

Engine Control Module (ECM) I/O Signal

ENGINE (DIAGNOSTICS)

5. Engine Control Module (ECM) I/O Signal

A: ELECTRICAL SPECIFICATION

A: TO B134								B: TO B135								C: TO B136								D: TO B137							
7	6	5	4	3	2	1		7	6	5	4	3				2	1	6	5		4	3	2	1	7	6	5	4	3	2	1
17	16	15	14	13	12	11	10	9	8									16	15	14	13	12	11	10	9	8					
27	26	25	24	23	22	21	20	19	18									27	26	25	24	23	22	21	20	19	18				
34	33					32	31	30	29	28								35	34			33	32			31	30	29	28		

EN-05288

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Contents		Connector No.	Terminal No.	Signal (V)		Note
				Ignition SW ON (engine OFF)	Engine ON (idling)	
Crankshaft position sensor	Signal (+)	B134	13	0	-7 — +7	Sensor output waveform
	Signal (-)	B134	14	0	0	—
	Shield	B134	24	0	0	—
Rear oxygen sensor	Signal	B135	4	0	0 — 0.9	—
	Shield	B135	1	0	0	—
	GND (sensor)	B135	30	0	0	—
Front oxygen (A/F) sensor heater	Signal 1	B136	3	0 — 1.0	—	Sensor output waveform
	Signal 2	B136	2	0 — 1.0	—	Sensor output waveform
Rear oxygen sensor heater signal		B136	4	0 — 1.0	—	Sensor output waveform
Engine coolant temperature sensor	Signal	B134	34	1.0 — 1.4	1.0 — 1.4	After engine is warmed-up.
	GND (sensor)	B134	29	0	0	After engine is warmed-up.
Vehicle speed signal		B136	13	0 or 5	0 or 5	"5" and "0" are repeatedly displayed when vehicle is driven.
Air flow sensor	Signal	B135	26	—	0.3 — 4.5	—
	Shield	B135	35	0	0	—
	GND	B135	34	0	0	—
Intake air temperature sensor signal		B135	18	0.3 — 4.6	0.3 — 4.6	—
Tumble generator valve position sensor RH	Signal	B134	26	Fully closed: 3.8 — 4.9 Fully open: 0.2 — 0.9		—
	Power supply	B134	19	5	5	—
	GND (sensor)	B134	29	0	0	—
Tumble generator valve position sensor LH	Signal	B134	16	Fully closed: 3.8 — 4.9 Fully open: 0.2 — 0.9		—
	Power supply	B134	19	5	5	—
	GND (sensor)	B134	29	0	0	—
Tumble generator valve RH (open)		B137	22	0 or 10 — 13	0 or 12 — 14	Sensor output waveform
Tumble generator valve RH (close)		B137	23	0 or 10 — 13	0 or 12 — 14	Sensor output waveform
Tumble generator valve LH (open)		B137	12	0 or 10 — 13	0 or 12 — 14	Sensor output waveform
Tumble generator valve LH (close)		B137	13	0 or 10 — 13	0 or 12 — 14	Sensor output waveform
Wastegate control solenoid valve		B137	27	0 or 10 — 13	0 or 12 — 14	Sensor output waveform
Starter switch		B136	32	0	0	Cranking: 8 — 14
A/C switch		B136	24	ON: 10 — 13 OFF: 0	ON: 12 — 14 OFF: 0	—
Ignition switch		B135	19	10 — 13	12 — 14	—
Neutral position switch		B136	31	ON: 10 — 13 OFF: 0	ON: 12 — 14 OFF: 0	—
Delivery (test) mode connector		B135	27	10 — 13	13 — 14	When connected: 0

