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Issue:	4
Date:	06/09/2014
Compliance date:	07/03/2015

Level 2

Check Marking and Recording on Test Copies

Endorsement and Authorisation

For endorsement and authorisation, please refer to NR/L2/SIG/30014

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Issue record

Issue	Date	Comments
1	Dec 09	Initial Issue, partially supercedes NR/GN/SIG/11722, and supercedes NR/GN/SIG/11723
2	Mar 11	Content of NR/GN/SIG/11723 included and NR/GN/SIG/11723 withdrawn.
3	Jun 12	§4.1 amended. The following figures have been amended: A3, B4, B5, B6, B7, B9, B10, B13, B14, B15, F1, F2, F3, F4, F5, F6, F7, G1, G2, G3, G4, G5, H3, K1 and K2.
4	Sep 14	Appendix J detail added. New Appendix M and Figures M1, M2, M3, M4 M5 and M6 for G110 testing associated with track renewals work using SMTH Test Plan procedures.

Compliance

This Network Rail standard is mandatory and shall be complied with by Network Rail and its contractors if applicable from 7 March 2015.

When this standard is implemented, it is permissible for all projects that have formally completed GRIP Stage 4 to continue to comply with the Issue of any relevant Network Rail Standards current when GRIP Stage 4 was reached and not to comply with requirements contained herein, unless the designated Standard Owner has stipulated otherwise in the accompanying Briefing Note.

Reference documentation

NR/L2/SIG/30014	Signalling Works Testing Handbook
NR/L2/SIG/30014/A110	Signalling Works Testing
NR/L2/SIG/30014/C410	Error Reporting
NR/L2/SIG/30014/E110	Signalling Works Testing Glossary

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1 Purpose

This document is part of the suite of documents contained within the Signalling Works Testing Handbook, NR/L2/SIG/30014, which together detail the requirements for signalling works testing activities.

This Level 2 document sets out the requirements for Check Marking and Recording on Test Copies to be used during signalling works testing.

2 Scope

This Level 2 standard applies to all projects to alter Network Rail's infrastructure, or with the potential to affect the fitness for purpose of the Network Rail Infrastructure. It is mandatory for all work with signalling content which requires testing to NR/L2/SIG/30014.

3 Flowchart

None

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4 Procedure

4.1 Check Marking and Recording on Test Copies

This standard provides a system for testing Check Marking and Recording that shall confirm a consistent presentation of records of testing activities performed during signalling works testing.

Throughout this standard where a SINGLE 'forward' tick (✓) is used, it is acceptable to use a 'reverse' tick (↘). However, in ALL cases where BOTH forward AND reverse ticks are used to signify specific meanings then the convention of forward and reverse ticks in this standard SHALL be followed.

The Check Marks for circuits detailed in the appendices are in general shown for a location but would be used in a similar manner if the work was within an equipment room.

Individual tests shall be recorded on the *Test Copy* using the Check Marks detailed in the Appendices of this standard. Where a need arises for a Check Mark that is not detailed in this standard, a novel Check Mark may be created but an explanation of the meaning shall be given either in the Test Plan or on the individual *Test Copy* being used.

The primary auditable document for recording tests is the *Test Copy*. As the testing progresses the tester shall add Check Marks to the *Test Copy* ONLY after an activity has been completed i.e. the presence of a Check Mark indicates the correctness of the inspection or test.

Because the *Test Copy* is the primary auditable document for the recording of testing; then once testing has commenced and Check Marks have been placed on a particular sheet of the *Test Copy*, if a new version of that sheet is issued, the Check Marks on the previously issued sheet shall NOT be "transferred" onto the new sheet. Further testing shall continue using the new sheet and Check Marks placed on that sheet. Both sheets shall be kept together to fully record the testing that has been carried out.

Often as part of the verification testing it is required to record other information (e.g. equipment serial numbers) then this information should be placed either on the applicable sheet of drawings or on a separate form if provided.

A discrepancy or failed test shall be recorded using a *Test Log* in accordance with NR/L2/SIG/30014/C410.

Where there is a discrepancy or a failed test or some other reason why the appropriate Check Mark cannot be added, an explanation shall be noted on the particular sheet of the *Test Copy*. If the reason has caused a Test Log to be raised, then "**TL….**" should be added alongside the explanation and, if feasible, when the Test Log number is known it should be added.

Each tester shall apply their Check Marks using a colour that does not already appear on *Test Copy*.

Each tester shall record their identity, and certify that they are responsible for the testing confirmed as complete by the application of their Check Marks, by use of their Tester Identifier and date on the *Test Copy*.

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Pre-commissioning Testing

For each sheet of the *Test Copy*, when all the testing prior to any changeover for commissioning is complete, the tester shall put "**PC**" [**P**re-commissioning testing **C**omplete] near the page number (in their colour) to signify that they have checked the sheet and confirm that all testing prior to the changeover and commissioning has been completed.

If all the testing can be completed on a particular sheet of the *Test Copy* during the pre-commissioning and there is no further testing required at the changeover and commissioning time, then "**CC**" may be placed near the page number (in the testers colour) to signify that they have checked the sheet and confirm that all the testing that is required has been completed.

