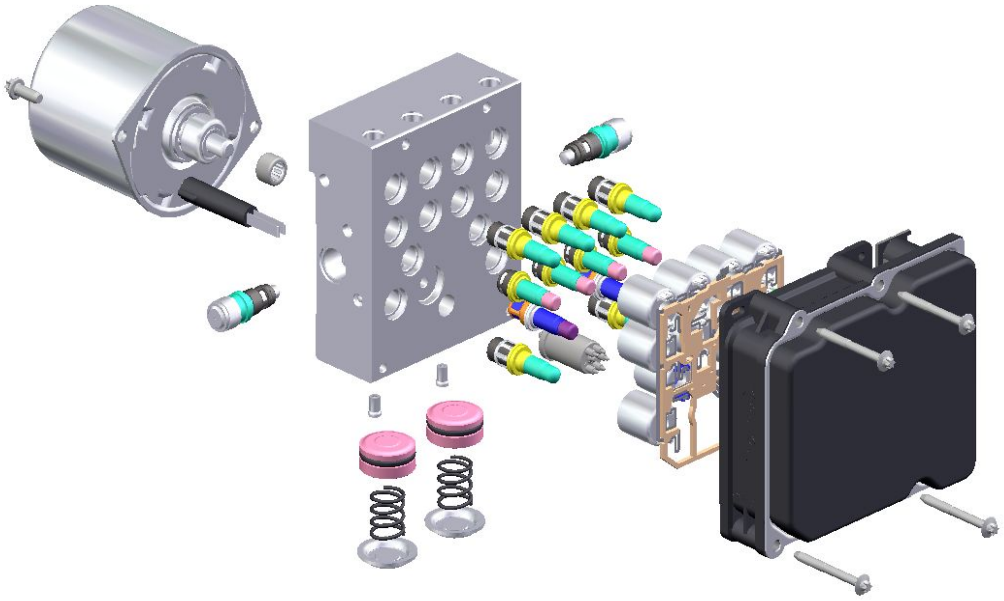
CM
ESP/ESC (Bosch 8)



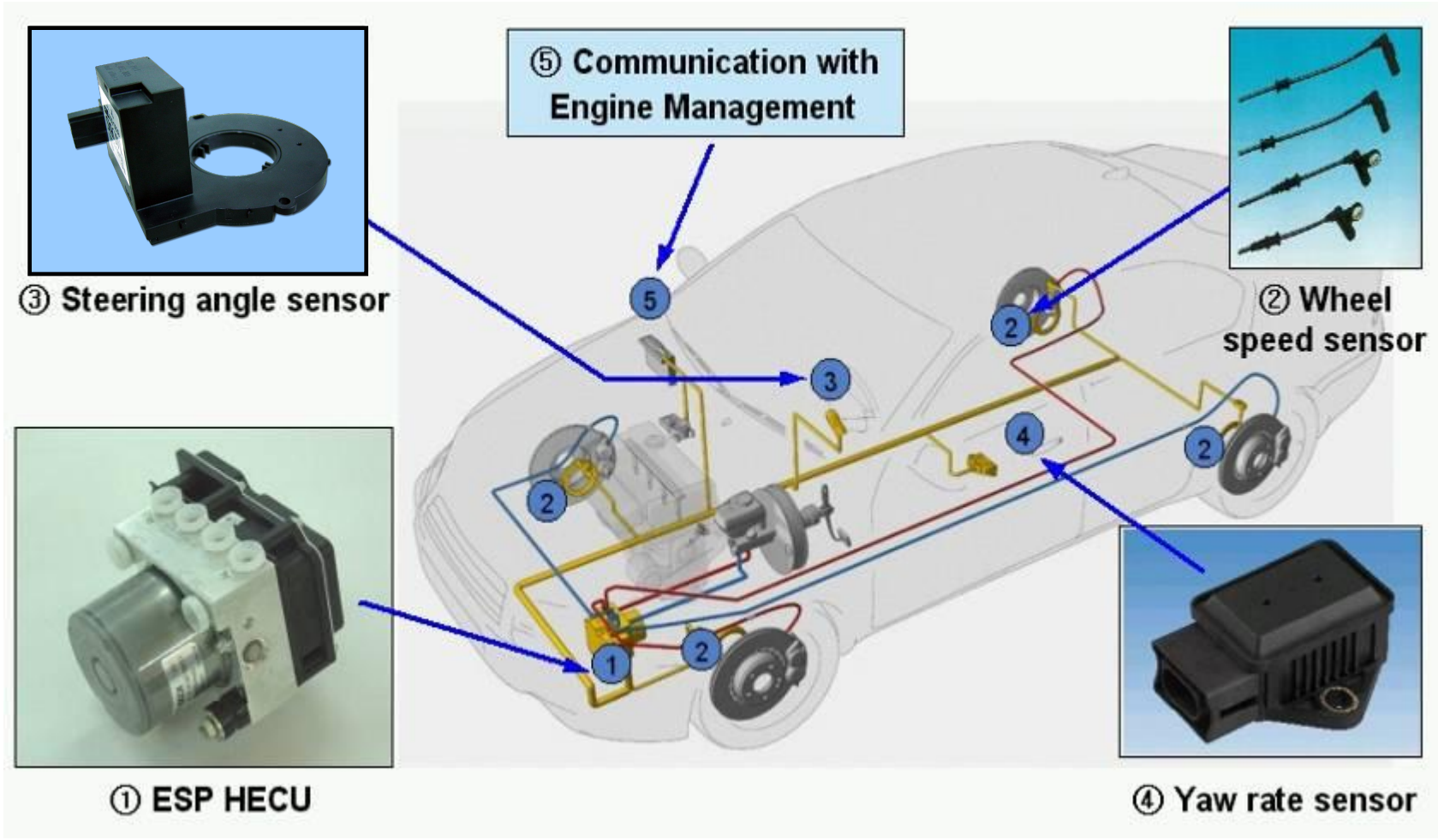
Line-up (BOSCH 8 ABS/ESP)

Variation

	Area				
	General	M/East	Europe	Aust.	USA/Canada
ABS	S (GL,GLS,LWB,SWB)				
ESP/ESC	O (GLS, LWB, SWB)		O (GL,GLS, LWB, SWB)	O (GLS, LWB, SWB)	O (GL,GLS, LWB)

