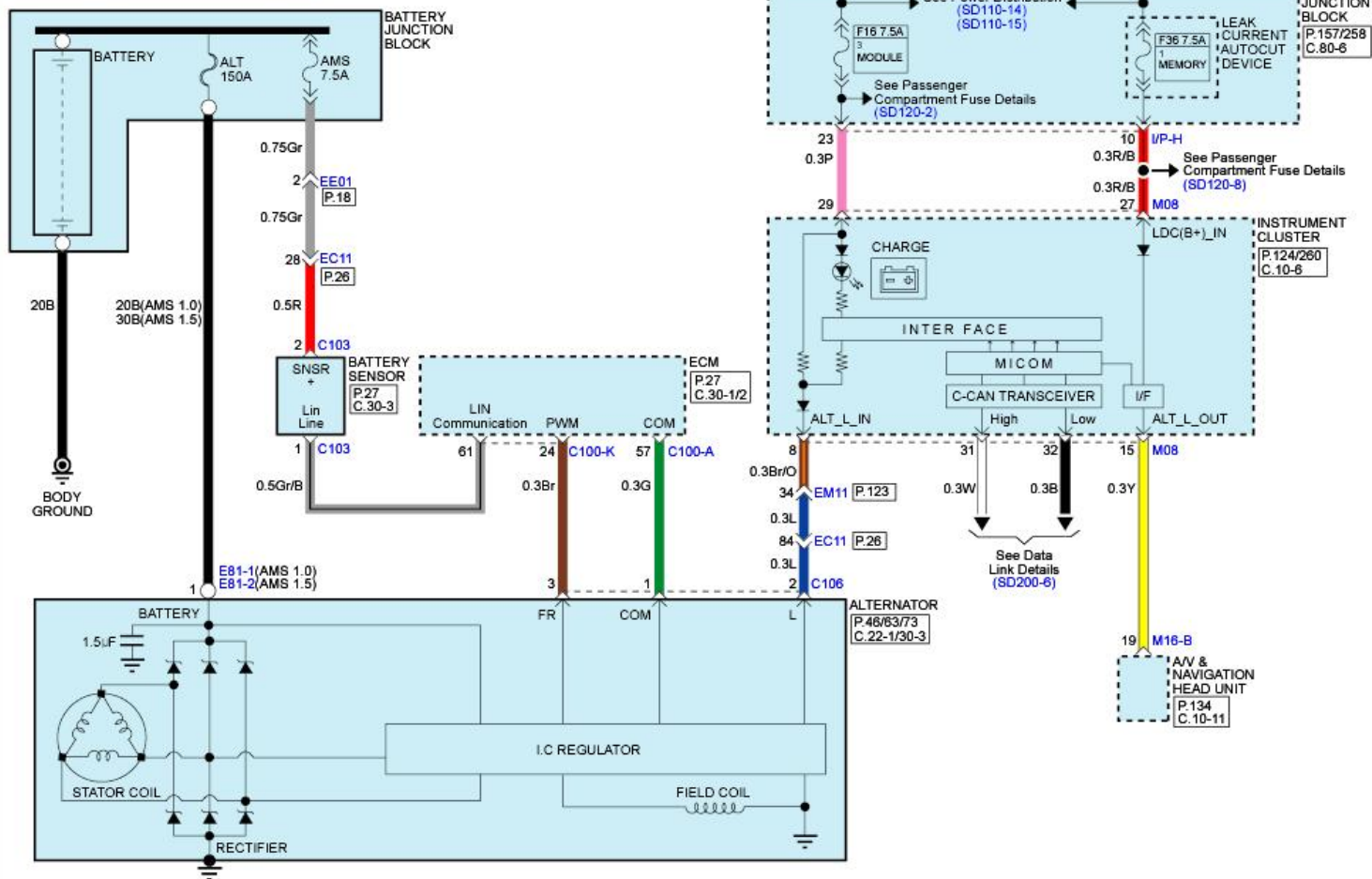


Charging System (1)

SD373-1

G4FD : GAMMA 1.6L GDI



Charging System

Service Tips (1)

Circuit Description

An alternator has built-in diodes each of which rectifies AC to DC to generate DC in the alternator B+ terminal. The generated current operates various electric systems via the engine room junction block and recharges the battery. If the ignition switch is switched to the ON position while the engine is turns OFF, IG1 power is applied to the alternator and the charge warning light on the instrument cluster is lighted. However, when the engine is turns ON, the input L terminal of the alternator and the output terminal of the instrument cluster are put in the isopotential state by the voltage generated by the stator coil. Then the charge warning light turns off, and the voltage is also used to magnetize the field coil. The electricity generated by the stator coil (which has to be higher than 12.6V of the battery for recharging) starts recharging the battery via the alternator B+ terminal.

When the power generated by the stator coil and constant power by the FR terminal become higher than the voltage of the Zener voltage inside the IC regulator, the field coil is no longer magnetized to lower the generated voltage. When the powers fall below the Zener voltage, the field coil is magnetized again to continue power generation and thereby maintain a certain level of voltage.

■ Alternator Management System (AMS)

The system improve on fuel economy and maintains the battery in the optimum state of recharge by detecting the vehicle operating condition (accelerating or decelerating), vehicle electric load and battery recharge state so that the ECM(PCM) can control the voltage generated by the alternator.

Depending on the battery recharge state and the vehicle operating condition, either recharging control, discharging control or normal control will be performed. During acceleration, the ECM(PCM) performs the battery discharging control to consume the battery's power and lower the alternator-generated voltage to reduce the load of the alternator. During deceleration, it performs recharging control to increase the generated voltage and supplement the voltage of the consumed battery.

■ Battery Sensor

A battery sensor installed on the battery (-) terminal detects the battery fluid temperature, voltage and current, which are needed by the control system, using the internal elements (silicon diode and shunt resistance) and mapping values, and then sends them to the ECM(PCM) using the LIN communication line.

■ Usage

1. B+ Terminal : A battery recharging terminal.
2. L Terminal : A terminal to operate the charge warning light in the instrument cluster.
3. FR Terminal : A terminal to monitor the power generator status by outputting the field coil operating status as the PWM signal
4. C Terminal : A terminal for generating the signal to control the regulating voltage of the generator
5. I.C Regulator : A device for regulating the voltage generated by the generator
6. Field Coil : A circuit that generates the voltage to be regulated by an I.C regulator
7. Stator Coil : A circuit that actually creates the voltage
8. Diode : A circuit that converts (rectifies) AC to DC

■ Inspection

The charge warning light must be turned on when the ignition switch is turned on, and turned off when the ignition switch is turned off. If the charge warning light is not lighted, turn on the ignition switch and connect the L terminal to a jumper cable for grounding. If it is still not lighted, it is mostly likely that the wiring has been cut off or the indicator is malfunctioning. After engine start, If the charge warning light is not turned off, it means that the generator voltage cannot coordinate the battery voltage and is most likely a problem of battery recharging. In that case, check the recharging system for repairs or replacement.