



DEPARTMENT OF TRANSPORT

RAILWAY ACCIDENT

**Report on the Collision that
occurred on 11th September 1986
at Bridgeton**

IN THE
SCOTTISH REGION
OF BRITISH RAILWAYS

HER MAJESTY'S STATIONERY OFFICE

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LONDON: HER MAJESTY'S STATIONERY OFFICE

29th July 1988

SIR,

I have the honour to report, for the information of the Secretary of State for Transport, in accordance with the Direction dated 26th November 1986, the results of my Inquiry into the collision that occurred between two empty electric multiple unit trains at 09.08 on 11th September 1986 near Bridgeton Carriage Service Depot in the Scottish Region of British Railways.

2. During a shunting movement, in clear, fine weather, a 6-car electric multiple unit train (EMU) was propelled into collision, inside a tunnel, with a 3-car EMU approaching the depot. I very much regret to report that the driver of the incoming train was killed instantly and the guard of the propelled train, who was at the leading end, was only released from the wreckage some 7 hours after the collision and succumbed eight days later to the injuries he had sustained. Additionally, the guard of the former train and the driver of the latter suffered bruising and shock necessitating their absence from work. The Emergency Services were quickly summoned and an ambulance was on site at 09.18 and at 09.28 an Emergency Electrical Isolation of the overhead line equipment (OLE) was imposed at the request of the Fire Service. Derailed vehicles were re-railed and made fit for movement by 02.39 the following day, the OLE isolation was withdrawn at 05.06 and both lines restored to traffic by 07.20 that day.

DESCRIPTION

The Site

3. Bridgeton Carriage Service Depot (CSD), now closed, was, up until 1979, the passenger terminal of the line from High Street. Latterly, and at the time of the incident, depot staff were responsible for the internal and external cleaning of 54 EMU's. Bridgeton Central Signal Box lay about 101 metres from the ramp end of platform No. 2, with the mouth of Bridgeton Central Tunnel being some 118 metres beyond the signal box. Two running lines, the Down and Up passed through this 202 metres long tunnel. The Up (south-bound) direction was towards the depot. All lines were electrified on the 25kV A.C. overhead system. A plan showing the track layout, together with signalling, gradient and curvature diagrams are given at Figures 1, 2, 3 and 4 at the back of this Report.

Signalling

4. The Goods line between High Street Station and Bridgeton CSD was subject to a maximum permissible line speed of 40 mile/h; it was worked in accordance with Track Circuit Block Regulations in association with Train Describer and Emergency Bell. Two, three and four aspect colour light running signals together with Position Light Subsidiary Signals were provided but signals from the platform sidings were of the mechanical disc type positioned at ground level. All signals and points were controlled from a mechanical lever frame located in Bridgeton Central Signal Box.

5. Signals and points relevant to this report were:--

Movements Towards the Depot

Signal No. 8 capable of displaying a red or yellow aspect, would not display a proceed aspect unless a route into the platform or carriage sidings had been cleared for movement by Signals Nos. 12 or 13 or 14 (for the former sidings) or 20 (for the carriage sidings) and its own ie No. 8, track circuit berth TC250B occupied; the latter feature providing for a measure of speed control.

Points No. 4 had to be in the normal position before the lever for Signal No. 8 could be pulled and when that was done, Points No. 4 were locked in the normal position. These points could not be released until Signal No. 8 was returned to Danger and track circuits TC251 and TC252 occupied and cleared in the correct sequence by the passage of a train. Should Signal No. 8 be restored to Danger before the passage of a train, the approach locking on Points No. 4 was only released after TC250B had been occupied for 30 seconds.

Occupation of TC353 caused Signals Nos. 12 or 13 or 14 or 20 to revert to Danger.

Movements from the Depot

Ground Disc Signal No. 53 could not be cleared unless Points No. 4 were reversed and Position Light Signal No. 6 cleared. When that was done the points were locked reversed by occupation of TC253 and the locking was released when a train had passed over these points or the signals had been returned to Danger and TC253 had been occupied for 30 seconds. Signal No. 6 had the single function of governing the movement of trains from the depot to the Down Main Line and was a feature within the route knowledge of staff working the depot.

