B8 ENGINE CONTROL SYSTEM

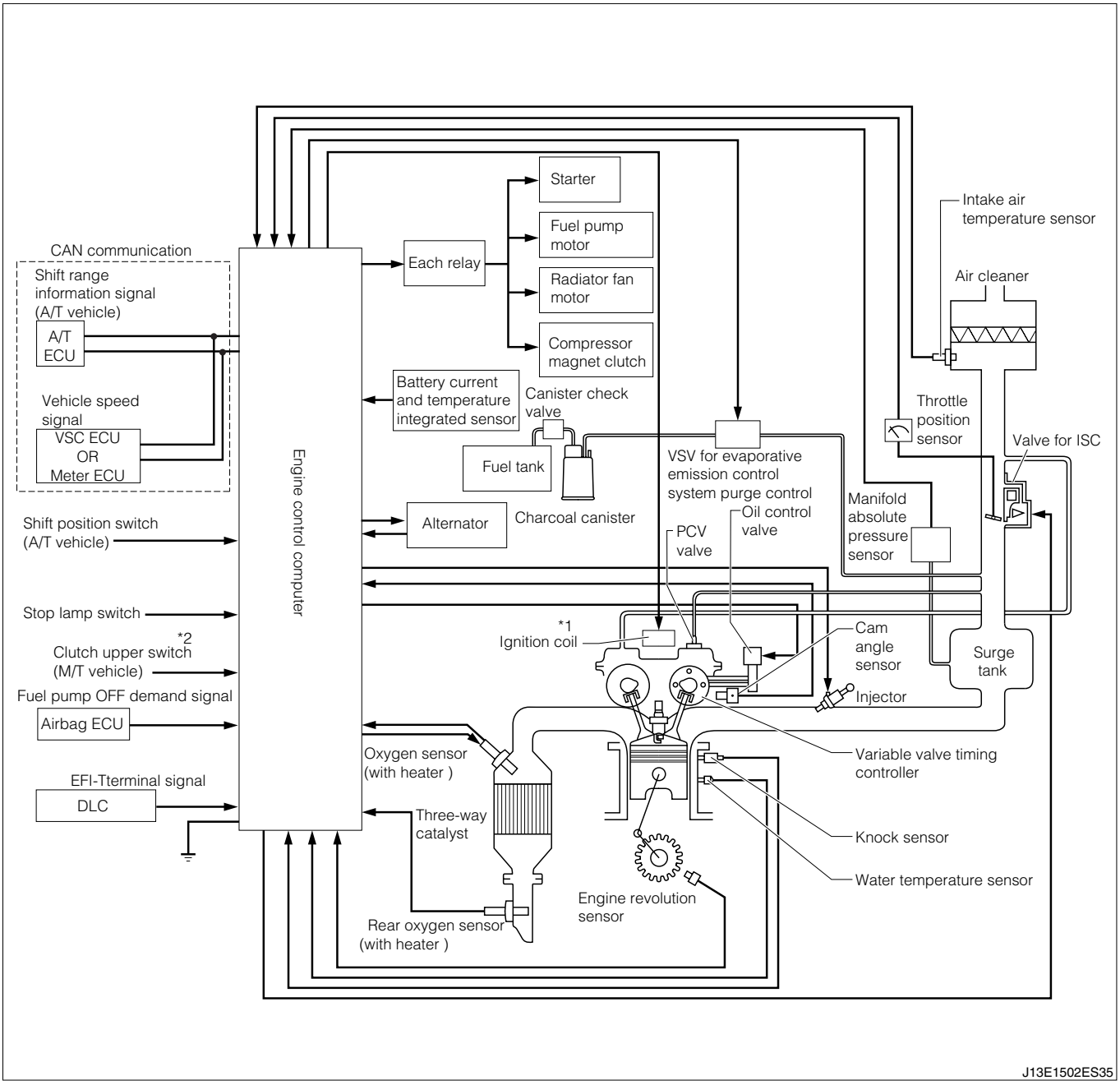
■ 3SZ,K3
1 OUTLINE

Refer to TERIOS TECHNICAL INFORMATION

1. With the adoption of idle-up control at the moment when the vehicle starts moving, the following changes have been made.(Europe specifications)
   (1) A clutch upper switch has been added. (M/T vehicles mounted with type 3SZ engines)
2. With the adoption of alternator electricity generation control, the following changes have been made.(Europe specifications)
   (1) An integrated battery current and temperature sensor has been added.
   (2) Some diagnosis (self-diagnosis) function specifications have been added.
   (3) Some fail-safe function specifications have been added.
3. With the adoption of cylinder identification in the primary ignition system, the following changes have been made. (General export specifications)
   (1) Some diagnosis (self-diagnosis) function specifications have been added.

