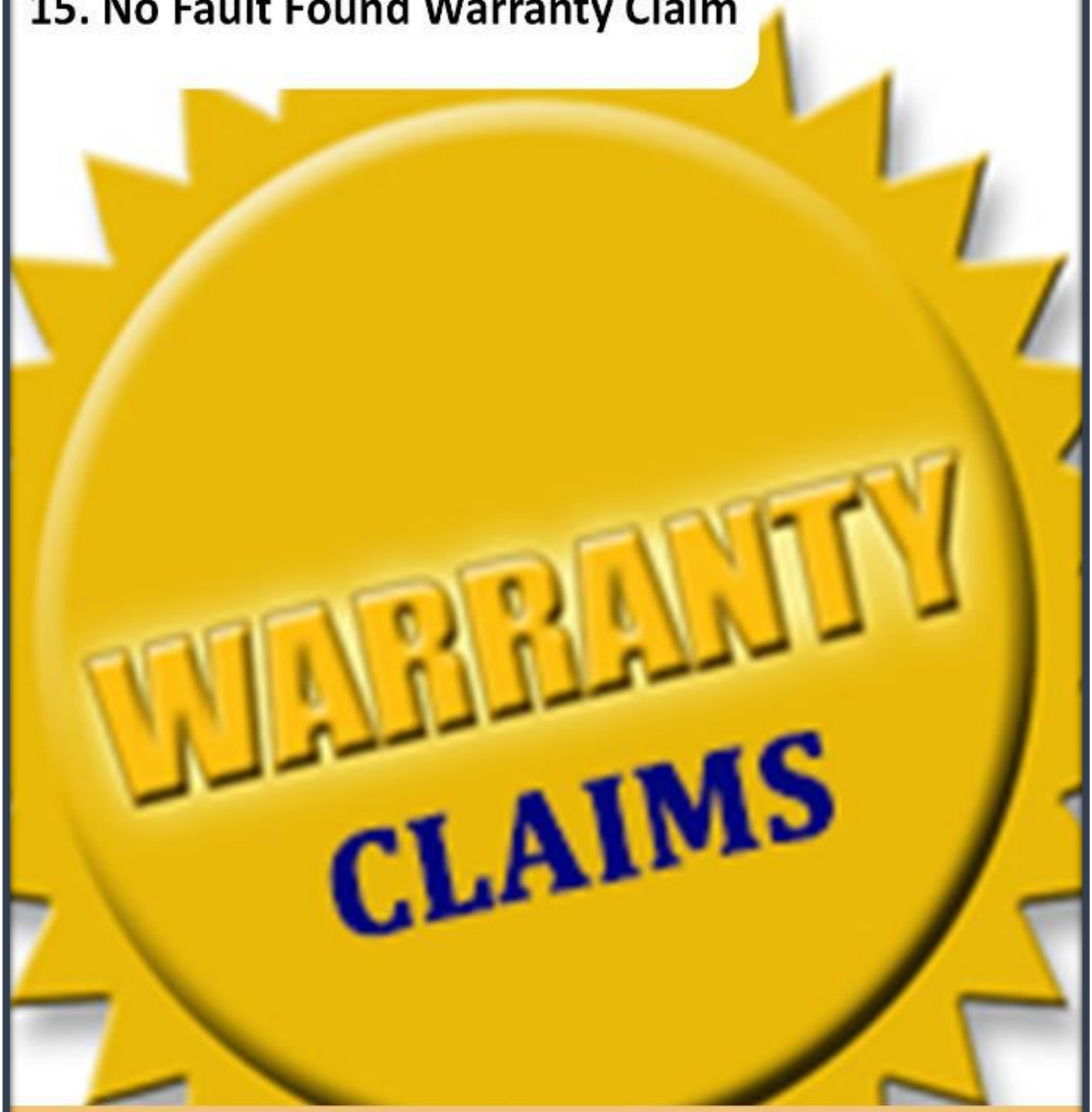
15. No Fault Found Warranty Claim



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15 No Fault Found Warranty Claims

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There is a perception in the industry that these events occur too often, taking up limited time/resources across a number of different companies without ever reaching a satisfactory conclusion as to why the fault occurred in the first place. It is difficult to quantify the service impact of these events due to the way data is currently collected and stored but it is good practice to reduce the number of No Fault Found (NFF) events to an absolute minimum.

In order to understand why this issue occurs, it is necessary to understand the process which underpins warranty claims, the stakeholders involved and the environment in which this process is implemented. Only then is it possible to identify the individual causes of NFF diagnoses and then develop good practice guidance which, if implemented, will help to reduce the number of said warranty claim diagnoses.

15.1 The process

Table 15.1 is a simplified representation of the warranty return process for components where the supplier finds no fault. (N.B.: this process is not completely standardised across the rail industry).

Occasions where the TOC disputes the outcome of the warranty claim and repairs outside of warranty are separate processes not detailed in this chapter.

