ERL MAINTENANCE SUPPORT SDN BHD

Co. Reg. No. 199901023674 (498574-T)

E-MAS

Effective Railway Operations; Reliable System Maintenance

SYSTEMS (SYS) DEPARTMENT

SIGNALLING (SIG) MAINTENANCE TECHNICAL INSTRUCTION

Ref. No. E00.OME.M12950.BT. 1001.A

Release

Released:	Ham Mow Wai	Maintenance	19.1.22	
Checked:	Anthony Arokianathan	Systems	19.1.22	
Checked:	Noel Devan	Systems	19 Jan 22	
Checked:	Tengku Nadzuan	Systems	01.12.2021	
Checked:	Laxchumy	Systems	07/10/2021	
Checked:	Mohd Hasan	Systems	13/10/21	
Checked:	Azuansyamsany	Systems	17.01.2022	
Author:	Asmawi Jusoh	Systems	7/10/21	
	Name	**Dept.**	**Date**	**Signature**

Amendments or additions to this procedure must be indicated with a vertical black line in the adjacent left margin.

Change Record and Configuration Control

A	26.8.2021	Department re-structuring (ELT and SIG Merged into SYSTEMS) and Technical Instruction updated.	Tengku Nadzuan and Asmawi
Revision	**Date**	**Modification**	**Name**

Planning Of Changes Reference For Revision: E00.OME.M12950.BT.1001.A					
Issues To Consider	**Checked** ***(Please mark X)***				**Remarks**
1) Are there any negative impact?	YES		NO	X	
2) Will the integrity of QEMS be affected?	YES		NO	X	
3) Resources available?	YES	X	NO		
4) Allocation or relocation of responsibilities and authorities required?	YES		NO	X	

TABLE OF CONTENTS **Page**

1 Purpose

1.1 This document provides a structured guidance / process flow for the purpose of maintenance on the various SYSTEMS - Signalling sub-systems.

1.2 This Technical Instruction / process flow is extracted from the O&M Manual and also based on the experience acquired from the daily maintenance of the SYS- Sig sub-system.

1.3 The guidance / process flow outlined in this document shall be used by all SYS-Sig personnel for carrying out maintenance activities as and when required.

2 Scope, Distribution & Access

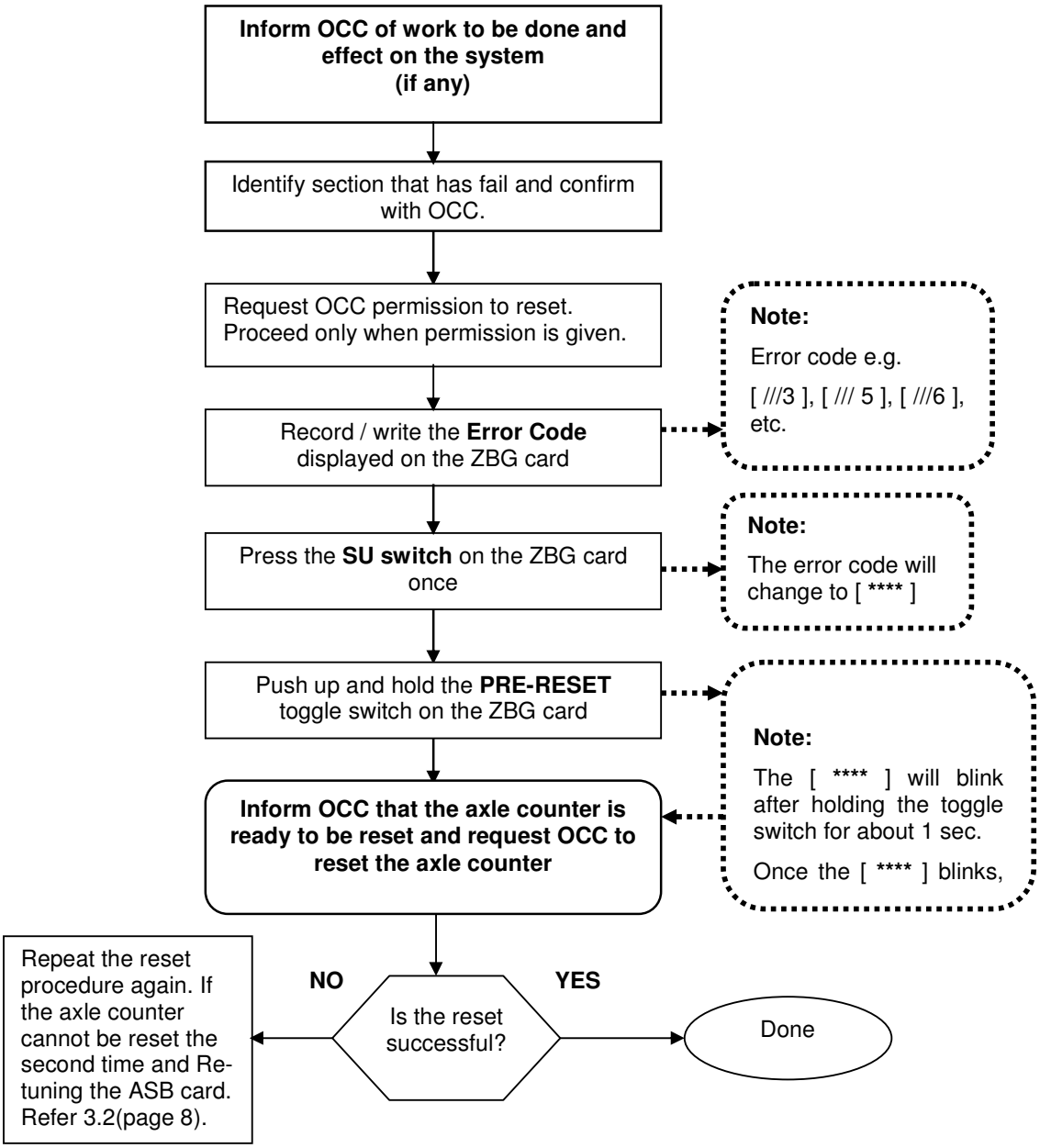
2.1 This document is specific for the various SYS - Sig sub-systems used in the ERL system.

2.2 A hardcopy of this document shall be made available for each SYS - Sig personnel as a personal guide. This document can also be accessed electronically via the common shared folder and Electronic Documentation Maintenance System (EDMS).

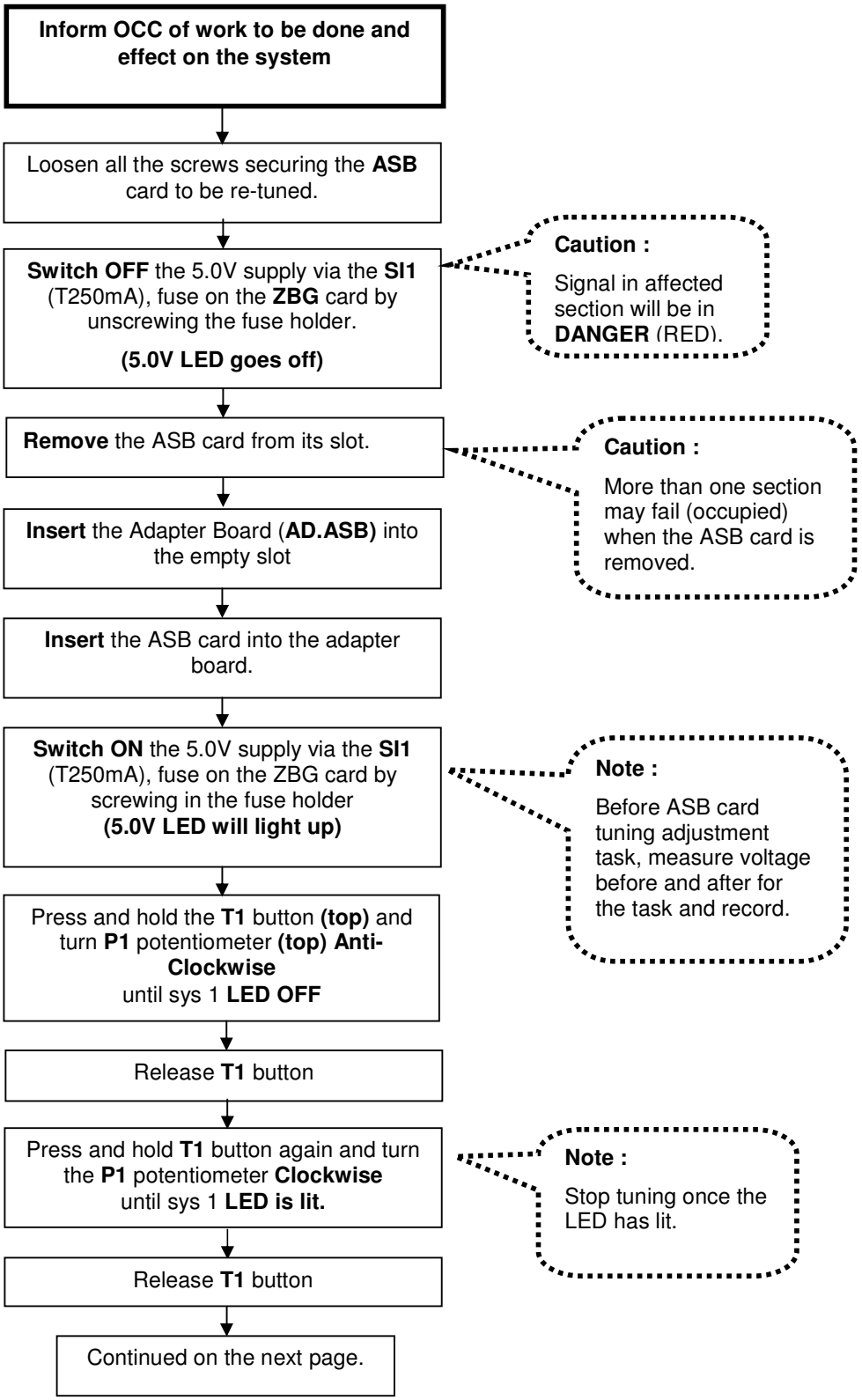
If there is any doubt in the references provided below, please refer to your superior immediately.

3 Axle Counter Maintenance Technical Instruction

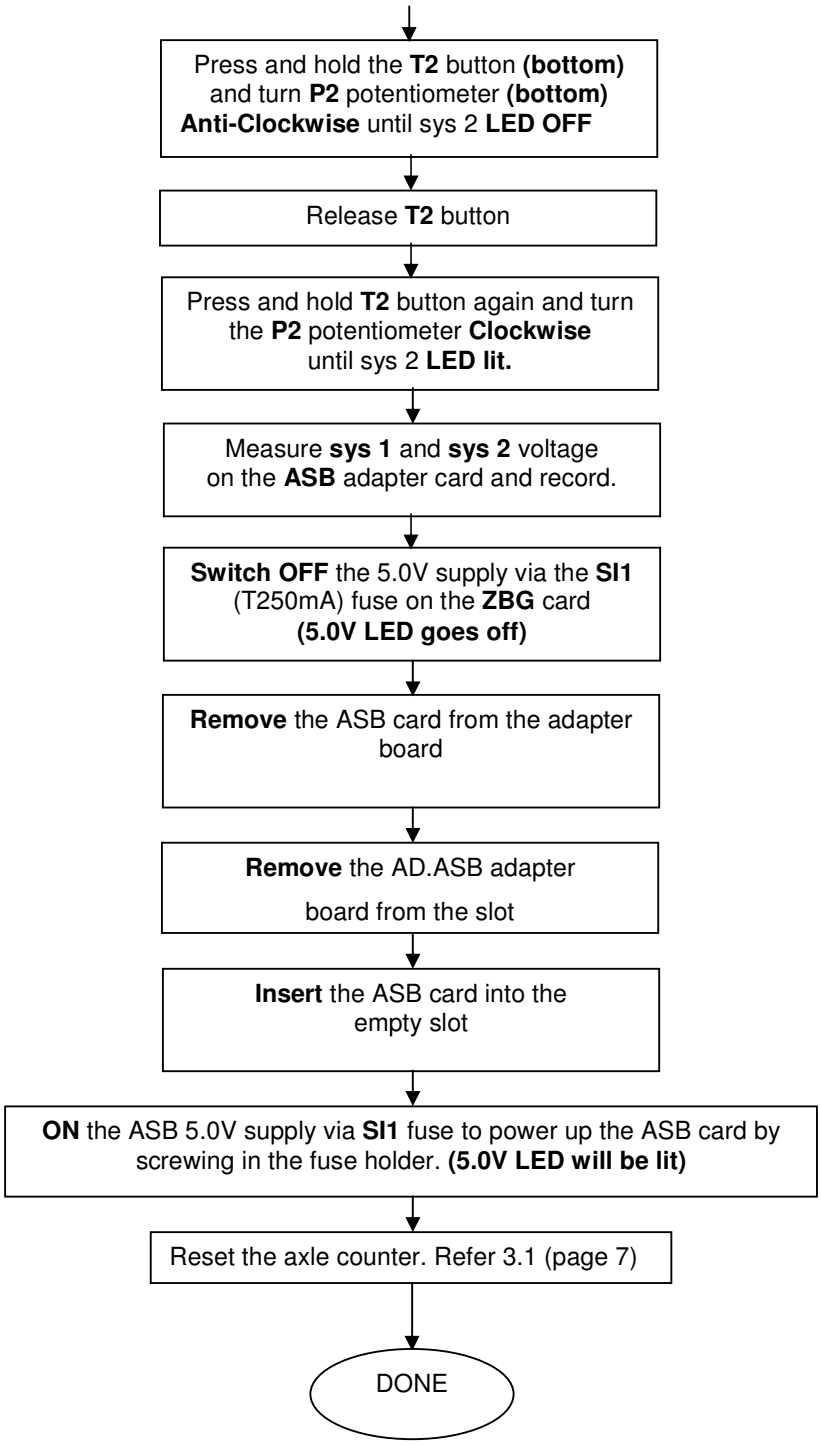
3.1 Resetting an Axle Counter



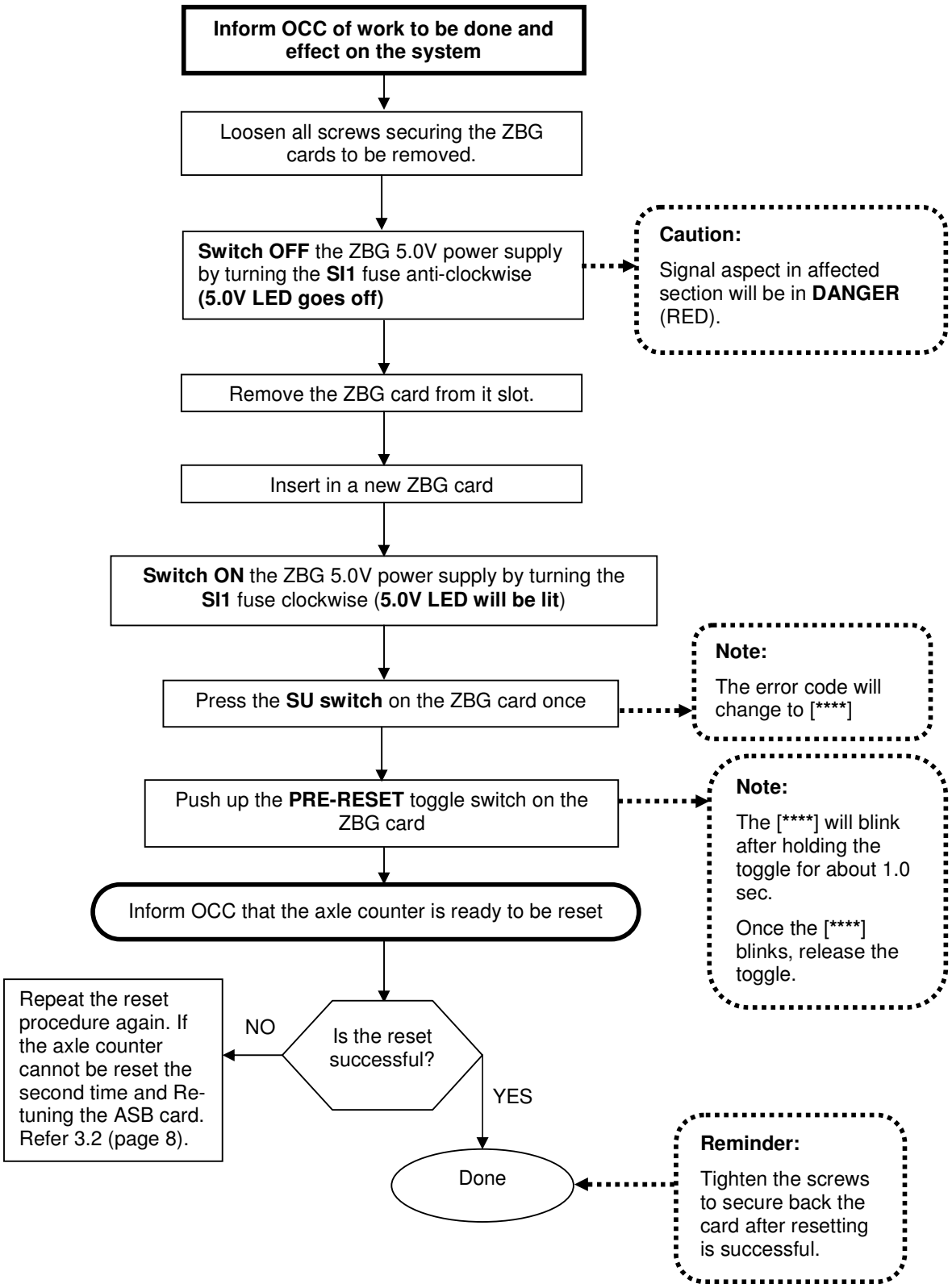
3.2 Re-tuning ASB Card



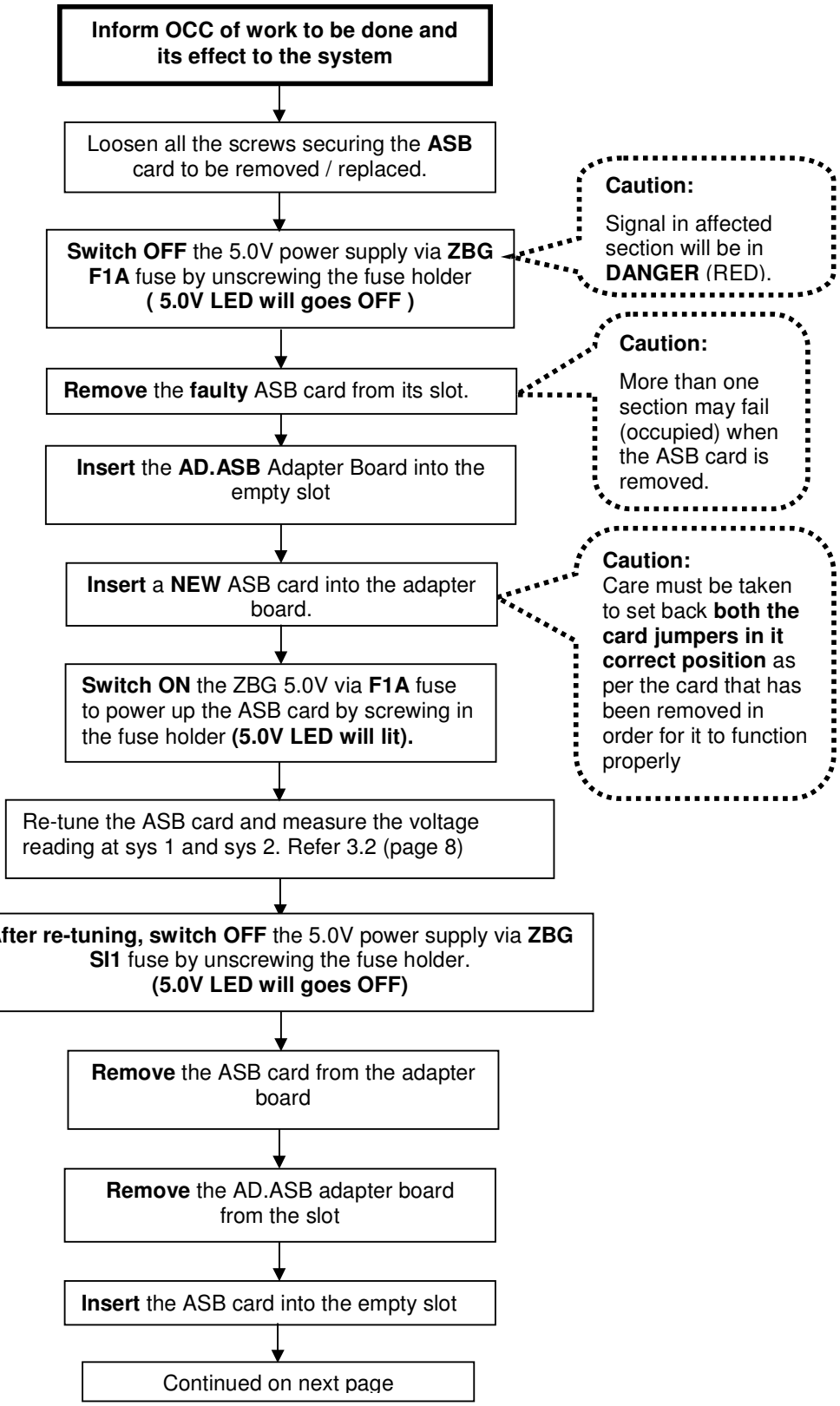
3.2 Re-tuning ASB Card (Continued)



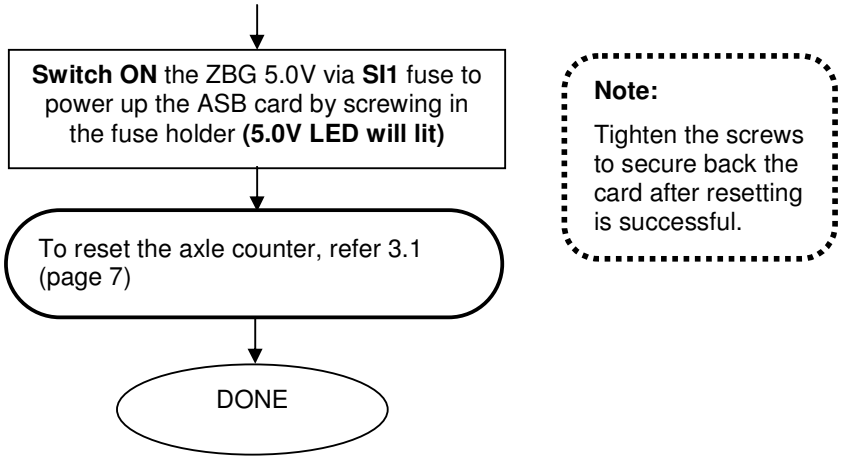
3.3 Replacement of ZBG Card



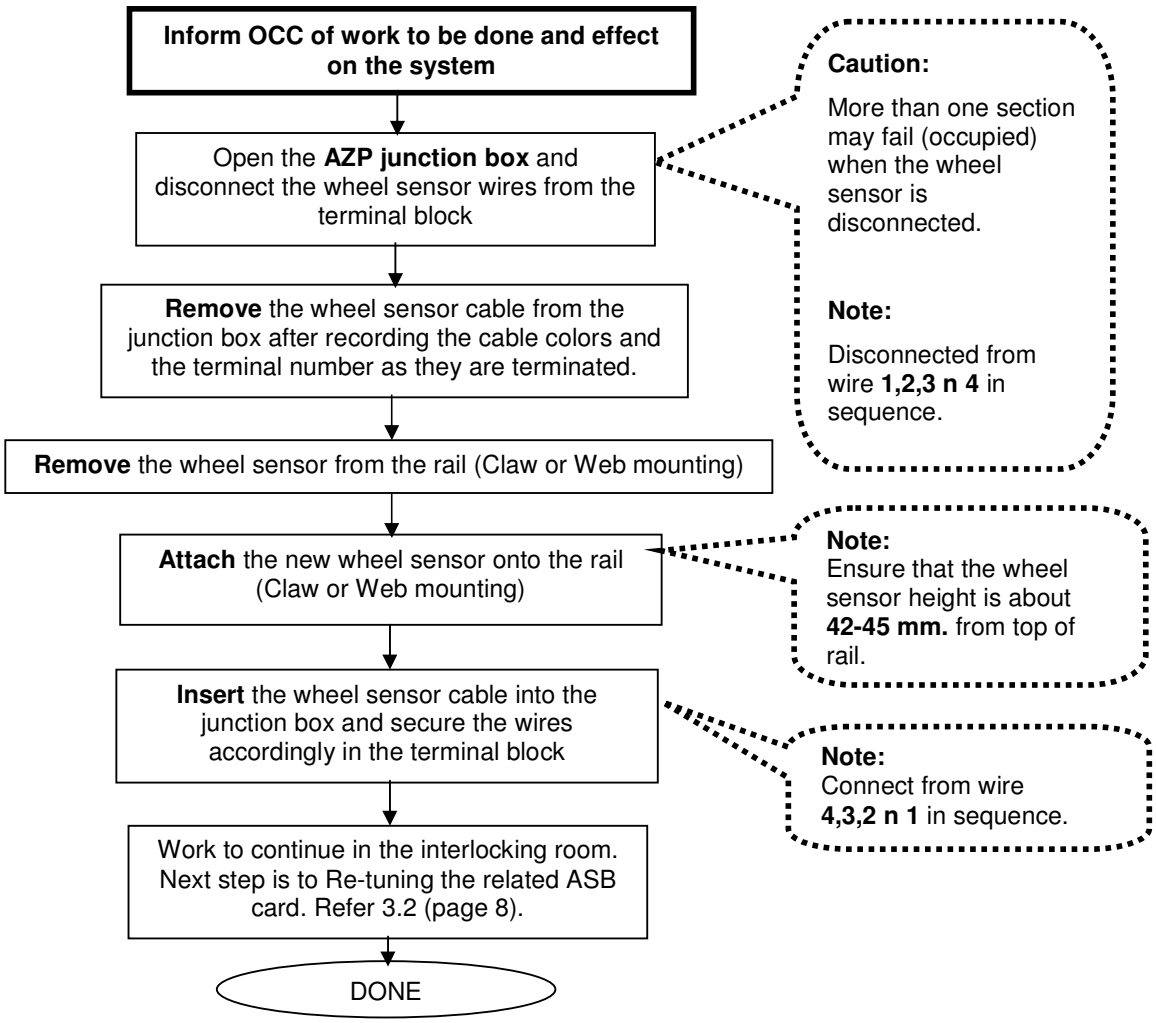
3.4 Replacement of ASB Card



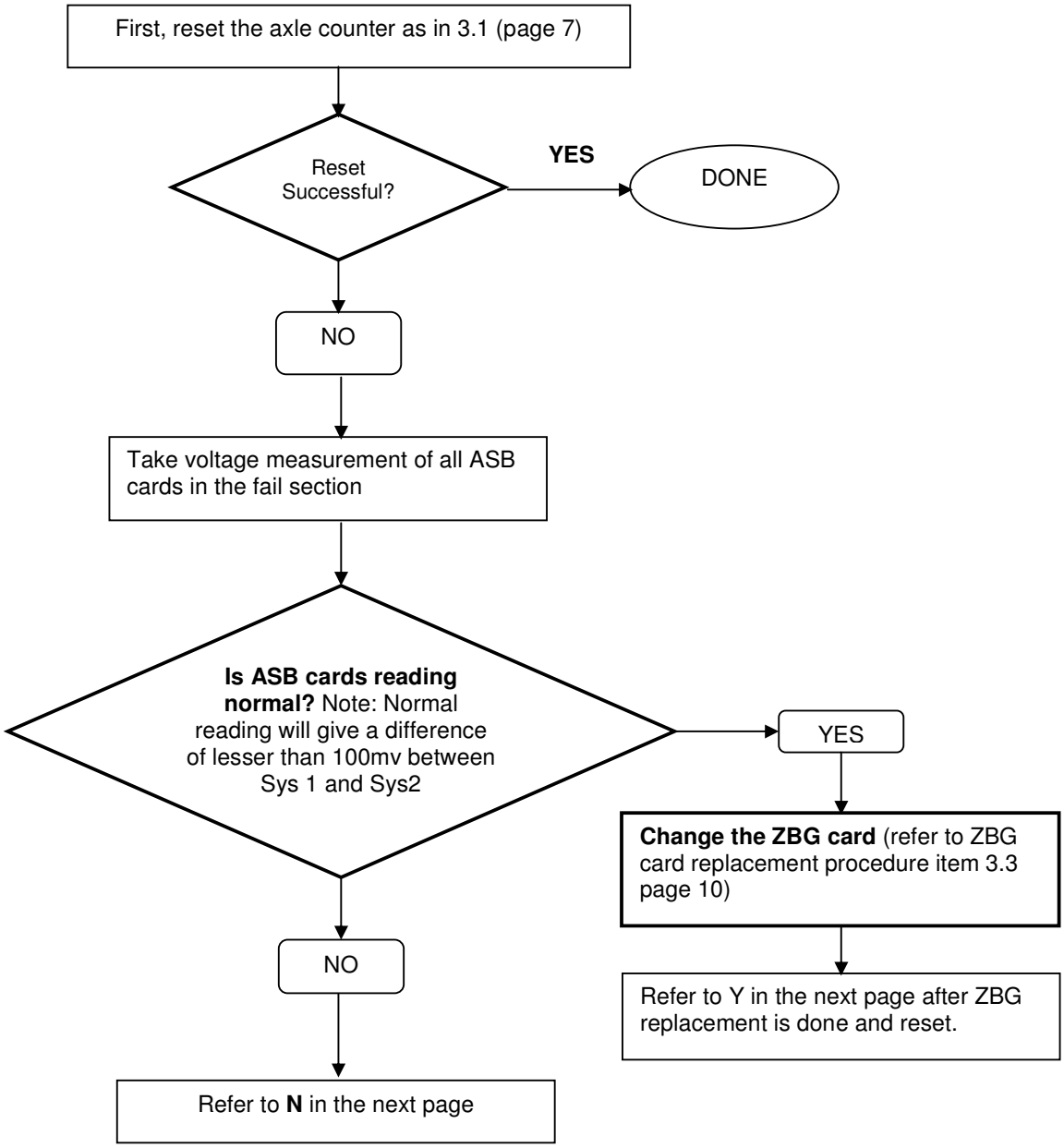
3.4 Replacement of ASB Card (Continued)



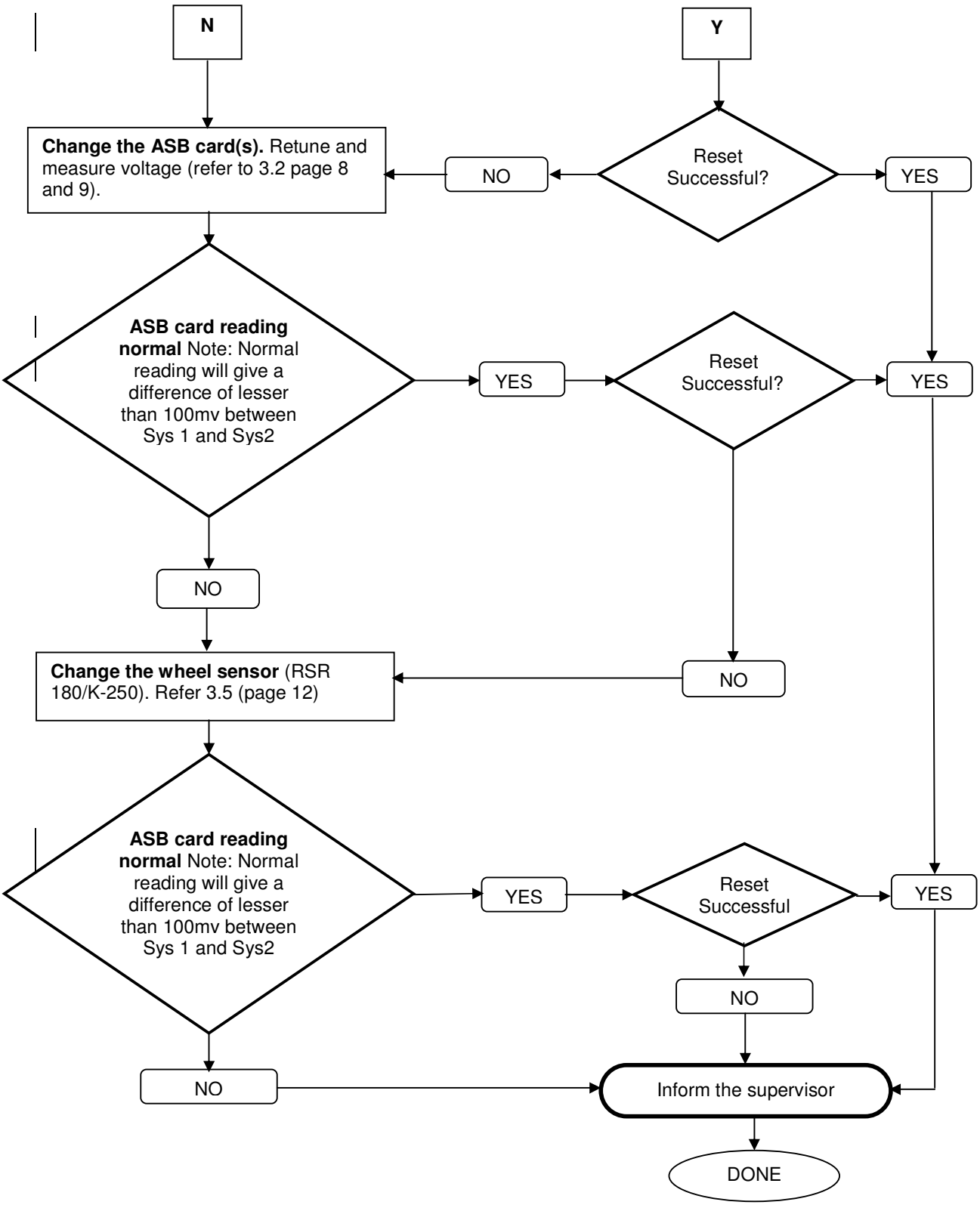
3.5 Replacement of Wheel Sensor



3.6 Axle Counter Failure Rectification Works

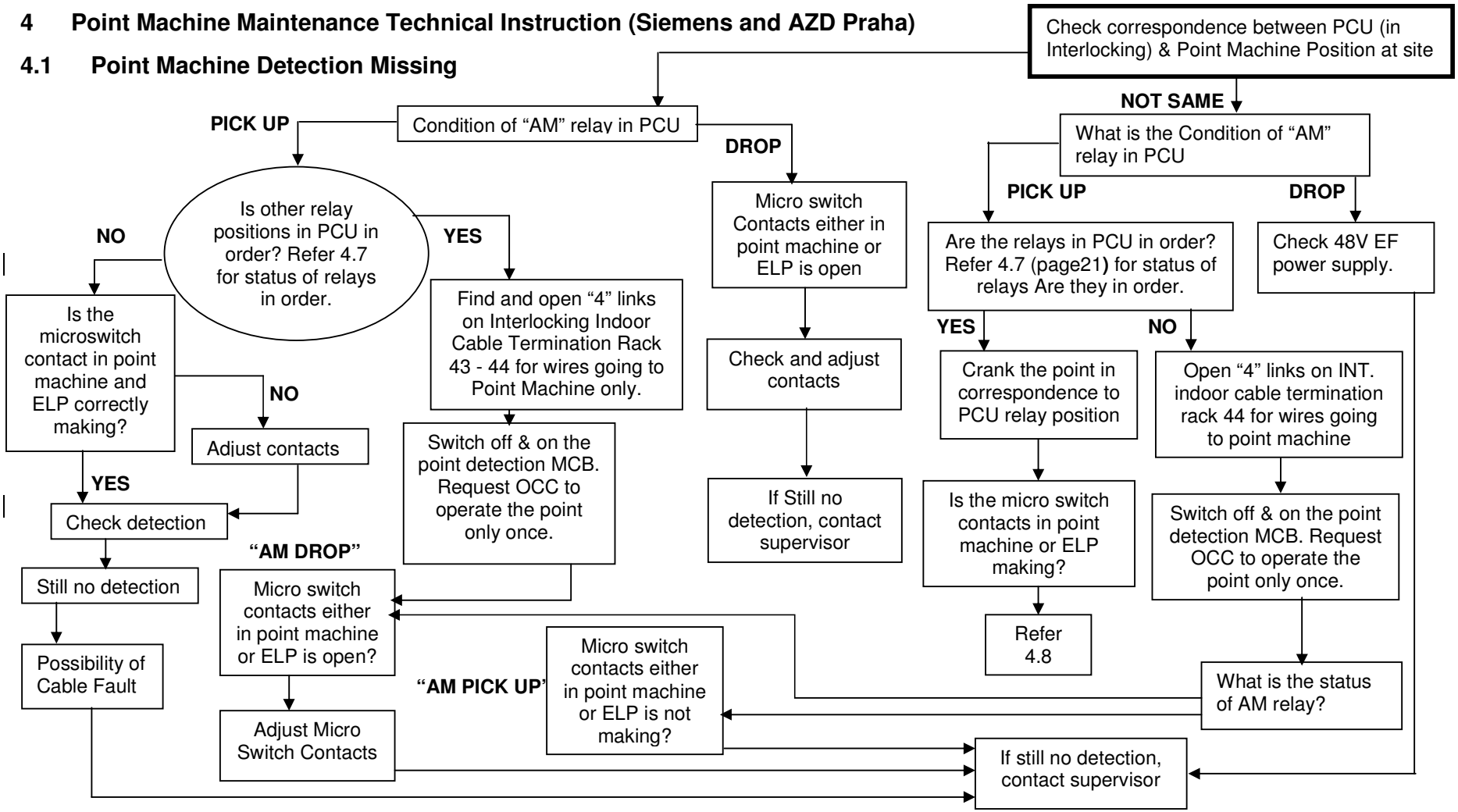


3.6 Axle Counter Failure Rectification Works (Continued)



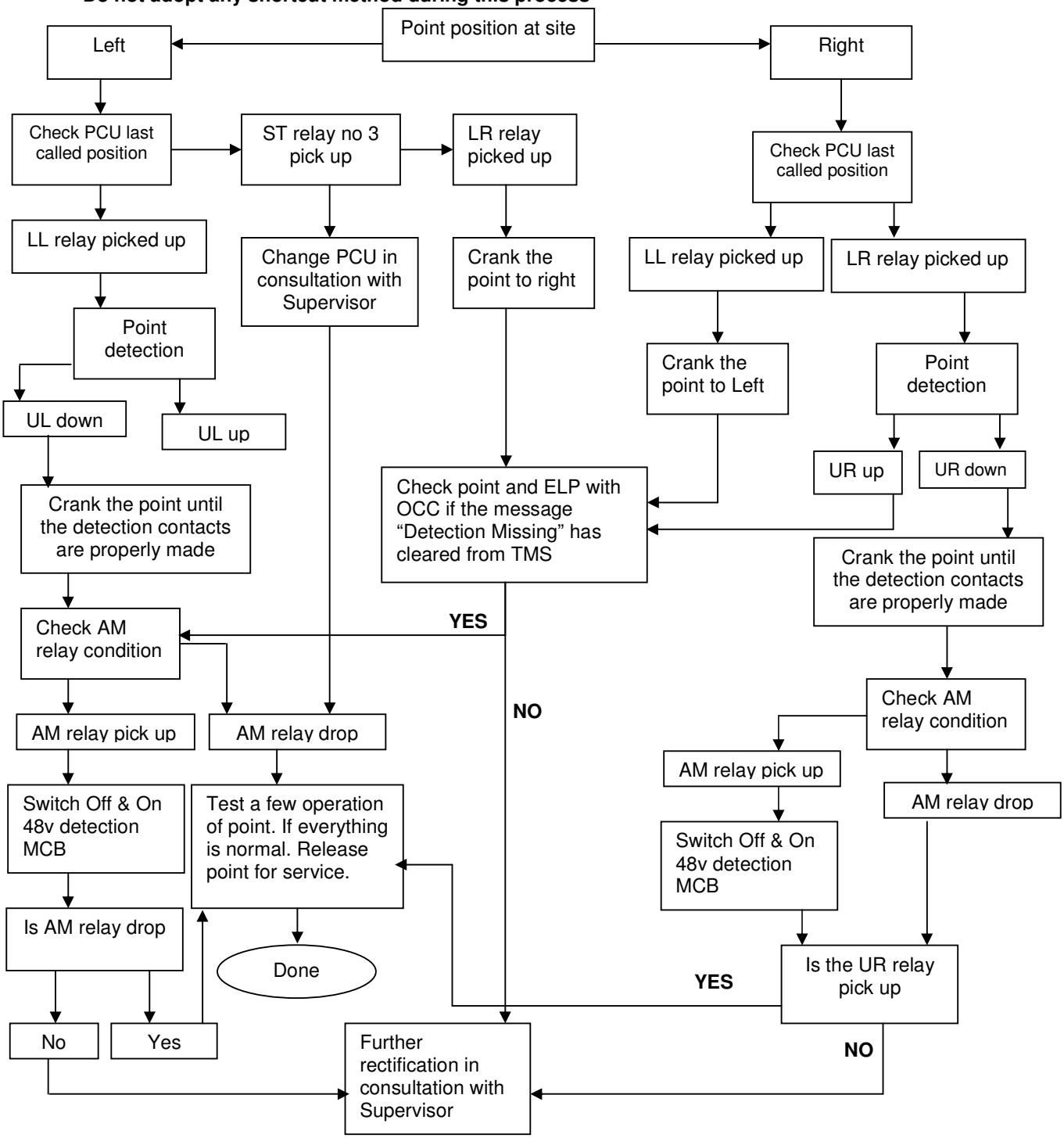
4 Point Machine Maintenance Technical Instruction (Siemens and AZD Praha)

