Series 1

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 relais 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 arround 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
Airco diagnostic connector : black

Series 2

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.
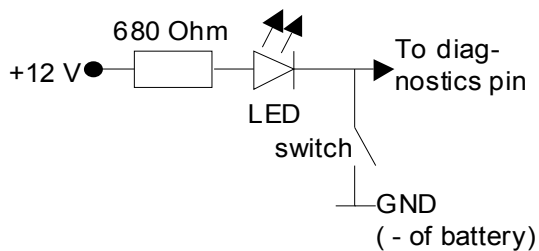
Hydroactive diagnostics pin : E2
Engine diagnostics pin : C3
ABS diagnostics pin : E1
Airco diagnostics pin : F1

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 apear. 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 apear. 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 excactly 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.

To test engine components:

Don't use this if you don't know what you are doing!!

1. Be sure ignition is turned off.
2. Close the switch
3. Turn on ignition
4. Within 1-12 seconds open the switch again
5. Wait some seconds
6. First code 91 will appear. Meaning the fuel pump will be activated periodically.
7. Close the switch for 3-5 seconds to test the next component.
8. Repeat until you arrived at the component which you want to test.

To tune the engine ecu:

Don't use this if you don't know what you are doing!! (I never tried it, so I don't guarantee it will work. It should work however on a Fenix 3B ecu (3.0 V6-12)

1. Be sure ignition is turned off.
2. Close the switch
3. Turn on ignition
4. Within 1-12 seconds open the switch again
5. Within 3 seconds close the switch again for 3-5 seconds.
6. Open the switch for 3 seconds (5 max)
7. Close the switch again for 3-5 seconds.
8. Open the switch again.
9. The ECU should indicate code 22 by blinking. Meaning program start.
10. Enter code 2 by means of close 5 secs, open 3 secs, close 5 secs, open again.
11. The ECU will return 12 by blinking. Meaning 4 degrees ignition advance.
12. Close switch for 10-20 seconds. ECU will indicate code 11, meaning 2 degrees earlier.

Regretfully I don't have more data on this.

Code	Description	Check	Comp
****	ECU XM Magneti Marelli G5	XM 2.0 RDZ XU10M Monopoint XM 2.0 R6A XU10J2 Monopoint (from '91)	***
11	End test		***
12	Start test		***
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 / Idle speed regulator		432
23	Idle speed 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	170 hPA : 0.25V, 1040 hPA : 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 8.6kOhm (Valeo) or 14kOhm (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 8.6kOhm (Valeo) or 14kOhm (Bosch)	

Code	Description	Check	Comp
****	ECU XM Bosch Motronic MP3.1	XM 2.0 RFZ XU10J2/Z Multipoint (till jun-93)	***
11	End test		***
12	Start test		***
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 / Idle speed regulator		432
31	Automatic adjustment air/fuel ratio	Check ogygen sensor, inlet&outlet manifold on leakage, fuel pressure, fuel injectors, spark plugs, air filter element, compression.	900
33	Inlet manifold air pressure sensor	Is integrated in the ECU and cannot be checked. Check vacuum hose to ECU.	
34	Canister discharge valve (active carbon filter)		430
41	Engine speed sensor	245 Ohm between pin 23 and 25; check isolation to ground	152
51	Oxygen/lambda sensor	When engine hot and running should constantly change from 0 to 1V measured between pin 24 and pin 8.	900
52	Air/fuel mixture control loop	inlet or outlet manifold leak or lambda-sensor failure	
53	Sensor power supply	Pin 16 and 5 should be connected to ground. Pin 18 should have +12V.	
54	ECU malfunction		142

Code	Description	Check	Comp
****	ECU XM Bosch Motronic MP3.2	XM 2.0 Turbo RGY or RGX XU10J2T/Z/L/L3 Multipoint	***
	Warning: Not checked against actual schematics!		
11	End test		***
12	Start test		***
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 / Idle speed regulator		432
31	Automatic adjustment air/fuel ratio	Check ogygen sensor, inlet&outlet manifold on leakage, fuel pressure, fuel injectors, spark plugs, air filter element, compression.	900
33	Inlet manifold air pressure sensor	Is integrated in the ECU and cannot be checked. Check vacuum hose to ECU.	
34	Canister discharge valve (active carbon filter)		430
41	Engine speed sensor	330 Ohm between pin 48 and 49; check isolation to ground	152
43	Engine knock control loop	correct fuel grade, 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		
54	ECU malfunction		142
65	Sensor reference cylinder		
71	Fuel injector 1	Check fuel injector resistance. Should be 16 Ohm each.	
72	Fuel injector 2	Check fuel injector resistance. Should be 16 Ohm each.	
73	Fuel injector 3	Check fuel injector resistance. Should be 16 Ohm each.	
74	Fuel injector 4	Check fuel injector resistance. Should be 16 Ohm each.	

