

4.0L - Engine - Motronic Multiport Fuel Injection (MFI) /202kW, code BDP,

from January 2002

Notes:

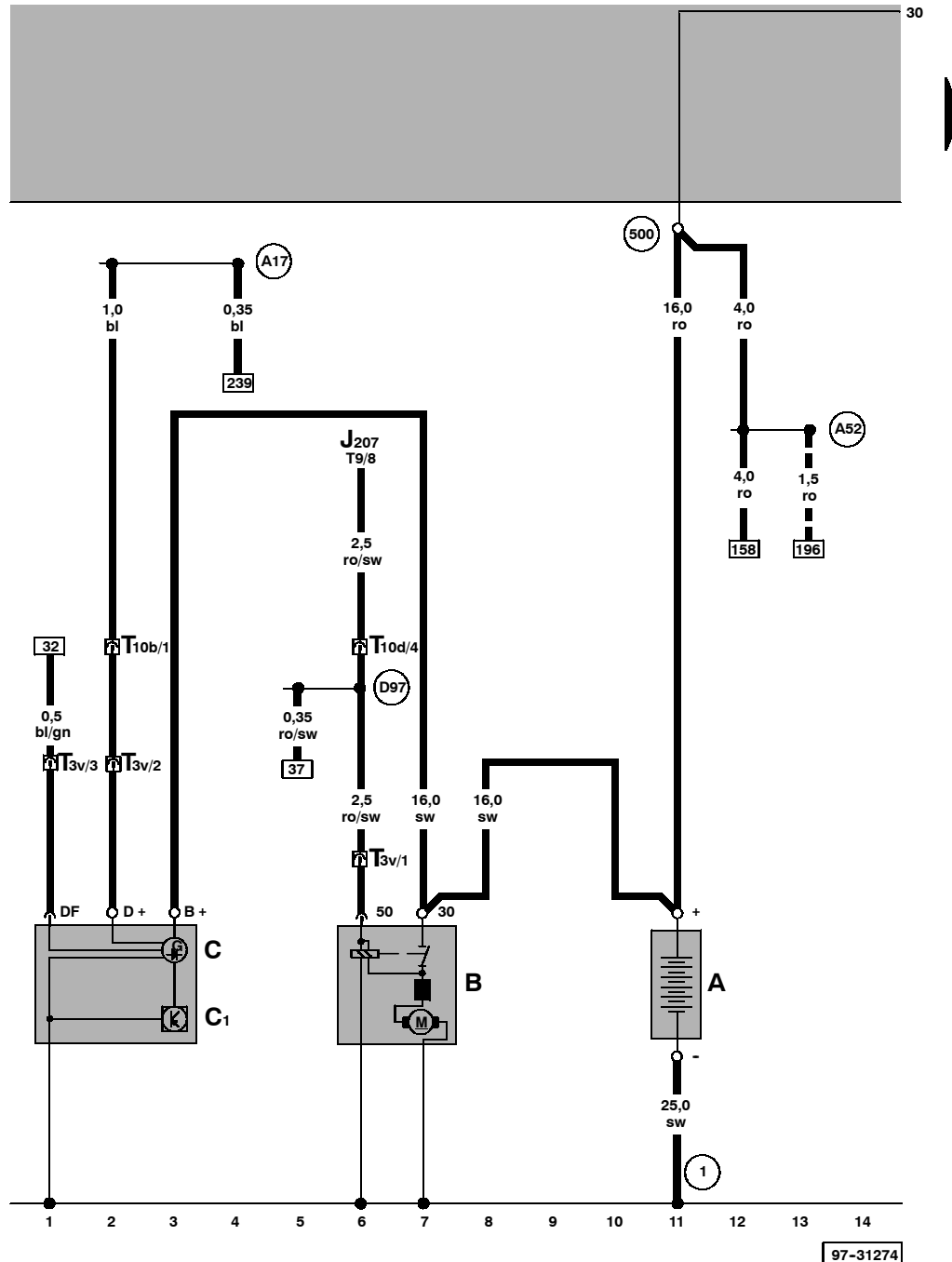
Information for

- ◆ *Relay and fuse arrangements*
 - ◆ *Connector arrangements*
 - ◆ *Control Modules and Relays*
 - ◆ *Ground connections*
- ⇒ *Component Locations!*

Information for

- ◆ *Troubleshooting Procedures*
- ⇒ *Guided Fault Finding using VAS 5051/5052*

Battery, Starter, Generator, Voltage Regulator



- A - Battery
- B - Starter
- C - Generator (GEN)
- C1 - Voltage Regulator (VR)
- J207 - Starting Interlock Relay
- T3v - 3-Pin connector, black, on engine block right
- T9 - 9-Pin connector, black, on starting interlock relay
- T10b - 10-Pin connector, black, on protective housing for control module, in engine compartment, left
- T10d - 10-Pin connector, brown, on protective housing for control module, in engine compartment, left

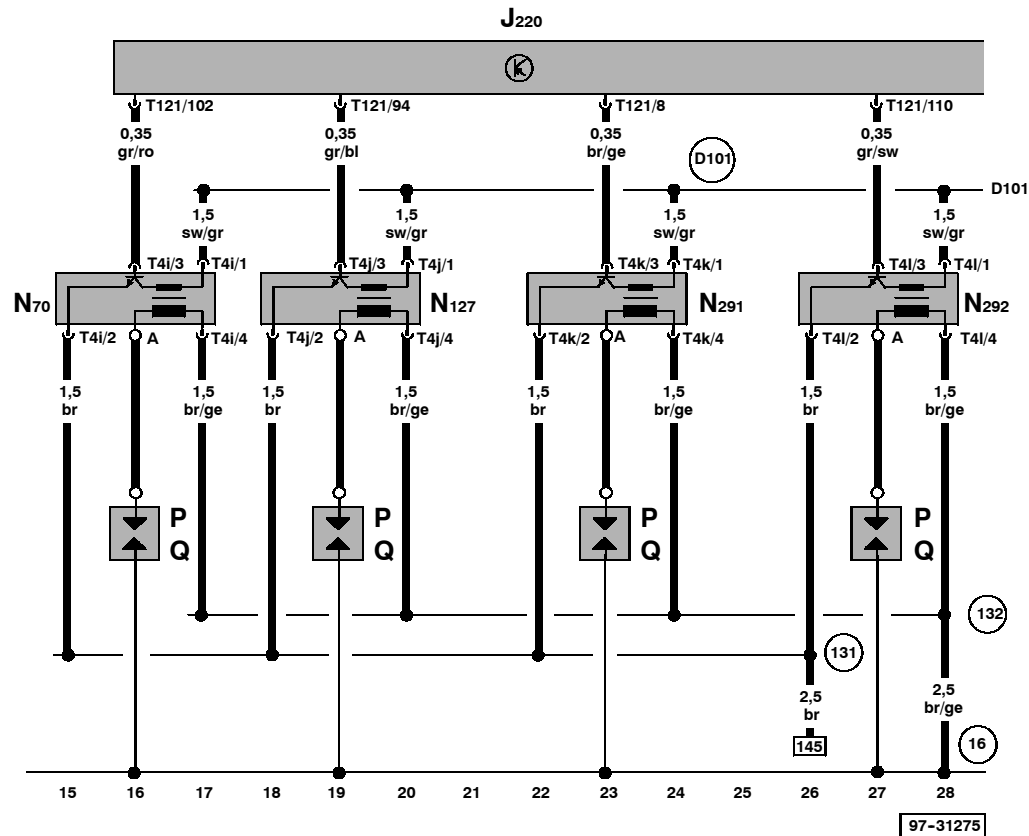
- 1 - Ground strap, battery to body
- 500 - Threaded connection -1- (30) on the relay plate
- A17 - wire connection (61), in instrument panel wiring harness
- A52 - Plus Connection 2 (30) (in instrument panel wiring harness)
- D97 - Wire connection (50), in engine compartment wiring harness, right

ws = white
 sw = black
 ro = red
 br = brown
 gn = green
 bl = blue
 gr = grey
 li = lilac
 ge = yellow
 or = orange

Motronic Engine Control Module, Ignition Coil 1-4, Spark Plug Connectors, Spark Plugs

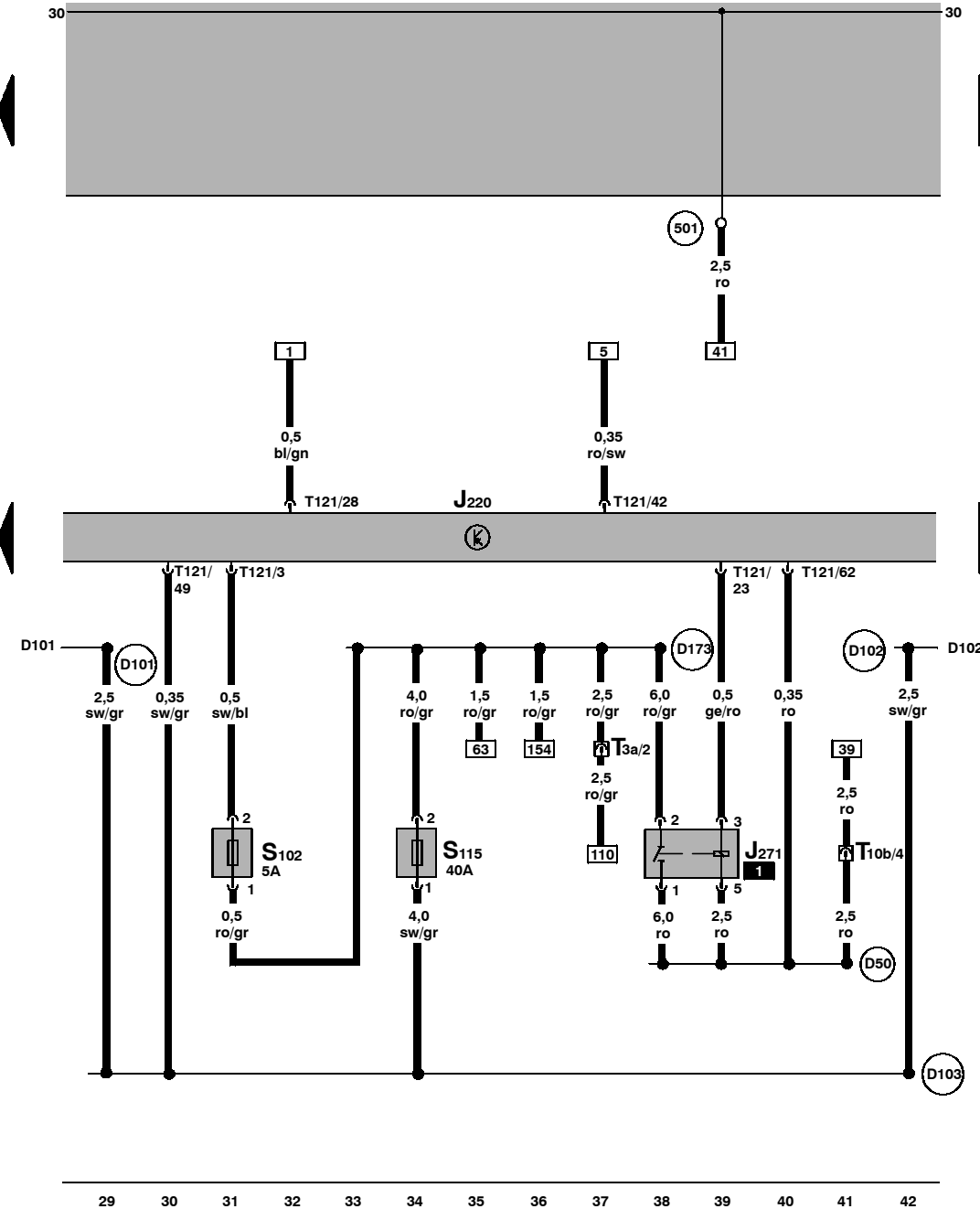
- J220 - Motronic Engine Control Module (ECM)
- N70 - Ignition Coil 1 with Power Output Stage
- N127 - Ignition Coil 2 with Power Output Stage
- N291 - Ignition Coil 3 with Power Output Stage
- N292 - Ignition Coil 4 with Power Output Stage
- P - Spark Plug Connectors
- Q - Spark Plugs
- T4i - 4-Pin connector, black, on Ignition Coil 1
- T4j - 4-Pin connector, black, on Ignition Coil 2
- T4k - 4-Pin connector, black, on Ignition Coil 3
- T4l - 4-Pin connector, black, on Ignition Coil 4
- T121 - 121-Pin connector, on Motronic Engine Control Module

