

Wiring Diagrams

Section 3A - Wiring Diagrams—ECM with 10-Pin Harness

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Engine Harness Legend

Wire Splice Description

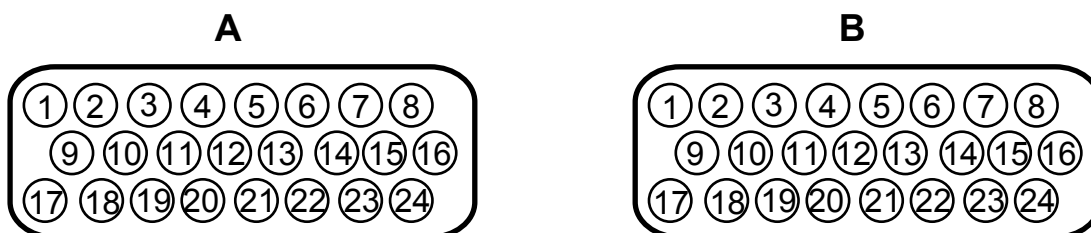
Splice Number	Description
100	5-Volt Transducer Ground
101	5-Volt Transducer Power
102	Wake Line
103	12-Volt 50-amp Protected
104	12-Volt Engine Ground
105	12-Volt From MPR
106	Switched 12-Volt Fused
107	12-Volt Fused
108	12-Volt Fused to All Injectors
109	Transmission and Drive Lube
110	Injectors 1, 4, 6, 7
111	Injectors 2, 3, 5, 8
113	Tachometer Lead
114	Ignition Coil and Coil Driver

Wire Color Code Abbreviations

Wire Color Abbreviations				
BLK	Black		BLU	Blue
BRN	Brown		GRY or GRA	Gray
GRN	Green		ORN or ORG	Orange
PNK	Pink		PPL or PUR	Purple
RED	Red		TAN	Tan
WHT	White		YEL	Yellow
LT or LIT	Light		DK or DRK	Dark

10-Pin ECM 555 Pinouts

Use this quick reference guide to the pins of the ECM to verify broken pins, determine what each pin controls, and to check wire continuity.

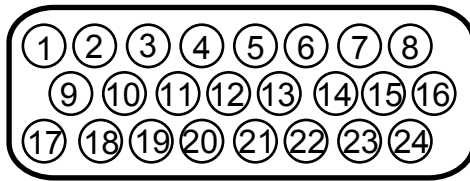


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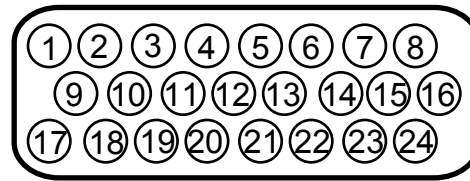
Connector A

	Mercury Part Number	865456A01	865454A01 865454A02	84-865245A02 84-865455A01 84-865455A02 84-865455A04	84-865454A03 Bravo 84-865454A04 Alpha 84-865454A05 Alpha 84-865454A06 Bravo 84-865455A03 Inboard
Pin	ECM555SD	4.3 MPI Sterndrive	V8 Sterndrive	V8 Inboard	V8 Sterndrive and Inboard
A1	Empty	Empty	Empty	Empty	LT-GRN/RED
A2	Fuel Injector Bank 2	LT-GRN/WHT	LT-GRN/WHT	LT-GRN/WHT	LT-GRN/WHT
A3	Empty	Empty	Empty	Empty	Empty
A4	CAN 1 (+)	WHT	WHT	WHT	WHT
A5	Scan (-)	WHT/PPL	WHT/PPL	WHT/PPL	WHT/PPL
A6	Knock Odd (-) V8	Empty	ORN/BLK	ORN/BLK	ORN/BLK
A7	Knock Even (-) V8	YEL/DK-BLU	Empty	Empty	BRN
A8	Trans Temp/Lube Bottle	DK-BLU/BRN	DK-BLU/BRN	DK-BLU/BRN	DK-BLU/BRN
A9	Warning Horn	BRN/DRK- BLU	BRN/DRK- BLU	BRN/DRK- BLU	BRN/DRK- BLU
A10	Tach Sig Out	GRY/WHT	GRY/WHT	GRY/WHT	GRY/WHT
A11	CAN 1 (-)	LT-BLU	LT-BLU	LT-BLU	LT-BLU
A12	Scan (+)	WHT/BLK	WHT/BLK	WHT/BLK	WHT/BLK
A13	Knock Odd (+) V8	Empty	BLK/ORN	BLK/ORN	BLK/ORN
A14	Knock Even (-) V8	DK-BLU/YEL	Empty	Empty	YEL/WHT
A15	E-stop (thru CAN)	DK-GRN/YEL	DK-GRN/YEL	DK-GRN/YEL	DK-GRN/YEL
A16	Ground	BLK	BLK	BLK	BLK
A17	Fuel Injector Bank 1	LT-GRN/PPL	LT-GRN/PPL	LT-GRN/PPL	LT-GRN/PPL
A18	Empty	Empty	Empty	Empty	LT GRN/ORN
A19	Fuel Pump Relay Control	DK-GRN	DK-GRN	DK-GRN	DK-GRN
A20	IAC Valve Control	BLK/DK-GRN	BLK/DK-GRN	BLK/DK-GRN	BLK/DK-GRN
A21	Gear Position Switch	YEL/DK-GRN	YEL/DK-GRN	YEL/DK-GRN	YEL/DK-GRN
A22	MPR Control	PPL/DK-GRN	PPL/DK-GRN	PPL/DK-GRN	PPL/DK-GRN
A23	MPR Output (to ECM)	PNK	PNK	PNK	PNK
A24	Ground	BLK	BLK	BLK	BLK

A



B



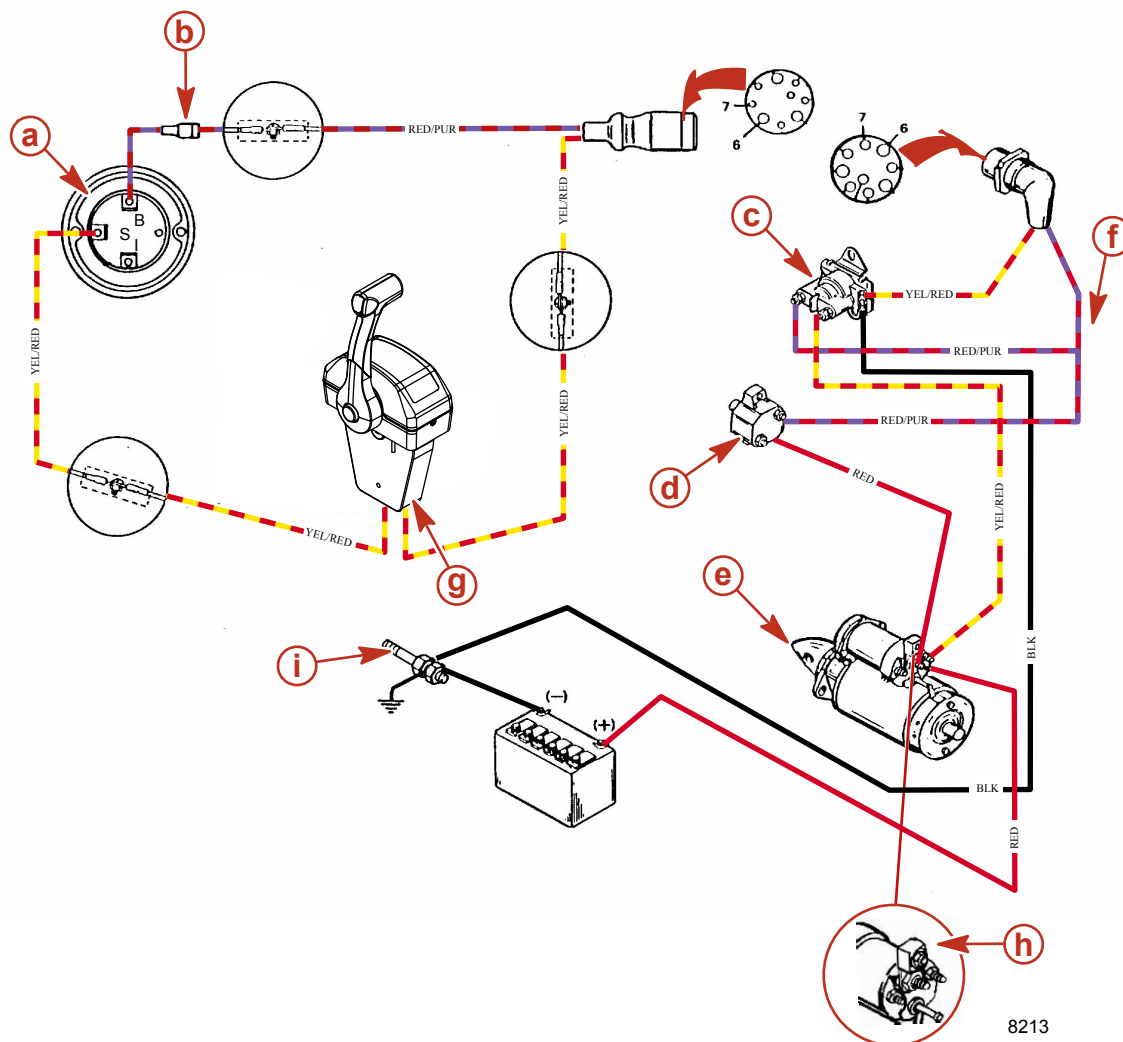
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Connector B

	Mercury Part Number	865456A01	865454A01 865454A02	84-865245A02 84-865455A01 84-865455A02 84-865455A04	84-865454A03 Bravo 84-865454A04 Alpha 84-865454A05 Alpha 84-865454A06 Bravo 84-865455A03 Inboard
Pin	ECM555SD	4.3 MPI Sterndrive	V8 Sterndrive	V8 Inboard	V8 Sterndrive and Inboard
B1	Sender Ground	BLK/PNK	BLK/PNK	BLK/PNK	BLK/PNK
B2	MAT Signal	BRN/YEL	BRN/YEL	BRN/YEL	BRN/YEL
B3	MAP Signal	LT-GRN	LT-GRN	LT-GRN	LT-GRN
B4	Fuel Level 1 Signal	LT-BLU/BLK	LT-BLU/BLK	LT-BLU/BLK or PNK/BLK)	LT-BLU/BLK
B5	Empty	Empty	Empty	Empty	TAN/BLK
B6	Empty	Empty	Empty	Empty	Empty
B7	Oil Pressure Signal	DK-BLU/BLK	DK-BLU/BLK	DK-BLU/BLK	DK-BLU/BLK
B8	Steering Angle Signal	PNK/DK-BLU	PNK/DK-BLU	PNK/DK-BLU	PNK/DK-BLU
B9	Paddle Wheel Signal	YEL/GRY	YEL/GRY	YEL/GRY	YEL/GRY
B10	CPS Signal	TAN/BLK	TAN/BLK	TAN/BLK	ORN/GRA
B11	Sea Pump Signal	DK-BLU/WHT	DK-BLU/WHT	DK-BLU/WHT	DK-BLU/WHT
B12	Pilot Signal	WHT/LT-BLU	WHT/LT-BLU	WHT/LT-BLU	WHT/LT-BLU
B13	Digital Trim Signal	ORN/WHT	ORN/WHT	LT-BLU/BLK	EMPTY or ORN/WHT
B14	ECT Signal	YEL	YEL	YEL	YEL
B15	Empty	Empty	Empty	Empty	Empty
B16	Empty	Empty	Empty	Empty	Empty
B17	Empty	Empty	Empty	Empty	Empty
B18	Wakeup	PPL	PPL	PPL	PPL
B19	Shift Interrupt Signal	YEL/PPL	YEL/PPL	Empty	Empty or YEL/PPL
B20	TPS Signal	DK-BLU/ORN	DK-BLU/ORN	DK-BLU/ORN	DK-BLU/ORN or YEL/PPL
B21	Sender Power	GRY	GRY	GRY	GRY
B22	Sea Temp Signal	WHT/YEL	WHT/YEL	WHT/YEL	WHT/YEL
B23	EST (Coil Control)	WHT/DK-GRN	WHT/DK-GRN	WHT/DK-GRN	WHT/DK-GRN
B24	Empty	Empty	Empty	Empty	Empty

EFI System Engine Wiring Harness Diagrams

10-Pin Engine Harness Starting System



Typical

- | | |
|-----------------------------------|----------------------------------|
| a - Ignition switch | e - Starter motor |
| b - 20-amp fuse | f - Wire junction |
| c - Starter slave solenoid | g - Neutral safety switch |
| d - 50-amp circuit breaker | h - 90-amp fuse |

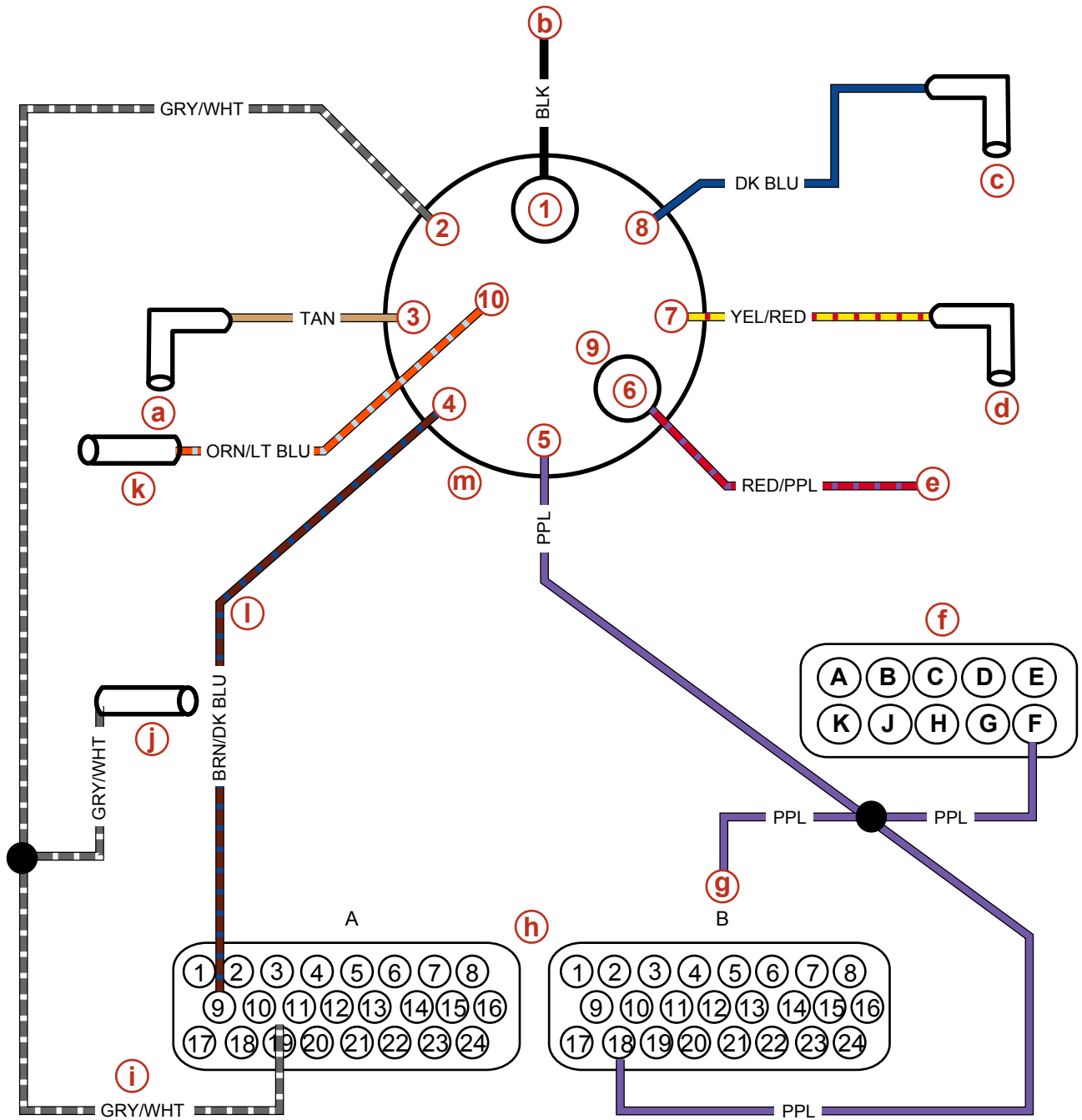
This is a general description of the positive current flow from the battery through the starting system until the starter motor cranks.

