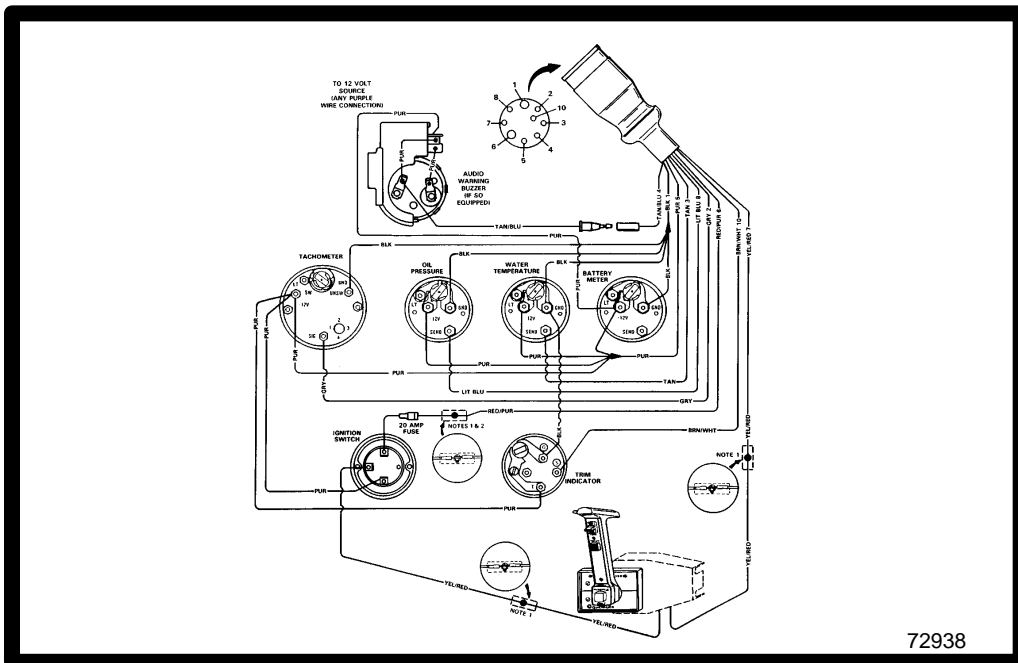


ELECTRICAL SYSTEMS

4

D



WIRING DIAGRAMS

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Wiring Colors for MerCruiser

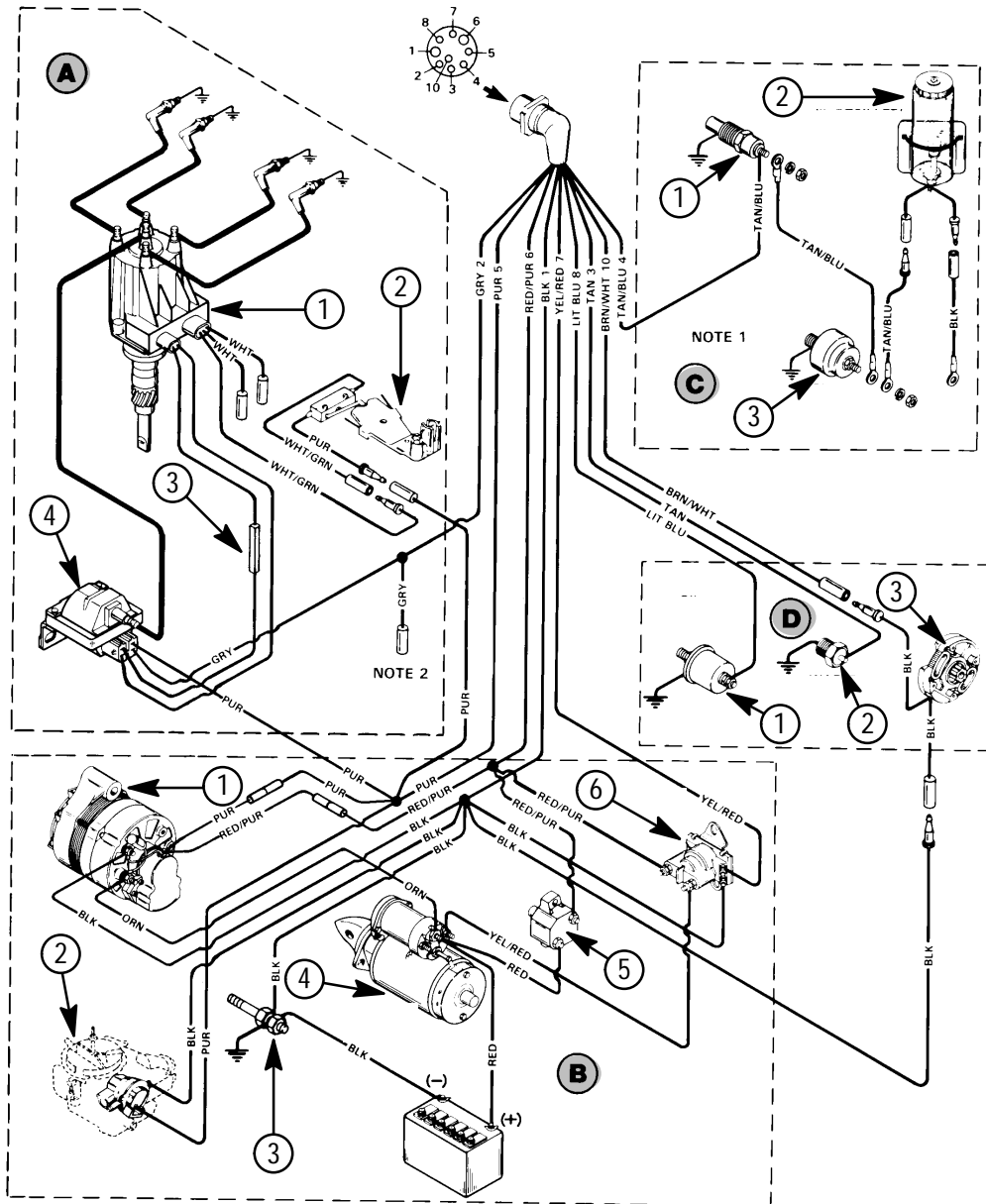
BIA Color Code	Where Used
Black	All Grounds
Brown	Reference Electrode-MerCathode
Orange	Anode Electrode-MerCathode
Lt. Blue/White	Trim- "Up" Switch
Gray	Tachometer Signal
Green/White	Trim -"Down" Switch
Tan	Water Temperature Sender to Gauge
Lt. Blue	Oil Pressure Sender to Gauge
Pink	Fuel Gauge Sender to Gauge
Brown/White	Trim Sender to Trim Gauge
Purple/White	Trim-"Trailer" Switch
Red	Unprotected Wires from Battery
Red/Purple	Protected (Fused) Wires from Battery
Red/Purple	Protected (+12V) to Trim Panel
Orange	Alternator Output
Purple/Yellow	Ballast Bypass
Purple	Ignition Switch (+12 V)
Yellow/Red	Starter Switch to Starter Solenoid to Neutral Start Switch

Wire Color Abbreviations

BLK	Black
BLU	Blue
BRN	Brown
GRY	Gray
GRN	Green
ORN	Orange
PNK	Pink
PUR	Purple
RED	Red
TAN	Tan
WHT	White
YEL	Yellow
LIT	Light
DRK	Dark

Wiring Diagrams

MCM 3.0L/3.0LX



NOTE : Gray lead for use with service tachometer.

A-Ignition System

- 1 -Distributor
- 2 -Shift Cutout Switch
- 3 -Filter
- 4 -Ignition Coil

B-Starting System

- 1 -Alternator
- 2 -Electric Choke (2 BBL Only)
- 3 -Ground Bolt
- 4 -Starter
- 5 -Circuit Breaker
- 6 -Starter Slave Solenoid

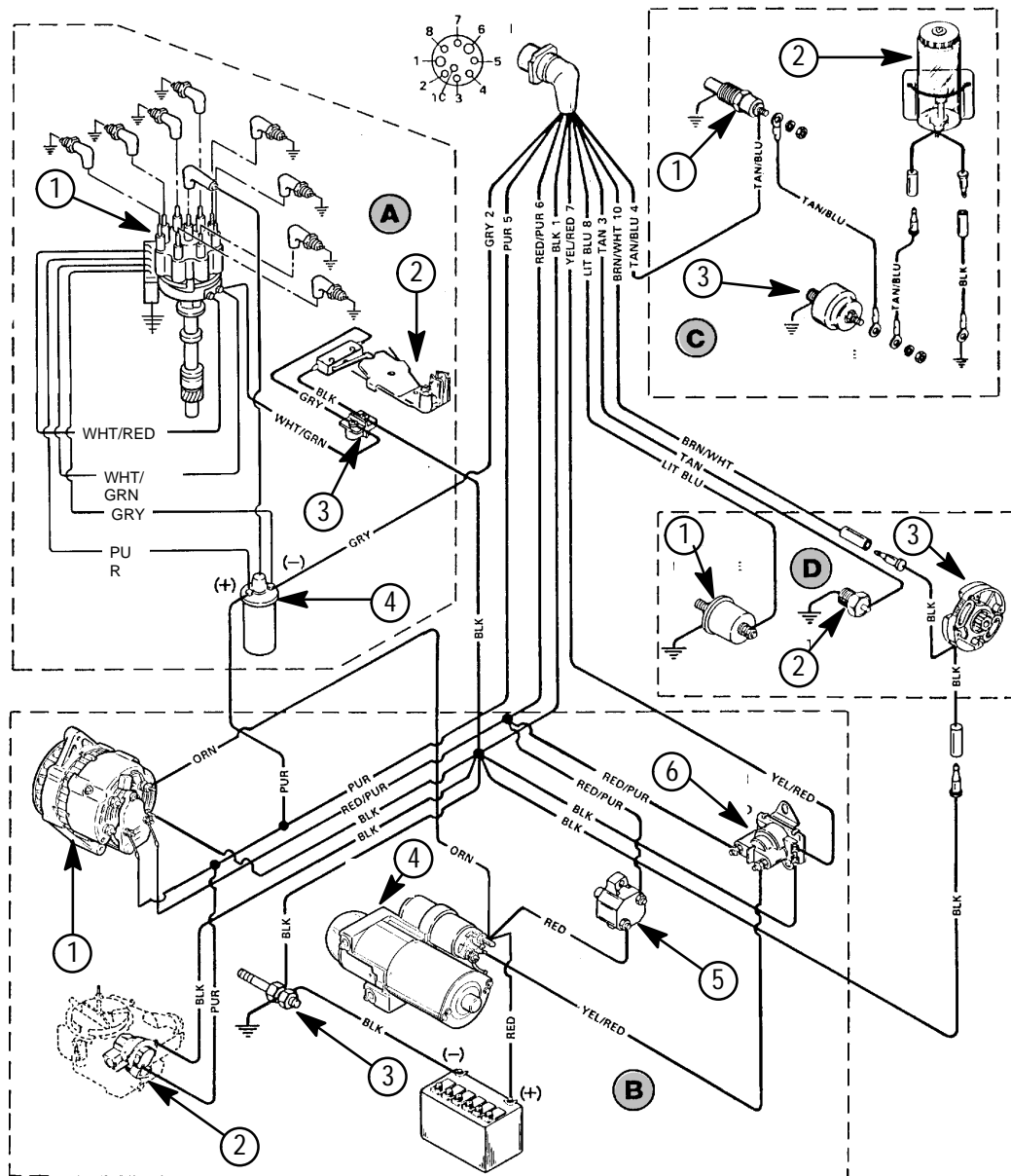
C-Audio Warning System

- 1 -Water Temperature
- 2 -Drive Unit Oil Level (If Equipped)
- 3 -Oil Pressure Switch

