



Wiring Harness for
66kW / 90hp 1996-1997 Volkswagen Passat TDI - Engine code 1Z

Wire Harness Instructions

for

1996-1997 Volkswagen Passat TDI

Engine code 1Z – 66kW / 90hp

into

Volkswagen Vanagon

Copyright © 2003 - 2006 David Marshall, All Rights Reserved

This is the Free Internet Version – all information provided “as is” without warranty. If you find this information useful please feel free to use it as long as you give me credit. If you have something to add or correct, please let me know and I will revise it.

.

HasenWerk
Box 4153
Quesnel BC, Canada V2J 3J2

Internet: <http://www.hasenwerk.ca>
Email: info@hasenwerk.ca
Copyright © 2003 to 2006 - David Marshall

Page 1

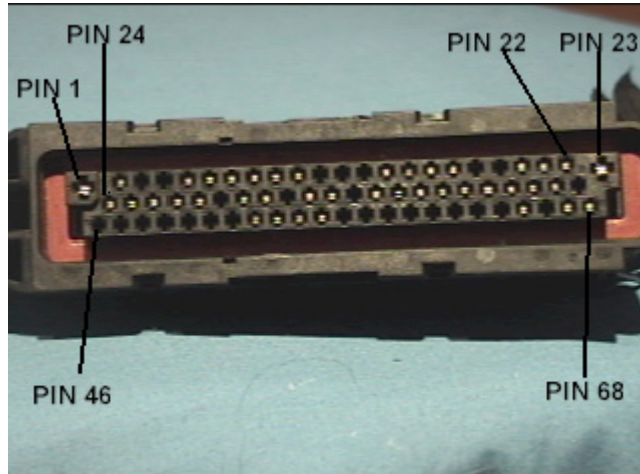
Free Internet Version

The latest authoritative version of this document is at <http://www.hasenwerk.ca/tech/wiring>

HasenWerk

Wiring Harness for
66kW / 90hp 1996-1997 Volkswagen Passat TDI - Engine code 1Z

Connector T68/nn – Diesel Direct Fuel Injection Module (J248)



ECU Part Numbers:

VW 028 906 021 BK
 028 906 021 AT

Bosch 0 281 001 389/390
 0 281 001 368/369

PIN	COLOR	DESCRIPTION	END PIN(s)
<u>Top row of pins</u>			
1	BR	31 Ground	31
2	BK/GN	1 Tachometer	1 (G1/12)
3	--		
4	BR/Y	G149 Injector Pump	T8/6
5	BR/Y	G149 Injector Pump	T8/6
6	BK/BL	J325 Coolant Heater Relay	J325/3
7	GY/GN	G149 Injector Pump	T8/2
8	W	G28 Engine Speed Sensor	T3/2
9	LI	Y Fuel Consumption Signal	
10	Y/BK	G20 Temperature sensor I for catalyst*	T4/1
		* Not all vehicles	
11	BL	G80 Needle Lift Sensor	T2/2
12	GR	G80 Needle Lift Sensor	T2/1
13	BR/R	G70 Mass Air Flow Sensor	T6/6
14	BL/BR	G27 Engine Temperature Sensor	T4/3
15	W/BL	G79 Throttle Position Sensor	T6/1
16	--		

Continued on next page . . .

HasenWerk
Box 4153
Quesnel BC, Canada V2J 3J2

Internet: <http://www.hasenwerk.ca>
Email: info@hasenwerk.ca
Copyright © 2003 to 2006 - David Marshall

HasenWerk

Wiring Harness for
66kW / 90hp 1996-1997 Volkswagen Passat TDI - Engine code 1Z

17	W/R	F36	Clutch Pedal (Normal Closed)	see notes
18			Auto transmission	
19	R/GN	G70	Mass Airflow Sensor	T6/1
20	W/Y	F47	Brake Switch (Normal Closed)	see notes
21	--			
22	--			
23	BL/R	J317	Power Supply Relay	J317/87 (G1/10)

