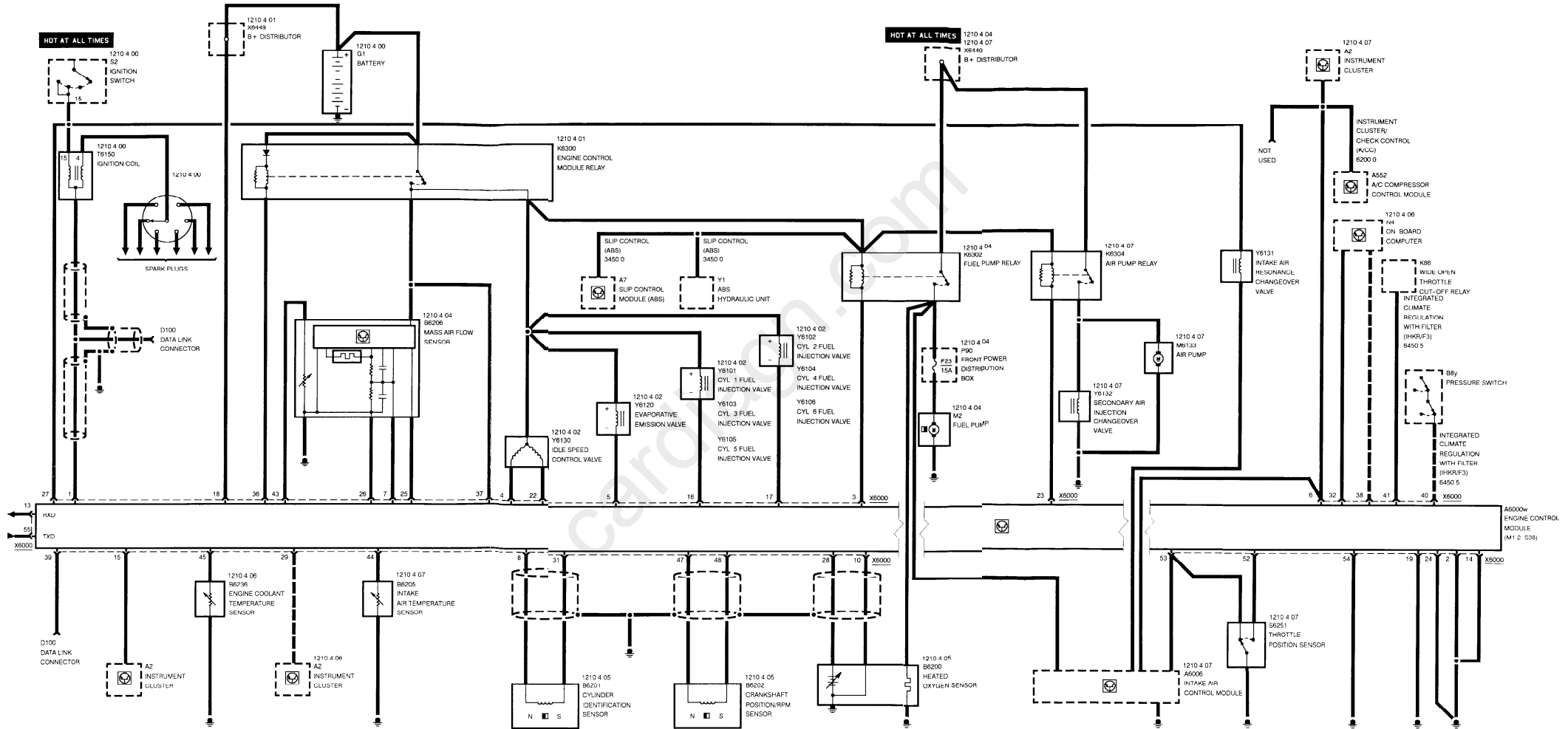
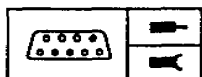






## DIGITAL ENGINE ELECTRONICS (DME 1.2, 6-CYLINDER S38)



### Pin Assignments

#### X6000

| Pin | Type | Description/Function                           | Connection                                         | Type of Signal                  | Tester Display | Measurement Notes                               |
|-----|------|------------------------------------------------|----------------------------------------------------|---------------------------------|----------------|-------------------------------------------------|
| 1   | A    | Ignition terminal                              | Ignition coil                                      | Primary signal                  | Oscilloscope   | Engine test, test step 05                       |
| 2   | M    | Ground                                         | Ground point                                       | Ground                          |                |                                                 |
| 3   | A    | EKP relay and TR signal (crankshaft reference) | EKP relay and electronic transmission control unit | Ground with superimposed signal | ON             | Can only be measured when crankshaft rotating   |
| 4   | A    | Idle speed actuator                            | Idle speed actuator                                | Pulsed ground                   |                | Component activation                            |
| 5   | A    | Evaporative valve                              | Evaporative valve                                  | Pulsed ground                   | CLOSED/OPEN    | Perform component activation, ground = > closed |
| 6   | A    | Engine speed signal                            | Instrument cluster                                 | Square wave signal              |                | One signal per ignition                         |
| 7   | E    | Air flow meter signal                          | Air mass meter                                     | 0...5 V                         | Load signal ms | See status monitoring                           |
| 8   | E    | Cylinder identification sensor (ignition)      | Cylinder identification sensor (connection B)      |                                 | ON/OFF         | See status monitoring                           |
| 9   |      | Not used                                       |                                                    |                                 |                |                                                 |
| 10  | M    | Ground, oxygen sensor                          | Oxygen sensor                                      | Ground                          |                |                                                 |
| 11  |      | Not used                                       |                                                    |                                 |                |                                                 |
| 12  |      | Not used                                       |                                                    |                                 |                |                                                 |
| 13  | E    | RxD diagnostic data line                       | Diagnostic socket                                  | > 10 V                          |                | When cover of diagnostic connector closed       |



## DIGITAL ENGINE ELECTRONICS (DME 1.2, 6-CYLINDER S38)

| Pin | Type | Description/Function                                                      | Connection          | Type of Signal                | Tester Display    | Measurement Notes                                                               |
|-----|------|---------------------------------------------------------------------------|---------------------|-------------------------------|-------------------|---------------------------------------------------------------------------------|
| 14  | M    | Ground, injection valves                                                  | Ground point        | Ground                        |                   |                                                                                 |
| 15  | A    | Indicator "Check engine"                                                  | Instrument cluster  | Ground                        |                   | Comes on if emission related error code is stored, and comes on during starting |
| 16  | A    | Injection valves cyl. (1 + 3 + 5)                                         | Injection valve     | Pulsed ground                 | Injection time ti | Ground = > injector valves open, see component activation                       |
| 17  | A    | Injection valves cyl. (2 + 4 + 6)                                         | Injection valve     | Pulsed ground                 | Injection time ti | Ground = > injector valves open, see component activation                       |
| 18  | E    | Hot at all times                                                          | Terminal 30         | > 10 V                        |                   |                                                                                 |
| 19  | M    | Ground for electronics and sensor shields                                 | Ground point        | Ground                        |                   |                                                                                 |
| 20  |      | Not used                                                                  |                     |                               |                   |                                                                                 |
| 21  |      | Not used                                                                  |                     |                               |                   |                                                                                 |
| 22  | A    | Idle speed actuator                                                       | Idle speed actuator | Pulsed ground                 |                   | See component activation                                                        |
| 23  | A    | Air pump relay signal                                                     | Air pump relay      | Ground                        |                   | Ground = > Air pump on                                                          |
| 24  | M    | Ground remaining output stages (except for ignition and injection valves) | Ground point        | Ground                        |                   |                                                                                 |
| 25  | A    | Preheating                                                                | Air mass meter      | Voltage plus for - 0,5 second |                   | Signal stops 4 seconds after engine stops                                       |
| 26  | M    | Ground air flow meter                                                     | Air mass meter      | Ground                        |                   |                                                                                 |
| 27  | E    | Ignition terminal 15                                                      | Ignition switch     | > 10 V                        |                   |                                                                                 |



## DIGITAL ENGINE ELECTRONICS (DME 1.2, 6-CYLINDER S38)

| Pin | Type | Description/Function                      | Connection                                    | Type of Signal                      | Tester Display                     | Measurement Notes                                                                                                   |
|-----|------|-------------------------------------------|-----------------------------------------------|-------------------------------------|------------------------------------|---------------------------------------------------------------------------------------------------------------------|
| 28  | E    | Oxygen sensor signal                      | Oxygen sensor                                 | Pulsating voltage up to approx. 1 V | Voltage value                      | Can only be measured with the engine running at operating temperature                                               |
| 29  | E    | Vehicle speed sensor                      | Instrument cluster                            | Square wave signal                  | km/h                               |                                                                                                                     |
| 30  |      | Not used                                  |                                               |                                     |                                    |                                                                                                                     |
| 31  | E    | Cylinder Identification sensor (ignition) | Cylinder Identification sensor (connection A) |                                     | ON/OFF                             | See status monitoring                                                                                               |
| 32  | A    | ti Measuring signal (KVA signal)          | Instrument cluster                            | Square wave signal                  | Multimeter function pulse duration | Oscilloscope                                                                                                        |
| 33  |      | Not used                                  |                                               |                                     |                                    |                                                                                                                     |
| 34  |      | Not used                                  |                                               |                                     |                                    |                                                                                                                     |
| 35  |      | Not used                                  |                                               |                                     |                                    |                                                                                                                     |
| 36  | A    | DME main relay                            | DME main relay terminal 85                    | Ground                              | ON                                 | Diagnosis not possible if not fitted, connect jumper at relay terminal 30 and 87                                    |
| 37  | 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 terminal 30 and 87 on relay |
| 38  | E    | Drive away protection                     | On-board computer                             | > 10 V                              |                                    |                                                                                                                     |
| 39  | E    | Programming voltage                       | Diagnostic connector                          |                                     |                                    | Only activated for control unit programming                                                                         |
| 40  | E    | A/C compressor signal                     | Pressure switch, compressor relay             |                                     | ON/OFF                             |                                                                                                                     |
| 41  | E    | Auxiliary fan signal                      | Full load cutoff relay                        | 12 V                                | ON/OFF                             |                                                                                                                     |

