PANDROL

2-hole DRS/SRS retrofit Vanguard

OPERATION MAINTENANCE MANUAL

001-03_B
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Contents

Summary

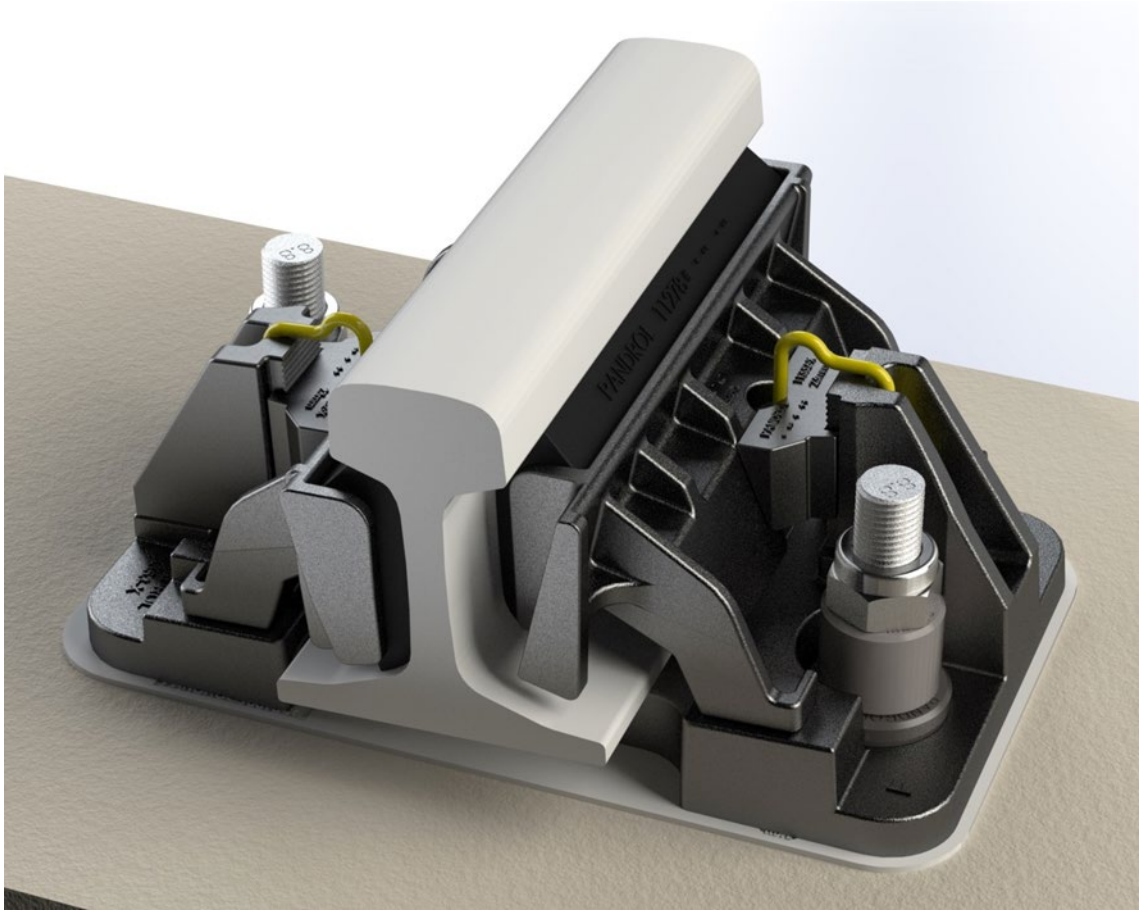
Pandrol Vanguard assemblies are suitable for fixing rail in situations where mitigation of ground-borne noise and/or vibration is required.

The low vertical stiffness of the assembly works with the suspended mass of the track and vehicles to reduce the transmission of vibration and impact forces to the support structure. Pandrol DRS/SRS retrofit Vanguard assemblies are tailored to suit the existing anchor position or suit common hole centres.

Pandrol Vanguard assemblies have been designed for long life and can be fully dismantled for inspection and maintenance purposes.