Table 15.1: The High-Level Warranty Claim Process

Step	TOC Operations	TOC Fleet or Train Maintainer	Logistics Company	Supplier or Overhauler
1	Train Defect Occurs			
2		Faulty Component Alleged		
3		Receive New Component → Fitted to Affected Train	Organise Component Assessment	
4				Component Tested OR Component Stripped & Inspected
5			Organise Component Return	
6		NFF Report Accepted	Component Placed in Common Pool	
7		Component Fitted to a Vehicle		

Commercial agreements between companies and fleets differ, making detailed application of the process more complex, but commercial agreements should identify information to be shared up and down the supply chain.

It is important to consider the wider context of managing component failures and how they can affect other parties not involved in managing the specific failure. For example, use of common component pools means that the TOC receiving the returned component may not be the one that sent it for testing and will not have a full understanding of the component's reliability history.

15.2 The issues and good practice

By understanding the specific issues which cause warranty claim NFF diagnoses, it is possible to identify good practices to reduce them. These are described below in more detail.

15.2.1 Behaviours and working practices

- Warranty management is not applied consistently across the industry and may sometimes be overlooked. It is good practice to place sufficient emphasis on warranty management and ensure it is a critical part of managing fleet reliability (e.g. ensuring warranty-related issues are routinely discussed at reliability meetings).
- Whilst contractual warranty terms are all different, it is important to review these prior to the start of a new franchise to ensure that they are optimised and not simply copied across to a new contract.
- Mistrust between the TOC and the supplier can foster a strictly contractual relationship. This may lead to more NFF diagnoses as they do not openly share all failure information for fear of being held responsible. It is critical for TOCs and suppliers to develop collaborative working relationships to improve the quality of failure investigations, e.g. by having regular meetings focussed on the common goal of identifying and resolving technical issues.
- Pressures to deliver a reliable service may lead to components being replaced as a preventative measure. These may then be returned to the supplier for further investigation without having validated whether the component was faulty. It is good practice to quarantine suspected components to see if the fault re-occurs, prior to returning it to the supplier.
- TOCs should avoid having a 'change it' culture (this may not apply to the whole fleet team and could be shift- or depot-specific). Efforts should be made to ensure that technical flow charts used for fault-finding do not exacerbate this issue. Warranty managers should work to identify those teams who are quick to change and return components by analysing the volume of claims they process and the number of components being returned for an individual failure.

Example: VTEC hold monthly technical and commercial meetings with suppliers to discuss the main issues affecting the fleet and provide a regular forum to work together towards resolution.

Example: Virgin Atlantic has a system whereby if a failure occurs which could be caused by a number of different components, they first change the component most likely to have been at fault and place it in quarantine for a set period of time. If the failure does not re-occur in that time, the component is returned to the manufacturer for diagnosis. If the failure does re-occur, the component is assumed to have not caused the failure and the next most likely component is removed and placed in quarantine.

15.2.2 Time taken to resolve issues

- There is a perception that it takes too long to investigate alleged component failures. It is difficult to quantify the validity of this perception due to the diversity of warranty SLAs. It may be that TOCs and suppliers have a slightly different interpretation of an SLA (e.g. whether the clock starts ticking from the moment the TOC sends off the faulty component or when the logistics company or supplier receives it). It is also important to understand that not all components are treated equally by logistics companies. Those with immediate demand or safety stock levels will be returned for repair immediately, otherwise the broken component may be stored in a warehouse awaiting future repair. It is therefore good practice for TOCs and suppliers to agree a common definition of terminologies and measure compliance against a set of agreed KPIs.

- The length of time taken to agree a failure diagnosis where there is a limited shared float available can result in availability/reliability issues at other TOCs not involved in the original failure. Pressure to conclude these matters may result in basic failure investigations and more NFF diagnoses in order to return the component to the common pool. RoSCos should be familiar with overhaul spares floats and logistics companies likewise with maintenance spares floats. Limited floats become a greater issue at times of overhaul and need to be proactively managed (*see Section 17 Overhaul Management).*
- Logistics companies can identify limited floats using critical spares and obsolescence forecasting; they should forecast maintenance activities to identify peaks and troughs so that limited floats can be managed proactively.
- When fleets are cascaded among different TOCs it is good practice to consider the impact this may have on component floats.
- It is good practice to identify required component floats upfront when introducing new fleets.

