Quick Reference Guide

LXA DP

(LOCOTROL® XA Distributed Power)

CONTENT

Overview

LXA is the next generation of software for distributed power (DP) and includes the following features:

- Improved DP radio communications
- Removal of transition penalties
- DP limited penalty
- Remote same/opposite selection and display
- Integrated HTD
- Mid-train HTD/ETD repeating
- Remote engine shutdown reporting
- Enhanced set out
- Incremental link/unlink

DP Feature Compatibility

The following chart explains which new LXA software features require upgrades on the lead and remote unit(s):

Feature	Lead	Remote Unit(s)
Removal of Transition Penalties at Linking	X	X
DP Limited Penalty	X	X
Remote Same/ Opposite Selection		X
Remote Same/Opposite Display	X	
Mid-Train HTD/ETD Repeating		X
Remote Engine Shutdown Reporting	X	X
Enhanced Set Out Mode	X	X
Incremental Link	X	
Incremental Unlink	X	X

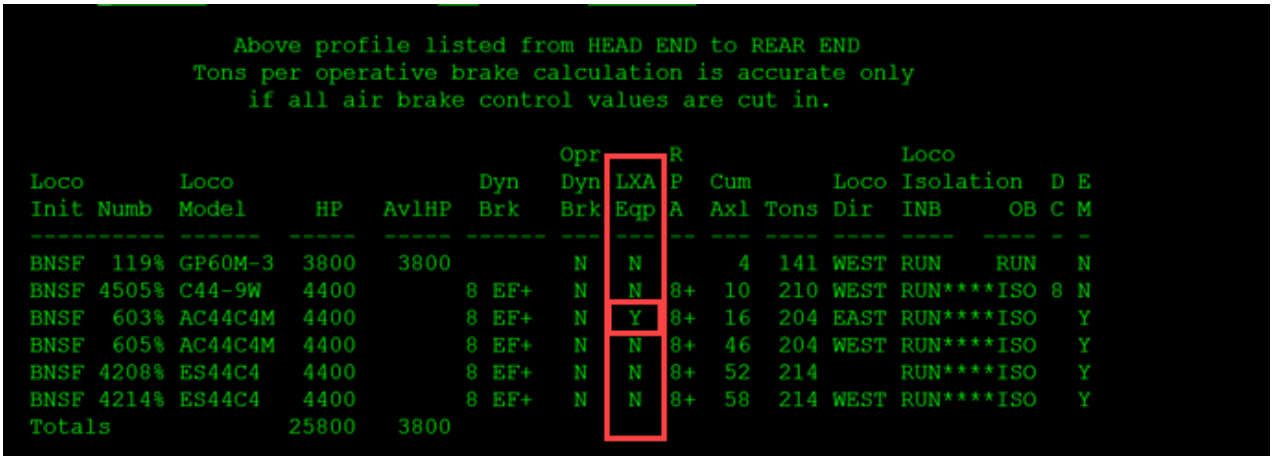
- Removal of Transition Penalties at Linking – All locomotives MUST be LXA
- DP Limited Penalty – All locomotives must be equipped – Need LXA or non-LXA with PTC installed

- Remote Same/Opposite Selection – Need LXA Remote Unit to default to UNKNOWN direction
- Remote Same/Opposite Display – Need LXA Lead only
- Mid-Train HTD/ETD Repeating – LXA Remote Unit with ETD ID entered and accepted
- Remote Engine Shutdown Reporting – Lead and Remote Unit experiencing the shutdown are equipped
  - Note AESS operation is unaffected by the DP/HTD circuit breaker position.
- Enhanced Set Out Mode – Lead and targeted Remoted Unit for Set Out mode must be equipped for this feature to be available
- Incremental Link – Need LXA Lead Only
- Incremental Unlink – All Locomotives MUST be LXA

Note: BNSF can link with several other railroads having these features, so a BNSF LXA unit *may* perform some features depending on the other railroad's DP configuration.

Identification of LXA Equipped Locomotives

The LXA column of the Train Profile identifies locomotives that are equipped with LXA software.



Above profile listed from HEAD END to REAR END
Tons per operative brake calculation is accurate only
if all air brake control values are cut in.