4.1 Point Machine Detection Missing

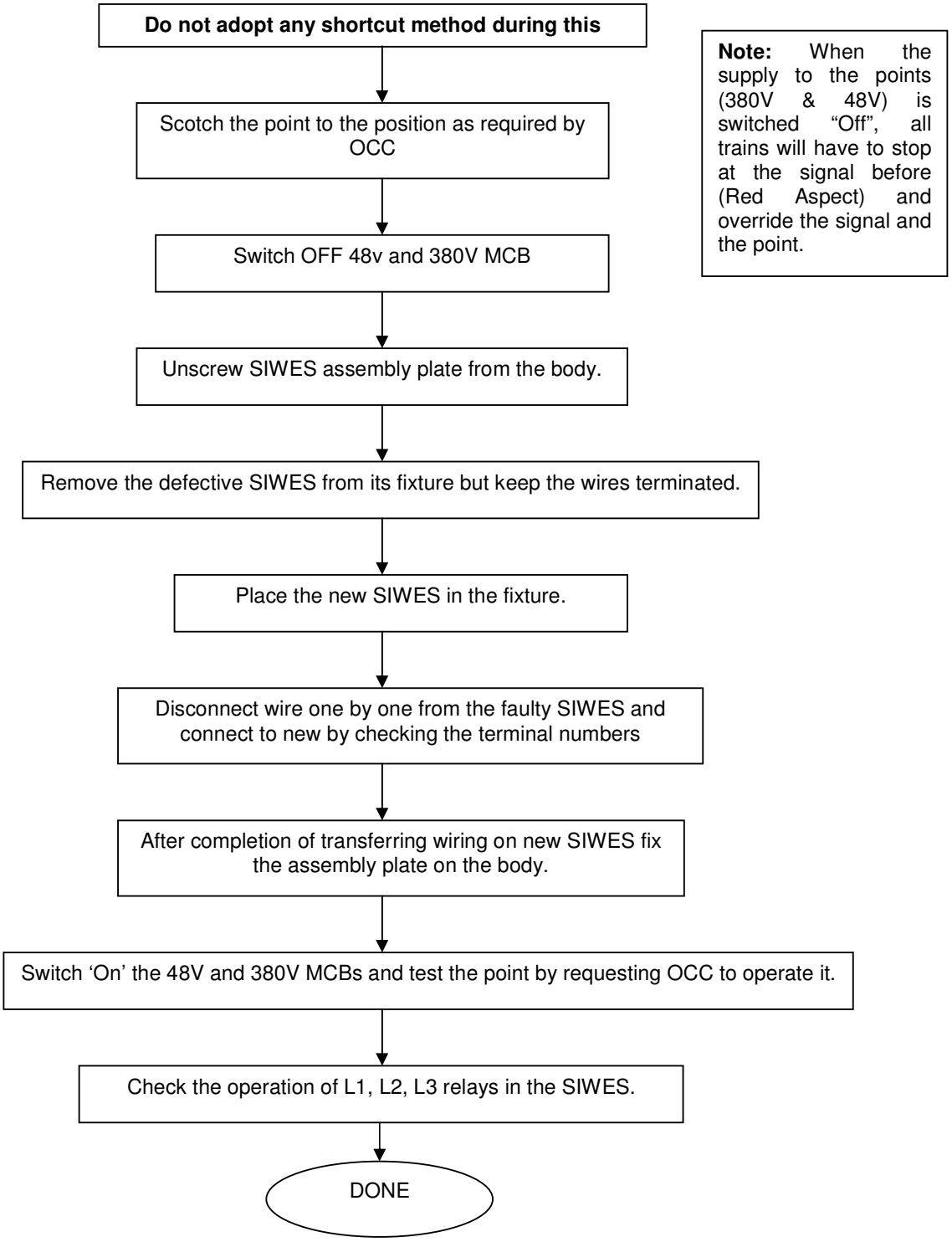


4.2 Point Machine "Detection Missing" and "Trailed"

Do not adopt any shortcut method during this process

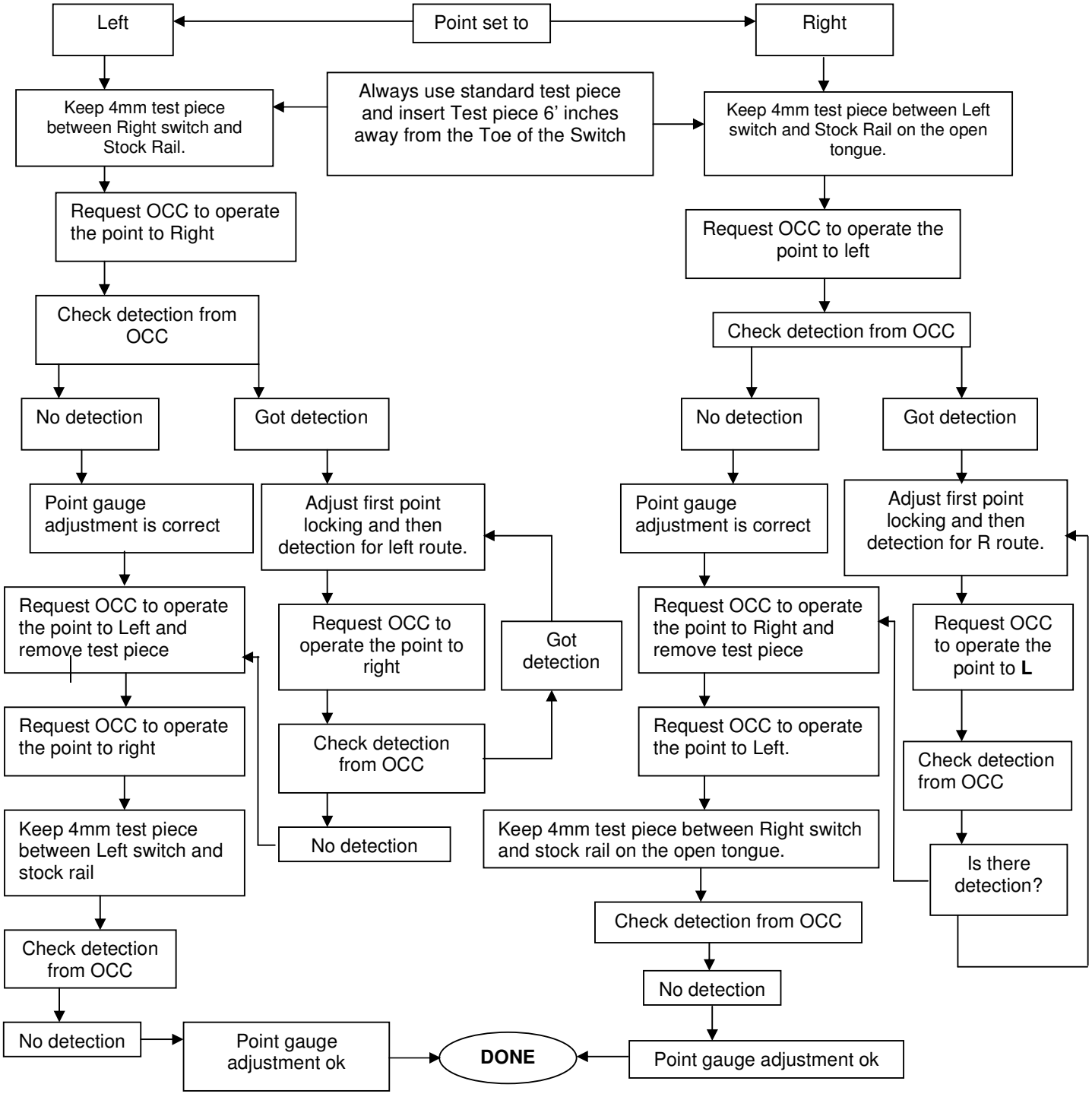


4.3 Replacement of SIWES

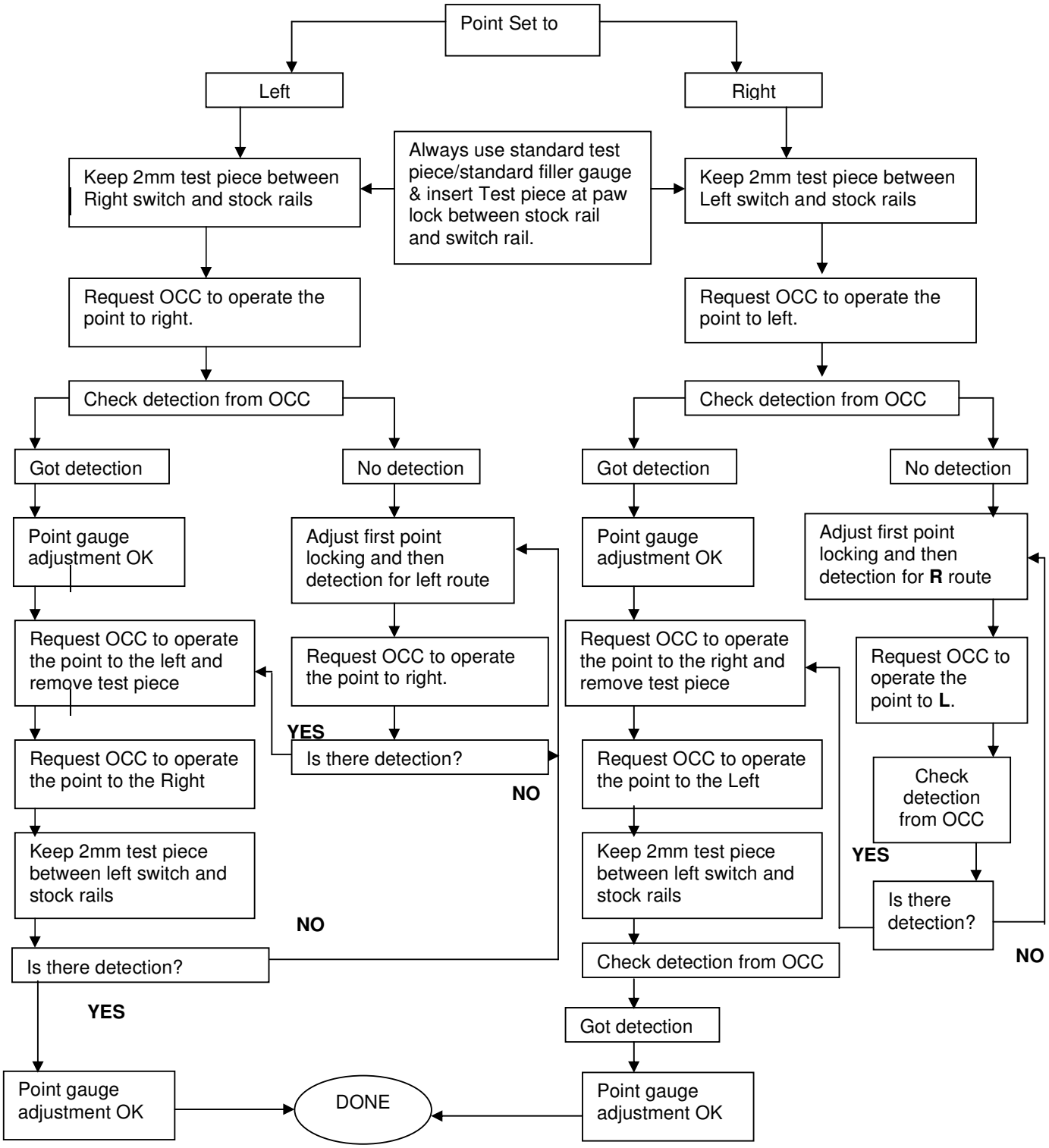


4.4 Point Machine (No Go) Test

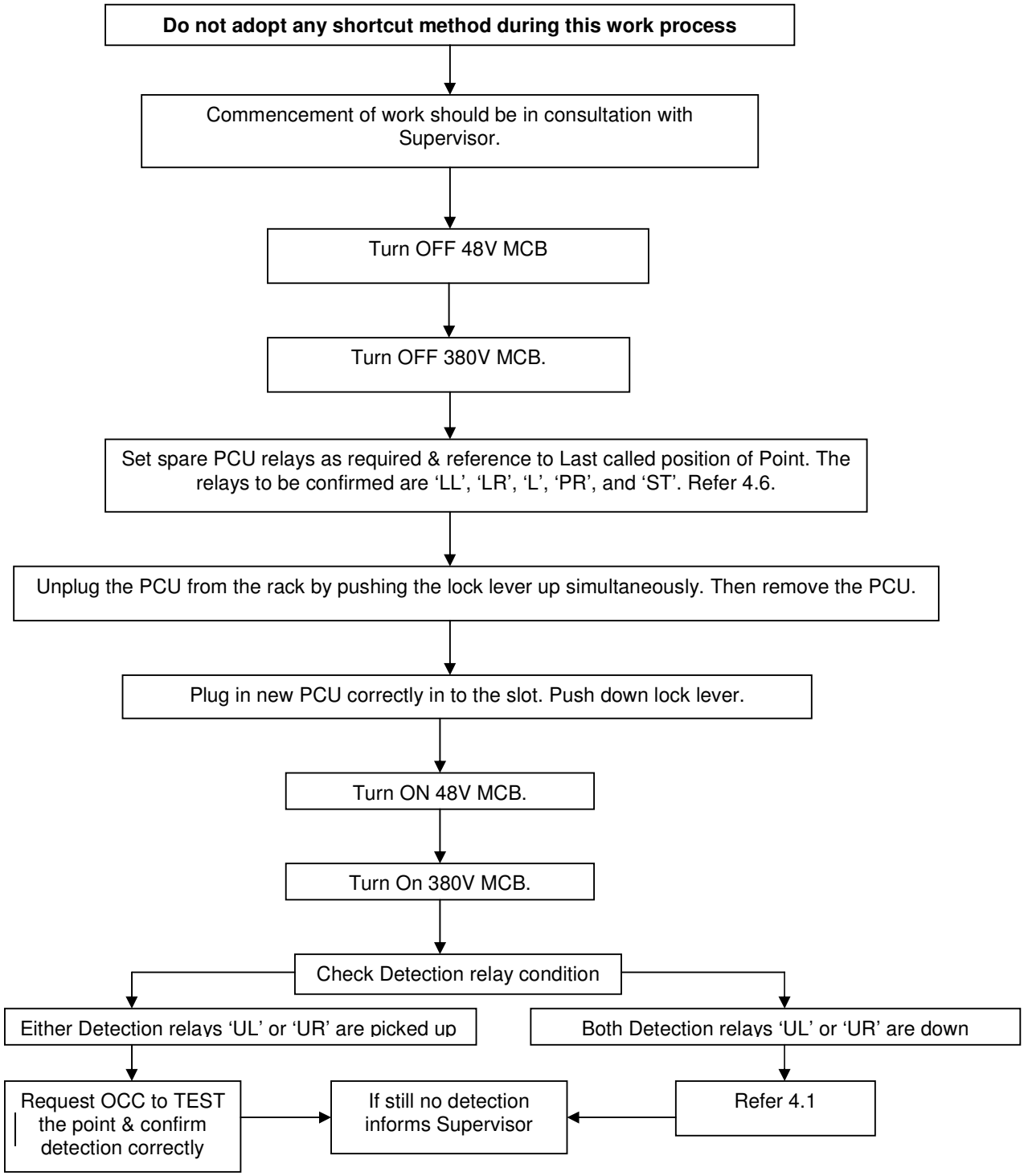
Do not adopt any shortcut method during this process



4.5 Point Machine (GO) Test



4.6 Replacement of Point Control Unit (PCU)



4.7 Point Control Unit (PCU) Relay Condition

PCU relay condition for point set to Left

LL ↑	PR ↓	ST ↓	AN ↓	AM ↓	TIMER
LR ↓	L ↓	ST ↑	AN ↓	UL ↑	UR ↓

PCU relay condition for point set to Right

LL ⊤↓	PR ↓	ST ↓	AN ↓	AM ↓	TIMER
LR ↑	L ↑	ST ↑	AN ↓	UL ↓	UR ↑

5 ATP Maintenance Technical Instruction

5.1 ATP Trainbone

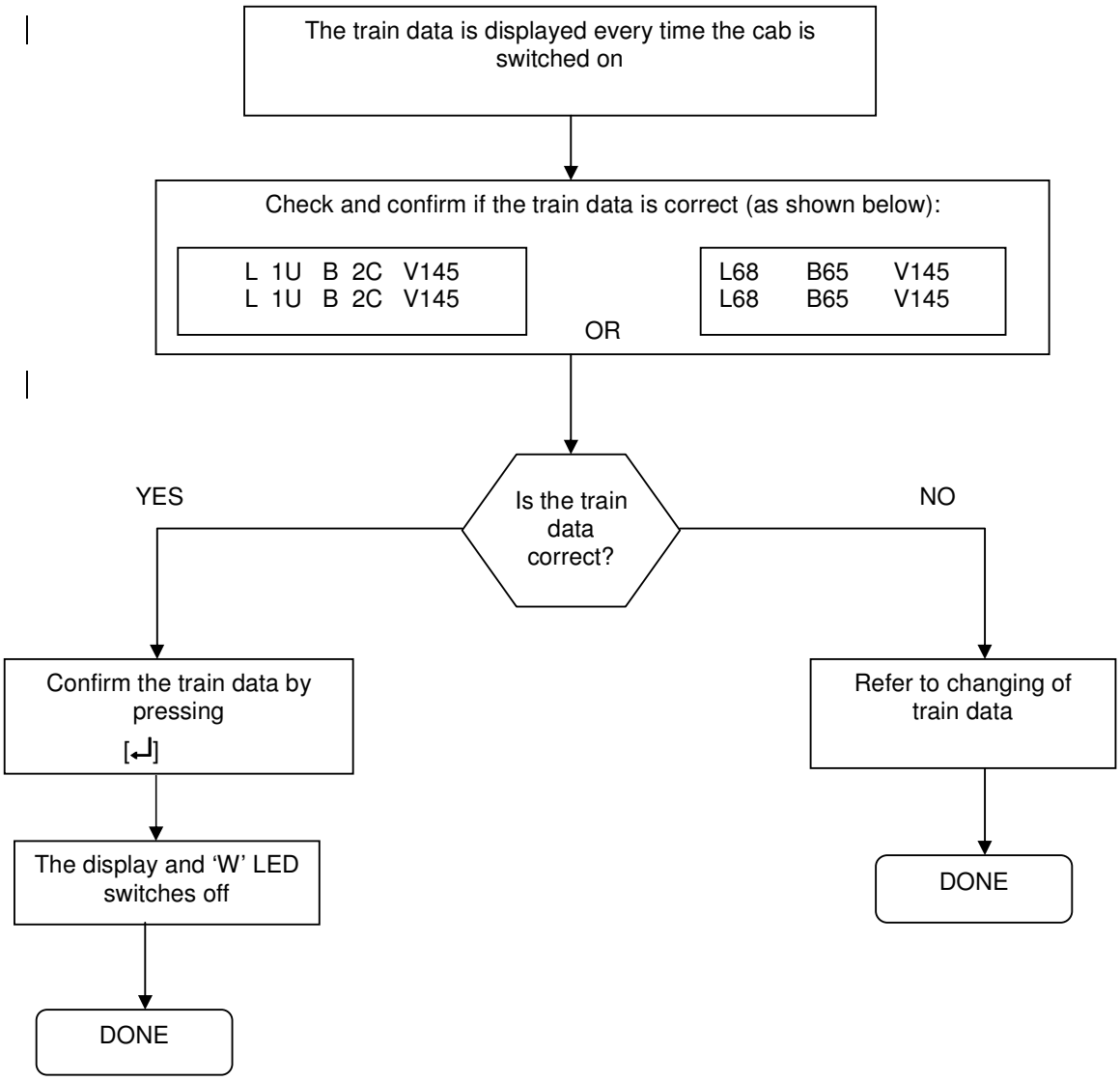
5.1.1 Confirming the Track Data for Train

Note: the train data has to be confirmed before the train can be moved.

The description of the train data is as given below:

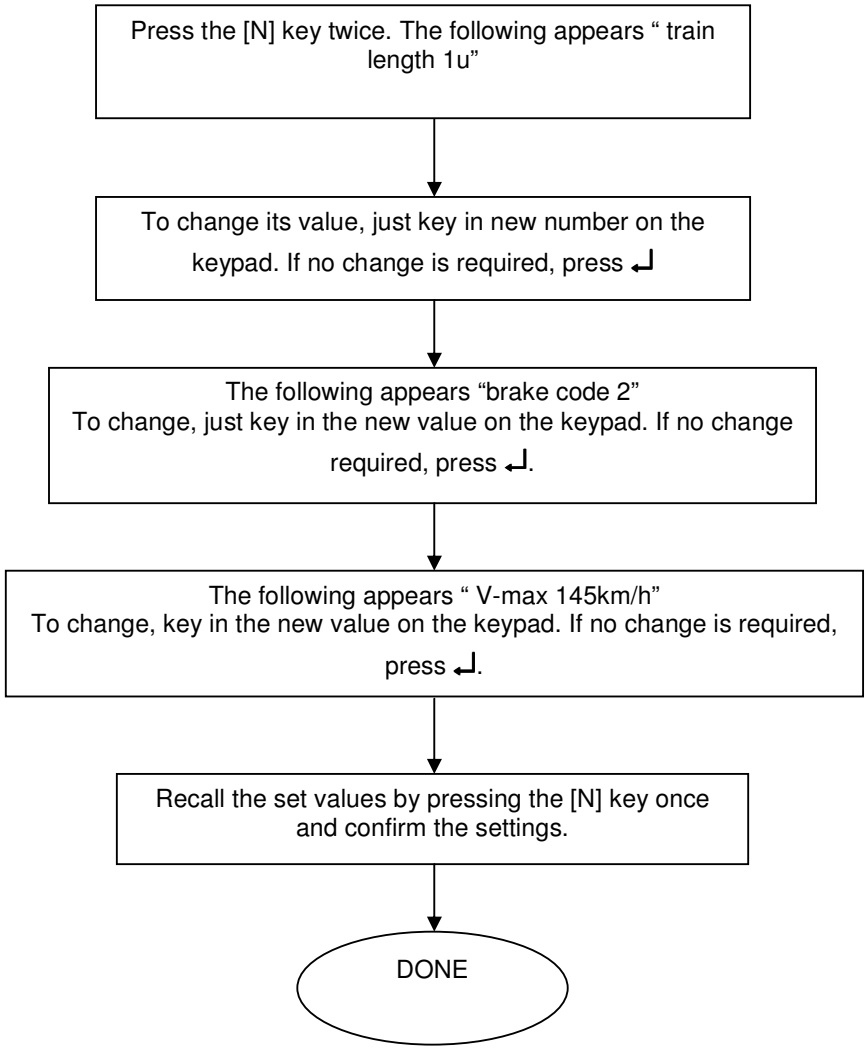
L1U : Length of one train = 68m or 1u
B2C : Brake code 2 = 65% or 2C
V160 : Maximum running speed = 160km/h Currently speed 145km/h until further notice.

Follow the process below to confirm train data:



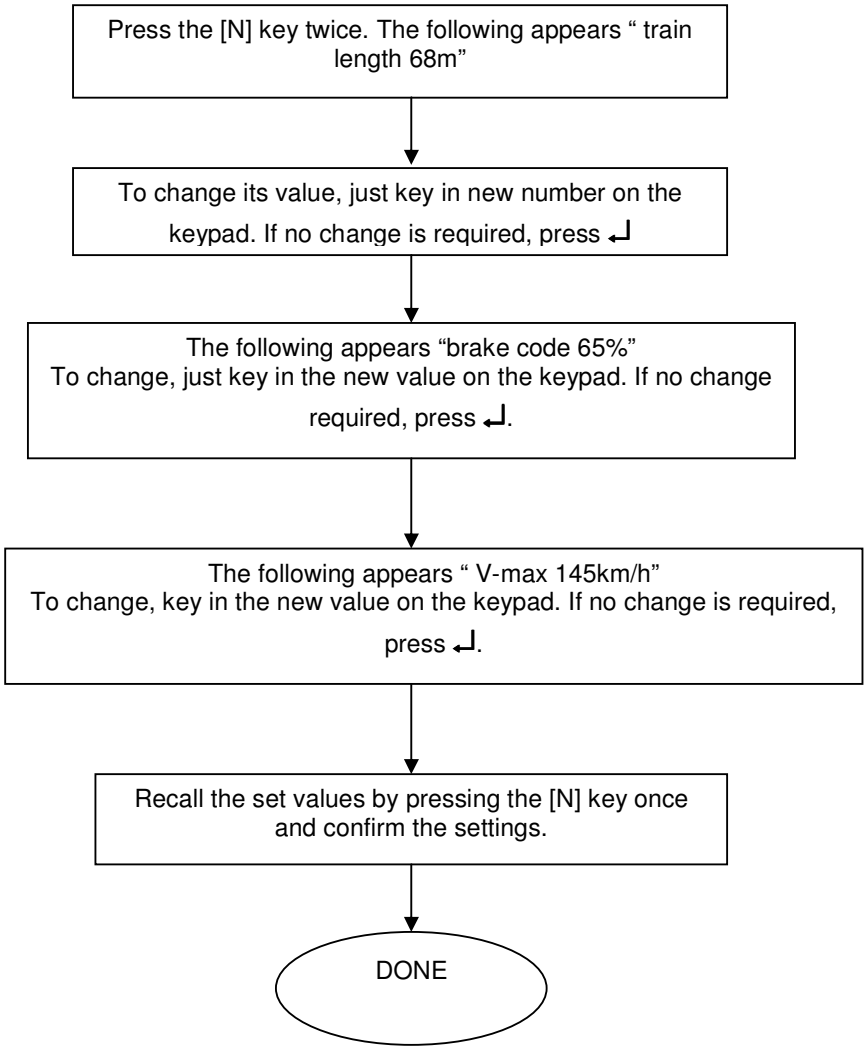
5.1.2 Changing of Train Data in Units

NOTE: Train Units **L= 1u**
B= 2u
V= 145km/h

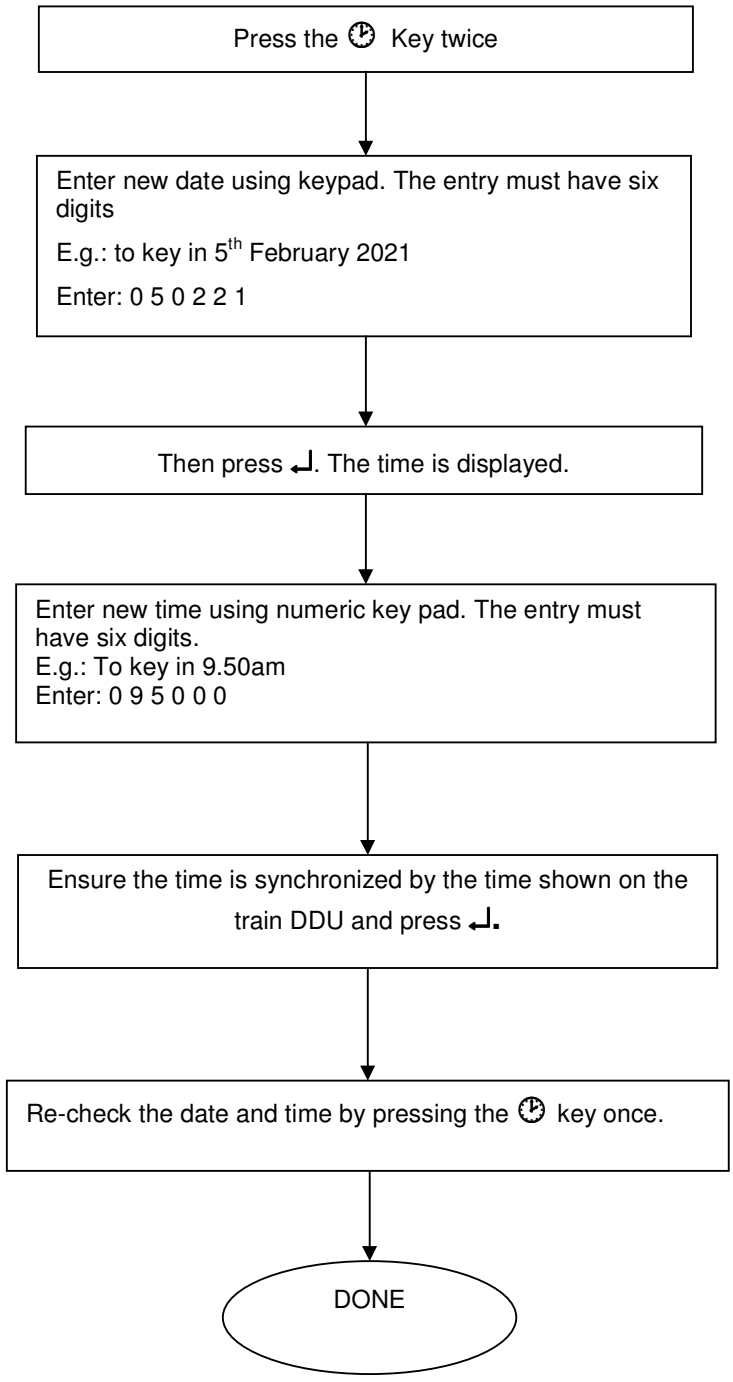


5.1.3 Changing of train Data in Absolute Numbers

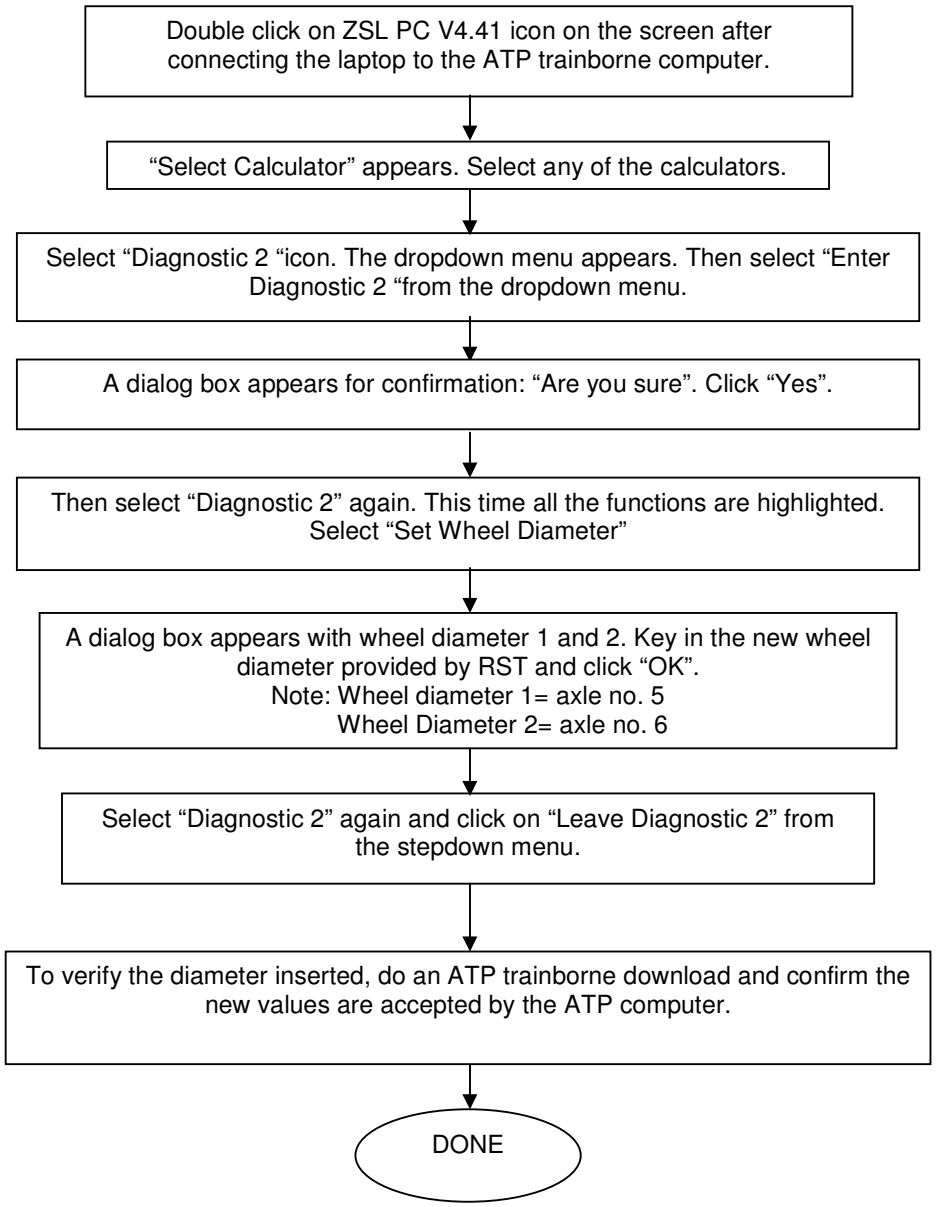
NOTE: Train Units **L= 1u**
B= 2u
V= 145km/h