15.2.3 **Trend identification and information sharing**

- There is no common view of component failures across all companies involved. Each company will maintain their own asset management systems which only show part of the story. Therefore no one has an overview from NFF component diagnosis to impact on the train service. Poor flow of information from end supplier to the TOC can result in a component being returned to a common pool without the new TOC being aware of its history, or without the TOC who returned the component finding out the failure diagnosis. Shared systems can help to create a more joined-up asset history with a clearer view from root cause to passenger impact.
- TOCs routinely analyse their failure data to identify the worst performing units and systems and repeat failures. However, issues may be identified sooner if these types of analyses are routinely shared with other TOCs who operate similar fleets. TOCs with common fleets should take part in regular fleet user groups to identify common faults and work together to reduce their occurrence.
- It is difficult for TOCs to identify repeat NFF for some components as not all components have serial numbers and generally no one TOC has a complete view of the component's reliability history. Component failures and equipment issues are generally identified by TOCs as they cause problems with reliability and availability, however logistics companies and suppliers could also work proactively to identify issues which may affect train service delivery and share this information.
- Failures caused by a faulty batch may not be correctly diagnosed straight away (or initially assumed to be random failures caused by bad luck) as the onus is on the TOC to identify reliability issues. Suppliers are in the best position to identify batch issues and component NFF diagnoses. These should be relayed to logistics companies who can work with affected TOCs to manage their impact.

15.2.4 **Information flow through supply chain**

- Poor flow of fault information from TOC to end supplier can prevent the failure investigation from making a positive diagnosis. Failure information is either not provided with useful detail or can be lost in the process of returning the faulty component to the supplier. This results in the supplier being unaware of symptoms, diagnostics undertaken by the TOC or other useful information which may help them to reach a positive failure diagnosis. Sometimes TOCs may not be able to provide useful or complete failure mode information to the supplier (e.g. part of a component may have been broken and fallen off the train or the component may be an

electrical box which has stopped working). This may impact on the quality of the investigation undertaken by the supplier as the testing may not consider the correct issue and therefore result in a NFF diagnosis. A thorough investigation requires a systems approach with all parties understanding what information is required and available. TOCs and suppliers should work together to identify where better information about the failure symptoms could be supplied by the TOC and agree a minimum standard for returns information. Logistics companies should ensure that all relevant information is passed on to the supplier. Warranty claim reporting templates/documentation should be updated to reflect any agreed changes to ensure that good practice becomes embedded. TOCs should have a dedicated warranty manager to ensure that claims are well managed (i.e. returned with the agreed information) and that outcome reports are followed up.

- Poor change control practices can result in component serial numbers being replaced or renewed by the supplier without the TOC's knowledge. This impacts trend analysis as repeat failures are harder to identify. To ensure component history is easily traceable, a robust change control process should be applied to managing serial numbers and there should be consistent use of tracking common pool components using a component tracker. To reduce the need to change serial numbers , components should be uniquely identified and fitted with robust serial numbers which are unlikely to fall off or become damaged.
- Sometimes a supplier may miss the warranty investigation SLA and credit is given to the TOC. If the component is being returned to a common pool, the TOC who returned the component may lack the incentive to chase an outcome report, especially as this can be time-consuming. It is difficult to quantify how often this happens because each warranty contract has a different SLA for investigating faulty components. It is assumed that there will be a higher level of NFF diagnoses in these situations. It is important that outcome reports are followed up by the logistics company and their results shared with TOCs. In order to better manage outcome reports where SLAs have been missed, it would be good practice to introduce standardised component SLAs across the industry.

15.2.5 **Testing regimes and specifications**

- It is important for all parties to agree component testing specification upfront (e.g. at the start of a new relationship) to reduce the number of NFF diagnoses and to provide a greater understanding of why faults occur and how components are required to perform. This is especially important for the introduction of new fleets and should also be considered prior to overhaul.
- Logistics companies can help to ensure that investigations result in a positive diagnosis by encouraging a systems-based approach to fault-finding (rather than component-based).
- The testing practices of TOCs and suppliers are not aligned, which can lead to different views of whether a component is faulty because supplier specifications may not represent how the component is actually used. Testing on depot may rely heavily on subjective events being observed, whereas testing at a supplier's facility may provide more ideal conditions. It is good practice to align supplier and TOC testing practices wherever practical.
- Joint investigations between TOCs and suppliers can be very productive in providing a common understanding of component failure and the steps needed to achieve a positive failure diagnosis. They can be difficult to organise if regarded as symptomatic of a breakdown in the process/relationship but TOCs and suppliers could work to develop better relationships and find a way to organise them more easily when required. It is also critical to ensure that learning from joint investigations becomes embedded in routine practice. This learning should be shared with other TOCs to prevent duplication of the investigation; failure to do so may be

detrimental to a positive TOC/supplier relationship.

- Asset data can be lost through testing. Some testing regimes cause the asset history to be wiped prior to the test, thereby losing potentially useful information about the asset's performance. It is critical to identify components which are at risk of losing failure data either through the testing process or because data is only stored for a limited time (e.g. if the asset is unpowered for a certain amount of time). Methods for data download or backup need to be in place to ensure that potentially useful information is not lost prior to testing.
- Testing methods do not typically recreate vehicle conditions (e.g. suppliers may only undertake an electrical test, not a mechanical one) and do not provide a complete picture of the failure environment. It is good practice to perform tests which more accurately recreate the operational environment in which the failure occurred (e.g. putting electronic equipment through 'shake and bake' tests in which vibration plates simulate train movement and climate chambers simulate real-life weather extremes).