Code	Description	Check	Comp
****	ECU XM Bosch Motronic MP5.1	XM 2.0 RFZ XU10J2/Z Multipoint (from jul-93)	***
11	End test		***
12	Start test		***
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 / Idle speed regulator		432
31	Automatic adjustment air/fuel ratio	Check ogygen sensor, inlet&outlet manifold on leakage, fuel pressure, fuel injectors, spark plugs, air filter element, 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	320-340 Ohm between pin 11 and 30; check isolation to ground	152
42	Fuel injectors	Check resistance of each injector. Should be 16 Ohm each.	570
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
****	ECU XM Bosch Motronic MP5.1.1 XM 2.0 RFV XU10J4R/L/L3 (16V) Multiploint		***
11	End test		***
12	Start test		***
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 / Idle speed regulator		432
27	Vehicle speed sensor	R=300 Ohm on sensor; When driving a speed relative signal on pin 9	154
31	Automatic adjustment air/fuel ratio	Check ogygen sensor, inlet&outlet manifold on leakage, fuel pressure, fuel injectors, spark plugs, air filter element, 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	320-340 Ohm 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 fuel grade, 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
****	ECU XM V6 Fenix 3B		***
11	End test		***
12	Start test		***
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
15	Fuel pump relais		807
21	Throttle spindle potentiometer	4,5V max swing on pin 9	770
22	Idling actuator / Idle speed regulator		432
23	Throttle spindle potentiometer idle value	0,5 +/- 0,1V between pin 9 and 17 (gnd)	770
27	Vehicle speed sensor	R=300 Ohm on sensor; When driving 1,5Volt on pin 3	154
31	Automatic adjustment air/fuel ratio	oxygen/lambda sensor too quick (disconnect heater element to resolve)	900
33	Inlet manifold air pressure sensor	400Pa=2,5V; 600Pa=1,25V between pin 33 and 17 (gnd)	903
34	Canister discharge valve (active carbon filter)		430
36	Relais oxygen/lambda sensor heater		818
41	Engine speed sensor	330 Ohm between pin 11 and 28; check isolation to ground	152
42	Fuel injectors	14 Ohm each injector (2-3 Ohm between pin 20/21 and pin 30)	570
43	Engine knock control loop	correct fuel grade, mechanical state engine	
44	Front anti-knock sensor		150
51	Oxygen/lambda sensor	When engine hot and running should constantly change from 0 to 1V on pin 35 from pin 32 (gnd)	900
52	Air/fuel mixture control loop	inlet or outlet manifold leak	
53	Sensor power supply	10-15,5V on pin 4 ECU from gnd (pin 1).	
54	ECU malfunction		142
56	Anti-theft start code not entered		176
62	Rear anti-knock sensor		151

Code	Description	Comp
****	ECU XM V6 Fenix 3B (activate components)	****
	Component activation is performed	
91	Activate fuel pump relais	807
92	Activate fuel injectors	570
93	Activate idling actuator	432
94	Activate canister discharge valve	430
95	Activate relais airco compressor	822
****	ECU XM V6 Fenix 3B (Mixture adjustment)	****
11	Make mixture richer	
22	Make mixture leaner	
33	Program start	
99	upper or lower limit reached	
****	ECU XM V6 Fenix 3B (Ignition timing adjustment)	****
11	2 degrees advance	
12	4 degrees advance	
13	6 degrees advance	
14	8 degrees advance	
19	default setting	
22	Program start	
99	upper or lower limit reached	

Code	Description	Check	Comp
****	ECU Hydroactive I/II suspension	Version HI and HII pinning are totally different.	****
11	End test		***
12	Start test		***
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 on 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 Ohm on speed sensor, when driving ca 1,5V on pin 13 black. HII: measure 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 on 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 acivated 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 acivated measure 12 volt, followed by an alternating signal at a few hundred Hertz.	
53	ECU powersupply	HI: check fuse 34. HII: check fuse 7.	
54	ECU malfunction		

