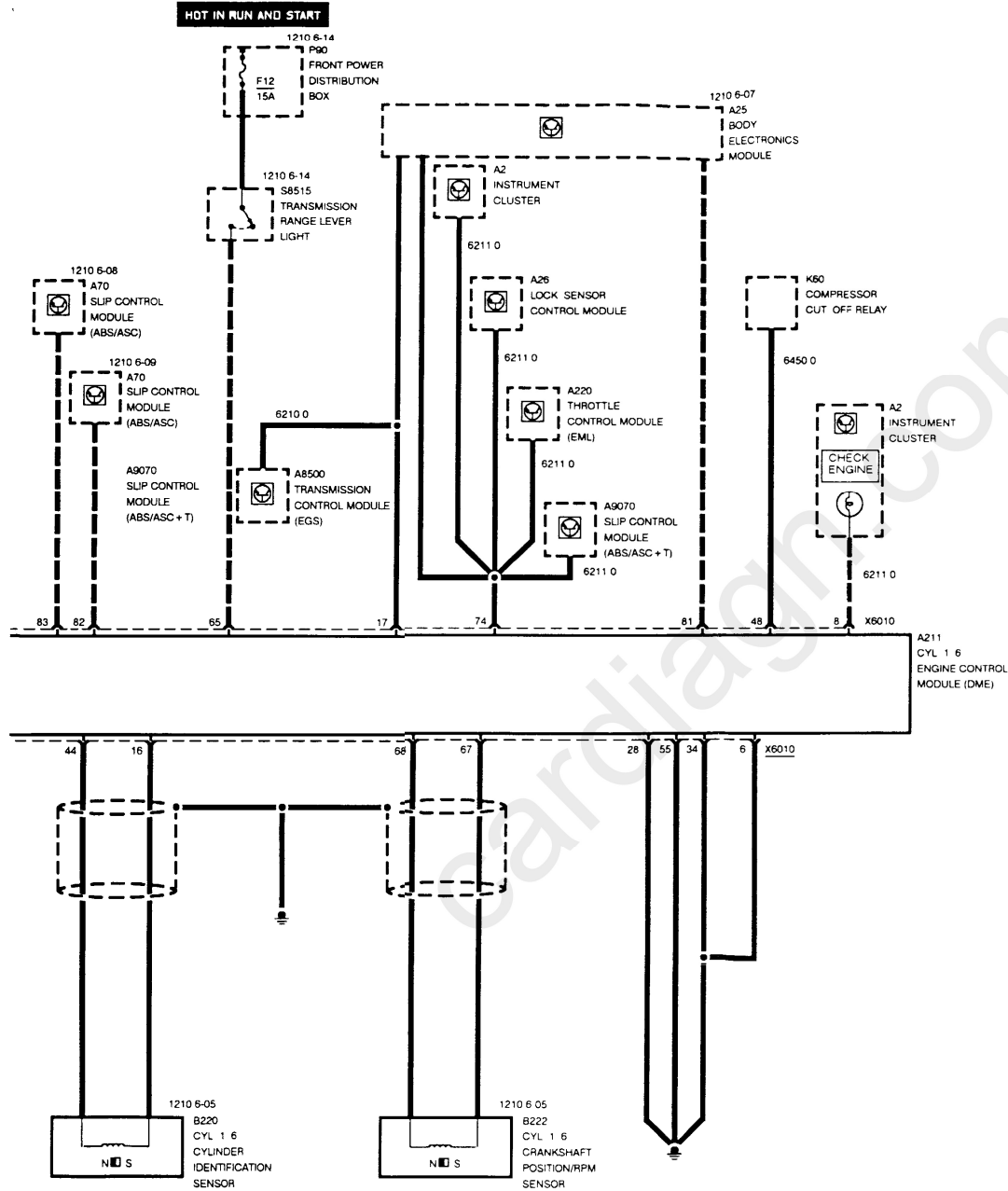
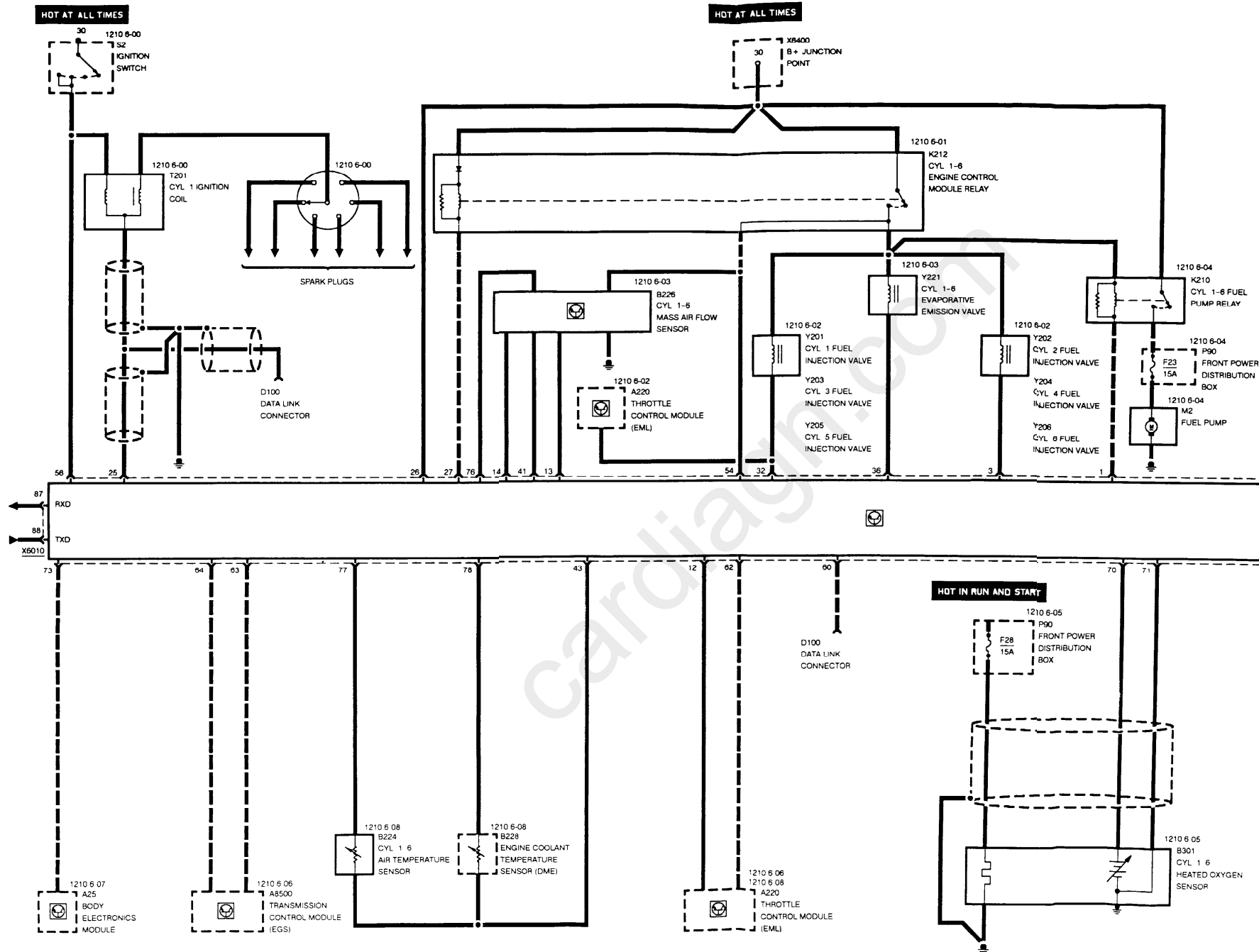
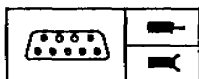








ENGINE CONTROL SYSTEM (DME M1.7, 12-CYLINDER M70)



Pin Assignments

X6010

Pin	Type	Description/Function	Connection	Type of Signal	Tester Display	Measurement Notes
1	A	EKP relay and TR signal (crankshaft reference)	EKP relay and EGS control unit torque converter clutch	Ground with su- perimposed en- gine speed signal	ON	Can only be measured when crankshaft rotating (the EKP relay does not switch if the TR signal is not applied)
2		Not used				
3	A	Injector valves cyl. 2-4-6	Injector valve EV	Ground clocked	Injection time ti	Ground => injector valves open, see component activation
4		Not used				
5		Not used				
6	M	Ground, EV output stages	Ground point	Ground		
7		Not used				
8	A	Defect lamp (US only)	Instrument cluster	Ground		
9		Not used				
10		Not used				
11		Not used				
12	E	Full load signal VL	EML control unit	Ground	ON	At full load (kick-down)



ENGINE CONTROL SYSTEM (DME M1.7, 12-CYLINDER M70)

Pin	Type	Description/Function	Connection	Type of Signal	Tester Display	Measurement Notes
13	A	Burn off	Air mass meter	Voltage increase for approx. 0.5 sec		See chapter component testing
14	M	Ground, air mass meter	Air mass meter	Ground		
15		Not used				
16	E	Cylinder reference sensor (ignition)	Cylinder reference sensor (connection B)		ON/OFF	See status monitoring
17	A	ti measuring signal (KVA signal)	EKM control unit	Square wave signal	Multimeter function Pulse duration	
18		Not used				
19		Not used				
20		Not used				
21		Not used				
22		Not used				
23		Not used				
24		Not used				
25	A	Ignition terminal 1	Ignition coil 1	Primary signal	Oscilloscope	Engine test, test step 05
26	E	Battery voltage	B+ terminal point	U-Batt		Diagnosis not possible if not fitted
27	A	DME main relay	DME main relay terminal 85 (additionally, jumper to second DME main relay)	Ground	ON	Diagnosis not possible if not fitted – connect jumper at relay terminal 30 and 87
28	M	Ground for electronics and shielding the sensors	Ground point	Ground		
29		Not used				



ENGINE CONTROL SYSTEM (DME M1.7, 12-CYLINDER M70)

Pin	Type	Description/Function	Connection	Type of Signal	Tester Display	Measurement Notes
30		Not used				
31		Not used				
32	A	Injector valves cyl. 1–3–5	EV and EML control unit	Ground clocked	Injection time ti	Ground => Injector valves open, see component activation
33		Not used				
34	M	Ground, remaining output stages (except for ignition and EV)	Ground point	Ground		
35		Not used				
36	A	Fuel evaporation control valve	TE valve	Ground clocked	CLOSED/OPEN	Perform component activation, ground => closed
37		Not used				
38		Not used				
39		Not used				
40		Not used				
41	E	Signal, air mass meter	Air mass meter	0...5 V	Load signal in ms	See status monitoring
42		Not used				
43	M	Ground for sensors	Temperature sensors	Ground		
44	E	Cylinder reference (ignition)	Cylinder reference (connection A)		ON/OFF	See status monitoring
45		Not used				
46		Not used				
47		Not used				
48	A	Compressor cut-off signal	Compressor cut-off relay	Ground		



ENGINE CONTROL SYSTEM (DME M1.7, 12-CYLINDER M70)

Pin	Type	Description/Function	Connection	Type of Signal	Tester Display	Measurement Notes
49		Not used				
50		Not used				
51		Not used				
52		Not used				
53		Not used				
54	E	U-Batt from DME main relay	Main relay terminal 87	U-Batt	Voltage value	Perform status monitoring. Diagnosis not possible if signal not applied – connect jumper to terminal 30 and 87 on relay
55	M	Ground ignition	Ground point	Ground		
56	E	Ignition terminal 15	Ignition switch	U-Batt		
57		Not used				
58		Not used				
59		Not used				
60	E	Programming voltage	Diagnostic connector			Only activated for control unit programming
61		Not used				
62	E	Idle signal LL	EML control unit	Ground	ON	See status monitoring
63	E	Torque converter clutch (WK)	EGS control unit	Ground	ON (with engine running)	When WK engaged, see status monitoring
64	E	Ignition timing intervention	EGS control unit	Ground	ON	Only active during gearshift
65	E	Park/Neutral sensing	Transmission selector lever switch	Ground	ON	When position P/N



