

Great Western Railway Goods Brake Van No 35938

(GWR Telegraphic code name TOAD)



Background

Great Western Railway goods brake vans were distinctive in having a single large veranda at one end. In the centre of this veranda stood the manual brake standard handle. Turning the handle on this standard applied clasp type brake-blocks to both sides of all four wheels of the brake van. To assist adhesion in wet weather, sand could also be applied to the track adjacent to each wheel via a pipe from a hopper bunker located above each wheel. A lever connected to the two sand hoppers on the veranda controlled the flow of sand from these, while another large lever next to the door was mechanically linked to the two internal sand hoppers at the far end of the brake van (This linkage also served as a handrail for the guard). At this end of the brake van was the accommodation for the guard and storage for his equipment. A coal fired stove vented through the roof via a stove-pipe chimney. This kept the interior warm and dry and provided basic cooking facilities. There were benches on either side under which were kept spare lamps, tools and equipment. The Guard was responsible for the safety of the train and in the event of the train stopping on the main line he was required to fix detonators to the track, where they would warn any following train. One common failure on Private Owner goods wagons was couplings breaking, so spare couplings of various types were kept in the Guard's Van.



The basic design of Great Western Railway Brake Van remained unchanged until the company was nationalised in 1948, although the brake vans gradually became larger and heavier as train loads became longer and heavier. Brake capacity was largely dependent on the weight of the brake van. Tests in the early 1920's on a 1 in 100 gradient showed that; a 10 ton brake van was capable of holding a load of 450 tons, while a 25 ton brake van was capable of holding a load of 840 tons. At the time a typical open wagon weighed 6 tons empty, or 16 tons when fully loaded with coal. The additional weight was added to the brake van during construction by filling voids in the underframe with scrap cast iron ballast.

In the days of steam, brake vans were found at the rear of all goods trains. Their function was to provide braking facilities for a guard to assist the locomotive crew in three main ways:

- 1) Stopping the train when required (including in emergency situations)
- 2) Securing a detached portion of the train to enable shunting operations to be safely performed
- 3) Controlling the train on gradients

Goods trains comprised mostly of unfitted wagons (i.e. wagons without any remotely actuated brake facilities) and to stop these trains relied on the co-ordinated application of brakes by the locomotive at the front and the brake van at the rear. The wagons in goods trains traditionally had a three-link coupling attached to the drawhook at each end of the wagon. To connect wagons, the loose link of a three-link coupling would be lifted and placed over the drawhook on an adjacent wagon (An action that could be performed relatively quickly by using a shunting pole). An advantage of three-link couplings was that there was naturally some slack between each wagon, which allowed the load of a heavy train to be picked up gradually by the locomotive as it started and this prevented the locomotive from slipping. The disadvantage of the three-link coupling was that when gradients changed they could 'snatch', which could cause them to break. Also when stopping, the guard needed to apply a brake at the rear of the train to prevent the wagons from bunching up. This could result in damage to freight being carried in the wagons, or in the case of a more sudden stop the combined weight of the wagons could push the locomotive or cause a derailment. A similar issue could occur when descending steep hills. In these cases goods trains were instructed to be brought to a halt at the top and the guard would manually apply brakes on a number of wagons in addition to using his brake to control the descent.

The brake van at Tyseley is unusual in also having a vacuum brake handle in addition to the manual brake (Note the red pipework and lever on left of doorway in photograph). This enabled the brake van to be used on goods trains where the wagons were either; fully-fitted (i.e. had individual vacuum brakes) or, piped (i.e. with a through vacuum pipe, which would be connected to the vacuum systems on the adjacent wagons). A train which comprised of vacuum brake fitted wagons had increased braking power, so was allowed to travel faster. Although this brake van had a lever that could release the vacuum in the train to operate the brakes on the connected wagons, it wasn't necessary for the brake van to have its own vacuum brake cylinder and the vacuum system was 'piped through'. The rubber hoses for the vacuum system can be seen at each end. Because the operation of vacuum brakes was quicker, wagons with vacuum brakes were fitted with either screw (or 'instanter') type couplings. These took longer to couple together, but reduced the amount of slack between the wagons. The brake van at Tyseley has screw type couplings.



