

APPENDIX A: CODES

The codelisted may not be used in all applications. A default value in the normal operating range is used by the ECU to provide for engine operation if a sensor failure is present.

DDC Code # (Flashed)	J1939	J1587		FMI	Description
	SPN	PID	SID		
—	—	—	240	2	FRAM Checksum Incorrect
—	—	—	240	13	TPU Checksum Incorrect
—	—	—	253	9	Calibration Checks Invalid
—	—	—	254	0	External RAM Failed
—	—	—	254	1	Internal RAM Failed
—	—	—	254	6	Module Forced to Boot Mode
—	—	—	254	12	Boot Mode Checksum Incorrect
11	187	187	--	4	Variable Speed Governor Sensor Voltage Low
11	187	187	--	7	Variable Speed Governor Switch System Not Responding
12	187	187	--	3	Variable Speed Governor Sensor Voltage High
13	111	111	--	4	Coolant Level Sensor Input Voltage Low
13	111	111	--	6	Add Coolant Level Sensor Input Voltage Low
13	2791		146	6	EGR Valve Current too High
14	110	110	--	3	Coolant Temperature Sensor Input Voltage High
14	175	175	--	3	Oil Temperature Sensor Input Voltage High
15	110	110	--	4	Coolant Temperature Sensor Input Voltage Low
15	175	175	--	4	Oil Temperature Sensor Input Voltage Low
16	111	111	--	3	Coolant Level Sensor Input Voltage High
16	111	111	--	5	Add Coolant Level Sensor Input Voltage High
16	2791		146	5	EGR Valve Current too Low
21	91	91	--	3	Throttle Position Sensor Input Voltage High
22	91	91	--	4	Throttle Position Sensor Input Voltage Low
23	174	174	--	3	Fuel Temperature Sensor Input Voltage High
24	174	174	--	4	Fuel Temperature Sensor Input Voltage Low
25	—	--	--	--	Reserved for "No Codes"
26	640	--	25	11	Aux. Shutdown #1 Active
26	640	--	61	11	Aux. Shutdown #2 Active (Rel 1.0 only)
26	—	--	315	11	Aux. Shutdown #2 Active (Rel. 2.00 or later)
27	105	105	--	3	Intake Manifold Temperature Sensor Input Voltage High
27	171	171	--	3	Ambient Air Temperature Sensor Input Voltage High
27	172	172	--	3	Air Temperature Sensor Input Voltage High
28	105	105	--	4	Intake Manifold Temperature Sensor Input Voltage Low
28	171	171	--	4	Ambient Air Temperature Sensor Input Voltage Low
28	172	172	--	4	Air Temperature Sensor Input Voltage Low

DDC Code # (Flashed)	J1939	J1587		FMI	Description
	SPN	PID	SID		
29	351	351	–	4	TCI Temperature Circuit Failed Low
29	404	404	—	4	Turbo Compressor Temperature Out Sensor Input Voltage Low
31	703	--	51	3	Aux. Output #3 Open Circuit (High Side), Pin E-49
31	703	--	51	4	Aux. Output #3 Short To Ground (High Side), Pin E-49
31	703	--	51	7	Aux. Output #3 Mechanical System Fail, Pin E-49
31	704	--	52	3	Aux. Output #4 Open Circuit (High Side), Pin E-48
31	704	--	52	4	Aux. Output #4 Short to Ground (High Side), Pin E-48
31	704	--	52	7	Aux. Output #4 Mechanical System Failure, Pin E-48
31		—	260	3	Aux Output #12 Open Circuit (High Side) – Pin E-46
31		—	260	4	Aux Output #12 Short to Gnd (High Side) – Pin E-46
31		—	260	7	Aux Output #12 Mechanical System Failure – Pin E-46
31		—	261	3	Aux Output #13 Open Circuit (High Side) – Pin E-47
31		—	261	4	Aux Output #13 Short to Gnd (High Side) – Pin E-47
31		—	261	7	Aux Output #13 Mechanical System Failure – Pin E-47
31		—	262	3	Aux Output #14 Open Circuit (High Side) – Pin E-50
31		—	262	4	Aux Output #14 Short to Gnd (High Side) – Pin E-50
31		—	262	7	Aux Output #14 Mechanical System Failure – Pin E-50
31		—	263	3	Aux Output #15 Open Circuit (High Side) – Pin E-51
31		—	263	4	Aux Output #15 Short to Gnd (High Side) – Pin E-51
31		—	263	7	Aux Output #15 Mechanical System Failure – Pin E-51
31		—	264	3	Aux Output #16 Open Circuit (High Side) – Pin E-52
31		—	264	4	Aux Output #16 Short to Gnd (High Side) – Pin E-52
31		—	264	7	Aux Output #16 Mechanical System Failure – Pin E-52
31		—	265	3	Aux Output #17 Open Circuit (High Side) – Pin E-53
31		—	265	4	Aux Output #17 Short to Gnd (High Side) – Pin E-53
31		—	265	7	Aux Output #17 Mechanical System Failure – Pin E-53
32	623	--	238	3	RSL Short to Battery (+)
32	623	--	238	4	RSL Open Circuit
32	624	--	239	3	AWL Short to Battery (+)
32	624	--	239	4	AWL Open Circuit
33	102	102	--	3	Turbo Boost Pressure Sensor Input Voltage High
34	102	102	--	4	Turbo Boost Pressure Sensor Input Voltage Low
35	19	19	--	3	High Range Oil Pressure Sensor Input Voltage High
35	100	100	--	3	Oil Pressure Sensor Input Voltage High
36	19	19	--	4	High Range Oil Pressure Sensor Input Voltage Low
36	100	100	--	4	Oil Pressure Sensor Input Voltage Low