ENGINE CONTROL SYSTEM (DME M1.7, 12-CYLINDER M70)

Pin	Type	Description/Function	Connection	Type of Signal	Tester Display	Measurement Notes
66		Not used				
67	E	Inductive pulse generator (connection B)	Pulse generator, Engine speed/position	A/C voltage	Engine speed	Between Pins 67 and 68 (can only be measured with crankshaft rotating)
68	E	Inductive pulse generator (connection A)	Pulse generator, Engine speed/position	A/C voltage	Engine speed	Between Pins 67 and 68 (can only be measured with crankshaft rotating)
69		Not used				
70	E	Oxygen sensor signal	Oxygen sensor	Pulsating voltage, up to approx. 1 V	Voltage value	Can only be measured with engine running at operating temperature
71	M	Ground, oxygen sensor	Oxygen sensor	Ground		
72		Not used				
73	E	Road speed signal	EKM control unit	Square-wave signal	km/h	
74	A	Engine speed signal (TD)	EKM control unit	Square-wave signal		One signal per ignition
75		Not used				
76	E	Idle CO-potentiometer	Air mass meter	0...5 V	Voltage value	
77	E	Intake air temperature	Intake air temperature sensor	0...5 V	0 C	Temperature-dependent
78	E	Engine temperature	Engine temperature sensor	0...5 V	0 C	Temperature-dependent
79		Not used				
80		Not used				
81	E	DWA signal	EKM control unit	Ground	OFF	U-Batt applied when DWA armed



ENGINE CONTROL SYSTEM (DME M1.7, 12-CYLINDER M70)

Pin	Type	Description/Function	Connection	Type of Signal	Tester Display	Measurement Notes
82	E	ASC/MSR	ASC or ASC + T	U-Batt	ON	U-Batt => signal active
83	E	ASC/ZAB	Only for ASC without T	U-Batt	ON	U-Batt => signal active
84		Not used				
85		Not used				
86		Not used				
87	E	RxD diagnostic data line	Diagnostic connector	U-Batt		When cover of diagnostic connector closed
88	E/A	TxD diagnostic data line	Diagnostic connector	Ground		When cover of diagnostic connector closed

E = Input, A = Output, M = Ground

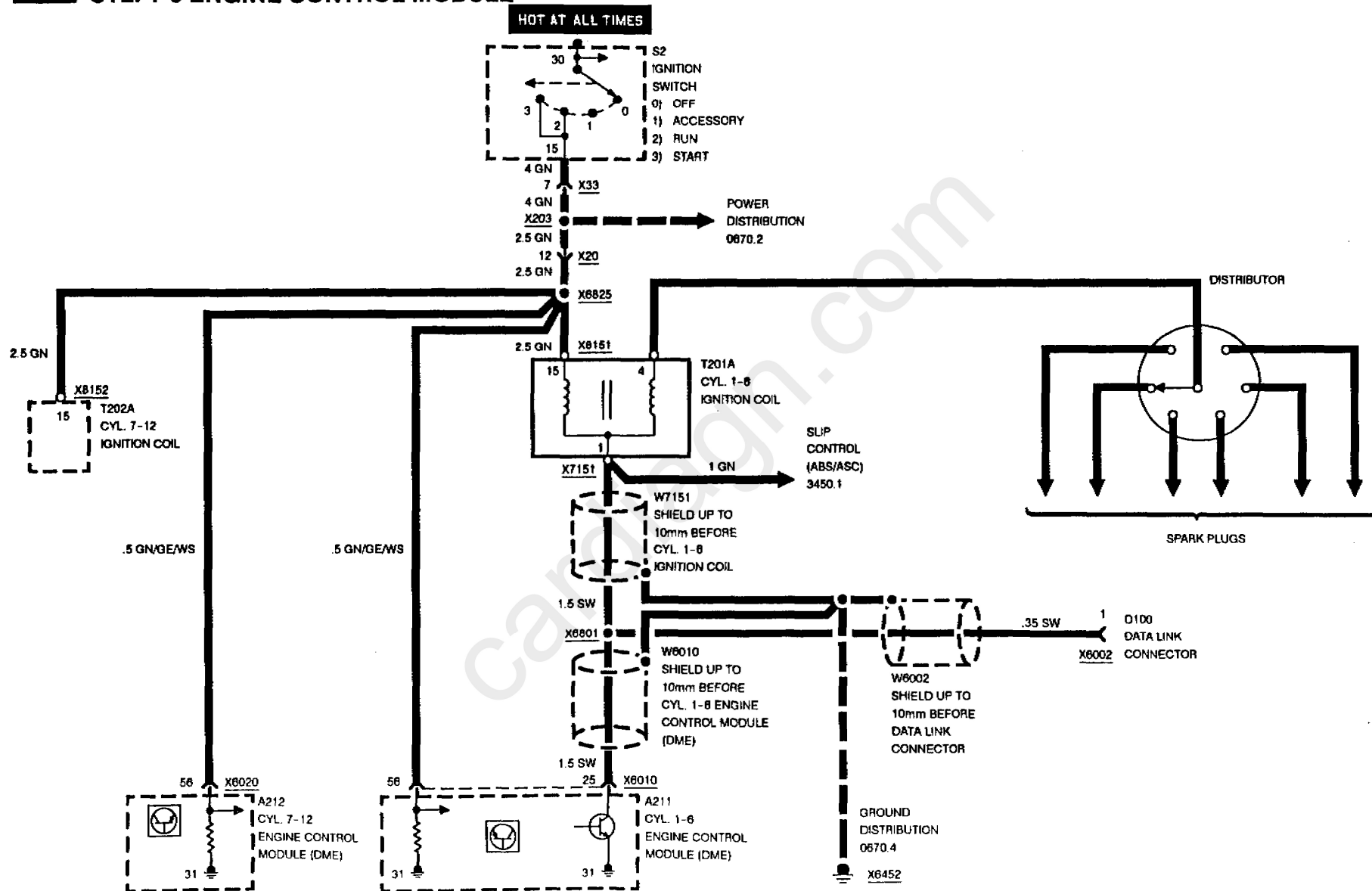


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ENGINE CONTROL SYSTEM (DME M1.7, 12-CYLINDER M70)

