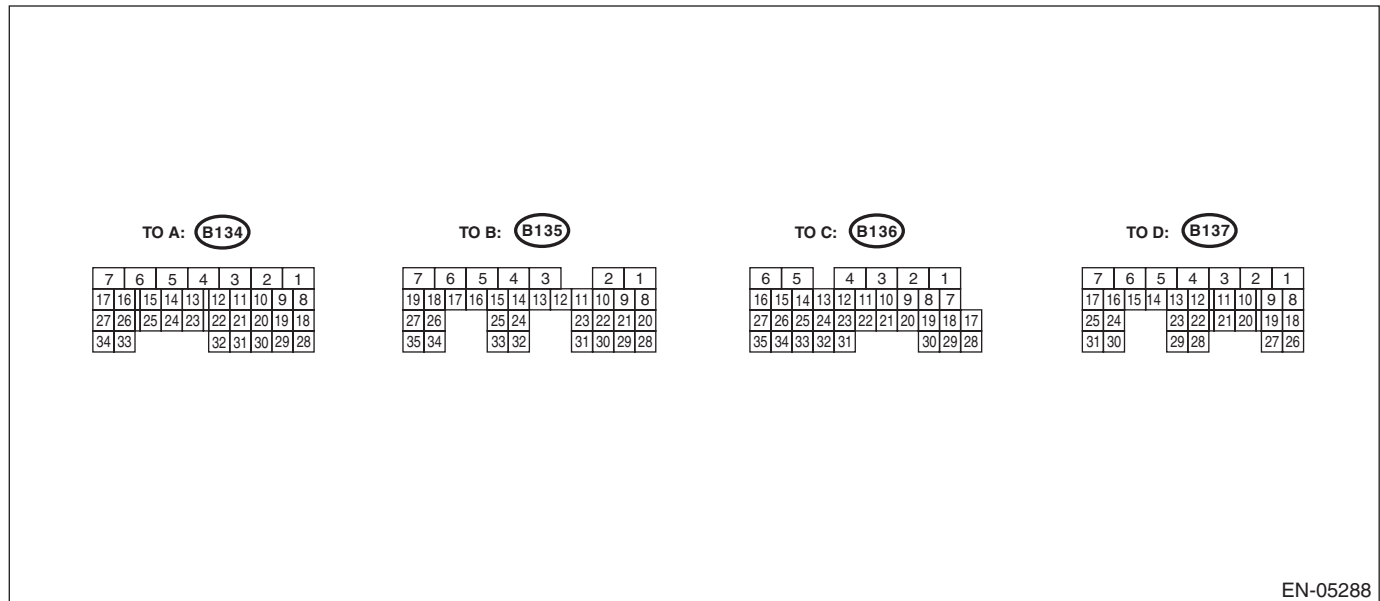


Engine Control Module (ECM) I/O Signal

ENGINE (DIAGNOSTICS)

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

A: ELECTRICAL SPECIFICATION



EN-05288

Description	Conne- ctor No.	Termi- nal No.	Signal (V)		Note	
			Ignition SW ON (engine OFF)	Engine ON (idling)		
Crankshaft position sen- sor	Signal (+)	B136	16	0	-7 — +7	Waveform
	Signal (-)	B136	27	0	0	—
	Shield	B136	35	0	0	—
Front oxygen (A/F) sensor	Signal (+)	B136	19	2.8 — 3.2	2.8 — 3.2	—
	Signal (-)	B136	18	2.4 — 2.7	2.4 — 2.7	—
	Shield	B136	30	0	0	—
Rear oxygen sensor	Signal	B136	21	0	0 — 0.9	—
	Shield	B136	30	0	0	—
Front oxygen (A/F) sensor heater signal	B136	5	—	—	Waveform	
Rear oxygen sensor heater signal	B134	6	0 — 13	—	Waveform	
Engine cool- ant tempera- ture sensor	Signal	B134	30	1.0 — 1.4	1.0 — 1.4	After engine is warmed up.
Air flow sen- sor	Signal	B137	22	—	0.3 — 4.5	—
	Shield	B137	28	0	0	—
	Ground	B137	29	0	0	—
Intake air temperature sen- sor signal	B137	12	0.3 — 4.6	0.3 — 4.6	—	
Engine oil temperature sensor signal	B134	20	1.0 — 1.4	1.0 — 1.4	After engine is warmed up.	
Starter switch	B137	17	0	0	Model without push but- ton start Cranking: 8 — 14 Model with push button start Cranking: waveform	

