

## Volvo Conversion Harness for 740 Turbo or Non-Turbo. Conversion to LH 2.4, EZK 116,

with optional use of High or Low Impedance Fuel Injectors.

Circuits related to the EZK system are in BLUE text.

#### **Understanding Diagram Wire Locations in These Pages**

You will see information such as shown below for each connector in this harness. In the event that you need to know where any wire goes, this will explain how to read it these diagrams.

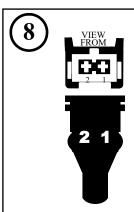


The number at left is a CONNECTOR NUMBER. You will see numbers like this for each connector listed.

#### The below example shows a plug with two wires.

The #1 **Black** wire shows **13**, which means the OTHER end on this wire goes to Connector 13 (which is a Ground Ring).

The #2 **Blue** wire shows **1/2**, which means the OTHER end of this wire goes to Connector 1, Position 2. Connector #1 is the ECU, so this circuit goes to ECU Pin 2.



Wire Colors:		
1. Black	13	to ground ring.
2. Blue	1/2	to ECU pin 2.
ſ		

#### **RESISTOR PACK PLUG**

This harness is equipped with the below CONNECTOR and BY-PASS ADAPTER shown in these diagrams as Connector #27 (6-pole plug).

With no changes and with by-pass plug in place, this harness will support High Impedance Injectors.

If you decide to use Low Impedance Injectors, you must unplug the by-pass adapter and instead plug in any standard Volvo 740 Turbo fuel injector Ballast Resistor Pack. Using low impedance injectors with an LH 2.4 ECU without this resistor pack can damage your ECU.







#### 35-Pole Fuel Injection ECU Connector — Under Dash

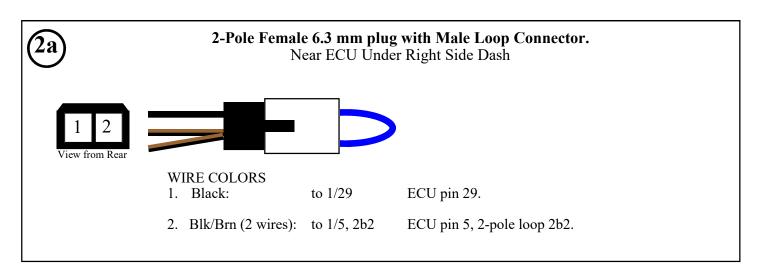
#### <u>1 2</u> 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18

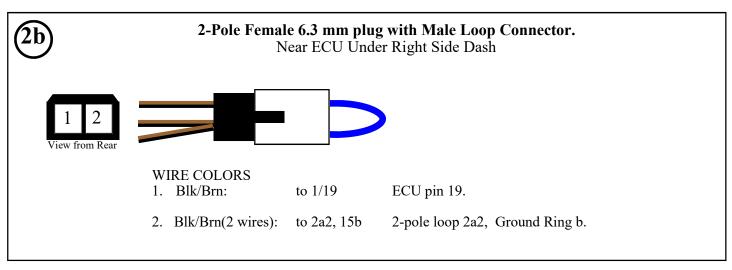
#### 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35