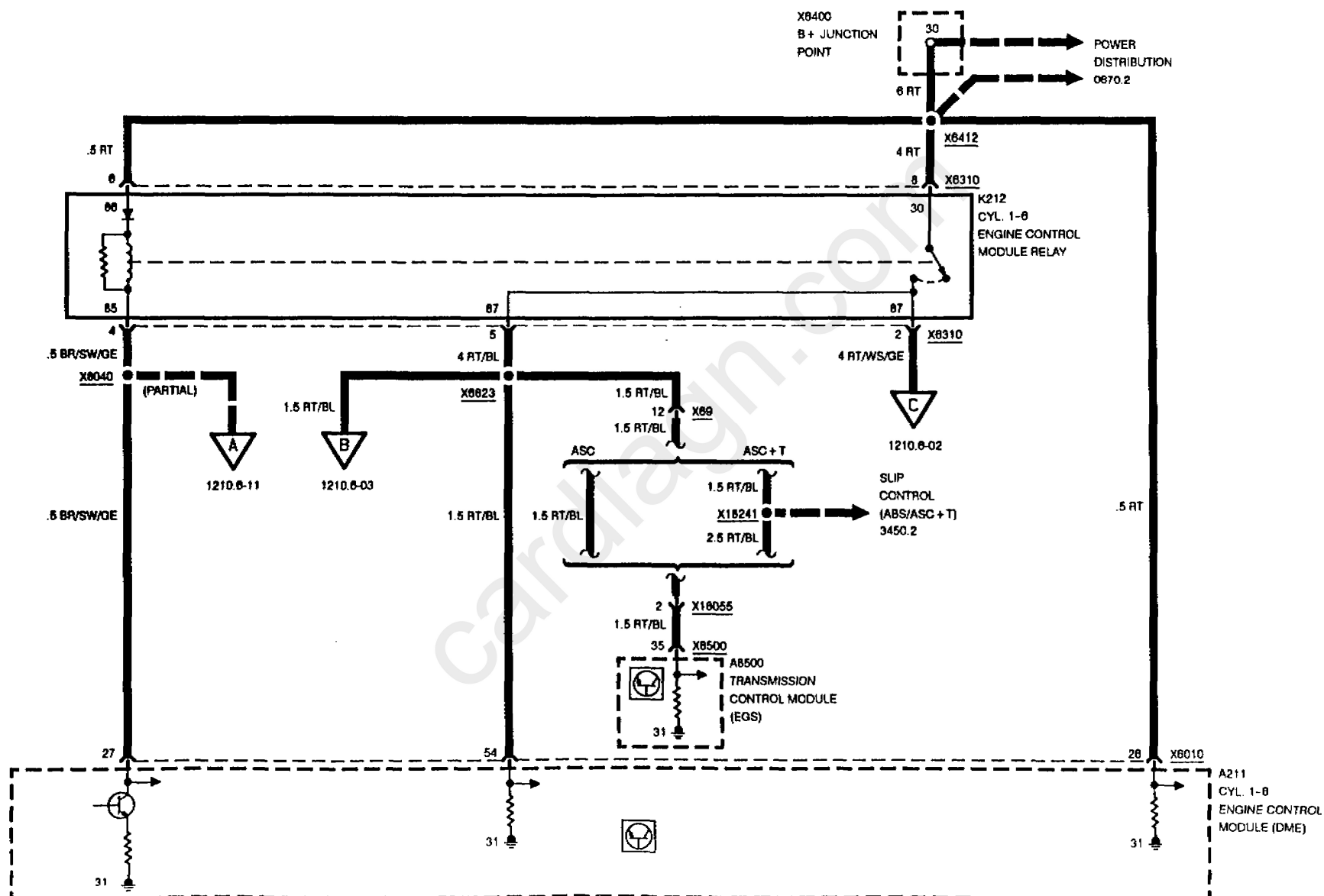
CYL. 1-6 ENGINE CONTROL MODULE





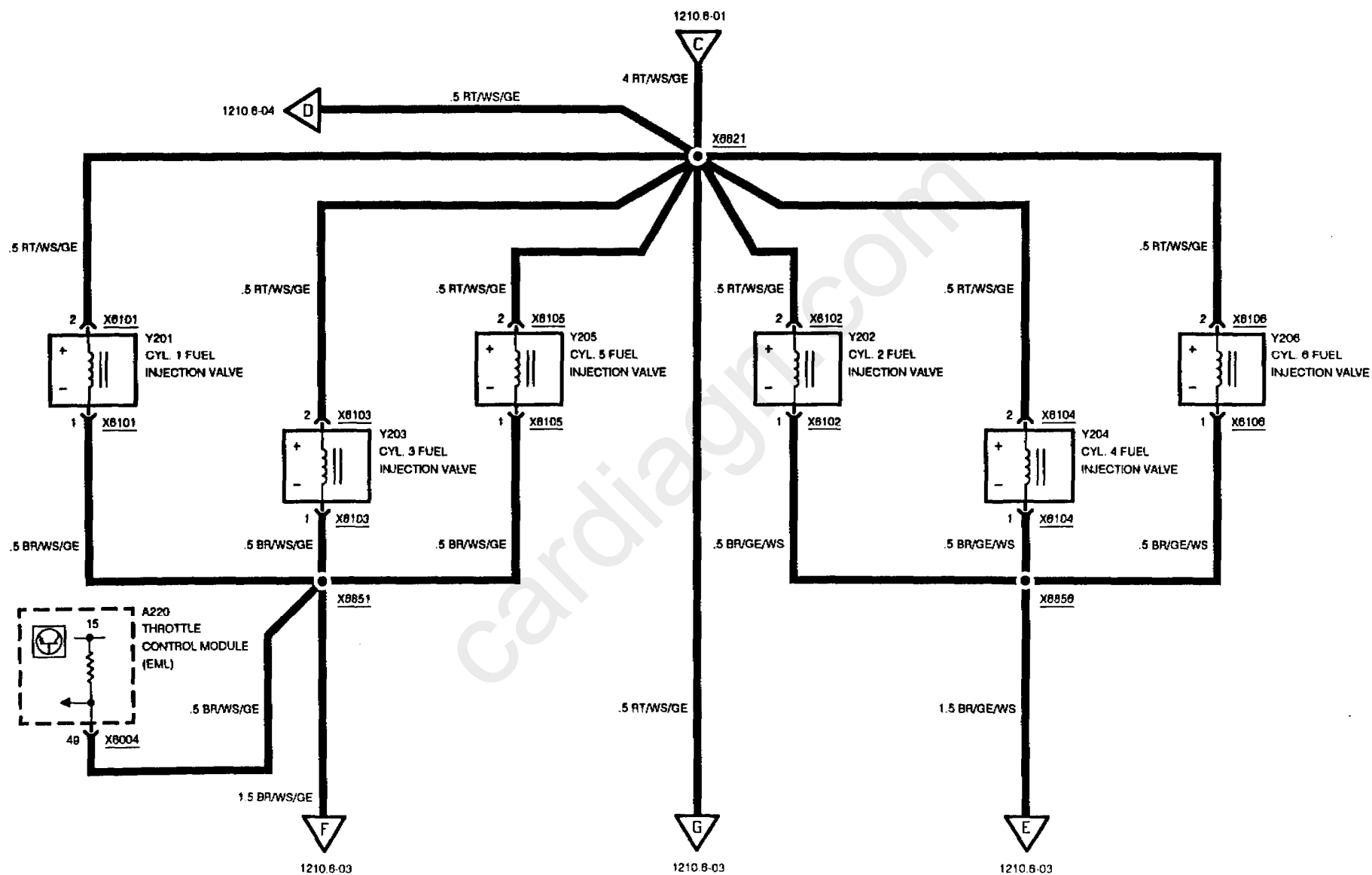
ENGINE CONTROL SYSTEM (DME M1.7, 12-CYLINDER M70)

CYL. 1-6 ENGINE CONTROL MODULE



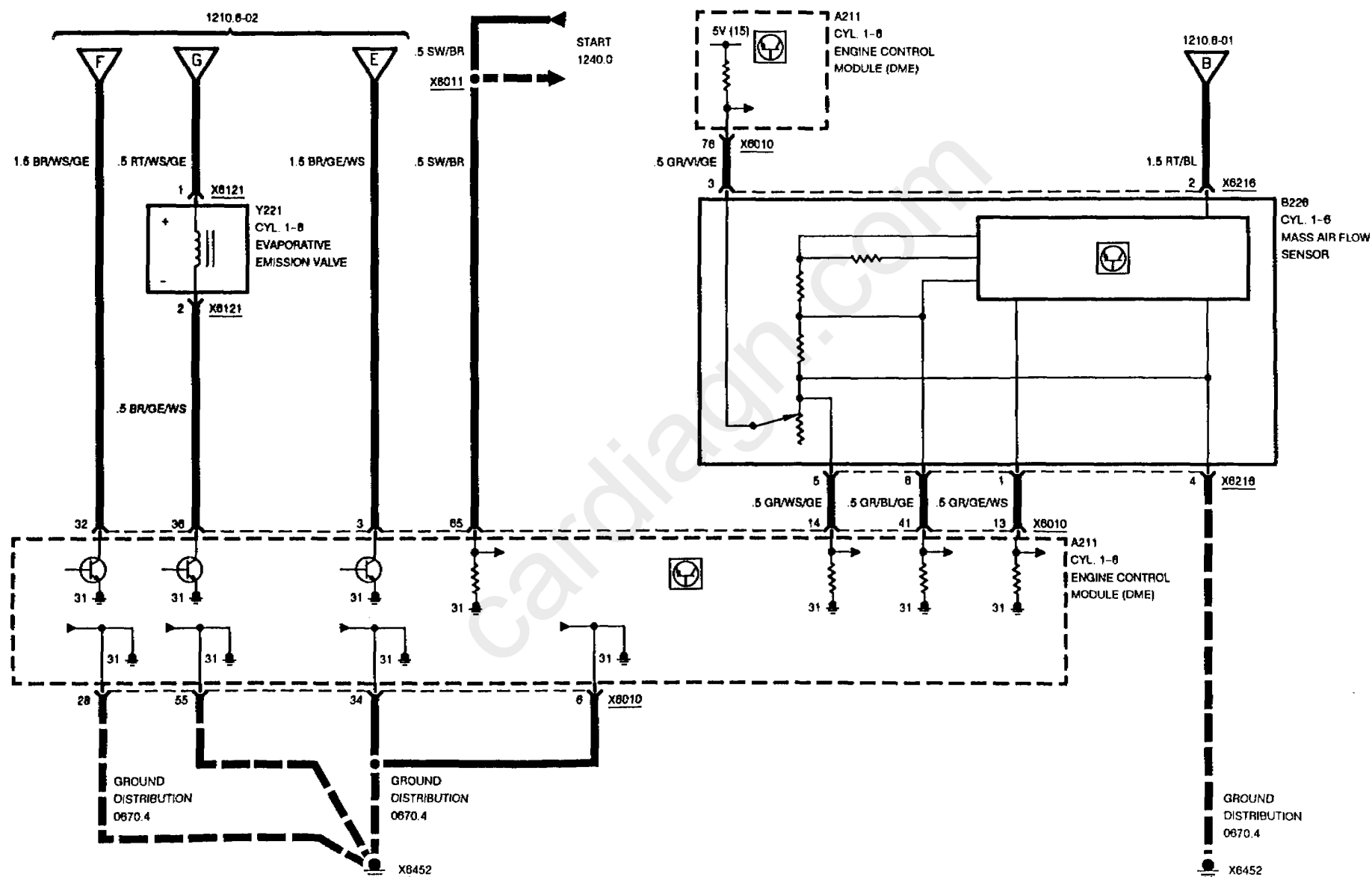
ENGINE CONTROL SYSTEM (DME M1.7, 12-CYLINDER M70)

FUEL INJECTION VALVES



ENGINE CONTROL SYSTEM (DME M1.7, 12-CYLINDER M70)

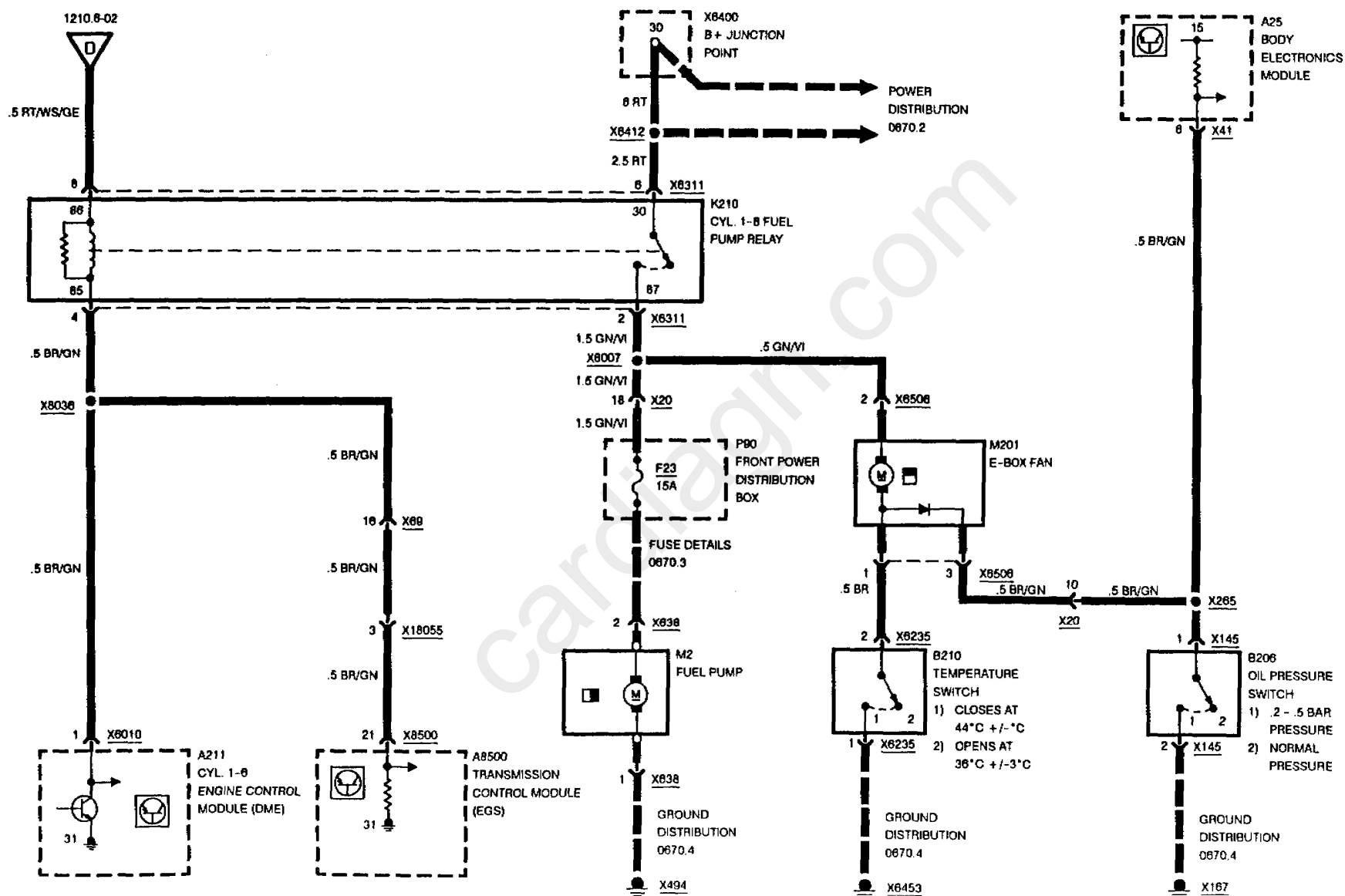
CYL. 1-6 ENGINE CONTROL MODULE





ENGINE CONTROL SYSTEM (DME M1.7, 12-CYLINDER M70)

