Series1

Alldiagnosticconnectorsarelocatedintherighthandsideofthecarinthelargeblackbox. Thecovercaneasilyberemovedbyfirstremovingthefrontcoverexposingtherelaisfollowed bythetopcover.ThiswillexposetheECU's.FromfronttobackthefollowingECU'scanbe found(dependantontheequipmentinstalled)HydroactiveIorII,EngineECU,ABSECU.The diagnosticconnectorscanbefoundfloatingarroundintheECUcompartment,andcanbe identifiedbytheircolor.Thediagnosticconnectorsareprotectedbyacoverwhichcanbe removed.

Hydroactivediagnosticconnector:blue.

Enginediagnosticconnector:green(pin2)

ABSdiagnosticconnector:grey

Aircodiagnosticconnector:black

Series2

I'munsurefromwhat,tillwhattimethelarge30pinsdiagnosticconnectorisused.The connectoris3pinswideand10pinslongwiththeconnectorhousingbeingbrown.Thepins arenumbered1,2,3fromtoptobottomandA,B,C….,I,Jfromlefttoright.

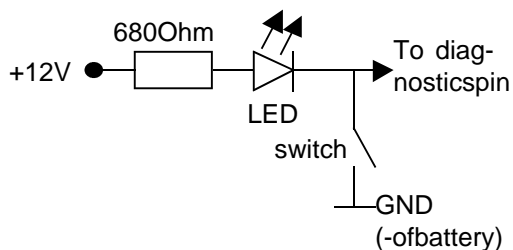Hydroactivediagnosticspin:E2

Enginediagnosticspin:C3

ABSdiagnosticspin:E1

Aircodiagnosticspin:F1

Thefollowingcircuitcanbeusedtoreadoutthediagnosticcodes.

```
        680Ohm        ▲▲
                      ◄◄
+12V ●──[_____]──────▷|──────────►  To diag-
                                     nosticspin
                      LED        │
                                 │
                   switch       ╲│
                                 └───┐
                                     │
                              └──GND
                              (-ofbattery)
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Incasethelarge30pinsdiagnosticconnectorispresentonlyawiretoconnectthediagnostic pintogroundisneeded.Thereadoutwillworkviathediagnosticlightsonthedashboard.(In caseitdoesn'twork,onecanalwaysrevertbacktothecircuitdescribedabove.)

Tostartreadoutofthecodes:

1.Connectthecircuitabove,withtheswitchopened.

2.Turnonignition

3.Within3secondsclosetheswitchfor3-5seconds,andopenitagain

4.Thestartcode12willapear.Blink,pause,blink,blink.

5.Presstheswitchagainfor3-5seconds,andopenitagain.

6a.Nowthediagnosticcodeswillfollowincasethereisanerrorcodestored.

6b.Ifnomorecodesarestoredtheendcode11willapear.Blink,pause,blink.

7arepeatstep5and6untilallcodesarereadout

7bAftertheendcodeyoucanclearallcodes.

Toclearallstorederrorcodes:

1.Firstreadoutallcodesdescribedabove

2.Aftertheendcode,closetheswitchforexcactly15seconds.

3.Opentheswitchagain

4.Nowallstoredcodesarecleared.

Alternativelyyoucaneraseallerrorcodesbydisconnectingthebatteryfor10(ormore) minutes.Thiswillnotonlyclearthecodes,butalsoerasethe'learned'settings(egforthe engine)andreferbacktofactorydefault.

Code	Description	Check	Comp
****	ECU XM Magneti Marelli G5	XM 2.0 RD ZXU10M Monopoint XM 2.0 R6A XU10J2 Monopoint (from '91)	***
11	Endtest		***
12	Starttest		***
13	Injection air temp sensor	4k@10C;2,5k@20C;680@55C	907
14	Cooling water temp sensor	4k@10C;2,5k@20C;680@55C;230@90C	909
21	Throttle spindle potentiometer	4,5V max swing on pin 2	770
22	Idling actuator/Idlespeed regulator		432
23	Idlespeed control failure		
31	Automatic adjustment air/fuel ratio	oxygen/lambda sensor too quick (disconnect heater element to resolve)	900
33	Inlet manifold air pressure sensor	170hPA:0.25V,1040hPA:4.8V between pin 9 and 12 (gnd) on ECU	903
34	Canister discharge valve (active carbon filter)		430
