



DASH-9 Auto Engine START/STOP (AESS)

Note: There are no indicator lights on GE AESS - equipped locomotives. The locomotive's DID panel is used to display information about AESS.

Crank Up and Shutdown Requirements

AESS will crank and shut down the unit when the required fields are satisfied.

<u>Cranking</u>	<u>Shutdown</u>
Enable Switch ON	Lube oil temp 160° F to 230° F
Reverser Thrown	Reverser Centered
Throttle In Idle.	Ambient Temp 45° F to 110° F
Ambient Temp < 40° F	Charging < 150 amps
Battery < 62 volts	Battery > 69 volts
Ind. and Auto. Brake Off	Battery test passed
MR < 15 PSI above BP	Air compressor speed 0
Last auto stop > 2hrs	< 8 auto stops in 24 hrs
(> = greater than)	(< = less than)

AESS Bells and Whistles

Note: Warning bell is not a trainline alarm.

- **During Crank Up:** Warning bell rings 30 sec. Message: *Auto Engine Start/Stop in process.*
- **During a Shut Down:** Warning bell rings for 30 seconds. Message: *Auto Engine Start/Stop in process.*
- **After AESS Shut Down:** Warning bell rings 1 second every 5 minutes. Message: *Auto Start/Stop Control Active* (unit ready to crank when requested: reverser signal, air pressures, etc...)

Delaying Shutdown

Press in the Auto Stop override "SASS" one time. This will delay shutdown for 120 minutes.

ELECTRO-MOTIVE

Auto Engine START/STOP (AESS)

Note: Auto Start/Stop status is displayed on the EC panel and computer screen.

Crank Up and Shutdown Requirements

AESS will crank and shut down the unit when the required fields are satisfied.

<u>Cranking</u>	<u>Shutdown</u>
Status light is GREEN	Status light is GREEN
Reverser Thrown	Reverser Centered
Throttle In Idle.	Charging < 20 amps
Water Temp. < 120° F	Water Temp. > 150° F
Battery < 65 volts	Battery > 65 volts
Independent Brake released	Independent Brake Applied
MR below < 110 lbs	Intentionally Blank
(> = greater than)	(< = less than)

AESS Bells and Whistles

Note: Warning bell is not a trainline alarm.

- **During Crank Up:** Loud alarm sounds for 30 seconds.
- **During a Shut Down:** Loud alarm sounds for 30 seconds.
- **After AESS Shut Down:** Alarm chirps every 30 seconds.

Delaying Shutdown

You can delay an auto shutdown for two (2) hours. Ten (10) minutes prior to shutdown, press the reset button. Message: *Auto shutdown delayed, manual override two (2) hours.*



EMD 38-2 "Basic Operation"

Solid ● Auto Start Indicator Light:

Smart Start being in good health, will not crank the engine whenever this light is solid RED.

Why the RED light?

- Smart Start tried to crank the engine but unit failed to crank. (Smart Start will attempt to crank 3 times).
- A manual emergency fuel cutoff was activated.
- Engine was shut down by something other than Smart Start. (low water, oil device, etc...)

Note: When any of these conditions exists, the light turns RED and will only crank manually.

How To Enable Smart Start

Manually crank the engine. After cranking, the light will turn GREEN. A solid GREEN (●) light means the Smart Start has the ability to both crank and shut down the locomotive. **Warning:** Whenever the indicator light is GREEN, use caution and stay in the clear of moveable equipment.

Crank Up and Shutdown Requirements:

Smart Start will crank and shut the unit down when the required fields are satisfied. Reasons for:

<u>Cranking:</u>	<u>Shutdown:</u>
Enable Switch On.	Reverser Centered.
Auto Start Light GREEN.	Water > 120° F
Throttle In Idle.	Ambient Temp > 32° F
Reverser Thrown.	Charging < 20 amps
Brake Cylinder < 60 lbs	Brake Cylinder > 65 lbs
Water < 120° F	Intentionally Blank
Ambient Temp < 32° F	Intentionally Blank
Battery < 63 volts	Intentionally Blank
(> = greater than)	(< = less than)

How To Crank A Smart Start-Equipped Loco

A Smart-Start-equipped locomotive will crank on or off line. Regardless of where it is placed in the consist, throw the reverser or release the independent brake below 60 lbs on the **lead locomotive** and the Smart Start-equipped locomotive will crank.