CYL. 1-6 ENGINE CONTROL MODULE

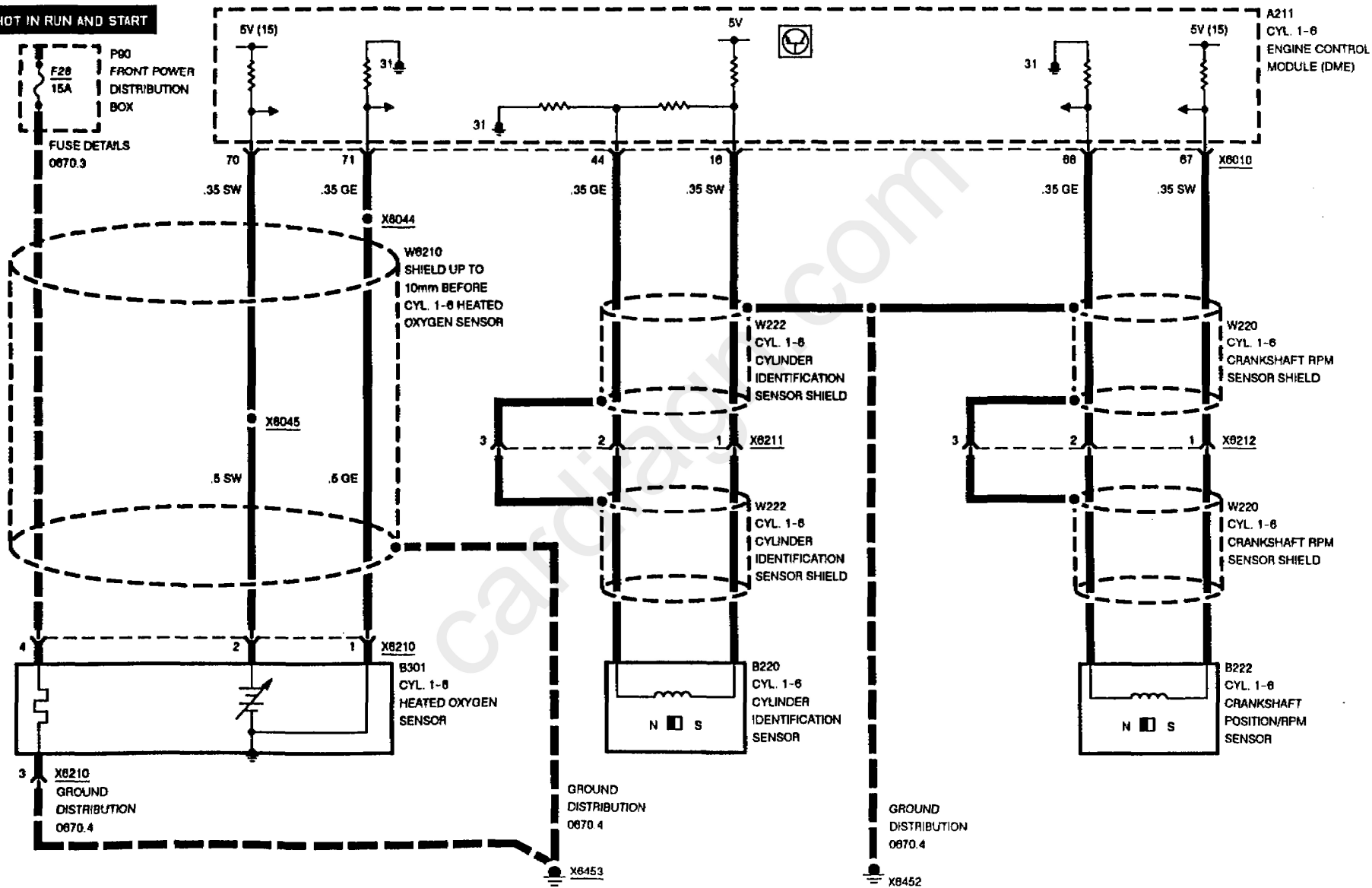




ENGINE CONTROL SYSTEM (DME M1.7, 12-CYLINDER M70)

CYL. 1-6 ENGINE CONTROL MODULE

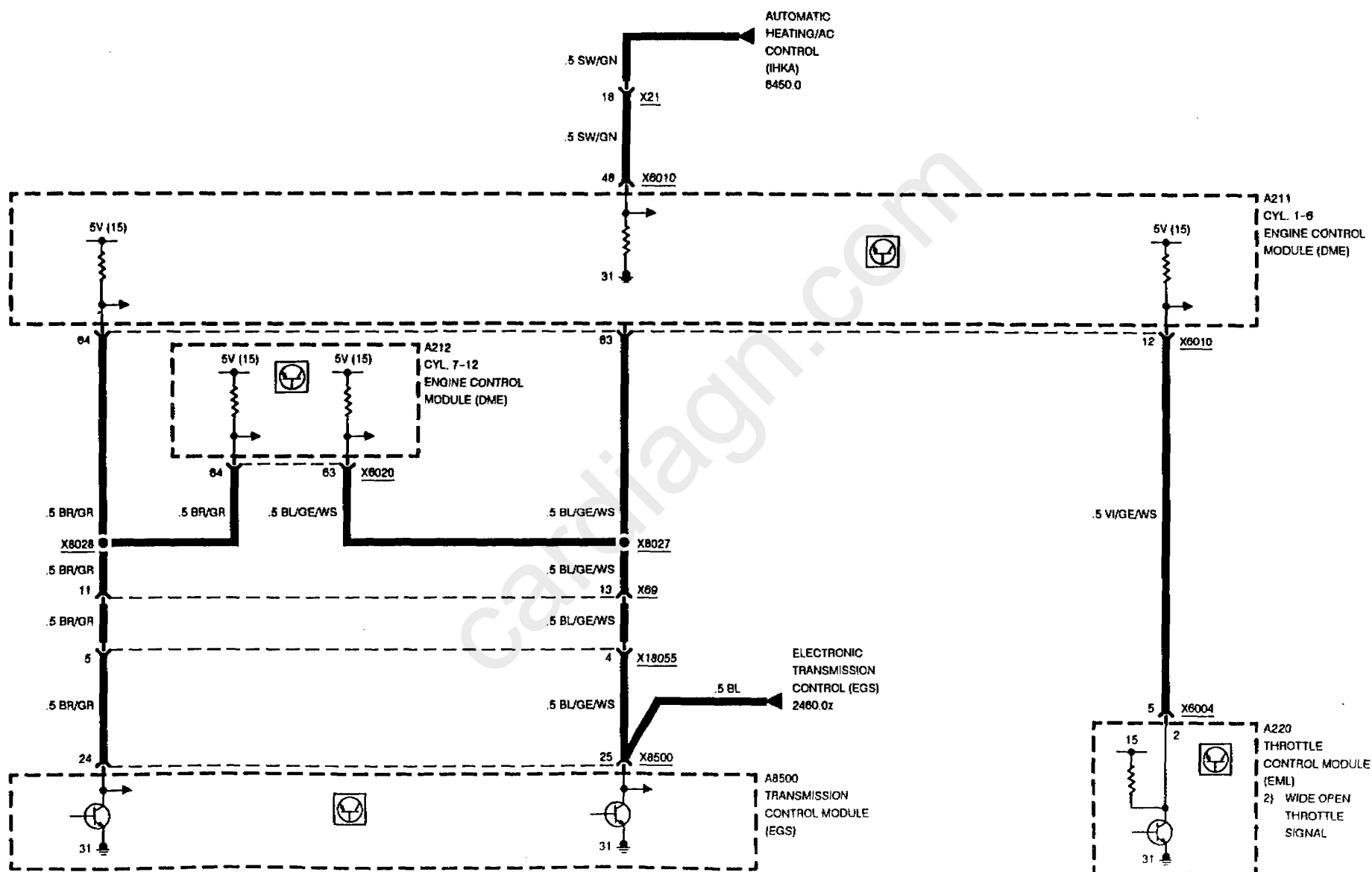
HOT IN RUN AND START





ENGINE CONTROL SYSTEM (DME M1.7, 12-CYLINDER M70)

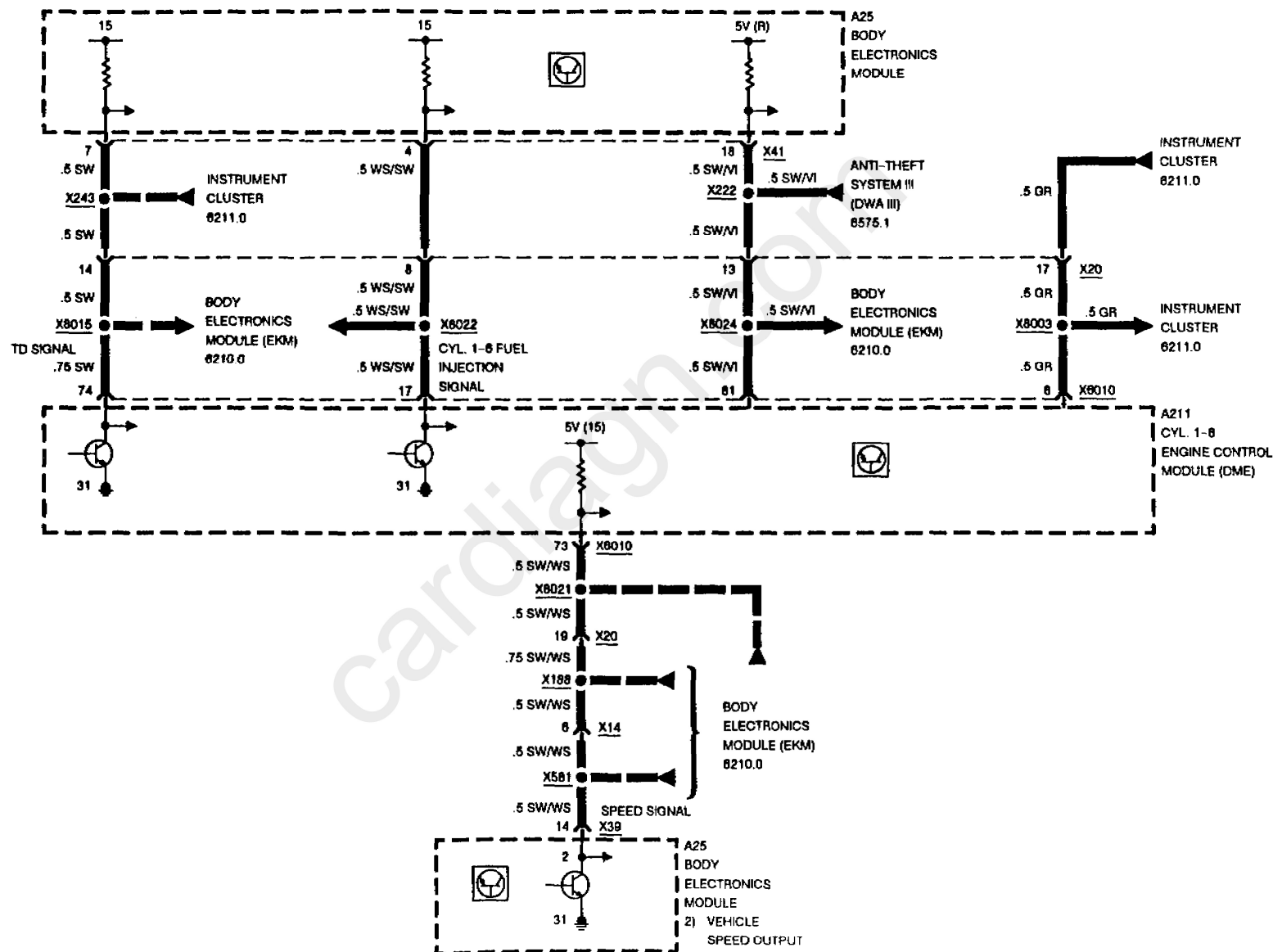
CYL. 1-6 ENGINE CONTROL MODULE





ENGINE CONTROL SYSTEM (DME M1.7, 12-CYLINDER M70)