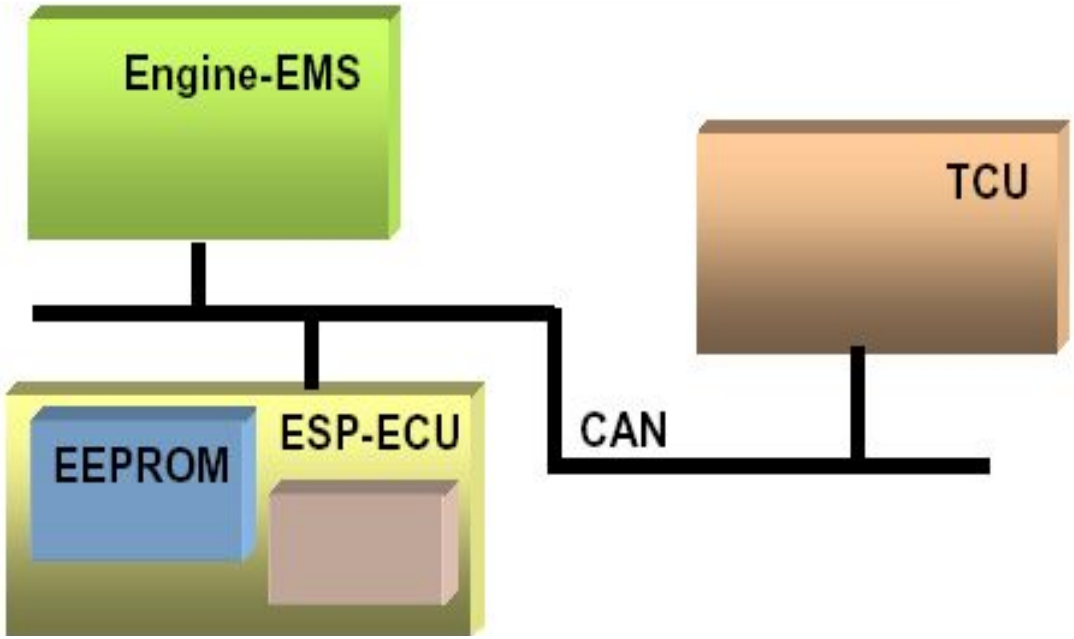
S: Standard, O: Option

COMPONENTS OF ESP SYSTEM

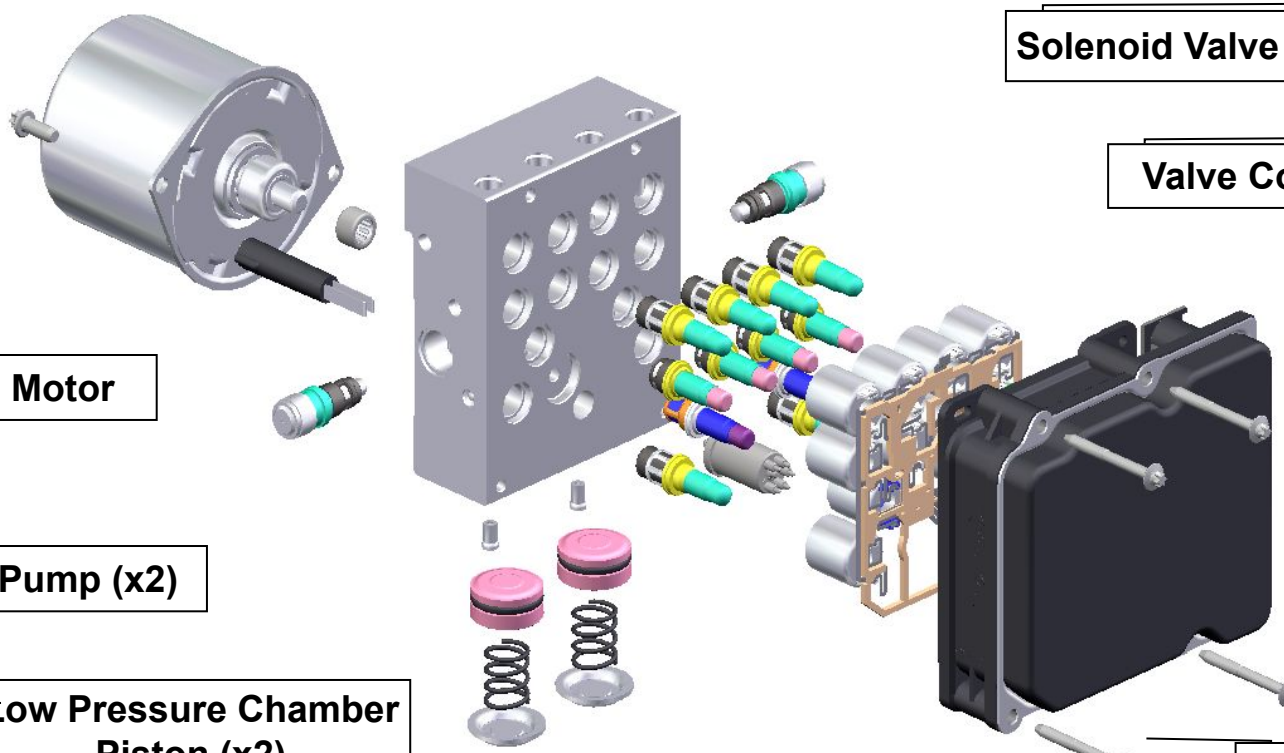


VARIANT CODING

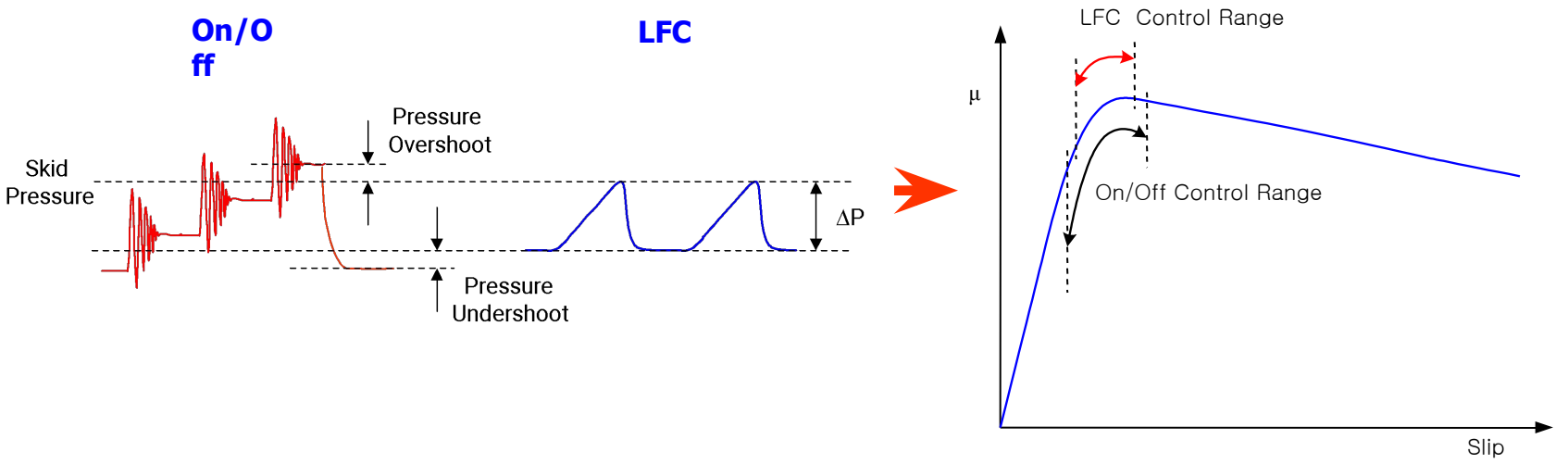
Perform the variant coding if there is a ESP OFF W/L on with a ‘C1702 (Variant Coding Error)’ after replacing a ECM,TCM or ESPCM.



Construction



LFC (Linear Flow Control)

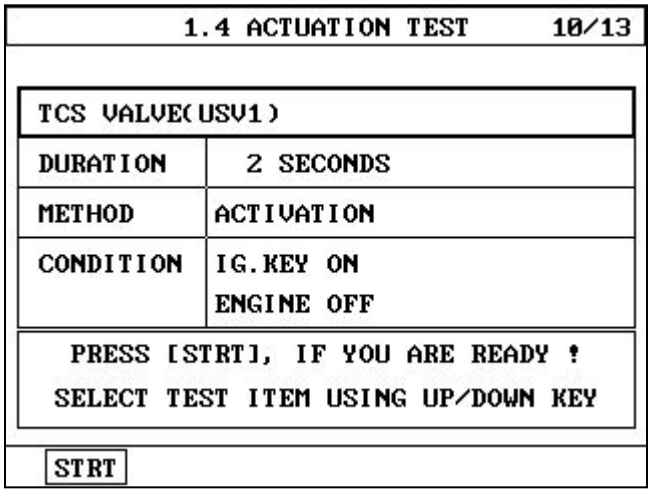


Effect of LFC (Linear Flow Control)

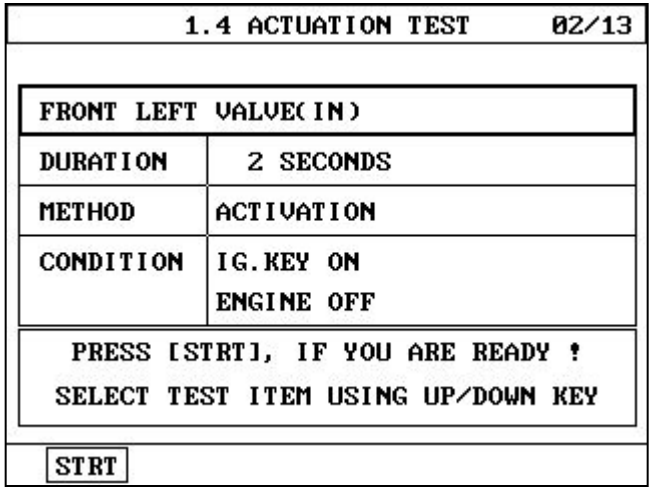
Prevent a pressure overshoot or undershoot → Control range decrease