- (16) - Ground connection -1-, on valve cover
- (131) - Ground connection -2-, in engine compartment wiring harness
- (132) - Ground connection -3-, in engine compartment wiring harness
- (D101) - Wire connection -1-, in engine compartment wiring harness



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Motronic Engine Control Module, Motronic Engine Control Module Power Supply Relay



- J220 - Motronic Engine Control Module (ECM)
- J271 - Motronic Engine Control Module (ECM) Power Supply Relay
- S102 - Engine Control Module (ECM) Fuse
- S115 - Fuse for ignition coil terminal 15
- T3a - 3-Pin connector, white, on protective housing for control module, in engine compartment, left
- T10b - 10-Pin connector, black, on protective housing for control module, in engine compartment, left
- T121 - 121-Pin connector, on Motronic Engine Control Module

- (501) - Threaded connection -2-(30) on the relay plate
- (D50) - plus connection (30), in engine compartment wiring harness
- (D101) - Wire connection -1-, in engine compartment wiring harness
- (D102) - Wire connection -2-, in engine compartment wiring harness
- (D103) - wire connection -3-, in engine compartment wiring harness
- (D173) - Connection (87)(in engine wiring harness)

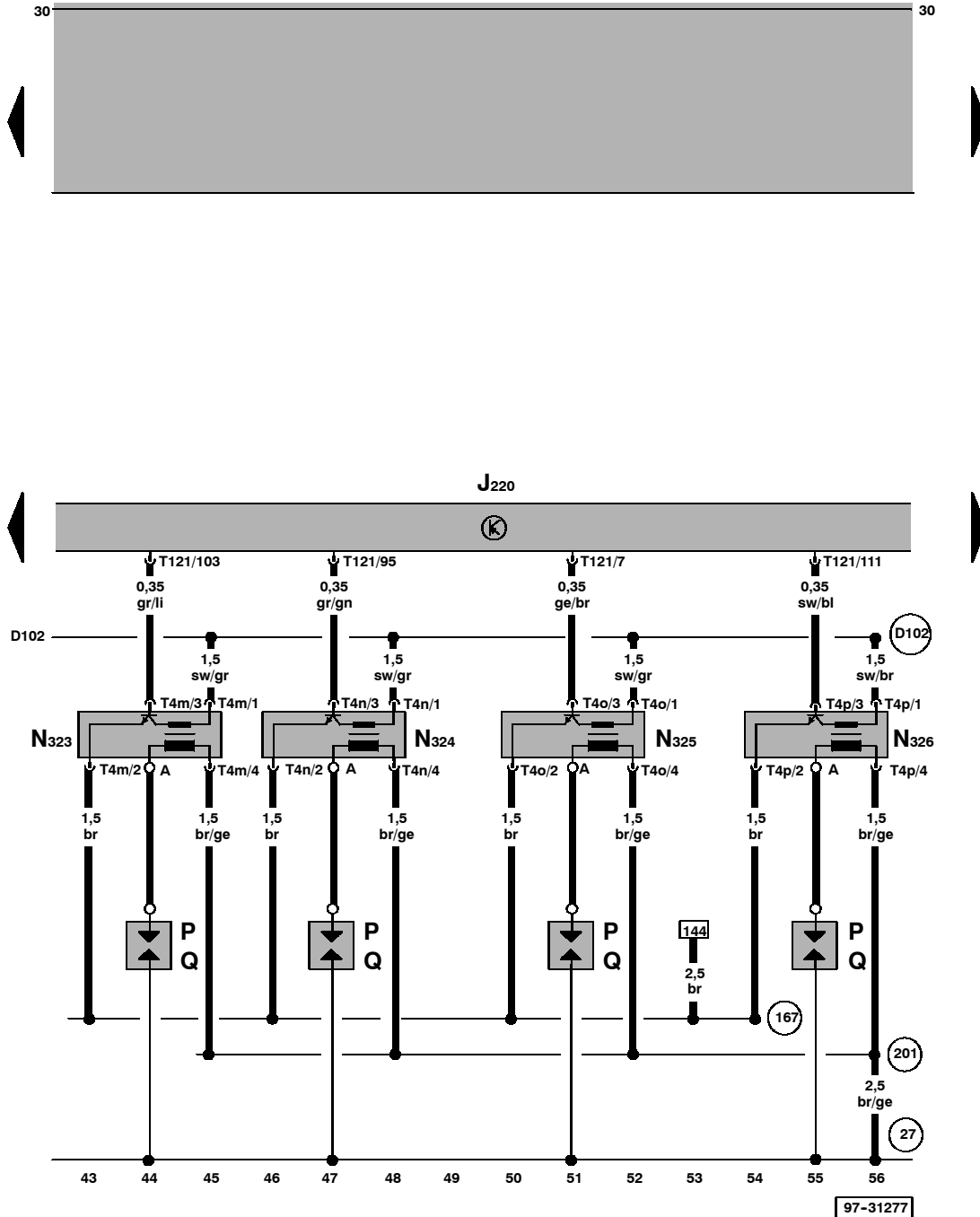
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Motronic Engine Control Module, Ignition Coil 5-8, Spark Plug Connectors, Spark Plugs

- J220 - Motronic Engine Control Module (ECM)
- N323- Ignition Coil 5 with Power Output Stage
- N324- Ignition Coil 6 with Power Output Stage
- N325- Ignition Coil 7 with Power Output Stage
- N326- Ignition Coil 8 with Power Output Stage
- P - Spark Plug Connectors
- Q - Spark Plugs
- T4m - 4-Pin connector, black, on the Ignition Coil 5
- T4n - 4-Pin connector, black, on the Ignition Coil 6
- T4o - 4-Pin connector, black, on the Ignition Coil 7
- T4p - 4-Pin connector, black, on the Ignition Coil 8
- T121 - 121-Pin connector, on Motronic Engine Control Module

- (27) - Ground connection -2-, on valve cover
- (167) - Ground connection -4-, in engine compartment wiring harness
- (201) - Ground connection -5-, in engine compartment wiring harness
- (D102) - Wire connection -2-, in engine compartment wiring harness

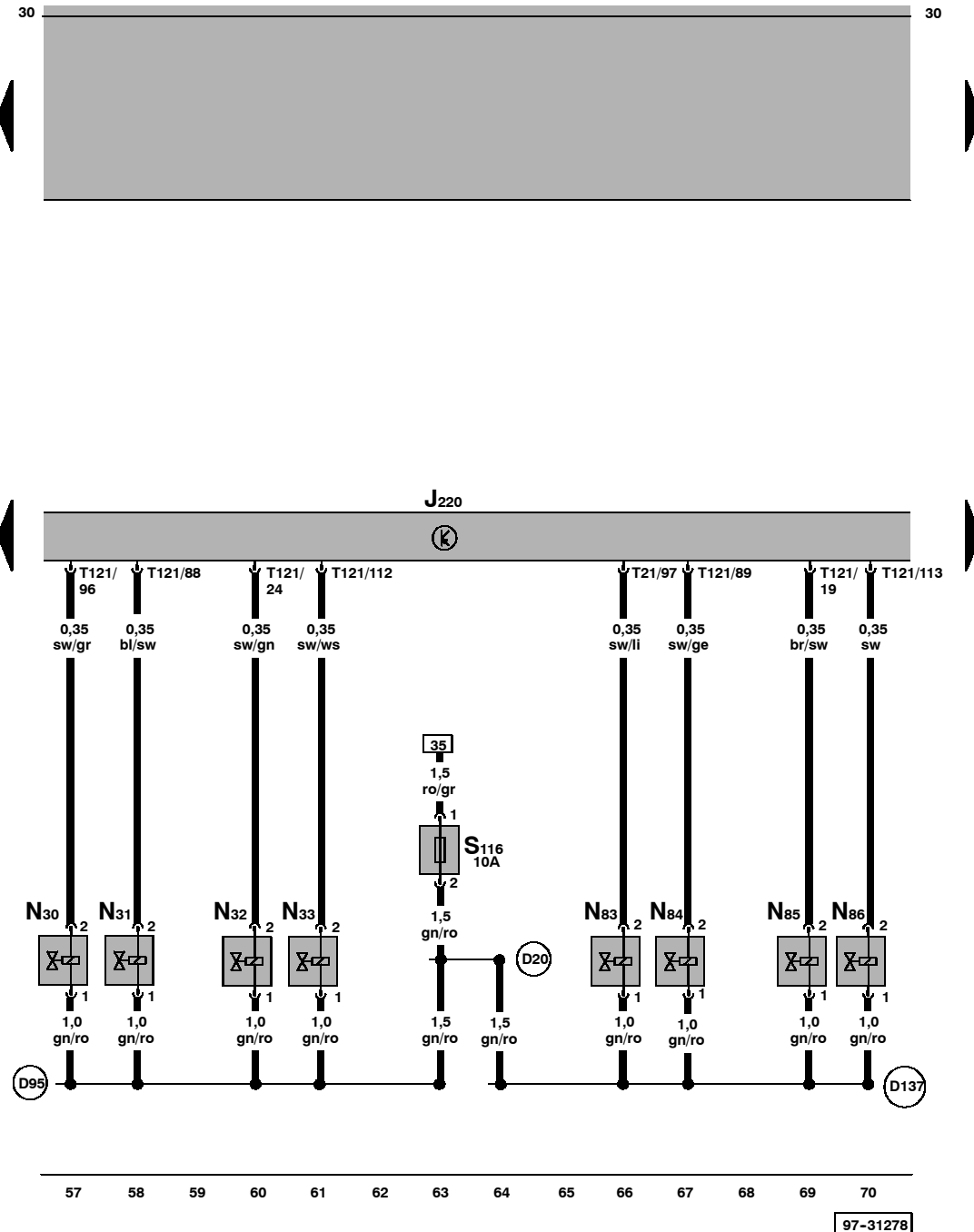
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Motronic Engine Control Module, Cylinder 1-8 Fuel Injector

- J220 - Motronic Engine Control Module (ECM)
- N30 - Cylinder 1 Fuel Injector
- N31 - Cylinder 2 Fuel Injector
- N32 - Cylinder 3 Fuel Injector
- N33 - Cylinder 4 Fuel Injector
- N83 - Cylinder 5 Fuel Injector
- N84 - Cylinder 6 Fuel Injector
- N85 - Cylinder 7 Fuel Injector
- N86 - Cylinder 8 Fuel Injector
- S116 - Fuse for injectors
- T121 - 121-Pin connector, on Motronic Engine Control Module



- (D20) - Connection (87a) (in right front wiring harness)
- (D95) - wire connection (injectors), in engine compartment wiring harness
- (D137) - Connection -2- (injectors), wiring harness, engine compartment