6. In an emergency, fog signals could be placed on the Up line opposite the signal box by the use of Lever No. 16, which stood some 8½ metres from the south end of the signal box. A set of signal flags was kept 3 metres from the same end.

The Trains Concerned and the Damage Caused

7. The incoming train was 5LO6, the 09.05 from High Street to Bridgeton CSD, comprising a 3-car EMU 303-026 with Brake Driving Trailer (BDT) leading. It weighed some 128 tonnes and was about 61 metres long overall. Driver A. Anderson was at its controls.

8. The 6-car EMU that was being propelled comprised Units 314-210 and 314-211; its total weight amounted to 206 tonnes and it was 121.08 metres long overall. Each unit consists of a Driving Motor Second (DMS) coach at each end and one Trailer (TS) coach, that carries the pantograph, between them. For coupling two or more sets together the outer ends of the DMS coaches are fitted with a "Tightlock" automatic centre coupling designed to take all traction and buffing loads and, therefore, the units are not provided with side buffers. Coupling and uncoupling can be achieved from the cab and indicators, known as "butterflies", show when the coupling is properly engaged. The coupler heads also connect electrical circuits and the main reservoir air pipes; an arm on a drum switch shows when they are properly coupled. Some details of the Tightlock auto-coupler are given at Figure 5. Each end of the train is equipped with a headlight, two marker lights and two red tail lights; the control switches are located on an upright console directly facing the driver's seat. During the propelling movement, Guard A. B. Burton was in the leading cab, where he had access to an emergency brake valve, warning horn and train communication equipment. This latter apparatus, comprising a telephone unit with indicator lights, has a selector switch maintained in the 'Cab-Cab' position by a spring. The pressing of a white 'call' button will sound an audible signal in each cab until released. A hand set is provided for essential conversation between the driver and guard or shunter. There is a public announcement facility, normally for use by the guard.

9. In the collision which took place some 61 metres inside Bridgeton Central Tunnel, the leading vehicles of Units 303-026 and 314-210 each telescoped approximately 5 metres and both driving cabs were destroyed. A small area of blue asbestos was exposed on one coach. The leading bogie of Unit 303-026 was pushed back under the vehicle some 5½ metres, with the leading right-hand wheel derailed to the four-foot way; the trailing wheels of the leading bogie of Unit 314-210 were derailed. The OLE contact wire was severed as a result of the collision causing two relevant Electrical Sections to trip. There was some track misalignment, and minor damage to Points No. 51 that required the replacement of a lock stretcher bar. The brake handle in the leading cab of Unit 303-206 (BDT) was found to be in the "Full Service" position and that in the leading cab of Unit 314-210 in the "Emergency" position.

Laid Down Instructions

10. Relevant extracts from the British Railways Rule Book, General Appendix and Working Instructions for Class 314 EMU trains are given at Appendix A to this Report.

EVIDENCE

11. *Driver G. Edwards* told me that he booked on duty at Bridgeton at 08.15 to move sets within the depot, a task he had repeatedly performed during the course of the week. He said that about 08.40 Senior Railman J. Lambert advised him that a 3-car set due to arrive on Platform Siding No. 2 was to be coupled to the train already standing there and then the 6 vehicles were to be moved through the washing plant before being taken to Platform Siding No. 4. When the set arrived it stopped short of the stationary train and Edwards said that he went to its leading end, in direction of approach, and moved the train to connect with the other 3 vehicles. He then walked to the driving cab in the rear of the newly formed train, that was just short of the buffer stops. Lambert stood in the space adjacent to his cab. On receiving a set back, "3 bells", signal which he assumed had been given from the leading end of the train, Edwards acknowledged it and applied power. However, when the train had moved a metre or so, it was abruptly brought to a stand by an automatic application of the brakes. Since he had

