

(German) Knorr brake (Type 8)

German steam locomotives mostly used the "Knorr braking system." Many steam locomotives had the "Knorr Brake lever Type 8". These been used till the last years in the steam era and also today still at museuem railways, as well known series as BR50, 52, 41, 44 and even the latest building locomotives BR23.

These brake lever has 6 positions. Typically, the main reservoir is max. 8 bar and the brake pipe pressure 5 bar.

Brake Valve Position	State	OR BrakeController Type
QuickRelease	Main reservoir is connected to brake pipe	TrainBrakesControllerFullQuickoverchargeReleaseStart
Running	Train pipe is maintained to 5 bar via reducing valve	TrainBrakesControllerReleaseStart
Hold	Train brake lever is closed	TrainBrakesControllerHoldStart
ApplyHold	Preparing and hold position for braking	TrainBrakesControllerHoldStart
Apply	braking start (little air off), stepwise braking,	TrainBrakesControllerApplyStart
Apply	braking start (more air off), stepwise braking,	TrainBrakesControllerFullServiceStart
Emergency	Emergency braking	TrainBrakesControllerEmergencyStart

5a to 5b (Apply) is in real live variable (how more to 5b, how more/faster air off). but after my opinion is "two positions" more user friendly in ORTS.

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Knorr train brake lever more explained.

Or 100% truth is I do not know, but I use the next following order of existing tokens.
(see "page 6, #57 in ET "Air Brakes - Additional Features")
In wrong order, I get indeed errors.....

a) TrainBrakesControllerFullQuickoverchargeReleaseStart

TrainBrakesControllerFullQuickReleaseStart
TrainBrakesControllerGraduatedQuickReleaseStart
TrainBrakesControllerReleaseStart

b) TrainBrakesControllerReleaseRunningStart

TrainBrakesControllerHoldStart

b) TrainBrakesControllerApplyHoldStart

TrainBrakesControllerEPAApplyStart
TrainBrakesControllerEPHoldStart
TrainBrakesControllerRunningStart
TrainBrakesControllerSelfLapStart
TrainBrakesControllerGraduatedSelfLapStart
TrainBrakesControllerGraduatedSelfLapLimitedStart
TrainBrakesControllerNeutralhandleOffStart
TrainBrakesControllerMinimalReductionStart

TrainBrakesControllerApplyStart

TrainBrakesControllerFullServiceStart

TrainBrakesControllerSuppressionStart
TrainBrakesControllerContinuousServiceStart

TrainBrakesControllerEmergencyStart

Remark.

- a) Should be created new:
- b) option, where conflict with other brake systems?

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currently (rel. 1.2.3766) I use the next train brake lever, whereby the brake pipe leakage works.
["TrainPipeLeakRate (0.00021bar/s)" is about -0,2bar/8 min.]

Brake_Train (0 1 0.01 0.25

NumNotches (7

Notch (0.00 0 TrainBrakesControllerFullQuickReleaseStart)

Notch (0.20 0 TrainBrakesControllerReleaseStart)

Notch (0.35 0 TrainBrakesControllerHoldStart)

Notch (0.40 0 TrainBrakesControllerHoldStart)

Notch (0.60 0 TrainBrakesControllerApplyStart)

Notch (0.90 0 TrainBrakesControllerFullServiceStart)

Notch (1.0 0 TrainBrakesControllerEmergencyStart)

)

= (1) [Knorr-QuickRelease]

= (2) [Knorr-Running]

= (3) [Knorr-Hold]

= (4) [Knorr-ApplyHold]

= (5a) [Knorr-Apply]

= (5b) [Knorr-Apply]

= (6) [Knorr-Emergency]

Knorr train brake lever

Main Reservoir = 8 Bar.

Brake pipe = 5 Bar.