1-1 SYSTEM DRAWING

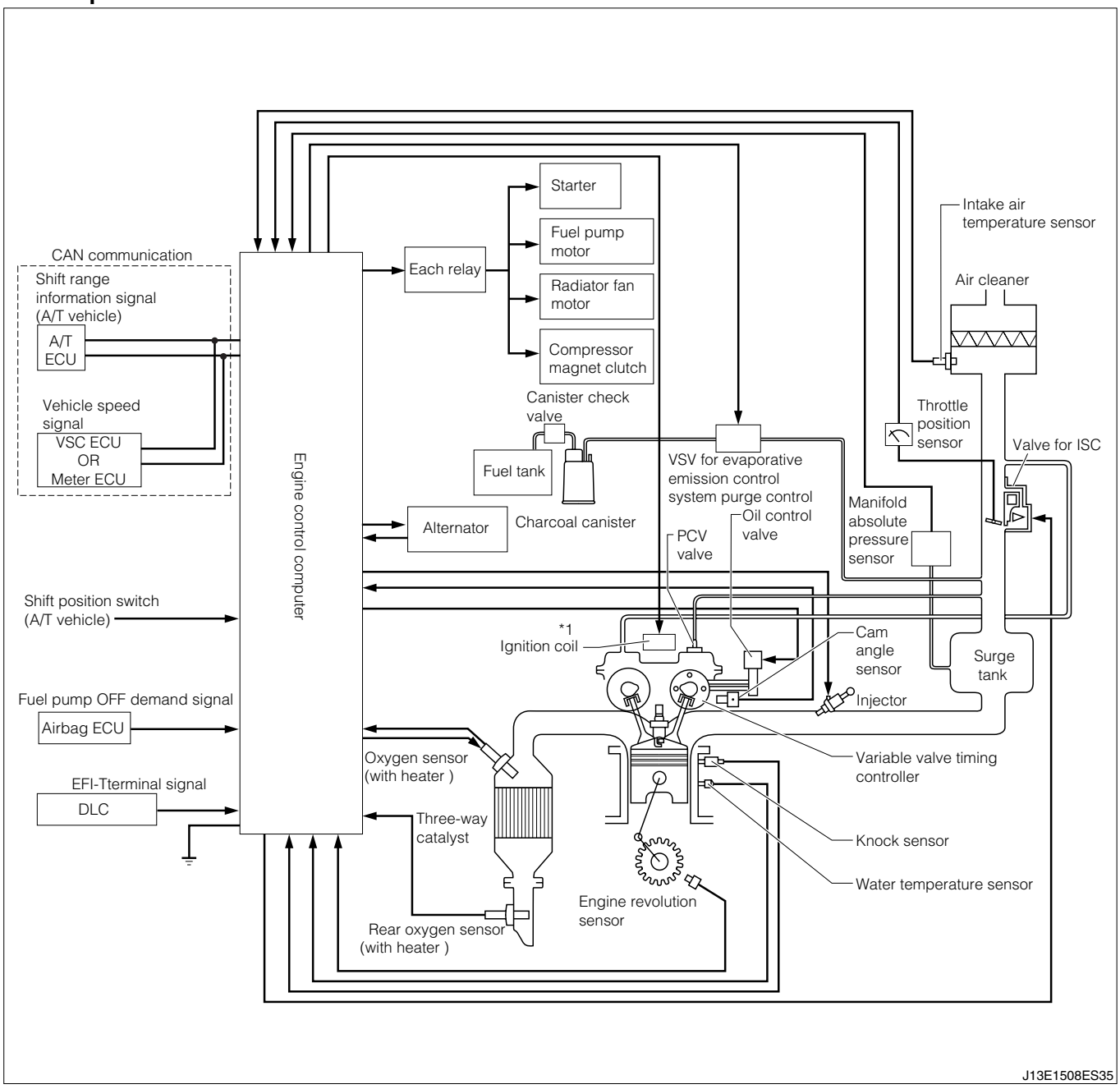
Europe specifications



*1: Ion current detection