# TURNOUT DETAILED INSPECTION

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| Location: Track: Equipment No.: |
| Kilometrage: Date:  |
| Ellipse Job.: TURN01 Ellipse Work Order No.:  |
| Type of turnout being inspected (circle answer): i) non-tangential, ii) tangential, iii) undercut switch / heavy duty switch and joggled stock rail |
| Points | Measure | Response (all speed in km/h) | Comments |
| Is there evidence of stock rail creep at switch? | Left |  | Report any defects. |  |
| Right |  | Report any defects. |  |
| Are the points going to be reversed to allow inspection on both sides? |  | If no, highlight a reason why:* Switch is currently clipped (booked out of use)
* Active traffic running on adjacent line
* Inspector not qualified to move points
* No suspected defects via observation (Section 3)
 |  |
| Gauge (Measured at switch tip) |  | >1455 mm apply plain track geometry responses1429 mm to 1427 mm speed 60/65 and monitor1426 mm to 1425 mm speed 20/20 and monitor<1425 mm speed 10/10 and pilot trains |  |
| Switch Width at Tip(Closed switch only, as presented to the wheel) (non-tangential, non-undercut switch only) | Left |  | 4 mm to 6 mm monitor7 mm to 8 mm speed 20/20 and monitor>8 mm speed 10/10 and pilot trains |  |
| Switch Height at Tip (distance from running surface to top of switch)(non-tangential, non-undercut switch only) | Left |  | Conventional switch only:>12 mm to <13 mm monitor12 mm or less speed 10/10 and pilot trainsUndercut and asymmetric switches should not sit high of the machined section of stock rail. Report any defect.  |  |
| Switch Tip Wear Angle(non-tangential, non-undercut switch only) | Left |  | Angle from vertical. Report suspect angles:18 to 26 degrees monitor>26 degrees speed 10/10 and pilot trains |  |
| Stock Rail Wear Angle(non-tangential, non-undercut switch only) | Right |  | Angle from vertical. Report suspect angles:18 to 26 degrees monitor>26 degrees speed 10/10 and pilot trains |  |
| Switch Width at Tip(Closed switch only, as presented to the wheel) (non-tangential, non-undercut switch only) | Right |  | 4 mm to 6 mm monitor7 mm to 8 mm speed 20/20 and monitor>8 mm speed 10/10 and pilot trains |  |
| Switch Height at Tip (distance from running surface to top of switch)(non-tangential, non-undercut switch only) | Right |  | Conventional switch only:>12 mm to <13 mm monitor12 mm or less speed 10/10 and pilot trainsUndercut and asymmetric switches should not sit high of the machined section of stock rail. Report any defect.  |  |
| Switch Tip Wear Angle(non-tangential, non-undercut switch only) | Right |  | Angle from vertical. Report suspect angles:18 to 26 degrees monitor>26 degrees speed 10/10 and pilot trains |  |
| Stock Rail Wear Angle(non-tangential, non-undercut switch only) | Left |  | Angle from vertical. Report suspect angles:18 to 26 degrees monitor>26 degrees speed 10/10 and pilot trains |  |
| **Tangential Turnouts - Manufacturer Specific Inspection Requirements. Complete Where Relevant.** |
| PRE Tangential Turnout |  | Broken slide baseplate jaws, broken slide tables. Detached or worn slide baseplate end stops. Record as defect and prioritise. |  |
| TKL Tangential Turnout |  | Inner stock rail bracing clip legs not fitted to thrust abutments. Record as defect and prioritise. |  |
| Vossloh Tangential Turnouts |  | IBAV not securely located in housing or housing incorrectly located against the foot of the stock rail at each slide plate. Record as defect and prioritise. |  |
| VAE Tangential Turnouts |  | Damaged or broken switch inside fastening system pins and keys. Record as defect and prioritise. |  |
| Martinus Tangential Turnouts. |  | Poor fitting or ineffective spring clip components for securing the stock rail inner foot to the switch slide chair. Record as defect and prioritise. |  |
| Points | Measure | Response (all speed in km/h) | Comments |
| Lever Effectiveness(Manual Points) |  | Insufficient tension to keep switch closed under trafficReport as defect and prioritise. |  |