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Contents		Connector No.	Terminal No.	Signal (V)		Note
				Ignition SW ON (engine OFF)	Engine ON (idling)	
Knock sensor	Signal	B134	15	2.8	2.8	—
	Shield	B134	25	0	0	—
Back-up power supply		B135	5	10 — 13	12 — 14	Ignition switch "OFF" : 10 — 13
Control module power supply		B134	7	10 — 13	12 — 14	—
		B135	2	10 — 13	12 — 14	—
Sensor power supply		B134	19	5	5	—
Ignition control	#1	B137	18	0	12 — 14	Waveform
	#2	B137	19	0	12 — 14	Waveform
	#3	B137	20	0	12 — 14	Waveform
	#4	B137	21	0	12 — 14	Waveform
Fuel injector	#1	B137	8	10 — 13	1 — 14	Waveform
	#2	B137	9	10 — 13	1 — 14	Waveform
	#3	B137	10	10 — 13	1 — 14	Waveform
	#4	B137	11	10 — 13	1 — 14	Waveform
Fuel pump control unit	Signal 1	B136	12	0 or 5	0 or 5	Sensor output waveform
	Signal 2	B135	33	10 — 13	12 — 14	—
A/C relay control		B136	9	ON: 0.5 or less OFF: 10 — 13	ON: 0.5 or less OFF: 12 — 14	—
Radiator fan relay 1 control		B136	18	ON: 0.5 or less OFF: 10 — 13	ON: 0.5 or less OFF: 12 — 14	—
Radiator fan relay 2 control		B136	29	ON: 0.5 or less OFF: 10 — 13	ON: 0.5 or less OFF: 12 — 14	Model with A/C only
Malfunction indicator light		B136	11	—	—	Light "ON": 1 or less Light "OFF": 10 — 14
Engine speed output		B136	22	—	0 — 13 or more	Waveform
Purge control solenoid valve 1		B137	29	ON: 1 or less OFF: 10 — 13	ON: 1 or less OFF: 12 — 14	Sensor output waveform
Purge control solenoid valve 2		B136	7	ON: 1 or less OFF: 10 — 13	ON: 1 or less OFF: 12 — 14	Sensor output waveform
Manifold absolute pressure sensor	Signal	B134	6	1.7 — 2.4	1.1 — 1.6	—
	Power supply	B134	19	5	5	
	GND (sensor)	B134	29	0	0	
Fuel tank pressure sensor	Signal	B135	32	2.3 — 2.7	2.3 — 2.7	The valve operates when fuel filler cap is removed and reinstalled.
	Power supply	B135	22	5	5	
	GND (sensor)	B135	30	0	0	—
Pressure control solenoid valve		B136	28	ON: 1 or less OFF: 10 — 13	ON: 1 or less OFF: 12 — 14	—
Drain valve		B136	17	ON: 1 or less OFF: 10 — 13	ON: 1 or less OFF: 12 — 14	—
Fuel level sensor		B135	10	0.12 — 4.75	0.12 — 4.75	—
Fuel temperature sensor signal		B135	17	2.5 — 3.8	2.5 — 3.8	Ambient temperature: 25°C (77°F)
Blow-by leak diagnosis signal		B134	30	0	0	At the time of open circuit (fault): 5
Small light switch		B135	15	ON: 0 OFF: 10 — 13	ON: 0 OFF: 12 — 14	—

