - ELECTRIC POWER SUPPLY

Photo 2 .



Instructions

Cutting off the electric power supply

Press the turntable emergency stop (ref. 1 Photo. 2, page 45).

Restoring the electric power supply:

Reset the emergency stop (ref. 1 Photo. 2, page 45).

8.5 - MAINTENANCE PLAN

The plan shows the frequency and area of maintenance and the consumables to be used.

The reference shown in the symbol shows the area maintained based on the frequency.

The symbol represents the consumable to use (or the operation to be carried out.

•

8.5.1 - Consumable

Consumable	Specification	Symbol	Lubricants used by Pinguely-Haulotte	ELF	TOTAL
Motor oil	SAE 15W40		SHELL RIMULA-X		
Gearbox oil	SAE 90		SHELL SPIRAX-A EP80W-90	Tranself EP 80 W 90	TM 80 W/90
Hydraulic oil	AFNOR 48602 ISO VG 46		SHELL TELLUS T46	HYDRELF DS 46	EQUIVIS ZS 46
Optional bio-degrada-ble hydraulic oil	EF-E 46		SHELL		
Lithium grease	KP 2 K		ESSO Beacon EP2	Epaxa 2	
Lithium grease	NLGI 2 EP		ESSO Moly Multi-Purpose Grease	Cadrexa GR1 AL	
Lead-free grease	Grade 2 ou 3		ESSO GP GREASE	Multimotive 2	Multis EP 2
Exchange or specific operation					

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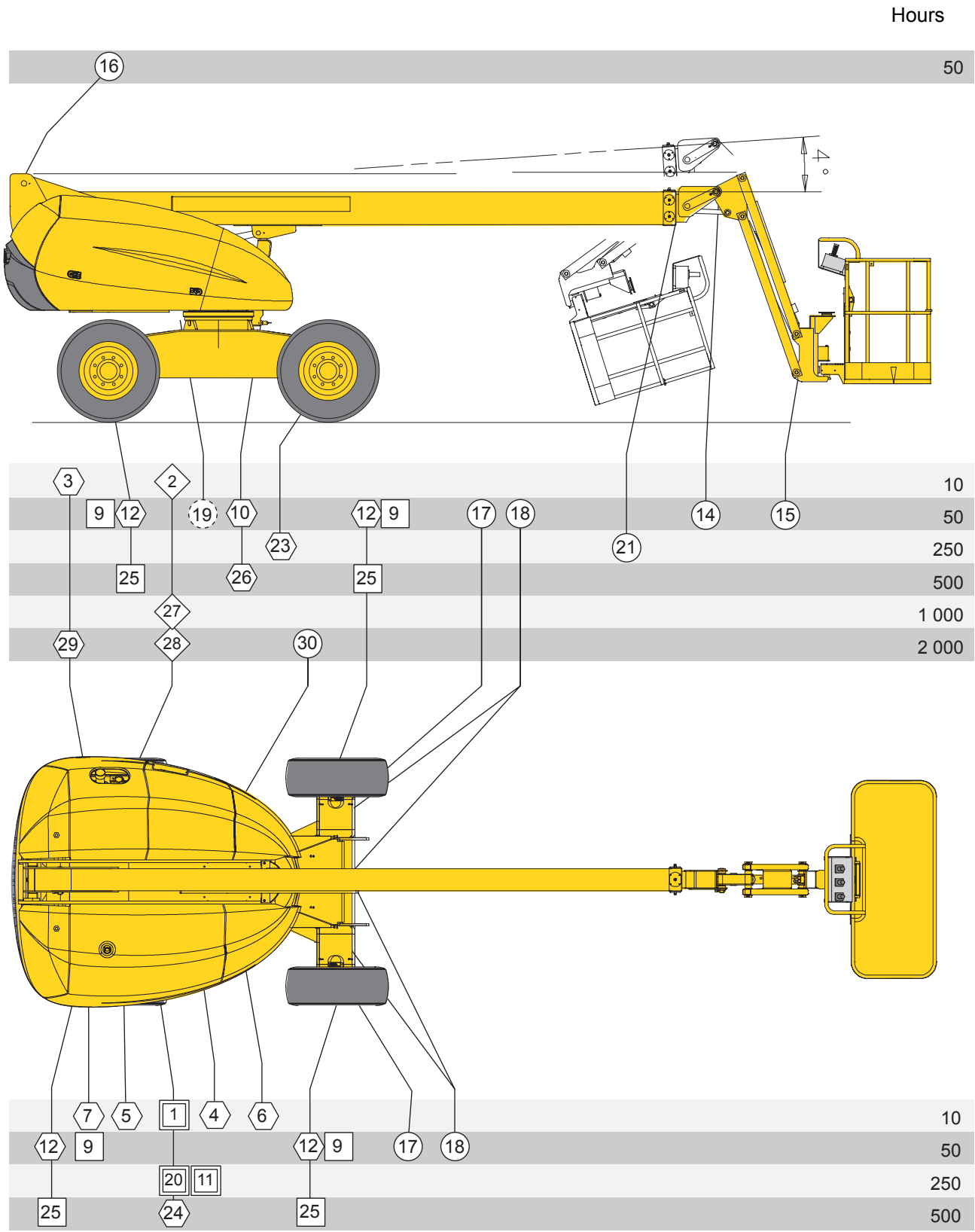

8.6 - OPERATIONS

8.6.1 - Summary table.

Frequency	Ref.	Operation
Every day or before each start of operations		Check the following levels
	1	• motor oil
	2	• hydraulic oil,
	3	• diesel.
	4	• electric batteries.
		Check the cleanliness
	5	• disel pre-filter, replace it if water or impurities are found.
	6	• motor air filter.
		• machine (in particular, check the tightness of connections and hoses), use the opportunity to check the condition of the tyres, cables and all accessories and equipment.
	7	Check the hydrualic oil filter for clogging.
		Change the cartridge if the clogging indicator is visible.
		Check the state of wear of the articulation axles.
The first 50 hours	9	Change the hydraulic oil filter cartridge (see frequency 250 hours).
	10	Change the oil of the drive wheel reducers (see frequency 500 hours) (2 points for 4x2 model - 4 points for 4x4 model).
		Check the tightness of the slew ring screws (torque 10 daN.m).
Every 50 hours	11	Motor: see manufacturer's manual.
	12	Check the level of the drive wheel reducers (see section 5.3.2.2).
		Grease:
	14	• jib articulation axle (for HB44J): 2 points.
	15	• basket link part articulation axle: 4 points.
	16	• boom base axle: 1 point.
	17	• wheel pivot pin axles: 8 points.
	18	• steering axle, central pivot pin and clevis pin: 10 points.
	19	• slew ring: bearing 2 points.
Every 250 hours	20	Motor: see manufacturer's manual.
	21	Grease the friction parts of the telescope (spatula). At the same time, check the condition of the friction pads.
	23	Check the tightness of the wheel nuts (torque 32 daN.m).
		Change the hydraulic filter cartridge.
Every 500 hours	24	Motor: see manufacturer's manual.
	25	Change the wheel reducer oil. Fill up (capacity 4 x 1.4 litres.for 4*4 and capacity 2 x 1.4 litres for 4*2).
	26	Ring screws check the tightness and tighten if necessary. (torque 10 daN.m).
Every 1000 hours or every year	11	Motor: see manufacturer's manual.
	27	Empty the hydraulic oil tank.
Every 2000 hours	28	Empty the tank and the whole hydraulic oil circuit.
	29	Empty and clean the diesel tank.
	30	Grease the rotation reducer: 1 point.
Every 3000 hours		Check the condition of the telescope friction pads, the electric cables and hydraulic hoses.

REMINDER: The frequencies given above are to be reduced in the case of work in difficult conditions (consult the After-Sales department if necessary).

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8.7 - PRESENCE OF LABELS

It is important to check that the labels and plates warning personnel of the various dangers associated with using the machine are in good condition.

The labels providing operators with information on machine use and maintenance must also be checked.

An illegible label may lead to incorrect or dangerous use of the machine.

Operating instructions:

Check the presence of the labels:

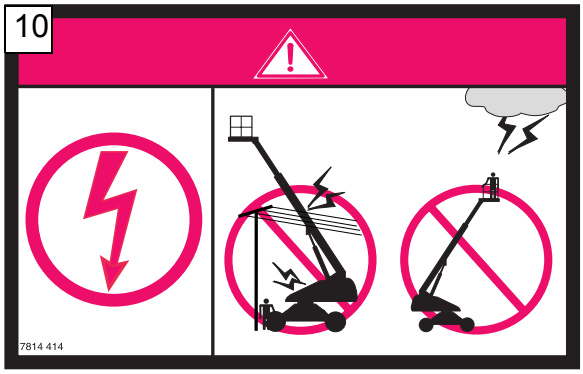
Check that all the labels described below are legible and in the correct place. Replace if necessary (spare parts can be supplied on request, if necessary).

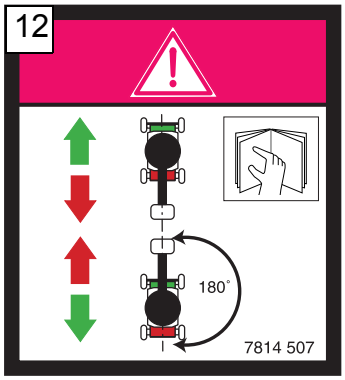
8.7.1 - Label references

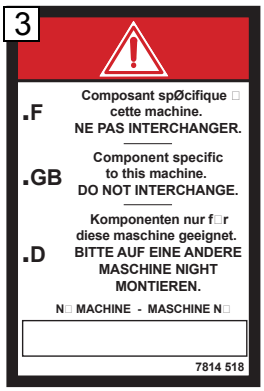
Ref	Code	Qty	Description
2	3078148220	2	H14TX logo
2	3078148210	2	H16TPX logo
5	3078146020	2	H14TX floor height + load
5	3078149210	2	H16TPX floor height + load
7	3078143450	1	Operating instructions
8	3078143270	1	Manufacturer's plate
9	3078144130	2	Do not park in the work area
10	3078144140	1	Danger of electrocution
11	3078143520	1	Hydraulic oil
12	3078145070	1	Danger, travel direction
13	3078143590	1	Oil level
17	3078143640	1	Do not stand on the cover
19	3078143600	2	Do not use as an earth
20	3078143540a	1	Socket 220V
21	3078143680b	1	Read operating manual
30	2420505950	1	Warranty activation
31	3078145180	1	Do not exchange
33	3078144490	4	Sling load capacity for Australia
34	3078144510	1	Fuel tank filling for Australia
40	2421808660	1	Yellow and black reflective adhesive marking
41	3078143570	1	Greasing the slew ring
42	3078143530	1	Remove the pin
44	3078143630	2	Danger of body crushing
47	3078146480	2	Vertical H16TP logo
48	3078143930	1	Green arrow
49	3078143940	1	Red arrow
50	3078148770	1	Haulotte logo
52	3078144530	1	Emergency operation for Australia
53	3078144520	2	Harness load for Australia
54	3078148970	2	Large size Haulotte logo
55	3078148410	1	Manual trouble-shooting
56	3078144930	1	Basket load conform to standard EN280 for Australia
14	3078143620	2	Risk of injury to hand and fingers
51	3078148700	1	Acoustic power
11	3078148890	1	Biodegradable oil in option

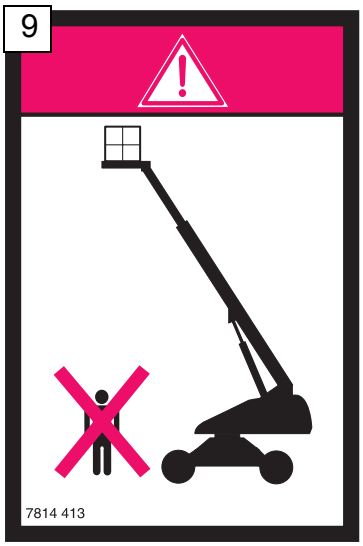
Ref	Code	Qty	Description
57	307P202360	1	Motor support rotation
29	3078145730	1	220 V socket for Holland only
24	3078145580	1	Platform control panel label
23	3078145570	1	Turntable control panel label
27		1	Operating and servicing manual
28		1	Parts manual
7	3078144560	1	Diesel operating instructions for Australia
10	3078144430	1	Danger of electrocution for Australia
60	3078149240	2	Do not spray water near the built-in generator
61	3078150500	1	Built-in generator ON button
48	3078145210	1	White arrow Australia
49	3078145220	1	Black arrow Australia
12	3078145230	1	Danger: Direction of movement Australia
59	3078145200	1	Pressurised fluid for Australia
24	307P203630	1	Platform control panel
23	307P203640	1	Ground control panel

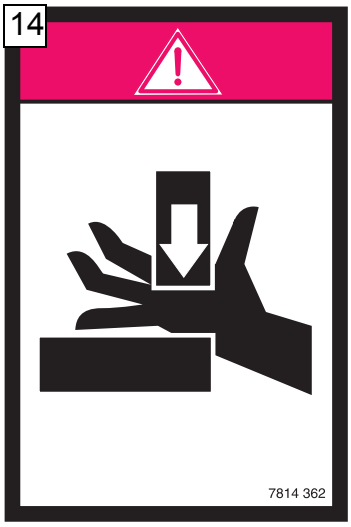
8.7.2 - Common "red" labels

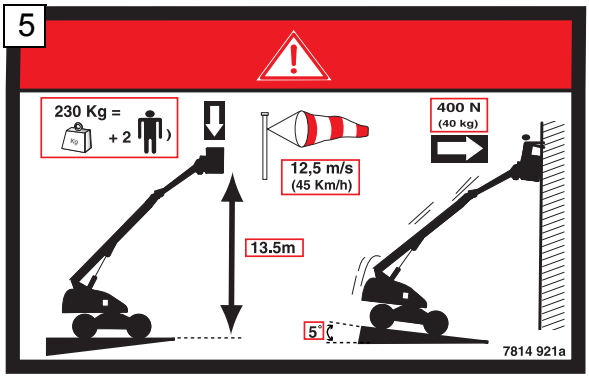


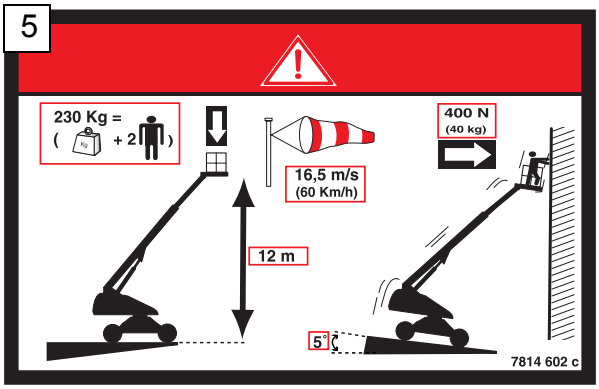












8.7.3 - Common "yellow" labels

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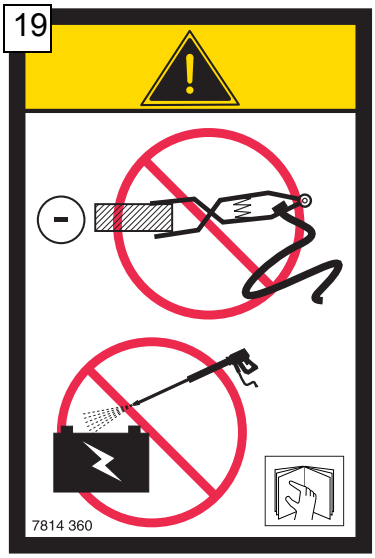

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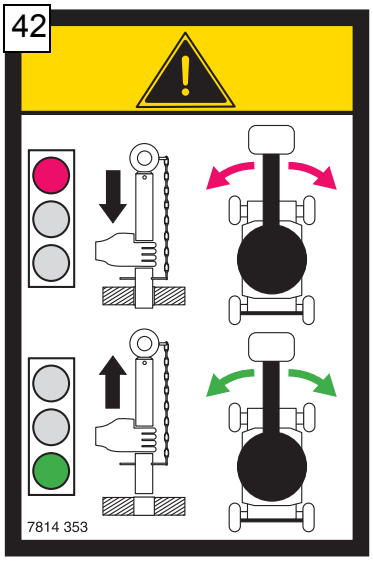

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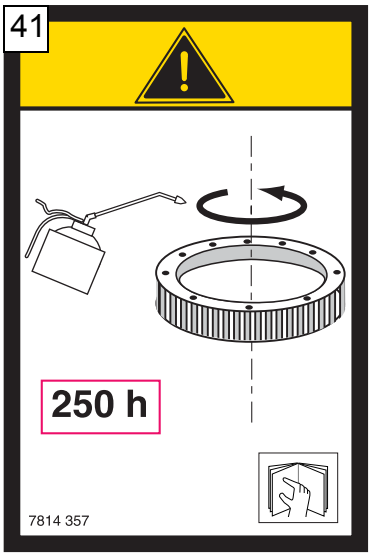

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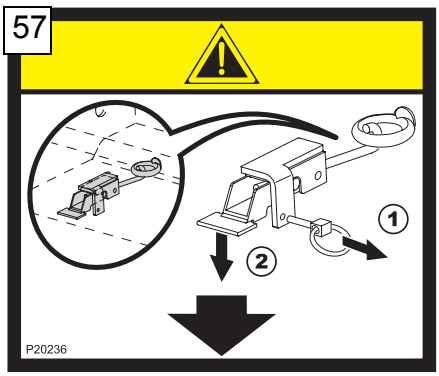


8.7.4 - Various common labels

7

CONSIGNE D'UTILISATION

POUR UTILISER CET APPAREIL
L'OPERATEUR DOIT

1 - Lire et comprendre les informations contenues dans le manuel de conduite et les inscriptions apposées sur la machine, se familiariser avec les commandes.
2 - Etre formé et entraîné pour la conduite de celui-ci, sous la responsabilité de son employeur.
3 - Assurer correctement l'entretien suivant le catalogue constructeur.
4 - Ne pas utiliser l'appareil en cas de disfonctionnement.
5 - Ne pas laver sous pression les composants électriques.
6 - Ne rien démonter, la stabilité serait modifiée.
7 - Ne pas modifier l'appareil sans accord du constructeur.
8 - Ne pas utiliser la machine comme masse de soudure.
9 - Ne pas souder sur la machine sans déconnecter les cosses des batteries, se référer à la notice de conduite et d'entretien.

INSPECTION JOURNALIERE

1 - Vérifier le niveau d'huile hydraulique et le liquide des batteries.
2 - Vérifier s'il n'y a pas de signe apparent de défectuosité (fuite hydraulique, boulonnerie, liaisons électriques).
3 - Vérifier le fonctionnement de l'indicateur de devers en faisant fonctionner l'alarme sonore.

INSTRUCTION AVANT UTILISATION

1 - Enlever la broche de blocage d'orientation (s'il y a une tourelle).
2 - IMPORTANT. La prise doit être raccordée sur une installation électrique protégée par un disjoncteur différentiel 30 mA (NORME C15 100)

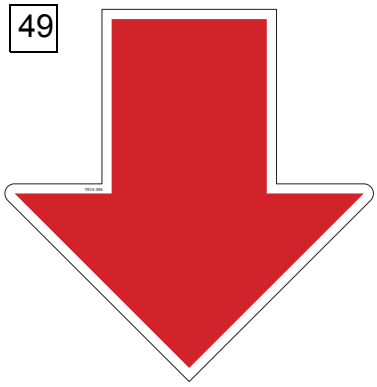
MISE EN ROUTE

1 - Déverrouiller l'arrêt d'urgence, puis actionner le bouton de démarrage.
2 - En cas de non fonctionnement, attendre 10 s et renouveler l'opération.

INTERDICTION
D'UTILISER L'APPAREIL
PENDANT LA CHARGE DES BATTERIES

7814 342

49



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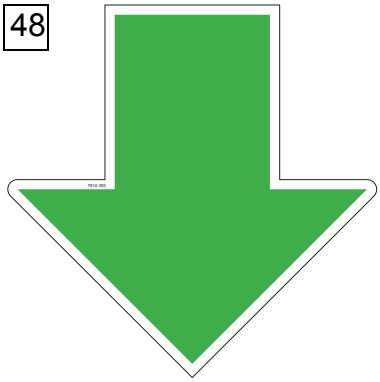

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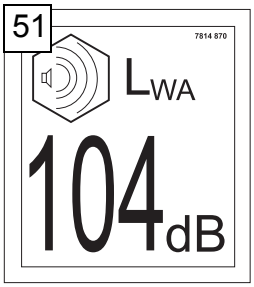

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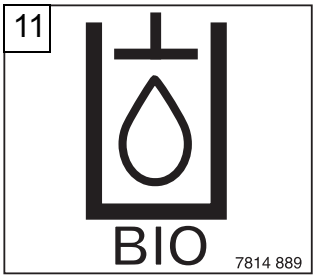

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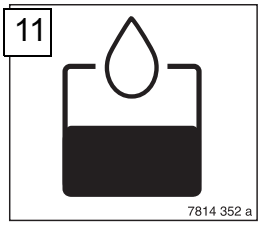

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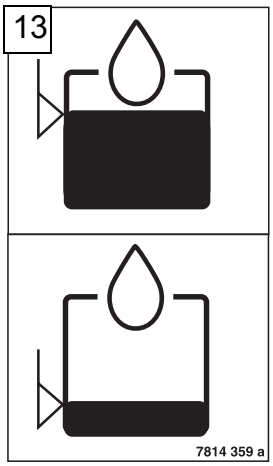

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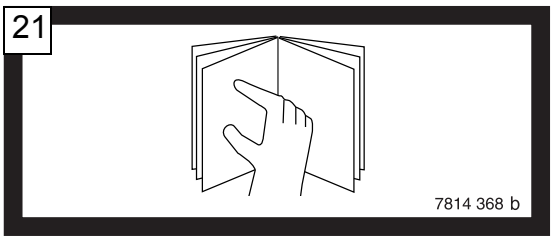

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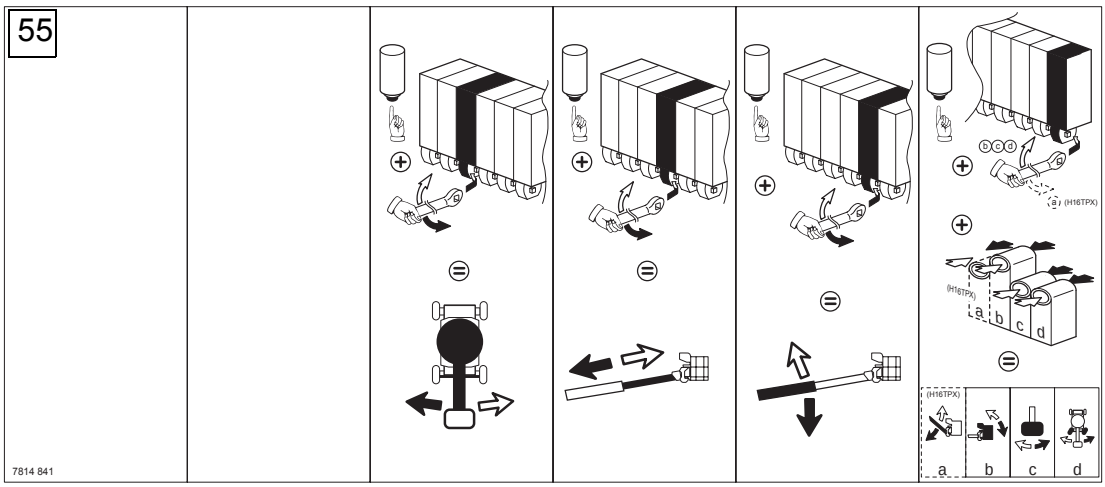


8.7.5 - Labels specific to Australia

56

Basket design loading is in accordance with EN 280

7814 454

52

RESCUE OPERATIONS

- Turn the key-operated selector to turntable position
- Activate and hold the switch and use the emergency lever on the distributor corresponding with the movment required

USE OF STANDBY UNIT

- Turn the key-operated selector to turntable position
- Be carefull that the emergency stop button is released
- Activate the switch in the triangle and activate the lever or the switch corresponding to the movment required in the same time

7814 453

3

FUEL

FUELLING WITH A FILLER ONLY

7814 451

33

LIFTING POINT
USE 4000 Kg MIN. RATED HOOK

7814 449 a

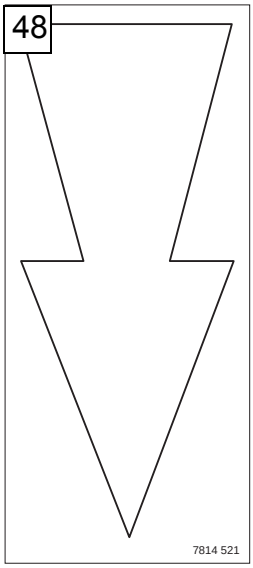
12

WARNING

IF DIRECTION OF TRAVEL IS OBSCURED, ROTATE UNIT THROUGH 180 DEGREES AND NOTE COLOUR OF DIRECTION OF TRAVEL ARROWS ON THE CHASSIS IN RELATION TO TRAVEL CONTROL JOYSTICK ARROWS

7814 523

48



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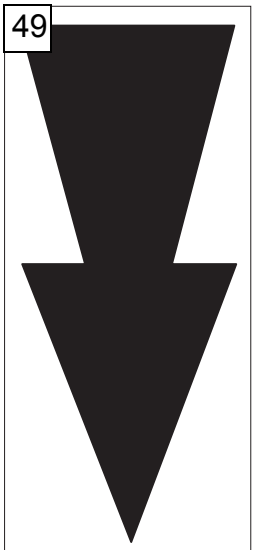

7814 522

59

WARNING
This accumulator contains pressurised oil. Care must be taken whilst carrying out maintenance on this component.

7814 520

53

CAUTION

FULL BODY HARNESS MUST BE USED

7814 452

7

RECOMMENDATIONS FOR USE

BEFORE USING THIS MACHINE
THE OPERATOR MUST

1 - Read and understand the information in the Operators Manual and the information marked on the machine, and become familiar with the controls.
2 - Receive training and practical experience in operating the machine, under the employer's supervision.
3 - Ensure that maintenance is performed in accordance with the manufacturer's instructions contained in the Operators Manual.
4 - Refrain from using the machine in the event of any malfunction.
5 - Avoid contact with electrical components when using high pressure cleaning equipment around the machine.
6 - Not remove any machine parts which might affect the stability.
7 - Not modify the machine without the manufacturer's written approval.
8 - Do not use the machine as a welding earth.
9 - Not carry out repairs on the machine involving welding without first disconnecting the battery.

DAILY INSPECTION

1 - Check the level of diesel fuel (for diesel engine platforms).
2 - Check that there are no apparent defects (hydraulic leaks, loose bolts, loose electric connections)
3 - Check that the tilt indicator operates correctly by manually tilting the switch with the power on.

INSTRUCTIONS BEFORE USE

1 - Remove the rotation locking pin (if fitted).
2 - **IMPORTANT** : when connecting AC power supply to the work platform, the wall power supply must be protected by 30 mA circuit breaker

START-UP

1 - Turn the battery isolator switch (if fitted) to the " on " position
2 - Unlock the emergency stop button then press the engine starter button.
3 - If the engine does not start, wait 10 seconds then repeat the operation.

THE MACHINE
MUST NOT BE USED
WHILE CHARGING THE BATTERIES

7814 456

10

DANGER

BEWARE OF OVERHEAD ELECTRICAL HAZARDS

REGULATION 133A of the CONSTRUCTION SAFETY ACT 1912 REQUIRES

a. Minimum approach of an appliance to live electrical apparatus.
b. Inspection of the work site for electrical hazards before commencing to use the appliance.

- 3 m for voltages up to 132,000
- 6 m for voltages above 132,000 and up to 330,000
- 8 m for voltages above 330,000

c. Constant vigilance and an observer required whilst working or travelling the appliance in the vicinity of live electrical apparatus.

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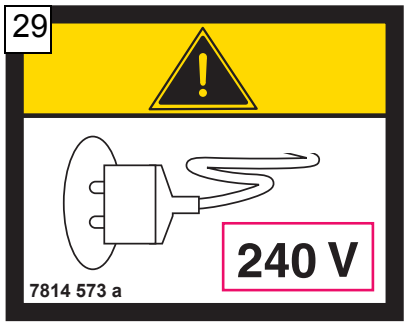
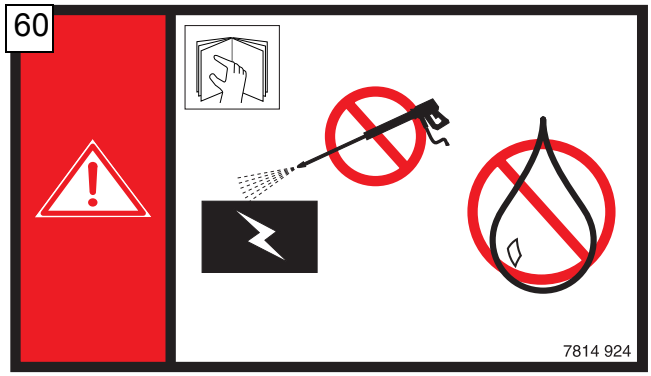
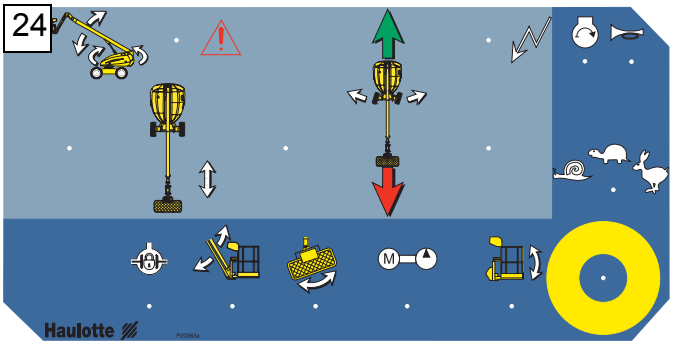
8.7.6 - Labels specific to Holland



8.7.7 - Built-in generator in option

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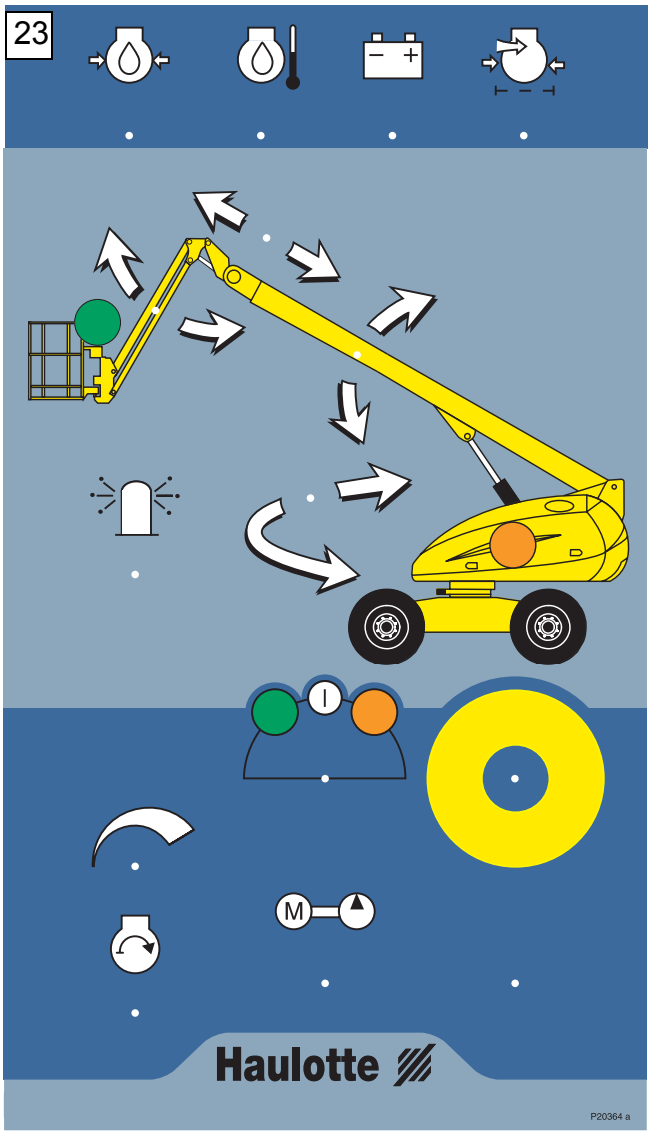
Haulotte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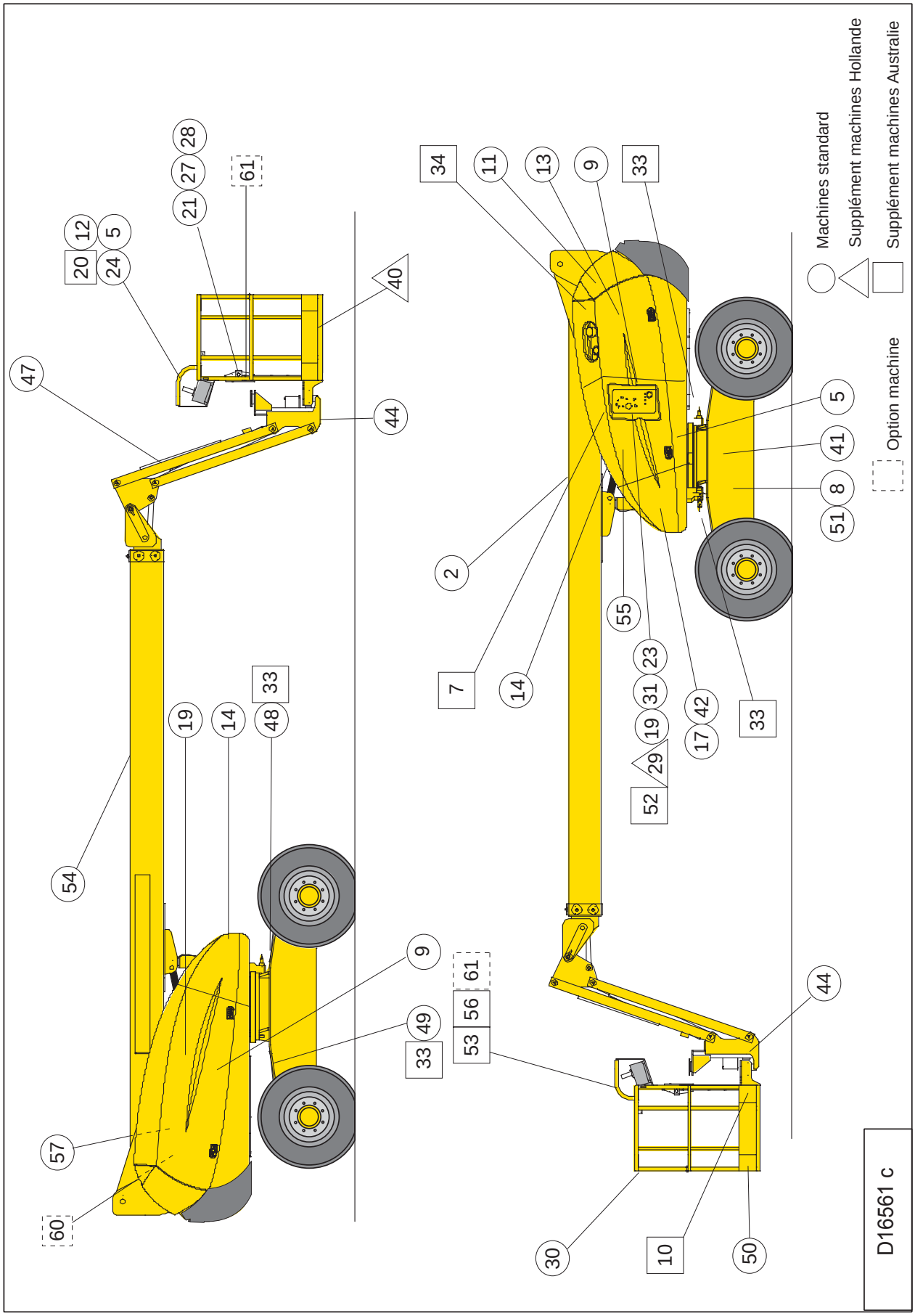
8.7.8 - Label positioning



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9 - PREVENTIVE MAINTENANCE SHEETS

List of preventive maintenance sheet

Sheet no.	Description
P005	Checking - filling the hydraulic oil tank
P006	Replacing the hydraulic filter cartridge
P007	Checking - changing the oilof a wheel reducing gear

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Sheet P005	PREVENTIVE MAINTENANCE SHEET	Folio 1/1
	CHECKING - FILLING THE HYDRAULIC OIL TANK	

1 - Preliminary operations

- Put the machine in the maintenance configuration (see § 6.3, page 32).
- Switch off electric power (see § 6.4, page 32).

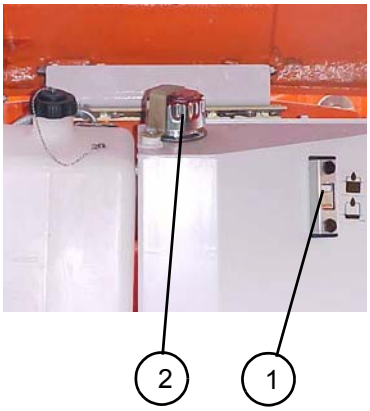
2 - Checking - filling the hydraulic oil tank

NB: This operation must be carried out when the oil is cold, i.e. before starting the machine.

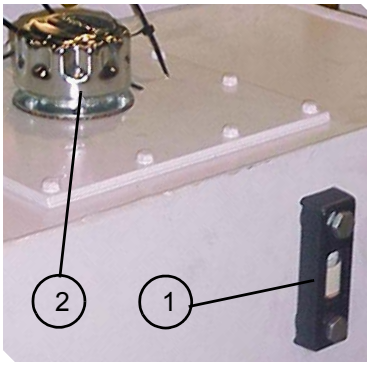
- Check that the level of oil (1) in the tank is between the high and low levels when cold.
- Top up if necessary, by filling via the cap (2).

NB: Only use the oil recommended by the manufacturer.

- Put the machine back into the operational configuration.



HA16/18PX - HA46/51JRT



HA16/18PX New Design
HA46/51JRT

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Sheet P006	PREVENTIVE MAINTENANCE SHEET	Folio 1/1
	CHANGING THE HYDRAULIC FILTER CARTRIDGE	

Caution!
Use a container to collect oil to prevent pollution of the environment.

2 - Preliminary operations

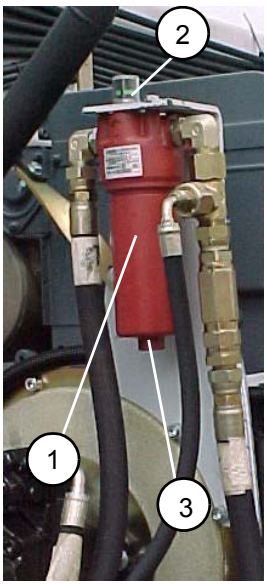
- Put the machine in the maintenance configuration (see § 6.3, page 32).
- Switch off electric power (see § 6.4, page 32).

2 - Replacing the hydraulic filter cartridge

NB: The filter has a clogging indicator. Clogging should be checked when the machine is hot, otherwise, the indicator may be visible due to the viscosity of the cold oil.

- Change the cartridge (1) if the clogging indicator appears (2).
- Unscrew the base nut (3) and remove the cartridge from the hydraulic filter.
- Screw a new cartridge into place.
- Put the machine back into the operational configuration.

HA16/18 PX
HA46/51JRT
HA20/26 PX
HA61/80JRT



H14P / H16TP
HB40/44J

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	PREVENTIVE MAINTENANCE SHEET	

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Sheet P007	PREVENTIVE MAINTENANCE SHEET	Folio 1/1
	CHECKING - CHANGING THE OIL OF A WHEEL REDUCING GEAR	

Caution!
Use a container to collect oil to prevent pollution of the environment.

Caution!
Make sure that the machine is properly stabilised, and that the lifting means are in good condition and of sufficient capacity.

3 - Preliminary operations

- Put the machine in the maintenance configuration (see § 6.3, page 32).
- Switch off electric power (see § 6.4, page 32).

2 - Checking the level

- Turn the wheel so that one cap (1) is on a horizontal line and the other (2) is on a vertical line.
- Unscrew the cap (1) and check the level that should be up to the hole. Top up if necessary.
- Screw the cap back into place.

NB: Only use the oil recommended by the manufacturer.

3 - Changing the oil

- In the same position, unscrew the 2 caps and let the oil flow out.
- Re-fill as described above.
- Screw the caps back into place.

NB: Collect old oil to prevent pollution of the environment.

4 - Additional operations

- Put the machine back into the operational configuration.

HA16/18PX - HA46/51JRT
HA20/26 PX - HA61/80JRT

H14T(X) - H16TP(X)
HB40/44J

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	PREVENTIVE MAINTENANCE SHEET	

10 - OPERATING INCIDENTS

10.1 - INCIDENT TABLE

Before diagnosing a failure, check that:

- the fuel tank is not empty,
- the batteries are properly charged,
- the turntable and platform "palm button" emergency stop buttons are unlocked,
- the relays (platform control panel - turntable box) are correctly pushed into their compartments, (see § 4.2, page 26).
- the main tank oil level is OK,
- the state of the fuses, (see § 4.2, page 26).
- the electrovalves are working properly by checking the state of the LEDs in the turntable box.

Check the state of the LEDs (see § 4.2, page 26):

The LEDs inside the turntable box indicate the state of the electrovalves:

- LED off: electrovalve present and not controlled,
- LED on: electrovalve present and controlled.

NB: If an electrovalve is not connected, the corresponding LED is permanently on.

Instructions:

- Identify the defective function.
- Machine power on but not started: check the presence of the electrovalves (LED off).
- No electrovalve should be controlled (LED on).
- Check that the outputs corresponding to the function are active using the LEDs and directly on the electrovalve heads.
- If they are not active, check which inputs create the function.
- Test the inputs with a voltmeter.

10.1.1 -General operation

ANOMALY	PROBABLE CAUSE	SOLUTION
The motor does not start, the starter is activated	• Diesel tank empty • Fuse FU1 defective • Diesel supply circuit defective • Wiring defective • Module U1 defective • Stop motor solenoid YA1 defective	Fiche DP015
The motor does not start, the starter is not activated	• Emergency stop locked • Generator defective • Batteries defective • Fuses FU1, FU4 or FU8 defective • Wiring defective • Switch SB3 or SB4 defective • Relay KA2 defective	Fiche DP016
The motor starts, then stops after 5s.	• Diesel tank empty • Diesel supply circuit defective	Fiche DP041
The motor does not start from the platform station but does start from the turntable station	• Fuse FU6 defective • Defective connection of switch SB4 • Switch SB4 defective • Wiring harness defective	Fiche DP019
The motor does not start from the turntable station but does start from the platform station	• Switch SB3 defective • Wiring harness defective	Fiche DP020
No motor acceleration regardless of the movement controlled from the platform	• Electronic module U1 defective • Wiring harness defective	Fiche DP021
No motor acceleration by activating the accelerator switch SA2 on the turntable control station	• Fuse FU3 defective • Relay KT2 defective • Electronic module U1 defective • Wiring harness defective • Accelerator switch SA2 defective • Motor accelerator coil YA2 defective	Fiche DP022
No movement available (from turntable or platform station)	• Insufficient hydraulic oil • Fuse FU7 or FU4 or FU10 defective • Wiring harness defective • Electrovalve YV1 defective • Incorrect "Load sensing" pressure setting • Motor-pump coupling defective • Hydraulic pump defective • Pressure limiter defective • Distribution block input module defective • Pump regulation unit incorrectly set or defective • Hydraulic pump defective • Electronic module U1 defective • Relay KMG defective • Printed circuit defective • Key switch SA1 defective	Fiche DP023

No movement available from the platform control station	• Fuse FU1 defective • Platform control station defective • Fail-safe pedal defective • Wiring harness defective	Fiche DP024
Noisy hydraulic pump	• Oil non-conform • Obstruction of the tank air vent • Suction valves closed • Defective pipes • Hydraulic pump defective • Insufficient oil level	Fiche DP025
Insufficient pressure or power at the pump	• Clogged air filter • Motor speed too low • Oil leak on connector, hose or component • Clogged oil filter	• Change the filter • Adjust speed • Repair or replace • Replace oil filter cartridge
No travel telescope out, boom and arm lifting, + buzzer sounding	• Slope or tilt >5°	• First retract the telescope and lower the boom to reset
Buzzer sounding	• Slope or tilt > 5° • Platform load close to cut-off • Hydraulic oil temperature too high	• Reset by retracting the telescope and lowering the boom • Remove load • Leave to cool
The electropump does not work	• Battery breaker open • Fuses broken • Defective or discharged batteries • The battery wires do not make contact	• Close the battery breaker • Replace the fuses • Replace or recharge the batteries • Clean or tighten the terminals

10.1.2 -Lifting system

ANOMALY	PROBABLE CAUSE	SOLUTION
No platform up and/or down compensation movement	• Electrovalve YV15 or YV2 defective • Coil defective • Electronic module U1 defective • Wiring harness defective • Printed circuit defective • Compensation switch SA5 defective • Lifting manipulator defective	Fiche DP026
No platform right and/or left rotation movement	• Electrovalve YV19 or YV2 defective • Coil defective • Electronic module U1 defective • Wiring harness defective • Printed circuit defective • Basket rotation swtich SA4 defective	Fiche DP027
No jib movement (up and / or down) from the platform (or turntable) control station	• Electrovalve YV18 or YV2 defective • Coil defective • Electronic module U1 defective • Wiring harness defective • Printed circuit defective • Flow limiter defective • Jib switch SA7 or SA6 defective	Fiche DP028
No telescoping movement (out and/or in) from the platform (or turntable) control station	• Electrovalve YV14 or YV2 defective • Coil defective • Electronic module U1 defective • Wiring harness defective • Printed circuit defective • Telescoping switch SA9 or SA8 defective • Pressure limiter defective	Fiche DP072
No boom lifting movement (up and/or down) from the platform (or turntable) control station	• Electrovalve YV3 defective • Electronic module U1 defective • Wiring harness defective • Printed circuit defective • Lifting switch SA13 defective • Lifting manipulator SM31 defective	Fiche DP030
The arms and boom do not move up	• Battery discharged by more than 80% • Charge check device defective	• Change the batteries • Replace the charge check device

10.1.3 -Travel system

ANOMALY	PROBABLE CAUSE	SOLUTION
No machine travel movement	• Connectors disconnected • Manipulator HM4 defective • Wiring harness defective • Electronic module U1 defective • Coils of electrovalve YV6 or YV7 defective • Electrovalves YV6 or YV7 defectives	Fiche DP032
Only travel micro-speed remains available on the machine, regardless of the speed selected	• Machine unfolded • Contactors SQ2, SQ3, SQ4 incorrectly set or defective • Wiring harness defective • Electronic module U1 defective • Printed circuit defective	Fiche DP056
Machine travel speed does not correspond to the selec-tor	• Electrovalve YV8, YV10, YV12 or YV17defective • Coil of electrovalve YV8, YV10 or YV12 de-fective • Wiring harness defective • Printed circuit defective • Speed selector SA11 defective • Electronic module U1 defective	Fiche DP034
Sudden stop of travel during a platform lifting operation	• Contactors SQ3, SQ4, SQ2 incorrectly set or defective • Wiring harness defective • Electronic module U1 defective	Fiche DP058
No differential blocking during action on switch SA3	• Switch SA3 or SA11 defective • Electronic module U1 defective • Wiring harness defective • Contactors SQ3, SQ9, SQ2 incorrectly set or defective • Printed circuit defective • Coils of electrovalves YV9 or YV13 defective • Electrovalves YV9 or YV13 defective	Fiche DP036
No grip on a drive wheel	• Insufficient load on one wheel	• Act on the blocking button

10.1.4 -Steering system

ANOMALY	PROBABLE CAUSE	SOLUTION
No steering movement (right and/or left) on the rear axle	• Electrovalve YV16 or YV2 defective • Coil defective • Electronic module U1 defective • Wiring harness defective • Printed circuit defective • Travel switch SM4 defective	Fiche DP060

10.1.5 -Turntable rotation system

ANOMALY	PROBABLE CAUSE	SOLUTION
No turntable rotation movement (right and/or left) from the platform (or turntable) control station	• Electrovalve YV5 defective • Electronic module U1 defective • Wiring harness defective • Printed circuit defective • Rotation switch SA15 defective • Rotation manipulator SM31 defective	Sheet DP018
The turntable does not turn	• The blocking pin has not been removed from the chassis	• Remove the pin

NB: In the turntable box, LEDs indicate the state of each output so that you can check if an output is activated.

10.2 - BREAKDOWN DETECTION FLOW CHART

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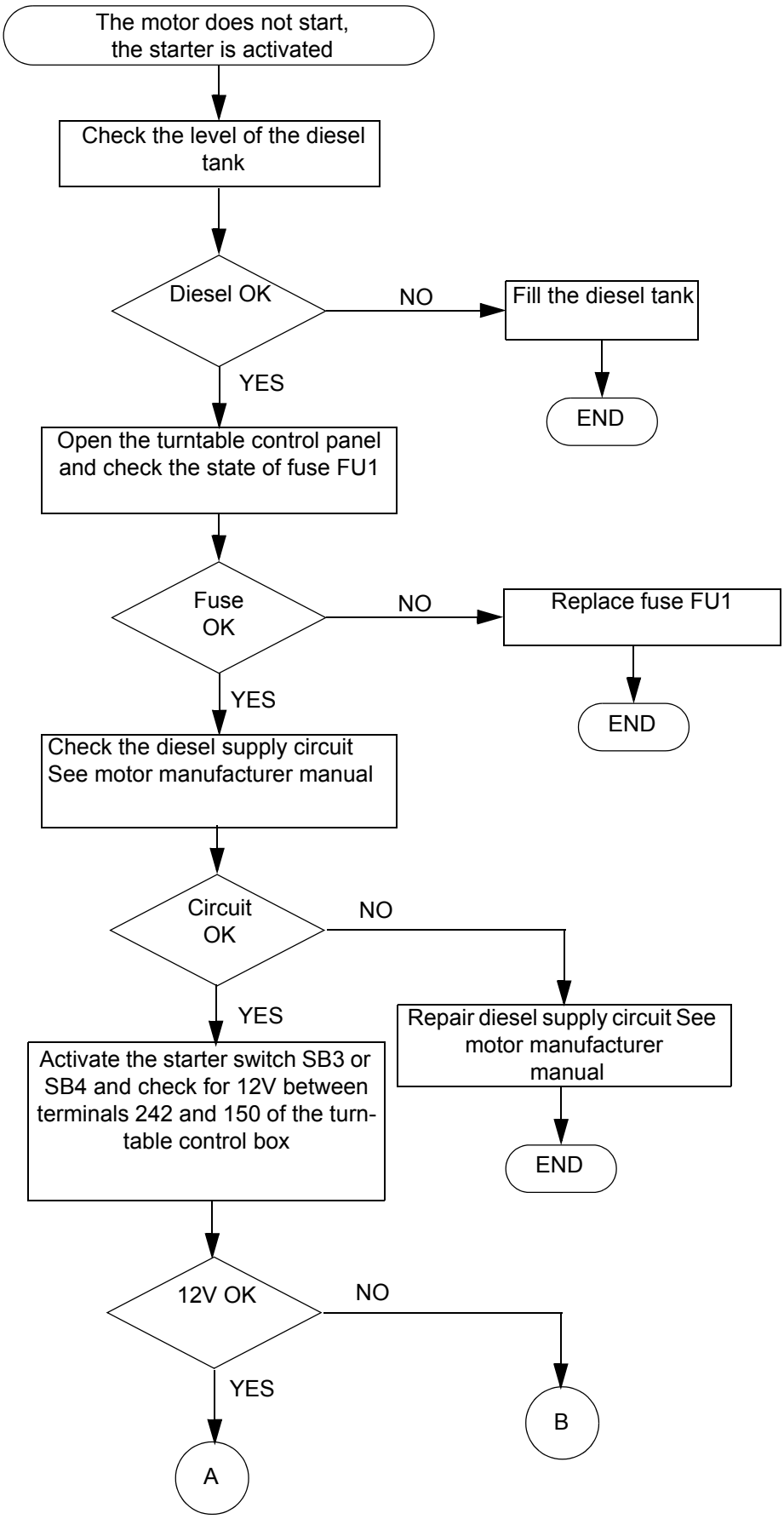
Sheet DP015	BREAKDOWN DETECTION FLOW CHART THE MOTOR DOES NOT START, THE STARTER IS ACTIVATED	Folio 1/2



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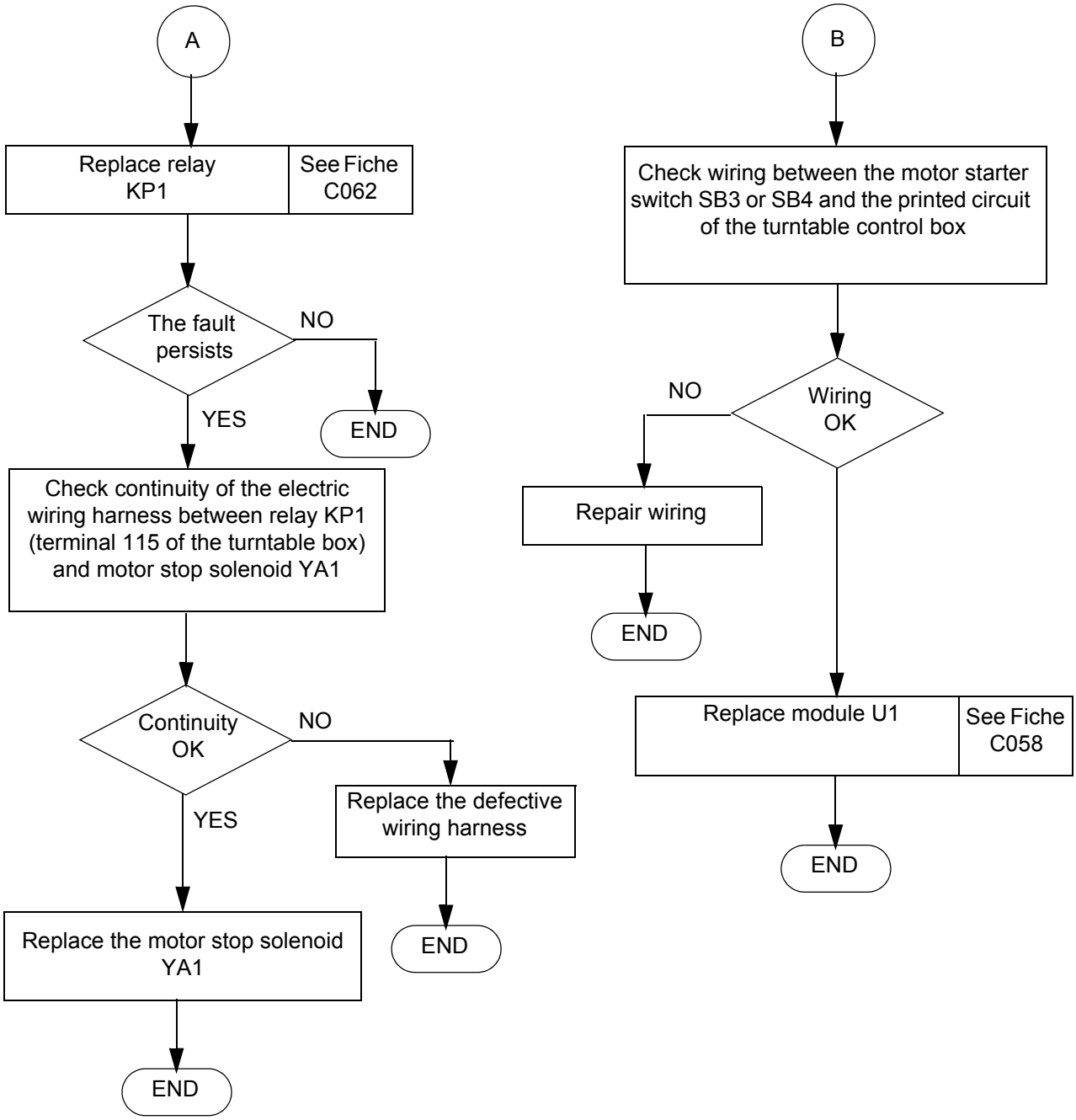
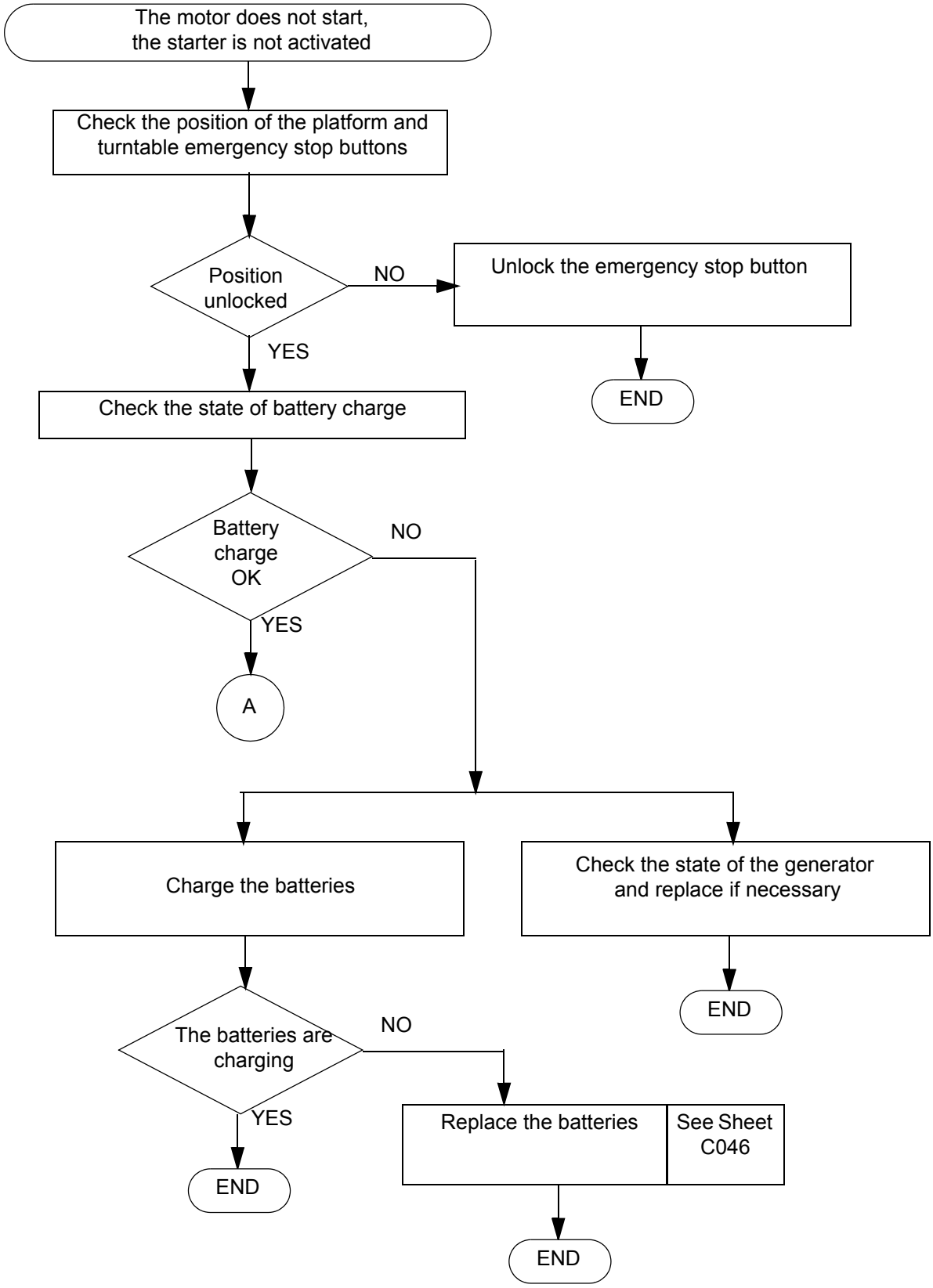
Sheet DP015	BREAKDOWN DETECTION FLOW CHART THE MOTOR DOES NOT START, THE STARTER IS ACTIVATED	Folio 2/2



