

LOCOMOTIVE TRAINEE TO LOCOMOTIVE ASSISTANT  
COURSE

Lesson 2

Signalling

Page 1

The student has now reached the stage when it is necessary for him to acquire a knowledge of signalling to prepare him for the signalling section of the examination.

The Trainee must equip himself with all the knowledge necessary for the more important job ahead of him. He is strongly urged to study thoroughly and take the lessons in the courses in easy stages. Thus he acquires a sound knowledge which he will retain.

At the outset it is emphasised that this and subsequent lessons on signalling and rules are designed to convey to Trainees some basic information on these subjects with a view to clarifying the instructions contained in the Rule Book (1965 issue). The information given is complementary to the Rules and Regulations and in no instance does it override any rules or instructions given in that book. It is meant to illustrate in clear and simple terms the correct interpretation of the various signals - fixed, hand and whistle - which are necessary in shunting yards and at a later stage on the main line.

The Rules and Regulations Book is divided into three sections, namely -

Rules  
Automatic Signalling  
Electric Train Tablet System

and throughout the training period reference will be made to a specific Rule or Regulation as:

|                                    |        |
|------------------------------------|--------|
| Rule                               | R. -   |
| Automatic Signalling<br>Regulation | A.S. - |
| Tablet Regulation                  | T. -   |

Further, from time to time it will be necessary to refer to the "Locomotive Staff Operating Instructions" Book and this will be referred to as L.S.O.I. or sometimes as H.I. (Handbook of Instructions).

The first and most important duty of every member of the service is to provide for the safety of the public and other employees.

As a Locomotive Trainee it is necessary to fully understand the definitions as set out in Rule 2.



Every member must have a thorough knowledge of all the Rules and Regulations which relate to the duties of the occupation in which he is employed and with all the special instructions as may from time to time be issued.

COLOURS AND INDICATIONS OF RAILWAY SIGNALS:

It is important that the colours and indications of railway signals be fully understood in order that no mistake is made when they are displayed. They are as follows -

|              |   |   |   |             |
|--------------|---|---|---|-------------|
| Red          | - | DANGER  | - | STOP        |
| Green Moved  | - | CAUTION   | - | MOVE SLOWLY |
| Green Steady | - | CLEAR   | - | PROCEED     |
| Yellow       | - | CAUTION   | - | MOVE SLOWLY |
| Purple       | - | Trap points indicator as explained in Rule 50 (b) |   |             |

HAND SIGNALS:

Hand signals will be made with flags or with the arms by day, and with lamps by night.

For the purpose of controlling shunting movements, the Shunter or other authorised member, uses his hands and arms by day, and hand lamps by night, to convey to the locomotive crew the direction in which he desires the shunt to move. Shunters do not use flags for giving signals for shunting movements. Should the Enginedriver or Locomotive Assistant lose sight of a Shunter exhibiting a hand signal the train or shunt must be stopped at once and remain stopped until receipt of a further signal. If the Shunter was signalling on the Locomotive Assistant's side, the Locomotive Assistant must immediately signal the Enginedriver to stop by calling "Whoa-Stop" at the same time raising both arms above the level of the head. The person exhibiting a hand signal must face the locomotive, but if this is not possible owing to working conditions, the employee must satisfy himself that the signal he is giving can be readily seen and understood by the locomotive crew.

| <u>Shunting Hand Signal by Day</u>   | <u>Indication of Signal</u>    |
|--|--------------------------------|
| Both arms raised above the level of the head, or any unusual signal  | Danger - <u>Emergency</u> Stop |
| (i) Both arms extended sideways horizontally from the shoulders, or  |                                |
| (ii) One arm raised above the level of the head with fingers outstretched - (to be used when Shunter has only one hand free) | Stop                           |
| One arm and hand moved in small circles and indicating the direction in which the shunt is to travel                         | Come slowly towards the signal |
| One arm and hand moved in full circles and indicating the direction in which the shunt is to travel                          | Come towards the signal        |



Shunting Hand Signal by Day (contd)

One arm and hand moved in small circles and indicating the direction in which the shunt is to travel

One arm and hand moved in full circles and indicating the direction in which the shunt is to travel

Hands brought together as in a clapping movement

Elbow held at shoulder height, and hand and forearm moved smartly towards and away from the head

