

5 FLASH CODES VS SAE CODES

Section	Page
5.1 READING THE DIAGNOSTIC CODES – FLASH METHOD	5-3
5.2 READING CODES	5-5
5.3 DDEC DESCRIPTIONS	5-6

5.1 READING THE DIAGNOSTIC CODES – FLASH METHOD

The following steps describe the flash method to interpret diagnostic codes:

NOTE:

If you are here to begin diagnosis of a problem and already know how to read codes, as well as understand active and inactive codes, refer to section 9.1.

1. Active versus Inactive codes:

- [a] Active codes are the codes which are currently keeping the “Check or Stop Engine” light on. Active codes are flashed via the Stop Engine Light (SEL).
- [b] Inactive codes are all the codes previously logged in the ECM. These codes can be cleared by using the DDR. Inactive codes are flashed via the Check Engine Light (CEL).

NOTE:

The Diagnostic Request Switch reads codes on the CEL and SEL when an DDR is not available. The following steps will enable you to obtain codes.

2. Turn vehicle ignition switch ON.

3. Depress and hold the diagnostic request switch.

- [a] As an example, observe Code 13 (active) and Code 21 (inactive) flashing out on the CEL and SEL; see Figure 5-1.
- [b] If input used is SEO/Diagnostic Request, press and release the switch.
- [c] If input used is Diagnostic Request, press and hold switch.

NOTE:

Active codes are flashed in ascending numerical flash code order.
Inactive codes are flashed in most recent to least recent order.