DDC Code # (Flashed)	J1939	J1587		FMI	Description
	SPN	PID	SID		
37	18	18	--	3	High Range Fuel Pressure Sensor Input Voltage High
37	94	94	--	3	Fuel Pressure Sensor Input Voltage High
37	95	95	--	3	Fuel Restriction Sensor Input Voltage High
38	18	18	--	4	High Range Fuel Pressure Sensor Input Voltage Low
38	94	94	--	4	Fuel Pressure Sensor Input Voltage Low
38	95	95		4	Fuel Restriction Sensor Input Voltage Low
39	2791	—	146	2	EGR Leak — Boost Power
39	2791	—	146	7	EGR Valve Not Responding
39	2791	—	146	12	EGR Leak — Boost Jake
39	641	—	147	2	VNT Vanes Not Responding — Boost Power
39	641	—	147	12	VNT Vanes Not Responding — Boost Jake
39	641	—	147	14	EGR Flow too Low
39	641	—	147	7	VNT Vanes Not Responding — EGR
41	636	--	21	0	Too Many SRS/CMP Sensor (missing TRS/CKP Sensor)
42	636	--	21	1	Too few SRS/CMP Sensor (missing SRS/CMP Sensor)
43	111	111	--	1	Coolant Level Low
44	105	105	--	0	Intake Manifold Temperature High
44	105	105	--	14	Engine Power Derate Due to Intake Manifold Temperature
44	110	110	--	0	Coolant Temperature High
44	110	110	--	14	Engine Power Derate Due to Coolant Temperature
44	172	172	--	0	Air Inlet Temperature High
44	175	175	--	0	Oil Temperature High
44	175	175	--	14	Engine Power Derate Due to Oil Temperature
45	19	19	--	1	High Range Oil Pressure Low
45	100	100	--	1	Oil Pressure Low
46	168	168	--	1	ECU Battery Voltage Low
46	168	168	--	14	OI Excessive Battery Time (Rel. 2.0 or later)
46	—	—	155	4	Injector V (reg) Voltage Failed Low
46	—	—	211	1	Sensor Supply Pins V-11/V-12 Low
46	—	—	212	4	Injector V (slope) Voltage Failed Low
46	1376	--	214	1	RTC Backup Battery Voltage Low, Pin V-61
46		—	221	4	Injector I (pull-in) Voltage Failed Low
46	620	--	232	1	Sensor Supply Voltage Low, Pin E-12/E-26
46	—	—	317	4	Injector V (reg) Voltage Failed Low (Rel. 2.0 or later)
47	18	18	--	0	High Range Fuel Pressure High
47	94	94	--	0	Fuel Pressure High
47	102	102	--	0	Turbo Boost Pressure High
47	102	102	--	14	Engine Power Derate Due to Turbo Boost Pressure