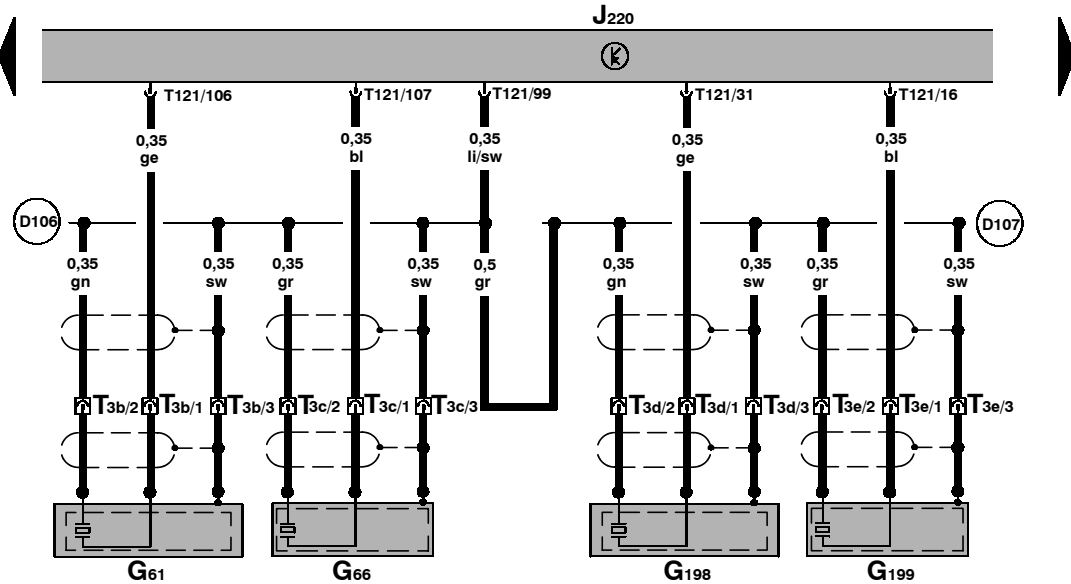
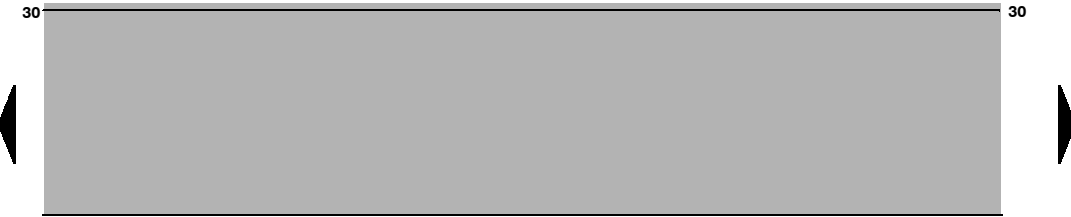


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Motronic Engine Control Module, Knock Sensor 1-4

- G61 - Knock Sensor (KS) 1
- G66 - Knock Sensor (KS) 2
- G198 - Knock sensor 3
- G199 - Knock sensor 4
- J220 - Motronic Engine Control Module (ECM)
- T3b - 3-Pin connector, black, on Knock Sensor 1
- T3c - 3-Pin connector, brown, on Knock Sensor 2
- T3d - 3-Pin connector, orange, on Knock Sensor 3
- T3e - 3-Pin connector, grey, on Knock Sensor 4
- T121 - 121-Pin connector, on Motronic Engine Control Module

-  - wire connection -4-, in engine compartment wiring harness
-  - wire connection -5-, in engine compartment wiring harness



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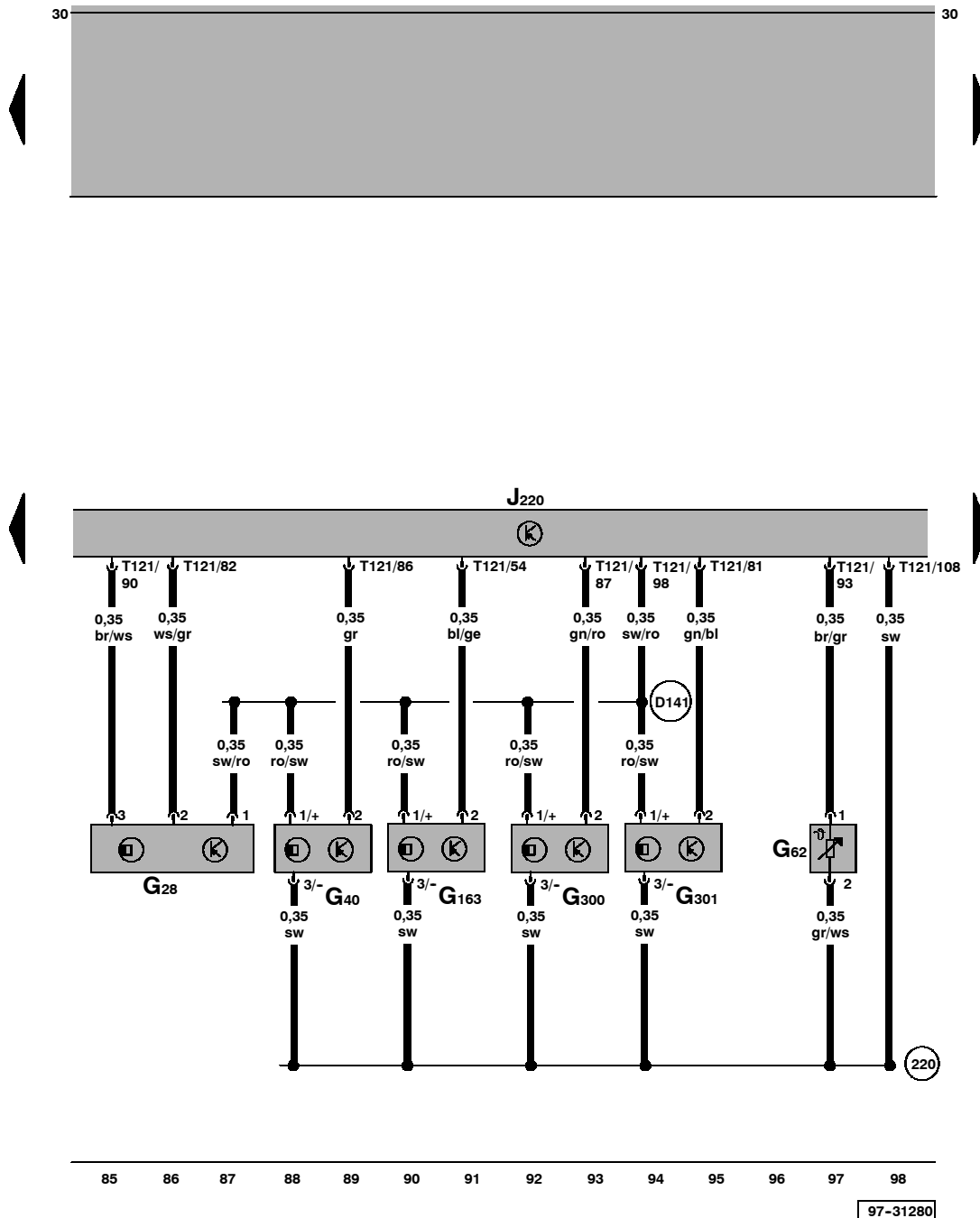
71 72 73 74 75 76 77 78 79 80 81 82 83 84

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Motronic Engine Control Module, Engine Coolant Temperature, Engine Speed Sensor, Camshaft Position Sensor 2-4

- G28 - Engine Speed (RPM) Sensor
- G40 - Camshaft Position (CMP) Sensor
- G62 - Engine Coolant Temperature (ECT) Sensor
- G163 - Camshaft Position (CMP) Sensor 2
- G300 - Camshaft Position (CMP) Sensor 3
- G301 - Camshaft Position (CMP) Sensor 4
- J220 - Motronic Engine Control Module (ECM)
- T121 - 121-Pin connector, on Motronic Engine Control Module

- (220) - Ground connection (sensor ground), in engine compartment wiring harness
- (D141) - Connection (5V), in wiring harness, engine pre-wiring

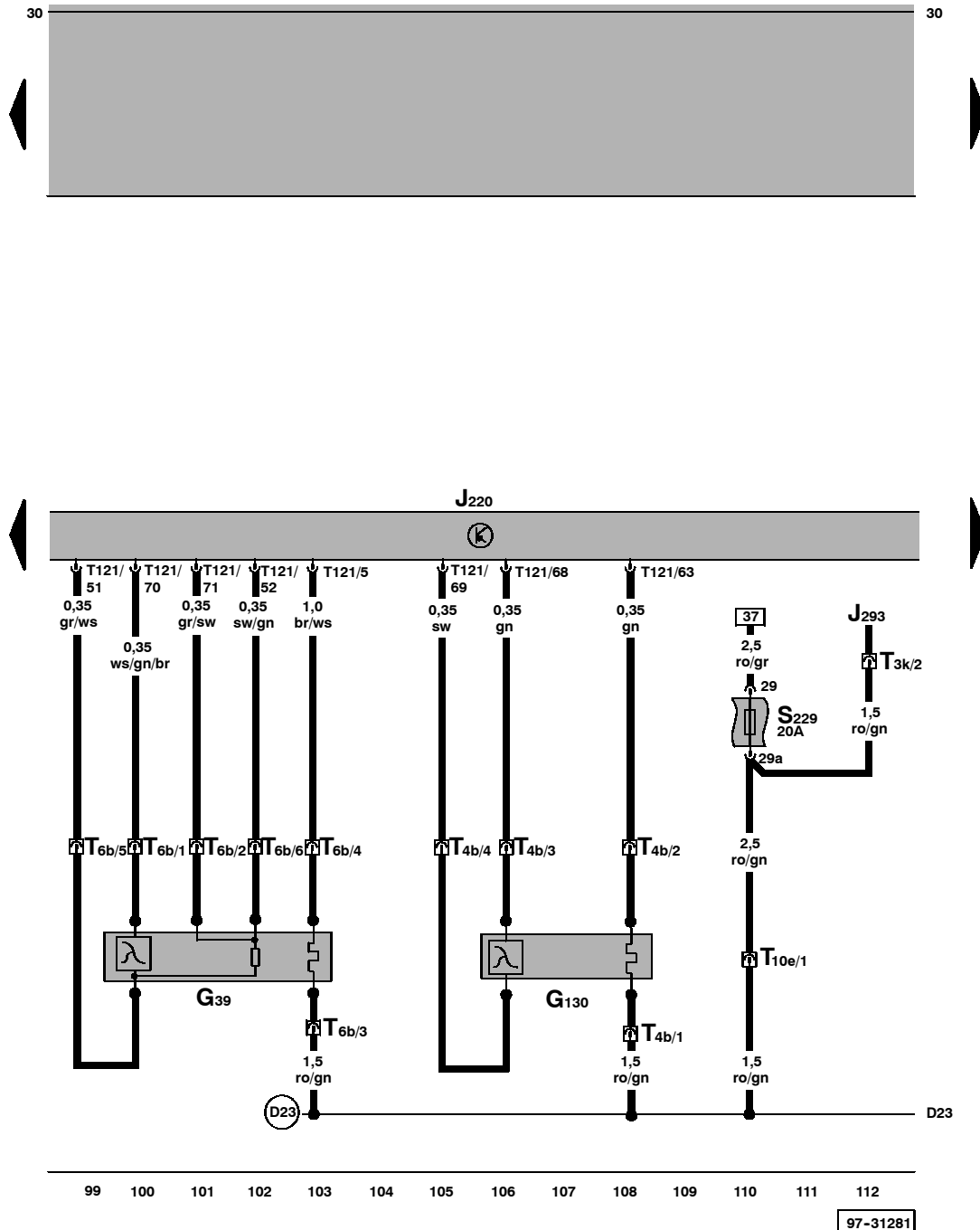


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Motronic Engine Control Module, Heated Oxygen Sensor, Oxygen Sensor Behind Three Way Catalytic Converter

- G39 - Heated Oxygen Sensor (HO2S)
- G130 - Oxygen Sensor (O2S) Behind Three Way Catalytic Converter (TWC)
- J220 - Motronic Engine Control Module (ECM)
- J293 - Coolant FC (Fan Control) Control Module
- S229 - Fuse in fuse holder
- T3k - 3-Pin connector, grey
- T4b - 4-Pin connector, black
- T6b - 6-Pin connector, black
- T10e - 10-Pin connector, orange, on protective housing for control module, in engine compartment, left
- T121 - 121-Pin connector, on Motronic Engine Control Module