NOTE: Ensure that all connections are tight and have the required resistance.

- Battery to the solenoid switch on the starter (RED battery cable)
- Solenoid switch to the circuit breaker (RED)
- Circuit breaker to the wire junction (RED/PPL)
- Wire junction to the wiring harness plug Terminal 6 (RED/PPL)
- Wiring harness plug to the 20-amp fuse (RED/PPL)
- 20-amp fuse to the ignition switch Terminal B (RED/PPL); at this point the ignition switch is turned to the START position

- Ignition switch Terminal B to Terminal S
- Ignition switch Terminal C to the neutral start switch (YEL/RED); NEUTRAL START SWITCH MUST BE AT NEUTRAL POSITION
- Neutral start switch to the wiring harness plug Terminal 7 (YEL/RED)
- Wiring harness plug to the starter solenoid (small terminal) (YEL/RED); also, ensure that the small terminal (BLK) wire is grounded
- Starter solenoid is now CLOSED, completing circuit between the large terminal (RED/PPL) and the other large terminal (YEL/RED), causing the starter motor to crank.

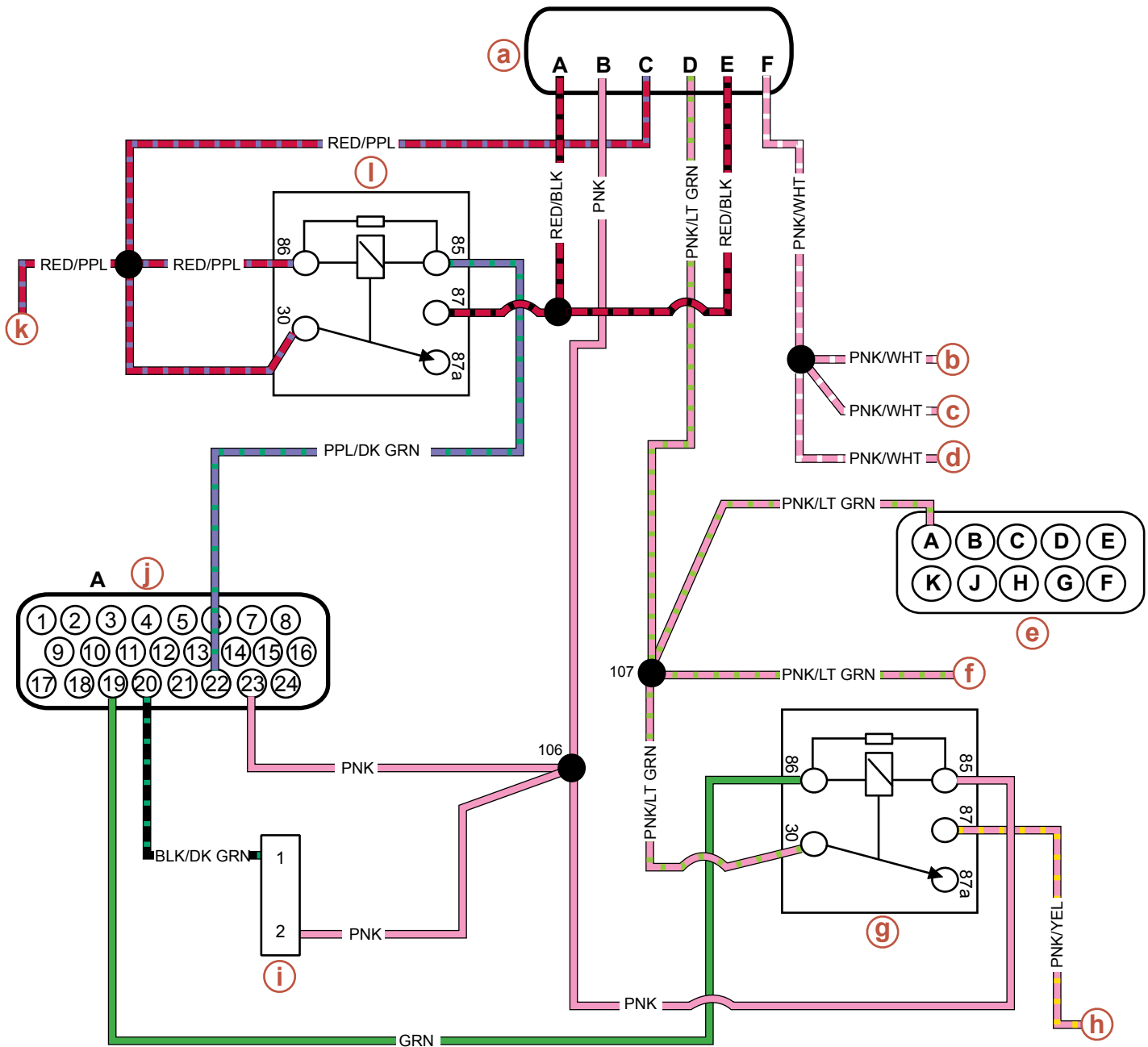
Wake, Horn, and Tachometer Circuits



17599

- a** - Analog coolant sender
- b** - To Splice 104 (ground)
- c** - Analog oil pressure sender
- d** - To crank solenoid
- e** - To Splice 103 B+ (from 50-amp circuit breaker)
- f** - ECM 555
- g** - Tachometer signal (gray on early models)
- h** - Tachometer connector
- i** - To analog trim sender
- j** - Warning horn circuit
- k** - 10-pin harness connector

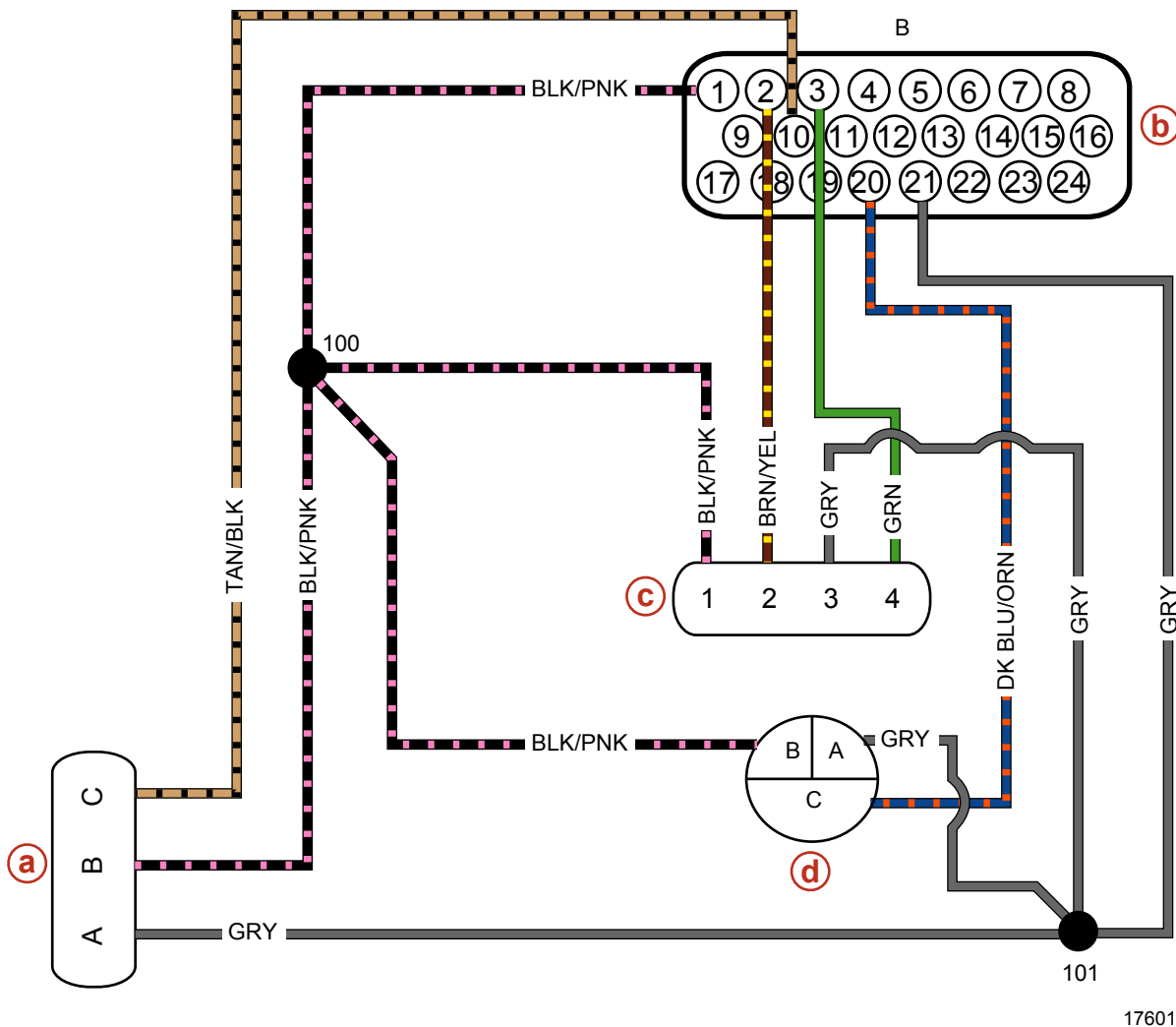
Fuses, IAC, and Relays



- a** - Fuse holder
- b** - To Pin A of all fuel injectors
- c** - To Pin A of ignition coil
- d** - To Pin A of coil driver
- e** - CAN connector
- f** - To alternator pin B sensing wire
- g** - Fuel pump relay
- h** - Cool fuel pump
- i** - IAC
- j** - ECM 555 connector A
- k** - To 50-amp circuit breaker
- l** - Main power relay (MPR)

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Manifold Air Pressure and Temperature, Crankshaft Position, and Throttle Position Sensors: V6 Engines



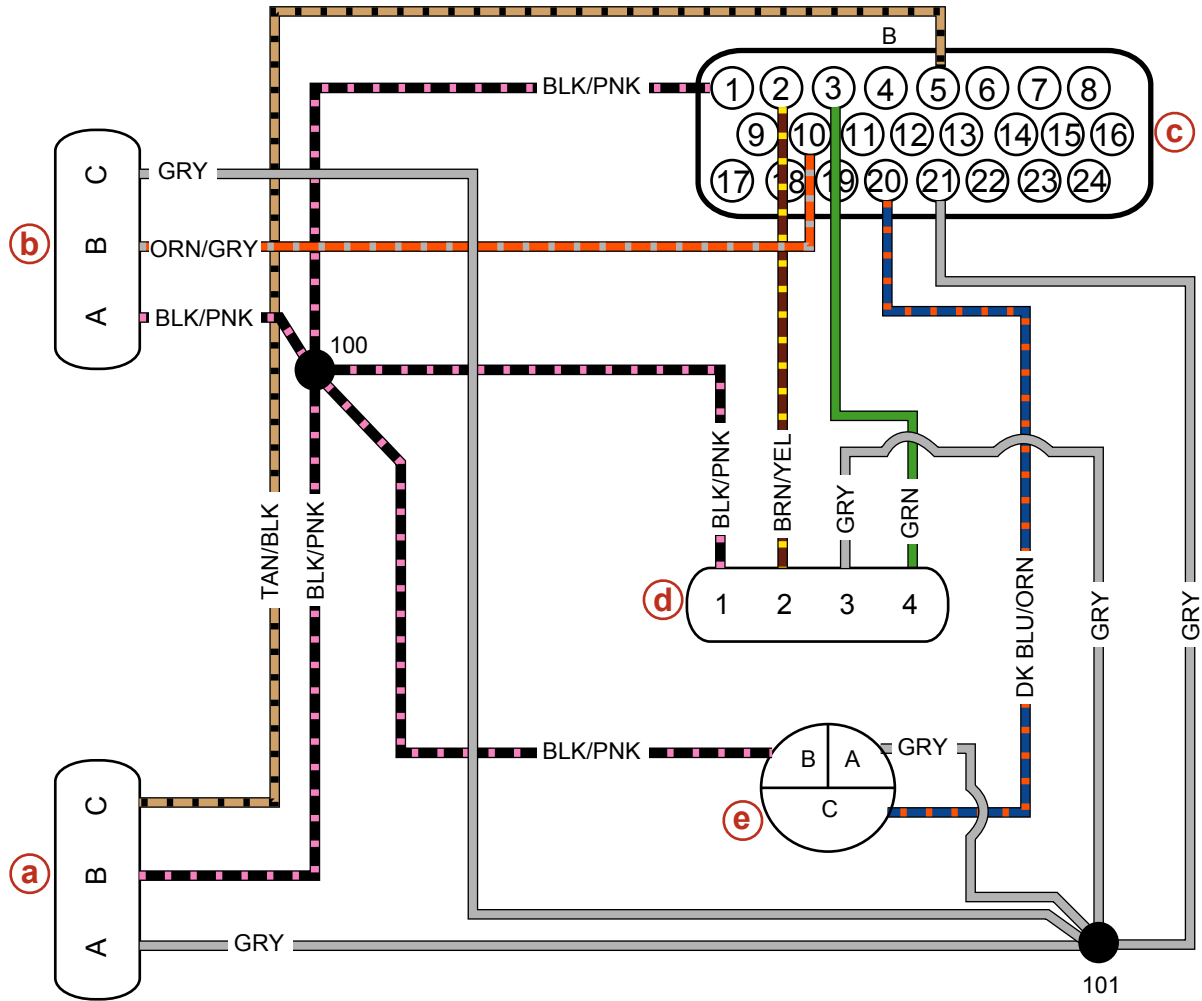
17601

a - Crankshaft position sensor
b - ECM 555

c - Manifold air pressure/Manifold air temperature
d - Throttle position sensor

NOTE: The **green** wire coming from ECM555 connector B pin 3 may be **light green** on some models.