Center row of pins

24	BR	31	Ground	31
25	BR/W	N18	EGR Vacuum Reg Solenoid Valve	2/1
26	BK/BR	J325	High Heat Output Relay	J325/5
27	GN/Y	V54	Metering Pump	
28	BR/GY	AC	Air Conditioning	
29	LI/BK	G149	Injector Pump	T8/1
30	BR/Y	G149	Injector Pump	T8/6
31			Auto transmission	
32			Auto transmission	
33	BR/BL	31	Sensor Ground	31
34	BL/GN	E45	Cruise Control Switch	T4/2
35	R	E45	Cruise Control Switch	T4/3
36	--			
37	GN/GY		Air Conditioning ON signal	
38	BK	15	12V Key On	15 (G1/4)
39	R/BK	DFM	Alternator Load	DFM
40	--			
41	--			
42	BK/LI	J317	Power Supply Relay	J317/85 (G1/7)
43	BL/W	VSS	Vehicle Speed Sensor	VSS
44	BK/R	F	Brake Light Switch	see notes
45	BK/Y	J317	Power Supply Relay	J317/87 (G1/10)

Continued on next page . . .

HasenWerk
Box 4153
Quesnel BC, Canada V2J 3J2

Internet: <http://www.hasenwerk.ca>
Email: info@hasenwerk.ca
Copyright © 2003 to 2006 - David Marshall



Wiring Harness for
66kW / 90hp 1996-1997 Volkswagen Passat TDI - Engine code 1Z

Bottom row of pins

46	BR	31	Ground	31
47	R/BL	N75	Wastegate bypass Reg Valve	T2/1
48	BK/BR	J29	Glow Plug Light	G2/5
49	BR/Y	G149	Injector Pump	T8/6
50	Y/BL	J52	Glow Plug Relay	G1/3 (J52/85)
51	BR/BK	N108	Cold Start Injector	T3/2
52	W/GN	G149	Injector Pump	T8/3
53	W/BK	N109	Fuel Cut Off Valve	T3/1
54	--			
55	GY/R	G79	Accelerator Position Sensor	T6/3
56	LI/BR	G132	Temperature sensor II for catalyst*	T4/4
			* Not all vehicles	
57	Y/GN	G79	Accelerator Position Sensor	T6/2
58	--			
59	--			
60	Y/W	K83	Malfunction Indicator Light	K83 (G1/9)
61	GR/W	K	OBD Diagnostic	T16/7
62	GN/W	G79	Accelerator Position Sensor	T6/5
63	Y/BK	G149	Injector Pump	T8/7
64	BL/GY	G72	Intake Air Temp Sensor	T2/1
65	GR/BL	G79	Accelerator Position Sensor	T6/4
66	BK/W	E45	Cruise Control Switch	T4/4
67	--			
68	BK/Y	J317	Power Supply Relay	J317/87 (G1/10)

Notes:

Double Strike Through "~~18~~" means removed from harness as it is not needed for the conversion.

I highly recommend purchasing the Volkswagen Passat Official Factory Repair Manual: 1995-1997 *Robert Bentley Publishers* – <http://www.rb.com> for complete information on troubleshooting and repair procedures for this TDI engine.

HasenWerk
Box 4153
Quesnel BC, Canada V2J 3J2

Internet: <http://www.hasenwerk.ca>
Email: info@hasenwerk.ca
Copyright © 2003 to 2006 - David Marshall



Wiring Harness for
66kW / 90hp 1996-1997 Volkswagen Passat TDI - Engine code 1Z

I also highly recommend purchasing a VAG-COM from <http://www.ross-tech.com>. The VAG-COM is a tool for running diagnostics and changing parameters on your TDI engine. Without this tool trouble shooting any issues that might arise will be extremely difficult if not impossible.

CONNECTIONS TO THE ORIGINAL VANAGON HARNESS IN THE ENGINE COMPARTMENT

At the front left corner of the engine compartment is the original seven pin connector that originally fed the gasoline engine. These wires must be connected to that plug.