(D23) - Connection (over fuse 229), in wiring harness front, right

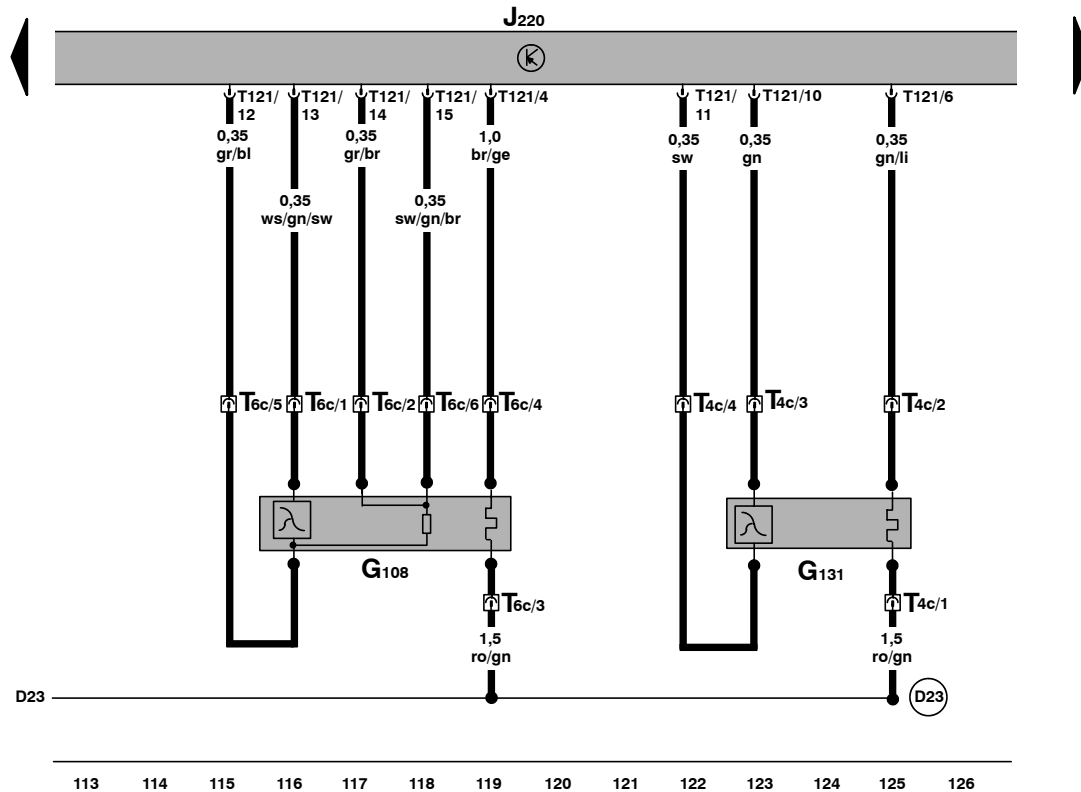


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Motronic Engine Control Module, Heated Oxygen Sensor 2, Oxygen Sensor 2 Behind Three Way Catalytic Converter

- G108 - Heated Oxygen Sensor (HO2S) 2
- G131 - Oxygen Sensor (O2S) 2 Behind Three Way Catalytic Converter (TWC)
- J220 - Motronic Engine Control Module (ECM)
- T4c - 4-Pin connector, brown
- T6c - 6-Pin connector, brown
- T121 - 121-Pin connector, on Motronic Engine Control Module

(D23) - Connection (over fuse 229), in wiring harness front, right



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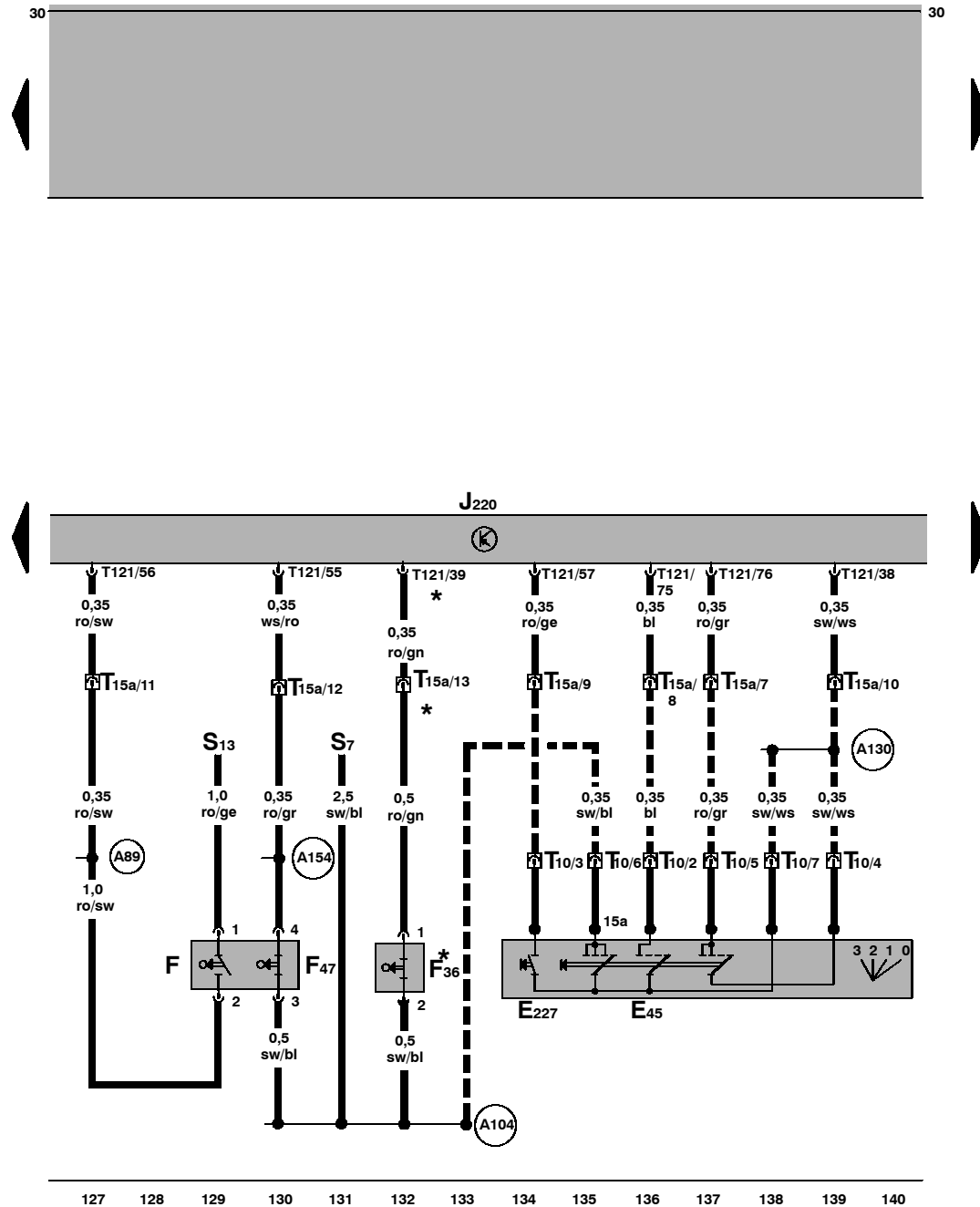
Motronic Engine Control Module, Cruise Control Switch, Button for cruise control, Brake Light Switch, Clutch Pedal Switch, Brake Pedal Switch

- E45 - Cruise Control Switch
- E227 - Button for cruise control (set)
- F - Brake Light Switch
- F36 - Clutch Pedal Switch
- F47 - Brake Pedal Switch
- J220 - Motronic Engine Control Module (ECM)
- S7 - Fuse
- S13 - Fuse
- T10 - 10-Pin connector, black, near steering column
- T15a - 15-Pin connector, white, on protective housing for control module, in engine compartment, left
- T121 - 121-Pin connector, on Motronic Engine Control Module

- (A89) - Connection 2 (54) (in instrument panel wiring harness)
- (A104) - Plus connection -2- (15), in instrument panel wiring harness
- (A130) - Connection for Cruise Control (instrument panel wiring harness)
- (A154) - Brake Pedal Switch Connection (in instrument panel wiring harness)

- - - - - cruise control only
- * - manual transmission only

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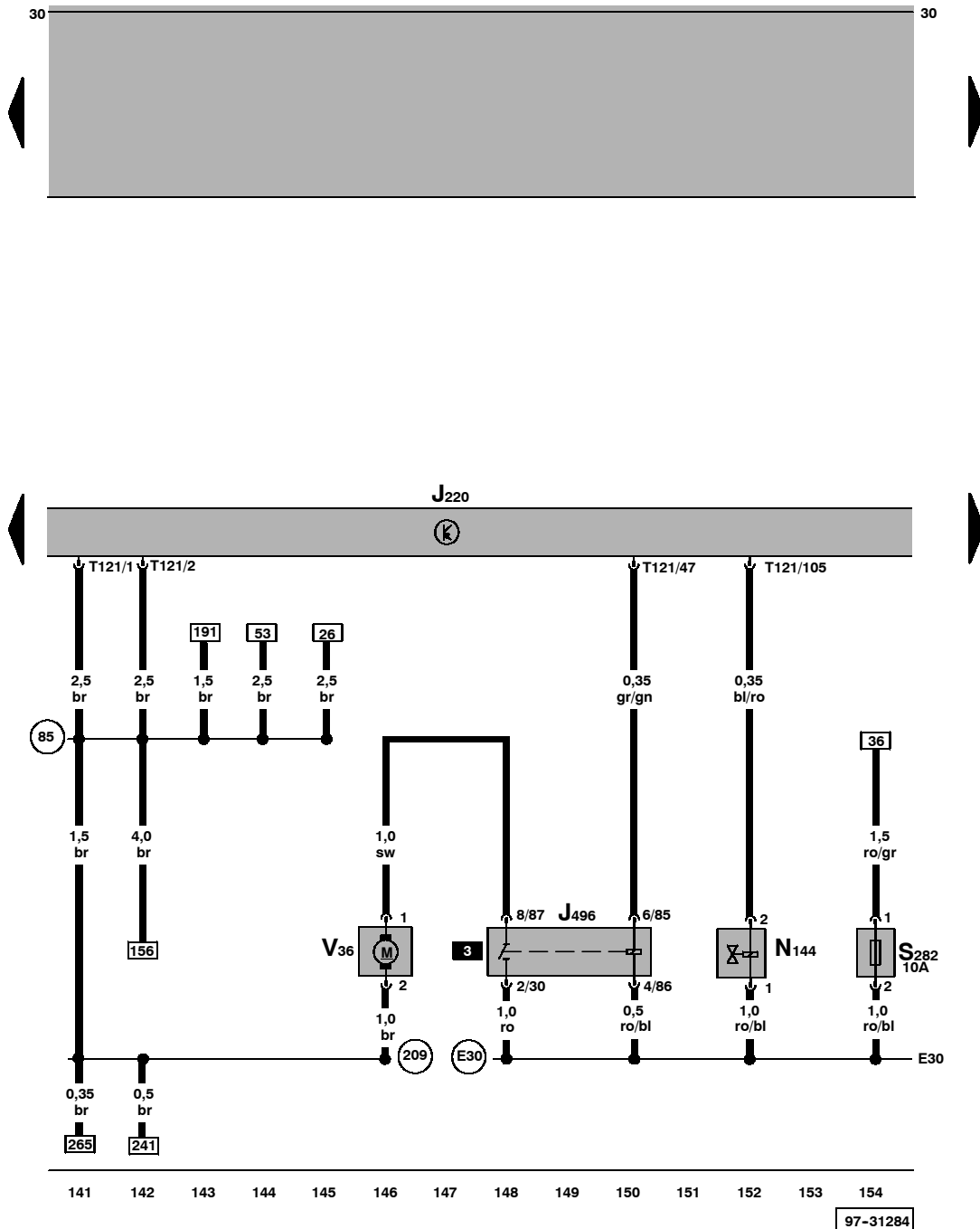


127 128 129 130 131 132 133 134 135 136 137 138 139 140

Motronic Engine Control Module, Auxiliary Engine Coolant Pump Relay, Left Electro-Hydraulic Mount Solenoid Valve, Coolant Pump

- J220 - Motronic Engine Control Module (ECM)
- J496 - Auxiliary Engine Coolant (EC) Pump Relay
- N144 - Left Electro-Hydraulic Engine Mount Solenoid Valve
- S282 - Engine Electronics Fuse
- T121 - 121-Pin connector, on Motronic Engine Control Module
- V36 - Coolant Pump

