



Skill Module Number: 2.7

Subject: Dual Battery System

Objective:

At the conclusion of this module, you will be able to:

- Experience normal operation of system
- Simulate a failure of the system battery
- Experience consumer prioritization – “Electric consumers offline!”
- Simulate a failure of the starter battery

Vehicle and tools required:

- R230 vehicle – (Top open, trunk lid open and Easy-pack activated)
- Battery disconnect switches installed on negative terminals of both batteries
- Fender covers

Required material:

Instructions:

1. Follow all the instructions exactly as written. Do not jump ahead.
2. Answer all the questions as we will review them later in class.
3. Ask your instructor if assistance is needed.

Experiencing a Failure of the System Battery

1. Remove ignition key from vehicle.
2. In trunk, remove black key at systems battery by turning it 90 degrees (G1). This will disconnect the systems battery from the vehicle's electrical system.
3. Insert key into ignition and wait 40 seconds. **Do not turn it.**
4. After 40 seconds, can you turn the ignition key? **Yes / No**
5. Why? _____
6. Remove key. Attempt to lock the vehicle with the remote. Did it lock? **Yes / No**
7. Then start the engine and let idle for 15 seconds.
8. Stop engine and remove key from ignition. Close all doors and trunk.
9. Attempt to lock vehicle with the remote. Did it lock? **Yes / No**
10. Is the red LED in the interior central locking switch flashing? **Yes / No**
11. What does the flashing red LED mean? _____
12. Note current time: _____ Read below while waiting for 5 minutes.

At this point you have simulated having a dead system battery (G1). This caused the N82/1 control module to engage its emergency operation functions. N82/1 is using the starter battery to power the vehicle's electrical systems. After starting the engine and then shutting it off again, the vehicle still has power, even with a dead systems battery. This is because N82/1 keeps the K57 relay energized for 5 minutes after the key is turned off. This would enable the client to still use Tele Aid to place a call to Roadside Assistance, for example.

There is a problem with this situation. If the customer locks the vehicle during this 5 minute period, the alarm will be armed. When the K57 relay is de-energized at the end of the 5 minute period, all electrical power to the vehicle will be shut off. This will cause the "smart" alarm siren (with its own back-up battery) to go off because it thinks someone has disabled the battery power in an attempt to steal the vehicle.

To turn off the "smart" siren:

- *unlock the driver's door using the mechanical blade key.*
- *insert the smart key into the ignition, this cause N82/1 to re-energize K57 relay.*

*Please read 14 and 15 **now** so you will know what to look for.*

13. Note current time: _____ After 5 minutes has elapsed, please continue.
14. Did the alarm siren sound? **Yes / No** Exterior lights flash? **Yes / No**
15. Will the vehicle place a TELE-AID call automatically for the alarm? **Yes / No**
Why? _____

Instructor check point _____

Experiencing Consumer Prioritization

1. Remove ignition key and reinsert, start engine and leave running.
2. Reconnect system battery at trunk by inserting black key and turning 90 degrees.
3. Close trunk lid and operate the following in the vehicle:

Seat heaters – What happened? _____

Close Vario roof – What happened? _____

Open Vario roof – What happened? _____

Rear window defroster – What happened? _____

Turn A/C blower to 100% - What happened? _____

4. What do all these electrical consumers have in common? _____
5. What fault messages are displayed in the multi-function display.
a) _____ b) _____
6. What control unit is responsible for consumer prioritization? _____
7. How do the control units receive the prioritization command? _____
8. Note current time: _____ Read below while waiting for 6 minutes.

. If the ignition key is cycled any time after 6 minutes, N82/1 control module immediately cancels consumer prioritization. If the key is not cycled (vehicle is being driven), consumer prioritization will automatically be cancelled by N82/1 after approx. 14-18 minutes.

9. Note current time: _____ After 6 minutes has elapsed, please continue.

10. Remove key from ignition **and wait 30 seconds.**

11. Now start the engine.

12. Operate the following in the vehicle:

Seat heaters – What happened? _____

Rear window defroster – What happened? _____

A/C blower to 100% - What happened? _____

Instructor check point _____

Experiencing a Failure of the Starter Battery

1. Remove key from ignition.
2. Remove the black key at the starter battery (G1/4) in engine compartment.
3. Operate the following in the vehicle:

Turn on headlamps – What happened? _____

Lock doors with remote – What happened? _____

Unlock the doors and turn off the lights. As you can see, the starter battery has nothing to do with the vehicle's power supply in normal operation mode.

4. Start the engine.
5. Did the engine start? **Yes / No**
6. What is displayed in the cluster? _____
7. What color is the display? _____
8. Can a display of this color will clear **without** a SDS/DAS? **Yes / No**
9. Does the vehicle's dual battery system provide any means of starting the engine with this condition? **Yes / No**
10. Reconnect starter battery with the black key in the engine compartment.
11. Start the engine.
12. According to Mercedes-Benz, if you need to jump start the R230, you only jump the _____ battery.

Perform a short test on your vehicle, erase all DTCs and then repeat the short test to insure there aren't any permanent faults. Show your instructor the results of your short test.

Instructor check point _____

If you have noticed any parts that need to be replaced on this vehicle, please inform your instructor now.