Forearms crossed in front of the chest with the hands open

Shunting Hand Signal by Night

A red light waved quickly, or any light waved in an unusual manner

A steady red light

A green light moved slowly from side to side across the body

A white light moved slowly from side to side across the body

A green light moved slowly up and down

A white light moved slowly up and down

A green light moved very slowly from side to side in a small arc

A white light moved rapidly from side to side in a small arc

A green light moved slowly up and down

Indication of Signal

Go slowly away from signal

Go away from the signal

"Ease Up" - Come slowly towards the signal bringing the buffers together

"Kicking movement" - Come quickly towards the signal being prepared to stop promptly

"Pull out and stop short" - Go away from the signal, being prepared to stop short

Indication of Signal

Danger - Emergency Stop

Stop

Come slowly towards the signal

Come towards the signal

Go slowly away from the signal

Go away from the signal

"Ease Up" - Come slowly towards the signal bringing the buffers together

"Kicking movement" - Come quickly towards the signal being prepared to stop promptly

"Pull out and stop short" - Go away from the signal, being prepared to stop short



WHISTLE SIGNALS FOR THE PURPOSE OF ATTRACTING ATTENTION ARE  
GIVEN AS FOLLOWS:

One short whistle  
Two short whistles  
Three short whistles (repeated)  
Four short whistles

Four long whistles

Twelve short whistles sounded  
for periods of 30 seconds,  
repeated if necessary

One long whistle

One long, to be sounded 300  
metres from and again  
immediately before entering  
a tunnel

Two long whistles

One long, one short, one  
long whistle

One short, one long, one short

One long, two short, one long

Two long, two short whistles

Going forward

Setting back

Apply brakes

Signal given by an Enginedriver  
to warn the Officer in Charge of  
a station that his train is  
being double banked

Signal given by Enginedriver to  
member protecting in rear to  
return to train

Outbreak of fire in a vehicle  
or on railway premises

Approaching level crossings,  
stations, signal-boxes, sidings,  
or workmen on or near the track  
or while passing another train  
which is stationary or shunting  
at a station on an adjacent line;  
also when required, where  
WHISTLE BOARDS are erected

Warning signal to men working  
in tunnel

Branch trains approaching  
junctions from either direction

Bank Enginedriver's signal to  
train Enginedriver to tell him  
that the bank engine key is on  
the banking locomotive

Guard required at engine. After  
sounding this signal the Engine-  
driver must not proceed unless he  
received a "CLEAR-PROCEED" signal  
from the Guard. Where necessary,  
the Guard must provide protection  
in accordance with Rule 74 before  
proceeding to the locomotive.

Train parted while running.

Signal from the Enginedriver of  
leading locomotive to the Engine-  
driver of locomotive assisting in  
rear of train to shut off power.

(Signal to be used when an  
unusual stop is to be made)



DETONATORS:

A detonator is a round metal container filled with explosive. It is provided with two lead clasps for attaching it to the rail. When the detonator is run over by a train or vehicle it explodes and the number of reports heard by the Enginedriver indicates the signal intended. They should be handled carefully as rough handling may cause them to explode.

When it is required to place them on the rail they must be placed label upwards in the centre of the rail, ten yards apart, and secured firmly with the lead clasps bent around the upper flange of the rail.

Detonators are used by track workers, or other maintenance employees, who are required to effect repairs to the track or to vehicles standing on any running line in a shunting yard. These members provide various signals to protect themselves and rolling stock from possible injury. These signals must be rigidly obeyed by locomotive crews. Where the use of detonators is prescribed by any rule, regulation or instruction, they must be used by day and by night.

DETONATOR SIGNALS are given as follows:

One or two pairs of detonators exploded indicates "Reduce speed and be prepared to stop if required", the Enginedriver proceeding cautiously to the defective place or until he receives a further signal for his guidance.

Three or more pairs of detonators exploded indicates "that the Enginedriver must stop the train immediately and it will remain stationary until he has found out the nature of the obstruction, when he must act as the circumstances of the case may require".

TRACK WORKERS' SIGNALS:

The following signals are used by track workers -

A Red disc, a Red flag, or both arms raised above the level of the head by day; a Red light, or any light waved violently by night; or three detonators exploded by day and by night indicates DANGER - STOP.

A Green flag moved slowly up and down by day, or a Green light moved slowly up and down by night indicates CAUTION - REDUCE SPEED TO 10 km/h. In the absence of a Green flag by day or a Green light by night, a Danger signal must be used.

Two detonators on each rail, 10 metres apart, exploded by day or by night, indicates CAUTION - REDUCE SPEED AND BE PREPARED TO STOP IF REQUIRED.

