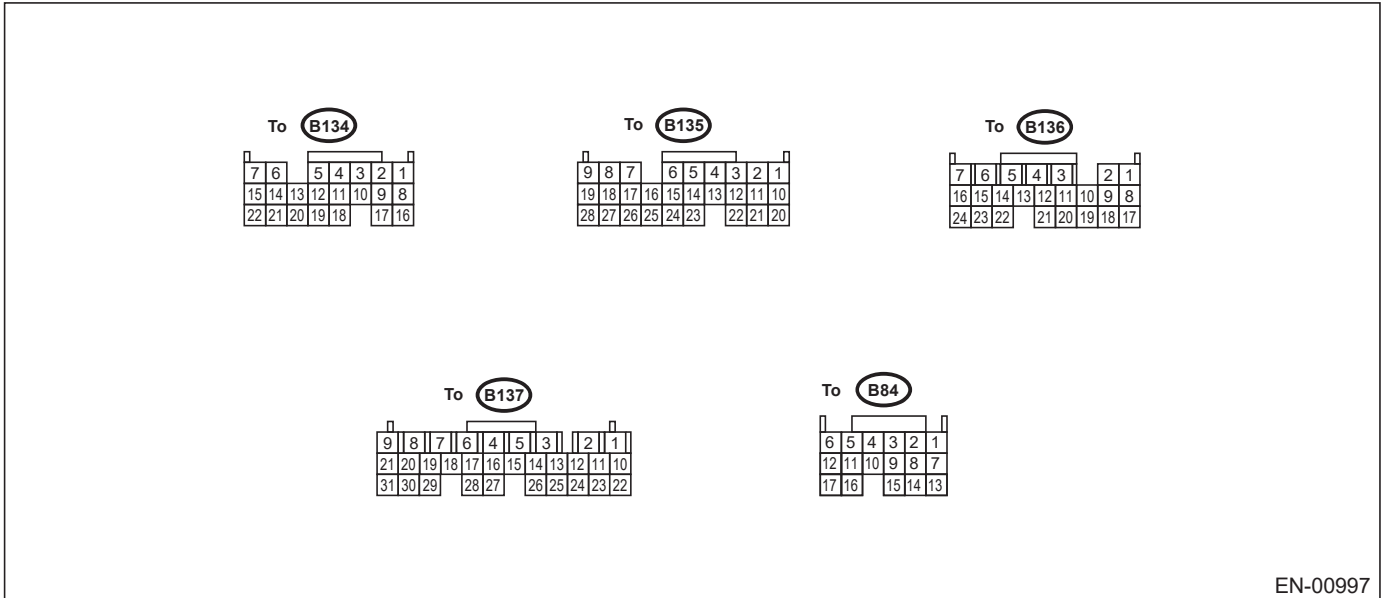


ENGINE CONTROL MODULE (ECM) I/O SIGNAL

ENGINE (DIAGNOSTICS)

5. Engine Control Module (ECM) I/O Signal

A: ELECTRICAL SPECIFICATION



EN-00997

| Content | | Con- nector No. | Termi- nal No. | Signal (V) | | Note |
|---|-------------------|-----------------------|-------------------|--|--------------------|--|
| | | | | Ignition SW ON (Engine OFF) | Engine ON (Idling) | |
| Crank- shaft posi- tion sensor | Signal (+) | B135 | 2 | 0 | -7 — +7 | Sensor output waveform |
| | Signal (-) | B135 | 11 | 0 | 0 | — |
| | Shield | B135 | 21 | 0 | 0 | — |
| Camshaft position sensor | Signal (+) | B135 | 1 | 0 | -7 — +7 | Sensor output waveform |
| | Signal (-) | B135 | 10 | 0 | 0 | — |
| | Shield | B135 | 21 | 0 | 0 | — |
| Throttle position sensor | Signal | B135 | 7 | Fully closed: 0.2 — 1.0 Fully opened: 4.2 — 4.7 | | — |
| | Power supply | B135 | 9 | 5 | 5 | — |
| | GND (sen- sor) | B135 | 19 | 0 | 0 | — |
| Rear oxy- gen sen- sor | Signal | B135 | 17 | 0 | 0 — 0.9 | — |
| | Shield | B135 | 26 | 0 | 0 | — |
| | GND (sen- sor) | B135 | 19 | 0 | 0 | — |
| Front oxy- gen (A/F) sensor heater | Signal 1 | B137 | 4 | 0 — 1.0 | 0 — 1.0 | — |
| | Signal 2 | B137 | 5 | 0 — 1.0 | 0 — 1.0 | — |
| Rear oxygen sensor heater signal | | B136 | 13 | 0 — 1.0 | 0 — 1.0 | — |
| Engine coolant tempera- ture sen- sor | Signal | B135 | 18 | 1.0 — 1.4 | 1.0 — 1.4 | After warm-up the engine. |
| | GND (sen- sor) | B135 | 19 | 0 | 0 | After warm-up the engine. |
| Vehicle speed signal | | B134 | 1 | 0 or 5 | 0 or 5 | "5" and "0" are repeatedly dis- played when the vehicle is driven. |

ENGINE CONTROL MODULE (ECM) I/O SIGNAL

ENGINE (DIAGNOSTICS)

| Content | | Con- nector No. | Termi- nal No. | Signal (V) | | Note |
|--|----------|-----------------------|-------------------|----------------------------------|----------------------------------|---|
| | | | | Ignition SW ON (Engine OFF) | Engine ON (Idling) | |
| Mass air flow sen- sor | Signal | B84 | 13 | — | 0.3 — 4.5 | — |
| | Shield | B84 | 8 | 0 | 0 | — |
| | GND | B84 | 7 | 0 | 0 | — |
| Intake air temperature sensor signal | | B135 | 27 | — | — | — |
| Wastegate control sole- noid valve | | B137 | 24 | 10 — 13 | 13 — 14 | — |
| Starter switch | | B134 | 16 | 0 | 0 | Cranking: 8 — 14 |
| A/C switch | | B134 | 6 | ON: 10 — 13 OFF: 0 | ON: 13 — 14 OFF: 0 | — |
| Ignition switch | | B134 | 14 | 10 — 13 | 13 — 14 | — |
| Neutral position switch (MT) | | B134 | 8 | ON: 12±0.5 OFF: 0 | | Switch is ON when gear is in neutral position. |
| Neutral position switch (AT) | | B134 | 8 | ON: 0 OFF: 12±0.5 | | Switch is ON when shift is in "N" or "P" position. |
| Test mode connector | | B134 | 5 | 5 | 5 | When connected: 0 |
| Knock sensor | Signal | B135 | 4 | 2.8 | 2.8 | — |
| | Shield | B135 | 22 | 0 | 0 | — |
| Back-up power supply | | B137 | 10 | 10 — 13 | 13 — 14 | Ignition switch "OFF": 10 — 13 |
| Control unit power sup- ply | B137 | 2 | 10 — 13 | 13 — 14 | — | |
| | B137 | 3 | 10 — 13 | 13 — 14 | — | |
| Sensor power supply | | B135 | 9 | 5 | 5 | — |
| Line end check | | B134 | 10 | 0 | 0 | — |
| Ignition control | #1 | B136 | 24 | 0 | 13 — 14 | Waveform |
| | #2 | B136 | 23 | 0 | 13 — 14 | Waveform |
| | #3 | B136 | 22 | 0 | 13 — 14 | Waveform |
| | #4 | B136 | 21 | 0 | 13 — 14 | Waveform |
| Fuel injec- tor | #1 | B137 | 1 | 10 — 13 | 1 — 14 | Waveform |
| | #2 | B136 | 6 | 10 — 13 | 1 — 14 | Waveform |
| | #3 | B136 | 5 | 10 — 13 | 1 — 14 | Waveform |
| | #4 | B136 | 4 | 10 — 13 | 1 — 14 | Waveform |
| Idle air control solenoid valve | Signal | B136 | 10 | 0 or 13 — 14 | 0 or 13 — 14 | Waveform |
| Fuel pump controller | Signal 1 | B134 | 13 | — | — | — |
| | Signal 2 | B136 | 16 | — | — | — |
| A/C relay control | | B137 | 27 | ON: 0.5, or less OFF: 10 — 13 | ON: 0.5, or less OFF: 13 — 14 | — |
| Radiator fan relay 1 control | | B137 | 17 | ON: 0.5, or less OFF: 10 — 13 | ON: 0.5, or less OFF: 13 — 14 | — |
| Radiator fan relay 2 control | | B137 | 28 | ON: 0.5, or less OFF: 10 — 13 | ON: 0.5, or less OFF: 13 — 14 | With A/C vehicles only |
| Malfunction indicator lamp | | B137 | 15 | — | — | Light "ON": 1, or less Light "OFF": 10 — 14 |
| Engine speed output | | B136 | 9 | — | 0 — 13, or more | Waveform |
| Torque control signal 1 | | B134 | 19 | 5 | 5 | — |
| Torque control signal 2 | | B134 | 18 | 5 | 5 | — |
| Torque control cut sig- nal | | B136 | 14 | 8 | 8 | — |
| Purge control solenoid valve | | B137 | 16 | ON: 1, or less OFF: 10 — 13 | ON: 1, or less OFF: 13 — 14 | — |