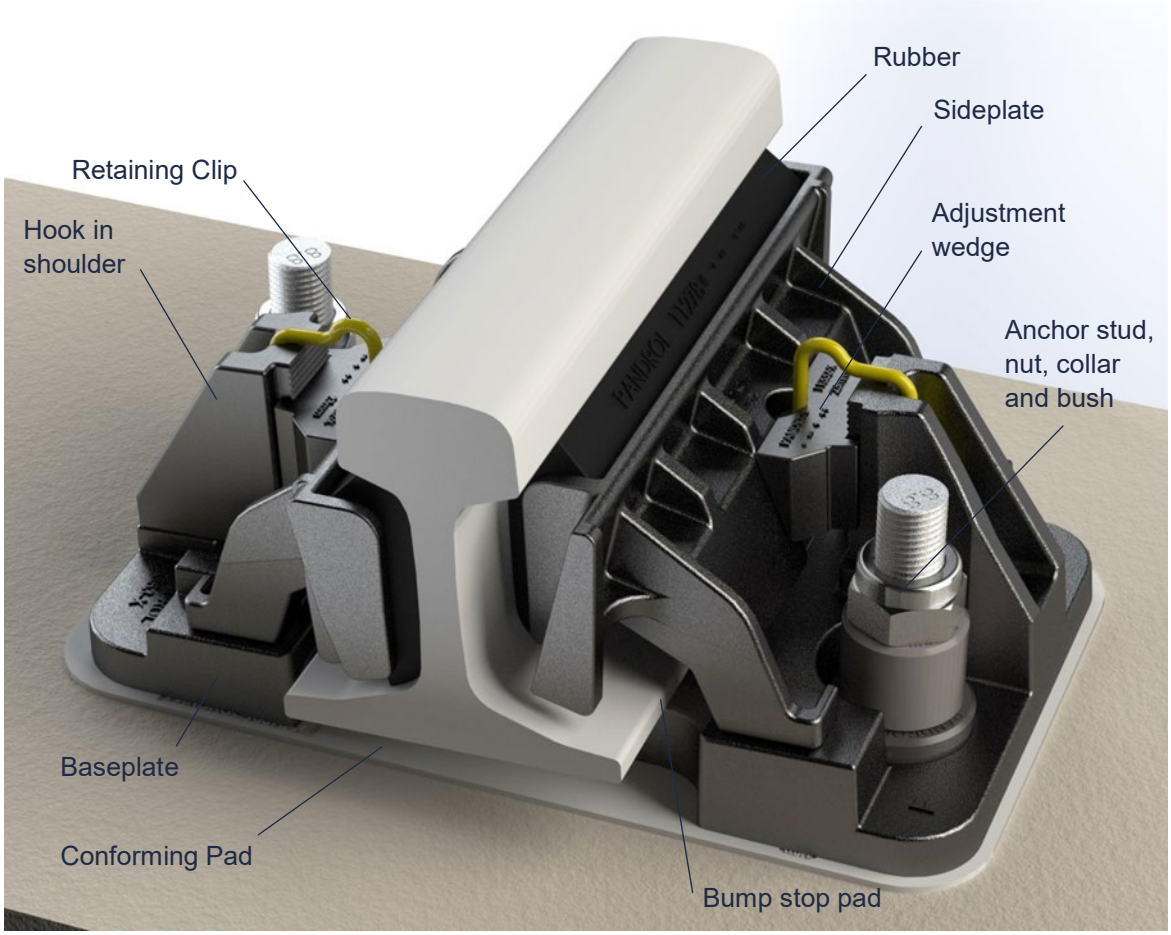
The product guide is to be read in conjunction with the product datasheet and any Pandrol drawing supplied. If required a full "*installation, inspection and maintenance manual*" for the DRS/SRS retrofit Vanguard system relating to your project, will be issued along with the product supply.

Figure 1: 2-hole DRS/SRS retrofit Vanguard



1. General description of Pandrol DRS/SRS retrofit Vanguard

Figure 2: Typical 2-hole DRS/SRS Retrofit Vanguard Assembly



Pandrol Vanguard system parts are supplied loose for assembly in-situ. Items such as anchor bolts, spring washers, nuts, and conforming pads are normally supplied in bags separately.