not checked the state of the butterfly indicators Edwards concluded that the mechanical coupling between the two 3-car sets was not fully made. He mentioned his misgivings to Lambert and they both proceeded to the middle of the train where they saw that to be the case. From a cab there he then uncoupled and re-connected the sets and satisfied himself that all was in order. While he was there Guard Burton approached him and Edwards explained the position and requested the guard to attend to an open window so as to prevent water entering at the washing plant. Edwards, with Lambert, returned to the rear of the train where he again received three bells, which he acknowledged before starting to propel, some 5 to 7 minutes after his earlier attempt. When they had just passed Points No. 51, travelling at a speed of between 4 and 10 mile/h Lambert remarked that it was surprising to see the points already set for Platform Siding No. 3, but before he could comment Edwards heard a loud bang and his train came to an abrupt halt. After failing to contact Burton on a 'Cab-Cab' call he alighted and was proceeding towards the front of the train when he met R. Wilson, the guard of the incoming train, who shouted that men were trapped and that he should call the emergency services. Edwards was hastening to the signal box when he met Supervisor J. Watt, whom he asked to contact the emergency services.

12. Edwards told me that he had previously worked with Burton and on the day under review he considered him to be his usual self. The driver readily admitted that he had not carried out all of the laid down instructions concerning coupling procedures and brake continuity test and had not contacted the signalman to explain the reason for the train's temporary disablement. He went on to say that he felt no brake application just prior to the collision. It was local practice for trains to be driven from the rear of the cab for the type of propelling movement being made; this method precluded the driver having to walk inside the unlit tunnel when changing ends.

13. The sole shunter on duty was *Senior Railman J. Lambert*. He told me that soon after he booked on at 08.00 Supervisor Watt gave him details of train movements required for cleaning purposes. At about 08.20 he instructed Burton, who appeared his usual self, to conduct a set into a siding. Later, at 08.35, he telephoned Signalman H. Higgins and asked him to direct Units 210 and 211 into Platform Siding No. 2. Soon after that he saw the first set brought to rest about a metre short of the buffer stops. Lambert walked through it checking that the windows were closed before the train passed through the washing plant and when he returned to the platform he observed that the second EMU set had arrived and had already been coupled to the first. He then proceeded to the cab nearest the buffer stops and stood in the space adjacent to the driver's compartment, where Edwards was; he assumed that Burton would be attending to the routine task of closing windows on the 3 vehicles nearest the signal box. Next he heard the proceed bell code being given to the driver and when the train had moved about 6 to 9 metres it came to an abrupt halt. He confirmed Edwards's account as far as their return to the original (trailing) cab, and said that Edwards then spoke to Burton on the hand telephone telling him that the brakes were releasing. Then he heard the proceed bell code being sounded, an acknowledgment was given and the train moved towards the tunnel a matter of, he thought 3 to 4 minutes after the earlier attempt to propel the train. When clear of Platform No. 2 he happened to glance at the track and saw that the points were, surprisingly, set for Platform Siding No. 3; in a matter of seconds he heard a bang and was thrown to the floor. He picked himself up and after assisting the driver from his compartment, Lambert went to the signal box to request assistance. He saw Edwards move in the direction of the tunnel and when the driver later arrived at the signal box, he said that the guard was trapped in the wreckage and lying partly out of the window.

14. Lambert added that just prior to the incident he had felt no brake application; he estimated the train speed to be between 5 and 10 mile/h. So far as he was aware there was no contact between driver and signalman concerning the earlier stoppage of the 6-car set. He went on to say that on numerous occasions he had taken up a position in the leading cab during a propelling movement of the kind being undertaken; this arrangement, he considered, saved the driver from having to walk in the unlit tunnel to change ends and allowed him to control movement of the train into the depot from the leading end.

15. *Relief Signalman H. Higgins* told me that he had taken up duty at Bridgeton signal box at 07.00, having terminated his previous shift at 14.00. He was familiar with the working of the box and had no unusual difficulty with the signalling equipment. He confirmed Lambert contacting him at about 08.35 concerning the movement of two sets from Platform Siding No. 2. After the arrival of the second train at about 09.00 he set the route from Platform Siding No. 2 to the Down line, and cleared Signals Nos. 6 and 53. Some 3 minutes later, he observed the units move towards Signal No. 53 and then come to a stand after travelling between 5 and 10 metres; he assumed that there was some problem associated with the coupling between the sets and so at 09.04, when 5LO6 was offered from High Street Junction signal box, he replaced Signals Nos. 53 and 6 to Danger and cleared Signal No. 7. Higgins saw no further movement of the units on Platform Siding No. 2, but he did see a person between Platforms 2 and 3 about the middle of the train. At 09.07 he observed from the Track Circuit Diagram that 5LO6 was approaching Signal No. 8 and as 5 to 6 minutes had elapsed without movement of the 6-car set, or word concerning its disablement, he normalised Points Nos. 51 and 4 and cleared the signals from the Up line into Platform Siding No. 3.