ENGINE CONTROL MODULE (ECM) I/O SIGNAL

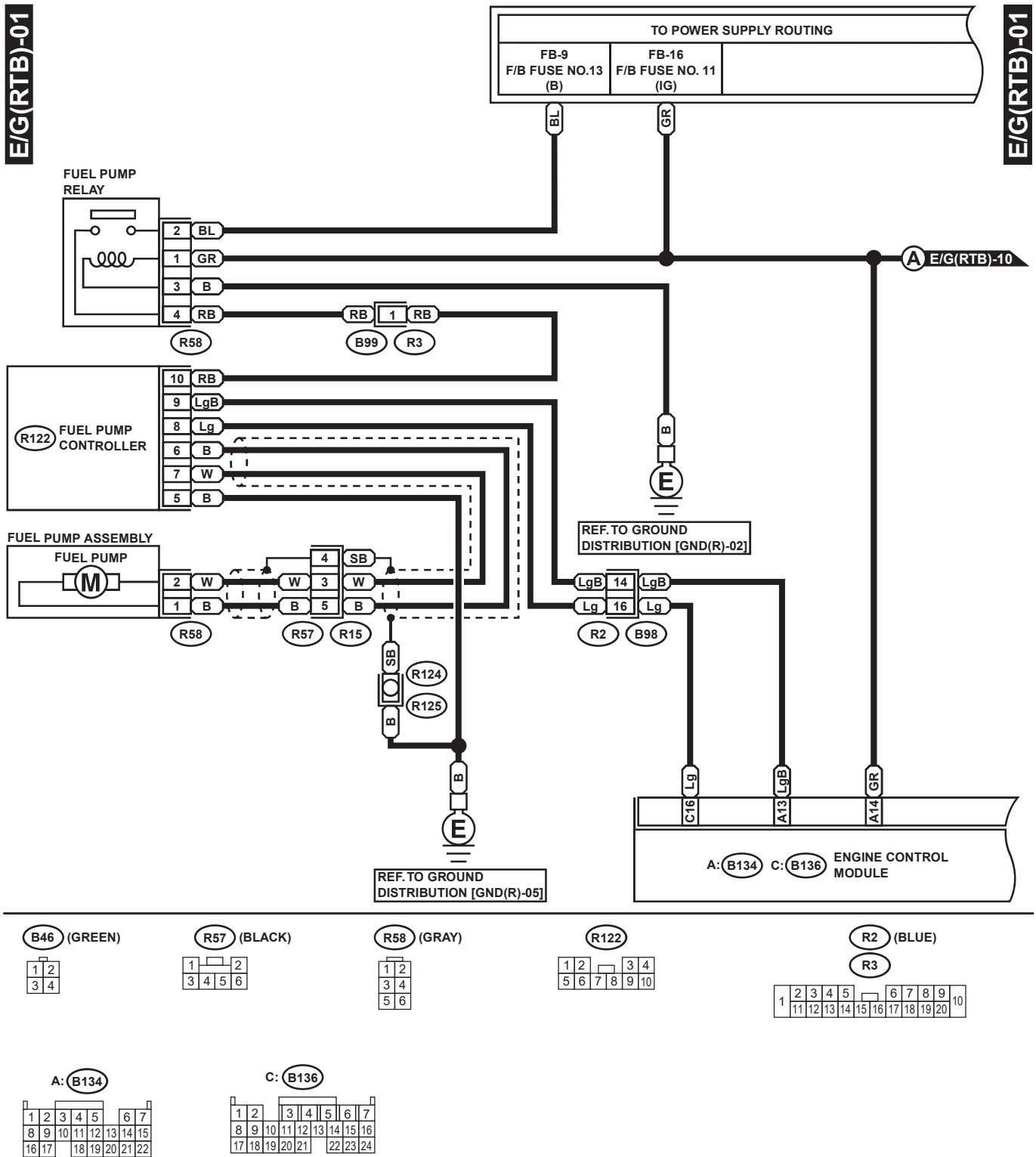
ENGINE (DIAGNOSTICS)

| Content | | Con- nector No. | Termi- nal No. | Signal (V) | | Note |
|---|-------------------|-----------------------|-------------------|--------------------------------|-------------------------------|------|
| | | | | Ignition SW ON (Engine OFF) | Engine ON (Idling) | |
| Pressure sensor | Signal | B135 | 8 | 1.7 — 2.4 | 1.1 — 1.6 | — |
| | Power supply | B135 | 9 | 5 | 5 | |
| | GND (sen- sor) | B135 | 19 | 0 | 0 | |
| Small light switch | | B134 | 17 | ON: 0 OFF: 10 — 13 | ON: 0 OFF: 13 — 14 | — |
| Blower fan switch | | B134 | 9 | ON: 0 OFF: 10 — 13 | ON: 0 OFF: 13 — 14 | — |
| Rear defogger switch | | B134 | 3 | ON: 0 OFF: 10 — 13 | ON: 0 OFF: 13 — 14 | — |
| Power steering oil pres- sure switch | | B135 | 24 | 10 — 13 | ON: 0 OFF: 13 — 14 | — |
| Front oxygen (A/F) sen- sor signal (+) | | B137 | 19 | 2.8 — 3.2 | 2.8 — 3.2 | — |
| Front oxygen (A/F) sen- sor signal (-) | | B137 | 29 | 2.4 — 2.7 | 2.4 — 2.7 | — |
| Front oxygen (A/F) sen- sor shield | | B137 | 18 | 0 | 0 | — |
| SSM/GST communica- tion line | | B134 | 21 | Less than 1 ←→ More than 4 | Less than 1 ←→ More than 4 | — |
| GND (sensors) | | B135 | 19 | 0 | 0 | — |
| GND (injectors) | | B136 | 8 | 0 | 0 | — |
| GND (ignition system) | | B136 | 18 | 0 | 0 | — |
| GND (power supply) | | B136 | 17 | 0 | 0 | — |
| | | B134 | 22 | 0 | 0 | — |
| GND (control systems) | | B134 | 7 | 0 | 0 | — |
| | | B134 | 15 | 0 | 0 | — |
| GND (oxygen sensor heater 1) | | B137 | 9 | 0 | 0 | — |
| GND (oxygen sensor heater 2) | | B137 | 8 | 0 | 0 | — |
| Differential pressure sensor signal | | B135 | 15 | 2 | 2 | — |
| Relief valve control solenoid valve 2 signal | | B136 | 11 | 10 — 13 | 13 — 14 | — |
| Relief valve control solenoid valve 1 signal | | B136 | 12 | 10 — 13 | 13 — 14 | — |
| Exhaust valve control solenoid valve (nega- tive pressure) signal | | B136 | 3 | 10 — 13 | 13 — 14 | — |
| Exhaust valve control solenoid valve (positive pressure) signal | | B136 | 1 | 10 — 13 | 13 — 14 | — |
| Intake air valve control solenoid valve signal | | B137 | 12 | 10 — 13 | 13 — 14 | — |
| Exhaust valve control duty solenoid valve | | B137 | 11 | 10 — 13 | 13 — 14 | — |