Engine Control Module (ECM) I/O Signal

ENGINE (DIAGNOSTICS)

Description	Connector No.	Terminal No.	Signal (V)		Note	
			Ignition SW ON (engine OFF)	Engine ON (idling)		
Accessory cut request	B135	32	10 — 13	12 — 14	Model with push button start Cranking: 0	
Starter switch 2	B137	14	0	0	Model with push button start Cranking: 8 — 14	
Starter cut relay	B135	34	0	0	Model with push button start Cranking: 8 — 14	
Ignition switch	B137	27	10 — 13	12 — 14	—	
Neutral position switch	B137	16	ON: 0 OFF: 10 — 13	ON: 0 OFF: 12 — 14	—	
Delivery (test) mode switch	B137	13	10 — 13	12 — 14	When fuse is installed: 0	
Knock sensor	Signal	B136	28	2.8	—	
	Shield	B136	29	0	—	
Back-up power supply	B137	2	10 — 13	12 — 14	Ignition switch "OFF": 10 — 13	
Control module power supply	B136	6	10 — 13	12 — 14	—	
	B137	1	10 — 13	12 — 14	—	
Sensor power supply	B134	19	5	5	—	
	B135	22	5	5	—	
Ignition control	#1	B134	21	0	0 or 5	Waveform
	#2	B134	10	0	0 or 5	Waveform
	#3	B134	31	0	0 or 5	Waveform
	#4	B134	8	0	0 or 5	Waveform
Fuel injector	#1	B134	12	10 — 13	1 — 14	Waveform
	#2	B134	22	10 — 13	1 — 14	Waveform
	#3	B134	32	10 — 13	1 — 14	Waveform
	#4	B134	13	10 — 13	1 — 14	Waveform
Fuel pump relay control	B135	19	ON: 0.5 or less OFF: 10 — 13	ON: 0.5 or less OFF: 12 — 14	—	
Main fan relay control	B135	12	ON: 0.5 or less OFF: 10 — 13	ON: 0.5 or less OFF: 12 — 14	—	
Sub fan relay control	B135	11	ON: 0.5 or less OFF: 10 — 13	ON: 0.5 or less OFF: 12 — 14	—	
Engine speed output	B135	15	—	0 — 13 or more	Waveform	
Purge control solenoid valve	B134	11	ON: 1 or less OFF: 10 — 13	ON: 1 or less OFF: 12 — 14	Waveform	
EGR control valve	Signal 1	B136	11	0 or 10 — 13	0 or 12 — 14	—
	Signal 2	B136	13	0 or 10 — 13	0 or 12 — 14	—
	Signal 3	B136	31	0 or 10 — 13	0 or 12 — 14	—
	Signal 4	B136	32	0 or 10 — 13	0 or 12 — 14	—
Manifold absolute pressure sensor signal	B136	20	3.5 — 4.8	1.1 — 1.6	—	
Electronic throttle control	Main	B134	18	Approx. 0.7	Approx. 0.6 — 0.7 (After engine is warmed up.)	Fully closed: Approx. 0.6 Fully open: Approx. 4.0
	Sub	B134	28	Approx. 1.6	Approx. 1.5 — 1.6 (After engine is warmed up.)	Fully closed: Approx. 1.5 Fully open: Approx. 4.2

Engine Control Module (ECM) I/O Signal

ENGINE (DIAGNOSTICS)