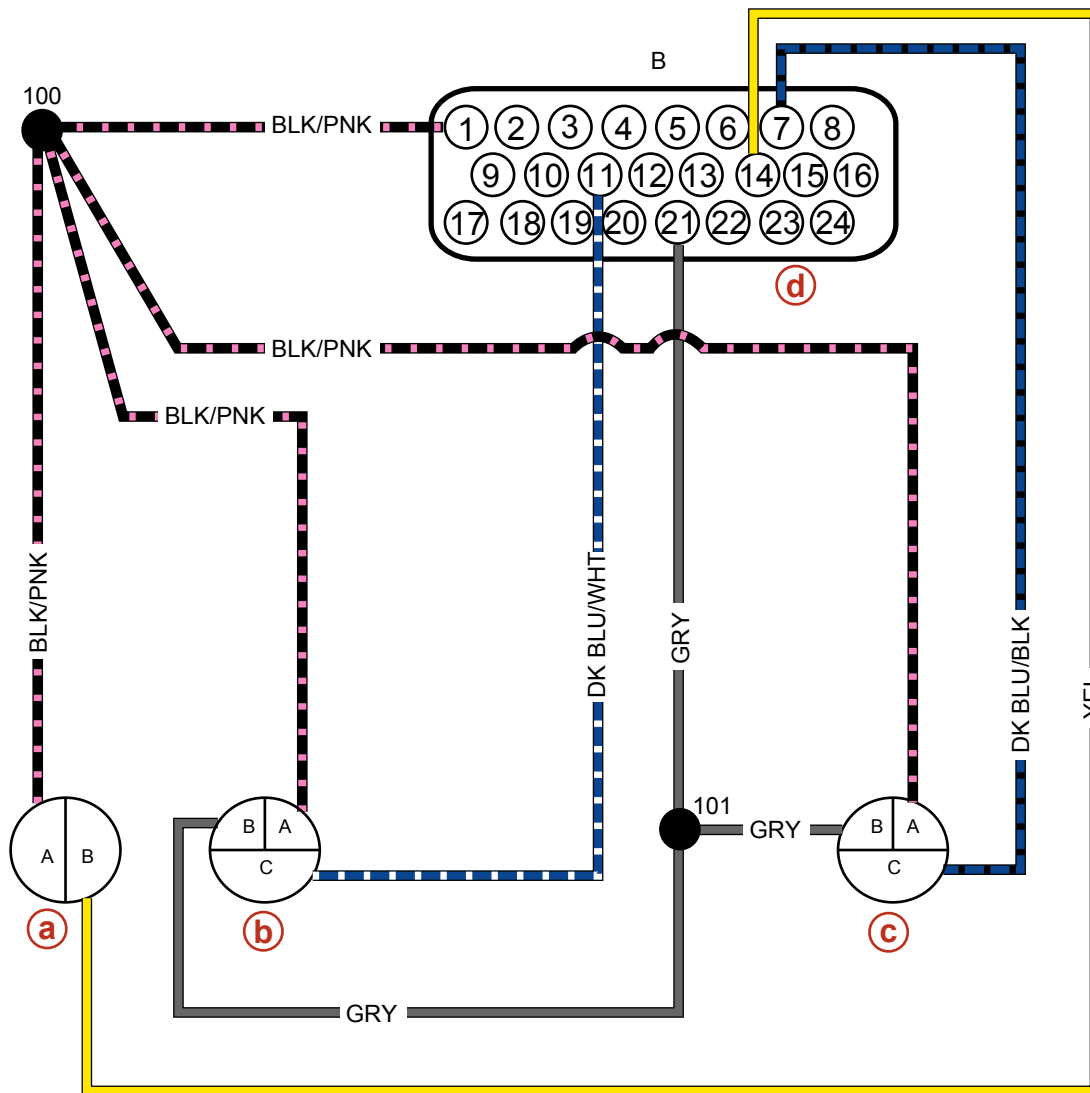
Manifold Air Pressure and Temperature, Crankshaft Position, Camshaft Position, and Throttle Position Sensors—V8 Engines



25744

- a - Crankshaft position sensor
- b - Camshaft position sensor
- c - ECM 555 connector B
- d - Manifold air pressure and manifold air temperature
- e - Throttle position sensor

Engine Coolant Temperature, Seawater Pump, and Oil Pressure Sensors

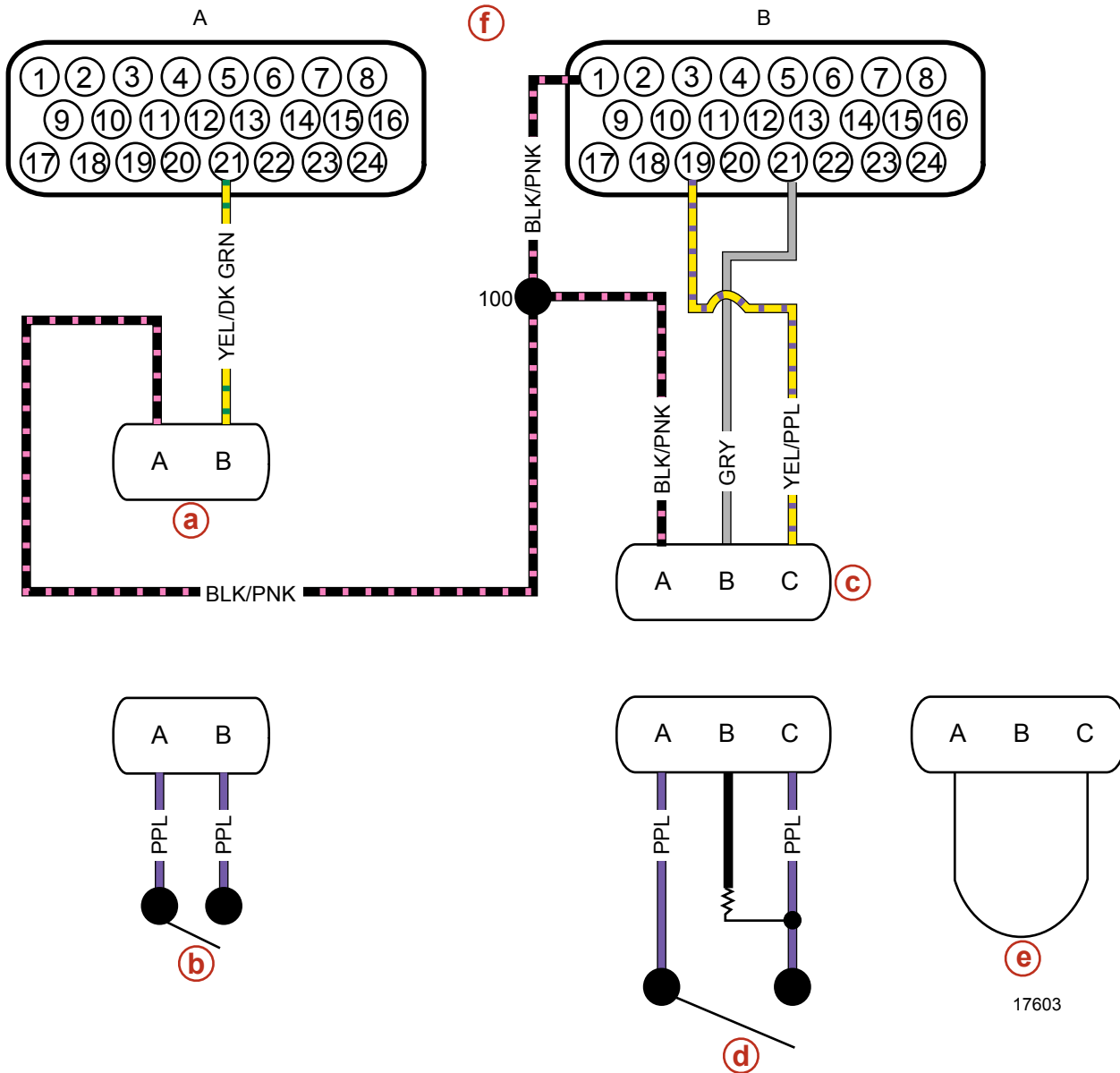


17602

- a** - Engine coolant temperature
- b** - Seawater pump pressure

- c** - Oil pressure
- d** - ECM 555 connector B

Gear Indicator and Shift Interrupt—Sterndrive

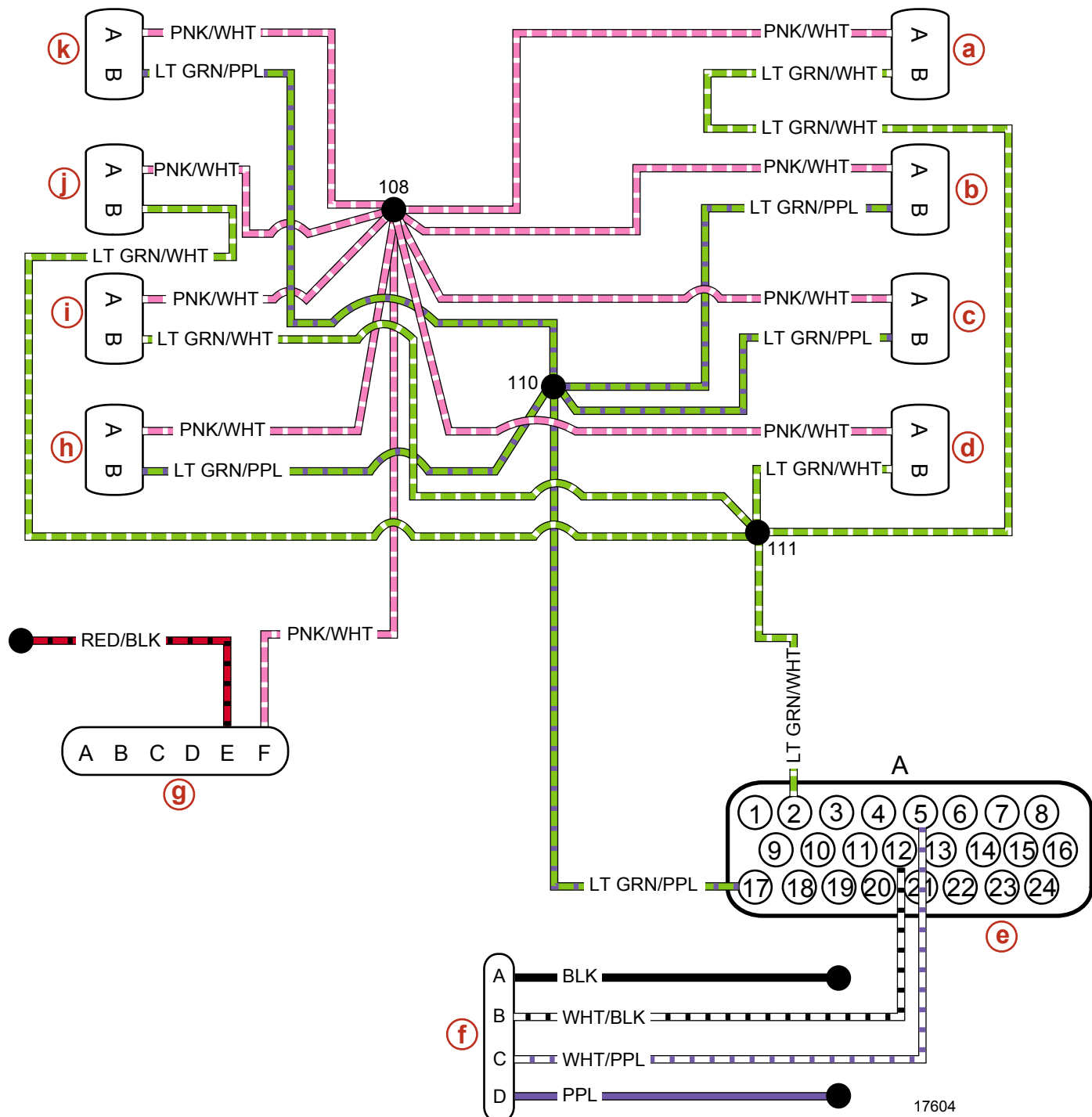


- a** - Gear indicator connector
- b** - Gear indicator switch (closed in neutral, open in gear, normally closed switch)
- c** - Shift interrupt switch connector

- d** - Shift interrupt switch—Alpha models (A to C normally closed, A to C open with switch engaged, A to B 10K ohms with switch released, A to B 8K ohms with switch engaged, B to C always 10K ohms)

- e** - Jumper plug (Bravo models)
- f** - ECM 555 connectors A and B

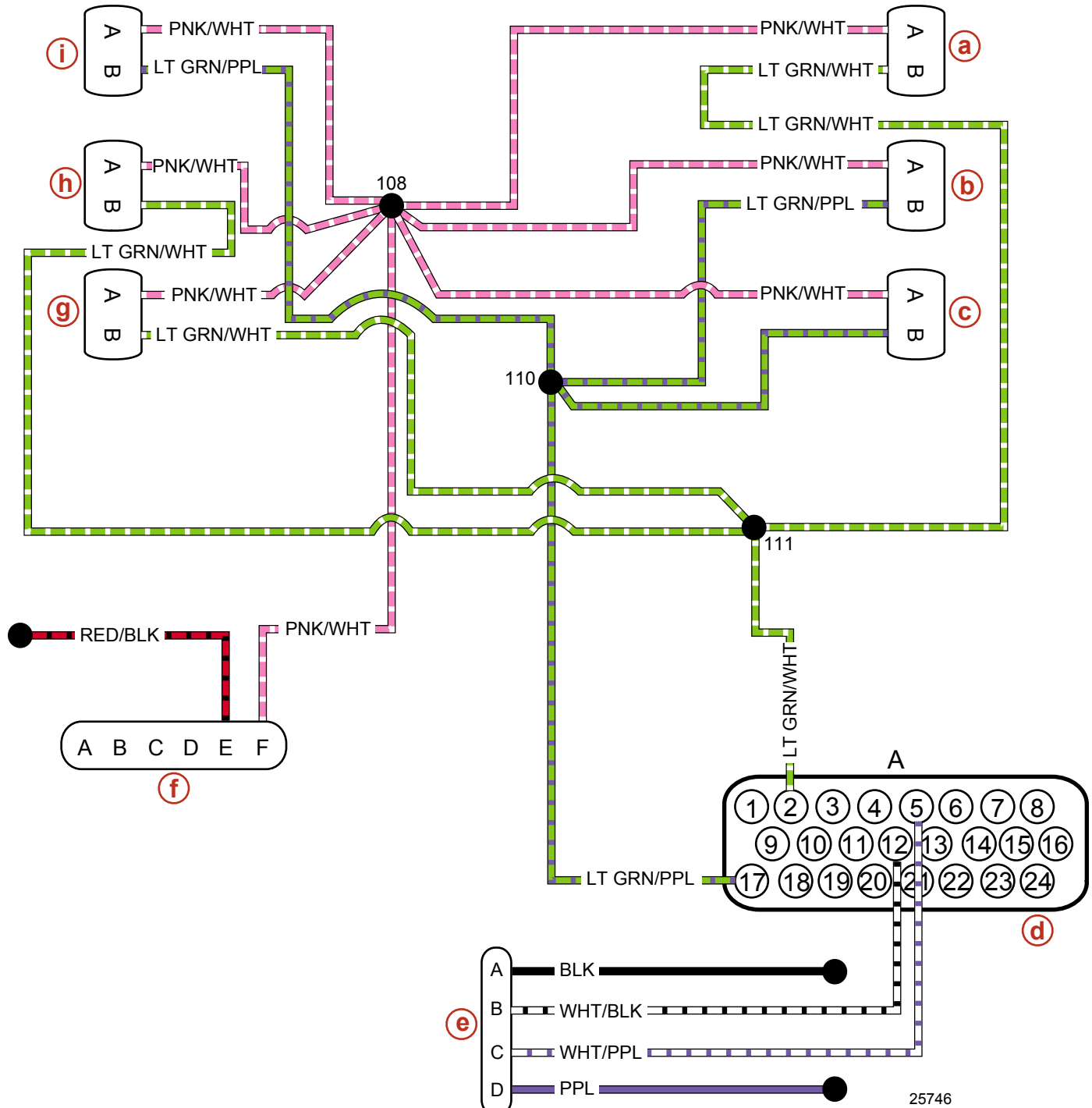
Fuel Injector Control Circuits and Diagnostic Circuits—Batch-Fired Injector System



