DK-STM

User Manual

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	Replaces		
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Content:

1 Introduction

1.1 Purpose

The purpose of this user manual is to describe how DK-STM is operated from a customised ETCS DMI.

Banedanmark TSA is considered to be the recipient of the manual.

DK-STM contains the same basic traffic functionalities that are applicable in ZUB123, which is why DK-STM carries out the same monitoring of the train's drive on an ATC infrastructure such as ZUB123.

This is not an STM-instruction but a user manual that later on can be used as the basis of preparation of an STM-instruction or as basis for training material.

DK-STM cannot work independently, but only together with a connected ETCS-system, which determines when DK-STM gets the possibility of becoming active or passive.

1.1.1 Activation of DK-STM

DK-STM can become activated in 2 ways. Active equals the DA- state (DA = Data Available).

1:
In rigging, after entry of train data choose to set DK-STM active right away.

Or

2:
If not, DK-STM will go into a condition (Cold Standby), where it awaits activation from the infrastructure. This will then take place when the train drives from an ETCS-infrastructure into an ATC-infrastructure. The activation takes place at laid down balises in the transition from ETCS to ATC.

Before the transition from ETCS-infrastructure to ATC-infrastructure, DK-STM will normally be updated with ATC-infrastructure data from a ZUB123-signal balise in the ETCS-area, so that DK-STM has information to drive after, when it has been set to active.

DK-STM does not have access to use DMI, until DK-STM has become active.

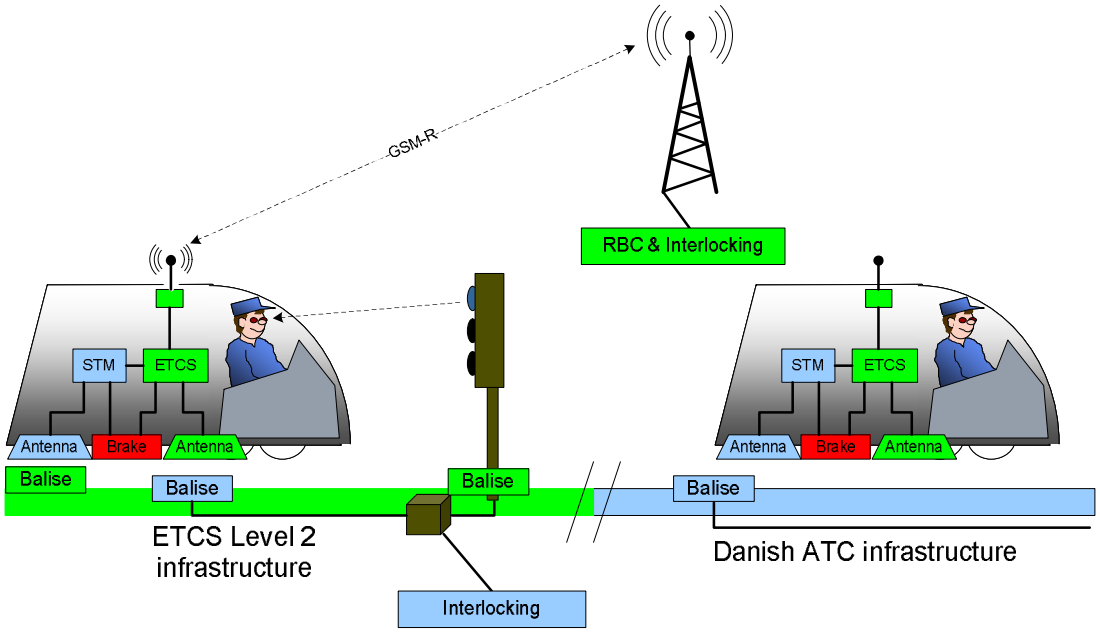

Figure shows situation 2, where DK-STM is set to active in the transition between ETCS infrastructure and ATC infrastructure.

1.2 Scope

Since this document is not an instruction, all drive combinations will not be examined, but it does however give a comprehensive description of the basic driving functionalities.

DK-STM's interface to the ETCS system is through a PROFIBUS-connection, as described in [ref.2] UNISIG SUBSET-058. A description of the data flow over this interface will not make sense to a user of the system.

The user manual describes the use of a customised DMI, corresponding to ERA's standard "ETCS Driver Machine Interface" for DMI.

The text is supported by DMI mimics. The mimics are not complete, but should only be considered as support to the text.

The user manual presupposes that the DK-STM antennas have been tuned as described in the installation manual [ref.6].

1.3 Context for DK-STM

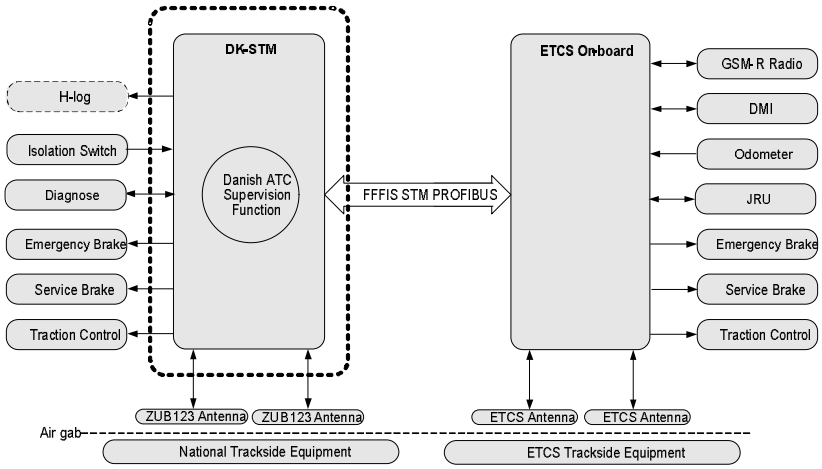

Fig. 1 Context for DK-STM

1.4 Definitions

Customised	Customised DMI. As opposed to Unified DMI
DA	Data Avaible. State where DK-STM has control over the train
DMI	Driver Machine Interface
DRU	Diagnostic Recording Unit (not used)
End of Mission	A drive is completed
ERA	European Railway Agency
ETCS	European Train Control System
EVC	European Vital Computer
FA	STM state Failure
Icon	Viewing of indications takes place by a mimic
JRU	Juridical Recording Unit
Release Speed	Speed where it is allowed to release the train from an initiated braking (braking curve).
Pass.Stop	Override
Passage Stop	Override
Ranger	Shunting
SNR1	Balise telegram term in ZUB123. Track number
SNR2	Balise telegram term in ZUB123. Distance number
Signal Balise	Balise that is controlled by signal information
STM	Specific Transmission Module
Trip Drive	ETCS term. Drive after passing danger point
Transition	Change from ETCS to STM or reversed
TSA	Technical System Responsible

1.5 References

[ref.1]	UNISIG SUBSET-035
[ref.2]	UNISIG SUBSET-058
[ref.3]	UNISIG SUBSET-026
[ref.4]	Glossary G81001-3107-L002-*
[ref.5]	Maintenance Manual VN 655.00 Q2961
[ref.6]	Installation Manual IN 655.00 Q2962
[ref.7]	SIN-G 02.03.2020

1.6 Document Log

Ver.	Date:	Change:	Init:
00.01	30.05.2011	First version	NEN
00.02	19.08.2011	Banedanmarks changes incorporated	NEN
00.03	28.09.2011	Banedanmarks changes incorporated	NEN
01.00	30.12.2011	Updated after BDK review	STN
01.01	15.1.2013	Updated with reference to CERT-22	NEN
02.00	25.1.2013	Updated with reference to review-01	NEN
03.00	15.3.2013	Updated with reference to BDK. See review-02	NEN
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05.00	25.09.2013	Updated in section: 3.1.4, 6, 9	NEN
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	07.11.2014	Updated in section: 1.2, 1.6, 2, 2.1.1, 3.1.4, 4.2, 5, 8.1.1, 9, Appendix A, B, C, D, E, F and G	NEN
	12.12.2014	New Appendix G Train data entry sequence New icons in mimics.	NEN
07.00	19.12.2014	Corrections according to Banedanmark review – e-mail Åge Vig Nielsen 2. Dec. 2014 ”JFJ review”.	NEN
08.00	20.2.2015	Updated 1.1, 2.1.1, 4.3 after review of translated edition	NEN
09.00	09.06.2016	Updated with reference to CERT-91, customised DMI, new Data Entry procedure and new functionality in the red and yellow display. Stylised mimics updated with reference to focus on DK-STM information in the mimics. ETCS entry sequence removed in appendix G	STN
10.00	10.11.2017	Chapter 1.1.1 Definition of active Chapter 1.3 Kontextdiagram updated Chapter 1.4 Definition of DA appended Chapter 2 Touch screen is added Movement of buttons added Chapter 4.1.2 ETCS Override appended Chapter 4.2 Warning in shunting appended Chapter 4.7 Text to Trip Drive updated Chapter 4.8 ATP-Drive appended Chapter 10 Error codes updated Chapter 10.1 Error classes updated	STN
11.00	17.09.2018	Chapter 10 Error codes and classes updated	STN
12.00	21.03.2019	Just alignment to DK version	STN

13.00	15.10.2020	Chapter 1.5 References extended with SIN-G Chapter 3.1.2 ”Vent. Togdata overføres” deleted Chapter 4.9 Added. Speed monitoring Chapter 8 ”Vent. Togdata overføres” changed to ”Indtast togdata” Chapter 10 Added. New error codes for speed monitoring FF510, FF511, FF512 Reaction for Ue_St_A and _B	
14.00	12.02.2021	Chapter 4.1.1 Text to Override-indicator in ETCS expanded Chapter 4.9 SB removed in “Hastighed fejl” Chapter 10 Reaction for Ue_St_A and Ue_St_B	

2 DMI-Indication

The user operates DK-STM by means of ETCS DMI.

DMI is a display with indicators and buttons (in the bottom and in the right side). The display can be pressure-sensitive. All drive relevant information will be shown on the DMI. The display is dimensioned and divided in main areas.

DK-STM relevant areas:

- Buttons (indication of)
- Indicators
- Release speed
- Distance column
- Allowed max. speed + release speed
- Text box for system notification and error notifications. E area, see Fig.3
- FF XXX error notifications in B3/B4 and B4/B5 areas, see Fig.3

This user manual describes a DMI type with physical touch buttons, also called “soft key” technology.

The placement of indicators and buttons on the pressure-sensitive screen is also shown. This technology is called “touch screen” technology

The following functionality mimics only show indications for the physical buttons.

2.1.1 ERA DMI with Soft Key Technology

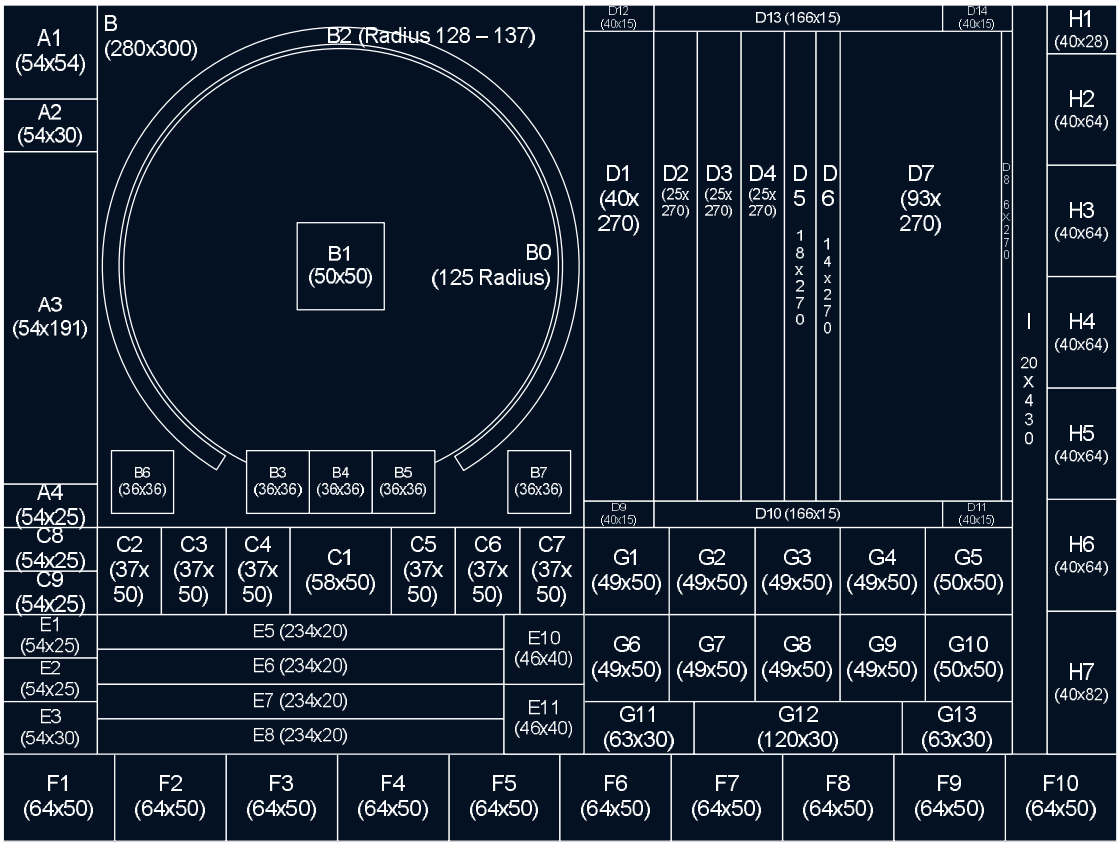


Fig. 2 Overview over Areas in ERA DMI

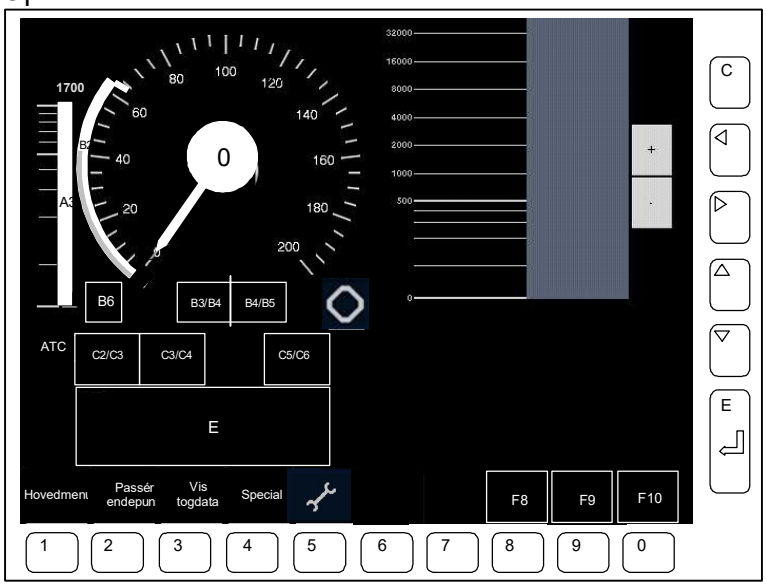
From the figure it can be seen that the DMI is divided into areas. At a standardized use of the DMI, the indications must be shown within the shown areas and with a certain type size.

As opposed to a customized DMI, which DK-STM uses, the indications can spread over the fixed areas; use other font sizes and icons.

With this approach the indications will be clearer to the users.

2.1.2 Location of Indications and Touch Buttons for DK-STM (soft key)

Option 1:



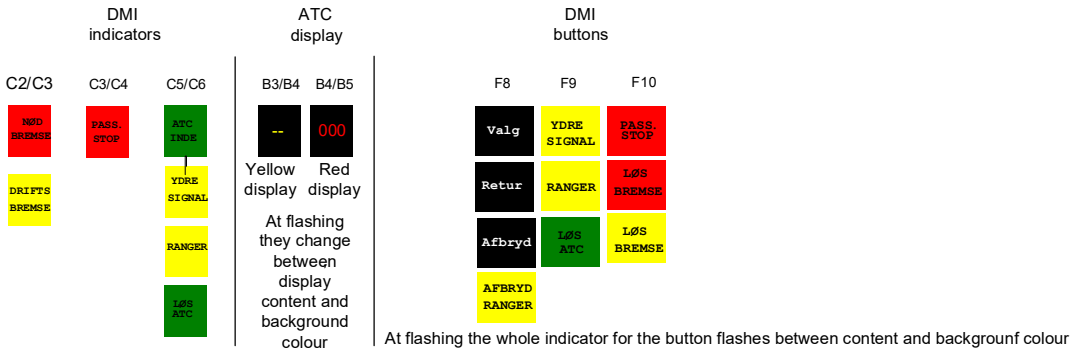


Fig. 3 Overview over DK-STM Used Areas on DMI

- B6: Release speed – indication is determined by ETCS
- A3: Distance column
- B2: Monitoring speed + poss. release speed ”dark grey”
- E: Error notifications and other system notifications.

Physical buttons are in the edge of the DMI.

Fig. 3 Overview over DK-STM Used Areas on DMI shows which DK-STM buttons and indications that is possible. It is seen that in certain area positions it is possible to show different indications/buttons dependent on the DK-STM condition.

The distance column can max. show 1000 metres, the correct distance is shown numerically above rounded off to the nearest 10 metres.

Following ETCS indications are shown:

The symbol for national STM in B7,  .

When the train emergency brakes or service brakes, the symbol  is shown just below the symbol 

which is shown permanently and is an expression that DK-STM is responsible for the monitoring.

When ETCS is in condition ”Level STM” and Passage Stop (Override) is activated, the symbol  is shown in position C7 (see Fig. 2).

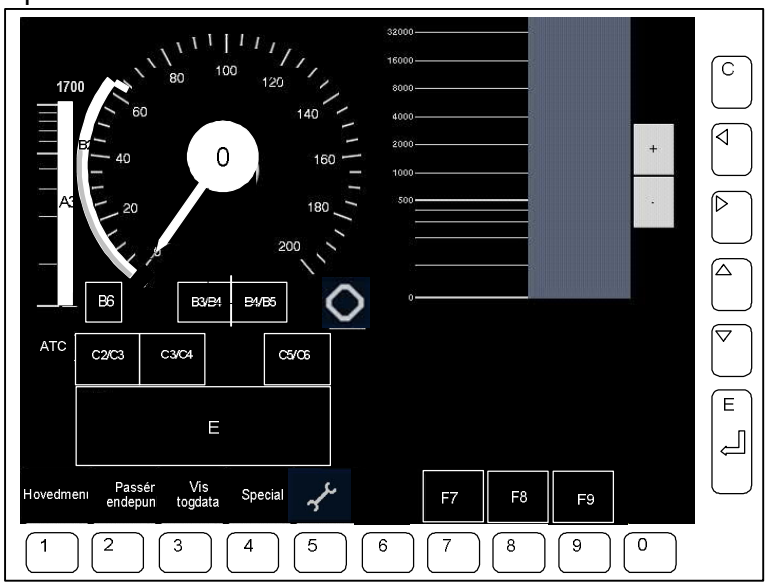
The buttons ”Hovedmenu”, “Passér endepunkt”, “Vis togdata”, “Special” and assigned text/symbol is determined by the ETCS supplier and can thus deviate from the indicated.

