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RAILINFRASTRUCTURE CORPORATION

Discipline
Rolling Stock Engineering Standard

Category
Inspection

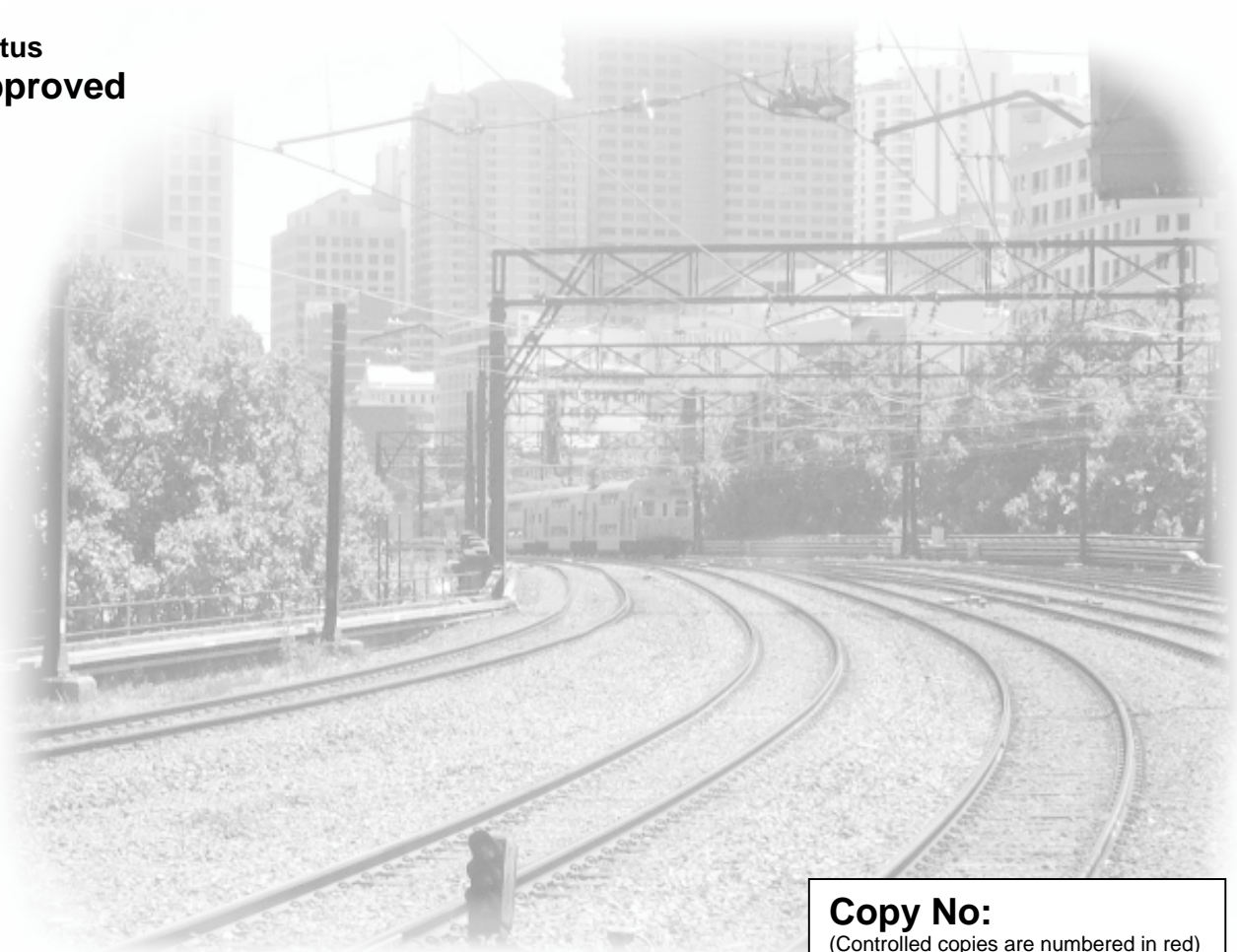
Title
FULL TRAIN INSPECTION (FX1)

Reference Number
RSS 0012

Version
1.1

Date of Issue
July 2004

Status
Approved



Copy No:
(Controlled copies are numbered in red)

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About This Standard

This procedure for examining general freight trains is based on general requirements set out in SWU 186 and 191.

With the cancellation of the Safe Working Units in December 2002, Operators were required to have procedures for train inspections. The full train inspection replaced the FX1 train examination.

This Standard complies with the requirements of Section 6, Train Inspection in the General Instruction Pages of the Train Operating Conditions (TOC) manual and Network Rule NTR 402 Inspecting Trains.

Refer to RSS 0013 for General Train Inspections (previously FX2 Examinations).

Version History

Version 1.0

First issued 2003

Draft 1 numbered RSS 0017

Draft 2 renumbered as RSS 0012

Version 1.1 July 2004

Requirement for all vehicles to have operative air brake added. Limits of unbraked vehicles added.

Warning re straddling the rail added.

Requirement for wheels on train to be chocked when using ground air plant added.

Note re releasing handbrakes added.

Items to check when proceeding to the rear of the train expanded.

Note re only trained persons to conduct HP grade inspections added

Table of brake holding times added.

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1 Scope

This procedure for inspecting Rail Infrastructure Corporation trains is based on general requirements set out in of Section 6, Train Inspection in the General Instruction Pages of the Train Operating Conditions (TOC) manual and Network Rule NTR 402 Inspecting Trains.

The full train inspection replaces the FX1 train examination.

Examiner/maintainers are to inspect trains according to this standard.

For trains requiring a HP Grade Inspection, the additional procedures in Section 10 are to be carried out in addition to the full train inspection.

All vehicles on a train should have the air brake cut in and operating.

Where it is not possible to repair the air brake on a vehicle, the maximum number of vehicles with air brake cut out is one in ten vehicles, or not more than ten per cent of the gross load of the train. Any vehicle with air brakes cut out must have a vehicle with operative air brakes marshalled either side of it, and must not be one of the last three vehicles of the consist or the first vehicle attached to the locomotives. If the train is to be run around, any vehicle with inoperative air brakes must not be marshalled in the first three vehicles of the consist.

2 Air Supply

A train inspection can be carried out with a locomotive attached to the train or by using a ground air plant.

2.1 Air supplied by a locomotive

The locomotive must have a qualified person present to operate the brakes. Any locomotive may be used to carry out the train inspection. The brake pipe must be set at 500 kPa.

2.2 Air supplied by a ground air plant

Ground air plants must have brake pipe pressure regulated to 500 kPa and be fitted with isolating cocks that can charge the brake pipe, exhaust the brake pipe and isolate, without exhausting, the brake pipe. A pressure gauge must be fitted to the ground plant suitable for carrying out brake pipe leakage tests.

3 Safety First

The main danger to inspectors/examiners while inspecting trains is the possibility of the train being moved during the inspection. Inspectors/examiners can assist in their own protection by:

3.1 Examination using locomotives

- Ensure a red flag is placed on the independent brake handle
- Ensure the driver enters and signs the brake pipe leakage section of the certificate before the inspection commences
- Keeping alert during the inspection by listening for unexpected brake releases or coupler take up noise or any unexpected train movement.
- Not placing any part of your body straddling the rail.

3.2 Examination using ground air plants

- Ensuring the road where the inspection will take place is protected according to local requirements.
- Placing red flags on couplers according to local requirements.
- Keeping alert during the inspection by listening for unexpected brake releases or coupler take up noise or any unexpected train movement.
- Not placing any part of your body straddling the rail.
- Ensuring that the train is correctly secured with handbrakes.
- Chock the wheels.

4 Equipment required

- Examiners safety flag
- Tools as required
- Continuity tester
- Radio (in most locations)
- Watch
- Book of train inspection certificates
- Green, Orange & Red Tickets as applicable
- Pen
- Torch (if required)

5 Basic Procedure

Each train inspection consists of the following procedures:

- Brake pipe leakage test
- Apply brakes by fully exhausting the brake pipe
- Proceed to rear of train inspecting wagons with brakes applied
- Check brake holding of rear wagons
- Signal for brakes to be released
- Proceed to front of train inspecting wagons with brakes released
- Complete paper work

6 Brake pipe leakage test

Train inspections must commence with a brake pipe leakage test. The results of this test gives the examiner/maintainer a good indication of the state of the train in regards to air leakage. A high figure means that there is likely to be one or more reasonably large air leaks on the train. It should be noted that as the test is carried out with the brakes applied, any air leakage could be from the brake pipe, brake cylinders or valves.

6.1 Brake pipe leakage test with locomotive

When a locomotive is being used to carry out the train inspection it is the responsibility of the driver to carry out the brake pipe leakage test. In this case, the examiner/maintainer must give the driver the Train Inspection Certificate book in which the driver will write the amount of brake pipe leakage. This must be verified by the driver signing beneath the leakage rate.

The brake pipe pressure must not have dropped by more than **35 kPa/minute**.

If the brake pipe leakage is in excess of 35 kPa/minute the train must be inspected for air leaks and repairs carried out. A second brake pipe leakage test must be then carried out.

6.2 Brake pipe leakage test with ground plant

Examiners must carry out their own brake pipe leakage test as follows:

- Charge brake pipe to 500 kPa
- Reduce brake pipe pressure to 350 kPa by opening the brake pipe exhaust cock
- Isolate brake pipe from air supply
- Wait one minute
- Note brake pipe pressure
- Wait a further minute
- Note brake pipe pressure
- The brake pipe pressure must not have dropped by more than **35 kPa/minute**.
- Write leakage rate on certificate if not excessive

If the brake pipe leakage is in excess of 35 kPa/minute the train must be inspected for air leaks and repairs carried out. A second brake pipe leakage test must be then carried out.

6.3 Apply brakes by fully exhausting the brake pipe

The brake pipe pressure must be fully exhausted to apply the brakes. The brake pipe exhaust must be kept fully open while each wagon is checked for brake application. (This is to ensure that air pressure can not build up in the brake pipe during the test.)

6.4 Locomotive(s)

The driver is to place and leave the brake valve handle in the emergency position.

6.5 Ground air plants

The examiner is to open and leave open the brake pipe exhaust cock on the ground plant.

7 Proceed to rear of train inspecting wagons with brakes applied

Walk from the front to the rear of the train (normally on the driver's side of the train).

For trains attached to a locomotive, release handbrakes from side where handbrake chain can be observed.

Visually check each vehicle for the following (see notes for details):

General

- Vehicle maintenance is within the required date (see note a)
- Loading and lashing are secured

Air brake equipment

- Brakes are applied. (see note b)
- Piston travel is within allowable limits. (see note c)
- Brake block alignment and thickness is correct. (see note d)
- Load compensation is correctly set. (see note e)
- Where fitted, grade control valve are correctly set. (see note f)
For HP grade examinations place grade control valves in HP.
- Coupling hoses are correctly coupled and appropriate coupling cocks opened. Coupling hoses are not damaged or perished.
- All safety loops are in place and in good condition.
- Condition of pins and cotters. (see note g)
- Check the following items for adjustment, security and condition:
 - brake cylinder(s) and reservoirs.
 - variable volume device and safety valve.
 - grade control valve and empty load valve.
 - release valve and operating chain or wire.
 - slack adjuster and fittings.
 - brake rigging levers and bushes.

wagon equipment

- Automatic couplers are secured and in correct engagement. (see note h)
- Wear in coupler knuckles and wear plates and fractures in coupler shanks and yokes.
- Security of coupler and draftgear carrier plates.
- Release levers and brackets in good condition.
- Wagon equipment is checked for adjustment, security and condition as applicable.
- Centre sills, side sills, end sills and staunchions.
- Side bearers and side bearer clearances.
- Step, handrails and ladders.
- Doors, twistlocks and trailer hitches.

bogie and wheel equipment

- Wheel condition to be checked. (see note i)
- Bogie springs not broken, sagging or missing.
- Ride control equipment.
- Friction wedges (see RSS 0040) and other damping devices and other specialised bogie equipment.
- Bogie frame.
- Bolster.
- Axles and wheel profiles.
- Roller bearing end caps, seals, backing rings, axle box plugs, adaptors and hornstays.
- Loose axlebox or loose horn cheek wear liners.
- King and queen castings. (minimum clearance 3 mm)

Notes:-

- a) If out of date, green ticket wagon and notify the Manager Train Operations Unit.
- b) If brakes are found released it does not necessarily mean that the brake are not operational. Released brakes near the front of the train, however, should be viewed with suspicion. Where brakes are found released, make a note of the wagon number and when returning to the front of the train, make a local reduction on that wagon to ensure that the brake does operate.

- c) The correct piston travels are:
- | | |
|--------------------|------------------|
| Relayed brakes | 75 mm to 150 mm |
| Non relayed brakes | 150 mm to 200 mm |

Where pistons are outside these limits, the travel should be re-adjusted, if possible towards the lower end of the above ranges, otherwise ticket the wagon for attention. When piston travels are considered excessively long or short, the brakes should be cutout and the wagon included as a cutout.

Where a piston is found at maximum stroke, it would be probable that the air brake and the handbrakes would be inoperable. If the fault cannot be corrected and the handbrake is inoperative, the appropriate operations officer must be informed that the wagon has no handbrake.

- d) Blocks must be correctly aligned with the wheel treads and be above the minimum acceptable thickness for the distance and the gradients over which the train must travel and, in any event, **not less than 10 mm at the thinnest point.**
- e) Manual empty/load valves must be placed in the loaded (L) position when the payload exceeds 20 tonne otherwise the valve is to remain in the empty (E) position.
- If a wagon has a number in the square on the code plate of the wagon, this number is to be used instead of 20 tonne.
- f) Grade control valves, if fitted, are normally carried in the EX position.
- g) The correct types and sizes of pins, cotters and clips must be used. R-clips, grip-clips and lynch pins must not be used below the axle centreline. All pins should be installed with the head at the top. Split pins should be opened out to 60 degrees.
- h) The difference in height of adjacent coupler knuckles must not exceed 140 mm or one-half the depth of the knuckle. If the difference in height between the connected knuckles exceeds this requirement, the wagons must be remarshalled. If the height cannot be corrected by remarshalling the wagons, the wagon with the lowest coupler must be detached and reported as unfit to run.
- i) Wheel defects are shown in RSS 0030 Wheel Defect Manual.

8 Check brake holding of rear wagons

When you arrive at the last three wagons of the train:

- Carry out a brake holding test by checking that the brakes are applied on the last three wagons (or all wagons if there is less than three wagons on the train). See Table 1 for minimum holding times.

Length of train including locomotives (metres)	Minimum brake holding time (minutes)
Up to 100	13
101 to 200	16
201 to 300	19
301 to 400	22
401 to 500	25
501 to 600	28
601 to 700	31
701 to 800	34
801 to 900	37
901 to 1000	40
Over 1000	40 plus 3 minutes for every addition 100 metres

Table 1 Minimum Brake Holding Times

Check that the brake blocks on these wagons are firmly against the wheel treads and the handbrakes are operable.