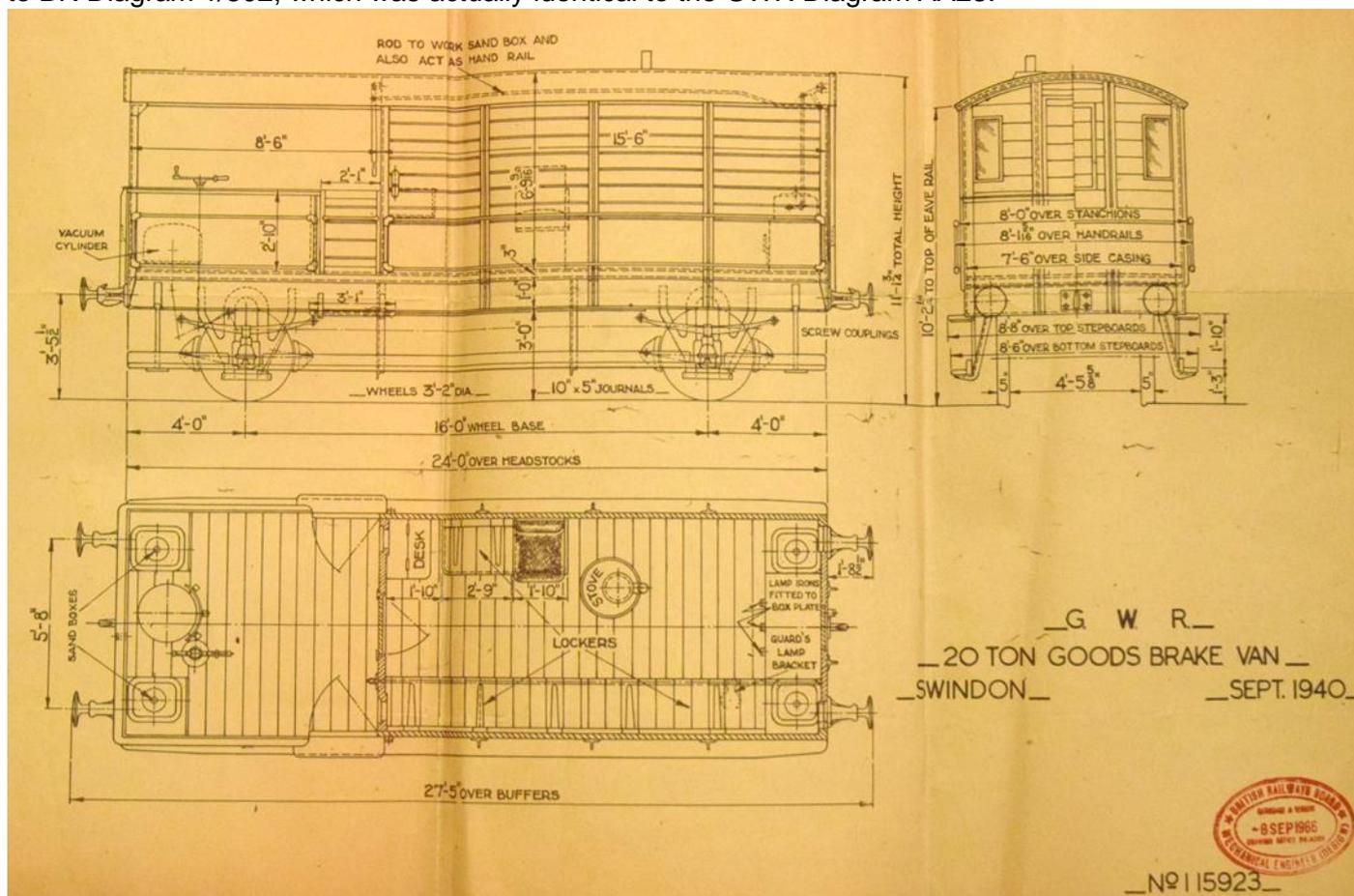
All railways used the telegraph to communicate between locations and they developed a short form code to clearly identify particular wagon types. The Great Western Railway used the telegraphic codeword 'TOAD' to describe their Goods Brake Vans and this is why these brake vans are frequently called Toads.