device built-in

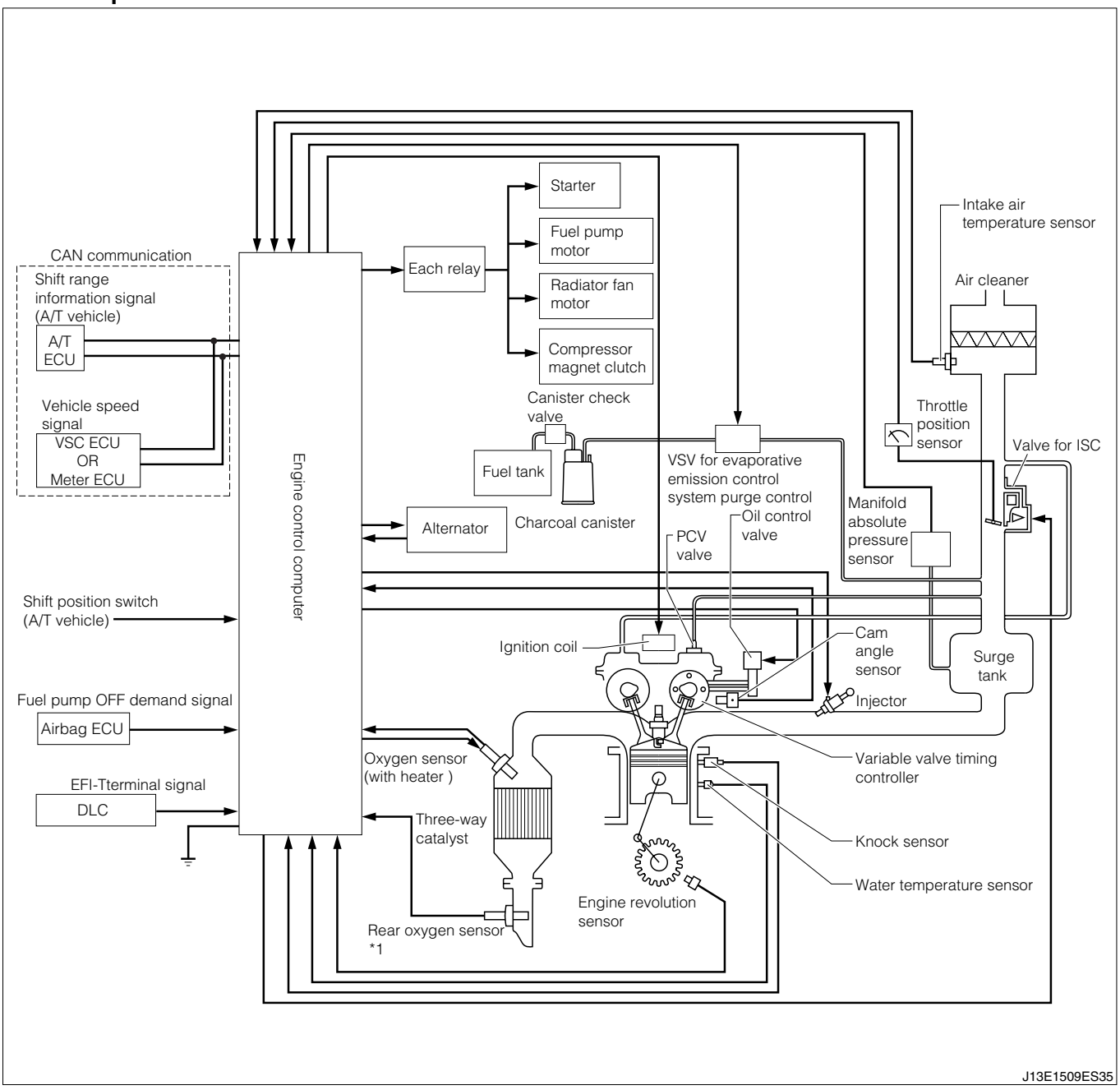
*2: M/T vehicles mounted with type 3SZ engines

