

System Description

General

HFM (*hot film air mass measurement*) is a system for controlling fuel injection and ignition that is found only on Mercedes cars. The system is used on both 4- and 6-cylinder engines. The advantage of using hot film is that the technique provides automatic air density compensation (eg height above sea level).

Because of stricter exhaust gas emission requirements, the system differs for different year models and countries.

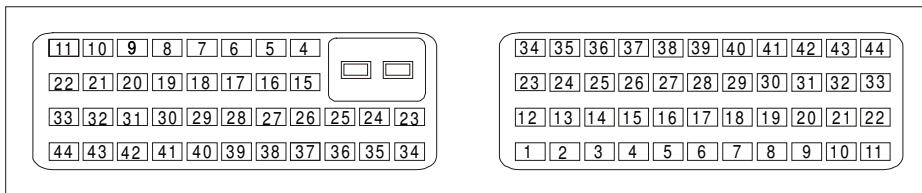
In most cases idling is controlled by a separate controller. The HFM controller receives idling information from the CAN bus. As a result, fault diagnosis of injectors is not possible above 1000 rpm.

Summary – Car Models

The following car models are equipped with HFM:

Class	Model	Year	Engine
C 180	202	96-98	1.8L
C 200	202	96-98	2.0L
C 200 K	202	96-98	2.0L
C 220	202	93-97	2.2L
C 230 K	202	95-98	2.3L
C 230	202	96-98	2.3L
C 280	202	93-97	2.8L
220 E /CE /TE	124	92-95	2.2L
280 E /TE	124	92-95	2.8L
320 E /CE /TE	124	92-95	3.2L
E 200	210	95-98	2.0L
E 230	210	95-97	2.3L
E 280	210	95-97	2.8L
E 320	210	95-97	3.2L
S 280	140	92-98	2.8L
300 SE	140	92-98	3.0L
S 320	140	93-98	3.2L
SL 280	129	93-98	2.8L
SL 320	129	93-98	3.2L

Interface - Signal Locations



A

B

- | | | | |
|-----|---|-----|--|
| A4 | Fuel cut-off from EA/CC/LLR | A26 | Lambda sensor 2 shield signal (not model 124) |
| A5 | Octane selection ground (certain systems) | A27 | Power supply from main relay |
| A6 | Octane selection (certain systems) | A28 | Not connected |
| A7 | Fuel consumption signal | A29 | Control signal to fuel pump relay |
| A8 | Signal from speed sensor | A30 | Lambda sensor 1 pre-heating |
| A9 | Transmission overload protection switch | A31 | Lambda sensor 2 pre-heating (not model 124, 210) |
| A10 | Idle speed signal from EA/CC/LLR (certain systems) | A32 | Ground from chassis |
| A11 | Status signal from air conditioning system (certain systems) | A33 | Ground to sensors |
| A15 | Lambda 1 to OBD2 (not modell 124) | A34 | Lambda sensor 1 ground |
| A16 | Lambda2 to OBD2 (not modell 124) | A35 | Signal from lambda sensor (certain systems) |
| A17 | Camshaft sensorsignal to OBD2 | A36 | Lambda sensor 1 shield signal (>11/94) |
| A18 | Engine speed signal to revolution counter | A37 | Temperature sensor cat. |
| A19 | Diagnosis | A38 | Temperature sensor cat. |
| A20 | Status signal from automatic gear (certain systems) | A39 | Power supply from main relay |
| A21 | Starter motor signal terminal 50 | A40 | Constant power supply from battery |
| A22 | Cruise control signal on/off (4-cylinder)
Clutch pedal switch (6-cylinder) | A41 | Lambda sensor 2 pre-heating |
| A23 | CO potentiometer (not cat) | A42 | Upshift delay (certain systems) |
| A24 | Ground to lambda sensor 2 (certain systems) | A43 | Control signal to tank ventilation valve |
| A25 | Signal from lambda sensor 2 (certain systems) | A44 | Ground to OBD2 |