Description	Connector No.	Terminal No.	Signal (V)		Note	
			Ignition SW ON (engine OFF)	Engine ON (idling)		
Electronic throttle control motor (+)	B134	2	Duty waveform	Duty waveform	Drive frequency: 500 Hz	
Electronic throttle control motor (-)	B134	1	Duty waveform	Duty waveform	Drive frequency: 500 Hz	
Electronic throttle control motor power supply	B135	7	10 — 13	12 — 14	—	
Electronic throttle control motor relay	B135	17	ON: 0 OFF: 10 — 13	ON: 0 OFF: 12 — 14	When ignition switch is turned to ON: ON	
Intake oil control solenoid (LH)	B134	16	ON: 0 OFF: 10 — 13	ON: 0 OFF: 10 — 13	—	
Intake oil control solenoid (RH)	B134	17	ON: 0 OFF: 10 — 13	ON: 0 OFF: 10 — 13	—	
Intake camshaft position sensor (LH)	B136	15	0 or 5	0 or 5	Waveform	
Intake camshaft position sensor (RH)	B136	26	0 or 5	0 or 5	Waveform	
Camshaft position sensor ground	B136	34	0	0	—	
Accelerator pedal position sensor	Main sensor signal	B135	23	Fully closed: 0.4 — 1.0 Fully opened: 2.4 — 3.7	Fully closed: 0.4 — 1.0 Fully opened: 2.4 — 3.7	—
	Main power supply	B135	21	5	5	—
	Ground (main sensor)	B135	29	0	0	—
	Sub signal sensor	B135	31	Fully closed: 0.3 — 1.1 Fully opened: 2.3 — 3.8	Fully closed: 0.3 — 1.1 Fully opened: 2.3 — 3.8	—
Starter relay	B135	26	ON: 0 OFF: 10 — 13	ON: 0 OFF: 12 — 14	ON: cranking	
Clutch switch	B137	15	When clutch pedal is depressed: 0 When clutch pedal is released: 10 — 13	When clutch pedal is depressed: 0 When clutch pedal is released: 12 — 14	MT model	
Brake switch 1 (brake switch)	B137	7	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 (stop light switch)	B137	3	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	—	
Cruise control command switch	B137	30	When operating nothing: 3.5 — 4.5 When operating RES/ACC: 2.5 — 3.5 When operating following distance setting: 1.5 — 2.5 When operating SET/COAST: 0.5 — 1.5 When operating CANCEL: 0 — 0.5	When operating nothing: 3.5 — 4.5 When operating RES/ACC: 2.5 — 3.5 When operating following distance setting: 1.5 — 2.5 When operating SET/COAST: 0.5 — 1.5 When operating CANCEL: 0 — 0.5	—	
Cruise control main switch	B137	23	ON: 0 OFF: 5	ON: 0 OFF: 5	—	

Engine Control Module (ECM) I/O Signal

ENGINE (DIAGNOSTICS)

Description		Connector No.	Terminal No.	Signal (V)		Note
				Ignition SW ON (engine OFF)	Engine ON (idling)	
CAN communication	(Hi)	B137	19	—	—	—
	(Lo)	B137	18	—	—	—
Self-shutoff control		B135	13	0	0	—
Power steering oil pressure switch		B136	10	ON: 1 or less 10 — 13	ON: 1 or less OFF: 12 — 14	—
Oil level switch		B136	24	0	0	Oil level LOW: 10 — 14
Tumble generator valve opening angle switch signal (LH)		B136	9	Fully closed: 0.5 or less Fully opened: 9.5 or more	Fully closed: 0.5 or less Fully opened: 9.5 or more	—
Tumble generator valve (LH open)		B134	23	0 or 10 — 13	0 or 12 — 14	—
Tumble generator valve (LH closed)		B134	24	0 or 10 — 13	0 or 12 — 14	—
Tumble generator valve opening angle switch signal (RH)		B136	23	Fully closed: 0.5 or less Fully opened: 9.5 or more	Fully closed: 0.5 or less Fully opened: 9.5 or more	—
Tumble generator valve (RH open)		B134	25	0 or 10 — 13	0 or 12 — 14	—
Tumble generator valve (RH closed)		B134	14	0 or 10 — 13	0 or 12 — 14	—
Immobilizer communication		B135	25	—	—	—
ELCM	Switching valve	B135	1	10 — 13	12 — 14	Operating: 0
	Pressure sensor	B135	20	1 — 4	1 — 4	When ignition switch is turned to ON: atmospheric pressure
	Vacuum pump	B135	8	10 — 13	12 — 14	Operating: 0
Ground	Sensor	B134	29	0	0	—
		B135	30	0	0	—
	Engine 1	B134	4	0	0	—
	Engine 2	B134	3	0	0	—
	Engine 3	B136	1	0	0	—
	Engine 4	B136	2	0	0	—
	Engine 5	B136	3	0	0	—
Body	B137	4	0	0	—	