The indicated buttons occupy positions F1 – F5 and the ETCS Onboard-supplier describes the functionalities of these.

2.1.2.1 Optional locations of buttons

In addition to the above-mentioned location of DK-STM buttons (Option 1, which is the preferred one and will be used in this User's Manual), the following locations may also occur:

Option 2:



DMI indicators

C2/C3 C3/C4 C5/C6

NØD BREMSE
PASS. STOP
ATC INDE
DRIFTS BREMSE
YDRE SIGNAL
RANGER
LØS ATC

ATC display

B3/B4 B4/B5

-- 000

Yellow display Red display

At flashing they change between display content and background colour

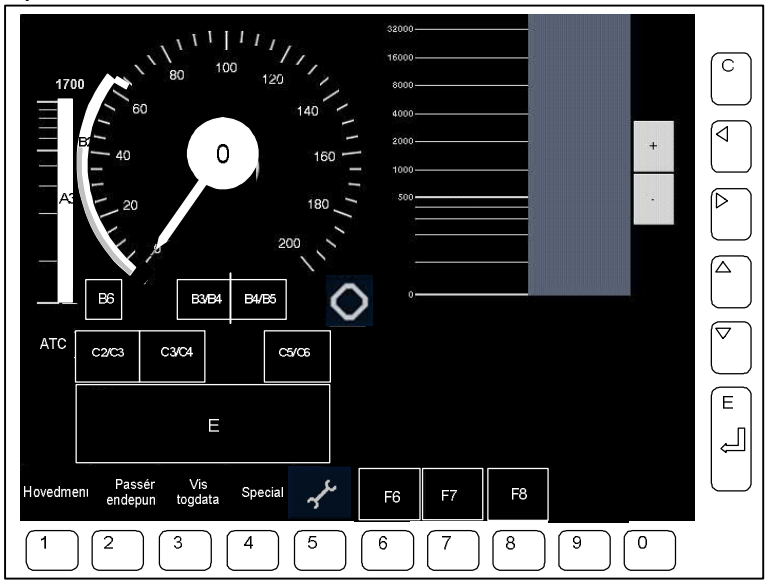
DMI buttons

F7 F8 F9

Valg YDRE SIGNAL PASS. STOP
Retur RANGER LØS BREMSE
Afbryd LØS ATC LØS BREMSE
AFBRYD RANGER

At flashing the whole indicator for the button flashes between content and backgrounf colour

Option 3:



DMI indicators

C2/C3

C3/C4

C5/C6

ATC display

B3/B4 B4/B5

Yellow display Red display

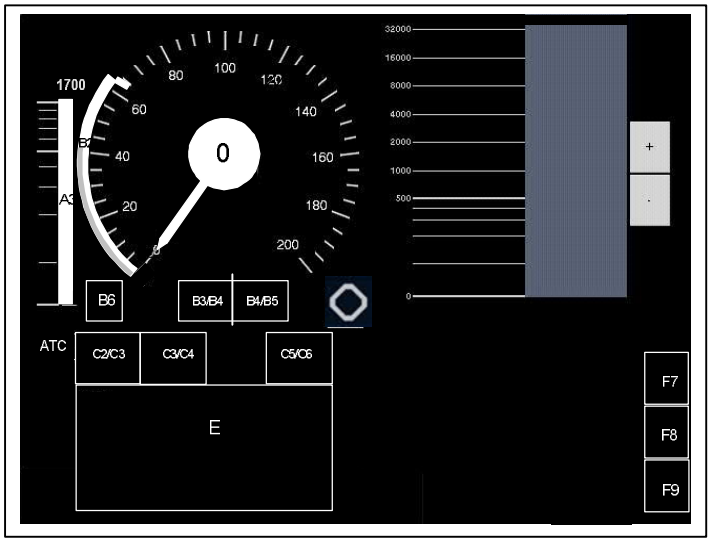
At flashing they change between display content and background colour

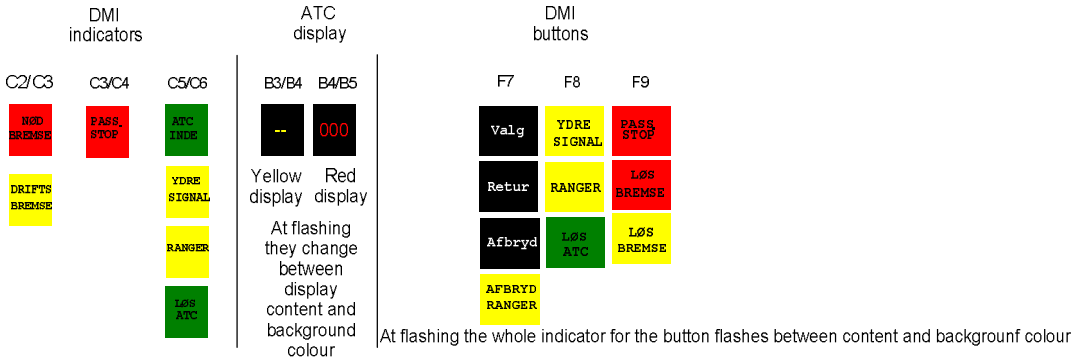
DMI buttons

F6 F7 F8

At flashing the whole indicator for the button flashes between content and backgrounf colour

2.1.3 Location of Indications and Touch Buttons for DK-STM (touch screen)





This picture is only used for indication of, where the DK-STM's buttons and indicators are placed on the DMI. The indicators have the same positions as on the soft key DMI.

2.1.4 DMI-Sounding

Dependent on the situation, DMI has the possibility of giving the following warning tones:

- Intermittent tone
- Fixed tone

Intermittent tone is used in less serious situations, e.g. when a service braking has been started.

Fixed tone is used in more serious situations, e.g. during a possible not releasable emergency braking.

Both tones have the same duration as in ATC ZUB123, however with a more optimised frequency.

3 Start-Up of DK-STM

The description of how DK-STM is turned on and off is presupposed to be carried out by the ETCS supplier.

It is presupposed that the ETCS-supplier describes how ETCS data and DK-STM specific train data are presented and acknowledged.

DK-STM presupposes that the train has been set in the direction FORWARD in order to start up, as train data otherwise cannot be entered.

3.1 Entry of Train Data

3.1.1 ETCS Train Data

ETCS train data are used by the ETCS computer. Three of these values, train length, maximum train speed and braking percentage are also used by DK-STM.

Procedure for entry of ETCS train data and other ETCS procedures are described by the ETCS on-board supplier.

Train data that are used by DK-STM, are entered under the ETCS train data entry:

- Train length: 30 – 960 [m]
- Maximum allowed train speed: 10 – 200 [km/h]
- Braking percentage: 50 - 230

DK-STM's check of correctly entered train data is not carried out until after entry of the specific train data to DK-STM, see below.

3.1.2 Specific DK-STM Train Data

It will only be possible to enter specific DK-STM train data, after ETCS train data have been entered. This means that every time new DK-STM train data are entered, e.g. after a shunting, it should be started with entry of ETCS train data.

After ETCS train data have been entered, the specific DK-STM train data must be entered.
This entry can take place without the train being in an ATC area.

Following specific train data must be used by DK-STM:

- Train length: Value from ETCS train data
- Brake %: Value from ETCS train data
- Maximum train speed: Value from ETCS train data
- ATC direction: A or b

Entry of specific DK-STM train data has been finished, when train data are accepted by DK-STM.

Furthermore it is possible to enter a code in order to open for entry of the train's configuration/maintenance data.

- Code for maintenance data: 4 digit number.
  (See Maintenance Manual for DK-STM)

Train Length:

The train length that is entered during the ETCS train data entry is shown.

Change of the train length during entry of Specific DK-STM train data is not going to be possible. If it is attempted to change it, the entry dialogue cannot be finalised. One has to start from the beginning with entry of ETCS train data.

If the value is below the allowed for DK-STM, 30m, the entered train length is shown. Internally in DK-STM this is however rounded up to 30m and is accepted.

If the value is above the allowed for DK-STM, 960m, the entered train length is shown. Entry of specific train data presupposes correct value is entered during renewed entry of ETCS Train data.

If the value is not divisible by 10, the entered train length is shown. Internally in DK-STM this is however rounded up to the closest value divisible by 10.

Brake Percentage:

The brake percentage that is entered during the ETCS train data entry is shown.

The brake percentage can be reedited within the allowed value area, [50 – 230].

If the brake percentage is below 50, it will be shown, but not accepted. It is not accepted until a value that equals or is higher than 50 and different from 255 is entered.

If the brake percentage is above 230, but not 255, it will internally be set to 230 and thus be accepted. The changed value is not shown.

If the brake percentage equals 255, it will be shown but not accepted. It will only be accepted, when a value equals or is higher than 50 and different from 255 is entered.

Maximal Train Speed:

The maximum train speed that is entered during the ETCS train data entry is shown.

A change of the maximum train speed during entry of Specific DK-STM train data is possible. If this immediately can be accepted by DK-STM, it is not shown again.

If DK-STM scales down the maximum train speed due to the combination of the train length and brake percentage, the down scaled train speed will be shown and the driver will be asked to accept this.

If the value is above the allowed for DK-STM, 200km/h, it is scaled down to 200km/h. The changed value is not shown.

If the value is below the allowed for DK-STM, 10km/h, it is rounded up to 10km/h and accepted.

ATC Direction:

If train data is entered as a part of the rigging up, the value “A” is shown.

If train data already exists, the last entered direction is shown.

The desired value for the ATC direction is entered.

New DK-STM train data can always be entered by starting ETCS train data entry[1]. This is expected to be described by the ETCS On-board supplier.

Code for Maintenance Data:

Maintenance data are only used during installation and maintenance, and are only entered by the service personnel.

Only if the correct code is entered, it will be possible to change in the maintenance data.

The entry of all train data must be confirmed via ETCS operation[2].

The menu for entry of Specific DK-STM train data disappears when train data has been accepted by DK-STM.

[1] This presupposes that no braking is active.

[2] Confirmation of train data is determined by the DMI/ETCS On-board supplier.

3.1.3 Acknowledgement for Train Data

When all DK-STM train data have been entered correctly, these must be confirmed via ETCS operation, following which train data is evaluated by DK-STM.

Below standing Fig. 4 shows a DMI-mimic of how an ETCS-Onboard acknowledgement of specific train data can look. It has no relation to any used DMI.

Fig. 4 Train Data Entered

DMI can show:

- Text, ”Train length” xxx
- Text, ”Brake %” xxx
- Text, ”Max. speed” xxx
- Text, ”ATC-direction” x
- Text, ”Maintenance code” xxxx

The text ”Maintenance code xxxx” is shown in order to give the service personnel the possibility of changing to entry of maintenance data, xxxx only symbolises that a 4 digit code can be entered. This is not used during normal operation.

The use of the menu ”Maintenance code” is described in [ref.6]

The train data entry must be confirmed via ETCS operation – This is presupposed to be described by the ETCS-supplier.

4 Drive with DK-STM

4.1 Drive with Train Data

After the train data entry has been acknowledged and accepted by DK-STM, DK-STM is in a condition where it awaits activation from the ETCS computer. In this condition DK-STM can receive balise information, but is otherwise passive.

The train runs, DK-STM is activated:

Activation takes place when the train from the line via an ETCS balise gets information that DK-STM must be active. This takes place while the train runs.

DMI can show:

- Allowed speed
- Actual speed
- Distance column
- The indicators
  DRIFTS BREMSE (SERVICE BRAKE),
  NØD BREMSE (EMERGENCY BRAKE),
  ATC INDE (DK-STM monitors the drive),
  YDRE SIGNAL (driving on EXTERIOR SIGNAL),
  RANGER (SHUNTING),
  PASS. STOP (OVERRIDE),
  LØS ATC (RELEASE ATC from braking curve),
  yellow display, red display
- The button “Valg” (Select)

The indicators ATC INDE, YDRE SIGNAL, RANGER and LØS ATC share the same position.

The indicators, the yellow and red display are shown as by ZUB123.

The actually allowed speed is given by read balise. If no balise has been read, the actually allowed speed will be max. 40 km/h. DMI shows ”--” in yellow display.

Following DK-STM has the full responsibility for the monitoring of the drive.

Especially after continuous[3] *drive for 45 hours:*
Following text is shown on DMI:

”ATC: skal genstartes indenfor 2 timer”

(”ATC: must be restarted within 2 hours”)

If this is ignored for up to 3 hours, the train is braked and DK-STM must following be re-started.

3 DK-STM has not been powerless.

The train stands still, DK-STM is activated

DK-STM can also be started directly via ETCS, while the train stands still, without the train having passed an ETCS-balise. This is expected to be described by the ETCS On-board supplier.

DMI shows:

- The indicator, yellow display ”--” fixed light
- The button, Valg

The allowed speed will be max 40 km/h, until a balise is passed and determines the allowed speed.

4.1.1 Passage Stop (Override) during Drive with Train Data

Passage Stop is used when a stop-sending or defect balise is requested to be passed. In the following the stop-sending balise must be understood in the broadest sense as a defect balise also will be ”stop-sending”.

DMI mimics for the following conditions appear from appendix A.

Following the different possible conditions for Passage Stop are shown. An overall graphical presentation appears from Appendix G Overall Passage Stop State Diagram. There can be details in Passage Stop that do not appear from the condition diagram.

Indication of the ETCS indicator  is controlled by the ETCS system and a possible extended indication is subject to the ETCS system’s timing. Indication and control are dependent of the supplier and can be different to the description here.

The following descriptions **>x**, where x is a digit between 0 and 8, is a reference to **State x** in the Passage Stop condition diagram in appendix G.

>0_NORMAL INDICATION<

DMI can show:

- The indicator, ”ATC INDE”
  (if not before the first balise, in the Y-area, or during reduced drive)
- The ETCS indicator,  always as long as Passage Stop is inactive
- The button, ”Valg”

If the button ”Valg” is pressed, while the train is running, it does not have an effect.
By pressing the button ”Valg”, when the train has stopped, DMI changes to the next state (shown in grey):

>1_FULL MONITORING<

The train has stopped:

DMI can show:

- The indicator, ”ATC INDE”
  (if not before the first balise, in the Y-area (Exterior area), or during reduced drive)
- The button, ”Retur”
- The button, ”RANGER”
- The button, ”PASS. STOP”

If the train has not stopped or if the buttons ”PASS. STOP”, ”RANGER” or ”Retur” are not pushed within 15 sec. there is a change to 0_.

If the button ”RANGER” is pressed, there is a change to SHUNTING.

By pressing button ”PASS. STOP” the DMI changes to the next state:

>2_PASSAGE STOP – DRIVE EXPECTED<

It is now possible for the train to drive 40 km/h and pass a stop sending or defect balise.

DMI can show:

- The indicator, ”PASS. STOP”
- The indicator, yellow display ”40” slow flashing.
- The button, ”Afbryd”
- ETCS the indicator, 
  (can remain standing for up to 1 min. after the condition has changed.)

If the button ”Afbryd” is pressed before the train drives or the train does not drive within a minute, there is a change to 0_. Passage Stop is thus left.

As soon as the train drives, there is a change to the next state:

>3_BALISE PASSAGE<

DMI can show:

- The indicator, ”PASS. STOP”
- The indicator, yellow display ”40” slow flashing
- The button, ”Afbryd”
- ETCS the indicator, 
  (can remain standing for up to 1 min. after the condition has changed.)

If the button ”Afbryd” is pressed or,
if a balise has not been passed before the train has driven 400 m, or if a signal balise is passed or if the train stops entirely, there is a change to 0_.

If a stop-sending balise is passed, DMI changes to the next state:

>4_DRIVER ACTION OR SIGNAL BALISE<

DMI can show:

- The indicator, yellow display ”40” slow flashing
- The button, ”Afbryd”
- The button, ”PASS. STOP”

If the button ”Afbryd” is pressed or
if the train stops entirely, there is a change to 6_.

If the train passes a signal balise (no stop), there is a change to normal indication 0_.

If the train passes a stop sending balise the emergency brake is activated.

If the button ”PASS. STOP” is pressed, the next stop-sending balise can be passed without stop and DMI changes to the next state:

>5_PASSAGE OF NEXT STOP-SENDING BALISE, AWAITED<

DMI can show:

- The indicator, ”PASS. STOP”
- The indicator, yellow display ”40” slow flashing
- The button, ”Afbryd”
- ETCS the indicator, 
  (can remain standing for up to 1 min. after the condition has changed.)

Here it is not checked if the next stop-sending balise is passed within 400m.

If the train passes a stop-sending balise, there is changed to 4_.
If the train passes a signal balise (no stop, no Y-drive, not reduced), there is a change to normal indication 0_.

If the button ”Afbryd” is pressed or the train stops entirely, the DMI changes to the next state:

>6_NEW SELECTION IS AWAITED <

DMI can show:

- The indicator, yellow display ”40” slow flashing
- The button, ”Valg”

If the train passes a signal balise, there is change to full monitoring 0_.

If the train passes a stop-sending balise, the emergency brake is activated.

By pressing the button ”Valg”, while the train is running, it has no effect.
If the train has stopped and button ”Valg” is pressed, DMI changes to the next state:

>7_NO MONITORING, TRAIN HAS STOPPED<

DMI can show:

- The indicator, yellow display ”40” slow flashing
- The button, ”Retur”
- The button, ”RANGER”
- The button, ”PASS. STOP”

If the button ”Retur” is pressed or if it has been more than 15 sec. since the button ”Valg” was pressed, or if the train starts to drive, there is a change to 6_.

If the button ”RANGER” is pressed, there is a change to SHUNTING.

If the button ”PASS. STOP” is pressed, DMI changes to the next state:

>8_START OF TRAIN IN PASSAGE STOP IS AWAITED <

DMI can show:

- The indicator, ” PASS. STOP”
- The indicator, yellow display ”40” slow flashing
- The button, ”Afbryd”
- ETCS the indicator, 
  (can remain standing for up to 1 min. after the condition has changed.)

If the button ”Afbryd” is pressed or it has been more than one min. without the train drove, there is a change to 6_.

If the train starts, there is a change to 5_.

4.1.2 Passage Stop (Override) in ETCS area

If the ETCS-button ”Override” is activated, it will be transferred to the DK-STM, which then will then his national Passage Stop.

If Override is deactivated, the national Passage Stop will be ended.

4.2 Shunting

WARNING

It shall here be noted, that when the national shunting is selected, the train data will be invalid.

This will have the consequence, if a train shunts over a transition to ETCS L1/L2, then the train will drive with invalid train data

THIS SHALL BE AVOIDED

As an extra security the DK-STM sends Trip (see chapter “Trip Drive”), when national shunting is active. This means, that the EVC activates the emergency brakes after an eventually transition, where the DK-STM is ordered out of the control over the train (out of state DA)

If the transition is not going to L1/L2, but to another STM, then the DK-STM will emergency brake the train to standstill. After that, the national shunting can be finished, and the change to the other STM will take place.