Code	Description	Check	Comp
****	ECU ABS (Teves version)	Teves version is with two seperature units, Bendix has valves and ecu integrated.	
11	End test		***
12	Start test		***
13	Electrovalves supply	check resistance on electrovalves 2-4Ohm each. Pin 1,2,3,4,5 on 7 pin connector against pin 5 on 5 pin connector	41
15	Electrovalves relais.	Check resistance between pin 2 and 3 on 5 pin connector 50-60Ohm	41
21	Electrovalves relais.	Check resistance between pin 2 and 3 on 5 pin connector 50-60Ohm	41
22	Electrovalves relais.	Check wiring to electrovalves on shortcircuit or loose connection	
24	LH rear wheel sensor	Measure R=1-1,4kOhm (after 3-94 R=2,2-3,2kOhm), between pin 15 and 32 on ECU	157
25	RH front wheel sensor	Measure R=1-1,4kOhm (after 3-94 R=2,2-3,2kOhm), between pin 16 and 33 on ECU	156
31	RH rear wheel sensor	Measure R=1-1,4kOhm (after 3-94 R=2,2-3,2kOhm), between pin 17 and 34 on ECU	158
32	LH front wheel sensor	Measure R=1-1,4kOhm (after 3-94 R=2,2-3,2kOhm), between pin 18 and 35 on ECU	155
33	LH rear wheel sensor signal	Check signal, check air-gap between teeth-sensor, check teeth condition	157
34	RH front wheel sensor signal	Check signal, check air-gap between teeth-sensor, check teeth condition	156
35	RH rear wheel sensor signal	Check signal, check air-gap between teeth-sensor, check teeth condition	158
41	LH front wheel sensor signal	Check signal, check air-gap between teeth-sensor, check teeth condition	155
42	Electrovalve RH front inlet	Check resistance of electrovalve between pin 2 on 7 pin connector and pin 5 on 5 pin connector	41
43	Electrovalve RH front return	Check resistance of electrovalve 2-4 Ohm between pin 4 on 7 pin connector and pin 5 on 5 pin connector	41
44	Electrovalve LH front inlet	Check resistance of electrovalve 2-4 Ohm between pin 3 on 7 pin connector and pin 5 on 5 pin connector	41
45	Electrovalve LH front return	Check resistance of electrovalve 2-4 Ohm between pin 5 on 7 pin connector and pin 5 on 5 pin connector	41
51	Electrovalve rear	Check resistance of electrovalve 2-4 Ohm between pin 1 on 7 pin connector and pin 5 on 5 pin connector	41
55	Error in ECU memory		140

Code	Description	Check
****	ECU ABS (Bendix version)	Teves version is with two seperature units, Bendix has valves and ecu integrated.
11	End test	
12	Start test	
13	Electrovalves supply	
15	Electrovalves relais.	Check Relais
21	Electrovalves relais.	Check Relais
22	Electrovalves relais.	Check Relais
24	LH rear wheel sensor	Measure R=1-1,4kOhm (Bendix type) or R=2,2-3,2kOhm (Bendix/Siemens type), between pin 19 and 28 on ECU
25	RH front wheel sensor	Measure R=1-1,4kOhm (Bendix type) or R=2,2-3,2kOhm (Bendix/Siemens type), between pin 1 and 6 on ECU
31	RH rear wheel sensor	Measure R=1-1,4kOhm (Bendix type) or R=2,2-3,2kOhm (Bendix/Siemens type), between pin 29 and 31 on ECU
32	LH front wheel sensor	Measure R=1-1,4kOhm (Bendix type) or R=2,2-3,2kOhm (Bendix/Siemens type), between pin 15 and 30 on ECU
33	LH rear wheel sensor signal	Check signal, check air-gap between teeth-sensor, check teeth condition
34	RH front wheel sensor signal	Check signal, check air-gap between teeth-sensor, check teeth condition
35	RH rear wheel sensor signal	Check signal, check air-gap between teeth-sensor, check teeth condition
41	LH front wheel sensor signal	Check signal, check air-gap between teeth-sensor, check teeth condition
42	Electrovalve RH front inlet	
43	Electrovalve RH front return	
44	Electrovalve LH front inlet	
45	Electrovalve LH front return	
51	Electrovalve rear	
55	Error in ECU memory	