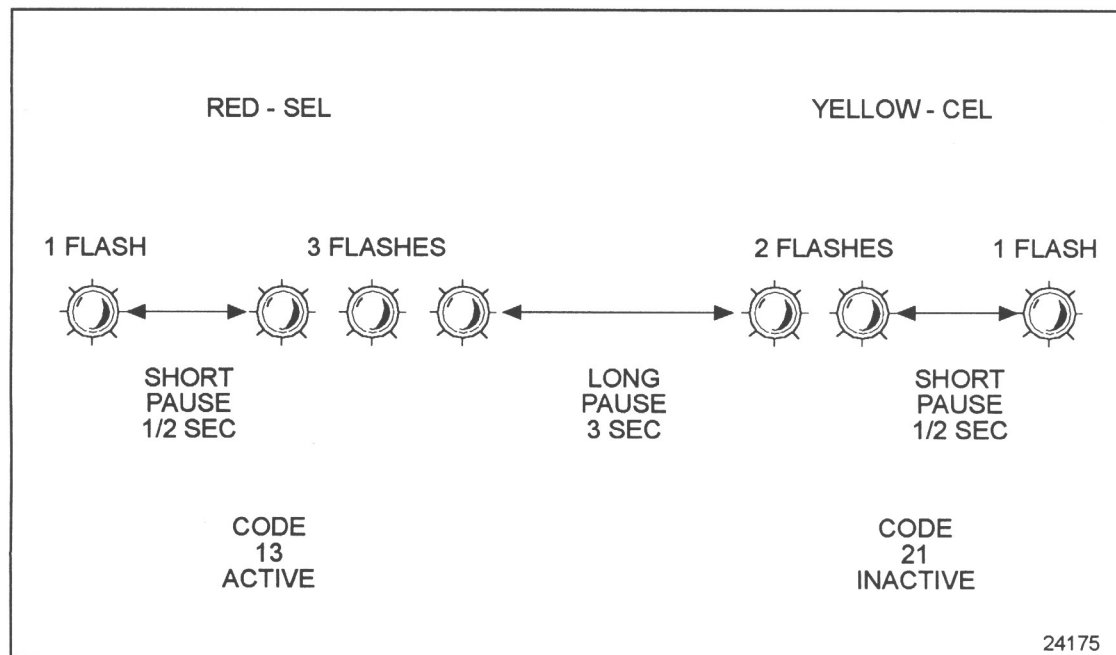


Figure 5–1 Flash Code Method

5.1.1 Clearing Codes

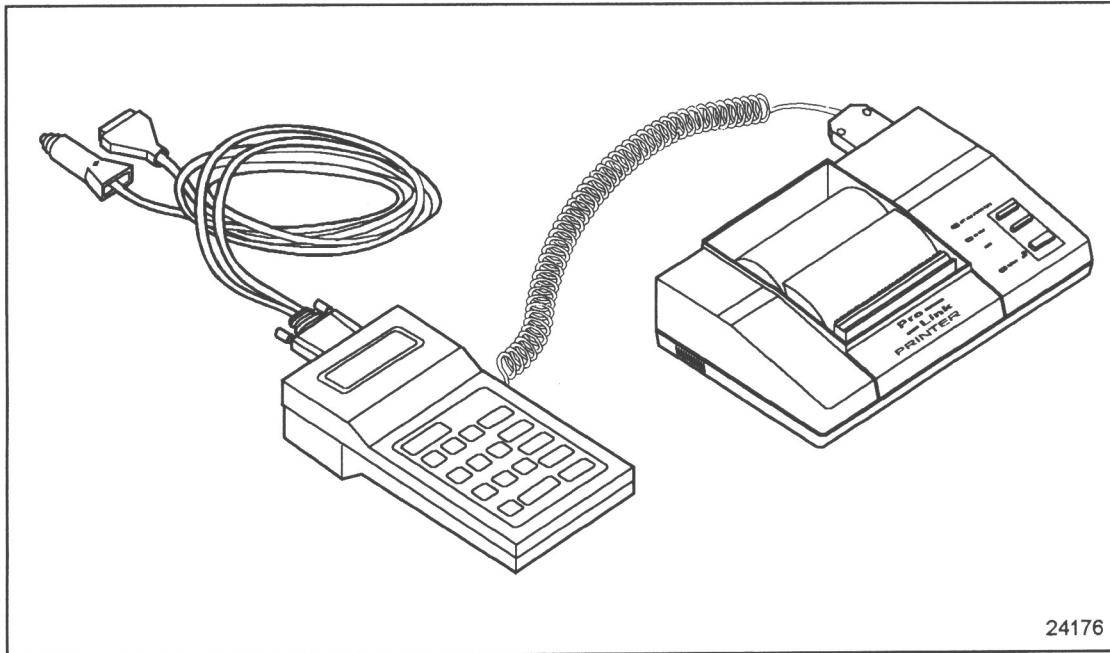
Fault codes can only be cleared using the DDR.

NOTE:

Removing the the battery cables will not clear codes.

5.2 READING CODES

For instructions for using the DDR or Pro-Link 9000®, (see Figure 5-2), refer to the Pro-Link Users Manual. For a list of Flash Codes and SAE Fault Codes, refer to section 5.3. Refer to section 94.1.1.



24176

Figure 5-2 **Pro-Link 9000**

5.3 DDEC DESCRIPTIONS

To read codes, use the diagnostic data reader or depress and hold the diagnostic request switch with the ignition ON, engine at idle or not running. Active codes will be flashed on the SEL. Inactive codes will be flashed on the CEL. The cycle will repeat until the operator releases the diagnostic request switch. Flash codes and descriptions are listed in Table 5-1.

Flash Codes	DDEC Description
11	VSG sensor input voltage low
12	VSG sensor input voltage high
13	Coolant level sensor input voltage low
14	Oil, coolant, or intercooler, temperature sensor input voltage high
15	Oil, coolant, or intercooler, temperature sensor input voltage low
16	Coolant level sensor input voltage high
17	Bypass or throttle, valve position sensor input voltage high
18	Bypass or throttle, valve position sensor input voltage low
21	TPS input voltage high
22	TPS input voltage low
23	Fuel temperature sensor input voltage high
24	Fuel temperature sensor input voltage low
25	No active codes
26	Auxiliary shutdown #1, or #2, input active
27	Air inlet or intake air, temperature sensor input voltage high
28	Air inlet or intake air, temperature sensor input voltage low
31	Auxiliary high side output open circuit or short to ground
32	CEL or SEL short to battery (+) or open circuit
33	Turbo boost sensor input voltage high
34	Turbo boost sensor input voltage low
35	Oil pressure sensor input voltage high
36	Oil pressure sensor input voltage low
37	Fuel pressure sensor input voltage high
38	Fuel pressure sensor input voltage low
41	Too many SRS (missing TRS)
42	Too few SRS (missing SRS)
43	Coolant level low
44	Oil, coolant, intercooler or intake air, temperature high
45	Oil pressure low
46	ECM battery voltage low
47	Fuel, air inlet, or turbo boost, pressure high
48	Fuel or air inlet pressure low
52	ECM A/D conversion fault
53	ECM non volatile memory fault
54	Vehicle speed sensor fault