<u>The train has stopped:</u>

By pressing the buttons ”Valg” and following ”RANGER” it will be possible for the train to max. drive 40 km/h during Shunting.

DMI can show:

- The indicator, ”RANGER”
- The indicator, yellow display ”40” fixed light
- The button, ”AFBRYD RANGER”
- The button, ” PASS. STOP”

If SHUNTING is left by pressing the button ”AFBRYD RANGER”, when the train has stopped, it is not possible to move the train until new train data are entered or “RANGER” is pressed again.

DMI can show:

- The indicator, Yellow display ”00”
- The indicator, Yellow display ”--” (after entry of train data and acknowledgement with “LØS ATC”, following which the “Valg”-button is shown)
- The button, ”RANGER” or
- The button, ”LØS ATC” (is shown flashing after entry of train data)
- Text, hh:mm ” ATC: INDGIV TOGDATA eller RANGER”, flashing

The driver can enter train data by starting ”ETCS train data” entry or selecting “RANGER” again.

4.2.1 Passage Stop (Override) during Shunting

DMI mimics for the following states appear from appendix B. A graphic presentation appears from Appendix G Overall Passage Stop State Diagram".

>1_SHUNTING<

DMI can show:

- The indicator, " RANGER"
- The indicator, yellow display "40" fixed light
- The button, "AFBRYD RANGER"
- The button, " PASS. STOP"

The train must stop in order for the button "AFBRYD RANGER" to have an effect.

If the train has stopped, the button "PASS. STOP" can be activated.

If the button "PASS. STOP" is pressed, DMI changes to the next state:

>2_PASSAGE STOP ALLOWED WITHIN ONE MIN. – DRIVE IS EXPECTED<

It is now possible for the train to drive 40 km/h and pass a stop-sending balise.

DMI can show:

- The indicator, "RANGER"
- The indicator, "PASS. STOP"
- The indicator, yellow display "40" slow flashing.
- The button, "Afbryd"
- ETCS the indicator, 
  (can remain standing for up to 1 min. after the condition has changed.)

If the button "Afbryd" is pressed before the train drives or the train does not drive within a minute, there is a change to shunting. Hereby Passage Stop is deactivated.

As soon as the train drives, DMI changes to the next state:

>3_BALISE PASSAGE<

DMI can show:

- The indicator, "RANGER"
- The indicator, "PASS. STOP
- The indicator, yellow display "40" slow flashing
- The button, "Afbryd"

- ETCS the indicator, 
  (can remain standing for up to 1 min. after the condition has changed.)

If the button ”Afbryd” is pressed or if a balise has not been passed before the train has driven 400 m, or if a signal balise is passed, if the train stops entirely, there is a change to shunting.

If a stop-sending balise is passed, DMI changes to the next state:

>4_AWAITS NEW DRIVER ACTION OR A SIGNAL BALISE<

DMI can show:

- The indicator, ”RANGER”
- The indicator, yellow display ”40” slow flashing
- The button, ”Afbryd”
- The button, ”PASS. STOP”

If the button ”Afbryd” is pressed or if the train passes a signal balise (no stop) or if the train stops entirely, there is a change to shunting.

If the train passes a stop-sending balise the emergency brake is activated, if STB1-bit has not been set in the balise telegram.

If the button ”PASS. STOP” is pressed, the next stop-sending balise can be passed without stop, and DMI changes to the next state:

>5_AWAITS PASSAGE OF NEXT STOP-SENDING BALISE<

DMI can show:

- The indicator, ”RANGER”
- The indicator, ”PASS. STOP”
- The indicator, ”40” slow flashing
- The button, ”Afbryd”
- ETCS the indicator, 
  (can remain standing for up to 1 min. after the condition has changed.)

If the button ”Afbryd” is pressed or the train passes a signal balise (no stop) or if the train stops entirely there is a change to shunting.

If the train passes a stop-sending balise, there is a change to 4_.

4.3 Drive on Exterior Signals (Ydre Signaler)

DMI mimics appear from appendix C.

If change to Y-drive is received when passing a balise the following is shown:

DMI can show:

- The indicator, ”YDRE SIGNAL”
- The indicator, yellow display ”YY” flashing
- The button, ”YDRE SIGNAL” flashing

If the button ”YDRE SIGNAL” is pressed, following is shown:

DMI can show:

- The indicator, ”YDRE SIGNAL”
- The indicator, yellow display ”YY” fixed light
- The button, ”Valg”

If the button ”YDRE SIGNAL” is not pressed within 5 sec. when driving and 60 sec. at stop (speed less than 2 km/h) the service brake will be activated.

Exterior drive is completed by passing a balise.

If shunting is used during drive on an exterior signal, train data must be entered after completed shunting. After this entry the window that covers the acknowledgement of exterior signal must be removed. This takes place by pressing X in the right side of the DMI.

4.4 Release ATC / Release Speed (Løs ATC)

DMI mimics for the following conditions appear from appendix D.

If release speed is received when passing a balise, the following is shown:

DMI can show:

- Rim indicator marks release speed ”dark grey” (shown for 2 sec.)
- The indicator, ”ATC INDE”
- The indicator, red display ”000”
- The button, ”Valg”

When requirement to speed and distance to signal has been met:

DMI can show:

- Rim indicator marks release speed ”dark grey”
- The indicator, ”ATC INDE”
- The indicator, red display ”000”
- The button, ”Valg”
- The button, ”LØS ATC”

When the driver presses the button ”LØS ATC:

DMI can show:

- Rim indicator marks release speed ”dark grey”
- The indicator, ”LØS ATC”
- The button, ”Valg”

It is now possible for the train to continue without being braked as long as the release speed is not exceeded.

The release speed is shown in the field B6.

When passing the signal balise following is shown:

DMI can show:

- The indicator, ”ATC INDE”
- The button, ”Valg”

Release speed can have one of the following values:

10, 25, 40, 60, 80, 100 or 120 km/h

4.5 Release Service Brake

DMI mimics for the following conditions appear from Appendix E Release Service Brake.

When a service braking has been initiated, following is shown:

DMI can show:

- The indicator, ”DRIFTS BREMSE”
- ETCS indicator 
- Other indicators dependent on the situation.
- Buttons dependent on the situation.

When a service braking can be released following is shown:

DMI can show:

- The indicator, ”DRIFTS BREMSE”
- ETCS indicator 
- Other indicators dependent on the situation
- The button ”LØS BREMSE”

When a service brake is released following is shown:

DMI can show:

- Indicators dependent on the situation
- Buttons dependent on the situation

4.6 Release Emergency Brake

DMI mimics for the following conditions appear from Appendix F Release Emergency Brake.

When an emergency braking has been initiated, following is shown:

DMI can show:

- The indicator, ”NØD BREMSE”
- ETCS indicator 
- Other indicators dependent on the situation
- Buttons dependent on the situation

When an emergency braking can be released, following is shown:

DMI can show:

- The indicator, ”NØD BREMSE”
- ETCS indicator 
- Other indicators dependent on the situation
- The button ”LØS BREMSE”

When an emergency braking has been released, following is shown:

DMI can show:

- Indicators dependent on the situation
- Buttons dependent on the situation

4.7 Trip Drive

Trip drive is a state, where a security critical event has happened, e.g. illegal overrun of stop signal, detection of balise error or too high speed in relation to the braking curve.

In every emergency braking the DK-STM sends frequently (about every 5 second) a trip message to the EVC. This has the effect, if the DK-STM is ordered out of control of the train (out of DA), the the EVC will continue the emergency braking to standstill.

At emergency braking over a transition from ZUB123 to ETCS, ETCS will carry out a trip-drive and continue the braking to standstill, see the chapter “Shunting”

4.8 ATP Drive

If the trains Litra-number equals 75, it will drive as an ATP-train. That means that it will react immediately with an emergency brake, if a balise error is detected. This is in contrast to ATC-driving, where an emergency brake is activated after approx. 26m after detection of a balise error.

All other conditions are the same, i.e. input of train data and DMI-showing/handling.

4.9 Speed monitoring

DK-STM monitors the validity of the received speed from the ETCS-onboard system.

DK-STM receives a speed, which the ETCS-onboard estimates to be the speed which the train drives. This speed is used as speed control in the DK-STM. Simultaneously is an interval received in which the estimated speed is guaranteed to lie. If the estimated speed and the values in the received interval shows too big deviations in a period, the DK-STM reacts with messages on the DMI.

First reaction is a warning message together with a beep sound:

ATC: Hastighed advarsel

This warning shall be acknowledged on the DMI*.*

From this message the driver shall consider the DK-STM as a non-functional train control, see /7/ Instruction 13 especially about the allowed speed.

The warning speed is monitored for 6 minutes.

If the warning speed still remains after the 6 minutes the reaction will be an error message together with a beep sound:

ATC: Hastighed fejl

This warning shall be acknowledged on the DMI.

If the warning or error message is shown the DK-STM monitors the speed. When the estimated speed and the safe speed again is close to each other the message is shown:

ATC: Hastighed OK

This message shall not be acknowledged. When this message is shown the driver can consider the speed as be alright.

The DK-STM is still to be considered as a non-functional train control until the DK-STM is updated from the line.

It should be noted that the DK-STM still monitors the drive after the estimated speed, but because of the uncertainty in the used speed the position on the line is not guaranteed. This is first established when the DK.-STM is updated again.

5 Closing of DK-STM

Disconnection of DK-STM only takes play by stopping the train and making DK-STM powerless. Following all operations pass over to ETCS. This is described by the ETCS On-board supplier.

The general closing procedure is described by the ETCS On-board supplier.

5.1 End of Mission

DK-STM goes into the condition ”End of Mission” when the driver’s cab is closed. The ”End of Mission”-condition is the same as Cold Standby, which occurs after entry of train data, where DK-STM is not set to active immediately from DMI.

DK-STM will still have its train data, but line data/braking curves will be deleted.

When a driver’s cab again is opened, DK-STM is again ready to be activated.

6 Havari Log (Accident Log)

DK-STM has a possibility of becoming connected to ATC ZUB123 Havari Log.

If Havari Log exists following applies:

Every time DK-STM receives valid train data a lamp is turned on in the driver’s desk for 2 sec. indicating Havari Log test. The lamp is controlled by the Havari Log.

Position and shape of the lamp is presupposed to be described by the ETCS supplier.

If the error notification FF249 on DMI is shown, it means that the Havari Log and ETCS speed reading deviates by more than 5 km/h.

This means that the Havari Log’s speed reading is faulty.

7 Bypassing / Isolation Switch

The input ”Isolation switch” on DK-STM is used from the outside to bypass DK-STM’s activation of the emergency brake.

If this input is activated, will DK-STM change to the condition FA.

Procedure for activating the Isolation switch input is expected to be described by the ETCS On-board supplier.

8 System Notifications

DK-STM can show 3 system notifications:

- "ATC: skal genstartes indenfor 2 timer"
  This notification is shown when DK-STM has been active for 45 continuous hours. It must now be restarted as the start up test needs to be made again. This is in order to ensure DK-STM's safety level
- "ATC: INDGIV TOGDATA eller RANGER"
  This notification is shown, when shunting is disconnected. It is possible to choose between shunting on or entering train data in order to drive the train again.
- "ATC: Indtast togdata"
  This notification shows that train data is to be given while DK-STM is active.

The system notifications are also described in the relevant places of this manual.

It should be noted that ETCS-Onboard possibly also can show a notifications that train data must be entered to DK-STM at the same time as DK-STM's system notification: "ATC: INDGIV TOGDATA eller RANGER"

9 Error Conditions

9.1 Operation Errors

Operation errors are shown as text for driver on DMI. The error notifications are shown in the E-areas on DMI.

Every error notification is shown on each line. The last 7 error notifications remain standing in DMI, as long as DK-STM is active.

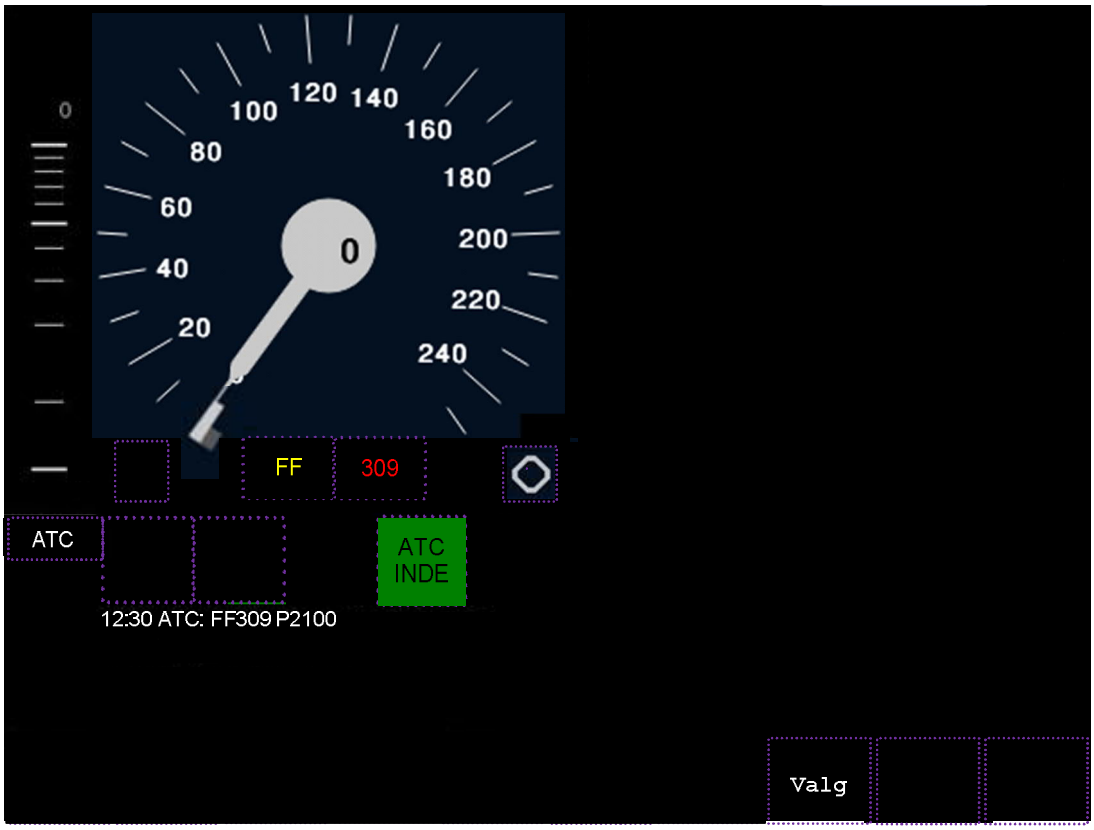
9.1.1 Indication on DMI

Error notifications are shown in the following way:

Time + "ATC: FFxxx Pzzzz"

Note that the shown DK-STM error notifications always start with "ATC: " and following the FF-notification.

Besides this shown error notification, the fields B3/B4 will show **FF** and the fields B4/B5 will show the same error code, **xxx**



/* The shown position, P2100, has no reference to the reality.

ATC: FFxxx Pzzzz

zzzz: Position for error (0000-9999) from last correctly read signal balise.

Digit 1 after P:	0: Station 1,2,3,4,5,6,7 Track no.
Digits 2,3,4 after P:	For station it applies that digits 2,3,4 show the station number and for line it is the AM-number.

9.2 The FA Condition

When DK-STM no longer, e.g. due to an error situation, can handle the monitoring of the train's drive, the condition is reported as "FA" to ETCS. Braking of the train is in this condition handled by ETCS. The DMI-indication is also a task for ETCS. DK-STM's DMI-indication will disappear.

It is presupposed that the description of DMI in ETCS On-board shows this.

Different situations can bring the DK-STM in the condition FA:

- DK-STM's "Isolation Switch" input is activated.
- At detection of internal error
- At two upon each other following similar balise errors, FF818. This error condition will cause that DK-STM will service and emergency brake. After 60 sec. DK-STM will go into the FA-condition. This is a special case but for the most often occurring errors of error class DAUER_A and DAUER_B, see 10.1. All errors belonging to these two error classes will be treated as the FF818-error.

The condition cannot be left without DK-STM being re-started.

Restart of DK-STM has been described by the ETCS On-board supplier.

