

Conn./Plug/Pin	Pin Information	Test Value	Comments
<u>N3/4</u>			
1.1-3	Pins not used		
1.4	Fuel cut off signal input, generated from EA/CC/ISC actuator	Ignition on 2.2-11 VDC	Feed from M16/1 or M16/2
1.5-9	Pins not used		
1.10	ICS signal input from CC/EA system, determined by setting of M16/1 or M16/2	Ignition on, acceleration pedal position: CTP < 4.8 VDC, WOT > 5.5 VDC	
1.11-14	Pins not used		
1.15	O2S 1 signal output to diagnostic module	Engine at idle for at least 2 min. ECT > 80 °C Voltage varies more than 0.3 VDC in a range from - 0.2 to + 1.0 VDC	generated by G3/2
1.16	O2S 2 signal output to diagnostic module	Engine at idle ECT > 80 °C measure to pin 24 >450 mVDC Raise to 2000-3000 rpm for at least 3 min until O2S heater switches to on, then accelerate briefly, voltage changes >100mVDC	generated by G3/1
1.17	CMP sensor signal output to diagnostic module	Engine at idle 1.3-1.7 VDC (value alternates)	generated by B6/1
1.18	Rpm signal output, controls (EA)CC/ISC system and tachometer A1p5	Engine at idle 5.0-7.5 VDC	
1.19	"Diagnostic port" for DTC readout and diagnostic purpose	Ignition on 12 VDC	To be tested with HHT refer to D.M.
1.20	Pin not used		
1.21	Circuit 50 starter signal recognition input	Gear range selector in pos P or N key held in starting position 12 VDC	
1.22,23	Pins not used		
1.24 1.25	O2S signal input, low side O2S signal input, high side	Engine at 2000-3000 rpm for at least 2 min. ECT > 80 °C > 550 mVDC across pin 24 and 25	
1.26	Pin not used		
1.27	Circuit 87 switched power input, switched by relay K40k3	Ignition on 12 VDC	
1.28	Pin not used		
1.29	Fuel pump activation signal output, activates relay K40k1	6-12 VDC during start procedure	
1.30	O2S heater activation signal (before TWC)	Ignition on approx. 0.6-3.4 A current draw to circuit 87 pin 39 Engine at idle for at least 2 min. ECT > 80 °C 12 VDC	
1.31	Pin not used		
1.32	Main ground to W16/6	Approx. 0 Ohm to ground	
1.33	Main ground to W16/6	Approx. 0 Ohm to ground	
1.34 1.35	O2S signal input, low side O2S signal input, high side	Engine at idle for at least 2 min. ECT > 80 °C, measure across pin 34 and 35 voltage varies > 0.3 VDC in a range from -0.2 to 1.0 VDC	
1.36-38	Pins not used		
1.39	Circuit 87 switched power input, switched by relay K40k2	Ignition on 12 VDC	
1.40	Circuit 30 main power input	12 VDC at all times	
1.41	O2S heater activation signal (after TWC)	Same as 1.30	
1.42	Pin not used		
1.43	Purge control signal output switched ground activates purge valve	Ignition on, approx. 0.2-0.3 A current draw Engine at idle for at least 1 min. Valve must recognizably cycle	