Loco Init	Numb	Loco Model	HP	AvlHP	Dyn Brk	Opr Dyn Brk	LXA Eqp	R P A	Cum Axl	Cum Tons	Loco Dir	Loco Isolation INB	Loco Isolation OB	D	E M
BNSF	119%	GP60M-3	3800	3800		N	N		4	141	WEST	RUN	RUN		N
BNSF	4505%	C44-9W	4400		8 EF+	N	N	8+	10	210	WEST	RUN	****ISO	8	N
BNSF	603%	AC44C4M	4400		8 EF+	N	Y	8+	16	204	EAST	RUN	****ISO		Y
BNSF	605%	AC44C4M	4400		8 EF+	N	N	8+	46	204	WEST	RUN	****ISO		Y
BNSF	4208%	ES44C4	4400		8 EF+	N	N	8+	52	214		RUN	****ISO		Y
BNSF	4214%	ES44C4	4400		8 EF+	N	N	8+	58	214	WEST	RUN	****ISO		Y
Totals			25800	3800											

Removal of Transition Penalties

The DP system no longer enforces an automatic penalty brake application when transitioning from conventional to distributed power. Whatever automatic brake application was in effect prior to entering DP will remain in effect.

Any active penalty or emergency brake application present on a locomotive being linked will propagate to the DP train during linking.

Transitions from DP to conventional will still result in a penalty brake application.

DP Limited Penalty

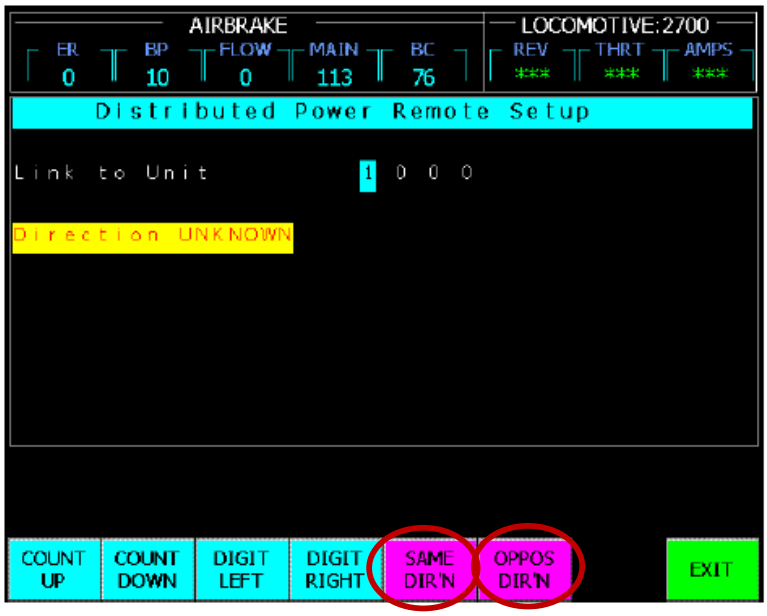
Typically, the DP Penalty for Lead EAB-initiated penalties results in a brake pipe (BP) reduction to 0 psi. With the DP Limited Penalty feature, the Lead EAB-initiated penalties result in a BP penalty reduction to ~58-59 psi (based on a regulating valve setting of 90).

The Train Config menu indicates whether the entire train is Limited Penalty capable. If Limited Penalty is N, the EAB system will take ER to 0 during a penalty application.

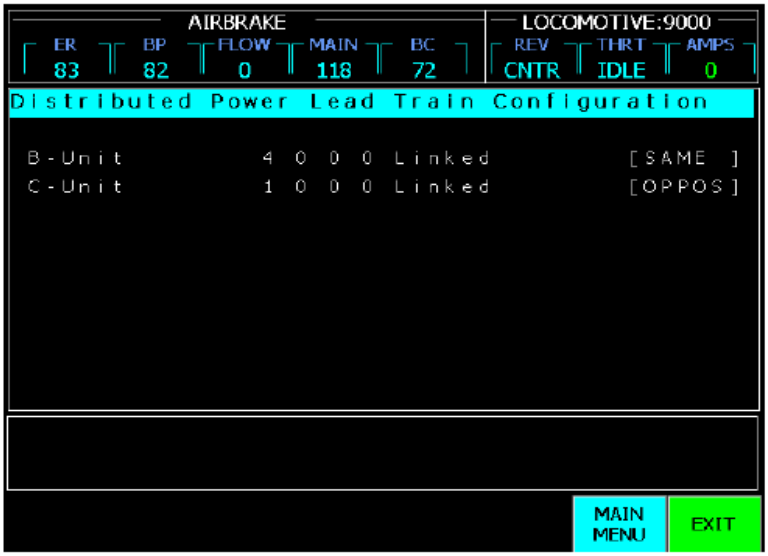
Remote Same/Opposite Selection and Display

The Remote Same/Opposite Selection and Display feature allows you to select **Same** or **Opposite** instead of defaulting the remote unit direction to **Same** or **Opposite**. The DP System will now display the Remote Setup (Same or Opposite) at the Lead.

