

YS2R6X400E9183445 / EMS, Engine Management System / E 44, EMS control unit / S6 / M, Electric motors / M1, Starter motor

E 44, EMS control unit

Control unit pin	Task	Signal type	Source/destination
A1/1	Injector control.	Pulsed voltage signal	9 litre: XPI injector, (V143). 13 litre: XPI injector, (V144). 16 litre: XPI injector, (V142).
A1/2	Injector control.	Pulsed voltage signal	9 litre: XPI injector, (V146). 13 litre: XPI injector, (V145). 16 litre: XPI injector, (V143).
A1/3	Injector control.	Pulsed voltage signal	13 litre: XPI injector, (V146). 16 litre: XPI injector, (V145).
A1/4	Injector control.	Pulsed voltage signal	16 litre: XPI injector, (V148).
A1/5	Not used.		
A1/6	Grounding, injector.	Ground	9 litre: XPI injector, (V143). 13 litre: XPI injector, (V144). 16 litre: XPI injector, (V142).
A1/7	Grounding, injector.	Ground	9 litre: XPI injector, (V146). 13 litre: XPI injector, (V145). 16 litre: XPI injector, (V143).
A1/8	Grounding, injector.	Ground	13 litre: XPI injector, (V146). 16 litre: XPI injector, (V145).
A1/9	Grounding, injector.	Ground	16 litre: XPI injector, (V148).
A1/10	Not used.		
A2/1	Not used.		
A2/2	Ground, exhaust gas pressure sensor.	Ground	Exhaust gas pressure sensor, (T125).
A2/3	Voltage supply, exhaust gas pressure sensor.	+5V	Exhaust gas pressure sensor, (T125).
A2/4	Ground, fuel pressure sensor.	Ground	Fuel pressure sensor, (T111).

A2/5	Voltage supply, fuel pressure sensor.	+5V	Fuel pressure sensor, (T111).
A2/6	Not used.		
A2/7	Exhaust gas pressure sensor signal.	Analogue signal	Exhaust gas pressure sensor, (T125).
A2/8	Not used.		
A2/9	Not used.		
A2/10	Fuel pressure sensor signal.	Analogue signal	Fuel pressure sensor, (T111).
A3/1	Control.	Digital output signal	Valve block, (V107).
A3/2	Signal, camshaft position sensor.	Input signal frequency	Camshaft position sensor, (T135).
A3/3	Signal, camshaft position sensor.	Input signal frequency	Camshaft position sensor, (T135).
A3/4	Signal from engine speed sensor T75.	Input signal frequency	Engine speed sensor, (T75).
A3/5	Signal from engine speed sensor T75.	Input signal frequency	Engine speed sensor, (T75).
A3/6	Ground, bypass valve	Ground	Valve block, (V107).
A3/7	Ground, EGR damper.	Ground	Valve block, (V107).
A3/8	EGR damper control.	PWM output signal	Valve block, (V107).
A3/9	Grounding exhaust brake damper.	Ground	Valve block, (V107).
A3/10	Grounding exhaust brake damper.	PWM output signal	Valve block, (V107).
A4/1	Not used.		
A4/2	Grounding.	Ground	13 litre: Valve block, (V107).
A4/3	Throttle control.	PWM output signal	13 litre: Valve block, (V107).
A4/4	Grounding the EGR valve position sensor.	Ground	EGR valve position sensor, (T124).
A4/5	Voltage supply, position sensor for EGR valve.	+5V	EGR valve position sensor, (T124).
A4/6	CAN bus to variable geometry turbocharger, M30, M42.	CAN High	CAN communication to E44.

A4/7	CAN bus to variable geometry turbocharger, M30.	CAN Low	CAN communication to E44.
A4/8	Not used.		
A4/9	Not used.		
A4/10	Signal from EGR valve position sensor.	Analogue signal	EGR valve position sensor, (T124).
A5/1	Wastegate valve control	PWM output signal	Valve block, (V107).
A5/2	Not used.		
A5/3	Not used.		
A5/4	Signal from engine speed sensor T74.	Input signal frequency	Engine speed sensor, (T74).
A5/5	Signal from engine speed sensor T74.	Input signal frequency	Engine speed sensor, (T74).
A5/6	Ground to wastegate valve control.	Ground	Valve block, (V107).
A5/7	Not used.		
A5/8	Not used.		
A5/9	Not used.		
A5/10	Not used.		
A6/1	Grounding, coolant pump rotational speed sensor.	Ground	Coolant pump rotational speed sensor, (V124).
A6/2	Voltage supply, coolant pump rotational speed sensor.	+12V	Coolant pump rotational speed sensor, (V124).
A6/3	Voltage supply of intake air temperature and flow sensor.	+24V	Intake air temperature and flow sensor, (T126).
A6/4	Grounding, pneumatic throttle position sensor.	Ground	Pneumatic throttle position sensor, (T162).
A6/5	Voltage supply, pneumatic throttle position sensor.	+5V	Pneumatic throttle position sensor, (T162).
A6/6	Signal, coolant pump rotational speed sensor.	PWM input signal	Coolant pump rotational speed sensor, (V124).
A6/7	Not used.		
A6/8	Grounding of intake air	Ground	Intake air temperature and