Engine Control Module (ECM) I/O Signal

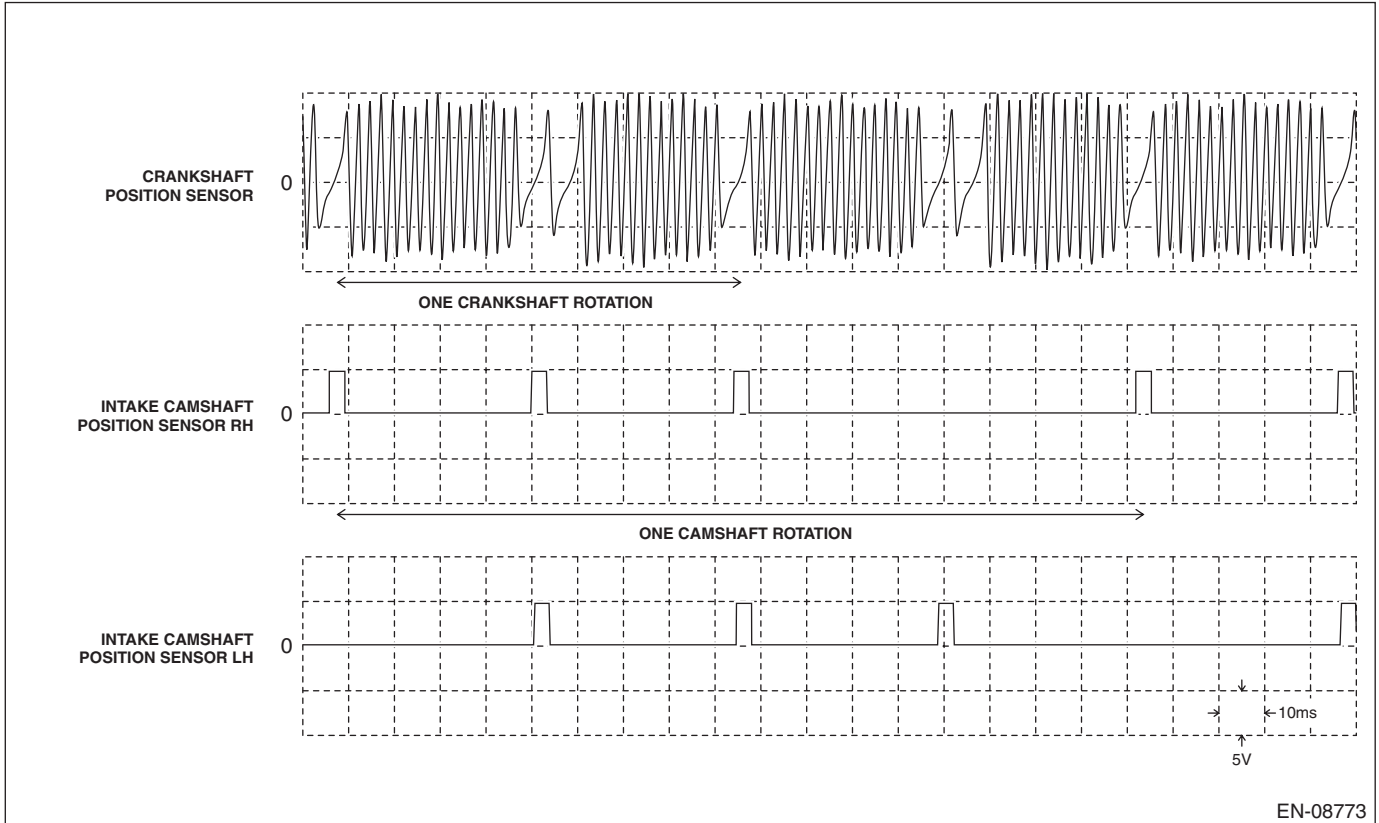
ENGINE (DIAGNOSTICS)

