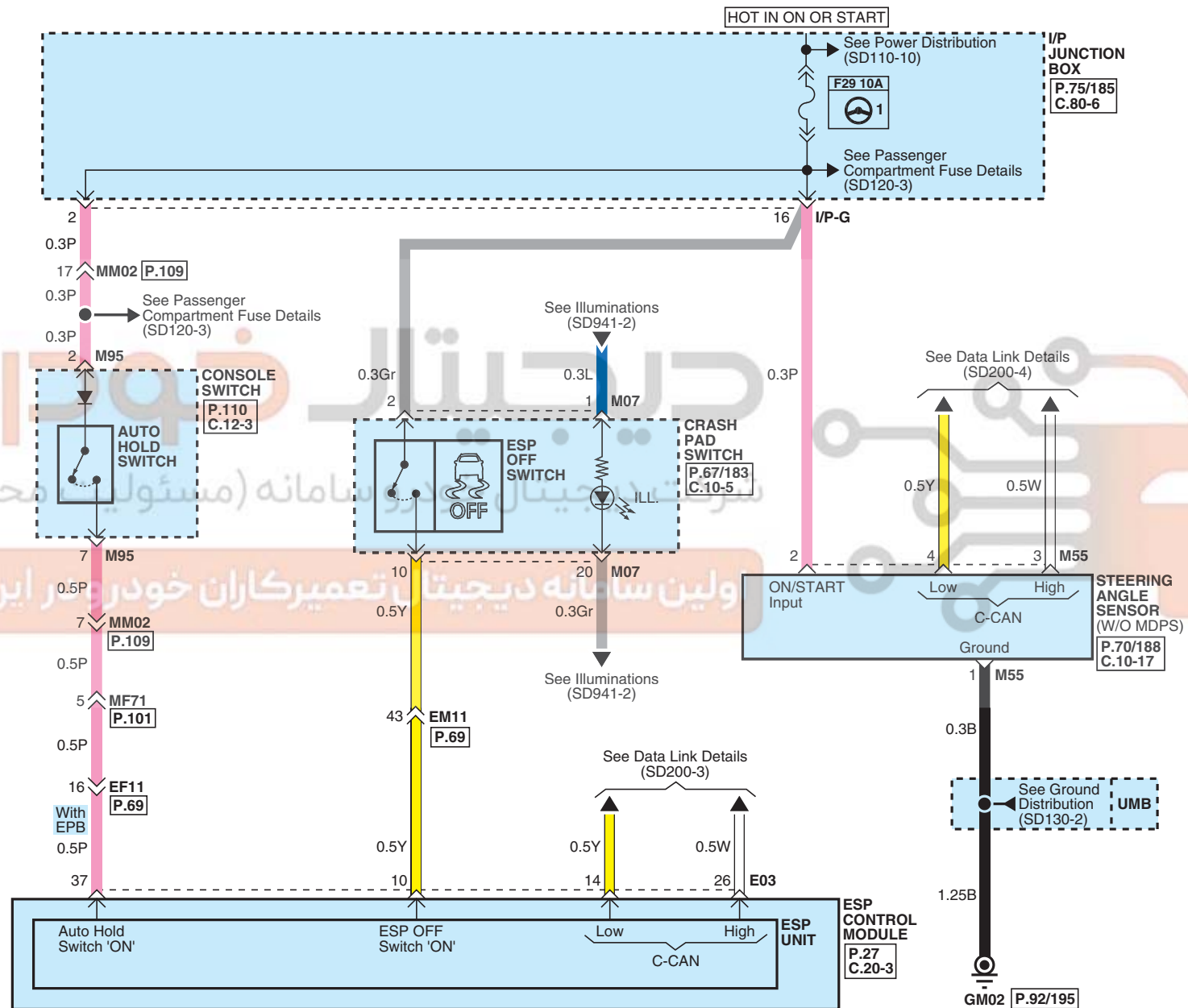


SD588-1



Electronic Stability Program (ESP) System (2)

