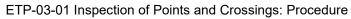
ETP-03-01 Inspection of Points and Crossings: Procedure

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#### **BROAD STANDARD DIAMOND DETAILED INSPECTION**

Location:	Turnout Number:	Equipment No.:	Kilometrage:
Inspector Name:	Date:	Work Order:	Track:

OVERVIEW INSPECTION I	nese tasks ap	pply generically to all poli	nts and crossings assemblies		1
ELEMENT	MEASURE	COMMENT	CONDITION		RESPONSE
Component Damage			Any component loose, missing or broken.	A6	Increase monitoring, prioritise repair
Track geometry, Pumping			5 – 20 mm	A6	Increase monitoring, prioritise repair
in Critical Areas			20 mm or more	A6	Increase monitoring, prioritise repair
			Visible deterioration	A6	Increase monitoring, prioritise repair
Track Geometry, Overall Condition			Single Measured defect	-	ETS-05-00 5.4 table 5-15
			Multiple measured defects	-	ETS-05-00 5.4 table 5-15
			1	A6	Increase monitoring, prioritise repair
Bearers and Fasteners, Ineffective in Critical Areas			2 consecutive	А3	40 km/h TSR until repaired
			> 2 consecutive	A1	10 km/h TSR until repaired
			< 20% loose clips, screws or spikes, timbers degraded	A6	Increase monitoring, prioritise repair
Bearers and Fasteners, Overall Condition			Pads and insulators skewed some fasteners missing 1 in 4 timbers deteriorating	A6	Increase monitoring, prioritise repair
			> 50% loose clips, screws or spikes, 1 in 3 timbers degraded missing fasteners	A6	Increase monitoring, prioritise repair
Ballast, condition and			Fines on surface. Ballast shoulder reduced.	A6	Increase monitoring, prioritise repair
profile			Trapped moisture, mud and track pumping. Ballast low, ends of multiple bearers visible.	A6	Increase monitoring, prioritise repair
			Ballast < 25 mm from moving parts. Ballast loose on sleepers.	A6	Increase monitoring, prioritise repair
Ballast, Excess			Ballast touching moving parts or ballast obstructing inspection of fasteners. Ballast fallen into trough.	A6	Increase monitoring, prioritise repair





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OVERVIEW INSPECTION These tasks apply generically to all points and crossings assemblies									
ELEMENT	MEASURE	COMMENT	CONDITION		RESPONSE				
			Any of below						
			Signs of rail movement						
Rail, Creep			V or K out of square.	A6	Increase monitoring, prioritise repair				
			Movement of point or splice rails exposing gaps to wheels						
			Irregular contact band.	A6	Increase monitoring, prioritise repair				
Rail, Condition			Minor RCF, wheel burns or top / side wear. Evidence of bent rail.	A6	Increase monitoring, prioritise repair				
Rail, Condition			Severe RCF likely to interfere with Ultrasonic testing. Advanced wear. Corrugations. Other rail defects requiring a response.	A6	Increase monitoring, prioritise repair				
			35mm to 26 mm	A7	Routine scheduled inspection				
Rail, Remaining Head Height			24 to 26 mm and without defect per Section 1 Rail	A6	Increase monitoring, prioritise repair				
Tioignt			Head height defect	-	Section 1 Rail				

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FIXED V CROSSING INPSECTION									
ELEMENT	MEASURE		COMMENT	CONDITION		RESPONSE			
				STANDARD	BROAD				
	CC 1/4	SG V2		≥ 1443 mm	≥ 1608 mm	A1	10 km/h TSR until repaired		
	SG V1	SG V2		> 1440 mm to < 1443 mm	> 1605 mm to < 1608 mm	A4	60/65 km/h TSR until repaired		
Track gauge (at the				> 1438 mm to 1440 mm	> 1603 mm to 1605 mm	A6	Increase monitoring. Prioritise repair		
crossing nose)			]	> 1430 mm to 1438 mm	> 1595 mm to 1603 mm	A7	Routine scheduled inspection		
	DO 1/4	DO 1/0		> 1427 mm to 1430 mm	> 1592 mm to 1595 mm	A6	Increase monitoring. Prioritise repair		
	BG V1	BG V2		> 1425 mm to 1427 mm	> 1590 mm to 1592 mm	A4	60/65 km/h TSR until repaired		
				1425 mm and less	1590 mm and less	A1	10 km/h TSR until repaired		
	SG V1			STANDARD	BROAD				
		SG V2		≥ 1400 mm	≥ 1565 mm	A1	10 km/h TSR until repaired		
				1398 mm to < 1400 mm	1563 mm to < 1565 mm	A3	40 km/h TSR until repaired		
				1396 mm to < 1398 mm	1561 mm to < 1563 mm	A4	60/65 km/h TSR until repaired		
Check Rail Effectiveness				1389 mm to < 1396 mm	1554 mm to < 1561 mm	A7	Routine scheduled inspection		
	BG V1	BG V2		1386 mm to < 1389 mm	1551 mm to < 1554 mm	A6	Increase monitoring. Prioritise repair		
				1384 mm to < 1386 mm	1549 mm to < 1551 mm	A4	60/65 km/h TSR until repaired		
	BG V1			1382 mm to < 1384 mm	1547 mm to < 1549 mm	А3	40 km/h TSR until repaired		
				< 1382 mm	< 1547 mm	A1	10 km/h TSR until repaired		
				>49 mm	•	A4	60/65 km/h TSR until repaired		
	SG V1	SG V2		48 mm to 49 mm		A6	Increase monitoring. Prioritise repair		
Check rail flangeway				40 mm to < 48 mm		A7	Routine scheduled inspection		
	BG V1	PC V2		38 mm to < 40 mm		A6	Increase monitoring. Prioritise repair		
	BG V1	BG V2		< 38 mm		A4	60/65 km/h TSR until repaired		