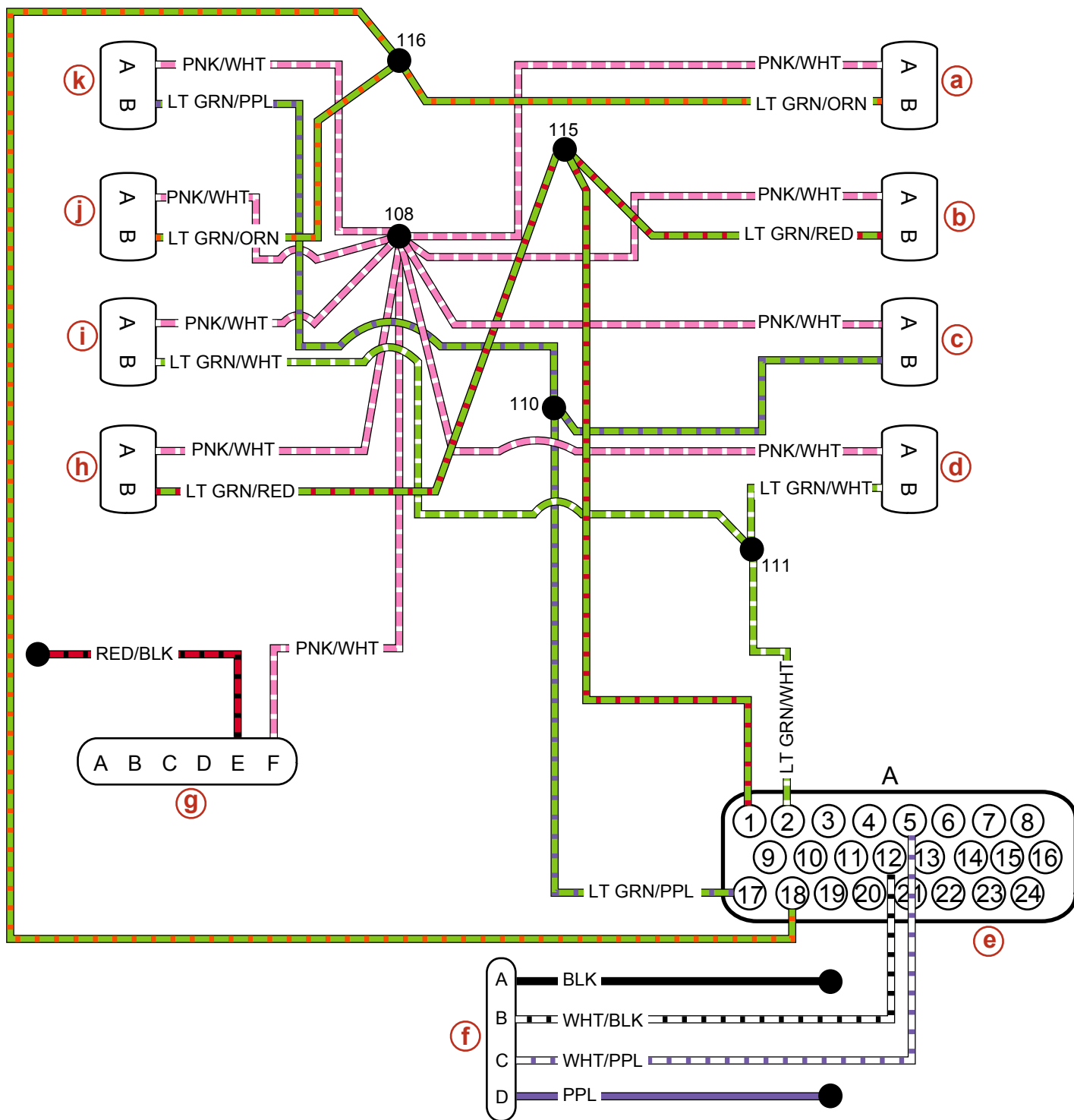
17604

- a** - Injector 2
- b** - Injector 4
- c** - Injector 6
- d** - Injector 8
- e** - ECM 555 connector A
- f** - Diagnostic connector
- g** - Fuse holder
- h** - Injector 7
- i** - Injector 5
- j** - Injector 3
- k** - Injector 1

Fuel Injector Control Circuits and Diagnostic Circuits—Batch-Fired Injector System (V6 Sterndrive)



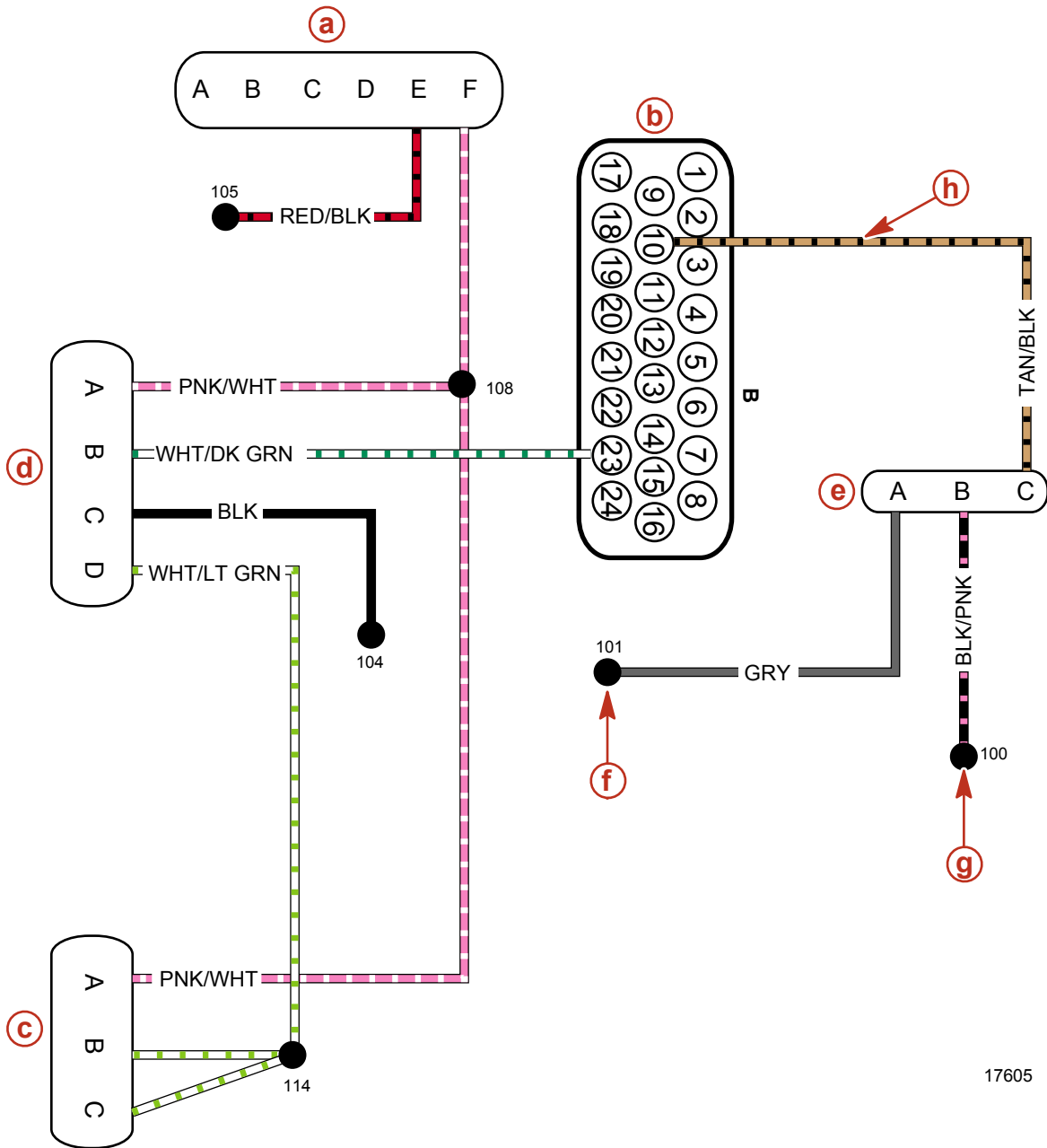
Fuel Injector Control Circuits and Diagnostic Circuits—Semi-Batch-Fired (V8)



25747

- a** - Injector 2
- b** - Injector 4
- c** - Injector 6
- d** - Injector 8
- e** - ECM 555 connector A
- f** - Diagnostic connector
- g** - Fuse holder
- h** - Injector 7
- i** - Injector 5
- j** - Injector 3
- k** - Injector 1

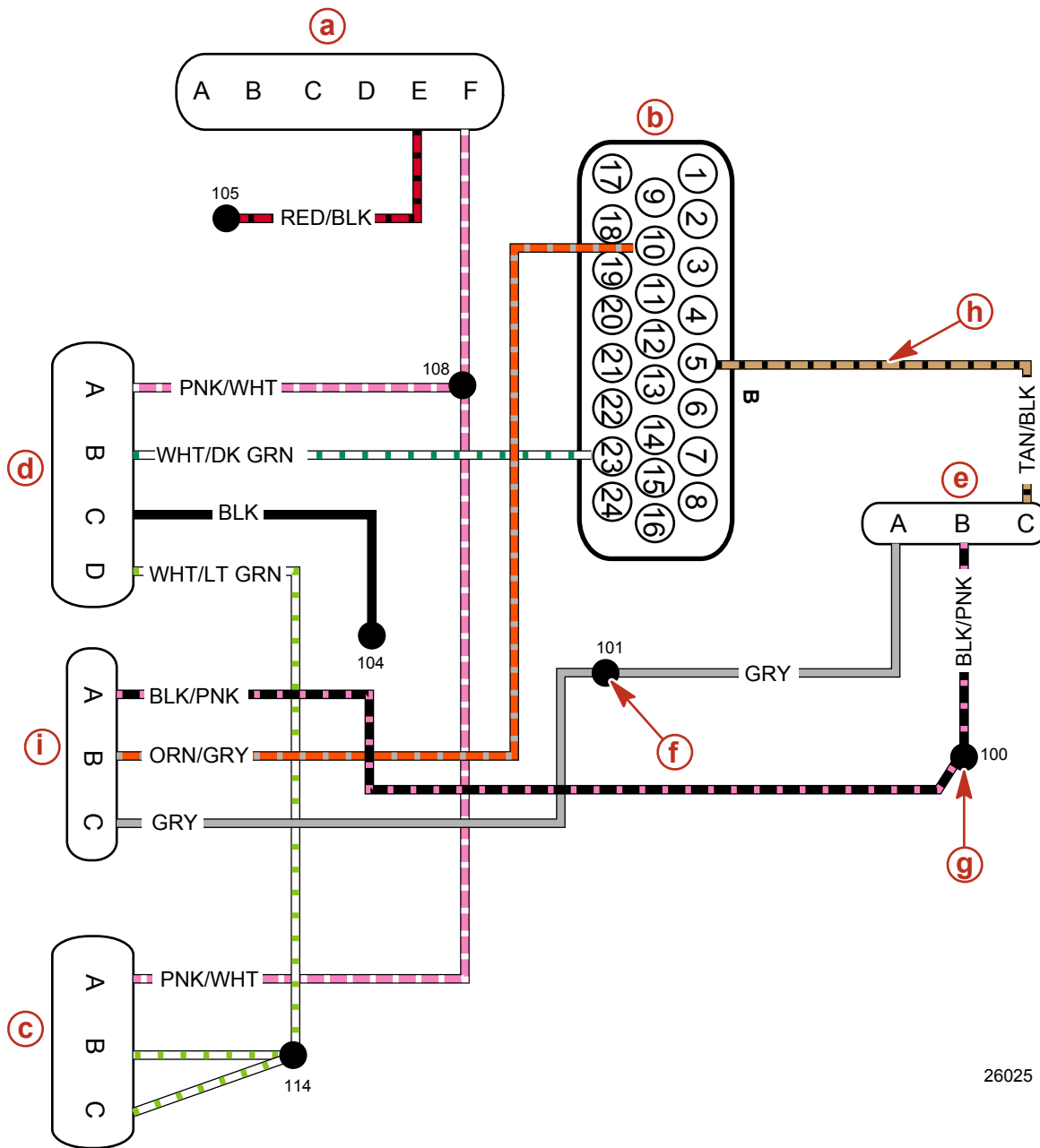
Ignition System Without Cam Position Sensor



17605

- a** - Fuse holder
- b** - ECM 555 connector B
- c** - Ignition coil
- d** - Ignition coil driver module
- e** - CPS connector
- f** - 5-volt power
- g** - 5-volt ground
- h** - CPS signal

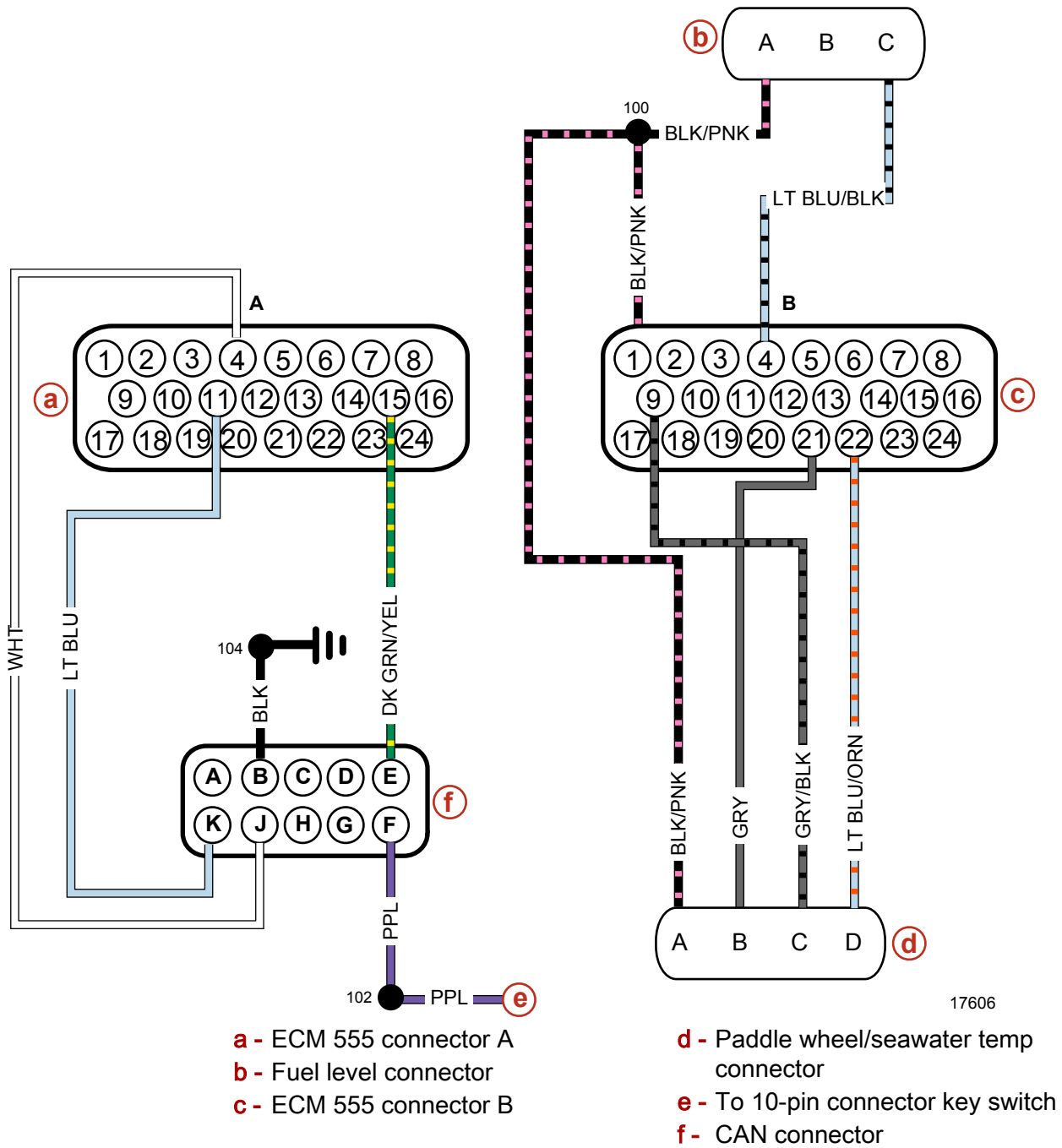
Ignition System With Cam Position Sensor