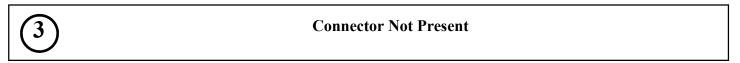
#### VIEW FROM FRONT FACE—USE POLE NUMBER MARKINGS ON PLUG

1	WIRE COLOR	DESTINATION	DESTINATION DESCRIPTION	ECU FUNCTION
1. 2.	Brown: Yell/White:	to <b>7/17</b> to <b>7/7</b> , 13/1	ICU pin 17. ICU pin 7, TPS pin 1.	Engine speed signal input from ICU. Input signal from TPS when throttle is closed
3.	Blk/White:	to 13/3	TPS pin 3.	(idle). Input signal from TPS for full throttle. Not used
4.	Red (2 wires):	to 4/3, <b>7/5</b> , 20	Fuel Relay pin 3, ICU pin 5,	on B230FT ( <b>SEE NOTE BELOW</b> ). 12v power constant (terminal 30).
5.	Blk/Brown: Black:	to 2a2	LH 25A fuse. 2-pole loop 2a2. Shield for 1/24 Green.	Ground for shield (Overgon Sonson)
6	Grn/Yell:	to 8/2		Ground for shield (Oxygen Sensor). Ground for MAF.
6. 7.	Red/Wht:	to 8/3	MAF pin 2.	
			MAF pin 3.	Input signal from MAF.
	White:	to 8/4	MAF pin 4.	Control signal to MAF for burn off.
	Blk/Red (2 wires):	to 4/1, 4/6	Fuel Relay pin 1, pin 6.	12v power supply from relay pin 1.
	Blk/Blu	to 28/1	2-pole female, pin 1.	Ground signal output to cooling fan relay, low speed. Late ECU for 740 or 940.
11.	Blk/Wht	to 28/2	2-pole female, pin 2.	Ground signal output to cooling fan relay, high speed. Late ECU for 740 or 940.
12.	Blk/Green:	to 21/2	8-pole OBD pin 2.	Diagnostic signal lead.
13.	Blue/Red:	to 12/2	Temp Sens pin 2.	Input signal from Coolant Temp Sensor (ECT).
14.	Green:	to 6A2	White 8-pole plug.	Input signal from AC (compressor on).
15.	Red/Gray:	to 6A1	White 8-pole plug.	Input signal from AC (AC starting).
	Empty		1 1 5	1 8
	Black:	to 15c	Ground Ring c.	Ground.
18.	Green/Wht:	to 14/2	Fuel Inj pin 2.	Control signal for fuel injectors.
	Blk/Brn:	to 2b1	2-pole loop 2b1.	Ground
	Blue/Green:	to 4/2	Fuel Relay pin 2.	Control signal to fuel pump relay function.
	Blk/Yell:	to 4/4	Fuel Relay pin 4.	Control signal to main fuel relay function.
	Pink/Wht:	to 6B6	White 8-pole plug.	Signal to Check Engine Light (CEL).
	Empty		1 1 6	
	Green (shielded):	to 9a	Oxygen Sensor.	Input from Oxygen Sensor.
	Brn/Yell:	to 7/8	ICU pin 8.	MAF load signal output to ICU.
26.	Violet:	to 6B5	White 8-pole plug.	Shift up output signal (manual).
27.	Empty		1 1 6	
	Brown/Wht:	to 7/4	ICU pin 4.	Input signal from ICU (Knock Sensor).
29.	Black:	to 2a1	2-pole loop 2a1.	Ground.
	Pink:	to 6B7	White 8-pole plug.	Input signal from Park-Neutral Position (PNP) Switch (auto trans) for use with idle control.
31.	Empty			,
	Black/Wht:	to 16/2	Cold Start Inj pin 2.	Control signal output to Cold Start Valve.
	Green/Red:	to 19/2	Idle Valve pin 2.	Control signal output to Idle Valve.
	Black/Blue:	to 6B4	White 8-pole plug.	Input VSS signal from speedometer.
	Blue:	to 6B1, 7/6	White 2-pole plug, ICU pin 6.	12v power switched (terminal 15).
	======	021,	2 part prog, 200 pm or	· F - · · · · · · · · · · · · · · · ·

PIN 3 NOTE: If you're using a Turbo ECU see Diagram 13 Throttle Position Sensor for needed modification.



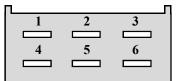






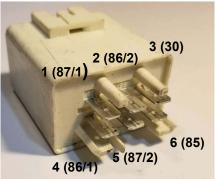
#### 6-Pole Female 6.3 mm Fuel Relay Connector.