Input/output name:

- Crankshaft position sensor
- Intake camshaft position sensor RH
- Intake camshaft position sensor LH

Measuring condition:

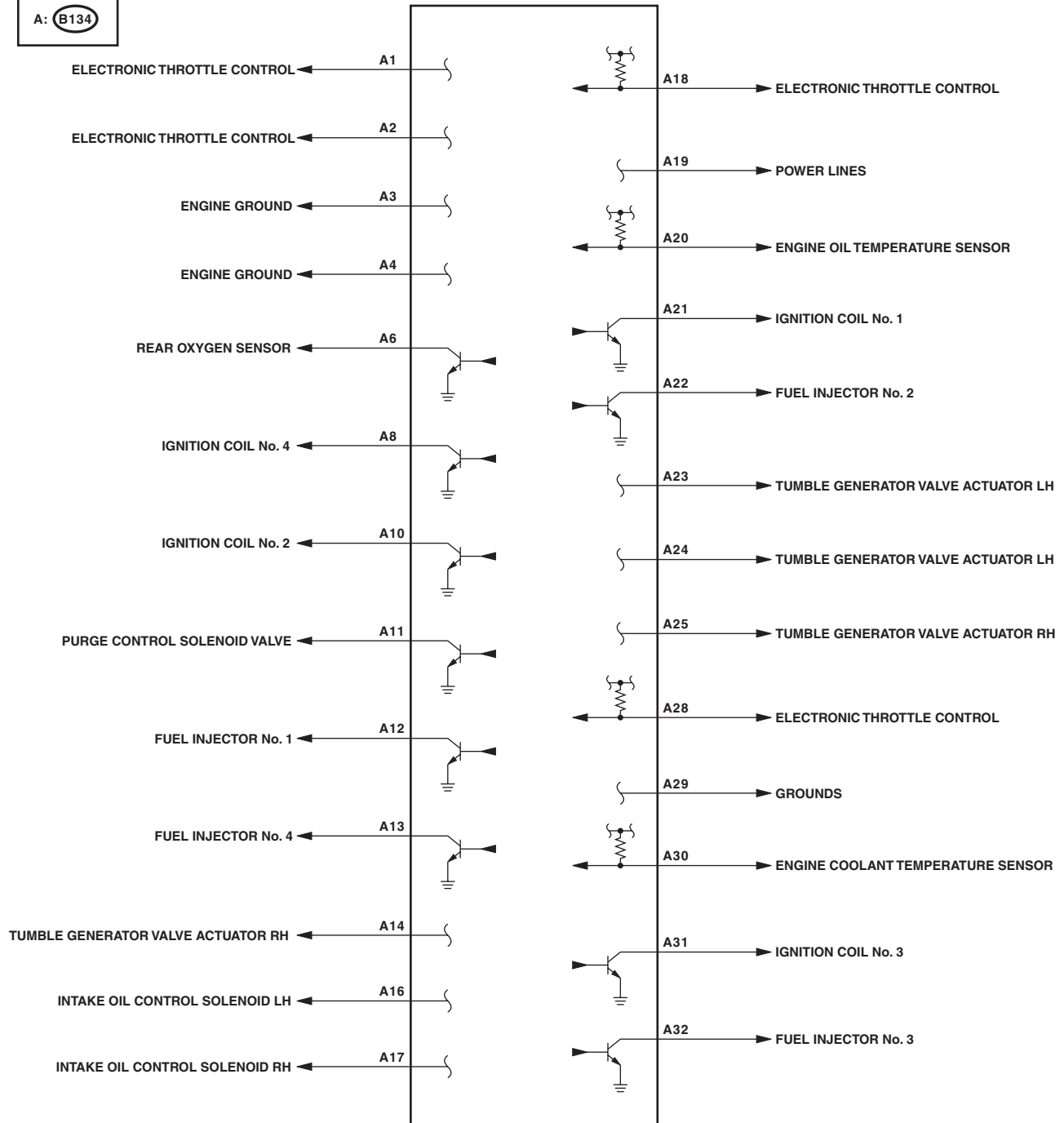
- After warming-up
- At idling



Engine Control Module (ECM) I/O Signal

ENGINE (DIAGNOSTICS)