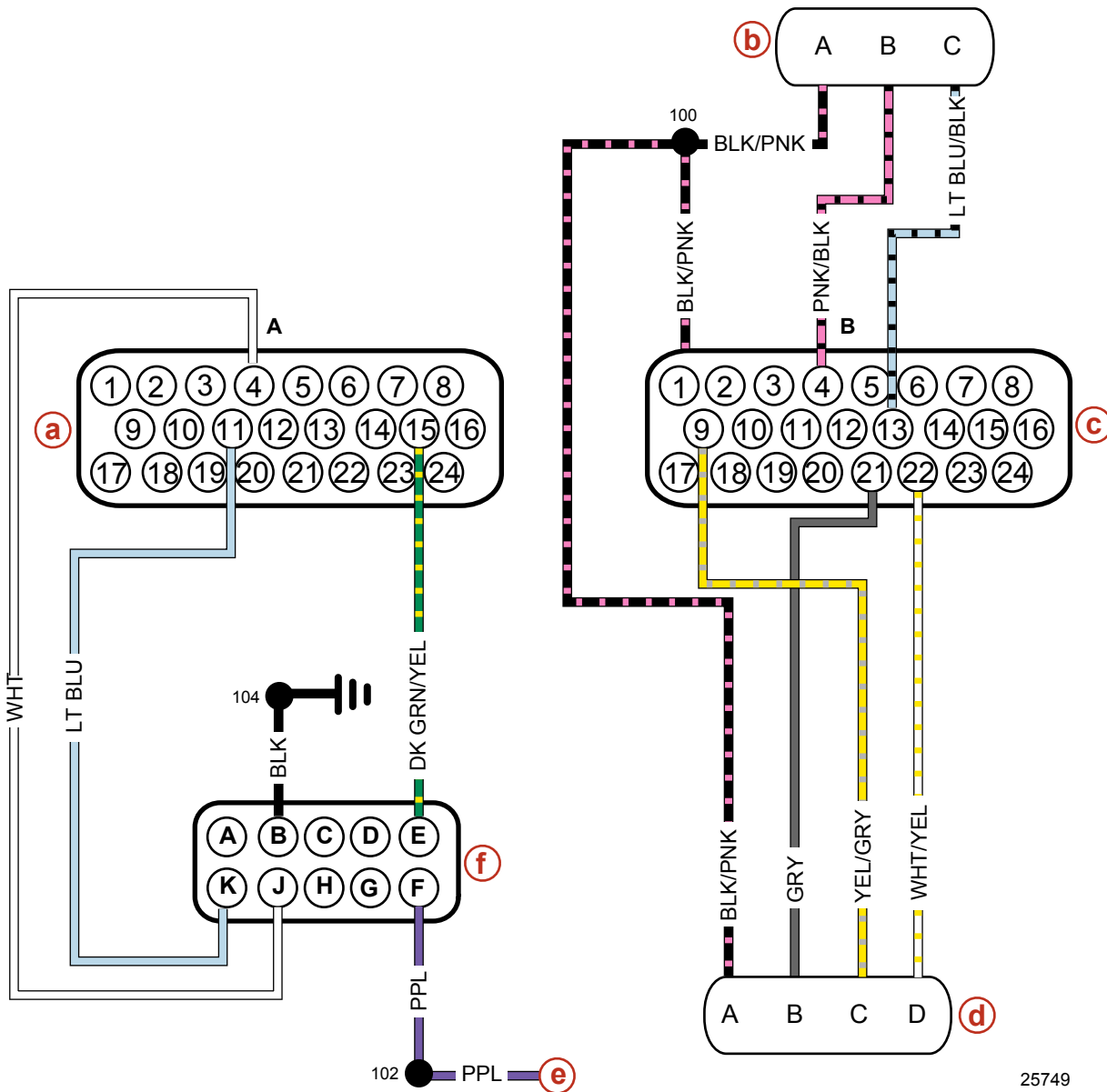
26025

- a** - Fuse holder
- b** - ECM 555 connector B
- c** - Ignition coil
- d** - Ignition coil driver module
- e** - CPS connector
- f** - 5-volt power
- g** - 5-Volt ground
- h** - CPS signal
- i** - Cam sensor

CAN, Fuel Level, Paddle Wheel, and Temperature Circuits—V6 Sterndrive



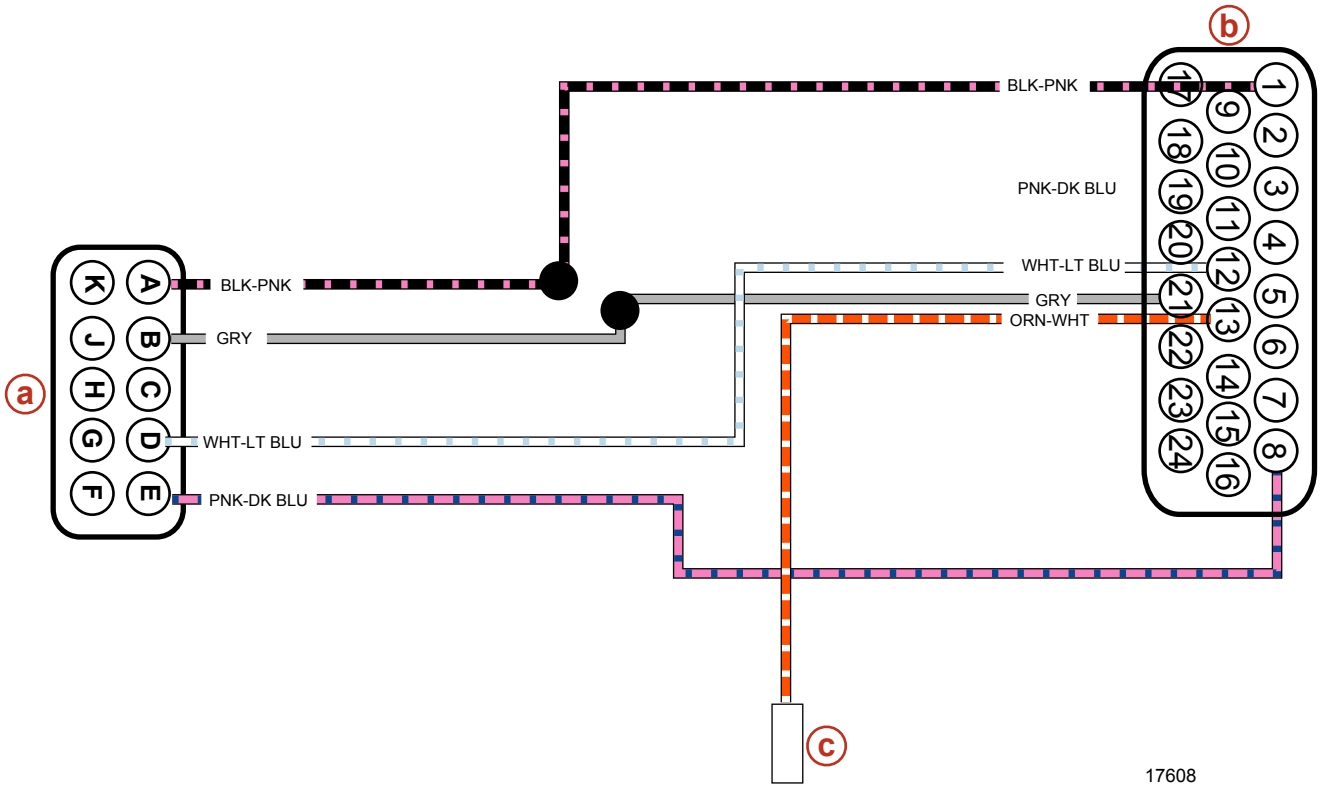
CAN, Fuel Level, Paddle Wheel, and Temperature Circuits—V8 Sterndrive and Inboard



25749

- a** - ECM 555 connector A
- b** - Fuel level connector
- c** - ECM 555 connector B
- d** - Paddle wheel and seawater temperature connector
- e** - To 10-pin connector key switch
- f** - CAN connector

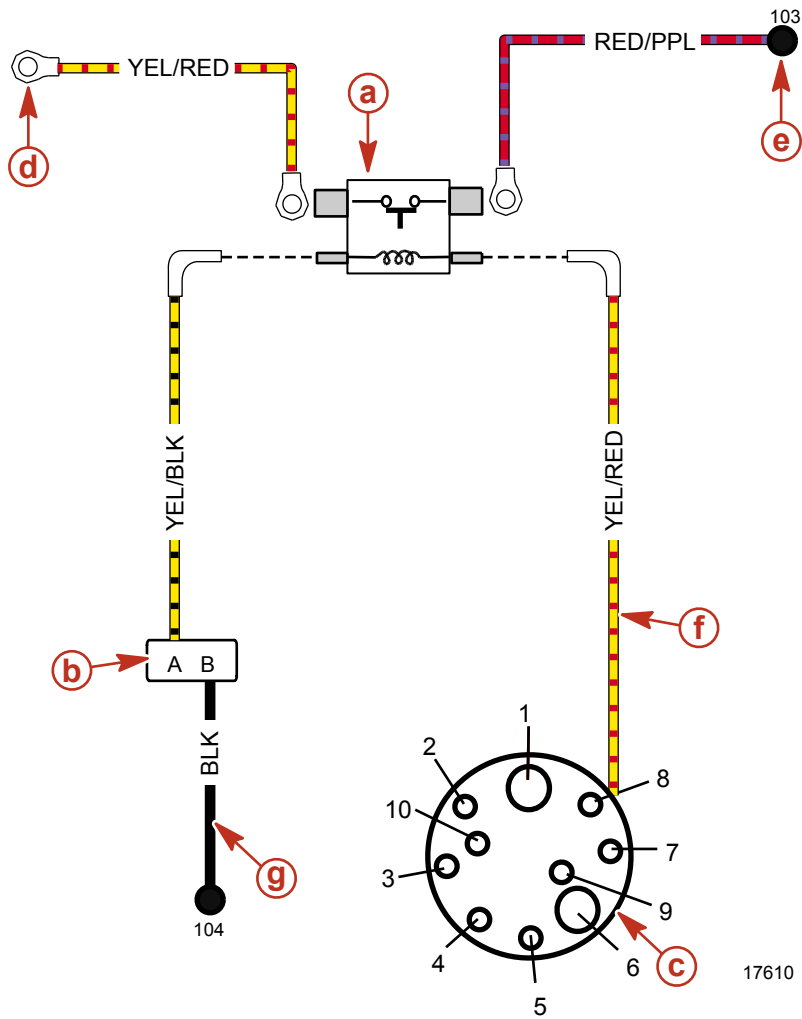
Transom Harness Connector (to Engine)



- a** - Transom harness connector (on engine harness); Pin D (pitot signal), Pin E (steering signal)
- b** - ECM 555 connector B
- c** - Digital trim

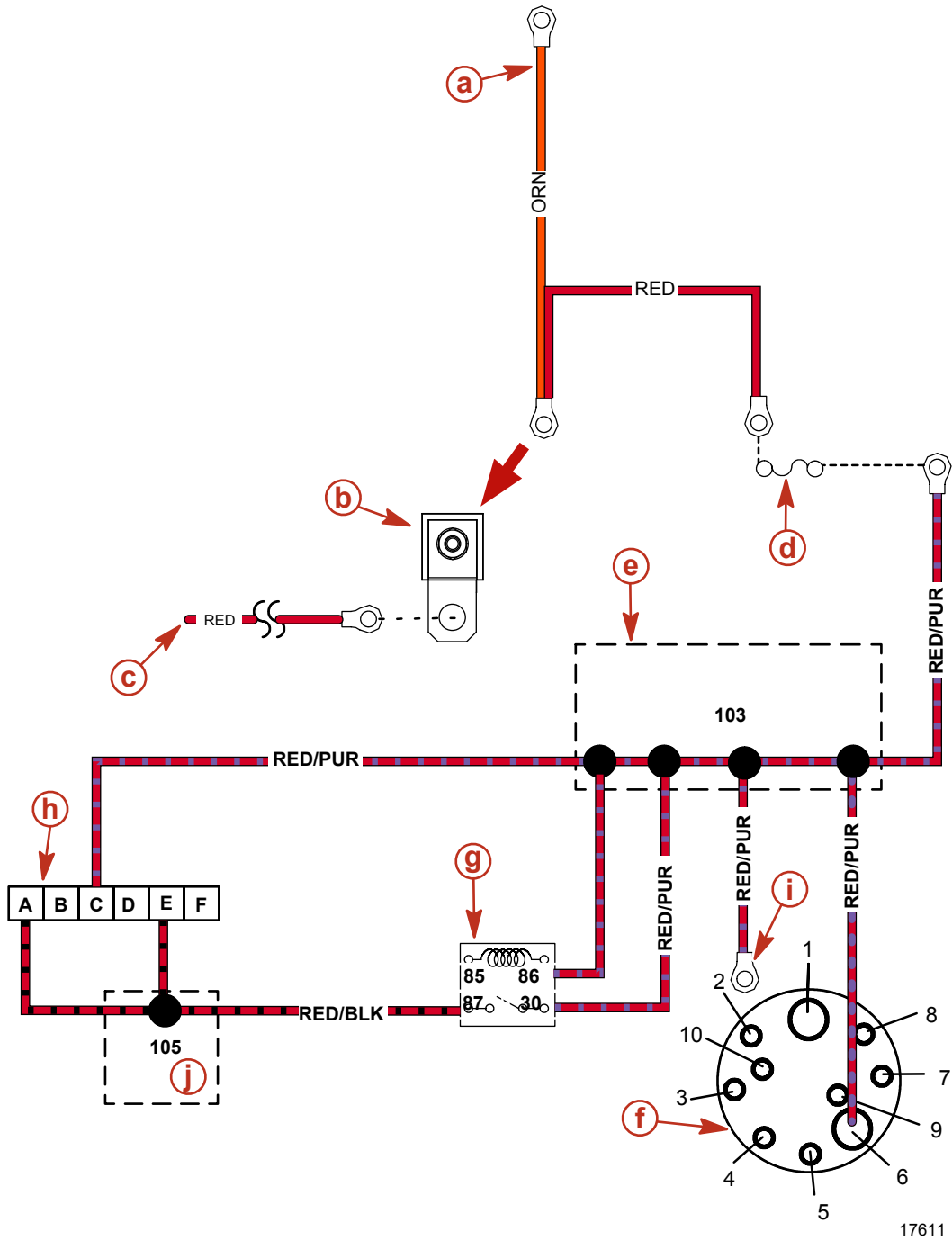
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Starter Solenoid Circuit



- | | |
|--|-------------------------------------|
| a - Starter solenoid | e - 12-volt power |
| b - Neutral safety switch (inboard) | f - Key switch-start |
| c - 10-pin connector | g - 12-volt ground (inboard) |
| d - Starter solenoid "S" terminal | |

