

Series1

All diagnostic connectors are located in the right hand side of the car in the large black box. The cover can easily be removed by first removing the front cover exposing the relays followed by the top cover. This will expose the ECU's. From front to back the following ECU's can be found (dependant on the equipment installed) Hydroactive I or II, Engine ECU, ABS ECU. The diagnostic connectors can be found floating around in the ECU compartment, and can be identified by their color. The diagnostic connectors are protected by a cover which can be removed.

Hydroactive diagnostic connector: blue.

Engine diagnostic connector: green (pin 2)

ABS diagnostic connector: grey

Aircod diagnostic connector: black

Series2

I'm unsure from what, till what time the large 30 pins diagnostic connector is used. The connector is 3 pins wide and 10 pins long with the connector housing being brown. The pins are numbered 1, 2, 3 from top to bottom and A, B, C, ..., I, J from left to right.

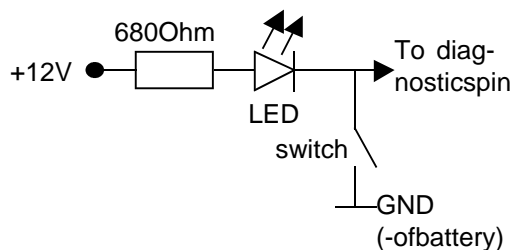
Hydroactive diagnostic pin: E2

Engine diagnostic pin: C3

ABS diagnostic pin: E1

Aircod diagnostic pin: F1

The following circuit can be used to read out the diagnostic codes.



In case the large 30 pins diagnostic connector is present only a wire to connect the diagnostic pin to ground is needed. The readout will work via the diagnostic lights on the dashboard. (In case it doesn't work, one can always revert back to the circuit described above.)

To start readout of the codes:

1. Connect the circuit above, with the switch opened.
2. Turn on ignition
3. Within 3 seconds close the switch for 3-5 seconds, and open it again
4. The start code 12 will appear. Blink, pause, blink, blink.
5. Press the switch again for 3-5 seconds, and open it again.
- 6a. Now the diagnostic codes will follow in case there is an error code stored.
- 6b. If no more codes are stored the end code 11 will appear. Blink, pause, blink.
- 7a. Repeat step 5 and 6 until all codes are read out
- 7b. After the end code you can clear all codes.

To clear all stored error codes:

1. First read out all codes described above
2. After the end code, close the switch for exactly 15 seconds.
3. Open the switch again
4. Now all stored codes are cleared.

Alternatively you can erase all error codes by disconnecting the battery for 10 (or more) minutes. This will not only clear the codes, but also erase the 'learned' settings (eg for the engine) and refer back to factory default.

Code	Description	Check	Comp
****	ECUXMMagnetiMarelliG5	XM2.0RDZXU10MMonopoint XM2.0R6AXU10J2Monopoint(from'91)	***
11	Endtest		***
12	Starttest		***
13	Injectionairtempsensor	4k@10C;2,5k@20C;680@55C	907
14	Coolingwatertempsensor	4k@10C;2,5k@20C;680@55C;230@90C	909
21	Throttlespindlepotentiometer	4,5Vmaxswingonpin2	770
22	Idlingactuator/Idlespeed regulator		432
23	Idlespeedcontrolfailure		
31	Automaticadjustmentair/fuel ratio	oxygen/lambdasensortooquick(disconnecttheater elementtoresolve)	900
33	Inletmanifoldairpressuresensor	170hPA:0.25V,1040hPA:4.8Vbetweenpin9 and12(gnd)onECU	903
34	Canisterdischargevalve(active carbonfilter)		430
41	Enginespeedsensor	345Ohmbetweenpin14and31;checkisolationto ground	152
42	Fuelinjector	Checkresistanceofinjector.1.5Ohm	570
45	Ignitioncoil1-4	Checkvoltagebetweenpin1andground,shouldbe +12V.Checkprimarywindingsshouldbe1.4Ohm (betweenpin1and4oncoil),secondary8.6kOhm (Valeo)or14kOhm(Bosch)	
52	Air/fuelmixturecontrolloop	inletoroutletmanifoldleakorlambda-sensor failure	
54	ECUmalfuction		142
57	Ignitioncoil2-3	Checkvoltagebetweenpin2andground,shouldbe +12V.Checkprimarywindingsshouldbe1.4Ohm (betweenpin2and4oncoil),secondary8.6kOhm (Valeo)or14kOhm(Bosch)	