	temperature and flow sensor:		flow sensor, (T126).
A6/9	Signal from intake air temperature and flow sensor:	Analogue signal	Intake air temperature and flow sensor, (T126).
A6/10	Signal, pneumatic throttle position sensor.	Analogue signal	Pneumatic throttle position sensor, (T162).
A7/1	Not used.		
A7/2	Grounding, oil pressure sensor.	Ground	Oil pressure sensor, (T5).
A7/3	Voltage supply, oil pressure sensor.	+5V	Oil pressure sensor, (T5).
A7/4	Grounding, coolant pump solenoid valve.	Ground	Coolant pump solenoid valve, (V124).
A7/5	Control, coolant pump solenoid valve.	PWM output signal	Coolant pump solenoid valve, (V124).
A7/6	Grounding of intake air temperature and flow sensor:	Ground	Intake air temperature and flow sensor, (T126).
A7/7	Supply voltage to and signal from, intake air temperature and flow sensor.	+5V/Analogue signal	Intake air temperature and flow sensor, (T126).
A7/8	Signal, oil pressure sensor.	Analogue signal	Oil pressure sensor, (T5).
A7/9	Voltage supply to and signal from, coolant temperature sensor.	+5V/Analogue signal	Coolant temperature sensor, (T33).
A7/10	Grounding, coolant temperature sensor.	Ground	Coolant temperature sensor, (T33).
B1/1	Injector control.	Pulsed voltage signal	9 litre: XPI injector, (V142). 13 litre: XPI injector, (V141). 16 litre: XPI injector, (V141).
B1/2	Injector control.	Pulsed voltage signal	9 litre: XPI injector, (V144). 13 litre: XPI injector, (V142). 16 litre: XPI injector, (V144).
B1/3	Injector control.	Pulsed voltage signal	9 litre: XPI injector, (V145). 13 litre: XPI injector, (V143). 16 litre: XPI injector, (V146).
B1/4	Injector control.	Pulsed voltage signal	16 litre: XPI injector, (V147).
B1/5	Not used		

B1/6	Grounding of injector.	Ground	9 litre: XPI injector, (V142). 13 litre: XPI injector, (V141). 16 litre: XPI injector, (V141).
B1/7	Grounding of injector.	Ground	9 litre: XPI injector, (V144). 13 litre: XPI injector, (V142). 16 litre: XPI injector, (V144).
B1/8	Grounding of injector.	Ground	9 litre: XPI injector, (V145). 13 litre: XPI injector, (V143). 16 litre: XPI injector, (V146).
B1/9	Grounding of injector.	Ground	16 litre: XPI injector, (V147).
B1/10	Not used.		
B2/1	Not used.		
B2/2	Not used.		
B2/3	Not used.		
B2/4	Grounding of charge air pressure sensor.	Ground	Charge air pressure sensor, (T122).
B2/5	Voltage supply, charge air pressure sensor.	+5V	Charge air pressure sensor, (T122).
B2/6	Not used.		
B2/7	Not used.		
B2/8	Grounding, charge air temperature sensor.	Ground	Charge air temperature sensor, (T121).
B2/9	Voltage supply to and signal from, charge air temperature sensor.	+5V/Analogue signal	Charge air temperature sensor, (T121).
B2/10	Signal, charge air pressure sensor.	Analogue signal	Charge air pressure sensor, (T122).
B3/1	Voltage supply 2, control unit.	+24V	P2.
B3/2	Grounding 2, control unit.	Ground	G15.
B3/3	Signal via starter lock.	+24V	15 voltage.
B3/4	Grounding, electric motor for variable geometry turbo-charger, M30.	Ground	G15.

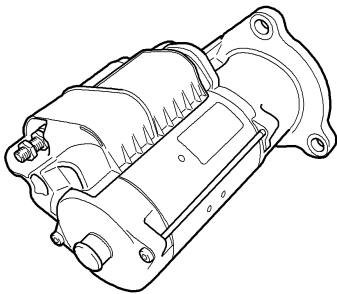
B3/5	Not used.		
B3/6	Voltage supply 1, control unit.	+24V	P2.
B3/7	Grounding 1, control unit.	Ground	G15.
B3/8	Voltage supply, electric motor for variable geometry turbo-charger.	+24V	P2.
B3/9	CAN Red bus.	CAN High	Red CAN.
B3/10	CAN Red bus.	CAN Low	Red CAN.
B4/1	Switching off the alternator. ADR only.	PWM output signal	ADR only.
B4/2	Not used.		
B4/3	Not used.		
B4/4	Not used.		
B4/5	Not used.		
B4/6	Not used.		
B4/7	Internal CAN communication.	CAN High	EEC3, (E67). GCS, (E88).
B4/8	Internal CAN communication.	CAN Low	EEC3, (E67). GCS, (E88).
B4/9	Not used.		
B4/10	Not used.		
B5/1	Control of starter motor.	Digital output signal	Starter motor (Relay) M1.
B5/2	Not used.		
B5/3	Signal from alternator.	Digital input signal	Alternator, (P3).
B5/4	Signal from alternator.	Digital input signal	Bus: Alternator, (P500).
B5/5	Signal, fan rotational speed sensor.	PWM input signal	Fan rotational speed sensor, (T123).
B5/6	Not used.		
B5/7	Grounding, fuel inlet metering valve.	Ground	Fuel inlet metering valve, (V120).