Table 1: Pandrol Vanguard component list

Component	Quantity	Part No.	Notes
VANGUARD baseplate	1	Refer to assembly drawing	Cast iron. Painted-Black
VANGUARD hook in shoulder	1		Cast iron. Painted-Black
Sideplate	2		Cast iron. Painted-Black
Adjustment wedge	2		Cast iron. Painted-Black
Rubber assembly	2		Natural rubber
Retaining clip	2		Sherardized– Powder coated Colour-Yellow

Component	Quantity	Part No.	Notes
Concentric bush	2		HVN, Colour-Black
Collar (spacer)	2		HVN, Colour–Blackor Steel
Bump stop pad	2		Natural rubber
Conforming shim	1		3mmLLDPE (White) or EVA (Black)
Anchor stud	2		Grade8.8 (Existing or New)
Nyloc nut	2		

*Quantities are per rail seat

Table 2: Technical Details

Detail	Comment
Static Stiffness (Typical)	5 kN/mm (typical)
Dynamic vertical rail deflection:	4.0 mm (typical)
Dynamic rail head lateral deflection	<1 mm (typical)
Clamping Force	> 15 kN per rail seat
Longitudinal Restraint	> 7 kN per rail seat
Electrical Resistance	> 25 kΩ
Standard Horizontal Adjustability	± 5 mm per rail seat*, (±10 mm total gauge adjustment)
Standard Vertical Adjustability	+12 mm per assembly*
Standard Fixing	2 xM27-M33 Anchor Studs
Rail Inclination	1:20, 1:30, 1:40 and non-inclined options as required applied by the baseplate

2. Assembly Method

The DRS/SRS retrofit Vanguard is assembled from a set of loose parts delivered to track, the images below gives a step by step overview of how the Vanguard system is assembled together, using the Vanguard clamp tool, standard track tools and a torque wrench and socket.

2.1 Bottom Up Construction

(For anchor studs already in place)

Figure 3: Ensure rail seat slab area is clean and the anchors studs are not damaged

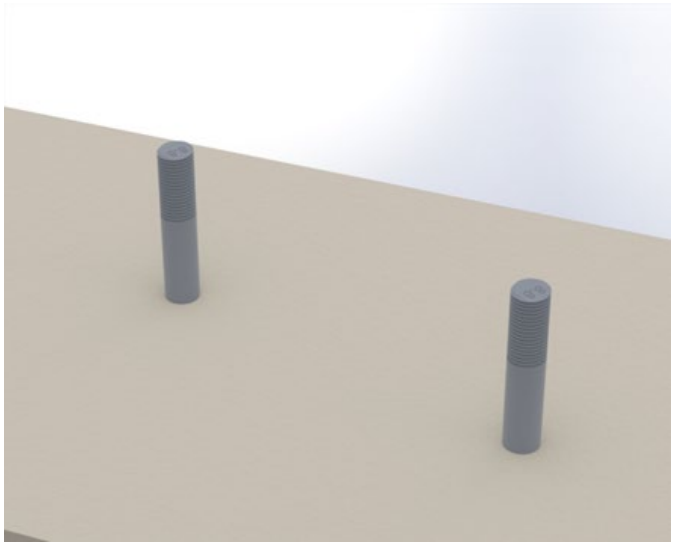


Figure 4: Fit conforming shim, height adjustment shims (if required) and baseplate.

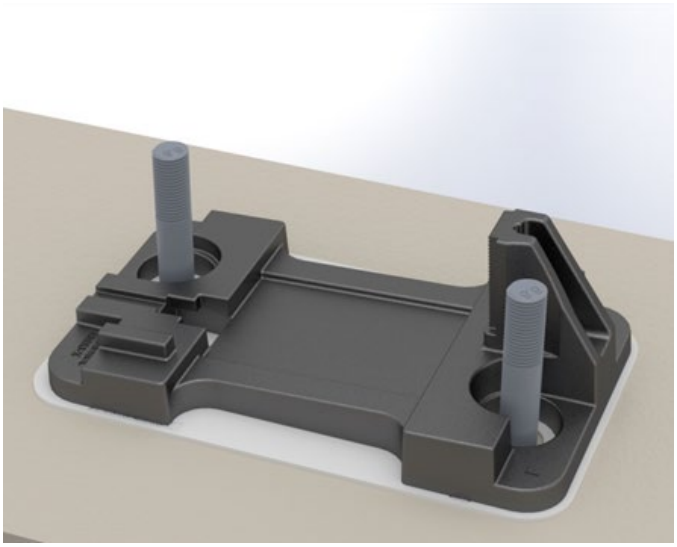


Figure 5: Fit anchors components (bush, collar and nut) and tighten to required torque.