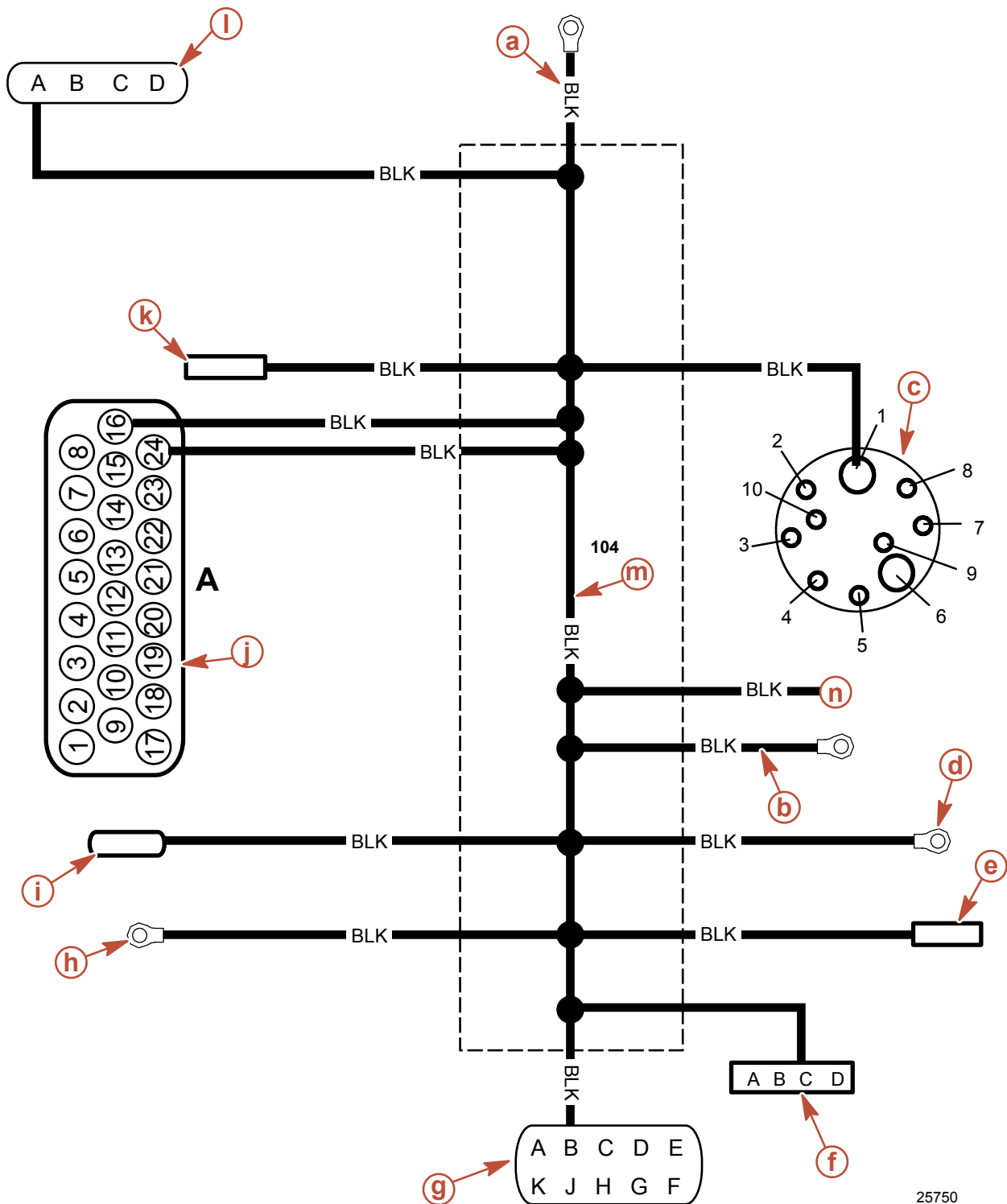
Alternator Output Circuit



- a** - From alternator
- b** - Fuse on starter
- c** - To battery
- d** - 50-amp circuit breaker
- e** - Splice 103

- f** - 10-pin
- g** - Main power relay
- h** - Fuses
- i** - Starter solenoid power
- j** - Splice 105

Engine 12-Volt Ground Circuit—All engines



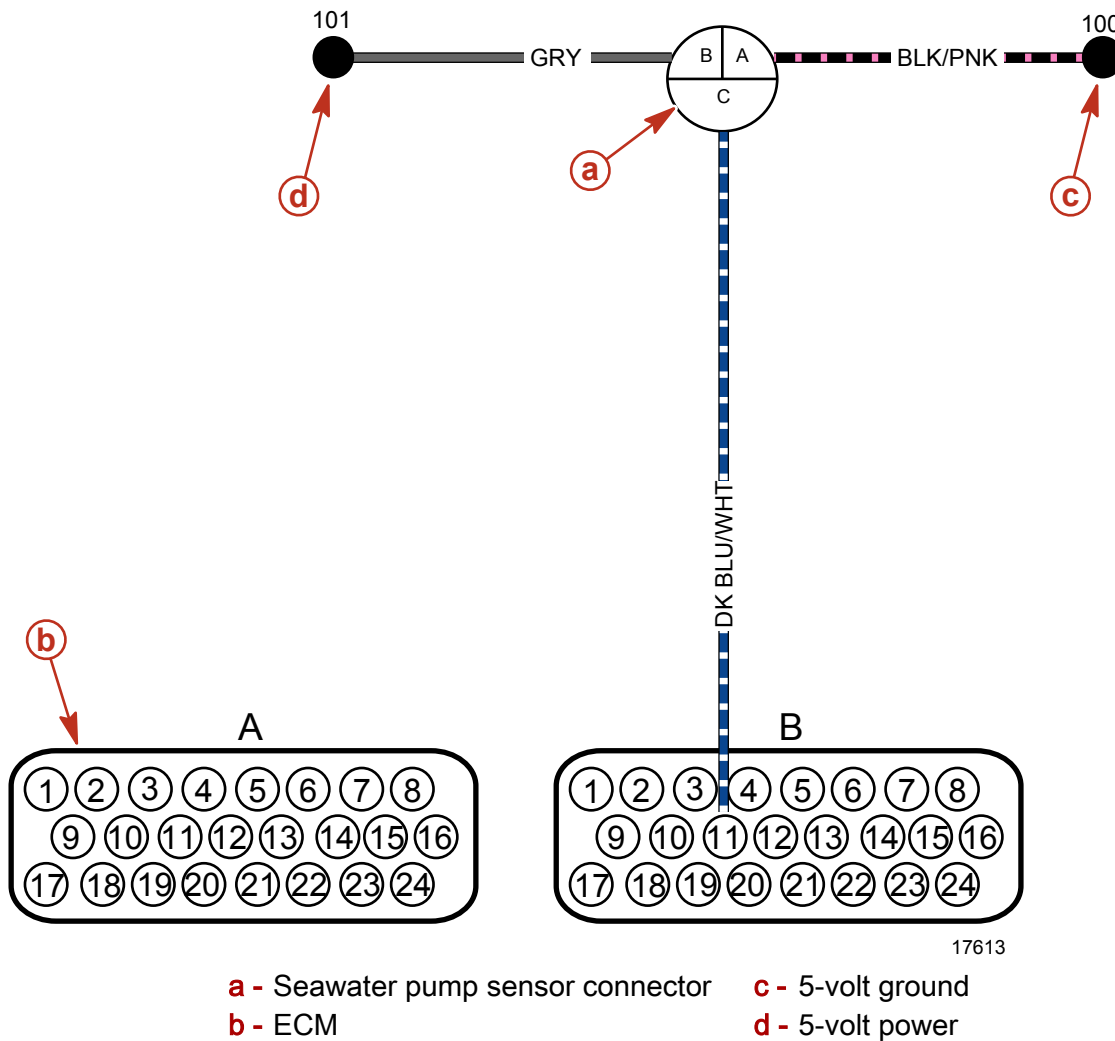
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- a** - Engine ground
- b** - Neutral safety switch (inboard)
- c** - 10-pin connector
- d** - Alternator
- e** - Transmission over-temperature and trim
- f** - Coil driver
- g** - CAN line
- h** - Mercathode
- i** - Starter solenoid ground (inboard)
- j** - ECM connector A
- k** - Lube monitor ground
- l** - Diagnostic
- m** - Splice 104
- n** - To fuel pump

Single Circuit Diagrams

This section outlines the circuitry, the wiring harness, and sensors as individual systems. This allows for a quick reference point when trying to detect a faulty connection. However, the complete system wiring diagram should be referenced if multiple electrical faults are occurring.

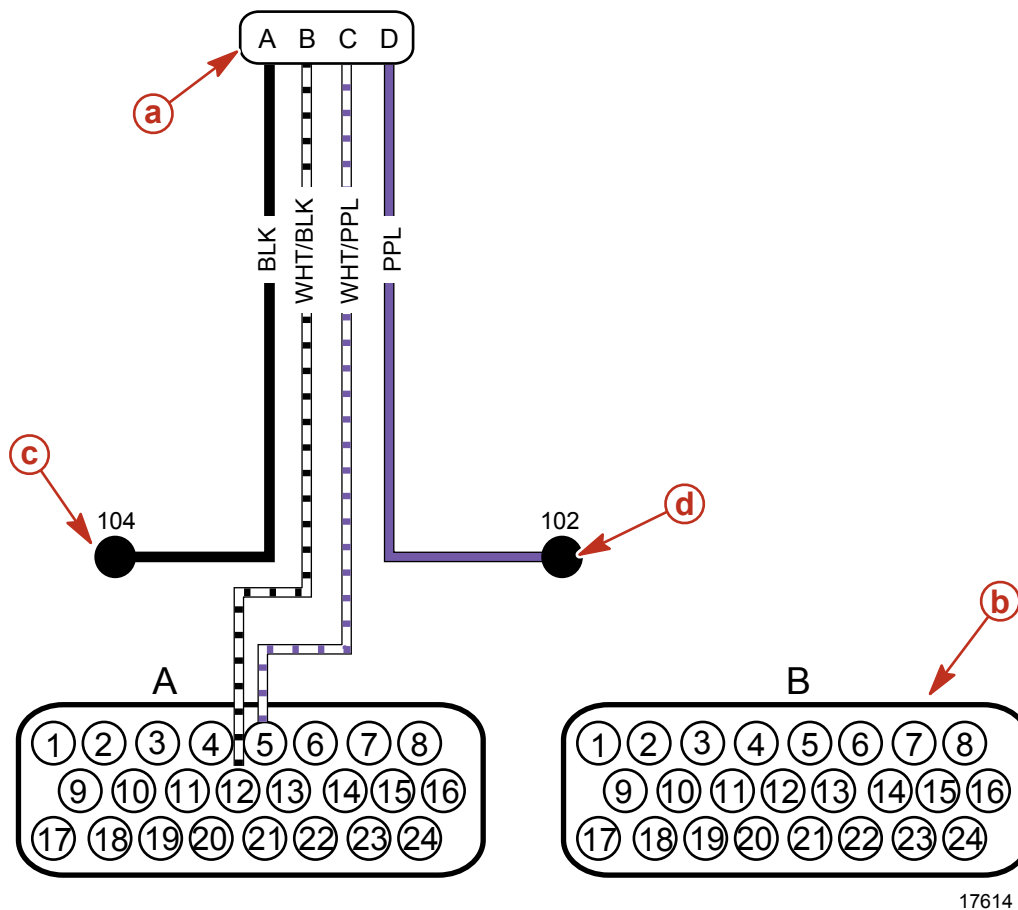
Seawater Pump Circuit



Seawater pump pressure sensor and water inlet pressure specifications are in the ECM Diagnostics Systems Information file. To check if the sensor is within range, the diagnostic tool reading with key on should be approximately 0.

A malfunction of the seawater pump sensor will set the fault of Seapump CKT Hi, Seapump CKT Lo, or Seapump PSI Lo.

Diagnostics Circuit



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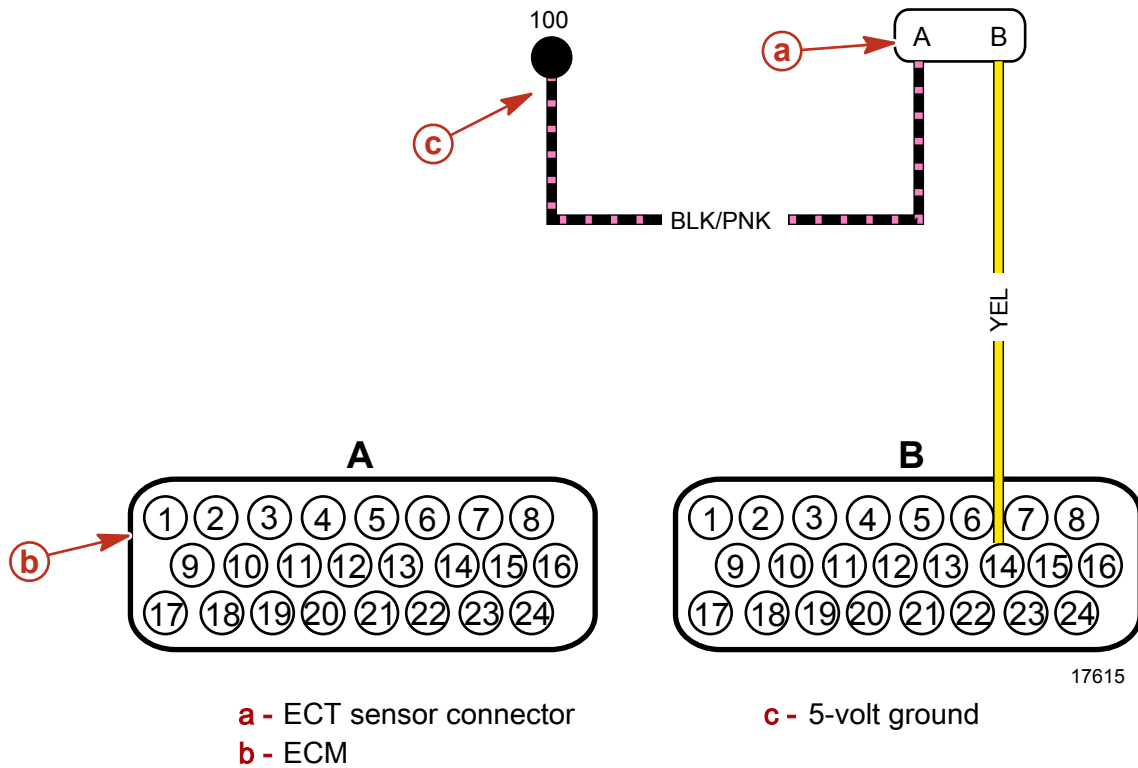
- a - Diagnostic connector
- b - ECM connectors A and B
- c - 12-volt ground
- d - 12-volt power

The data link connector (DLC) is a 4-pin circuit for attaching the diagnostic tool to the ECM. The DLC is located on the port side of the engine next to the oil filter. Before attaching a diagnostic tool to the engine, verify that the key is off and the pins are clean of corrosion and debris. Pin A is the 12-volt ground connected to the engine harness at splice 104. Pins B and C are data retrieval lines from the ECM. Pin D is the 12-volt supply to the diagnostic tool.

IMPORTANT: Diagnostic tools can only receive data with the key on or engine operating. Diagnostic tools need a minimum of 9.5 volts. If the diagnostic tool does not respond, verify the connection, verify that the key is on, and check the battery voltage.

A malfunction of the data link connector will not set a fault.