SD588-2

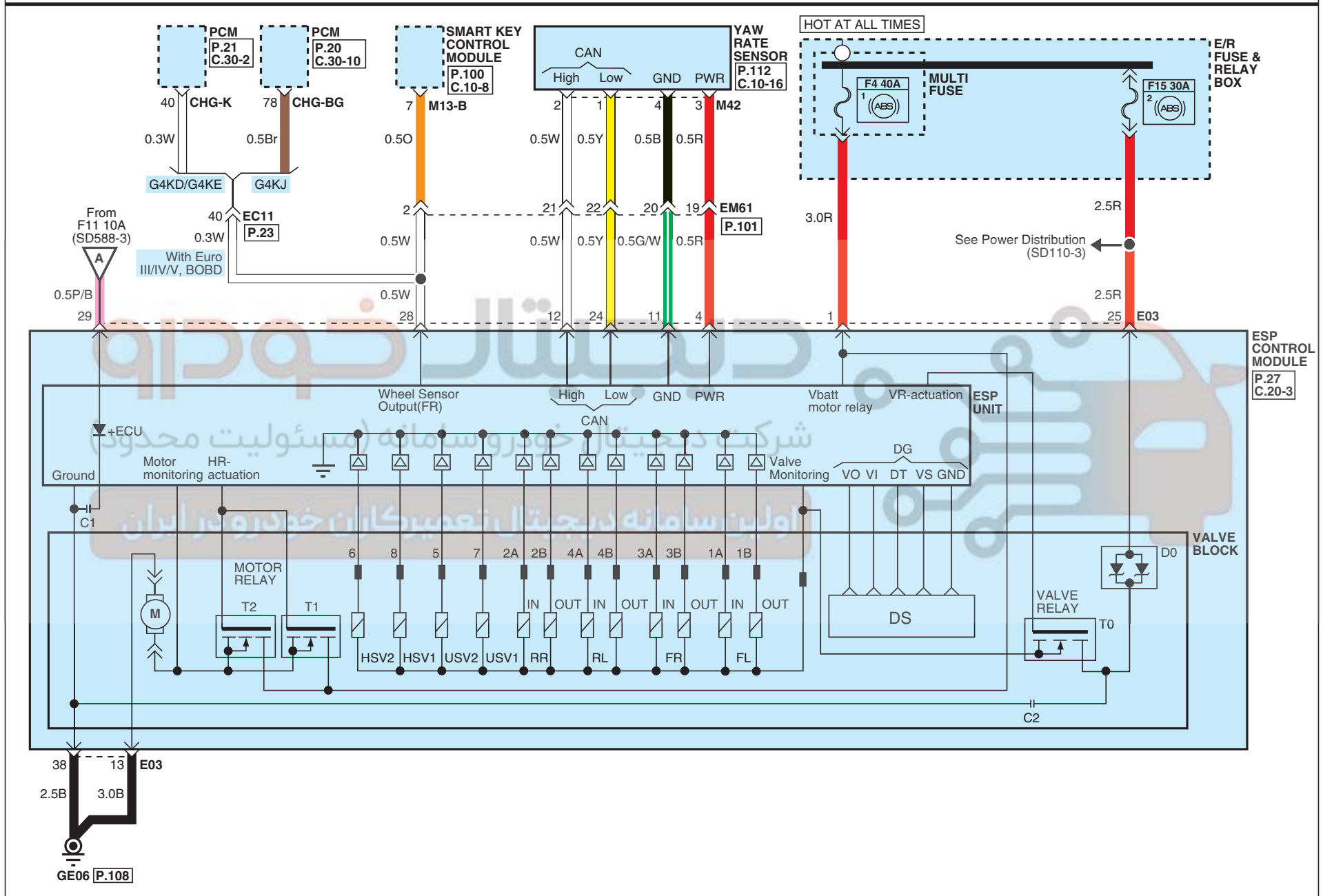


SD588-3



Electronic Stability Program (ESP) System (4)

SD588-4



Electronic Stability Program (ESP) System

Service Tips (1)

Circuit Description

ESP adds a further function known as Active Yaw Control (AYC) to the ABS, TCS, EBD and EDC functions. Whereas the ABS/TCS function controls wheel slip during braking and acceleration and, thus, mainly intervenes in the longitudinal dynamics of the vehicle, active yaw control stabilizes the vehicle about its vertical axis. This is achieved by wheel individual brake intervention and adaptation of the momentary engine torque with no need for any action to be taken by the driver.

- **Wheel Sensor**

The ESP control module receives the wheel speed signals from 4 wheel sensors. It receives the signal as current from the wheel sensors and converts it to voltage. Furthermore, the ESP control module checks wiring and shortage of the sensors and surrounding circuits. It stops operation when there is a problem with one or more wheel sensors.

- **Stop Lamp Switch**

This stop lamp switch sends brake pedal operating signals to the ESP control module. This switch is a dual type switch (stop lamp switch signal A and B).