16. Soon after, he heard a noise outside and saw that the train from Platform Siding No. 2 had now passed, at danger, Signal No. 53; he also noted that 5LO6 had passed Signal No. 8. Higgins immediately ran to a window and exhibited a red flag to the depot train but it continued to travel forward. There was a figure in the leading cab of the train at which end Higgins also noted the twin tail lights being extinguished and the headlight illuminated. The train did not appear to reduce speed; it passed Signal No. 6 at Danger before entering the tunnel on the Up line and only moments later he heard the sound of the collision. He instituted emergency regulations and contacted the Railway Control.

17. Having replaced Signal No. 53 to danger after first clearing it for the propelling movement Higgins knew, he said, that he should have satisfied himself that Edwards was aware of that before a conflicting route was set; he had overlooked it on this occasion. He added that he could not recall an instance when he had to get in touch with a train crew and implied that there might be some difficulty at Bridgeton in doing so. When questioned about the use of the emergency detonator placers he replied that he had never had to use them except during the normal monthly replacement of the detonators.

18. *Senior Technician K. L. C. Parry* told me that, accompanied by a technician, he was standing, about opposite Bridgeton Signal Box, waiting to cross the running lines, when a train passed them travelling at no more than, he estimated, 10 mile/h towards the tunnel. Just before the train shielded his view, Parry said he observed a signalman at the window exhibiting a red object which he took to be a flag that was not completely unfurled; next he heard a loud bang from the vicinity of the tunnel. Parry asked the signalman if the train had run through points and was told that it had collided with an incoming train. He obtained a handlamp from the signalman and hurried to the tunnel where he met a guard, who appeared to be in a confused condition. He arranged for his colleague to escort the guard to receive medical attention and to ensure that the Emergency Services had been summoned. Parry then came to the point of collision and saw that a man was trapped in the leading cab of the outgoing train. He tried to release him and reassure him while waiting for assistance to arrive. Also, he attempted to ascertain the whereabouts of the driver of the train from High Street and observed part of his body trapped in the wreckage and clearly beyond aid so Parry returned the few steps to comfort the other man who complained of terrible pains in his legs and repeatedly asked "What happened?". When the ambulance arrived, Parry continued to provide assistance as necessary. I commended Parry for his caring attitude.

19. Later, after leaving the tunnel, he met his *Supervisor, I. L. MacKenzie*, and they visited the signal box to examine the state of the equipment there. MacKenzie told me that they found the signal levers to be set for incoming train, except the Lever No. 7 had been restored and collared. Outside he noted that Signals Nos. 53 and 6 were placed at Danger and that the control wire of the former signal was sound and free from obstruction; there was evidence that Points No. 51 had been run through. He returned the following day to conduct mechanical and electrical tests and found that the equipment performed satisfactorily.

20. *Guard R. Wilson* told me that he was in charge of 5LO6, the 09.05 empty coaching stock from High Street to Bridgeton CSD. He had booked on duty at 05.15 at Hyndland Depot and there met his Driver A. Anderson, whom he knew and who appeared his usual self. After detraining passengers at High Street this train departed about one minute late for Bridgeton. From his position in the Guard's compartment located in the middle coach of the 3-car set he considered that the train reached a speed of about 20 mile/h before he felt the brakes being applied and the train slowed to a speed of 10 mile/h when, he assumed, the train was approaching Signal No. 8. Next, he sensed the brakes were released and soon after, without there being a further brake application and with the train travelling at a speed he estimated at 10 to 15 mile/h he heard a loud bang and he was thrown from his seated position to the floor. Wilson said that he quickly got to his feet, looked out of the window and saw two men running towards him. He then confirmed the evidence given by the others.