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				Ignition SW ON (engine OFF)	Engine ON (idling)	
Blower fan switch		B135	16	ON: 0 OFF: 10 — 13	ON: 0 OFF: 12 — 14	—
Rear defogger switch		B135	14	ON: 0 OFF: 10 — 13	ON: 0 OFF: 12 — 14	—
Power steering oil pressure switch		B134	33	10 — 13	ON: 0 OFF: 12 — 14	—
Front oxygen (A/F) sensor	Signal (+)	B135	9	2.8 — 3.2	2.8 — 3.2	—
	Signal (—)	B135	8	2.4 — 2.7	2.4 — 2.7	—
	Shield	B135	1	0	0	—
SSM/GST communication line		B136	16	1 ↔ 4	1 ↔ 4	—
Ground (engine 4)		B137	1	0	0	—
Ground (ignition system 1)		B137	26	0	0	—
Ground (ignition system 2)		B137	6	0	0	—
Ground (engine 3)		B137	2	0	0	—
Ground (engine 1)		B134	5	0	0	—
Ground (engine 5)		B137	3	0	0	—
Ground (engine 2)		B137	7	0	0	—
Camshaft position sensor (LH)		B134	21	0 — 0.9	ON: 0 OFF: 4.7 — 5.3	Sensor output waveform
Camshaft position sensor (RH)		B134	11	0 — 0.9	ON: 0 OFF: 4.7 — 5.3	Sensor output waveform
Electronic throttle control	Main	B134	18	0.64 — 0.72 Fully opened: 3.96	0.64 — 0.72 (After engine is warmed-up.)	Fully closed: 0.6 Fully opened: 3.96
	Sub	B134	28	1.51 — 1.58 Fully opened: 4.17	1.51 — 1.58 (After engine is warmed-up.)	Fully closed: 1.48 Fully opened: 4.17
	Power supply	B134	19	5	5	—
	GND (sensor)	B134	29	0	0	—
Electronic throttle control motor (+)		B137	5	Duty waveform	Duty waveform	Drive frequency: 500 Hz
Electronic throttle control motor (—)		B137	4	Duty waveform	Duty waveform	Drive frequency: 500 Hz
Electronic throttle control motor power supply		B136	1	10 — 13	12 — 14	—
Electronic throttle control motor relay		B136	21	0	0	—
Oil flow control solenoid (LH)	Signal (+)	B137	15	ON: 10 — 13 OFF: 0	ON: 12 — 14 OFF: 0	—
	Signal (—)	B137	14	0	0	—
Oil flow control solenoid (RH)	Signal (+)	B137	17	ON: 10 — 13 OFF: 0	ON: 12 — 14 OFF: 0	—
	Signal (—)	B137	16	0	0	—

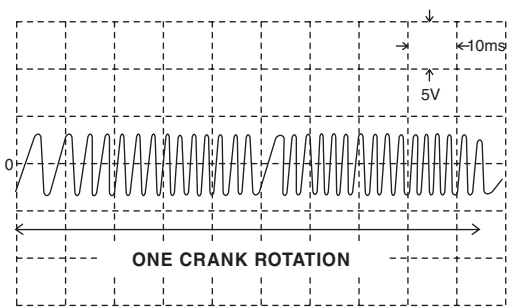
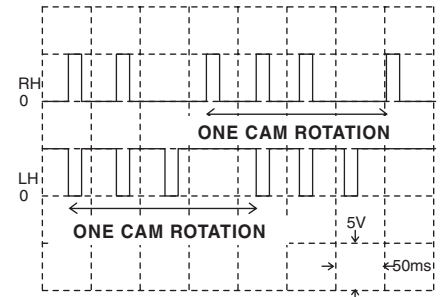
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Contents		Connector No.	Terminal No.	Signal (V)		Note
				Ignition SW ON (engine OFF)	Engine ON (idling)	
Accelerator pedal position sensor	Main sensor signal	B135	23	Fully closed: 1 Fully opened: 3.5	Fully closed: 1 Fully opened: 3.5	—
	Main power supply	B135	21	5	5	—
	GND (main sensor)	B135	29	0	0	—
	Sub sensor signal	B135	31	Fully closed: 1 Fully opened: 3.5	Fully closed: 1 Fully opened: 3.5	—
	Sub power supply	B135	22	5	5	—
	GND (Sub sensor)	B135	30	0	0	—
Main light		B135	6	ON: 0 OFF: 10 — 13	ON: 0 OFF: 12 — 14	—
Cruise control set light		B135	3	ON: 0 OFF: 10 — 13	ON: 0 OFF: 12 — 14	—
Clutch switch		B136	25	When clutch pedal is depressed: 0 When brake pedal is released: 10 — 13	When clutch pedal is depressed: 0 When brake pedal is released: 12 — 14	—
SET/COAST switch		B135	24	ON: 10 — 13 OFF: 0	ON: 12 — 14 OFF: 0	—
Brake switch 1		B135	20	When brake pedal is depressed: 0 When brake pedal is released: 10 — 13	When brake pedal is depressed: 0 When brake pedal is released: 12 — 14	—
Brake switch 2		B135	28	When brake pedal is depressed: 10 — 13 When brake pedal is released: 0	When brake pedal is depressed: 12 — 14 When brake pedal is released: 0	—
Main switch		B135	12	ON: 10 — 13 OFF: 0	ON: 12 — 14 OFF: 0	—
CAN communication	Signal (+)	B136	27	Pulse signal		—
	Signal (—)	B136	35	Pulse signal		—
Secondary air piping pressure sensor	Signal	B134	27	1.7 — 2.4	1.1 — 1.6	—
	Power supply	B134	19	5	5	
	GND (sensor)	B134	29	0	0	
Secondary air combination valve relay 1		B136	30	ON: 0 OFF: 10 — 13	ON: 0 OFF: 12 — 14	—
Secondary air combination valve relay 2		B136	19	ON: 0 OFF: 10 — 13	ON: 0 OFF: 12 — 14	—
Secondary air pump relay		B136	8	ON: 0 OFF: 10 — 13	ON: 0 OFF: 12 — 14	—