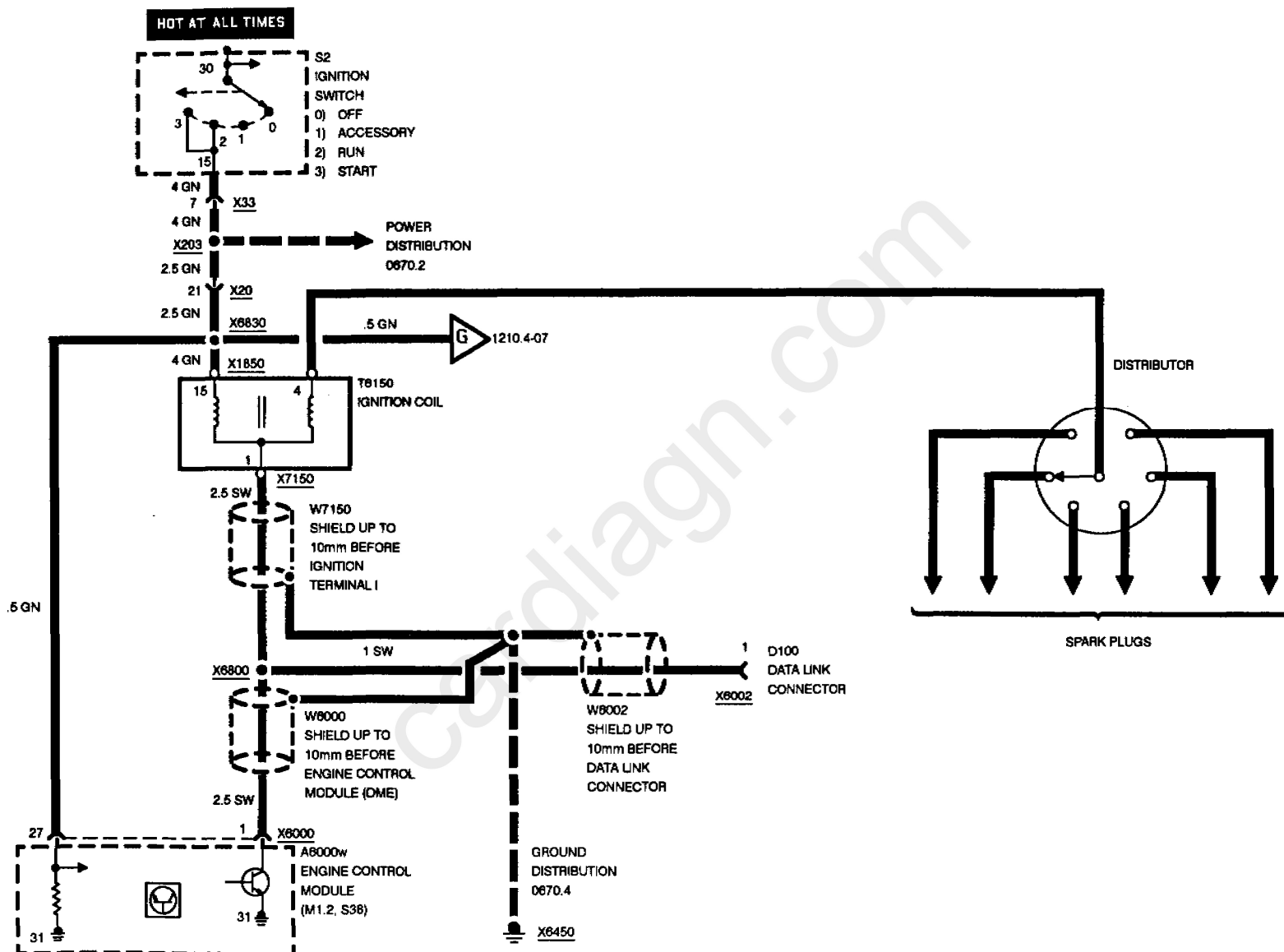


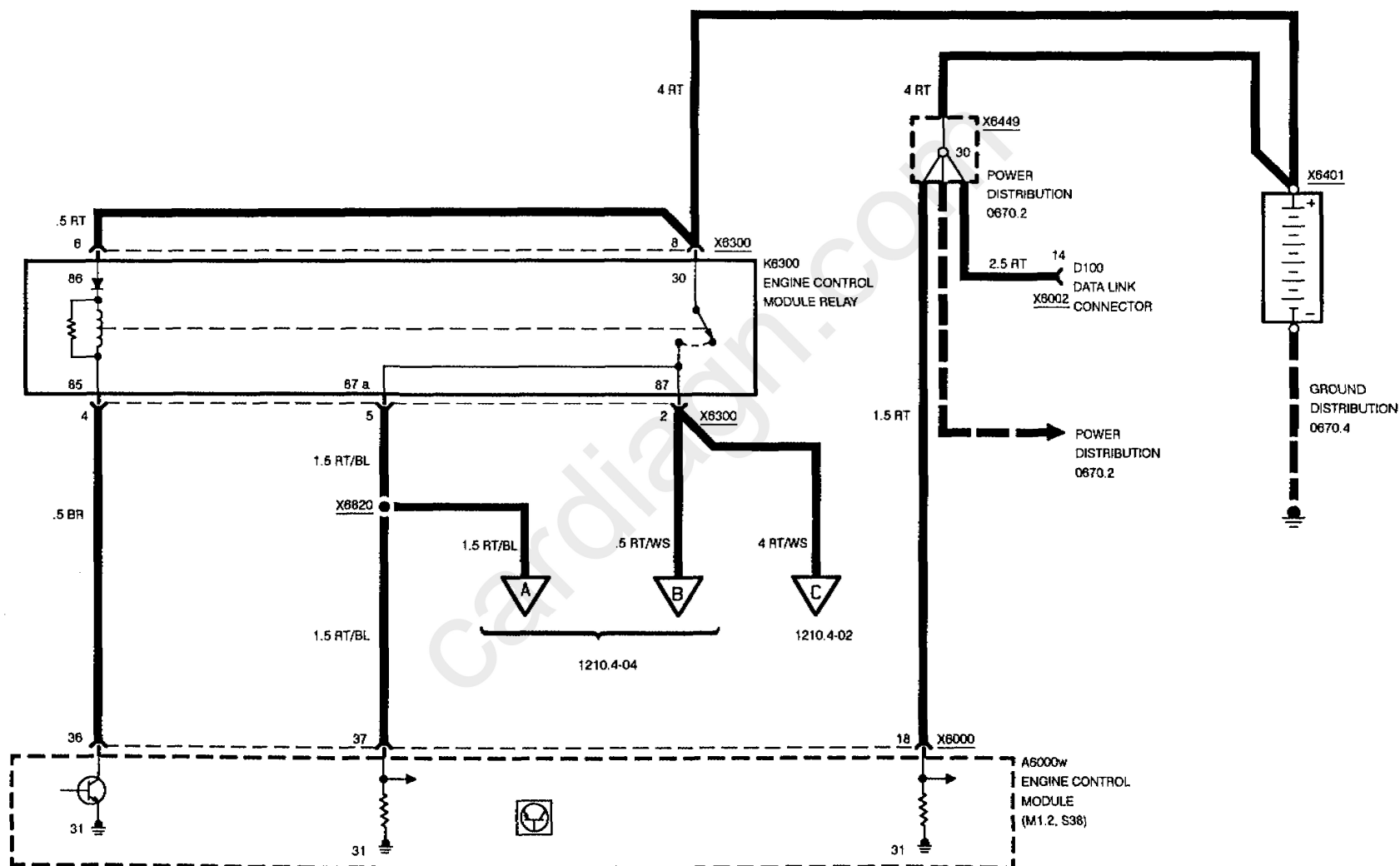
## DIGITAL ENGINE ELECTRONICS (DME 1.2, 6-CYLINDER S38)