China specifications



*1: Ion current detection device built-in

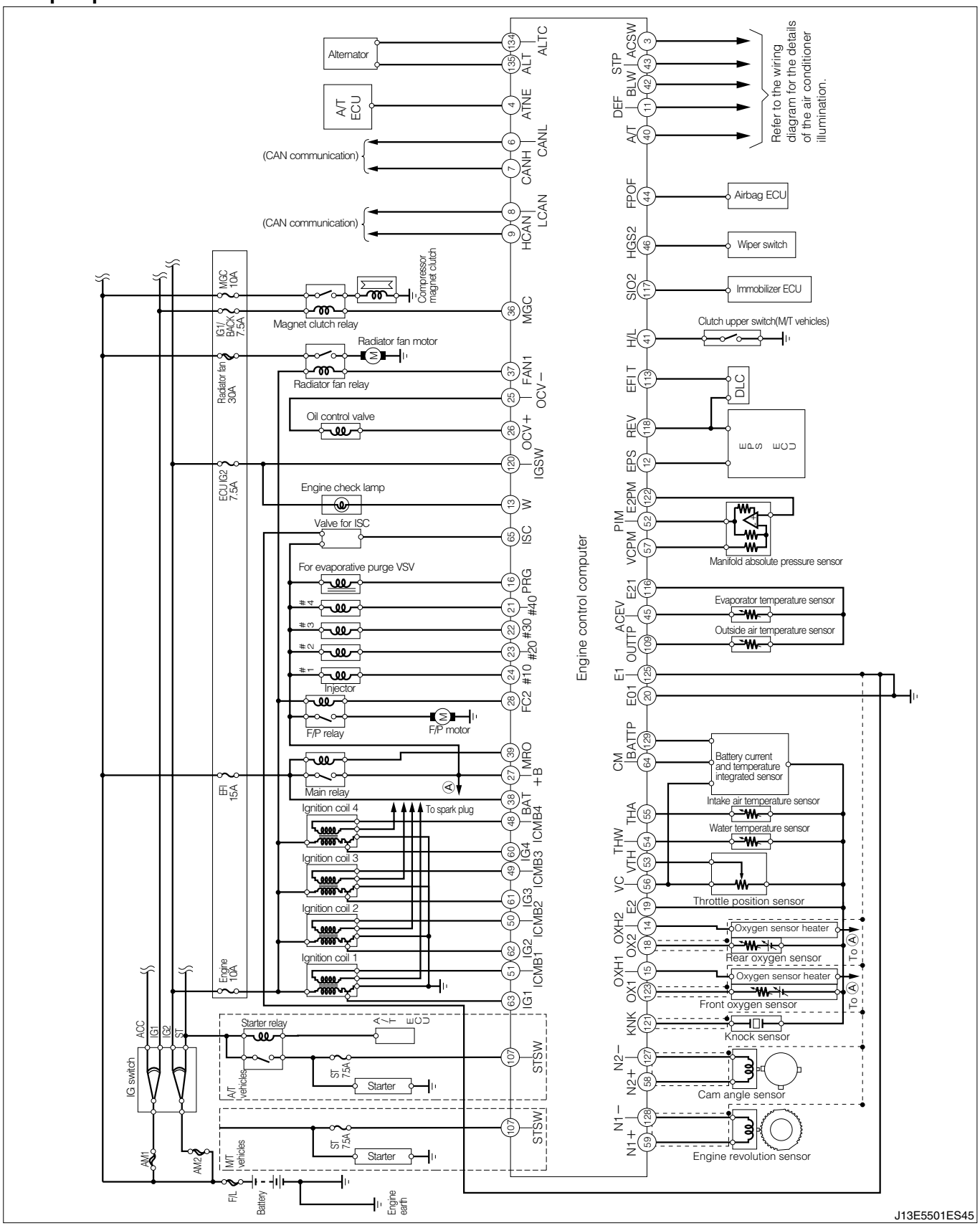
General specifications



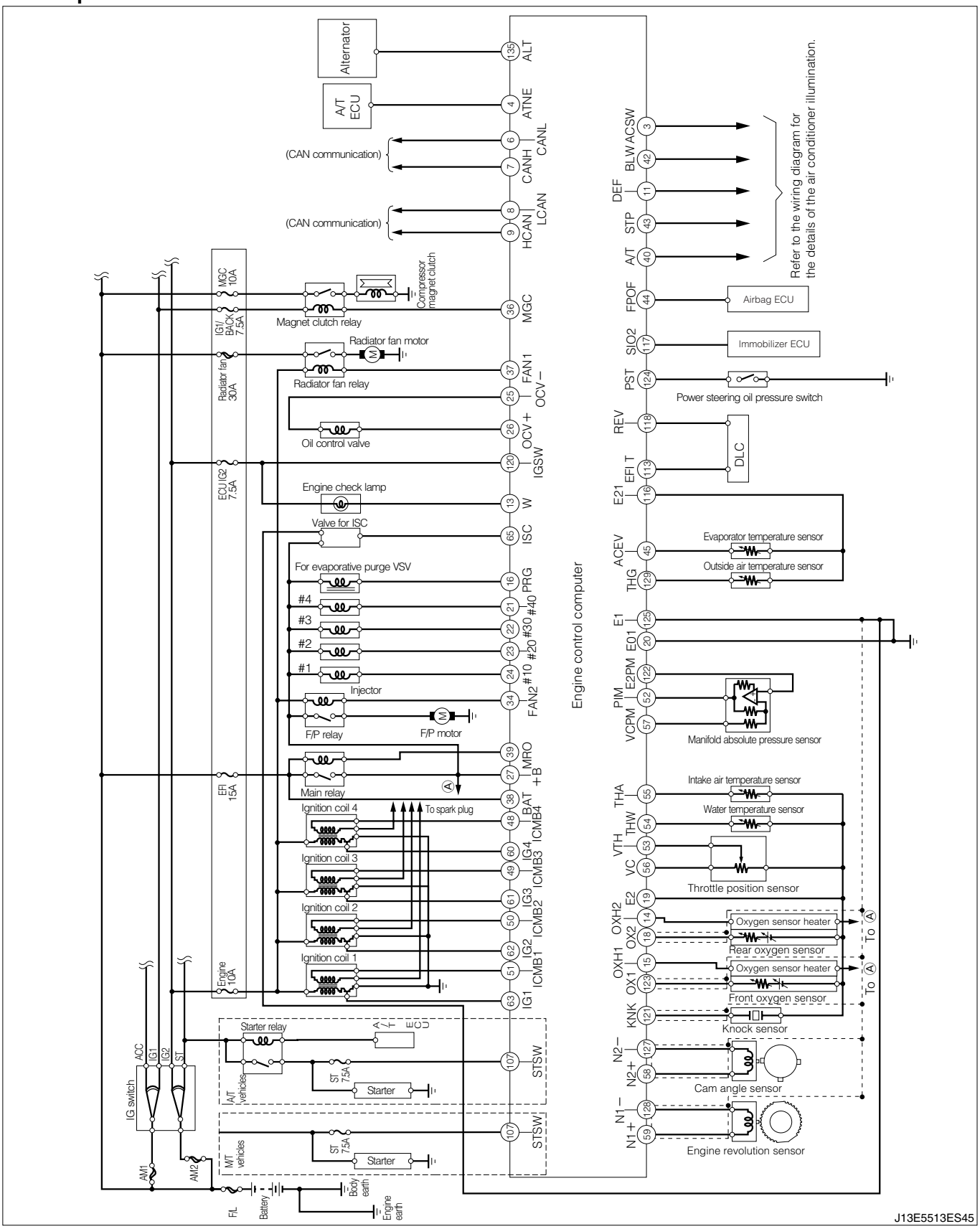
*1:Rear oxygen sensor equipped vehicle