A steady Green flag or one arm held horizontally across the line by day; or a steady Green light by night indicates - CLEAR PROCEED.



When a portion of the track is under repair and is not fit for normal speed, temporary outer and inner speed boards are erected. The outer board is placed at least 1200 metres from the defective place and is painted yellow with the word "CAUTION" written on it, and also the speed per hour that the train is permitted to travel over the restricted area.

Temporary inner speed boards, which are diamond shaped and painted white, are placed 50 metres on each side of the defective place. They are lettered "C", indicating the commencement of the restricted area and "T" indicating the termination of the restricted area. They are used in conjunction with all temporary outer speed boards. On reaching the inner "C" board the Enginedriver will commence to run at the speed shown on the outer board. He must maintain this speed until the last vehicle on the train has passed the next inner board with the "T" on it, when normal speed may be resumed.

Study carefully the diagram on page 111 of the Rule Book.

#### AIR BRAKE TEST SIGNALS:

Train Examiners and other members when testing the air brakes on a train use signals as follows -

##### By Day

Both hands brought smartly together above the head indicates that the brakes are to be applied for the test.

Both hands held together above the head and then parted outwards until level with the shoulders indicates that the brakes are to be released for the test.

##### By Night

A steady Red light, followed by a steady White light, followed by a steady Red light, indicates that the brakes are to be applied for the test.

A steady White light, followed by a steady Red light, followed by a steady White light, indicates that the brakes are to be released for the test.

See diagrams on page 16 of Rule Book.

#### HAND SIGNALS FOR THE MOVEMENT OF TRAINS:

We can now consider the hand signals used for the movement of trains. The student, having dealt with the signals used for shunting movements, whistle, brake testing signals and track workers' signals, can now commence to study the hand signals he will be called upon to interpret when engaged on train running duties.



At stations where fixed signals are NOT provided for the purpose all train movement must be hand-signalled with flags during daylight and with handlamps by night. Under these circumstances if a train is to enter the station on the main line or crossing loop or siding at a station the following hand signals would be given -

- By Day - A Green flag moved slowly from side to side across the body.
- By Night - A Green light moved slowly from side to side across the body.

On receipt of these signals the train would come on slowly and stop at the station or enter the crossing loop or siding. If it is necessary for the Signaller to proceed to the points to set the road for a train to enter the loop or siding he will give the signal from the main line points.

When the train enters on the main line the signal will be given from the station platform.

When a train is to depart from a loop or siding and there are no fixed signals for the purpose and it is necessary for the Signaller to proceed to the points to set the road the hand signal must be the same as that given to a train to enter the station. (See Rule 10, Clauses d and e).

If the points are operated from a signal box the Guard's signal to start the train will indicate to the Enginedriver that the points are set to leave the loop. If the Enginedriver and the Locomotive Assistant are in a position to do so they must see that the points are correctly set for the movement.

SIGNALS TO START A TRAIN:

Too much importance cannot be attached to the necessity of locomotive crews having a complete knowledge of signals required to start a train. In this respect there are many occasions when the Enginedriver is called upon to accept from his mate the signal he receives from the Guard. It can therefore be seen that Locomotive Assistants must have a reliable knowledge of these signals in order that the Enginedriver can accept them with confidence. The following description clearly explains the signals which will be received:

Guard's Signal to Enginedriver to Start the Train:

| <u>Signal by Day</u>   | <u>Signal by Night</u>   | <u>Indication of Signal</u>                    |
|--|--|--|
| Guard blowing his whistle and showing a Green flag held above the level of the head. | Guard blowing his whistle and showing a Green light held steadily above the level of the head. | Guard's signal to Enginedriver to start train. |



| <u>Signal by day</u>                                 | <u>Signal by night</u>                                | <u>Indication of Signal</u>  |
|--|---|--|
| Green flag held steadily above the level of the head | Green light held steadily above the level of the head | To indicate to Enginedriver or Locomotive Assistant when starting that Guard has joined the train. (To be acknowledged by a short pop of whistle). |

It is necessary too that Rule 134 should be fully understood and in order that its relation to starting trains can be explained, this Rule is now quoted -

- Rule 134 (a) An Enginedriver must not start his train until he has received a proper signal from the Guard. The Guard before giving such signal must obtain permission to leave from the Officer-in-Charge either verbally or by a signal in accordance with Rule 10 Clause (f).
- (b) Where there are no fixed signals controlling the departure of trains, and points are operated from a signal box, the Officer-in-Charge, before giving the Guard permission to start the train, must satisfy himself that the points are correctly set. In this case the Guard's signal to the Enginedriver will be an indication to the latter that the points are correctly set. When in a position to do so the Enginedriver must keep a lookout to see that the points are correctly set before passing over them.
- (c) At unattended stations, the Guard must satisfy himself that all is right to proceed before giving the signal.
- (d) The Enginedriver, on receiving the Guard's signal, must sound the whistle before moving.
- (e) Where there are fixed signals controlling the departure of trains the Enginedriver must satisfy himself that the correct signals are at "Proceed" and that the line before him is clear before starting.