- **Noise : Pulse-Up Noise decrease**
- **Enhanced Pedal Feeling**

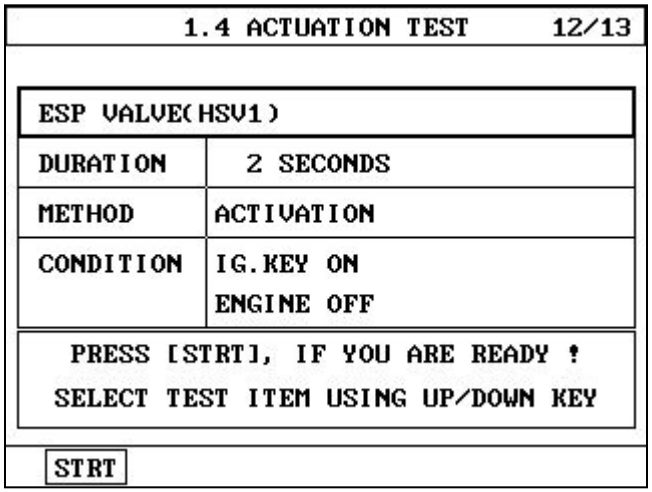
ACTUATION TEST



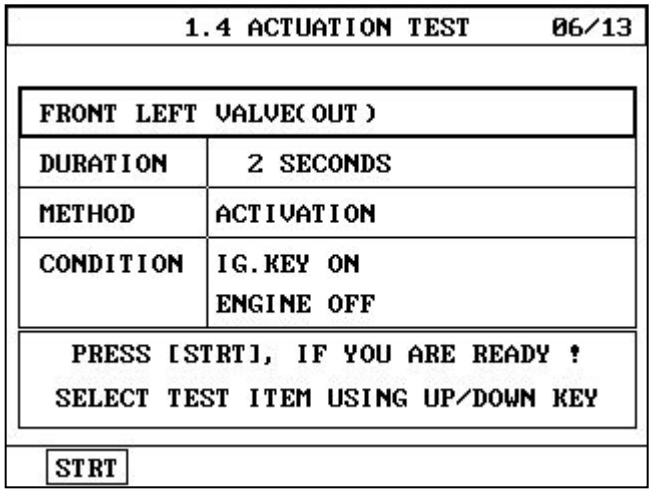
PWM control



PWM control



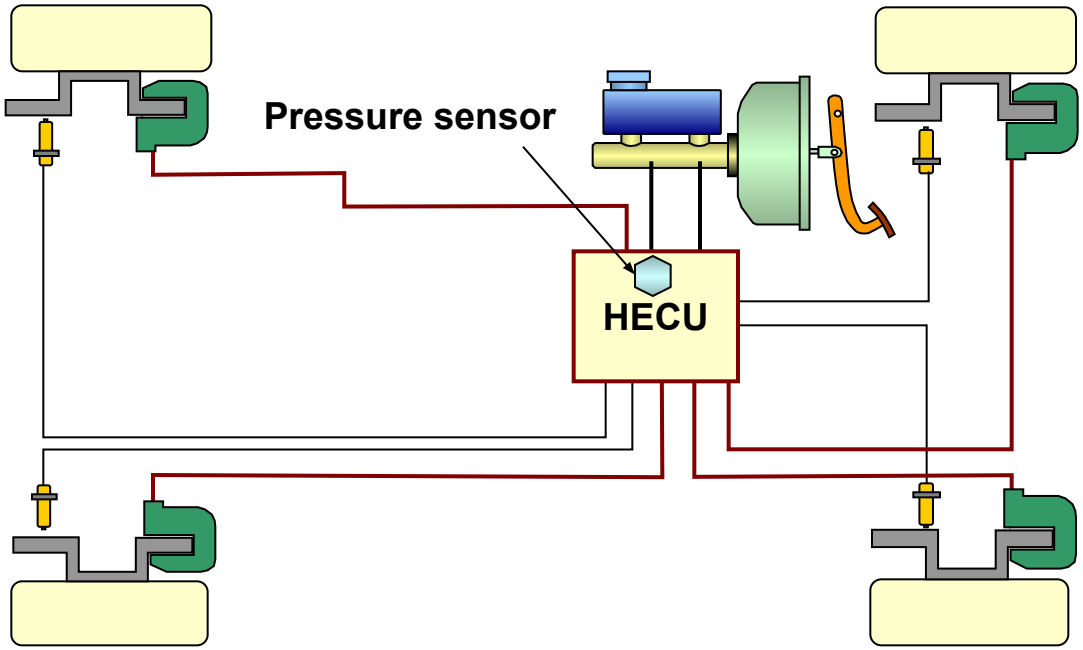
ON/OFF control



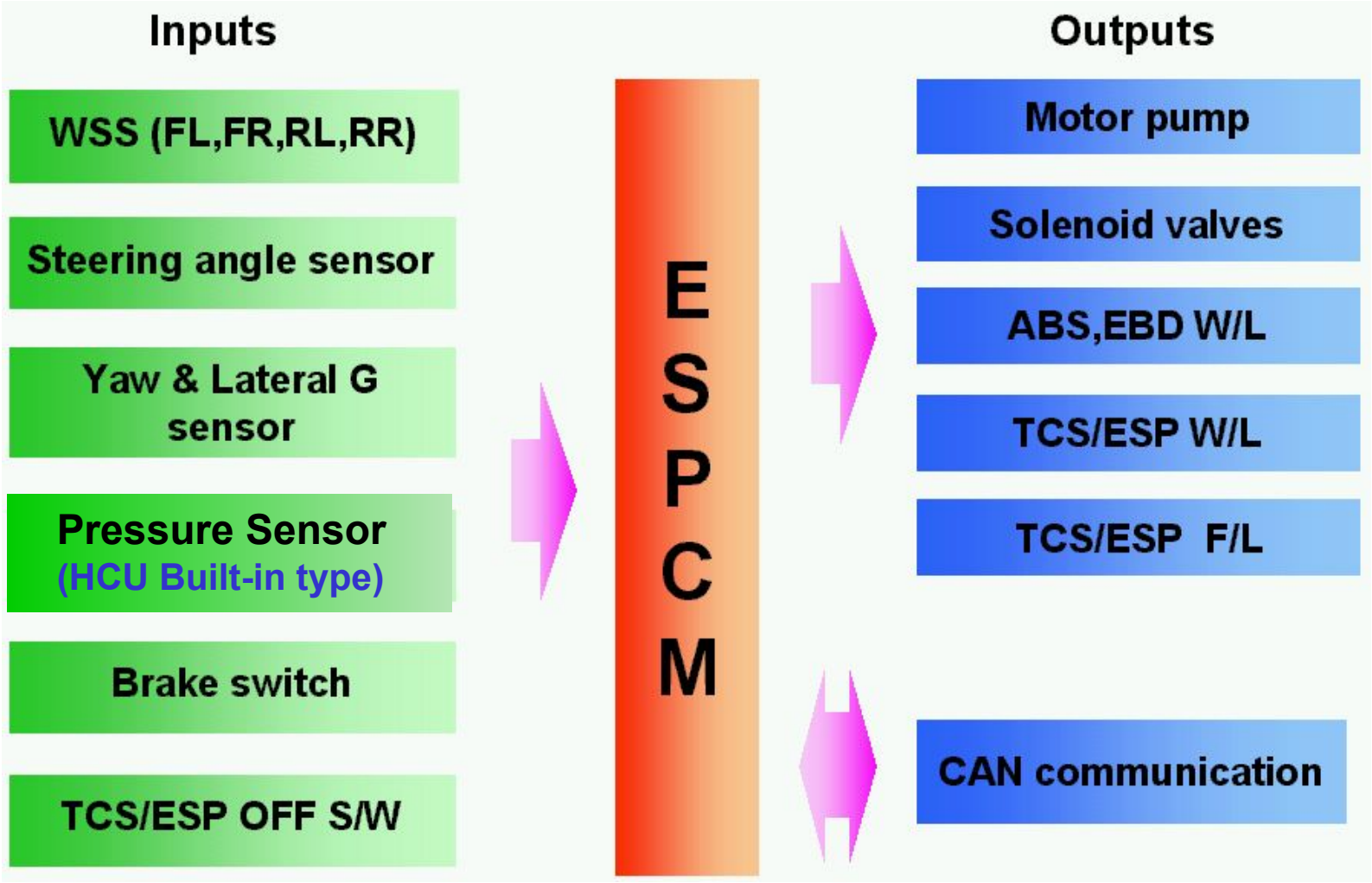
ON/OFF control

Operating condition

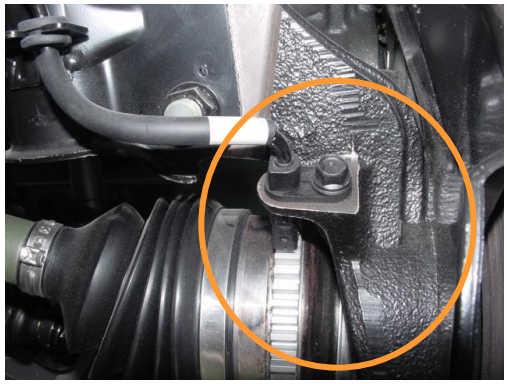
- over 30 bar
- over 2,200 bar/sec
- over 20 km/h



INPUTS AND OUTPUTS



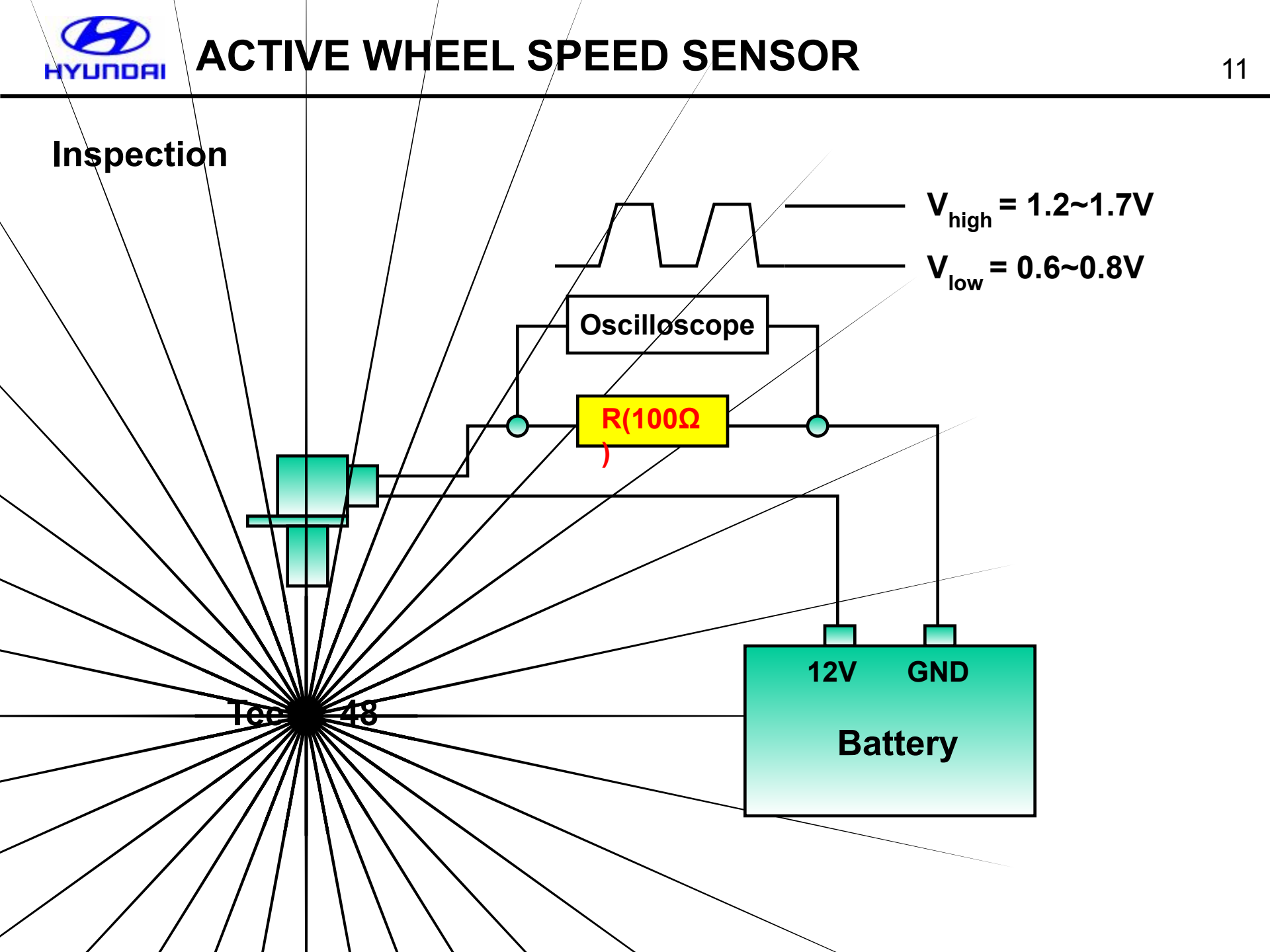
ACTIVE WHEEL SPEED SENSOR



- Type: Hall Effect
- Output signal: Digital (Open Collector Type circuit integrated)
- Good characteristics against temperature variation and noise
- Low RPM Detection: 0 RPM can be detected
- Air gap sensitivity: stable output pulse against air-gap change
-Supplying power: DC 12V

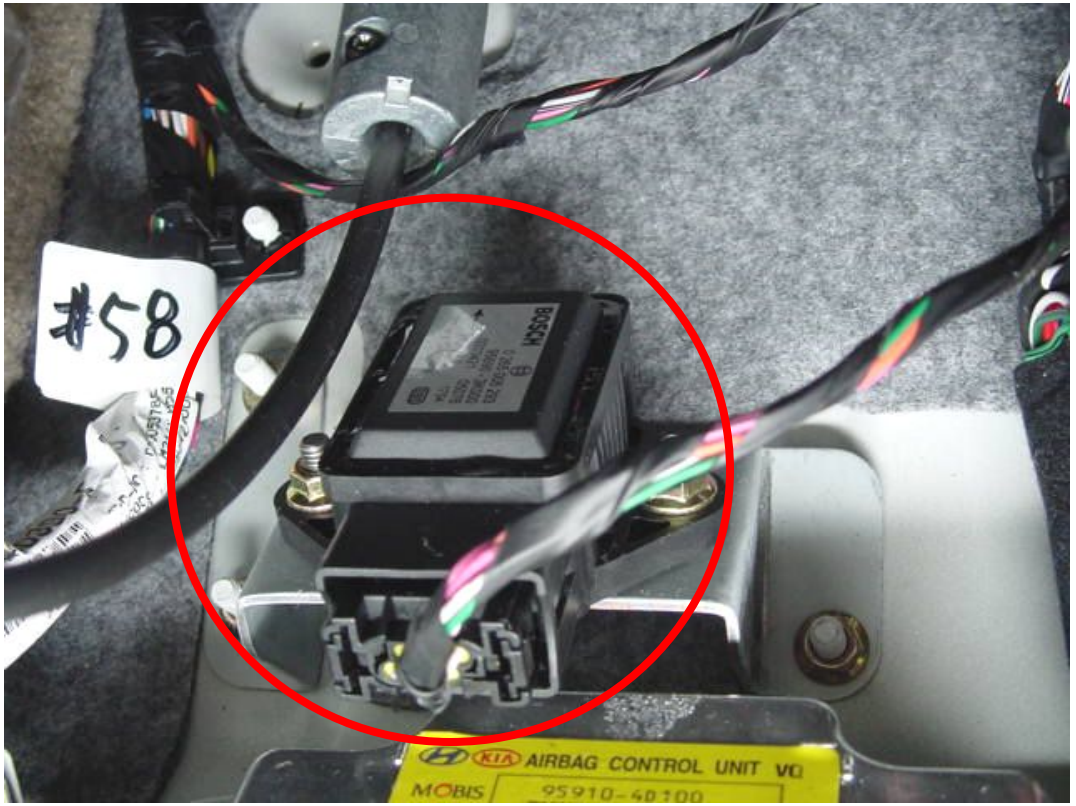
OUTPUT SIGNAL		MAX	TYPICAL	MIN
LOWER SIGNAL	I_{LOW} (mA)	5.9	7	8.4
UPPER SIGNAL	I_{HIGH} (mA)	11.8	14	16.8
SIGNAL RATIO	I_{HIGH} / I_{LOW}	1.85 or more		
OPERATING FREQUENCY		1 ~ 2500 Hz		
OPERATING DUTY		30~70%		