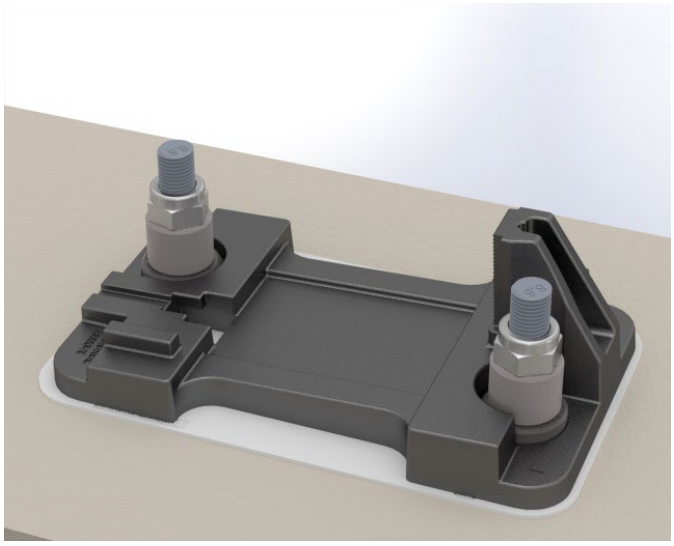


Figure 6: Fit rubber bump stop pad into the recess in the baseplate.

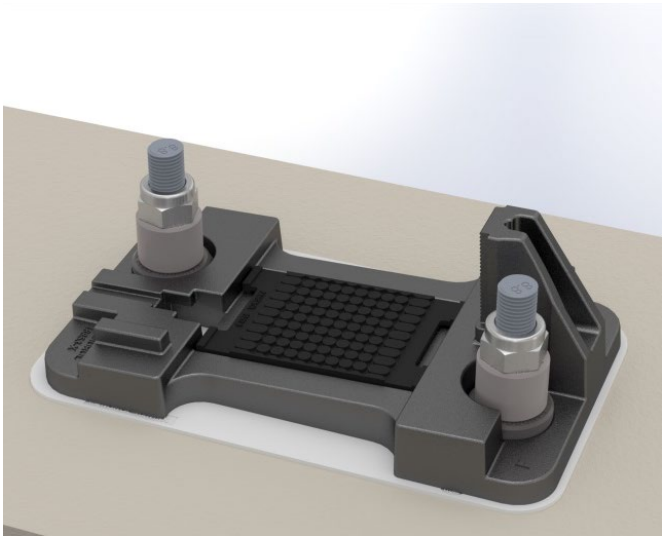


Figure 7: Position the rail

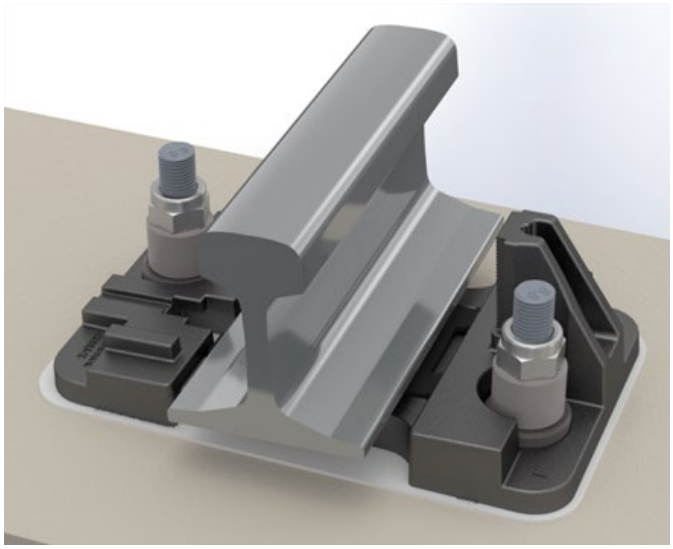


Figure 8: Fit the gauge side hook in shoulder, pre-assembly the side rubber into the sideplate, the both in the assembly, ensure rubber is fully in contact with the rail.