Sheet DP016	BREAKDOWN DETECTION FLOW CHART THE MOTOR DOES NOT START, THE STARTER IS NOT ACTIVATED	Folio 1/3



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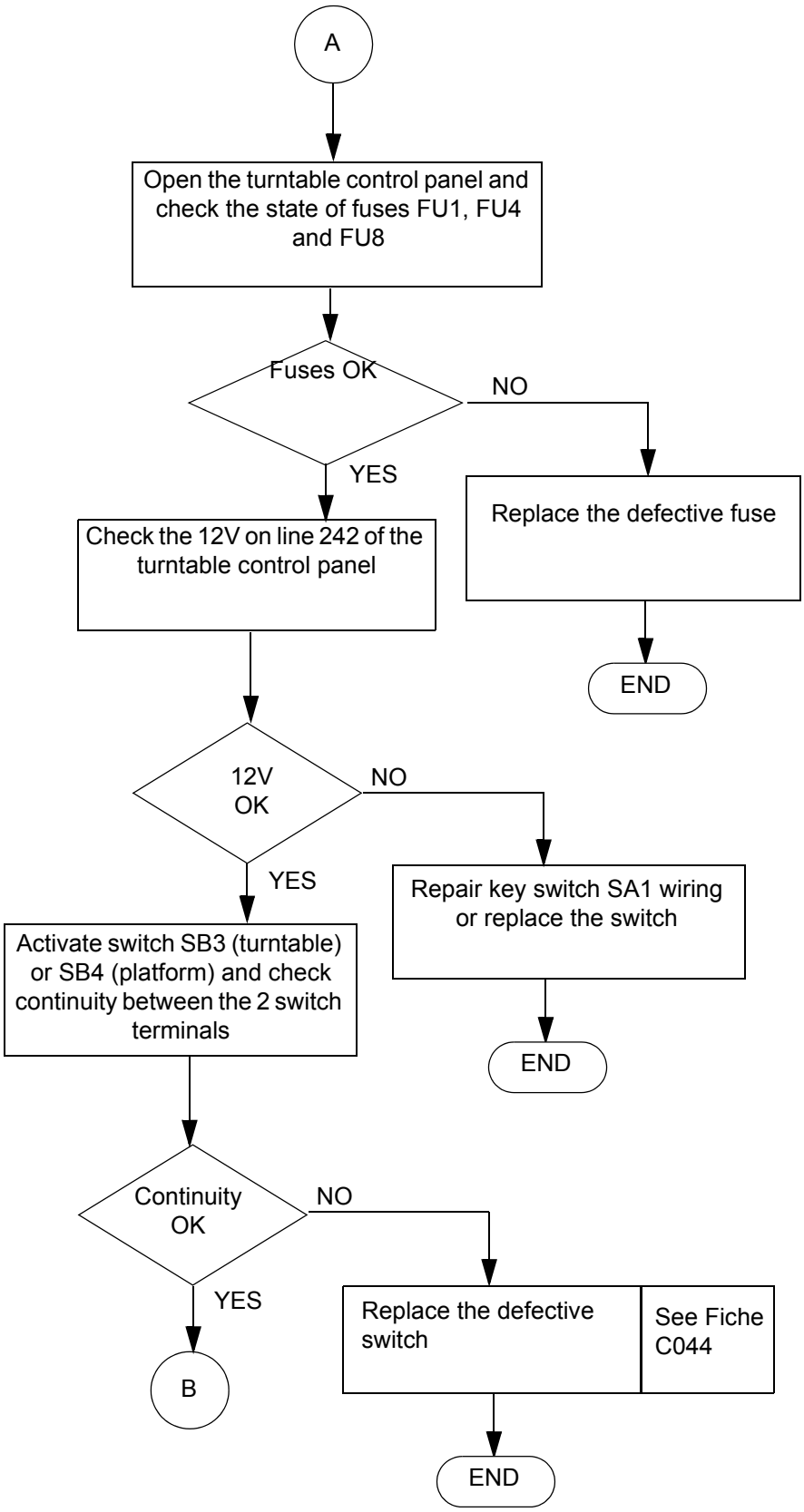
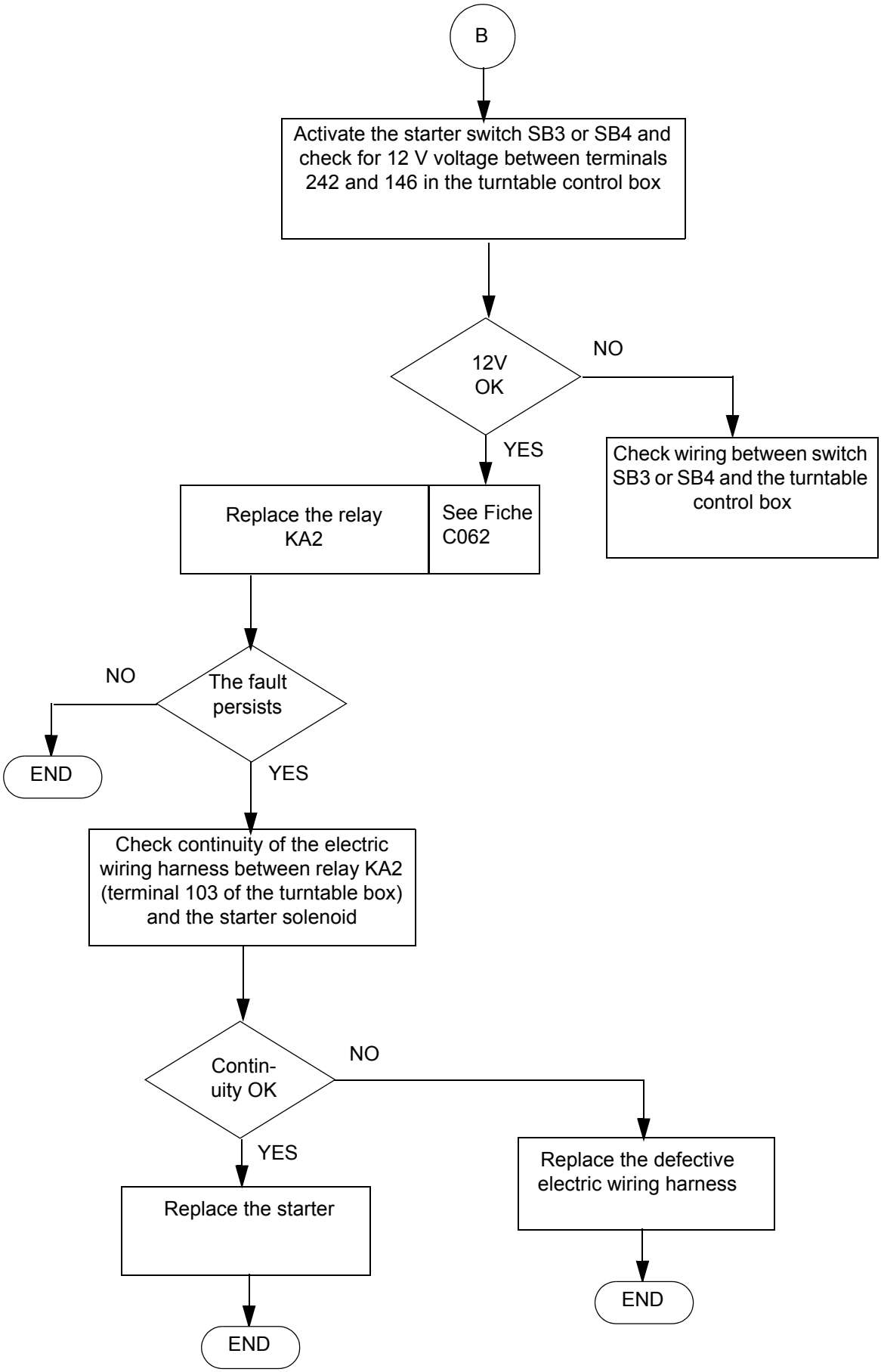
Sheet DP016	BREAKDOWN DETECTION FLOW CHART THE MOTOR DOES NOT START, THE STARTER IS NOT ACTIVATED	Folio 2/3



Sheet DP016	BREAKDOWN DETECTION FLOW CHART THE MOTOR DOES NOT START, THE STARTER IS NOT ACTIVATED	Folio 3/3



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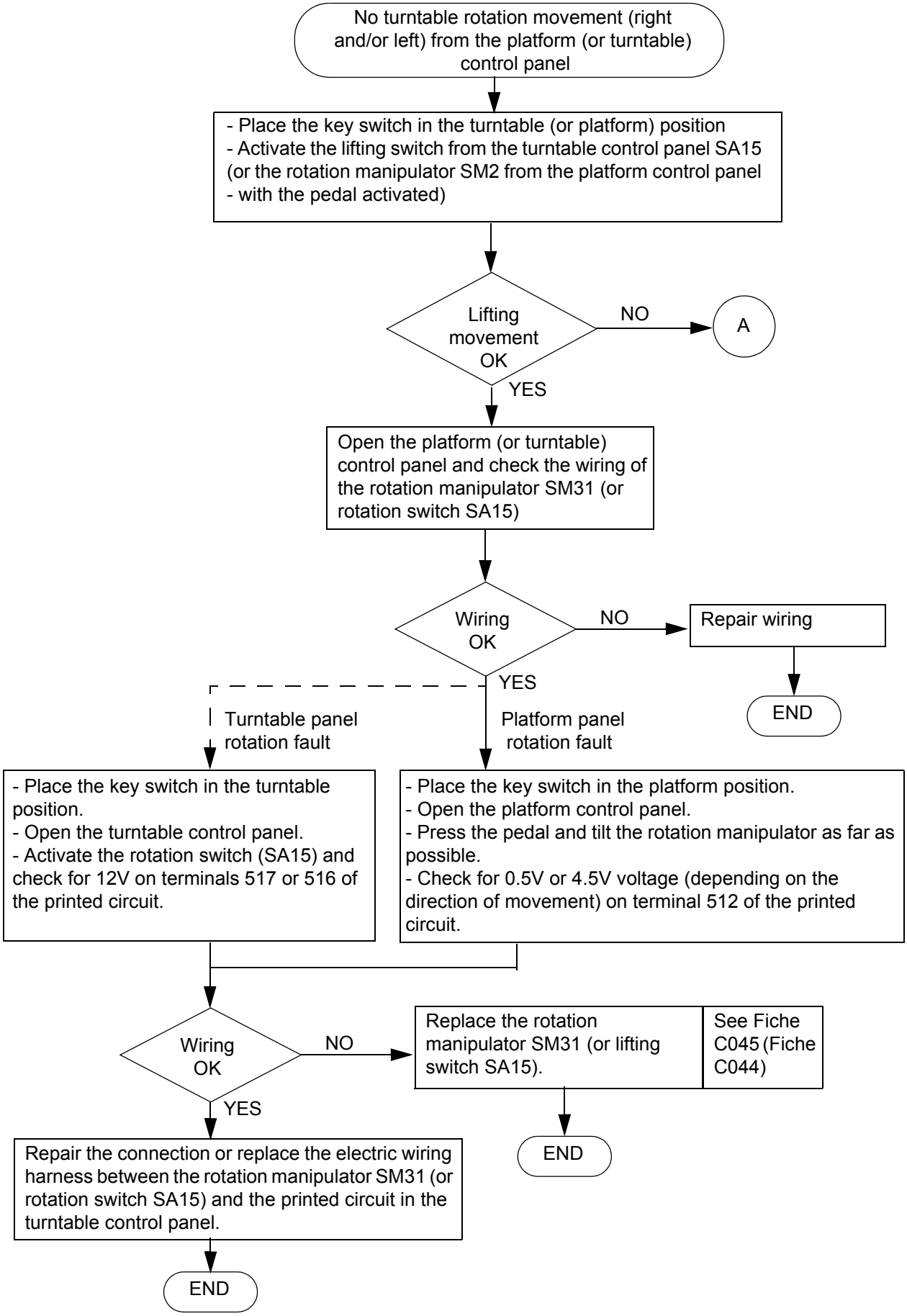
Sheet DP018	BREAKDOWN DETECTION FLOW CHART NO TURNTABLE ROTATION MOVEMENT (RIGHT AND / OR LEFT) FROM THE PLATFORM (OR TURNTABLE) CONTROL PANEL	Folio 1/3



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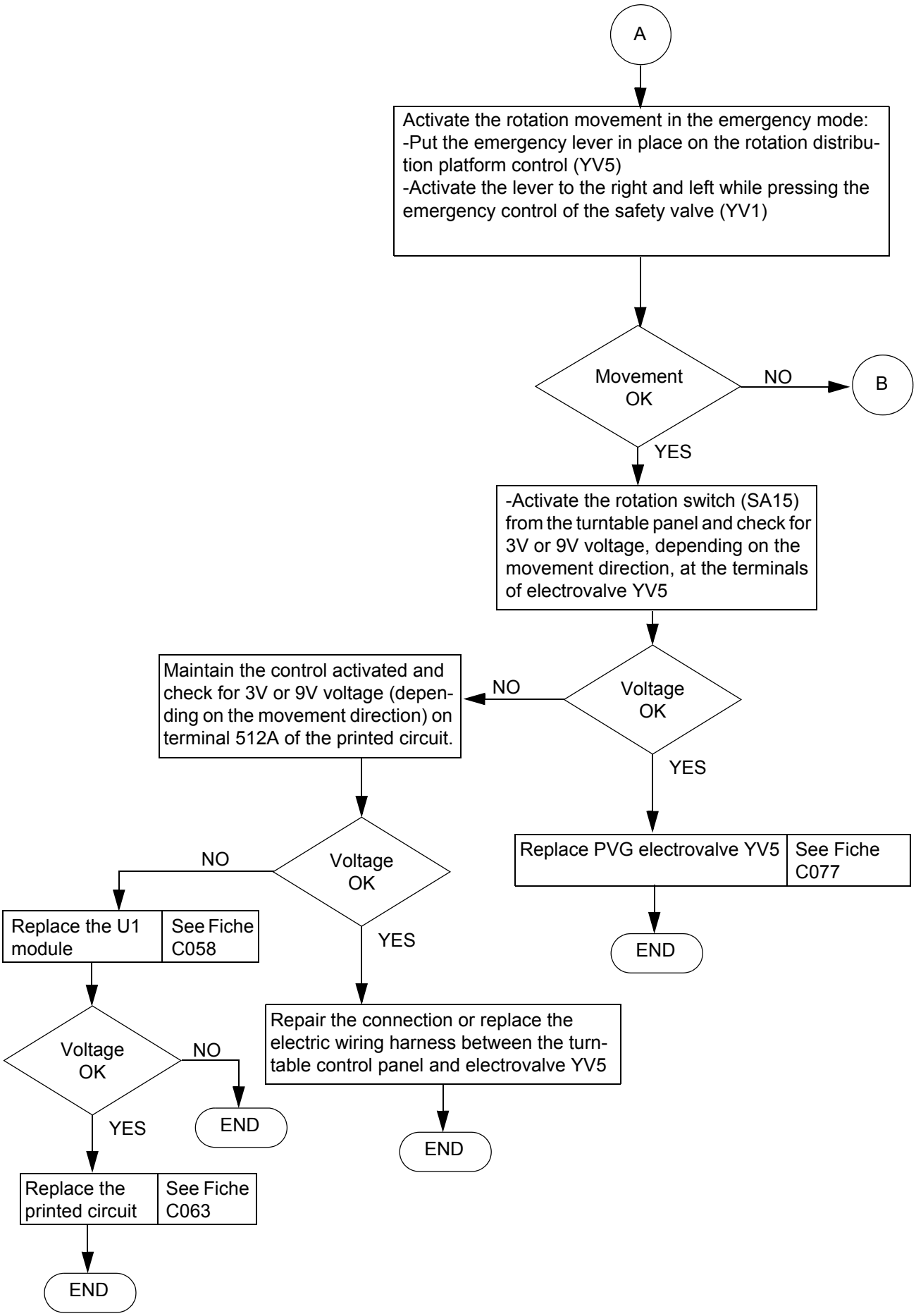
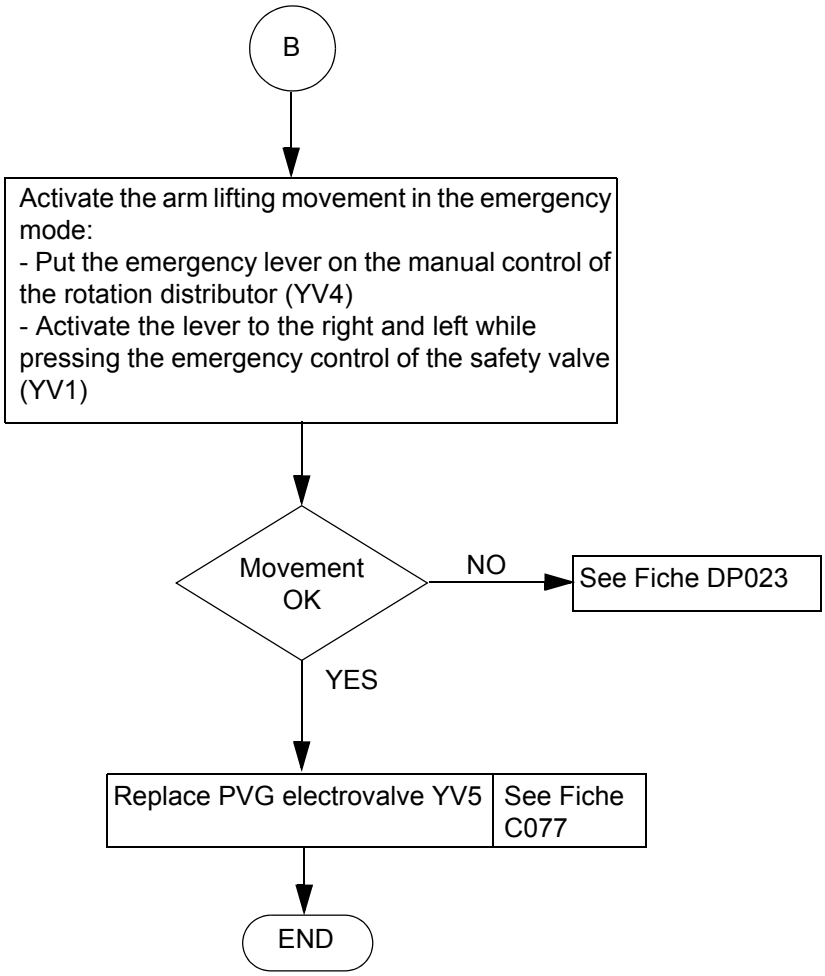
Sheet DP018	BREAKDOWN DETECTION FLOW CHART NO TURNTABLE ROTATION MOVEMENT (RIGHT AND / OR LEFT) FROM THE PLATFORM (OR TURNTABLE) CONTROL PANEL	Folio 2/3



Sheet DP018	BREAKDOWN DETECTION FLOW CHART NO TURNTABLE ROTATION MOVEMENT (RIGHT AND / OR LEFT) FROM THE PLATFORM (OR TURNTABLE) CONTROL PANEL	Folio 3/3



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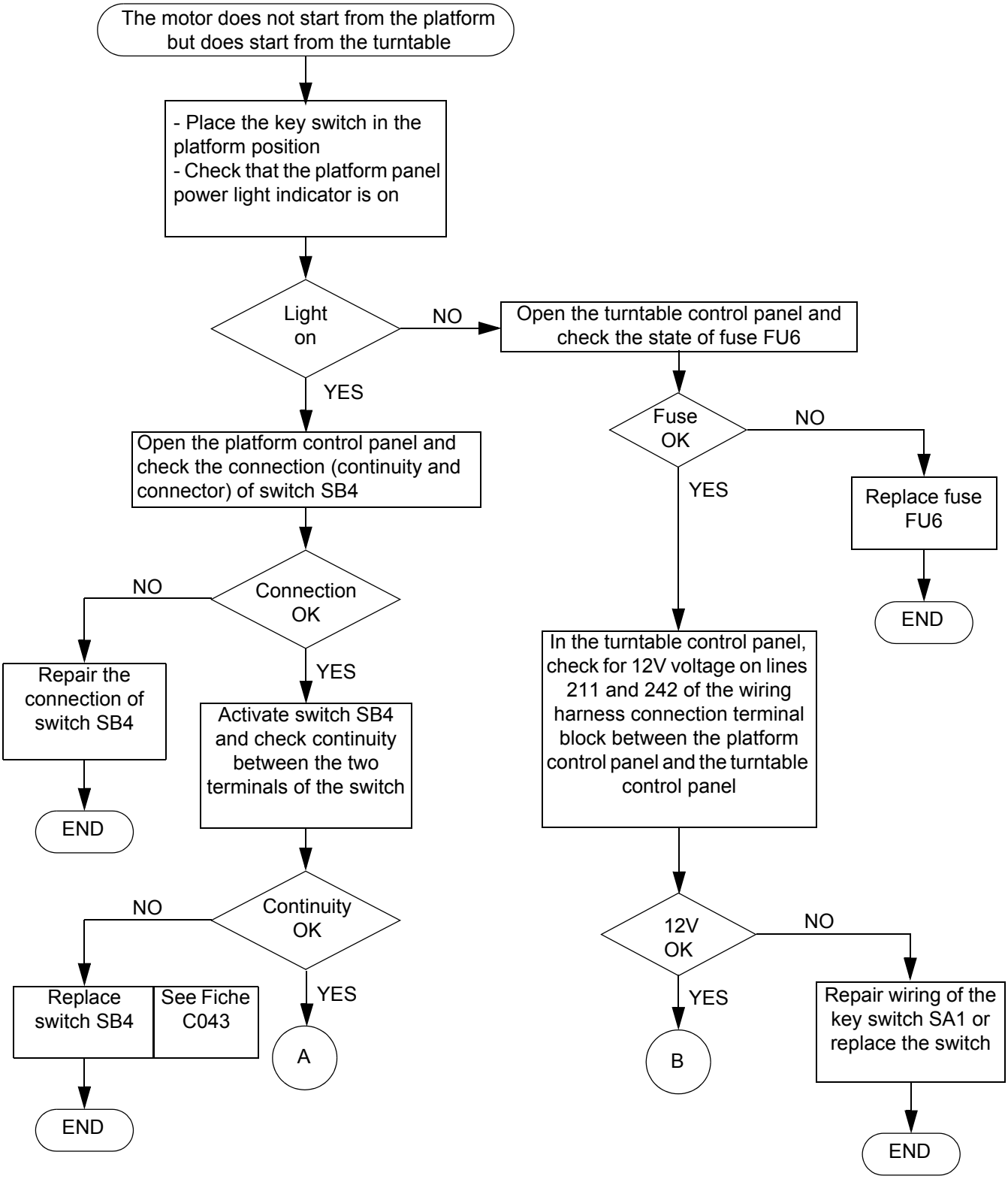
Sheet DP019	BREAKDOWN DETECTION FLOW CHART THE MOTOR DOES NOT START FROM THE PLATFORM PANEL BUT DOES START FROM THE TURNTABLE PANEL	Folio 1/2



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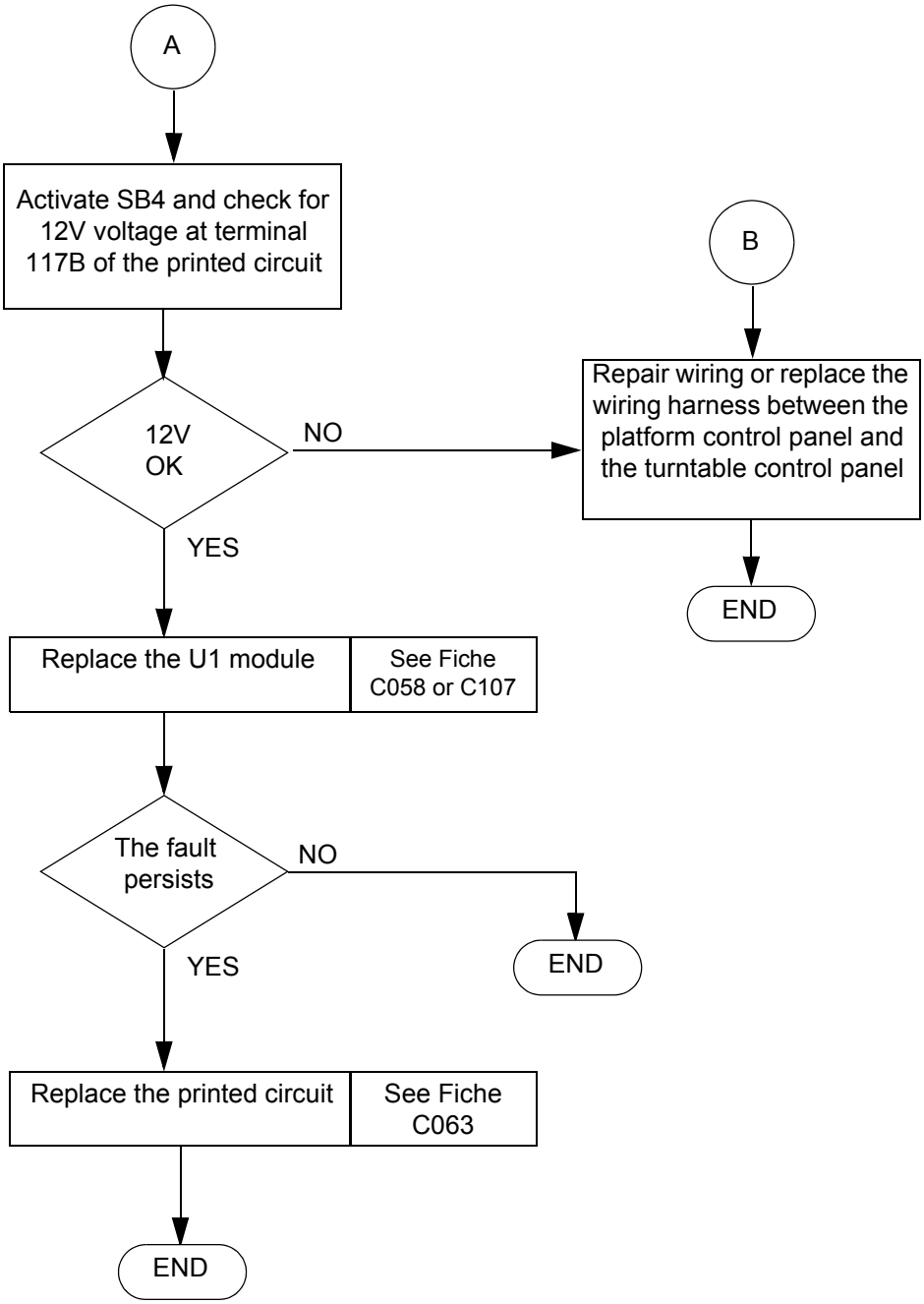
Sheet DP019	BREAKDOWN DETECTION FLOW CHART THE MOTOR DOES NOT START FROM THE PLATFORM PANEL BUT DOES START FROM THE TURNTABLE PANEL	Folio 2/2



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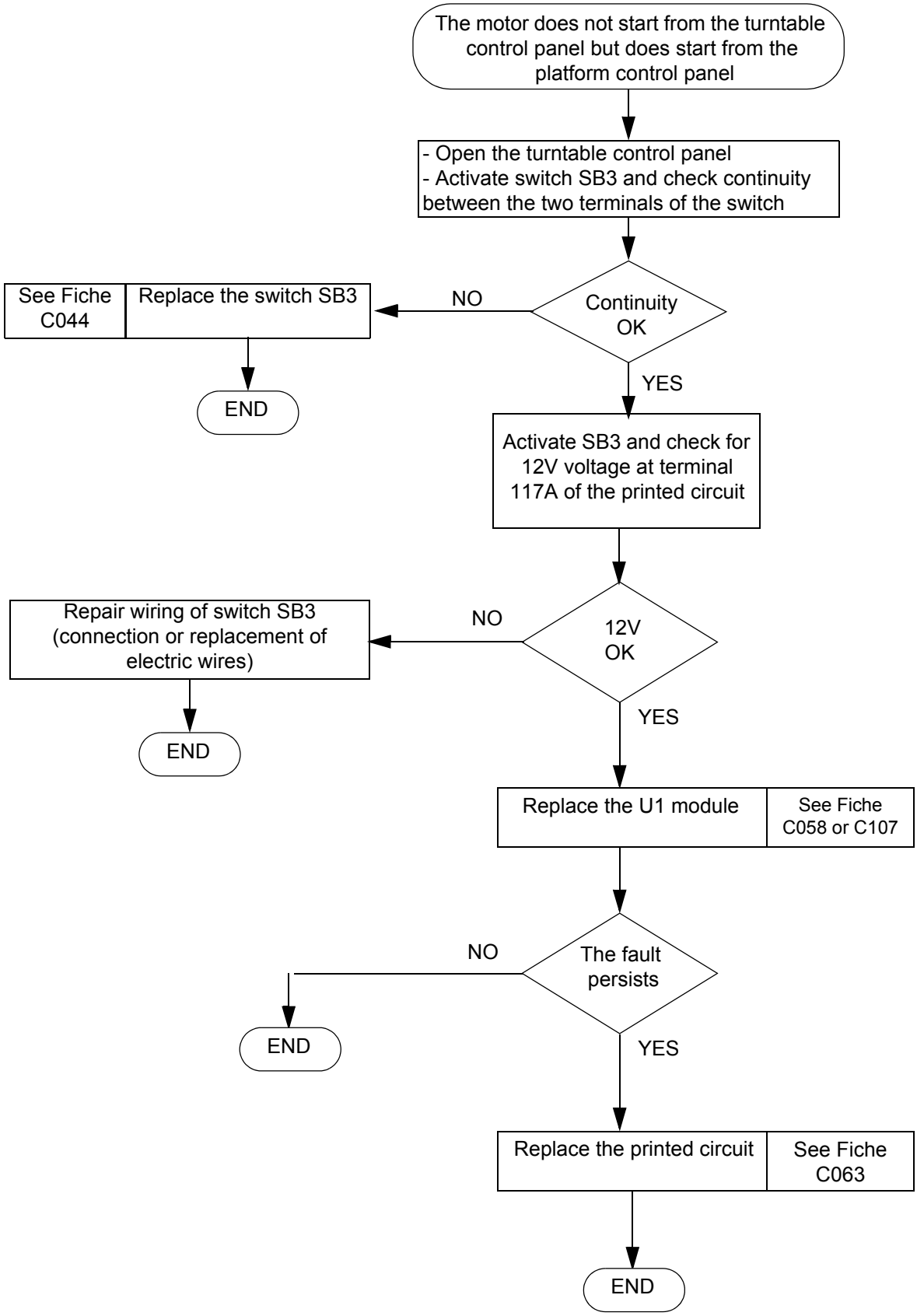
Sheet DP020	BREAKDOWN DETECTION FLOW CHART THE MOTOR DOES NOT START FROM THE TURNTABLE CONTROL PANEL BUT DOES START FROM THE PLATFORM CONTROL PANEL	Folio 1/1



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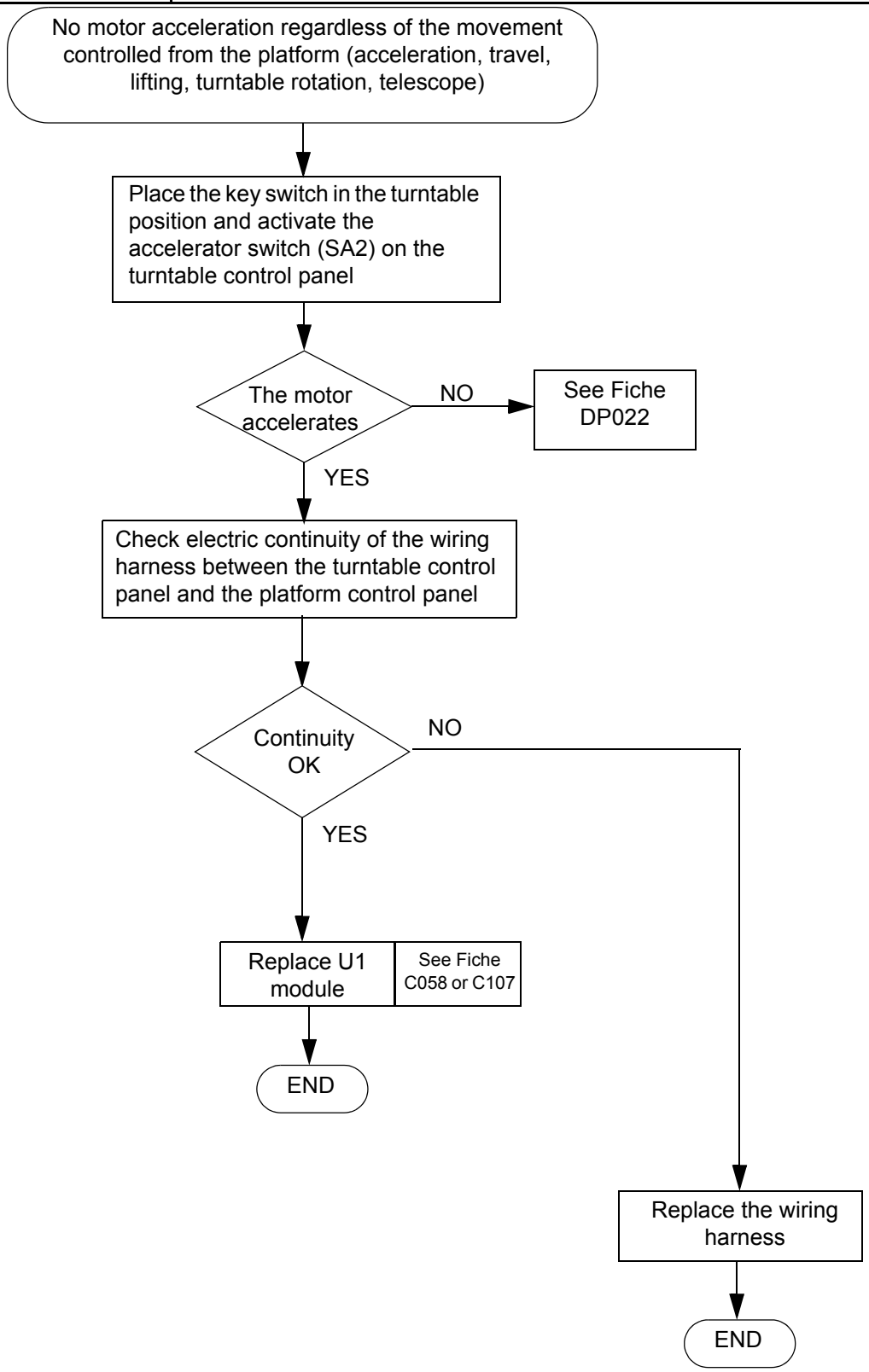
Sheet DP021	BREAKDOWN DETECTION FLOW CHART MOTOR ACCELERATION FOR ANY MOVEMENT CONTROLLED FROM THE PLATFORM (ACCELERATION, TRAVEL, LIFTING, TURNTABLE ROTATION, TELESCOPE)	Folio 1/1



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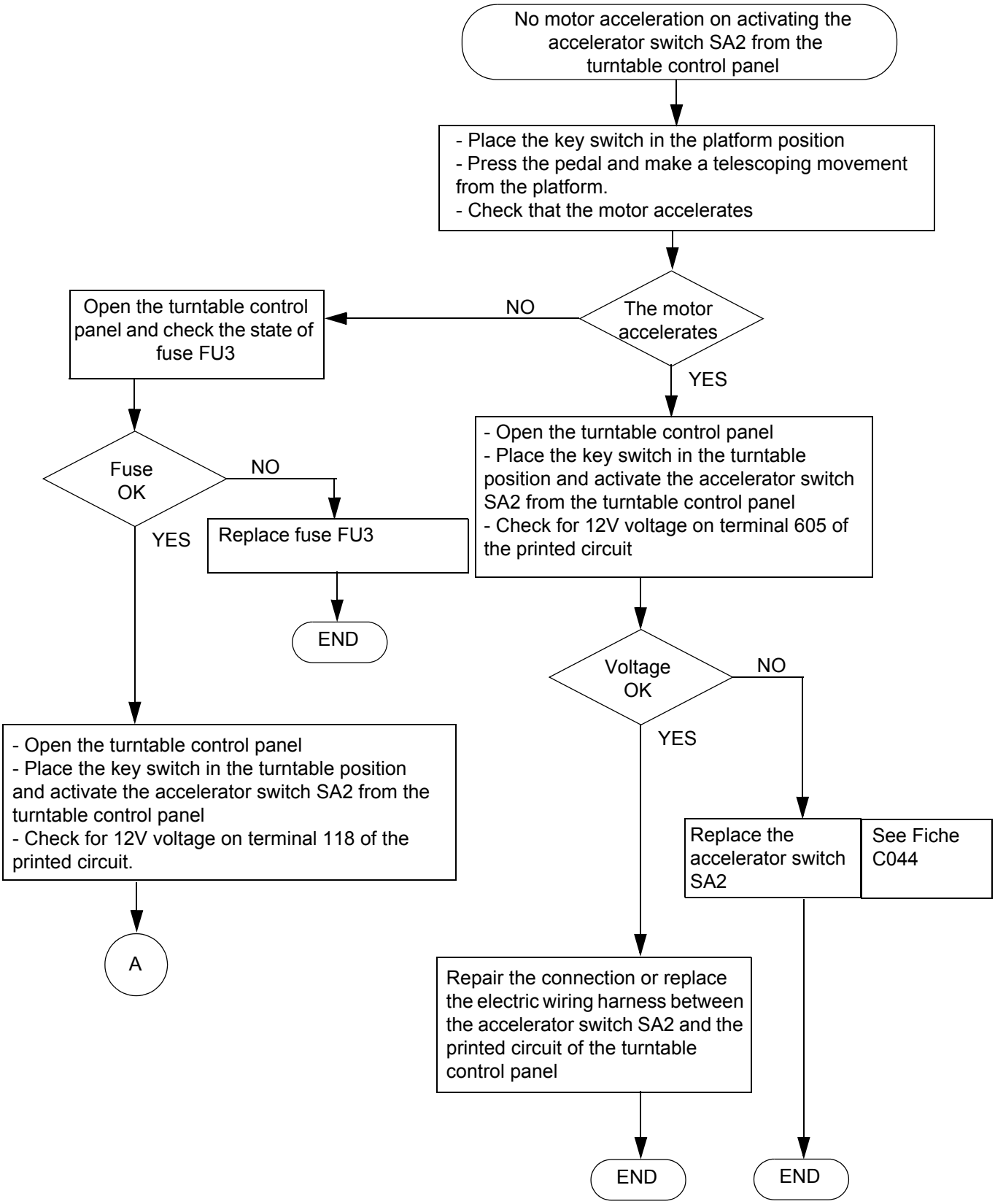
Sheet DP022	BREAKDOWN DETECTION FLOW CHART NO MOTOR ACCELERATION ON ACTIVATING THE ACCELERATOR SWITCH SA2 FROM THE TURNTABLE CONTROL PANEL	Folio 1/2



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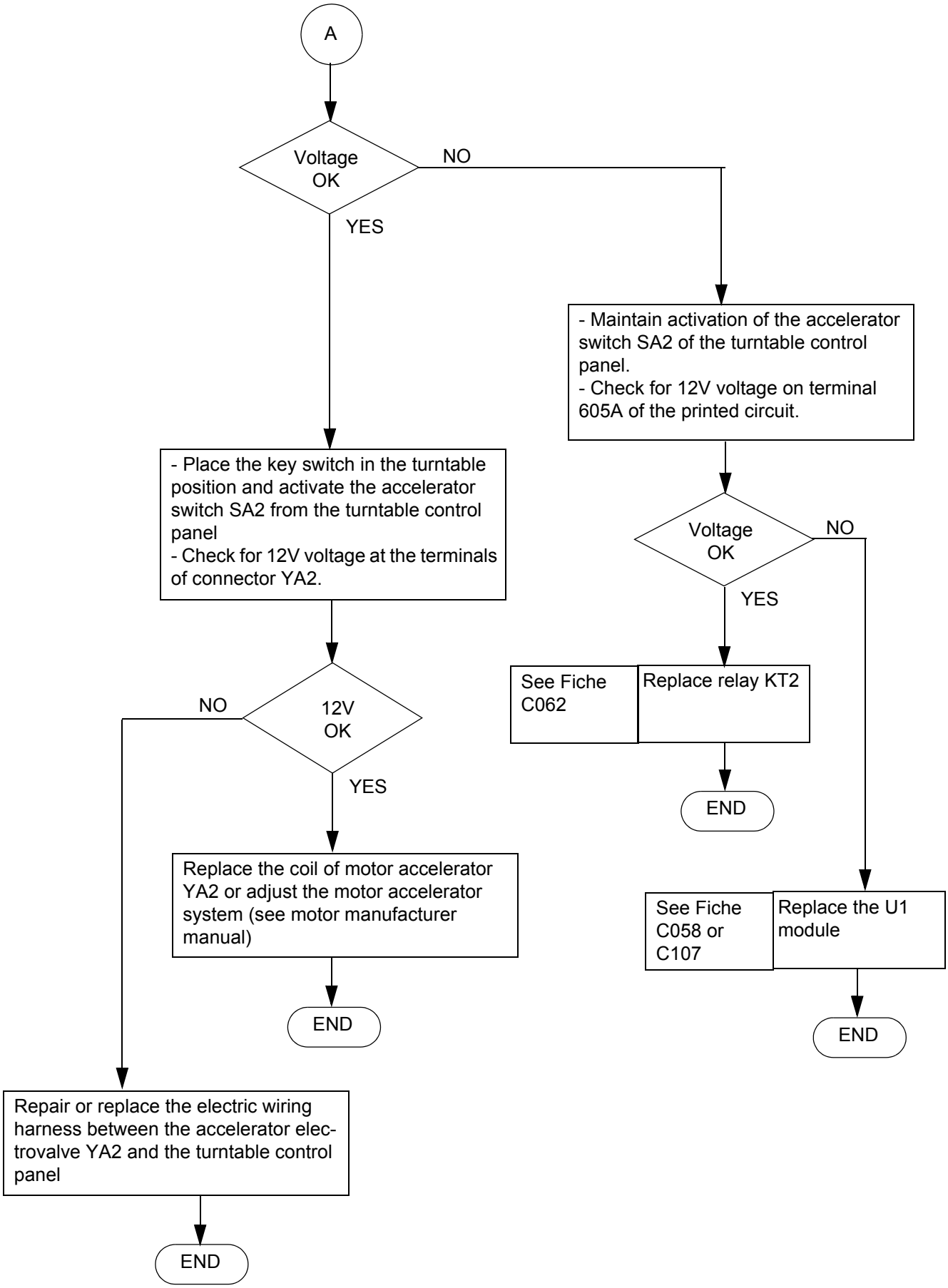
Sheet DP022	BREAKDOWN DETECTION FLOW CHART NO MOTOR ACCELERATION ON ACTIVATING THE ACCELERATOR SWITCH SA2 FROM THE TURNTABLE CONTROL PANEL	Folio 2/2



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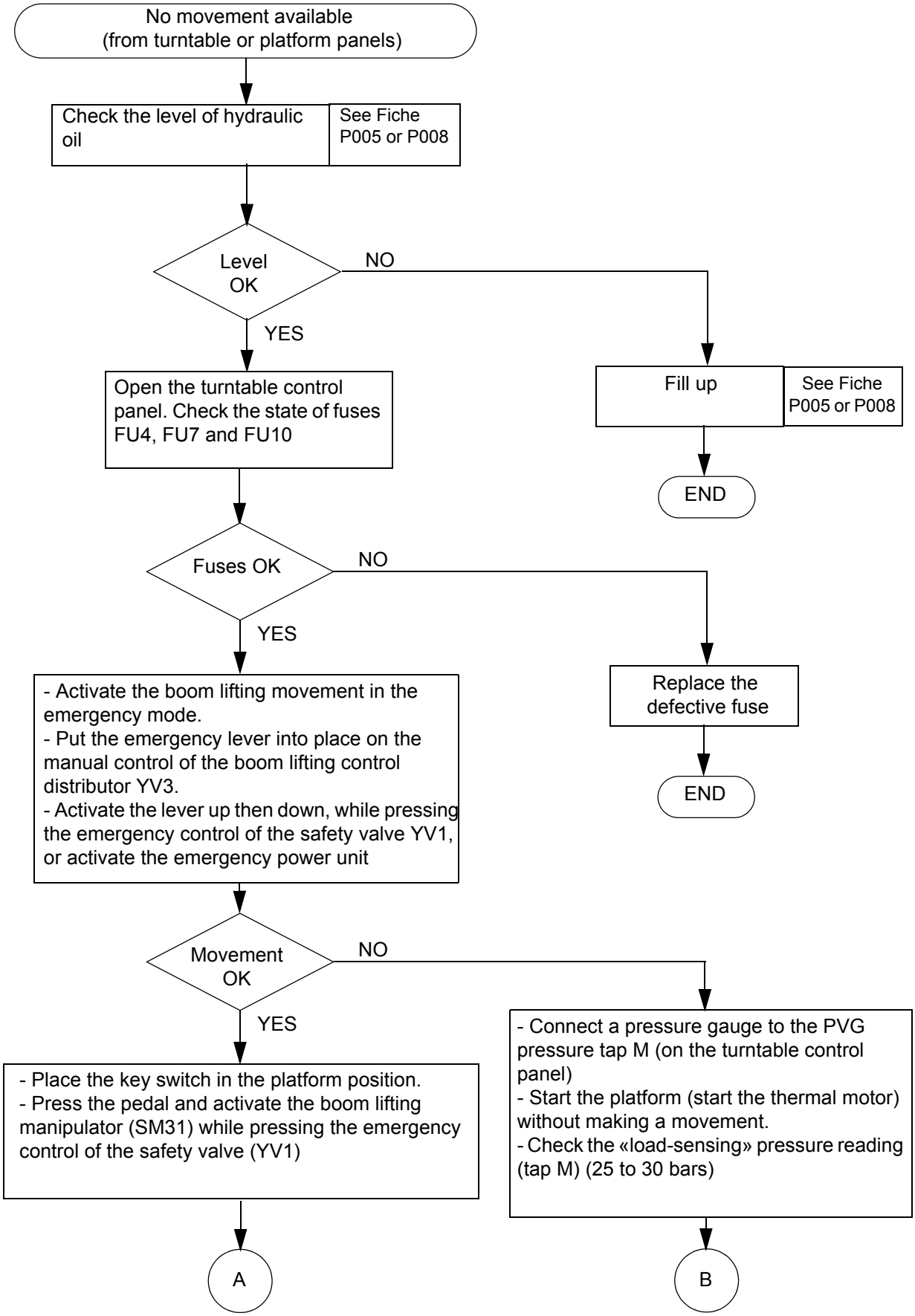
Sheet DP023	BREAKDOWN DETECTION FLOW CHART NO MOVEMENT AVAILABLE (FROM TURNTABLE OR PLATFORM CONTROL PANELS)	Folio 1/5



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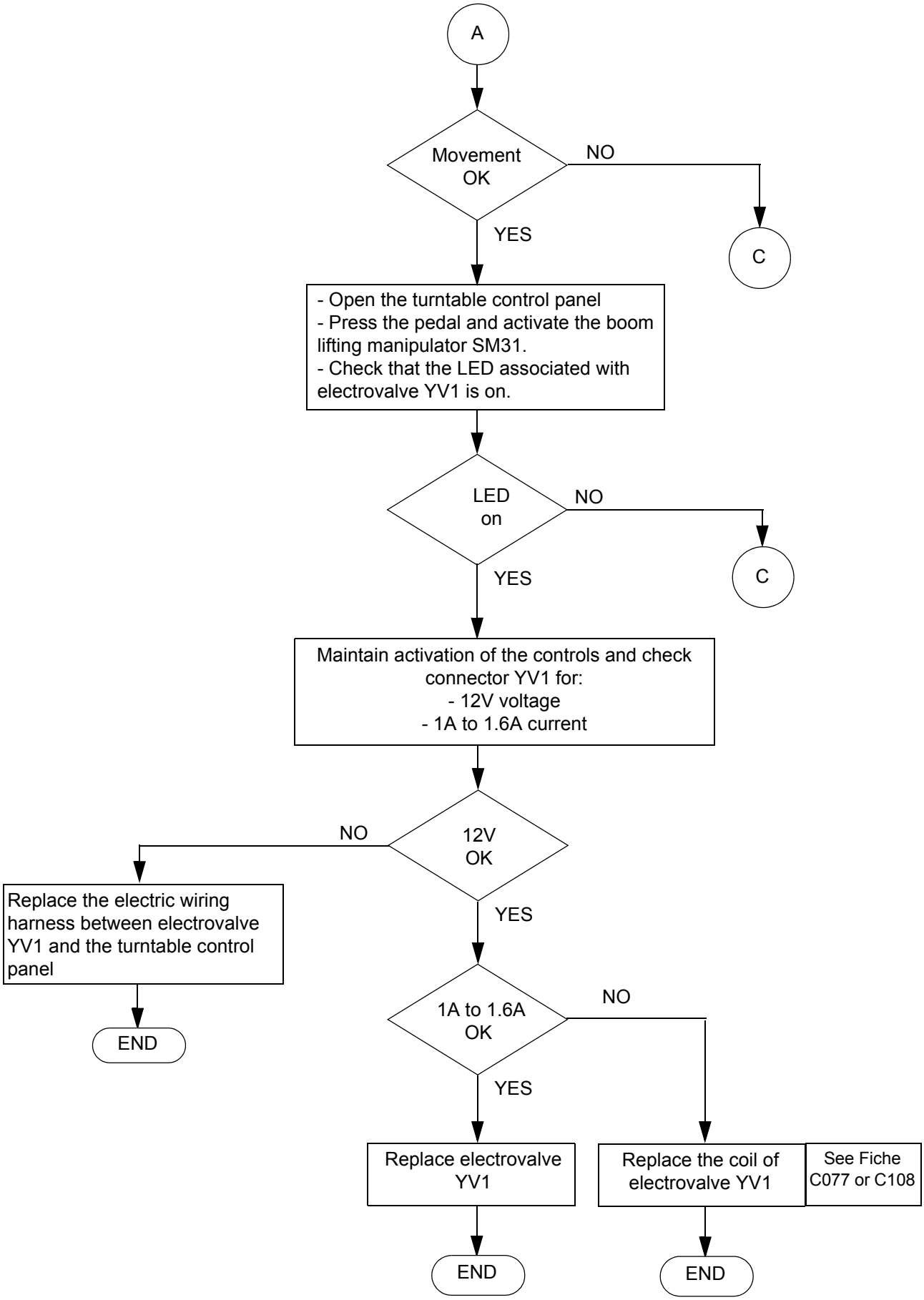
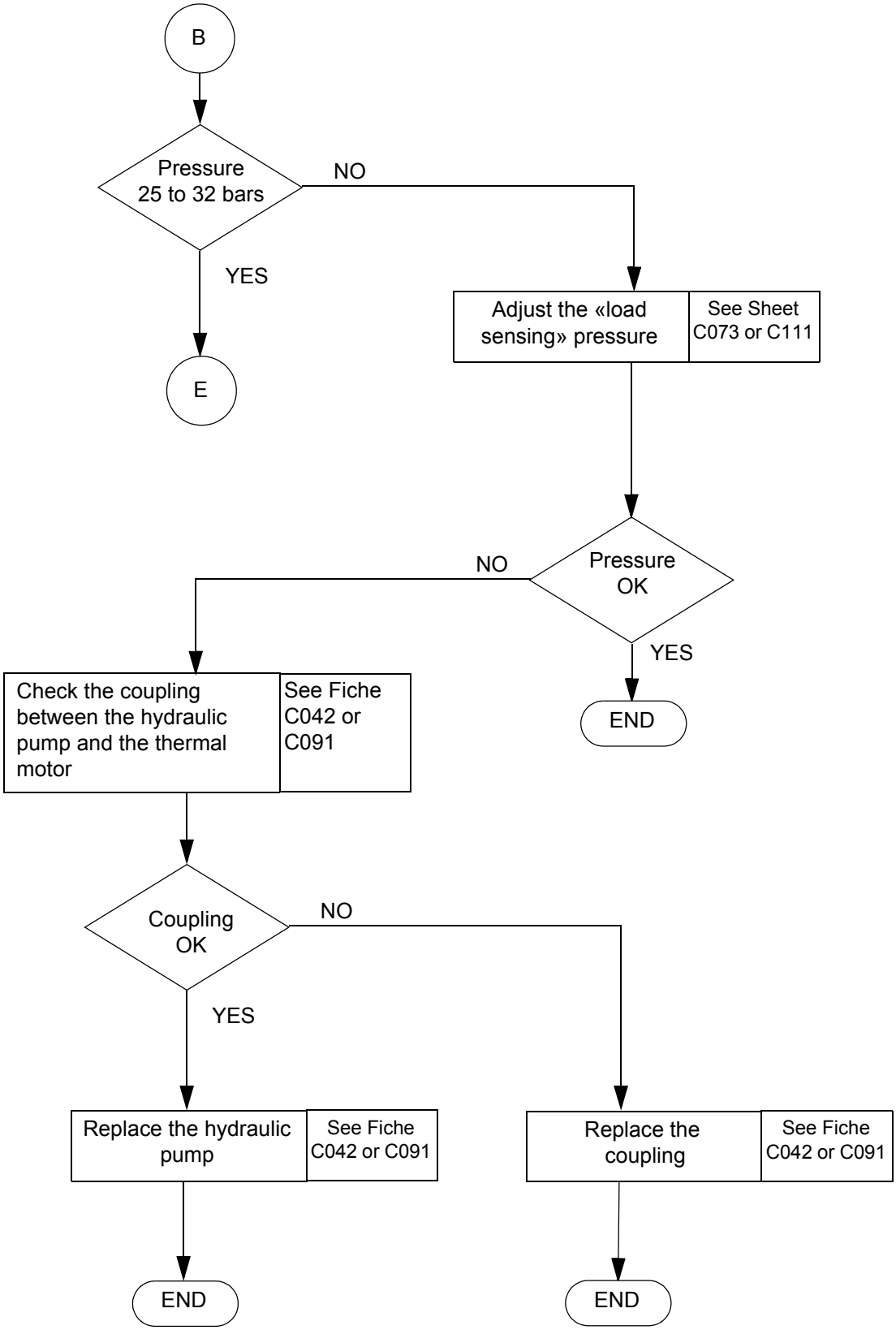
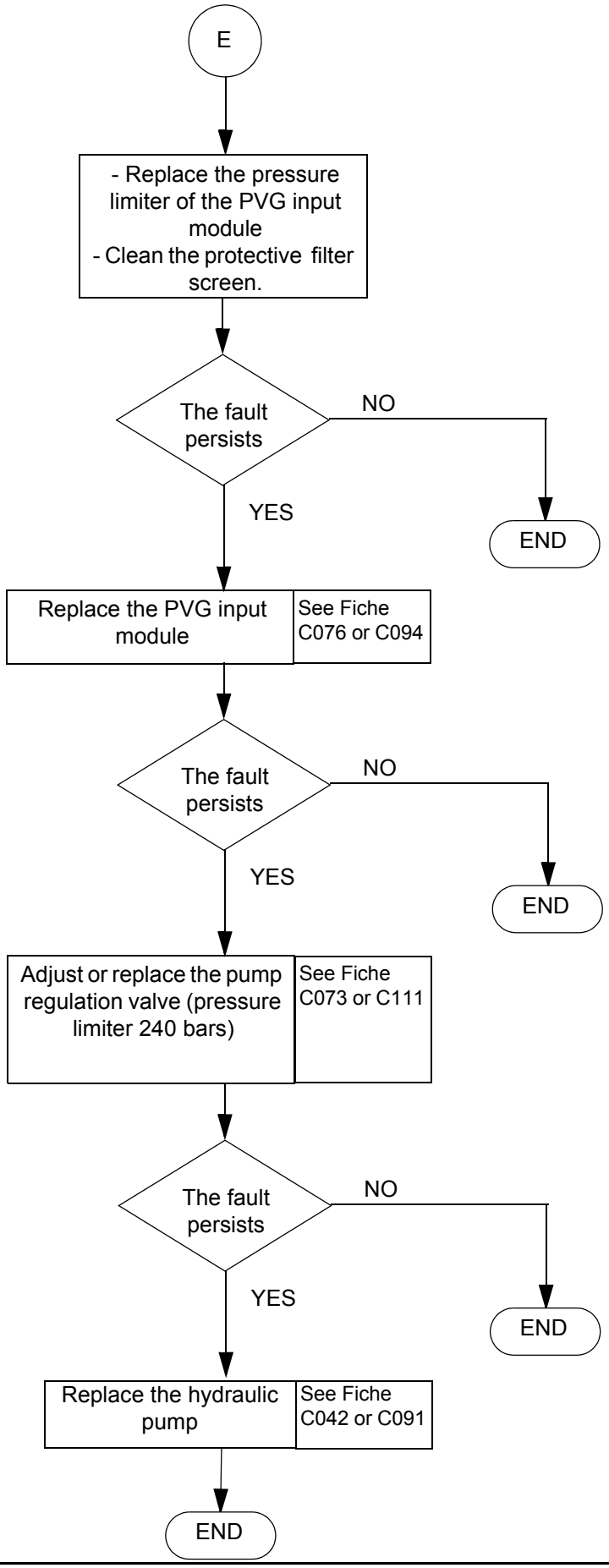
Sheet DP023	BREAKDOWN DETECTION FLOW CHART	Folio 2/5
	NO MOVEMENT AVAILABLE (FROM TURNTABLE OR PLATFORM CONTROL PANELS)	



