Track Work Instruction 2P040

How to shim a joint

Introduction

This Track Work Instruction explains how to shim rail joints in jointed track.
Shims are a useful method of extending joint life. They work by taking up the wear between the fishing surfaces of the rail and the fishplates. They cannot cure crippled rail ends or battered rail ends. They cannot be used to correct mismatched rail sections.

See also separate instructions:

TWI 2C001	How to change fishplates
TWI 2C020	How to replace a fishbolt
TWI 2C021	How to recognise fishbolt types
TWI 2C023	How to recognise fishplate types
TWI 2C024	How to recognise joint types
TWI 2G036	How to repair a dipped joint
TWI 2P003	How to lubricate fishplates
TWI 2P023	How to recognise seized joints
TWI 2P024	How to repair seized joints
TWI 2P025	How to recognise joint defects
TWI 2P027	How to maintain joints

Competence

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

Risks

Beware of trapping your fingers between the rail ends when the fishplates are released.

Avoid lifting the track off the bed if you need to move sleepers to allow fishplates to be released.

Track Work Instruction 2P040

How to shim a joint

Materials and Spares

Shims of varying sizes and lengths.

Make sure you have the correct shims. They are marked with the thickness.

Flatbottom shims have a wider slot from the end and are in two parts - one part for each side of the joint. They are left handed and right handed.

Bullhead shims are longer, with the slot over 2 bolt holes.

It is common for them to be cut in half because of different wear in the running on and off ends.

Lubricant oil for plate oiling and running the nuts back on.

Sacks or bags for removing small items of scrap from site at the end of the shift.

Tools and Equipment

1m straight edge
Shim gauge
Brush (for oil/lubricant)
Bars to open the plates or to move sleepers over to allow the plates to be released.
Hammers
Spanners: always take large spanners for easing the nuts, small spanners for running the nuts to end of the bolts.
Shovels or forks to remove excessive ballast
Thermometer
Pway tools for lifting and packing

Just in case

Take spare bolts and fishplates. When you release the fishplates, you may find cracks in the fishplates or bolts may be broken.

Sometimes a drift can be used to assist removing bolts.

Carry spare shims (of different thickness) ensuring an equal number of right hand and left hand.

Track Work Instruction 2P040

How to shim a joint

Method

Before you start

Visit the track in daylight. Check the overall track condition making sure that all fastenings are present and tight.

Joints must be packed before shimming using MSP or Kango equipment.

Shimming can only be carried out when traffic is stopped.

The plates need to be almost removed to fit some shims.

Shims have been known to drop behind the fishplates. The fishplates then have to be completely removed to retrieve them.

IMPORTANT! Shimming must not be used on insulated joints.

How to do it

Do not start if the rail temperature is at or likely to rise above 38^{O}C.

Measuring the joints

Measure the dip with the 1m straight edge and the correct gauge.

Place the straight edge on the rail head over the centre of the joint.

Fit the shim gauge under the straight edge approximately 3/4” or 18mm from the rail end. This gives you the approximate wear on the fishing surfaces.

Mark the size of shim you require on the head of the rail.

Note that the running off end may be less worn than the running on end.

Fitting the shims

Check the shims are correct; either bullhead or flatbottom and that they are the correct thickness.

Do not over compensate using thicker shims. You will bow the plates.

Run off the fishbolts to release the plates enough to slip the shims in between the fishplates below the railhead.

Putting the fishplates back on

See TWI 2C001 ‘How to change fishplates’.

Lubricate the fishplates.

Tighten up the bolts to the correct torque.

It can be difficult to tighten (draw in) the fishplates as the shims bed in. An assistant is often required to tap the fish bolt with a hammer as the nut is tightened to draw in the plate. Gradually tighten the nuts.

How to shim a joint

Method continued

Don’t tighten one all the way up before you start on the others.
Allow enough time to do this properly. Don’t over-tighten the nuts.

Before you leave the site

You must always re-pack the joint sleepers after shimming in case your work has caused voids to form.

Remove unused shims and discarded track components.

Clear the work site of all unwanted scrap. Bag it up and remove it from site.

Check the site from end to end that all fastenings have been tightened.

Check that no bond wires have been damaged.

Check that all bolts have been tightened.