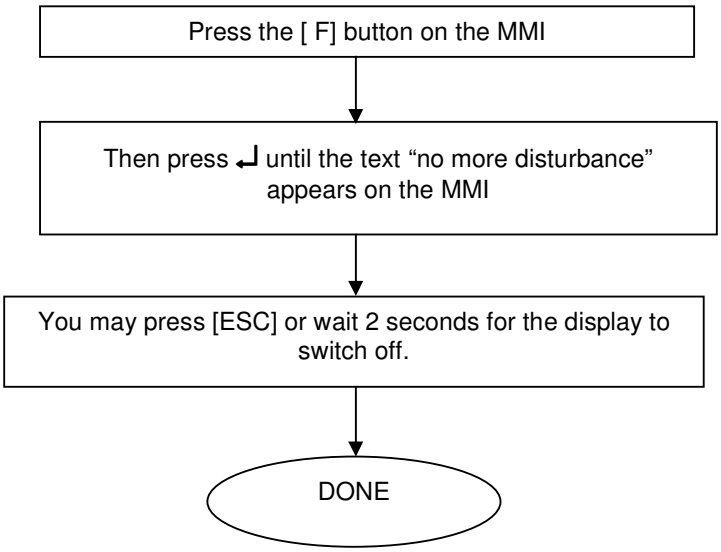
5.1.4 Keying new Time and Date at MMI



5.1.5 Keying New Wheel Diameter

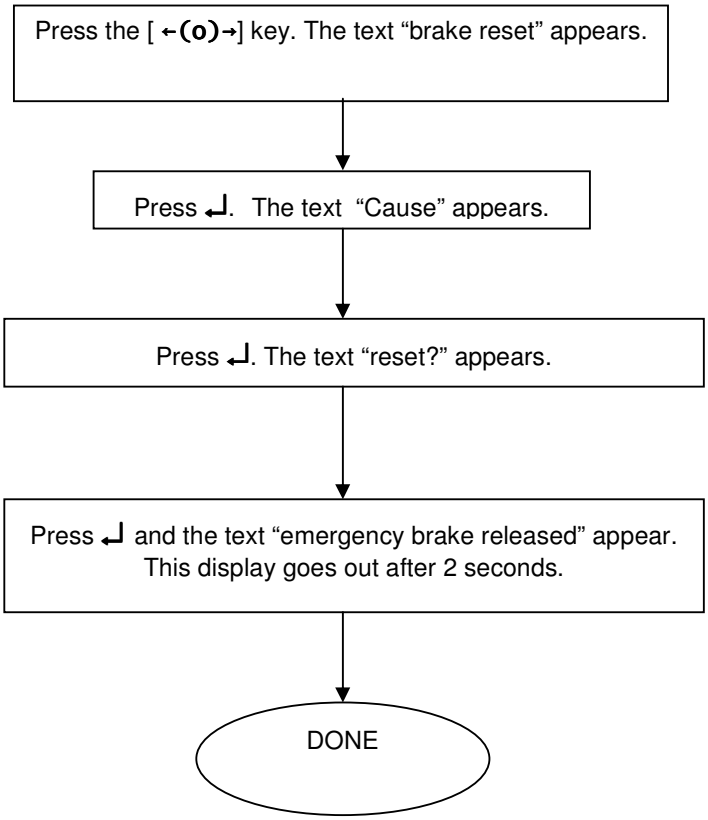


5.1.6 Checking for Fault On the MMI



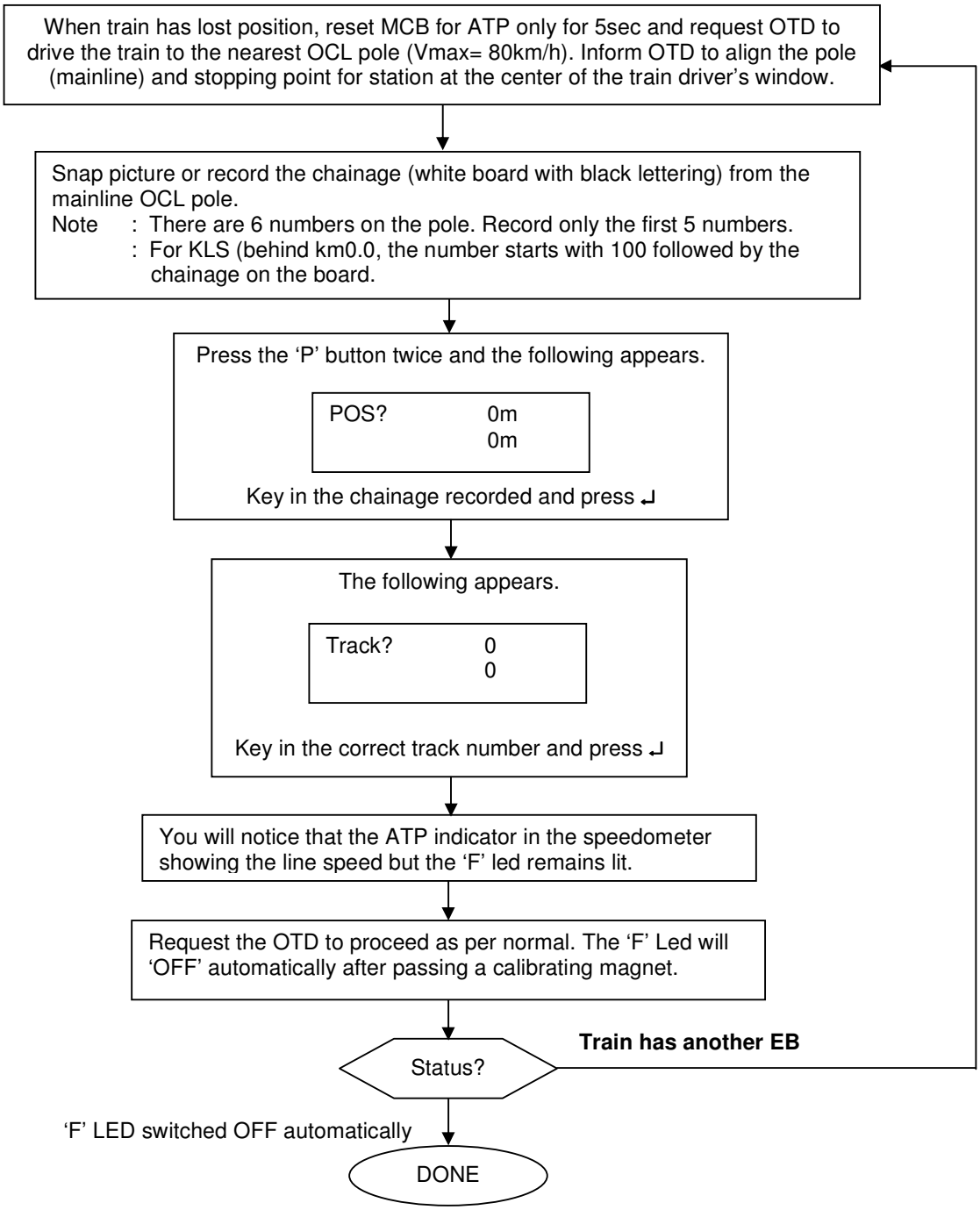
5.1.7 Clearing ATP Fault and Releasing the EB via MMI

NOTE: Reset and clearing of ATP fault can be done only when the train is at complete stop.

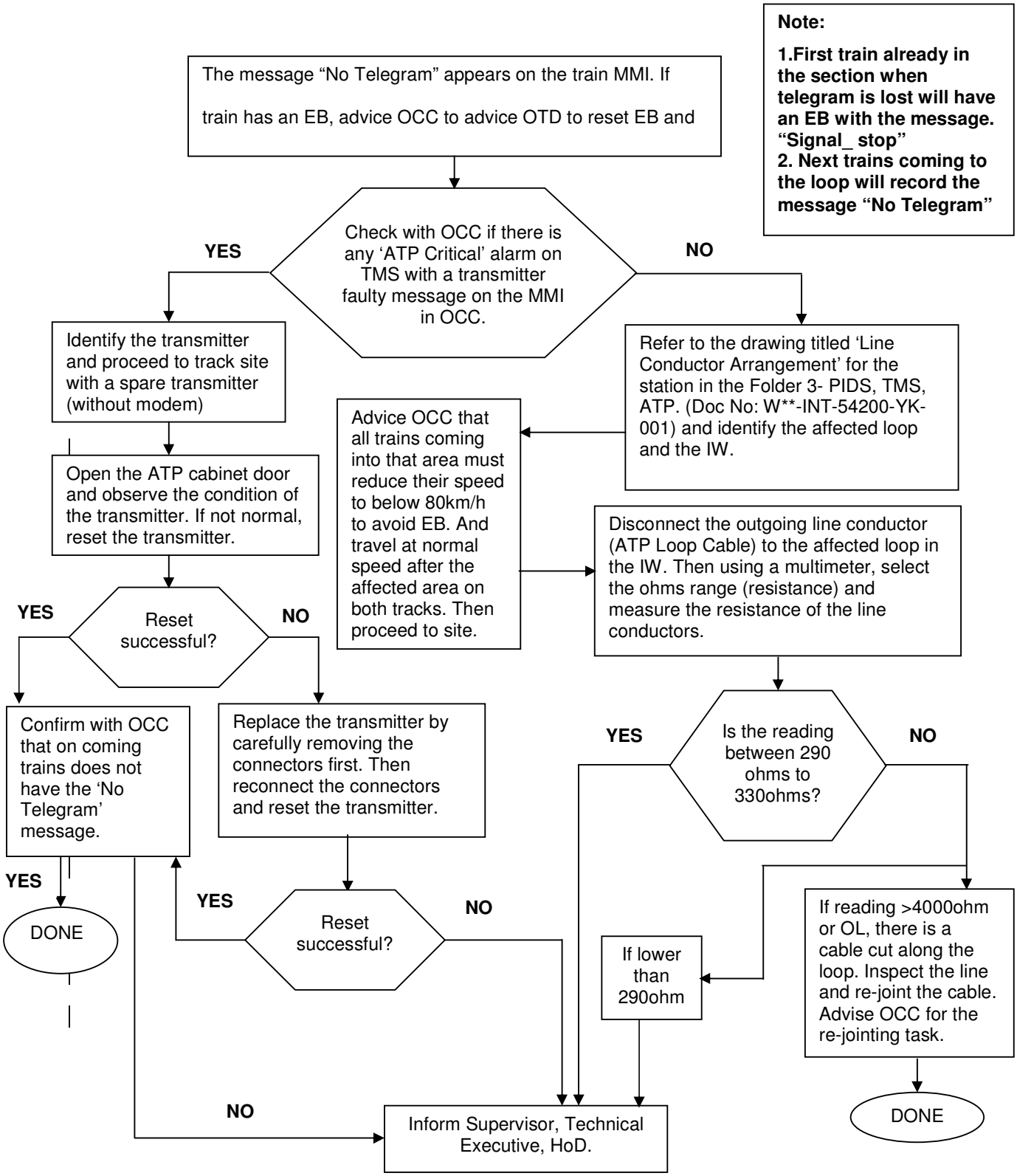


5.1.8 Keying in New Position and Track number.

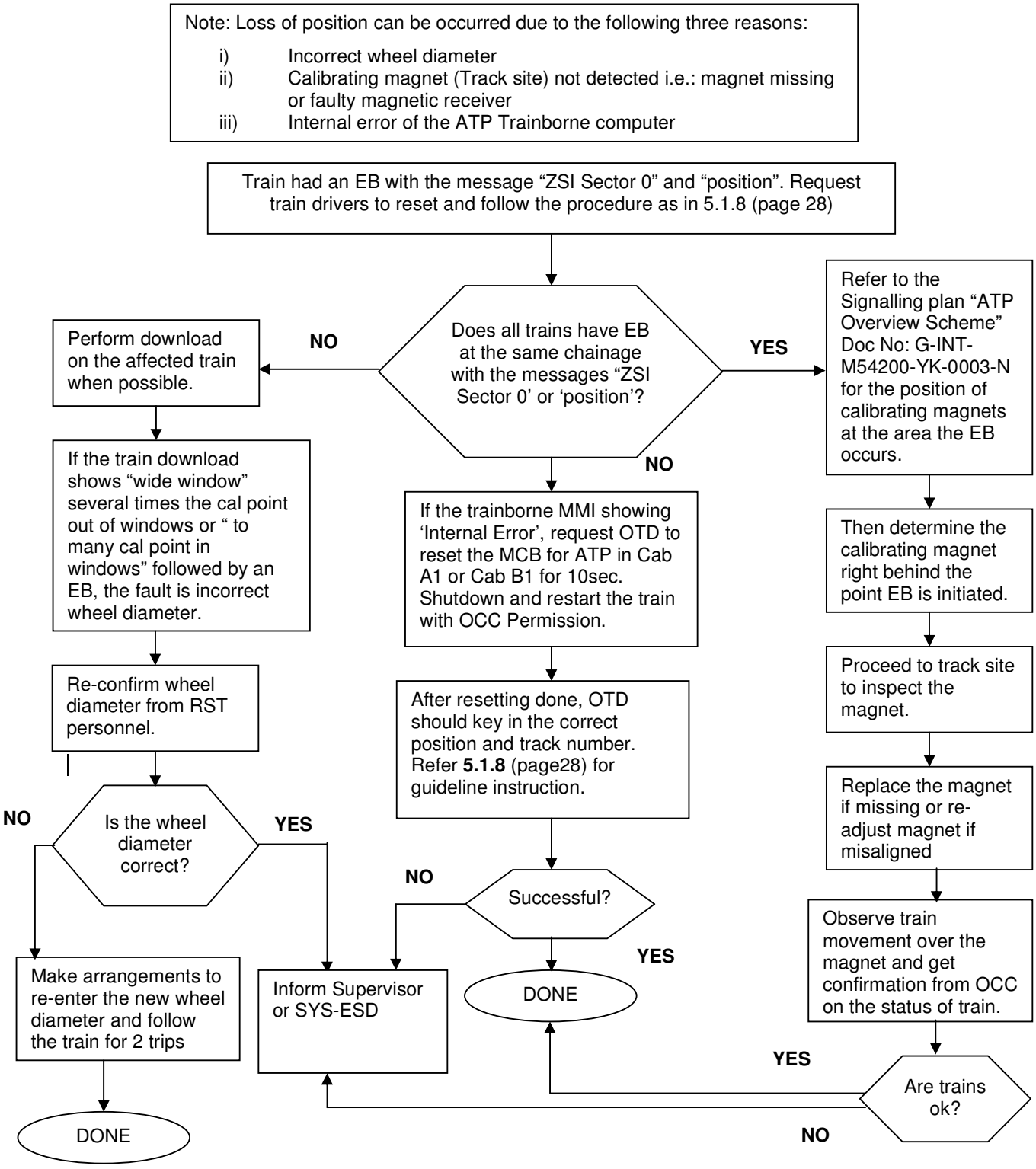
Note: For Depot, use position = 40, Track 0



5.1.9 No Telegram Fault message



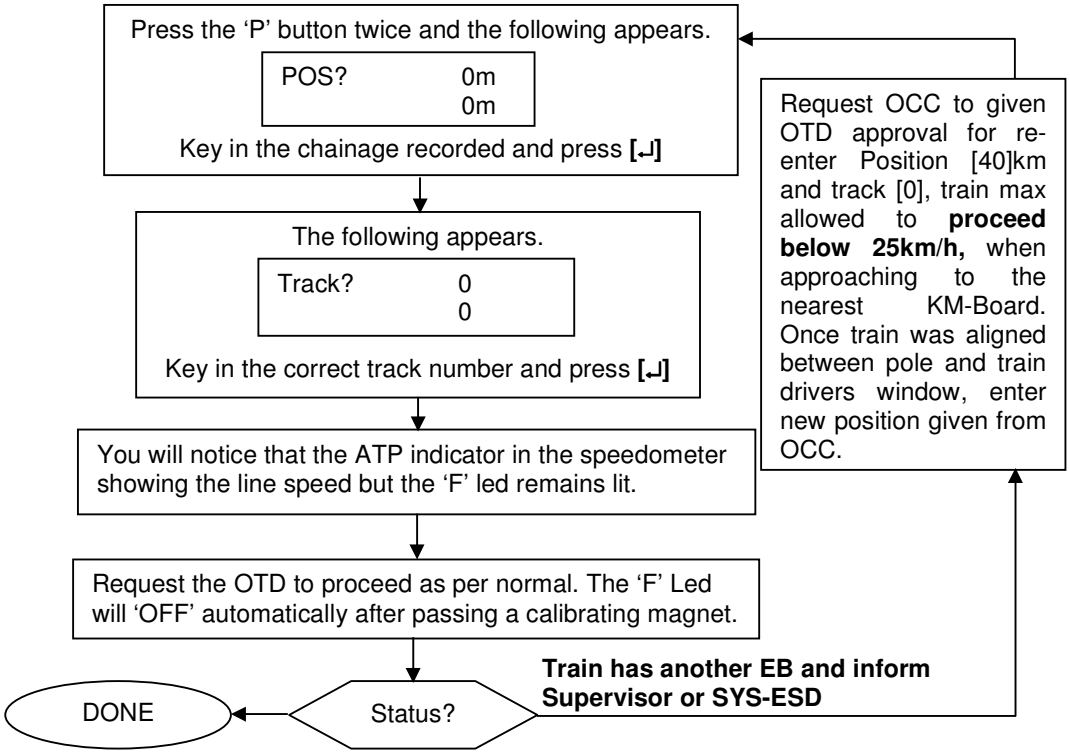
5.1.10 Lost Position fault



5.1.10 Lost Position fault (Continued)

Trainborne MMI Blank / Hang after EB.

- Request OTD to **hard reset the MCB for ATP** in Cab A1 or Cab B1 for 10Second.
- Hard Reset done. **Mandatory for OTD to key in the new correct position and track number**.
  - OTD need to re-**enter Position [40km] and Track number [0]**, **Drive below 25Km/h** until reached and aligned to the KM-Board, between OCL pole and train driver window.
  - With KM-Board number, OTD need to inform and **retrieve new position and track number from OCC**.
  - **Enter new Position and Track number** given by OCC only.



5.1.11 Train ATP Computer Download

Connect the ATP converter 232/ 485 cables to the laptop and insert the DB connector to the 'BJ' slot (2nd slot from bottom card XEC 4027/1) on the ATP trainborne computer.

↓

Click the ZSL icon to open the file to communicate with the ATP computer.

↓

Select either of the ATP calculators to perform the download. You may choose 1,2 or 3.

↓

Click on the "Memory" icon and select "save/ delete memory"

↓

You will be required to open a new folder for the download. Then click "save" to download the data.

↓

After the download is completed, disconnect the ATP converter 232/ 485 cable from the ATP computer and reset the ATP computer by switching "OFF" and "ON" the power push button.

↓

DONE

Note:
Ensure train is at stationary position when doing the ATP download.

5.1.12 Real Time Monitoring on ATP diagnostic software

Double click on ZSL PC after connecting the laptop to the ATP trainborne computer.

↓

"Select Calculator" appears. Select any of the calculators.

↓

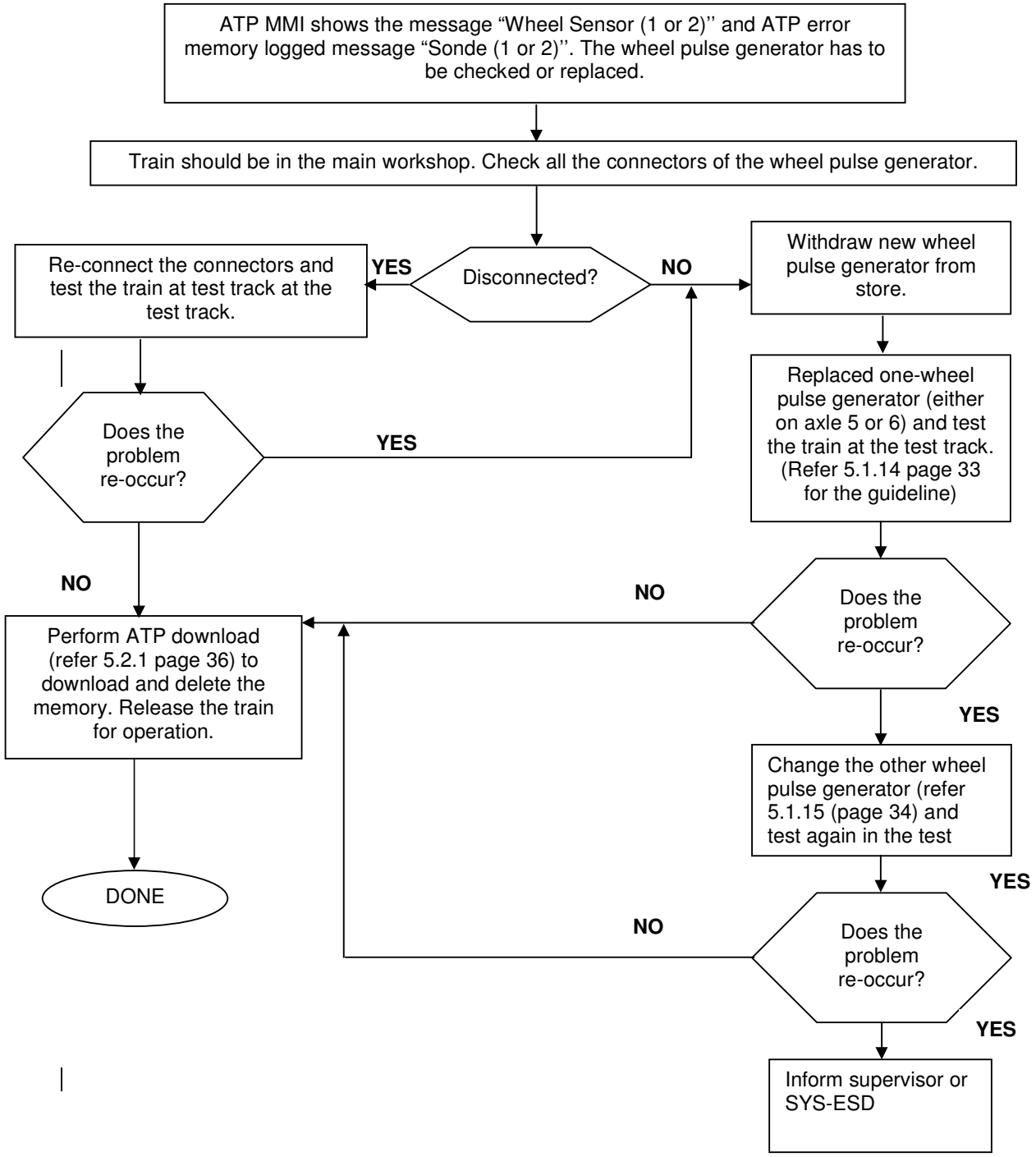
Select "Realtime" from the bar and Refer the table below to display realtime monitoring.

↓

Description on dropdown menu	Details
Display Speeds	Display actual speed of train (V-act) and maximum allowable speed by ATP (V-Moni)
Compare actual speeds	Compares the speed on all the calculators simultaneously. V-act (l, p, n) 0000,0000,0000
Compare positions	Compares the position of all the calculators simultaneously. Pos. (l, p, n) 0000000, 0000000,0000000
Real Odometer device	Shows the actual speed and the direction of travel. Vact: - 0000; dist + 0000000000
Receipt Cor. Telegram	Measures the telegram received at both the antenna. Channel 1/ Channel 2 0005/ 0006

5.1.13 Position Measuring Probe Failure

Note: 1) Wheel Pulse generator (WPG) is installed at axle no 5 (side 2) and 6 (side1).
2) They are connected to the junction box by cables, which are labeled.
3) After changing the wheel pulse generator, the new wheel pulse generator has to be commissioned.



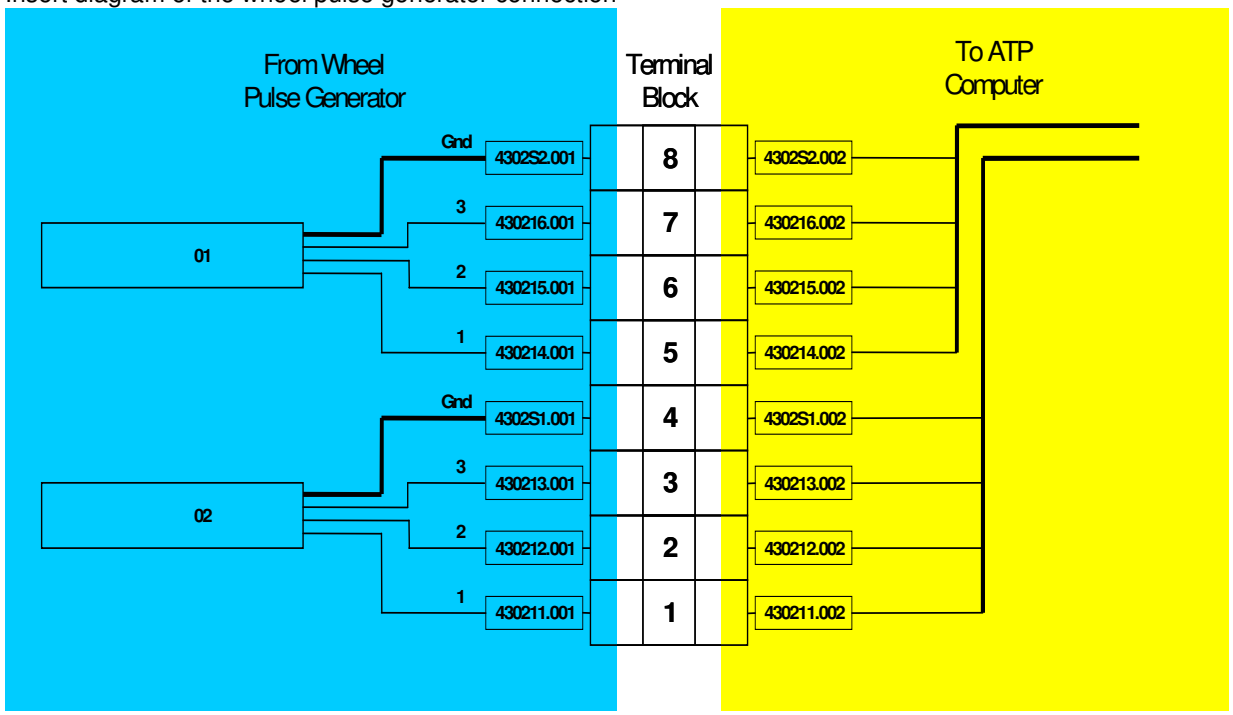
5.1.14 Replacement of Wheel Pulse Generator

Note: Once the Wheel Pulse Generator is suspected/ identified to be faulty, the following process is to be followed.

Disconnect the wires in the junction box and Dismount the Wheel Pulse Generator from the wheel.

Re-connect the new Wheel Pulse Generator as in the diagram below

Insert diagram of the wheel pulse generator connection



After the wheel pulse generator is connected, take the train to the test track and perform the commissioning test.

Refer 5.1.15 (page 34)

Once the commissioning test is completed, the train can be released for service.

DONE

5.1.15 Wheel Pulse Generator Commissioning

Note: Follow the following procedure and tick the provided YES or NO column. For any NO ticked, consult with SYS-ESD

Name	Staff ID	Signature	Train ID	Date

Wheel Pulse Generator 1 (Axle 05)

Switch Off trainborne ATP Computer.
Disconnect DB connector for WPG02.
Connect DB connector for WPG01.
Switch ON trainborne ATP Computer.
Connect the ATP diagnostic laptop to the ATP computer and select to view the real time for position.

	YES	NO
1. Fault Indication no longer present.	☐	☐
2. Move train in direction of KLIA specific distance (min. 15m) Position measurement indication positive (+ve)	☐	☐
3. Speed Indication positive (+ve).	☐	☐
4. After _____m LEDs 3 and 4 on the position measuring interface illuminate.	☐	☐
5. The fault lamps on the Man Machine Interface on the display unit come ON.	☐	☐
6. When the fault is queried, the message “Wheel Sensor 1” at MMI displayed.	☐	☐

Move the Train the same distance forward (Direction KLS) using CAB 2

7. Position measurement indication negative (-ve).	☐	☐
8. Speed indication negative (-ve).	☐	☐
9. Move forwards at a defined speed in accordance with the analogue tachometer. The indicated speed on the display unit is correct.	☐	☐

5.1.15 Wheel Pulse Generator Commissioning (Continued)

Note: Follow the following procedure and tick the provided YES or NO column. For any NO ticked, consult with SYS-ESD.

Name	Staff ID	Signature	Train ID	Date

Wheel Pulse Generator 2 (Axle 06)

Switch Off trainborne ATP Computer.
Disconnect DB connector for WPG01.
Connect DB connector for WPG02.
Switch ON trainborne ATP Computer.
Connect the ATP diagnostic laptop to the ATP computer and select to view the real time for position.

	YES	NO
1. Fault Indication no longer present.	☐	☐
2. Move train in direction of KLIA specific distance (min. 15m) Position measurement indication positive (+ve)	☐	☐
3. Speed Indication positive (+ve).	☐	☐
4. After _____m LEDs 1 and 2 on the position measuring interface illuminate.	☐	☐
5. The fault lamps on the Man Machine Interface on the display unit come ON.	☐	☐
6. When the fault is queried, the message “Wheel Sensor 2” at MMI displayed.	☐	☐

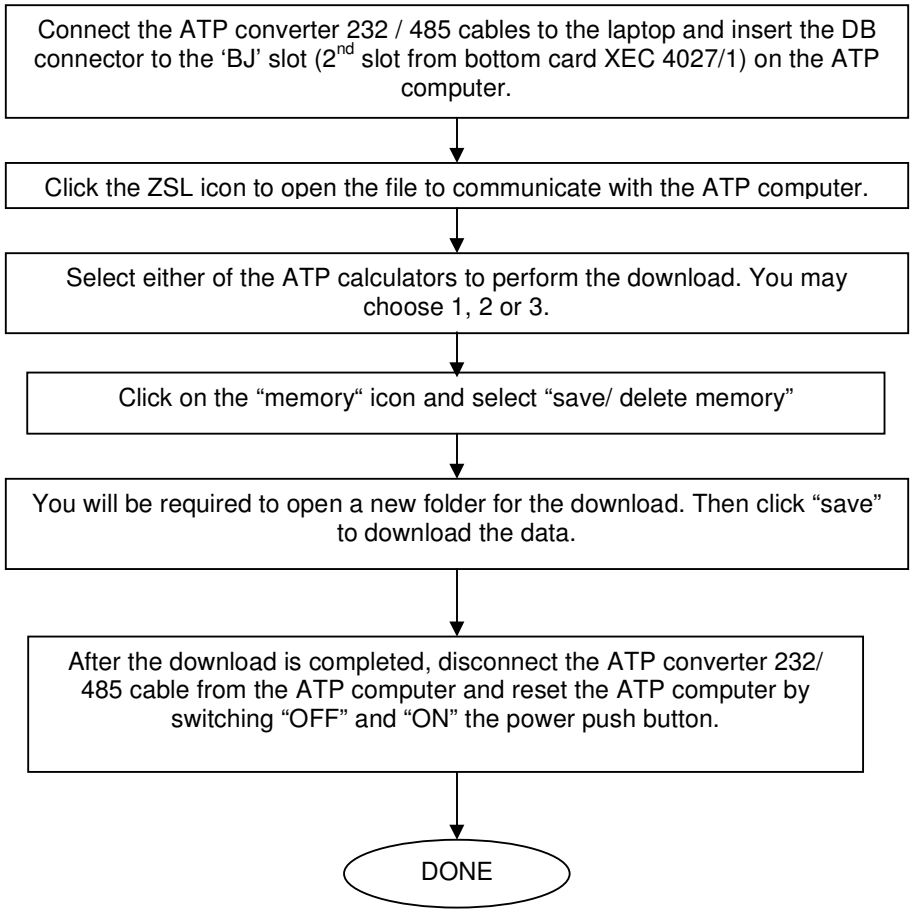
Move the Train the same distance forward (direction KLS) using CAB 2

7. Position measurement indication negative (-ve).	☐	☐
8. Speed indication negative (-ve).	☐	☐
9. Move forwards at a defined speed in accordance with the analogue tachometer. The indicated speed on the display unit is correct.	☐	☐

5.2 ATP Indoor

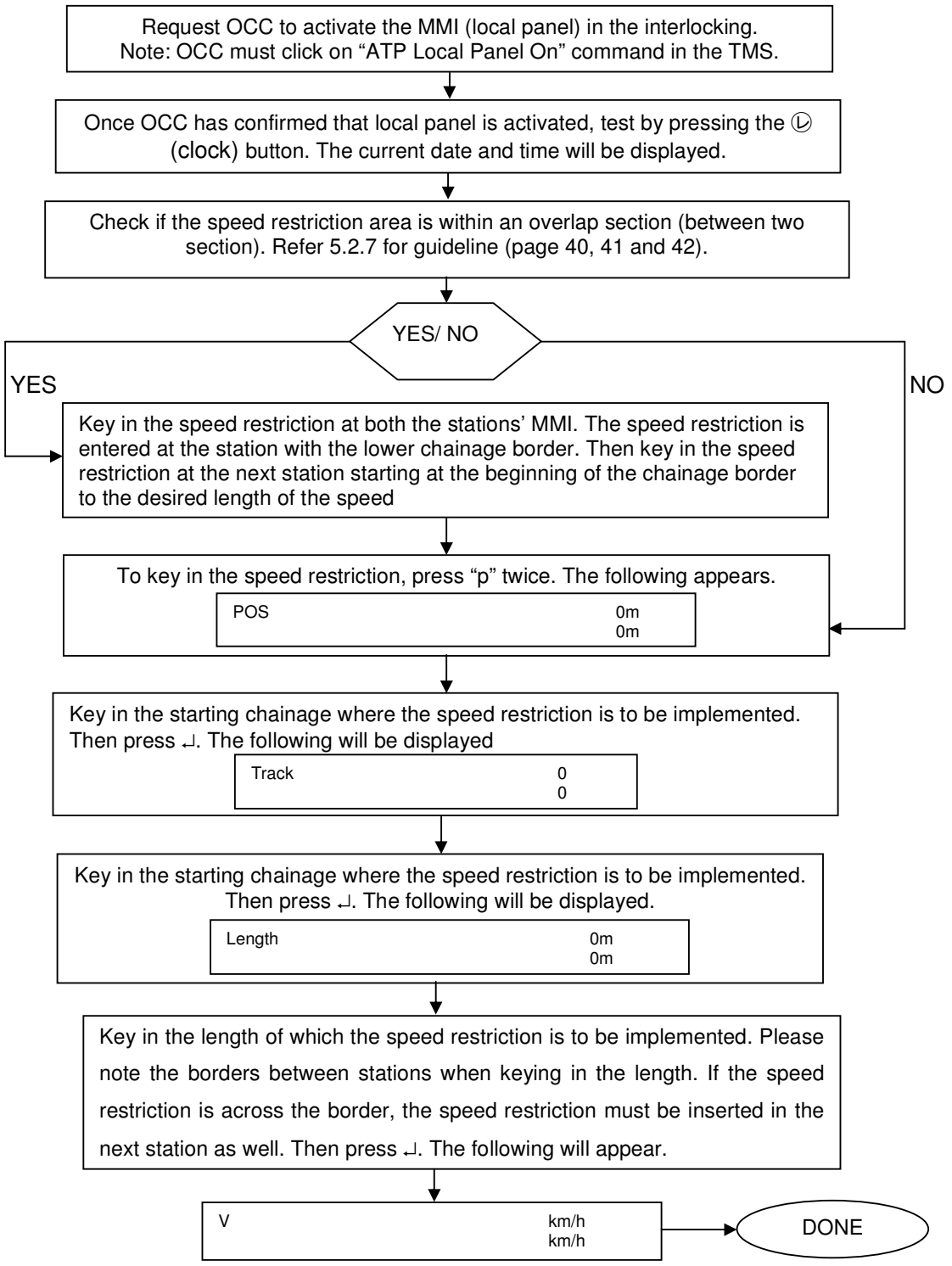
5.2.1 Downloading ATP Computer in Interlocking

Note: Ensure there are no trains moving in the section when doing the ATP download.