Under Passenger Dash



VIEW FROM REAR OF PLUG

#### <>< Connector for white FUEL PUMP RELAY PN 3523608.



RELAY PIN	WIRE COLOR	DESTINATION	DESTINATION DESCRIPTION
1. 87/1 2. 86/2 3. 30 4. 86/1 5. 87/2 6. 85	Blk/Red(fat): Blue/Grn: Red (fat): Blk/Yell: Red/Yell(2 wires): Blk/Red(fat):	to 1/9, 4/6, 8/5 to 1/20 to 1/4, 7/5, 23 to 1/21 to 6B2, 9b1 to 1/9, 4/1, 27/A2	ECU pin 9, Relay pin 6, MAF pin 5. ECU pin 20 (control signal output). ECU pin 4, ICU pin 5, (power input from LH Fuse). ECU pin 21 (control signal output). Output to white 8-pole plug pin B2, O2 Plug pin b1. ECU pin 9, Relay pin 1, Injector Ballast Resistor plug pin A2.
I			

NOTE: Pin 3 is main voltage from battery via the LH fuse. Pin 5 is output power to fuel pumps via white 8-pole plug, pin B2.



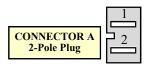
#### **Connector Not Present**

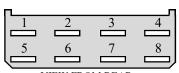


#### White 2-Pole Female Plug with 6.3 mm Terminals.

These are wires that need to be connected from this conversion harness to various locations under your dash.

Connector A (2-pole) **on this page** is only relevant to air conditioning. Connector B (8-pole) **on next page** is relevant to all other connections.





CONNECTOR B 8-Pole Plug

VIEW FROM REAR

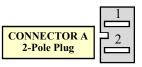
HARNESS CO	NNECTIONS P	LUG A (Origin)	CAR CONNECTIONS (Destination)
A1. Red/Gray:	from 1/15	ECU pin 15.	This wire brings input to your ECU <b>from the AC relay</b> pin D+/61 or AC control switch (Red/Gray). It allows the ECU to compensate the idle speed when AC is activated.
A2. Green:	from 1/14	ECU pin 14.	This wire brings input to your ECU from the AC compressor. It tells the ECU that your AC compressor is engaged. It's used to keep the idle speed stable when compressor starts.

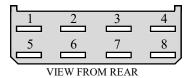
# Plug B

White 8-Pole Female Plug with 6.3 mm Terminals.

These are wires that need to be connected from this conversion harness to various locations under your dash.

> Connector A (2-pole) on previous page is only relevant to air conditioning. Connector B (8-pole) on this page is relevant to all other connections.

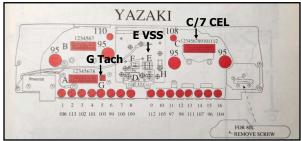


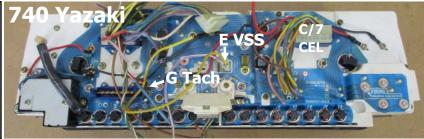


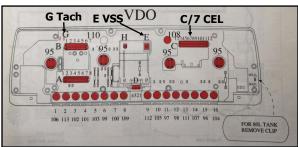
CONNECTOR B 8-Pole Plug

HARNESS CO	NNECTIONS PL	LUG B (Origin)	CAR CONNECTIONS (Destination)
B1. Blue:	from <b>7/6</b> , 1/35	ICU pin 6, ECU pin 35.	Connect this to <b>switched power</b> from ignition switch Terminal 15 (or any 12v circuit "ON" with Ignition Switch in the "RUN" position). <b>This circuit may be combined with wire B3 Blue.</b> Ensure the 12v connection used also remains "ON" when the key is turned to the "CRANK" position.
B2. Red/Yell (fa	at): from 4/5	Fuel Relay pin 5.	This is the output from the Fuel Pump Relay to supply power to the fuel pumps.
B3. Blue (fat):	from 23b	Coil +.	Connect this to <b>switched power</b> from ignition switch Terminal 15 (any 12v circuit "ON" with Ignition Switch in the "RUN" position). <b>This circuit may be combined with wire B1 Blue.</b> Ensure the 12v connection used also remains "ON" when the key is turned to the "CRANK" position.
B4. Blk/Blue:	from 1/34	ECU pin 34.	Connect to pulse signal from LH 2.4 speedometer output pin if available. This signal is produced by an LH 2.4 compatible speedo ( <b>pin E</b> ) which is connected to the differential VSS.  See NEXT DIAGRAM for instrument cluster pins.
B5. Violet:	from 1/26	ECU pin 26.	May be connected for Shift Up Light for a manual transmission car if this system is present.
B6. Pink/Wht (2 wires):	from 1/22, <b>7/3</b>	ECU pin 22, ICU pin 3.	Check engine light (CEL). Connect to pin C/7 (740) or C/9 (940) of an LH 2.4 compatible instrument cluster.  See NEXT DIAGRAM for these instrument cluster pins.
B7. Pink:	from 1/30	ECU pin 30.	Supplies LH ECU pin 30 with momentary power when starter is engaged for idle enhancement. If used, connect this wire to starter solenoid circuit. The starter solenoid circuit is normally the Blue/Yellow wire in the under dash multi-pin plug or 8-pole firewall plug.
B8 Red/White	from 22/1	Ign Powerstage pin 1.	Output to tachometer lead if needed for your tach or any other device. You may connect this wire to your tach input pin shown in the next diagram. Pin G (740) or A/6 (940).  See NEXT DIAGRAM for tach spade connection.

