

3.0

Level Crossing Types and AHB Sequence of Operation

3.0 Types of UK Level Crossing

Accommodation Crossings

Accommodation crossings enable a landowner to get between the two parts of his field which has been split by the railway having been built across it but where no dwellings are involved¹⁹. Accommodation can be thought of as field to field; many are 'sleeping dogs'; others see only seasonal or occasional use.



*Figure 3.1
Typical
Accommodation
level crossing, NIR,
on the Bleach Green
to Antrim line near
Doagh; note the lack
of any decking for
the user.*

*Photo:
Tony Goodyear*

Automatic Half Barrier

A level crossing with half barriers that close off half the road, allowing an exit if the barriers operate whilst the user is on the crossing. The barriers and road signals are operated automatically by the passage of trains and the crossing operation is supervised by a remote signalman. Maximum train speed allowed 160km/h. (see illustrations in section 3.1)

Automatic Half Barrier Distant Monitored

Unique to NIR; the three crossings at Culleybackey North, South and Station fall into this unusual category. A level crossing with half barriers that close off half the road, allowing an exit if the barriers operate whilst the user is on the crossing. The barriers and road signals are operated automatically by the passage of trains and the crossing is

¹⁹ Definition, courtesy John Hopkinson, HM Principal Inspecting Officer of Railways, HMRI, London.

supervised by the driver of the approaching train, who has a white flashing aspect to advise him of the correct operation of the equipment; the driver has to be able to stop in an emergency. In addition, the three crossings are supervised by a remote signalman in the same way as an AHB, although in this case the supervisory indications are common to all three crossings and the signalman cannot determine which one is failing. The signalman has no responsibility for the safe operation of the crossing. The train driver's flashing white light is located approximately 300m from the crossing. Maximum train speed allowed 90km/h.

Automatic Half Barrier Crossing Locally Monitored

A level crossing with half barriers that close off half the road, allowing an exit if the barriers operate whilst the user is on the crossing. The barriers and road signals are operated automatically by the passage of trains and the crossing is supervised by the driver of the approaching train, who has a white flashing aspect to advise him of the



Figure 3.2

Train Driver's view of AOCL level crossing at Winchelsea, East Sussex. Note the two driver's white lights, whistle board and the road signals.

correct operation of the equipment; the driver has to be able to stop in an emergency. The driver's flashing white light is located close to the crossing. Maximum train speed allowed 90km/h. See figure K.15 showing Kempston Hardwick ABCL LC.

Automatic Open Crossing Locally Monitored

A open level crossing with no barriers and whose road signals are operated automatically by the passage of trains; The crossing is supervised by the driver of the approaching train, who has a white flashing aspect to advise him of the correct operation of the equipment; the driver has to be able to stop in an emergency. The train driver's flashing white light is located close to the crossing. Maximum train speed allowed 90km/h. See figure 3.2.

Automatic Open Crossing Remotely Monitored

An open level crossing with no barriers and road signals that are operated automatically by the passage of trains and the crossing operation is supervised by a remote signalman. These are no longer installed following the Lockington accident. Maximum train speed allowed 120km/h. Only one crossing of this type remains in the UK; at Rosarie (Grid Ref. NJ383503) between Keith and Elgin on the Aberdeen to Inverness line, It is monitored from Keith Junction Signalbox.

Manually Controlled Barriers

A level crossing with barriers operated by a local signalman or gatekeeper employed by the railway. The barriers may be interlocked with the railway signals. The barriers close off the whole road. Maximum train speed allowed 200km/h.

Manually Controlled Barriers, with Closed Circuit Television

A level crossing with barriers operated by a remote signalman or gatekeeper employed by the railway, who uses closed circuit television to supervise the crossing. The barriers are interlocked with the railway signals. The barriers close off the whole road. Maximum train speed allowed 200km/h. See figures 2.3 and 2.4.



*Figure 3.3
Miniature Stop Lights, Westbrook Lane UWG LC near Collingham, Lincs, showing both operating conditions. Note the 'home made' light shield fitted to the right hand side.*

Manually Controlled Gates

A level crossing with gates operated by a local signalman or gatekeeper employed by the railway. The gates may be interlocked with the railway signals. The gates close off the whole road. Maximum train speed allowed 200km/h.

Miniature Stop Lights (also known as Miniature Warning Lights²⁰)

Miniature red and green lights operated by approaching trains. These can be fitted to road or bridleway level crossings with UWG or UWB, or footpath crossings, with or without wicket gates. The UWG or UWB close off the whole road. See figures 2.1 and 3.3.

Open Crossing

A level crossing with road signs only at which the road user has to give way to trains, and where the train is obliged to stop short of obstructions. Maximum train speed allowed 15km/h. Only one railway track is permitted. See figure 2.2.