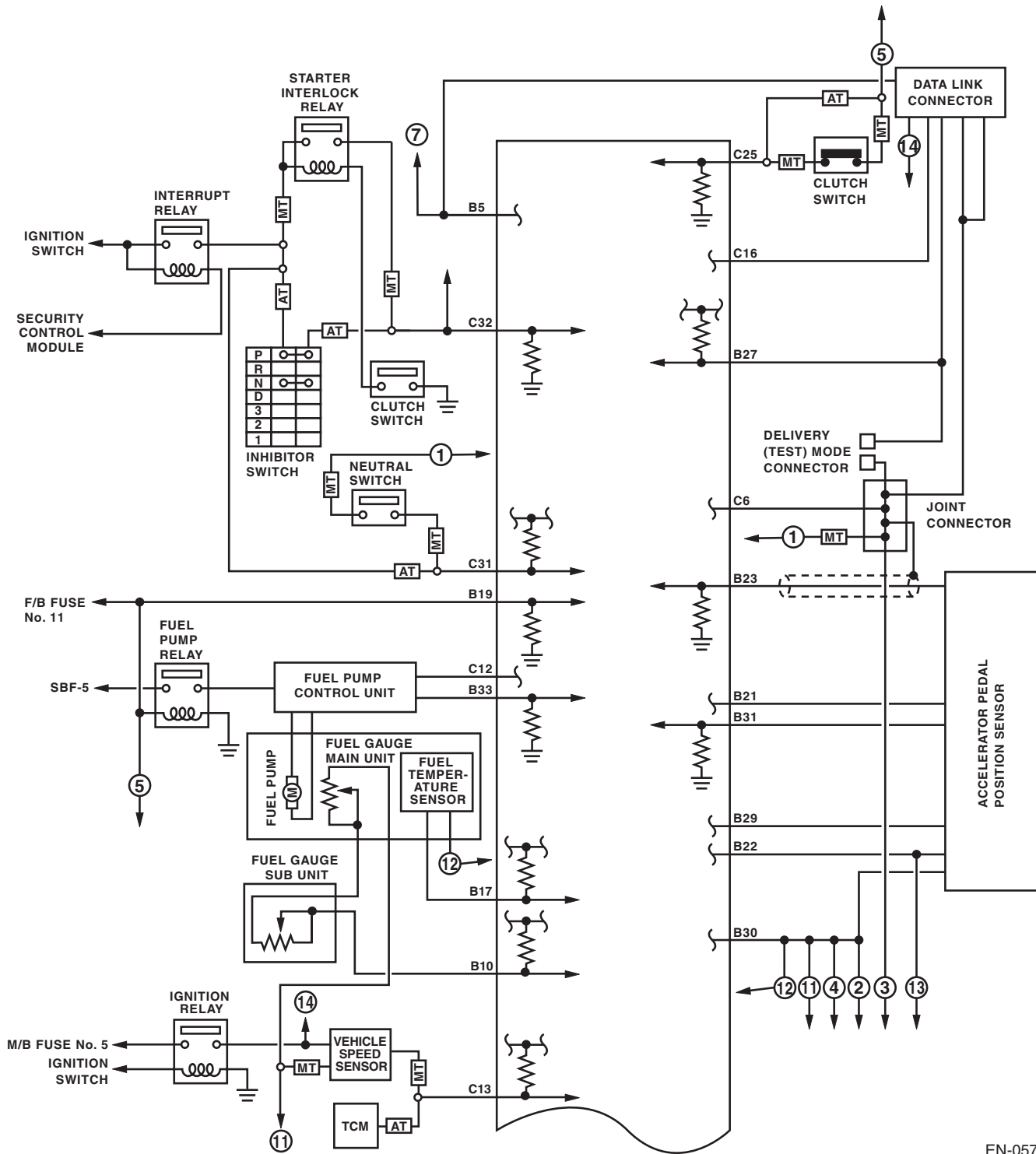
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Input/output name	Measuring condition	Waveform
1. Crankshaft position sensor	During idling	 EN-05322
2. Camshaft position sensor	During idling	 EN-05359