Inspection


V_{high} = 1.2~1.7V
V_{low} = 0.6~0.8V
Oscilloscope
R(100Ω
)
12V
GND
Battery
Tec 48

YAW RATE & LATERAL G SENSOR

Appearance



YAW RATE & LATERAL G SENSOR

Sensor specification

a. Yaw Rate Sensor Specification

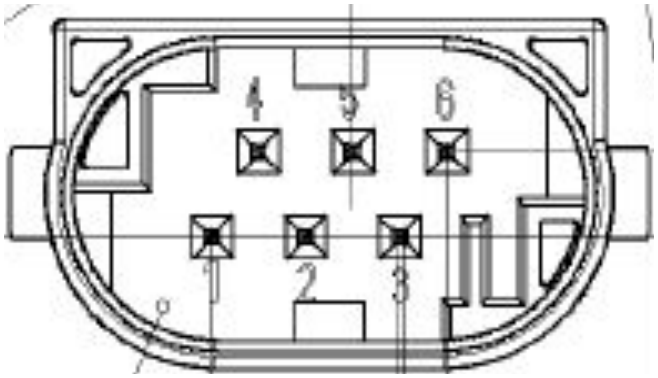
- Measuring Range : ±100˚/s
- Resolution : ± 0.3˚/s
- Output Voltage Range : 0.5 ~ 4.5V
- Sensitivity : 18 mV / (°/s)

b. Lateral G (Acceleration) Sensor Specification

- Measuring Range : ±1.8 g (±1.5G)
- Resolution : ± 0,005 g
- Output Voltage Range : 0.5 ~ 4.5 V
- Sensitivity : 1V/g

YAW RATE & LATERAL G SENSOR

Pin layout

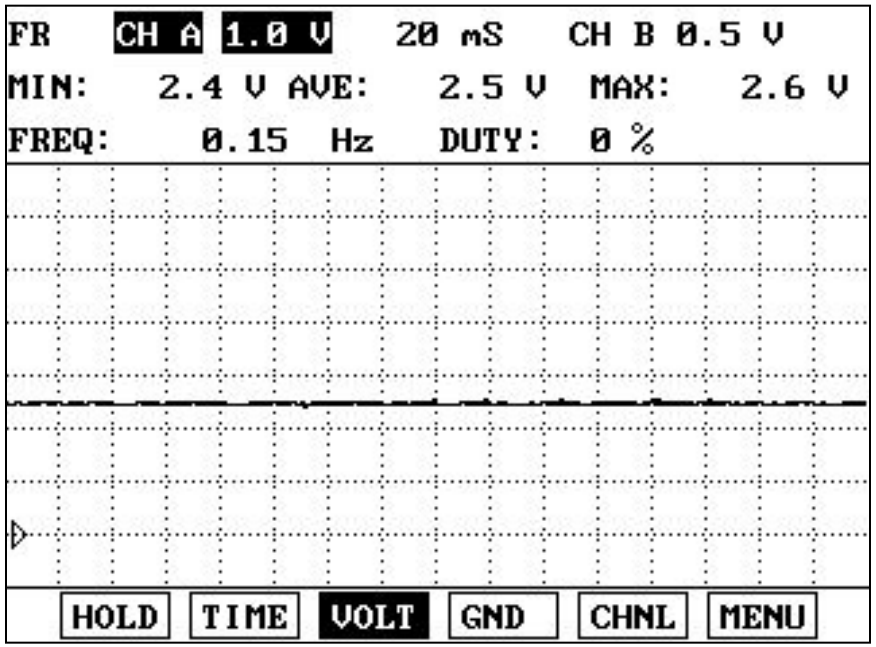


[Sensor connector - Male side]

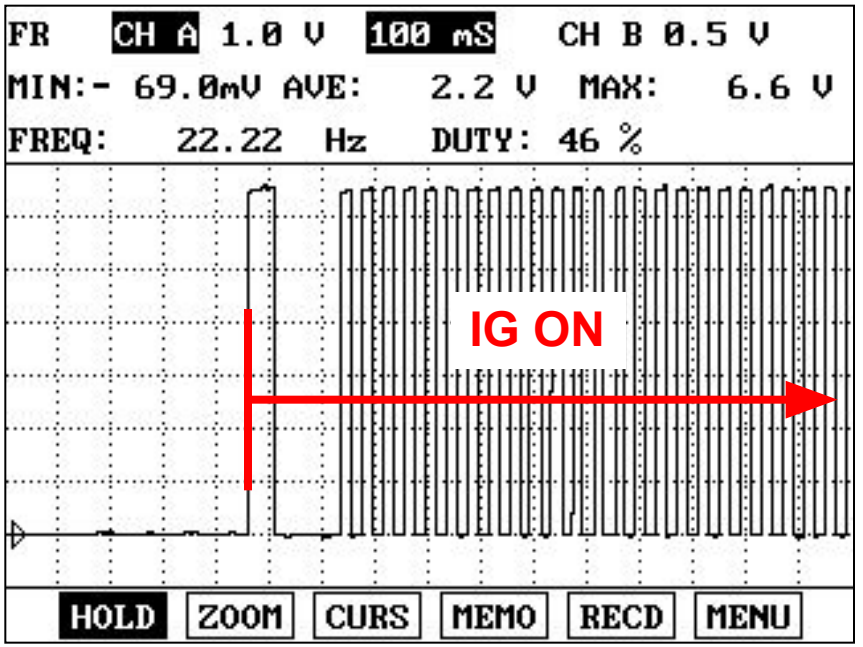
Pin configuration	
Pin1	Reference Voltage
pin2	Bite
Pin3	12V
pin4	Out Yaw Rate Sensor
pin5	Out Lateral Acceleration Sensor
pin6	GND

YAW RATE & LATERAL G SENSOR

Sensor Output



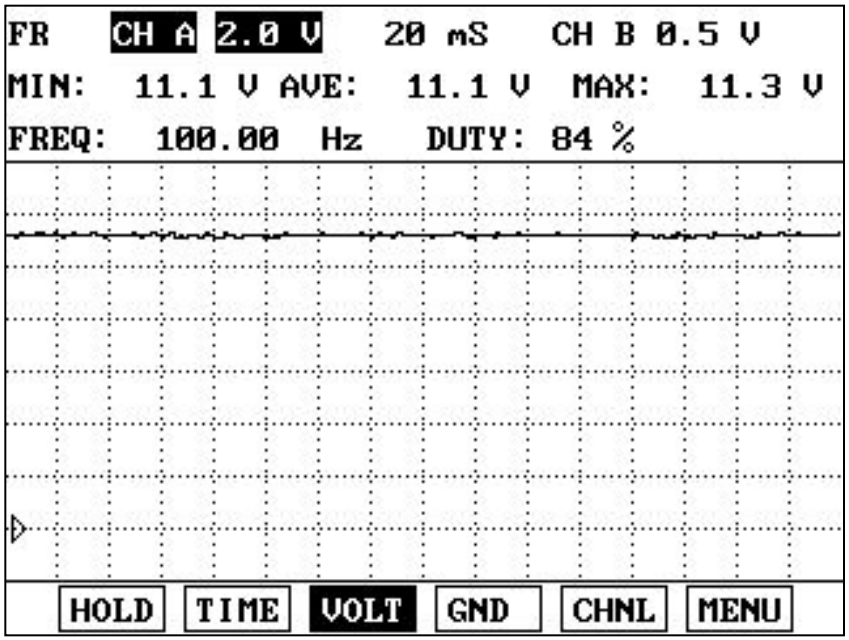
[Pin1- Reference voltage of the sensor]



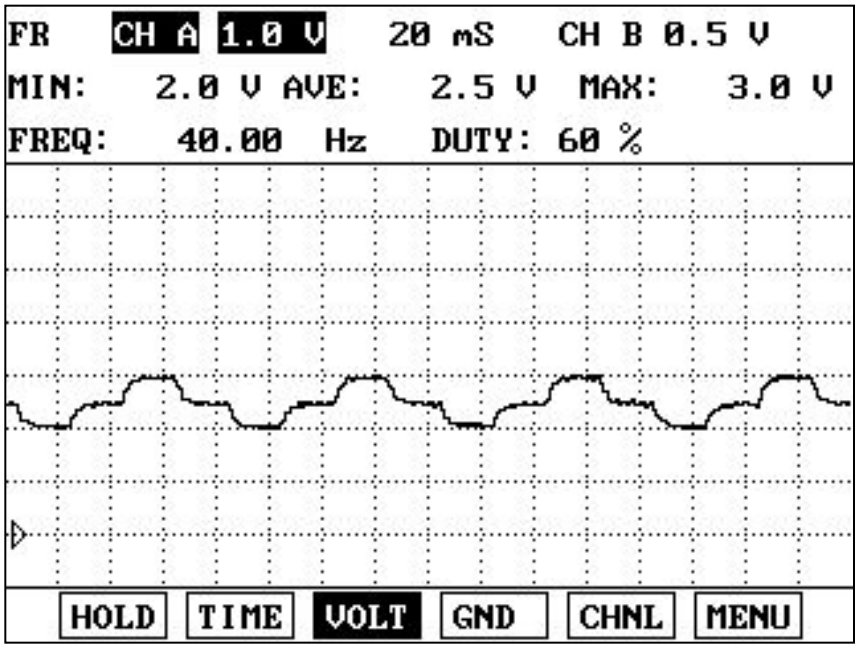
[Pin2- Bite : for self test]