Token (1) [Knorr-QuickRelease]

"TrainBrakesControllerFullQuickoverchargeReleaseStart"

8 bar Main Reservoir is connected to brake pipe

Function:

- To give a short air burst to triple valves via train pipe, from braking to release.
- Faster release of long (freight) train.
- Drivers must set back lever to token 2, to prevent overcharging! (typical before BP = 5 Bar)
- (Brake lever auxiliary reservoir is disconnected)

Should be created new in ORTS:

- "**fasterfillingrate BP**" from existing BP pressure to max. pressure of the main reservoir (MR)
- End pressure BP = MR (BP=MR can rise via air pump until "**maxpressureMR**" ["8 Bar"])
- BP leak is compensated by MR and air pump = no "**trainpipeleakrate**"

Remark:

Disadvantage is that you can overcharging the brake pipe, so example to 5.3 Bar. (or to 8 Bar....). If this happens, you have to discharge [bail off] the wagons..... But a challenge, whether you're a good driver!

Token (2) [Knorr-Running]

(TrainBrakesControllerReleaseRunningStart)

TrainBrakesControllerReleaseStart

Train pipe is maintained to 5 bar via reducing valve.

Function:

- Normal "driving" position. (maintained 5 bar BP pressure)
- Train is (slow) released from braking.
- If train was overloaded (BP > 5.x bar), wagons with the brakes blocked, discharge [bail off] it first.....!
- (Brake lever auxiliary reservoir is connected)

ORTS:

- "**maxBPpressure**" [5 Bar] is maintained.
- BP leak is compensated by MR and air pump = no "**trainpipeleakrate**"
- from existing BP pressure "**normalfillingrate BP**" and "**normalairoffrate**" to/from max. BP pressure. ["5 Bar"]
- adding air pressure from main reservoir (MR). (as usual)

remark:

"TrainBrakesController*RunningStart*" is not possible in connection with the order. Also with

"TrainBrakesController*RunningStart*" you do not have a release of the train.

As far as I can test works this " TrainBrakesController*ReleaseStart* " token good for this function
Knorr-Running, release of train works and BP remains 5 Bar. So if there are no other conflicts?

Token (3) [Knorr-Hold]

TrainBrakesControllerHoldStart

Train brake lever is closed (no connection with MR or BP)

Function:

- close brake lever
- testing train pipe leakage
- Real Live: locomotive as "second locomotive" in train.
- Real Live: prevent damage to brake lever if there is pressure in BP but not/lower in MR
- (Brake lever auxiliary reservoir is disconnected)

ORTS:

- No maintained of BP pressure.
- leakage via "[trainpipeleakrate](#)". (example 0.00021bar/s)
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Remark:

both "Real Live " options are inapplicable for ORTS, to my knowledge.

Token (4) [Knorr-ApplyHold]

([TrainBrakesControllerApplyHoldStart](#))

TrainBrakesControllerHoldStart

Beginning and hold position for braking (no air off)

Function:

- Preparing braking
- (Brake lever auxiliary reservoir is connected)

ORTS:

- No maintained of BP pressure.
- leakage via "[trainpipeleakrate](#)" keeps existing.
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Remark,

For testing, I used token "TrainBrakesControllerHoldStart" twice. It works well but in fact you can not use in ORTS duplicate names/identical tokens. ?? (yes or no?)
Token with "Dummy" does not work well !!

Token (5a/b) [Knorr-Apply]

TrainBrakesControllerApplyStart

braking start (little air off)

Function:

- stepwise braking
- Shortly in position 5, after air out back to 4
- If sufficient braking force, stay in 4 otherwise repeat again.
- Maximum BP pressure lowered to 3.5 bar makes no sense. (This gives the maximum braking force too brake cylinders)

ORTS:

- leakage via "trainpipeleakrate" keeps existing.
- etc. etc. etc. The normal "releaseout" etc and braking as now exist in ORTS.

Remark:

Token 5b " **TrainBrakesControllerFullServiceStart** " is the same effect as **TrainBrakesControllerApplyStart** 5a to 5b is in real live variable (how more to 5b, how more/faster air off). but after my opinion is "two positions" more user friendly in ORTS.