D-Instrumentation System

- 1 -Oil Pressure Sender
- 2 -Water Temperature Sender
- 3 -Trim Sender

MCM V-8 Alpha Drive Engines



72935

A-Ignition System

- 1 -Distributor
- 2 -Shift Cutout Switch
- 3 -Terminal Block
- 4 -Ignition Coil

B-Starting System

- 1 -Alternator
- 2 -Electric Choke (2 BBL Only)
- 3 -Ground Bolt
- 4 -Starter
- 5 -Circuit Breaker
- 6 -Starter Slave Solenoid

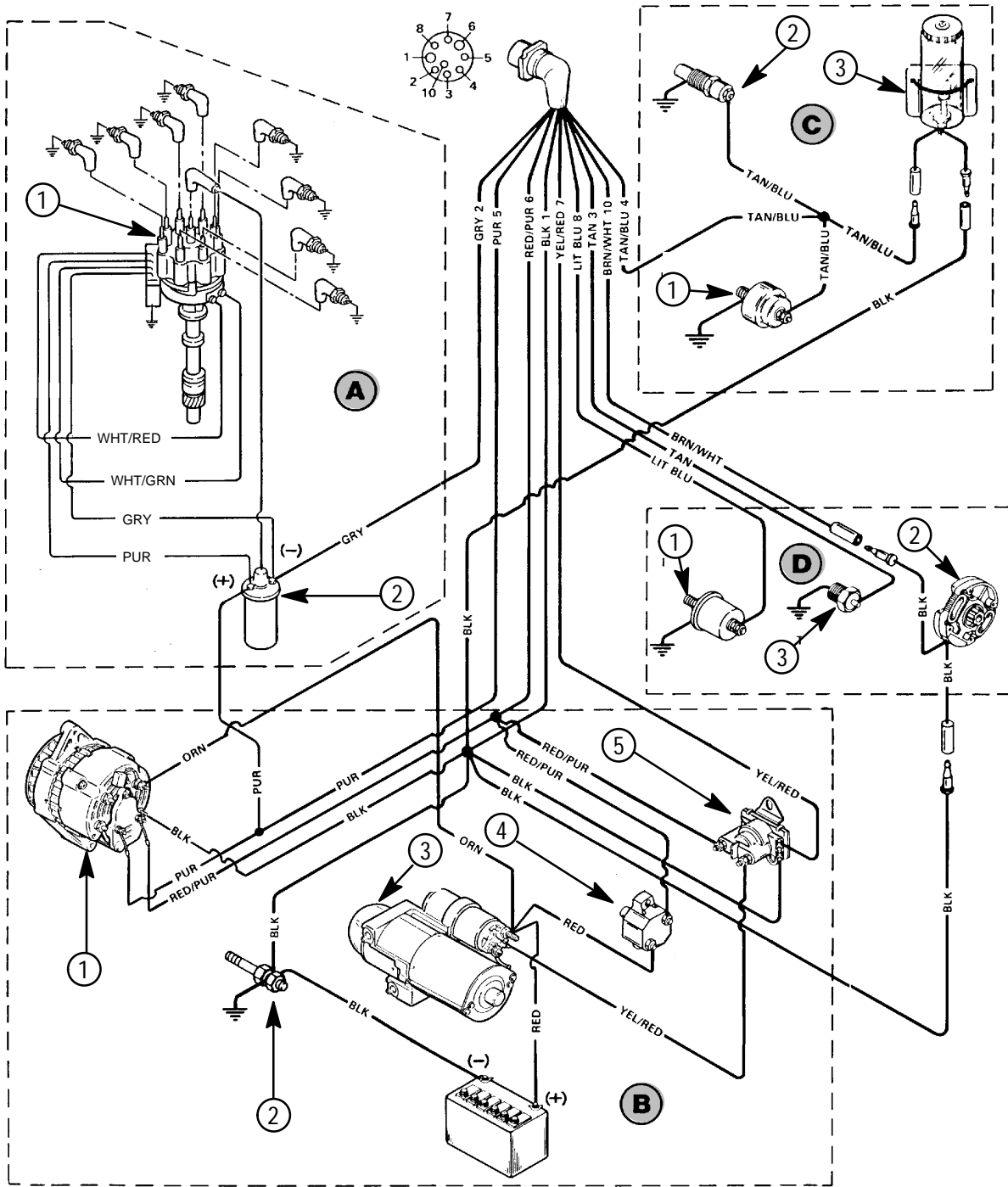
C-Audio Warning System

- 1 -Water Temperature
- 2 -Drive Unit Oil Level (If Equipped)
- 3 -Oil Pressure Switch

D-Instrumentation System

- 1 -Oil Pressure Sender
- 2 -Water Temperature Sender
- 3 -Trim Sender

MCM V-8 Bravo Drive Engines



A-Ignition System

- 1 -Distributor
- 2 -Ignition Coil

B-Starting and Charging Systems

- 1 -Alternator
- 2 -Ground Stud
- 3 -Starter Motor
- 4 -Circuit Breaker
- 5 -Starter Slave Solenoid

C-Audio Warning System

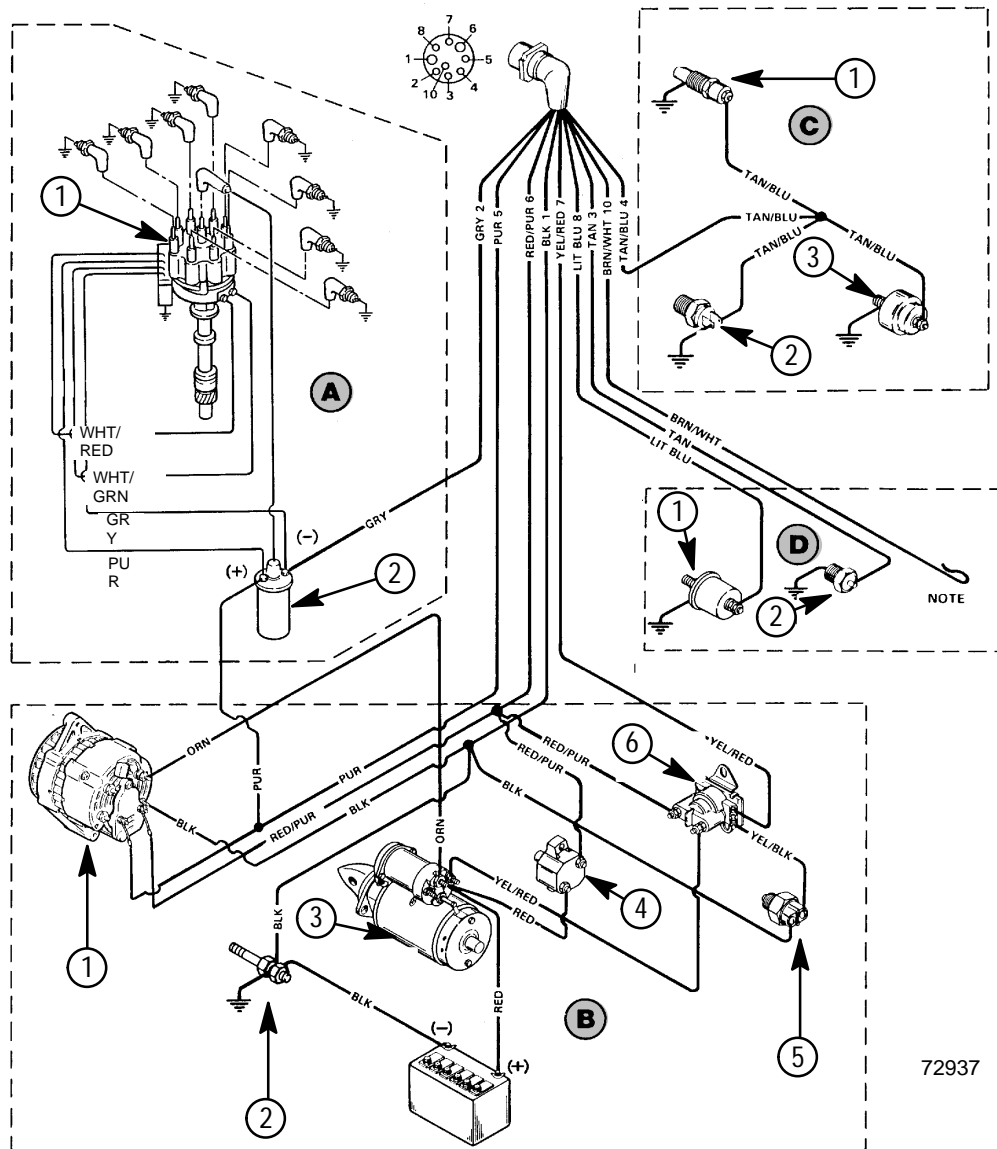
- 1 -Water Temperature
- 2 -Drive Unit Oil Level (If Equipped)
- 3 -Oil Pressure Switch

D-Instrumentation System

- 1 -Oil Pressure Sender
- 2 -Trim Sender
- 3 -Water Temperature Sender

72936

MIE V-8 All Inboard and Ski Engines



72937

NOTE : Taped back brown and black wire may be used for an accessory. LOAD MUST NOT EXCEED 5 AMPS

A-Ignition System

- 1 -Distributor
- 2 -Ignition Coil

B-Starting and Charging System

- 1 -Alternator
- 2 -Ground Stud
- 3 -Starter Motor
- 4 -Circuit Breaker
- 5 -Neutral Safety Switch