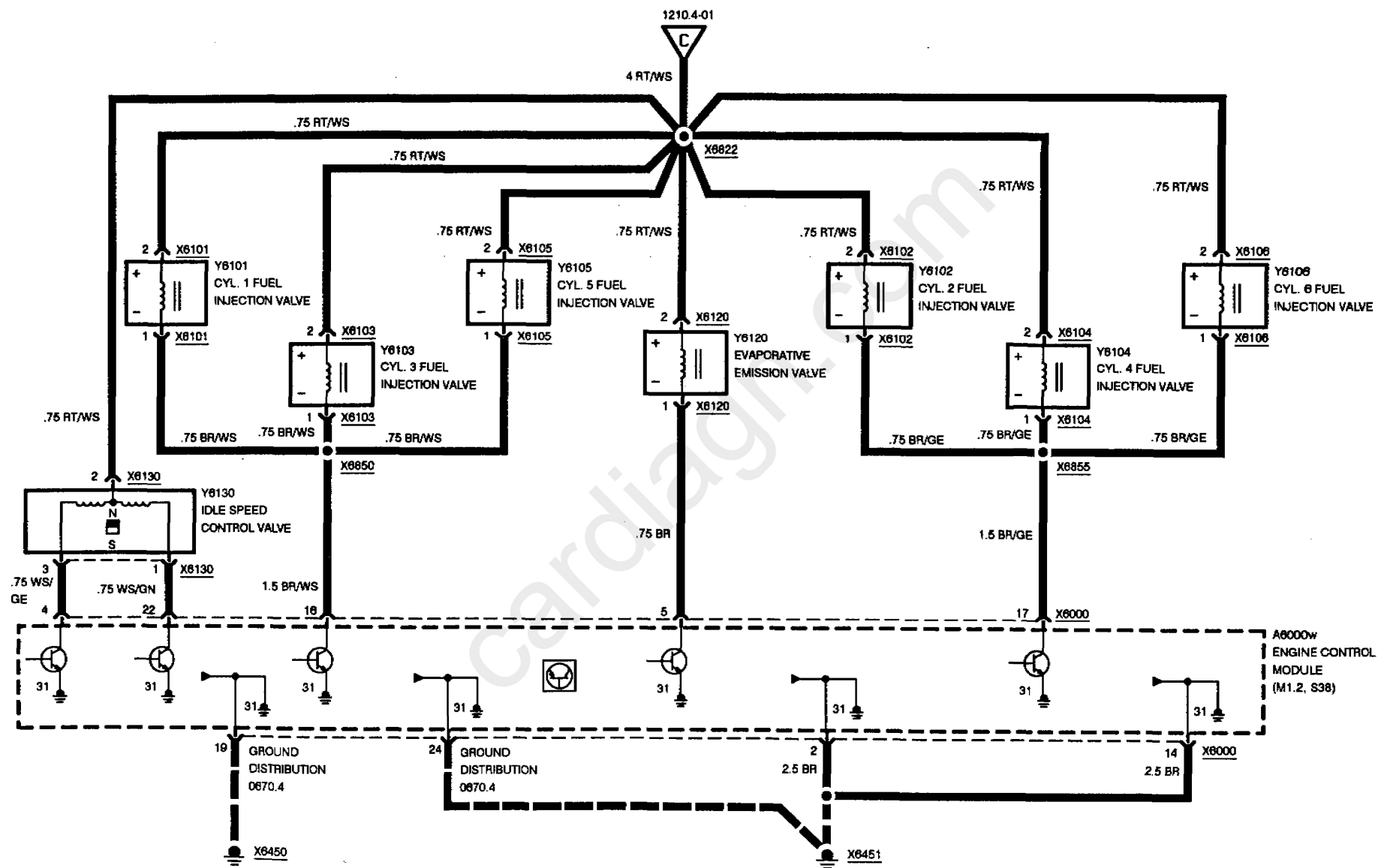
| Pin | Type | Description/Function                     | Connection                                        | Type of Signal | Tester Display | Measurement Notes                                                      |
|-----|------|------------------------------------------|---------------------------------------------------|----------------|----------------|------------------------------------------------------------------------|
| 42  |      | Not used                                 |                                                   |                |                |                                                                        |
| 43  | E    | Idle CO potentiometer                    | Air mass meter                                    | 0...5 V        | Voltage value  |                                                                        |
| 44  | E    | Intake air temperature                   | Intake air temperature sensor                     | 0...5 V        | °C             | Temperature dependent                                                  |
| 45  | E    | Coolant temperature                      | Coolant temperature sensor                        | 0...5 V        | °C             | Temperature dependent                                                  |
| 46  |      | Not used                                 |                                                   |                |                |                                                                        |
| 47  | E    | Inductive pulse generator (connection A) | Pulse generator, engine speed/crankshaft position | A/C voltage    | Engine speed   | Between Pins 47 and 48 (can only be measured with crankshaft rotation) |
| 48  | E    | Inductive pulse generator (connection B) | Pulse generator, engine speed/crankshaft position | A/C voltage    | Engine speed   | Status monitoring at or above starting rpm                             |
| 49  |      | Not used                                 |                                                   |                |                |                                                                        |
| 50  |      | Not used                                 |                                                   |                |                |                                                                        |
| 51  |      | Not used                                 |                                                   |                |                |                                                                        |
| 52  | E    | Idle signal                              | Throttle switch                                   | Ground         | ON             | See status monitoring on set idle speed                                |
| 53  | E    | Full load signal VL                      | Throttle switch                                   | Ground         | ON             | At full load (kick-down)                                               |
| 54  | E    | Coding signal                            | Fuel coding connector                             | Ground         |                |                                                                        |
| 55  | E/A  | TxD diagnostic data line                 | Diagnostic socket                                 | Ground         |                | When cover of diagnostic connector closed                              |



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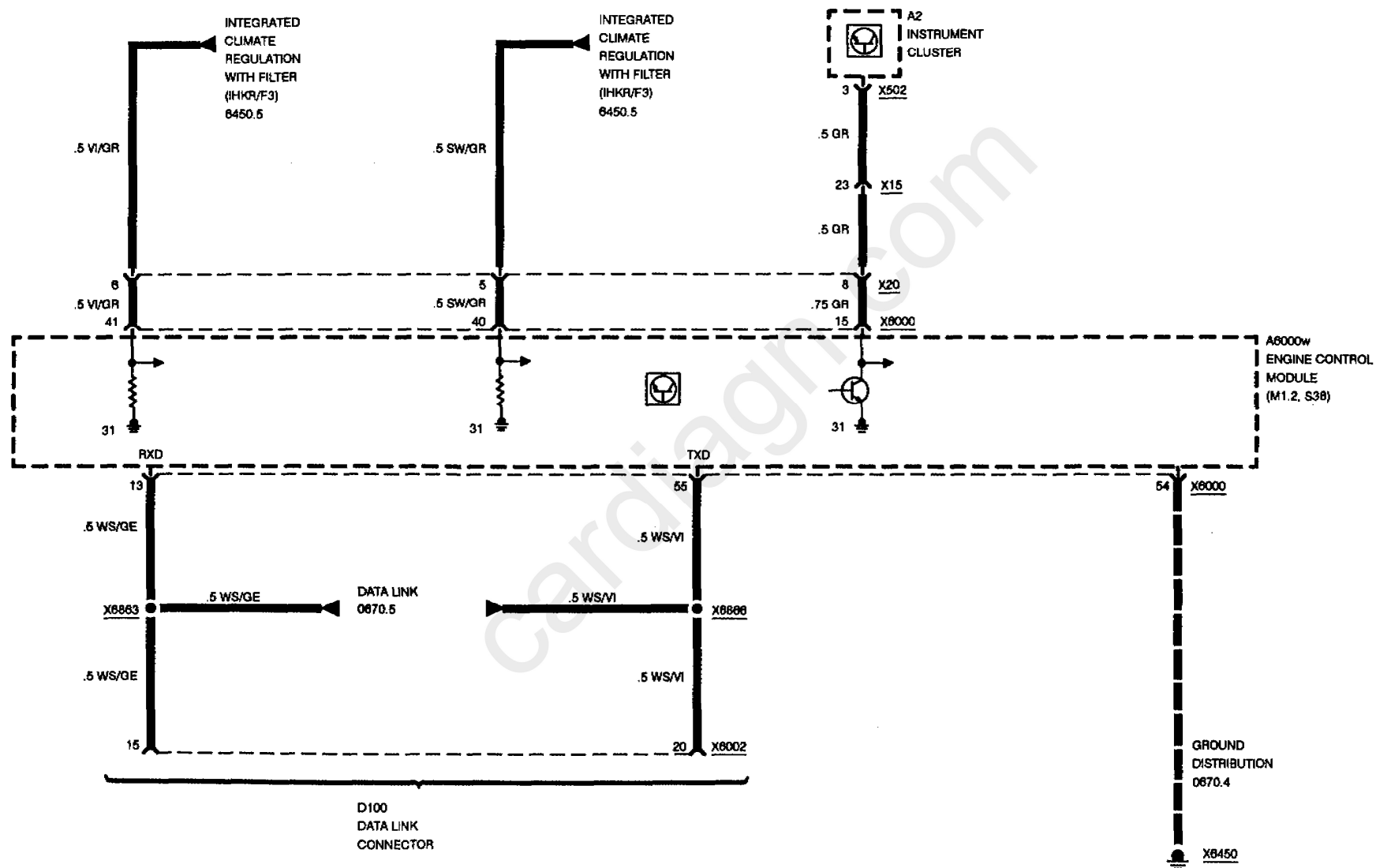