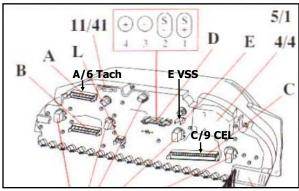
### Notes for locations of instrument cluster pins: 740 and 940.



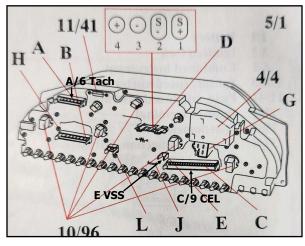
















25-Pole Ignition Control Unit (ICU) Connector. Wire leads are extended to allow mounting of this ICU in or near the factory left dash position.

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

VIEW FROM FRONT

#### VIEW FROM FRONT FACE—USE POLE NUMBER MARKINGS ON PLUG

V	VIRE COLOR	DESTINATION	DESTINATION DESCRIPTION	ICU FUNCTION
1.	White:	to 21/6	8-pole OBD pin 6.	Signal output to diagnostic socket.
<b>2.</b>	Blue/Red:	to 12/1	Temp Sens pin 1.	Signal input from Coolant Temp. (CLT).
<b>3.</b>	Pink/Wht:	to 1/22, 6B6	ECU pin 22, White 8-pole	Signal to Check Engine Light (CEL).
			plug pin B6.	
4.	Brown/Wht:	to 1/28	ECU pin 28.	Knock Sensor output to ECU.
<b>5.</b>	Red:	to 1/4, 4/3, 20	ECU pin 4, Relay pin 3,	12v power constant (terminal 30).
			LH fuse.	
<b>6.</b>	Blue(2 wires):	to 1/35, 6B1	ECU pin 35, White 2-pole	12v switched (terminal 15).
			plug pin B1.	
7.	Yell/White (2 wires):	to 1/2, 13/1	ECU pin 2, TPS pin 1.	Input signal from TPS when throttle is
				closed (idle).
<b>8.</b>	Brn/Yell:	to 1/25	ECU pin 25.	Load signal input from MAF via ECU.
9.	Empty			
	Blue (shielded):	to 10/1	Crank Pos Sens pin 1.	Input from Crank Position Sens (CPS).
	Blk (shield for 10 & 23):	to 10/3	Crank Pos Sens pin 3.	Shield for CPS (both wires).
	Blk (shield for 13):	to 17/2	Knock Sens pin 2.	Shield for Knock Sensor.
	Green (shielded):	to 17/1	Knock Sens pin 1.	Input signal from Knock Sensor.
	Empty (relevant to EGR Grou			
	Empty (relevant to EGR Cont	rol)		
<b>16.</b>	Gray (shielded):	to 22/5	Ign Powerstage pin 5,	Ignition pulse output to Powerstage.
			(Shield is at Diag. 22/3)	
	Brown:	to 1/1	ECU pin 1.	Engine speed signal output to ECU.
	Empty			
19.	Empty			
	Blk/Brown:	to 15b	Ground Ring b.	Ground for ICU.
	Empty			
22. Empty (relevant to EGR Temp Sensor)				
	Red (shielded):	to 10/2	Crank Pos Sens pin 2.	Input from Crank Position Sens (CPS).
24.	Empty			