6 -StarterSlave Solenoid

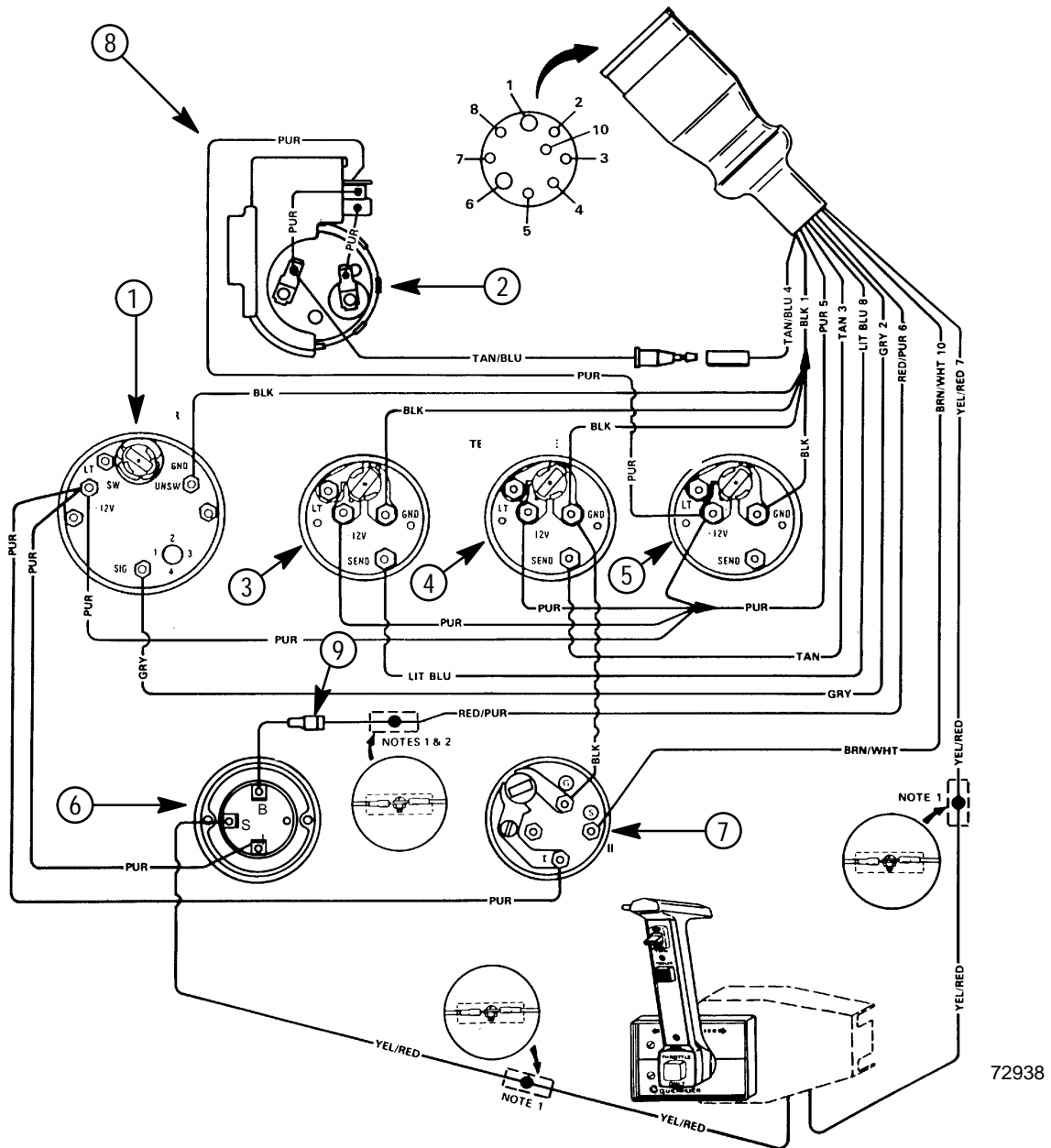
C-Audio Warning System

- 1 -Water Temperature
- 2 -Transmission Fluid Temperature
- 3 -Oil Pressure

D-Instrumentation System

- 1 -Oil Pressure Sender
- 2 -Water Temperature Sender

MCM Quicksilver Instrumentation



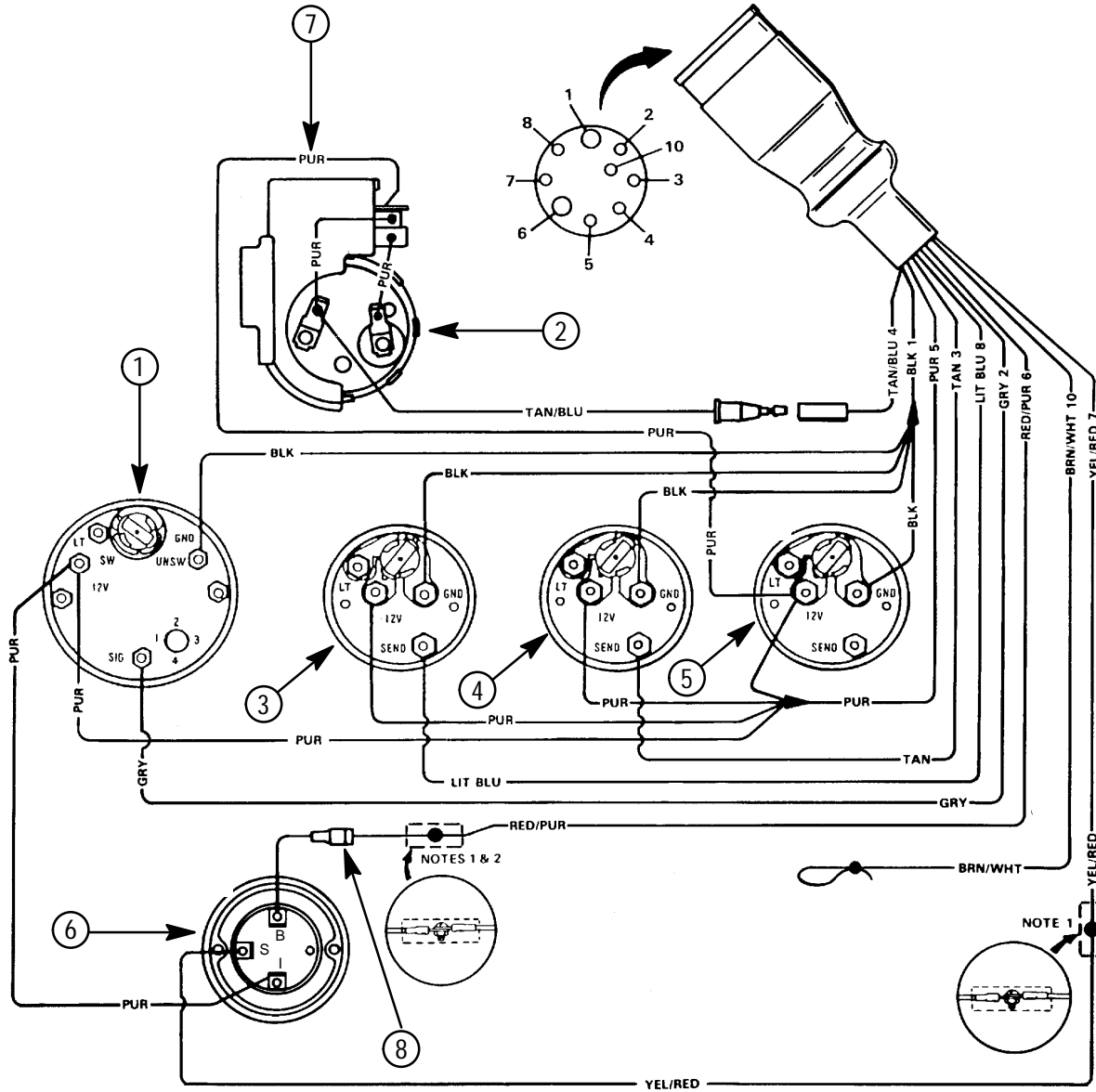
72938

NOTE 1: Connect wires together with screw and hex nut. Apply Quicksilver Liquid Neoprene to connection and slide rubber sleeve over connection.

NOTE 2: Power for a second fused accessory panel may be taken from this connection. Load **MUST NOT** exceed 35-40 amps. Panel ground wire **MUST BE** connected to instrument terminal that has an 8 gauge black (ground) harness wire connected to it.

- 1 - Tachometer
- 2 - Audio Warning Buzzer (if Equipped)
- 3 - Oil Pressure
- 4 - Water Temperature
- 5 - Battery Meter
- 6 - Ignition Switch
- 7 - Trim Indicator
- 8 - To 12 Volt Source (purple wire connection)
- 9 - 20 Ampere Fuse

MIE Quicksilver Instrumentation



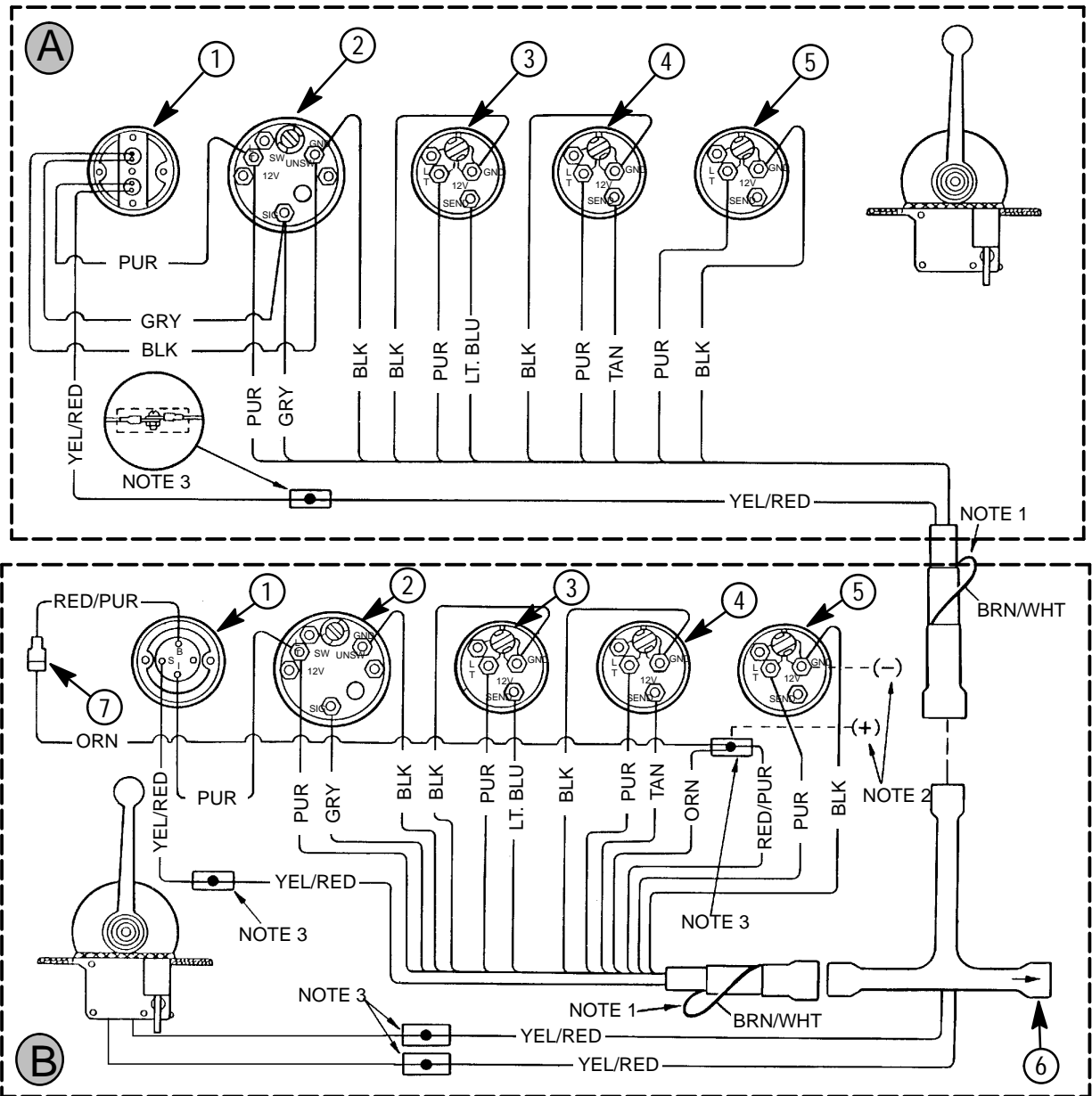
72939

NOTE 1: Connect wires together with screw and hex nut. Apply Quicksilver Liquid Neoprene to connection and slide rubber sleeve over connection.

NOTE 2: Power for a second fused accessory panel may be taken from this connection. Load **MUST NOT** exceed 35-40 amps. Panel ground wire **MUST BE** connected to instrument terminal that has an 8 gauge black (ground) harness wire connected to it.

- 1 - Tachometer
- 2 - Audio Warning Buzzer (if Equipped)
- 3 - Oil Pressure
- 4 - Water Temperature
- 5 - Battery Meter
- 6 - Ignition Switch
- 7 - To 12 Volt Source (purple wire connection)
- 8 - 20 Ampere Fuse

Dual Station Wiring (Using a Neutral Safety Switch in Only one Remote Control)



72940

NOTE 1: Brown/white wire is taped back at instrument end. If installing on boat that is equipped with MerCruiser Stern Drive, brown/white wire is connected to trim sender terminal block. If installing on MerCruiser Inboard, brown/white wire is taped back at engine end, or it may be used for an accessory (limit 5 amperes)

NOTE 2: An accessory fuse panel may be connected at this location. The combined current draw of the primary station and secondary station **MUST NOT** exceed 35 amperes.

NOTE 3: Connect wires together with screw and hex nut. Apply Quicksilver Liquid Neoprene to connection and slide rubber sleeve over connection.