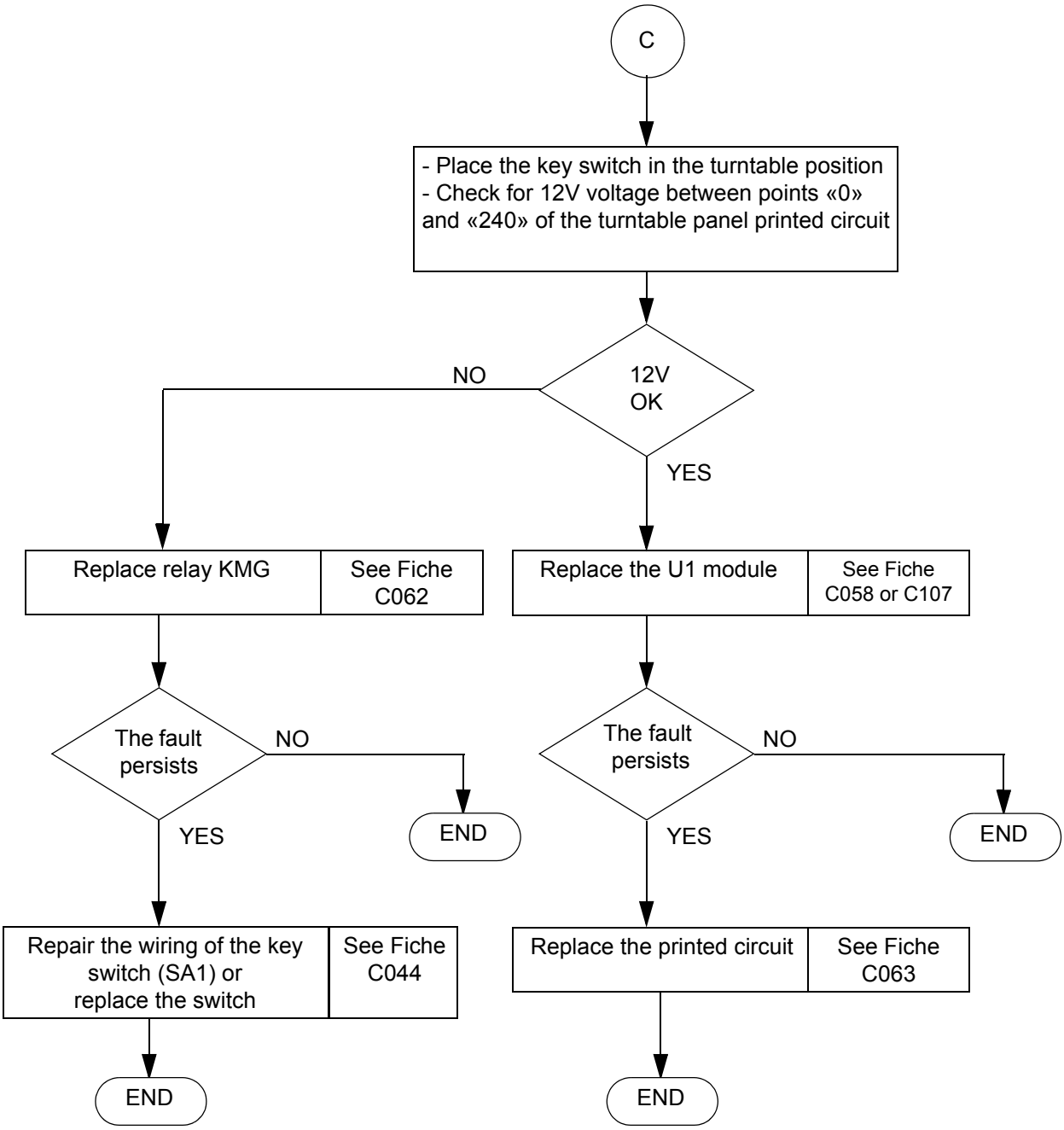
Sheet DP023	BREAKDOWN DETECTION FLOW CHART NO MOVEMENT AVAILABLE (FROM TURNTABLE OR PLATFORM CONTROL PANELS)	Folio 3/5



Sheet DP023	BREAKDOWN DETECTION FLOW CHART	Folio 4/5
	NO MOVEMENT AVAILABLE (FROM TURNTABLE OR PLATFORM CONTROL PANELS)	



Sheet DP023	BREAKDOWN DETECTION FLOW CHART NO MOVEMENT AVAILABLE (FROM TURNTABLE OR PLATFORM CONTROL PANELS)	Folio 5/5



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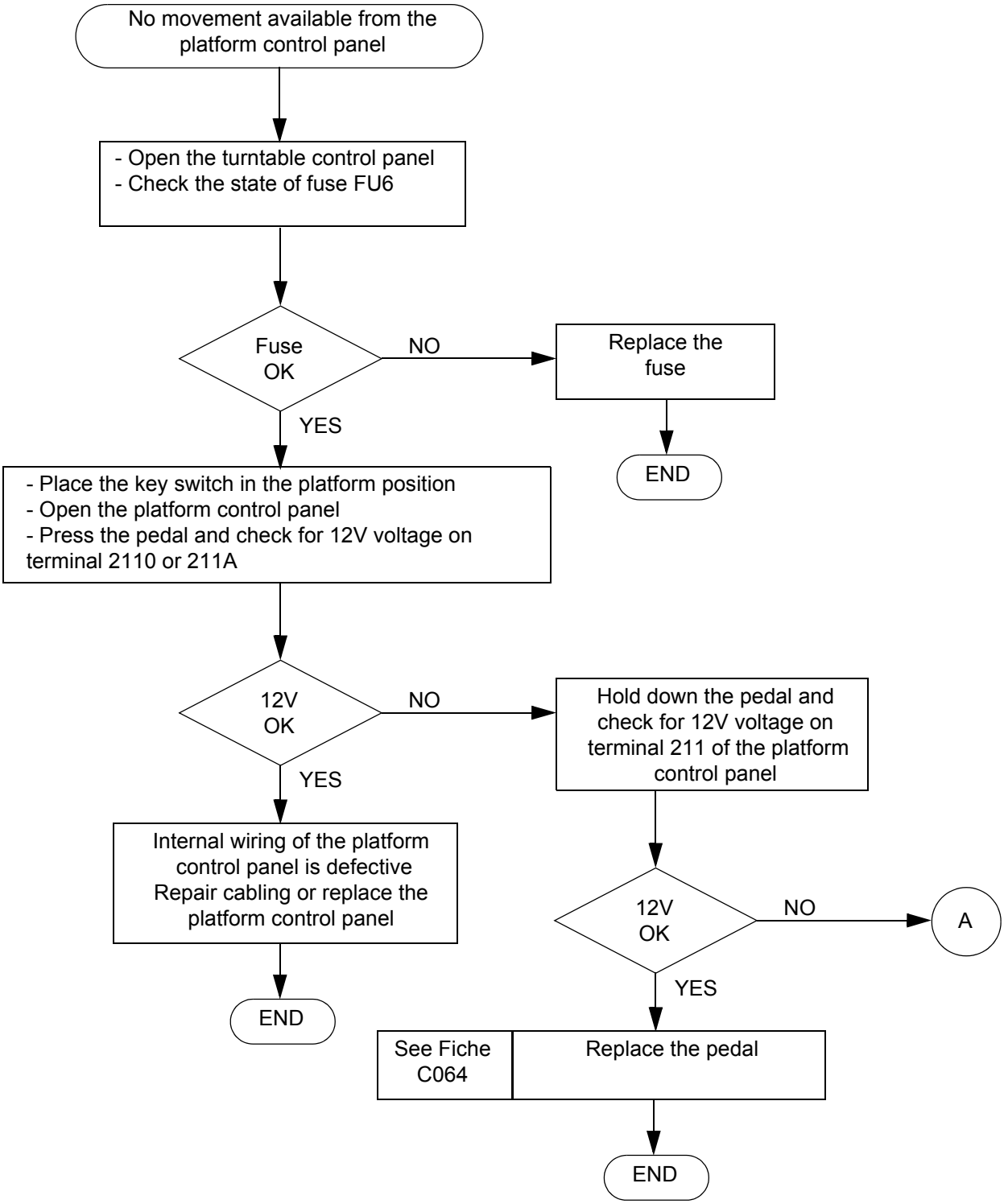
Sheet DP024	BREAKDOWN DETECTION FLOW CHART NO MOVEMENT AVAILABLE FROM THE PLATFORM CONTROL PANEL	Folio 1/2



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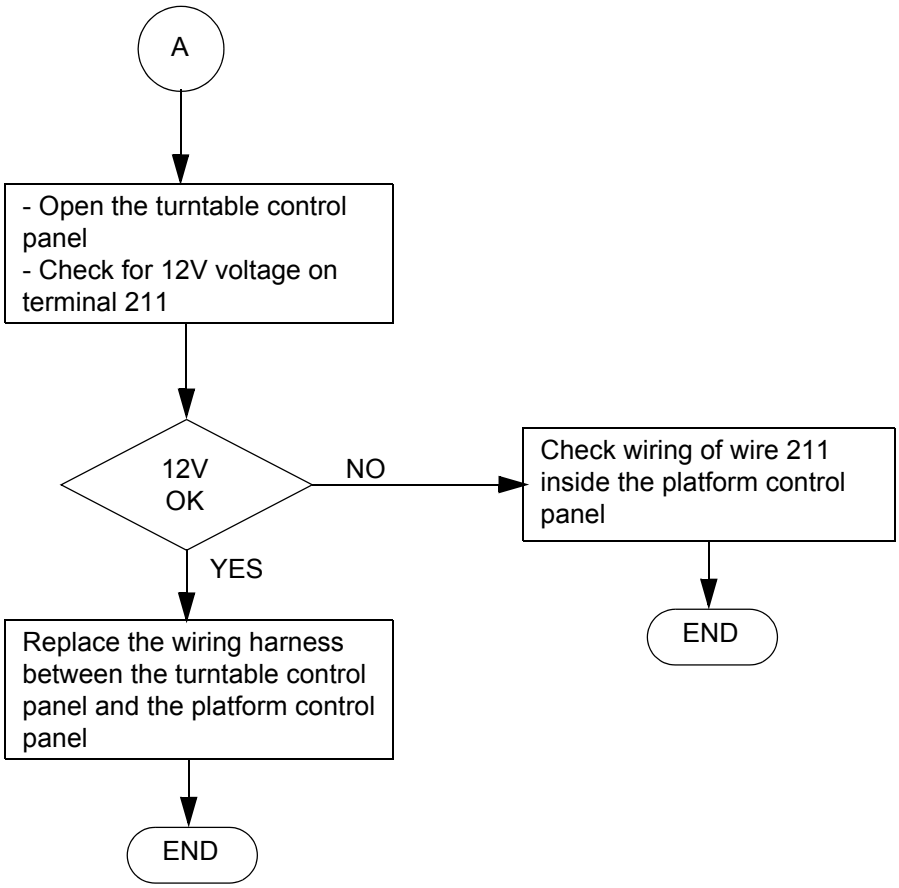
Sheet DP024	BREAKDOWN DETECTION FLOW CHART NO MOVEMENT AVAILABLE FROM THE PLATFORM CONTROL PANEL	Folio 2/2



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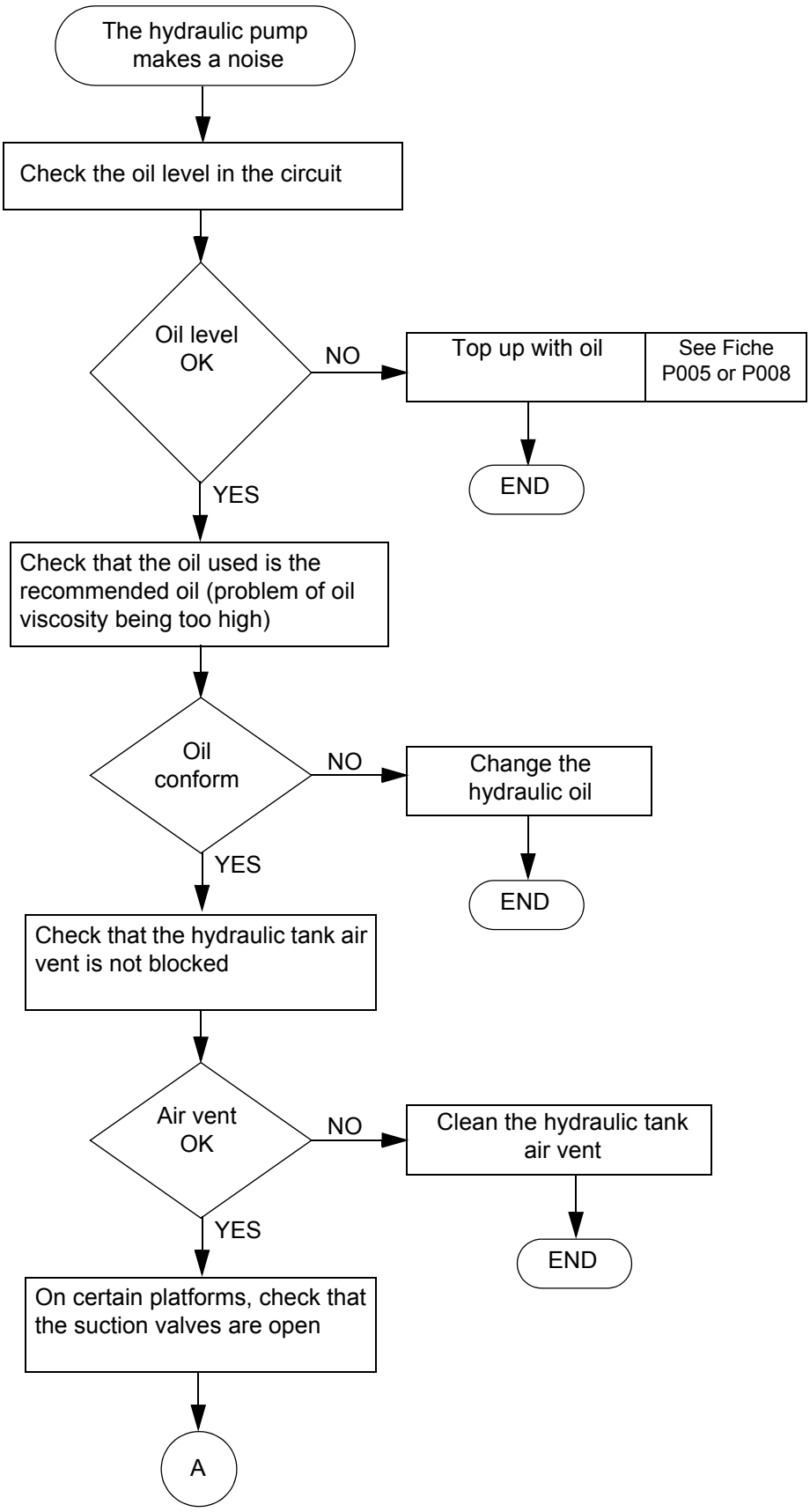
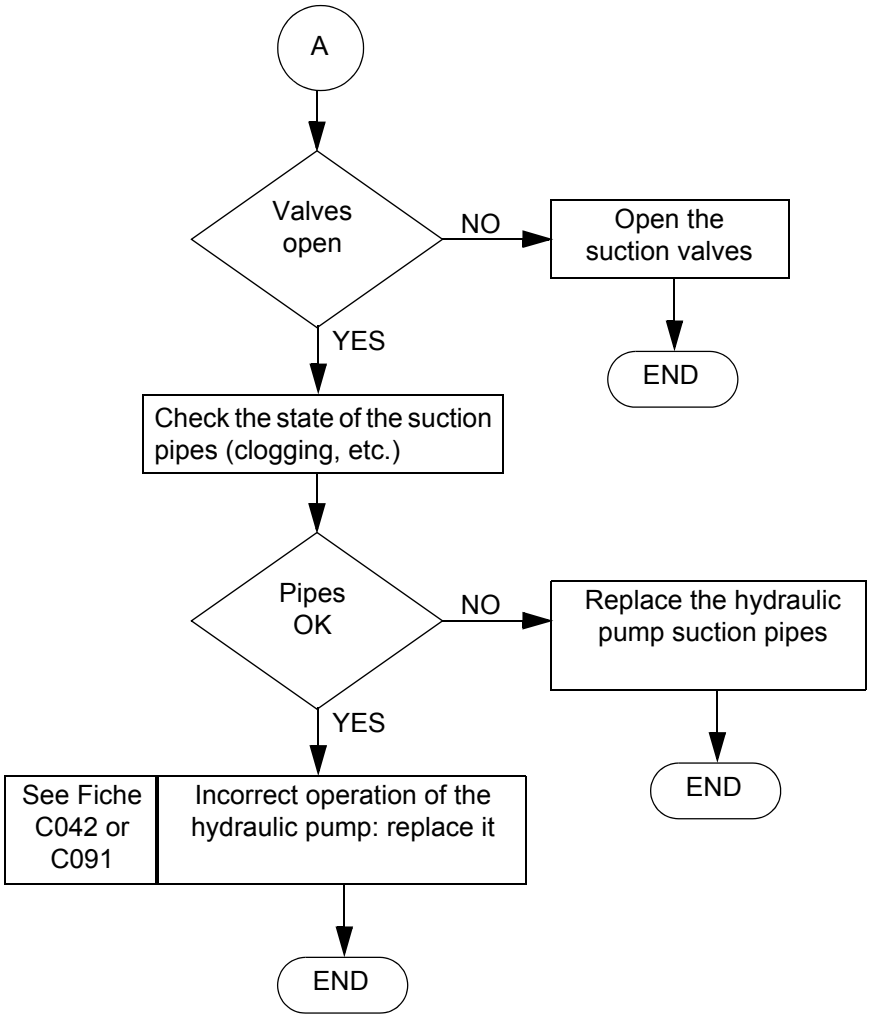
Sheet DP025	BREAKDOWN DETECTION FLOW CHART NOISY HYDRAULIC PUMP	Folio 1/2



Sheet DP025	BREAKDOWN DETECTION FLOW CHART NOISY HYDRAULIC PUMP	Folio 2/2



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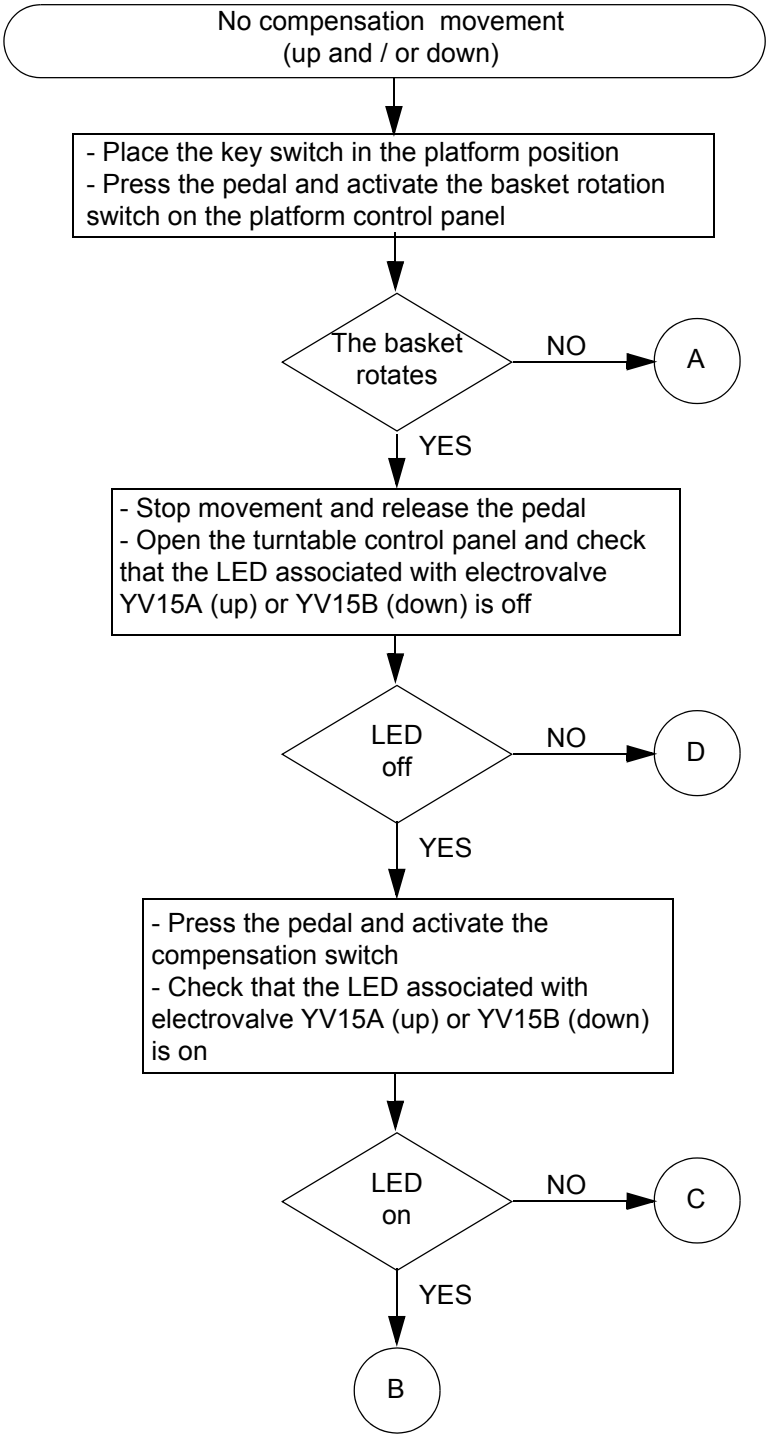
Sheet DP026	BREAKDOWN DETECTION FLOW CHART	Folio 1/5
	NO COMPENSATION MOVEMENT (UP AND / OR DOWN)	



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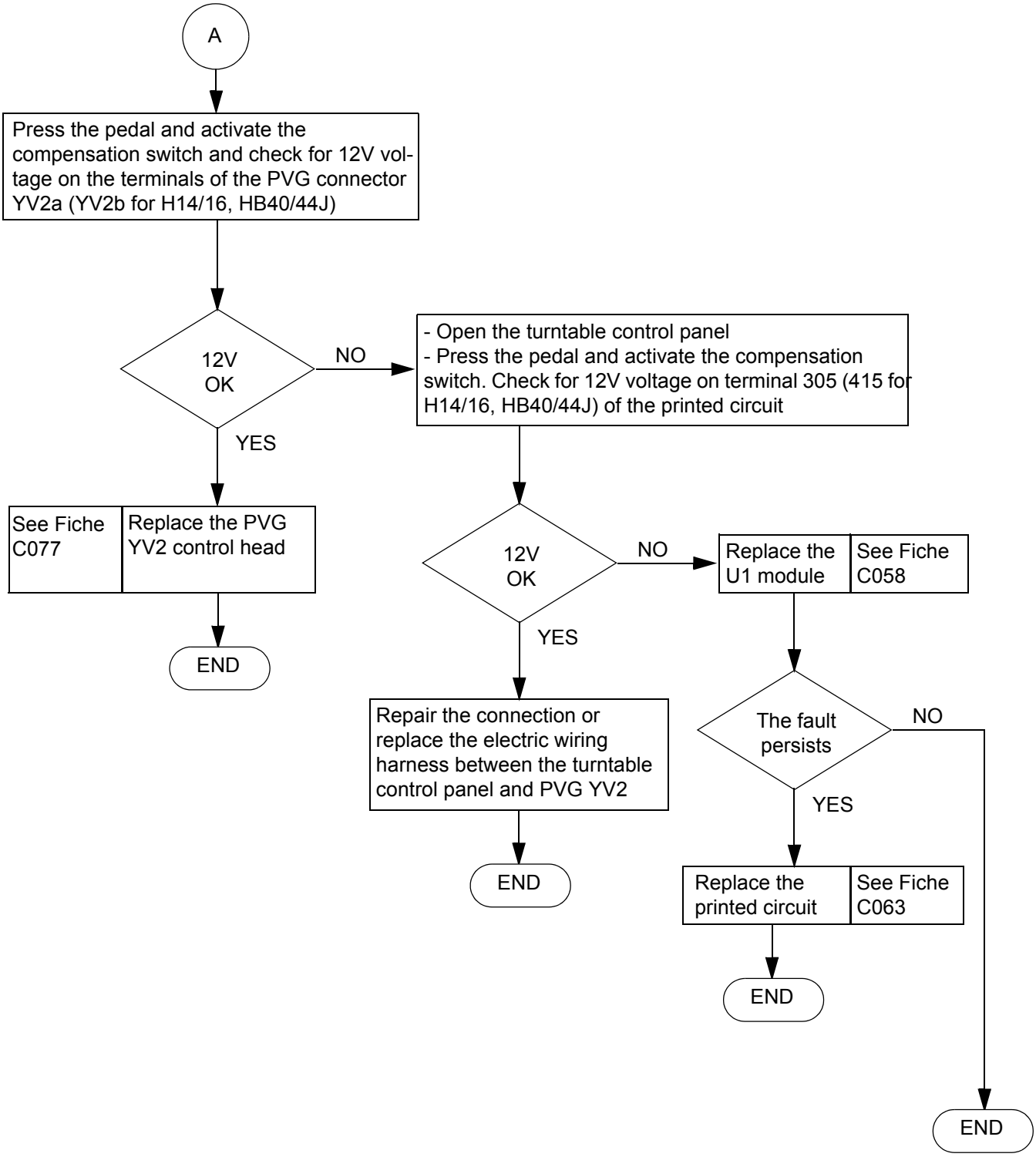
Sheet DP026	BREAKDOWN DETECTION FLOW CHART NO COMPENSATION MOVEMENT (UP AND / OR DOWN)	Folio 2/5



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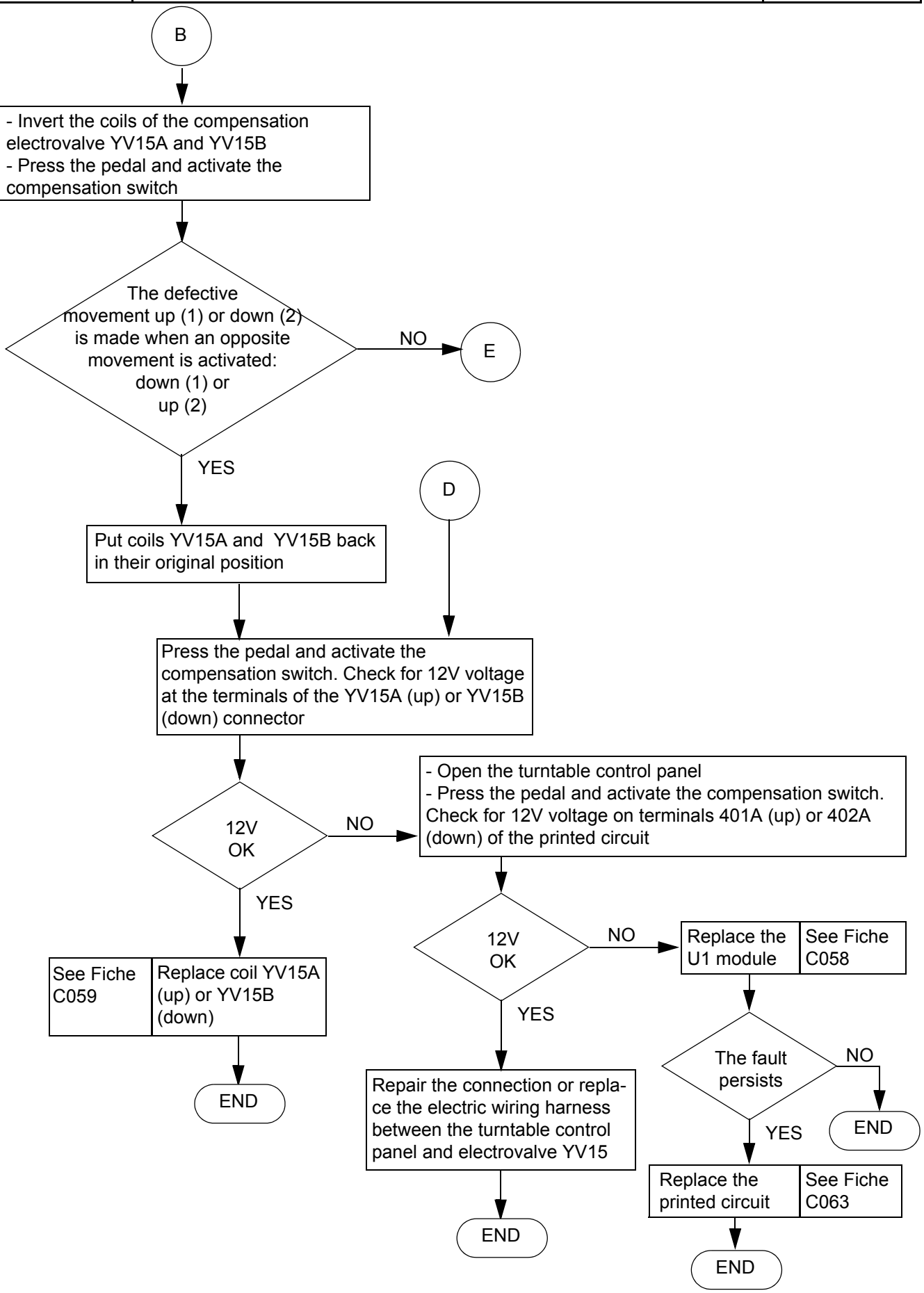
Sheet DP026	BREAKDOWN DETECTION FLOW CHART NO COMPENSATION MOVEMENT (UP AND / OR DOWN)	Folio 3/5



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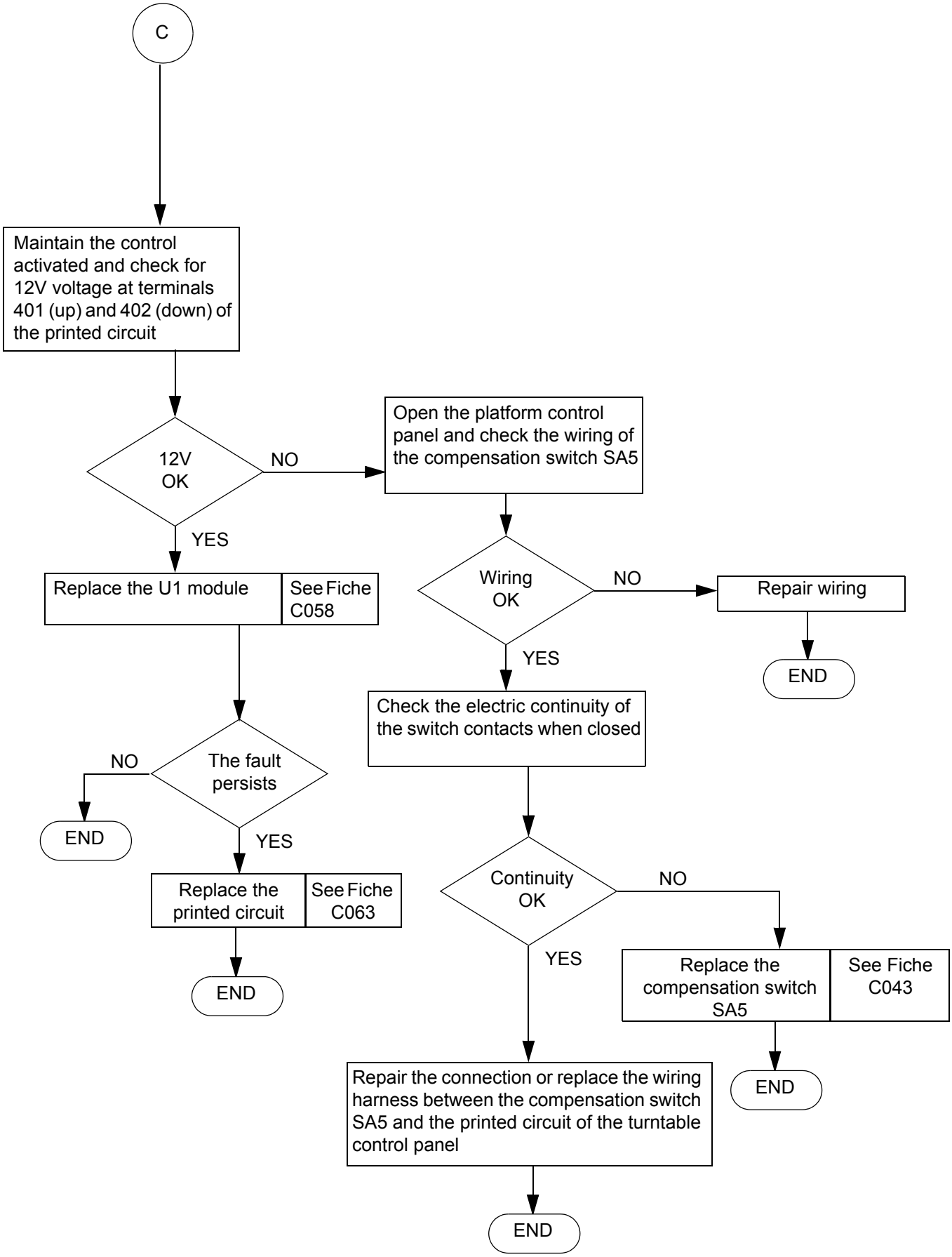
Sheet DP026	BREAKDOWN DETECTION FLOW CHART NO COMPENSATION MOVEMENT (UP AND / OR DOWN)	Folio 4/5



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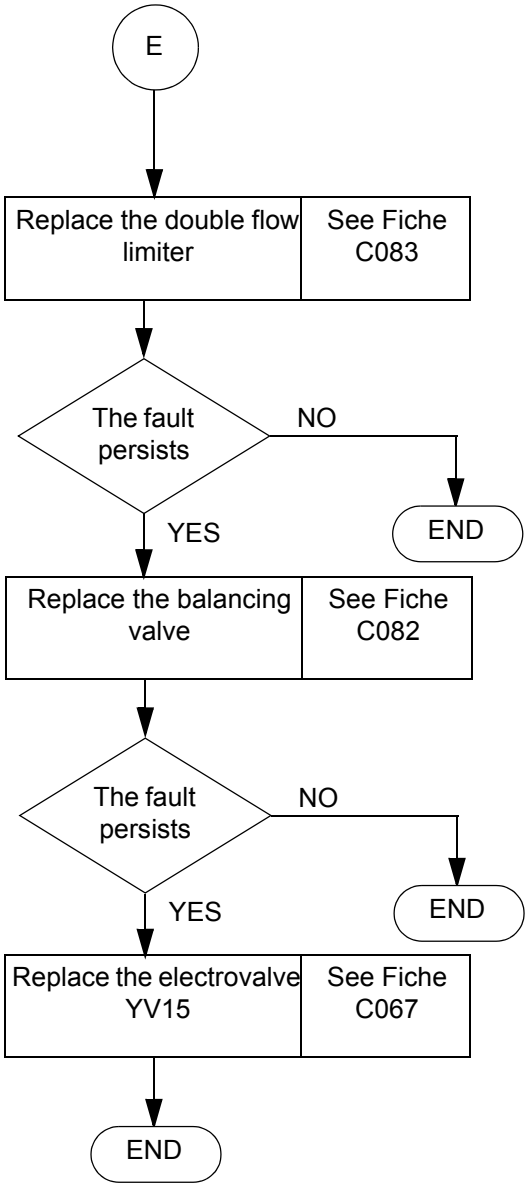
Sheet DP026	BREAKDOWN DETECTION FLOW CHART	Folio 5/5
	NO COMPENSATION MOVEMENT (UP AND / OR DOWN)	



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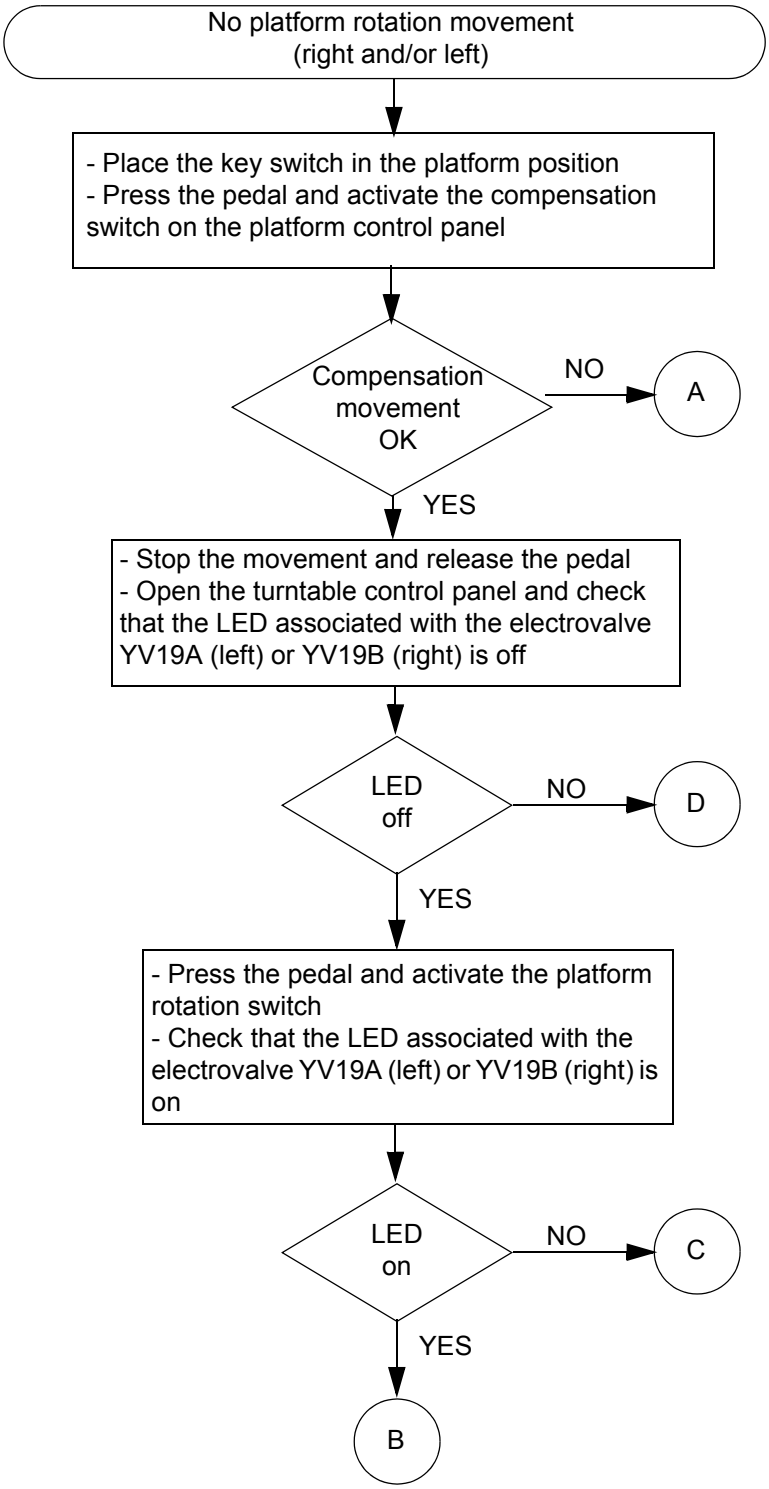
Sheet DP027	BREAKDOWN DETECTION FLOW CHART NO PLATFORM ROTATION MOVEMENT (RIGHT AND / OR LEFT)	Folio 1/5



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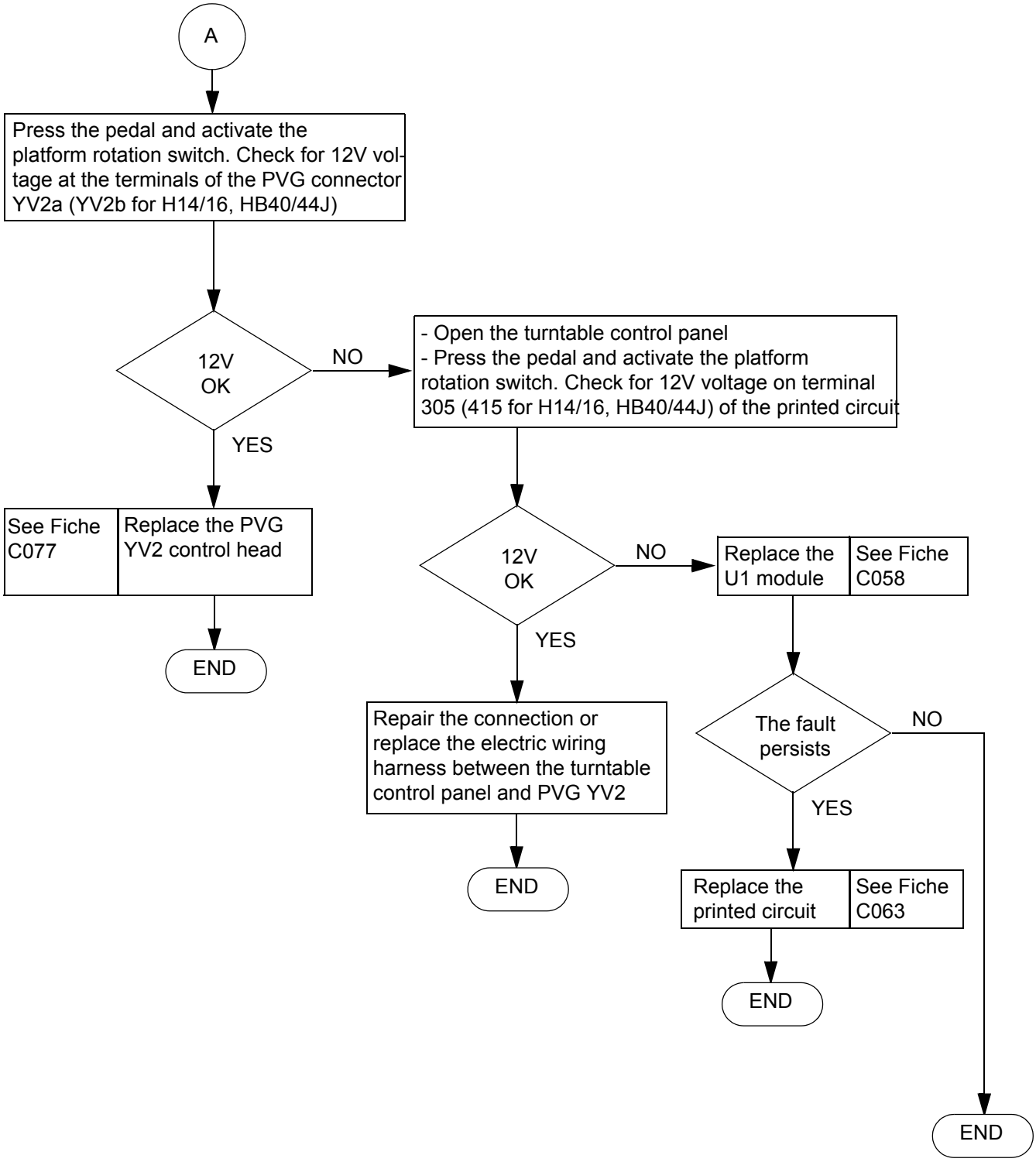
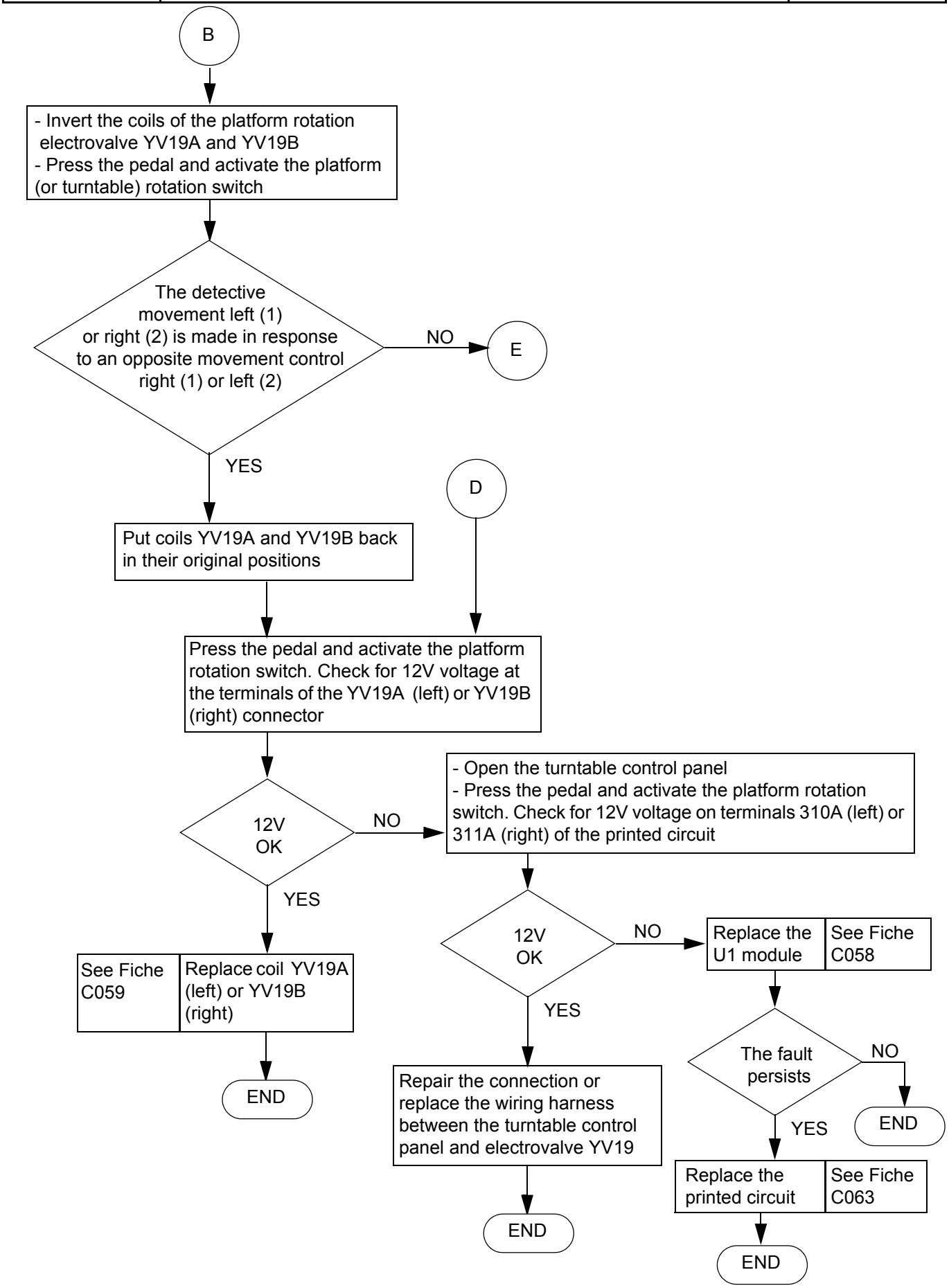
Sheet DP027	BREAKDOWN DETECTION FLOW CHART	Folio 2/5
	NO PLATFORM ROTATION MOVEMENT (RIGHT AND / OR LEFT)	



Sheet DP027	BREAKDOWN DETECTION FLOW CHART NO PLATFORM ROTATION MOVEMENT (RIGHT AND / OR LEFT)	Folio 3/5



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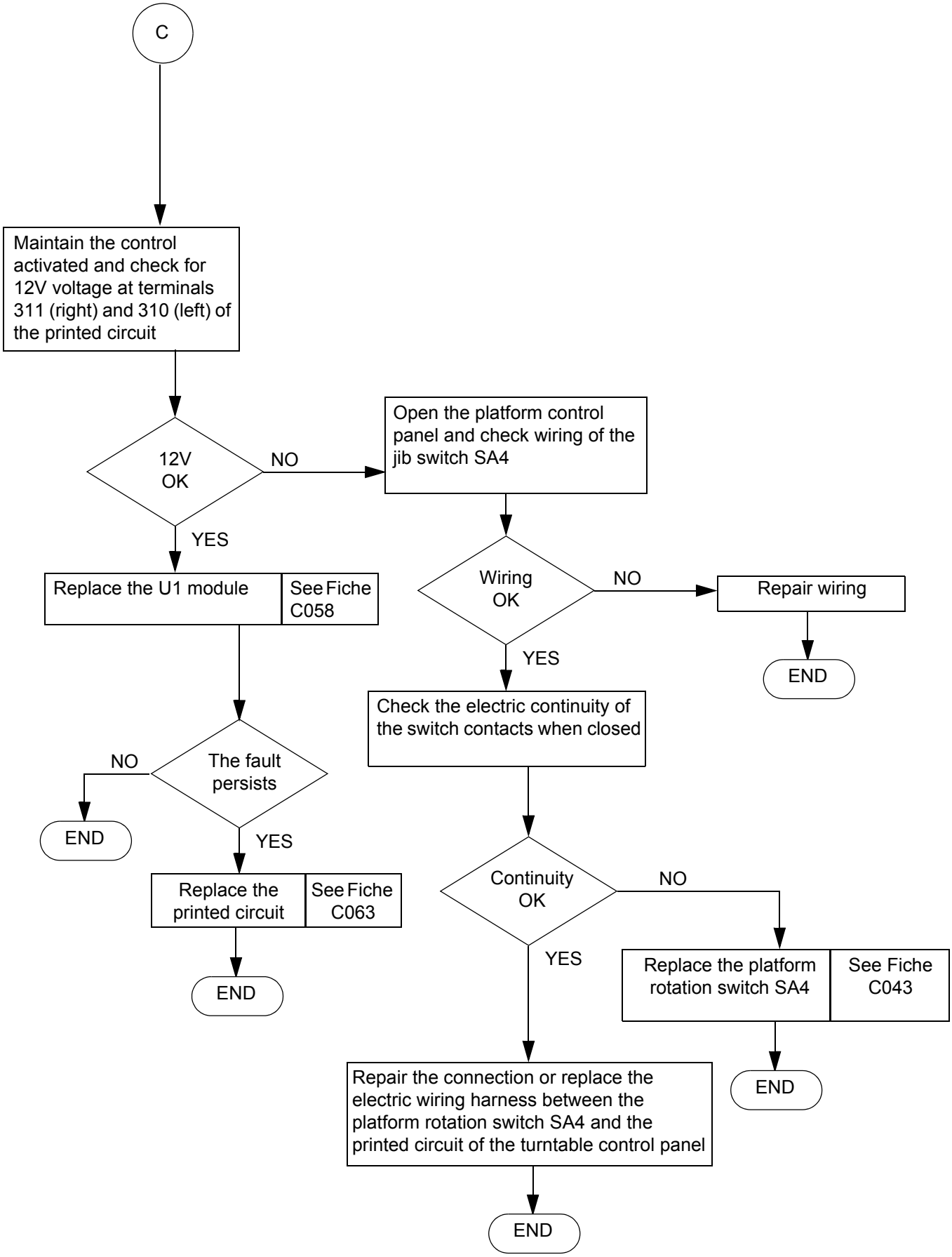
Sheet DP027	BREAKDOWN DETECTION FLOW CHART NO PLATFORM ROTATION MOVEMENT (RIGHT AND / OR LEFT)	Folio 4/5



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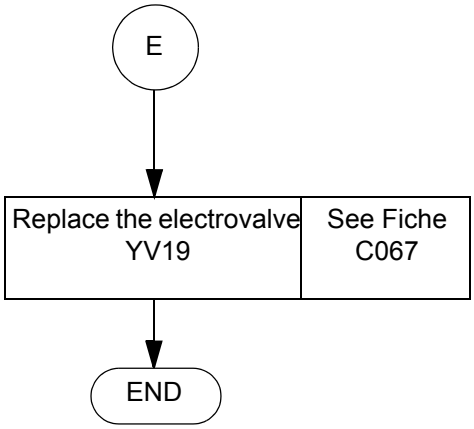
Sheet DP027	BREAKDOWN DETECTION FLOW CHART	Folio 5/5
	NO PLATFORM ROTATION MOVEMENT (RIGHT AND / OR LEFT)	



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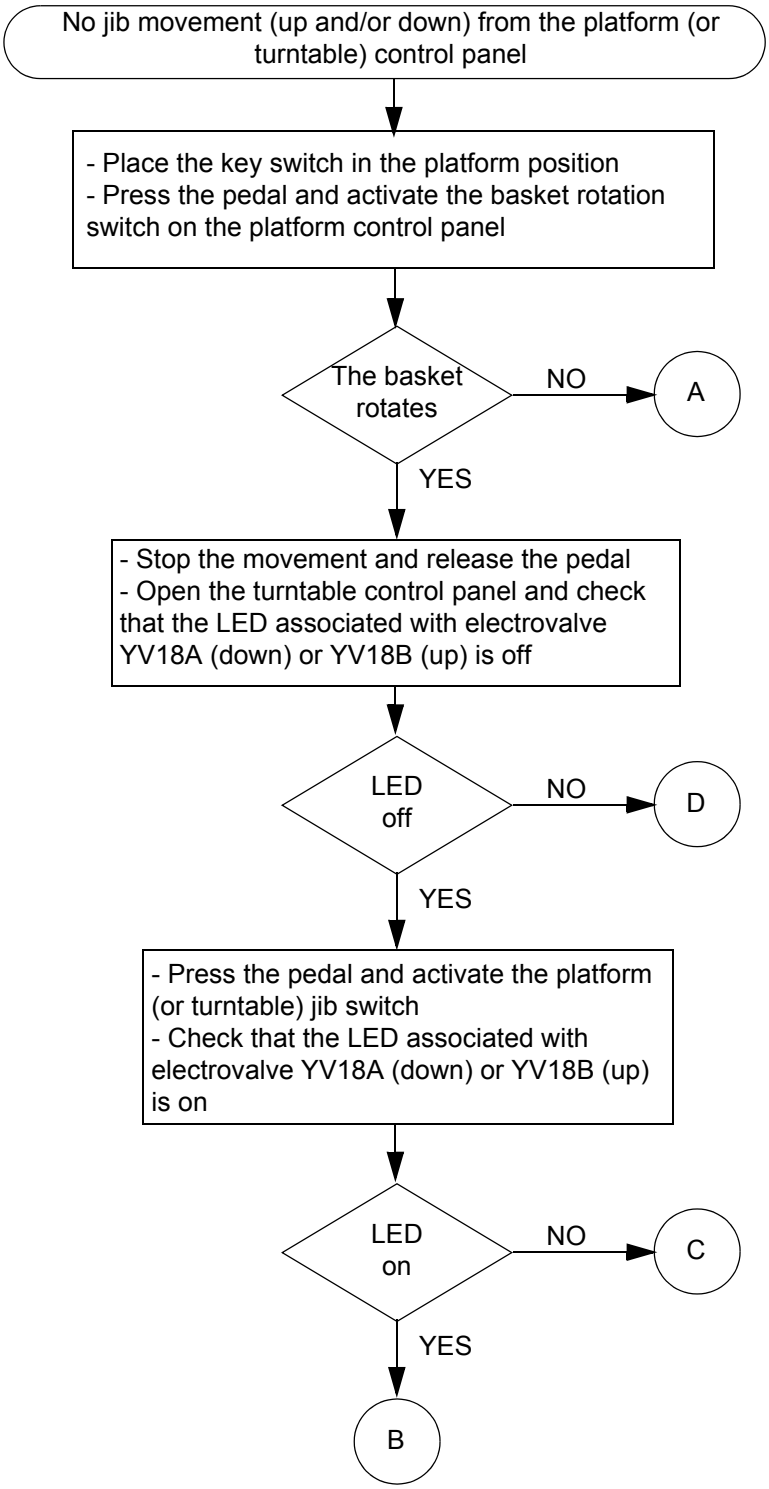
Sheet DP028	BREAKDOWN DETECTION FLOW CHART NO JIB MOVEMENT (UP AND / OR DOWN) FROM THE PLATFORM (OR TURNTABLE) CONTROL PANEL	Folio 1/5