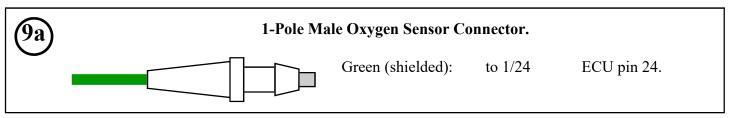
25. Empty

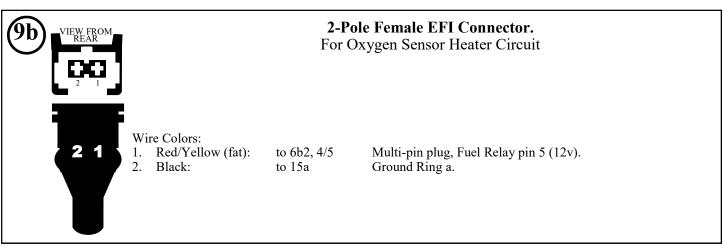
6-Pole Female Mass Air Flow (MAF) Sensor EFI Connector. 50" lead from firewall junction for reach to Turbo or non-turbo position.

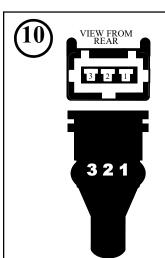
WIRE COLORS:

Ground Ring a 1. Blk/Brn: to 15a ECU pin 6. 2. Green/Yell: to 1/6 3. Red/Wht: ECU pin 7. to 1/7 White: to 1/8 ECU pin 8. 5. Blk/Red: to 4/1 Fuel Relay pin 1. empty

\*\*Number markings embossed on plug. Peel back rubber boot to see.







#### 3-Pole Female EFI Connector. Crank Position Sensor.

#### WIRE COLORS\*

Blue: to 7/10 (shielded wire)
 Red: to 7/23 (shielded wire)
 Black: to 7/11 (shield for above)

ICU pin 10.
ICU pin 23.
ICU pin 11.

Blue/Yell and Red/Yell are shielded pair with Black connected to the shield.

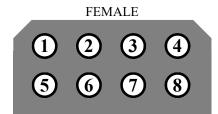


#### 8-Pole Female BULLET Connector.

LEFT side Firewall

This connector is used to provide circuit connections for the Oil Pressure Sender, Coolant Temperature Sender (for dash gauge) and the Starter Solenoid. It may change in wire order depending on which year 740 you have.

This connector plugs into the existing mating 8-pole MALE connector near your left fender, which supplies these circuits to your dash area.



VIEW FROM REAR

#### WIRE COLOR ORDER FOR 1985-86 740 TURBO OR NON-TURBO:

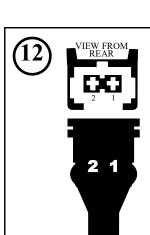
1. Yellow	To Conn. 24	1-pole Coolant Temp Sender (for dash cluster gauge).
2. Black	To Conn. 29	Oil Pressure Sender.
3. empty		
4. Red	To Conn. 27	Alternator D+ wire.
5. Blu/Yel	To Conn. 19	Starter solenoid.
6. Green	To Conn. 28	Oil pressure sender (for opt. 52 mm gauge).
7. empty		, , , , , , , , , , , , , , , , , , , ,
8. empty		

If a Brown wire exists in position 3 in your mating 8-pole connector, it should be removed and ignored. If an Orange wire exists in position 6 in your mating 8-pole connector, it should be removed and ignored.

#### WIRE COLOR ORDER FOR 1987-92 740 TURBO OR 1987-91 740 NON-TURBO:

1. Yellow	To Conn. 24	2-pole Coolant Temp Sender (for dash cluster gauge).
2. Black	To Conn. 29	Oil Pressure Sender.
3. empty		
4. Red	To Conn. 27	Alternator D+ wire.
5. Blu/Yel	To Conn. 19	Starter solenoid.
6. Green	To Conn. 28	Oil pressure sender (for opt. 52 mm gauge).
7. empty		
8. Yellow/Black	to Conn. 24	2-pole Coolant Temp Sender (for dash cluster gauge).