Code	Description	Check	Comp
****	ECUXMBoschMotronicMP3.1	XM2.0RFZXU10J2/ZMultipoint(tilljun-93)	***
11	Endtest		***
12	Starttest		***
13	Injectionairtempsensor	4k@10C;2,5k@20C;680@55C	907
14	Coolingwatertempsensor	4k@10C;2,5k@20C;680@55C;230@90C	909
21	Throttlespindlepotentiometer	Closed0.5V,fullyopen4.5V(minimal)	770
22	Idlingactuator/Idlespeed regulator		432
31	Automaticadjustmentair/fuel ratio	Checkoxygenensor,inlet&outletmanifoldon leakage,fuelpressure,fuelinjectors,sparkplugs, airfilterelement,compression.	900
33	Inletmanifoldairpressuresensor	IsintegratedintheECUandcannotbechecked. CheckvacuumhosestoECU.	
34	Canisterdischargevalve(active carbonfilter)		430
41	Enginespeedsensor	245Ohmbetweenpin23and25;checkisolationto ground	152
51	Oxygen/lambdasensor	Whenenginehotandrunningshouldconstantly changefrom0to1Vmeasuredbetweenpin24and pin8.	900
52	Air/fuelmixturecontrolloop	inletoroutletmanifoldleakorlambda-sensor failure	
53	Sensorpowersupply	Pin16and5shouldbeconnectedtoground.Pin18 shouldhave+12V.	
54	ECUmalfunction		142

Code	Description	Check	Comp
****	ECUXMBoschMotronicMP3.2	XM2.0TurboRGYorRGXXU10J2T/Z/L/L3 Multipoint	***
	Warning:Notcheckedagainst actualschematics!		
11	Endtest		***
12	Starttest		***
13	Injectionairtempsensor	4k@10C;2,5k@20C;680@55C	907
14	Coolingwatertempsensor	4k@10C;2,5k@20C;680@55C;230@90C	909
21	Throttlespindlepotentiometer	Closed0.5V,fullyopen4.5V(minimal)	770
22	Idlingactuator/Idlespeed regulator		432
31	Automaticadjustmentair/fuel ratio	Checkogygensensor,inlet&outletmanifoldon leakage,fuelpressure,fuelinjectors,sparkplugs, airfilterelement,compression.	900
33	Inletmanifoldairpressuresensor	IsintegratedintheECUandcannotbechecked. CheckvacuumhosestoECU.	
34	Canisterdischargevalve(active carbonfilter)		430
41	Enginespeedsensor	330Ohmbetweenpin48and49;checkisolationto ground	152
43	Engineknockcontrolloop	correctfuelgrade,mechanicalstateengine	
44	Anti-knocksensor	Checkmountingofsensor(torque:20Nm)	150
51	Oxygen/lambdasensor	Whenenginehotandrunningshouldconstantly changefrom0to1Vmeasuredbetweenpin28and pin10.	900
52	Air/fuelmixturecontrolloop	inletoroutletmanifoldleakorlambda-sensor failure	
53	Sensorpowersupply		
54	ECUmalfunction		142
65	Sensorreferencecylinder		
71	Fuelinjector1	Checkfuelinjectorresistance.Shouldbe16Ohm each.	
72	Fuelinjector2	Checkfuelinjectorresistance.Shouldbe16Ohm each.	
73	Fuelinjector3	Checkfuelinjectorresistance.Shouldbe16Ohm each.	
74	Fuelinjector4	Checkfuelinjectorresistance.Shouldbe16Ohm each.	