Engine Coolant Temperature Circuit

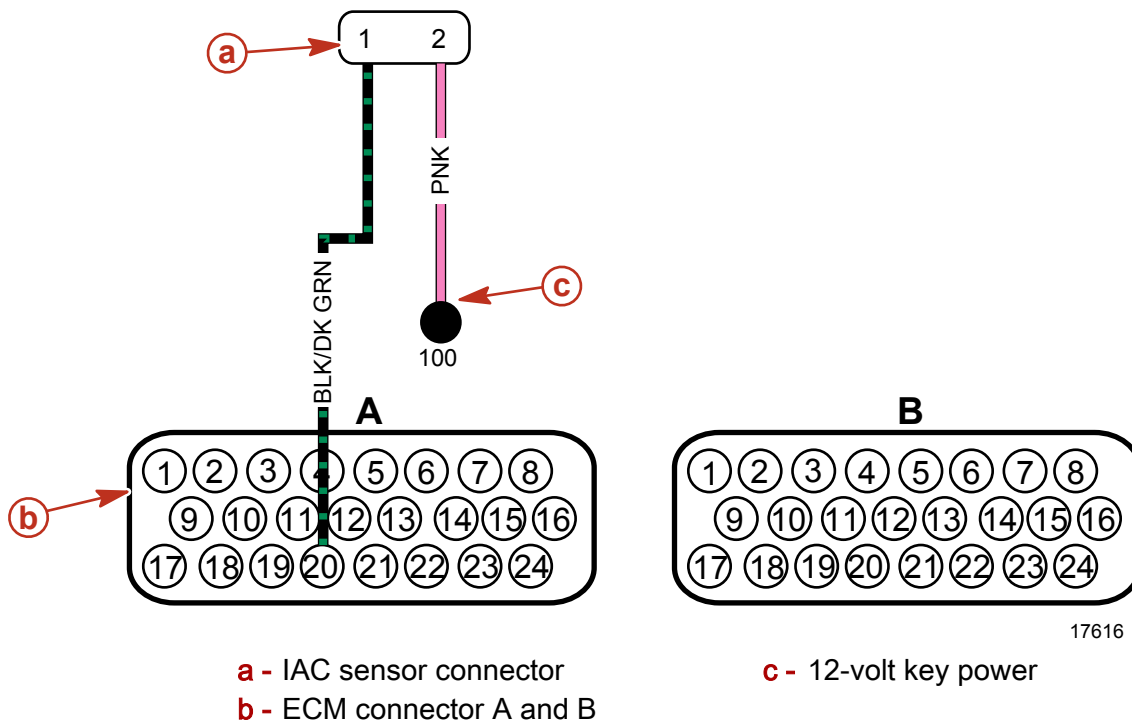


The engine coolant temperature (ECT) sensor is a thermistor immersed in the engine coolant stream. The ECT is located in the thermostat housing of the engine. Low coolant temperature produces high resistance, while high temperature causes low resistance.

A malfunction of the ECT sensor will set a fault of ECT CKT Hi, ECT CKT Lo, or ECT Coolant Overheat.

Approximate Temperature-to-Resistance Values		
Degrees F	Degrees C	Ohms
210	100	185
160	70	450
100	38	1,800
70	20	3,400
40	4	7,500
20	-7	13,500
0	-18	25,000
-40	-40	100,700

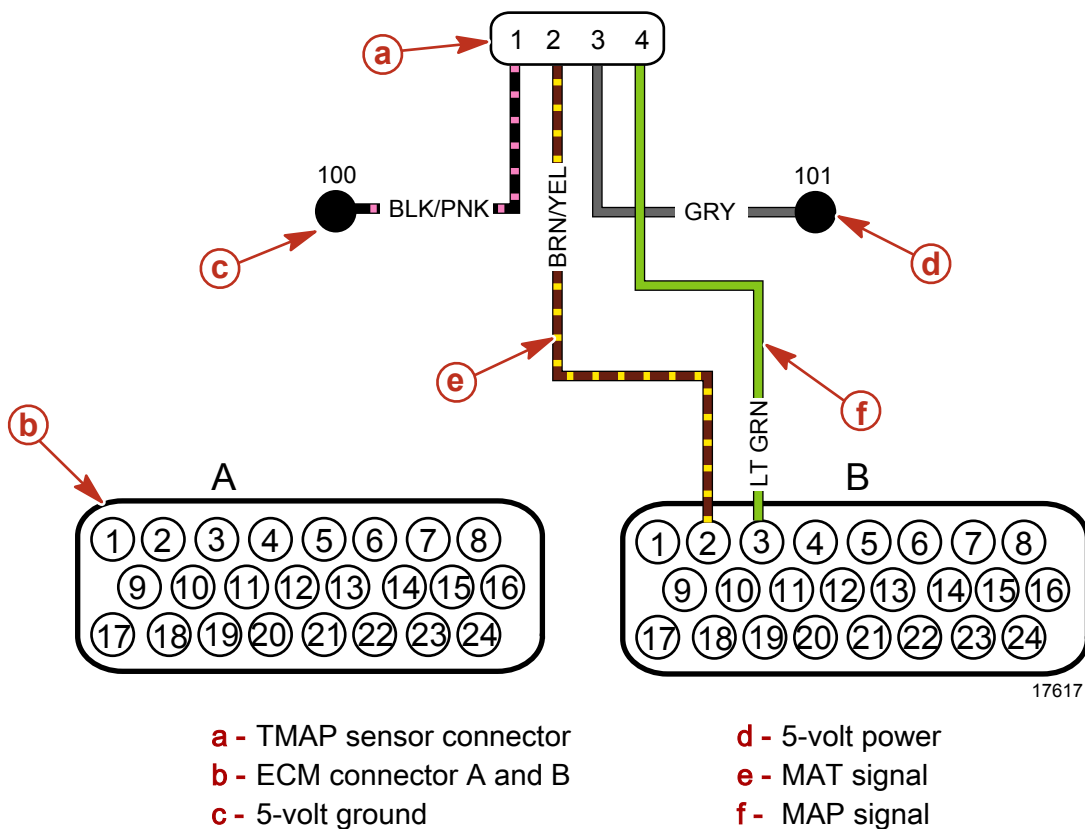
IAC Circuit



The idle air control (IAC) valve is a 12 volt circuit powered by the MPR. The IAC is located at the top rear of the engine.

A malfunction of the IAC will set a fault of IAC Output.

TMAP Circuit



The MAP/MAT sensor measures both manifold air temperature and manifold air pressure. The two measures function as two separate circuits.

MAT CIRCUIT

The MAT portion of the sensor is a thermistor that controls signal voltage to the ECM. It is located at the rear of the engine in the intake manifold plenum. When intake air is cold, the sensor resistance is high. As the air temperature rises, resistance lowers at normal engine operating temperature.

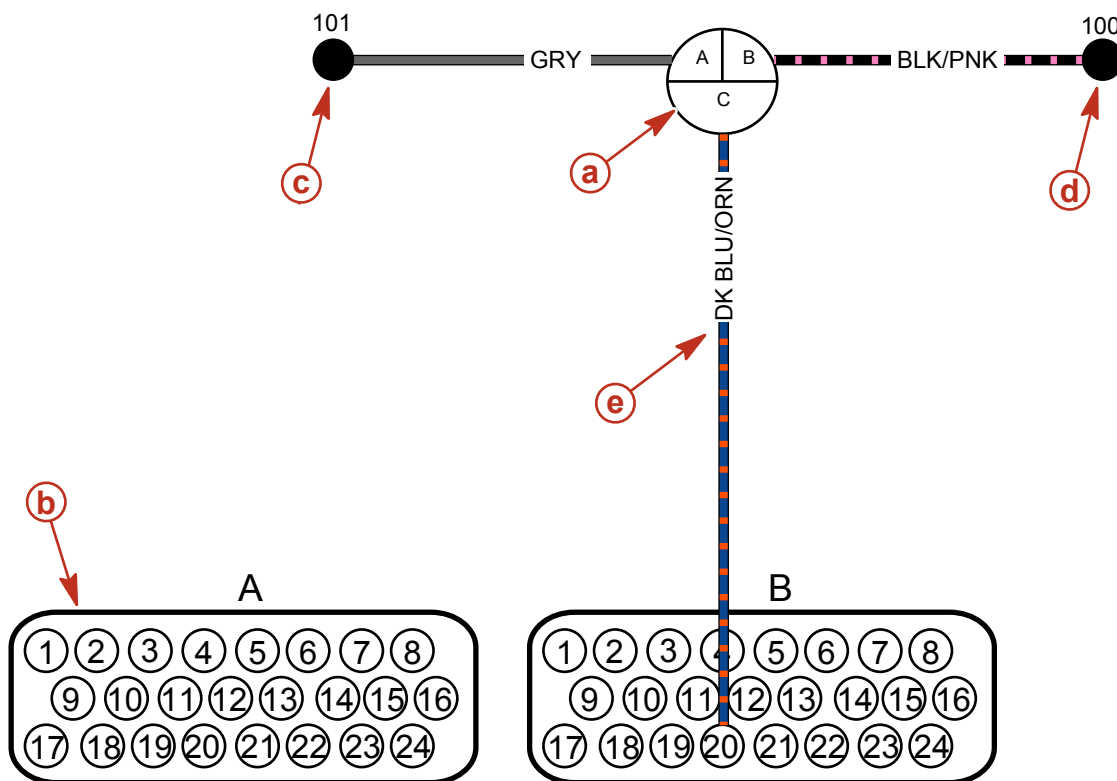
A malfunction in the MAT will set the fault of AIR TMP CKT Hi or AIR TMP CKT Lo.

MAP CIRCUIT

The MAP portion of the sensor measures the changes in the intake manifold pressure. It is located on the intake manifold on the top of the engine. At key on, the MAP is equal to atmospheric pressure. This information is used by the ECM as an indication of altitude and is recorded as BARO. Comparison of this BARO reading with a known good MAP sensor is a good check of a suspect sensor. The pressure changes as a result of engine load and speed change. The ECM receives this information as a signal voltage that will vary from about 1.0 to 2.0 volts at idle to about 4.0 to 5.0 volts at WOT.

A malfunction in the MAP sensor circuit sets the fault of MAP Sensor Input HI or MAP Sensor Input Lo.

Throttle Position Circuit



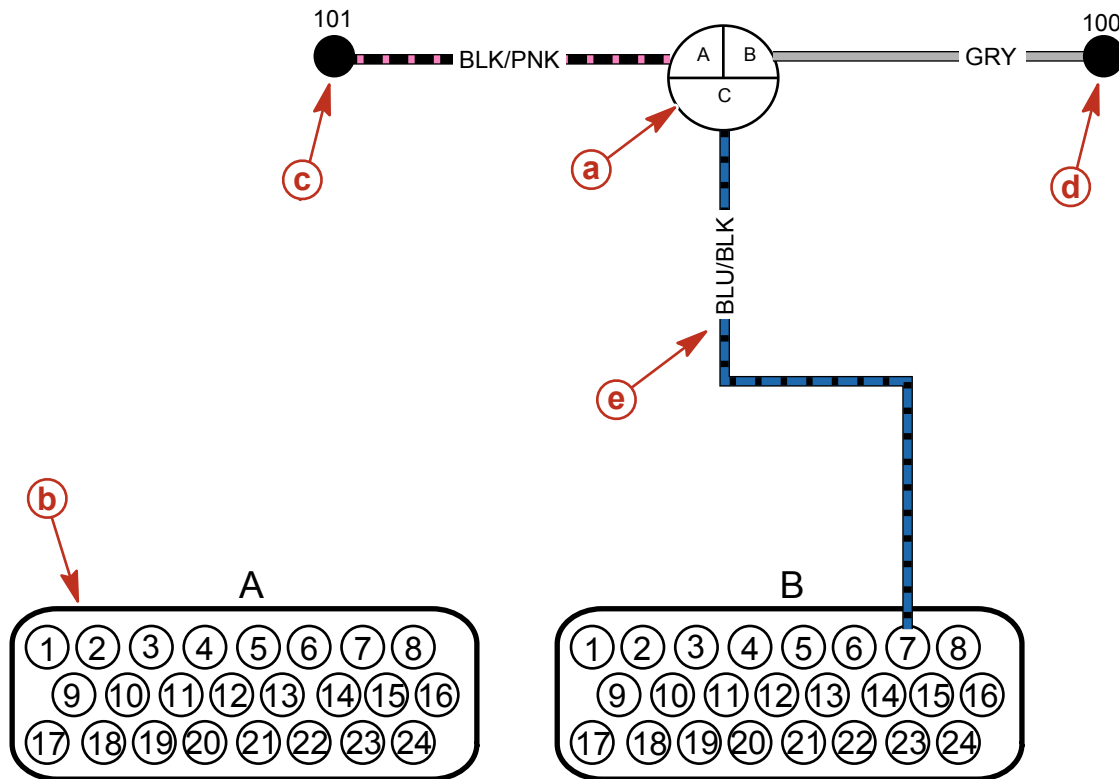
17618

- a - TPS connector
- b - ECM connector A and B
- c - 5-volt power
- d - 5-volt ground
- e - TPS signal

The throttle position sensor (TPS) sends throttle plate angle information to the ECM. The TPS is located on the throttle body. Signal voltage should vary from 0.5 volts at idle to 4.8 volts at WOT, although these numbers can vary by model. If the TPS malfunctions, the ECM will reset to a default value.

A malfunction in the TPS circuit sets the fault of TPS Input Hi, TPS Input Lo, TPS Range Hi, TPS Range Lo, or TPS No Adapt.

Oil Pressure Circuit



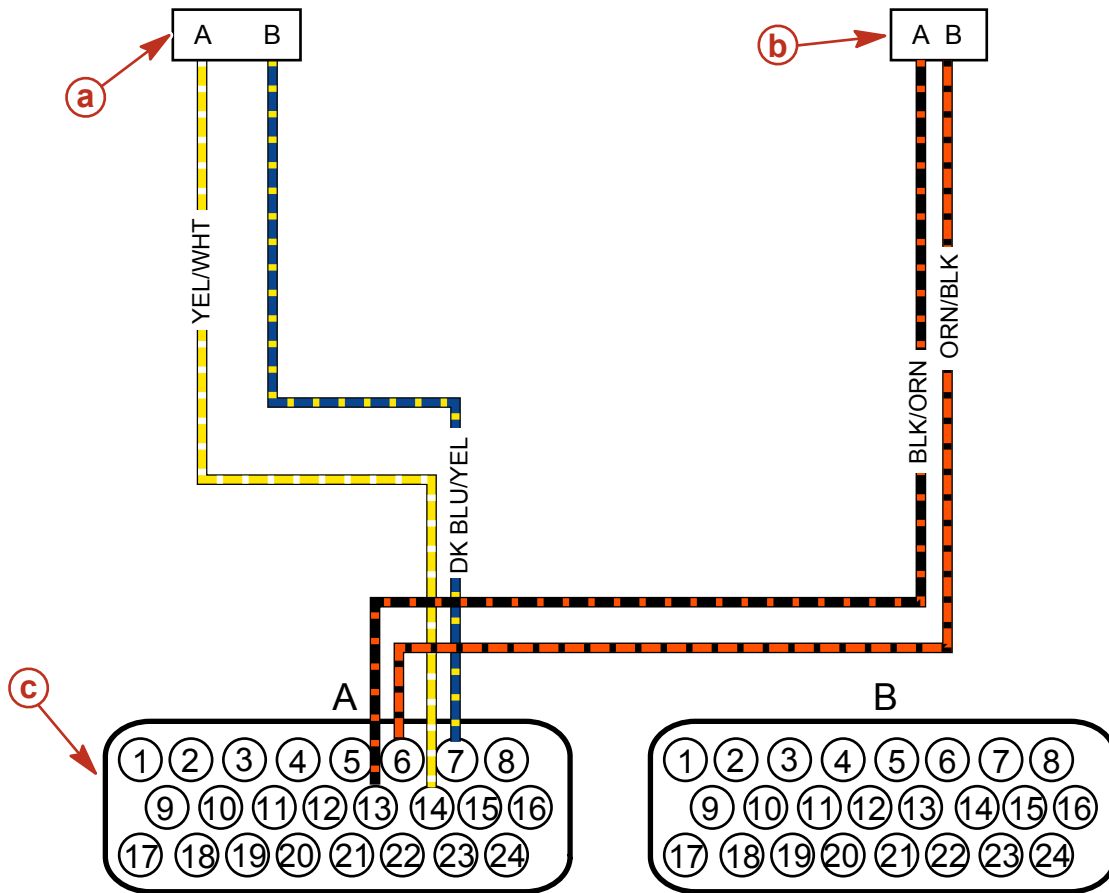
25395

- a** - Oil pressure sensor connector
- b** - ECM connector A and B
- c** - 5-volt power
- d** - 5-volt ground
- e** - Signal

The oil pressure sensor measures oil flow through the oil galleries. It is located on the rear port side of the engine.

A malfunction of the oil pressure sensor will set the fault Oil PSI CKT Hi, Oil PSI CKT Lo, or Oil PSI Lo.