21. During the course of my Inquiry, I learned that Burton was engaged on general guard duties, and had sound experience of working at Bridgeton Depot, having been successful in the current bi-ennial re-examination of his knowledge of the Rules, Regulations and other Instructions relating to his post at the Depot. He had changed his roster so as to be at the Depot during the week leading up to the time of the accident. J. Watt, the Supervisor in charge of the Depot, told me that Burton's duties then would have been to assist in the movement of vehicles for cleaning purposes, and that it would have been normal for Burton to have taken up a position in the leading cab of a propelling movement. I was told that, following the accident, a copy of the Working Instructions for Class 314 EMU was found in his kit. Driver Anderson was familiar with the journey from High Street to Bridgeton, having driven that route as recently as the previous day.

22. From the leading cab of a train leaving Platform Siding No. 2, Signal No. 53 is clearly visible throughout. From Edward's driving position, however, even looking from an open cab window this signal does not come into view until the leading end of a 6-car EMU is some 30 metres beyond the switch at Points No. 51. Signal No. 6, situated on the right-hand side in the direction of travel, can be sighted from the leading cab before Signal No. 53 is passed; thereafter, it is obscured from view for a distance of some 52 metres by the support pillars of an overbridge and then it is continuously visible over a distance of 116 metres.

23. For the incoming train, the signal for clearance or otherwise for entry to the platform or carriage sidings may be observed from a point some 73½ metres inside Bridgeton Central Tunnel in direction of travel.

DISCUSSION

24. The conflict of evidence given by Higgins, Lambert and Edwards concerning the distance of the initial movement of the 6-car EMU along Platform Siding No. 2 is of no significance.

25. While there were a number of telephones located about the platforms their ringing may not always have been apparent to persons located inside vehicles standing at the depot. If the signaller desired to speak to a driver or a member of the train crew he could have readily contacted the Supervisor's Office, located about opposite the terminal end of Platform Siding No. 2, requesting that a message be relayed accordingly.

26. Considerations of the speed of the train, signal sighting distance, gantry signal height, height to top of the roof of the Class 314 units, Anderson's viewpoint above rail level and assuming that the noise heard by Higgins was that of the depot train bursting through Points No. 51 lead me to believe that Anderson had only some 4½ seconds in which to observe the gantry signal before the approaching train obscured his view of it. My analysis, however, has not taken into account the disposition of the pantograph on the Class 314 units, and which may have reduced the interval during which the signal was observable to Anderson. I believe that at about these critical moments, Anderson would be deliberating on the path being taken by the approaching train and realised too late that the train was not travelling on the adjacent, Down, line, as he would have expected, but was traversing the same curved section of line, inside the unlit tunnel, that he was negotiating. That he may have attempted a last moment application of the brake may be deduced from the disposition of the brake handle stated earlier but Wilson's evidence indicates that no retardation of the train was sensed just before impact took place.

27. It is a matter for conjecture what pre-occupied Burton during the period, I estimate about 1½ minutes, from onset of the subsequent movement from Platform Siding No. 2 until time of the collision. While operating the headlight and tail lamp switches would have taken no more than a couple of seconds, it may be partly the reason for his failure to heed the signal warnings given and not realise that he was entering the tunnel on the wrong line.

28. It is a matter for comment that had Edwards properly carried out the critical coupling-up procedure, the accident may not have occurred; moreover he failed to contact the signaller concerning the delay to his train.

CONCLUSIONS

29. From the evidence available to me, I conclude that Guard Burton failed to discharge the duties demanded of him when positioned at the leading end of the train moving from Platform Siding No. 2 and must be held primarily responsible for the event that overtook him.

30. Higgins must accept a measure of responsibility for not satisfying himself before altering the position of the points that the crew of the train on Platform Siding No. 2 were aware that Signal No. 53 had been replaced to danger.