When the Guard has joined the train after giving the starting signal, he must exhibit a Green flag by day or a Green light by night, held steadily above the level of the head, which the Enginedriver must acknowledge with a short pop of the whistle. The Guard must exhibit the signal from the side upon which the engine crew will have the better view of the signal.



- (f) When a train has been checked or stopped at a signal the Enginedriver must sound a short whistle immediately the signal is set at "Proceed" as an acknowledgment of the signal. If the train is stopped within station limits, it must not start until the Enginedriver receives a signal from the Guard.

#### GUARD'S SIGNAL TO ENGINEDRIVER TO STOP AT A STATION:

If it is necessary to stop a train at a station where it is <sup>not</sup> timed to stop if required to set down passengers or for van work the Guard will give the following signal to the Enginedriver :-

By day : A Green flag moved slowly from side to side across the body.

By night : A Green light moved slowly from side to side across the body.

#### TRAIN PARTED WHILE RUNNING:

If it so happens that a train has parted while running and the Enginedriver or Guard is not aware of it any member who has noticed this and is in a position to do so will give the following signal to the Enginedriver or Guard :-

By day : A Green flag and a White flag held together and waved apart at frequent intervals above the head.

By night : A lamp showing in quick alternations Green and White lights.

#### SIGNALS CARRIED BY TRAINS:

Every train must carry two side lamps and one tail lamp, except that when flashing tail lamps are used a lamp must be placed on the lower bracket on each side to be lighted after sunset or during fog or falling snow or in any other circumstances of bad visibility. These lamps are attached to the last vehicle of a train to indicate that it is complete.

The side lamps when lighted show Red lights to the rear and White lights forward. The White light as seen by the locomotive crew will indicate that the last vehicle is following.

The tail lamp or lamps which are placed on the lower brackets show when lighted, Red lights to the rear.

When a shunting train is authorised to run without a brake van attached in the rear a tail lamp must be provided. By day a Red flag will be used if a lamp is not available.

Locomotives assisting trains in the rear must have a tail lamp placed at the back of the locomotive.



A locomotive running light must display a tail lamp.

When two or more locomotives are coupled running light the tail lamp must be placed at the back of the rear locomotive. In the case of electric or diesel locomotives running light the tail lamp must be illuminated both by day and by night.

Locomotives drawing trains must not carry tail lamps, nor do locomotives carry side lamps.

Head lamps on diesel, diesel-electric and electric locomotives, railcars and electric multiple units must be illuminated day and night when running on the main line.

Head lights on locomotives engaged exclusively on shunting operations must be on "dim" by day. After sunset or during fog or falling snow such locomotive must display a white light at each end.

#### CALLING AND REPEATING SIGNAL INDICATIONS:

All Locomotive Trainees have been issued with the instructions connected with "Calls" and "hand signals" to the Enginedriver. These are all dealt with in Instruction 28 pages 11 to 32 in Locomotive Staff Operating Instructions (L.S.O.I.)

As these "Calls" and "Handsignals" occupy an important part of the Locomotive Assistants examination students are urged to study them closely.

The following are common terms which Locomotive Trainees and Locomotive Assistants will come across in the course of their duties.

You should study these terms and become familiar with their meanings.

Leading Handbrake: When the brake handle is in front of a moving vehicle.

Marking-up: Chalking destination on sides of wagon before marshalling or breaking up a train.

Marshall or Make-up: To arrange vehicles on a train in station or district order.

Vehicles Out Foul: Vehicles left standing in a siding or loop but obstructing the adjoining siding or running line.

Pull-Out and Stop Short: Enginedriver to go ahead and be prepared to stop short. A green light moved up and down at night or in daytime arms crossed over the chest.

Pulling the Tap: To pull down or open a coupling cock at the end of a vehicle thus stopping a train or wagons with the air brakes.



