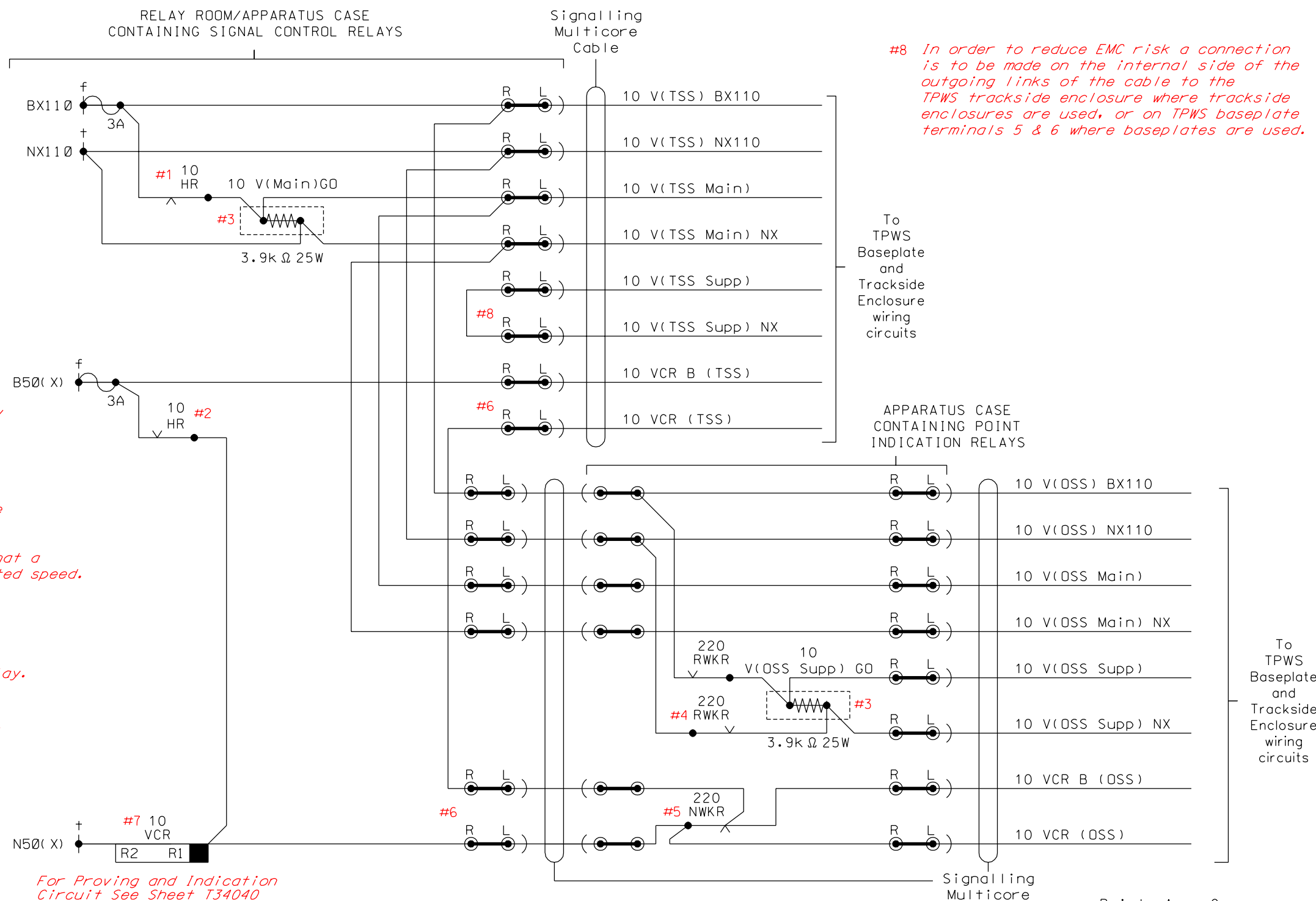
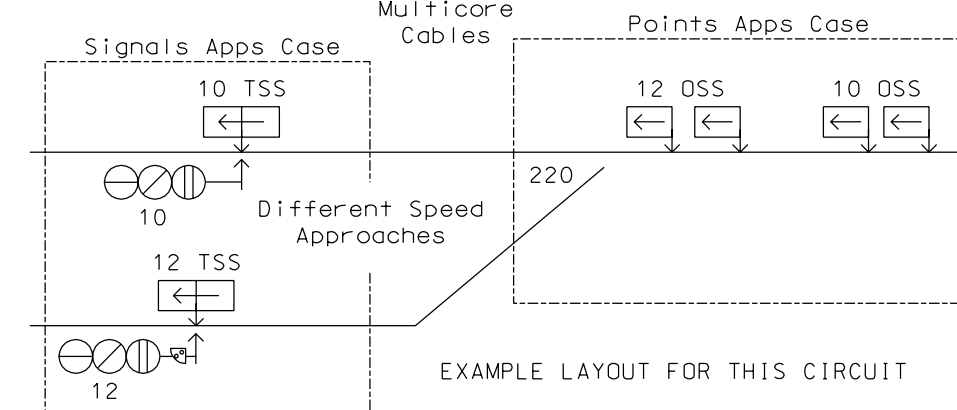