- (85) - Ground connection -1-, in engine compartment wiring harness
- (209) - Ground connection -6-, in engine compartment wiring harness
- (E30) - Connection (87a), in wiring harness engine

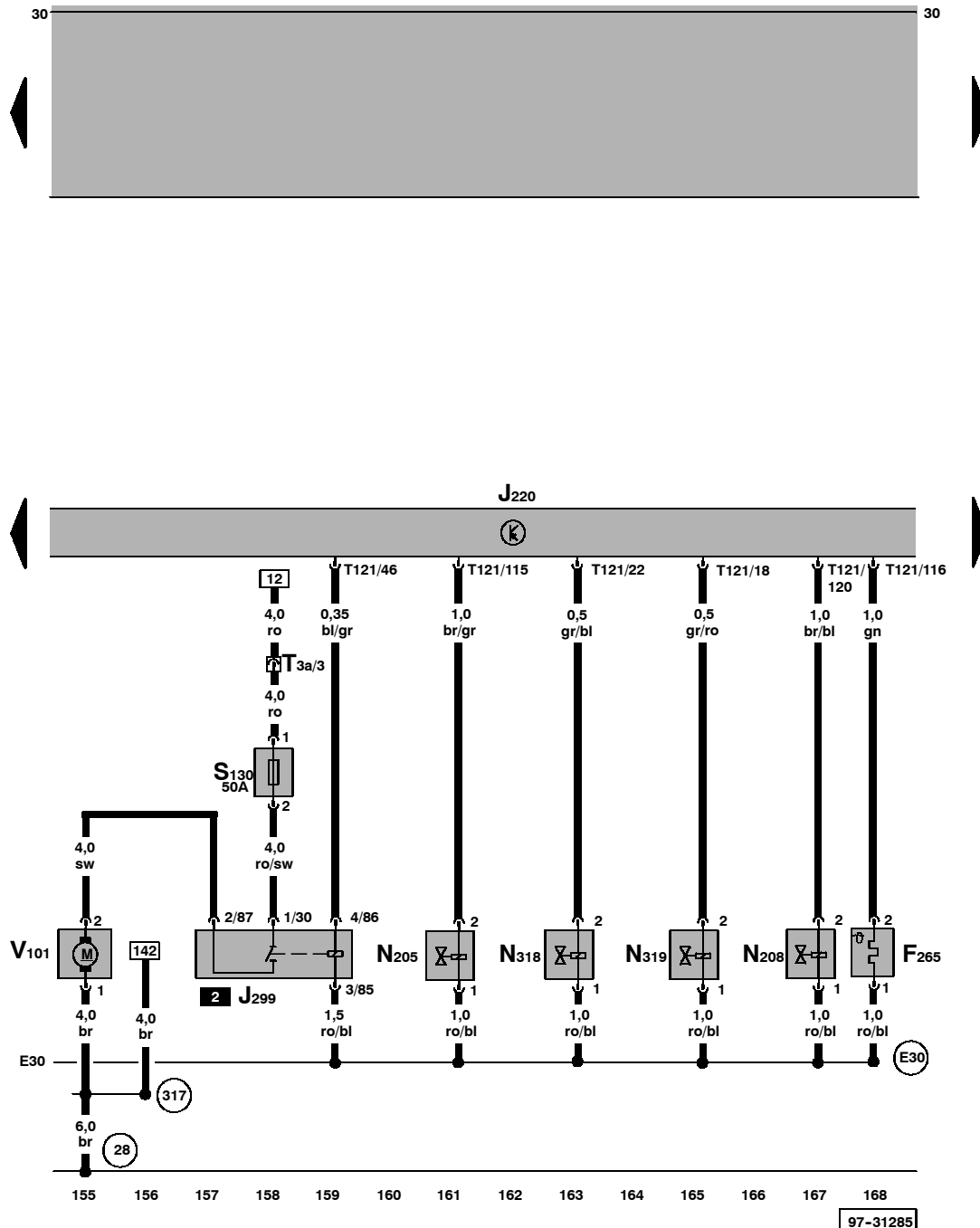


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Motronic Engine Control Module, Secondary Air Injection Pump Relay, Map Controlled Engine Cooling Thermostat, Valve 1 and 2

- F265 - Map Controlled Engine Cooling Thermostat
- J220 - Motronic Engine Control Module (ECM)
- J299 - Secondary Air Injection (AIR) Pump Relay
- N205 - Valve -1- for camshaft adjustment
- N208 - Valve -2- for camshaft adjustment
- N318 - Camshaft Adjustment Valve 1 (exhaust)
- N319 - Camshaft Adjustment Valve 2 (exhaust)
- S130 - Fuse for secondary air pump
- T3a - 3-Pin connector, white, on protective housing for control module, in engine compartment, left
- T121 - 121-Pin connector, on Motronic Engine Control Module
- V101 - Secondary Air Injection (AIR) Pump Motor

- (28) - Ground connection, on firewall
- (317) - Ground connection -7-, in engine compartment wiring harness
- (E30) - Connection (87a), in wiring harness engine

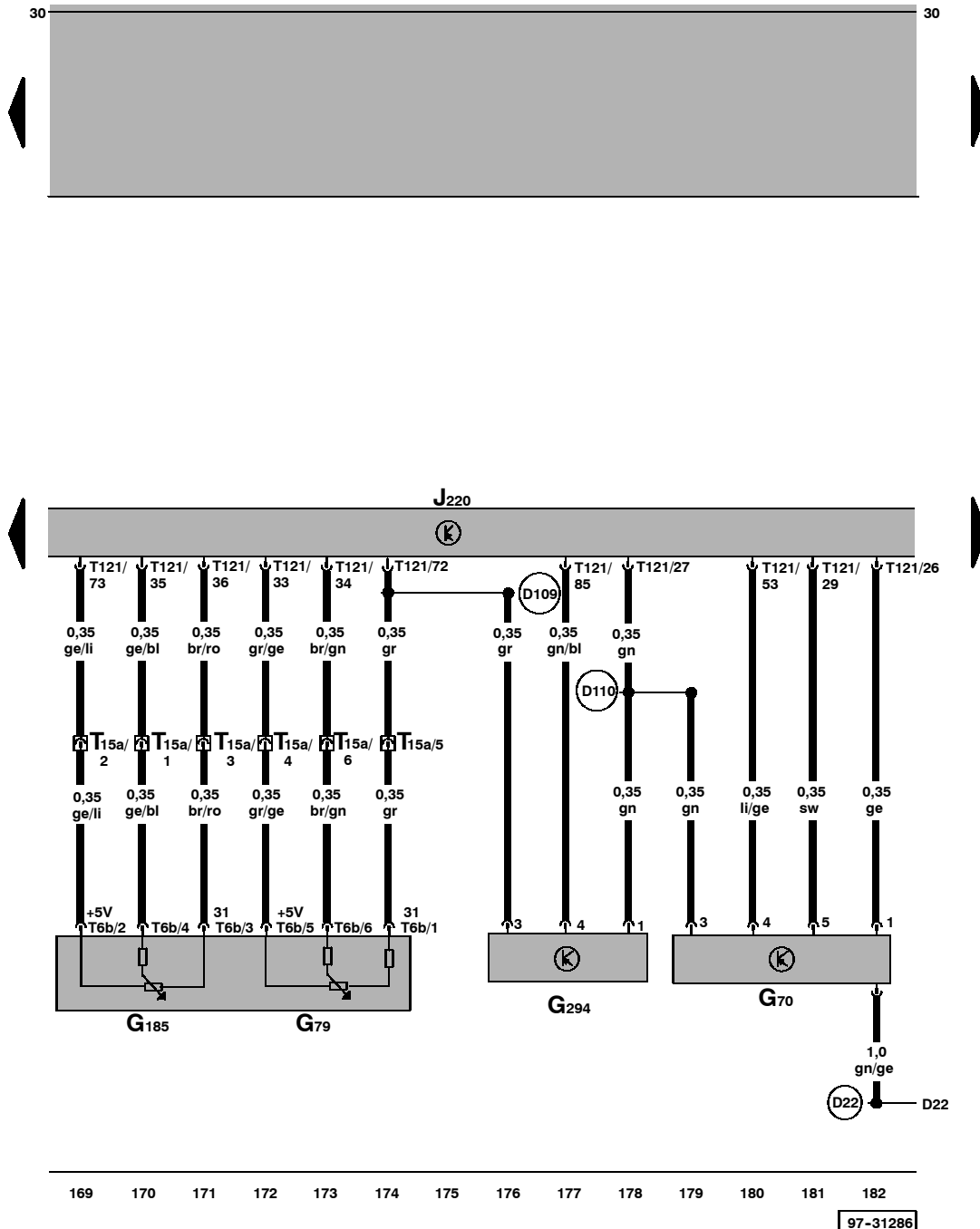


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Motronic Engine Control Module, Mass Air Flow (MAF) Sensor, Throttle Position (TP) Sensor, Brake Booster Pressure Sensor

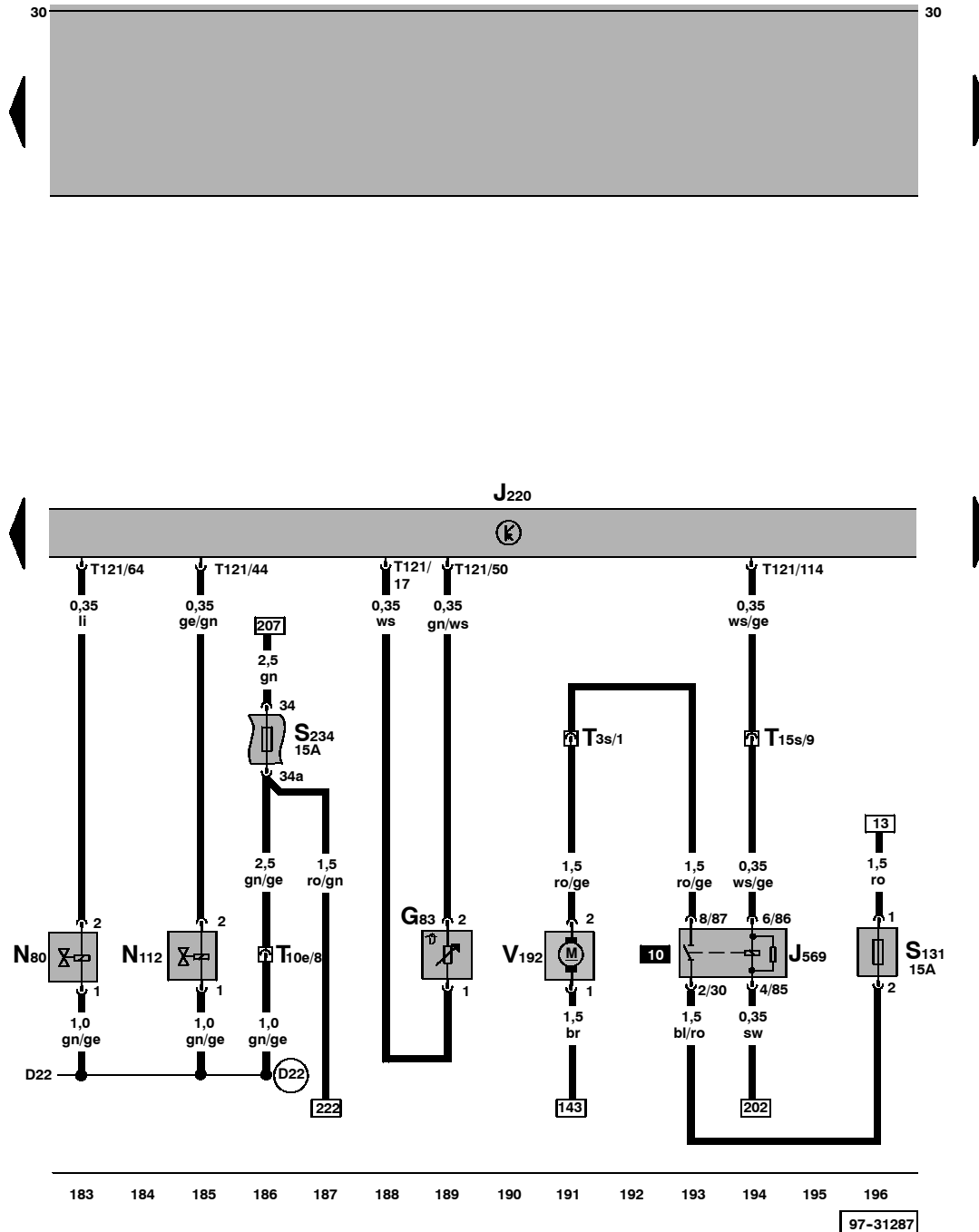
- G70 - Mass Air Flow (MAF) Sensor
- G79 - Throttle Position (TP) Sensor
- G185- Sender -2- for accelerator pedal position
- G294- Brake Booster Pressure Sensor
- J220 - Motronic Engine Control Module (ECM)
- T6b - 6-Pin connector, on throttle position sensor
- T15a - 15-Pin connector, white, on protective housing for control module, in engine compartment, left
- T121 - 121-Pin connector, on Motronic Engine Control Module