Despite having a single veranda, the brake vans were not required to be orientated in any particular direction in a train. They were however originally allocated to particular goods yards and depots and this location was written on the outside of the brake van to ensure that they were returned there. After 1943, a shortage of goods brake vans required them to be pooled and these allocations generally removed. There were windows at both ends of the enclosed portion, but no protruding side window 'Duckets' for viewing

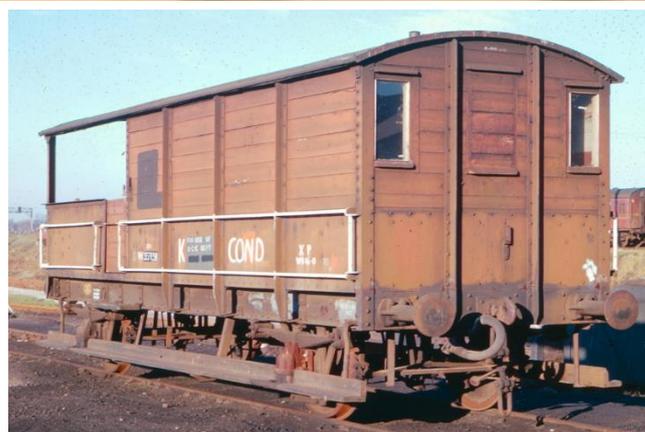
from inside. This meant the guard was required to spend time on the veranda and this made the brake vans unpopular outside the western region. As a result, after nationalisation their usage was restricted to the western region and they were branded 'RU', later the term 'Not in Common Use' was introduced. Eventually they were prohibited by BR from working on long-distance trains, so many became surplus to requirements and were converted to other uses, in particular Engineering Department Mess Vans.

Brake Van No.35938

The goods Brake Van at Tyseley was numbered No.35938. Records show that this particular brake van was built by the Great Western Railway at their Swindon Works. Both of the steel solebars are embossed 'Earl of Dudley Steel 12 x 3/4 BSG 118' indicating the size of the steel channel used and where the channel was manufactured – at Round Oak Steelworks in Dudley. The brake van was one of fifty 20 ton Goods Brake Vans ordered under lot 1451 in 1943. It was built to GWR Diagram AA23, which was the final evolution of this iconic goods brake van design with its single large veranda. A total of four hundred of these Diagram AA23 Brake Vans were ordered, but only six lots were built between 1942 and 1949, totalling three hundred and twenty-six. The remaining seventy-four brake vans originally ordered on GWR lot 1641 were cancelled after nationalisation, but then re-ordered on BR lot 2099 in 1949. These were built to BR Diagram 1/502, which was actually identical to the GWR Diagram AA23.



Goods Brake Van No.35938 was acquired with the Tyseley site in 1966. It had been painted in bauxite livery, which was standard BR colours for non fully-fitted vacuum stock and branded 'XP' with the sixteen foot wheelbase length marked underneath, indicating that it could safely travel in express passenger trains. The brake van was also marked 'FOR USE BY DCE DEPT', indicating that it had been reallocated to the Divisional Civil Engineering Department. The abbreviation 'COND' indicated that it had been condemned by British Railways. At some stage the Goods Brake Van had undergone major surgery as all the vertical corner and



end stanchions show signs of welding just above the solebar. All four sand pipes have also been cut at this height. This seems to indicate that the upper bodywork had been removed from the underframe at some stage. The fact that the sand pipes had not been reinstated suggests the work was done when (or after) the reallocation from its brake van role. It is possible that it was intended to remove ballast from the voids in the underframe to reduce the tare weight, but the figure 20t can still be seen painted on the side in the earlier photograph. Another possibility that has been suggested is that the brake van was involved in an accident and bodywork of a second brake van was substituted during the repair. If this happened, the bodywork must have come from another diagram AA23 brake van as the external handrails on the bodywork have corner fittings which are only found on this particular diagram. This possibility might explain the number (35382) roughly etched into the wood inside the brake van, as this is the number of another diagram AA23 brake van (one of sixty built on Lot 1588 in 1947). More investigation is clearly required.



The brake van was carefully restored by volunteers at Tyseley and repainted in Great Western Railway livery. Over the years it has; given rides, served as a class room on educational visits, as a mess room for the volunteers and been a regular attraction at Open Weekends. It was repaired and repainted a few years ago by volunteers, but is again in need of some care and attention.