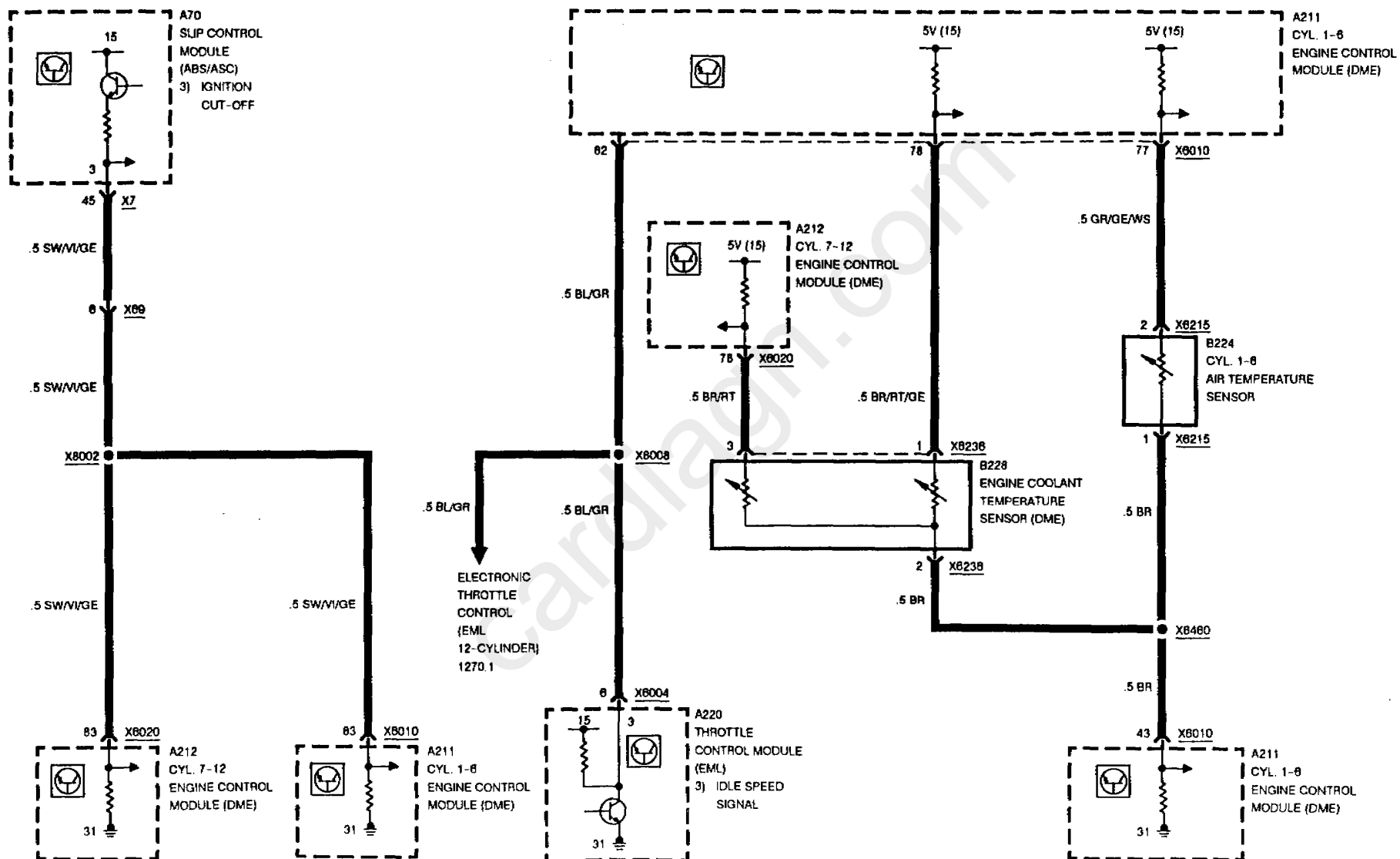
CYL. 1-6 ENGINE CONTROL MODULE





ENGINE CONTROL SYSTEM (DME M1.7, 12-CYLINDER M70)

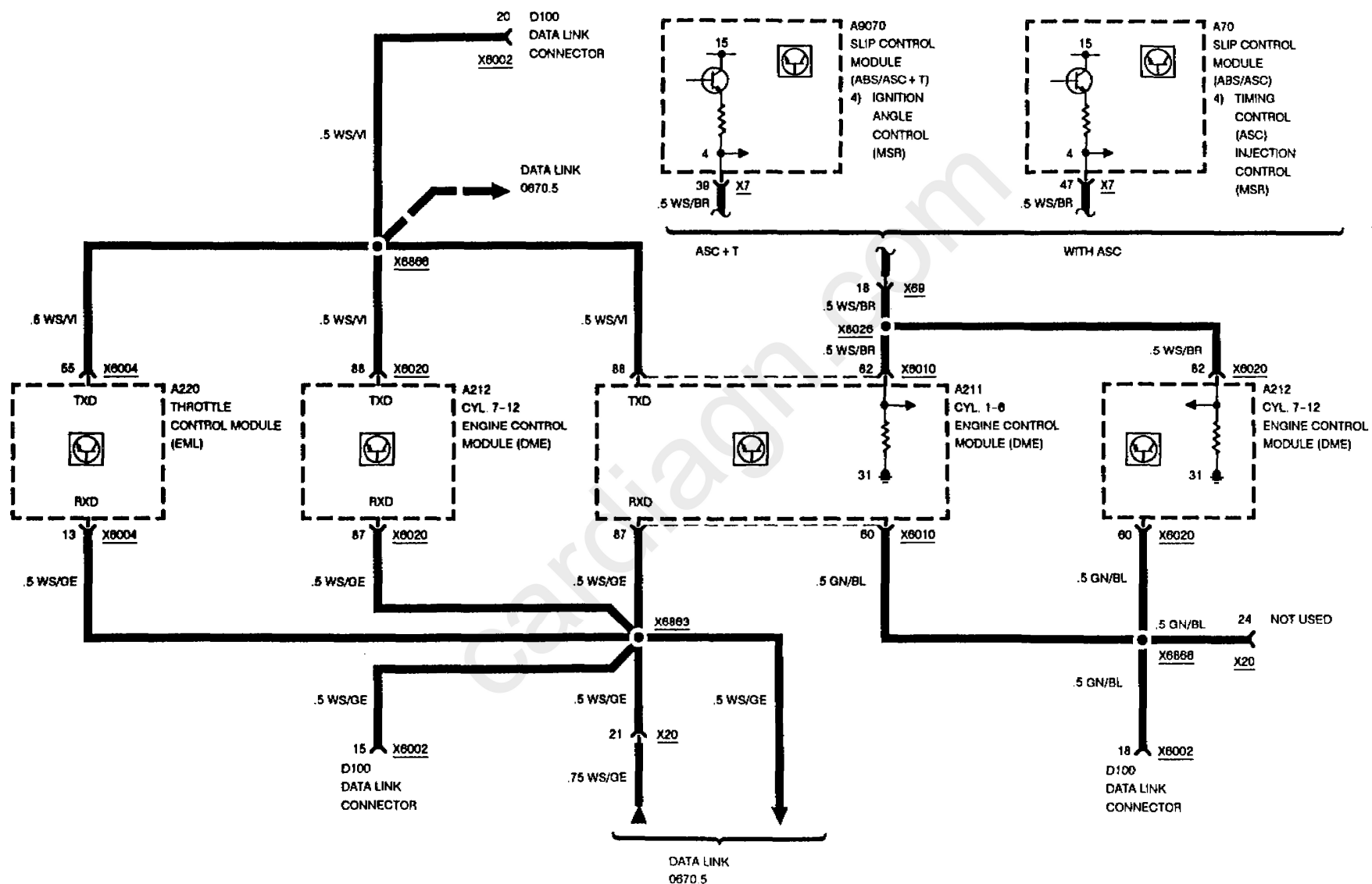
CYL. 1-6 ENGINE CONTROL MODULE





ENGINE CONTROL SYSTEM (DME M1.7, 12-CYLINDER M70)