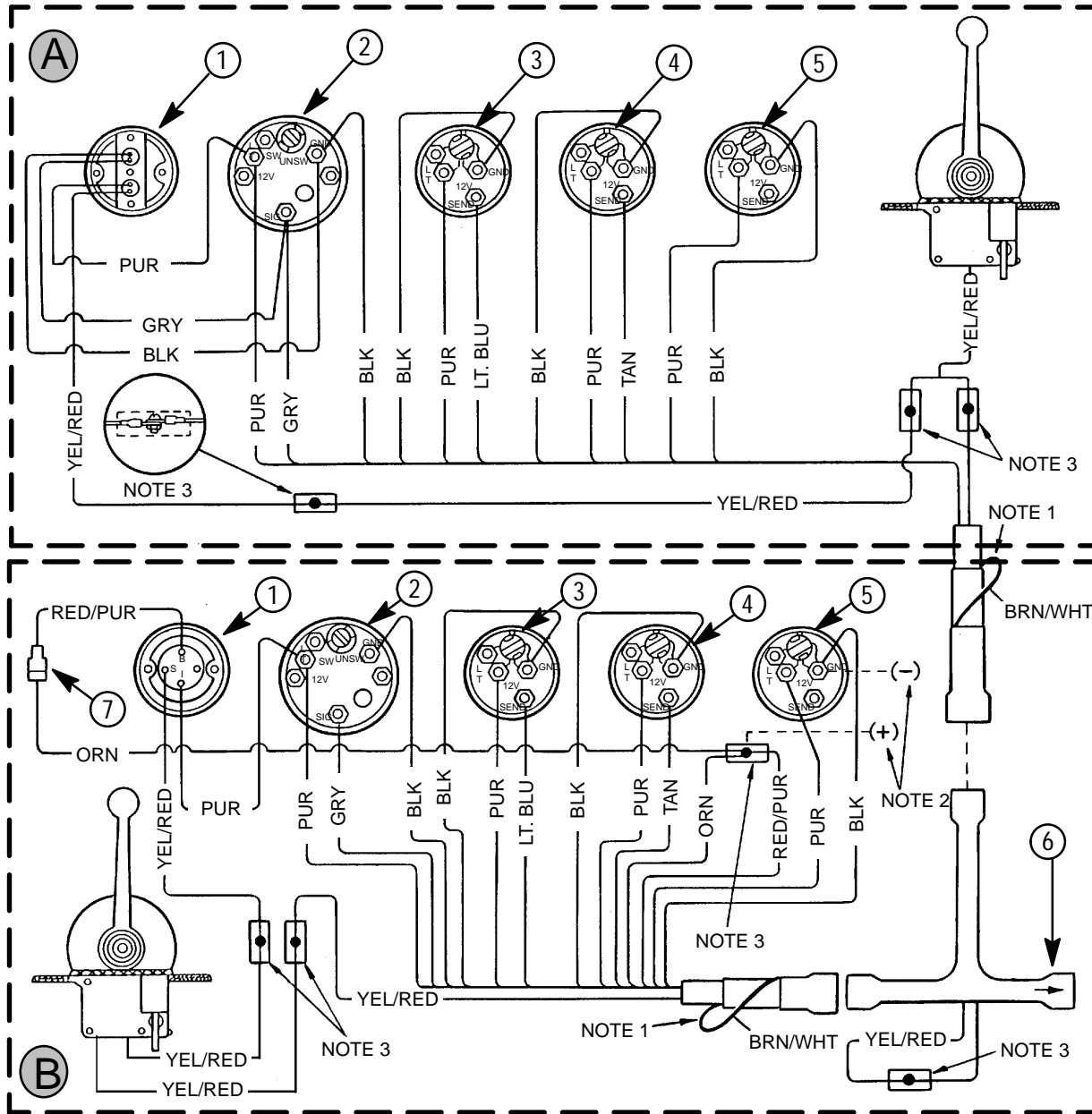
A - Secondary Station

- 1 - Stop -Start Panel
- 2 - Tachometer
- 3 - Oil Pressure
- 4 - Water Temperature
- 5 - Battery Meter

B - Primary Station

- 1 - Ignition Switch
- 2 - Tachometer
- 3 - Oil Pressure
- 4 - Water Temperature
- 5 - Battery Meter
- 6 - To Engine
- 7 - 20 Ampere Fuse

Dual Station Wiring (Using A Neutral Safety Switch In both Remote Controls)



72941

NOTE 1: Brown/white wire is taped back at instrument end. If installing on boat that is equipped with MerCruiser Stern Drive, brown/white wire is connected to trim sender terminal block. If installing on MerCruiser Inboard, brown/white wire is taped back at engine end, or it may be used for an accessory (limit 5 amperes)

NOTE 2: An accessory fuse panel may be connected at this location. The combined current draw of the primary station and secondary station **MUST NOT** exceed 35 amperes.

NOTE 3: Connect wires together with screw and hex nut. Apply Quicksilver Liquid Neoprene to connection and slide rubber sleeve over connection.

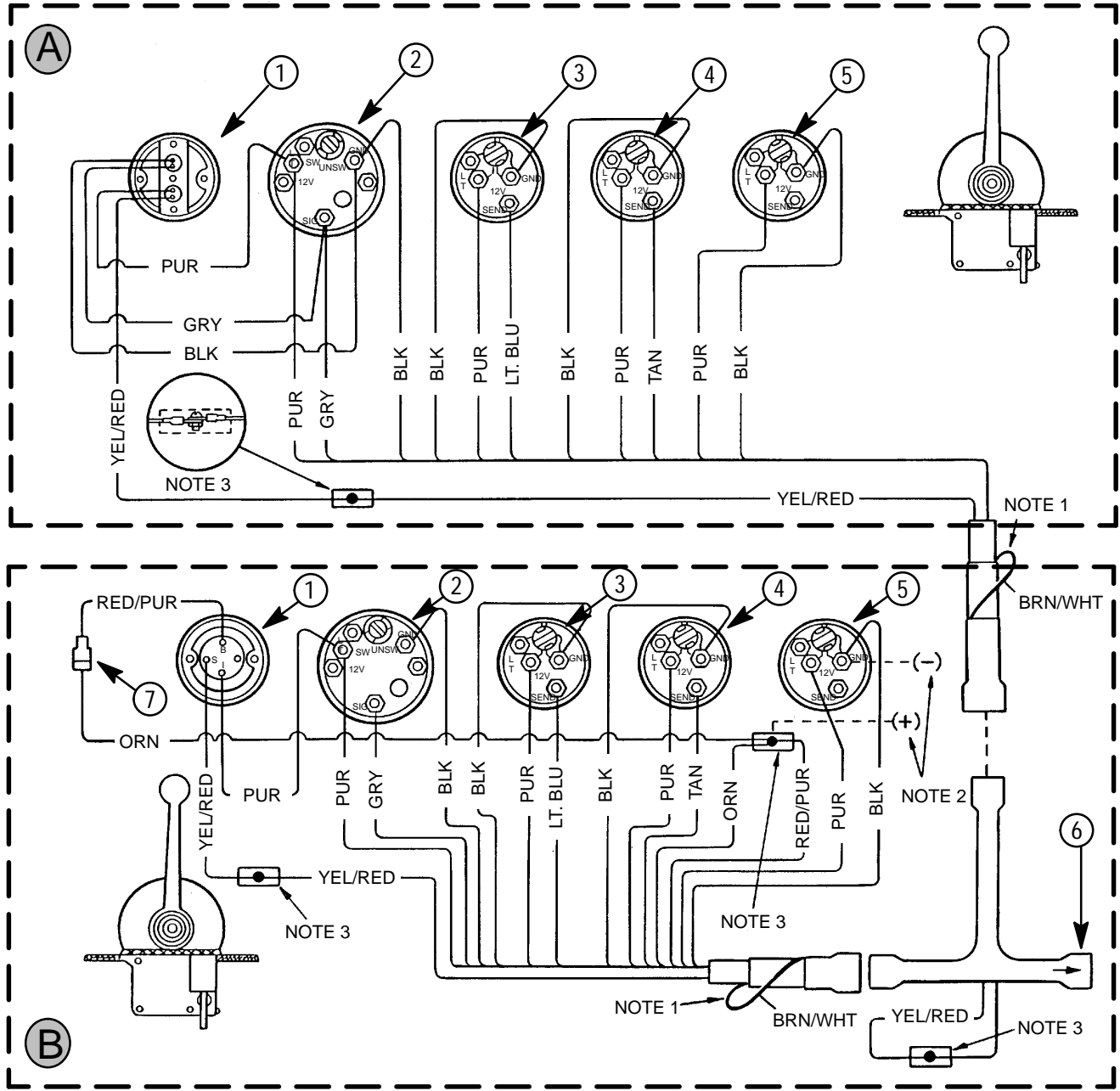
A - Secondary Station

- 1 - Stop -Start Panel
- 2 - Tachometer
- 3 - Oil Pressure
- 4 - Water Temperature
- 5 - Battery Meter

B - Primary Station

- 1 - Ignition Switch
- 2 - Tachometer
- 3 - Oil Pressure
- 4 - Water Temperature
- 5 - Battery Meter
- 6 - To Engine
- 7 - 20 Ampere Fuse

Dual Station Wiring (Using a Neutral Safety Switch in Engine Wiring Harness)



72942

NOTE 1: Brown/white wire is taped back at instrument end. If installing on boat that is equipped with MerCruiser Stern Drive, brown/white wire is connected to trim sender terminal block. If installing on MerCruiser Inboard, brown/white wire is taped back at engine end, or it may be used for an accessory (limit 5 amperes)

NOTE 2: An accessory fuse panel may be connected at this location. The combined current draw of the primary station and secondary station **MUST NOT** exceed 35 amperes.

NOTE 3: Connect wires together with screw and hex nut. Apply Quicksilver Liquid Neoprene to connection and slide rubber sleeve over connection.

A - Secondary Station

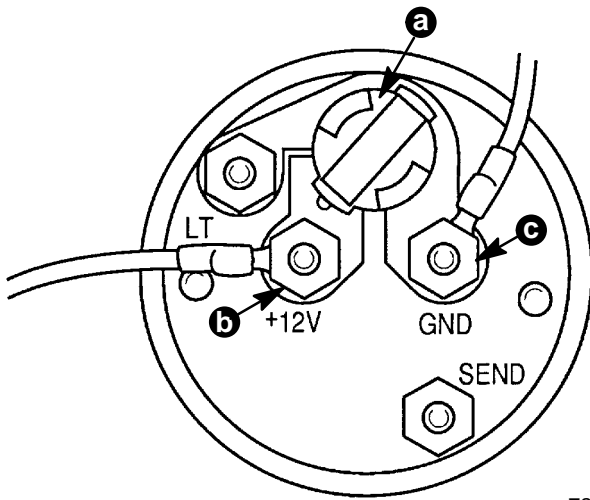
- 1 - Stop -Start Panel
- 2 - Tachometer
- 3 - Oil Pressure
- 4 - Water Temperature
- 5 - Battery Meter

B - Primary Station

- 1 - Ignition Switch
- 2 - Tachometer
- 3 - Oil Pressure
- 4 - Water Temperature
- 5 - Battery Meter
- 6 - To Engine
- 7 - 20 Ampere Fuse

Gauges

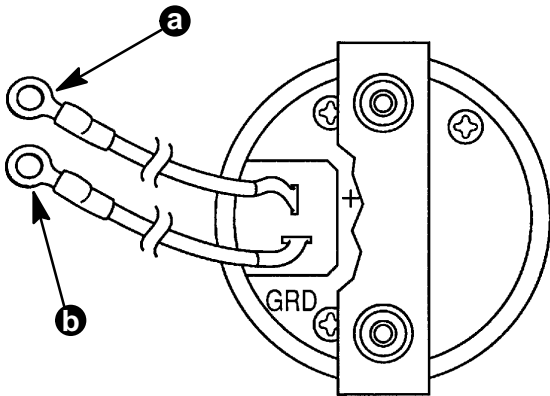
Battery Meter Gauge



72814

- a - Lamp Mounting Hole
- b - Purple (or White) Jumper Wire from This Terminal to I . . .
.. (or+) Terminal on Water Temperature or Oil Pressure Gauge
- c - Black Jumper Wire from This Terminal to Ground Terminal on Water Temperature or Oil Pressure Gauge

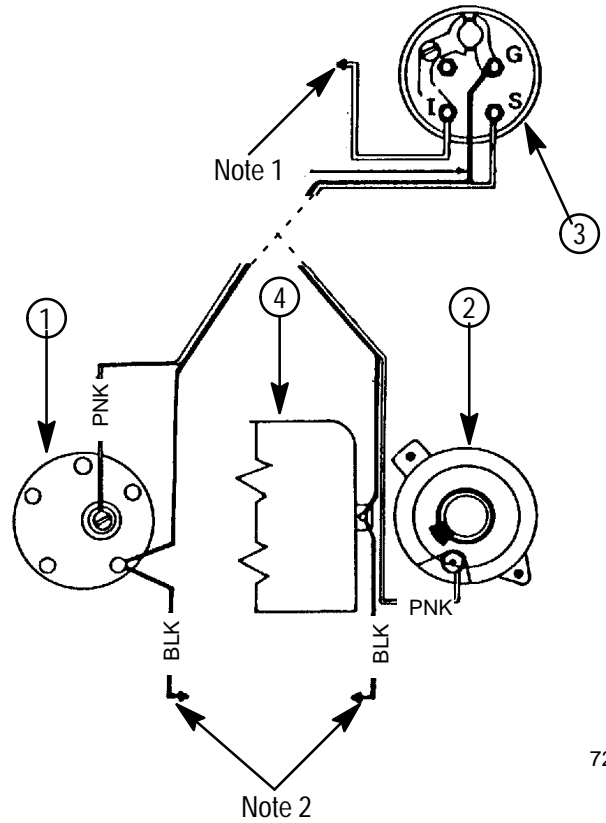
Cruiselog



72815

- a - Connect to Ignition Switch 12 Volt Positive(+) Source (PURPLE WIRE)
- b - Connect to Negative (-) Ground (BLACK WIRE)

Fuel Gauge and Sender



72816

Note 1: Connect terminal to Ignition or Accessory Terminal of Ignition.