| Spreader Bar/Drive Rods |  | Missing/Broken – Notify signalling maintainer. Secure switch and/or impose 10/10 speed and pilot trains as appropriate. |  |
| Are switches bearing evenly on slide plates for the entire length? |  | Report any defects. |  |
| Open throw dimension (Switch blade open gap) | Left |  | 85 mm to < 95 mm monitor80 mm to < 85 mm speed 20/20 and monitor<80 mm speed 10/10 and pilot trains |  |
| Back of switch rail to stock rail (Flangeway throat gap) | Left |  | 35 mm to <40 mm speed 40/40 and monitor<35 mm speed 10/10 and pilot trains |  |
| Switch/Stock rail contact area (amount of lipping) | Left |  | Report if switch or stock rail need grinding and prioritise. Report if switch or stock rail have lipping of 1mm or greater. This lipping should be ground. |  |
| Switch blade closed gap | Right |  | 1 mm to 3 mm record as defect, program adjustment>3 mm record as defect, urgent attention |  |
| Is there any observed damage to switch tips? |  | Report any defects. |  |
| Switch Blade Damage(deeper than 19mm from running surface of stock rail) | Left |  | 100 mm to 199 mm long – monitor≥200 mm long - speed 10/10 and pilot trains |  |
| Open throw dimension (Switch blade open gap) | Right |  | 85 mm to < 95 mm monitor80 mm to < 85 mm speed 20/20 and monitor<80 mm speed 10/10 and pilot trains |  |
| Back of switch rail to stock rail (Flangeway throat gap) | Right |  | 35 mm to <40 mm speed 40/40 and monitor<35 mm speed 10/10 and pilot trains |  |
| Switch/Stock rail contact area (amount of lipping) | Right |  | Report if switch or stock rail need grinding and prioritise. Report if switch or stock rail have lipping of 1mm or greater. This lipping should be ground. |  |
| Switch blade closed gap | Left |  | 1 mm to 3 mm record as defect, program adjustment>3 mm record as defect, urgent attention |  |
| Switch Blade Damage(deeper than 19mm from running surface of stock rail) | Right |  | 100 mm to 199 mm long – monitor≥200 mm long - speed 10/10 and pilot trains |  |
| Heel Blocks(includes fixed, pivot heel and stress transfer blocks) | Left |  | Cracked: 23 tonne axle load speed 80/90, 25 tonne speed 60/65, 30 tonne speed 40/40.Broken but effective – 40/40 speed and monitor.Missing/Broken ineffective – speed 10/10 and pilot trains |  |
| Heel Blocks(includes fixed, pivot heel and stress transfer blocks) | Right |  | Cracked: 23 tonne axle load speed 80/90, 25 tonne speed 60/65, 30 tonne speed 40/40.Broken but effective – 40/40 speed and monitor.Missing/Broken ineffective – speed 10/10 and pilot trains |  |
| Creep Control Blocks | Left |  | Missing/Broken ineffective - monitor |  |
| Creep Control Blocks | Right |  | Missing/Broken ineffective - monitor |  |
| Rail Brace/Chair | Left |  | Cracked/Loose – monitorBroken/Ineffective:1 only – monitor except for 60/65 speed 25 tonne, 40/40 speed 30 tonne axle load areas.2 consecutive – speed 60/65 except for 40/40 speed in 25 or 30 tonne axle load areas.>2 consecutive - speed 10/10 and pilot trains |  |
| Rail Brace/Chair | Right |  | Cracked/Loose – monitorBroken/Ineffective:1 only – monitor except for 60/65 speed 25 tonne, 40/40 speed 30 tonne axle load areas.2 consecutive – speed 60/65 except for 40/40 speed in 25 or 30 tonne axle load areas.>2 consecutive - speed 10/10 and pilot trains |  |
| Switch Bearing Stops | Left |  | Cracked/Loose – monitorBroken/Ineffective:1 only – monitor except for 60/65 speed 25 tonne, 40/40 speed 30 tonne axle load areas.2 consecutive – speed 60/65 except for 40/40 speed in 25 or 30 tonne axle load areas.>2 consecutive - speed 10/10 and pilot trains |  |
| Switch Bearing Stops | Right |  | Cracked/Loose – monitorBroken/Ineffective:1 only – monitor except for 60/65 speed 25 tonne, 40/40 speed 30 tonne axle load areas.2 consecutive – speed 60/65 except for 40/40 speed in 25 or 30 tonne axle load areas.>2 consecutive - speed 10/10 and pilot trains |  |
| Ineffective Bearers/Fasteners(In critical area) |  | 1 only – monitor2 consecutive – speed 40/40 and monitor>2 consecutive - speed 10/10 and pilot trains |  |
| Bolts |  | Loose/Broken/Missing – record as defect and prioritise |  |