1. On the Distributed Power Remote Setup screen, select **SAME DIR'N** or **OPPOS DIR'N** (default is now UNKNOWN).



2. To verify the direction of each remote unit, open the Distributed Power Lead Train Configuration screen or observe it during the linking process.



Integrated HTD

HTD functionality is now integrated within the LXA system. As such, the DP/HOT and/or Distributed Power circuit breaker **MUST** be ON during a conventional mode of operation for HTD functionality to be used.

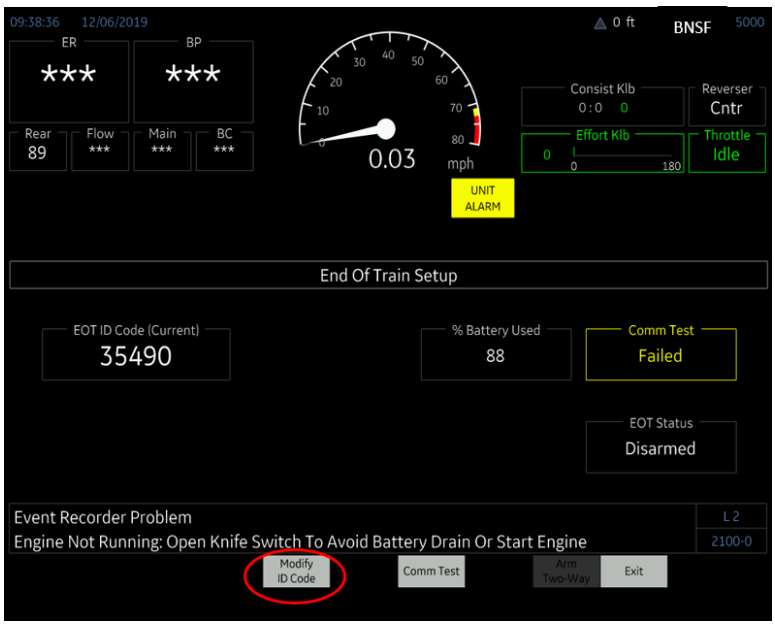
Mid-Train HTD/ETD Repeating

The HTD/ETD Repeating feature allows the LXA system on the mid-train locomotive to repeat HTD messages and ETD messages. To enable this feature, enter the ETD ID on the remote unit.

You may enter the ETD ID number on the remote unit's system prior to enabling DP (Conventional Mode), DP Enabled-Unlinked, or DP Enabled-Linked.

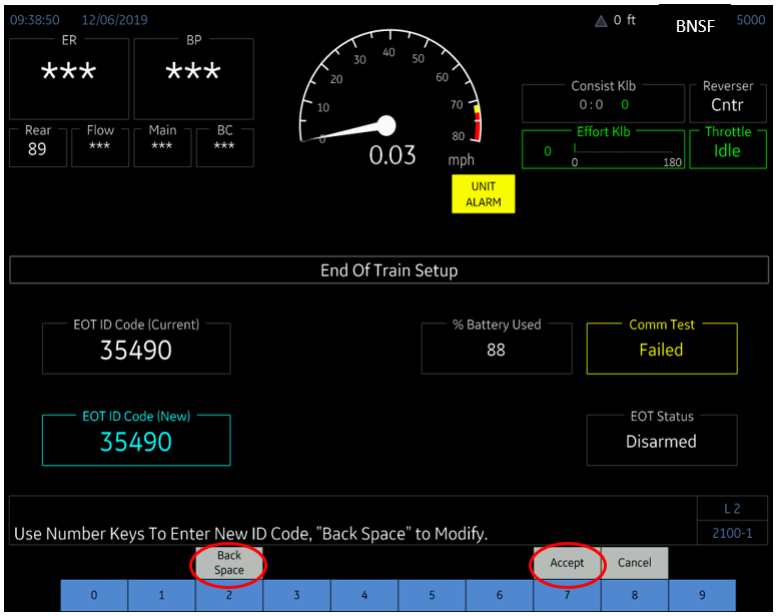
1. Navigate to the **End of Train** menu.

2. Press **Modify ID Code**.



3. Enter the **ETD ID** code and press **Accept**.

Note: If the ETD ID contains a prior number, press the **Back Space** key to set the value to zero, and then enter the new ETD ID.



Note: The DP System is designed to operate with **only one** remote set up as an HTD/ETD repeater.