1 Tachometer

This wire can be optionally connected to the vehicles tachometer. This wire is usually green in color in the recipient vehicle. Most tachometers will require a modification in order to work correctly with the ECU's tachometer signal. Fast Forward Automotive Inc. can provide the service of modifying your tachometer.

15 12V with key in on position

This must be connected to a switched 12V source that is on when the key is in the on position. This wire is usually black in the recipient vehicle.

ALT Alternator Warning Light

This wire gets connected to the alternator warning light located in the instrument cluster. This wire is usually blue in color.

H20 Coolant Temperature Gauge

This wire can be connected to the coolant gauge. This wire is usually yellow with a red stripe on the recipient vehicle.

HasenWerk
Box 4153
Quesnel BC, Canada V2J 3J2

Internet: <http://www.hasenwerk.ca>
Email: info@hasenwerk.ca
Copyright © 2003 to 2006 - David Marshall



Wiring Harness for
66kW / 90hp 1996-1997 Volkswagen Passat TDI - Engine code 1Z

OIL 1.8 Oil Pressure Switch - 1.8 BAR

This wire must be connected to the high oil pressure wire in the vehicle. This wire is usually yellow in color in the recipient vehicle.

OIL 0.3 Oil Pressure Switch - 0.3 BAR

This wire must be connected to the low oil pressure wire in the vehicle. This wire is usually blue/black in color in the recipient vehicle.

Important: The original 30 and 31 connectors (red and brown) on the Vanagon are too light to be used with the TDI harness.

CONNECTIONS TO OTHER DEVICES IN ENGINE BAY

30 Constant 12V

This wire must be connected to a constant 12V source. We recommend connecting this wire to the large terminal on the alternator that runs to the battery.

31 Ground

This wire must be connected to the body of the recipient vehicle. Ensure that this spot is clean and rust free.

CCV Positive Crank Case Vent Heating Valve

This is usually located on the intake system.

DFM Alternator Load Sensor

This is located on the alternator.

G2 / G62 Engine Coolant Temp Sensor

Located on the flywheel side of the engine at the main water output flange.

HasenWerk
Box 4153
Quesnel BC, Canada V2J 3J2

Internet: <http://www.hasenwerk.ca>
Email: info@hasenwerk.ca
Copyright © 2003 to 2006 - David Marshall



Wiring Harness for
66kW / 90hp 1996-1997 Volkswagen Passat TDI - Engine code 1Z

G28 Engine Speed Sensor

This sender is located below the oil filter. It is a three pin connector that terminates next to the G149 and G80 connectors.

G149 Injector Pump

This is the plug for the injector pump. It is a multi-pin connector that terminates next to G28 and G80

G80 Needle Lift Sensor

This is the wire coming from the 3rd injector that terminates next to G28 and G149

G70 Mass Air Flow Sensor

Plug this into the air flow sensor. This is normally near the driver side tail light on most installations.

G72 Intake Air Temperature Sensor

Plug this into the sender on the intercooler piping.

J52 Glow Plug Relay

This relay can go in the original relay box that was used for the wasserboxer engine.

30	R	30
85	Y/BL	ECU Pin 50
86	BK	15
87	BK/W	Glow Plug Harness

J317 Accessory Relay

This relay can go in the original relay box that was used for the wasserboxer engine.

30	R	30
85	BK/LI	ECU Pin 42
86	R	30
87	BL/R	J359, J360, N146, N75, G70, N18, N108

HasenWerk
Box 4153
Quesnel BC, Canada V2J 3J2

Internet: <http://www.hasenwerk.ca>
Email: info@hasenwerk.ca
Copyright © 2003 to 2006 - David Marshall



Wiring Harness for
66kW / 90hp 1996-1997 Volkswagen Passat TDI - Engine code 1Z

J325 Coolant Glow Plug Relay

This relay supplies power to the coolant glow plugs that supplement the interior heating system.

N18 EGR Vacuum Solenoid Valve

This is the EGR control valve – usually mounted on the driver side wall of the engine compartment.

N75 Waste Gate Bypass Valve

This is the turbo control valve - usually mounted on the driver side wall of the engine compartment.

