

RAIB Bulletin 02/2009

Tamping machine derailed in September 2008

Description of the accident

1. In September 2008 a Plasser 07 tamping machine (Figure 1) was proceeding from a stabling point to a worksite when it became derailed as it passed over a set of *trailing points* on the running line. Neither of the two operators travelling on the machine was injured, and no other train was in the vicinity, so there was no immediate risk to any other train.
2. The tamping machine had been prepared for use by its operators, who then drove it towards the worksite. This preparation included testing whether the tamping banks were securely retained in a raised position, by attempting to lower them against their retaining pins.
3. The machine had travelled some 25 miles from its stabling point when the derailment occurred. The tamper was travelling at a speed of approximately 10 mph at the time of the derailment. This was less than the maximum permitted speed for both the tamper and the route at that location.
4. The cause of the derailment was the uncontrolled lowering of one tamping bank; as a result the *tamping tines* had become lodged under the head of the *stock rail* in the points, forcing the tamper laterally, and derailing it.



Figure 1: Plasser 07 series tamping machine showing position of the tamping banks

Findings of the RAIB

5. Apart from damage arising from the derailment, the tamping machine was found to be in good order.
6. The RAIB concluded that the left hand tamping bank retaining pin had not been fully engaged before the transit move from the stabling point. This resulted in the securing pin vibrating loose and the subsequent dropping of the bank.
7. Investigation showed that it was possible to locate the tamper bank retaining pins in such a way that, although they appeared to be fully engaged, they were not inserted far enough into the locating hole in the machine's frame to be locked in place. Observation of this condition, as part of the required preparation for moving the tamper from the depot to the worksite which took place at approximately 22:30 hrs, was made more difficult by the limited illumination of the pins and locking mechanism during hours of darkness.
8. Under these circumstances, when the tamping machine was stationary, the weight of the tamping bank kept each pin in position. As the tamping machine moved on its journey, and particularly through turnouts, the resulting vibration intermittently relieved the weight of the banks and the unlocked pin was able to move laterally until it released the tamper bank, allowing it to lower.