1-2 SYSTEM WIRING DIAGRAM

Europe specifications



China specifications



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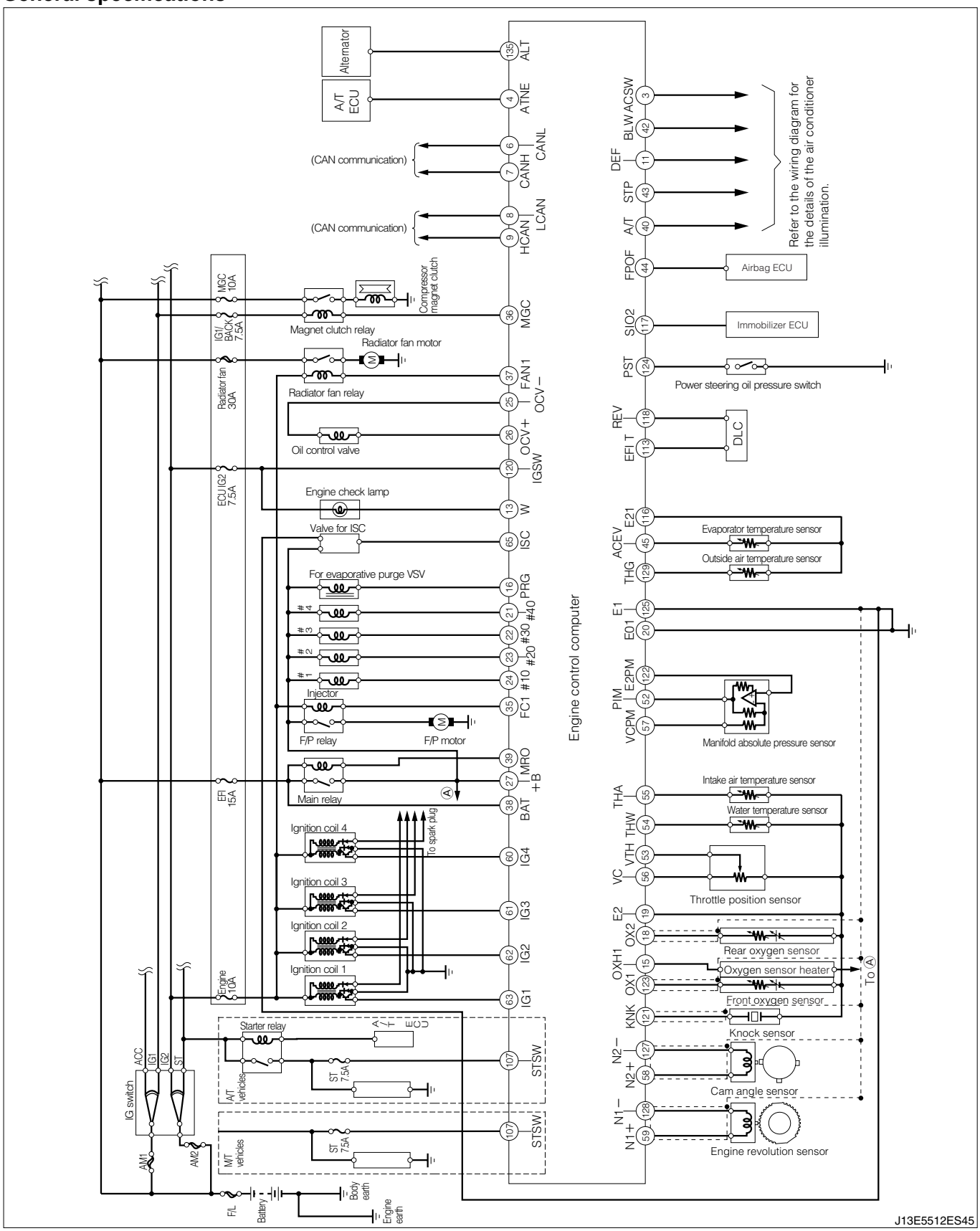
General specifications