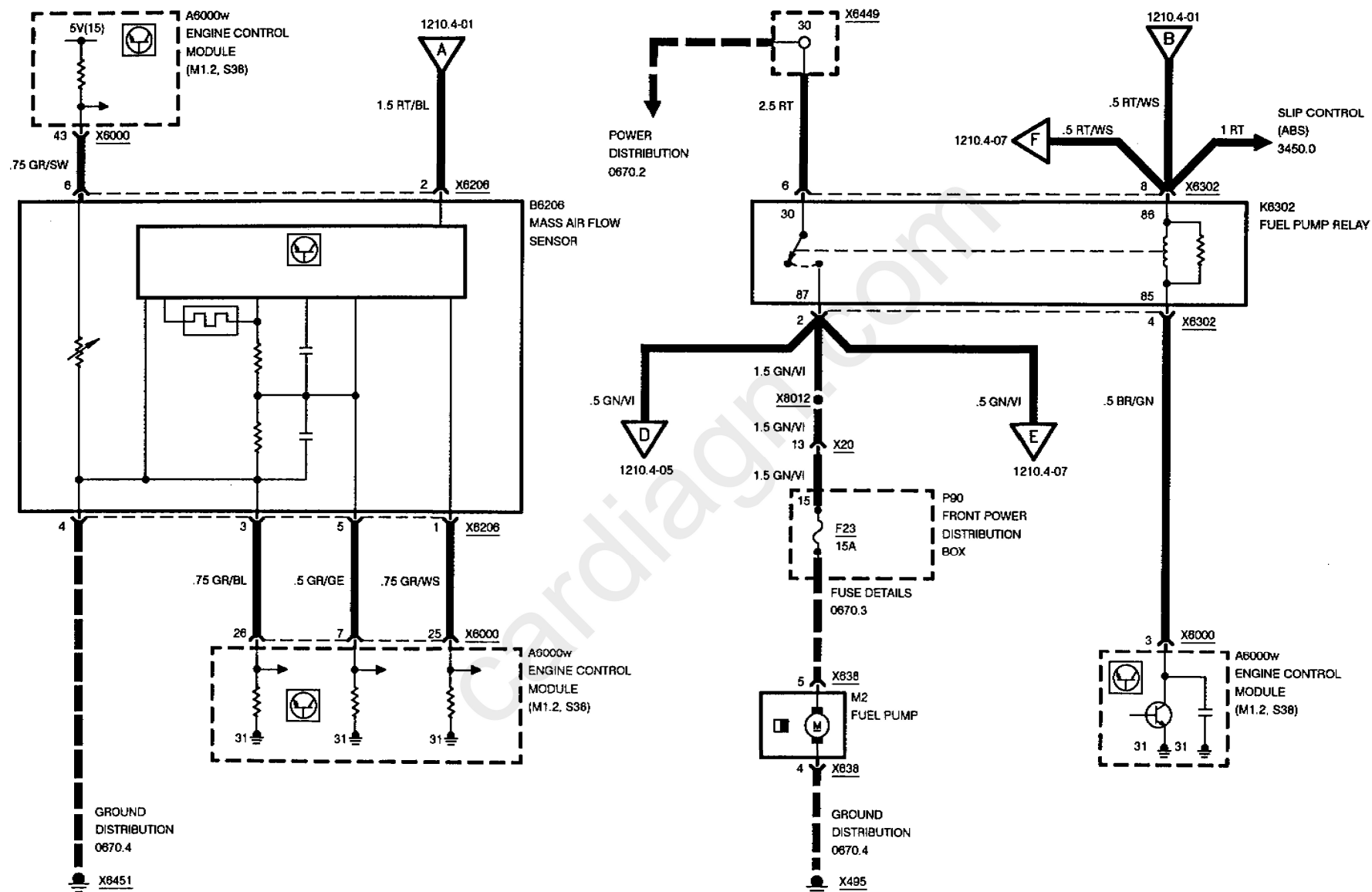


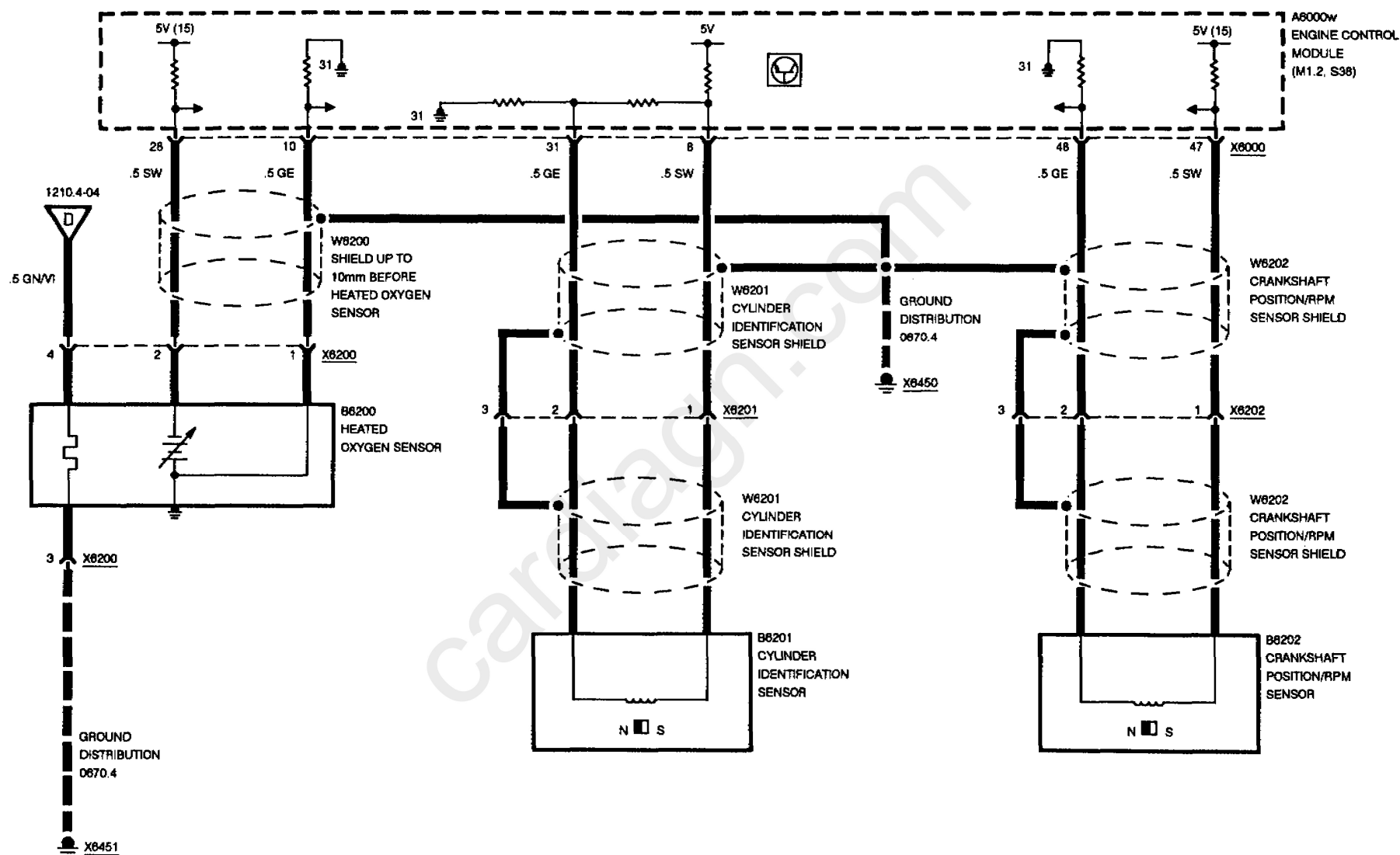


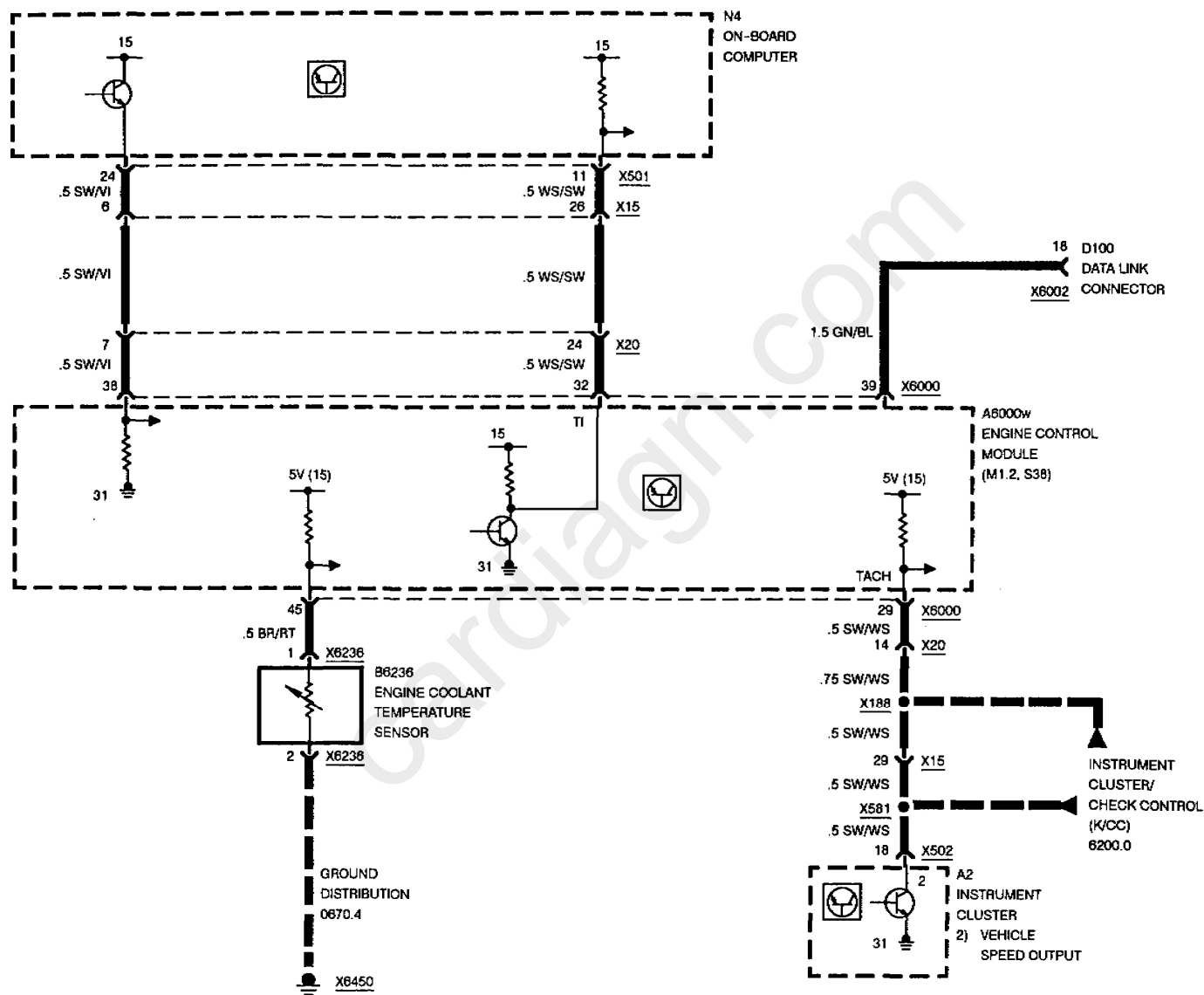
# ENGINE CONTROL SYSTEM (DME M1.2, 6-CYLINDER S38)