Token (6) [Knorr-Emergency]

TrainBrakesControllerEmergencyStart

Emergency braking

Function:

- Emergency braking

ORTS:

- (leakage via "trainpipeleakrate" keeps existing)
- BP quick release to "0 bar"
- etc. etc. etc. The normal "releaseout" etc and braking as now exist in ORTS.

General comment "brake pipe leakage".

At the moment it goes "wrong" with the brake pipe leakage. The train pipe leakage works in TrainBrakesControllerHoldStart. [OK]

If after waiting a few minutes, the BP pressure drops due to leakage. Example 5 bar to 4.7 bar. brakes are activated. (so far so good).

But if you go to a lower position toward brakes (as TrainBrakesControllerApplyStart), you immediately see the BP pressure goes back to its old value? result than 4.7 bar to 5 bar in BP, i.e. the brakes are released !

Is ORTS calculate included pressure in the "brake lever auxiliary tank" of the Train brake lever?

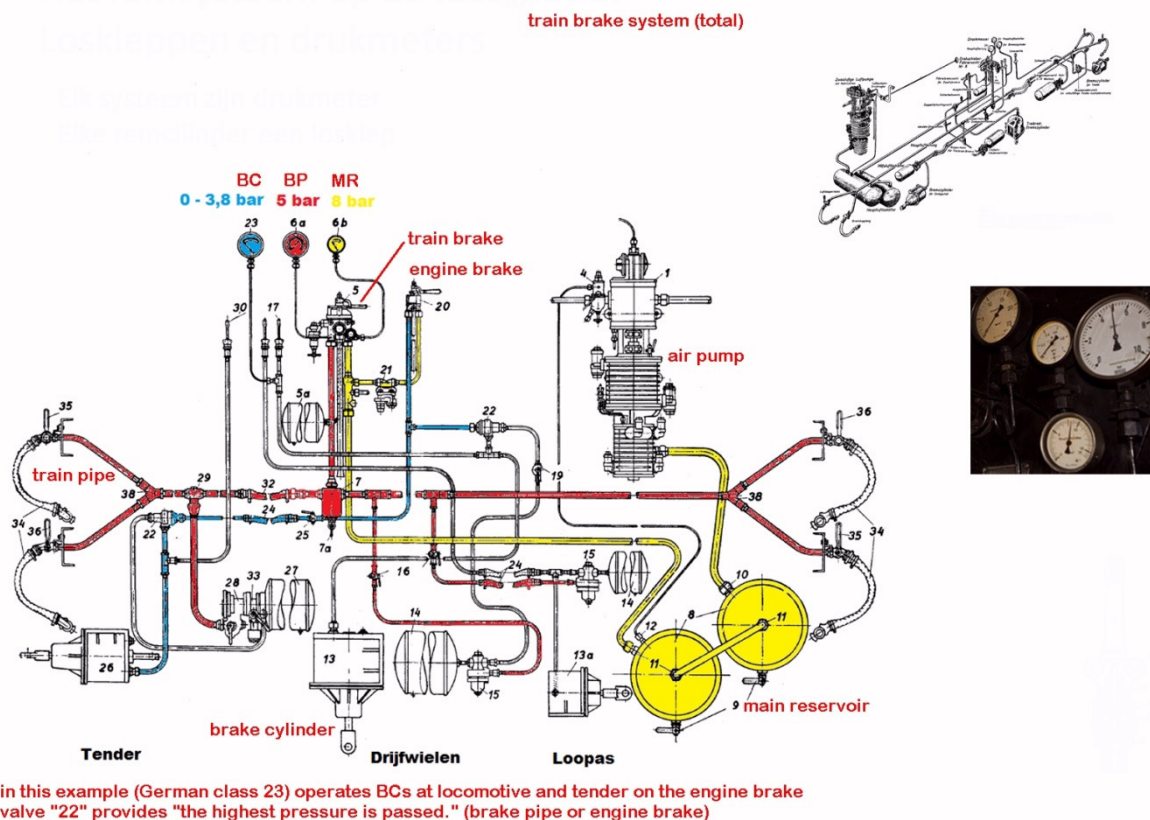
If yes, I understand "why" and that the "existing 5 Bar from the auxiliary tank" is now connected to the train brake pipe again, so 'it jumps' back to 5 bar.