Code	Description	Check	Comp
****	ECUXMBoschMotronicMP5.1	XM2.0RFZXU10J2/ZMultipoint(fromjul-93)	***
11	Endtest		***
12	Starttest		***
13	Injectionairtempsensor	4k@10C;2,5k@20C;680@55C	907
14	Coolingwatertempsensor	4k@10C;2,5k@20C;680@55C;230@90C	909
21	Throttlespindlepotentiometer	Closed0.5V,fullyopen4.5V(minimal)	770
22	Idlingactuator/Idlespeed regulator		432
31	Automaticadjustmentair/fuel ratio	Checkoxygenensor,inlet&outletmanifoldon leakage,fuelpressure,fuelinjectors,sparkplugs, airfilterelement,compression.	900
33	Inletmanifoldairpressuresensor	IsintegratedintheECUandcannotbechecked. CheckvacuumhoseetoECU.	903
34	Canisterdischargevalve(active carbonfilter)		430
41	Enginespeedsensor	320-340Ohmbetweenpin11and30;check isolationtground	152
42	Fuelinjectors	Checkresistanceofeachinjector.Shouldbe16 Ohmeach.	570
51	Oxygen/lambdasensor	Whenenginehotandrunningshouldconstantly changefrom0to1Vmeasuredbetweenpin28and pin10.	900
52	Air/fuelmixturecontrolloop	inletoroutletmanifoldleakorlambda-sensor failure	
53	Sensorpowersupply	Pin19,2and14shouldbeconnectedtground. Pin18,37shouldhave+10-15.5Vonthem(+from battery)	
54	ECUmalfunction		142

Code	Description	Check	Comp
****	ECUXMBoschMotronicMP5.1.1	XM2.0RFVXU10J4R/L/L3(16V)Multiploint	***
11	Endtest		***
12	Starttest		***
13	Injectionairtempsensor	4k@10C;2,5k@20C;680@55C	907
14	Coolingwatertempsensor	4k@10C;2,5k@20C;680@55C;230@90C	909
21	Throttlespindlepotentiometer	Closed0.5V,fullyopen4.5V(minimal)	770
22	Idlingactuator/Idlespeed regulator		432
27	Vehiclespeedsensor	R=300Ohmsensor;Whendrivingaspeed relativesignalonpin9	154
31	Automaticadjustmentair/fuel ratio	Checkogygensensor,inlet&outletmanifoldon leakage,fuelpressure,fuelinjectors,sparkplugs, airfilterelement,compression.	900
33	Inletmanifoldairpressuresensor	IsintegratedintheECUandcannotbechecked. CheckvacuumhoseetoECU.	903
34	Canisterdischargevalve(active carbonfilter)		430
41	Enginespeedsensor	320-340Ohmbetweenpin11and30;check isolationtoground	152
42	Fuelinjectors	Checkresistanceofeachinjector.Shouldbe16 Ohmeach.	570
43	Engineknockcontrolloop	correctfuelgrade,mechanicalstateengine	
44	Anti-knocksensor	Checkmountingofsensor(torque:20Nm)	150
51	Oxygen/lambdasensor	Whenenginehotandrunningshouldconstantly changefrom0to1Vmeasuredbetweenpin28and pin10.	900
52	Air/fuelmixturecontrolloop	inletoroutletmanifoldleakorlambda-sensor failure	
53	Sensorpowersupply	Pin19,2and14shouldbeconnectedtoground. Pin18,37shouldhave+10-15.5Vonthem(+from battery)	
54	ECUmalfuction		142