Commissioning Testing

For each sheet of the *Test Copy*, when the changeover and subsequent testing has been completed, the tester shall put "**CC**" [**C**ommissioning changeover and testing **C**omplete] near the page number (in their colour) to signify that they have checked the sheet and confirm that all the changeover and testing that is required at the commissioning has been completed.

Wiring Recovery Check Marks

For alteration work, wiring that is to be recovered may be check marked in various ways according to whether a wire has been able to be positively identified or not and whether that wire is to be removed, temporarily insulated or permanently insulated.

The Check Marks used are detailed below and have the following meaning:

REM – where a wire is to be removed at the changeover and during preparation testing it is positively identified (by hand tracing) the wire is marked on the *Test Copy* with REM.

TBC – where a wire is to be removed at the changeover and during preparation testing it is not possible to positively identify it, the wire is marked on the *Test Copy* with TBC.

TMP – where it is decided that a wire is to be temporarily made safe and removed at a later time, each end of the wire is marked on the *Test Copy* with TMP.

INS – where it is decided that a wire is to be permanently insulated, each end of the wire is marked on the *Test Copy* with INS.

Wiring Recovery Check Mark Ticking

The above mentioned check marks, when ticked, have the following meaning:

REM – the wire has been removed.

TBC – the wire has been disconnected at both ends and has been continuity tested.

TMP – the wire has been made safe at that end.

INS – the wire has been permanently insulated at that end.

The above explanations should be read in conjunction with Figures B13 (a, b & c) and B15 (a, b & c).

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4.2 Test Certificate completion by review

As detailed in NR/L2/SIG/30014/D110 section 4.6, where a Test Certificate entry has not been completed by the tester, but there is evidence from a detailed review of the Check Marks on the Test Copies, then the Tester in Charge (or other suitably qualified tester) may complete the Test Certificate as normal, with “Check Mark Review” or **CMR** added alongside their entry.

5 Abbreviations and Definitions

5.1 Abbreviations

There are no particular abbreviations.

5.2 Definitions

Refer to NR/L2/SIG/30014/E110.

There are no particular definitions.

6 Appendices

Throughout the following appendices; **PURPLE** is used for the Check Marks associated with the described test and **ORANGE** is used to show previous testing. The colour **TURQUOISE,** is used where it is necessary to show subsequent testing.

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6.1 Appendix A – Check Marks associated with Inspection

The Figures below describe the Check Marks, and their meaning, to be used when carrying out *Inspection* depending on the work content (all new work or altered work).

Figure A1 details the Check Marks associated with the *Inspection* of a location layout (profile), equipment type (specification) and labelling for new work. Present design shows this information of all items of equipment in tabular form. Consequently the Check Marks should be placed on the table confirming the correct position, type and labelling for all equipment.

The “layout” drawing need only be used to show alterations to the dimensions and relative positions of the equipment.