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FIXED V CROSSING INPSECTION										
ELEMENT		MEASURE		COMMENT	CONDITION		RESPO	RESPONSE		
		SG V1,	SG V1,		STANDARD	BROAD				
	V1	V1 end	V2 end		1360 mm to < 1365 mm	1525 mm to < 1530 mm	A6	Increase monitoring. Prioritise repair		
	"	BG V1,	BG V1,		1365 mm to < 1370 mm	1530 mm to < 1535 mm	A3	40 km/h TSR until repaired		
		V1 end	V2 end		≥ 1370 mm	≥ 1535 mm	A1	10 km/h TSR until repaired		
Check rail flare		SG V2,	SG V2,		STANDARD	BROAD				
	V2	V1 end	V2 end		1360 mm to < 1365 mm	1525 mm to < 1530 mm	A6	Increase monitoring. Prioritise repair		
		BG V2,	BG V2,		1365 mm to < 1370 mm	1530 mm to < 1535 mm	A3	40 km/h TSR until repaired		
		V1 end	V2 end		≥ 1370 mm	≥ 1535 mm	A1	10 km/h TSR until repaired		
	•				Cracked		A4/A3	60/65 km/h TSR until repaired Heavy Haul 40 km/h TSR until repaired		
Check rail spacer blo	ocks	V1	V2		Broken but still effective		А3	40 km/h TSR until repaired		
					Missing/Broken and ineffective		A1	10 km/h TSR until repaired		
					Missing/ineffective ≤2		A4/A3	60/65 km/h TSR until repaired		
Check rail spacer blobolts	ocks,	V1	V2		Missing/ineffective 3		A3	40 km/h TSR until repaired		
					Missing/ineffective >3 or miss	ing end bolt in check rail.	A1	10 km/h TSR until repaired		
					15 mm to 20 mm width		A6	Increase monitoring. Prioritise repair		
Crossing nose break	Crossing nose break width		V2		20 mm to 25 mm width		A3	40 km/h TSR until repaired		
					> 25 mm wide		A1	10 km/h TSR until repaired		
Crossing nose condi	tion,	V1	V2		1 mm or more flow		A6	Increase monitoring. Prioritise repair		



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FIXED V CROSSING INPS	ECTION						
ELEMENT	MEASURE	MEASURE C		CONDITION	RESPONSE		
Crossing nose condition, batter/ hollow	V1	V2		2 mm or more hollow / severe	A6	Increase monitoring. Prioritise repair	
Crossing nose condition, surface condition	V1	V2		Pieces 3mm or more across have fallen from surface	A6	Increase monitoring. Prioritise repair	
				No cracks	A7	Routine scheduled inspection	
				Noncritical	A6	Increase monitoring. Prioritise repair	
Crossing Cracks	V1	V2		Critical	A6	Increase monitoring. Prioritise repair	
				Fully (not affecting the running surface)	A4	60/65 km/h TSR until repaired	
				Fully (affecting the running surface)		10 km/h TSR until repaired	
	SG V1	SG V2		Visible evidence of flange tips running in dirt.	A6	Increase monitoring. Prioritise repair	
Crossing flangeway	BG V1	BG V2		Flangeway obstructed (with ballast etc) or evidence of flange tip running on steel work		10 km/h TSR until repaired	
				Cracked	A 4/A O	60/65 km/h TSR until repaired	
Crossing spacer blocks	V1	1/0			A4/A3	Heavy Haul 40 km/h TSR until repaired	
Crossing spacer blocks	VI	V2		Broken but still effective	A3	40 km/h TSR until repaired	
				Missing/Broken and ineffective		10 km/h TSR until repaired	
				Single or multiple bolts loose yet effective	A6	Increase monitoring. Prioritise repair	
					A4/A3	60/65 km/h TSR until repaired	
Crossing spacer blocks, bolts	V1	1 V2		Missing/ineffective ≤2		Heavy Haul 40 km/h TSR until repaired	
				Missing/ineffective 3	A3	40 km/h TSR until repaired	
				Missing/ineffective >3	A1	10 km/h TSR until repaired	