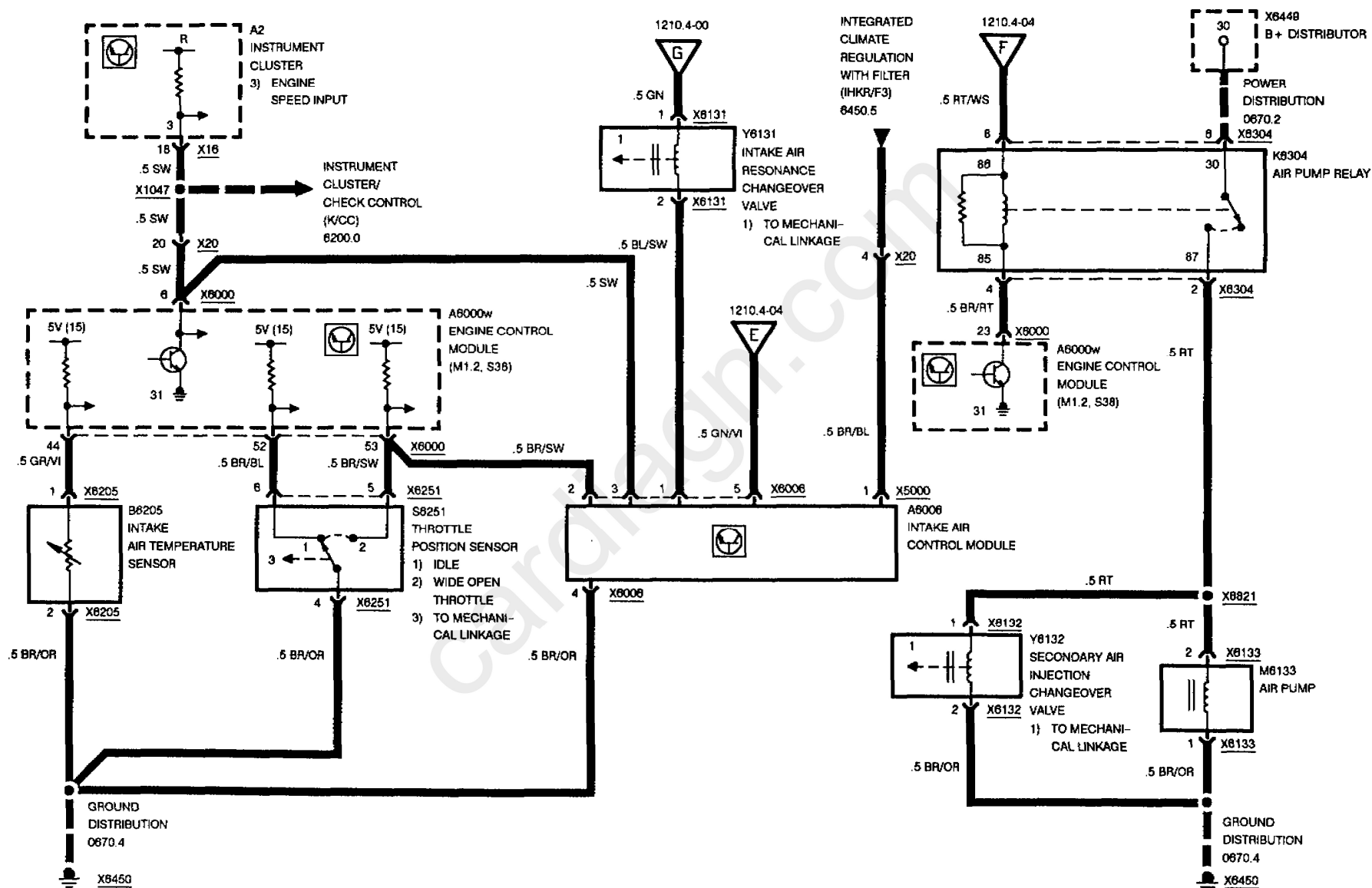
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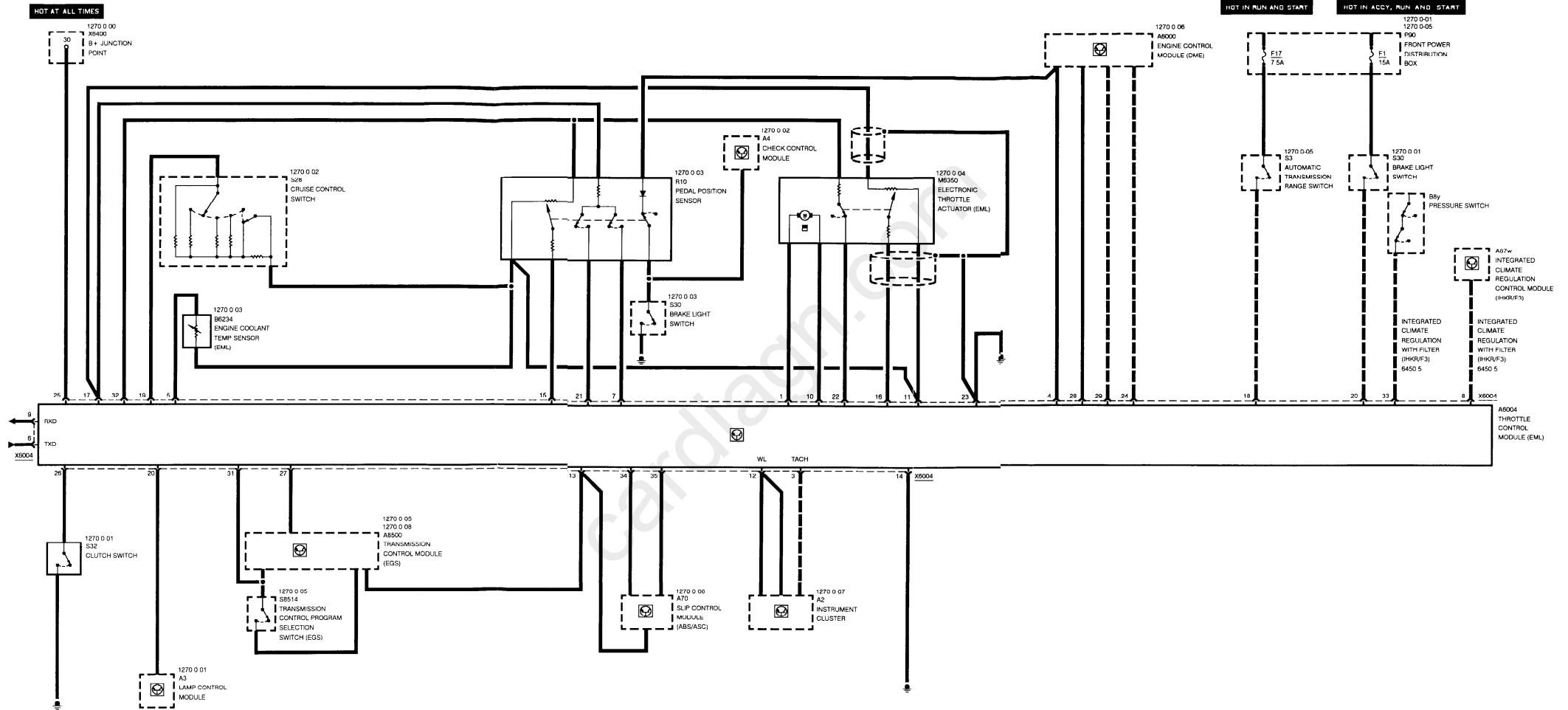






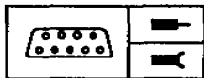
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## ELECTRONIC THROTTLE CONTROL (EML, 6-CYLINDER)



### Pin Assignments

#### X6004

| Pin | Type | Description/Function          | Connection                             | Type of Signal     | Tester Display | Measurement Notes |
|-----|------|-------------------------------|----------------------------------------|--------------------|----------------|-------------------|
| 1   | A/E  | Drive throttle actuator       | EML actuator                           | Square wave signal |                |                   |
| 2   |      | Not used                      |                                        |                    |                |                   |
| 3   | E    | Vehicle speed signal          | Instrument cluster                     | Square wave signal |                |                   |
| 4   | A    | Idle signal                   | DME control unit                       | approx. 0 V        |                |                   |
| 5   | A/E  | Engine coolant temperature    | Water temp sensor (EML)                | approx. 0...5 V    |                |                   |
| 6   | E/A  | Diagnosis                     | Diagnostic connector TxD               |                    |                |                   |
| 7   | E    | Kick-down signal              | Pedal position sensor                  | approx. 5 V        |                |                   |
| 8   | E    | A/C system signal             | IHKP/F3 control unit                   | approx. 12 V (ON)  |                |                   |
| 9   | E    | Diagnosis                     | Diagnostic connector RxD               |                    |                |                   |
| 10  | A/E  | Drive throttle actuator       | EML actuator                           | Square wave signal |                |                   |
| 11  | A    | Electronic ground             | Component ground                       | Ground             |                |                   |
| 12  | A    | EML-warning lamp              | Instrument cluster                     |                    |                |                   |
| 13  | A    | Throttle position signal      | ASC/EGS                                | Square wave signal |                |                   |
| 14  | E    | Output ground                 | Ground point                           | Ground             |                |                   |
| 15  | E    | Throttle position             | Pedal position sensor                  | 0.4...4 V          |                |                   |
| 16  | E    | Actuator position sensor      | EML actuator                           | 1 V...4.6 V        |                |                   |
| 17  | A    | 5 V (not short circuit proof) | Pedal position sensor/<br>EML actuator | 5 V                |                |                   |