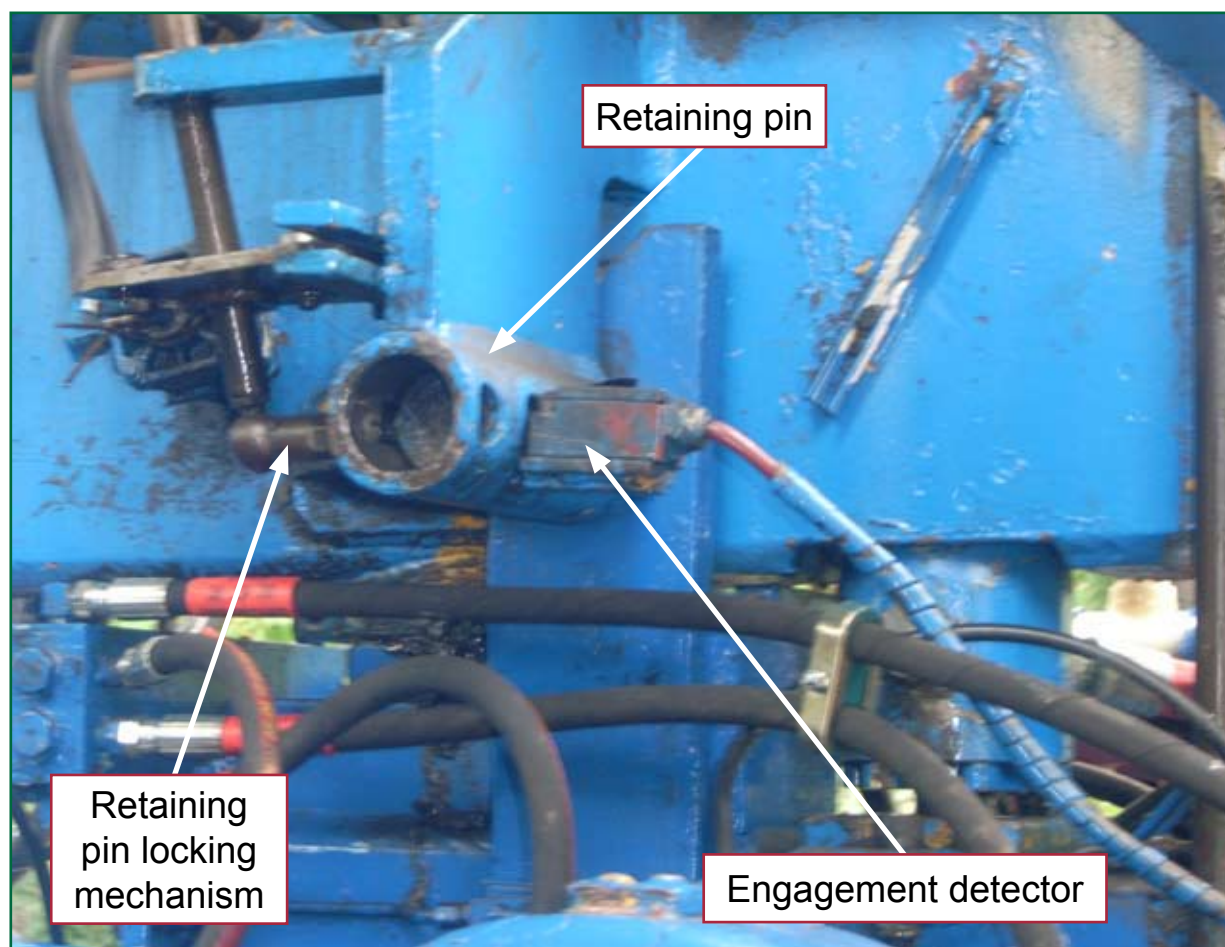


Figure 2: Tamper bank securing pin and locking mechanism

9. A light, activated by the locking mechanism, is fitted to the operating console, though not at either driving position, to indicate to the operator whether or not the tamping banks are securely retained for transit. The interpretation of the indication varies between machines (on some machines the lamp being illuminated indicates secure retention, whilst on others the lamp being extinguished indicates the same thing). This has led to a sense of uncertainty in the minds of the tamper operators. On the machine concerned, the lights were extinguished to indicate that the banks were securely retained.



Figure 3: Tamper bank locking indicator lights

Learning points

10. The RAIB has decided not to conduct a full investigation as it does not believe that it would lead to the identification of any further significant lessons that would improve the safety of the railways or prevent further accidents or incidents. However, the RAIB believes that there are some learning points to be disseminated to other Plasser 07 tamping machine owners and operators.
11. These are:
- The indications given by the machine's systems to the operating personnel should be consistent and unambiguous, and also should be 'fail safe'. This would mean that illuminated lamps would indicate that the tamper banks are securely retained.
 - The companies that own and operate Plasser 07 tampers should be aware of the difficulty of observing that the tamping banks are secure under low lighting conditions, and should train their maintaining and operating staff in the correct observation of the retaining pins.

- Those companies which anticipate retaining the Plasser 07 tamper in longer term use should consider the possibility of modifying the tampers to ensure that the main drive cannot be engaged unless the tamper banks are proved to be secured.
12. The RAIB has written to the company that owns and operates the tamping machine involved in the derailment, informing it of the RAIB's conclusions and decisions.
13. The findings of this bulletin are drawn to the attention of other owners and operators of Plasser 07 series tamping machines so that they can consider and take action to implement the learning points accordingly.

The events described above took place at Wokingham, Berkshire on 7 September 2008.

Glossary of terms

Stock rail	The continuous, fixed rail at a set of points.
Tamping tines	Tools driven by the tamping bank which penetrate the ballast and compress it under the track.
Trailing points	Points which a train runs through where two tracks join, as opposed to diverge, in the direction of running.

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Any enquiries about this publication should be sent to:

RAIB	Telephone: 01332 253300
The Wharf	Fax: 01332 253301
Stores Road	Email: enquiries@raib.gov.uk
Derby UK	Website: www.raib.gov.uk
DE21 4BA	