INTERFACE - SIGNAL LOCATIONS

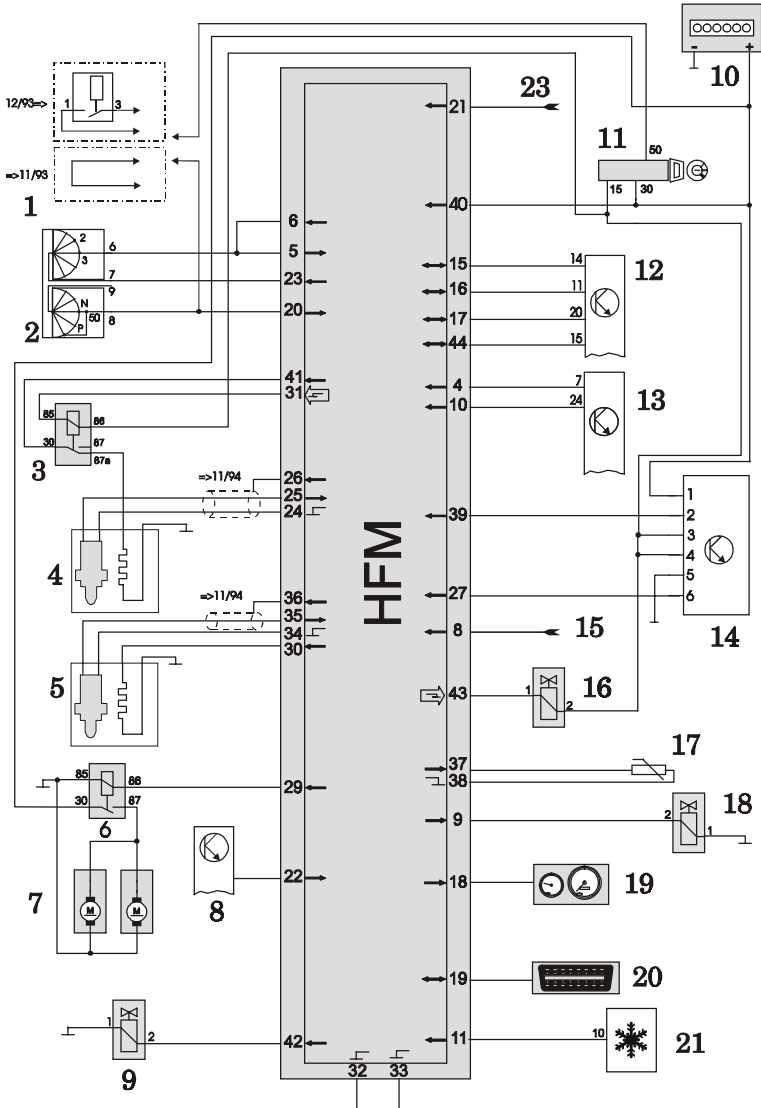
B1	Control signal to adjustable camshaft sensor	B26	Control signal to idle speed correction (certain systems)
B2	Control signal to injection valve, cylinder 4/3 (6-cylinder)	B27	Ground to air mass meter
B3	Control signal to injection valve, cylinder 4 (6-cylinder)	B28	Ground to air/coolant temperature sensor
B4	Control signal to idle speed correction (certain systems)	B29	Ground to crankshaft sensor
B5	Signal from air mass meter	B30	Signal from crankshaft sensor
B6	Ground to ISC unit	B31	Not connected
B7	Signal from ISC potentiometer (certain systems)	B32	Not connected
B8	Signal from camshaft sensor	B33	Not connected
B9	Control signal to ignition coil	B34	Signal from idle switch (certain systems)
B10	Control signal to ignition coil	B35	Not connected
B11	Not connected	B36	Signal from coolant temperature sensor
B12	Control signal to injection valve, cylinder 3/5 (6-cylinder)	B37	Signal from air temperature sensor
B13	Control signal to injection valve, cylinder 2 (6-cylinder)	B38	Not connected
B14	Control signal to adjustable manifold valve (certain systems)	B39	Signal from throttle potentiometer (certain systems)
B15	Control signal to air pump (certain systems)	B40	Knock sensor 1 ground
B16	Not connected	B41	Knock sensor 1 signal
B17	Not connected	B42	Knock sensor 2 ground (not 4-cylinder)
B18	Power supply to ISC/throttle potentiometer (certain systems)	B43	Knock sensor 2 signal (not 4-cylinder)
B19	Ground to camshaft sensor	B44	Not connected
B20	Not connected		
B21	Control signal to ignition coil		
B22	Ground from chassis		
B23	Control signal to injection valve, cylinder 1		
B24	Control signal to injection valve, cylinder 2/6 (6-cylinder)		
B25	Control signal to EGR-valve (certain systems)		