10 Error Codes

Error Number	Error Class	Description
110	RKSTP_A	Software system error. Cannot occur
111	RKSTP_A	Software system error. Cannot occur
112	RKSTP_A	Software system error. Cannot occur
113	RKSTP_A	Software system error. Cannot occur
114	RKSTP_A	Software system error. Cannot occur
115	RKSTP_A	Software system error. Cannot occur
116	RKSTP_A	Software system error. Cannot occur
117	RKSTP_A	Software system error. Cannot occur
120	RKSTP_A	Software system error. Cannot occur
121	RKSTP_A	Software system error. Cannot occur
122	RKSTP_A	Software system error. Cannot occur
124	RKSTP_A	Software system error. Cannot occur
125	RKSTP_A	Software system error. Cannot occur
126	KeinR_A	Internal notification
127	KeinR_A	Internal notification
220	Dauer_A	Software system error. Cannot occur
221	RKSTP_A	Software system error. Cannot occur
239	RKSTP_A	Software system error. Cannot occur
243	RKSTP_A	Software system error. Cannot occur
244	RKSTP_A	Unknown letter type
249	MldFl_A	(Vhv > 8 AND Vevc < 3) or (Vevc > 8 AND Vhv < 3) Status 1 Vhv > 8, status 2 Vevc > 8 Vhv Speed from Havari Log, Vevc Speed from ETCS
250	RKSTP_A	Software system error. Cannot occur
251	RKSTP_A	Software system error. Cannot occur
252	RKSTP_A	Software system error. Cannot occur
253	RKSTP_A	Software system error. Cannot occur
254	KeinR_A	Internal notification
255	RKSTP_A	Software system error. Cannot occur
256	KeinR_B	Internal notification
257	RKSTP_A	Software system error. Cannot occur
258	KeinR_B	Buffer toward radio full
259	RKSTP_A	Software system error. Cannot occur
260	MldFE_A	Buffer toward HLOG full
261	RKSTP_A	Software system error. Cannot occur
262	RKSTP_A	Software system error. Cannot occur
263	RKSTP_A	Software system error. Cannot occur
264	RKSTP_A	Software system error. Cannot occur
265	MldFE_A	Internal notification
266	RKSTP_A	Software system error. Cannot occur
267	RKSTP_A	Software system error. Cannot occur
268	RKSTP_A	Software system error. Cannot occur
269	RKSTP_A	Software system error. Cannot occur
270	RKSTP_A	Software system error. Cannot occur
271	RKSTP_A	Software system error. Cannot occur

Error Number	Error Class	Description
272	RKSTP_A	Software system error. Cannot occur
273	RKSTP_A	Software system error. Cannot occur
274	RKSTP_A	Software system error. Cannot occur
275	RKSTP_A	Software system error. Cannot occur
276	RKSTP_A	Software system error. Cannot occur
277	RKSTP_A	Software system error. Cannot occur
279	RKSTP_A	Software system error. Cannot occur
280	RKSTP_A	Software system error. Cannot occur
281	MldFl_A	Internal notification
294	RKSTP_A	Software system error. Cannot occur
295	RKSTP_A	Software system error. Cannot occur
300	KeinR_A	Internal notification
301	KeinR_A	Error in data traffic to line radio (MSR3)
302	RKSTP_A	Error in data traffic to line radio (MSR3)
303	KeinR_A	Error in data traffic to line radio (MSR3)
304	MldFE_A	Error in data traffic to line radio (MSR3)
305	KeinR_A	Error in data traffic to line radio (MSR3)
306	KeinR_A	Error in data traffic to line radio (MSR3)
307	RKSTP_A	Error in data traffic to line radio (MSR3)
308	RKSTP_A	Error in data traffic to line radio (MSR3)
309	MldFE_A	Error in data traffic to line radio (MSR3)
310	KeinR_A	Internal notification
311	KeinR_A	Internal notification
312	RKSTP_A	Internal notification
313	KeinR_A	Internal notification
314	MldFE_A	Internal notification
315	KeinR_A	Internal notification
316	KeinR_A	Internal notification
317	RKSTP_A	Internal notification
318	RKSTP_A	Internal notification
319	MldFE_A	Internal notification
320	KeinR_A	Error in data traffic to HLOG
321	KeinR_A	Error in data traffic to HLOG
322	RKSTP_A	Error in data traffic to HLOG
323	KeinR_A	Error in data traffic to HLOG
324	MldFE_A	Error in data traffic to HLOG
325	KeinR_A	Error in data traffic to HLOG
326	KeinR_A	Error in data traffic to HLOG
327	RKSTP_A	Error in data traffic to HLOG
328	RKSTP_A	Error in data traffic to HLOG
329	MldFE_A	Error in data traffic to HLOG
360	KeinR_A	Internal notification
361	KeinR_A	Internal notification
364	RKSTP_A	Software system error. Cannot occur
365	RKSTP_A	Software system error. Cannot occur
366	MldFE_A	Internal notification
367	MldFE_A	Internal notification
370	KeinR_A	Internal notification

Error Number	Error Class	Description
371	KeinR_A	Internal notification
372	KeinR_A	Internal notification
373	KeinR_A	Internal notification
380	KeinR_A	Internal notification
381	KeinR_A	Internal notification
382	KeinR_A	Internal notification
383	RKSTP_A	Internal notification
401	KeinR_B	Internal notification
402	RKSTP_A	Internal notification
404	RKSTP_A	Internal notification
406	RKSTP_A	Internal notification
407	RKSTP_A	Internal notification
409	RKSTP_A	Internal notification
410	RKSTP_A	Internal notification
411	RKSTP_A	Internal notification
412	RKSTP_A	Internal notification
415	RKSTP_A	Internal notification
416	Dauer_A	Error at operation of keys in driver's cab. Key activated with 40 times within 60 sec
417	Dauer_A	Error at operation of keys in driver's cab. Keys activated 60 sec. Status see 416
418	Dauer_A	Error at operation of keys in driver's cab, Status see 416
419	MldFL_B	Internal notification
420	MldFL_B	Internal notification
421	MldFL_A	Internal notification
425	RKSTP_A	Software system error. Cannot occur
426	RKSTP_A	Software system error. Cannot occur
427	RKSTP_A	Software system error. Cannot occur
428	RKSTP_A	Software system error. Cannot occur
450	KeinR_B	Internal notification
501	RKSTP_A	Software system error. Cannot occur
502	RKSTP_A	Software system error. Cannot occur
510	JxR_D_S_F_	Speed supervision Alarm
511	JxR_D_S_F_	Speed supervision Error (activation of service brake)
512	JxR_D_S_F_	Speed supervision OK
530	KeinR_B	Wheel slip has lasted too long. Internal notification. No error.
540	Ue_St_B	Distance between test balises too big. The train has driven significantly more than 120 m after the first balise.
541	MldFL_C	Speed tolerance exceeded between test balises.
542	RKSTP_A	Wrong wheel diameter
546	MldFL_C	First test balise passed with too high speed
549	MldFL_C	Only last test balise received
550	MldFL_C	Wheel slip between two test balises

Error Number	Error Class	Description
551	JxRxD_S_F_	STM-34 contained wrong button-id.
552	JxRxD_SxFx	Baseline 2.3.0.d selected.
553	JxRxD_SxFx	Baseline 3 selected.
554	JxRxD_SxFx	STM Isolation.
555	JxRxDxSxF_	Antenna tuning completed with success.
556	JxRxDxSxF_	Antenna tuning failed.
557	JxRxD_SxFx	UEBGEN5 and TASSEE5 can be accessed in Hot Stand-by and in Data Available.
558	JxRxD_SxFx	Interrupt error in Tasse5 test
559	J_R_DxSxF_	At least one antenna must be tuned
560	JxRxD_SxF_	Emergency brake has been activated
561	JxRxD_SxF_	Emergency brake has been deactivated
562	JxRxD_SxF_	Service brake has been activated
563	JxRxD_SxF_	Service brake has been deactivated
565	J_RxD_SxF_	Baseline 3 DK-STM
566	JxRxD_SxF_	DK-STM must be reset within 2 hours
581	JxRxD_SxFx	I/O error on the SERIO board
582	JxRxD_SxFx	PROFIBUS safe time layer reports error when sending
583	JxRxD_SxFx	Error on SRAUS1
584	JxRxD_SxFx	Error on SRAUS2
585	JxRxD_SxFx	Error on TASSE5
586	JxRxD_SxFx	Error on UEBGEN5. It can be disrupted connection to antenna, tuning of non-connected antenna
590	JxRxDxSxF_	Antenna B is tuned OK. Antenna A is not tuned
591	JxRxDxSxF_	Antenna A is tuned OK. Antenna B is not tuned
592	JxRxDxSxF_	Antenna tuning failed on 100 kHz
593	JxRxDxSxF_	Antenna tuning failed on 50 kHz
594	JxRxD_SxFx	Current-/voltage error on Übgen5
595	JxRxD_SxFx	UEBGEN5 board- or access error
600	RKSTP_A	Software system error
601	RKSTP_A	Software system error
602	RKSTP_A	Software system error
603	RKSTP_A	Software system error
604	RKSTP_A	Software system error
605	RKSTP_A	Software system error
606	RKSTP_A	Software system error
607	RKSTP_A	Software system error
608	RKSTP_A	Software system error
609	RKSTP_A	Software system error
610	RKSTP_A	Software system error
611	RKSTP_A	Software system error
612	RKSTP_A	Software system error
613	RKSTP_A	UEBGEN signal error. The inactive antenna cannot have status 0. Error with status FF
614	RKSTP_A	Software system error
615	RKSTP_A	Software system error

Error Number	Error Class	Description
617	RKSTP_A	Software system error
618	RKSTP_A	Software system error
619	RKSTP_A	Software system error
620	RKSTP_A	Software system error
621	KeinR_A	TAS Buffer-size-error.
622	MldFE_A	Buffer-error at collection of data from COM-PORT
623	MldFE_A	Internal notification
624	MldFE_A	Internal notification
625	KeinR_B	Internal notification
627	KeinR_B	Internal notification. Could not access UEBGEN board. Typically happens during start-up
800	Ue_St_A	Difference in receiver channel
801	Ue_St_A	Telegrams are missed. 50kHz power lowering OK
802	Ue_St_A	Real telegrams are missed, 50kHz power lowering OK
803	Ue_St_A	Balise telegram only received from EPROM 1, 50kHz power lowering OK
804	Ue_St_A	Balise telegram only received from EPROM 0, 50kHz power lowering OK
805	Ue_St_A	Telegram identity not achieved (EPROM 0/1)
806	Ue_St_A	Real telegrams received, no 50kHz power lowering.
807	Ue_St_A	No 50kHz power lowering, Telegrams not identical in the two TAS telegram channels
808	Ue_St_A	No 50kHz power lowering, and no OK telegrams
809	Ue_St_A	No 50kHz power lowering, balise telegram only from EPROM 1
810	Ue_St_A	No 50kHz power lowering, balise telegram only from EPROM 0
811	Ue_St_A	No 50kHz power lowering, Telegrams OK, but not identity (EPROM 0/1)
812	MldFS_A	Notification at balise: Not received loop telegram.
813	Dauer_B	50 kHz power lowering has been found over a distance > 6 m
814	keinR_B	Loop telegram without ID (EPROM 0/1) or with CRC from received loop
815	KeinR_B	Additional notification to 806. 50 kHz only in one channel. Misses on the SUM (FUE_AB) signal.
816	KeinR_B	Additional notification to 806. 50 kHz only on the SUM signal. Misses on the single signal.
817	KeinR_A	Additional notification to notification to 806. No 50 kHz lowering.
818	Dauer_B	Two identical errors on two balises in sequence. The mobile system is presumed to be faulty.
819	Ue_St_A	The other balise of a couple not localised within 26 m

Error Number	Error Class	Description
821	Ue_St_A	Balise misses
822	Ue_St_A	One of two identical balises is not registered
823	Ue_St_A	Signal balise is not recognised
824	Ue_St_A	Second balise at signal-balise couples are not recognised
825	Ue_St_A	Both balises in a couple are faulty
826	Ue_St_A	Expected signal-balise missing. Z1 monitoring missing.
827	MldFS_A	Signal balise has been recognised too early.
828	Ue_St_A	Wrong number of balises
829	Ue_St_A	Balises in couple balises mixed up.
830	Ue_St_A	Distance between balise couples too small.
832	Ue_St_A	50 kHz power lowering, but only enough data for loop recognition.
833	MldFS_A	Telegrams received from another balise.
834	Ue_St_B	Not all FUE-Signals were correctly inactive.
835	Ue_St_B	Not all FUE-Signals were correctly active. Interrupt misses.
853	KeinR_A	Wrong ATC direction in loop telegram. Loop telegram is ignored.
854	MldFS_A	Wrong SNR1 number in loop telegram. Loop telegram s ignored.
855	MldFS_A	Both ATC direction and SNR1 wrong in loop telegram. Telegram is ignored.
856	MldFS_A	Wrong SNR2. Loop ignorered due to SNR2. On line it must be different from the previous one
857	MldFS_A	Receipt of loop blocked via a GK8, or the first loop after a station is not notified.
858	MldFS_A	Loop on station does not contain the expected number. Telegram is ignorered.
859	MldFS_A	Loop on station not notified. Telegram is ignorered.
860	Ue_St_A	Not identical telegrams received in TASEE5 channels A and B
861	Ue_St_A	Telegrams missing. 50kHz power lowering OK
862	Ue_St_A	Right telegrams missing, 50kHz power lowering OK
863	Ue_St_A	Balise telegram only received from EPROM 1, 50kHz power lowering OK
864	Ue_St_A	Balise telegram only received from EPROM 0, 50kHz power lowering OK
865	Ue_St_A	Telegram identity not achieved (EPROM0/1)
866	Ue_St_A	Right telegrams received, no 50kHz power lowering.
867	Ue_St_A	No 50kHz power lowering, Telegrams not identical in the two TAS telegram channels
868	Ue_St_A	No 50kHz power lowering, and no OK telegrams
869	Ue_St_A	No 50kHz power lowering, balise telegram only from EPROM1

Error Number	Error Class	Description
870	Ue_St_A	No 50kHz power lowering, balise telegram only from EPROM0
871	Ue_St_A	No 50 khz power lowering, Telegrams OK. Not identity (EPROM0/1)
872	Ue_St_A	50 kHz power lowering, but only data enough for loop recognition.
881	Ue_St_B	Too many simultaneous braking curves
882	Ue_St_B	Maximum number of LA brake curves exceeded
884	keinR_A	Illicit telegram from loop
885	Ue_St_B	Illicit speed reduction during Y drive
886	Ue_St_B	Illicit speed reduction in Y balise
887	Ue_St_B	Balise telegram with LA or LA/FH complete received with wrong code
890	Ue_St_A	Undefined group code in balise
891	MldFS_A	Decoding of the binary values wrong
892	MldFS_A	Position notification too big
893	MldFS_A	Error in radio telegram from balise
894	KeinR_A	Group code 5 or 6 received. Planned for use on S-banen
895	Ue_St_A	GK7-GKS. Balise are addressed with 0-0
896	Ue_St_A	GK7-GKS. Balise are addressed with F-F
900	Dauer_B	Signals in DRIVER'S CAB OPERATED, FORWARD or REVERSE are not correct. Status: Bit 0:FRI_A1, Bit 1:FRI_B1, Bit 2:FRI_B2 Bit 3:FRI_A2, or 16 means both CABs are occupied
901	RKSTP_A	Software system error. Cannot occur
902	Dauer_B	Software system error .Cannot occur
903	Dauer_A	Signal "DRIVER'S CAB OPERATED" (FRA/FRB) removed during drive (> 5 km/h)
905	RKSTP_A	Software system error. Cannot occur
906	RKSTP_A	Software system error. Cannot occur
907	RKSTP_A	Software system error. Cannot occur
908	RKSTP_A	Software system error. Cannot occur
910	Dauer_A	Software system error. Cannot occur
920	RKSTP_A	Software system error. Cannot occur
921	RKSTP_A	Software system error. Cannot occur
922	RKSTP_A	Software system error. Cannot occur
923	Dauer_A	Error notification due to planning error
924	RKSTP_A	Software system error. Cannot occur
925	Dauer_A	Software system error. Cannot occur
926	RKSTP_A	Software system error. Cannot occur
931	RKSTP_A	Software system error. Cannot occur
942	RKSTP_A	Error in DRIVER'S CAB OPERATED and FORWARD/REVERSE Status: The received bit pattern Bit 0: DRIVER'S CAB A, Bit 1: DRIVER'S CAB B, Bit 4: FORWARD A, Bit 5: FORWARD B, Bit 6: REVERSE A, Bit 7: REVERSE B

Error Number	Error Class	Description
943	RKSTP_A	Software system error. Received Config data more than once
944	MldFL_C	No config data received

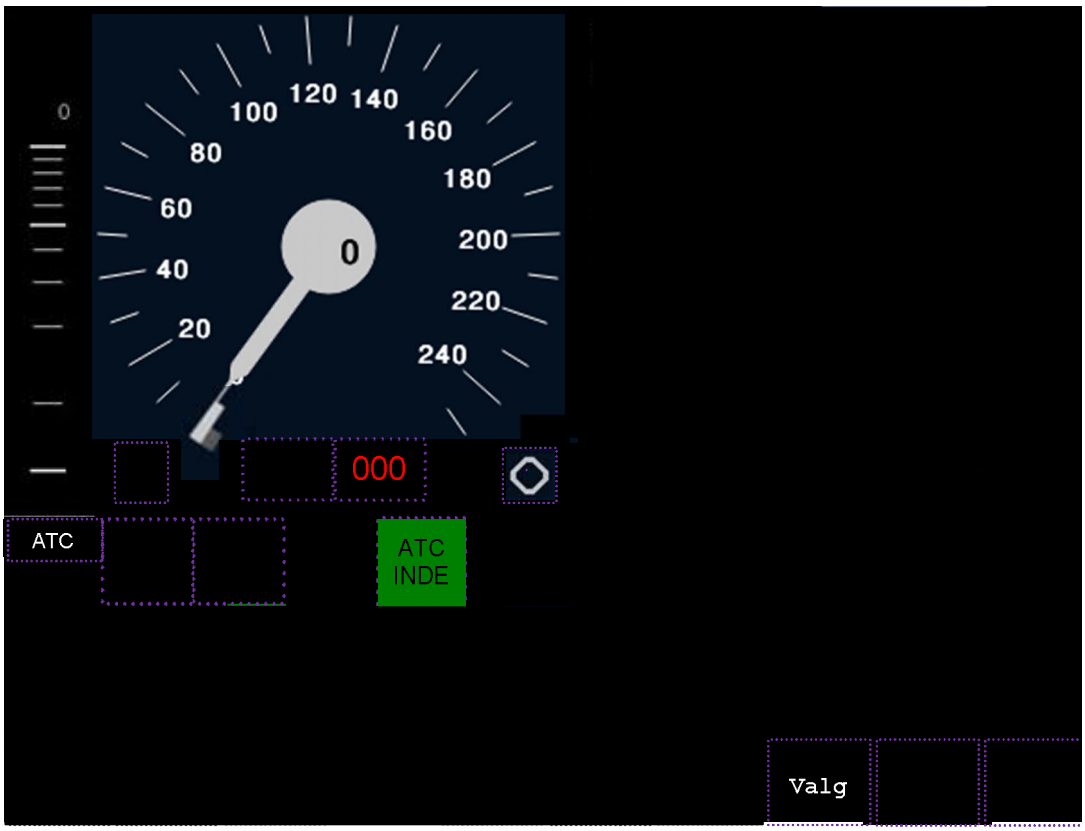
10.1 Used Error Classes:

The error classes described under error codes in section 10 have the following meaning:

Class Term	Meaning
J_R_D_S_F_ Where action is: J=JRU (send to) R=DRU (send to) D=DMI (send to E-field) S=Saved in STM-DK-memory F= STM-DK goes into FA (error state) or ComputerStop.	The new errors from STM-DK are in the interval 551 – 595 and are directly mapped to this Class Term. The original ATC Class Term are described below and the new mapping is shown. A 'x' after the above mentioned letters means, that the action will take place. I.e. a Dx means the error is shown in the DMI's error window (field E in the window in paragraph 2.1.3 above) and in the fields B3/B4 and in B4/B5 in the yellow and red digits.
RKSTP_A New class term: JxRxD_SxFx	The main computer is immediately stopped As the main computer has stopped, it will not be possible to show these errors on the DMI
Dauer_A New class term: JxR_D_SxFx	Persistent error The train brakes and the error code is shown for 60 sec. before DK-STM goes into the FA-condition Errors belonging to this class will be shown in the red (B3/B4) and yellow (B4/B5) display on the DMI
Dauer_B New class term: JxRxD_SxFx	Persistent error The train brakes and the error code is shown for 60 sec. before DK-STM goes into the FA-condition Errors belonging to this class will be shown in the red (B3/B4) and yellow (B4/B5) display on the DMI