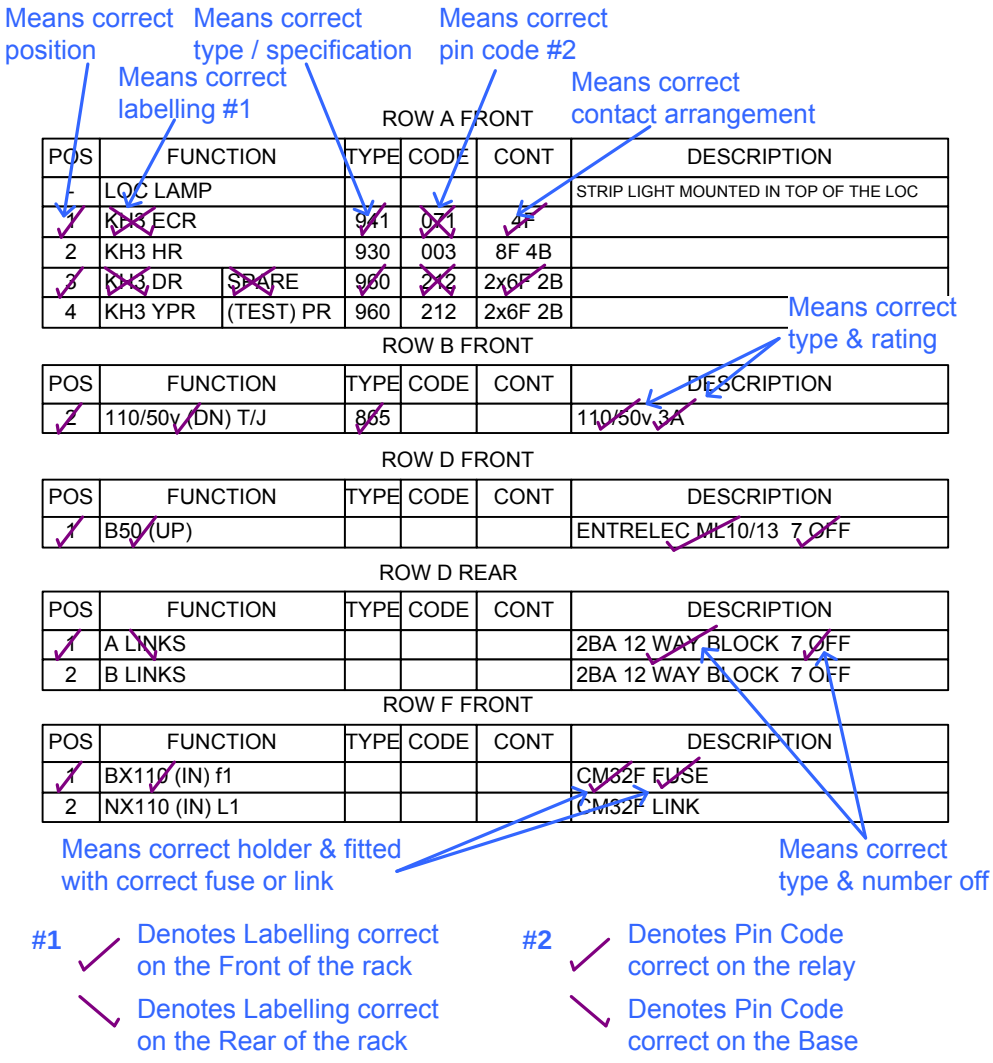

Figure A1 – Inspection for Location Equipment [New Work]

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Figure A2 details how the “layout” may be used to show alterations to the dimensions or relative positions of the equipment, again when it is new work. Additionally, where the position of an item of equipment is NOT given in the previously mentioned table, the position and type would be Check Marked on the “layout” drawing.

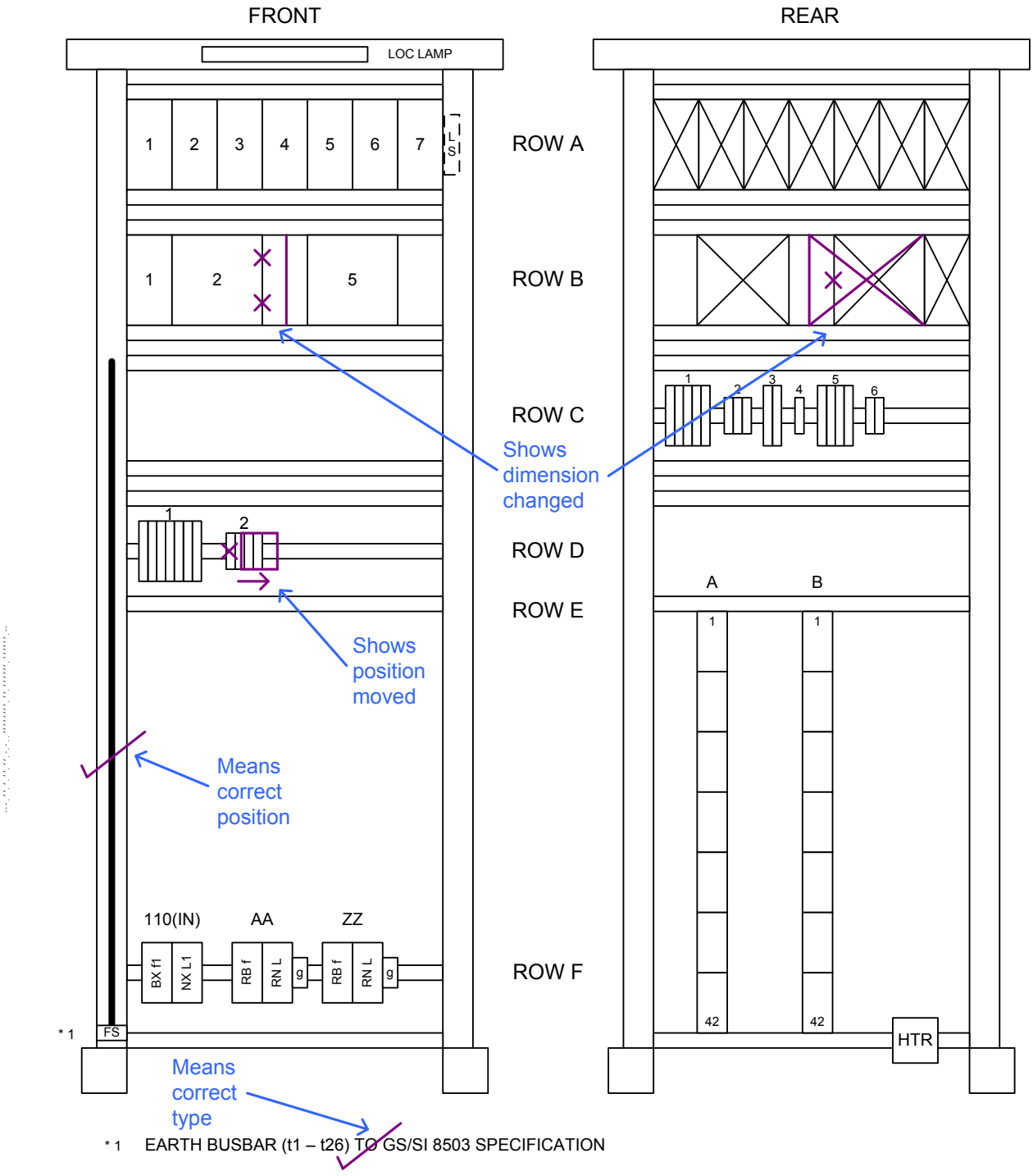

Figure A2 – Location “Layout” Alterations [New Work]

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Where the work involves alterations, the new work would be Check Marked in a similar manner to that of the All New Work, as shown previously.