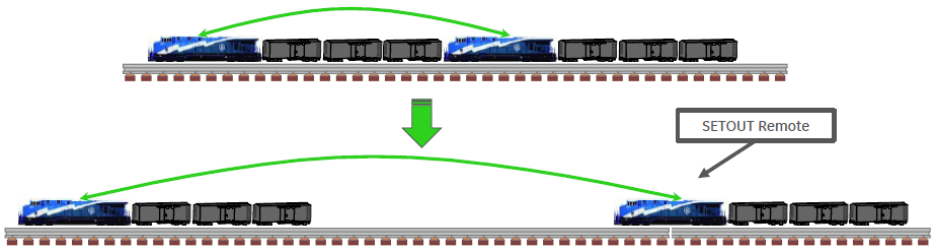
Note: The Comm Test is **not** functional on a DP Remote.

Remote Engine Shutdown Reporting

The Remote Engine Shutdown Reporting feature allows a Remote unit to report to the lead consist that its engine has shut down. Furthermore, the lead will receive the shutdown indication and display it in the DP System Events screen. This notification will appear in the event of a manual shutdown or an AESS shutdown.

Enhanced Set Out Mode

The LXA system is equipped with a new version of Set Out mode where the brake valve (BV) remains cut in on a remote unit in order to keep the brake pipe charged. **This feature will only be available for use when the Lead DP and at least one remote unit in the train is equipped with the LXA system.**



For an LXA-equipped remote unit with the BV cut in when using Set Out mode, new protections will declare a safety emergency if movement conditions are detected or certain faults occur.

To use the enhanced Set Out mode feature and close the angle cock on the detached portion of the train, at least one remote unit in the train must be equipped with LXA. The BVs on all LXA remote units will automatically remain cut in when going to Set Out mode. However, if the train includes any non-LXA remote units, the BVs on those units will cut out when going into Set Out mode.

Note: The Train Config screen shows whether each remote unit has the enhanced Set Out mode feature.

Per ABTH 105.6.5, after selecting and placing each remote unit in Set Out mode, the BVs on LXA-equipped remote units remain cut in, while BVs on non-LXA remote units cut out. When separating the train, the angle cock can remain closed to prevent the train from going into emergency and the LXA remote unit(s) will maintain the train's air.

Note: Once the setout remote is normalized (Normal Mode), the BV will cut out.

If desired, Standard (Non-Enhanced) Set Out mode can be achieved on an LXA-equipped DP remote by commanding BV Out mode prior to commanding Set Out mode. This sequence—BV OUT, then SETOUT—is critical. Otherwise, the remote unit will not be secure and unintended movement may result.

IMPORTANT: If you place a train that does **not** have an LXA-equipped remote unit into Set Out mode, all BVs will cut out and the angle cock must be left open to place the train into emergency. You will then have to vent the trainline on the stationary portion once the cut is made. **In all cases, before leaving the train unattended, secure it per ABTH 102.1.2.**

Example: Limited Penalty Enabled (lead and all remote units equipped with LXA feature)

- Remote unit B is LXA equipped and has Enhanced Set Out mode, so the BV remains cut in when placed in Set Out Mode.
- Remote unit C is not LXA equipped, so the BV cuts out.

Incremental Link/Unlink

The Incremental Link/Unlink feature allows adding up to four additional remote units or dropping linked remotes from the DP train without unlinking the train.

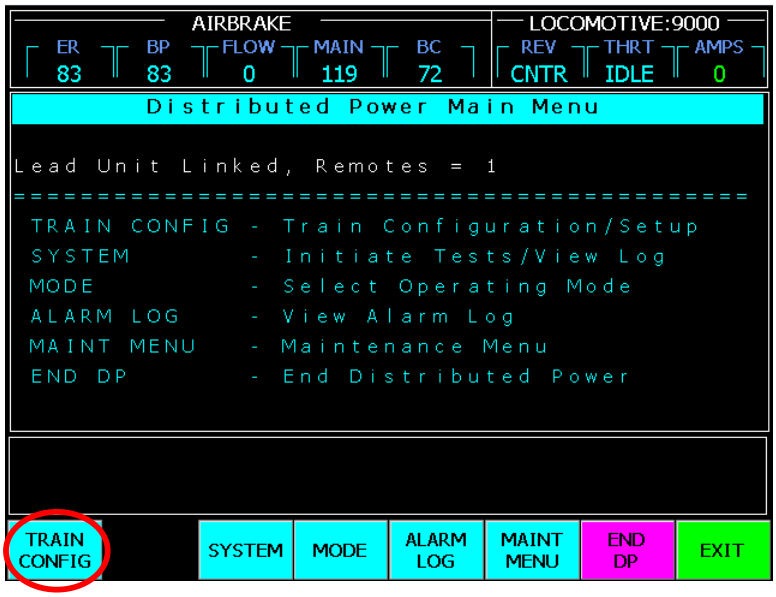
To incrementally link remotes, ensure:

- Train is stopped
- No sustained communications loss between the lead and currently linked remotes
- Independent Brake applied in Full
- Throttle set to Idle
- Direction set to Neutral

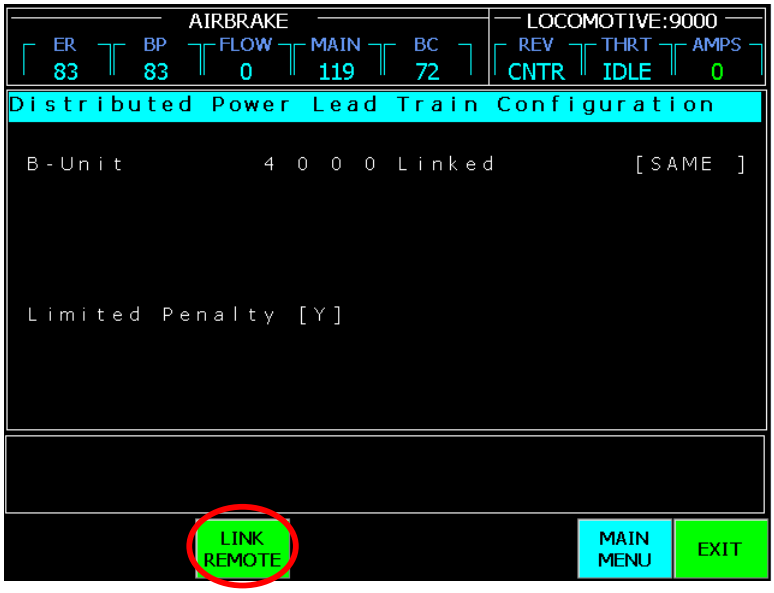
To incrementally unlink remote units in a train, they must support the Incremental Link/Unlink feature. Access the feature by selecting Link/Unlink Remote from the Distributed Power Lead Train Configuration menu. This new menu shows the current train makeup and allows for incrementally linking or unlinking remote locomotives.

Incrementally Link a Remote

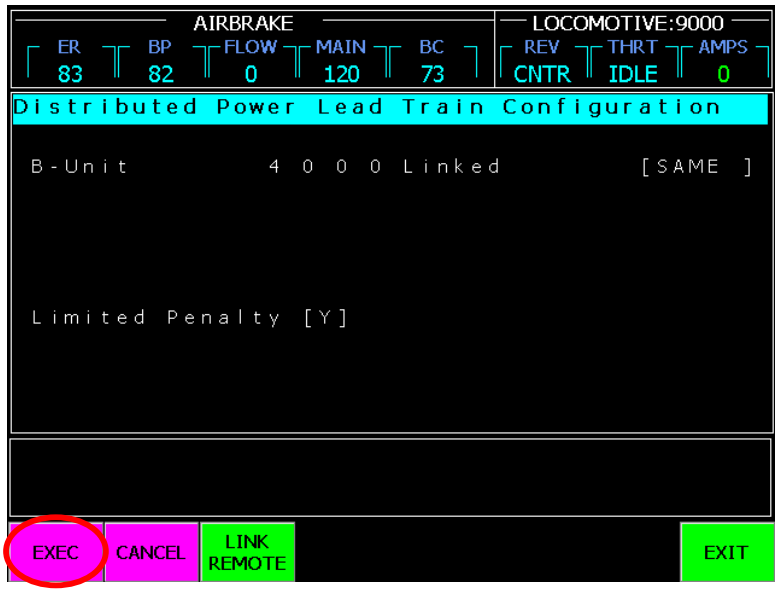
1. Press **TRAIN CONFIG**.