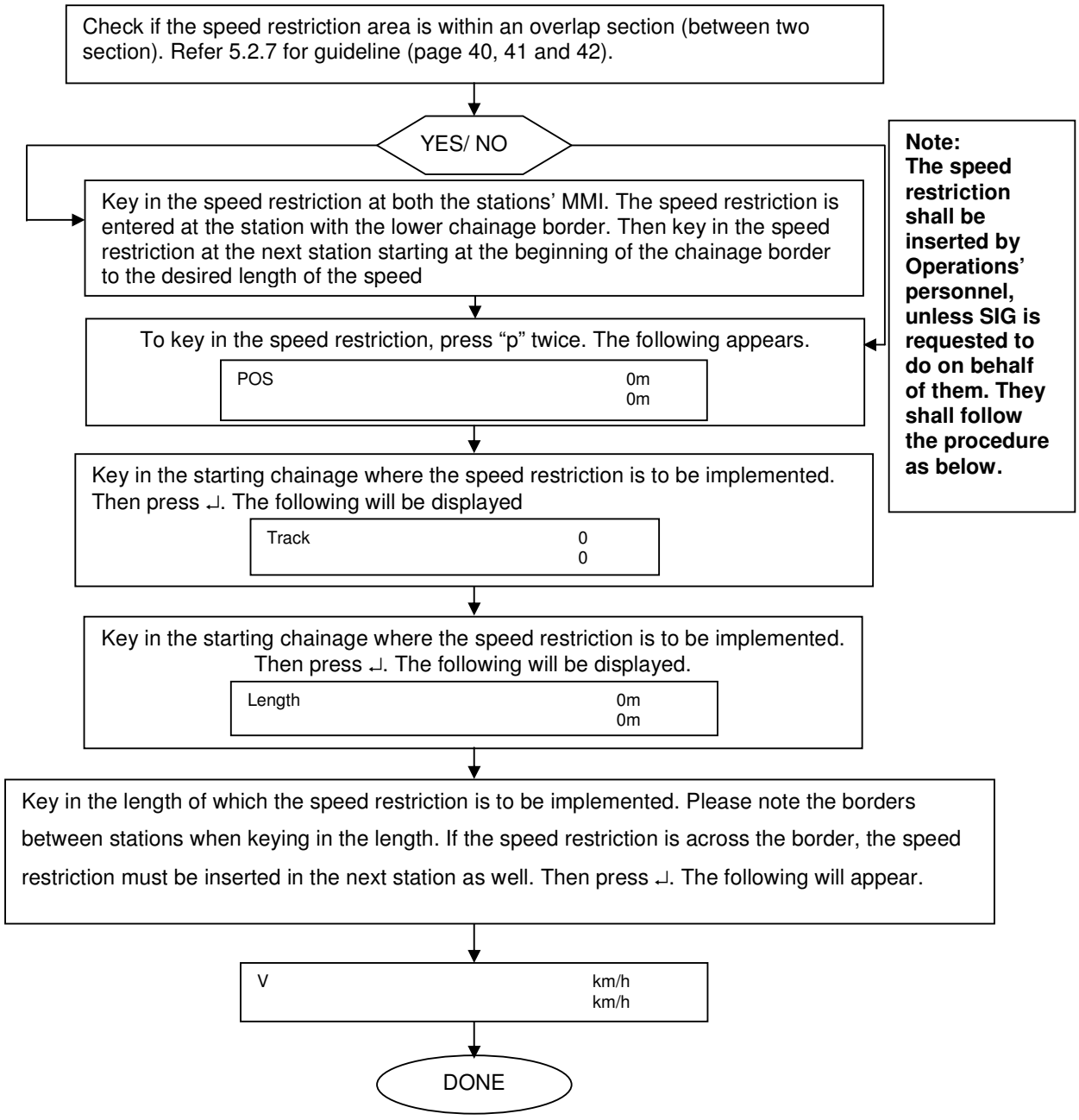


5.2.2 Inserting Speed Restriction from Interlocking

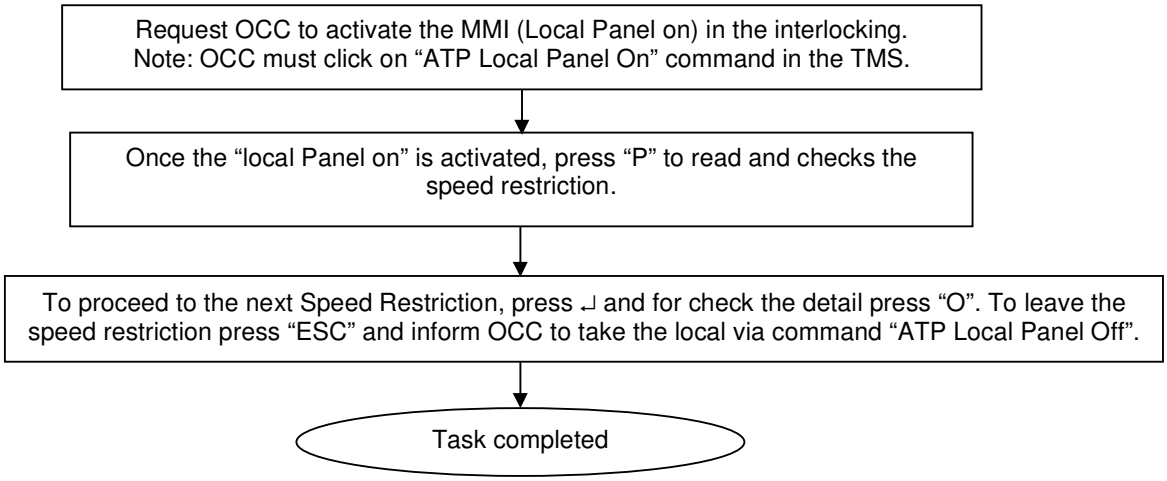
Note: Under normal condition, the ATP MMI in the interlocking is inactive and has to be activated by requesting from OCC.



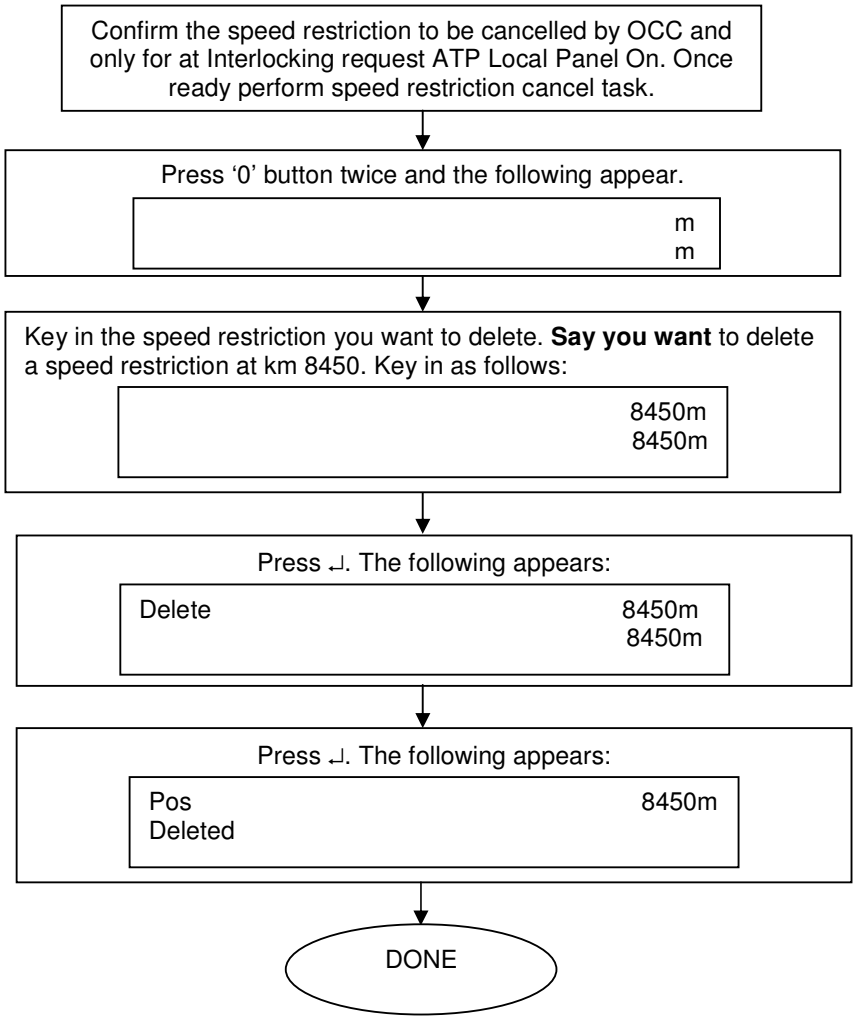
5.2.3 Inserting Speed Restriction from OCC



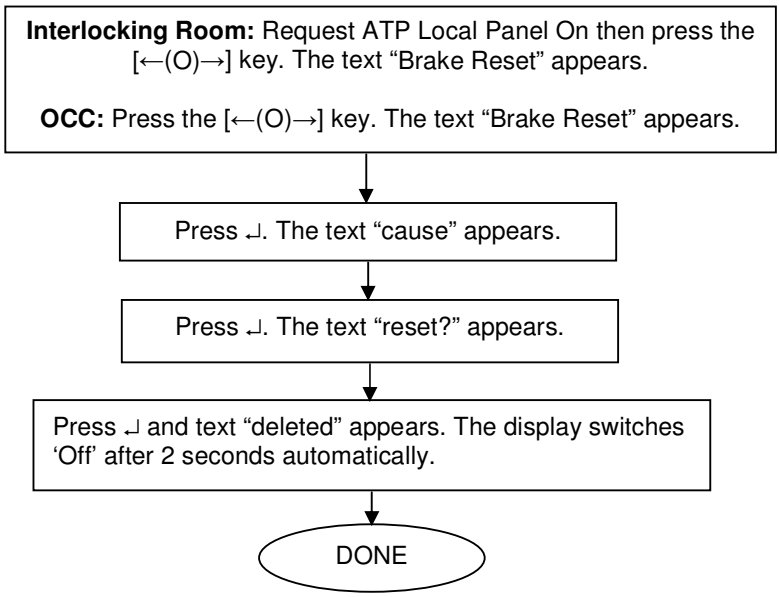
5.2.4 Check Inserting Speed Restriction from Interlocking.



5.2.5 Cancelling Speed Restriction (Interlocking and OCC)

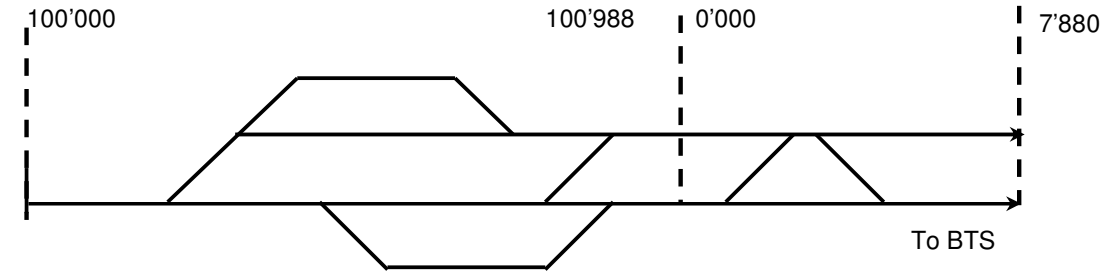


5.2.6 Clearing of ATP fault (via OCC MMI & Interlocking MMI)

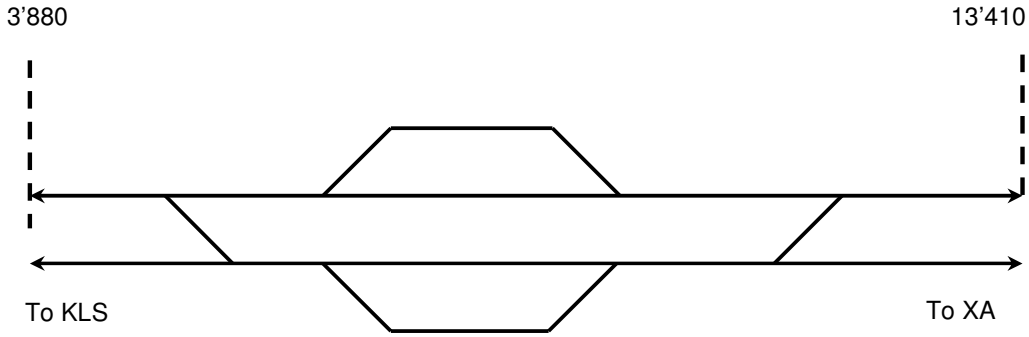


5.2.7 ATP Station borders and overlaps

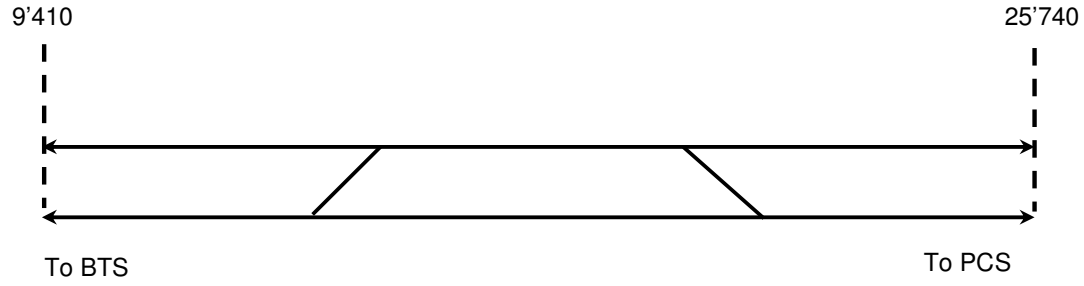
KUALA LUMPUR SENTRAL (KLS)



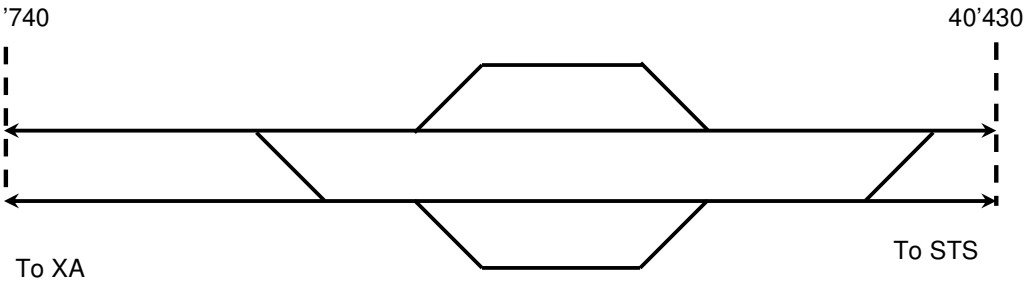
BANDAR TASIK SELATAN (BTS)



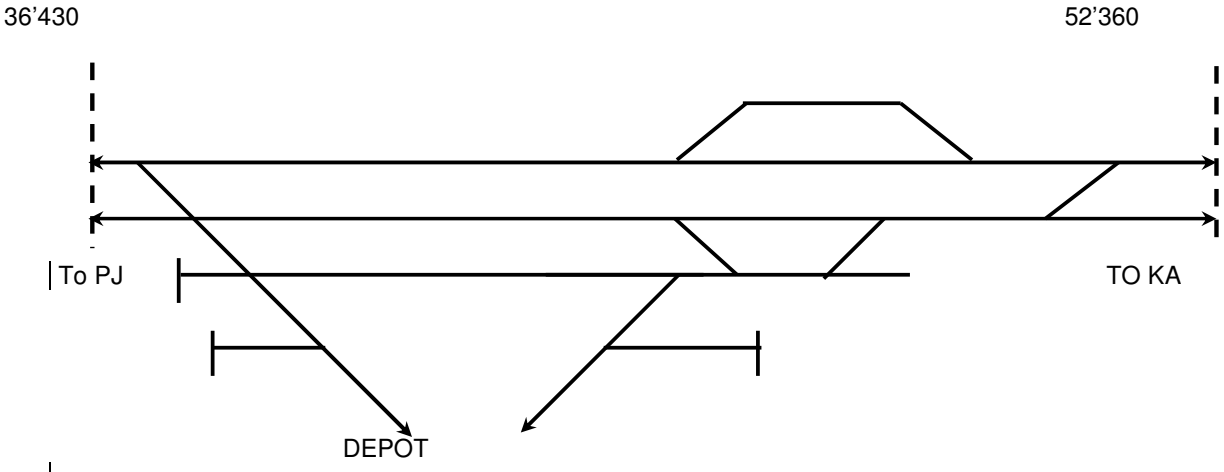
CROSSOVER (XA)



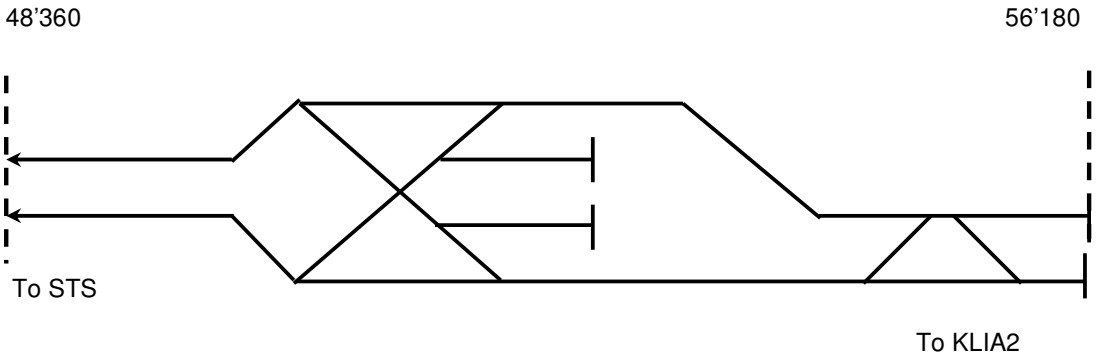
PUTRAJAYA (PCS)



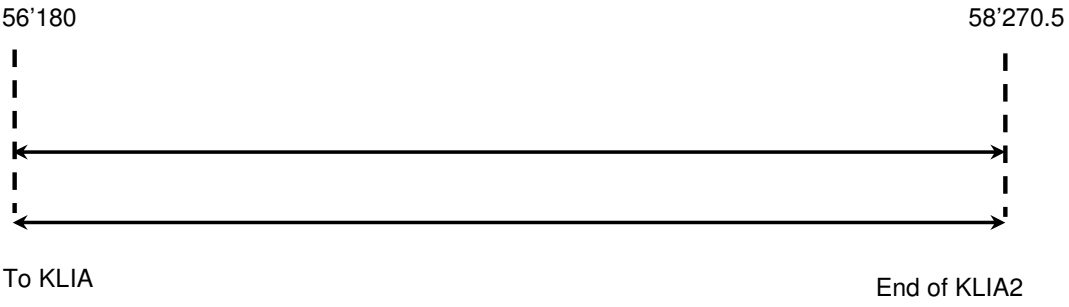
SALAK TINGGI (STS)



KUALA LUMPUR INTERNATIONAL AIRPORT (KA)

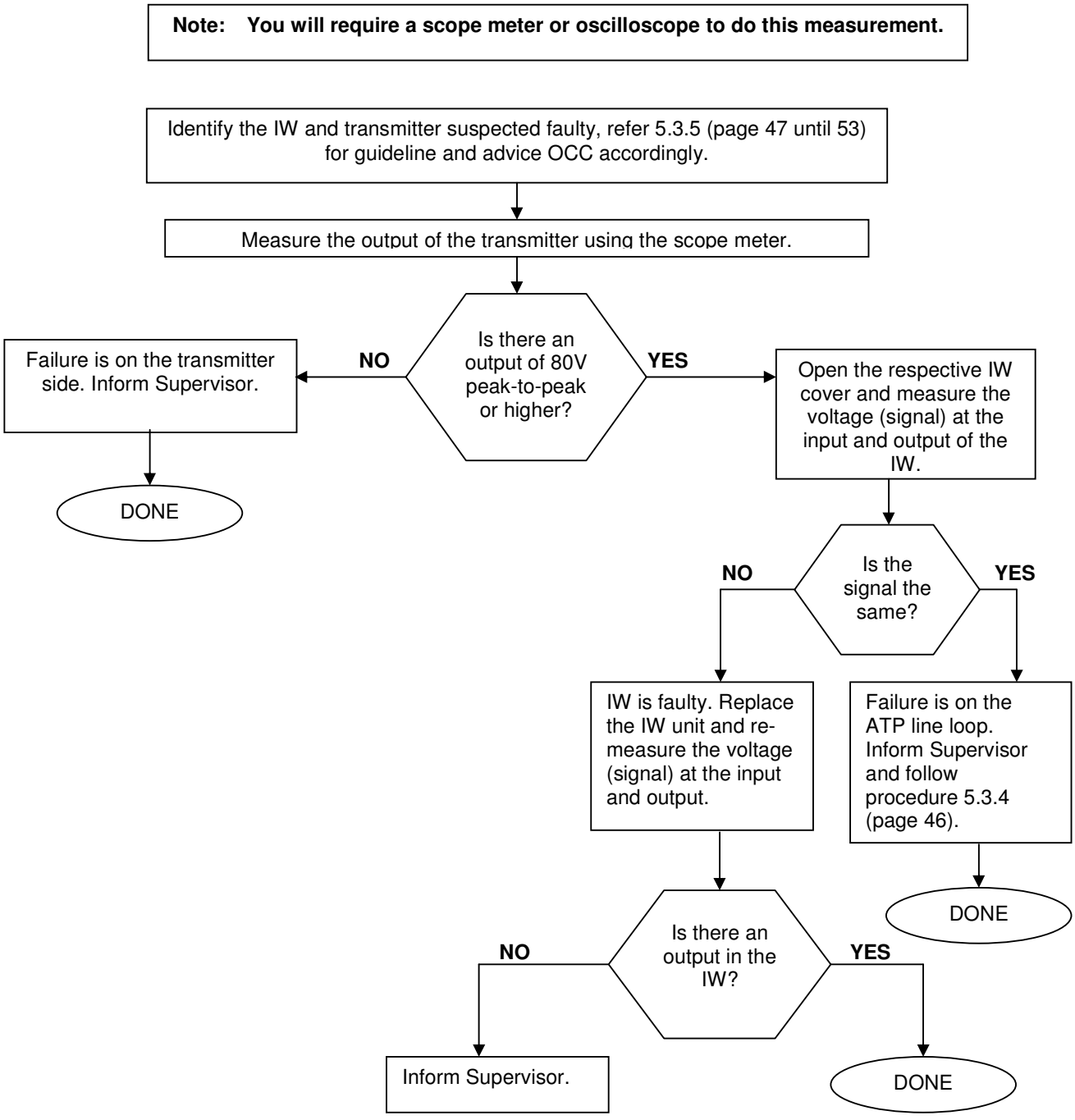


KUALA LUMPUR INTERNATIONAL AIRPORT 2 (KA2)

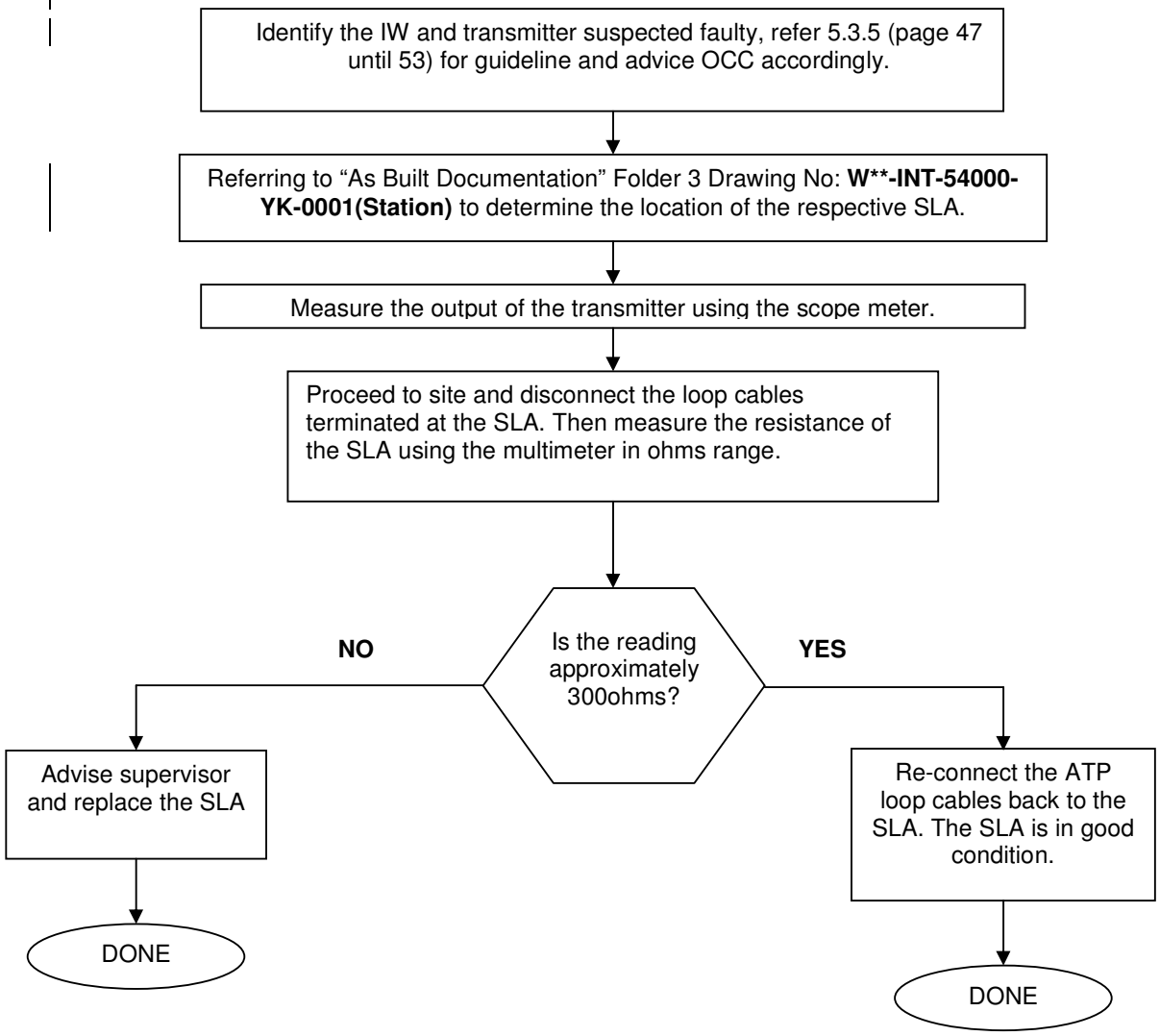


5.3 ATP Outdoor

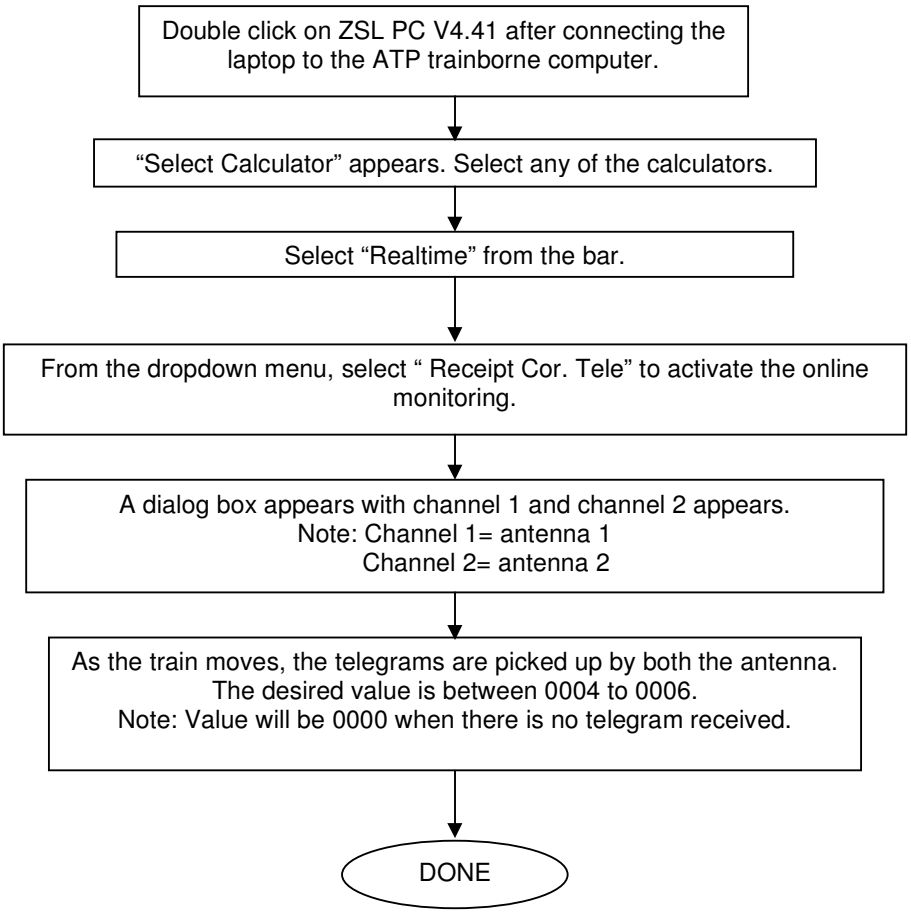
5.3.1 Measurement of Impedance Transformer



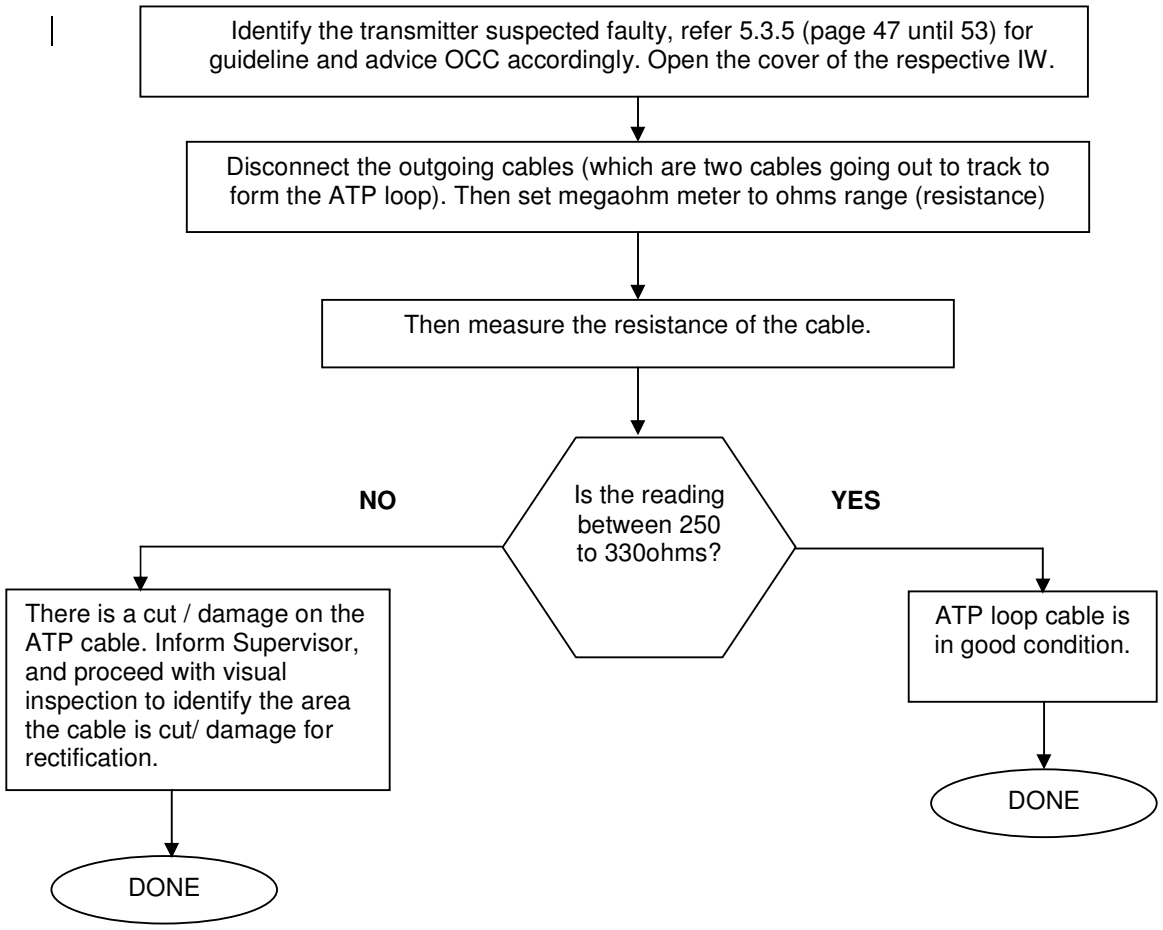
5.3.2 Measurement of SLA



5.3.3 Reading the ATP Telegram Using Train



5.3.4 Measurement of ATP loop cable resistance



5.3.5 IW, Transmitter and ATP loop configuration

Station	Transmitter no:	IW & SLA	Signals and point affected	Call and Advise OCC
KLS	1	IW 01/01 (KM100+264) SLA 01/01 (KM100+000))	Signals: N34, T34, N33, T33, T32, N32, T31, N31, S27, N42 Points: 201,202,302,223,322,323,221	- Override all signal and points. - All trains shall proceed with max speed lower than 80km/h from KM 0-979 to KM 0-270. **Note: Advice OCC to run Trains via Bi-directional and override element if the Trains EB for 2 or more consecutive signal occurred.**
	2	IW 01/ 02 (KM100+620) SLA 01/02 (KM1.400)	Signal: N23, N22, T42, T43, N13, N12, T3011, RN13, N2013 Points: 325,326,225,226	- Override all signal and points. - All trains shall proceed with max speed lower than 80km/h from KM 0-270 to KM1.400 **Note: Advice OCC to run Trains via Bi-directional and override element if the Trains EB for 2 or more consecutive signal occurred.**
	3	IW 01/03 (KM 3.400) SLA 01/03 (KM1.401)	Signal: T3021, N2023, T3023, N2029 Points: Nil	- Override all signal and points. - All trains shall proceed with max speed lower than 80km/h from KM 1.400 to KM 3.700 **Note: Advice OCC to run Trains via Bi-directional and override element if the Trains EB for 2 or more consecutive signal occurred.**
	4	IW 01/04 (KM 3.700) SLA 01/04 (KM5.876)	Signals: T3039, N2039, T3051, N2049 Points: Nil	- Override all signal and points. - All trains shall proceed with max speed lower than 80km/h from KM 3.700 to KM 6.000. **Note: Advice OCC to run Trains via Bi-directional and override element if the Trains EB for 2 or more consecutive signal occurred.**