- #1 The Relay Contact that drives the TPWS should be of the same relay that drives the signal. Where necessary the HR should be changed to a relay with sufficient back contact provision. This may necessitate the provision of an HPR to provide for any front contact deficit arising. Any additional repeat relays should be considered for down proving in the final function.
- #2 This should preferably be a contact of the same relay that switches the control circuit #1. If this is not available a contact of an existing or newly created front contact repeat relay may be used.
- #3 Load resistor added to draw enough current to clean control contacts. This is to be mounted on Paxolin board on the relay rack. One resistor is needed for each set of inputs using the same controls.
- #4 Contacts of any point indication relay(s) needed to suppress the transmission of only this OSS function. Double cutting of point KR relay contacts is required if TPWS is fed over a line circuit in accordance with RT/E/C/11600 Part D Section 4.5. Where available, point operating relays may be used. Care should be taken to ensure that a failure of these relays (which may lead to an unwanted OSS transmission) will affect the interlocking in such a manner that a train can only approach the OSS at restricted speed.
- #5 Contacts of any point indication relay(s) needed to inhibit the failure reporting of only this OSS function in the VCR circuit. Can be a back contact of point detection relay or front contact of opposite lock relay.
- #6 VCR relay should prove the operation of all TPWS functions associated with this signal. These shall be included in series with each other.
- #7 BR934A PC063 8F 4B relay. If 50V DC is not available, a 110V AC supply can be used with a VCR Relay of type BR966 F7 PC029 8F 4B.