Flash Codes	DDEC Description
55	J1939 data link fault
56	J1587 data link fault
57	J1922 data link fault
58	Torque overload
61	Injector response time long
62	Auxiliary output short to battery (+) or open circuit, or mechanical fault
63	PWM drive short to battery (+) or open circuit
64	Turbo speed sensor input fault
65	Throttle valve position input fault
66	Engine knock sensor input fault
67	Coolant or air inlet, pressure sensor input voltage fault
68	TPS idle validation switch open circuit or short to ground
71	Injector response time short
72	Vehicle overspeed
73	Gas valve position input fault or ESS fault
74	Optimized idle safety loop short to ground
75	ECM battery voltage high
76	Engine overspeed with engine brake
77	Fuel temperature high
81	Oil level, crankcase pressure, dual fuel BOI, or exhaust temperature voltage high
82	Oil level, crankcase pressure, dual fuel BOI, or exhaust temperature voltage low
83	Oil level, crankcase pressure, exhaust temperature, or external pump pressure high
84	Oil level or crankcase pressure low
85	Engine overspeed
86	External pump or barometer pressure sensor input voltage high
87	External pump or barometer pressure sensor input voltage low
88	Coolant pressure low

Table 5–1 Flash Codes and Description

SAE faults and flash codes with descriptions are listed in Table 5-2.

SAE Faults	Flash Code	DDEC Description
p051 0	65	Throttle valve position above normal range
p051 1	65	Throttle valve position below normal range
p051 3	17	Throttle valve input voltage high
p051 4	18	Throttle valve input voltage low
p051 7	65	Throttle valve not responding
p052 0	44	Intercooler temperature high
p052 3	14	Intercooler sensor input voltage high
p052 4	15	Intercooler sensor input voltage low
p070 4	74	Optimized idle safety loop short to ground
p072 3	17	Bypass position sensor input voltage high
p072 4	18	Bypass position sensor input voltage low
p073 0	83	External pump pressure high
p073 3	86	Pump pressure sensor input voltage high
p073 4	87	Pump pressure sensor input voltage low
p084 0	72	Vehicle overspeed (fueled)
p084 11	72	Vehicle overspeed (absolute)
p084 12	54	Vehicle speed sensor failure
p091 3	21	Throttle position sensor input voltage high
p091 4	22	Throttle position sensor input voltage low
p092 0	58	Torque overload
p094 0	47	Fuel pressure high
p094 1	48	Fuel pressure low
p094 3	37	Fuel pressure sensor input voltage high
p094 4	38	Fuel pressure sensor input voltage low
p098 0	83	Oil level high
p098 1	84	Oil level low
p098 3	81	Oil level sensor input voltage high
p098 4	82	Oil level sensor input voltage low
p100 1	45	Oil pressure low
p100 3	35	Oil pressure sensor input voltage high
p100 4	36	Oil pressure sensor input voltage low
p101 0	83	Crankcase pressure high
p101 1	84	Crankcase pressure low
p101 3	81	Crankcase pressure sensor input voltage high
p101 4	82	Crankcase pressure sensor input voltage low
p102 0	47	Turbo boost pressure high
p102 3	33	Turbo boost pressure sensor input voltage high
p102 4	34	Turbo boost pressure sensor input voltage low
p103 8	64	Turbo speed sensor input failure
p105 0	44	Intake air temperature high