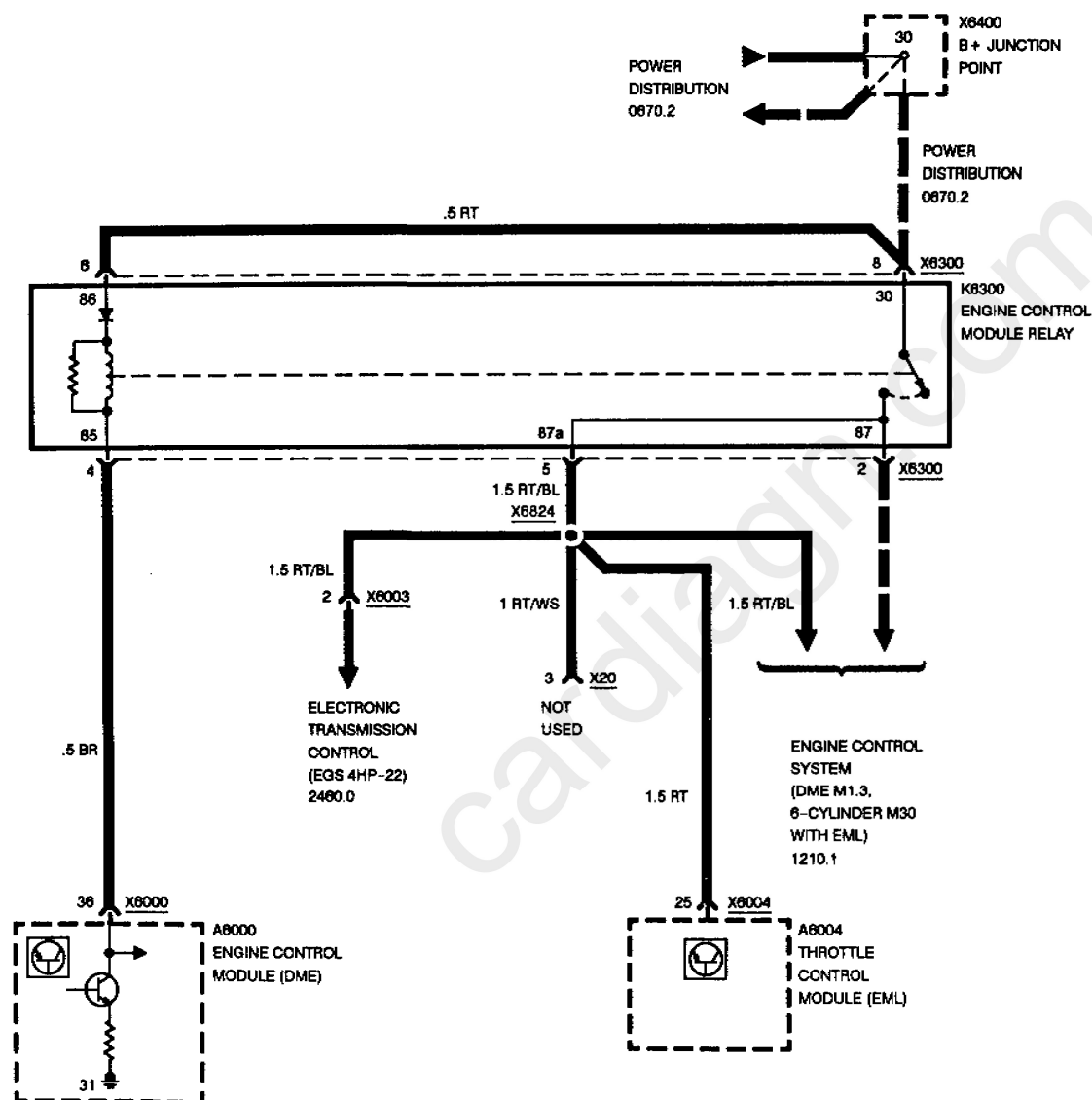
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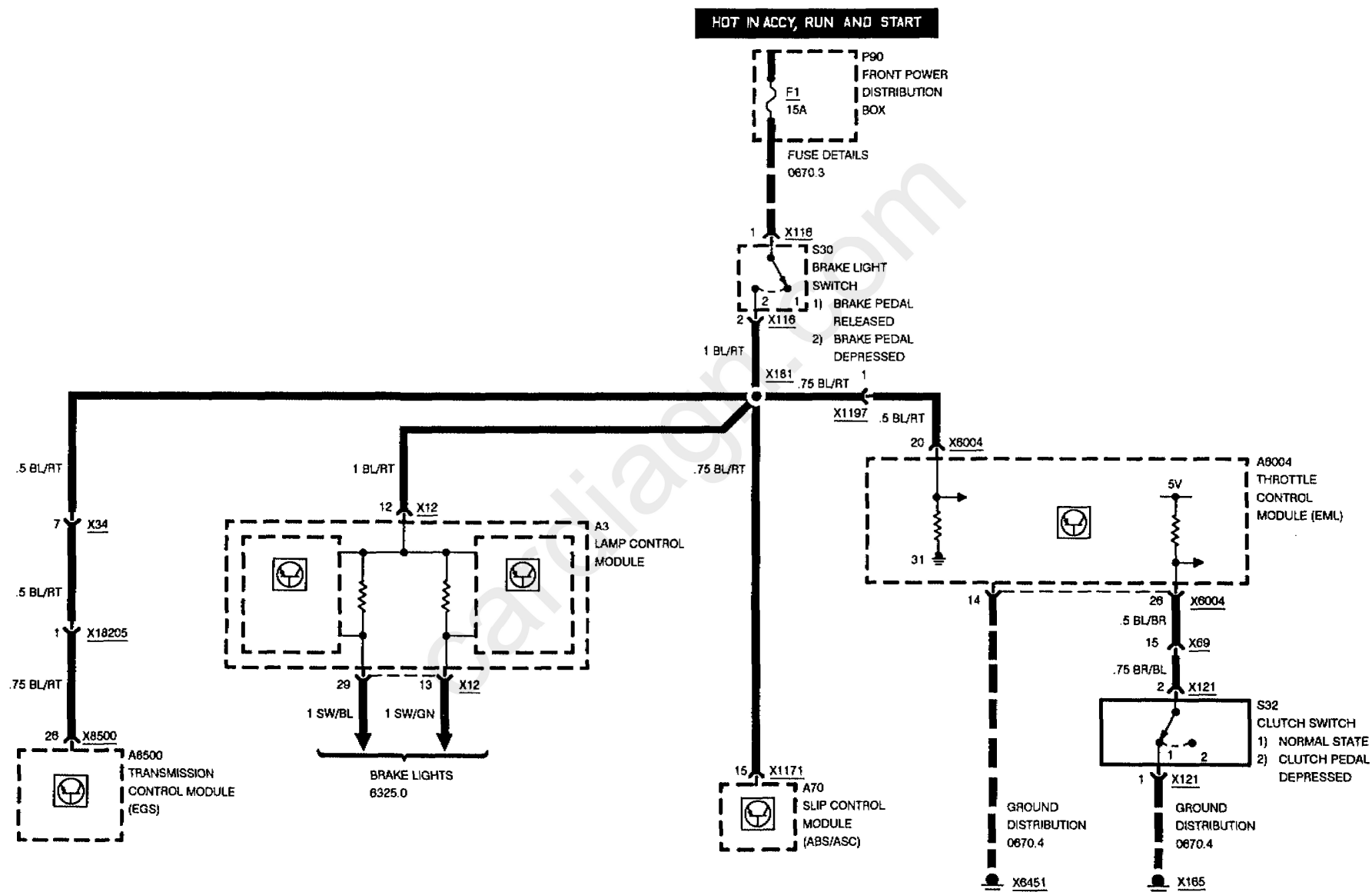
| Pin | Type | Description/Function                      | Connection                             | Type of Signal                         | Tester Display | Measurement Notes |
|-----|------|-------------------------------------------|----------------------------------------|----------------------------------------|----------------|-------------------|
| 18  | E    | P and N identifier (EGS)                  | Transmission range switch              | approx. 12 V (ON)<br>approx. 0 V (OFF) |                |                   |
| 19  | E/A  | Cruise control switch signal              | Cruise control switch                  | 0 V...5 V                              |                |                   |
| 20  | E    | Brake pedal signal                        | Brake light switch                     | approx. 12 V (ON)<br>approx. 0 V (OFF) |                |                   |
| 21  | E    | PWG 9° switch                             | Pedal position sensor                  | approx. 5 V (ON)                       |                |                   |
| 22  | E    | Throttle 17° switch                       | EML actuator                           | approx. 5 V (ON)                       |                |                   |
| 23  | A    | Electronic ground                         | Component ground                       | Ground                                 |                |                   |
| 24  | E    | Injection signal ti                       | DME control unit                       | Square wave signal                     |                |                   |
| 25  | E    | Terminal 30 +                             | DME - relay                            | approx. on-board voltage               |                |                   |
| 26  | E    | Clutch pedal signal                       | Clutch switch                          | approx. 0 V                            |                |                   |
| 27  | A    | Kick-down signal                          | EGS control unit                       | approx. 0 V (ON)<br>approx. 12 V (OFF) |                |                   |
| 28  | A    | Full load signal                          | DME control unit                       | approx. 0 V                            |                |                   |
| 29  | E    | Engine speed signal (TD)                  | DME control unit                       | Square wave signal                     |                |                   |
| 30  |      | Not used                                  |                                        |                                        |                |                   |
| 31  | E    | S-program identification                  | EGS control unit                       | approx. 0 V                            |                |                   |
| 32  | A    | 5 V (not short circuit proof)             | Pedal position sensor/<br>EML actuator | approx. 5 V                            |                |                   |
| 33  | E    | A/C compressor ON                         | Pressure switch                        | approx. 12 V (ON)                      |                |                   |
| 34  | E    | Decrease throttle position<br>angle (DKR) | ABS/ASC-control unit                   | Square wave signal                     |                |                   |
| 35  | E    | Increase throttle position<br>angle (DKE) | ABS/ASC-control unit                   | Square wave signal                     |                |                   |