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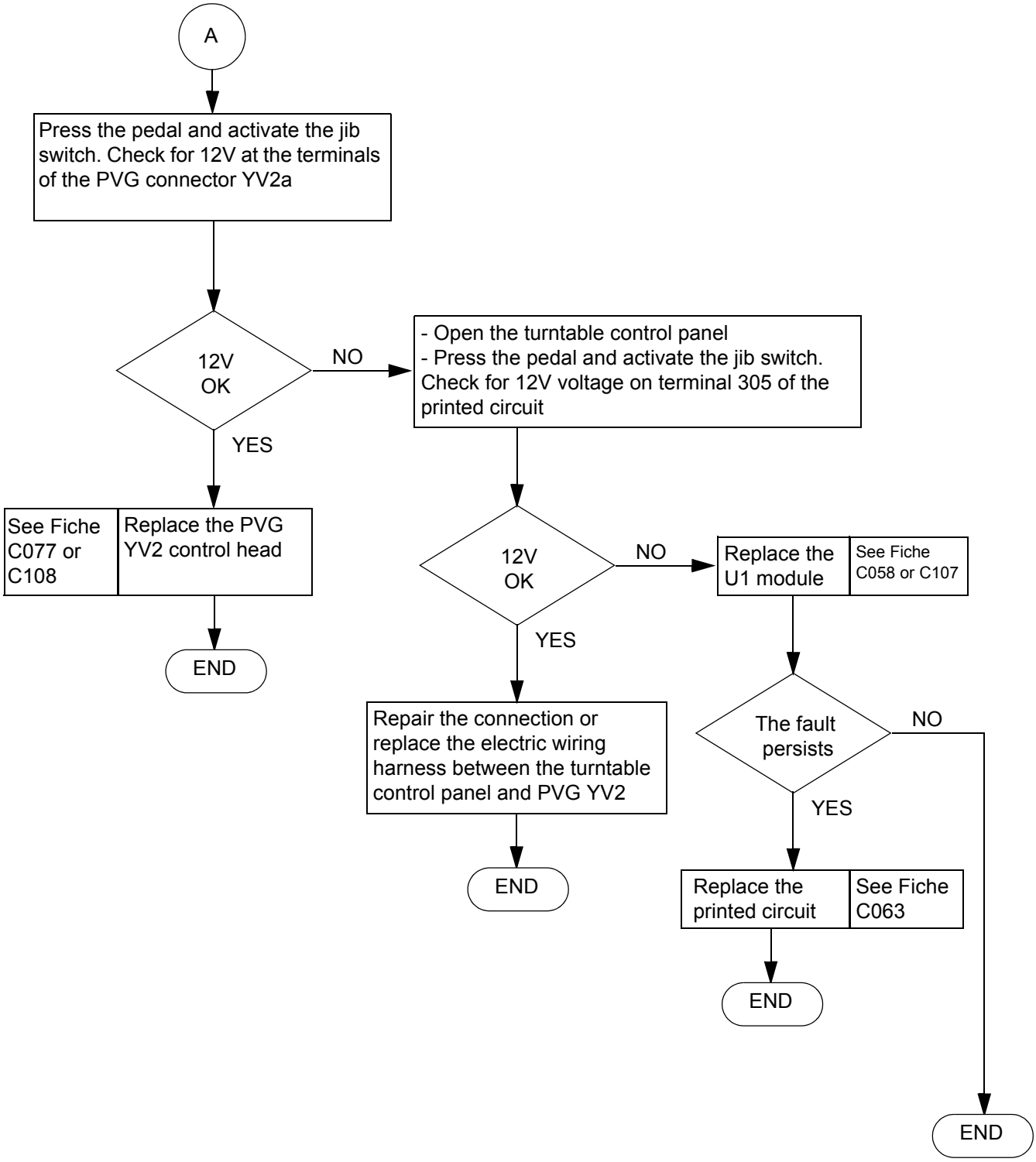
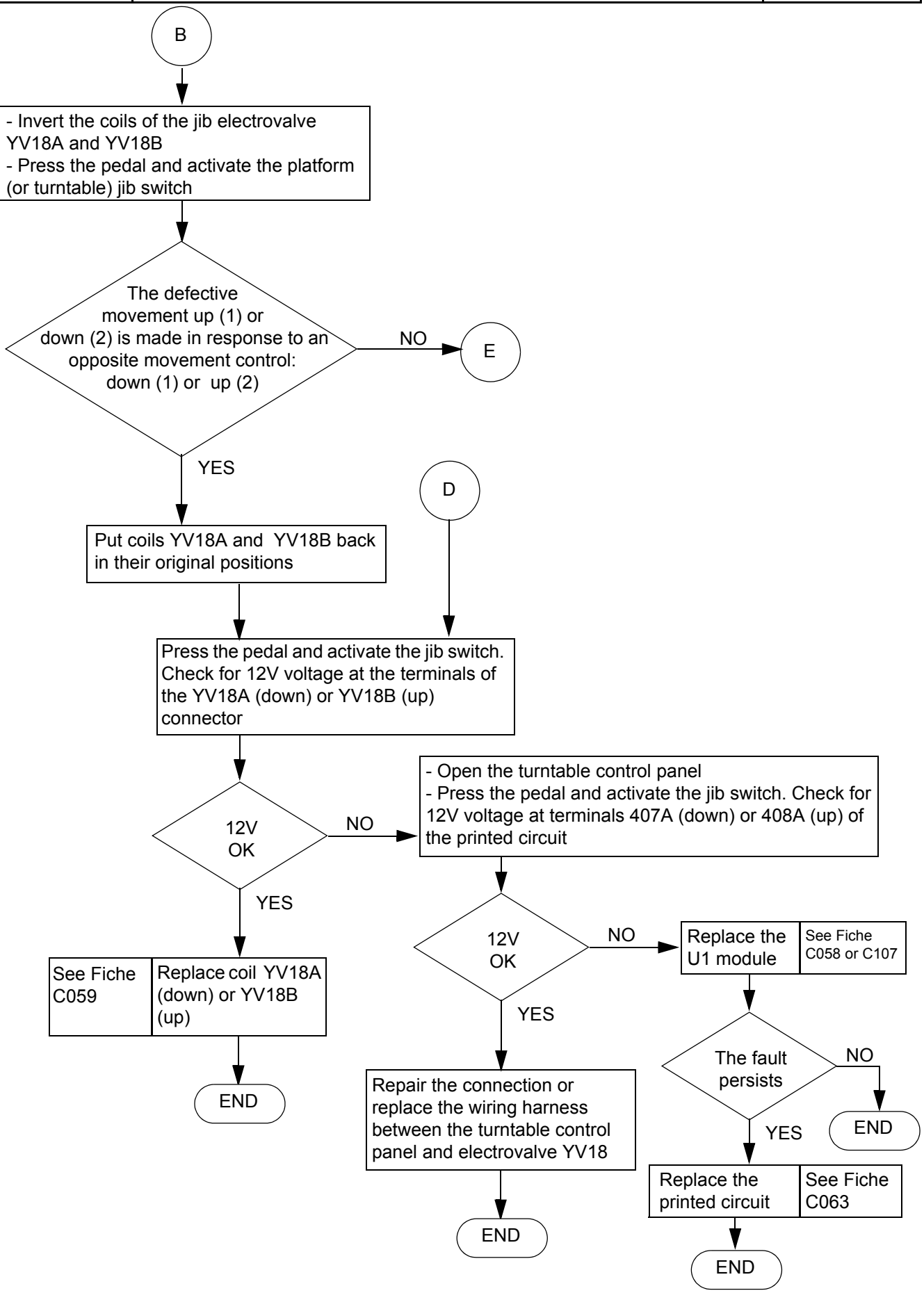
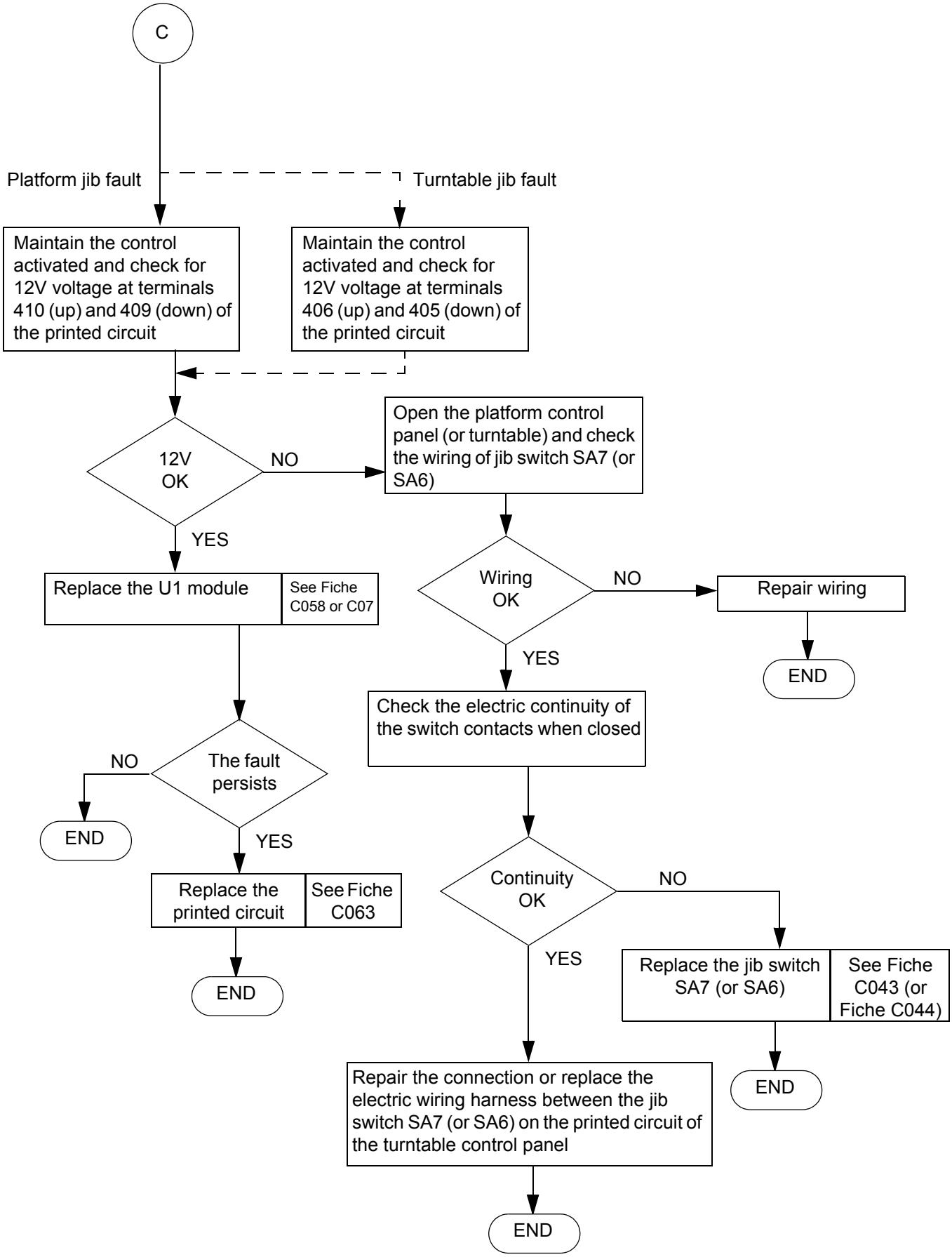
Sheet DP028	BREAKDOWN DETECTION FLOW CHART NO JIB MOVEMENT (UP AND / OR DOWN) FROM THE PLATFORM (OR TURNTABLE) CONTROL PANEL	Folio 2/5



Sheet DP028	BREAKDOWN DETECTION FLOW CHART NO JIB MOVEMENT (UP AND / OR DOWN) FROM THE PLATFORM (OR TURNTABLE) CONTROL PANEL	Folio 3/5



Sheet DP028	BREAKDOWN DETECTION FLOW CHART NO JIB MOVEMENT (UP AND / OR DOWN) FROM THE PLATFORM (OR TURNTABLE) CONTROL PANEL	Folio 4/5



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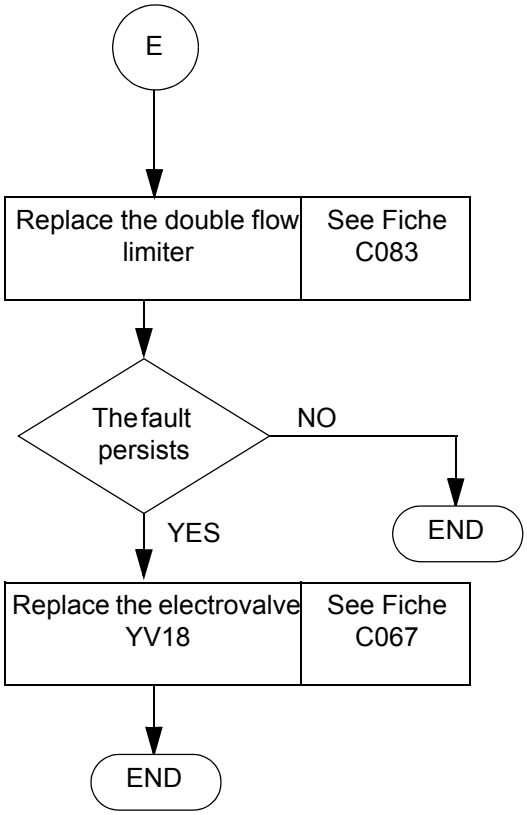
Sheet DP028	BREAKDOWN DETECTION FLOW CHART NO JIB MOVEMENT (UP AND / OR DOWN) FROM THE PLATFORM (OR TURNTABLE) CONTROL PANEL	Folio 5/5



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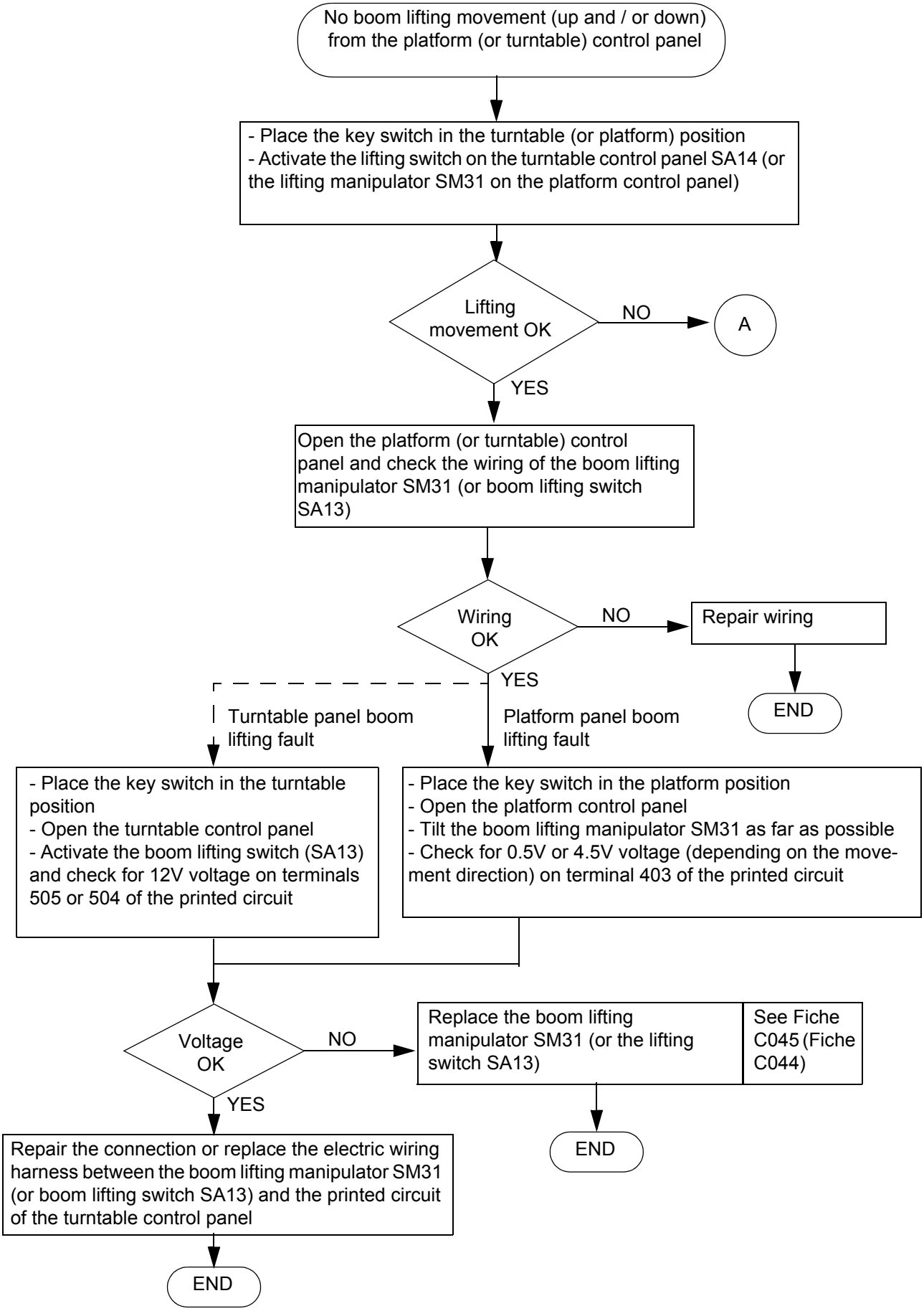
Sheet DP030	BREAKDOWN DETECTION FLOW CHART NO BOOM LIFTING MOVEMENT (UP AND / OR DOWN) FROM THE PLATFORM (OR TURNTABLE) CONTROL PANEL	Folio 1/3



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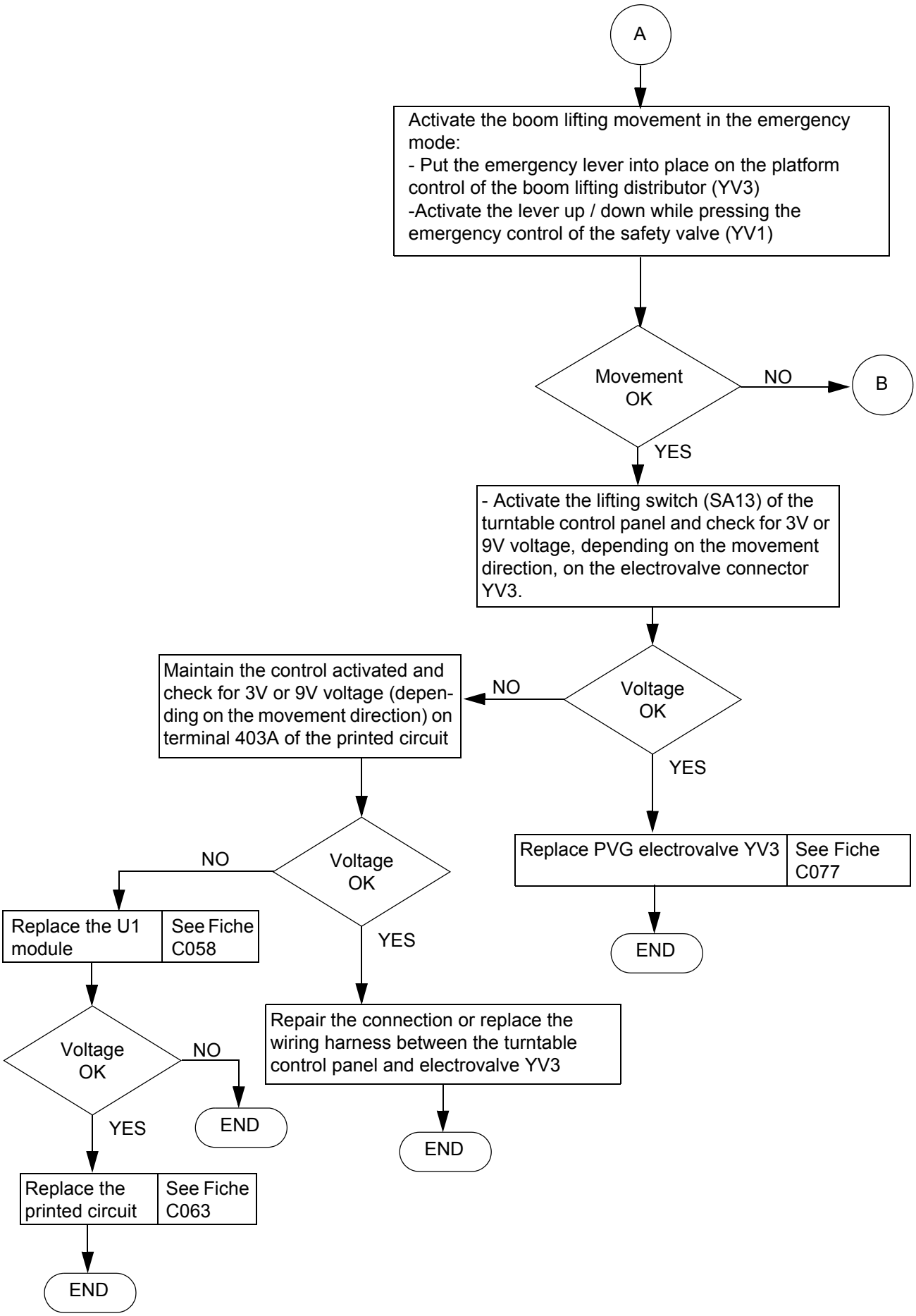
Sheet DP030	BREAKDOWN DETECTION FLOW CHART NO BOOM LIFTING MOVEMENT (UP AND / OR DOWN) FROM THE PLATFORM (OR TURNTABLE) CONTROL PANEL	Folio 2/3



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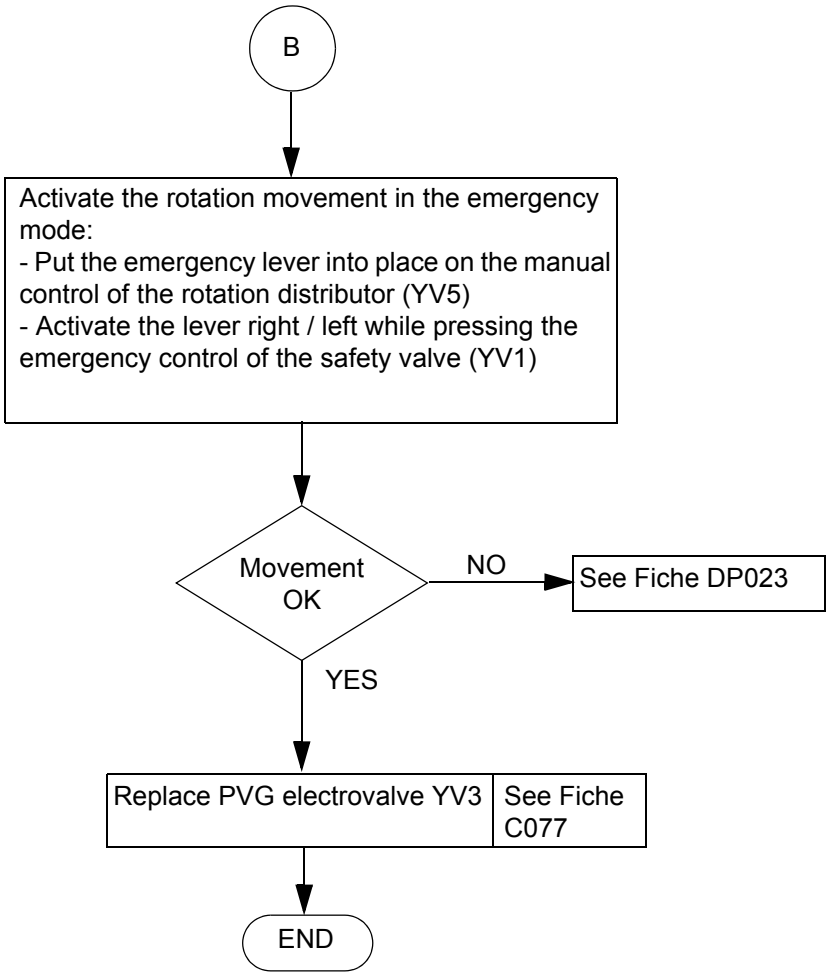
Sheet DP030	BREAKDOWN DETECTION FLOW CHART NO BOOM LIFTING MOVEMENT (UP AND / OR DOWN) FROM THE PLATFORM (OR TURNTABLE) CONTROL PANEL	Folio 3/3



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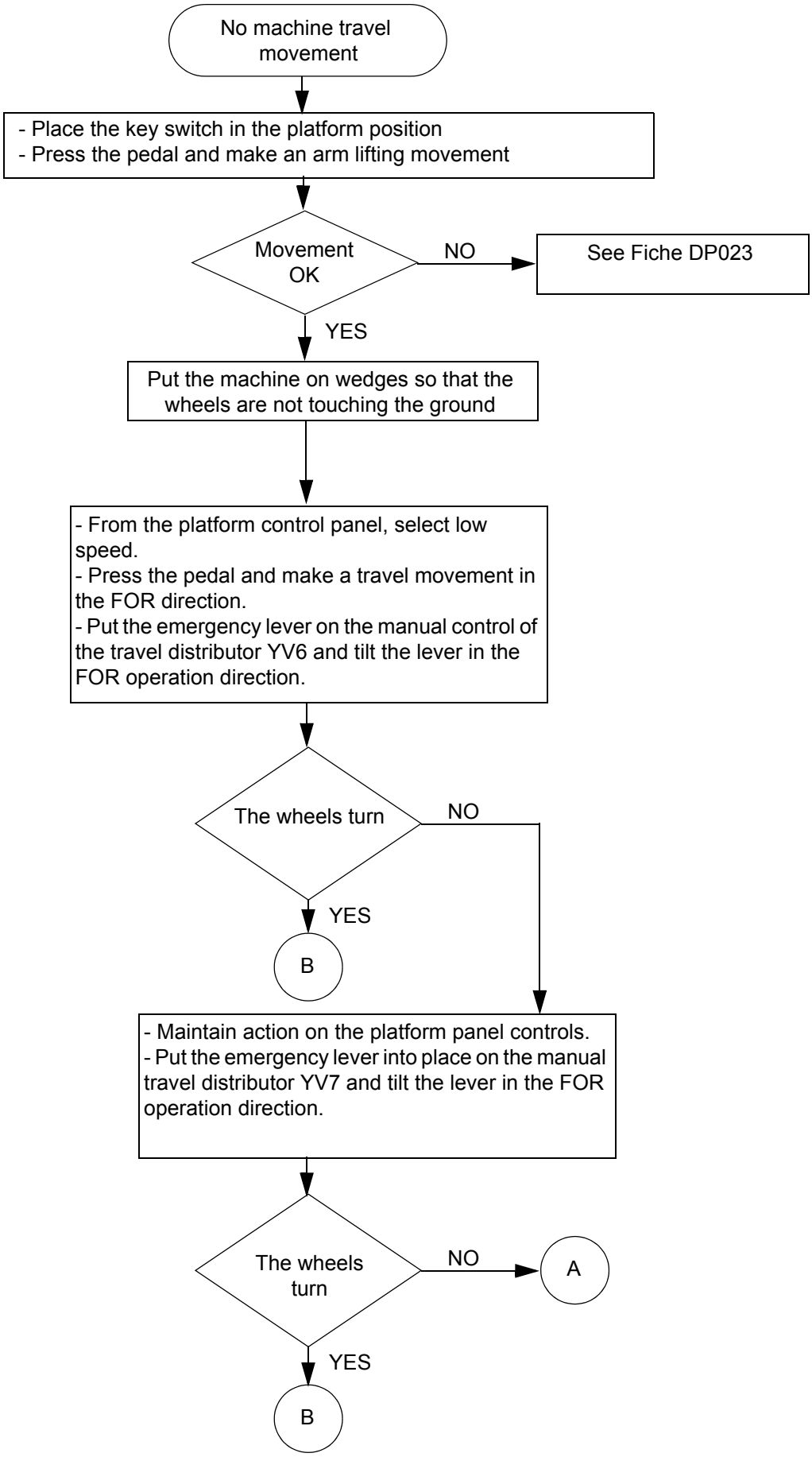
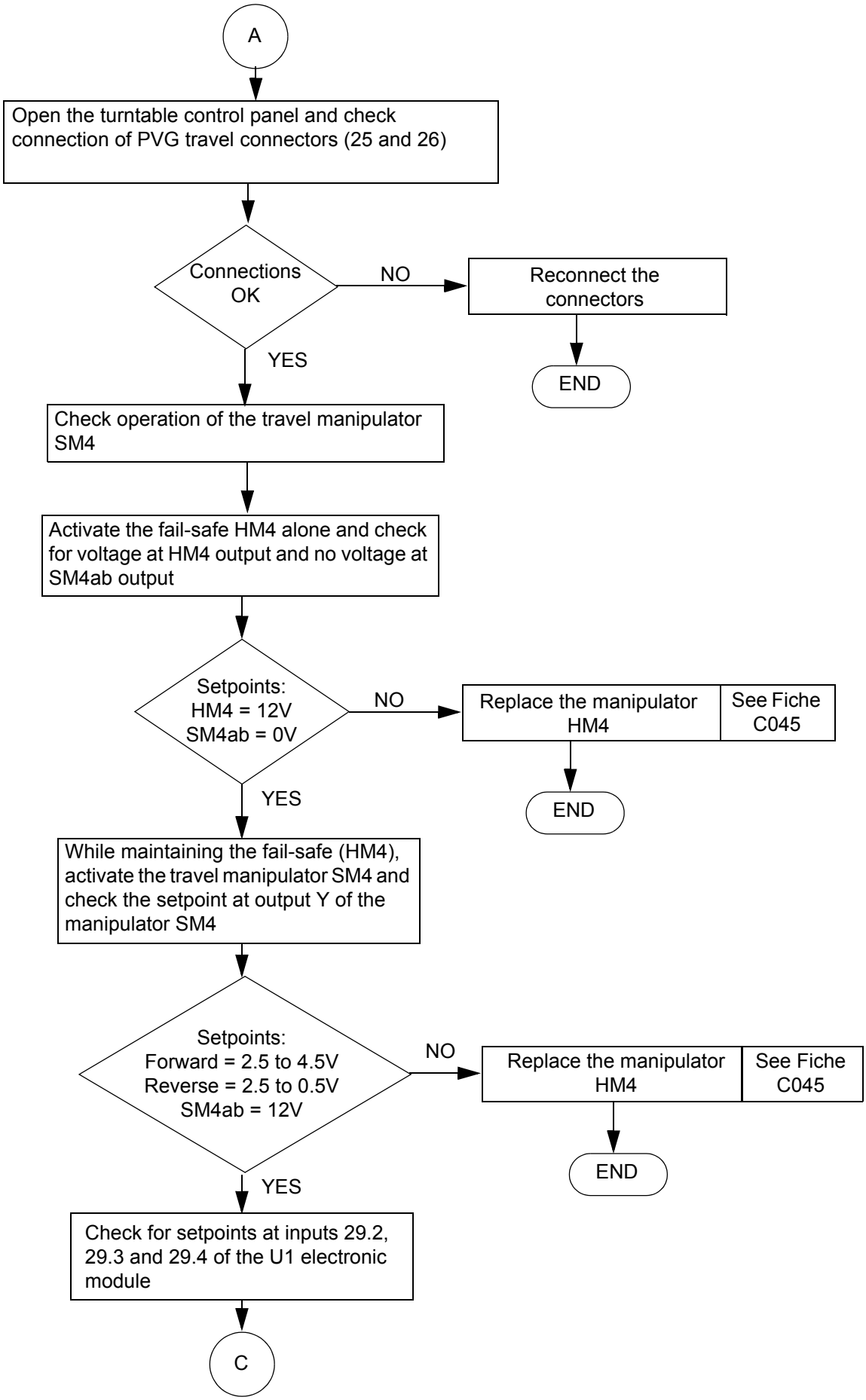
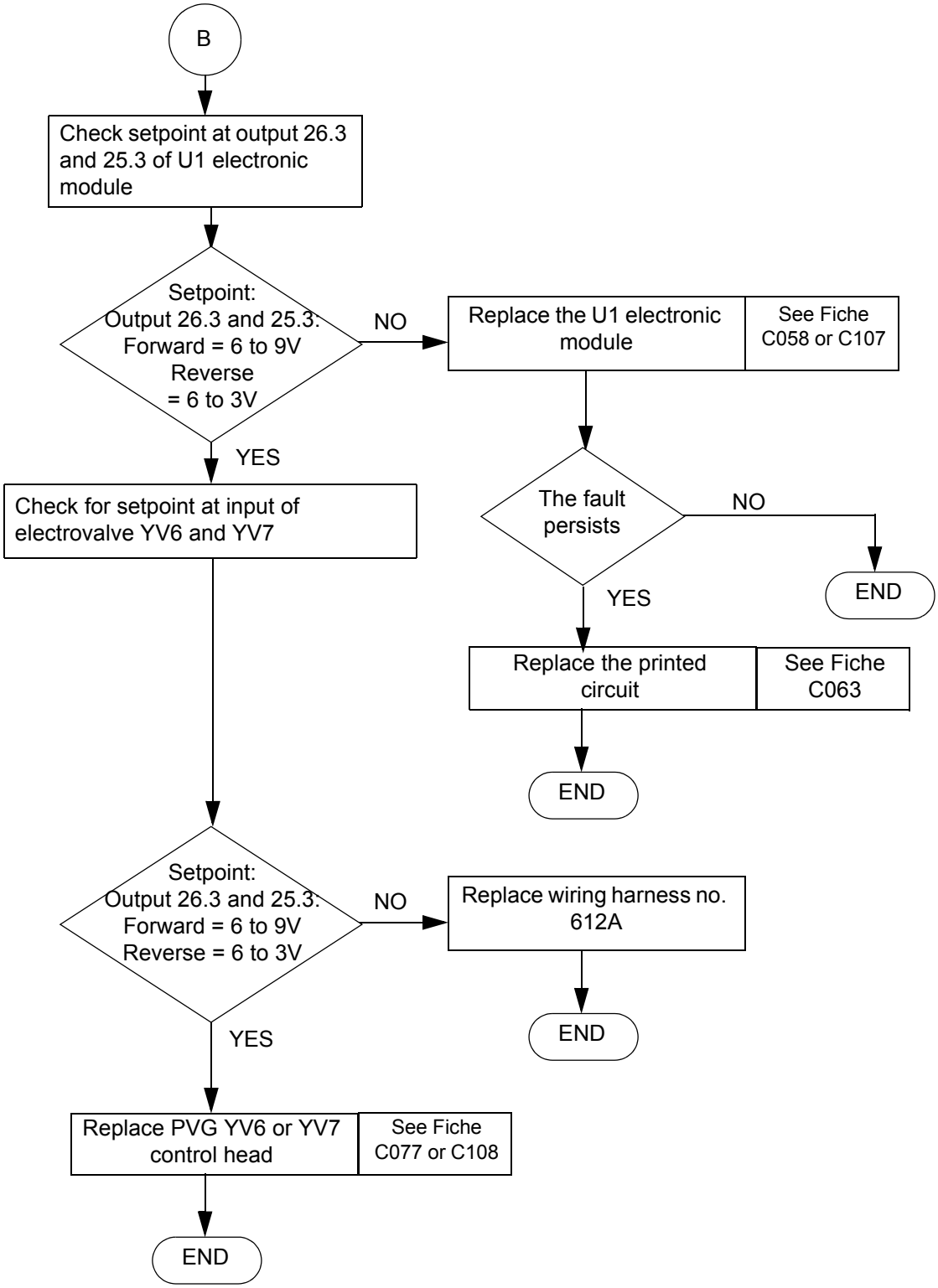
Sheet DP032	BREAKDOWN DETECTION FLOW CHART NO MACHINE TRAVEL MOVEMENT	Folio 1/4



Sheet DP032	BREAKDOWN DETECTION FLOW CHART NO MACHINE TRAVEL MOVEMENT	Folio 2/4



Sheet DP032	BREAKDOWN DETECTION FLOW CHART NO MACHINE TRAVEL MOVEMENT	Folio 3/4



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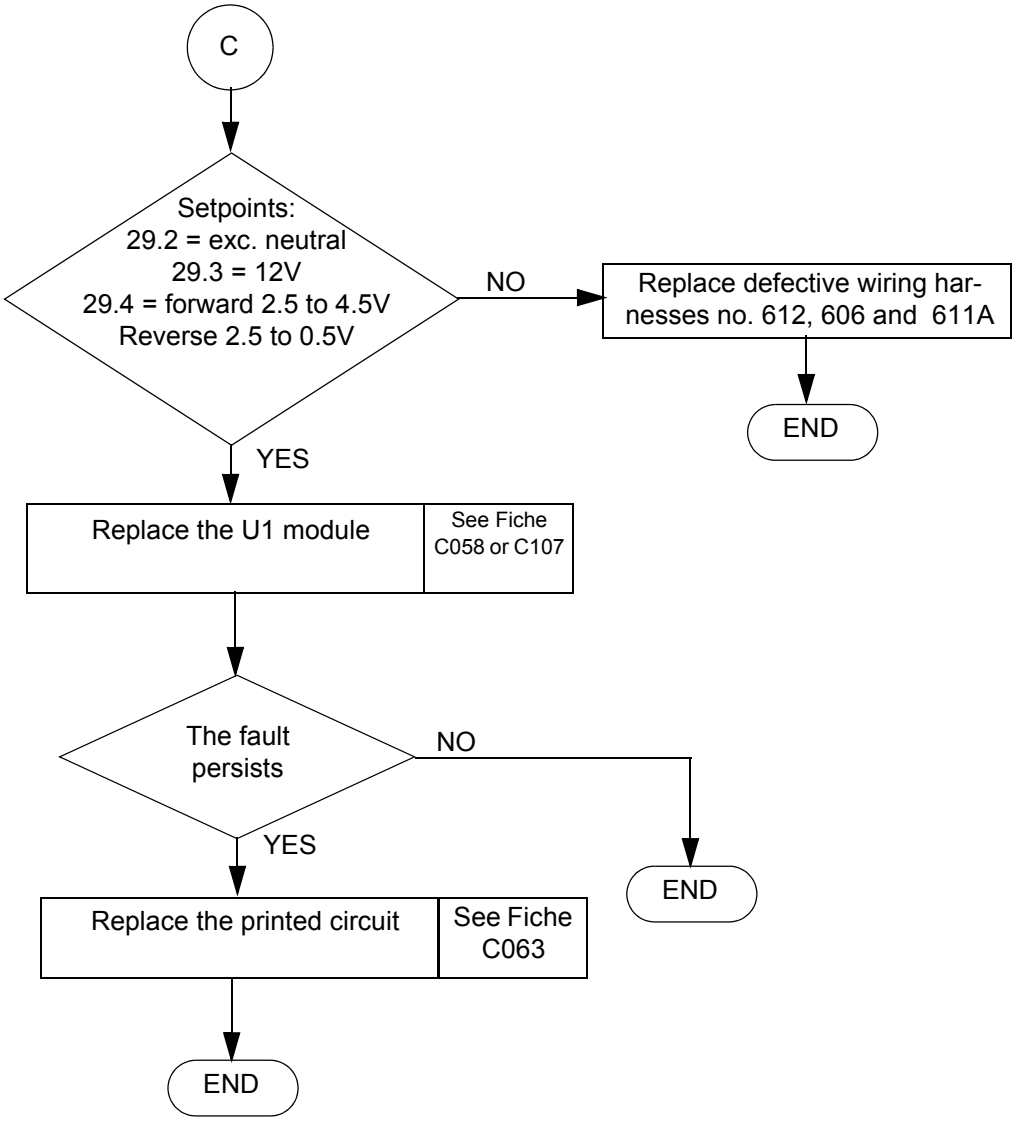
Sheet DP032	BREAKDOWN DETECTION FLOW CHART NO MACHINE TRAVEL MOVEMENT	Folio 4/4



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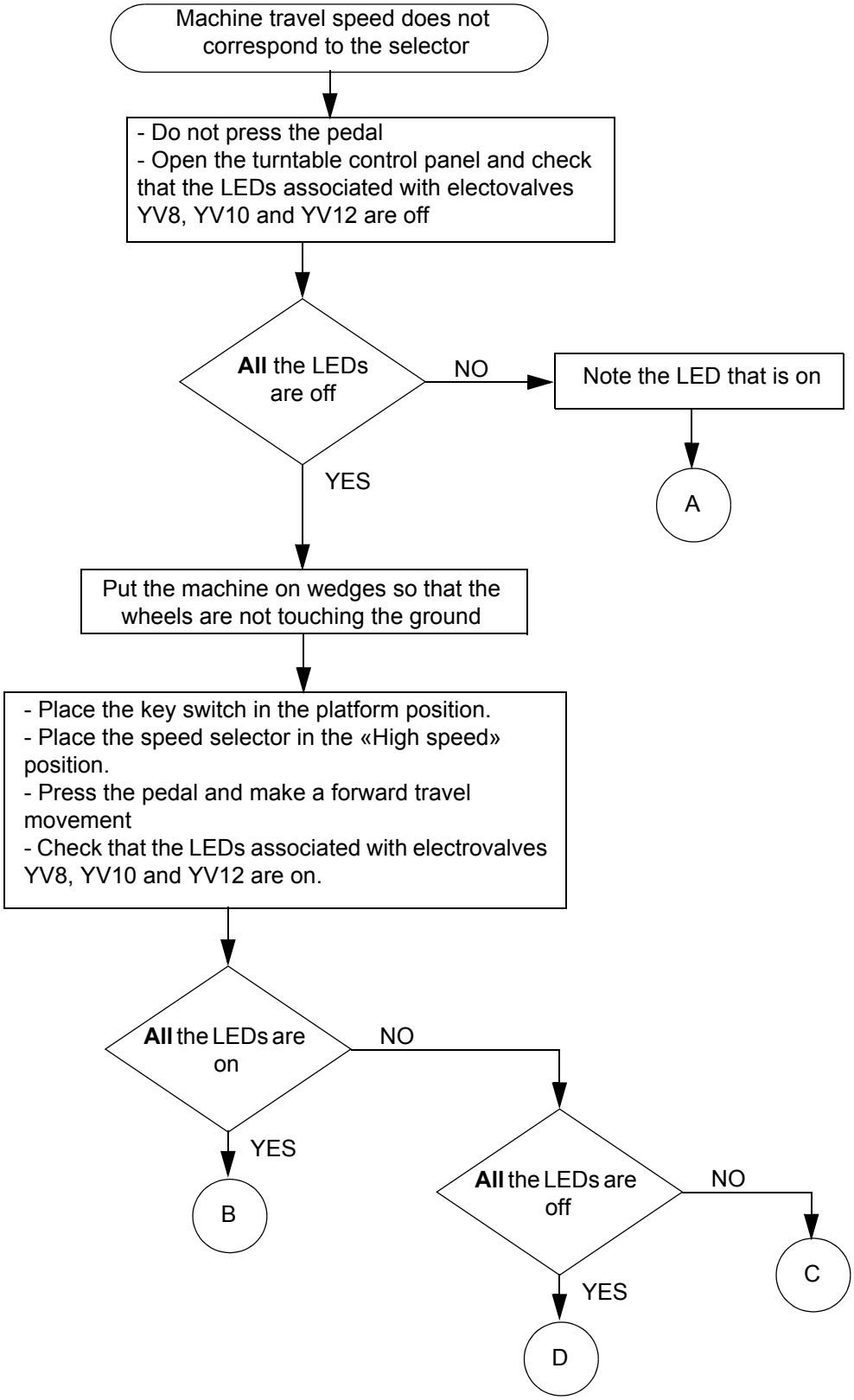
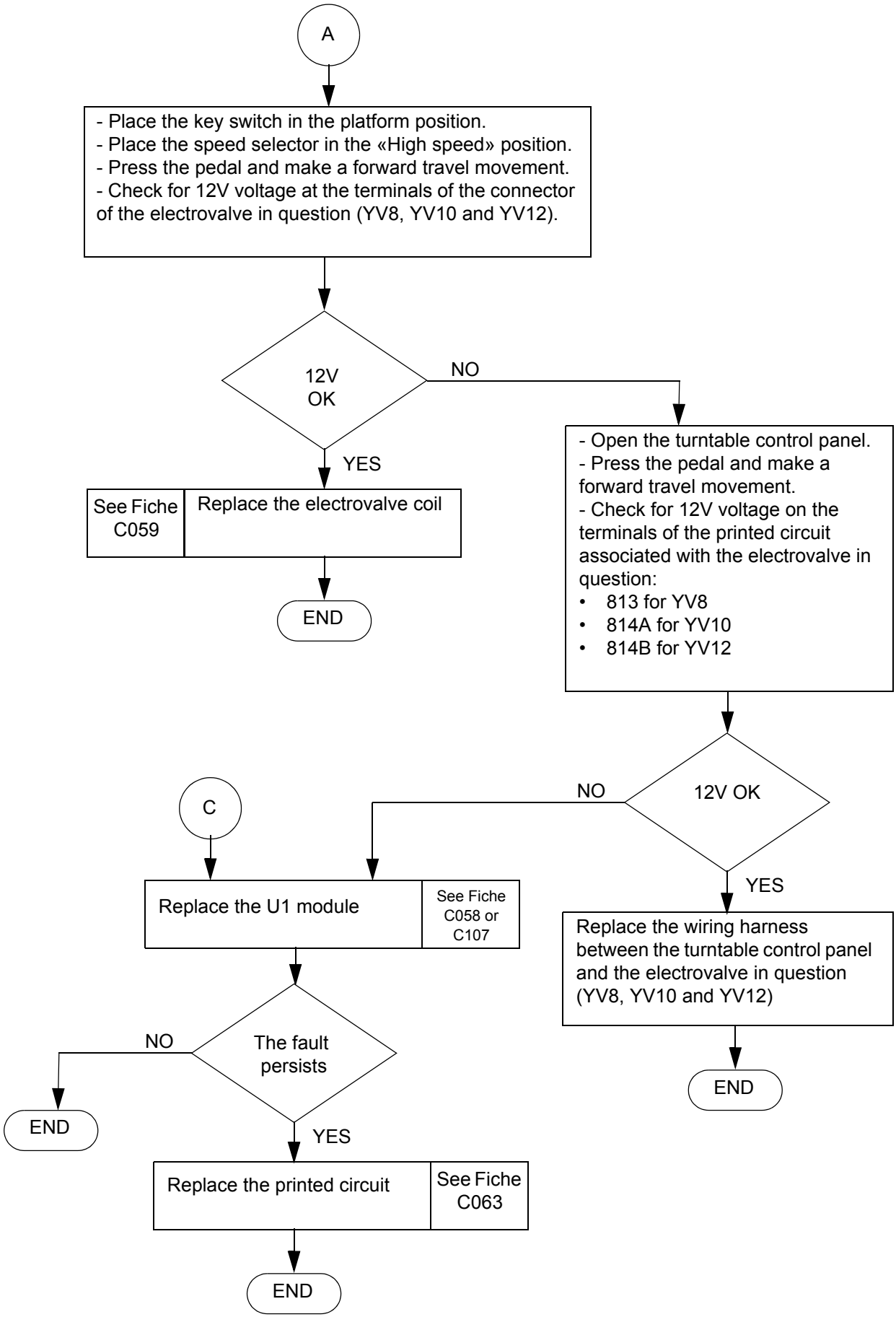
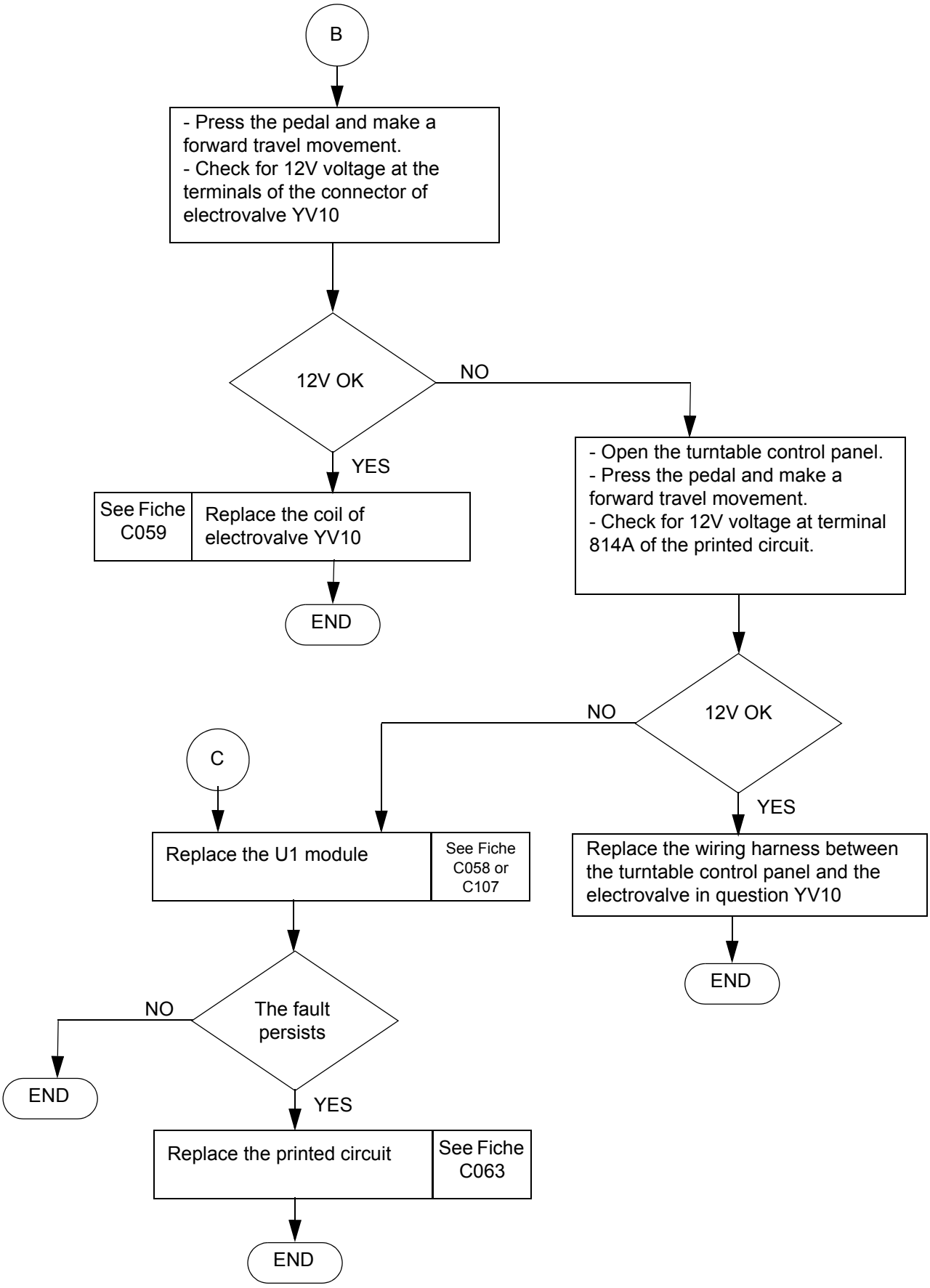
Sheet DP034	BREAKDOWN DETECTION FLOW CHART MACHINE TRAVEL SPEED DOES NOT CORRESPOND TO THE SELECTOR SPEED	Folio 1/4



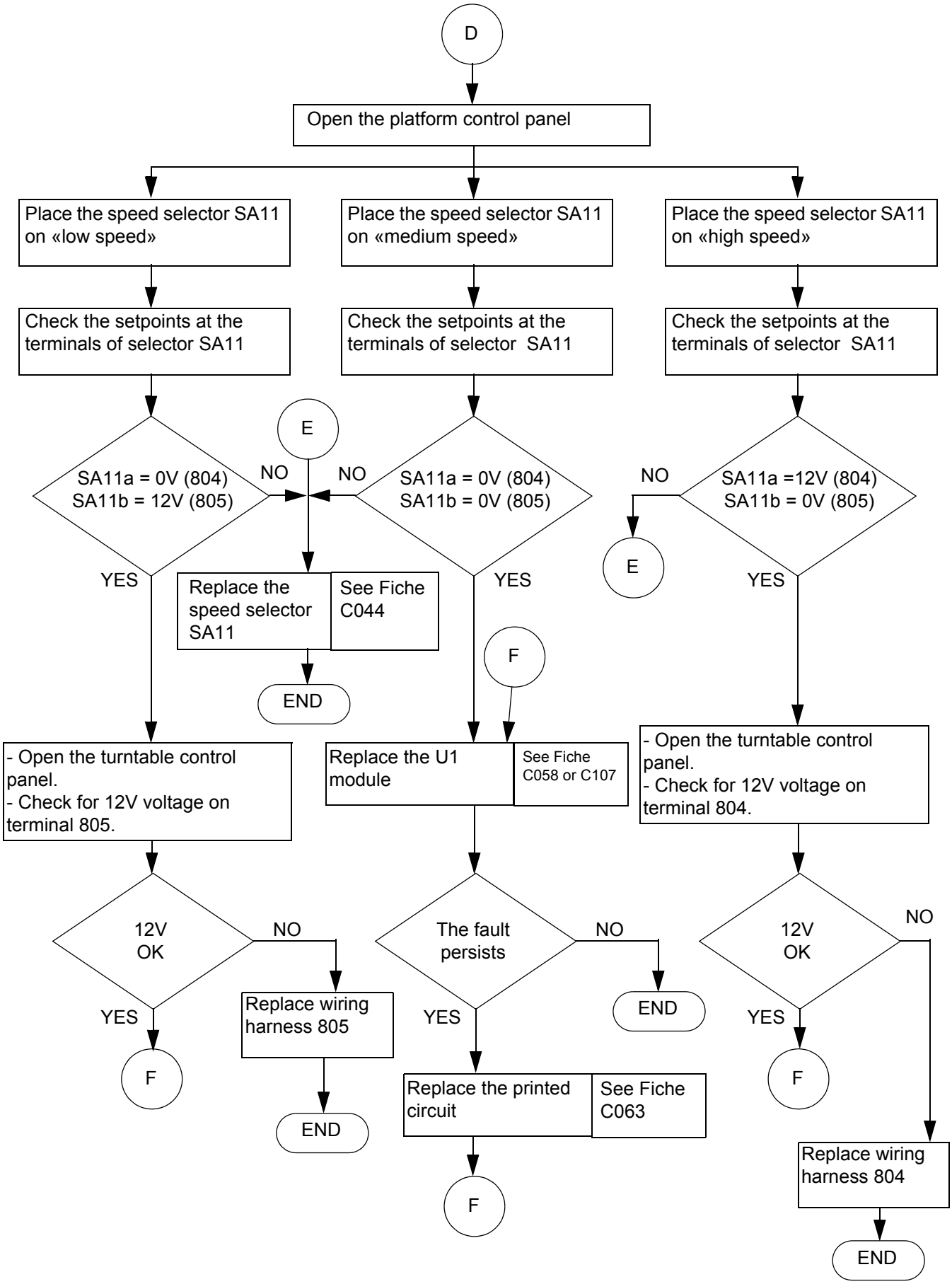
Sheet DP034	BREAKDOWN DETECTION FLOW CHART MACHINE TRAVEL SPEED DOES NOT CORRESPOND TO THE SELECTOR SPEED	Folio 2/4



Sheet DP034	BREAKDOWN DETECTION FLOW CHART MACHINE TRAVEL SPEED DOES NOT CORRESPOND TO THE SELECTOR SPEED	Folio 3/4



Sheet DP034	BREAKDOWN DETECTION FLOW CHART MACHINE TRAVEL SPEED DOES NOT CORRESPOND TO THE SELECTOR SPEED	Folio 4/4



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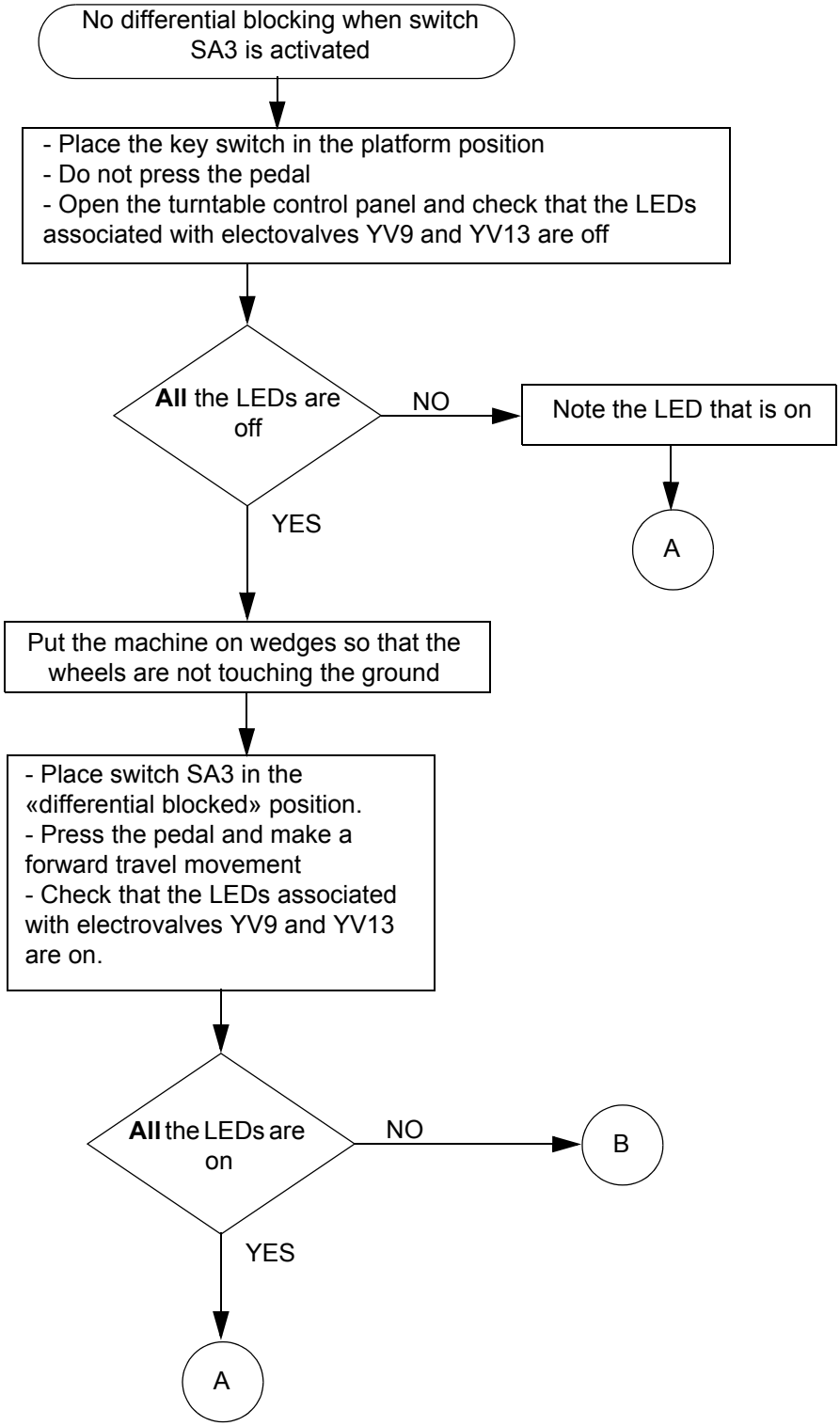
Sheet DP036	BREAKDOWN DETECTION FLOW CHART NO DIFFERENTIAL BLOCKING WHEN SWITCH SA3 IS ACTIVATED	Folio 1/3