A: (B134)



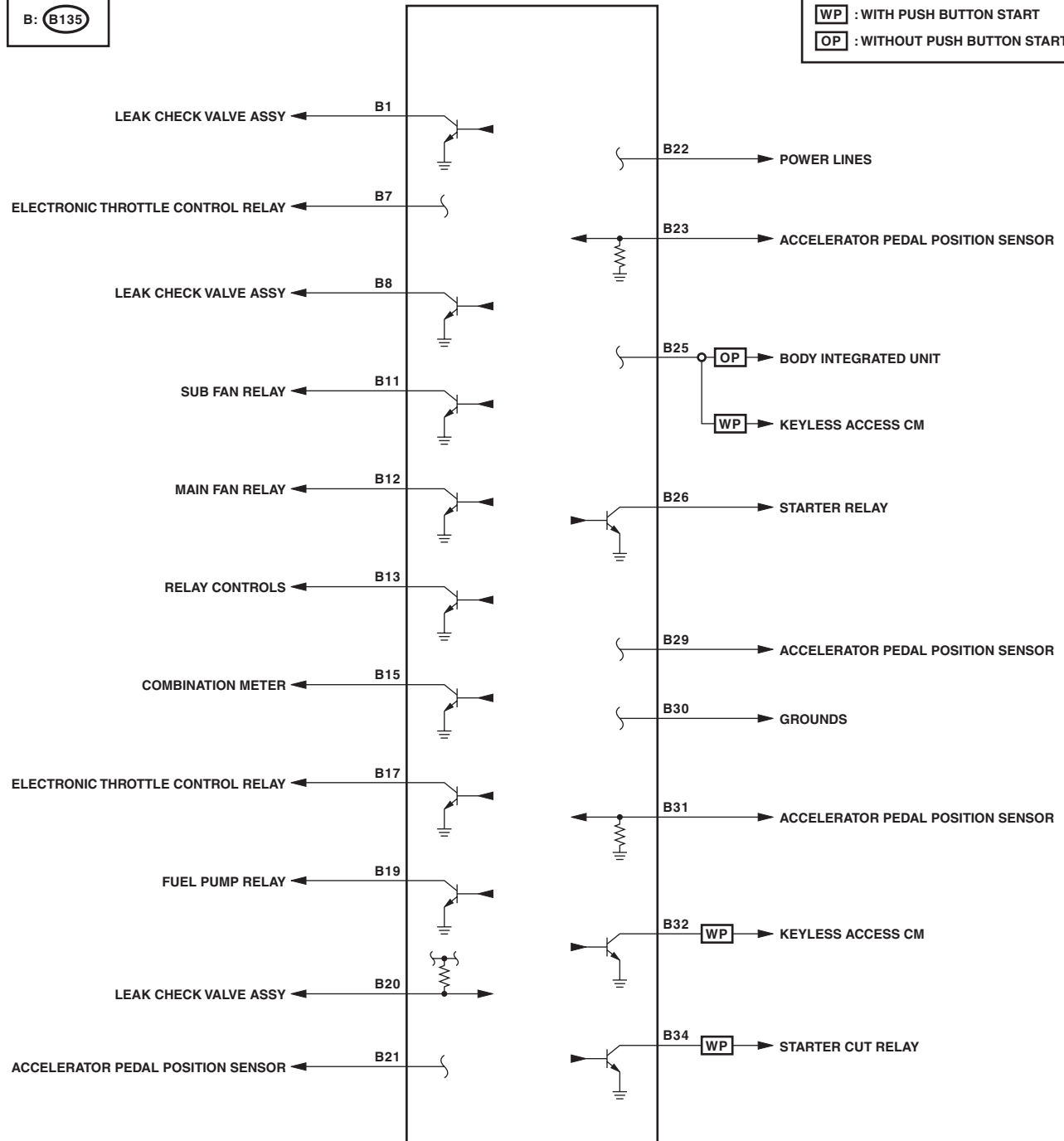
EN-09847

Engine Control Module (ECM) I/O Signal

ENGINE (DIAGNOSTICS)