Code	Description	Check	Comp
****	ECUXMV6Fenix3B		***
11	Endtest		***
12	Starttest		***
13	Injectionairtempsensor	4k@10C;2,5k@20C;680@55C	907
14	Coolingwatertempsensor	4k@10C;2,5k@20C;680@55C;230@90C	909
15	Fuelpumprelais		807
21	Throttlespindlepotentiometer	4,5Vmaxswingonpin9	770
22	Idlingactuator/Idlespeed regulator		432
23	Throttlespindlepotentiometer idlevalue	0,5+/-0,1Vbetweenpin9and17(gnd)	770
27	Vehiclespeedsensor	R=300Ohmsensor;Whendriving1,5Voltonpin 3	154
31	Automaticadjustmentair/fuel ratio	oxygen/lambdasensortooquick(disconnecttheater elementtoresolve)	900
33	Inletmanifoldairpressuresensor	400Pa=2,5V;600Pa=1,25Vbetweenpin33and17 (gnd)	903
34	Canisterdischargevalve(active carbonfilter)		430
36	Relaisoxygen/lambdasensor heater		818
41	Enginespeedsensor	330Ohmbetweenpin11and28;checkisolationto ground	152
42	Fuelinjectors	14Ohmeachinjector(2-3Ohmbetweenpin20/21 andpin30)	570
43	Engineknockcontrolloop	correctfuelgrade,mechanicalstateengine	
44	Frontanti-knocksensor		150
51	Oxygen/lambdasensor	Whenenginehotandrunningshouldconstantly changefrom0to1Vonpin35frompin32(gnd)	900
52	Air/fuelmixturecontrolloop	inletoroutletmanifoldleak	
53	Sensorpowersupply	10-15,5Vonpin4ECUfromgnd(pin1).	
54	ECUmalfuction		142
56	Anti-theftstartcodenotentered		176
62	Rearanti-knocksensor		151

Code	Description	Comp
****	ECUXMV6Fenix3B(activatecomponents) Componentactivationisperformed	****
91	Activatefuelpumprelais	807
92	Activatefuelinjectors	570
93	Activateidlingactuator	432
94	Activatecanisterdischargevalve	430
95	Activaterelaisaircompressor	822
****	ECUXMV6Fenix3B(Mixtureadjustment)	****
11	Makemixture richer	
22	Makemixture leaner	
33	Programstart	
99	upperorlowerlimitreached	
****	ECUXMV6Fenix3B(Ignitiontimingadjustment)	****
11	2degreesadvance	
12	4degreesadvance	
13	6degreesadvance	
14	8degreesadvance	
19	defaultsetting	
22	Programstart	
99	upperorlowerlimitreached	

Code	Description	Check	Comp
****	ECU Hydroactive/II suspension	Version H and HII pinning are totally different.	****
11	Endtest		***
12	Starttest		***
21	Brake pressure switch	Switch will open when firm brake pressure applied (HI measure between pin 7 white and ground, HII between pin 11 black and gnd)	670
22	Accelerator pedal position potentiometer (situated under pedal)	Pedal up = 3-4V; pedal down < 3V. HI measure between pin 10 white and ground. HII between pin 4 black and ground.	771
23	Steering wheel position sensor	Will alternate between 0 and +5V when slowly moving steering wheel. HI: Measure on both pins 6 and 13 white to pin 12 white which is ground. HII: pin 9, 10, 15 black and 13 white are for steering wheel sensor. Two pins for position, other two for power supply and ground.	159
24	Vehicle speed sensor	HI: R = 300 Ohms speed sensor, when driving ca 1,5V on pin 13 black. HII: measures speed signal on pin 11 white.	154
25	Vehicle height sensor	Will alternate between 0 and +5V when vehicle height is changed. HI: Measure on both pins 3 and 4 black to ground. HII measure on both pins 13 and 14 black to ground.	153
31	Electrovalve firm/soft suspension	R = 3-5 Ohm, when valve is operated suspension is soft. HI: Measure between pin 9 black and ground. HII: Measure between pin 1 white and ground. When valve is activated measure 12 volt, followed by an alternating signal at a few hundred Hertz.	433
32	Back electrovalve firm/soft suspension	Only present on Hydroactive II. R = 3-5 Ohm, when valve is operated suspension is soft. HII: Measure between pin 2 white and ground. When valve is activated measure 12 volt, followed by an alternating signal at a few hundred Hertz.	
53	ECU power supply	HI: check fuse 34. HII: check fuse 7.	
54	ECU malfunction		