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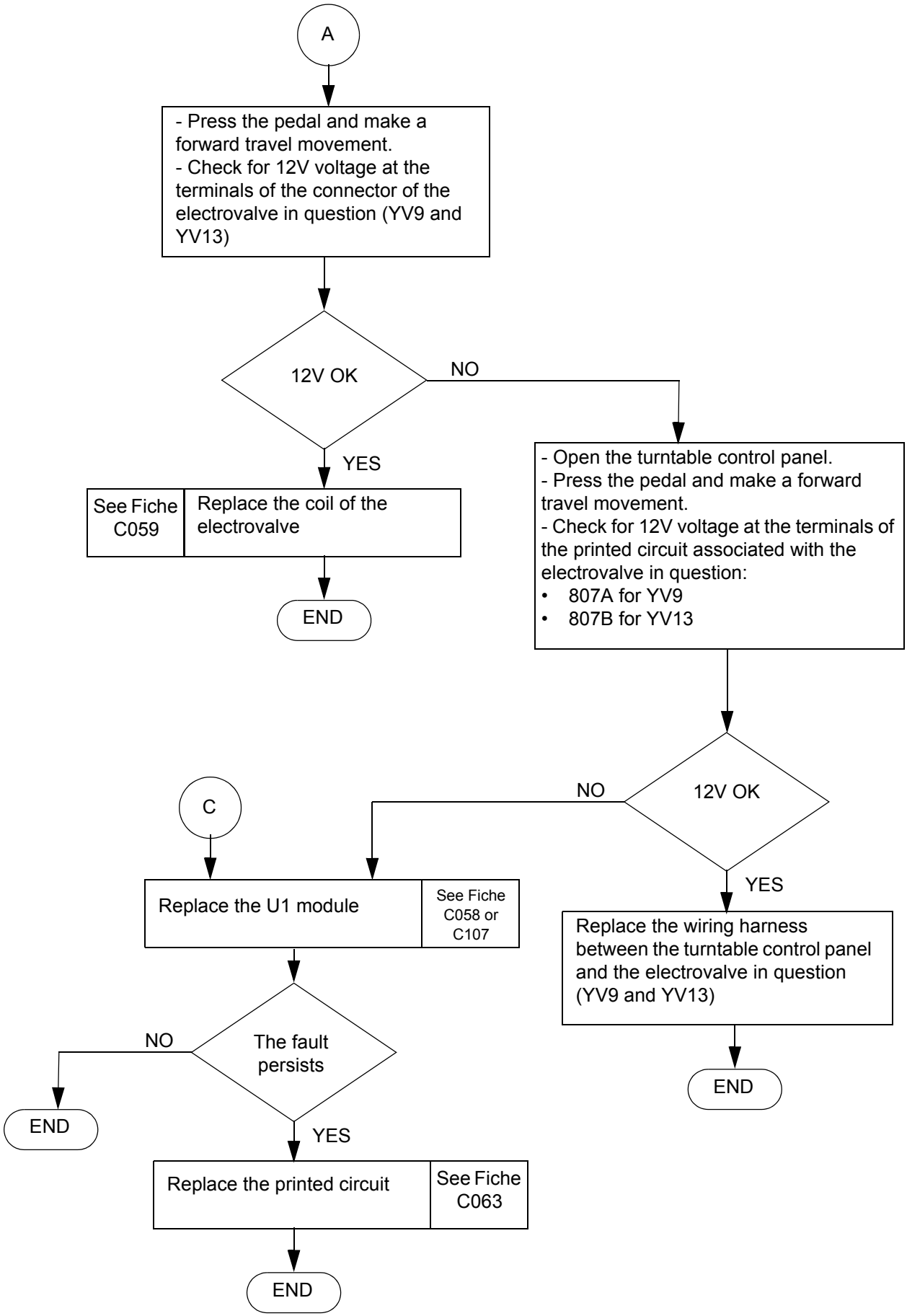
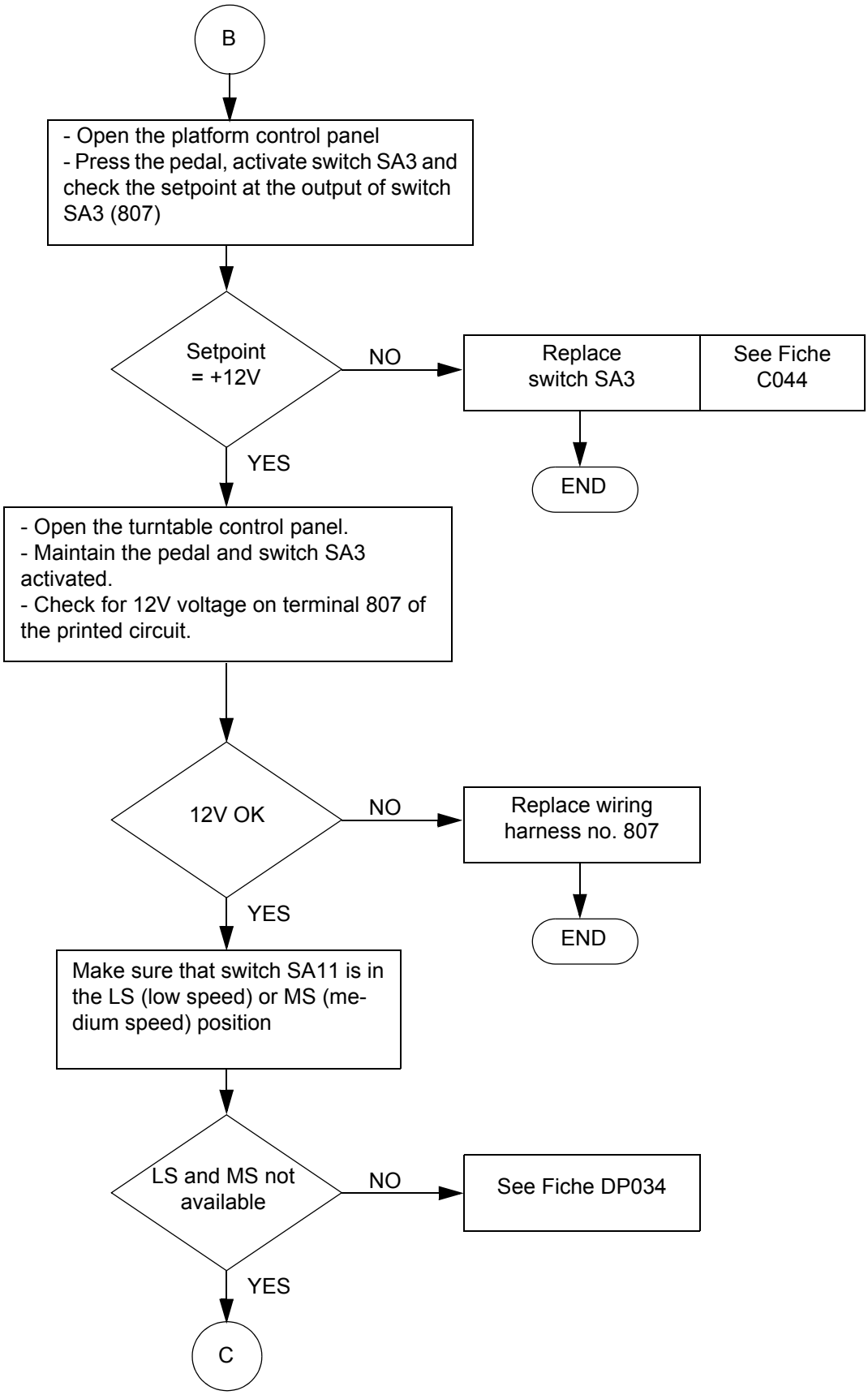
Sheet DP036	BREAKDOWN DETECTION FLOW CHART NO DIFFERENTIAL BLOCKING WHEN SWITCH SA3 IS ACTIVATED	Folio 2/3



Sheet DP036	BREAKDOWN DETECTION FLOW CHART NO DIFFERENTIAL BLOCKING WHEN SWITCH SA3 IS ACTIVATED	Folio 3/3



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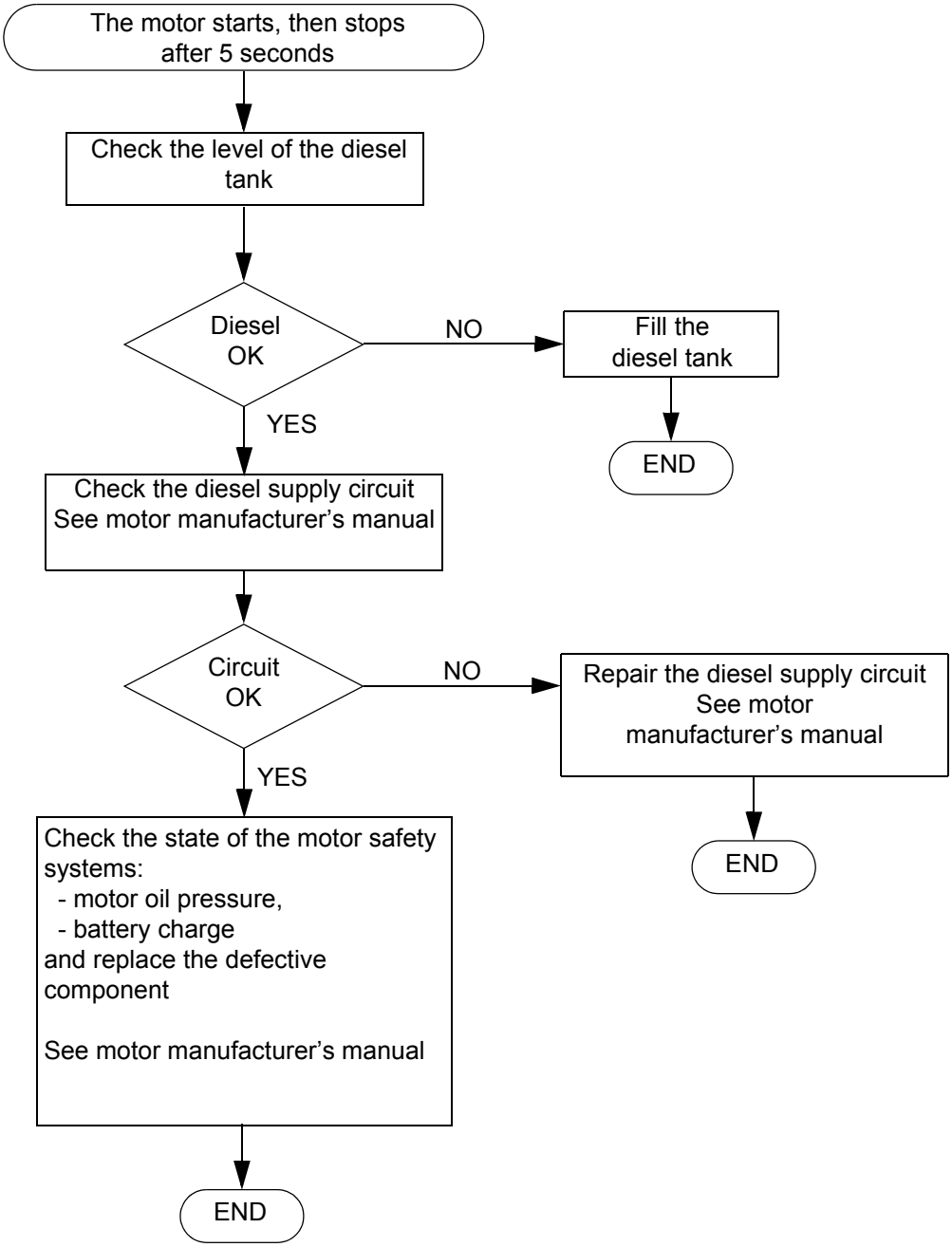
Sheet DP041	BREAKDOWN DETECTION FLOW CHART THE MOTOR STARTS THEN STOPS AFTER 5 SECS	Folio 1/1



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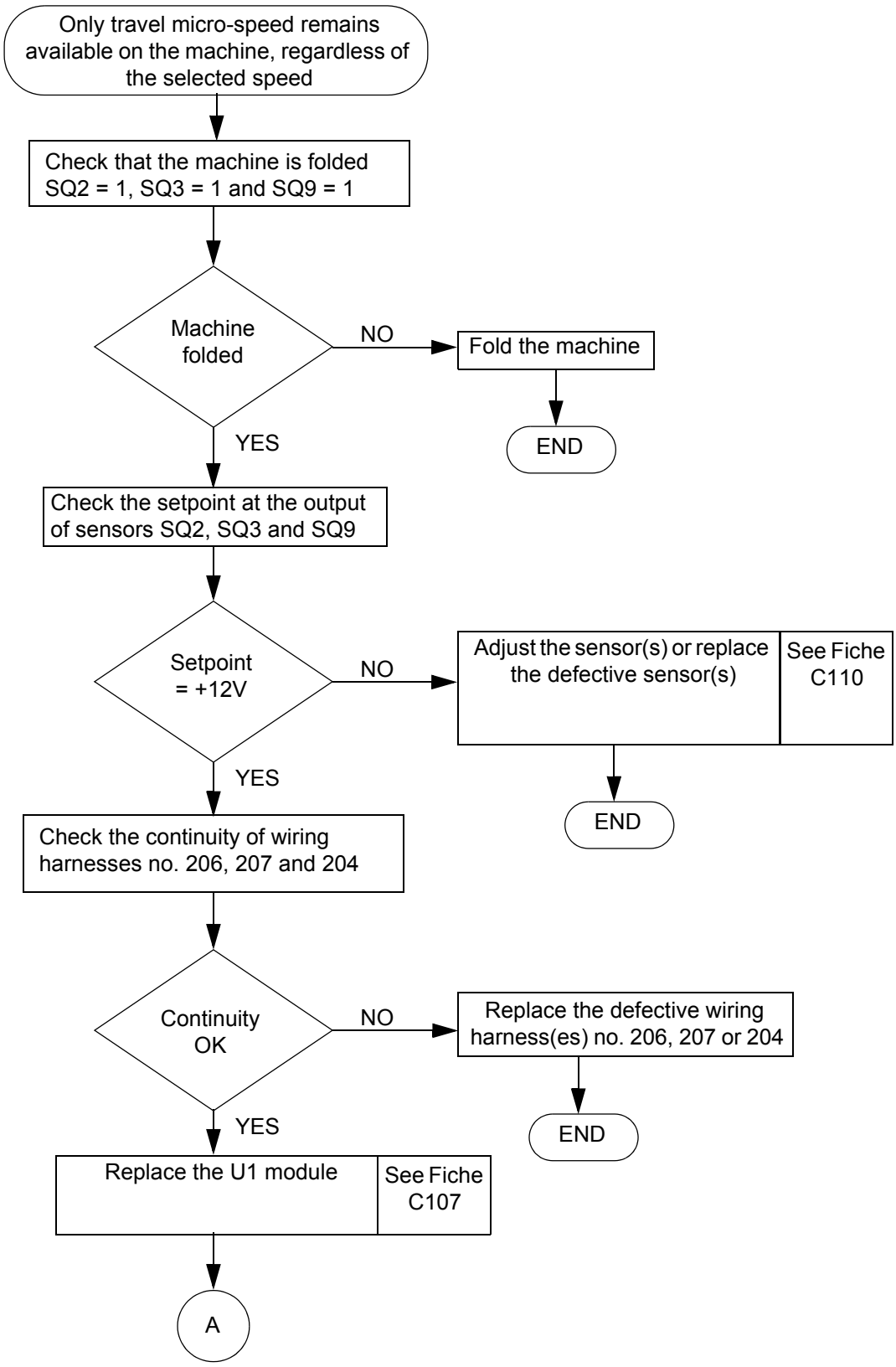
Sheet DP056	BREAKDOWN DETECTION FLOW CHART ONLY TRAVEL MICRO-SPEED IS AVAILABLE ON THE MACHINE REGARDLESS OF THE SPEED SELECTED	Folio 1/2



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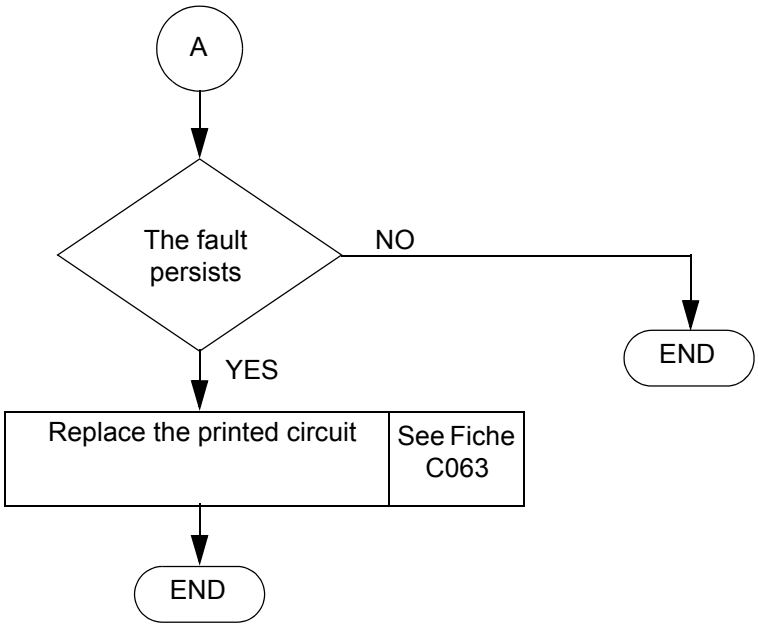
Sheet DP056	BREAKDOWN DETECTION FLOW CHART ONLY TRAVEL MICRO-SPEED IS AVAILABLE ON THE MACHINE REGARDLESS OF THE SPEED SELECTED	Folio 2/2



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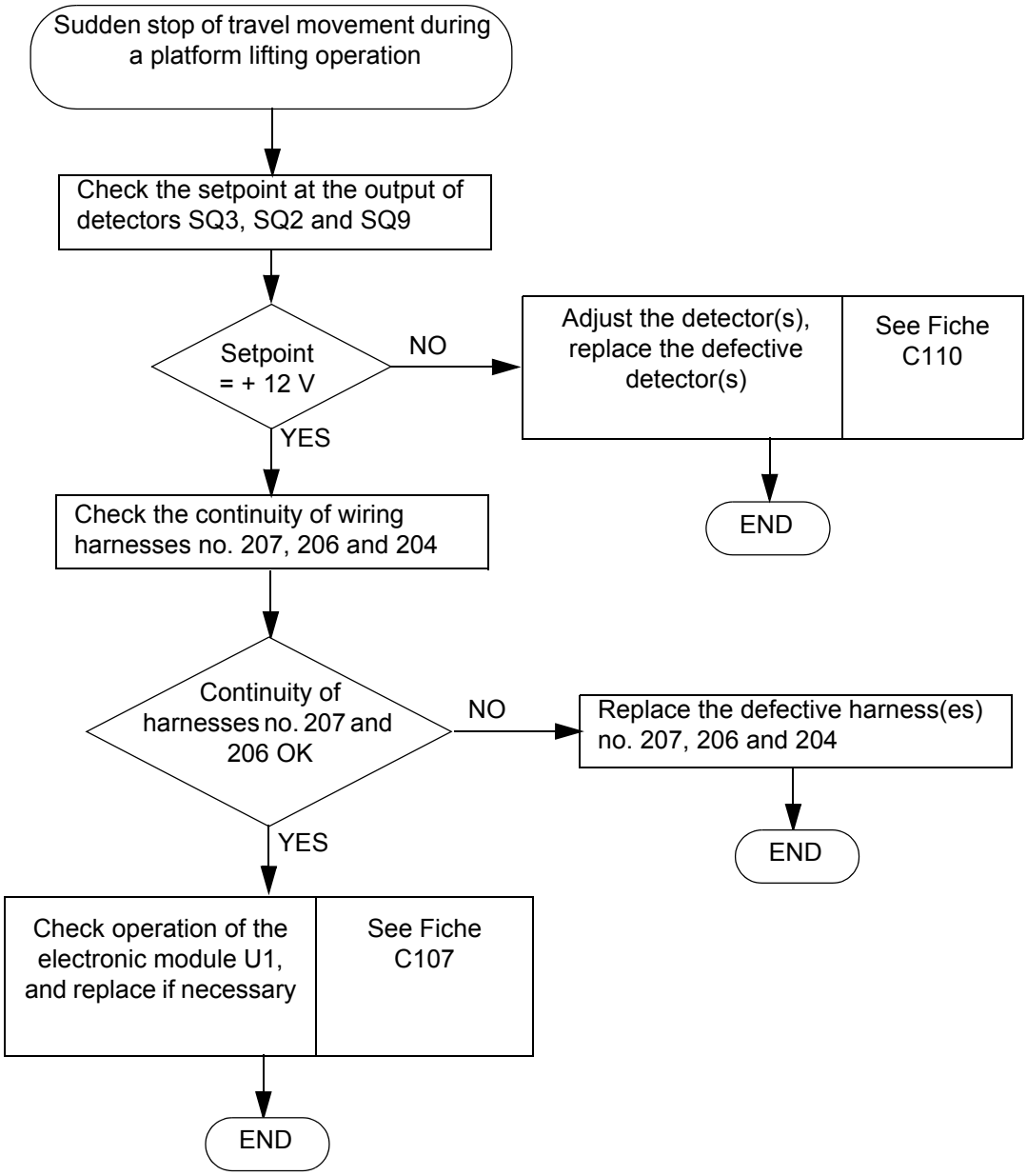
Sheet DP058	BREAKDOWN DETECTION FLOW CHART	Folio 1/1
	SUDDEN STOP OF TRAVEL MOVEMENT DURING A PLATFORM LIFTING OPERATION	



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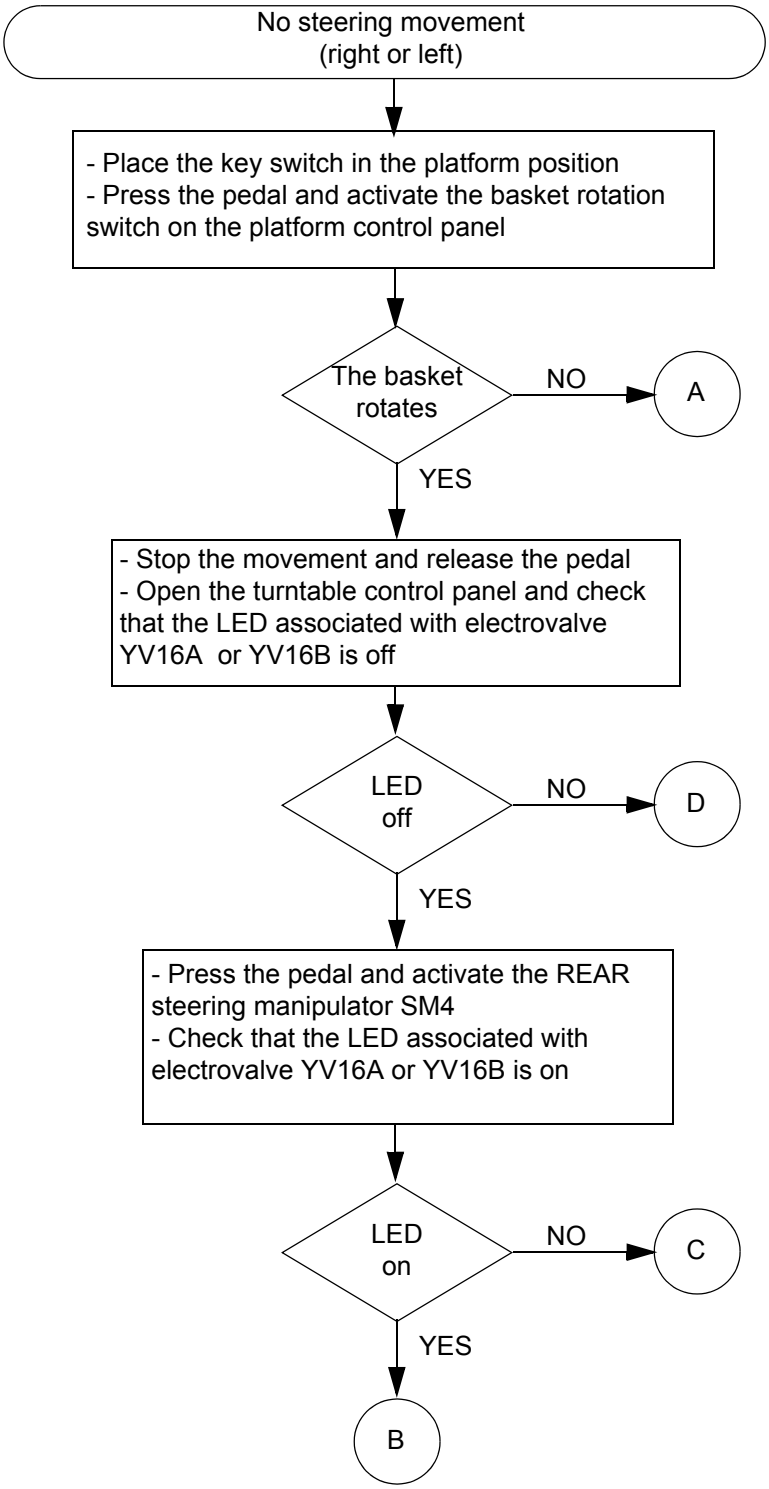
Sheet DP060	BREAKDOWN DETECTION FLOW CHART	Folio 1/4
	NO STEERING MOVEMENT (RIGHT OR LEFT)	



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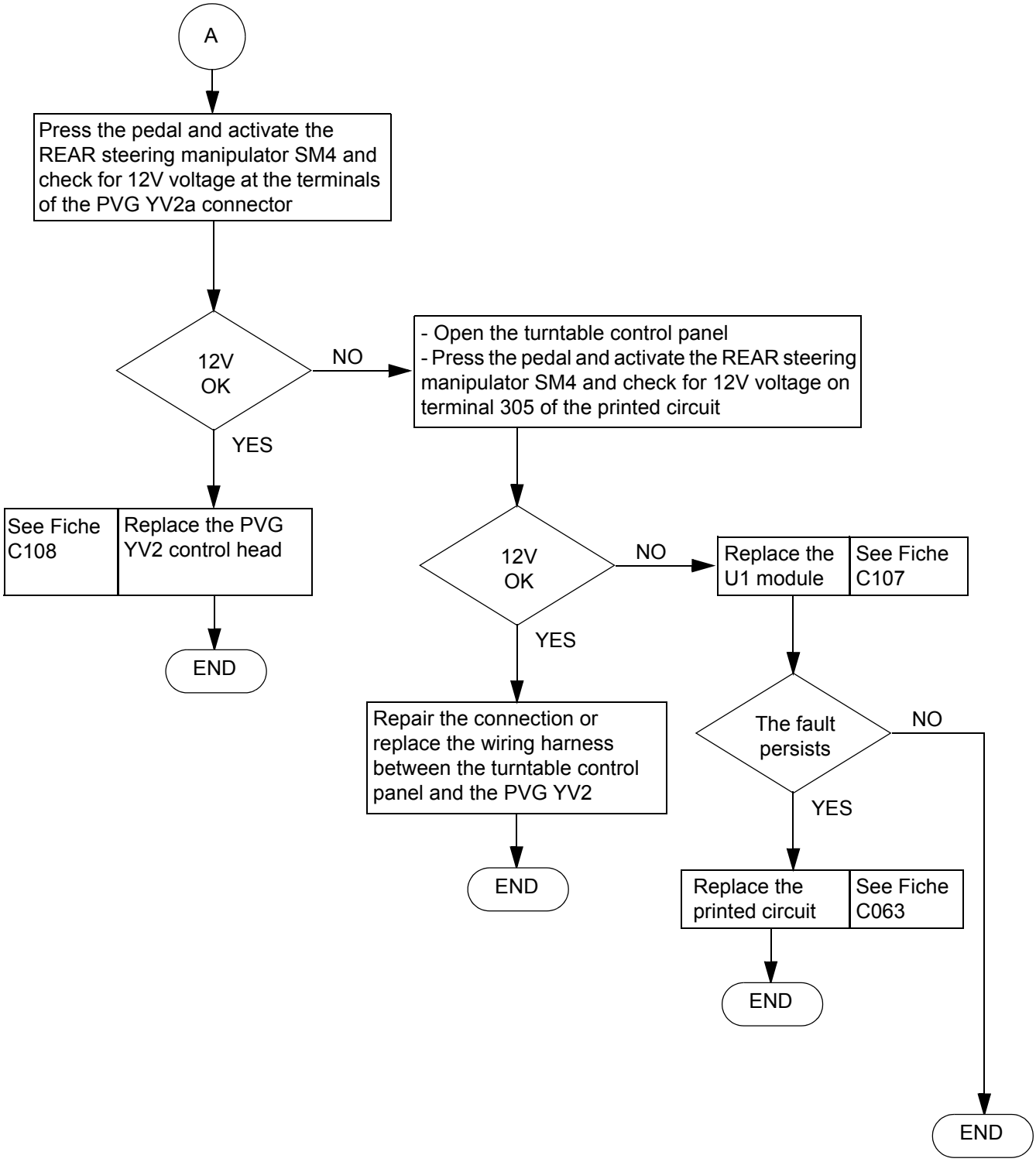
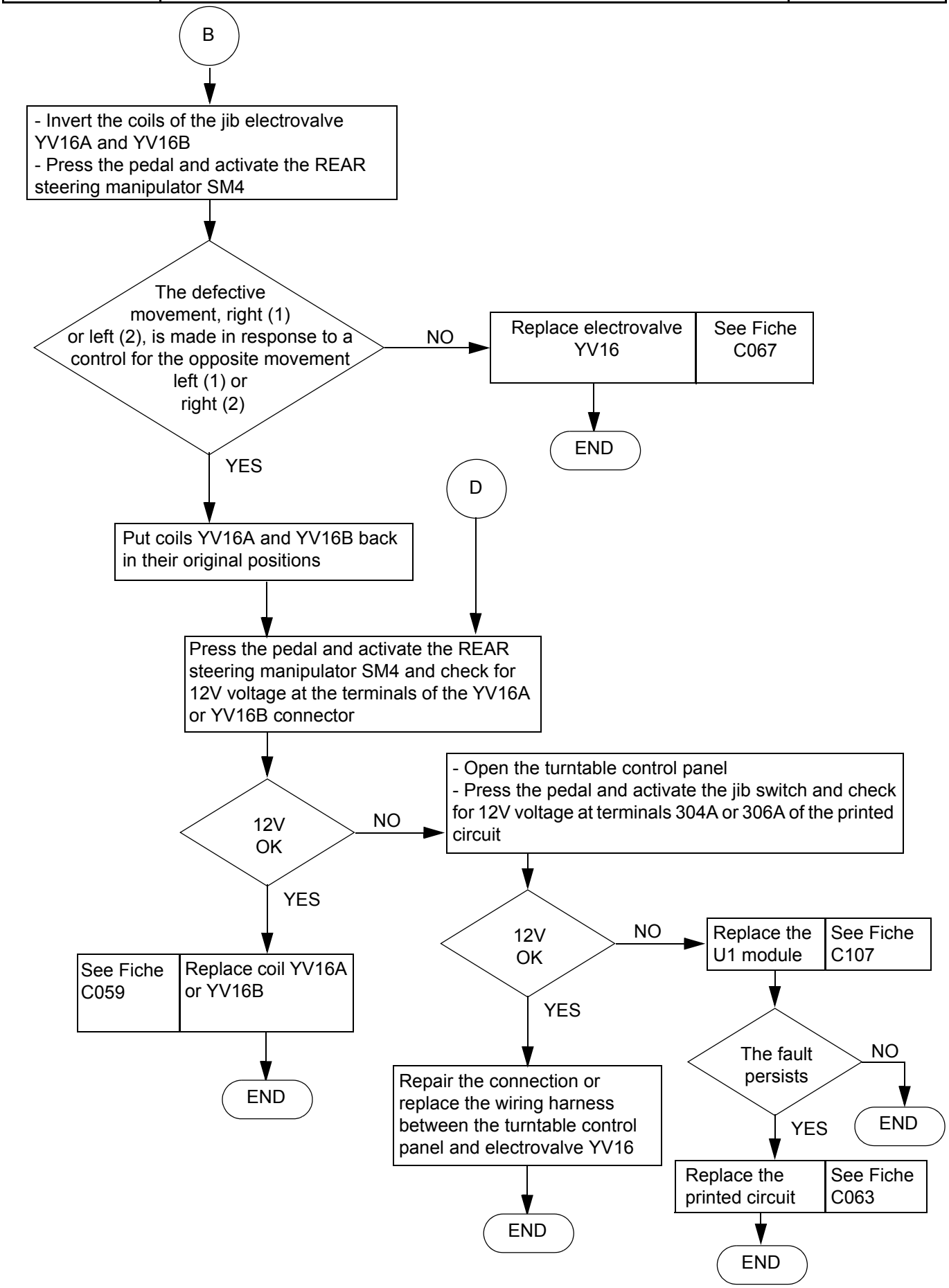
Sheet DP060	BREAKDOWN DETECTION FLOW CHART NO STEERING MOVEMENT (RIGHT OR LEFT)	Folio 2/4

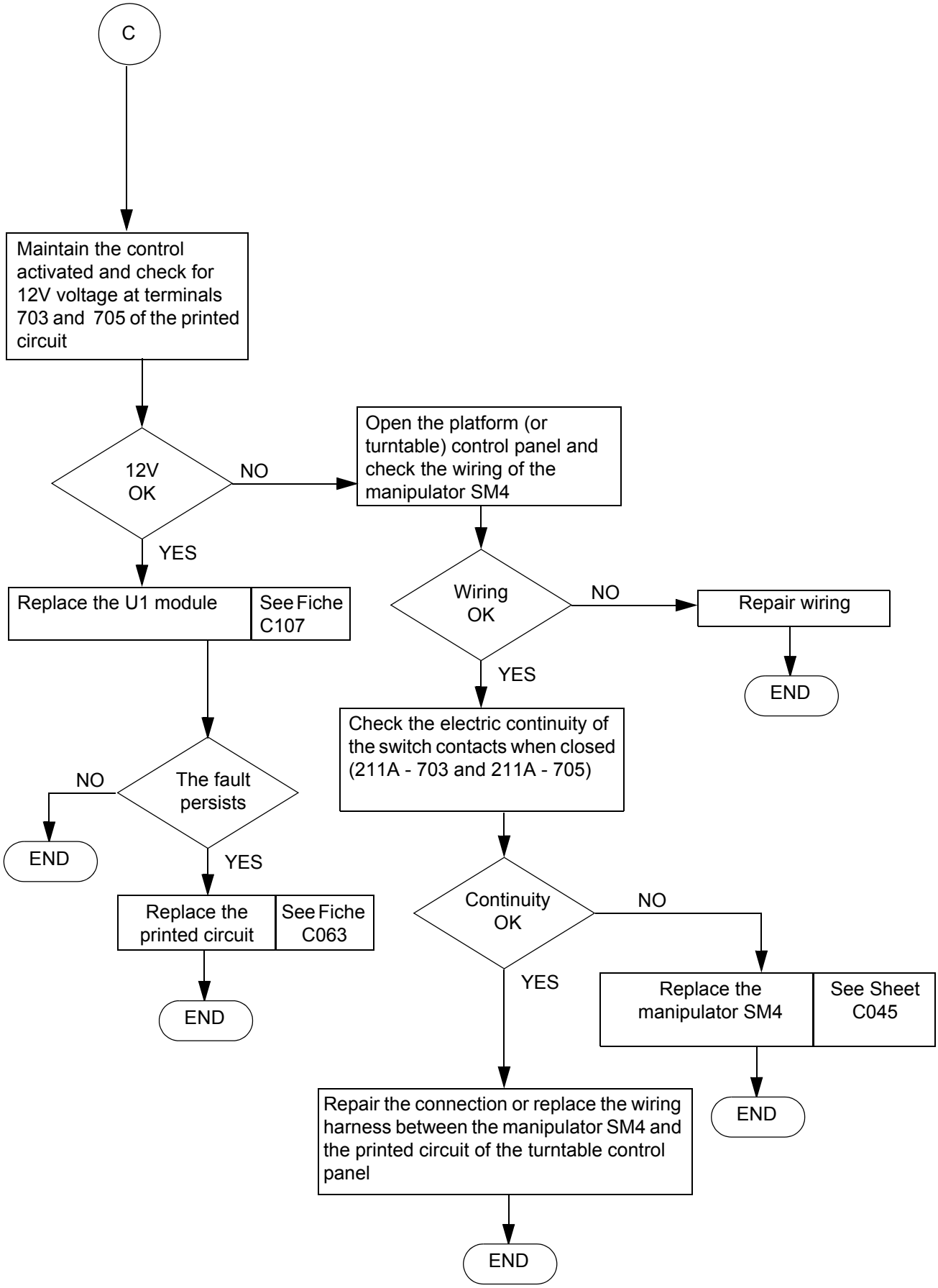


Pinguely-Haulotte

Sheet DP060	BREAKDOWN DETECTION FLOW CHART NO STEERING MOVEMENT (RIGHT OR LEFT)	Folio 3/4



Sheet DP060	BREAKDOWN DETECTION FLOW CHART NO STEERING MOVEMENT (RIGHT OR LEFT)	Folio 4/4



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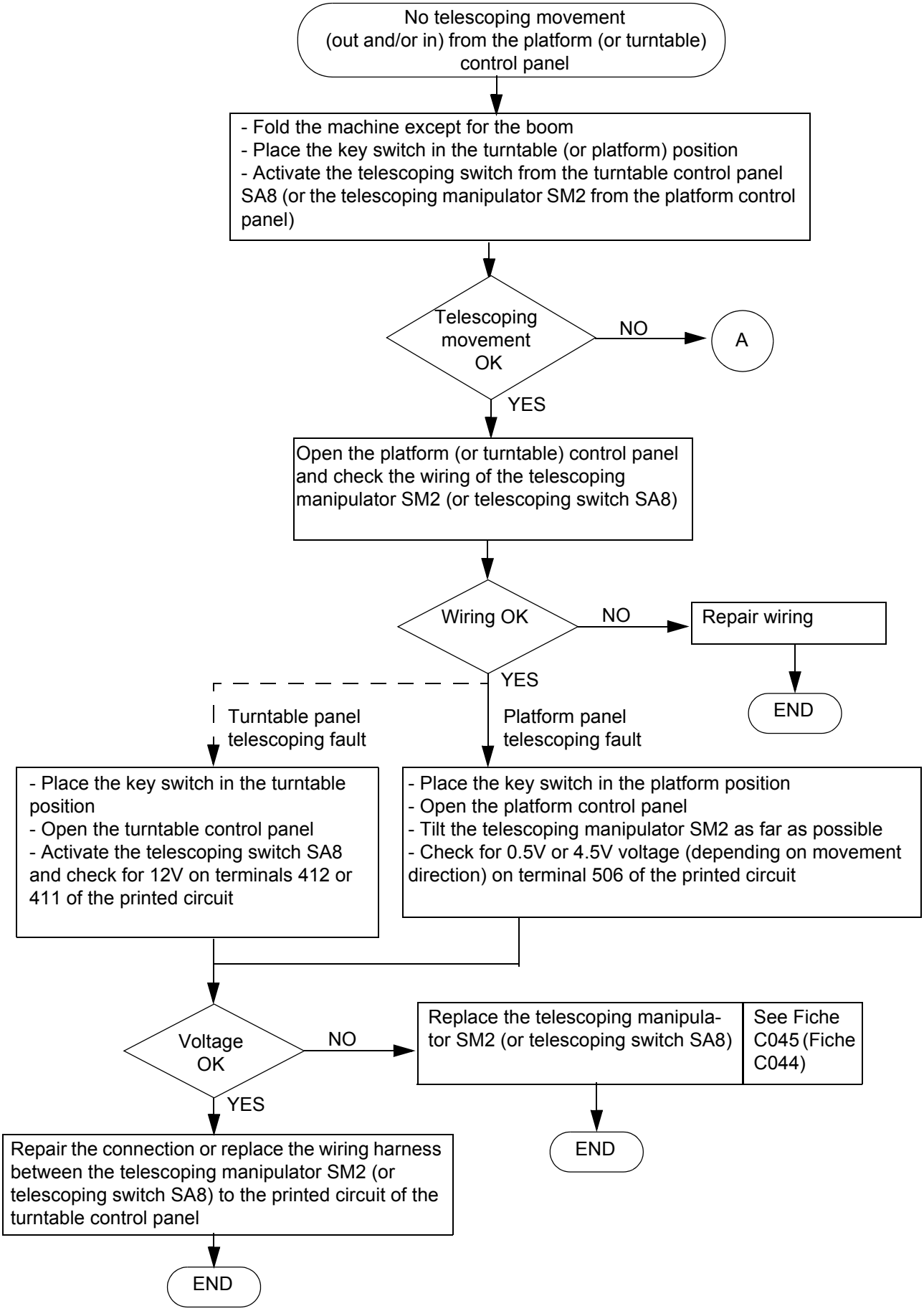
Sheet DP072	BREAKDOWN DETECTION FLOW CHART NO TELESCOPING MOVEMENT (IN AND/OR OUT) FROM THE PLATFORM (OR TURNTABLE) CONTROL PANEL	Folio 1/4



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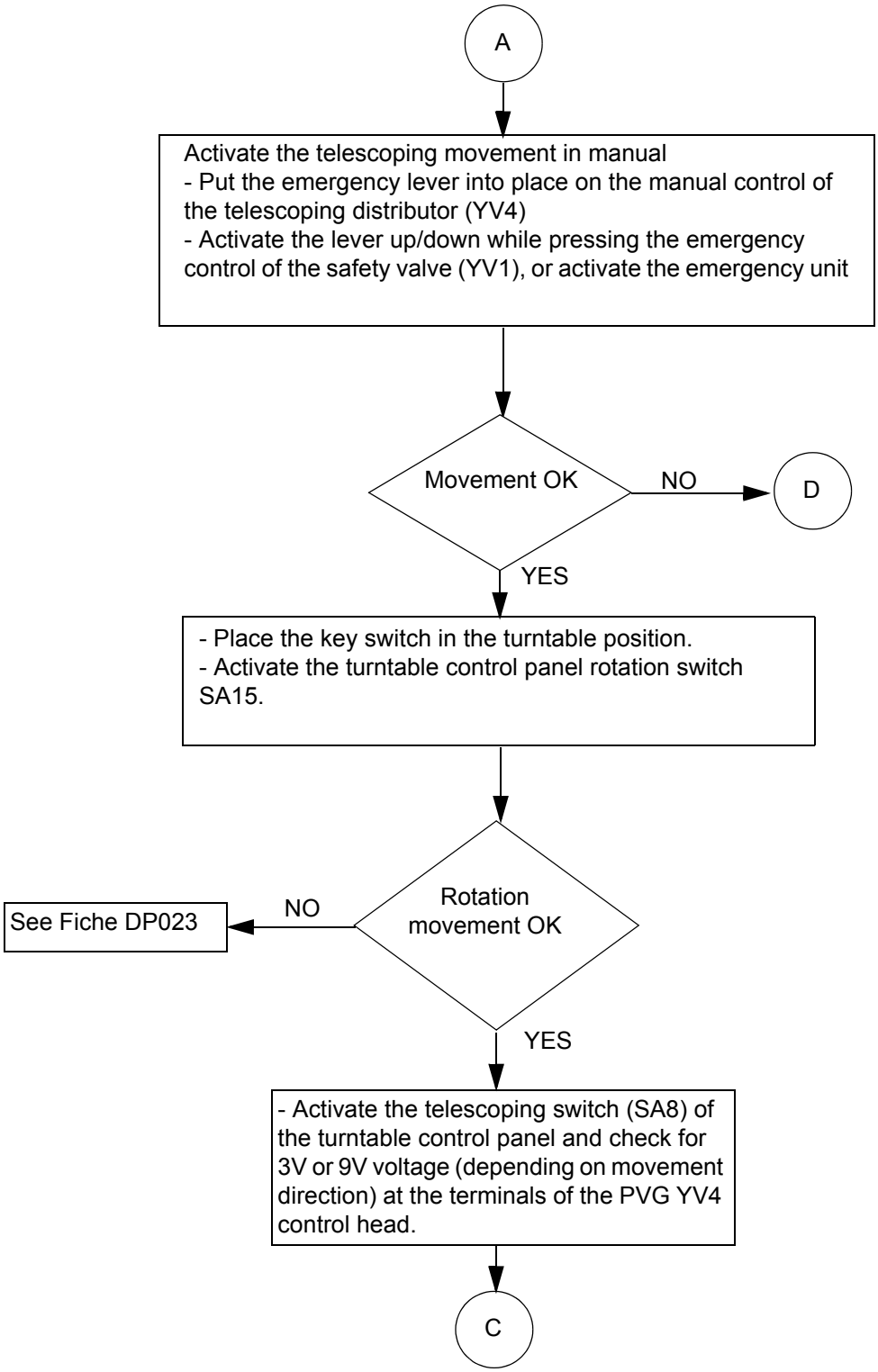
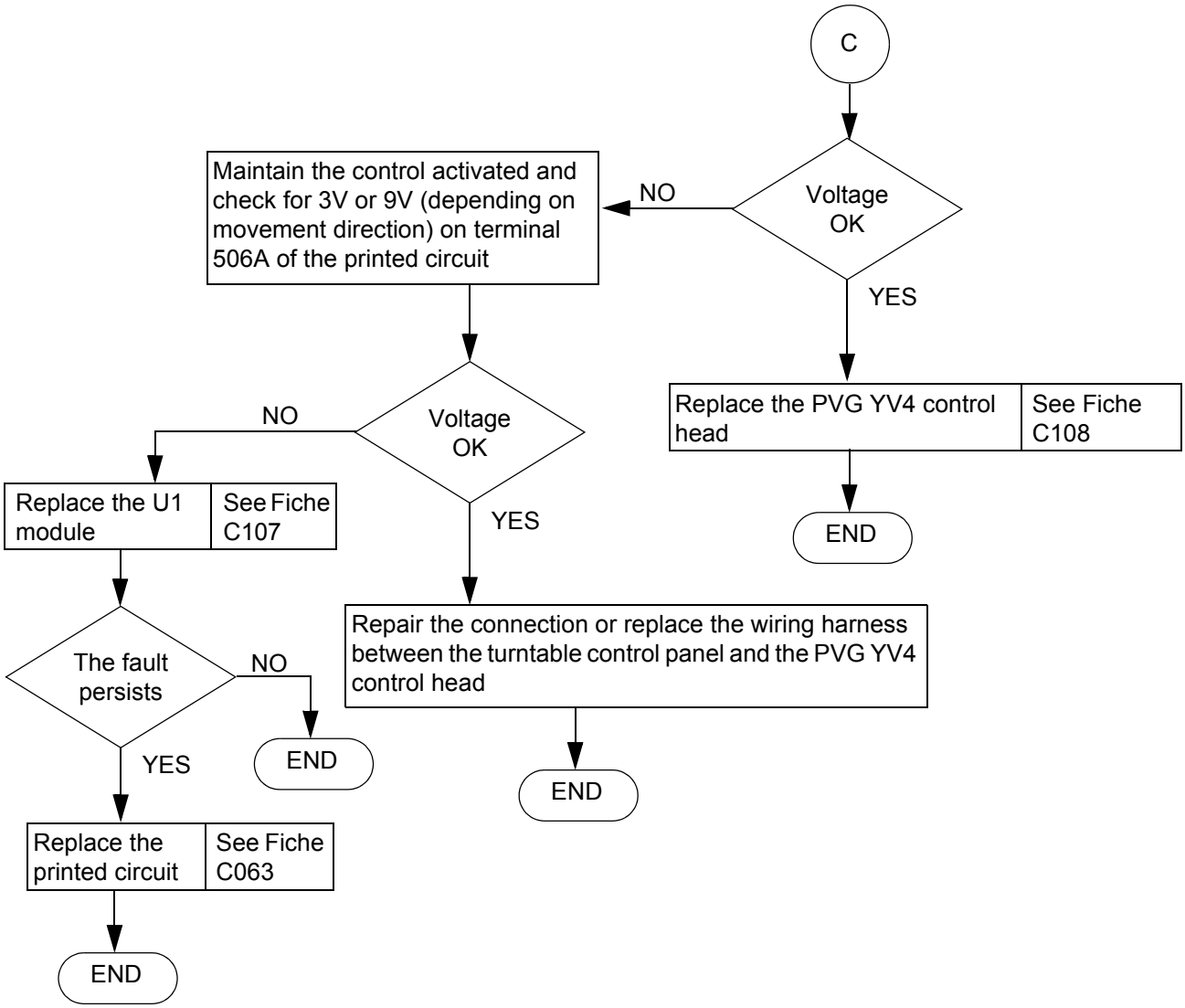
Sheet DP072	BREAKDOWN DETECTION FLOW CHART NO TELESCOPING MOVEMENT (IN AND/OR OUT) FROM THE PLATFORM (OR TURNTABLE) CONTROL PANEL	Folio 2/4



Sheet DP072	BREAKDOWN DETECTION FLOW CHART NO TELESCOPING MOVEMENT (IN AND/OR OUT) FROM THE PLATFORM (OR TURNTABLE) CONTROL PANEL	Folio 3/4



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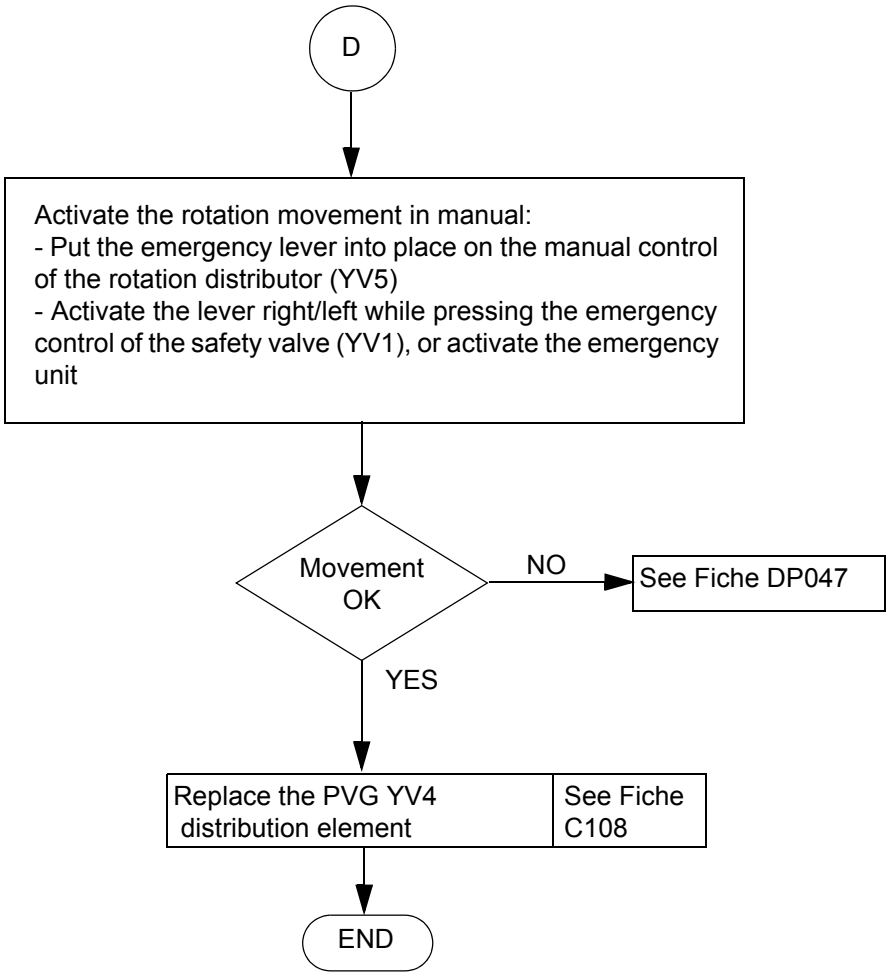
Sheet DP072	BREAKDOWN DETECTION FLOW CHART NO TELESCOPING MOVEMENT (IN AND/OR OUT) FROM THE PLATFORM (OR TURNTABLE) CONTROL PANEL	Folio 4/4



11 - CORRECTIVE MAINTENANCE PROCEDURE

List of corrective maintenance sheets:

Sheet no.	Description
C010	Changing a hose
C034	Changing a wheel
C035	Changing a wheel reducing hear or a travel hysraulic motor
C038	Changing a cylinder
C039	Changing the tilt sensor
C040	Changing the horn
C041	Changing the tilt sensor buzzer
C042	Changing the hydraulic pump
C043	Changing an electric component of the top control panel
C044	Changing an electric component of the bottom control panel
C045	Changing a manipulator
C046	Changing the starter battery
C047	Changing a cover gas spring
C050	Changing the turntable rotation hydraulic motor
C051	Changing the swing joint
C052	Changing the basket rotation hydraulic motor
C053	Changing the basket
C054	Changing the weighing rolling bearing
C055	Changing the turntable rotation gearing
C056	Changing the hydraulic filter
C058	Changing the U1 electronic module
C059	Changing a coil
C062	Changing relay
C063	Changing a printed circuit
C064	Changing the fail-safe pedal
C066	Changing the distribution hydraulic block
C067	Changing an electrovalve
C068	Changing the double balancing valve of the rotation function
C069	Dismantling / re-assembly the jib
C073	Adjusting a pressure limiter
C074	Changing the jib cylinder
C075	Changing the boom lifting cylinder
C076	Dismantling / re-assembly the distribution hydraulic block
C077	Changing a control unit of the distribution block

Sheet no.	Description
C079	Changing a flow separator
C081	Changing a pressure limiter - telescope out function
C082	Changing a balancing valve - compensation function
C083	Changing a double flow limiter - compensation function
C120	Dismantling and re-assembling the steering system
C121	Changing an end of stroke contactor
C122	Changing a motor cover
C123	Changing a control panel cover
C124	Changing a tank cover
C125	Changing a front cover on the motor or tank side
C126	Changing a steering pivot
C127	Changing the emergency unit
C128	Changing the slew ring
C129	Dismantling / re-assembling the boom
C130	Changing the DEUTZ diesel thermal motor
C131	Changing a non-return valve
C136	Changing the petrol / gas GM thermal motor
C138	Changing the counterweight

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Sheet C010	CORRECTIVE MAINTENANCE SHEET	Folio 1/1
	CHANGING A HOSE	

Caution!
Ensure that the oil is not too hot.

Caution!
Use a container to collect oil to prevent pollution of the environment.

1 - Preliminary operations

- Put the machine in the maintenance configuration (see corresponding paragraph).
- Switch off electric power (see corresponding paragraph).
- Close the shut-off valve, if any; if not, empty the hydraulic tank.

2 - Removing a hose

- Disconnect the hose from the equipment to which it is connected.

NB: Unscrew the hose slowly to release residual hydraulic pressure.

- Protect the holes of the equipment using caps.

3 - Installing a hose

- Reconnect a new hydraulic hose.
- Put the machine back into the operational configuration.
- Make several movements using the hose to purge the hydraulic circuit.
- Check the level in the hydraulic oil tank.

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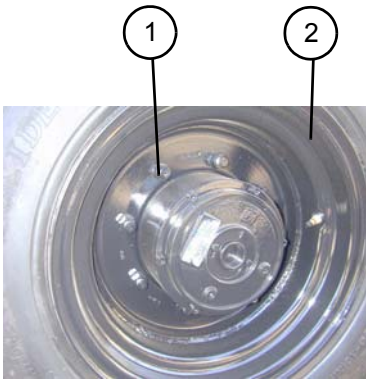
Sheet C034	CORRECTIVE MAINTENANCE SHEET	Folio 1/1
	CHANGING A WHEEL	



4 - Preliminary operations

- Put the machine in the maintenance configuration (see corresponding paragraph).
- Switch off electric power (see corresponding paragraph).

5 - Removing a wheel

- Unblock (without completely unscrewing) the fixing screws (1) of the wheel to be removed.
- Raise the machine using a jack or hoist.
- Remove the fixing screws (1) from the wheel and remove the wheel (2).

6 - Installing a wheel

- Put a new wheel into place and put back the fixing screws.
- Put the machine on the ground.
- Tighten the fixing screws to the recommended torque (see tightening torque value table).
- Put the machine back into the operational configuration.

Caution!
Use a container to collect oil to prevent pollution of the environment.

Caution!
It is essential to put the component in slings before dismantling/re-assembling it.

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Sheet C035	CORRECTIVE MAINTENANCE SHEET	Folio 1/2
	CHANGING A WHEEL REDUCING GEAR OR A TRAVEL HYDRAULIC MOTOR	

Caution!
Ensure that the oil is not too hot.

Caution!
Use a container to collect oil to prevent pollution of the environment.

Caution!
It is essential to put the component in slings before dismantling/re-assembling it.

1 - Preliminary operations

- Put the machine in the maintenance configuration (see corresponding paragraph).
- Switch off electric power (see corresponding paragraph).
- Remove the wheel corresponding to the element to be removed (see corresponding sheet).

2 - Removing a wheel reducing gear or a hydraulic motor

NB: *Figure 1: steering axle.*
Figure 2: fixed axle.

- If working on a steering axle, uncouple the steering connecting rod from the pivot.
- Mark and disconnect the hoses of the hydraulic motor (1) and reducing gear (2).

NB: *Unscrew the hose slowly to release residual hydraulic pressure.*

- Put caps on the hoses.
- Place a wedge under the wheel reducing gear.
- Remove the reducing gear / motor assembly by removing the fixing bolts (3).
- Unscrew the screws (4) fixing the hydraulic motor to the wheel reducing gear.
- Replace the defective hydraulic motor or reducing gear.

3 - Installing a wheel reducing gear or a hydraulic motor

- Assemble the hydraulic motor to the reducing gear using fixing screws equipped with new grower washers.
- Fix the hydraulic motor using the four fixing bolts, equipped with new elastic washers.
- Re-install the reducing gear / motor assembly and secure with fixing screws. Tighten to the torque recommended (see tightening torque value table).
- In the case of a steering axle, couple the steering connecting rod to the pivot.
- Reconnect the hydraulic hoses to the hydraulic motor and the reducing gear hose equipped with a new seal, according to the marks made when dismantling.

4 - Additional operations

- Check the level of oil in the wheel reducing gear (see corresponding sheet).
- Put the wheel back (see corresponding sheet).
- Put the machine back into the operational configuration.
- Make several travel movements to purge the hydraulic circuit.
- Check the level of the hydraulic oil tank.

Sheet C035	CORRECTIVE MAINTENANCE SHEET	Folio 2/2
	CHANGING A WHEEL REDUCING GEAR OR A TRAVEL HYDRAULIC MOTOR	

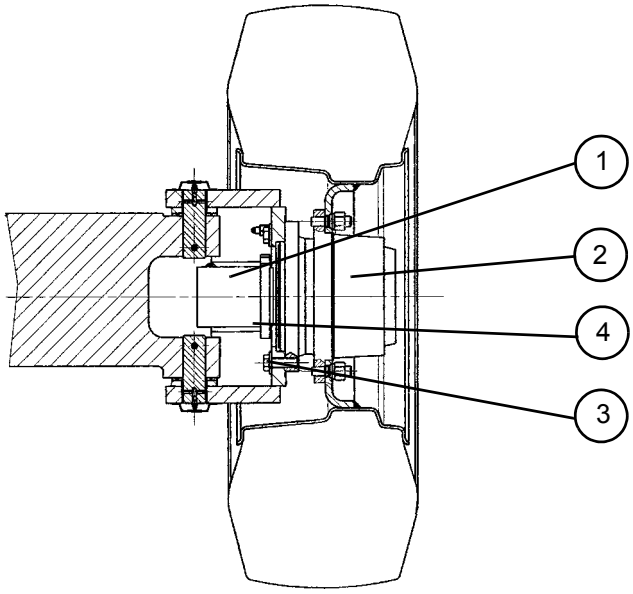

Figure 1

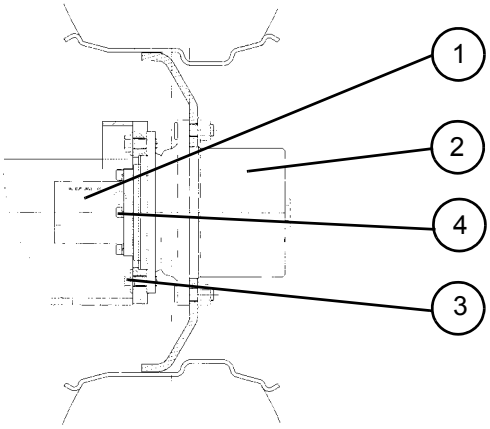

Figure 2

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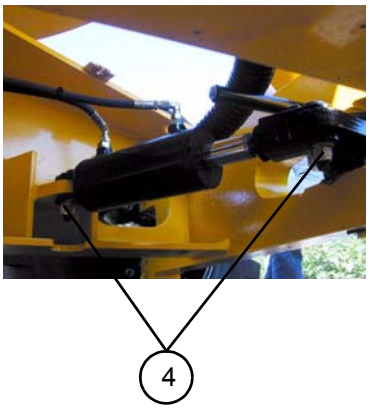
Sheet C038	CORRECTIVE MAINTENANCE SHEET	Folio 1/1
	CHANGING THE STEERING CYLINDER	

Caution!
Ensure that the oil is not too hot.