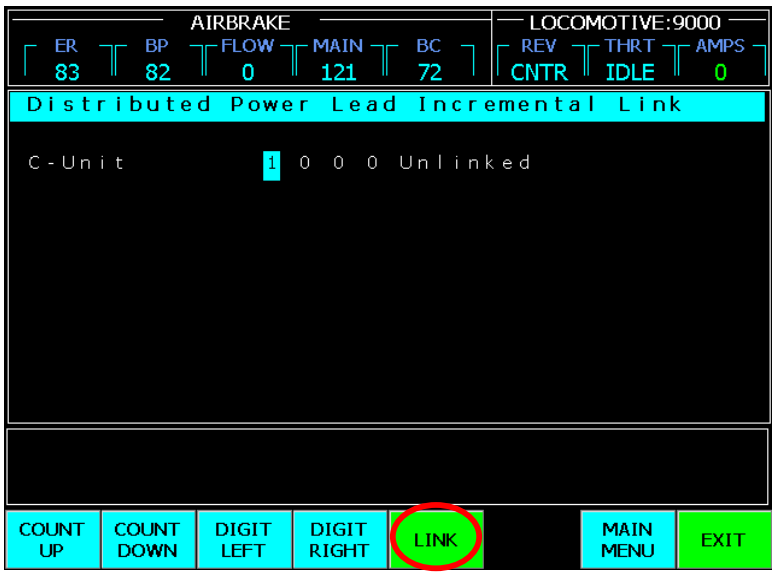
2. Press **LINK REMOTE**.



3. Press **EXEC**.



4. Enter the road number and press **LINK**.



Note: If linking additional remotes, continue entering road numbers

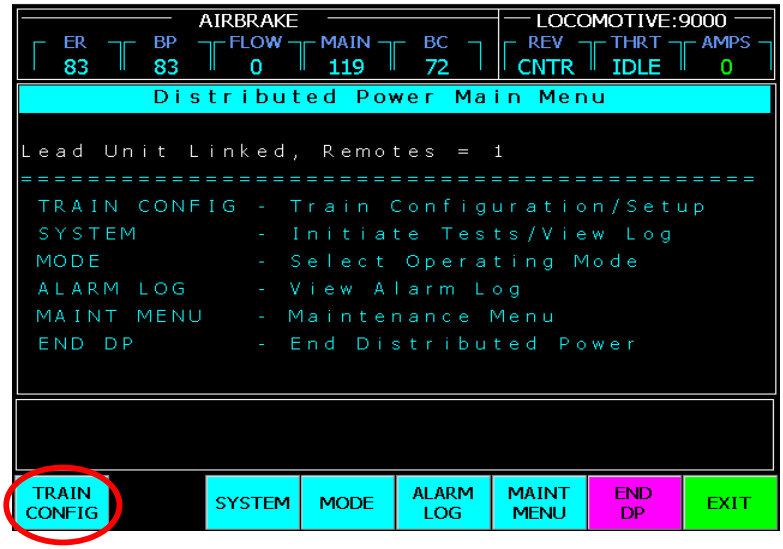
5. When all remotes are linked, press **DONE**.

At this point, DP is in System Mode IDLE.

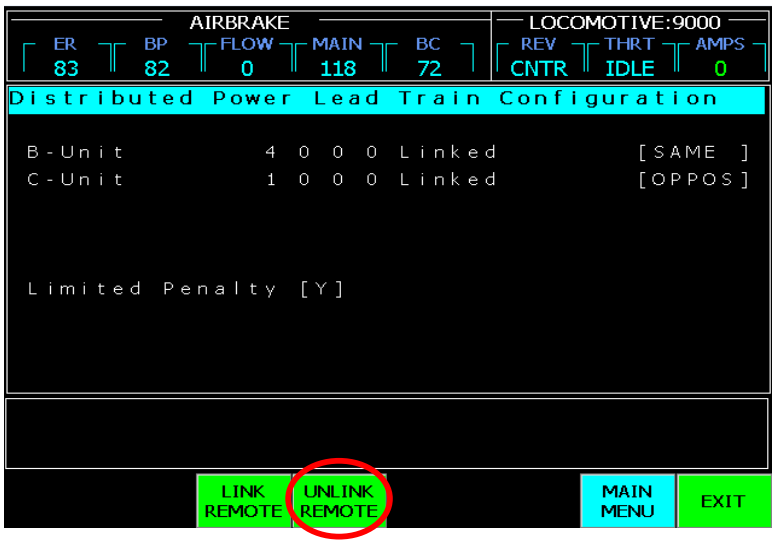
6. Run an additional brake pipe test and, if successful, place DP into System Mode **RUN**.