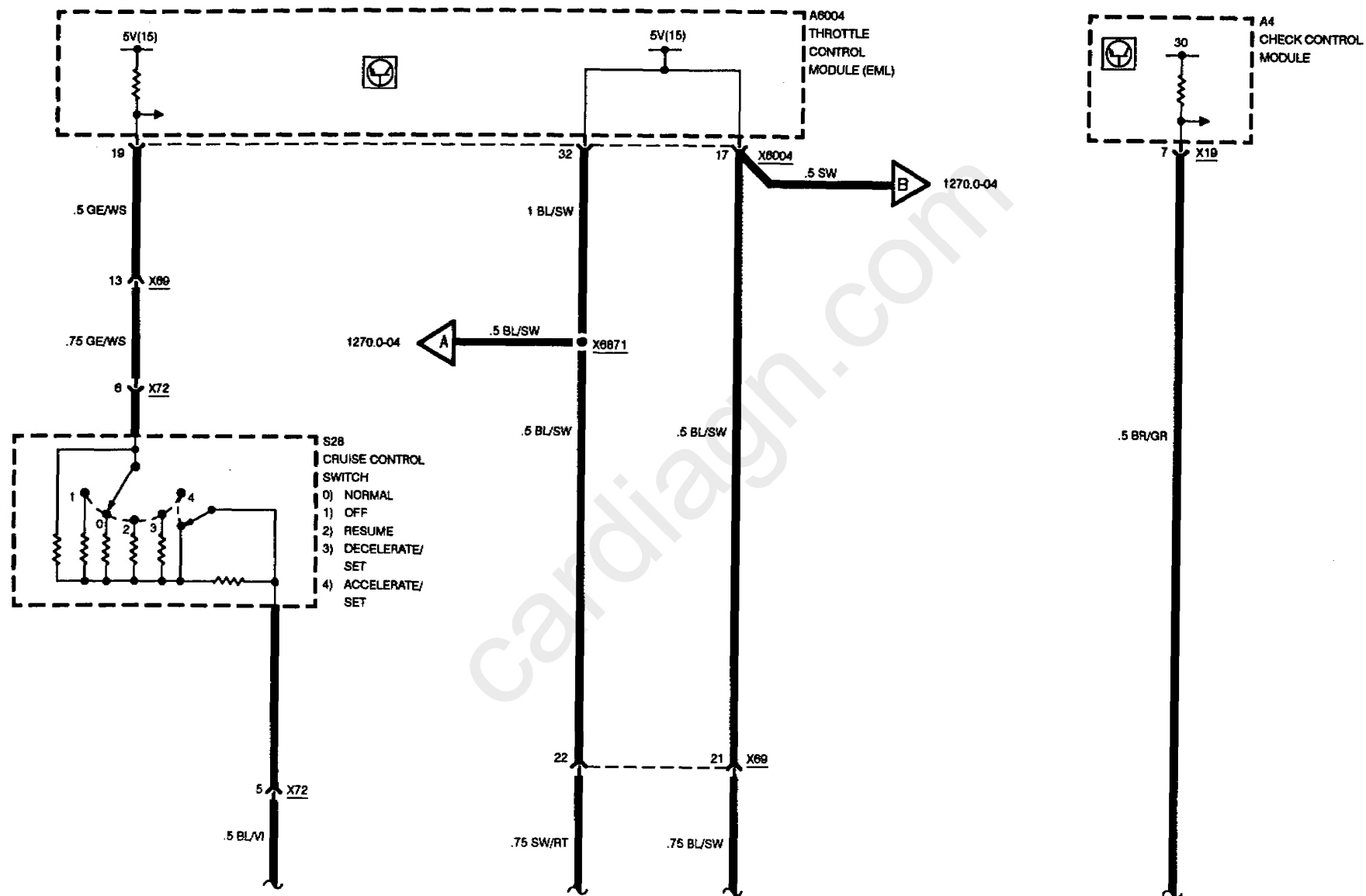


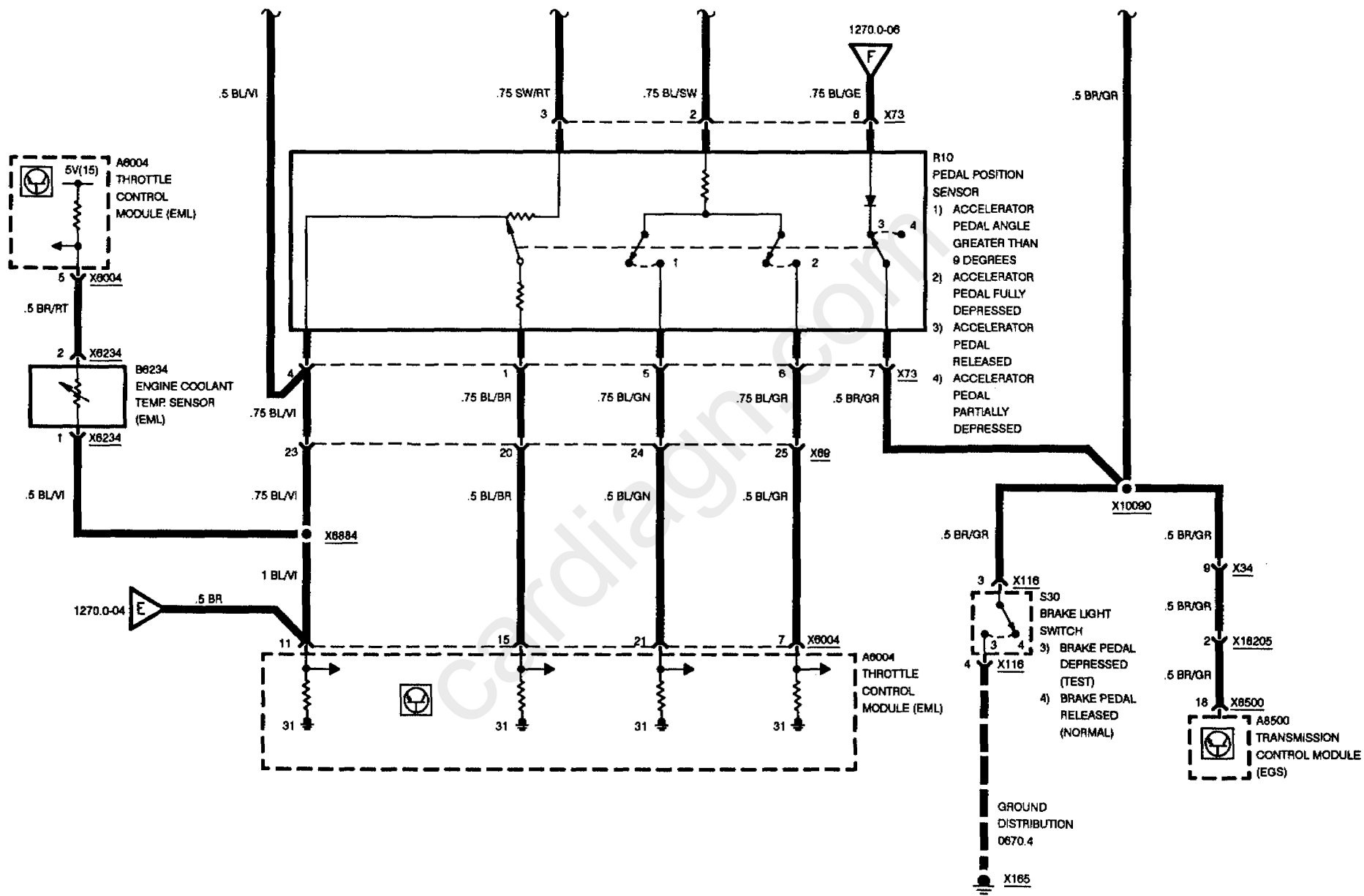
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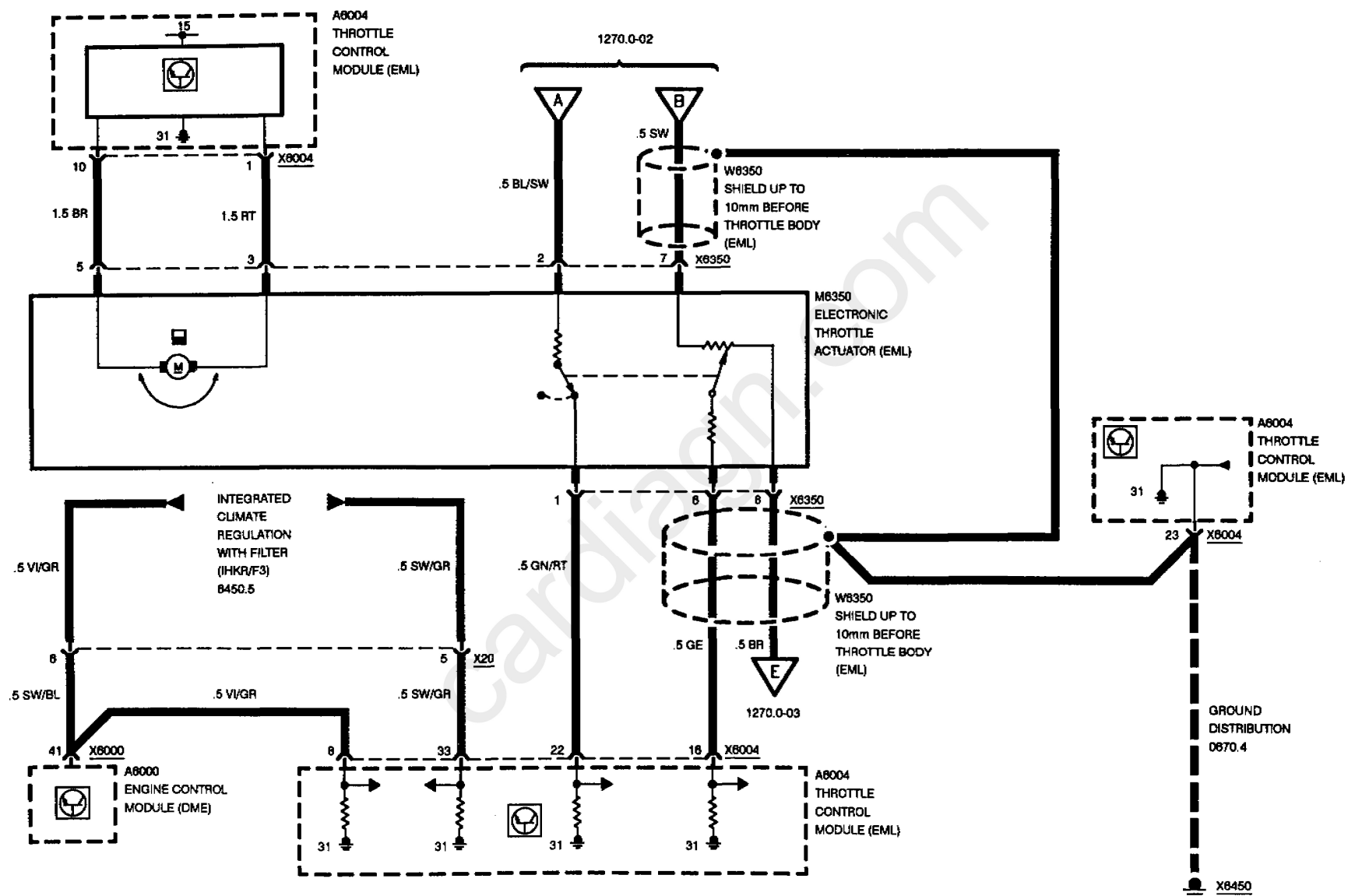
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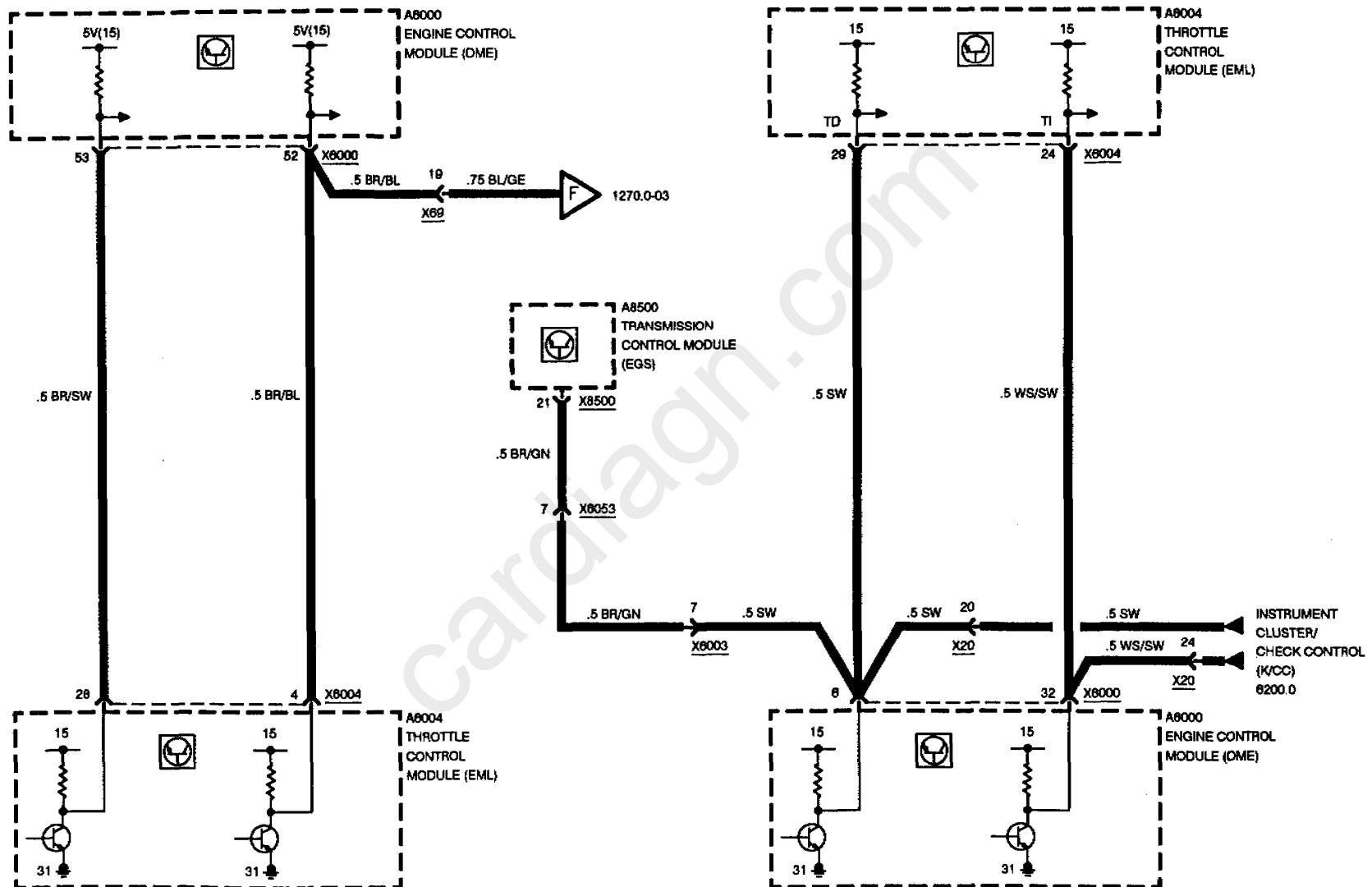