BTS	1	IW 08/01 (Km 8.29) SLA 08/01 (Km 5.88)	Signals: N2059, T3063, N2069, T3073, R T22 N2077, T23, T22 Points: Nil	- Override all signal and points. - All trains shall proceed with max speed lower than 80km/h from KM 5.900 to KM 8.300. **Note: Advice OCC to run Trains via Bi-directional and override element if the Trains EB for 2 or more consecutive signal occurred.**
	2	IW 08/02 (Km 8.93) SLA 08/02 (Km 8.23)	Signals; N31, N32, T31, T32, T33, T34, N33, N34 Points: 302,202,305.206,322,221,325,225	- Override all signal and points. - All trains shall proceed with max speed lower than 80km/h from KM 8.200 to KM 9.500. **Note: Advice OCC to run Trains via Bi-directional and override element if the Trains EB for 2 or more consecutive signal occurred.**
	3	IW 08/03 (Km 9.22) SLA 08/03 (Km 11.41)	Signals: N23, N22, T3097, RN 23, N2015, T3113 Points: Nil	- Override all signal and points. - All trains shall proceed with max speed lower than 80km/h from KM 9.100 to KM 11.400. **Note: Advice OCC to run Trains via Bi-directional and override element if the Trains EB for 2 or more consecutive signal occurred.**
XA	1	IW 16/01 (KM 13.700) SLA 16/01 (KM 11.414)	Signals: N2115, T3125, N2125 Points: Nil	- Override all signal and points. - All trains shall proceed with max speed lower than 80km/h from KM 11.400 to KM 13.700. **Note: Advice OCC to run Trains via Bi-directional and override element if the Trains EB for 2 or more consecutive signal occurred.**

XA	2	IW 16/02 (KM 13.700) SLA 16/02 (KM 15.800)	Signal: T3135, N2135, T3145, RT 22, N2151 Points: Nil	- Override all signal and points. - All trains shall proceed with max speed lower than 80km/h from KM 13.7 to KM 15.8. **Note: Advice OCC to run Trains via Bi-directional and override element if the Trains EB for 2 or more consecutive signal occurred.**
	3	IW 16/03 (KM 17.100) SLA 16/03 (KM 15.801)	Signal: T23, T22, N33, N32 Points: 302,202	- Override all signal and points. - All trains shall proceed with max speed lower than 80km/h from KM 15.800 to KM 17.100. **Note: Advice OCC to run Trains via Bi-directional and override element if the Trains EB for 2 or more consecutive signal occurred.**
	4	IW 16/04 (KM 17.101) SLA 16/04 (KM 19.200)	Signal: T33, N23, T32, N22, T3193 Points: 225, 325	- Override all signal and points. - All trains shall proceed with max speed lower than 80km/h from KM 17.1 to KM 19.200. **Note: Advice OCC to run Trains via Bi-directional and override element if the Trains EB for 2 or more consecutive signal occurred.**
	5	IW 16/05 (KM 21.300) SLA 16/05 (KM 19.201)	Signal: RN 23, N 2195, T 3207, N 2207 Points: Nil	- Override all signal and points. - All trains shall proceed with max speed lower than 80km/h from KM 19.200 to KM 21.300. **Note: Advice OCC to run Trains via Bi-directional and override element if the Trains EB for 2 or more consecutive signal occurred.**
	6	IW 16/06 (KM 21.301) SLA 16/06 (KM 23.739)	Signal: N 2221. T 3227 Points: Nil	- Override all signal and points. - All trains shall proceed with max speed lower than 80km/h from KM 21.300 to KM 23.500. **Note: Advice OCC to run Trains via Bi-directional and override element if the Trains EB for 2 or more consecutive signal occurred.**

PJS	1	IW 31/01 (KM26.050) SLA 31/01 (KM 23.740)	Signals: N2235, T 3247, N2251 Points: Nil	- Override all signal and points. - All trains shall proceed with max speed lower than 80km/h from KM 23.500 to KM 26.100. **Note: Advice OCC to run Trains via Bi-directional and override element if the Trains EB for 2 or more consecutive signal occurred.**
	2	IW 31/02 (KM26.050) SLA 31/02 (KM 28.500)	Signals: T 3267, N 2267, RT 12, N 2281 Points: Nil	- Override all signal and points. - All trains shall proceed with max speed lower than 80km/h from KM 26.000 to KM 28.500. **Note: Advice OCC to run Trains via Bi-directional and override element if the Trains EB for 2 or more consecutive signal occurred.**
	3	IW 31/03 (KM 30.560) SLA 31/03 (KM 28.501)	Signal: T13, T12, N43, N42, T23, T22 Points: 302,202	- Override all signal and points. - All trains shall proceed with max speed lower than 80km/h from KM 28.500 to KM 30.600. **Note: Advice OCC to run Trains via Bi-directional and override element if the Trains EB for 2 or more consecutive signal occurred.**
	4	IW 31/04 (KM 31.360) SLA 31/04 (KM 31.480)	Signals: N34, N33, N32, N31, T34, T33, T32, T31 Points: 305,206,322,221,325,225	- Override all signal and points. - All trains shall proceed with max speed lower than 80km/h from KM 30.600 to KM 31.700. **Note: Advice OCC to run Trains via Bi-directional and override element if the Trains EB for 2 or more consecutive signal occurred.**
	5	IW 31/05 (KM 31.400) SLA 31/05 (KM 33.600)	Signals: N 23, N 22, T 3325 Points: Nil	- Override all signal and points. - All trains shall proceed with max speed lower than 80km/h from KM 31.300 to KM 33.600. **Note: Advice OCC to run Trains via Bi-directional and override element if the Trains EB for 2 or more consecutive signal occurred.**

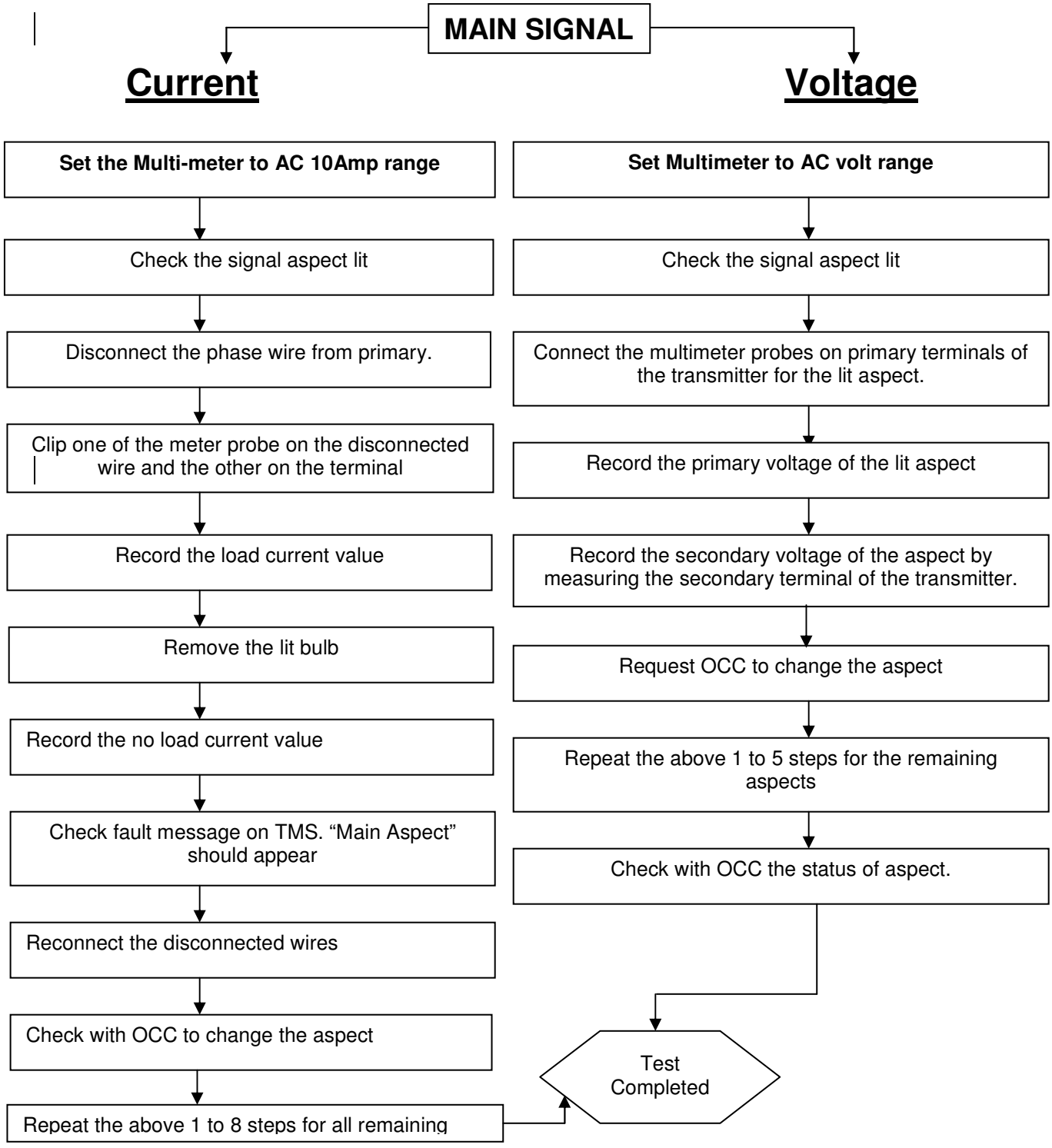
PJS	6	IW 31/06 (KM 36.000) SLA 31/06 (KM 33.601)	Signals: RN 23, T 3345, N 2341, N 2359 Points: Nil	- Override all signal and points. - All trains shall proceed with max speed lower than 80km/h from KM 33.600 to KM 36.00. **Note: Advice OCC to run Trains via Bi-directional and override element if the Trains EB for 2 or more consecutive signal occurred.**
	7	IW 31/07 (KM 36.001) SLA 31/07 (KM 38.418)	Signals: T 3361, T3377, N 2377 Points: Nil	- Override all signal and points. - All trains shall proceed with max speed lower than 80km/h from KM 36.000 to KM 38.400 **Note: Advice OCC to run Trains via Bi-directional and override element if the Trains EB for 2 or more consecutive signal occurred.**
STS	1	IW 46/01 (KM 40.500) SLA 46/01 (KM 38.419)	Signals: T3397, N2397 Points: Nil	- Override all signal and points. - All trains shall proceed with max speed lower than 80km/h from KM 38.400 to KM 40.500. **Note: Advice OCC to run Trains via Bi-directional and override element if the Trains EB for 2 or more consecutive signal occurred.**
	2	IW 46/02 (KM 40.501) SLA 46/02 (KM 42.600)	Signals: T3415, RT 12, N 2417 Points: Nil	- Override all signal and points. - All trains shall proceed with max speed lower than 80km/h from KM 40.500 to KM 42.600. **Note: Advice OCC to run Trains via Bi-directional and override element if the Trains EB for 2 or more consecutive signal occurred.**
	3	IW 46/03 (KM 44.155) SLA 46/03 (KM 42.601)	Signals: N53, T13, N52, T12, T15 Points: 302,202,206,106	- Override all signal and points. - All trains shall proceed with max speed lower than 80km/h from KM 42.600 to KM 44.100. **Note: Advice OCC to run Trains via Bi-directional and override element if the Trains EB for 2 or more consecutive signal occurred.**

STS	4	IW 46/04 (KM 45.999) SLA 46/04 (KM 44.055)	Signals: N43, T23, N42, T22 Points: 325	- Override all signal and points. - All trains shall proceed with max speed lower than 80km/h from KM 44.000 to KM 46.000 **Note: Advice OCC to run Trains via Bi-directional and override element if the Trains EB for 2 or more consecutive signal occurred.**
	5	IW 46/05 (KM 45.920) SLA 46/05 (KM 44.570)	Signals: T35, N45, N46 Points: 106, 108, 508, 901	- Override all signal and points. - Speed restriction not required. **Note: Advice OCC to run Trains via Bi-directional and override element if the Trains EB for 2 or more consecutive signal occurred.**
	6	IW 46/06 (KM 46.100) SLA 46/06 (KM 45.670)	Signals: N31, T32, T31, T36 Points: 114,115,216,221	- Override all signal and points. - All trains shall proceed with max speed lower than 80km/h from KM 45.800 to KM 46.500. **Note: Advice OCC to run Trains via Bi-directional and override element if the Trains EB for 2 or more consecutive signal occurred.**
	7	IW 46/07 (KM 48.000) SLA 46/07 (KM 46.000)	Signals: N34, N33, T34, T33, N23, T 3476, N22 Points: 322, 325, 225	- Override all signal and points. - All trains shall proceed with max speed lower than 80km/h from KM 46.000 to KM 48.000. **Note: Advice OCC to run Trains via Bi-directional and override element if the Trains EB for 2 or more consecutive signal occurred.**
STS	8	IW 46/08 (KM 48.001) SLA 46/08 (KM 50.360)	Signals: RN 23, T 3491, N2487, T3503, N2503 Points: Nil	- Override all signal and points. - All trains shall proceed with max speed lower than 80km/h from KM 48.000 to KM 50.400 **Note: Advice OCC to run Trains via Bi-directional and override element if the Trains EB for 2 or more consecutive signal occurred.**

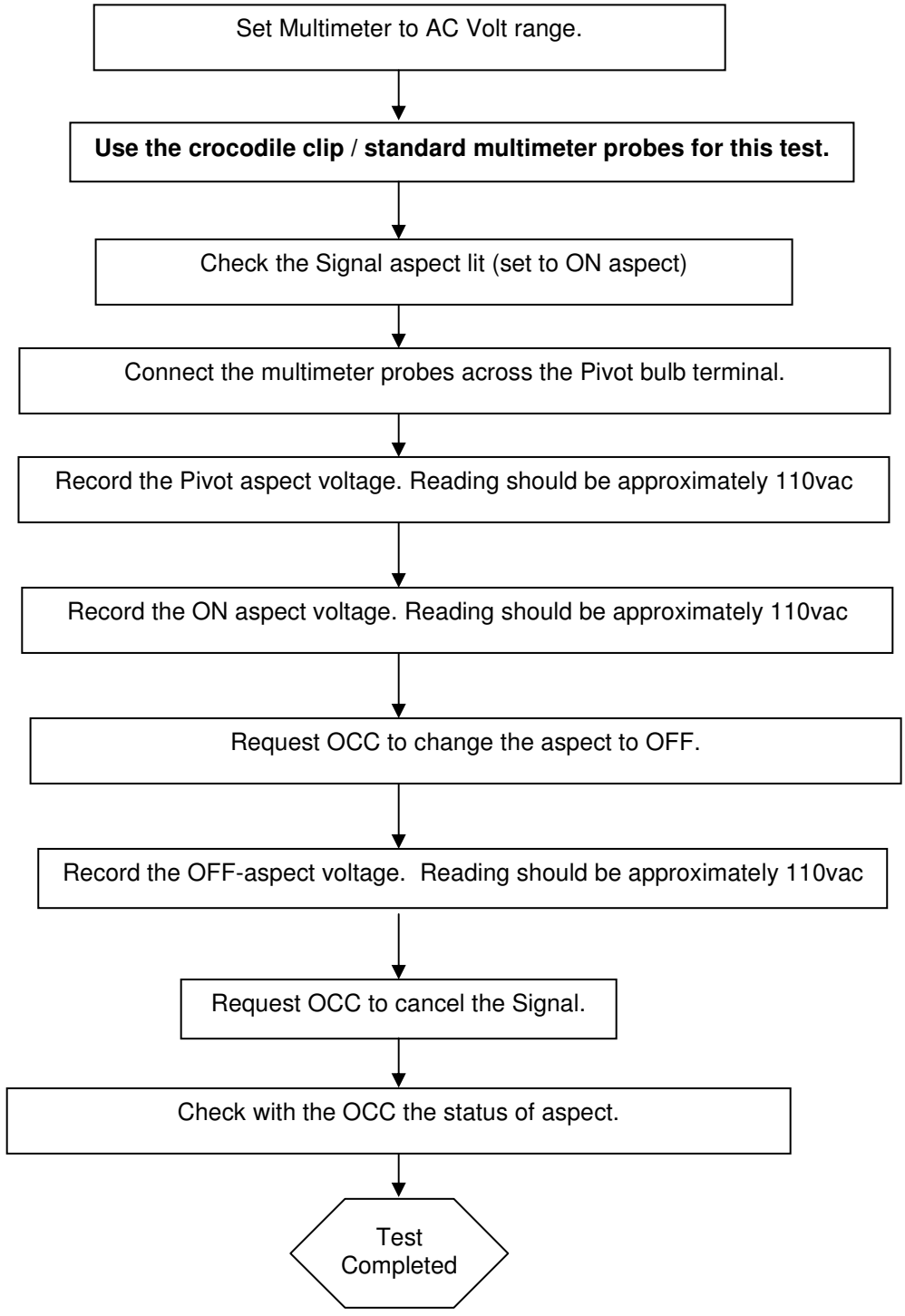
KLIA	1	IW 55/01 (KM 52.500) SLA 55/01 (KM 50.361)	Signals: T3517, N2517, N2503 Points: Nil	- Override all signal and points. - All trains shall proceed with max speed lower than 80km/h from KM 50.200 to KM 52.500. **Note: Advice OCC to run Trains via Bi-directional and override element if the Trains EB for 2 or more consecutive signal occurred.**
	2	IW 55/02 (KM 52.501) SLA 55/02 (KM 54.700)	Signals: T3533, N2533, RT12, T13, T12, N2541 Points: Nil	- Override all signal and points. - All trains shall proceed with max speed lower than 80km/h from KM 52.500 to KM 54.7. **Note: Advice OCC to run Trains via Bi-directional and override element if the Trains EB for 2 or more consecutive signal occurred.**
	3	IW 55/03 (KM 54.701) SLA 55/03 (KM 56.140)	Signals: N43, N42, T23, N33, T33, N34, T34, S24, T44 Points: 302,203,303,322,421,425,426	- Override all signal and points. - All trains shall proceed with max speed lower than 80km/h from KM 54.700 to KM 56.1 **Note: Advice OCC to run Trains via Bi-directional and override element if the Trains EB for 2 or more consecutive signal occurred.**
KLIA2	4	IW 55/04 (KM 55.015) SLA 55/04 (KM 58.256)	Signals: N32, T32, T31, S21, T41, **RS21, RS24** Points: 201203,303,221,122,125,126,425,426	- Override all signal and points. - All trains shall proceed with max speed lower than 80km/h from KM 55.000 to KM 58.256. **Note: Advice OCC to run Trains via Bi-directional and override element if the Trains EB for 2 or more consecutive signal occurred.**

6 Signal Maintenance Technical Instruction

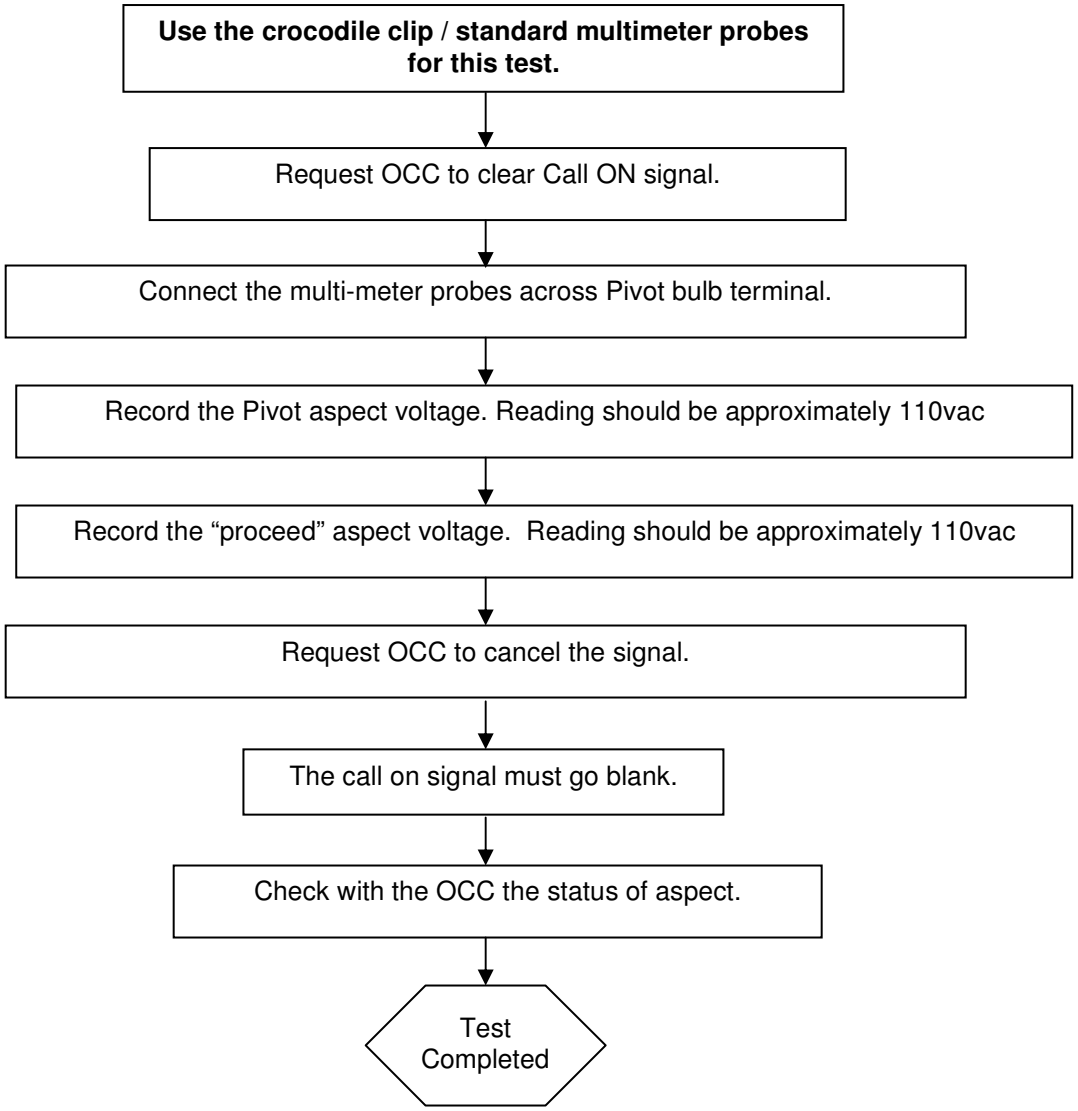
6.1 Signal Transformer Voltage & Current Measurement



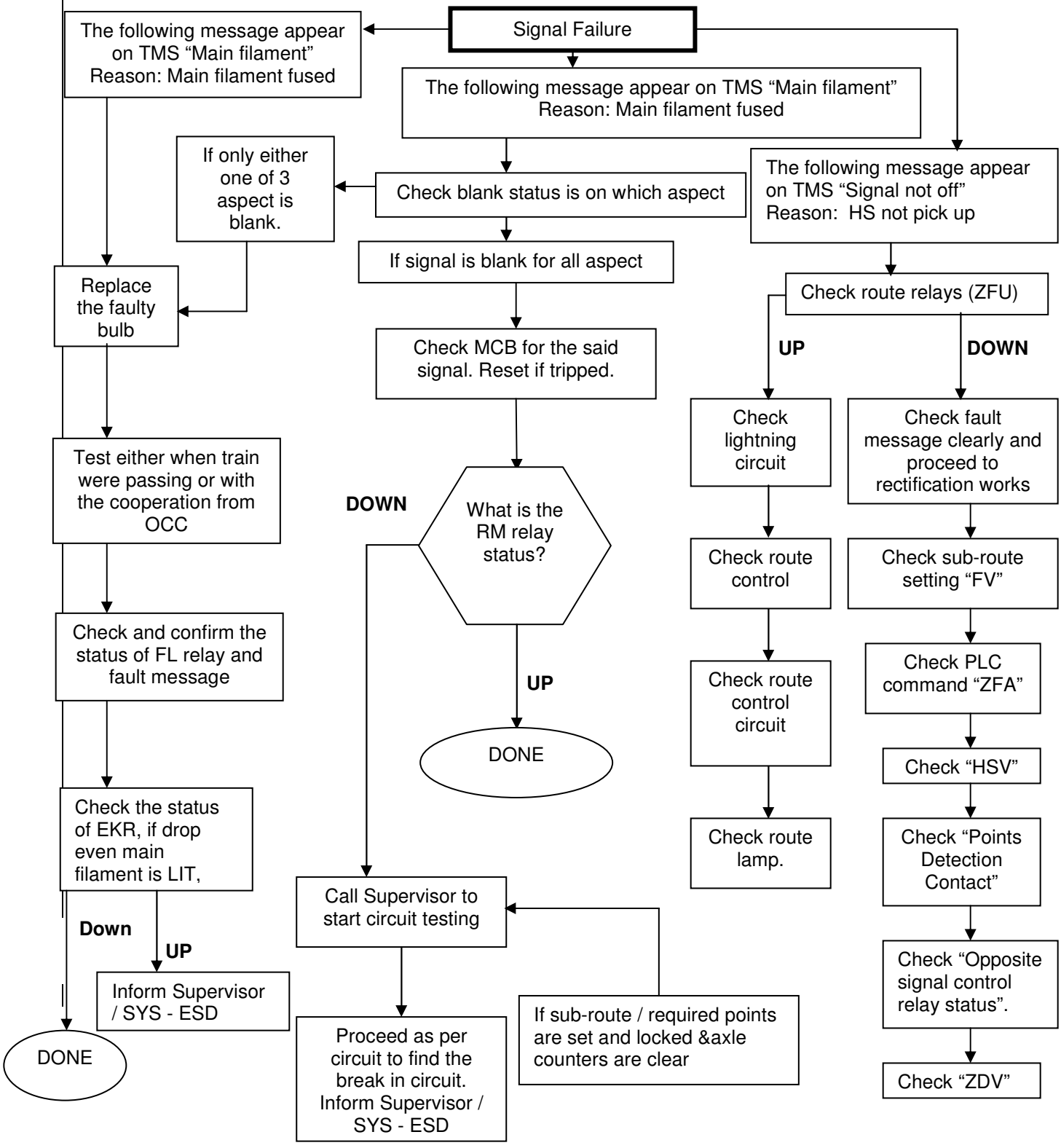
6.2 Signal Transformer Voltage Measurement - Shunt Signal



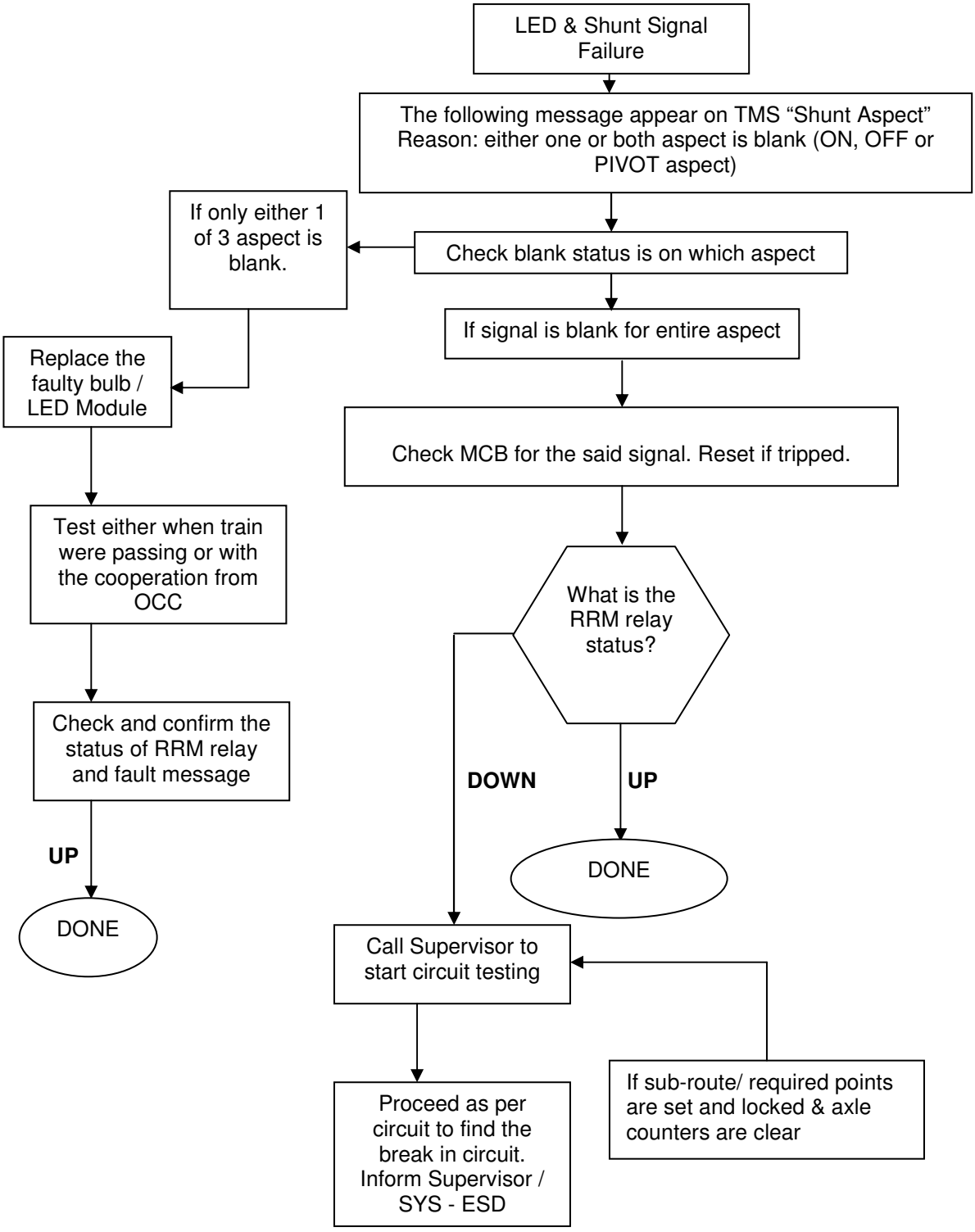
6.3 Call ON Signal Voltage Measurement



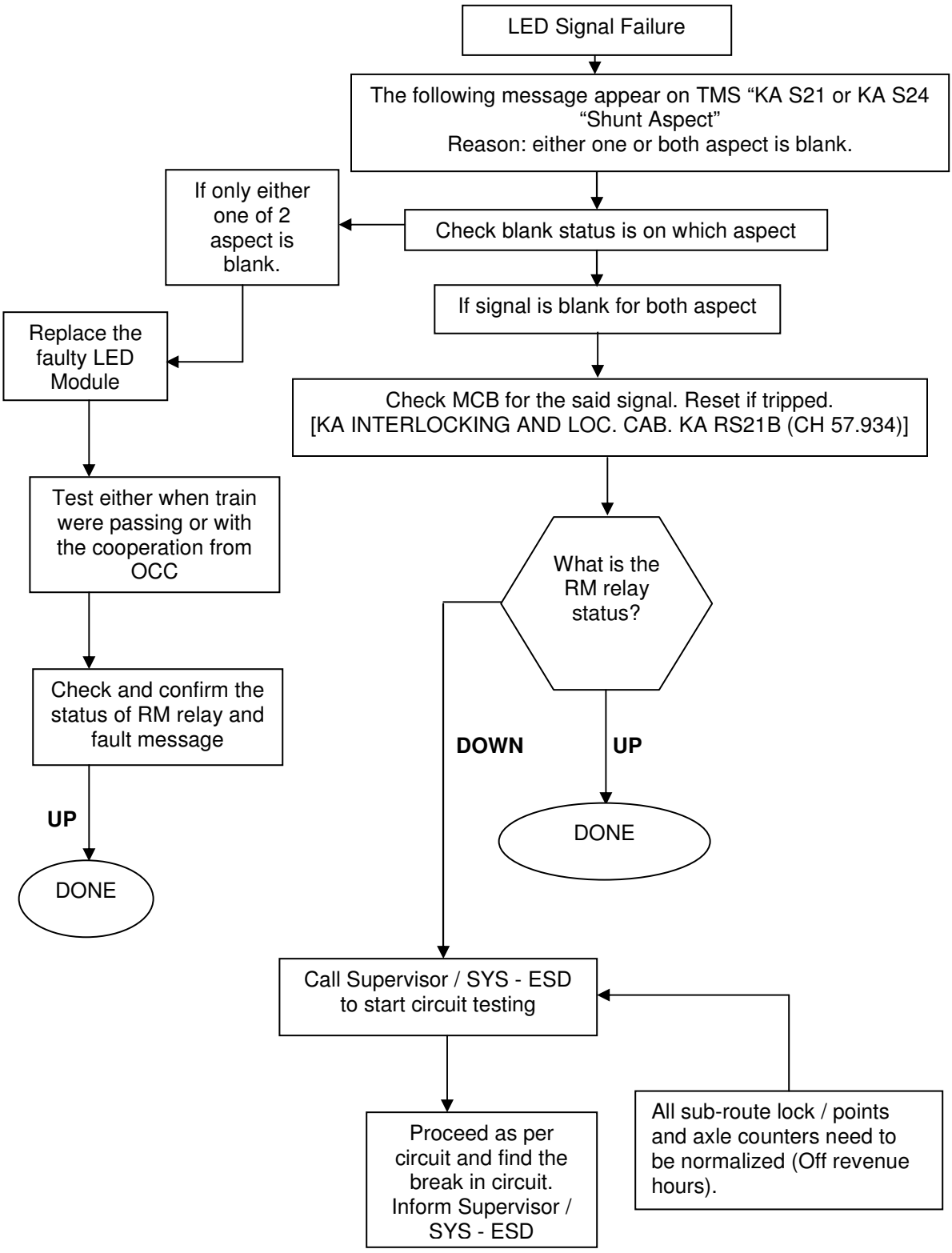
6.4 Colour Light Signals Failure



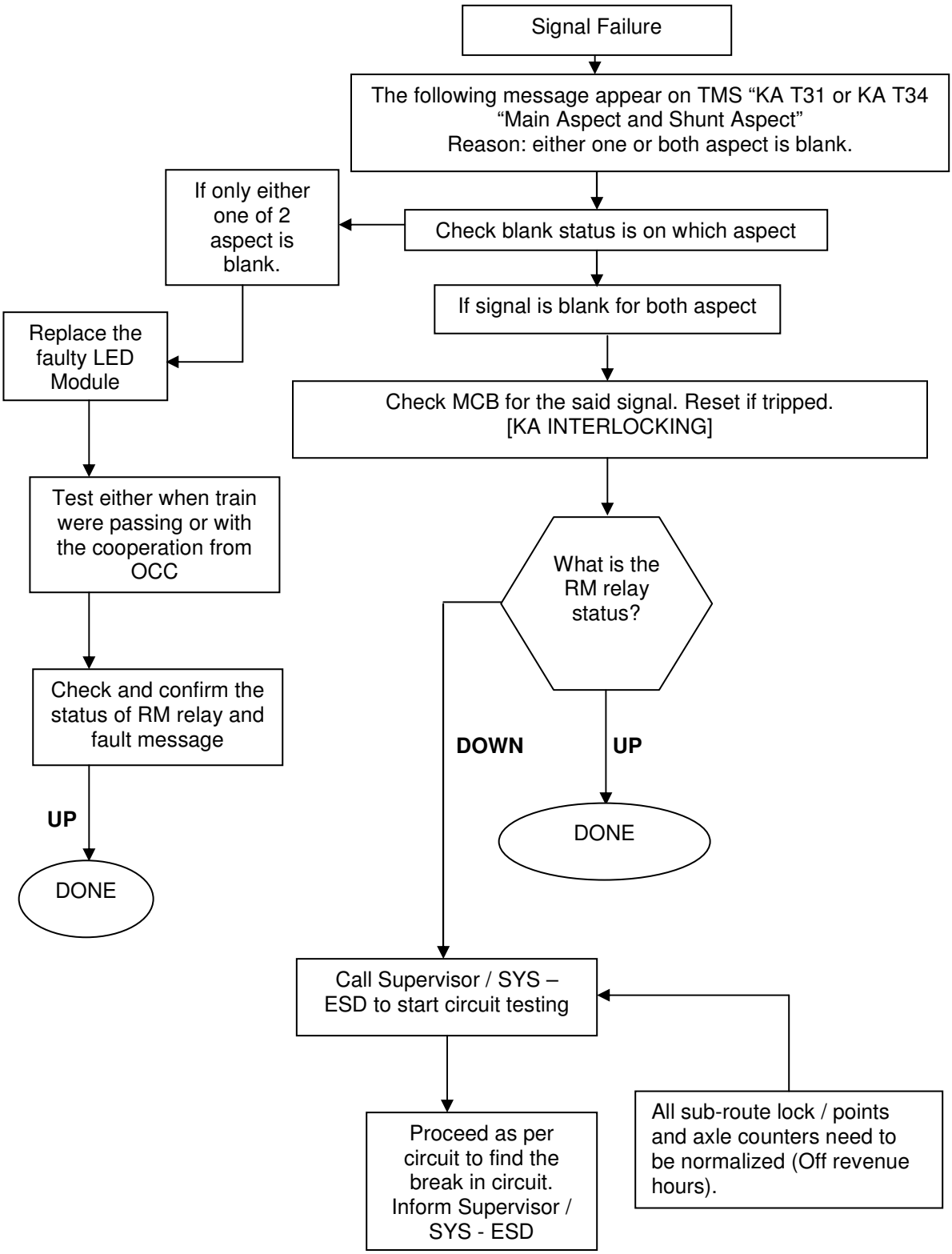
6.5 LED Shunt & Shunt Signal Failure



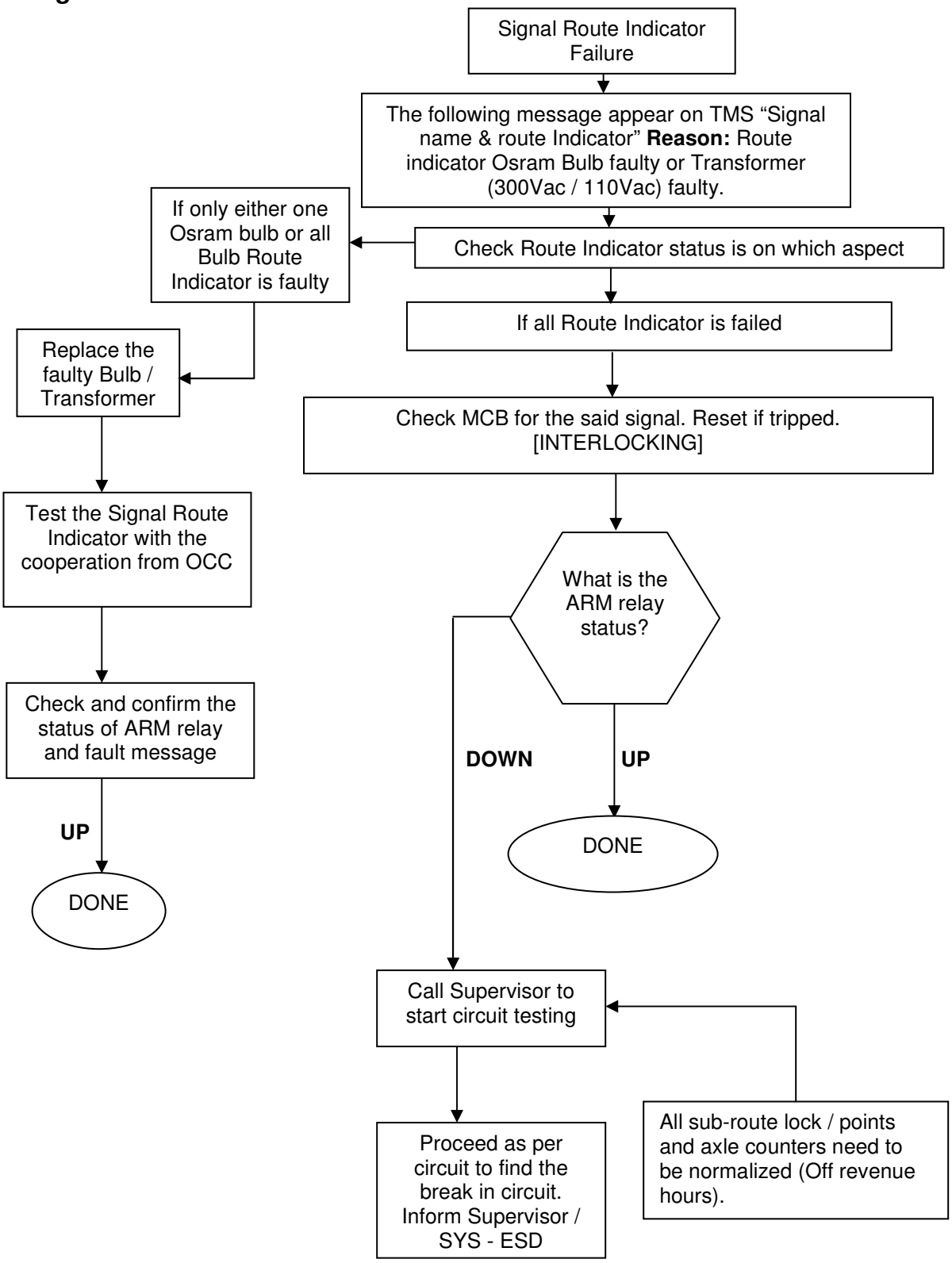
6.6 LED Signal Failure (KA S21, KA S24, KA RS21 and KA RS24)