- (D22) - Connection (over fuse 234), in wiring harness front, right
- (D109) - wire connection -7-, in engine compartment wiring harness
- (D110) - wire connection -8-, in engine compartment wiring harness



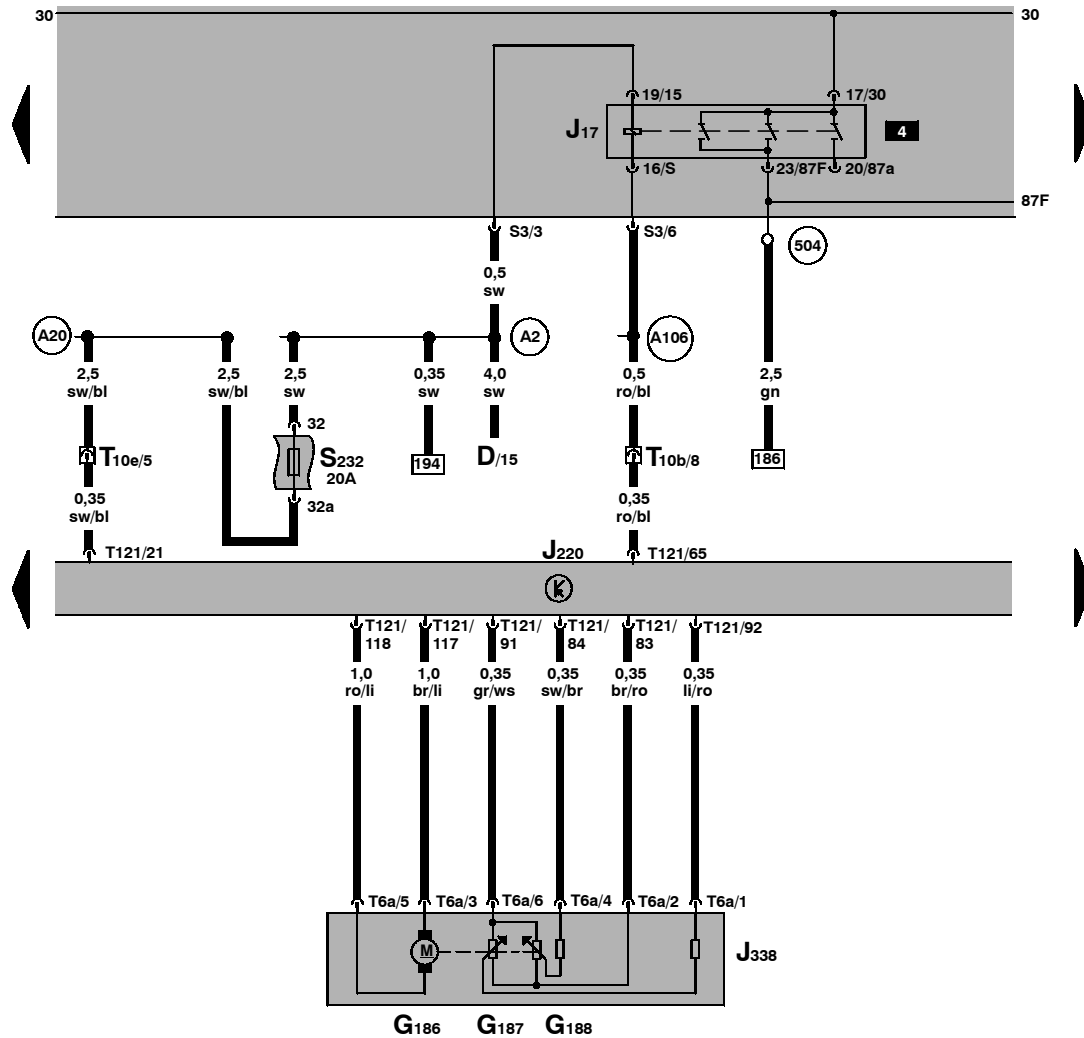
Motronic Engine Control Module, Brake Booster Relay, Engine Coolant Temperature Sensor, Valve

- G83 - Engine Coolant Temperature (ECT) Sensor (on Radiator)
- J220 - Motronic Engine Control Module (ECM)
- J569 - Brake Booster Relay
- N80 - Evaporative Emission (EVAP) Canister Purge Regulator Valve
- N112 - Secondary Air Injection (AIR) Solenoid Valve
- S131 - Safety fuse 1
- S234 - Fuse in fuse holder
- T3s - 3-Pin connector, red, on protective housing for control module, in engine compartment, left
- T10e - 10-Pin connector, orange, on protective housing for control module, in engine compartment, left
- T15s - 15-Pin connector, red, on protective housing for control module, in engine compartment, left
- T121 - 121-Pin connector, on Motronic Engine Control Module
- V192 - Brake System Vacuum Pump
- (D22)** - Connection (over fuse 234), in wiring harness front, right



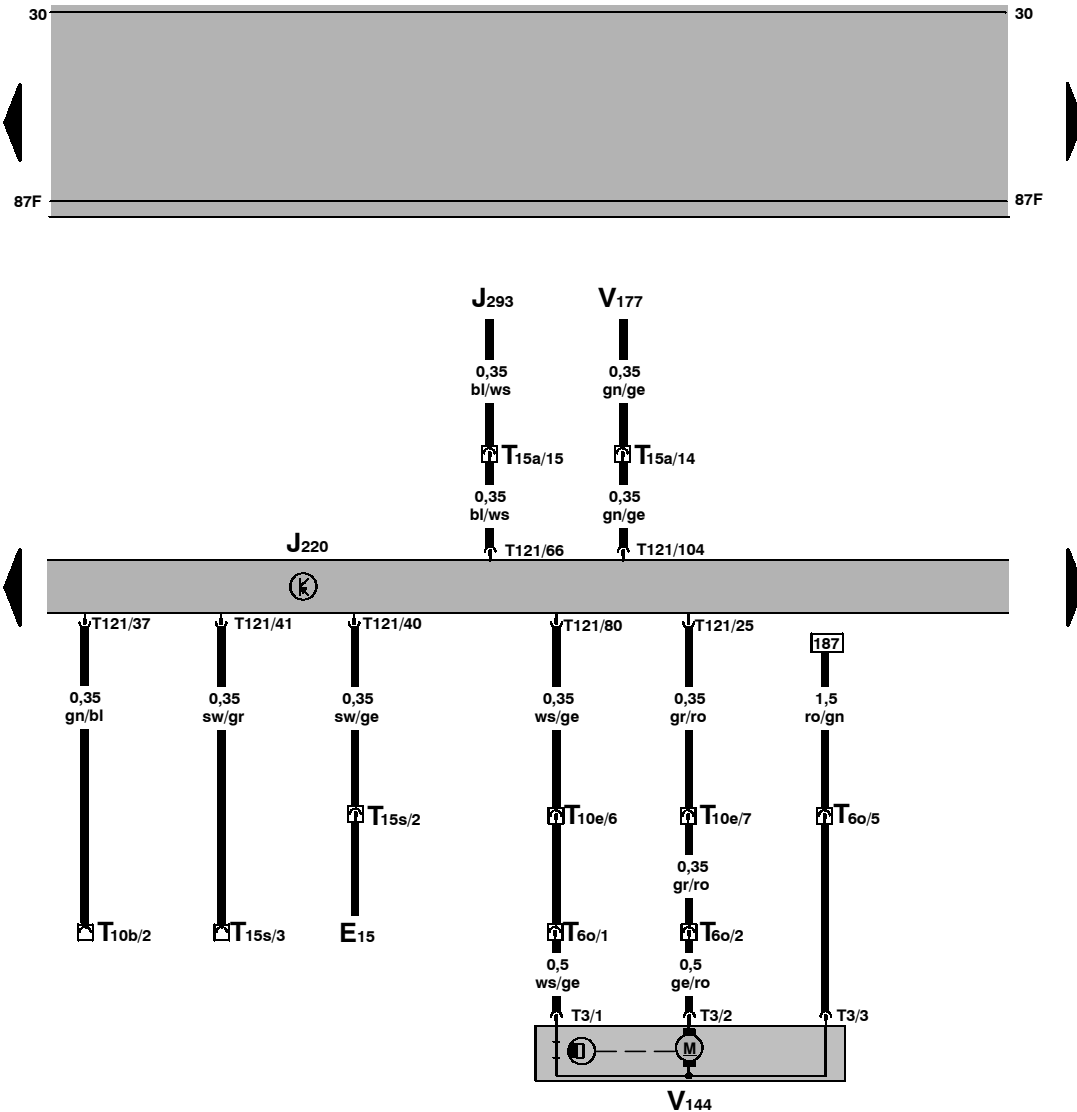
Motronic Engine Control Module, Fuel Pump Relay, Throttle drive, Angle sensor 1 and 2 for throttle drive

- D - Ignition/Starter Switch
 - G186- Throttle drive (power accelerator actuation)
 - G187- Angle sensor -1- for throttle drive (power accelerator actuation)
 - G188- Angle sensor -2- for throttle drive (power accelerator actuation)
 - J17 - Fuel Pump (FP) Relay
 - J220 - Motronic Engine Control Module (ECM)
 - J338 - Throttle Valve Control Module
 - S232 - Fuse in fuse holder
 - T6a - 6-Pin connector, black, connector station A-pillar
 - T10b - 10-Pin connector, black, on protective housing for control module, in engine compartment, left
 - T10e - 10-Pin connector, orange, on protective housing for control module, in engine compartment, left
 - T121 - 121-Pin connector, on Motronic Engine Control Module
- (504) - Threaded connection -1- (87) on the relay plate
 - (A2) - Plus connection (15), in instrument panel wiring harness
 - (A20) - Plus Connection (15a) (in instrument panel wiring harness)
 - (A106) - Connection -2- (86s), in instrument panel wiring harness



ws = white
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Motronic Engine Control Module, Leak Detection Pump