Incrementally Unlink a Remote

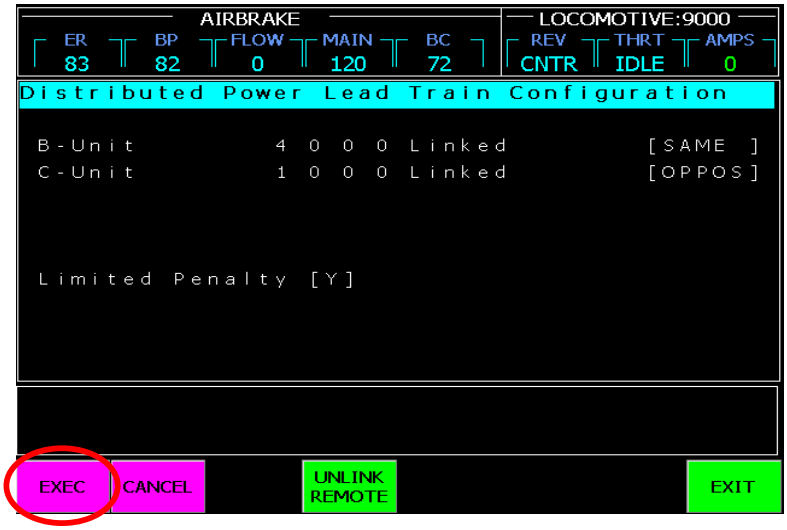
1. Press **TRAIN CONFIG**.



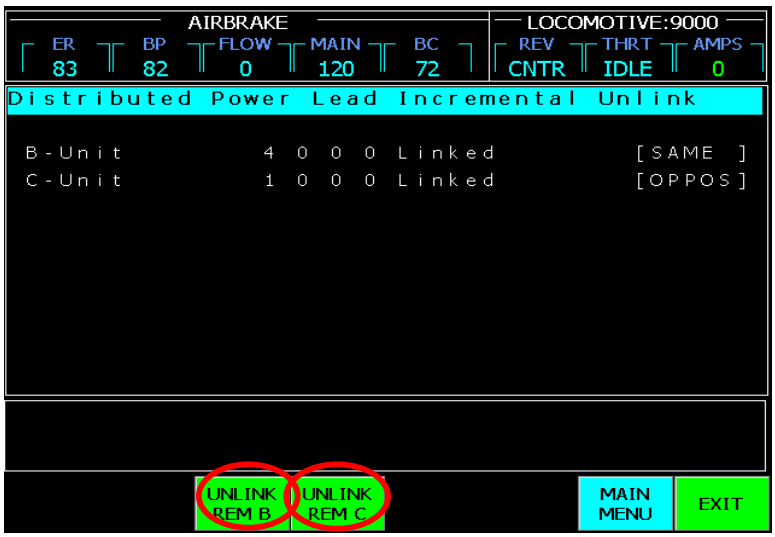
2. Press **UNLINK REMOTE**.



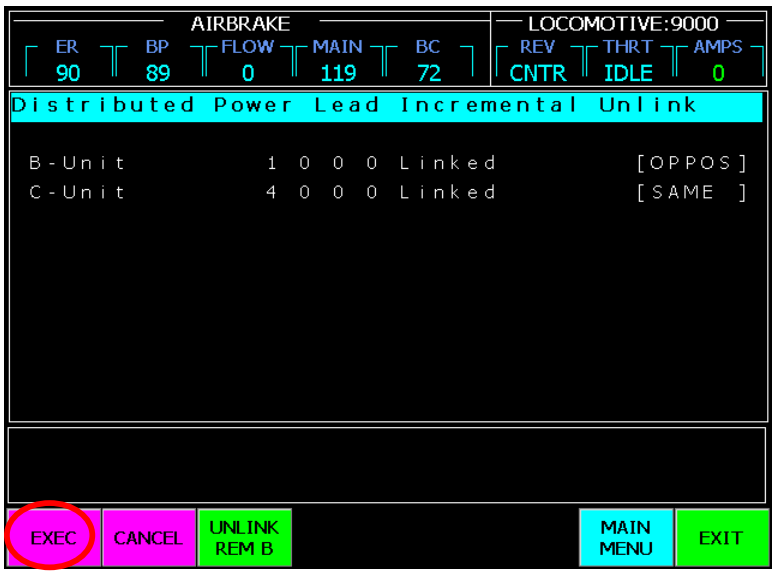
3. Press **EXEC**.