By Robert Ferris

Volunteer Archivist (August 2021)

References

Photographs and Documents from the Tyseley Archive and personal collection
 Great Western Railway, Book of Rules and Regulations for employees (GWR) Various Years
 Great Western Railway, General Appendix to the Rule Book (GWR) 1910, 1923 & 1936
 Pamphlet 'Goods Guards Duties' (Great Western Railway) * **Reproduced below**
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 Great Western Railway Magazine, Spotlight on My Job No.6 By a Goods Guard by E Smith (GWR) 1937
 Great Western Railway Magazine, Spotlight on My Job No.15 By a Country Goods Guard by I Evans (GWR) 1938
 Great Western Railway Drawing 115923 - 20ton Brake Van Diagram AA21 (Swindon DO) 1940
 Great Western Railway Magazine, Pride in the Job No.7 Goods Guard (GWR) 1947
 GWR Goods Wagons by A Atkins, W Beard & R Turret (OPC) 2013
 GWR Goods Train Working, Volume 1 'From Development to Guard Duties' by A Atkins (Crecy) 2016
 Acquired Wagons of BR, Volume 1 'Fleet composition and Brake Vans' by D Larkin (Crecy) 2018
 Graces Guide Website

GOODS GUARDS' DUTIES

General Instructions.

THE train is under the control of the guard, who must give the engine-driver all necessary instructions as to the working of the train.

When trains are within station limits the guards are under the orders of the station master or person in charge.

The guard's brake-van must be at the rear of the train, and behind it a tail lamp painted red must be carried by day and night. This lamp shows a red light. Also, on each side of the brake-van there must be a side lamp. When lighted this shows white towards the engine and red towards the rear. The lamps must be lighted at night and during fog or falling snow.

A goods guard's equipment consists of the following:—

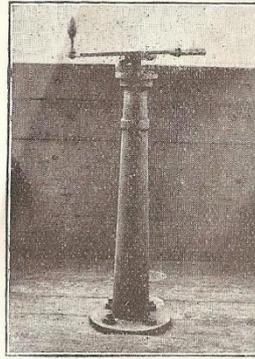
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| Red flag. | Watch. |
| Green flag. | 12 detonators. |
| Hand lamp. | Guard's journal forms. |
| Shunting pole. | "Wrong Line" order forms (for emergencies). |
| 2 sprags. | Pencil. |

See that the wagons on the train are labelled, safely loaded, and coupled together; also that the doors of the vehicles are secured.

The train should be formed, as nearly as practicable, with the wagons that are first to be put off, nearest the engine, those for the next place immediately behind them, and so on, the wagons for the destination of the train being next to the



GUARD'S BRAKE VAN WITH SIDE AND TAIL LAMPS.



HAND BRAKE IN GUARD'S VAN.

brake-van. Wagons picked up on the journey should, if possible, be placed in their right positions in the train.

The hand brake should be screwed clear off before starting.

The hand lamp should be lighted before entering long tunnels.

Always apply the hand brake as soon as you are aware that the engine-driver is applying his.

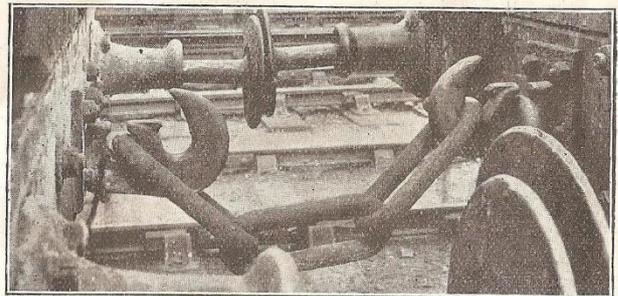
When an engine-driver requires the special assistance of the guard's brake he gives three or more sharp whistles, or sounds the brake-whistle, when he has a special whistle for that purpose.

Keep a good look-out on the journey. If any reason to apprehend danger, make efforts to notify the engine-driver. His attention can be attracted by applying the hand brake sharply and releasing it suddenly, and repeating this several times. Then signal to him by hand or lamp.

Before descending steep inclines a sufficient number of wagon brakes should be fastened down and, in going down, the guard must apply his hand brake to steady the train. Care should be taken not to skid the wheels. At places where this is necessary, there are notice boards at the tops of the inclines instructing the engine-driver to stop for brakes to be put down.

Wagons of live stock should be shunted as gently as possible. The animals should be inspected occasionally, and if any are found down or requiring attention they should be put right.