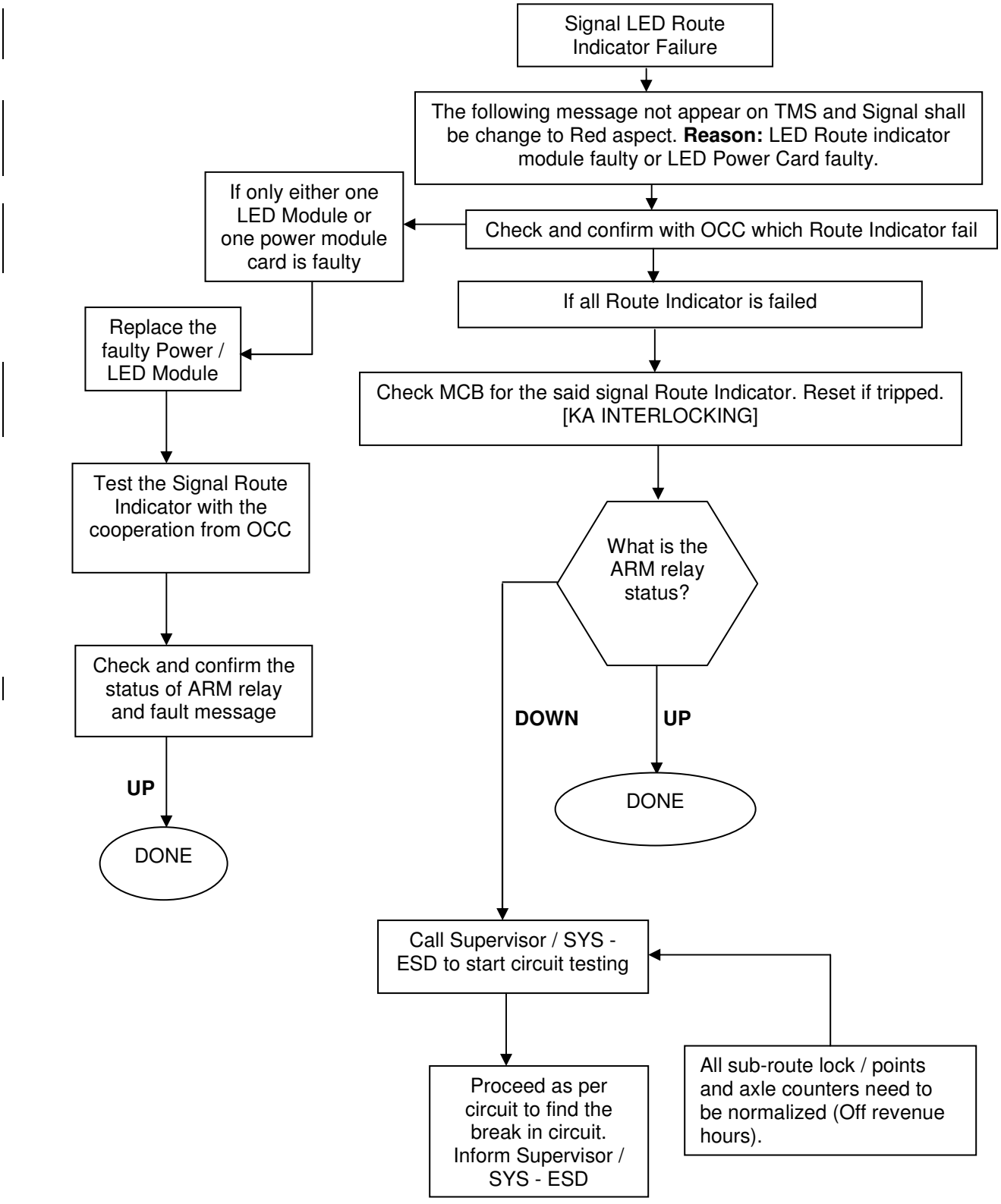
6.7 LED Signal Failure (KA T31 and KA T34)



6.8 Signal Route Indicator Failure

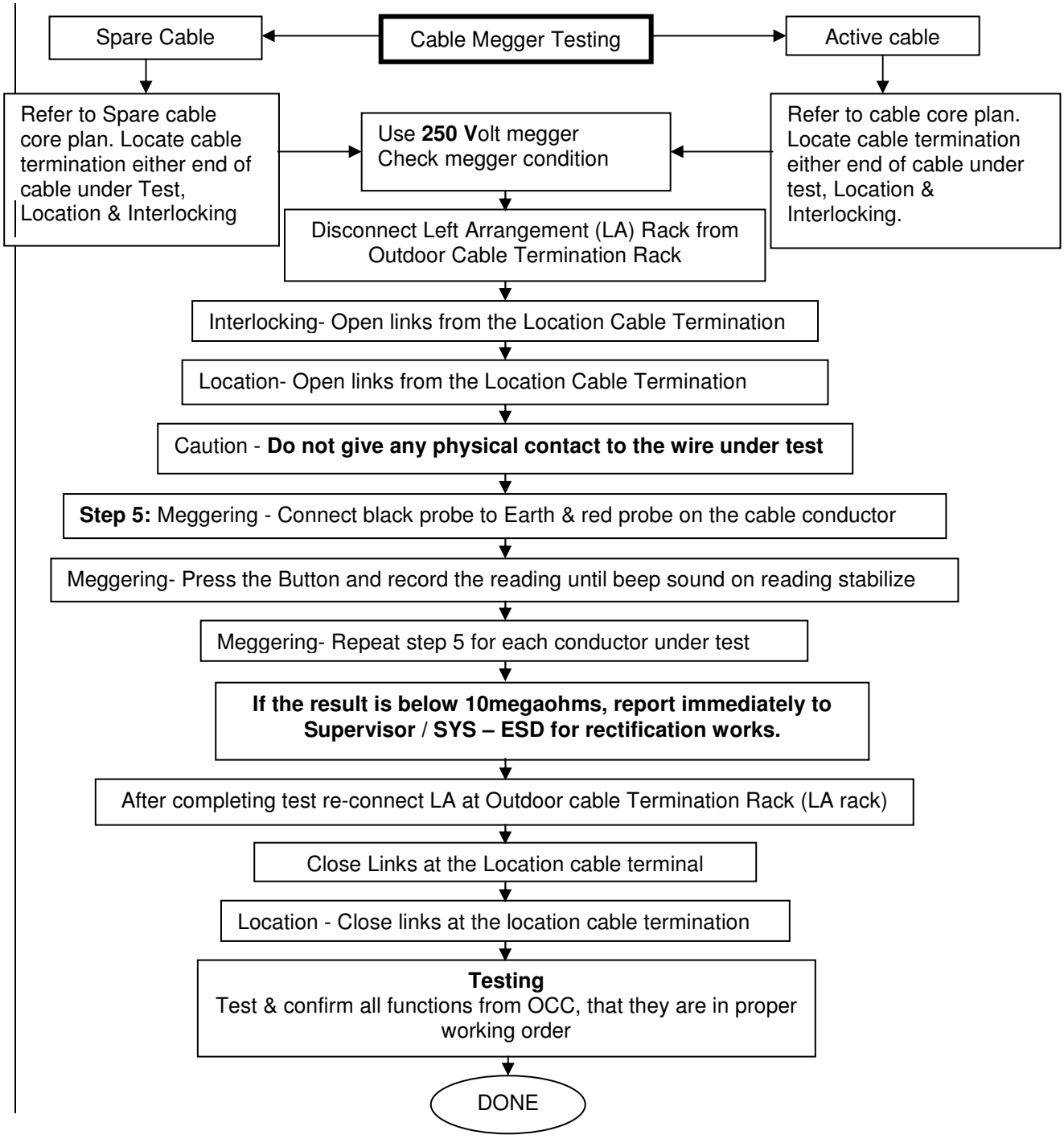


6.9 LED Route Indicator Failure (KA T31, KA T34, KA S21 and KA S24)

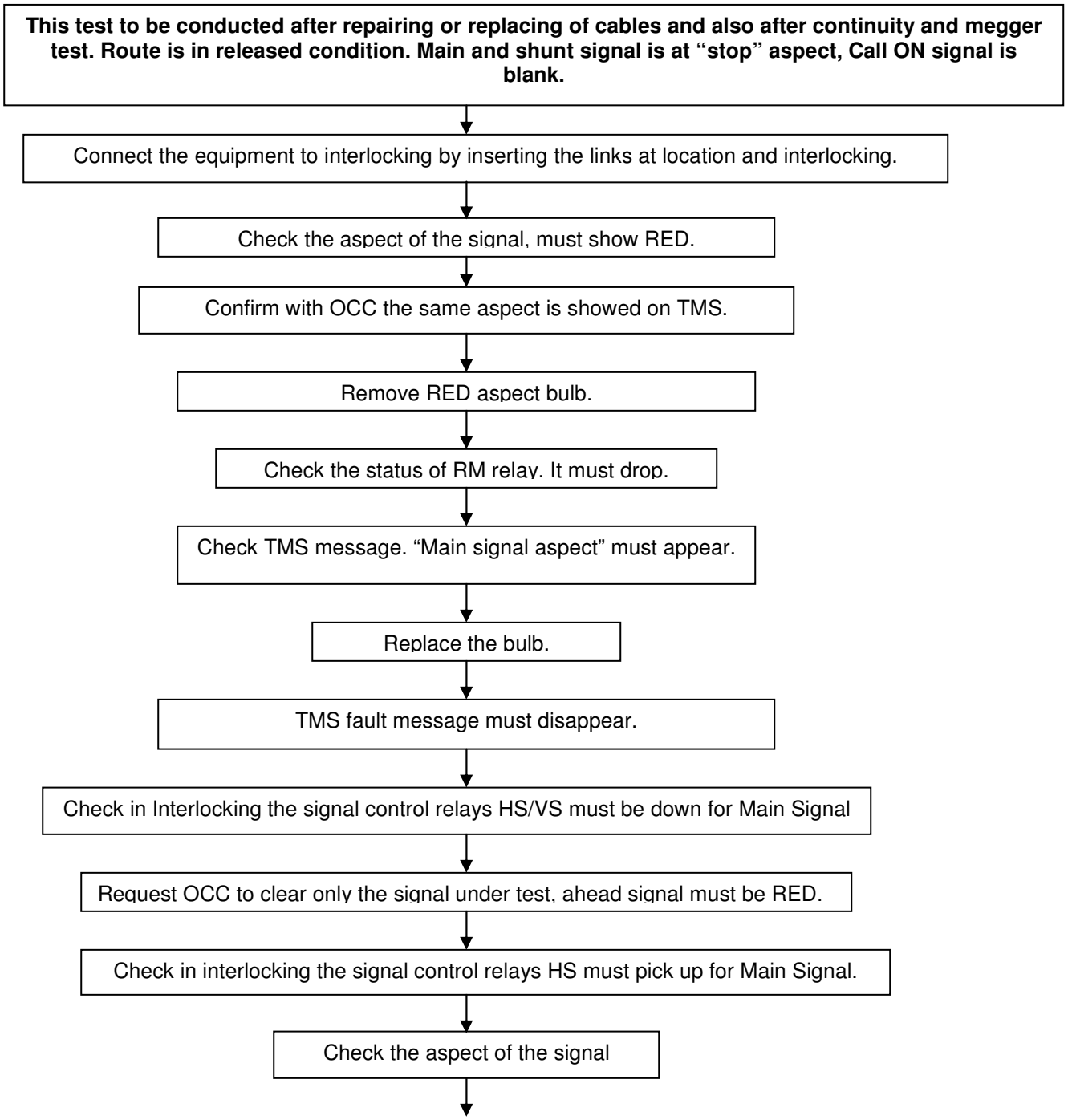


7 Cable Maintenance Technical Instruction

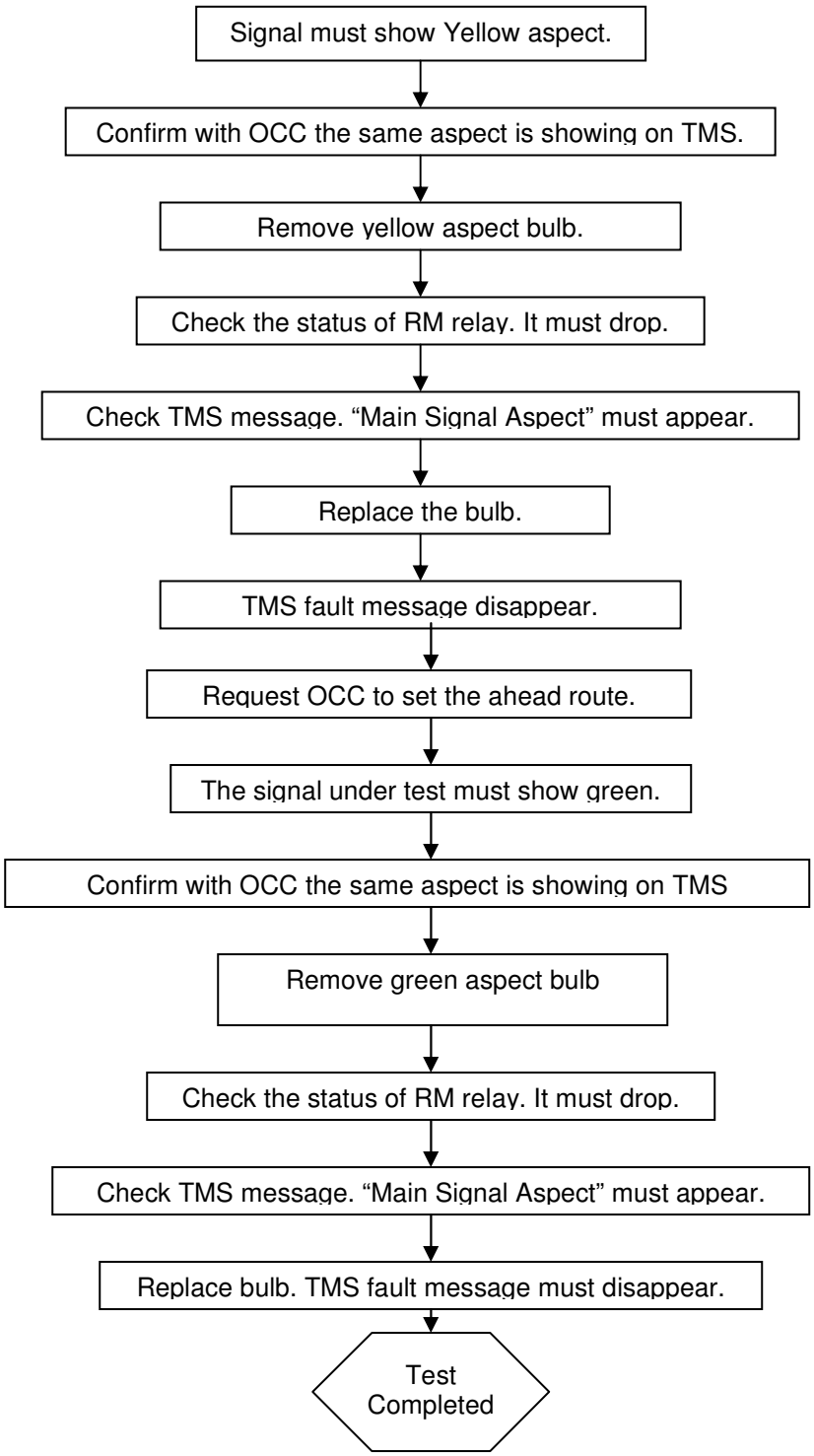
7.1 Cable Megger Testing



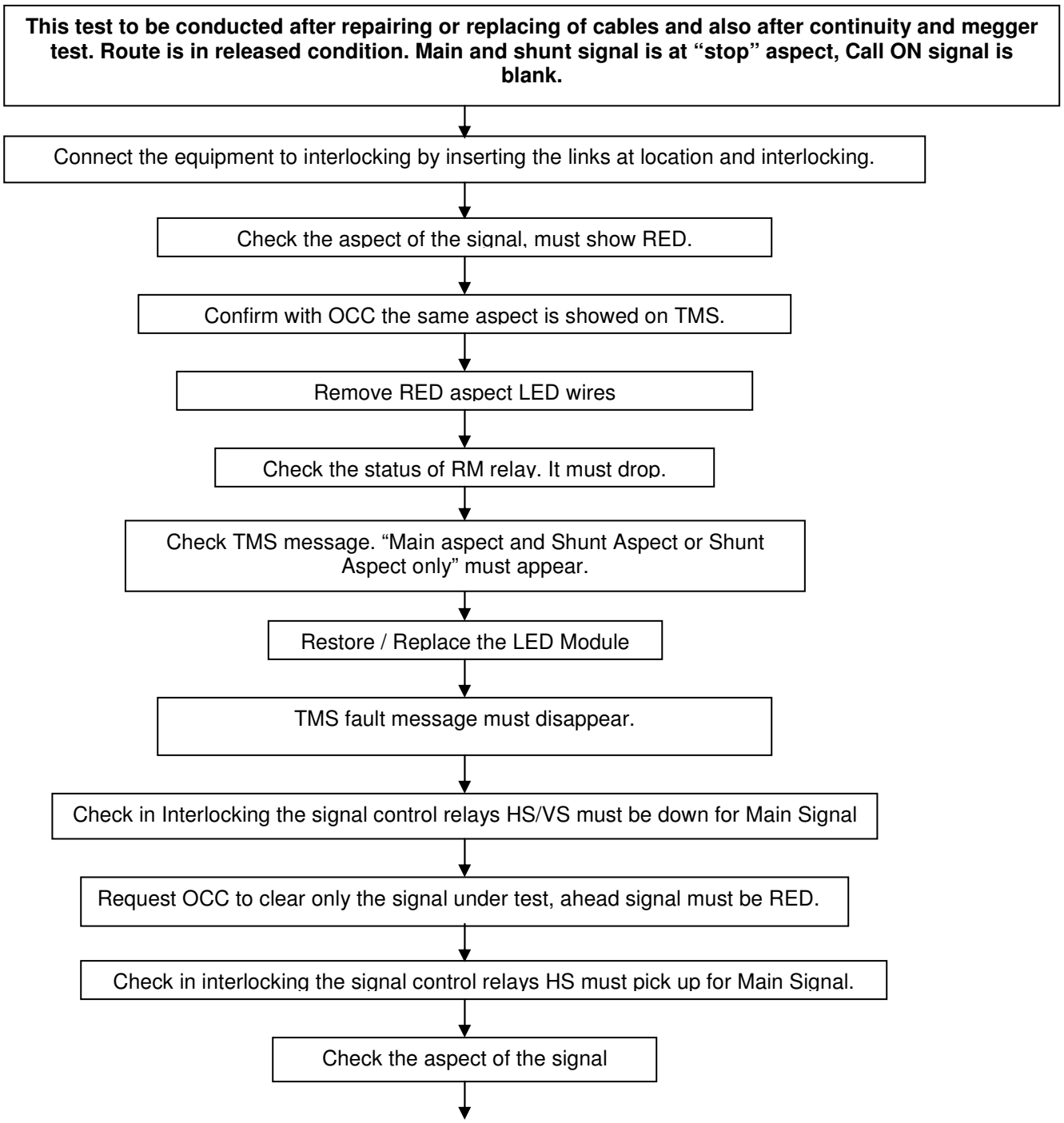
7.2 Correspondence Test – Main Signal for Color Light Signal



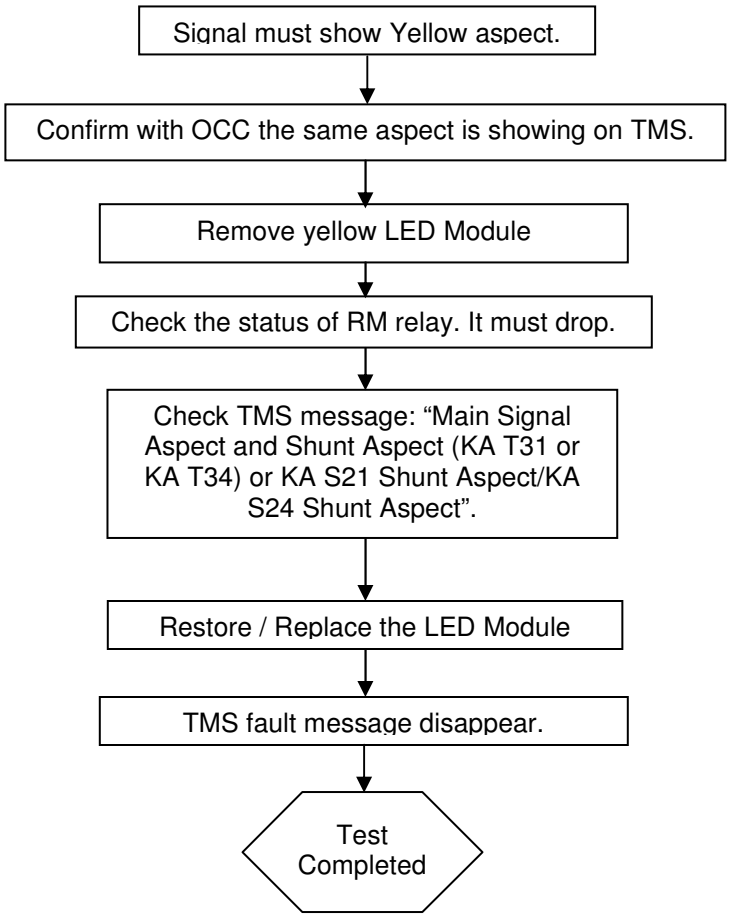
7.2 Correspondence Test- Main Signal for Color Light Signal (continued)



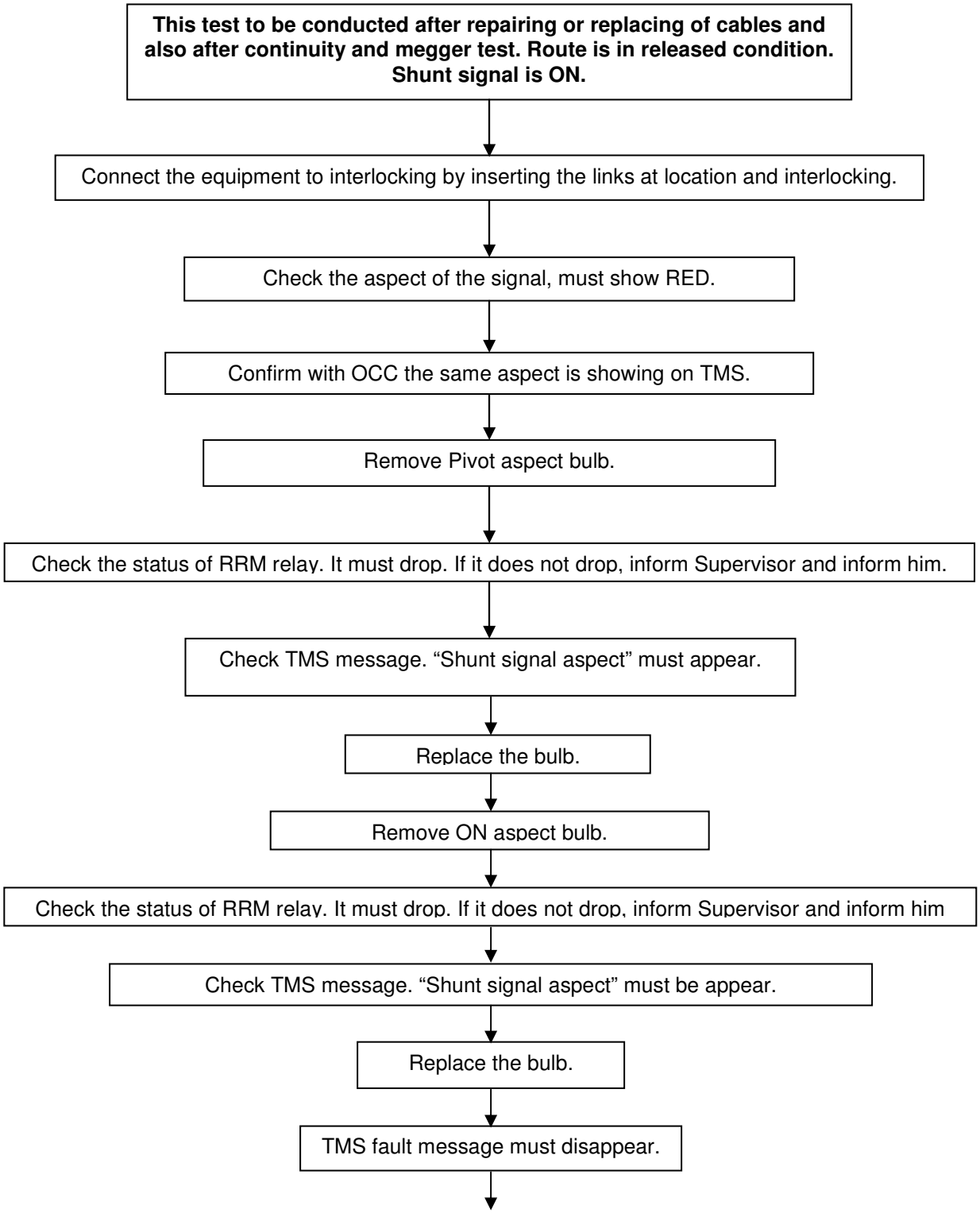
7.3 Correspondence Test – LED Signal



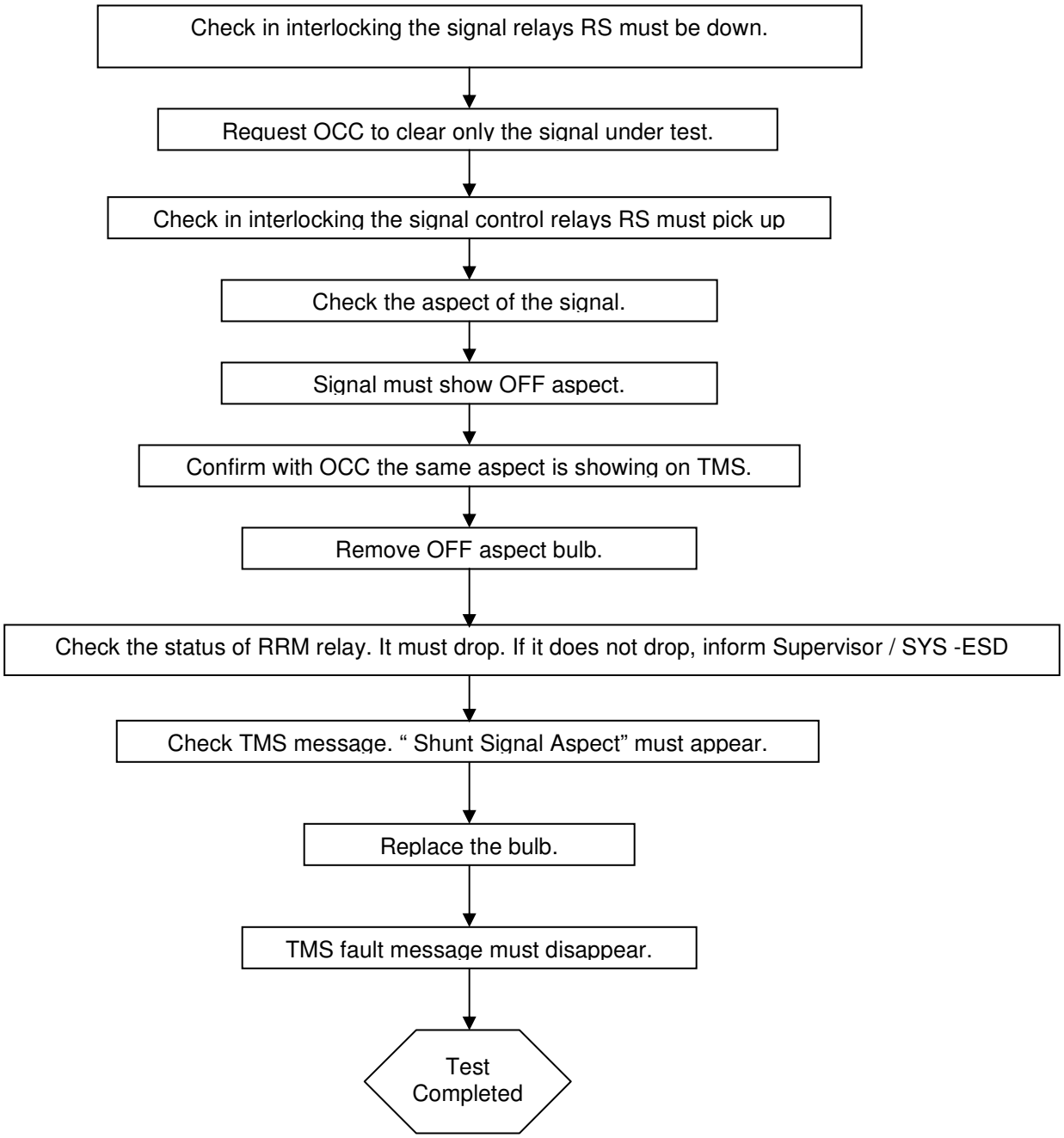
7.3 Correspondence Test – LED Signal (continued)