These two signals send opposite values depending on the brake operation. If the brake stepped on, the stop lamp switch A sends the power voltage value while the stop lamp switch B sends a 0V value. On the other hand, if the brake is not stepped on, the opposite values are output.

- **Stop Lamp Relay**

It is used to increasing long-term reliability for stop lamp switch.

- **ESS (Emergency Stop Signal) Relay**

In sudden stop situation, ESP control module receives signal and control the ESS relay (ON & OFF) to inform the risk for rear vehicle driver by blinking the stop lamps.

- **HAC (Hill-start Assist Control) Relay**

The system prevents the car from rolling away when trying to pull away on an up or down gradient. The system engages automatically when a gradient is detected; it then acts to hold the car stationary for two seconds after the brake is released giving the driver time to apply the throttle.

- **Solenoid Valve**

The Solenoid Valve is operated when one edge of the solenoid valve coil is connected to the (+) voltage supplied by the valve relay and another edge to the grounding of the semiconductor circuit. Under normal operating conditions, the valve test always checks the electrical function of the valve through a pulse.

- **Yaw Rate Sensor**

When the vehicle is turning, the yaw rate sensor detects the yaw rate electronically by the vibration change of plate fork inside the yaw rate sensor. If the yaw velocity reaches the specific velocity after it detects the vehicle's yawing, the ESP control is reactivated. The lateral G sensor senses the vehicle's lateral acceleration. A small element inside the sensor is attached to a deflectable lever arm by lateral acceleration. Direction and magnitude of lateral acceleration loaded to vehicle can be known by electrostatic capacity changing according to lateral acceleration. It interchanges signals with ESP through extra CAN BUS line.

- **Steering Angle Sensor (SAS)**

Steering Wheel Angle Sensor detects rotating direction of the vehicle. Rotating direction detected by the sensor is communicated with ESP control module as CAN signal involving information about the angle through CAN communication line. ESP control module detects speed of the steering wheel handling and the angle with this CAN signal. ESP control module also uses this signal as the input signal to control ESP.

Electronic Stability Program (ESP) System

Service Tips (2)

• **ABS IND.**

This light illuminates if the ignition switch is turned ON and goes off in approximately 3 seconds if the system is operating normally. If the ABS warning light remains on, comes on while driving, or does not come on when the ignition switch is turned to the ON position, this indicates that there may be a malfunction with the ABS.

• **Parking Brake IND.**

This warning light is illuminated when the parking brake is applied and the brake fluid level in the reservoir is low. This warning light is illuminated for about 3 seconds and turned off if the ignition switch is turned ON or START with the parking brake released. If the warning light is not turned off with the parking brake released after starting the engine, inspect the brake fluid and supplement it if needed.

• **ESP IND.**

The ESP indicator will illuminate when the ignition switch is turned ON, but should go off after approximately 3 seconds. When the ESP is on, it monitors the driving conditions under normal driving conditions, the ESP light will remain off. When a slippery or low traction condition is encountered, the ESP will operate, and the ESP indicator will blink to indicate the ESP is operating. The ESP indicator stays on when the ESP may have a malfunction.

• **ESP Off IND.**

The ESP OFF indicator will illuminate when the ignition switch is turned ON, but should go off after approximately 3 seconds. To switch to ESP OFF mode, press the ESP OFF button. The ESP OFF indicator will illuminate indicating the ESP is deactivated. If this indicator stays on when ESP OFF is not selected, the ESP may have malfunctioned.

• **ESP Off Switch**

Driver can inhibit the ESP control by ESP switch.

When switch signal sends into the ESP control module, the ESP warning lamp goes "ON" and the ESP control is stopped and if the next switch signal is inputted again, the ESP control is ready. This function is used for sporty driving or vehicle inspection.

• **Auto Hold IND.**

- 1) White : When AUTO HOLD switch is turned 'ON'
- 2) Green : When vehicle completely stop by pressing the brake pedal with AUTO HOLD switch 'ON'
- 3) Yellow : When AUTO HOLD system is malfunction.

• **Auto Hold Switch**

The AUTO HOLD keeps the vehicle stopped after the driver brings the vehicle to a complete stop with the foot brake and releases the brake pedal.

If you press the accelerator pedal with the transmission in R (Reverse), D (Drive) or sports mode, the AUTO HOLD will be released automatically and the vehicle will start to move. The indicator changes from green to white.