YAW RATE & LATERAL G SENSOR

Sensor Output



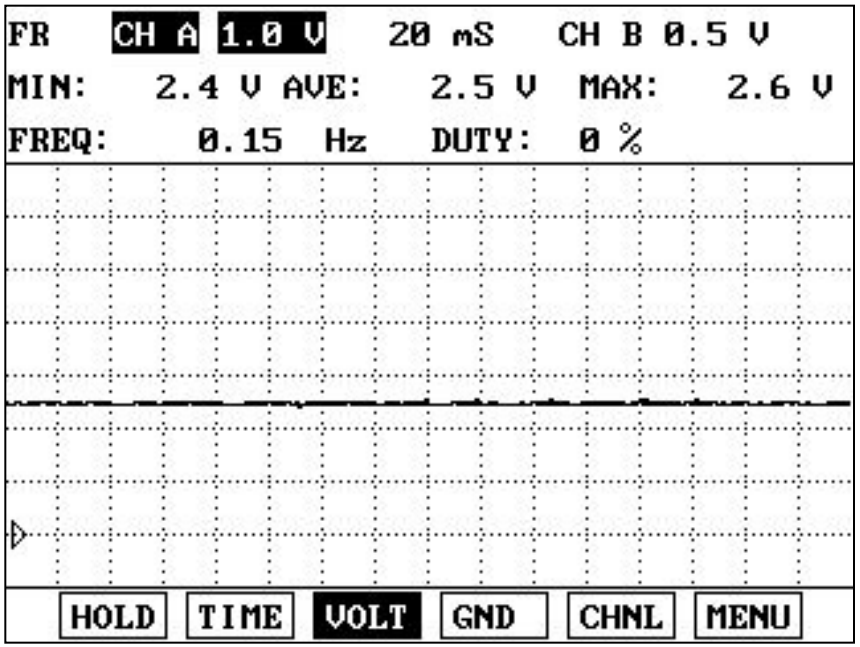
[Pin3 - sensor power]



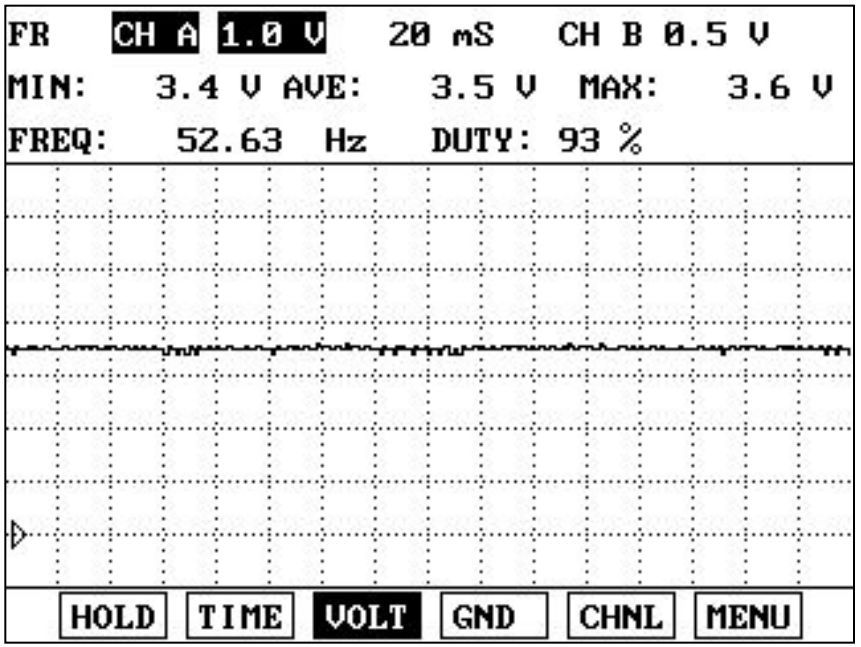
[Pin4 - Output of Yaw Rate]

YAW RATE & LATERAL G SENSOR

Sensor Output



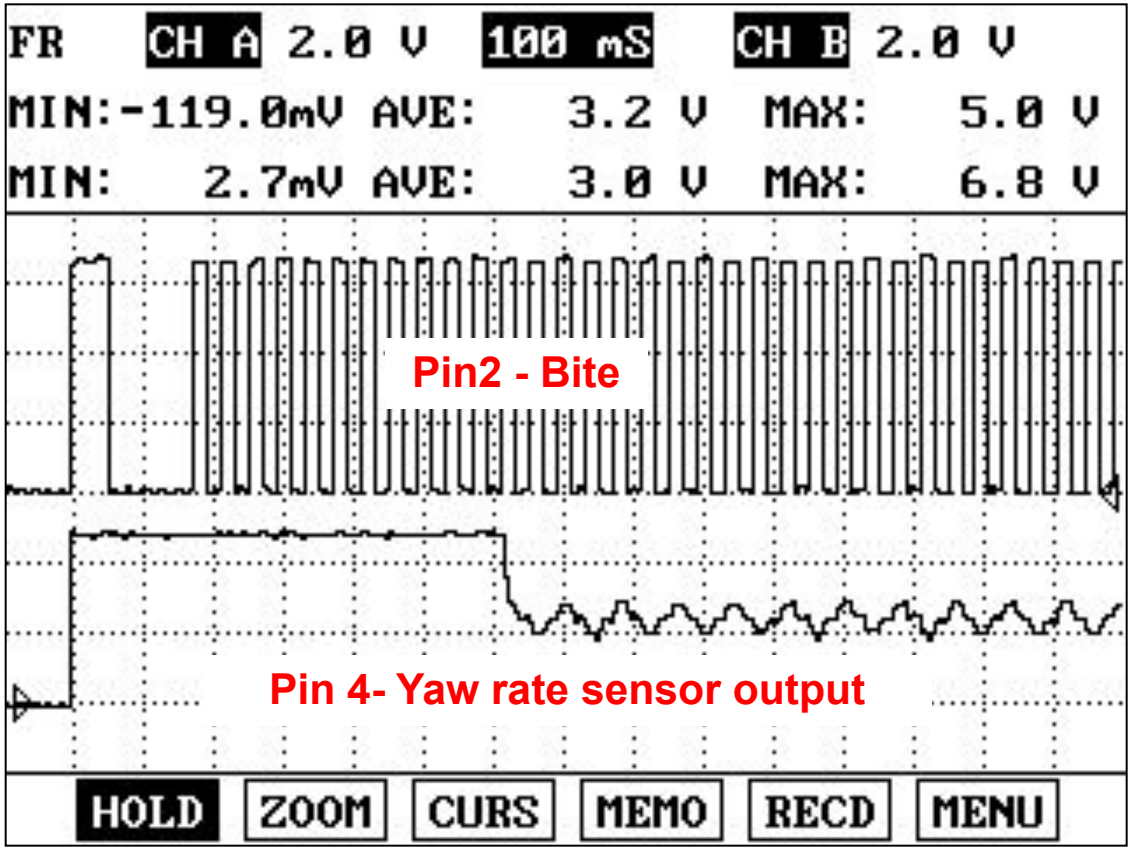
[Pin5 - Lateral G sensor output]



[Lateral G sensor output: 90˚ to the right]

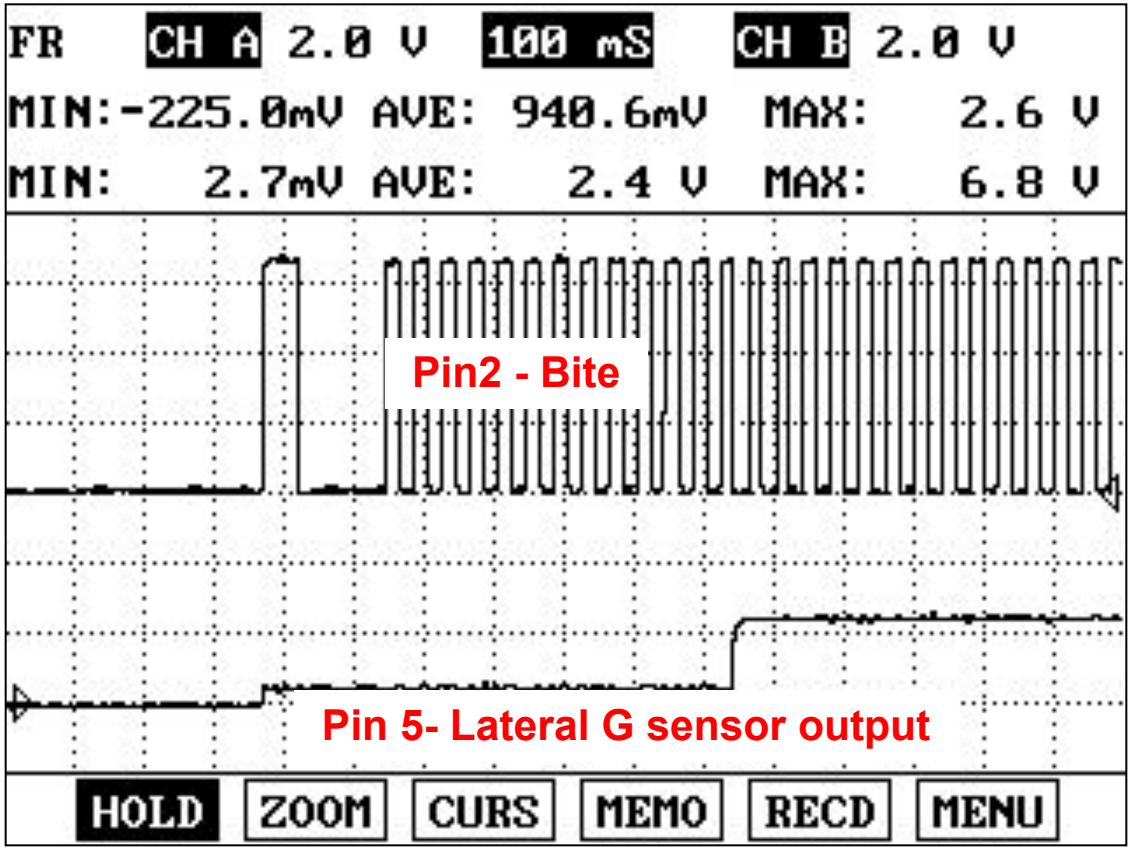
YAW RATE & LATERAL G SENSOR

Sensor self-test (Yaw rate sensor)