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FIXED V CROSSING INPSECTION									
ELEMENT	MEASURE		COMMENT	CONDITION		RESPONSE			
Wing rail vertical weer	SG V1	SG V2		5 mm to 10 mm	A6	Increase monitoring. Prioritise repair			
Wing rail vertical wear	BG V1	BG V2		>10 mm	A3	40 km/h TSR until repaired			
	SG V1	SG V2							
Wing Rail Condition, metal flow	BG V1	BG V2		1 mm or more flow	A6	Increase monitoring. Prioritise repair			
Mr. D. 11.0	SG V1	SG V2							
Wing Rail Condition, surface condition	BG V1	BG V2		Pieces 3mm or more across have fallen from surface	A6	Increase monitoring. Prioritise repair			
	SC VI	SG V1	SG V2		1360 mm to < 1365 mm	A6	Increase monitoring. Prioritise repair		
Wing Rail flare	00 41	00 42		1365 mm to < 1370 mm	А3	40 km/h TSR until repaired			
	BG V1	BG V2		≥ 1370 mm	A1	10 km/h TSR until repaired			



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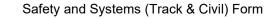
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FIXED K CROSSING INPSECTION										
ELEMENT	MEASURE	MEASURE	COMMENT	CONDITION		RESPONSE				
				STANDARD	BROAD					
	K1a SG	K1b BG		≥ 1443 mm	≥ 1608 mm	A1	10 km/h TSR until repaired			
	KIA SG	KID BG		> 1440 mm to < 1443 mm	> 1605 mm to < 1608 mm	A4	60/65 km/h TSR until repaired			
Track gauge (at the				> 1438 mm to 1440 mm	> 1603 mm to 1605 mm	A6	Increase monitoring. Prioritise repair			
crossing nose)*				> 1430 mm to 1438 mm	> 1595 mm to 1603 mm	A7	Routine scheduled inspection			
	K2c BG	K2d SG		> 1427 mm to 1430 mm	> 1592 mm to 1595 mm	A6	Increase monitoring. Prioritise repair			
	NZC BG	K2a SG		> 1425 mm to 1427 mm	> 1590 mm to 1592 mm	A4	60/65 km/h TSR until repaired			
				1425 mm and less	1590 mm and less	A1	10 km/h TSR until repaired			
	K1a SG	K1b BG		STANDARD	BROAD					
				≥ 1400 mm	≥ 1565 mm	A1	10 km/h TSR until repaired			
				1398 mm to < 1400 mm	1563 mm to < 1565 mm	A3	40 km/h TSR until repaired			
				1396 mm to < 1398 mm	1561 mm to < 1563 mm	A4	60/65 km/h TSR until repaired			
Check Rail Effectiveness				1389 mm to < 1396 mm	1554 mm to < 1561 mm	A7	Routine scheduled inspection			
		K2d SG		1386 mm to < 1389 mm	1551 mm to < 1554 mm	A6	Increase monitoring. Prioritise repair			
	K2c BG			1384 mm to < 1386 mm	1549 mm to < 1551 mm	A4	60/65 km/h TSR until repaired			
	NZC BG	K20 30		1382 mm to < 1384 mm	1547 mm to < 1549 mm	A3	40 km/h TSR until repaired			
				< 1382 mm	< 1547 mm	A1	10 km/h TSR until repaired			
	K1a	K1b		>49 mm		A4	60/65 km/h TSR until repaired			
Check rail flangeway	r\1d	K1b		48 mm to 49 mm		A6	Increase monitoring. Prioritise repair			
Check fall llangeway	K2c	K2d		40 mm to < 48 mm		A7	Routine scheduled inspection			
	NZC	K2d		38 mm to < 40 mm		A6	Increase monitoring. Prioritise repair			

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#### FIXED K CROSSING INPSECTION

