

TIPS AND TRICKS

Stop & StARS system

Application

Part numbers

Stop & StARS systems All models

Stop & StARS system

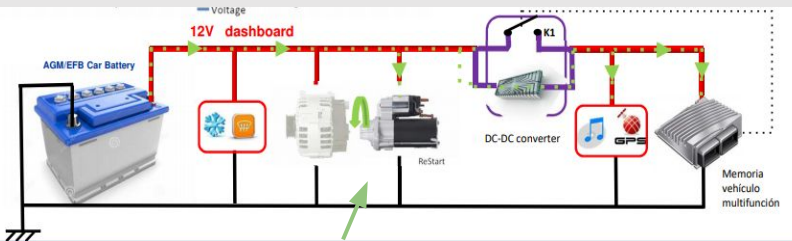
ReStart System Description

This system adopted with **reinforced starter** with a specific battery , the system has 3 working phases

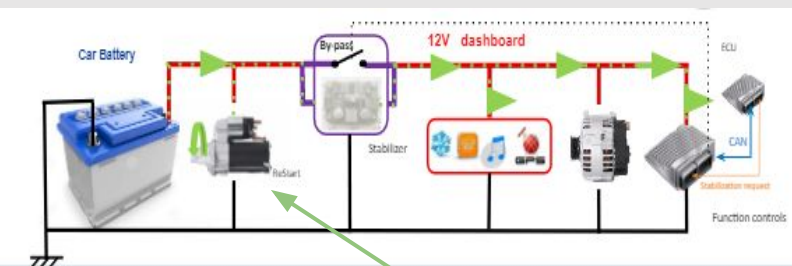
- **Ongoing phase**:- the alternator supply current to the battery to recharge it and provide current to the **Engine Control Unit (ECU)** & the others functions.
- **Stop phase**:- the car battery supply the current to all the vehicle functions like a standard car while the engine is stopped
- **Restart phase**:- the car battery supply current to the reinforced starter to start the engine & to the other functions

The **Restart phase** works with two different system architecture

- **1st architecture**:- A **DC-DC converter** is embedded in the circuit to keep all ECU and other functions safe with steady current **see Fig. 1**
- **2nd Architecture**:- there is **Boardnet Voltage Stabilization System DMTr** supply current only to the ECU on a dedicated network to maintain same current for each sensor & quick start, **see fig. 2**



Restart phase 1st architecture Fig. 1



Restart phase 2nd architecture Fig. 2



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StARS & iStARS System Description

This two systems don't have Starter to start the engine, it depend on the alternator,
The alternator plays two roles, 1st role as Alternator to supply current to the vehicle and the 2nd role is a starter to start the engine (Induction principle)

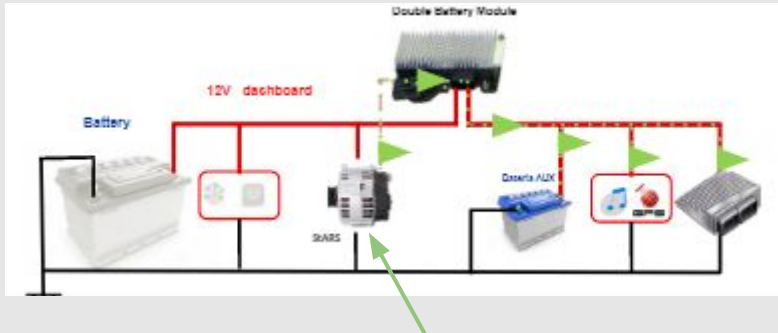
StARS system 1st generation: 3 operating phases

- **Ongoing phase:** The Alternator (StARS) supplies current to the battery, comfort functions & modules.
- **Stop phase:** An **auxiliary battery** with the size of motorbike battery is installed to supply current to the functions and other modules.
- **Restart phase:** The auxiliary battery supplies current to the StARS to start the engine, the Alternator become Starter in this phase See **Fig.3**

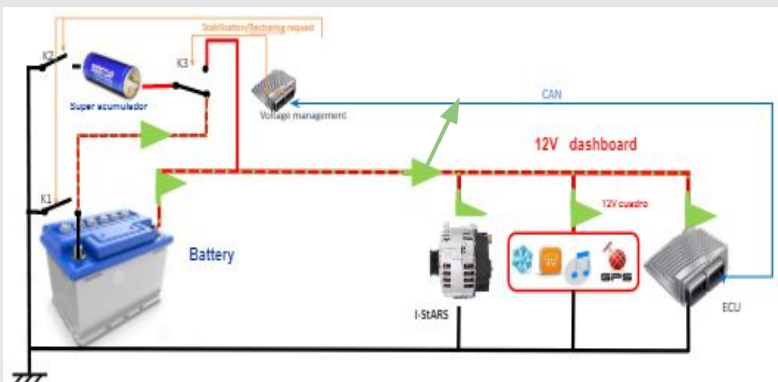
iStARS system 2nd Generation: 3 operating phases

- **Ongoing phase:-** iStARS is an alternator which supplies current to the battery, vehicle functions, ECU & charge the super accumulator.
- **Stop phase:** The car battery supplies the current to the other functions and the **Engine Control Unit ECU** to record all the data
- **Start Phase:** The super accumulator (ultra capacitor) and the battery are connected in series to generate more current to start the engine to avoid voltage drop during starting, see Fig 4. (in this phase mosfet K1 is opened and K2 & K3 closes to put the capacitor & battery in series)

Note:- In this 2nd architecture the key role for this circuit is the mosfet K1, K2 & K3 those switches are responsible to connect the battery or the super capacitor to allow them to supply current to the car according to the current phase.



StARS system 1st architecture, Restart phase Fig. 3



iStARS system 2nd architecture, Restart phase Fig. 4



iStARS system: Accumulator of energy ultra-accumulator

In the i-StARS system 2nd generation, there is an accumulator which help the battery when it is connected in series to start the engine very fast to eliminate the noises and vibration in 400 msec twice faster as normal starter, mainly this type is used in Diesel engines. See Fig. 3



Super Accumulator Part, Fig.3

Accumulator Specifications

Maximum Load	Maximum Discharge	Accumulator capacity	intensity in Discharge
5.4V	0.5V	600 Farad	600 A

Also the E-booster modules in the Accumulator control the discharge and charging of the ultracapacitor during the recuperative phase, See Fig. 4



E-booster module, Fig. 4



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