ECM Single Knock Sensor Signal—V6



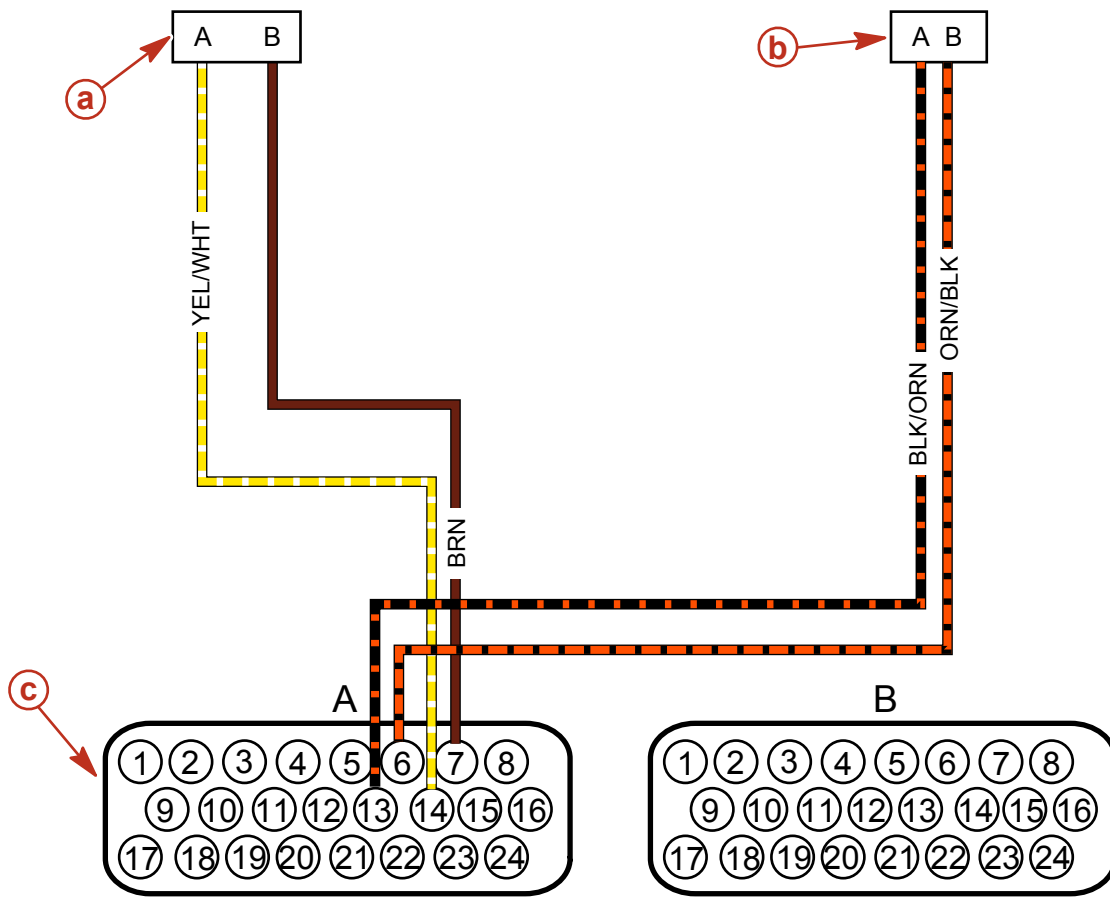
a - V-6 knock sensor
b - Not used

c - ECM connector A

17620

The knock sensor detects engine detonation, or spark knock, and sends a voltage signal to the ECM. It is located on the lower half of the engine on the port side near the oil sending transducer. As the sensor detects knock, the voltage output level increases and signals the ECM of the problem.

ECM Dual Knock Sensor Signal—V8

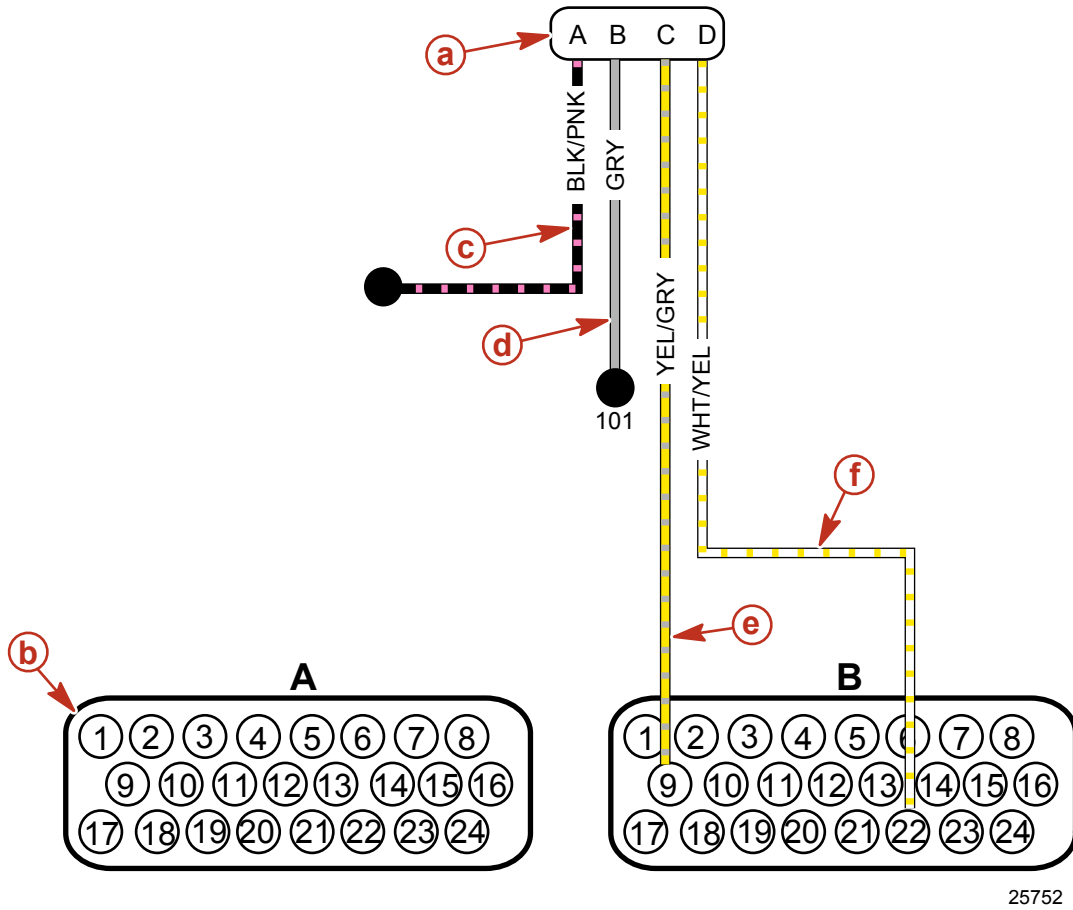


25997

- a** - Starboard knock sensor (cylinders 2,4,6, and 8)
- b** - Port knock sensor (cylinders 1,3,5, and 7)
- c** - ECM connector A

The knock sensor detects engine detonation, or spark knock, and sends a voltage signal to the ECM. It is located on the lower half of the engine on the port side near the oil sending transducer. As the sensor detects knock, the voltage output level increases and signals the ECM of the problem.

Paddle Wheel Connector Circuit—All Engines

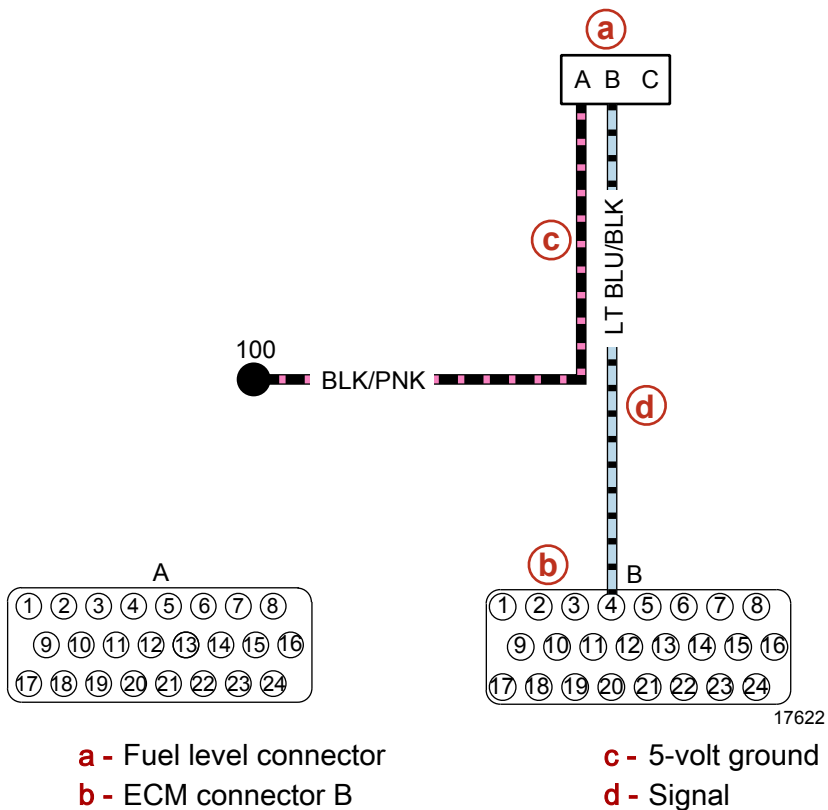


- a** - Paddle wheel connector
- b** - ECM connector A and B
- c** - 5-volt ground
- d** - 5-volt power
- e** - Paddle wheel
- f** - Water temperature

The paddle wheel circuit supplies the ECM with boat speed and seawater temperature readings; it is much more precise than the pitot circuit at lower speeds. The paddle wheel circuit is located on the rear of the engine.

A malfunction in the paddle wheel circuit does not set a fault.

Fuel Level Circuit—V6 and V8 Sterndrive

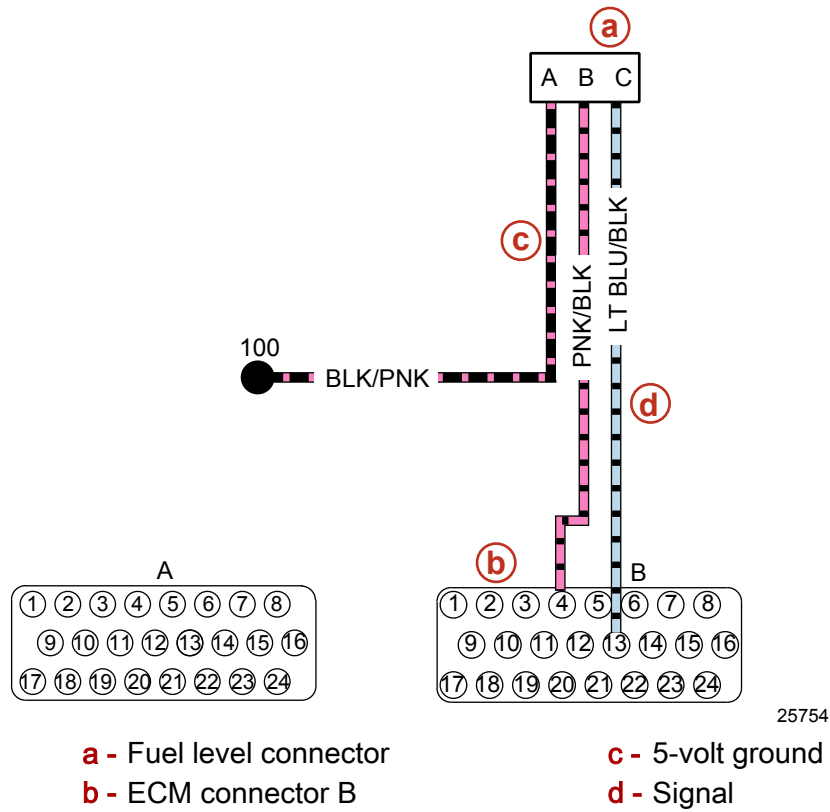


The fuel level sensor circuit supplies the ECM with the fuel level. It is located on the port rear of the engine.

A malfunction in the fuel level circuit does not set a fault.

A second tank is added on Scorpion models.

Fuel Level Circuit—V8 Inboard

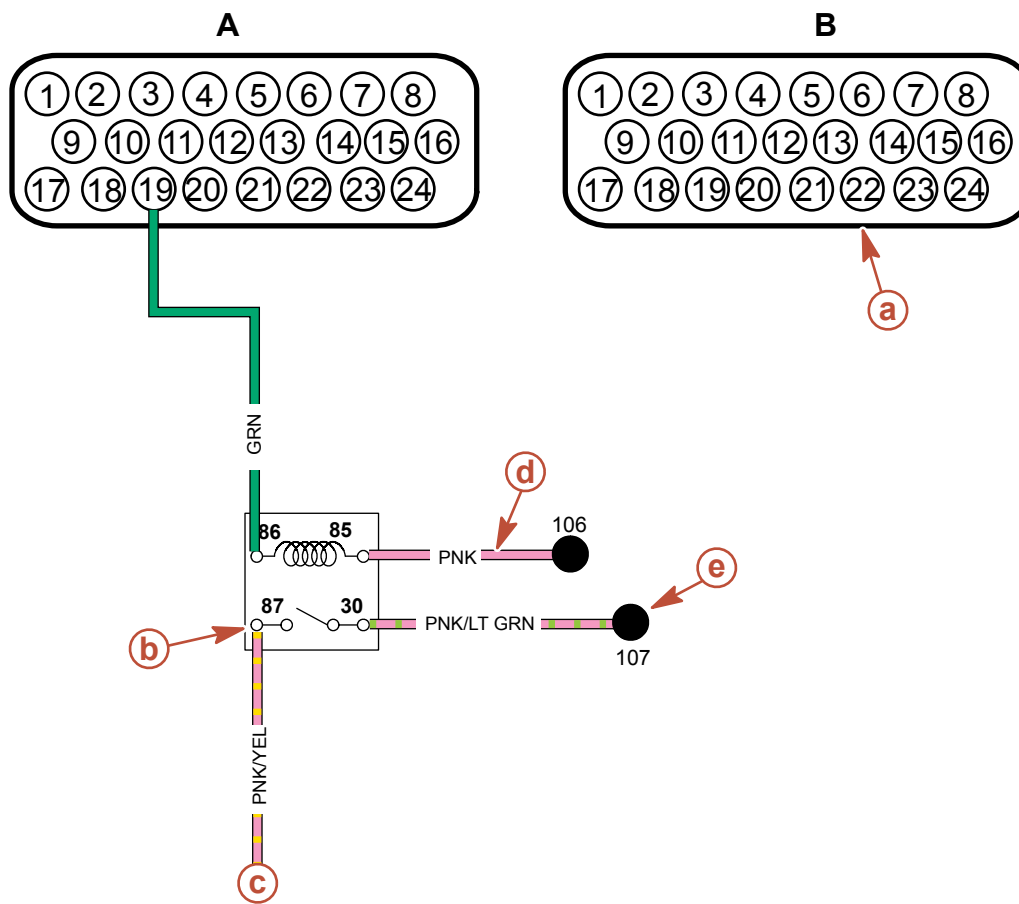


The fuel level sensor circuit supplies the ECM with the fuel level. It is located on the port rear of the engine.

A malfunction in the fuel level circuit does not set a fault.

A second tank is added on Scorpion models.

Fuel Pump Relay Circuit—All Engines



25756

- a** - ECM connectors A and B
- b** - Fuel pump relay
- c** - To fuel pump
- d** - Switched fused 12-volt power
- e** - 12-volt fused power

When the key is turned to the on position the fuel pump relay receives 12-volt battery power through the fuses at terminal 30. The relay powers both fuel pumps and signals the ECM that the engine is ready to start. Listen for both fuel pumps to operate when the key is first turned to the on position.