Code	Description	Check	Comp
****	ECUABS(Tevesversion)	Tevesversioniswithtwoseperatureunits,Bendix hasvalvesandecuintegrated.	
11	Endtest		***
12	Starttest		***
13	Electrovalvessupply	checkresistanceonelectrovalves2-4Ohmeach. Pin1,2,3,4,5on7pinconnectoragainstpin5on5 pinconnector	41
15	Electrovalvesrelais.	Checkresistancebetweenpin2and3on5pin connector50-60Ohm	41
21	Electrovalvesrelais.	Checkresistancebetweenpin2and3on5pin connector50-60Ohm	41
22	Electrovalvesrelais.	Checkwiringtoelectrovalvesonshortcircuitor looseconnection	
24	LHrearwheelsensor	MeasureR=1-1,4kOhm(after3-94R=2,2-3,2kOhm),betweenpin15and32onECU	157
25	RHfrontwheelsensor	MeasureR=1-1,4kOhm(after3-94R=2,2-3,2kOhm),betweenpin16and33onECU	156
31	RHrearwheelsensor	MeasureR=1-1,4kOhm(after3-94R=2,2-3,2kOhm),betweenpin17and34onECU	158
32	LHfrontwheelsensor	MeasureR=1-1,4kOhm(after3-94R=2,2-3,2kOhm),betweenpin18and35onECU	155
33	LHrearwheelsensorsignal	Checksignal,checkair-gapbetweenteeth-sensor, checkteethcondition	157
34	RHfrontwheelsensorsignal	Checksignal,checkair-gapbetweenteeth-sensor, checkteethcondition	156
35	RHrearwheelsensorsignal	Checksignal,checkair-gapbetweenteeth-sensor, checkteethcondition	158
41	LHfrontwheelsensorsignal	Checksignal,checkair-gapbetweenteeth-sensor, checkteethcondition	155
42	ElectrovalveRHfrontinlet	Checkresistanceofelectrovalvebetweenpin2on 7pinconnectorandpin5on5pinconnector	41
43	ElectrovalveRHfrontreturn	Checkresistanceofelectrovalve2-4Ohmbetween pin4on7pinconnectorandpin5on5pin connector	41
44	ElectrovalveLHfrontinlet	Checkresistanceofelectrovalve2-4Ohmbetween pin3on7pinconnectorandpin5on5pin connector	41
45	ElectrovalveLHfrontreturn	Checkresistanceofelectrovalve2-4Ohmbetween pin5on7pinconnectorandpin5on5pin connector	41
51	Electrovalverear	Checkresistanceofelectrovalve2-4Ohmbetween pin1on7pinconnectorandpin5on5pin connector	41
55	ErrorinECUmemory		140

Code	Description	Check
****	ECUABS(Bendixversion)	Tevesversioniswithtwoseperatureunits,Bendix hasvalvesandecuintegrated.
11	Endtest	
12	Starttest	
13	Electrovalvessupply	
15	Electrovalvesrelais.	CheckRelais
21	Electrovalvesrelais.	CheckRelais
22	Electrovalvesrelais.	CheckRelais
24	LHrearwheelsensor	MeasureR=1-1,4kOhm(Bendixtype)orR=2,2-3,2kOhm(Bendix/Siemenstype),betweenpin19 and28onECU
25	RHfrontwheelsensor	MeasureR=1-1,4kOhm(Bendixtype)orR=2,2-3,2kOhm(Bendix/Siemenstype),betweenpin1 and6onECU
31	RHrearwheelsensor	MeasureR=1-1,4kOhm(Bendixtype)orR=2,2-3,2kOhm(Bendix/Siemenstype),betweenpin29 and31onECU
32	LHfrontwheelsensor	MeasureR=1-1,4kOhm(Bendixtype)orR=2,2-3,2kOhm(Bendix/Siemenstype),betweenpin15 and30onECU
33	LHrearwheelsensorsignal	Checksignal,checkair-gapbetweenteeth-sensor, checkteethcondition
34	RHfrontwheelsensorsignal	Checksignal,checkair-gapbetweenteeth-sensor, checkteethcondition
35	RHrearwheelsensorsignal	Checksignal,checkair-gapbetweenteeth-sensor, checkteethcondition
41	LHfrontwheelsensorsignal	Checksignal,checkair-gapbetweenteeth-sensor, checkteethcondition
42	ElectrovalveRHfrontinlet	
43	ElectrovalveRHfrontreturn	
44	ElectrovalveLHfrontinlet	
45	ElectrovalveLHfrontreturn	
51	Electrovalverear	
55	ErrorinECUmemory	