CYL. 1-6 ENGINE CONTROL MODULE

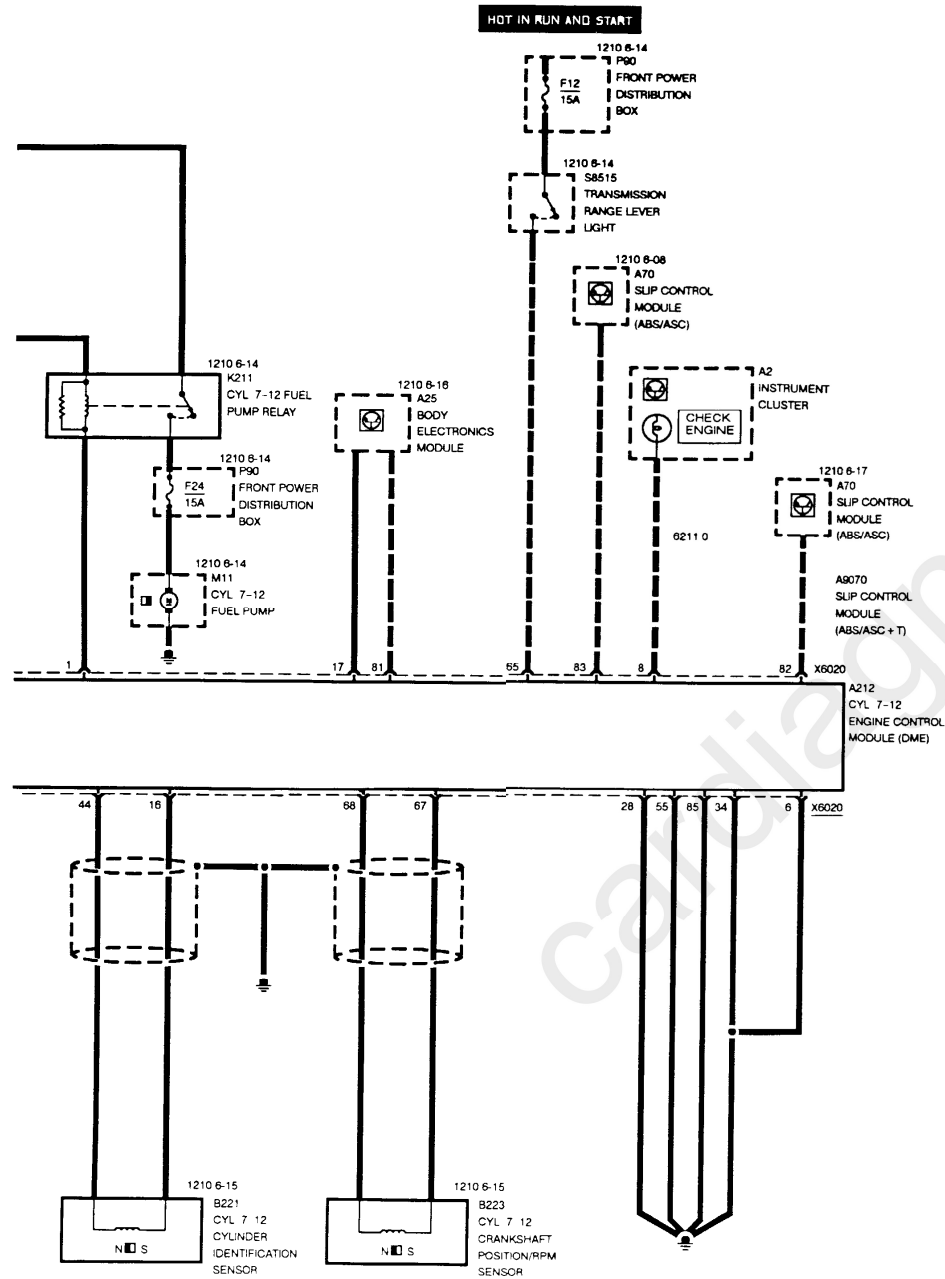


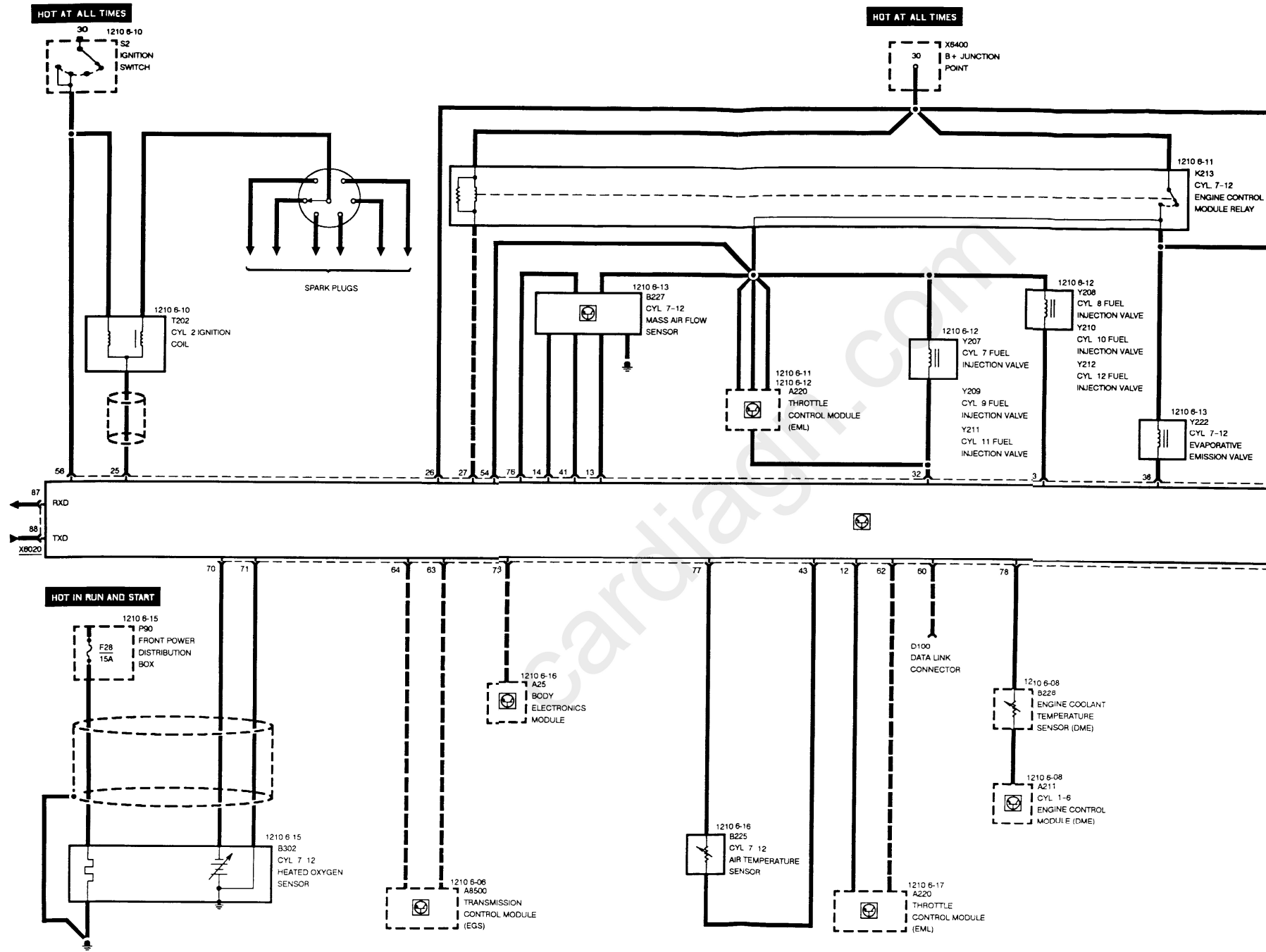


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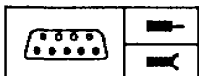
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ENGINE CONTROL SYSTEM (DME M1.7, 12-CYLINDER M70)



Pin Assignments

X6020

Pin	Type	Description/Function	Connection	Type of Signal	Tester Display	Measurement Notes
1	A	EKP relay and TR signal (crankshaft reference)	EKP relay and EGS control unit torque converter clutch	Ground with superimposed engine speed signal	ON	Can only be measured when crankshaft rotating (the EKP relay does not switch if the TR signal is not applied)
2		Not used				
3	A	Injector valves cyl. 8–10–12	Injector valve EV	Ground clocked	Injection time ti	Ground => injector valves open, see component activation
4		Not used				
5		Not used				
6	M	Ground, EV output stages	Ground point	Ground		
7		Not used				
8	A	Defect lamp (US only)	Instrument cluster	Ground		
9		Not used				
10		Not used				
11		Not used				
12	E	Full load signal VL	EML control unit	Ground	ON	At full load (kick-down)



ENGINE CONTROL SYSTEM (DME M1.7, 12-CYLINDER M70)

Pin	Type	Description/Function	Connection	Type of Signal	Tester Display	Measurement Notes
13	A	Burn off	Air mass meter	Voltage increase for approx. 0.5 sec		See chapter component testing
14	M	Ground, air mass meter	Air mass meter	Ground		
15		Not used				
16	E	Cylinder reference sensor (ignition)	Cylinder reference sensor (connection B)		ON/OFF	See status monitoring
17	A	ti measuring signal (KVA signal)	EKM control unit	Square wave signal	Multimeter function Pulse duration	
18		Not used				
19		Not used				
20		Not used				
21		Not used				
22		Not used				
23		Not used				
24		Not used				
25	A	Ignition terminal 1	Ignition coil	Primary signal	Oscilloscope	Engine test, test step 05
26	E	Battery voltage	B+ terminal point	U-Batt		Diagnosis not possible if not fitted
27	A	DME main relay	DME main relay terminal 85 (additionally, jumper to second DME main relay)	Ground	ON	Diagnosis not possible if not fitted – connect jumper at relay terminal 30 and 87
28	M	Ground for electronics and shielding the sensors	Ground point	Ground		
29		Not used				



ENGINE CONTROL SYSTEM (DME M1.7, 12-CYLINDER M70)

Pin	Type	Description/Function	Connection	Type of Signal	Tester Display	Measurement Notes
30		Not used				
31		Not used				
32	A	Injector valves cyl. 7–9–11	EV and EML control unit	Ground clocked	Injection time ti	Ground => Injector valves open, see component activation
33		Not used				
34	M	Ground, remaining output stages (except for ignition and EV)	Ground point	Ground		
35		Not used				
36	A	Fuel evaporation control valve	TE valve	Ground clocked	CLOSED/OPEN	Perform component activation, ground => closed
37		Not used				
38		Not used				
39		Not used				
40		Not used				
41	E	Signal, air mass meter	Air mass meter	0...5 V	Load signal in ms	See status monitoring
42		Not used				
43	M	Ground for sensor	Temperature sensor	Ground		
44	E	Cylinder reference (ignition)	Cylinder reference (connection A)		ON/OFF	See status monitoring
45		Not used				
46		Not used				
47		Not used				
48		Not used				



ENGINE CONTROL SYSTEM (DME M1.7, 12-CYLINDER M70)

Pin	Type	Description/Function	Connection	Type of Signal	Tester Display	Measurement Notes
49		Not used				
50		Not used				
51		Not used				
52		Not used				
53		Not used				
54	E	U-Batt from DME main relay	Main relay terminal 87	U-Batt	Voltage value	Perform status monitoring. Diagnosis not possible if signal not applied – connect jumper to terminal 30 and 87 on relay
55	M	Ground ignition	Ground point	Ground		
56	E	Ignition terminal 15	Ignition switch	U-Batt		
57		Not used				
58		Not used				
59		Not used				
60	E	Programming voltage	Diagnostic connector			Only activated for control unit programming
61		Not used				
62	E	Idle signal LL	EML control unit	Ground	ON	See status monitoring
63	E	Torque converter clutch (WK)	EGS control unit	Ground	ON (with engine running)	When WK engaged, see status monitoring
64	E	Ignition timing intervention	EGS control unit	Ground	ON	Only active during gearshift
65	E	Park/Neutral sensing	Transmission selector lever switch	Ground	ON	When position P/N



ENGINE CONTROL SYSTEM (DME M1.7, 12-CYLINDER M70)

Pin	Type	Description/Function	Connection	Type of Signal	Tester Display	Measurement Notes
66		Not used				
67	E	Inductive pulse generator (connection B)	Pulse generator, Engine speed/position	A/C voltage	Engine speed	Between Pins 67 and 68 (can only be measured with crankshaft rotating)
68	E	Inductive pulse generator (connection A)	Pulse generator, Engine speed/position	A/C voltage	Engine speed	Between Pins 67 and 68 (can only be measured with crankshaft rotating)
69		Not used				
70	E	Oxygen sensor signal	Oxygen sensor	Pulsating voltage, up to approx. 1 V	Voltage value	Can only be measured with engine running at operating temperature
71	M	Ground, oxygen sensor	Oxygen sensor	Ground		
72		Not used				
73	E	Road speed signal	EKM control unit	Square-wave signal	km/h	
74	A	Engine speed signal (TD)	EKM control unit	Square-wave signal		one signal per ignition
75		Not used				
76	E	Idle CO-potentiometer	Air mass meter	0...5 V	Voltage value	
77	E	Intake air temperature	Intake air temperature sensor	0...5 V	0 C	Temperature-dependent
78		Not used				
79		Not used				
80		Not used				
81	E	DWA signal	EKM control unit	Ground	OFF	U-Batt applied when DWA armed



ENGINE CONTROL SYSTEM (DME M1.7, 12-CYLINDER M70)

Pin	Type	Description/Function	Connection	Type of Signal	Tester Display	Measurement Notes
82	E	ASC/MSR	ASC or ASC + T	U-Batt	ON	U-Batt => signal active
83	E	ASC/ZAB	Only for ASC without T	U-Batt	ON	U-Batt => signal active
84		Not used				
85	E	Identifier, DME control unit II	Ground point	Ground	DME cyl. 7...12	The DME control unit can only be selected with the diagnostic procedure when this link is set up.
86		Not used				
87	E	RxD diagnostic data line	Diagnostic connector	U-Batt		When cover of diagnostic connector closed
88	E/A	TxD diagnostic data line	Diagnostic connector	Ground		When cover of diagnostic connector closed