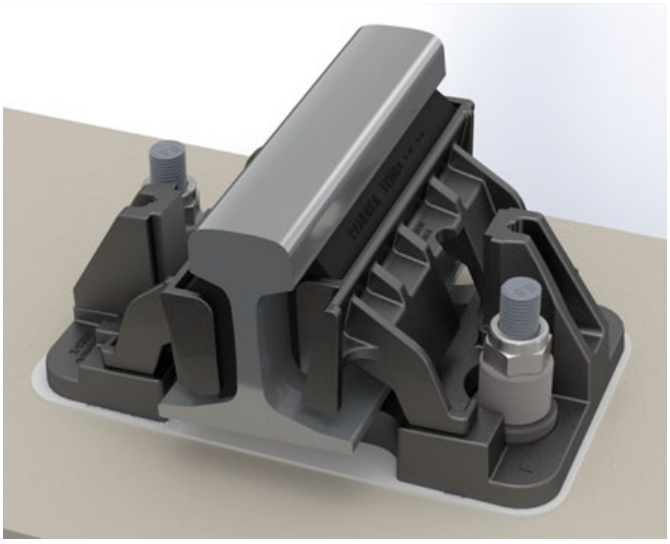


Figure 9: Drop adjustment wedges in place and apply the required force with the Vanguard clamping tool to lock wedge into position.

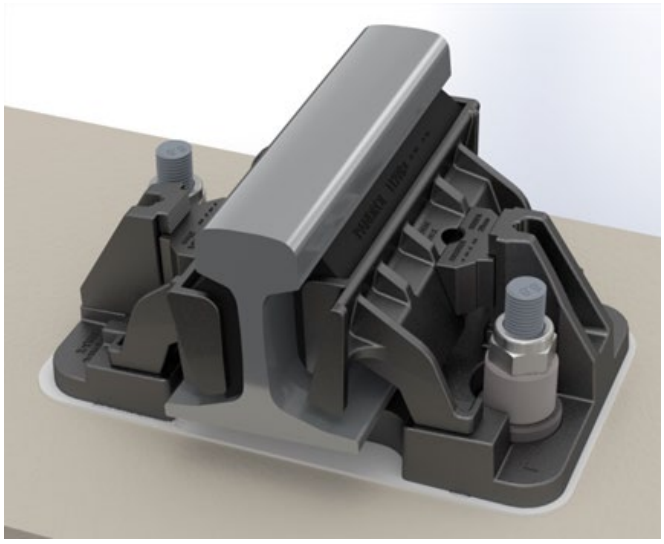
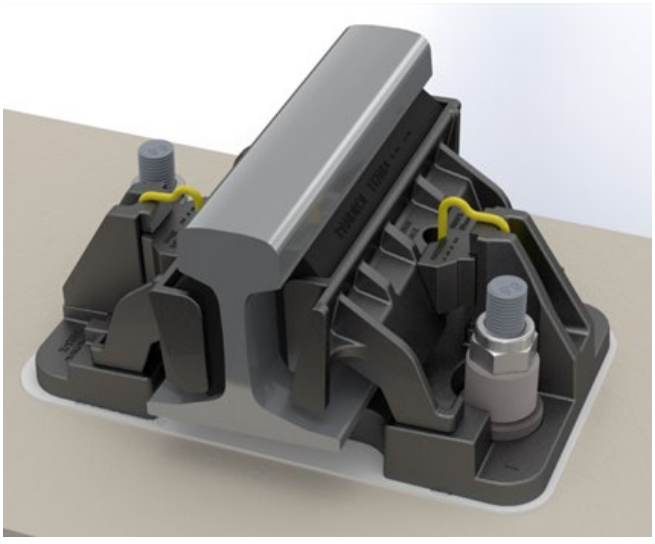


Figure 10: Fit Yellow retaining clips



3. Construction Method

Generally, the DRS/SRS Vanguard assembly will be retrofit either onto an DRS or SRS rail seat using the existing anchor studs (as for “Bottom Up” build), but if required the track can be built with the retrofit Vanguard assembly using a “Top Down” build method.

Type of Construction	Optimised	Alternative	Comment
Top down wet pour		✓	Optional methods exist
Top down drill/grout		✓	Glue in anchors
Precast block/sleeper		✓	Cast in splayed anchors
Precast plinth/slab		✓	Cast in splayed anchors
Booted sleeper		✓	Consult Pandrol
Retrofit existing system	✓		Existing anchor stud

3.1 Bottom Up

Using a either the existing pre-cast concrete slab/base structure or steel structure to support the track fasteners.