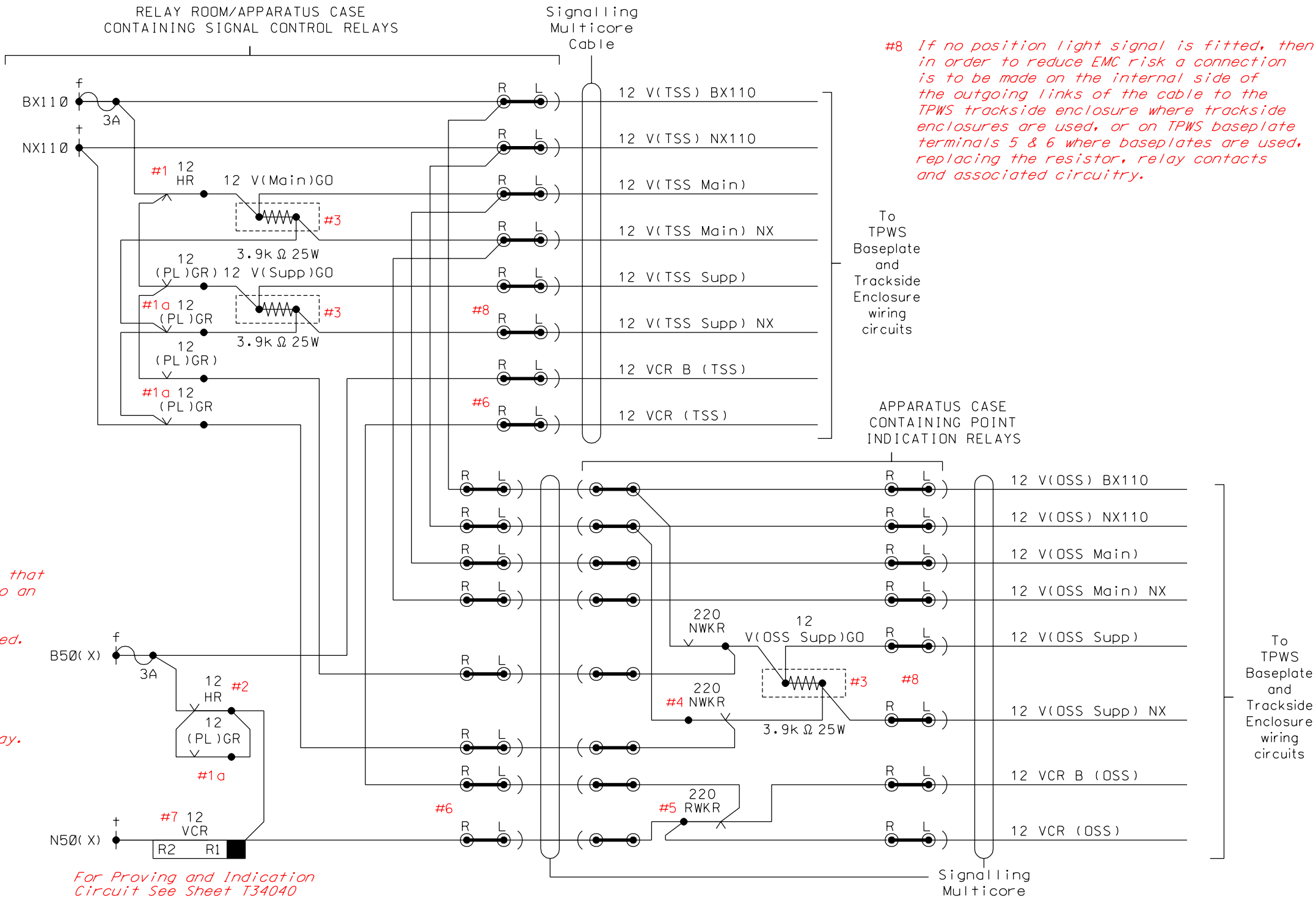
TPWS Function	Controls					Fault Reporting							Comments
	Signal On	Suppressed By				Included In			Inhibited By				
		Signal Off	When Points		Track Circuits	Signal ECR \$56	EKR Group	Other \$57 or \$58	Signal Off	Or Points		Or Track Circuits	
			Normal \$51	Reverse \$51						Not Nor \$52	Not Rev \$52		
10 TSS	#1 10					#6 10			10				
10 OSS				#4 220						#5 220			