Caution!
Use a container to collect oil to prevent pollution of the environment.

Caution!
It is essential to put the component in slings before dismantling/re-assembling it.

HA16/18 - HA46/51 JRT



HA16/18 - HA46/51 JRT

7 - Preliminary operations

- Put the machine in the maintenance configuration (see corresponding paragraph).
- Switch off electric power (see corresponding paragraph).

2 - Removing the steering cylinder

- Open the upper chassis cover.
- Mark and disconnect the two hoses (2) of the steering cylinder (1).

NB: Unscrew the hoses slowly to release residual hydraulic pressure.

- Put caps on the hoses.
- Put the cylinder in slings.
- Remove the Nylstop nuts (4) then remove the two fastening pins (3) from the steering cylinder.
- Remove the steering cylinder.

3 - Installing the steering cylinder

- Put a new steering cylinder into place.
- Install the fastening pins and fix using new Nylstop nuts and their washers.
- Reconnect the hydraulic hoses according to the marks made during dismantling.
- Put the machine back into the operational configuration.
- Make several steering movements to purge the hydraulic circuit.
- Check the level of the hydraulic oil tank.

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Sheet C039	CORRECTIVE MAINTEANCE SHEET	Folio 1/1
	CHANGING THE TILT SENSOR	

Caution!
Do not use the machine during maintenance operations.

1 - Preliminary operations

- Put the machine on a flat surface with zero slope.
- Put the machine into the maintenance configuration (see corresponding paragraph).
- Switch off electric power (see corresponding paragraph).

2 - Removing the tilt sensor

- Mark and disconnect the electric connections of the tilt sensor.
- Remove the tilt sensor (2) by unscrewing the fixing bolts (1).

3 - Installing the tilt sensor

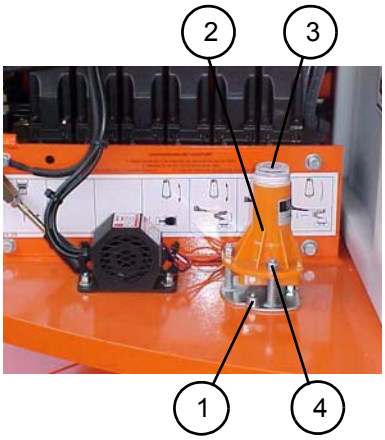
- Put a new tilt sensor into place and fix using the fixing bolts (1).
- Reconnect the electric connections according to the marks made during dismantling.
- Place a spirit level on the top surface of the tilt sensor and set the adjustment screws (4) so that the tilt sensor is level.

NB: The spirit level (3) is built into certain tilt sensors.

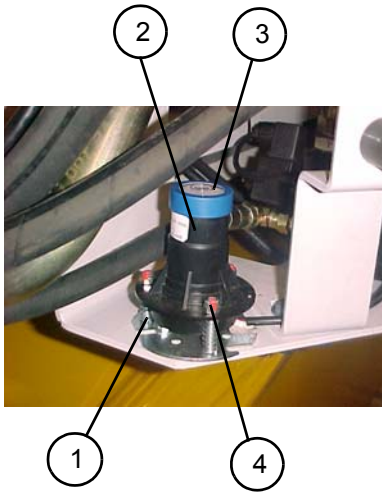
- Put the machine back into the operational configuration.

4 - Tilt sensor operating test

- Extend the machine.
- Tilt the tilt sensor and check that the buzzer sounds.
- Check that after 1 or 2 seconds, extension or travel movements have been disabled.



HA16/18PX - HA46/51 JRT



HA16/18PX nouvelle génération
HA46/51JRT New Design

Caution!
The buzzer should be audible from the basket.

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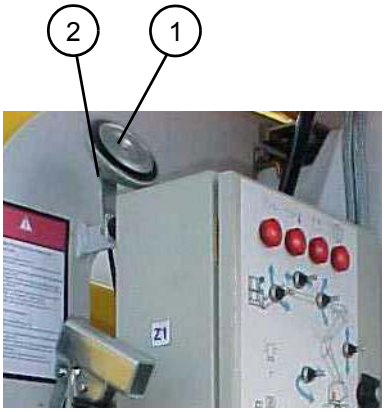
Sheet C040	CORRECTIVE MAINTENANCE SHEET	Folio 1/1
	CHANGING THE HORN	

Caution!
Do not use the machine during maintenance operations.



Caution!
The horn should be audible from the basket.

1 - Preliminary operations
- Switch off electric power (see corresponding paragraph).

2 - Removing the horn
- Mark and disconnect the electric connections from the horn (1).
- Remove the horn, by unscrewing the fixing bolts (2).

3 - Installing the horn
- Put the horn back into place and fix with the fixing bolt.
- Reconnect the electric connections according to the marks made during dismantling.

4 - Test
- Select the top control panel and switch on machine power.
- Put the machine back into the operational configuration.
- Activate the horn switch from the platform control panel and check that the horn sounds.

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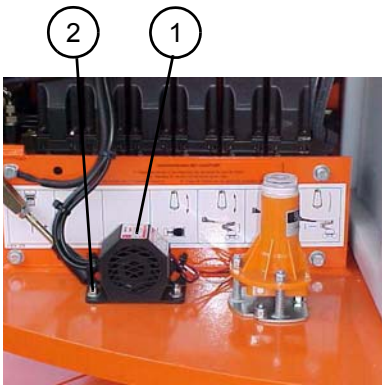
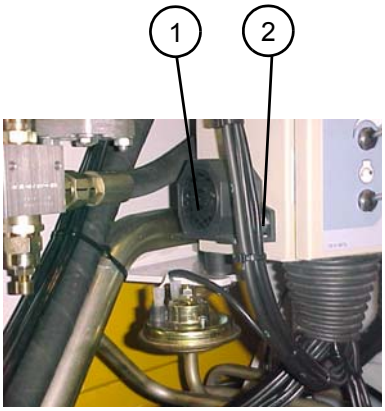
Sheet C041	CORRECTIVE MAINTENANCE SHEET	Folio 1/1
	CHANGING THE TILT SENSOR BUZZER	

Caution!
Do not use the machine during maintenance operations.

HA16/18PX - HA46/51JRT



HA16/18PX New design
HA46/51JRT New Design



Caution!
The buzzer should be audible from the basket.

1 - Preliminary operations
- Switch off electric power (see corresponding paragraph).

2 - Removing the buzzer
- Mark and disconnect the buzzer's electric connections (1).
- Remove the buzzer by unscrewing the fixing bolts (2).

3 - Installing the buzzer
- Put the buzzer back into place and fix with the fixing bolts.
- Reconnect the electric connections according to the marks made during dismantling.

4 - Test
- Put the machine back into the operational configuration.
- Extend the machine, tilt the tilt sensor and check that the buzzer sounds.

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Sheet C042	CORRECTIVE MAINTENANCE SHEET	Folio 1/2
	CHANGING THE HYDRAULIC PUMP	

Caution!
Ensure that the oil is not too hot.

Caution!
Use a container to collect oil to prevent pollution of the environment.

Caution!
It is essential to put the component in slings before dismantling/re-assembling it.

8 - Preliminary operations

- Put the machine in the maintenance configuration (see corresponding paragraph).
- Switch off electric power (see corresponding paragraph).
- Close the shut-off valve, if any. Otherwise, empty the hydraulic tank.

2 - Removing the hydraulic pump

- Mark and disconnect the pump hoses (1).

NB: Unscrew the hoses slowly to release residual hydraulic pressure.

- Put caps on the hoses.
- Remove the pump's fixing screws and washers (2) on the motor flange (3), and remove the pump (5).
- Remove the spined split hub (6) by unscrewing the tightening screw (7).
- Remove the hydraulic unions (4) screwed on the pump (see figure on page 2/2)
- Discard the O-rings.

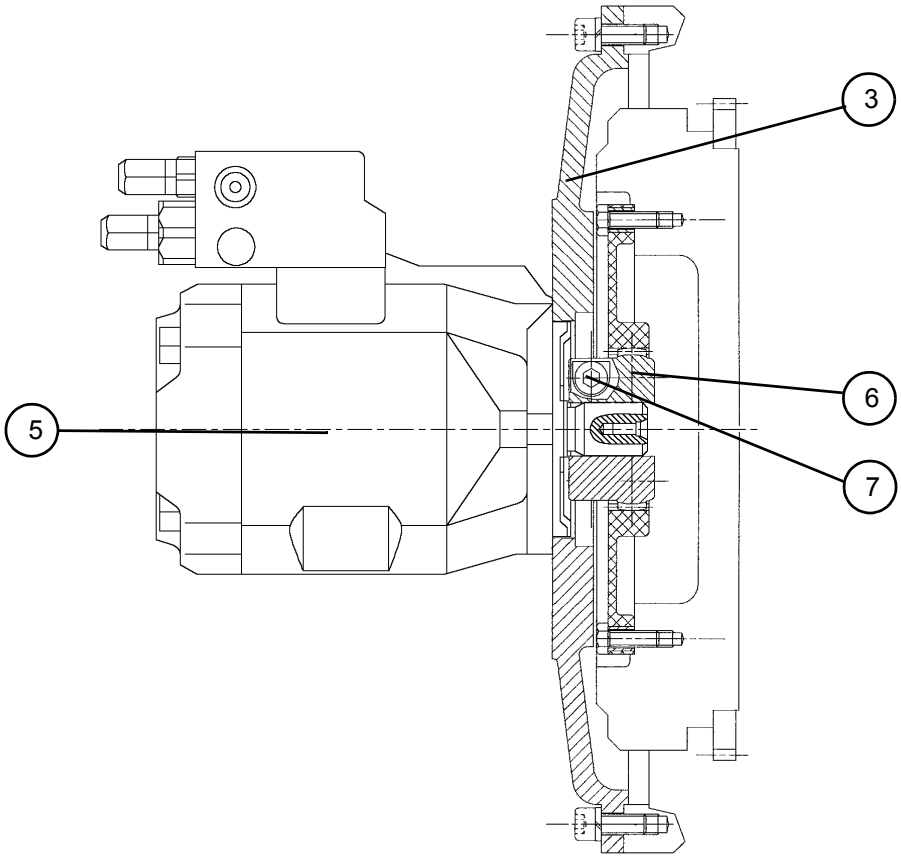
3 - Installing the hydraulic pump

- Fit new O-rings to the unions.
- Screw the hydraulic unions to the pump.
- Lubricate, then install the spined split hub on a new pump.
- Ensure that the spined hub is against the pump shaft shoulder.
- Coat the hub tightening screw with normal blue loctite 243 then tighten to a torque of 83 N.m (61 lb.ft).
- Install the pump on the flange and fix using fixing screws, previously coated with normal blue loctite 243 bleu and fitted with new grower washers. Tighten to a torque of 86 N.m.
- Reconnect the hydraulic hoses according to the marks made during dismantling.
- Open the shut-off valve, if any.
- Check the level of the hydraulic tank and top up if necessary.
- Before re-starting, fill the pump pan with hydraulic oil (hole L).

4 - Additional operations

- Put the machine back into the operational configuration.
- Make several extension cycles to purge the hydraulic circuit.
- Check the level in the hydraulic oil tank
- Adjust pump output, the load sensing pressure limiter and the main pressure limiter (see corresponding sheet).

Sheet C042	CORRECTIVE MAINTENANCE SHEET	Folio 2/2
	CHANGING THE HYDRAULIC PUMP	



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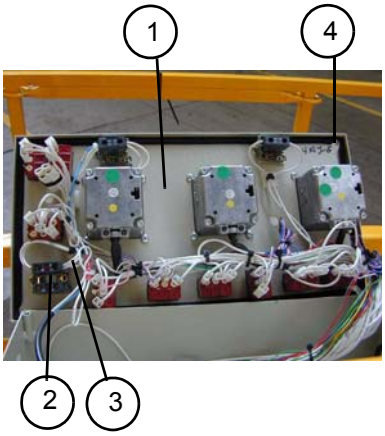
Sheet C043	CORRECTIVE MAINTENANCE SHEET	Folio 1/1
	CHANGING AN ELECTRIC COMPONENT ON THE TOP CONTROL PANEL	

Caution!
Do not use the machine during maintenance operations.



1 - Preliminary operations

- Put the machine in the maintenance configuration (see corresponding paragraph).
- Switch off electric power (see corresponding paragraph).
- Disconnect the «-» then «+» terminals of the starter battery.

2 - Removing a component from the top control panel

- Remove the closing plate (1) by removing the four fixing screws (4).
- Mark and disconect the electric connections (3) of the component to be replaced (2).
- Remove the component.

3 - Installing a component in the top control panel

- Put a new component and seal into place on the front panel of the top control panel.

NB: In the case of a lever switch, adjust the position of the fixing nut and counter-nut so that the switch lever's articulation pin is at the same level as the seal, to ensure tightness.

- Reconnect the electric connections according to the marks made during dismantling.
- Fix the closing plate using the four fixing screws.
- Reconnect the « + » then « - » terminals of the battery.
- Put the machine back into the operational configuration.
- Perform the function corresponding to the replaced component to check that it works properly.

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Sheet C044	CORRECTIVE MAINTENANCE SHEET	Folio 1/1
	CHANGING AN ELECTRIC COMPONENT ON THE BOTTOM CONTROL PANEL	

Caution!
Do not use the machine during maintenance operations.

1 - Preliminary operations

- Put the machine in the maintenance configuration (see corresponding paragraph).
- Switch off electric power (see corresponding paragraph).
- Disconnect the «-» then «+» terminals to isolate the circuit.

2 - Removing a component from the bottom control panel

- Open the door of the bottom control panel (1).
- Mark and disconect the electric connections (3) of the component to be replaced (2).
- Remove the component.

3 - Installing a component in the bottom control panel

- Put a new component and seal into place on the front panel of the bottom control panel.

NB: In the case of a lever switch, adjust the position of the fixing nut and counter-nut so that the switch lever's articulation pin is at the same level as the seal, to ensure tightness.

- Reconnect the electric connections according to the marks made during dismantling.
- Close the door of the bottom control panel.
- Reconnect the « + » then « - » terminals of the battery.

4 - Test

- Put the machine back into the operational configuration.
- Perform the function corresponding to the replaced component to check that it works properly.

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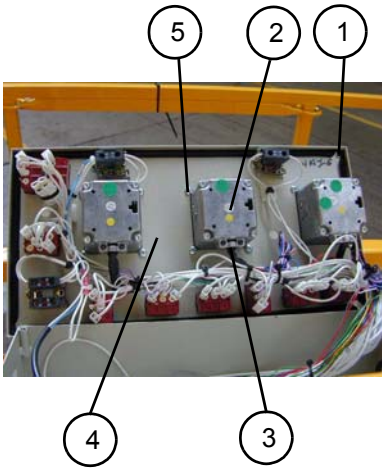
Sheet C045	CORRECTIVE MAINTENANCE SHEET	Folio 1/1
	CHANGING A MANIPULATOR	

Caution!
Do not use the machine during maintenance operations.



1 - Preliminary operations

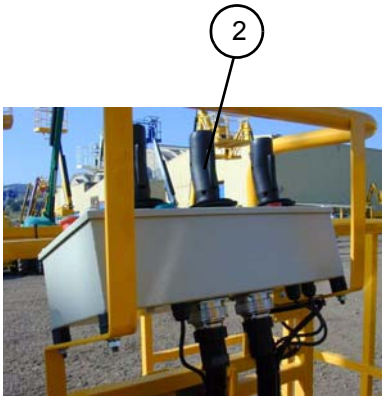
- Put the machine in the maintenance configuration (see corresponding paragraph).
- Switch off electric power (see corresponding paragraph).
- Disconnect the «-» then «+» terminals to isolate the circuit.

2 - Removing a manipulator (2)

- Remove the upper panel (4) of the top control box by removing its fixing screws (1).
- Using cutters, remove the cable clamps from the defective manipulator wires.
- Carefully mark the positions of the different manipulator wires (3) on the top control panel connector.
- Disconnect the wires from the top control panel plug.
- Disconnect the positive wires 211 from the switches, and then the negative wire.
- Remove the fixing screws (5) from the manipulator and take the manipulator out of the box.

3 - Installing a manipulator

- Place the replacement manipulator in position and put back the fixing screws (5).
- Put back the wires (3) in the cable strand and fasten the strand using plastic clamps.
- Fit male reference contacts to the ends of the wires (3).
- Connect the wires in the plug according to the marks made during dismantling.
- Re-connect the supply wires 211 and then the negative wire.
- Put back the upper panel (4) of the box and fix using screws (1).
- Re-connect the « + » then « - » terminals of the battery.
- Put the machine back into its operational configuration.
- Make several movements controlled from the basket to test manipulator operation.



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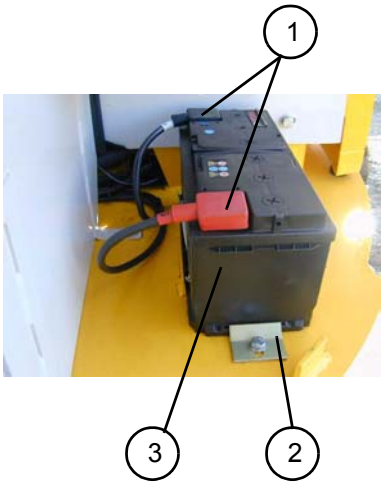
Sheet C046	CORRECTIVE MAINTENANCE SHEET	Folio 1/1
	CHANGING THE STARTER BATTERY	

Caution!
Wear protective goggles and gloves for any operation on the batteries.



1 - Preliminary operations

- Put the machine in the maintenance configuration (see corresponding paragraph).
- Switch off electric power (see corresponding paragraph).

2 - Removing the starter battery

- Disconnect the « - » then « + » terminals (1) of the battery (3).
- Remove the fixing screws from the battery fixing tab and remove the fixing tab (2).
- Remove the battery.

3 - Installing the starter battery

- Put a new battery into place.
- Put back the fixing tab and secure with the fixing screw equipped with a new toothed washer.
- Re-connect the « + » then « - » terminals of the battery and lubricate them to improve contact.
- Put the machine back into its operational configuration.
- Start the machine to check that the battery works properly.

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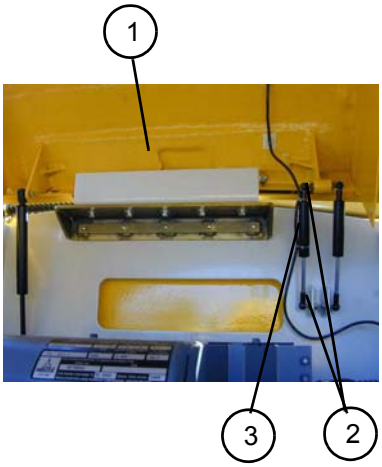
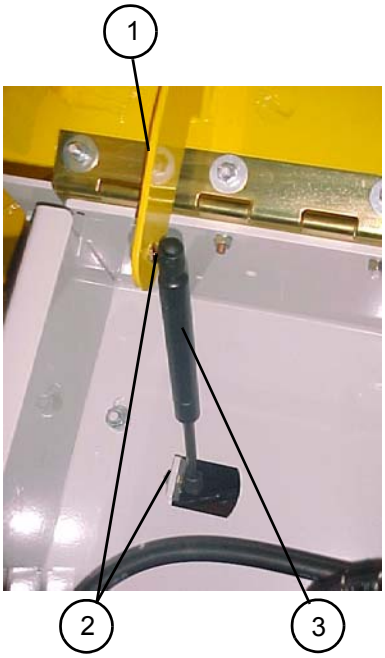
Sheet C047	CORRECTIVE MAINTENANCE SHEET	Folio 1/1
	CHANGING A COVER GAS SPRING	

Caution!
Do not use the machine during maintenance operations.

HA16/18PX - HA46/51JRT



HA16/18 PX New design
HA46/51JRT New Design



1 - Preliminary operations

- Put the machine in the maintenance configuration (see corresponding paragraph).
- Switch off electric power (see corresponding paragraph).

2 - Removing a gas spring

- Open the cover (1) concerned.
- Put the cover in slings.
- Remove the fixing nuts and washers (2) at both ends of the gas spring (3).

3 - Installing a gas spring

- Put a new gas spring into place and fix at both ends using the fixing nuts and washers.
- Put the machine back into the operational configuration.
- Check that the cover opens and closes correctly.

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Sheet C050	CORRECTIVE MAINTENANCE SHEET	Folio 1/1
	CHANGING THE TURNTABLE ROTATION HYDRAULIC MOTOR	

Caution!
Ensure that the oil is not too hot.

Caution!
Put the turntable rotation blocking pin into place.

Caution!
Use a container to collect oil to prevent pollution of the environment.

Caution!
It is essential to put the component in slings before dismantling/re-assembling it.

1 - Preliminary operations

- Put the machine in the maintenance configuration (see corresponding paragraph).
- Switch off electric power (see corresponding paragraph).

2 - Removing the hydraulic motor

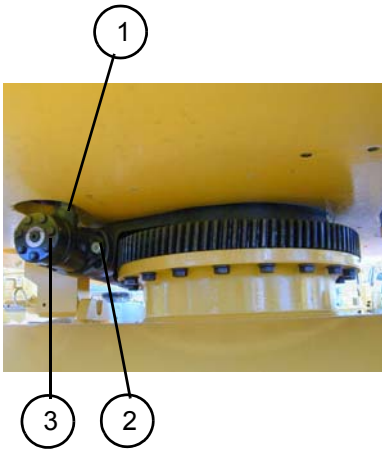
- Mark and disconnect the hoses (1) of the hydraulic motor (3).

NB: Unscrew the hoses slowly to release residual hydraulic pressure.

- Fit caps to the hoses.
- Place a wedge under the hydraulic motor.
- Remove the hydraulic motor by removing its fixing bolts (2).

3 - Installing the hydraulic motor

- Put a new hydraulic motor into place.
- Fix the hydraulic motor using fixing bolts equipped with new spring washers.
- Re-connect the hydraulic hoses according to the marks made during dismantling.
- Put the machine back into the operational configuration.
- Remove the turntable rotation blocking pin.
- Make several turntable rotation movements to purge the hydraulic circuit.
- Check the level of the hydraulic oil tank.



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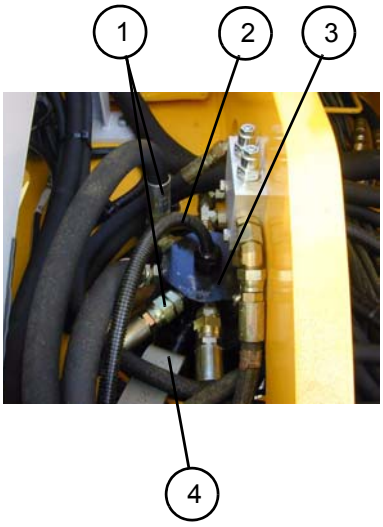
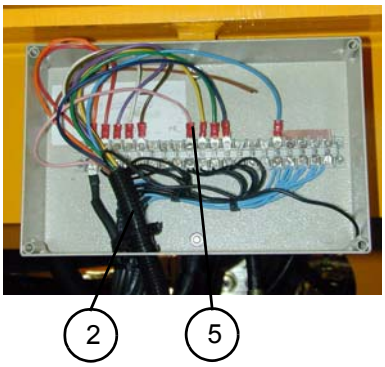
Sheet C051	CORRECTIVE MAINTENANCE SHEET	Folio 1/1
	CHANGING THE SWING JOINT	

Caution!
Ensure that the oil is not too hot.

Caution!
Use a container to collect oil to prevent pollution of the environment.

Caution!
It is essential to put the component in slings before dismantling/re-assembling it.





1 - Preliminary operations

- Lift the arms sufficiently to enable access to the swing joint.
- Place wedges under the arm to support it.
- Put the machine in the maintenance configuration (see corresponding paragraph).
- Switch off electric power (see corresponding paragraph).
- Block turntable rotation using the blocking pin.

2 - Removing the swing joint

- Open the chassis box, mark and disconnect all electric connectors (5).
- Remove the wiring harness (2) that passes through the swing joint.
- Mark and disconnect the hoses and hydraulic caps (1) on the swing joint (3), turntable and the bottom of the chassis.

NB: Unscrew the hoses slowly to release residual hydrualic pressure.

- Put caps on the hoses.
- Put the swing joint into slings.
- Remove the stop (4) of the swing joint by removing the 2 fixing screws.
- Remove the 3 fixing screws from the swing joint on the chassis.
- Remove the swing joint.

3 - Installing the swing joint

- Put the swing joint into place and fix with the fixing screws equipped with new washers.
- Block swing joint rotation using the swing joint stop.
- Fix the swing joint stop using the two fixing screws equipped with new washers.
- Re-connect the hydraulic hoses and caps on the swing joint according to the marks made during dismantling.
- Pass the wiring harness through the swing joint and re-connect the electric connections in the chassis box according to the marks made during dismantling.

4 - Additional operations

- Put the machine back into the operational configuration.
- Remove the wedges from under the arm.
- Make several steering and travel movements, using all possible travel speeds to purge the hydraulic circuit.
- Check the level of the hydraulic oil tank.

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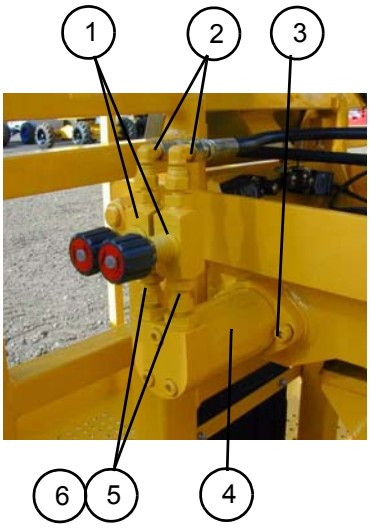
Sheet C052	CORRECTIVE MAINTENANCE SHEET	Folio 1/1
	CHANGING THE BASKET ROTATION HYDRAULIC MOTOR	

Caution!
Ensure that the oil is not too hot.

Caution!
Use a container to collect oil to prevent pollution of the environment.



1 - Preliminary operations

- Put the machine in the maintenance configuration (see corresponding paragraph).
- Switch off electric power (see corresponding paragraph).

2 - Removing the hydraulic motor

- Mark and disconnect the hoses (2) from the hydraulic motor (4).

NB: Unscrew the hoses slowly to release residual hydrualic pressure.

- Fit caps to the hoses.
- Remove the flow limiters (1) by unscrewing the unions (5) and adapters (6).
- Remove the hydraulic motor by unscrewing its fixing screws (3).

3 - Installing the hydraulic motor

- Replace the flow limiters if necessary.
- Put a new hydraulic motor into place.
- Fix the hydraulic motor using fixing screws equipped with new grower washers.
- Screw the unions, adapters and flow limiters onto the motor.
- Reconnect the hydraulic hoses according to the marks made during dismantling (see table of tightening torque values).
- Put the machine back into the operational configuration.
- Make several platform rotation movements to purge the hydraulic circuit and adjust rotation speed using the flow limiter adjustment buttons (see Table of adjustment times).
- Check the level of the hydraulic oil tank.

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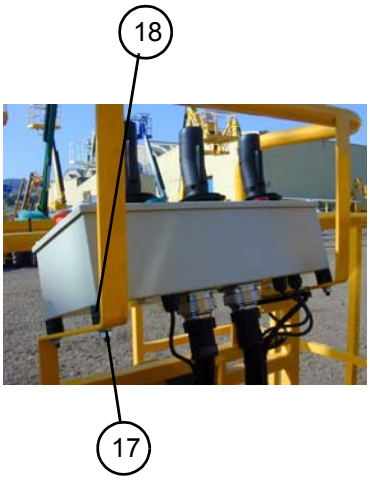
Sheet C053	CORRECTIVE MAINTENANCE SHEET	Folio 1/3
	CHANGING THE BASKET	

Caution!
It is essential to put the component in slings before dismantling/re-assembling it.



1 - Preliminary operations

- Put the machine in the maintenance configuration (see corresponding paragraph).
- Switch off electric power (see corresponding paragraph).
- Disconnect the « - » then « + » terminals of the starter battery.

2 - Removing the platform

- Disconnect the platform control panel electric wiring harness.
- Remove the control panel fixing screws (17).
- Remove the control panel and its silent blocks (18).
- Remove the platform's electric plug (19), if any, by unscrewing its fixing bolts.
- Put the platform in slings.
- Remove the pre-stressing stop by unscrewing the screw (1) and nut (2).

Upper part

- Remove the Nylstop nut (3) and its washer (4) on the platform side.
- Remove the stop pad (5) on the platform side.
- Remove the weighing articulation pin (6).

Lower part

- Remove the lower pivot pin (7) by removing its fixing screws (8) and washer (9).
- Remove the platform and retain the ball (10), the nylatron washer (11) and the stop (12).
- If necessary, unscrew the pre-stressing nut totally (13) as a safety measure, before performing any operation on the platform.

3 - Installing the platform

- Check the condition of the elastic parts and wearing parts, and replace if necessary (spring washers (14), collar rings (15), ring (16), nylatron washer (11), control panel silent blocks, circlips).

Lower part

- If necessary, adjust the pre-stressing system by tightening the pre-stressing nut (13), so that the washers are 108 mm high (see figure 3).
- Put the platform into place, taking care to put the ball (10), nylatron washer (11) and stop (12) in the right places.
- Lubricate the bore and put the lower pivot (7) into place. Fix using the fixing screw (8) and washer (9).

NB: Only use lubricants recommended by the manufacturer.

Upper part

- Lubricate then put back the weighing articulation pin (6).
- Put back the stop tab (5).
- Install the Nylstop nut (3) and its washer (4).
- Adjust the stop for the pre-stressing system by tightening the screw (1) and the nut (2).
- Put the control panel into place on its silent blocks and fix using the screws equipped with new washers.
- Reconnect the control panel wiring harness.

Sheet C053	CORRECTIVE MAINTENANCE SHEET	Folio 2/3
	CHANGING THE BASKET	

- If necessary, put the platform's electric plug back into place and fix using its fixing bolts equipped with new toothed washers.
- Reconnect the « + » then « - » terminals of the starter battery.
- Put the machine back into the operational configuration.
- Adjust the weighing contactors (see corresponding sheet).

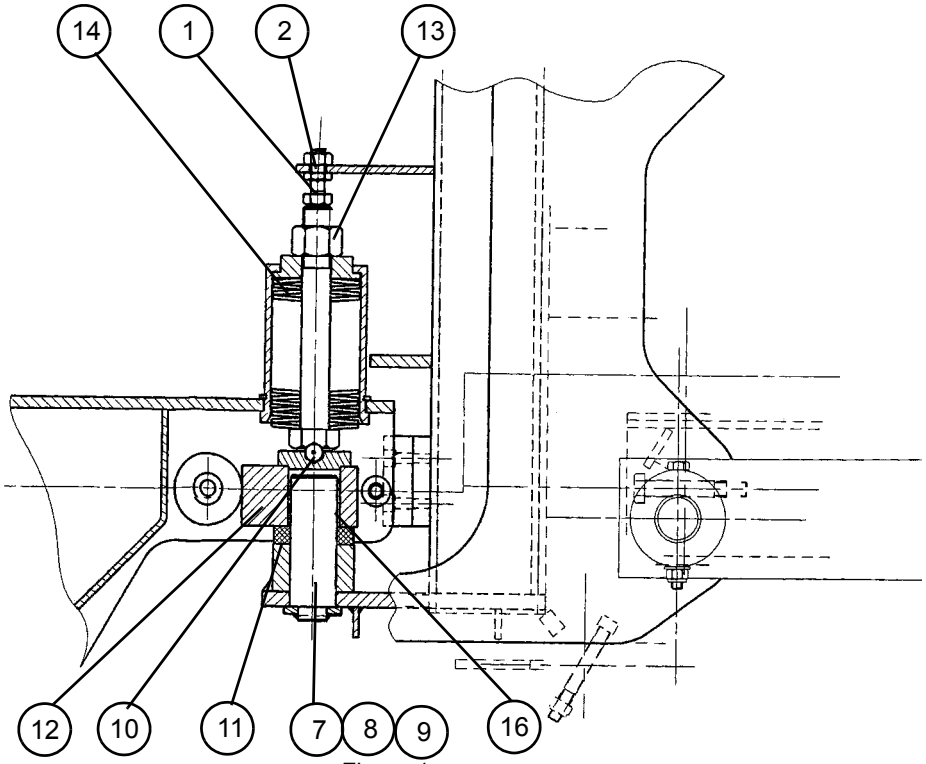
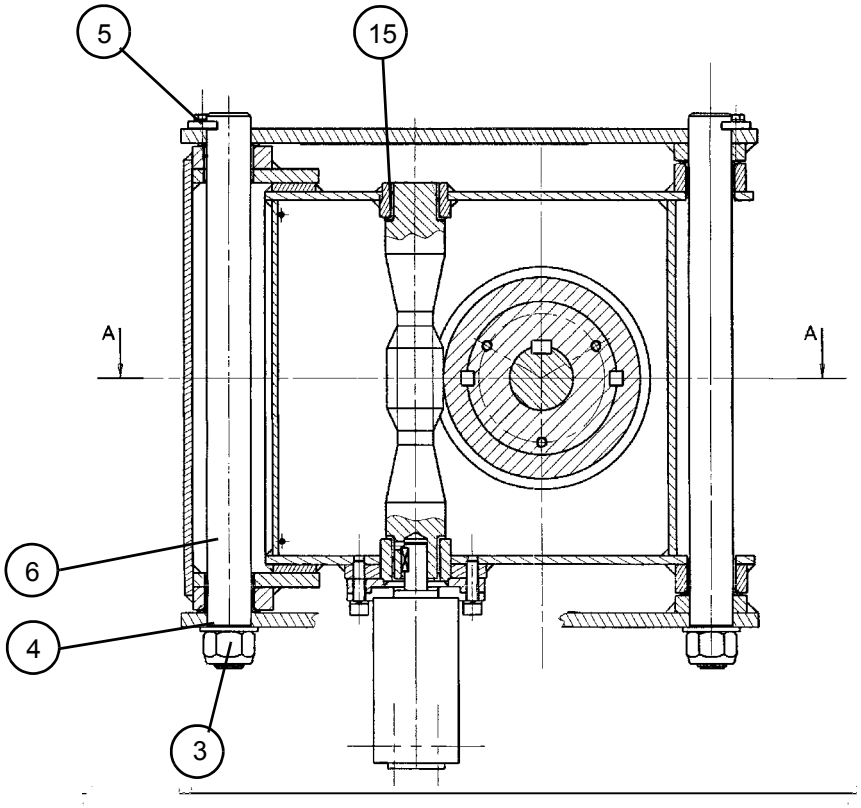


Figure 1



Sheet C053	CORRECTIVE MAINTENANCE SHEET	Folio 3/3
	CHANGING THE BASKET	

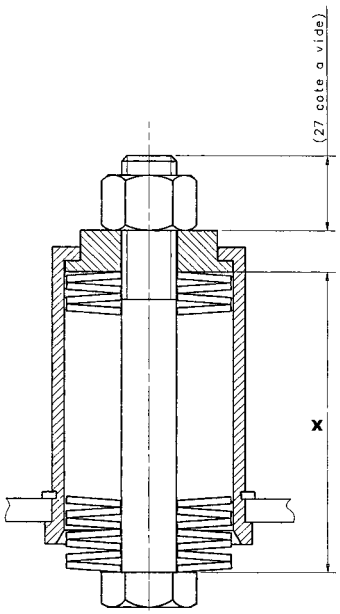


Figure 3

X =

HA16/18PX - HA46/51JRT = 108 mm / 4.25 in

H21T - HB62 = 103 mm / 4.055 in

H23T/TP - H25TP - HB68J - HB76J = 108 mm / 4.25 in

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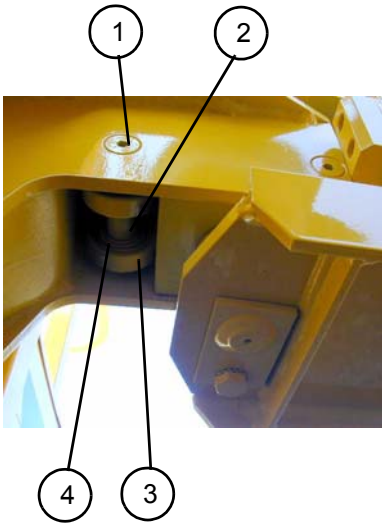
Sheet C054	CORRECTIVE MAINTENANCE SHEET	Folio 1/1
	CHANGING A WEIGHING SYSTEM ROLLING BEARING	



1 - Preliminary operations

- Put the machine in the maintenance configuration (see corresponding paragraph).
- Switch off electric power (see corresponding paragraph).
- Remove the basket (see corresponding sheet).

2 - Removing the rolling bearing

- Remove the screws (1) from the rolling bearing track.
- Remove the rolling bearing track (2).
- Remove the circlips (4), then the ball bearings (3).

3 - Installing the rolling bearing

- Put new rolling elements on the bearing track. Block in travel using the circlips.
- Lubricate the rolling bearings.

NB: Only use lubricants recommended by the manufacturer.

- Re-install the basket (see corresponding sheet).
- Put the machine back in the operational configuration.

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Sheet C055	CORRECTIVE MAINTENANCE SHEET	Folio 1/2
	CHANGING THE BASKET ROTATION GEARING	

1 - Preliminary operations

- Put the machine in the maintenance configuration (see corresponding paragraph).
- Switch off electric power (see corresponding paragraph).
- Remove the basket (see corresponding sheet).
- Remove the basket rotation hydraulic motor (see corresponding sheet).

Caution!
It is essential to put the component into slings before dismantling/re-assembling it.

2 - Removing the gearing

- Remove the motor fixing flange (1).
- Remove the endless screw (2) and adjustment washers (3), if any.
- Remove the Stauff collar fixing screw (4). Retain the toothed washer (5), spacer (6) and spacer washer (7).
- Remove the cap (8), then the platform link part (9) and Nylatron washer (10).
- Remove the nylstop nut (11), bushing (12), elastic washers (13), plate (14).
- Remove the articulation pin assembly (15) then the disk (16) and pad (17).
- Remove the screws and washers (18) and (19) and remove the pin (15), tangent wheel (22), keys (17), hub (20), key (21),

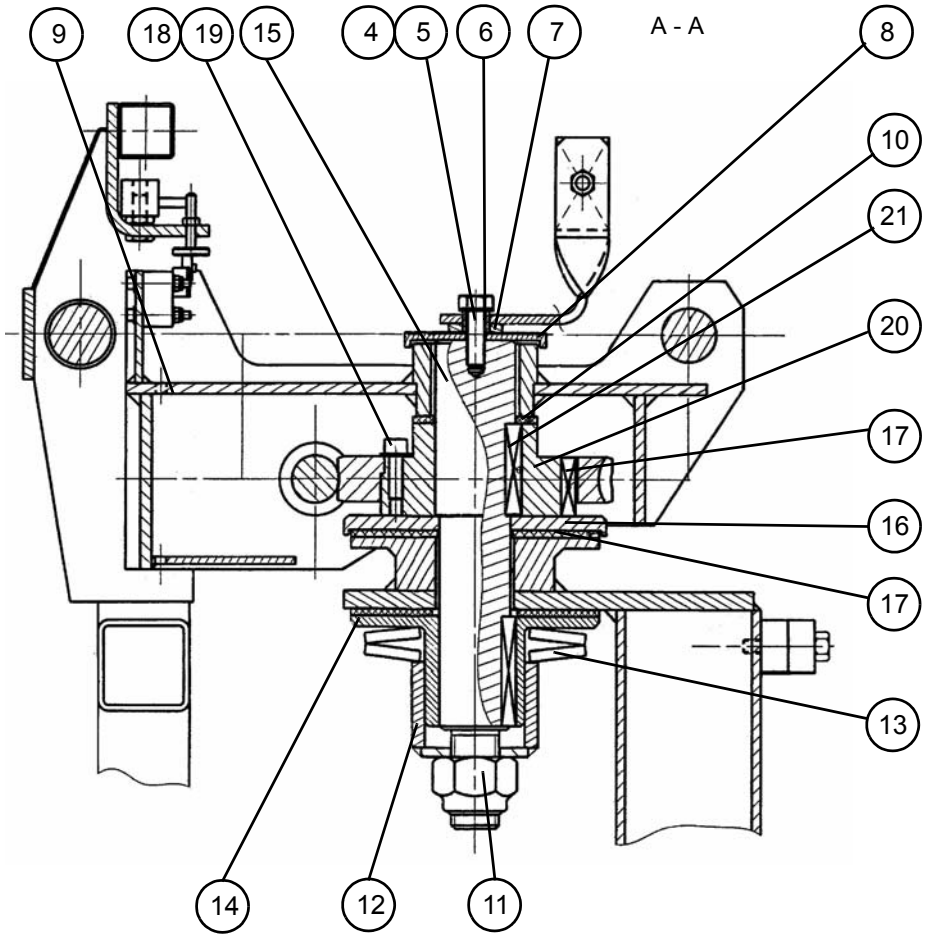
3 - Installing the gearing

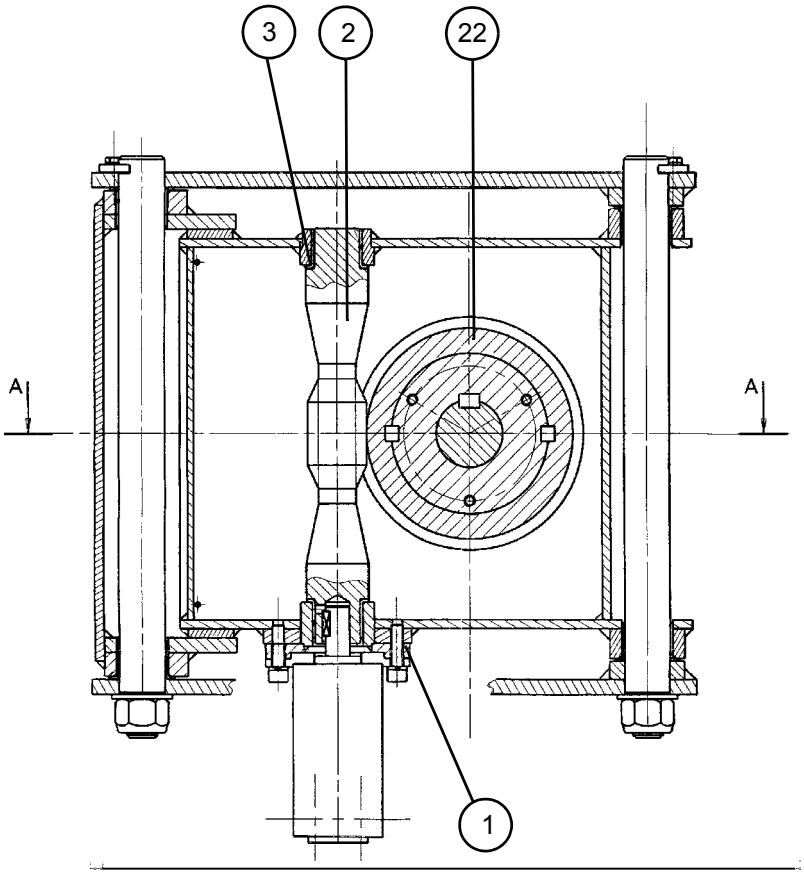
- Replace rings, pads and keys if necessary.
- Put into place on the articulation pin (15), the key (21), hub (20), 2 keys (17), tangent wheel (22). Put back screws and washers (18) and (19).
- Put the disk (16) and pad (17) into place, then the articulation pin assembly (15).
- Put into place the plate (14), elastic washers (13), bushing (12), then the nylstop nut (11).
- Put into place the Nylatron washer (10), platform link part (9), cap (8), spacer washer (7), spacer (6) and Stauff collar.
- Fix the assembly using the screw (4) eqipped with a new toothed washer.
- Install the endless screw (2) and adjustment washers (3) if necessary.
- Install the motor fixing flange (1).
- Install the basket rotation hydraulic motor (see corresponding sheet).
- Install the basket (see corresponding sheet).
- Lubricate the gearing.

NB: Only use lubricants recommended by the manufacturer.

- Put the machine back into the operational configuration.

Sheet C055	CORRECTIVE MAINTENANCE SHEET	Folio 2/2
	CHANGING THE BASKET ROTATION GEARING	





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Sheet C056	CORRECTIVE MAINTENANCE SHEET	Folio 1/1
	CHANGING THE HYDRAULIC FILTER	

Caution!
Ensure that the oil is not too hot.

Caution!
Use a container to collect oil to prevent pollution of the environment.

HA16/18PX - HA46/51JRT

H14/16TPX - HB40/44J

1 - Preliminary operations

- Put the machine in the maintenance configuration (see corresponding paragraph).
- Switch off electric power (see corresponding paragraph).
- Close the shut-off valve, if any. Otherwise, empty the hydraulic tank.

2 - Removing the hydraulic filter

- Disconnect the hydraulic filter hoses (1).

NB: Unscrew the hoses slowly to release residual hydraulic pressure.

- Fit caps to the hoses.
- Unscrew the fixing screws (2) and remove the hydraulic filter.
- Remove the two connectors (3) from the hydraulic filter.

3 - Installing the hydraulic filter

- Install the two connectors on a new hydraulic filter (see the table of tightening torque values).
- Put the equipped hydraulic filter back into place, respecting the oil flow direction and fix using the fixing screws.
- Reconnect the hydraulic hoses.
- Put the machine back into the operational configuration.
- Make several lifting cycles to purge the hydraulic circuit.

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	CORRECTIVE MAINTENANCE SHEET	

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Sheet C058	CORRECTIVE MAINTENANCE SHEET	Folio 1/1
	CHANGING THE U1 ELECTRONIC MODULE	

Caution!
Computers are not interchangeable, they have a serial number corresponding to a given machine. If this rule is ignored, dangerous malfunctions may occur.

1 - Preliminary operations

- Put the machine in the maintenance configuration (see corresponding paragraph).
- Switch off electric power (see corresponding paragraph).
- Disconnect the « - » then « + » terminals of the starter battery to isolate the electric circuit.

2 - Removing the U1 electronic module

- Open the turntable electric box.
- Remove the fixing flange (2) from the U1 electronic module.
- Remove the U1 electronic module.

3 - Installing the U1 electronic module

- Install a new U1 electronic module, previously programmed by the manufacturer.
- Install the fixing flange.
- Close the electric box.
- Reconnect the « + » then « - » terminals of the starter battery.
- Put the machine back into the operational configuration.
- Check that the U1 electronic module works perfectly using the check list for the machine concerned.

4 - Testing the U1 electronic module

- Make all movements from the bottom control panel for two seconds.
- Make all movements from the top control panel for two seconds.
- Lift the jib (> 0°)
- Make a travel movement with the selector on high speed and check that movement speed is actually micro-speed.
- Lower the jib.
- Lift the arm to 3 metres.
- Make a travel movement with the selector on high speed and check that movement speed is actually micro-speed.
- Lower the arm.
- Lift the boom.
- Make a travel movement with the selector on high speed and check that movement speed is actually micro-speed.
- Lower the boom.

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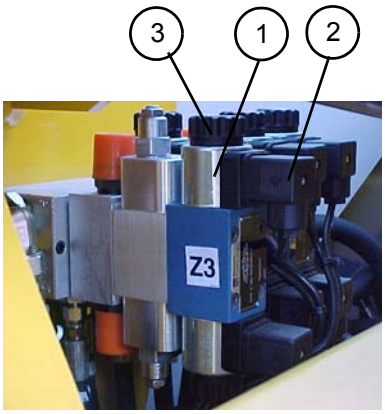
Sheet C059	CORRECTIVE MAINTENANCE SHEET	Folio 1/1
	CHANGING A COIL	



1 - Preliminary operations

- Put the machine in the maintenance configuration (see corresponding paragraph).
- Switch off electric power (see corresponding paragraph).

2 - Removing a coil

- Disconnect the electric connector (2) from the coil concerned.
- Unscrew the nut (3) and remove the coil (1).

3 - Installing a coil

- Put a new coil into place (1) and fix with the nut (3).
- Reconnect the electric connector (2) to the coil.
- Put the machine back into the operational configuration.
- Check proper operation by making the movement corresponding to the replaced coil.

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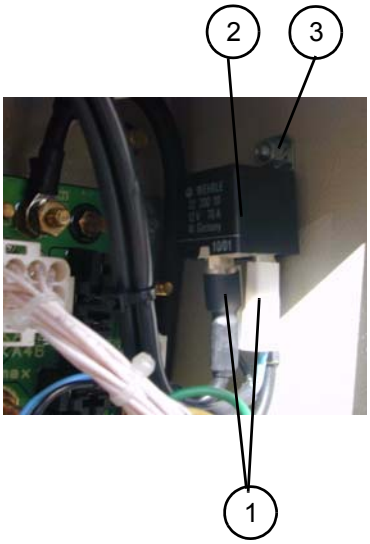
Sheet C062	CORRECTIVE MAINTENANCE SHEET	Folio 1/1
	CHANGING A RELAY	



1 - Preliminary operations

- Put the machine in the maintenance configuration (see corresponding paragraph).
- Switch off electric power (see corresponding paragraph).
- Disconnect the « - » then « + » terminals of the starter battery.

2 - Removing a relay

- Open the turntable electric box.
- Mark and disconnect the electric connections (1) of the relay (2).
- Remove the relay by removing the fixing bolt (3).

3 - Installing a relay

- Put a new relay into place and fix using its bolt equipped with a new grower washer.
- Reconnect the electric connections according to the marks made during dismantling.
- Close the turntable box.
- Reconnect the « + » then « - » terminals of the starter battery.
- Put the machine back into the operational configuration.

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Sheet C062	CORRECTIVE MAINTENANCE SHEET	
	CHANGING A RELAY	

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Sheet C063	CORRECTIVE MAINTENANCE SHEET	Folio 1/1
	CHANGING THE PRINTED CIRCUIT	

1 - Preliminary operations

- Put the machine in the maintenance configuration (see corresponding paragraph).
- Switch off electric power (see corresponding paragraph).
- Disconnect the « - » then « + » terminals of the starter battery.

2 - Removing the printed circuit

- Open the turntable electric box.
- Carefully mark and disconnect all the electric connections (1) of the printed circuit (2).
- Remove the U1 electronic module (4) (see corresponding sheet)
- Remove the bolts (3) fixing the board to the box and their sealing washers.
- Remove the printed circuit and silent-blocks equipping the fixing bolts.

3 - Installing the printed circuit

- Put a new printed circuit into place and fix using the bolts equipped with silent blocks, sealing rings and new toothed washers.
- Install the U1 electronic module (see corresponding sheet).
- Reconnect the electric connections according to the marks made during dismantling.
- Close the turntable box.
- Reconnect the « + » then « - » terminals of the starter battery.
- Put the machine back into the operational configuration.
- Test the printed circuit.

4 - Testing the printed circuit

- Perform the computer operating test (see «changing the U1 electronic module» sheet).

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Sheet C064	CORRECTIVE MAINTENANCE SHEET	Folio 1/1
	CHANGING THE FAIL-SAFE PEDAL	

1 - Preliminary operations

- Put the machine in the maintenance configuration (see corresponding paragraph).
- Switch off electric power (see corresponding paragraph).
- Disconnect the « - » then « + » terminals of the starter battery.

2 - Removing the fail-safe pedal

- Open the platform electric box.
- Mark and disconnect the electric connections (1) of the fail-safe pedal (2) in the box.
- Mark the pedal cabling path (1) along the vertical platform parts and then cut the fixing collars (3).
- Remove the pedal by removing the pedal's fixing bolts (4) and their washers.

3 - Installing the fail-safe pedal

- Put a new pedal into place and fix using the bolts and their washers.
- Reconnect the electric connections in the box, according to the marks made during dismantling.
- Close the platform box.
- Fix the electric cable to the vertical platform parts using collars.
- Reconnect the « + » then « - » terminals of the starter battery.
- Put the machine back into the operational configuration.
- Check that movements from the platform are possible only if the fail-safe pedal is pressed.

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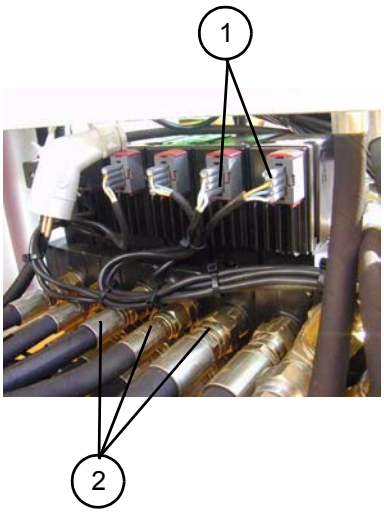
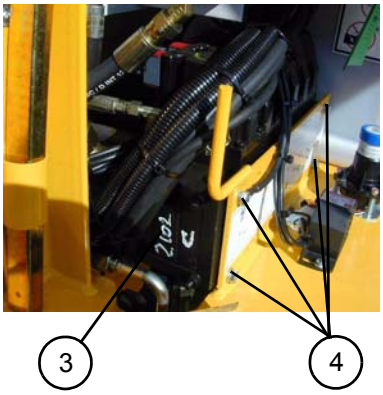
Sheet C066	CORRECTIVE MAINTENANCE SHEET	Folio 1/1
	CHANGING THE DISTRIBUTION HYDRAULIC BLOCK	

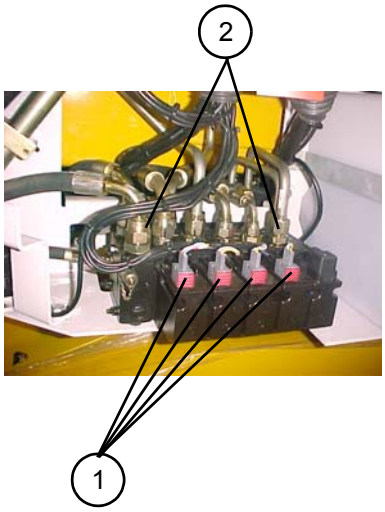
Caution!
Ensure that the oil is not too hot.

HA16/18PX - HA46/51JRT





HA16/18PX New Design



HA46/51JRT New Design

1 - Preliminary operations

- Put the machine in the maintenance configuration (see corresponding paragraph).
- Switch off electric power (see corresponding paragraph).

2 - Removing the hydraulic block

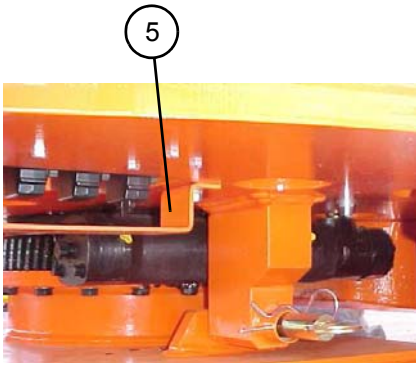
- Mark and disconnect the hydraulic block's (1) electric connections (2).
- Mark and disconnect the hoses (4) of the hydraulic block.

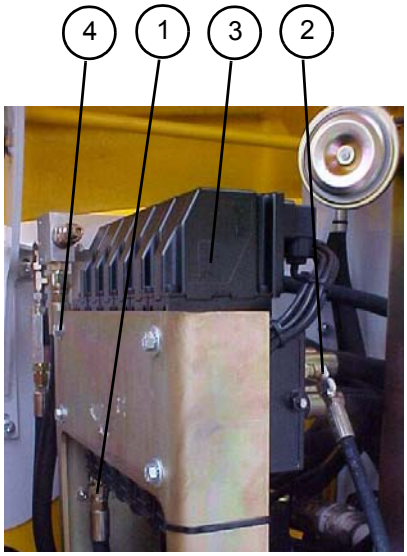
NB: Unscrew the hoses slowly to release residual hydraulic pressure.

- Fit caps to the hoses.
- Remove the lower protective plate (5) (only in presence of this one).
- Place a wedge under the hydraulic block.
- Remove the hydraulic block by removing the fixing screws and washers (4).
- Take out the block from the turntable.
- Dismantle the hydraulic block to replace one of its elements if necessary (see corresponding sheet).

3 - Installing the distribution hydraulic block

- When installing a new distribution block, equip the new block with the unions retained from the old block, after replacing the O-rings. Tighten to the recommended torque (see corresponding paragraph).
- Put the hydraulic block into place and fix using the screws equipped with new toothed washers.
- Install the lower protective plate.
- Reconnect the hydraulic hoses according to the marks made during dismantling. Tighten to the recommended torque (see corresponding paragraph).
- Reconnect the hydraulic block's electric connections, according to the marks made during dismantling.
- Put the machine back into the operational configuration.
- Make several lifting, travel, steering and turntable rotation movements to purge the hydraulic circuit and test block operation.
- Check the level of the hydraulic oil tank.





H14/16 - HB40/44J

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	CORRECTIVE MAINTENANCE SHEET	

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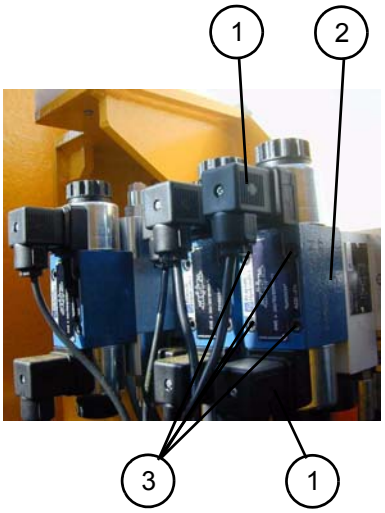
Sheet C067	CORRECTIVE MAINTENANCE SHEET	Folio 1/1
	CHANGING AN ELECTROVALVE	

Caution!
Ensure that the oil is not too hot.