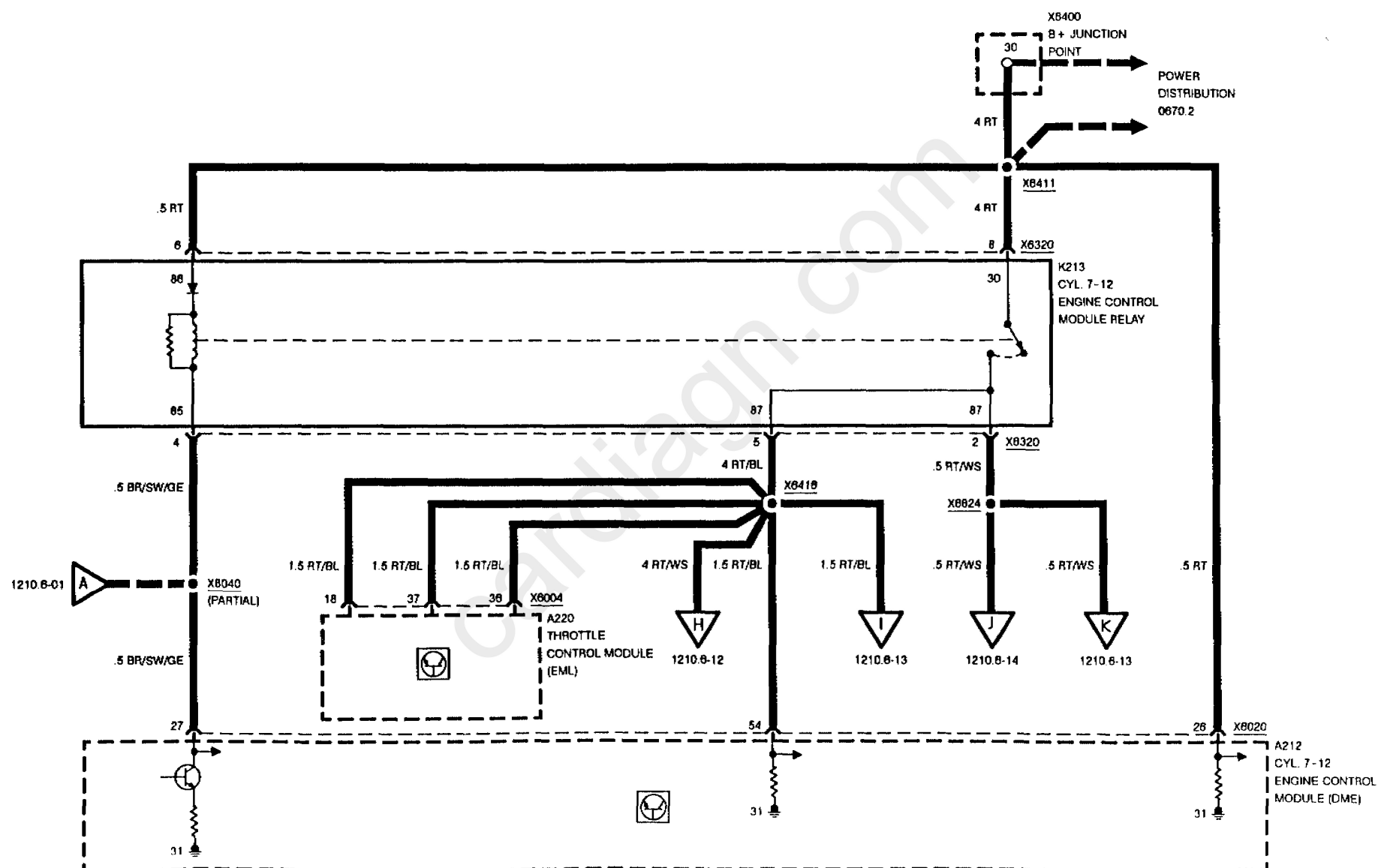
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1210.6-10

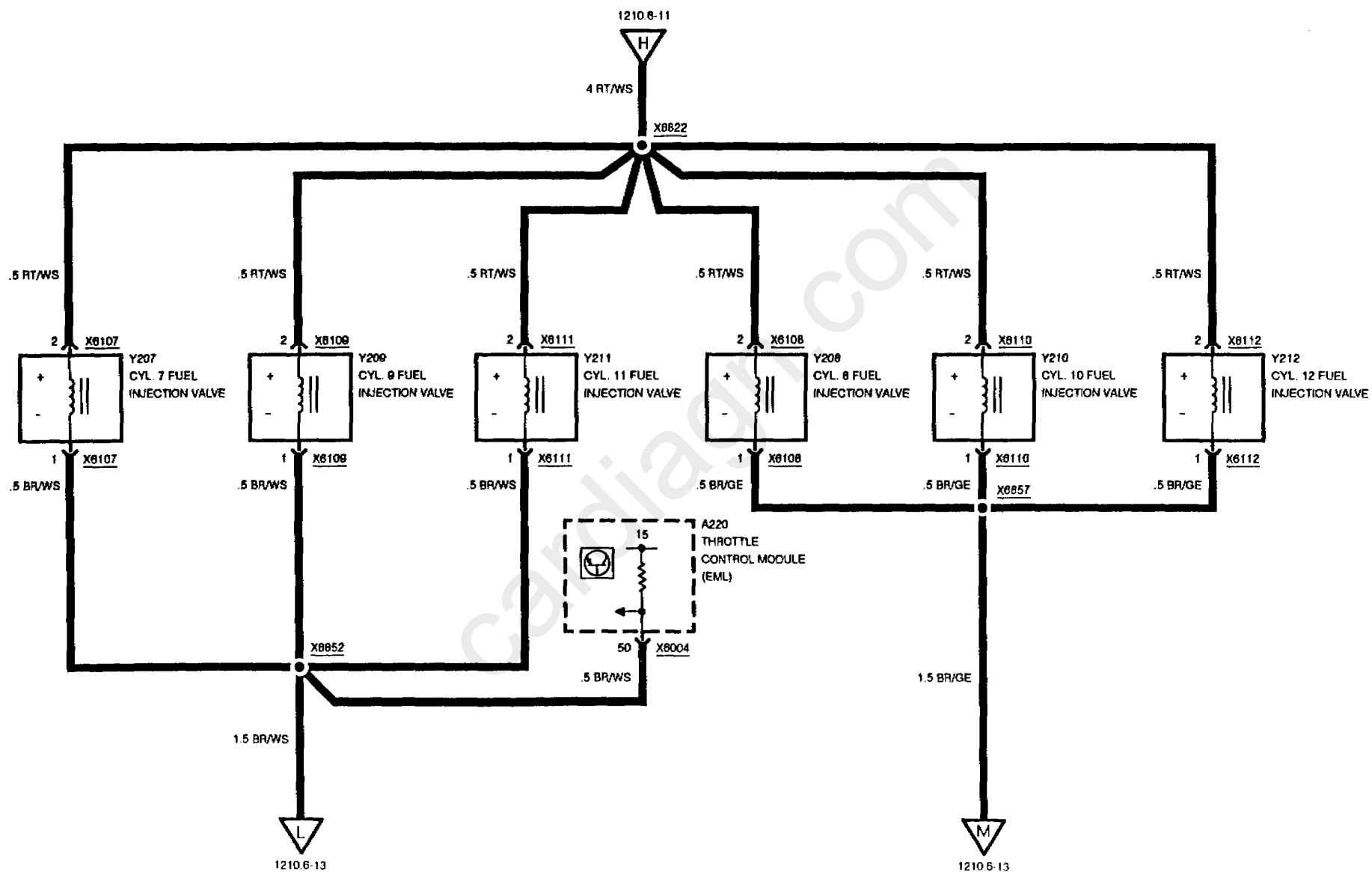
ENGINE CONTROL SYSTEM (DME M1.7, 12-CYLINDER M70)

CYL. 7-12 ENGINE CONTROL MODULE



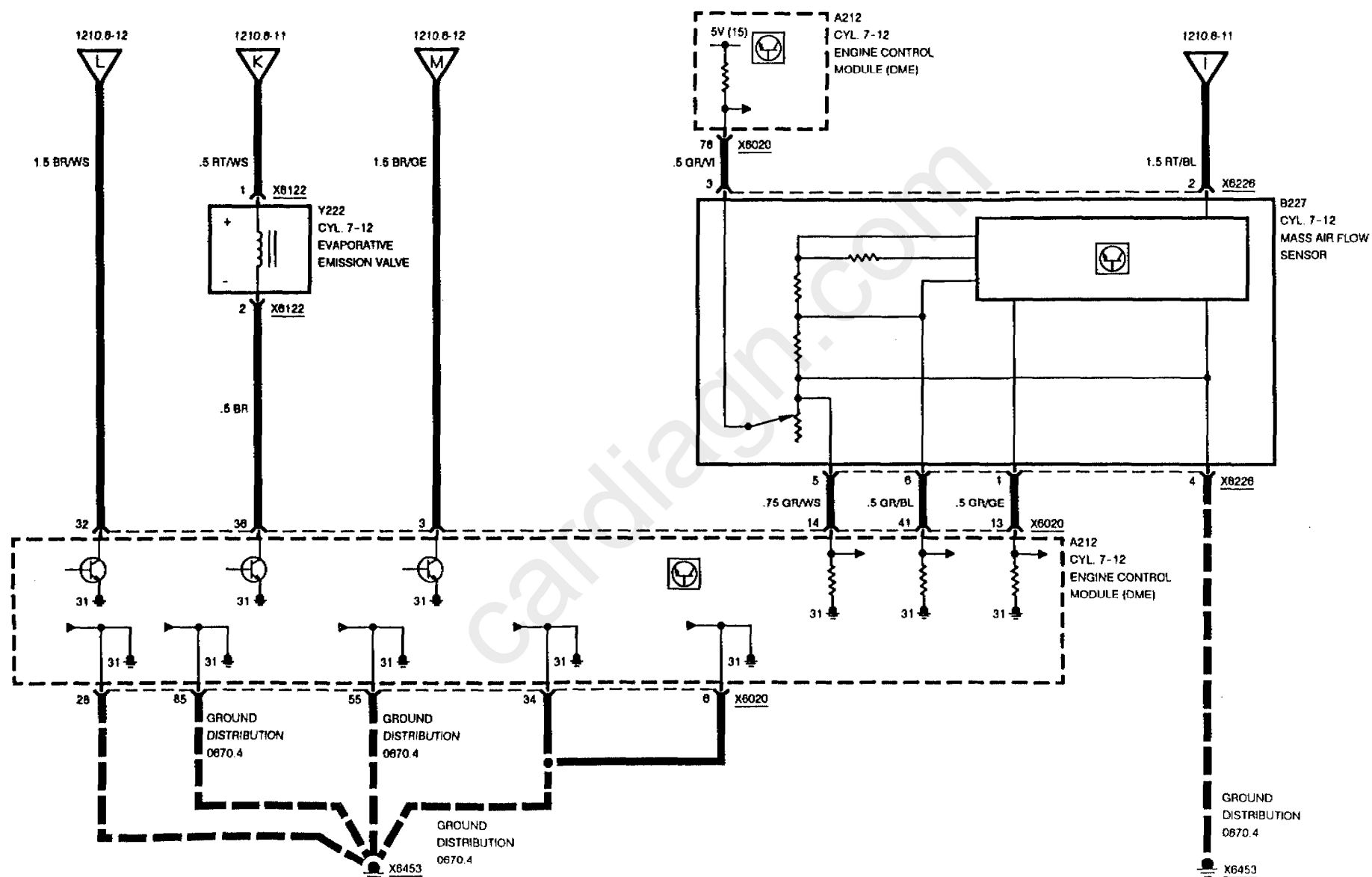
ENGINE CONTROL SYSTEM (DME M1.7, 12-CYLINDER M70)

FUEL INJECTION VALVES



ENGINE CONTROL SYSTEM (DME M1.7, 12-CYLINDER M70)