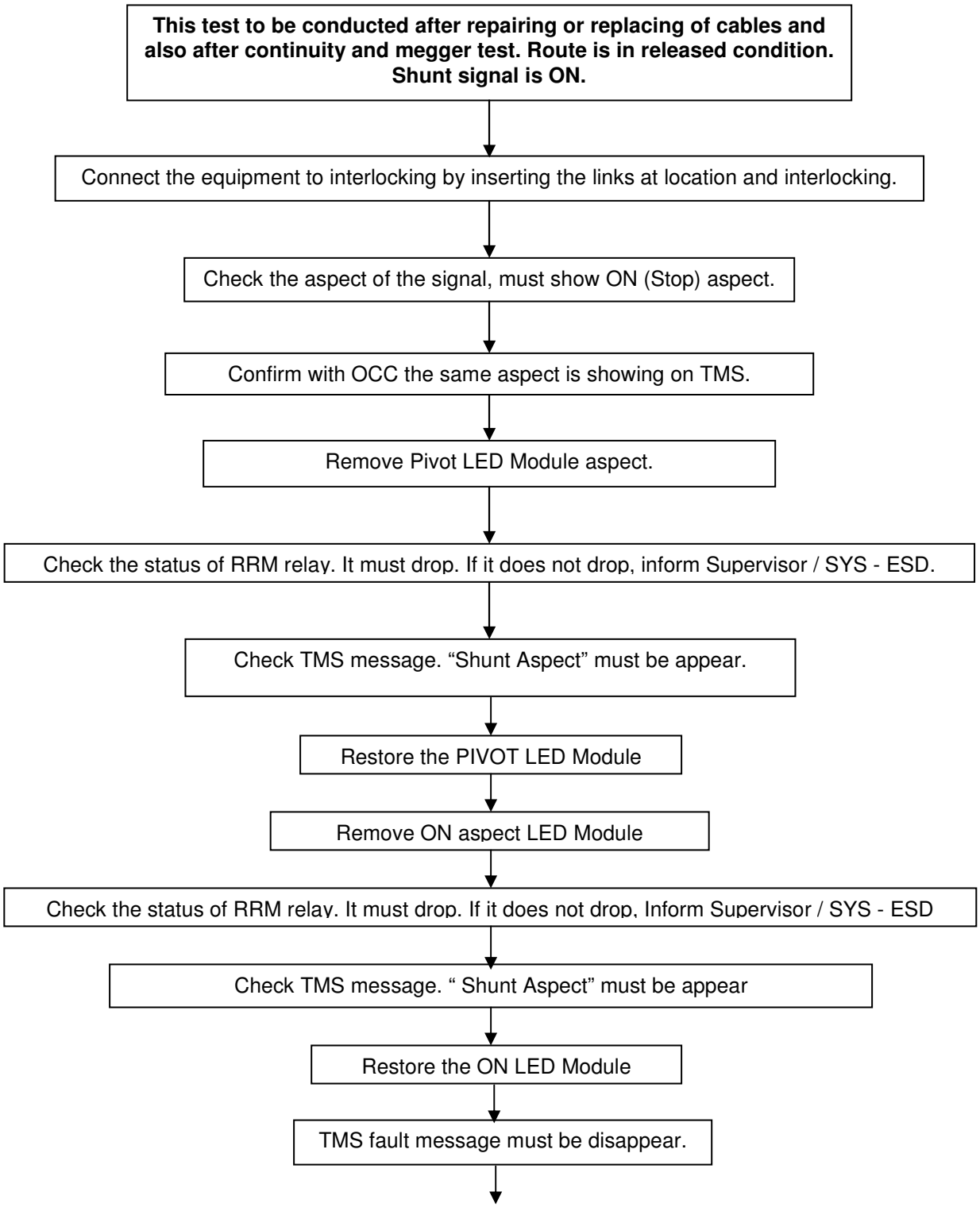
7.4 Correspondence Test – Shunt Signal



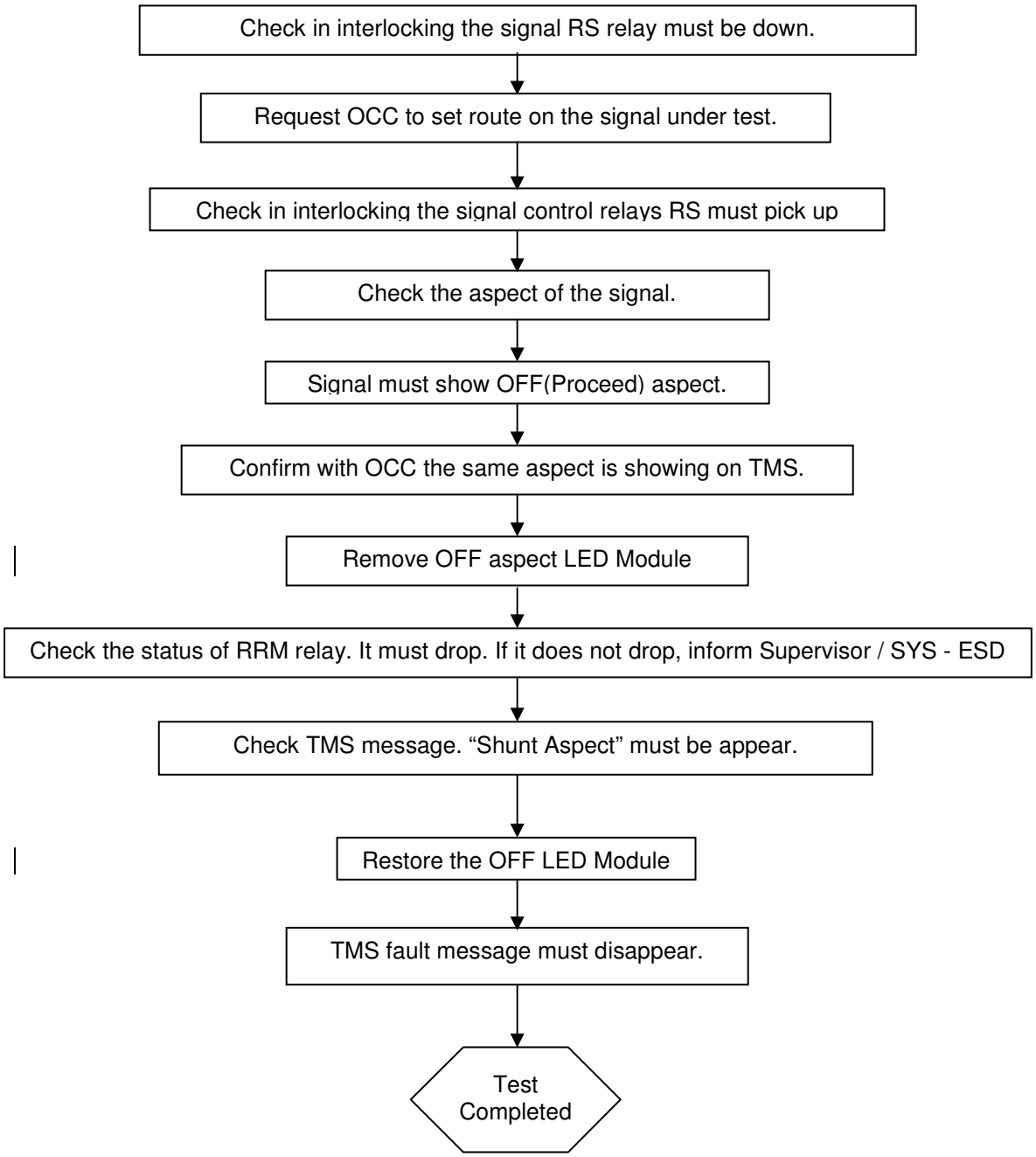
7.4 Shunt Signal Correspondence Test (continued)



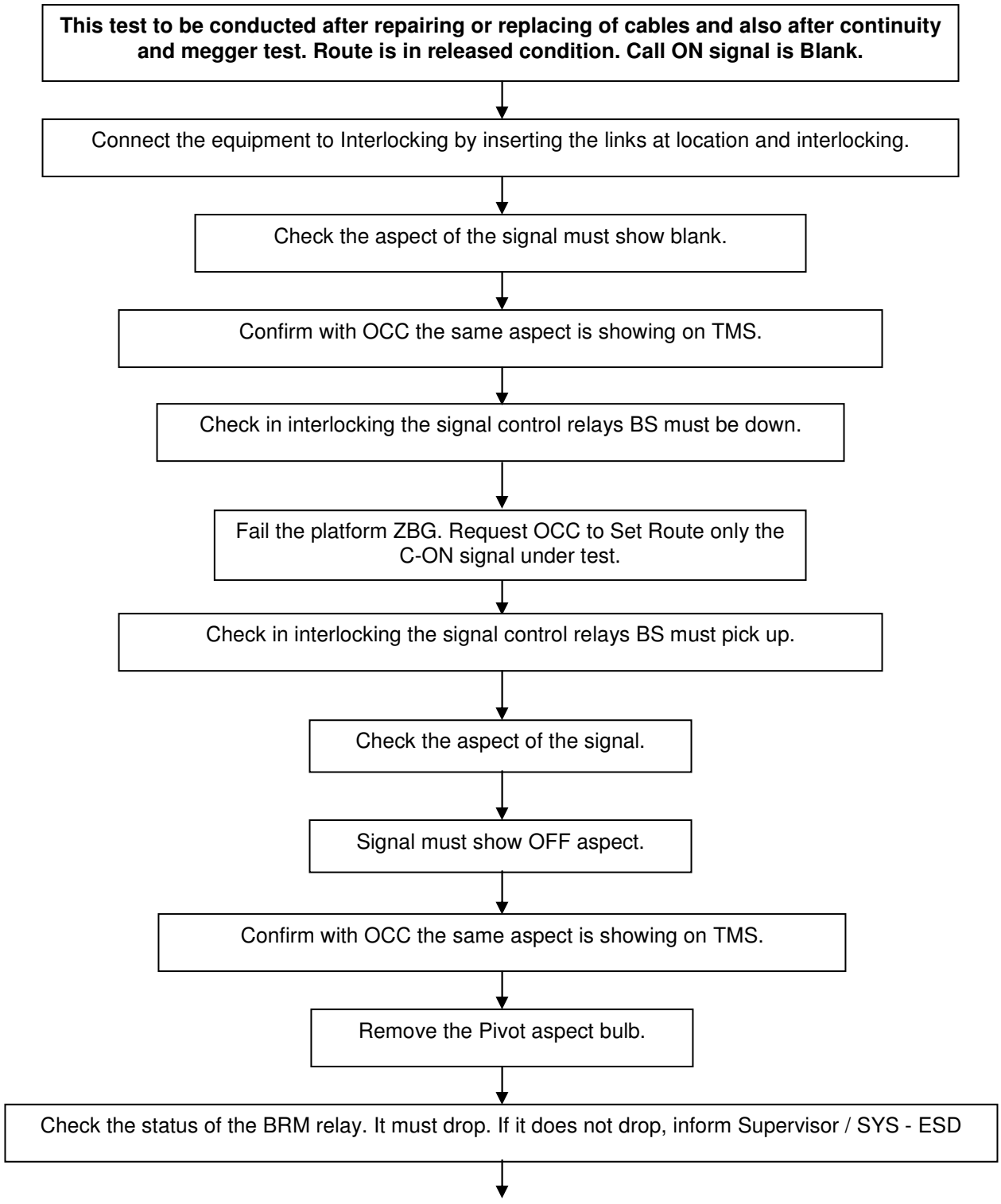
7.5 LED Shunt Signal Correspondence Test – LED Shunt Signal



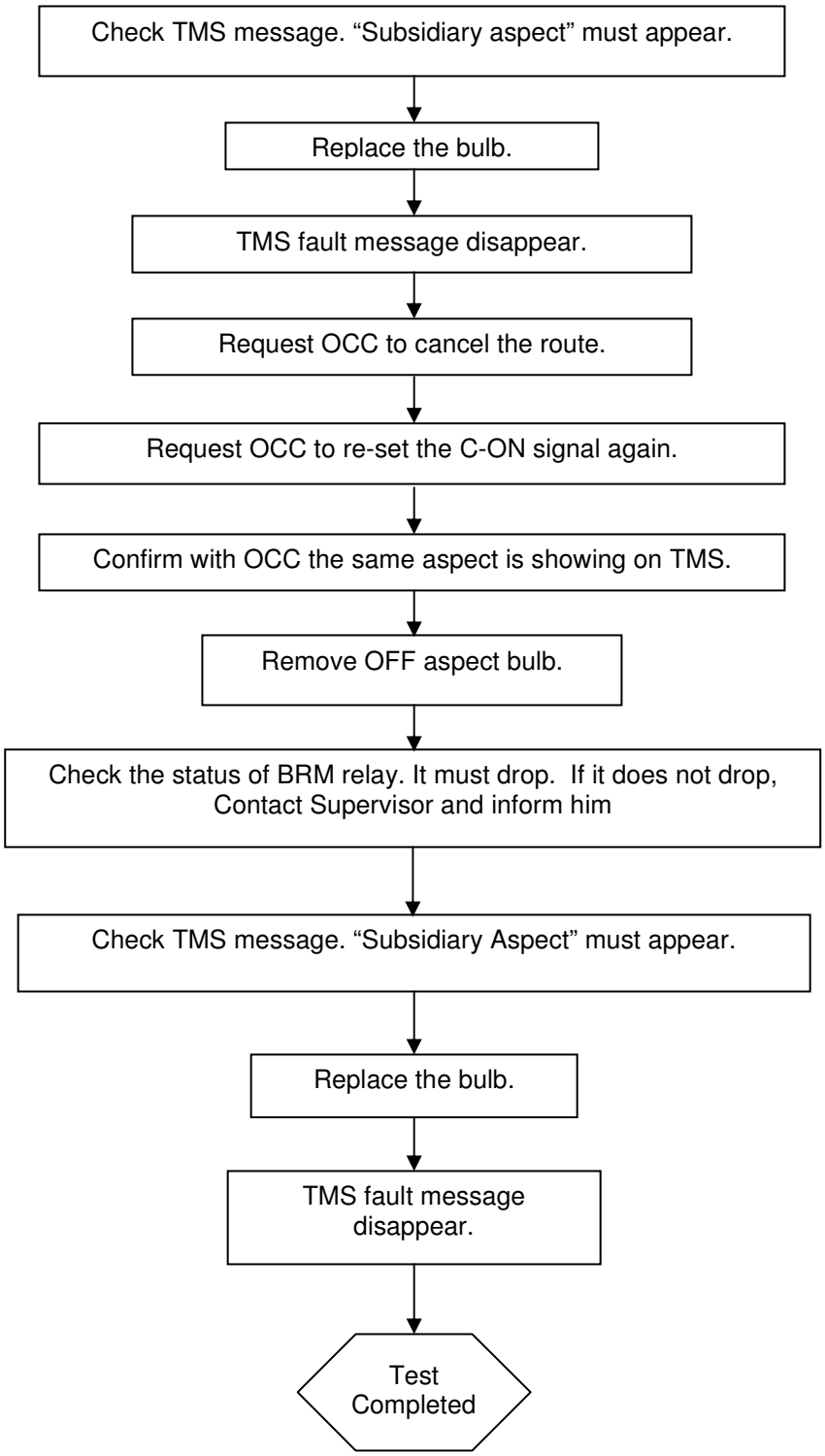
7.5 LED Shunt Signal Correspondence Test (continued)



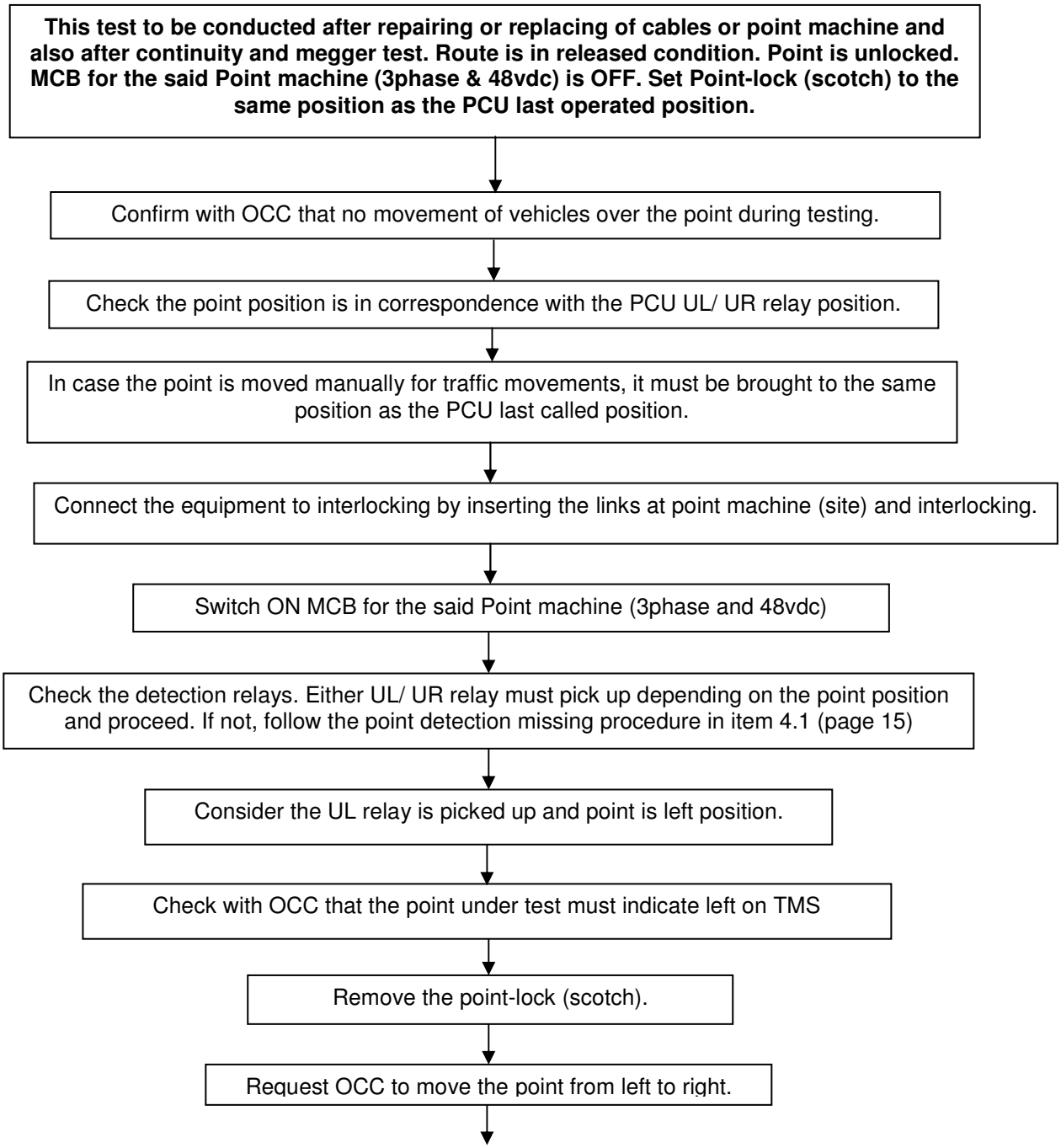
7.6 Correspondence Test – Call On Signal



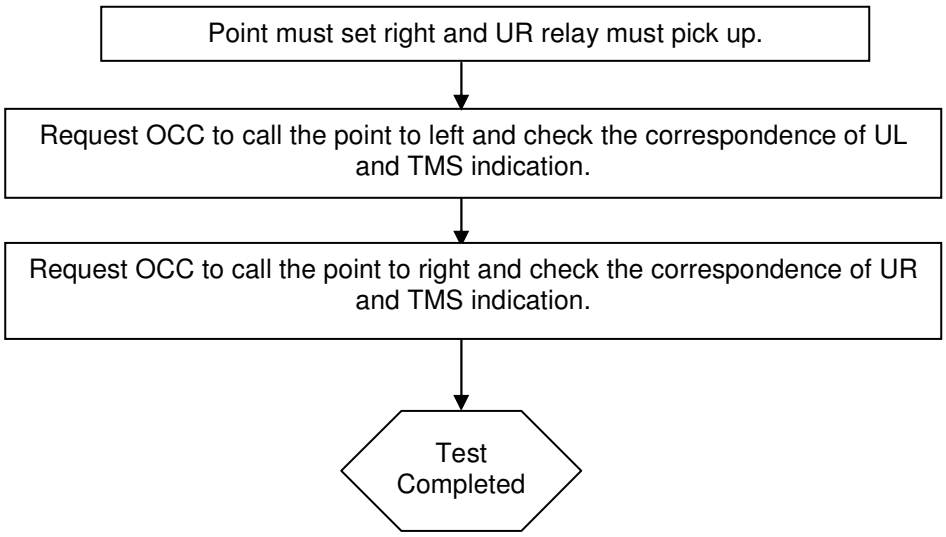
7.6 Correspondence Test – Call On signal (continued)



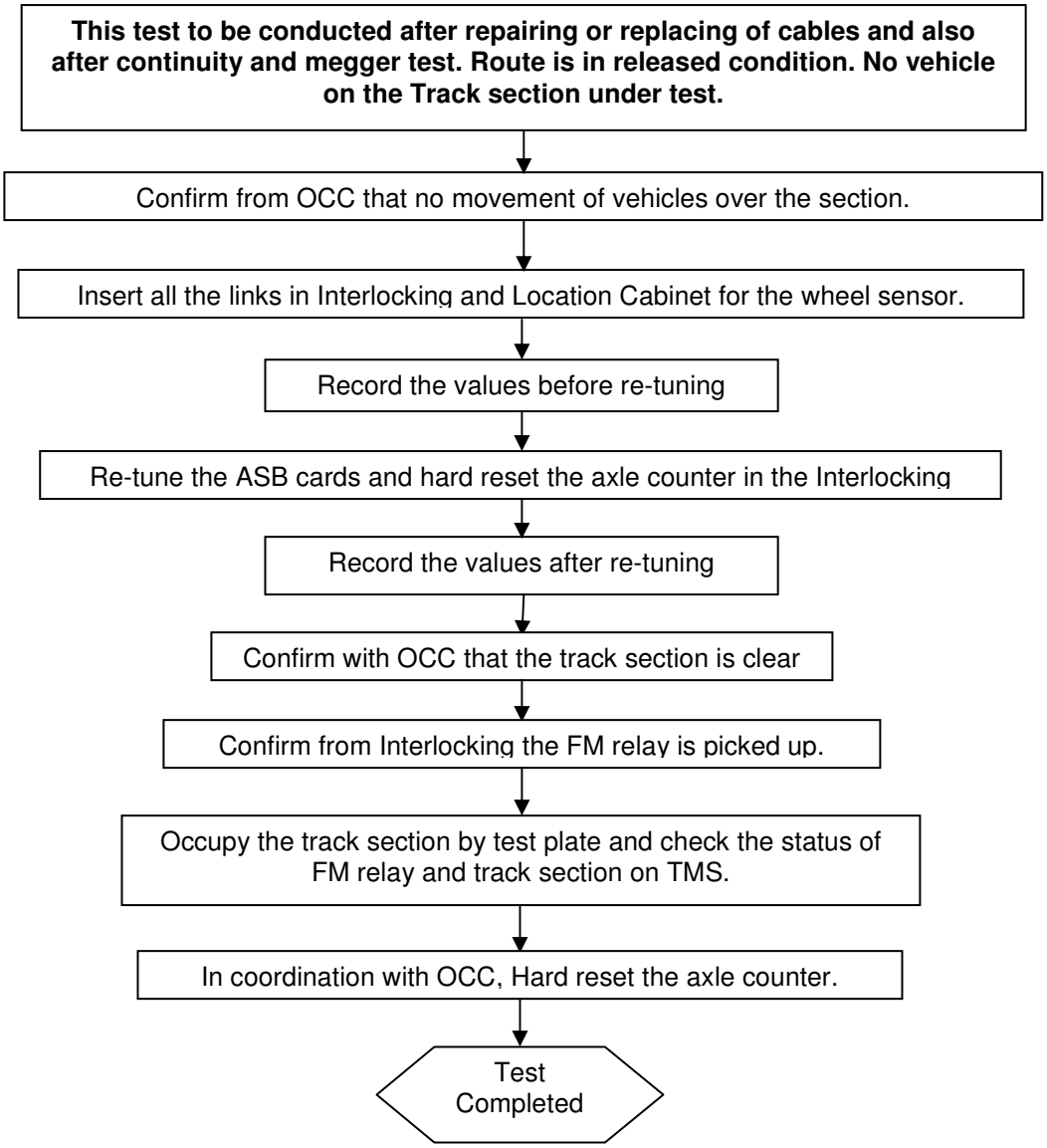
7.7 Correspondence Test – Point Machine



7.7 Correspondence Test – Point Machine (continued)

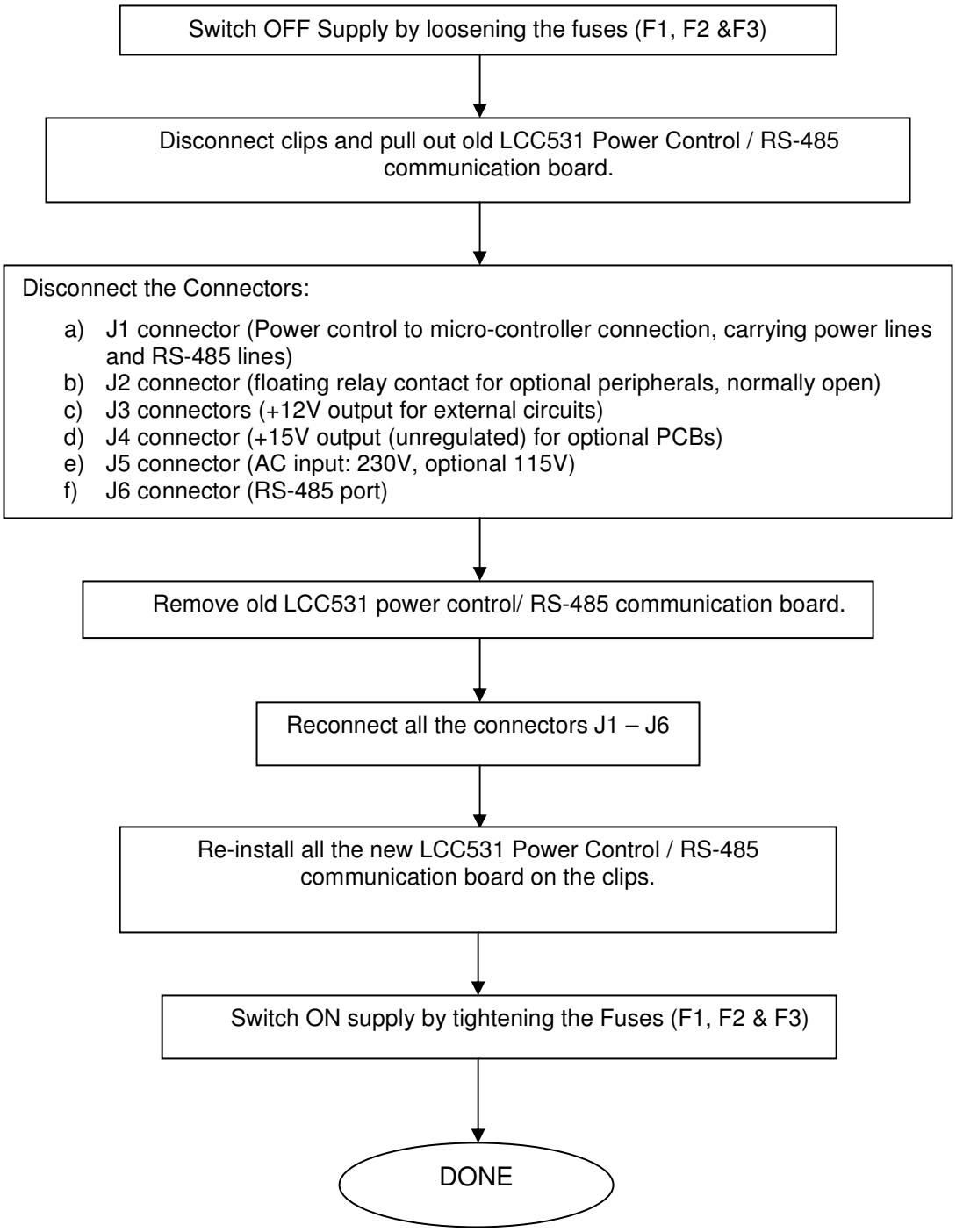


7.8 Correspondence Test – Wheel Sensor

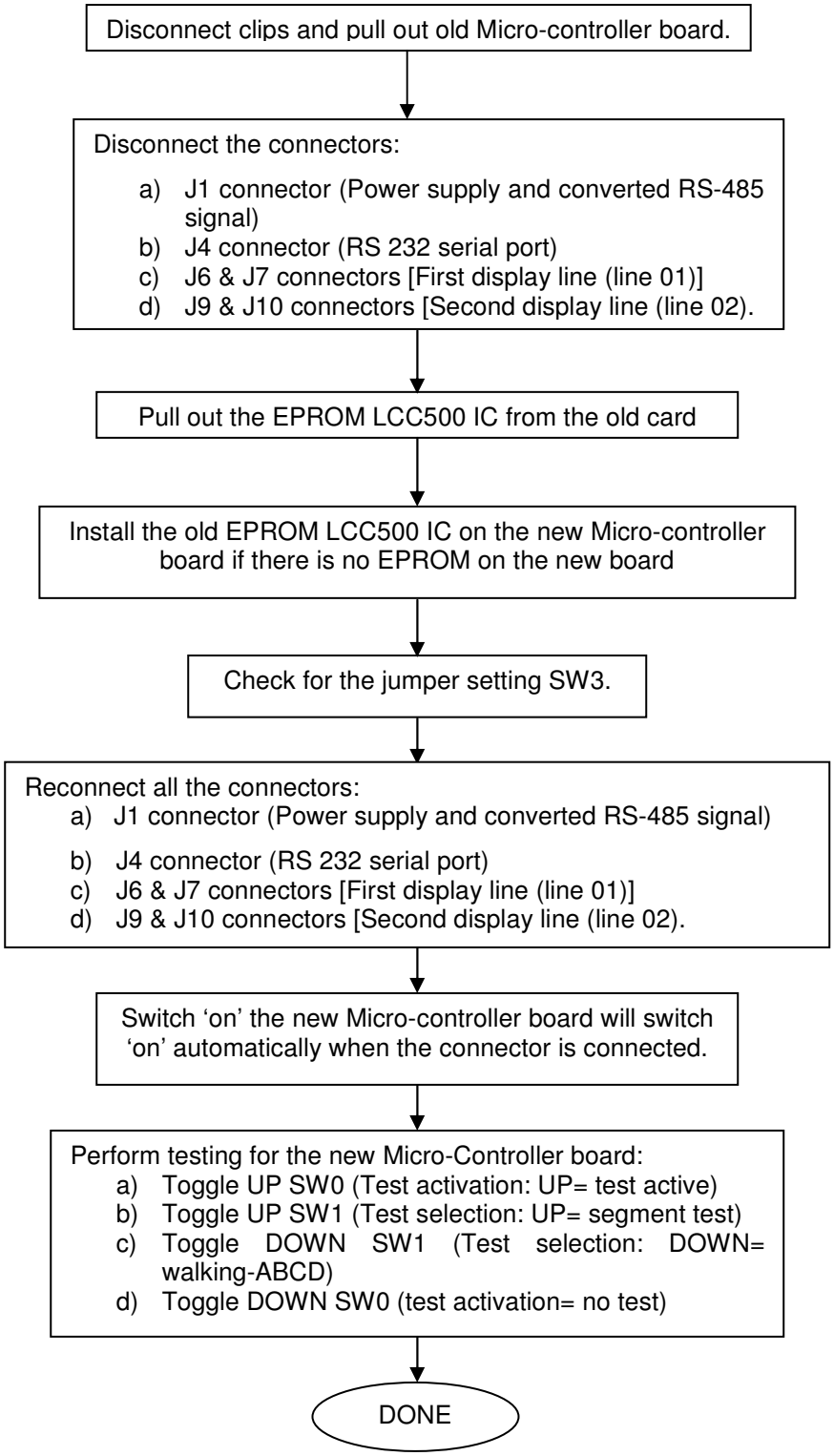


8 PIDS Maintenance Technical Instruction For SAF Model and Industronic Model.

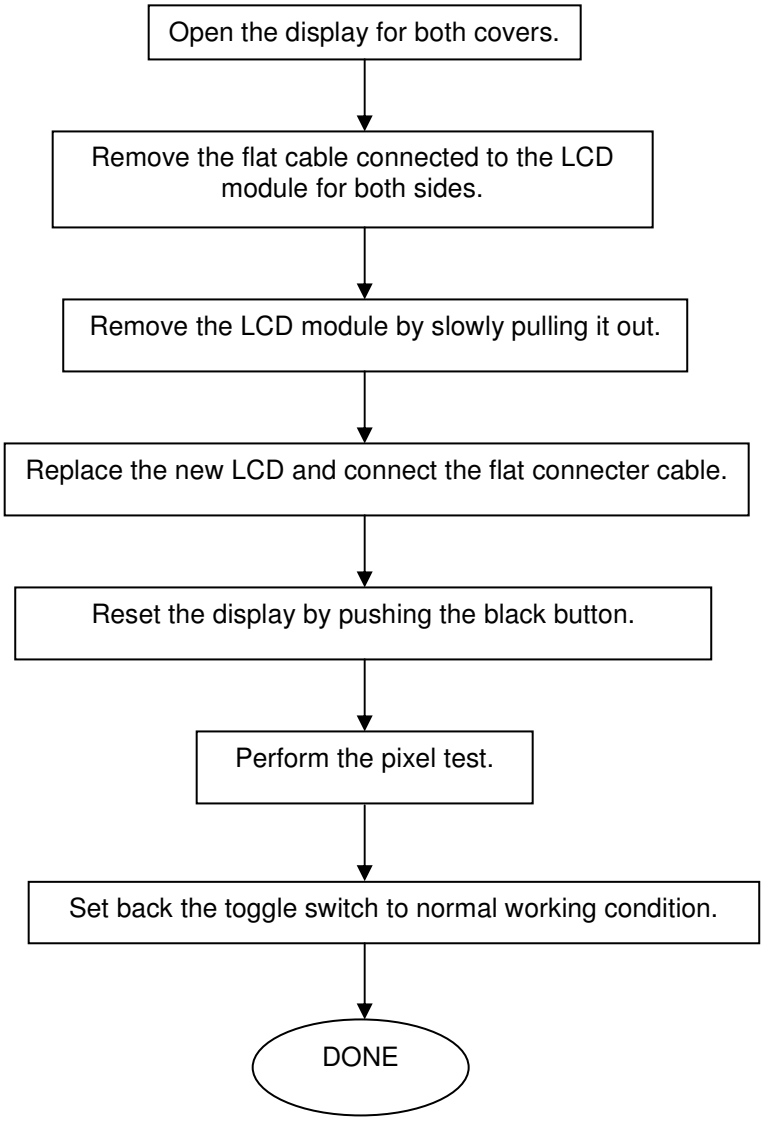
8.1 To Replace LCC531 Power Control / RS-485 Communication Board (SAF)



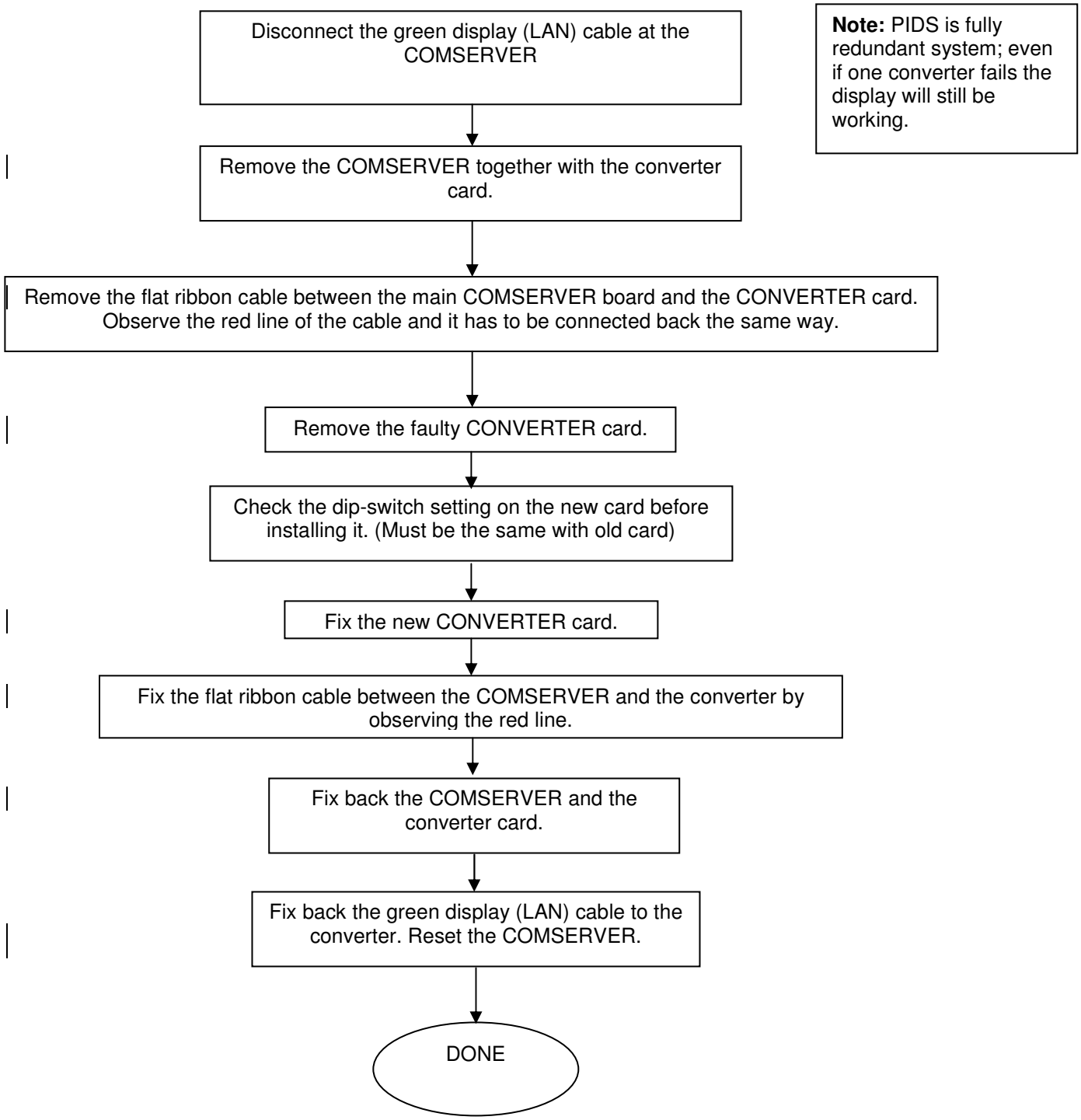
8.2 To Replace LCC500 Micro – Controller Board



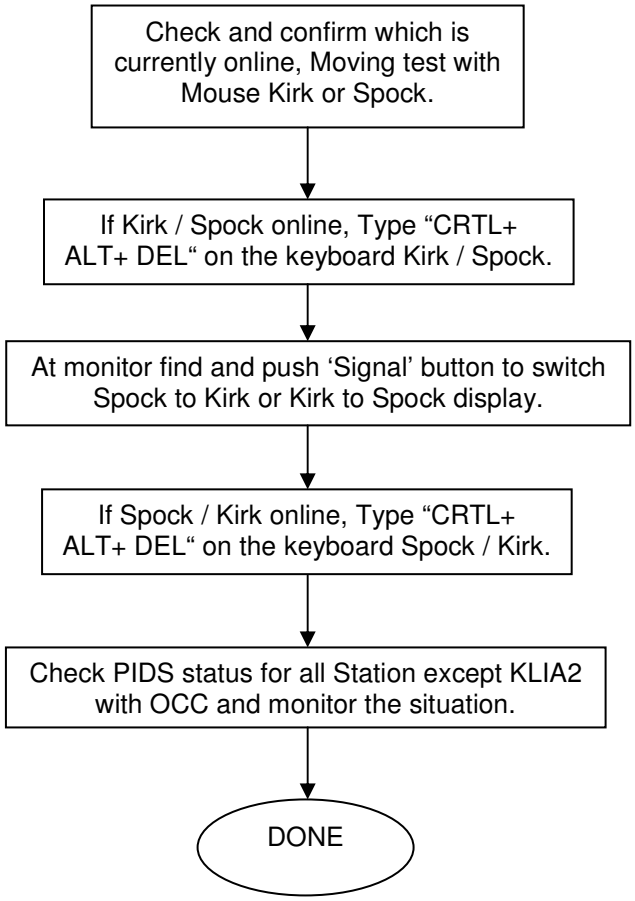
8.3 To Change LCD Module (SAF)



8.4 To Change Converter Card (SAF)



8.5 Process for Soft Reset FIA PIDS Software (SAF)



Note:

Soft-reset only can be done at Depot Interlocking and after approval from Supervisor or Superior and OCC.