Code	Description	Check	Comp
****	ECUAirconditioning(Full automatic,Semiautomatic with/withoutairco)		
11	Endtest		***
12	Starttest		***
13	Airflowdirectionvalveposition potentiometersignal	Fullautoonly;pin3blackvoltage should vary when changing vent position.	710
14	Airflowdirectionvalveposition potentiometers short-circuit		710
15	Recirculationvalveposition potentiometersignal	Fullautoonly;pin4blackvoltage should change when changing recirculation.	711
16	Recirculationvalveposition potentiometers short-circuit		711
17	Airflowdirectionvalveposition signalswingnotcorrect	Fullautomaticonly.ElectrovalveonRHsideof mid-console.	710
18	Hotair/coldaircontrolvalve positionsignalswingnotcorrect.	Fullautomaticonly.ElectrovalveonLHsideofmid-console.	700
21	Hotair/coldaircontrolvalve positionpotentiometersignal	Fullauto:pin15black.Other:pin3blue.Signal should vary when changing temperature between min and max.	700
22	Hotair/coldaircontrolvalve positionpotentiometers short-circuit		700
23	Evaporator temperaturesensor signal	Fullauto:Betweenpin14blackandpin1black. Semiauto:Betweenpin2blueandpin1black. R=10k@10C;6k@20C;5k@25C;4k@30C	912
24	Evaporator temperaturesensor short-circuit		912
25	Outdoortemperaturesensor signal	Inair-inlet.Fullauto:Betweenpin13blackandpin1black.Semiauto:Betweenpin1blueandpin1black.R=20k@10C;12,5k@20C;10k@25C; 8k@30C	908
26	Outdoortemperaturesensor short-circuit		908
27	Recirculationvalvepositionsignal swingnotcorrect	Fullautomaticonly.Electrovalveonblowerunit?	711
31	Interior temperaturesensorsignal	Fullauto:Betweenpin10blueandpin1black. Semiauto:Betweenpin5blackandpin1black. R=20k@10C;12,5k@20C;10k@25C;8k@30C	913
32	Interior temperaturesensorshort-circuit		913
33	Interiorairblowermotorsignal lineinterrupted	Semiautoonly.Ifonlyhighestspeedworks,check transistorsoncontrolmoduleonblowermotor.	681
34	Interiorairblowermotorsignal lineshort-circuit	Semiautoonly.	681
35	Hotair/coldairflapmotorline interrupted	Fullauto:Betweenpin6and7black.Semiauto: Betweenpin9and10blue.R=50Ohm.	700
36	Hotair/coldairflapmotorline short-circuit	Seefault35.Typicalfaultarewornmotorbrushes, whichcausesshort-circuit.Canbesolvedby reshapingbrushes(eg.withaknife).	700
41	Airblowerspeedpotentiometer signalinterrupted	Semiautoonly.Visuallycheckpotentiometertrack onpcb.	183
42	Airblowerspeedpotentiometer signalshort-circuited	Semiautoonly.Visuallycheckpotentiometertrack onpcb.	183
43	Temperatureselection potentiometersignalsignal interrupted	Semiautoonly.Visuallycheckpotentiometertrack onpcb.	182
44	Temperatureselection	Semiautoonly.Visuallycheckpotentiometertrack	182