SAE Faults	Flash Code	DDEC Description
p105 3	27	Intake air temperature sensor input voltage high
p105 4	28	Intake air temperature sensor input voltage low
p106 0	47	Air inlet pressure high
p106 1	48	Air inlet pressure low
p106 3	67	Air inlet pressure sensor input voltage high
p106 4	67	Air inlet pressure sensor input voltage low
p108 3	86	Barometer pressure sensor input voltage high
p108 4	87	Barometer pressure sensor input voltage low
p109 1	88	Coolant pressure low
p109 3	67	Coolant pressure sensor input voltage high
p109 4	67	Coolant pressure sensor input voltage low
p110 0	44	Coolant temperature high
p110 3	14	Coolant temperature sensor input voltage high
p110 4	15	Coolant temperature sensor input voltage low
p111 1	43	Coolant level low
p111 3	16	Coolant level sensor input voltage high
p111 4	13	Coolant level sensor input voltage low
p121 0	76	Engine overspeed with engine brake
p168 0	75	ECM battery voltage high
p168 1	46	ECM battery voltage low
p172 3	27	Air temperature sensor input voltage high
p172 4	28	Air temperature sensor input voltage low
p173 0	83	Exhaust temperature high
p173 3	83	Exhaust temperature sensor input voltage high
p173 4	83	Exhaust temperature sensor input voltage low
p174 0	77	Fuel temperature high
p174 3	23	Fuel temperature sensor input voltage high
p174 4	24	Fuel temperature sensor input voltage low
p175 0	44	Oil temperature high
p175 3	14	Oil temperature sensor input voltage high
p175 4	15	Oil temperature sensor input voltage low
p187 3	12	VSG sensor input voltage high
p187 4	11	VSG sensor input voltage low
p187 7	11	VSG switch system not responding
p190 0	85	Engine overspeed
p251 10	—	Clock module abnormal rate
p251 13	—	Clock module fault
s001 0	61	Injector #1 response time long
s001 1	71	Injector #1 response time short
s002 0	61	Injector #2 response time long
s002 1	71	Injector #2 response time short

SAE Faults	Flash Code	DDEC Description
s003 0	61	Injector #3 response time long
s003 1	71	Injector #3 response time short
d004 0	61	Injector #4 response time long
s004 1	71	Injector #4 response time short
s005 0	61	Injector #5 response time long
s005 1	71	Injector #5 response time short
s006 0	61	Injector #6 response time long
s006 1	71	Injector #6 response time short
d007 0	61	Injector #7 response time long
s007 1	71	Injector #7 response time short
s008 0	61	Injector #8 response time long
s008 1	71	Injector #8 response time short
s009 0	61	Injector #9 response time long
s009 1	71	Injector #9 response time short
s010 0	61	Injector #10 response time long
s010 1	71	Injector #10 response time short
s011 0	61	Injector #11 response time long
s011 1	71	Injector #11 response time short
s012 0	61	Injector #12 response time long
s012 1	71	Injector #12 response time short
s013 0	61	Injector #13 response time long
s013 1	71	Injector #13 response time short
s014 0	61	Injector #14 response time long
s014 1	71	Injector #14 response time short
s015 0	61	Injector #15 response time long
s015 1	71	Injector #15 response time short
s016 0	61	Injector #16 response time long
s016 1	71	Injector #16 response time short
s020 3	81	Dual fuel BOI input voltage high
s020 4	82	Dual fuel BOI input voltage low
s021 0	41	Too many SRS (missing TRS)
s021 1	42	Too few SRS (missing SRS)
s025 11	26	Auxiliary engine shutdown #1 input active
s026 3	62	Auxiliary output #1 short to battery (+)
s026 4	62	Auxiliary output #1 open circuit
s026 7	62	Auxiliary output #1 mechanical system not responding properly
s040 3	62	Auxiliary output #2 short to battery (+)
s040 4	62	Auxiliary output #2 open circuit
s040 7	62	Auxiliary output #2 mechanical system not responding properly
s047 0	61	Injector #17 response time long
s047 1	71	Injector #17 response time short
s048 0	61	Injector #18 response time long