1.44	Ground signal to diagnostic module		
2.1	Adjustable camshaft timing signal output, determines camshaft timing correction	Engine at approx. 2000 rpm, ECT >70 °C 1-1.5 A current draw across Y49 Engine at idle. Insert bridge to gnd (max. 10 sec.) engine runs rough or stops	
2.2	Injector 3 timing signal output controls fuel injection quantity	Use scope, probe tip to pin 1.39, ground to pin 2.2 ECT 20 °C start engine approx. t=8 msec. ECT 80 °C engine at idle approx. t=3-5 msec. accelerate briefly approx. t=17 msec.	Waveform needle pulse approx. 40 Vpp coil 14-17 Ohm
2.3	Injector 4 timing signal output controls fuel injection quantity	Use scope, probe tip to pin 1.39, ground to pin 2.3, same as pin 2.2	
2.4	Pin not used		
2.5	IAT sensor signal input temperature relating voltage	Engine at idle, ECT > 70 °C 0.8-1.1 VDC voltage raises with increasing rpm	
2.6,7	Pins not used		
2.8	CKP sensor signal input high side CKP status affects injection system timing	Engine at idle > 0.2 VAC to pin 2.19 voltage raises with increasing rpm. Coil resistance approx. 0.9-1.6 KOhm	
2.9	Ignition coil 2 signal output	Ignition on 12 VDC Starter cranks > 6 VDC	
2.10	Ignition coil 3 signal output	Ignition on 12 VDC Starter cranks > 6 VDC	
2.11	Pin not used		
2.12	Injector 5 timing signal output controls fuel injection quantity	Use scope, probe tip to pin 1.39, ground to pin 2.12, same as pin 2.2	
2.13	Injector 2 timing signal output controls fuel injection quantity	Use scope, probe tip to pin 1.39, ground to pin 2.13, same as pin 2.2	
2.14	Resonance intake manifold switchover signal output, activates valve depending on rpm	Engine at idle, measure to circuit 87 pin 1.39 accelerate to > 3900 rpm voltage changes from 0 to 12 VDC	
2.15	Air pump activation switched ground signal output, activates relay K40k6	Substitute ECT sensor by 2.5 Kohm resistor engine at idle 12 VDC and air pump is running duration approx. 2 min.	
2.16-18	Pins not used		
2.19	CKP sensor signal input low side	See pin 2.8	
2.20	Pin not used		
2.21	Ignition coil 1 signal output	Ignition on 12 VDC Starter cranks > 6 VDC	
2.22	Main ground to W16/6	Approx. 0 Ohm to ground or measure to circuit 30 12 VDC	
2.23	Injector 1 timing signal output controls fuel injection quantity	Use scope, probe tip to pin 1.39, ground to pin 2.23, same as pin 2.2	
2.24	Injector 6 timing signal output controls fuel injection quantity	Use scope, probe tip to pin 1.39, ground to pin 2.24, same as pin 2.2	
2.25	EGR valve switchover signal output to initialize NOX reduction circuit	Engine at idle, measure to circuit 87 pin 1.39 accelerate briefly voltage changes from 0 to 12 VDC	
2.26	Pin not used		
2.27	Ground signal to IAT sensor	Disconnect plug, measure to pin 2.22 < 20 Ohm	
2.28	Temperature sensors ground signal	See pins 2.36 and 2.37	B17, B11/4 (IAT/ECT)
2.29 2.30	CKP sensor signal input low side (shield) CKP sensor signal input high side CKP status affects injection system timing	Start engine > 0.4 VAC, at idle > 1 VAC voltage raises with increasing rpm or use scope: sine wave 30 Vpp, t=0.7 msec. at idle	Coil resistance 0.7-1.4 Kohm
2.31-35	Pins not used		
2.36	ECT sensor signal input	Ignition on, measure to pin 2.28 ECT at: 20 °C approx. 3.5 VDC	

		60 °C approx. 1.9 VDC 80 °C approx. 1.2 VDC	
2.37	IAT sensor signal input	Ignition on, measure to pin 2.28 ECT at: 20 °C approx. 2.6 VDC 60 °C approx. 0.9 VDC 80 °C approx. 0.5 VDC	
2.38,39	Pins not used		
2.40 2.41	Knock sensor 1 signal input low side Knock sensor 1 signal input high side affects ignition system timing	Ignition on, use oscilloscope tap on engine block see signal vary (looks like noise) Piezo element generates increasing voltage with increasing knock signal	
2.42 2.43	Knock sensor 2 signal input low side Knock sensor 2 signal input high side		
2.44	Pin not used		
3.H	CAN-Bus (high side). High speed data transfer bus input and output, shares data with other ECMs	No reliable test. Check continuity to other ECMs approx. 5 VAC when data is on bus.	HHT is also used for CAN diagnosis
3.L	CAN-Bus (low side). High speed data transfer bus input and output, shares data with other ECMs		