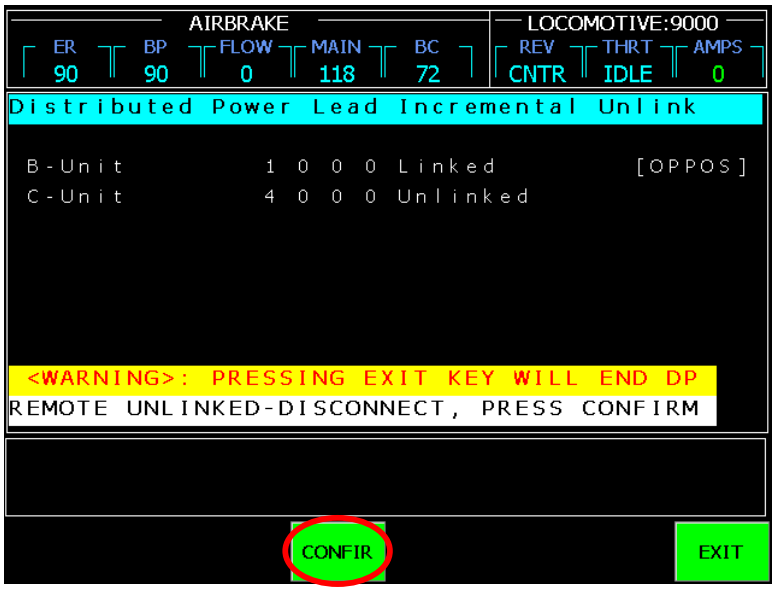
4. Select the remote you wish to unlink.



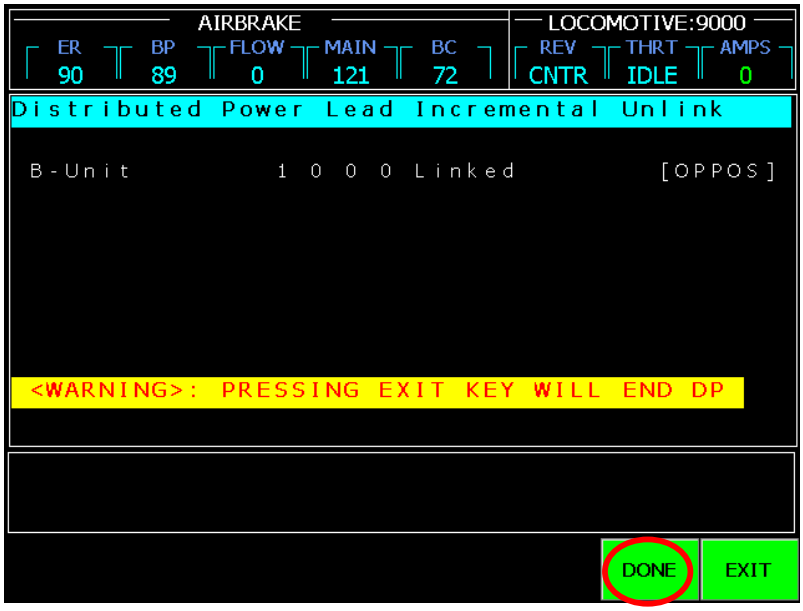
5. Press **EXEC**.



6. Press **CONFIR[M]**.



7. Press **DONE.**

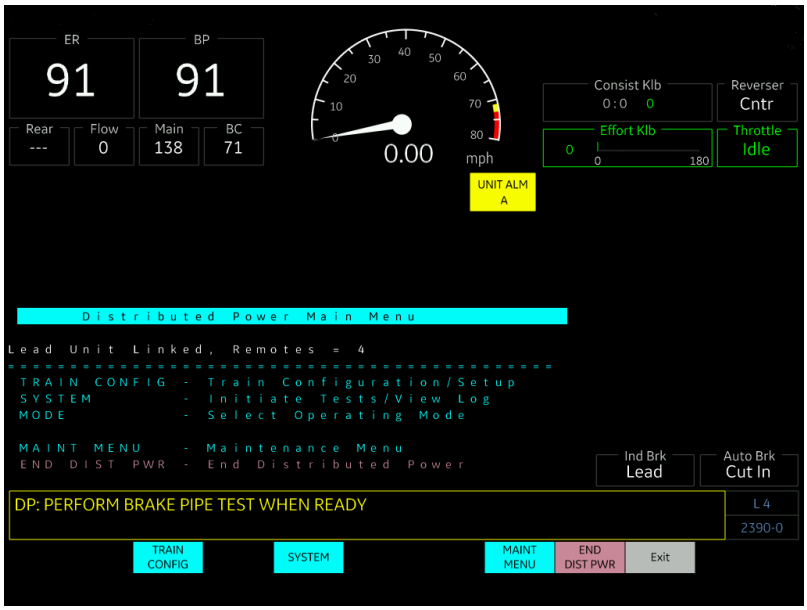


At this point, DP is in System Mode IDLE.

8. Run an additional brake pipe test and, if successful, place DP into System Mode **RUN**.

DP Alarm/DP System Log

The DP System and DP Alarm Logs have been consolidated onto the DP System Log screen. There is no longer a DP ALARM key to view details of a DP Alarm.



In order to view information regarding a DP Alarm, you will need to access the DP System Log screen by selecting SYSTEM from the Distributed Power Main Menu.