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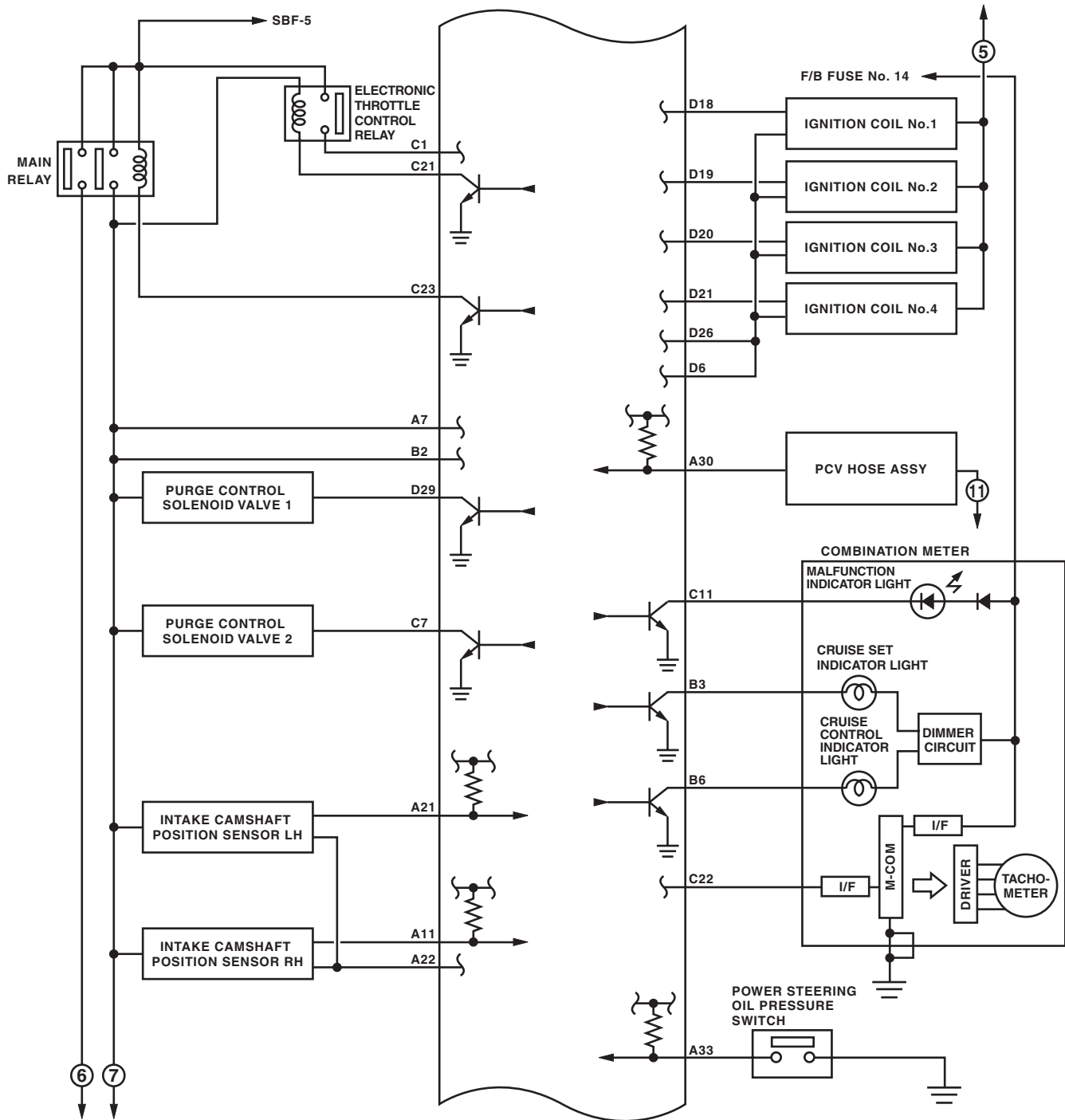
ENGINE (DIAGNOSTICS)