| Crossing | Measure | Response | Comments |
| Gauge(At crossing nose) | Mainline |  | ≥1443 mm - speed 20/20 and monitor1442 mm to 1441 mm - speed 60/65 and monitor1440 mm to 1439 mm - monitor1430 mm to 1428 mm – monitor1427 mm to 1426 mm – speed 60/65 and monitor≤1425 mm – speed 20/20 and monitor |  |
| Check Rail Effectiveness | Mainline |  |  ≥1400 mm - speed 10/10 and pilot trains1399 mm to 1398 mm - speed 40/40 and monitor1397 mm to 1396 mm - speed 60/65 and monitor1388 mm to 1386 mm – monitor1385 mm to 1384 mm – speed 60/65 and monitor1383 mm to 1382 mm – speed 40/40 and monitor<1382 mm– speed 10/10 and pilot trains |  |
| Check Rail Flangeway Width | Mainline |  | >49 mm - speed 60/65 and monitor49 mm to 48 mm– monitor39 mm to 38 mm – monitor<38 mm - speed 60/65 and monitor |  |
| Gauge(At crossing nose) | Turnout |  | ≥1443 mm - speed 20/20 and monitor1442 mm to 1441 mm - speed 60/65 and monitor1440 mm to 1439 mm - monitor1430 mm to 1428 mm – monitor1427 mm to 1426 mm – speed 60/65 and monitor≤1425 mm – speed 20/20 and monitor |  |
| Check Rail Effectiveness | Turnout |  |  ≥1400 mm - speed 10/10 and pilot trains1399 mm to 1398 mm - speed 40/40 and monitor1397 mm to 1396 mm - speed 60/65 and monitor1388 mm to 1386 mm – monitor1385 mm to 1384 mm – speed 60/65 and monitor1383 mm to 1382 mm – speed 40/40 and monitor<1382 mm– speed 10/10 and pilot trains |  |
| Check Rail Flangeway Width | Turnout |  | >49 mm - speed 60/65 and monitor49 mm to 48 mm– monitor39 mm to 38 mm – monitor<38 mm - speed 60/65 and monitor |  |
| Wing Rail Vertical Wear |  | 5 mm to 10 mm – monitor>10 mm - speed 40/40 and monitor |  |
| Crossing Nose Broken Down or Worn width(Within transfer length) |  | 15 mm to 20 mm – monitor21 mm to 25 mm – speed 40/40 and monitor>25 mm – speed 10/10 and pilot trains |  |
| Ineffective Bearers/Fasteners(In critical area) |  | 1 only – monitor2 consecutive – speed 40/40 and monitor>2 consecutive - speed 10/10 and pilot trains |  |
| Cracks in Cast Crossings |  | Partially cracked – MonitorFully cracked (not affecting running surface) – speed 60/65 and monitorFully cracked (affecting running surface) – speed 10/10 and pilot trains |  |
| Spacer Blocks |  |  Broken/cracked - monitor |  |
| Check Rail Bolts(Each Check Rail) |  | Loose – monitorMissing/Ineffective:≤2 bolts –monitor except for 60/65 speed 25 tonne 40/40 speed 30 tonne axle load traffic areas3 bolts– speed 60/65 except for 40/40 speed in 25 or 30 tonne axle load areas.>3 bolts – speed 20/20 and monitor |  |
| Crossing Bolts |  | Loose/Missing/Ineffective - record as defect and prioritise |  |
| Metal Flow(At crossing nose) |  | Report if crossing nose has metal flow |  |
| General | Ok/Not Ok | Comments |  | Ok/Not Ok | Comments |
| Response assessment by competent person |
| Drainage |  |  | Stock Rails (1) |  |  |
| Bearers/Fasteners |  |  | Check Rails (1) |  |  |
| Ballast |  |  | Other Rails (1) |  |  |
| Track Geometry (2) |  |  |  |  |  |
| Catchpoints | Ok/Not Ok | Comments |  | Ok/Not Ok | Comments |
| In addition to Points and General sections above |
| Throw Off Rail |  |  | Derail Block |  |  |
| BEARERS REQUIRED (Optional) |
| 2.8m | 3.0m | 3.2m | 3.4m | 3.6m | 3.8m | 4.0m | 4.2m | 4.4m | 4.6m | 4.8m | 5.0m | 6.0m |
|  |  |  |  |  |  |  |  |  |  |  |  |  |

Notes:

1. Reporting of rolling contact fatigue (RCF), rail squats, wheel burns and corrugations which will require appropriate repair / renewal action
2. If the Track Geometry is assessed above as “Not ok” or the turnout has been determined as high risk, a manual assessment of track geometry parameters using form ETE0301F-04 Manual Recording of Gauge, Play & Superelevation in Points & Crossings is required.

\* “Monitor” means at an appropriate increased frequency compared to the current inspection

\* Responses are default actions pending appropriate repair / renewal action

\* If the cause of a defect is known, and it is known that it will not deteriorate into an unsafe condition an alternate response to that shown is permitted with appropriate documentation

Name of Inspector: Signature: