Track Work Instruction 2B004

How to regulate ballast by hand

Introduction

This instruction covers the movement of ballast using hand tools.

See also the separate instruction:
TWI 2B006 How to treat wet beds

Competence

You must be competent to carry out this work.
See TWI 2G086 - Competence requirements.

Risks

The work is hard and hot weather can mean that the task takes longer than you think.

Check the weather forecast and allow sufficient time if high temperatures are forecast.

Ensure that there is an adequate supply of drinking water available to avoid dehydration.

The work can be noisy.

The work can get spread out over a large area. Keep the work group together.

Tools and Equipment

- Ballast forks
- Shovels

It is very important that you use the correct, traditional ballast moving tools - the ballast fork and the ballast shovel.

In 3rd rail electrified areas you must use insulated equipment.

If you need to move ballast any distance along the track – perhaps more than ½ length (approx 10m), then consider using ballast baskets on skates.

Always carry a rail thermometer with you.

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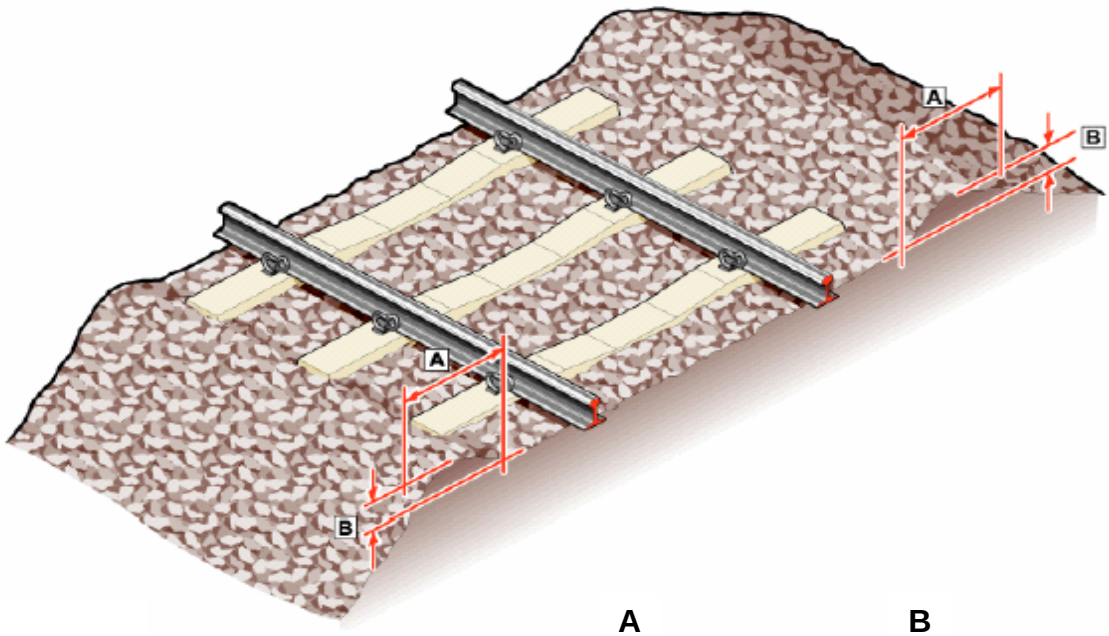
Method

Although it is sensible to start from one end and progress through a site, the areas with stone piled close to the rail must be cleared first, particularly if traffic is still running.

The final profile

The final profile for correctly regulated track is as shown in the diagram below. Bear in mind that the profile can vary for different track categories and sleeper types.

See Company Standard for the recommended values of dimensions A and B. Typical values at the time of writing are shown in the table below.



	A	B
Location	**Minimum width of shoulder (mm)** (1)	**Height of shoulder above sleeper top (mm)**
Straight track; curves over 2000m radius speed over 125 mph speed up to 125 mph	 450 375	125 in all cases
Curved track with radius 2000m or less	450	
Any discontinuity (2)	450	

Notes:

1. The width of the ballast shoulder is measured outside the sleeper ends, at sleeper-top level.
2. Discontinuities include insulated joints, adjustment switches, abutting toes of S&C, and catch points. The wider shoulder shall apply over not fewer than 10 bays each side of the discontinuity.

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Method continued

Care of cabling and signalling equipment

Make sure that everyone knows the location of cables - no matter how small they are. Take care to avoid damaging them with tools.

Always assume that they are all live!

Regulating around point machines and clamp locks

Take especial care when regulating around point machines, clamp locks and other signalling equipment.

It is important to make sure that the ballast profile is correct, but it is also important that none of the equipment is damaged or obstructed.

Get the signaller to try the points before you leave the site - just in case.

Before you leave the site

Before you leave the site you must ensure that there is no ballast left on the rail head, piled against the rails, over the fastenings or loose on the sleepers.

Ballast that is left on the rail head can damage the rail and prompt rough ride reports.

Problem solving

What if there is not enough ballast to achieve a full profile?

Concentrate your work on the sleeper ends and shoulders.

Arrange for someone to order and unload additional ballast as a matter of urgency.

The track must not be left in an unsafe condition. A speed restriction may be needed if the weather becomes hot.

What if there is too much stone?

If there is too much stone you must arrange for it to be cleared away from the track.

It may be possible to spread it on other tracks that may be short of ballast if protection is possible.

Pay attention to the level in four-foot and don't have a high shoulder that will damage 3rd rail equipment on trains. These can run on areas which are not electrified.

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Problem solving continued

What if work is halted before completion?

If work has to stop before you have completed all the regulating, you must make a note if any of the remaining places are short of ballast. Arrange for work on the site to be reprogrammed.

What if cables are damaged or bonds dislodged?

Cables and bonds can be damaged by hand tools. This can happen in poor lighting conditions or when staff are tired. Do not attempt to make a repair, but report the damage immediately.

What do you do about Signal rodding?

Make sure that signal rodding is not obstructed by ballast and that cranks are clear for their full sweep of operation. If you don't, there will be train delays - and these may occur after you have left site.

What if temperatures rise during the work?

Do not stop work, but make sure that you are boxing in the weakest sections of the track first. On no account should you remove ballast from standard shoulders to repair weak spots.

Make sure that whoever is responsible for the track is aware that the ballast profile is not yet to standard and that hot weather precautions will be necessary.