31. I consider Anderson to be free from blame.

REMARKS AND RECOMMENDATIONS

32. From the introduction at Bridgeton CSD of Class 303 units, without an exit door or gangway connection at either end of a 3-car set, it was accepted that shunting movements from the depot towards the

Down line would be driven from the rear cab, with a person in the leading cab to keep a good lookout, operate the warning horn when necessary and be prepared to stop the train by application of the emergency brake. This practice avoided the need for the driver to change ends within the the unlit Bridgeton Tunnel. As such, it continued when the Class 314 units were allocated to the depot. Although the DMS coaches are provided with a single leaf emergency door in their vestibule, and may afford access from one 3-car EMU to another similar set, their provision is for the detrainment of passengers in an emergency. While the type of depot movement under consideration was not technically catered for in the laid down instructions, I do not criticise this method of operation and I am pleased to say that following the accident the relevant exemption to rules was properly formalised.

33. Unfortunately, the acceptance of this procedure suggests a conflict with the requirements relating to the disposition of staff given in Section 6.4.3 of the Working Instructions (see Appendix A) and needs to be resolved. Additionally Edwards' oversight in connection with the brake testing suggests this item warrants monitoring.

34. Again, Rules C.4.10.2 and H.3.5.2 do not make clear who in the leading cab and trailing cabs for movements driven from the rear cab should be contacted by the signalman and, in turn, who should contact the signalman. I recommend that early action should be taken to rid the instructions of any ambiguity. It is a pity that the opportunity was not taken when the reprinted regulations came into force on 4th June 1988.

35. In view of Higgins' oversight concerning Rule C.4.10.2. I discussed with Railway Officers who attended my Inquiry the position for other signal boxes. I am pleased to report that as a result of a survey promptly carried out amongst ten signal boxes, all the signalmen approached stated that under no circumstances would they alter the routes unless the driver had been contacted. I understand that the Scottish Region (Sc.R) Area Managers have been asked to continue to remind signalmen on this point and I recommend that this item form part of a general monitoring programme throughout British Railways.

36. Although a small area of blue asbestos was exposed on account of the collision, its presence was not formally confirmed until over two hours had elapsed from the time of arrival of the emergency teams. In this connection. Home Office guidance has already been given to the fire service and states "Unless and until it is confirmed that blue asbestos is not present, they (firemen) should assume that it is and take the appropriate precautions". In their Emergency Instructions the Sc. R make it clear that, given detailed information on locomotive/vehicles involved in a mishap, their Control Office can obtain information as to the presence or otherwise of blue asbestos. The Sc. R has reminded staff of the necessity for checking for the presence of asbestos as soon as possible after an accident and their Regional Control major mishap checklist has been updated accordingly. In this respect, I am pleased to say that I have personally witnessed a satisfactory application of the directive to a subsequent incident involving another vehicle.

I have the honour to be,

Sir,

Your obedient servant

A. WILLIAMS

The Permanent Secretary
Department of Transport

NOTE

Since 4th June 1988, re-issued instructions have become effective. Where appropriate, reference to these is made alongside the instructions applicable at the time of the incident, and are underlined with a broken line.

RULE BOOK*Section C. Fixed Signals* (Signalmen's General Instructions. Working of Signals—General Instructions 7.6.4)

- 4. Duties of Signalmen
- 4.10 Replacing signals to Danger before passage of a train
- 4.10.2 If a Signalman has cleared his signal for a train to start and he finds it necessary to replace the signal to Danger before the train starts, he must, before allowing any obstruction of the line to which the signal applies or before altering the position of the points, satisfy himself that the Driver is aware of the signal having been replaced to Danger.

Section H Working of Trains

- 1. Principle (1)
The safe and efficient movement of trains is dependent upon observance of standard operating procedures by all the staff involved.
- 2. Method (2.1 and 2.2)
For the observance of the standard operating procedures, staff-----, they must have a thorough knowledge of their duties and there must be a clear understanding between the staff involved in any particular movement.
- 3. Duties of Drivers and Driver's Assistants
- 3.5 Observance of Signals (Section C.6.1.1)
- 3.5.2. If a Driver brings his train to a stand when approaching or about to pass signals which are in the Clear position, he must, before restarting, again observe the position of the signal. If unable to proceed in the usual course, the Driver must arrange for the Signalman to be immediately advised.
- 8. Joint duties of Drivers and Guards or Shunters in respect of Propelling.
- 8.2. Lights to be exhibited.
The Guard or Shunter must ensure that a white light is exhibited on the leading vehicle when propelling in the right direction-----.