When Smart Start cranks the locomotive, the following will occur:

- A two (2) second alarm bell will sound, then the Smart Start siren will sound for ten (10) seconds while the solid **GREEN** Enable Light will start flashing **GREEN-RED, GREEN-RED**.
- The siren will silence for five (5) seconds then start again for ten (10) more seconds.
- The siren will silence, then Smart Start will engage the starters to crank the engine.
- Once the locomotive has started up, **it must run for one (1) minute before it will load.**

How To Shut Down a Smart Start-Equipped Loco

Push the **Lighting Enable** push button. Smart Start will disable the trainline for a dead unit in consist.

Disabling Smart Start

The locomotive will not run with Smart Start disabled. You can disable Smart Start while working on equipment by:

- Pulling starting fuse and/or battery knife switch.
- Shut the unit down manually and drop the engine control breakers.

Note: When Smart Start switch is in the **OFF** position, you will have a **RED** auto start indicator light and a continuous siren.

Smart Start Bells and Whistles

When Smart Start encounters an improper shutdown, it will give a continuous siren. Reset the siren by pushing in the **FUEL CUTOFF** a second time.

Lights and Headlights

Two (2) minutes after an automatic shutdown, the headlights will shut off and the **HEADLIGHT ENABLE** button will illuminate. Ten (10) minutes after an automatic shutdown, all other auxiliary lighting will shut off.

To Reset Lighting

Press the **STANDBY LIGHTING ENABLE** button when lit to restore the headlights for two (2) minutes and the auxiliary lighting for ten (10) minutes.



ECOTRANS K9 APU

"Basic Operation"

Note: Locomotives equipped with Engine Shutdown Timer (EST) and Auxiliary Power Unit (APU) will not restart automatically. You have to start the locomotive with the engine start switch.

The APU is a separate engine system that is designed to automatically start up when the locomotive water temperature drops below 60° F. When the locomotive and APU have been correctly setup and shutdown, the APU will start up to circulate and heat the locomotive oil and water by way of the APU pumps and pre-heaters. The unit will continually heat and cycle the oil until the water temperature reaches 100 ° F.

The locomotive will shut down when the following conditions exist:

- 30 Minutes of idle activity.
- APU is online for operation.

During a Shutdown

- EST will issue three (3) beeps alerting you that a shutdown is approaching.
- Two (2) minutes after the unit shuts down, all lighting will turn off.

Proper Shutdown of an EST/APU—Equipped Unit

Push the yellow **Headlight Reset** button located on the electrical cabinet to shutdown the locomotive.



General Information on LOCOMOTIVE AUTOMATIC ENGINE START/STOP (AESS) Systems

AESS-Equipped locomotives have these things in common:

- Periodic chirps indicate the AESS system is enabled and is controlling the Start Up and Shut Down of the locomotive.
- **Manually shutting down the locomotive disables the AESS system.**
- When a Start/Stop is initiated, an audible alarm will sound. (No train line alarm).
- **To restart the locomotive in lead or trail, move the reverser to Forward or Reverse.**
- Once the locomotive starts running, it must run 1 to 3 minutes before it will load.
- After 30 minutes of no trainline activity, the locomotive will shut down and no trainline alarm will be given.

Note: You can get more detailed information at the NS Mechanical Department Web page. Go to **Locomotive**, then **Manufacturer**, then **Vender Information**. Select any one of the following:

- APU-EcoTrans Technologies
- EMD AESS-Electro-Motive Diesel
- GE AESS-General Electric Transportation Systems
- Smart Start-ZTR Control Systems



GE
Transportation



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