SAE Faults	Flash Code	DDEC Description
s048 1	71	Injector #18 response time short
s049 0	61	Injector #19 response time long
s049 1	71	Injector #19 response time short
s050 0	61	Injector #20 response time long
s050 1	71	Injector #20 response time short
s051 3	31	Auxiliary output #3 open circuit
s051 4	31	Auxiliary output #3 short to ground
s052 3	31	Auxiliary output #4 open circuit
s052 4	31	Auxiliary output #4 short to ground
s053 3	62	Auxiliary output #5 short to battery (+)
s053 4	62	Auxiliary output #5 open circuit
s053 7	62	Auxiliary output #5 mechanical system not responding properly
s054 3	62	Auxiliary output #6 short to battery (+)
s054 4	62	Auxiliary output #6 open circuit
s054 7	62	Auxiliary output #6 mechanical system not responding properly
s055 3	62	Auxiliary output #7 short to battery (+)
s055 4	62	Auxiliary output #7 open circuit
s055 7	62	Auxiliary output #7 mechanical system not responding properly
s056 3	62	Auxiliary output #8 short to battery (+)
s056 4	62	Auxiliary output #8 open circuit
s056 7	62	Auxiliary output #8 mechanical system not responding properly
s057 3	63	PWM driver #1 short to battery (+)
s057 4	63	PWM driver #1 open circuit
s058 3	63	PWM driver #2 short to battery (+)
s058 4	63	PWM driver #2 open circuit
s059 3	63	PWM driver #3 short to battery (+)
s059 4	63	PWM driver #3 open circuit
s060 3	63	PWM driver #4 short to battery (+)
s060 4	63	PWM driver #4 open circuit
s061 11	26	Auxiliary engine shutdown #2 input active
s072 0	61	#21 injector response time long
s072 1	71	#21 injector response time short
s073 0	61	#22 injector response time long
s073 1	71	#22 injector response time short
s074 0	61	#23 injector response time long
s074 1	71	#23 injector response time short
s075 0	61	#24 injector response time long
s075 1	71	#24 injector response time short
s076 0	66	Engine knock level above normal range
s076 3	66	Engine knock sensor input voltage high
s076 4	66	Engine knock sensor input voltage low
s076 7	66	Engine knock sensor torque reduction

SAE Faults	Flash Code	DDEC Description
s077 0	73	Gas valve position above normal range
s077 1	73	Gas valve position below normal range
s077 3	73	Gas valve position input voltage high
s077 4	73	Gas valve position input voltage low
s151 14	73	System Diagnostic Code #1 (ESS)
s226 11	73	Transmission Neutral Switch (ESS)
s227 4	73	Auxiliary analog input #1 voltage low (ESS)
s227 3	73	Auxiliary analog input #1 voltage high (ESS)
s227 2	73	Auxiliary analog input #1 data erratic, intermittent or incorrect (ESS)
s230 5	68	TPS idle validation switch open circuit
s230 6	68	TPS idle validation switch short to ground
s231 12	55	J1939 data link fault
s238 3	32	SEL short to battery (+)
s238 4	32	SEL open circuit
s239 3	32	CEL short to battery (+)
s239 4	32	CEL open circuit
s240 2	—	Fram checksum incorrect
s248 8	55	Proprietary data link fault (master)
s248 9	55	Proprietary data link fault (slave)
s249 12	57	J1922 data link fault
s250 12	56	J1587 data link fault
s253 2	53	Non volatile memory data incorrect
s253 12	53	Non volatile memory fault
s253 13	—	Incompatible calibration version
s254 0	—	External failed RAM
s254 1	—	Internal failed RAM
s254 6	—	Entered boot via switches
s254 12	52	ECM A/D conversion fail

Table 5–2 SAE Faults and Flash Codes