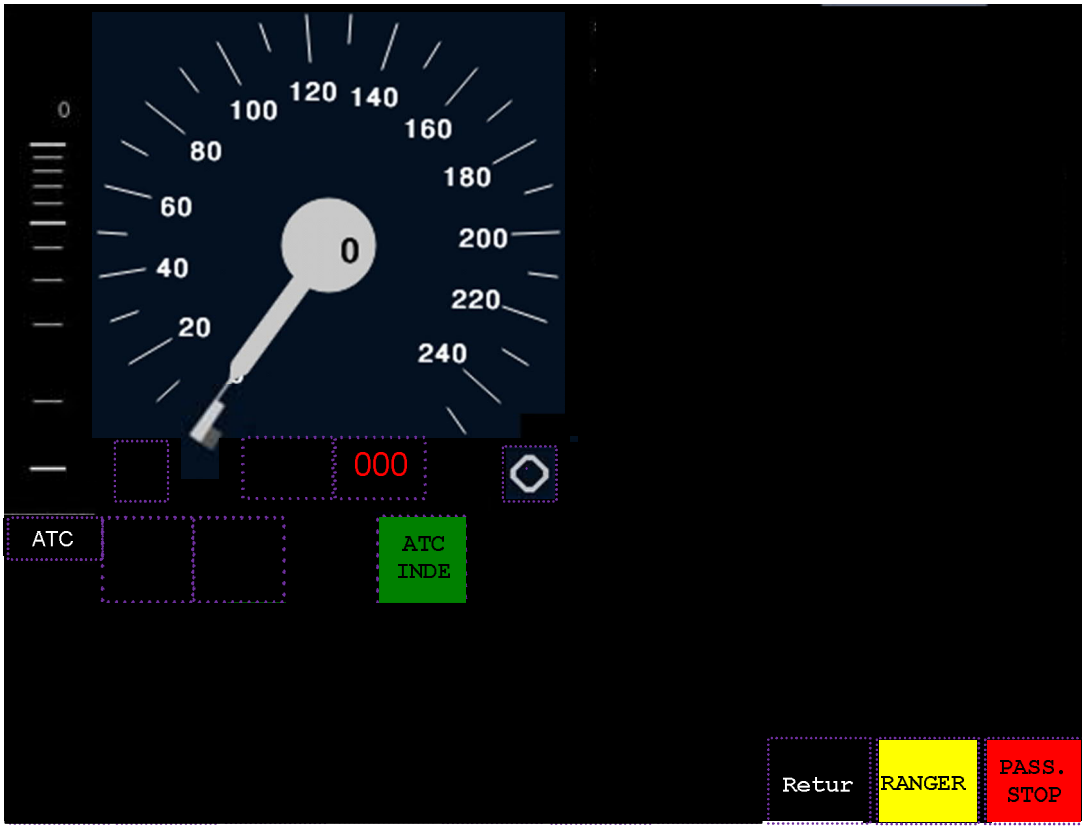
MldFE_A New class term: JxRxDxSxF_	Notification.
MldFL_A New class term: J_R_DxSxF_	Operational error
MldFL_B New class term: JxR_DxSxF_	Operational error
MldFL_C New class term: JxRxDxSxF_	Operational error
Ue_St_A New class term: JxRxDxSxF_	Transmission disturbance The train brakes
Ue_St_B New class term: JxRxDxSxF_	Transmission disturbance The train brakes
KeinR_A New class term: J_R_D_SxF_	No reaction
KeinR_B New class term: JxR_D_SxF_	No reaction
MldFS_A New class term: JxRxDxSxF_	Line error

Appendix A Passage Stop with Train Data



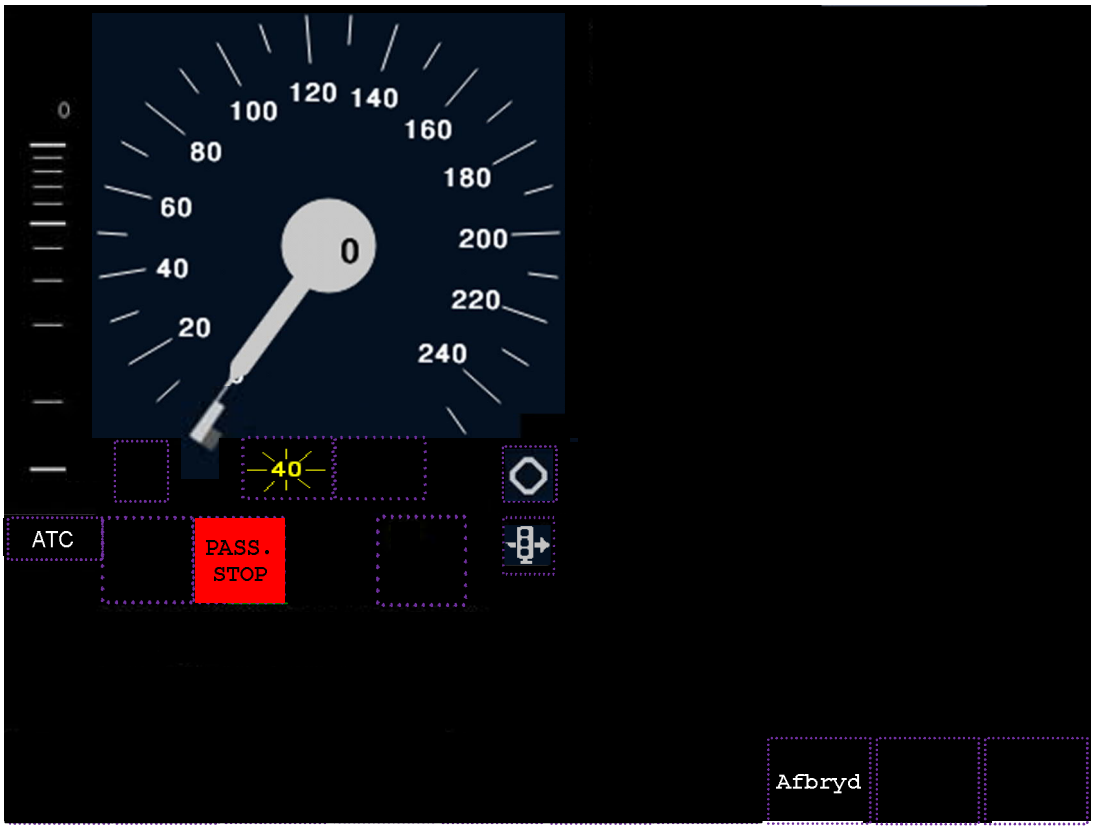
Passage Stop with train data

0_NORMAL INDICATION



Passage Stop with Train Data
1_FULL MONITORING

The mimic is max. shown for 15 sec.

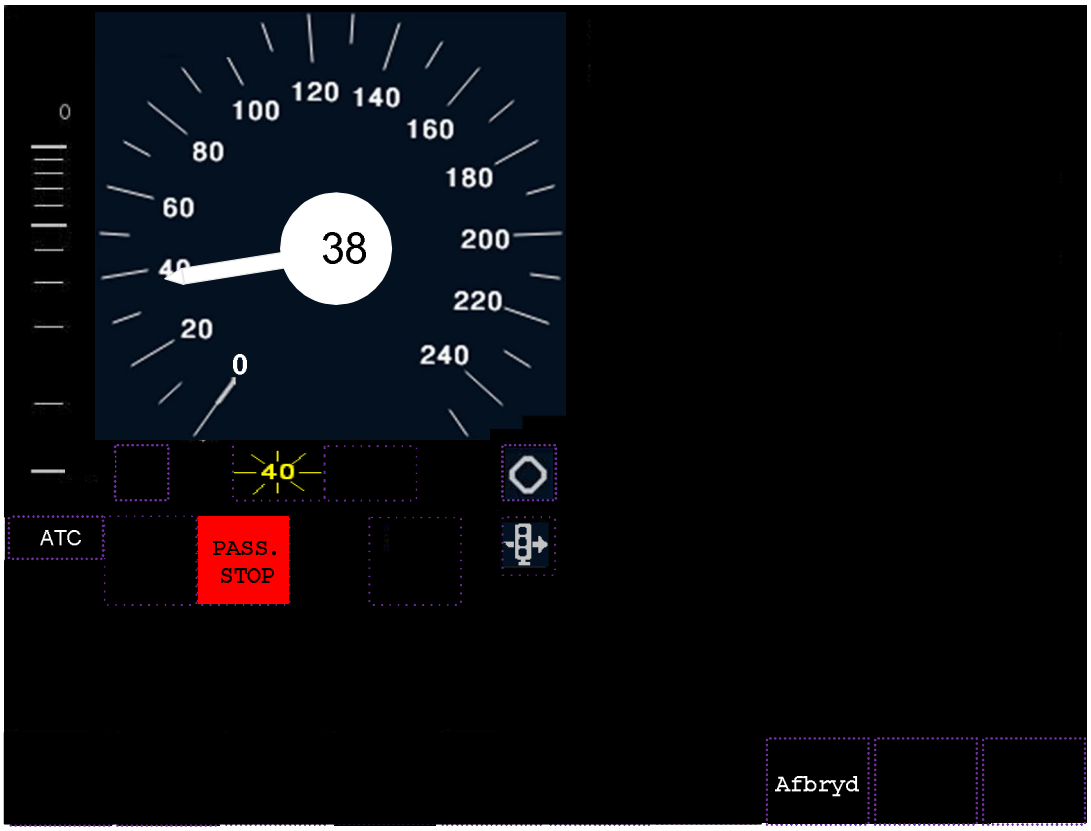


Passage Stop with Train Data

2_PASSAGE STOP – DRIVE EXPECTED

Yellow display flashes

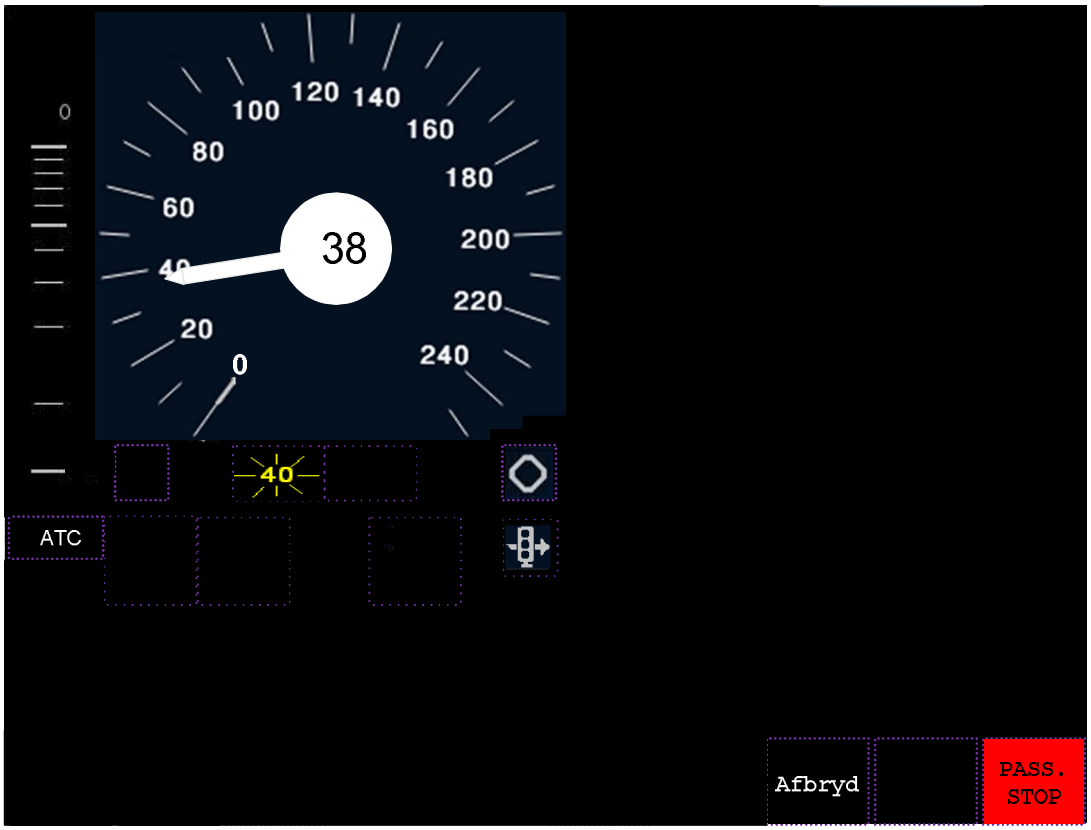
The mimic is shown for max. 60 sec. after the PASS. STOP button is pressed.



Passage Stop with Train Data (stop-sending balise not passed)

3_BALISE PASSAGE<

Yellow display flashes

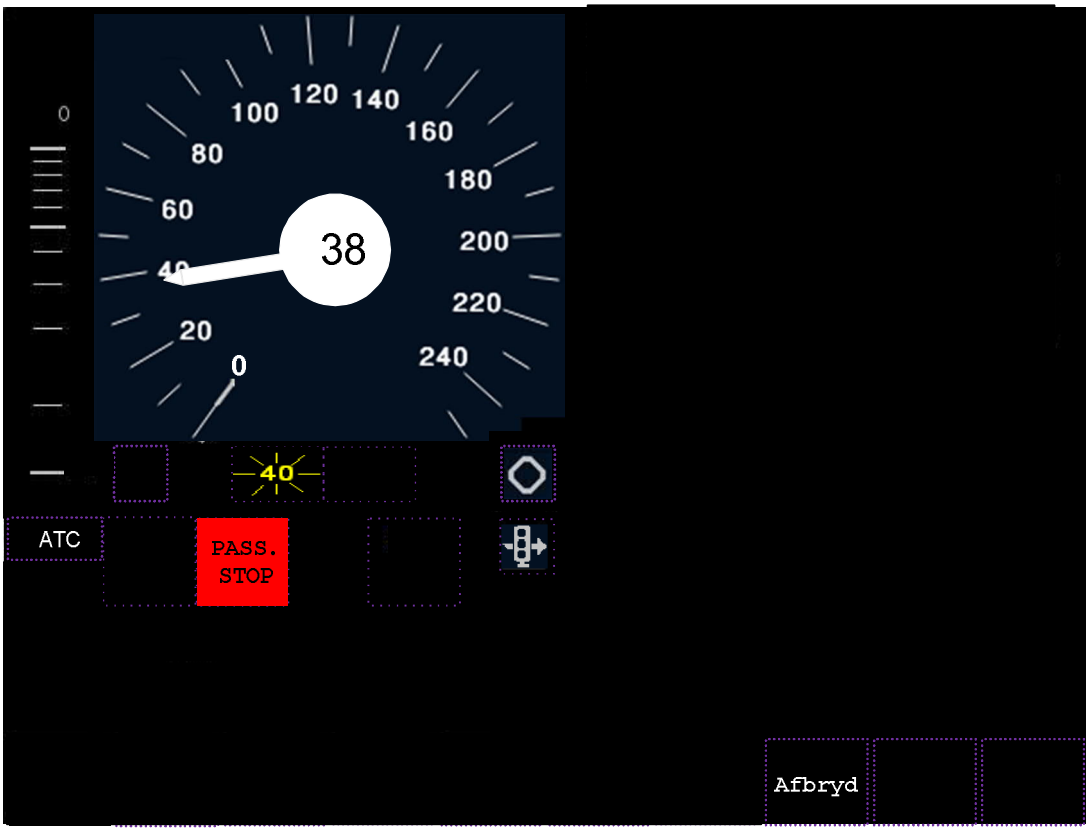


Passage Stop with Train Data (stop-sending balise passed)

4_DRIVER HANDLING OR SIGNAL BALISE

Yellow display flashes

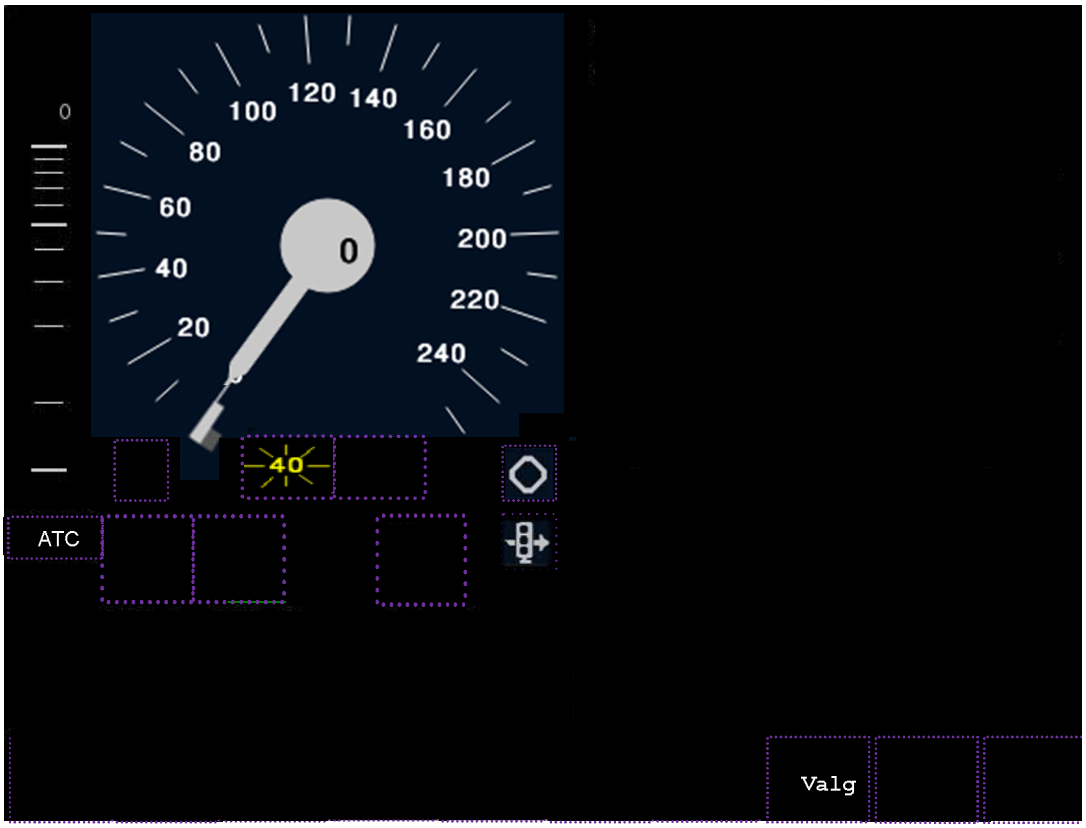
The indicator for ETCS override is shown for 1 min. after the change of condition.