UNDER THE REAR BENCH SEAT – original 2.1L wbx
BEHIND LEFT TAIL LIGHT – original 1.9L wbx

ECU Engine Control Unit

This is the engine computer.

CONNECTIONS AT THE FRONT OF THE VEHICLE

E45 Cruise Control

This can be left disconnected or it can be connected to the vehicles cruise control switch. Ensure that the BRAKE and CLUTCH switches are enabled as well as VSS.

- | | | |
|---|-------|---------------------------------------|
| 1 | BK | 12V input to switch |
| 2 | BL/GY | Resume Button. Closed = 12V to ECU 34 |
| 3 | R | Set Button. Closed = 12V to ECU 35 |
| 4 | BK/W | Enable Cruise Closed = 12V to ECU 66 |

F* Brake Light Switch

Brakes off = GND input
Brakes on = 12V input

HasenWerk
Box 4153
Quesnel BC, Canada V2J 3J2

Internet: <http://www.hasenwerk.ca>
Email: info@hasenwerk.ca
Copyright © 2003 to 2006 - David Marshall



Wiring Harness for
66kW / 90hp 1996-1997 Volkswagen Passat TDI - Engine code 1Z

F36* Clutch Switch

Clutch off = GND input
Clutch on = open circuit

F47* Brake Switch

Brake off = GND input
Brake on = open circuit

* It is important for F, F36 and F47 to equal '0' (Measuring block 006) when the pedals are at rest – you will set off an error code if this condition is not met. It is important for F and F47 to switch states at exactly the same time.

G79 Accelerator Pedal

This must be connected to the TDI's accelerator pedal potentiometer. It is highly recommend to use a pedal from a Golf IV as it will make your life 10x easier! Fast Forward Automotive Inc. can supply a proper pedal with the appropriate wiring a nominal fee.

K29 Glow Plug Relay Light

This wire must be optionally connected to an LED in the instrument cluster that shows when the glow plugs are turned on. This is the negative side of the circuit, meaning that the LED must be constantly fed with 12V. You must connect a 1K Ohm resistor in series with the LED. This LED is usually yellow. Fast Forward Automotive Inc. can install LEDs into your instrument cluster for a nominal fee.

HasenWerk
Box 4153
Quesnel BC, Canada V2J 3J2

Internet: <http://www.hasenwerk.ca>
Email: info@hasenwerk.ca
Copyright © 2003 to 2006 - David Marshall



Wiring Harness for
66kW / 90hp 1996-1997 Volkswagen Passat TDI - Engine code 1Z

K83 Malfunction Indicator Light

This wire must be optionally connected to an LED in the instrument cluster that shows when there is a fault with the engine. This is the negative side of the circuit, meaning that the LED must be constantly fed with 12V. You must connect a 1K Ohm resistor in series with the LED. This LED is usually red. Fast Forward Automotive Inc. can install LEDs into your instrument cluster for a nominal fee.

OBD On Board Diagnostics

This is the connector that you connect a VAG-COM or VAS-1552 to. A good place for it to be located is in the glove compartment.

Pin 1	15 (Power Key On)
Pin 4	31 (Ground)
Pin 5	31 (Ground)
Pin 7	K (ECU pin 61)
Pin 16	30 (Constant Power)

VSS Vehicle Speed Sender

This wire must be connected to a Vehicle Speed Sender also known as a VSS. The VSS supplies the ECU with a speed signal so that the ECU knows if the vehicle is accelerating, decelerating or remaining at a constant speed. It is not 100% necessary to connect this but the engine will run smoother with it connected and you must connect it in order for Cruise Control to work. The two wire VSS that is normally found on the Vanagon will not project the correct signal. Fast Forward Automotive Inc. can provide the correct VSS for your instrument cluster for a nominal fee.

HasenWerk
Box 4153
Quesnel BC, Canada V2J 3J2

Internet: <http://www.hasenwerk.ca>
Email: info@hasenwerk.ca
Copyright © 2003 to 2006 - David Marshall