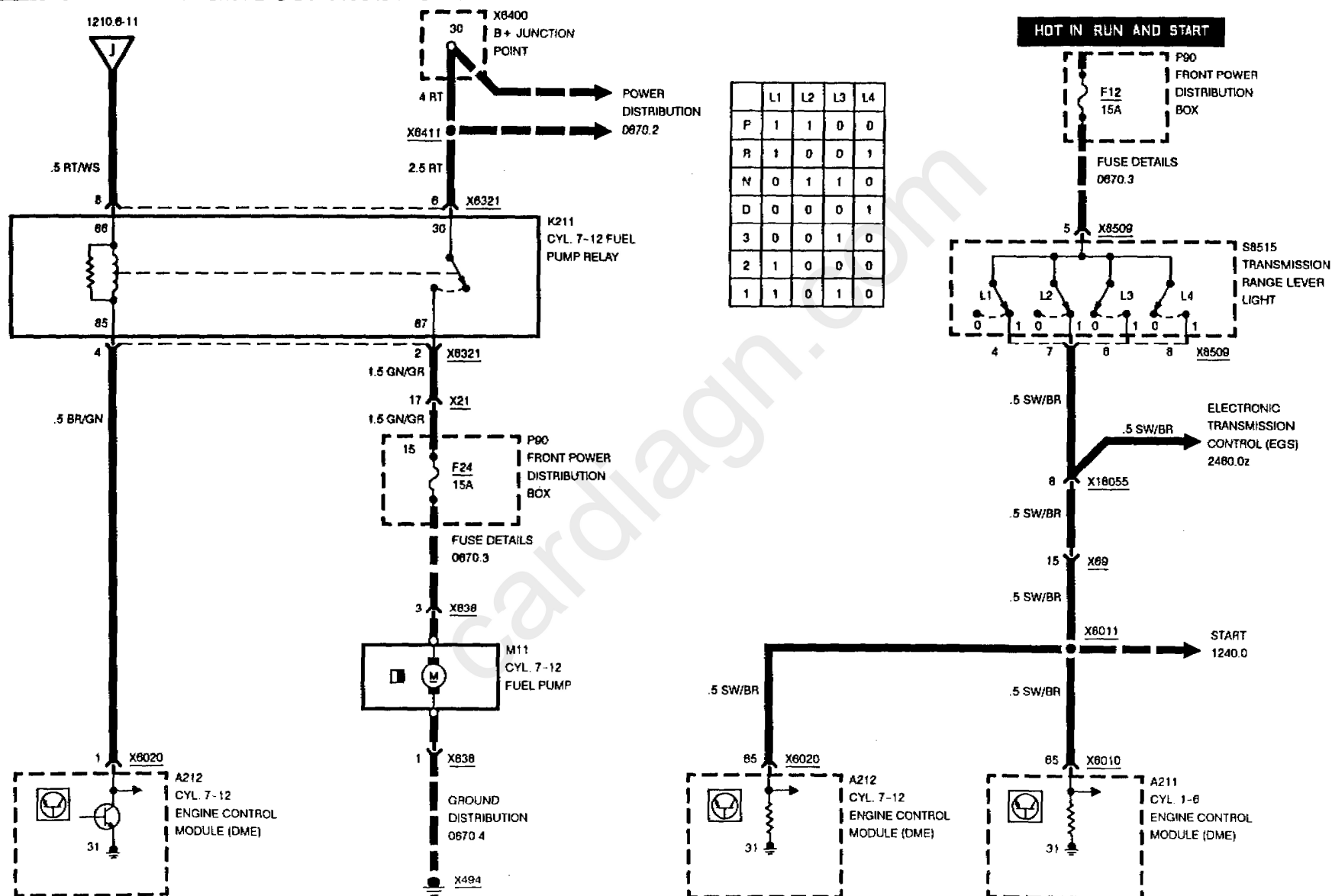
CYL. 7-12 ENGINE CONTROL MODULE





ENGINE CONTROL SYSTEM (DME M1.7, 12-CYLINDER M70)

CYL. 7-12 ENGINE CONTROL MODULE

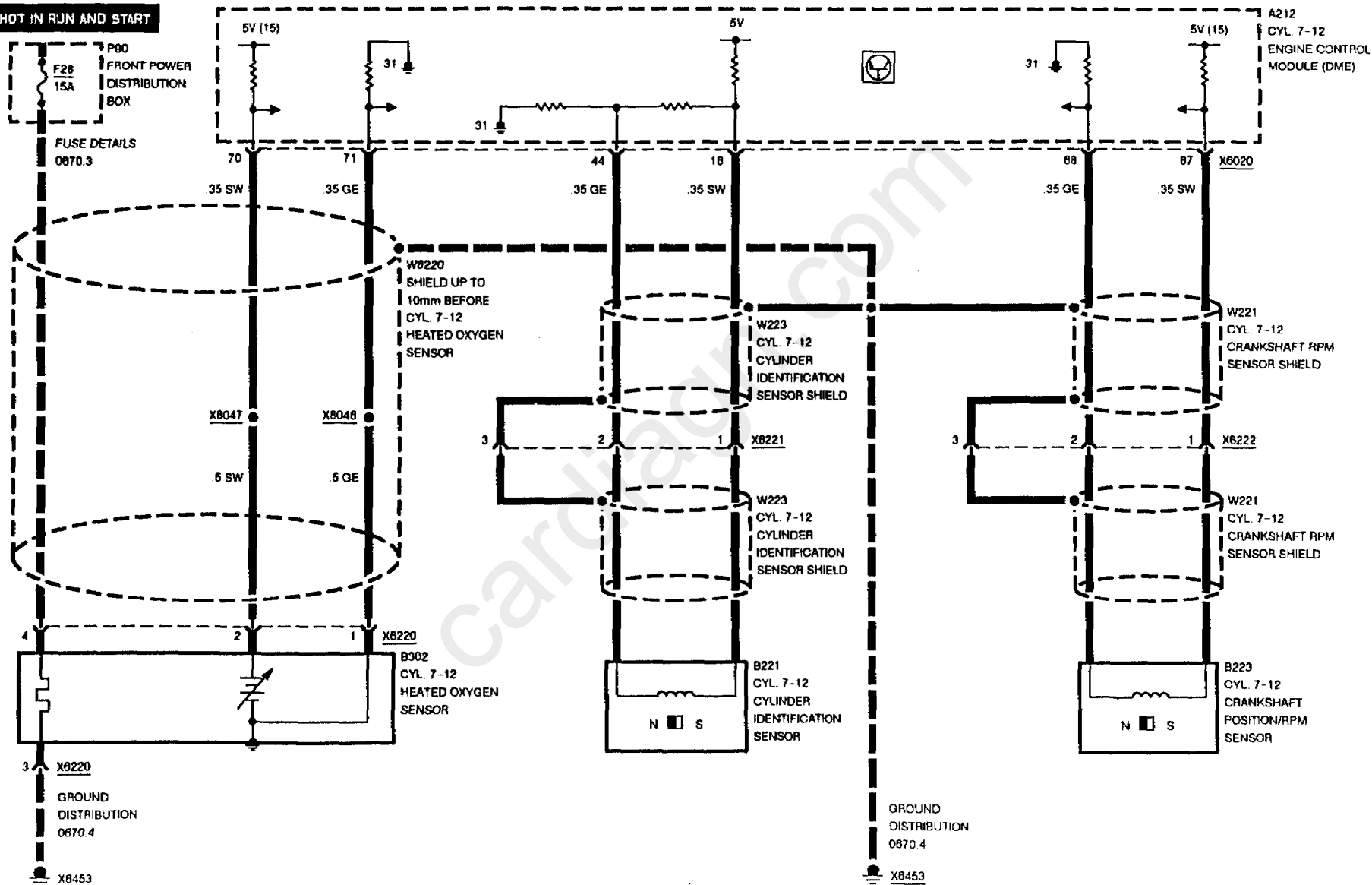




ENGINE CONTROL SYSTEM (DME M1.7, 12-CYLINDER M70)

CYL. 7-12 ENGINE CONTROL MODULE

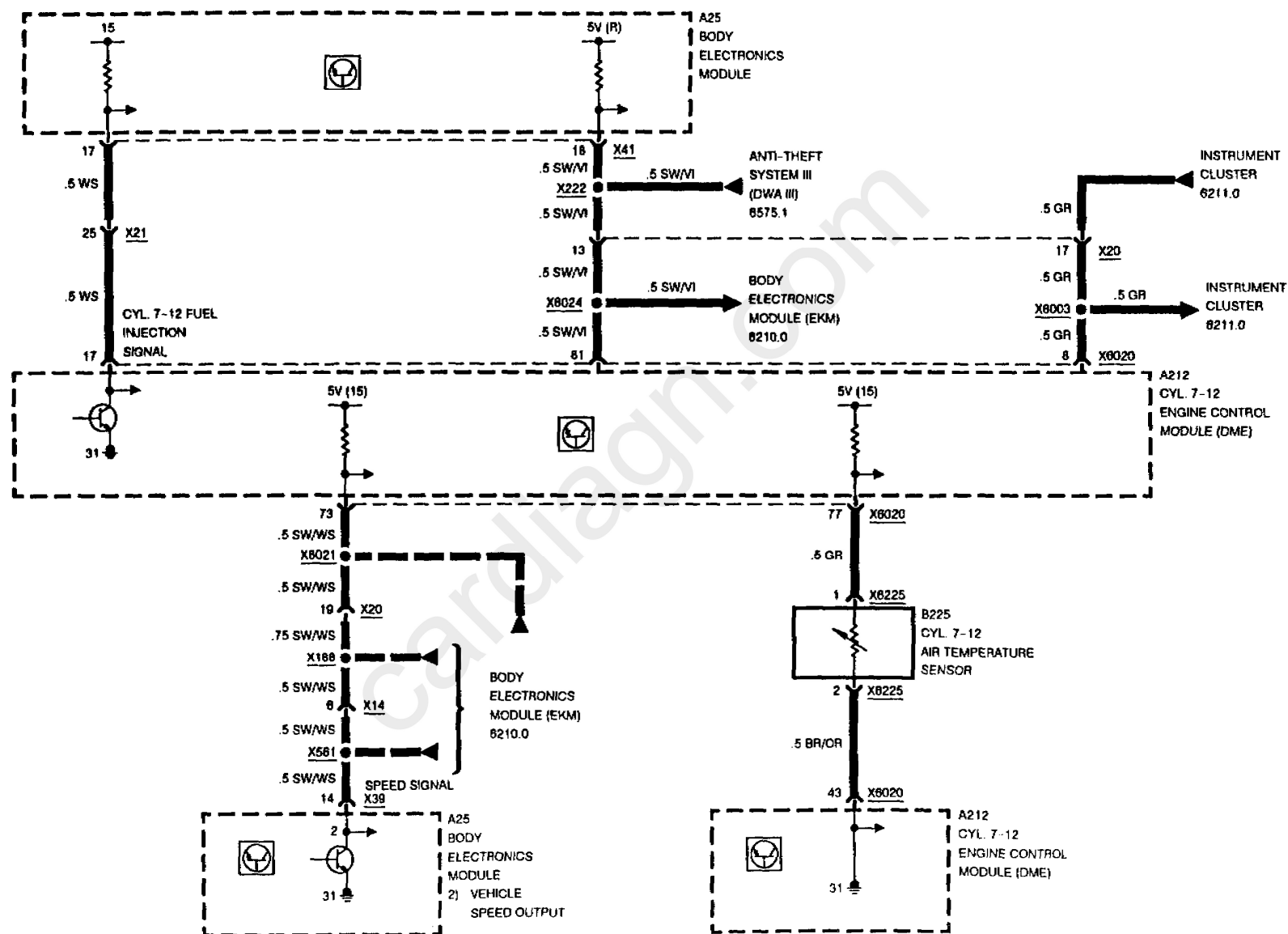
HOT IN RUN AND START





ENGINE CONTROL SYSTEM (DME M1.7, 12-CYLINDER M70)

CYL. 7-12 ENGINE CONTROL MODULE





1210.6-17