ENGINE ELECTRICAL SYSTEM

WIRING SYSTEM

7. RHD TURBO ENGINE MODEL



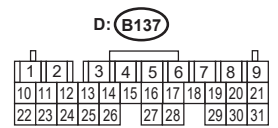
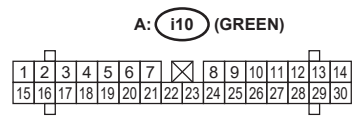
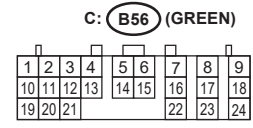
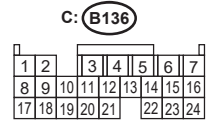
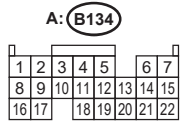
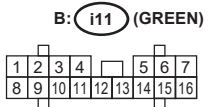
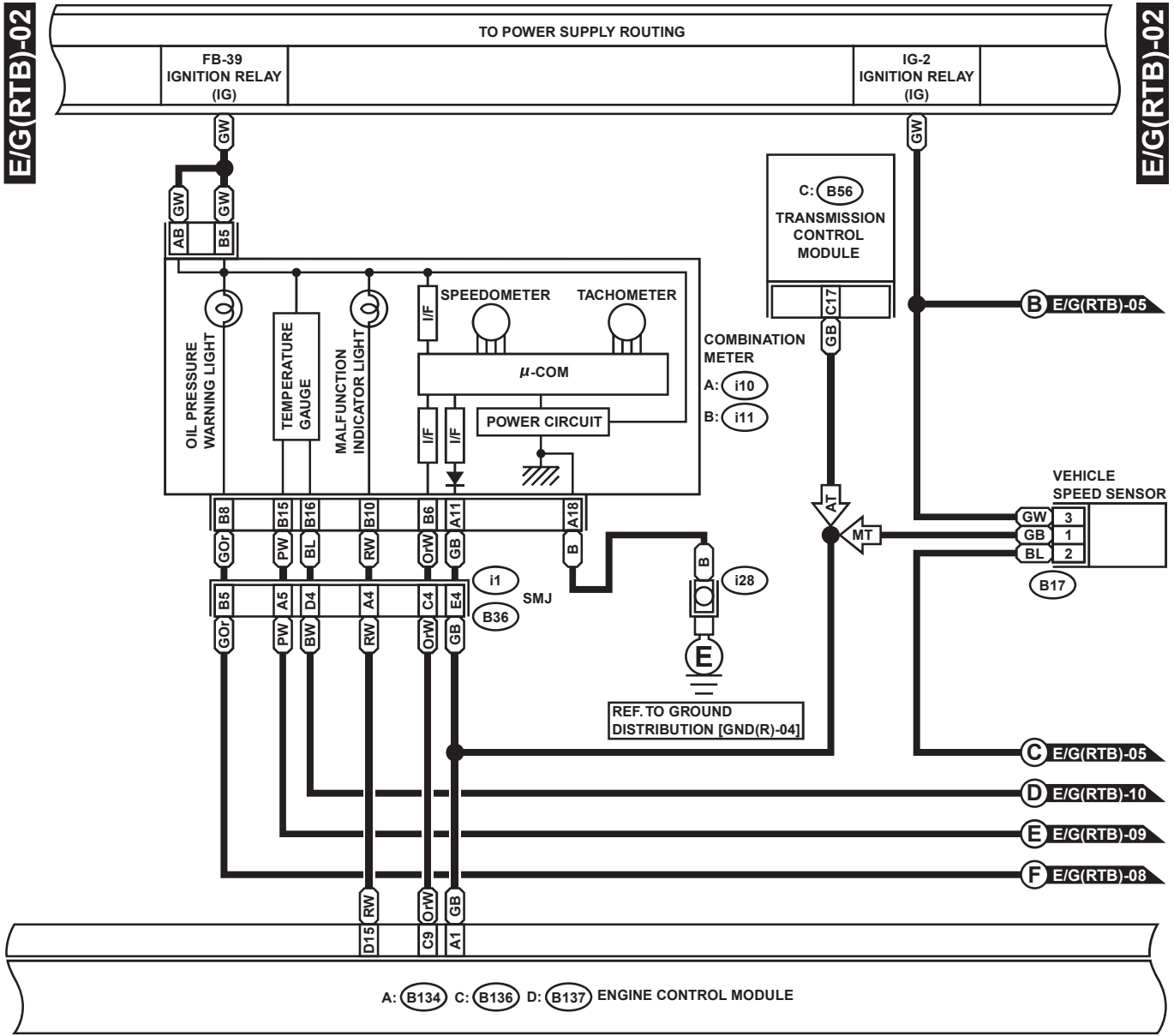
WI-00929