Code	Description	Check	Comp
****	ECU Airconditioning (Full automatic, Semi automatic with/without airco)		
11	End test		***
12	Start test		***
13	Airflow direction valve position potentiometer signal	Full auto only; pin 3 black voltage should vary when changing vent position.	710
14	Airflow direction valve position potentiometer short-circuit		710
15	Recirculation valve position potentiometer signal	Full auto only; pin 4 black voltage should change when changing recirculation.	711
16	Recirculation valve position potentiometer short-circuit		711
17	Airflow direction valve position signal swing not correct	Full automatic only. Electrovalve on RH side of mid-console.	710
18	Hot air/cold air control valve position signal swing not correct.	Full automatic only. Electrovalve on LH side of mid-console.	700
21	Hot air/cold air control valve position potentiometer signal	Full auto: pin 15 black. Other: pin 3 blue. Signal should vary when changing temperature between min and max.	700
22	Hot air/cold air control valve position potentiometer short-circuit		700
23	Evaporator temperature sensor signal	Full auto: Between pin 14 black and pin 1 black. Semi auto: Between pin 2 blue and pin 1 black. R=10k@10C; 6k@20C; 5k@25C; 4k@30C	912
24	Evaporator temperature sensor short-circuit		912
25	Outdoor temperature sensor signal	In air-inlet. Full auto: Between pin 13 black and pin 1 black. Semi auto: Between pin 1 blue and pin 1 black. R=20k@10C; 12,5k@20C; 10k@25C; 8k@30C	908
26	Outdoor temperature sensor short-circuit		908
27	Recirculation valve position signal swing not correct	Full automatic only. Electrovalve on blower unit?	711
31	Interior temperature sensor signal	Full auto: Between pin 10 blue and pin 1 black. Semi auto: Between pin 5 black and pin 1 black. R=20k@10C; 12,5k@20C; 10k@25C; 8k@30C	913
32	Interior temperature sensor short-ciruit		913
33	Interior air blower motor signal line interrupted	Semi auto only. If only highest speed works, check transistors on control module on blower motor.	681
34	Interior air blower motor signal line short-circuit	Semi auto only.	681
35	Hot air/cold air flap motor line interrupted	Full auto: Between pin 6 and 7 black. Semi auto: Between pin 9 and 10 blue. R=50Ohm.	700
36	Hot air/cold air flap motor line short-circuit	See fault 35. Typical fault are worn motor brushes, which cause short-circuit. Can be solved by reshaping brushes (eg. with a knife).	700
41	Air blower speed potentiometer signal interrupted	Semi auto only. Visually check potentiometer track on pcb.	183
42	Air blower speed potentiometer signal short-circuited	Semi auto only. Visually check potentiometer track on pcb.	183

43	Temperature selection potentiometer signal signal interrupted	Semi auto only. Visually check potentiometer track on pcb.	182
44	Temperature selection potentiometer signal signal short-circuit	Semi auto only. Visually check potentiometer track on pcb.	182
46	Airco compressor electro-magnetic clutch	Full and semi auto: pin 2 white. Check if short circuit in wiring.	255
51	Recirculation flap motor line interrupted?	Full auto only. Between pin 8 and 9 black measure R=50Ohm.	711
52	Recirculation flap motor line short-circuit?	See fault 51. Typical fault are worn motor brushes, which cause short-circuit. Can be solved by reshaping brushes (eg. with a knife).	711
53	Airflow direction flap motor line interrupted	Full auto only. Between pin 10 and 11 black measure R=50Ohm.	710
54	Airflow direction flap motor line short-circuit	See fault 53. Typical fault are worn motor brushes, which cause short-circuit. Can be solved by reshaping brushes (eg. with a knife).	710
55	Cooling water temperature sensor signal	Full auto only. Measure between pin 11 blue and pin 1 black.	916
56	Cooling water temperature sensor short-circuit		916
63	Interior air blower motor signal line interrupted	Full auto only. If only highest speed works, check transistors on control module on blower motor.	681
64	Interior air blower motor signal line short-circuit	Full auto only.	681