EN-05779

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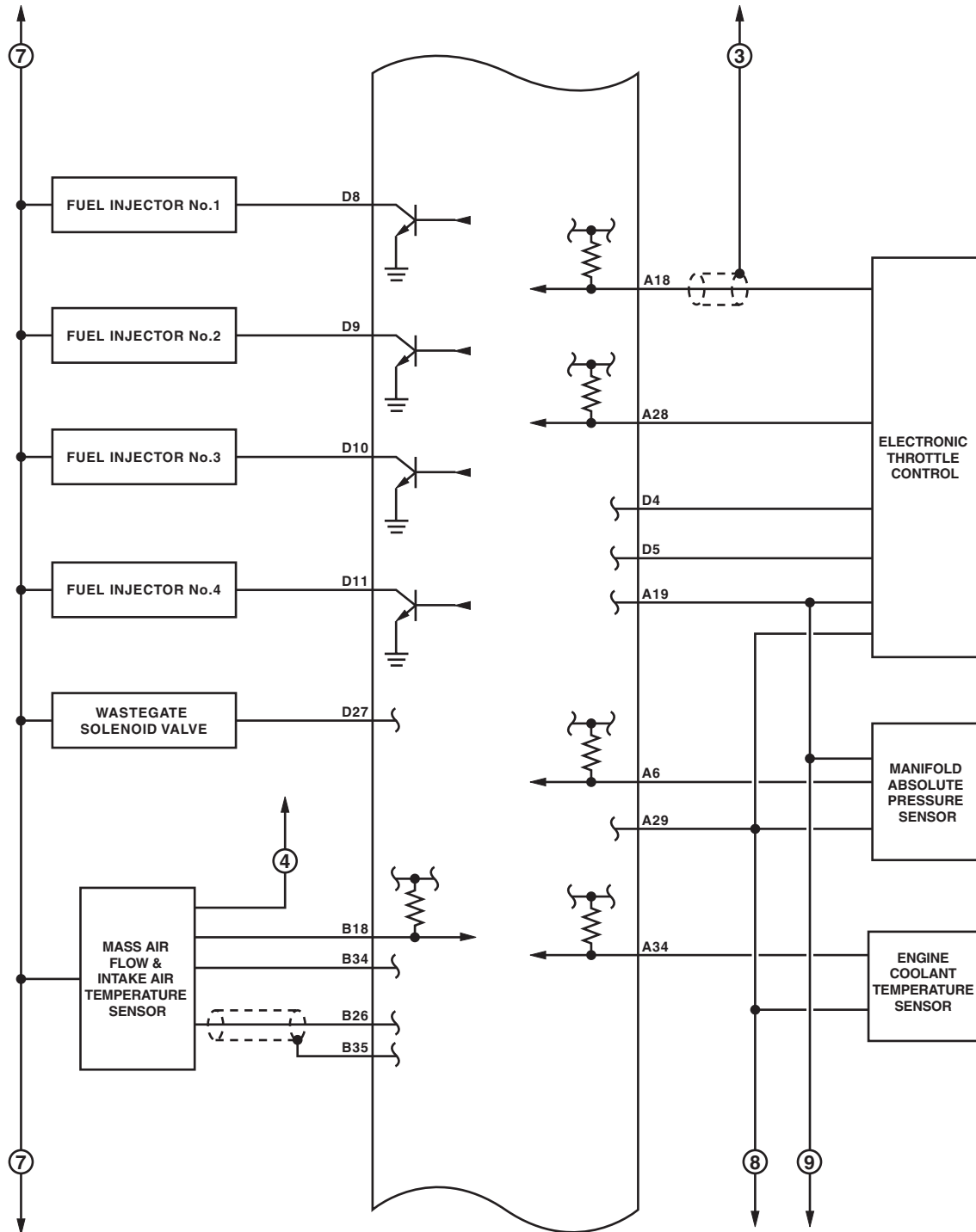
ENGINE (DIAGNOSTICS)