EXAMPLE CONTROL TABLE FOR THE ABOVE CIRCUIT



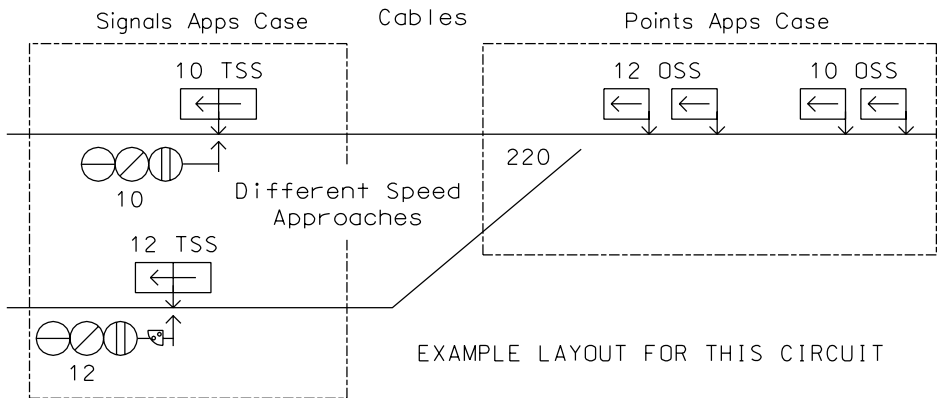
REVISION/VERSION			3.0			REVISION/VERSION			2.0			REVISION/VERSION									Code Of Practice						RAILTRACK																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
Headings for "Suppressed By" and "Fault Reporting Inhibited By" columns ammended.									Contro <table>table updated in line with RT/E/C/11202 Issue 2. Note 1a removed (not used).</table>									DRAWN DWB 20/10/02 CHECKED AJH 21/10/02 DOCUMENT REF. RT/LS/CAT005 Part3 (1) DOCS\SSC\CAD\1\T34006/1 This document is the property of Railtrack. It shall not be reproduced in whole or in part, nor disclosed to any third party, without the written permission of Railtrack. ISSUE 3.0									© Copyright Railtrack 2001						Published by Railtrack.						LINESIDE & ON TRACK EQUIPMENT TYPICAL CIRCUITS TPWS CONTROL CIRCUITS FOR RETRO FITMENT TO RELAY OPERATED SIGNALLING DIVERGING APPROACH 1 – SHEET 1 OF 2 Issue Date: 7th December 2002 DRG No. T34006/1 <table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td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- #1 The Relay Contact that drives the TPWS should be of the same relay that drives the signal. Where necessary the HR should be changed to a relay with sufficient back contact provision. This may necessitate the provision of an HPR to provide for any front contact deficit arising. Any additional repeat relays should be considered for down proving in the final function.
- #1a These contacts should be the same relay as that which clears the sub-signal proceed aspect or a front contact repeat relay of this relay.
- #2 This should preferably be a contact of the same relay that switches the control circuit #1. If this is not available a contact of an existing or newly created front contact repeat relay may be used.
- #3 Load resistor added to draw enough current to clean control contacts. This is to be mounted on Paxolin board on the relay rack. One resistor is needed for each set of inputs using the same controls.
- #4 Contacts of any point indication relay(s) needed to suppress the transmission of only this OSS function. Double cutting of point KR relay contacts is required if TPWS is fed over a line circuit in accordance with RT/E/C/11600 Part D Section 4.5. Where available, point operating relays may be used. Care should be taken to ensure that a failure of these relays (which may lead to an unwanted OSS transmission) will affect the interlocking in such a manner that a train can only approach the OSS at restricted speed.
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- #6 VCR relay should prove the operation of all TPWS functions associated with this signal. These shall be included in series with each other.
- #7 BR934A PC063 8F 4B relay. If 50V DC is not available, a 110V AC supply can be used with a VCR Relay of type BR966 F7 PC029 8F 4B.



TPWS Function	Controls					Fault Reporting							Comments
	Signal On	Suppressed By				Included In			Inhibited By				
		Signal Off	When Points		Track Circuits	Signal ECR \$56	EKR Group	Other \$57 or \$58	Signal Off	Or Points		Or Track Circuits	
			Normal \$51	Reverse \$51						Not Nor \$52	Not Rev \$52		
12 TSS	#1 12	#1 a 12 (Sub)				#6 12			12 12 (Sub)				
12 OSS				#4 220							#5 220		

EXAMPLE CONTROL TABLE FOR THE ABOVE CIRCUIT



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3.0			2.0						© Copyright Railtrack 2001 Published by Railtrack.				Issue Date: 7th December 2002			
Headings for "Suppressed By" and "Fault Reporting Inhibited By" columns ammended.			Controltable updated in line with RT/E/C/11202 Issue 2.						LINESIDE & ON TRACK EQUIPMENT TYPICAL CIRCUITS				DRG No.			
			Position light controls added to OSS suppression circuit.						TPWS				T34006/2			
DRAWN DWB			DRAWN DWB			DRAWN DWB			CONTROL CIRCUITS FOR RETRO FITMENT TO RELAY OPERATED SIGNALLING DIVERGING APPROACH 1 - SHEET 2 OF 2							
CHECKED AJH			CHECKED RAB			CHECKED										
RAILTRACK			RAILTRACK			RAILTRACK										

TPWS

DRAWN

CHECKED

DOCUMENT REF.

DWB

AJH

RT/LS/CAT005 Part3 (1)

20/10/02

21/10/02

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LINESIDE & ON TRACK EQUIPMENT TYPICAL CIRCUITS

TPWS

CONTROL CIRCUITS FOR RETRO FITMENT TO RELAY OPERATED SIGNALLING DIVERGING APPROACH 1 - SHEET 2 OF 2

Issue Date: 7th December 2002

DRG No. T34006/2