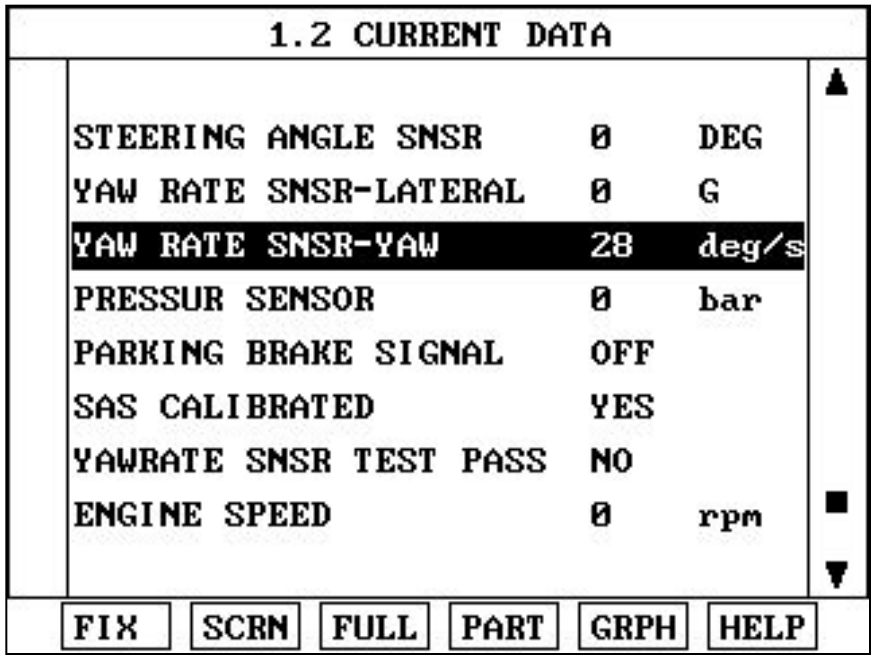
YAW RATE & LATERAL G SENSOR

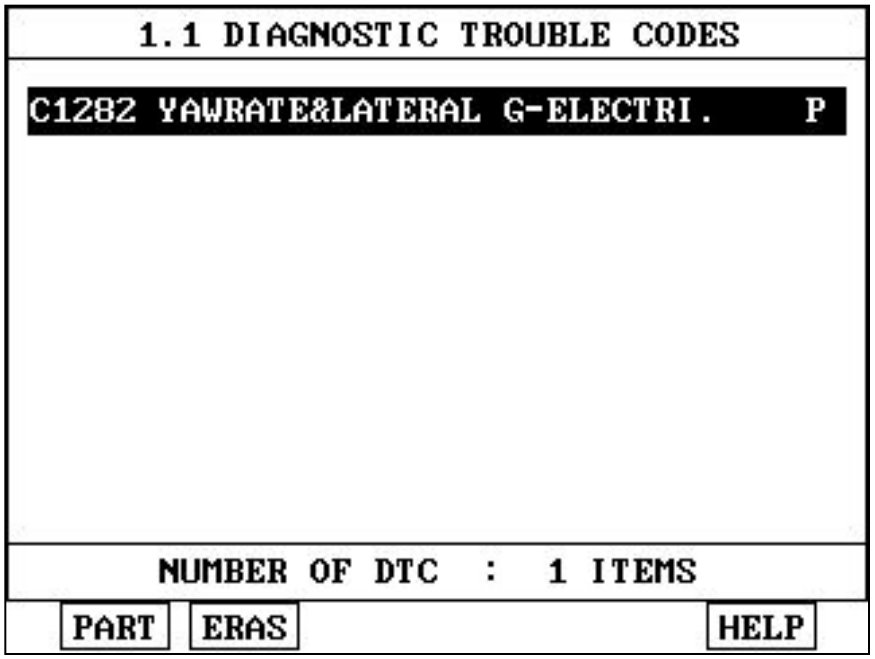
Sensor self-test (Lateral G sensor)



YAW RATE & LATERAL G SENSOR

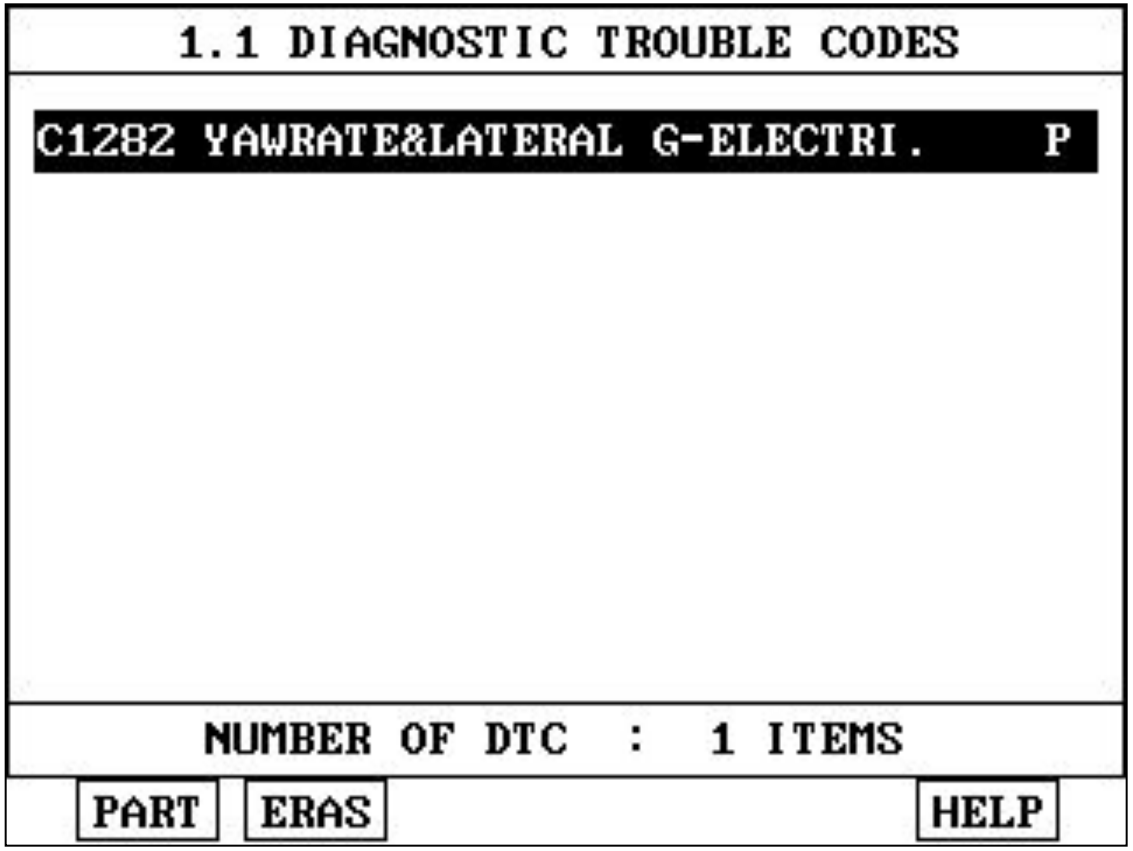
Current data & DTC





YAW RATE & LATERAL G SENSOR

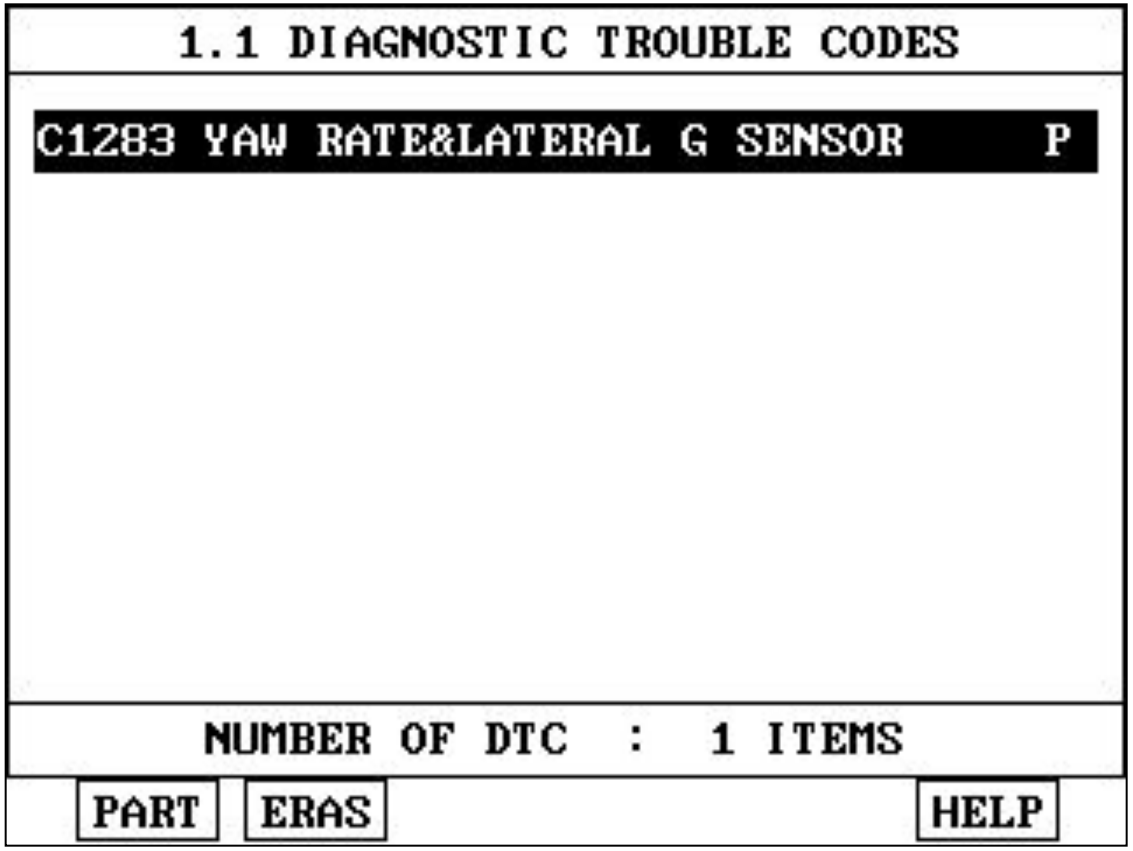
Current data & DTC



C1282 (Reference voltage/Yaw/Lateral G Sensor short to GND)