- If required carry out an extended brake holding test by waiting the required time before checking that the brakes are applied on the last three wagons.
- If the train requires a holding test on the leading three wagons, request the driver (or, in the case of an inspection using a ground air plant, a competent yard employee) to check and confirm that the brakes are applied on the leading three wagons and the handbrakes are operable.
- Attach continuity tester to rear brake hose and open coupling cock.
- If one of the last three vehicles fails the holding test, check that the brakes on the 4th, 5th or 6th last vehicle re still applied/
- Signal for brakes to be released.
- Ensure brake pipe pressure builds up to at least 425 kPa.
- Enter the code and number of the last three wagons on the train inspection certificate.

9 Proceed to front of train inspecting wagons with brakes released

If the continuity tester belongs to the locomotive leave attached to rear brake hose.

Walk on opposite side of the train, if possible.

For trains attached to a locomotive, release handbrakes that have not been released.

Visually check each vehicle for the following:

- Air brakes are released, except in the case of HP Grade Inspection. See below.
- Brake block alignment and thickness is correct
- Grade control valve, where fitted, are correctly set
For HP grade inspections place grade control valves in IP and ensure brakes release
- Wagon equipment is checked for adjustment, security and condition as applicable
- Loading is secured
- Repair any audible air leaks.

10 HP Grade Inspection

This inspection is to be carried out in conjunction Sections 7, 8 and 9.

If the train has at least 80 % of the wagons fitted with fixed exhaust chokes, a HP grade inspection is not required.

Note: A HP Grade Inspection must only be carried out by staff specifically trained to conduct HP Grade Inspections.

10.1 Proceeding to the rear of the train

While inspecting each vehicle of the train, set the grade control valve to the “HP” position.

10.2 Proceeding to the front of the train

Before proceeding from the rear to the front of the train, wait two (2) minutes after the triple valve/distributor valve is heard to operate to release the brakes.

Proceed towards the front of the train placing the grade control valve on each vehicle in the "IP" position facing the locomotive and wait for an audible blow of air to be heard indicating that the brakes have released.

If the air brake on or more vehicle releases before the grade control valve has been tested, either re-apply the brake locally or ask the driver to re-apply and release the brakes so that the grade control valves can be tested.

11 Complete paper work

If a brake holding test was successfully carried out on the leading three wagons, write the wagon code and number on the train inspection certificate.

Also write on the certificate the code and number of any wagon with air brakes not working or cut out. Ensure that the train does not exceed the allowable cutouts i.e. 1 in 10 wagons or 10% of trailing load. Any vehicle with air brakes cut out must have a vehicle with operative air brakes marshalled either side of it, and must not be one of the last three vehicles of the consist or the first vehicle attached to the locomotives. If the train is to be run around, any vehicle with inoperative air brakes must not be marshalled in the first three vehicles of the consist.

If a HP Grade Inspection was carried out, write on the Certificate the code and number of any vehicle with inoperative grade control valve. Ensure that the number of vehicles with inoperative grade control valves does not exceed 1 in 5 wagons or 20% of the trailing load.

Train inspection with locomotive

- Sign the certificate and hand book to driver to sign.
- Ensure driver takes the top two copies with the white copy remaining in the book.
- Retrieve red flag from driver

Train inspection with ground plant

- Sign the certificate
- Remove the top two copies and leave in location as per local arrangements.
- Remove wheel chocks.
- Remove any protection placed on the train as per local arrangements.

12 Reference Documents

12.1 RIC Standards

OS 001 IM	Train Operating Conditions manual
NTR 402	Network Rules, train working, inspecting trains
RSS 0001	Minimum Operating Standards for Rolling Stock
RSS 0010	Wagon Maintenance & Inspection Policy
RSS 0011	Wagon Maintenance Policy (1996)
RSS 0013	General Train Inspection
RSS 0020	Inspection of Steps & Handrails
RSS 0030	Wheel Defect Manual
RSS 0040	Inspection of Freight Bogies
RSS 0050	Inspection of Drawgear on Freight Vehicles
RSS 0060	Air Brake Maintenance
RSS 0061	Single Car Air Test
RSS 0063	Security of Brake Gear