EN-05780

Engine Control Module (ECM) I/O Signal

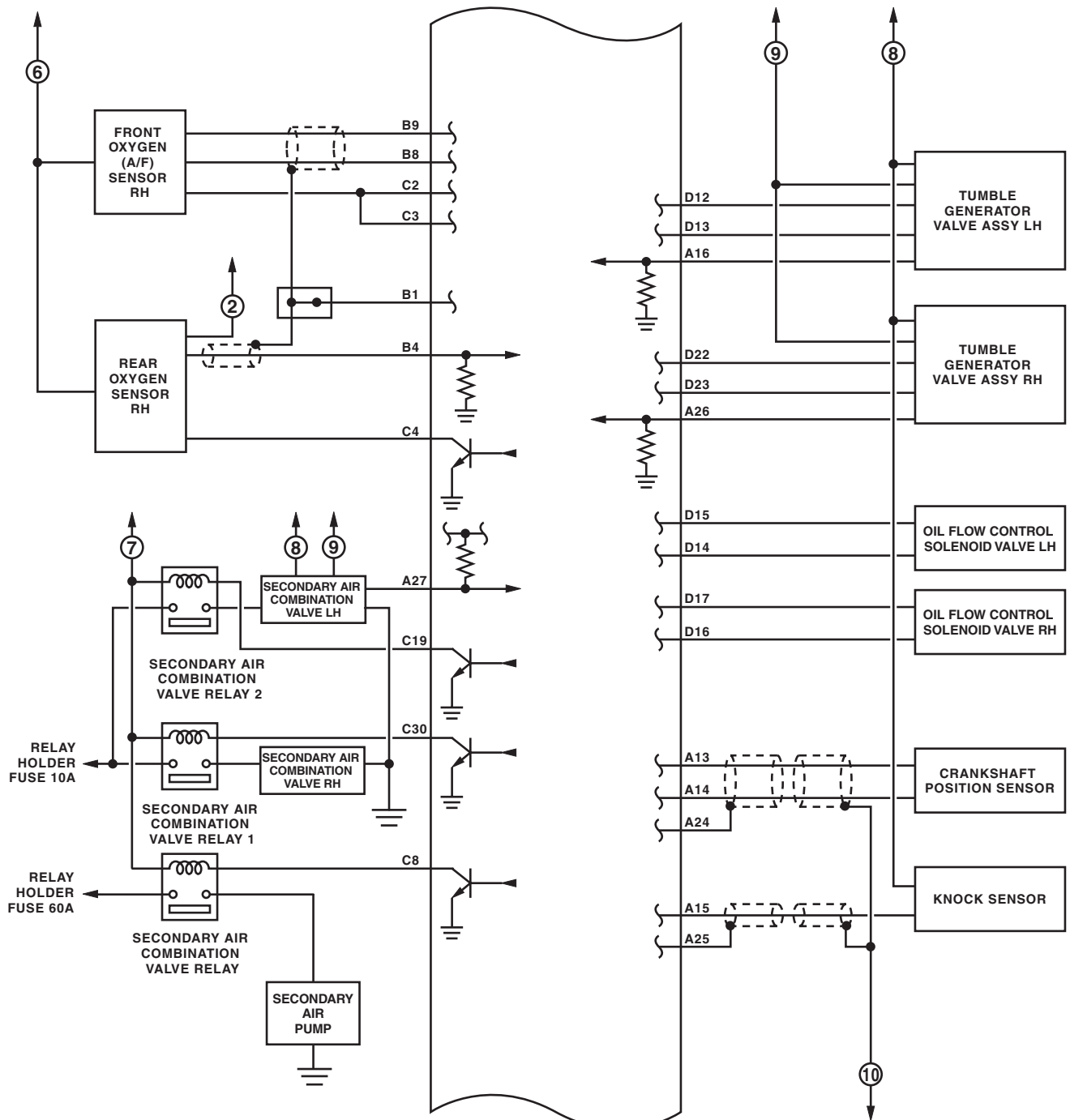
ENGINE (DIAGNOSTICS)