DDC Code # (Flashed)	J1939	J1587		FMI	Description
	SPN	PID	SID		
47	106	106	--	0	Air Inlet Pressure High
48	18	18	--	1	High Range Fuel Pressure Low
48	94	94	--	1	Fuel Pressure Low
48	106	106	--	1	Air Inlet Pressure Low
48	351	351	-	1	TCI Temperature Low
48	404	404	—	1	Turbo Compressor Temperature Out Low
48	411	411	-	1	EGR Delta Pressure Low
48	412	412	-	1	EGR Temperature Low
49	351	351	-	0	TCI Temperature High
49	404	404	—	0	Turbo Compressor Out Temperature High
49	404	404	—	14	Engine Power Derate Due to Turbo Compressor Out Temperature
51	351	351	-	3	TCI Temperature Circuit Failed High
51	404	404	—	3	Turbo Compressor Out Temperature Sensor Input Voltage High
52	—	—	254	3	ADC Reference Voltage High
52	—	—	254	4	ADC Reference Voltage Low
52	—	—	254	12	A/D Conversion Failed
53	—	—	253	2	Memory Check Failed on Startup
53	—	—	253	12	Memory Write Error — Single Location
53	—	—	253	13	Calibration Versions Invalid
53	—	—	253	14	Memory Write Error — All Locations
54	84	84	--	12	Vehicle Speed Sensor Fault
55	1484	--	216	14	Other ECU Fault (This fault is logged in conjunction with another fault to indicate missing information from another ECU.)
55	639	--	231	12	J1939 Data Link Fault
56	608	--	250	12	J1587 Data Link Fault
58	69	69	—	9	Two-speed Axle Switch Status not Responding
58	69	69	—	12	Two-speed Axle Switch Status Failed
58	92	92	--	0	Torque Overload
58	40	40	-	9	Engine Retarder Switch Status Not Responding
58	40	40	-	12	Engine Retarder Switch Status Failed
58	70	70	-	9	Park Brake/OI Switch Status Loop Not Responding
58	70	70	-	12	Park Brake/OI Switch Status Loop Failed
58	--	--	216	7	ECU Information not Responding — Mux'd IO
58	--	--	242	9	Cruise Control Resume/Accel Switch Status Not Responding
58	--	--	242	12	Cruise Control Resume/Accel Switch Status Failed
58	--	--	243	9	Cruise Control Set/Coast Switch Status Not Responding
58	--	--	243	12	Cruise Control Set/Coast Switch Status Failed
58	--	--	244	9	Cruise Control Enable Switch Status Not Responding

DDC Code # (Flashed)	J1939	J1587		FMI	Description
	SPN	PID	SID		
58	--	--	244	12	Cruise Control Enable Switch Status Failed
58	--	--	245	9	Clutch Pedal Switch Status Not Responding
58	--	--	245	9	Clutch Pedal Switch Status Failed
58	--	--	246	9	Service Brake Pedal Switch Status not Responding
58	--	--	246	12	Service Brake Pedal Switch Status Failed
61	--	--	xxx	0	Injector xxx Response Time Long
61	--	--	xxx	6	Injector xx Circuit Short to Ground
62	701	--	26	3	Aux. Output #1 Short to Battery (+), Pin V-4
62	701	--	26	4	Aux. Output #1 Open Circuit, Pin V-4
62	701	—	26	7	Aux. Output #1 Mechanical System Not Responding Properly - Pin V-4
62	702	--	40	3	Aux. Output #2 Short to Battery (+), Pin V-5
62	702	--	40	4	Aux. Output #2 Open Circuit, Pin V-5
62	702	—	40	7	Aux. Output #2 Mechanical System Not Responding Properly - Pin V-5
62	705	--	53	3	Aux. Output #5 Short to Battery (+), Pin V-6
62	705	--	53	4	Aux. Output #5 Open Circuit - Pin V-6
62	705	—	53	7	Aux. Output #5 Mechanical System Not Responding Properly - Pin V-6
62	706	--	54	3	Aux. Output #6 Short to Battery (+), Pin V-7
62	706	--	54	4	Aux. Output #6 Open Circuit - Pin V-7
62	706	--	54	7	Aux. Output #6 Mechanical System Not Responding Properly - Pin V-7
62	707	--	55	3	Aux. Output #7 Short to Battery (+), Pin V-40
62	707	--	55	4	Aux. Output #7 Open Circuit - Pin V-40
62	707	—	55	7	Aux. Output #7 Mechanical System Not Responding Properly - Pin V-40
62	708	--	56	3	Aux. Output #8 Short to Battery (+), Pin V-53
62	708	--	56	4	Aux. Output #8 Open Circuit - Pin V-53
62	708	--	56	7	Aux. Output #8 Mechanical System Not Responding Properly, Pin V-53
62	709	—	257	3	Aux Output #9 Short to Gnd — Pin V-54
62	709	—	257	4	Aux Output #9 Open Circuit — Pin V-54
62	709	—	257	7	Aux Output #9 Mechanical System Failure — V-54
62	710	—	258	3	Aux Output #10 Short to Gnd — Pin V-55
62	710	—	258	4	Aux Output #10 Open Circuit — Pin V-55
62	710	—	258	7	Aux Output #10 Mechanical System Failure — V-55
62	711	—	259	3	Aux Output #11 Short to Gnd — Pin E-13
62	711	—	259	4	Aux Output #11 Open Circuit — Pin E-13
62	711	—	259	7	Aux Output #11 Mechanical System Failure — Pin E-13
63	697	--	57	0	PWM #1 Above Normal Range, Pin V-52
63	697	--	57	1	PWM #1 Below Normal Range, Pin V-52
63	697	--	57	3	PWM #1 Short to Battery (+), Pin V-52