ELEMENT	MEASURE	MEASURE	COMMENT	CONDITION		RESPONSE	
				STANDARD	BROAD		
0	K1a SG	K1b BG		1360 mm to < 1365 mm	1525 mm to < 1530 mm	A6	Increase monitoring. Prioritise repair
Check rail flare	1/0 - 0.0	1/0.1.00		1365 mm to < 1370 mm	1530 mm to < 1535 mm	A3	40 km/h TSR until repaired
	K2c BG	K2d SG		≥ 1370 mm	≥ 1535 mm	A1	10 km/h TSR until repaired
				Constant		A4/A3	60/65 km/h TSR until repaired
Charle wait amazaw blaska	124	1/0		Cracked		A4/A3	Heavy Haul 40 km/h TSR until repaired
Check rail spacer blocks	K1	K2		Broken but still effective		A3	40 km/h TSR until repaired
				Missing/Broken and ineffective	9	A1	10 km/h TSR until repaired
						A 4/A O	60/65 km/h TSR until repaired
Check rail spacer blocks,	164	1/0		Missing/ineffective ≤2  Missing/ineffective 3		A4/A3	Heavy Haul 40 km/h TSR until repaired
bolts	K1	K2				A3	40 km/h TSR until repaired
			Missing/ineffective >3 or missing end bolt in check rail.		A1	10 km/h TSR until repaired	
Crossing nose condition,	K1a	K1b		4.00		A 4	CO/CE loss/le TOD contil accessing d
metal flow	K2c	K2d		< 38 mm		A4	60/65 km/h TSR until repaired
Crossing nose condition,	K1a	K1b		2 mars on mass hallow / 2 av		A.C.	Impressor magnituding Delavities requir
batter/ hollow	K2c	K2d		2 mm or more hollow / sev	ere	A6	Increase monitoring. Prioritise repair
Crossing nose condition,	K1a	K1b		Dia 2	a baya fallan fuana ayufa a	A.C.	Impressor magnituding Delavities requir
surface condition	K2c	K2d		Pieces 3mm or more acros	s nave lallen from surface	A6	Increase monitoring. Prioritise repair
	1/4 =	I/A la		No cracks		A7	Routine scheduled inspection
	K1a	K1b		Noncritical		A6	Increase monitoring. Prioritise repair
Crossing Cracks		K2d		Critical		A6	Increase monitoring. Prioritise repair
	K2c			Fully (not affecting the running surface)		A4	60/65 km/h TSR until repaired
				Fully (affecting the running	surface)	A1	10 km/h TSR until repaired





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FIXED K CROSSING INPO	SECTION						
ELEMENT	MEASURE	MEASURE	COMMENT	CONDITION		RESPO	DNSE
	K1a	K1b		Visible evidence of flange	tips running in dirt.	A6	Increase monitoring. Prioritise repair
Crossing flangeway	K2c	K2d		Flangeway obstructed (with flange tip running on steel	n ballast etc) or evidence of work	A1	10 km/h TSR until repaired
							60/65 km/h TSR until repaired
Crossing spacer blocks	K1	K2		Cracked		A4/A3	Heavy Haul 40 km/h TSR until repaired
				Broken but still effective		A3	40 km/h TSR until repaired
				Missing/Broken and ineffec	otive	A1	10 km/h TSR until repaired
				Single or multiple bolts loos	se yet effective	A6	Increase monitoring. Prioritise repair
		K2					60/65 km/h TSR until repaired
Crossing spacer blocks, bolts	K1		Missing/ineffective ≤2  Missing/ineffective 3  Missing/ineffective >3		A4/A3	Heavy Haul 40 km/h TSR until repaired	
						A3	40 km/h TSR until repaired
						A1	10 km/h TSR until repaired
Knuckle vertical wear	K1a	K1b		5 mm to 10 mm		A6	Increase monitoring. Prioritise repair
Knuckie vertical wear	K2c	K2d		>10 mm		A3	40 km/h TSR until repaired
Wing Rail Condition,	K1a	K1b		1 mans on manua flavor		A.C.	In an analysis of Delaying Paragraphy
metal flow	K2c	K2d		1 mm or more flow		A6	Increase monitoring. Prioritise repair
Wing Rail Condition,	K1a	K1b		Di 2	- l f-II f	4.0	In an
surface condition	K2c	K2d		Pieces 3mm or more acros	s nave fallen from surface	A6	Increase monitoring. Prioritise repair
	1/4 - DO	K41- 00		STANDARD	BROAD		
	K1a BG	K1b SG		1360 mm to < 1365 mm	1525 mm to < 1530 mm	A6	Increase monitoring. Prioritise repair
Wing Rail flare	K2c SG	1/0   00		1365 mm to < 1370 mm	1530 mm to < 1535 mm	A3	40 km/h TSR until repaired
		K2d BG		≥ 1370 mm	≥ 1535 mm	A1	10 km/h TSR until repaired

<sup>\*</sup>Where diamonds are designed with 6mm tight gauge through K crossing area an A6 response for tight gauge may be reduced to A7.





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