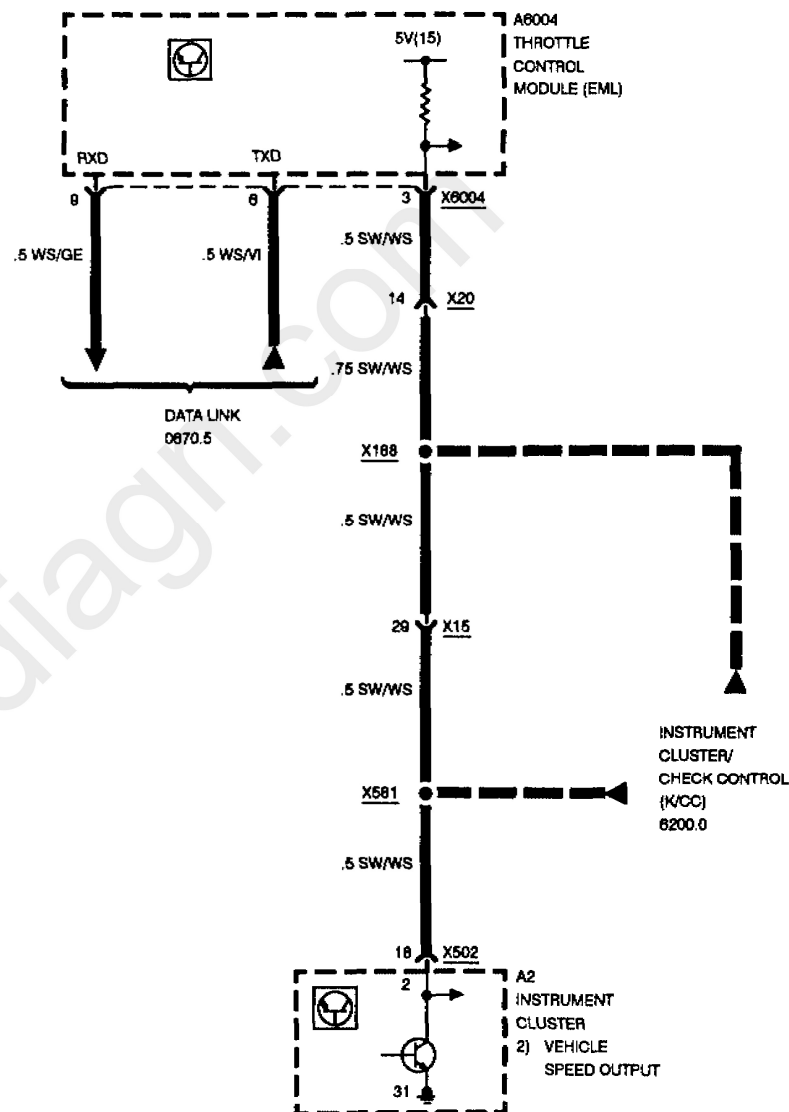
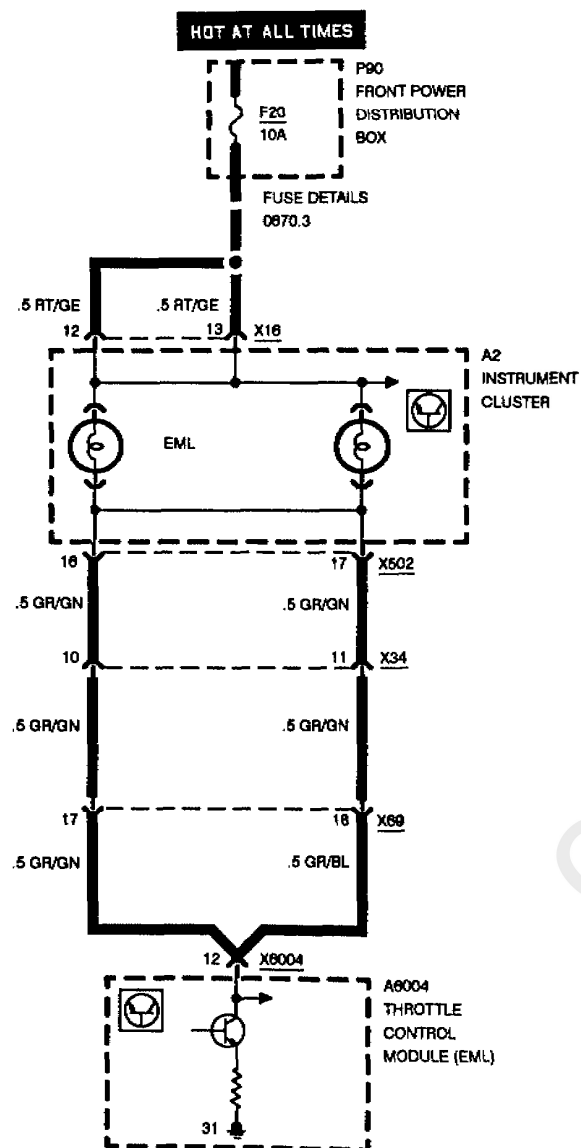








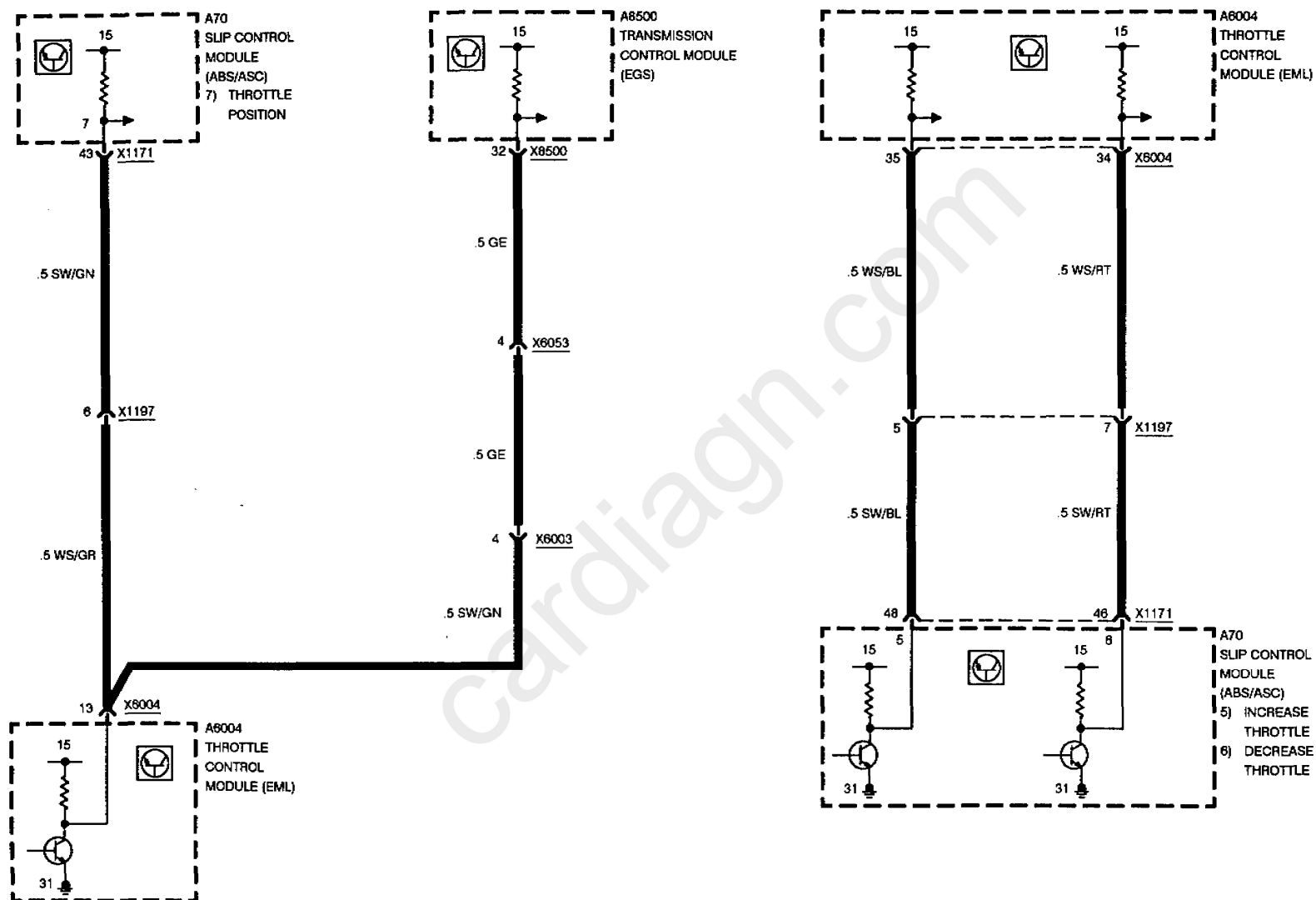






# ELECTRONIC THROTTLE CONTROL (EML 6-CYLINDER) ENGINE CONTROL SYSTEMS (DME)

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