Continued drive in Passage Stop with Train Data after Stop-Sending Balise has been passed

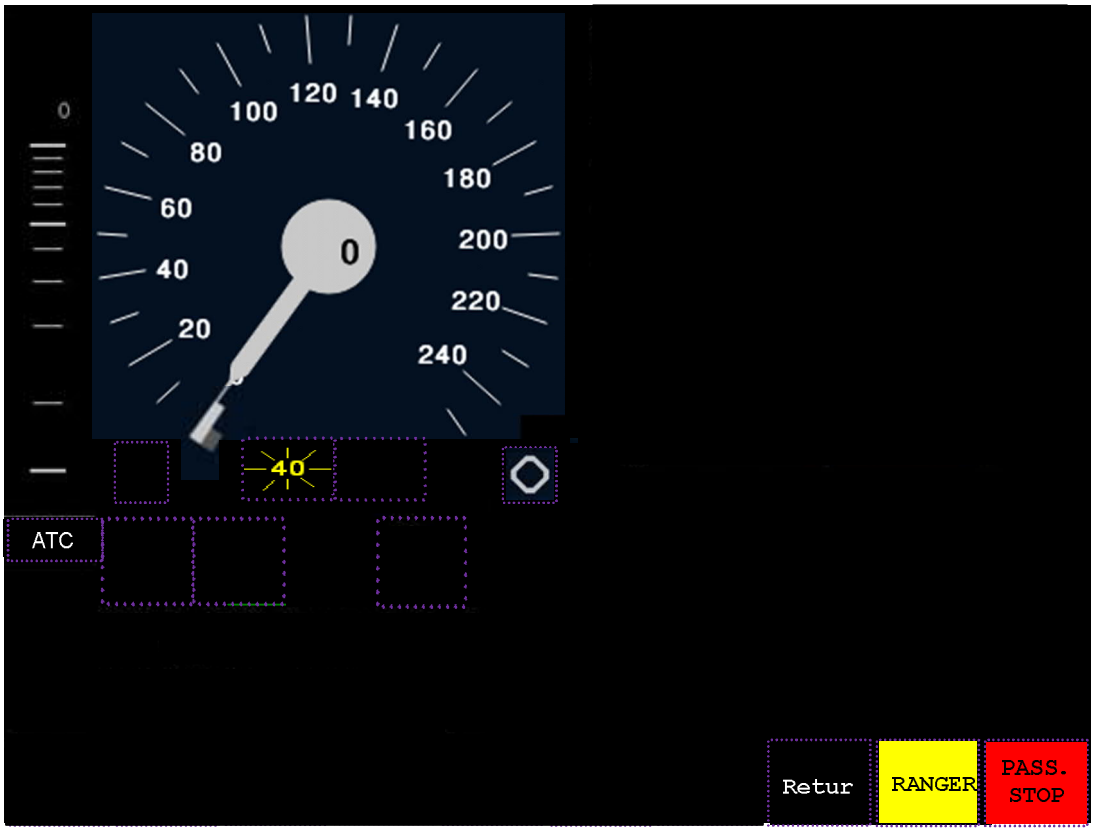
5_PASSAGE OF NEXT STOP-SENDING BALISE, AWAITED

Yellow display flashes

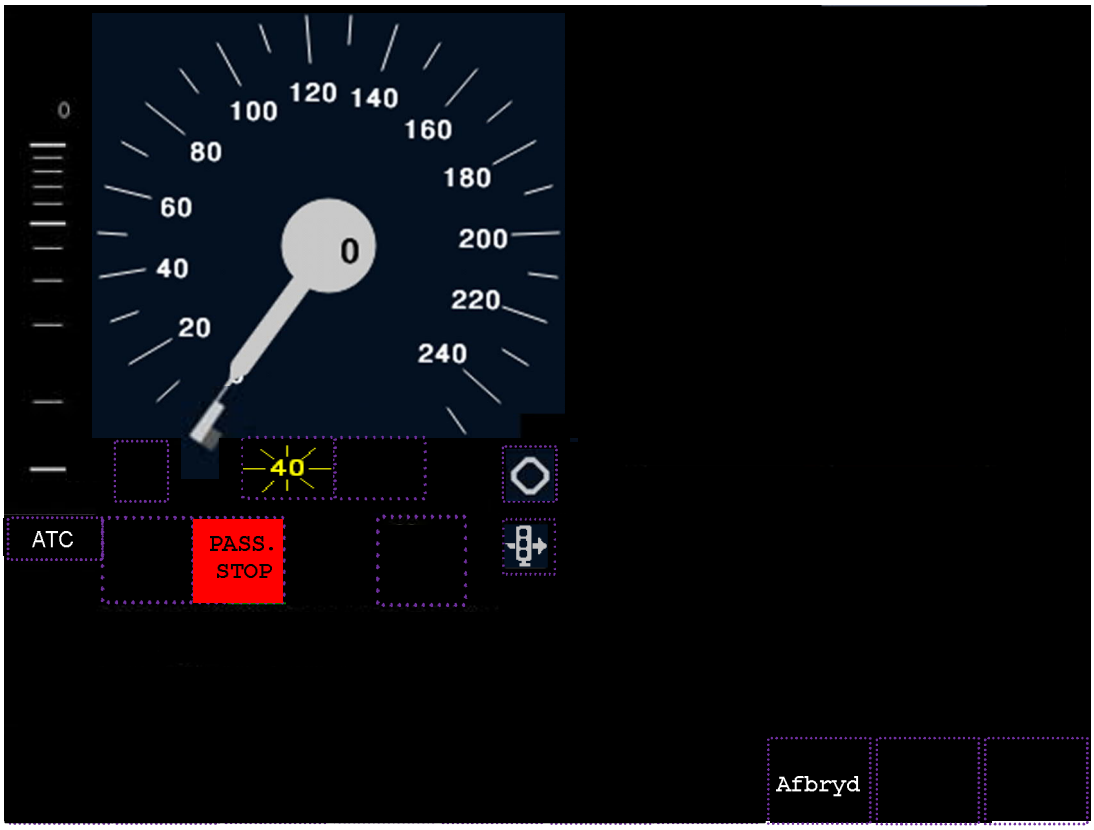


Passage Stop with Train Data
6_NEW SELECT AWAITED

The indicator for ETCS override is shown for 1 min. after the change of condition.
Yellow display flashes

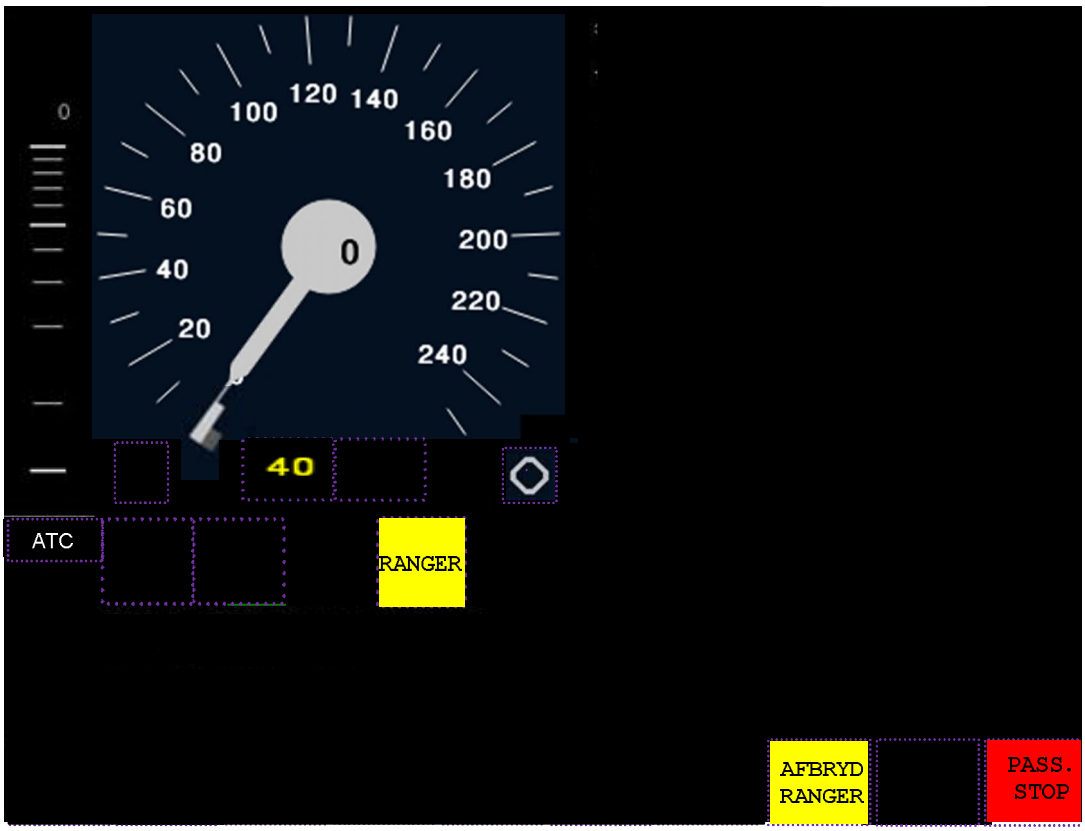


Passage Stop with Train Data
7_NO MONITORING, TRAIN HAS STOPPED
Yellow display flashes

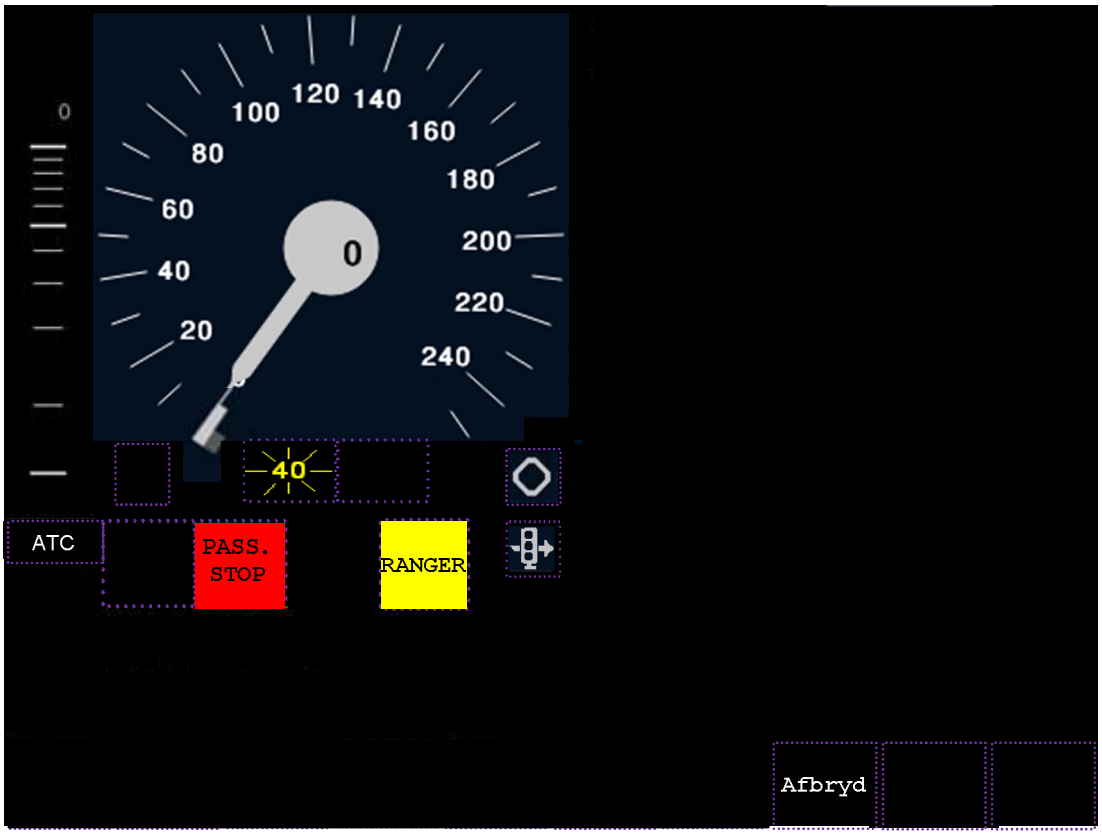


Passage Stop with Train Data
8_START OF TRAIN IN PASSAGE STOP AWAITED
Yellow display flashes

Appendix B Passage Stop during Shunting



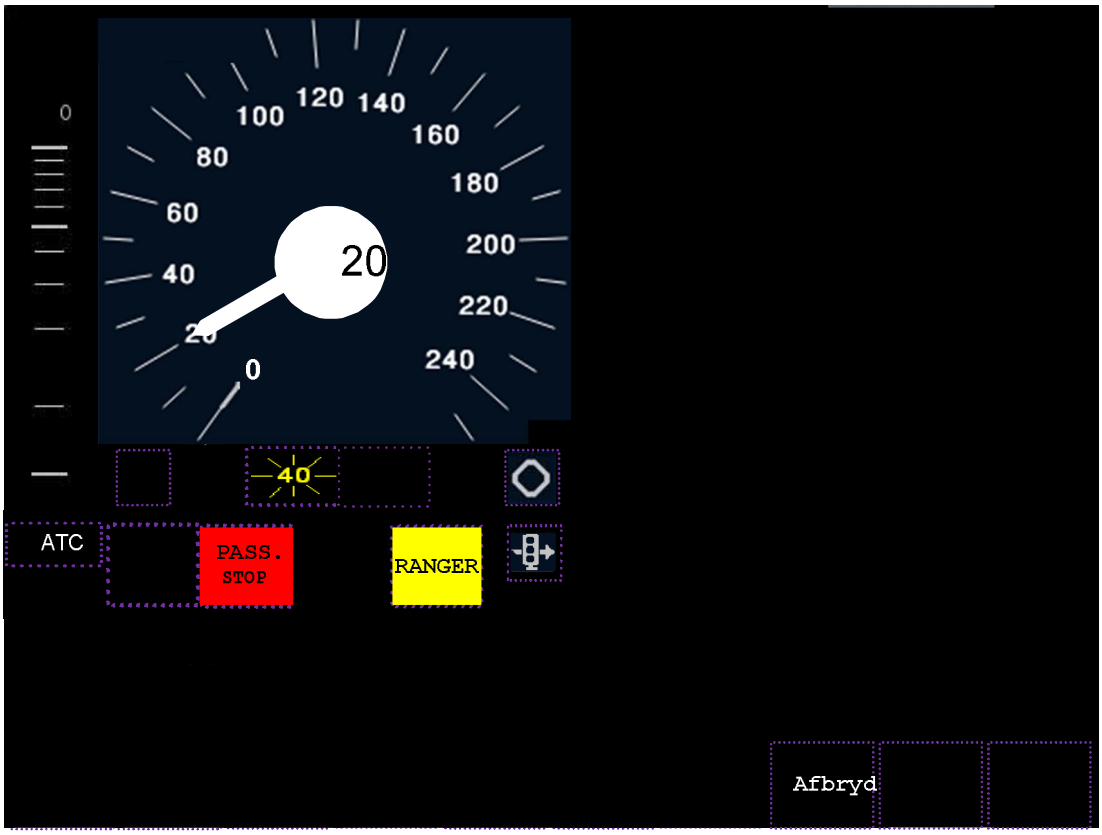
Passage Stop during Shunting
1__SHUNTING



Passage Stop during Shunting

2__Passage stop allowed within one min. – drive is expected

Yellow display flashes

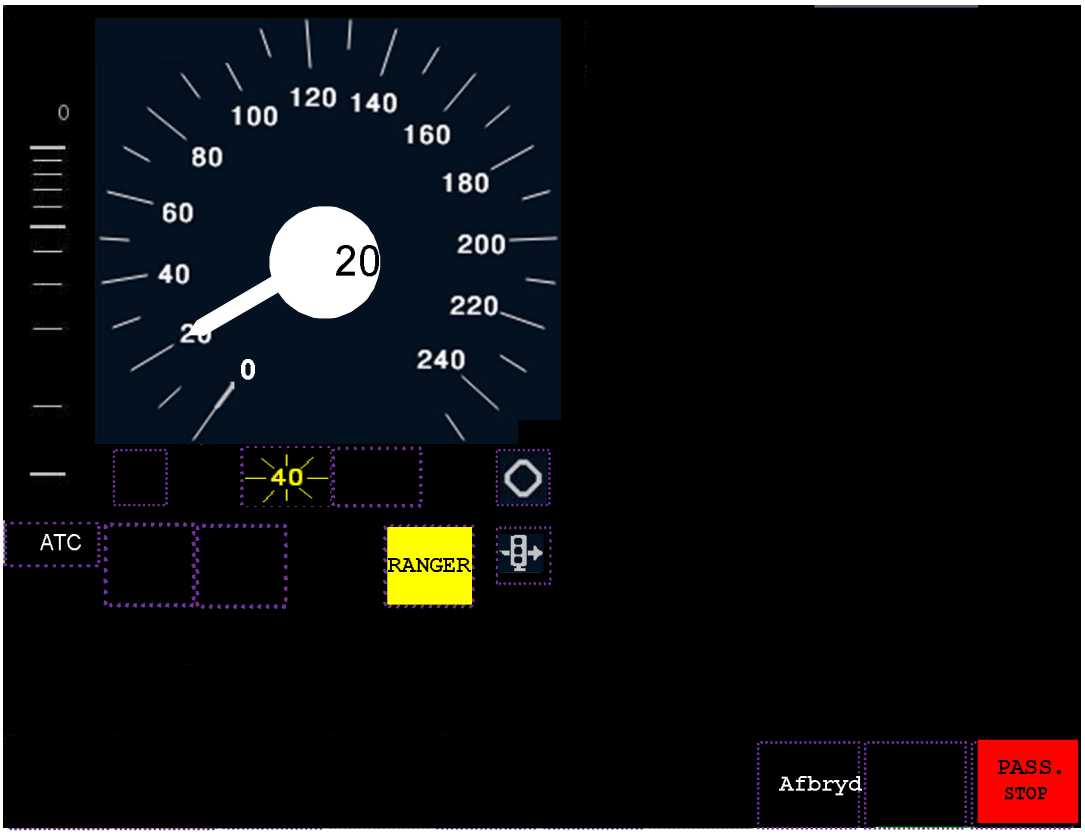


Passage Stop during Shunting

3__BALISE PASSAGE

Yellow display flashes

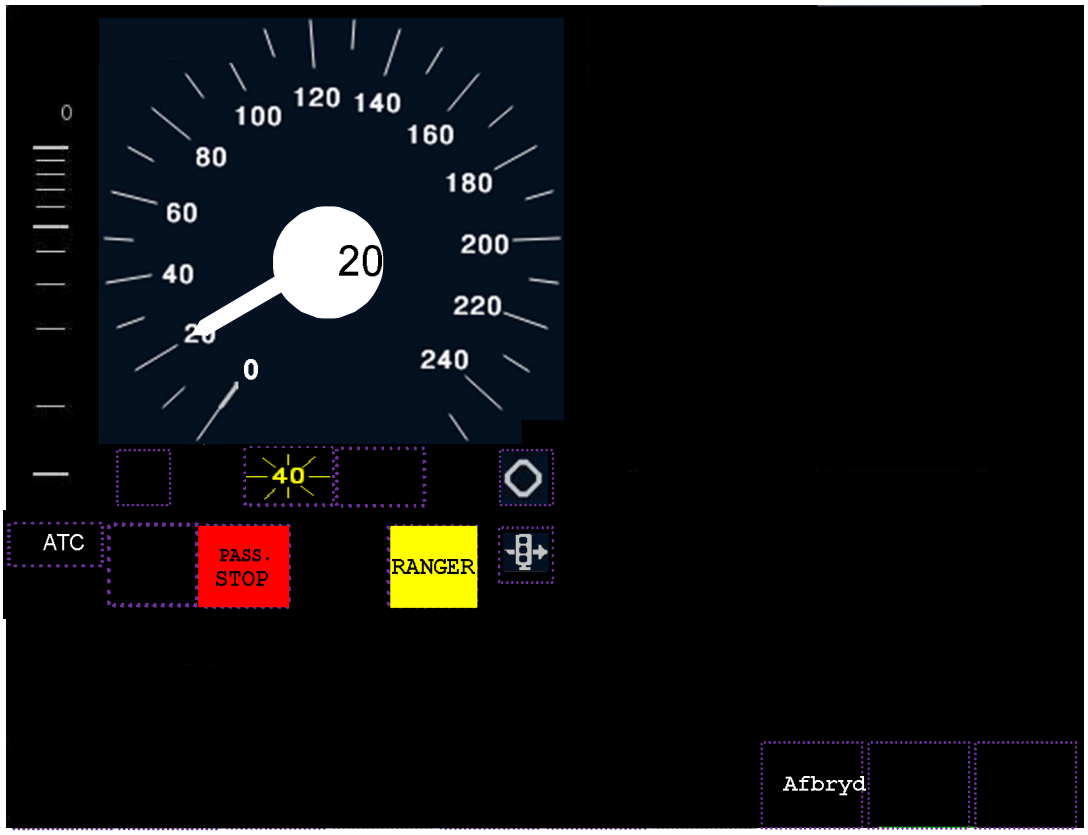
The indicator for ETCS override is shown for 1 min. after change to Passage Stop.



