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SUBJECT:

Charge Functions and Charge Inhibits

OVERVIEW:

This bulletin involves discussing the charging strategy - support of low voltage system

MODELS:

2021 (JL) Jeep Wrangler

NOTE: This bulletin applies to vehicles within the following markets/countries: North America, EMEA and APAC.

NOTE: This bulletin applies to vehicles equipped with 2.0L I4 DOHC DI Turbo PHEV Engine (Sales Code ECX).

DISCUSSION:

Auxiliary Power Module (APM) function/overview: To charge and maintain the standard vehicle 12 volt battery and provide steady state power to vehicle loads, the DC-DC converter converts power from the High Voltage (HV) battery (400 V) to the 12 volt system.

There are conditions under which the APM will not allow the HV battery to be used to charge the 12 volt battery. These conditions are listed below:

1. The hood is open.
2. The HV battery is fully charged and the vehicle is in sleep/IGN OFF condition.
3. The HV battery State of Charge is below 5.5%.
4. The HV battery contactors are open or open pending.
5. The engine is cranking.
6. The APM is also disabled to protect the HV battery when the high voltage current exceeds a threshold for a period of time or when HV battery long term power limit is below a threshold.

Whenever the propulsion system is active, or electric Vehicle Service Equipment (EVSE) charging is in process, the 4xe system uses power from the High Voltage battery to actively maintain the 12 volt battery state of charge (like an alternator). This can happen even when the engine is not running. However, when the hood is open, this function is suppressed.

The 4xe system automatically manages the State of Charge of the HV battery. It can safely operate at "<1%" HV State of Charge, and often does. It can also operate all the way up to 100%. That's the energy customers can use to drive 21 all-electric miles. It is not necessary to recharge the HV battery just because the cluster says "<1%."

The Wrangler 4xe can and often does idle and drive without starting the gasoline engine. In the likely case the Propulsion System is Active, the vehicle speed is 0, a green “READY” indicator light will illuminate in the instrument cluster (Fig. 1) , to notify the driver that the vehicle is ready to drive.



Fig. 1
“READY” Light Illuminated In Instrument Cluster

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