EN-05716

Engine Control Module (ECM) I/O Signal

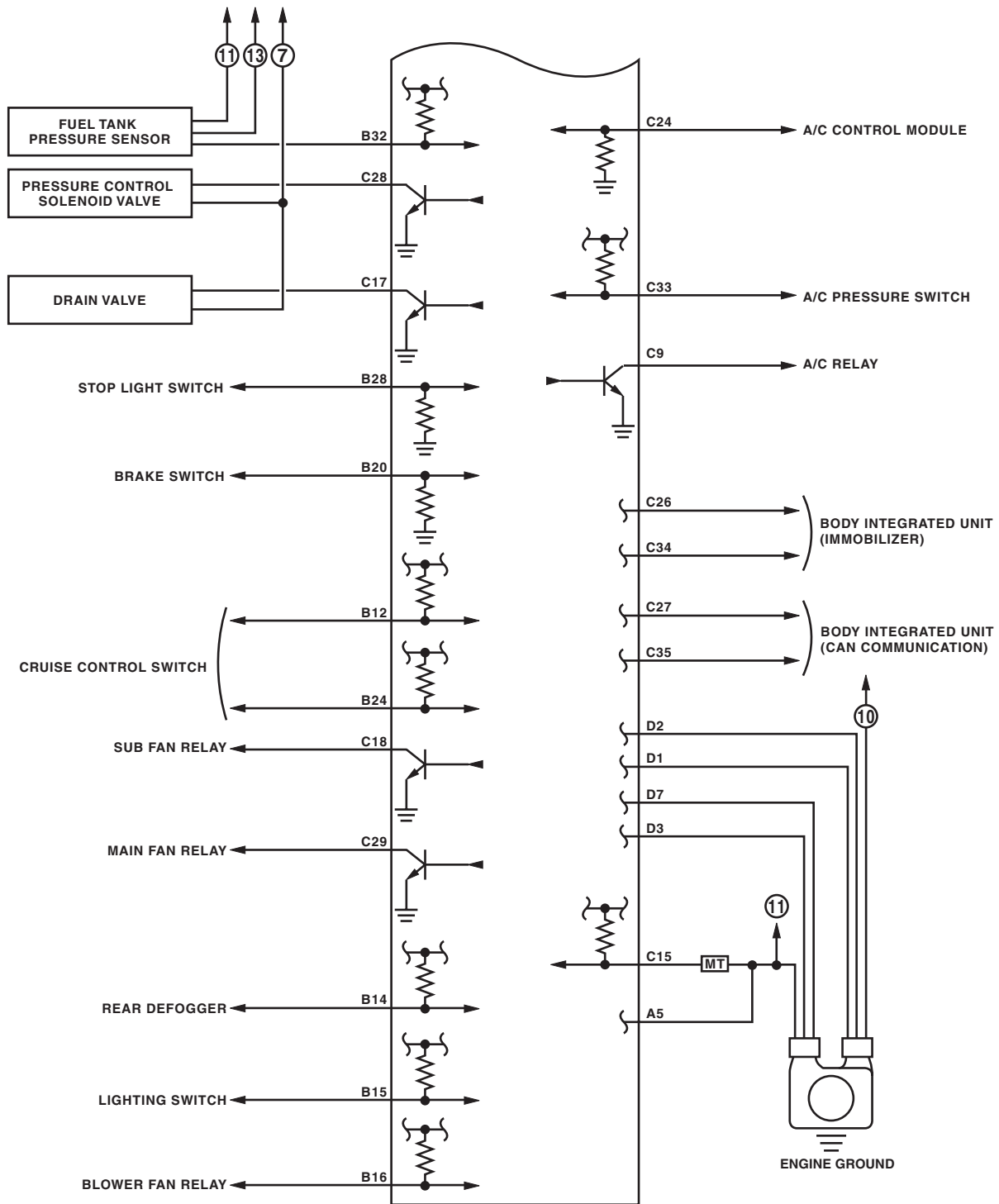
ENGINE (DIAGNOSTICS)



EN-05781

Engine Control Module (ECM) I/O Signal

ENGINE (DIAGNOSTICS)



EN-05782