Components - Wiring Diagram

- 1 Starter lock-out relay module
- 2 Starter lock signal
- 3 Relay lambda sensor 2 pre-heating
- 4 Lambda sensor 2 (after cat.)
- 5 Lambda sensor 1 (before cat.)
- 6 Relay fuel pump
- 7 Fuel pump
- 8 Cruise control module
- 9 Delay valve
- 10 Battery
- 11 Ignition coil
- 12 Control unit OBD2
- 13 Control unit EA/CC/LLR
- 14 Relay with surge protection
- 15 Speed signal
- 16 Tank ventilation
- 17 Temperature sensor cat.
- 18 Transmission overload protection valve
- 19 Revolution counter
- 20 Diagnosis terminal
- 21 Air condition
- 22 Clutch pedal switch
- 23 Signal from starter motor
- 30 Air mass meter
- 31 Adjustable camshaft sensor
- 32 Adjustable manifold valve
- 33 EGR valve
- 34 Relay air pump
- 35 Valve air pump
- 36 Air pump
- 37 Camshaft sensor
- 38 Ignition coil
- 39 Knock sensor
- 40 Injector
- 41 Crankshaft sensor
- 42 Intake air temperature sensor
- 43 Engine coolant temperature sensor
- 44 ISC unit
- A Terminal 87