Where there is equipment to be recovered these shall be marked with a “green” cross and the testers shall place their commissioning identifier on the cross when confirmed correct and mark the *Test Copy* with “REM” in the colour of their Check Marks.

Figure A3 details the Check Marks to be used for the recovered equipment.

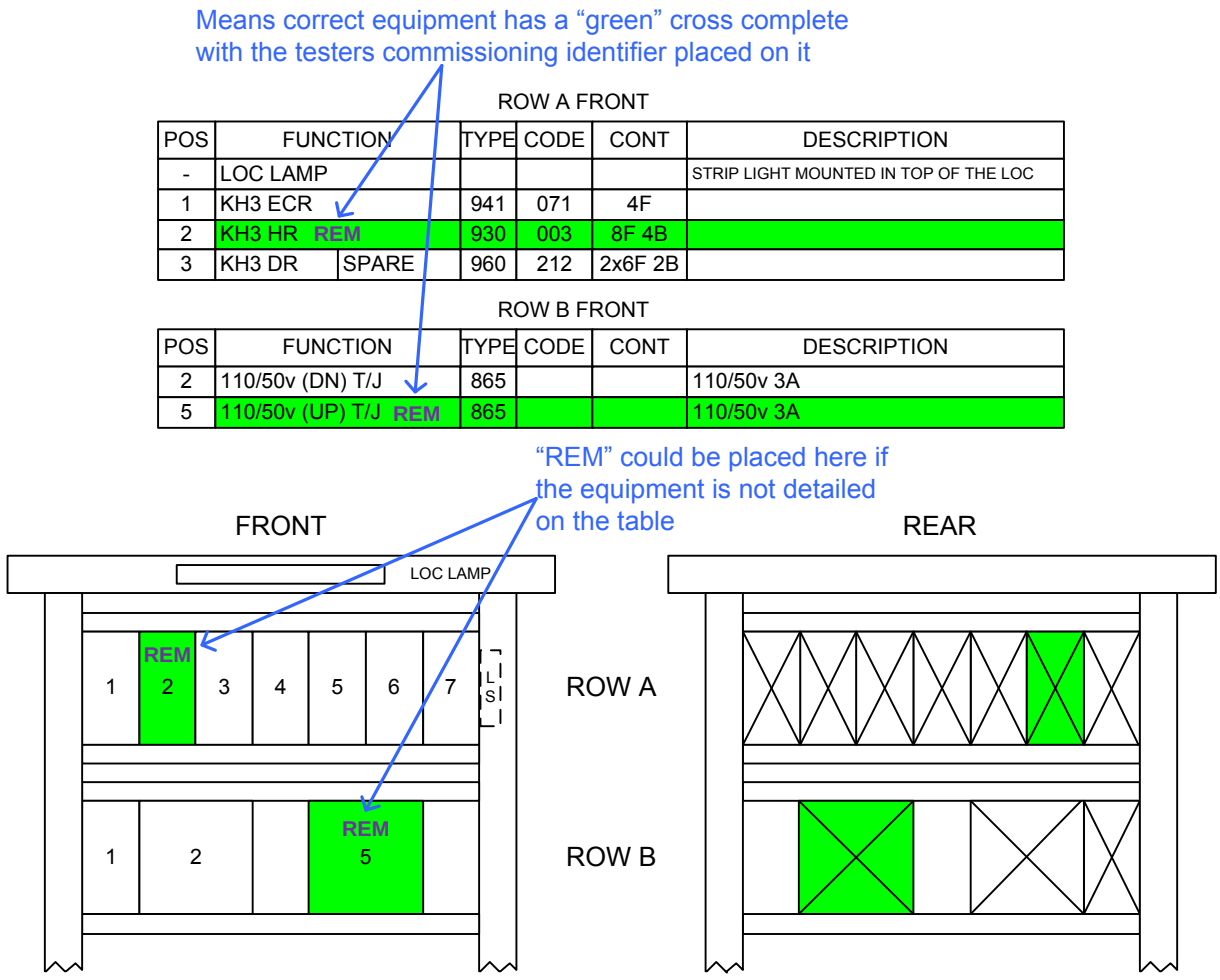

Figure A3 – Inspection for Location Equipment [Recovery]

Figures A1, A2 and A3 are shown as if the design has been produced using the Two Drawing Method. If the design has been produced using the One Drawing Method, then the content of all three Figures would be incorporated on the one drawing.

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Most trackside equipment is usually shown on the *Test Copy* of the controlling location and as such would use the above mentioned Check Marks accordingly. However Insulated Rail Joints and other track mounted equipment associated with the “4 foot” may only be shown on Bonding or Track Plans.

Figure A4 details the Check Marks associated with the *Inspection* of these on-track equipments.