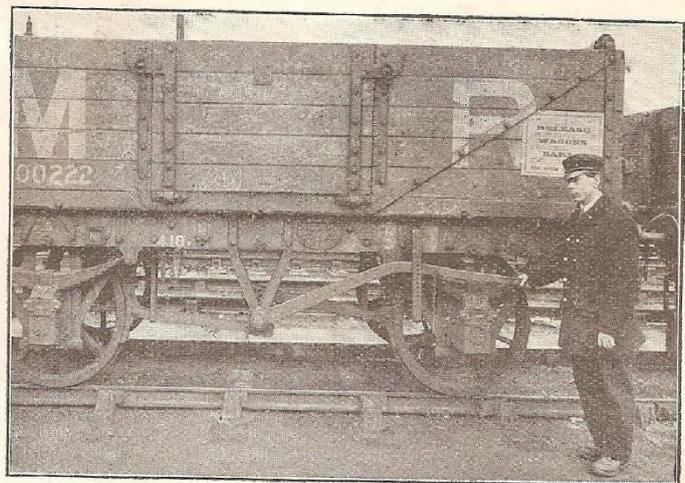
A "journal," on a proper form, must be prepared for each journey. The form itself shows what information has to be given.



HOW GOODS WAGONS ARE COUPLED TOGETHER. THE COUPLING CHAIN OF ONE VEHICLE MUST BE ATTACHED TO THE HOOK OF THE OTHER.



TWO SPRAGS ARE PART OF A GOODS GUARD'S EQUIPMENT. THIS PICTURE SHOWS THEIR NATURE AND HOW THEY ARE USED



THIS PICTURE SHOWS HOW THE BRAKE OF A WAGON IS APPLIED. THERE ARE DIFFERENT TYPES OF LEVERS ON VARIOUS COMPANIES' TRUCKS, BUT ALL ARE OPERATED VERY SIMILARLY. WHEN THE BRAKE IS "OFF," THE LEVER SHOULD REST IN A NOTCH OR BRACKET PROVIDED AT THE TOP OF THE BRAKE-RACK.

SIGNALS

The signal to the engineman to start the train is, by day, one arm held in a horizontal position; and at night, by a green light held steadily above the head.

At night, after the train has started, a green light waved from side to side by the guard from his van, shows the engineman that the train is travelling complete.

IN SHUNTING

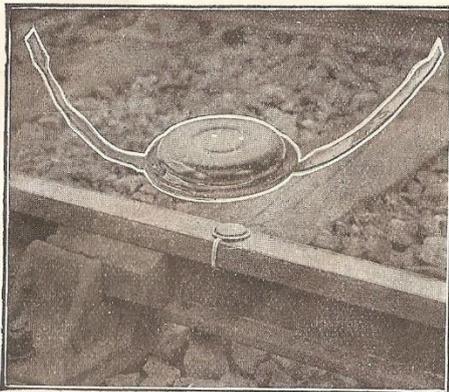
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| Move Forward—White light | } Waved slowly up and down. | |
| Move Forward Slowly—Green light | | |
| Move Backward—White light | | } Waved slowly from side to side across body. |
| Move Backward Slowly—Green light | | |
| STOP—Red light. | | |



BOTH ARMS RAISED ABOVE THE HEAD DENOTES DANGER.

ONE ARM RAISED ABOVE THE HEAD DENOTES CAUTION.

ONE ARM HELD IN A HORIZONTAL POSITION DENOTES ALL RIGHT.



A "DETONATOR," HAVING STRIPS OF LEAD BY WHICH IT IS FASTENED TO THE LINE. ALSO ONE IN POSITION. ON BEING RUN OVER IT EXPLODES WITH A LOUD REPORT.

DETENTION OF TRAIN ON THE RUNNING LINE

When a train is detained at a signal on the main line for more than three minutes, the guard, fireman, or shunter must go to the signal box, and remind the signalman of the position of the train, so as to prevent him from forgetting that the train is there and allowing another to run into it. In foggy weather or during falling snow, this course must be taken *immediately the train comes to a stand*. It must also be followed *immediately* whenever the train is shunted on to the opposite running line, or while it is standing on the running line waiting to be shunted clear. Unless the shunter goes to the signal box, the fireman should go if the engine is nearer than the guard's brake-van, and the guard if he himself is nearer. In any case, the guard must see that one or the other goes.

The man must remain at the signal box until the signalman has made use of the appliances provided in his box as a reminder of the position of the train or gives him permission to leave.