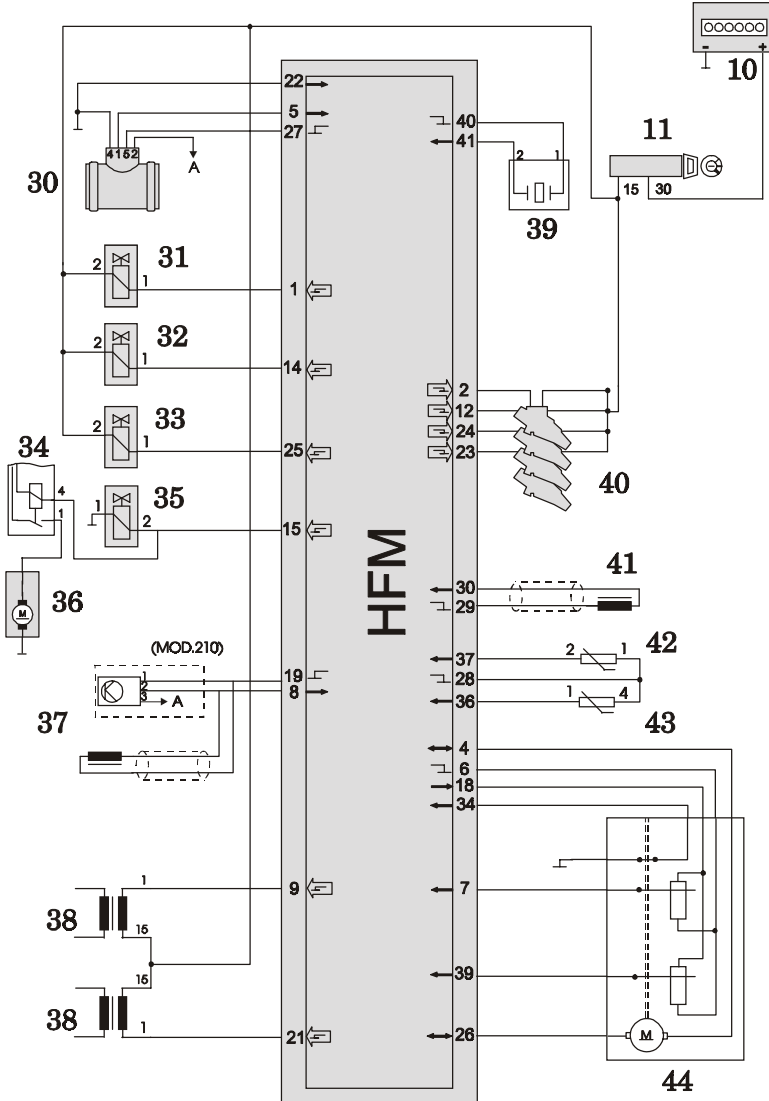
Wiring Diagram 4 cylinder connector A

This wiring diagram is an example. Check in the relevant workshop manual for the diagram of the car you are working with.



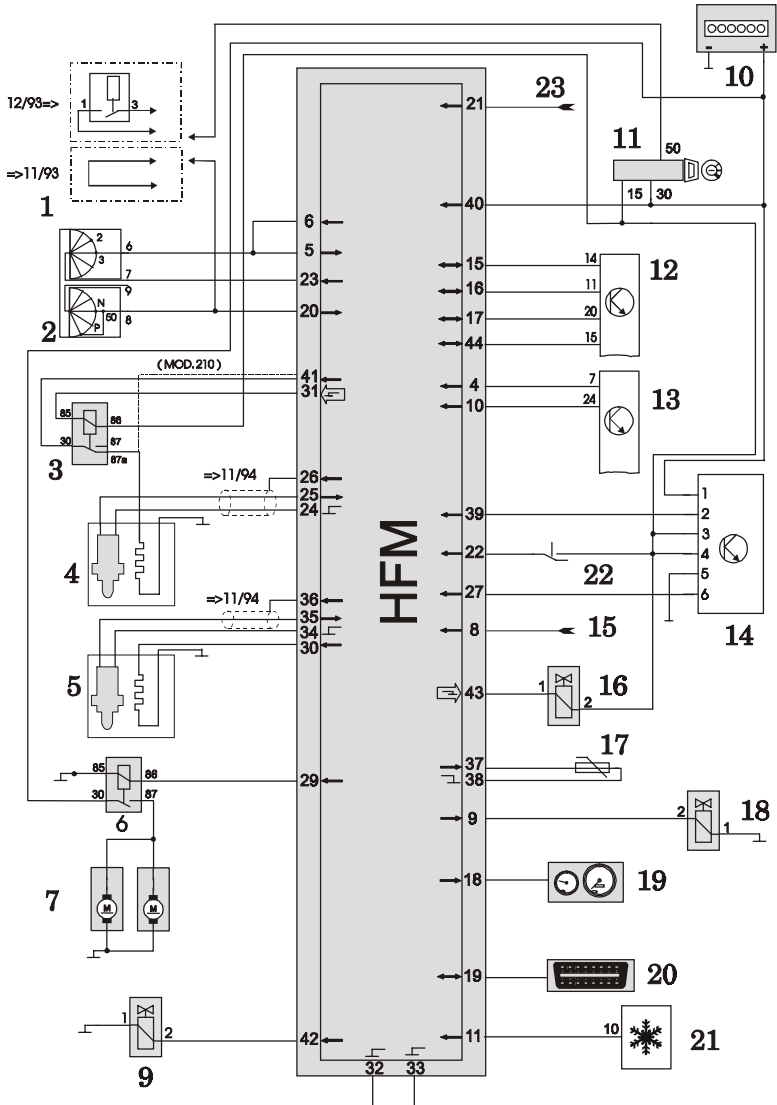
Wiring Diagram 4 cylinder conntector B

This wiring diagram is an example. Check in the relevant workshop manual for the diagram of the car you are working with.



Wiring Diagram 6 cylinder connector A

This wiring diagram is an example. Check in the relevant workshop manual for the diagram of the car you are working with.



Wiring Diagram 6 cylinder connector B

This wiring diagram is an example. Check in the relevant workshop manual for the diagram of the car you are working with.