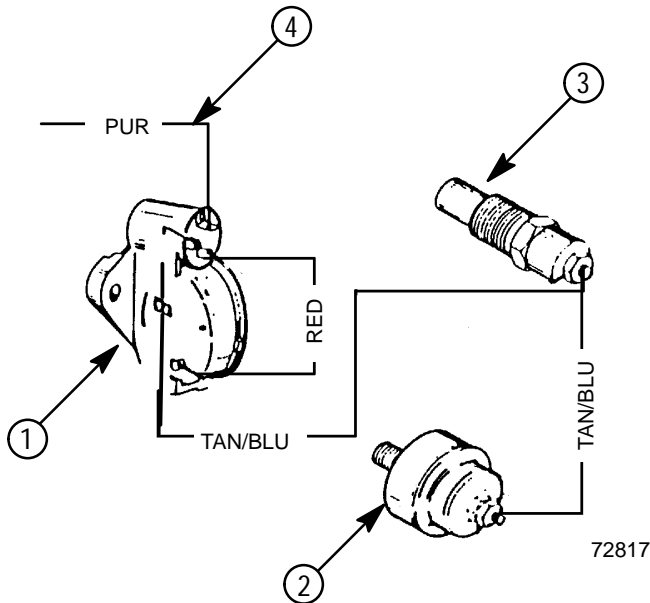
Note 2: Connect to Negative Battery Terminal or Suitable Ground.

- 1 - Tank Sender
- 2 - Sender Capsule
- 3 - Fuel Gauge (Black Case)

Audio Warning System

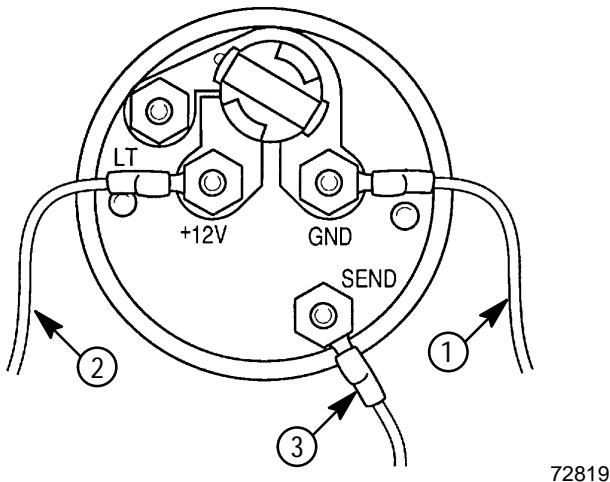
⚠ WARNING

Buzzer is not external ignition-proof; therefore, **DO NOT** mount buzzer in engine or fuel tank compartments.



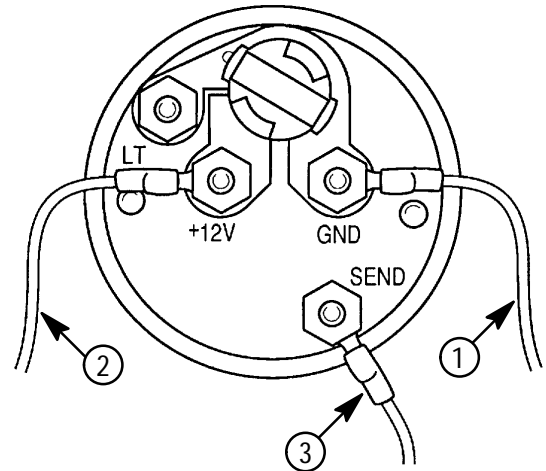
- 1 - Audio Warning Buzzer
- 2 - Water Temperature Switch
- 3 - Oil Pressure Switch
- 4 - 12 Volt Power Source

Water Temperature Gauge



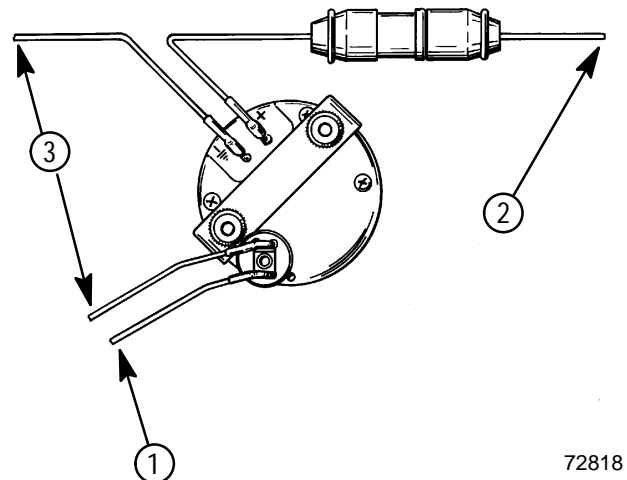
- 1 - Ground (BLACK)
- 2 - Switched 12 Volt Terminal (PURPLE)
- 3 - Sender Lead (TAN)

Oil Pressure Gauge



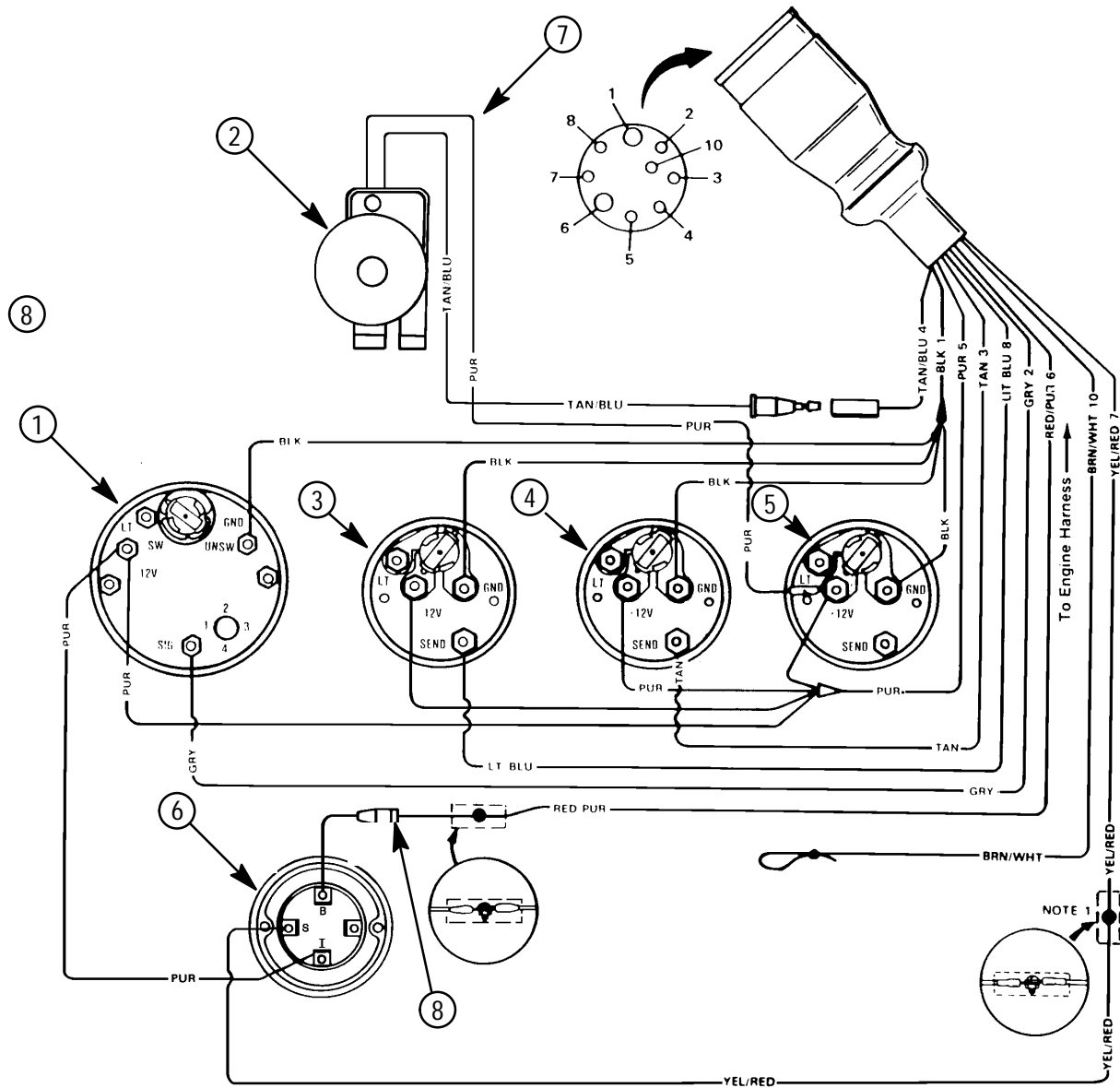
- 1 - Ground (Black)
- 2 - Switched 12 Volt Terminal (PURPLE)
- 3 - Sender Lead (LIGHT BLUE)

Clock



- 1 - Connect Wire (DARK BLUE) to an Ignition Terminal of an Adjacent Gauge or to Any Switched 12 Volt Terminal.
- 2 - Connect to Instrument Harness (RED/PURPLE) Lead and Slide a Rubber Sleeve over the Connection.
- 3 - Connect Wire (BLACK) to a Terminal on an Adjacent Gauge or to Another Suitable Ground.