GENERAL APPENDIX TO WORKING TIMETABLES AND BOOKS OF RULES AND REGULATIONS (Rule Book Section H.12)**LIGHT LOCOMOTIVES, PUSH-PULL AND MULTIPLE-UNIT TRAINS—DRIVING FROM THE LEADING CAB**

- 1. -----multiple-unit trains **MUST BE DRIVEN FROM THE LEADING CAB** on all lines and sidings except during shunting operations. In such circumstances-----trains may be driven from other than the leading cab provided the following instructions are observed:
 - a) Unless the Shunter is preceding the leading end, a Guard, Shunter or Driver's Assistant must ride in the leading cab.
 - b) He must keep a good look-out, operate the warning horn as necessary, and carefully observe all signals.
 - c) He must signal to the Driver as necessary by means of buzzer communication (where provided) or hand-signals, and be prepared to stop the movement by operation of the emergency brake valve (where provided).
 - d) The movement must be made cautiously and at such reduced speed as will enable it to be stopped within the distance which the person controlling the movement can see to be clear.

2. In the following circumstances however, the — — — train MUST ALWAYS be driven from the leading cab:
- a) when making a movement within a maintenance/servicing/stabling siding/depot.

CLASS 314 EMU TRAINS—WORKING INSTRUCTIONS

5. PROPELLING

When propelling, the speed must not exceed 5 m.p.h. other than when assisting a failed train. The Guard or Shunter must ride in the leading driving cab and keep a good look-out, operate the warning horn when necessary and be prepared to stop the train, if required, by application of the automatic brake. The Guard or Shunter must observe carefully all signals and signal as may be necessary in accordance with the bell code — — — — —.

6. BRAKE REGULATIONS

6.4 Brake Continuity Test

6.4.1 The Driver and Guard must co-operate in making this VITAL test which is for the purpose of proving the continuity of electrical control of the brake system throughout the train. The brake continuity test must be made in the following circumstances.

- (a) Before a train leaves a shed or stabling point.
- (b) When another unit is attached or detached.
- (c) After any brake defect or irregularity has been rectified.

6.4.2 Both SERVICE and EMERGENCY applications must be tested.

6.4.3 The Guard or Shunter must carry out the test from the rearmost driving cab of the train and the Driver must observe it in the leading driving cab.

22. COUPLING AND UNCOUPLING

22.2 Coupling of these units is only to be performed by the Driver using these procedures:—

22.2.1 Check that the jaw of at least one of the Tightlock automatic couplings is open.

22.2.2 Check that the covers over the connection block on both couplings are closed.

22.2.3 Draw up to the unit which is to be coupled and stop 6 feet short.

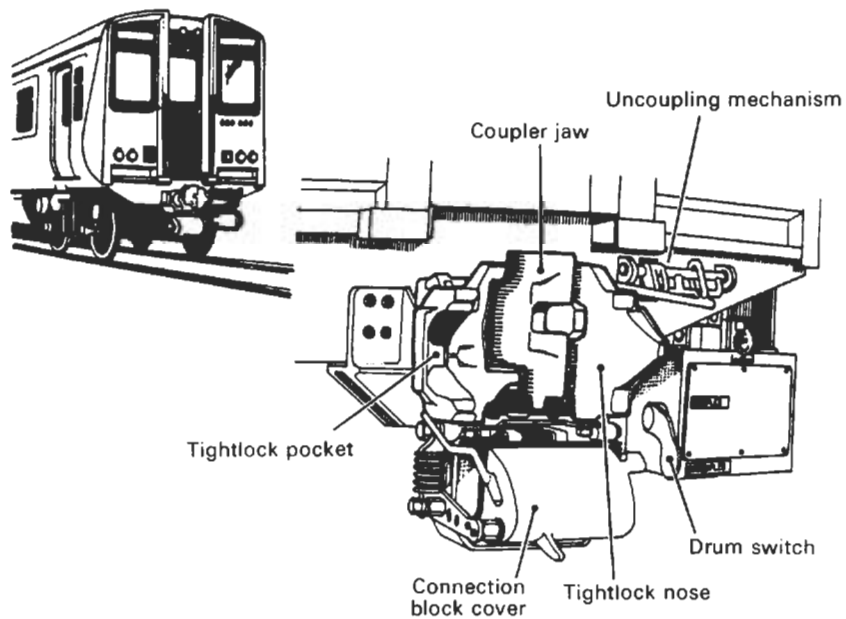
22.2.4 Draw up again and stop a second time 2 feet short before contact is made.