Caution!
Use a container to collect oil to prevent pollution of the environment.



1 - Preliminary operations

- Put the machine in the maintenance configuration (see corresponding paragraph).
- Switch off electric power (see corresponding paragraph).

2 - Removing an electrovalve

- Mark and disconnect the electric connections(1) of the coils.
- Mark the installation position of the electrovalve on the block.
- Unscrew the four fixing screws (3) of the electrovalve (2) and remove.

3 - Installing an electrovalve

- Put a new electrovalve equipped with its seals into place and fix using the 4 screws, in the position of the electrovalve on the block. Tighten to the recommended torque (see corresponding paragraph).
- Reconnect the electrovalve's electric connections, according to the marks made during dismantling.
- Put the machine back into the operational configuration.
- Make several movement cycles using the replaced electrovalve to purge the hydraulic circuit.
- Check the level of the hydraulic oil tank.

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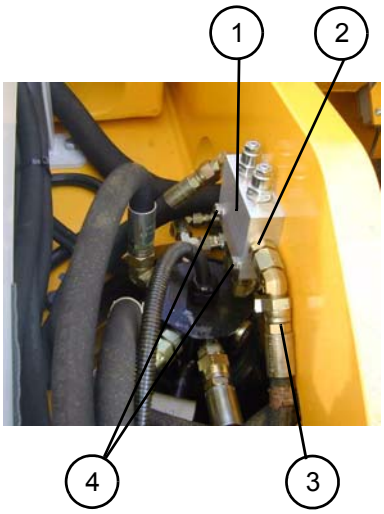
Sheet C068	CORRECTIVE MAINTENANCE SHEET	Folio 1/1
	CHANGING THE DOUBLE BALANCING VALVE OF THE ROTATION FUNCTION	

Caution!
Ensure that the oil is not too hot.



Caution!
Balancing valves are safety elements. They are calibrated in the plant and must not be re-adjusted.

1 - Preliminary operations

- Put the machine in the maintenance configuration (see corresponding paragraph).
- Switch off electric power (see corresponding paragraph).

2 - Removing a double balancing valve

- Mark and disconnect the four hydraulic hoses (3) on the double balancing valve unit (1).

NB: Unscrew the hoses slowly to release residual hydraulic pressure.

- Fit the hoses with caps.
- Remove the unit's 4 unions (2).
- Remove the unit (1) by unscrewing the 2 fixing bolts (4).

3 - Installing a double balancing valve

- Put a new unit into place and fix with the two bolts, equipped with new toothed washers.
- Put the four unions equipped with new O-rings back onto the unit. Tighten to the recommended torque (see corresponding paragraph).
- Reconnect the hydraulic hoses, according to the marks made during dismantling. Tighten to the recommended torque (see corresponding paragraph).
- Put the machine back into the operational configuration.
- Make several movement cycles using the replaced double balancing valve to purge the hydraulic circuit.
- Check the level of the hydraulic oil tank.

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Sheet C069	CORRECTIVE MAINTENANCE SHEET	Folio 1/2
	DISMANTLING / RE-ASSEMBLING THE JIB	

Caution!
Ensure that the oil is not too hot.

Caution!
Make sure that the lifting equipment is in good condition and of sufficient capacity.

Caution!
Use a container to collect oil to prevent pollution of the environment.

Caution!
It is essential to put the component in slings before dismantling/re-assembling it.

1 - Preliminary operations

- Put the machine in the maintenance configuration (see corresponding paragraph).
- Switch off electric power (see corresponding paragraph).
- Remove contactor SQ2 (see corresponding sheet).

2 - Removing the platform+support assembly

- Mark and disconnect the electric connections at the platform box.
- Mark and disconnect the hydraulic hoses of the platform rotation motor and the jib cylinder (1).

NB: Unscrew the hoses slowly to release residual hydraulic pressure.

- Fit caps to the hoses.
- Open the two cable passage collars on the platform, and the three collars along the jib.
- Mark the path of the electric cables and hoses, then remove all cables passing along the length of the jib.
- Put the platform into slings.
- Put the jib cylinder (1) and vertical elements (2) and (3) into slings.
- Remove the four bolts and pin stop rings (5) fixing the platform assembly (4).
- Remove the two Mécanindus pins blocking the pins (5).
- Remove the two pins (5) and remove the platform assembly.

3 - Removing the jib

- Mark the position of the cam (6) of sensor SQ2 (7).
- Remove the two pins (8) fixing the jib to the jib link part, as described above, then remove the vertical parts of the jib (2) and (3) and the cylinder (1).

4 - Removing the jib link part (9)

- Put the jib link part into slings (9).
- Put the receiver compensation cylinder into slings (10).
- Remove the Mécanindus pin blocking the pin, then remove the pin (11) of the receiver compensation cylinder (10).
- Remove the male clevis blocking the link part rotation pin (12) by removing its fixing screw.
- Remove the rotation pin (12) then remove the jib link part (9).

5 - Installing the jib link part

NB: Lubricate all bores before re-installing the pins.
Only use lubricants recommended by the manufacturer.

- Check the condition of the rings of the different jib pins, and replace if necessary.
- Put the jib link part back into place.
- Install the link part rotation pin.
- Install the clevis and block using the screw, previously coated with normal blue loctite 243.
- Install the receiver compensation cylinder pin and block with a new Mécanindus pin.

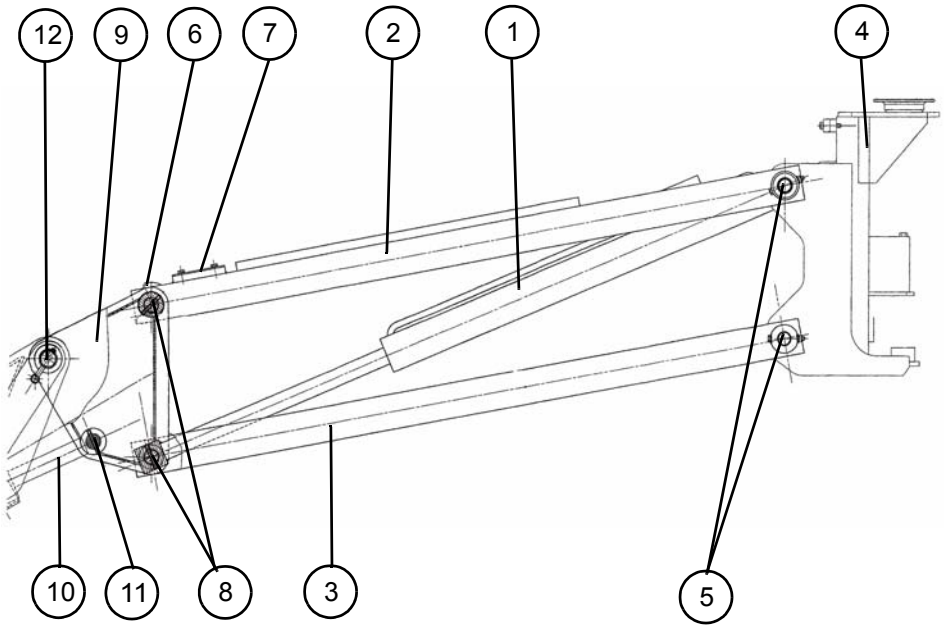
Sheet C069	CORRECTIVE MAINTENANCE SHEET	Folio 2/2
	DISMANTLING / RE-ASSEMBLING THE JIB	

6 - Installing the jib

- Put the jib and its cylinder into place and install the articulation pins.
- Fix the pins with Mécanindus pins.
- Install the 3 stop rings and the contactor SQ2 cam in the positions marked during dismantling and fix with their bolts.

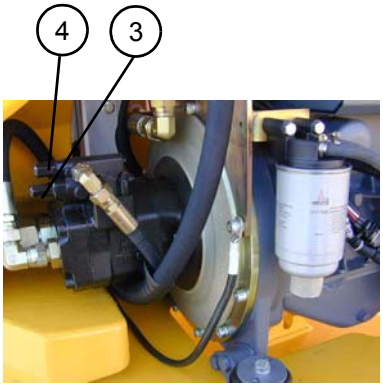
7 - Installing the platform+support assembly

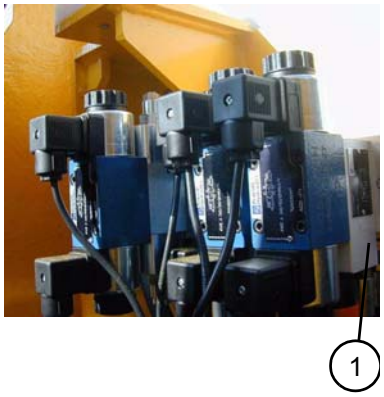
- Put the platform+support assembly into place and install the two articulation pins.
- Block the pins with new Mécanindus pins.
- Install the four pin stop rings and fix using their fixing bolts.
- Pass the hydraulic hoses and electric cables along the jib according to the marks made during dismantling and reconnect.
- Install the two cable passage collars on the platform and the three collars along the length of the jib.
- Install and set the contactor SQ2 (see corresponding sheet).
- Put the machine back into the operational configuration.
- Make several jib lifting, boom lifting and platform rotation movements, to purge the hydraulic circuit.
- Check the level of the hydraulic oil tank.

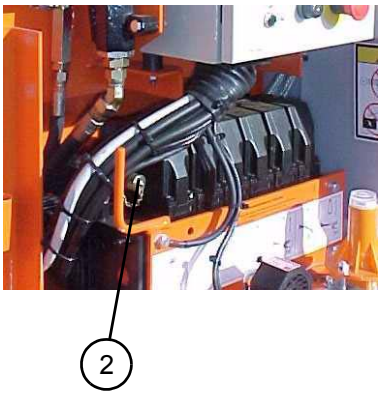


Sheet C073	CORRECTIVE MAINTENANCE SHEET	Folio 1/4
	ADJUSTING A PRESSURE LIMITER	

Caution!
Ensure that the oil is not too hot.







Caution!
Use a container to collect oil to prevent pollution of the environment.

NB: Before any adjustment operation, operate the machine so that the oil in the tank is at a temperature of approximately 50°.

1 - Adjusting the load sensing pressure (4)

- Put the machine in the maintenance configuration (see corresponding paragraph).
- Switch off electric power (see corresponding paragraph).
- Unscrew the cap of the minimess hydraulic pressure tapping (2) on the distribution block and connect a pressure gauge of at least 0/300 bars (0/4351 PSI).
- Switch electric power on again (see corresponding paragraph) and start the motor.
- Without activating a movement, measure pressure on the gauge.
- Adjust the hexagonal socket head screw on the pressure limiter (4) until the pressure indicated in the table below is shown on the pressure gauge.
- Put the machine in the maintenance configuration (see corresponding paragraph).
- Switch off electric power (see corresponding paragraph).
- Unscrew the pressure gauge and put the hydraulic pressure tapping cap back into place.
- Put the machine back in the operational configuration.
- Extend the machine several times to check operation.

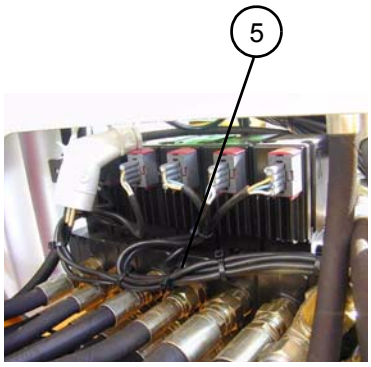
2 - Adjusting the main pressure limiter (3)

- Put the machine in the maintenance configuration (see corresponding paragraph).
- Switch off electric power (see corresponding paragraph).
- Unscrew the cap of the minimess hydraulic pressure tapping (2) on the distribution block and connect a pressure gauge of at least 0/300 bars (0/4351 PSI).
- Switch electric power on again (see corresponding paragraph).
- Extend the boom lifting cylinder fully (to its stop) to block the movement.
- Activate a boom lifting movement and measure pressure on the gauge.
- Adjust the hexagonal socket head screw on the main pressure limiter (3) so that movements are disabled at the pressure indicated in the table below.
- Put the machine in the maintenance configuration (see corresponding paragraph).
- Switch off electric power (see corresponding paragraph).
- Unscrew the pressure gauge and put the hydraulic pressure tapping cap back into place.
- Put the machine back in the operational configuration.
- Make several boom lifting movements to check operation.

3 - Adjusting the telescope extension pressure limiter (1)

- Put the machine in the maintenance configuration (see corresponding paragraph).
- Switch off electric power (see corresponding paragraph).
- Unscrew the cap of the minimess hydraulic pressure tapping (2) on the distribution block and connect a pressure gauge of at least 0/300 bars (0/4351PSI).
- Switch electric power on again (see corresponding paragraph).
- Extend the telescope cylinder fully (to its stop) to block the movement.
- Activate a telescoping movement and measure telescoping pressure on the gauge.
- Adjust the hexagonal socket head screw on the telescoping pressure limiter (1) so that movements are disabled at the pressure indicated in the table below.

Sheet C073	CORRECTIVE MAINTENANCE SHEET ADJUSTING A PRESSURE LIMITER	Folio 2/4



- Put the machine in the maintenance configuration (see corresponding paragraph).
- Switch off electric power (see corresponding paragraph).
- Unscrew the pressure gauge and put the hydraulic pressure tapping cap back into place.
- Put the machine back in the operational configuration.
- Make several telescoping movements to check operation.

4 - Checking the turntable rotation pressure limiter

NB: Turntable rotation pressure is preset and may not be modified.

- Put the machine in the maintenance configuration (see corresponding paragraph).
- Switch off electric power (see corresponding paragraph).
- Unscrew the cap of the minimess hydraulic pressure tapping (2) on the distribution block and connect a pressure gauge of at least 0/300 bars (0/4351 PSI).
- Switch electric power on again (see corresponding paragraph).
- Put the turntable rotation blocking pin in place to block movement.
- Activate turntable rotation and measure pressure on the gauge.

NB: Check pressure in both rotation directions.

- If the pressure measured is not conform to the value in the table, replace the pressure limiter concerned.
- Put the machine in the maintenance configuration (see corresponding paragraph).
- Switch off electric power (see corresponding paragraph).
- Unscrew the pressure gauge and put the hydraulic pressure tapping cap back into place.
- Put the machine back in the operational configuration.
- Make several turntable rotation movements to check operation.

5 - Pressure table (in bar)

	Load sensing (stand by)	Main	Steering	Brake release	Right and left rotation	Lifting	Lowering	Boom lifting
HA16-18PX HA46/51JRT	30	240	240	240	100	240	240	240
HA16-18PX NG HA46/51JRT New Design	30	240	240	240	100	240	240	240

	Boom lowering	Telescope out	Telescope in	Travel	Compensation	Jib lifting	Jib lowering	Standby unit
HA16-18PX HA46/51JRT	240	110	240	240	240	240	240	manual
HA16-18PX NG HA46/51JRT New Design	240	110	240	240	240	240	240	210

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6 - Pressure table (in psi)

	Load sensing (stand by)	Main	Steering	Brake release	Right and left rotation	Lifting	Lowering	Boom lifting
HA16-18PX HA46/51JRT	435	3481	3481	3481	1450	3481	3481	3481
HA16-18PX NG HA46/51JRT New Design	435	3481	3481	3481	1450	3481	3481	3481

	Boom lowering	Telescope out	Telescope in	Travel	Compensation	Jib lifting	Jib lowering	Standby unit
HA16-18PX HA46/51JRT	3481	1595	3481	3481	3481	3481	3481	manual
HA16-18PX NG HA46/51JRT New Design	3481	1595	3481	3481	3481	3481	3481	3045

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Sheet C073	CORRECTIVE MAINTENANCE SHEET	Folio 4/4
	ADJUSTING A PRESSURE LIMITER	

Sheet C074	CORRECTIVE MAINTENANCE SHEET	Folio 1/2
	CHANGING THE JIB CYLINDER	

Caution!
Ensure that the oil is not too hot.

1 - Preliminary operations

- Put the machine in the maintenance configuration (see corresponding paragraph).
- Switch off electric power (see corresponding paragraph).
- Secure the platform to the ground.

2 - Removing the jib cylinder

- Put the cylinder (1) and the vertical elements (2) and (3) of the jib into slings.
- Mark and disconnect the 2 hydraulic hoses of the jib cylinder.

NB: Unscrew the hoses slowly to release residual hydraulic pressure.

- Fit the hoses with caps.
- Remove the 2 bolts and stop rings from the cylinder pin's pin(4) on the cylinder body side.
- Remove the Mécanindus pin blocking the pin and remove the pin (4).
- Remove the two bolts and stop rings from the cylinder pin's pin (5) on the cylinder rod side.
- Remove the Mécanindus pin blocking the pin, then remove the pin (5).
- Remove the jib cylinder (1).

3 - Installing the jib cylinder

NB: Before re-assembly, check the condition of all the articulation pin rings, and replace if necessary. Lubricate all bores before re-installing the pins. Only use lubricants recommended by the manufacturer.

- Put the jib cylinder back into place and put back the two articulation pins on the cylinder rod and body side.
- Fix the pins with Mécanindus pins.
- Install the 4 stop rings and fix with their bolts.
- Remove the slings.

4 - Additional operations

- Unfasten the platform.
- Put the machine back into the operational configuration.
- Make several jib movements to check operation and purge the hydraulic circuit.
- Check the level of the hydraulic circuit.

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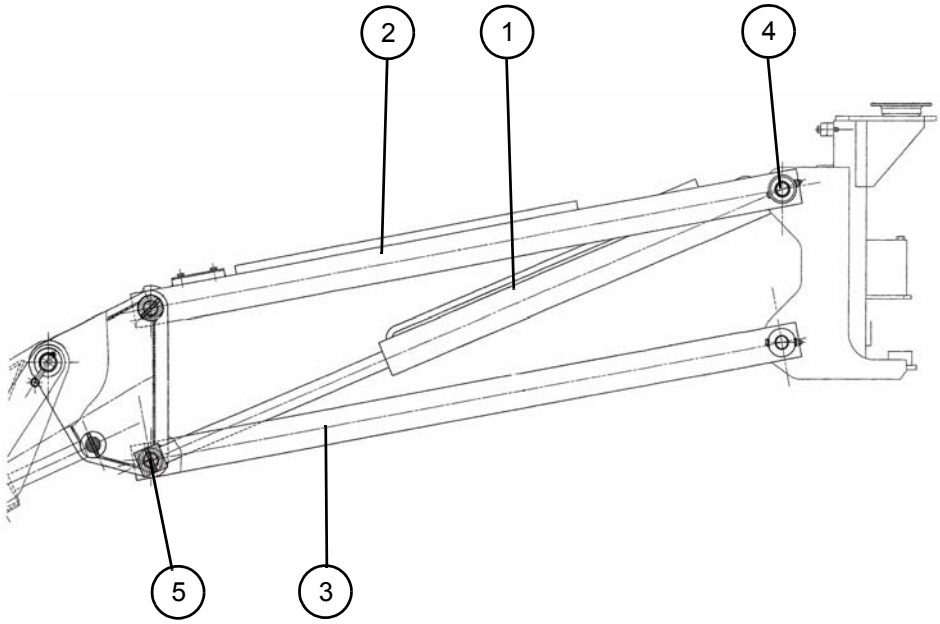
Sheet C074	CORRECTIVE MAINTENANCE SHEET	Folio 2/2
	CHANGING THE JIB CYLINDER	



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Sheet C075	CORRECTIVE MAINTENANCE SHEET	Folio 1/2
	CHANGING THE BOOM LIFTING CYLINDER	

Caution!
Ensure that the oil is not too hot.

1 - Preliminary operations

- Position the elevating platform on a firm, horizontal surface.
- Put the turntable rotation blocking pin into place.
- Lift the boom to enable access to the arm lifting cylinder fixtures (1).
- Retract the telescope, lower the arm and put the jib in the low position.
- Switch off electric power (see corresponding paragraph).
- Put the boom into slings to take the weight of the boom while the cylinder is removed.

2 - Removing the boom lifting cylinder

- Put the boom lifting cylinder into slings.
- Mark and disconnect the two hydraulic hoses on the boom lifting cylinder.

NB: Unscrew the hoses slowly to release residual hydraulic pressure.

- Fit caps to the hoses.
- Remove the male clevis blocking the pin (3) of the boom lifting cylinder, on the cylinder body side, by removing its fixing screw and washer, then remove the pin (3).
- Remove the male clevis blocking the pin (2) of the boom lifting cylinder, on the cylinder rod side, by removing its fixing screw and washer, then remove the pin (2).
- Remove the boom lifting cylinder.

3 - Installing the boom lifting cylinder

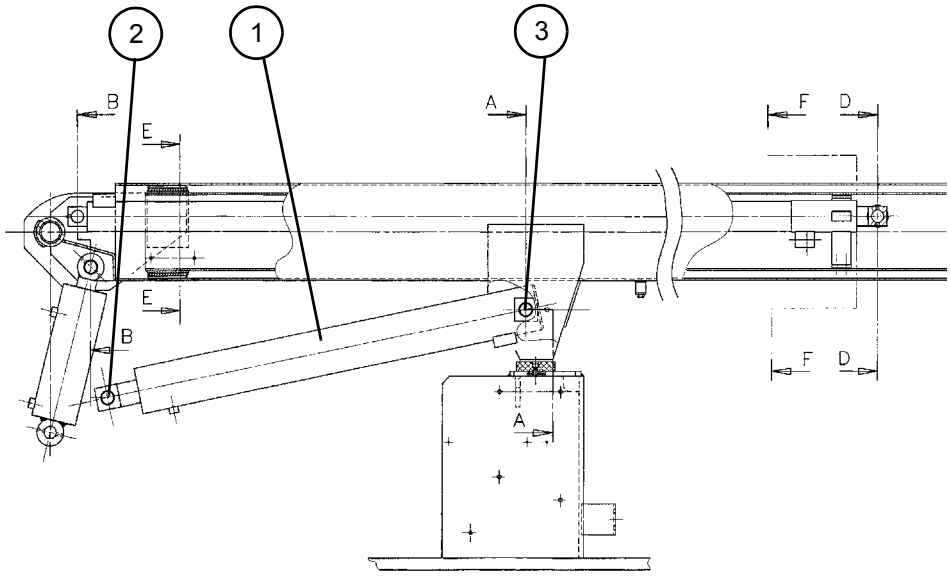
NB: Lubricate all bores before re-installing the pins. Only use lubricants recommended by the manufacturer.

- Put the boom lifting cylinder into place and fix the rod side to the boom support with the articulation pin.
- Install the male clevis to block the cylinder pin and fix with its fixing screw equipped with a new grower washer.
- Fix the boom lifting cylinder on the body side of the cylinder using the pin.
- Install the male clevis to block the pin and fix with its fixing screw equipped with a new grower washer.
- Reconnect the 2 hydraulic hoses of the boom lifting cylinder.

4 - Additional operations

- Lower the boom.
- Remove the sling from the boom.
- Put the machine back into the operational configuration.
- Make several boom lifting movements to check operation and purge the hydraulic circuit.
- Check the level of the hydraulic circuit.

Sheet C075	CORRECTIVE MAINTENANCE SHEET	Folio 2/2
	CHANGING THE BOOM LIFTING CYLINDER	



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Sheet C076	CORRECTIVE MAINTENANCE SHEET	Folio 1/1
	DISMANTLING / RE-ASSEMBLING THE HYDRAULIC DISTRIBUTION BLOCK	

Caution!
Ensure that the oil is not too hot.

Caution!
Use a container to collect oil to prevent pollution of the environment.

1 - Preliminary operations

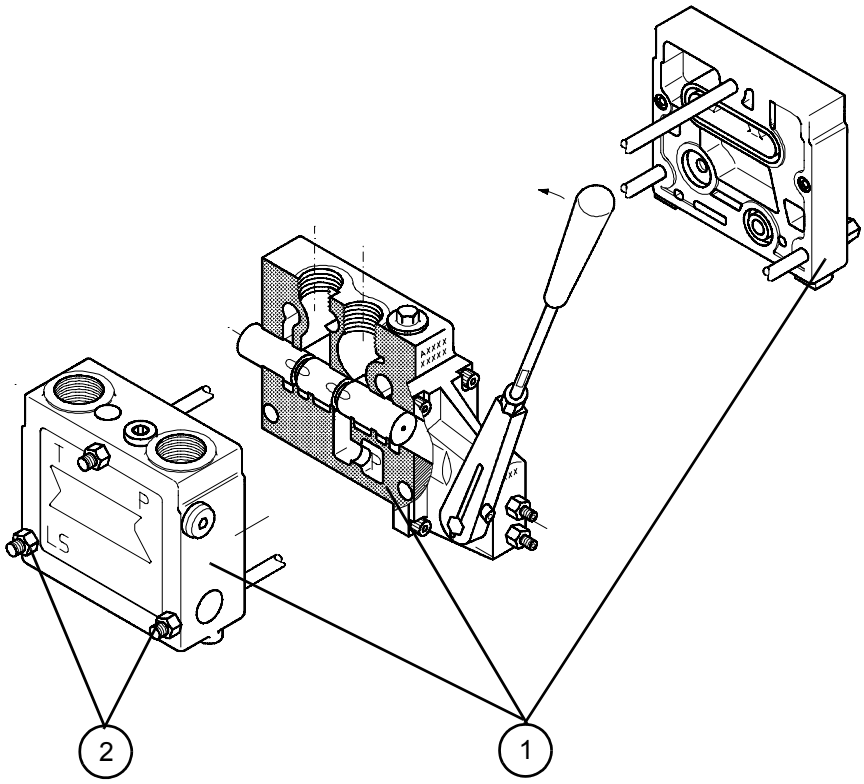
- Remove the hydraulic distribution block (see corresponding sheet).

2 - Dismantling the hydraulic distribution block (1)

- Mark the positions of the input plate, input module, distribution elements and the closing plate.
- If necessary, remove the control units (see corresponding sheet).
- Remove the fixing nuts and the 3 tie rods (2) then separate the elements.

3 - Re-assembling the hydraulic distribution block

- Replace the O-rings seals.
- If necessary, put back the control units (see corresponding sheet).
- Install the input plate, input module, distribution elements and closing plate.
- Install the fixing nuts and 3 tie rods (2). Tighten to 2.2 daN.m (1.4 lb.ft).
- Install the hydraulic distribution block (see corresponding sheet).
- Put the machine back in the operational configuration.
- Make several lifting, travel, steering and turntable rotation movements to purge the hydraulic circuit.
- Check the level of the hydraulic oil tank.



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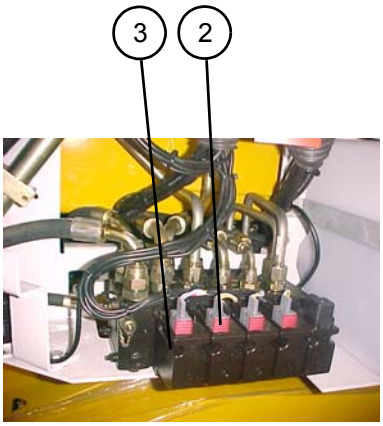
Sheet C077	CORRECTIVE MAINTENANCE SHEET	Folio 1/1
	CHANGING A CONTROL UNIT ON THE DISTRIBUTION BLOCK	

Caution!
Ensure that the oil is not too hot.

HA16/18PX - HA46/51JRT

HA16/18PX New design



HA46/51JRT New Design

1 - Preliminary operations

- Put the machine in the maintenance configuration (see corresponding paragraph).
- Switch off electric power (see corresponding paragraph).

2 - Removing the control unit

- Remove the 4 fixing bolts and silent-blocks (1) from the turntable box.

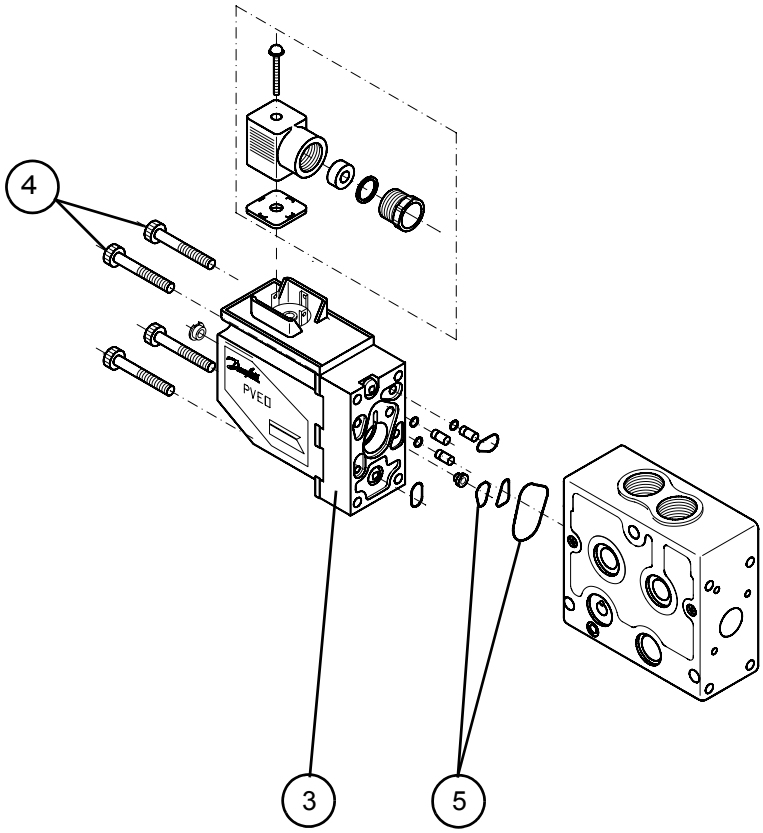
NB: One of the bolts also holds the horn.

- Place the turntable box and the horn on the wheel.
- Mark and disconnect the electric connections (2) of the control unit (3).
- Remove the control unit by removing its 4 fixing screws (4).
- Discard the O-rings (5).

3 - Installing the control unit

- Replace the O-rings.
- Install the control unit and fix using the 4 fixing screws. Tighten the screws to a torque of between 7.5 and 8.5 N.m (5.53 and 6.26 lb.ft).
- Reconnect the control unit's electric connections.

- *For HA16/18PX and HA46/51JRT old design*
  - Install the turntable box and horn, and fix with the 4 fixing bolts and silent-blocks.
- Put the machine back in the operational configuration.
- Test the movement corresponding to the replaced control unit. Make several movements to purge the hydraulic circuit.
- Check the level of the hydraulic tank.



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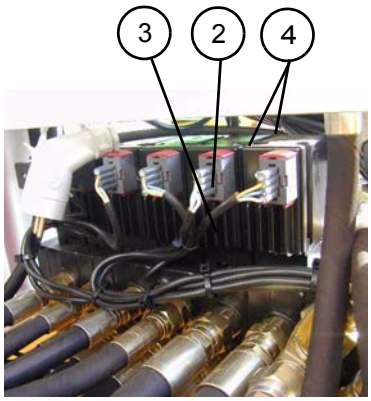
	CORRECTIVE MAINTENANCE SHEET	

HA16/18PX - HA46/51JRT



Caution!
Use a container to collect oil to prevent pollution of the environment.

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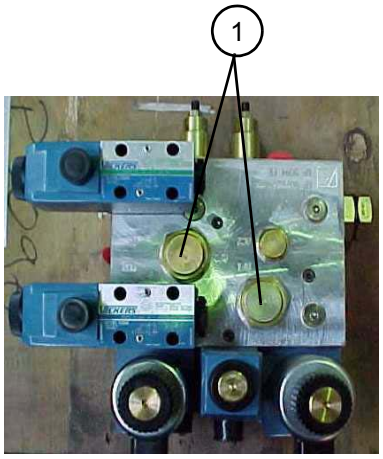
Sheet C079	CORRECTIVE MAINTENANCE SHEET	Folio 1/1
	CHANGING A FLOW SEPARATOR	

Caution!
Ensure that the oil is not too hot.

Caution!
Use a container to collect oil to prevent pollution of the environment.



1 - Preliminary operations

- Put the machine in the maintenance configuration (see corresponding paragraph).
- Switch off electric power (see corresponding paragraph).

2 - Removing a flow separator

- Remove the flow separator (1) by unscrewing it.

3 - Installing a flow separator

- Screw a new flow separator, whose characteristics correspond to the machine in question, into the hydraulic block.
- Tighten to the recommended torque:
  - Flow separator ref. FDC1-10: 47 to 54 Nm. (34 to 39.8 lb.ft)
  - Flow separator ref. FDC1-16: 108 to 122 Nm (79.6 to 89.9 lb.ft).
- Put the machine back into the operational configuration.
- Make several movements using the replaced flow separator to purge the circuit.
- Check that the corresponding movement is made correctly.

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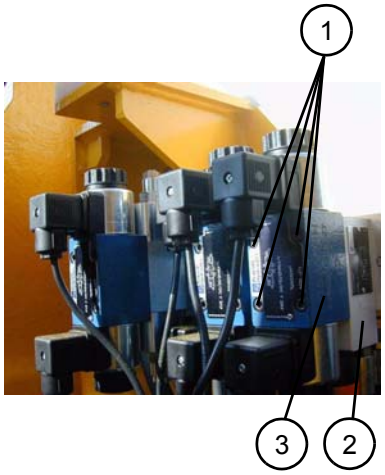
Sheet C081	CORRECTIVE MAINTENANCE SHEET	Folio 1/1
	CHANGING A PRESSURE LIMITER FOR THE TELESCOPE EXTENSION FUNCTION	

Caution!
Ensure that the oil is not too hot.



Caution!
Use a container to collect oil to prevent pollution of the environment.

1 - Preliminary operations

- Put the machine in the maintenance configuration (see corresponding paragraph).
- Switch off electric power (see corresponding paragraph).

2 - Removing a pressure limiter

- Mark the installation position of the pressure limiter unit electrodistributor.
- Remove the 4 fixing screws (1), then take out the electrovalve (3) + pressure limiter (2) assembly.
- Remove the pressure limiter (2).

3 - Installing a pressure limiter

- Replace the seals and put into place on the hydraulic block a new pressure limiter (2), whose characteristics correspond to the machine in question, then the electrovalve (3).
- Fix the assembly with the 4 fixing screws (1). Tighten to the recommended torque (see corresponding chapter).
- Put the machine back into the operational configuration.
- Make several movements using the replaced pressure limiter to purge the circuit.
- Adjust the limiter to the required pressure (see corresponding sheet).
- Check that the corresponding movement is made correctly.

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Sheet C082	CORRECTIVE MAINTENANCE SHEET	Folio 1/1
	CHANGING A BALANCING VALVE FOR THE COMPENSATION FUNCTION	

Caution!
Ensure that the oil is not too hot.

Caution!
Use a container to collect oil to prevent pollution of the environment.

Caution!
Balancing valves are safety elements. They are calibrated in the plant and must not be re-adjusted.

1 - Preliminary operations

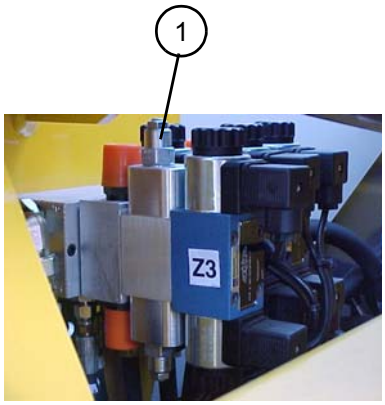
- Put the machine in the maintenance configuration (see corresponding paragraph).
- Switch off electric power (see corresponding paragraph).

2 - Removing a balancing valve

- Remove the balancing valve (1) by unscrewing it.

3 - Installing a balancing valve

- Screw a new balancing valve, whose characteristics correspond to the machine in question, into the hydraulic block. Tighten to a torque of 45 to 50 Nm (33 to 36.7 lb.ft).
- Put the machine back into the operational configuration.
- Make several movements using the replaced balancing valve to purge the circuit.
- Check that the corresponding movement is made correctly.



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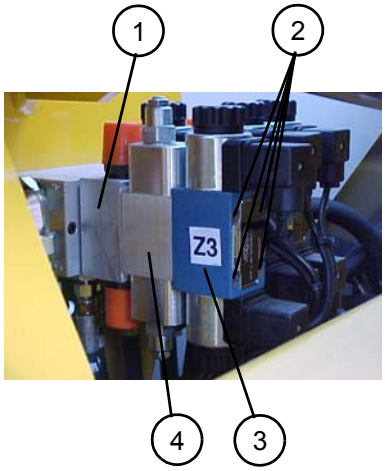
Sheet C083	CORRECTIVE MAINTEANCE SHEET	Folio 1/1
	CHANGING A DOUBLE FLOW LIMITER FOR THE COMPENSATION FUNCTION	

Caution!
Ensure that the oil is not too hot.

Caution!
Use a container to collect oil to prevent pollution of the environment.



1 - Preliminary operations

- Put the machine in the maintenance configuration (see corresponding paragraph).
- Switch off electric power (see corresponding paragraph).

2 - Removing a double flow limiter (1)

- Mark the installation position of the electrodistributor, balancing valve and double flow limiter.
- Remove the 4 fixing screws (2), then take out the electrovalve (3) + balanging valve (4) + double flow limiter (1) assembly.
- Remove the double flow limiter (1).

3 - Installing the double flow limiter

- Replace the seals and put into place on the hydraulic block a new flow limiter (1), whose characteristics correspond to the machine in question, then the balancing valve (4) and the electrovalve (3).
- Fix the assembly with the 4 fixing screws (2). Tighten to the recommended torque (see corresponding chapter).
- Put the machine back into the operational configuration.
- Make several movements using the replaced double flow limiter to purge the circuit.
- Adjust compensation up and down speeds (see corresponding chapter).
- Check that the corresponding movement is made correctly.

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Sheet C120	CORRECTIVE MAINTENANCE SHEET	Folio 1/2
	DISMANTLING AND RE-ASSEMBLING THE STEERING SYSTEM	

1 - Preliminary operations

- Put the machine in the maintenance configuration (see corresponding paragraph).
- Switch off electric power (see corresponding paragraph).

Caution!
Ensure that the oil is not too hot.

2 - Removing a steering bar (see figure 1)

- Remove the fixing screws (23) from the two steering clevis pins (1).
- Remove the two steering clevis pins (11).
- Remove the steering bar (6).

Caution!
Use a container to collect oil to prevent pollution of the environment.

3 - Removing the steering lever

- Open the upper cover of the chassis.
- Remove the Nylstop nut (24) and the washer (23) from the cylinder fastening pin.
- Remove the pin (27) from the steering cylinder clevis.
- Unscrew the screws (23) and washers (24).
- Remove the two pins (11) from the clevises (8) of the two steering bars (6) linked to the lever (26).
- Remove the screw (16) and support washer (25) from the smooth male clevis (31).
- Remove the smooth male clevis (31).
- Remove the central pin (12) from the lever.
- Remove the lever.

Caution!
It is essential to put the component in slings before dismantling/re-assembling it.

4 - Installing the steering lever

NB: When re-installing the pins, take the measures necessary to avoid damanging the pins, rings and bores.

- Replace the pins and lubricators if necessary.
- Put the steering bar into place.
- Put back the central steering pin (12).
- Put back the smooth male clevis (31) and fix using its fixing screw (16) equipped with a new washer (25).
- Put the steering cylinder clevis into place.
- Put back the pin (27).
- Put the washer (22) into place and screw the nut (21).
- Position the clevises of the two steering bars on the lever and put back the pins (11).
- Fix with screws (23) and washers (24)
- Lubricate the central pivot pin and the steering bar clevis pins

Caution!
When replacing a steering bar, check that the adjustment clevis is on the steering lever side. If the bar is fitted the wrong way round, there may be interference between the clevis counter-nut and the hydraulic motor when turning to maximum.

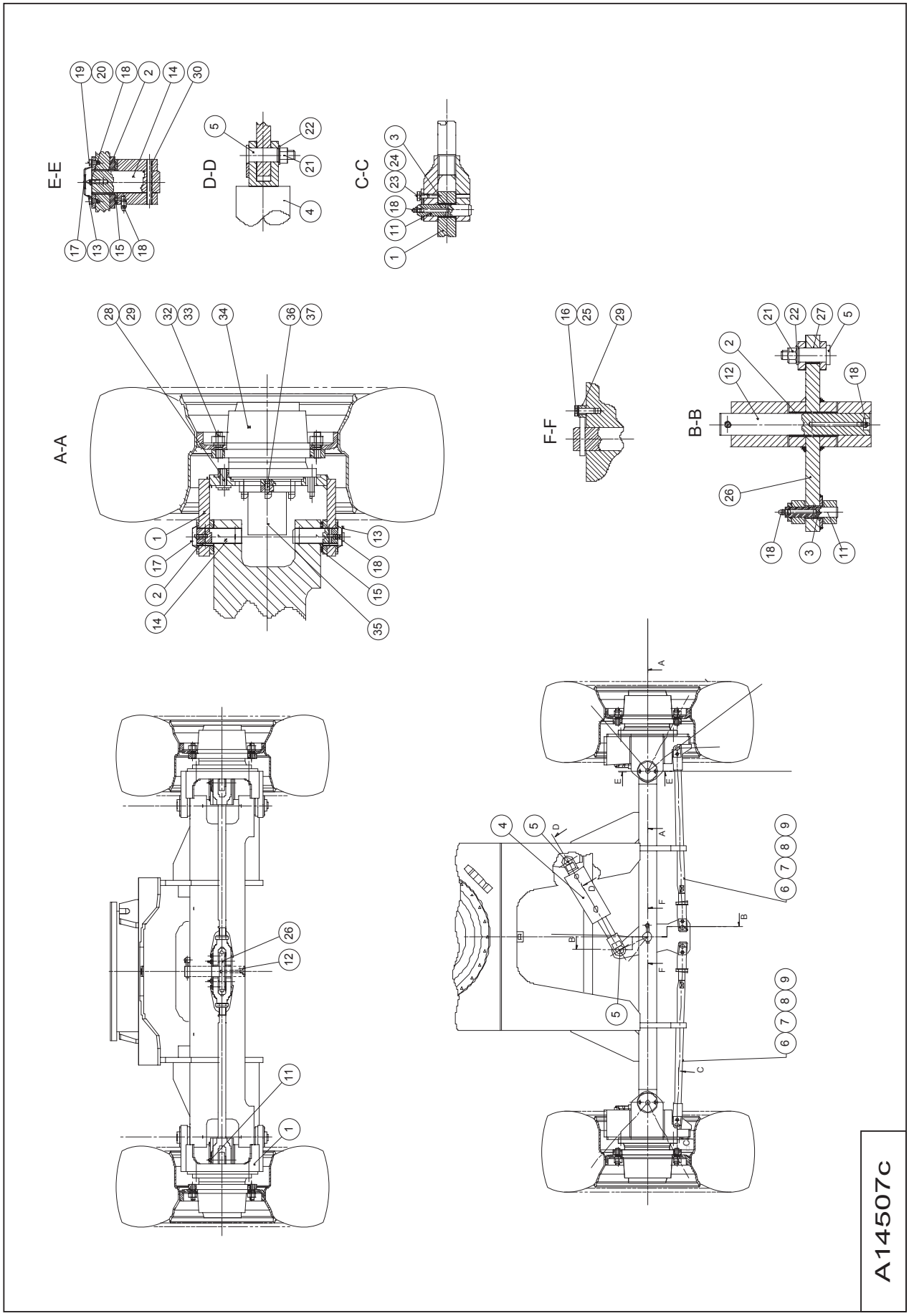
5- Installing a steering bar

- Replace the pins and lubricators if necessary.
- Put the steering bar into place.
- Adjust wheel alignment if necessary:
  - slacken the counter-nut (9) on the steering bar,
  - screw or unscrew the clevis (8) to adjust the length of the steering bar.
  - tighten the counter-nut (9).
- Put back the two pins (11) and block with screws (23) and washers (24).
- Lubricate the pins.

6 - Additional operations

- Put the machine back in the operational configuration.
- Lubricate the pins using the lubricators.

	CORRECTIVE MAINTENANCE SHEET	Folio 2/2



Sheet C121	CORRECTIVE MAINTENANCE SHEET	Folio 1/4
	CHANGING AN END OF STROKE CONTACTOR	

Photo 12

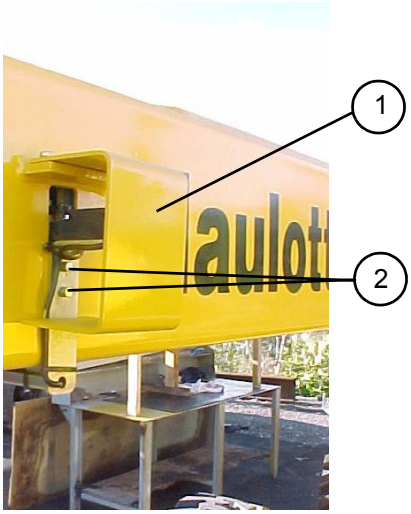
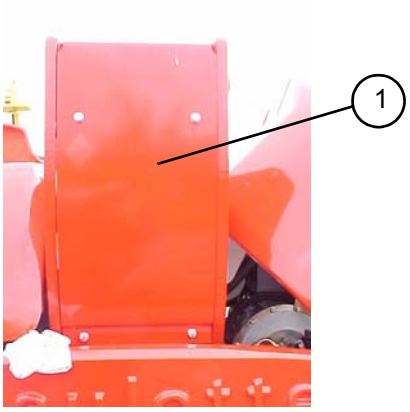


Photo 13

Photo 14



1 - Preliminary operations

- Put the machine in the maintenance configuration (see corresponding paragraph).
- Switch off electric power (see corresponding paragraph).

2 - Removing an SQ9 end of stroke contactor (telescope)

- Remove the protective plate (ref. 1 Photo 12).
- Unscrew the fixing screws (ref. 2 Photo 12) of the contactor support.
- Remove the end of stroke contactor.
- Open the end of stroke contactor, mark and disconnect the electric connections.

3 - Installing an SQ9 end of stroke contactor (telescope)

- Open the new end of stroke contactor, reconnect the electric connections and close the end of stroke contactor.
- Put the end of stroke contactor back into place, in the position marked during dismantling and fix on its support using screws (ref. 2 Photo 12).
- Fix the support to the telescope.

4 - Adjustment and testing

- Put the machine back in the operational configuration.
- Make a telescoping movement.
- Adjust the contactor if necessary.

NB: Ensure that the end of stroke contactor roller is not at its limit against the telescope. A slight gap should be left in the plunger.

5 - Checking break actions

- When the telescope is extended, travel should switch to micro-speed, and if the machine is tilted, all movements are disabled except: telescope in, boom lifting, rotation, basket rotation and compensation.
- For the USA: if the machine is tilted, the tilt buzzer sounads and the fault light on the platform control panel comes on.

6 - Removing an SQ3 end of stroke contactor (boom lifting)

- Remove the protective plate (ref. 1 Photo 14).
- Unscrew the fixing screws (ref. 2 Photo 15) of the contactor support.
- Remove the end of stroke contactor.
- Open the end of stroke contactor, mark and disconnect the electric connections.

7 - Installing an SQ3 end of stroke contactor (boom lifting)

- Open the new end of stroke contactor, reconnect the electric connections and close the end of stroke contactor.
- Put the end of stroke contactor back into place, in the position marked during dismantling and fix on its support using screws (ref. 2 Photo 15).

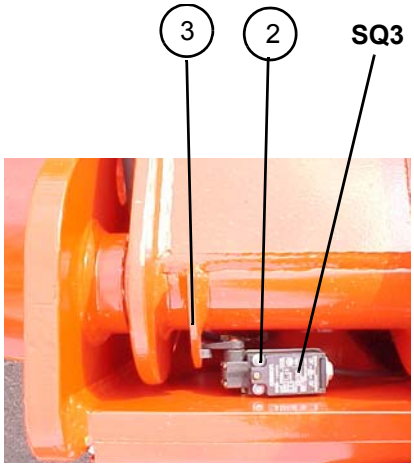
8 - Adjustment and testing

- Put the machine back into the operational configuration.
- Make a boom lifting movement.

NB: Ensure that the end of stroke contactor roller is not at its limit against the welded cam (ref. 3 Photo 15). A slight gap should be left in the plunger.

Sheet C121	CORRECTIVE MAINTENANCE SHEET	Folio 2/4
	CHANGING AN END OF STROKE CONTACTOR	

Photo 15



9 - Checking break actions

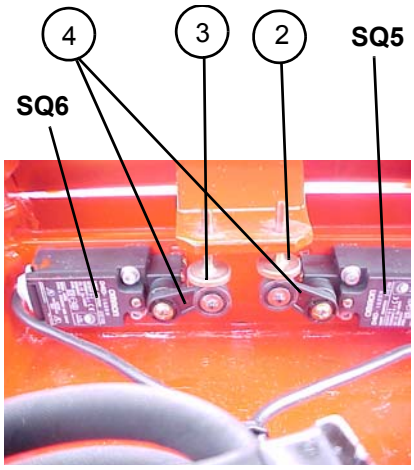
- When the boom is above the horizontal, travel should switch to micro-speed, and if the machine is tilted, all movements are disabled except: telescope in, boom lifting, rotation, basket rotation and compensation.
- For the USA: if the machine is tilted, the tilt buzzer sounads and the fault light on the platform control panel comes on.

10 - Removing an SQ5 or SQ6 end of stroke contactor (Weighing - EC only)

- Remove the protective plate (ref. 1 Photo 17).
- Unscrew the fixing screws (ref. 2 Photo 17).
- Remove the end of stroke contactor.
- Open the end of stroke contactor, mark and disconnect the electric connections.

11 - Installing an SQ5 or SQ6 end of stroke contactor (Weighing - EC only)

Photo 16

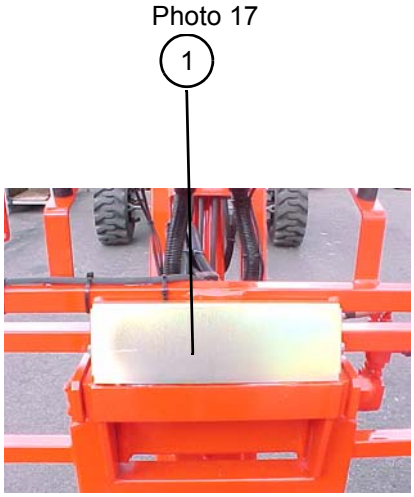


SQ5: 1st threshold detection (platform control panel buzzer)
SQ6: 2nd threshold detection (movements disabled + turntable buzzer + red light indicator lit on platform control panel)

- Screw the two adjustment wheels as far as possible (ref. 2 and 3 Photo 16).
- Open the new end of stroke contactor, reconnect the electric connections and close the end of stroke contactor.
- Put the end of stroke contactor back into place, in the position marked during dismantling.
- Fix the contactor.
- Adjust the levers (ref. 4 Photo 16) of the contactors so that when idle, the rollers are aligned with the wheels.

IF THIS PROCEDURE IS NOT RESPECTED AND THE MACHINE JOLTS, THERE IS A RISK THAT THE ROLLER MAY MOVE OUTSIDE THE ADJUSTMENT WHEEL.

Photo 17



12 - Adjustment and testing of the SQ5

- Put the machine back in the operational configuration.
- Put a load of 230 kg (507 lb) in the basket.
- Unscrew the adjustment wheel (ref. 3 Photo 16) until the basket control panel buzzer sounds.
- Tighten the counter-nut.

13 - Adjustment and testing of the SQ6

- Put the machine back in the operational configuration.
- Put a load of 250 kg (551 lb) in the basket.
- Unscrew the adjustment wheel (ref. 2 Photo 16) until movements are disabled, the turntable buzzer sounds and the red alert light indicator is lit on the platform control panel.
- Tighten the counter-nut.
- If necessary, adjust the basket stops (ref. 5 Photo 18).

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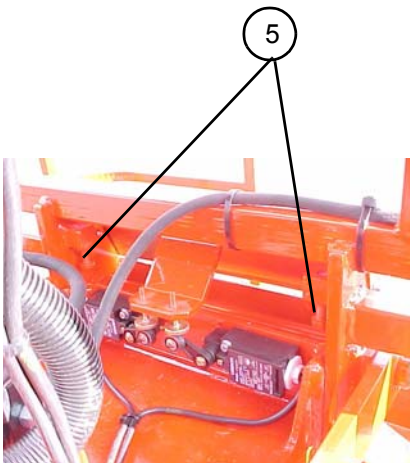
Photo 18



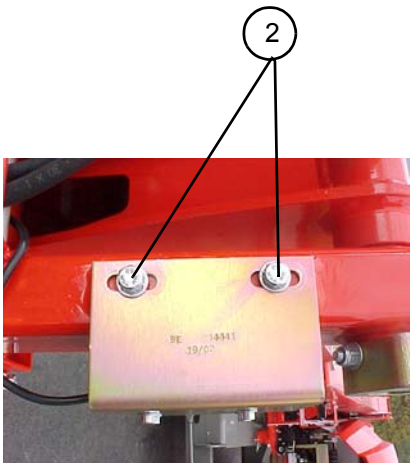
In the event of overload, the basket stops protect the contactors by preventing the basket from reaching its mechanical stop against the contactors.

NB: In the event of overload, movements from the turntable remain possible but are very slow.

14 - Removing an end of stroke contactor SQ2 (jib - H16TP and HB44J only)

- Unscrew the fixing screws (ref. 2 Photo 19).
- Unscrew the screws (ref. 3 Photo 19) fixing the contactor on the support
- Remove the end of stroke contactor.
- Open the end of stroke contactor, mark and disconnect the electric connections.

Photo 19



15 - Installing an end of stroke contactor SQ2

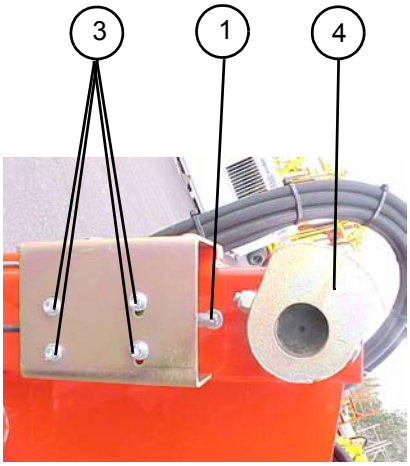
- Open the new end of stroke contactor, reconnect the electric connections and close the end of stroke contactor.
- Fix the contactor on its support.
- Fix the support on the jib.

16 - Adjustment and testing

- Put the machine back into its operational configuration.
- Make a jib movement.
- Micro-speed and tilt are only activated when the jib is above 0°.
- The support is equipped with lights enabling transversal adjustment of the end of stroke contactor and longitudinal adjustment of the contactor support.

NB: Ensure that the end of stroke contactor roller is not at its mechanical stop with the cam (ref. 4. Photo 20). A slight gap should be left in the plunger.

Photo 20



17 - Checking break actions

- For the USA: if the machine is tilted, the tilt buzzer sounds and the fault light on the platform panel comes on.

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Sheet C121	CORRECTIVE MAINTENANCE SHEET	Folio 4/4
	CHANGING AN END OF STROKE CONTACTOR	

Pinguely-Haulotte

Sheet C122	CORRECTIVE MAINTENANCE SHEET	Folio 1/1
	CHANGING A MOTOR COVER	

Caution!
Do not use the machine during maintenance operations.

1 - Preliminary operations

- Put the machine in the maintenance configuration (see corresponding paragraph).
- Switch off electric power (see corresponding paragraph).

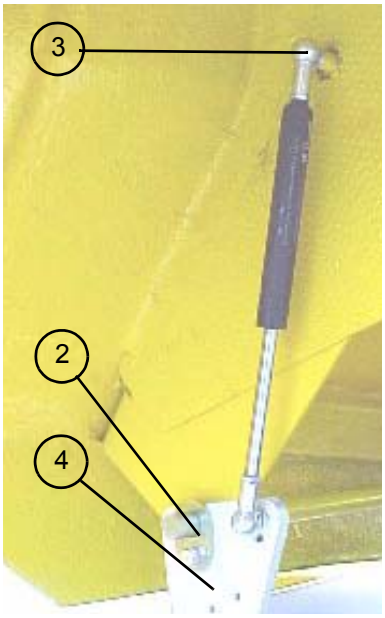
2 - Removing a cover

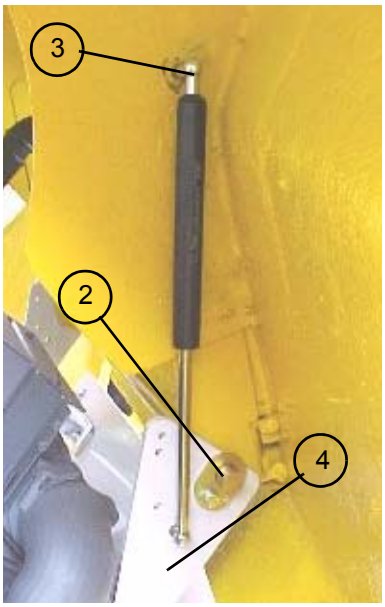
- Open the motor cover.
- Dismount the support (1).
- Remove the cover's two support washers (2) (on the right and left side of the cover support).
- Remove the locking pins from the upper ball pivots on the 2 gas springs (3).
- Free the ball pivots from the 2 pin gas springs.
- Put in slings then close the cover.
- Remove the cover by raising it to free it from the two supports (4).

3 - Installing a cover

- Put a new cover into place and position on the supports (4).
- Put the washers (2), gas spring ball pivots (3) and locking pins into place on the pins.
- Re-mount the support (1)
- Put the machine back in the operational configuration.
- Check that the cover opens and closes properly.

NB: When re-installing a cover, adjustment may be necessary. For this purpose, supports (1) and (4) are equipped with adjustment lights.





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	CORRECTIVE MAINTENANCE SHEET	

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Sheet C123	CORRECTIVE MAINTENANCE SHEET	Folio 1/1
	CHANGING A CONTROL PANEL COVER	

Attention !
Do not use the machine during maintenance operations.

1 - Preliminary operations

- Put the machine in the maintenance configuration (see corresponding paragraph).
- Switch off electric power (see corresponding paragraph).