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	SPN	PID	SID		
63	697	--	57	4	PWM #1 Open Circuit, Pin V-52
63	697	--	57	7	PWM #1 Mechanical Failure, Pin V-52
63	698	--	58	0	PWM #2 Above Normal Range, Pin V-46
63	698	--	58	1	PWM #2 Below Normal Range, Pin V-46
63	698	--	58	3	PWM #2 Short to Battery (+), Pin V-46
63	698	--	58	4	PWM #2 Open Circuit, Pin V-46
63	698	--	58	7	PWM #2 Mechanical Failure, Pin V-46
63	699	--	59	0	PWM #3 Above Normal Range, Pin E-1
63	699	--	59	1	PWM #3 Below Normal Range, Pin E-1
63	699	--	59	3	PWM #3 Short to Battery (+), Pin E-1
63	699	--	59	4	PWM #3 Open Circuit, Pin E-1
63	699	--	59	7	PWM #3 Mechanical Failure, Pin E-1
63	700	--	60	0	PWM #4 Above Normal Range, Pin E-4
63	700	--	60	1	PWM #4 Below Normal Range, Pin E-4
63	700	--	60	3	PWM #4 Short to Battery (+), Pin E-4
63	700	--	60	4	PWM #4 Open Circuit, Pin E-4
63	700	--	60	7	PWM #4 Mechanical Failure, Pin E-4
63	701	—	267	0	PWM # 5 Above Normal Range — Pin E-8
63	701	—	267	1	PWM # 5 Below Normal Range — Pin E-8
63	701	—	267	3	PWM # 5 Short to Battery — E-8
63	701	—	267	4	PWM # 5 Open Circuit — Pin E-8
63	701	—	267	7	PWM # 5 Mechanical System Failed — Pin E-8
63	702	—	268	0	PWM # 6 Above Normal Range — Pin E-11
63	702	—	268	1	PWM # 6 Below Normal Range — Pin E-11
63	702	—	268	3	PWM # 6 Short to Battery — E-11
63	702	—	268	4	PWM # 6 Open Circuit — Pin E-11
63	702	—	268	7	PWM # 6 Mechanical System Failed — Pin E-11
64	103	103	--	0	Turbo Overspeed
64	103	103	--	1	Turbo Speed Low (Rel. 2.0 or later)
64	103	103	--	8	Turbo Speed Sensor Input Failure — Abnormal Period
65	107	107	--	3	Air Filter Restriction Sensor Voltage High
65	107	107	--	4	Air Filter Restriction Sensor Voltage Low
66	99	99	--	3	Oil Filter Restriction Sensor Voltage High
66	99	99	--	4	Oil Filter Restriction Sensor Voltage Low
67	106	106	--	3	Air Inlet Pressure Sensor Input Voltage High
67	106	106	--	4	Air Inlet Pressure Sensor Input Voltage Low
67	109	109	--	3	Coolant Pressure Sensor Input Voltage High
67	109	109	--	4	Coolant Pressure Sensor Input Voltage Low
68	558	--	230	5	TPS Idle Validation Circuit Fault (open circuit)
68	558	--	230	6	TPS Idle Validation Circuit Fault (short to ground)