If a Brown or Black wire exists in position 3 in your mating 8-pole connector, it should be removed and ignored. If an Orange wire exists in position 6 in your mating 8-pole connector, it should be removed and ignored. If any wire exists in position 7 in your mating 8-pole connector, it should be removed and ignored. If Brown wire exists in position 8 in your mating 8-pole connector, it should be left there.



#### 2-Pole Female EFI Connector.

Coolant Temperature Sensor

Wire Colors:

Blue/Red: to 7/2
 Blue/Red: to 1/13
 ECU pin 2.
 ECU pin 13.



#### 3-Pole Female EFI Connector.

Throttle Position Sensor (TPS)



1. Yell/White: to 7/7, 1/2 ICU pin 7, ECU pin 2 (idle signal).

2. Black: to 15c Ground Ring c.

3. Blk/White: to 1/3 ECU pin 3 (WOT). **SEE NOTE BELOW** 



**PIN 3 NOTE:** Pin 3 Blk/White wire above goes to ECU pin 3. It's a Wide Open Throttle (WOT) signal used for the B230F only. This circuit is NOT used in a TURBO ECU. So if you're using a TURBO ECU, it is advisable to cut or disconnect this Blk/White wire.

\*\*Number markings on plug

**NOTE: BLUE TAPE** 



#### 2-Pole Female EFI Connectors.

Fuel Injectors (x4)



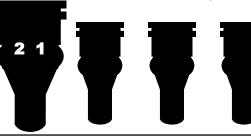
WIRE COLORS

1. Blk/Red: to 19/1, 27/A1, A3, A4 or A6 Idle Valve pin 1, Injector Ballast Resistor Plug

pins A1, A3, A4 or A6.

2. Grn/White: to 1/18

ECU pin 18 (control signal from ECU).



All four injector connectors are wired the same. The leads are different lengths so they may be routed for best fit.





Bolted to Intake Manifold

WIRE COLORS

15a. Blk/Brn, Black(2 wires): to 8/1, 9b2, 22/2

MAF pin 1, O2 Sens 9 pin b2,

Ign Powerstage pin 2.

15b. Blk/Brn (3 wires): to 2b2, 7/20, 21/8 2-pole loop 2 pin b2, ICU pin 20,

8-pole OBD pin 8.

15c. Black (thin): Black (fat):

TPS pin 2. ECU pin 17.





#### 2-Pole Female EFI Connector. Cold Start Injector. BLUE TAPE

thin to 13/2

fat to 1/17

This Injector is Optional. It came on 700 Turbo versions. It was not present on 240 models, but it may be used if you're using a Turbo ECU.



Blk/Red: to 27/A2 Fuel Inj Ballast Resistor Plug pin A2.

Blk/White: to 1/32 ECU pin 32 (control signal).

NOTE: Blk/Red wire for this connector is joined to four Blk/Red Fuel Injectors through the ballast resistor plug (Connector 27).





2-Pole Female EFI Connector. Ignition Knock Sensor.

Knock sensor needs to be Bosch style.

to 7/13 (shielded wire) 1. Green: ICU pin 13. 2. Black: to 7/12 (shield for above) ICU pin 12.



#### 1-Pole or 2-Pole Coolant Temp Sender (for dash cluster gauge).

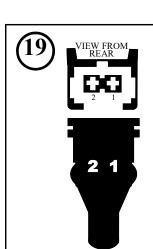
NOTE: A 2-pole style temp sender, PN 1362645, is supported by this harness, which fits a 1987 and later 740. Or this plug may be altered to a 1-pole plug for a 1-pole VDO sender for 1986 and earlier 740, sender Volvo PN 460191. A 1-pole plug will use the Yellow wire only.





1. Yellow/Black

To Conn. 14, pin 8 2. Yellow To Conn. 14, pin 2 8-pole Female Volvo Firewall Connector (1987 and later only). 8-pole Female Volvo Firewall Connector.