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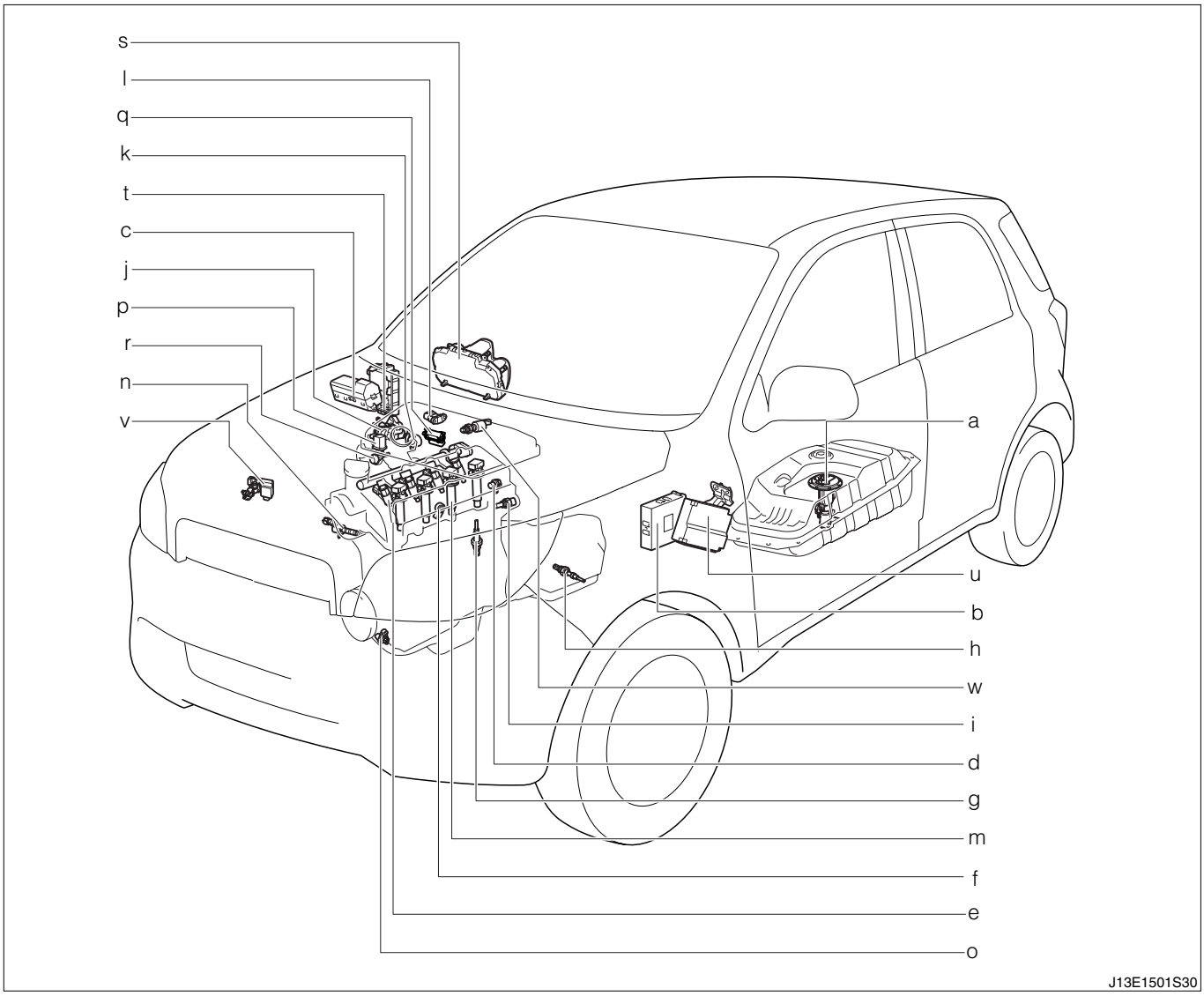
1-3 LOCATION OF COMPONENTS



Code	Part name	Code	Part name
a	Fuel pump	m*1	Ignition coil
b	Engine control computer	n	Oil control valve
c	Relay block	o	Engine revolution speed sensor
d	Cam angle sensor	p	VSV control for evaporative purge
e	Injectors	q	DLC
f	Knock sensor	r	Intake air temperature sensor
g	Front oxygen sensor	s	Combination meter
h	Rear oxygen sensor	t	Fuse block
i	Engine coolant temperature sensor	u*2	A/T ECU
j	Rotary ISC	v*3	Battery current and temperature integrated sensor
k	Throttle position sensor	w*4	Clutch upper switch
l	Manifold absolute pressure sensor	–	–

*1:Ion current detection device built-in for Europe and China specifications
*2:Automatic transaxle vehicles
*3:Europe specifications
*4:European specification (M/T vehicles mounted with type 3SZ engines)

2 CONTROL

2-1 IDLE-UP CONTROL AT MOMENT WHEN VEHICLE STARTS MOVING(EUROPE SPECIFICATIONS)