Figure 11:

3.2 Top Down

Figure 12: Direct concrete pour using either a construction shim or a slave plate

Figure 13: Direct concrete pour using a pre cast concrete element (block/sleeper)

Figure 14: Core drill and glue anchors into the base slab, along with building up the surface with a grout support.

4. Details of baseplate anchoring fastening

The DRS/SRS retrofit Vanguard baseplates are secured via a high tensile steel anchor stud grade 8.8 unless otherwise specified. The diameter of the anchor stud will range from M27 to M33 depending on track and track parameters. There are two types of anchor studs depending on construction methods for the DRS or SRS baseplate assemblies: cast in (direct pour and pre-casted blocks/sleepers) or glue in (existing or new slab). Both anchor studs types share the same anchor components above concrete level. For full details of the type and length of the anchor studs, refer to the DRS/SRS assembly drawings specific to the project.

Figure 15: Cast in (left) and glue in (right) anchor studs

5. Auxiliary Parts

The table below outlines the available shims required for vertical adjustment.

Component	Part No.	Notes
1 mm height adjustment shim	Refer to assembly drawing	Stainless steel
2 mm height adjustment shim		HDPE, Colour-Black
3 mm height adjustment shim		HDPE, Colour-Black
5 mm height adjustment shim		HDPE, Colour-Black
10 mm height adjustment shim		HDPE, Colour-Black

Figure 16: Plastic height adjustment shims

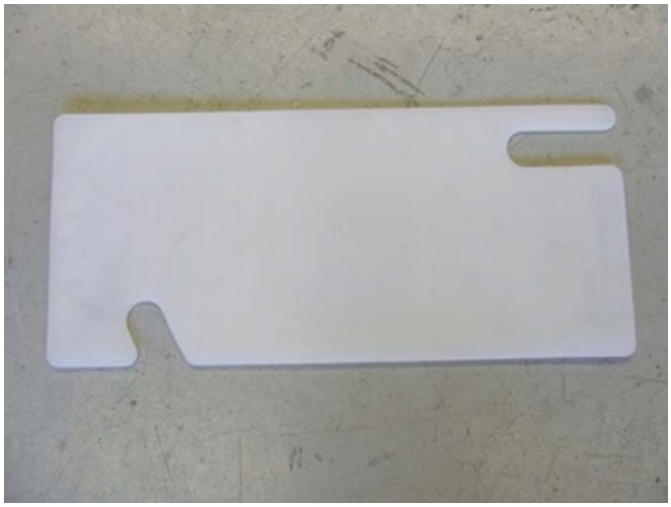


Figure 17: Steel height adjustment shims

6. Hand Tools

A Vanguard hand tools (supplied by Pandrol Ltd) will be required to install the Vanguard assembly. The hand tool has been designed with safety and ease of operation in mind. Hand tools are designed for use by one or two operators at a time.

In order to correctly assemble the Pandrol DRS/SRS retrofit Vanguard assembly, the following Pandrol Vanguard clamping tool should be used;

Component	Part No.	Notes
Vanguard clamping tool	AE17481	Extra wide asymmetric

Figure 18: Vanguard clamping tool (manual pump)

Figure 19: Clamping up in progress

7. Adjustment

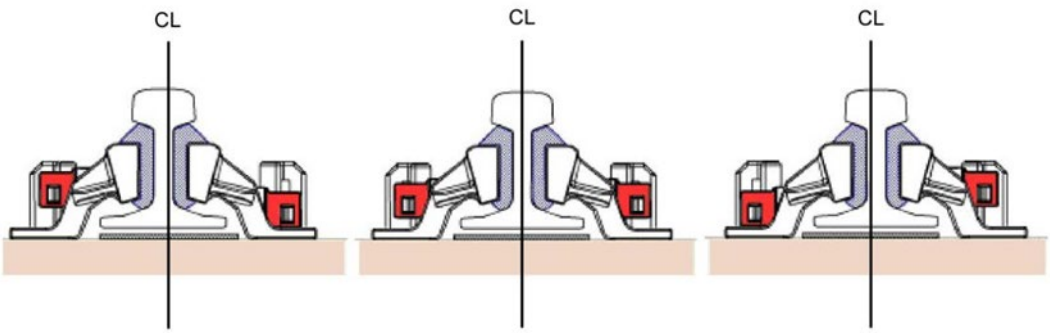
7.1 Vertical adjustment

Depending on the configuration of the VIPA DRS/SRS retrofit Vanguard assembly supplied (please refer to assembly drawing for full details), allows for up to +12 mm vertical adjustment per assembly by inserting shims between the baseplate pad and conforming or construction shim. The +12 mm vertical adjustment should always be achieved by using a maximum of three height adjustment shims only.