ENGINE ELECTRICAL SYSTEM

WIRING SYSTEM

E/G(RTB)-02

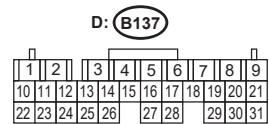
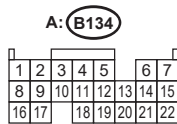
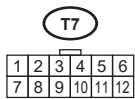
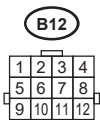
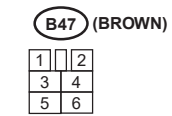
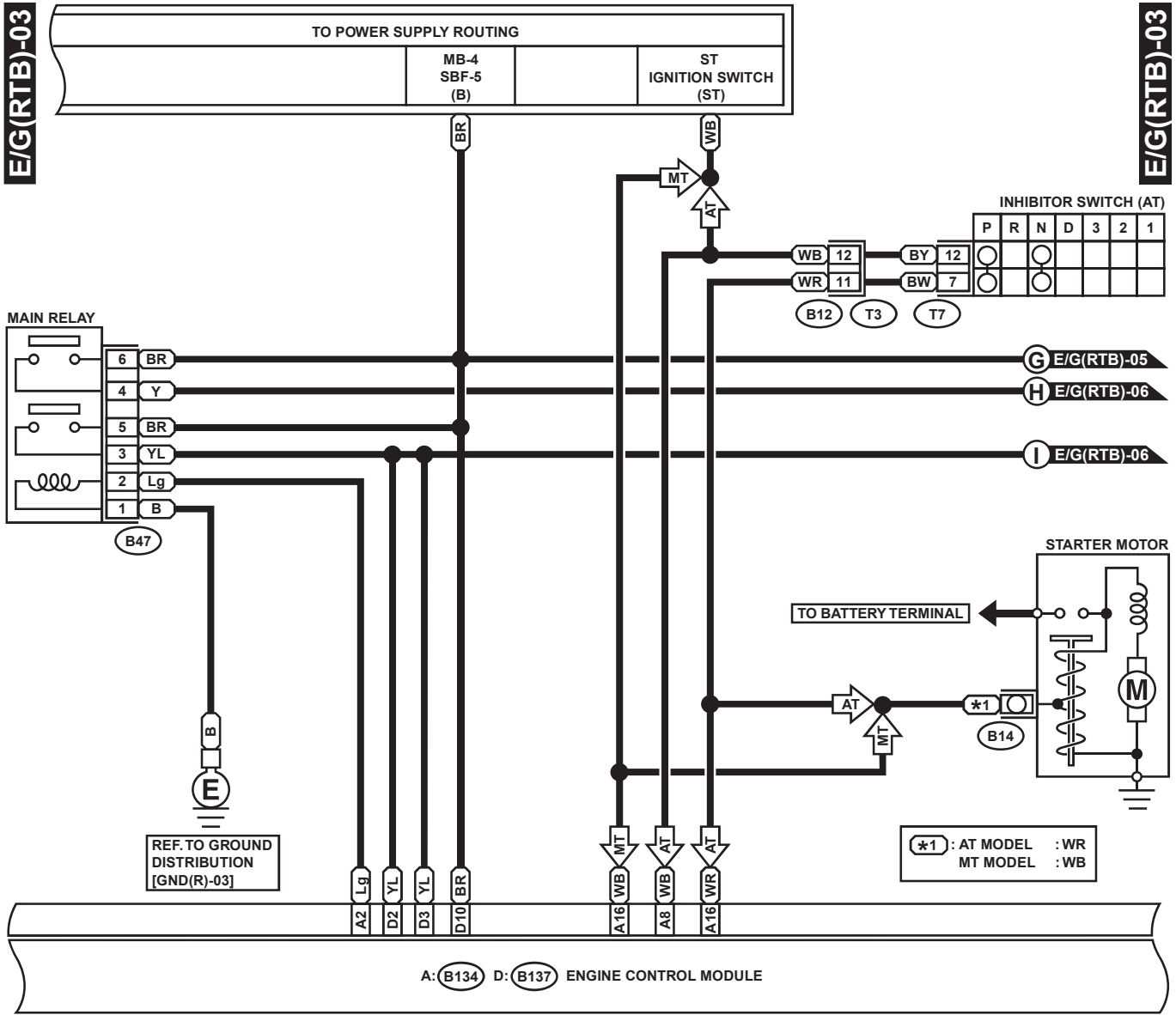
E/G(RTB)-02



WI-00930

ENGINE ELECTRICAL SYSTEM

WIRING SYSTEM



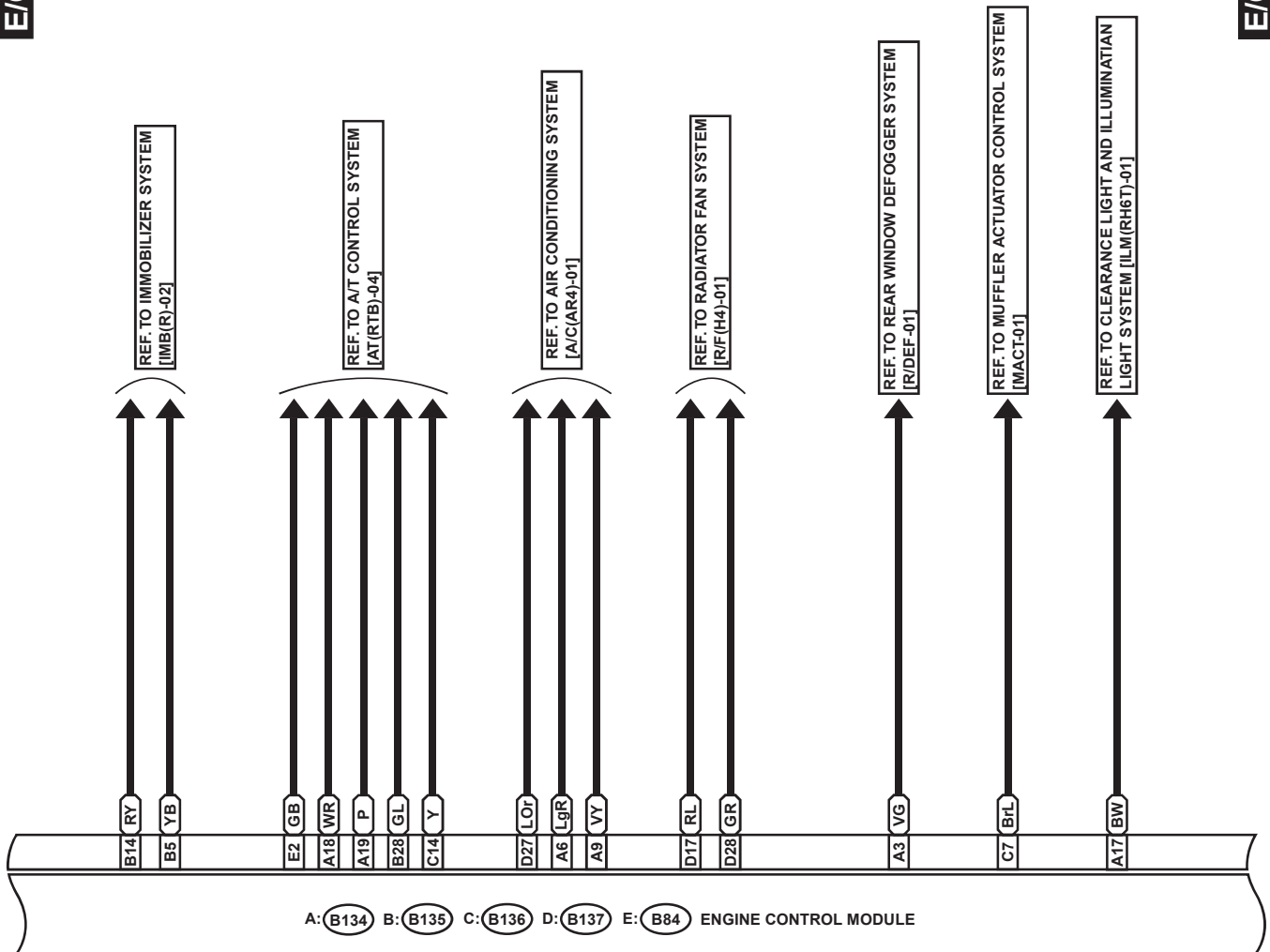
WI-00931

ENGINE ELECTRICAL SYSTEM

WIRING SYSTEM

E/G(RTB)-04

E/G(RTB)-04



E: B84

| | | | | | |
|----|----|----|----|----|----|
| 1 | 2 | 3 | 4 | 5 | 6 |
| 7 | 8 | 9 | 10 | 11 | 12 |
| 13 | 14 | 15 | 16 | 17 | |

A: B134

| | | | | | | | |
|----|----|----|----|----|----|----|----|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | |
| 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| 16 | 17 | 18 | 19 | 20 | 21 | 22 | |

C: B136

| | | | | | | | | |
|----|----|----|----|----|----|----|----|----|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | | |
| 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | |

B: B135

| | | | | | | | | | |
|----|----|----|----|----|----|----|----|----|----|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | |
| 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 |
| 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | |

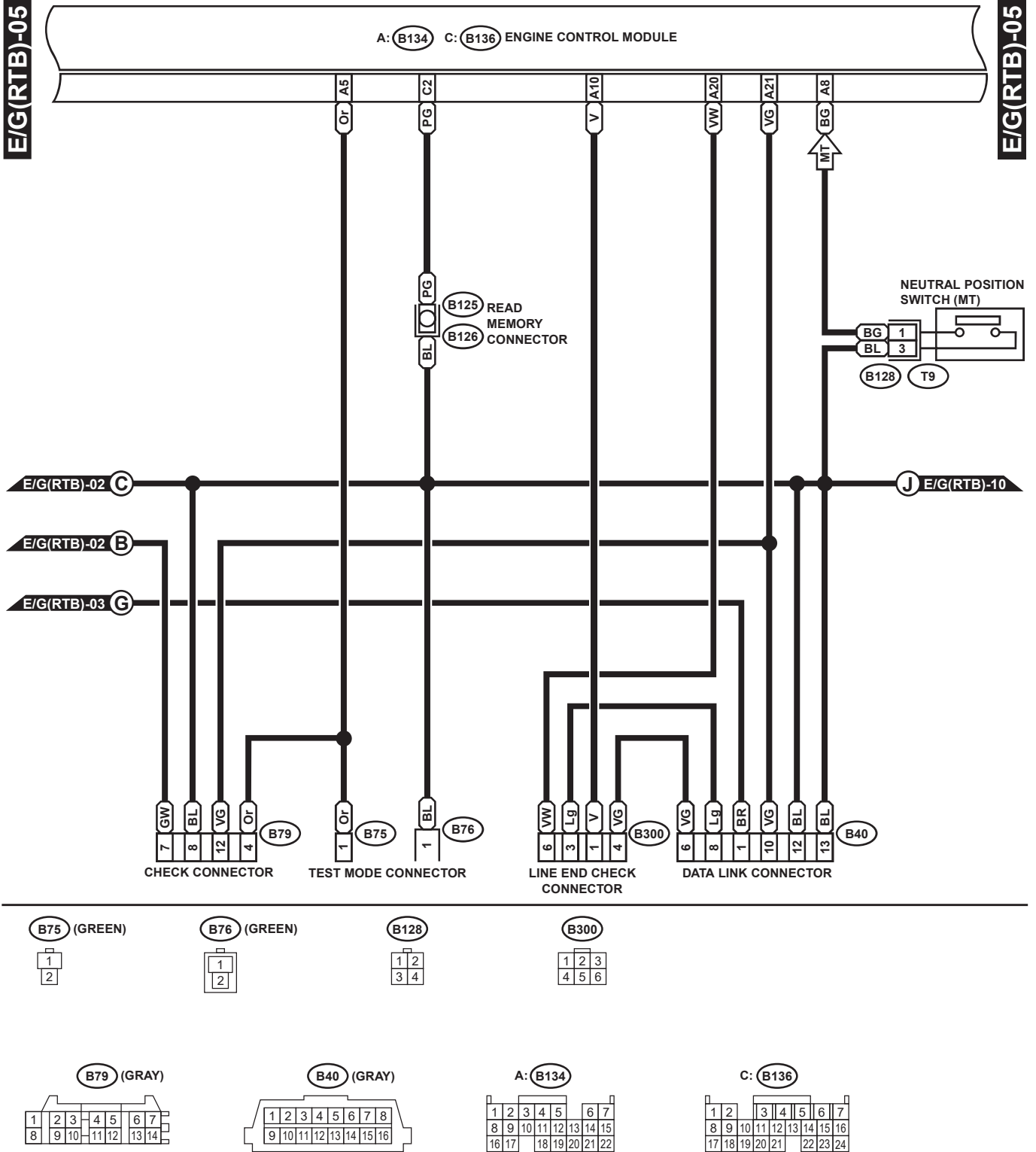
D: B137

| | | | | | | | | | | | |
|----|----|----|----|----|----|----|----|----|----|----|----|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | | | |
| 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 |
| 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | | |

WI-00932

ENGINE ELECTRICAL SYSTEM

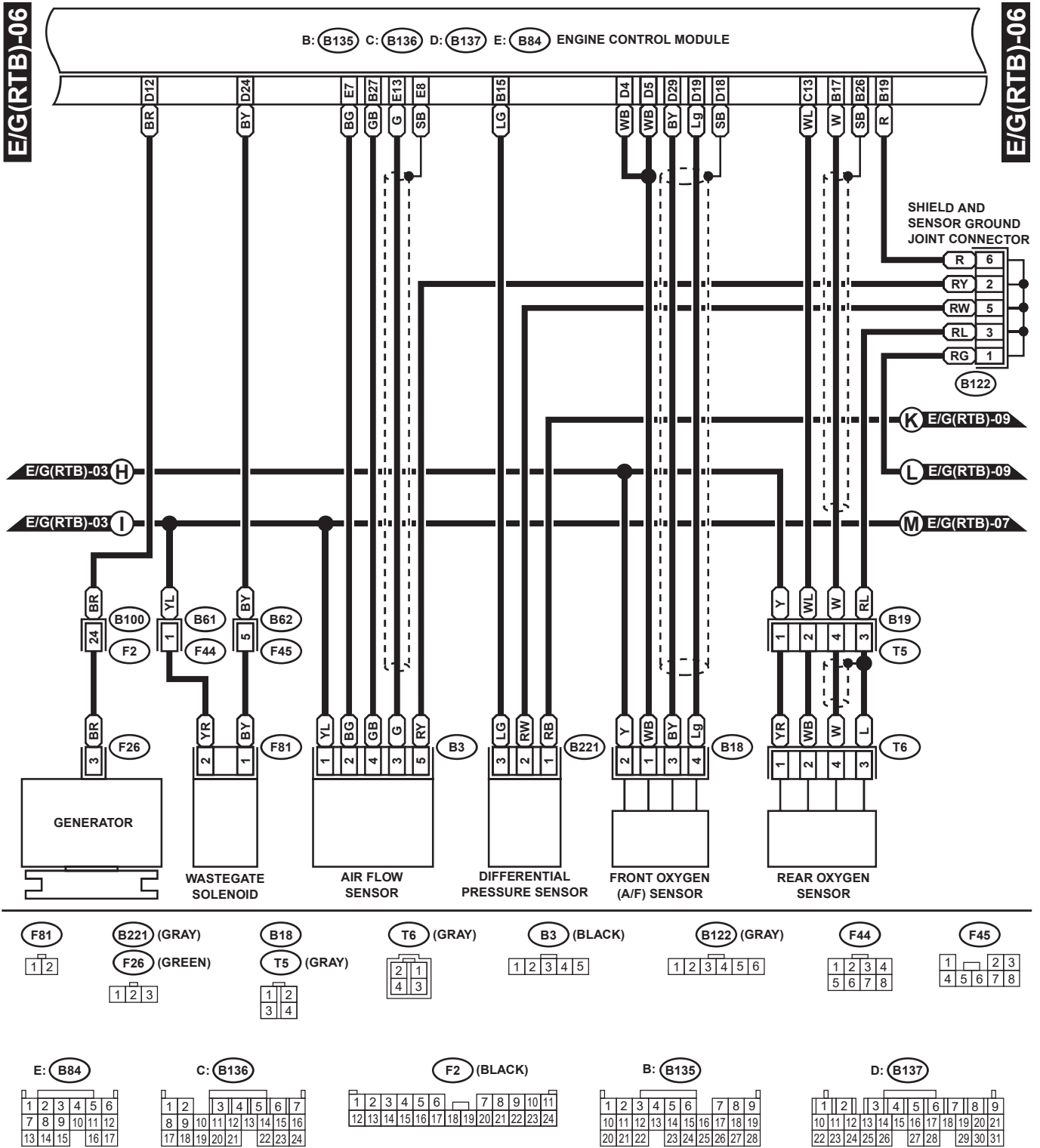
WIRING SYSTEM



WI-00933

ENGINE ELECTRICAL SYSTEM

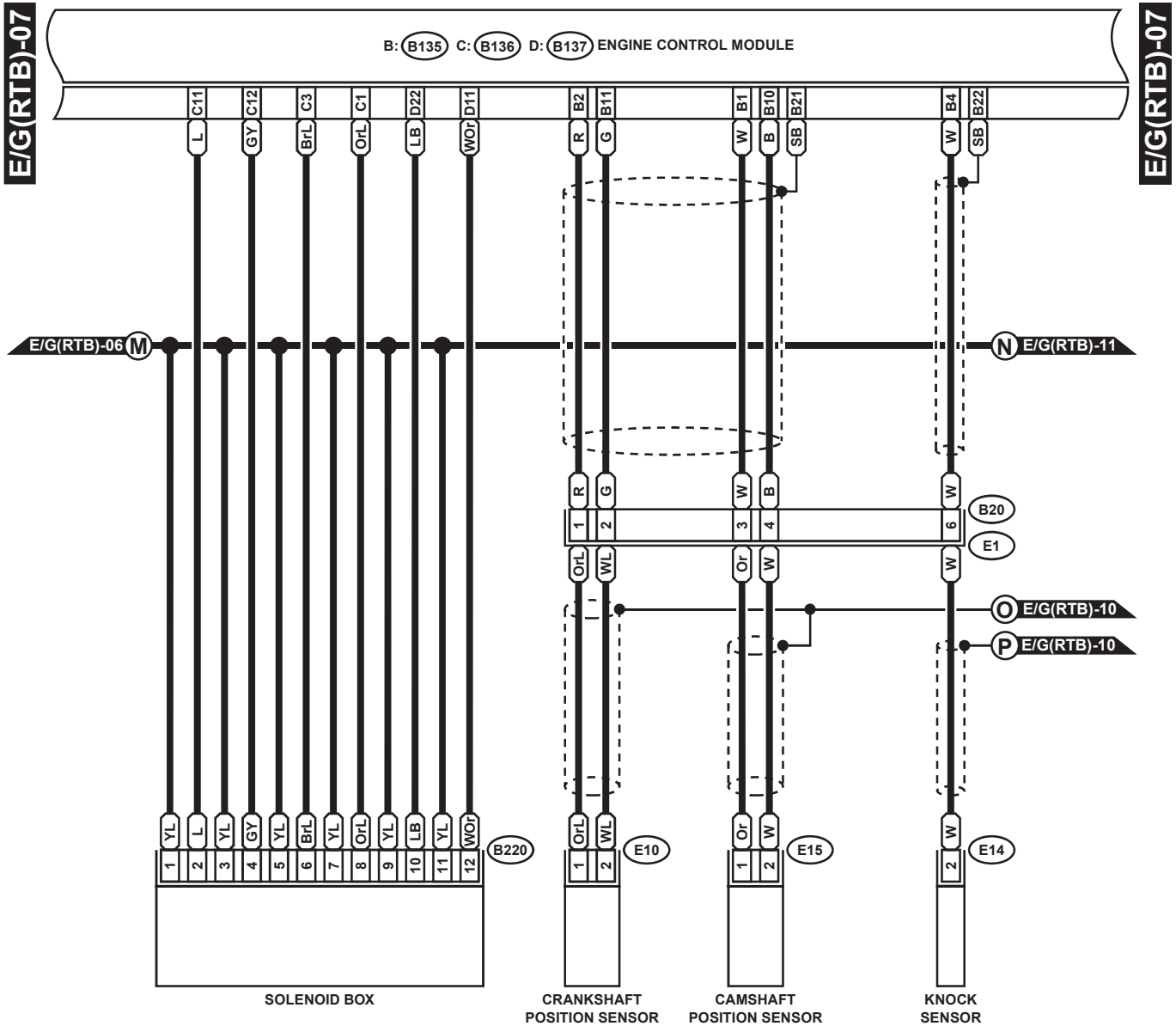
WIRING SYSTEM



WI-00934

ENGINE ELECTRICAL SYSTEM

WIRING SYSTEM



E10 (GRAY)

B20 (LIGHT GRAY)

B220

C: B136

B: B135

D: B137

E14 (GRAY)

| | | | |
|---|---|----|---|
| 1 | 2 | 3 | 4 |
| 5 | 6 | 7 | |
| 8 | 9 | 10 | |

| | | | |
|---|----|----|----|
| 1 | 2 | 3 | 4 |
| 5 | 6 | 7 | 8 |
| 9 | 10 | 11 | 12 |

| | | | | | | | | |
|----|----|----|----|----|----|----|----|----|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | | |
| 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | |

| | | | | | | | | | |
|----|----|----|----|----|----|----|----|----|----|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | |
| 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 |
| 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | |

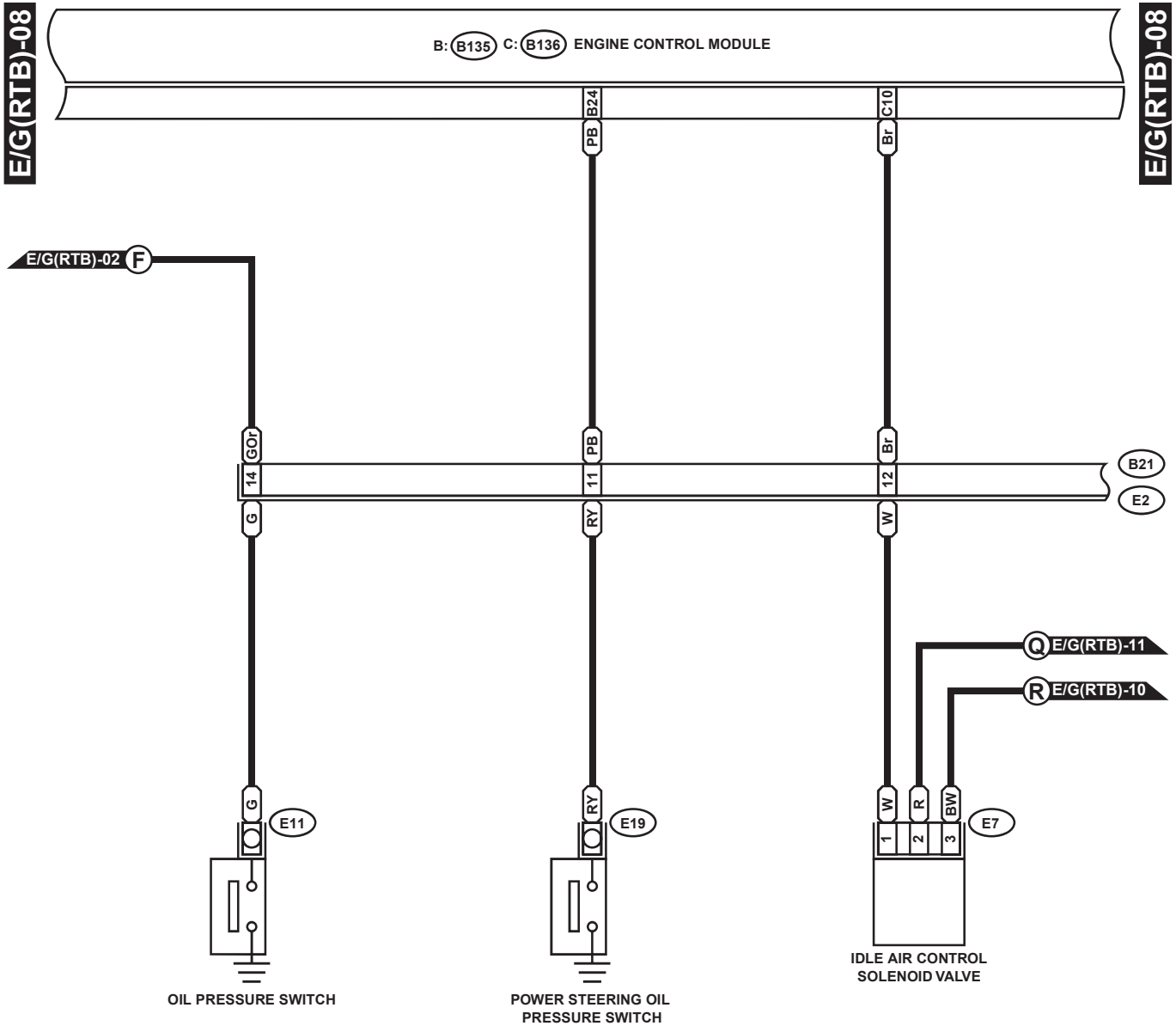
| | | | | | | | | | | | |
|----|----|----|----|----|----|----|----|----|----|----|----|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | | | |
| 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 |
| 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | | |

| | |
|---|---|
| 1 | 2 |
|---|---|

WI-00935

ENGINE ELECTRICAL SYSTEM

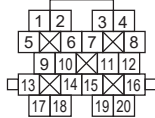
WIRING SYSTEM



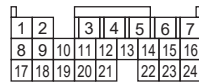
E7 (BLACK)



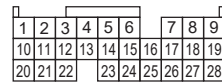
B21 (BLACK)



C: (B136)



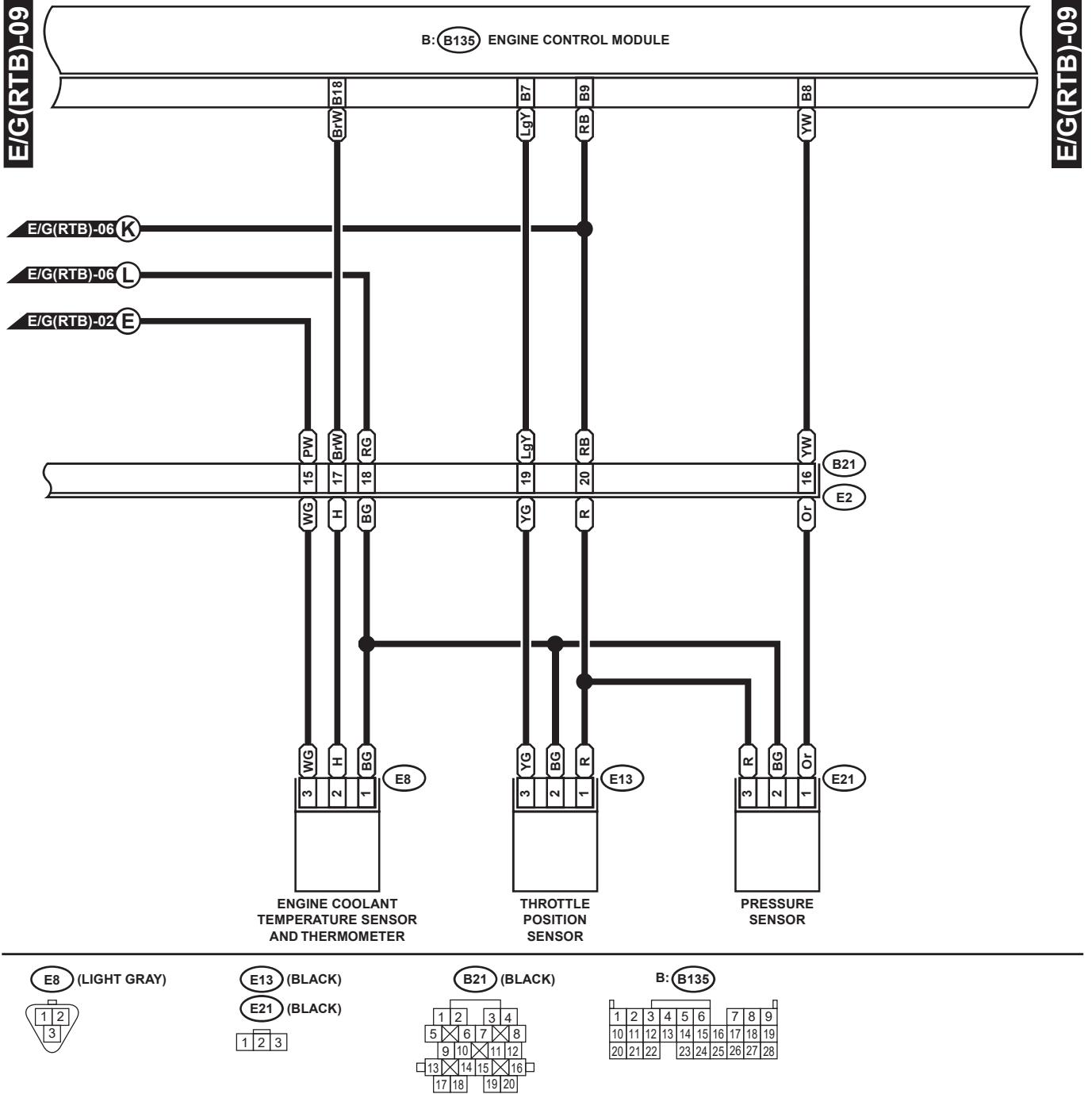
B: (B135)