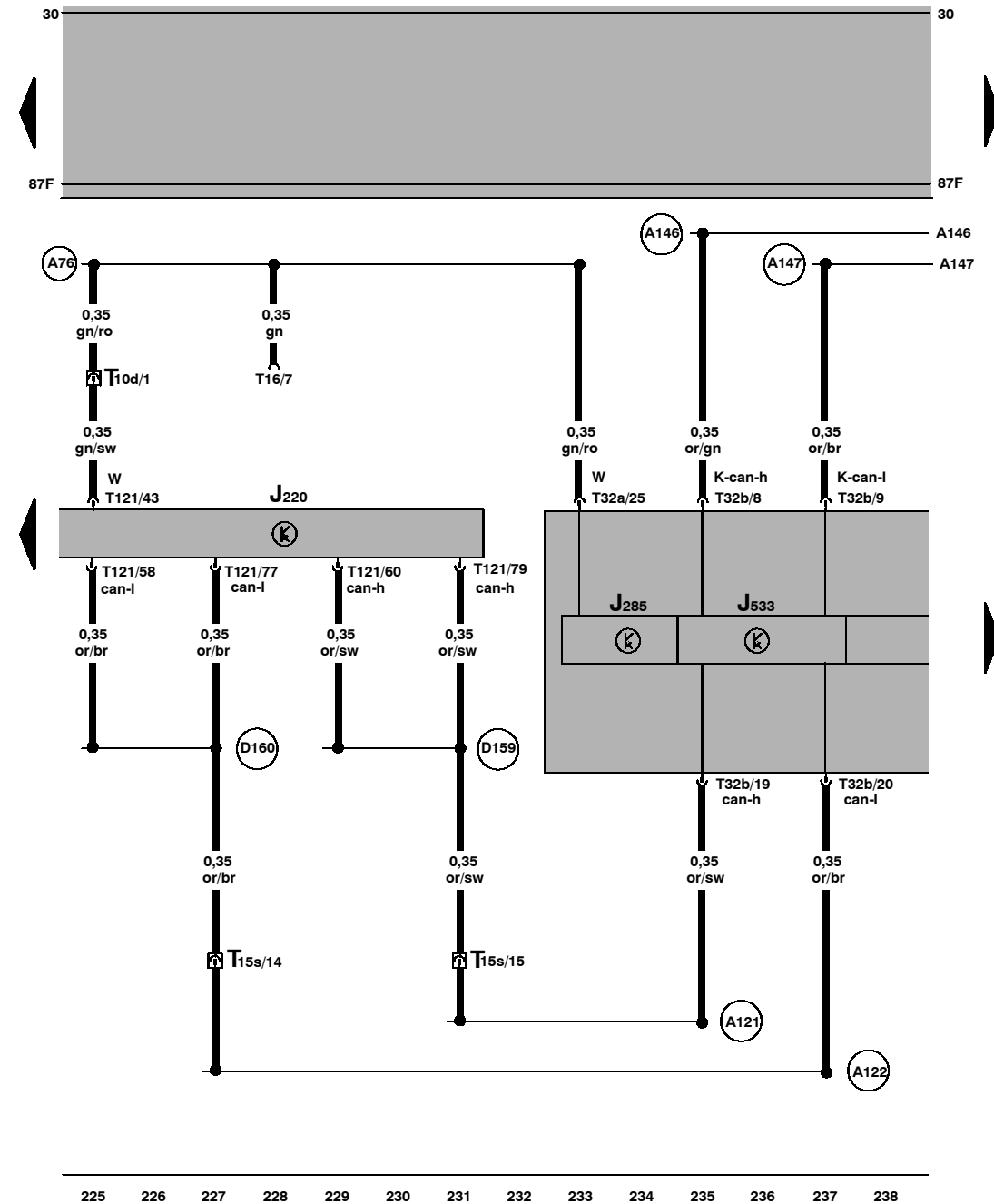
- E15 - Rear window defogger switch
- J220 - Motronic Engine Control Module (ECM)
- J293 - Coolant FC (Fan Control) Control Module
- T6o - 6-Pin Connector, brown, connector station A-pillar, right
- T10b - 10-Pin connector, black, on protective housing for control module, in engine compartment, left
- T10e - 10-Pin Connector, orange, on protective housing for control module, in engine compartment, left
- T15a - 15-Pin connector, white, on protective housing for control module, in engine compartment, left
- T15s - 15-Pin connector, red, on protective housing for control module, in engine compartment, left
- T121 - 121-Pin connector, on Motronic Engine Control Module
- V144 - Leak Detection Pump (LDP)
- V177 - Coolant Fan -2-

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211 212 213 214 215 216 217 218 219 220 221 222 223 224

97-31289

Motronic Engine Control Module, Control Module with indicator unit in instrument panel insert, Data Bus On Board Diagnostic Interface



- J220 - Motronic Engine Control Module (ECM)
- J285 - Control module with indicator unit in instrument panel insert
- J533 - Data Bus On Board Diagnostic Interface
- T10d - 10-Pin connector, brown, on protective housing for control module, in engine compartment, left
- T15s - 15-Pin connector, red, on protective housing for control module, in engine compartment, left
- T16 - 16-Pin connector, black, Data Link Connector (DLC), below instrument panel, left
- T32a - 32-Pin connector, blue, on instrument cluster
- T32b - 32-Pin connector, green, on instrument cluster
- T121 - 121-Pin connector, on Motronic Engine Control Module

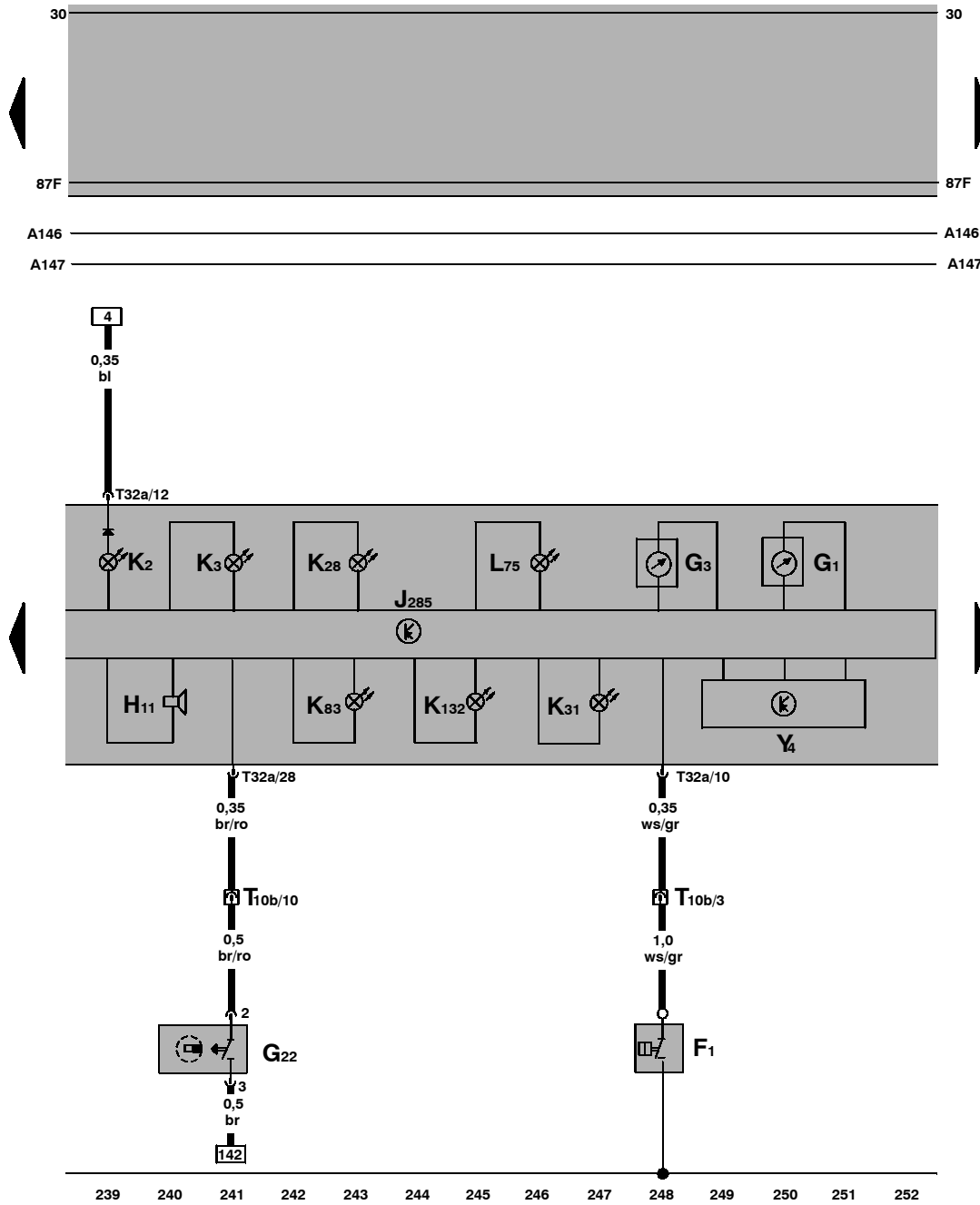
- (A76) - Connection (K-diagnosis wire) in instrument panel wiring harness
- (A122) - Connection (low bus) in instrument panel wiring harness
- (A146) - Comfort System High-bus Connection (in instrument panel wiring harness)
- (A147) - Comfort System Low-bus Connection (in instrument panel wiring harness)
- (D159) - High-bus Connection (in engine compartment wiring harness)
- (D160) - Low-bus Plus Connection (in engine compartment wiring harness)

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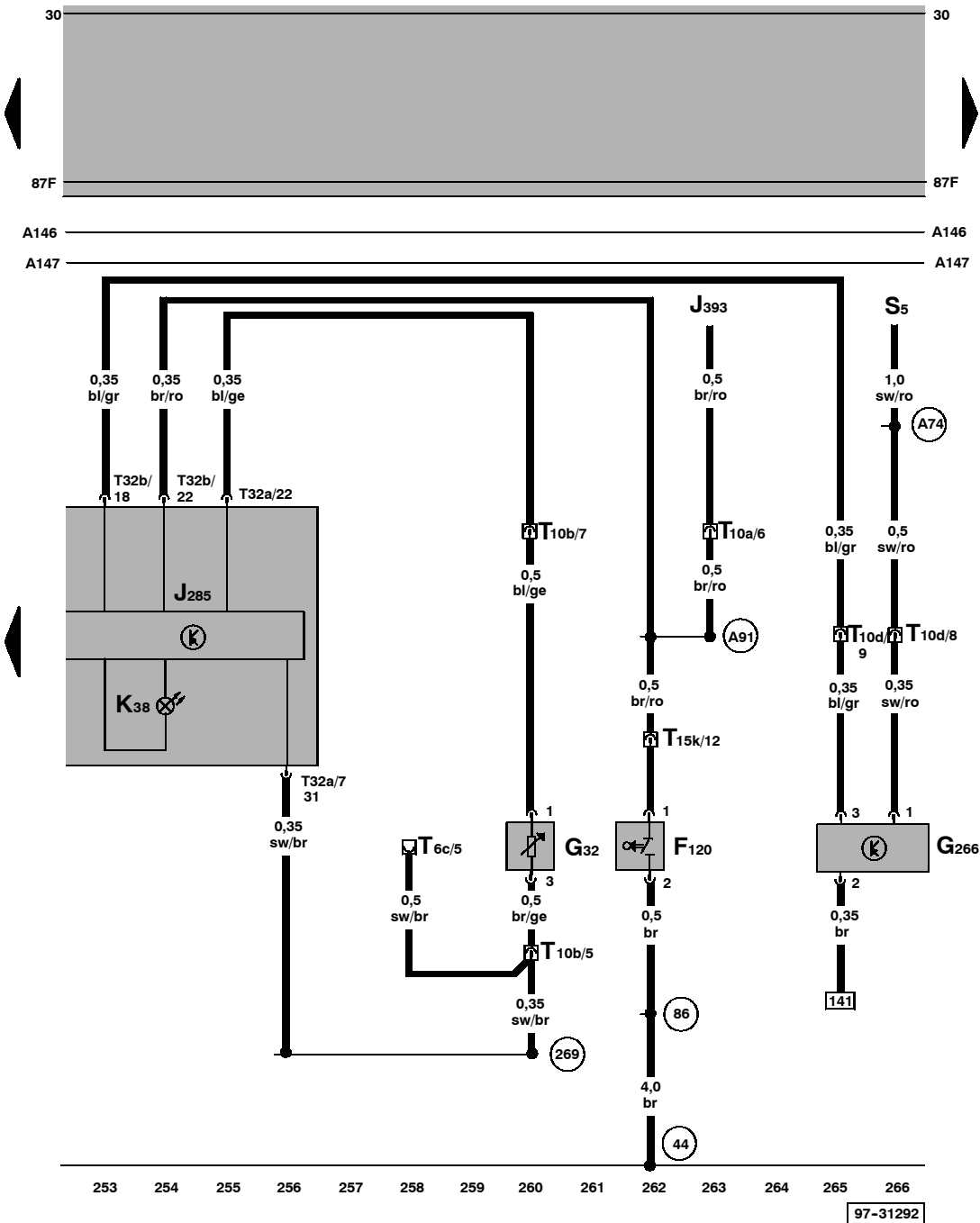
Control Module with indicator unit in instrument panel insert, Speedometer Vehicle Speed Sensor (VSS), Oil Pressure Switch