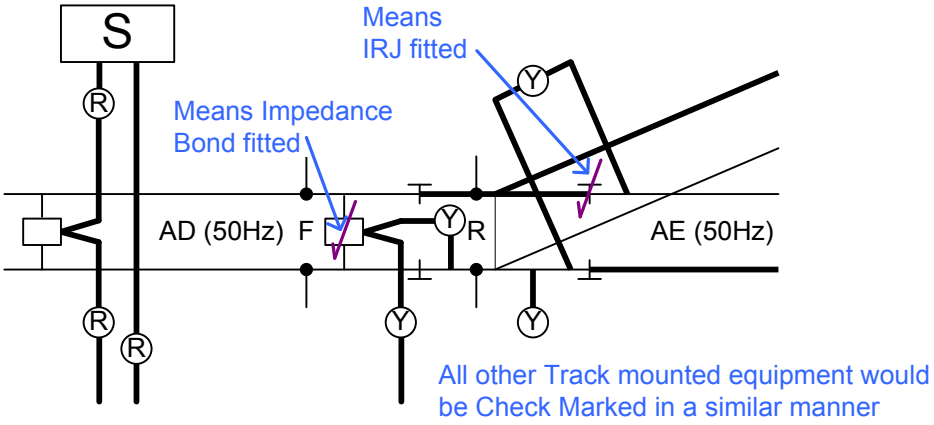

Figure A4 – Inspection for On-Track Equipment

Figure A5 details the Check Marks associated with the *Inspection* of a panel facia.

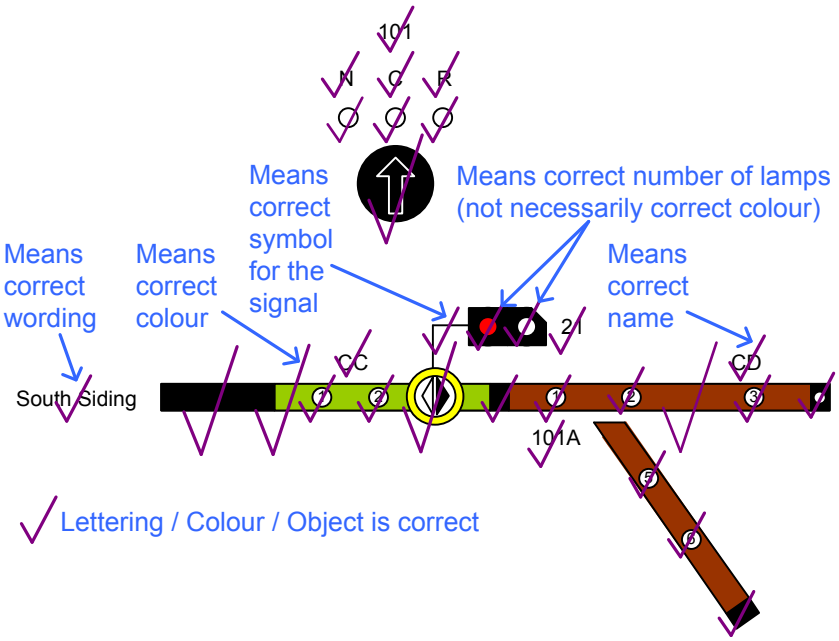

Figure A5 – Inspection of a Panel Facia

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6.2 Appendix B – Check Marks associated with Wire Counting

The Figures below describe the Check Marks, and their meaning, to be used when carrying out a *Wire Count* depending on the work content (all new work or altered work).

Three types of *Wire Count* are used as part of signalling works testing. These are:

- Analysis *Wire Count*
- Diagram *Wire Count*
- Final *Wire Count*

Analysis Wire Count is recorded on the *Test Copy* of analysis sheets for relays, fuse and terminals and cable link terminations.

Figures B1 and B2 detail the Check Marks associated with the recording of the relay contact analysis for new work.

As analysis wire counting is to confirm the presence and absence of wires, ALL contacts shall be counted even if there are no contacts available for that specific type of relay.