YAW RATE & LATERAL G SENSOR

Current data & DTC

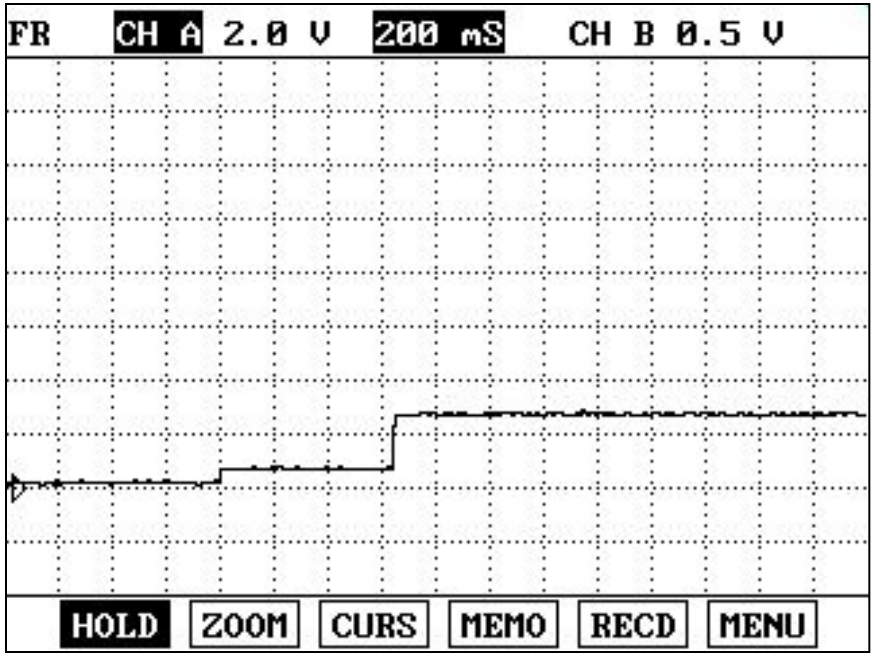


C1283 (BITE short to GND)

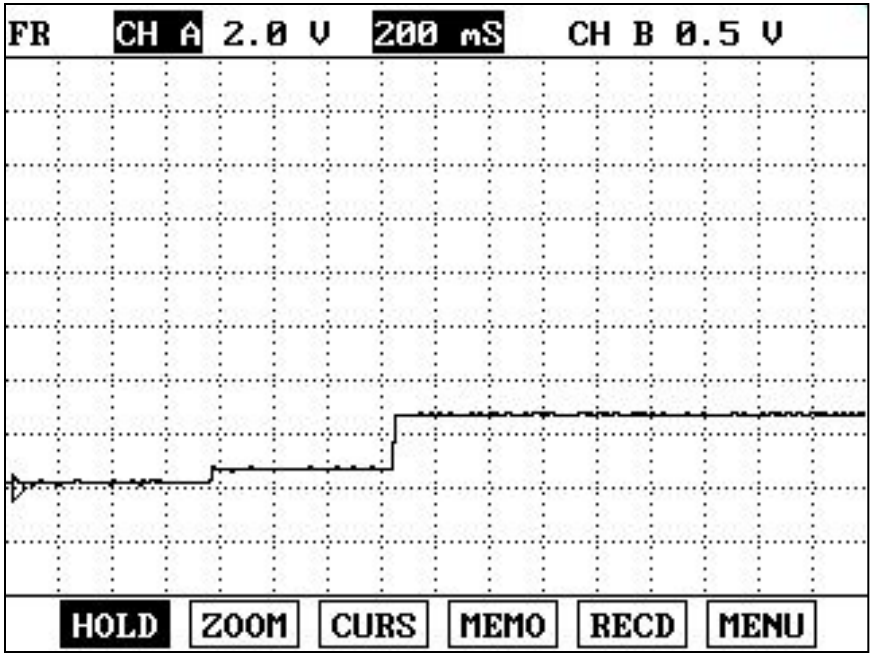
YAW RATE & LATERAL G SENSOR

Current data & DTC

Lateral G sensor output



[When the BITE is normal]

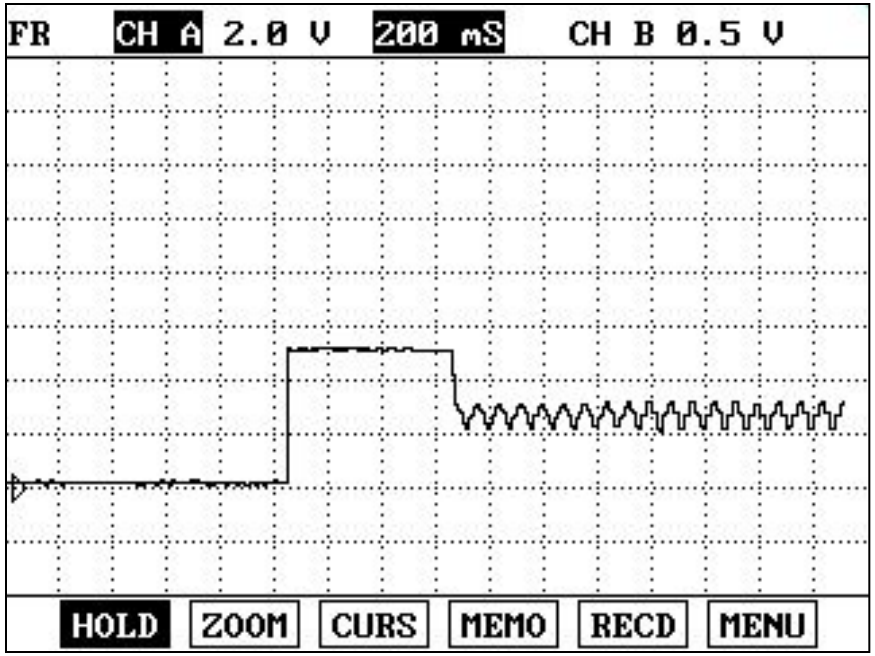


[When the BITE(Pin2) short to GND]

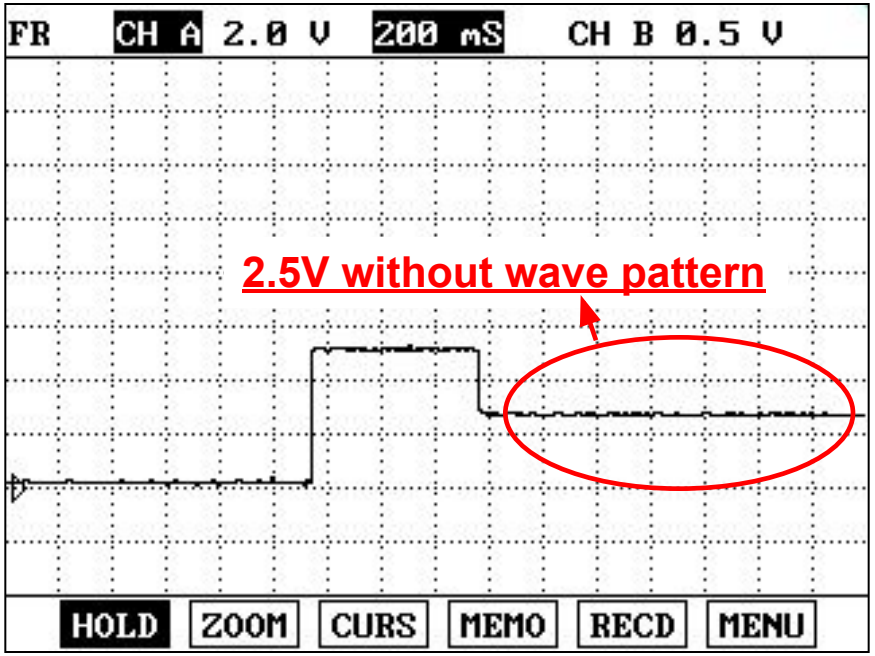
YAW RATE & LATERAL G SENSOR

Current data & DTC

Yaw rate sensor output



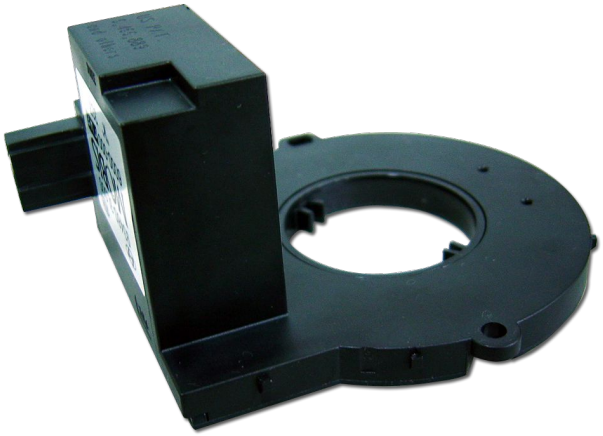
[When the BITE is normal]

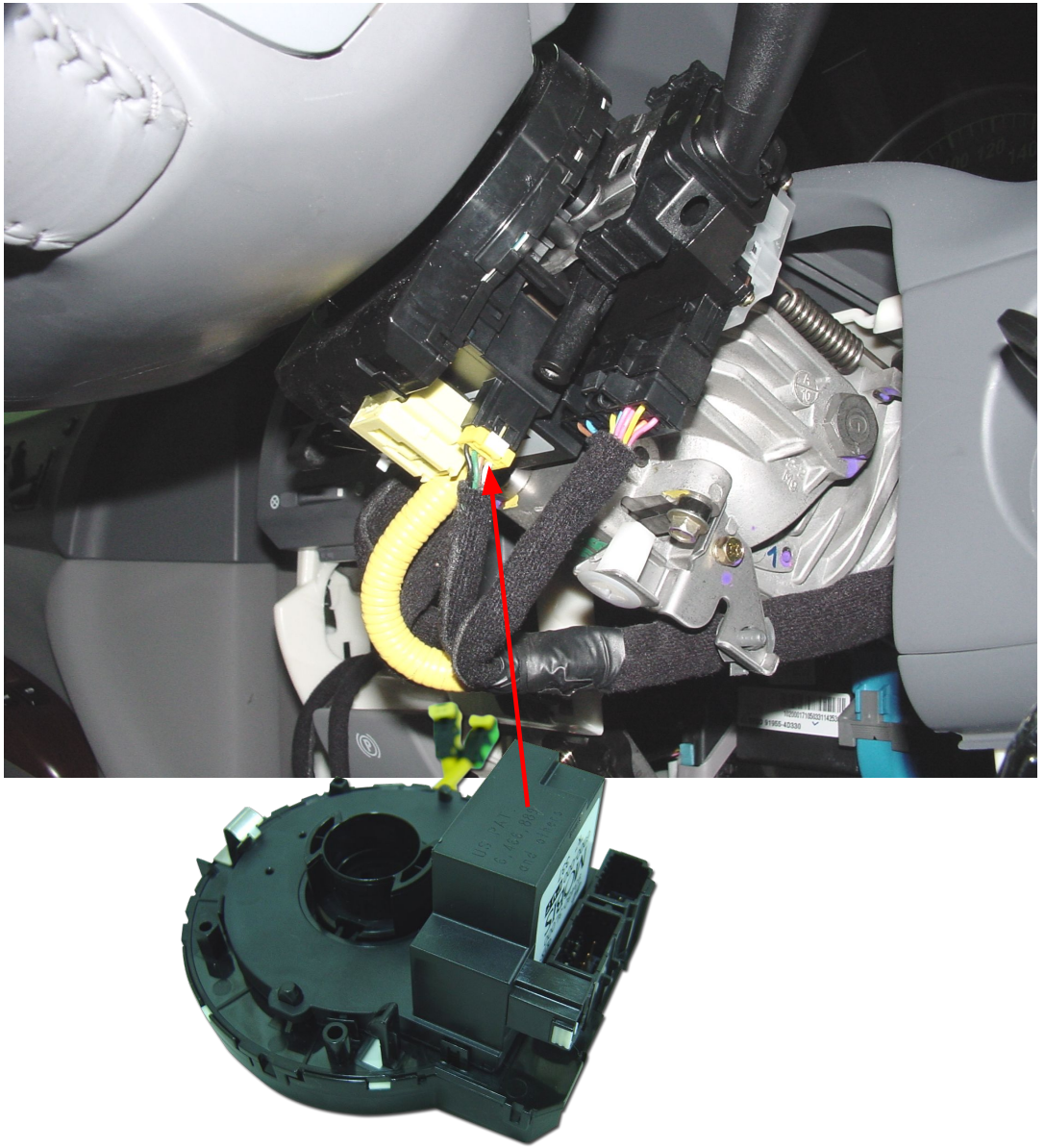


[When the BITE(Pin2) short to GND]