²⁰ Correct term is MSL.



*Figure 3.4
Melton Lane LC, near
Swanland,
East Yorkshire;
Toe Motor Boom Gates, and
inset, detail of motor and
driving tyres.*

Occupation Crossing

An occupation crossing enables a dweller (usually, but not always a farmer) to reach his living premises where the only access was by a road/track now 'severed' by the railway²¹. Occupation crossings serve dwellings and are in constant use: could easily be twenty crossings a day (see figure 10.10).

²¹ Definition, courtesy John Hopkinson, HM Principal Inspecting Officer of Railways, HMRI, London.

Toe Motor Boom Gates

A motorised level crossing gate introduced prior to automatic crossings. The gate is driven to either the open or closed position by the action of a small electric motor driving two tyres. (See figure 3.4).



Figure 3.5

*Jacky Duffin Wood, MSLUWB LC,
near Drax, Yorkshire;*

*Note the red pump handle for the motorist to use
to raise barrier immediately below the MSL
signboard. (Inset) The sign is a reminder to the
motorist as it is very easy to drive away and leave
the barriers up.*



Trainman Operated

A level crossing whose gates or barriers are operated by the train crew.

User Worked Barriers

A level crossing whose barriers are operated by the user, public or private. Maximum train speed allowed 160km/h unless additional protection is provided. See figure 3.5.

User Worked Gates

A level crossing whose gates are operated by the road user, public or private. Maximum train speed allowed 160km/h unless additional protection is provided. See figure 2.1.

Note

The road user is unlikely to be able to differentiate between the AHB, ABCL and AHBD as these level crossings will all appear to be half barrier level crossings.

3.1 Automatic Level Crossing Operation

The following sequence of photographs shows the operation of typical AHB level crossings. All AHB, ABCL, AOCL and AHBD automatic level crossings work to the same basic timing principles.

3.3.1 'Strike in' & Amber signal; 0-3 seconds



Figure 2.6

Havenhouse, AHB LC, Lincolnshire;

At a point on the railway 27 seconds away at maximum line speed the train will strike in causing the crossing operating sequence to start. At this moment in time the Amber aspect will show to motorists and pedestrians for the next 3 seconds. The Yodalarm will sound until the barriers raise (or a bell on un-modernised crossings).

3.1.2 Red flashing signal; 4-10 seconds



Figure 3.7

Hawthorn Bank, Spalding, AHB LC Lincolnshire;

At 4 seconds the red lights in the primary road signals will begin to flash alternately until the level crossing is clear and the barriers rise.

3.1.3 Barriers operate; 11-20 seconds

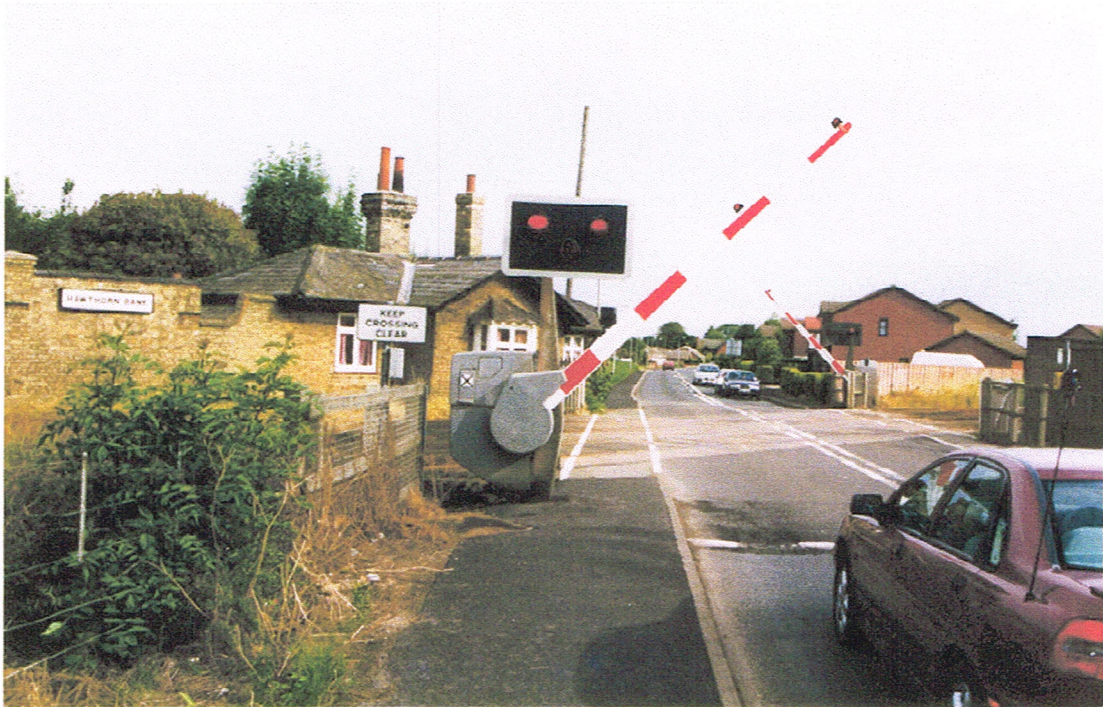


Figure 3.8

Hawthorn Bank, Spalding, AHB LC, Lincolnshire;