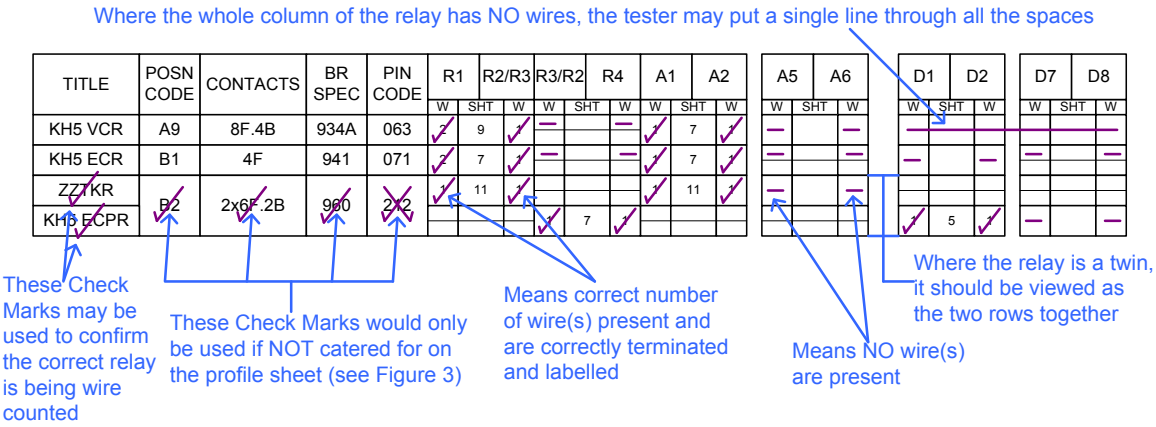

Figure B1 – Analysis Wire Count for Relay Contacts [New Work] - 1

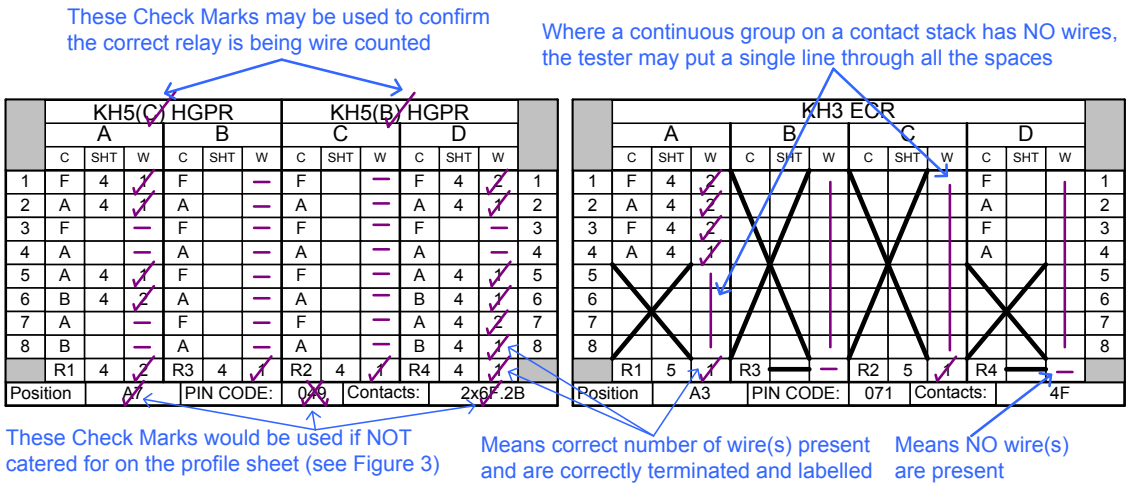

Figure B2 – Analysis Wire Count for Relay Contacts [New Work] - 2

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Figure B3 details the Check Marks associated with the recording of the fuse and terminal analysis for new work.

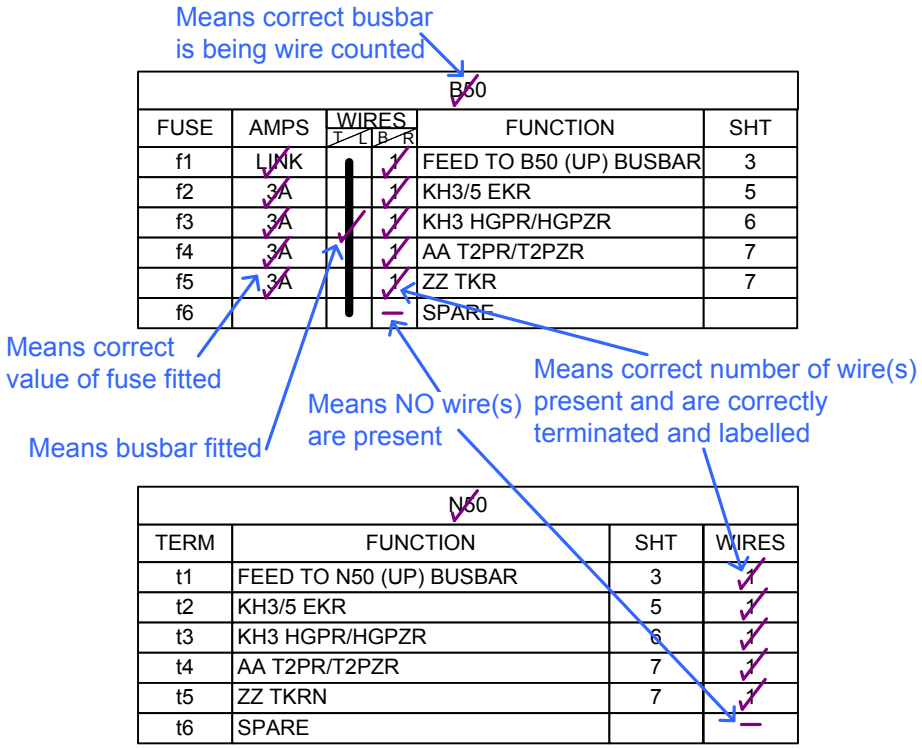

Figure B3 – Analysis Wire Count for Fuses and Terminals [New Work]

Figure B4 details the Check Marks associated with the recording of the cable link analysis for new work.