#### 2-Pole Female EFI Connector.

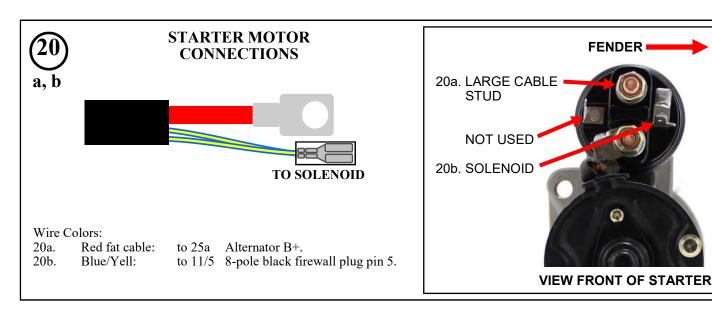
Idle Valve. LH 2.4 compatible type.

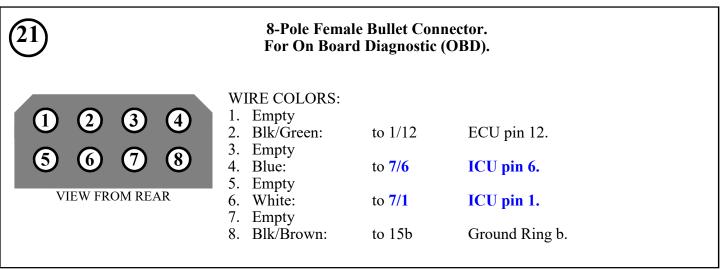
1. Blk/Red: to 4/6, 27/A2 Fuel Relay pin 6, Fuel Inj. Ballast Resistor Plug pin A2.

Green/Red: to 1/33 ECU pin 33 (control signal).

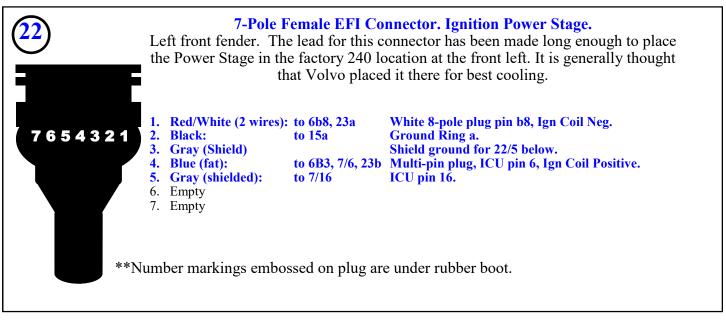
NOTE: Blk/Red wire for this Idle Valve is joined to four Blk/Red Fuel Injectors through the ballast resistor plug (Connector 27).

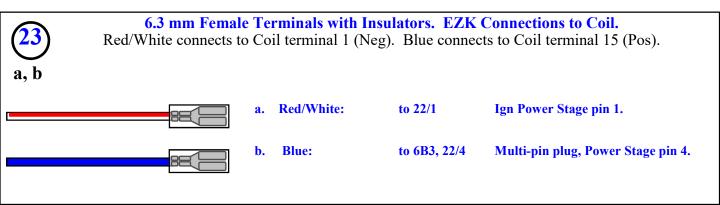
**FENDER** 

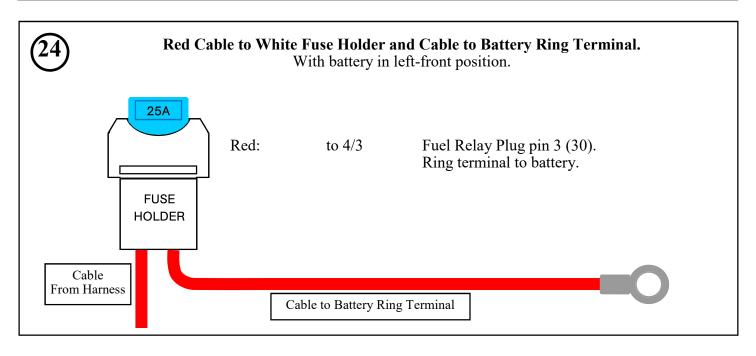


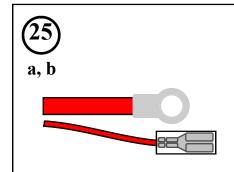


<sup>\*\*</sup>Number markings on plug are under rubber boot.