- F1 - Oil Pressure Switch
- G1 - Fuel Gauge
- G3 - Engine Coolant Temperature (ECT) Gauge
- G22 - Speedometer Vehicle Speed Sensor (VSS)
- H11 - Oil Pressure Warning Buzzer
- J285 - Control module with indicator unit in instrument panel insert
- K2 - Generator (GEN) Warning Light
- K3 - Oil Pressure Warning Light
- K28 - Engine Coolant Level/Temperature (ECL/ECT) Warning Light
- K31 - Cruise Control Indicator Light
- K83 - Malfunction Indicator Lamp (MIL)
- K132 - Electronic Power Control (EPC) Warning Lamp
- L75 - Digital Display Light
- T10b - 10-Pin connector, black, on protective housing for control module, in engine compartment, left
- T32a - 32-Pin connector, blue, on instrument cluster
- Y4 - Odometer Display



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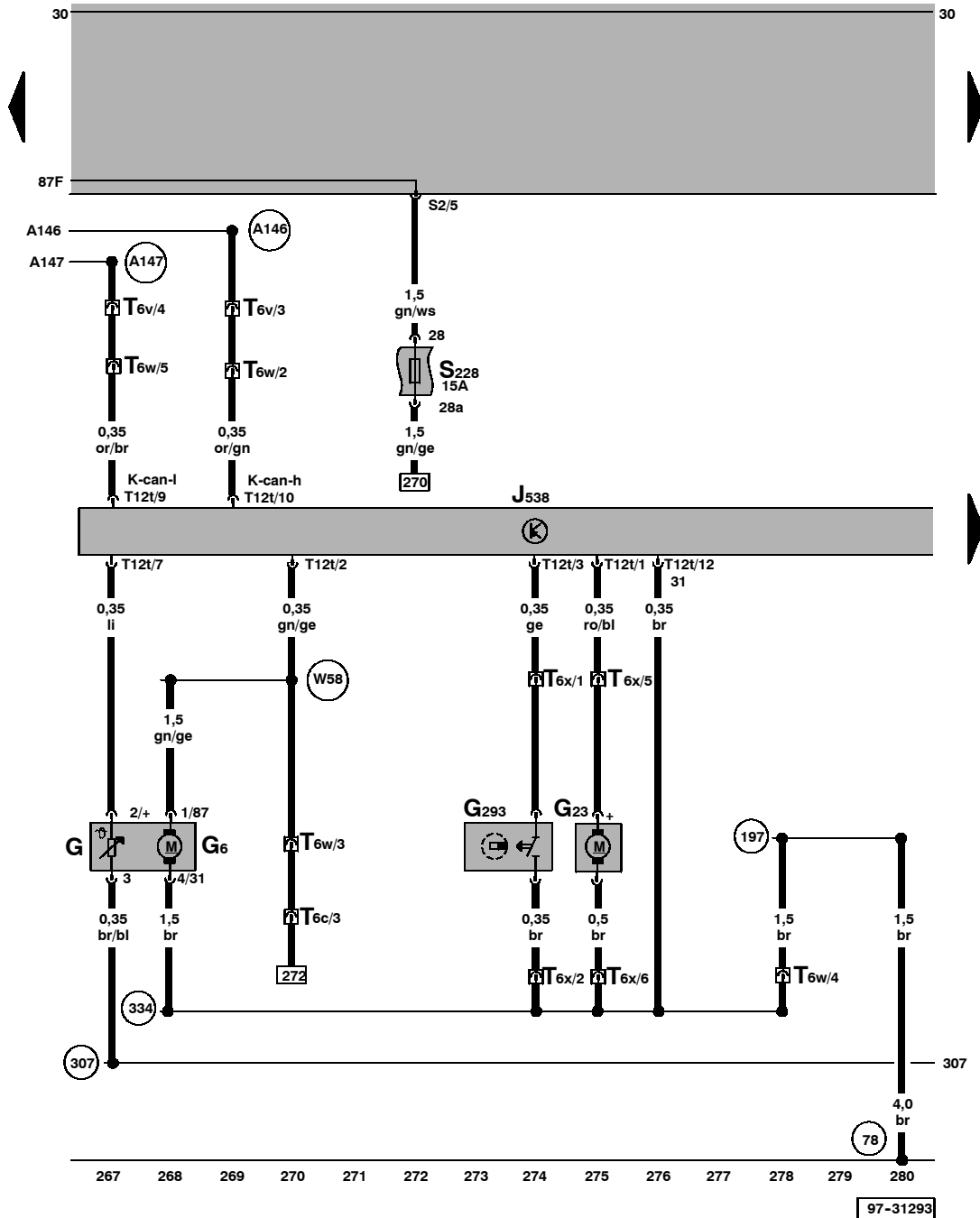
Control Module with indicator unit in instrument panel insert, Hood Alarm Switch



- F120 - Hood Alarm Switch
- G32 - Engine Coolant Level (ECL) Sensor
- G266 - Oil Level Thermal Sensor
- J285 - Control module with indicator unit in instrument panel insert
- J293 - Coolant FC (Fan Control) Control Module
- K38 - Engine Oil Level Indicator Light
- S5 - Fuse
- T6c - 6-Pin connector, blue, connector station A-pillar, left
- T10a - 10-Pin connector, brown, connector station A-pillar, left
- T10b - 10-Pin connector, black, on protective housing for control module, in engine compartment, left
- T10d - 10-Pin connector, brown, on protective housing for control module, in engine compartment, left
- T15k - 15-Pin connector, grey, connector station A-pillar, left
- T32a - 32-Pin connector, blue, on instrument cluster
- T32b - 32-Pin connector, green, on instrument cluster
- (44) - Ground connection, on left A-pillar, lower part
- (86) - Ground connection -1-, in rear wiring harness
- (269) - Ground connection (sensor ground) -1-, in instrument panel wiring harness
- (A74) - Connection (15a - fuse 5) in instrument panel wiring harness
- (A91) - Connection (signal for instrument panel insert), in instrument panel wiring harness

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Fuel Pump Control Module, Sender for fuel gauge, Fuel Pump, Transfer Fuel Pump, Auxiliary Tank Fuel Level Empty Sensor



- G - Sender for fuel gauge
- G6 - Fuel Pump (FP)
- G23 - Transfer Fuel Pump (FP)
- G293- Auxiliary Tank Fuel Level Empty Sensor
- J538 - Fuel Pump (FP) Control Module
- S228 - Fuse in fuse holder
- T6c - 6-Pin connector, blue
- T6v - 6-Pin connector, lilac
- T6w - 6-Pin connector
- T6x - 6-Pin connector
- T12t - 12-Pin connector

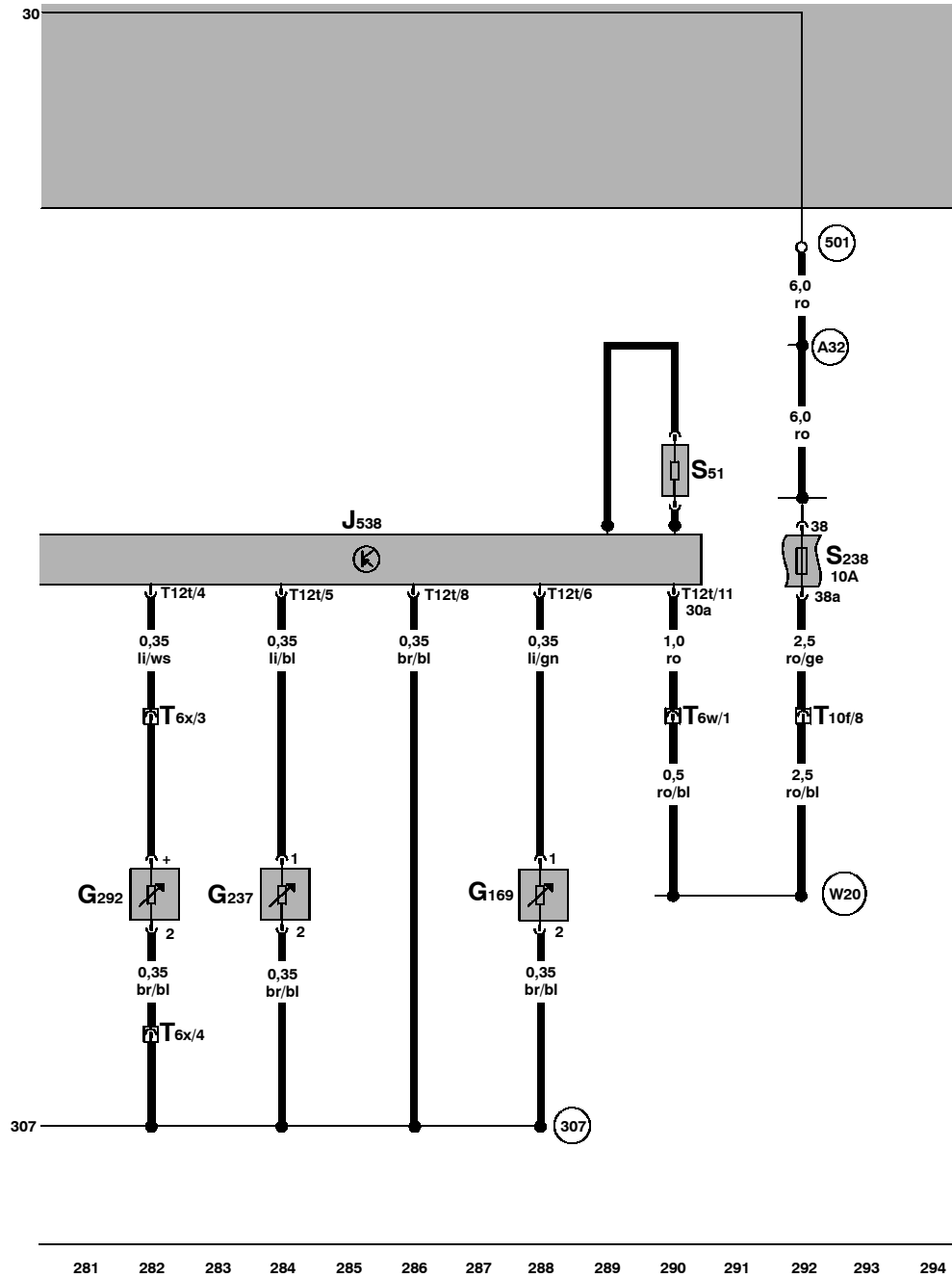
- (78) - Ground Connection (lower right B-pillar)
- (197) - Ground connection -4-, in wiring harness rear
- (307) - Ground Connection for Sensor (floor wiring harness)
- (334) - Ground Connection 6 (in rear wiring harness)
- (A146) - Comfort System High-bus Connection (in instrument panel wiring harness)
- (A147) - Comfort System Low-bus Connection (in instrument panel wiring harness)
- (W58) - Connection (87) (in rear wiring harness)

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Fuel Pump Control Module, Fuel Level Sensor 2, Fuel Supply Sensor 3, Auxiliary Tank Fuel Level Sensor

- G169 - Fuel Level Sensor 2
- G237 - Fuel Supply Sensor 3
- G292 - Auxiliary Tank Fuel Level Sensor
- J538 - Fuel Pump (FP) Control Module
- S51 - Fuse
- S238 - Fuse in fuse holder
- T6w - 6-Pin connector
- T6x - 6-Pin connector
- T10f - 10-Pin connector, blue, connector station A-pillar, left
- T12t - 12-Pin connector

- (307) - Ground Connection for Sensor (floor wiring harness)
- (501) - Threaded connection -2- (30) on the relay plate
- (A32) - Plus connection (30), in instrument panel wiring harness
- (W20) - Plus connection (30a) in wiring harness, rear



ws = white
 sw = black
 ro = red
 br = brown
 gn = green
 bl = blue
 gr = grey
 li = lilac
 ge = yellow
 or = orange

281 282 283 284 285 286 287 288 289 290 291 292 293 294

97-39866