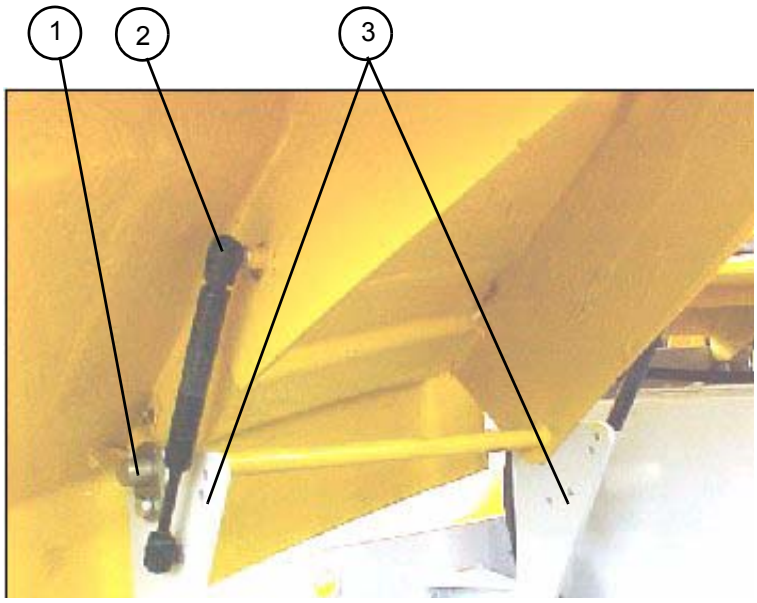
2 - Removing a cover

- Open the control panel cover.
- Remove the cover's two support washers (1) (on the right and left side of the support).
- Remove the locking pins from the upper ball pivots on the 2 gas springs (2).
- Free the ball pivots from the 2 pin gas springs.
- Close the cover and raise to free it from the two supports (3).
- Remove the cover.

3 - Installing a cover

- Position the cover on the supports (3).
- Put into place on the pins the washers (1), ball pivots (2) (on the gas springs), and locking pins.
- Check that the cover opens and closes properly.
- Put the machine back in the operational configuration.

NB: When installing a new cover, adjustment may be necessary. For this purpose, the supports (3) are equipped with adjustment lights.



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Sheet C124	CORRECTIVE MAINTENANCE SHEET	Folio 1/1
	CHANGING A TANK COVER	

Caution!
Do not use the machine during maintenance operations.

1 - Preliminary operations

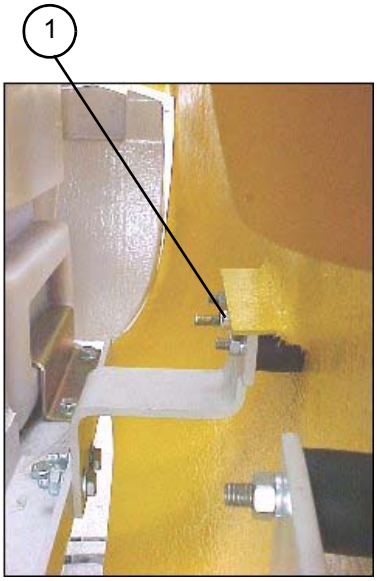
- Put the machine in the maintenance configuration (see corresponding paragraph).
- Switch off electric power (see corresponding paragraph).

2 - Removing a cover

- Open the tank cover.
- Unscrew the nut (1) fixing the cover to the support.
- Raise the cover until the support pins are free of the bosses fixed on the side plate.
- Remove the cover.

3 - Installing a cover

- Position the cover so that the support pins are facing the bosses.
- Block the fixing nut (1).
- Check that the cover opens and closes properly.
- Put the machine back in the operational configuration.



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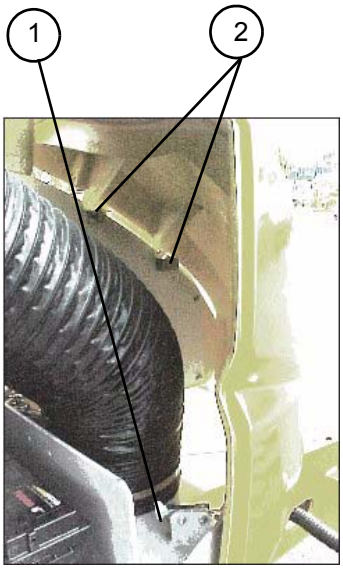
Sheet C125	CORRECTIVE MAINTENANCE SHEET	Folio 1/1
	CHANGING A FRONT COVER ON THE MOTOR OR TANK SIDE	

Caution!
Do not use the machine during maintenance operations.



1 - Preliminary operations

- Put the machine in the maintenance configuration (see corresponding paragraph).
- Switch off electric power (see corresponding paragraph).

2 - Removing a cover

- Open the large motor cover.
- Open the spring clip (1).
- Put the cover in slings.
- Remove the cover by raising it until the support pins (2) are free of the bosses fixed to the side plate.

3 - Installing a cover

- Put a new cover into place and position so that the support pins are facing the bosses (2).
- Lock the spring clip (1)
- Put the machine back in the operational configuration.
- Check that the cover opens and closes properly.

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Sheet C126	CORRECTIVE MAINTENANCE SHEET	Folio 1/2
	CHANGING A STEERING PIVOT	

Caution!
Ensure that the oil is not too hot.

Caution!
Use a container to collect oil to prevent pollution of the environment.

Caution!
It is essential to put the component in slings before dismantling/re-assembling it.

1 - Preliminary operations

- Put the machine in the maintenance configuration (see corresponding paragraph).
- Switch off electric power (see corresponding paragraph).
- Remove the wheel corresponding to the element to be removed (see corresponding sheet).
- Remove the motor and reducing gear corresponding to the pivot to be removed (see corresponding sheet).

2 - Removing a pivot (see figure 1)

- Place a wedge under the steering pivot(1).
- Remove the fixing screw (23) from the steering clevis pin.
- Remove the pin (11) from the clevis.
- Disconnect the hoses from the hydraulic motor (35) and remove them.
- Remove the two screws (19) from the cap (17) on the pivot pin (14).
- Remove the cap and unscrew the pin's lubricator (18). Do the same on both pins.
- Put the pivot + reducing gear assembly in slings (34)
- Take out the two Mécanindus pins (30), then remove the two pins (14)
- Take the pivot + reducing gear assembly out of the machine
- Take the reducing gear (34) off the pivot (1)

3 - Installing a reducing gear or hydraulic motor

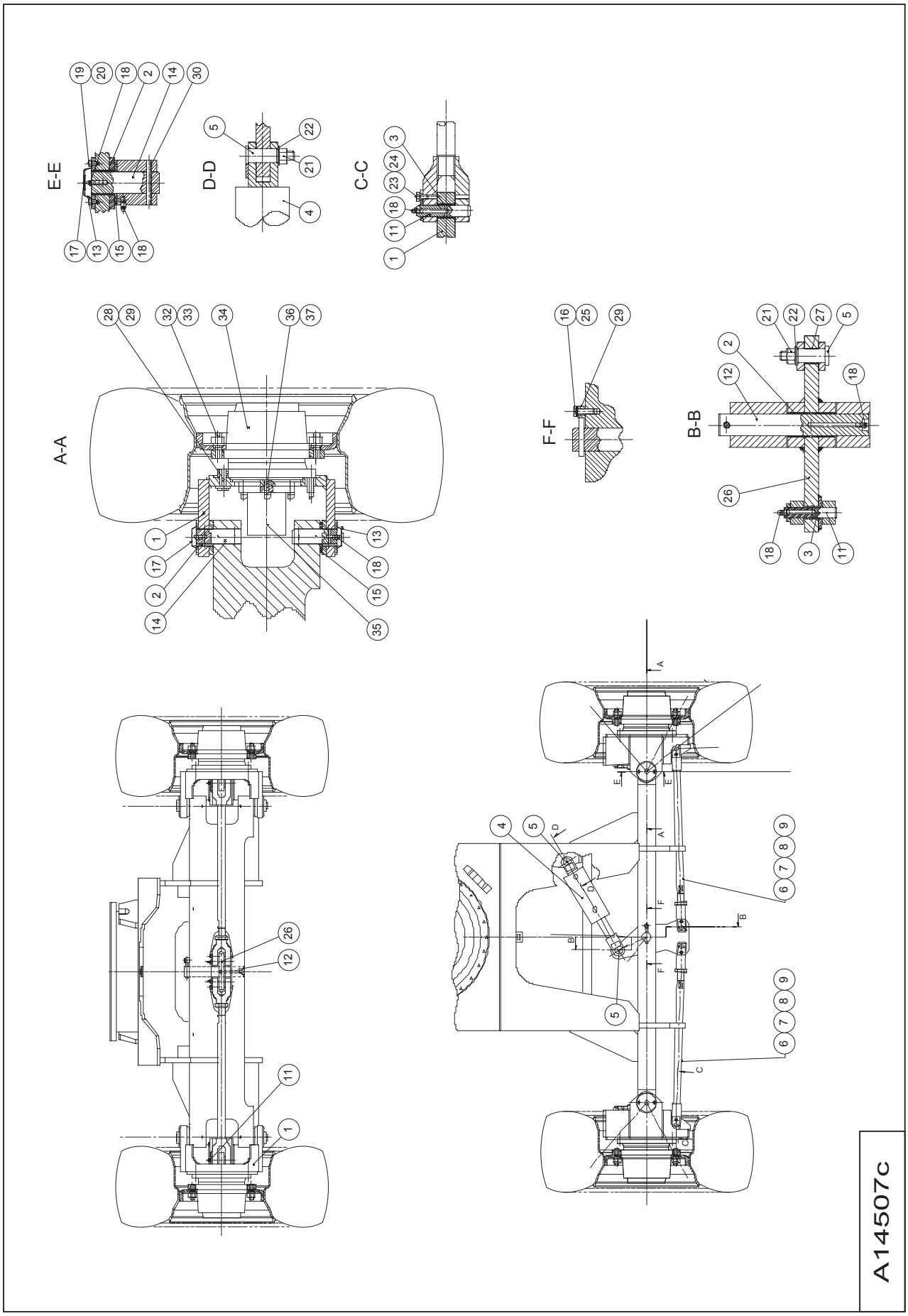
- Ensure that there are rings on the new pivot.
- Remount the reducing gear on the pivot with screws and conical washers (see tightening torque values)
- Put the pivot+ reducing gear into slings and re-install on the machine.
- Put the washers into place (15).
- Put the pins back into place and block with new mécanindus pins
- Put back the two lubricators and lubricate the pins.
- Put back the pivot pin caps and fix with screws and brake washers.
- Put back the hydraulic motor and connect the hoses.
- Put back the steering bar clevis pin and fix with the screw equipped with a grower washer. Lubricate this pin.

NB: When re-installing pins, take the necessary measures to avoid damaging the pins, rings and bores.

4 - Additional operations

- Put back the motor and reducing gear (see corresponding sheet).
- Put back the wheel (see corresponding sheet).
- Put the machine back in the operational configuration.
- Make several travel movements to purge the hydraulic circuit.
- Check the level of oil in the wheel reducing gear (see corresponding sheet).
- Check the level of the hydraulic oil tank.
- Lubricate the pins using the lubricators.

Sheet C126	CORRECTIVE MAINTENANCE SHEET	Folio 2/2
	CHANGING A STEERING PIVOT	



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Sheet C127	CORRECTIVE MAINTENANCE SHEET	Folio 1/1
	CHANGING THE EMERGENCY UNIT	

Caution!
Use a container to collect oil to prevent pollution of the environment.

1 - Preliminary operations

- Put the machine in the maintenance configuration (see corresponding paragraph).
- Switch off electric power (see corresponding paragraph).
- Close the hydraulic tank suction valve.

2 - Removing the emergency unit

- Remove the cover on the reducing gear side (see corresponding sheet).
- Disconnect the battery terminals (see corresponding sheet).
- Disconnect the unit's supply terminals (1) after marking them.

NB: Unscrew the hoses slowly to release residual hydraulic pressure.

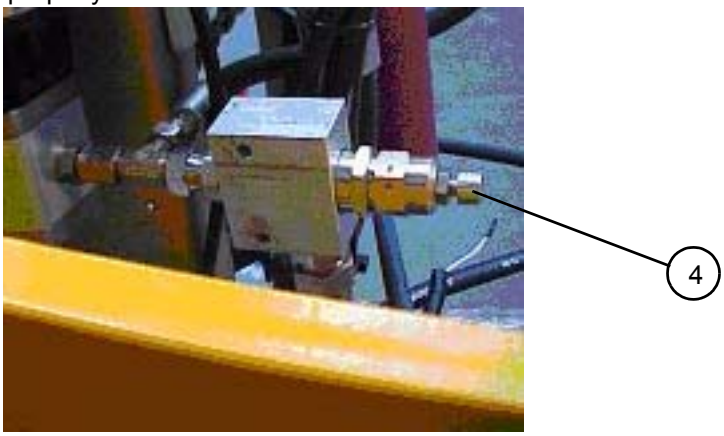
- Mark then disconnect the hoses (2) at the emergency pump.
- Put caps on the hoses.
- Unscrew the tightening flange (3) of the emergency unit.
- Remove the emergency unit by pulling it upwards.

3 - Installing the emergency unit

- Put the emergency unit into place, making sure it is the right way round.
- Screw the tightening flange (3) back onto the emergency unit.
- Reconnect the hydraulic hoses according to the marks made during dismantling.
- Reconnect the supply terminals according to the marks made during dismantling
- Open the hydraulic tank suction valve.
- Put the machine back in the operational configuration.
- Perform an emergency operation to check that the emergency unit works properly.

4 - Additional operations

- If it is necessary to change the calibration valve unit of the emergency circuit:
  - Perform the preliminary operations.
  - Calibrate the emergency unit at 110 bar:
    - Make a movement to its limit (e.g. telescoping).
    - Adjust the screw (4).
  - Open the hydraulic tank suction valve.
  - Put the machine back in the operational configuration.
  - Perform an emergency operation to check that the emergency unit works properly.



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Sheet C128	CORRECTIVE MAINTENANCE SHEET	Folio 1/6
	CHANGING THE SLEW RING	

Caution!
Ensure that the oil is not too hot.

Caution!
Make sure that the lifting means are in good condition and of sufficient capacity.

Caution!
Use a container to collect oil to prevent pollution of the environment.

Caution!
It is essential to put the component in slings before dismantling/re-assembling it.

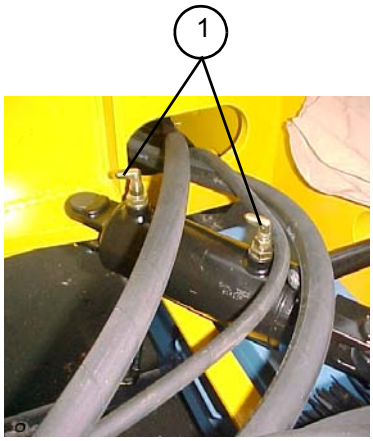
Photo 21 - Slinging

1 - Preliminary operations

- Turn the turntable to the locking position.
- Put the machine in the maintenance configuration (see see corresponding paragraph).
- Switch off electric power (see see corresponding paragraph).
- Close the valve on the pump suction circuit at the hydraulic tank.
- Disconnect the battery (see corresponding sheet).
- Remove the covers and the two support plates (see corresponding sheet).
- Remove the boom assembly (see corresponding sheet
- Remove the counterweight (H14/HB40: 700 kg / 1543 lb - H16/HB44J: 1450 kg / 3197 LB) (Photo 21).
- Mark and disconnect the two hoses (ref. 1 Photo 2) (located in the chassis) of the steering cylinder and plug the connectors.

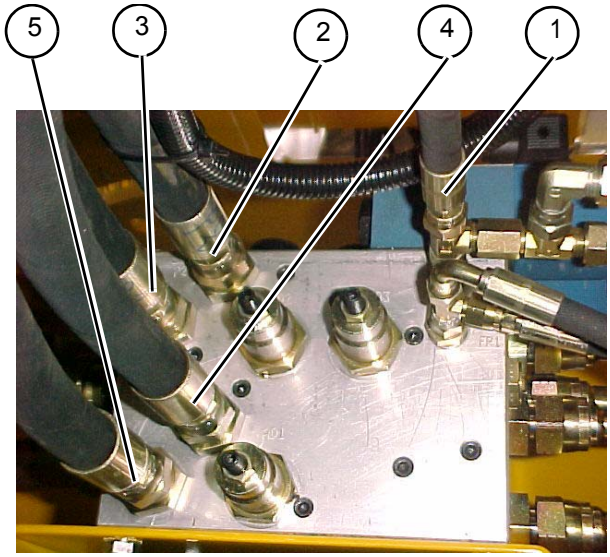
NB: Unscrew the hoses slowly to release residual hydraulic pressure.

Photo 2



- On the travel block, mark then disconnect the hoses (ref 1, 2, 3, 4 and 5 Photo 3) coming from the hydraulic swing joint. Put caps on the connectors.

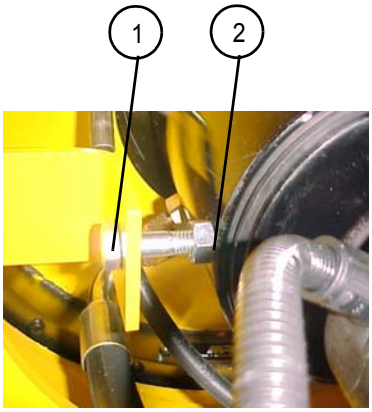
Photo 3



Sheet C128	CORRECTIVE MAINTENANCE SHEET	Folio 2/6
	CHANGING THE SLEW RING	

Photo 4

Photo 5



- In the chassis box, mark and disconnect the electric wires coming from the swing joint (Photo 4).
- Remove the screw that blocks rotation on the lower part of the swing joint by slackening the counter-nut (ref. 1 Photo 5) and unscrew the screw (ref. 2 Photo 5).
- Bring the electric wiring harness and hoses under the hydraulic swing joint.
- Put the turntable assembly into slings (see Photo 6 and Photo 7)

Photo 6

Photo 7

Photo 8

- Unscrew the 28 screws and remove the flat washers fixing the ring onto the chassis (see Photo 8).
- Place the turntable assembly onto suitable safety stands (see Photo 9 and Photo 10).

Photo 9

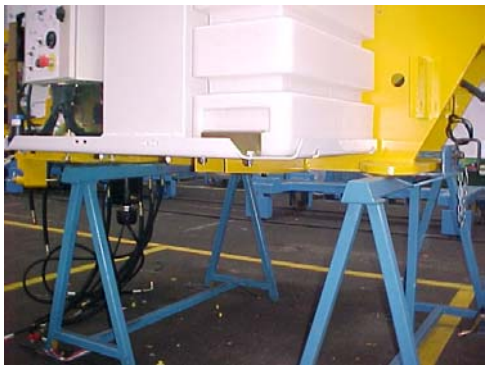


Photo 10

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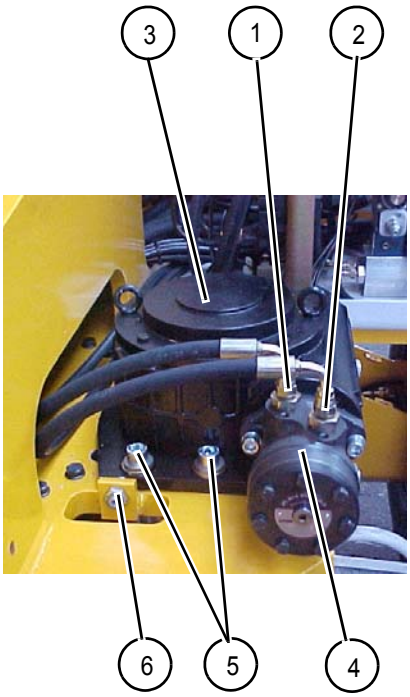
Photo 11



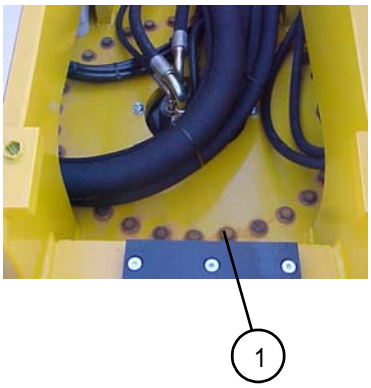
2 - Removing the ring

- Mark then disconnect the hoses (ref. 1 and 2 Photo 11) of the rotation reducing gear (ref. 3 Photo 11) hydraulic motor (ref. 4 Photo 11).
- Put caps on the connectors.

NB: Unscrew the hoses slowly to release residual hydraulic pressure.

- Unscrew the four screws (ref. 5 Photo 11) and washers fixing the reducing gear to the turntable.
- Unscrew the reducing gear's 4 adjusting screws (ref. 6 Photo 11).
- Remove the reducing gear.
- Secure the slew ring on the forks of a lift truck and unscrew the 31 screws (ref.1 Photo 11) and washers holding the ring to the turntable.

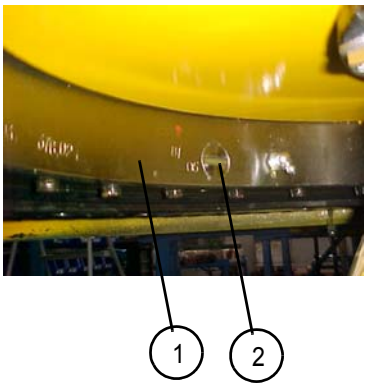
Photo 12



Sheet C128	CORRECTIVE MAINTENANCE SHEET CHANGING THE SLEW RING	Folio 4/6

Caution!
For this operation, all slew ring fixing screws and washers are to be replaced with new ones.

Photo 13



3 - Installing a slew ring

- Position the ring (ref. 1 Photo 13) on the turntable.
- Put the cap (ref. 2 Photo 13) in the zone that is not subject to the main load (on the transversal axis of the turntable).
- Fix the ring using screws and flat washers (ref. 1 Photo 12).
- Tighten in a star pattern to a torque of 100 Nm (73.75 lb.ft).

NB: Four Hm 12 55/30 screws are to be positioned in the counterbores under the rotation reducing gear.

- Put back the rotation reducing gear without blocking it (if the pinion shows signs of wear, replace it).
- Remove the hydraulic motor (see corresponding sheet) to be able to turn the ring.
- Turn the reducing gear to position the ring teeth marked with colour opposite the reducing gear pinion.

4 - Adjusting the gap between the slew ring teeth and the rotation reducing gear pinion

- The coloured mark corresponds to the most excentric point of the ring. Adjust the gap between teeth to 300 µm using a set of flakes.
- Adjust using the reducing gear's adjusting screws (ref. 6 Photo 11).
- When the gap is correct, block the 4 screws fixing the reducing gear to the turntable to a torque of 270 Nm (199 lb.ft).
- Tighten the reducing gear adjusting screw counter-nuts.
- Turn the reducing gear to position the ring quenching connector point marked by the letter S in the reducing gear axis.
- When putting the turntable into place on the chassis, ensure that point «S» is in the zone that is not subject to the main load (in the transversal axis of the chassis).

5 - Installing a slew ring (cont.)

- Remount the rotation reducing gear's hydraulic motor and connect the hoses.
- Put the turntable in slings and position the assembly on the chassis (see Photo 8).

TAKE CARE NOT TO TRAP THE HYDRAULIC HOSES OR WIRING HARNESS DURING THIS OPERATION.

- Fix the ring to the chassis using new flat washers and screws. Tighten to a torque of 100 Nm (73.75 lb.ft).
- Put the rotation blocking screws into place on the lower part of the hydraulic swing joint (see Photo 5).
- Make the swing joint's electric connections in the chassis (see Photo 4).
- Reconnect the hoses on the steering cylinder and travel block (see Photo 2 and Photo 3).
- Put back the counterweight (see corresponding sheet).
- Put back the boom (see corresponding sheet).
- Put back the covers (see corresponding sheet).

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6 - Additional operations

- Reconnect the battery (see corresponding sheet).
- Open the pump suction valve at the hydraulic tank.
- Make several turntable rotation, steering and travel movements, using all available speeds to purge the hydraulic circuit.
- Fill up with the oil recommended by the manufacturer.
- Using the lubricators, lubricate the slew ring bearing path.
- Lubricate the ring teeth.

NB: *For the ring, only use oil recommended by the manufacturer.*

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Sheet C128	CORRECTIVE MAINTENANCE SHEET	Folio 6/6
	CHANGING THE SLEW RING	

Sheet C129	CORRECTIVE MAINTENANCE SHEET	Folio 1/6
	DISMANTLING / RE-ASSEMBLING THE BOOM	

Caution!
Make sure that the lifting means are in good condition and of sufficient capacity.

Caution!
It is essential to put the component in slings before dismantling/re-assembling it.

Caution!
Ensure that the oil is not too hot.

Caution!
Use a container to collect oil to prevent pollution of the environment.

Photo 14

1 - Preliminary operations

- Extend the telescope so that the receiver compensation cylinder pin is visible (ref. 10 Figure 1).
- Rest the boom on its support.
- Lower the jib (for HA16TPX, HA46JRT)).
- Put the machine in the maintenance configuration (see see corresponding paragraph).
- Switch off electric power (see see corresponding paragraph).
- Disconnect the battery (see corresponding sheet).
- Remove the closing plate on the turntable at the back of the telescope.
- Open the turntable electric control panel.
- Disconnect plugs 3, 29, 30 and 49 on the printed circuit.
- Disconnect the terminal of wire 16.
- Take the two cables out of the electric control panel and bring them to the rear of the telescope.

REMINDER: **Weight of the elements:**
Boom assembly (drum + telescope + telescoping cylinder): approx. 850 kg (1874lb)
Hose guide chain: approx. 100 kg (221lb)
Boom drum: approx. 300 kg (662 lb)
Telescope: approx. 200 kg (441 lb)
Telescoping cylinder: approx. 200 kg (441 lb)

2 - Dismantling the boom

- At the rear of the telescope, mark and disconnect the emitting compensation cylinder hoses (ref. 2 Figure 1).
- Plug the connectors.
- Remove the lower pin of the emitting compensation cylinder (ref. 50 Figure 1) (see Photo 14).
- Mark and disconnect the telescope cylinder hoses (ref. 3 Figure 1) Put caps on the connectors.
- On either side of the boom, unscrew the two collars holding the hoses against the sides.
- Mark and disconnect the hoses on the bulkhead unions on the bar on the right side of the boom (see Photo 2).
- Put caps on the connectors.
- On the basket control panel, unscrew the two plugs and if the 220V plug is present, remove the wiring.
- Mark and disconnect the hoses on the basket rotation hydraulic motor, jib cylinder (HA16 and HA46 only) and compensation cylinder.
- Put caps on all the connectors.
- Remove the various collars holding the wires and hoses on the jib (mark the length of the different loops).
- Bring all the wires and hoses to the end of the telescope chute (see Photo 3).
- Put the jib and basket assembly in slings.
- Remove the receiver compensation cylinder pin (ref. 48 Figure 1). To do this, remove the (ref. 49 Figure 1).
- Remove the pin (ref. 47 Figure 1) of the link part (ref. 8 Figure 2). To do this, remove the screw and pin stop clevis.

Sheet C129	CORRECTIVE MAINTENANCE SHEET	Folio 2/6
	DISMANTLING / RE-ASSEMBLING THE BOOM	

Photo 2

- Take out the jib and basket assembly.
- Put the boom assembly in slings at both ends (see Photo 4).
- Wedge the boom lifting cylinder (see Photo 5)
- Remove the pin (ref. 8 Figure 1) from the boom lifting cylinder. To do this, remove the screw and washers from the stop clevis.
- Remove the stop clevis and remove the pin.
- Remove the pin (ref. 51 Figure 1) fixing the boom drum to the turntable.
- Remove the boom assembly, taking care that none of the electric wires and hoses are trapped during the operation.
- Remove the boom and wedge it on a suitable safety stand (see Photo 6).

3 - Removing the telescope

- Remove the pin (ref. 35 Figure 1) of the telescope case.
- Remove the screws and washers (ref. 44 and 45 Figure 1) on both sides of the pin.
- Put the cylinder in slings.
- Take out the pin (ref. 10 Figure 1).
- Take out the 4 screws, washers and nuts to free the telescope chute (ref. 3 Figure 2).
- Put the telescope in slings.
- Remove the 5 pad supports and pads (ref. 31, 28 and 20 Figure 1).
- Put a wedge under the telescope cylinder (ref. 3 Figure 1) at the rear of the boom.
- Remove the telescope fixing pin (ref. 7 Figure 1). To do this, remove the screw and washer, then take out the pin stop clevis.
- Pull the telescope, using a lifting truck or beam, to free it from the boom drum.

Photo 3

INSTALL MORE SLINGS BEFORE COMPLETELY WITHDRAWING THE TELESCOPE.

- Place and secure the case on suitable safety stands.
- Remove the pin (ref. 36 Figure 1) from the pin (ref. 9 Figure 1). Holes are provided on and under the case.
- Put the telescope cylinder into slings and take it out from the rear of the case.
- Remove the pads (ref. 11, 13 and 17 Figure 1) fixed on the rear of the telescope.

Photo 4

NB: Depending on the max. and min. tolerances of the case, and to limit clearance to 3 mm, adjustment wedges may be inserted between the side pads and the telescope.

4 - Replacing the boom drum (if necessary)

- Remove the two protective covers from the hoses along the boom (ref. 4 and 5 Figure 2).
- Remove the collars holding the hoses at the top of the boom drum case.
- Remove the collar holding the electric wires at the bottom of the boom.
- Remove the two support tabs (ref. 6 Figure 2).
- Mark then unscrew the bulkhead unions (ref. 46 Figure 2) on the bar welded at the rear of the boom drum.
- Remove the telescope contactor protective plate and unscrew the support.
- Put the chute (ref. 3 Figure 2) and the chain support (ref. 2 Figure 2) in slings.

Photo 5

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Photo 6

- Put wedges under these two elements and remove the screws and washers (ref. 18 and 19 Figure 2).
- Remove the assembly, taking care not to trap the hoses or electric wires. It is possible to fasten them together using Colson collars.
- Remove the chain roller (ref. 27 Figure 2).

5 - Re-assembly

Perform the dismantling operations in reverse order.

6 - Some advice for re-assembly

- Change all pins and rings showing signs of wear. Lubricate them when re-assembling.
- Take care to install all pin stop systems properly.
- Replace worn friction pads.
  - CAUTION: when replacing a telescope or boom drum, it may be necessary to wedge the rear side pads to reduce clearance. (Max. clearance 3 mm). Front pads are adjusted using the pad holder screws.
- Lubricate the telescope.
- Purge the compensation and telescope cylinder and then top up the hydraulic oil.

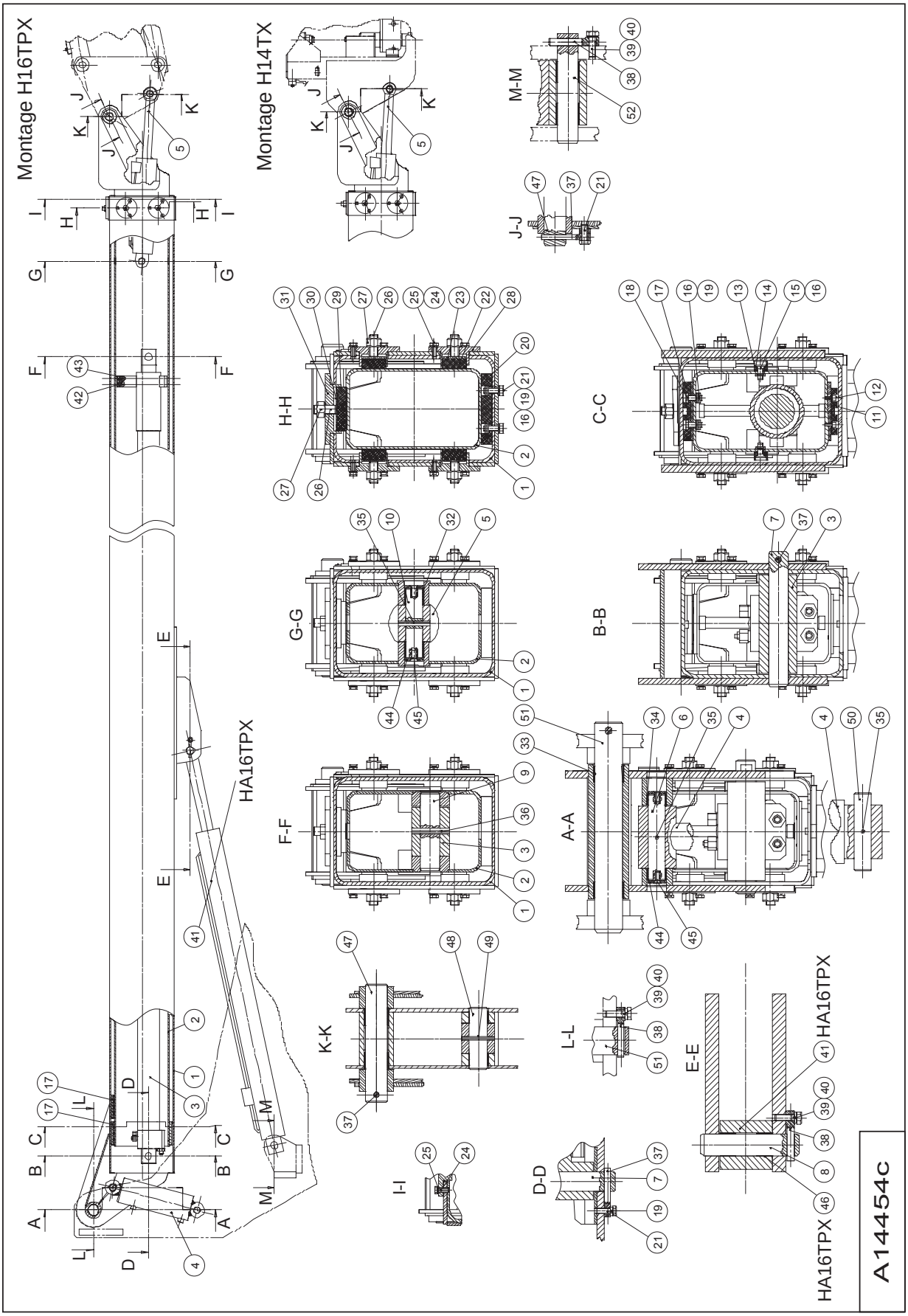
Caution!
Replacement of safety parts must be validated by static tests.
CE = 1.25 x nominal
USA = 1.5 x nominal

7 - Additional operations

- Put the machine back in the operational configuration.
- Remove the slings.
- Extend the machine several times to test operation and purge the hydraulic circuit.
- Check the level of the hydraulic circuit.

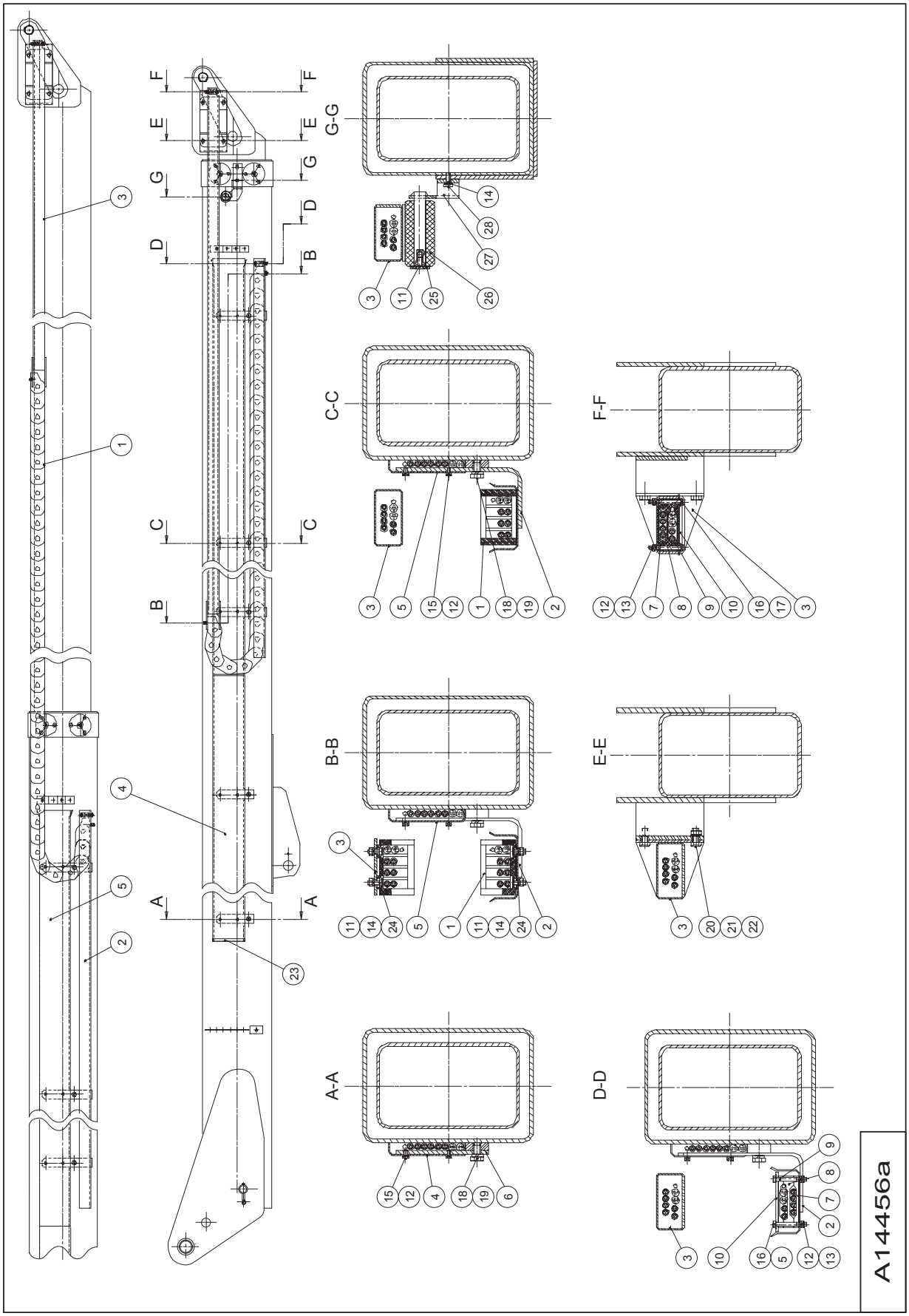
Sheet C129	CORRECTIVE MAINTENANCE SHEET	Folio 4/6
	DISMANTLING / RE-ASSEMBLING THE BOOM	

Figure 1



Sheet C129	CORRECTIVE MAINTENANCE SHEET	Folio 5/6
	DISMANTLING / RE-ASSEMBLING THE BOOM	

Figure 2



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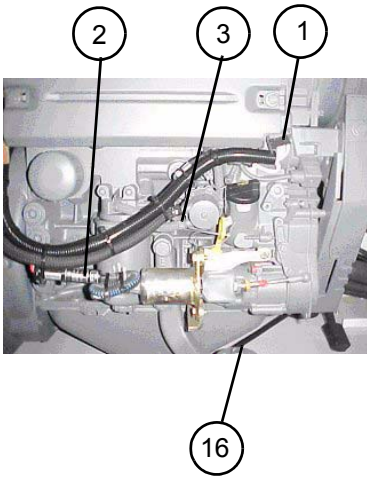
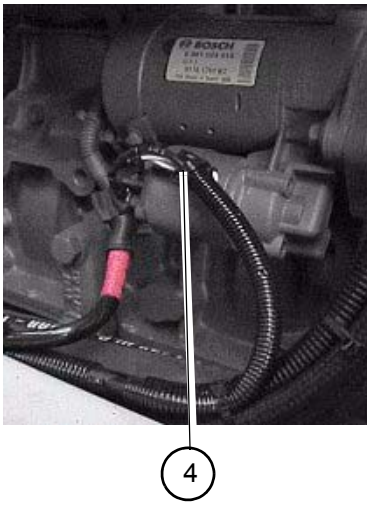
Sheet C129	CORRECTIVE MAINTENANCE SHEET	Folio 6/6
	DISMANTLING / RE-ASSEMBLING THE BOOM	

Sheet C130	CORRECTIVE MAINTENANCE SHEET	Folio 1/2
	CHANGING THE DEUTZ DIESEL THERMAL MOTOR	

Caution!
Leave the motor and exhaust pipe to cool sufficiently before performing any maintenance operation on these elements.





1 - Preliminary operations
- Put the machine in the maintenance configuration (see see corresponding paragraph).
- Switch off electric power (see see corresponding paragraph).
- Close the hydraulic tank suction valve.
-

2 - Removing the connections
- Remove the cover on the motor side (see corresponding sheet).
- Disconnect the starter battery terminals (see corresponding sheet).
- On the motor, disconnect the electric connectors (1) (oil temperature, oil pressure, generator).
- Disconnect the fuel incoming (2) and outgoing pipes.
- Disconnect the electric connectors of the starter (4) accessible by pivoting the motor housing.

3 - Removing the air suction and ventilation duct
- Remove the suction duct by unscrewing the collar (5).
- Remove the ventilation duct by unscrewing the Cerflex collar (6).

4 - Removing the exhaust
- Remove the fixing bolts from the collars (7) and (8).
- Remove the exhaust

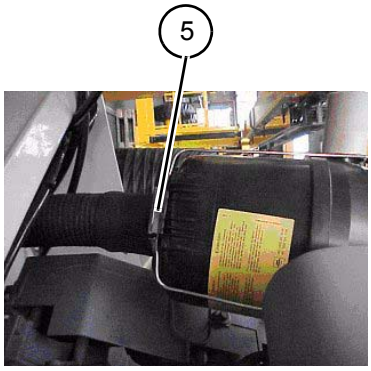
5 - Removing the coupling
- Remove the hydraulic pump (9) (see corresponding sheet).
- Remove the two fixing screws (10) from the hydraulic oil filter support (11) and the two screws from the exhaust collar support plate.
- Remove the 6 screws (12) fixing the flange (13) of the motor flap, then remove the flap and earth braid.
- Remove the 8 fixing screws (14) from the coupling (15).

6 - Removing the thermal motor
- Put the motor in slings as instructed by the motor manufacturer.
- Remove the 4 fixing screws (16) from the motor and remove the motor.

7 - Installing the thermal motor
- Visually check the condition of the silent blocks and replace if necessay.
- Position the thermal motor and fix using the 4 fixing screws, previously coated with normal blue loctite 243, equipped with new grower washers.
- Put back the air filter duct with its collar.
- Put back the ventilation duct with its collar.

8 - Installing the coupling
- Position the coupling and fix with 8 fixing screws, previously coated with normal blue loctite 243. Tighten to a torque of 25 Nm (18.4 lb.ft).
- Put the motor flap flange into place and fix with 6 screws equipped with new grower washers.
- Put the earth braid into place, do not tighten immediately.
- Put back the oil filter support and exhaust support and fix to the flange with 4 screws equipped with new grower washers.
- Tighten the 10 fixing screws (10) and (12) on the flange to a torque of 49 Nm.
- Put back the hydraulic pump (see corresponding sheet).

Sheet C130	CORRECTIVE MAINTENANCE SHEET	Folio 2/2
	CHANGING THE DEUTZ DIESEL THERMAL MOTOR	

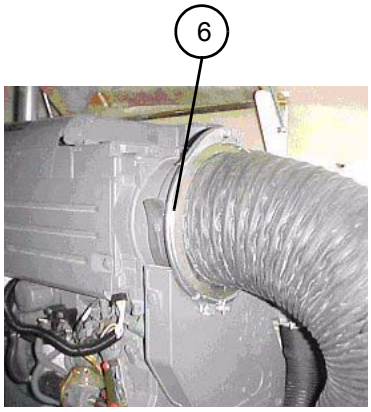


9 - Installing the exhaust

- Position the exhaust and fix using fixing collars (7) and (8).
- Adjust the angle of the exhaust later to simplify its passage in the cover, tighten the collars.

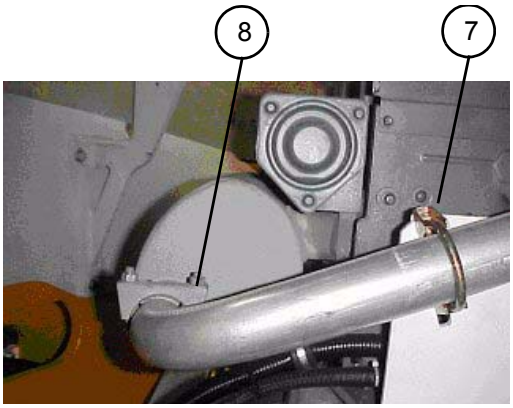
10 - Connection

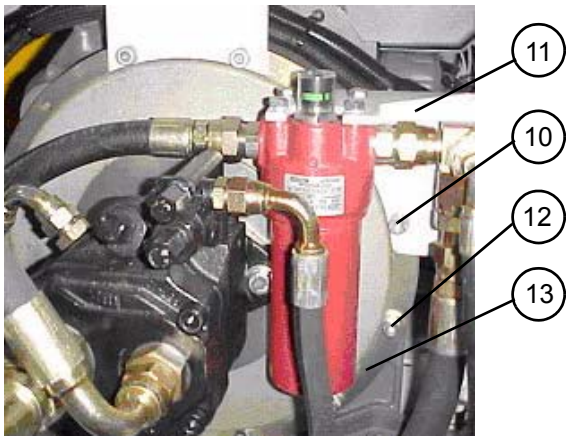
- Reconnect the fuel incoming and outgoing pipes.
- On the motor, reconnect the electric connectors (acceleration setpoints, oil temperature, oil pressure, starter supply).
- Reconnect the starter battery terminals (see corresponding sheet).
- Put back the cover (see corresponding sheet).



11 - Additional operations

- Put the machine back in the operational configuration.
- If the motor installed is new, follow the first commissioning instructions (see motor manufacturer's manual).
- Start the motor and check that it works properly.





Pinguely-Haulotte

Sheet C131	CORRECTIVE MAINTENANCE SHEET	Folio 1/2
	CHANGING A NON-RETURN VALVE	

Caution!
Ensure that the oil is not too hot.

Caution!
Use a container to collect oil to prevent pollution of the environment.

Photo 6

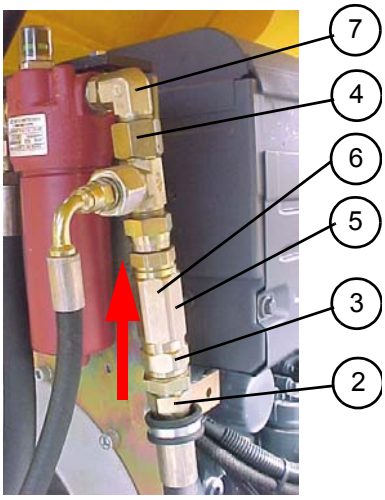
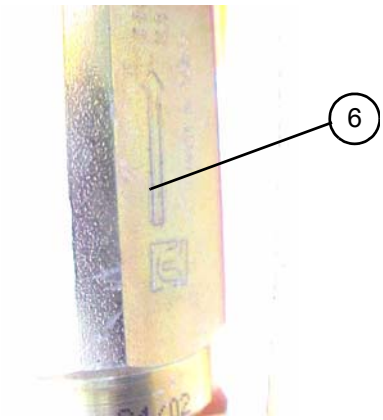


Photo 7



1 - Preliminary operations

- Put the machine in the maintenance configuration (see see corresponding paragraph).
- Switch off electric power (see see corresponding paragraph).
- Close the pump oil suction valve.

2 - Removing a non-return valve fitted towards the hydraulic filter

- Remove the fixing collar (ref. 2 Photo 6) from the hose on the filter support.
- Unscrew and cap the hose (ref. 3 Photo 6).
- Unscrew the connector (ref. 4 Photo 6).
- Unscrew the union (ref. 5 Photo 6) and adapter (ref. 4 Photo 6) of the valve (ref. 1 Photo 6).

3 - Installing a non-return valve

- Check the direction of oil passage, shown by an arrow (ref. 6 Photo 7) engraved on the valve body (ref. 1 Photo 6).
- Screw the union (ref. 3 Photo 6) and adapter (ref. 4 Photo 6) onto the valve.
- Screw the adapter (ref. 4 Photo 6) onto the T (ref. 7 Photo 6).
- Screw the hose (ref. 3 Photo 6) into place.
- Put the collar into place (ref. 2 Photo 6).
- Open the pump shut-off valve.
- Put the machine back in the operational configuration.
- Make several movements using the replaced non-return valve to purge the circuit.
- Check that the corresponding movement is made correctly.

4 - 4 - Removing a non-return valve fitted on an emergency electropump unit (ref. 8 Photo 8)

- Unscrew and cap the hose (ref. 3 Photo 6).
- Unscrew the connector (ref. 4 Photo 6).
- Unscrew the union (ref. 5 Photo 6) and adapter (ref. 4 Photo 6) on the valve (ref. 1 Photo 6).
-

5 - Installing a non-return valve

- Check the direction of oil passage, shown by an arrow (ref. 6 Photo 7) engraved on the valve body (ref. 1 Photo 6).
- Screw the union (ref. 3 Photo 6) and adapter (ref. 4 Photo 6) onto the valve.
- Screw the adapter (ref. 4 Photo 6) onto the T (ref. 7 Photo 6).
- Screw the hose (ref. 3 Photo 6).
- Open the pump shut-off valve.
- Put the machine back in the operational configuration.
- Make several movements using the replaced non-return valve to purge the circuit.
- Check that the corresponding movement is made correctly.

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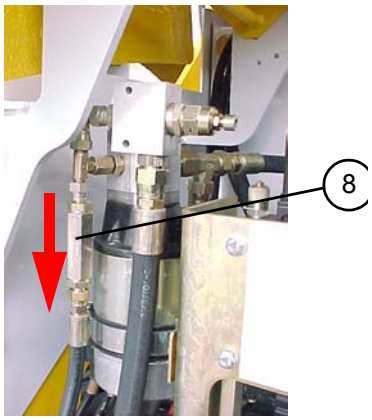
Sheet C131	CORRECTIVE MAINTENANCE SHEET	Folio 2/2
	CHANGING A NON-RETURN VALVE	

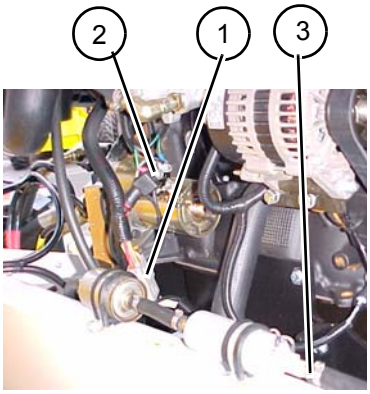
Photo 8

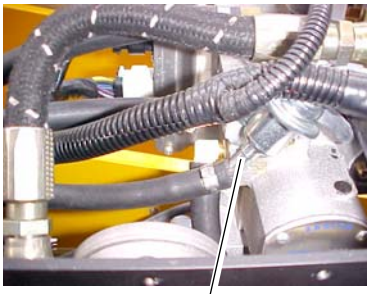


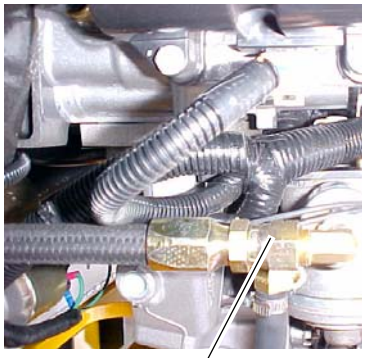
Pinguely-Haulotte

Sheet C136	CORRECTIVE MAINTENANCE SHEET	Folio 1/2
	CHANGING THE PETROL / GAS GM THERMAL MOTOR	

Caution!
Leave the motor and exhaust to cool sufficiently before performing any maintenance operation on these elements.







1 - Preliminary operations
- Put the machine in the maintenance configuration (see corresponding paragraph).
- Switch off electric power (see corresponding paragraph).
- Close the hydraulic tank suction valve.

2 - Removing the connections
- Remove the covers on the motor side (see corresponding sheet).
- Disconnect the starter battery terminals (see corresponding sheet).
- Pivot the motor housing to enable access to the rear of the motor.
- On the motor, disconnect the electric connectors (1) (oil temperature, oil pressure, generator, etc.).
- Remove the starter terminals (2) after marking them and the earth terminal (10).
- Disconnect the incoming and outgoing fuel pipes (3) and (4).
- Disconnect the gas supply pipe (5).

3 - Removing the air suction duct
- Remove the suction duct by unscrewing the collar (14).
- If the air filter is to be recovered, unscrew the nuts (6) and collar (15).

4 - Removing the exhaust
- Remove the fixing nuts on the flange (7).
- Remove the silencer flanges (8).
- Remove the exhaust.
- Remove the brackets (9) fixed on the radiator.

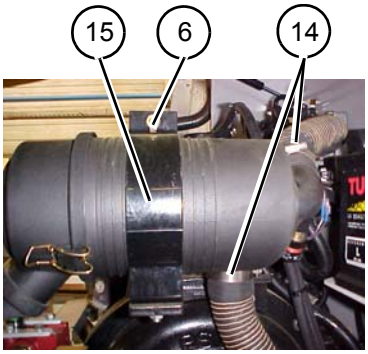
5 - Removing the thermal motor
- Remove the hydraulic pump (13) (see corresponding sheet).
- Put the motor in slings according to the motor manufacturer's instructions.
- Remove the 4 fixing screws (16) from the motor and remove the motor.
- Retain the motor fixing support parts (12) if necessary to be remounted on the new motor.

6 - Installing the thermal motor
- Visually check the condition of the silent blocks and replace if necessary.
- Position the thermal motor and fix using the 4 fixing screws, previously coated with normal blue loctite 243, equipped with new grower washers.
- Put back the air filter with its collar.
- Put back the air filter suction duct with its collar.
- Put back the hydraulic pump (see corresponding sheet).

7 - Installing the exhaust
- Put back and fix the exhaust silencer support brackets (9)
- Put the silencer (8) back on its brackets (9) and screw the collars without tightening them.
- Position and tighten the collector screws (7).
- Tighten the silencer support collars.

8 - Connections
- Reconnect the fuel incoming and outgoing pipes.
- On the motor, reconnect the electric connectors (1) (acceleration set-points, oil temperature, oil pressure, starter supply).
- Reconnect the starter terminals (2) and the earth terminal (10).
- Reconnect the starter battery terminals (see corresponding sheet).
- Put back the cover (see corresponding sheet).

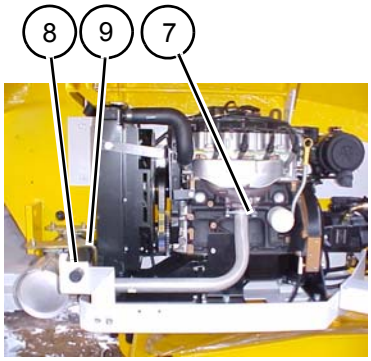
Sheet C136	CORRECTIVE MAINTENANCE SHEET	Folio 2/2
	CHANGING THE PETROL / GAS GM THERMAL MOTOR	

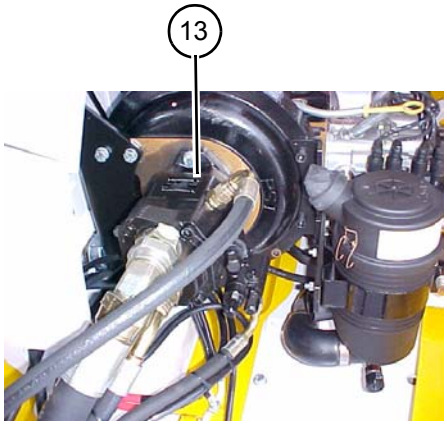


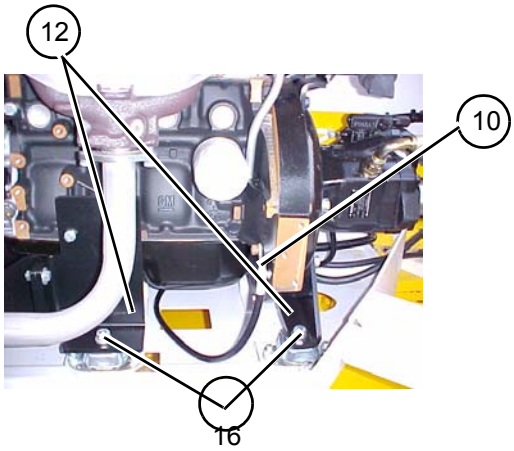
- Reconnect the gas supply pipe (5) using joint compound on the special gas threading.
- Check that the circuit is tight using a special GAS developing agent on connection and opening the gas cylinder.

9 - Additional operations

- Put the machine back in the operational configuration.
- If the motor installed is new, follow the first commissioning instructions (see motor manufacturer's manual).
- Start the motor and check that it works correctly with both fuel types: petrol and gas.







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Sheet C138	CORRECTIVE MAINTENANCE SHEET	Folio 1/2
	CHANGING THE COUNTERWEIGHTS	

1 - Preliminary operations

- Put the machine in the maintenance configuration (see corresponding paragraph).
- Switch off electric power (see corresponding paragraph).
- Put the boom into slings (1) to prevent tipping when the counterweight is removed.
- Fix a vehicle lift to the lifting beam and apply tension to the vehicle lift.

2 - Removing the counterweight

- Remove the cover (see corresponding sheet).
- Sling the counterweight by screwing 2 hooks of handling (2) M24 in the nuts envisaged for this purpose on the top of the counterweight.
- Remove the screws (3) M24x90, the washer TREP type 4L and the washer Ref : 178D15857 for H14PX (HB40), and the screws and washers (4) for H16TPX (HB44J).
- Remove the counterweight

3 - Installing the counterweight

- Put back the three fixings screws and washers. Tighten to the torque recommended (see tightening torque value table).

4 - Additional operations

- Check that the counterweight is properly secured to the machine.
- Remove the straps from the counterweight.
- Remove the sling from the boom.
- Put the machine back in the operational configuration.

Caution !
Ensure that the lifting equipment is in good condition and of sufficient capacity.

Caution !
It is essential to put the component in slings before dismantling/re-assembling it.

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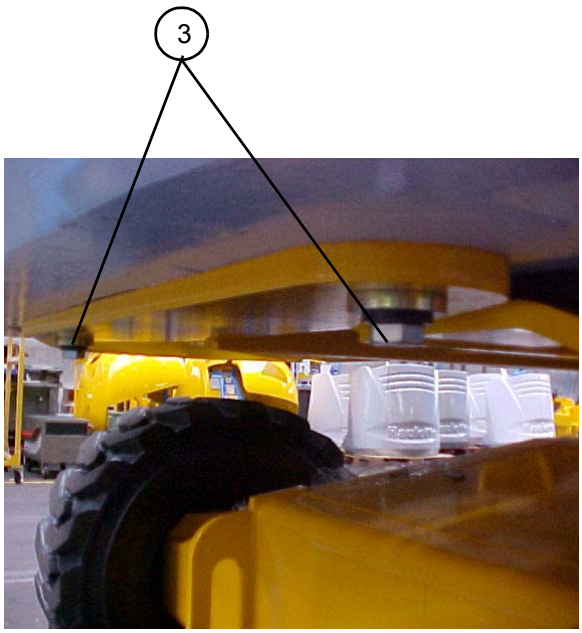
Sheet C138	CORRECTIVE MAINTENANCE SHEET	
	CHANGING THE COUNTERWEIGHTS