B: (B135)

WP : WITH PUSH BUTTON START
OP : WITHOUT PUSH BUTTON START

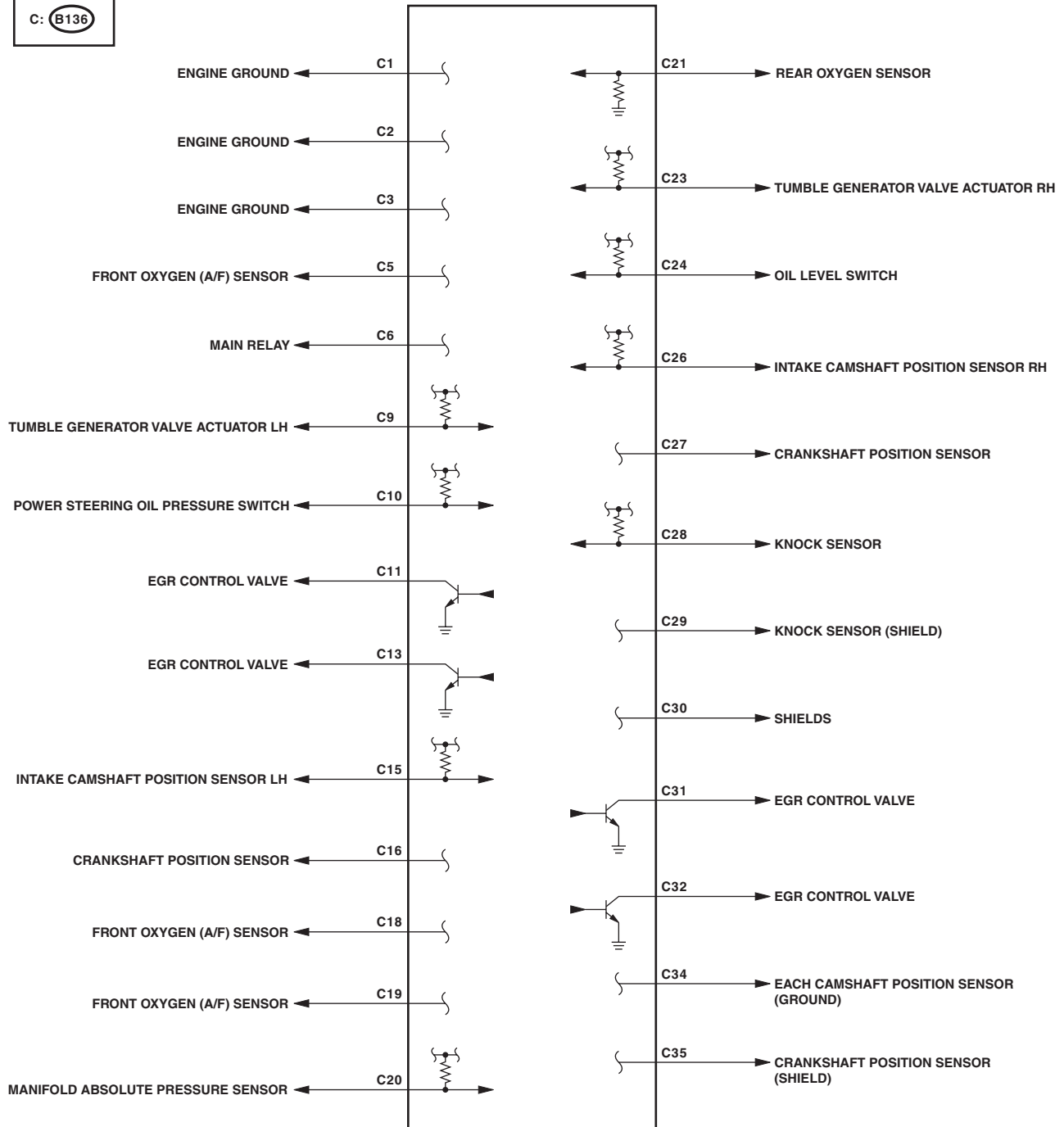


EN-10579

Engine Control Module (ECM) I/O Signal

ENGINE (DIAGNOSTICS)