Passage Stop during Shunting

4__ AWAITS NEW DRIVER ACTION OR A SIGNAL BALISE

Yellow display flashes

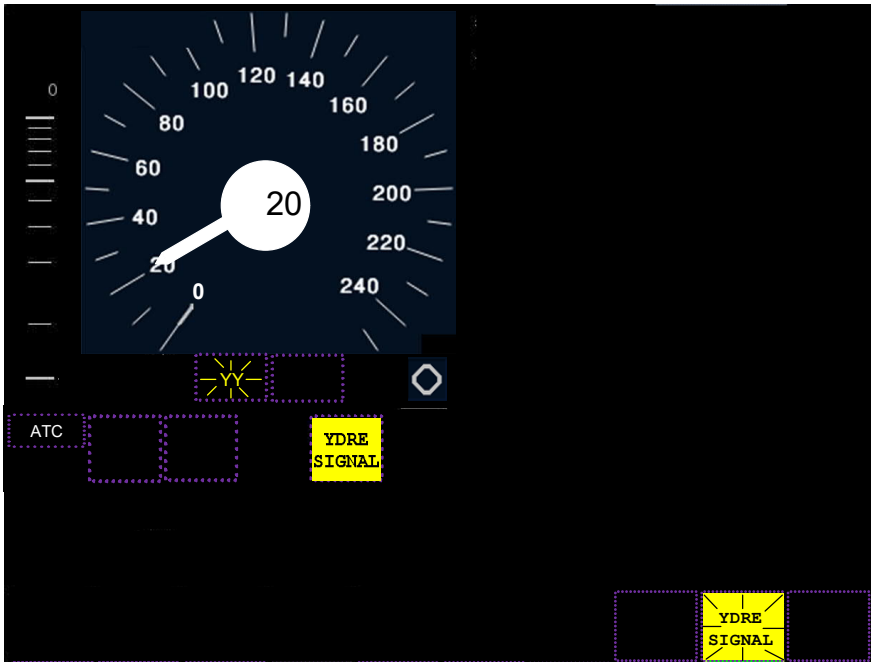


Passage Stop during Shunting

5__ AWAITS PASSAGE OF NEXT STOP-SENDING BALISE

Yellow display flashes

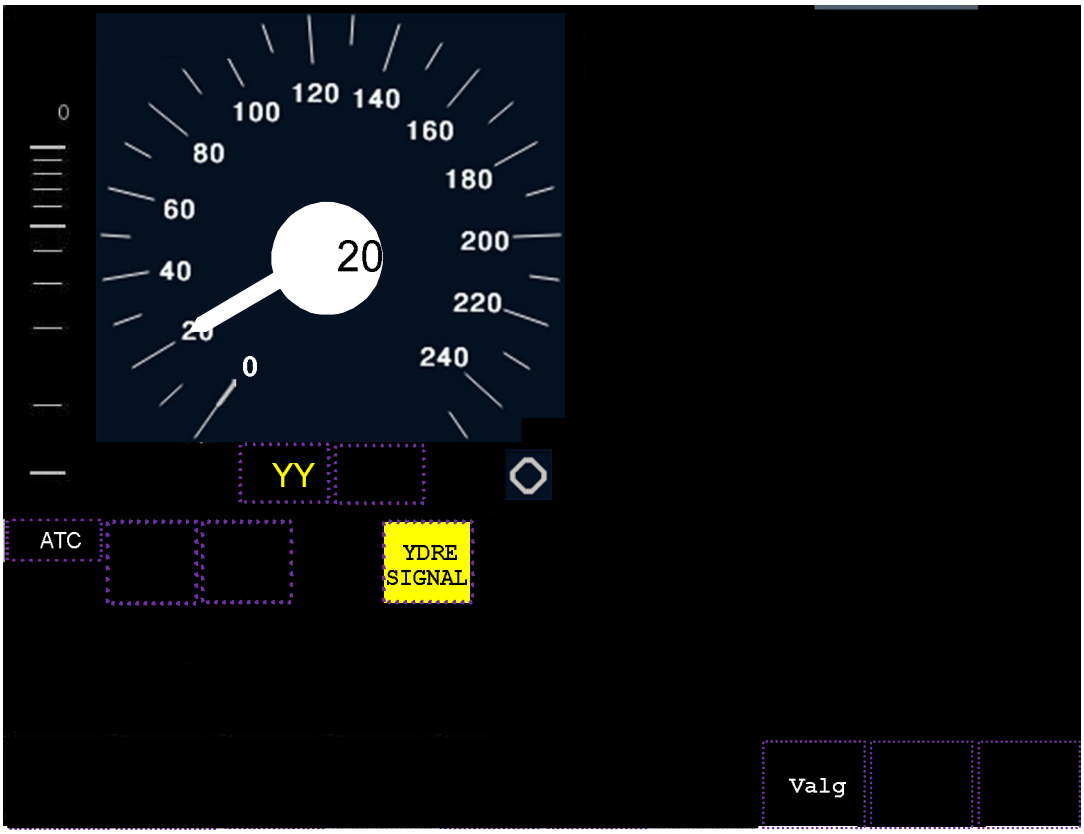
Appendix C Drive on Exterior Signals



Drive on Exterior Signals
Received change to Y-drive when passing a balise (button flashes)
Yellow display flashes

If the button “YDRE SIGNAL” is not pressed within 5 sec. the service brake is activated.
If the train has stopped, the time is increased before the service brake is activated to 60 sec.

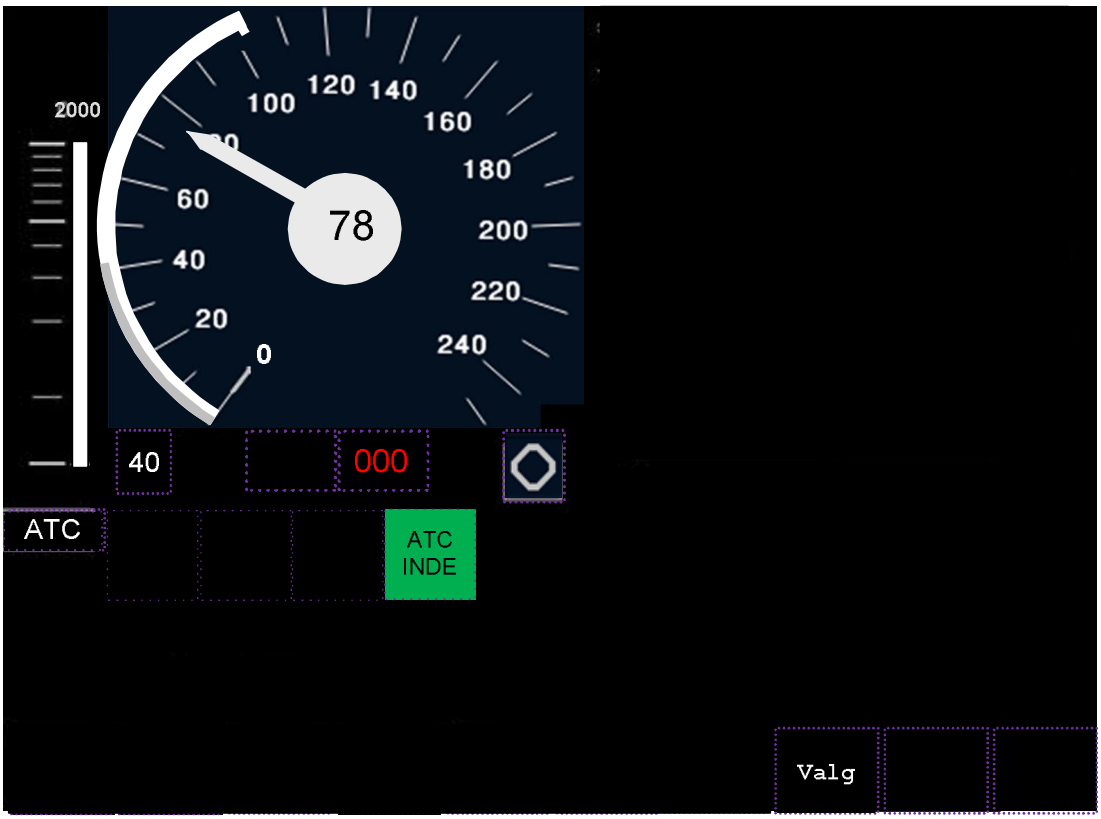
If there was a shunting during Y-drive, the Y must be acknowledged in a similar way after entry of train data, instead of “LØS ATC”



Drive on Exterior Signals

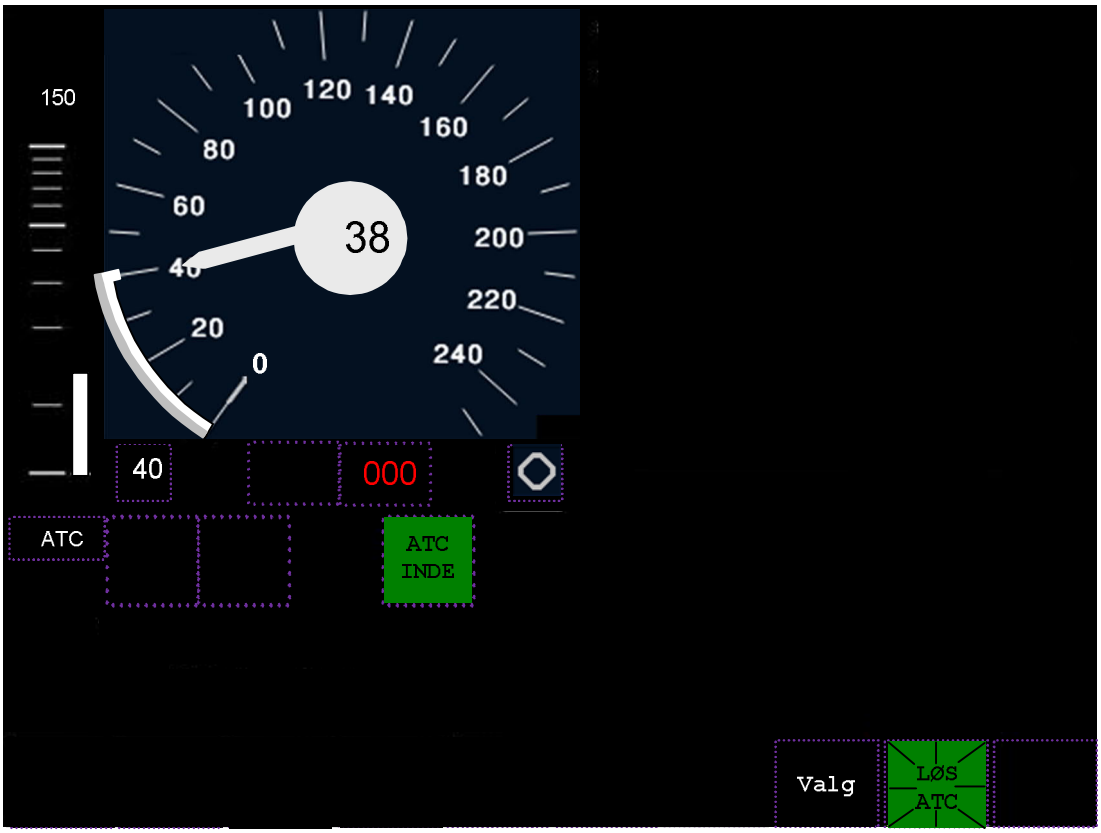
If the button ”YDRE SIGNAL” is pressed

Appendix D Release ATC/ Release Speed



Release ATC / Release Speed
Is release speed received when passing a balise. The release speed is shown for 2 sec.

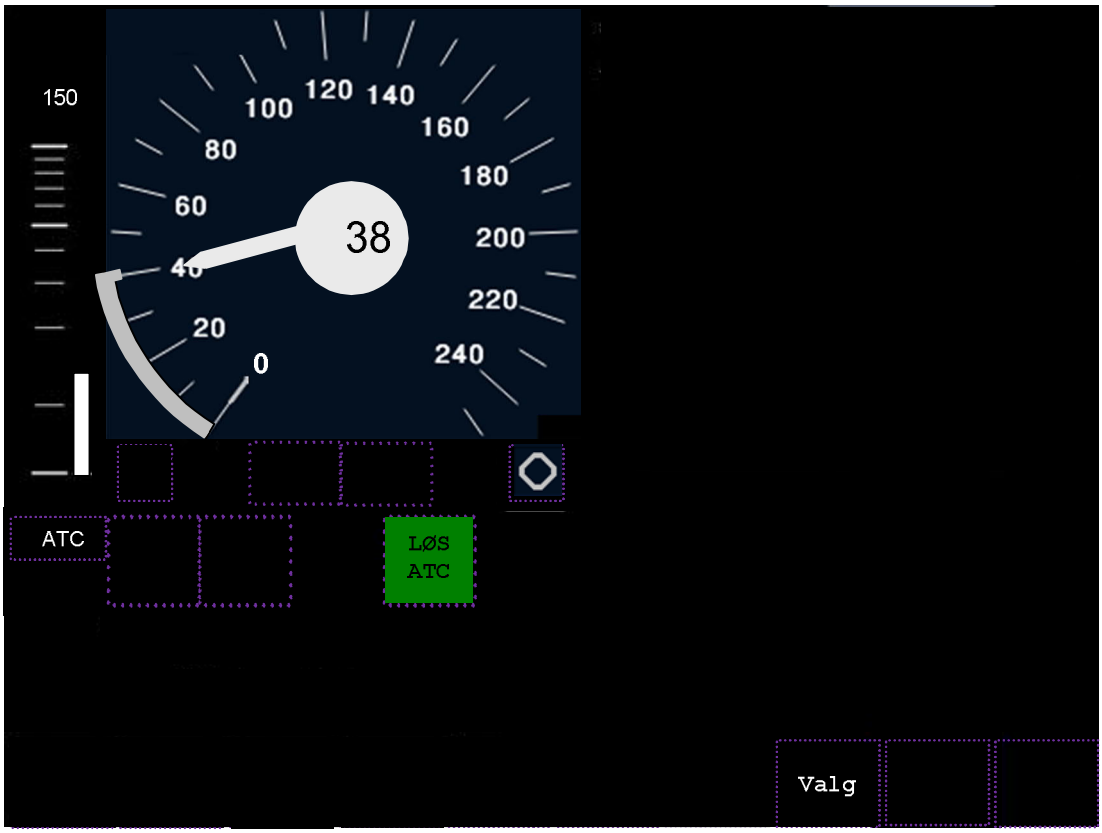
Indication of the release speed (40) to the right of the distance column is guiding. It is controlled by ETCS.



Release ATC / Release Speed

When the driver presses the button ”LØS ATC” and the train’s speed lies within the allowed area. (Button is shown flashing)

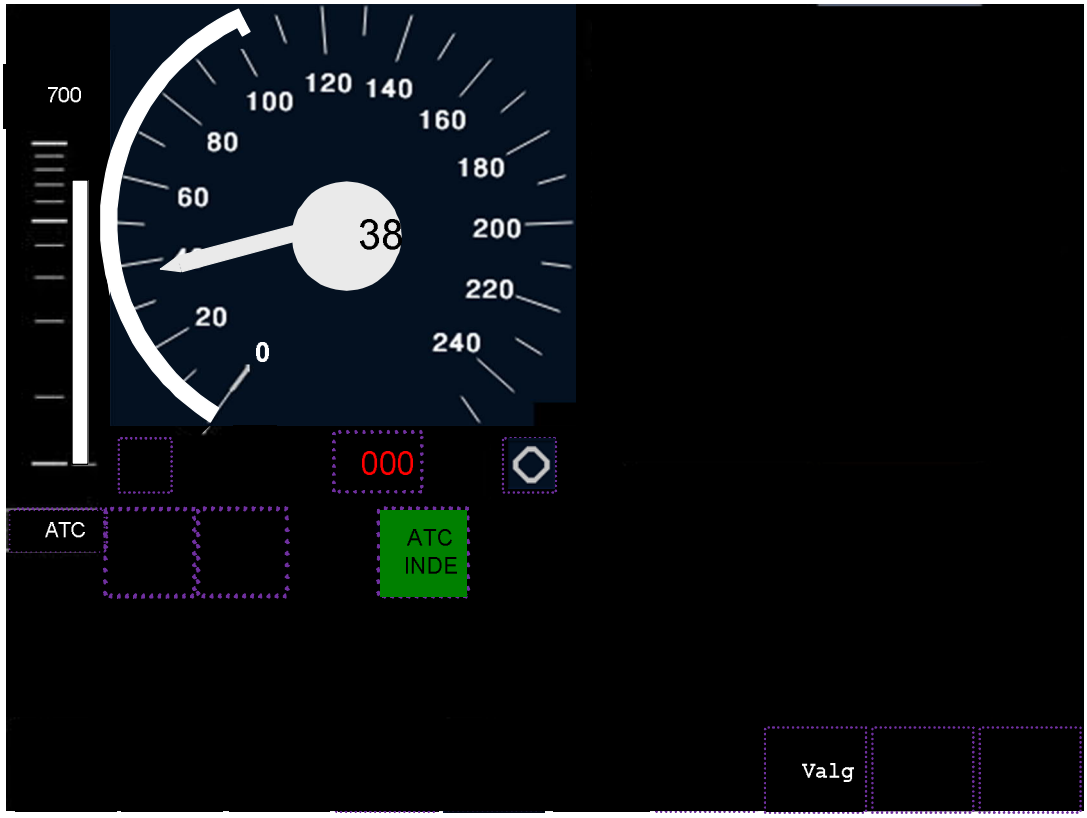
Indication of the release speed (40) to the right of the distance column is guiding. It is controlled by ETCS.