7.2 Lateral Adjustment

Lateral (or gauge) adjustment of the rail can be made using the adjustment wedges in the Vanguard fastening system rail seat. This can be done at either the installation or maintenance stage. The total scope of adjustment available is dependent on the Vanguard assembly supplied. Typically, +/-5 mm per rail seat is available. Pandrol recommend that any lateral adjustment should be done at baseplate level first, if available. At nominal design gauge both the adjustment wedges are supposed to be at the same height (refer to centre diagram), assuming all components, rails and track gauge are at nominal dimensions. To increase the track gauge the adjustment wedge on the gauge side will be lower than the field side adjustment wedge (refer to left hand diagram). To decrease the track gauge the adjustment wedge on the field side will be set lower than the gauge side adjustment wedge (refer to right hand diagram). Locking wedges set at differing heights provide lateral adjustment at rail seat level

Figure 20: Simplified rail seat lateral adjustment diagram



8. Inspection

It is recommended that a visual inspection is carried out every 3 months or as part of the standard maintenance regime of the maintaining organization. This inspection can easily be undertaken while inspecting other track member components such as rail or concrete slab. A visual assessment should include the inspection of all the fully or partially visible components of the assembly.

At times of major work, (such as a rail change), it is possible to dismantle the Vanguard completely assembly for full inspection and, if necessary, replace individual parts. There is no need to remove the full assembly from track to undertake this operation, unless otherwise required

Component and observation:	Action to be taken:
Cast Baseplates	
Broken baseplate	Replace baseplate
Cracked baseplate	Replace baseplate
Corroded baseplate	Monitor, replace if severe
Cast Side Support Bracket	
Broken bracket	Replace side plate
Cracked bracket	Replace side plate
Corroded bracket	Monitor, replace if severe
Cast Hook in Shoulder	
Broken shoulder	Replace shoulder
Cracked shoulder	Replace shoulder
Corroded shoulder	Monitor, replace if severe
Cast Locking Wedge	
Broken wedge	Replace wedge
Cracked wedge	Replace wedge
Corroded wedge	Monitor, replace if severe
Rubber Wedge	
Loose wedge	See section 8A
Worn wedge	Monitor
Bump Stop Pad	
Worn pad	Monitor
Missing pad	Fit pad
Retaining Clip	
Loose clip	Tap back into correct position
Broken clip	Replace clip
Missing clip	Fit clip
Corroded clip	Monitor, replace if severe
Anchor Bolt Assembly	
Loose part	Re-tighten assembly to adequate torque setting
Broken/damage part	Replace part
Missing part	Fit part
Baseplate Height Adjustment Shim	
Misaligned	Reposition
Broken/damage part	Replace part

9. Maintenance

9.1 General Track Maintenance

Maintenance features

- Gauge adjustment of ±5 mm per rail seat.
- Height adjustment up to +12 mm. (Depending on configuration)

The Pandrol Vanguard assembly is designed for long life and under normal operating conditions it should not require maintenance for many years. The modular construction of the Pandrol Vanguard baseplate assembly allows for simple dismantling and replacement of components, should the need arise. The assembly can be easily dismantled using a Vanguard clamping tool and basic hand tools, allowing easy replacement of parts within short engineering access hours. All spare parts are available directly from Pandrol Ltd.

In isolated cases, the replacement of damaged, corroded or missing components is not urgent and can be scheduled into the normal maintenance routine of the track maintainer. However, if these issues are apparent over a significant number of assemblies in close proximity to one another, the cause should be investigated and then the problem should be addressed as soon as possible.

10. Track Issues

Consideration should be given to the following which may be during installation and/or required prior to the installation of Vanguard into track, thus preventing issues or delays occurring. Pandrol can supply more information on any of the subjects on request.

- Track Stiffness Transitions
- Rail Welding
- Rail Joints Bars
- Check and Guard rails
- Rail Lubricators
- Rail Expansion Switches
- Rail Induction cables
- Existing rail welds in track
- Damage or Broken Anchor stud
- Grouting beneath a Baseplate assembly
- Concrete surface beneath a Baseplate assembly

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