22.2.5 Proceed onto the unit which is to be coupled.

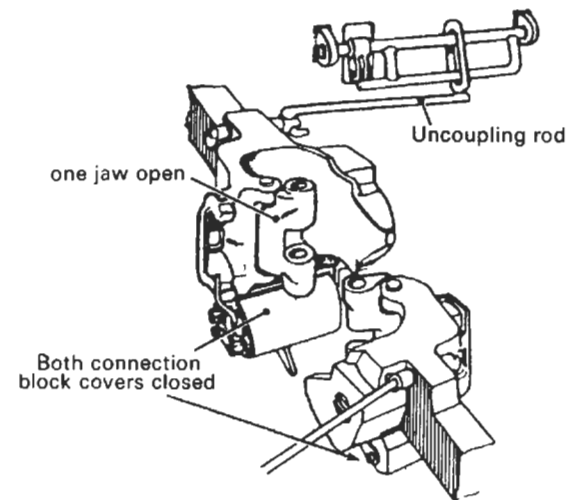
22.2.6 Check that the couplings have locked by pulling away gently from the attached unit.

22.2.7 Press the 'COUPLE' push button on the driving compartment desk for 2 seconds, with the master switch in the NEUTRAL position.

22.2.8 Alight and check that both drum switches have moved to the 'coupled' position, that both butterfly indicators are visible and that there is clearance between the indicator and the coupler body.



COUPLING OF UNITS



UNITS COUPLED

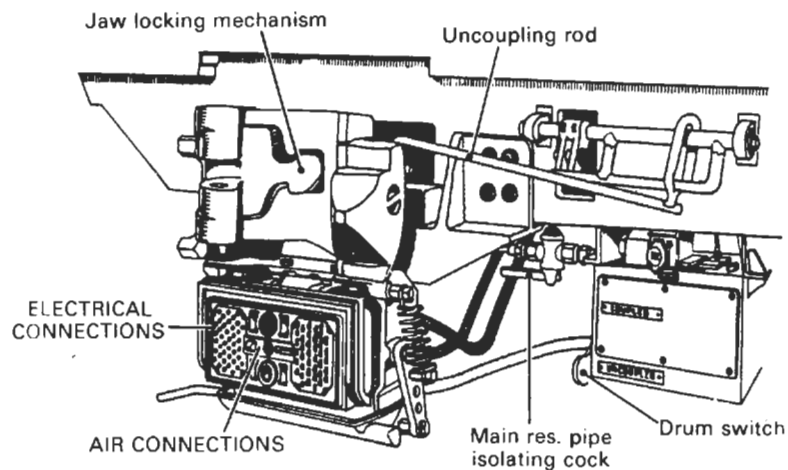
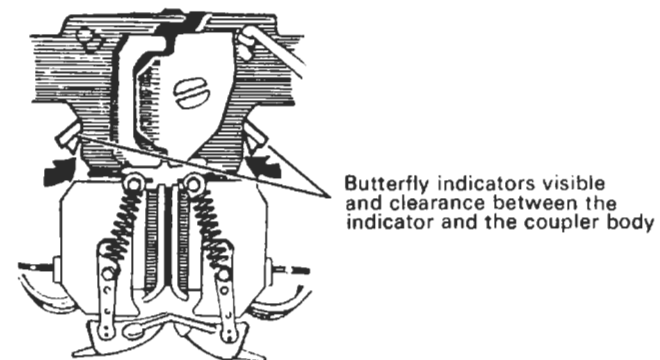


FIGURE 5: TIGHTLOCK AUTO-COUPLER

COLLISION THAT OCCURRED ON THURSDAY 11TH SEPTEMBER 1986 AT BRIDGETON