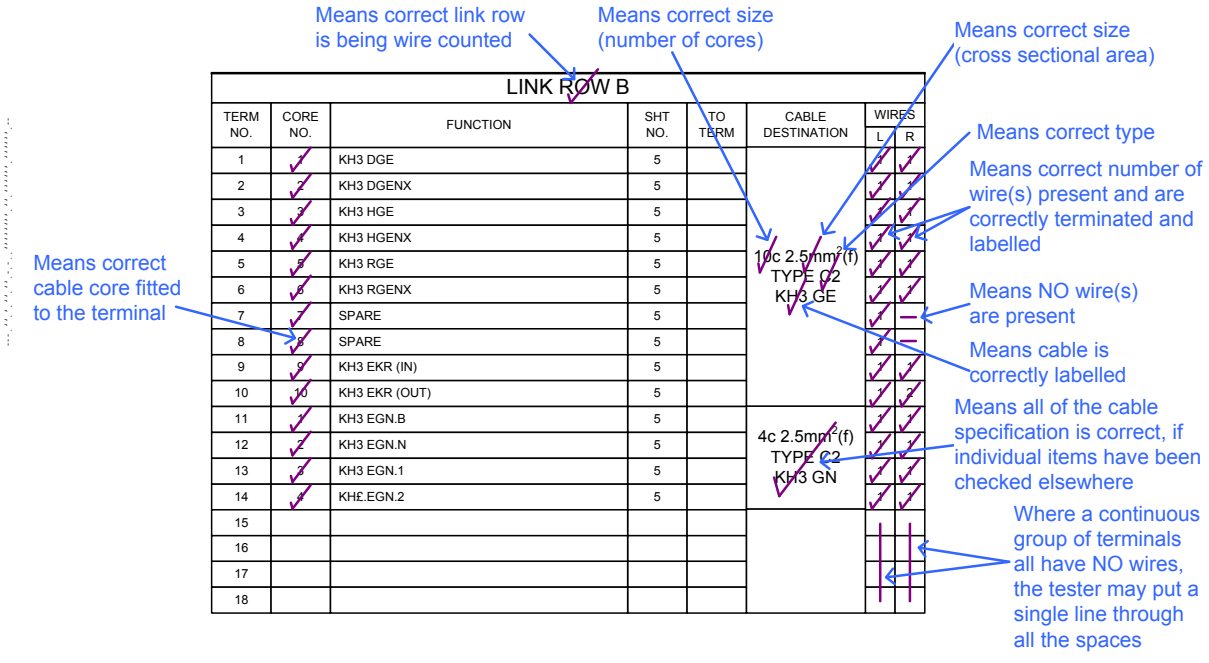

Figure B4 – Analysis Wire Count for Cable Links [New Work]

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Figure B5 details the Check Marks associated with the recording of relay contact analysis for recovery work.

Usually "greening up" for recovery is carried out to the wiring sheets, but where there is a full relay being recovered it might be decided to carry out a check to the analysis sheet. In this case, where the whole relay is being recovered and all the wires on the relay have been "greened up" as a group, the tester will confirm the number of wires to the analysis and place a single commissioning identifier on the "green" tape, then mark the Test Copy with REM here

TITLE	POSN CODE	CONTACTS	BR SPEC	PIN CODE	R1			R2/R3			R3/R2			R4			A1			A2			A5			A6		
					W	SHT	W	W	SHT	W	W	SHT	W	W	SHT	W	W	SHT	W	W	SHT	W	W	SHT	W	W	SHT	W
REM KH5 VCR	A9	8F.4B	934A	063	2	9	1										1	7	1									
KH5 ECR	B1	4F	941	071	2	7	1										1	7	1									
ZZTKR	B2	2x6F.2B	960	212	1	11	1										1	11	1									
KH5 ECPR											1	7	1															

	KH5(C) HGPR A			KH5(C) HGPR B			KH5(B) HGPR C			KH5(B) HGPR D			
	C	SHT	W	C	SHT	W	C	SHT	W	C	SHT	W	
1	F	4	1	F			F			F	4	2	1
2	A	4	1	A			A			A	4	1	2
3	F			F			F			F			3
4	A			A			A			A			4
5	A	4	1	F			F			A	4	1	5
6	B	4	2	A			A			B	4	1	6
7	A			F			F			A	4	2	7
8	B			A			A			B	4	1	8
	R1	4	2	R3	4	1	R2	4	1	R4	4	1	
Position	A7			PIN CODE:			049			Contacts:		2x6F.2B	

Figure B5 – Analysis Wire Count for Relay Contacts [Recovery]

Figure B6 details the Check Marks associated with the recording of fuse and terminal analysis for recovery work.

Usually "greening up" for recovery is carried out to the wiring sheets, but it might be decided to carry out a check to the analysis sheet. In this case the Testers will confirm the wires in the normal way and place their check mark on the analysis sheet. This would be a similar check mark to what would have been placed on the wiring sheet.

B50					
FUSE	AMPS	WIRES T / L / B / R		FUNCTION	SHT
f1	LINK		1	FEED TO B50 (UP) BUSBAR	3
f2	3A		1	KH3/5 EKR	5
f3	3A		1	KH3 HGPR/HGPZR	6
f4	3A		1	AA T2PR/T2PZR	7
f5	3A		1	ZZ TKR REM / TBC / INS	7
f6				SPARE	

N50			
TERM	FUNCTION	SHT	WIRES
t1	FEED TO N50 (UP) BUSBAR	3	1
t2	KH3/5 EKR	5	1
t3	KH3 HGPR/HGPZR	6	1
t4	AA T2PR/T2PZR	7	1
t5	ZZ TKRN REM / TBC / INS	7	1
t6	SPARE		

Figure B6 – Analysis Wire Count for Fuses and Terminals [Recovery]

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Figure B7 details the Check Marks associated with the recording of cable link analysis for recovery work.