Quicksilver Instrumentation For 454 Magnum EFI Ski

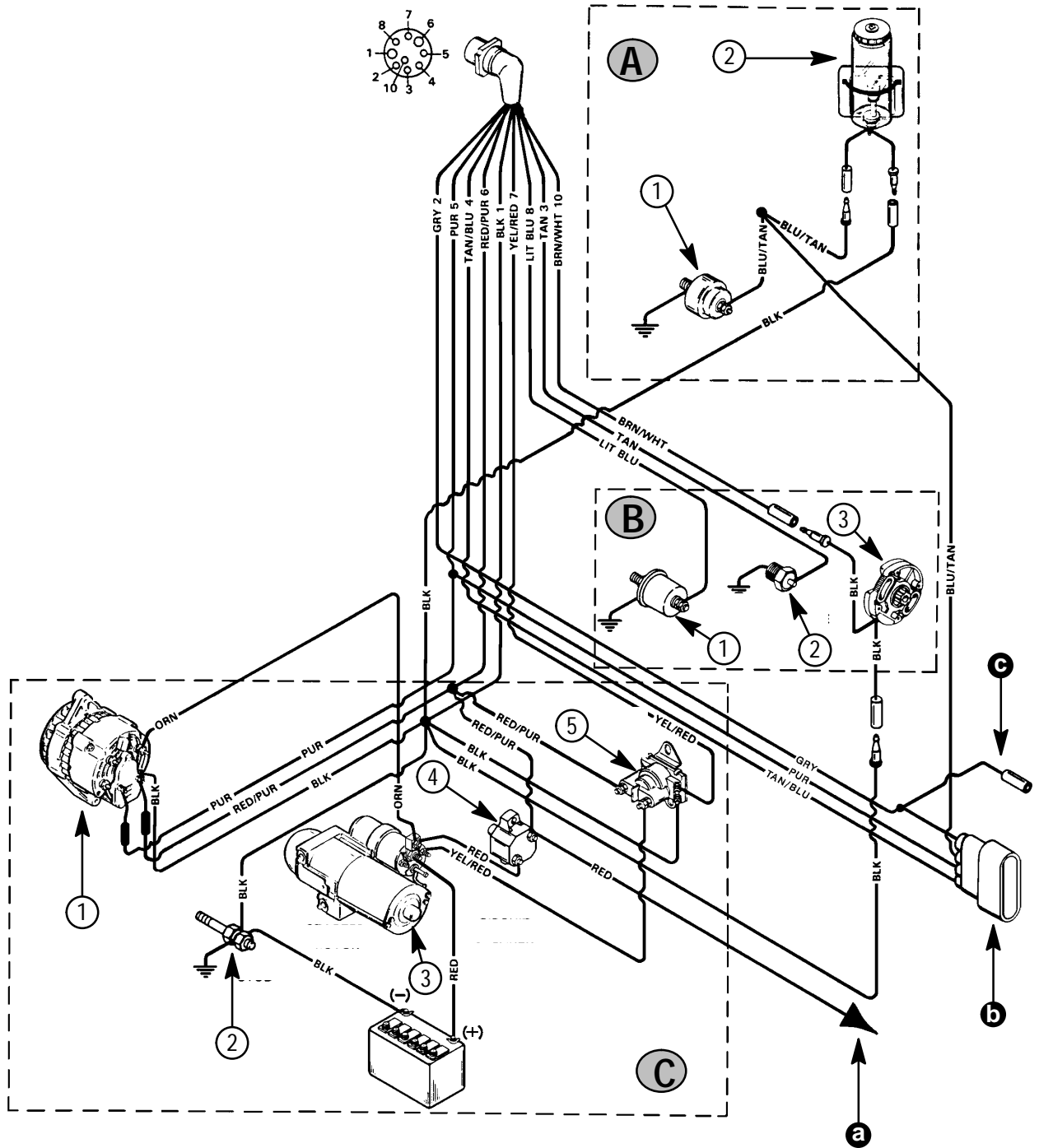


NOTE 1: Connect wires together with screw and hex nut. Apply Quicksilver Liquid Neoprene to connection and slide rubber sleeve over connection.

NOTE 2: Power for a second fused accessory panel may be taken from this connection. Load **MUST NOT** exceed 35-40 amps. Panel ground wire **MUST BE** connected to instrument terminal that has an 8 gauge black (ground) harness wire connected to it.

- 1 - Tachometer
- 2 - Audio Warning Buzzer (if Equipped)
- 3 - Oil Pressure
- 4 - Water Temperature
- 5 - Battery Meter
- 6 - Ignition Switch
- 7 - To 12 Volt Source (purple wire connection)
- 8 - 20 Ampere Fuse

Wiring Diagrams for 502 EFI



71693

A - Audio Warning System

- 1 - Oil Pressure Switch
- 2 - Drive Unit Oil Level

B - Instrumentation System

- 1 - Oil Pressure Sender
- 2 - Water Temperature Sender
- 3 - Trim Sender

C - Charging and Starting System

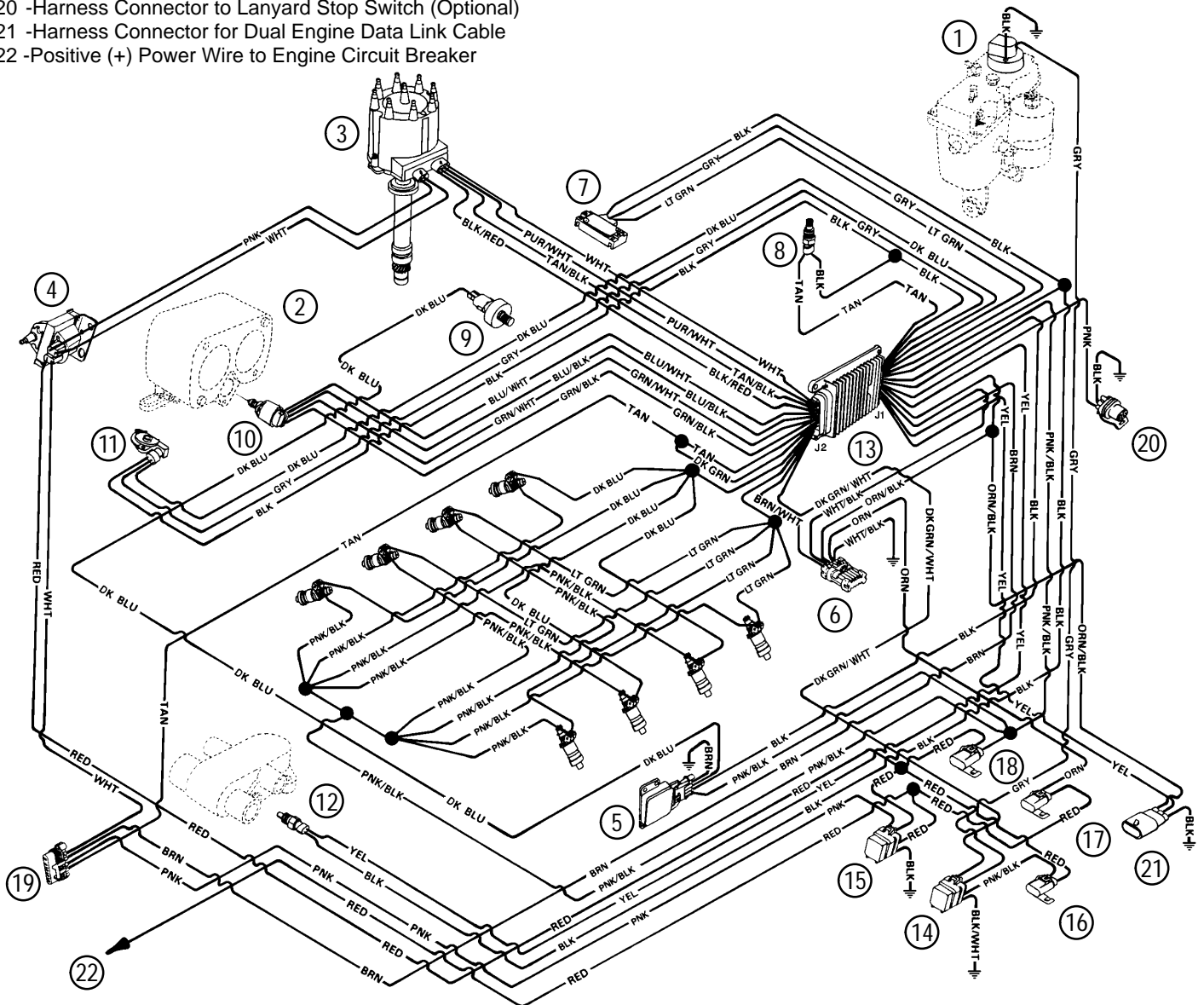
- 1 - Alternator
- 2 - Ground Stud
- 3 - Starter
- 4 - Circuit Breaker
- 5 - Starter Slave Solenoid

- a - Positive Power Wire To EFI System Harness
- b - Harness Connector To EFI System Harness
- c - Auxiliary Tachometer Lead

Wiring Diagrams (Continued)

- 1 - Vapor Separator Tank (VST)
- 2 - Throttle Body
- 3 - Distributor
- 4 - Coil
- 5 - Electronic Spark Control (ESC) Module
- 6 - Assembly Line Data Link (ALDL)
- 7 - Manifold Absolute Pressure (MAP) Sensor
- 8 - Manifold Air Temperature (MAT) Sensor
- 9 - Knock Sensor
- 10 -Idle Air Control (IAC)
- 11-Throttle Position Sensor (TPS)
- 12 -Coolant Temperature Sensor (CTS)
- 13 -Electronic Control Module (ECM)
- 14 -Fuel Pump Relay
- 15 -Ignition Relay
- 16 -Fuel Pump Fuse (15 Amp)
- 17 -Injector Fuse(15 Amp)
- 18 -ECM Fuse (10 Amp)
- 19 -Harness Connector to Starting/Charging Harness
- 20 -Harness Connector to Lanyard Stop Switch (Optional)
- 21 -Harness Connector for Dual Engine Data Link Cable
- 22 -Positive (+) Power Wire to Engine Circuit Breaker

- BLK = Black
- BLU = Blue
- BRN = Brown
- GRN = Green
- GRY = Gray
- ORN =Orange
- PNK = Pink
- PUR = Purple
- RED = Red
- TAN = Tan
- WHT White
- YEL = Yellow
- LIT = Light
- DRK = Dark

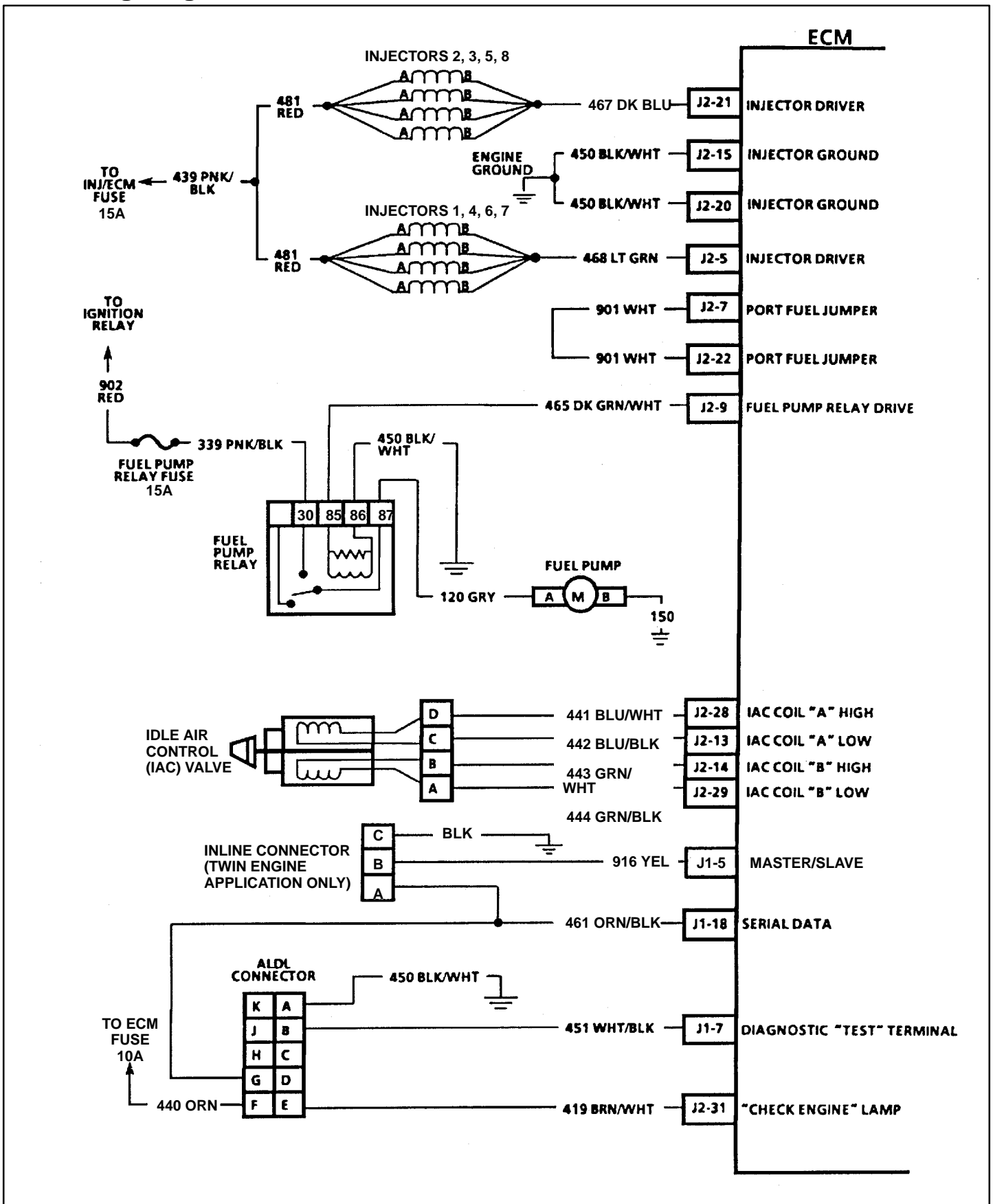


NOTE: All black wires with a ground symbol are interconnected within the EFI system harness.