In some boxes electrical or other appliances are provided, to remind signalmen of the presence of trains standing at the signals. Notice-boards reading "Train Indicator in box," or words to this effect, are placed on or near the signals affected. At these places it is not necessary for a man to go to the signal box.

ATTACHING OR DETACHING VEHICLES WHERE THE LINE IS NOT LEVEL.

Before the engine is uncoupled, the van-brake and a sufficient number of wagon brakes must be put on tightly, also one or more sprags placed in the wheels of the wagons next to the brake-van, on a rising gradient, or of the foremost wagons in the case of a falling gradient.

WHEN THE TRAIN IS SHUNTED ON TO ANOTHER LINE OR A SIDING DURING DARKNESS.

The side and tail lamps must be removed when a train is shunted on to a siding or another line during darkness, for a following train to pass, so as not to exhibit red lights to the other train. The lamps must be replaced before the train is recrossed to its proper line.

ACCIDENTS

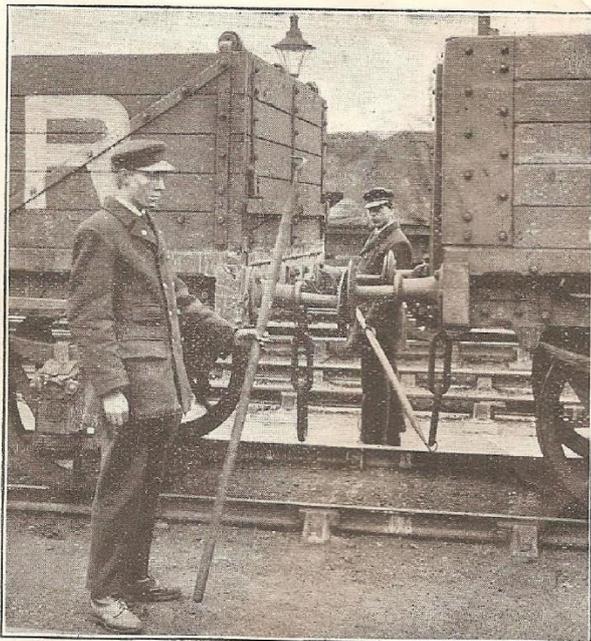
Should the train be stopped by an accident, failure, obstruction, or other exceptional cause, outside the protection of signals, the following procedure must be followed:—

IF THE OPPOSITE LINE IS FOULED

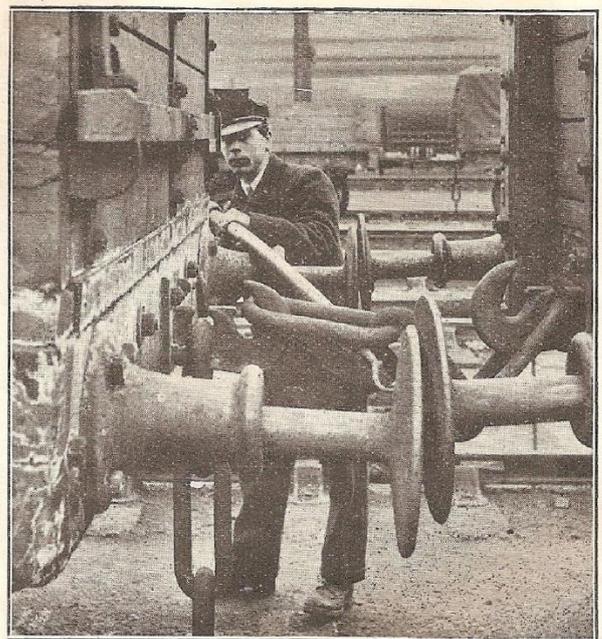
If the opposite line is fouled, the engine-driver must immediately detach the engine, run ahead for three-quarters-of-a-mile, and there leave his fireman with detonators and a danger hand signal, to prevent the approach of any train. The fireman must put down three detonators, ten yards apart, and remain on the spot to stop any train that may arrive.

The engine-driver must run forward with his engine to the nearest signal box and inform the signalman of the obstruction.

Should the engine be disabled, the fireman must proceed on foot, and place one detonator on the opposite line, a-quarter-of-a-mile from the



THE SHUNTING POLE AND HOW TO USE IT. TO COUPLE WAGONS, TAKE HOLD OF THE END LINK WITH THE HOOK OF THE SHUNTING POLE AND SWING THE LINK OVER THE OTHER WAGON.