Usually “greening up” for recovery is carried out to the wiring sheets, but where there is a whole cable being recovered it might be decided to carry out a check to the analysis sheet. In this case, where the whole cable is being recovered and all the cores of the cable have been “greened up” as a group, the tester will confirm the number of cores to the analysis and place a single commissioning identifier on the “green” tape, then mark the Test Copy with REM here

LINK ROW A							
TERM NO.	CORE NO.	FUNCTION	SHT NO.	TO TERM	CABLE DESTINATION	WIRES L	WIRES R
1	1	KH5 (TSS) ARM	10		LOC 1/1 – KH5 (TSS) ARM LOOP #1	1	1
2	2	KH5 (TSS) ARM RTN	10			1	1
3	s	KH5 (TSS) SCREEN	10			1	1
4	1	KH5 (TSS) TRIG	10		LOC 1/1 – KH5 (TSS) TRIG LOOP #1	1	1
5	2	KH5 (TSS) TRIG RTN	10			1	1
6	s	KH5 (TSS) SCREEN	10			1	1
7	1	KH5 (PL) GE	8		2c 2.5 mm² (f) TYPE C2 KH5 (PL)GE REM	1	1
8	2	KH5 (PL) GENX	8			1	1
9	1	KH5 UGE	7		2c 2.5 mm² (f) TYPE C2 KH5 UGE	1	1
10	2	KH5 UGENX	7			1	1
11							
12							

Figure B7 – Analysis Wire Count for Cable Links [Recovery]

Figures B1 to B7 are shown as if the design has been produced using the Two Drawing Method. If the design has been produced using the One Drawing Method, then the content of Figures B1, B2 and B5; Figures B3 and B6; Figures B4 and B7 would be incorporated on one drawing each.

Where it is necessary to wire count terminations associated with a panel, then where there is an analysis sheet the Check Marks as detailed above may be used.

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Figure B8 details the Check Marks associated with the recording of a *Wire Count* of the module free connector of an SSI TFM. This *Wire Count* is done to the engineering details but the process and recording is similar to the *Wire Count* of analysis. Because the connector shall NOT be opened, a check of the termination cannot be made and consequently only a check of where there are pins inserted or not is carried out.

It should be noted that the drawing of this connector in the *Test Copy* is usually a mirror image of the view the tester sees when the connector is removed from the SSI TFM.

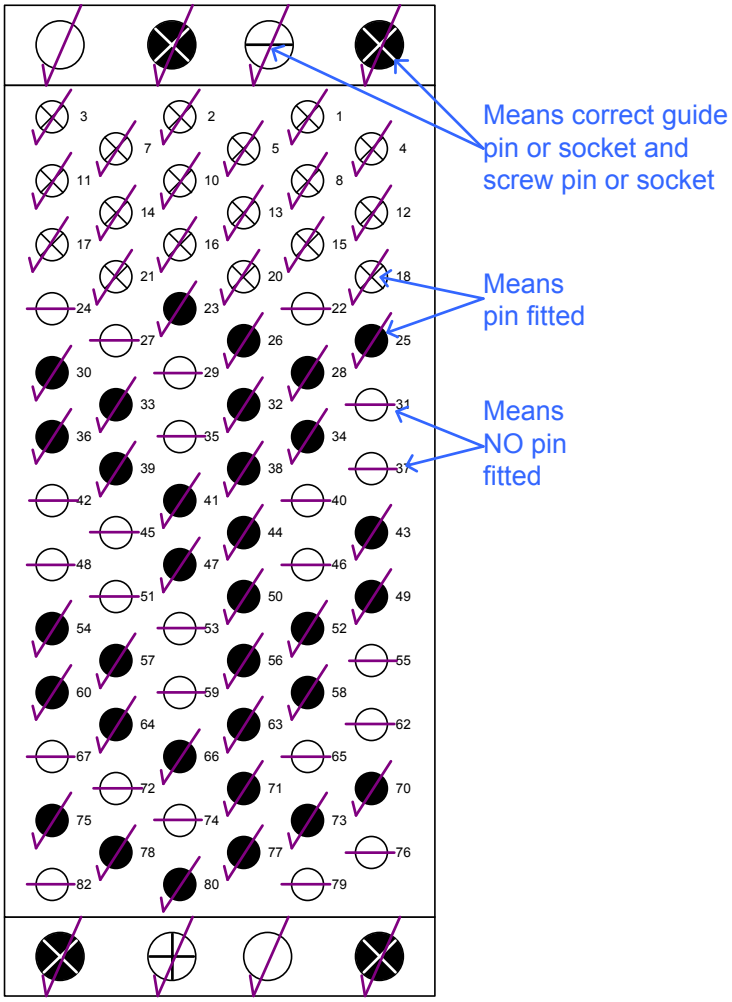

Figure B8 – Analysis Wire Count for SSI Module Free Connector

A similar approach should be adopted for other types of plug couplers, where only a single wire is capable of being terminated to a pin and the wiring once terminated and the coupler closed should not be opened by the tester.

Final Wire Count, if required by the Tester in Charge, is carried out as an analysis *Wire Count* which is recorded on a clean set of analysis sheets. This may be carried out for any of the analysis sheets.

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