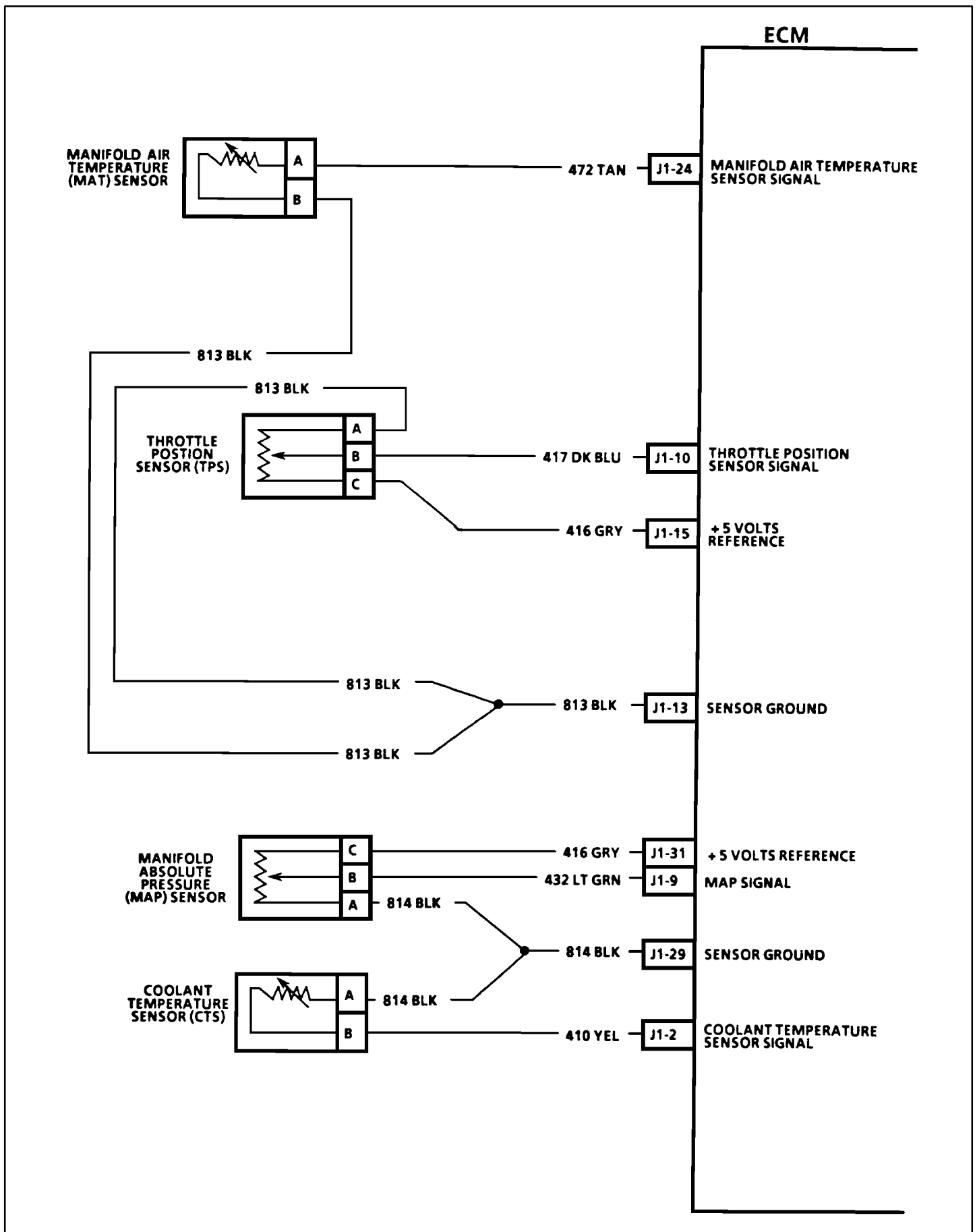
71692

MCM (Stern Drive) -454/502 MAGNUM EFI ENGINE SYSTEM HARNESS

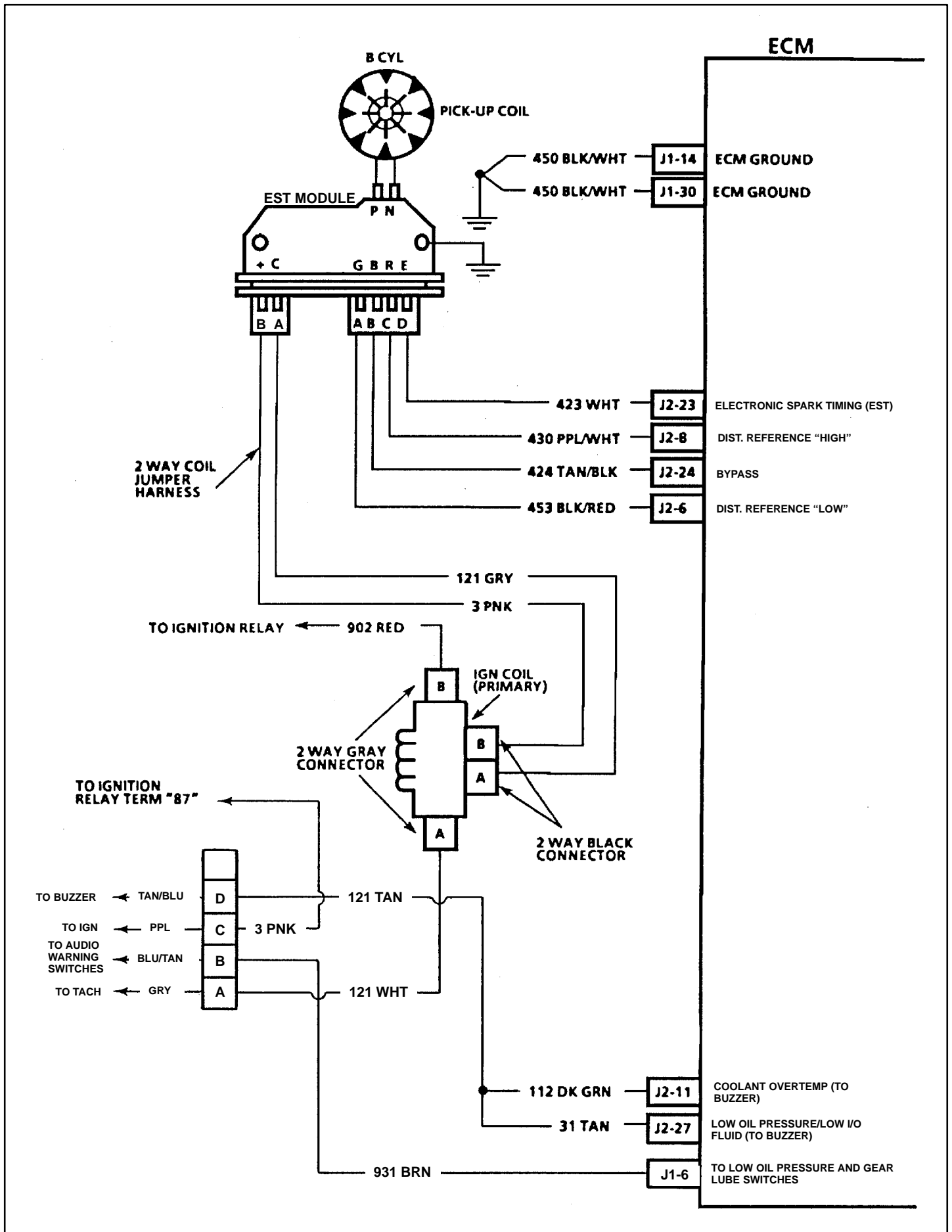
EFI Wiring Diagram



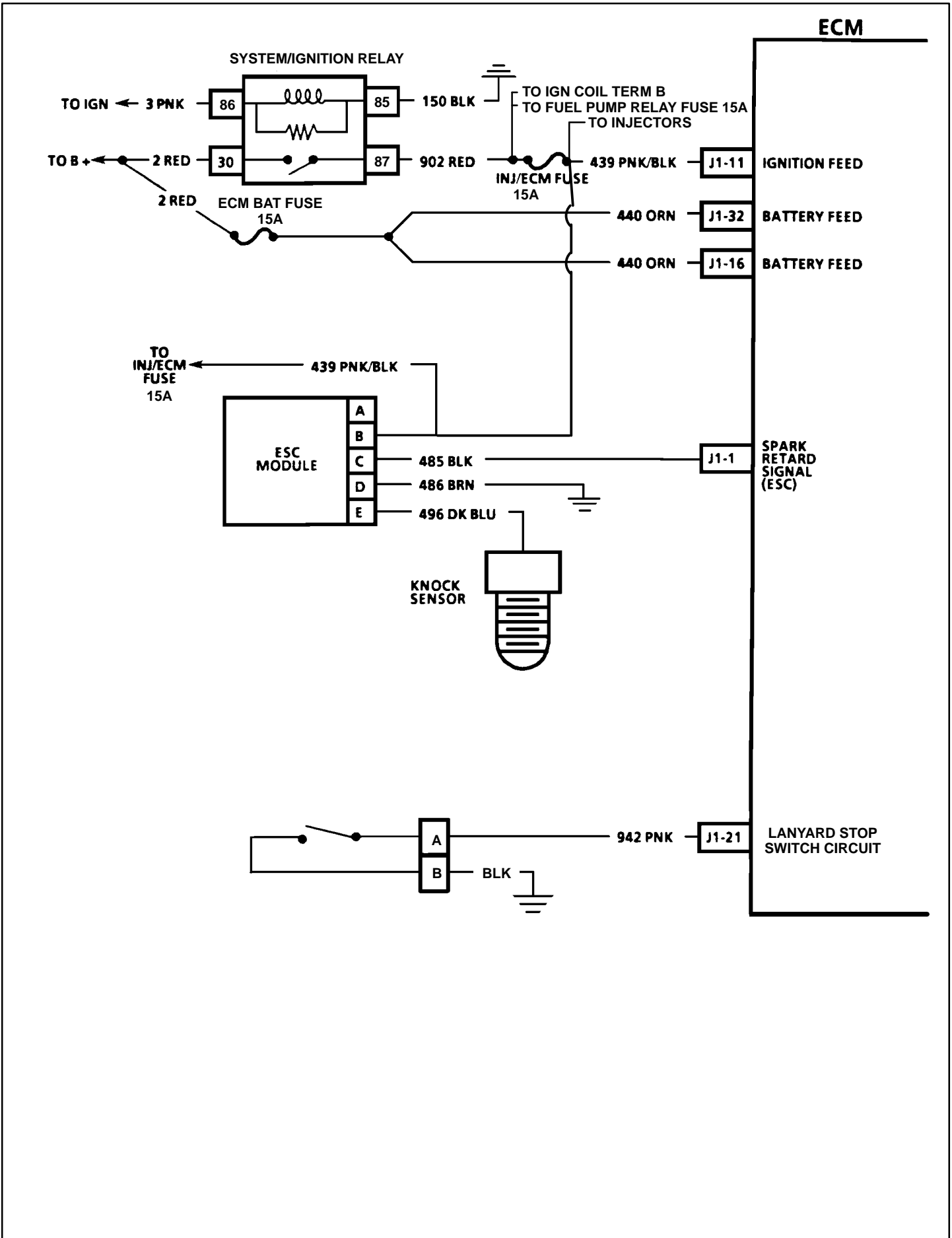
EFI Wiring Diagram (1 of 4)