TO UNCOUPLE WAGONS, PLACE THE SHUNTING POLE IN THE POSITION HERE SHOWN—THE END BEING UNDER THE FARTHER PORTION OF THE COUPLING LINK. THEN, USING THE SHUNTING POLE AS A LEVER, LIFT THE LINK FROM THE HOOK.

obstruction, another detonator a further quarter-of-a-mile away, and three detonators, ten yards apart, at the distance of three-quarters-of-a-mile from the obstruction. If he arrives at a signal box within this distance, he need not go beyond it, but must there place three detonators on the opposite line.

If both lines should be obstructed and the engine-driver run forward without being aware of the accident, the guard must see first to the protection of the opposite line. If he can obtain the services of a competent person, he must send him forward to protect the opposite line, as described in the previous paragraph. If no competent person is at hand, the guard must himself go forward quickly and protect the opposite line in the manner described, returning after he has placed down the three detonators three-quarters-of-a-mile from the obstruction. He must then proceed at once to protect his own train, as described below.

PROTECTION OF DISABLED TRAIN

Unless the opposite line requires to be protected, the guard must immediately take his red flag (or lamp) and detonators, and walk back on the same line, at least three-quarters-of-a-mile, to protect the disabled train. He must exhibit the DANGER signal as he proceeds, and place a detonator on the line a-quarter-of-a-mile from the train, another detonator half-a-mile from the train, and three detonators, ten yards apart, three-quarters-of-a-mile from the train. He must then remain at this spot until recalled to his train by the engine-driver sounding the whistle of the engine. When returning, he must leave the three most distant detonators on the line and pick up the others on his way.

Should the guard, in going to protect his train, arrive at a signal box within the distance of three-quarters-of-a-mile, he need not go beyond it, but must place three detonators on the line opposite the box, and instruct the signalman to protect the obstructed line. He must then return to the train to deal as necessary with the obstruction.

If, in going back, the guard comes to a tunnel, he must place three detonators, ten yards apart, at the end of the tunnel nearest to the obstruction.

Should the distance of three-quarters-of-a-mile fall within a tunnel, or close to the mouth of a tunnel, three more detonators must be placed on the line at the farther end of the tunnel.

TO OBTAIN ASSISTANCE

If the signal box in advance is nearer than the one in the rear, the fireman must immediately go to it, and describe the circumstances to the signalman.

Should the engine be able to run forward, the driver must proceed with it to the next box; but before he starts away from his train he must obtain from the guard a written order to return on the wrong line. This order reads:—

“ To the signalman at Allow driver of engine No. to return on the wrong line to the remainder of his train standing on the Line at I will prevent its being moved until the return of the engine.”

Signed Guard.

Should the signal box in the rear be the nearer, the guard, after protecting his train as already described, must go to that signal box and advise the signalman. When an assistant train is obtained from the rear, the guard of the disabled train must ride upon the engine of it, and point out to the driver the position of the obstruction.

ENGINE TRAVELLING ON WRONG LINE

An engine must not travel on the wrong line, outside the protection of the signals at a signal box, without a special written order. When a portion of a train is left on any running line through accident or other cause, and the engine-driver has to return on the same line for it, he must first obtain from the guard a “ Wrong Line ” order (described on the previous page). He should send his fireman to the guard for it before starting away with the first portion of the train. This rule applies even if, after a train has become divided, both portions are brought to a stand in sight of each other, and there is not a signal box near either end of the train. Before the engine-driver sets back the front portion, to be re-coupled, he must send his fireman to the guard, who is protecting the rear portion, for a written authority to set back.

If, in case of accident, it is necessary for a train, or portion of a train, to return on the wrong line to the signal box in the rear, the guard or fireman must first go to the signalman there and obtain a signalman’s “ Wrong Line ” order, which reads:—

“ To the driver of engine No. working m. train from to I authorise you to return with your train on the wrong line to this signal box.”

(Signed) Signalman.

..... Signal Box.”

GOODS TRAIN DIVIDED

Should a goods train have to be divided on an incline, owing to the inability of the engine to take the whole forward, the fireman must ride upon the last vehicle of the front portion, or the nearest suitable vehicle thereto, and the guard, after putting on his brake securing the last portion of the train so that it will remain stationary, must go back and protect it.