Rake: A number of wagons or carriages coupled together.  
(may be part of a train).

Runner: When a wagon, not necessarily an empty, is used to separate wagons whose overhanging loads would otherwise foul one another without it.

Spreader-Bar: Used between certain classes of locomotives to keep their cow-catchers apart. A suitable "runner" may be substituted.

Samson-Post: Concrete or hardwood stop at the end of a siding or platform dock.

Stop-Block: As distinct from a Samson-Post. A hinged derailing block over a rail to prevent wagons from fouling a running line.

Shunting-Leg: A backshunt leading off a loop line or siding to allow shunting movements to be carried out without fouling the running lines.

Slipping: The art of shunting a wagon or wagons into a siding which lies ahead of the locomotive. The wagon is pulled by the loco. which accelerates. When the required speed is attained the locomotive eases up allowing the Shunter to lift the hook. The locomotive again accelerates thus making a gap between it, the wagon and the points. The points are then turned over and the wagon runs into the siding under its own momentum.

Total: This refers to the number of wagons on a train.

Trailing hand-brake: When the brake-handle is on the rear of a moving vehicle in the direction in which it is travelling.

#### UNOFFICIAL HAND SIGNALS IN EVERYDAY USE:

Cut-off or break: The Shunter gives this indication by clenching his fists in front of his body and then breaking them apart.

Brake Test Completed: The Train Examiner gives this indication by crossing his arms low down in front of his body.



LOCOMOTIVE TRAINEES COURSE FOR LOCOMOTIVE ASSISTANTS

Assignment No. 2

QUESTIONS

January 1977

Question  
No.

- 1 Explain the following definitions:
- (a) O.C.T.R.
  - (b) O.I.C.
  - (c) Signaller
  - (d) Main Line
  - (e) Crossing Loop
  - (f) Signal Box
  - (g) Station Limits
  - (h) Open Section
- R2
- 2 Describe fully the procedure when protecting a train in case of accident, failure or obstruction.
- R74
- 3 When it is necessary in the case of a breakdown for a relief train or locomotive to enter the obstructed section :
- (a) What written undertaking must the Enginedriver give the Locomotive Assistant.
  - (b) How should the Locomotive Assistant deal with this form?
- R73
- 4 Explain fully the Locomotive Assistant's duties in calling and repeating all signal indications.
- L.S.O.I. 28
- 5 What are the Locomotive Assistant's duties in keeping a sharp lookout while his train is in motion?
- R181
- 6 Name the types of fixed signals in use.
- R22
- Name the classes of fixed signals in use.
- R23
- 8 How would you know when :
- (a) Semaphore signals
  - (b) Shunting signals
  - (c) Colour light signals
- are not in use?
- R25
- 9 Where are "Catch" and "Safety Points" placed and what is their purpose?
- R49



Question  
No.

- 10 (a) What signal does a train crew require to enter or depart from a loop or siding where there are no fixed signals for the purpose, both by day and by night?
- (b) Describe the Guard's hand signal by day and by night to the Enginedriver to start the train.
- (c) What hand signal must the Guard give (by day and by night) to indicate he has joined the train?
- (d) What hand signal must the Guard give (by day and by night) to indicate to the Enginedriver he is required to "STOP" at the next station? R10
- 11 What is the purpose of a tail light or lamp on a train and what indication does it display when lighted? R16
- 12 Where two position semaphore (not distant signals) signals are in use, what indications do they display by day and night and what are their meanings? R27
- 13 Describe the indications displayed by semaphore and colour light "Distant Signals" by day and night and give the meaning of the indications. R31
- 14 Where are Home signals placed and what is their purpose? R32
- 15 Where are Directing signals placed and what is their purpose? R45
- 6 What is the purpose of Starting and Advance starting signals? R42
- 17 What indications do mechanical shunting disc signals display by day and night and what are their meanings? R47
- 18 Describe the indications displayed by three position colour light ground shunt signals by day and night and give the meaning of the indications. R48
- 19 (a) Where are Arrow light indicators and their related Points Indicators located?
- (b) When an Arrow light indicator is illuminated, what does it indicate? R51
- 20 (a) What are "Trap Points"; what is their purpose; what indications does a trap points indicator display by day and by night and what is their meaning?
- (b) What must be observed and received before passing over trap points? R50



Question  
No.

- 21      (a) What would constitute an unusual or irregular signal?
- (b) What action must the Locomotive Assistant take if he observes such a signal?
- 

R52