(or if you already braked, back to it's old value)

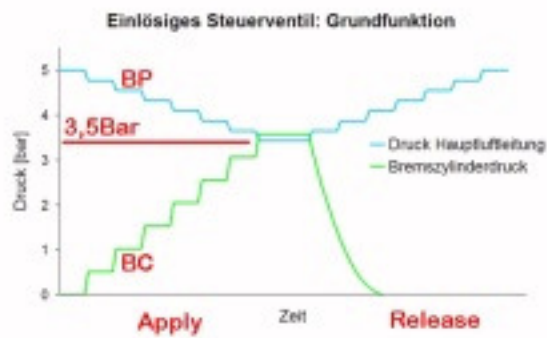
Technically 'correct', although in real live the auxiliary tank is not able to fill the entire train pipe. (locomotive and wagons, BC auxiliary tanks, etc.).

Thus the pressure increase by auxiliary tank is almost negligible, a result of which does not increase the BP pressure and to be released the brakes.

Actually the "brake lever auxiliary tank" should fast take over the existing train pipe pressure. So the train pipe pressure keeps his old value (trough leakage).



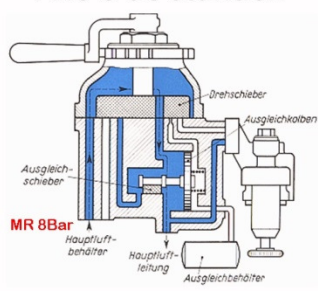
stepwise Apply, stepwise vs. not stepwise Release (triple valve)



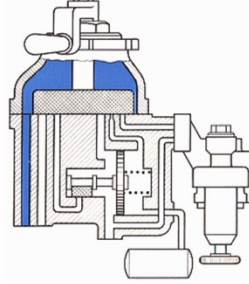
maximum pressure decrease to 3.5 bar (BP). further reducing gives no more braking power (BC)

De treinremkraan, Knorr type 8 train brake lever (Knorr Type-8)

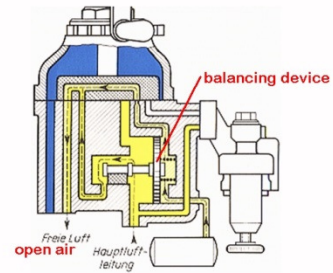
Alle 6 de standen 6 positions (notch)



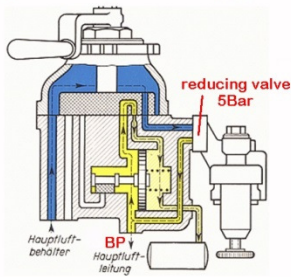
I: Vulstand, 8 bar naar treintl.
(1) full release (8bar to brake pipe)



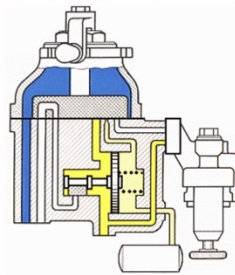
III: Afsluitstand
(3) neutral (closed)



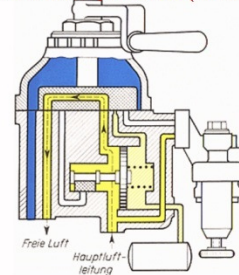
V: Normale remstand
(5) Apply (BP connected, air release)
(5) Apply (BP connected, air release)
between 4 and 5, is variable (the more, the larger air outlet)



II: Rijstand, 5 bar naar treintl.
(2) Running (5Bar maintained by pressure reducing valve)



IV: Voorberijde remstand
(4) Hold Apply (BP connected, no air release)



VI: Snelremstand
(6) Emergency (BP connected, full air release)

(Annex courtesy of the VSM)