41	Engine speed sensor	345 Ohm between pin 14 and 31; check isolation to ground	152
42	Fuel injector	Check resistance of injector.1.5 Ohm	570
45	Ignition coil 1-4	Check voltage between pin 1 and ground, should be +12V. Check primary windings should be 1.4 Ohm (between pin 1 and 4 on coil), secondary 8.6 kOhm (Valeo) or 14 kOhm (Bosch)	
52	Air/fuel mixture control loop	inlet or outlet manifold leak or lambda-sensor failure	
54	ECU malfunction		142
57	Ignition coil 2-3	Check voltage between pin 2 and ground, should be +12V. Check primary windings should be 1.4 Ohm (between pin 2 and 4 on coil), secondary 8.6 kOhm (Valeo) or 14 kOhm (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	Checkogygensensor,inlet&outletmanifoldon leakage,fuelpressure,fuelinjectors,sparkplugs, airfilterelement,compression.	900
33	Inletmanifoldairpressuresensor	IsintegratedintheECUandcannotbechecked. CheckvacuumhosetoECU.	
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. CheckvacuumhosetoECU.	
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	Checkogygensensor,inlet&outletmanifoldon leakage,fuelpressure,fuelinjectors,sparkplugs, airfilterelement,compression.	900
33	Inletmanifoldairpressuresensor	IsintegratedintheECUandcannotbechecked. CheckvacuumhosetoECU.	903
34	Canisterdischargevalve(active carbonfilter)		430
41	Enginespeedsensor	320-340Ohmbetweenpin11and30;check isolationtoground	152
42	Fuelinjectors	Checkresistanceofeachinjector.Shouldbe16 Ohmeach.	570
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	ECUmalfunction		142

Code	Description	Check	Comp
****	ECU XM Bosch Motronic MP5.1.1	XM 2.0RFV XU10J4R/L/L3 (16V) Multiploint	***
11	Endtest		***
12	Starttest		***
13	Injection air temp sensor	4k@10C;2,5k@20C;680@55C	907
14	Cooling water temp sensor	4k@10C;2,5k@20C;680@55C;230@90C	909
21	Throttle spindle potentiometer	Closed 0.5V, fully open 4.5V (minimal)	770
22	Idling actuator/Idlespeed regulator		432
27	Vehicle speed sensor	R=300Ohm on sensor; When driving a speed relative signal on pin 9	154
31	Automatic adjustment air/fuel ratio	Check ogygensensor, inlet & outlet manifold on leakage, fuelpressure, fuelinjectors, sparkplugs, airfilterelement, compression.	900
33	Inlet manifold air pressure sensor	Is integrated in the ECU and cannot be checked. Check vacuum hose to ECU.	903
34	Canister discharge valve (active carbon filter)		430
41	Engine speed sensor	320-340Ohm between pin 11 and 30; check isolation to ground	152
42	Fuel injectors	Check resistance of each injector. Should be 16 Ohm each.	570
43	Engine knock control loop	correct fuelgrade, mechanical state engine	
44	Anti-knock sensor	Check mounting of sensor (torque: 20Nm)	150
51	Oxygen/lambda sensor	When engine hot and running should constantly change from 0 to 1V measured between pin 28 and pin 10.	900
52	Air/fuel mixture control loop	inlet or outlet manifold leak or lambda-sensor failure	
53	Sensor power supply	Pin 19, 2 and 14 should be connected to ground. Pin 18, 37 should have +10-15.5V on them (+ from battery)	
54	ECU malfunction		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=300Ohmonsensor;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	ECUmalfunction		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	Activaterelaisaircocompressor	822