8.6 To Change Power Supply Unit (PSU) for PIDS Display (Industronic Model).

Check and confirm PIDS Display Model and bring the correct PSU to the Display.

Power OFF the display and disconnect it from the mains supply.

Unlock the latches and open the chassis to access the unit.

Loosen the screw nuts at the PSU 'L' bracket then remove all cables connected to the PSU

Replace the faulty PSU with a new PSU

Tighten the screw nuts back to the 'L' bracket

Reconnect all cables

Check the connection are correct, ensure no reverse polarity

Replacement of PSU is complete.

Reconnect the display to the mains power

DONE

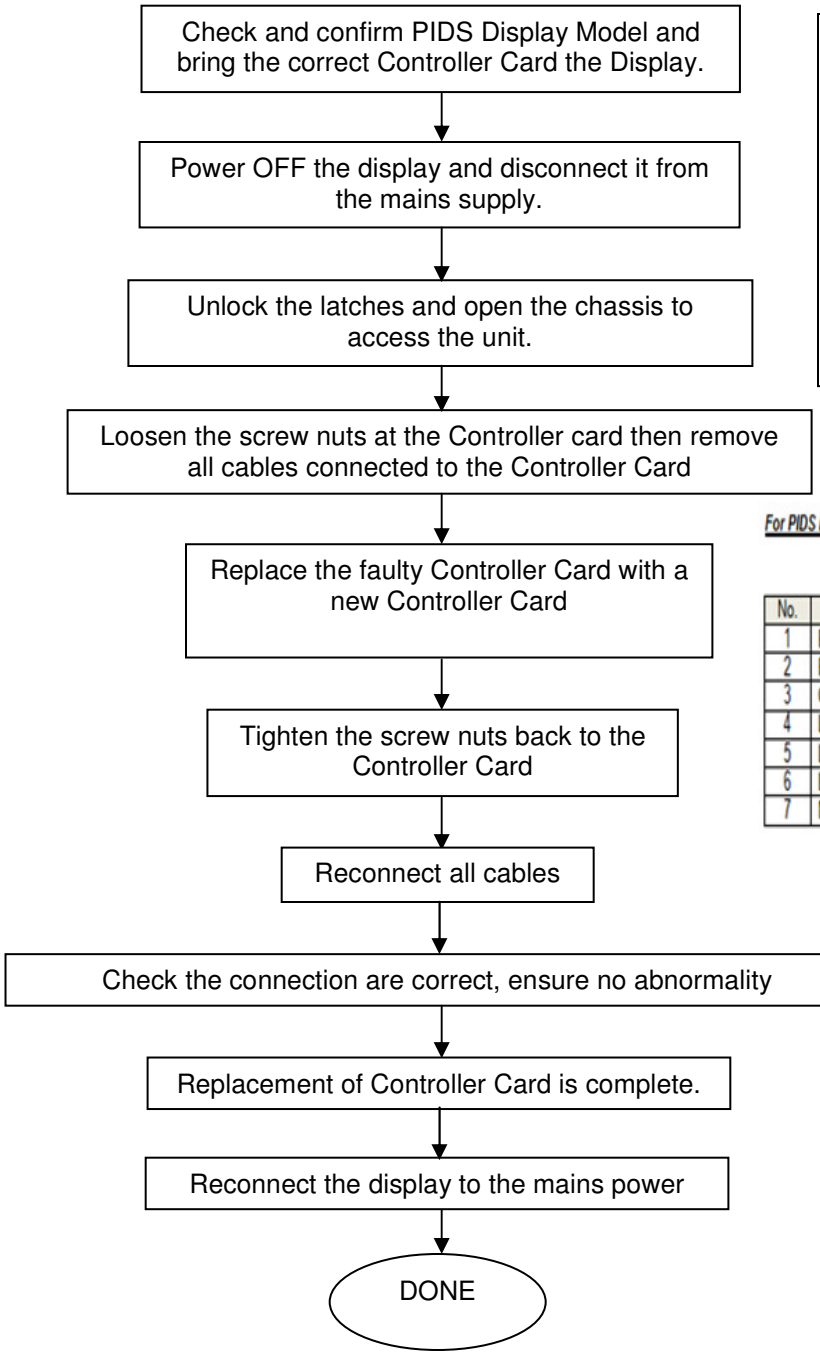
Note:
Tools Required:
- Philip Screwdriver
- M3 Screw nut Driver
- M43 Screw nut Driver

PIDS Display Type:
- Type A: Only at KLIA2
- Type B: Only at KLIA
- Type C: KLIA & KLIA2
- Type D: Only at KLIA2

For PIDS Displays (Type A, B, C)

No.	Component	Part Name & Model
1	Power Supply Unit (PSU) for Type A	Meanwell, S-320-5
2	Power Supply Unit (PSU) for Type B & C	Meanwell, NES-150-5
3	Controller Card	EBCTR4C.pcb
4	LED Display Card for Type A	S16812B
5	LED Display Card for Type B	S32087A.PCB & S48087A.PCB
6	LED Display Card for Type C	S32087A.PCB & S48087A.PCB
7	Network Interface Card	Moxa NE4110s

8.7 To Change Controller Card for PIDS Display (Industronic Model).



Tools Required:

- Philip Screwdriver
- M3 Screw nut Driver
- M43 Screw nut Driver

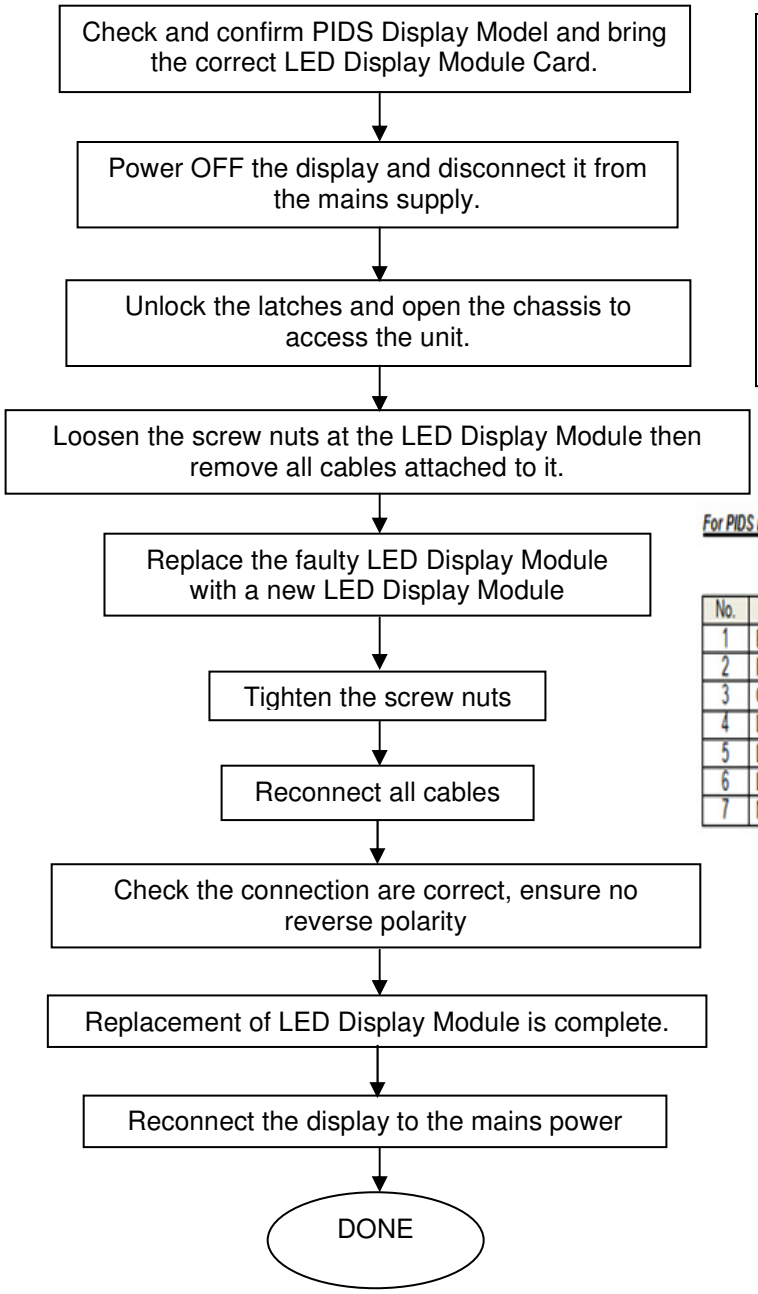
PIDS Display Type:

- Type A: Only at KLIA2
- Type B: Only at KLIA
- Type C: KLIA & KLIA2
- Type D: Only at KLIA2

For PIDS Displays (Type A, B, C)

No.	Component	Part Name & Model
1	Power Supply Unit (PSU) for Type A	Meanwell, S-320-5
2	Power Supply Unit (PSU) for Type B & C	Meanwell, NES-150-5
3	Controller Card	EBCTR4C.pcb
4	LED Display Card for Type A	S16812B
5	LED Display Card for Type B	S32087A.PCB & S48087A.PCB
6	LED Display Card for Type C	S32087A.PCB & S48087A.PCB
7	Network Interface Card	Moxa NE4110s

8.8 LED Module Display Card Replacement (Industronic Model).



Tools Required:

- Philip Screwdriver
- M3 Screw nut Driver
- M43 Screw nut Driver

PIDS Display Type:

- Type A: Only at KLIA2
- Type B: Only at KLIA
- Type C: KLIA & KLIA2
- Type D: Only at KLIA2

For PIDS Displays (Type A, B, C)

No.	Component	Part Name & Model
1	Power Supply Unit (PSU) for Type A	Meanwell, S-320-5
2	Power Supply Unit (PSU) for Type B & C	Meanwell, NES-150-5
3	Controller Card	EBCTR4C.pcb
4	LED Display Card for Type A	S16812B
5	LED Display Card for Type B	S32087A.PCB & S48087A.PCB
6	LED Display Card for Type C	S32087A.PCB & S48087A.PCB
7	Network Interface Card	Moxa NE4110s

9 TMS Maintenance Technical Instruction

9.1 Functions of Abbreviation in the Timetable Planning

D- Availability stop
Causes the next set point to not setting automatically. As the train approaches, 'Operate signals' request will be activated.

H- Absolute stop
Same as D, except without an 'Operate Signals' request.

A (K)- Waiting for connection
Next set point is not set until the reference train has reached the programmed place and the connection time programmed in the system has elapsed.

B (K)- Waiting for delay
The next set point is not set until the reference train has reached the programmed place.

T (K)- Departure time
The next set point is not set until the departure time is reached.

S- Setting-back train
Drive train in the opposite direction with the same train number.

W- Push and Pull train
Travels in the opposite direction with a new train number.

N- New train number during stop
The new train number can be changed during a stop,

M- New train number on a moving train
Train number is changed when the train passes the station.

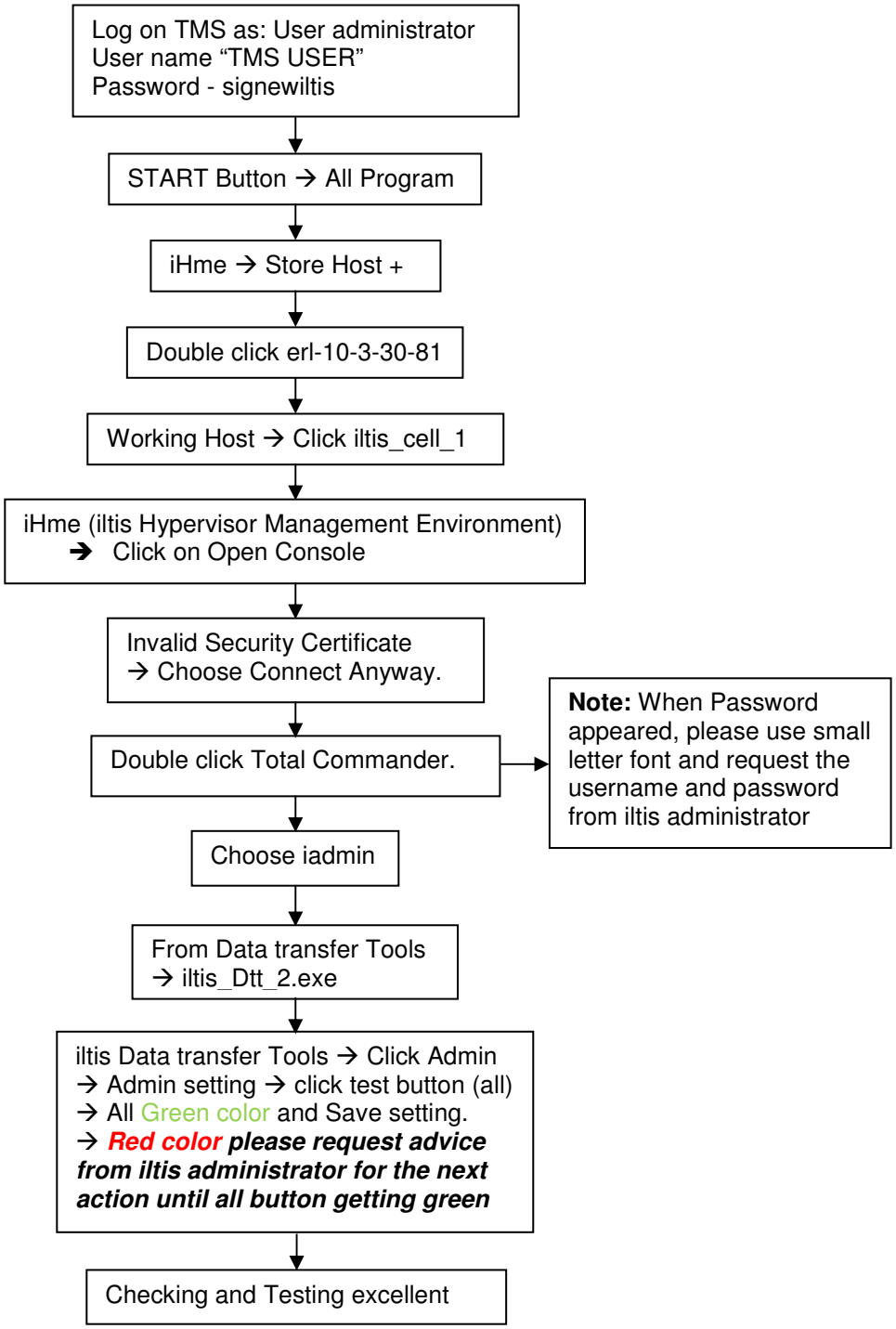
Z- Stop at the block signal
If a train has to stop at a block signal lying along the routes, a Z is programmed. Without a Z, the corresponding track is used as a diversion point for trains passing through.

F- Train number stepping
This function is used to step a train number to any routing track.

X- Interruption in the route
Set at the place where the train left the train guidance zone. The routing track where the train re-enters the train guidance zone is programmed as the next routing track.

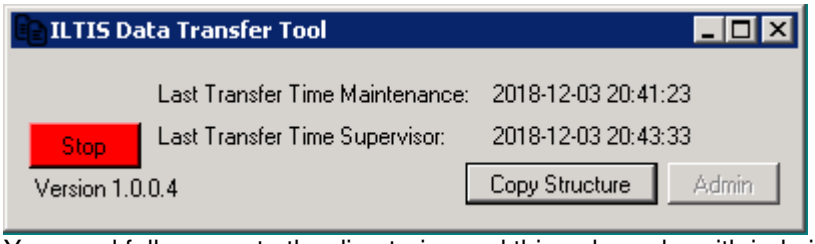
V- Delayed start
The driving position for a signal may be delayed in order to put back the start of barrier procedure in case of trains that stop or in order to prevent the premature blocking of the other routes.

9.2 Checking and Testing Data Transfer Tools on CST 70 and CST 71.

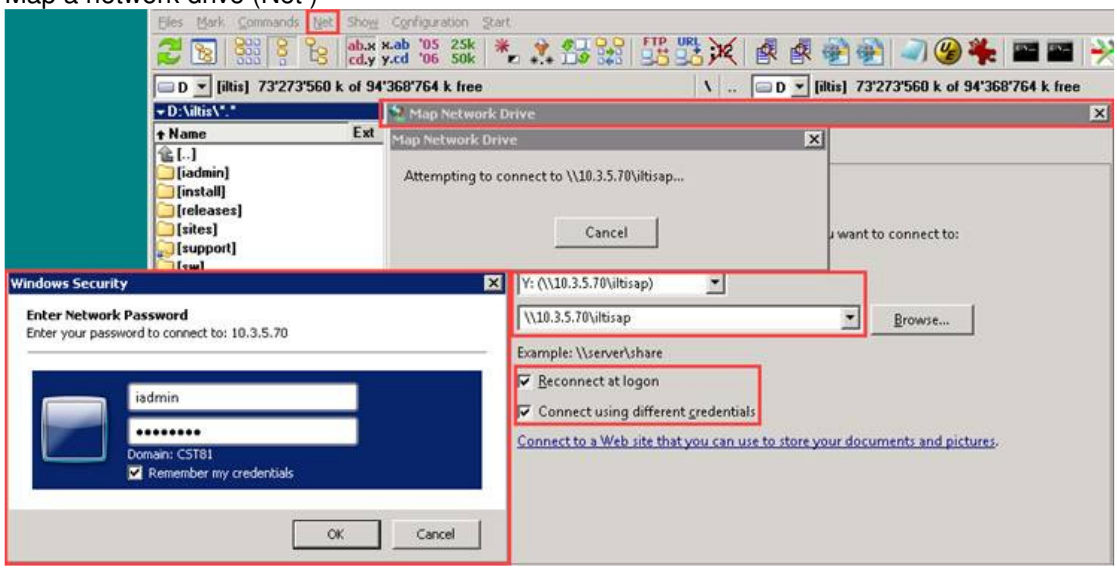


9.3 TSP task fail to export to File exchange server.

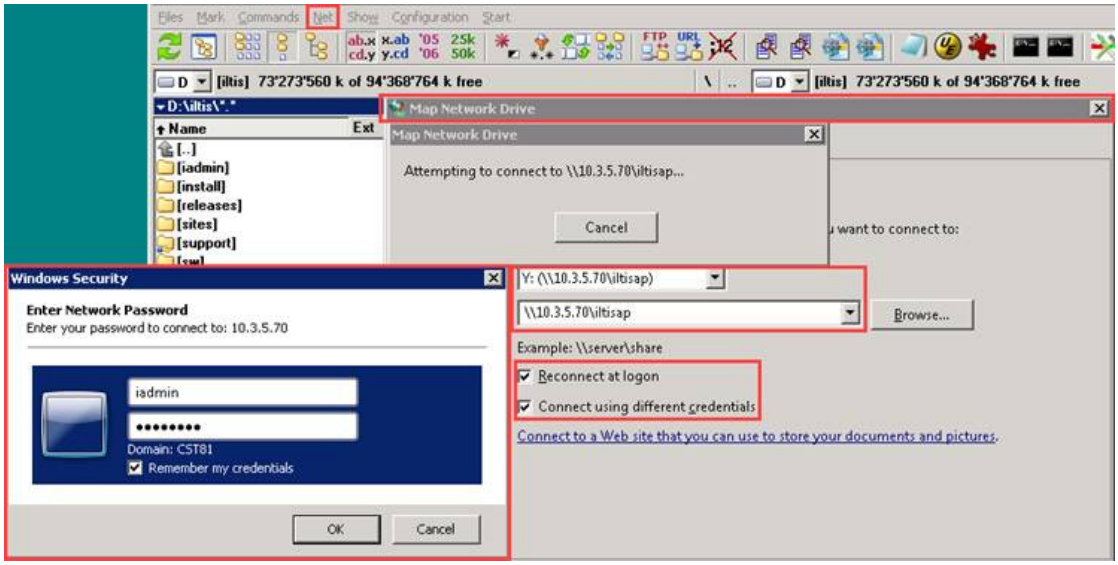
1. If the tool no longer works, error messages are displayed on the user interface. These messages are not always written to the log file.
2. The lines “Last Transfer time <computer>” show the last transfers. This is useful for tests. If a file is changed on the computer with the monitored directory, e.g. new file name, the display should refresh.



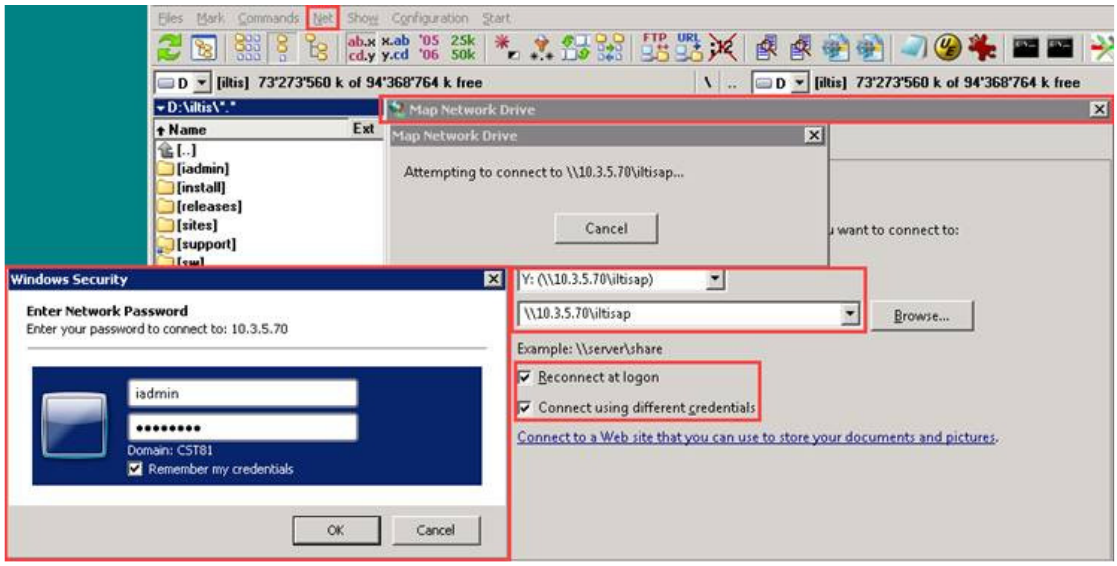
3. You need full access to the directories and this only works with iadmin <password>.
   Best practice for configuring this:
   1. Login as support and Password as xxxxxxx
   2. Open Total Commander →(Right click to run as administrator)
   3. Map a network drive (Net)



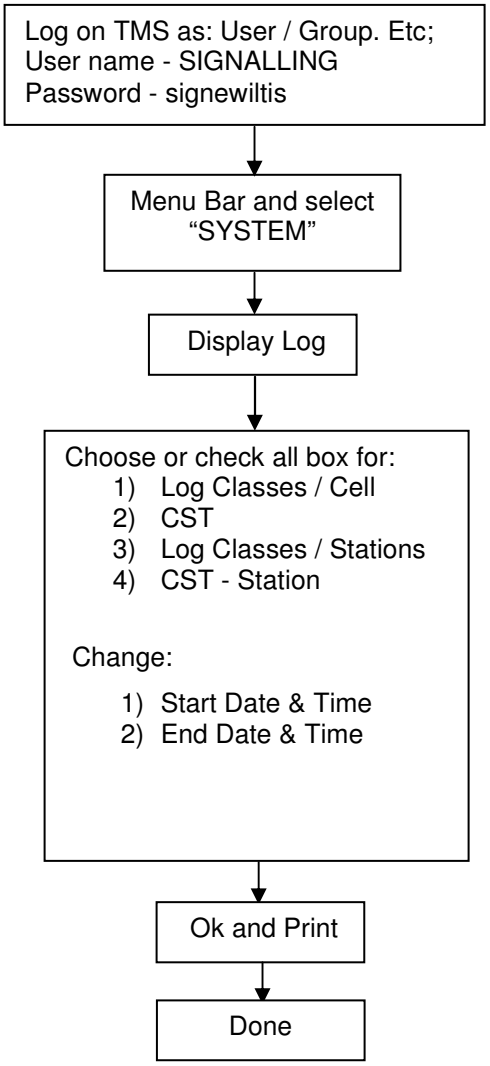
   4. Choose any drive letter and key in the path of the remote (both WorkStation)
      - X: \\10.3.5.70\iltisap → Maintenance Workstation
      - Y: \\10.3.24.71\iltisap → OCS Workstation
   5. Click reconnect at logon and connect using different credentials
   6. Enter network password; use iadmin <password>, this step must be done by SYS-SIG TMS Administrator staff.



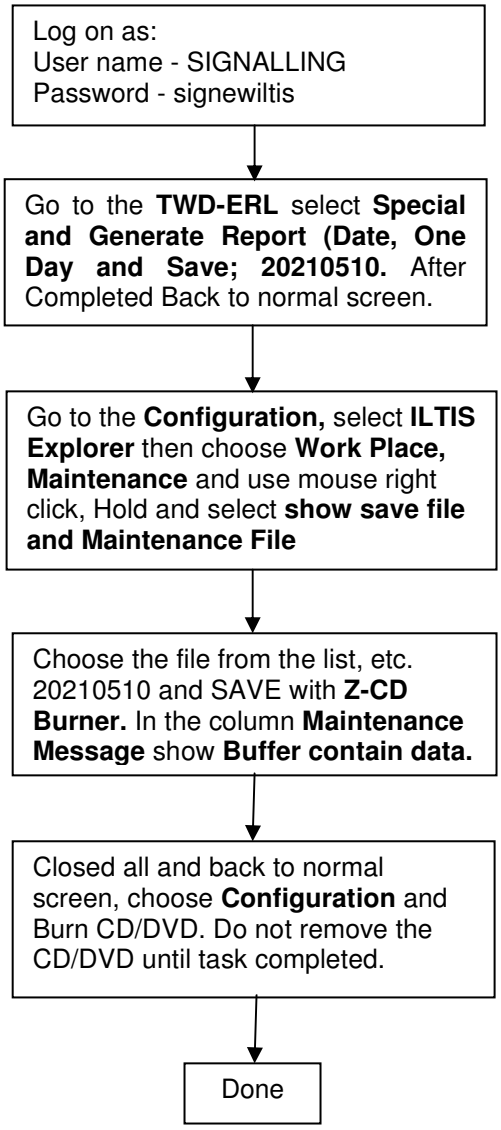
7. Logon File Exchange Server (NMS)
    - Login as Iltisexport and enter password SigILTIS2017
    - Double click FILE and choose Data Export.
    - Choose File Maintenance and check all folder and file.
    - Log out.



9.4 Key in the TMS username and download the log File



9.5 Perform Task TSP using CD/DVD Rom at ILTIS workstation



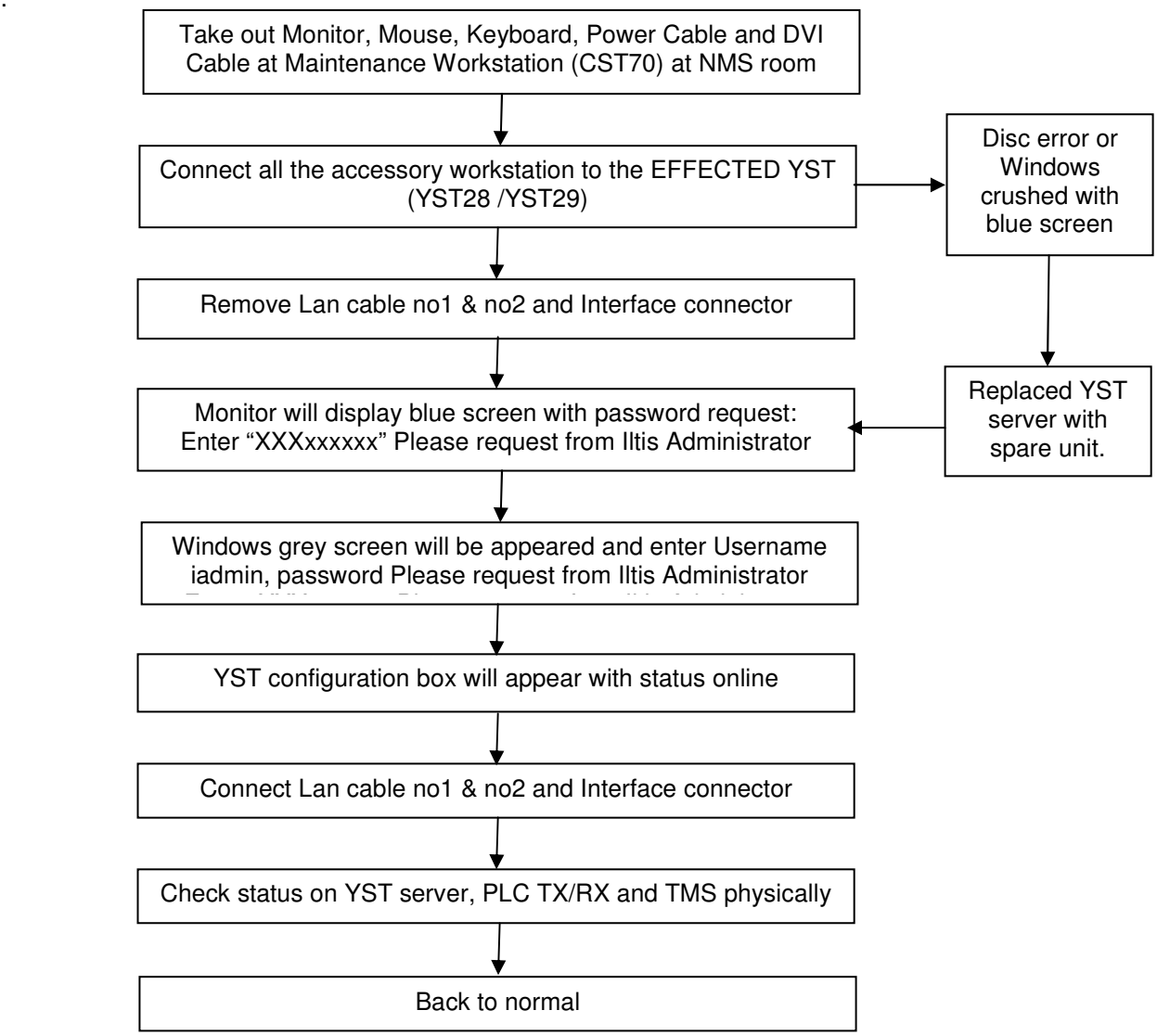
9.6 Restoration of YST 28 or YST 29 or both goes down.

WARNING:

WHEN POWER FAILURE OCCURRED AND ANY YST OR BOTH YST SERVER GOES DOWN, PLEASE DO NOT SWITCH OFF OR ON MANUALLY AT YST SERVER.

IMPACT FOR DOING WRONG ACTION WILL COST YST HDD SERVER MAYBE CORRUPTED AND CRUSHED.

Refer below for the action need to be done.



10 Operating Instruction For UPS (Uninterruptable Power Supply).

10.1 UPS Maintenance START - UP Procedure

WARNING: 'A WRONG PROCEDURE COULD DISCONNECT THE LOAD'

UPS IN MAINTENANCE BY-PASS operation, with service switches Q1 and Q4 OFF, and Q2 ON and battery F8-F9 OFF.

- LCD will display "LOAD OFF".
- LED 2, 8, 9 & Service check, Alarm & Light "ON".
- LED 1, 3, 4a, 4b, 5, 6, 7 & Battery level Indicator "OFF".

STEP – 1 **TURN SWITCH "Q4" TO "ON" POSITION.**

- LCD will display "LOAD OFF".
- LED 3 Flashing.
- LED 1, 2, 8, 9 & Service check "ON".
- LED 4a, 4b, 5, 6 & 7 "OFF".
- Alarm & Light "ON".
- After 30 to 40 Second LED 3 Steady &
- Green LED beside Battery Fuse Lights up.

STEP – 2 **PUSH IN "ON" THE BATTERY FUSE 8 & 9.**

- LED 4b & Battery level Indicator "ON".
- Alarm & Light "OFF".

STEP – 3 **"Q1" SWITCH "ON" POSITION.**

- LCD will display "LOAD ON BY-PASS".
- LED 1, 2, 3, 4b, 7, 8, 9 "ON".
- LED 4a, 5, 6 "OFF" & Service check "OFF".

STEP – 4 **"Q2" SWITCH "OFF" POSITION.**

- LED 1, 2, 3, 4b, 7 & 8 "ON".
- LED 4a, 5, 6 & 9 "OFF".

STEP – 5 **PRESS** **I** **KEY once**

- LED 1, 2, 3, 4b & 8 "ON".
- LED 5 Start Flashing for 5 Seconds then Steady.
- LED 6 will "ON" after 20 Seconds.
- LED 4a, 7 & 9 "OFF".
- LCD will display "LOAD ON INVERTER".

10.2 UPS Maintenance BY – PASS Procedure

WARNING: 'A WRONG PROCEDURE COULD DISCONNECT THE LOAD'

UPS IN NORMAL operation, with service switches Q1 and Q4 ON, and Q2 OFF, battery F8-F9 ON and Load On Inverter.

- LCD will display "LOAD ON INVERTER".
- LED 1, 2, 3, 4B, 5, 6 & 8 "ON".
- LED 4a, 7 & 8 "OFF".

STEP – 1 **PRESS 0 KEY once, Then press again (within 5 Seconds)**

- LED 5, 4a, 6 & 9 "OFF".
- LCD will display "LOAD ON BY-PASS".
- LED 1, 2, 3, 4b, 7 & 8 "ON".

STEP – 2 **"Q2" SWITCH "ON" POSITION.**

- LED 1, 2, 3, 4b 7, 8 & 9 "ON".
- LED 4a, 5 & 6 "OFF".

STEP – 3 **"Q1" SWITCH "OFF" POSITION.**

- LED 1, 2, 3, 4b 7, 8, 9 & Service Check "ON".
- LED 4a,5 & 6 "OFF".

STEP – 4 **PRESS "LOAD OFF" PUSH BUTTON by lifting red cover.**

- LCD will display "LOAD OFF".
- LED 1, 2, 3, 4b, 8, 9 & Service check "ON".
- LED 4a, 5, 6 & 7 "OFF".

STEP – 5 **TURN SWITCH "Q4" TO "OFF" POSITION.**

- LCD will display "LOAD OFF".
- LED 2, 4a, 8, 9 & Service check "ON".
- LED 1, 3, 4b, 5, 6 & 7 "OFF".
- Alarm & Light "ON".

STEP – 6 **BATTERY FUSE 8 & 9 "OUT".**

- LCD will display "LOAD OFF".
- LED 2, 8, 9 & Service check, Alarm & Light "ON".
- LED 1, 3, 4a, 4b, 5, 6, 7 & Battery Level Indicator "OFF".

Press "mute" button to acknowledge Alarm.