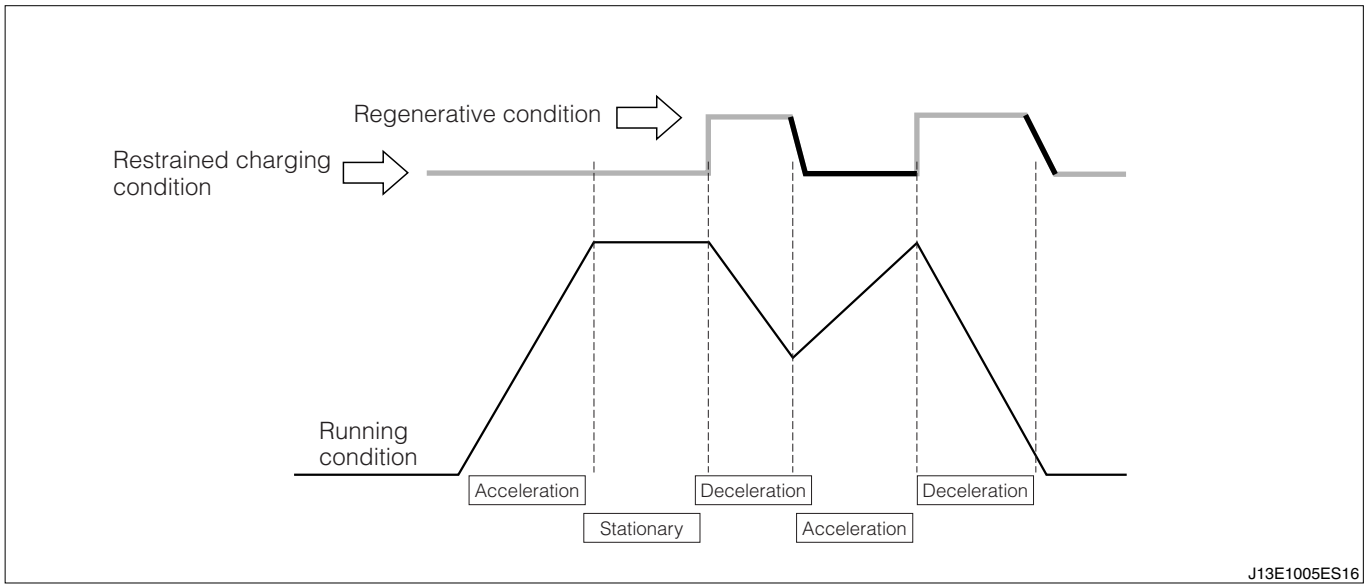
2-1-1 DESCRIPTION

1. When the vehicle starts moving with the shift lever in Ⓓ range, the engine control computer increases the idling speed of the engine to increase the creep power. (A/T vehicles)
2. When the clutch pedal is depressed, the engine control computer increases the idling speed of the engine, making it easier for the vehicle to start moving. (M/T vehicles mounted with type 3SZ engines)

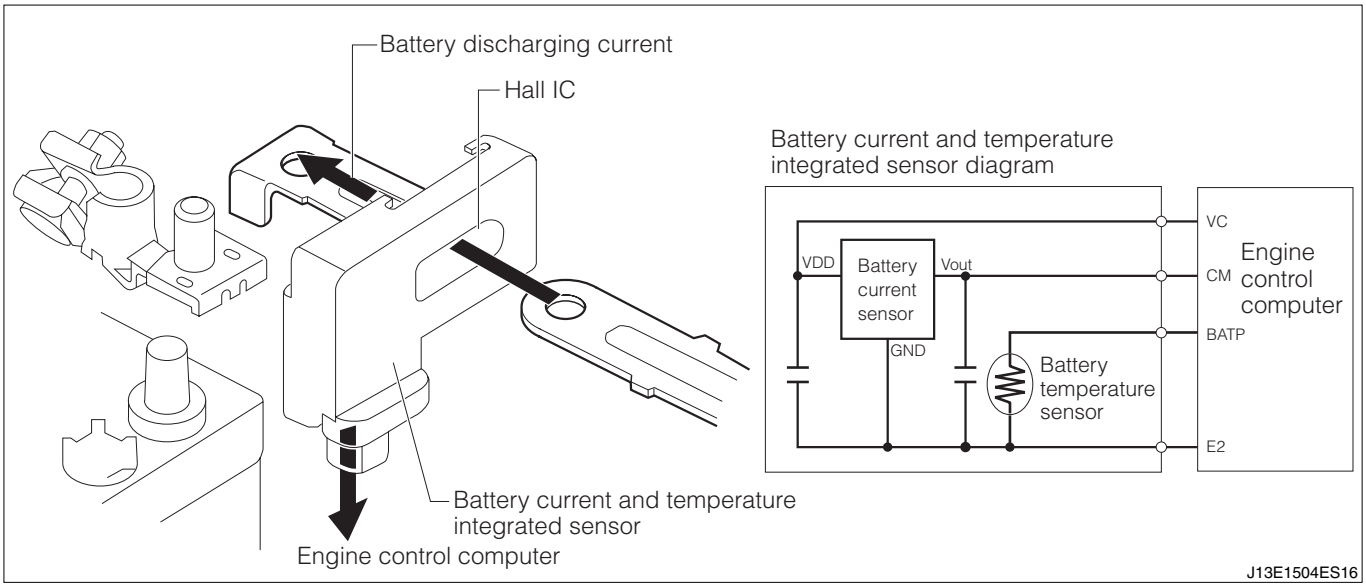
2-2 ALTERNATOR ELECTRICITY GENERATION CONTROL(EUROPE SPECIFICATIONS)

2-2-1 DESCRIPTION

1. Through continuous monitoring of the battery status, the excessive electricity generation of the alternator can be prevented.



2. The battery temperature sensor determines the temperature of the battery fluid surrounding the battery and sends signals to the engine control computer to perform charging control. Accordingly, the battery is protected, and a drop in battery capacity can be prevented.
3. The Hall IC is used to detect the amount of current discharged. It converts the amount of change in the magnetic flux density, which is generated at the core by the current discharged from the battery, into voltage. The engine control computer receives this voltage as a signal, and calculates the battery capacity from the change in the signal voltage.



2-3 DIAGNOSIS (SELF-DIAGNOSIS) FUNCTION

2-3-1 OUTLINE

Refer to TERIOS TECHNICAL INFORMATION

1. With the addition of alternator electricity generation control, a diagnosis (self-diagnosis) function has also been added.
2. With the adoption of cylinder identification in the primary ignition system,a diagnosis (self-diagnosis) function has been added.

2-3-2 FAIL-SAFE FUNCTION

Refer to TERIOS TECHNICAL INFORMATION

1. When the malfunction is remedied to the normal condition after an abnormality was detected, the fail-safe control will be released. However, the diagnosis result remains.