Release ATC / Release Speed

The driver has pressed the button ”LØS ATC”.

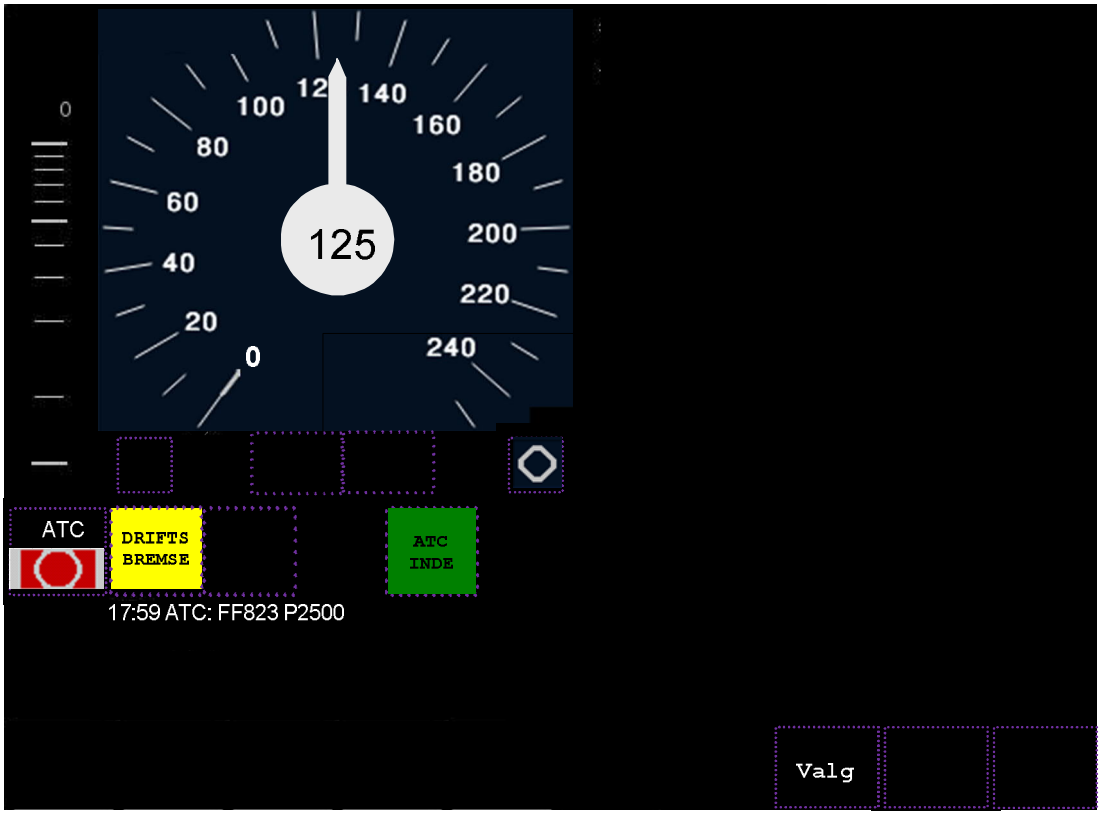
The signal balise has still not been passed.



Release ATC / Release Speed

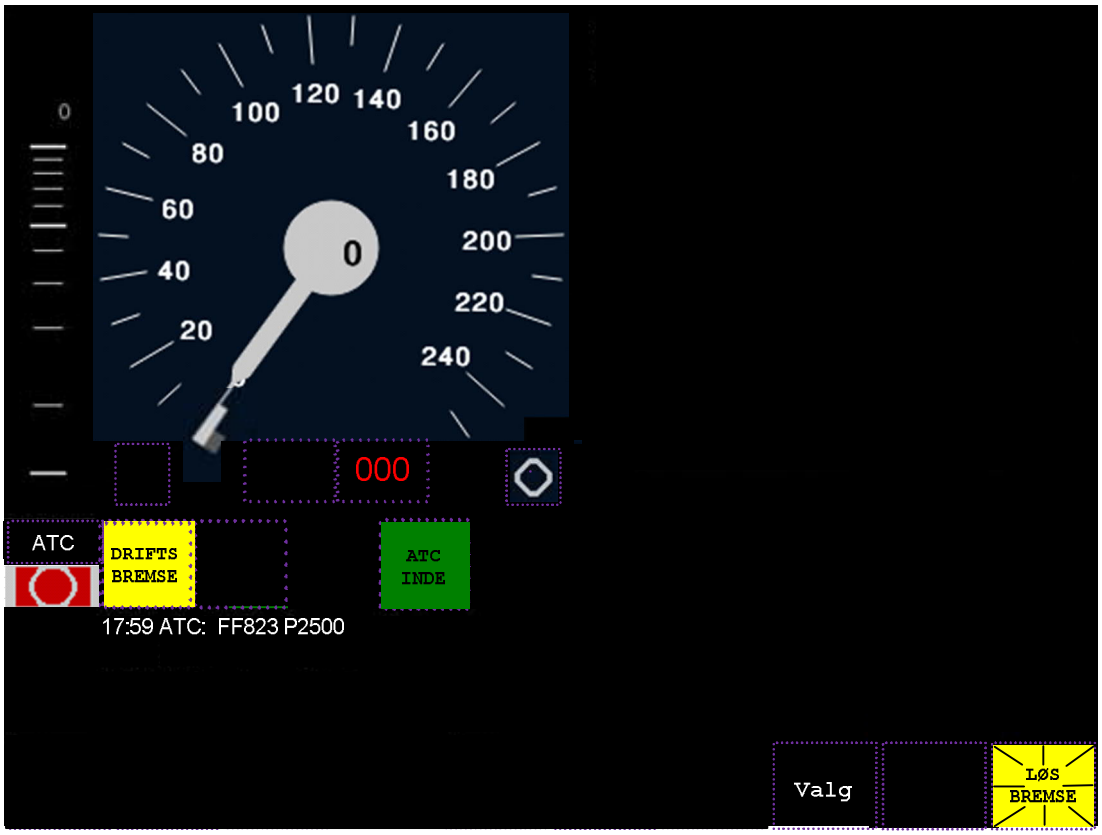
The train can continue without being braked when passing the signal balise. (Indication after passage).

Appendix E Release Service Brake



Release Service Brake

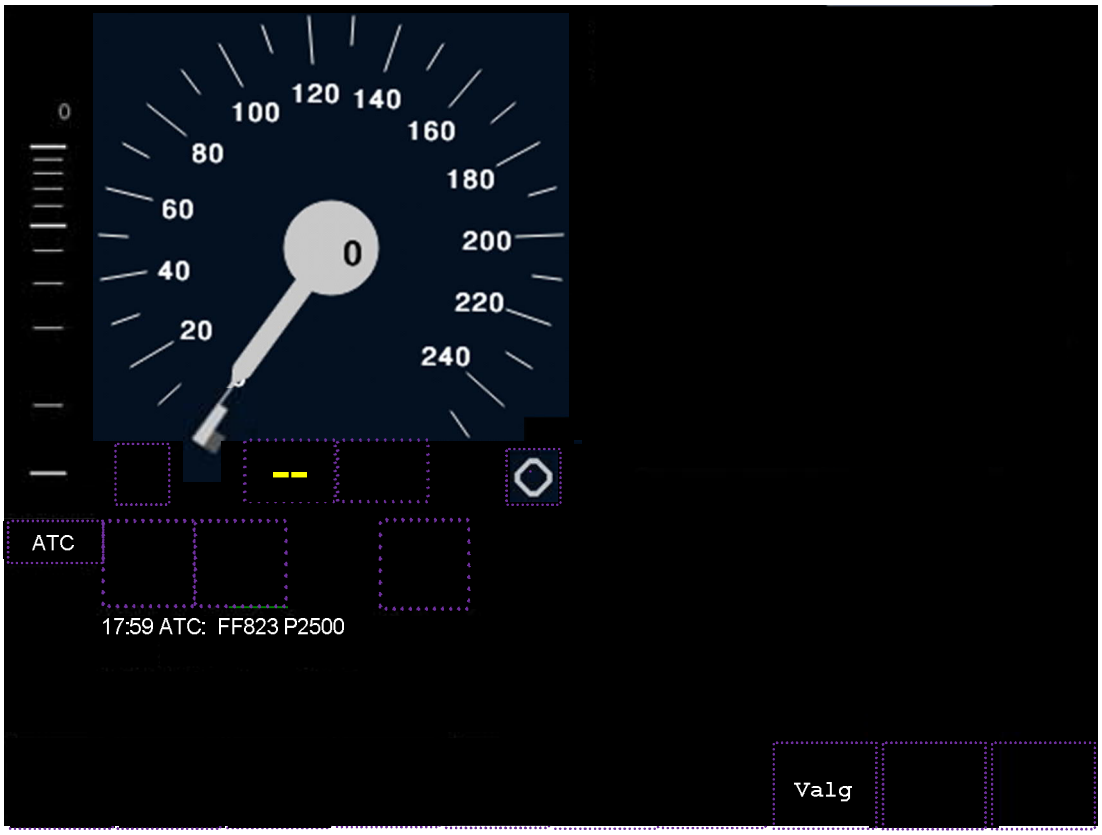
/* Shown position has no relation to the reality.



Release Service Brake

The service brake can be released (button flashes)

/* The shown position has no relation to the reality.

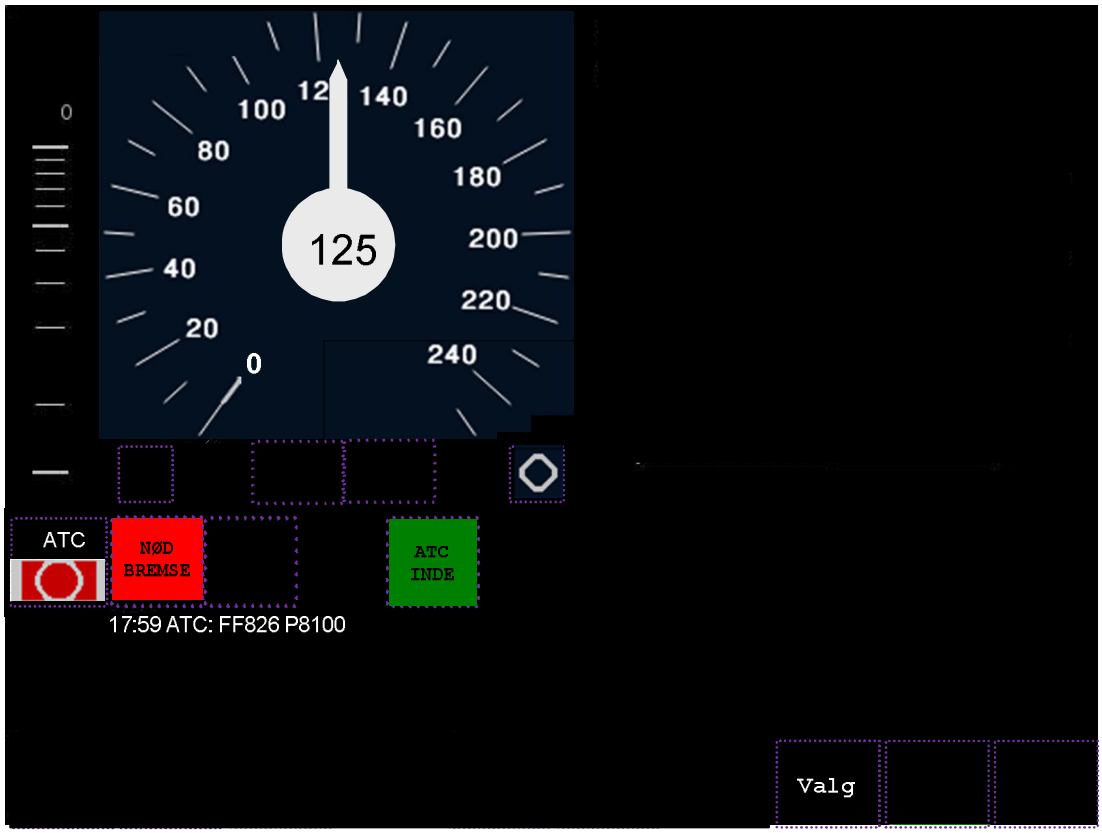


Release Service Brake

The service brake has been released

/* The shown position has no relation to the reality.

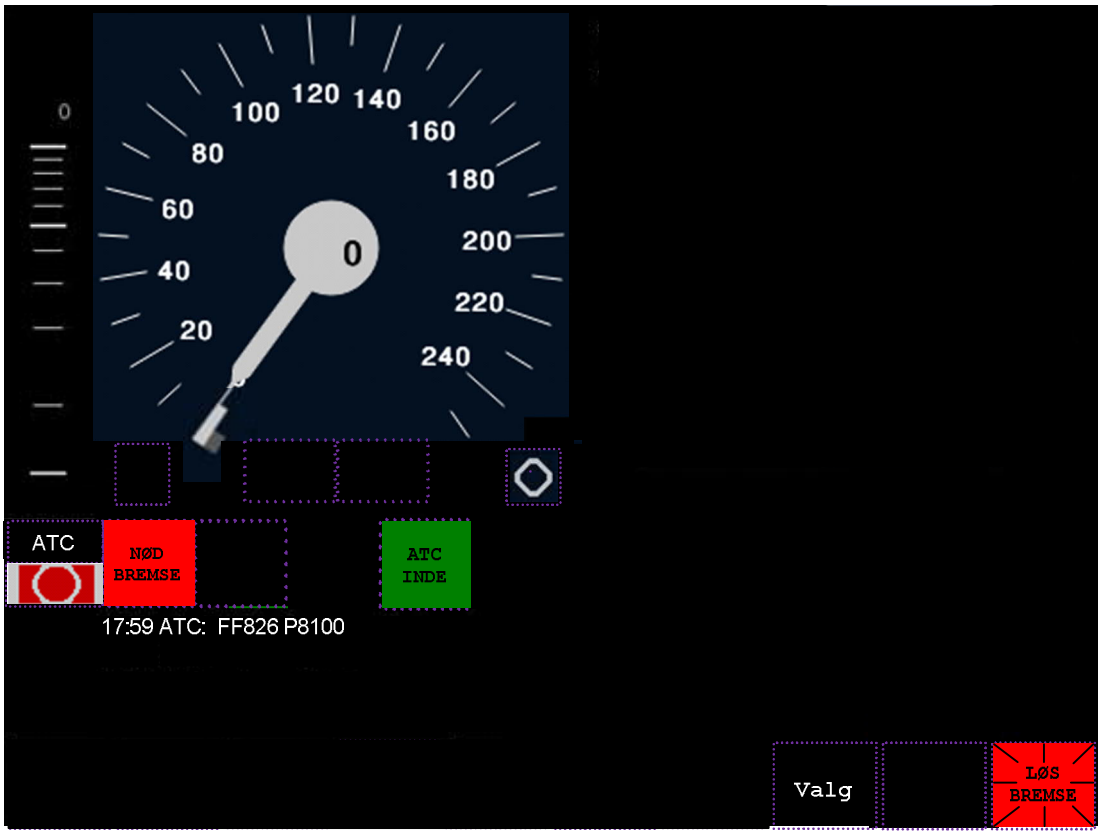
Appendix F Release Emergency Brake



Release Emergency Brake

/* The shown position has no relation to the reality.

When passing the stop-sending balise the red display will show ’000’

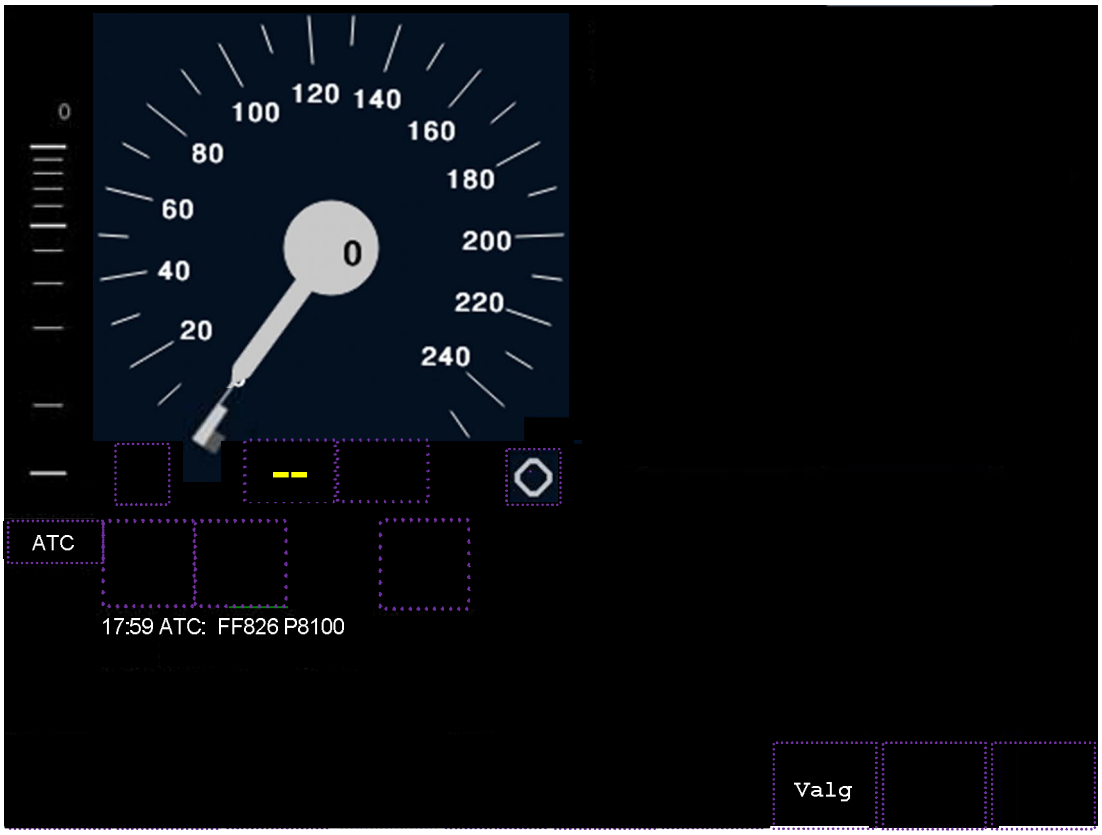


Release Emergency Brake

The emergency brake can be released (button flashes)

/* The shown position has no relation to the reality.

When passing the stop-sending balise the red display will show ’000’



Release Emergency Brake

The emergency brake has been released

/* The shown position has no relation to the reality.

Appendix G Overall Passage Stop State Diagram