STEERING ANGLE SENSOR

Appearance

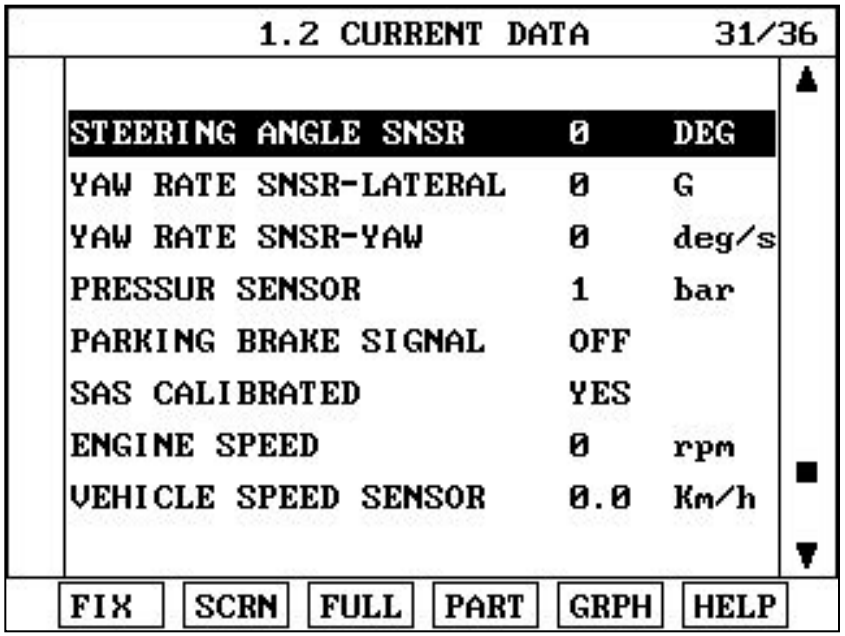


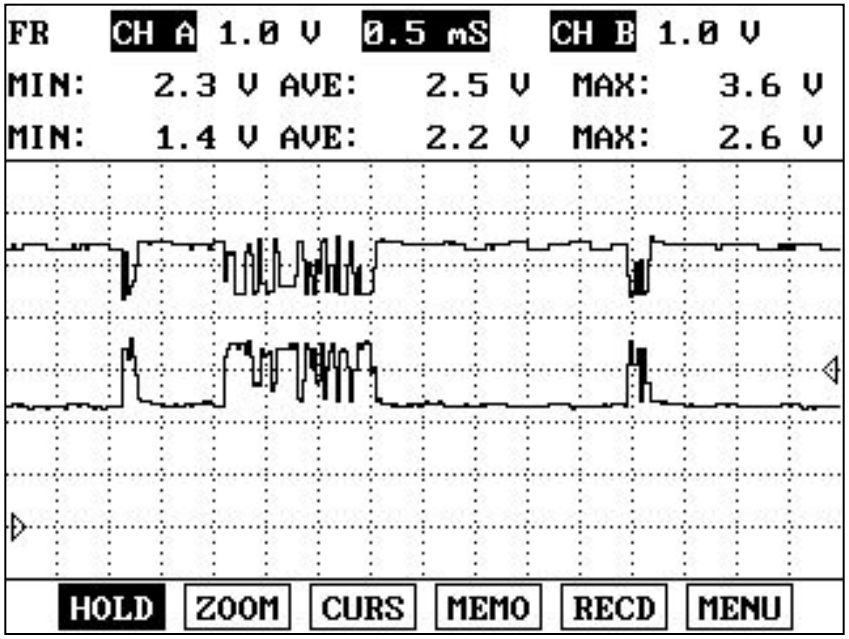


- Maker : RUF (Germany)
- Installation : Steering wheel

STEERING ANGLE SENSOR

Hi-scan data

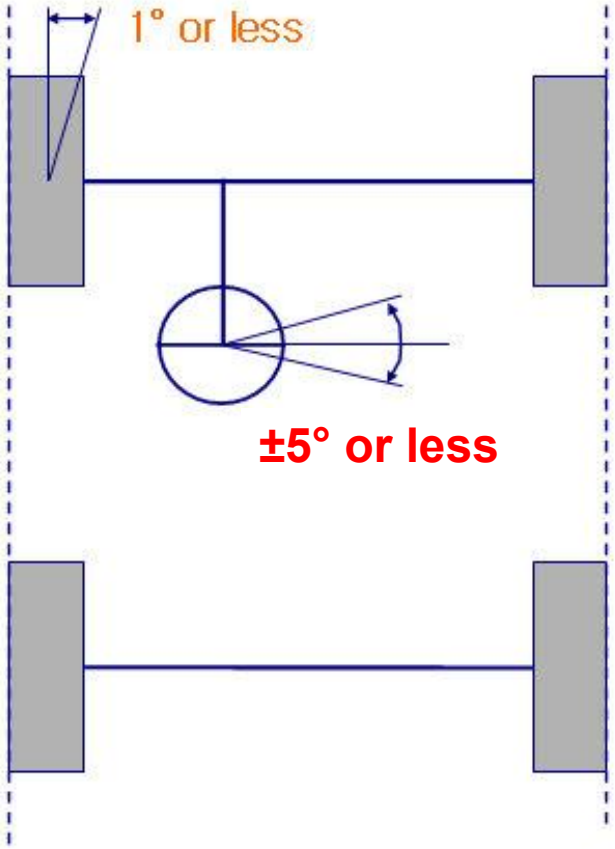




STEERING ANGLE SENSOR

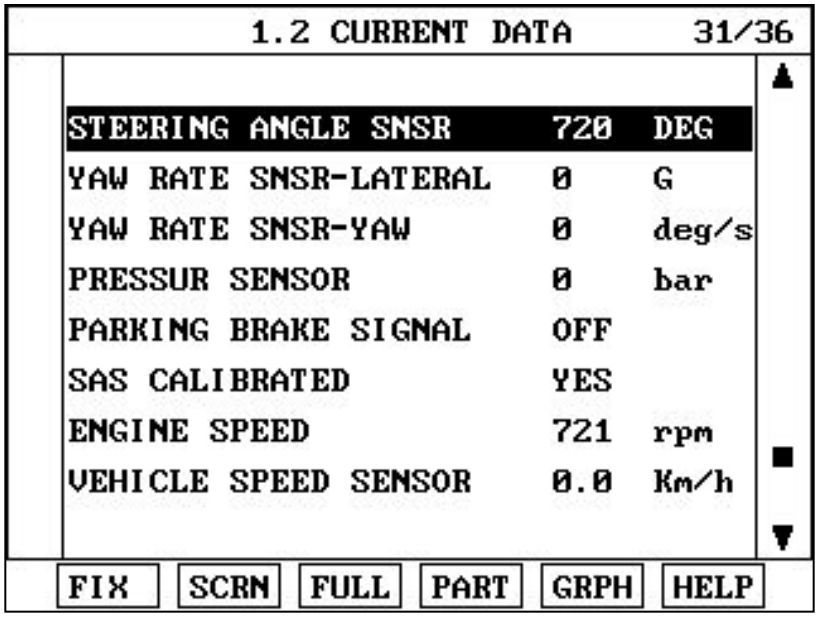
Steering angle calibration

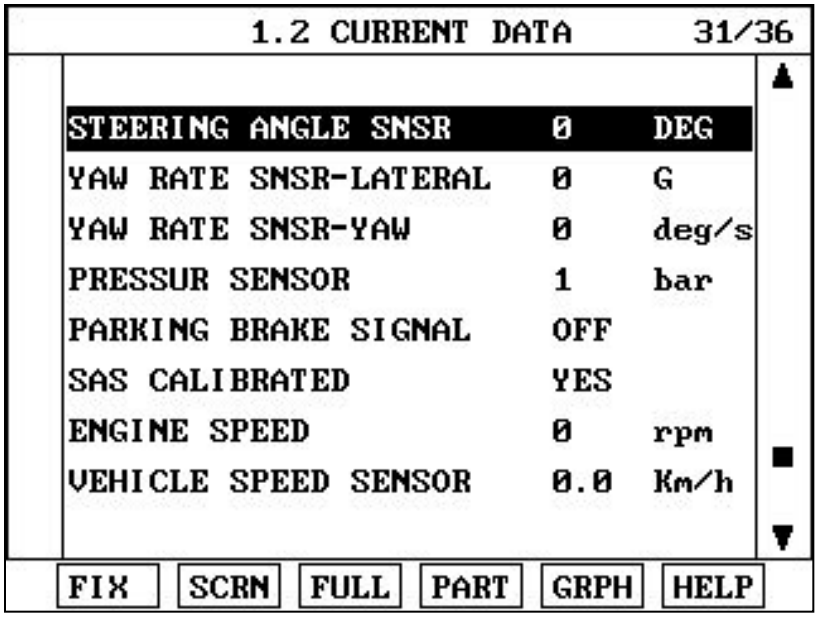
1. Suspension analysis for steering angle calibration or wheel in straight-ahead position. A prolonged straight-ahead drive can also be used during calibration to determine the steering wheel center position.
2. Calibration of the wheel angle sensor in straight-ahead position.
   (An incorrect calibration will set a fault code in the fault code memory.)



STEERING ANGLE SENSOR

Steering angle calibration





- Steering angle sensor calibration

  : After SAS replacement or clock spring replacement

PRESSURE SENSOR

Specification

- Operating Voltage : 5± 0.25 V
- Output voltage : 10% ~ 90% V_{pwr}
- Operating Pressure : 0 ~ 200 bar
- Response time : Max. 10msec
- Operational Temp. : - 40℃ ~ 125 ℃