At approximately 11 seconds, the barriers will start to descend. They should reach the horizontal position in 6-10 seconds. The boom lights will also illuminate as the barriers start their descent.

3.1.4 Barriers down; 21-26 seconds



Figure 3.9
Willington, AHB LC on the Derby Uttoxeter line;
The waiting period. Seen through the windscreen of the author's car.
Note the 'Yellow' box road markings.

3.1.5 Train arrives; 27 seconds

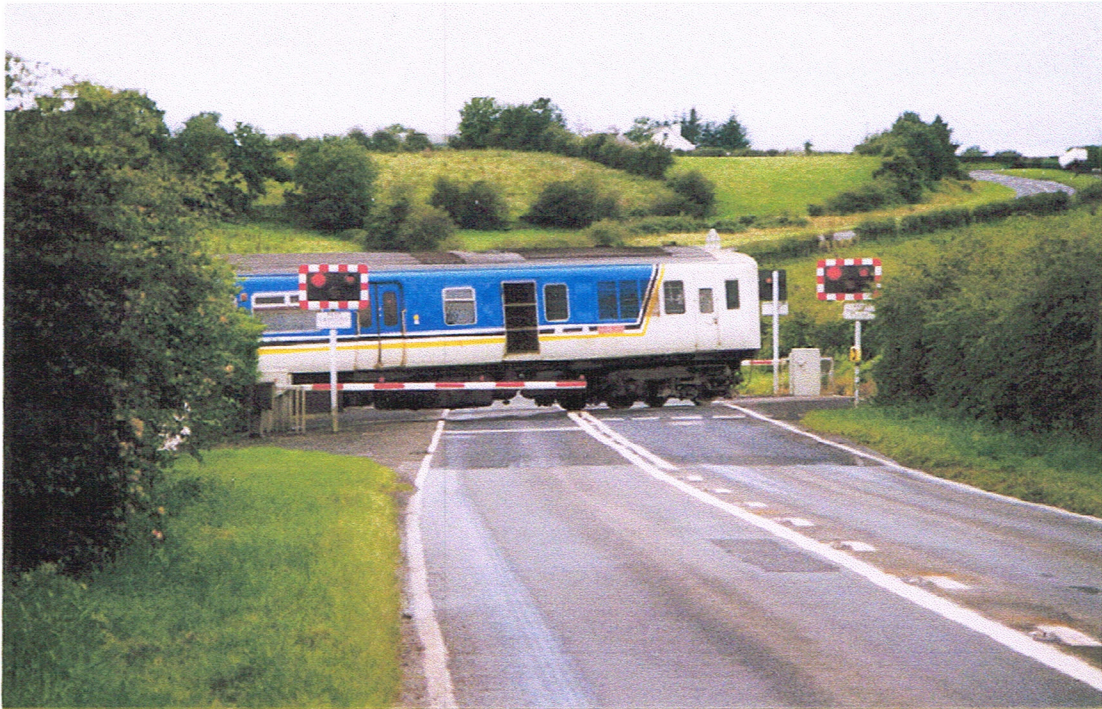


Figure 3.10

Ballyboyland, AHB LC, County Antrim, (NIR);

If the train is travelling at maximum line speed it should arrive at the crossing at circa 27 seconds. If it is travelling more slowly, the public have a correspondingly longer wait. This is the dangerous moment as impatience leads to risk taking by the public.

Note the video camera in the top right hand side of the picture, 2 cm down from top.

3.1.6 Train 'strikes out'; circa 30-35 seconds



Figure 3.11

Cranswick AHB LC at Hutton Cranswick Station, East Yorkshire;

The rear of the train has just cleared the controlling track circuit; the barriers have started to rise. They should rise in 6-8 seconds; the road signals, boom lights and yodalarm are still operating.

3.1.7 Level crossing clear; circa 30-35 seconds



Figure 3.12

*Cranswick AHB LC at Hutton Cranswick Station,
East Yorkshire;*

The road traffic signals, and boom lights will extinguish when the barrier arms reach 45° above the horizontal position. The Yodalarm, or bell, will be silenced at this time, and road traffic and pedestrians can now cross.