## Alternator Connections. Heavy Red cable (B+). Red wire (D+) 6.3 mm terminal with insulator.

a. (B+) Red Cable: to 20a Starter.

b. (D+) Red: to 11/3 8-pole firewall connector pin 3.

#### Below lead extends under the engine to the right side for Oil Pressure Sender.

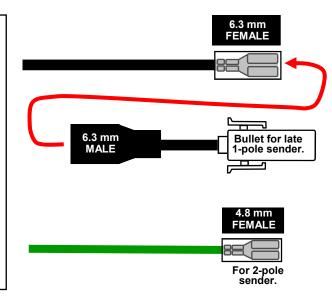


#### **Oil Pressure Sender (OPS)**

26a: (Black wire) 6.3 mm FEMALE terminal. Used by itself only with early style 1-pole oil pressure sender that has a flat spade. Also used for a 2-pole oil pressure sender (accessory OP gauge) in conjunction with the below green wire.

**Short adapter:** (Black wire) This is a 6.3 mm MALE terminal with a FEMALE BULLET plug on other end. This adapter is plugged into the above black wire and used for a LATER style 1-pole oil pressure sender using a bullet connector.

**26b: (Green wire)** 4.8 mm FEMALE terminal. Used only with a 2-pole oil pressure sender for an accessory oil pressure gauge.



WIRE COLORS:

26a. Black: to 11/1 8-pole black firewall plug pin 1.

26b. Green: to 11/6 8-pole black firewall plug pin 6.



#### Notes for 6-Pole Female Connector EFI RESISTOR PACK PLUG

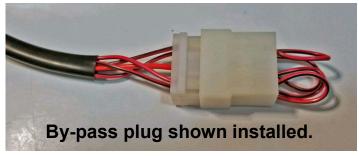
This harness is equipped with the below CONNECTOR and included BY-PASS ADAPTER.

Using the by-pass adapter this harness will support **High Impedance Injectors**.

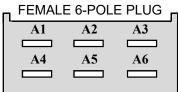
If you decide to use **Low Impedance Injectors**, you must unplug the by-pass adapter and instead plug in any standard **Volvo 740 Turbo (B230FT) fuel injector Ballast Resistor Pack.** 

#### **CAUTION:**

Using low impedance injectors WITHOUT a ballast resistor pack can DAMAGE your LH 2.4 ECU.







VIEW FROM REAR OF PLUG

#### 6-POLE PLUG WIRE CONNECTIONS:

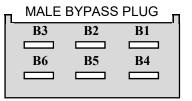
Pin A1: BLK-RED to 14/1 Fuel Injector plug pin 1.

Pin A2: BLK-RED (fat) to 4/1, 4/6 Fuel Relay plug pins 1 & 6 (12v source).

Pin A3: BLK-RED to 14/1 Fuel Injector plug pin 1. Fuel Injector plug pin 1. Fuel Injector plug pin 1.

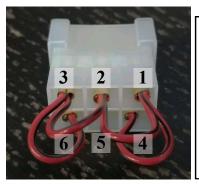
Pin A5: empty

Pin A6: BLK-RED to 14/1 Fuel Injector plug pin 1.



6-Pole MALE Connector BYPASS Plug.
This bypass plug should be in place when HIGH Impedance Injectors are to be installed.

VIEW FROM REAR OF PLUG



#### BYPASS PLUG WIRE CONNECTIONS:

Pin B1: BLK-RED to pin 2, 4 Pin B2: BLK-RED to pin 1, 3, 4, 6 Pin B3: BLKL-RED to pin 2, 6

Pin B4: BLK-RED to pin 1, 2

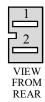
Pin B5: empty

Pin B6: BLK-RED to pin 2, 3



#### 2-Pole Female 6.3 mm.

Optional connector with low speed and high speed ECU ground signal outputs for controlling a 2-speed electric cooling fan relay. Outputs may be extended to relay if desired.



1. Blk/Blu: to 1/10

35-pole ECU, pin 10 (low speed).

2. Blk/Wht to 1/11

35-pole ECU, pin 11 (high speed).