DDC Code # (Flashed)	J1939	J1587		FMI	Description
	SPN	PID	SID		
71	—	--	xxx	1	Injector xxx Response Time Short
72	84	84	--	0	Vehicle Overspeed
72	84	84	--	11	Vehicle Overspeed (Absolute)
73	107	107	—	0	Air Filter Restriction High
74	70	70	--	4	Optimized Idle Safety Loop Short to Ground
74	99	99	--	0	Oil Filter Restriction High
75	168	168	--	0	ECU Battery Voltage High
75	21	—	155	3	Injector V (reg) Voltage Failed High
75	21	—	211	0	Sensor Supply Pins V-11/V-12 Voltage High
75	21	—	212	3	Injector V (slope) Voltage Failed High
75	21	—	221	3	Injector V (pull-in) Voltage Failed High
75	21	—	317	3	Injector V (reg) Voltage Failed High (Rel. 2.0 or later)
75	1376	--	214	0	RTC Backup Battery Voltage High
75	620	--	232	0	Sensor Supply Voltage High. Pin E-26
76	121	121	--	0	Engine Overspeed With Engine Brake
77	19	19	—	0	High Range Oil Pressure High
77	20	20	—	0	High Range Coolant Pressure High
77	21	21	—	0	ECU Temperature Above Range
77	21	21	—	1	ECU Temperature Below Range
77	21	21	—	3	ECU Temperature Above Failed High
77	21	21	—	4	ECU Temperature Above Failed Low
77	73	73	—	1	Fire Pump Pressure Low
77	81	81	—	0	Exhaust Back Pressure High
77	81	81	—	1	Exhaust Back Pressure Low
77	81	81	—	3	Exhaust Back Pressure Sensor Voltage High
77	81	81	—	4	Exhaust Back Pressure Sensor Voltage Low
77	81	81	—	12	Exhaust Back Pressure at Rampdown Threshold
77	95	95	—	1	Fuel Filter Differential Pressure Low
77	99	99	—	1	Oil Filter Differential Pressure Low
77	100	100	—	0	Engine Oil Pressure High
77	102	102	—	1	Turbo Boost Pressure Low
77	105	105	—	1	Inlet Manifold Temperature Low
77	107	107	—	1	Air filter Restriction Pressure Low
77	108	108	—	0	Barometric Pressure High
77	108	108	—	1	Barometric Pressure Low
77	110	110	—	1	Coolant Temperature Low
77	111	111	—	0	Coolant Level High
77	171	171	—	0	Ambient Air Temperature High
77	171	171	—	1	Ambient Air Temperature Low
77	172	172	—	1	Air Inlet Temperature Low
77	174	174	—	0	Fuel Temperature High

DDC Code # (Flashed)	J1939	J1587		FMI	Description
	SPN	PID	SID		
77	174	174	—	1	Fuel Temperature Low
77	175	175	—	1	Engine Oil Temperature Low
77	222	222	—	14	Anti-Theft Fault Present
77	251	251	—	10	Clock Module Abnormal Rate of Change
77	251	251	—	13	Clock Module Failure
77	252	252	—	10	Clock Module Abnormal Rate of Change
77	252	252	—	13	Clock Module Failure
77	611	—	151	11	Service Now Lamp Fault Expiration
77	611	—	316	11	Service Now Lamp Fault Expiration (Rel 2.0 or later)
78	86	86	--	14	Cruise Control/Adaptive Cruise Control Fault
81	98	98	--	3	Oil Level Sensor Input Voltage High
81	153	153	--	3	Extended Crankcase Pressure Input Voltage High
81	173	173	--	3	Exhaust Temperature Sensor Input Voltage High
81	355	355	--	3	Engine Oil Life Circuit Failed High
81	411	411	—	3	EGR Delta Pressure Sensor Circuit Failed High
81	412	412	—	3	EGR Temperature Sensor Input Failed High
82	98	98	--	4	Oil Level Sensor Input Voltage Low
82	101	101	--	4	Crankcase Pressure Sensor Input Voltage Low
82	153	153	--	4	Extended Crankcase Pressure Input Voltage Low
82	173	173	—	4	Exhaust Temperature Sensor Input Voltage Low
82	355	355	—	4	Engine Oil Life Circuit Failed Low
82	411	411	—	4	EGR Delta Pressure Sensor Circuit Failed Low
82	412	412	—	4	EGR Temperature Circuit Failed Low
83	73	73	—	0	Pump Pressure High
83	98	98	--	0	Oil Level High
83	101	101	--	0	Crankcase Pressure High
83	153	153	--	0	Extended Crankcase Pressure High
83	173	173	—	0	Exhaust Temperature High
83	355	355	—	9	Coolant Ingress Fault Detected
83	355	355	—	14	Change Oil Now
83	411	411	—	0	EGR Delta Pressure High
83	412	412	—	0	EGR Temperature High
84	98	98	--	1	Oil Level Low
84	355	355	—	1	Change Oil Soon
85	190	190	--	0	Engine Overspeed
85	190	190	--	14	Engine Overspeed Signal
86	73	73	--	3	Pump Pressure Sensor Input Voltage High
86	108	108	--	3	Barometric Pressure Sensor Input Voltage High
87	73	73	--	4	Pump Pressure Sensor Input Voltage Low
87	108	108	--	4	Barometric Pressure Sensor Input Voltage Low

DDC Code # (Flashed)	J1939	J1587		FMI	Description
	SPN	PID	SID		
89	95	95	--	0	Fuel Restriction High
89	111	111	--	12	Maintenance Alert Coolant Level Fault