B5/8	Control of fuel inlet metering valve.	PWM output signal	Fuel inlet metering valve, (V120).
B5/9	Control of alternator 1.	PWM output signal	Alternator, (P3).
B5/10	Control of alternator 2.	PWM output signal	Bus: Alternator, (P500).
B6/1	Control of fan solenoid valve.	PWM output signal	Fan solenoid valve, (T123). Bus: Hydraulic pump (V119).
B6/2	Voltage supply, oil level sensor.	+5V	Oil level sensor (T110).
B6/3	Control of coupling coil for A/C compressor.	Digital output signal	Coupling coil for A/C compressor, (V2).
B6/4	Grounding of coupling coil for A/C compressor.	Ground	Coupling coil for A/C compressor, (V2).
B6/5	Voltage supply of fan rotational speed sensor.	+12V	Fan rotational speed sensor, (T123).
B6/6	Grounding of fan solenoid valve.	Ground	Fan solenoid valve, (T123). Bus: Hydraulic pump (V119).
B6/7	Grounding of oil level sensor.	Ground	Oil level sensor, (T110).
B6/8	Signal, oil level sensor.	Analogue signal	Oil level sensor, (T110).
B6/9	Grounding of fan rotational speed sensor.	Ground	Fan rotational speed sensor, (T123).
B6/10	Not used.		
B7/1	Signal, turbo speed sensor.	Frequency, input signal	Turbo speed sensor, (T120).
B7/2	Voltage supply, electric motor for variable geometry turbocharger.	+24V	Electric motor for variable geometry turbocharger, (M30).
B7/3	Not used.		
B7/4	Grounding, differential pressure sensor for particulate filter and pressure sensor for charge air cooler.	Ground	EEV: Differential pressure sensor for particulate filter, (T141). Euro 6: Charge air cooler pressure sensor, (T166).
B7/5	Voltage supply, differential pressure sensor for particulate filter and pressure sensor for charge air cooler.	+5V	EEV: Differential pressure sensor for particulate filter, (T141). Euro 6: Charge air cooler pressure sensor, (T166).

B7/6	Signal, turbo speed sensor.	Frequency, input signal	Turbo speed sensor, (T120).
B7/7	Grounding, electric motor for variable geometry turbo-charger.	Ground	Electric motor for variable geometry turbocharger, (M30).
B7/8	Not used.		
B7/9	Not used.		
B7/10	Signal, charge air cooler pressure sensor. Vehicles with EEV only: Signal, particulate filter differential pressure sensor.	Analogue signal	Euro 6: Charge air cooler pressure sensor, (T166). EEV: Differential pressure sensor for particulate filter, (T141).

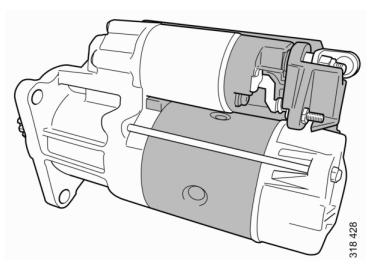
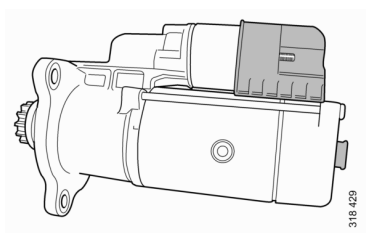
M 1, Starter motor

The starter motor is activated via control voltage from the engine control unit and via battery voltage (30 supply). The control voltage activates a pre-relay. When control voltage is activated, the starter relay (solenoid) in the starter motor is powered up. When the control voltage is interrupted, the solenoid switch is no longer powered. The engine control unit monitors the start-up process. Fault codes will be generated, if the start-up process is not carried out normally. To prevent the starter motor from overheating, it should be operated for a maximum of 30 seconds. After that, the starter motor must be rested for at least 30 seconds. The starter motor may only be used 5 times in a row. After that it must be rested for 15 minutes. In an emergency, the starter motor on vehicles with a manual gearbox can be run for a maximum of 64 seconds to move the vehicle to a safer place. After that, the control unit shuts off the starter motor.

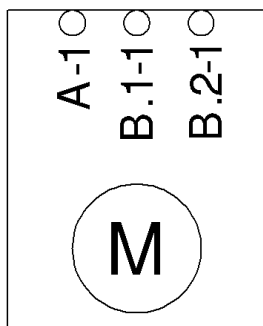


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