WI-00936

ENGINE ELECTRICAL SYSTEM

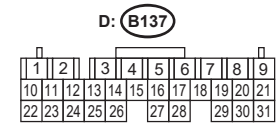
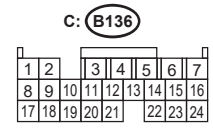
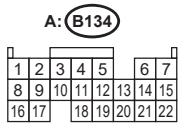
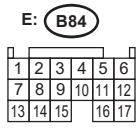
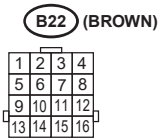
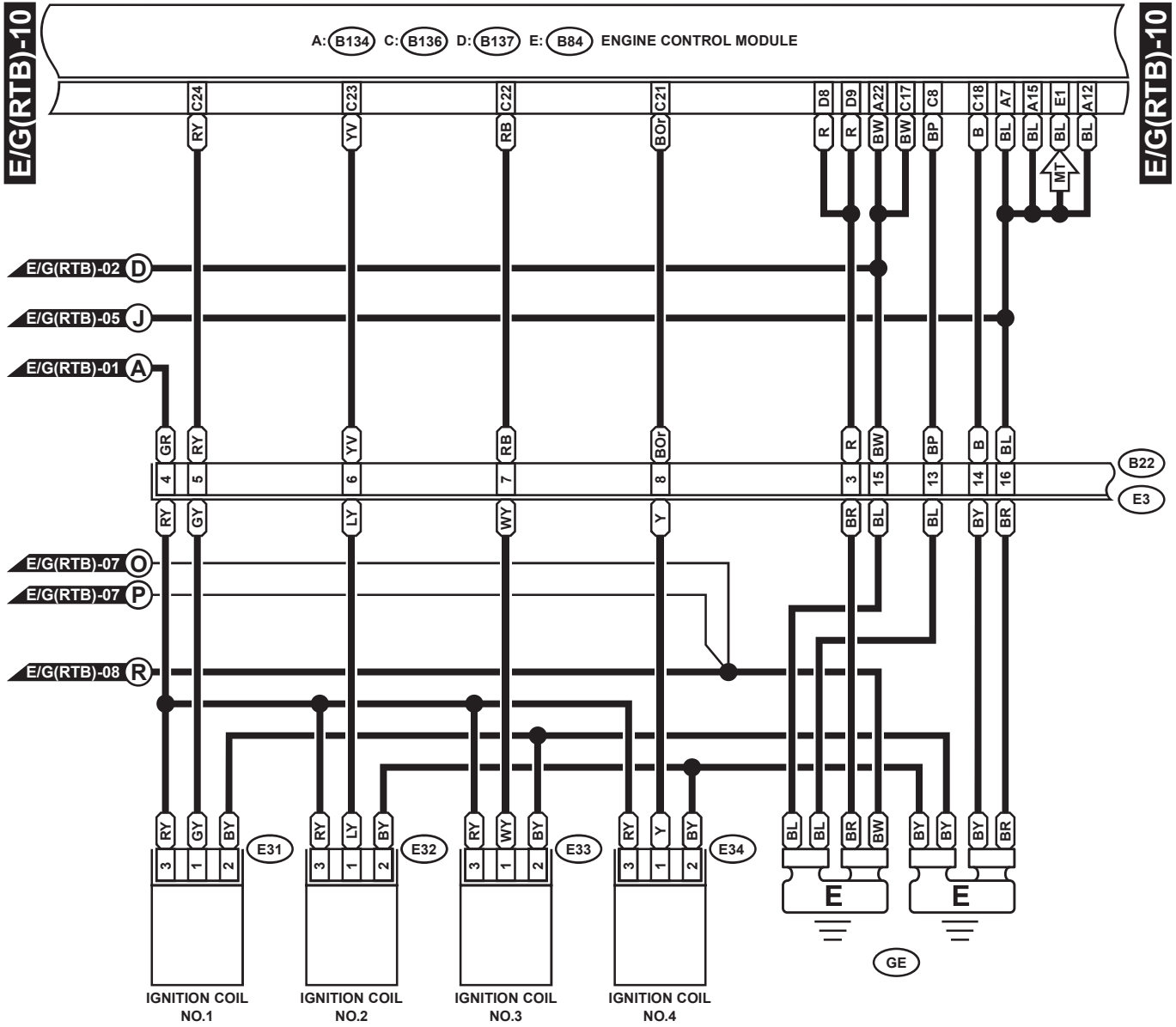
WIRING SYSTEM



WI-00937

ENGINE ELECTRICAL SYSTEM

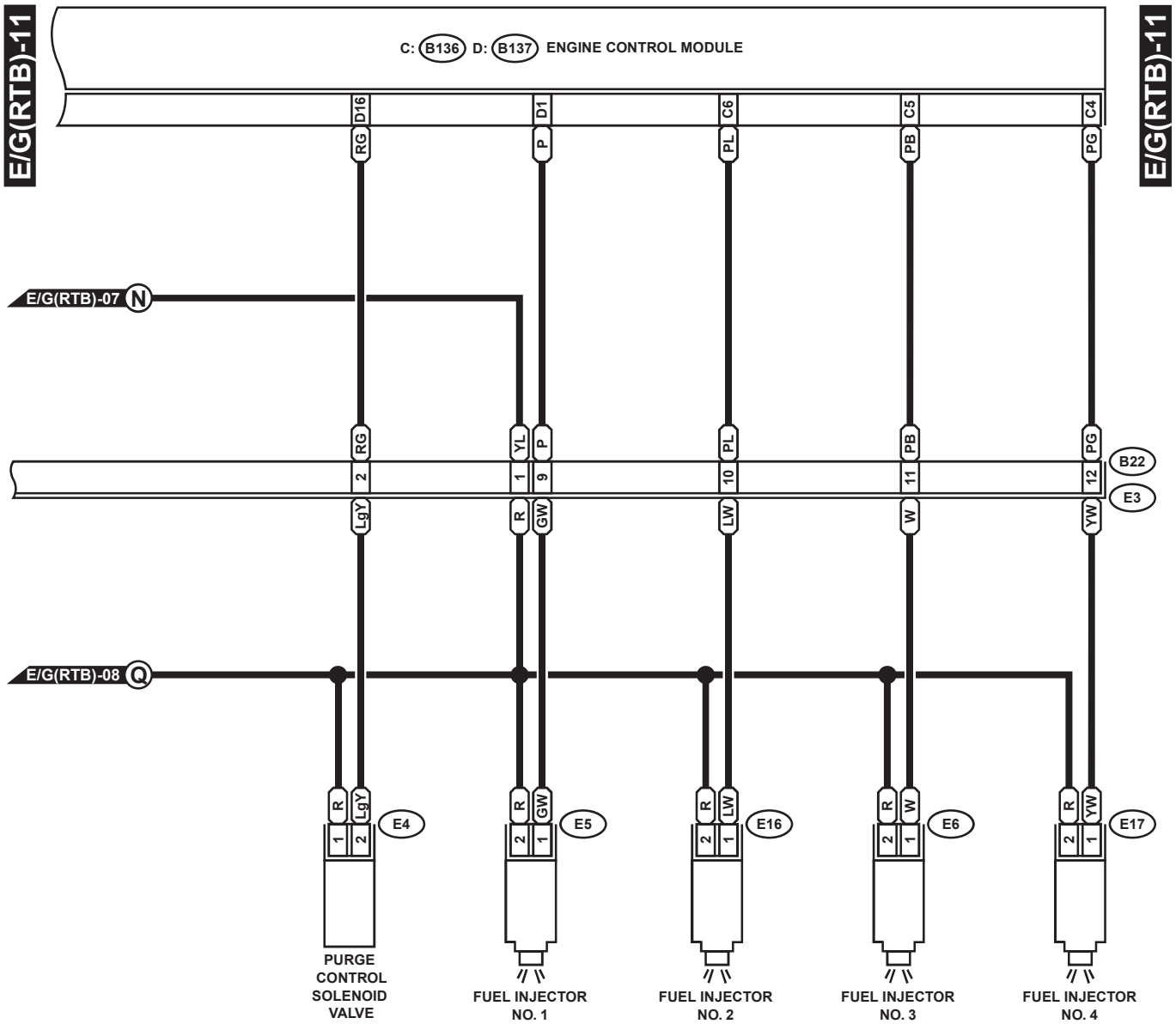
WIRING SYSTEM



WI-00938

ENGINE ELECTRICAL SYSTEM

WIRING SYSTEM



E5 (DARK GRAY)

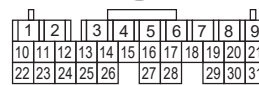
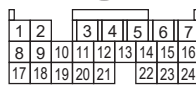
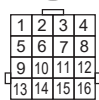
E4 (BLACK)

B22 (BROWN)

C: (B136)

D: (B137)

E6 (DARK GRAY)



E16 (DARK GRAY)

E17 (DARK GRAY)



WI-00939