EFI Wiring Diagram (2 of 4)



EFI Wiring Diagram (3 of 4)



EFI Wiring Diagram (4 of 4)

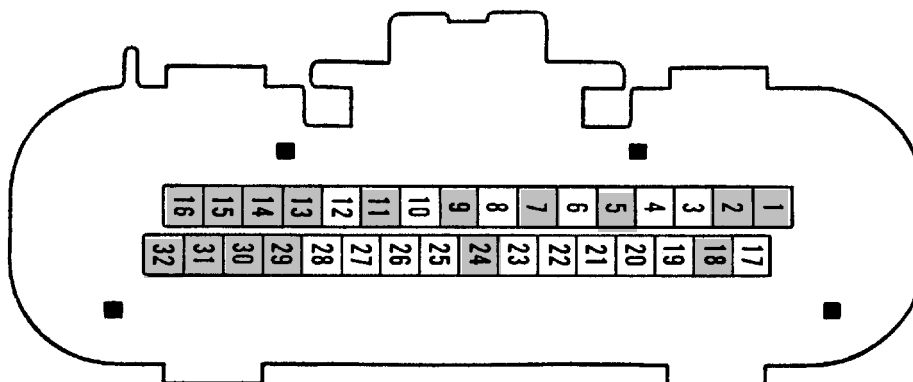
ECM Component Connector Charts

The following charts is to aid in diagnosis of symptoms. These voltages were derived from a known good engine. The voltages shown were done with the electrical system intact and operational. These are voltage requirements to operate the different circuits.

⚠ CAUTION

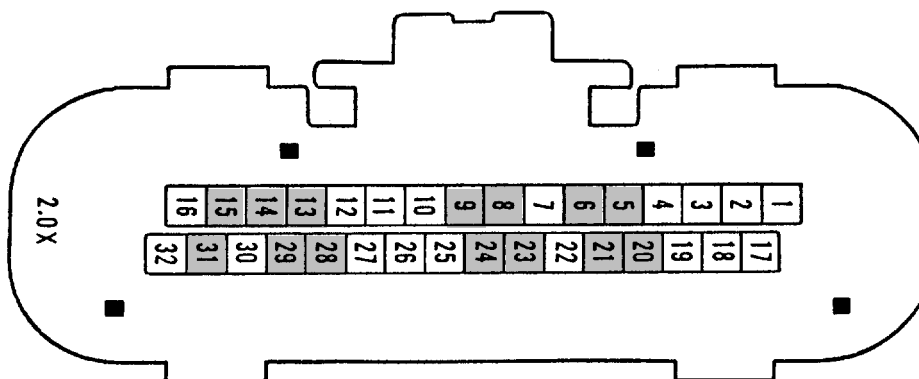
Do not attempt to obtain these voltages by probing wires and connectors. Serious damage could result in loss of engine operation or wiring damage. Voltages can vary with battery conditions.

J-1



J-1 Front Pin 32 Pin Output Connector

J-2



J-2 Rear Pin 32 Pin Output Connector

THESE NOTES APPLY TO FOLLOWING ECM CONNECTOR AND SYMPTOMS CHARTS.

The "B+" Symbol indicates a system voltage (battery).

NOTE 1: Battery voltage for first two seconds, then 0 volts.

NOTE 2: Varies with temperature.

NOTE 3: Varies with manifold vacuum.

NOTE 4: Varies with throttle movement.

NOTE 5: Less than .5 volt (500 mV).

ECM Connector and EFI Symptoms Chart

Pin	Pin Function	Circuit (CKT) Number (#)	Wire Color	Component Connector	Normal Voltage		Diagnostic Trouble Codes DTC(s)	Possible Symptoms
					Ignition ON	Engine Running		
J1-1	Knock Sensor Signal	485	BLK	Knock Sensor	9.5V	9.5V	43	Poor Fuel Economy, Poor Performance Detonation
J1-2	ECT Signal	410	YEL	ECT Sensor	1.95V (NOTE 2)	1.95V (NOTE 2)	14	Poor Performance, Exhaust Odor, Rough Idle, RPM Reduction
J1-3	Not Used	–	–	–	–	–	–	–
J1-4	Not Used	–	–	–	–	–	–	–
J1-5	Master Slave	916	YEL	In Line Boat Harness	B+	B+	None	Lack Of Data From Other Engine (Dual Engine Only)
J1-6	Not Used	–	–	–	–	–	–	–
J1-7	Diagnostic Test	451	WHT/BLK	Data Link Connector	B+	B+	None	Incorrect Idle, Poor Performance
J1-8	Not Used	–	–	–	–	–	–	–
J1-9	Map Signal	432	LT GRN	MAP Sensor	4.9V	1.46V (NOTE 3)	33	Poor Performance, Surge, Poor Fuel Economy, Exhaust Odor
J1-10	TP Signal	–	DK BLU	TP Sensor	.62V (NOTE 4)	.62V (NOTE 4)	21	Poor Performance And Acceleration, Incorrect Idle
J1-11	Ignition Fused	439	PNK/BLK	Splice	B+	B+	None	No Start
J1-12	Not Used	–	–	–	–	–	–	–
J1-13	TP and IAT Ground	813	BLK	TP and IAT Sensor	0 (NOTE 5)	0 (NOTE 5)	21,23	High Idle, Rough Idle, Poor Performance Exhaust Odor
J1-14	ECM Ground	450	BLK/WHT	Engine Block	0 (NOTE 5)	0 (NOTE 5)	None	No Charge
J1-15	TP 5V Reference	416	GRY	TP,MAP Sensors	5V	5V	21,33	Lack Of Power, Idle High
J1-16	Battery	440	ORN	Splice	B+	B+	None	No Start

See Page 4D-21 For NOTES

ECM Connector and EFI Symptoms Chart

Pin	Pin Function	Circuit (CKT) Number (#)	Wire Color	Component Connector	Normal Voltage		Diagnostic Trouble Codes DTC(s)	Possible Symptoms
					Ignition ON	Engine Running		
J1-17	Not Used	–	–	–	–	–	–	–
J1-18	Serial Data	461	ORN/BLK	Data Link Connector	5V	5V	None	No Serial Data
J1-19	Not Used	–	–	–	–	–	–	–
J1-20	Not Used	–	–	–	–	–	–	–
J1-21	Not Used	–	–	–	–	–	–	–
J1-22	Not Used	–	–	–	–	–	–	–
J1-23	Not Used	–	–	–	–	–	–	–
J1-24	IAT Sensor	472	TAN	IAT Sensor	5V	(NOTE 2)	23	Poor Fuel Economy, Exhaust Odor
J1-25	Not Used	–	–	–	–	–	–	–
J1-26	Not Used	–	–	–	–	–	–	–
J1-27	Not Used	–	–	–	–	–	–	–
J1-27	Not Used	–	–	–	–	–	–	–
J1-28	Not Used	–	–	–	–	–	–	–
J1-29	MAP Ground	814	BLK	MAP Sensor	0 (NOTE 5)	0 (NOTE 5)	33	Lack Of Performance, Exhaust Odor, Stall
J1-30	ECM Ground	450	BLK/WHT	Engine Block	0 (NOTE 5)	0 (NOTE 5)	None	No Change
J1-31	MAP 5V Reference	416E	GRY	MAP Sensor	5V	5V	33	Lack Of Power, Surge, Rough Idle, Exhaust Odor
J1-32	Battery	440	ORN	Splice	B+	B+	None	No Start

See page 4B-22 for NOTES

ECM Connector and EFI Symptoms Chart

Pin	Pin Function	Circuit (CKT) Number (#)	Wire Color	Component Connector	Normal Voltage		Diagnostic Trouble Codes DTC(s)	Possible Symptoms
					Ignition ON	Engine Running		
J2-1	Not Used	–	–	–	–	–	–	–
J2-2	Not Used	–	–	–	–	–	–	–
J2-3	Not Used	–	–	–	–	–	–	–
J2-4	Not Used	–	–	–	–	–	–	–
J2-5	Injector Driver	468	LT GRN	Injector	B+	B+	None	Rough Idle, Lack Of Power, Stall
J2-6	Ignition Control Ref. Low	463	BLK/WHT	Ignition Control Module	0 (NOTE 5)	0 (NOTE 5)	None	No Change
J2-7	Not Used	–	–	–	–	–	–	–
J2-8	Ignition Control Ref. High	430	PUR/WHT	Ignition Control Module	5V	1.6V	None	No Restart
J2-9	Fuel Pump Relay Driver	465	DK GRN/WHT	Fuel Pump Relay	0 (NOTE 1&5)	B+	None	No Start
J2-10	Not Used	–	–	–	–	–	–	–
J2-11	Not Used	112	DK GRN	Buzzer, Ignition, Tach	–	–	–	–
J2-12	Not Used	–	–	–	–	–	–	–
J2-13	IAC "A" Low	442	BLU/BLK	IAC Valve	Not Usable	Not Usable	None	Rough Unstable or Incorrect Idle
J2-14	IAC "B" Low	443	GRN/WHT	IAC Valve	Not Usable	Not Usable	None	Rough Unstable or Incorrect Idle
J2-15	Fuel Injector Ground	450	BLK/WHT	Engine Ground	0 (NOTE 5)	0 (NOTE 5)	None	No Change
J2-16	Not Used	–	–	–	–	–	–	–

See page 4B-22 for NOTES

ECM Connector and EFI Symptoms Chart

Pin	Pin Function	Circuit (CKT) Number (#)	Wire Color	Component Connector	Normal Voltage		Diagnostic Trouble Codes DTC(s)	Possible Symptoms
					Ignition ON	Engine Running		
J2-17	Not Used	–	–	–	–	–	–	–
J2-18	Not Used	–	–	–	–	–	–	–
J2-19	Not Used	–	–	–	–	–	–	–
J2-20	Fuel Injector Ground	450	BLK/WHT	Engine Ground	0 (NOTE 5)	0 (NOTE 5)	None	No Change
J2-21	Injector Driver	467	DK BLU	Injector	B+	B+	None	Rough Idle, Lack Of Power, Stalling
J2-22	Not Used	–	–	–	–	–	–	–
J2-23	Ignition Control Signal	423	WHT	Ignition Control Module	0 (NOTE 5)	1.2V	42	Stall, Will Restart In Bypass Mode, Lack Of Power
J2-24	Ignition Control Bypass	424	TAN/BLK	–	0 (NOTE 5)	4.5V	42	Lack Of Power, Fixed Timing
J2-25	Not Used	–	–	–	–	–	–	–
J2-26	Not Used	–	–	–	–	–	–	–
J2-27	Not Used	–	–	–	–	–	–	–
J2-28	Idle Air Control "A" High	441	BLU/WHT	IAC Valve	Not Usable	Not Usable	None	Rough Unstable or Incorrect Idle
J2-29	Idle Air Control "B" Low	444	GRN/WHT	IAC Valve	Not Usable	Not Usable	None	Rough Unstable or Incorrect Idle
J2-30	Not Used	–	–	–	–	–	–	–
J2-31	Malfunction Indicator Lamp	419	BRN/WHT	Data Link Connector	0 (NOTE 5)	0 (NOTE 5)	None	Lamp Inoperative
J2-32	Not Used	–	–	–	–	–	–	–

See page 4B-22 for NOTES