****	ECUXMV6Fenix3B(Mixtureadjustment)	****
11	Makemixturericher	
22	Makemixtureleaner	
33	Programstart	
99	upperorlowerlimitreached	
****	ECUXMV6Fenix3B(Ignitiontimingadjustment)	****
11	2degreesadvance	
12	4degreesadvance	
13	6degreesadvance	
14	8degreesadvance	
19	defaultsetting	
22	Programstart	
99	upperorlowerlimitreached	

Code	Description	Check	Comp
****	ECUHydroactiveI/IIsuspension	VersionHIandHIIpinningaretotallydifferent.	****
11	Endtest		***
12	Starttest		***
21	Brakepressureswitch	Switchwillopenwhenfirmbrakepressureapplied (HImeasurebetweenpin7whiteandground,HII betweenpin11blackandgnd)	670
22	Acceleratorpedalposition potentiometer(situatedunder pedal)	Pedalup=3-4V;pedaldown<3V.HImeasure betweenpin10whiteandground.HIIbetweenpin 4blackandground.	771
23	Steeringwheelpositionsensor	Willalternatebetween0and+5Vwhenslowly movingsteeringwheel.HI:Measureonbothon pins6and13whitetopin12whitewhichis ground.HII:pin9,10,15blackand13whitearefor steeringwheelsensor.Twopinsforposition,other twoforpowersupplyandground.	159
24	Vehiclespeedsensor	HI:R=300Ohmonspeedsensor,whendrivingca 1,5Vonpin13black.HII:measurespeedsignalon pin11white.	154
25	Vehicleheightsensor	Willalternatebetween0and+5Vwhenvehicle heightischanged.HI:Measureonbothonpins3 and4blacktoground.HIImeasureonbothpins 13and14blacktoground.	153
31	Electrovalvefirm/softsuspension	R=3-5Ohm,whenvalveisoperatedsuspensionis soft.HI:Measurebetweenpin9blackandground. HII:Measurebetweenpin1whiteandground. Whenvalveisacivatedmeasure12volt,followed byanalternatingsignalatafewhundredHertz.	433
32	Backelectrovalvefirm/soft suspension	OnlypresentonHydroactiveII.R=3-5Ohm,when valveisoperatedsuspensionissoft.HII:Measure betweenpin2whiteandground.Whenvalveis acivatedmeasure12volt,followedbyan alternatingsignalatafewhundredHertz.	
53	ECUpowersupply	HI:checkfuse34.HII:checkfuse7.	
54	ECUmalfunction		

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;pin3blackvoltageshouldvary whenchangingventposition.	710
14	Airflowdirectionvalveposition potentiometershort-circuit		710
15	Recirculationvalveposition potentiometersignal	Fullautoonly;pin4blackvoltageshouldchange whenchangingrecirculation.	711
16	Recirculationvalveposition potentiometershort-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 shouldvarywhenchangingtemperaturebetween minandmax.	700
22	Hotair/coldaircontrolvalve positionpotentiometershort-circuit		700
23	Evaporatortemperaturesensor signal	Fullauto:Betweenpin14blackandpin1black. Semiauto:Betweenpin2blueandpin1black. R=10k@10C;6k@20C;5k@25C;4k@30C	912
24	Evaporatortemperaturesensor short-circuit		912
25	Outdoortemperaturesensor signal	Inair-inlet.Fullauto:Betweenpin13blackandpin 1black.Semiauto:Betweenpin1blueandpin1 black.R=20k@10C;12,5k@20C;10k@25C; 8k@30C	908
26	Outdoortemperaturesensor short-circuit		908
27	Recirculationvalvepositionsignal swingnotcorrect	Fullautomaticonly.Electrovalveonblowerunit?	711
31	Interiortemperaturesensorsignal	Fullauto:Betweenpin10blueandpin1black. Semiauto:Betweenpin5blackandpin1black. R=20k@10C;12,5k@20C;10k@25C;8k@30C	913
32	Interiortemperaturesensorshort-ciruit		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, whichcauseshort-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