Fail-safe specifications

Item	Fail-safe execution conditions	Fail-safe specifications
Camshaft angle sensor system	When an abnormality occurs in the signal from the camshaft angle sensor	· The signal from the camshaft angle sensor is set to a constant value.
Ignition primary system*1	When malfunction takes place in the ignition signal	· Fuel injection is stopped. · The fuel to each cylinder is cut. · Air-to-fuel ratio feedback control is prohibited. · The target displacement angle is kept constant.
Knock sensor system	When abnormality takes place in the signal from the knock sensor circuit	·The ignition timing is retarded.
Rear oxygen sensor system*2	When malfunction takes place in the signal from the rear oxygen sensor	·The feedback control is turned to open control.
Manifold absolute pressure sensor signal system	When abnormality takes place in the signal from the manifold absolute pressure sensor	·The manifold absolute pressure is estimated by the throttle opening angle and the engine revolution speed. ·When abnormality occurs in the signal from the throttle position sensor, the signal from the manifold absolute pressure sensor is set to the constant value. ·If both the throttle opening angle and engine speed exceed their set values, the fuel is cut.
Throttle position sensor signal system	When malfunction takes place in the signal from the throttle position sensor	·The signal from the throttle position sensor is set to a constant value.
Water temperature sensor signal system	When malfunction takes place in the signal from the water temperature sensor	·The signal from the water temperature sensor is set to a constant value.
Intake air temperature sensor signal system	When malfunction takes place in the signal from the intake air temperature sensor	·The signal from the intake air temperature sensor is set to a constant value.
Air conditioner evaporator temperature sensor signal system	When malfunction takes place in the signal from the A/C evaporator temperature sensor	·The air conditioner will be cut.
Variable valve timing system	When an abnormality occurs in the valve timing control twice in a row	· The variable valve timing is set to the most retarded timing angle.
Rotary ISC system	When an abnormal signal occurs in the for ISC	·Cut off the energizing control for ISC.
Oil control valve system	When malfunction takes place in the control voltage for the oil control valve	·Prohibit the oil control valve energizing control.

*1:General specifications

*2:Rear oxygen sensor equipped vehicles

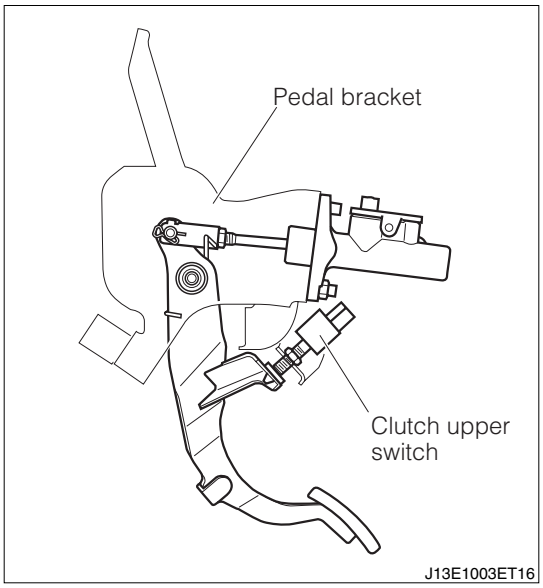
Item	Fail-safe execution conditions	Fail-safe specifications
Ion current control system*1*2	When an abnormality occurs in the ion current detection signal	· Ignition timing retarding control using ion current control is prohibited.
Battery current sensor signal system*1	When an abnormality occurs in the signal from the integrated battery current and temperature sensor	· Alternator electricity generation control is prohibited.
Battery temperature sensor signal system*1	When an abnormality occurs in the signal from the integrated battery current and temperature sensor	· Alternator electricity generation control is prohibited.
Starter relay drive output system	When an abnormality occurs in the starter relay output circuit or starter relay output monitor circuit	· Starter relay control is prohibited. · Fuel cut control is implemented. (When the engine revolution speed is 3500 rpm or more) · Prohibition of fuel injection at moment when vehicle starts moving
Immobilizer signal circuit malfunction*3	When abnormality occurs in the writing and reading-out of the rolling codes into/from the immobilizer ECU during immobilizer communication. When the rolling codes can not be exchanged between the EFI ECU and immobilizer ECU or rolling codes are not matched.	· Prohibition of fuel injection and ignition.
CAN communication system	When an abnormality occurs in the CAN communication system	· The values used for control are kept constant.

*1:Europe specifications
*2:China specifications
*3:Immobilizer equipped vehicles

3 COMPONENTS

3-1 CLUTCH UPPER SWITCH(EUROPEAN SPECIFICATION M/T VEHICLES MOUNTED WITH TYPE 3SZ ENGINES)

The clutch upper switch is installed in the return stopper bolt of the pedal bracket, and inputs the "ON" and "OFF" signals of the clutch into the engine control computer.



3-2 BATTERY CURRENT AND TEMPERATURE INTEGRATED SENSOR(EUROPE SPECIFICATIONS)

The battery current and temperature integrated sensor is located on the side of the negative terminal of the battery, where it is less likely to be affected by the heat of the engine, and detects both the charging status and the temperature status of the battery.