C: B136



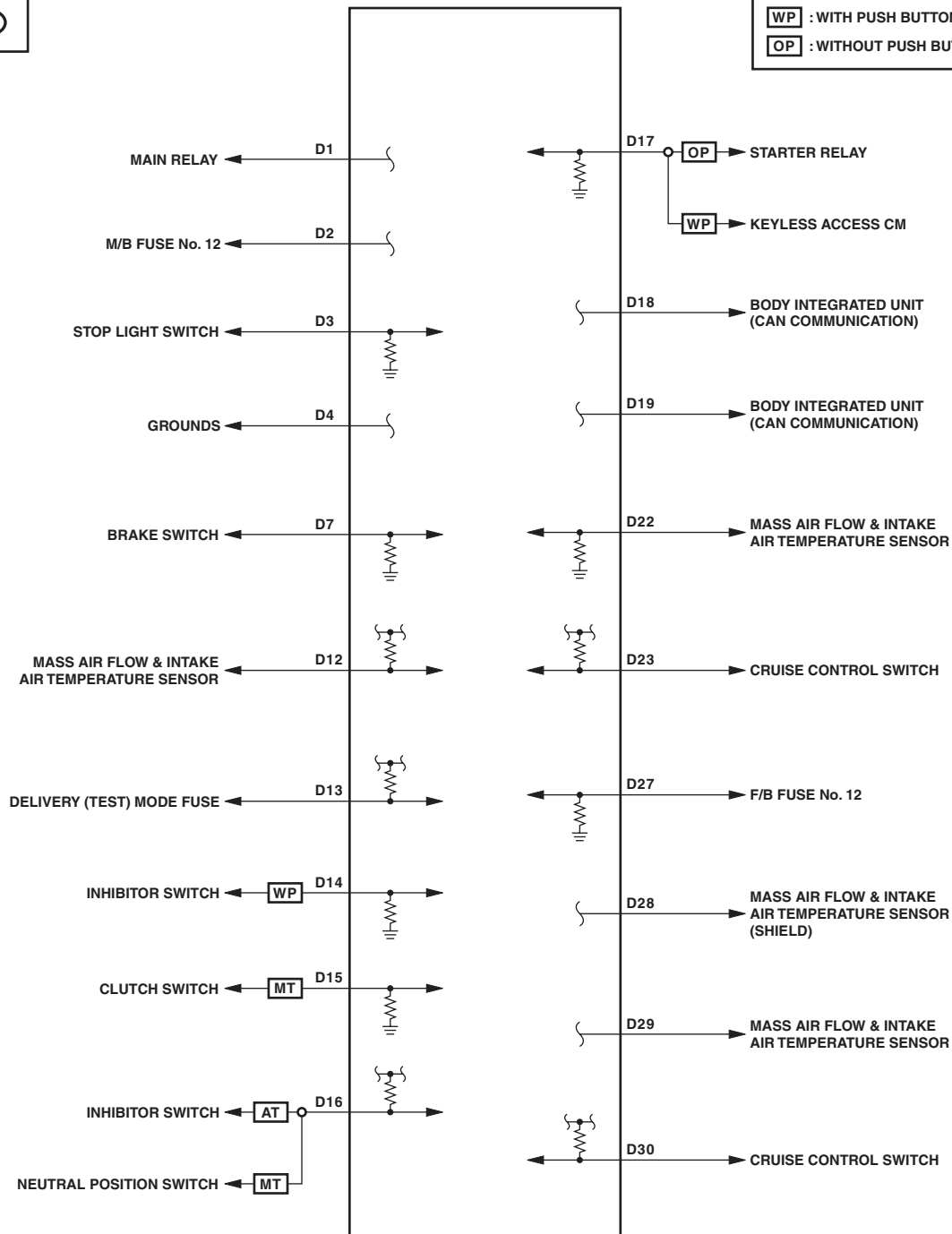
EN-09849

Engine Control Module (ECM) I/O Signal

ENGINE (DIAGNOSTICS)

D: B137

WP : WITH PUSH BUTTON START
 OP : WITHOUT PUSH BUTTON START



EN-09850